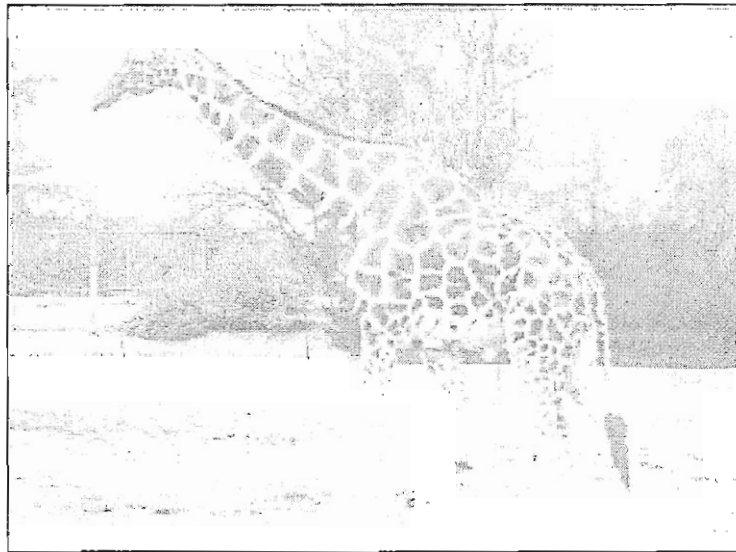




SAFARI

OWNER'S SUPPLEMENT

SAHARA & Serengeti



The descriptions and specifications in this manual were in effect at the time of its approval for printing. Safari Motor Coaches reserves the right to change specifications or designs without notice or incurring obligation. This manual includes information on several different model options. Your motorhome may not contain every system described.

Revision Date: March 15, 1999



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Foreword

To our valued customers:

Congratulations on the purchase of your luxurious new Safari Sahara or Serengeti Edition. You have made a substantial investment of time and money in selecting your motorhome. Now let's take the time to get to know your coach. This, too, is worth the investment of your time and could save you some money.

Although we are quite sure this manual will never reach the *New York Times Best Sellers List*, or even *Barnes & Noble's Top Ten Beach Reads*, it will save you time and trouble, especially when you're out on the road, away from your local service center. Let's face it - even though we have done everything possible to prevent such circumstances, sometimes things go wrong. By reading this manual and the other manuals that came with your coach, you can troubleshoot some of the more common problems.

This manual is not designed to be a service manual, nor should it be used as such. It has been designed to give you a comprehensive overview of your motorhome's operational systems and features. If you require service or need warranty assistance, please call the number(s) listed in your *Safari Owner's Manual*. And remember...before calling Warranty, it's always a good idea to write down the last five numbers of your (VIN) Vehicle Identification Number. This is located on a plaque next to the entry door on the exterior of the coach. Also note your coach's mileage. This will speed the process of locating your records.

Thank you - and we hope you enjoy your new Safari Motor Coach!

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CHAPTER 1 – VEHICLE OPERATION

OUTLINE

Your Safari coach has been built to enhance your living and driving pleasure. All components have been integrated to ensure maximum comfort. The main dashboard and side console have each been designed so that the controls are conveniently placed and easy to read - day or night.

WARNING: This manual is meant for reference only. Become familiar with all procedures, cautions and warnings given in the various manufacturers' manuals provided with your coach before operating your motorhome.

WARNING: Make sure there is adequate ventilation when running your coach engine or heaters.



VEHICLE OPERATION

When starting the engine, first make sure to engage the parking brake and turn off the headlights. Put the transmission in NEUTRAL and turn the key to the ON position. The CHECK ENGINE and ENGINE PREHEAT lights will activate. Wait until the ENGINE PREHEAT light shuts off before starting the engine. Under normal conditions, this should only take about five seconds. It will take longer when you are in colder climates. At this time, it would be a good practice to turn off the ignition and repeat this cycle before actually starting the coach.

WARNING: When first starting your coach, you must wait until the ENGINE PREHEAT light shuts off. Do not crank the starter for more than thirty seconds at a time. If the engine fails to start, wait before cranking again.

Check the engine oil pressure soon after starting. You should let the engine idle for three to five minutes before moving out, but do not allow the engine to idle too long. Idling for more than ten minutes can lead to improper fuel consumption and may cause problems with the efficiency of the engine.

NOTE: Minimize the load on the chassis batteries by turning off all unnecessary lights and accessories when starting your coach.

In cold weather the engine may be more difficult to start. Oil becomes thicker, making the engine crank more slowly.



WARNING: If you plan on traveling in cold areas (consistently below 20 degrees Fahrenheit), use oil that is recommended for colder climates.

If the chassis batteries fail to provide enough power to crank the engine quickly enough, press the BOOST SWITCH to connect to the house batteries for added power.

Carefully monitor all gauges while running the engine. The normal operating ranges are discussed below and in the engine and chassis manuals.

Warning: Before shutting the engine down, allow it to idle for a few minutes to cool the combustion chamber, bearings, turbo charger and crankshaft.

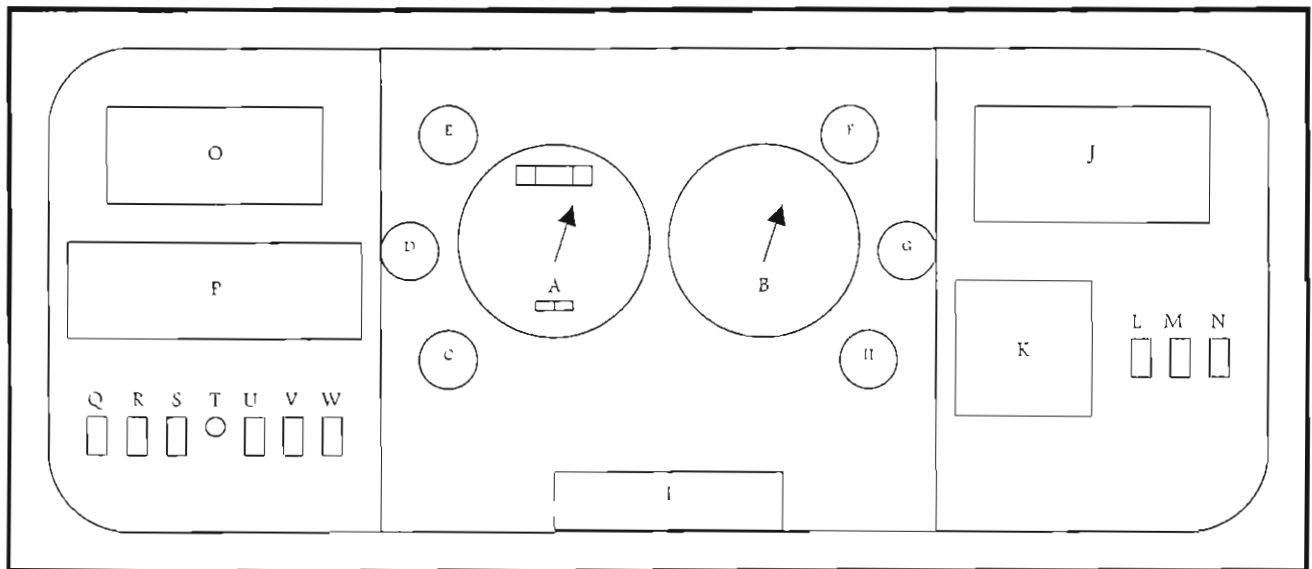
WARNING: Monitor your gauges closely while driving. If any readings are not in their normal operating range, take appropriate action immediately.



Main Dashboard

The Safari dash is designed to be easy to read and easy to use. All important gauges are placed directly in front of the driver and arranged for comfortable viewing. The controls are arranged around the central instrument cluster and are well marked for quick identification. Most of these items require little explanation, however, they are summarized here.

Figure 1: Serengeti Main Dash

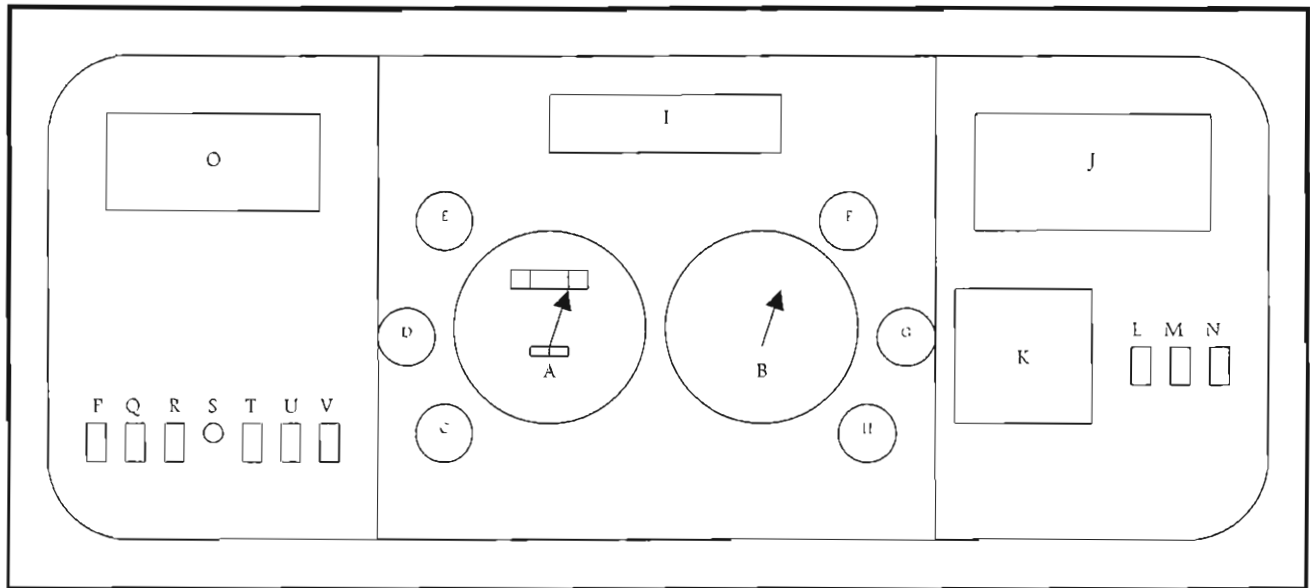


Serengeti Main Dash Detail

O. HEATING & A/C CONTROL	A. SPEEDOMETER/ODOMETER/TRIPOMETER	J. VMSII (OPTIONAL)
P. BLANK	B. TACHOMETER	K. RADIO
Q. AIR DUMP OR (BLANK)	C. TURBO BOOST OR AIR GAUGE (PSI)	L. BATTERY BOOST
R. DOCKING LIGHTS	D. OIL PRESSURE	M. STEREO SWITCH
S. DASH FANS	E. WATER TEMPERATURE	N. (BLANK)
T. HEADLIGHT SWITCH	F. FUEL GAUGE	
U. DRIVING LIGHTS	G. TRANSMISSION TEMPERATURE	
V. REAR HALOGEN LIGHTS	H. VOLT METER	
W. MIRROR HEAT	I. ICON BAR	



Figure 2: Sahara Main Dash



Sahara Main Dash Detail

O. HEATING & A/C CONTROL	A. SPEEDOMETER/ODOMETER/TRIPOMETER	J. VMSII (OPTIONAL)
P. BLANK	B. TACHOMETER	K. RADIO
Q. DOCKING LIGHTS	C. TURBO BOOST	L. BATTERY BOOST
R. DASH FANS	D. OIL PRESSURE	M. STEREO SWITCH
S. HEADLIGHT SWITCH	E. WATER TEMPERATURE	N. (BLANK)
T. DRIVING LIGHTS	F. FUEL GAUGE	
U. REAR HALOGEN LIGHTS	G. TRANSMISSION TEMPERATURE	
V. MIRROR HEAT	H. VOLT METER	
	I. ICON BAR	

Speedometer/Odometer/Tripometer

The speedometer indicates the forward speed of the vehicle in miles per hour. The odometer indicates the total distance, in miles, that the vehicle has traveled. For coaches sold in Canada, the gauge is metered in kilometers instead of miles. Before each trip, you may set the tripometer to zero. The meter will then record the distance, in miles, that the coach has traveled.



Tachometer

The tachometer displays the engine rpm (revolutions per minute). The reading must be multiplied by 100. The engine should not be run at less than 1000 rpm for extended periods of time.

Air Pressure Gauge (Magnum B Series Chassis Air Ride Suspension)

The needle on the air pressure gauge shows the pressure in the chassis air system. An on-board air pump creates air pressure in the chassis system. The chassis air bags automatically level the coach while driving. The normal operating range of air pressure should read between 90 and 110 PSI.

Turbo Boost PSI (Magnum M Series Chassis Velvet Ride Suspension)

The Turbo Boost gauge shows the relative boost of pressure in the turbo. Normal boost at a full load for the 425 HP diesel engine is between 28-30 PSI and for the 330 HP engine is approximately 25 PSI.

Oil Pressure Gauge

Oil pressure indicates possible problems with the lubrication of the engine. While idling, the gauge should read about 10 PSI and while driving it should rise to about 35 PSI. When the engine is cold, the pressure will be considerably higher due to the increased viscosity (thickness) of the oil.

WARNING: If the oil pressure drops significantly below 35 PSI while driving or 10 PSI while idling, stop the engine immediately and check the oil level.



Engine Water Temperature

The normal operating temperature for the engine is 190 to 215 degrees Fahrenheit. Overheating can occur because of insufficient coolant or a problem in the cooling system. It can also occur in hot weather with slow or stop and go driving.

WARNING: Do not operate the engine over 230 degrees. If the temperature reading exceeds this level, pull over promptly and allow the engine to cool. Extended or frequent operation at this temperature will void your engine warranty.

Fuel Gauge

The fuel reading will vary when cornering, accelerating, braking, and climbing or descending hills. The Serengeti fuel tank has a capacity of 105 gallons and the Sahara fuel tank capacity is 90 gallons.

Transmission Temperature

The transmission should normally operate between 140 and 250 degrees Fahrenheit.

WARNING: If the transmission temperature reaches 290 degrees, stop the vehicle, shift into neutral, and run the engine at 1200 rpm for two minutes or more. The temperature should drop to its normal range. If problems persist, check the transmission oil level or consult an authorized service center.



DC Voltmeter Gauge

This gauge displays the performance of the chassis DC system, especially the batteries and alternator. With the engine off and the key switch on it should read approximately 12 volts. It should be approximately 13 volts with the engine running.

Icon Bar (Warning Lights)

Warning lights will activate under certain conditions to warn you of potential problems. They include: CHECK ENGINE, PARK BRAKE, DO NOT SHIFT, INTAKE MANIFOLD AIR HEATER, and BRAKE SERVICE. Also, to the extreme left and right, directional turn arrows are included in this cluster.

WARNING: If the CHECK ENGINE light activates while driving, the engine will automatically derate (operate at approximately half power with a maximum speed of 30 mph). If this happens, turn off the CRUISE CONTROL and press the RESUME/SET switch. The CHECK ENGINE light will then flash a two-digit diagnostics code that will be needed for repair if engine problems are detected. Do not shut off your engine before recording this code. (See engine manual for code details.)

SilverLeaf VMSII (Standard in Serengeti - Optional in Sahara)

The SilverLeaf VMSII's modern diagnostics allow you to monitor your coach's overall performance. Its advanced programming and user-friendly interface track fuel economy, complete trip information and engine, transmission, and chassis maintenance. VMSII combines features such as time, alarm, and calendar functions with an innovative anti-theft device. Read the manufacturer's information included in your warranty packet for operation instructions.



In-Dash Radio

Your coach is equipped with an in-dash AM/FM radio and cassette deck. Operation of this radio is similar to most stereo systems found in automobiles. For details of operation, refer to the radio manufacturer's manual.

Battery Boost

The battery boost switch can be used in addition to the chassis batteries for extra DC power when needed in starting the engine. (See the Electrical section description for more detail.)

Stereo Switch

In the OFF position this switch mutes the residential stereo amplifier. In the ON position it powers a cooling fan in the overhead cabinet.

Dash Heat and A/C Controls

The cabin heater and air conditioning controls operate similarly to those in most automobiles. The left knob controls fan speed, the center controls amount of heat or cooling and the right controls air flow. Please refer to operating instructions included in your chassis owner's manual.

Air Dump (Magnum B Series Chassis Air Ride Suspension)

Push the Air Dump switch to release all air from the chassis air bag system. This is important to reduce wear on the air bags when storing or parking your coach for longer periods of time. It also shortens the length the jacks will have to travel to level your coach.



WARNING: Never press the Air Dump switch when the coach is moving.

Docking Lights

Push this switch to activate the docking light on the driver's side of the coach. The docking light is the large light located near the top and center of the exterior of the coach.

Dash Fan Control Switch

Push to activate the dash fans to circulate air in the cabin area. The switch has two speeds. The bottom stop is low speed, the middle stop is OFF, and the top stop is high speed.

Headlights/Dimmer

Turn the parking lights on by pulling the knob to the first stop. Turn the headlights on by pulling the knob out to the furthest extension. Turn the knob to the left or right to adjust the console dimmer lights brightness level to your comfort. To activate map lights, turn the switch to its furthest counter-clockwise position.

Driving Lights

The driving lights are a separate unit from the headlights and can be turned on or off independently of them. These lights are typically used when driving conditions do not require headlights, such as an overcast day, where using the lights on the coach will increase your safety by allowing other drivers to more easily see the coach from a distance.



Rear Halogen Lights

Two halogen lights are mounted on the back end of your motor coach to provide extra light while parking.

WARNING: Do not turn on Rear Halogen lights while driving.

Mirror Heaters

The remote mirrors will be heated when this switch is turned on. Use this feature when mirrors are frosted or iced during cold weather conditions.



Side Console

A. Transmission Controls

B. Fast Idle

C. Cruise ON/OFF

D. Cruise SET/RESUME

E. Wiper Control

F. Mirror Controls

G. Clearance Lights

H. Back Up Camera

I. Pacbrake

J. Cup Holder

K. Leveler Controls

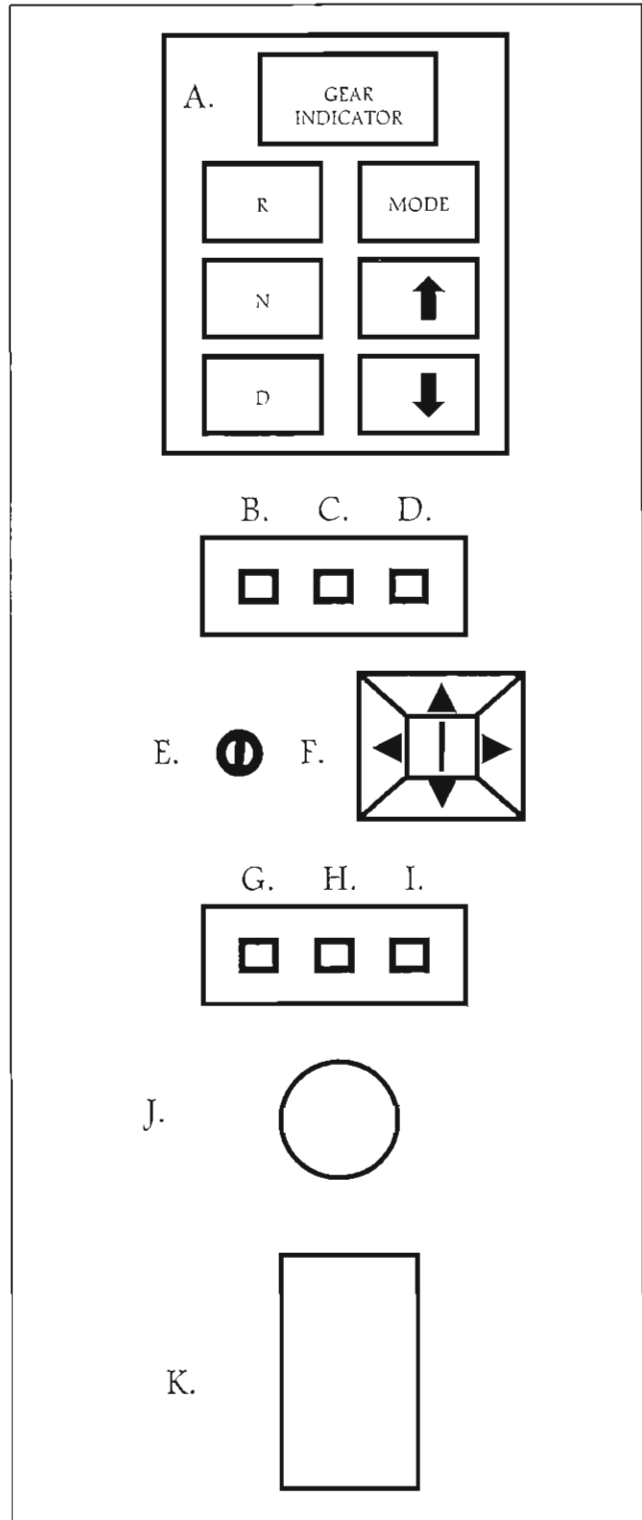


Figure 3: Side Console



Transmission Controls

The Allison World Transmission in your coach is a highly sophisticated, electronically controlled automatic transmission. It operates much like a typical automatic transmission, utilizing a push button control located on the Side Console. However, unlike most automatic transmissions, this unit contains sophisticated electronics that evaluate every situation and actually "learn" the most efficient shifting pattern to compliment your driving style.

The controls consist of seven selectors located on the Side Console Panel, to the left of the driver.

1. Top - GEAR INDICATOR WINDOW.
2. Top Left - REVERSE.
3. Top Right - MODE INDICATOR (standard shift or economy shift.)
4. Middle Left - NEUTRAL.
5. Middle Right - UPSHIFT.
6. Bottom Left - DRIVE.
7. Bottom Right - DOWNSHIFT.

For normal driving, depress the button that coincides with the correct gear. Pressing the "N" puts it in NEUTRAL, "R" in REVERSE, and "D" in DRIVE, etc. The transmission will not shift into REVERSE if the coach is moving forward. The arrows allow you to upshift or downshift while in DRIVE. The transmission automatically prevents shifts that might be damaging to the transmission.

The panel contains status lights to indicate the presence of a problem. If any of these lights are displayed, consult the chassis manual or an authorized service center immediately. The safeguards in the system may prevent certain shifts from occurring, and it will attempt to protect the transmission from further damage or problems. For detailed instructions refer to your Allison manual.



CRUISE POWER and SET/RESUME Switches

The CRUISE CONTROL POWER, SET and RESUME switches are to be used in operating the coach's cruise control. To engage the cruise control, follow the steps below:

1. Turn on CRUISE POWER switch.
2. When you are at the speed you wish to drive, push the CRUISE SET button.
3. The cruise will disengage when you brake the coach. To return to cruise speed, press the RESUME switch.

If you wish to increase cruising speed while driving, press the RESUME switch and the coach will increase speed. If you wish to decelerate, press the brake pedal lightly to disengage the cruise control and repeat steps one and two above.

NOTE: Cruise Control will not operate while your Pacbrake switch is on.

FAST IDLE FEATURE

The CRUISE POWER and RESUME switches can also be used to allow the coach to idle faster after starting. This is useful to warm up the engine faster to aid cold weather starts. To use this feature, start the coach and put the transmission in NEUTRAL. Press the CRUISE POWER switch to engage the fast idle. Press the RESUME switch and hold until the desired idling speed is reached. The desired idle speed can also be reached by pressing the RESUME button repeatedly to increase the speed.

Please refer to your Caterpillar Operations and Maintenance manual for full instructions on how to use the cruise control.



Rear-View Camera

The television monitor and stationary rear-view camera are installed at the factory to be ready to use. The camera is mounted on the back of the coach and is set to view a portion of the rear of the coach, your tow vehicle, and the area behind. This is a very useful feature when backing up, checking a tow car and while driving to make sure no vehicles are directly behind the coach.

The television monitor is located in a concealed area under the TV cabinet above the driver. Simply turn on the power and press the spring-loaded tab. The monitor will pivot down from the cabinet for viewing. If necessary adjust the brightness and contrast. *See the instruction manual for complete information.*

This switch also activates the inverter. Turn the switch to the ON position, turn on the t.v., select VIDEO on the t.v. and the inverter will automatically activate and power up the rear-view camera.

Pacbrake Switch (Caterpillar 3126-B Engine)

A Pacbrake is simply a valve that restricts the flow of exhaust gasses and creates backpressure in the engine cylinders which, in turn, helps to slow the vehicle. The master ON/OFF switch on the Side Console controls the air solenoid. When activated, the air solenoid applies pressure to the Pacbrake cylinder, causing the Pacbrake to close.

Once the valve is closed the compressed air in the engine cylinder causes backpressure in the engine combustion cylinders. This pressure is normally "exhausted" on the exhaust cycle of the engine. When air pressure is held inside the cylinder the engine will work against this pressure as the air is expelled (kind of like holding your finger over a hose nozzle). This will cause the engine to absorb energy rather than produce energy, causing the engine to decelerate (or retard).

The Pacbrake is intended for use as a supplement to your vehicle's primary wheel braking system. It is used to help you control or reduce your road speed, either independently of the standard brakes or in conjunction. It should not be used by itself to completely stop the vehicle.



The Pacbrake can also be used to aid in routine slowing situations such as approaching slow or stopped traffic, traffic signals, or preparing to exit an off-ramp, etc.

When the Pacbrake is in actual use, the *CRUISE CONTROL* *will not* activate and the throttle is *closed* or in the *idling* position. The amount of braking power is relevant to the engine speed (rpm). In other words - the higher the rpm, the more the retarding power.

SMC Corporation has preset the Pacbrake to work in conjunction with the Allison World six-speed automatic transmission to protect the engine and the transmission. When the Pacbrake is activated, the transmission will downshift through the gears until it finally reaches second gear. Once fourth gear (a lock-up gear) has been reached, the brake will close and it becomes more effective. Whenever the throttle is depressed the Pacbrake will automatically deactivate.

NOTE: All Pacbrake models are designed and approved for safe use at your engine's maximum rated rpm. Certain conditions may require downshifting for adequate rpm for maximum retarding. Refer to your Caterpillar manual for manufacturer specifications.

Mirror Controls

One control operates both side-view mirrors. The selector in the center of the knob determines which mirror is being adjusted. Slide the lever to either the **LEFT** or **RIGHT** position. Arrows are located around the selector that point in which direction to adjust the mirror: up, down, left or right.



Other Controls

Levelers Control Pad

Please refer to the operating instructions in the *Levelers* section of this chapter.

Park Brake

Pull out the park brake control to set the parking brake. Release the park brake by pushing the park brake control valve back in. There must be at least 90 psi of pressure in the air bag system for the brake to release.

WARNING: Do not attempt to drive or move the coach with the parking brake set.

Electric Step

The electric step is controlled by two methods: the activation of the ignition switch and by an ON/OFF switch in the entry stairwell. The ON/OFF switch controls the 12 VDC power to the step. If the switch is on, then the step will extend and retract when the door is opened and closed. If the switch is off, the step will not move. Therefore, to lock the step in its extended position when parked, turn the switch on, open the door, and allow the step to extend, then turn off the switch.

The ignition switch overrides the ON/OFF switch. When the ignition is switched to the ON position and the door is opened, the step will extend. It will automatically retract when the door is closed.

The step mechanism does require regular lubrication and it must be kept clean. Refer to the manufacturer's manual for details on step operation and maintenance.



WARNING: Always make sure the step is retracted before moving the coach.

Windshield Washer/Wiper Controls

These controls are located on the Side Console. To operate, turn the wiper switch to the first stop to engage the intermittent windshield wiper feature. Turn the windshield wiper switch past the intermittent position to engage continuous wiping motion. Push down wiper control button to squirt the windshield with fluid from the windshield washer reservoir.

Levelers

Safari installs a three-point hydraulic leveling system. The hydraulic system is designed to be easy to operate, quick, reliable, and, most importantly, stable. The levelers operate with power provided by a 12 VDC pump. *Refer to your operations manual for operating details, troubleshooting and maintenance procedures before operating the leveling system on your coach. The following steps should be used only as a guideline after you are familiar with the procedure.*

WARNING: Do not allow anybody near the jacks or under the coach when operating the leveling system.



WARNING: If you plan to use the slide out unit, it is imperative that you extend the slide room prior to leveling the coach. Please familiarize yourself with this process by reading the Slide Out chapter of your Safari Owner's Manual.

Extending the Three-Point Leveling System

Step 1	Park the coach in a level spot. Make sure your transmission is in NEUTRAL and the parking brake is set. Turn the ignition to the ACCESSORY position. If the coach is equipped with an air ride suspension system, press the AIR DUMP switch to discharge the air from your air bags.
Step 2	Go outside the coach and check to ensure the jacks have a clear path to the ground. Block the front tires. If leveling on asphalt or soft ground, place pads under the jacks. Pads should be made of a sturdy material such as wood or plastic and be at least 2x8x8 inches in size.
Step 3	NOTE: If you plan to extend your slide unit, please do so BEFORE leveling the coach. The slide unit will not operate unless the ignition switch is in the OFF position.
Step 4	Press the leveling system switch to the ON position. The green light will appear to indicate the system is ready.
Step 5	Extend the jacks by pressing the rocker switches to EXTEND. Always extend the rear jacks first and level the coach from side to side. Then extend the front jack and level the coach lengthwise. As the jacks extend, a red light will flash and a beeping alarm will sound. (This will also happen if the ignition key is turned on while the jacks are extended.)
Step 6	Turn off the leveling system and the ignition. All lights on the leveling system panel should be off

NOTE: The front tires should always be blocked when the leveling the coach.

NOTE: The leveling system should be operated at least once a month or each trip to keep the system in working condition.



NOTE: If leveling on asphalt or soft ground, use a pad under the jack to increase stability.

NOTE: Never move the coach with the leveling jacks or the slide unit extended. This will cause serious damage to the leveling system or slide mechanism as well as the coach itself.

WARNING: Do not attempt to use the jacks on unstable ground. Do not stack objects under the jacks except for the wood or plastic blocks mentioned in Step 2 of the leveling process. Never raise the tires off the ground. If the ground is too uneven for the jacks to adequately level the coach, the coach should be moved to a different location.

WARNING: Do not use leveling system for changing tires or working under the vehicle. There is a possibility that the vehicle may move and cause injury or damage if the system is not used properly. Use of the leveling system for any purpose other than intended may void the warranty.

NOTE: If slide out is extended, retract the unit **AFTER** retracting the jacks.



Retracting the Three-Point Leveling System

Step 1	Be sure that the coach is in NEUTRAL and the parking brake is set. Turn on the coach ignition and leveling system switches. Clean any debris off the jack cylinders.
Step 2	While it is possible to use the RETRACT ALL switch to retract all the jacks at once, Safari recommends retracting the jacks using the individual jack switches. First, retract the front jack. Then retract both rear jacks simultaneously by pressing the rocker switches to RETRACT. This method will provide the smoothest possible retraction. The flashing red light and beeping alarm will deactivate when the jacks are within six inches of full retraction.
Step 3	Turn off the leveling system and the ignition. All lights on the leveling system panel should be off
Step 4	Retract the slide unit.
Step 5	Remove the tire blocks and jack pads. Inspect the jacks to be sure they are fully retracted.

WARNING: Do not rely solely on the warning light and alarm. Visually inspect the jacks to ensure they are fully retracted.

For maintenance instructions and detailed operating procedures, consult the manufacturer's instructions included with your manual package.



Coach Monitor Panel

Located in a compartment above the dining table (front entry) or above the entrance (mid entry) in your Safari coach is the Coach Monitor panel. This panel monitors switches for inverter power, battery levels, and LP gas, water and holding tank level. There are also switches to start the water pump, generator and Hurricane system. Depending on floor plan and optional equipment, there are also switches for the slide out, porch light, entry step, electric awning and docking lights. Some of these switches may be located over the entry in front entry models.

A description of some of these switches and their functions follows.

CMP 10 (Sahara)

The Sahara's panel monitors the levels of LP gas, battery power and fresh, black and grey water tanks. Depress the switch to illuminate the panel. The panel displays either EMPTY, 1/3 FULL, 2/3 Full or FULL for the LP gas, fresh water, and holding tanks. For the battery levels, the panel displays whether the house batteries are WEAK, FAIR, GOOD and CHG (charged).

The panel also has a remote starting switch for the water pump. Press the switch upward and the pump will automatically start itself. See the LP Gas, Electrical, Plumbing and Wastewater chapters for details on readings.

CMP II (Serengeti)

The Serengeti features a more sophisticated electronically monitored Coach Monitor Panel. In addition to the features mentioned above, this panel displays battery levels by voltage and tank measurements in percentages. A warning is signaled when tank levels reach high (black tank) or low (fresh water) levels.



Inverter Remote Panel

This panel has a remote starter for the inverter and displays inverter functions. This switch is often located in the bedroom cabinetry. See the inverter section of the Electrical chapter for details of operation.

Electric Awning w/Control (Optional)

On coaches equipped with this optional awning, electronic buttons control the extension or retraction of your patio awning. Push the down arrow button to extend the awning and the up arrow button to retract it. Push the "Stop" button when the awning is extended or retracted to the desired position. The awning will stop automatically when fully extended or retracted. See the Awnings section of the Appliances chapter for details of operation and maintenance.

Generator Stop/Start Switch

Use this switch to start and stop the generator. Press and hold it until the generator starts. To stop the generator, press the lower portion of the switch until the motor comes to a complete halt.

NOTE: If the generator does not start within five seconds, release the button and try again. Continuous cranking can damage the generator starter.

Generator Hour Meter

This meter, located on the Coach Monitor Panel, displays the total hourly usage of the generator.



Coach Heating

Safari Motor Coaches installs two types of furnaces - LP gas or hydronic. The following is general information on both types of furnaces. For specific information related to the appliance that is installed in your coach, please read the manufacturer's manual before operating. Failure to follow the instructions may result in damage to the unit.

40,000 BTU Suburban LP Gas Furnace

This type of furnace utilizes LP gas to generate heat to warm your coach. A fan distributes the heat. The air is drawn into the furnace, heated, then ducted to all parts of the coach. Thermostats control room temperature.

Hurricane Heat and Power (Optional)

Push this switch to the ON position to heat the interior of your coach using the Hurricane hydronic heating system. In addition, Zone 1 (living room and galley area) is controlled at this panel. The switch controls the airflow into the coach. The Hurricane heat exchangers are controlled at this panel and can be set to HIGH for faster heating of the coach, LOW for normal heating, or OFF when minimal or no heating is required. See the Hurricane Heating section in your Safari owner's manual for details of operation.

In the Serengeti, the bedroom and bathroom heat exchangers are controlled separately. These switches are labeled "heater" and are located in the bedroom near the thermostat, and in the bathroom on the sink cabinet. An additional fan is installed in the wall of some private toilet floor plans. This fan will draw heated air from the bath area into the private lavatory. The control of the fan is with the bathroom heat exchanger switches on the Serengeti units.



In the Sahara, the bedroom and bathroom heat exchangers are controlled by one switch located in the bedroom near the thermostat. In private bathroom plans on Sahara coaches (or Serengeti's without Hurricane units) a switch on the bathroom sink cabinet controls this fan.



CHAPTER 2 - ELECTRICAL SYSTEM

OUTLINE

The electrical system in your Safari motor coach provides maximum power and this system is basically automatic in operation. Any appliance you would use in your home can be used in your coach within the amperage limits of the system. There are also features in place to prevent such problems as battery drain and circuit overload.



Electrical System Operations

Your coach has five main sources of electrical power: the generator, the shore line connection, inverter, chassis batteries and coach batteries. All sources are independent of each other, but can be combined in a variety of ways to provide the most efficient electrical supply to the coach and to charge the batteries.

Your coach uses two types of power: 120-volt alternating current (VAC) and 12 volt direct current (VDC). Most homes in North America use 120 VAC electrical power, while 12 VDC is most common in automobiles. In your coach, most of the appliances and lights you would find in a home use 120 VAC power. A main circuit breaker box located over the bed in the rear of the coach distributes the 120 VAC power to the coach. This power is separated into two main paths.

Engine starting and control, dash lights, pumps, fans, and chassis functions use 12 VDC. Batteries similar to those in automobiles provide this power source. The alternator charges these batteries while the engine is running and is assisted by the solar panel. (The Sahara has one 20 watt solar panel and the Serengeti has one 75 watt solar panel.)

Your coach is also equipped with an inverter that will convert 12 VDC power into 120 VAC power for use when the two primary sources are not available. This inverter also will convert 120 VAC power to 12 VDC power to charge the batteries.

More information on operation of the generator, inverter, and the 12 VDC system is detailed later in this chapter. Please become familiar with your electrical system for your safety and to maximize its efficiency. Detailed manuals from the manufacturers of the generator and inverter are included with your manual package.



WARNING: Do not connect the shore line to any source other than an RV approved outlet. Connecting your shore line to 30 amp outlets such as dryer or welder outlets in the home or well pumps on a farm will cause extreme damage to the electrical system of your coach and may cause severe injury.

120 VAC SYSTEM

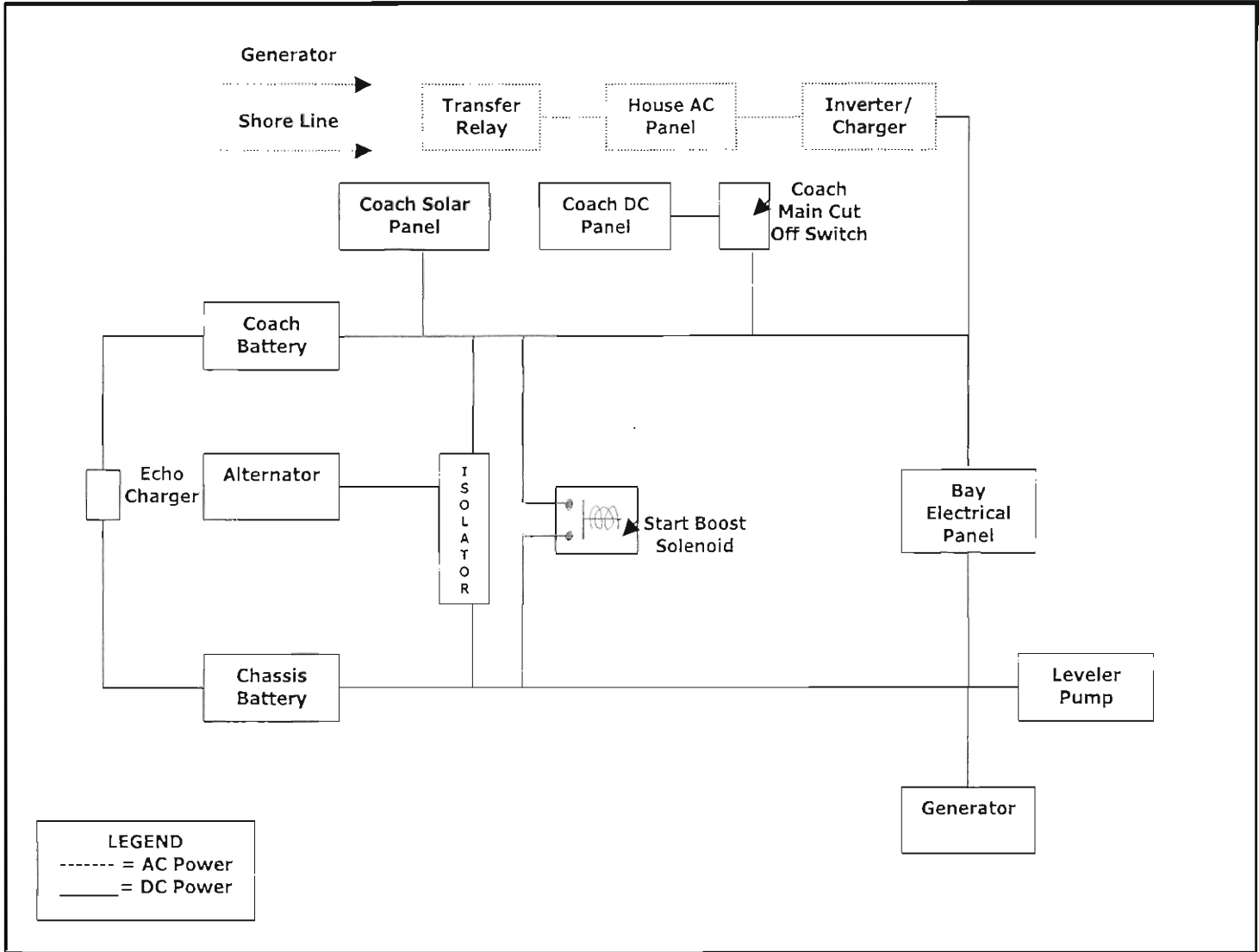
The 120 VAC system consists of the shore power, generator and inverter. The shore line connection is the primary source for power. The shore line or the generator powers all 120 VAC items in your coach. In the event power is unavailable from the shore line or generator, the inverter will provide power to the system - such as the television, VCR, or sound system. The system is protected from overloads by a set of system breakers and fuses.

The 120 VAC shore line system works via a power transfer switch. From this transfer switch, power is routed to the entire 120 VAC system. The inverter circuit is powered up through relays in the inverter itself, which then furnish 120 VAC power to the two circuits.

The system will take power from the most appropriate source automatically. The inverter remote switch must be on for the inverter to furnish power to the 120 VAC system. When dry camping, it is wise to only turn on the inverter when it is needed. Leaving the inverter on at all times will result in drained batteries.



Figure 4: Simplified Electrical System



WARNING: Modifying the circuitry in your motor home may void the warranties of the coach and any appliances on that circuit. Never work on a live circuit. Never bypass breakers or fuses.



Table 1. 120 VAC Operations

These items operate ONLY with SHORE LINE power or while running the GENERATOR:

- Rear roof air conditioning
- Front roof air conditioning
- Washer/dryer combo
- Hot water tank.
- Passenger side night stand outlet
- Bathroom G.F.C.I. outlet
- Pantry receptacle
- Refrigerator
- INVERTER/charger
- Bed box receptacle

These items can operate with power from the INVERTER.

- VCR/Satellite
 - Bose system amplifier
 - Front TV
 - Rear TV
 - Living room sconce lights
 - Bedroom sconce lights
 - Dining light fixture
 - Fluorescent kitchen light
 - Basement Outlet Center
 - Bathroom lights
 - Patio receptacles
 - Living room bar cabinet
 - Gas cook top ignition
 - Microwave/convection oven *
 - Galley G.F.C.I. outlet
 - Two other galley outlets
- * Non CSA vehicles with 2000 watt INVERTER only.

Circuit Breakers and G.F.C.I.

The 120 VAC system has two important safety mechanisms. First, a set of circuit breakers prevents any circuit from being overloaded. A breaker can be tripped as the result of a short circuit, a faulty appliance, or too many appliances being run on the same circuit. The system is divided into several separate circuits which decrease the load on each and allow other circuits to operate if another goes down.

WARNING: A circuit without a breaker presents a serious safety hazard. Never attempt to bypass the circuit breakers for any reason. Doing so will void the warranty both of your coach and any appliance on the circuit.



The Freedom 20 inverter (Sahara upgrade/Serengeti) is routed from the 20 amp breaker on the inverter to a sub-panel located inside the D/S overhead cabinet in the bedroom. The main breaker panel is labeled with the appliances and outlets on each circuit. The inverter contains its own circuit breaker so power from it is not channeled through the main panel. The RESET switches are on the inverter itself, located in the same bay as the 50 amp shore line. If the inverter is not producing power, check the breaker on the inverter. Also check the sub-panel in the D/S overhead cabinet in the bedroom.

G.F.C.I. refers to Ground Fault Circuit Interrupt. This is a safety feature that halts power through a circuit if a short or other malfunction is detected. This is an important mechanism, designed to help prevent electrocution. The G.F.C.I. works in a manner similar to a circuit breaker. If a fault is detected in the circuit, a switch inside the G.F.C.I. is tripped, halting power flow. The circuit will not operate again until the switch is reset in the G.F.C.I. receptacle.

WARNING: G.F.C.I. circuits are designed to prevent electrical shock, not overloads. They do not replace circuit breakers.

NOTE: Several outlets as well as coach lighting may be connected to the G.F.C.I. circuit. Therefore, if a set of interior lights are not working or if an appliance is not operating, check the nearest G.F.C.I. reset switch to see if it has been tripped.

Generator

Depending on the coach, the generator runs on LP gas or diesel. Both types of generator provide a very efficient source of 120 VAC power.



This section contains only an overview - please refer to the manufacturer's manual in the warranty pack for full specifications, instructions, and maintenance requirements on the generator.

You can start your generator by using one of two generator switches. One is located on the Coach Monitor Panel and is marked GEN START. The other is located on the generator itself. The Sahara generator is located in the driver's side far rear compartment. On the Serengeti, the generator is located in a compartment on the front of the coach. Depress the GEN START button and hold it until the generator starts. A delay of up to five seconds is normal. To stop the generator, press the lower portion of the switch until the motor comes to a complete halt.

NOTE: If the generator does not start, release the button and try again. Continuous cranking can damage the generator starter.

Do not neglect maintenance of the generator. A full schedule is provided in the generator manual. An hour meter is mounted on the Coach Monitor Panel for your convenience. If you are operating in dirty or dusty conditions, you should accelerate the schedule accordingly. Monitor the generator for signs of problems, such as odd noises, power loss, and overheating. If any such signs appear, have the generator serviced promptly.

WARNING: Never use your generator as an emergency power source for a residence, or any other facility connected to an electric utility service. Using the coach generator to provide power to any building on an electric utility energy grid may allow electricity to flow back to the utility lines. This would present an extreme hazard to any technician working to restore power.



WARNING: Never store anything in the generator compartment. Using this area for storage presents a fire hazard, and may prevent the correct operation of the generator.

Power Transfer Switch

An automatic power transfer switch, located in the bay on the driver's side behind the rear wheels, connects the coach to external power if it is available. If 120 VAC power is not present from the external power source, the transfer switch will select generator power approximately 40 seconds after the generator starts producing electricity.

Inverter

The inverter is located in the compartment behind the driver's side rear wheel. It transforms 12 VDC into 120 VAC power usable by the major appliances. It also allows use of these items without the generator or shore line from the power stored in the house batteries. The remote inverter panel is located in the bedroom. Not all circuits are connected to the inverter and so not all appliances can be run without the generator or shore line. (See Table 1 in this section for a listing.)

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The inverter has its own internal breakers; therefore, power from the inverter is not channeled through the circuit breaker panel. If power is not reaching appliances served by the inverter, you should reset the inverter by pressing the RESET button. Also check the circuit breakers in the sub-panel on units with the Freedom 20 inverter (Sahara upgrade/Serengeti). This panel is located in the D/S overhead cabinet in the bedroom.



The power for the inverter comes from the house batteries, and you should keep an eye on the battery level as you use your appliances. The battery level can be checked using the Coach Monitor Panel.

Your coach is equipped with a 1000 watt (Sahara) or 2000 watt (Sahara upgrade/Serengeti) inverter. These inverters are ample for most purposes. In units equipped with a 1,000 watt inverter, the microwave oven requires either shore line or generator power to operate. Units equipped with a 2,000 watt inverter have the microwave wired through the inverter sub-panel.

NOTE: Power provided by the inverter is intended for your convenience. It should be used sparingly as to not drain the batteries.

WARNING: Never store liquids or flammable material near the automatic transfer switch or the inverter.



12 VDC SYSTEM

The 12 VDC coach system provides power for a variety of applications. Many coach lights, fans, the water pump, and other coach accessories use 12 VDC. In addition, 12 VDC power is used to ignite the Hurricane hydronic heating system or furnace, power its fans, and run the indicator lights in the refrigerator and the Coach Monitor Panel. The 12 VDC system also can provide power for the 120 VAC appliances with use of the inverter.

The 12 VDC system is divided into two sections. The "chassis" section powers the engine, running lights, dash accessories, radio and generator. It includes the "chassis" batteries and alternator. (Bose Stereo option uses 120 VAC power for amplification.)

The "house" section powers the 12 VDC interior lighting, ceiling fans, refrigerator, furnace, water heater, monitor panel, and water pump. This section includes the set of "house" batteries. It also provides power to the inverter.

A boost switch connects the two systems. This allows the house system to supplement the chassis system and also prevents the chassis battery from being drained by house demands. This is more fully discussed in the next section.

Chassis System

The chassis electrical system is enhanced by Safari in several ways. The system provides power for starting the engine and also powers the leveler pump and generator. It is recharged by the alternator and protected by a 250 amp fuse. It can also be charged with generator or shore power by the Echo charger.



The solar panel provides up to five amps of power during the daytime to assist charging the house batteries. This helps to maintain the battery charge even when parked for extended periods. All solar panels produce a slight drain during the night. In your coach, the drain is virtually immeasurable.

Isolator

Power from the alternator is channeled through an isolator. This device allows the alternator to simultaneously charge the chassis and house system, while keeping the two systems separate. With the isolator, draining the house batteries will not affect the chassis batteries, and vice-versa. With a small amount of care, at least one battery system will always be charged.

Boost Switch

If the chassis batteries lose their charge and become unable to start the engine, it is possible to apply the house system to the task. A boost switch, located on the left driver's console, connects the two systems. By activating the switch, the starter can get power from the house batteries and converter. The boost switch should only be activated for the time that the power is needed.

NOTE: To start the engine when both the chassis and house batteries have lost their charge, connect the shore line to an approved RV outlet and activate the boost switch. Do not start your coach until there is enough charge in the battery system. This will be indicated on the remote panel when the amp charge has dropped from its starting level.



House System

The house 12 VDC system provides the power for all 12 VDC accessories with the exception of the engine starter, leveler pump, generator, and automotive functions. The system includes four batteries that are designed to preserve their power even after repeated drains and charges as long as the battery is properly maintained. This battery type is known as a "deep cycle" battery. The system is routed through the fuse panel located over the bed in the rear of the coach.

The system is charged by several sources. The alternator charges the system through the isolator when the engine is running. As mentioned above, the isolator keeps the house system separate from the chassis system, preventing the chassis battery from being drained by the house appliances. The converter provides power from a 120 VAC source, either the generator or shore line. It operates automatically according to the presence of 120 VAC power. The solar panel located on the roof of the coach assists in charging the house batteries during the day when direct sunlight is present via a solar regulator located in the electrical bay underneath the driver's seat.

The house battery system provides power directly to the inverter. It serves circuits which run to the interior and lighting. These include the ceiling fans, furnace, water heater, water pump, cargo lights, Hurricane heating system and refrigerator. They are connected directly to the house batteries through a 250 amp fuse located under the bed and in a panel located near the bedroom door. The circuit breaker panel is located by the 120 VAC breaker in the bedroom overhead cabinet. The house battery system is also connected to the chassis system through the boost switch.

The main circuit breaker panel is separated from the batteries by a fuse and a switch. The switch is mounted on the firewall near the coach entry. The fuse is located under the bed.

The strength of the batteries can be checked using the monitor panel. On the CMP-10 (Sahara), the monitor can only give a general indication of the charge level of the battery. On the CMP-II (Serengeti), battery levels are displayed in voltage.



With five ways to recharge your batteries (shore line, generator, alternator, solar panel, and Echo charger), you have plenty of options to assist your power management. One factor to remember is that recharging time is greatly affected by the load. The less drain from lighting and accessories, the faster the batteries will recover.

Fuses

Fuses offer a simple and effective method of protecting the 12 VDC lines from overloads. By burning out during an overload, they stop the current and end the hazard the overloaded circuit might present to the appliances and to the coach. Fuses are an important safety feature, and should never be bypassed.

If power no longer flows to a particular 12 VDC appliance or circuit, the fuse should be one of the first items to check. A fuse can be checked visually, but an ohmmeter will detect whether the fuse still conducts electricity if you are in doubt. If the fuse is blown, there may be a problem in the system. Check the appliances on the circuit for signs of damage or defects and check the wiring for possible shorts.

NOTE: When replacing a fuse, always use a fuse of the same amperage rating -- never higher.

TV Antenna System

Your coach is equipped with an amplified TV booster. It is located in the overhead cabinet above the driver's seat. The path from the antenna can be followed down to the Antenna booster switch. The antenna booster indicator will light RED, specifying that the booster is in operation.



This switch also controls whether the system is sending signals to the VCR from the antenna or a cable connection. When the switch is on, the antenna is being selected. When the switch is off a shore cable is in use.

There are three television outlets: one each for the front tv, the bedroom tv, and one in the basement storage for outdoor program viewing. The bedroom outlet and storage outlet are tapped off the remote tv outlet on the back of the VCR. Therefore, different channels cannot be viewed on these two televisions at the same time.

NOTE: See the drawings in figures 5 and 6 (VCR front and back)

NOTE: Turn the antenna boost switch off when not in use. Even when the television is off it will continue to draw power from the batteries

Figure 5: VCR (Front)

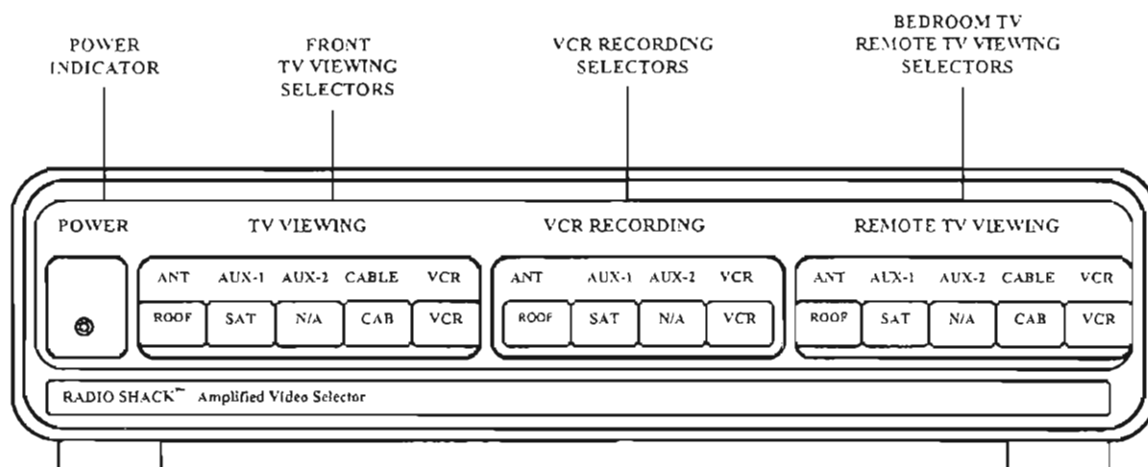
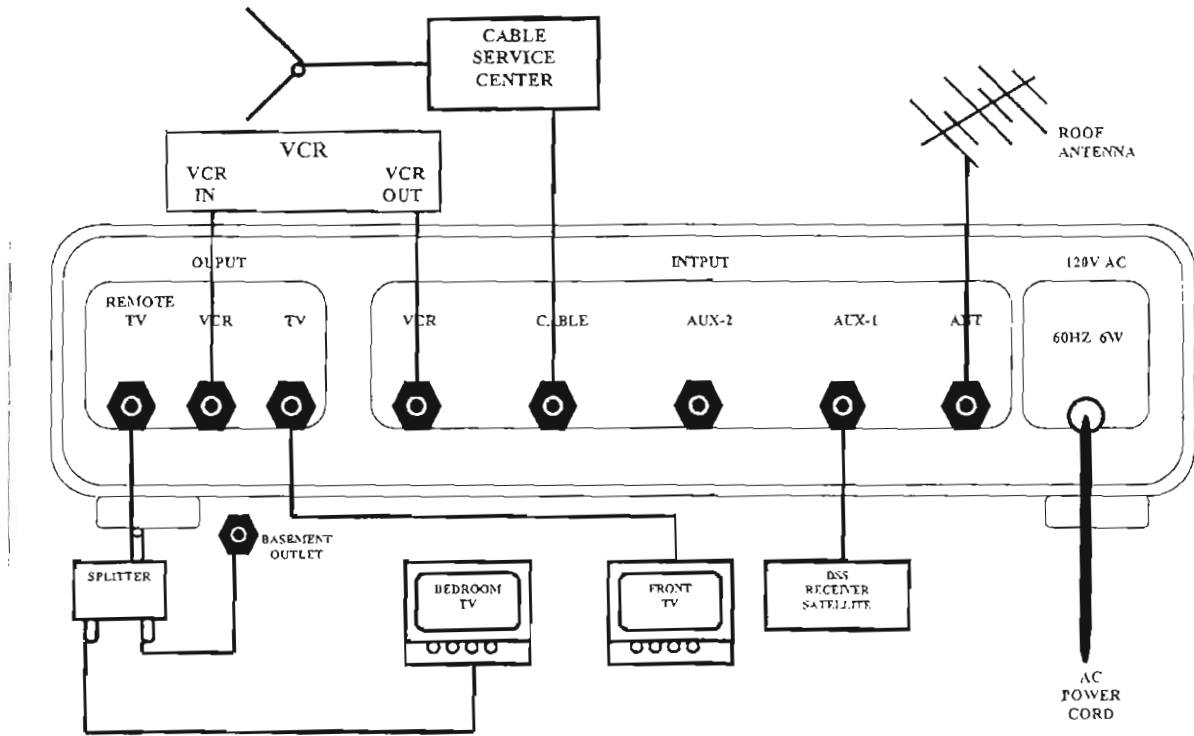




Figure 6: VCR (Back)





APPENDIX A – LOCATION REFERENCE

OUTLINE

This chapter provides charts and tables giving reference information. This information was correct at the time of printing, but is subject to change without notice. The presence of certain options may also cause changes affecting the information included in this chapter.



Locator Guide

The following table is designed to help you locate various items in your coach. The locations of items vary with floor plan and with certain options.

In the following tables these abbreviations are used: DS - Driver's Side, PS - Passenger's Side:

Plumbing & Waste	
Fresh Water Tank	Basement Front Between Rails
Black Water Waste Tank	Under Toilet
Grey Water Waste Tank	Center of Couch on Basement Floor
Tank Drain Valve	P/S Front of Basement
Low Point Drain Valve	House Water Service Center
Water Pump	Behind Service Panel in Water Service Center
Water Heater (LPG)	In Wardrobe (Slide Out Units) In Lower Galley Corner Cabinet (Non-Slide Out Units)

Appliances & Connections	
House Water Service Center	DS, Forward of Rear Wheels
Chassis Service Center	PS, Behind Rear Wheels
LP Gas Tank	Behind Front Wheels (Connections on D/S)
Furnace (LPG)	Under Refrigerator
Hurricane Burner & Hot Water Reservoir	Behind Front Wheels P/S
Generator	Behind Rear Wheels (Sahara) Front Cap (Serengeti)



Electrical	
Inverter/Charger	DS Behind Rear Wheels
Transfer Switch	DS Behind Rear Wheels
House Batteries	PS Behind Rear Wheels
Chassis Batteries	PS Behind Rear Wheels
12 Volt Cut-Off Switch	Step Well
Inverter Monitor	Bedroom Overhead Cabinet
AC Breaker Panel	Bedroom Overhead Cabinet
Fuse Panel (House)	Bedroom Overhead Cabinet
12 VDC Breaker Panels (Chassis and Dash)	DS Ahead of Front Wheel
Isolator	Bed Box
Inverter AC Breaker Panel	Bedroom Overhead Cabinet D/S

Engine and Chassis	
Fuel Tank	Between Rails Behind Front Axle
Fuel Fill	DS Front Corner
Oil Fill	Above Radiator At Rear Access
Oil Dipstick	Chassis Service Center
Transmission Fill and Dipstick	Chassis Service Center
Hydraulic Fluid Reservoir	Chassis Service Center
Fuel/Water Separator	Chassis Service Center
Coolant Fill	Above Radiator
Oil Filter	DS Middle of Engine
Coolant Filter	DS Top Of Engine
Air Filter	PS Engine (Best Reached From Below)
Air Restriction Indicator	Chassis Service Center
Remote Engine Start	Chassis Service Center
Secondary Fuel Filer	Chassis Service Center



Miscellaneous	
Coach Monitor Panel	Above The Dining Table (Front Entry) or Above The Entrance (Mid Entry)
Water Pump Switch	Coach Monitor Panel
Furnace/Front AC/Thermostat	Refer Cabinet/Under Bedroom TV
Generator Switch	Coach Monitor Panel
Electric Step Switch	P/S Armrest Face
Antenna Boos Switch	DS Front Overhead Cabinet



Figure 7: DC Breaker Lay Out (Serengeti)

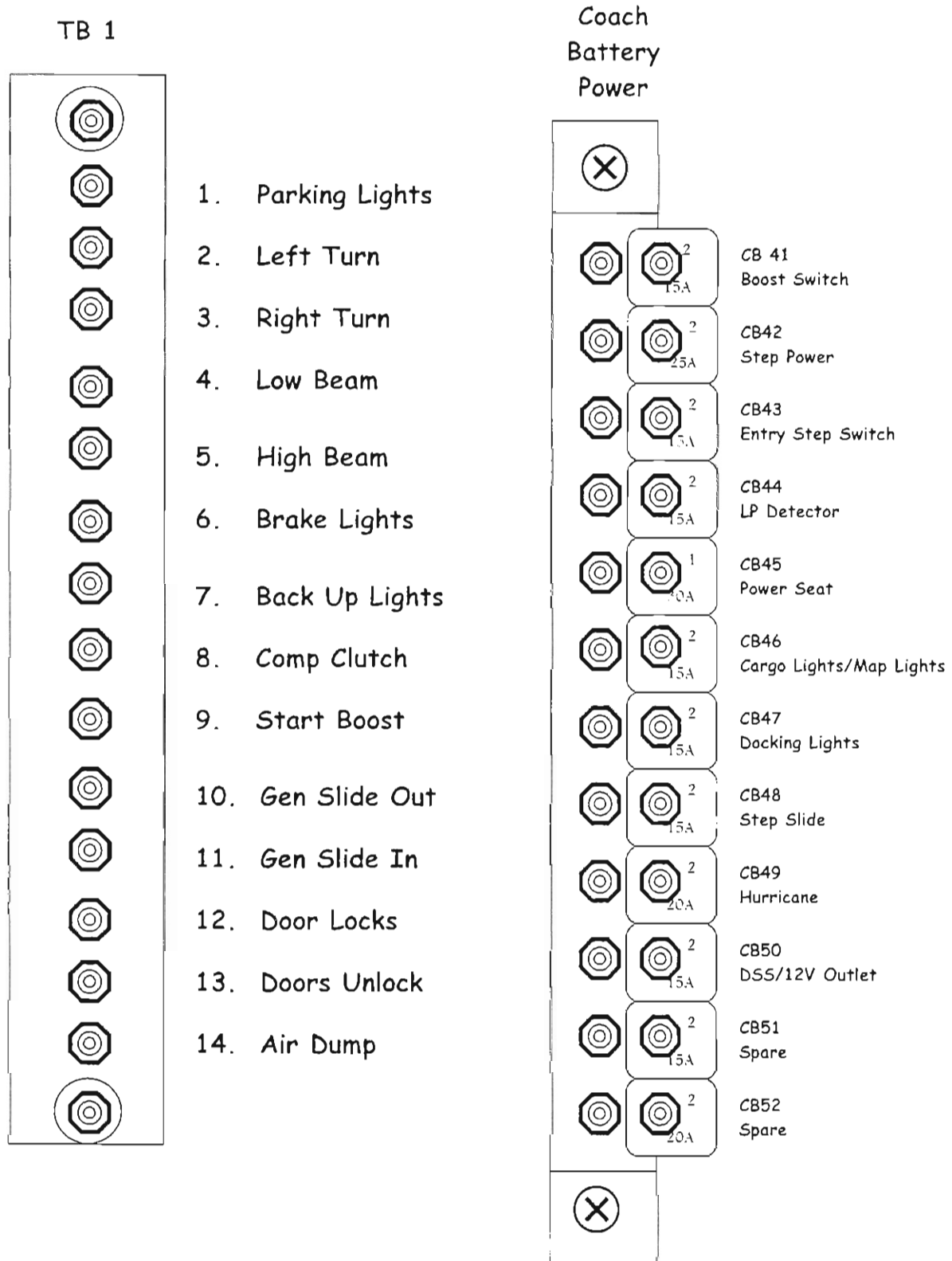




Figure 7: DC Breaker Lay Out (Serengeti - Continued)

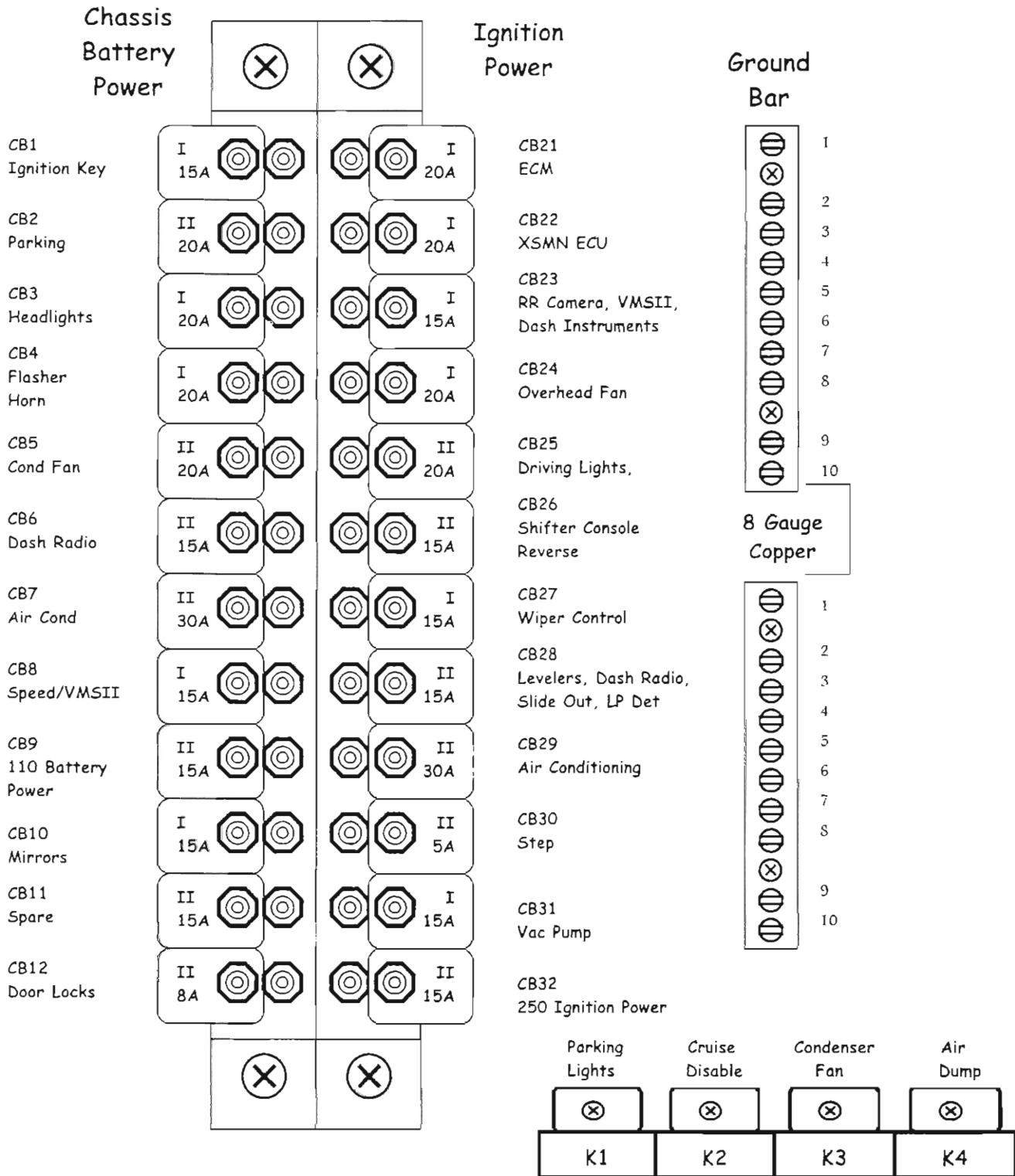
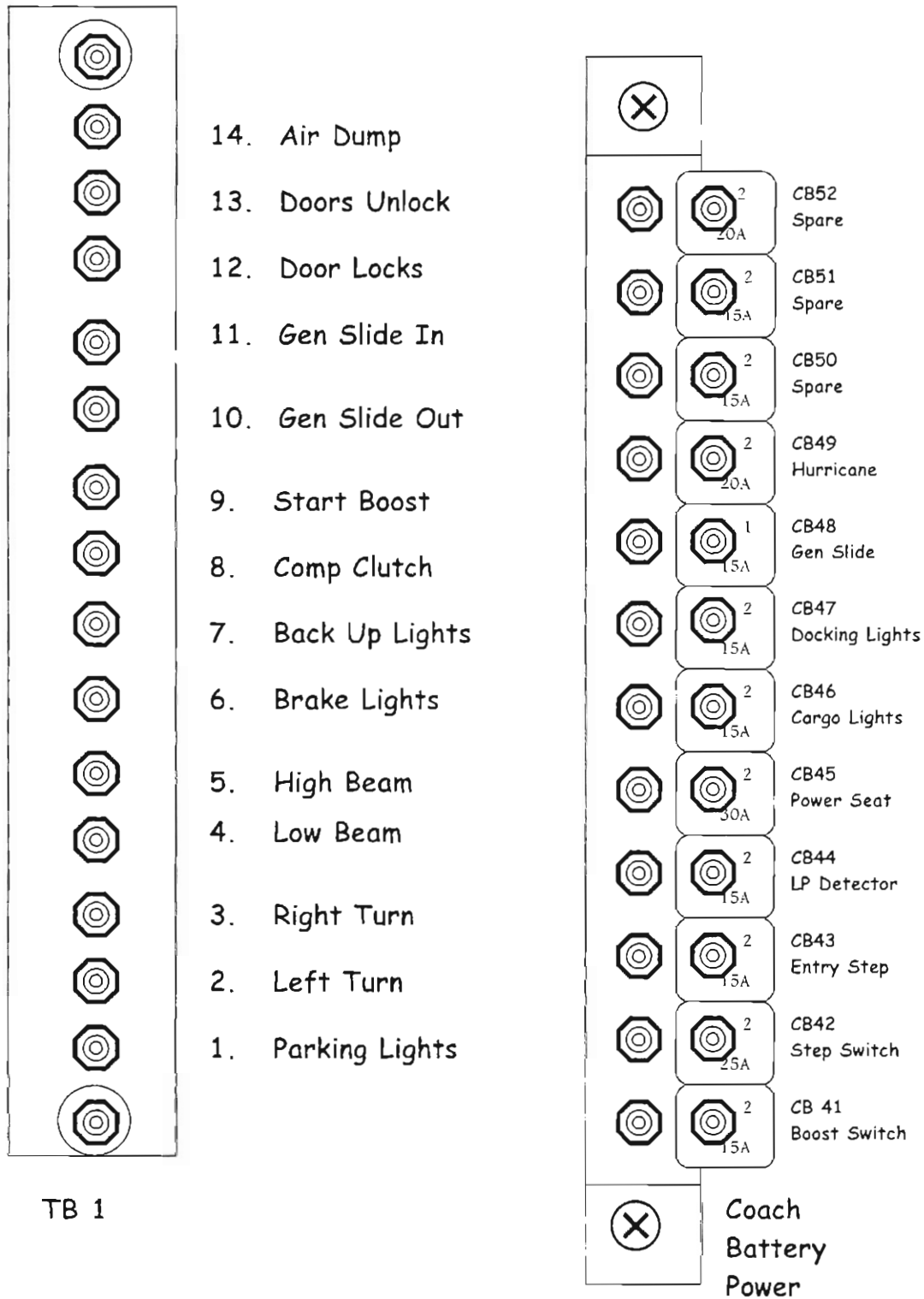
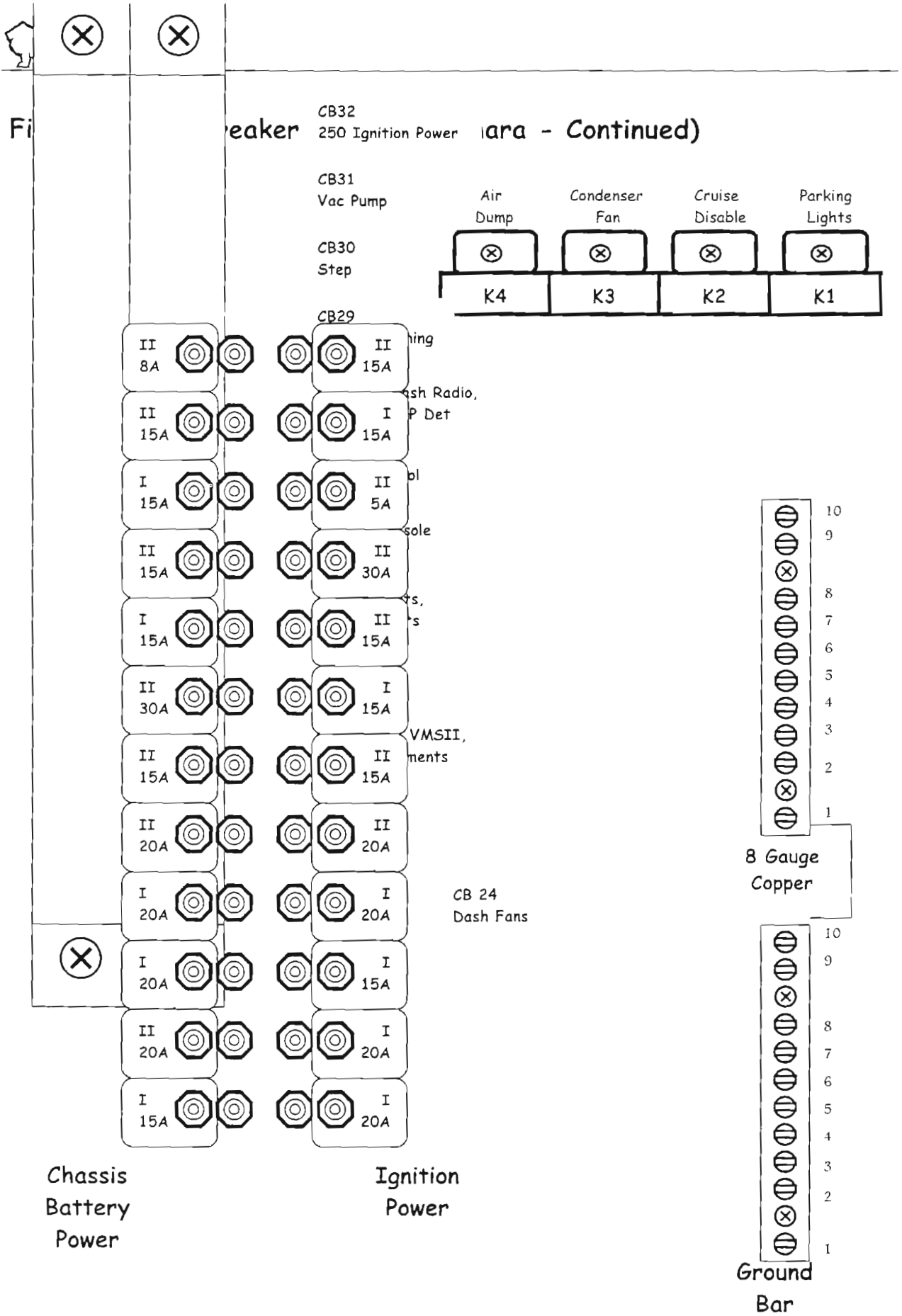




























Figure 8: DC Breaker Lay Out (Sahara)







HOUSE FUSE BLOCK (SAFARI W/O HURRICANE)					
CKT	AMPS		WIRE	SIZE	DESCRIPTION
1	20		ORG	12 GA	LIVING ROOM LIGHTS
			RED	10 GA	SLIDE OUT POWER (OPTION)
2	20		RED	12 GA	KITCHEN LIGHTS
3	20		BLU	12 GA	BATH/BEDROOM LIGHTS
4	15		YEL	12 GA	BATH FAN/TOILET FAN/GALLEY FAN
5	15		PUR	12 GA	MONITOR PANEL/WATER PUMP
6	10		ORG	14 GA	WATER HEATER IGNITOR
					
7	20		BRN	10 GA	FURNACE/AC THERMOSTATS
8	15		BLK	12 GA	FRONT & REAR TV BOOST
9	5		YEL	14 GA	REFER/PRINCESS STOVE (OPTION)

HOUSE FUSE BLOCK (SAFARI WITH HURRICANE)					
CKT	AMPS		WIRE	SIZE	DESCRIPTION
1	20		ORG	12 GA	LIVING ROOM LIGHTS
			RED	10 GA	SLIDE OUT POWER (OPTION)
2	20		RED	12 GA	KITCHEN LIGHTS
3	20		BLU	12 GA	BATH/BEDROOM LIGHTS
4	15		YEL	12 GA	BATH FAN/TOILET FAN/GALLEY FAN
5	15		PUR	12 GA	MONITOR PANEL/WATER PUMP
6			SPARE		
					
7			SPARE		
8	15		BLK	12 GA	FRONT & REAR TV BOOST
9	5		YEL	14 GA	REFER/PRINCESS STOVE (OPTION)



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