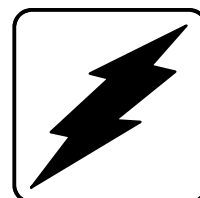


Service Parts

Automatic Transfer Switches



Models:

G/GN
GLS/GLN
GTS/GTN

Power Switching Device:
Contactor
40 to 400 Amperes

Electrical Controls:
S340 (Solid-State)
M340 (Microprocessor)

ISO 9001
KOHLER
GENERATORS
INTERNATIONALLY REGISTERED

KOHLER[®]
POWER SYSTEMS

TP-5995 6/01a

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This manual lists service parts for model G/GN, GTN/GTS, and GLN/GLS transfer switches. On occasion, the manufacturer may include this manual with similar models that are not listed here.

Information in this publication represents data available at the time of print. Kohler Co. reserves the right to change this publication and the products represented without notice and without any obligation or liability whatsoever.

Illustrations (or exploded-view drawings) accompany most groups in this manual. The illustrations do not depict all details and may not show all parts. Do not use the illustrations for assembly or disassembly instructions.

The following sections provide instructions to help identify the transfer switch and locate service parts within this manual.

Nameplate

A nameplate attached to the inside of the enclosure door or cover includes a model designation, a serial number, ratings, and other information about the transfer switch. See Figure 1 or Figure 2. Use the chart in Figure 4 to record and interpret the model designation.

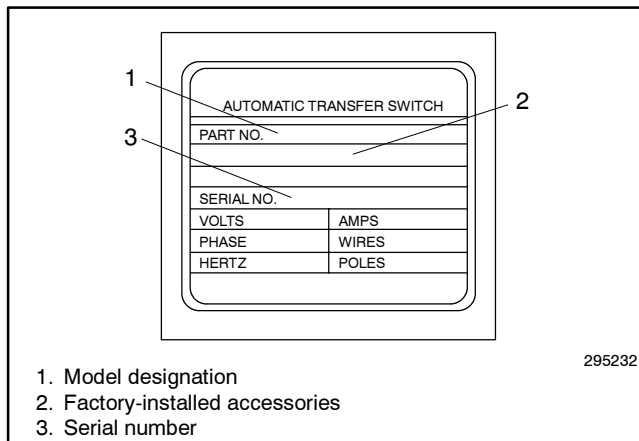


Figure 1 Typical Transfer Switch Nameplate (used before April 8, 1999)

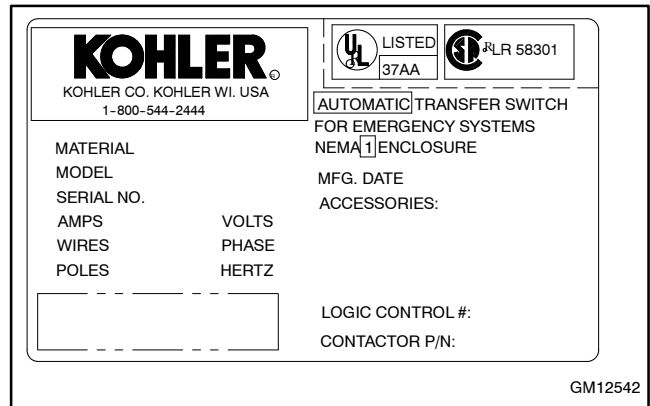


Figure 2 Typical Transfer Switch Nameplate (used after April 8, 1999)

Model Designation

Model GTN/GTS and GLN/GLS transfer switches were once designated as Model G (automatic) or GN (nonautomatic) transfer switches.

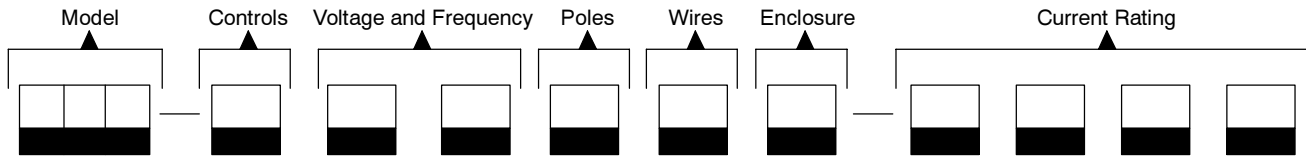
- Model G or GN transfer switches with a maximum contactor voltage rating of 600 volts are now designated as Model GLS (automatic) or GLN (nonautomatic).
- Model G or GN transfer switches with a maximum contactor voltage rating of 250 volts are now designated as Model GTS (automatic) or GTN (nonautomatic).

The 250 volt maximum voltage and frequency codes that formerly began with the number 2 have been changed to codes beginning with the number 6. Figure 3 summarizes voltage codes that are no longer used and the new codes.

Old Code	New Code	Voltage and Frequency
21	61	110 Volt, 50 Hz
22	62	120 Volt, 60 Hz
23	63	220 Volt, 50 Hz
24	64	240 Volt, 60 Hz
27	67	190 Volt, 50 Hz
28	68	208 Volt, 60 Hz

Figure 3 Voltage and Frequency Code Conversion

Record the transfer switch model designation in the boxes below. The transfer switch model designation defines characteristics and ratings as explained in the accompanying chart.



Kohler® Model Designation Key

This chart explains the Kohler® transfer switch model designation system. The sample model designation shown is for a Model GTS automatic transfer switch that uses a 250-volt maximum contactor power switching device with S340 solid-state electrical controls rated at 240 volts, 60 hertz, 1 phase, 2 poles, and 3 wires in a NEMA type 1 enclosure with a current rating of 200 amperes. Not all possible combinations are available.

SAMPLE MODEL DESIGNATION

GTS-164231-0200

Switch Classification or Family

G: Model GLN/GLS/GTN/GTS contactor-type transfer switch

Power Switching Device Characteristics

T: 250-volt maximum contactor, 40–200 amperes
L: 600-volt maximum contactor, 40–400 amperes

Operation Classification

S: Automatic N: Nonautomatic

Electrical Controls (Logic Controller)

1: S340 solid state 5: M340 microprocessor

Voltage and Frequency (other codes possible)

53: 220 Volts, 60 Hz	60: 600 Volts, 60 Hz	61: 110 Volts, 50 Hz
62: 120 Volts, 60 Hz	63: 220 Volts, 50 Hz	64: 240 Volts, 60 Hz
65: 550 Volts, 60 Hz	66: 480 Volts, 60 Hz	67: 190 Volts, 50 Hz
68: 208 Volts, 60 Hz	69: 440 Volts, 60 Hz	70: 400 Volts, 50 Hz
71: 380 Volts, 50 Hz	72: 380 Volts, 60 Hz	73: 416 Volts, 50 Hz

Number of Poles and Phase

2: 2 pole, 1 phase 3: 3 pole, 3 phase 4: 3 pole, 1 phase
6: 4 pole, 3 phase

Number of Wires

3: 3 Wire 4: 4 Wire

Enclosure

0: Open unit 1: NEMA type 1 2: NEMA type 12
3: NEMA type 3R

Current Rating

Numbers indicate the current rating of switch in amperes

Figure 4 Transfer Switch Model Designation

Finding Part Numbers

Parts are listed by major assembly groups or accessory part numbers. Use the following sections to locate and identify transfer switch service parts.

Service Parts

1. Use Figure 4 and the transfer switch model designation from the nameplate to determine the transfer switch's type of electrical controls, voltage and frequency ratings, number of poles and phases, number of wires, enclosure type, and current rating (amperage).
2. Find the section for the assembly group that contains the part. Use the Table of Contents at the beginning of this manual to find the major assembly groups, if necessary.
3. Locate the part in the illustration and note the item number or find the part description in the table.
4. Find the corresponding item number in the table following the illustration to determine the part number and quantity required. Some part numbers vary according to the transfer switch rating or type of controls. When there are multiple possibilities for parts, use the transfer switch information determined in step 1 to determine the part number and quantity required.

Enclosures

Notice that there are two enclosure parts list tables. Use the table corresponding to the type of controls installed on the switch, S340 or M340. There are four choices for the enclosure type: NEMA 1, NEMA 3R, NEMA 12, or open unit with no enclosure. Use the column corresponding to the transfer switch current rating and enclosure type to determine part numbers and quantities.

Contactors Assemblies

The manual contains five different contactor assembly tables organized by voltage rating, current rating, and the type of controls used on the transfer switch. Use the following instructions to identify the table and then the correct contactor assembly part number for your transfer switch.

1. Use the transfer switch model designation and Figure 4 to identify the transfer switch maximum voltage rating, 250 or 600 volts, and the current rating.

2. Identify the type of controls used on the transfer switch, S340 or M340.
3. Find the contactor assembly table that corresponds to the voltage rating, current rating, and type of controls determined above. Use the Table of Contents at the beginning of this manual to find the contactor assembly tables, if necessary.
4. Each contactor assembly table is organized by current rating and number of poles. Find the current rating and the code for the number of poles in the transfer switch model designation, then find the corresponding section of the table.
5. Find the voltage code from the transfer switch model designation and find the corresponding row in the table. The contactor assembly part number is shown in the Contactor Assembly Part Number column.

Note: The contactor assembly table includes a coil voltage column to help identify the solenoid part number. The coil voltage is not required to identify the contactor assembly part number.

Accessories

Accessory parts lists are arranged by the accessory number. For example, accessories KA-1- are first and KA-2- appear next. Accessories KD- appear after KA-, followed by GM- and then PA- numbers.

Determine the accessory number from the transfer switch nameplate.

Leads

Fabricate replacement leads using the same type of wire as the old leads. Add terminals and lead markers at each end of the new lead.

Common Hardware

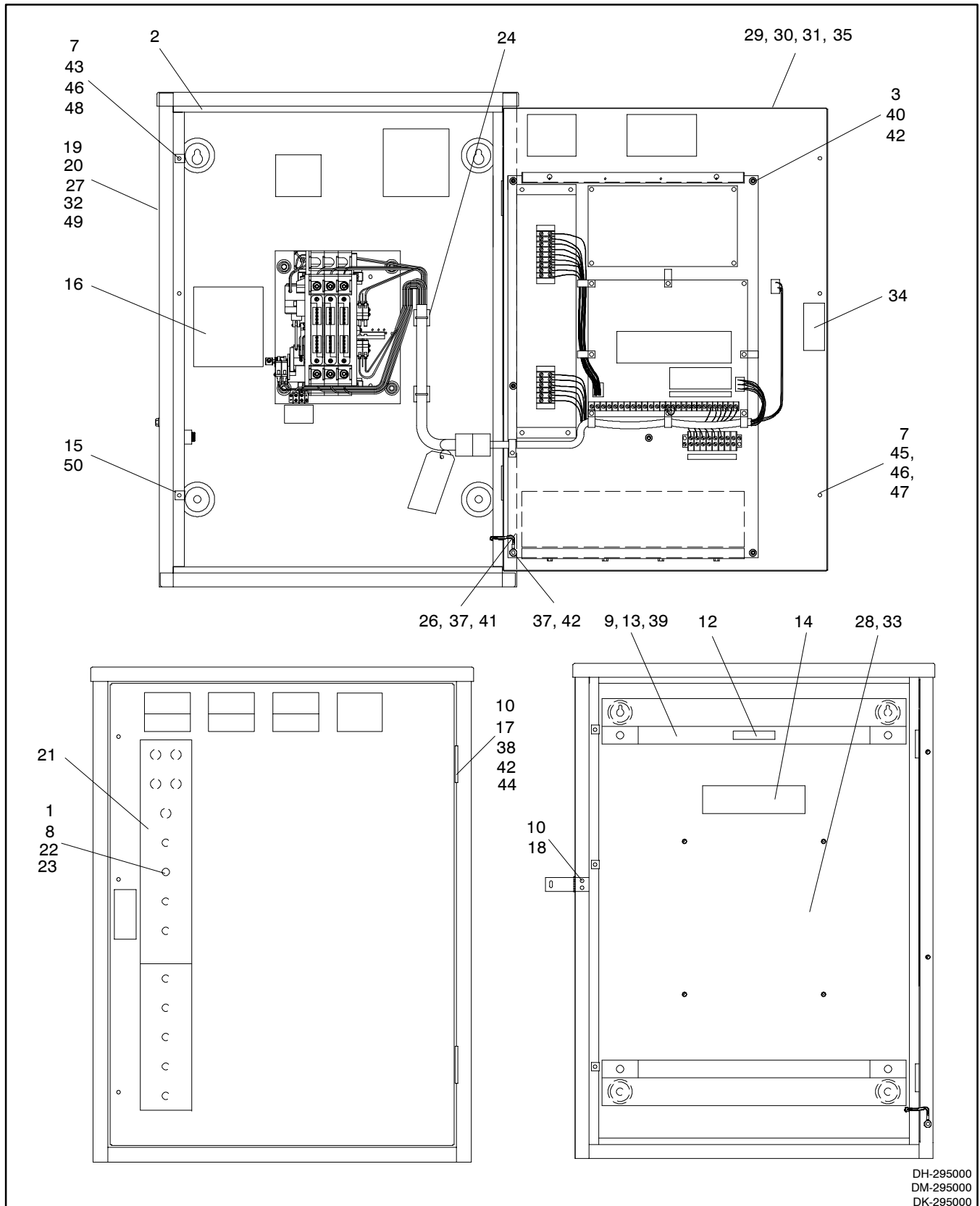
Common hardware such as nuts, bolts, screws, and washers are Grade 2 unless otherwise noted. Obtain common hardware locally if the same type and grade is available. Refer to Appendices B through E for general torque specifications and to identify hardware that may not be shown in the parts lists.

NOTICE

When replacing hardware, do not substitute with inferior grade hardware. Screws and nuts are available in different hardness ratings. To indicate hardness, American Standard hardware uses a series of markings, and metric hardware uses a numeric system. Check the markings on the bolt heads and nuts for identification.

Service Parts, Main Unit

Enclosure, S340 Controls



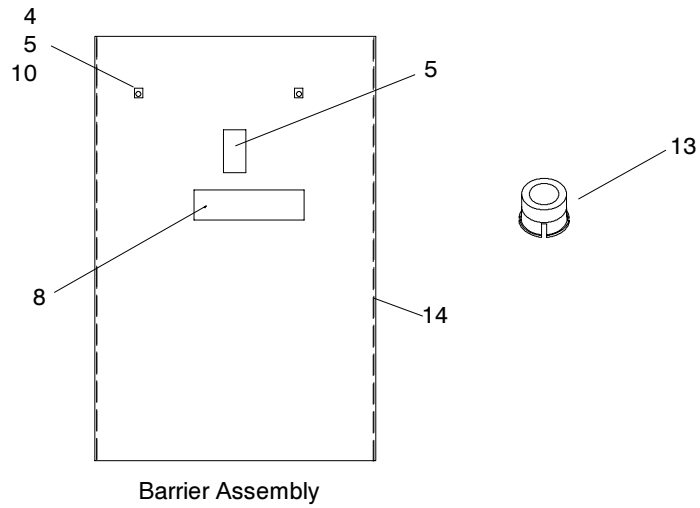
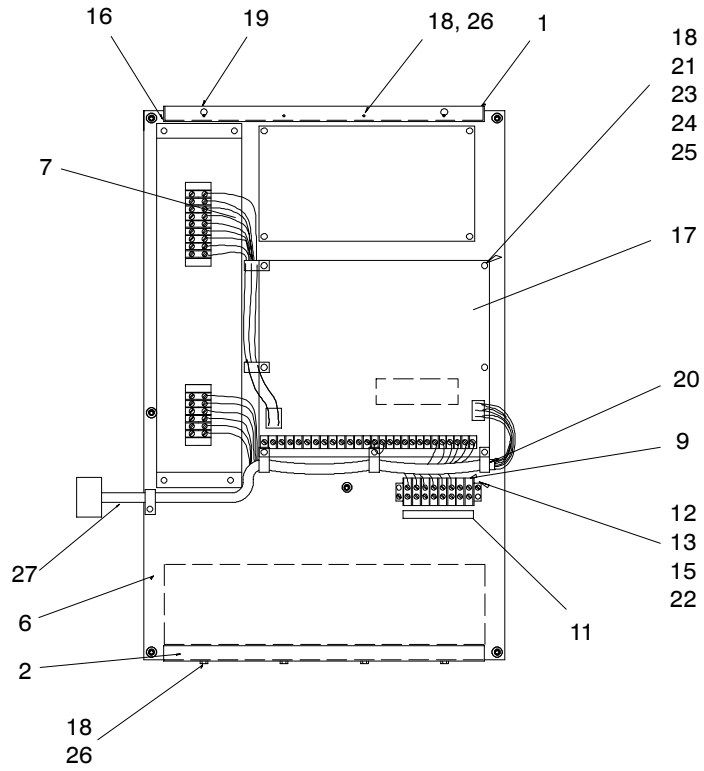
Enclosure, S340 Controls

Item	Part No.	Description	Quantity by Amperage and Enclosure Type						
			40-200 Amps NEMA Enclosure			225-400 Amps NEMA Enclosure			40-400 A
			1	3R	12	1	3R	12	Open
1	151511	Ring, lock switch	1			1			1
2	25486 00062	Gasket, rubber, NEMA 3R		10.1 ft.			11.5 ft.		
3	265861	Spacer, .281 x .500 x .375	6			6			
4	294326	Stud, steel-plated							2
5	294327	Clip							2
6	294328	Decal							1
7	295009	Retainer	2	3			3		
8	295068	Switch, toggle, 1-pole	1			1			1
9	295081	Bracket, mounting		2			2		
10	295098	Screw, flat countersunk, machine	8	10		8	10		
11	295279	Retainer							2
12	295350	Decal		1			1		
13	295364	Gasket		4			4		
14	295932	Decal		1			1		
15	297002	Gasket, washer		3					
16	297556	Decal, torque	1	1	1	1	1	1	
17	297600	Hinge, split	2	2		2	2		
18	297798	Hasp		1			1		
19	297913	Enclosure, NEMA 12			1				
20	297915	Enclosure, NEMA 12						1	
21	297938	Decal, control panel	1	1	1	1	1	1	
22	298036	Switch, pushbutton operator		1	1		1	1	
23	298046	Contact		1	1		1	1	
24	298776	Base, tie, wrap	2	2	1	2	2	1	
25	321017	Guard							1
26	344295	Decal, equipment ground	1	1	1	1	1	1	
27	362094	Enclosure, transfer panel, NEMA 1	1	1					
28	362136	Panel, ATS mounting			1				
29	362168	Door, enclosure		1					
30	GM11427	Door, enclosure				1			
31	362198	Door, enclosure					1		
32	294306	Enclosure, transfer panel					1		
33	362275	Panel						1	
34	362442	Latch, locking	1			1			
35	GM11425	Door, enclosure	1						
36	X-22-11	Washer, lock, .262 ID x .469 in. OD						1	
37	X-22-12	Washer, lock .262 ID x .743 in. OD	3	3		3	3		
38	X-22-9	Washer, lock .20 ID x .373 in. OD	4	4		4	4		
39	X-25-18	Washer, plain, .391 ID x .875 in. OD		4			4		
40	X-25-40	Washer, plain, .281 ID x .625 in. OD	1			1			
41	X-6207-3	Lug, terminal, aluminum	1	1	1	1	1	1	
42	X-6210-5	Nut, flange spiralock, 1/4-20	4	5	5	4	5	5	
43	X-6220-1	Clip, speed	2	3			3		
44	X-70-2	Nut, hex machine screw, 10-24	4	4		4	4		
45	X-791-11	Screw, slotted HH washer, machine	2	3			3		
46	295010	Retainer				2	3		
47	X-117-4	Screw				2	3		
48	257442	Clip, speed				2	3		
49	294306	Enclosure				1			
50	297001	Gasket, washer					3		

Enclosure, M340 Controls

Item	Part No.	Description	Quantity by Amperage and Enclosure Type						40-400 A Open
			40-150 A NEMA Enclosure			225-400 A NEMA Enclosure			
			1	3R	12	1	3R	12	
1	GM14177	Handle		1	1		1	1	
2	265861	Spacer, .281 x .500 x .375		4	4		4	4	
3	294520	Decal, danger	1	1	1	1	1	1	1
4	294651	Block, contact	1	1	1	1	1	1	1
5	294653	Switch, pushbutton	1	1	1	1	1	1	1
6	295009	Retainer	2						
7	295010	Retainer		2	2	2	2	2	
8	295098	Screw, flat countersunk, machine	8			8			
9	297556	Decal, torque	1	1	1	1	1	1	
10	297600	Hinge, split	2			2			
11	298049	Contact	1	1	1	1	1	1	1
12	298776	Base, tie, wrap	2	2	2	2	2	2	
13	320620	Pan, mounting							1
14	321124	Enclosure, NEMA 12			1				
15	321127	Bracket		2	2				
16	321138	Bracket					2	2	
17	321227	Enclosure, NEMA 3R		1					
18	321250	Enclosure, NEMA 3R					1		
19	344295	Decal, equipment ground	1	1	1	1	1	1	
20	362094	Enclosure, transfer panel, NEMA 1	1						
21	362136	Panel, ATS mounting		1	1				
22	362146	Decal, control panel	1	1	1	1	1	1	
23	362148	Door		1	1				
24	GM11426	Door, enclosure				1			
25	294306	Enclosure, transfer panel				1			
26	362275	Panel					1	1	
27	362276	Door					1	1	
28	362442	Latch, locking	1			1			
29	GM11430	Door, enclosure	1						
30	X-22-11	Washer, lock, .262 ID x .469 in. OD		1	1		1	1	
31	X-22-12	Washer, lock .262 ID x .743 in. OD	3	3	3	3	3	3	
32	X-22-9	Washer, lock .20 ID x .373 in. OD	4			4			
33	X-50-8	Screw, slotted pan head machine		7	7		6	6	
34	X-6204-3	Retainer, nut		7	7		6	6	
35	X-6207-3	Lug, terminal, aluminum	1	1	1	1	1	1	
36	X-6220-1	Clip, speed	2						
37	X-70-2	Nut, hex machine screw, 10-24	4			4			
38	X-791-11	Screw, slotted HH washer, machine	2						
39	X-6210-2	Nut, flange spirallock, 1/4-20	4	4	4	4	4	4	
40	X-72-4	Nut, hex machine screw, 8-32	4	4	4	4	4	4	
41	X-22-7	Washer lock, .172 ID x .333 in. OD	4	4	4	4	4	4	
42	257442	Clip, speed				2			
43	X-117-4	Screw, slotted hex washer head				2			
44	X-50-4	Screw, slotted pan head machine		2	2		2	2	

Inner Panel, S340 Controls

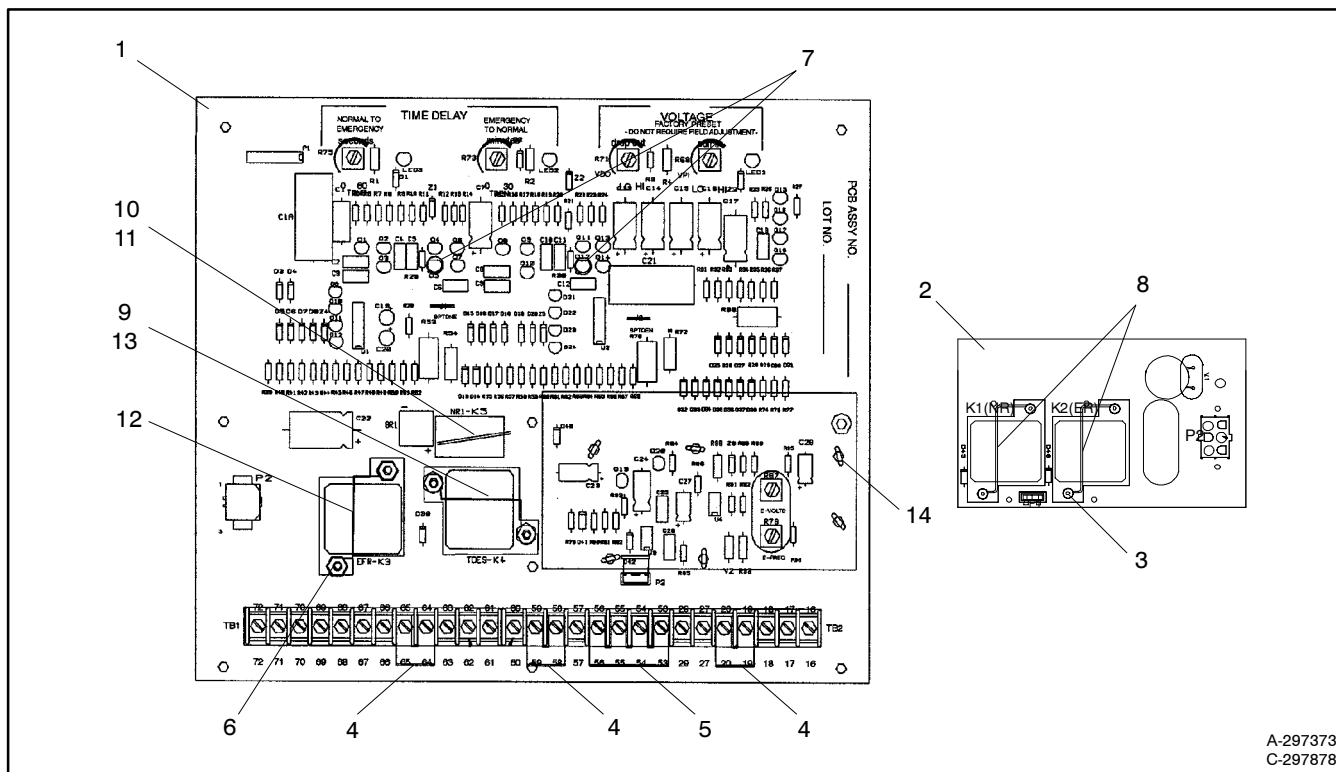


DN-295000

Inner Panel, S340 Controls

Item	Part No.	Description	Quantity by Phase and Frequency				
			All	1 Ph. 60 Hz	3 Ph. 60 Hz	1 Ph. 50 Hz	3 Ph. 50 Hz
1	294316	Bracket	1				
2	294317	Bracket	1				
3	294326	Stud, steel-plated	2				
4	294327	Clip	2				
5	294328	Decal	1				
6	295005	Panel, inner	1				
7	321155	Wiring harness			1		1
7	321156	Wiring harness		1		1	
8	295261	Decal	1				
9	295266	Terminal block	1				
10	295279	Retainer	2				
11	295329	Decal	1				
12	295925	Cover, terminal strip	1				
13	298811	Nut, captive, 8-32	2				
14	321017	Guard	1				
15	352911	Clip, retaining	2				
16	362116	Block, wood	2				
17	E-297373	PCB assembly, ATS controller (see also controller board parts)		1			
17	E-297375	PCB assembly, ATS controller (see also controller board parts)			1		
17	F-297372	PCB assembly, ATS controller (see also controller board parts)				1	
17	F-297374	PCB assembly, ATS controller (see also controller board parts)					1
18	X-22-7	Washer, lock, .172 ID x .333 in. OD	23				
19	X-634-15	Grommet, round	1				
20	X-468-3	Cable tie, nylon	9				
21	X-51-37	Screw, slotted round head machine	3				
22	X-51-4	Screw, cross recess round head machine	2				
23	X-593-2	Grommet	9				
24	X-67-145	Screw, cross recess, sheet metal	4				
25	X-67-146	Screw, cross recess, sheet metal	5				
26	X-794-2	Screw, hex washer head, drill	8				
27	295134	Wiring harness	1				

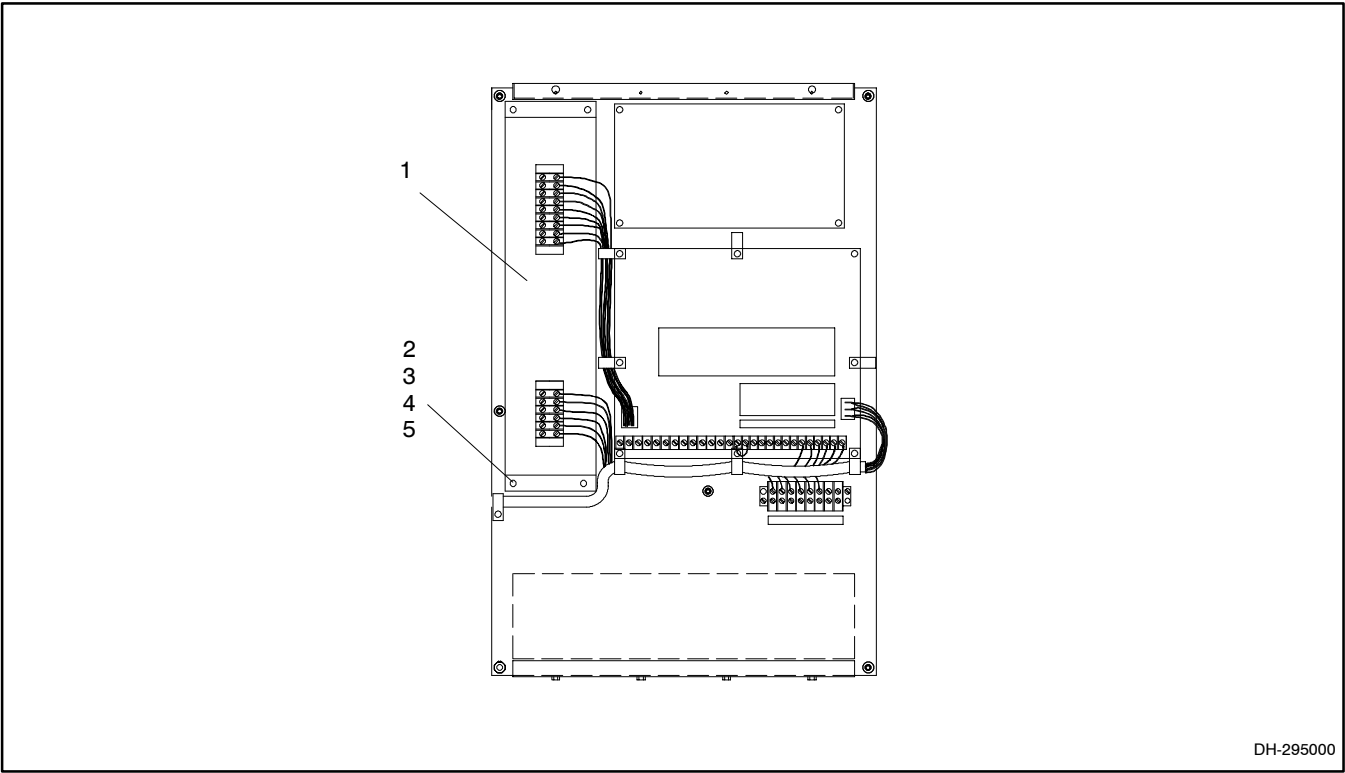
Controller Board, S340 Controls



A-297373-
C-297878-

Item	Part No.	Description	Quantity
1	See inner panel	PCB assembly, ATS controller (includes items 2-16)	1
2	C-297878	PCB assembly, ATS daughter board (includes items 3 and 4)	1
3	X-71-2	Nut, hex machine screw, 6-32	4
4	X-6048-2	Jumper, term block, 2-position	3
5	X-6048-4	Jumper, term block, 4-position	1
6	X-71-2	Nut, hex machine screw, 6-32	4
7	233579	Spacer, mounting	2
8	295253	Relay, 10 A, NR/ER	2
9	295255	Relay, TDES	1
10	295270	Relay, NR1	1
11	295271	Clip, relay, NR1	1
12	295318	Relay, EFR	1
13	297835	Clamp, relay hold down, TDES	1
14	299988	Spacer, PCB mounting	6

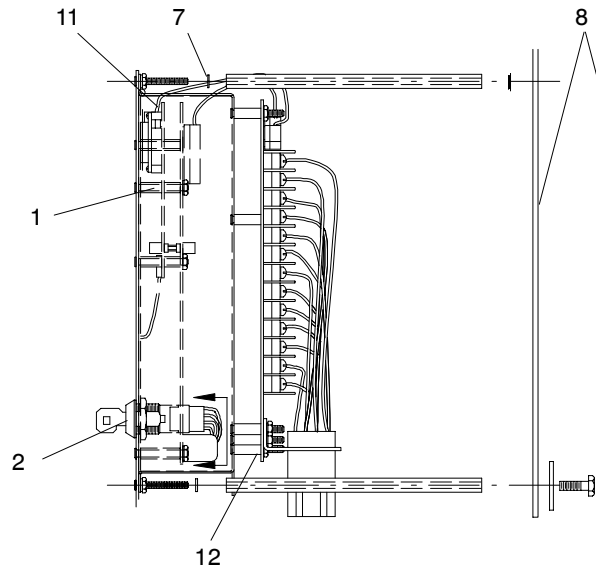
Transformer, S340 Controls



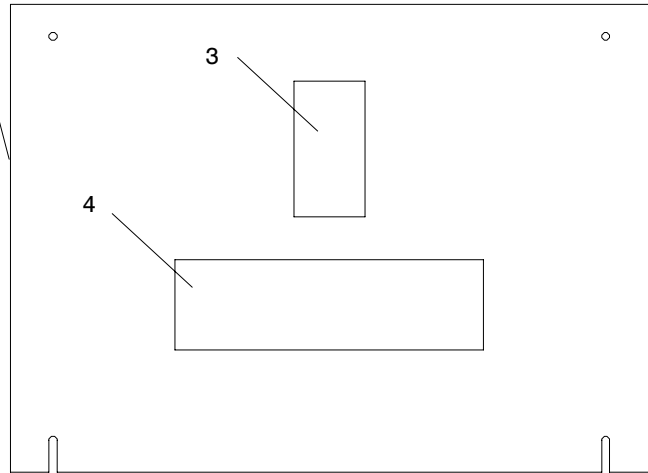
DH-295000

Item	Part No.	Description	Quantity by Voltage, Frequency, and Phase									
			220 V 50 Hz, 240 V 60 Hz		110 V 50 Hz, 120 V, 60 Hz		190 V 50 Hz, 208 V 60 Hz		440 V 50 Hz, 480 V, 60 Hz		600 V 60 Hz	380/416 V, 50/60 Hz
			Phase									
			1	3	1	3	1	3	3	3	3	
1	A-295035	Transformer assembly	1									
1	A-295036	Transformer assembly			1							
1	A-295037	Transformer assembly						1				
1	A-295038	Transformer assembly		1								
1	A-295039	Transformer assembly							1			
1	A-295040	Transformer assembly								1		
1	A-295041	Transformer assembly				1						
1	A-295042	Transformer assembly										1
1	A-295049	Transformer assembly					1					
2	298811	Nut, captive, 8-32				4					4	
3	X-22-7	Washer, locking, 172 ID x .333 in. OD				4					4	
4	X-51-53	Screw, cross recess round head machine				4					4	
5	X-6216-1	Screw, Phillips hex crimp-tite	4	4	4		4	4	4			4

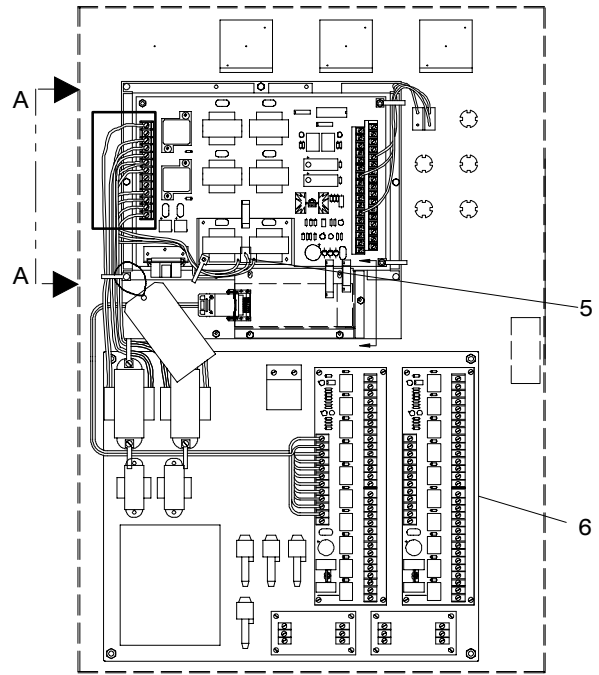
Inner Panel, M340 Controls



View A-A



Barrier Assembly

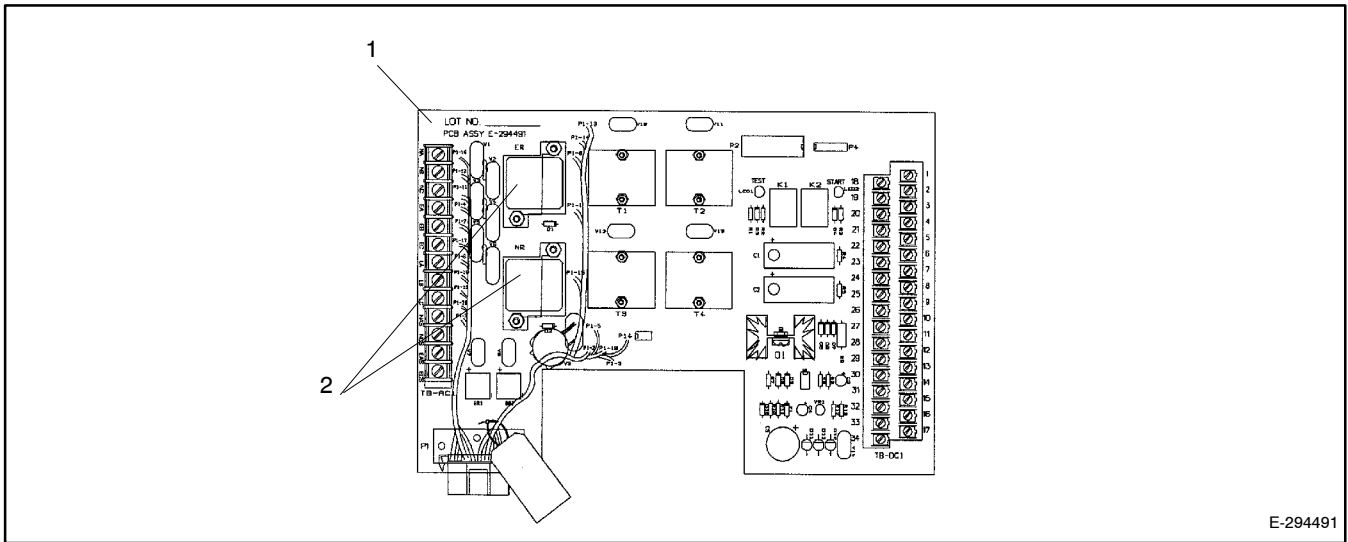


BW-295000
 DR-295000
 DH-295000

Inner Panel, M340 Controls

Item	Part No.	Description	Quantity
1	253797	Spacer, .187 in. OD x .13 in.	19
2	294122	Switch, key	1
3	294328	Decal	1
4	294523	Decal	1
5	294634	Shunt, programming	1
6	294741	Panel, inner	1
7	294759	Retainer	2
8	294860	Guard	1
9	346339	Tag, notice	1
10	362146	Decal, control panel	1
11	362060	ATS controller service kit (includes display, logic board, and transformer board)	1
12	E-294491	PCB assembly, ATS controller, transformer (see also controller board parts)	1

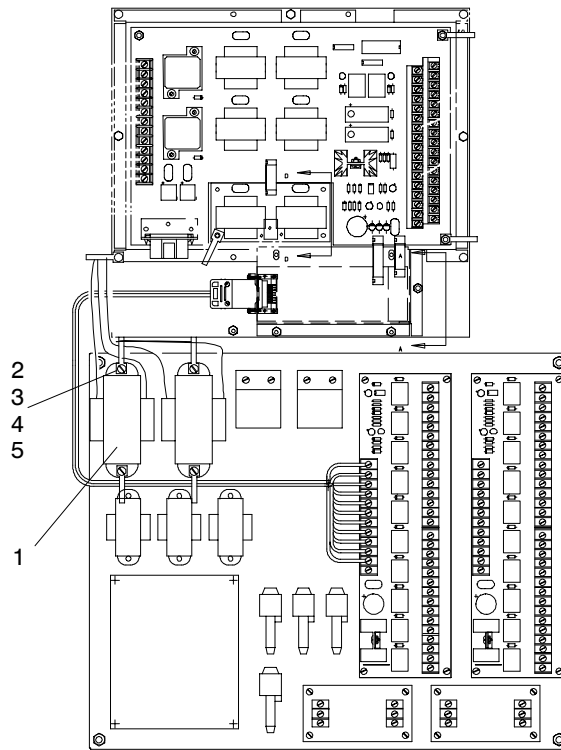
Controller Board, M340 Controls



E-294491

Item	Part No.	Description	Quantity
1	E-294491	PCB assembly, ATS controller, transformer (includes items 2-4)	1
2	294571	Relay, NR/ER	2

Transformer, M340 Controls

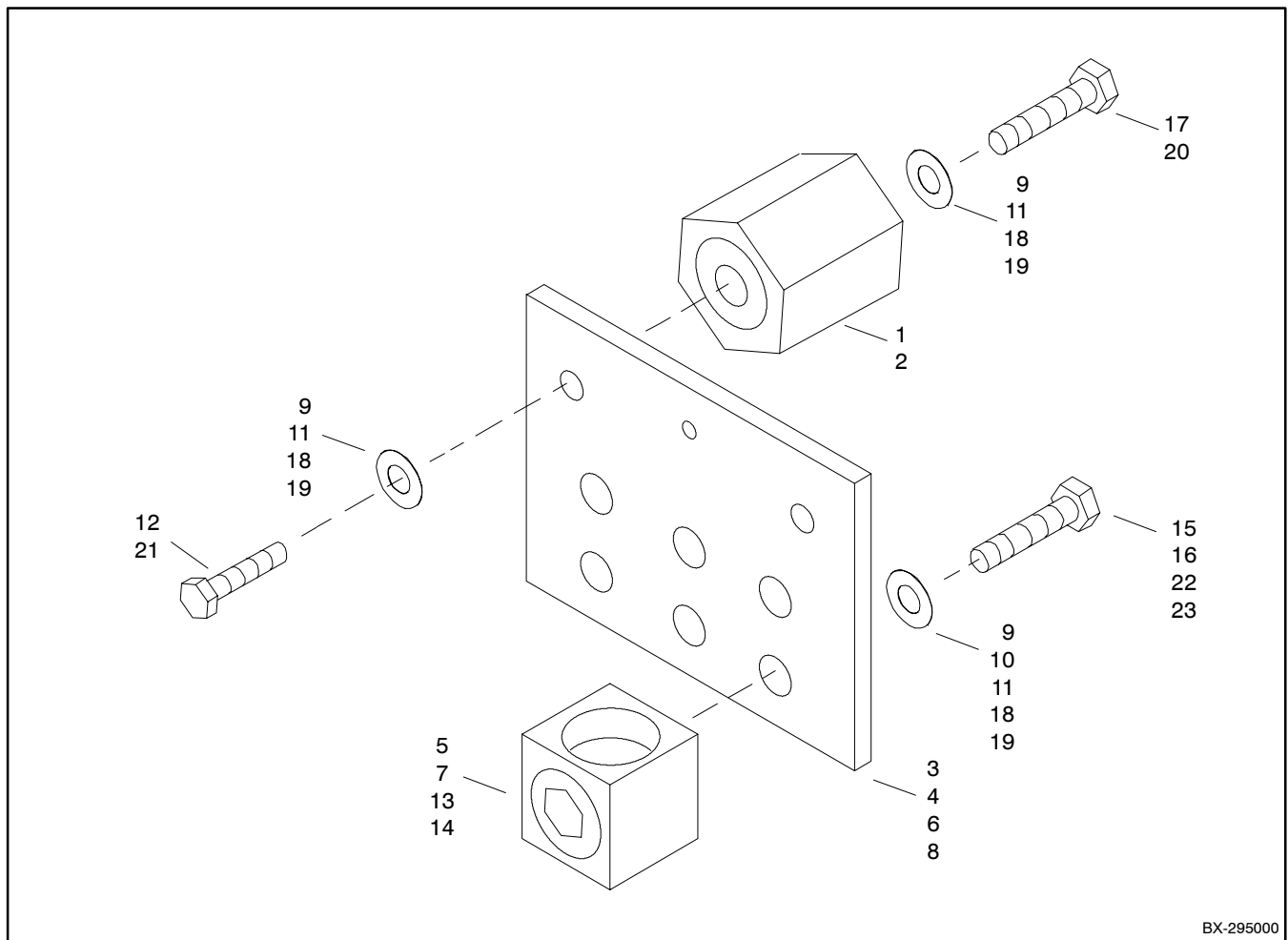


View of Inner Door Panel

BW-295000

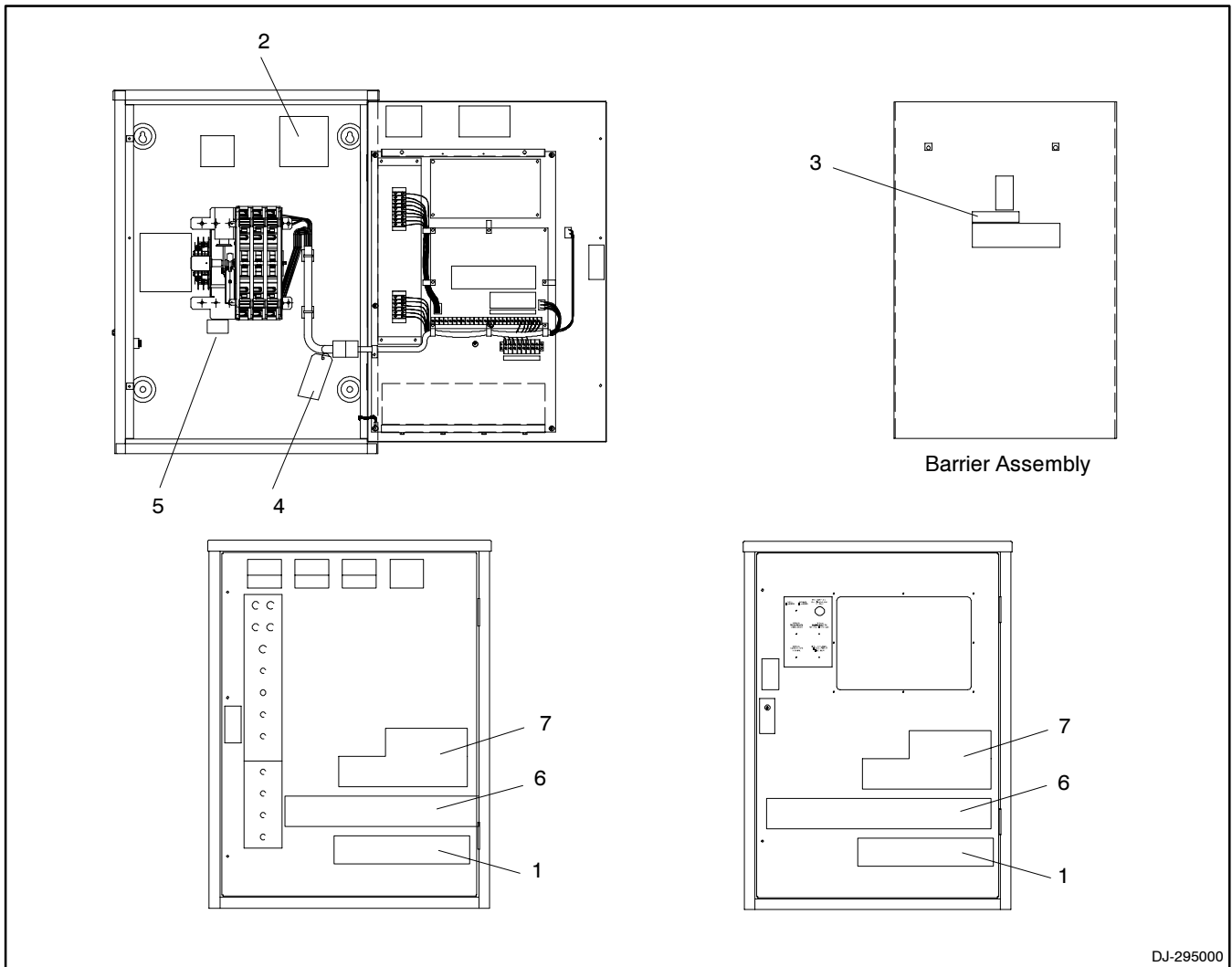
Item	Part No.	Description	Quantity by Voltage, Frequency, and Phase					
			600 V 60 Hz	480 V 60 Hz	208 V 60 Hz	380 V 50 Hz	240 V 60 Hz	120 V 60 Hz
			Phase					
			3	3	3	3	1, 3	1
1	294593	Transformer, 120 V, 19 V						2
1	294594	Transformer, 208 V, 19 V			2			
1	294595	Transformer, 240 V, 19 V					2	
1	294596	Transformer, 380V, 19 V				2		
1	294598	Transformer, 480 V, 19 V		2				
1	294599	Transformer, 600 V, 19 V	2					
2	298811	Nut, captive, 8-32	4	4	4	4	4	4
3	X-22-7	Washer, lock .172 ID x .333 in. OD	4	4	4	4	4	4
4	X-51-4	Screw, cross recess round head machine	2	2	2	2	2	2
5	X-51-53	Screw, slotted round head machine	2	2	2	2	2	2

Neutral Lugs



BX-295000

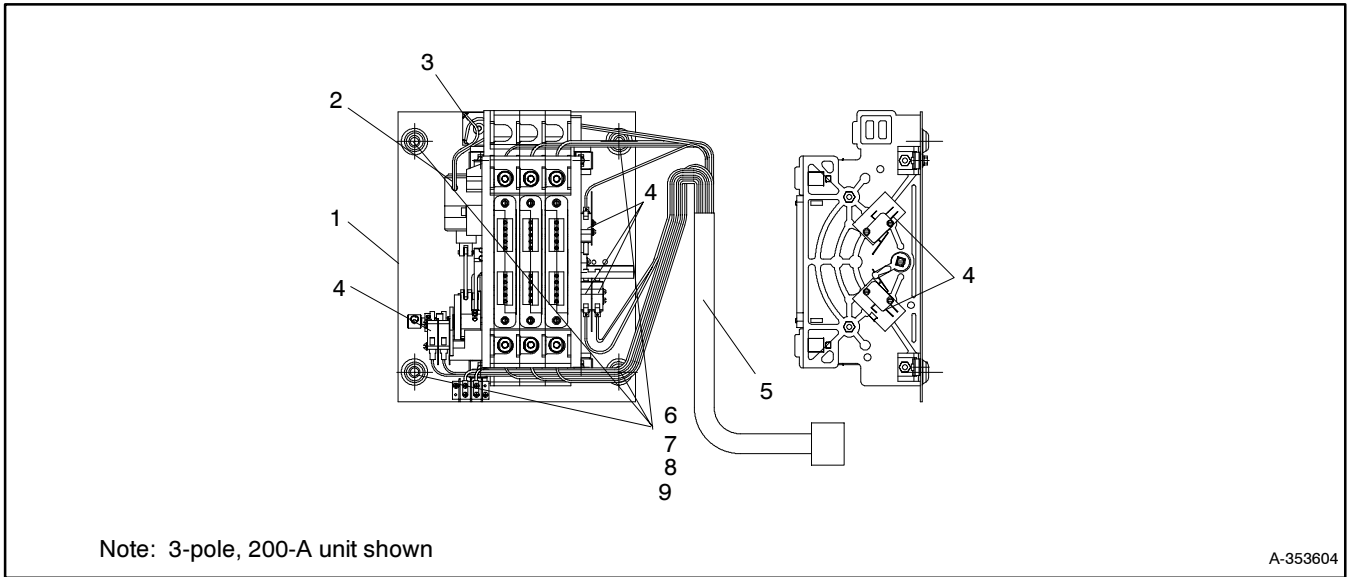
Item	Part No.	Description	Quantity by Amperage			
			40, 80, 100	150, 200	225, 260	400
1	233269	Insulator, panel	2	2		
2	233568	Insulator			2	2
3	294359	Bracket, mounting				1
4	294362	Bracket, mounting			1	
5	295303	Lug, aluminum terminal	3			
6	295304	Bracket, mounting	1	1		
7	297712	Lug, terminal		3		
8	297713	Bracket, mounting		1		
9	X-22-11	Washer, lock, .262 ID x .469 in. OD	4	7	7	
10	X-22-9	Washer, lock, .20 ID x .373 in. OD	3			
11	X-25-40	Washer, plain, .281 ID x .625 in. OD		2		
12	X-465-6	Bolt, hex cap	2	2		
13	X-6207-5	Lug, aluminum terminal			3	
14	X-6207-9	Lug, aluminum terminal				3
15	X-6238-14	Bolt, hex cap			3	3
16	X-97-11	Screw, slotted hex head machine	3	3		
17	X-465-17	Screw, hex head machine	2	2		
18	X-25-118	Washer, plain, .406 ID x 1 in. OD			10	10
19	X-6086-6	Washer, spring, .39 ID x .81 in. OD			7	7
20	X-6238-37	Bolt, hex cap			2	2
21	X-6238-10	Bolt, hex cap			2	2
22	X-465-6	Bolt, hex cap		3		
23	X-83-7	Nut, hex, zinc, 3/8-16 (not shown)			3	3



Item	Part No.	Description	Quantity by Model, Control, and Enclosure Type							
			Nonautomatic			Automatic				
			S340			S340	S340, M340	S340	M340, NEMA 12,3R	M340
			NEMA 1, 3R	NEMA 12	Open	NEMA 12	NEMA 1	Open	S340, NEMA3R	Open
1	273746	Decal, TRANSFER SWITCH	1	1		1	1		1	
2	294414	Decal, notice	1	1	1	1	1	1	1	1
3	295933	Decal, mounting						1		1
4	297949	Tag, hang	1	1	1	1	1	1	1	1
5	362113	Decal, engine start	1	1	1	1	1	1	1	1
6	X-6232-1	Decal, stripes, Kohler					1		1	
6	X-6232-3	Decal, stripes, Kohler		1		1				
6	X-6232-5	Decal, stripes, Kohler	1							
7	X-6246-3	Decal, KOHLER POWER SYSTEMS	1	1		1	1		1	

Contactors

250 Volt Max. Contactors, 40-200 Amps



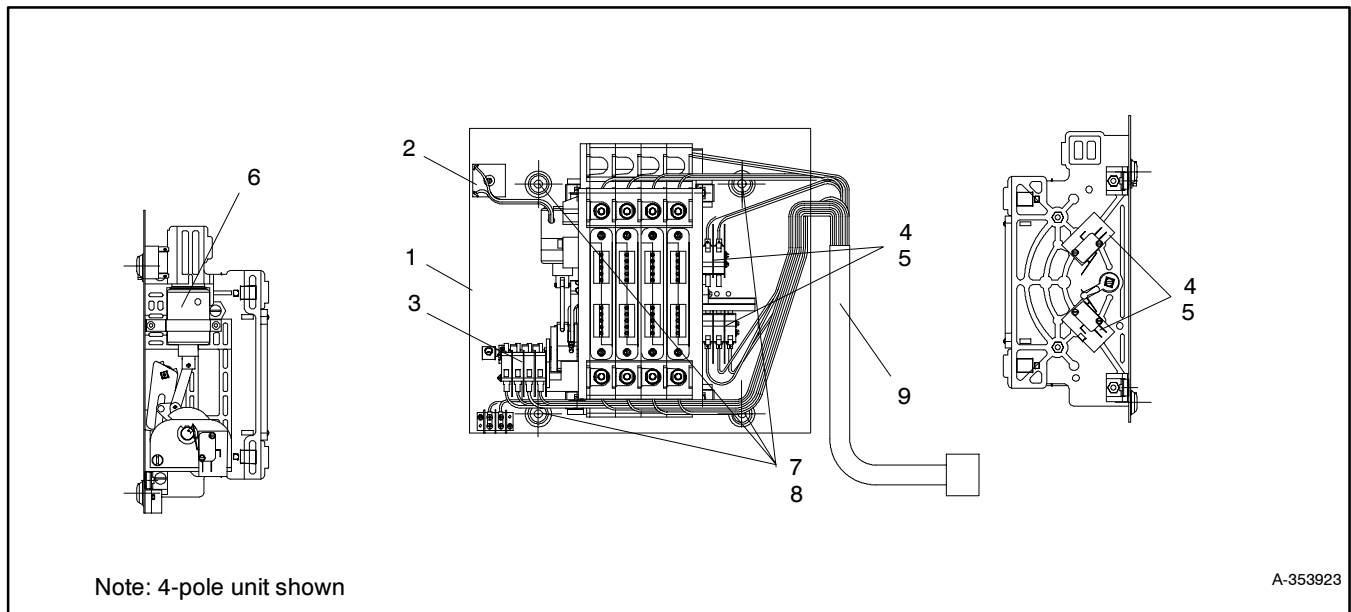
Item	Part No.	Description	Quantity
1	See the following tables.	Contactors assembly, complete	2
2	362078	Solenoid, 110/120 VAC, 6.0 ohms*	1
2	362087	Solenoid, 190/208 VAC, 18.1 ohms*	1
2	362135	Solenoid, 220/240 VAC, 28.8 ohms*	1
3	362080	Rectifier assembly, full wave bridge	1
4	362081	Switch, coil-clearing SCE/SCN or auxiliary SE/SN	5
5	GM13719	Wiring harness, contactor	1
6	X-22-11	Washer, lock, .262 ID x .469 in. OD, 40-200 A	4
7	X-81-10	Nut, hex, 1/4-20, 40-200 A	4
8	295008	Bolt, 1/4-20 x 1 in., 225-400 A	4
9	295009	Retainer, 225-400 A	4

* See the contactor assemblies table on the next page to find the solenoid coil voltage.

Contactor Assemblies, S340, 250 V Maximum, 40-200 Amps

Amps	Poles Code	G/GN Voltage Codes	GTS/GTN Voltage Codes	Solenoid Coil Voltage	Contactor Assembly Part No.
40	2	21, 22	61, 62	110-120	A-353604
40	2	27, 28	67, 68	190-208	A-353605
40	2	23, 24	63, 64	220-240	A-353606
40	3	21, 22	61, 62	110-120	A-353719
40	3	27, 28	67, 68	190-208	A-353608
40	3	23, 24	63, 64	220-240	A-353609
80	2	21, 22	61, 62	110-120	A-353694
80	2	27, 28	67, 68	190-208	A-353695
80	2	23, 24	63, 64	220-240	A-353696
80	3	21, 22	61, 62	110-120	A-353697
80	3	27, 28	67, 68	190-208	A-353698
80	3	23, 24	63, 64	220-240	A-353699
100	2	21, 22	61, 62	110-120	A-353700
100	2	27, 28	67, 68	190-208	A-353701
100	2	23, 24	63, 64	220-240	A-353702
100	3	21, 22	61, 62	110-120	A-353703
100	3	27, 28	67, 68	190-208	A-353704
100	3	23, 24	63, 64	220-240	A-353705
150	2	21, 22	61, 62	110-120	A-353769
150	2	27, 28	67, 68	190-208	A-353730
150	2	23, 24	63, 64	220-240	A-353731
150	3	21, 22	61, 62	110-120	A-353732
150	3	27, 28	67, 68	190-208	A-353733
150	3	23, 24	63, 64	220-240	A-353734
600	2	21, 22	61, 62	110-120	A-353735
600	2	27, 28	67, 68	190-208	A-353738
600	2	23, 24	63, 64	220-240	A-353739
600	3	21, 22	61, 62	110-120	A-353740
600	3	27, 28	67, 68	190-208	A-353741
600	3	23, 24	63, 64	220-240	A-353742

600 Volt Max. Contactors, 40-150 Amps



Item	Part No.	Description	Quantity
1	See the following tables.	Contactors assembly	1
2	362080	Rectifier assembly, full wave bridge	1
3	362081	Switch, coil clearing, SCN/SCE, 480 V nominal and below	4
3	362092	Switch, coil clearing, SCN/SCE, 600 V nominal only	4
4	362081	Switch, auxiliary, SN/SE, solid-state controls (tin contacts)	3
4	GM10316	Switch, auxiliary, SN/SE, microprocessor controls (gold contacts)	3
5	362081	Switch, main shaft auxiliary A3/A4, 480 V nominal and below	2
5	362092	Switch, main shaft auxiliary A3/A4, 600 V nominal only	2
6	362078	Solenoid, 110/120 VAC, 6.0 ohms*	1
6	362087	Solenoid, 190/208 VAC, 18.1 ohms*	1
6	362135	Solenoid, 220/240VAC, 28.8 ohms*	1
6	362089	Solenoid, 380/416 VAC, 62.8 ohms*	1
6	362090	Solenoid, 440/480 VAC, 89.6 ohms*	1
6	362091	Solenoid, 575/600 VAC, 162.4 ohms*	1
7	X-22-11	Washer, lock, .262 ID x .469 in. OD	4
8	X-81-10	Nut, hex, 1/4-20	4
9	GM13735	Wiring harness, contactor	1

* See the contactor assemblies tables on the next pages to find the solenoid coil voltage.

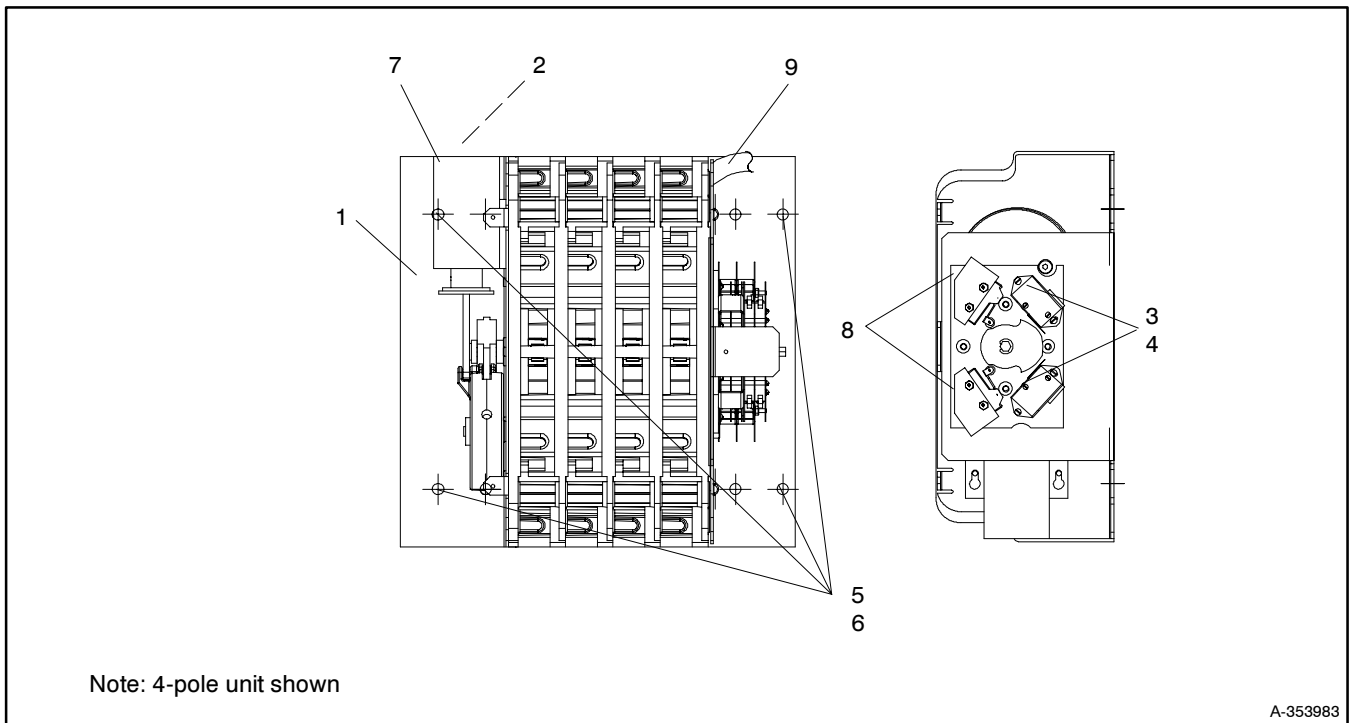
Contactor Assemblies, S340, 600 V Maximum, 40-150 Amps

Amps	Poles Code	G/GN/GLS/GLN Voltage Codes	Solenoid Coil Voltage	Contactor Assembly Part No.
40	2	53, 54, 63, 64	220-240	A-353923
40	2	61, 62	110-120	A-353924
40	2	56, 59, 66, 69	440-480	A-353925
40	2	58, 67, 68	190-208	A-353926
40	3, 4	53, 54, 63, 64	220-240	A-353927
40	3, 4	58, 67, 68	190-208	A-353928
40	3, 4	56, 59, 66, 69	440-480	A-353929
40	3, 4	61, 62	110-120	A-353930
40	3, 4	60	550-600	A-353931
40	3, 4	71, 73, 74	380-416	A-353932
40	6	58, 67, 68	190-208	A-353933
40	6	71, 73, 74	380-416	A-353934
40	6	56, 59, 66, 69	440-480	A-353935
40	6	60	550-600	A-353936
40	6	53, 54, 63, 64	220-240	A-353937
80	2	53, 54, 63, 64	220-240	A-353938
80	2	61, 62	110-120	A-353939
80	2	56, 59, 66, 69	440-480	A-353940
80	2	58, 67, 68	190-208	A-353941
80	3, 4	58, 67, 68	190-208	A-353942
80	3, 4	56, 59, 66, 69	440-480	A-353943
80	3, 4	61, 62	110-120	A-353944
80	3, 4	53, 54, 63, 64	220-240	A-353945
80	3, 4	60	550-600	A-353946
80	3, 4	71, 73, 74	380-416	A-353947
80	6	58, 67, 68	190-208	A-353948
80	6	53, 54, 63, 64	220-240	A-353949
80	6	56, 59, 66, 69	440-480	A-353950
80	6	60	550-600	A-353951
80	6	71, 73, 74	380-416	A-353952
100	2	53, 54, 63, 64	220-240	A-353953
100	2	61, 62	110-120	A-353954
100	2	56, 59, 66, 69	440-480	A-353955
100	2	58, 67, 68	190-208	A-353956
100	3, 4	58, 67, 68	190-208	A-353957
100	3, 4	56, 59, 66, 69	440-480	A-353958
100	3, 4	61, 62	110-120	A-353959
100	3, 4	53, 54, 63, 64	220-240	A-353960
100	3, 4	60	550-600	A-353961
100	3, 4	71, 73, 74	380-416	A-353962
100	6	58, 67, 68	190-208	A-353963
100	6	53, 54, 63, 64	220-240	A-353964
100	6	56, 59, 66, 69	440-480	A-353965
100	6	60	550-600	A-353966
100	6	71, 73, 74	380-416	A-353967
150	2	53, 54, 63, 64	220-240	A-353968
150	2	61, 62	110-120	A-353969
150	2	56, 59, 66, 69	440-480	A-353970
150	2	58, 67, 68	190-208	A-353971
150	3, 4	58, 67, 68	190-208	A-353972
150	3, 4	56, 59, 66, 69	440-480	A-353973
150	3, 4	61, 62	110-120	A-353974
150	3, 4	53, 54, 63, 64	220-240	A-353975
150	3, 4	71, 73, 74	380-416	A-353976
150	3, 4	60	550-600	A-353977
150	6	58, 67, 68	190-208	A-353978
150	6	53, 54, 63, 64	220-240	A-353979
150	6	71, 73, 74	380-416	A-353980
150	6	56, 59, 66, 69	440-480	A-353981
150	6	60	550-600	A-353982

Contactor Assemblies, M340, 600 V Maximum, 40-150 Amps

Amps	Poles Code	Voltage Codes G/GN/GLS/GLN	Solenoid Coil Voltage	Contactor Assembly Part No.
40	2	61, 62	110-120	A-353743
40	2	53, 54, 63, 64	220-240	A-353744
40	2	71, 73, 74	380-416	A-353745
40	2	56, 59, 66, 69	440-480	A-353746
40	2	60	550-600	A-353747
40	2	58, 67, 68	190-208	A-353748
40	3, 4	61, 62	110-120	A-353749
40	3, 4	58, 67, 68	190-208	A-353750
40	3, 4	53, 54, 63, 69	440-480	A-353751
40	3, 4	60	550-600	A-353752
40	3, 4	53, 54, 63, 64	220-240	A-353753
40	3, 4	71, 73, 74	380-416	A-353754
40	6	61, 62	110-120	A-353755
40	6	58, 67, 68	190-208	A-353756
40	6	71, 73, 74	380-416	A-353757
40	6	56, 59, 66, 69	440-480	A-353758
40	6	60	550-600	A-353759
40	6	53, 54, 63, 64	220-240	A-353760
80	2	61, 62	110-120	A-353761
80	2	58, 67, 68	190-208	A-353762
80	2	53, 54, 63, 64	220-240	A-353763
80	2	71, 73, 74	380-416	A-353764
80	2	60	550-600	A-353765
80	2	56, 59, 66, 69	440-480	A-353766
80	3, 4	58, 67, 68	190-208	A-353767
80	3, 4	53, 54, 63, 64	220-240	A-353768
80	3, 4	56, 59, 66, 69	440-480	A-353769
80	3, 4	60	550-600	A-353770
80	3, 4	61, 62	110-120	A-353771
80	3, 4	71, 73, 74	380-416	A-353772
80	6	61, 62	110-120	A-353773
80	6	58, 67, 68	190-208	A-353774
80	6	53, 54, 63, 64	220-240	A-353775
80	6	56, 59, 66, 69	440-480	A-353776
80	6	60	550-600	A-353777
80	6	71, 73, 74	380-416	A-353778
100	2	61, 62	110-120	A-353779
100	2	58, 67, 68	190-208	A-353780
100	2	53, 54, 63, 64	220-240	A-353781
100	2	71, 73, 74	380-416	A-353782
100	2	56, 59, 66, 69	440-480	A-353783
100	2	60	550-600	A-353784
100	3, 4	61, 62	110-120	A-353785
100	3, 4	58, 67, 68	190-208	A-353786
100	3, 4	53, 54, 63, 64	220-240	A-353787
100	3, 4	56, 59, 66, 69	440-480	A-353788
100	3, 4	60	550-600	A-353789
100	3, 4	71, 73, 74	380-416	A-353790
100	6	61, 62	110-120	A-353791
100	6	58, 67, 68	190-208	A-353792
100	6	53, 54, 63, 64	220-240	A-353793
100	6	56, 59, 66, 69	440-480	A-353794
100	6	60	550-600	A-353795
100	6	71, 73, 74	380-416	A-353796
150	2	61, 62	110-120	A-353797
150	2	58, 67, 68	190-208	A-353798
150	2	53, 54, 63, 64	220-240	A-353799
150	2	71, 73, 74	380-416	A-353800
150	2	56, 59, 66, 69	440-480	A-353801
150	2	60	550-600	A-353802
150	3, 4	61, 62	110-120	A-353803
150	3, 4	58, 67, 68	190-208	A-353804
150	3, 4	53, 54, 63, 64	220-240	A-353805
150	3, 4	71, 73, 74	380-416	A-353806
150	3, 4	56, 59, 66, 69	440-480	A-353807
150	3, 4	60	550-600	A-353808
150	6	61, 62	110-120	A-353809
150	6	58, 67, 68	190-208	A-353810
150	6	53, 54, 63, 64	220-240	A-353811
150	6	71, 73, 74	380-416	A-353812
150	6	56, 59, 66, 69	440-480	A-353813
150	6	60	550-600	A-353814

600 Volt Max. Contactors, 225-400 Amps



Item	Part No.	Description	Quantity
1	See the following tables.	Contactors assembly	1
2	362080	Rectifier assembly, full wave bridge (not shown)	1
3	362081	Switch, auxiliary, SN/SE, solid-state controls (tin contacts)	3
3	GM10316	Switch, auxiliary, SN/SE, microprocessor controls (gold contacts)	3
4	362081	Switch, main shaft auxiliary A3/A4	2
5	295008	Bolt, 1/4-20 x 1 in.	4
6	295009	Retainer	4
7	GM10268	Solenoid, 110/120 VAC, 3.5 ohms*	1
7	GM10269	Solenoid, 190/208 VAC, 5.3 ohms*	1
7	GM10270	Solenoid, 220/240 VAC, 5.3 ohms*	1
7	GM10271	Solenoid, 380/416 VAC, 20.1 ohms*	1
7	GM10272	Solenoid, 440/480 VAC, 28.5 ohms*	1
7	GM10273	Solenoid, 575/600 VAC, 47.2 ohms*	1
8	GM10317	Switch, coil clearing, SCN/SCE	4
9	GM13722	Wiring harness, contactor	1

* See the contactor assemblies tables on the next pages to find the solenoid coil voltage.

Contactors Assemblies, S340, 600 V Maximum, 225-400 Amps

Amps	Poles Code	Voltage Codes G/GN/GTS/GTN	Solenoid Coil Voltage	Contactors Assembly Part No.
225	2	61, 62	110-120	A-353983
225	2	53, 54, 63, 64	220-240	A-353984
225	2	56, 59, 66, 69	440-480	A-353985
225	2	58, 67, 68	190-208	A-353986
225	2	71, 73, 74	380-416	A-362279
225	2	60	550-600	A-362280
225	3, 4	53, 54, 63, 64	220-240	A-353987
225	3, 4	71, 73, 74	380-416	A-353988
225	3, 4	58, 67, 68	190-208	A-353989
225	3, 4	56, 59, 66, 69	440-480	A-353990
225	3, 4	60	550-600	A-353991
225	3, 4	61, 62	110-120	A-353992
225	6	53, 54, 63, 64	220-240	A-353993
225	6	71, 73, 74	380-416	A-353994
225	6	58, 67, 68	190-208	A-353995
225	6	56, 59, 66, 69	440-480	A-353996
225	6	60	550-600	A-353997
225	6	60	550-600	A-353998
260	2	61, 62	110-120	A-362254
260	2	53, 54, 63, 64	220-240	A-362255
260	2	56, 59, 66, 69	440-480	A-362256
260	2	58, 67, 68	190-208	A-362257
260	2	71, 73, 74	380-416	A-362277
260	2	60	550-600	A-362278
260	3, 4	53, 54, 63, 64	220-240	A-362258
260	3, 4	71, 73, 74	380-416	A-362259
260	3, 4	58, 67, 68	190-208	A-362260
260	3, 4	56, 59, 66, 69	440-480	A-362261
260	3, 4	60	550-600	A-362262
260	3, 4	61, 62	110-120	A-362263
260	6	53, 54, 63, 64	220-240	A-362264
260	6	71, 73, 74	380-416	A-362265
260	6	58, 67, 68	190-208	A-362266
260	6	56, 59, 66, 69	440-480	A-362267
260	6	60	550-600	A-362268
260	6	60	550-600	A-362269
400	2	56, 59, 66, 69	440-480	A-353999
400	2	61, 62	110-120	A-362001
400	2	53, 54, 63, 64	220-240	A-362002
400	2	60	550-600	A-362003
400	2	58, 67, 68	190-208	A-362281
400	2	71, 73, 74	380-416	A-362282
400	3, 4	53, 54, 63, 64	220-240	A-362004
400	3, 4	71, 73, 74	380-416	A-362005
400	3, 4	58, 67, 68	190-208	A-362006
400	3, 4	56, 59, 66, 69	440-480	A-362007
400	3, 4	60	550-600	A-362008
400	3, 4	61, 62	110-120	A-362009
400	6	53, 54, 63, 64	220-240	A-362010
400	6	71, 73, 74	380-416	A-362011
400	6	58, 67, 68	190-208	A-362012
400	6	56, 59, 66, 69	440-480	A-362013
400	6	60	550-600	A-362014
400	6	61, 62	110-120	A-362015

Contactor Assemblies, M340, 600 V Maximum, 225-400 Amps

Amps	Poles Code	Voltage Codes G/GLS	Solenoid Coil Voltage	Contactor Assembly Part No.
225	2	61, 62	110-120	A-353815
225	2	58, 67, 68	190-208	A-353816
225	2	53, 54, 63, 64	220-240	A-353817
225	2	71, 73, 74	380-416	A-353818
225	2	56, 59, 66, 69	440-480	A-353819
225	2	60	550-600	A-353820
225	3, 4	61, 62	110-120	A-353821
225	3, 4	58, 67, 68	190-208	A-353822
225	3, 4	71, 73, 74	380-416	A-353823
225	3, 4	56, 59, 66, 69	440-480	A-353824
225	3, 4	60	550-600	A-353825
225	3, 4	53, 54, 63, 64	220-240	A-353826
225	6	61, 62	110-120	A-353827
225	6	58, 67, 68	190-208	A-353828
225	6	56, 59, 66, 69	440-480	A-353829
225	6	60	550-600	A-353830
225	6	53, 54, 63, 64	220-240	A-353831
225	6	71, 73, 74	380-416	A-353832
260	2	61, 62	110-120	A-362283
260	2	58, 67, 68	190-208	A-362284
260	2	53, 54, 63, 64	220-240	A-362285
260	2	71, 73, 74	380-416	A-362239
260	2	56, 59, 66, 69	440-480	A-362240
260	2	60	550-600	A-362241
260	3, 4	61, 62	110-120	A-362242
260	3, 4	58, 67, 68	190-208	A-362243
260	3, 4	71, 73, 74	380-416	A-362244
260	3, 4	56, 59, 66, 69	440-480	A-362245
260	3, 4	60	550-600	A-362246
260	3, 4	53, 54, 63, 64	220-240	A-362247
260	6	61, 62	110-120	A-362248
260	6	58, 67, 68	190-208	A-362249
260	6	56, 59, 66, 69	440-480	A-362250
260	6	60	550-600	A-362251
260	6	53, 54, 63, 64	220-240	A-362252
260	6	71, 73, 74	380-416	A-362253
400	2	61, 62	110-120	A-353833
400	2	58, 67, 68	190-208	A-353834
400	2	53, 54, 63, 64	220-240	A-353835
400	2	71, 73, 74	380-416	A-353836
400	2	56, 59, 66, 69	440-480	A-353837
400	2	60	550-600	A-353838
400	3, 4	61, 62	110-120	A-353839
400	3, 4	58, 67, 68	190-208	A-353840
400	3, 4	71, 73, 74	380-416	A-353841
400	3, 4	56, 59, 66, 69	440-480	A-353842
400	3, 4	60	550-600	A-353843
400	3, 4	53, 54, 63, 64	220-240	A-353844
400	6	61, 62	110-120	A-353845
400	6	58, 67, 68	190-208	A-353846
400	6	56, 59, 66, 69	440-480	A-353847
400	6	60	550-600	A-353848
400	6	53, 54, 63, 64	220-240	A-353849
400	6	71, 73, 74	380-416	A-353850

Notes

Service Parts, Accessories

Qty.	Description	Part No.
	TDNE (Adj. 1-30 Min)	KA-1-BS3
1	PCB assy., ATS controller, 3 phase, 60 Hz	E-297383
	TDNE (Adj. 1-30 Min)	KA-1-BS4
1	PCB assy., ATS controller, 1 phase, 60 Hz	E-297381
	TDNE (Adj. 1-30 Min)	KA-1-BS5
1	PCB assy. ATS controller, 3 phase, 50 Hz	E-297382
	TDES (Adj. 3-20 Sec)	KA-2-AS
1	Relay, time delay	295263
	TDES (Adj. 20-240 Sec)	KA-2-FS
1	Relay, time delay	295974
	TDES (Adj. 0.5-6 Sec)	KA-2-GS
1	Relay, time delay	295975
	TDEC (Fixed at 5 Min)	KA-4-DS
3	Screw, cross recess pan head machine	X-49-6
1	Strap, holddown	X-6124-1
1	Spacer, .25 OD, .25 in.	X-712-2
1	Bridge rectifier, 25 A	228163
1	Socket, relay	295034
1	Relay, 12 VDC, 10 A	295319
3	Nut, captive, 6-32	298810
	Test Switch Maintained	KA-6-D
1	Ring, lock switch	151511
1	Switch, toggle, 1-pole	268015
	Maintained Test Switch	KA-6-D3
1	Decal	294429
1	Switch, key operator	298040
1	Contact	298046
	Momentary Test Switch	KA-6-F
1	Ring, lock switch	151511
1	Decal, auto/test, 1.37 x 3.5 in.	346343
1	Lock, key switch	353293
	Momentary Test Switch	KA-6-F3
1	Decal	294429
1	Switch, key operator	298041
1	Contact	298046
	Maintained Test Switch	KA-6-H
2	Terminal, spade, 22-16 AWG	X-285-1
1	Ring, lock switch	151511
1	Switch, key	297006
1	Decal, auto/test, 1.37 x 3.5 in.	346343
	Maintained Test Switch	KA-6-H3
1	Decal	294429
1	Switch, key operator	298040
1	Contact	298046
	Three-Position Test Switch	KA-6-M
1	Decal	294432
1	Switch, selector, 4 pole	297349
	Three-Position Test Switch	KA-6-M3
1	Decal	294432
1	Contact	297350
1	Switch, selector	298055

Qty.	Description	Part No.
	4-Position Selector Switch w/Lamp	KA-7-DS
1	Ring, lock switch	151511
1	Switch, selector, 10-pole	295323
1	Lamp, 12 V, 2 W	295324
1	Lamp socket	295325
1	Lens	295326
	4-Position Selector Switch w/Lamp	KA-7-HS
1	Lamp, 28 V	X-6127-1
1	Lens, clear	X-6127-5
1	Ring, lock switch	151511
1	Adapter, tab	287571
1	Lamp, 12 V, 2 W	298840
1	Switch, selector, 16-pole	298854
	Bypass Switch P.B.E.N.	KA-8-CS
1	Ring, lock switch	151511
2	Tab	201620-168
1	Switch, toggle, 2-pole	295033
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
2	Nut, captive, 6-32	298810
	Bypass Switch P.B.E.N.	KA-8-CS3
2	Tab	201620-168
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Switch, pushbutton operator	298037
1	Contact	298050
2	Nut, captive, 6-32	298810
	Pilot Light Green (Norm)	KA-12-C
1	Lamp, 12 V, 2 W	295324
1	Lamp socket	295325
1	Lens, green	295327
	Pilot Light Green (Norm)	KA-12-C3
1	Lamp, 12 V	X-6127-25
1	Lens, green	X-6127-4
	Pilot Light Red (Emerg)	KA-12-DS
1	Lamp, 12 V, 2 W	295324
1	Lamp socket	295325
1	Lens	295328
	Pilot Light Red (Emerg)	KA-12-DS3
1	Lens, red	X-6127-2
1	Lamp, 12 V	X-6127-25
	Pilot Light White (Norm)	KA-12-G
1	Lamp, 12 V, 2 W	295324
1	Lamp socket	295325
1	Lens	295326
	Pilot Light White (Norm)	KA-12-G3
1	Lamp, 12 V	X-6127-25
1	Lens, clear	X-6127-5
	Pilot Light White (Emerg)	KA-12-H
1	Lamp, 12 V, 2 W	295324
1	Lamp socket	295325
1	Lens	295326

Qty.	Description	Part No.
	Pilot Light White (Norm)	KA-12-H3
1	Lamp, 12 V	X-6127-25
1	Lens, clear	X-6127-5
	Auxiliary Relay Contacts (Norm)	KA-14-C
2	Screw, cross recess pan head machine	X-49-6
2	Spacer, .25 OD, .25 in.	X-712-2
1	Tab, identification	201620-157
1	Socket, relay	295034
1	Spacer, socket	295151
1	Clamp, relay holddown	295189
1	Relay	295254
2	Nut, captive, 6-32	298810
	Auxiliary Relay Contacts (Emerg)	KA-14-D
2	Screw, cross recess pan head machine	X-49-6
2	Spacer, .25 OD, .25 in.	X-712-2
1	Tab, identification	201620-158
1	Socket, relay	295034
1	Spacer, socket	295151
1	Clamp, relay holddown	295189
1	Relay	295254
2	Nut, captive, 6-32	298810
	Auxiliary Contacts	KA-15-N
2	Screw, slotted round head machine	X-49-56
2	Switch, contactor auxiliary	362081
4	Insulator, contactor auxiliary switch	362203
	Auxiliary Contacts 1 Set	KA-15-P
2	Screw, slotted round head machine	X-49-55
2	Switch, contactor auxiliary	362081
2	Insulator, contactor auxiliary switch	362203
	Auxiliary Contacts 2 Sets	KA-15-R
2	Screw, slotted round head machine	X-49-55
2	Screw, slotted round head machine	X-49-56
4	Switch, contactor auxiliary	362081
6	Insulator, contactor auxiliary switch	362203
	Frequency Meter 120 V	KA-18-GA
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
	Frequency Meter 208 V	KA-18-GB
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz	295348
1	Clip, U	297937
	Frequency Meter 240 V	KA-18-GC
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz	295348
1	Clip, U	297937
	Frequency Meter 380 V	KA-18-GD
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 380 V, 120 V	295300
1	Clip, U	297937

Qty.	Description	Part No.
	Frequency Meter 416 V	KA-18-GE
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 415 V, 12V	295301
1	Clip, U	297937
	Frequency Meter 440-480 V	KA-18-GF
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 480 V, 120 V	295302
1	Clip, U	297937
	Frequency Meter 550-600 V	KA-18-GG
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 600 V, 120 V	295299
1	Clip, U	297937
	Volt/Amm Selector Switch 550-600 V	KA-18-JB10
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Resistor assy.	295396
1	Clip, U	297937
	Volt/Amm Selector Switch 190-208 V	KA-18-JB2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Clip, U	297937
	Volt/Amm Selector Switch 220-240 V	KA-18-JB4
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295341
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 380-480 V	KA-18-JB9
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 550-600 V	KA-18-JC10
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-100/200 A, AC	295338
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 190-208 V	KA-18-JC2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-100/200 A, AC	295338
1	Decal	295342
1	Clip, U	297937

	Volt/Amm Selector Switch 220-240 V	KA-18-JC4
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 100:5, round	246885
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-100/200 A, AC	295338
1	Decal	295341
1	Clip, U	297937

	Volt/Amm Selector Switch 380-480 V	KA-18-JC9
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-100/200 A, AC	295338
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 550-600 V	KA-18-JD10
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 190-208 V	KA-18-JD2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Clip, U	297937

	Volt/Amm Selector Switch 220-240 V	KA-18-JD4
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 150:5, round	246886
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295341
1	Clip, U	297937

	Volt/Amm Selector Switch 380-480 V	KA-18-JD9
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 550-600 V	KA-18-JE10
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 190-208 V	KA-18-JE2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Clip, U	297937
	Volt/Amm Selector Switch 220-240 V	KA-18-JE4
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295341
1	Clip, U	297937
	Volt/Amm Selector Switch 380-480 V	KA-18-JE9
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937
	Volt/Amm Selector Switch 190-208 V	KA-18-JG2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
3	Current transformer, 600:5, round	297148
1	Clip, U	297937
	Volt/Amm Selector Switch 220-240 V	KA-18-JG4
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295341
2	Current transformer, 600:5, round	297148
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 380-480 V	KA-18-JG9
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Resistor assembly	295396
3	Current transformer, 600:5, round	297148
1	Clip, U	297937
	Volt/Amm Selector Switch 550-600 V	KA-18-JG10
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Resistor assembly	295396
3	Current transformer, 600:5, round	297148
1	Clip, U	297937
	Plant Exerciser 110-120 V	KA-23-WA
1	Exercise timer kits	TT-1122
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
2	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 190-240 V	KA-23-WB
1	Exercise timer kits	TT-1122
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
2	Nut, captive, 8-32	298811
1	Timer	346648
	Plant Exerciser 380-416 V	KA-23-WC
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 415 V, 12 V	295301
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 440-480 V	KA-23-WD
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 480 V, 120 V	295302
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 550-600 V	KA-23-WE
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 600 V, 120 V	295299
4	Nut, captive, 8-32	298811
1	Timer	346647

Qty.	Description	Part No.
	Plant Exerciser 110-120 V	KA-23-XA
1	Exercise timer kits	TT-1122
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
2	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 190-240 V	KA-23-XB
1	Exercise timer kits	TT-1122
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
2	Nut, captive, 8-32	298811
1	Timer	346648
	Plant Exerciser 380-416 V	KA-23-XC
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 415 V, 12 V	295301
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 440-480 V	KA-23-XD
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 480 V, 120 V	295302
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 550-600 V	KA-23-XE
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 600 V, 120 V	295299
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 110-120 V	KA-23-YA
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Switch, selector, 4-pole	295322
2	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 110-120 V	KA-23-YA3
1	Exercise timer kits	TT-1122
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
2	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 190-240 V	KA-23-YB
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Switch, selector, 4-pole	295322
2	Nut, captive, 8-32	298811
1	Timer	346648

Qty.	Description	Part No.
	Plant Exerciser 190-240 V	KA-23-YB3
1	Exercise timer kits	TT-1122
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
2	Nut, captive, 8-32	298811
1	Timer	346648
	Plant Exerciser 380-416 V	KA-23-YC
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 415 V, 12 V	295301
1	Switch, selector, 4-pole	295322
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 380-416 V	KA-23-YC3
1	Exercise timer kits	TT-1122
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 415 V, 12 V	295301
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 440-480 V	KA-23-YD
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 480 V, 120 V	295302
1	Switch, selector, 4-pole	295322
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 440-480 V	KA-23-YD3
1	Exercise timer kits	TT-1122
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 480 V, 120 V	295302
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser 550-600 V	KA-23-YE
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 600 V, 120 V	295299
1	Switch, selector, 4-pole	295322
4	Nut, captive, 8-32	298811
1	Timer	346647

Qty.	Description	Part No.
	Plant Exerciser 550-600 V	KA-23-YE3
1	Exercise timer kits	TT-1122
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Transformer, 600 V, 120 V	295299
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
4	Nut, captive, 8-32	298811
1	Timer	346647
	Battery Charger 220 V	KA-24-53A
1	Charger, battery	A-294230
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	KA-24-53B
1	Charger, battery	A-294233
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 600 V	KA-24-60A
1	Charger, battery	A-294236
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger, 600 V	KA-24-60B
1	Charger, battery	A-294237
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 120 V	KA-24-62A
1	Charger, battery	A-294226
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 120 V	KA-24-62B
1	Charger, battery	A-294227
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 220 V	KA-24-63A
1	Charger, battery	A-294230
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 220 V	KA-24-63B
1	Charger, battery	A-294231
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	KA-24-64A
1	Charger, battery	A-294232
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	KA-24-64B
1	Charger, battery	A-294233
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 480 V	KA-24-66A
1	Charger, battery	A-294236
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger, 480 V	KA-24-66B
1	Charger, battery	A-294237
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811

Qty.	Description	Part No.
	Battery Charger 208 V	KA-24-68A
1	Charger, battery	A-294228
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 208 V	KA-24-68B
1	Charger, battery	A-294229
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KA-24-71A
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KA-24-71B
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KA-24-72A
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KA-24-72B
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 416 V	KA-24-73A
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 416 V	KA-24-73B
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Area Protection (Mounted)	KA-26-DS
1	Spacer, .25 OD, .25 in.	X-712-2
1	Tab, identification (APR)	201620-161
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
2	Nut, captive, 6-32	298810
	Intelligent Circuit Fuses	KA-28-A
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Clip, U	297937
	Auto/Manual Operation	KA-29-GS
6	Screw, cross recess pan head machine	X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
3	Ring, lock switch	151511
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER3)	201620-160
1	Tab, identification (ER4)	201620-162
4	Terminal, piggyback, male	233704
1	Switch, toggle, 2-pole	238357
1	Decal	294314
1	Wiring harness	294361
2	Switch, toggle, 1-pole	295030
3	Socket, relay	295034
3	Spacer, socket	295151
3	Clamp, relay holddown	295189
3	Relay	295254
6	Nut, captive, 6-32	298810

Qty.	Description	Part No.
Auto/Manual Operation KA-29-GS3		
6	Screw, cross recess pan head machine	X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
3	Ring, lock switch	151511
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER3)	201620-160
1	Tab, identification (ER4)	201620-162
4	Terminal, piggyback, male	233704
1	Wiring harness	294361
1	Decal	294408
3	Socket, relay	295034
3	Spacer, socket	295151
3	Clamp, relay holddown	295189
3	Relay	295254
2	Switch, pushbutton operator	298037
1	Switch, selector	298039
2	Contact	298048
1	Contact	298050
6	Nut, captive, 6-32	298810
Auto/Manual Operation KA-29-JS		
6	Screw, cross recess pan head machine	X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
3	Ring, lock switch	151511
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER4)	201620-162
4	Terminal, piggyback, male	233704
1	Switch, toggle, 2-pole	238357
1	Decal	294314
1	Switch, toggle, 1-pole	295030
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
6	Nut, captive, 6-32	298810
1	Wiring harness, 245-400 A, solid-state	321278
Auto/Manual Operation KA-29-JS3		
6	Screw, cross recess pan head machine	X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
3	Ring, lock switch	151511
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER4)	201620-162
4	Terminal, piggyback, male	233704
1	Decal	294314
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Switch, selector	298038
1	Switch, selector	298039
1	Contact	298048
1	Contact	298050
6	Nut, captive, 6-32	298810
1	Wiring harness, 245-400 A, solid-state	321278

Qty.	Description	Part No.
Auto/Manual Operation KA-29-PS		
6	Screw, cross recess pan head machine	X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
2	Ring, lock switch	151511
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER3)	201620-160
2	Terminal, piggyback, male	233704
1	Switch, toggle, 2-pole	238357
1	Decal	294314
1	Wiring harness	294363
1	Switch, toggle, 1-pole	295030
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
4	Nut, captive, 6-32	298810
Auto/Manual Operation KA-29-PS3		
6	Screw, cross recess pan head machine	X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER3)	201620-160
1	Wiring harness	294363
1	Decal	294408
2	Socket, relay	295034
1	Wiring harness	295134
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Switch, pushbutton operator	298037
1	Switch, key operator	298040
1	Contact	298046
1	Contact	298048
4	Nut, captive, 6-32	298810
Manual Switch Operation KA-29-TS		
6	Screw, cross recess pan head machine	X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
3	Ring, lock switch	151511
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER3)	201620-160
1	Tab, identification (ER4)	201620-162
4	Terminal, piggyback, male	233704
1	Switch, toggle, 2-pole	238357
1	Decal	294314
1	Wiring harness	294361
2	Switch, toggle, 1-pole	295030
3	Socket, relay	295034
3	Spacer, socket	295151
3	Clamp, relay holddown	295189
3	Relay	295254
6	Nut, captive, 6-32	298810

Qty.	Description	Part No.
Manual Switch Operation		
6	Screw, cross recess pan head machine	KA-29-TS3 X-49-6
6	Spacer, .25 OD, .25 in.	X-712-2
3	Ring, lock switch	151511
1	Tab, identification (NR3)	201620-159
1	Tab, identification (ER3)	201620-160
1	Tab, identification (ER4)	201620-162
4	Terminal, piggyback, male	233704
1	Wiring harness	294361
1	Decal	294408
3	Socket, relay	295034
3	Spacer, socket	295151
3	Clamp, relay holddown	295189
3	Relay	295254
2	Switch, pushbutton operator	298037
1	Switch, selector	298039
1	Contact	298046
2	Contact	298048
1	Block, contact	298052
6	Nut, captive, 6-32	298810
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASB X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Monitor, inphase	295157
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASC X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Monitor, inphase	295158
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASD X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Monitor, inphase	295159
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASE X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295906
6	Nut, captive, 6-32	298810

Qty.	Description	Part No.
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASF X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295907
6	Nut, captive, 6-32	298810
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASG X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295908
6	Nut, captive, 6-32	298810
1	Decal, UL ATS emergency system	353498
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASH X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295909
6	Nut, captive, 6-32	298810
Inphase Monitor		
2	Screw, cross recess pan head machine	KA-34-ASJ X-49-15
4	Screw, cross recess pan head machine	X-49-2
1	Tab, identification	201620-120
1	Inphase monitor, kit	294216
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810
Synch Check Relay		
1	Insulink	KA-34-BSB X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 208 V, 12 V	295285
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320530

Qty.	Description	Part No.
Synch Check Relay		
1	Insulink	KA-34-BSC X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 240 V, 12 V	295286
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320531
Synch Check Relay		
1	Insulink	KA-34-BSJ X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 380 V, 12 V	295290
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320532
Synch Check Relay		
1	Insulink	KA-34-BSD X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 480 V, 12 V	295293
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320535
Synch Check Relay		
1	Insulink	KA-34-BSE X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 600 V 12V	295287
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320536
Synch Check Relay		
1	Insulink	KA-34-BSF X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 600 V 12V	295287
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320536

Qty.	Description	Part No.
Synch Check Relay		
1	Insulink	KA-34-BSJ X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 416 V, 12 V	295291
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320533
Load Shedding Contacts		
1	Protective relay, load shed	KA-35-GA A-297096
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	KA-35-GB A-297097
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	KA-35-GC A-297098
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	KA-35-GD A-297099
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	KA-35-GE A-297100
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	KA-35-GF A-297101
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
3-Phase Emerg/Volt Sensing		
1	PCB assy, ATS controller, emergency 3-phase sensing	KD-5-K C-294493
4	Spacer, .25 OD, .625 in.	X-712-8
1	Shunt, programming	294634
1	Cable, multiconductor ribbon	294638
Test Switch (Momentary)		
1	Switch, key operator	KD-6-F 294656
1	Decal, auto/test	294689
3-Position Test Switch		
1	Decal	KD-6-N 294685
1	Switch, selector, 4-pole	294691
3-Position Test Switch		
1	Decal	KD-6-P 294685
1	Switch, keyed selector, 4-pole	294692

Qty.	Description	Part No.
	4-Position Test Switch	KD-7-D
1	Decal, ATS	294686
1	Switch, selector, 6-pole	294695
	4-Position Test Switch	KD-7-F
1	Decal, ATS	294686
1	Switch, keyed selector, 6-pole	294696
	Override TDNE Pushbutton	KD-8-C
1	Switch, pushbutton	294653
1	Contact	298049
	Override TDNE Pushbutton	KD-8-D
1	Switch, pushbutton	294653
1	Contact	298049
	Ten Contact Kit Remote	KD-14-G
1	PCB assy., 10-relay dry contact	D-294303
6	Washer, lock, 172 ID x .333 in. OD	X-22-7
6	Grommet	X-593-2
3	Jumper, term block 2-pos	X-6048-2
6	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294631
1	Cover, terminal strip	294632
1	Clip, U	297937
	Relay Auxiliary Contact (Norm)	KD-14-H
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937
	Relay Auxiliary Contact (Emerg)	KD-14-J
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937
	Relay Auxiliary Contact (Norm)	KD-14-K
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937
	Relay Auxiliary Contact (Emerg)	KD-14-L
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937

Qty.	Description	Part No.
	Relay Auxiliary Contact	KD-14-M
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937
	Relay Auxiliary Contact	KD-14-N
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937
	Relay Auxiliary Contact	KD-14-P
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937
	Relay Auxiliary Contact	KD-14-R
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Cover, terminal strip	294633
1	Clip, U	297937
	Auxiliary Contacts 1 Set	KD-15-N
2	Screw, slotted round head machine	X-49-56
2	Switch, contact auxiliary	362081
4	Insulator, contactor auxiliary switch	362203
	Frequency Meter 120 V	KD-18-GA
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Guard, meter	294705
1	Meter, frequency, 45-65 Hz, AC	295069
	Frequency Meter 208 V	KD-18-GB
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Guard, meter	294705
1	Meter, frequency, 45-65 Hz	295348
1	Clip, U	297937
	Frequency Meter 240 V	KD-18-GC
3	Insulink, 22-18 gauge, insulated	X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Guard, meter	294705
1	Meter, frequency, 45-65 Hz	295348
1	Clip, U	297937

Qty.	Description	Part No.
Frequency Meter 380 V		
3	Insulink, 22-18 gauge, insulated	KD-18-GD X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Guard, meter	294705
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 380 V, 120 V	295300
1	Clip, U	297937
Frequency Meter 416 V		
3	Insulink, 22-18 gauge, insulated	KD-18-GE X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Guard, meter	294705
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 415 V, 12V	295301
1	Clip, U	297937
Frequency Meter 440-480 V		
3	Insulink, 22-18 gauge, insulated	KD-18-GF X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Guard, meter	294705
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 480 V, 120 V	295302
1	Clip, U	297937
Frequency Meter 550 V		
3	Insulink, 22-18 gauge, insulated	KD-18-GG X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Guard, meter	294705
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 600 V, 120 V	295299
1	Clip, U	297937
Volt/Amm Selector Switch 550-600 V		
1	Insulink	KD-18-JB10 X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-75/150 A, AC	295337
1	Resistor assembly	295396
1	Clip, U	297937
Volt/Amm Selector Switch 190-208 V		
1	Insulink	KD-18-JB2 X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 75:5, round	246884
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Clip, U	297937

Qty.	Description	Part No.
Volt/Amm Selector Switch 220-240 V		
2	Insulink, 22-18 gauge, insulated	KD-18-JB4 X-367-3
1	Insulink	X-367-4
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	294701
1	Decal, selector switch, 2.62 x 3.06 in.	294703
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Clip, U	297937
Volt/Amm Selector Switch 440-480 V		
1	Insulink	KD-18-JB9 X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 75:5, round	246884
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-75/150 A, AC	295337
1	Resistor assembly	295396
1	Clip, U	297937
Volt/Amm Selector Switch 190-208 V		
1	Insulink	KD-18-JC2 X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-100/200 A, AC	295338
1	Clip, U	297937
Volt/Amm Selector Switch 220-240 V		
2	Insulink, 22-18 gauge, insulated	KD-18-JC4 X-367-3
1	Insulink	X-367-4
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 100:5, round	246885
1	Switch, selector, 8-pole	294701
1	Decal, selector switch, 2.62 x 3.06 in.	294703
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-100/200 A, AC	295338
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 440-480 V	KD-18-JC9
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-100/200 A, AC	295338
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 550-600 V	KD-18-JC10
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-100/200 A, AC	295338
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 190-208 V	KD-18-JD2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Insulink	X-367-4
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Clip, U	297937

	Volt/Amm Selector Switch 220-240 V	KD-18-JD4
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Insulink	X-367-4
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 150:5, round	246886
1	Switch, selector, 8-pole	294701
1	Decal, selector switch, 2.62 x 3.06 in.	294703
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 440-480 V	KD-18-JD9
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-75/150 A, AC	295337
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 550-600 V	KD-18-JD10
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-75/150 A, AC	295337
1	Resistor assembly	295396
1	Clip, U	297937

	Volt/Amm Selector Switch 190-208 V	KD-18-JE2
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Clip, U	297937

	Volt/Amm Selector Switch 220-240 V	KD-18-JE4
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Insulink	X-367-4
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	294701
1	Decal, selector switch, 2.62 x 3.06 in.	294703
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 440-480 V	KD-18-JE9
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-300/600 A, AC	295339
1	Resistor assembly	295396
1	Clip, U	297937
	Volt/Amm Selector Switch 550-600 V	KD-18-JE10
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-300/600 A, AC	295339
1	Resistor assembly	295396
1	Clip, U	297937
	Volt/Amm Selector Switch 190-208 V	KD-18-JG2
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
3	Current transformer, 600:5, round	297148
1	Clip, U	297937
	Volt/Amm Selector Switch 220-240 V	KD-18-JG4
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Insulink	X-367-4
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 8-pole	294701
1	Decal, selector switch, 2.62 x 3.06 in.	294703
1	Guard, meter	294705
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
2	Current transformer, 600:5, round	297148
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 440-480 V	KD-18-JG9
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-300/600 A, AC	295339
1	Resistor assembly	295396
3	Current transformer, 600:5, round	297148
1	Clip, U	297937
	Volt/Amm Selector Switch 550-600 V	KD-18-JG10
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-300/600 A, AC	295339
1	Resistor assembly	295396
3	Current transformer, 600:5, round	297148
1	Clip, U	297937
	Plant Exerciser	KD-23-C
1	Shunt, programming	294634
	Plant Exerciser	KD-23-D
1	Shunt, programming	294634
	Plant Exerciser	KD-23-G
2	Screw, cross recess round machine	X-51-9
1	Ring, lock switch	151511
1	Switch, toggle, 1-pole	268015
1	Shunt, programming	294634
1	Decal	294690
1	Bracket	294718
2	Nut, captive, 8-32	298811
	Battery Charger 240 V	KD-24-53A
1	Charger, battery	A-294232
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	KD-24-53B
1	Charger, battery	A-294233
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 600 V	KD-24-60A
1	Charger, battery	A-294236
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 600 V	KD-24-60B
1	Charger, battery	A-294237
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 120 V	KD-24-62A
1	Charger, battery	A-294226
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811

Qty.	Description	Part No.
	Battery Charger 120 V	KD-24-62B
1	Charger, battery	A-294227
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 220 V	KD-24-63A
1	Charger, battery	A-294230
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 220 V	KD-24-63B
1	Charger, battery	A-294231
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	KD-24-64A
1	Charger, battery	A-294232
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	KD-24-64B
1	Charger, battery	A-294233
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 480 V	KD-24-66A
1	Charger, battery	A-294236
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 480 V	KD-24-66B
1	Charger, battery	A-294237
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 208 V	KD-24-68A
1	Charger, battery	A-294228
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 208 V	KD-24-68B
1	Charger, battery	A-294229
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KD-24-71A
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KD-24-72A
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KD-24-71B
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380 V	KD-24-72B
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 416 V	KD-24-73A
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811

Qty.	Description	Part No.
	Battery Charger 416 V	KD-24-73B
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Manual Emerg/Normal	KD-29-X
1	Block, contact	294651
1	Switch, pushbutton	294653
1	Switch, key operator	294655
2	Contact	298049
	Inphase Monitor	KD-34-A
1	Shunt, programming	294634
	Under/Over Voltage	KD-34-J
1	Shunt, programming	294634
	Phase Rotation	KD-34-Z
1	Shunt, programming	294634
	Load Sequencer	KD-35-N
1	PCB assy., load shed buffer	C-294495
1	PCB assy., 10-relay dry contact	D-294303
6	Grommet	X-593-2
6	Screw, cross recess, sheet metal	X-67-145
4	Spacer, .25 OD, .25 in.	X-712-2
1	Wiring harness	294616
2	Cover, terminal strip	294631
1	Cover, terminal strip	294632
1	Cable, multiconductor ribbon	294638
1	Box, cover	294719
	RS-485 Direct or LAN Connection	KD-51-A
1	PCB assy., ATS controller, RS-485	B-294499
4	Spacer, .25 OD, .625 in.	X-712-8
1	Cable, multiconductor ribbon	294638
1	Box, cover	294719
	RS-232 Mode Connection	KD-51-B
1	PCB assy., ATS controller, RS-232	C-294501
4	Spacer, .25 OD, .625 in.	X-712-8
1	Cable, multiconductor ribbon	294638
1	Box, cover	294719
	Time Delay (Adj 0-99 Min)	KD-100-B
1	Shunt, programming	294634
	4-Position Test Switch	GM10916-KP
1	Decal, ATS	294686
1	Switch, keyed selector, 6-pole	294696
1	Diagram, wiring	320664
	Neutral Lug	GM11559-KP
3	Lug, terminal, aluminum	X-6207-5
2	Screw, hex head machine	X-6238-10
2	Insulator	233568
1	Bracket, mounting	294362
4	Screw, hex head machine	X-465-6
4	Washer, plain, .281 ID x .625 in. OD	X-25-40
	Neutral Lug	GM11560-KP
3	Lug, terminal, aluminum	X-6207-9
2	Insulator	233568
1	Bracket, mounting	294359
4	Screw, hex head machine	X-465-6
4	Washer, plain, .281 ID x .625 in. OD	X-25-40

Qty.	Description	Part No.
	Amm/Voltmeter	GM11848-KP
1	Insulink	X-367-2
2	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Diagram, wiring	294671
1	Switch, selector, 14-pole	294699
1	Decal, selector switch, 2.62 x 3.06 in.	294704
1	Guard, meter	294705
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-300/600 A, AC	295339
1	Resistor assembly	295396
1	Heater, strip	295937
	Pilot Light Green (Norm)	PA-294450
1	Lamp, 12 V	X-6127-25
1	Lens, green	X-6127-4
1	Diagram, wiring	346342
	Pilot Light Red (Emerg)	PA-294454
1	Lens, red	X-6127-2
1	Lamp, 12 V	X-6127-25
1	Diagram, wiring	346342
	Voltage Surge Withstand	PA-294530
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
2	Washer, lock .20 ID x .403 in. OD	X-22-22
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
4	Screw, slotted pan head, thread-forming	X-67-77
2	Nut, hex machine screw, 10-32	X-70-3
1	Screw, slotted hex head machine	X-97-11
2	Screw, slotted hex washer head, machine	X-97-13
1	Bracket, mounting	294509
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
1	Bracket	294527
1	Block, distribution	294528
2	Bolt, 1/4-20 x 1 in.	295008
2	Clip, cable	299096
	Voltage Surge Withstand	PA-294531
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
2	Washer, lock, .20 ID x .403 in. OD	X-22-22
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
8	Screw, slotted pan head, thread-forming	X-67-124
2	Nut, hex machine screw, 10-32	X-70-3
1	Screw, slotted hex head machine	X-97-11
2	Screw, slotted hex washer head, machine	X-97-13
1	Bracket, mounting	294509
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
1	Bracket	294527
2	Block, distribution	294529
2	Bolt, 1/4-20 x 1 in.	295008
2	Clip, cable	299096

Qty.	Description	Part No.
	Voltage Surge Withstand	PA-294532
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
8	Cable tie	X-468-2
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
2	Nut, hex machine screw, 10-32	X-70-3
2	Screw, slotted hex washer head, machine	X-791-2
4	Nut, hex jam, 3/8-16	X-83-6
1	Screw, slotted hex head machine	X-97-11
2	Screw, slotted hex washer head, machine	X-97-13
1	Bracket, mounting	294509
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
8	Clip, cable	299096
	Voltage Surge Withstand	PA-294538
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
2	Washer, lock, .20 ID x .403 in. OD	X-22-22
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
4	Screw, slotted pan head, thread-forming	X-67-77
2	Nut, hex machine screw, 10-32	X-70-3
1	Screw, slotted hex head machine	X-97-11
2	Screw, slotted hex washer head, machine	X-97-13
1	Bracket, mounting	294509
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
1	Bracket	294527
1	Block, distribution	294528
2	Bolt, 1/4-20 x 1 in.	295008
2	Clip, cable	299096
	Voltage Surge Withstand	PA-294539
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
2	Washer, lock, .20 ID x .403 in. OD	X-22-22
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
1	Screw, self-tapping	X-67-64
4	Screw, slotted pan head, thread-forming	X-67-77
2	Nut, hex machine screw, 10-32	X-70-3
1	Screw, slotted hex head machine	X-97-11
1	Bracket, mounting	294509
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
1	Bracket	294527
1	Block, distribution	294528
1	Suppressor assembly	294560
2	Screw, slotted hex washer head, machine	X-97-13
2	Bolt, 1/4-20 x 1 in.	295008
2	Clip, cable	299096

Qty.	Description	Part No.
Voltage Surge Withstand PA-294556		
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
2	Washer, lock, .20 ID x .403 in. OD	X-22-22
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
1	Bracket, mounting	294509
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
1	Bracket	294527
1	Screw, self-tapping	X-67-64
4	Screw, slotted pan head, thread-forming	X-67-77
2	Nut, hex machine screw, 10-32	X-70-3
1	Screw, slotted hex head machine	X-97-11
2	Screw, slotted hex washer head, machine	X-97-13
1	Block, distribution	294528
1	Suppressor assembly	294560
2	Bolt, 1/4-20 x 1 in.	295008
2	Clip, cable	299096
Voltage Surge Withstand PA-294557		
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
2	Washer, lock, .20 ID x .403 in. OD	X-22-22
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
1	Bracket, mounting	294509
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
8	Screw, slotted pan head, thread-forming	X-67-124
1	Screw, self-tapping	X-67-64
2	Nut, hex machine screw, 10-32	X-70-3
1	Screw, slotted hex head machine	X-97-11
2	Screw, slotted hex washer head, machine	X-97-13
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
1	Bracket	294527
2	Block, distribution	294529
1	Suppressor assembly	294560
2	Bolt, 1/4-20 x 1 in.	295008
2	Clip, cable	299096
Voltage Surge Withstand PA-294558		
2	Washer, lock, .172 ID x .373 in. OD	X-22-20
1	Washer, lock, 20 ID x .373 in. OD	X-22-9
2	Washer, plain, .281 ID x .625 in. OD	X-25-40
1	Washer, plain, .203 ID x .344 in. OD	X-25-79
8	Cable tie	X-468-2
2	Nut, flange spirallock, 1/4-20	X-6210-2
2	Nut, flange whiz, 8-32	X-6210-4
1	Screw, self-tapping	X-67-64
2	Nut, hex machine screw, 10-32	X-70-3
1	Bracket, mounting	294509
1	Terminal block	294510
1	Arrester, lightning	294511
1	Label	294512
1	Suppressor assembly	294560
2	Screw, slotted hex washer head, machine	X-791-2
4	Nut, hex jam, 3/8-16	X-83-6
1	Screw, slotted hex head machine	X-97-11
2	Screw, slotted hex washer head, machine	X-97-13
8	Clip, cable	299096

Qty.	Description	Part No.
PC Modem PA-294864		
1	Controller Communications Kits	TT-847
1	Cable, multiconductor	294981
1	Modem, 120 V, 60 Hz	294986
1	Connector	294988
External Modem PA-294865		
1	Controller Communications Kits	TT-847
1	Cable, multiconductor	294982
1	Modem, 120 V, 60 Hz	294987
RS 485 Direct or LAN Connection PA-294866		
1	PCB assy., ATS controller, RS-485	B-294499
1	Controller Communications Kits	TT-847
10	Washer, lock, 172 ID x .333 in. OD	X-22-7
5	Nut, flange whiz, 8-32	X-6210-4
4	Spacer, .25 OD, .625 in.	X-712-8
4	Nut, hex machine screw, 8-32	X-72-4
1	Cable, multiconductor ribbon	294638
1	Box, cover	294719
RS-232 Modem Connection PA-294867		
1	PCB assy., ATS controller, RS-232	C-294501
1	Controller Communications Kits	TT-847
10	Washer, lock, 172 ID x .333 in. OD	X-22-7
5	Nut, flange whiz, 8-32	X-6210-4
4	Spacer, .25 OD, .625 in.	X-712-8
4	Nut, hex machine screw, 8-32	X-72-4
1	Cable, multiconductor ribbon	294638
1	Box, cover	294719
Accessory Shunt PA-294869		
10	Shunt, programming	294634
PC Cable PA-294992		
1	Controller Communications Kits	TT-847
1	Cable, multiconductor	294981
1	Connector	294988
Area Protection PA-295353		
1	Spacer, .25 OD, .25 in.	X-712-2
1	Tab, identification (APR)	201620-161
1	Socket, relay	295034
1	Spacer, socket	295151
1	Clamp, relay holddown	295189
1	Relay	295254
2	Nut, captive, 6-32	298810
Pilot Light White (Norm) PA-295627		
1	Bag, 3 x 5 in.	PLW-2000
1	Lamp, 12 V, 2 W	295324
1	Lamp socket	295325
1	Lens	295326
1	Diagram, wiring	346342
Relay Auxiliary Contact PA-295641		
2	Washer, plain, .156 ID x .375 in. OD	X-25-9
2	Screw, cross recess pan head machine	X-49-6
2	Spacer, .25 OD, .25 in.	X-712-2
1	Socket, relay	295034
1	Spacer, socket	295151
1	Clamp, relay holddown	295189
1	Relay	295254
2	Nut, captive, 6-32	298810

Qty.	Description	Part No.
Relay Auxiliary Contact		
2	Washer, plain, .156 ID x .375 in. OD	PA-295642 X-25-9
2	Screw, cross recess pan head machine	X-49-6
2	Spacer, .25 OD, .25 in.	X-712-2
1	Socket, relay	295034
1	Spacer, socket	295151
1	Clamp, relay holddown	295189
1	Relay	295254
2	Nut, captive, 6-32	298810
Frequency Meter		
3	Insulink, 22-18 gauge, insulated	PA-295645 X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Decal, UL bypass isolation	353500
Frequency Meter 208 V		
3	Insulink, 22-18 gauge, insulated	PA-295646 X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz	295348
1	Clip, U	297937
Frequency Meter 240 V		
3	Insulink, 22-18 gauge, insulated	PA-295647 X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz	295348
1	Clip, U	297937
Frequency Meter 380 V		
3	Insulink, 22-18 gauge, insulated	PA-295648 X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 380 V, 120 V	295300
1	Clip, U	297937
Frequency Meter 440-480 V		
3	Insulink, 22-18 gauge, insulated	PA-295650 X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 480 V, 120 V	295302
1	Clip, U	297937
Frequency Meter 550-600 V		
3	Insulink, 22-18 gauge, insulated	PA-295651 X-367-3
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
1	Meter, frequency, 45-65 Hz, AC	295069
1	Transformer, 600 V, 120 V	295299
1	Clip, U	297937
Volt/Amm Selector Switch 190-208 V		
1	Insulink, 22-18 gauge, insulated	PA-295653 X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Clip, U	297937

Qty.	Description	Part No.
Volt/Amm Selector Switch 220-240 V		
1	Insulink, 22-18 gauge, insulated	PA-295655 X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295341
1	Clip, U	297937
Volt/Amm Selector Switch 190-208 V		
1	Insulink, 22-18 gauge, insulated	PA-295665 X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-100/200 A, AC	295338
1	Decal	295342
1	Clip, U	297937
Volt/Amm Selector		
1	Insulink	PA-295670 X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 100:5, round	246885
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-100/200 A, AC	295338
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937
Volt/Amm Selector Switch-Kit		
1	Insulink	PA-295671 X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 75:5, round	246884
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937
Volt/Amm Selector Switch 190-208 V		
1	Insulink, 22-18 gauge, insulated	PA-295673 X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch	PA-295680
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 150:5, round	246886
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-75/150 A, AC	295337
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937
	Volt/Amm Selector Switch 190-240 V	PA-295683
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Clip, U	297937
	Kit, Volt/Amm Selector Switch	PA-295685
1	Insulink, 22-18 gauge, insulated	X-367-3
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295341
1	Clip, U	297937
	Volt/Amm Selector Switch 480V-Kit	PA-295690
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937
	Volt/Amm Selector Switch 550-600 V	PA-295691
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 300:5, round	246889
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-750 V, AC	295017
1	Transformer, 600 V, 120 V	295299
1	Ammeter, 0-300/600 A, AC	295339
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937

Qty.	Description	Part No.
	Volt/Amm Selector Switch 190-208 V	PA-295693
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 400:5, round	248874
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-400/800 A, AC	295340
1	Decal	295342
1	Clip, U	297937
	Volt/Amm Selector Switch 220-240 V	PA-295695
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
2	Current transformer, 400:5, round	248874
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-300 V, AC	295011
1	Ammeter, 0-400/800 A, AC	295340
1	Decal	295341
1	Clip, U	297937
	Volt/Amm Selector Switch 380 V-Kit	PA-295700
1	Insulink	X-367-2
1	Insulink, 22-18 gauge, insulated	X-367-3
6	Cable Tie	X-468-1
1	Conduit, convoluted	X-6003-36
1	Fuse, 2 A, 300 V	239049
1	Fuse holder	239050
3	Current transformer, 400:5, round	248874
1	Switch, selector, 8-pole	283638
1	Voltmeter, 0-600 V, AC	295014
1	Transformer, 480 V, 120 V	295302
1	Ammeter, 0-400/800 A, AC	295340
1	Decal	295342
1	Resistor assembly	295396
1	Clip, U	297937
	Inphase Monitor 208 V	PA-295768
6	Washer, plain, .156 ID x .375 in. OD	X-25-9
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Monitor, inphase	295157
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810
	Inphase Monitor 240 V	PA-295769
6	Washer, plain, .156 ID x .375 in. OD	X-25-9
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Monitor, inphase	295158
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810

Qty.	Description	Part No.
Inphase Monitor 480 V		
6	Washer, plain, .156 ID x .375 in. OD	PA-295770 X-25-9
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Monitor, inphase	295159
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810
Inphase Monitor 220 V		
6	Washer, plain, .156 ID x .375 in. OD	PA-295910 X-25-9
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295906
6	Nut, captive, 6-32	298810
Inphase Monitor 380 V		
6	Washer, plain, .156 ID x .375 in. OD	PA-295911 X-25-9
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295907
6	Nut, captive, 6-32	298810
Inphase Monitor 416 V		
6	Washer, plain, .156 ID x .375 in. OD	PA-295912 X-25-9
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295908
6	Nut, captive, 6-32	298810
Inphase Monitor 440 V		
6	Washer, plain, .156 ID x .375 in. OD	PA-295913 X-25-9
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
1	Monitor, inphase	295909
6	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	PA-297120 A-297096
4	Washer, plain, .156 ID x .375 in. OD	X-25-9
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810

Qty.	Description	Part No.
Load Shedding Contacts		
1	Protective relay, load shed	PA-297121 A-297097
4	Washer, plain, .156 ID x .375 in. OD	X-25-9
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	PA-297122 A-297098
4	Washer, plain, .156 ID x .375 in. OD	X-25-9
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	PA-297123 A-297099
4	Washer, plain, .156 ID x .375 in. OD	X-25-9
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	PA-297124 A-297100
4	Washer, plain, .156 ID x .375 in. OD	X-25-9
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Load Shedding Contacts		
1	Protective relay, load shed	PA-297125 A-297101
4	Washer, plain, .156 ID x .375 in. OD	X-25-9
4	Screw, cross recess pan head machine	X-49-2
1	Wiring harness, ATS 2-position switch	295391
4	Nut, captive, 6-32	298810
Synch Check Relay		
6	Washer, plain, .156 ID x .375 in. OD	PA-297334 X-25-9
1	Insulink	X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
4	Nut, flange whiz, 6-32	X-6210-3
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 208 V, 12 V	295285
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320530
Synch Check Relay		
6	Washer, plain, .156 ID x .375 in. OD	PA-297335 X-25-9
1	Insulink	X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
4	Nut, flange whiz, 6-32	X-6210-3
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 240 V, 12 V	295286
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320531

Qty.	Description	Part No.
Synch Check Relay		
6	Washer, plain, .156 ID x .375 in. OD	PA-297336 X-25-9
1	Insulink	X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
4	Nut, flange whiz, 6-32	X-6210-3
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 380 V, 12 V	295290
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320532
Synch Check Relay		
6	Washer, plain, .156 ID x .375 in. OD	PA-297337 X-25-9
1	Insulink	X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
4	Nut, flange whiz, 6-32	X-6210-3
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 480 V, 12 V	295293
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320535
Synch Check Relay		
6	Washer, plain, .156 ID x .375 in. OD	PA-297338 X-25-9
1	Insulink	X-367-1
2	Screw, cross recess pan head machine	X-49-15
4	Screw, slotted pan head machine	X-49-26
4	Nut, flange whiz, 6-32	X-6210-3
1	Spacer, .25 OD, .25 in.	X-712-2
2	Tab, identification	201620-120
2	Socket, relay	295034
2	Spacer, socket	295151
2	Clamp, relay holddown	295189
2	Relay	295254
1	Transformer, 600 V 12V	295287
1	Wiring harness, ATS 2-position switch	295391
2	Nut, captive, 6-32	298810
8	Nut, captive, 8-32	298811
1	Protective relay, synch check	320536
Dry Contact		
1	PCB assy., 10-relay dry contact	PA-320224 D-294303
6	Washer, lock, 172 ID x .333 in. OD	X-22-7
6	Grommet	X-593-2
3	Jumper, term block 2 pos	X-6048-2
6	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294631
1	Cover, terminal strip	294632

Qty.	Description	Part No.
Relay Auxiliary Contact (NORM)		
1	PCB assy., 1-relay dry contact	PA-320225 C-294301
4	Washer, lock, .172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937
Relay Auxiliary Contact (Emerg)		
1	PCB assy., 1-relay dry contact	PA-320226 C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937
Relay Dry Contact		
1	PCB assy., 1-relay dry contact	PA-320227 C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937
Relay Dry Contact		
1	PCB assy., 1-relay dry contact	PA-320228 C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937
Relay Dry Contact		
1	PCB assy., 1-relay dry contact	PA-320229 C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937
Relay Dry Contact		
1	PCB assy., 1-relay dry contact	PA-320230 C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937
Relay Auxiliary Contact		
1	PCB assy., 1-relay dry contact	PA-320231 C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937

Qty.	Description	Part No.
	Relay Auxiliary Contact	PA-320232
1	PCB assy., 1-relay dry contact	C-294301
4	Washer, lock, 172 ID x .333 in. OD	X-22-7
4	Grommet	X-593-2
4	Screw, cross recess, sheet metal	X-67-145
1	Fuse holder	239050
1	Fuse, 6 A, 300 V	239179
2	Cover, terminal strip	294633
1	Clip, U	297937
	Plant Exerciser	PA-320233
1	Shunt, programming	294634
	Plant Exerciser	PA-320234
2	Screw, slotted round head machine	X-51-53
1	Ring, lock switch	151511
1	Switch, toggle, 1-pole	268015
1	Decal	294690
1	Bracket	294718
2	Nut, captive, 8-32	298811
	Man. E-N, W/A-M Key	PA-320254
1	Block, contact	294651
1	Switch, pushbutton	294653
1	Switch, key operator	294655
1	Contact	298049
	Load Shed Contacts	PA-320267
1	PCB assy., load shed buffer	C-294495
1	PCB assy., 10-relay dry contact	D-294303
1	Load shed kits	TT-1006
10	Washer, lock, 172 ID x .333 in. OD	X-22-7
6	Grommet	X-593-2
5	Nut, flange whiz, 8-32	X-6210-4
6	Screw, cross recess, sheet metal	X-67-145
4	Spacer, .25 OD, .25 in.	X-712-2
4	Nut, hex machine screw, 8-32	X-72-4
1	Wiring harness	294616
2	Cover, terminal strip	294631
1	Cover, terminal strip	294632
1	Cable, multiconductor ribbon	294638
1	Box, cover	294719
	Inphase Monitor	PA-320499
2	Screw, cross recess pan head machine	X-49-15
4	Screw, cross recess pan head machine	X-49-2
2	Tab, identification	201620-120
1	Inphase monitor, kit	294216
1	Socket, relay	295034
1	Clamp, relay holddown	295189
1	Relay	295254
1	Wiring harness, ATS 2-position switch	295391
6	Nut, captive, 6-32	298810
	Battery Charger 120 V	PA-320741
1	Charger, battery	A-294226
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 120 V	PA-320742
1	Charger, battery	A-294227
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 208 V	PA-320743
1	Charger, battery	A-294228
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811

Qty.	Description	Part No.
	Battery Charger 208 V	PA-320744
1	Charger, battery	A-294229
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 220 V	PA-320745
1	Charger, battery	A-294230
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 220 V	PA-320746
1	Charger, battery	A-294231
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	PA-320747
1	Charger, battery	A-294232
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	PA-320748
1	Charger, battery	A-294233
4	Nut, captive, 8-32	298811
1	Battery chargers, ATS	TT-855
	Battery Charger 380/416 V	PA-320749
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380/416 V	PA-320750
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 12 V	PA-320751
1	Charger, battery	A-294236
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 480/600 V	PA-320752
1	Charger, battery	A-294237
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 120 V	PA-320753
1	Charger, battery	A-294226
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 120 V	PA-320754
1	Charger, battery	A-294227
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 208 V	PA-320755
1	Charger, battery	A-294228
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 208 V	PA-320756
1	Charger, battery	A-294229
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 220 V	PA-320757
1	Charger, battery	A-294230
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811

Qty.	Description	Part No.
	Battery Charger 220 V	PA-320758
1	Charger, battery	A-294231
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	PA-320759
1	Charger, battery	A-294232
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 240 V	PA-320760
1	Charger, battery	A-294233
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 380/416 V	PA-320761
1	Charger, battery	A-294234
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 480/600 V	PA-320762
1	Charger, battery	A-294235
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 480/600 V	PA-320763
1	Charger, battery	A-294236
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Battery Charger 480/600 V	PA-320764
1	Charger, battery	A-294237
1	Battery chargers, ATS	TT-855
4	Nut, captive, 8-32	298811
	Plant Exerciser	PA-346650
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
2	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser	PA-346651
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
2	Nut, captive, 8-32	298811
1	Timer	346648
	Plant Exerciser	PA-346652
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 415 V, 12V	295301
4	Nut, captive, 8-32	298811
1	Timer	346647

Qty.	Description	Part No.
	Plant Exerciser	PA-346653
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 480 V, 120 V	295302
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser	PA-346654
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 600 V, 120 V	295299
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser	PA-346655
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
2	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser	PA-346656
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
2	Nut, captive, 8-32	298811
1	Timer	346648
	Plant Exerciser	PA-346657
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 415 V, 12 V	295301
4	Nut, captive, 8-32	298811
1	Timer	346647
	Plant Exerciser	PA-346658
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 480 V, 120 V	295302
4	Nut, captive, 8-32	298811
1	Timer	346647

Qty.	Description	Part No.
Plant Exerciser PA-346659		
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 600 V, 120 V	295299
4	Nut, captive, 8-32	298811
1	Timer	346647
Plant Exerciser PA-346660		
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Switch, selector, 4-pole	295322
2	Nut, captive, 8-32	298811
1	Timer	346647
Plant Exerciser PA-346661		
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
2	Nut, captive, 8-32	298811
1	Timer	346647
Plant Exerciser PA-346662		
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Switch, selector, 4-pole	295322
2	Nut, captive, 8-32	298811
1	Timer	346648
Plant Exerciser PA-346663		
1	Exercise timer kits	TT-1122
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
2	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
2	Nut, captive, 8-32	298811
1	Timer	346648
Plant Exerciser PA-346664		
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 415 V, 12 V	295301
1	Switch, selector, 4-pole	295322
4	Nut, captive, 8-32	298811
1	Timer	346647

Qty.	Description	Part No.
Plant Exerciser PA-346665		
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 415 V, 12 V	295301
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
4	Nut, captive, 8-32	298811
1	Timer	346647
Plant Exerciser PA-346666		
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 480 V, 120 V	295302
1	Switch, selector, 4-pole	295322
4	Nut, captive, 8-32	298811
1	Timer	346647
Plant Exerciser PA-346667		
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 480 V, 120 V	295302
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
4	Nut, captive, 8-32	298811
1	Timer	346647
Plant Exerciser PA-346668		
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 600 V, 120 V	295299
1	Switch, selector, 4-pole	295322
4	Nut, captive, 8-32	298811
1	Timer	346647
Plant Exerciser PA-346669		
1	Exercise timer kits	TT-1122
2	Washer, lock, 172 ID x .333 in. OD	X-22-7
2	Washer, plain, .188 ID x .438 in. OD	X-25-48
4	Screw, cross recess round machine	X-51-9
1	Track, mounting, 1 in.	294622
1	Plate, mounting	294627
1	Transformer, 600 V, 120 V	295299
1	Switch, selector	298039
2	Block, contact	298051
1	Block, contact	298052
1	Contact	298054
4	Nut, captive, 8-32	298811
1	Timer	346647

Qty.	Description	Part No.
	RS-232/RS-485 Converter for PC	PA-352249
1	Converter assy.	B-352250
1	Controller communications kits	TT-847
1	Resistor, 121 ohm, 1/4 W	X-6058-27
	PC Modem & Cable	PA-353073
1	Controller communications kits	TT-847
1	Cable, multiconductor	294981
1	Connector	294988
1	Modem, 220 V, 50 Hz	353072
	ATS Modem & Cable	PA-353074
1	Controller communications kits	TT-847
1	Cable, multiconductor	294982
1	Modem, 220 V, 50 Hz	353071
	Monitor Software Kit	PA-354235
1	O/M monitor software, DOS	TP-5823

Qty.	Description	Part No.
	Monitor II Software Kit	PA-361725
1	O/M monitor II software, win 95/98/NT	TP-5972
	Neutral Lug	PA-362151
7	Washer, lock, 20 ID x .373 in. OD	X-22-9
3	Screw, slotted hex head machine	X-97-11
2	Insulator, panel	233269
3	Lug, terminal, aluminum	295303
1	Bracket, mounting	295304
	Neutral Lug	PA-362152
7	Washer, lock, .262 ID x .469 in. OD	X-22-11
2	Insulator, panel	233269
3	Lug, terminal	297712
1	Bracket, mounting	297713

Appendix A Abbreviations

The following list contains abbreviations that may appear in this publication.

A, amp	ampere	CG	center of gravity	fglass.	fiberglass
ABDC	after bottom dead center	CID	cubic inch displacement	FHM	flat head machine (screw)
AC	alternating current	CL	centerline	fl. oz.	fluid ounce
A/D	analog to digital	cm	centimeter	flex.	flexible
ADC	analog to digital converter	CMOS	complementary metal oxide substrate (semiconductor)	freq.	frequency
adj.	adjust, adjustment			FS	full scale
ADV	advertising dimensional drawing	cogen.	cogeneration	ft.	foot, feet
AHWT	anticipatory high water temperature	Com	communications (port)	ft. lbs.	foot pounds (torque)
AISI	American Iron and Steel Institute	conn.	connection	ft./min.	feet per minute
ALOP	anticipatory low oil pressure	cont.	continued	g	gram
alt.	alternator	CPVC	chlorinated polyvinyl chloride	ga.	gauge (meters, wire size)
Al	aluminum	crit.	critical	gal.	gallon
ANSI	American National Standards Institute (formerly American Standards Association, ASA)	CRT	cathode ray tube	gen.	generator
		CSA	Canadian Standards Association	genset	generator set
AO	anticipatory only	CT	current transformer	GFI	ground fault interrupter
API	American Petroleum Institute	Cu	copper	GND, ⊕	ground
approx.	approximate, approximately	cu. in.	cubic inch	gov.	governor
AR	as required, as requested	cw.	clockwise	gph	gallons per hour
AS	as supplied, as stated, as suggested	CWC	city water-cooled	gpm	gallons per minute
ASE	American Society of Engineers	cyl.	cylinder	gr.	grade, gross
ASME	American Society of Mechanical Engineers	D/A	digital to analog	GRD	equipment ground
assy.	assembly	DAC	digital to analog converter	gr. wt.	gross weight
ASTM	American Society for Testing Materials	dB	decibel	H x W x D	height by width by depth
ATDC	after top dead center	dBA	decibel (A weighted)	HC	hex cap
ATS	automatic transfer switch	DC	direct current	HCHT	high cylinder head temperature
auto.	automatic	DCR	direct current resistance	HD	heavy duty
aux.	auxiliary	deg., °	degree	HET	high exhaust temperature
A/V	audiovisual	dept.	department	hex	hexagon
avg.	average	dia.	diameter	Hg	mercury (element)
AVR	automatic voltage regulator	DI/EO	dual inlet/end outlet	HH	hex head
AWG	American Wire Gauge	DIN	Deutsches Institut für Normung e. V. (also Deutsche Industrie Normenausschuss)	HHC	hex head cap
AWM	appliance wiring material			HP	horsepower
bat.	battery	DIP	dual inline package	hr.	hour
BBDC	before bottom dead center	DPDT	double-pole, double-throw	HS	heat shrink
BC	battery charger, battery charging	DPST	double-pole, single-throw	hsg.	housing
BCA	battery charging alternator	DS	disconnect switch	HVAC	heating, ventilation, and air conditioning
BCI	Battery Council International	DVR	digital voltage regulator	HWT	high water temperature
BDC	before dead center	E, emer.	emergency (power source)	Hz	hertz (cycles per second)
BHP	brake horsepower	EDI	electronic data interchange	IC	integrated circuit
blk.	black (paint color), block (engine)	EFR	emergency frequency relay	ID	inside diameter, identification
blk. htr.	block heater	e.g.	for example (<i>exempli gratia</i>)	IEC	International Electrotechnical Commission
BMEP	brake mean effective pressure	EG	electronic governor	IEEE	Institute of Electrical and Electronics Engineers
bps	bits per second	EGSA	Electrical Generating Systems Association	IMS	improved motor starting
br.	brass	EIA	Electronic Industries Association	in.	inch
BTDC	before top dead center	EI/EO	end inlet/end outlet	in. H ₂ O	inches of water
Btu	British thermal unit	EMI	electromagnetic interference	in. Hg	inches of mercury
Btu/min.	British thermal units per minute	emiss.	emission	in. lbs.	inch pounds
C	Celsius, centigrade	eng.	engine	Inc.	incorporated
cal.	calorie	EPA	Environmental Protection Agency	ind.	industrial
CARB	California Air Resources Board	EPS	emergency power system	int.	internal
CB	circuit breaker	ER	emergency relay	int./ext.	internal/external
cc	cubic centimeter	ES	engineering special, engineered special	I/O	input/output
CCA	cold cranking amps	ESD	electrostatic discharge	IP	iron pipe
ccw.	counterclockwise	est.	estimated	ISO	International Organization for Standardization
CEC	Canadian Electrical Code	E-Stop	emergency stop	J	joule
cfh	cubic feet per hour	etc.	et cetera (and so forth)	JIS	Japanese Industry Standard
cfm	cubic feet per minute	exh.	exhaust	k	kilo (1000)
		ext.	external	K	kelvin
		F	Fahrenheit, female	KA	kiloampere
				KB	kilobyte (2 ¹⁰ bytes)

kg	kilogram	MW	megawatt	rms	root mean square
kg/cm ²	kilograms per square centimeter	mW	milliwatt	rnd.	round
kgm	kilogram-meter	μF	microfarad	ROM	read only memory
kg/m ³	kilograms per cubic meter	N, norm.	normal (power source)	rot.	rotate, rotating
kHz	kilohertz	NA	not available, not applicable	rpm	revolutions per minute
kJ	kilojoule	nat. gas	natural gas	RS	right side
km	kilometer	NBS	National Bureau of Standards	RTV	room temperature vulcanization
kOhm, kΩ	kilo-ohm	NC	normally closed	SAE	Society of Automotive Engineers
kPa	kilopascal	NEC	National Electrical Code	scfm	standard cubic feet per minute
kph	kilometers per hour	NEMA	National Electrical Manufacturers Association	SCR	silicon controlled rectifier
kV	kilovolt	NFPA	National Fire Protection Association	s, sec.	second
kVA	kilovolt ampere	Nm	newton meter	SI	<i>Système international d'unites</i> , International System of Units
kVAR	kilovolt ampere reactive	NO	normally open	SI/EO	side in/end out
kW	kilowatt	no., nos.	number, numbers	sil.	silencer
kWh	kilowatt-hour	NPS	National Pipe, Straight	SN	serial number
kWm	kilowatt mechanical	NPSC	National Pipe, Straight-coupling	SPDT	single-pole, double-throw
L	liter	NPT	National Standard taper pipe thread per general use	SPST	single-pole, single-throw
LAN	local area network	NPTF	National Pipe, Taper-Fine	spec, specs	specification(s)
L x W x H	length by width by height	NR	not required, normal relay	sq.	square
lb.	pound, pounds	ns	nanosecond	sq. cm	square centimeter
lbm/ft ³	pounds mass per cubic feet	OC	overcrank	sq. in.	square inch
LCB	line circuit breaker	OD	outside diameter	SS	stainless steel
LCD	liquid crystal display	OEM	original equipment manufacturer	std.	standard
ld. shd.	load shed	OF	overfrequency	stl.	steel
LED	light emitting diode	opt.	option, optional	tach.	tachometer
Lph	liters per hour	OS	oversize, overspeed	TD	time delay
Lpm	liters per minute	OSHA	Occupational Safety and Health Administration	TDC	top dead center
LOP	low oil pressure	OV	overvoltage	TDEC	time delay engine cooldown
LP	liquefied petroleum	oz.	ounce	TDEN	time delay emergency to normal
LPG	liquefied petroleum gas	p., pp.	page, pages	TDES	time delay engine start
LS	left side	PC	personal computer	TDNE	time delay normal to emergency
L _{wa}	sound power level, A weighted	PCB	printed circuit board	TDOE	time delay off to emergency
LWL	low water level	pF	picofarad	TDON	time delay off to normal
LWT	low water temperature	PF	power factor	temp.	temperature
m	meter, milli (1/1000)	ph., ∅	phase	term.	terminal
M	mega (10 ⁶ when used with SI units), male	PHC	Phillips head crimptite (screw)	TIF	telephone influence factor
m ³	cubic meter	PHH	Phillips hex head (screw)	TIR	total indicator reading
m ³ /min.	cubic meters per minute	PHM	pan head machine (screw)	tol.	tolerance
mA	milliampere	PLC	programmable logic control	turbo.	turbocharger
man.	manual	PMG	permanent-magnet generator	typ.	typical (same in multiple locations)
max.	maximum	pot	potentiometer, potential	UF	underfrequency
MB	megabyte (2 ²⁰ bytes)	ppm	parts per million	UHF	ultrahigh frequency
MCM	one thousand circular mils	PROM	programmable read-only memory	UL	Underwriter's Laboratories, Inc.
MCCB	molded-case circuit breaker	psi	pounds per square inch	UNC	unified coarse thread (was NC)
meggar	megohmmeter	pt.	pint	UNF	unified fine thread (was NF)
MHz	megahertz	PTC	positive temperature coefficient	univ.	universal
mi.	mile	PTO	power takeoff	US	undersize, underspeed
mil	one one-thousandth of an inch	PVC	polyvinyl chloride	UV	ultraviolet, undervoltage
min.	minimum, minute	qt.	quart	V	volt
misc.	miscellaneous	qty.	quantity	VAC	volts alternating current
MJ	megajoule	R	replacement (emergency) power source	VAR	voltampere reactive
mJ	millijoule	rad.	radiator, radius	VDC	volts direct current
mm	millimeter	RAM	random access memory	VFD	vacuum fluorescent display
mOhm, mΩ	milliohm	RDO	relay driver output	VGA	video graphics adapter
MOhm, MΩ	megohm	ref.	reference	VHF	very high frequency
MOV	metal oxide varistor	rem.	remote	W	watt
MPa	megapascal	RFI	radio frequency interference	WCR	withstand and closing rating
mpg	miles per gallon	RH	round head	w/	with
mph	miles per hour	RHM	round head machine (screw)	w/o	without
MS	military standard	rly.	relay	wt.	weight
m/sec.	meters per second			xfrm	transformer
MTBF	mean time between failure				
MTBO	mean time between overhauls				
mtg.	mounting				

Appendix B Common Hardware Application Guidelines

Use the information below and on the following pages to identify proper fastening techniques when no specific reference for reassembly is made.

Bolt/Screw Length: When bolt/screw length is not given, use Figure 1 as a guide. As a general rule, a minimum length of one thread beyond the nut and a maximum length of 1/2 the bolt/screw diameter beyond the nut is the preferred method.

Washers and Nuts: Use split lock washers as a bolt locking device where specified. Use SAE flat washers with whiz nuts, spirallock nuts, or standard nuts and preloading (torque) of the bolt in all other applications.

See Appendix C, General Torque Specifications, and other torque specifications in the service literature.

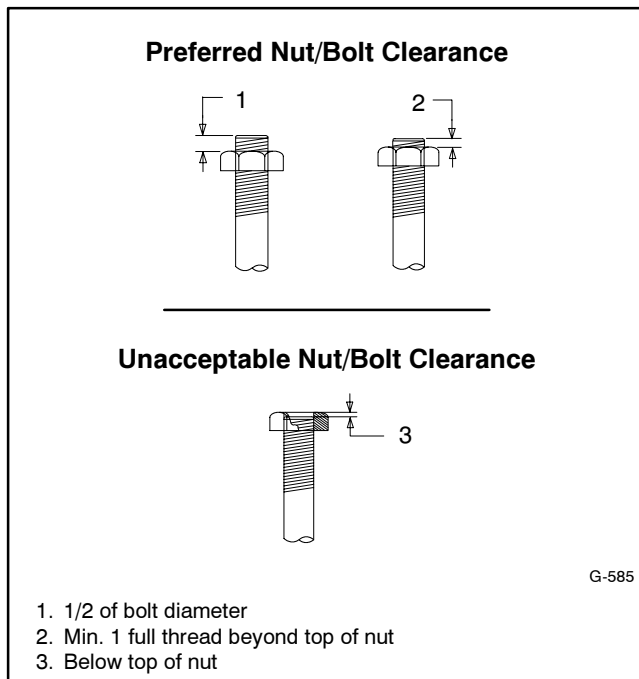


Figure 1 Acceptable Bolt Lengths

1. 1/2 of bolt diameter
2. Min. 1 full thread beyond top of nut
3. Below top of nut

Steps for common hardware application:

1. Determine entry hole type: round or slotted.
2. Determine exit hole type: fixed female thread (weld nut), round, or slotted.

For round and slotted exit holes, determine if hardware is greater than 1/2 inch in diameter, or 1/2 inch in diameter or less. Hardware that is *greater than 1/2 inch* in diameter takes a standard nut and SAE washer. Hardware *1/2 inch or less* in diameter can take a properly torqued whiz nut or spirallock nut. See Figure 2.

3. Follow these SAE washer rules after determining exit hole type:
 - a. Always use a washer between hardware and a slot.
 - b. Always use a washer under a nut (see 2 above for exception).
 - c. Use a washer under a bolt when the female thread is fixed (weld nut).
4. Refer to Figure 2, which depicts the preceding hardware configuration possibilities.

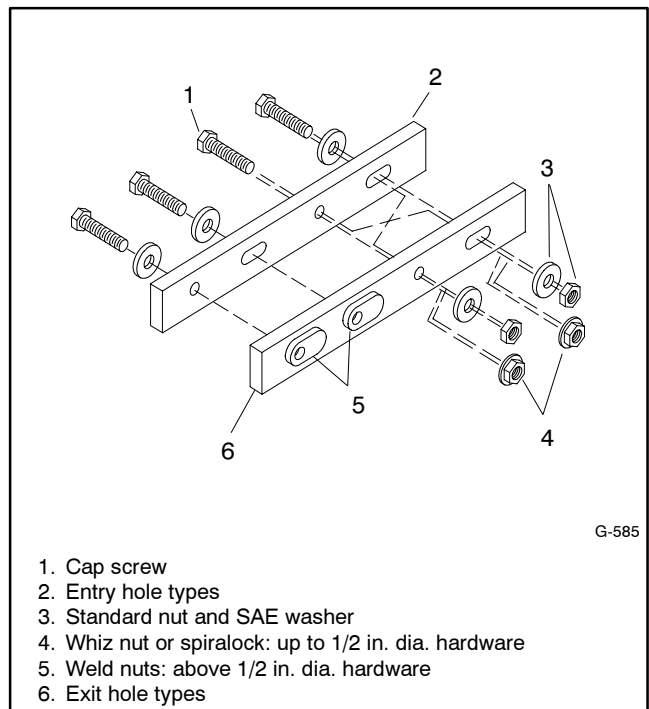


Figure 2 Acceptable Hardware Combinations

1. Cap screw
2. Entry hole types
3. Standard nut and SAE washer
4. Whiz nut or spirallock: up to 1/2 in. dia. hardware
5. Weld nuts: above 1/2 in. dia. hardware
6. Exit hole types

Appendix C General Torque Specifications















Use the following torque specifications when service literature instructions give no specific torque values. The charts list values for new plated, zinc phosphate, or












oiled threads. Increase values by 15% for nonplated threads. All torque values are +0%/-10%.






American Standard Fasteners Torque Specifications					
Size	Torque Measurement	Assembled into Cast Iron or Steel			Assembled into Aluminum Grade 2 or 5
		Grade 2	Grade 5	Grade 8	
8-32	Nm (in. lb.)	1.8 (16)	2.3 (20)	—	1.8 (16)
10-24	Nm (in. lb.)	2.9 (26)	3.6 (32)	—	2.9 (26)
10-32	Nm (in. lb.)	2.9 (26)	3.6 (32)	—	2.9 (26)
1/4-20	Nm (in. lb.)	6.8 (60)	10.8 (96)	14.9 (132)	6.8 (60)
1/4-28	Nm (in. lb.)	8.1 (72)	12.2 (108)	16.3 (144)	8.1 (72)
5/16-18	Nm (in. lb.)	13.6 (120)	21.7 (192)	29.8 (264)	13.6 (120)
5/16-24	Nm (in. lb.)	14.9 (132)	23.1 (204)	32.5 (288)	14.9 (132)
3/8-16	Nm (ft. lb.)	24.0 (18)	38.0 (28)	53.0 (39)	24.0 (18)
3/8-24	Nm (ft. lb.)	27.0 (20)	42.0 (31)	60.0 (44)	27.0 (20)
7/16-14	Nm (ft. lb.)	39.0 (29)	60.0 (44)	85.0 (63)	—
7/16-20	Nm (ft. lb.)	43.0 (32)	68.0 (50)	95.0 (70)	—
1/2-13	Nm (ft. lb.)	60.0 (44)	92.0 (68)	130.0 (96)	—
1/2-20	Nm (ft. lb.)	66.0 (49)	103.0 (76)	146.0 (108)	—
9/16-12	Nm (ft. lb.)	81.0 (60)	133.0 (98)	187.0 (138)	—
9/16-18	Nm (ft. lb.)	91.0 (67)	148.0 (109)	209.0 (154)	—
5/8-11	Nm (ft. lb.)	113.0 (83)	183.0 (135)	259.0 (191)	—
5/8-18	Nm (ft. lb.)	128.0 (94)	208.0 (153)	293.0 (216)	—
3/4-10	Nm (ft. lb.)	199.0 (147)	325.0 (240)	458.0 (338)	—
3/4-16	Nm (ft. lb.)	222.0 (164)	363.0 (268)	513.0 (378)	—
1-8	Nm (ft. lb.)	259.0 (191)	721.0 (532)	1109.0 (818)	—
1-12	Nm (ft. lb.)	283.0 (209)	789.0 (582)	1214.0 (895)	—

Metric Fasteners Torque Specifications, Measured in Nm (ft. lb.)					
Size (mm)	Assembled into Cast Iron or Steel			Assembled into Aluminum Grade 5.8 or 8.8	
	Grade 5.8	Grade 8.8	Grade 10.9		
M6 x 1.00	5.6 (4)	9.9 (7)	14.0 (10)	5.6 (4)	
M8 x 1.25	13.6 (10)	25.0 (18)	35.0 (26)	13.6 (10)	
M8 x 1.00	21.0 (16)	25.0 (18)	35.0 (26)	21.0 (16)	
M10 x 1.50	27.0 (20)	49.0 (35)	68.0 (50)	27.0 (20)	
M10 x 1.25	39.0 (29)	49.0 (35)	68.0 (50)	39.0 (29)	
M12 x 1.75	47.0 (35)	83.0 (61)	117.0 (86)	—	
M12 x 1.50	65.0 (48)	88.0 (65)	125.0 (92)	—	
M14 x 2.00	74.0 (55)	132.0 (97)	185.0 (136)	—	
M14 x 1.50	100.0 (74)	140.0 (103)	192.0 (142)	—	
M16 x 2.00	115.0 (85)	200.0 (148)	285.0 (210)	—	
M16 x 1.50	141.0 (104)	210.0 (155)	295.0 (218)	—	
M18 x 2.50	155.0 (114)	275.0 (203)	390.0 (288)	—	
M18 x 1.50	196.0 (145)	305.0 (225)	425.0 (315)	—	

Appendix D Common Hardware Identification

Screw/Bolts/Studs	
Head Styles	
Hex Head or Machine Head	
Hex Head or Machine Head with Washer	
Flat Head (FHM)	
Round Head (RHM)	
Pan Head	
Hex Socket Head Cap or Allen™ Head Cap	
Hex Socket Head or Allen™ Head Shoulder Bolt	
Sheet Metal Screw	
Stud	
Drive Styles	
Hex	
Hex and Slotted	
Phillips®	
Slotted	
Hex Socket	

Nuts	
Nut Styles	
Hex Head	
Lock or Elastic	
Square	
Cap or Acorn	
Wing	
Washers	
Washer Styles	
Plain	
Split Lock or Spring	
Spring or Wave	
External Tooth Lock	
Internal Tooth Lock	
Internal-External Tooth Lock	

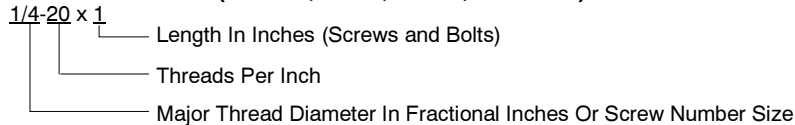
Hardness Grades	
American Standard	
Grade 2	
Grade 5	
Grade 8	
Grade 8/9 (Hex Socket Head)	
Metric	
Number stamped on hardware; 5.8 shown	

Allen™ head screw is a trademark of Holo-Krome Co.

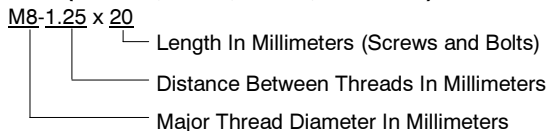
Phillips® screw is a registered trademark of Phillips Screw Company.

Sample Dimensions

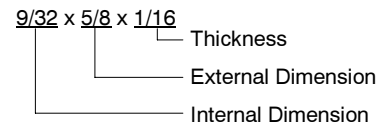
American Standard (Screws, Bolts, Studs, and Nuts)



Metric (Screws, Bolts, Studs, and Nuts)



Plain Washers



Lock Washers



Appendix E Common Hardware List

The Common Hardware List lists part numbers and dimensions for common hardware items.

American Standard

Part No.	Dimensions	Part No.	Dimensions	Part No.	Dimensions	Type
Hex Head Bolts (Grade 5)		Hex Head Bolts, cont.		Hex Nuts		
X-465-17	1/4-20 x .38	X-6024-5	7/16-14 x .75	X-6009-1	1-8	Standard
X-465-6	1/4-20 x .50	X-6024-2	7/16-14 x 1.00	X-6210-3	6-32	Whiz
X-465-2	1/4-20 x .62	X-6024-8	7/16-14 x 1.25	X-6210-4	8-32	Whiz
X-465-16	1/4-20 x .75	X-6024-3	7/16-14 x 1.50	X-6210-5	10-24	Whiz
X-465-18	1/4-20 x .88	X-6024-4	7/16-14 x 2.00	X-6210-1	10-32	Whiz
X-465-7	1/4-20 x 1.00	X-6024-11	7/16-14 x 2.75	X-6210-2	1/4-20	Spiralock
X-465-8	1/4-20 x 1.25	X-6024-12	7/16-14 x 6.50	X-6210-6	1/4-28	Spiralock
X-465-9	1/4-20 x 1.50	X-129-15	1/2-13 x .75	X-6210-7	5/16-18	Spiralock
X-465-10	1/4-20 x 1.75	X-129-17	1/2-13 x 1.00	X-6210-8	5/16-24	Spiralock
X-465-11	1/4-20 x 2.00	X-129-18	1/2-13 x 1.25	X-6210-9	3/8-16	Spiralock
X-465-12	1/4-20 x 2.25	X-129-19	1/2-13 x 1.50	X-6210-10	3/8-24	Spiralock
X-465-14	1/4-20 x 2.75	X-129-20	1/2-13 x 1.75	X-6210-11	7/16-14	Spiralock
X-465-21	1/4-20 x 5.00	X-129-21	1/2-13 x 2.00	X-6210-12	1/2-13	Spiralock
X-465-25	1/4-28 x .38	X-129-22	1/2-13 x 2.25	X-6210-15	7/16-20	Spiralock
X-465-20	1/4-28 x 1.00	X-129-23	1/2-13 x 2.50	X-6210-14	1/2-20	Spiralock
X-125-33	5/16-18 x .50	X-129-24	1/2-13 x 2.75	X-85-3	5/8-11	Standard
X-125-23	5/16-18 x .62	X-129-25	1/2-13 x 3.00	X-88-12	3/4-10	Standard
X-125-3	5/16-18 x .75	X-129-27	1/2-13 x 3.50	X-89-2	1/2-20	Standard
X-125-31	5/16-18 x .88	X-129-29	1/2-13 x 4.00			
X-125-5	5/16-18 x 1.00	X-129-30	1/2-13 x 4.50			
X-125-24	5/16-18 x 1.25	X-463-9	1/2-13 x 5.50			
X-125-34	5/16-18 x 1.50	X-129-44	1/2-13 x 6.00			
X-125-25	5/16-18 x 1.75	X-129-51	1/2-20 x .75			
X-125-26	5/16-18 x 2.00	X-129-45	1/2-20 x 1.25			
230578	5/16-18 x 2.25	X-129-52	1/2-20 x 1.50			
X-125-29	5/16-18 x 2.50	X-6021-3	5/8-11 x 1.00			
X-125-27	5/16-18 x 2.75	X-6021-4	5/8-11 x 1.25			
X-125-28	5/16-18 x 3.00	X-6021-2	5/8-11 x 1.50			
X-125-22	5/16-18 x 4.50	X-6021-1	5/8-11 x 1.75			
X-125-32	5/16-18 x 5.00	273049	5/8-11 x 2.00			
X-125-35	5/16-18 x 5.50	X-6021-5	5/8-11 x 2.25			
X-125-36	5/16-18 x 6.00	X-6021-6	5/8-11 x 2.50			
X-125-40	5/16-18 x 6.50	X-6021-7	5/8-11 x 2.75			
X-125-43	5/16-24 x 1.75	X-6021-12	5/8-11 x 3.75			
X-125-44	5/16-24 x 2.50	X-6021-11	5/8-11 x 4.50			
X-125-30	5/16-24 x .75	X-6021-10	5/8-11 x 6.00			
X-125-39	5/16-24 x 2.00	X-6021-9	5/8-18 x 2.50			
X-125-38	5/16-24 x 2.75	X-6239-1	3/4-10 x 1.00			
X-6238-2	3/8-16 x .62	X-6239-8	3/4-10 x 1.25			
X-6238-10	3/8-16 x .75	X-6239-2	3/4-10 x 1.50			
X-6238-3	3/8-16 x .88	X-6239-3	3/4-10 x 2.00			
X-6238-11	3/8-16 x 1.00	X-6239-4	3/4-10 x 2.50			
X-6238-4	3/8-16 x 1.25	X-6239-5	3/4-10 x 3.00			
X-6238-5	3/8-16 x 1.50	X-6239-6	3/4-10 x 3.50			
X-6238-1	3/8-16 x 1.75	X-792-1	1-8 x 2.25			
X-6238-6	3/8-16 x 2.00	X-792-5	1-8 x 3.00			
X-6238-17	3/8-16 x 2.25	X-792-8	1-8 x 5.00			
X-6238-7	3/8-16 x 2.50					
X-6238-8	3/8-16 x 2.75					
X-6238-9	3/8-16 x 3.00					
X-6238-19	3/8-16 x 3.25					
X-6238-12	3/8-16 x 3.50					
X-6238-20	3/8-16 x 3.75					
X-6238-13	3/8-16 x 4.50					
X-6238-18	3/8-16 x 5.50					
X-6238-25	3/8-16 x 6.50					
X-6238-14	3/8-24 x .75					
X-6238-16	3/8-24 x 1.25					
X-6238-21	3/8-24 x 4.00					
X-6238-22	3/8-24 x 4.50					

Washers

Part No.	ID	OD	Thick.	Bolt/ Screw
X-25-46	.125	.250	.022	#4
X-25-9	.156	.375	.049	#6
X-25-48	.188	.438	.049	#8
X-25-36	.219	.500	.049	#10
X-25-40	.281	.625	.065	1/4
X-25-85	.344	.687	.065	5/16
X-25-37	.406	.812	.065	3/8
X-25-34	.469	.922	.065	7/16
X-25-26	.531	1.062	.095	1/2
X-25-15	.656	1.312	.095	5/8
X-25-29	.812	1.469	.134	3/4
X-25-127	1.062	2.000	.134	1

Metric

Hex head bolts are hardness grade 8.8 unless noted.

Part No.	Dimensions	Part No.	Dimensions	Part No.	Dimensions	Type
Hex Head Bolts (partial thread)						
M931-05055-60	M5-0.80 x 55					
M931-06040-60	M6-1.00 x 40					
M931-06055-60	M6-1.00 x 55					
M931-06060-60	M6-1.00 x 60					
M931-06070-60	M6-1.00 x 70					
M931-06070-SS	M6-1.00 x 70					
M931-06075-60	M6-1.00 x 75					
M931-06090-60	M6-1.00 x 90					
M931-06150-60	M6-1.00 x 150					
M931-08035-60	M8-1.25 x 35					
M931-08040-60	M8-1.25 x 40					
M931-08040-82	M8-1.25 x 40*					
M931-08045-60	M8-1.25 x 45					
M931-08050-60	M8-1.25 x 50					
M931-08055-60	M8-1.25 x 55					
M931-08055-82	M8-1.25 x 55*					
M931-08060-60	M8-1.25 x 60					
M931-08070-60	M8-1.25 x 70					
M931-08070-82	M8-1.25 x 70*					
M931-08075-60	M8-1.25 x 75					
M931-08080-60	M8-1.25 x 80					
M931-08090-60	M8-1.25 x 90					
M931-08095-60	M8-1.25 x 95					
M931-08100-60	M8-1.25 x 100					
M931-08120-60	M8-1.25 x 120					
M931-08130-60	M8-1.25 x 130					
M931-08140-60	M8-1.25 x 140					
M931-10040-82	M10-1.25 x 40*					
M931-10040-60	M10-1.50 x 40					
M931-10045-60	M10-1.50 x 45					
M931-10050-60	M10-1.50 x 50					
M931-10055-60	M10-1.50 x 55					
M931-10060-60	M10-1.50 x 60					
M931-10065-60	M10-1.50 x 65					
M931-10070-60	M10-1.50 x 70					
M931-10080-60	M10-1.50 x 80					
M931-10090-60	M10-1.50 x 90					
M931-10090-82	M10-1.50 x 90*					
M931-10100-60	M10-1.50 x 100					
M931-10110-60	M10-1.50 x 110					
M931-10120-60	M10-1.50 x 120					
M931-10130-60	M10-1.50 x 130					
M931-10140-60	M10-1.50 x 140					
M931-10180-60	M10-1.50 x 180					
M931-12045-60	M12-1.75 x 45					
M960-12050-60	M12-1.25 x 50					
M960-12050-82	M12-1.25 x 50*					
M931-12050-60	M12-1.75 x 50					
M931-12055-60	M12-1.75 x 55					
M931-12060-60	M12-1.75 x 60					
M931-12065-60	M12-1.75 x 65					
M931-12075-60	M12-1.75 x 75					
M931-12080-60	M12-1.75 x 80					
M931-12090-60	M12-1.75 x 90					
M931-12100-60	M12-1.75 x 100					
M931-12110-60	M12-1.75 x 110					
M960-16090-60	M16-1.50 x 90					
M931-16090-60	M16-2.00 x 90					
M931-16100-60	M16-2.00 x 100					
M931-20065-60	M20-2.50 x 65					
M931-20120-60	M20-2.50 x 120					
M931-20160-60	M20-2.50 x 160					
M931-22090-60	M22-2.50 x 90					
M931-22120-60	M22-2.50 x 120					
M931-22160-60	M22-2.50 x 160					
M931-24090-60	M24-3.00 x 90					
M931-24120-60	M24-3.00 x 120					
M931-24160-60	M24-3.00 x 160					
Hex Head Bolts (full thread)						
M933-04006-60	M4-0.70 x 6					
M933-05035-60	M5-0.80 x 35					
M933-05050-60	M5-0.80 x 50					
M933-06010-60	M6-1.00 x 10					
M933-06014-60	M6-1.00 x 14					
M933-06016-60	M6-1.00 x 16					
M933-06020-60	M6-1.00 x 20					
M933-06025-60	M6-1.00 x 25					
M933-06040-60	M6-1.00 x 40					
M933-06050-60	M6-1.00 x 50					
M933-08012-60	M8-1.25 x 12					
M933-08016-60	M8-1.25 x 16					
M933-08020-60	M8-1.25 x 20					
M933-08025-60	M8-1.25 x 25					
M933-08030-60	M8-1.25 x 30					
M933-08030-82	M8-1.25 x 30*					
M933-10012-60	M10-1.50 x 12					
M961-10020-60	M10-1.25 x 20					
M933-10020-60	M10-1.50 x 20					
M933-10025-60	M10-1.50 x 25					
M961-10030-60	M10-1.25 x 30					
M933-10030-60	M10-1.50 x 30					
M933-10030-82	M10-1.50 x 30*					
M961-10035-60	M10-1.25 x 35					
M933-10035-60	M10-1.50 x 35					
M933-12016-60	M12-1.75 x 16					
M933-12020-60	M12-1.75 x 20					
M933-12025-60	M12-1.75 x 25					
M933-12025-82	M12-1.75 x 25*					
M961-12030-60	M12-1.25 x 30					
M933-12030-60	M12-1.75 x 30					
M933-12035-60	M12-1.75 x 35					
M961-12040-82	M12-1.25 x 40*					
M933-12040-60	M12-1.75 x 40					
M933-12040-82	M12-1.75 x 40*					
M961-14025-60	M14-1.50 x 25					
M933-14025-60	M14-2.00 x 25					
M961-16025-60	M16-1.50 x 25					
M933-16025-60	M16-2.00 x 25					
M961-16030-82	M16-1.50 x 30*					
M933-16030-82	M16-2.00 x 30*					
M933-16035-60	M16-2.00 x 35					
M961-16040-60	M16-1.50 x 40					
M933-16040-60	M16-2.00 x 40					
M933-16050-60	M16-2.00 x 50					
M933-16050-82	M16-2.00 x 50*					
M933-16060-60	M16-2.00 x 60					
M933-18035-60	M18-2.50 x 35					
M933-18050-60	M18-2.50 x 50					
M933-18060-60	M18-2.50 x 60					
M933-20050-60	M20-2.50 x 50					
M933-20055-60	M20-2.50 x 55					
Pan Head Machine Screws						
M7985A-03010-20	M3-0.50 x 10					
M7985A-03012-20	M3-0.50 x 12					
M7985A-04010-20	M4-0.70 x 10					
M7985A-04020-20	M4-0.70 x 20					
M7985A-04100-20	M4-0.70 x 100					
M7985A-05010-20	M5-0.80 x 10					
M7985A-05012-20	M5-0.80 x 12					
M7985A-05016-20	M5-0.80 x 16					
M7985A-05100-20	M5-0.80 x 100					
M7985A-06100-20	M6-1.00 x 100					
Flat Head Machine Screws						
M965A-04012-SS	M4-0.70 x 12					
M965A-05012-SS	M5-0.80 x 12					
M965A-05016-20	M5-0.80 x 16					
Hex Nuts						
M934-03-50	M3-0.50	Standard				
M934-035-50	M3.5-0.50	Standard				
M934-04-50	M4-0.70	Standard				
M934-05-50	M5-0.80	Standard				
M982-05-80	M5-0.80	Elastic Stop				
M934-06-60	M6-1.00	Standard				
M934-06-64	M6-1.00	Std. (green)				
M6923-06-80	M6-1.00	Spirallock				
M982-06-80	M6-1.00	Elastic Stop				
M934-08-60	M8-1.25	Standard				
M6923-08-80	M8-1.25	Spirallock				
M982-08-80	M8-1.25	Elastic Stop				
M934-10-60	M10-1.50	Standard				
M934-10-60F	M10-1.25	Standard				
M6923-10-80	M10-1.50	Spirallock				
M6923-10-62	M10-1.50	Spirallock†				
M982-10-80	M10-1.50	Elastic Stop				
M934-12-60	M12-1.75	Standard				
M934-12-60F	M12-1.25	Standard				
M6923-12-80	M12-1.75	Spirallock				
M982-12-80	M12-1.75	Elastic Stop				
M982-14-80	M14-2.00	Elastic Stop				
M6923-16-80	M16-2.00	Spirallock				
M982-16-80	M16-2.00	Elastic Stop				
M934-18-80	M18-2.5	Standard				
M982-18-80	M18-2.50	Elastic Stop				
M934-20-80	M20-2.50	Standard				
M982-20-80	M20-2.50	Elastic Stop				
M934-22-60	M22-2.50	Standard				
M934-24-80	M24-3.00	Standard				
M982-24-80	M24-3.00	Elastic Stop				
M934-30-80	M30-3.50	Standard				
Washers						
						Bolt/ Thick. Screw
Part No.	ID	OD				
M125A-03-80	3.2	7.0	0.5	M3		
M125A-04-80	4.3	9.0	0.8	M4		
M125A-05-80	5.3	10.0	1.0	M5		
M125A-06-80	6.4	12.0	1.6	M6		
M125A-08-80	8.4	16.0	1.6	M8		
M125A-10-80	10.5	20.0	2.0	M10		
M125A-12-80	13.0	24.0	2.5	M12		
M125A-14-80	15.0	28.0	2.5	M14		
M125A-16-80	17.0	30.0	3.0	M16		
M125A-18-80	19.0	34.0	3.0	M18		
M125A-20-80	21.0	37.0	3.0	M20		
M125A-24-80	25.0	44.0	4.0	M24		

* This metric hex bolt's hardness is grade 10.9.

† This metric hex nut's hardness is grade 8.

TP-5995 6/01a

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