

TEST REPORT

Report No.: D1090.01-301-44

Rendered to:

PRL ALUMINUM ARCHITECTURAL PRODUCTS
City of Industry, California

PRODUCT TYPE: Bi-Fold Door
SERIES/MODEL: Accordion Bi-Fold

SPECIFICATION: AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

Title	Summary of Results
Primary Product Designator	SP – PG45 2413 x 2108 mm
Design Pressure	±2160 Pa (±45.11 psf)
Air Infiltration @ 1.57 psf	0.45 L/s/m ² (0.09 cfm/ft ²)
Air Infiltration @ 6.27 psf	1.05 L/s/m ² (0.21 cfm/ft ²)
Water Penetration Resistance Test Pressure	330 Pa (6.89 psf)

Test Completion Date: 10/02/2013

Reference must be made to Report No. D1090.01-301-44, dated 01/13/14 for complete test specimen description and detailed test results.

1.0 Report Issued To: PRL Architectural Aluminum Products
14760 Don Julian Road
City of Industry, California 91746

2.0 Test Laboratory: Architectural Testing, Inc.
4 Rancho Circle
Lake Forest, California 92630
949-460-9600

3.0 Project Summary:

3.1 Product Type: Bi-Fold Door

3.2 Series/Model: Accordion Bi-Fold

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The specimen tested successfully met the performance requirements for a **SP - PG45 2413 x 2108 mm** rating.

3.4 Test Dates: 08/29/2013 - 10/02/2013

3.5 Test Record Retention End Date: All test records for this report will be retained until October 02, 2017.

3.6 Test Location: Architectural Testing, Inc. test facility in Lake Forest, California.

3.7 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Architectural Testing for a minimum of four years from the test completion date.

3.8 Drawing Reference: The test specimen drawings are located in Appendix B

3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Frank Fisher	PRL Aluminum Architectural Products
Hany Ibrahim	PRL Aluminum Architectural Products
Jarod Hardman	Architectural Testing, Inc.

4.0 Test Specification:

AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

5.0 Test Specimen Description:

5.1 Product Sizes:

Test Specimen:

Overall Area: 5.07 m ² (54.75 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	2413	95	2108	83
Panel Size	1146	45 - 1/8	2019	79 - 1/2

5.2 Frame Construction:

Frame Member	Material	Description
Head	Aluminum	Thermally broken extrusion, Part #BF-01
Head	Aluminum	Head track end damn plate, Part #777-02-F01
Sill	Aluminum	Thermally broken extrusion, Part #BF-03
Sill	Aluminum	Clip in bottom roller track insert, Part #BF-03C-F03
Sill	Polyvinyl Chloride	Clip in roller track guide track, Part #999VY-11-F03
Jambs	Aluminum	Thermally broken extrusion, Part #BF-04

	Joinery Type	Detail
Head	Butt	Secured through head extrusion with two #8 x 3" drill point Phillips flat head sheet metal screws and sealed with silicone sealant.
Sill	Butt	Secured through jamb extrusion with two #8 x 1" Phillips flat head sheet metal screws and sealed with silicone sealant.

5.0 Test Specimen Description: (Continued)

5.3 Panel Construction:

Active Hinge Panel:

Panel Member	Material	Description
Top, bottom, sides	Aluminum	Thermally broken extrusion, Part #BF-21-F50
Vertical Stile	Aluminum	Cover plate, Part #BF-61-F02, located on the top and bottom of both vertical stiles secured with two 1/2" Flat-head screws.
Top, bottom, sides	Aluminum	Glass stop extrusion, Part #BF-41, clip in

Fixed Hinge Panel:

Panel Member	Material	Description
Top, bottom, sides	Aluminum	Thermally broken extrusion, Part #BF-21-F50
Vertical Stile	Aluminum	Cover plate, Part #BF-61-F02, located on the top and bottom of the vertical stile opposite the lock stile secured with two 1/2" Flat-head screws.
Vertical Lock Stile	Aluminum	Door stile gear box, Part# BF-60-F04, located on the top and bottom of the lock stile secured with two 1/2" Flat-head screws.
Top, bottom, sides	Aluminum	Glass stop extrusion, Part #BF-41

	Joinery Type	Detail
All corners	Coped	Secured through top and bottom rails with one #10 x 1/2" Phillips flat head screw into the aluminum corner block, Part # BF-61-F01, mounted at each corner on the stiles.

5.0 Test Specimen Description: (Continued)

5.4 Weatherstripping:

Description	Quantity	Location
3/8" high vinyl wrapped foam bulb gasket.	2 Rows	One row located at the interior and the exterior edge of each panel at the head and sill.
1/4" high vinyl wrapped foam bulb gasket.	2 Rows	One row located at the interior and the exterior edge of each panel at the vertical stiles.
1/4" high vinyl wrapped foam bulb gasket.	1 Row	One row centered in the frame at the head, sill, and jambs.
3/8" high foam wedge gasket	1 Row	One row at the interior leg of the frame at the head, sill, and jambs.

5.5 Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1" IG	1/2" A1-D	1/4" Tempered	1/4" Tempered	Exterior glazed with snap in glazing bead.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Panel	2	955 x 1829	37 - 19/32 x 72	1/2"-3/4"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weephole	1/2" x 1/4"	3	4" from each end and mid-span through the exterior leg of the snap in sill roller track assembly.

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Hinge, Part #BF-63-F01	4	1/2" from top and bottom of the panel jamb stile.
Hinge, Part #BF-62-F02	3	1/2" from the top and bottom of the vertical stile between panels, midspan of the vertical stile between panels.
Hinge, Part #BF-62-F01	3	Directly opposite of Hinge Part #BF-62-F02
Hinge pin & handle assembly, Part #BFH-07	1	Located midspan of the vertical stile between panels in the hinge.
Lock rods, Part# 777-03-F01	2	Located at the center hinge stile of the active panel.
Intermediate hinge pin, Part #BFH-05	2	Located at the head and sill of the vertical stile between panels in the hinge assemblies.
Bottom sill jamb pivot, Part #BFH-03	1	Located at the sill corner of the fixed jamb panel on the exterior face of the panel stile.
Top jamb starter pivot, Part #BFH-01	1	Located at the head corner of the fixed jamb panel directly above Part #BFH-03 on the exterior face of the panel stile.
Half sill guide assembly, Part #BFH-09	1	Located at the sill corner of the active jamb panel on the exterior face of the panel stile.
Half roller assembly, Part #BFH-08	1	Located at the head corner of the active jamb panel directly above Part BFH-09 on the exterior face of the panel stile.

5.8 Reinforcement: No reinforcement was utilized.

5.9 Screen Construction: No screen was utilized.

6.0 Installation:

The specimen was installed into an aluminum channel buck. The rough opening allowed for a 0" shim space. The exterior perimeter of the window was sealed with polyurethane sealant.

Location	Anchor Description	Anchor Location
Jamb	#12 x 3-1/4" Phillips flat head screws.	10" from each corner through the jamb of the frame into the aluminum buck.
Head and sill	#10 x 1" Phillips pan head screws.	6" from the corner and 8" on center.

7.0 Test Results: The temperature during testing was 26.1°C (79°F). The results are tabulated as follows:

Test Specimen:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 46.7 N (10.5 lbf) Maintain motion: 8.9 N (2.0 lbf) Force to latch: 71.2 N (16.0 lbf) Locks: 11.1 N (2.5 lbf)	178 N (40 lbf) max. 111 N (25 lbf) max. Report Only 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.45 L/s/m ² (0.09 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (6.27 psf)	1.05 L/s/m ² (0.21 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Water Penetration, per ASTM E 547 and ASTM E 331 at 330 Pa (6.89 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 taken at lock stile +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	5.8 mm (0.23") 6.6 mm (0.26")	Report Only	2, 3, 4, 5
Uniform Load Structural, per ASTM E 330 taken at lock stile +3240 Pa (+67.67 psf) -3240 Pa (-67.67 psf)	0.3 mm (0.01") <0.3 mm (<0.01")	3.6 mm (0.14") max. 3.6 mm (0.14") max.	2, 4, 5
Forced Entry Resistance, per ASTM F 842, Type: A - Grade: 10	Pass	No entry	
Forced Entry Resistance, per AAMA 1304	Pass	No entry	

7.0 Test Results: (Continued)

Note 1: *The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.*

Note 2: *The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.*

Note 3: *The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

Note 4: *Loads were held for 10 seconds.*

Note 5: *Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.*



Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, Inc.

Jarod Hardman
Laboratory Manager

Leaton Kirk
Director – Regional Operations

JH: ms

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Alteration Addendum (1)

Appendix-B: Drawings (22) Complete drawings packet on file with Architectural Testing, Inc.



Appendix A

Alteration Addendum

Alteration #1: Date - 09/18/2013
Cause for alteration - Failure of water test
Remedial action taken - Addition of weep hole mid-span of the of sill assembly.



Architectural Testing

Test Report No.: D1090.01-301-44
Report Date: 01/13/14
Record Retention End Date: 10/02/17

Appendix B

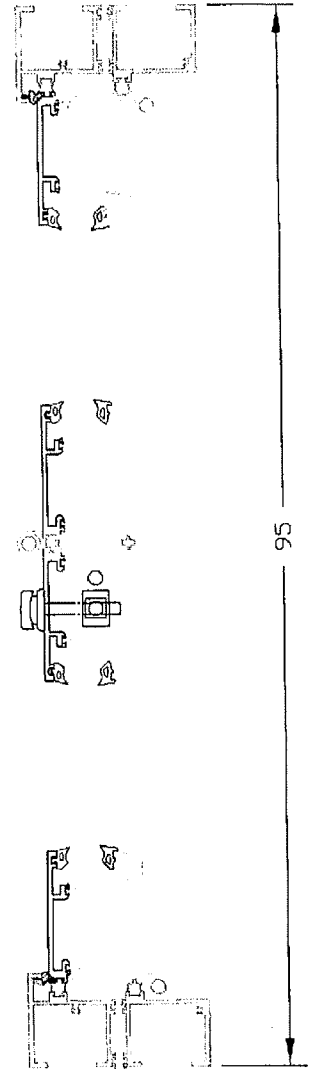
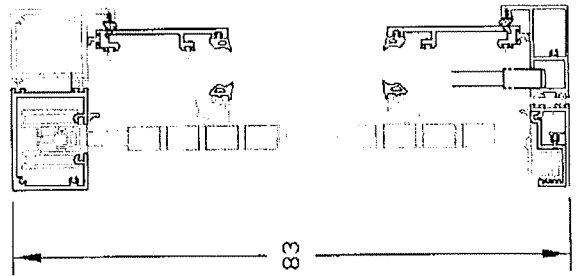
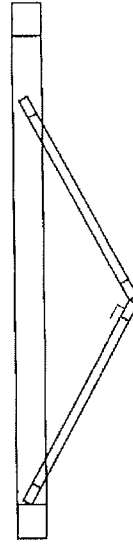
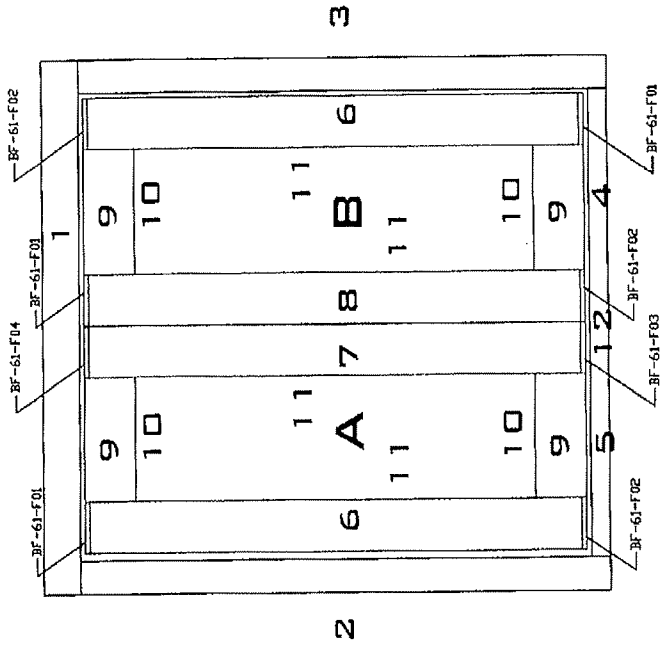
Drawings

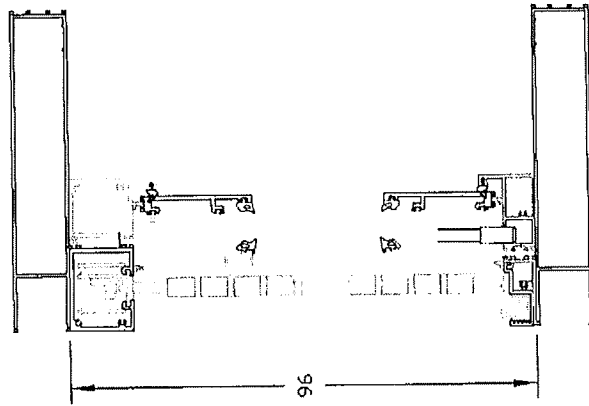
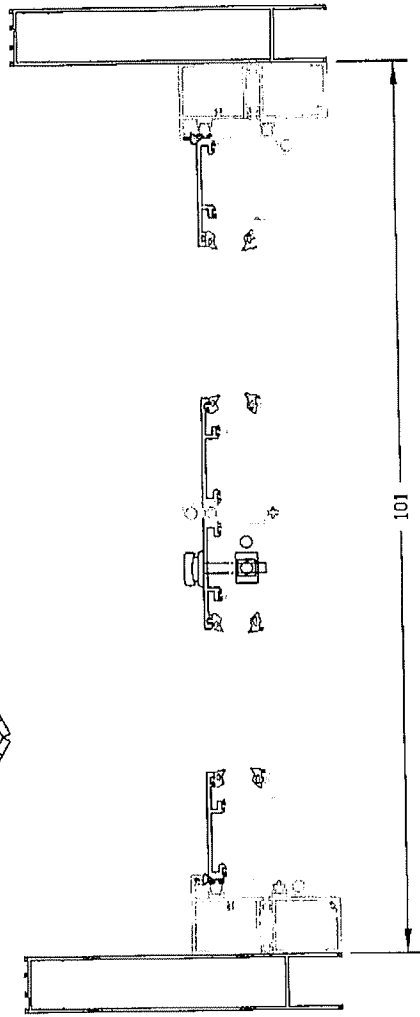
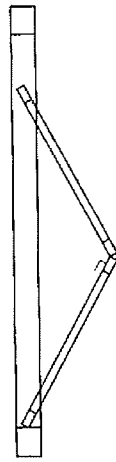
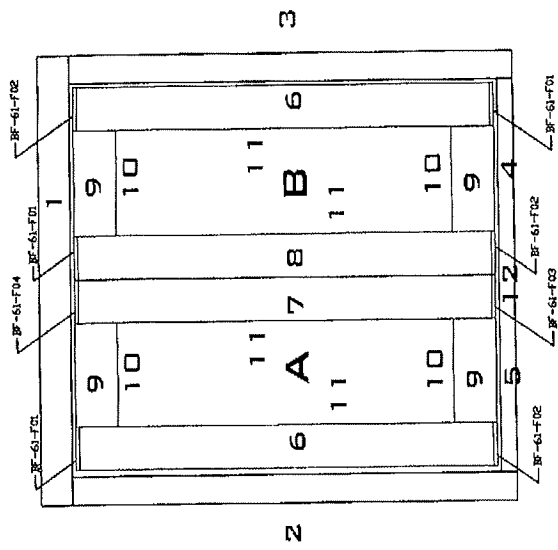
***Note:** Complete drawings packet on file with Architectural Testing, Inc.*

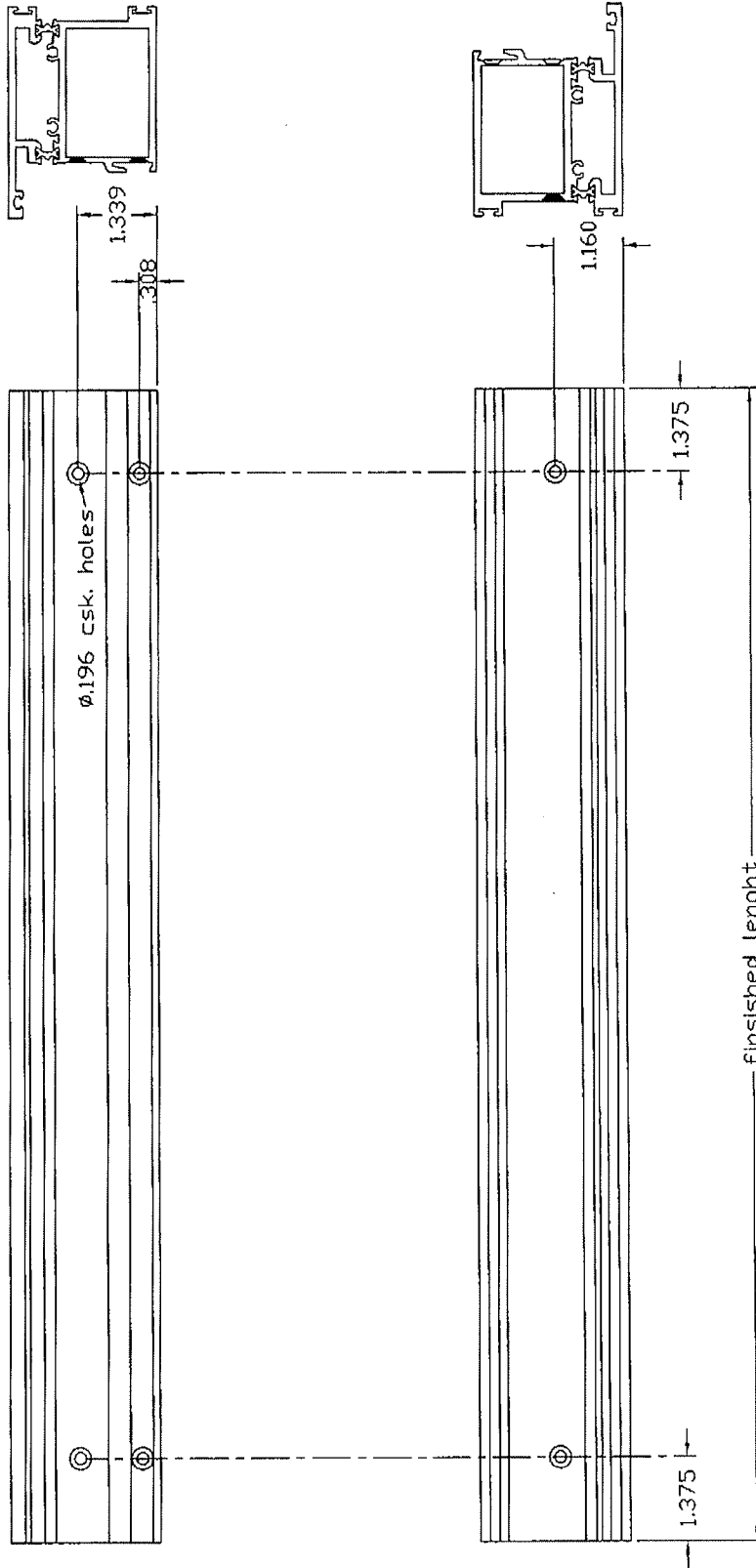
PARTS LIST

BI-FOLD ALUMINUM

PART NO.	DESCRIPTION	COMPANY
BF21	INTERIOR STILE	PRL
XBF-41	GLASS STOP	PRL
BF-63-F01	END HINGE / WALL / HALF	PRL
BF-62-F02	HALF HINGE STILES	PRL
BF-62-F01	HALF HINGE STILES	PRL
BF-61	CORNER BLOCK	PRL
XBF-61-F02	COVER PLATE	PRL
XBF-60-F04	DOOR STILE GEAR BOX	PRL
BF-21-F50	EXTERIOR STILE	PRL
XBF-03	BOTTOM TRACK	PRL
XBF-04	SIDE JAMBS	PRL
XBF-03C	BOTTOM TRACK INSERT	PRL
X999VY-11	SILL GUIDE TRACK	PRL
X777-02-F01	HEAD TRACK END DAM	PRL
777-01-F01	SHIM HEAD STARTER PIVOT	PRL
1B14-F01	GEAR BOX SHIM	PRL
777-03-F01	LOCK RODS	INTERLOCK
777-05F-01	LOCK STRIKE SHIM	PRL
XBF-01	HEAD TRACK	PRL
XBFH-01	TOP JAMB STARTER PIVOT	INTERLOCK
XBFH-03	BOTTOM SILL JAMB PIVOT	INTERLOCK
XBFH-04	INTERMEDIATE ROLLER ASS	INTERLOCK
XBGH-05	INTERMEDIATE HINGE PIN	INTERLOCK
XBFH-06	INTERMEDIATE SILL GUIDE	INTERLOCK
XBFH-07	INTERMEDIATE HINGE PIN & HANDLE	INTERLOCK
XBFH-08	HALF ROLLER ASSEMBLY	INTERLOCK
XBFH-09	HALF SILL GUIDE ASSEMBLY	INTERLOCK



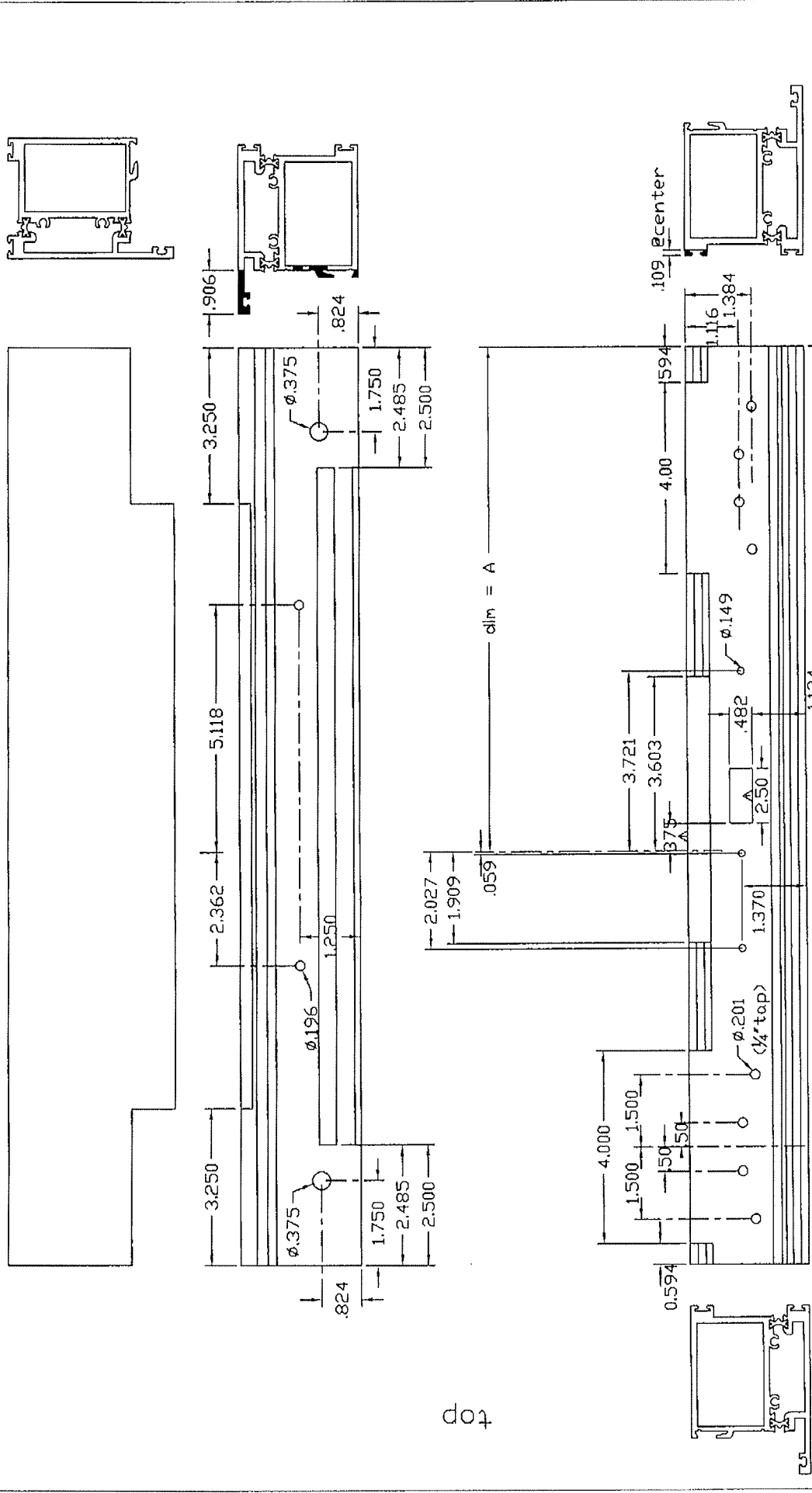




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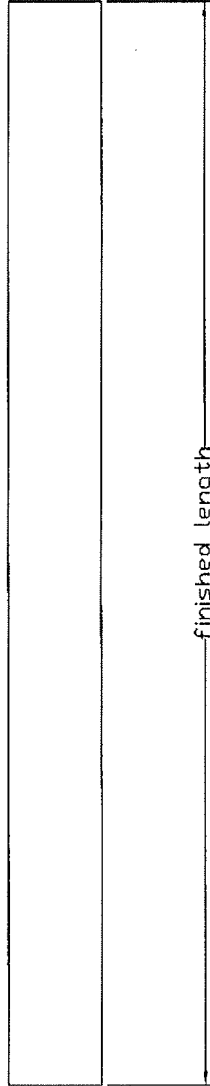
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PRL
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 BF-21-F17

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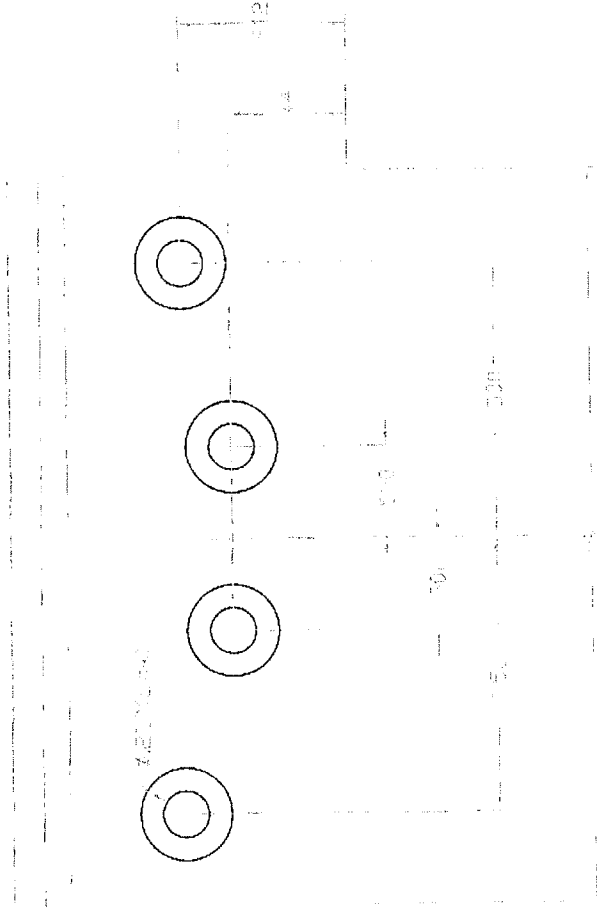
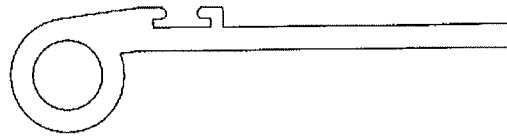
finished length

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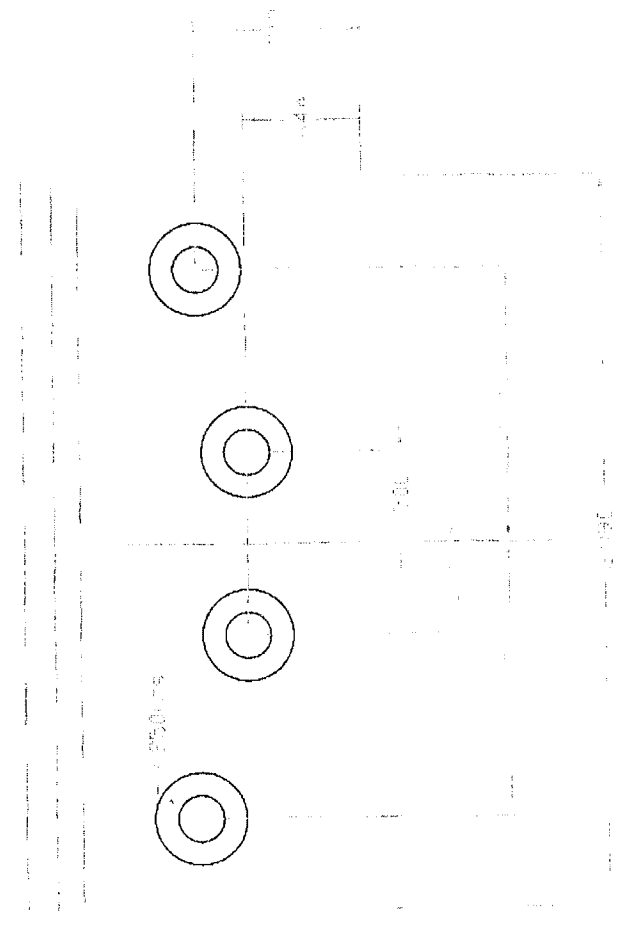
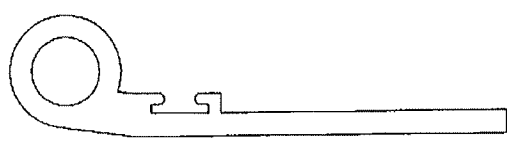
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ALUMINUM INC.

BF-63-F01

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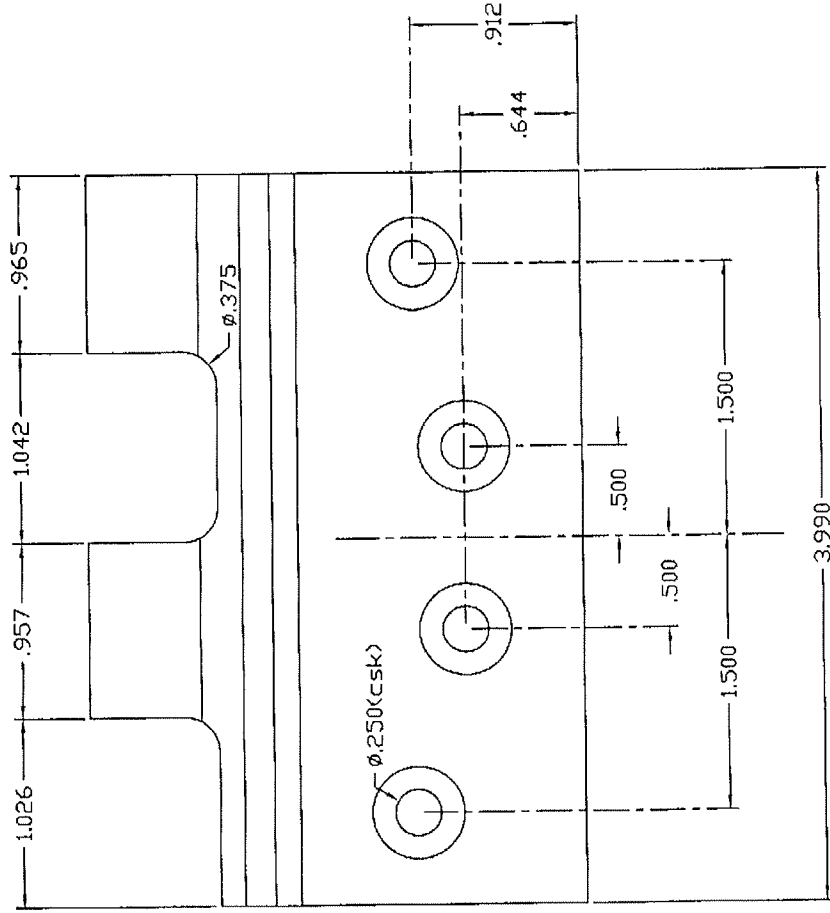
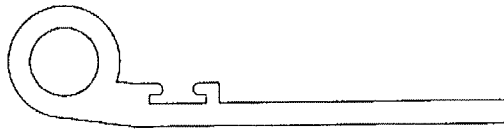


DATE FOR ORDERING: 09/11/12
DRAWN BY: J. J. JONES
CHECKED BY: J. J. JONES

PRI
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BF-62-F02

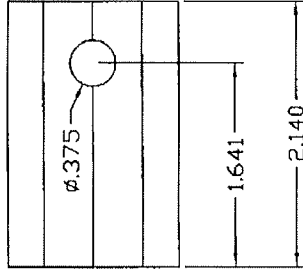
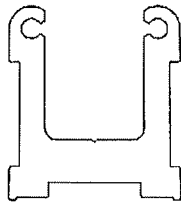


Material: aluminum
clear or black anodize
hinge half

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o.s built 3-15-13

BF-62-F01



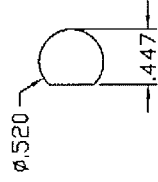
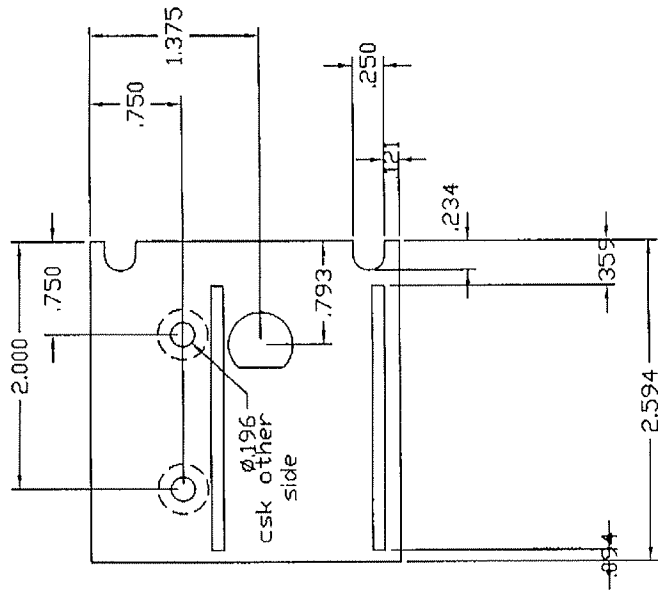
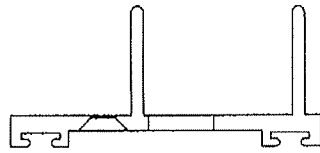
material: mill finish aluminum
corner block

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BF-61-F01

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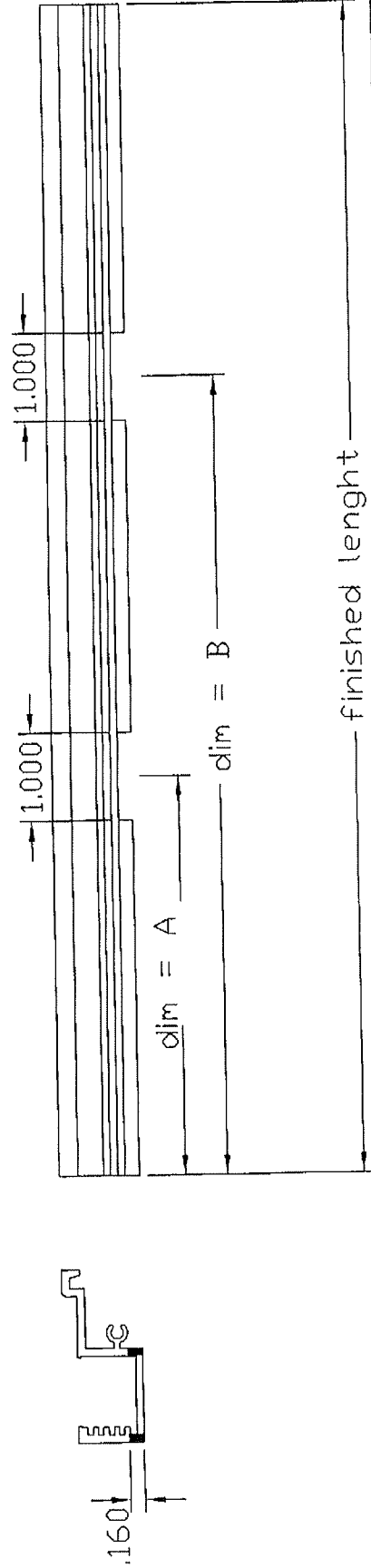
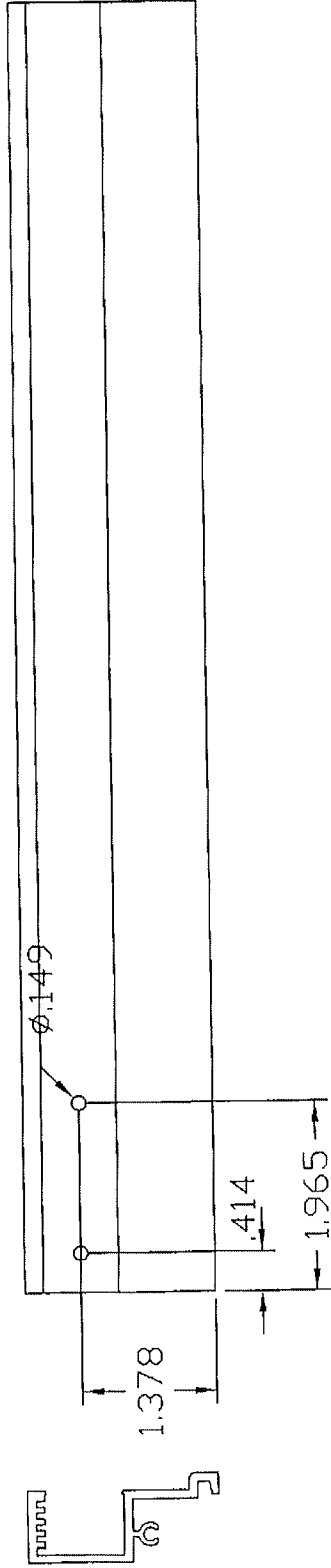
cut out detail

use @ door stile with gear box/lock box

PRL
ALUMINUM INC.

BF-60-F04

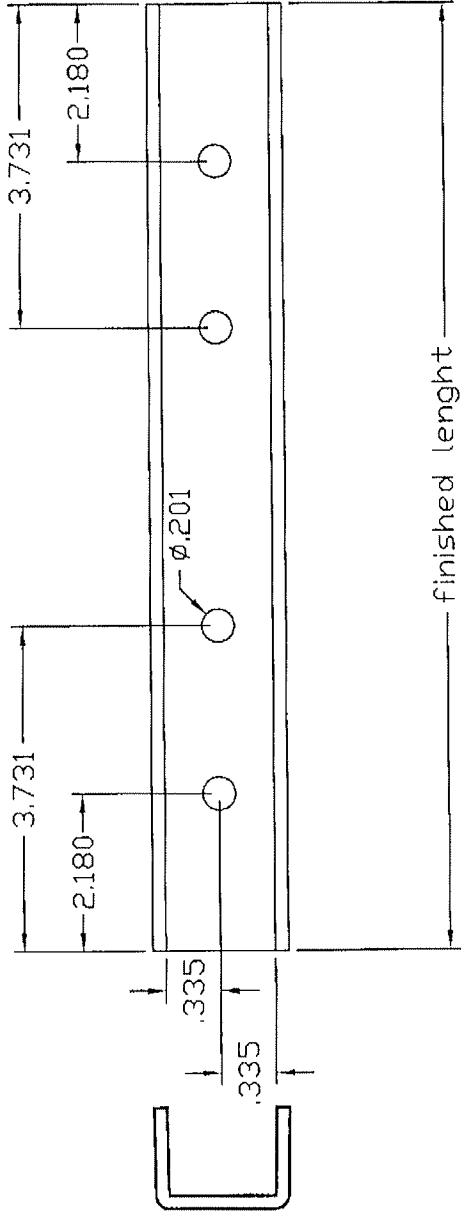
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PRL
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BF-03C-F03



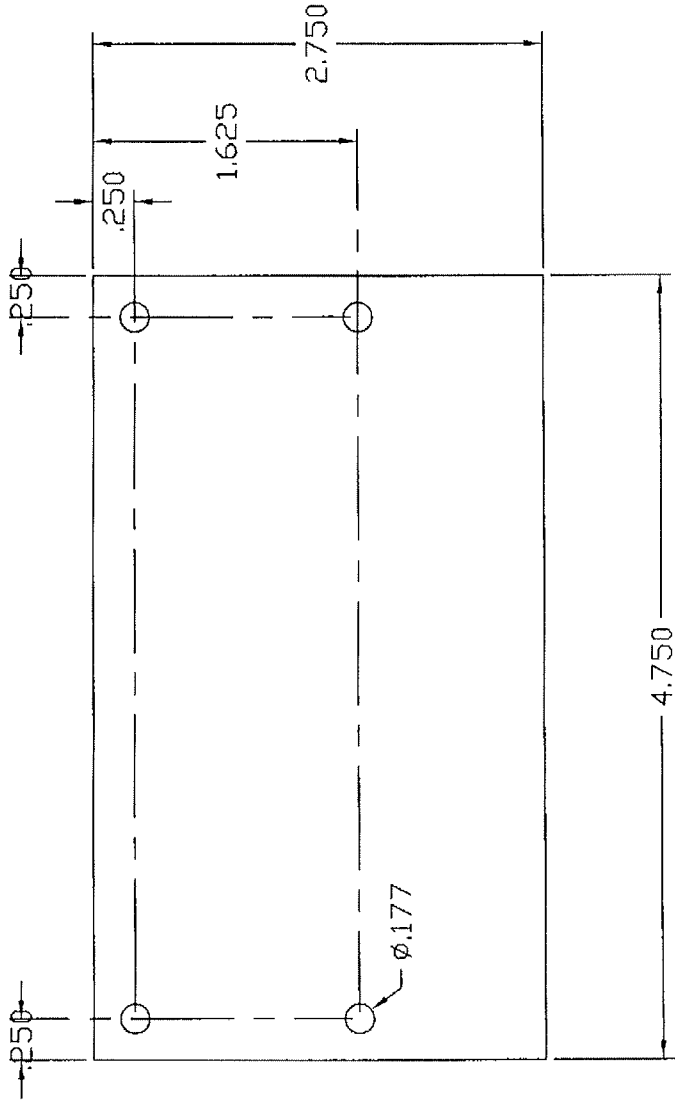
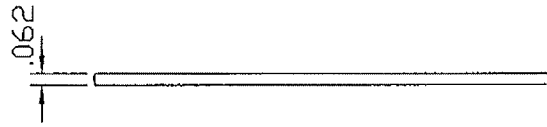
Material: black PVC

sill guide track

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999VY-11-F03

DRAWN FZ
9-11-12



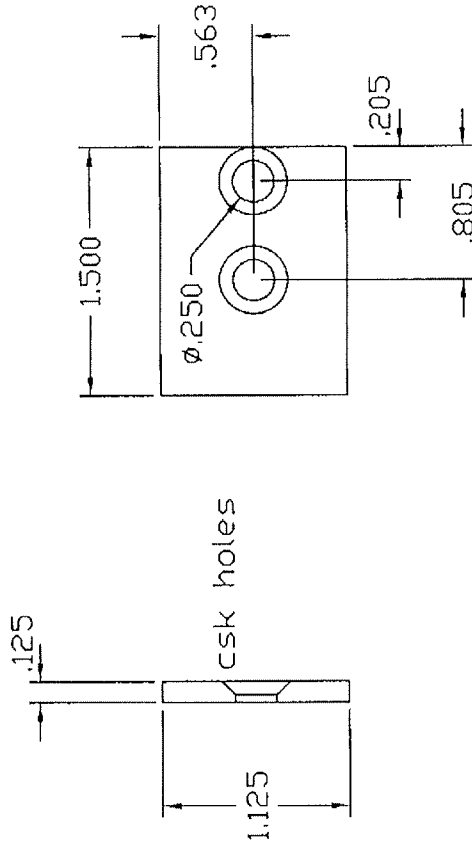
Material: mill finish aluminum

head track end dam

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DRAWN FZ
9-11-12

777-02-F01



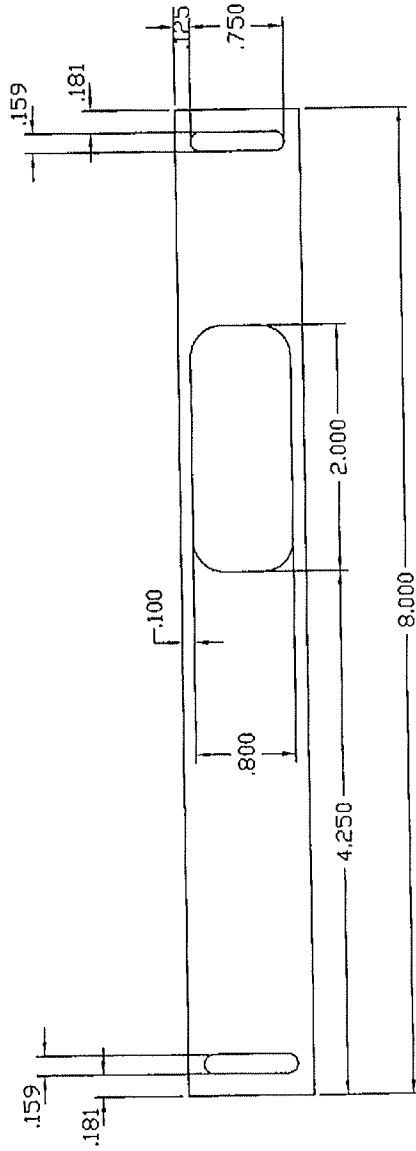
Material: stainless steel

use with BF03-6010 head starter pivot

DRAWN F²
9-11-12

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777-01-F01

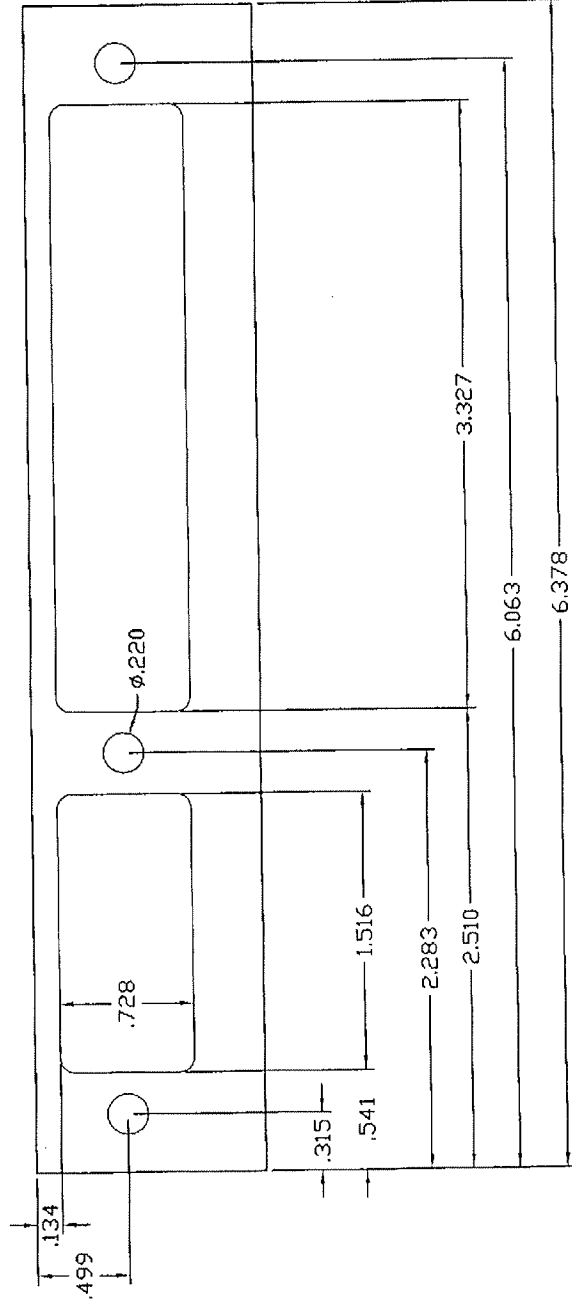
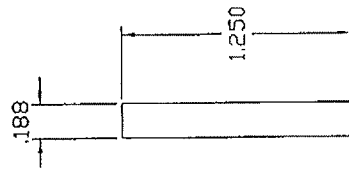


gearbox shim
 material: mill finish aluminum

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1B14-F01

DRAWN F-2
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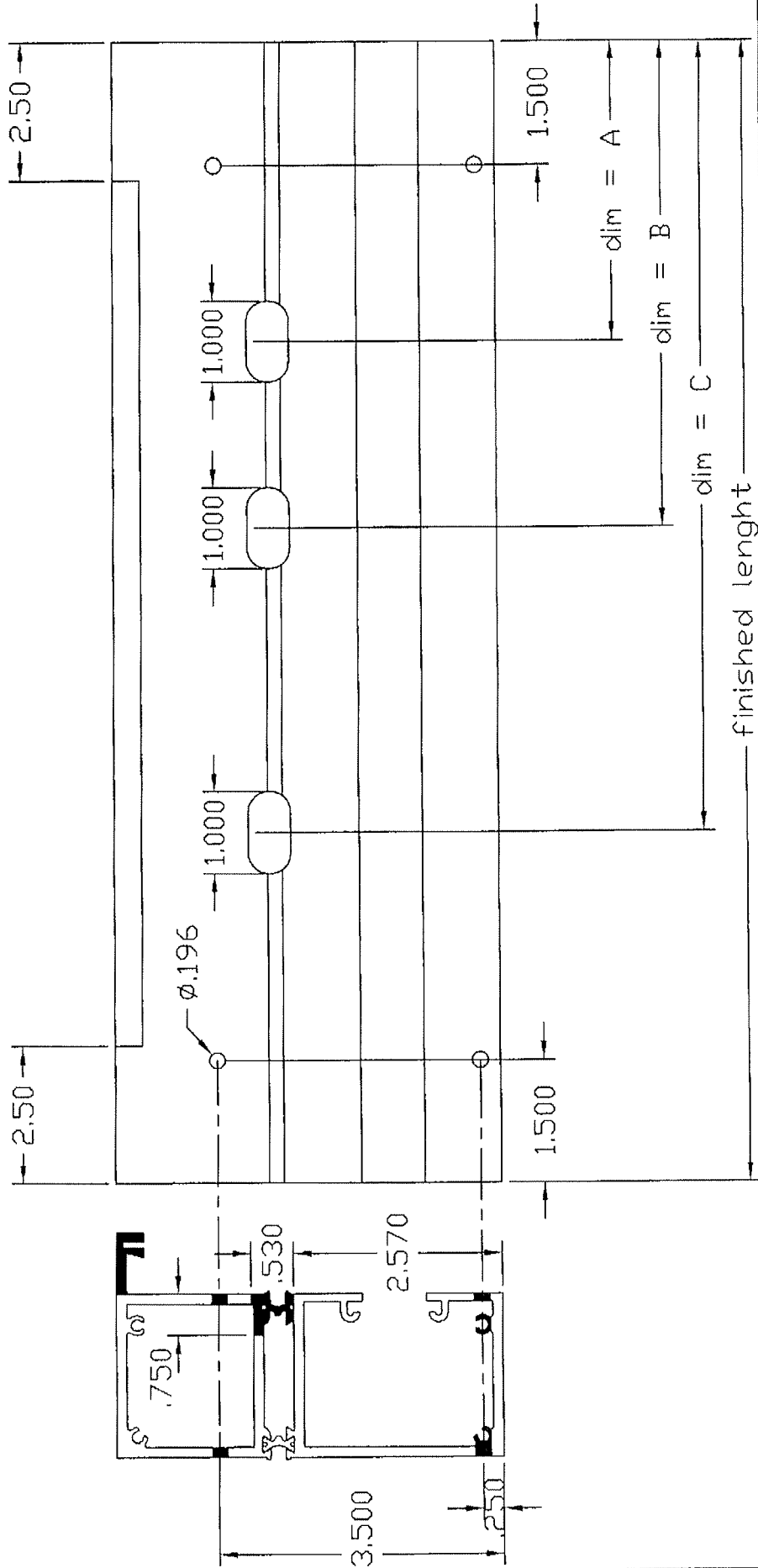


Material: aluminum- black anodize
lock strike shim

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DRAWN F-
2-11-12

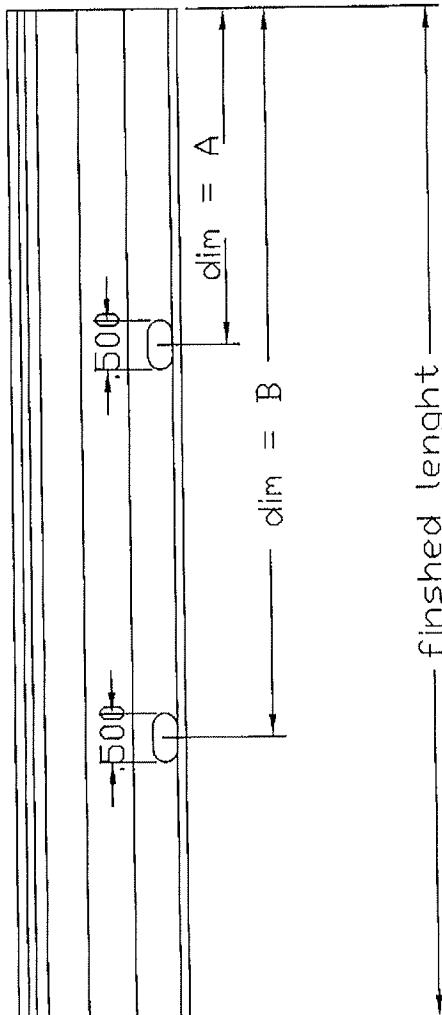
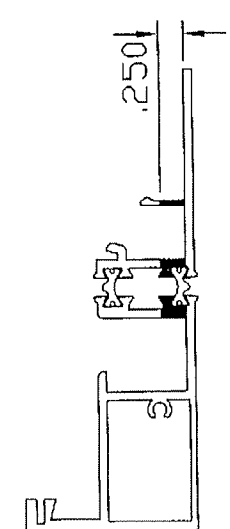
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ALUMINUM INC.

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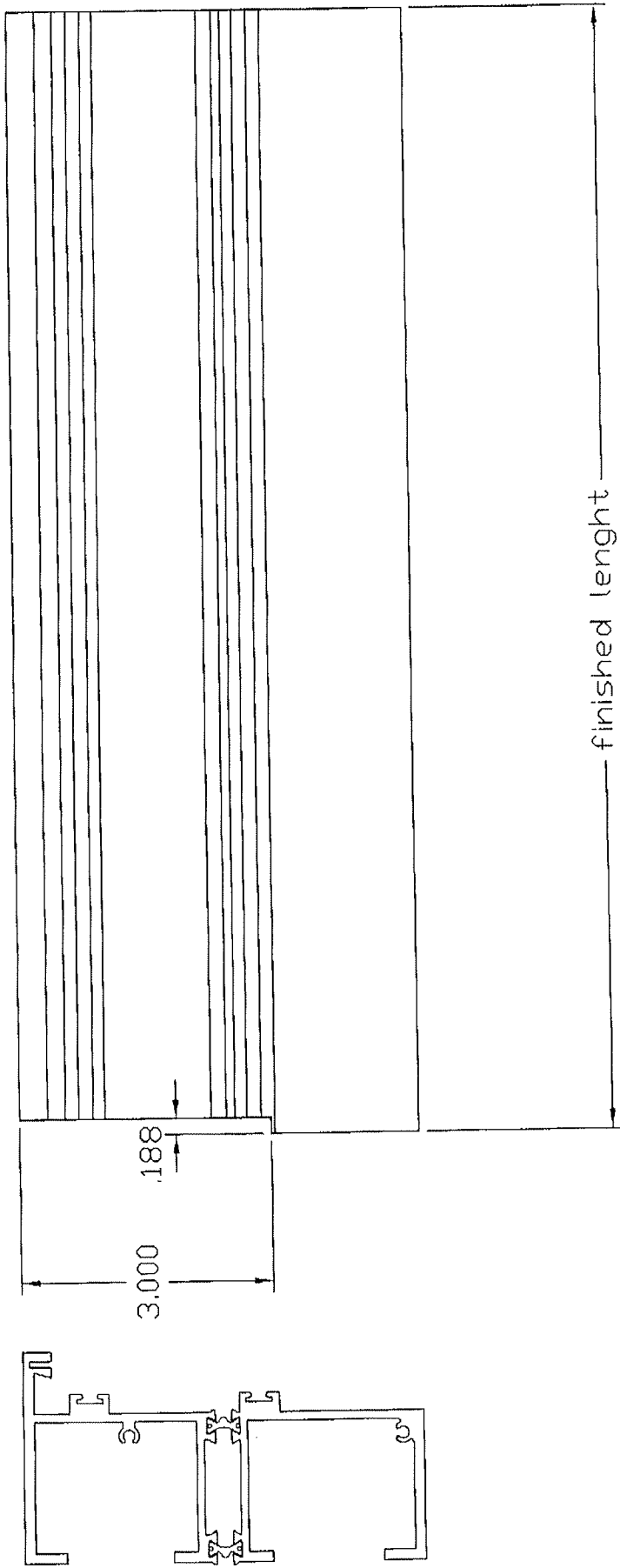
BF-01-F01



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DRAWN FZ
5-15-13

BF-03-F03



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ALUMINUM INC.

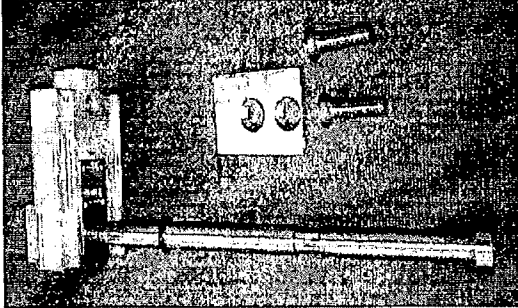
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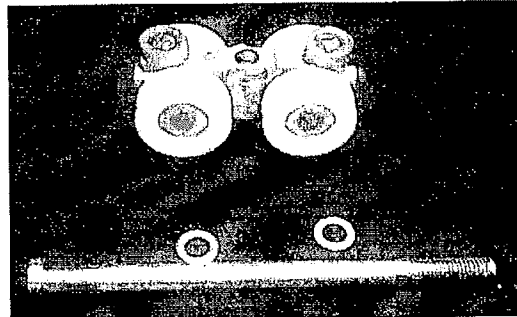
BF-04-F13

PRL Bi-Fold Hardware

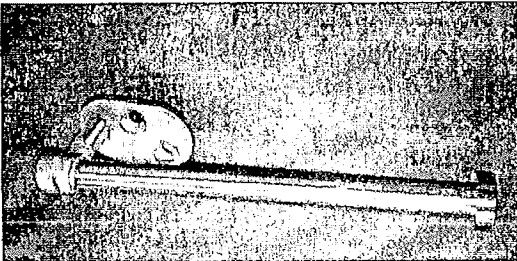
BFH-01 top jamb starter pivot



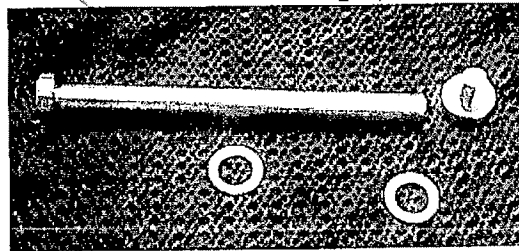
BFH-04 intermediate roller assembly



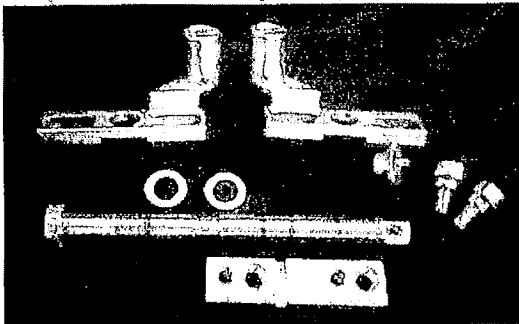
BFH-02 intermediate jamb pivot (when used)



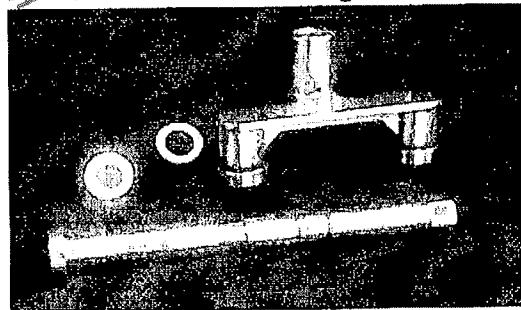
BFH-05 intermediate hinge pin



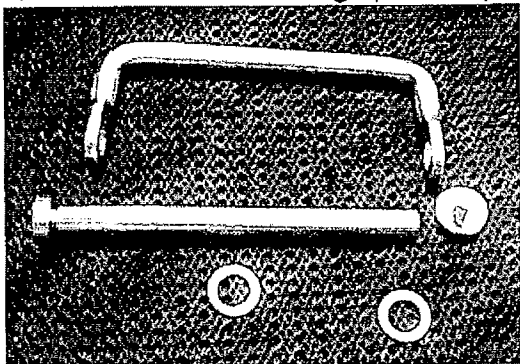
BFH-03 bottom sill jamb pivot



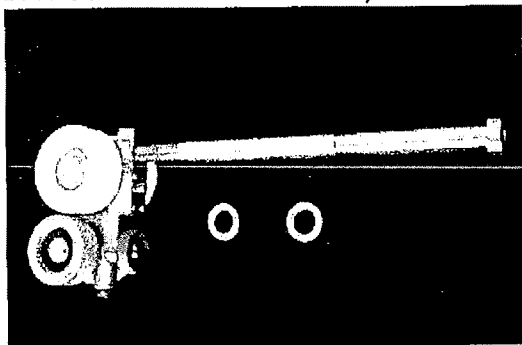
BFH-06 intermediate sill guide



BFH-07 intermediate hinge pin and pull handle



BFH-08 Half roller assembly



BFH-09 Half sill guide assembly

