

INSTALLATION INSTRUCTIONS

Original Issue Date: 4/02

Model: **Model K and Model S Programmable Transfer Switches and Bypass-Isolation Transfer Switches**

Market: **Transfer Switches**

Subject: **Neutral Lug/Bus Assembly Kits**

Introduction

This document provides neutral lug/bus assembly kit installation instructions. See Figure 1 and Figure 2. Neutral lug/bus assemblies provide easy and convenient normal, emergency, and load connections to the transfer switch during installation. See Figure 3 for neutral lug kit applications.

Location. The following illustrations indicate specific locations inside the transfer switch enclosure to install the neutral lug/bus. In some cases optional locations are shown. The installer should base the location decision on each application taking into account where the normal, emergency, and load cables enter the enclosure, the cable size (bend radius), and service accessibility.

Read the entire installation procedure and compare the kit parts with the parts list at the end of this publication before beginning installation. Perform the steps in the order shown.

Special Tools Required

- Torque wrench

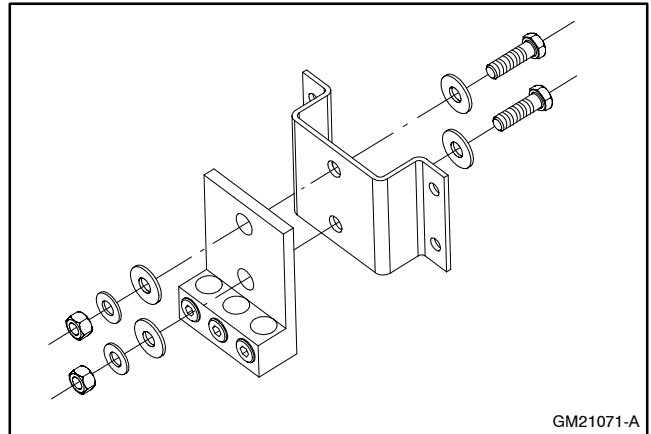


Figure 1 Neutral Lug Kit, Typical

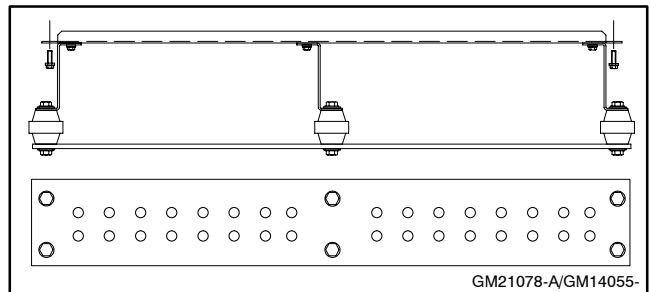


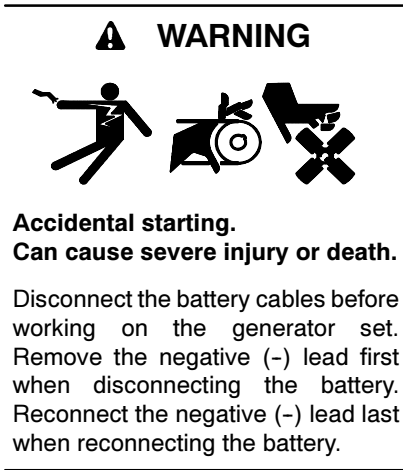
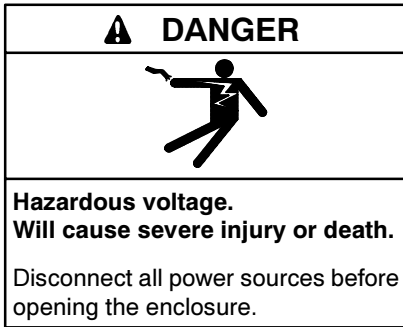
Figure 2 Neutral Bus Kit

Neutral Lug Kit	Transfer Switch	No. of Terminals	Wire Range and Connection Type
GM21070-KP1	30-150 amp	3	3/0-#6 Lugs
GM21071-KP1	225/400 amp	3	(1) 600MCM-#4 or (2) 250MCM-1/0 Lugs
GM21294-KP1	600/800 amp	12	(4) 800MCM-#2 Lugs
GM21565-KP1	1000/1200 amp	16	750MCM-1/0 Lugs
GM21565-KP2	1600/2000 amp, Front Connected	24	750MCM-1/0 Lugs
GM21565-KP2	1600/2000 amp	24	750MCM-1/0 Lugs
GM21565-KP3	2500/3000 amp	36	750MCM-1/0 Lugs
GM21078-KP3	4000 amp	32 hole bus	14.2 mm (0.56 in.) dia. holes with 44.45 mm (1.75 in.) center-to-center vertical spacing between holes

Figure 3 Neutral Lug/Bus Assembly Kits

Safety Precautions

Observe the following safety precautions during installation.



Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

Grounding electrical equipment. Hazardous voltage can cause severe injury or death. Electrocutation is possible whenever electricity is present. Open the main circuit breakers of all power sources before servicing the equipment. Configure the installation to electrically ground the generator set, transfer switch, and related equipment and electrical circuits to comply with applicable codes and standards. Never contact electrical leads or appliances when standing in water or on wet ground because these conditions increase the risk of electrocution.

Short circuits. Hazardous voltage/current can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while making adjustments or repairs. Remove all jewelry before servicing the equipment.

Installation Procedure

1. Remove the generator set and transfer switch from service

- 1.1 Place all generator set master switches in the OFF position.
- 1.2 Disconnect the power to all battery chargers, if equipped.
- 1.3 Disconnect all generator set engine starting battery(ies), negative (-) leads first.
- 1.4 Disconnect all power sources to transfer switches and power monitors.
- 1.5 Turn off and disconnect the power to all devices in the system.
- 1.6 Open the transfer switch enclosure.

2. Assemble the neutral lug/bus components

- 2.1 Assemble the components as shown in the corresponding illustration. Refer to the table in Figure 4 for the correct illustration.

2.2 Torque mounting hardware to values shown in Figure 5.

Note: Do not use the torque values shown in Figure 5 for assemblies with standoff insulators.

Neutral Lug Kit	Assembly Illustration
GM21070-KP1	Figure 9
GM21071-KP1	Figure 10
GM21294-KP1	Figure 11
GM21565-KP1	Figure 12
GM21565-KP2	Figure 13
GM21565-KP3	Figure 14
GM21078-KP3	Figure 15

Figure 4 Neutral Lug/Bus Assembly Illustration Reference

Screw Size/ Hardness	Torque Value for Metal-to-Metal Assemblies Nm (ft. lb.)
3/8-16, grade 5	38 (28)

Figure 5 Torque Values

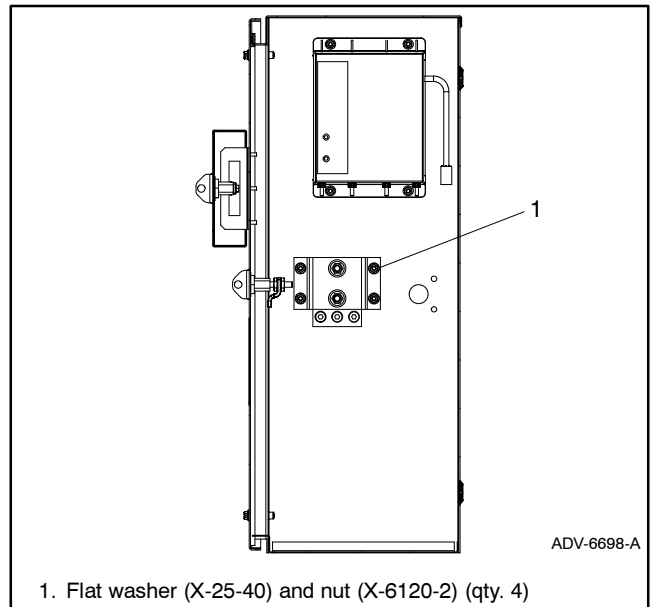
3. Mount the neutral assembly kit to the enclosure

3.1 **GM21070-KP1, GM21071-KP1, and GM21294-KP1 kits only.** Mount the kit to the enclosure studs using four flat washers (X-25-40) and nuts (X-6120-2) as shown in Figure 6. Refer to the table in Figure 7 for the corresponding location illustration.

3.2 **GM21565-KP1, GM21565-KP2, GM21565-KP3, and GM21078-KP3 kits only.** Mount the kit to the enclosure using eight screws (X-67-114) as shown in Figure 8. Refer to the table in Figure 7 for the corresponding location illustration.

4. Restore the generator set and transfer switch to service

- 4.1 Close and secure the transfer switch enclosure.
- 4.2 Check that all generator set master switches are in the OFF position.
- 4.3 Reconnect the generator set engine starting battery(ies), negative (-) leads last.
- 4.4 Reconnect power to the battery charger, if equipped.
- 4.5 Reconnect all power sources to the transfer switches and power monitors.
- 4.6 Reconnect power to all devices in the system.
- 4.7 Place all generator set master switches to the AUTO position.

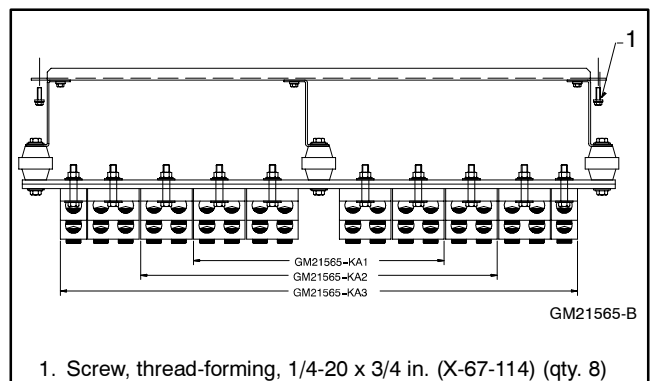


1. Flat washer (X-25-40) and nut (X-6120-2) (qty. 4)

Figure 6 Mounting the Neutral Lug Assembly to the Enclosure, Typical

Neutral Lug Kit	Amp	Neutral Lug/Bus Mounting Location Illustrations
GM21070-KP1	30-150	Figure 16
GM21071-KP1	225/400	Figure 17 (Open Transition) Figure 18 (Programmed Transition)
GM21294-KP1	600/800	Figure 19
GM21565-KP1	1000/1200	Figure 20
GM21565-KP2, Front Mounted	1600/2000	Figure 21
GM21565-KP2	1600/2000	Figure 22
GM21565-KP3	2500/3000	Figure 23
GM21078-KP3	4000	Figure 24

Figure 7 Neutral Assembly Mounting Locations



1. Screw, thread-forming, 1/4-20 x 3/4 in. (X-67-114) (qty. 8)

Figure 8 Mounting the Neutral Lug Assembly to the Enclosure, Typical

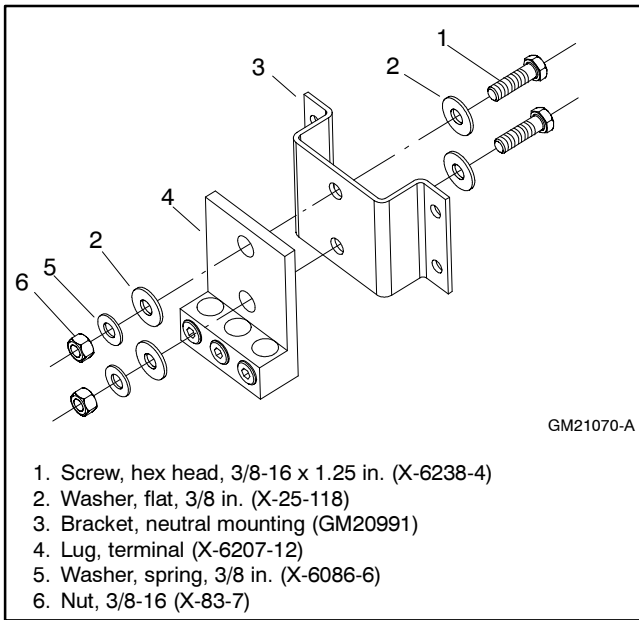


Figure 9 Assembling the Neutral Lug
GM21070-KP1 (30-150 amp)

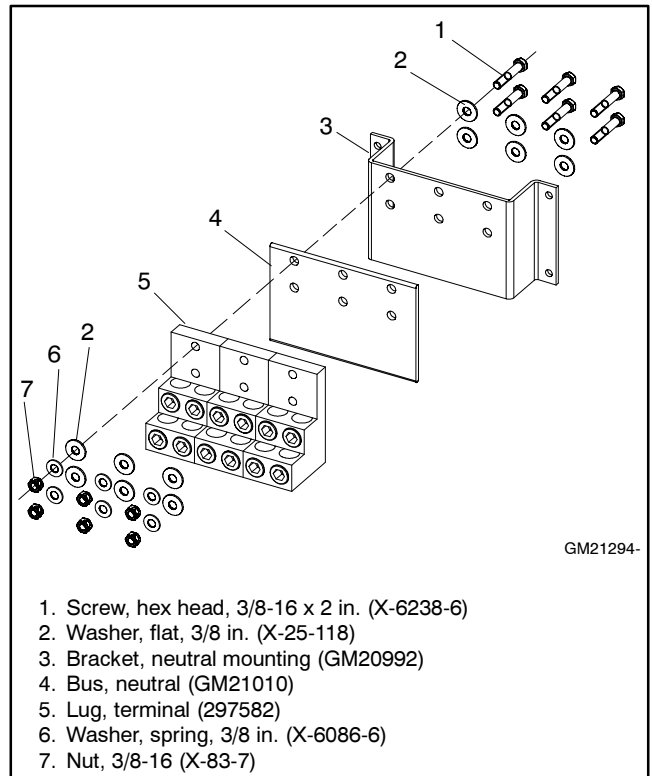


Figure 11 Assembling the Neutral Lug
GM21294-KP1 (600/800 amp)

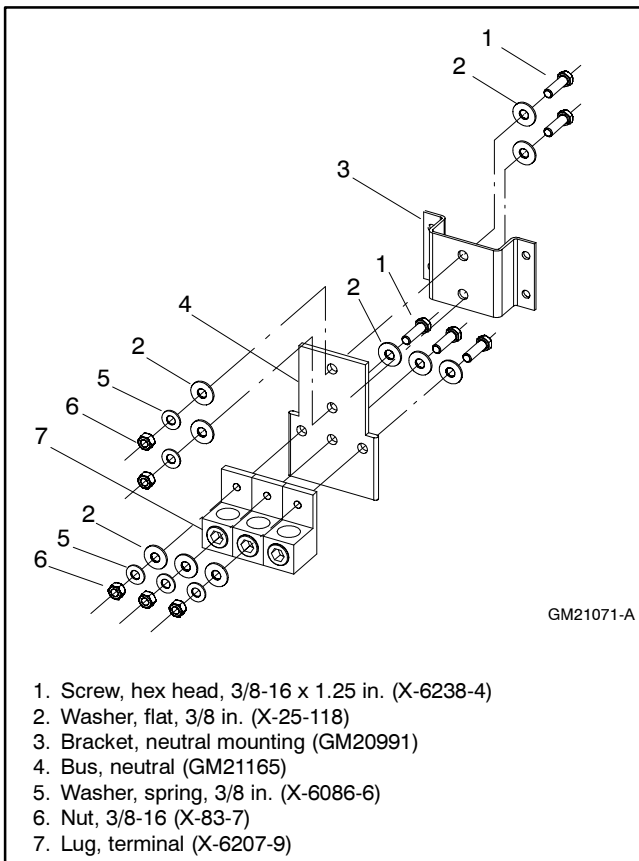


Figure 10 Assembling the Neutral Lug
GM21071-KP1 (225/400 amp)

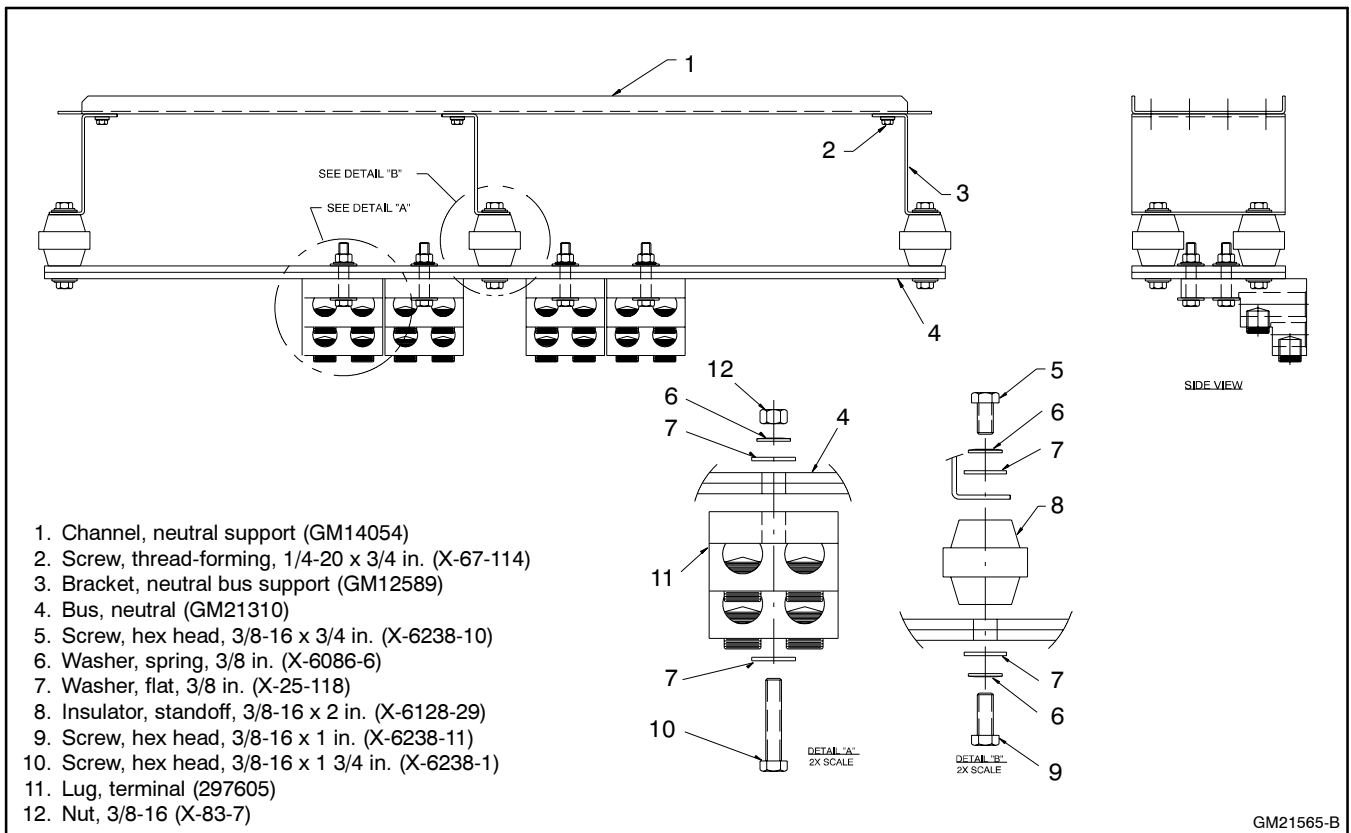


Figure 12 Assembling the Neutral Lug GM21565-KP1 (1000/1200 amp)

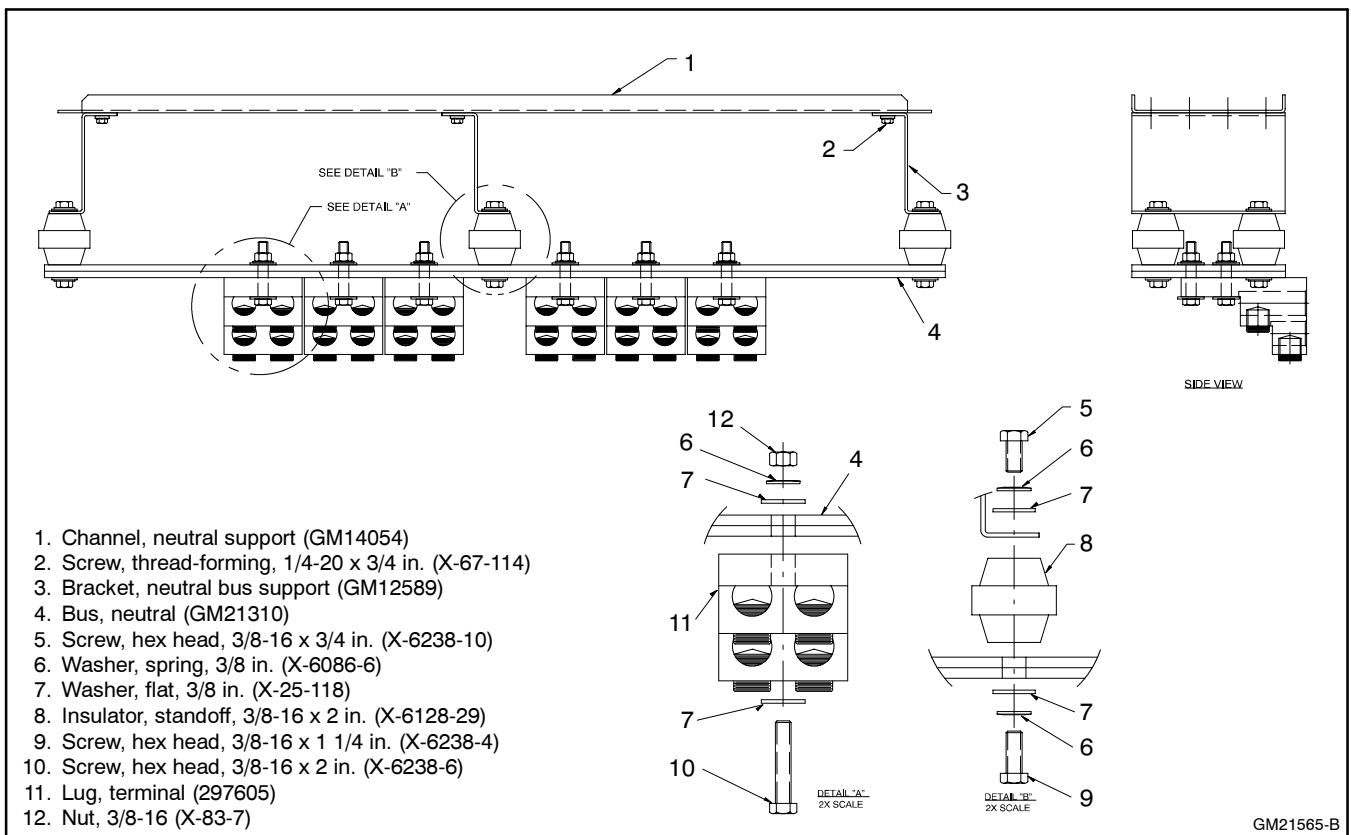


Figure 13 Assembling the Neutral Lug GM21565-KP2 (1600/2000 amp)

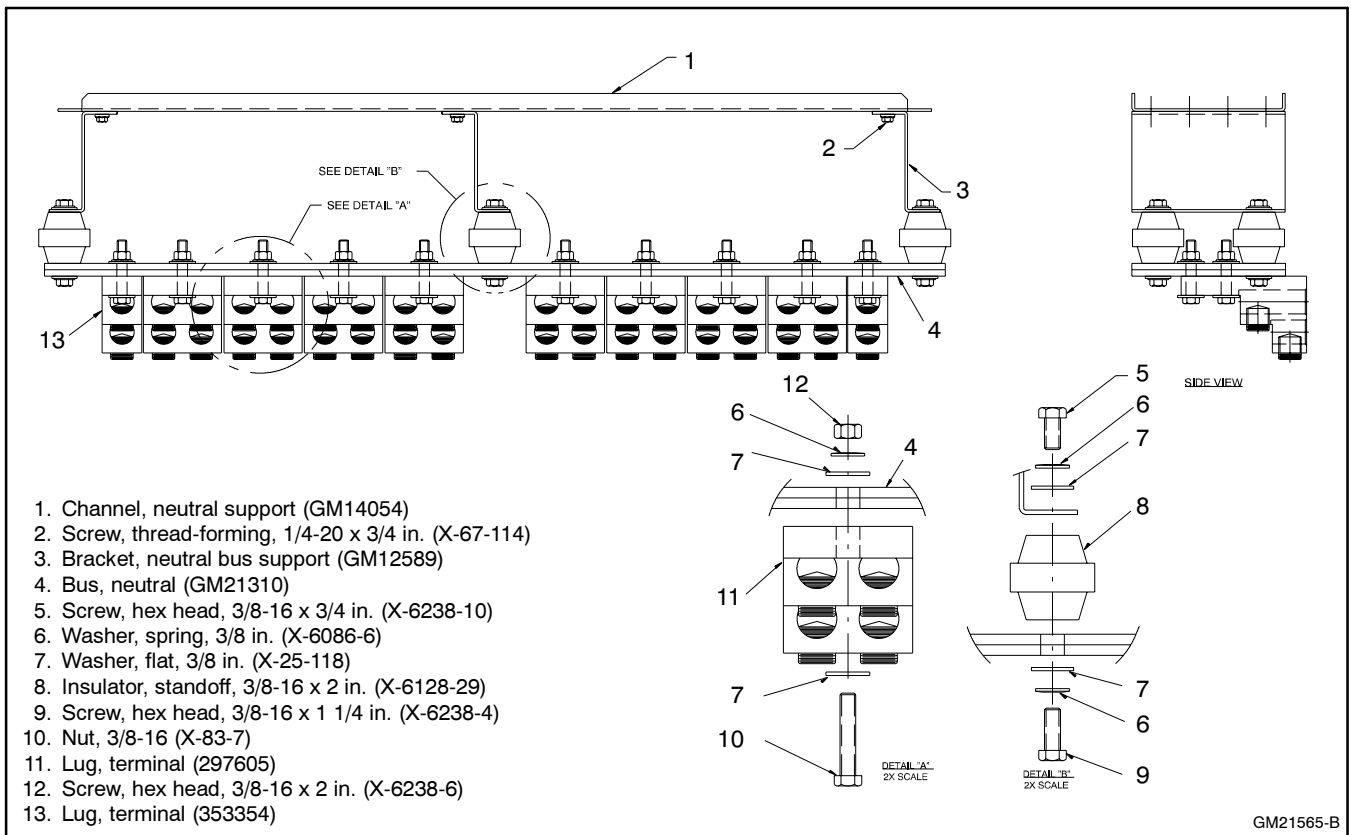


Figure 14 Assembling the Neutral Lug GM21565-KP3 (2500/3000 amp)

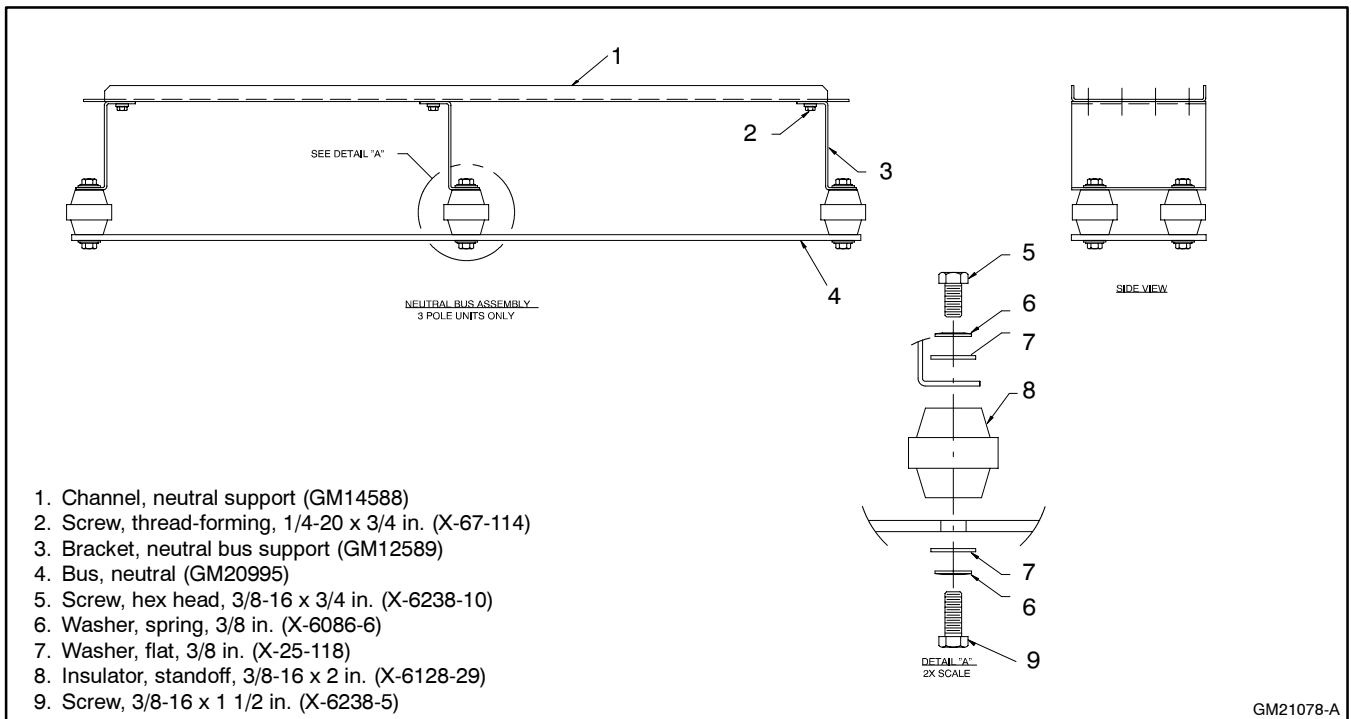


Figure 15 Assembling the Neutral Bus GM21078-KP3 (4000 amp)

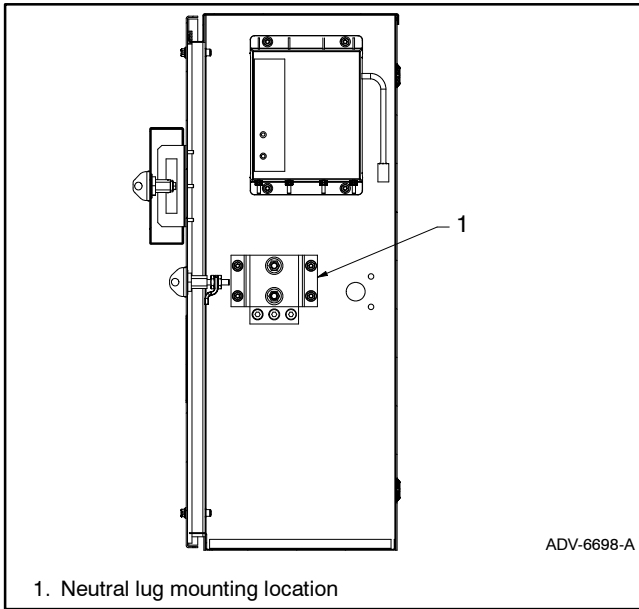


Figure 16 30-150 Amp Transfer Switch, Typical

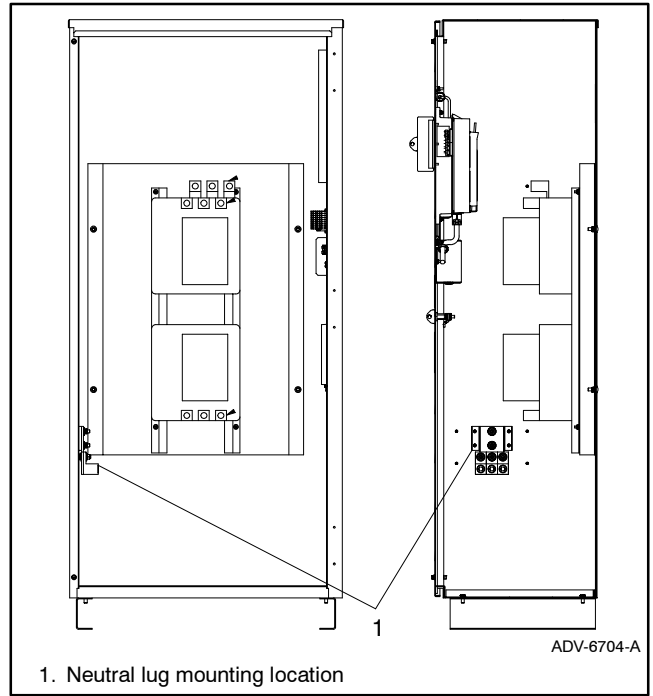


Figure 18 225-400 Amp Transfer Switch
Programmed Transition, Typical

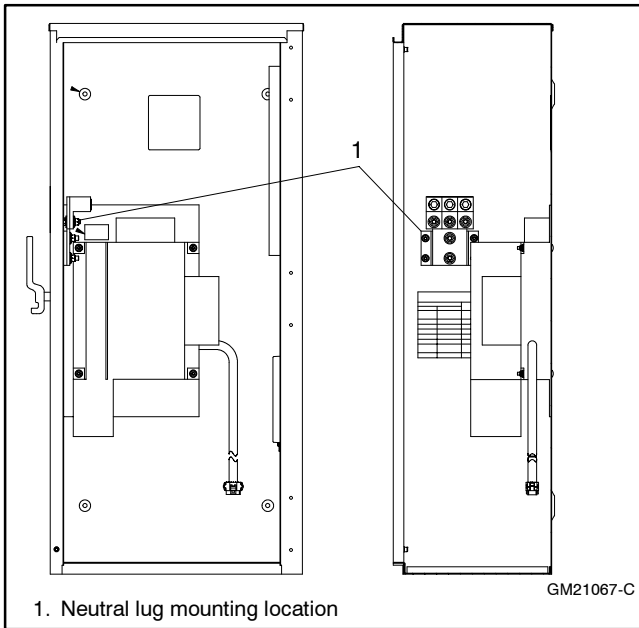


Figure 17 225-400 Amp Transfer Switch, Open
Transition, Typical

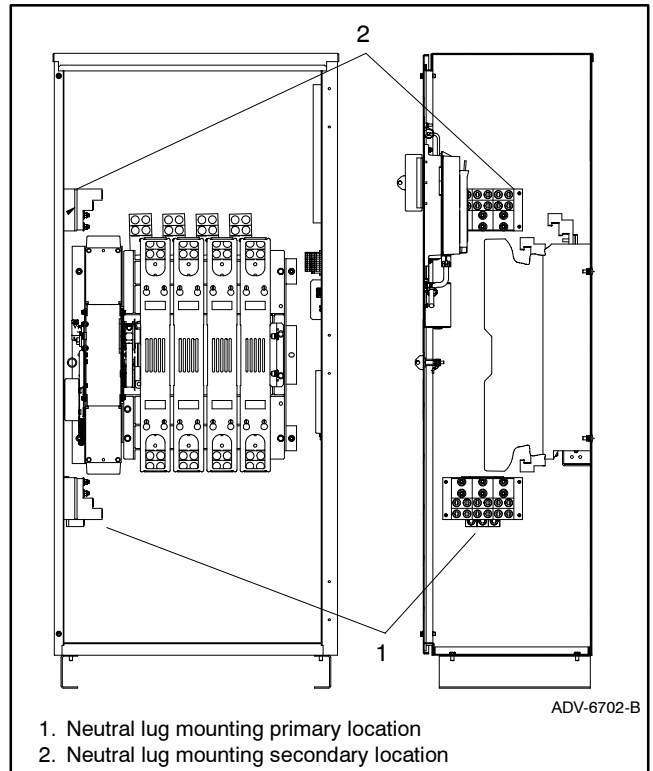


Figure 19 600/800 Amp Transfer Switch, Typical

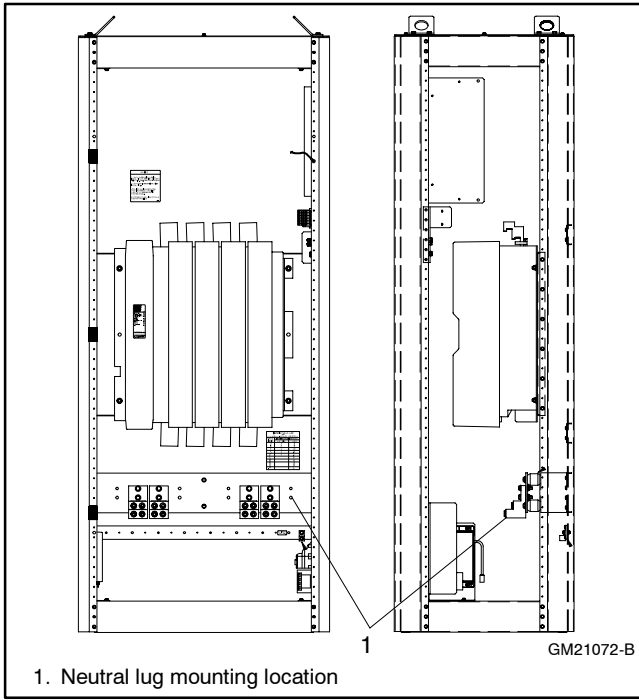


Figure 20 1000/1200 Amp Transfer Switch, Typical

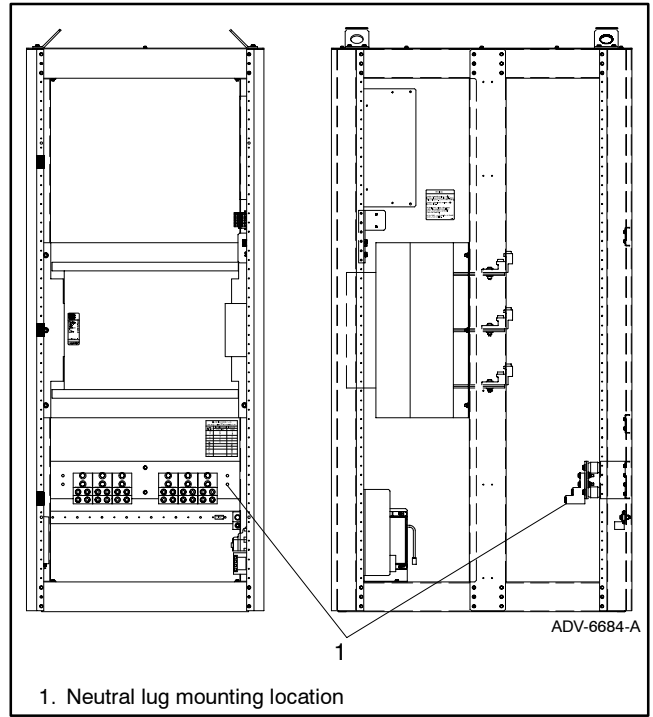


Figure 22 1600-2000 Amp Transfer Switch, Typical

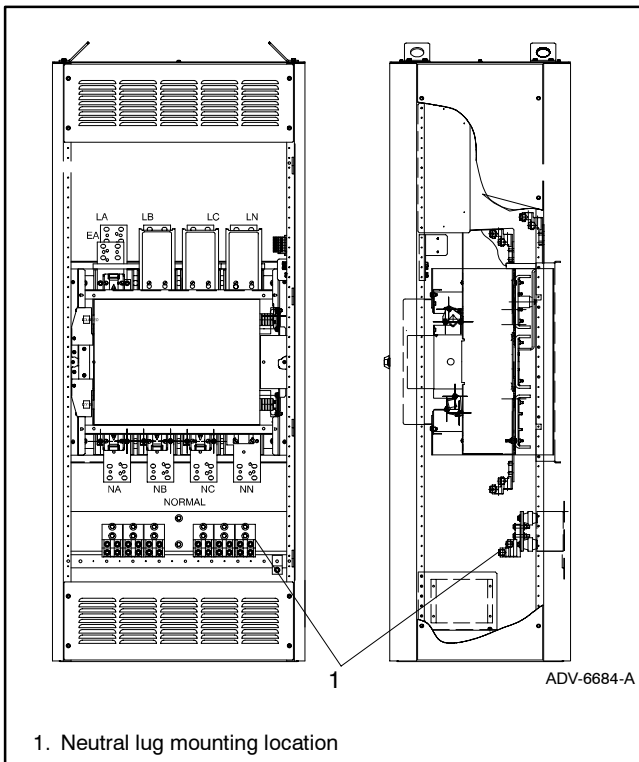


Figure 21 1600-2000 Amp Transfer Switch
Front-Mounted, Typical

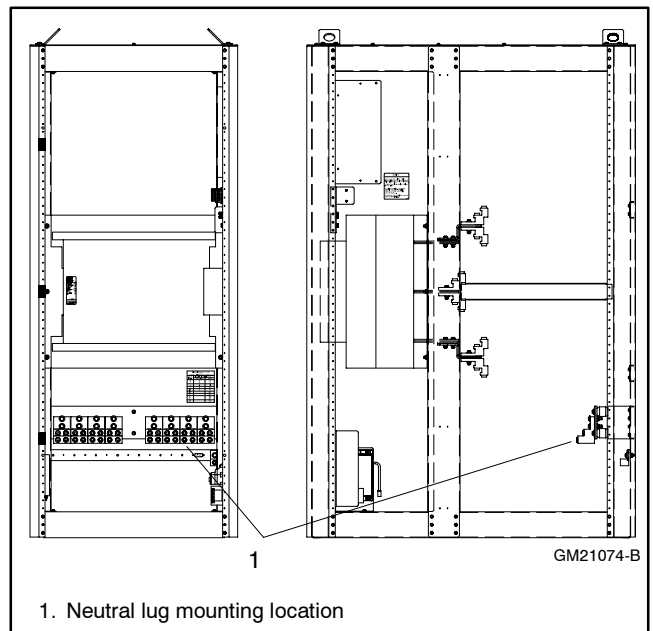


Figure 23 2600-3000 Amp Transfer Switch, Typical

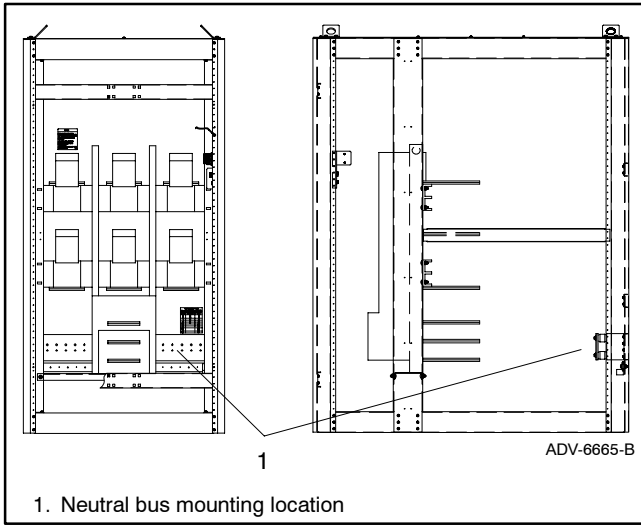


Figure 24 4000 Amp Transfer Switch, Typical

Parts List

Neutral Assembly Kits

Kit: GM-21070-KP1		
Qty.	Description	Part Number
1	Bracket, neutral mounting	GM20991
1	Lug, terminal (3 terminals)	X-6207-12
2	Screw, hex head, 3/8-16 x 1.25 in.	X-6238-4
4	Washer, flat, 3/8 in.	X-25-118
2	Washer, spring, 3/8 in.	X-6086-6
2	Nut, 3/8-16	X-83-7
4	Washer, flat, 1/4 in.	X-25-40
4	Nut, 1/4-20	X-6210-2

Kit: GM-21071-KP1		
Qty.	Description	Part Number
1	Bracket, neutral mounting	GM20991
1	Bus, neutral	GM21165
3	Lug, terminal (1 terminal)	X-6207-9
5	Screw, hex head, 3/8-16 x 1.25 in.	X-6238-4
10	Washer, flat, 3/8 in.	X-25-118
5	Washer, spring, 3/8 in.	X-6086-6
5	Nut, 3/8-16	X-83-7
4	Washer, flat, 1/4 in.	X-25-40
4	Nut, 1/4-20	X-6210-2

Kit: GM-21294-KP1		
Qty.	Description	Part Number
1	Bracket, neutral mounting	GM20992
1	Bus, neutral	GM21010
3	Lug, terminal (4 terminals)	297582
6	Screw, hex head, 3/8-16 x 2 in.	X-6238-6
10	Washer, flat, 3/8 in.	X-25-118
6	Washer, spring, 3/8 in.	X-6086-6
6	Nut, 3/8-16	X-83-7
4	Washer, flat, 1/4 in.	X-25-40
4	Nut, 1/4-20	X-6210-2

Kit: GM-21565-KP1		
Qty.	Description	Part Number
3	Bracket, neutral mounting	GM12589
1	Bus, neutral	GM21310
4	Lug, terminal (4 terminals)	297605
1	Channel, neutral support	GM14054
6	Insulator, standoff, 3/8-16 x 2 in.	X-6128-29
20	Screw, thread-forming, 1/4-20 x 3/4 in.	X-67-114
6	Screw, hex head, 3/8-16 x 3/4 in.	X-6238-10
6	Screw, hex head, 3/8-16 x 1 in.	X-6238-11
8	Screw, hex head, 3/8-16 x 1 3/4 in.	X-6238-1
28	Washer, flat, 3/8 in.	X-25-118
20	Washer, spring, 3/8 in.	X-6086-6
8	Nut, 3/8-16	X-83-7

Kit: GM-21565-KP2		
Qty.	Description	Part Number
3	Bracket, neutral mounting	GM12589
2	Bus, neutral	GM21310
6	Lug, terminal (4 terminals)	297605
1	Channel, neutral support	GM14054
6	Insulator, standoff, 3/8-16 x 2 in.	X-6128-29
20	Screw, thread-forming, 1/4-20 x 3/4 in.	X-67-114
6	Screw, hex head, 3/8-16 x 3/4 in.	X-6238-10
6	Screw, hex head, 3/8-16 x 1 1/4 in.	X-6238-4
12	Screw, hex head, 3/8-16 x 2 in.	X-6238-6
36	Washer, flat, 3/8 in.	X-25-118
24	Washer, spring, 3/8 in.	X-6086-6
12	Nut, 3/8-16	X-83-7

Kit: GM-21565-KP3		
Qty.	Description	Part Number
3	Bracket, neutral mounting	GM12589
2	Bus, neutral	GM21310
8	Lug, terminal (4 terminals)	297605
2	Lug, terminal (2 terminals)	353354
1	Channel, neutral support	GM14054
6	Insulator, standoff, 3/8-16 x 2 in.	X-6128-29
20	Screw, thread-forming, 1/4-20 x 3/4 in.	X-67-114
6	Screw, hex head, 3/8-16 x 3/4 in.	X-6238-10
6	Screw, hex head, 3/8-16 x 1 1/4 in.	X-6238-4
20	Screw, hex head, 3/8-16 x 2 in.	X-6238-6
52	Washer, flat, 3/8 in.	X-25-118
32	Washer, spring, 3/8 in.	X-6086-6
20	Nut, 3/8-16	X-83-7

Kit: GM-21078-KP3		
Qty.	Description	Part Number
3	Bracket, neutral mounting	GM12589
3	Bus, neutral	GM20995
1	Channel, neutral support	GM12588
6	Insulator, standoff, 3/8-16 x 2 in.	X-6128-29
20	Screw, thread-forming, 1/4-20 x 3/4 in.	X-67-114
6	Screw, hex head, 3/8-16 x 1 1/2 in.	X-6238-5
12	Screw, hex head, 3/8-16 x 2 in.	X-6238-6
12	Washer, flat, 3/8 in.	X-25-118
12	Washer, spring, 3/8 in.	X-6086-6
6	Screw, hex head, 3/8-16 x 3/4 in.	X-6238-10

