

Allen-Bradley
1397
Enhanced Field Supply Card
Cat. Nos. 1397-FS1010
1397-FS1020

What This Option Provides

When installed, the Enhanced Field Supply Card provides greater control over the field output for 230V 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 230V 1397 Drives.

Catalog Number	Enhanced Field Supply Amp Rating
1397-FS1010	10A
1397-FS1020	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.

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Installation



ATTENTION: This board contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing or repairing this assembly. 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.

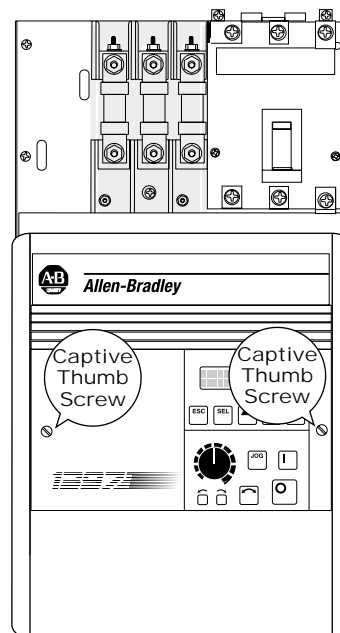


ATTENTION: Electric Shock can cause injury or death. Remove all power before working on this product.

The drive is at line voltage when connected to incoming AC power. Before proceeding with any installation or troubleshooting activity, disconnect, lock out, 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 lock-out all incoming power to the drive.

- 2 For 1.5-30HP Drives, loosen the (2) captive thumb screws to remove the drive cover.

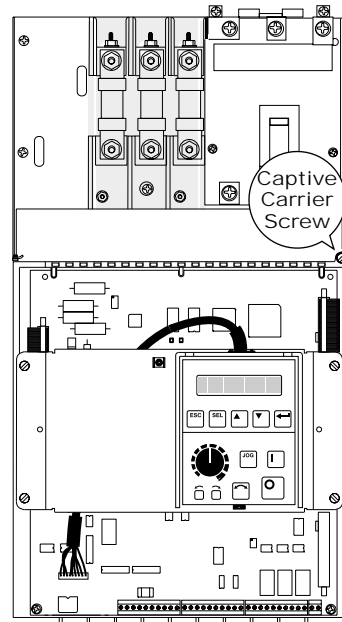


1.5-30HP Drives with Drive Cover in Place

Installation

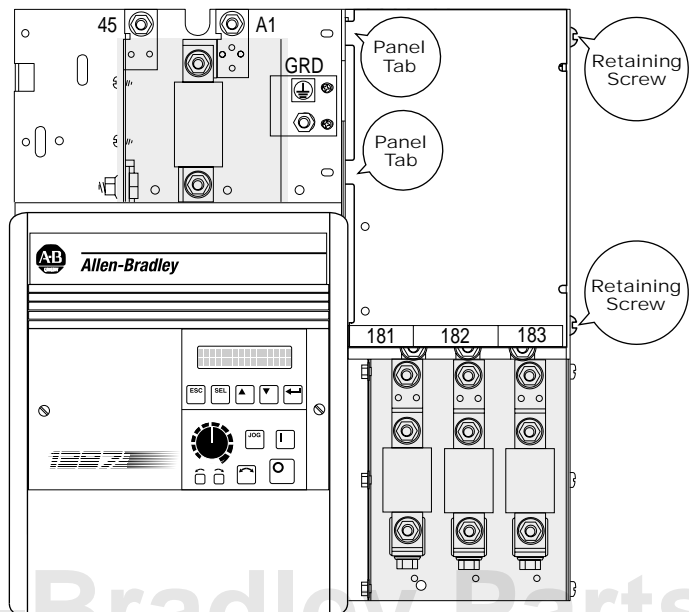
(continued)

- ❑ 3 For 1.5-30HP Drives, loosen the captive carrier retaining screw to swing the carrier door open.



1.5-30HP Drives with Carrier Door Closed

- ❑ 4a For 40-75HP 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.



40-75HP Drives with Auxiliary Panel Cover

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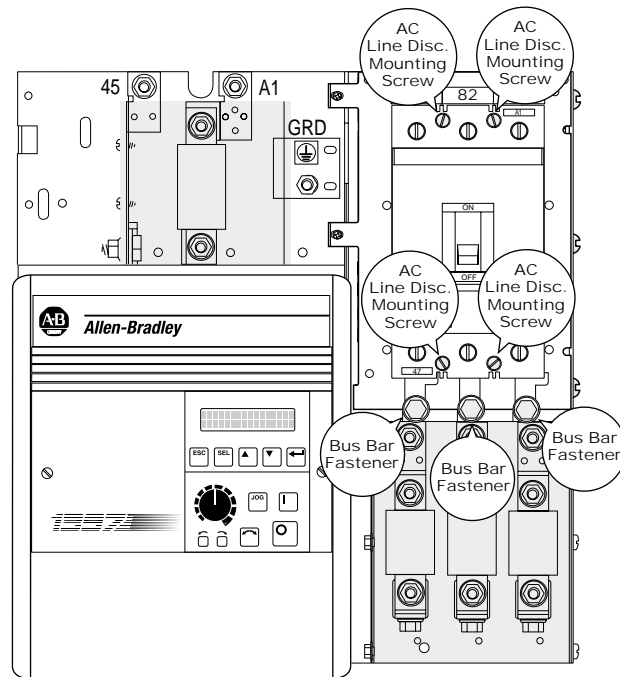
Installation

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- ❑ 4b For 40-75HP Drives with an AC line disconnect, both the disconnect switch and disconnect panel must be removed.

To remove the disconnect switch from the disconnect panel:

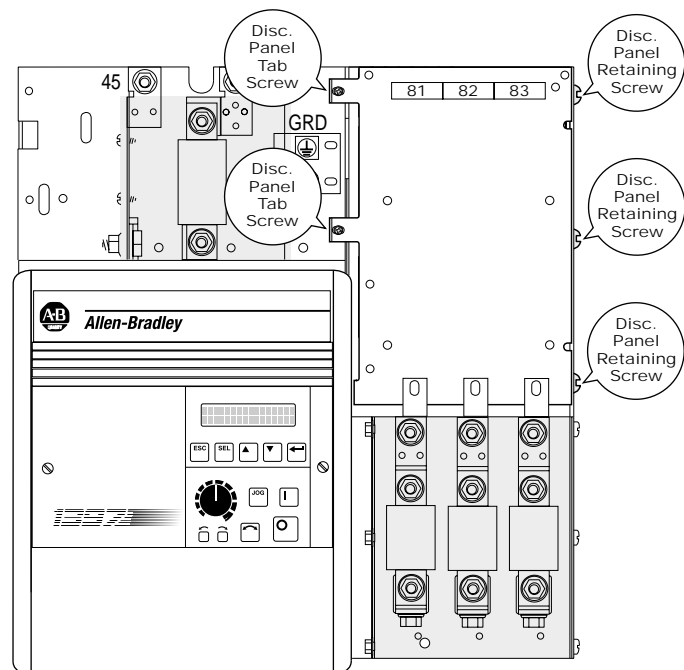
- Remove the (3) bus bar $\frac{1}{4}$ "(250A disconnect) or $\frac{3}{8}$ "(400A disconnect) fasteners.
- Remove the (4) AC line disconnect mounting screws.



40-75HP 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 panel retaining screws.
- Loosen the middle disconnect panel retaining screw to slide out the disconnect panel for removal.



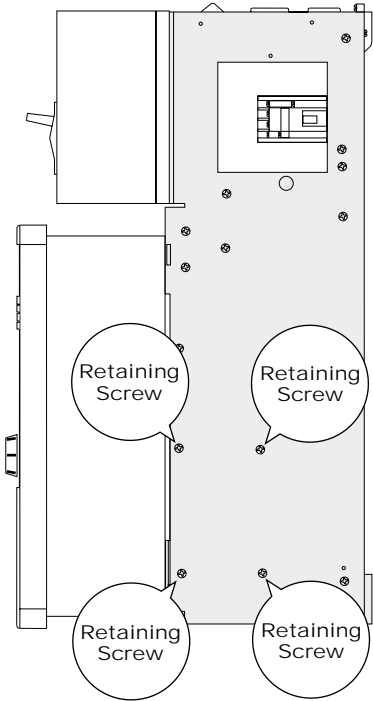
40-75HP Drives with AC Line Disconnect Removed

Installation

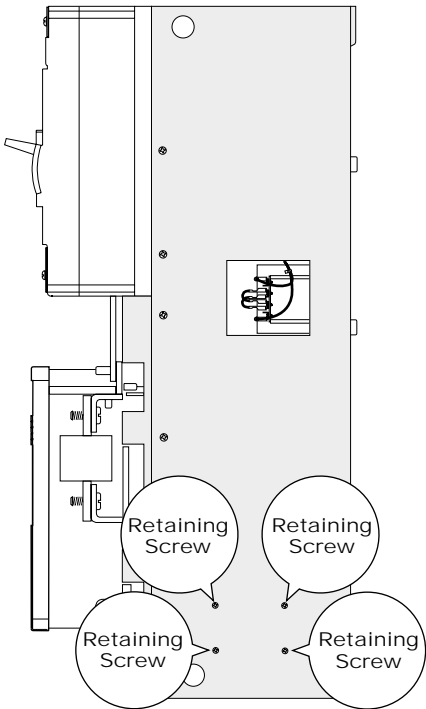
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- ❑ 5 To remove either the Fixed or Regulated Field Supply, remove the (4) retaining screws from the outside right side panel.

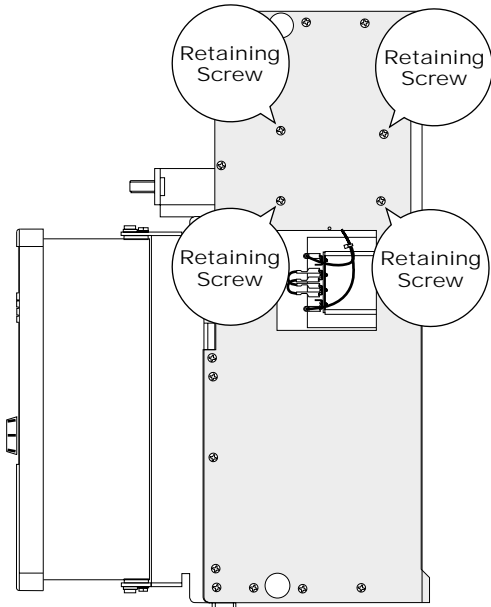
Outside Right Side Panel



1.5-30HP Drives



100-150HP Drives



40-75HP Drives

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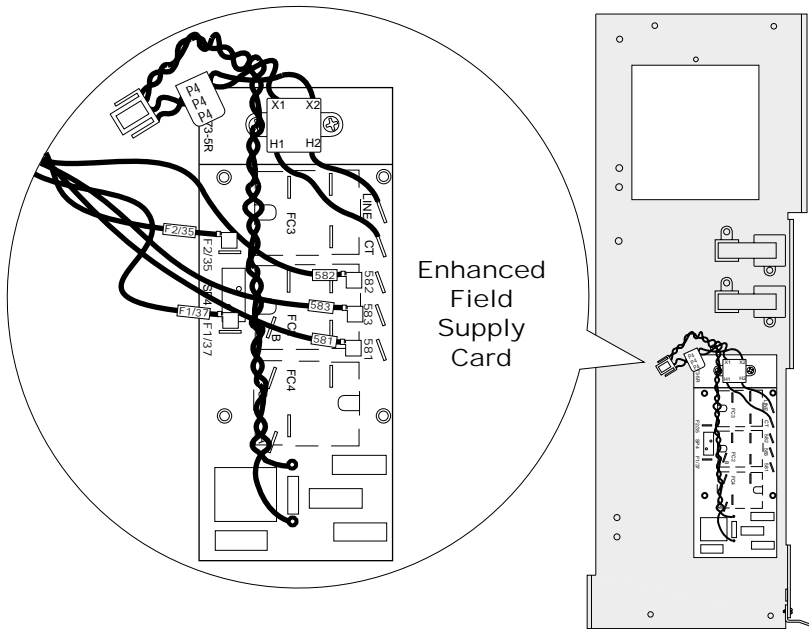
Installation

(continued)

- ❑ 6 Unplug the (5) blue fast-on connectors from the Fixed or Regulated Field Supply Card.

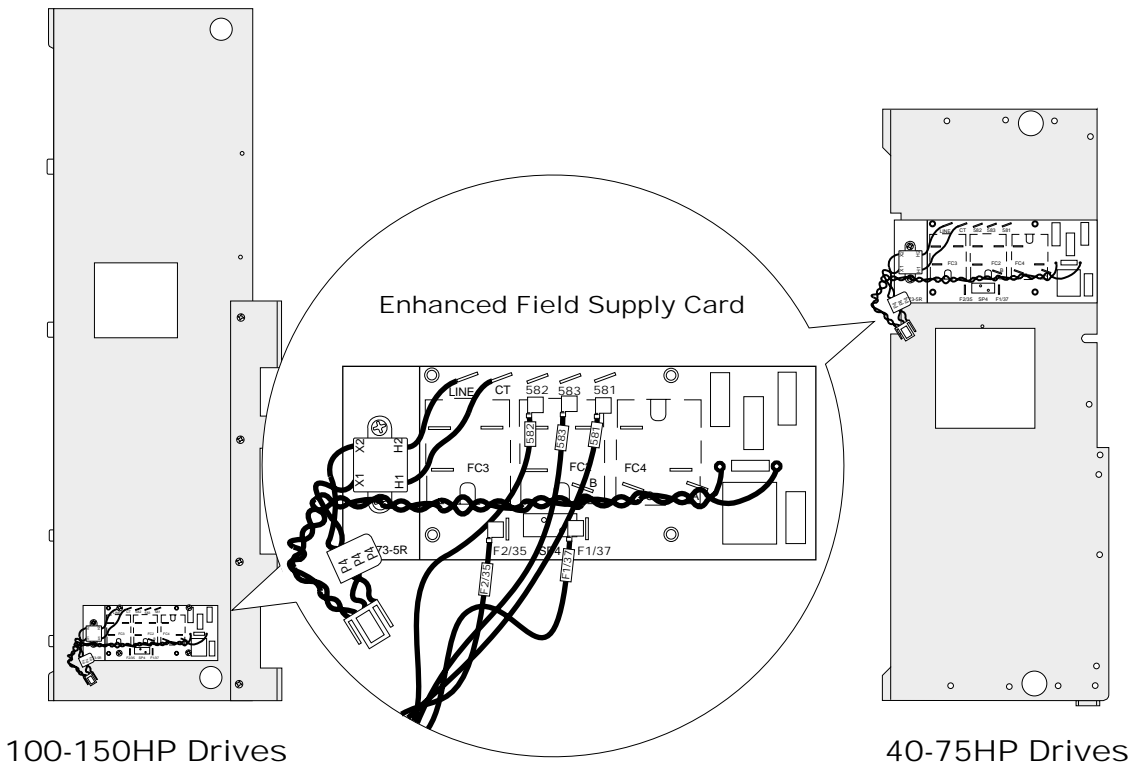
- For the Fixed Field Supply, unplug the red P4 connector from the Power Interface Board to free the card.
- For the Regulated Field Supply, unplug the Regulated Field Supply cable assembly at Regulator Board Connector J25 to route the cable back through the carrier door.

Inside Right Side Panel



1.5-30HP 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.



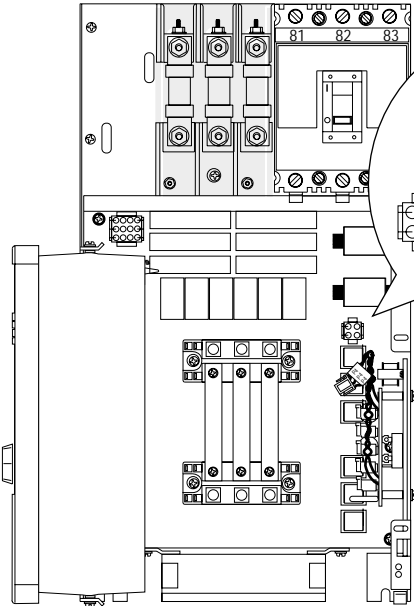
100-150HP Drives

40-75HP Drives

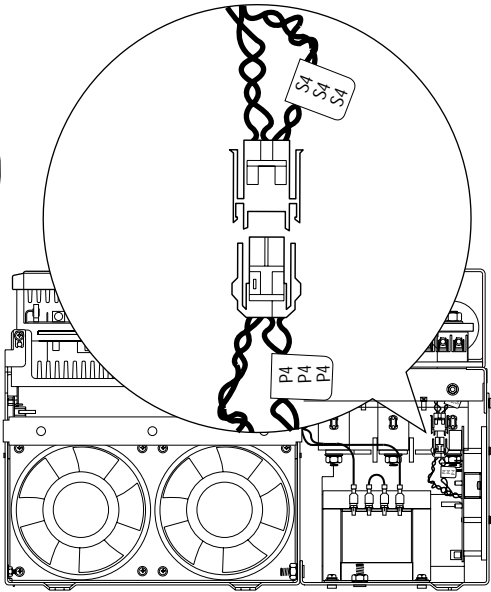
Installation

(continued)

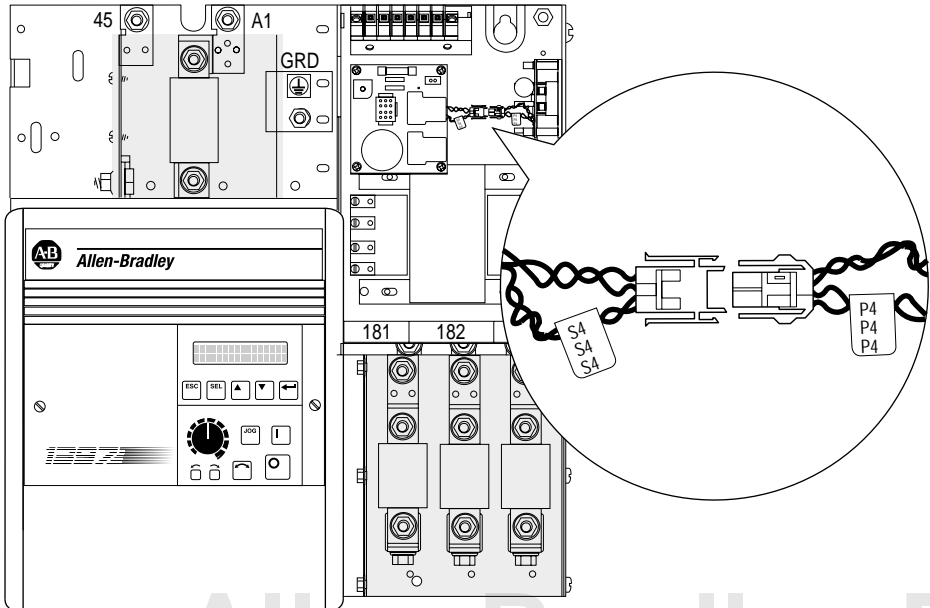
- 8 For 1.5-30HP Drives, plug the Enhanced Field Supply connector P4 into Power Interface Board connector P4.
For 40-150HP Drives, plug the Enhanced Field Supply connector P4 into Power Interface Board connector S4.



1.5-30HP Drives with Carrier Door Open



100-150HP Drives — Bottom



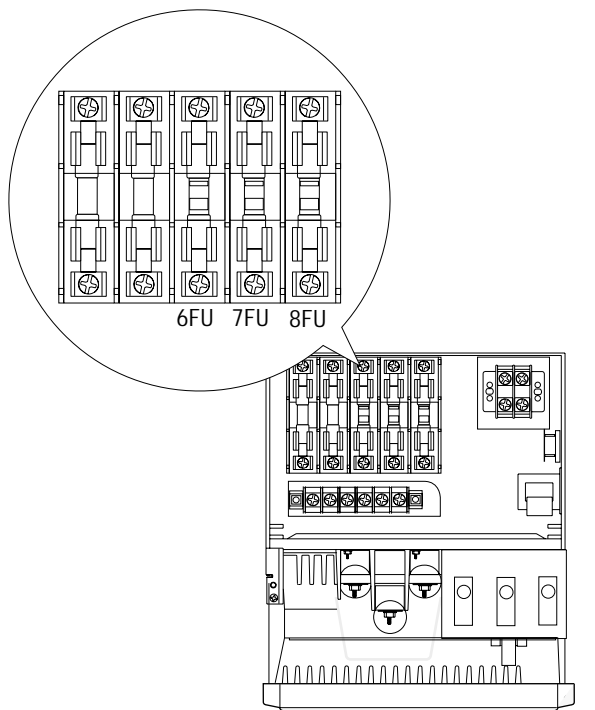
40-75HP Drives with Auxilliary Panel Cover Removed

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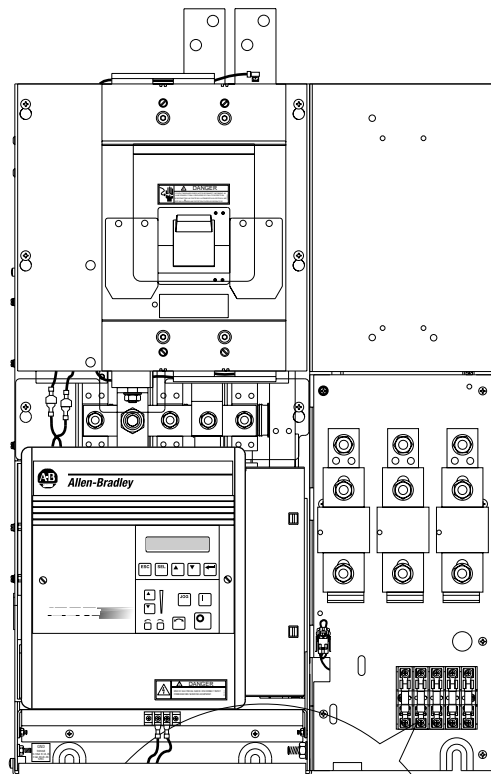
Installation

(continued)

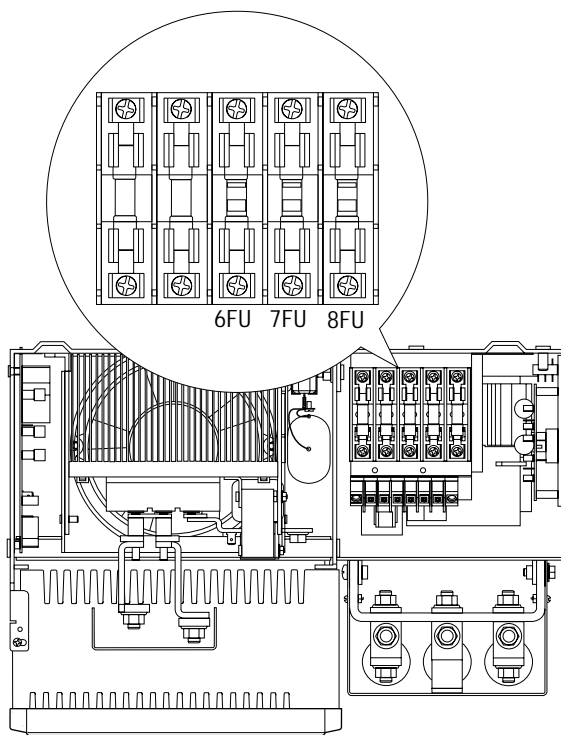
- 9 Replace fuses 6FU, 7FU & 8FU with the (3) UL Class CC/600V/25A fuses included with the kit.



Top — 1.5-30HP Drives



Front — 100-150HP Drives



Top — 40-75HP Drives

Installation

(continued)

- ❑ 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.

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].

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Setup

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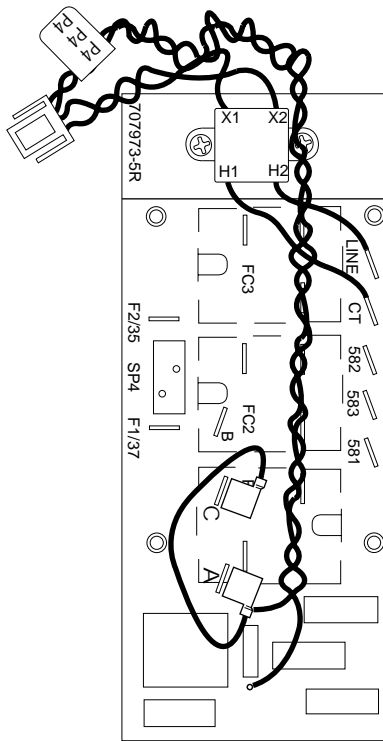
P.272 E-Fld Volts Adj

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.

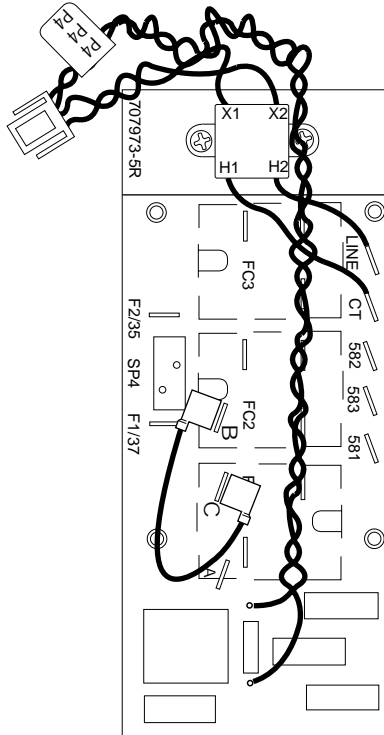
$$\text{Where: The Line Multiplier} = \frac{\text{The Motor Nameplate Field Voltage}}{\text{AC Line Input Voltage}}$$

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

Drive Input Volts	Enhanced Field Supply Jumper Set to A-C										
	Minimum Output Motor Field Volts	Maximum Output Motor Field Volts									
230VAC	0.9V DC	1.12V DC									
P.272 →	0	1	2	3	4	5	6	7	8	9	
↓	000	0.9003	0.9004	0.9005	0.9006	0.9009	0.9012	0.9015	0.9020	0.9025	0.9031
	010	0.9037	0.9045	0.9052	0.9061	0.9070	0.9080	0.9090	0.9102	0.9113	0.9126
	020	0.9139	0.9153	0.9167	0.9182	0.9198	0.9214	0.9231	0.9248	0.9267	0.9285
	030	0.9305	0.9325	0.9345	0.9366	0.9388	0.9410	0.9433	0.9456	0.9480	0.9505
	040	0.9530	0.9555	0.9581	0.9608	0.9635	0.9662	0.9690	0.9719	0.9748	0.9777
	050	0.9807	0.9837	0.9868	0.9899	0.9931	0.9963	0.9995	1.0028	1.0061	1.0095
	060	1.0129	1.0162	1.0196	1.0229	1.0262	1.0294	1.0326	1.0358	1.0389	1.0420
	070	1.0450	1.0480	1.0509	1.0538	1.0567	1.0595	1.0622	1.0649	1.0676	1.0702
	080	1.0727	1.0752	1.0777	1.0801	1.0824	1.0847	1.8690	1.0891	1.0912	1.0932
	090	1.0952	1.0972	1.0990	1.1009	1.1026	1.1043	1.1059	1.1075	1.1090	1.1104
	100	1.1118	1.1131	1.1144	1.1156	1.1167	1.1177	1.1187	1.1196	1.1205	1.1213
	110	1.1220	1.1226	1.1232	1.1237	1.1242	1.1245	1.1248	1.1251	1.1253	1.1254
	120	1.1252	—	—	—	—	—	—	—	—	—



B-C Jumper Settings

		Enhanced Field Supply Jumper Set to B-C										
Drive Input Volts		Minimum Output Motor Field Volts				Maximum Output Motor Field Volts						
230VAC		0.45V DC				0.9V DC						
	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	0.45873	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 230V AC, 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.

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-Flt Volts Adj] to 84 — 080 + 4.

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Rockwell Automation Headquarters, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414 382-2000, Fax: (1) 414 382-4444