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Model V195

13-Slot, C-Size VXI Mainframe

INSTRUCTION MANUAL

February, 1997

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Warranty

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13-Slot, C-Size, VXIbus Mainframes

dc and ac mainframes with unsurpassed features

V194, V195

Features

- **The V194 operates from a dc power source for mobile applications and supports a wide dc voltage input range (19 to 36 V dc)**
- **The V195 operates from an ac power source for most applications and supports input voltage ranges from 103.5 to 126.5 V and 207 to 253 V ac at 50 - 60 Hz**
- **Sturdy, reliable construction**
- **1000 W power supply**
- **Superior cooling**
- **High performance jumperless backplane**
- **Quick-disconnect power supply and fan unit design**
- **Unsurpassed user convenience**
- **Accepts Virginia Panel Receiver Adapter**

Typical Applications

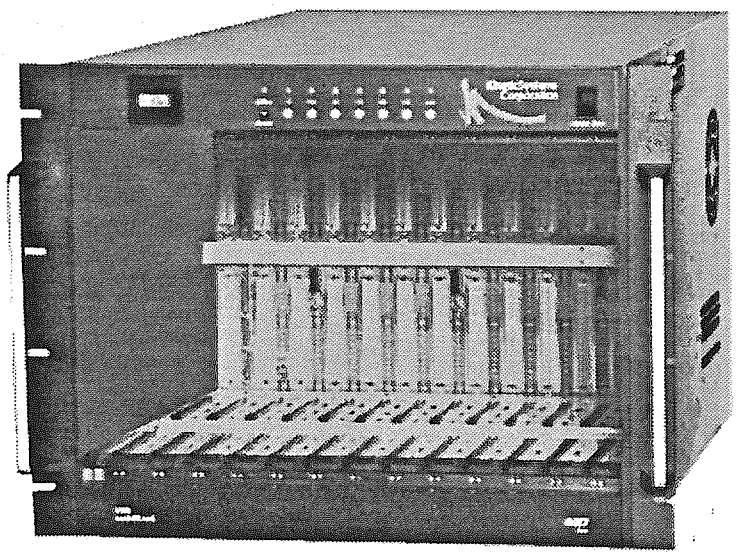
- **Data acquisition and control systems**
- **Automatic test equipment (ATE)**
- **Product development and debugging (V194 or V195 development option)**
- **Applications requiring a VXI mainframe**
- **Mobile applications (V194)**

General Description *(Product specifications and descriptions subject o change without notice.)*

he V194 and V195 are 13-slot, C-size, VXIbus mainframes with the performance and flexibility to accommodate a wide variety of systems. They were designed to be the most user-friendly mainframes in the industry. Each of these chassis combines a modular power supply, high-performance backplane, and efficient cooling in a reliable, maintainable system. For maximum flexibility, a number of configuration options are available for both rack mounting and stand-alone use. They feature rugged construction for high reliability and comply with the rigorous standards established for full-size, VXIbus mainframes by the VXI Specification, Rev. 1.4. The V194 is dc-powered for mobile applications, while the V195 is ac-powered for fixed applications.

High Power

Each of these mainframes contains a 1000 Watt power supply to easily cover the most demanding configurations. The power supply is a modular, interchangeable unit which is easy to remove in the field for maintenance or upgrade. In fact, the V194 and the V195 offer the lowest mean-time-to-replace supply units available.



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Effective Cooling

The V194 and V195 use positive pressure cooling rather than exhaust fans which may not provide adequate cooling. Backward-curved impellers are used to provide clean, filtered air to the modules with minimum noise. These impellers force the filtered air into a pressurized plenum chamber and through a metered impedance tray which insures uniform airflow even in a partially populated mainframe. The pressurized plenum chamber and metered plate are designed to deliver cool air evenly to all slots with or without the front door installed. This quiet, effective cooling eliminates the need for variable-speed fans and protects your VXI investment by increasing system reliability.

Jumperless Backplane

These mainframes use multi-layer, high-performance backplanes which meet or exceed the requirements of the VXIbus specification for C-size backplanes. They employ jumperless connectors for automatic configuration of the Bus Grant and IACK signal lines which eliminates the need to install or remove jumpers. All signals reside in a fully shielded, monolithic, stripline environment for maximum electrical performance.

User-friendly Features

While most VXIbus mainframes are designed to be kind to the electronics, these VXIbus mainframes are also designed to be kind to the user. They use a specially designed front-entry guide to provide the easiest module insertion available. To make it even easier to change modules quickly, the V194 and V195 feature a small screwdriver compartment, complete with reversible screwdriver, so it is always easy to remove or insert a module.

These mainframes take advantage of a unique design to allow the insertion of a VME module without using extenders or removing any parts. *This feature can be used only with VME modules with no connections made to the outer rows of the P2 connector. VXI uses these contacts for signals and power supplies.*

Each mainframe uses a magnetic-hydraulic circuit breaker to eliminate the need for fuses. The breaker may be reset by cycling power to the mainframe once the fault condition has been remedied. Backward-curved impellers are used to provide superior cooling while minimizing ambient noise. In order to meet changing user needs, the V194 and V195 were designed for easy conversion between rack mount (support rails or rack slide mounts), desktop, cable tray, and front cable housing configurations.

Easy Maintenance

Ease of maintenance was given high priority in making these mainframes convenient to use. Washable, reusable air filters are easy to clean and guarantee that only clean, filtered air reaches the modules. They are easily removed from the rear of the rack, or from the front, if mounted on the optional rack slides.

The power supply assembly is mounted on a hinged rear panel and uses a quick disconnect design. It may be replaced in less than one minute for the lowest mean-time-to-replace (MTTR) available. The power supply is available as a field-replaceable unit. It may be easily replaced from the rear of the rack, or from the front, if rack slides are used. The fan assembly is also available as a field replaceable unit for easy maintenance and repair. The quick-disconnect design allows the fan assembly to be replaced in less than one minute—again, the lowest MTTR anywhere.

Versatile Options

These mainframes are available with all the necessary hardware for a wide variety of mounting options and system configurations. A cable tray, front cable housing, rack mount ears and front handles, support rails, rack slides, and blank panels are available for flexible system configuration. For ease of system configuration, the optional cable tray provides an enclosed area below the mainframe for routing cables. Holes are provided at regular intervals to allow users to tie down the cables for permanent installation.

The optional front cable housing allows cables to be routed down the front of the mainframe behind a polycarbonate door. The enclosed environment is deep enough to fully enclose either the four inch module termination housings used by KineticSystems and others or a thin-thick Ethernet adapter with the door completely closed.

A development access panel is also available as an option to allow for easy probing and testing of VXI modules. The removable access panel allows the user to open up one side of the mainframe and gain access to the VXI module while it is still plugged directly into the backplane. This eliminates electrical problems caused by extending the module away from the backplane and insures that the module receives proper cooling.

For convenience, most major options are available in kit form or factory pre-assembled. In addition, most options are available as simple field upgrades to protect your VXI mainframe investment as your requirements change.

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Item	Specification		
DC Output	V194	V195	Ripple/Noise
+5 V	60 A	60 A	50 mV
+12 V	8 A	8 A	50 mV
-12 V	8 A	8 A	50 mV
+24 V (V194)	6.25 A	8 A	150 mV
-24 V (V194)	6.25 A	8 A	150 mV
-5.2 V	28 A	28 A	50 mV
-2 V	20 A	20 A	50 mV
Load/line regulation	± 0.1% for all line and load changes		
Protection	Overload, short to ground, reverse voltage, short to other outputs, thermal shutdown		
V194 Input Power			
Input voltage range	19 - 36 V dc		
Maximum input power	1463 W		
Input protection	1-pole magnetic-hydraulic circuit breaker		
V195 Input Power			
Line voltage range	103.5-126.5 V ac @ 50-60 Hz 207-253 V ac @ 50-60 Hz		
Maximum input power	1430 W		
Input protection	2-pole magnetic-hydraulic circuit breaker, simultaneously disconnects both hot and neutral		
Safety			
Power Supply	Soft start for limiting inrush current British Telecom specifications for conducted EMI Input Over, Under, and Reverse voltage protection Output over-current protection on all outputs Output over-voltage protection on all outputs Output over-temerature protection on all outputs Each dc-dc converter is fused with a PC-Tron ™ fast-acting fuse in the positive input terminal		
Power Supply Certification	UL, CSA listed		
V194 Mainframe	80 A, single-pole magnetic-hydraulic circuit breaker Power supply lockout when fan tray is removed		
Cooling			
Fans	Two backward-curved impellers		
Air flow	30 CFM per slot		
Monitor Option (V194-xB21, V195-xB21)			
Systems monitored	All power supplies, both fans		
Power supply threshold	Alarm set if any power supply falls below 90% of nominal voltage		
Fan threshold	Alarm set if fan speed out of range		
Local indication	One green/red, bi-color, status LED per power supply (seven total) One green/red, bi-color, status LED per fan (two total)		
Remote indication	Single BNC connector indicates the status of all monitored systems. Relay contact closure signals a system fault		
Alarm reset	Alarm condition is latched until cleared by pressing front-panel Alarm Reset button		

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Dimensions	
Height (including removable feet)	14.25" (36.20 cm)
Width	16.5" (41.91 cm)
Depth	24.75" (62.87 cm)
Weight	
Mainframe	67 lbs (29.48 kg)
Shipping	86 lbs (38.10 kg)
Rack Mount	Standard 19" (45.26 cm) format
Environment	
Operating temperature	0°C to 40°C, full load
Storage temperature	-20°C to 85°C
Humidity	20% to 90% RH (non-condensing)
MTBF	100,000 hours (calculated per MIL-HDBK-217)

V194 Ordering Information

Model V194-wx21 13-Slot, dc Powered, C-Size, VXIbus Mainframe

w: A = Standard mainframe
B = Standard mainframe with cable tray (1U)
C = Standard mainframe with cable tray (1U) and front cable housing with door
D = Development mainframe (removable side panel)
E = Development mainframe with cable tray (1U)
F = Standard mainframe with extra deep cable tray (2U)
G = Standard mainframe with extra deep cable tray (2U) and front cable housing with door
H = Development mainframe with extra deep cable tray (2U)

x: A = No monitor
B = Power supply and fan monitor unit included

Model V194-KB11 Single-width blank panel
Model V194-KB21 Double-width blank panel
Model V194-KB31 Triple-width blank panel

Model V194-KC11 Cable tray (1U) field upgrade kit
Model V194-KC21 Extra deep cable tray field upgrade kit (2U)

Model V194-KF11 Front cable housing field upgrade kit (1U)
Model V194-KF21 Front cable housing field upgrade kit for extra deep cable tray (2U)

Model V194-KR11 Support rail kit for 24" rack (includes two)
Model V194-KR21 Support rail kit for use with front housing and 30" rack (includes two)
Model V194-KS11 Rack slide kit for 24" rack (includes two)
Model V194-KS21 Rack slide kit (roller slides) for use with front housing and 30" to 35" rack (includes two)

Model V194-KP21 1000 W, 24 V dc power supply replacement kit

Note: Either support rails or rack slides must be used for rack mounting.

Example: To order a standard mainframe with (1U) cable tray and front cable housing, and 30" rack slide kit:

V194-CA21 quantity 1
V194-KS21 quantity 1

Related Products

VPC Model 310 113 268 Adapter Kit for KineticSystems C-Size, VXIbus mainframe (V194 & V195)

This adapter kit allows a Virginia Panel receiver unit to be attached to the front of the mainframe for Automatic Test Equipment (ATE) applications.

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V195 Ordering Information

Model V195-wx21 13-Slot, ac Powered, C-Size, VXIbus Mainframe

w: A = Standard mainframe
B = Standard mainframe with cable tray (1U)
C = Standard mainframe with cable tray (1U) and front cable housing with door
D = Development mainframe (removable side panel)
E = Development mainframe with cable tray (1U)
F = Standard mainframe with extra deep cable tray (2U)
G = Standard mainframe with extra deep cable tray (2U) and front cable housing with door
H = Development mainframe with extra deep cable tray (2U)

x: A = No monitor
B = Power supply and fan monitor unit included

Model V195-KB11 Single-width blank panel
Model V195-KB21 Double-width blank panel
Model V195-KB31 Triple-width blank panel

Model V195-KC11 Cable tray (1U) field upgrade kit
Model V195-KC21 Extra deep cable tray field upgrade kit (2U)

Model V195-KF11 Front cable housing field upgrade kit (1U)
Model V195-KF21 Front cable housing field upgrade kit for extra deep cable tray (2U)

Model V195-KR11 Support rail kit for 24" rack (includes two)
Model V195-KR21 Support rail kit for use with front housing and 30" rack (includes two)
Model V195-KS11 Rack slide kit for 24" rack (includes two)
Model V195-KS21 Rack slide kit (roller slides) for use with front housing and 30" to 35" rack (includes two)

Model V195-KP21 1000 W, ac power supply replacement kit

Note: Either support rails or rack slides must be used for rack mounting.

Example: To order a standard mainframe with (1U) cable tray and front cable housing, and 30" rack slide kit:

V195-CA21 quantity. 1
V195-KS21 quantity 1

Related Products

VPC Model 310 113 268 Adapter Kit for KineticSystems C-Size, VXIbus mainframe (V194 & V195)

This adapter kit allows a Virginia Panel receiver unit to be attached to the front of the mainframe for Automatic Test Equipment (ATE) applications.

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COOLING

Positive pressure cooling is provided by two EBM backwards curved impellers that provide up to 224 CFM each. Air is drawn in from the rear of the unit and pressurized. The pressurized air then flows through impedance metering plates. This approach provides cooling to modules in a partially filled mainframe.

OUTPUT POWER

Total Output Power	1051W
+5 volt output current	60 Amps
-5.2 volt output current	28 Amps
-2 volt output current	15 Amps
+12 volt output current	8 Amps
-12 volt output current	8 Amps
+24 volt output current	8 Amps
-24 volt output current	8 Amps

MECHANICAL

Dimensions: Height = 14"
Width = 16½"
Depth = 24⅝"
Weight = 65 lbs

ENVIRONMENTAL

Ambient operating temperature:	0 to 40°C
Storage temperature:	-20 to 65°C
Humidity:	5 to 95% noncondensing

INPUT POWER REQUIREMENTS

The V195 is equipped with an Autoranging Power Supply which can operate from 90 to 264. **Make sure the voltage selector switch is set to the correct position.**

* The Cooling Fans have a voltage selector switch. In the 120V AC position, fans have a voltage range from 103.5 to 126.5. In the 230V AC position, fans have a voltage range from 207 to 253.

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* Autoranging Power Supply current requirements at 70% efficiency:

AC Line Voltage IN	AC Line Current at Full Load
	1052.28W
103.5V AC	14.51 Amps
* 115V AC *	13.06 Amps
126.5V AC	11.87 Amps
207V AC	7.25 Amps
* 230V AC *	6.53 Amps
253V AC	5.93 Amps

Due to the AC voltage limitations of the fans, the effective AC voltage range of the V195 is:

Voltage Selector Switch Setting	AC Voltage Range
115	103-126.5
230	207-253

INPUT PROTECTION

The main AC Input is protected by a 2-pole magnetic circuit breaker (Front panel on off switch) rated at 15 amps.

POWER SUPPLY SPECIFICATIONS

AC Input:
Autoranging Input: 90-132 or 180-264 VAC 47-500Hz
or 260-380 VDC

Conducted EMI: VDE/FCC:
VDE Class A and FCC Class A

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Power Supply Specifications Continued

Transient Load Response:
Load step from 25% to 75% with a di/dt of 0.7A per microsecond.

	Peak Amplitude	Recovery Time to within 1% of the Nominal Output Voltage
5V at 30A output	700 mV	150μS

Hold Up:
> 20mSec at full load with nominal input line voltage.

Overall Efficiency:
> 70% depending on output voltage, loading and AC input.

Peak In Rush:
30 Amps RMS Max at 115 VAC
60 Amps RMS Max at 230 VAC

Low Line:
Turn on 90 VAC before or at full load.

Turn On Delay From Power Up:
1 Sec. (Max).

Regulation:
Line 0.2% (Max), Load 0.2% (Max).
Thermal .02% / Deg. C (Max).

Ripple and Noise:
50 mV pk to pk at any load (20 MHZ BWL).
except ±24V DC which shall not exceed 150 mV measured at unit outputs.

Overshoot:
No overshoot at turn on or turn off.

Over Voltage Protection:
Nominal 115% to 135% latching.

Over Current Protection:
Nominal 105% to 125% of full load. Fold back on voltages of 5.2V or below; straight line on voltages over 5.2V. Automatic restart. Continuous short circuit without damage.

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Power Supply Specifications Continued

Over Temperature Protection:
In the event of over temperature condition, unit automatically shuts down. Latching.

MTBF (Mean Time Between Failures) on DC-DC converters:
>700,000 hours (35°C, G_B)

MONITOR OPTION

The monitor option has eight (8) dual color LEDs. Seven of the LEDs are for voltage monitoring and one is for monitor airflow.

Normal operating condition is represented by the color green. If there should be a failure, it will be indicated by the color red.

When a failure occurs, the status is latched (except for airflow). For example, if the +5 volt supply were to dip below 90% of nominal, an error would occur. The +5 volt LED would change from green to red and remain red until the front panel reset switch is depressed provided that the +5 volt supply is within 90% of nominal. All voltages are monitored within 90% of nominal. You cannot clear the error condition if the fault still exists.

This latching feature will catch intermittents if any are in the power supply. Latching can be disabled by moving the strap labeled "Error" from the "EN" position to the "DISEN" position. The "Error" strap is located on the back side of the front panel. To get at it you must remove the top of the chassis.

Airflow is monitored by two airflow sensors located in the air plenum. If airflow drops below 200 feet per minute an error will occur.

Voltage tests points are provided on the front panel should you want to measure the voltage with a DVM.

Remote monitoring of the VXI chassis can be done with the status out BNC connector located at the rear of the chassis.

The status out is a relay contact which is in the closed position when there is a failure or if the chassis is turned off. The contact is capable of sinking 500 mA at 5 volts.

When the chassis is operating properly, the contact assumes the open position. The closed position connects the center pin of the BNC to chassis ground. This output looks like an open collector with no pullup resistor. You must externally pull the status high.

Many chassis may be connected together using BNC cables. If one chassis fails then the status of all chassis will be pulled to ground indicating a failure.

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Fan Unit Removal and Installation:

Removal of Fan Unit

Step 1. Disconnect V195 from AC Power Source

Step 2. Turn two thumbscrews counter clockwise until unit can be pulled out. (See Figure 1.

Step 3. Clean the air filters before reinstalling the fan unit.

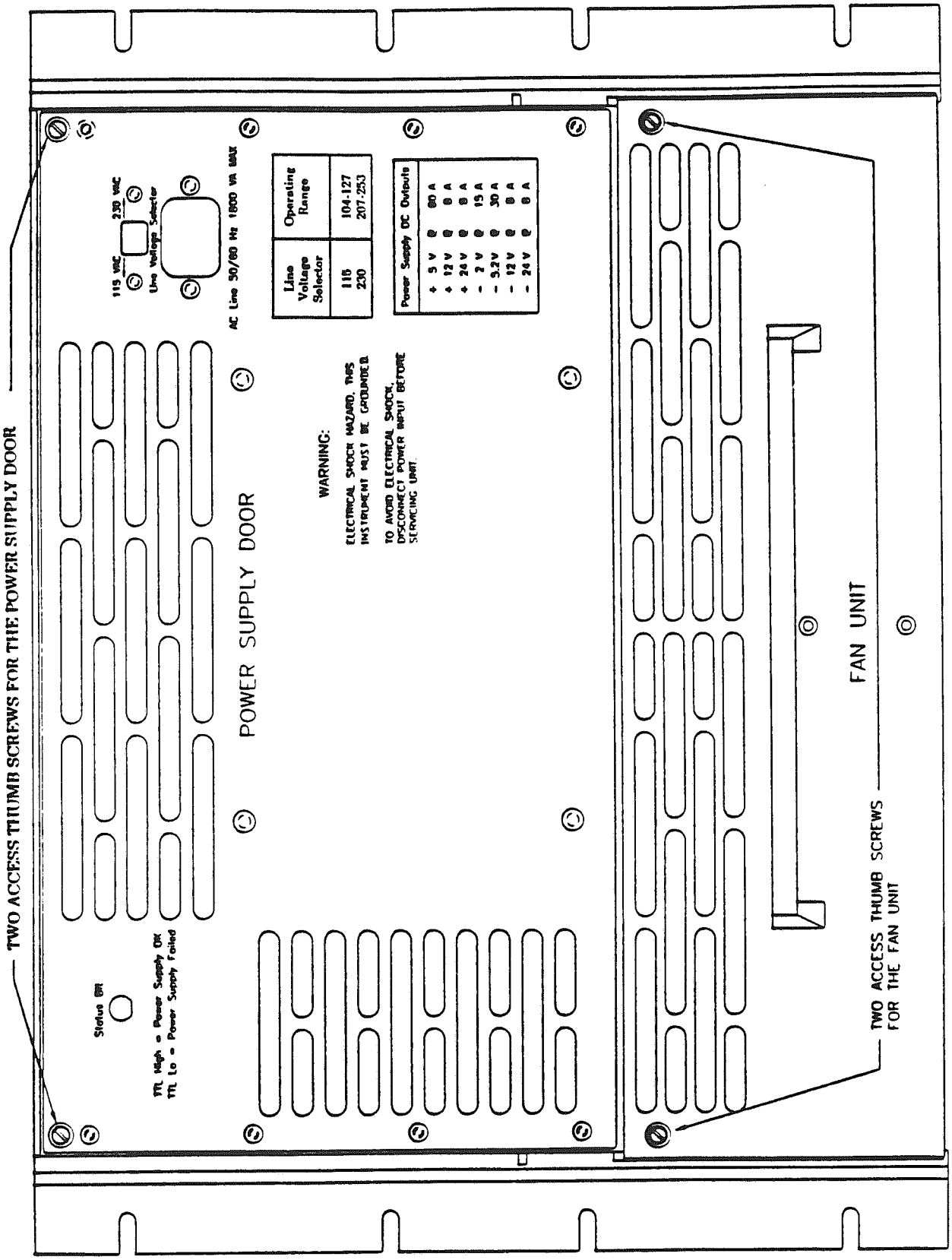
Installation of Fan Unit

Step 1. Make sure air filters are clean and secured.

Step 2. Slide fan unit into the chassis and tighten down the thumbscrews. See Figure 1.

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FIGURE 1



REAR VIEW OF THE V195, SHOWING THE POWER SUPPLY DOOR & FAN UNIT.

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Power Supply Removal and Installation:

Step 1. Disconnect V195 from AC Power Source by unplugging unit and remove power cord from rear of unit. See Figure 1.

Step 2. Turn two thumbscrews counter clockwise until power supply can be dropped down. See Figure 2.

Step 3. Undo the two thumbscrews at the wiring harness shown in Figure 2 and push away the wiring harness to the backplane. Once the wiring harness has been disconnected you can pick up on the power supply door and remove the door and power supply as a unit. See Figure 2.

Installation of V195 Power Supply:

Step 1. Install power supply unit so that it is in the open position. See Figure 2. Note the location of the Allen Head Stop on V195 chassis and the dowel pin hinge on power supply door.

Step 2. Connect wiring harness to top of power supply. Make sure the two thumbscrews for securing backplane wiring harness are tight.

Step 3. Lift up on the power supply door to close and tighten two access thumbscrews. Note not to pinch any of the wires when closing power supply door.

Power supply has been installed. You may apply power to the V195.

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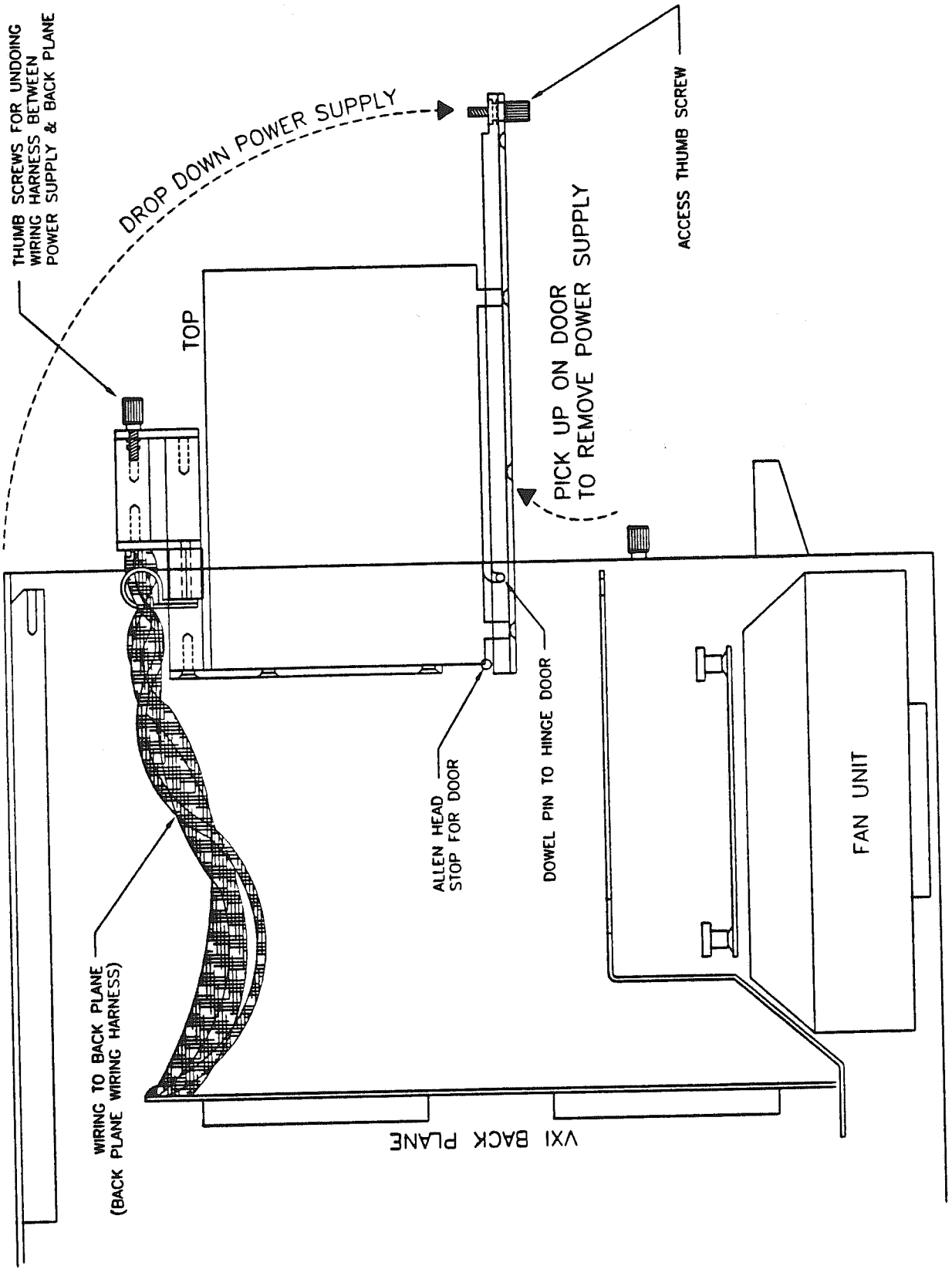


FIGURE 2
SIDE VIEW OF V195 WITH POWER SUPPLY DOOR OPEN

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APPENDIX A

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Inserting a VME Module in the V195 VXI Chassis

CAUTION:	**If you want to use a VME module in the V195 VXI Chassis, you must determine whether your VME module uses the P2 connector, Rows A and C. If it does, you must isolate these pins from your VME module. If these pins cannot be isolated from your VME module, then you cannot use that VME module in the V195 VXI Chassis.**

Please note the differences in the P2 connector. Table 1 shows the pinout for a VME P2 connector. Tables 2 and 3 show the pinout for a VXI P2 connector.

On the P2 connector of a VXI Backplane, Rows A and C are used.

The VXI backplane supplies power to some locations in Rows A and C of the P2 connector.

KineticSystems Corporation assumes no liability for the damage of any VME modules inserted into the V195 VXI Chassis.

To install a VME module in the V195 VXI Chassis, follow these instructions:

Step 1. Reach into the chassis and pull the rear upper rack toward the front of the chassis until it locks into position. See Figure 1.

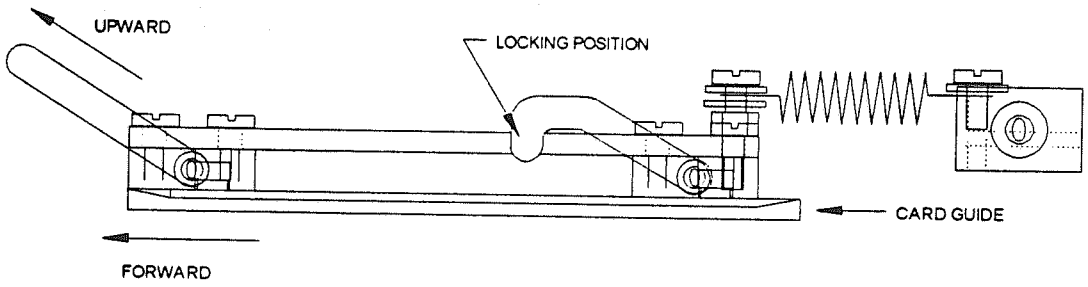
Step 2. Install the VME module.

Step 3. Push up on the rear of the upper rack to release it from its locked position. See Figure 1.

Step 4. Align the VME card so the upper rack seats on the VME card.

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Figure 1 - V195 VME Card Guide Assembly



Look inside mainframe and pull VME Card Guide forward to insert VME module. As Card Guide is pulled forward, it will lift up.

Note locking position.

After installation of VME module, push up on VME Card Guide (shown by arrow) to release it from the locked position. Let it drop into position. The top of the VME card may have to be moved to seat the Card Guide.

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VME Connector P2/J2			
Pin Number	**Row A**	**Row B**	**Row C**
1	User Defined	+5 VDC	User Defined
2	User Defined	GND	User Defined
3	User Defined	RESERVED	User Defined
4	User Defined	A24	User Defined
5	User Defined	A25	User Defined
6	User Defined	A26	User Defined
7	User Defined	A27	User Defined
8	User Defined	A28	User Defined
9	User Defined	A29	User Defined
10	User Defined	A30	User Defined
11	User Defined	A31	User Defined
12	User Defined	GND	User Defined
13	User Defined	+5 VDC	User Defined
14	User Defined	D16	User Defined
15	User Defined	D17	User Defined
16	User Defined	D18	User Defined
17	User Defined	D19	User Defined
18	User Defined	D20	User Defined
19	User Defined	D21	User Defined
20	User Defined	D22	User Defined
21	User Defined	D23	User Defined
22	User Defined	GND	User Defined
23	User Defined	D24	User Defined
24	User Defined	D25	User Defined
25	User Defined	D26	User Defined
26	User Defined	D27	User Defined
27	User Defined	D28	User Defined
28	User Defined	D29	User Defined
29	User Defined	D30	User Defined
30	User Defined	D31	User Defined
31	User Defined	GND	User Defined
32	User Defined	+5 VDC	User Defined

Table 1

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VXI Connector P2 Slot 0

Pin Number	ROW A Signal Mnemonic	ROW B Signal Mnemonic	ROW C Signal Mnemonic	Pin Number
1	ECLTRG0	+5V	CLK10+	1
2	-2V	GND	CLK10-	2
3	ECLTRG1	RSV1	GND	3
4	GND	A24	-5.2V	4
5	MODID12	A25	LBUSC00	5
6	MODID11	A26	LBUSC01	6
7	-5.2V	A27	GND	7
8	MODID10	A28	LBUSC02	8
9	MODID09	A29	LBUSC03	9
10	GND	A30	GND	10
11	MODID08	A31	LBUSC04	11
12	MODID07	GND	LBUSC05	12
13	-5.2V	+5V	-2V	13
14	MODID06	D16	LBUSC06	14
15	MODID05	D17	LBUSC07	15
16	GND	D18	GND	16
17	MODID04	D19	LBUSC08	17
18	MODID03	D20	LBUSC09	18
19	-5.2V	D21	-5.2V	19
20	MODID02	D22	LBUSC10	20
21	MODID01	D23	LBUSC11	21
22	GND	GND	GND	22
23	TTLTRG0*	D24	TTLTRG1*	23
24	TTLTRG2*	D25	TTLTRG3*	24
25	+5V	D26	GND	25
26	TTLTRG4*	D27	TTLTRG5*	26
27	TTLTRG6*	D28	TTLTRG7*	27
28	GND	D29	GND	28
29	RSV2	D30	RSV3	29
30	MODID00	D31	GND	30
31	GND	GND	+24V	31
32	SUMBUS	+5V	-24V	32

Table 2

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VXI Connector P2 Slot 1-12

Pin Number	ROW A Signal Mnemonic	ROW B Signal Mnemonic	ROW C Signal Mnemonic	Pin Number
1	ECLTRG0	+5V	CLK10+	1
2	-2V	GND	CLK10-	2
3	ECLTRG1	RSV1	GND	3
4	GND	A24	-5.2V	4
5	LBUSA00	A25	LBUSC00	5
6	LBUSA01	A26	LBUSC01	6
7	-5.2V	A27	GND	7
8	LBUSA02	A28	LBUSC02	8
9	LBUSA03	A29	LBUSC03	9
10	GND	A30	GND	10
11	LBUSA04	A31	LBUSC04	11
12	LBUSA05	GND	LBUSC05	12
13	-5.2V	+5V	-2V	13
14	LBUSA06	D16	LBUSC06	14
15	LBUSA07	D17	LBUSC07	15
16	GND	D18	GND	16
17	LBUSA08	D19	LBUSC08	17
18	LBUSA09	D20	LBUSC09	18
19	-5.2V	D21	-5.2V	19
20	LBUSA10	D22	LBUSC10	20
21	LBUSA11	D23	LBUSC11	21
22	GND	GND	GND	22
23	TTLTRG0*	D24	TTLTRG1*	23
24	TTLTRG2*	D25	TTLTRG3*	24
25	+5V	D26	GND	25
26	TTLTRG4*	D27	TTLTRG5*	26
27	TTLTRG6*	D28	TTLTRG7*	27
28	GND	D29	GND	28
29	RSV2	D30	RSV3	29
30	MODID	D31	GND	30
31	GND	GND	+24V	31
32	SUMBUS	+5V	-24V	32

Table 3

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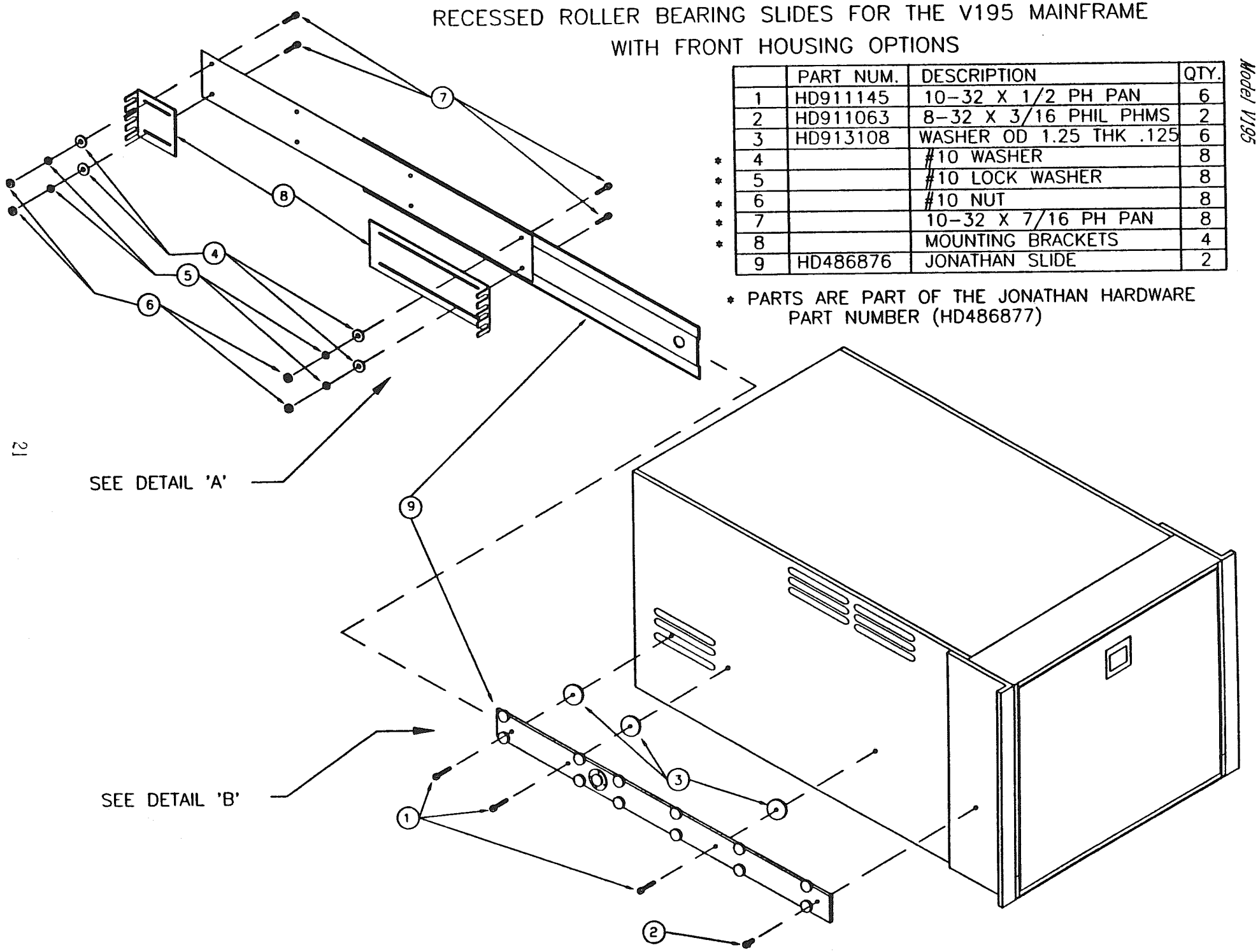
Appendix B

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RECESSED ROLLER BEARING SLIDES FOR THE V195 MAINFRAME WITH FRONT HOUSING OPTIONS

		PART NUM.	DESCRIPTION	QTY.
1		HD911145	10-32 X 1/2 PH PAN	6
2		HD911063	8-32 X 3/16 PHIL PHMS	2
3		HD913108	WASHER OD 1.25 THK .125	6
4	*		#10 WASHER	8
5	*		#10 LOCK WASHER	8
6	*		#10 NUT	8
7	*		10-32 X 7/16 PH PAN	8
8	*		MOUNTING BRACKETS	4
9		HD486876	JONATHAN SLIDE	2

* PARTS ARE PART OF THE JONATHAN HARDWARE PART NUMBER (HD486877)



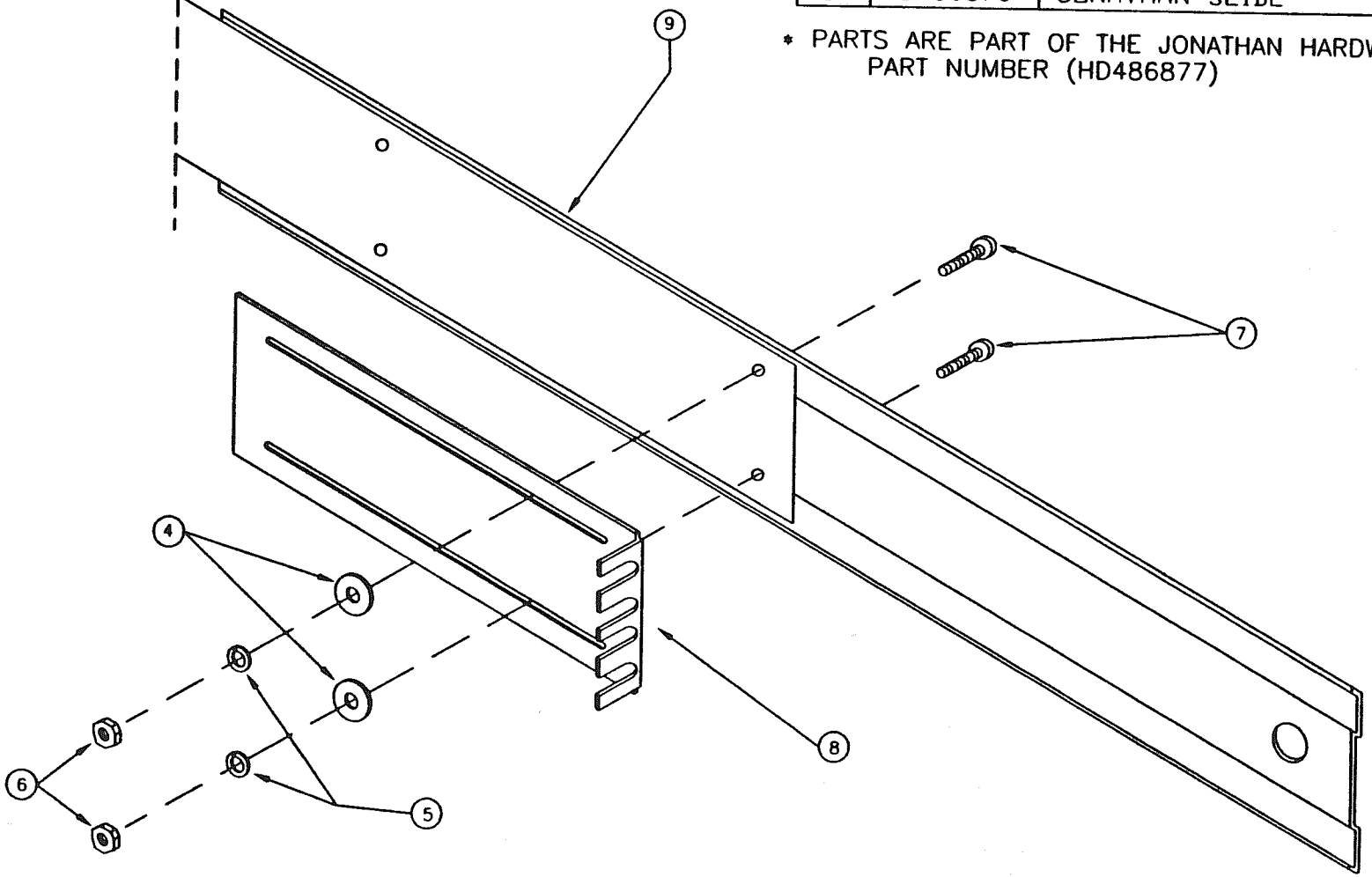
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MOUNTING BRACKET ASSEMBLY ON THE V195

	PART NUM.	DESCRIPTION	QTY.
* 4		#10 WASHER	8
* 5		#10 LOCK WASHER	8
* 6		#10 NUT	8
* 7		10-32 X 7/16 PH PAN	8
* 8		MOUNTING BRACKETS	4
9	HD486876	JONATHAN SLIDE	2

* PARTS ARE PART OF THE JONATHAN HARDWARE PART NUMBER (HD486877)

DETAIL 'A'

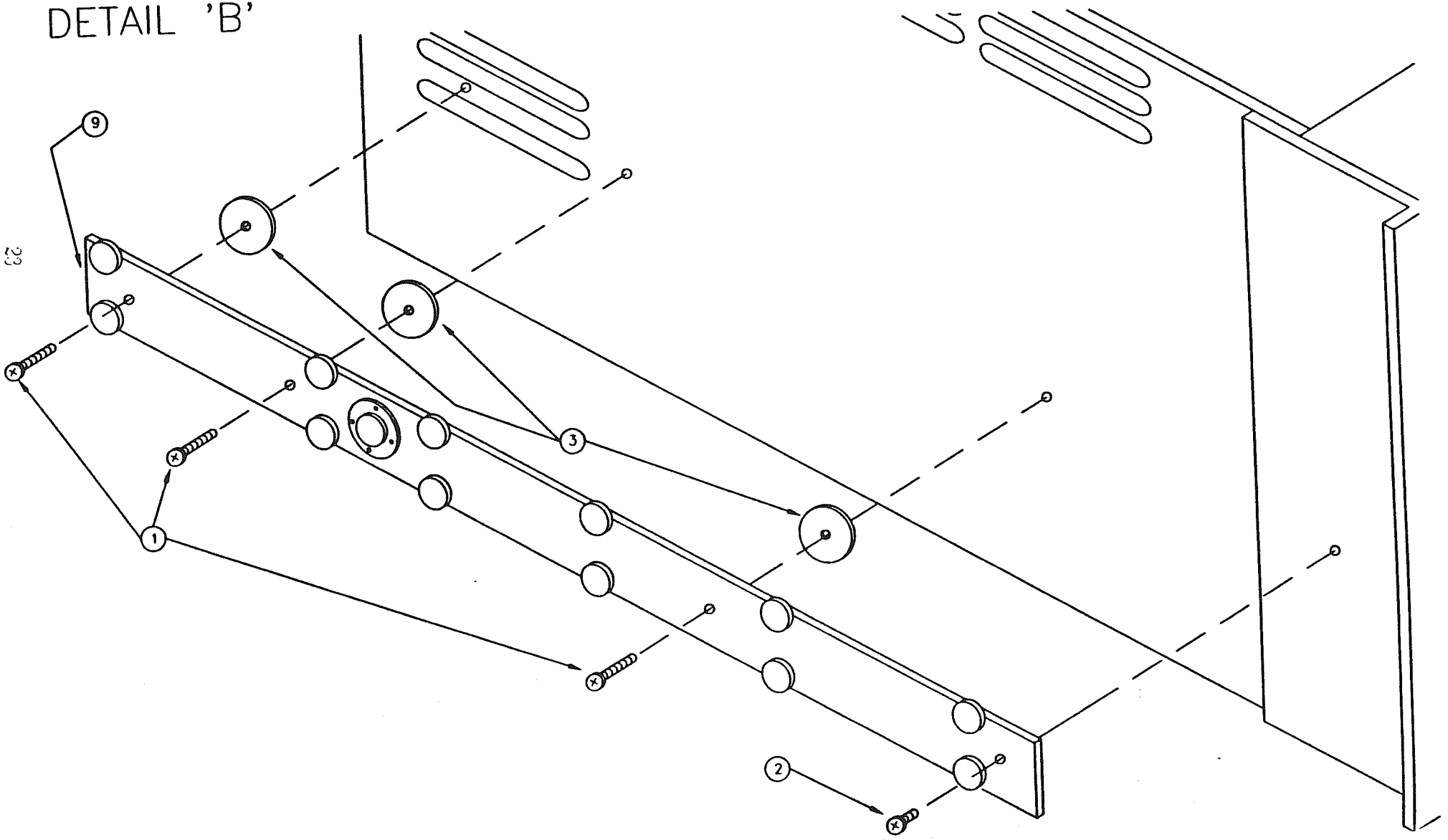


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RECESSED ROLLER SLIDE ASSEMBLY ON THE V195

	PART NUM.	DESCRIPTION	QTY.
1	HD911145	10-32 X 1/2 PH PAN	6
2	HD911063	8-32 X 3/16 PHIL PHMS	2
3	HD913108	WASHER OD 1.25 THK .125	6
9	HD486876	JONATHAN SLIDE	2

DETAIL 'B'



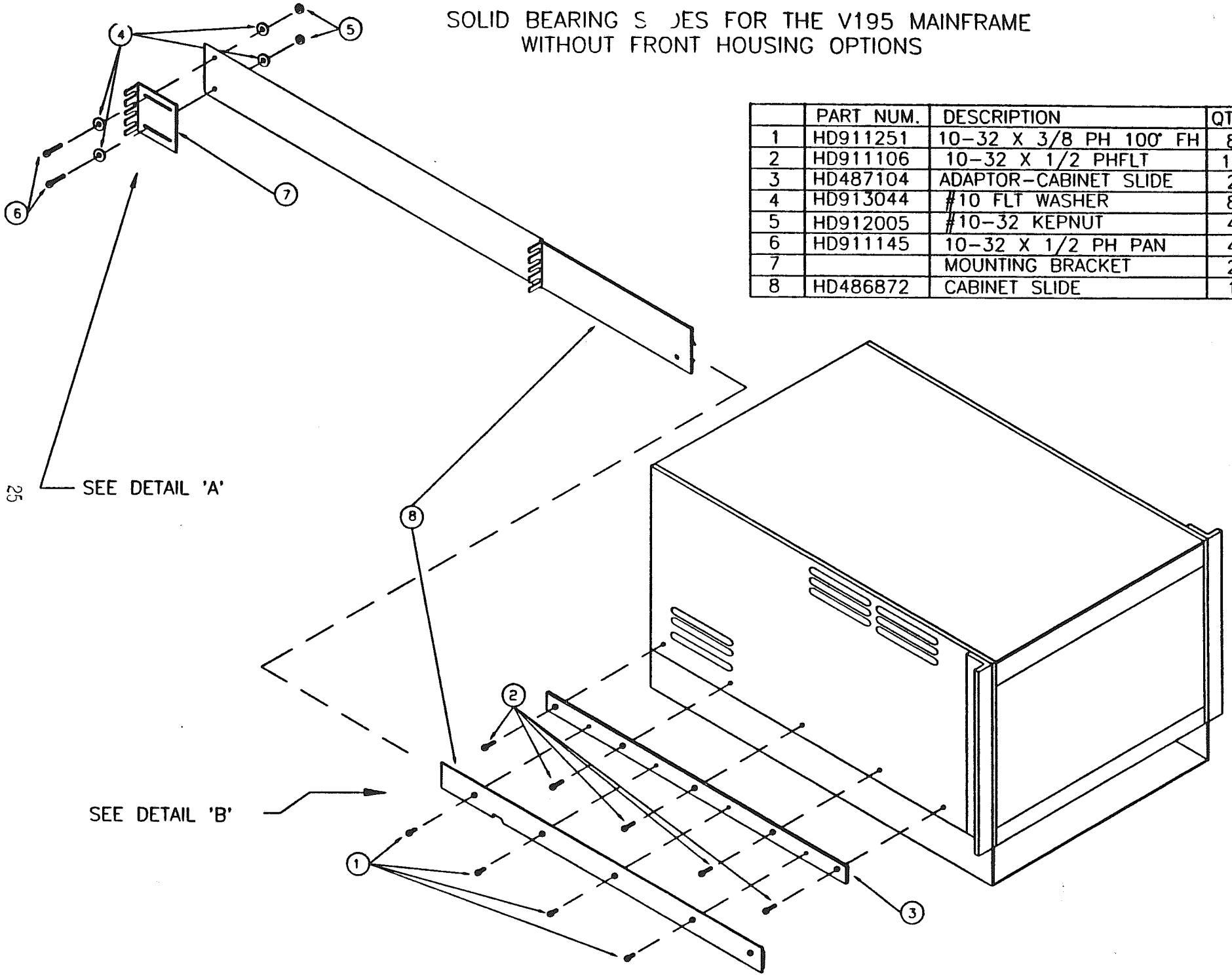
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Appendix C

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SOLID BEARING S DES FOR THE V195 MAINFRAME WITHOUT FRONT HOUSING OPTIONS

	PART NUM.	DESCRIPTION	QTY.
1	HD911251	10-32 X 3/8 PH 100° FH	8
2	HD911106	10-32 X 1/2 PHFLT	10
3	HD487104	ADAPTOR-CABINET SLIDE	2
4	HD913044	#10 FLT WASHER	8
5	HD912005	#10-32 KEPNUT	4
6	HD911145	10-32 X 1/2 PH PAN	4
7		MOUNTING BRACKET	2
8	HD486872	CABINET SLIDE	1

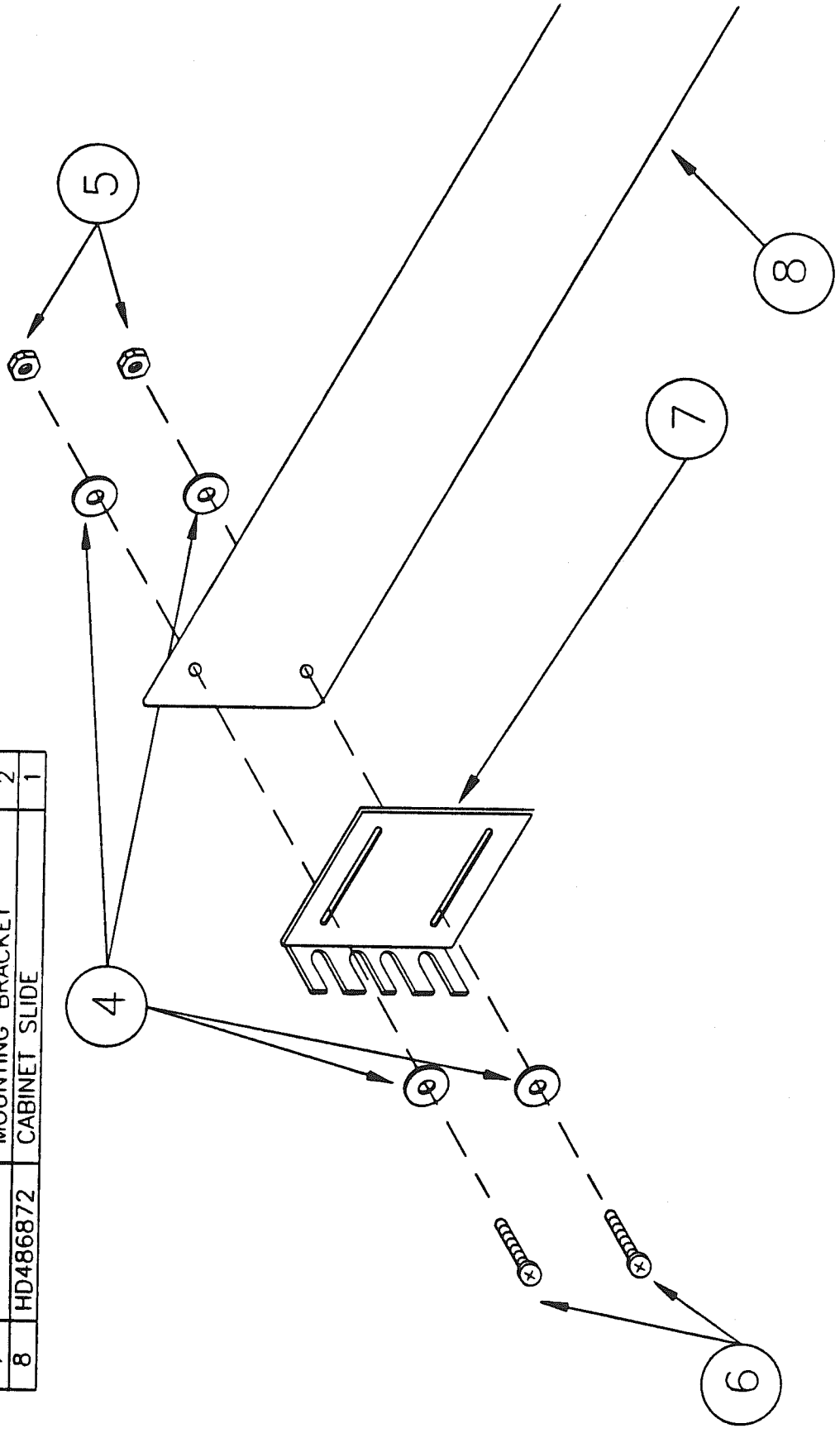


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DETAIL 'A'

MOUNTING BRACKET ASSEMBLY FOR THE V195

	PART NUM.	DESCRIPTION	QTY.
1	HD911251	10-32 X 3/8 PH 100° FH	8
2	HD911106	10-32 X 1/2 PHFLT	10
3	HD487104	ADAPTOR-CABINET SLIDE	2
4	HD913044	#10 FLT WASHER	8
5	HD912005	#10-32 KEPNUT	4
6	HD911145	10-32 X 1/2 PH PAN	4
7		MOUNTING BRACKET	2
8	HD486872	CABINET SLIDE	1

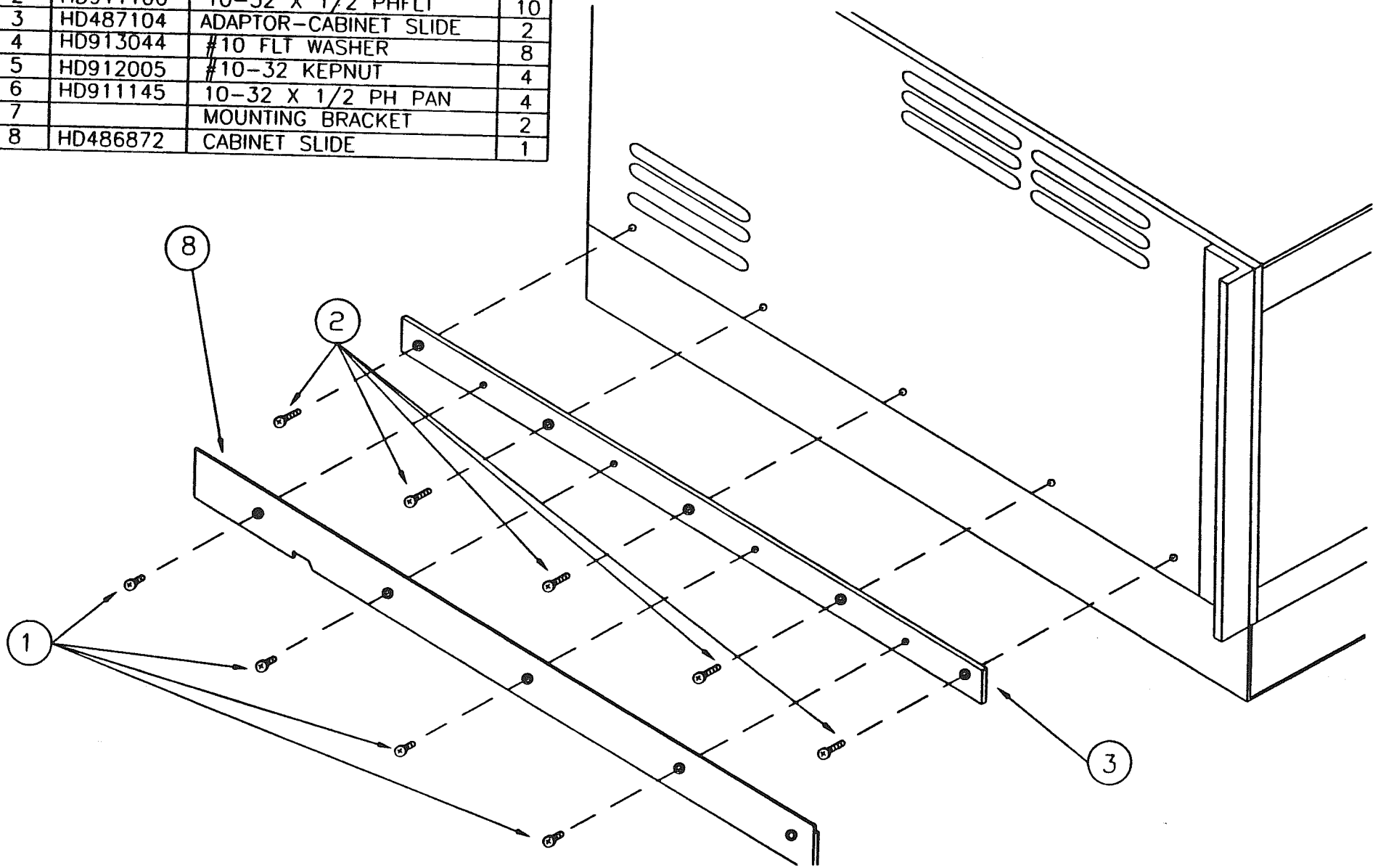


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DETAIL 'B'

SOLID BEARING SLIDES FOR THE V195 MAINFRAME WITHOUT FRONT HOUSING OPTIONS

	PART NUM.	DESCRIPTION	QTY.
1	HD911251	10-32 X 3/8 PH 100° FH	8
2	HD911106	10-32 X 1/2 PHFLT	10
3	HD487104	ADAPTOR-CABINET SLIDE	2
4	HD913044	#10 FLT WASHER	8
5	HD912005	#10-32 KEPNUT	4
6	HD911145	10-32 X 1/2 PH PAN	4
7		MOUNTING BRACKET	2
8	HD486872	CABINET SLIDE	1



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