

CHAPTER 96

ELECTRICAL SYSTEM

| <u>Section</u> | <u>Title</u> | <u>Page</u> |
|----------------|---|-------------|
| 96-00 | Description | 96.1 |
| 96-10 | Battery | 96.3 |
| 96-11 | Lead-Acid Battery Installations | 96.3 |
| 96-12 | Lithium-Ion Battery Installation | 96.7 |
| 96-20 | External Power | 96.9 |
| 96-30 | Starter and Ignition System | 96.9 |
| 96-40 | Lighting System | 96.10 |
| 96-50 | Annunciator Panel | 96.10 |
| 96-60 | Low Rotor RPM Warning Unit Adjustment | 96.12 |
| 96-70 | Audio System | 96.12 |
| 96-80 | Engine Monitoring Unit (EMU) | 96.13 |
| 96-90 | Emergency Locator Transmitter (ELT) | 96.14 |
| 96-100 | Electrical Load Analysis | 96.15 |
| 96-110 | Audio Alerts | 96.18 |

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CHAPTER 96

ELECTRICAL SYSTEM

96-00 Description**CAUTION**

The installation of electrical devices can affect the accuracy and reliability of the electronic tachometer.

A 28-volt DC electrical system is standard. Primary system components are a sealed lead-acid battery, a starter-generator, and a generator control unit. The battery is located beneath the left front seat or in a compartment in the left side of the baggage compartment.

The circuit breaker panel is on the ledge just forward of the left front seat. Breakers are marked to indicate function and amperage and are of the push-to-reset type.

The battery switch controls the battery relay which connects the battery to the electrical system. A wire protected by a fuse near the battery bypasses the battery relay to allow the tachometers and clock to receive battery power with the battery switch OFF.

The avionics switch controls power to avionics. This allows avionics to be switched OFF via a single switch. Having sensitive electrical equipment off when the generator is switched ON protects against voltage spikes.

An ammeter indicates total generator output. A digital voltmeter which reads main bus voltage at the circuit breaker panel is incorporated as part of the OAT indicator. Normal indication is 27.3 to 28.7 volts with the generator ON.

A generator control unit (GCU) controls starter-generator function. Below 58 percent N_1 RPM, the GCU is in start mode regardless of generator switch position. Above 58 percent, the GCU automatically switches to generate mode. The generator switch should normally be off for starting to prevent applying generator load to the engine before reaching idle RPM.

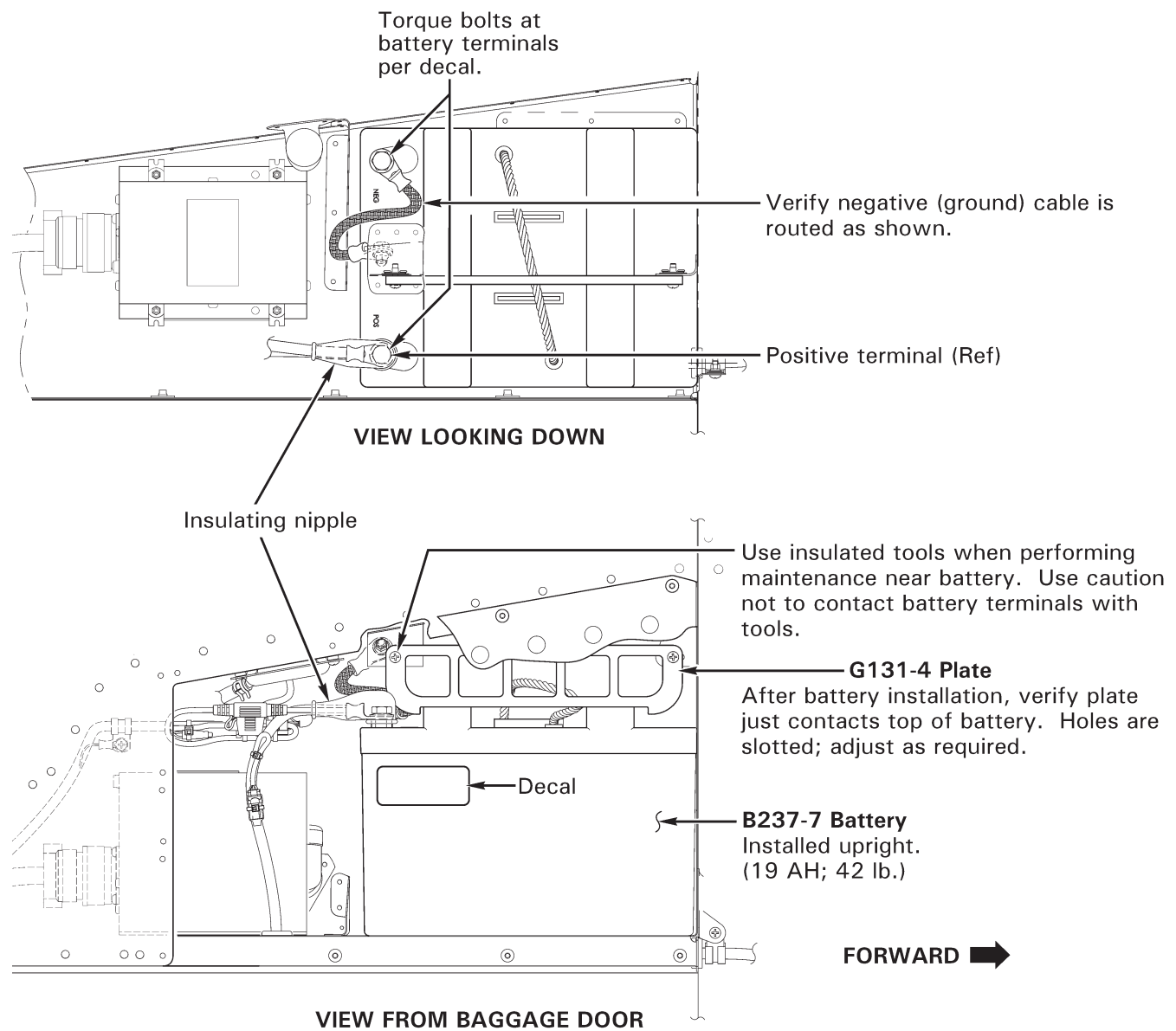


FIGURE 96-1A B237-7 (LEAD-ACID) BATTERY INSTALLATION

96-10 Battery

96-11 Lead-Acid Battery Installations

NOTE

Refer to Concorde Battery Corporation's Owner/Operator's Manual, and Instruction for Continued Airworthiness for battery maintenance procedures.

CAUTION

B237-7 battery (19 AH) weighs 42 lb and B237-8 battery (25 AH) weighs 52 lb including electrolyte. Carefully remove/install battery using handle provided to prevent injury.

CAUTION

Use insulated tools when performing maintenance near battery. When removing or installing G131-2 and G131-4 plate, use caution not to contact battery terminals with tools.

CAUTION

To minimize risk of electrical discharge: When disconnecting battery, disconnect negative (ground) cable from battery first, then the positive cable. When connecting battery, connect positive cable to battery first, then the negative (ground) cable.

A. Disconnecting and Removing Battery

1. Turn battery switch off. Open baggage compartment door. Remove auxiliary fuel tank per § 28-51, if installed.
2. Refer to Figure 96-1A & 96-1B. Remove G248-8 cover assembly.
3. Remove hardware securing negative (ground) cable to battery negative terminal (B237-7 battery) or G131-5 terminal assembly (B237-8 battery).
4. Remove hardware securing positive cable to battery positive terminal. Carefully remove battery. Remove G131-5 terminal assembly (B237-8 battery), as required.

B. Installing and Connecting Battery

1. Turn battery switch off. Open baggage compartment door. Refer to Figure 96-1A & 96-1B.
 - a. If B237-7 battery was removed and B237-8 battery is being installed: Remove G131-4 plate and install G131-2 plate as shown; verify security. If not previously installed, verify battery terminal is clean and install G131-5 terminal assembly; special torque bolt per battery decal. Carefully install B237-8 battery.

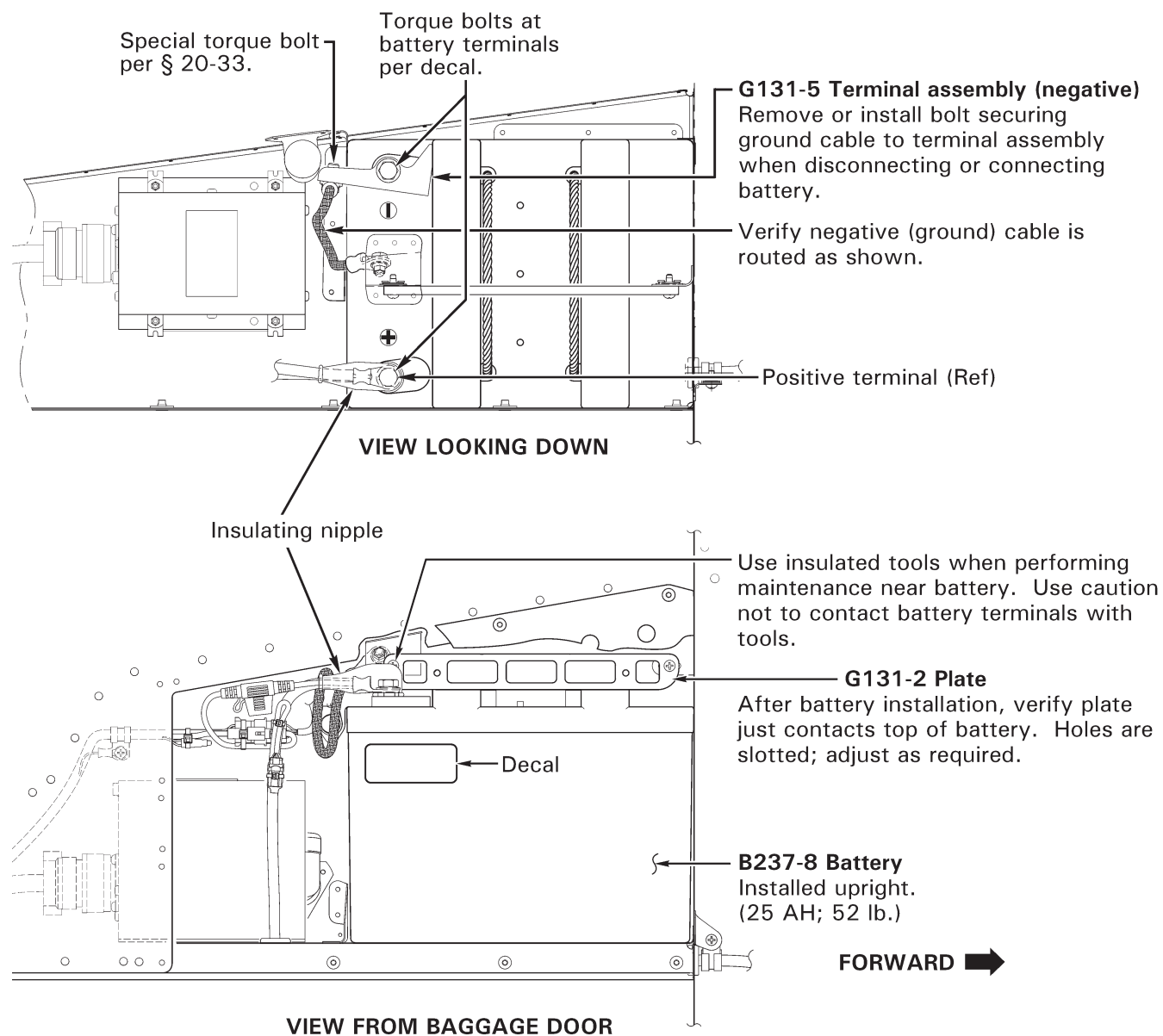


FIGURE 96-1B B237-8 (LEAD-ACID) BATTERY INSTALLATION

96-11 Lead-Acid Battery Installations (continued)

B. Installing and Connecting Battery (continued)

1. b. If B237-8 battery was removed and B237-7 battery is being installed: Remove G131-2 plate and install G131-4 plate as shown; verify security. Carefully install B237-7 battery.
- c. If battery being installed is same part number as battery removed: Verify installation and security of parts. Carefully install battery.
2. Verify G131-2 or G131-4 plate just contacts top of battery (holes are slotted). Adjust as required; verify security.
3. Verify negative (ground) cable is attached to airframe and routed as shown. Adjust as required.
4. Verify battery terminal is clean and install positive cable on battery positive terminal. Special torque bolt per battery decal and torque stripe per Figure 5-1. Slide insulating nipple over attached terminal.
5. Verify battery terminal is clean and install negative (ground) cable on battery negative terminal (B237-7 battery) or G131-5 terminal assembly (B237-8 battery), routing negative (ground) cable as shown. Special torque bolt per battery decal and torque stripe per Figure 5-1.
6. Install G248-8 cover assembly; verify security. Install auxiliary fuel tank per § 28-51, as required. Close baggage compartment door.
7. a. If B237-7 battery was removed and B237-8 battery was installed: Revise Weight and Balance Record in R66 Pilot's Operating Handbook (POH) Section 6 to incorporate the following data:

Subtract:

| Item | Weight | Long. Arm | Long. Moment | Lat. Arm | Lat. Moment |
|----------------|----------|-----------|----------------|------------|----------------|
| B237-7 Battery | 42.00 lb | 96.88 in. | 4068.96 in.-lb | -20.87 in. | -876.54 in.-lb |

Add:

| Item | Weight | Long. Arm | Long. Moment | Lat. Arm | Lat. Moment |
|----------------|----------|-----------|----------------|------------|-----------------|
| B237-8 Battery | 52.00 lb | 96.88 in. | 5037.76 in.-lb | -21.73 in. | -1129.96 in.-lb |

- b. If B237-8 battery was removed and B237-7 battery was installed: Revise Weight and Balance Record in R66 Pilot's Operating Handbook (POH) Section 6 to incorporate the following data:

Subtract:

| Item | Weight | Long. Arm | Long. Moment | Lat. Arm | Lat. Moment |
|----------------|----------|-----------|----------------|------------|-----------------|
| B237-8 Battery | 52.00 lb | 96.88 in. | 5037.76 in.-lb | -21.73 in. | -1129.96 in.-lb |

Add:

| Item | Weight | Long. Arm | Long. Moment | Lat. Arm | Lat. Moment |
|----------------|----------|-----------|----------------|------------|----------------|
| B237-7 Battery | 42.00 lb | 96.88 in. | 4068.96 in.-lb | -20.87 in. | -876.54 in.-lb |

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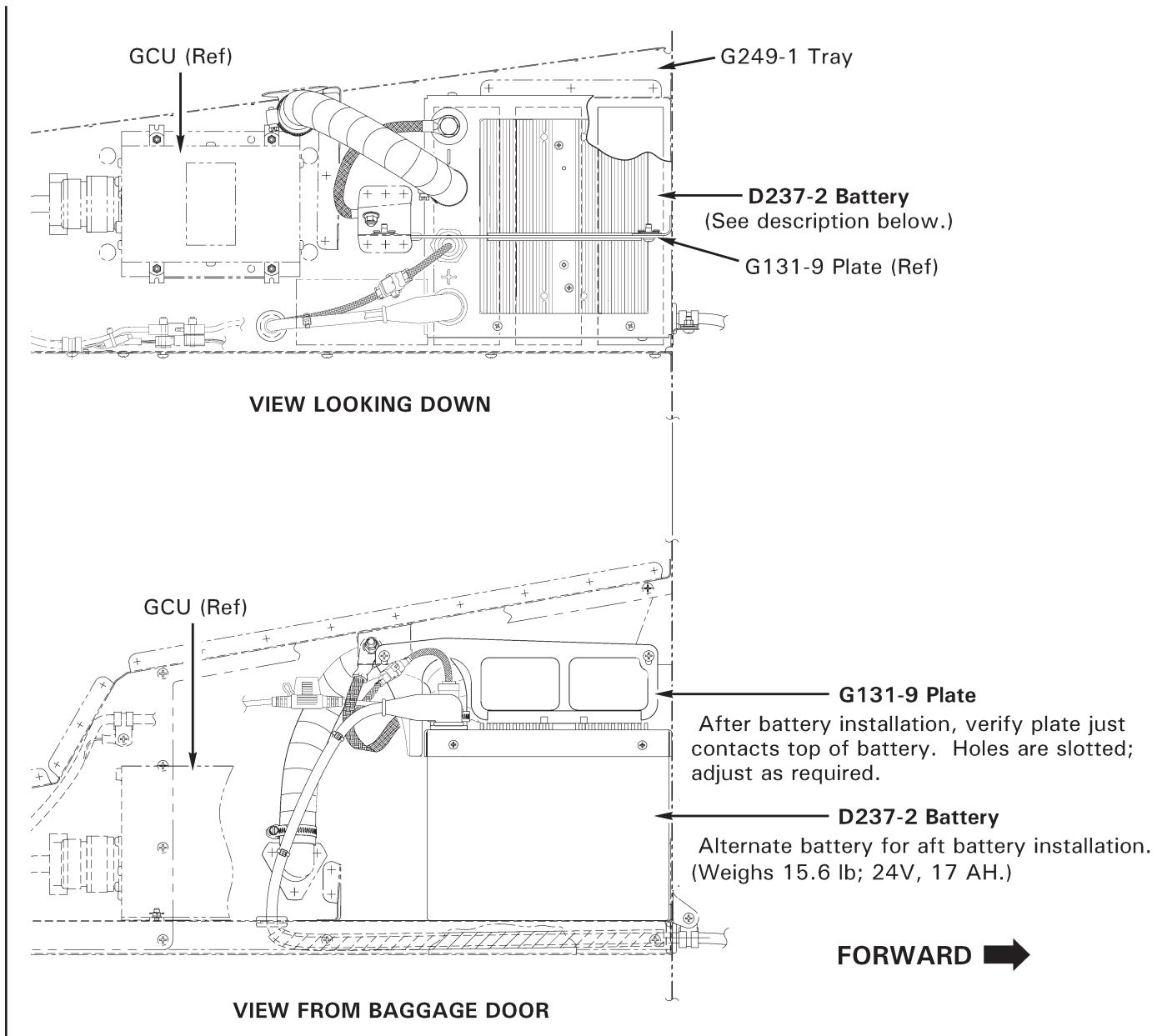


FIGURE 96-2 LITHIUM-ION BATTERY INSTALLATION

96-12 Lithium-Ion Battery Installation

A. Description

The True Blue Power (a division of Mid-Continent Instrument Company) TB17 Lithium-ion battery is a 24-volt, 17 amp-hour battery, and weighs 15.6 lb.

In addition to significant weight savings (the R66 standard lead-acid battery weighs 42 lb), lithium batteries feature improved starter performance as well as cooler starts.

A dedicated vent line ensures proper venting of toxic or flammable gases in the unlikely event of a battery internal failure.

A 7-pin "comm" connector sends signals to the console indicator lights. In cold weather, a heater light may illuminate when the battery is switched on, indicating that the lithium battery's internal battery is automatically warming the battery cells to an optimal starting temperature. It is recommended that the heater light is extinguished prior to attempting an engine start.

The battery's internal circuitry is self-monitoring and will switch itself off when it reaches a certain low state of charge (SOC). In that event, two commercial, non-rechargeable, 9-volt batteries mounted under the co-pilot's seat will supply backup power to the EMU and MGT gage. Though not critical for flight safety, power to these units ensures the recording of a gas temperature exceedence were one to occur during engine start.

NOTE

Refer to True Blue Power Installation Manual and Operating Instructions for battery maintenance procedures.

CAUTION

To minimize risk of electrical discharge: When disconnecting battery, disconnect negative (ground) cable from battery first, then the positive cable. When connecting battery, connect positive cable to battery first, then the negative (ground) cable.

B. Disconnecting and Removing Battery

1. Remove auxiliary fuel tank per § 28-51, if installed.
2. Turn battery switch off. Open baggage compartment door.
3. Remove hardware securing G248-8 cover assembly and remove cover.
4. Loosen clamp securing vent hose to battery and pull hose off of battery.
5. Disconnect airframe wiring plug from battery's comm connector.
6. Remove hardware securing negative (ground) cable to battery negative terminal.
7. Slide nipple away from battery positive terminal and remove hardware securing positive cable to battery positive terminal. Carefully remove battery.

96-12 Lithium-Ion Battery Installation (continued)**C. Installing and Connecting Battery**

1. Remove auxiliary fuel tank per § 28-51, if installed.
2. Perform pre-installation inspection and completely charge battery per True Blue Power Installation Manual and Operating Instructions. If battery is new, also perform visual inspection, charging, capacity check, and return to service per True Blue Power Installation Manual and Operating Instructions.
3. Turn battery switch off. Open baggage compartment door.
4. Refer to Figure 96-2. Verify security, proper orientation, and installation of G131-9 plate. Carefully install battery.
5. Verify G131-9 plate just contacts top of battery (holes are slotted). Adjust as required.
6. Verify battery terminal surfaces are clean to ensure electrical conductivity. Install positive cable on battery positive terminal and install battery hardware. Special torque terminal bolt as noted on battery label, and torque stripe per Figure 5-1. Slide nipple over terminal.
7. Install negative (ground) cable to battery negative terminal and install battery hardware. Special torque terminal bolt as noted on battery label, and torque stripe per Figure 5-1.
8. Install G248-8 cover assembly and install hardware. Verify security. Close and latch baggage compartment door.

D. Scheduled Maintenance and Inspections

Every 6 Months: If battery is unused for more than 6 months, either installed in helicopter or in storage, completely charge battery per True Blue Power Installation Manual and Operating Instructions.

Every Annual Inspection: Replace two, non-rechargeable, 9-volt batteries mounted under the co-pilot's seat every annual inspection.

Every 24 Months: Perform visual inspection, charging, capacity check, and return to service per True Blue Power Installation Manual and Operating Instructions every 24 months from date of aircraft delivery or subsequent new battery installation.

96-12 Lithium-Ion Battery Installation (continued)**E. Special Maintenance and Inspections**

No other battery maintenance other than routine maintenance specified by True Blue Power is permitted.

Operators are encouraged to review important safety information regarding handling, shipping, storage instructions, estimated unit life, and disposal instructions provided in True Blue Power Installation Manual and Operating Instructions.

Note: In accordance with industry and regulatory standards, the TB17 Lithium-ion battery will be shipped with a state of charge (SOC) not to exceed 30% of rated capacity.

96-20 External Power

A 28-volt MS3506-compatible external power receptacle is located inside the right engine cowl door. When the battery is switched ON, the external power relay and the battery relay both close, connecting external power to the aircraft electrical system and battery. The external power relay will not close if reverse polarity is provided to the receptacle.

A separate wire from the external power receptacle to the battery bypasses the external power and battery relays. This wire allows battery charging via the external receptacle with the battery switch OFF. A 10-amp circuit breaker at the receptacle opens if current exceeds normal charging levels, and a diode provides polarity protection.

96-30 Starter and Ignition System

A single starter-generator is used for engine starting and electrical power generation. A generator control unit (GCU) controls starter-generator function. During a start, the GCU latches the starter on until N_1 reaches 58 percent RPM. Therefore, the pilot is not required to hold the start button down throughout the start sequence. Above 58 percent N_1 RPM, the GCU automatically switches out of start mode, but the generator switch should not be switched ON until idle RPM stabilizes to prevent the generator load from bringing the RPM down.

When the igniter key switch is in the enable position, depressing the start button causes a normal start sequence with the starter latching on and the igniter firing. Above 58 percent N_1 RPM, the igniter will fire while the start button is depressed.

When the igniter switch is OFF, the engine can be motored by the starter by depressing the start button without the starter latching or the igniter firing. This is useful for performing a compressor wash or rinse. If the igniter is switched OFF during a start, the starter will disengage. If the igniter is switched OFF while the engine is running, the engine will continue to run; however, this is not recommended.

NOTE

Start button is active when battery switch is ON, even if igniter switch is OFF. Rotor brake may be left engaged after shutdown to disable start button.

96-40 Lighting System

A red anti-collision light is installed on the tailcone and is controlled by the strobe switch on the instrument console. Position lights are installed on each side of the cabin and in the tail and are controlled by the nav lights switch. A light at the top of the windshield and post lights illuminate the instrument panel. Panel lighting is active when the nav lights switch is ON and lighting is dimmed via the knob above the nav lights switch. An overhead map light mounted on a swivel is controlled by an adjacent switch with high and low settings. The map light may be used for emergency lighting of the instrument panel. An additional cabin light with an adjacent switch is located just aft of the map light. The map and cabin lights are not connected to the dimmer circuit.

Two long-life, high intensity discharge (HID) landing lights are installed in the nose. One wide-angle and one narrow-beam light are used to increase lighted area. The landing light switch is located on the cyclic center post.

NOTE

Continuous operation of landing and position lights in flight is recommended to promote collision avoidance.

An optional flashing light may be mounted on the tailcone in addition to the standard anti-collision light. The optional light is controlled by an additional position on the strobe switch and may be turned on or off anytime at pilot discretion.

96-50 Annunciator Panel

The annunciator panel consists of illuminated segments located at the top of the main instrument panel. If a caution or warning condition occurs, the appropriate segment(s) illuminate indicating the nature of the problem.

The CHIP segments are illuminated by magnetic chip devices in each gearbox which collect metallic particles in order to complete an electric circuit. The engine gearbox has two magnetic chip detectors, either of which can illuminate the ENGINE CHIP segment.

The MR TEMP/PRESS segment is illuminated by either the temperature switch or oil pressure switch at the main gearbox. The ENGINE FIRE segment is illuminated by a temperature switch in the engine compartment. The ENGINE OIL segment is activated by a pressure switch which is independent of the oil pressure sender. The ANTI-ICE segment illuminates via a pressure switch in the engine anti-ice air line. The GEN segment illuminates when the generator is disconnected from the main electrical bus.

The LOW FUEL segment is illuminated by a float switch in the tank which is independent of the fuel quantity sender. The FUEL FILTER segment illuminates when a pressure switch detects excessive pressure drop across the fuel filter. The LOW RPM segment is illuminated by a sensor measuring driveline speed at the aft end of the main gearbox. A horn sounds simultaneously with illumination of the LOW RPM segment when rotor speed is below 95% RPM. The horn is disabled when the collective is fully down.

96-50 Annunciator Panel (continued)**A. Description**

The COWL DOOR segment is illuminated when the fuel filler cowl door, the right engine cowl door (which accesses the external power receptacle), or the baggage door is not closed. The AIR FILTER segment illuminates when pressure drop across the filter opens bypass doors, allowing unfiltered air to the engine. The EMU (Engine Monitoring Unit) segment indicates the EMU status with either steady, flashing, or no illumination. The EMU segment will illuminate only when the test button is depressed.

A push-to-test button on the instrument panel should cause all segments on the annunciator panel, as well as the ROTOR BRAKE light, to illuminate when depressed. The LOW FUEL segment takes approximately two seconds before it illuminates due to a time delay in the circuit (time delay prevents sloshing fuel from giving a false indication.) The EMU segment takes approximately ten seconds to perform a self-test after the battery is switched ON before it will illuminate. The test button may be used on the ground or in flight to verify all circuits are functioning.

B. Troubleshooting

1. Turn battery switch off. Access EMU behind right, aft seatback assembly.
2. Disconnect EMU from airframe electrical harness.
3. Using an insulated jumper, connect airframe wire -2044 (pin 13 on airframe connector to EMU) to a convenient airframe ground.
4. Turn battery switch on. Depress push-to-test switch adjacent to annunciator panel and observe EMU annunciator segment response:
 - a. If EMU annunciator segment illuminates: Turn battery switch off and disconnect jumper. Replace EMU per § 71-43.
 - b. If EMU annunciator segment remains extinguished: Turn battery switch off and disconnect jumper. Proceed to step 5.
5. Turn battery switch on. Depress push-to-test switch and verify system voltage at wire -2044 (pin 13 on EMU airframe connector). Turn battery switch off. If there is no system voltage at wire -2044, disconnect F695-4 tester assembly from airframe electrical harness. Using an insulated jumper, connect airframe wire -2062 (pin 38 on airframe connector to F695-4/F694-1 circuit board) to a convenient airframe ground.
6. Turn battery switch on. Depress push-to-test switch adjacent to annunciator panel and observe EMU annunciator segment response:
 - a. If EMU annunciator segment illuminates: Turn battery switch off and disconnect jumper. Replace F695-4 tester.
 - b. If EMU annunciator segment remains extinguished: Turn battery switch off and disconnect jumper. Proceed to step 7.

96-50 Annunciator Panel (continued)**B. Troubleshooting (continued)**

7. Either an open circuit exists along wire -2062 between F695-1 tester and G198-1 annunciator, or G198-1 annunciator panel is faulty. Troubleshoot beginning with Console Connector 1 ("C1"), pin 34 and verifying security of pins on both halves of connector. If no fault is found in connector, verify continuity of wire -2062 at all connections. If no fault is detected in wire -2062 circuit, replace G198-1 annunciator panel.

96-60 Low Rotor RPM Warning Unit Adjustment

The low rotor RPM warning unit is located inside the upper console, mounted to the left vertical panel. Two magnets attached to the main gearbox tail rotor driveline output yoke provide an RPM signal for the warning unit's gearbox-mounted Hall-effect senders. When the collective is at least 0.2 to 0.4 inch (measured at grip) above the full down position and rotor RPM is 95% or less, the warning unit illuminates the Low RPM annunciator segment and sounds two warning horns. Fully lowering the collective will silence both horns, but will not extinguish the annunciator segment. The Low RPM annunciator segment and both horns must remain off above 95% rotor RPM.

To make an adjustment, remove the plastic plug (from a 3/8-inch diameter hole) in the left-vertical panel exterior. Adjust screw on back of warning unit (2 turns equals approximately 1% change).

96-70 Audio System

A five-place audio system is standard. An audio control panel allows control of communication radios, intercom, and stereo-capable auxiliary audio (e.g. music) input.

The system has four modes of operation. In normal mode, all occupants hear incoming and outgoing radio communications, intercom, and auxiliary audio. The pilot and copilot can both transmit on the selected radio.

In crew mode, the pilot and copilot are isolated from rear seat occupants. The crew does not hear rear seat intercom or auxiliary audio and rear seat occupants do not hear crew intercom or radio communications.

In pilot isolate mode, the pilot is isolated from all other occupants. The copilot is grouped with the rear seat occupants for intercom and auxiliary audio.

In emergency mode, the pilot transmits and receives on the number one radio only (regardless of audio panel switch position). All other audio is disabled.

The first three modes are selectable via the audio control panel. Emergency mode occurs if power to the panel is lost. In addition to the mode control, the audio panel has controls for squelch, volume, and selection of transmit and receive radios. A detail description of these controls can be found in the audio system operation manual.

96-70 Audio System (continued)

Headset jacks are located in the ceiling near each seat. Pilot and copilot intercom and transmit are controlled via trigger switches on the cyclic grips. The trigger has two detents; the first detent activates the intercom and the second detent transmits. Additional intercom buttons are located on the forward side of the rear seats and on the left forward floor. Intercom may also be set to be voice activated. Auxiliary audio may be plugged in to a jack on the forward face of the circuit breaker panel. In normal mode, auxiliary audio is automatically muted during radio communication.

96-80 Engine Monitoring Unit (EMU)

Refer to Section 71-43 for EMU maintenance procedures.

The Engine Monitoring Unit (EMU) is a digital recording device mounted behind the right rear seatback panel. The EMU continuously monitors N_1 , N_2 , engine torque, and MGT. EMU status is indicated by the EMU segment on the annunciator panel. The EMU segment will only illuminate while the annunciator panel test button is depressed. The EMU requires approximately ten seconds to initialize after the aircraft battery is switched ON. Once initialization is complete, steady illumination of the annunciator means normal EMU operation. A slowly flashing indication (once every two seconds) is given if the EMU detects a fault in its senders or circuitry. A fast flashing indication (four times per second) is given if the EMU has detected an exceedance. A fault or exceedance indication should be investigated and reset by a qualified mechanic prior to further flight.

The EMU records exceedances of Rolls-Royce engine limits, not airframe operating limits as given in Section 2. The EMU will record an exceedance if any of the following are exceeded:

| | |
|---------------------|---|
| MGT during start: | 999°C, or 927°C for 1 second, or 810°C for 10 seconds. |
| MGT engine running: | 843°C, or 782°C for 6 seconds, or 706°C for 5 minutes. |
| N_1 : | 106%, or 105% for 15 seconds. |
| N_2 : | 110%, or 105% for 15 seconds. 78% to 88% for 60 seconds over 38% torque. |
| Torque: | 122% for 15 seconds, or 104% for 5 minutes. |

The EMU also records a start cycle when N_1 exceeds 30% and MGT is at least 343°C.

The EMU is intended to be used only as a maintenance aid. It is the pilot's responsibility to report any observed exceedances and the operator's responsibility to maintain a record of engine starts and time in service.

96-90 Emergency Locator Transmitter (ELT)

Refer to Section 25-61 for ELT programming instructions and maintenance procedures.

The Emergency Locator Transmitter (ELT) installation consists of a transmitter with internal battery pack, an external antenna, and a remote switch/annunciator. The transmitter is mounted to the upper steel tube frame and is accessible through the spring loaded air intake door in the right-side cowl. The remote switch/annunciator is located left of the cyclic stick.

The ELT is operated by a switch on the transmitter and by the remote switch. The transmitter switch has been set in the ARM position at installation and should always be in this position for flight. The remote switch/annunciator is a three position switch with indicator light. This switch should be in the ARMED position for flight. With both switches set to armed, the ELT will begin transmitting when subjected to a high "G" load. When the unit is transmitting, the red indicator light illuminates.

Moving the remote switch to ON activates the transmitter. Use the ON position if an emergency landing is imminent and time permits.

If the ELT is inadvertently activated, use the momentary RESET & TEST position of the remote switch to stop transmission and reset the unit. The red indicator will extinguish when unit is reset.

For more detailed instructions on ELT operation, maintenance, and required tests, refer to manufacturer's instructions supplied with the unit.

96-100 Electrical Load Analysis

| COMPONENT | QTY | CONTINUOUS AMPS EACH | INTERMITTENT AMPS EACH | CONTINUOUS TOTAL | INTERMITTENT TOTAL |
|-----------------------------------|-----|-------------------------|---------------------------|---------------------|-----------------------|
| MAIN BUS | | | | | |
| WARNING LT PANEL | 1 | 0.006 | 0.320 | 0.006 | 0.320 |
| ROTOR BRAKE LT | 1 | --- | 0.044 | 0.000 | 0.044 |
| MAPLIGHT | 1 | 0.020 | 0.020 | 0.020 | 0.020 |
| INTERIOR DOME LT | 1 | 0.020 | 0.020 | 0.020 | 0.020 |
| OAT GAGE | 1 | 0.150 | 0.150 | 0.150 | 0.150 |
| ENGINE TORQUEMETER | 1 | 0.050 | 0.050 | 0.050 | 0.050 |
| INSTRUMENT CLUSTER | 1 | 0.375 | 0.375 | 0.375 | 0.375 |
| MOP SENDER | 1 | 0.025 | 0.025 | 0.025 | 0.025 |
| TORQ SENDER | 1 | 0.025 | 0.025 | 0.025 | 0.025 |
| LOW RPM UNIT W/HORN | 1 | 0.045 | 0.160 | 0.045 | 0.160 |
| AA12S-600 AUDIO PANEL | 1 | 1.000 | 1.000 | 1.000 | 1.000 |
| N ₂ GOVERNOR SYSTEM | 1 | 0.000 | 0.087 ¹ | 0.000 | 0.087 ¹ |
| N ₂ GOV ACTUATOR @ 12V | 1 | --- | 0.150 | | |
| N ₂ GOV RELAY @ 12V | 1 | --- | 0.010 | | |
| ANTI-ICE SOLENOID | 1 | 0.670 | 0.670 | 0.670 | 0.670 |
| HEATED PITOT | 1 | 4.000 | 4.000 | 4.000 | 4.000 |
| ENGINE HOUR METER | 2 | 0.015 | 0.015 | 0.030 | 0.030 |
| HYD CONTROL SOLENOID | 1 | --- | 0.800 | 0.000 | 0.800 |
| ENGINE MONITORING UNIT | 1 | 0.180 | 0.180 | 0.180 | 0.180 |
| AVIONICS RELAY | 1 | --- | 0.060 | 0.000 | 0.060 |
| LOW FUEL RELAY | 1 | --- | 0.010 | 0.000 | 0.010 |
| WARNING LIGHT TEST CB | 1 | --- | 0.020 | 0.000 | 0.020 |
| TACH PWR TEST RELAY | 1 | --- | 0.060 | 0.000 | 0.060 |
| BOSE HEADSET | 5 | 0.025 | 0.500 | 0.125 | 2.500 |
| AUX POWER PLUG | 1 | 2.000 | 2.000 | 2.000 | 2.000 |
| SUBTOTAL (MAIN BUS) | | | | 8.721 | 12.606 |

96-100 Electrical Load Analysis (continued)

| COMPONENT | QTY | CONTINUOUS AMPS EACH | INTERMITTENT AMPS EACH | CONTINUOUS TOTAL | INTERMITTENT TOTAL |
|--------------------------------|-----|-------------------------|---------------------------|---------------------|-----------------------|
| LIGHTS BUS | | | | | |
| LANDING LT BALLAST | 2 | 1.600 ³ | 5.250 ³ | 3.200 | 10.500 |
| LANDING LT RELAY | 1 | 0.060 | 0.060 | 0.060 | 0.060 |
| CIRCUIT BREAKER LTS | 1 | 0.001 ³ | 0.001 ³ | 0.001 | 0.001 |
| INSTRUMENT LT | 1 | 0.500 ⁵ | 0.500 ⁵ | 0.500 ⁵ | 0.500 ⁵ |
| POST LTS | 2 | 0.040 ¹ | 0.040 ¹ | 0.080 | 0.080 |
| INTERNAL AVIONICS LTS | 6 | 0.100 ¹ | 0.100 ¹ | 0.600 | 0.600 |
| VERT CARD COMPASS LT | 1 | 0.050 ³ | 0.050 ³ | 0.050 | 0.050 |
| POSITION LT RH (GREEN) | 1 | 0.250 | 0.250 | 0.250 | 0.250 |
| POSITION LT LH (RED) | 1 | 0.250 | 0.250 | 0.250 | 0.250 |
| POSITION LT TAIL (WHT) | 1 | 0.300 | 0.300 | 0.300 | 0.300 |
| STROBE LIGHT | 1 | 0.670 | 3.000 | 0.670 | 3.000 |
| SUBTOTAL (LIGHTS BUS) | | | | 5.961 | 15.591 |
| COMPONENT | QTY | CONTINUOUS AMPS EACH | INTERMITTENT AMPS EACH | CONTINUOUS TOTAL | INTERMITTENT TOTAL |
| AVIONICS BUS | | | | | |
| KY196A COM | 1 | 1.000 | 5.000 | 1.000 | 5.000 ² |
| GNC 420W GPS/COM | 1 | 1.215 | 4.200 | 1.215 | 1.215 ² |
| GNS 530AW GPS/COM/NAV | 1 | 1.415 | 4.400 | 1.415 | 1.415 ² |
| GTX 330 XPDR | 1 | 1.640 | 9.090 | 1.640 | 9.090 |
| BLIND ENCODER | 1 | 0.600 | 0.600 | 0.600 | 0.600 |
| AM/FM/CD RCVR | 1 | 1.500 | 1.500 | 1.500 | 1.500 |
| KR87 ADF RCVR | 1 | 0.429 | 0.429 | 0.429 | 0.429 |
| KR22 MARKER BEACON | 1 | 0.040 | 0.500 | 0.040 | 0.500 |
| AVIONIC BLOWER | 1 | 0.180 | 0.180 | 0.180 | 0.180 |
| PILOT AV BLOWER | 1 | 0.100 | 0.100 | 0.100 | 0.100 |
| ELT ⁴ | 1 | --- | --- | --- | --- |
| HSI (PICT NAV SYSTEM) | 1 | 1.730 | 1.730 | 1.730 | 1.730 |
| ATTITUDE HORIZON | 1 | 0.270 | 0.700 | 0.270 | 0.700 |
| TURN COORDINATOR | 1 | 0.350 | 0.350 | 0.350 | 0.350 |
| RADAR ALTIMETER | 1 | 0.727 | 0.727 | 0.727 | 0.727 |
| SUBTOTAL (AVIONICS BUS) | | | | 11.196 | 23.536 |

96-100 Electrical Load Analysis (continued)

| COMPONENT | QTY | CONTINUOUS AMPS EACH | INTERMITTENT AMPS EACH | CONTINUOUS TOTAL | INTERMITTENT TOTAL |
|--|-----|-------------------------|---------------------------|---------------------|-----------------------|
| TACH BUS | | | | | |
| N ₂ TACH (INCL REG) | 1 | 0.022 ¹ | 0.022 ¹ | 0.022 ¹ | 0.022 ¹ |
| N ₂ TACH @ 13.75V | 1 | 0.035 | 0.035 | | |
| ROTOR TACH (INCL REG) | 1 | 0.022 ¹ | 0.022 ¹ | 0.022 ¹ | 0.022 ¹ |
| ROTOR TACH @13.75V | 1 | 0.035 | 0.035 | | |
| SUBTOTAL (TACH BUS) | | | | 0.044 | 0.044 |
| COMPONENT | QTY | CONTINUOUS AMPS EACH | INTERMITTENT AMPS EACH | CONTINUOUS TOTAL | INTERMITTENT TOTAL |
| OTHER EQUIPMENT | | | | | |
| TACH RELAY | 1 | 0.060 | 0.060 | 0.060 | 0.060 |
| CLOCK (DIGITAL) | 1 | 0.003 | 0.003 | 0.003 | 0.003 |
| BATTERY RELAY | 1 | 0.250 | 6.000 | 0.250 | 6.000 |
| START/GEN RELAY | 1 | 0.250 | 6.000 | 0.250 | 6.000 |
| GEN LT RELAY | 1 | 0.010 | 0.010 | 0.010 | 0.010 |
| GEN CONTROL UNIT | 1 | 0.200 ⁴ | 2.000 ⁵ | 0.200 | 2.000 |
| IGNITION EXCITER | 1 | --- | 1.500 | 0.000 | 1.500 |
| EXTERNAL PWR RELAY ² | 1 | 0.250 | 6.000 | --- | --- |
| BAGGAGE COMPARTMENT LT ² | 1 | 0.020 | 0.020 | --- | --- |
| SIGHT GLASS LED ² | 2 | 0.020 | 0.020 | --- | --- |
| LATCHING START RELAY ³ | 1 | 0.060 | 0.060 | --- | --- |
| STARTER-GENERATOR ³ | 1 | --- | 231.06 | --- | --- |
| SUBTOTAL (OTHER) | | | | 0.773 | 15.573 |
| TOTAL (MAIN + LIGHTS + AVIONICS + TACH + OTHER) | | | | 26.70 | 67.357 |
| STARTER-GENERATOR MARGIN (160-AMP MAX) | | | | + 133.30 | + 92.657 |

96-110 Audio Alerts

All R66 helicopters have a low-RPM horn which sounds when rotor RPM is below 95%. The horn is muted when the collective is fully down. On earlier aircraft, the horn is provided by speakers in the side of the instrument console. On later aircraft, a tone generator in the audio system provides the horn through crew headsets.

Later aircraft also have audio alerts in the headsets for high rotor RPM and high engine torque/MGT. For high RPM, a warble tone (high/low tone) indicates rotor RPM above 105%. For high engine torque/MGT, a beeping tone indicates torque above 100% or MGT above 782°C (5-minute limits). High torque is indicated by four beeps per second, increasing to 12 beeps per second if torque exceeds 108%. High MGT is indicated by 12 beeps per second. The beep tone will also come on during start if MGT exceeds 860°C, indicating an abnormally hot start.

Test buttons on the instrument panel permit pre-flight or in-flight tests of the high RPM and high torque/MGT tones. For high torque/MGT, depressing the test button give four beeps per second for two seconds followed by 12 beeps per second.

Additional audio alerts may my be provided in the headsets depending on optional equipment installed, such as terrain warnings, traffic warnings, and autopilot modes.