

Shoulder Harness Upgrade

Mandatory Service Bulletin # 122004

29 November 2004

MaxFlight Corporation is issuing this mandatory Service Bulletin #122004. This service bulletin must be complied with by all owner/operators of all MaxFlight manufactured Virtual Reality models VR2000, VR2002, FS2000, VR2500 and MT3000.

The models involved include all hydraulic as well as electrical versions of the above mentioned models.

Should any/all owner/operators fail to fully comply with this service bulletin, then, any further incidents incurred by operating unmodified MaxFlight models, (using the old style shoulder restraint system), will be the sole responsibility of the owner/operator of such a machine and release MaxFlight Corporation of any legal damages.

The Upgrade Kit will contain the following parts, drawings, pictures and instructions:

Drawings;

- Seat Pan modification drawing # SB122004-8
- Hinge Drawing # SB122004-2
- Crotch belt top ½ installation to shoulder restraint, side view. #SB122004-1
- Drawing locating lower ball pivot bracket to the steel back
- # SB122004-5 for Double Wide units with on-board computers
- # SB122004-6 for VR2000 Single seat Flight Simulators
- # SB122004-7 for Hydraulic units with standard seats. VR2002,VR2500,MT3000
- Drawing showing installation of upper bolt, nut, washer and pivot ball onto shoulder restraint assembly. # SB122004-3
- Electrical drawing showing wiring of new seat belt interlock system to the current patron E-Stop circuit.
 - # SE11104 for Hydraulic Machines
 - # SE11103 for Electrical Machines.
- SB122004-9, Padding and Covering modification.
- SB122004-10, Hinge location on seat cross bar.

Parts;

1. 2 each PN 12092 Beams crotch belts with integral N/C micro switch.
2. 2 each E22002 Top anchor bars for upper restraint.
3. 4 each ¼ X 20 X 1.75" Hex bolts
4. 4 each ¼ X 20 hex nuts, nylon self lockers
5. 2 each 3/8 X 18 X 1.5" Allen Cap bolts
6. 2 each 3/8 flat washers
7. 2 each 3/8" nylon self locker nuts.
8. 2 each ½ X 13 X 2.5" modified hex bolt with pivot ball.
9. 2 each ½ flat washers
10. 2 each ½ X 13 nylon self lockers hex nuts.
11. 2 each pivot ball bracket for lower mount.
12. 4 each ¼ X 20 X 1.5" Allen cap bolts

13. 4 each ¼ X20 nylon self locker hex nuts.
14. 2 each 90 LB gas struts
15. 2 each wire adapter harnesses, allows connecting crotch belt to E-Stop circuit
16. 4 each 3/8 X 18 X 1.5" Hex bolts, holds hinge to seat frame.
17. 4 each 3/8 X 18 Nylon self locker hex nuts
18. 4 each 3/8 flat washers.
19. 2 each blue inline quick splice connectors.

Upgrade Instructions.

1. Inventory the entire kit. If parts are missing do not start upgrade but contact MaxFlight Corp. at (732)-281-2007, Ext 235 and request missing parts.
2. Review the instructions, drawings and pictures that are part of this upgrade.
3. Remove power from machine.
4. Remove lower ABS, to allow access to wiring from roll ring to the cockpit.
5. Remove any old shoulder restraint device currently installed on shoulder restraint ie:
 - a. Old style electric locking device and associated gas strut
 - b. Old style hydraulic shoulder locking device and associated gas strut
 - c. Old style gas strut and cable release system.
6. Remove the outer shoulder restraint covering on both sides of machine. This will allow access to upper pivot mounting area and lower cross bar of restraint.
7. Remove the lower cross bar foam rubber padding, both sides. Will be modified before reinstallation.
8. Place aside foam padding and remove the current upper pivot pin or bolt/s that now fastened the locking mechanism to the shoulder restraint system.
9. With the units that have previously upgraded to the gas shocks with upper clevis and pin, verify that the bushings installed in the shoulder restraints are in good condition. If worn call for new ones before installing new bolt/s with pivot ball.
10. Locate modified ½" hex bolt with pivot ball.
11. Insert bolt from inside of machine outwards through flat washer then shoulder harness steel and/or bushings.
12. Install nylon self locker hex nut. Tighten tightly, no play.
13. Install pivot ball into end of 1/2" bolt by using blue loctite on threaded end, tighten pivot ball.
14. Repeat 10-14 on other shoulder harness.
15. Using lower pivot bracket installation drawing, measure and mark the steel back for bolt location. See Dwgs. # SB122004-5 through -7 for your machine type.
16. Drill ¼" holes through steel back.
17. Using ¼ X 20 X 1.5" allen bolts, push bolts through steel back, through pivot bracket with ball facing towards the outside of the machine. Install ¼ X 20 nylon self locker hex nuts and tighten snug.
18. Repeat 14-18 on other side of the machine. (If Required)
19. Locate the drawing # SB122004-4, this shows the location of holes to be drilled on lower cross tube of shoulder restraint.
20. Measure, mark and drill left side bolt hole first on cross tubes, place hold bar in place with bolt and nut according to drawing. Holding bar parallel, drill second hole through tube using bar as guide.
21. Locate the two crotch belt, separate the two halves.
22. Using the tongue end, insert a anchor bar into and through the loop end. See Dwg. SB122004-1.

23. Facing the lower cross bar, verify that the tongue and tightening strap are facing outwards.
24. Insert the two ¼ X 20 X 1.75" hex bolts through the anchor bar ends and through the cross tube.
25. Install two flat washers and ¼ X 20 nylon self locker hex nuts on inside and tighten till snug.
26. Repeat steps 20-26 for other shoulder restraint assembly.
27. Modify cross bar padding and outer covering per drawing #SB122004-9. Reinstall foam padding with cutout slit facing downwards.
28. Reinstall foam padding on upper bolt side if removed. Wrap duct tape around padding to help keep in place.
29. Reinstall restraint covering completely both sides.
30. Locate the gas struts. With the black thicker part of gas strut facing upwards, insert top pivot socket over top ball stud by pressing on gas strut until it snaps into place.
31. Install lower socket onto lower ball stud and bracket by pressing on socket till it snaps into place.
32. Remove the seats and retain hardware for reinstallation of same later.
33. Remove seat pan if installed and modify same as per drawing # SB122004-8.
34. Reinstall seat pan after modification.
35. Using drawing # SB122004-10, measure, mark and drill holes for the hinge that will mount to the lower front seat cross bar.
36. Install hinge to cross brace using two 3/8 X 18 X 1.5" Hex bolts.
37. Push hex bolts through from front through washer then cross bar through hinge.
38. Install two 3/8 X18 nylon self locker hex nuts on backside. Tighten assembly .
39. Repeat steps 32-39 on other side. (If you have two seats).
40. Reinstall seat assembly both sides.
41. Locate lower half of crotch belt and cable assembly.
42. Feed wire loop end and switch cable through front lower seat opening.
43. Using the 3/8 X 18 X 1.5" allen bolt, flat washer and nylon self locker hex nut, install washer over the bolt, feed bolt through seat buckle mount loop, then through hinge mount hole. Install nylon self locker nut onto bolt and tighten. See Dwg. #SB122004-2.
44. Feed switch cable downwards, verify cable is not pinched between seat pan and cross bar.
45. Repeat switch cable on other side.
46. Locate the wiring assembly as per drawing # SE11103 for Electric, SE11104 for Hydraulic machines.
47. Fish the crotch belt cables towards the center rear of the machine and connect each connector to the adapter harness.
48. Locate the cable coming from the patron E-stop and follow same till it connects to the roll slip ring wiring harness.
 - a. The connector is a military style connector on hydraulic units. You do not have to disengage the connector to finish the modification. You must however allow free play in the cables to allow you access to the wires on back of the military connector.
 - b. On electric machines, you need only to separate the 2 pin molex connection between E-stop cable and connector going to roll slip ring. Install cable assembly harness provided SE11103.
49. On cockpit side of hydraulic units E-stop cable, push back the nylon covering or strip carefully the rubber insulation covering. Start about one inch behind the connector and peel open about 1.5 inches of the covering. This will expose two wires one black and one white.

50. Locate the inline quick connectors (blue), slip one over the black and white wire that you exposed earlier.
51. Insert the new wiring adapter See Dwg SE11104, white wire into white wire, black to black quick connector.
52. Verify each wire is all the way into the electrical quick connect, using a common pliers crimp down on metal bar in center of connector till fully seated. Click insulation cover into place. Repeat with other wire.
53. Give slight tug on inserted wires to verify new wires installed are grabbed by crimp.
54. Using an ohm meter test each cable by placing meter leads to pins A and B of cannon plug on hydraulic units, or across the two pins going to roll ring connector.
 - a. Verify E-stop is pulled out.
 - b. Insert tongue into buckle end of crotch belt both sides. You should show infinity on meter. (Open)
 - c. Open one shoulder restraint buckle. You should show a short on meter.
 - d. Re-buckle tested side and repeat on other side.
 - e. Connect to roll ring connector.
55. Cable tie loose cables into bundle to prevent damage to same.
56. Before installing lower ABS panel.
 - a. Close and latch the new crotch belts both sides.
 - b. Verify that the old E-stop button is pulled out OFF.
 - c. Close and latch regular seat belts.
 - d. Close and latch canopy
 - e. Power up the motion control computer.
 - f. For those machines that have new motion com installed;
 - i. Open Motion Client program
 - ii. Verify that the only sensor checked is the lowered sensor. If the E-stop sensor is checked you either did not latch one of the crotch belts or E-stop switch is pressed in, Check and retest.
 - g. For those older machines that do not have motion com installed;
 - i. Power up main control computer.
 - ii. Open the normal program ie: Roller Coaster, Flight Sim or Monster Truck program.
 - iii. In Coaster program control window, you have five sensor icons in lower middle of the control window. The only icon that should be ON is the lowered icon light. If the E-Stop light is ON, reverify that crotch belts are buckled and E-Stop switch is out. Retest.
 - iv. In Monster Truck and Flight sim control window, you should have an icon right middle of window. This should be the E-Stop indicator icon. With program ready to run this icon must be gray, not red. If red, check crotch belts and E-stop switch. Retest.
57. If test indications are correct, run one or two demo rides to verify correct installation of upgrade.
58. When demo rides complete correctly, install the lower rear ABS panel.
59. Machine is ready for the public.

About the upgrade and how what does it do?

The crotch belts lower buckle half has a N/C micro switch installed. This switch is opened when the top buckle part is inserted correctly. The two micro switches are wired in parallel with the E-Stop switch.

Should a patron open/release the buckle of the shoulder restraint safety device, the shoulder restraints will go upwards, the computer will see an E-Stop safety request. The computer will issue an immediate go to home motion command to the system.

The cockpit will return immediately to the home level position and all motion to the platform will stop. The operator must lower the cockpit to the full down position before any other action to the platform can be taken.

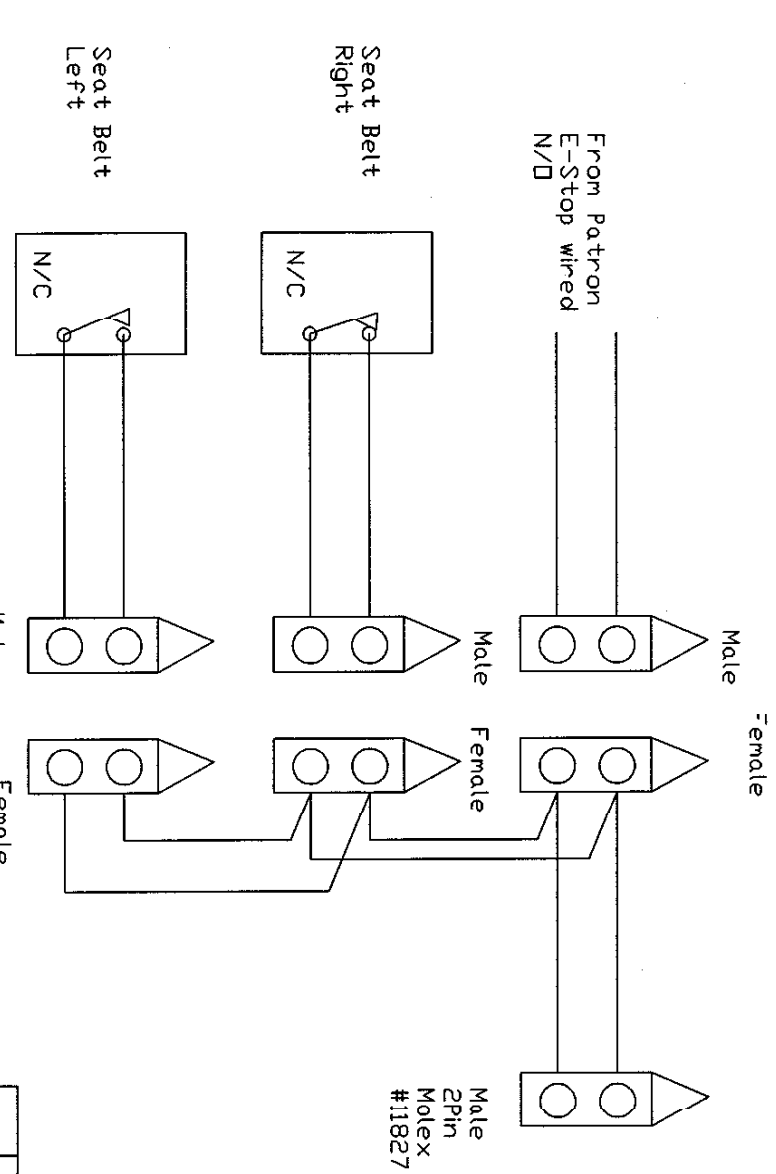
The crotch belts must be buckled before the operator can even attempt to raise the platform.

The indication on the program control panel is same as if the E-Stop was activated by a patron.

Pictures,

1. Complete Belt System
2. Lower side of cross bar of shoulder restraint, shows modification for belt.
3. Hinge assembly below seat shows assembly of belt to hinge.
4. Lower Pivot hinge bracket.
5. Upper pivot ball and gas strut installation.
6. Crotch belt buckle end. Has a normally closed micro switch installed.
7. Restraint cross bar drilled for seat belt anchor bar. Padding removed.
8. Complete parts for one side assembly
9. Parts for lower pivot bracket installation.
10. Upper pivot bolt and ball assembly.
11. Hinge and mounting hardware.
12. Lower part of buckle showing mounting loop and wire harness from buckle.

REVISIONS



Beams Industry, (NIV002), FBK:020-1 with
Integral N/C buckle switch.

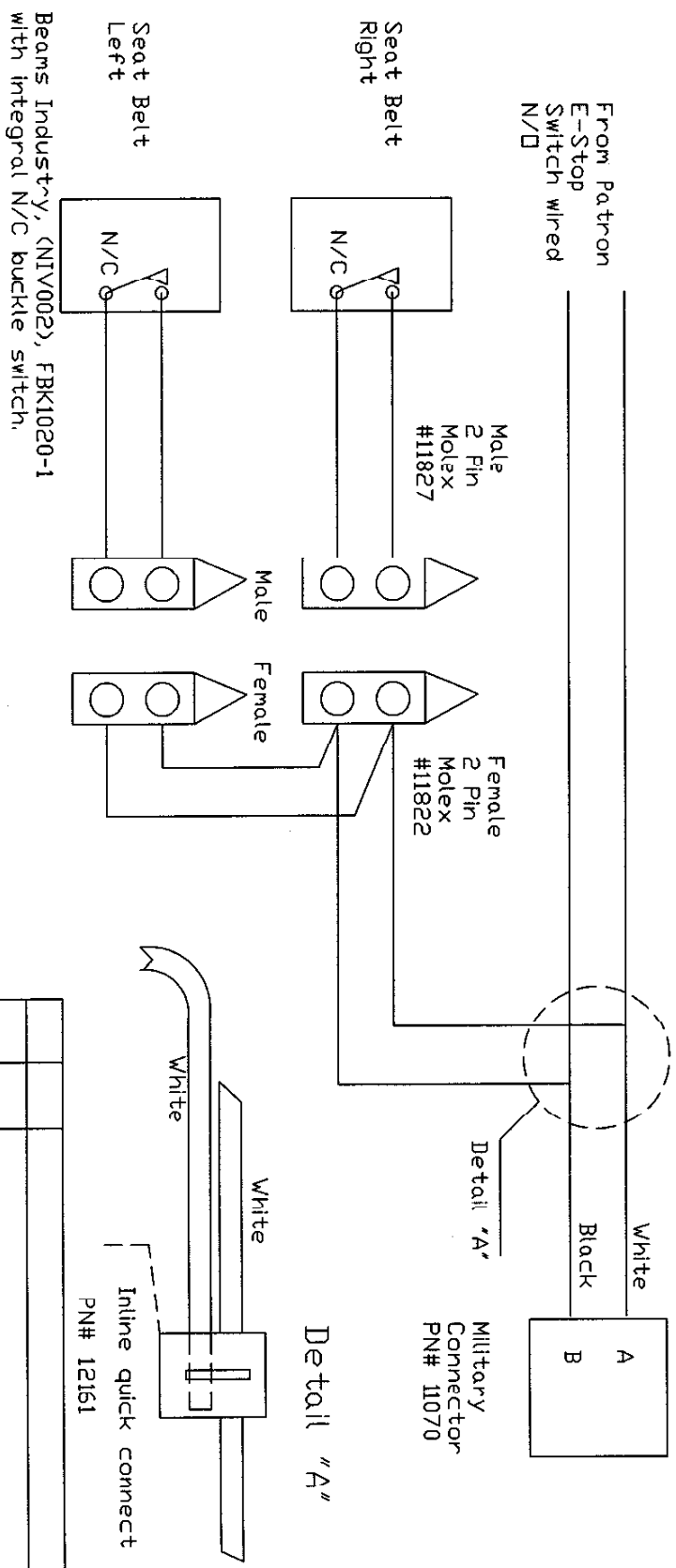
Male 2Pin Molex #11827

Female 2 Pin Molex #11822

Upgrade diagram for Electric
Machine installing new sensor
shoulder restraint crotch belt.

Item	Qty	Description (part Number)
Parts List		
Title: Seat Belt Interlock Upgrade Elect.		
HAWKFLIGHT CORPORATION 1 Executive Drive Tom's River, NJ 08755 1-732-281-2007 FAX: 1-732-281-02009		
P.L.	DWG	SE11:03
Scale: None	DRAWN BY: VVB	
DATE: 29 Nov 2004	DATE: 29 Nov 2004	REV
APPROVED BY:	DATE:	

REVISIONS



Upgrade diagram for Hydraulic Machine installing new sensor shoulder restraint crotch belt.

Beams Industry, (NIV002), FBK1020-1 with integral N/C buckle switch.

Item	Qty	Description (Part Number)
Parts List:		
TITLE: Seat Belt Interlock Upgrade Hydraulic		
MAX LIGHT CORPORATION 1 Executive Drive Toms River, NJ 08755 1-732-261-2007 FAX: 1-732-261-02009		
P.L.	DWG.	SE11104
Scale: None	DRAWN BY: VVB	
Metri	DATE: 29 Nov 2004	REV
APPROVED BY: JATEI		

C/L

1.3125'

2.69'

Dia.
0.265'
2Plcs

0.75'

Front View

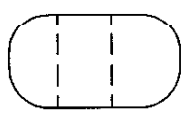
3.5'



.075"

REVISIONS

End View



Btm./Top Edge
Rounded to prevent
seat belt cutting.

Crotch Belt Front Anchor Bar

MAXELIGHT CORPORATION
1 Executive Drive Toms River, NJ 08755
1-732-281-2007

TITLE Top Crotch Belt Anchor Bars

DOCUMENT NUMBER SE222002

SIZE	DRAWN BY: WVB	APPROVED BY:	REV
CHECKED BY:			

DATE 29 Nov 2004

REVISIONS

Crotch Belt Lock Loop

Front Side

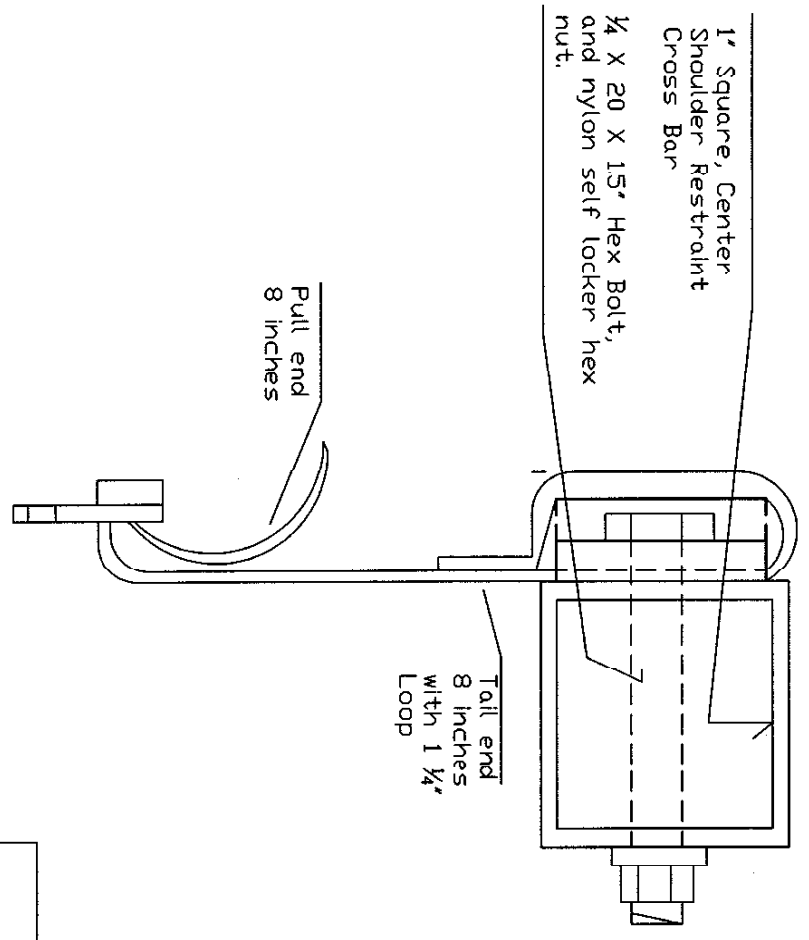
Seat Side

1" Square, Center
Shoulder Restraint
Cross Bar
1/4 X 20 X 15" Hex Bolt,
and nylon self locker hex
nut.

Pull end
8 inches

Tail end
8 inches
with 1 1/4"
Loop

Adjustable Male
Torque End



MAXELIGHT CORPORATION
1 Executive Drive Tom's River, NJ 08755
1-732-281-2007

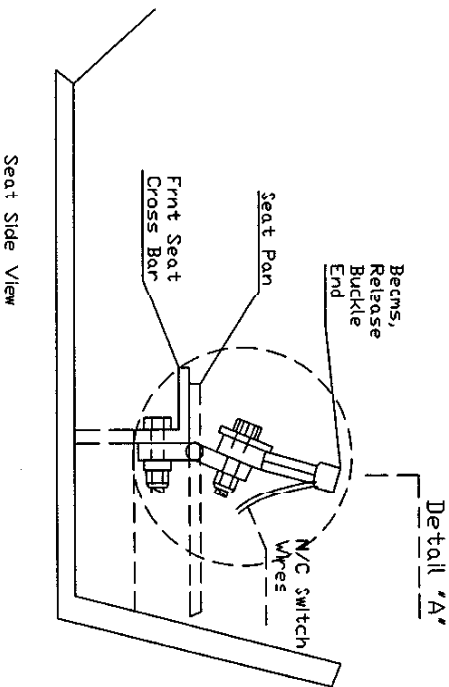
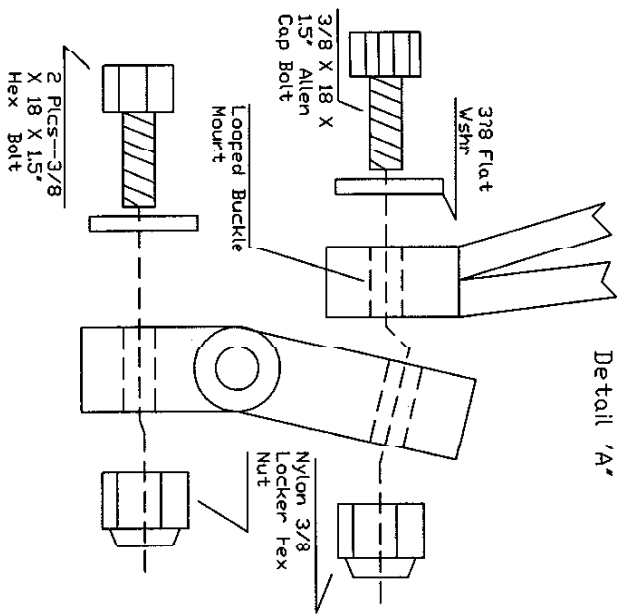
TITLE Top half of Crotch belt Installation

DOCUMENT NUMBER SB122004-1

SIZE	DRAWN BY: W/W/B	REV
CHECKED BY:	APPROVED BY:	

DATE 29 Nov 2004

REVISIONS



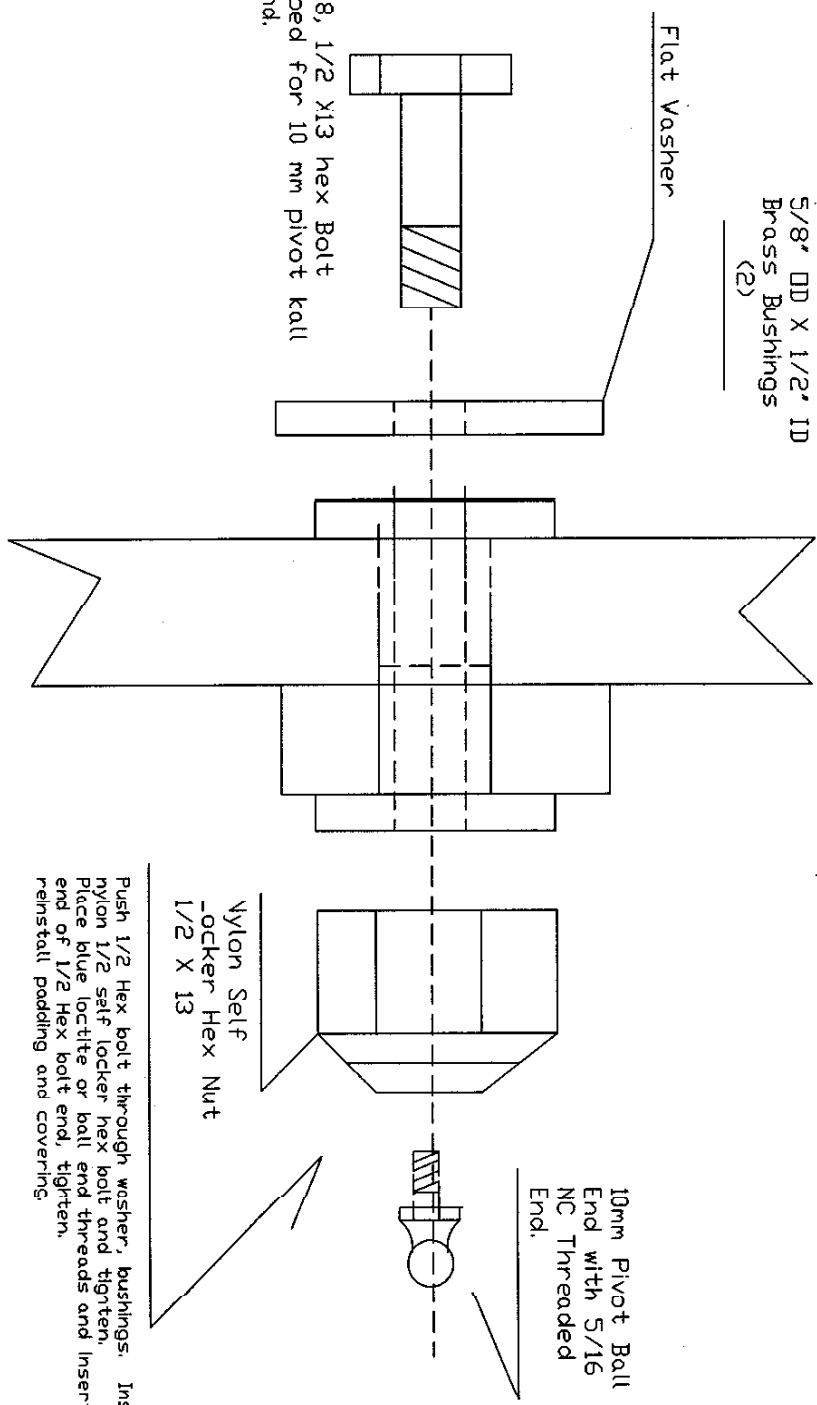
Item	Qty	Description (Part Number)
Parts List:		
Title: Crotch Belt Lower Buckle Mount Hinge		
MAXELIGHT CORPORATION 1 Executive Drive Toms River, NJ 08755 1-732-281-2007 FAX: 1-732-281-02009		
P.L.	DWG	SBI22004-2
Scale: None	DRAWN BY: VVB	
DATE: 30 Nov 2004	REV	
APPROVED BY:		

Shoulder Restraint
outer support bar.

5/8" OD X 1/2" ID
Brass Bushings
(2)

Flat Washer

Modified Grade 8, 1/2 X 13 hex Bolt
Drilled and tapped for 10 mm pivot ball
on threaded end.

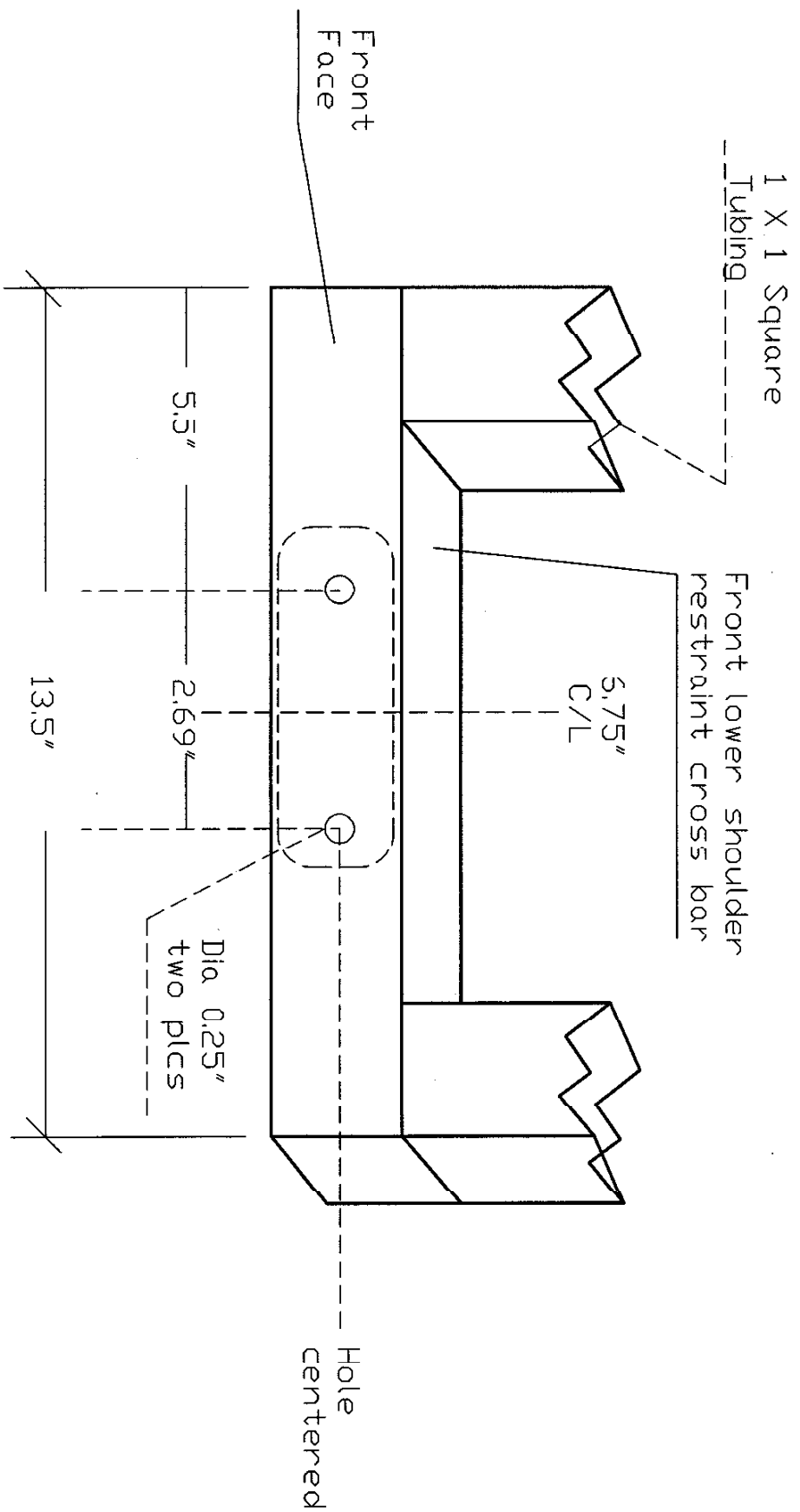


On systems that were modified with brass bushings, verify that bushings are in good shape before installing new bolt and pivot ball assembly.

On systems that were never modified and have the original 1/2" hole through shoulder restraint, verify hole and shoulder restraint is in good condition before installing new pivot ball assembly.

MaxFlight Corporation		Toms River, NJ 08755	
1 Executive Drive		FAX (732)-281-2009	
(732)-281-2007			
TITLE Top Pivot bolt/ball installation			
PN: _____		DWG: SB122004-3	
DRAWN BY: _____	DATE: 29 Nov 2004	SCALE: None	REV
CHECKED BY: _____	DATE: _____	DATE: _____	
APPROVED BY: _____	DATE: _____		

REVISIONS



MAXELIGHT CORPORATION
1 Executive Drive Tom's River, NJ 08755
1-732-281-2007

TITLE Shoulder Restraint Cross bar

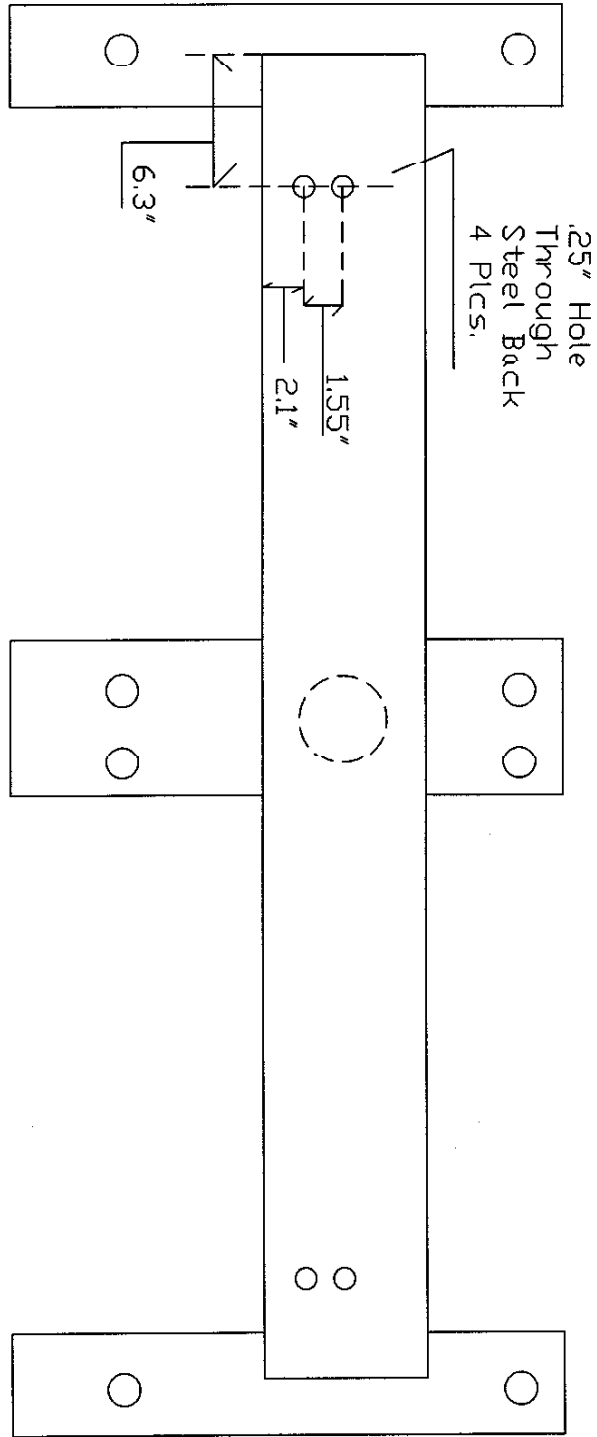
DOCUMENT NUMBER SB122004-4

SIZE	DRAWN BY: WVB	REV
CHECKED BY:	APPROVED BY:	

DATE 29 Nov 2004

REVISIONS

Rear View

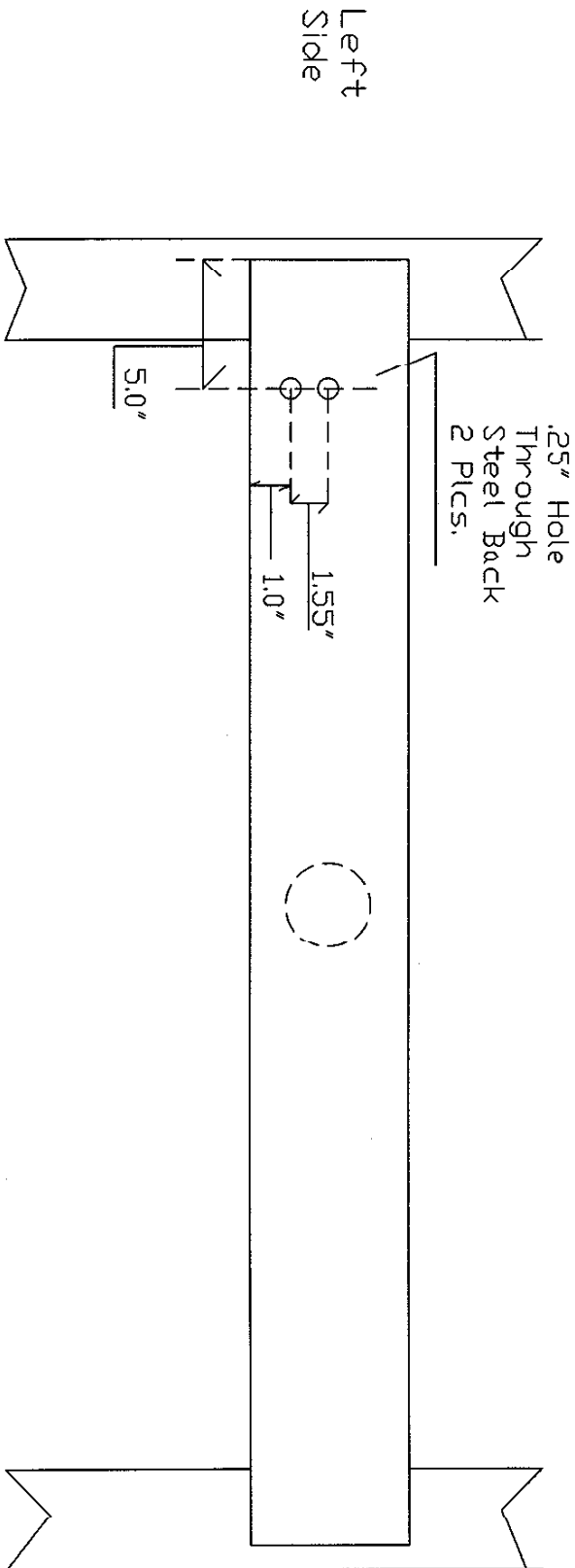


Double Wide Units with On-Board Computers

Item	Qty	Description (Part Number)
Parts List		
title: Steel Back Lower Pivot Bracket Location MAXELIGHT CORPORATION 1 Executive Drive Toms River, NJ 08755 1-732-281-2007 FAX: 1-732-281-02009		
P.L.		DWG: SB122004-5
Scale: None		DRAWN BY: VVB
Mch		DATE: 29 Nov 2004
APPROVED BY:		DATE:

REVISIONS

Rear View

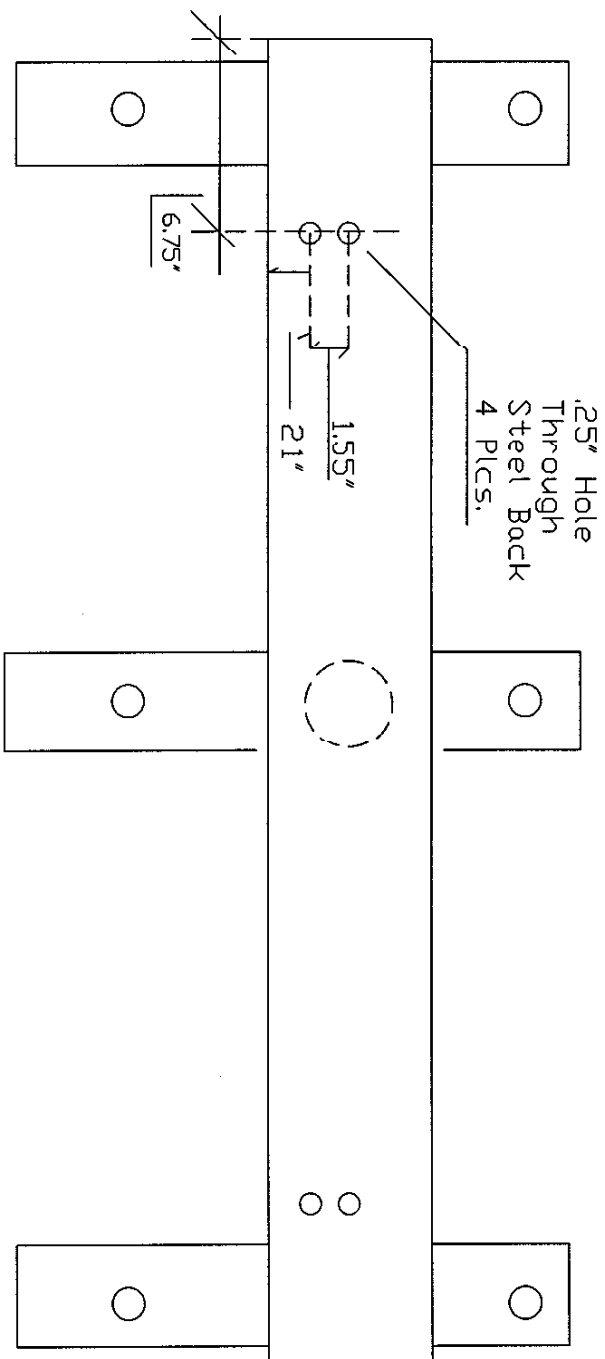


VR2000 Single Seat Flight Simulator

Item	Qty	Description (Part Number)
Parts List		
TITLE: VR2000 Lower Pivot Bracket Location		
MAXE LIGHT CORPORATION 1 Executive Drive Toms River, NJ 08755 1-732-261-2007 FAX: 1-732-281-02009		
P.L.		DWG. SB122004-6
Scale:	None	DRAWN BY: VVB
Metri		DATE: 29 Nov 2004
APPROVED BY:		DATE:
		REV

REVISIONS

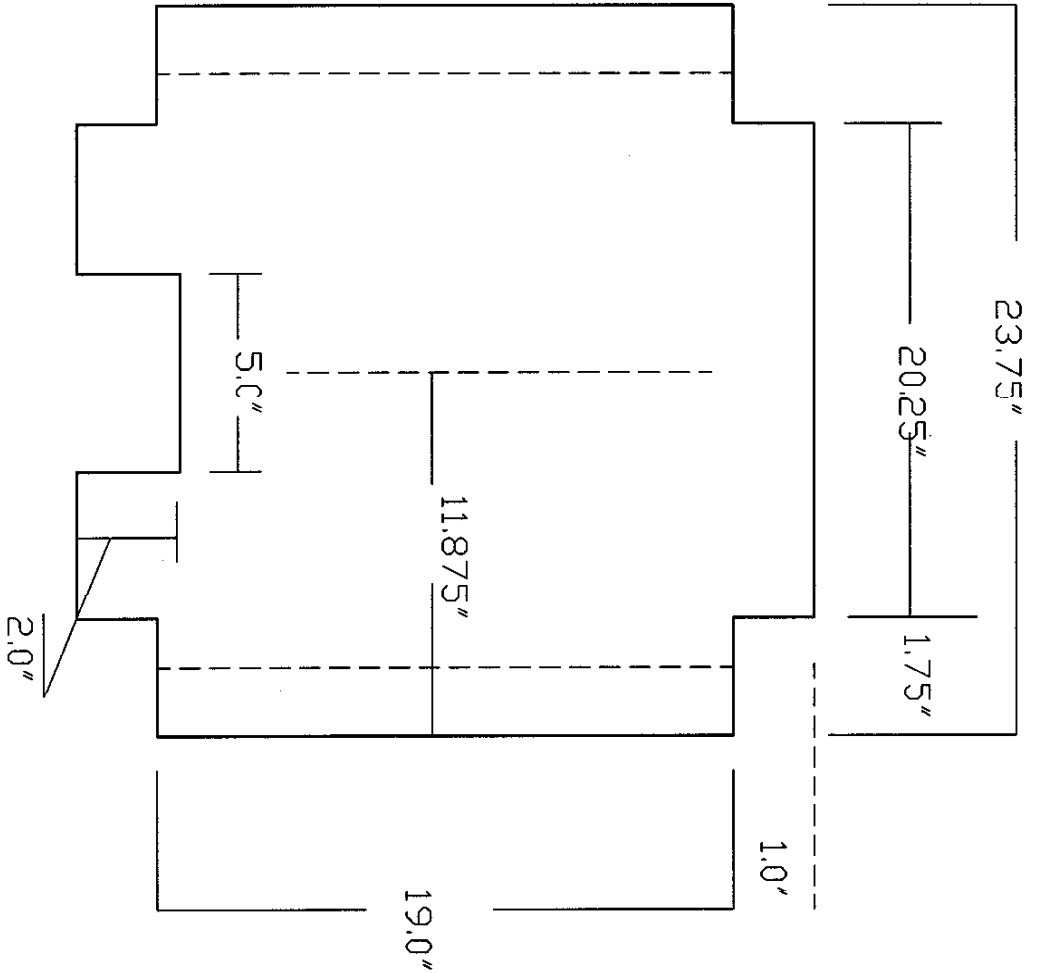
Rear View



Hydraulic Units with Standard Seats with Steel Seat Backs, VR2002, VR2500, MT3000

Old Aluminium Seat Backs are no longer authorized and should have been replaced with steel back mount system along with roll hub retention system.

Item	Qty	Description (Part Number)
Parts List:		
Title: Standard Seat Units Pivot Bracket Location		
MAXE LIGHT CORPORATION 1 Executive Drive Toms River, NJ 08755 1-732-261-2007 FAX: 1-732-261-0209		
P/L		DWG: SB122004-7
Scale:	None	DRAWN BY: WVB
Notes		DATE: 29 Nov 2004
APPROVED BY:		DATE:

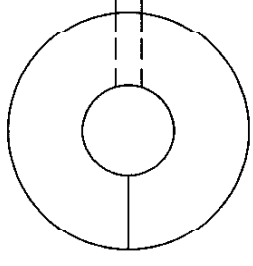
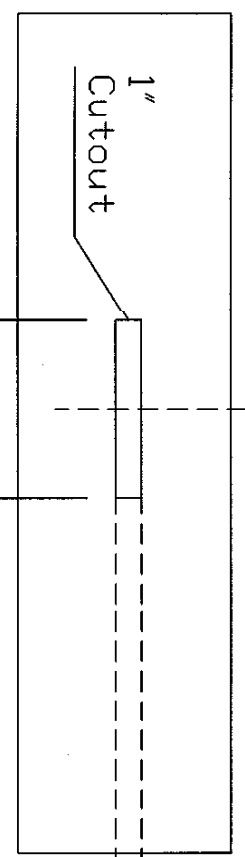


MaxFlight Corporation		Toms River, NJ 08755	
1 Executive Drive		FAX (732)-281-2009	
(732)-281-2007			
TITLE: Seat Pan Modified			
PN: SE122004-8		DWG: SE122004-8	
DRAWN BY: DATE: 30 Nov 2014		SCALE: None	
CHECKED BY: DATE:		REV	
APPROVED BY: DATE:			

REVISIONS

Center opening side to side
Bottom View of Padding

End View of Cross Bar Padding



Hook loop side of velcro strip on cover

Cut a slit to match padding cut.

bottom edge of Cover

Hair side of velcro strip on cover

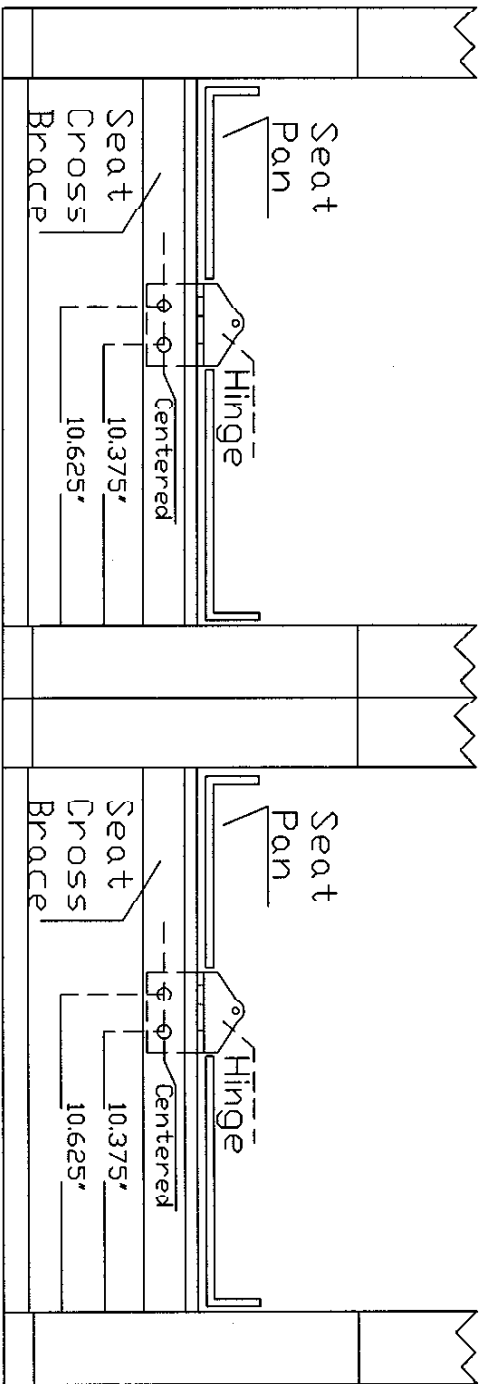
Item	Qty.	Description (part Number)
Parts List		
Title: Restraint Cover and pad modification		

MAXFLIGHT CORPORATION
1 Executive Drive Tom's River, NJ 08755
1-732-281-2007 FAX 1-732-281-02009

P4 DWG: SB122004-9
Scale: None DRAWN BY: VVB
DATE: 30 Nov 2004 REV

APPROVED BY: DATE:

REVISIONS



Front of Seat Frame Assy.

Shown are double wide seats. Standard wide seats will be measured the same. The difference will be only one center down tube instead of two as shown.
 VR2000 single seat flight simulators will use the right side of drawing for measurements.

Item	Qty.	Description (part Number)
Parts List		
TITLE: Hinge location drawing		
MAXLIGHT CORPORATION 1 Executive Drive Toms River, NJ 08755 1-732-281-2007 FAX 1-732-281-02009		
PL		DWG: SB122004-N
Scale:	None	DRAWN BY: WVB
Mktg		DATE: 30 Nov 2008
APPROVED BY:		DATE:

