hinged window hardware catalog

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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 product. 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 buyer’s 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.

† 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.

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 90º. 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 90º.
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 90º. For this reason, the amount of opening must be limited to 45º 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

**13.13 Shown**

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* OPERATOR IS MOUNTED ON THE SIDE JAMB

### RECOMMENDED SCREWS

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

**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 90º - 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 90º 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 90º.

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**

**NOTES:**
1. REFER TO OPERATOR/HINGE COMPATIBILITY INFORMATION GIVEN FOR EACH OPERATOR. SEE RESPECTIVE CATALOG PAGE FOR THE OPERATOR OF YOUR CHOICE.

2. NOT FOR USE ON AWNING WINDOWS.

**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, UNDERCUT, SST, SHEET METAL SCREW.

- TRACK: 8(19115)#7X.750 PHILLIPS, FLAT HEAD, UNDERCUT, SST, SHEET METAL SCREWS.

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>A</th>
<th>C</th>
<th>D</th>
<th>L</th>
<th>ARM &amp; RIVET</th>
<th>ATTACHMENT</th>
<th>SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.05</td>
<td>4.906 (124.6mm)</td>
<td>9.625 (244.5mm)</td>
<td>4.953 (125.8mm)</td>
<td>10.000 (254.0mm)</td>
<td>ADJUSTABLE BRASS SNAP STUD</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>14.06</td>
<td>5.531 (140.5mm)</td>
<td>13.625(346.1mm)</td>
<td>4.805(122.1mm)</td>
<td>14.000(355.6mm)</td>
<td>STEEL SNAP STUD</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>14.08</td>
<td>6.938 (176.2mm)</td>
<td>13.625(346.1mm)</td>
<td>4.805(122.1mm)</td>
<td>14.000(355.6mm)</td>
<td>STANDARD BRASS SNAP STUD</td>
<td>A</td>
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<tr>
<td>14.75</td>
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<td>9.625 (244.5mm)</td>
<td>4.953 (125.8mm)</td>
<td>10.000 (254.0mm)</td>
<td>STEEL SNAP STUD</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>14.76</td>
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<td>4.805(122.1mm)</td>
<td>14.000(355.6mm)</td>
<td>STEEL SNAP STUD</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Δ 14.77</td>
<td>2.281 (57.9mm)</td>
<td>9.625 (244.5mm)</td>
<td>4.953 (125.8mm)</td>
<td>10.000 (254.0mm)</td>
<td>STAINLESS STEEL SNAP STUD</td>
<td>A</td>
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<tr>
<td>14.17</td>
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<td>4.805(122.1mm)</td>
<td>14.000(355.6mm)</td>
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</tr>
<tr>
<td>14.80</td>
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<td>10.000 (254.0mm)</td>
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<td></td>
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<tr>
<td>14.91</td>
<td>5.531 (140.5mm)</td>
<td>13.625(346.1mm)</td>
<td>4.805(122.1mm)</td>
<td>14.000(355.6mm)</td>
<td>STAINLESS STEEL SNAP STUD</td>
<td>B</td>
<td></td>
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<tr>
<td>Δ 14.93</td>
<td>2.281 (57.9mm)</td>
<td>9.625 (244.5mm)</td>
<td>4.953 (125.8mm)</td>
<td>10.000 (254.0mm)</td>
<td>STAINLESS STEEL SNAP STUD</td>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>
A self location stud option is available on the following hinges to aide in the ease of installation:

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
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 X 1/16"=.042" (APPROX. 3/64")


   THE MAXIMUM 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

NOTES:
1. NOT FOR USE ON AWNING WINDOWS.

RECOMMENDED SCREWS

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. 2  APPLICATION OF 14.12 CONCEALED MAXIM EGRESS HINGE

STAINLESS STEEL VERSION AVAILABLE

DIMENSION LINE IS FROM END OF TRACK WHEN CLOSED

NOTES:
1. NOT FOR USE ON AWNING WINDOWS.

RECOMMENDED SCREWS FOR WOOD AND PVC APPLICATIONS:

(LENGTH AND THREAD TYE 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

LIPPED WINDOW (SHOWN) REQUIRES A 4-BAR 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 X 1/16" = .042" (APPROX. 3/64")


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 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
ACCESSORIES.

2. Choose High Performance Hinge style (and other recommended hardware) specified by part number using the hinge chart (Fig. 6) or the 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” x 1 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 guidelines 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 come 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

<table>
<thead>
<tr>
<th>Hardware System</th>
<th>Part Number</th>
<th>Description</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Performance Hinges</strong></td>
<td>14.10.00.511.1</td>
<td>HGE CSM LL TRK NF WSH SS HGE CSM LL ARM WSH SS</td>
<td>KD LL Track and Arm</td>
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<td></td>
<td>14.10.00.513.1</td>
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<tr>
<td></td>
<td>14.10.00.512.1</td>
<td>HGE CSM UL TRK NF WSH SS HGE CSM UL ARM WSH SS</td>
<td>KD UL Track and Arm</td>
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<td></td>
<td>14.10.00.514.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hinge Stop</strong></td>
<td>33506</td>
<td>SHOE STOP, HINGE SS3</td>
<td>Using screw hole on track or near stud to prevent shoe from sliding out of track</td>
</tr>
<tr>
<td><strong>Snubber</strong></td>
<td>23555.92</td>
<td>Die cast zinc (can be applied with #10 PH, or Pop rivet)</td>
<td>Using the same screw boss as hinge screw on the side wall</td>
</tr>
<tr>
<td></td>
<td>23557.92</td>
<td>Die cast zinc (To be applied with #8 FH)</td>
<td>Using the same screw boss as hinge screw on the side wall</td>
</tr>
<tr>
<td><strong>Adjustable Wrench</strong></td>
<td>31887</td>
<td>WRENCH, ADJ STUD - COMBO</td>
<td>Adjustment made easy without disconnecting hinge arm</td>
</tr>
<tr>
<td><strong>Operator</strong></td>
<td></td>
<td></td>
<td>Please refer to Hardware Comparison Chart for operator selection along with hinges</td>
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<tr>
<td><strong>Standard Hinges</strong></td>
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<td></td>
<td>Please refer to Concealed casement for application information including the shim/spacer for larger cavity</td>
</tr>
<tr>
<td><strong>Locks</strong></td>
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<td></td>
<td>Please refer to Lock systems for application information</td>
</tr>
<tr>
<td><strong>Spacers</strong></td>
<td>23612 - Shim, 5.744&quot;</td>
<td></td>
<td>To be applied with standard Concealed Casement and Awning hinges to fit 5/8&quot;x1 3/16&quot; hinge cavity</td>
</tr>
<tr>
<td></td>
<td>23613 - Shim, 8.616&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23638 - Shim, 11.488&quot;</td>
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<tr>
<td><strong>Screws</strong></td>
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<td></td>
<td>Please refer to application print for specific screw sizes. Refer to technote #11 Truth Tips for additional information on screw selection</td>
</tr>
</tbody>
</table>
FIG. 1 APPLICATION OF CONCEALED HIGH PERFORMANCE CASEMENT HINGE

DIMENSION LINE IS FROM END OF TRACK WHEN CLOSED

ROLLER

NEGATIVE AIR RAMP

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

58°

110°

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
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 X 1/16" = .042" (APPROX. 3/64")


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 NAIF Casemen Window Hardware Load Test

**North American Fenestration Standards (AAAMA/WDMA/CSA 101/L.S. 2/A440-08)**

**CAUTION:** There are many factors in addition to the hardware which influence the maximum size case ment window that should be produced. These include sash and frame stiffness and strength, screen holding strength, sash ag, 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 II:** The maximum frame size and sash weight are listed in the table.

**Performance Classes L, C, HC, AH:** The maximum frame area (Width x Height) listed in the table must be reduced by 30%.

### Maximum Frame Size & Sash Weight for Operator & Hinge Combination Shown

<table>
<thead>
<tr>
<th>Operator</th>
<th>Maxim Washable</th>
<th>Maxim Egress</th>
<th>Heavy Duty</th>
<th>10&quot; Standard</th>
<th>10&quot; Washable</th>
<th>10&quot; Egress</th>
<th>10&quot; HP Concoed</th>
<th>Egress</th>
<th>Butt Hinge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxim Dual Arm 50.00</td>
<td>48&quot;W x 66&quot;H, 18.0/41 lbs</td>
<td>32&quot;W x 47&quot;H, 103/140 lbs</td>
<td>32&quot;W x 68&quot;H, 58 lbs</td>
<td>32&quot;W x 74&quot;H, 63 lbs</td>
<td>32&quot;W x 68&quot;H, 69 lbs</td>
<td>32&quot;W x 74&quot;H, 69 lbs</td>
<td>Not Recommended</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>Maxim Short Dual Arm 50.04</td>
<td>Not Recommended</td>
<td>32&quot;W x 68&quot;H, 69 lbs</td>
<td>Not Recommended</td>
<td>2&quot;W x 68&quot;H, 69 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Maxim Dyad 50.05</td>
<td>32&quot;W x 71&quot;H, 75 lbs (box 12)</td>
<td>Not Recommended</td>
<td>32&quot;W x 68&quot;H, 47 lbs</td>
<td>32&quot;W x 68&quot;H, 46 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Maxim Reverse Dyad 50.70</td>
<td>2.4&quot;W x 72&quot;H, 53 lbs</td>
<td>2.4&quot;W x 72&quot;H, 53 lbs</td>
<td>2.4&quot;W x 72&quot;H, 53 lbs</td>
<td>2.4&quot;W x 72&quot;H, 53 lbs</td>
<td>2.4&quot;W x 72&quot;H, 53 lbs</td>
<td>2.4&quot;W x 72&quot;H, 53 lbs</td>
<td>2.4&quot;W x 72&quot;H, 53 lbs</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Maxim Single Arm 50.01</td>
<td>Not Recommended</td>
<td>32&quot;W x 68&quot;H, 71 lbs</td>
<td>32&quot;W x 74&quot;H, 71 lbs</td>
<td>32&quot;W x 68&quot;H, 69 lbs</td>
<td>32&quot;W x 74&quot;H, 71 lbs</td>
<td>32&quot;W x 74&quot;H, 71 lbs</td>
<td>32&quot;W x 74&quot;H, 71 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maxim Single Arm 50.06</td>
<td>Not Recommended</td>
<td>22&quot;W x 63&quot;H, 42 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>EntryGuard Dual Arm 50.10</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EntryGuard Egress D.A. 50.15</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EntryGuard Dual Arm 50.11</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>24&quot;W x 67&quot;H, 48 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EntryGuard Single Arm 50.14</td>
<td>Not Recommended</td>
<td>22&quot;W x 67&quot;H, 42 lbs</td>
<td>Not Recommended</td>
<td>24&quot;W x 67&quot;H, 42 lbs</td>
<td>24&quot;W x 67&quot;H, 42 lbs</td>
<td>24&quot;W x 67&quot;H, 42 lbs</td>
<td>24&quot;W x 67&quot;H, 42 lbs</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>13.5 Single Arm 50.56</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>22&quot;W x 67&quot;H, 42 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5 Single Arm 50.55</td>
<td>Not Recommended</td>
<td>22&quot;W x 67&quot;H, 42 lbs</td>
<td>Not Recommended</td>
<td>22&quot;W x 67&quot;H, 42 lbs</td>
<td>22&quot;W x 67&quot;H, 42 lbs</td>
<td>22&quot;W x 67&quot;H, 42 lbs</td>
<td>22&quot;W x 67&quot;H, 42 lbs</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>6&quot; Single Arm 50.39</td>
<td>Not Recommended</td>
<td>18&quot;W x 67&quot;H, 35 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Arm 50.13</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Series Single Arm 13.3F 20.03</td>
<td>Not Recommended</td>
<td>24&quot;W x 67&quot;H, 53 lbs</td>
<td>30&quot;W x 67&quot;H, 69 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Series Single Arm 9.3F 20.01</td>
<td>Not Recommended</td>
<td>24&quot;W x 67&quot;H, 51 lbs</td>
<td>30&quot;W x 67&quot;H, 69 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Series Single Arm 17.3F 20.36</td>
<td>Not Recommended</td>
<td>24&quot;W x 67&quot;H, 51 lbs</td>
<td>30&quot;W x 67&quot;H, 69 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Series Single Arm 25.7F 20.78</td>
<td>Not Recommended</td>
<td>24&quot;W x 67&quot;H, 51 lbs</td>
<td>30&quot;W x 67&quot;H, 69 lbs</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 Series Dyad Long Link 20.49</td>
<td>37&quot;W x 67&quot;H, 64 lbs (21&quot;)</td>
<td>37&quot;W x 67&quot;H, 64 lbs</td>
<td>37&quot;W x 67&quot;H, 64 lbs</td>
<td>37&quot;W x 67&quot;H, 64 lbs</td>
<td>37&quot;W x 67&quot;H, 64 lbs</td>
<td>37&quot;W x 67&quot;H, 64 lbs</td>
<td>37&quot;W x 67&quot;H, 64 lbs</td>
<td>1.5</td>
<td></td>
</tr>
</tbody>
</table>

### Typical Mounting Positions - Used for Hardware Comparison

<table>
<thead>
<tr>
<th>Hinge</th>
<th>Operator</th>
<th>Bracket Position A</th>
<th>Bracket Position B</th>
<th>Operator Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.XX Concealed Hinges</td>
<td>Maxim Reverse Dyad</td>
<td>11.062</td>
<td>.813</td>
<td>Dual Arm &amp; Dyad determined by Bracket Position A.</td>
</tr>
<tr>
<td></td>
<td>Other Moesin</td>
<td>1.750</td>
<td>1.563</td>
<td>Single Arm per catalog.</td>
</tr>
<tr>
<td></td>
<td>EntryGuard Dual Arm w/10&quot; Washable Hinge</td>
<td>1.625</td>
<td>.875</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other EntryGuard Dual Arm Operators</td>
<td>1.375</td>
<td>1.563</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Traditional &amp; Ellipse</td>
<td>2.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.10 Heavy Duty Hinges</td>
<td>Maxim Reverse Dyad</td>
<td>11.062</td>
<td>.813</td>
<td>Dual Arm &amp; Dyad determined by Bracket Position A.</td>
</tr>
<tr>
<td></td>
<td>Other Moesin</td>
<td>1.750</td>
<td>1.563</td>
<td>Single Arm per catalog.</td>
</tr>
<tr>
<td></td>
<td>EntryGuard Single Arm</td>
<td>4.000</td>
<td></td>
<td>Catalog Dim B=8.000</td>
</tr>
<tr>
<td></td>
<td>Traditional &amp; Strike Single Arm</td>
<td>2.500</td>
<td></td>
<td>Operator is fully open (arm against stop) at 90° window position.</td>
</tr>
</tbody>
</table>

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.

1. The smallest sash weight shown in the table is the maximum permitted for the AAAMA Hardware Load Test. The sash weight shown in parenthesis is the maximum recommended by Truth to assure ease of operation.
2. If the sash weight in parenthesis exceeds the maximum permitted for the AAAMA Hardware Load Test, a counteracting force must be applied to the sash during the test to reduce the load to the level specified by AAAMA.
3. The Maxim Reverse Dyad Operator has been limited to use in windows 24" wide and narrower in order to ensure good performance near the 10" Point. In its full open position, it can support windows larger than those shown in the table.
4. This is the maximum rating of the hinge. Ease of operation is provided up to this weight.
5. 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 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: 8 (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.

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Model</th>
<th>Finish</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>24</td>
<td>00</td>
<td>208</td>
</tr>
<tr>
<td></td>
<td>Heavy Duty 10&quot; length</td>
<td>No decorative finish</td>
<td>W/Stop Std. open (Hinge Feature)</td>
</tr>
</tbody>
</table>

**CASEMENT**

**AWNING**
GUIDE TO 4-BAR HINGE SELECTION

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).

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.)

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.

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 operators.

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.

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

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

Stack height:______________________________
Application:_______________________________
Length:__________________________________
Functions:________________________________

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.
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

<table>
<thead>
<tr>
<th>MATL</th>
<th>CALL OUT &amp; (ACTUAL LENGTH)</th>
<th>PART NUMBER</th>
<th>STD. STOP</th>
<th>NO STOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>8&quot; 8.22&quot; [207.8 mm]</td>
<td>34.10.00</td>
<td>.101</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>10&quot; 10.22&quot; [258.6 mm]</td>
<td>34.11.00</td>
<td>.102</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>12&quot; 12.22&quot; [309.4 mm]</td>
<td>34.12.00</td>
<td>.100</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>14&quot; 14.22&quot; [360.2 mm]</td>
<td>34.13.00</td>
<td>.102</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>16&quot; 16.22&quot; [410.9 mm]</td>
<td>34.14.00</td>
<td>.100</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>18&quot; 18.22&quot; [461.8 mm]</td>
<td>34.15.00</td>
<td>.102</td>
<td></td>
</tr>
<tr>
<td>SST</td>
<td>20&quot; 20.22&quot; [512.7 mm]</td>
<td>34.16.00</td>
<td>.100</td>
<td>.101</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>PRODUCT NO.</th>
<th>MODEL</th>
<th>FINISH</th>
<th>ASSEMBLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>10</td>
<td>00</td>
<td>101</td>
</tr>
<tr>
<td>4-BAR HINGE</td>
<td>STD. LENGTH</td>
<td>DECORATIVE FINISH</td>
<td>W/ STOP STD. OPEN</td>
</tr>
</tbody>
</table>

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 (12.7 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 101/1.3 2/NAPS-02 "CASEMENT HARDWARE LOAD TEST".
### 4-BAR HINGE APPLICATION TABLE FOR PROJECTED & AWNING HINGES

(AS CERTIFIED TO AAMA 904.1)

<table>
<thead>
<tr>
<th>HINGE CALL OUT (ACTUAL LENGTH)</th>
<th>*COUNTERBALANCED</th>
<th>***ULTIMATE (SEE NOTE #2)</th>
<th>DEGREES OF OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SASH/VENT HEIGHT RANGE</td>
<td>MAX SASH VENT WEIGHT</td>
<td>SASH/VENT HEIGHT RANGE</td>
</tr>
<tr>
<td>8’ [8.18”] (207.8 mm)</td>
<td>9”-16” [229-406 mm]</td>
<td>19 LBS [8.6 KG]</td>
<td>9”-16” [229-406 mm]</td>
</tr>
<tr>
<td>12’ [12.18”] (309.4 mm)</td>
<td>20”-24” [508-610 mm]</td>
<td>28 LBS [12.7 KG]</td>
<td>20”-24” [508-610 mm]</td>
</tr>
<tr>
<td>14’ [14.18”] (360.2 mm)</td>
<td>23”-28” [584-711 mm]</td>
<td>33 LBS [15.0 KG]</td>
<td>23”-28” [584-711 mm]</td>
</tr>
<tr>
<td>16’ [16.18”] (410.9 mm)</td>
<td>28”-34” [711-864 mm]</td>
<td>40 LBS [18.1 KG]</td>
<td>28”-34” [711-864 mm]</td>
</tr>
<tr>
<td>18’ [18.18”] (461.8 mm)</td>
<td>28”-34” [711-864 mm]</td>
<td>40 LBS [18.1 KG]</td>
<td>28”-34” [711-864 mm]</td>
</tr>
<tr>
<td>20’ [20.18”] (512.6 mm)</td>
<td>32”-34” [813-864 mm]</td>
<td>40 LBS [18.1 KG]</td>
<td>32”-34” [813-864 mm]</td>
</tr>
</tbody>
</table>

**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”.

### 4-BAR HINGE APPLICATION TABLE FOR CASEMENT (SIDE HUNG) HINGES

(AS CERTIFIED TO AAMA 904.1)

<table>
<thead>
<tr>
<th>HINGE CALL OUT (ACTUAL LENGTH)</th>
<th>ULTIMATE (SEE NOTE #2)</th>
<th>DEGREES OF OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SASH/VENT HEIGHT RANGE</td>
<td>MAX SASH VENT WEIGHT</td>
</tr>
<tr>
<td>8’ [10.50”] (266.7mm)</td>
<td>12”-32” [305-914 mm]</td>
<td>65 LBS AT 32” [45.36 KG AT 914 mm]</td>
</tr>
<tr>
<td>10’ [12.50”] (317.5mm)</td>
<td>12”-32” [305-914 mm]</td>
<td>65 LBS AT 32” [45.36 KG AT 914 mm]</td>
</tr>
<tr>
<td>12’ [14.50”] (368.3mm)</td>
<td>12”-32” [305-914 mm]</td>
<td>65 LBS AT 32” [45.36 KG AT 914 mm]</td>
</tr>
<tr>
<td>14’ [16.50”] (419.1mm)</td>
<td>12”-32” [305-914 mm]</td>
<td>65 LBS AT 32” [45.36 KG AT 914 mm]</td>
</tr>
</tbody>
</table>

**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

NOTE: IF PREDRILLING, TRUTH RECOMMENDS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE DESIGN)

* NOTE: DIMENSIONS.

CENTERLINE OF SASH BAR

OFFSET BETWEEN SASH BAR & HINGE TRACK

.043in
[1.09mm ± 0.25]

CENTERLINE OF HINGE TRACK

.3575in
[9.1mm ± 0.01]

.010
[0.25mm ± 0.025]

.500 ± 0.030
[12.7mm ± 0.76]

.155 ± 0.010
[3.94mm ± 0.25]

.715 ± 0.030
[18.16mm ± 0.76]

.062" [1.5 MM]

ANGLE

.010.625
[30.12 ± 0.76mm]

.25 mm

6.65 ± 0.10
[168.82 ± 2.54mm]

.921 ± 0.030
[23.40 ± 0.76mm]
<table>
<thead>
<tr>
<th>HINGE CALL</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM HINGE LENGTH</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>&quot;F&quot; DIM</th>
<th>&quot;G&quot; DIM</th>
<th>&quot;H&quot; DIM</th>
<th>APPROX. ANGLE OF OPENING</th>
<th>NUMBER OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>34.10.00.XXX</td>
<td>8.22&quot; [208.8 mm]</td>
<td>NA</td>
<td>4.75&quot;  [120.7 mm]</td>
<td>5.19&quot;  [131.8 mm]</td>
<td>6.78&quot;  [172.2 mm]</td>
<td>5.59&quot;  [142.0 mm]</td>
<td>5.16&quot;  [131.1 mm]</td>
<td>3.63&quot;  [92.1 mm]</td>
<td>4.03&quot;  [102.4 mm]</td>
<td>55°  7</td>
</tr>
<tr>
<td>10&quot;</td>
<td>34.11.00.XXX</td>
<td>10.22&quot; [259.6 mm]</td>
<td>2.00&quot;   [50.8 mm]</td>
<td>5.75&quot;  [146.1 mm]</td>
<td>6.19&quot;  [157.3 mm]</td>
<td>8.78&quot;  [223.0 mm]</td>
<td>6.47&quot;  [164.3 mm]</td>
<td>6.03&quot;  [153.2 mm]</td>
<td>4.50&quot;  [114.3 mm]</td>
<td>4.99&quot;  [128.7 mm]</td>
<td>55°  8</td>
</tr>
<tr>
<td>12&quot;</td>
<td>34.12.00.XXX</td>
<td>12.22&quot; [310.4 mm]</td>
<td>2.00&quot;   [50.8 mm]</td>
<td>6.75&quot;  [171.5 mm]</td>
<td>7.19&quot;  [182.6 mm]</td>
<td>10.78&quot; [273.8 mm]</td>
<td>7.34&quot;  [196.4 mm]</td>
<td>6.91&quot;  [175.5 mm]</td>
<td>5.35&quot;  [135.9 mm]</td>
<td>5.75&quot;  [146.0 mm]</td>
<td>55°  8</td>
</tr>
<tr>
<td>14&quot;</td>
<td>34.13.00.XXX</td>
<td>14.22&quot; [361.2 mm]</td>
<td>2.00&quot;   [50.8 mm]</td>
<td>7.75&quot;  [196.9 mm]</td>
<td>8.19&quot;  [208.0 mm]</td>
<td>12.78&quot; [324.6 mm]</td>
<td>8.20&quot;  [208.3 mm]</td>
<td>7.78&quot;  [197.6 mm]</td>
<td>6.63&quot;  [168.3 mm]</td>
<td>6.41&quot;  [162.8 mm]</td>
<td>55°  8</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.14.00.XXX</td>
<td>16.22&quot; [411.9 mm]</td>
<td>2.00&quot;   [50.8 mm]</td>
<td>8.75&quot;  [222.3 mm]</td>
<td>9.19&quot;  [233.4 mm]</td>
<td>14.78&quot; [375.4 mm]</td>
<td>9.09&quot;  [230.9 mm]</td>
<td>8.76&quot;  [219.9 mm]</td>
<td>7.10&quot;  [180.3 mm]</td>
<td>7.50&quot;  [190.5 mm]</td>
<td>55°  8</td>
</tr>
<tr>
<td>18&quot;</td>
<td>34.15.00.XXX</td>
<td>18.22&quot; [462.8 mm]</td>
<td>2.00&quot;   [50.8 mm]</td>
<td>9.75&quot;  [247.7 mm]</td>
<td>10.19&quot; [258.8 mm]</td>
<td>16.78&quot; [426.2 mm]</td>
<td>9.97&quot;  [242.1 mm]</td>
<td>9.53&quot;  [242.1 mm]</td>
<td>7.47&quot;  [198.7 mm]</td>
<td>8.15&quot;  [207.0 mm]</td>
<td>55°  8</td>
</tr>
<tr>
<td>20&quot;</td>
<td>34.16.00.XXX</td>
<td>20.22&quot; [513.6 mm]</td>
<td>2.00&quot;   [50.8 mm]</td>
<td>10.75&quot; [273.1 mm]</td>
<td>11.19&quot; [284.2 mm]</td>
<td>18.78&quot; [477.0 mm]</td>
<td>10.84&quot; [275.3 mm]</td>
<td>10.41&quot; [264.4 mm]</td>
<td>8.84&quot;  [224.5 mm]</td>
<td>9.24&quot;  [234.7 mm]</td>
<td>55°  8</td>
</tr>
</tbody>
</table>
FIG. 5 TRUTH STANDARD DUTY 4-BAR HINGE W/O STOP
(ANDERBERG 201SS SERIES)
<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM HINGE LENGTH</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>&quot;F&quot; DIM</th>
<th>&quot;G&quot; DIM</th>
<th>&quot;H&quot; DIM</th>
<th>&quot;J&quot; DIM</th>
<th>APPROX. + ANGLE OF OPENING</th>
<th>NUMBER OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>34.10.00.XXX</td>
<td>8.22&quot; [208.8 mm]</td>
<td>NA</td>
<td>4.75&quot; [120.7 mm]</td>
<td>5.19&quot; [131.8 mm]</td>
<td>6.78&quot; [172.2 mm]</td>
<td>5.53&quot; [140.5 mm]</td>
<td>NA</td>
<td>5.13&quot; [130.3 mm]</td>
<td>5.25&quot; [133.4 mm]</td>
<td>55°</td>
<td>6</td>
</tr>
<tr>
<td>10&quot;</td>
<td>34.11.00.XXX</td>
<td>10.22&quot; [259.6 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>5.75&quot; [146.1 mm]</td>
<td>6.19&quot; [157.3 mm]</td>
<td>8.78&quot; [223.0 mm]</td>
<td>6.78&quot; [172.2 mm]</td>
<td>NA</td>
<td>6.36&quot; [161.5 mm]</td>
<td>6.37&quot; [161.8 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>12&quot;</td>
<td>34.12.00.XXX</td>
<td>12.22&quot; [310.4 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>6.75&quot; [171.5 mm]</td>
<td>7.19&quot; [182.6 mm]</td>
<td>10.78&quot; [273.8 mm]</td>
<td>7.78&quot; [197.6 mm]</td>
<td>NA</td>
<td>7.29&quot; [185.2 mm]</td>
<td>7.34&quot; [184.6 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>14&quot;</td>
<td>34.13.00.XXX</td>
<td>14.22&quot; [361.2 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>7.75&quot; [196.9 mm]</td>
<td>8.19&quot; [208.0 mm]</td>
<td>12.78&quot; [324.6 mm]</td>
<td>9.03&quot; [229.4 mm]</td>
<td>4.75&quot; [120.6 mm]</td>
<td>8.53&quot; [216.7 mm]</td>
<td>8.69&quot; [220.7 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.14.00.XXX</td>
<td>16.22&quot; [411.9 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>8.75&quot; [222.4 mm]</td>
<td>9.19&quot; [233.4 mm]</td>
<td>14.78&quot; [375.4 mm]</td>
<td>10.28&quot; [261.1 mm]</td>
<td>5.62&quot; [142.7 mm]</td>
<td>9.78&quot; [248.4 mm]</td>
<td>9.88&quot; [251.0 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>20&quot;</td>
<td>34.16.00.XXX</td>
<td>20.22&quot; [513.6 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>10.75&quot; [273.1 mm]</td>
<td>11.19&quot; [284.2 mm]</td>
<td>18.78&quot; [477.0 mm]</td>
<td>12.53&quot; [318.3 mm]</td>
<td>7.32&quot; [185.9 mm]</td>
<td>12.01&quot; [305.0 mm]</td>
<td>12.21&quot; [310.1 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
</tbody>
</table>

+ AAMA CYCLE TEST ANGLE

ULTIMATE OPENING ANGLE IS 77°
HEAVY DUTY 4-BAR HINGE PART NUMBER GUIDE

<table>
<thead>
<tr>
<th>MAT'L</th>
<th>HINGE CALLOUT (ACTUAL LENGTH)</th>
<th>PART NUMBER</th>
<th>STD. STOP</th>
<th>NO STOP</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Model</th>
<th>Finish</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>24</td>
<td>00</td>
<td>208</td>
</tr>
<tr>
<td>4-Bar Hinge</td>
<td>Heavy Duty 10&quot; Length</td>
<td>No Decorative Finish</td>
<td>W/ Stop Std. Open (Hinge Feature)</td>
</tr>
</tbody>
</table>

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 101/1.S 2/NAFS-02 “CASEMENT HARDWARE LOAD TEST”.

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

<table>
<thead>
<tr>
<th>HINGE CALL OUT &amp; (ACTUAL LENGTH)</th>
<th><em>COUNTERBALANCED</em></th>
<th><strong>ULTIMATE</strong> [SEE NOTE #2]</th>
<th>DEGREES OF OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SASH/VENT HEIGHT RANGE</td>
<td>MAX SASH VENT WEIGHT</td>
<td>SASH/VENT HEIGHT RANGE</td>
</tr>
<tr>
<td>10&quot; (10.50&quot;) [266.7mm]</td>
<td>12&quot;-20&quot; [305-508 mm]</td>
<td>58 LBS [26.3 KG]</td>
<td>12&quot;-20&quot; [305-508 mm]</td>
</tr>
<tr>
<td>12&quot; (12.50&quot;) [317.9mm]</td>
<td>20&quot;-26&quot; [508-635 mm]</td>
<td>73 LBS [33.1 KG]</td>
<td>20&quot;-26&quot; [508-635 mm]</td>
</tr>
<tr>
<td>14&quot; (14.50&quot;) [368.3mm]</td>
<td>23&quot;-29&quot; [584-737 mm]</td>
<td>85 LBS [39.0 KG]</td>
<td>23&quot;-29&quot; [584-737 mm]</td>
</tr>
<tr>
<td>16&quot; (16.50&quot;) [419.1mm]</td>
<td>25&quot;-34&quot; [635-864 mm]</td>
<td>99 LBS [44.9 KG]</td>
<td>25&quot;-40&quot; [635-1016 mm]</td>
</tr>
<tr>
<td>18&quot; (18.50&quot;) [469.9mm]</td>
<td>32&quot;-37&quot; [813-940 mm]</td>
<td>108 LBS [49.0 KG]</td>
<td>32&quot;-40&quot; [813-1143 mm]</td>
</tr>
<tr>
<td>20&quot; (20.50&quot;) [520.7mm]</td>
<td>34&quot;-40&quot; [864-1016 mm]</td>
<td>117 LBS [53.1 KG]</td>
<td>34&quot;-50&quot; [864-1270 mm]</td>
</tr>
<tr>
<td>24&quot; (24.50&quot;) [622.3mm]</td>
<td>40&quot;-44&quot; [1016-1118 mm]</td>
<td>129 LBS [58.5 KG]</td>
<td>40&quot;-60&quot; [1016-1524 mm]</td>
</tr>
<tr>
<td>28&quot; (28.50&quot;) [723.9mm]</td>
<td>50&quot;-64&quot; [1270-1626 mm]</td>
<td>175 LBS [79.4 KG]</td>
<td>50&quot;-80&quot; [1270-2032 mm]</td>
</tr>
</tbody>
</table>

++ AAMA CYCLE TEST ANGLE
++ ULTIMATE OPENING ANGLE

### 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 101/1.3 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST."
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.

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

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART #</th>
<th>“A”</th>
<th>HINGE LG</th>
<th>“B”</th>
<th>“C”</th>
<th>“D”</th>
<th>“E”</th>
<th>“F”</th>
<th>“G”</th>
<th>“H”</th>
<th>“J”</th>
<th>“K”</th>
<th>ANGLE</th>
<th># OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10”</td>
<td>34.24.00.XXX</td>
<td>10.50”</td>
<td>[266.7 mm]</td>
<td>NA</td>
<td>NA</td>
<td>6.50”</td>
<td>[165.1 mm]</td>
<td>7.00”</td>
<td>[177.8 mm]</td>
<td>8.59”</td>
<td>[218.2 mm]</td>
<td>6.34”</td>
<td>NA</td>
<td>4.38”</td>
</tr>
<tr>
<td>12”</td>
<td>34.25.00.XXX</td>
<td>12.50”</td>
<td>[317.5 mm]</td>
<td>2.56”</td>
<td>[65.0 mm]</td>
<td>NA</td>
<td>7.50”</td>
<td>[190.5 mm]</td>
<td>8.00”</td>
<td>[203.2 mm]</td>
<td>10.59”</td>
<td>[269.0 mm]</td>
<td>6.59”</td>
<td>NA</td>
</tr>
<tr>
<td>14”</td>
<td>34.26.00.XXX</td>
<td>14.50”</td>
<td>[368.3 mm]</td>
<td>2.56”</td>
<td>[65.0 mm]</td>
<td>NA</td>
<td>8.50”</td>
<td>[215.9 mm]</td>
<td>9.00”</td>
<td>[228.6 mm]</td>
<td>12.59”</td>
<td>[319.8 mm]</td>
<td>6.94”</td>
<td>NA</td>
</tr>
<tr>
<td>16”</td>
<td>34.27.00.XXX</td>
<td>16.50”</td>
<td>[419.1 mm]</td>
<td>2.56”</td>
<td>[65.0 mm]</td>
<td>5.06”</td>
<td>[128.5 mm]</td>
<td>9.50”</td>
<td>[241.3 mm]</td>
<td>10.00”</td>
<td>[254.0 mm]</td>
<td>14.59”</td>
<td>[370.6 mm]</td>
<td>7.66”</td>
</tr>
<tr>
<td>18”</td>
<td>34.28.00.XXX</td>
<td>18.50”</td>
<td>[469.9 mm]</td>
<td>2.56”</td>
<td>[65.0 mm]</td>
<td>6.06”</td>
<td>[153.9 mm]</td>
<td>10.50”</td>
<td>[266.7 mm]</td>
<td>11.00”</td>
<td>[290.3 mm]</td>
<td>16.59”</td>
<td>[421.4 mm]</td>
<td>8.28”</td>
</tr>
<tr>
<td>20”</td>
<td>34.29.00.XXX</td>
<td>20.50”</td>
<td>[520.7 mm]</td>
<td>2.56”</td>
<td>[65.0 mm]</td>
<td>7.06”</td>
<td>[179.3 mm]</td>
<td>11.50”</td>
<td>[292.1 mm]</td>
<td>12.00”</td>
<td>[304.8 mm]</td>
<td>18.59”</td>
<td>[472.2 mm]</td>
<td>8.97”</td>
</tr>
<tr>
<td>24”</td>
<td>34.31.00.XXX</td>
<td>24.50”</td>
<td>[622.3 mm]</td>
<td>2.56”</td>
<td>[65.0 mm]</td>
<td>9.06”</td>
<td>[230.1 mm]</td>
<td>13.50”</td>
<td>[342.9 mm]</td>
<td>14.00”</td>
<td>[355.6 mm]</td>
<td>22.59”</td>
<td>[573.8 mm]</td>
<td>9.09”</td>
</tr>
<tr>
<td>28”</td>
<td>34.86.00.XXX</td>
<td>28.50”</td>
<td>[723.9 mm]</td>
<td>2.56”</td>
<td>[65.0 mm]</td>
<td>11.06”</td>
<td>[280.9 mm]</td>
<td>15.50”</td>
<td>[393.7 mm]</td>
<td>16.00”</td>
<td>[406.4 mm]</td>
<td>26.59”</td>
<td>[675.4 mm]</td>
<td>9.59”</td>
</tr>
</tbody>
</table>
CASEMENT

AWNING

HEAVY DUTY

4-BAR HINGE

(301SS Series)

.073
[1.85mm]

1.85mm

.895±.010
[22.73mm±0.25]

.448
[11.37mm]

.895±.010
[22.73mm±0.25]

1.531±.030
[38.89mm±0.76]

1.382±.030
[35.10mm±0.76]

** AT AAMA CERTIFIED ANGLE

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

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

..FIG. 11 TRUTH HEAVY DUTY 4-BAR HINGE W/NO STOP

(CASERBERG 301SS SERIES)
### TRUTH HEAVY DUTY 4-BAR HINGE W/O STOP

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART #</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot;</th>
<th>&quot;H&quot;</th>
<th>&quot;J**&quot;</th>
<th>&quot;K***&quot;</th>
<th>AAMA CERTIFIED ANGLE</th>
<th># OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot;</td>
<td>34.24.00.XXX</td>
<td>10.50&quot; [266.7 mm]</td>
<td>NA</td>
<td>NA</td>
<td>6.50&quot; [165.1 mm]</td>
<td>7.00&quot; [177.8 mm]</td>
<td>8.59&quot; [218.2 mm]</td>
<td>7.22&quot; [183.4 mm]</td>
<td>NA</td>
<td>4.98&quot; [126.5 mm]</td>
<td>5.30&quot; [134.6 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>12&quot;</td>
<td>34.25.00.XXX</td>
<td>12.50&quot; [317.5 mm]</td>
<td>NA</td>
<td>NA</td>
<td>7.50&quot; [190.5 mm]</td>
<td>8.00&quot; [203.2 mm]</td>
<td>10.59&quot; [269.0 mm]</td>
<td>8.97&quot; [227.8 mm]</td>
<td>NA</td>
<td>6.16&quot; [156.5 mm]</td>
<td>6.48&quot; [164.6 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>14&quot;</td>
<td>34.26.00.XXX</td>
<td>14.50&quot; [368.3 mm]</td>
<td>NA</td>
<td>NA</td>
<td>8.50&quot; [215.9 mm]</td>
<td>9.00&quot; [228.6 mm]</td>
<td>12.59&quot; [319.8 mm]</td>
<td>10.47&quot; [265.9 mm]</td>
<td>NA</td>
<td>7.33&quot; [186.2 mm]</td>
<td>7.65&quot; [194.3 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.27.00.XXX</td>
<td>16.50&quot; [419.1 mm]</td>
<td>NA</td>
<td>NA</td>
<td>9.50&quot; [241.3 mm]</td>
<td>10.00&quot; [254.0 mm]</td>
<td>14.59&quot; [370.6 mm]</td>
<td>11.97&quot; [304.0 mm]</td>
<td>7.66&quot; [194.6 mm]</td>
<td>8.50&quot; [215.9 mm]</td>
<td>8.83&quot; [224.3 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>18&quot;</td>
<td>34.28.00.XXX</td>
<td>18.50&quot; [469.9 mm]</td>
<td>NA</td>
<td>NA</td>
<td>10.50&quot; [266.7 mm]</td>
<td>11.00&quot; [279.4 mm]</td>
<td>16.59&quot; [421.4 mm]</td>
<td>13.47&quot; [342.1 mm]</td>
<td>8.28&quot; [210.3 mm]</td>
<td>9.66&quot; [245.4 mm]</td>
<td>9.98&quot; [253.5 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>20&quot;</td>
<td>34.29.00.XXX</td>
<td>20.50&quot; [520.7 mm]</td>
<td>NA</td>
<td>NA</td>
<td>11.50&quot; [292.1 mm]</td>
<td>12.00&quot; [304.8 mm]</td>
<td>18.39&quot; [472.2 mm]</td>
<td>14.97&quot; [380.2 mm]</td>
<td>8.97&quot; [227.8 mm]</td>
<td>10.82&quot; [274.8 mm]</td>
<td>11.14&quot; [283.0 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>24&quot;</td>
<td>34.31.00.XXX</td>
<td>24.50&quot; [622.3 mm]</td>
<td>NA</td>
<td>NA</td>
<td>13.50&quot; [342.9 mm]</td>
<td>14.00&quot; [355.6 mm]</td>
<td>22.59&quot; [573.8 mm]</td>
<td>17.97&quot; [456.4 mm]</td>
<td>9.09&quot; [230.9 mm]</td>
<td>13.13&quot; [333.5 mm]</td>
<td>13.45&quot; [341.6 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
</tbody>
</table>

** 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.

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

TRUTH STD DUTY 4-BAR CASEMENT HINGE W/ STOP

<table>
<thead>
<tr>
<th>MATL</th>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>PART NUMBER</th>
<th>STD STOP</th>
<th>EGRESS TO WASHABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>12”</td>
<td>12.61” [320.3 mm]</td>
<td>35.09.00</td>
<td>.100</td>
</tr>
<tr>
<td>SST</td>
<td>16”</td>
<td>16.41” [416.7 mm]</td>
<td>35.10.00</td>
<td>.100</td>
</tr>
<tr>
<td>SST</td>
<td>16”</td>
<td>16.41” [416.7 mm]</td>
<td>35.11.00</td>
<td>.100</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Model</th>
<th>Finish</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>09</td>
<td>00</td>
<td>100</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>Ultimate (see note #6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sash/Vent Width Range</td>
</tr>
<tr>
<td></td>
<td>Max Sash Vent Weight</td>
</tr>
<tr>
<td>12” 12.61” [320.3 mm]</td>
<td>14”-32” [356 mm-813 mm]</td>
</tr>
<tr>
<td>16” 16.41” [416.7 mm]</td>
<td>18”-32” [457 mm-813 mm]</td>
</tr>
<tr>
<td>16” 16.41” [416.7 mm]</td>
<td>18”-32” [457 mm-813 mm]</td>
</tr>
</tbody>
</table>

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 101/1.5 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

5q
### Notes:
1. If predrilling, Truth recommends adding 0.062 [1.5 mm] to the noted dimensions.
2. The 35.11 hinge offers you the advantage of allowing the outside of the vent 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 [114.3 mm]. (See Truth Tip No. 2 for additional information.)

### Recommended Screws:
- 6 #10 Phillips, Pan Head, Stainless Steel Screws (1 1/2" Long & Thread Type to be determined by profile/section)

### Specifications:

#### Erberg 222SS and 224SS Series

- **Release Key #16000** (2 required per window)
- **Max Hedge Length:**
  - 35.09
  - 35.10
  - 35.11

#### Egress Hinge with Washability Feature

<table>
<thead>
<tr>
<th>Hinge Part #</th>
<th>&quot;A&quot; Hinge Length</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot; max</th>
<th>&quot;H&quot; max</th>
<th>Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.09</td>
<td>12.61&quot; [320.3mm]</td>
<td>6.25&quot; [158.6mm]</td>
<td>6.68&quot; [169.8mm]</td>
<td>11.24&quot; [285.4mm]</td>
<td>5.93&quot; [150.6mm]</td>
<td>5.49&quot; [139.6mm]</td>
<td>2.02&quot; [51.3mm]</td>
<td>2.09&quot; [53.1mm]</td>
<td>84*</td>
</tr>
<tr>
<td>35.10</td>
<td>16.41&quot; [416.8mm]</td>
<td>7.01&quot; [178.0mm]</td>
<td>7.45&quot; [189.2mm]</td>
<td>15.03&quot; [381.8mm]</td>
<td>8.55&quot; [216.7mm]</td>
<td>8.09&quot; [205.5mm]</td>
<td>2.02&quot; [51.3mm]</td>
<td>2.05&quot; [52.1mm]</td>
<td>88*</td>
</tr>
<tr>
<td>35.11</td>
<td>16.41&quot; [416.8mm]</td>
<td>7.01&quot; [178.0mm]</td>
<td>7.45&quot; [189.2mm]</td>
<td>15.03&quot; [381.8mm]</td>
<td>7.03&quot; [178.6mm]</td>
<td>6.59&quot; [167.4mm]</td>
<td>2.09&quot; [53.1mm]</td>
<td>2.11&quot; [53.6mm]</td>
<td>88*</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>MATL</th>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>PART NUMBER</th>
<th>EGRESS TO WASHABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>16&quot; 16.76&quot; [425.7mm]</td>
<td>35.12.00.208</td>
<td>N/A</td>
</tr>
<tr>
<td>SST</td>
<td>16&quot; 16.72&quot; [424.7mm]</td>
<td>35.13.00.208</td>
<td>YES</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>PRODUCT NO.</th>
<th>MODEL</th>
<th>FINISH</th>
<th>ASSEMBLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>12</td>
<td>00</td>
<td>208</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>ULTIMATE (SEE NOTE #6)</th>
<th>SASH/VENT WIDTH RANGE</th>
<th>MAX SASH VENT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.12 16.76&quot; [425.7mm]</td>
<td>18&quot;-32&quot; [457.2 mm-812.8 mm]</td>
<td>175 LBS AT 32&quot; [79.4 KG AT 812.8 mm]</td>
<td></td>
</tr>
<tr>
<td>35.13 16.72&quot; [424.7mm]</td>
<td>18&quot;-32&quot; [457.2 mm-812.8 mm]</td>
<td>158 LBS AT 32&quot; [79.4 KG AT 812.8 mm]</td>
<td></td>
</tr>
</tbody>
</table>

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.
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 101/13 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)

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM LENGTH</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>NUMBER OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>16&quot;</td>
<td>35.12.00.XXX</td>
<td>16.76&quot; [425.7mm]</td>
<td>6.50&quot; [165.1mm]</td>
<td>7.00&quot; [177.8mm]</td>
<td>15.01&quot; [381.3mm]</td>
<td>8.39&quot; [213.1mm]</td>
<td>6</td>
</tr>
</tbody>
</table>

CENTERLINE OF SASH BAR

OFFSET BETWEEN SASH BAR & HINGE TRACK

CENTERLINE OF HINGE TRACK

1.375±.030 [34.9mm±0.76]

.186±.010 [4.72±0.25]

.895±.0100 [22.73mm±0.2540]

.073 [1.85mm]

.625±.030/0 [15.88mm±0.76]

.448 [11.37mm]

.166±.010 [4.72±0.25]

.895±.0100 [22.73mm±0.2540]
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.

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM LENGTH</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>NUMBER OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>16&quot;</td>
<td>35.13.00.XXX</td>
<td>16.72&quot; [424.7mm]</td>
<td>6.50&quot; [165.1mm]</td>
<td>7.00&quot; [177.8mm]</td>
<td>14.97&quot; [380.2mm]</td>
<td>6.72&quot; [170.6mm]</td>
<td>6</td>
</tr>
</tbody>
</table>
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.
TRUTH STD DUTY 4-BAR CASEMENT HINGE W/ 90° STOP

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST 12&quot;</td>
<td>12.22&quot; [310.4mm]</td>
<td>34.55.00.300</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>PRODUCT NO.</th>
<th>MODEL</th>
<th>FINISH</th>
<th>ASSEMBLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>55</td>
<td>00</td>
<td>300</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>ULTIMATE (SEE NOTE #6)</th>
<th>MAX SASH VENT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; [310.4mm]</td>
<td>12&quot;-32&quot; [305mm-813mm]</td>
<td>65 lbs at 32&quot; [29.5 kg at 813mm]</td>
</tr>
</tbody>
</table>

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/IS 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".
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.
TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE W/ 90° STOP

<table>
<thead>
<tr>
<th>MAT'L</th>
<th>HINGE CALLOUT &amp; ACTUAL LENGTH</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST 14&quot;</td>
<td>14.50&quot; [368.3 mm]</td>
<td>34.59.00.208</td>
</tr>
<tr>
<td>SST 16&quot;</td>
<td>16.50&quot; [419.1 mm]</td>
<td>34.60.00.208</td>
</tr>
<tr>
<td>SST 18&quot;</td>
<td>18.50&quot; [469.9 mm]</td>
<td>34.61.00.208</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>PRODUCT NO.</th>
<th>MODEL</th>
<th>FINISH</th>
<th>ASSEMBLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>59</td>
<td>00</td>
<td>208</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>ULTIMATE (SEE NOTE #6)</th>
<th>MAX SASH VENT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SASH/VENT WIDTH RANGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14&quot; [368.8 mm]</td>
<td>14&quot;-36&quot; [356mm-914mm]</td>
<td>120 lbs at 36&quot; [54.4 kg at 914mm]</td>
</tr>
<tr>
<td>16&quot; [419.6 mm]</td>
<td>16&quot;-36&quot; [406mm-914mm]</td>
<td>120 lbs at 36&quot; [54.4 kg at 914mm]</td>
</tr>
<tr>
<td>18&quot; [470.4 mm]</td>
<td>18&quot;-36&quot; [457mm-914mm]</td>
<td>120 lbs at 36&quot; [54.4 kg at 914mm]</td>
</tr>
</tbody>
</table>

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/JS 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.
### FIG 5 TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE

(Truth 601SS Series)

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM LENGTH</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>&quot;F&quot; DIM</th>
<th>&quot;G&quot; DIM</th>
<th># OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>14&quot;</td>
<td>34.59.00.XXX</td>
<td>14.52&quot; [368.8 mm]</td>
<td>8.01&quot;</td>
<td>8.51&quot;</td>
<td>12.59&quot;</td>
<td>8.30&quot;</td>
<td>6.59&quot;</td>
<td>7</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.60.00.XXX</td>
<td>16.52&quot; [419.6 mm]</td>
<td>8.01&quot;</td>
<td>8.51&quot;</td>
<td>14.59&quot;</td>
<td>7.75&quot;</td>
<td>6.09&quot;</td>
<td>7</td>
</tr>
<tr>
<td>18&quot;</td>
<td>34.61.00.XXX</td>
<td>18.52&quot; [470.4 mm]</td>
<td>8.01&quot;</td>
<td>8.51&quot;</td>
<td>16.59&quot;</td>
<td>7.51&quot;</td>
<td>5.77&quot;</td>
<td>7</td>
</tr>
</tbody>
</table>
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 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 per RECOMMENDED SCREWS per 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
SUPERIOR 4-BAR HINGE

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
(ANDBERG 301 SERIES)

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

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>HINGE LENGTH</th>
<th>VENT HEIGHT RANGE</th>
<th>DEGREE OF OPENING</th>
<th>REQUIRED NO. OF RISER BLOCKS PER HINGE</th>
<th>MAXIMUM VENT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.87</td>
<td>28.48&quot; (723.4 mm)</td>
<td>64° (1635.6 mm) TO 87° (2219.8 mm)</td>
<td>20°</td>
<td>NONE</td>
<td>300 lb (136.09 kg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>17°</td>
<td>ONE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14°</td>
<td>TWO</td>
<td></td>
</tr>
</tbody>
</table>

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

STAINLESS STEEL CENTERLINE OF VENTILATOR BAR & HINGE TRACK

ANCHOR HOLES

CENTERLINE OF VENTILATOR BAR

ANCHOR Holes

CENTERLINE OF HINGE TRACK

STAINLESS STEEL
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.

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Model</th>
<th>Finish</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>24</td>
<td>00</td>
<td>208</td>
</tr>
<tr>
<td>4-Bar Hinge</td>
<td>Heavy Duty 10&quot; length</td>
<td>No decorative finish</td>
<td>W/Stop Std. open (Hinge Feature)</td>
</tr>
</tbody>
</table>
GUIDE TO 4-BAR HINGE SELECTION

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).

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.)

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.

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 operators.

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.

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 more than 8" wide.

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

Stack height: ____________________________
Application: ___________________________
Length: _______________________________
Functions: _____________________________

SEE CHART FOR OPTIONS
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.
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.
**STANDARD DUTY 4-BAR HINGE PART NUMBER GUIDE**

<table>
<thead>
<tr>
<th>MAT'L</th>
<th>CALL OUT &amp; (ACTUAL LENGTH)</th>
<th>PART NUMBER</th>
<th>STD. STOP</th>
<th>NO STOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>8” 8.22” [207.8 mm]</td>
<td>34.10.00</td>
<td>.101</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>10” 10.22” [258.6 mm]</td>
<td>34.11.00</td>
<td>.102</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>12” 12.22” [309.4 mm]</td>
<td>34.12.00</td>
<td>.100</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>14” 14.22” [360.2 mm]</td>
<td>34.13.00</td>
<td>.102</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>16” 16.22” [410.9 mm]</td>
<td>34.14.00</td>
<td>.100</td>
<td>.101</td>
</tr>
<tr>
<td>SST</td>
<td>18” 18.22” [461.8 mm]</td>
<td>34.15.00</td>
<td>.102</td>
<td></td>
</tr>
<tr>
<td>SST</td>
<td>20” 20.22” [512.6 mm]</td>
<td>34.16.00</td>
<td>.100</td>
<td>.101</td>
</tr>
</tbody>
</table>

**PART NUMBERING SYSTEM**

<table>
<thead>
<tr>
<th>PRODUCT NO.</th>
<th>MODEL</th>
<th>FINISH</th>
<th>ASSEMBLY</th>
</tr>
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<tbody>
<tr>
<td>34</td>
<td>10</td>
<td>00</td>
<td>101</td>
</tr>
</tbody>
</table>

**STANDARD DUTY 4-BAR HINGE**

**FIG. 1 TRUTH STANDARD DUTY 4-BAR HINGE**

*(ANDERBERG 201 SS SERIES)*

**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 (12.7 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.”
### 4-BAR HINGE APPLICATION TABLE FOR PROJECTED & AWNING HINGES

<table>
<thead>
<tr>
<th>HINGE CALL OUT &amp; ACTUAL LENGTH</th>
<th>*COUNTERBALANCED SASH/VENT WEIGHT</th>
<th>**ULTIMATE SASH/VENT WEIGHT</th>
<th>DEGREES OF OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; [8.18&quot;] [207.8 mm]</td>
<td>9&quot;-16&quot; [229-406 mm] 19 LBS [8.6 KG]</td>
<td>9&quot;-16&quot; [229-406 mm] 19 LBS [8.6 KG]</td>
<td>55° 55° 65°</td>
</tr>
</tbody>
</table>

**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/IS 2/NAFS-02 “Casement Hardware Load Test.”

### 4-BAR HINGE APPLICATION TABLE FOR CASEMENT (SIDE HUNG) HINGES

<table>
<thead>
<tr>
<th>HINGE CALL OUT &amp; ACTUAL LENGTH</th>
<th>ULTIMATE SASH/VENT WEIGHT</th>
<th>DEGREES OF OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; [10.50&quot;] [266.7mm]</td>
<td>12&quot;-32&quot; [305-914 mm] 65 LBS AT 32&quot; [45.36 KG AT 914 mm]</td>
<td>55°</td>
</tr>
<tr>
<td>10&quot; [12.50&quot;] [317.5mm]</td>
<td>12&quot;-32&quot; [305-914 mm] 65 LBS AT 32&quot; [45.36 KG AT 914 mm]</td>
<td>55°</td>
</tr>
<tr>
<td>12&quot; [14.50&quot;] [368.3mm]</td>
<td>12&quot;-32&quot; [305-914 mm] 65 LBS AT 32&quot; [45.36 KG AT 914 mm]</td>
<td>55°</td>
</tr>
<tr>
<td>14&quot; [16.50&quot;] [419.1mm]</td>
<td>12&quot;-32&quot; [305-914 mm] 65 LBS AT 32&quot; [45.36 KG AT 914 mm]</td>
<td>55°</td>
</tr>
</tbody>
</table>

**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/IS 2/NAFS-02 “Casement Hardware Load Test.”

---

**FIG. 2 TRUTH STANDARD DUTY 4-BAR HINGE (ANDERBERG 201SS SERIES)**
FIG. 3 TRUTH STANDARD DUTY 4-BAR HINGE W/STOP
(ANDERBERG 201SS SERIES)

**NOTE:**
- Dimensions.
- If predrilling, Truth recommends length and thread type to be determined by profile design.

**RECOMMENDED SCREWS:**
- #10 slotted or #8 Phillips, recommended screws: Pan head stainless steel screws.

**ANGLE:**
- .062" [1.5 MM]
- 33.71 ±.76mm

**OFFSET BETWEEN SASH BAR CENTERLINE:**
- 1.09mm ±.030
- 30.12 ±.76mm

**CENTRELINE OF HINGE TRACK:**
- 3.575in [9.1mm]
- 18.1mm ±.025
<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM HINGE LENGTH</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>&quot;F&quot; DIM</th>
<th>&quot;G&quot; DIM</th>
<th>&quot;H&quot; DIM</th>
<th>&quot;J&quot; DIM</th>
<th>APPROX ANGLE OF OPENING</th>
<th>NUMBER OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>34.10.00.xxx</td>
<td>8.22&quot; [208.8 mm]</td>
<td>NA</td>
<td>4.75&quot;  [120.7 mm]</td>
<td>5.19&quot;  [131.8 mm]</td>
<td>6.78&quot;  [172.2 mm]</td>
<td>5.59&quot;  [142.0 mm]</td>
<td>5.16&quot;  [131.1 mm]</td>
<td>3.63&quot;  [92.1 mm]</td>
<td>4.03&quot;  [102.4 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>10&quot;</td>
<td>34.11.00.xxx</td>
<td>10.22&quot; [299.6 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>5.75&quot;  [146.1 mm]</td>
<td>6.19&quot;  [157.3 mm]</td>
<td>8.78&quot;  [223.0 mm]</td>
<td>6.47&quot;  [164.3 mm]</td>
<td>6.03&quot;  [153.2 mm]</td>
<td>4.50&quot;  [114.3 mm]</td>
<td>4.99&quot;  [126.7 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>12&quot;</td>
<td>34.12.00.xxx</td>
<td>12.22&quot; [310.4 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>6.75&quot;  [171.5 mm]</td>
<td>7.19&quot;  [182.6 mm]</td>
<td>10.78&quot; [273.8 mm]</td>
<td>7.34&quot;  [196.4 mm]</td>
<td>6.91&quot;  [175.5 mm]</td>
<td>5.35&quot;  [135.9 mm]</td>
<td>5.75&quot;  [146.0 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>14&quot;</td>
<td>34.13.00.xxx</td>
<td>14.22&quot; [361.2 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>7.75&quot;  [196.9 mm]</td>
<td>8.19&quot;  [208.0 mm]</td>
<td>12.78&quot; [324.6 mm]</td>
<td>8.20&quot;  [208.3 mm]</td>
<td>7.78&quot;  [197.6 mm]</td>
<td>6.63&quot;  [168.3 mm]</td>
<td>6.41&quot;  [162.8 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.14.00.xxx</td>
<td>16.22&quot; [411.9 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>8.75&quot;  [223.3 mm]</td>
<td>9.19&quot;  [233.4 mm]</td>
<td>14.78&quot; [375.4 mm]</td>
<td>9.09&quot;  [230.9 mm]</td>
<td>8.66&quot;  [219.9 mm]</td>
<td>7.10&quot;  [180.3 mm]</td>
<td>7.90&quot;  [190.5 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>18&quot;</td>
<td>34.15.00.xxx</td>
<td>18.22&quot; [462.8 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>9.75&quot;  [247.7 mm]</td>
<td>10.19&quot; [258.8 mm]</td>
<td>16.78&quot; [426.2 mm]</td>
<td>9.97&quot;  [253.2 mm]</td>
<td>9.53&quot;  [242.1 mm]</td>
<td>7.47&quot;  [169.7 mm]</td>
<td>8.15&quot;  [207.0 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>20&quot;</td>
<td>34.16.00.xxx</td>
<td>20.22&quot; [513.6 mm]</td>
<td>2.00&quot; [50.8 mm]</td>
<td>10.75&quot; [273.1 mm]</td>
<td>11.19&quot; [284.2 mm]</td>
<td>18.78&quot; [477.0 mm]</td>
<td>10.44&quot; [264.4 mm]</td>
<td>10.41&quot; [264.4 mm]</td>
<td>8.84&quot;  [224.5 mm]</td>
<td>9.24&quot;  [234.7 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
</tbody>
</table>
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" (.15 MM) TO THESE
  DIMENSIONS.
** AT AAMA CERTIFIED ANGLE.

** AT AAMA CERTIFIED ANGLE.

NO HOLE FOR "G" DIM ON NO STOP VERSION

CENTERLINE OF SASH BAR

OFFSET BETWEEN SASH BAR & HINGE TRACK

CENTERLINE OF HINGE TRACK

.043
[1.09 mm]

.155 ± .010
[3.94 ± 0.25 mm]

.715 ± .010
[18.16 mm ± 0.25]

.357 [9.08 mm]

.500 ± .030 [12.70 mm ± 0.76]

.500 ± .030 [12.70 mm ± 0.76]

.043 [1.09 mm]

.625 [15.88 mm]

.625 [15.88 mm]

"A" ± .055 [± 1 mm]

"B"

"C"

"D"

"E"

"F"

"G" + .043
[1.09 mm]

"H" **

"J" **
<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM HINGE LENGTH</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>&quot;F&quot; DIM</th>
<th>&quot;G&quot; DIM</th>
<th>&quot;H&quot; DIM</th>
<th>&quot;J&quot; DIM</th>
<th>APPROX. ANGLE OF OPENING</th>
<th>NUMBER OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>34.10.00.XXX</td>
<td>8.22&quot; [206.8 mm]</td>
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<td>4.75&quot;</td>
<td>5.19&quot;</td>
<td>6.78&quot;</td>
<td>5.53&quot;</td>
<td>NA</td>
<td>5.13&quot;</td>
<td>5.25&quot;</td>
<td>55°</td>
<td>6</td>
</tr>
<tr>
<td>10&quot;</td>
<td>34.11.00.XXX</td>
<td>10.22&quot; [259.6 mm]</td>
<td>2.00&quot;</td>
<td>5.75&quot;</td>
<td>6.19&quot;</td>
<td>8.78&quot;</td>
<td>6.78&quot;</td>
<td>NA</td>
<td>6.36&quot;</td>
<td>6.37&quot;</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>12&quot;</td>
<td>34.12.00.XXX</td>
<td>12.22&quot; [310.4 mm]</td>
<td>2.00&quot;</td>
<td>6.75&quot;</td>
<td>7.19&quot;</td>
<td>10.78&quot;</td>
<td>7.78&quot;</td>
<td>NA</td>
<td>7.29&quot;</td>
<td>7.34&quot;</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>14&quot;</td>
<td>34.13.00.XXX</td>
<td>14.22&quot; [361.2 mm]</td>
<td>2.00&quot;</td>
<td>7.75&quot;</td>
<td>8.19&quot;</td>
<td>12.78&quot;</td>
<td>9.03&quot;</td>
<td>4.75&quot;</td>
<td>8.53&quot;</td>
<td>8.69&quot;</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.14.00.XXX</td>
<td>16.22&quot; [411.9 mm]</td>
<td>2.00&quot;</td>
<td>8.75&quot;</td>
<td>9.19&quot;</td>
<td>14.78&quot;</td>
<td>10.28&quot;</td>
<td>5.62&quot;</td>
<td>9.78&quot;</td>
<td>9.88&quot;</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>20&quot;</td>
<td>34.16.00.XXX</td>
<td>20.22&quot; [513.6 mm]</td>
<td>2.00&quot;</td>
<td>10.75&quot;</td>
<td>11.19&quot;</td>
<td>18.78&quot;</td>
<td>12.53&quot;</td>
<td>7.32&quot;</td>
<td>12.01&quot;</td>
<td>12.21&quot;</td>
<td>55°</td>
<td>7</td>
</tr>
</tbody>
</table>

+ AAMA CYCLE TEST ANGLE
ULTIMATE OPENING ANGLE IS 77°
### HEAVY DUTY 4-BAR HINGE PART NUMBER GUIDE

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

### PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Model</th>
<th>Finish</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>24</td>
<td>00</td>
<td>208</td>
</tr>
</tbody>
</table>

### HEAVY DUTY 4-BAR HINGE

**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 101/1.5/2/NAFS-02 “CASEMENT HARDWARE LOAD TEST”.
### 4-BAR HINGE APPLICATION TABLE FOR PROJECTED & AWNING HINGES

(AS CERTIFIED TO AAMA 904.1)

<table>
<thead>
<tr>
<th>HINGE CALL OUT &amp; (ACTUAL LENGTH)</th>
<th><strong>COUNTERBALANCED</strong></th>
<th><strong>ULTIMATE (SEE NOTE #2)</strong></th>
<th>DEGREES OF OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SASH/VENT HEIGHT RANGE</td>
<td>SASH/VENT VENT WEIGHT</td>
<td>SASH/VENT HEIGHT RANGE</td>
</tr>
<tr>
<td>10&quot; (10.50&quot;) [266.7mm]</td>
<td>12&quot;-20&quot; [305-508 mm]</td>
<td>58 LBS [26.3 KG]</td>
<td>12&quot;-20&quot; [305-508 mm]</td>
</tr>
<tr>
<td>12&quot; (12.50&quot;) [317.5mm]</td>
<td>20&quot;-26&quot; [508-635 mm]</td>
<td>73 LBS [33.1 KG]</td>
<td>20&quot;-26&quot; [508-635 mm]</td>
</tr>
<tr>
<td>14&quot; (14.50&quot;) [368.3mm]</td>
<td>23&quot;-29&quot; [584-737 mm]</td>
<td>85 LBS [39.0 KG]</td>
<td>23&quot;-29&quot; [584-737 mm]</td>
</tr>
<tr>
<td>16&quot; (16.50&quot;) [419.1mm]</td>
<td>25&quot;-34&quot; [635-864 mm]</td>
<td>99 LBS [44.9 KG]</td>
<td>25&quot;-40&quot; [635-1016 mm]</td>
</tr>
<tr>
<td>18&quot; (18.50&quot;) [469.9mm]</td>
<td>32&quot;-37&quot; [813-940 mm]</td>
<td>108 LBS [49.0 KG]</td>
<td>32&quot;-40&quot; [813-1143 mm]</td>
</tr>
<tr>
<td>20&quot; (20.50&quot;) [520.7mm]</td>
<td>34&quot;-40&quot; [864-1016 mm]</td>
<td>117 LBS [53.1 KG]</td>
<td>34&quot;-50&quot; [864-1270 mm]</td>
</tr>
<tr>
<td>24&quot; (24.50&quot;) [622.3mm]</td>
<td>40&quot;-44&quot; [1016-1118 mm]</td>
<td>129 LBS [58.5 KG]</td>
<td>40&quot;-60&quot; [1016-1524 mm]</td>
</tr>
<tr>
<td>28&quot; (28.50&quot;) [723.9mm]</td>
<td>50&quot;-64&quot; [1270-1626 mm]</td>
<td>175 LBS [79.4 KG]</td>
<td>50&quot;-80&quot; [1270-2032 mm]</td>
</tr>
</tbody>
</table>

**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 101/1.5 2/NAFS-02 “CASEMENT HARDWARE LOAD TEST.”

### 4-BAR HINGE APPLICATION TABLE FOR CASEMENT (SIDE HUNG) Hinges

(AS CERTIFIED TO AAMA 904.1)

<table>
<thead>
<tr>
<th>HINGE CALL OUT &amp; (ACTUAL LENGTH)</th>
<th>ULTIMATE (SEE NOTE #2)</th>
<th>DEGREES OF OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SASH/VENT HEIGHT RANGE</td>
<td>MAX SASH VENT WEIGHT</td>
</tr>
<tr>
<td>10&quot; (10.50&quot;) [266.7mm]</td>
<td>12&quot;-34&quot; [305-914 mm]</td>
<td>100 LBS AT 36&quot; [45.36 KG AT 914 mm]</td>
</tr>
<tr>
<td>12&quot; (12.50&quot;) [317.5mm]</td>
<td>12&quot;-34&quot; [305-914 mm]</td>
<td>100 LBS AT 36&quot; [45.36 KG AT 914 mm]</td>
</tr>
<tr>
<td>14&quot; (14.50&quot;) [368.3mm]</td>
<td>12&quot;-34&quot; [305-914 mm]</td>
<td>100 LBS AT 36&quot; [45.36 KG AT 914 mm]</td>
</tr>
<tr>
<td>16&quot; (16.50&quot;) [419.1mm]</td>
<td>12&quot;-34&quot; [305-914 mm]</td>
<td>100 LBS AT 36&quot; [45.36 KG AT 914 mm]</td>
</tr>
</tbody>
</table>

**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 101/1.5 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 PROFILE DESIGNED BY

**NOTE:** IF PREDRILLING, TRUTH RECOMMENDS ADDING 0.062" (1.5MM) TO THESE DIMENSIONS.

**CENTERLINE OF SASH BAR:** 0.073

**OFFSET BETWEEN SASH BAR & HINGE TRACK:** 0.750

**CENTERLINE OF HINGE TRACK:** 1.850

**HINGE TRACK:** (ANDERBERG 301SS SERIES)

**SASH BAR**

**FIG. 9 TRUTH HEAVY DUTY 4-BAR HINGE W/STOP**
## TRUTH HEAVY DUTY 4-BAR HINGE W/STOP

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART #</th>
<th>&quot;A&quot; HINGE LG</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot;</th>
<th>&quot;H&quot;</th>
<th>&quot;J&quot;</th>
<th>&quot;K&quot;</th>
<th>ANGLE</th>
<th># OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot;</td>
<td>34.24.00.XXX</td>
<td>10.50&quot; [266.7 mm]</td>
<td>NA</td>
<td>NA</td>
<td>6.50&quot; [165.1 mm]</td>
<td>7.00&quot; [177.8 mm]</td>
<td>8.59&quot; [218.2 mm]</td>
<td>6.34&quot; [161.0 mm]</td>
<td>NA</td>
<td>4.38&quot; [111.2 mm]</td>
<td>4.72&quot; [119.9 mm]</td>
<td>59°</td>
<td>7</td>
</tr>
<tr>
<td>12&quot;</td>
<td>34.25.00.XXX</td>
<td>12.50&quot; [317.5 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>NA</td>
<td>7.50&quot; [190.5 mm]</td>
<td>8.00&quot; [203.2 mm]</td>
<td>10.59&quot; [269.0 mm]</td>
<td>6.59&quot; [167.4 mm]</td>
<td>NA</td>
<td>4.51&quot; [114.6 mm]</td>
<td>4.96&quot; [126.0 mm]</td>
<td>53°</td>
<td>7</td>
</tr>
<tr>
<td>14&quot;</td>
<td>34.26.00.XXX</td>
<td>14.50&quot; [368.3 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>NA</td>
<td>8.50&quot; [215.9 mm]</td>
<td>9.00&quot; [228.6 mm]</td>
<td>12.59&quot; [319.8 mm]</td>
<td>6.94&quot; [176.3 mm]</td>
<td>NA</td>
<td>4.81&quot; [122.2 mm]</td>
<td>5.30&quot; [134.6 mm]</td>
<td>50°</td>
<td>7</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.27.00.XXX</td>
<td>16.50&quot; [419.1 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>5.06&quot; [128.5 mm]</td>
<td>9.50&quot; [241.3 mm]</td>
<td>10.00&quot; [254.0 mm]</td>
<td>14.59&quot; [370.6 mm]</td>
<td>7.66&quot; [194.6 mm]</td>
<td>NA</td>
<td>5.53&quot; [140.3 mm]</td>
<td>6.02&quot; [152.9 mm]</td>
<td>50°</td>
<td>8</td>
</tr>
<tr>
<td>18&quot;</td>
<td>34.28.00.XXX</td>
<td>18.50&quot; [469.9 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>6.06&quot; [153.9 mm]</td>
<td>10.50&quot; [266.7 mm]</td>
<td>11.00&quot; [280.1 mm]</td>
<td>16.59&quot; [421.4 mm]</td>
<td>8.28&quot; [210.3 mm]</td>
<td>NA</td>
<td>6.16&quot; [156.5 mm]</td>
<td>6.66&quot; [169.2 mm]</td>
<td>50°</td>
<td>8</td>
</tr>
<tr>
<td>20&quot;</td>
<td>34.29.00.XXX</td>
<td>20.50&quot; [520.7 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>7.06&quot; [179.3 mm]</td>
<td>11.50&quot; [292.1 mm]</td>
<td>12.00&quot; [304.8 mm]</td>
<td>18.59&quot; [472.2 mm]</td>
<td>8.97&quot; [227.6 mm]</td>
<td>NA</td>
<td>6.86&quot; [174.2 mm]</td>
<td>7.35&quot; [186.7 mm]</td>
<td>49°</td>
<td>8</td>
</tr>
<tr>
<td>24&quot;</td>
<td>34.31.00.XXX</td>
<td>24.50&quot; [622.3 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>9.06&quot; [230.1 mm]</td>
<td>13.50&quot; [342.9 mm]</td>
<td>14.00&quot; [355.6 mm]</td>
<td>22.59&quot; [573.8 mm]</td>
<td>9.09&quot; [230.1 mm]</td>
<td>NA</td>
<td>6.90&quot; [175.3 mm]</td>
<td>7.44&quot; [189.0 mm]</td>
<td>44°</td>
<td>8</td>
</tr>
<tr>
<td>28&quot;</td>
<td>34.86.00.XXX</td>
<td>28.50&quot; [723.9 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>11.06&quot; [280.9 mm]</td>
<td>15.50&quot; [393.7 mm]</td>
<td>16.00&quot; [406.4 mm]</td>
<td>26.59&quot; [675.4 mm]</td>
<td>9.59&quot; [243.6 mm]</td>
<td>NA</td>
<td>7.36&quot; [186.9 mm]</td>
<td>7.93&quot; [201.4 mm]</td>
<td>42°</td>
<td>8</td>
</tr>
</tbody>
</table>
**CASEMENT AWNING HEAVY DUTY 4-BAR HINGE (301SS Series)**

**RECOMMENDED SCREWS:**
- #10 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

---

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

---

**DIMENSIONS:**

- **CENTERLINE OF SASH BAR**
  - OFFSET BETWEEN SASH BAR & HINGE TRACK
  - CENTERLINE OF HINGE TRACK

- **HOLE FOR "C" DIM ON NO STOP VERSION NOT USED**

- **ANGLE**
  - "A" ±.055 [±1mm]
  - "B" ±.030 [±.76mm]
  - "C" ±.055 [±1mm]
  - "D" ±.030 [±.76mm]
  - "E" ±.055 [±1mm]
  - "F" ±.055 [±1mm]
  - "G" ±.055 [±1mm]
  - "H" ±.055 [±1mm]
  - "K" ±.055 [±1mm]
  - "J" ±.055 [±1mm]

- **Screw Note:**
  - #10 PHILLIPS, PAN HEAD STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE DESIGN)
  - #8 PHILLIPS UNDERCUT FLATHEAD SCREW
<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART #</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot;</th>
<th>&quot;H&quot;</th>
<th>&quot;J&quot;**</th>
<th>&quot;K&quot;**</th>
<th>AAMA CERTIFIED ANGLE</th>
<th># OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot;</td>
<td>34.24.00.XXX</td>
<td>10.50&quot; [266.7 mm]</td>
<td>NA</td>
<td>NA</td>
<td>6.50&quot; [165.1 mm]</td>
<td>7.00&quot; [177.8 mm]</td>
<td>8.59&quot; [218.2 mm]</td>
<td>7.22&quot; [183.4 mm]</td>
<td>NA</td>
<td>4.98&quot; [126.5 mm]</td>
<td>5.30&quot; [134.6 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>12&quot;</td>
<td>34.25.00.XXX</td>
<td>12.50&quot; [317.5 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>NA</td>
<td>7.50&quot; [190.5 mm]</td>
<td>8.00&quot; [203.2 mm]</td>
<td>10.59&quot; [269.0 mm]</td>
<td>8.97&quot; [227.8 mm]</td>
<td>NA</td>
<td>6.16&quot; [156.5 mm]</td>
<td>6.48&quot; [164.6 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>14&quot;</td>
<td>34.26.00.XXX</td>
<td>14.50&quot; [368.3 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>NA</td>
<td>8.50&quot; [215.9 mm]</td>
<td>9.00&quot; [228.6 mm]</td>
<td>12.59&quot; [319.8 mm]</td>
<td>10.47&quot; [265.9 mm]</td>
<td>NA</td>
<td>7.33&quot; [186.2 mm]</td>
<td>7.65&quot; [194.3 mm]</td>
<td>55°</td>
<td>7</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.27.00.XXX</td>
<td>16.50&quot; [419.1 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>5.06&quot; [128.5 mm]</td>
<td>9.50&quot; [241.3 mm]</td>
<td>10.00&quot; [254.0 mm]</td>
<td>14.59&quot; [370.6 mm]</td>
<td>11.97&quot; [304.0 mm]</td>
<td>7.66&quot; [194.6 mm]</td>
<td>8.50&quot; [215.9 mm]</td>
<td>8.83&quot; [224.3 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>18&quot;</td>
<td>34.28.00.XXX</td>
<td>18.50&quot; [469.9 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>6.06&quot; [153.9 mm]</td>
<td>10.50&quot; [266.7 mm]</td>
<td>11.00&quot; [279.4 mm]</td>
<td>16.59&quot; [421.4 mm]</td>
<td>13.47&quot; [342.1 mm]</td>
<td>8.28&quot; [210.3 mm]</td>
<td>9.66&quot; [245.4 mm]</td>
<td>9.98&quot; [253.5 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>20&quot;</td>
<td>34.29.00.XXX</td>
<td>20.50&quot; [520.7 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>7.06&quot; [179.3 mm]</td>
<td>11.50&quot; [292.1 mm]</td>
<td>12.00&quot; [304.8 mm]</td>
<td>18.39&quot; [472.2 mm]</td>
<td>14.97&quot; [380.2 mm]</td>
<td>8.97&quot; [227.8 mm]</td>
<td>10.82&quot; [274.8 mm]</td>
<td>11.14&quot; [283.0 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
<tr>
<td>24&quot;</td>
<td>34.31.00.XXX</td>
<td>24.50&quot; [622.3 mm]</td>
<td>2.56&quot; [65.0 mm]</td>
<td>9.06&quot; [230.1 mm]</td>
<td>13.50&quot; [342.9 mm]</td>
<td>14.00&quot; [355.6 mm]</td>
<td>22.59&quot; [573.8 mm]</td>
<td>17.97&quot; [456.4 mm]</td>
<td>9.09&quot; [230.9 mm]</td>
<td>13.13&quot; [333.5 mm]</td>
<td>13.45&quot; [341.6 mm]</td>
<td>55°</td>
<td>8</td>
</tr>
</tbody>
</table>

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

TRUTH STD DUTY 4-BAR CASEMENT HINGE W/ STOP

<table>
<thead>
<tr>
<th>MATL</th>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>PART NUMBER</th>
<th>STD STOP</th>
<th>EGRESS TO WASHABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>12” 12.61” [320.3 mm]</td>
<td>35.09.00</td>
<td>.100</td>
<td>N/A</td>
</tr>
<tr>
<td>SST</td>
<td>16” 16.41” [416.7 mm]</td>
<td>35.10.00</td>
<td>.100</td>
<td>N/A</td>
</tr>
<tr>
<td>SST</td>
<td>16” 16.41” [416.7 mm]</td>
<td>35.11.00</td>
<td>.100</td>
<td>YES</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Model</th>
<th>Finish</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>09</td>
<td>00</td>
<td>100</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>HINGE CALLOUT &amp; (ACTUAL LENGTH)</th>
<th>Ultimate (see note #6)</th>
<th>Sash/Vent Width Range</th>
<th>Max Sash Vent Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12” 12.61” [320.3 mm]</td>
<td></td>
<td>14”-32” [356 mm-813 mm]</td>
<td>82 lbs at 32” [37.2 kg at 813 mm]</td>
</tr>
<tr>
<td>16” 16.41” [416.7 mm]</td>
<td></td>
<td>18”-32” [457 mm-813 mm]</td>
<td>82 lbs at 32” [37.2 kg at 813 mm]</td>
</tr>
<tr>
<td>16” 16.41” [416.7 mm]</td>
<td></td>
<td>18”-32” [457 mm-813 mm]</td>
<td>82 lbs at 32” [37.2 kg at 813 mm]</td>
</tr>
</tbody>
</table>

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 101/1.5 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".
FIG. 2. TRUTH STANDARD DUTY EGRESS (60°) 4-BAR HINGE
(Truth 222SS AND 224SS Series)

RECOMMENDED SCREWS:
6 - #10 PHILLIPS, PAN HEAD
STAINLESS STEEL SCREWS. (ENGRAVED THREAD
TYPE TO BE DETERMINED BY PROFILE/BEIGE)

NOTE:
1. IF PREDRILLING, TRUTH RECOMMENDS ADDING
.062 [1.5 MM] TO THE NOTED DIMENSIONS.

2. THE 35.11 HINGE OFFERS YOU THE ADVANTAGE OF
ALLOWING THE OUTSIDE OF THE VENT TO BE WASHED
FROM THE INSIDE BY INSERTING A KEY AND SLIDING
THE CASEMENT WINDOW TOWARDS THE CENTER OF THE
FRAME OPENING GIVING A WASHING SPACE OF
APPROXIMATELY 4 1/2" [114.3 MM].

SEE TRUTH TIP NO. 2 FOR ADDITIONAL INFORMATION.

<table>
<thead>
<tr>
<th>HINGE PART #</th>
<th>&quot;A&quot; HINGE LENGTH</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot; MAX</th>
<th>&quot;H&quot; MAX</th>
<th>ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.09</td>
<td>12.61&quot; [320.3mm]</td>
<td>6.25&quot; [158.6mm]</td>
<td>6.68&quot; [169.8mm]</td>
<td>11.24&quot; [285.4mm]</td>
<td>5.93&quot; [150.4mm]</td>
<td>5.49&quot; [139.4mm]</td>
<td>2.02&quot; [51.3mm]</td>
<td>2.09&quot; [53.1mm]</td>
<td>84*</td>
</tr>
<tr>
<td>35.10</td>
<td>16.41&quot; [416.8mm]</td>
<td>7.01&quot; [178.0mm]</td>
<td>7.45&quot; [189.2mm]</td>
<td>15.03&quot; [381.8mm]</td>
<td>8.53&quot; [216.7mm]</td>
<td>8.09&quot; [205.5mm]</td>
<td>2.02&quot; [51.3mm]</td>
<td>2.05&quot; [52.1mm]</td>
<td>88*</td>
</tr>
<tr>
<td>35.11</td>
<td>16.41&quot; [416.8mm]</td>
<td>7.01&quot; [178.0mm]</td>
<td>7.45&quot; [189.2mm]</td>
<td>15.03&quot; [381.8mm]</td>
<td>7.03&quot; [178.6mm]</td>
<td>6.59&quot; [167.4mm]</td>
<td>2.09&quot; [53.1mm]</td>
<td>2.11&quot; [53.6mm]</td>
<td>88*</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>MAT'L</th>
<th>HINGE CALLOUT &amp; [ACTUAL LENGTH]</th>
<th>PART NUMBER</th>
<th>EGRESS TO WASHABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>16&quot; [425.7mm]</td>
<td>35.12.00.208</td>
<td>N/A</td>
</tr>
<tr>
<td>SST</td>
<td>16&quot; [424.7mm]</td>
<td>35.13.00.208</td>
<td>YES</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>PRODUCT NO.</th>
<th>MODEL</th>
<th>FINISH</th>
<th>ASSEMBLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>12</td>
<td>00</td>
<td>208</td>
</tr>
<tr>
<td>4-BAR HINGE</td>
<td>HEAVY DUTY EGRESS 16&quot; LENGTH</td>
<td>NO DECORATIVE FINISH</td>
<td>W/ STOP STD. OPEN (HINGE FEATURE)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>HINGE CALLOUT &amp; [ACTUAL LENGTH]</th>
<th>ULTIMATE (SEE NOTE #6)</th>
<th>SASH/VENT WIDTH RANGE</th>
<th>MAX SASH VENT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.12 16.76&quot; [425.7mm]</td>
<td>18&quot;-32&quot; [457.2 mm-812.8 mm]</td>
<td>175 LBS AT 32&quot; [79.4 KG AT 812.8 mm]</td>
<td></td>
</tr>
<tr>
<td>35.13 16.72&quot; [424.7mm]</td>
<td>18&quot;-32&quot; [457.2 mm-812.8 mm]</td>
<td>158 LBS AT 32&quot; [79.4 KG AT 812.8 mm]</td>
<td></td>
</tr>
</tbody>
</table>

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.
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 101/1.3 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".
HEAVY DUTY 4-BAR EGRESS HINGES
(Truth 333SS Series)

CENTERLINE OF SASH BAR

OFFSET BETWEEN SASH BAR & HINGE TRACK

CENTERLINE OF HINGE TRACK

.073 [1.85mm]

.186±.010 [4.72±0.25]

.448 [11.37mm]

.895±.0100 [22.73mm±0.25]

.625±.030 [15.88±0.76]

.75 [19.0mm]

2.09 MAX. [53.1mm]

1.375±.030 "E" [34.9mm±0.76]

1.390±.030 "B" [35.3mm±0.76]

"A" ±.055 [±1mm]

"D" DIM "C" DIM "E" DIM

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
RECOMMENDED SCREWS:
#10 Phillips pan head stainless steel screws
(length and thread type to be determined by profile design)

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

**TABLE**

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM HINGE LENGTH</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>NUMBER OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>16&quot;</td>
<td>3513.00.xxx</td>
<td>16.72&quot; [424.7mm]</td>
<td>6.50&quot;   [165.1mm]</td>
<td>7.00&quot;  [177.8mm]</td>
<td>14.97&quot;  [380.2mm]</td>
<td>6.72&quot;  [170.6mm]</td>
<td>6</td>
</tr>
</tbody>
</table>
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.
FIG. 1 TRUTH STANDARD DUTY 4-BAR CASEMENT HINGE
(Truth 401SS Series)

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

<table>
<thead>
<tr>
<th>PART NUMBERING SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT NO.</td>
</tr>
<tr>
<td>34</td>
</tr>
</tbody>
</table>

| 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" [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/IS 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".
FIG. 2  TRUTH STANDARD DUTY 4-BAR CASEMENT HINGE
(Truth 401SS Series)
TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE W/ 90° STOP

<table>
<thead>
<tr>
<th>MAT'L</th>
<th>HINGE CALLOUT &amp; ACTUAL LENGTH</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>14&quot; 14.50” [368.3 mm]</td>
<td>34.59.00.208</td>
</tr>
<tr>
<td>SST</td>
<td>16&quot; 16.50” [419.1 mm]</td>
<td>34.60.00.208</td>
</tr>
<tr>
<td>SST</td>
<td>18&quot; 18.50” [469.9 mm]</td>
<td>34.61.00.208</td>
</tr>
</tbody>
</table>

PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>PRODUCT NO.</th>
<th>MODEL</th>
<th>FINISH</th>
<th>ASSEMBLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>59</td>
<td>00</td>
<td>208</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>HINGE CALLOUT &amp; ACTUAL LENGTH</th>
<th>ULTIMATE (SEE NOTE #6)</th>
<th>SASH/VENT WIDTH RANGE</th>
<th>MAX SASH VENT WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>14” [368.8 mm]</td>
<td>14”-36” [356mm-914mm]</td>
<td>120 lbs at 36” [54.4 kg at 914mm]</td>
<td></td>
</tr>
<tr>
<td>16” [419.6 mm]</td>
<td>16”-36” [406mm-914mm]</td>
<td>120 lbs at 36” [54.4 kg at 914mm]</td>
<td></td>
</tr>
<tr>
<td>18” [470.4 mm]</td>
<td>18”-36” [457mm-914mm]</td>
<td>120 lbs at 36” [54.4 kg at 914mm]</td>
<td></td>
</tr>
</tbody>
</table>

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 101/1.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".
NOTE: * IF PREDRILLING, TRUTH RECOMMENDS ADDING .062" [1.5 mm] TO THESE DIMENSIONS.

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

CENTERLINE OF SASH BAR

OFFSET BETWEEN SASH BAR & HINGE TRACK

CENTERLINE OF HINGE TRACK

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

### Truth 601SS Series

<table>
<thead>
<tr>
<th>HINGE CALL OUT</th>
<th>HINGE PART NUMBER</th>
<th>&quot;A&quot; DIM LENGTH</th>
<th>&quot;C&quot; DIM</th>
<th>&quot;D&quot; DIM</th>
<th>&quot;E&quot; DIM</th>
<th>&quot;F&quot; DIM</th>
<th>&quot;G&quot; DIM</th>
<th># OF SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>14&quot;</td>
<td>34.59.00.XXX</td>
<td>14.52&quot; [368.8 mm]</td>
<td>8.01&quot;</td>
<td>8.51&quot;</td>
<td>12.59&quot;</td>
<td>8.30&quot;</td>
<td>6.59&quot;</td>
<td>7</td>
</tr>
<tr>
<td>16&quot;</td>
<td>34.60.00.XXX</td>
<td>16.52&quot; [419.6 mm]</td>
<td>8.01&quot;</td>
<td>8.51&quot;</td>
<td>14.59&quot;</td>
<td>7.75&quot;</td>
<td>6.09&quot;</td>
<td>7</td>
</tr>
<tr>
<td>18&quot;</td>
<td>34.61.00.XXX</td>
<td>18.52&quot; [470.4 mm]</td>
<td>8.01&quot;</td>
<td>8.51&quot;</td>
<td>16.59&quot;</td>
<td>7.51&quot;</td>
<td>5.77&quot;</td>
<td>7</td>
</tr>
</tbody>
</table>
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 SCREWSper 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)

---

### Recommended Screws:

Stainless Steel: 8\# No. 10 Phillips Pan Head Stainless Steel Screws.

<table>
<thead>
<tr>
<th>Required No. of Riser Blocks Per Hinge</th>
<th>Degree of Opening</th>
<th>Required No. of Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>20°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>34°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>50°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>60°</td>
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</tr>
<tr>
<td></td>
<td>70°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>80°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>90°</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>100°</td>
<td>10</td>
</tr>
</tbody>
</table>

---

### Installation of Riser Block

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 screwdriver
4. Repeat steps 2 & 3 for needed

---

### Anchors

<table>
<thead>
<tr>
<th>P/N 16076 Riser Block</th>
<th>Two</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>300lb (136.05kg)</td>
</tr>
</tbody>
</table>

---

### Track Stop

- Degree of Opening
- STD. Stop

---

### Ventilator Bar

- Centerline of Hinge Track
- Centerline of Ventilator Bar
- MAXIMUM VENT HEIGHT RANGE
- VENT HEIGHT RANGE

<table>
<thead>
<tr>
<th>MAXIMUM VENT WEIGHT</th>
<th>REQUIRED NO. OF RISER BLOCKS PER HINGE</th>
<th>DEGREE OF OPENING</th>
<th>STD. STOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>300lb</td>
<td>1</td>
<td>0°</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>20°</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>30°</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>45°</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>60°</td>
<td>12</td>
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<tr>
<td></td>
<td>6</td>
<td>70°</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>80°</td>
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<td>8</td>
<td>90°</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>100°</td>
<td>12</td>
</tr>
</tbody>
</table>

---

### Anchors

- Anchors 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 screwdriver
  4) Repeat steps 2 & 3 for needed

---

### Ventilator Bar Degree of Opening

- STD. STOP
- REQUIRED NO. OF RISER BLOCKS
- DEGREE OF OPENING
- MAXIMUM VENT WEIGHT

<table>
<thead>
<tr>
<th>REQUIRED NO. OF RISER BLOCKS PER HINGE</th>
<th>DEGREE OF OPENING</th>
<th>STD. STOP</th>
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<tr>
<td></td>
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<td>12</td>
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<tr>
<td></td>
<td>100°</td>
<td>12</td>
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</tbody>
</table>

---

### Ventilator Bar Centerline of Hinge Track

- INSTALLATION OF RISER BLOCK
- Anchors 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 screwdriver
  4) Repeat steps 2 & 3 for needed

---

### Ventilator Bar Centerline of Ventilator Bar

- INSTALLATION OF RISER BLOCK
- Anchors 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 screwdriver
  4) Repeat steps 2 & 3 for needed

---

### anchors

- Anchors 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 screwdriver
  4) Repeat steps 2 & 3 for needed

---

### Ventilator Bar

- Centerline of Hinge Track
- Centerline of Ventilator Bar
- MAXIMUM VENT HEIGHT RANGE
- VENT HEIGHT RANGE

<table>
<thead>
<tr>
<th>REQUIRED NO. OF RISER BLOCKS PER HINGE</th>
<th>DEGREE OF OPENING</th>
<th>STD. STOP</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td>12</td>
</tr>
<tr>
<td></td>
<td>100°</td>
<td>12</td>
</tr>
</tbody>
</table>
**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” (.59 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.

---

<table>
<thead>
<tr>
<th>HEAVY DUTY FRIC TION ADJUSTORS (See Fig. 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART NUMBER</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>37.41.00.100</td>
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<tr>
<td>37.42.00.100</td>
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<tr>
<td>37.43.00.100</td>
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</table>

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

<table>
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<tr>
<th>STANDARD DUTY FRIC TION ADJUSTORS (See Fig. 3)</th>
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<tbody>
<tr>
<td>PART NUMBER</td>
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<td>-------------</td>
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*Bar length is always 2” shorter than Track length.

<table>
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<tr>
<th>LIMIT DEVICE WITH THE KEY RELEASE FEATURE (See Fig. 4)</th>
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<tbody>
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</tr>
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<td>-------------</td>
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<tr>
<td>37.34.00.200</td>
</tr>
<tr>
<td>37.34.00.201</td>
</tr>
</tbody>
</table>

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

SASH

JAMB

NOT GREATER THAN 45°

MOUNTING BRACKET

OPEN POSITION

CLOSED POSITION

DISTANCE BETWEEN BOTTOM MOUNTING HOLE IN BRACKET AND END MOUNTING HOLE IN TRACK DETERMINES DEGREE OF LIMITED OPENING. THE GREATER THE DISTANCE THE MORE RESTRICTED THE OPENING.

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

FRICITION ADJUSTER ARM

FRICTION ADJUSTMENT SCREW

BRASS SHOE

AVAILABLE BRACKET HEIGHT

STACK HEIGHT

A

.110 (2.8mm) .468 (11.9mm)

.180 (4.6mm) .538 (13.7mm)

.235 (6.0mm) .593 (15.1mm)

.422 (10.7mm) .780 (19.8mm)

*STANDARD

RECOMMENDED SCREWS:
4 (P/N 19640) #10-24 x .375 PHILLIPS UNDERCUT FLATHEAD, STAINLESS STEEL MACHINE SCREWS.
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)

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

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.
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

<table>
<thead>
<tr>
<th>10&quot; HINGE</th>
<th>DEGEOES OPENING</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
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<td>14.188 (360.4mm)</td>
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<td>10</td>
<td>.625 (15.9mm)</td>
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<td>20</td>
<td>.625 (15.9mm)</td>
<td>6.625 (168.3mm)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13&quot; HINGE</th>
<th>DEGREES OPENING</th>
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<th>B</th>
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<td>10.156 (258.0mm)</td>
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<tr>
<td>20</td>
<td>.625 (15.9mm)</td>
<td>8.313 (211.2mm)</td>
<td></td>
</tr>
</tbody>
</table>

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. 6 99.20 LIMIT DEVICE
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 re-close 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)

FIG. 9 TRUTH SUPPORT ARMS W/LIMITED OPENING (Anderberg 880SS Series)
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 window 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 predetermined 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 instructions [www.truth.com/instructions](http://www.truth.com/instructions) or [www.truth.com/instructionvideos](http://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](http://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.
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.


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

<table>
<thead>
<tr>
<th>OEM</th>
<th>Left Hand Casement WOCD</th>
<th>Right Hand Casement WOCD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factory Installed</strong></td>
<td>14149 WOCD ASSY, OEM 7/16&quot; LH Incl: arm assy and track assy</td>
<td>14150 WOCD ASSY, OEM 7/16&quot; RH Incl: arm assy and track assy</td>
</tr>
<tr>
<td><strong>Kit</strong></td>
<td>14151 WOCD ASSY, Field Kit 7/16&quot; LH Incl: arm assy, track assy, template, instruction and std screw pack (4 Screws), window label</td>
<td>14152 WOCD ASSY, Field Kit 7/16&quot; RH Incl: arm assy, track assy, template, instruction and std screw pack (4 Screws), window label</td>
</tr>
</tbody>
</table>

Note:
1. This device is not designed for Awning application.
2. Specific SKU to be ordered separately for OEM application.
FIG. 1 SAFEGARD WOCD CASEMENT APPLICATION

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

LOCATE ARM ASSEMBLY WITH INSTALLATION TEMPLATE 92251
WARNING: THE WOCD WILL NOT FUNCTION PROPERLY IF THE ARM IS NOT LOCATED PROPERLY AT INSTALLATION

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

LOCATE TRACK ASSEMBLY IN BOTTOM CORNER OF FRAME

ARM TO HANG AT ANGLE TOWARD HOUSEHOLD INTERIOR
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 cladded 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 weather seal 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

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

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**

<table>
<thead>
<tr>
<th>Jamb Jack III</th>
<th>TRUTH TIPS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Order Insert &amp; Screw separately.</td>
<td>1. When installing the Jamb Jack III screw into the frame, make sure that the screw snaps twice into the insert.</td>
</tr>
<tr>
<td>2. Order #21146 White Finishing Cap.</td>
<td>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 upon the size of the unit.</td>
</tr>
<tr>
<td>(See Truth Tip #3).</td>
<td>3. White Finishing Cap may be painted to match non-standard colors.</td>
</tr>
<tr>
<td>#21150 Door Insert</td>
<td>5. Solid shims are recommended behind the strike plate locations on door jamb installations.</td>
</tr>
<tr>
<td>#21171 Door Screw</td>
<td>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.</td>
</tr>
<tr>
<td>Window Application:</td>
<td></td>
</tr>
<tr>
<td>#21151 Window Insert</td>
<td></td>
</tr>
<tr>
<td>#21175 Window Screw</td>
<td></td>
</tr>
<tr>
<td>3. Order #21183 Turbo Driver Installation Bit (power installation of insert).</td>
<td></td>
</tr>
</tbody>
</table>
FIG. 1 INSTALLATION OF JAMB JACK III WINDOW INSERT

- Turbo Driver 21183
- Window Insert 21151
- Insert to be flush with Jamb frame side of Jamb
- Turn insert clockwise to install into Jamb
- Pilot hole 13.5 mm (0.531 in. approx.) drill

FIG. 2 ADJUSTMENT OF JAMB JACK III FOR WINDOWS

- Screw 21175
- Window Insert 21151
- T25 Torx Screwdriver (not available from Truth)
- Make sure screw snaps twice in insert
- Counter clockwise pushes Jamb out
- Clockwise pulls Jamb in
- Cover hole with cap 21146 after adjustment is complete
FIG. 3 INSTALLATION OF JAMB JACK III DOOR INSERT

1. Turn insert clockwise to install into jamb.
2. Pilot hole 13.5 mm (.531 in. approx.) drill.
3. Frame side of jamb.
4. Turbo driver 21183.
5. Door insert 21150.
6. Insert to be flush with jamb or until flange (opposite side) comes into contact with jamb.

FIG. 4 ADJUSTMENT OF JAMB JACK III FOR DOORS

1. Make sure screw snaps twice in insert.
2. Door insert 21150.
3. T25 torx screwdriver (not available from Truth).
4. Frame.
5. Jamb.
6. Screw 21171.
7. Counter clockwise-pulls jamb in.
8. Clockwise-pushes jamb out.
9. Cover hole with cap 21146 after adjustment is complete.
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

FIG. 10 TURBO DRIVER 21183

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

FOR INSTALLATION OF JAMB JACK III INSERT #21150 OR #21151
# Hardware Comparison for NAFS Casement Window Hardware Load Test

## Performance Classes:
- **R**: The Maximum Frame Size and Sash Weight are listed in the table. Performance Classes LC, C, HC, AW: The Maximum Area (Width x Height) listed in the table must be reduced by 20%.

## Maximum Frame Size & Sash Weight for Operator & Hinge Combination Shown

<table>
<thead>
<tr>
<th>Operator</th>
<th>Hinge</th>
<th>Approx. Minimum Frame Width to Fit Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxim Dual Arm 50.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40&quot; x 84&quot;</td>
<td>108 lbs.</td>
<td></td>
</tr>
<tr>
<td>32&quot; x 68&quot;</td>
<td>65 lbs.</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>24&quot; x 84&quot;</td>
<td>108 lbs.</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>22&quot; x 63&quot;</td>
<td>35 lbs.</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>24&quot; x 84&quot;</td>
<td>108 lbs.</td>
<td>Not Recommended</td>
</tr>
</tbody>
</table>

## Notes:
- 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.
- 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.
- Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as this matrix suggests.
- 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 this table.
- Performance Class R: The maximum frame size and sash weight are listed in the table. Performance Classes LC, C, HC, AW: The maximum area (Width x Height) listed in the table must be reduced by 20%.
- Weatherstrip drag. For this reason, Truth recommends careful evaluation of the entire window before producing units as large as this matrix suggests.
- 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.

## Typical Mounting Positions - Used for Hardware Comparison

<table>
<thead>
<tr>
<th>Hinge</th>
<th>Operator</th>
<th>Bracket Position A</th>
<th>Bracket Position B</th>
<th>Operator Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.00 Heavy Duty Hinges</td>
<td></td>
<td></td>
<td></td>
<td>Dual Arm &amp; Dyad determined by Bracket Position A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Single Arm per catalog.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.XX Concealed Hinges</td>
<td>Maxim Reverse Dyad</td>
<td>3.275</td>
<td>Dual Arm &amp; Dyad determined by Bracket Position A.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other Maxim</td>
<td>4.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EntryGard Dual Arm w/10&quot; Washable Hinge</td>
<td>5.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other EntryGard Dual Arm Operators</td>
<td>6.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EntryGard Dyad &amp; Single Arm</td>
<td>7.125</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Traditional &amp; Ellipse</td>
<td>8.125</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 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. Consult 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).
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)

NOTE:
FOR PROPER KEEPER ALIGNMENT USE A MOUNTING TEMPLATE.

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

FIG. 3  SLOTTED KEEPER 31437

FIG. 4  OFFSET KEEPER
31345 (Steel)

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)

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.

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

TIE BAR LENGTH

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 Snubby 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 Snubby 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:
HANDLELESS 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)

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

LEFT HAND SHOWN

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 0.625" (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

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

LEFT HAND SHOWN
FOR PROPER KEEPER ALIGNMENT USE A MOUNTING TEMPLATE

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

<table>
<thead>
<tr>
<th>AVAILABLE KEEPERS</th>
<th>MOUNTING TEMPLATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>30827</td>
<td>91674</td>
</tr>
<tr>
<td>30899</td>
<td>91674</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Length</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.27</td>
<td></td>
</tr>
<tr>
<td>16.30</td>
<td></td>
</tr>
</tbody>
</table>

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 (hanging 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

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)

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.

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.60.XX</td>
<td>ESCUTCHEON, HANDLE AND LINK ASSEMBLY</td>
</tr>
<tr>
<td>2</td>
<td>TIE BAR ASSEMBLY (HANDED)</td>
</tr>
<tr>
<td>11498.XX</td>
<td>KEEPER (NON-HANDED)</td>
</tr>
</tbody>
</table>

XX DENOTES FINISH CODE
FIG. 2 SIDE STOP ROUTING DETAIL (2 AND 3 LOCKING POINT)

### 2 POINT LOCKING SYSTEM

<table>
<thead>
<tr>
<th>TIE BAR E DIM</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.175 in (410.8 mm)</td>
<td>20.536 (521.6mm)</td>
<td>38.596 (980.3mm)</td>
</tr>
<tr>
<td>22.175 in (563.2 mm)</td>
<td>26.536 (674.0mm)</td>
<td>44.596 (1132.7mm)</td>
</tr>
<tr>
<td>28.175 in (715.6 mm)</td>
<td>32.536 (826.4mm)</td>
<td>50.596 (1285.1mm)</td>
</tr>
<tr>
<td>34.175 in (868 mm)</td>
<td>38.536 (978.8mm)</td>
<td>56.596 (1437.5mm)</td>
</tr>
<tr>
<td>40.175 in (1020.4 mm)</td>
<td>44.536 (1131.2mm)</td>
<td>4.107 (104.3mm)</td>
</tr>
<tr>
<td>46.175 in (1172.8 mm)</td>
<td>50.536 (1283.6mm)</td>
<td>12.951 (328.9mm)</td>
</tr>
<tr>
<td>52.175 in (1325.2 mm)</td>
<td>56.536 (1436.0mm)</td>
<td>4.646 (118.0mm)</td>
</tr>
</tbody>
</table>

### 3 POINT LOCKING SYSTEM

<table>
<thead>
<tr>
<th>TIE BAR E DIM</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.175 in (868.0mm)</td>
<td>23.596 (599.3mm)</td>
<td>38.596 (980.3mm)</td>
</tr>
<tr>
<td>40.175 in (1020.4 mm)</td>
<td>26.596 (675.5mm)</td>
<td>44.596 (1132.7mm)</td>
</tr>
<tr>
<td>46.175 in (1172.8 mm)</td>
<td>29.596 (751.7mm)</td>
<td>50.596 (1285.1mm)</td>
</tr>
<tr>
<td>52.175 in (1325.2 mm)</td>
<td>32.596 (827.9mm)</td>
<td>56.596 (1437.5mm)</td>
</tr>
</tbody>
</table>

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

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

### 3 POINT TIE BAR ASSEMBLIES

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>LH</th>
<th>RH</th>
<th>C DIM</th>
<th>D DIM</th>
<th>E DIM</th>
<th>A DIM</th>
<th>B DIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>11521.XX</td>
<td>11521.XX</td>
<td>11522.XX</td>
<td>14.75 in (374.5mm)</td>
<td>15.00 in (381mm)</td>
<td>34.175 in (868mm)</td>
<td>15.00 in (381mm)</td>
<td>15.00 in (381mm)</td>
</tr>
<tr>
<td>11523.XX</td>
<td>11523.XX</td>
<td>11524.XX</td>
<td>17.75 in (450.9mm)</td>
<td>18.00 in (457.2mm)</td>
<td>40.175 in (1020.4mm)</td>
<td>18.00 in (457.2mm)</td>
<td>18.00 in (457.2mm)</td>
</tr>
<tr>
<td>11525.XX</td>
<td>11525.XX</td>
<td>11526.XX</td>
<td>20.75 in (527.1mm)</td>
<td>21.00 in (533.4mm)</td>
<td>46.175 in (1172.8mm)</td>
<td>21.00 in (533.4mm)</td>
<td>21.00 in (533.4mm)</td>
</tr>
<tr>
<td>11527.XX</td>
<td>11527.XX</td>
<td>11528.XX</td>
<td>23.75 in (603.3mm)</td>
<td>24.00 in (609.6mm)</td>
<td>52.175 in (1325.2mm)</td>
<td>24.00 in (609.6mm)</td>
<td>24.00 in (609.6mm)</td>
</tr>
</tbody>
</table>

XX DENOTES FINISH CODE

**NOTE:**
1. TIE BAR GUIDES ARE PRE-LOCATED ON BAR.
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

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:

- 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)

SECTION A - A

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.
FIG. 6 APPLICATION OF SINGLE POINT WITH DRIVER MECHANISM

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.
FIG. 8 AWNING APPLICATION

RECOMMENDED SCREWS:

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.61.XX</td>
<td>ESCUTCHEON, HANDLE AND LINK ASSEMBLY</td>
</tr>
<tr>
<td>11502.XX</td>
<td>RH TIE BAR ASSEMBLY (LH P/N 11501.XX)</td>
</tr>
<tr>
<td>11498.XX</td>
<td>KEEPER (NON-HANDED)</td>
</tr>
</tbody>
</table>

XX DENOTES FINISH CODE

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.
FIG. 9 SIDE STOP ROUTING DETAIL (AWNING)

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.

RIGHT HAND SHOWN
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.


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

**NOTE:** FOR PROPER KEEPER ALIGNMENT USE MOUNTING TEMPLATE.

**TABLE 1**

<table>
<thead>
<tr>
<th>AVAILABLE LOCKS</th>
<th>A KEEPER</th>
<th>B COVER</th>
<th>REPLACES</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.49</td>
<td>.500 (12.7mm)</td>
<td>.312 (7.9mm)</td>
<td>2.750 (69.9mm)</td>
</tr>
<tr>
<td>16.50</td>
<td>.500 (12.7mm)</td>
<td>.312 (7.9mm)</td>
<td>3.0 (76.2mm)</td>
</tr>
</tbody>
</table>

* 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 complement 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

PARTS SHOWN
- 24.11 LOCKING HANDLE
- 21087 KEEPER

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.

<table>
<thead>
<tr>
<th>AVAILABLE KEEPERS</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>21087</td>
<td>.250 ( 6.4mm)</td>
<td>.594 (15.1mm)</td>
<td>.750 (19.1mm)</td>
</tr>
<tr>
<td>21088</td>
<td>.375 ( 9.5mm)</td>
<td>.594 (15.1mm)</td>
<td>.750 (19.1mm)</td>
</tr>
<tr>
<td>21089</td>
<td>.438 (11.1mm)</td>
<td>.594 (15.1mm)</td>
<td>.750 (19.1mm)</td>
</tr>
<tr>
<td>20800</td>
<td>.250 ( 6.4mm)</td>
<td>.688 (17.5mm)</td>
<td>.750 (19.1mm)</td>
</tr>
<tr>
<td>31384</td>
<td>.250 ( 6.4mm)</td>
<td>.594 (15.1mm)</td>
<td>.750 (19.1mm)</td>
</tr>
</tbody>
</table>
FIG. 3 LOCKING HANDLE 24.11

NOTE: NOT TIE BAR COMPATIBLE.

<table>
<thead>
<tr>
<th>AVAILABLE KEEPERS</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>21087</td>
<td>.250</td>
<td>.718</td>
<td>.844</td>
</tr>
<tr>
<td>21088</td>
<td>.375</td>
<td>.718</td>
<td></td>
</tr>
<tr>
<td>21089</td>
<td>.438</td>
<td>.718</td>
<td></td>
</tr>
<tr>
<td>20800</td>
<td>.250</td>
<td>.812</td>
<td></td>
</tr>
<tr>
<td>31376</td>
<td>.438</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31384</td>
<td>.250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

NOTE: WHEN ORDERING SPECIFY LOCKING HANDLE AND/OR LOCKING CAM.

<table>
<thead>
<tr>
<th>AVAILABLE KEEPERS</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>21087</td>
<td>.250</td>
<td>.594</td>
<td>1.0</td>
</tr>
<tr>
<td>21088</td>
<td>.375</td>
<td>.594</td>
<td></td>
</tr>
<tr>
<td>21089</td>
<td>.438</td>
<td>.594</td>
<td></td>
</tr>
<tr>
<td>20800</td>
<td>.250</td>
<td>.688</td>
<td></td>
</tr>
<tr>
<td>31376</td>
<td>.438</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31384</td>
<td>.250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

NOTE: WHEN ORDERING SPECIFY LOCKING HANDLE AND/OR LOCKING CAM.

<table>
<thead>
<tr>
<th>AVAILABLE KEEPERS</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>21087</td>
<td>.250 (6.4mm)</td>
<td>.718 (18.3mm)</td>
<td>1.0 (25.4mm)</td>
</tr>
<tr>
<td>21088</td>
<td>.375 (9.5mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21089</td>
<td>.438 (11.1mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20800</td>
<td>.250 (6.4mm)</td>
<td>.812 (20.6mm)</td>
<td></td>
</tr>
<tr>
<td>31376</td>
<td>.438 (11.1mm)</td>
<td>.718 (18.3mm)</td>
<td></td>
</tr>
<tr>
<td>31384</td>
<td>.250 (6.4mm)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>AVAILABLE KEEPERS</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>21087</td>
<td>.250 (6.4mm)</td>
<td>.718 (18.3mm)</td>
<td>1.156 (29.4mm)</td>
</tr>
<tr>
<td>21088</td>
<td>.375 (9.5mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21089</td>
<td>.438 (11.1mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20800</td>
<td>.250 (6.4mm)</td>
<td>.812 (20.6mm)</td>
<td></td>
</tr>
<tr>
<td>31376</td>
<td>.438 (11.1mm)</td>
<td>.718 (18.3mm)</td>
<td></td>
</tr>
<tr>
<td>31384</td>
<td>.250 (6.4mm)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

LOCK CUT-OUT DETAIL

* 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)

<table>
<thead>
<tr>
<th>AVAILABLE KEEPERS</th>
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<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>20800</td>
<td>.218</td>
<td>1.375 (34.9mm)</td>
</tr>
<tr>
<td>21087</td>
<td>.218</td>
<td></td>
</tr>
<tr>
<td>21088</td>
<td>.344</td>
<td></td>
</tr>
<tr>
<td>20109</td>
<td>.406</td>
<td>1.282 (32.5mm)</td>
</tr>
<tr>
<td>31384</td>
<td>.218</td>
<td></td>
</tr>
<tr>
<td>31376</td>
<td>.406</td>
<td></td>
</tr>
</tbody>
</table>
FIG. 8 TIE BAR APPLICATION FOR ALL TIE BAR COMPATIBLE LOCKS

<table>
<thead>
<tr>
<th>TIE BAR</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>20049</td>
<td>18.0 (457.2mm)</td>
</tr>
<tr>
<td>20050</td>
<td>24.0 (609.6mm)</td>
</tr>
<tr>
<td>20051</td>
<td>30.0 (762.0mm)</td>
</tr>
<tr>
<td>20280</td>
<td>36.0 (914.4mm)</td>
</tr>
<tr>
<td>20698</td>
<td>42.0 (1066.8mm)</td>
</tr>
</tbody>
</table>

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 KEEPER 21087, 21088, 21089 AND 21325

- 14 GA SST
- E
- F
- 2X .200in

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

<table>
<thead>
<tr>
<th>KEEPER NUMBER</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>21087</td>
<td>.375 [9.5mm]</td>
<td>4.735 [120.3mm]</td>
</tr>
<tr>
<td>21088</td>
<td>.500 [12.7mm]</td>
<td>4.647 [118.0mm]</td>
</tr>
<tr>
<td>21089</td>
<td>.562 [14.3mm]</td>
<td>4.593 [116.7mm]</td>
</tr>
<tr>
<td>21325</td>
<td>.688 [17.5mm]</td>
<td>4.647 [118.0mm]</td>
</tr>
</tbody>
</table>

FIG. 10 KEEPER 20800

- 14 GA SST
- .375in [9.5mm]
- 3.750in [95.3mm]
- 2.500in [63.5mm]
- .562in [14.3mm] 2X .208in [5.3mm]

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

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

NOTE: CANNOT BE USED IN TIEBAR APPLICATIONS.

- POSITIVE PICK UP TAB
- 2.5in [63.5mm]
- 0.37in [9.5mm] .562in [14.3mm]

<table>
<thead>
<tr>
<th>KEEPER NO.</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>31376</td>
<td>.590 [15.0mm]</td>
<td>4.593 [116.7mm]</td>
</tr>
<tr>
<td>31384</td>
<td>.373 [9.5mm]</td>
<td>4.735 [120.3mm]</td>
</tr>
</tbody>
</table>
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.
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 TRUTH HARDWARE PRODUCT SPECIALIST.
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**

**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.

3. TIE BARS WITH ADDITIONAL LOCK POINTS FOR HIGHER DP RATINGS. CONTACT TRUTH APPLICATION SPECIALIST FOR MORE INFORMATION.

**TIE BAR ASSEMBLY**

<table>
<thead>
<tr>
<th>RECOMMENDED MINIMUM FRAME HEIGHT</th>
<th>PART NO.</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>20in (508.0mm)</td>
<td>11901</td>
<td>14.9 (379.5mm)</td>
<td>11.00 (279.4mm)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>24in (609.6mm)</td>
<td>11902</td>
<td>16.0 (406.1mm)</td>
<td>15.00 (381.0mm)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>28in (711.2mm)</td>
<td>11903</td>
<td>22.0 (558.8mm)</td>
<td>19.00 (482.6mm)</td>
<td>10.00 (254.0mm)</td>
<td>NA</td>
</tr>
<tr>
<td>32in (812.8mm)</td>
<td>11904</td>
<td>26.0 (660.4mm)</td>
<td>23.00 (584.2mm)</td>
<td>12.00 (304.8mm)</td>
<td>NA</td>
</tr>
<tr>
<td>36in (914.4mm)</td>
<td>11905</td>
<td>30.0 (762.0mm)</td>
<td>27.00 (685.8mm)</td>
<td>14.00 (355.6mm)</td>
<td>NA</td>
</tr>
<tr>
<td>40in (1016.0mm)</td>
<td>11906</td>
<td>34.0 (863.6mm)</td>
<td>31.00 (787.4mm)</td>
<td>16.00 (406.4mm)</td>
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<tr>
<td>44in (1117.6mm)</td>
<td>11907</td>
<td>36.0 (914.4mm)</td>
<td>35.00 (889.0mm)</td>
<td>18.00 (457.2mm)</td>
<td>NA</td>
</tr>
<tr>
<td>48in (1219.2mm)</td>
<td>11908</td>
<td>42.0 (1066.8mm)</td>
<td>39.00 (990.6mm)</td>
<td>20.00 (508.0mm)</td>
<td>NA</td>
</tr>
<tr>
<td>52in (1320.8mm)</td>
<td>11909</td>
<td>46.0 (1168.4mm)</td>
<td>43.00 (1092.2mm)</td>
<td>22.00 (558.8mm)</td>
<td>NA</td>
</tr>
<tr>
<td>56in (1422.4mm)</td>
<td>11910</td>
<td>50.0 (1269.9mm)</td>
<td>47.00 (1193.8mm)</td>
<td>24.00 (609.6mm)</td>
<td>NA</td>
</tr>
<tr>
<td>60in (1524.0mm)</td>
<td>11911</td>
<td>54.0 (1371.6mm)</td>
<td>51.00 (1304.4mm)</td>
<td>26.00 (660.4mm)</td>
<td>NA</td>
</tr>
<tr>
<td>64in (1625.6mm)</td>
<td>11912</td>
<td>58.0 (1460.1mm)</td>
<td>55.00 (1397.0mm)</td>
<td>28.00 (711.2mm)</td>
<td>NA</td>
</tr>
<tr>
<td>68in (1727.2mm)</td>
<td>11913</td>
<td>62.0 (1571.5mm)</td>
<td>59.00 (1498.6mm)</td>
<td>30.00 (750.0mm)</td>
<td>19.78 (504.8mm)</td>
</tr>
<tr>
<td>72in (1828.8mm)</td>
<td>11914</td>
<td>66.0 (1699.2mm)</td>
<td>63.00 (1600.2mm)</td>
<td>42.00 (1072.3mm)</td>
<td>21.11 (536.1mm)</td>
</tr>
<tr>
<td>76in (1930.4mm)</td>
<td>11915</td>
<td>70.0 (1850.0mm)</td>
<td>67.00 (1701.8mm)</td>
<td>44.00 (1146.3mm)</td>
<td>22.45 (570.2mm)</td>
</tr>
</tbody>
</table>
**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**

- E* (TO CL OF ROLLER)

- G* (TO CL OF ROLLER)

- H* (TO CL OF ROLLER)

**RECOMMENDED SCREWS:**

WOOD/PVC/METAL: 2-#8 PHILLIPS,PAN HEAD,SST

SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILES)

<table>
<thead>
<tr>
<th>PART #</th>
<th>INTERLOCK ROLLER</th>
<th>CONE ROLLER</th>
<th>G</th>
<th>H</th>
<th>F</th>
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<tbody>
<tr>
<td>40823</td>
<td>0.333</td>
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<td>0.010</td>
<td>0.219</td>
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<tr>
<td>45145</td>
<td>0.333</td>
<td>0.400</td>
<td>0.010</td>
<td>0.218</td>
<td>0.862</td>
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<tr>
<td>45148</td>
<td>0.333</td>
<td>0.400</td>
<td>0.010</td>
<td>0.218</td>
<td>0.944</td>
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<tr>
<td>40862</td>
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<td>0.010</td>
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<tr>
<td>40726</td>
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<td>0.400</td>
<td>0.010</td>
<td>0.493</td>
<td>1.039</td>
</tr>
<tr>
<td>45143</td>
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<td>0.400</td>
<td>0.010</td>
<td>0.619</td>
<td>1.165</td>
</tr>
<tr>
<td>45152</td>
<td>0.361</td>
<td>0.430</td>
<td>0.040</td>
<td>0.628</td>
<td>1.174</td>
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<td>45157</td>
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<td>0.044</td>
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<td>45172</td>
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<tr>
<td>40647</td>
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<td>0.063</td>
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<td>45363</td>
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<td>0.462</td>
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<td>1.095</td>
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<tr>
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<td>0.471</td>
<td>0.538</td>
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<td>0.169</td>
<td>0.552</td>
<td>1.098</td>
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<tr>
<td>45195</td>
<td>0.493</td>
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<td>0.170</td>
<td>0.471</td>
<td>1.017</td>
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<tr>
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<td>0.496</td>
<td>0.563</td>
<td>0.173</td>
<td>0.523</td>
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<tr>
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<td>0.563</td>
<td>0.173</td>
<td>0.545</td>
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<td>0.563</td>
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<td>0.646</td>
<td>1.192</td>
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<td>45137</td>
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<td>0.192</td>
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<td>1.177</td>
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<tr>
<td>45141</td>
<td>0.526</td>
<td>0.593</td>
<td>0.203</td>
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<td>45248</td>
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<td>0.394</td>
<td>0.940</td>
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<td>0.650</td>
<td>0.260</td>
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<tr>
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<td>0.650</td>
<td>0.260</td>
<td>0.462</td>
<td>1.008</td>
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<td>0.704</td>
<td>0.314</td>
<td>0.281</td>
<td>0.827</td>
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</tbody>
</table>

* DIMENSION CAN BE VARIED TO SUIT CUSTOMER PROFILE

CONTACT TRUTH PRODUCT SPECIALIST FOR ASSISTANCE

**DIMENSIONS**

- E*: (TO CL OF ROLLER)
- G*: (TO CL OF ROLLER)
- H*: (TO CL OF ROLLER)

**FIG. 7 TIE BAR GUIDE**

- E* (TO CL OF ROLLER)
- G* (TO CL OF ROLLER)
- H* (TO CL OF ROLLER)

* DIMENSION CAN BE VARIED TO SUIT CUSTOMER PROFILE

CONTACT TRUTH PRODUCT SPECIALIST FOR ASSISTANCE
FIG. 8 21600 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 PROFILE OR WHEN ADDED SPACE IS NEEDED FOR THE BAR OR KEEPER CLEARANCE

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

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:
(QTY 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)
FIG. 14 ADJUSTABLE KEEPER (FOR INTERLOCK ROLLER SYSTEM)

NOTES:

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)

<table>
<thead>
<tr>
<th>KEEPER NUMBER</th>
<th>RH</th>
<th>LH</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>40684</td>
<td>40685</td>
<td>0.278</td>
<td></td>
</tr>
<tr>
<td>40724</td>
<td>40725</td>
<td>0.331</td>
<td></td>
</tr>
<tr>
<td>40773</td>
<td>40774</td>
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<td></td>
</tr>
<tr>
<td>40709</td>
<td>40710</td>
<td>0.371</td>
<td></td>
</tr>
</tbody>
</table>

FIG. 15 40928 (LH) AND 40929 (RH) KEEPER USE WITH INTERLOCK TIE BARS

USE WITH INTERLOCK TIE BARS

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)
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

**NOTES:**
- 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)

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

FIG. 21  KEEPER 21087, 21088 AND 21089

FIG. 22  KEEPER 31384 (WITH POSITIVE PICK-UP TAB)

NOTE: CANNOT BE USED IN TIE BAR APPLICATIONS

<table>
<thead>
<tr>
<th>KEEPER</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>21087</td>
<td>0.375 (9.5mm)</td>
<td>4.735 (120.3mm)</td>
</tr>
<tr>
<td>21088</td>
<td>0.500 (12.7mm)</td>
<td>4.647 (118.0mm)</td>
</tr>
<tr>
<td>21089</td>
<td>0.562 (14.3mm)</td>
<td>4.593 (116.7mm)</td>
</tr>
<tr>
<td>21325</td>
<td>0.688 (17.5mm)</td>
<td>4.647 (118.0mm)</td>
</tr>
</tbody>
</table>

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

**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.

**ATTRACTIONAL 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.
3. 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

F: Dimensions vary based on profile shape. Contact technical service for assistance with application of hardware.

Scale 1:1
FIG. 2 SINGLE POINT / AWNING APPLICATION

"I" dimensions vary based on profile shape. Contact Truth Technical Services for assistance with application of hardware.
FIG. 3A LOCK TIE BARS

"F" DIMENSIONS VARY BASED ON PROFILE SHAPE CONTACT TRUTH TECHNICAL SERVICES FOR ASSISTANCE WITH APPLICATION OF HARDWARE

FIG. 3B TIEBAR CHART

<table>
<thead>
<tr>
<th>Window Frame Height (inches)</th>
<th>Tie bar Length (inches)</th>
<th>Number of Lock Points</th>
<th>Spacing Between Tie Bar Guides &quot;A&quot; (inches)</th>
<th>Spacing Between Keepers &quot;B&quot; (inches)</th>
<th>Tiebar Part Number</th>
</tr>
</thead>
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<td>18-24</td>
<td>8.5</td>
<td>1</td>
<td>5.500</td>
<td>0.000</td>
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<tr>
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<td>16.5</td>
<td>2</td>
<td>8.000</td>
<td>8.560</td>
<td>*</td>
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<tr>
<td>30-36</td>
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<td>14.000</td>
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<td>20.560</td>
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<td>42-48</td>
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<td>16.280</td>
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<td>16.000</td>
<td>16.280</td>
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<td>19.000</td>
<td>19.280</td>
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<td>14.853</td>
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<td>20.000</td>
<td>20.140</td>
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* 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

330
[8.38]

"A"

14481
.089 [2.26mm]

14482
.120 [3.05mm]

14483
.150 [3.81mm]

14484
.180 [4.57mm]

14485
.210 [5.33mm]

14486
.240 [6.10mm]

14487
.270 [6.85mm]

14488
.300 [7.62mm]

ROTATE THE KEEPER RIVET
±30° WITH A 1361.4MM
HEX WRENCH TO ADJUST
THE WEATHER STRIP
COMPRESSION

PART NUMBER  "A" DIMENSION
14481     0.089 [2.26mm]
14482     0.120 [3.05mm]
14483     0.150 [3.81mm]
14484     0.180 [4.57mm]
14485     0.210 [5.33mm]
14486     0.240 [6.10mm]
14487     0.270 [6.85mm]
14488     0.300 [7.62mm]

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

337
[8.56]

"A"

1.000
[25.40]

2.000
[50.80]

PART NUMBER  "A" DIMENSION
33702     1.28 [3.26mm]
33703     2.28 [5.84mm]

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.

**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.
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. 
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

NOTES:

1. ACCURACY OF INDICATED DIMENSIONS IS CRITICAL TO THE FUNCTION OF THE MULTI-POINT LOCK
2. "A", "B" AND "C" DIMENSIONS ARE CONFIGURED TO GIVE SEQUENTIAL LOCKING, STARTING WITH THE BOTTOM LOCKING POINT. REFER TO FIG. 4
3. TIE BAR MOVES APPROX. 1.50" (38.1 mm)
4. CONTACT TECHNICAL SERVICES FOR TIE BAR INFORMATION

HARDWARE SHOWN

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>12662.XX</td>
<td>ENCORE TANGO HANDLE AND ESCUTCHEON</td>
</tr>
<tr>
<td>33593.92</td>
<td>STEEL KEEPER, LH FLANGE (33592.92 RH)(QTY:1 PER LOCK POINT)</td>
</tr>
<tr>
<td>12642.92</td>
<td>ENCORE LOCK DRIVE ASSEMBLY</td>
</tr>
</tbody>
</table>
FIG. 2 CASEMENT APPLICATION WITH BISCUIT KEEPER

NOTES:

1. ACCURACY OF INDICATED DIMENSIONS IS CRITICAL TO THE FUNCTION OF THE MULTI-POINT LOCK

2. "A", "B" AND "C" DIMENSIONS ARE CONFIGURED TO GIVE SEQUENTIAL LOCKING, STARTING WITH THE BOTTOM LOCKING POINT. REFER TO FIG. 4

3. TIE BAR MOVES APPROX. 1.50" (38.1 mm)

4. CONTACT TECHNICAL SERVICES FOR TIE BAR INFORMATION

<table>
<thead>
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<th>PART NO.</th>
<th>DESCRIPTION</th>
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<tr>
<td>12662.XX</td>
<td>ENCORE TANGO HANDLE AND ESCUTCHEON</td>
</tr>
<tr>
<td>SEE FIG. 5</td>
<td>ENCORE TIE BAR ASSEMBLY</td>
</tr>
<tr>
<td>41341.92</td>
<td>STEEL KEEPER, NON-HANDED BISCUIT (QTY: 1 PER LOCK POINT)</td>
</tr>
<tr>
<td>12642.92</td>
<td>ENCORE LOCK DRIVE ASSEMBLY</td>
</tr>
</tbody>
</table>
FIG. 3  TIE BARS ABOVE AND BELOW LOCK DRIVE

<table>
<thead>
<tr>
<th>NUMBER OF LOCK POINTS ON UPPER TIE BAR</th>
<th>ADJUSTMENT TO DIMENSIONS IN FIG. 5</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>A +.310</td>
</tr>
<tr>
<td>2</td>
<td>B +.155</td>
</tr>
<tr>
<td>3</td>
<td>C -.155</td>
</tr>
</tbody>
</table>

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.
FIG. 4  SIDE STOP AND JAMB ROUTING DETAIL

SECTION C-C
PROFILE REQUIREMENTS

SECTION D-D

LEFT HAND SHOWN

ENCORE™ MULTI-POINT
LOCKING SYSTEM
### FIG. 5 TIE BAR ASSEMBLY CHART

RECOMMENDED SCREWS

- 2 (P/N 19077.92)
- #6 x 1 PAN HEAD
- SHEET METAL SCREW

### ENCORE CASEMENT TIE BAR ASSEMBLIES

<table>
<thead>
<tr>
<th>APPROX. WINDOW HEIGHT</th>
<th>&quot;E&quot; DIM ROUND TOP WINDOWS ONLY</th>
<th># OF LOCK POINTS</th>
<th>PART NO.</th>
<th>TIE BAR LENGTH</th>
<th>&quot;A&quot; DIM FLANGE KEEPER</th>
<th>&quot;A&quot; DIM BISCUIT KEEPER</th>
<th>&quot;B&quot; DIM</th>
<th>&quot;C&quot; DIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEE FIG. 1 &amp; 2</td>
<td>SEE FIG. 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>69&quot;-75&quot;</td>
<td>60&quot;-66&quot;</td>
<td>3</td>
<td>12659</td>
<td>12660</td>
<td>57.44</td>
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<tr>
<td>63&quot;-69&quot;</td>
<td>54&quot;-60&quot;</td>
<td>3</td>
<td>12657</td>
<td>12658</td>
<td>51.44</td>
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<td>57&quot;-63&quot;</td>
<td>48&quot;-54&quot;</td>
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<td>12696</td>
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<td></td>
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<td>33.44</td>
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<tr>
<td>39&quot;-45&quot;</td>
<td>30&quot;-36&quot;</td>
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<td>12649</td>
<td>12650</td>
<td>27.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33&quot;-39&quot;</td>
<td>24&quot;-30&quot;</td>
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<td>12648</td>
<td>21.44</td>
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<td></td>
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<tr>
<td>27&quot;-33&quot;</td>
<td>18&quot;-24&quot;</td>
<td>1</td>
<td>12645</td>
<td>12646</td>
<td>15.44</td>
<td>13.685</td>
<td>14.050</td>
<td></td>
</tr>
<tr>
<td>21&quot;-27&quot;</td>
<td>12&quot;-18&quot;</td>
<td>1</td>
<td>12643</td>
<td>12644</td>
<td>9.44</td>
<td>7.685</td>
<td>8.050</td>
<td></td>
</tr>
<tr>
<td><strong>TIE BAR LENGTH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6.185</td>
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<td></td>
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<td>6.550</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SEE FIGURES 1-3
FIG. 6 AWNING APPLICATION WITH FLANGE KEEPER

NOTES:

APPROXIMATE MINIMUM WINDOW FRAME HEIGHT IS 17.5 INCHES.

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>12662.XX</td>
<td>ENCORE TANGO HANDLE AND ESCUTCHEON</td>
</tr>
<tr>
<td>12665.92</td>
<td>ENCORE TIE BAR ASSEMBLY, AWNING LH (12666.92 RH)</td>
</tr>
<tr>
<td>33593.92</td>
<td>STEEL KEEPER, LH FLANGE (33592.92 RH)</td>
</tr>
<tr>
<td>12642.92</td>
<td>ENCORE LOCK DRIVE ASSEMBLY</td>
</tr>
</tbody>
</table>
FIG. 7 AWNING APPLICATION WITH BISCUIT KEEPER

LEFT HAND SHOWN

SECTION A-A
LOCK DRIVE MOUNTING

SECTION B-B
TIE BAR & KEEPER MOUNTING

NOTES:
APPROXIMATE MINIMUM WINDOW FRAME HEIGHT IS 17.5 INCHES.

<table>
<thead>
<tr>
<th>PART NO.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>12662.XX</td>
<td>ENCORE TANGO HANDLE AND ESCUTCHEON</td>
</tr>
<tr>
<td>12665.92</td>
<td>ENCORE TIE BAR ASSEMBLY. AWNING LH (12666.92 RH)</td>
</tr>
<tr>
<td>41341.92</td>
<td>STEEL KEEPER, NON-HANDED BISCUIT</td>
</tr>
<tr>
<td>12642.92</td>
<td>ENCORE LOCK DRIVE ASSEMBLY</td>
</tr>
</tbody>
</table>
FIG. 8  KEEPER FLANGE 33592 (RH) 33593 (LH)

LEFT HAND ShOWN

1.005  
[25.5 mm]

.140  
[3.6 mm]

1.125  
[28.6 mm]

2.490  
[63.2 mm]

.188  
[4.8 mm]

RECOMMENDED SCREWS:

2 (P/N 19051.92) #6 X 1 FLAT HEAD SHEET METAL SCREW

FIG. 9  KEEPER, BISCUIT 41341 (NON-HANDED)

R1.531  
[38.9 mm]

1.060  
[26.9 mm]

.470  
[11.9 mm]

.810  
[20.6 mm]

1.000  
[25.4 mm]

2.941  
[74.7 mm]

.090  
[2.3 mm]

RECOMMENDED SCREWS:

2 (P/N 19230.92) #8 X 1 PAN HEAD SHEET METAL SCREW

FIG. 10  HANDLE AND ESCUTCHEON 12662.XX

5.316  
[135.0 mm]

.661  
[16.8 mm]

.568  
[14.4 mm]

.360  
[9.1 mm]

FIG. 11  LOCK DRIVE ASSEMBLY 12642.92

2.620  
[66.5 mm]

6.319  
[160.5 mm]

1.494  
[37.9 mm]

RECOMMENDED SCREWS:

2 (P/N 19077.92) #6 X 1 PAN HEAD SHEET METAL SCREW
FIG. 12 ROUND TOP APPLICATION

NOTES:
1. REFER TO FIGURES 1-5 FOR APPLICATION OF STRAIGHT TIE BAR
2. REFER TO FIG. 4 FOR SIDE STOP AND JAMB ROUTING DETAIL
3. CONNECTING LINK LENGTH ±.50 IS "D"="E" - TIE BAR LENGTH - 2.305
**FIG. 13 CONNECTING LINK 45459**

- Measure "D" from this end.
- Break connecting link at appropriate "V" groove to achieve required length.
- Discard this end when broken.
- Recommended screws: 2 #6-32 x 3/8 flat head self-tapping screws.

**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**

- Radii: R12.00
- Tie bar radius may be resized by bending to fit various window sizes.

---

*ENCORE™ MULTI-POINT LOCKING SYSTEM*
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 then 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

![Diagram of a multi-point locking system](image)

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION (RIGHT HAND SHOWN)</th>
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<tbody>
<tr>
<td>24.84.XX.002</td>
<td>LOCK ASSEMBLY (L.H. 24.84.XX.001)</td>
</tr>
<tr>
<td>21132</td>
<td>SUPPORT PLATE</td>
</tr>
<tr>
<td>19545</td>
<td>#8-32 PHILLIPS SELF THREADING SCREW</td>
</tr>
<tr>
<td>*</td>
<td>TIE BAR GUIDE (NON HANDED)</td>
</tr>
<tr>
<td>**</td>
<td>#8 PH SST SHEET METAL SCREW BAR GUIDE</td>
</tr>
<tr>
<td>*</td>
<td>KEEPER R.H. (L.H. IS *)</td>
</tr>
<tr>
<td>**</td>
<td>#8 PH SST SHEET METAL SCREW (KEEPER)</td>
</tr>
<tr>
<td>SEE CHART ***</td>
<td>TIE BAR ASSEMBLY (NON HANDED)</td>
</tr>
</tbody>
</table>

* 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**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION (RIGHT HAND SHOWN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.84.XX.002</td>
<td>LOCK ASSEMBLY (L.H. 24.84.XX.001)</td>
</tr>
<tr>
<td>21132</td>
<td>SUPPORT PLATE</td>
</tr>
<tr>
<td>19545</td>
<td>#8-32 PHILLIPS SELF THREADING SCREW</td>
</tr>
<tr>
<td>*</td>
<td>TIE BAR GUIDE (NON HANDED)</td>
</tr>
<tr>
<td>**</td>
<td>#8 PH SST SHEET METAL SCREW BAR GUIDE</td>
</tr>
<tr>
<td>31302</td>
<td>KEEPER R.H. (L.H. IS 31301)</td>
</tr>
<tr>
<td>**</td>
<td>#8 PH SST SHEET METAL SCREW (KEEPER)</td>
</tr>
<tr>
<td>SEE CHART</td>
<td>TIE BAR ASSEMBLY (NON HANDED)</td>
</tr>
</tbody>
</table>

* DEPENDENT ON PROFILE DESIGN
** SCREWS NOT FURNISHED BY TRUTH
*** OTHER LENGTHS AVAILABLE UPON REQUEST
XX PAINT COLOR CODE

**NOTE:**
- MOUNTING SCREWS FOR KEEPER AND TIE BAR GUIDE MUST PASS THRU TWO WALLS.
- DIMENSION VARIABLE-DEPENDENT ON CUSTOMER PROFILES.
- WASHERS OR TRUTH PART NO. 31491 MAY ALSO BE USED. (SEE FIG. 7)
- 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 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.

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION (RIGHT HAND SHOWN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.84.XX.002</td>
<td>LOCK ASSEMBLY (L.H. 24.84.XX.001)</td>
</tr>
<tr>
<td>21132</td>
<td>SUPPORT PLATE</td>
</tr>
<tr>
<td>19545</td>
<td>#8-32 PHILLIPS SELF THREADING SCREW</td>
</tr>
<tr>
<td>*</td>
<td>TIE BAR GUIDE (NON HANDED)</td>
</tr>
<tr>
<td>**</td>
<td>#8 PH SST SHEET METAL SCREW BAR GUIDE</td>
</tr>
<tr>
<td>*</td>
<td>KEEPER R.H. (L.H. IS 31301)</td>
</tr>
<tr>
<td>**</td>
<td>#8 PH SST SHEET METAL SCREW (KEEPER)</td>
</tr>
<tr>
<td>11925</td>
<td>TIE BAR ASSEMBLY (NON HANDED)</td>
</tr>
</tbody>
</table>

* DEPENDENT ON PROFILE DESIGN
** SCREWS NOT FURNISHED BY TRUTH
XX PAINT COLOR CODE
### FIG. 4 TIE BAR CHART FOR INTERLOCK ROLLER

![Diagram of tie bar chart for interlock roller]

<table>
<thead>
<tr>
<th>WINDOW SIZE</th>
<th>PART NO.</th>
<th>2 ROLLERS</th>
<th>3 ROLLERS</th>
<th>A DIM</th>
<th>B DIM</th>
<th>C DIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 in (558.8mm)</td>
<td>11113</td>
<td>NA</td>
<td></td>
<td>10.9 (276.9mm)</td>
<td>7.0 (177.8mm)</td>
<td>NA</td>
</tr>
<tr>
<td>26 in (660.4mm)</td>
<td>11114</td>
<td>NA</td>
<td></td>
<td>14.9 (378.5mm)</td>
<td>11.0 (279.4mm)</td>
<td>NA</td>
</tr>
<tr>
<td>30 in (762.0mm)</td>
<td>11115</td>
<td>NA</td>
<td></td>
<td>18.9 (480.1mm)</td>
<td>15.0 (381.0mm)</td>
<td>NA</td>
</tr>
<tr>
<td>34 in (863.6mm)</td>
<td>11116</td>
<td>11126</td>
<td></td>
<td>22.9 (581.7mm)</td>
<td>19.0 (482.6mm)</td>
<td>10.0 (254.0mm)</td>
</tr>
<tr>
<td>38 in (965.2mm)</td>
<td>11117</td>
<td>11127</td>
<td></td>
<td>26.9 (683.3mm)</td>
<td>23.0 (584.2mm)</td>
<td>12.0 (304.8mm)</td>
</tr>
<tr>
<td>42 in (1066.8mm)</td>
<td>11118</td>
<td>11128</td>
<td></td>
<td>30.9 (784.9mm)</td>
<td>27.0 (685.8mm)</td>
<td>14.0 (355.6mm)</td>
</tr>
<tr>
<td>46 in (1168.4mm)</td>
<td>11119</td>
<td>11129</td>
<td></td>
<td>34.9 (886.5mm)</td>
<td>31.0 (787.4mm)</td>
<td>16.0 (406.4mm)</td>
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<tr>
<td>50 in (1270.0mm)</td>
<td>11120</td>
<td>11130</td>
<td></td>
<td>38.9 (988.1mm)</td>
<td>35.0 (889.0mm)</td>
<td>18.0 (457.2mm)</td>
</tr>
<tr>
<td>54 in (1371.6mm)</td>
<td>11121</td>
<td>11131</td>
<td></td>
<td>42.9 (1089.7mm)</td>
<td>39.0 (990.6mm)</td>
<td>20.0 (508.0mm)</td>
</tr>
<tr>
<td>58 in (1473.2mm)</td>
<td>11122</td>
<td>11132</td>
<td></td>
<td>46.9 (1191.3mm)</td>
<td>43.0 (1092.2mm)</td>
<td>22.0 (558.8mm)</td>
</tr>
<tr>
<td>62 in (1574.8mm)</td>
<td>11123</td>
<td>11133</td>
<td></td>
<td>50.9 (1292.9mm)</td>
<td>47.0 (1193.8mm)</td>
<td>24.0 (609.6mm)</td>
</tr>
<tr>
<td>66 in (1676.4mm)</td>
<td>11124</td>
<td>11134</td>
<td></td>
<td>54.9 (1394.5mm)</td>
<td>51.0 (1295.4mm)</td>
<td>26.0 (660.4mm)</td>
</tr>
<tr>
<td>70 in (1778.0mm)</td>
<td>11125</td>
<td>11135</td>
<td></td>
<td>58.9 (1496.1mm)</td>
<td>55.0 (1397.0mm)</td>
<td>28.0 (711.2mm)</td>
</tr>
</tbody>
</table>
MULTI-POINT LOCKING SYSTEM

FIG. 5 SUPPORT PLATES

21132 SUPPORT PLATE

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

L.H. SHOWN

SCREWS: 19146
10-32 X 1 PH OH MS

FIG. 2 CLASSIC SINGLE POINT 60.01.XX.001/.002

L.H. SHOWN

SCREWS: 19146
10-32 X 1 PH OH MS

FIG. 3 RETRO MULTI-POINT 60.02.XX.001/.002

L.H. SHOWN

SCREWS: 19146
10-32 X 1 PH OH MS

FIG. 4 RETRO SINGLE POINT 60.03.XX.001/.002

L.H. SHOWN

SCREWS: 19146
10-32 X 1 PH OH MS

FIG. 5 SPINDLE 22852

1.220

7 mm

NOTE:
CUSTOM LENGTHS OFFERED
CLEARANCE HOLE IS Ø.4375
<table>
<thead>
<tr>
<th>BAR LENGTH &quot;A&quot;</th>
<th>2 PT. LOCATIONS &quot;B&quot;</th>
<th>4 PT. LOCATIONS &quot;C&quot;</th>
<th>HDL SETBACK &quot;D&quot; = 22mm 9mm ROLLER</th>
<th>Handle Height &quot;E&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>in</td>
<td>STEEL</td>
<td>SST</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>9.84</td>
<td>13594</td>
<td>13602</td>
<td>4.92</td>
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<tr>
<td>400</td>
<td>15.75</td>
<td>13595</td>
<td>13603</td>
<td>7.88</td>
</tr>
<tr>
<td>600</td>
<td>23.62</td>
<td>13596</td>
<td>13604</td>
<td>11.81</td>
</tr>
<tr>
<td>800</td>
<td>31.50</td>
<td>13597</td>
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<td>1000</td>
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<td>13598</td>
<td>13606</td>
<td>19.69</td>
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<tr>
<td>1200</td>
<td>47.24</td>
<td>13599</td>
<td>13607</td>
<td>23.62</td>
</tr>
<tr>
<td>1400</td>
<td>55.11</td>
<td>13600</td>
<td>13608</td>
<td>23.62</td>
</tr>
<tr>
<td>1600</td>
<td>63.00</td>
<td>13601</td>
<td>13609</td>
<td>23.62</td>
</tr>
</tbody>
</table>

**FIG. 6 LOCK BAR CENTER HANDLE (SEE CHART ABOVE)**

**FIG. 7 APPLICATION OF LOCK BAR INTO SASH ROUTING AND DRILLING PATTERN**
<table>
<thead>
<tr>
<th>BAR LENGTH &quot;A&quot;</th>
<th>2 PT. LOCATIONS &quot;B&quot;</th>
<th>4 PT. LOCATIONS &quot;C&quot;</th>
<th>HDL SETBACK &quot;D&quot; = 22mm 9mm ROLLER</th>
<th>Handle Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>in</td>
<td>in</td>
<td>STEEL</td>
<td>SST</td>
</tr>
<tr>
<td>600</td>
<td>23.62</td>
<td>19.13</td>
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<tr>
<td>800</td>
<td>31.50</td>
<td>27.01</td>
<td>13750</td>
<td>13761</td>
</tr>
<tr>
<td>1000</td>
<td>39.37</td>
<td>34.88</td>
<td>13750</td>
<td>13762</td>
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<td>1200</td>
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<td>1400</td>
<td>55.11</td>
<td>50.62</td>
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<td>13764</td>
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<tr>
<td>1600</td>
<td>63.00</td>
<td>58.51</td>
<td>13750</td>
<td>13765</td>
</tr>
</tbody>
</table>

**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

COLOR: BLACK
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

SCREWS: 19240 - 8 X 1 PH FH SMS

LOCK BAR COVER INCLUDED

AMOUNT OF TRAVEL .785

.866 [22]

2X .843

.800 AMOUNT OF TRAVEL

LOCK BAR

SLIDE CLIPS OUT TO COVER LOCK BAR

SCREWS: 19240 - 8 X 1 PH FH SMS
## PUSH OUT HARDWARE

### FIG. 18 FRENCH CASEMENT LOCK BAR - LONG BOX (SEE CHART ABOVE)

### FIG. 19 APPLICATION OF LOCK BAR INTO SASH ROUTING AND DRILLING PATTERN

<table>
<thead>
<tr>
<th>SASH SIZE</th>
<th>BAR LENGTH</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot;</th>
<th>&quot;H&quot;</th>
<th>&quot;I&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handle</td>
<td>MM</td>
<td>MAX</td>
<td>MIN</td>
<td>ROLLER</td>
<td>NO ROLLER</td>
<td>9MM</td>
<td></td>
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<tr>
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<td>IN</td>
<td>IN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>27.02</td>
<td>260</td>
<td>10.31</td>
<td>5.11</td>
<td>13860</td>
<td>13469</td>
<td>13.51</td>
<td>4.17</td>
<td>1.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.26</td>
<td>390</td>
<td>15.43</td>
<td>10.23</td>
<td>13861</td>
<td>13470</td>
<td>18.63</td>
<td>9.30</td>
<td>1.87</td>
<td>6.98</td>
<td></td>
</tr>
<tr>
<td>47.36</td>
<td>520</td>
<td>20.48</td>
<td>15.28</td>
<td>13862</td>
<td>13471</td>
<td>23.68</td>
<td>14.21</td>
<td>1.87</td>
<td>5.70</td>
<td>12.04</td>
</tr>
<tr>
<td>57.76</td>
<td>650</td>
<td>25.68</td>
<td>20.48</td>
<td>13863</td>
<td>13472</td>
<td>28.88</td>
<td>19.44</td>
<td>1.87</td>
<td>8.36</td>
<td>17.26</td>
</tr>
<tr>
<td>67.86</td>
<td>780</td>
<td>30.73</td>
<td>25.53</td>
<td>13864</td>
<td>13473</td>
<td>33.93</td>
<td>24.65</td>
<td>2.06</td>
<td>12.12</td>
<td>22.36</td>
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<tr>
<td>78.12</td>
<td>910</td>
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<td>30.66</td>
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<td>13474</td>
<td>39.06</td>
<td>29.63</td>
<td>2.06</td>
<td>14.68</td>
<td>27.47</td>
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<td>40.99</td>
<td>35.79</td>
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<td>13475</td>
<td>44.19</td>
<td>34.89</td>
<td>2.06</td>
<td>17.22</td>
<td>32.56</td>
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</table>

### Notes:
- FIG. 18: French Casement Lock Bar - Long Box (See Chart Above)
- FIG. 19: Application of Lock Bar into Sash Routing and Drilling Pattern
### FIG. 20 FRENCH CASEMENT LOCK BAR - SHORT BOX (SEE CHART ABOVE)

<table>
<thead>
<tr>
<th>SASH SIZE &quot;A&quot; Handle Centered</th>
<th>BAR LENGTH &quot;B&quot;</th>
<th>&quot;C&quot; LOCK POINT HEIGHT</th>
<th>&quot;D&quot; HANDLE HEIGHT</th>
<th>&quot;E&quot; LOCKING POINTS</th>
<th>SCREW HOLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM</td>
<td>MAX IN</td>
<td>MIN IN</td>
<td>ROLLER 9MM</td>
<td>NO ROLLER 9MM</td>
<td>&quot;G&quot;</td>
</tr>
<tr>
<td>24.38</td>
<td>260</td>
<td>10.31</td>
<td>5.11</td>
<td>13860</td>
<td>13469</td>
</tr>
<tr>
<td>34.61</td>
<td>390</td>
<td>15.43</td>
<td>10.23</td>
<td>13861</td>
<td>13470</td>
</tr>
<tr>
<td>44.41</td>
<td>520</td>
<td>20.48</td>
<td>15.28</td>
<td>13862</td>
<td>13471</td>
</tr>
<tr>
<td>55.1</td>
<td>650</td>
<td>25.68</td>
<td>20.48</td>
<td>13863</td>
<td>13472</td>
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<tr>
<td>65.21</td>
<td>780</td>
<td>30.73</td>
<td>25.53</td>
<td>13864</td>
<td>13473</td>
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<tr>
<td>75.46</td>
<td>910</td>
<td>35.86</td>
<td>30.66</td>
<td>13865</td>
<td>13474</td>
</tr>
<tr>
<td>85.72</td>
<td>1040</td>
<td>40.99</td>
<td>35.79</td>
<td>13866</td>
<td>13475</td>
</tr>
</tbody>
</table>

### FIG. 21 APPLICATION OF LOCK BAR INTO SASH ROUTING AND DRILLING PATTERN
FIG. 22 SCREEN HINGE - METAL 29.20.XX.00/.002

L.H. SHOWN

LOOSE PIN

SCREWS: 19051 - 6 X 1 T17 PH FH SMS

FIG. 23 SCREEN HINGE - WOOD 29.21.XX.001/.002

L.H. SHOWN

SCREWS: 19187 - 7 X 1 T17 PH FU SMS

FIG. 24 SCREEN KNOB 13301.XX

SCREW INCLUDED: 8-32 X 1 PH/SL TH MS

FIG. 25 SCREEN PULL 41678.XX/41679.XX

SCREWS: 19146 10-32 X 1 PH OH MS
FIG. 26 12.81 STAY BAR

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.81.XX.001</td>
<td>17.00</td>
<td>12.00</td>
</tr>
<tr>
<td>12.81.XX.002</td>
<td>12.00</td>
<td>7.00</td>
</tr>
</tbody>
</table>

SCREWS: #8 X 1 FH WS (QTY:2 (INCLUDED) #8 X 1.5 FH WS (QTY:4)
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

PIN IS REMOVABLE TO DISCONNECT SASH
FIG. 28 14.61 FRICTION HINGE 14” - STANDARD WASH

REFINED 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. 29 14.60 FRICTION HINGE 10" - STANDARD WASH

OPTIONAL STOP
33047(LH)
33048(RH)

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

85° MAX.
FIG. 30 14.60 FRICTION HINGE 10" - EGRESS

LEFT HAND SHOWN

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

OPTIONAL STOP
33045
### FIG. 31 HINGE SASH SIZE TABLE

<table>
<thead>
<tr>
<th>Hinge Size/Type</th>
<th>Arm &amp; Track Assembly P/N</th>
<th>KD Arm Assembly P/N</th>
<th>Stops Used</th>
<th>Maximum Recommended (sash)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10” Egress</td>
<td>14.60.00.005/006</td>
<td>14.60.00.007/008</td>
<td>No Track Stops</td>
<td>Width (in.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>10” Egress</td>
<td>14.60.00.005/006</td>
<td>14.60.00.007/008</td>
<td>No Track Stops</td>
<td>20</td>
</tr>
<tr>
<td>14” Wash</td>
<td>14.61.00.005/006</td>
<td>14.61.00.007/008</td>
<td>No Track Stops</td>
<td>24</td>
</tr>
<tr>
<td>14” Wash</td>
<td>14.61.00.005/006</td>
<td>14.61.00.007/008</td>
<td>No Track Stops</td>
<td>26</td>
</tr>
<tr>
<td>10” Wash</td>
<td>14.60.00.001/002</td>
<td>14.60.00.003/004</td>
<td>No Track Stops</td>
<td>24</td>
</tr>
<tr>
<td>10” Wash</td>
<td>14.60.00.001/002</td>
<td>14.60.00.003/004</td>
<td>No Track Stops</td>
<td>28</td>
</tr>
<tr>
<td>10” Wash</td>
<td>14.60.00.001/002</td>
<td>14.60.00.003/004</td>
<td>33047/8</td>
<td>34</td>
</tr>
<tr>
<td>10” Wash</td>
<td>14.60.00.001/002</td>
<td>14.60.00.003/004</td>
<td>33047/8</td>
<td>36</td>
</tr>
<tr>
<td>10” Egress</td>
<td>14.60.00.005/006</td>
<td>14.60.00.007/008</td>
<td>33045</td>
<td>36</td>
</tr>
<tr>
<td>10” Egress</td>
<td>14.60.00.005/006</td>
<td>14.60.00.007/008</td>
<td>33045</td>
<td>36</td>
</tr>
<tr>
<td>14” Wash</td>
<td>14.61.00.005/006</td>
<td>14.61.00.007/008</td>
<td>26110</td>
<td>36</td>
</tr>
<tr>
<td>14” Wash</td>
<td>14.61.00.005/006</td>
<td>14.61.00.007/008</td>
<td>26110</td>
<td>38</td>
</tr>
</tbody>
</table>
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.
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 show 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

<table>
<thead>
<tr>
<th>NO.</th>
<th>QTY</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>14048</td>
<td>SHORT KEEPER</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>14061</td>
<td>SHORT END LOCK PT</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>14049</td>
<td>DRIVE BLOCK</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>14062</td>
<td>LONG END LOCK PT</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>14051</td>
<td>CLASSIC STD HANDLE</td>
</tr>
</tbody>
</table>
FIG. 2  2 POINT LOCK WITH SHOOT BOLTS (DUAL DRIVE HANDLE)

<table>
<thead>
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<th>NO.</th>
<th>QTY</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>14063</td>
<td>SHOOT BOLT</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>14050</td>
<td>CENTER LOCK PT</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>14058</td>
<td>BI - DRIVE BLOCK</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>14056</td>
<td>CLASSIC DUAL HANDLE</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>14048</td>
<td>SHORT KEEPERS</td>
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</tbody>
</table>
FIG. 3 6 POINT LOCKING ON 3 SIDES OF VENT

<table>
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<th>QTY</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
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<tr>
<td>1</td>
<td>4</td>
<td>14048</td>
<td>SHORT KEEPER</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>14050</td>
<td>CENTER LOCK PT</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>14049</td>
<td>DRIVE BLOCK</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>14062</td>
<td>LONG END LOCK PT</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>14054</td>
<td>RADIUS STD HANDLE</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>14057</td>
<td>CORNER DRIVE</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>14061</td>
<td>SHORT END LOCK PT</td>
</tr>
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</table>
FIG. 4 TERRACE DOOR SYSTEM WITH 2 POINT LOCKING

<table>
<thead>
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<th>NO.</th>
<th>QTY</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
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<td>2</td>
<td>1</td>
<td>14062</td>
<td>LONG END LOCK PT</td>
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<tr>
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<td>1</td>
<td>14059</td>
<td>DOOR LOCK BOX</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>14053</td>
<td>CLASSIC DOOR SET</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>14048</td>
<td>SHORT KEEPER</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>14060</td>
<td>DOOR STRIKE</td>
</tr>
</tbody>
</table>
FIG. 5 SPECIFICATION OF THE SLOT SECTION FOR MOVEABLE FITTINGS

HOLE FOR TRANSMISSION RODS

DIMENSION FOR THE HANDLE INSTALLATION
FIG. 6 OUTSWING 2 POINT LOCK

<table>
<thead>
<tr>
<th>NO.</th>
<th>QTY</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
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<td>1</td>
<td>2</td>
<td>14048</td>
<td>SHORT KEEPER</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>14061</td>
<td>SHORT END LOCK PT</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>14062</td>
<td>LONG END LOCK PT</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>14051</td>
<td>CLASSIC STD HANDLE</td>
</tr>
</tbody>
</table>
FIG. 7 OUT-SWING MOUNTING CUTOUT

SECTION A-A
FIG. 13 CURTAIN WALL POINT 14046

FIG. 14 SHOOT BOLT 14063

FIG. 15 CORNER DRIVE 14057
FIG. 16  CLASSIC STANDARD HANDLE 14051

FIG. 17  CLASSIC DUAL HANDLE 14056
FIG. 18 RADIUS STANDARD HANDLE 14054

FIG. 19 RADIUS DUAL HANDLE 14148
FIG. 20 LOCK BOX 14059

FIG. 21 DOOR STRIKE 14060
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. 14231 14232
- "A" 1.08 [27.5] 1.25 [31.8]
- "B" 1.08 [27.5] 1.25 [31.8]
- "C" 2.16 [54.9] 2.50 [63.5]
FIG. 27 TALL KEEPER 14047

FIG. 28 SHORT KEEPER 14048

FIG. 29 ADJUSTABLE KEEPER 14064
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)

RECOMMENDED SCREWS:
METAL: 2 (P/N 19630) #10-24 X .312 PHILLIPS FLAT HEAD SST MACHINE SCREWS
PVC / WOOD: 2 -#10 PHILLIPS FLAT SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 3 25.31 CAM HANDLE (In-Line Base)

RECOMMENDED SCREWS:
METAL: 2 (P/N 19630) #10-24 X .312 PHILLIPS FLAT HEAD SST MACHINE SCREWS
PVC / WOOD: 2 -#10 PHILLIPS FLAT SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)
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

LEFT HAND SHOWN

FIG. 5  25.80 CAM HANDLE FOR LOOPER WINDOWS
25.81 (inline base)

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**

<table>
<thead>
<tr>
<th>A</th>
<th>STRIKE HOUSING NUMBER</th>
<th>INSERT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>.218</td>
<td>20236</td>
<td>20231</td>
</tr>
<tr>
<td>.282</td>
<td>20236</td>
<td>20232</td>
</tr>
<tr>
<td>.344</td>
<td>20236</td>
<td>20233</td>
</tr>
</tbody>
</table>

**FIG. 8 OFFSET STRIKE HOUSING 20237**

<table>
<thead>
<tr>
<th>A</th>
<th>STRIKE HOUSING NUMBER</th>
<th>INSERT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>.218</td>
<td>20237</td>
<td>20231</td>
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<tr>
<td>.282</td>
<td>20237</td>
<td>20232</td>
</tr>
<tr>
<td>.344</td>
<td>20237</td>
<td>20233</td>
</tr>
</tbody>
</table>

**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)
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

HARDWARE SHOWN
25.74 CAM HANDLE
20236 STRIKE HOUSING
20233 INSERT

HARDWARE SHOWN
25.72 CAM HANDLE
20236 STRIKE HOUSING
20233 INSERT

LEFT HAND SHOWN

STRIKE HOUSING AND INSERT
SEE FIG. 5 AND 6

RIGHT HAND SHOWN

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 20233
.344 (8.7mm)

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 20233
.344 (8.7mm)

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

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. 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.
FIG. 1 APPLICATION OF TRIMLINE CAM HANDLES WITH CONCEALED PAWL

LEFT HAND SHOWN
AS USED ON A PROJECTED IN HOPPER WINDOW

FIG. 2 TRIMLINE CAM HANDLE WITH CONCEALED PAWL

LEFT HAND SHOWN IN CLOSED POSITION
AS USED ON A PROJECT IN HOPPER WINDOW

NOTE: SPECIFY HANDLE ROTATION TO OPEN (CW) OR (CCW)

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A</th>
<th>B</th>
<th>BASE TYPE</th>
<th>PAWL OFFSET DIRECTION CLOSED POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.13</td>
<td>.438  (11.1mm)</td>
<td>.218 (5.6mm)</td>
<td>OFFSET</td>
<td>UP</td>
</tr>
<tr>
<td>27.19</td>
<td>.438  (11.1mm)</td>
<td>.218 (5.6mm)</td>
<td>INLINE</td>
<td>UP</td>
</tr>
<tr>
<td>27.20</td>
<td>.500  (12.7mm)</td>
<td>.218 (5.6mm)</td>
<td>INLINE</td>
<td>UP</td>
</tr>
<tr>
<td>27.21</td>
<td>.523  (13.3mm)</td>
<td>.344 (8.7mm)</td>
<td>INLINE</td>
<td>UP</td>
</tr>
<tr>
<td>27.46</td>
<td>.562  (14.3mm)</td>
<td>.625 (15.9mm)</td>
<td>INLINE</td>
<td>UP</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>A DIA.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20303</td>
<td>.204 (5.2mm)</td>
</tr>
<tr>
<td>20404</td>
<td>.250 (6.4mm)</td>
</tr>
</tbody>
</table>

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)

1.438 (36.5mm)

FIG. 6 20556 GASKET (offset base)

1.438 (36.5mm)
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 90º 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.
POLE-OPERATED CAM HANDLE WITH CONCEALED PAWL

FIG. 1 APPLICATION OF CAM HANDLE WITH CONCEALED PAWL

(AS USED ON A PROJECT IN HOPPER WINDOW)

NOTE: THE OFFSET ON ALL PAWLS POINT UP IN THE CLOSED POSITION

FIG. 2 CAM HANDLE WITH CONCEALED PAWL

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>BASE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.25</td>
<td>.438 (11.1mm)</td>
<td>.218 (5.6mm)</td>
<td>OFFSET</td>
</tr>
<tr>
<td>27.31</td>
<td>.438 (11.1mm)</td>
<td>.218 (5.6mm)</td>
<td>INLINE</td>
</tr>
<tr>
<td>27.32</td>
<td>.500 (12.7mm)</td>
<td>.218 (5.6mm)</td>
<td>INLINE</td>
</tr>
<tr>
<td>27.33</td>
<td>.500 (12.7mm)</td>
<td>.344 (8.7mm)</td>
<td>INLINE</td>
</tr>
<tr>
<td>27.53</td>
<td>.563 (14.3mm)</td>
<td>.625 (15.8mm)</td>
<td>INLINE</td>
</tr>
</tbody>
</table>

RECOMMENDED SCREWS:

WOOD/METAL/PVC: 2-#10 PHILLIPS FLAT HEAD SST SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)
POLE-OPERATED CAM HANDLE WITH CONCEALED PAWL

FIG. 3  KEEPER 20303 AND 20404

![Diagram of Keeper 20303 and 20404]

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>A DIA.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20303</td>
<td>.204</td>
</tr>
<tr>
<td>20404</td>
<td>.250</td>
</tr>
</tbody>
</table>

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

![Diagram of 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)

![Diagram of Gasket 20408]

RECOMMENDED SCREWS:
WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 6  GASKET 20556 (offset base)

![Diagram of Gasket 20556]

RECOMMENDED SCREWS:
WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)
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.
FIG. 1 CUSTODIAL LOCK (key operated)

NOTE:
1. SPECIAL LOCKS ARE AVAILABLE THAT UNLOCK IN A COUNTERCLOCKWISE 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)

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>MOUNTING</th>
<th>FORCED ENTRY RESISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.23</td>
<td>.438 (11.1mm)</td>
<td>.218 (5.6mm)</td>
<td>1.500 (38.1mm)</td>
<td>REAR</td>
<td>300 LBS.</td>
</tr>
<tr>
<td>28.24</td>
<td>.438 (11.1mm)</td>
<td>.344 (8.7mm)</td>
<td>1.500 (38.1mm)</td>
<td>REAR</td>
<td>250 LBS.</td>
</tr>
<tr>
<td>28.26</td>
<td>.875 (22.2mm)</td>
<td>.218 (5.6mm)</td>
<td>1.500 (38.1mm)</td>
<td>REAR</td>
<td>300 LBS.</td>
</tr>
<tr>
<td>28.27</td>
<td>.875 (22.2mm)</td>
<td>.344 (8.7mm)</td>
<td>1.500 (38.1mm)</td>
<td>REAR</td>
<td>250 LBS.</td>
</tr>
<tr>
<td>28.29</td>
<td>.438 (11.1mm)</td>
<td>.218 (5.6mm)</td>
<td>1.375 - 1.500 (34.9mm-38.1mm)</td>
<td>FRONT</td>
<td>300 LBS.</td>
</tr>
<tr>
<td>28.31</td>
<td>.438 (11.1mm)</td>
<td>.562 (14.3mm)</td>
<td></td>
<td>FRONT</td>
<td>160 LBS.</td>
</tr>
<tr>
<td>28.32</td>
<td>.875 (22.2mm)</td>
<td>.218 (5.6mm)</td>
<td></td>
<td>FRONT</td>
<td>300 LBS.</td>
</tr>
<tr>
<td>28.34</td>
<td>.875 (22.2mm)</td>
<td>.562 (14.3mm)</td>
<td></td>
<td>FRONT</td>
<td>160 LBS.</td>
</tr>
<tr>
<td>28.66</td>
<td>.875 (22.2mm)</td>
<td>.938 (23.8mm)</td>
<td></td>
<td>FRONT</td>
<td>50 LBS.</td>
</tr>
</tbody>
</table>
FIG. 2 20303 AND 20404 KEEPERS

FIG. 3 30238 KEEPER

FIG. 4 20313 KEY

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

**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.
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 #11).

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.

• 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 Cover
#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
#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. 25ee and 25hh.*

- 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:
     - #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.
FIG. 1 APPLICATION OF MAXIM DUAL ARM OPERATOR (SILL MOUNT VERSION)

SEE FIG. 2 FOR BILL OF MATERIAL AND NOTES
**FIG. 2 APPLICATION OF MAXIM DUAL ARM OPERATOR (CONTINUED)**

*SILL MOUNT VERSION*

![Diagram of Dual Arm Operator](image)

**12511.XX**
BRACKET PLACEMENT

**11576.XX**
TRACK PLACEMENT

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
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</thead>
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<tr>
<td>50.00.XX.011</td>
<td>DUAL ARM OPERATOR</td>
</tr>
<tr>
<td>12511.XX</td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>11576.XX</td>
<td>TRACK ASSEMBLY</td>
</tr>
<tr>
<td>14.97.00.XXX</td>
<td>WASHABILITY HINGE</td>
</tr>
<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
</tr>
<tr>
<td>31882</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

### HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.300 [7.6 mm]</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>.300 [7.6 mm]</td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGES</td>
<td>.250 [6.4 mm]</td>
</tr>
</tbody>
</table>

### 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)

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) 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)
FIG. 5 BACK PLATE 23058.92

FOR USE WITH 51.02 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(RH) (SHOWN) 12510.XX(LH)

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 STANDARD MAXIM DUAL ARM OPERATOR
(SILL MOUNT VERSION) (LOW PROFILE)

LEFT HAND SHOWN

SEE FIG. 7 FOR BILL OF MATERIAL AND NOTES

OPERATOR CUT-OUT (PVC)

REQUIRED FOR BOTTOM SEAL

APPROXIMATE MINIMUM COMPONENT WIDTH

SASH AT 90° WITH 14.97 WASHABILITY HINGE

SASH AT 90° WITH 14.12 EGRESS HINGE

MAX
MIN

21,000 [533.4 mm]

4.938 [125.4 mm]

BASE MOUNTING FLANGE

1.750 [44.5 mm]

7.750 [196.9 mm]

8.000 [203.2 mm]

5.200 [132.1 mm]

.125 [3.2 mm]

2.125 MAX
1.625 MIN

54.0 mm
41.3 mm

420 MAX
10.7 mm
BELOW OPERATOR

.595 MIN
[15.1 mm]
SEE FIG 7

4.955 MIN
[125.9 mm]
SEE FIG 7

4X R.094 [2.4 mm]

.080 [2.0 mm]

"A" MIN.

.720
.625
18.288 mm
15.875 mm

2.420
.353 [9.0 mm]

1.188 [30.2 mm]

.125 [3.2 mm]
**Fig. 9** Application of Standard Maxim Dual Arm Operator (continued) (sill mount version) (low profile)

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>50.01.XX.011</td>
<td>Dual Arm Operator</td>
</tr>
<tr>
<td>11661.XX</td>
<td>Stud Bracket</td>
</tr>
<tr>
<td>32384.XX</td>
<td>Track</td>
</tr>
<tr>
<td>14.97.00.XXX</td>
<td>Washability Hinge</td>
</tr>
<tr>
<td>11454.XX</td>
<td>Contour Handle</td>
</tr>
<tr>
<td>31882</td>
<td>Gasket (PVC)</td>
</tr>
</tbody>
</table>

**Hinge**

<table>
<thead>
<tr>
<th>Hinge</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.422 [10.7 mm]</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td></td>
</tr>
<tr>
<td>Other 14 series casement hinges</td>
<td>.375 [9.5 mm]</td>
</tr>
</tbody>
</table>

**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.

⚠️ 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)
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)

LEFT HAND SHOWN

SEE FIG. 2 FOR BILL OF MATERIAL AND NOTES

OPERATOR CUT-OUT
(WOOD)

OPERATOR CUT-OUT
(PVC)
FIG. 2 APPLICATION OF STANDARD MAXIM DYAD OPERATOR (CONTINUED) (SILL MOUNT VERSION)

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.50.XX.011</td>
<td>DYAD OPERATOR</td>
</tr>
<tr>
<td>12511.XX</td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>14.97.00.XXX</td>
<td>WASHABILITY HINGE</td>
</tr>
<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
</tr>
<tr>
<td>31882</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

**HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG. 1**

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.300 [7.6 mm]</td>
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<tr>
<td>14.12.00.XXX</td>
<td></td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGE</td>
<td>.250 [6.4 mm]</td>
</tr>
</tbody>
</table>

**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)
FIG. 8 APPLICATION OF MAXIM DYAD OPERATOR (CONTINUED) (SILL MOUNT VERSION) (LOW PROFILE)

![Diagram](image)

**HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.5**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
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<tr>
<td>50.51.XX.XXX</td>
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<tr>
<td>11661.XX</td>
<td>STUD BRACKET</td>
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<td>14.97.00.XXX</td>
<td>WASHABILITY HINGE</td>
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<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
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<tr>
<td>31882</td>
<td>GASKET (PVC)</td>
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</table>

<table>
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<tr>
<th>HINGE</th>
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<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.422 [10.7 mm]</td>
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<tr>
<td>14.12.00.XXX</td>
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<tr>
<td>OTHER 14 SERIES</td>
<td>.375 [9.5 mm]</td>
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<tr>
<td>CASEMENT HINGES</td>
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</tr>
</tbody>
</table>

**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
FIG. 9  MAXIM DYAD OPERATOR  
(SILL MOUNT VERSION)  
(LOW PROFILE)  

50.51.XX.XXX LEFT HAND SHOWN

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

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)

LEFT HAND SHOWN
SEE FIG. 2 FOR BILL OF MATERIAL AND NOTES
HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
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<td>50.70.XX.XXX</td>
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<td>STUD BRACKET</td>
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<tr>
<td>14.05.00.XXX</td>
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<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
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<td>31882</td>
<td>GASKET (PVC)</td>
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<tr>
<td>14.05.00.XXX</td>
<td>5.973 [151.7 mm]</td>
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<tr>
<td>14.77.00.XXX</td>
<td>5.532 [140.5 mm]</td>
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NOTES:

⚠️ 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. 7 APPLICATION OF MAXIM REVERSE DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

LEFT HAND SHOWN

SEE FIG. 6 FOR BILL OF MATERIAL AND NOTES
FIG. 8 APPLICATION OF MAXIM REVERSE DYAD OPERATOR (CONTINUED)
(SILL MOUNT VERSION) (LOW PROFILE)

<table>
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<th>PART NUMBER</th>
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<td>14.05.00.XXX</td>
<td>HINGE</td>
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<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
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<tr>
<td>31882</td>
<td>GASKET (PVC)</td>
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</table>

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.5

<table>
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<th>HINGE</th>
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<tbody>
<tr>
<td>14.05.00.XXX</td>
<td>5.973 [151.7 mm]</td>
</tr>
<tr>
<td>14.77.00.XXX</td>
<td>5.532 [140.5 mm]</td>
</tr>
</tbody>
</table>

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. 9 STANDARD MAXIM REVERSE DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

STAINLESS STEEL VERSION AVAILABLE

50.71.XX.011 LEFT HAND ShOWN

FIG. 10 MAXIM COVER 41212.XX/HANDLE 11329.XX (RH) (SHOWN)

FIG. 11 STUD BRACKET 11661.XX(LH) (SHOWN), 11662.XX(RH)

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)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX
FIG. 1 APPLICATION OF STANDARD MAXIM SINGLE ARM OPERATOR (SILL MOUNT VERSION)

SASH AT 90° WITH 14.12 EGRESS HINGE

APPROXIMATE MINIMUM COMPONENT WIDTH

MAX

MIN

BASE MOUNTING FLANGE

OPERATOR CUT-OUT (WOOD)

OPERATOR CUT-OUT (PVC)

SEE FIG 2

SEE FIG 2

SEE FIG 2

1.000 MAX
25.400 mm
6.350 mm

2X R.094
[2.4 mm]

4X R.094
[2.4 mm]

2.840
[72.1 mm]

4.955 MIN
[125.9 mm]

2.375
[60.3 mm]

5.200
[132.1 mm]

4.938
[125.4 mm]

.080
[2.0 mm]

REQUIRED FOR BOTTOM SEAL

.810 MIN
[20.6 mm]

.420 MAX
[10.7 mm]
BELOW OPERATOR

.595 MIN
[15.1 mm]

SEE FIG 2

SEE FIG 2

SEE FIG 2

53.975 mm
41.275 mm

2.125 MAX
1.625 MIN
53.975 mm
41.275 mm

.125 MIN
[3.2 mm]

.675 MIN
[17.1 mm]

.353
[8.0 mm]

.080
[2.0 mm]

REQUIRED FOR BOTTOM SEAL

.810 MIN
[20.6 mm]

.420 MAX
[10.7 mm]
BELOW OPERATOR

.595 MIN
[15.1 mm]

SEE FIG 2

SEE FIG 2

SEE FIG 2

16.590
[421.4 mm]

APPROXIMATE MINIMUM COMPONENT WIDTH

MAX

MIN

LEFT HAND SHOWN

SEE FIG 2 FOR BILL OF MATERIAL AND NOTES

OPERATOR CUT-OUT (WOOD)

OPERATOR CUT-OUT (PVC)

1.188
[30.2 mm]
FIG. 2  APPLICATION OF MAXIM SINGLE ARM OPERATOR (CONTINUED)
(SILL MOUNT VERSION)

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.01.XX.XXX</td>
<td>SINGLE ARM OPERATOR</td>
</tr>
<tr>
<td>11576.XX</td>
<td>TRACK ASSEMBLY</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>EGRESS HINGE</td>
</tr>
<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
</tr>
<tr>
<td>31882</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.300 [7.6 mm]</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td></td>
</tr>
<tr>
<td>OTHER 14</td>
<td>.250 [6.4 mm]</td>
</tr>
<tr>
<td>SERIES</td>
<td>CASEMENT</td>
</tr>
<tr>
<td>CASEMENT</td>
<td></td>
</tr>
<tr>
<td>HINGES</td>
<td></td>
</tr>
</tbody>
</table>

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)

STAINLESS STEEL VERSION AVAILABLE

52.01.XX.XXX LEFT HAND SHOWN

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)
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)

LEFT HAND SHOWN
SEE FIG.6 FOR BILL OF MATERIAL NOTES

OPERATOR CUT-OUT METAL (SAME AS PVC)
OPERATOR CUT-OUT (PVC)

SEE FIG 6
**FIG. 8 APPLICATION OF MAXIM SINGLE ARM OPERATOR (CONTINUED)
(SILL MOUNT VERSION) (LOW PROFILE)**

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.5

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.03.XX.011</td>
<td>SINGLE ARM OPERATOR</td>
</tr>
<tr>
<td>30175</td>
<td>TRACK</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>EGRESS HINGE</td>
</tr>
<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
</tr>
<tr>
<td>31882</td>
<td>GASKET</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.12.00.XXX</td>
<td>.322 [8.2 mm]</td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGES</td>
<td>.275 [7.0 mm]</td>
</tr>
</tbody>
</table>

**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. 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)
FIG. 1 APPLICATION OF STANDARD MAXIM AWNING OPERATOR (SILL MOUNT VERSION)

AWNING HINGE DETERMINED BY SASH WEIGHT AND HEIGHT

BASE MOUNTING FLANGE

OPERATOR CUT-OUT (WOOD)

OPERATOR CUT-OUT (PVC)

REQUIRED FOR BOTTOM SEAL

SEE FIG 2

SEE FIG 2

SEE FIG 2
FIG. 2 APPLICATION OF STANDARD MAXIM AWNING OPERATOR (CONTINUED) (SILL MOUNT VERSION)

HARDWARE SHOWN, SEE FIG. 1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.00.XX.011</td>
<td>AWNING OPERATOR</td>
</tr>
<tr>
<td>11577.92</td>
<td>TRACK ASSEMBLY</td>
</tr>
<tr>
<td>13.XX.XX.XXX</td>
<td>HINGE</td>
</tr>
<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
</tr>
<tr>
<td>31882</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

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.
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

(SILL MOUNT VERSION)

AWNING HINGE DETERMINED BY SASH WEIGHT AND HEIGHT

4938 [125.4 mm] 2X R.094 (SEE FIG. 2)

4X R.094 [2.4 mm]

MAX. MIN.
4.955 [125.9 mm]

(SEE FIG. 2)

W3 R.094 [2.4 mm]

10.955 [278.3 mm]

53.975 mm

41.275 mm

1.000 MIN
[25.4 mm]

2.125 MAX.
1.625 MIN.

53.975 mm
41.275 mm

5.20 [132.0 mm]

3.53 [9.0 mm]

53.975 mm

41.275 mm

2.125 MAX.
1.625 MIN.

53.975 mm
41.275 mm

.875 [22.2 mm] COVER HEIGHT

.84 [21.4 mm]

.844 [21.4 mm]

0.675 MIN.
[17.1 mm]

.99 [25.1 mm]

0.675 MIN.
[17.1 mm]

.99 [25.1 mm]

4.955 [125.9 mm]

(SEE FIG. 2)

W3 R.094 [2.4 mm]

10.955 [278.3 mm]

53.975 mm

41.275 mm

2.125 MAX.
1.625 MIN.

53.975 mm
41.275 mm

0.75 [19.1 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]

.500 MAX
[12.7 mm]
FIG. 2 APPLICATION OF MAXIM NARROW AWNING OPERATOR (CONTINUED)

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

HARDWARE SHOWN SEE FIG. 1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.01.XX.011</td>
<td>AWNING OPERATOR</td>
</tr>
<tr>
<td>22143</td>
<td>BRACKET</td>
</tr>
<tr>
<td>13.XX.XX.XXX</td>
<td>HINGE</td>
</tr>
<tr>
<td>11454.XX</td>
<td>CONTOUR HANDLE</td>
</tr>
<tr>
<td>31882</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

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 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)

STAINLESS STEEL VERSION AVAILABLE

RECOMMENDED SCREWS:

(QTY 6) P/N 19240.XX)#8 X 1.0 PHILLIPS, FLAT HEAD SHEET METAL SCREWS
(SEE TRUTH TIPS FOR MORE INFORMATION)

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)

FIG. 4  BRACKET 22143
Hardware Comparison for NAFS Casement Window Hardware Load Test


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., H.C., 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

<table>
<thead>
<tr>
<th>Operator</th>
<th>Maxim Washable</th>
<th>Maxim Egress</th>
<th>10&quot; Standard</th>
<th>10&quot; Washable</th>
<th>10&quot; Egress</th>
<th>10&quot; HP Concealed</th>
<th>10&quot; HP Concealed</th>
<th>Butt Hinge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxim Reverse Dyad</td>
<td>50.00</td>
<td>50.70</td>
<td>50.00</td>
<td>50.70</td>
<td>50.90</td>
<td>50.90</td>
<td>50.90</td>
<td>50.90</td>
</tr>
<tr>
<td>Maxim Single Arm</td>
<td>52.01</td>
<td>52.06</td>
<td>52.06</td>
<td>52.06</td>
<td>52.06</td>
<td>52.06</td>
<td>52.06</td>
<td>52.06</td>
</tr>
<tr>
<td>EntryGard Dual Arm</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
</tr>
<tr>
<td>EntryGard Single Arm</td>
<td>15.84</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
</tr>
<tr>
<td>EntryGard Dyad</td>
<td>15.11</td>
<td>15.11</td>
<td>15.11</td>
<td>15.11</td>
<td>15.11</td>
<td>15.11</td>
<td>15.11</td>
<td>15.11</td>
</tr>
<tr>
<td>EntryGard Single Arm</td>
<td>15.84</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
</tr>
<tr>
<td>Split Arm</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
<td>15.15</td>
</tr>
<tr>
<td>23 Series Single Arm 13.5&quot;</td>
<td>23.03</td>
<td>23.03</td>
<td>23.03</td>
<td>23.03</td>
<td>23.03</td>
<td>23.03</td>
<td>23.03</td>
<td>23.03</td>
</tr>
<tr>
<td>EntryGard Single Arm</td>
<td>15.84</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
<td>15.32</td>
</tr>
</tbody>
</table>
| Typical Mounting Positions - Used for Hardware Comparison

<table>
<thead>
<tr>
<th>Hinge</th>
<th>Bracket Position A</th>
<th>Bracket Position B</th>
<th>Operator Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxim Reverse Dyad</td>
<td>11.062</td>
<td>813</td>
<td>Dual Arm &amp; Dyad determined by Bracket Position A</td>
</tr>
<tr>
<td>14 XX Concealed Hinges</td>
<td>3.275</td>
<td>1.950</td>
<td>Single Arm per catalog</td>
</tr>
<tr>
<td>Other Maxim</td>
<td>1.625</td>
<td>0.875</td>
<td></td>
</tr>
<tr>
<td>Other Maxim</td>
<td>1.375</td>
<td>1.593</td>
<td></td>
</tr>
<tr>
<td>Other Maxim</td>
<td>4.000</td>
<td>2.437</td>
<td>Catalog Dim &amp; Price</td>
</tr>
<tr>
<td>23 Series Single Arm</td>
<td>2.125</td>
<td>1.253</td>
<td>Operator is fully open (arm against stop) at 90° window position</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>SHIM</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>21544</td>
<td>.048 [1.2 mm]</td>
</tr>
<tr>
<td>21545</td>
<td>.096 [2.4 mm]</td>
</tr>
<tr>
<td>21546</td>
<td>.138 [3.5 mm]</td>
</tr>
<tr>
<td>21547</td>
<td>.189 [4.8 mm]</td>
</tr>
<tr>
<td>21548</td>
<td>.205 [5.2 mm]</td>
</tr>
</tbody>
</table>
FIG. 5 APPLICATION OF MAXIM FOLDING HANDLE COVER

[Diagram showing the application of the cover to the handle]

LEFT HAND SHOWN
OPERATOR ARMS REMOVED FOR CLARITY

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.
50.00
50.50
50.70
52.01
52.06
15.10
15.15
15.11
15.94
15.32
15.31
15.56
15.39
15.18
23.03
23.01
23.38
23.78
23.46
23.32
32"W x 68"H; 69 lbs
Not Recommended
24"W x 72"H; 53 lbs**
32"W x 72"H; 73 lbs
22"W x 63"H; 42 lbs
Not Recommended
28"W x 60"H; 52 lbs
Not Recommended
22"W x 62"H; 42 lbs
26"W x 65"H; 52 lbs
24"W x 65"H; 48 lbs
22"W x 63"H; 42 lbs
18"W x 66"H; 35 lbs
Not Recommended
26"W x 66"H; 53 lbs
24"W x 69"H; 51 lbs
22"W x 69"H; 46 lbs
20"W x 60"H; 36 lbs
Not Recommended
Not Recommended

10" Standard
14.75
14.80
14.05
14.19
32"W x 84"H; 85 lbs
24"W x 64"H; 47 lbs
24"W x 72"H; 53 lbs**
32"W x 70"H; 71*(36) lbs
Not Recommended
32"W x 60"H; 60 lbs
Not Recommended
26"W x 61"H; 49 lbs
22"W x 60"H; 40 lbs
26"W x 67"H; 54*(50) lbs
24"W x 61"H; 45*(27) lbs
Not Recommended
Not Recommended
24"W x 70"H; 52 lbs
26"W x 69"H; 55 lbs
24"W x 65"H; 48*(31) lbs
Not Recommended
Not Recommended
26"W x 63"H; 51 lbs
26"W x 62"H; 50 lbs

Hinge

32"W x 72"H; 73 lbs
24"W x 60"H; 45 lbs
24"W x 72"H; 53 lbs**
32"W x 70"H; 71*(29) lbs
Not Recommended
32"W x 60"H; 60*(54) lbs
Not Recommended
24"W x 67"H; 49 lbs
Not Recommended
26"W x 69"H; 55*(41) lbs
24"W x 62"H; 45*(19) lbs
Not Recommended
Not Recommended
24"W x 64"H; 47 lbs
26"W x 71"H; 57*(43) lbs
24"W x 66"H; 48*(22) lbs
Not Recommended
Not Recommended
24"W x 68"H; 50 lbs
24"W x 67"H; 49 lbs

10" Washable
14.76
14.91
14.06

Typical Mounting Positions - Used for Hardware Comparison

40"W x 84"H; 108*(96) lbs
32"W x 72"H; 73*(55) lbs
24"W x 72"H; 53 lbs**
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
Not Recommended
30"W x 63"H; 59 lbs
32"W x 67"H; 68 lbs

Maxim Egress
14.12
14.13

32"W x 68"H; 69 lbs
Not Recommended
24"W x 72"H; 53 lbs**
32"W x 72"H; 73 lbs
22"W x 63"H; 42 lbs
Not Recommended
28"W x 60"H; 52 lbs
Not Recommended
22"W x 62"H; 42 lbs
26"W x 65"H; 52 lbs
24"W x 65"H; 48 lbs
22"W x 63"H; 42 lbs
18"W x 66"H; 35 lbs
Not Recommended
26"W x 66"H; 53 lbs
24"W x 69"H; 51 lbs
22"W x 69"H; 46 lbs
20"W x 60"H; 36 lbs
Not Recommended
Not Recommended

10" Egress
14.77
14.93

38"W x 78"H; 95 lbs
28"W x 69"H; 49*(44) lbs
24"W x 72"H; 53 lbs**
32"W x 70"H; 71*(36) lbs
Not Recommended
32"W x 60"H; 60 lbs
Not Recommended
30"W x 61"H; 57 lbs
22"W x 60"H; 40 lbs
26"W x 67"H; 54(50) lbs
24"W x 61"H; 45*(27) lbs
Not Recommended
Not Recommended
30"W x 64"H; 60*(56) lbs
26"W x 69"H; 55 lbs
24"W x 65"H; 48*(31) lbs
Not Recommended
Not Recommended
28"W x 61"H; 53 lbs
28"W x 66"H; 58 lbs

10" HP Concealed
14.96

32"W x 68"H; 69 lbs
Not Recommended
24"W x 72"H; 53 lbs**
32"W x 72"H; 73 lbs
22"W x 63"H; 42 lbs
Not Recommended
28"W x 60"H; 52 lbs
Not Recommended
22"W x 62"H; 42 lbs
26"W x 65"H; 52 lbs
24"W x 65"H; 48 lbs
22"W x 63"H; 42 lbs
18"W x 66"H; 35 lbs
Not Recommended
26"W x 66"H; 53 lbs
24"W x 69"H; 51 lbs
22"W x 69"H; 46 lbs
20"W x 60"H; 36 lbs
Not Recommended
Not Recommended

10" HP Concealed
Egress
14.00

† 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.

Butt Hinge

Not Recommended
Not Recommended
24"W x 72"H; 53 lbs**
30"W x 69"H; 65 lbs
20"W x 60"H; 36 lbs
Not Recommended
Not Recommended
Not Recommended
20"W x 61"H; 36 lbs
24"W x 64"H; 47 lbs
22"W x 65"H; 43 lbs
20"W x 65"H; 39 lbs
16"W x 70"H; 33 lbs
Not Recommended
26"W x 62"H; 50 lbs
24"W x 69"H; 50 lbs
24"W x 64"H; 47 lbs
22"W x 68"H; 45 lbs
Not Recommended
Not Recommended

** 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 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.

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.

Operator
Hinge Position
Bracket Position A Bracket Position B
Operator Position
Maxim Reverse Dyad
11.062
.813
Dual Arm & Dyad
Other Maxim
1.750
1.563
determined by Bracket
EntryGard Dual Arm w/10" Washable Hinge
1.625
.875
2.375
14.XX Concealed Hinges
Position A.
Other EntryGard Dual Arm Operators
Entrygard Dyad & Single Arm
1.375
1.563
Single Arm per catalog.
Traditional & Ellipse
22 Series
2.125
Maxim Reverse Dyad
11.062
2.437
Catalog Dim A=8.000
EntryGard Single Arm
Catalog Dim A=4.000
4.000
Butt Hinges
Operator is fully open
Maxim Single Arm
NA
NA
(arm against stop) at
Traditional & Ellipse Single Arm
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).

Hinge

Maxim Dual Arm
Maxim Dyad
Maxim Reverse Dyad
Maxim Single Arm
Maxim Short Single Arm
EntryGard Dual Arm
EntryGard Egress D.A.
EntryGard Dyad
EntryGard Single Arm
13.5" Single Arm
9.5" Single Arm
7.5" Single Arm
6" Single Arm
Split Arm
23 Series Single Arm 13.5"
23 Series Single Arm 9.5"
23 Series Single Arm 7.5"
23 Series Single Arm 6"
23 Series Dyad Short Link
23 Series Dyad Long Link

Operator

Maxim Washable
14.97
14.92

Maximum Frame Size & Sash Weight for Operator & Hinge Combination Shown

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%.

24"
16"
12"
20"
15"
20"
18"
13"
16" - 18" †
22" - 24" †
18" - 20" †
16"
15"
16"
22" - 24" †
18" - 20" †
16"
15"
15"
19"

Approx.
Minimum
Frame
Width to Fit
Operator

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 carefull evaluation of the entire window before producing units as large as this matrix suggests.


Hardware Comparison for NAFS Casement Window Hardware Load Test

MAXIM® AWNING
OPERATORS

25nn


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.

- 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 handling 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 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 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. 2 APPLICATION OF ENCORE DUAL ARM OPERATOR CONTINUED (SILL MOUNT VERSION)

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.10.00.011</td>
<td>DUAL ARM OPERATOR</td>
</tr>
<tr>
<td>12511.XX</td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>11576.XX</td>
<td>TRACK ASSEMBLY</td>
</tr>
<tr>
<td>14.97.00.XXX</td>
<td>WASHABILITY HINGE</td>
</tr>
<tr>
<td>12614.XX</td>
<td>TANGO HANDLE/Cover Pack</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.300 [7.6 mm]</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>.250 [6.4 mm]</td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGES</td>
<td>.250 [6.4 mm]</td>
</tr>
</tbody>
</table>

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)

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) 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)
FIG. 5 BACK PLATE 21969.92

STAINLESS STEEL VERSION AVAILABLE

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

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)
FIG. 9 APPLICATION OF ENCORE DUAL ARM OPERATOR CONTINUED (SILL MOUNT VERSION) (LOW PROFILE)

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.8

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.11.00.011</td>
<td>DUAL ARM OPERATOR</td>
</tr>
<tr>
<td>11661.XX</td>
<td>STUD BRACKET</td>
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<tr>
<td>32384.XX</td>
<td>TRACK</td>
</tr>
<tr>
<td>14.97.00.XXX</td>
<td>WASHABILITY HINGE</td>
</tr>
<tr>
<td>12614.XX</td>
<td>TANGO HANDLE/Cover Pack</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.422 [10.7 mm]</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td></td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGES</td>
<td>.375 [9.5 mm]</td>
</tr>
</tbody>
</table>

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.

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)
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)

LEFT HAND SHOWN
SEE FIG 2 FOR BILL OF MATERIAL AND NOTES

FRAME
SASH
OPERATOR
SILL
FILLER
OPERATOR CUT-OUT (WOOD)
OPERATOR CUT-OUT (PVC)

APPROXIMATE MINIMUM COMPONENT WIDTH

SASH AT 90° WITH 14.97 WASHABILITY HINGE

MAX
MIN

2X R.094 [2.4 mm]
4X R.094 [2.4 mm]

REQUIRED FOR BOTTOM SEAL

"A" MIN.

.080 [2.0 mm]

.810 [20.6 mm]

.420 MAX [10.7 mm] BELOW OPERATOR

.500 MAX [12.7 mm]

.675 MIN [17.1 mm] SEE FIG 2

.595 MIN [15.1 mm] SEE FIG 2

4.955 MIN [125.9 mm]

SEE FIG 2

250 [6.3 mm]

353 [9.0 mm]

.810 [20.6 mm]

.080 [2.0 mm]

.810 [20.6 mm]

.500 MAX [12.7 mm]

.675 MIN [17.1 mm] SEE FIG 2

.595 MIN [15.1 mm] SEE FIG 2

4.955 MIN [125.9 mm]

SEE FIG 2

2X R.094 [2.4 mm]
4X R.094 [2.4 mm]

REQUIRED FOR BOTTOM SEAL

"A" MIN.
FIG. 2 APPLICATION OF ENCORE DYAD OPERATOR CONTINUED (SILL MOUNT VERSION)

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG. 1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.60.00.011</td>
<td>DYAD OPERATOR</td>
</tr>
<tr>
<td>12511.XX</td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>14.97.00.XXX</td>
<td>WASHABILITY HINGE</td>
</tr>
<tr>
<td>12616.XX</td>
<td>TANGO HANDLE/Cover PACK</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.300 [7.6 mm]</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>.250 [6.4 mm]</td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGE</td>
<td>.250 [6.4 mm]</td>
</tr>
</tbody>
</table>

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.

⚠️ 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.

⚠️ 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)
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)*

---

**HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.7**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.61.00.XXX</td>
<td>DYAD OPERATOR</td>
</tr>
<tr>
<td>11661.XX</td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>14.97.00.XXX</td>
<td>WASHABILITY HINGE</td>
</tr>
<tr>
<td>12616.XX</td>
<td>TANGO HANDLE/Cover PACK</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

**HINGE**

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>0.422 [10.7 mm]</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td></td>
</tr>
<tr>
<td>OTHER 14</td>
<td></td>
</tr>
<tr>
<td>SERIES</td>
<td></td>
</tr>
<tr>
<td>CASEMENT</td>
<td></td>
</tr>
<tr>
<td>HINGES</td>
<td>0.375 [9.5 mm]</td>
</tr>
</tbody>
</table>

**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

⚠️ 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
FIG. 9  ENCORE DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

RECOMMENDED SCREWS:
(QTY 4)(PN 19205.XX)#8 X 1/2 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

50.61.XXX LEFT HAND SHOWN

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)
HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.80.00.XXX</td>
<td>REVERSE DYAD OPERATOR</td>
</tr>
<tr>
<td>11674.XX</td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>14.05.00.XXX</td>
<td>HINGE</td>
</tr>
<tr>
<td>12616.XX</td>
<td>TANGO HANDLE/Cover pack</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.05.00.XXX</td>
<td>5.973 [151.7 mm]</td>
</tr>
<tr>
<td>14.77.00.XXX</td>
<td>5.532 [140.5 mm]</td>
</tr>
</tbody>
</table>

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.

**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)
FIG. 7 APPLICATION OF ENCORE REVERSE DYAD OPERATOR
(SILL MOUNT VERSION)
(LOW PROFILE)

LEFT HAND SHOWN
SEE FIG. 6 FOR BILL OF MATERIAL AND NOTES

OPERATOR CUT-OUT
(WOOD)

OPERATOR CUT-OUT
(PVC)

REQUIRED FOR BOTTOM SEAL

SEE FIG 6

APPROXIMATE MINIMUM COMPONENT WIDTH

BASE MOUNTING FLANGE

SASH AT 60° WITH 14.05 HINGE

SASH A 60° WITH 14.77 HINGE

1.000 MAX
25.400 mm
6.350 mm

.080
[2.0 mm]

1.188
[30.2 mm]

2.125 MAX
1.625 MIN
53.975 mm
41.275 mm

.420 MAX
[10.7 mm]

5.330 [135.4 mm]

10.785 [273.9 mm]

4.938
[125.4 mm]

4X R.094

2X R.094
[2.4 mm]

.500 MAX
[12.7 mm]

.675 MIN
[17.1 mm]

.625 MAX
18.288 mm
15.875 mm

.595 MIN
[15.1 mm]

.720 MAX
MIN.

SEE FIG 6

SEE FIG 6

SEE FIG 6

SEE FIG 6
FIG. 8 APPLICATION OF ENCORE REVERSE DYAD OPERATOR CONTINUED
(SILL MOUNT VERSION)
(LOW PROFILE)

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>50.81.00.011</td>
<td>REVERSE DYAD OPERATOR</td>
</tr>
<tr>
<td>11674.XX</td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>14.05.00.XXX</td>
<td>HINGE</td>
</tr>
<tr>
<td>12616.XX</td>
<td>TANGO HANDLE/COVER PACK</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.05.00.XXX</td>
<td>5.973 [151.7 mm]</td>
</tr>
<tr>
<td>14.77.00.XXX</td>
<td>5.532 [140.5 mm]</td>
</tr>
</tbody>
</table>

NOTES:

⚠️ 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. 9 ENCORE REVERSE DYAD OPERATOR
(SILL MOUNT VERSION)
(LOW PROFILE)

RECOMMENDED SCREWS:
(QTY 4)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

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)

SASH AT 90° WITH 14.12 EGRESS HINGE

APPROXIMATE MINIMUM COMPONENT WIDTH

MAX
MIN

1.000
250
25.4 mm
6.3 mm

1.25 MIN [3.2 mm]

1.590
[421.4 mm]

2.840
[72.1 mm]

LEFT HAND SHOWN

SEE FIG.2 FOR BILL OF MATERIAL AND NOTES

SEE FIG.2 FOR BILL OF MATERIAL AND NOTES

OPERATOR CUT-OUT (WOOD)

OPERATOR CUT-OUT (PVC)

A MIN.

1.188
[30.2 mm]

2.125
1.625
54.0 mm
41.3 mm

0.420
[10.7 mm] BELOW OPERATOR

0.595
[15.1 mm]

0.675
[17.1 mm]

0.595
[125.9 mm]

5.330
[135.4 mm]

4.938
[125.4 mm]

4.955
[125.9 mm]

2X R.094
[2.4 mm]

2X R.094
[2.4 mm]

4X R.094
[2.4 mm]

 requirement for bottom seal

810
[20.6 mm]

0.080
[2.0 mm]

SEE FIG.2

SEE FIG.2

SEE FIG.2

SEE FIG.2

SEE FIG.2

SEE FIG.2

SEE FIG.2

SEE FIG.2

SEE FIG.2

SEE FIG.2
FIG. 2 APPLICATION OF ENCORE SINGLE ARM OPERATOR CONTINUED
(SILL MOUNT VERSION)

- **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.

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.11.00.XXX</td>
<td>SINGLE ARM OPERATOR</td>
</tr>
<tr>
<td>11576.XX</td>
<td>TRACK ASSEMBLY</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>EGRESS HINGE</td>
</tr>
<tr>
<td>12614.XX</td>
<td>TANGO HANDLE/Cover PACK</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.97.00.XXX</td>
<td>.300</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>.300</td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGES</td>
<td>.250</td>
</tr>
</tbody>
</table>
FIG. 3 ENCORE SINGLE ARM OPERATOR (SILL MOUNT VERSION)

STAINLESS STEEL VERSION AVAILABLE

52.11.XX.XXX LEFT HAND SHOWN

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)
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)

LEFT HAND ShOWN

SEE FIG. 8 FOR BILL OF MATERIAL NOTES

OPERATOR CUT-OUT METAL (SAME AS PVC)

OPERATOR CUT-OUT (PVC)

ENCORE™ SINGLE ARM OPERATORS (LOW PROFILE)
FIG. 8 APPLICATION OF ENCORE SINGLE ARM OPERATOR CONTINUED
(SILL MOUNT VERSION)
(LOW PROFILE)

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.13.00.011</td>
<td>SINGLE ARM OPERATOR</td>
</tr>
<tr>
<td>30175</td>
<td>TRACK</td>
</tr>
<tr>
<td>14.12.00.XXX</td>
<td>EGRESS HINGE</td>
</tr>
<tr>
<td>12614.XX</td>
<td>TANGO HANDLE/Cover Pack</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HINGE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.12.00.XXX</td>
<td>.322 [8.2 mm]</td>
</tr>
<tr>
<td>OTHER 14 SERIES CASEMENT HINGES</td>
<td>.275 [7.0 mm]</td>
</tr>
</tbody>
</table>

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. 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)

RECOMMENDED SCREWS:

(QTY 2)(PN 19214.XX)#8 X 1 FLAT
HEAD SHEET METAL (SEE TRUTH
TIPS FOR MORE INFORMATION)

FIG. 11 TRACK 30175

RECOMMENDED SCREWS:

(QTY 6)(PN 19214.XX)#8 X 1 FLAT
HEAD SHEET METAL (SEE TRUTH
TIPS FOR MORE INFORMATION)
FIG. 1 APPLICATION OF ENCORE AWNING OPERATOR (SILL MOUNT VERSION)

AWNING HINGE DETERMINED BY SASH WEIGHT AND HEIGHT

OPERATOR CUT-OUT (WOOD)

OPERATOR CUT-OUT (PVC)

REQUIRED FOR BOTTOM SEAL

BASE MOUNTING FLANGE

SEE FIG 2

MAX
MIN

5.000
[127.0 mm]

5.000
[127.0 mm]

5.330
[135.4 mm]

4.938
[125.4 mm]

2.125
[17.1 mm]

1.625
[17.1 mm]

1.188
[30.2 mm]

2X R.094
[2.4 mm]

4X R.094
[2.4 mm]

.810
[20.6 mm]

.080
[2.0 mm]

.595
[15.1 mm]

.595
[15.1 mm]

.675
[17.1 mm]

.675
[17.1 mm]

.500
[12.7 mm]

1.971
[70.6 mm]

4.04
[10.3 mm]

2.779
[70.6 mm]

SEE FIG 2

SEE FIG 2

SEE FIG 2

SEE FIG 2

FRAME

SASH

SASH

FRAME

SILL

FILLER

SILL

FILLER

BASE

MOUNTING

FLANGE
FIG. 2 APPLICATION OF ENCORE AWNING OPERATOR CONTINUED (SILL MOUNT VERSION)

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.10.00.X11</td>
<td>AWNING OPERATOR</td>
</tr>
<tr>
<td>11577.XX</td>
<td>TRACK ASSEMBLY</td>
</tr>
<tr>
<td>13.XX.XX.XXX</td>
<td>HINGE</td>
</tr>
<tr>
<td>12614.XX</td>
<td>TANGO HANDLE/COVER PACK</td>
</tr>
<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
</tr>
</tbody>
</table>

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
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

(SILL MOUNT VERSION)

AWNING HINGE
DETERMINED BY
SASH WEIGHT
AND HEIGHT

2.125
1.625
MAX.
MIN.
53.975 mm
41.275 mm

.810 MIN
[20.6 mm]

1.688
[42.9 mm]

.384
[9.8 mm]

.844
[21.4 mm]

10.955
[278.3 mm]

.845
[21.5 mm]

4.938
[125.4 mm]

2X R.094
[.094 in]

.675 MIN
[17.1 mm]

(SEE △ FIG. 2)

OPERATOR CUT-OUT
(WOOD)

OPERATOR CUT-OUT
(PVC)

.810 MIN
[20.6 mm]

5.330
[135.4 mm]

4.955 MIN.
[125.9 mm]

.353
[9.0 mm]

MAX.
MIN.

.844
[21.4 mm]

(SEE △ FIG. 2)

2.125 MAX.
1.625 MIN.
53.975 mm
41.275 mm

.420 MAX.
[10.7 mm]
BELOW
OPERATOR

595 MIN.
[15.1 mm]

(SEE △ FIG. 2)

.955 MIN.
[125.9 mm]

(SEE △ FIG. 2)

.080
[2.0 mm]

REQUIRED FOR
BOTTOM SEAL

.500 MAX
[12.7 mm]

53.975 mm
41.275 mm

.1188
[30.2 mm]

.810 MIN
[20.6 mm]

.500 MAX
[12.7 mm]

53.975 mm
41.275 mm

.1188
[30.2 mm]

.810 MIN
[20.6 mm]

.500 MAX
[12.7 mm]

53.975 mm
41.275 mm

.1188
[30.2 mm]

.810 MIN
[20.6 mm]

.500 MAX
[12.7 mm]

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41.275 mm

.1188
[30.2 mm]

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.1188
[30.2 mm]

.810 MIN
[20.6 mm]

.500 MAX
[12.7 mm]

53.975 mm
41.275 mm

.1188
[30.2 mm]

.810 MIN
[20.6 mm]

.500 MAX
[12.7 mm]
FIG. 2 APPLICATION OF ENCORE NARROW AWNING OPERATOR (CONTINUED)

![Diagram.png](image-url)

**BRACKET PLACEMENT**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
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<tr>
<td>51.11.XX.011</td>
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<td>13.XX.XX.XXX</td>
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<td>12614.XX</td>
<td>TANGO HANDLE/COVER PACK</td>
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<tr>
<td>32658</td>
<td>GASKET (PVC)</td>
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</table>

**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 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)

STAINLESS STEEL VERSION AVAILABLE

RECOMMENDED SCREWS:
(QTY 6)(P/N 19240.XX)#8 X 1.0 PHILLIPS, FLAT HEAD SHEET METAL SCREWS (SEE TRUTH TIPS FOR MORE INFORMATION)

NOTE:
1. BRACKET IS SUPPLIED WITH OPERATOR. DO NOT ORDER SEPARATELY

PART NO. "A" APPROXIMATE AMOUNT OF OPENING
51.11 11" 8"

FIG. 4 BRACKET 22143

RECOMMENDED SCREWS:
(QTY 2)(P/N 19230.XX)#8 X 1.0 PHILLIPS, PAN HEAD, SHEET METAL SCREWS (SEE TRUTH TIPS FOR MORE INFORMATION)

NOTE:
1. BRACKET IS SUPPLIED WITH OPERATOR. DO NOT ORDER SEPARATELY
# Hardware Comparison for NAFS Casement Window Hardware Load Test


**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

<table>
<thead>
<tr>
<th>Operator</th>
<th>Approx. Minimum Frame Width to Fit Operator</th>
<th>Hinge</th>
<th>10° Standard</th>
<th>10° Washable</th>
<th>10° Egress</th>
<th>10° HP Concaped</th>
<th>10° HP Concaped</th>
<th>Butt Hinge</th>
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## Typical Mounting Positions - Used for Hardware Comparison

<table>
<thead>
<tr>
<th>Operator</th>
<th>Bracket Position A</th>
<th>Bracket Position B</th>
<th>Operator Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.XX Concealed Hinges</td>
<td>11.062</td>
<td>8.13</td>
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<td>Catalog 3 in Air 4.00</td>
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<tr>
<td>Traditional &amp; Ellipse</td>
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<td>23 Series Single Arm</td>
<td>2.125</td>
<td>NA</td>
<td>Operator is fully open (arm against stop) at 90° window position</td>
</tr>
</tbody>
</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.

†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 #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. 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)

LEFT HAND SHOWN
OPERATOR ARMS REMOVED FOR CLARITY

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)

LEFT HAND SHOWN
OPERATOR ARMS REMOVED FOR CLARITY

FIG. 12  DIMENSIONS FOR FOLDING HANDLE COVER (LH) (SHOWN)
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.


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

HARDWARE SHOWN
15.10 OPERATOR
10339 STUD BRACKET
30473 TRACK
14.05 HINGE
10341 COVER
10579 HANDLE

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 7.50 (19.1mm).
5. USE L, F, AND LINK THICKNESS TO CALCULATE MOUNTING HEIGHT.

TABLE OF APPLICATION FOR 90° SASH OPENING

<table>
<thead>
<tr>
<th>AVAILABLE HINGES</th>
<th>HINGE CONSTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.05</td>
<td>5.932 (150.7mm)</td>
</tr>
<tr>
<td>14.06</td>
<td>6.560 (166.8mm)</td>
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<td>14.75</td>
<td>5.932 (150.7mm)</td>
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<tr>
<td>14.76</td>
<td>6.560 (166.8mm)</td>
</tr>
<tr>
<td>14.77</td>
<td>3.591 (91.2mm)</td>
</tr>
<tr>
<td>14.80</td>
<td>5.932 (150.7mm)</td>
</tr>
<tr>
<td>14.91</td>
<td>6.560 (166.8mm)</td>
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<tr>
<td>14.93</td>
<td>3.591 (91.2mm)</td>
</tr>
<tr>
<td>34.81</td>
<td>5.692 (144.6mm)</td>
</tr>
</tbody>
</table>
**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)

**PREFERRED MOUNTING HOLES**

USE L, F, AND LINK THICKNESS TO CALCULATE BRACKET MOUNTING HEIGHT

(SEE STUD BRACKETS FOR "F" DIM.)

**Bracket Clearance**

<table>
<thead>
<tr>
<th>OPERATORS</th>
<th>LINK OFFSET</th>
<th>CLIP</th>
<th>B STUD LOCATION</th>
<th>BRACKET CLEARANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10339 L</td>
</tr>
<tr>
<td>15.10</td>
<td>UP TOP</td>
<td>14.05</td>
<td>14.06</td>
<td>14.75</td>
</tr>
<tr>
<td>15.61</td>
<td>DOWN TOP</td>
<td></td>
<td>5.270</td>
<td>(133.9mm)</td>
</tr>
<tr>
<td>15.63</td>
<td>UP BOTTOM</td>
<td>1.430* (36.3mm)</td>
<td>.960 (24.4mm)</td>
<td>1.430* (36.3mm)</td>
</tr>
<tr>
<td>15.73</td>
<td>DOWN TOP</td>
<td>1.280* (32.5mm)</td>
<td>.780 (19.8mm)</td>
<td>1.280* (32.5mm)</td>
</tr>
<tr>
<td>15.15</td>
<td>EGRESS TOP</td>
<td>14.77</td>
<td>2.929</td>
<td>(74.4mm)</td>
</tr>
</tbody>
</table>

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.
FIG. 6 STUD BRACKET 10339.XX, 10340.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)

FIG. 7 STUD BRACKET 10402.XX, 10403.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)

FIG. 8 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)
**FIG. 9 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)

10745 LEFT HAND SHOWN

NOTE: 10746 RIGHT HAND

**FIG. 10 STUD BRACKET 10558.XX**

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)
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.

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 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, 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 90º 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**

**LEFT HAND SHOWN**

**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).**

**PARTS SHOWN**

<table>
<thead>
<tr>
<th>PARTS SHOWN</th>
<th>QTY</th>
<th>DESCRIPTION</th>
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</thead>
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<tr>
<td>15.62</td>
<td></td>
<td>OPERATOR</td>
</tr>
<tr>
<td>12512</td>
<td></td>
<td>STUD BRACKET</td>
</tr>
<tr>
<td>14.05</td>
<td></td>
<td>HINGE</td>
</tr>
<tr>
<td>10341</td>
<td></td>
<td>COVER</td>
</tr>
<tr>
<td>10579</td>
<td></td>
<td>HANDLE</td>
</tr>
</tbody>
</table>

**RECOMMENDED:**

- **A:** 1.375 (34.9mm) TO 2.125 (54.0mm)
- **B:** .750 (19.1mm) TO 1.750 (44.5mm)
- **C:** 5.637 (143.2mm)
- **D:** 1.938 (49.2mm)
FIG. 2 ENTRYGARD DYAD OPERATOR

15.11 LEFT HAND SHOWN

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)

<table>
<thead>
<tr>
<th>AVAILABLE OPERATORS</th>
<th>LINK OFFSET</th>
<th>CLIP</th>
<th>BRACKETS</th>
</tr>
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<tbody>
<tr>
<td>15.11</td>
<td>DOWN</td>
<td>TOP</td>
<td>10917 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10918 R</td>
</tr>
<tr>
<td>15.62</td>
<td>UP</td>
<td></td>
<td>D= .95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(24.1mm)</td>
</tr>
<tr>
<td>15.64</td>
<td>UP</td>
<td></td>
<td>D= 1.09</td>
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<td>15.76</td>
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<td>BOTTOM</td>
<td>D= .952</td>
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<td></td>
<td></td>
<td></td>
<td>(24.1mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D= .810</td>
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<td></td>
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<td>(20.6mm)</td>
</tr>
</tbody>
</table>

(=* OPPOSITE HAND INVERTED BRACKET)
FIG. 3 ENTRYGARD OPERATOR COVER 10341

LOGO AREA AVAILABLE

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.


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:
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.
15 ENTRYGARD® SINGLE ARM OPERATOR

FIG. 1 APPLICATION OF TRUTH ENTRYGARD SINGLE ARM OPERATOR

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)

NOTE:

TABLE OF APPLICATION FOR 90º SASH OPENING

<table>
<thead>
<tr>
<th>AVAILABLE HINGES</th>
<th>Y HINGE CONSTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>*14.02</td>
<td>7.997 (203.1mm)</td>
</tr>
<tr>
<td>14.05</td>
<td>7.008 (178.0mm)</td>
</tr>
<tr>
<td>14.06</td>
<td>7.655 (194.4mm)</td>
</tr>
<tr>
<td>14.75</td>
<td>6.947 (176.5mm)</td>
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<tr>
<td>14.76</td>
<td>7.575 (192.4mm)</td>
</tr>
<tr>
<td>14.77</td>
<td>4.318 (109.7mm)</td>
</tr>
<tr>
<td>*14.80</td>
<td>6.947 (176.5mm)</td>
</tr>
<tr>
<td>*14.91</td>
<td>7.575 (192.4mm)</td>
</tr>
<tr>
<td>*14.93</td>
<td>4.068 (103.3mm)</td>
</tr>
<tr>
<td>14.96</td>
<td>6.986 (177.4mm)</td>
</tr>
</tbody>
</table>

* STAINLESS STEEL HINGES

HARDWARE SHOWN
- 15.94 OPERATOR
- 30706 TRACK
- 14.05 HINGE
- 10341 COVER
- 10579 HANDLE

APPROXIMATE MINIMUM SASH WIDTH WITH 14.05 HINGE

LEFT HAND SHOWN
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)

LEFT HAND SHOWN

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.


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 - 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 jams.

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.
FIG. 1 APPLICATION OF TRUTH ENTRYGARD AWNING OPERATOR

NOTE:
1. TO DETERMINE THE \( W \) DIMENSION FOR OPERATOR SPACE REQUIREMENTS ADD HOOK DIMENSION \( H \) TO OPERATOR CONSTANT \( O \). \( W = O + H \)

2. OPERATOR CUTOUT SIZE 5.0 (127.0mm) X .750 (19.1mm)

FIG. 2 ENTRYGARD AWNING OPERATOR (single pull)

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)

PREFERRED MOUNTING HOLES

1.021 MIN (25.9mm)

1.938 (49.4mm)

.468 MAX (11.9mm)

.555 (14.1mm)

.816 MIN (20.7mm)

FIG. 4 ENTRYGARD AWNING OPERATOR (GUIDE BAR)

CENTER HOLE APPLICABLE (31642 ONLY)

.312 (7.9mm)

.316 (8.0mm)

.599 (14.2mm)

NOTE: MOUNTING HOLE LOCATIONS SHOWN IN FIG. 2.

<table>
<thead>
<tr>
<th>AVAILABLE OPERATOR</th>
<th>AVAILABLE GUIDE BAR</th>
<th>SCREW REQD.</th>
<th>GUIDE BAR OVERALL LENGTH A</th>
<th>GUIDE BAR HOLE TO HOLE DIM B</th>
<th>APPROXIMATE SASH OPENING</th>
<th>DIMENSION C</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.43</td>
<td>31641</td>
<td>2</td>
<td>22.750 (577.9mm)</td>
<td>22.125 (562.0mm)</td>
<td>7.688 (195.3mm)</td>
<td>.599 (14.2mm)</td>
</tr>
<tr>
<td>11.44</td>
<td>31642</td>
<td>3</td>
<td>30.750 (781.1mm)</td>
<td>30.125 (765.2mm)</td>
<td>11.312 (287.3mm)</td>
<td></td>
</tr>
</tbody>
</table>

RECOMMENDED SCREWS:

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 (P/N 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)
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 Operators manufactured by Truth Hardware, Owatonna, MN.
FIG. 1 APPLICATION OF TRUTH ELLIPSE SINGLE ARM OPERATOR

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

AVAILABLE HINGES

<table>
<thead>
<tr>
<th>AVAILABLE HINGES</th>
<th>Y HINGE CONSTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.05</td>
<td>5.290 (134.4mm)</td>
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<tr>
<td>14.06</td>
<td>5.915 (150.2mm)</td>
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<tr>
<td>14.75</td>
<td>5.290 (134.4mm)</td>
</tr>
<tr>
<td>14.76</td>
<td>5.915 (150.2mm)</td>
</tr>
<tr>
<td>14.77</td>
<td>3.110 (79.0mm)</td>
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<tr>
<td>14.91</td>
<td>5.915 (150.2mm)</td>
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<td>35.10</td>
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<td>35.11</td>
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<td>35.12</td>
<td>1.645 (41.8mm)</td>
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<tr>
<td>35.13</td>
<td>1.645 (41.8mm)</td>
</tr>
</tbody>
</table>

HARDWARE SHOWN

<table>
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<th>HARDWARE SHOWN</th>
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</thead>
<tbody>
<tr>
<td>15.31 OPERATOR</td>
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<tr>
<td>30706.92 TRACK</td>
</tr>
<tr>
<td>14.05 HINGE</td>
</tr>
<tr>
<td>11454.XX HANDLE</td>
</tr>
</tbody>
</table>

X LEFT HAND SHOWN

(AVAILABLE HINGES)

HARDWARE SHOWN

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

A TRACK LOCATION SEE FIG. 3

SEE NOTE 1

C [9.9 mm] 390 (CUT-OUT LOCATION)
FIG. 2 ELLIPSE SINGLE ARM WOOD/PVC CUT-OUT DETAIL

**Wood Profile**

- 0.100 [2.5 mm]
- 1.125 [28.6 mm]
- 0.085 [2.2 mm]
- 0.420 max. wall [10.7 mm]

**PVC Profile**

- 0.100 [2.5 mm]
- 1.125 [28.6 mm]
- 0.085 [2.2 mm]
- 0.420 max. wall [10.7 mm]

**Sash**

- 0.100 [2.5 mm]
- 1.125 [28.6 mm]
- 0.085 [2.2 mm]

**Sill Frame**

- 0.100 [2.5 mm]
- 1.125 [28.6 mm]
- 0.085 [2.2 mm]

**Dimensions**

- 0.750 [19.0 mm]
- 0.400 [10.2 mm]
- 3.780 [96.0 mm]
- 0.490 [12.4 mm]
- 0.575 [14.6 mm]

⚠️ Hold these dimensions as close to minimum as possible for proper gasket fit.

**Note:**

- Of screw location see Fig. 1
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. 4  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. 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)
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

NOTE:

⚠️ 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

<table>
<thead>
<tr>
<th>D DIMENSION</th>
<th>C DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.500 (38.1mm)</td>
<td>7.663 (194.6mm)</td>
</tr>
<tr>
<td>1.750 (44.5mm)</td>
<td>7.607 (193.2mm)</td>
</tr>
<tr>
<td>2.000 (50.8mm)</td>
<td>7.540 (191.5mm)</td>
</tr>
</tbody>
</table>

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 HANDLING OF BRACKET
FIG. 2 ELLIPSE DYAD WOOD/PVC CUT-OUT DETAIL

1. Hold these dimensions as close to minimum as possible for proper gasket fit.

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**

**LEFT HAND SHOWN**

**PREFERRED MOUNTING HOLES**
(WOOD APPLICATION)

- **15.18 OPERATOR**
  - 3.0 [76.2 mm]
  - 2.222 [56.4 mm]
  - .375 [9.5 mm]
  - .843 [21.4 mm]

- **15.30 OPERATOR**
  - 1.625 [41.3 mm]
  - 1.444 [36.7 mm]

- **15.26 OPERATOR**
  - 1.125 [28.6 mm]

**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)

<table>
<thead>
<tr>
<th>AVAILABLE OPERATOR</th>
<th>*RECOMMENDED STUD BRACKET</th>
<th>AVAILABLE HINGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.18</td>
<td>12510.92 LH 12511.92 RH</td>
<td>14.05 14.06 14.75 14.76</td>
</tr>
<tr>
<td>15.26</td>
<td>12510.92 LH 12511.92 RH</td>
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</tr>
<tr>
<td>15.30</td>
<td>12510.92 LH 12511.92 RH</td>
<td></td>
</tr>
</tbody>
</table>

*See Truth Tip #1 for handling 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)

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**

- **C. CENTER SLIDE SHOE ON THE SASH.**
  (This becomes more important as the window width increases)
  See Truth Tips #3

**NOTE:**

- Hold these dimensions as close to minimum as possible for proper gasket fit.

### Available Operator vs. Available Track

<table>
<thead>
<tr>
<th>Available Operator</th>
<th>Available Track</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.71</td>
<td>30169</td>
<td>13.50 (342.9mm)</td>
<td>16.039 (407.4mm)</td>
</tr>
<tr>
<td>15.60</td>
<td>30169</td>
<td>9.500 (241.3mm)</td>
<td>12.039 (305.8mm)</td>
</tr>
</tbody>
</table>
FIG. 2 ELLIPSE SINGLE ARM AWNING OPERATOR

NON-HANDED

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)
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**

**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

<table>
<thead>
<tr>
<th>AVAILABLE HINGES</th>
<th>Y HINGE CONSTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.05</td>
<td>5.290 (134.4mm)</td>
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<tr>
<td>14.06</td>
<td>5.915 (150.2mm)</td>
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<tr>
<td>14.75</td>
<td>5.290 (134.4mm)</td>
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<td>14.76</td>
<td>5.915 (150.2mm)</td>
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<tr>
<td>14.77</td>
<td>3.110 (79.0mm)</td>
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<tr>
<td>14.91</td>
<td>5.915 (150.2mm)</td>
</tr>
<tr>
<td>35.10</td>
<td>1.758 (44.7mm)</td>
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<tr>
<td>35.11</td>
<td>1.758 (44.7mm)</td>
</tr>
<tr>
<td>35.12</td>
<td>1.645 (41.8mm)</td>
</tr>
<tr>
<td>35.13</td>
<td>1.645 (41.8mm)</td>
</tr>
</tbody>
</table>

**HARDWARE SHOWN**

| 15.31 OPERATOR    | 30706.92 TRACK    |
| 14.05 HINGE       | 11454.XX HANDLE  |

**ARM AND HINGE AT 90°**

**LEFT HAND SHOWN**

**TRACK LOCATION SEE FIG. 3**

**SEE NOTE 1**

**AVAILABLE HINGES**

- 14.05
- 14.06
- 14.75
- 14.76
- 14.77
- 14.91
- 35.10
- 35.11
- 35.12
- 35.13

**Y HINGE CONSTANT**

- 5.290 (134.4mm)
- 5.915 (150.2mm)
- 3.110 (79.0mm)
FIG. 2 TRADITIONAL SINGLE ARM WOOD/PVC CUT-OUT DETAIL

WARNING: 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)

<table>
<thead>
<tr>
<th>AVAILABLE OPERATOR</th>
<th>ARM LENGTH E</th>
<th>A SEE FIG. 1</th>
<th>TRACK FOR USE WITH EGRESS HINGE</th>
<th>TRACK FOR USE WITH WASHABILITY HINGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.32</td>
<td>13.500 (342.9mm)</td>
<td>15.310 (388.9mm)</td>
<td>30150.92</td>
<td>30706.92</td>
</tr>
<tr>
<td>15.31</td>
<td>9.500 (241.3mm)</td>
<td>11.310 (287.3mm)</td>
<td></td>
<td>30706.92</td>
</tr>
<tr>
<td>15.56</td>
<td>7.500 (190.5mm)</td>
<td>9.310 (236.5mm)</td>
<td>30706.92</td>
<td></td>
</tr>
<tr>
<td>15.39</td>
<td>6.000 (15.24mm)</td>
<td>7.810 (198.4mm)</td>
<td>31375.92</td>
<td>NA</td>
</tr>
</tbody>
</table>
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**

**LEFT HAND SHOWN**

**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

**HARDWARE SHOWN**

<table>
<thead>
<tr>
<th>D DIMENSION</th>
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</tr>
</thead>
<tbody>
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</table>

*SEE TRUTH TIP #1 FOR HANDLING OF BRACKET*
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
**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)

<table>
<thead>
<tr>
<th>AVAILABLE OPERATOR</th>
<th>*RECOMMENDED STUD BRACKET</th>
<th>AVAILABLE HINGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.18</td>
<td>12510.92 LH 12511.92 RH</td>
<td>14.05</td>
</tr>
<tr>
<td>15.26</td>
<td>12510.92 LH 12511.92 RH</td>
<td>14.06</td>
</tr>
<tr>
<td>15.30</td>
<td>12510.92 LH 12511.92 RH</td>
<td>14.75</td>
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</tbody>
</table>

*SEE TRUTH TIP #1 FOR HANDING OF BRACKET*
TRADITIONAL STYLE
DYAD OPERATOR

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)

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

CENTER OPERATOR ON THE SASH. (THIS BECOMES MORE IMPORTANT AS THE WINDOW WIDTH INCREASES) SEE TRUTH TIPS #3

NOTE:
Δ HOLD THESE DIMENSIONS AS CLOSE TO MINIMUM AS POSSIBLE FOR PROPER GASKET FIT

<table>
<thead>
<tr>
<th>AVAILABLE OPERATOR</th>
<th>AVAILABLE TRACK</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.71</td>
<td>30169</td>
<td>13.50</td>
<td>16.039</td>
</tr>
<tr>
<td>15.60</td>
<td>30169</td>
<td>9.500</td>
<td>12.039</td>
</tr>
</tbody>
</table>

15.60 SHOWN

PIVOT SHOE

WATER DAM

OF SCREW LOCATION

A

B

CUT-OUT LOCATION

MIN

MAX

[2.2 mm]

[10.2 mm]

[1.5 mm]

[12.4 mm]
FIG. 2 TRADITIONAL SINGLE ARM AWNING OPERATOR

**LEFT HAND SHOWN**

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 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)
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 90º 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).
5. Optional Handle styles, such as Truth’s Folding Handle, are also available.
6. Operator Track - see Figures 2 & 3 for available track options.
7. Ruber-cork adhesive backed operator gasket (optional).
8. #21306 - Protective red plastic spline cap
9. #32357 - 375 pcs per box
10. #30174 - 400 pcs per box
11. #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.
FIG. 1 APPLICATION OF THE 23 SERIES SINGLE ARM OPERATOR

SINGLE ARM OPERATOR (FACE-MOUNT)

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

<table>
<thead>
<tr>
<th>AVAILABLE HINGES</th>
<th>Y HINGE CONSTANT</th>
<th>D (MINIMUM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.05</td>
<td>3.939 [100.1mm]</td>
<td>4.76 [12.1mm]</td>
</tr>
<tr>
<td>14.06</td>
<td>4.567 [116.0mm]</td>
<td></td>
</tr>
<tr>
<td>14.75</td>
<td>3.939 [100.1mm]</td>
<td></td>
</tr>
<tr>
<td>14.76</td>
<td>4.567 [116.0mm]</td>
<td></td>
</tr>
<tr>
<td>14.77</td>
<td>1.311 [33.3mm]</td>
<td>.562 [14.3mm]</td>
</tr>
<tr>
<td>14.80</td>
<td>3.939 [100.1mm]</td>
<td></td>
</tr>
<tr>
<td>35.10</td>
<td>.495 [12.6mm]</td>
<td>.687 [17.5mm]</td>
</tr>
<tr>
<td>35.11</td>
<td>.495 [12.6mm]</td>
<td></td>
</tr>
<tr>
<td>35.12</td>
<td>.389 [9.9mm]</td>
<td></td>
</tr>
<tr>
<td>35.13</td>
<td>.389 [9.9mm]</td>
<td></td>
</tr>
</tbody>
</table>

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

CENTERLINE OF MOUNT SCREWS

.954 [24.2 mm] MINIMUM

SECONDARY WALL CUT-OUT FOR PVC

OPERATOR CUT-OUT

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

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

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
FIG. 2  SINGLE ARM OPERATOR 23.00, 23.01, 23.02, 23.03 AND 23.38
(commercially handed - see Truth Tips)

RECOMMENDED SCREWS:
FRONT MOUNT: (QTY 4)/P/N 19700.XX)-#10 PHILLIPS, FLAT HEAD, STAINLESS STEEL, SELF TAPPING SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)
REAR MOUNT: (QTY 4)-#10-24 PHILLIPS, PAN HEAD, STAINLESS STEEL MACHINE SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

<table>
<thead>
<tr>
<th>OPER</th>
<th>B MIN.</th>
<th>TRACK LENGTH</th>
<th>TRACK MODEL</th>
<th>MOUNT TYPE</th>
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<tbody>
<tr>
<td>23.38</td>
<td>5.688</td>
<td>7.500</td>
<td>31002</td>
<td>FRONT</td>
</tr>
<tr>
<td>23.01</td>
<td>7.688</td>
<td>9.500</td>
<td>30175</td>
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</tr>
<tr>
<td>23.03</td>
<td>11.688</td>
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<td>30175</td>
<td></td>
</tr>
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<tr>
<td>23.00</td>
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<td>30175</td>
<td></td>
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<td>23.02</td>
<td>11.688</td>
<td>13.500</td>
<td>30175</td>
<td></td>
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</tbody>
</table>

FIG. 3  TRACK 30175 AND 31002

RECOMMENDED SCREWS:
WOOD: (QTY 2)-#10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS
PVC & METAL: (QTY 2)-#10 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

<table>
<thead>
<tr>
<th>TRACK</th>
<th>D</th>
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<tbody>
<tr>
<td>30175</td>
<td>13.125</td>
</tr>
<tr>
<td>31002</td>
<td>8.500</td>
</tr>
</tbody>
</table>

FIG. 4  GASKET 30174

FIG. 5  BACKING PLATE 20947.XX

NOTE:
1. (QTY 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
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 hinge side 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).

**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: 1.750 (44.5mm) TO 2.750 (69.9mm).
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 COMPATIBILITY CHART IN FIG.2 BEFORE SELECTING OPERATOR FOR YOUR APPLICATION.
5. TO DETERMINE MTG LOCATION OF BRACKETS ADD OR SUBTRACT DIMENSION L AND F.

HARDWARE SHOWN
23.54 OPERATOR
14.05 HINGE
10558 BRACKET
10579 HANDLE
20947 BACKING PLATE (2)
## OPERATOR/HINGE COMPATABILITY TABLE

<table>
<thead>
<tr>
<th>HINGE STACK H</th>
<th>DESCRIPTION</th>
<th>HINGE PART NUMBER</th>
<th>TYPE OF HINGE</th>
<th>23.46 &amp; 23.59</th>
<th>23.49</th>
<th>23.54 &amp; 23.65</th>
<th>23.55 &amp; 23.66</th>
</tr>
</thead>
<tbody>
<tr>
<td>.438 (11.1mm)</td>
<td>CONCEALED CSMT HNG</td>
<td>14.75 &amp; 14.05</td>
<td>2 BAR</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
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<tr>
<td></td>
<td>CONCEALED CSMT HNG</td>
<td>14.76 &amp; 14.06</td>
<td>2 BAR</td>
<td>Z</td>
<td>Z</td>
<td>Z</td>
<td>Z</td>
</tr>
<tr>
<td></td>
<td>CONCEALED CSMT HNG</td>
<td>14.80</td>
<td>2 BAR</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>.500 (12.7mm)</td>
<td>201 8”</td>
<td>34.10 NO STOP</td>
<td>4 BAR</td>
<td>O</td>
<td>O</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>201 10”</td>
<td>34.11 NO STOP</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>201 12”</td>
<td>34.12 NO STOP</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>401 90° 12”</td>
<td>34.55</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>531 (13.5mm)</td>
<td>401 90° 5D 12”</td>
<td>** 34.81</td>
<td>4 BAR</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>.625 (15.9mm)</td>
<td>301 10”</td>
<td>34.24 NO STOP</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>301 12”</td>
<td>34.25 NO STOP</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>Z</td>
<td>Z</td>
</tr>
<tr>
<td></td>
<td>601 90° 14”</td>
<td>34.59</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>601 90° 16”</td>
<td>34.60</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>601 90° 18”</td>
<td>34.61</td>
<td>4 BAR</td>
<td>Z</td>
<td>Z</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

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)

**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:**

1. CHECK THE OPERATOR/HINGE COMPATABILITY TABLES TO VERIFY THAT A PARTICULAR OPERATOR WILL WORK WITH A PARTICULAR HINGE (SEE FIG. 2)

**Hinge Stack**

<table>
<thead>
<tr>
<th>H</th>
<th>G MINIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>.438 (11.1mm)</td>
<td>.622 (15.8mm)</td>
</tr>
<tr>
<td>.500 (12.7mm)</td>
<td>.671 (17.0mm)</td>
</tr>
<tr>
<td>.532 (13.5mm)</td>
<td>.702 (17.8mm)</td>
</tr>
<tr>
<td>.625 (15.9mm)</td>
<td>.761 (19.3mm)</td>
</tr>
</tbody>
</table>

**FIG. 4  23.49 DYAD OPERATOR**

**RECOMMENDED SCREWS:**

WOOD: 2 (P/N 19535.XX) #8 - 32X .312 PHILLIPS, TRUSS HEAD, MACHINE SCREWS

**NOTE:**

1. CHECK THE OPERATOR/HINGE COMPATABILITY TABLES TO VERIFY THAT A PARTICULAR OPERATOR WILL WORK WITH A PARTICULAR HINGE (SEE FIG. 2)
**FIG. 5 23.54 and 23.65 DYAD OPERATOR (23.65 has stability tab)**

- **No offset**
- **Left hand shown**
- **Available brackets**
  - LH: 10494
  - RH: 10495
  - *Recommended: 10558

**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

**Note:**
1. Check the operator/hinge compatibility tables to verify that a particular operator will work with a particular hinge (see Fig. 2)

**Hinge stack**

<table>
<thead>
<tr>
<th>Hinge stack (see note 1)</th>
<th>G minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>.438 (11.1mm)</td>
<td>.622 (15.8mm)</td>
</tr>
<tr>
<td>.500 (12.7mm)</td>
<td>.671 (17.0mm)</td>
</tr>
<tr>
<td>.532 (13.5mm)</td>
<td>.702 (17.8mm)</td>
</tr>
<tr>
<td>.625 (15.9mm)</td>
<td>.761 (19.3mm)</td>
</tr>
</tbody>
</table>

**C = 6.300 (160.0mm)**

**FIG. 6 2.55 and 23.66 DYAD OPERATOR (23.66 has stability tab)**

- **Arm is offset upward**
- **125 (3.2mm)**
- **Left hand shown**
- **Available brackets**
  - LH: 10494
  - RH: 10495
  - *Recommended: 10558

**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

**Note:**
1. Check the operator/hinge compatibility tables to verify that a particular operator will work with a particular hinge (see Fig. 2)

**Hinge stack**

<table>
<thead>
<tr>
<th>Hinge stack (see note 1)</th>
<th>G minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>.438 (11.1mm)</td>
<td>.537 (13.6mm)</td>
</tr>
<tr>
<td>.500 (12.7mm)</td>
<td>.586 (14.9mm)</td>
</tr>
<tr>
<td>.532 (13.5mm)</td>
<td>.617 (15.7mm)</td>
</tr>
<tr>
<td>.625 (15.9mm)</td>
<td>.676 (17.2mm)</td>
</tr>
</tbody>
</table>

**C = 6.260 (159.0mm)**
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

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

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)

10494 LEFT HAND SHOWN

NOTE: 10495 RIGHT HAND

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.
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.
FIG. 1 APPLICATION OF TRUTH TELESCOPING PUSH BAR OPERATOR
(ANDERBERG 44AL SERIES)

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.
FIG. 2  APPLICATION OF TRUTH TELESCOPING PUSH BAR OPERATOR
(ANDERBERG 44WD SERIES)

YOKE LENGTH = PIVOT RIVET TO YOKE RIVET

<table>
<thead>
<tr>
<th>TRUTH PART NO.</th>
<th>X DIMENSION</th>
<th>YOKE LENGTH</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CLOSED</td>
<td>EXTENDED</td>
</tr>
<tr>
<td>12.50</td>
<td>1.000 (25.4mm)</td>
<td>.844 (21.4mm)</td>
<td>8.00 (203.2mm)</td>
</tr>
<tr>
<td>12.52</td>
<td>1.438 (36.5mm)</td>
<td>1.282 (32.5mm)</td>
<td>8.00 (203.2mm)</td>
</tr>
</tbody>
</table>

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.
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.


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):
   - Contour Handle (painted) or 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).
   - Stabilizing Tab Kit.
   - Backing Plate (2 per operator).
   - Protective red plastic spline cap (optional).
   - 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.
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**

<table>
<thead>
<tr>
<th>PART No.</th>
<th>ARM LENGTH</th>
<th>OVERALL LENGTH</th>
<th>MOUNTING STYLE</th>
<th>STABILIZING TAB TO ORDER</th>
<th>RECOMMENDED TRACK</th>
<th>TRACK LENGTH</th>
<th>HARDWARE SHOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.10</td>
<td>11.00</td>
<td>27.75</td>
<td>FRONT</td>
<td>30169</td>
<td>30169</td>
<td>13.00</td>
<td>OPERATOR</td>
</tr>
<tr>
<td>22.17</td>
<td>5.50</td>
<td>16.75</td>
<td>FRONT</td>
<td>31594</td>
<td>31594</td>
<td>7.50</td>
<td>TRACK (2)</td>
</tr>
<tr>
<td>22.18</td>
<td>9.00</td>
<td>25.75</td>
<td>FRONT</td>
<td>31322</td>
<td>31322</td>
<td>12.00</td>
<td>HANDLE</td>
</tr>
<tr>
<td>22.19</td>
<td>11.00</td>
<td>27.75</td>
<td>REAR</td>
<td>30169</td>
<td>30169</td>
<td>13.00</td>
<td>TRACK (2)</td>
</tr>
</tbody>
</table>

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.
FIG. 2  FRONT MOUNT CUT OUT DETAILS

RECOMMENDED SCREWS: (AVAILABLE WITH OR WITHOUT STABILIZING TAB)

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: (AVAILABLE WITH OR WITHOUT STABILIZING TAB)

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.

**Recommended Screws:**

**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.
FIG. 1 APPLICATION 22 SCISSORS ARM OPERATOR

### Dimensions

<table>
<thead>
<tr>
<th>Sash Hook</th>
<th>C</th>
<th>D Min</th>
<th>E Min</th>
<th>H</th>
<th>W = H + O</th>
</tr>
</thead>
<tbody>
<tr>
<td>20008</td>
<td>.090 (2.3mm)</td>
<td>.220 (5.6mm)</td>
<td>.560 (14.2mm)</td>
<td>+.410 (10.4mm)</td>
<td></td>
</tr>
<tr>
<td>40543</td>
<td>N/A</td>
<td></td>
<td></td>
<td>.549 (13.9mm)</td>
<td>±.160 (4.1mm)</td>
</tr>
<tr>
<td>31336</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*31336 SASH HOOK BRACKET WILL ADD OR SUBTRACT FROM O DIMENSION.

### Operator Part No.

<table>
<thead>
<tr>
<th>Operator Part No.</th>
<th>A Overall Width</th>
<th>B Arm Clearance</th>
<th>Mounting</th>
<th>Stabilizing Tab</th>
<th>Approximate Sash Opening</th>
<th>O Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.21</td>
<td>21.50 (546.1mm)</td>
<td>.250 (6.4mm)</td>
<td>FRONT</td>
<td>ORDER (PN 12789)</td>
<td>15.00 (381.0mm)</td>
<td>1.403 (35.6mm)</td>
</tr>
<tr>
<td>22.22</td>
<td>21.50 (546.1mm)</td>
<td>.340 (8.6mm)</td>
<td>FRONT</td>
<td></td>
<td>10.00 (254.0mm)</td>
<td>1.497 (38.0mm)</td>
</tr>
<tr>
<td>22.23</td>
<td>16.00 (406.4mm)</td>
<td>.250 (6.4mm)</td>
<td>REAR</td>
<td></td>
<td>15.00 (381.0mm)</td>
<td>1.403 (35.6mm)</td>
</tr>
<tr>
<td>22.27</td>
<td>15.00 (381.0mm)</td>
<td>.340 (8.6mm)</td>
<td>REAR</td>
<td></td>
<td>10.00 (254.0mm)</td>
<td>1.497 (38.0mm)</td>
</tr>
<tr>
<td>22.28</td>
<td>21.50 (546.1mm)</td>
<td>.250 (6.4mm)</td>
<td>FRONT</td>
<td></td>
<td>15.00 (381.0mm)</td>
<td>1.403 (35.6mm)</td>
</tr>
<tr>
<td>22.29</td>
<td>16.00 (406.4mm)</td>
<td>.340 (8.6mm)</td>
<td>REAR</td>
<td></td>
<td>10.00 (254.0mm)</td>
<td>1.497 (38.0mm)</td>
</tr>
</tbody>
</table>

NOTE: TO DETERMINE THE MINIMUM W DIMENSION FOR OPERATOR ARM CLEARANCE, ADD HOOK DIMENSION (H) TO OPERATOR CONSTANT (O).

20947 BACKING PLATE (2) (20189 BACKING GROMMET CAN ALSO BE USED)

TAPPED #8-32 (.218 MIN. SCREW ENGAGEMENT)

REAR MOUNT SEE FIG. 3

FRONT MOUNT SEE FIG. 2

OPTIONAL STABILIZING TAB
FIG. 2  FRONT MOUNT CUT OUT DETAILS

4X PILOT FOR #10 SCREWS OR .25DIA HOLES FOR (P/N 20189) GROMMETS

PILOT FOR A #8 SCREW

STABILIZING TAB

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

2X Ø .296 [7.5mm]

PILOT FOR A #8 SCREW

STABILIZING TAB

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 19230.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 19240.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

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. 8 BACKING PLATE 20947.XX

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).

**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

NOTE:
TO DETERMINE THE MIN W DIMENSION FOR OPERATOR SPACE
REQUIREMENTS ADD HOOK DIMENSION H TO OPERATOR
CONSTANT O. (W = O + H)

PARTS SHOWN
11.12 OPERATOR
20008 SASH HOOK
10579 HANDLE

FIG. 2 ROTO GEAR AWNING OPERATOR (SINGLE PULL)

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)

AVAILABLE SASH HOOKS | DIMENSION B | DIMENSION H
----------------------|-------------|-------------
20008 | 0.442 (11.2mm) | +0.410 (10.4mm)
* 31336 | N/A | ±0.160 (4.1mm)
40543 | 0.442 (11.2mm) | +0.845 (21.5mm)

NOTE: PREFERRED MOUNTING HOLES

OPERATOR | OVERALL LENGTH | APPROXIMATE SASH OPENING
----------|----------------|-------------------------
11.10 | 21.520 (546.1mm) | 15.790 (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)

<table>
<thead>
<tr>
<th>OPERATOR</th>
<th>APPROXIMATE SASH OPENING</th>
<th>SASH HOOKS PART NUMBER</th>
<th>DIMENSION B</th>
<th>DIMENSION H</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.14</td>
<td>14.500 (368.3mm)</td>
<td>(2) 20008</td>
<td>.442 (11.2mm)</td>
<td>+.410 (10.4mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) 31336 *</td>
<td>N/A</td>
<td>±.160 (4.1mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) 40543</td>
<td>.442 (11.2mm)</td>
<td>+.845 (21.5mm)</td>
</tr>
</tbody>
</table>

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 TO BE DETERMINED BY PROFILE)

NOTE: 1. MOUNTING HOLE LOCATIONS SHOWN FIG 2
2. * 30385 CLIPS INCLUDED WITH OPERATOR.
3. MOUNTING HOLE LOCATIONS SHOWN IN FIG. 2

FIG. 4 ROTO GEAR AWNING OPERATOR (GUIDE BAR)

<table>
<thead>
<tr>
<th>OPERATOR</th>
<th>GUIDE BAR</th>
<th>APPROXIMATE SASH OPENING</th>
<th>DIMENSION B</th>
<th>DIMENSION W MIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.16</td>
<td>30568</td>
<td>10.00 (254.0mm)</td>
<td>.568 (14.4mm)</td>
<td>2.00 (50.8mm)</td>
</tr>
</tbody>
</table>

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
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19230.XX) #8 X 1.0 PHILLIPS, PAN HEAD, SHEET METAL SCREWS
PVC & METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE 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)
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.
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.

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**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>20008</td>
<td>+.383 (.9mm)</td>
<td>+.410 (10.4mm)</td>
</tr>
<tr>
<td>40543</td>
<td>N/A</td>
<td>+.845 (21.5mm)</td>
</tr>
<tr>
<td>*31336</td>
<td>N/A</td>
<td>+.160 (4.1mm)</td>
</tr>
</tbody>
</table>

* 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.

<table>
<thead>
<tr>
<th>ESCRUTcheon PLATE</th>
<th>O</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2.215 (56.3mm)</td>
<td>1.00 (25.4mm)</td>
<td>1.843 (46.8mm)</td>
<td>.688 (17.5mm)</td>
</tr>
<tr>
<td>E</td>
<td>1.965 (50.9mm)</td>
<td>.750 (19.1mm)</td>
<td>2.093 (53.2mm)</td>
<td>.437 (11.1mm)</td>
</tr>
<tr>
<td>* F</td>
<td>1.840 (46.7mm)</td>
<td>.625 (15.9mm)</td>
<td>2.218 (56.3mm)</td>
<td>.312 (7.9mm)</td>
</tr>
</tbody>
</table>

* REMOVABLE ESCRUTcheon MODELS AVAILABLE IN "F" TYPE ONLY.

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.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window Operators shall 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. 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)

APPROXIMATE SASH OPENING:
15.500 (393.7mm)

AVAILABLE WITH REMOVABLE ESCUTCHEON
FOR PVC OR METAL WINDOWS (ON 10.18)

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)

APPROXIMATE SASH OPENING
14.000 (355.6mm)

AVAILABLE WITH REMOVABLE
ESCUTCHEON FOR PVC OR
METAL WINDOWS (ON 10.19)

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)

APPROXIMATE SASH OPENING
8.500 (215.9mm)

AVAILABLE WITH REMOVABLE
ESCUTCHEON FOR PVC OR
METAL WINDOWS (ON 10.17)
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. 5 SASH HOOK 20008.XX (SST 30764)

FIG. 6 SASH HOOK 40543.XX

FIG. 7 SASH HOOK 31336.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)
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.

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.
MANUAL SKYLIGHT OPERATOR SYSTEM

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:
1. Select Drive needed:
   - 42.75 Straight Drive (painted)
   - 42.65 Angle Drive (painted).
2. Specify finish number.
3. Choose method of operation for Ele
   - #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)
- #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 11/4” 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:
1. 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.
2. 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.
3. 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.
4. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
5. For metal window profiles, Truth recommends stainless steel machine screws. However, in most applications, stainless steel sheet metal screws will provide adequate holding power.
6. 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**
REAL MOUNT

SCREWS ENTER FROM BEHIND AND SCREW INTO BASE AT LOCATION Y.

RECOMMENDED SCREWS:
4-(P/N 19992) #12-24 X 0.50 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

RECOMMENDED SCREWS:
SEE MOUNTING OPTIONS IN Fig. 2

**AVAILABLE DRIVES FOR ANGLE DRIVE MODULE**
- 10024 HANDLE
- 10579 HANDLE
- 30682 HEX BALL DRIVE ADAPTER
- 10453 HOOK
- 31000 EYELET
- 40096 2.0 (50.8mm) EXTENSION
- 40097 4.0 (101.6mm) EXTENSION

* NOTE: SEE POLES AND MISC. SKYLIGHT HARDWARE FOR MORE INFORMATION
**FIG. 4 STRAIGHT DRIVE MODULE 42.75**

- **Available Drives for Straight Drive Module**

<table>
<thead>
<tr>
<th>Drive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30662</td>
<td>HEX BALL DRIVE ADAPTER</td>
</tr>
<tr>
<td>10453</td>
<td>HOOK</td>
</tr>
<tr>
<td>31000</td>
<td>EYELET</td>
</tr>
<tr>
<td>40096</td>
<td>2.0 (50.8mm) EXTENSION</td>
</tr>
<tr>
<td>40097</td>
<td>4.0 (101.6mm) EXTENSION</td>
</tr>
</tbody>
</table>

**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**

- **Skylight Operator Angle Drive Module**

- **Skylight Operator Straight Drive Module**

**Maximum Operational Angle**

- 52.4° Approach Angle
- 18.4° Approach Angle

**4-12 Pitch 18.4° REF.**

WALL
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

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DRIVE</th>
<th>EXTENDED</th>
<th>COLLAPSED</th>
<th>COMPATIBLE WITH</th>
</tr>
</thead>
<tbody>
<tr>
<td>10637</td>
<td>HEX BALL (INCLUDED)</td>
<td>115.75 (2940.1mm)</td>
<td>67.75 (1720.3mm)</td>
<td>30662 HEX BALL DRIVE ADAPTOR (SEE FIG. 11)</td>
</tr>
<tr>
<td>10638</td>
<td>HOOK (INCLUDED)</td>
<td>116.50 (2959.1mm)</td>
<td>68.50 (1739.9mm)</td>
<td>10453 HOOK (SEE FIG. 18) OR 31000 EYELET (SEE FIG. 19)</td>
</tr>
<tr>
<td>10864</td>
<td>HEX BALL (INCLUDED)</td>
<td>73.75 (1873.3mm)</td>
<td>47.75 (1212.9mm)</td>
<td>30662 HEX BALL DRIVE ADAPTOR (SEE FIG. 11)</td>
</tr>
<tr>
<td>10865</td>
<td>HOOK (INCLUDED)</td>
<td>74.50 (1892.3mm)</td>
<td>48.50 (1231.9mm)</td>
<td>10453 HOOK (SEE FIG. 18) OR 31000 EYELET (SEE FIG. 19)</td>
</tr>
</tbody>
</table>

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)

33.0 [838mm] APPROX. EFFECTIVE EXTENSION LENGTH

36.125 [917.6 mm]

NO MORE THAN ONE EXTENSION SHOULD BE USED PER TELESCOPING POLE CRANK.
**FIG. 9 HANDLE EXTENSIONS 40096.XX, 40097.XX**

<table>
<thead>
<tr>
<th>EXTENSION</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>40096</td>
<td>2.0 (50.8mm)</td>
</tr>
<tr>
<td>40097</td>
<td>4.0 (101.6mm)</td>
</tr>
</tbody>
</table>

**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**

- Rigid aluminum tubing with flex cable inside
- Handle included
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.

FIG. 12 HANDLE 10579.XX (Long Handle)

FIG. 13 CONTOUR HANDLE 11454.XX

FIG. 14 HAND KNOB 11660.XX

FIG. 15 T-HANDLE 11573.XX

FIG. 16 HOOK 10453

FIG. 17 EYELET 31000.XX

FIG. 18 HEX BALL DRIVE 30957

FIG. 19 HEX BALL ADAPTOR 30662.XX

INCLUDES SET SCREW.

INCLUDES SET SCREW.

INCLUDES SET SCREW.
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 home’s 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 V AC 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 home’s 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...
(for large/ heavyweight 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 POWER WINDOW SYSTEMS**

**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

FIG. 2 WLS MOTOR SYSTEM APPLIED TO SKYLIGHT WINDOW

* THESE DIMENSIONS WILL VARY SLIGHTLY DEPENDING ON MANUAL OPERATOR USED
**FIG. 3 SENTRY II PRE-WIRING FOR CASEMENT/AWNING WINDOWS**

**WIRE SIZE (CLASS 2)**

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Total Distance from Control Panel to Motor</th>
<th>Number of Conductors</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 AWG</td>
<td>50 ft (15m) MAX</td>
<td>Motor Only: 2, Motor + 1 Lock: 4, Motor + 2 Locks: 6</td>
</tr>
<tr>
<td>14 AWG</td>
<td>100 ft (30m) MAX</td>
<td></td>
</tr>
<tr>
<td>12 AWG</td>
<td>150 ft (60m) MAX</td>
<td></td>
</tr>
</tbody>
</table>

**WIRE TERMINATION POINT-**

- **LEAVE 10" PIG TAIL**

**WALL STUD**

- **SEE TABLE FOR WIRE SIZE**

- **8 FT. WIRE PIG TAIL SUPPLIED WITH LOCK**

**RAIN SENSOR WIRE-SEE NOTE 2**

**WIRE EXIT LOCATION**

- **IS DETERMINED BY OPERATOR TYPE**

**MOTORIZED LOCK (IF USED)**

**OPERATOR WITH CENTERED HANDLE INPUT:**

- **HOLE CAN BE PLACED ON EITHER SIDE OF OPERATOR**

**OPERATOR WITH OFFSET HANDLE INPUT:**

- **HOLE MUST BE PLACED ON HANDLE INPUT SIDE OF OPERATOR**

**5/16" DIA.-FOR WINDOWS WITH NON-MOTORIZED LOCKS, 1/2"-FOR WINDOWS WITH MOTORIZED LOCKS. (SIZE OF HOLE SUBJECTED TO WIRE SIZE USED)**

**OPERATOR WITH OFFSET HANDLE INPUT:**

- **HOLE MUST BE PLACED ON HANDLE INPUT SIDE OF OPERATOR**

**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

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
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 home’s 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.
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

<table>
<thead>
<tr>
<th>Order 1 per skylight</th>
<th>43.50.00.005 - Sentry II HS System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12481.XX - Cover (.xx denotes finish code)</td>
</tr>
</tbody>
</table>

Order 1 Hand Held Remote &/or Wall Switch

<table>
<thead>
<tr>
<th>43.53.00.002 - Hand Held RF Remote</th>
</tr>
</thead>
</table>

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 kgs.), 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
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-
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.

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)
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)

<table>
<thead>
<tr>
<th>FRAME BRACKET</th>
<th>&quot;W&quot;</th>
<th>&quot;X&quot;</th>
<th>&quot;Y&quot;</th>
<th>&quot;Z&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A&quot;</td>
<td>15.31&quot; [389mm]</td>
<td>1.38&quot;  [35mm]</td>
<td>15.82&quot; [402mm]</td>
<td>.482&quot;  [12mm]</td>
</tr>
<tr>
<td>&quot;B&quot;</td>
<td>15.19&quot; [386mm]</td>
<td>1.63&quot;  [41mm]</td>
<td>15.86&quot; [403mm]</td>
<td>.728&quot;  [18.5mm]</td>
</tr>
</tbody>
</table>

1.882 [47.8 mm]

1/2 "W"

"W"

"Y"

"X"

"Z"
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)
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)
FIG. 4 MOTOR UNIT OVERALL DIMENSIONS
(MARVEL 42.90.XX.100 KIT)

14.252
[362.0 mm]

1.909
[48.5 mm]

1.312
[33.3 mm]

VIEW A-A
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)
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.
STUD BRACKETS & TRACK

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) #8 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
PVC & METAL: 2 - #8 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) #8 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
PVC & METAL: 2 - #8 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)

RECOMMENDED SCREWS:
WOOD: 3 (P/N 19340.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

NON HANDED
FIG. 9 STUD BRACKET 10494.XX, 10495.XX

10494 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: 10495 RIGHT HAND

FIG. 10 STUD BRACKET 10498.XX, 10499.XX

10498 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: 10499 RIGHT HAND

FIG. 11 STUD BRACKET 10680.XX, 10681.XX
Snap Stud

10680 LEFT HAND SHOWN

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

10739 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: 10740 RIGHT HAND
FIG. 13  STUD BRACKET 10745.XX, 10746.XX

10745 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: 10746 RIGHT HAND

FIG. 14  STUD BRACKET 10748.XX, 10749.XX

10748 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: 10749 RIGHT HAND

FIG. 15  STUD BRACKET 10917.XX, 10918.XX

10917 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: 10918 RIGHT HAND

FIG. 16  STUD BRACKET 10986.XX, 10987.XX

10986 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: 10987 RIGHT HAND
FIG. 17 STUD BRACKET 10583.XX, 10584.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: 10583 LEFT HAND SHOWN

FIG. 18 STUD BRACKET 10415.XX, 10416.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: 10415 LEFT HAND SHOWN

FIG. 19 STUD BRACKET 10521.XX, 10522.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: 10522 LEFT HAND SHOWN

FIG. 20 STUD BRACKET 10795.XX, 10796.XX

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
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

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

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

FIG. 22 STUD BRACKET 11257.XX, 11258.XX

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. 21 STUD BRACKET 11253.XX, 11254.XX

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
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

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.

<table>
<thead>
<tr>
<th>EXTENSION</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>40096</td>
<td>2.0 (50.8mm)</td>
</tr>
<tr>
<td>40097</td>
<td>4.0 (101.6mm)</td>
</tr>
</tbody>
</table>
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)

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

INCLUDES SET SCREW.
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)

ADAPTOR 20550
SASH
FRAME
ANY TRUTH OPERATOR
RIGID ALUMINUM TUBING
WITH FLEX CABLE INSIDE
CLERESTORY POLE CRANK
30476

RECOMMENDED HEIGHT RANGE (FROM FLOOR) 8' - 11' (WINDOWS ONLY)

FIG. 23 ADAPTOR 20550

Ø.750
(19.1mm)
1.188
(30.2mm)
HEX
.625
(15.9mm)
INTERNAL SPLINE
HANDLE INCLUDED
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.