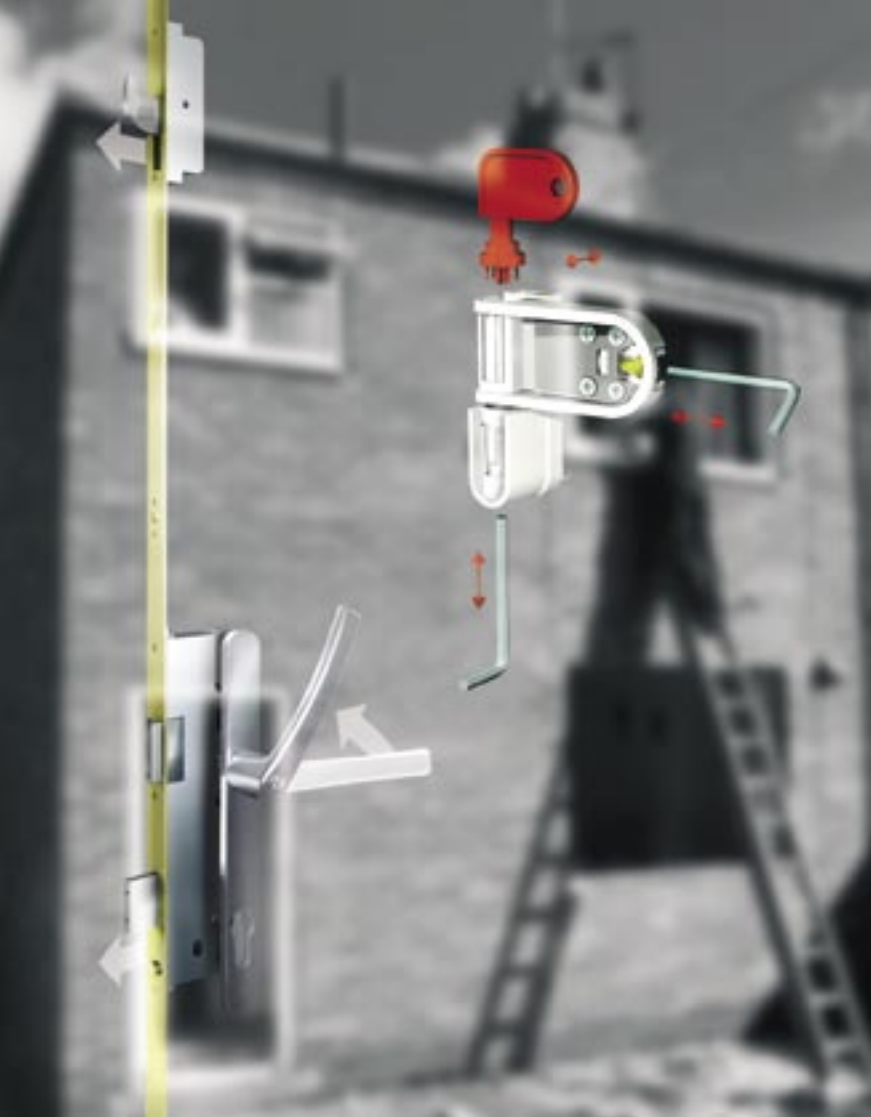


WE OPEN SPACE



Roto Frank Ltd

## Door systems

Troubleshooting guide

The information contained in this publication is intended for guidance purposes only. Whilst every effort has been made to ensure the accuracy of the information presented, it is the reader's responsibility to establish the veracity of the information and to ensure that the information is appropriate to a specific installation's requirements. Roto Frank cannot be held responsible for any omissions or errors and reserves the right to change the information, without notice, at any time. If you are in any doubt, you should consult the supplier of your doors and/or windows.

## ROTO FRANK

Roto Frank is the world's leading designer and manufacturer of hardware for all types of windows, doors and environmental management control systems.

Founded in 1935, Roto has been responsible for some of the most innovative fittings to be used in the building industry. We have established an international reputation for product quality, performance and originality.

Renowned for our range of tilt and turn hardware – over half of the world's tilt and turn installations use Roto systems – we offer an extensive range of fittings to suit all popular types of windows and doors in virtually every situation.

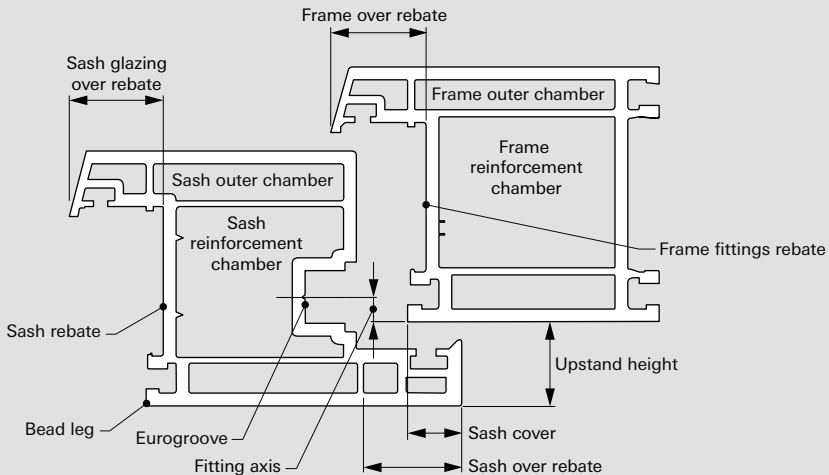
In addition to a great range of exceptional products, when you choose Roto you are assured of the very best in service, customer care and technical support before, during and after installation.

Our dedication to customer satisfaction gives you total confidence every step of the way.

## INTRODUCTION

The installation, adjustment and subsequent reliable operation of PVC-U doors can pose particular problems for fabricators and installers and they can often be a particularly troublesome cause of dissatisfaction with customers.

It is important to appreciate that there are so many variables in the manufacture and installation of doorsets that it would be impossible to cover every eventuality. This booklet, therefore, aims to look at the main areas of door malfunction and to offer solutions to the most common problems encountered on site.



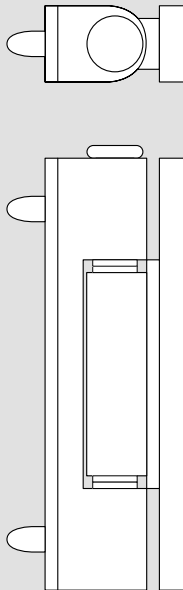
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## 1. TYPES OF DOOR HINGE

### Standard butt hinge

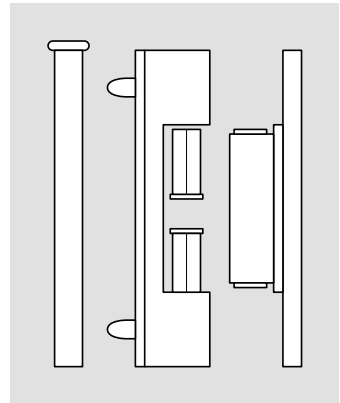
This type of hinge has no mechanical adjustment and relies on the door being fitted properly within the building opening, with the correct amount of toeing and heeling applied to the glass.



**Standard butt hinge**

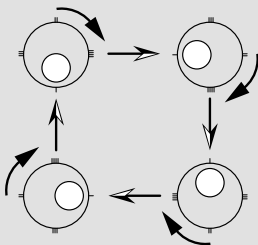
### Eccentric bush butt hinge

This hinge has limited, but sufficient, adjustment if the door has been correctly fitted. It allows for adjustment to increase or decrease the sash cover depending on the hinge setting at the time of assembly. It also allows for an increase or a decrease in compression, again depending on the hinge setting at the time of assembly. Great care should be taken when moving the eccentric bushes to ensure that they are in line with each other. If they are out of line, damage may be caused to the bushes. It is advisable to try the pin in the hinge before re-hanging the sash.

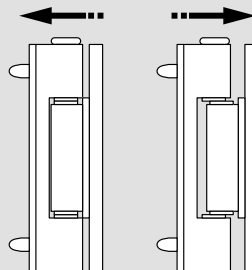


**Eccentric bush hinge components**

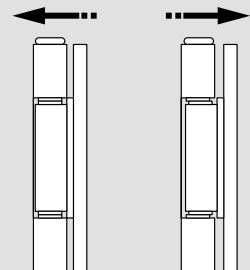
#### Bush adjustments



#### Sash compression



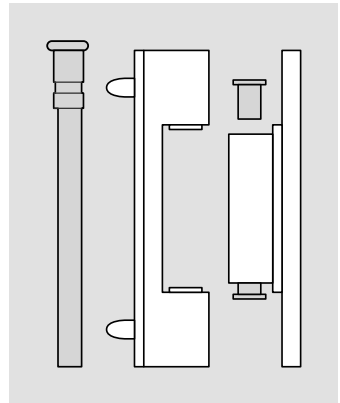
#### Sash cover



**Eccentric bush hinge adjustments**

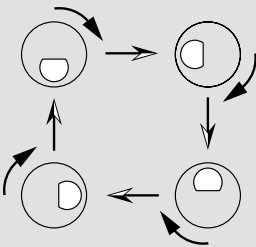
## Eccentric pin butt hinge

In the case of the eccentric pin hinge, instead of removing the bushes to adjust the hinge, an Allen key is normally inserted into the head of the hinge pin and the hinge position is adjusted by rotating the Allen key in either direction. The same movements will be achieved as described for the eccentric bush type hinge.

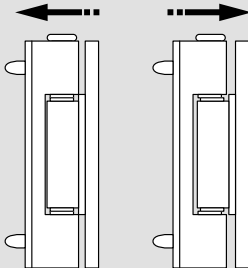


**Eccentric pin hinge components**

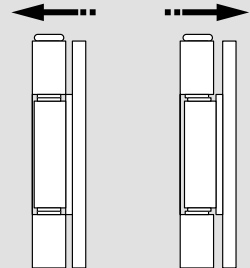
### Pin adjustments



### Sash compression



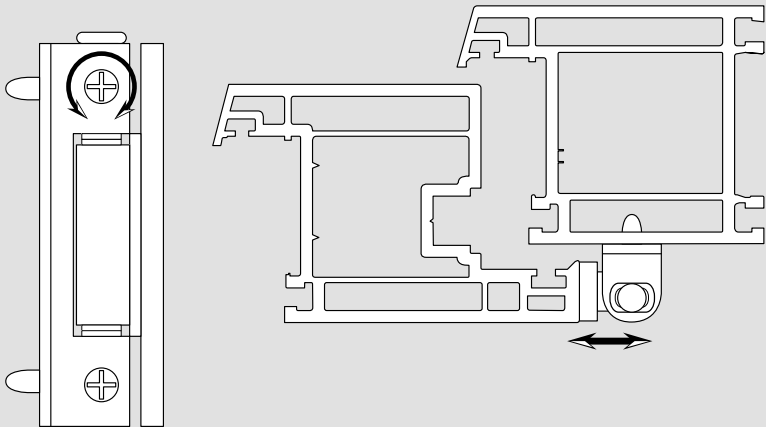
### Sash cover



**Eccentric pin hinge adjustments**

### Laterally adjustable butt hinge

The laterally adjustable hinge gives scope for an increase or decrease in sash cover. There is no compression adjustment available. Again, the amount of adjustment relies on the hinge having been fitted correctly during assembly.

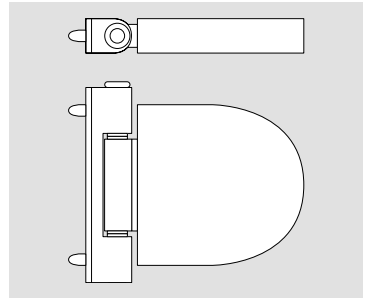


Laterally adjustable hinge

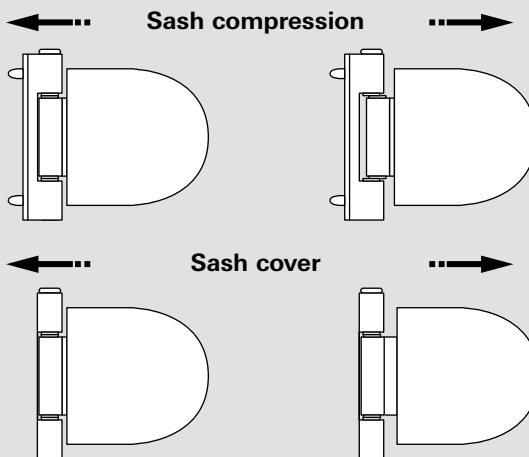
## 2D flag hinge

The 2D hinge is, as its name implies, adjustable in two directions. The sash cover and/or sash compression can be increased or decreased. To adjust the sash compression, an Allen key is normally inserted into the head of the hinge pin and the position is adjusted by rotating the Allen key in either direction. The same movements will be achieved as described for the eccentric bush or eccentric pin type hinge.

To adjust the sash cover an Allen key is normally inserted into the rounded end of the flag and the position is adjusted by rotating the Allen key in either direction.

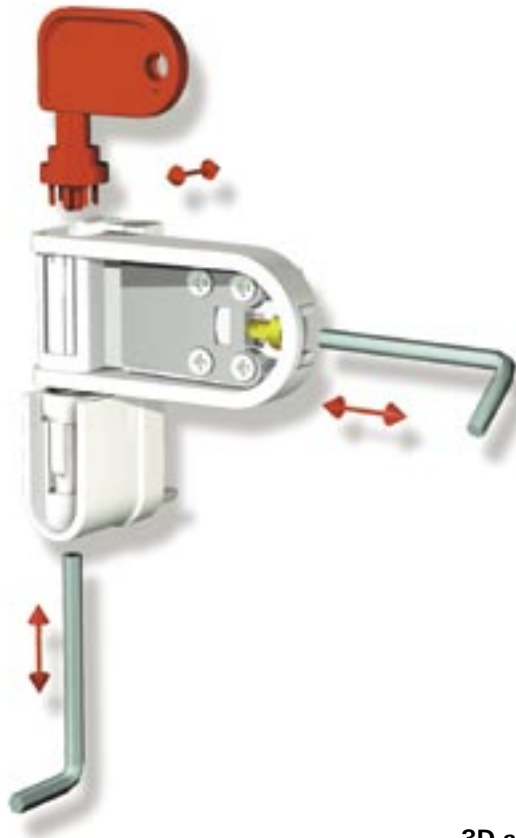


**2D adjustable flag hinge**



### 3D flag hinge

This is the most versatile hinge currently available as it allows adjustment in all directions. The sash cover can be increased and decreased, the compression can be increased or decreased and the height adjusted up or down.



3D adjustable hinge

## 2. DOOR SASH TOUCHES OUTER FRAME

If the sash touches the top or the bottom of the outer frame, but not both at the same time, it could be caused by one of the following:-

### **Frame out of true in opening**

Using a spirit level, check that the vertical and horizontal members of the door frame are true. Also check that the frame is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

### **Frame out of tolerance**

Measure the frame components and check that the frame is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

### **Sash out of tolerance**

Measure the sash rebate size and the frame rebate size. The sash should be 24mm smaller +/- 1.5mm. Check that the sash is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

### 3. DOOR SASH KNOCKING OR CATCHING ON KEEPS

If the door sash is knocking or catching on the keeps, it could be caused by one of the following:-

#### **Frame out of tolerance**

Measure the frame components and check that the frame is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

#### **Sash out of tolerance**

Measure the sash rebate size and the frame rebate size. The sash should be 24mm smaller +/- 1.5mm. Check that the sash is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

#### **Air gap incorrect at lock stile**

Measure the sash rebate depth, then measure the sash cover on the frame, minus the cover from the rebate depth and this will give you the air gap. It should be 12mm +/- 1.5mm. The air gap can be adjusted with an Allen key if 3D hinges are fitted. If butt hinges are fitted, one approach is to allow for lateral adjustment by turning the eccentric bushes. If neither of these options is available, the hinges will almost certainly have to be re-sited. It should be noted that the accuracy of the locking stile is more important than the hinge stile.

#### **Glass sealed unit or in-fill panel incorrectly packed in sash**

To check if the sealed units and/or in-fill panels are toed and heeled correctly, measure the diagonals and ensure that they are within a tolerance of +/- 2mm. If not, the beads will need to be removed and the units/panels re-packed to bring the diagonals within tolerance. Refer to the Roto booklet 'Fixing & Glazing Packer Recommendations' for packer positions.

### **3. DOOR SASH KNOCKING OR CATCHING ON KEEPS *continued***

#### **Hinges incorrectly fitted and adjusted (3D only)**

If none of the points above have solved the problem, try adjusting the hinges. It would be advisable to mark the starting position with a pencil and adjust by measurement in a methodical manner. It is worth remembering that, with three hinges fitted, the sash can very easily be distorted if the middle hinge is adjusted in the opposite direction to the top and bottom hinges. Adjust the hinges to give you the correct air gap of 12mm +/-1.5mm using the calculation method stated in 'Air gap incorrect at lock stile', on page 13.

#### 4. DOOR DIFFICULT OR STIFF TO OPERATE

If the door is difficult or stiff to operate it could be caused by one of the following:-

##### **Frame out of tolerance**

Measure the frame components and check that the frame is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

##### **Sash out of tolerance**

Measure the sash rebate size and the frame rebate size. The sash should be 24mm smaller +/- 1.5mm. Check that the sash is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

##### **Air gap incorrect at lock stile**

Measure the sash rebate depth, then measure the sash cover on the frame, minus the cover from the rebate depth and this will give you the air gap. It should be 12mm +/- 1.5mm. The air gap can be adjusted with an Allen key if 3D hinges are fitted. If butt hinges are fitted, one approach is to allow for lateral adjustment by turning the eccentric bushes. If neither of these options is available, the hinges will almost certainly have to be re-sited. It should be noted that the accuracy of the locking stile is more important than the hinge stile.

##### **Incorrect weatherseal gaskets**

Check that the weatherseal gasket is of the correct type and size. Gaskets can be out of tolerance. Make sure that the gasket is not puckered or bunched up at any point of contact with the frame.

#### **4. DOOR DIFFICULT OR STIFF TO OPERATE *continued***

##### **Incorrect compression adjustment**

Open the door and operate the lock mechanism; If the mechanism functions correctly and smoothly, this points to the keeps requiring compression adjustment. There are various methods that can be used to make these adjustments, but we will offer what we believe to be the optimum solution: Before commencing adjustment, it is advisable to reset the keeps to the neutral position and start from scratch, then simply adjust one keep at a time until the desired compression is achieved. Using a methodical approach usually provides the best results.

##### **Key/thumb turn difficult to operate**

Ensure that the euro-cylinder is sitting correctly within the lock housing; Problems may be caused by over-tightening of the retaining screw, which can result in the euro-cylinder being twisted out of position within the housing. Swarf and other debris can have a detrimental effect on operation; Make sure that the environment is clean and clear of obstruction. Also, it should never be assumed that the euro-cylinder is without fault; If in doubt, use a spare to eliminate this possibility.

##### **Door hinge bound**

If, when closing the door, a certain amount of resistance can be felt just before the sash latches (that is, if the door were released just before latching, the sash would spring back open), it could be that the sash is hinge bound with the hinge requiring a decrease in the compression adjustment (3D & 2D only). It should be noted that, with butt hinges, this can only be accomplished if they have eccentric cam adjustment. If the butt hinges are non-adjustable, packers may be required to ease the compression on the hinge stile.

#### 4. DOOR DIFFICULT OR STIFF TO OPERATE *continued*

##### **Hinges incorrectly fitted and adjusted (3D only)**

It is worth remembering that, with three hinges fitted, the sash can very easily be distorted if the middle hinge is adjusted in the opposite direction to the top and bottom hinges. Try adjusting the hinges and it would be advisable to mark the starting position with a pencil and adjust by measurement in a methodical manner. Adjust the hinges to give you the correct air gap of 12mm +/-1.5mm using the calculation method stated in 'Air gap incorrect at lock stile', on page 15.

##### **Sash not cleaned properly**

Ensure that all weld sprue, which could interfere with the operation of the door, has been removed and that the gasket grooves have been cleaned out correctly to allow the weatherseal gasket to sit properly.

##### **Handle incorrectly fitted**

Ensure that the handle has not been over-tightened; This can cause distortion, collapse of the profile and possible bowing of the handle set.

##### **Incorrect handle routing**

Handle stiffness can sometimes be caused by the routing being out of line from one side of the sash to the other. This normally occurs when the profile has been routed on one side and then turned to complete the process; Remove the euro-cylinder and handle set, paying attention to the ease or difficulty of disassembling the components, and make a visual inspection of the routing.

#### **4. DOOR DIFFICULT OR STIFF TO OPERATE *continued***

##### **Incorrect lock pocket routing**

Make sure that the lock pockets are deep enough to accommodate the lock. For the lock to function correctly, the drive train at the back of the lock needs to be level; Check that the lock face-plate is flush with the face of the sash. If the face-plate is raised at any point, the drive train will not be level and will require additional force to work, resulting in excessive strain on the lock operating mechanism.

If there is any evidence of bowing, remove the lock mechanism, check the depth of the pockets and look for swarf build-up or weld sprue which has not been removed at the assembly stage. At the same time, it would be advisable to check the mechanisms for any obvious signs of swarf, which will need to be removed.

##### **Fixing screws incorrectly inserted**

Find out whether any of the fixing screws are interfering with the drive train. If there is a suspicion of this, remove the screws one at a time, replacing each if the problem remains. Also, check that there are no screws interfering with the lock or hook/deadbolt gearboxes.

## 5. OBSTRUCTIVE RESISTANCE ENCOUNTERED WHEN LOCKING DOOR

If an obstructive resistance is encountered when locking the door, do not force the handle and strain the mechanism. It could be caused by one of the following:-

### **Misalignment of keeps**

Open the door and operate the lock mechanism; If the mechanism functions correctly and smoothly, this points to the keeps being out of alignment and requiring adjustment. There are various methods that can be used to make these adjustments, but we will offer what we believe to be the optimum solution: With the sash in the open position, throw the handle and set the lock in the locked position; Gently close the sash onto the frame and, using a pencil, mark the positions of the hooks/deadbolts on the outer frame. Make sure that the pencil marks line up with the hook/deadbolt pockets of the frame keeps. The keeps do not necessarily need to be moved; Prior symptoms and solutions with regard to toeing and heeling the glass or in-fill panel should be reviewed. Adjustment of the hinges could accommodate the required alignment or it could be a case of checking for a bow in the frame. It is worth spending time to evaluate all the options, as moving the keeps can leave unsightly screw holes. However, if everything else is satisfactory, then there is generally no other option but to remove each keep and ascertain where the problem may be.

## 6. DRAUGHTS OR WATER PASSING LOCK SIDE OF DOOR SASH

Draughts or water ingress can be caused by one of the following:

### **Incorrect weatherseal gaskets**

Confirm the weatherseal gasket is the correct type and size. Gaskets can be out of tolerance. Make sure the gasket is not puckered or bunched up at any point of contact with the frame.

### **Sash not cleaned properly**

Ensure that all weld sprue, which could interfere with the operation of the door, has been removed and that the gasket grooves have been cleaned out correctly to allow the weatherseal gasket to sit properly.

### **Drainage problems**

Drainage is a complex topic with, many variables having a bearing on its correct operation. One aspect often overlooked is the inclusion of positive venting in the head of frames and sashes, which provides the necessary pressure equalisation, thus allowing a constant flow of drainage water from the frame or sash. If in doubt, seek technical assistance from qualified personnel at the profile systems company.

### **Compression adjustment at keeps**

Open the door and operate the lock mechanism; If the mechanism functions correctly and smoothly, this points to the keeps requiring compression adjustment. There are various methods that can be used to make these adjustments, but we will offer what we believe to be the optimum solution: Before commencing adjustment, it is advisable to reset the keeps to the neutral position and start from scratch, then simply adjust one keep at a time until the desired compression is achieved. Using a methodical approach usually provides the best results.

## 7. DRAUGHTS OR WATER PASSING HINGE SIDE OF DOOR SASH

Draughts or water getting past the hinge side of the door can be caused by one of the following:

### **Incorrect weatherseal gaskets**

Confirm that the weatherseal gasket is of the correct type and size. Gaskets can be out of tolerance. Make sure that the gasket is not puckered or bunched up at any point of contact with the frame.

### **Sash not cleaned properly**

Ensure that all weld sprue, which could interfere with the operation of the door, has been removed and that the gasket grooves have been cleaned out correctly to allow the weatherseal gasket to sit properly.

### **Drainage problems**

Drainage is a complex topic, with many variables having a bearing on its correct operation. One aspect often overlooked is the inclusion of positive venting in the head of frames and sashes, which provides the necessary pressure to allow a constant flow of drainage water from the frame or sash. If in doubt, the appropriate technical assistance should be sought from suitably qualified personnel.

### **Door hinge failing to compress gasket**

When closing the door, check to see if the weatherseal gasket is compressing. If there is a lack of compression, the hinge will require an increase in the compression adjustment (3D & 2D only). It should be noted that, with butt hinges, this can only be accomplished if they have eccentric cam adjustment. If the butt hinges are non-adjustable, re-siting the hinges may be the only available course of action.

## 8. HANDLE BACK PLATE MOVES

If the handle back plate moves during operation, it could be caused by one of the following:

### **Incorrect routing**

Make sure that the holes that accept the locating lugs on the backplate of the handle, are not excessively oversize.

### **Screw tightness**

Check the screws with a hand screwdriver; If the screws are loose, do not over tighten.

## KEY DIFFICULT TO INSERT

If the key is difficult to insert or cannot be inserted, it could be caused by one of the following:

### **Damaged key**

Visually check the key for bends in any direction and/or other obvious damage. If there is damage, it is recommended that the key be disposed of. If this is the only key, a locksmith may be able to cut a new key from the old one, but it can sometimes be more cost effective to change the euro-cylinder.

### **Lack of lubrication**

Use graphite powder as the best lubricant for the cylinder but under no circumstances use WD40, as this will wash out any residual grease injected during the manufacture of the euro-cylinder. If too thick an oil or grease is used, this can cause the locking pins to gum up. If this happens, use a light oil which will help to dilute the existing grease/oil.

## 10. DOOR SASH RATTLES OR DOES NOT LATCH PROPERLY

A rattling door sash or a sash that will not latch properly can be caused by one of the following:

### **Latch keep incorrectly adjusted**

The latch keep can be adjusted by either adjusting its position using an Allen key or by slackening the screws with a screwdriver. Adjust the keep, either in or out, until the desired operation is achieved.

### **Latch keep out of alignment**

There are different methods that can be used to check the alignment of the keep; This is only one method: Gently close the sash onto the frame and, using a pencil, mark the position of the latch on the outer frame. Make sure that the pencil marks line up with the latch keep. The keep may not necessarily require moving, it could be a case of reviewing prior symptoms and solutions with regard to toeing and heeling the glass or in-fill panel. Adjustment of the hinges could accommodate the required alignment or the frame may need checking for bowing. It is worth spending time to evaluate all the options, as moving the keep can leave unsightly screw holes. However, if every thing else is satisfactory then there may be no other option.

## 11. DOUBLE DOOR SASHES KNOCKING ON OUTER FRAME

Double door sashes knocking on the frame at either the top or the bottom could be caused by one of the following:

### **Frame out of tolerance**

Measure the frame components and check that the frame is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

### **Sash out of tolerance**

Measure the sash rebate size and the frame rebate size. The sash should be 24mm smaller +/- 1.5mm. Check that the sash is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

### **Bowed frame head or sill**

Check that the frame head or sill are not bowed using a spirit level or a straight edge, or by measuring the vertical height of the frame at each jamb and at the middle of the frame. If there is a bow, it can normally be overcome by resetting the outer frame or by either adding or removing frame packing. As advised in previous sections, the air gap between the sash and frame should be 12mm +/- 1.5mm.

### **Air gap incorrect at lock stile**

Measure the sash rebate depth, then measure the sash cover on the frame, minus the cover from the rebate depth and this will give you the air gap. It should be 12mm +/- 1.5mm. The air gap can be adjusted with an Allen key if 3D hinges are fitted. If butt hinges are fitted, some allow for lateral adjustment by turning the eccentric bushes, but if you have neither of these options, the hinges will almost certainly have to be re-sited. It should be noted that the accuracy of the locking stile is more important than the hinge stile.

## **11. DOUBLE DOOR SASHES KNOCKING ON OUTER FRAME** *continued*

### **Glass sealed unit or in-fill panel incorrectly packed in sash**

To check if the sealed units and/or in-fill panels are toed and heeled correctly, measure the diagonals and ensure that they are within a tolerance of +/- 2mm. If not, the beads will need to be removed and the units/panels re-packed to bring the diagonals within tolerance. Refer to the Roto booklet 'Fixing & Glazing Packer Recommendations' for packer positions.

### **Hinges incorrectly fitted and adjusted (3D only)**

If none of the points above have solved the problem, try adjusting the hinges. It would be advisable to mark the starting position with a pencil and adjust by measurement in a methodical manner. It is worth remembering that, with three hinges fitted, the sash can very easily be distorted if the middle hinge is adjusted in the opposite direction to the top and bottom hinges. Adjust the hinges to give you the correct air gap of 12mm +/- 1.5mm using the calculation method stated in 'Air gap incorrect at lock stile', on page 25.

### **Lock mechanism incorrectly set**

If the sash shootbolts are not retracting properly, they may require re-setting. Remove the shootbolt, move the toothed receptor back by one tooth on the drive train and refix. It is always advisable to check the lock operation with the sash in the open position after such adjustments.

## 12. DOUBLE DOOR SASHES DIFFICULT OR STIFF TO OPERATE

Difficult or stiff operation, can be caused by one of the following:

### **Frame out of tolerance**

Measure the frame components and check that the frame is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

### **Sash out of tolerance**

Measure the sash rebate size and the frame rebate size. The sash should be 24mm smaller +/- 1.5mm. Check that the sash is square by measuring the diagonals and ensuring that they are within a tolerance of +/- 2mm.

### **Air gap incorrect at lock stile**

Measure the sash rebate depth, then measure the sash cover on the frame, minus the cover from the rebate depth and this will give you the air gap. It should be 12mm +/- 1.5mm. The air gap can be adjusted with an Allen key if 3D hinges are fitted. If butt hinges are fitted, some allow for lateral adjustment by turning the eccentric bushes, but if you have neither of these options, the hinges probably need to be resited. It should be noted that the accuracy of the locking stile is more important than the hinge stile.

### **Incorrect weatherseal gaskets**

Confirm that the weatherseal gasket is of the correct type and size. Gaskets can be out of tolerance. Make sure that the gasket is not puckered or bunched up at any point of contact with the frame.

### **Sash and/or frame obstructions**

Open the door and operate the lock mechanism; If the mechanism functions correctly and smoothly there may be an interference holding either or both of the sashes off

## **12. DOUBLE DOOR SASHES DIFFICULT OR STIFF TO OPERATE *continued***

their true closed positions, such as damage to the mullion end cap. Thoroughly check the sashes and the frame for such obstructions.

### **Compression adjustment at keeps**

Open the door and operate the lock mechanism; If the mechanism functions correctly and smoothly, the keeps may require compression adjustment. There are various methods that can be used to make these adjustments, but we will offer what we believe to be the optimum solution: Before commencing adjustment, it is advisable to reset the keeps to the neutral position and start from scratch, then simply adjust one keep at a time until the desired compression is achieved. Using a methodical approach usually provides the best results.

### **Key/thumb turn difficult to operate**

Ensure that the euro-cylinder is sitting correctly within the lock housing; Problems may be caused by over-tightening of the retaining screw, which can result in the euro-cylinder being twisted out of position within the housing. Swarf and other debris can have a detrimental effect on operation; Make sure that the environment is clean and clear of obstruction. Also, it should never be assumed that the euro-cylinder is without fault; If in doubt, use a spare to eliminate this possibility.

### **Door hinge bound**

If, when closing the door, a certain amount of resistance can be felt just before the sash latches (that is, if the door were released just before latching, the sash would spring back open), it could be that the sash is hinge bound with the hinge requiring a decrease in the compression adjustment (3D & 2D only). It should be noted that, with butt hinges, this can only be accomplished if they have eccentric cam adjustment.

## 12. DOUBLE DOOR SASHES DIFFICULT OR STIFF TO OPERATE *continued*

If the butt hinges are non-adjustable, packers may be required to ease the compression on the hinge stile.

### **Sash not cleaned properly**

Ensure that all weld sprue, which could interfere with the operation of the door, has been removed and that the gasket grooves have been cleaned out correctly to allow the weatherseal gasket to sit properly.

### **Handle incorrectly fitted**

Ensure that the handle has not been over-tightened; This can cause distortion, collapse of the profile and possible bowing of the handle set.

### **Incorrect handle routing**

Handle stiffness can sometimes be caused by the routing being out of line from one side of the sash to the other. This normally occurs when the profile has been routed on one side and then turned to complete the process; Remove the euro-cylinder and handle set, paying attention to the ease or difficulty of disassembling the components, and make a visual inspection of the routing.

### **Incorrect lock pocket routing**

Make sure that the lock pockets are deep enough to accommodate the lock. For the lock to function correctly, the drive train at the back of the lock needs to be level; Check that the lock face-plate is flush with the face of the sash. If the face-plate is raised at any point, the drive train will not be level and will require additional force to work, resulting in excessive strain on the lock operating mechanism.

If there is any evidence of bowing, remove the lock mechanism, check the depth of the pockets and look for swarf build-up or weld sprue which has not been removed

## 12. DOUBLE DOOR SASHES DIFFICULT OR STIFF TO OPERATE *continued*

at the assembly stage. At the same time, it would be advisable to check the mechanisms for any obvious signs of swarf, which will need to be removed.

### **Fixing screws incorrectly inserted**

Find out whether any of the fixing screws are interfering with the drive train. If there is a suspicion of this, remove the screws one at a time, replacing each if the problem remains. Also, check that there are no screws interfering with the lock or hook/deadbolt gearboxes.

### 13. OBSTRUCTIVE RESISTANCE WHEN LOCKING DOUBLE DOORS

If an obstructive resistance is encountered when trying to lock double doors, do not force the handle and strain the mechanism. It could be caused by one of the following:-

#### **Misalignment of keeps**

Open the door and operate the lock mechanism; If the mechanism functions correctly and smoothly, this points to the keeps being out of alignment and requiring adjustment. There are various methods that can be used to make these adjustments, but we will offer what we believe to be the optimum solution: With the sash in the open position, throw the handle and set the lock in the locked position; Gently close the sash onto the frame and, using a pencil, mark the positions of the hooks/deadbolts on the outer frame. Make sure that the pencil marks line up with the hook/deadbolt pockets of the frame keeps. The keeps do not necessarily need to be moved; Prior symptoms and solutions with regard to toeing and heeling the glass or in-fill panel should be reviewed. Adjustment of the hinges could accommodate the required alignment or it could be a case of checking for a bow in the frame. It is worth spending time to evaluate all the options, as moving the keeps can leave unsightly screw holes. However, if everything else is satisfactory, then there is generally no other option.

#### **Blocked keeps**

Check that the shootbolt keep pockets are free from swarf and other debris which could interfere with the operation of the lock.



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