INSTALLATION INSTRUCTIONS

Original Issue Date: **6/13**
Model: **RDT and RXT Automatic Transfer Switches**
Market: **Residential/Light Commercial ATS**
Subject: **Load Shed Kits GM88281-KA1 and GM88281-KP1-QS**

Introduction

The load shed kit mounts inside the Model RDT or Model RXT transfer switch enclosure.

The load shed kit operates with Kohler® single-phase residential/commercial generator sets that are equipped with the RDC2 or DC2 controller. This includes the following generator set models:

- 14RESA and 14RESAL
- 20RESA and 20RESAL
- 38RCL and 48RCL (single-phase only)

The load shed kit provides an automatic load management system to comply with Section 702.5 of NEC 2008. The installer is responsible for ensuring that the power system installation complies with all applicable state and local codes.

Many appliances do not run continuously. Air conditioners and furnaces, refrigerators, sump pumps, and other appliances cycle on and off as needed. With the load shed kit, less critical appliances can be powered by the generator set when the more important appliances are not running, allowing the use of a smaller generator set than would be needed to run all of the building's electrical equipment at the same time.

The load shed kit automatically manages up to six residential loads. Up to four (4) customer-supplied power relays can be connected through normally open relay contacts on the circuit board. Two relays are included to control two independent heating, ventilation, and air conditioning (HVAC) loads. The relay specifications are:

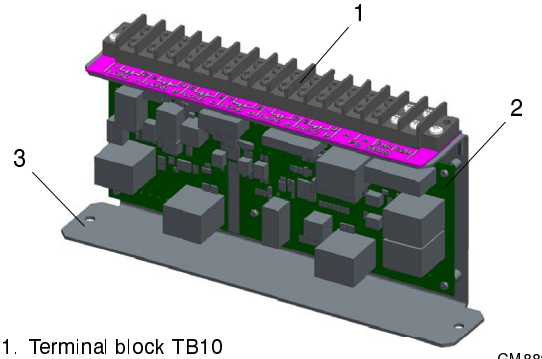
- 125 VAC, 10 A (general purpose)
- 120 VAC, 125 VA (pilot duty)

Note: Connect only non-essential loads to the load shed kit.

Note: Do not install both a load shed kit and a load control module (LCM) on the same system. If the transfer switch includes a load shed kit but you prefer to use the LCM, see Section 8 on page 27.

Before starting the installation, confirm that the generator set is equipped with one of the controllers shown in Figure 2. RDC2/DC2 controller firmware version 4.03 or higher is required. If a Model RDT ATS is used, RDC2/DC2 controller firmware version 5.04 or higher is recommended. Check the version number on the controller and update the firmware, if necessary.

Read the entire installation procedure and compare the kit parts with the parts list on the last page. Perform the steps in the order shown.



1. Terminal block TB10
2. Load control circuit board
3. Mounting bracket

Note: Kit includes current transformer (CT), not shown.

Figure 1 Load Shed Assembly GM88281-1

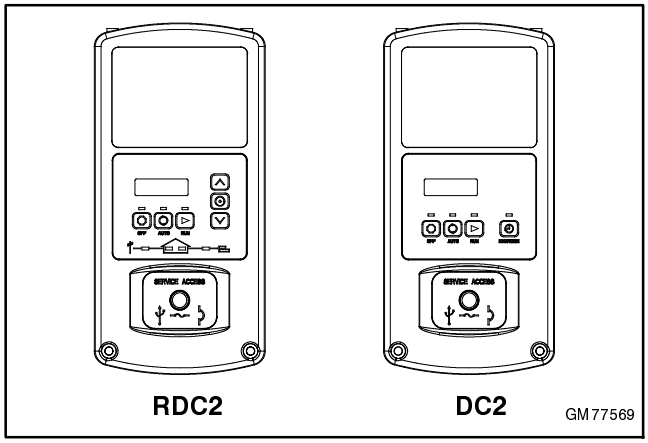


Figure 2 RDC2 and DC2 Controller Identification

Special Equipment

The following items are necessary for installation of the load shed kit.

- Up to four customer-provided power relays with customer-supplied voltage source.
- Shielded, twisted-pair communication cable for RBUS connections (Model RDT transfer switch only). See Section 2 for cable specifications.

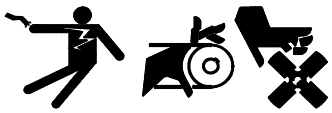
An adequate electrical supply is required for operation of the customer-supplied relays connected to the load shed kit. 120 VAC relays require a customer-supplied voltage source. Check the electrical requirements of the customer-provided equipment prior to installation to determine the wire size and circuit protection required. Verify that customer-provided equipment complies with applicable local and national electrical codes.

Contents

Safety Precautions

Observe the following safety precautions while performing this procedure.

⚠ WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect the power to the battery charger, if equipped. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

⚠ DANGER

Hazardous voltage.
Will cause severe injury or death.

Disconnect all power sources before opening the enclosure.

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

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

1 Installation Procedure

1. Press the OFF button on the generator set controller.
2. Disconnect the utility power to the generator set.
3. Disconnect the generator set engine starting battery(ies), negative (-) lead first.
4. Disconnect power to the transfer switch.
5. Remove the ATS enclosure cover.
6. If the kit is being installed in a Model RDT transfer switch, the communication cable will need to be connected to the generator set controller or to the programmable interface module (PIM), if used.
   a. Use separate conduit for the low-voltage controller communication leads and the load connection wiring. The communication cable can be routed with the engine start leads.
   b. Cover the internal transfer switch components to protect them from metal chips and debris before cutting an opening in the side of the enclosure for the communication leads.

   Note: For outdoor installations, use watertight conduit hubs.
7. Install current transformer (CT) GM83929 on the emergency source lines. Installation inside the transfer switch enclosure is recommended.

   Note: Be sure to route the leads through the current transformer from opposite sides as shown in Figure 4. The leads must cross in opposite directions as they pass through the transformer.

   If the application requires cables that are too large for the inside diameter of the CT provided, order current transformer GM17250 or obtain a current transformer that meets the specifications shown in Figure 3.

CT Specifications	GM83929 (provided)	GM17250*
Primary Rating	400 Amps	400 Amps
Secondary Rating	3 VAC	3 VAC
Burden Resistor	16 Ohms	16 Ohms
Burden Resistor Location	Internal	Internal
Inner Diameter (I.D.)	28.7 mm (1.13 in.)*	57.2 mm (2.25 in.)
* Order GM17250 for applications that use larger cables.		

Figure 3 Current Transformer (CT) Specifications

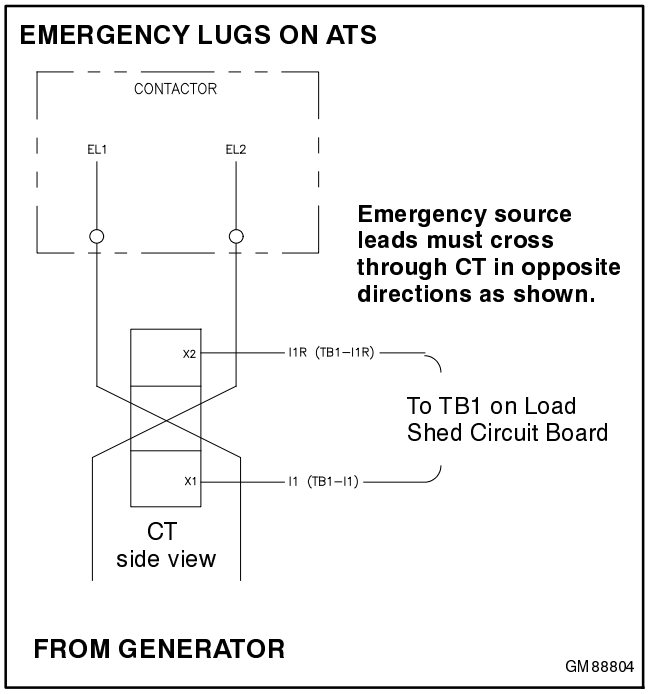


Figure 4 Current Transformer (CT) Wiring

8. Install load shed assembly GM88281-1 inside the ATS enclosure. Enclosures manufactured after June 24, 2013 are equipped with mounting holes and/or hardware at the mounting location.
   a. If the enclosure is equipped with mounting holes and/or hardware, see Figure 25, Figure 26, or Figure 27 for typical mounting locations inside the RXT or RDT enclosure. NEMA 1: Use two screws, X-67-133, to mount the load shed kit. NEMA 3R: Remove the hardware and use it to mount the load shed kit.
   b. If the enclosure is not equipped with mounting holes or hardware, see Figure 28 through Figure 31 for suggested kit mounting locations inside the ATS enclosure. Swab the mounting area with alcohol and let dry. Peel off the backing on the double-sided adhesive tape, apply the tape to the mounting bracket, and press the load shed assembly firmly into place.

   Note: Once installed using the adhesive tape, the mounting bracket cannot be repositioned or removed.

9. Connect the controller interface connection to A, B, PWR, and COM on terminal block TB10 on the load shed kit. See Figure 6. See Section 2.3 for more information about the interface connections.

   a. Model RXT: Use harness GM88557, provided with the kit, to connect the load shed kit communications connections to the transfer switch's RBUS interface board.

   b. Model RDT: Use customer-supplied communication cable to connect the load shed kit communications connections to the RBUS connector on the generator set. See Section 2.3 for cable specifications. Discard harness GM88557 (provided with the kit).

Note: See Section 2 for more wiring information and refer to the wiring diagrams in Section 7.

10. Connect the CT leads to connector TB1 on the load control circuit board. Extend the leads, if necessary, using customer-supplied wiring. See Figure 6 and/or the wiring diagram in Figure 23 for the connector location.

11. Note the load priorities shown in Figure 5 and connect the customer-provided load relays accordingly. Connect load connections to the terminal blocks for Loads A, B, C, and D. The contacts on the load shed kit are normally open as shown in Figure 6.

    Note: Priority 1 is considered the most critical and will add first and shed last. Priority 6 is considered the least critical and will add last and shed first.

12. Connect HVAC loads to TB10. See Figure 6. Note the priorities of HVAC A and HVAC B relative to Loads A through D. See Figure 5 and Section 3.3.

13. Record the names of the loads connected to each relay in Figure 5. For example, Load A may be a sump pump, and HVAC A may be the air conditioner.

    Note: If the OnCue® Generator Management System is used, the load descriptions in OnCue's power chain view can be changed to identify the load connections. See TP-6796, OnCue Software Operation Manual.

14. Install the ATS enclosure cover.

15. Check that the generator set is OFF.

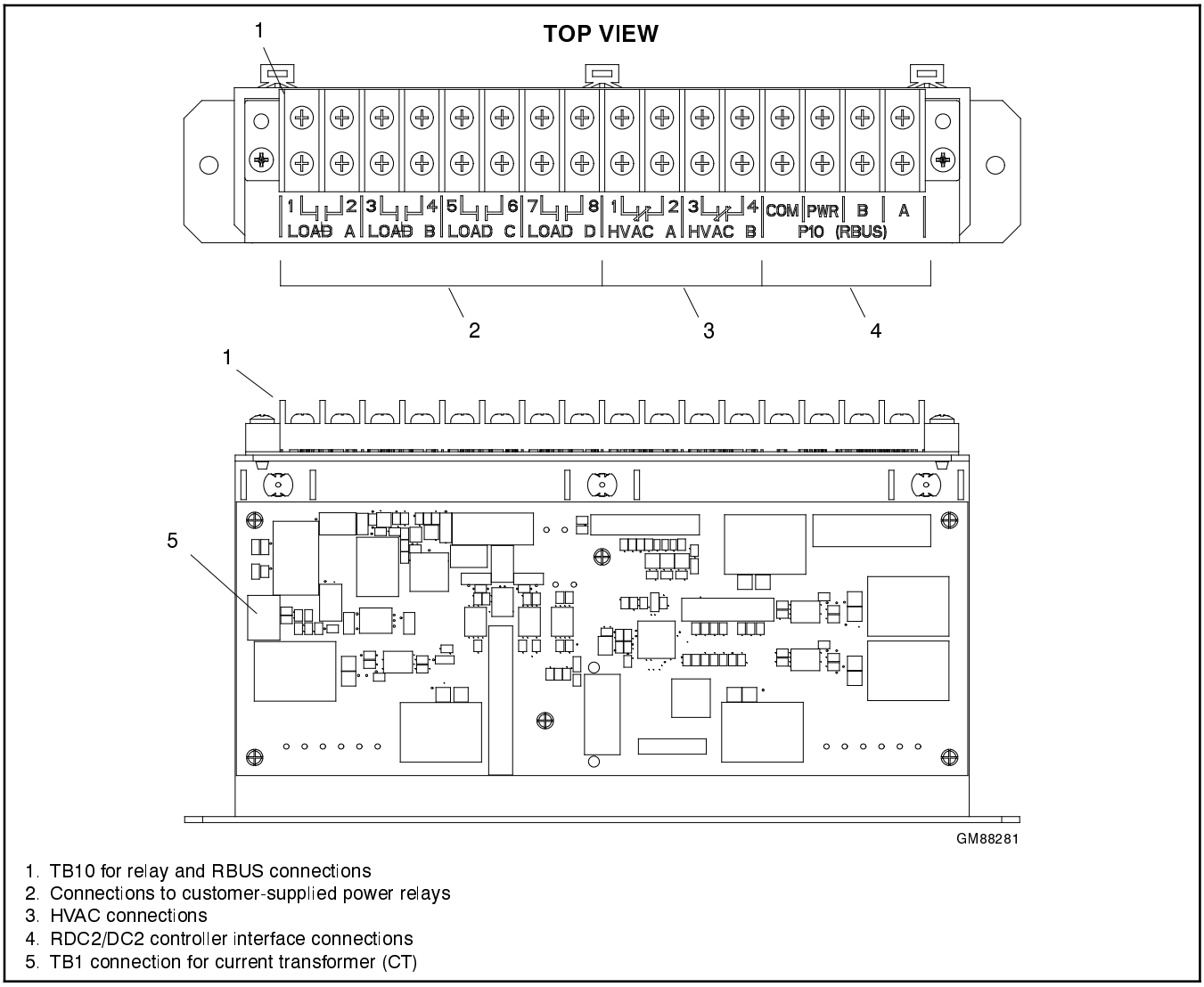
16. Reconnect the utility power to the transfer switch.

17. Reconnect the generator set engine starting battery, negative (–) lead last.

18. Reconnect utility power to the generator set.

Priority	Relay	Record the Load Description
1	Load A	
2	HVAC A	
3	Load B	
4	Load C	
5	HVAC B	
6	Load D	
Note: Priority 1 (Load A) adds first and sheds last.		

Figure 5 Load Priority and Descriptions



1. TB10 for relay and RBUS connections
2. Connections to customer-supplied power relays
3. HVAC connections
4. RDC2/DC2 controller interface connections
5. TB1 connection for current transformer (CT)

Figure 6 Load Shed Kit Customer Connections

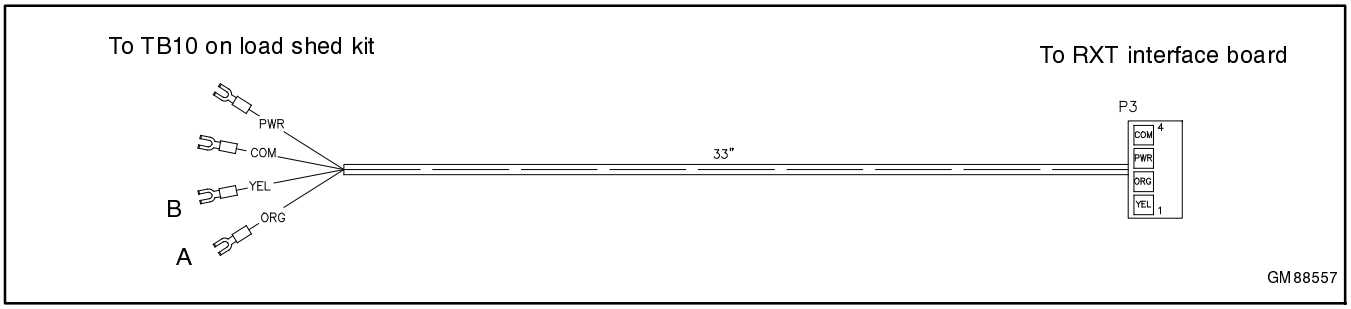


Figure 7 Communication Harness GM88557 (use for Model RXT only)

2 Wiring

See Figure 6 for the terminal block illustration. See the wiring diagram and schematic in Figure 23 and Figure 24.

Note: Use separate conduit for the low-voltage controller communication leads and the load connection wiring. If a Model RDT transfer switch is used, the communication cable can be routed with the engine start leads.

Six customer-supplied relays or circuits can be connected to the load shed kit's terminal block TB10.

2.1 Power Relay Load Connections

Connect up to four (4) customer-supplied power relays to terminal block TB10. Check the electrical requirements of customer-provided equipment prior to installation to determine the wire size and circuit protection required.

120 VAC relays require a customer-supplied voltage source. Verify that customer-provided equipment complies with applicable local and national electrical codes.

2.2 HVAC Connections

Two of the load shed kit relays can be used to control heating, ventilation, and air conditioning (HVAC) loads. The operation of the HVAC relays includes a five-minute start delay and different timing for load add compared to the power relays. See Sections 3.2 and 4.1 for more details.

The air conditioner control scheme involves splicing into the existing building low voltage wiring from the thermostat to the air conditioner/furnace. In a typical four wire scheme, connect the cooling wire (Y) in series to the respective terminal block on the load shed kit.

Connect to the terminals labeled HVAC on terminal block TB10. See the wiring diagrams in Section 7. Connect the more important air conditioner to HVAC A. Connect the less important air conditioner, if applicable, to HVAC B.

2.3 Generator Controller Interface Connection

Connect the RBUS connections A, B, PWR and COM on the load shed kit's terminal block to the RXT transfer switch interface board or to the RBUS circuit on the generator set as described in this section.

If a Model RXT transfer switch is used, connect the RBUS circuit from TB10 on the load shed kit circuit board to the RXT interface board using the communications harness provided with the kit. See Figure 10 and the wiring diagrams in Section 7.

If a Model RDT transfer switch is used, connect the communication leads from terminal block TB10 on the load shed kit to the RDC2 or DC2 controller on the generator set, or connect to the optional programmable interface module (PIM), if used. See Figure 11 and Figure 12. Use 20 AWG shielded, twisted-pair communications cable. See Figure 9 for cable recommendations.

Communication Connections	
Designation	**Description**
A	RBUS Communication +
B	RBUS Communication -
PWR	12VDC Power +
COM	12VDC Power -
RBUS: RS-485 proprietary communication.	

Figure 8 RBUS Connections

RBUS Connections A and B

For the RBUS communication connections A and B, use 20 AWG shielded, twisted-pair communication cable. Belden #9402 (two-pair) or Belden #8762 (single-pair) or equivalent cable is recommended.

For outdoor installations, including those with buried cables and/or conduit, use outdoor-rated Belden #1075A or equivalent 20 AWG shielded, twisted-pair communication cable.

PWR and COM Connections

For the PWR and COM connections from TB1 to the RXT, load shed kit, and/or optional PIM, use the second pair in the two-pair communication cable for short runs, or use 12–14 AWG cable for longer runs as shown in Figure 9.

The maximum cable length depends on the number of optional modules connected. A module can be a Model RXT transfer switch, a load shed kit, or a programmable interface module (PIM). See Figure 9 for the maximum cable lengths for 1, 2, or 3 modules per cable run. Note the shield connections shown in Figure 10.

Cable Size for PWR and COM Connections	Indoor or Outdoor Installation	Maximum length per run, meters (ft.) Number of Modules per Run (ATS, load shed kit, and PIM)		
		1 Module	2 Modules	3 Modules
20 AWG Belden #9402 or equivalent, two-pair	Indoor	61 (200)	31 (100)	21 (67)
20 AWG Belden #1075A or equivalent, two-pair	Outdoor	61 (200)	31 (100)	21 (67)
14 AWG *	—	152 (500)	152 (500)	122 (400)
12 AWG *	—	152 (500)	152 (500)	152 (500)

* Use 12 or 14 AWG cable for PWR and COM connections only. For RBUS connections A and B, use shielded, twisted pair communication cable specified above.

Figure 9 Total Communication Cable Lengths with Accessory Modules Connected

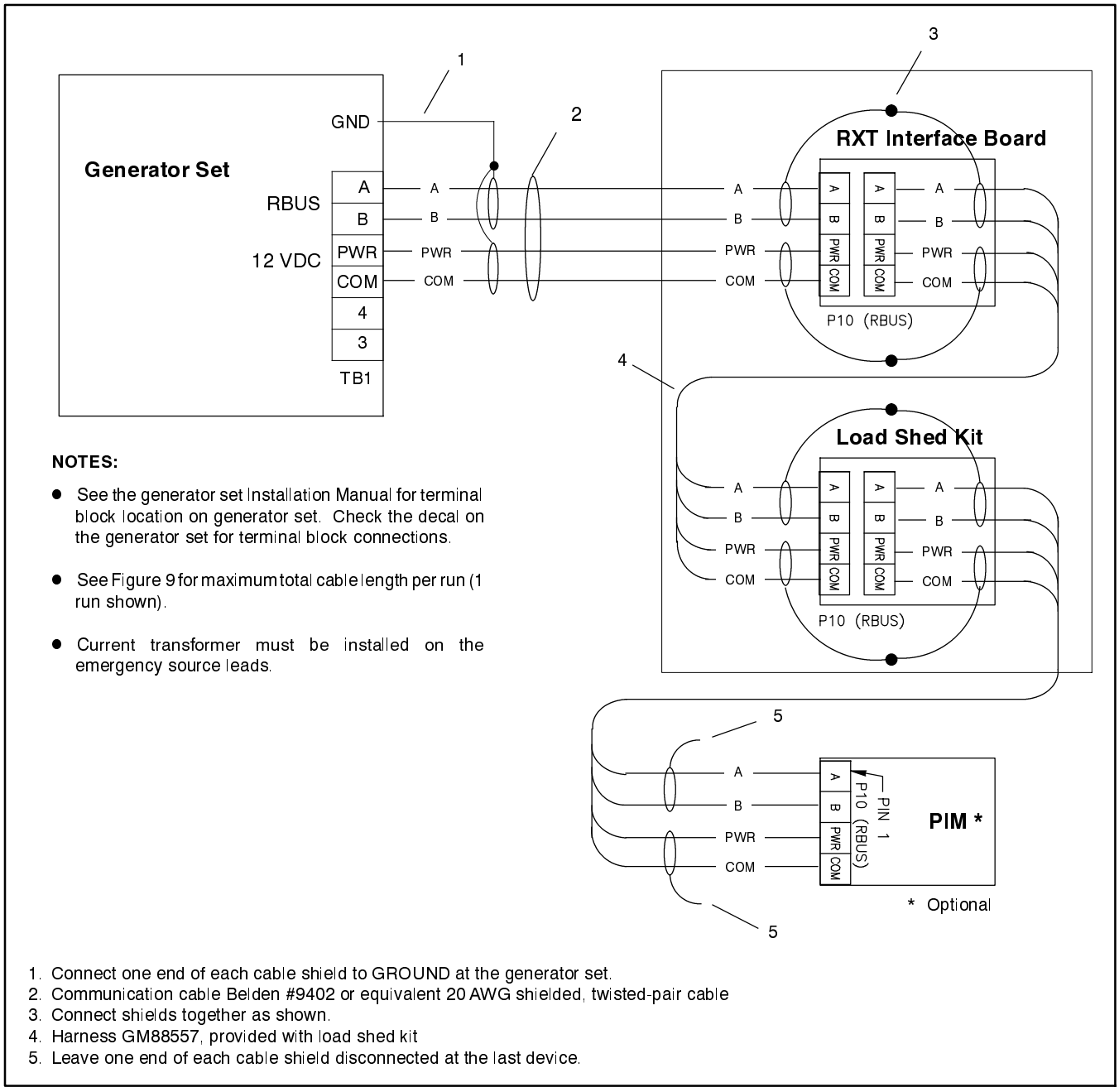


Figure 10 RBUS Communication Connection Details with Model RXT Transfer Switch

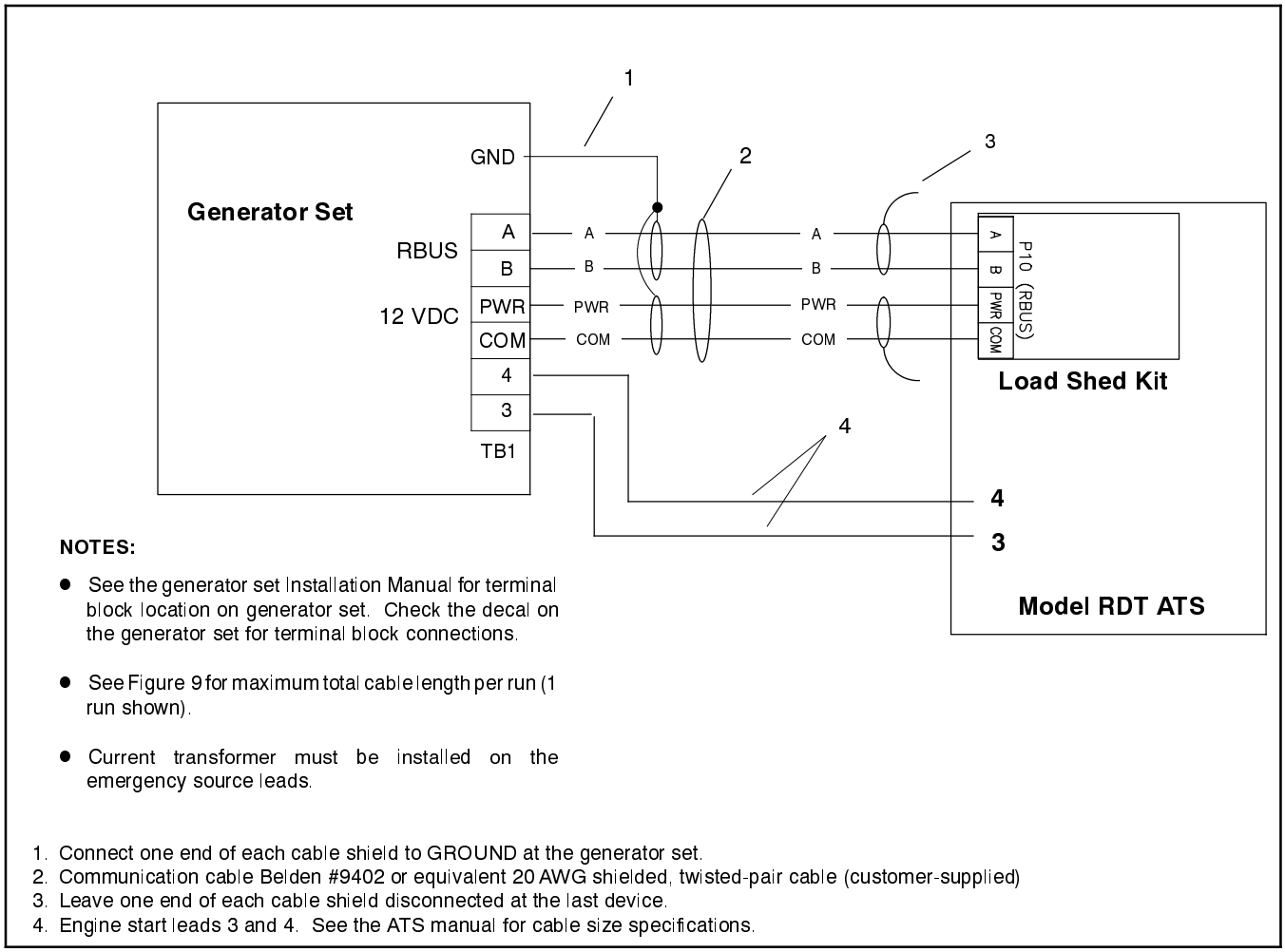
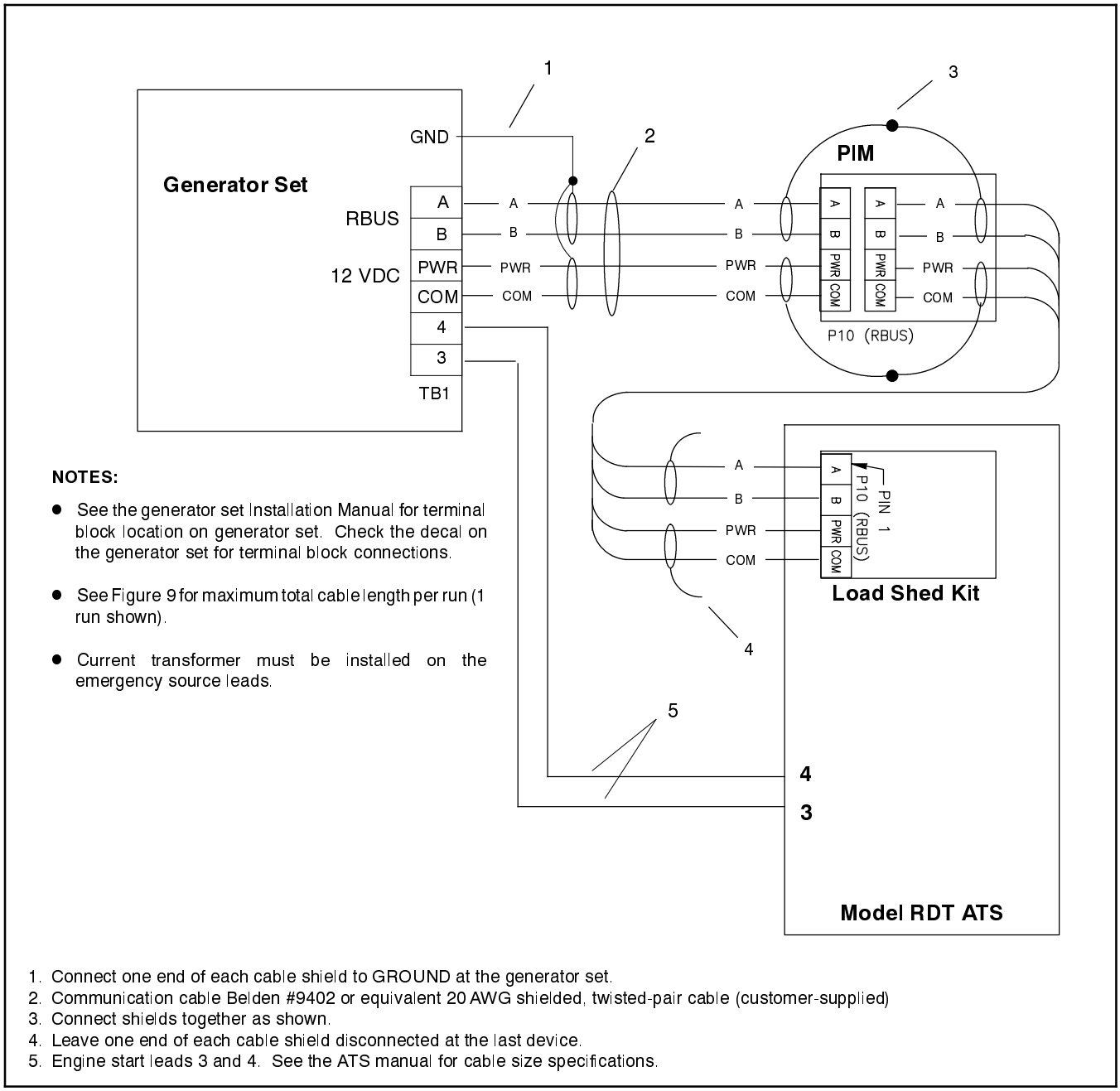


Figure 11 RBUS Communication Connection Details with Model RDT Transfer Switch



1. Connect one end of each cable shield to GROUND at the generator set.
2. Communication cable Belden #9402 or equivalent 20 AWG shielded, twisted-pair cable (customer-supplied)
3. Connect shields together as shown.
4. Leave one end of each cable shield disconnected at the last device.
5. Engine start leads 3 and 4. See the ATS manual for cable size specifications.

Figure 12 Alternate RBUS Communication Connection Details with Model RDT Transfer Switch and Optional Programmable Interface Module (PIM)

3 Operation

Many appliances do not run continuously. Air conditioners and furnaces, refrigerators, sump pumps, and other appliances cycle on and off as needed. With the load shed kit, less critical appliances can be powered by the generator set when the more important appliances are not running, allowing the use of a smaller generator set than would be needed to run all of the building's electrical equipment at the same time.

The RDC2/DC2 generator controller receives input from current transformer (located in the ATS) and determines whether load shedding or adding shall occur. The load shed kit receives commands from the generator controller and energizes or de-energizes the appropriate load relays.

The load shed kit is activated by the ATS transferring from the utility (normal) source to the generator. When activated, the load shed kit sheds all connected loads. After transfer to the generator set, loads are added according to their priority.

If the ATS fails to transfer from the utility source to the generator, the load shed kit will re-add all loads. When the ATS transfers to utility, the load shed kit adds all loads that have been previously shed.

For more information about the load add and load shed timing, see Section 4, Theory of Operation.

3.1 Power Loads

Up to four customer-supplied power relays can be connected for management of non-essential secondary loads. If two-pole relays are used, two (2) 120 VAC loads (shed simultaneously) or a single 240 VAC load can be wired to each relay.

3.2 HVAC Loads

There are two (2) relays available to control two (2) independent heating, ventilation, and air conditioning (HVAC) loads.

A 5-minute time delay prevents HVAC loads from adding too quickly. Air conditioning compressors may be damaged if they start too soon after being stopped due to the necessity of starting the compressor against a large residual pressure. Five minutes is a typically accepted time required for an AC compressor to bleed off to a pressure level that the motor can successfully start against.

3.3 Load Add/Shed Priority

Loads are prioritized from priority 1 to priority 6. See Figure 5 on page 4. Priority 1 is considered the most critical; it will add first and shed last. Priority 6 is considered the least critical; it will add last and shed first.

4 Theory of Operation

4.1 Load Add

The load shed kit adds and sheds loads based on the available capacity of the generator set. When the generator has ample available capacity, loads are added quickly. When the available capacity is low, loads are added more slowly to give the generator time to recover and to allow ample time to ensure that any switching loads will come on before adding more load than the generator can handle.

The load add time ranges from 15 seconds to 120 seconds depending on the loading of the generator set. Figure 13 shows an example of the load add timing for a 20 kW generator set with the maximum capacity set to the default setting of 70%. Figure 14 shows the HVAC load add timing for a 20 kW generator set.

Available Capacity (%)	Load (%)	Load (kW) for a 20 kW Generator	Time (Seconds)
70%	0%	0	15
50%	20%	4	23
37%	33%	6.6	34
30%	40%	8	40
20%	50%	10	48
5%	65%	13	60
<5%	>65%	>13 kW	Never Add

Figure 13 Example: Power Relay Load Add Timing for a 20 kW Generator

Available Capacity (%)	Load (%)	Load (kW) for a 20 kW Generator	Time * (Seconds)
70%	0%	0	30
50%	20%	4	66
37%	33%	6.6	91
30%	40%	8	102
20%	50%	10	120
<20%	>50%	>10 kW	Never Add
* After the 5-minute HVAC delay			

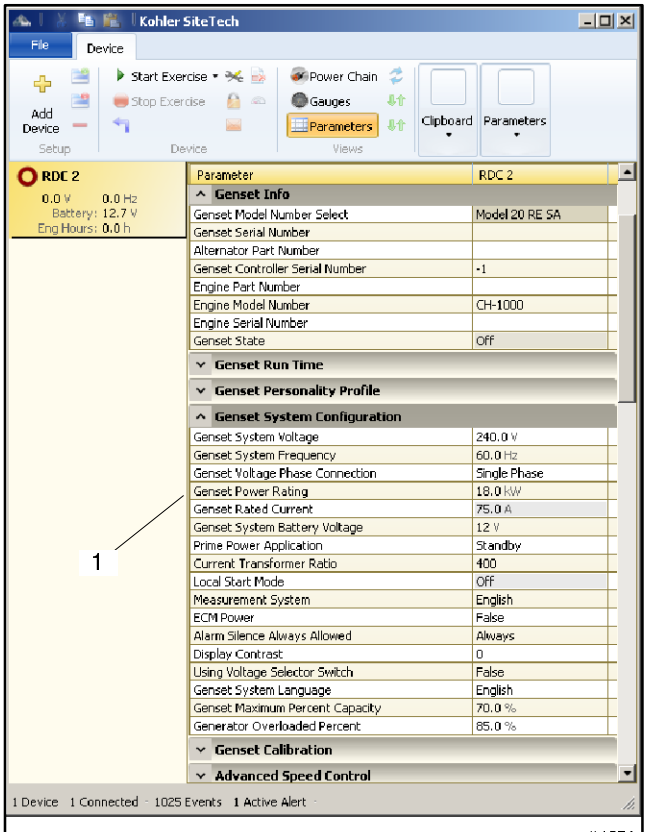
Figure 14 Example: HVAC Load Add Timing for a 20 kW Generator

Capacity

The Generator Maximum Percent Capacity setting dictates the maximum level that the load control module will automatically place on the generator. This setting is adjustable using a laptop computer connected to the RDC2 or DC2 controller and Kohler® SiteTech™ software. See Section 4.2.4.

The maximum load is calculated by multiplying the Generator Maximum Percent Capacity by the Genset Power Rating, which is a setting in the RDC2/DC2 controller. The Genset Power Rating, in kW, is factory-set to the natural gas rating. If the 14RESA or 20RESA has been converted to LP fuel, use SiteTech to change the Genset Power Rating on the controller. Refer to the generator set specification sheet for the new rating, and change the rating (kW) under the Genset System Configuration in SiteTech. See Figure 15 and TP-6701, SiteTech Software Operation Manual.

The load shed kit will operate if the rating setting is not changed, but loads will be shed at a kW level based on the factory default rating, rather than the rating of the reconfigured generator set.



1. Genset Power Rating setting

Figure 15 Genset Power Rating in SiteTech

4.2 Load Shed

Less important (higher priority number) loads are shed when the generator is unable to support them. This permits more important loads to continue to receive power from the generator. The less important loads are re-added after the generator loading has gone down enough to support them again. The load shed kit sheds less important loads before the power quality of the generator suffers from the overload.

Loads are shed in two ways – Overload and Under Frequency.

4.2.1 Overload Shed

Loads are shed on a time scale which is based on the total generator overload. The loads will shed slowly when the generator is not heavily overloaded. Loads are shed much more quickly when the overload is higher. The timing variation allows consistent overloads to be removed, instantaneous excessive overloads to be very quickly removed and normal overloads (such as motor inrush) to remain online until the transient overload condition is removed.

Figure 16 shows the overload shed timing for a 20 kW generator set with the generator overloaded percent set to the default setting of 85%. If the overload condition persists, the load shed timing can be affected by load shed acceleration. See Section 4.2.3.

The Generator Overload Percent setting is the maximum load that the load shed kit will accept without shedding. The setting is adjustable using a laptop computer connected to the RDC2 or DC2 controller and Kohler SiteTech software. See Section 4.2.4. Set the Generator Overload Percent at least 10% higher than the Generator Maximum Percent Capacity.

Generator Overload (%)	Load (%)	Load (kW) for a 20 kW Generator	Time (seconds)
0%	<85%	<17 kW	Never Shed
0%	85%	17	40
10%	95%	19	28
13%	98%	19.6	24
15%	100%	20	22
20%	105%	21	17
>35%	>120%	>24 kW	0.5

Figure 16 Overload Shed Timing for a 20 kW Generator

4.2.2 Under Frequency Shed

Loads are shed on a time scale which is based on the generator frequency droop. The loads will shed quickly when the frequency droop is high (output frequency is lower), and more slowly when the generator is running close to rated frequency. The timing variation allows large overloads to be shed very quickly, while allowing the generator to ride through normal transients (such as starting an AC compressor).

Figure 17 shows the under frequency shed timing for a 60 Hz generator set. If the underfrequency condition persists, the load shed timing can be affected by load shed acceleration. See Section 4.2.3.

Frequency (Hz)	Frequency Droop (Hz)	Time (seconds)
>59 Hz	<1 Hz	Never Shed
58.5	1.5	5.4
57	3	4.3
56	4	3.4
54	6	1.8
<52.5 Hz	>7.5 Hz	0.3

Figure 17 Under Frequency Shed Timing for a 60Hz Generator

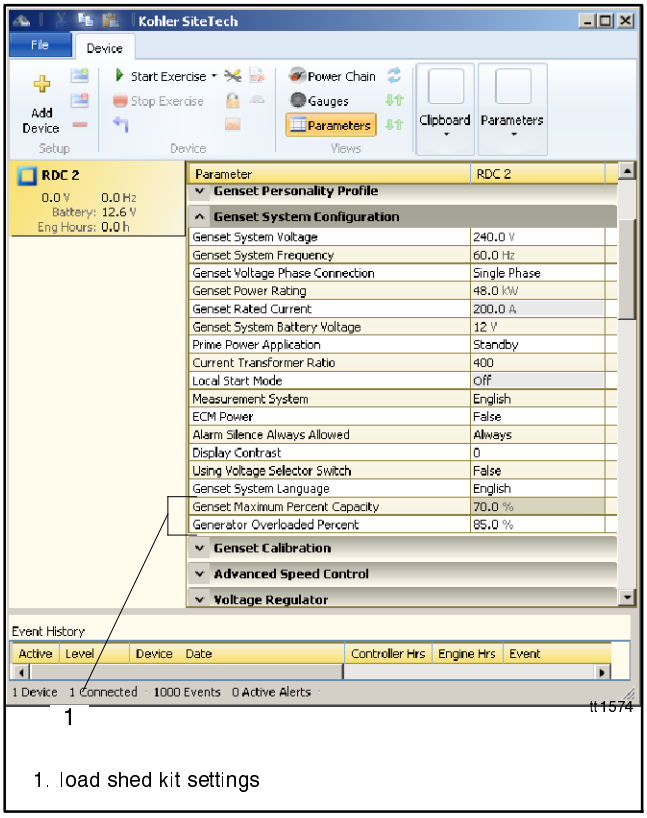
4.2.3 Load Shed Acceleration

Load shed acceleration is used to shed loads more quickly if an overload or underfrequency condition persists. If an overload condition is not cleared by shedding a load, each subsequent load will shed more quickly. The acceleration is more pronounced for an underfrequency shed.

4.2.4 Changing Settings

The Generator Maximum Percent Capacity and Generator Overloaded Percent settings can be changed using a laptop computer connected to the RDC2 or DC2 controller and Kohler® SiteTech™ software. The load control settings are found in the Genset System Configuration group. See Figure 18 and TP-6701, SiteTech Software Operation Manual.

Set the Generator Overload Percent at least 10% higher than the Generator Maximum Percent Capacity.



1. load shed kit settings

Figure 18 SiteTech Screen

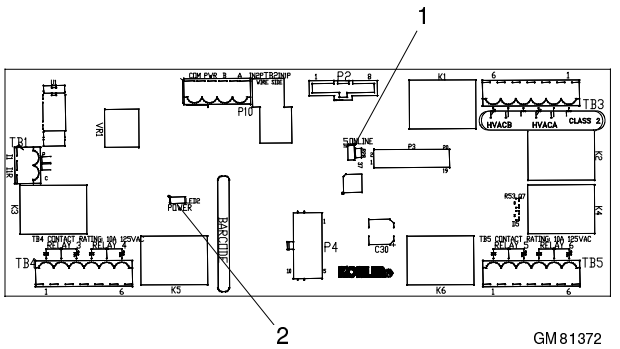
5 LEDs

Two LEDs on the load shed kit circuit board indicate power and communication as described in Figure 19.

See Figure 20 for the LED locations.

LED	Operation
Online	On (green): Connected to RDC2 or DC2 controller.
Power	On (green): Power is on. Flashing: Indicates a problem. Off: No power or the board is booting up.

Figure 19 Load Shed Circuit Board LED Operation



1. Online LED
2. Power LED

Figure 20 LEDs on the Load Shed Circuit Board

6 Troubleshooting

If the load shed kit does not operate as expected, follow the procedures in this section to troubleshoot the equipment. First check that the controller is communicating with the load shed kit as shown in the following procedure. Then check the troubleshooting tables for potential problems and recommendations.

Verify that the Controller Recognizes the Load Shed Kit

There are two ways to verify that the RDC2 controller recognizes the Load Shed Kit.

1. On the RDC2 controller, navigate to the Networking Menu and check the number of modules connected and the information for remote devices. See Figure 21 and Figure 22. The number should equal the number of RBUS devices connected, including the load shed kit, RXT transfer switch (if used) and the PIM (if used). A Model RDT transfer switch is not an RBUS device.

2. For the RDC2 or DC2 controller, use a laptop computer connected to the controller's USB port and Kohler® OnCue® or SiteTech software. In OnCue, check that the load shed kit appears in the Power Chain view. See the OnCue Software Operation Manual, TP-6796, for instructions. In the Parameters view of OnCue or SiteTech, check that the RBUS network screen shows the correct number of RBUS devices connected (one Load Shed Kit, RXT transfer switch, and PIM, if used). See SiteTech Operation Manual TP-6701 for instructions.

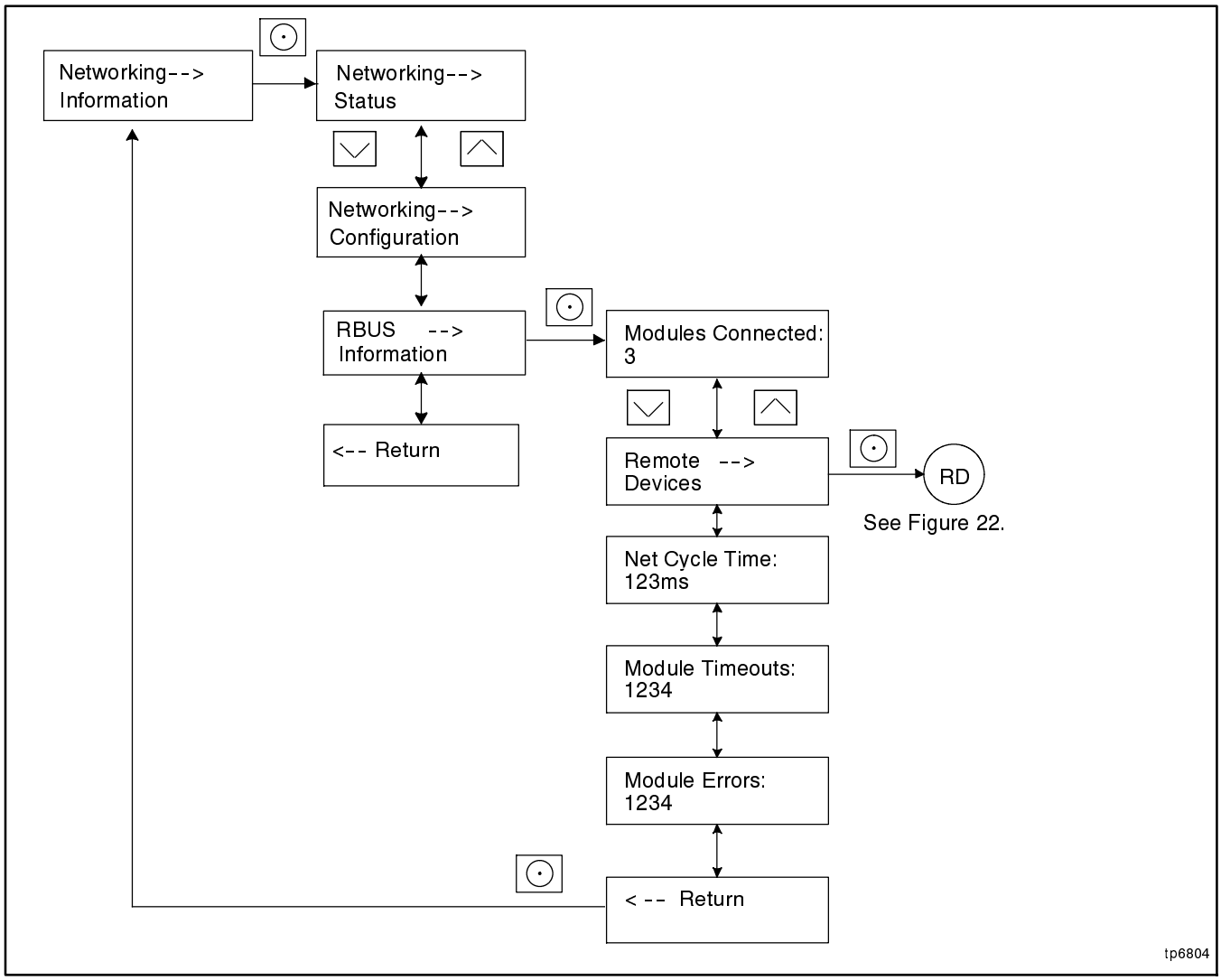


Figure 21 RDC2 Controller, Networking Information Menu

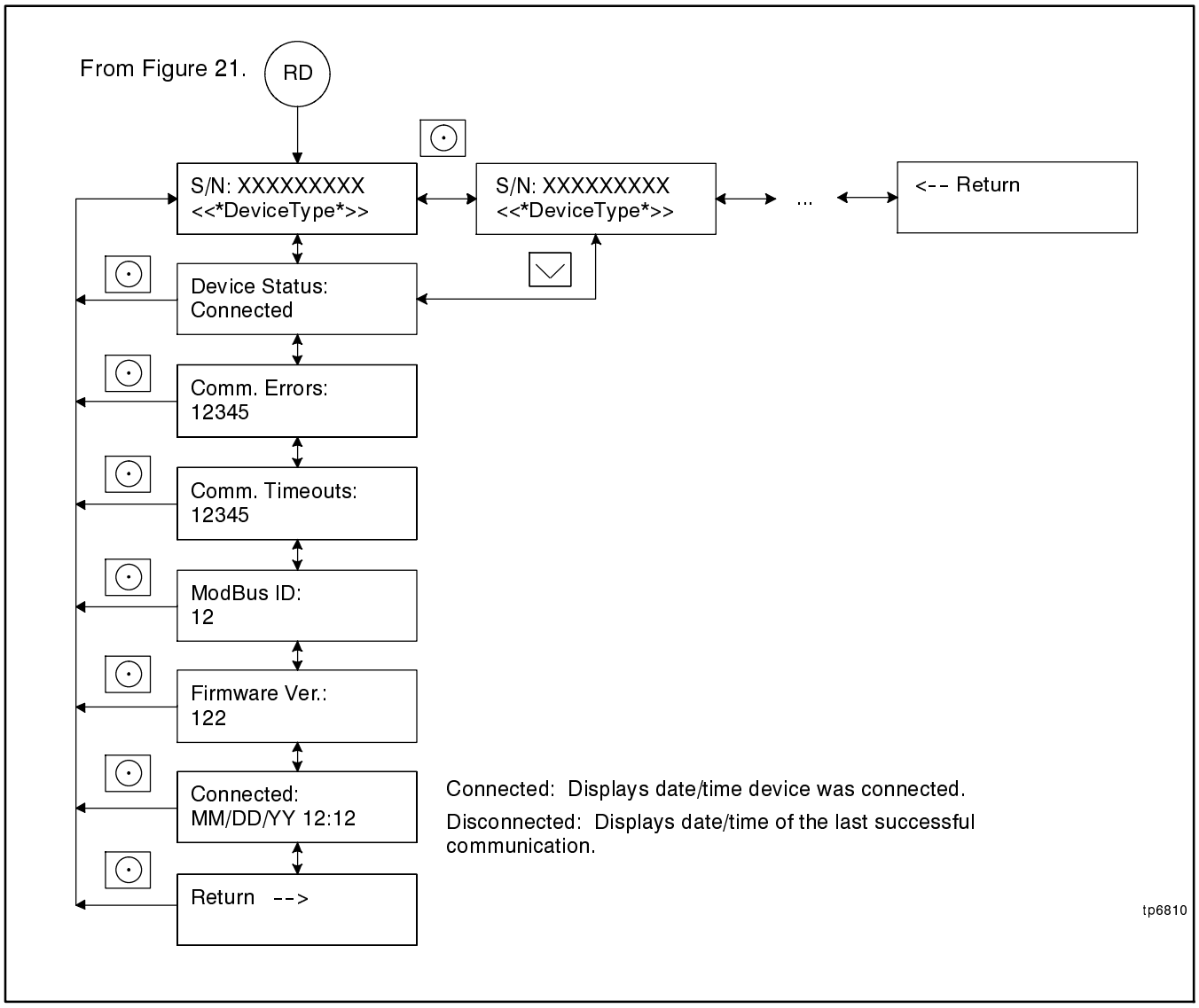


Figure 22 RDC2 Controller, Remote Devices Submenu

Troubleshooting Tables

The following tables list potential load shed kit operation problems and recommendations for troubleshooting.

Load shed kit functional issues.	
Problem	**Check**
Load shed AC relays do not activate.	Verify 120 VAC supply voltage to relays. Verify correct wiring to the load shed kit board and AC relays.
Metering always reads 0% under load.	Verify that the Emergency feed to the ATS goes through the CT correctly. Verify the the CT leads are connected to the load shed kit input correctly. Verify that the correct CT is used. (400 A to 3V)
Metering never reads 0%.	Verify that the CT is wired correctly. Verify that twisted-pair cable was used. Verify that CT wiring is in separate conduit from AC leads.

Load shed kit does not shed enough load for the generator to recover.	
Problem	**Check**
HVAC units do not shed.	Verify normally closed (NC) output is used to control AC relays.
Does not shed when load is between 85% and 90%.	Verify that the load is not intermittently dropping below 85%. Verify that the load remains above 90% for at least 40 seconds. Verify that the % load is metering correctly. Verify that the overload percent is set at 10% or more below indicated level. Verify that the load shed kit is communicating with the generator set controller.
Does not shed when load is at 100%.	Verify that the % load is steady at 100% for approximately 25 seconds. Verify that the % load is metering correctly. Verify that the overload percent is set at 10% or more below indicated level. Verify that the load shed kit is communicating with the generator set controller.
Does not shed when load is greater than 110%.	Wait at least 15 seconds. Verify that frequency is greater than 59 Hz. Verify that the load shed kit is communicating with the generator set controller.
Generator still overloaded when all loads are shed.	Verify that only non-essential load are connected through the Load Shed Kit. Correctly set up unused relays for the run length. Verify that all load shed kit AC relays are properly supplied. Verify that the wire size is correct for the run length.

Loads do not add when they should.	
Problem	**Check**
Loads do not add when load is below 56%.	Verify that the generator set maximum load capacity is adequately sized for the application. Verify that the load is not jumping above the maximum capacity.
Loads never add.	Verify that % load is below 50%. Verify that the wiring between the load shed kit and the generator set controller is correct. Verify that the generator set maximum load capacity is adequately sized for the application. Verify that the load is not jumping above the maximum capacity.

Sporadic load adds and sheds.	
Problem	**Check**
Load adds and then sheds after about 6 seconds.	Verify that the fuel pressure to the generator set is within specification. Verify that the % load is correctly measured. Verify that the wiring between the load shed kit and the CT meets specifications. Verify that the Generator Set maximum Load Capacity is not set too high. One AC relay may have too much load. Even out the loads on the AC relays. Verify that generator frequency is within specification.
Loads continually add and shed.	One AC relay may have too much load. Even out the loads on the AC relays. Verify that generator frequency is within specification.
Some loads add but then all loads shed suddenly.	Verify stable communication between the load shed kit and the ATS with the generator controller. One AC relay may have too much load. Even out the loads on the AC relays. Verify that generator frequency is within specification.

Load does not shed after transfer to Emergency.	
Problem	**Check**
Load does not shed after transfer to Emergency.	Verify that frequency is greater than 59 Hz. Verify that the transfer switch is a model RXT. Verify that the remote start signal is true. Verify that generator set controller is configured as a single-phase unit. Verify that the load shed kit sensed load is less than 7%.
Load sheds when Normal is available.	Verify that the ATS is connected correctly. Verify that the system indicates that the Normal source is available. If an RDT transfer switch is used, verify that the remote start signal is off (false). Verify that the load shed kit sensed load is less than 7%.

7 Drawings and Diagrams

The wiring diagram, schematic, and drawings showing recommended locations for the load shed kit are shown on the following pages.

7.1 Wiring Diagram and Schematic

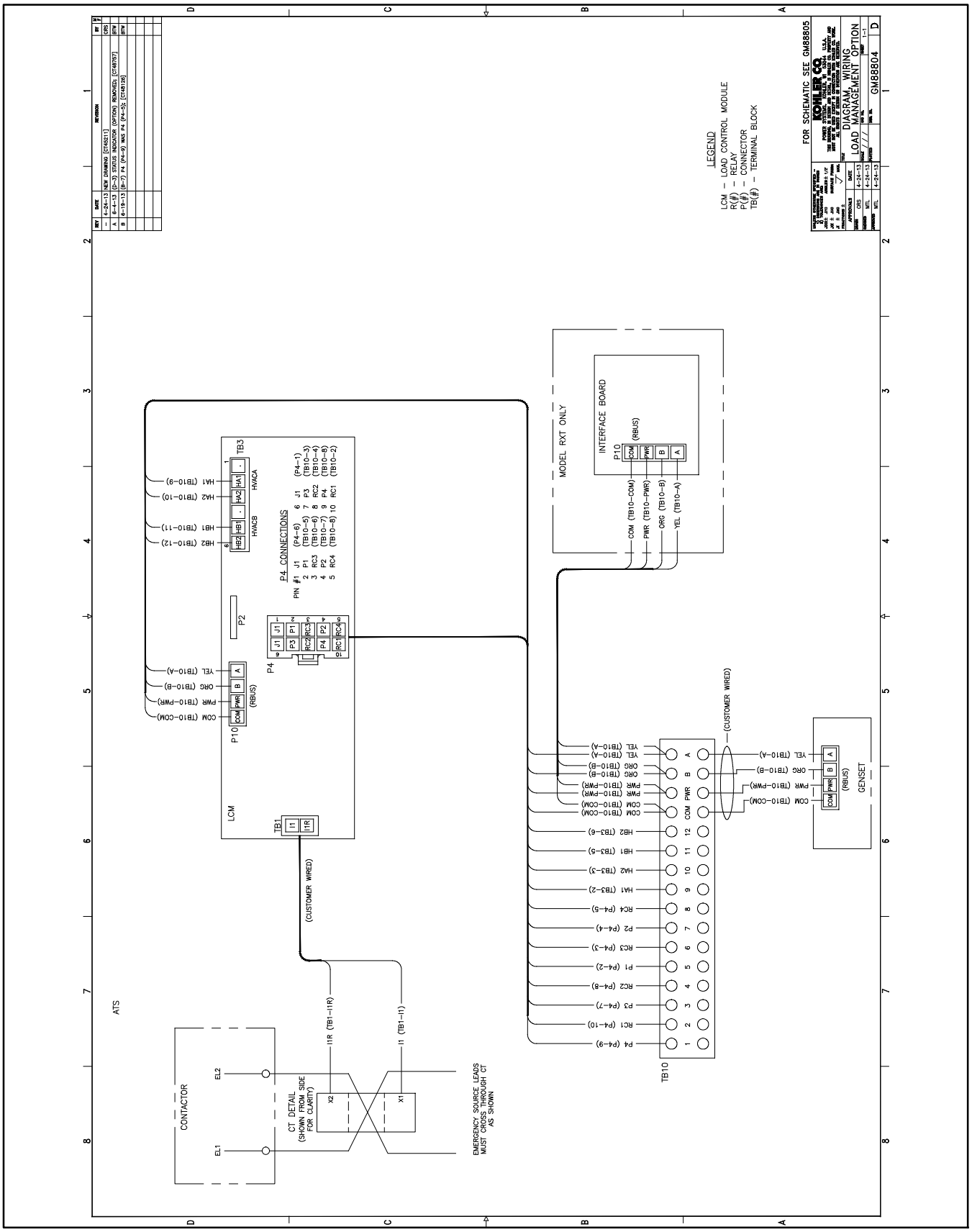


Figure 23 Wiring Diagram GM88804

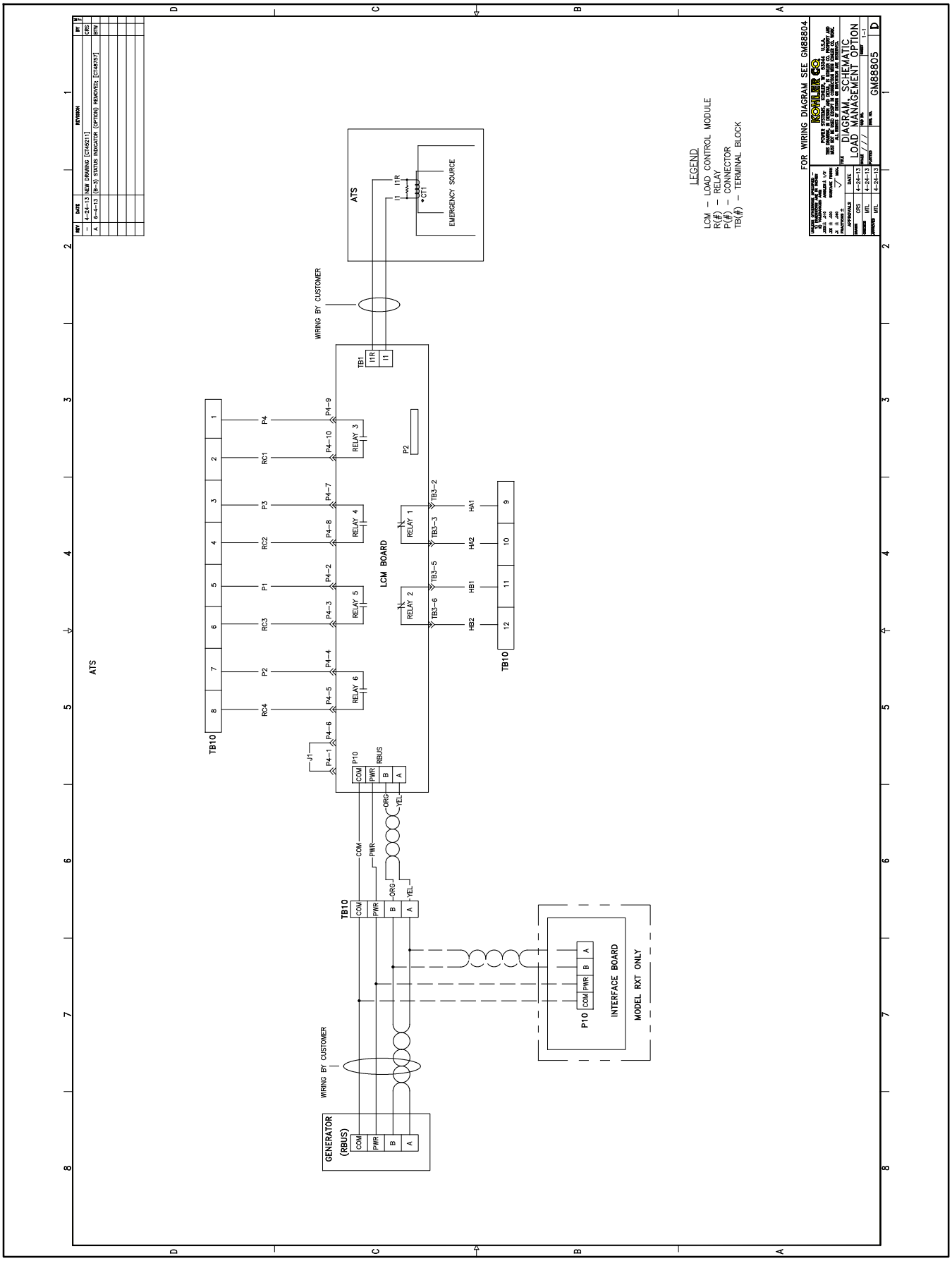
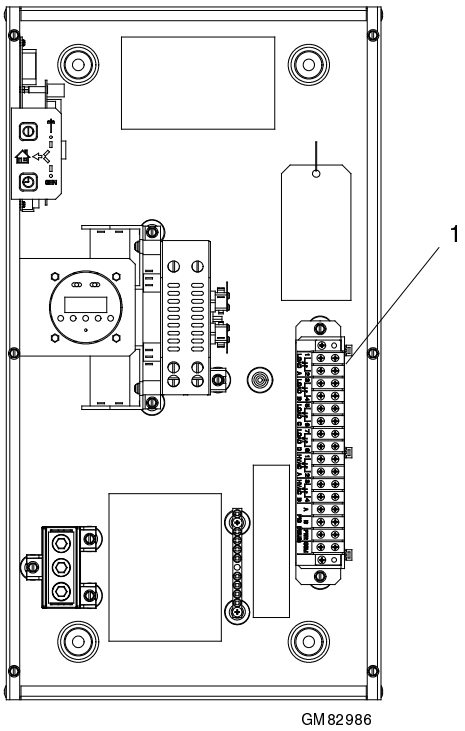


Figure 24 Schematic Diagram GM88805

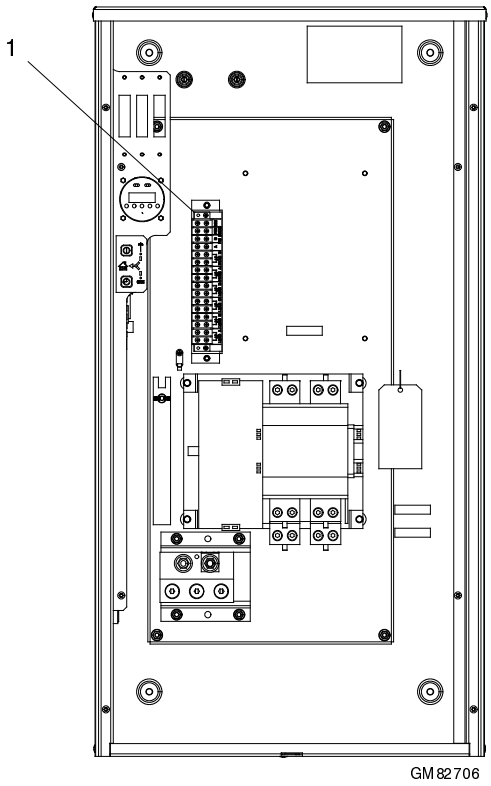
7.2 Recommended Mounting Locations

Figure 25 through Figure 27 show the typical kit mounting locations in transfer switch enclosures that include kit mounting holes and/or hardware.

Figure 28 through Figure 31 show the recommended kit mounting locations in transfer switches that do not include kit mounting holes and hardware. These locations apply to the installation of loose kits into older transfer switches that were manufactured before June 24, 2013. The location can vary depending on the installation. Use the double-sided mounting tape provided with the kit to mount the assembly inside the ATS enclosure if mounting holes and/or hardware are not included.



100-200A, TYPICAL

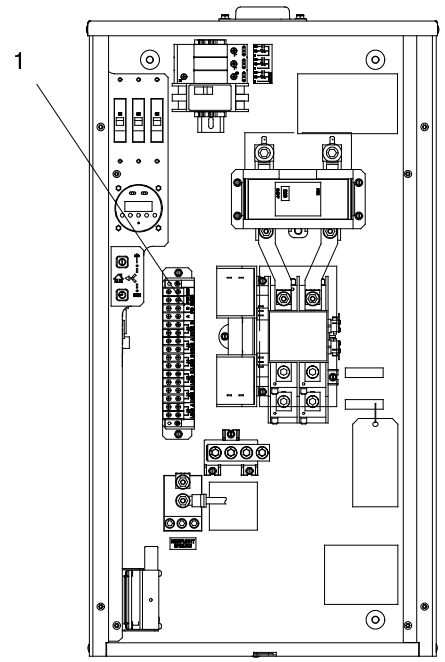


400A, TYPICAL

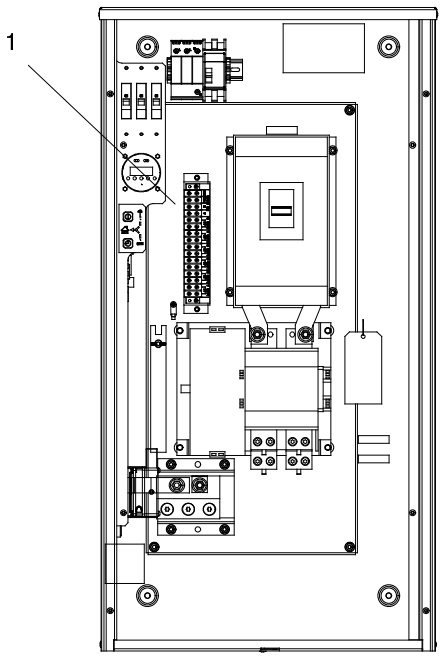
1. Load shed kit mounting location inside enclosure

Note: Drawings are not to scale.

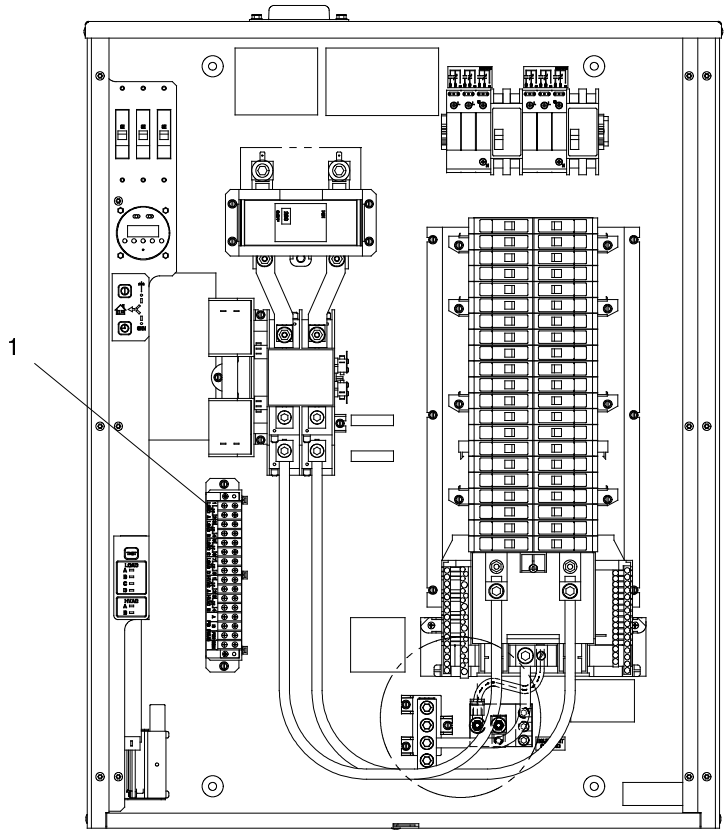
Figure 25 Typical Load Shed Kit Mounting Locations, Model RDT with Mounting Holes and/or Hardware



200A SERVICE ENTRANCE



400A SERVICE ENTRANCE

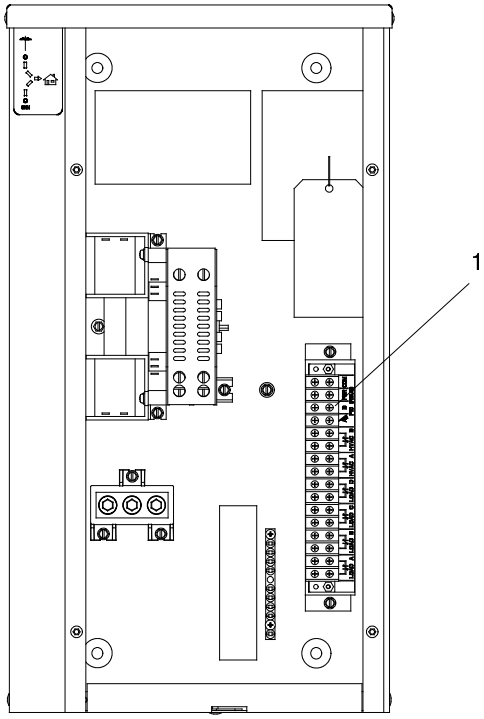


200A SERVICE ENTRANCE WITH 42-CIRCUIT LOAD CENTER

1. Load shed kit mounting location inside the enclosure

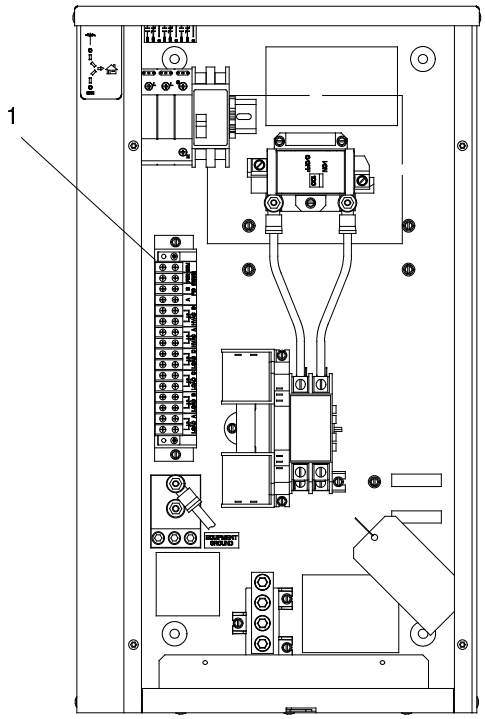
Note: Drawings are not to scale.

Figure 26 Typical Load Shed Kit Mounting Locations, Model RDT Service Entrance Models with Mounting Holes and/or Hardware



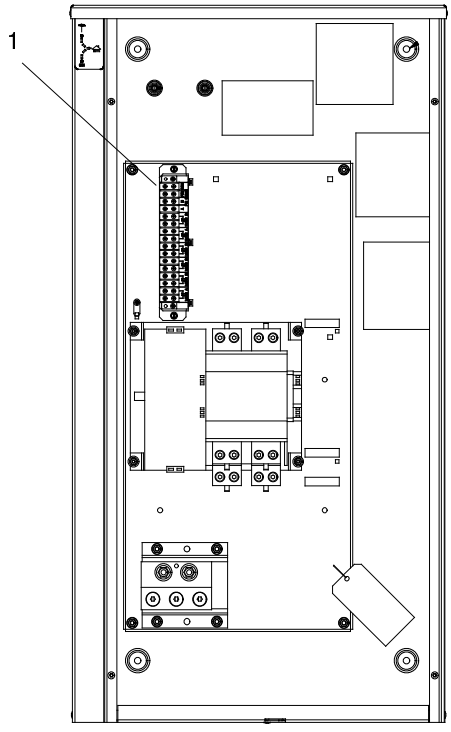
GM78647

100–200A NEMA 3R



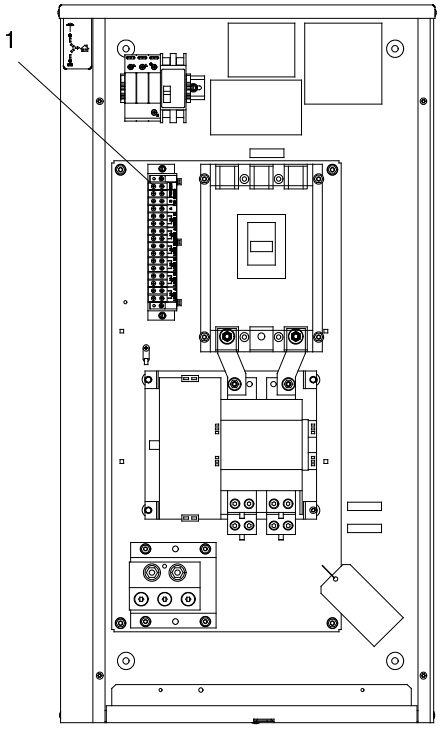
GM79351

100–200A SERVICE ENTRANCE MODELS, TYPICAL LOCATION



GM79353

400A NEMA 3R



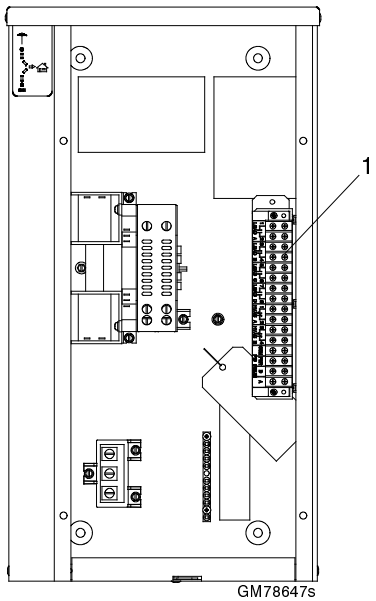
GM80198

400A SERVICE ENTRANCE MODEL

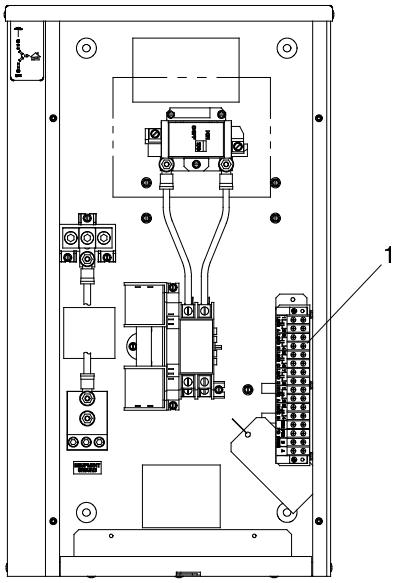
1. Load shed kit location inside ATS enclosure

Note: Drawings are not to scale.

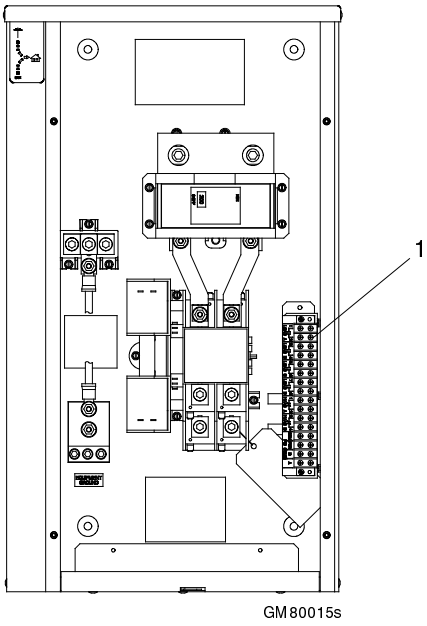
Figure 27 Typical Load Shed Kit Mounting Locations, Model RXT with Mounting Holes and/or Hardware



100-200A NEMA 3R



100A SERVICE ENTRANCE

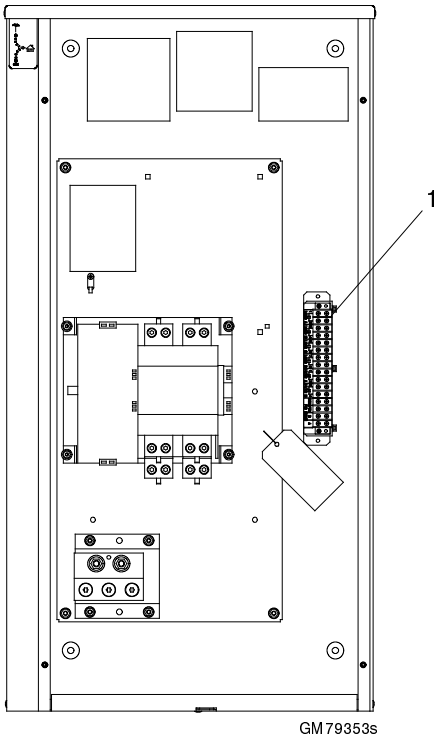


200A SERVICE ENTRANCE

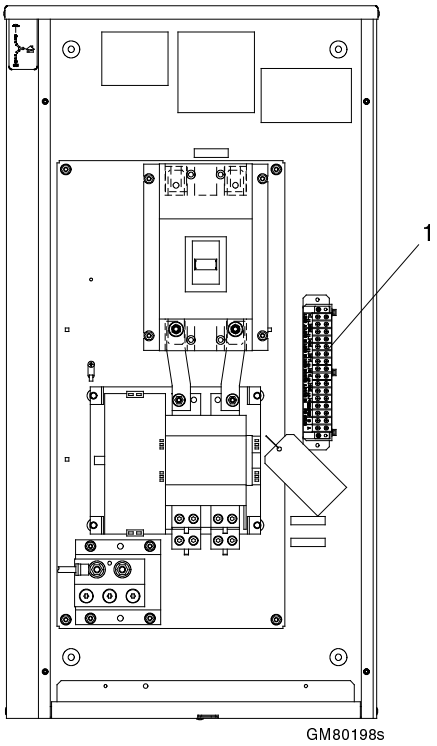
1. Suggested load shed kit mounting location inside the enclosure

Note: Drawings are not to scale.

Figure 28 Recommended Kit Mounting Locations, 100-200 Amp Model RXT Transfer Switches without Mounting Holes or Hardware



400A NEMA 3R

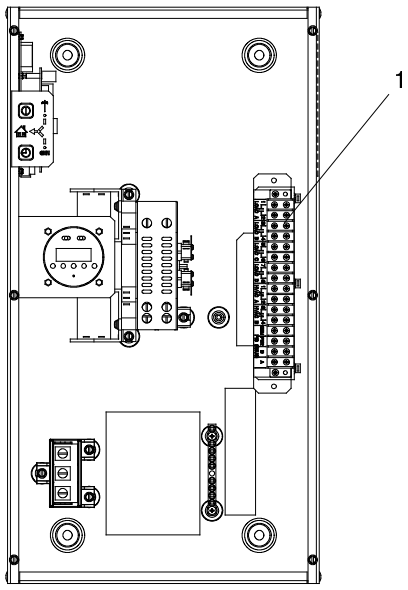


400A SINGLE-PHASE SERVICE ENTRANCE

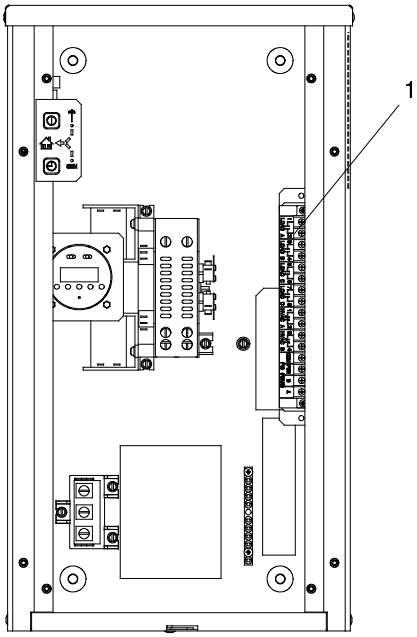
1. Suggested load shed kit mounting location inside the enclosure

Note: Drawings are not to scale.

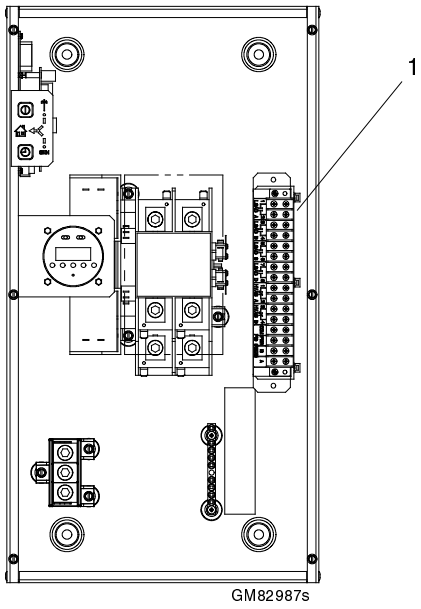
Figure 29 Recommended Kit Mounting Locations, 400 Amp Model RXT Transfer Switches without Mounting Holes or Hardware



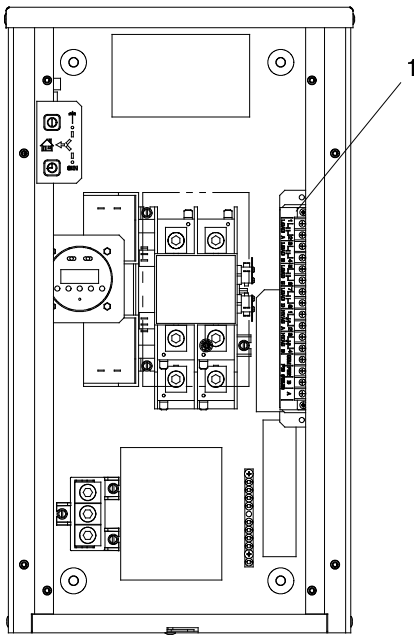
100A NEMA 1



100A NEMA 3R



200A NEMA 1

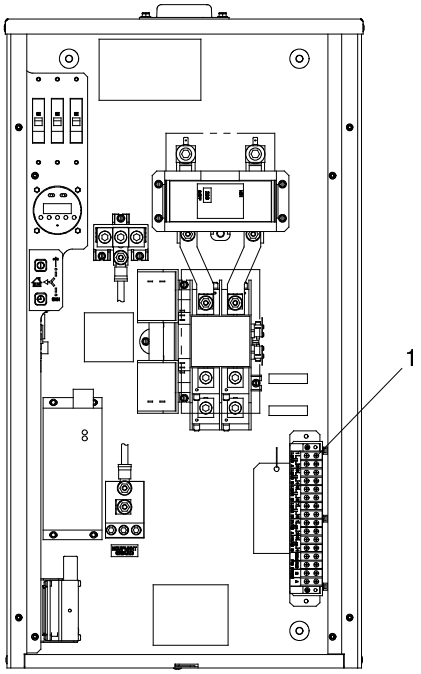


200A NEMA 3R

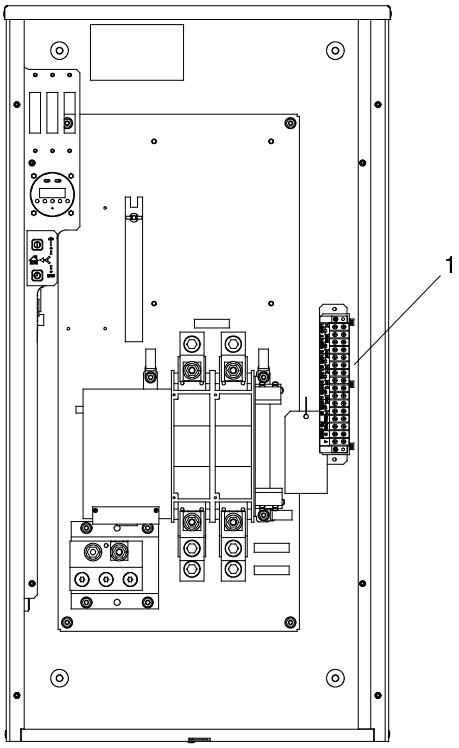
1. Suggested load shed kit mounting location inside the enclosure

Note: Drawings are not to scale.

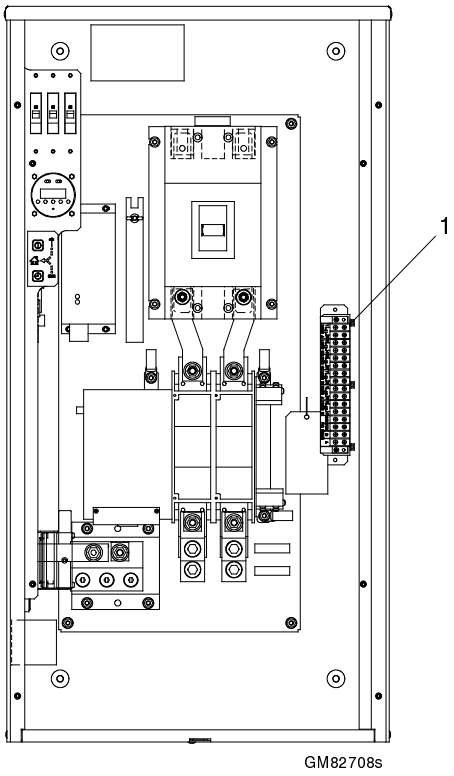
Figure 30 Recommended Kit Mounting Locations, 100–200 Amp Model RDT Transfer Switches without Mounting Holes or Hardware



200A SERVICE ENTRANCE



400A NEMA 3R



400A SERVICE ENTRANCE

1. Suggested load shed kit mounting location inside the enclosure

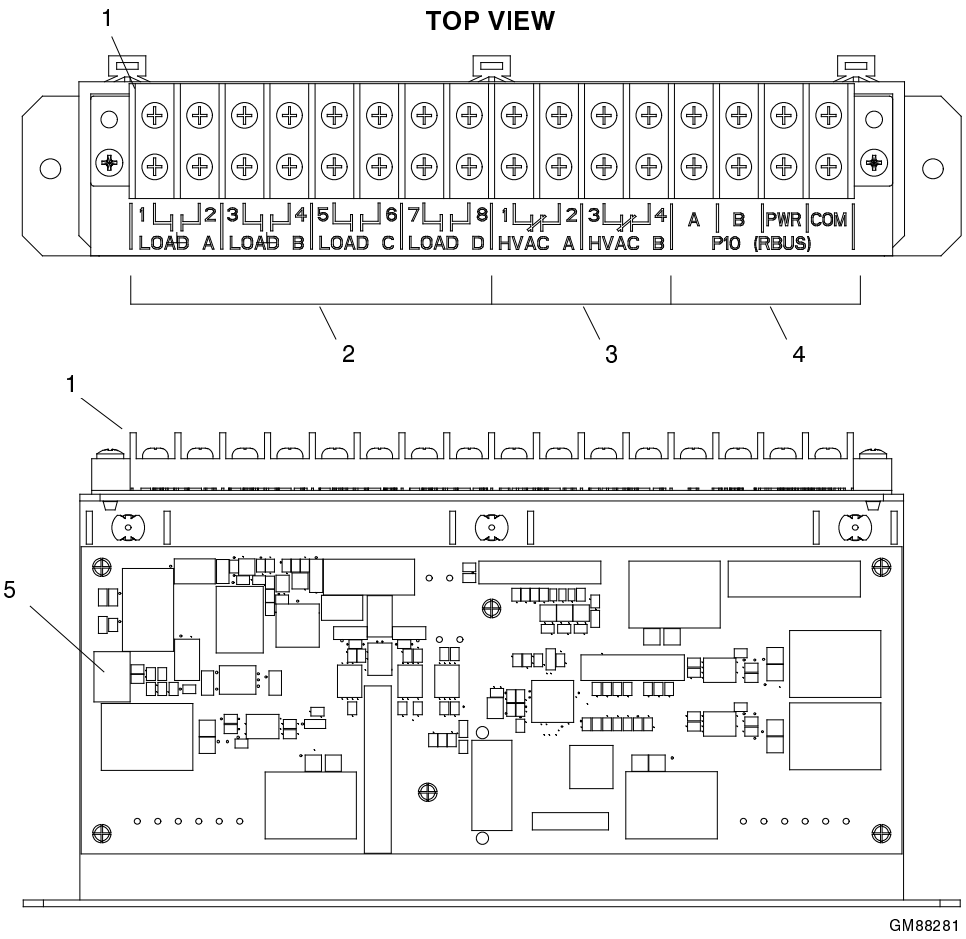
Note: Drawings are not to scale.

Figure 31 Recommended Kit Mounting Locations, 200 Amp Service Entrance and 400 Amp Model RDT Transfer Switches without Mounting Holes or Hardware

8 Important Information about Load Control Modules (LCMs)

Do not install both a load shed kit and a load control module (LCM) on the same system. If the transfer switch includes a load shed kit but you prefer to use the LCM, follow these instructions.

- Disconnect the four RBUS leads from the load shed kit to the RXT interface board. See Figure 32.
- Disconnect any relay, RBUS, and CT connections to the load shed kit. See Figure 32.
- Do not make any connections to the load shed kit assembly in the transfer switch enclosure.
- Install and connect the LCM as described in TT-1574, provided with the LCM.



1. TB10
2. Disconnect power relay connections (if connected).
3. Disconnect HVAC connections (if connected).
4. Disconnect RBUS connections to the RXT interface board, PIM, or generator set controller (if connected).
5. Disconnect current transformer (CT) (if connected).

Figure 32 Disconnecting the Load Shed Kit to use a Load Control Module (LCM)

9 Parts List

The parts list for the loose (non-factory-installed) kit is shown below.

Load Shed Kit for ATS

Kit: GM88281-KP1-QS		
Qty.	**Description**	**Part Number**
0.76	Tape, black bonding	32000 00110
1	Transformer, current	GM83929
1	Load control, ATS	GM88281-1
1	Harness, communications	GM88557
1	Installation Instructions	TT-1609
2	Screw, hex washer, thread-forming	X-67-133

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.