

Allen-Bradley
1397
Enhanced Field Supply
Cat. Nos. 1397-FS3010
1397-FS3020

What This Option Provides

When installed, the Enhanced Field Supply Card provides greater control over the field output for 230 or 460V drives, allowing the user to directly match the rated DC motor field voltage.

Where This Option Is Used

This option may be used with all 230 or 460V 1397 Drives.

Catalog Number	Enhanced Field Supply Amp Rating
1397-FS3010	10A
1397-FS3020	20A

What These Instructions Contain

These instructions contain the necessary information to install and configure a 1397 Enhanced Field Supply Card. For additional information on cable and wire recommendations, parameter programming and function block diagrams, refer to the 1397 User Manual — Publication 1397-5.0.

Installation



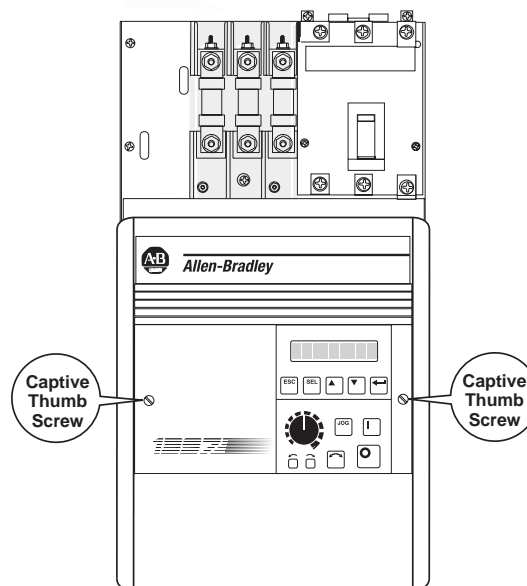
ATTENTION: This drive and board contain ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing or repairing the drive or board. Component damage may result if ESD control precautions are not followed. If you are not familiar with static control procedures, reference AB publication 8000-4.5.2, "Guarding Against Electrostatic Damage" or any other applicable ESD protection handbook.



ATTENTION: Electric Shock can cause injury or death. Remove all power before working on this product. The drive is at line voltage when connected to incoming AC power. Before proceeding with any installation or troubleshooting activity, disconnect, lockout and tag all incoming power to the drive. Verify with a voltmeter that no voltage exists at terminals L1, L2 and L3 on the drive input power terminal block.

❑ 1 Remove and lockout all incoming power to the drive.

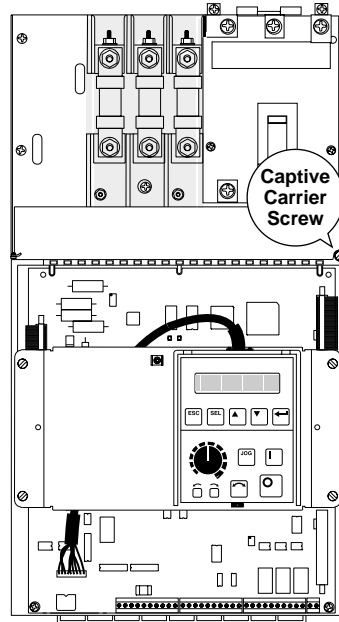
❑ 2 For 1.5-30HP/230V drives & 3-60HP/460V drives, loosen the (2) captive thumb screws to remove the drive cover.



**1.5-30HP/230V and 3-60HP/460V Drives
with Drive Cover in Place**

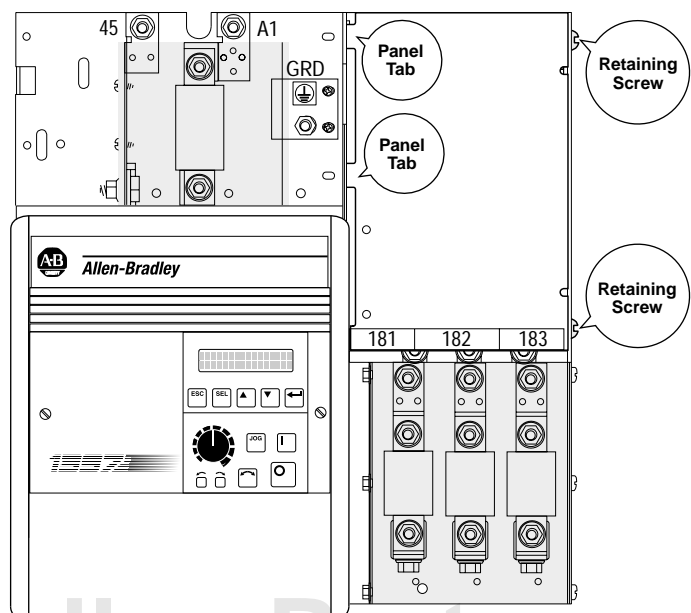
Installation, Cont'd

- ❑ 3 Loosen the captive carrier retaining screw to swing the carrier door open.



**1.5-30 HP/230V and 3-60HP/460V Drives
with Carrier Door Closed**

- ❑ 4a For 40-75HP/230V drives & 75-150HP/460V drives without an AC line disconnect, loosen the (2) auxiliary panel cover retaining screws. To lift out the auxiliary panel, loosen the screws only enough to allow the panel tabs to slide out.



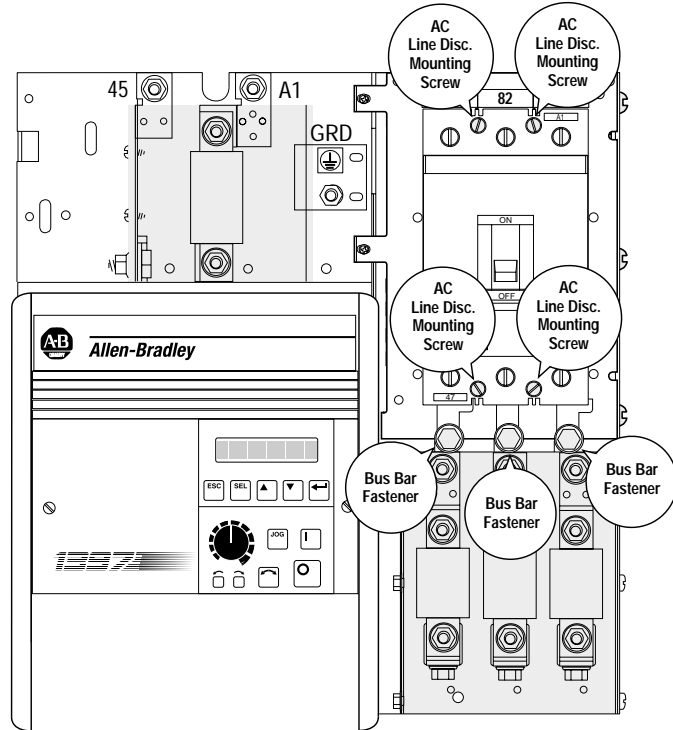
**40-75 HP/230V and 75-150 HP/460V Drives
with Auxiliary Panel Cover**

Installation, Cont'd

- ❑ 4b For 40-75HP/230V & 75-150HP/460V drives with an AC line disconnect switch, both the disconnect switch and disconnect panel must be removed.

To remove the disconnect switch from the disconnect panel:

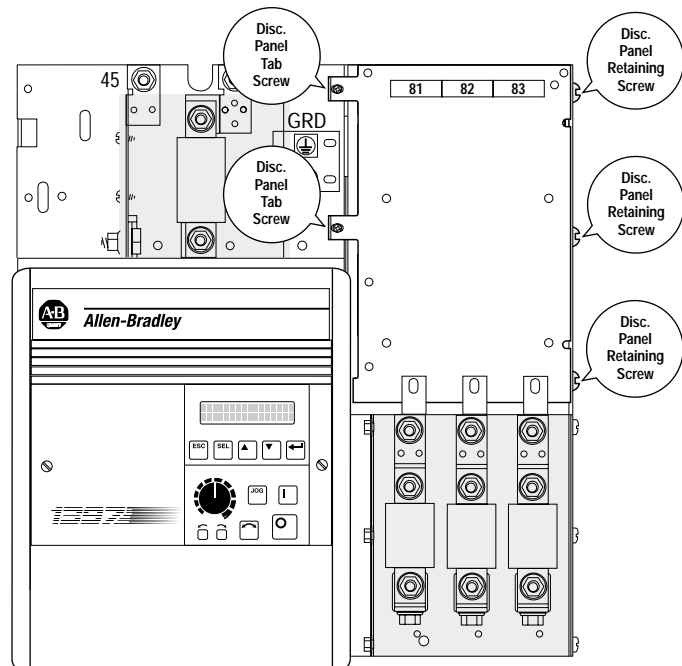
- Remove the (3) bus bar 1/4" (250A disconnect) or 3/8" (400A disconnect) fasteners.
- Remove the (4) AC line disconnect mounting screws.



40-75 HP/230V and 75-150 HP/460V Drives
with AC Line Disconnect

To remove the disconnect panel:

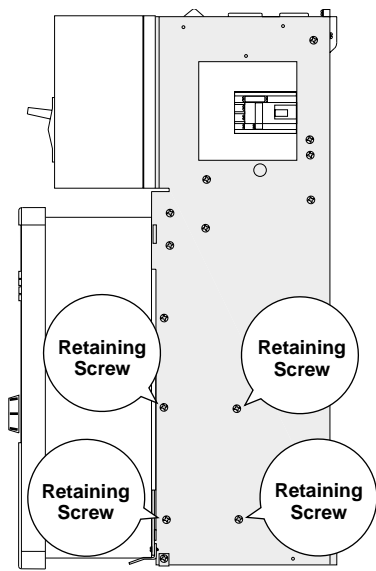
- Remove the (2) disconnect panel tab screws to free the tabs.
- Remove the top and bottom disconnect retaining screws.
- Loosen the middle disconnect panel retaining screw to slide out the disconnect panel for removal.



40-75 HP/230V and 75-150 HP/460V Drives
with AC Line Disconnect Removed

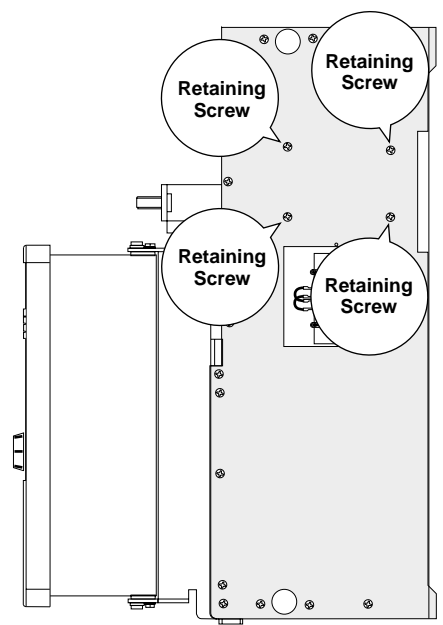
Installation, Cont'd

- 5 To remove either the Fixed or Regulated Field Supply, remove the (4) retaining screws from the outside right side panel.

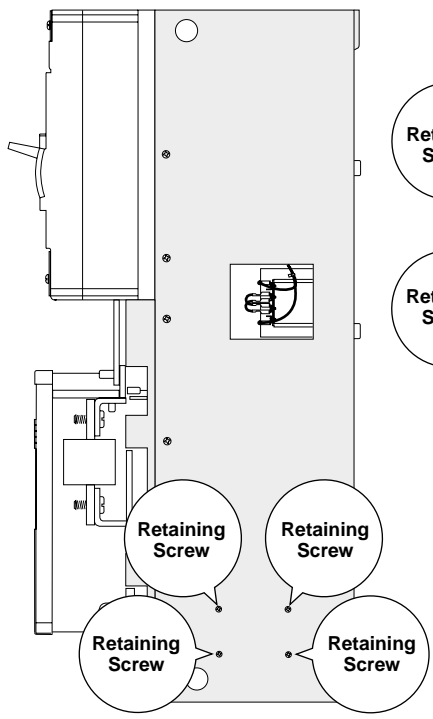


**1.5-30 HP/230V Drives
3-60 HP/460V Drives**

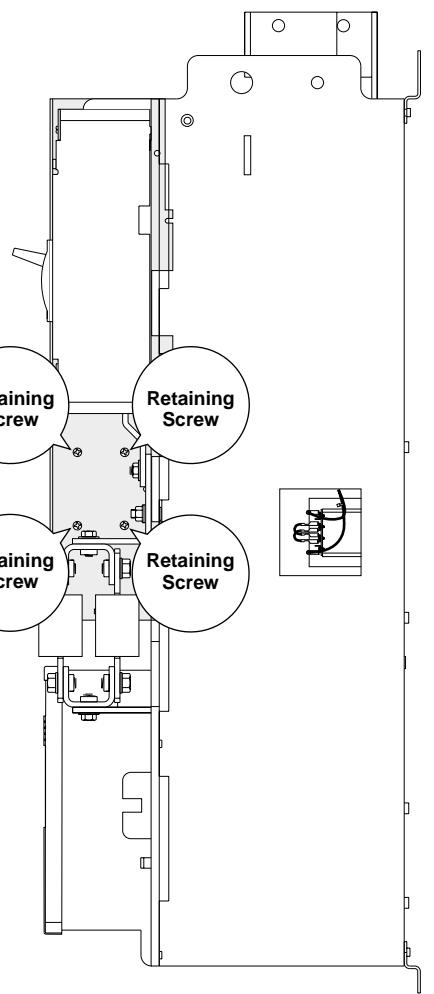
Outside Right Side Panel



**40-75 HP/230V Drives
75-150 HP/460V Drives**



**100-150 HP/230V Drives
200-300 HP/460V Drives**

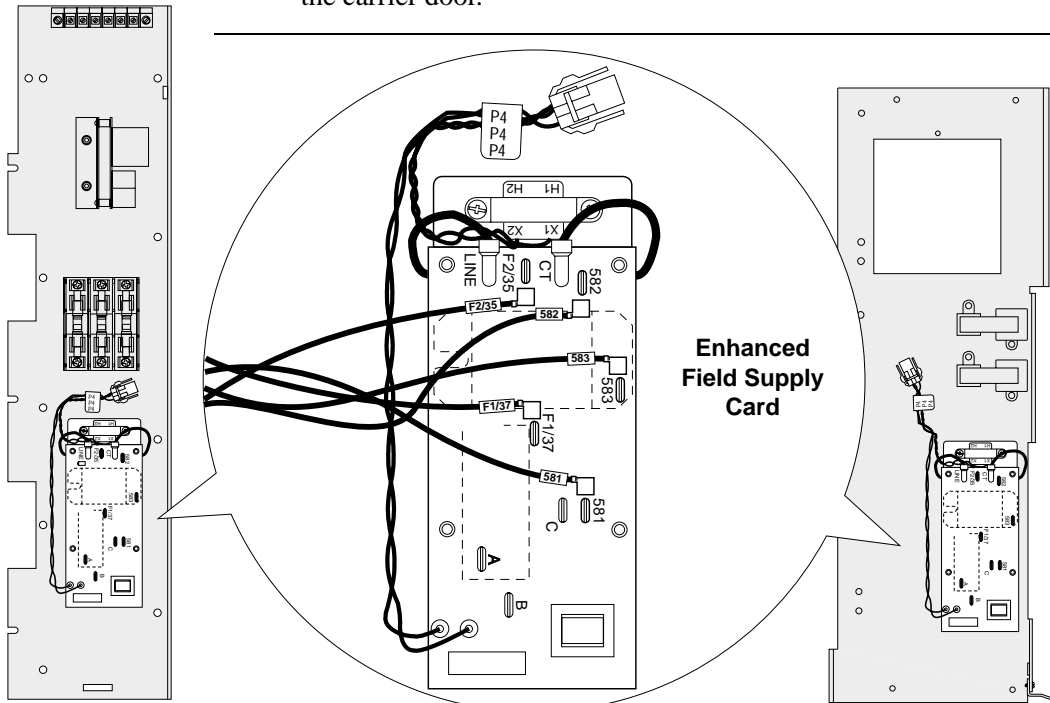


400-600 HP/460V Drives

Installation, Cont'd

Inside
Right Side Panel

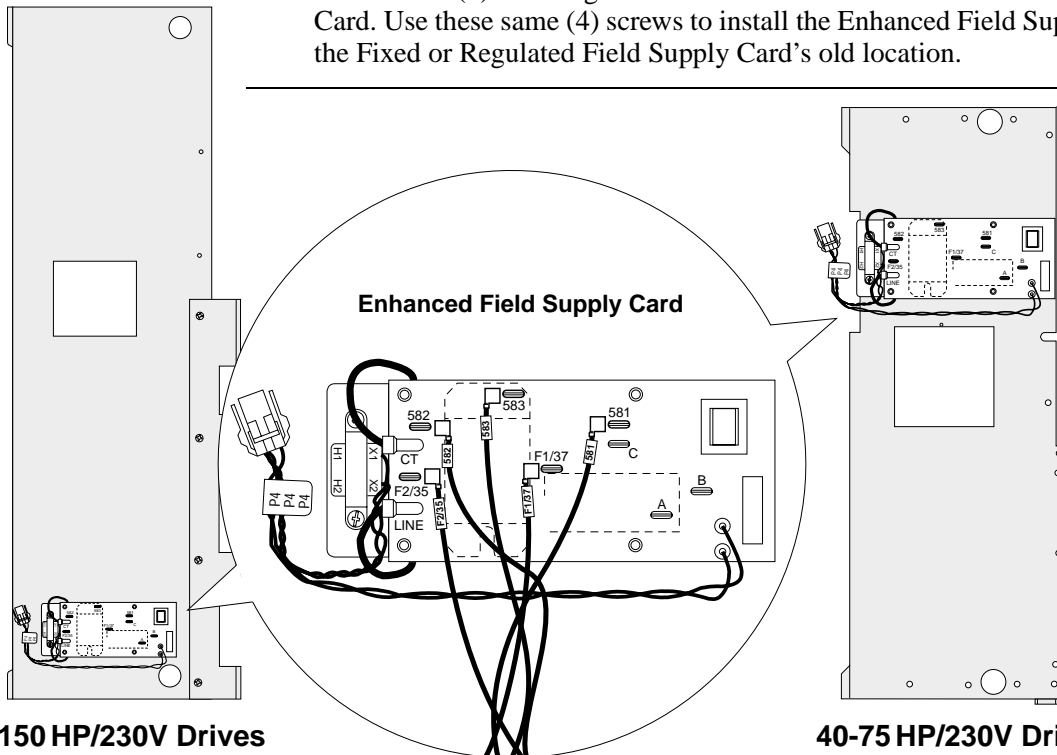
- ❑ 6 Unplug the (5) fast-on connectors from the Fixed or Regulated Field Supply Card.
 - For the Fixed Field Supply, unplug the P4 connector from the Power Interface Board to free the card.
 - For the Regulated Field Supply, unplug the Regulated Field Supply Cable assembly at Regulator Board Connector J25 to route the cable back through the carrier door.



400-600 HP/460V Drives

**1.5-30 HP/230V Drives
3-60 HP/460V Drives**

- ❑ 7 Remove the (4) retaining screws from the back of the Enhanced Field Supply Card. Use these same (4) screws to install the Enhanced Field Supply card in the Fixed or Regulated Field Supply Card's old location.



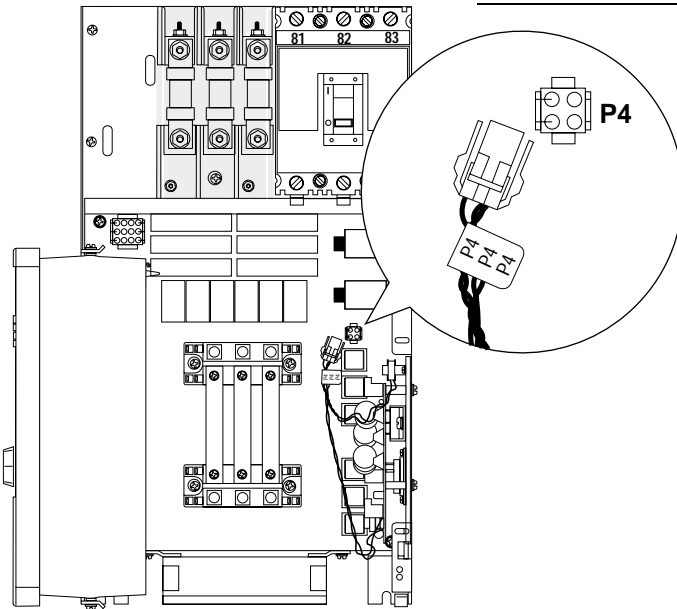
**100-150 HP/230V Drives
200-300 HP/460V Drives**

**40-75 HP/230V Drives
75-150 HP/460V Drives**

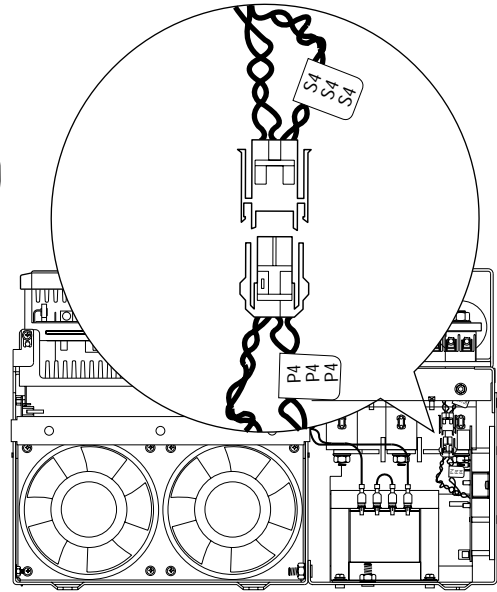
Installation, Cont'd

- 8 For 1.5-30HP/230V & 3-60HP/460V drives, plug the Enhanced Field Supply connector P4 into Power Interface Board connector P4.

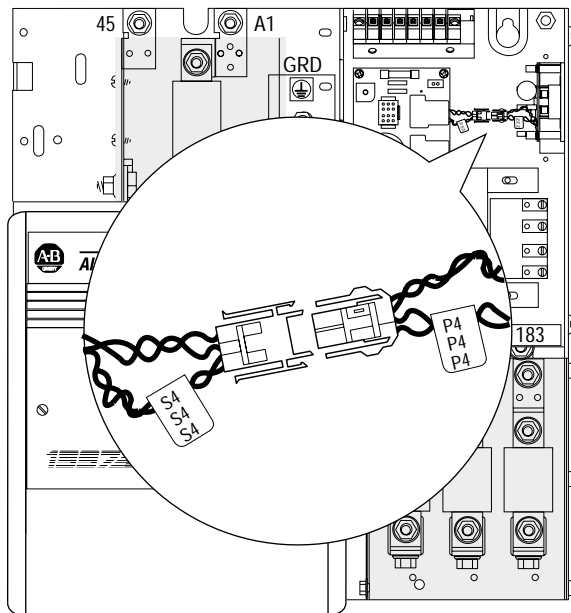
For 40-150HP/230V drives & 75-600HP/460V drives, plug the Enhanced Field Supply connector P4 into Power Interface Board connector S4.



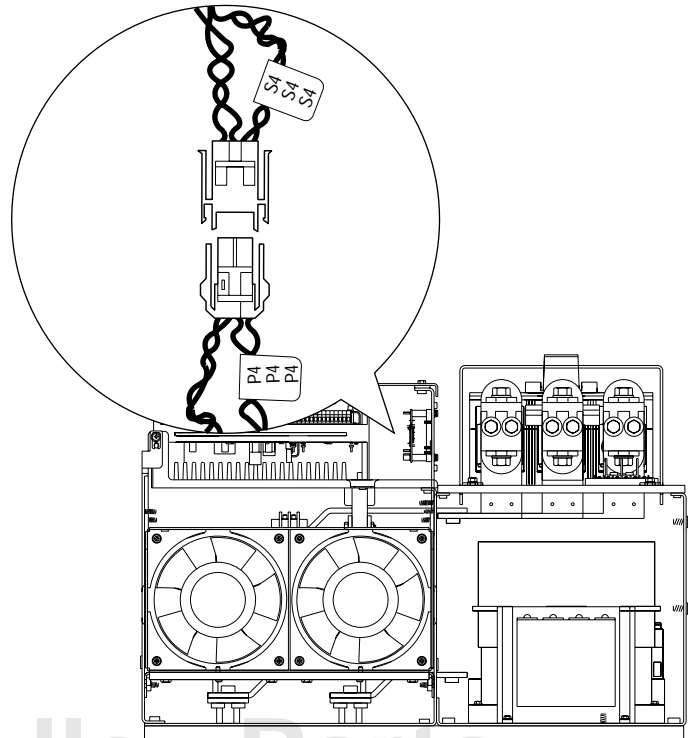
**1.5-30 HP/230V Drives
3-60 HP/460V Drives
with Carrier Door Open**



**100-150 HP/230V Drives
200-300 HP/460V Drives
— Bottom —**



**40-75 HP/230V Drives
75-150 HP/460V Drives
with Auxiliary Panel Cover Removed**

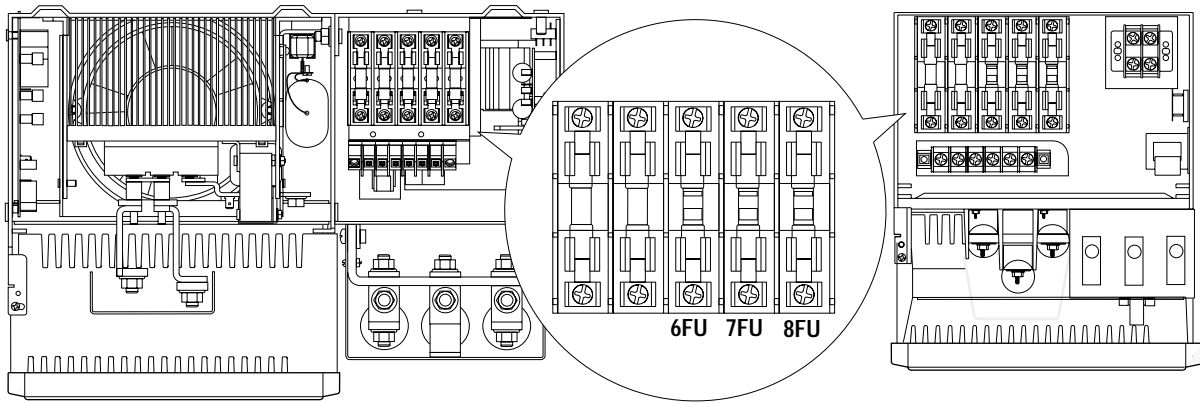


400-600 HP/460V Drives — Bottom

Installation, Cont'd

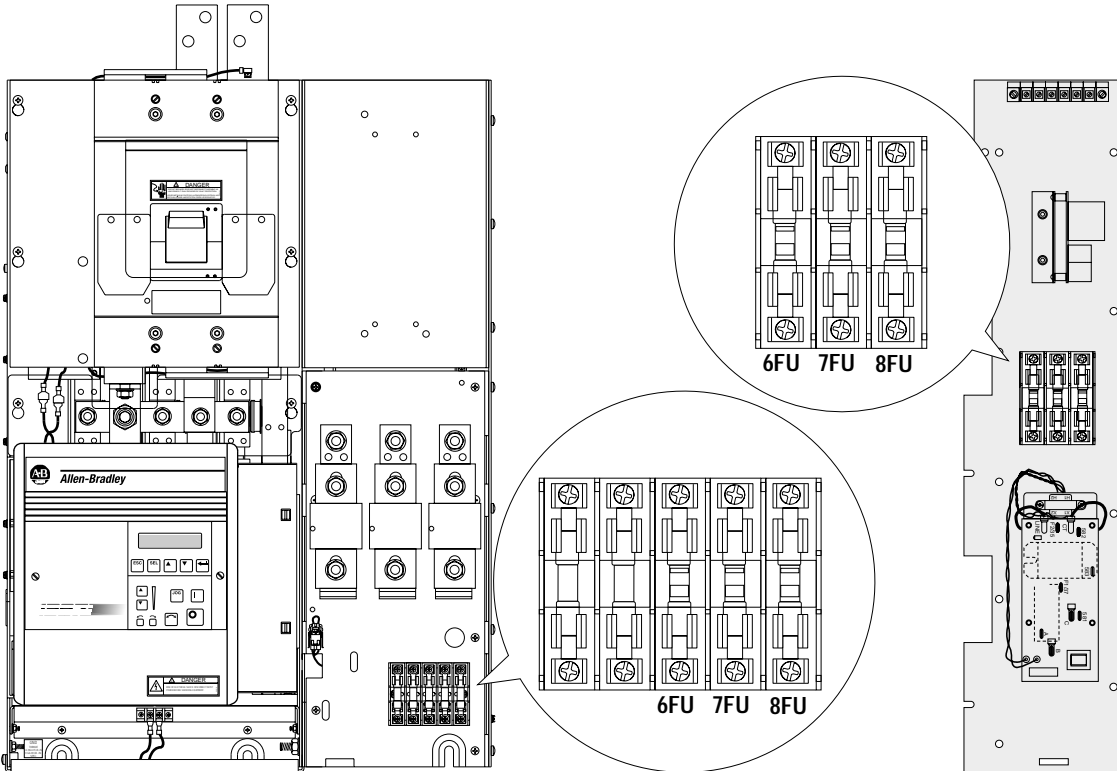
- 9 Replace fuses 6FU, 7FU & 8FU with the (3) UL class CC/600V/25A fuses included with the kit.

Locate the replacement fuse table on the back of the carrier. Attach one of the adhesive fuse rating labels (P/N 179540) over the 600V 15A designations as shown in the illustration.



— Top —
40-75 HP/230V Drives
75-150 HP/460V Drives

— Top —
1.5-30 HP/230V Drives
3-60 HP/460V Drives



— Front —
100-150 HP/230V Drives
200-300 HP/460V Drives

— Inside Right Side Panel —
400-600 HP/460V Drives

Label Replacement

REPLACE FUSES WITH:				
HP @ 230VAC	11FU BRUSH type XL70F	1FU 2FU 3FU BRUSH type XL50F	4FU 5FU LITTELFUSE type KLDR	6FU 7FU 8FU CLASS CC non-time delay
1.5	700V 15A	500V 40A	600V 1.5A	600V 15A
2	700V 20A			
3	700V 25A			
5	700V 35A			
7.5	700V 40A	500V 80A	600V .6A	600V 15A
10	700V 50A			
15	700V 70A			
3	700V 15A	500V 40A	600V .6A	600V 15A
5	700V 20A			
7.5	700V 25A			
10	700V 35A			
15	700V 40A	500V 80A	600V .6A	600V 15A
20	700V 50A			
25	700V 60A			
30	700V 70A			
HP @ 460VAC	11FU BRUSH type XL70F	1FU 2FU 3FU BRUSH type XL50F	4FU 5FU LITTELFUSE type KLDR	6FU 7FU 8FU CLASS CC non-time delay

600V 25A

802273-34B

Typical Fuse Label Replacement
(3 to 60 HP @ 460 VAC Drives Shown)

Installation, Cont'd

- ❑ 10 If required, reinstall the auxiliary panel cover or AC line disconnect removed in steps 4a & 4b. Torque the (3) bus bar fasteners to the values listed below.

Fastener Size	Maximum Torque
1/4"	7.46 N-m (66 lb.-in.)
3/8"	26.66 N-m (236 lb.-in.)

Setup

(3) drive parameters, Jumper 21 on the drive's Regulator Board, and the Enhanced Field Supply Card's jumper wire must be set to configure the Enhanced Field Supply Card. The J21 Jumper on the Regulator Board must be set to the same setting as the Enhanced Field Supply.

P.050 — Nominal AC Freq

This parameter must be set to match the AC input line's frequency.

P.273 — Fld Econ Delay

Some motor fields may not be able to withstand the power dissipated under full field voltage with the motor stopped. Parameter P.273 [Fld Econ Delay] allows a fixed reduction of field voltage to be set for a user specified amount of time while the motor is stopped. When restarted, the motor will be returned to the full field output voltage level set by P.272 [E-Fld Volts Adj].

Allen-Bradley Parts

Setup, Cont'd

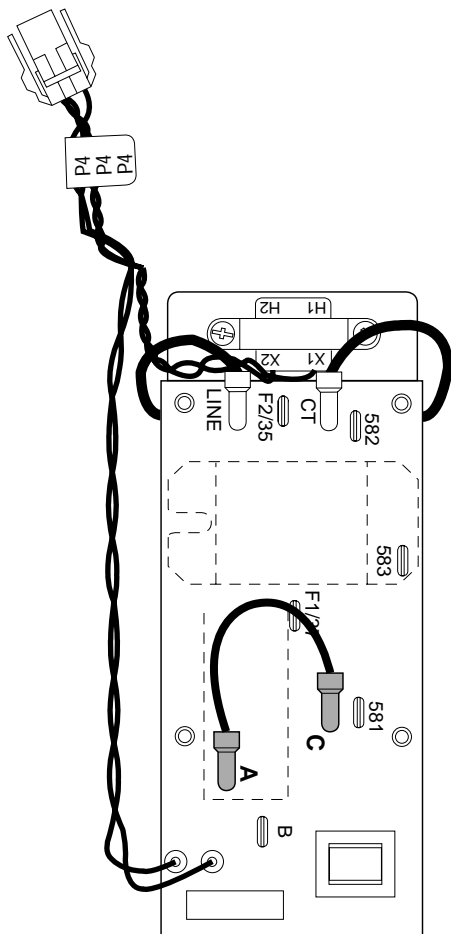
P.272 — E-Fld Volts Adj

Parameter P.272 [E-Fld Volts Adj] is used to match the drive's rated field voltage to different DC motor field voltages. A field voltage below the motor's rated value can operate the motor above rated base speed with reduced torque. A voltage above the motor's rated base speed however, could also result in armature overvoltage and overheating of the motor's field windings.

Shown below and on the following page is the range of output motor field voltages available using the Enhanced Field Supply Card. With the Enhanced Field Supply Card, output voltage to the motor field is set equal to the AC input line voltage times a line multiplier.

Where: The Line Multiplier = $\frac{\text{The Motor Nameplate Field Voltage}}{\text{AC Line Input Voltage}}$

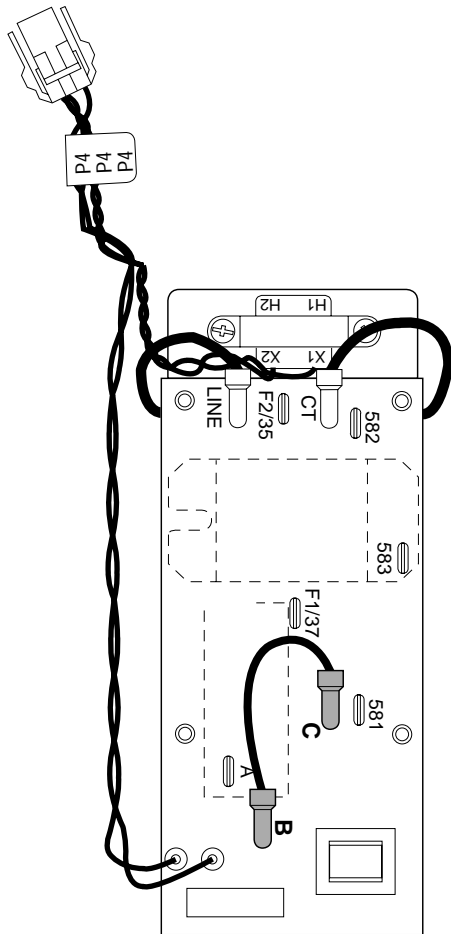
The following line multipliers correspond to an Enhanced Field Supply Jumper setting of either A-C or B-C. The shaded values shown correspond to settings for parameter P.272 [E-Fld Volts Adj] as explained in the example on the following page. Jumper J21 on the drive's Regulator Board must then be set to match the calculated A-C or B-C range.



A-C Jumper Settings

Enhanced Field Supply Jumper Set to A-C										
Drive Input Volts	Minimum Output Motor Field Volts									Maximum Output Motor Field Volts
230/460VAC	VDC = 0.9 × VAC									VDC = 1.12 × VAC
P.272 →	0	1	2	3	4	5	6	7	8	9
↓	000	010	020	030	040	050	060	070	080	090
	0.9003	0.9004	0.9005	0.9006	0.9009	0.9012	0.9015	0.9020	0.9025	0.9031
	0.9037	0.9045	0.9052	0.9061	0.9070	0.9080	0.9090	0.9102	0.9113	0.9126
	0.9139	0.9153	0.9167	0.9182	0.9198	0.9214	0.9231	0.9248	0.9267	0.9285
	0.9305	0.9325	0.9345	0.9366	0.9388	0.9410	0.9433	0.9456	0.9480	0.9505
	0.9530	0.9555	0.9581	0.9608	0.9635	0.9662	0.9690	0.9719	0.9748	0.9777
	0.9807	0.9837	0.9868	0.9899	0.9931	0.9963	0.9995	1.0028	1.0061	1.0095
	1.0129	1.0162	1.0196	1.0229	1.0262	1.0294	1.0326	1.0358	1.0389	1.0420
	1.0450	1.0480	1.0509	1.0538	1.0567	1.0595	1.0622	1.0649	1.0676	1.0702
	1.0727	1.0752	1.0777	1.0801	1.0824	1.0847	1.0870	1.0891	1.0912	1.0932
	1.0952	1.0972	1.0990	1.1009	1.1026	1.1043	1.1059	1.1075	1.1090	1.1104
	1.1118	1.1131	1.1144	1.1156	1.1167	1.1177	1.1187	1.1196	1.1205	1.1213
	1.1220	1.1226	1.1232	1.1237	1.1242	1.1245	1.1248	1.1251	1.1253	1.1254
	1.1252	—	—	—	—	—	—	—	—	—

Setup, Cont'd



B-C Jumper Settings

Enhanced Field Supply Jumper Set to B-C										
Drive Input Volts	Minimum Output Motor Field Volts									
230/460VAC	VDC = 0.45 × VAC									
	Maximum Output Motor Field Volts									
	VDC = 0.9 × VAC									
P.272→ ↓	0	1	2	3	4	5	6	7	8	9
000	0.4502	0.4502	0.4503	0.4505	0.4507	0.4510	0.4514	0.4518	0.4523	0.4529
010	0.4536	0.4543	0.4551	0.4559	0.4568	0.4578	0.4589	0.4600	0.4612	0.4624
020	0.4637	0.4651	0.4665	0.4681	0.4696	0.4712	0.4729	0.4747	0.4765	0.4784
030	0.4803	0.4823	0.4844	0.4865	0.4886	0.4909	0.4931	0.4955	0.4979	0.5003
040	0.5028	0.5054	0.5080	0.5106	0.5133	0.5161	0.5189	0.5217	0.5246	0.5276
050	0.5306	0.5336	0.5367	0.5398	0.5429	0.5461	0.5494	0.5527	0.5560	0.5593
060	0.5627	0.5661	0.5696	0.5731	0.5766	0.5801	0.5837	0.5873	0.5909	0.5946
070	0.5983	0.6020	0.6057	0.6094	0.6132	0.6170	0.6208	0.6246	0.6284	0.6323
080	0.6362	0.6400	0.6439	0.6478	0.6517	0.6556	0.6595	0.6635	0.6674	0.6713
090	0.6752	0.6792	0.6831	0.6870	0.6909	0.6940	0.6988	0.7027	0.7066	0.7104
100	0.7143	0.7182	0.7220	0.7259	0.7297	0.7335	0.7373	0.7410	0.7448	0.7485
110	0.7522	0.7559	0.7596	0.7632	0.7668	0.7704	0.7739	0.7774	0.7809	0.7844
120	0.7878	0.7912	0.7945	0.7978	0.8011	0.8043	0.8075	0.8107	0.8138	0.8169
130	0.8199	0.8229	0.8258	0.8287	0.8316	0.8344	0.8371	0.8398	0.8425	0.8451
140	0.8477	0.8502	0.8526	0.8550	0.8573	0.8596	0.8618	0.8640	0.8661	0.8682
150	0.8702	0.8721	0.8740	0.8758	0.8775	0.8792	0.8809	0.8824	0.8838	0.8854
160	0.8867	0.8881	0.8893	0.8905	0.8916	0.8926	0.8936	0.8945	0.8954	0.8962
170	0.8969	0.8975	0.8981	0.8986	0.8991	0.8995	0.8998	0.9000	0.9002	0.9003
180	0.9003	—	—	—	—	—	—	—	—	—

Example

A 230VAC, 60Hz input is connected to the drive. The drive's output is connected to a 15HP DC motor with a nameplate field voltage of 150VDC.

$$\text{The Line Multiplier} = \frac{150}{230} = 0.6522$$

0.6522 is within the B-C jumper range of 0.45-0.9. In the B-C Jumper settings table, 0.6522 is closest to 0.6517.

Therefore:

1. Set Enhanced Field Supply Jumper to B-C.
2. Set drive Regulator Board Jumper J21 to B-C.
3. Set parameter P.272 [E-Fld Volts Adj] to 84 (080 + 4).



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