

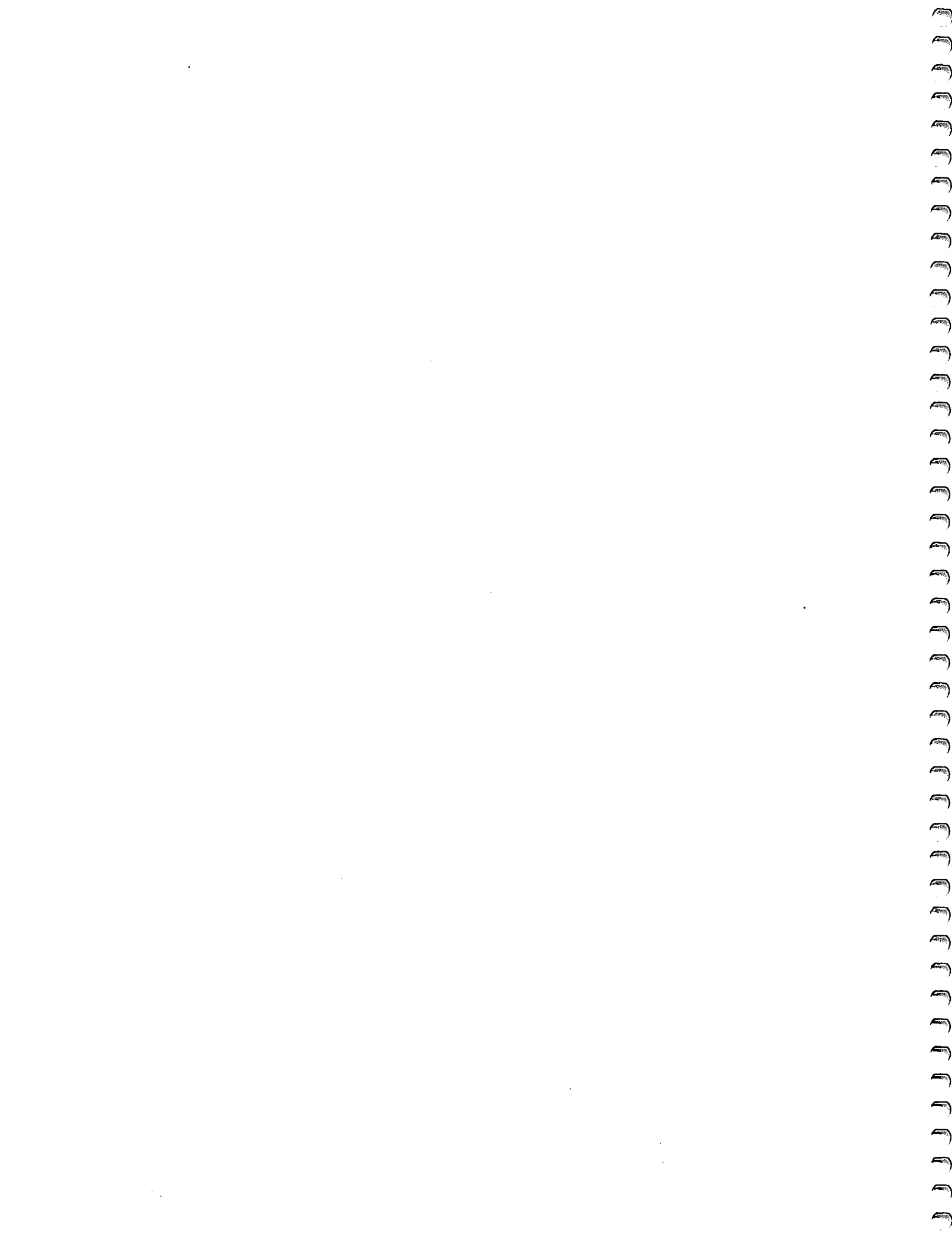
RIALTA SERVICE MANUAL

701674-19-000



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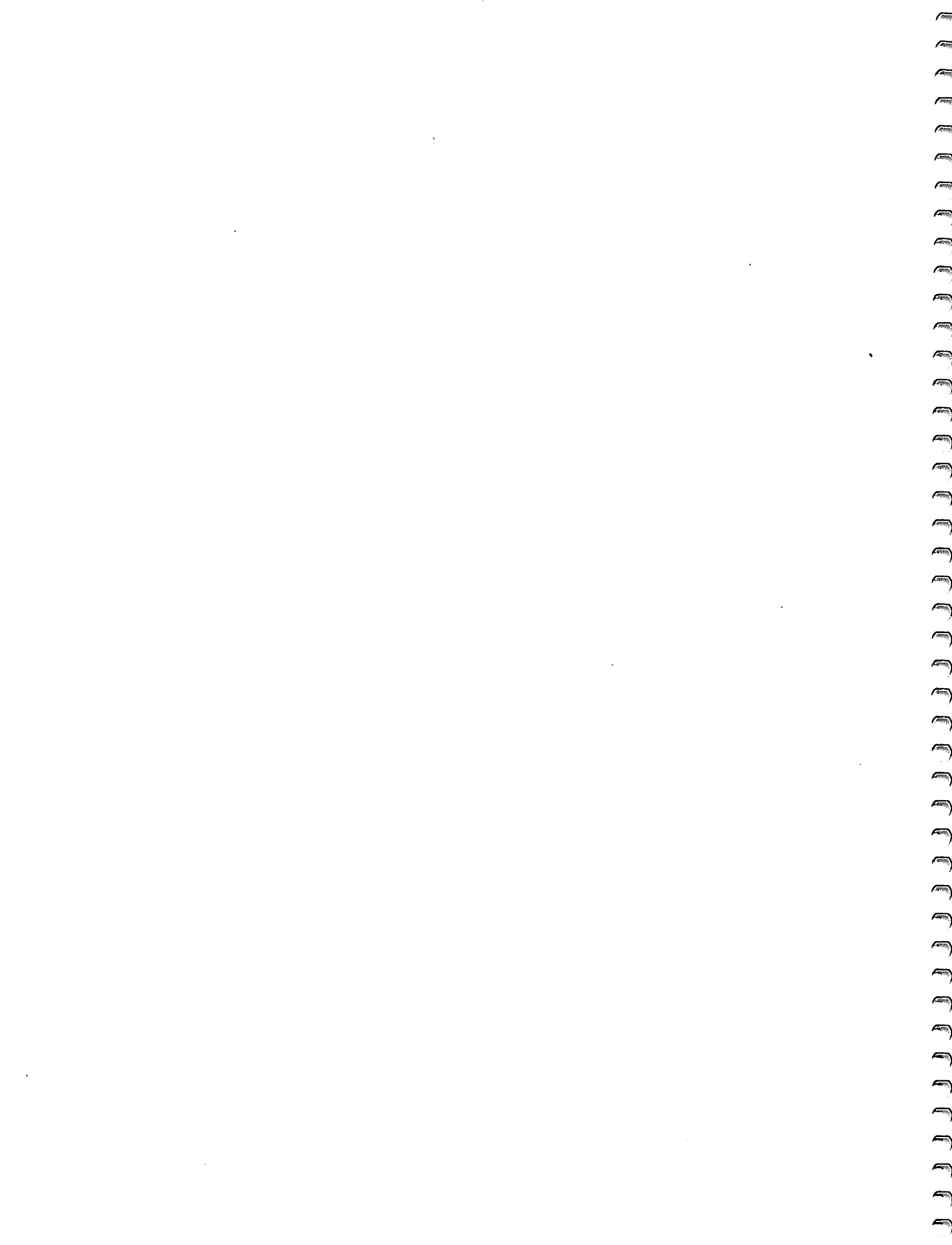
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SECTION 0 GENERAL INFORMATION

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SECTION 0

GENERAL INFORMATION

This manual contains information specific to the vehicle components installed by Winnebago Industries.

For information regarding the chassis of this vehicle, refer to the appropriate Volkswagen service information.

To obtain Volkswagen service information, contact:

Dymont Distribution
1-800-544-8021
Hours: 9:00 a.m. to 5:00 p.m. EST

Ask for a "Volkswagen Index". The index will be mailed to you. It includes a listing of service information, prices, and how to place an order.

Or, you may also contact your local Volkswagen retailer.

Keep this manual available for ready reference. It will aid the technician in providing quality service and repairs to the vehicle.

The methods described in this manual are based upon the most recent information available at the time of publication. Winnebago Industries, Inc., reserves the right to make any changes without prior notice.

Winnebago Industries, Inc., reserves the right to make changes and to make additions to or improvement in its products without imposing any obligation upon itself to make such changes, improvements, or additions to products previously manufactured.

Winnebago may periodically publish service bulletins and manual revisions to either supplement or supersede information in the manual. It is your responsibility to read these updates and file them in the appropriate section of this manual.

CAUTION

To properly reduce the chance of personal injury and/or property damage, the following instructions must be carefully observed.

Proper service and repair are important to the safety of the service technician and the safe, reliable operation of all motor vehicles. If part replacement is necessary, the part must be replaced with one of the same part number or with an equivalent part. Do not use a replacement part of lesser quality.

The service procedures recommended and described in this manual are effective methods of performing service and repair. Some of these procedures require the use of tools specially designed for the purpose.

Accordingly, anyone who intends to use a replacement part, service procedure or tool, which is not recommended by the vehicle manufacturer, must first determine that neither his safety nor the safe operation of the vehicle will be jeopardized by the replacement part, service procedure, or tool selected.

It is important to note that this manual contains various "Cautions" and "Warnings" that must be carefully observed in order to reduce the risk of personal injury during service or repair, or the possibility that

improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that these "Cautions" and "Warnings" are not exhaustive, because it is impossible to warn of all the possible hazardous consequences that might result from failure to follow these instructions.

These vehicles contain some parts dimensioned in the metric system as well as in the domestic system. Some fasteners are metric and are very close in dimension to familiar customary fasteners in the inch system. It is important to note that, during any vehicle maintenance procedures, replacement fasteners must have the same measurements and strength as those removed, whether metric or domestic. (Numbers on the heads of metric bolts and on surfaces of metric nuts indicate their strength. Domestic bolts used radial lines for this purpose, while most domestic nuts do not have strength markings.) Mismatched or incorrect fasteners can result in vehicle damage or malfunction, or possibly personal injury. Therefore, fasteners removed from the vehicle should be saved for reuse in the same location unless otherwise indicated. Where the fasteners are not satisfactory for reuse, care should be taken to select a replacement that matches the original.

Winnebago Industries, Inc.
Forest City, Iowa 50436

If after consulting this manual you require further technical assistance, please contact Winnebago Industries Service Department at:


1-515-582-6939

The following component manufacturers may also be contacted at their respective telephone numbers for technical assistance.

Phillips Industries/Ventline Division (Monitor Panel)	219-848-4491
Magnetek (Converter)	317-452-5444
Norcold (Refrigerator)	800-543-1219
Suburban (Furnace)	615-775-2131
Coleman Company (dba/RV Products, Inc.)	800-227-5693
Generac	800-336-8389
Atwood	800-847-7160

VEHICLE IDENTIFICATION SPECIFICATIONS

Vehicle Certification Label - All Rialtas will display the vehicle certification label on the driver's door jamb. This label contains important information, including manufacturing date, G.V.W.R. limits, rim and tire size and inflation pressures, serial and model number, V.I.N. number, type of vehicle, and color specifications. Never destroy or remove this label.

MANUFACTURED BY		MONTH AND YEAR OF MANUFACTURE: <u> 1 </u> / <u> </u> GVWR <u> 2 </u> LB. <u> 2 </u> KG	
			
GAWR:	SUITABLE TIRE AND RIM CHOICE	COLD INFLATION PRESSURE	
FRT <u> 3 </u> LB <u> 3 </u> KG	TIRE <u> 5 </u> RIM <u> 6 </u>	7 PSI <u> 7 </u> KPA <u> 8 </u>	
RR <u> 4 </u> LB <u> 4 </u> KG	TIRE <u> 5 </u> RIM <u> 6 </u>	7 PSI <u> 7 </u> KPA <u> 8 </u>	
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.			
SERIAL NO. <u> 9 </u>	VIN <u> 10 </u>		
TYPE <u> 11 </u>	MODEL <u> 12 </u>	COLOR <u> 13 </u>	

Explanation of Data:

1. Month and year of manufacture at Winnebago Industries, Inc.
2. Gross Vehicle Weight Rating: The total permissible weight of the vehicle, including driving, passengers, and the vehicle itself with all options, and the load it is carrying, including all liquids. (Given all pounds and kilograms.)
3. Gross Axle Weight Rating - Front: The total permissible weight allowed for the front axle. (Listed in pounds and kilograms.)
4. Gross Axle Weight Rating - Rear: The total permissible weight allowed for the rear axle. (Listed in pounds and kilograms.)
5. Suitable Tire Choice: Tire recommended to meet handling and safety requirements. When replacing any tires on your vehicle, always replace with a tire that meets or exceeds these specifications.
6. Suitable Rim Choice: Front/Rear: Wheel rim recommended to meet handling and safety requirements. When replacing any rim, always replace with a rim that meets these specifications.
7. Cold Inflation Pressure: Front/Rear: Inflation pressure recommended (while cold) for the tires originally equipped on your vehicle. These pressure levels must be maintained to assure proper handling, safety, and fuel economy.
8. Rear Axle Wheel Configuration: Single, Dual, etc.
9. Serial Number: This is the serial number assigned to your vehicle by Winnebago Industries.
10. Vehicle Identification Number: This number is the legal identification number of your vehicle which will be used on your vehicle's Title Certificate and Owner Registration Certificate. It is permanently attached to the front left of the dashboard bracket and can be seen through the windshield from the outside of the vehicle.
11. Type: This blank states the usage classification to which your vehicle belongs.
12. Model: Lists the Winnebago product model number of your vehicle.
13. Color: Signifies the base color code number of the vehicle.

CONVERSION TABLE

DECIMAL AND METRIC EQUIVALENTS					
Fractions	Decimal In.	Metric MM	Fractions	Decimal In.	Metric MM
1/64	.015625	.39688	33/64	.515625	13.09687
1/32	.03125	.79375	17/32	.53125	13.49375
3/64	.046875	1.19062	35/64	.546875	13.89062
1/16	.0625	1.58750	9/16	.5625	14.28750
5/64	.078125	1.98437	37/64	.578125	14.68437
3/32	.09375	2.38125	19/32	.59375	15.08125
7/64	.109375	2.77812	39/64	.609375	15.47812
1/8	.125	3.1750	5/8	.625	15.87500
9/64	.140625	3.57187	41/64	.640625	16.27187
5/32	.15625	3.96875	21/32	.65625	16.66875
11/64	.171875	4.36562	43/64	.671875	17.06562
3/16	.1875	4.76250	11/16	.6875	17.46250
13/64	.203125	5.15937	45/64	.703125	17.85937
7/32	.21875	5.55625	23/32	.71875	18.25625
15/64	.234375	5.95312	47/64	.734375	18.65312
1/4	.250	6.3500	3/4	.750	19.05000
17/64	.265625	6.74687	49/64	.765625	19.44687
9/32	.28125	7.14375	25/32	.78125	19.84375
19/64	.296875	7.54062	51/64	.796875	20.24062
5/16	.3125	7.93750	13/16	.8125	20.63750
21/64	.328125	8.33437	53/64	.828125	21.03437
11/32	.34375	8.73125	27/32	.84375	21.43125
23/64	.359375	9.12812	55/64	.859375	21.82812
3/8	.375	9.52500	7/8	.875	22.22500
25/64	.390625	9.92187	57/64	.890625	22.62187
13/32	.40625	10.31875	29/32	.90625	23.01875
27/64	.421875	10.71562	59/64	.921875	23.41562
7/16	.4375	11.11250	15/16	.9375	23.81250
29/64	.453125	11.50937	61/64	.953125	24.20937
15/32	.46875	11.90625	31/32	.96875	24.60625
31/64	.484375	12.30312	63/64	.984375	25.00312
1/2	.500	12.70000	1	1.00	25.40000

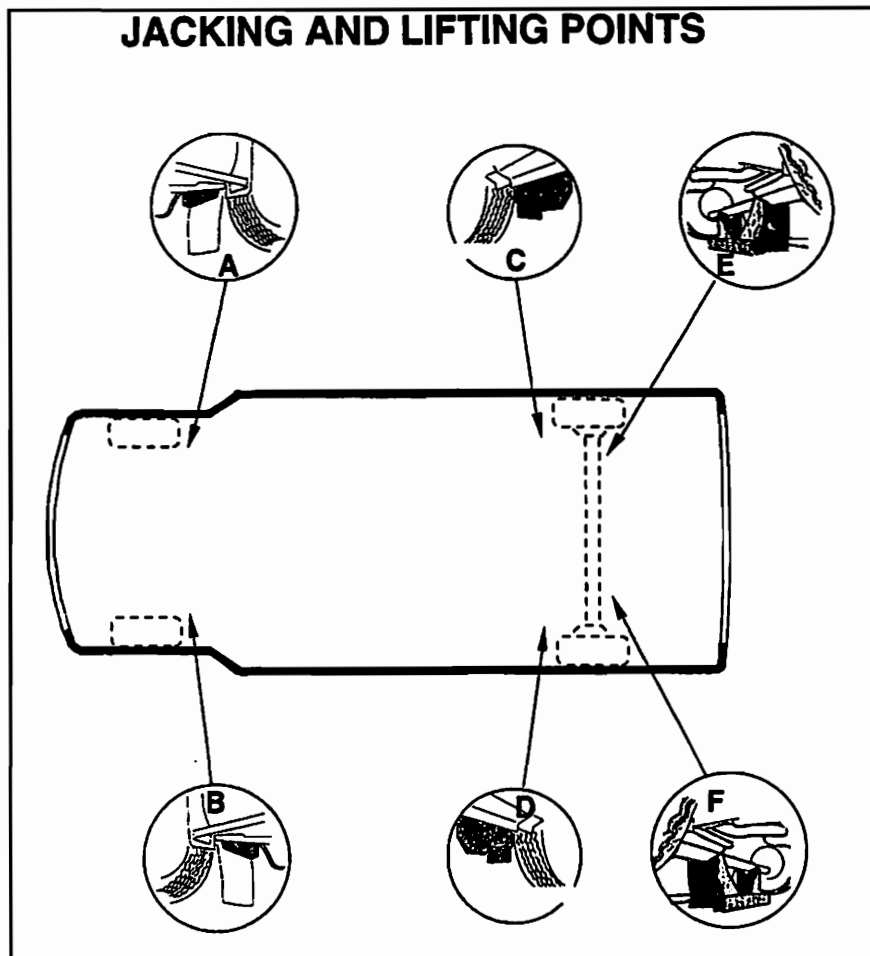
CONVERSION TABLE

Multiply	By	To Get Equivalent Number of:
LENGTH		
Inch	25.4	millimeters (mm)
Foot	0.304	meters (m)
Yard	0.914	meters
Mile	1.609	kilometers (km)
AREA		
Inch ²	645.2	millimeters ² (mm ²)
	6.45	centimeters ² (cm ²)
Foot ²	0.092	meters ² (m ²)
Yard ²	0.836	meters ²
VOLUME		
Inch ³	16.387	mm ³
	16.387	cm ³
	0.016	litres (l)
Quart	0.946	litres
Gallon	3.785	litres
Yard ³	0.764	meters ³ (m ³)
MASS		
Pound	0.453	kilograms (kg)
Ton	907.18	kilograms (kg)
Ton	0.907	tonne (t)
Ounce	31.25	grams
FORCE		
Kilogram	9.807	newtons (N)
Ounce	0.278	newtons
Pound	4.448	newtons
TEMPERATURE		
Degree Fahrenheit	(°F-32) - 1.8	degree Celsius (C)
ACCELERATION		
Foot/sec ²	0.304	meter/sec ² (m/s ²)
Inch/sec ²	0.025	meter/sec ²
TORQUE		
Pound-inch	0.112	newton-meters (N-m)
Pound-foot	1.355	newton-meters
Pound-foot	.1355	deca-newton meters (daNm)

CONVERSION TABLE

Multiply	By	To Get Equivalent Number of:
POWER		
Horsepower	0.746	kilowatts (kW)
PRESSURE OR VACUUM		
Inches of water	.354	bars
Pounds/sq. in.	.068	bars
ENERGY OR WORK		
BTU	1.055	joules (J)
Foot-pound	1.355	joules
Kilowatt-hour	3 600 000 or 3.6×10^6	joules
LIGHT		
Foot candle	1.076	lumens/meter ² (lm/m) ²
FUEL PERFORMANCE		
Miles/gal.	.0425	kilometers/liter (km/l)
Gal./mile	2.352	liter/kilometer (l/km)
VELOCITY		
Miles/hour	1.609	kilometers/hr (km/h)

JACKING AND LIFTING



When jacking or lifting the Rialta. Use the following lift points in accordance with the type of equipment used.

- A = Front crossmember behind right front tire.
- B = Front crossmember behind left front tire.
- C = Rear jack plate ahead of right rear tire.
- D = Rear jack plate ahead of left rear tire.
- E = Rear axle
- F = Rear axle

Tool	Jacking and Lifting Points
Service Jack (Provided with vehicle)	A, B, C, D
Frame Contact Lift (Twin Column Only!)	A, B, C, D
Axle Contact Lift (Two post movable piston)	A, B, E, F

CAUTION

Do NOT use the service jack to support the vehicle for any purpose other than changing a tire!

VEHICLE SPECIFICATIONS AND CAPACITIES

Automotive Fluid Capacities

● Fuel tank	21.1 gals. (80 liters)
● Automotive Transmission (ATF)	3.2 qts. (3 liters)
● Windshield Washer Container	7.3 qts. (7 liters)
● Engine Oil	
- with filter change	5.8 qts. (5.5 liters)
- without filter change	5.3 qts. (5.3 liters)

Coach Fluid Capacities

● Fresh water tank	16 gals. (60.56 liters)
● Water heater	4 gals. (15.14 liters)
● Gray water tank	6 gals. (22.71 liters)
● Black water tank	13 gals. (49.2 liters)
● LP Tank	28 lbs. (12.68 liters)

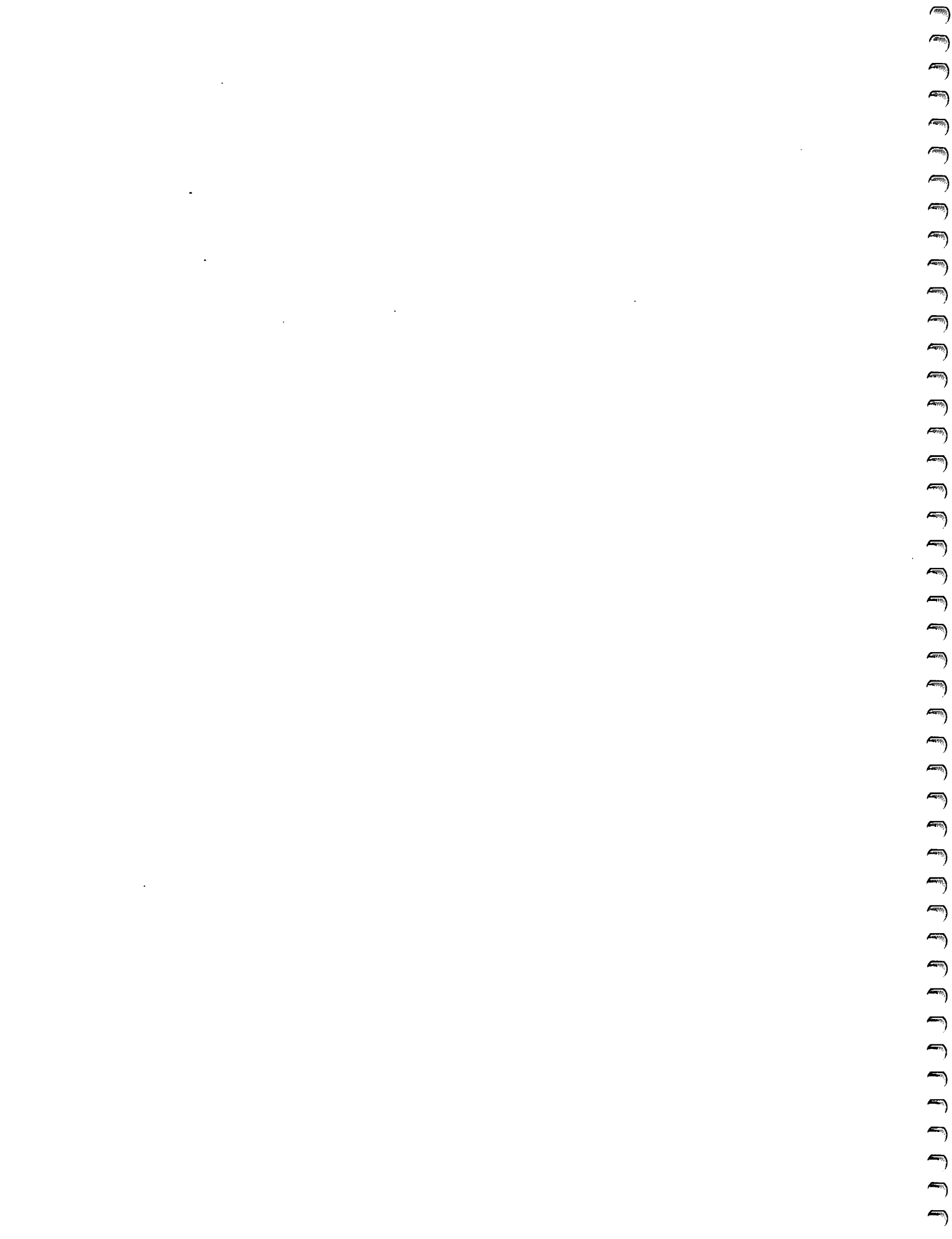
SPECIFICATIONS

● Length	20' 8"
Wheel base	152"
Exterior height - with roof air	8' 4"
- without roof air	7' 5"
● Exterior Width	7' 4"
● Interior Height (max.)	6' 2"
● Interior Width	6' 10.5"
● GVWR	7,000 lbs.
● GCWR	9,000 lbs.

SECTION 1 ELECTRICAL

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SECTION 1

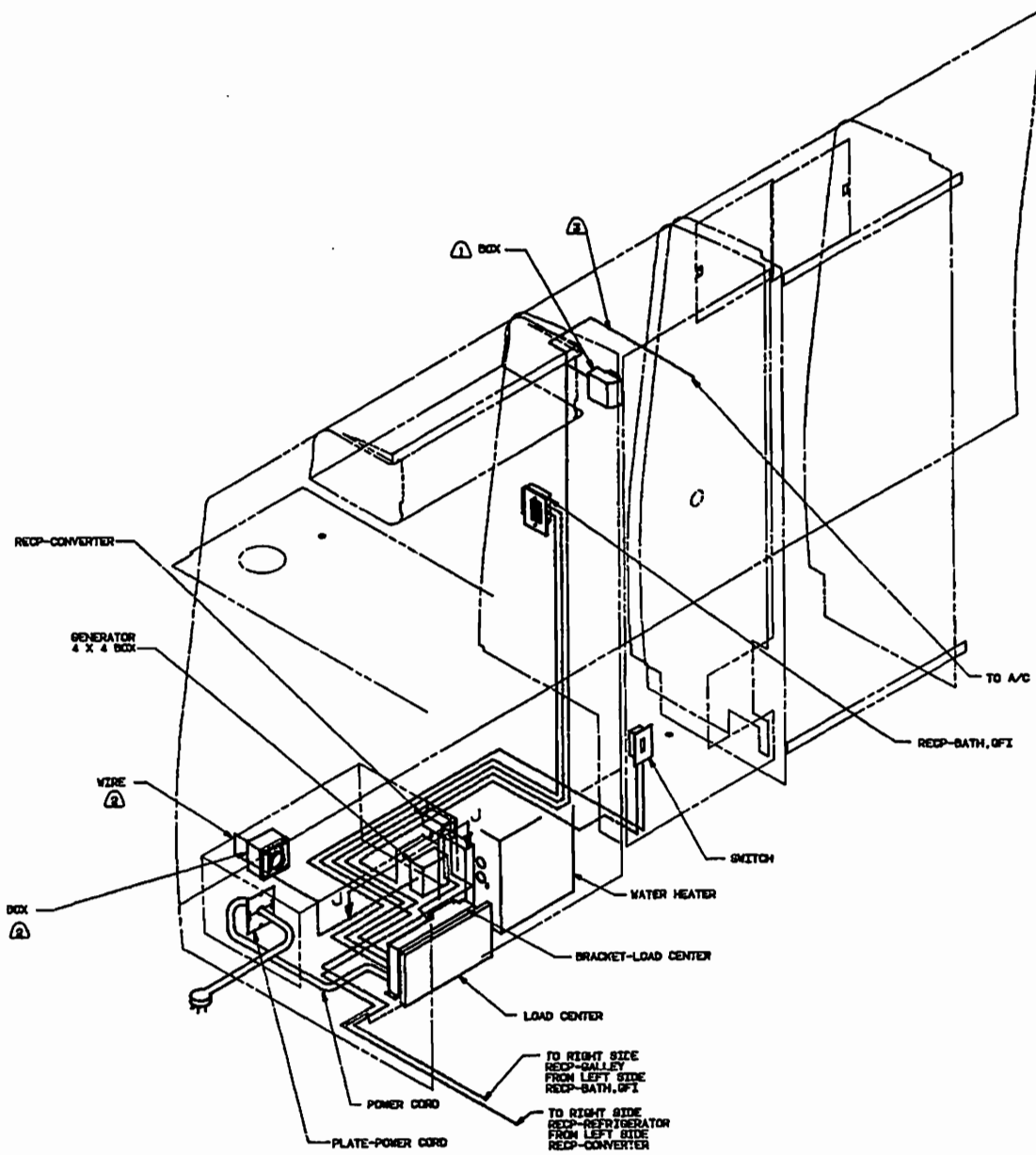
ELECTRICAL

ELECTRICAL

Winnebago installs two separate electrical systems in the Rialta. The 110-volt AC system and the 12-volt DC coach system.

The 110-volt system is comprised of the following components:

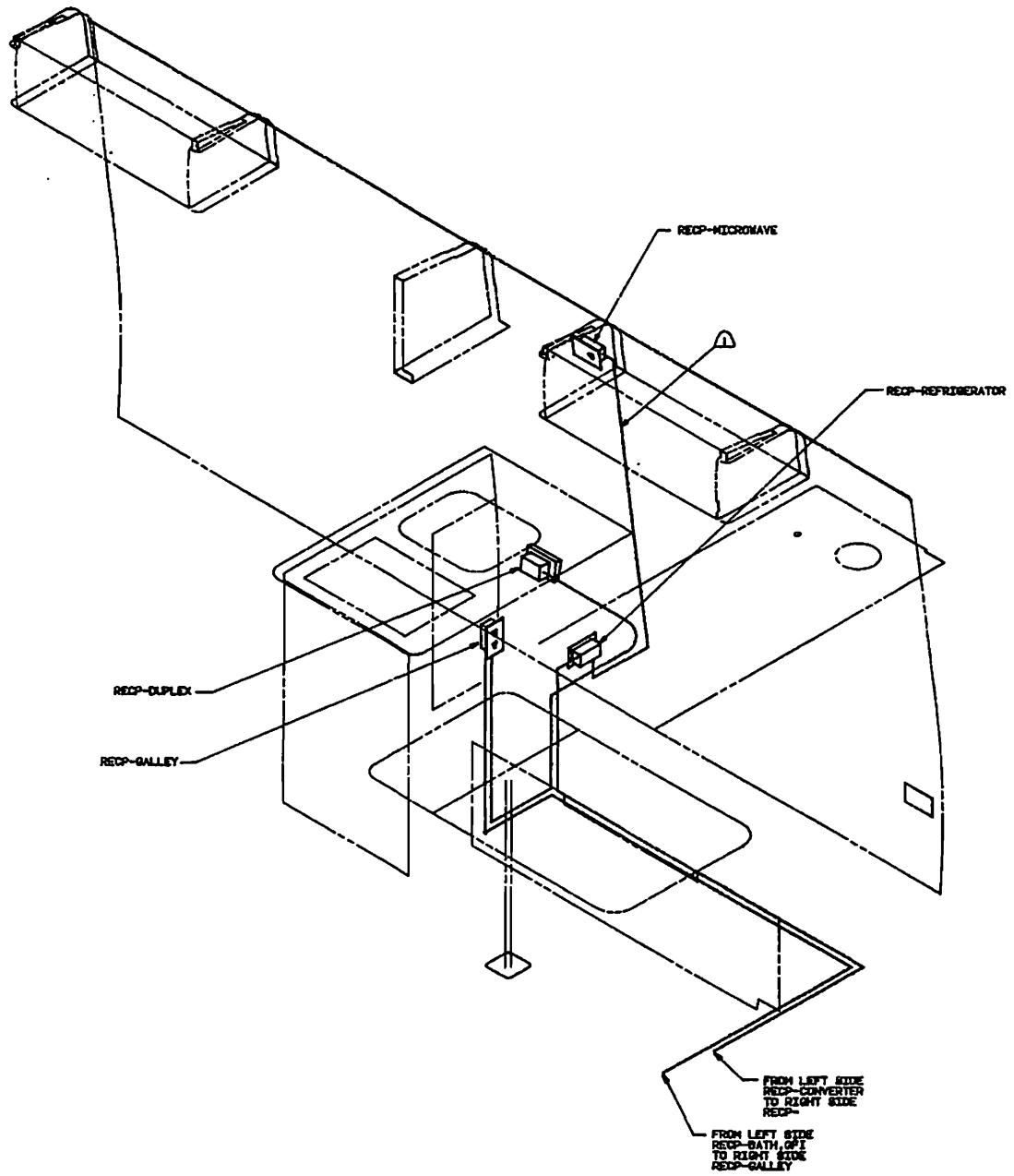
- Exterior shoreline power cord
- Load center
- Circuit breakers
- Receptacles
- Ground fault interrupter
- Generator



110V LEFT (US)

- ⚠ WITH FACTORY A/C ONLY.
- ⚡ USE WITH GENERATOR ONLY.
- ⚠ USE WITHOUT FACTORY A/C.

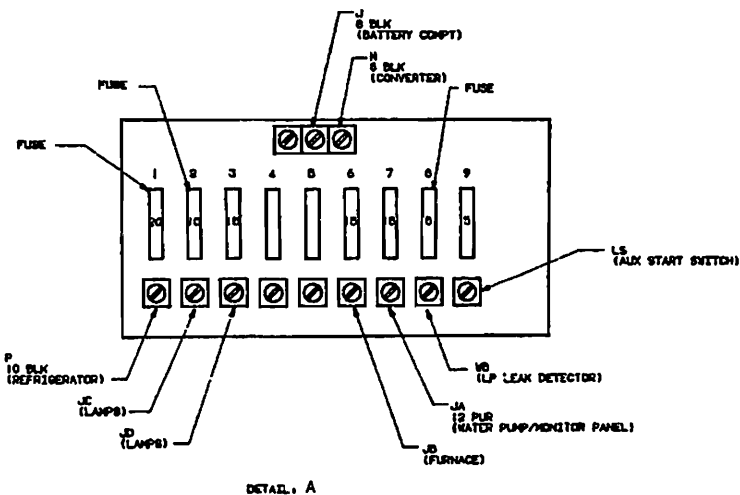
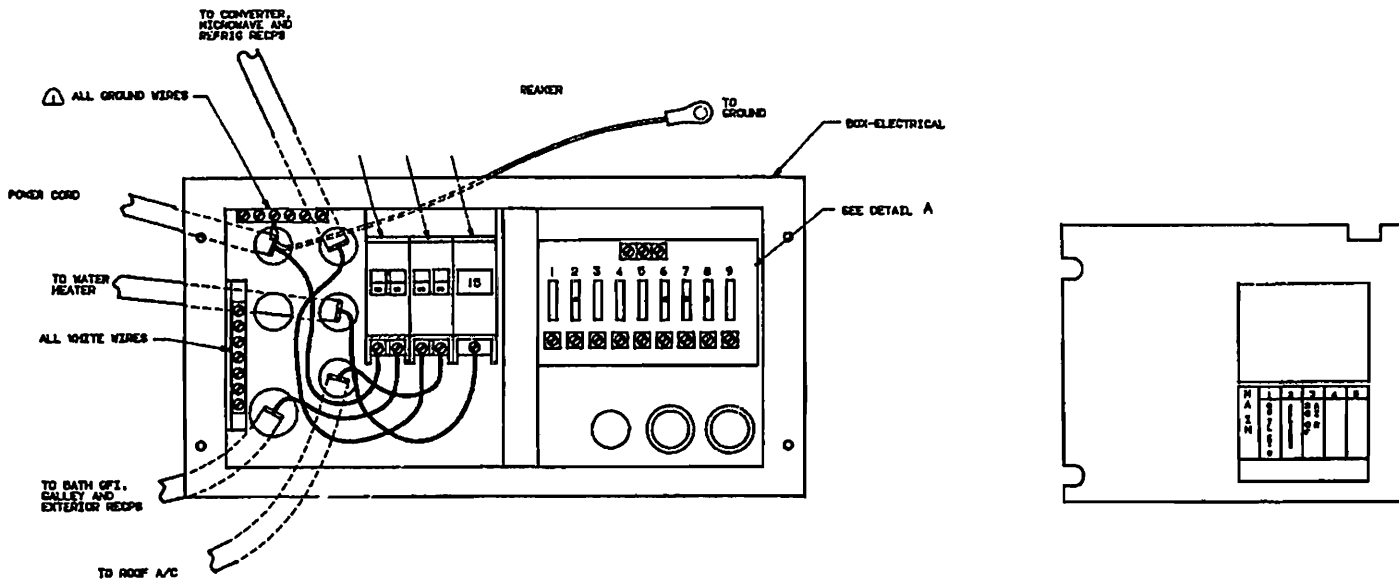
NOTES:



110V RIGHT (US)

⚠ WIRE ROUTED THRU SIDEMALL.

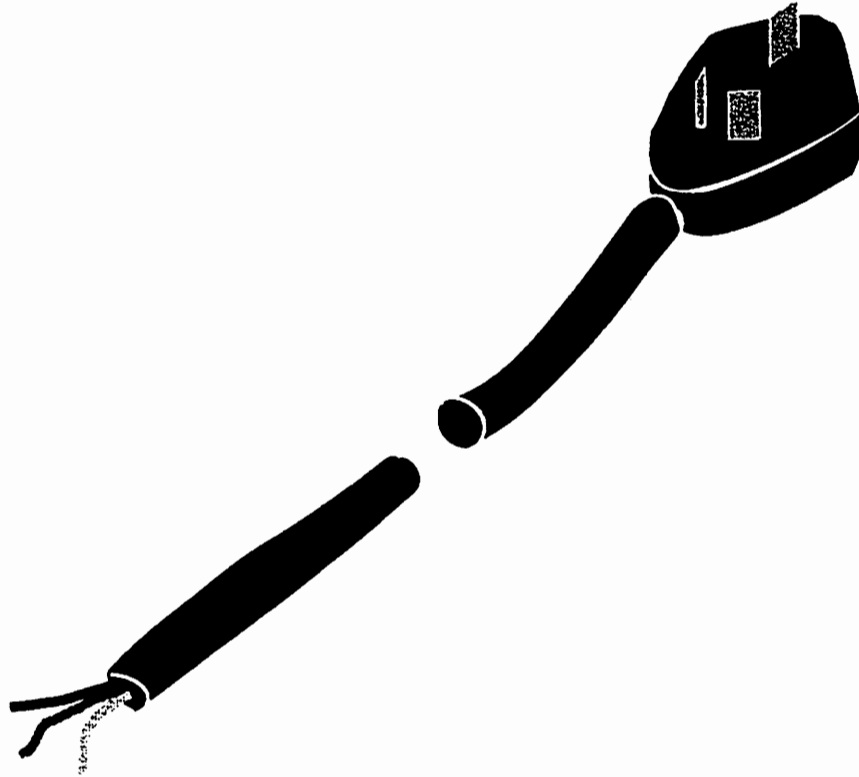
NOTES:



DETAIL A

LOAD CENTER (US)

ALL GROUND
NOTES:



SHORELINE POWER CORD

The shoreline power cord is located in the storage compartment on the left side of the rear cap. It is a 3-wire cable rated at 30 amps, which conducts 110-volt AC from a stationary power source (or the generator) to the load center.

CAUTION

Never use an extension cord or adapter that is not rated for 30 amp service!

TROUBLESHOOTING

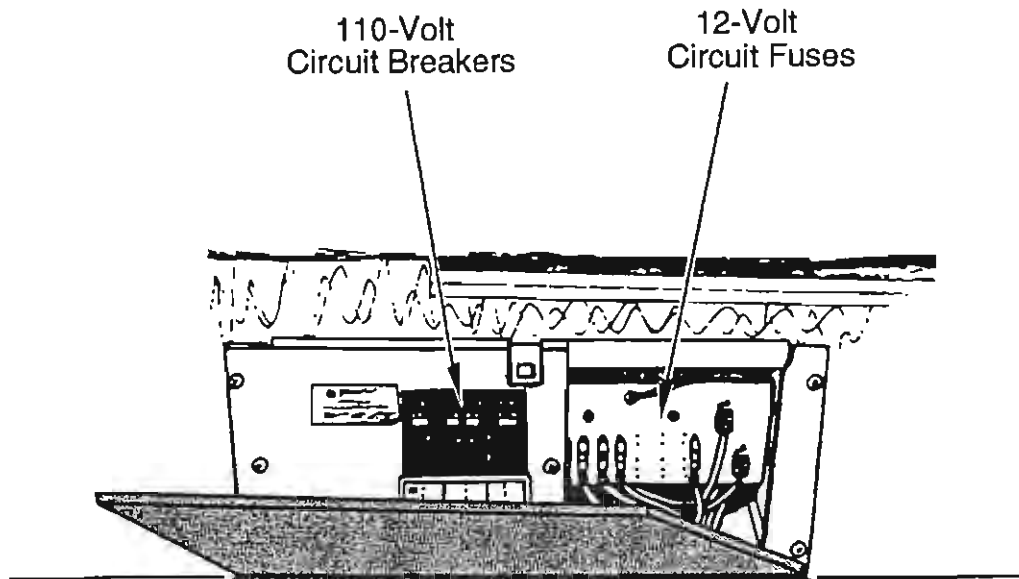
Symptom	Course of Action
1. If a failure of the power cord is suspected.	<ol style="list-style-type: none">1. Unplug shoreline from power source. Use a plug in continuity tester to verify that voltage is present at the power source. Are 110 volts available? (Yes) Proceed to Step 2. (No) Contact proper personnel to repair cause of voltage loss.2. Visually inspect power cord for damage. Is damage evident? (Yes) Proceed to Step 6. (No) Proceed to Step 3.3. Remove cover from the load center (reference "Load Center" in this section.) Inspect connections. Is there evidence of poor connections or other damage? (Yes) Repair. (No) Proceed to Step 4.4. Note locations of connections. Remove wires from the hot, neutral, and ground connections. Disconnect power cord wires from the load center. Use an ohmmeter to test the hot, neutral, and ground wires individually for high resistance or an open wire? (Yes) Proceed to Step 6. (No) Repeat this test while wiggling the power cord. Pay special attention to the point where the male plug in head mates to the cable body. Did this test show evidence of high resistance or open? (Yes) Proceed to Step 6. (No) Proceed to Step 5.5. You should only arrive at this point if the power cord has passed previous tests. The malfunction is downstream of the power cord. Begin diagnosis at the load center.6. Replace shoreline power cord. Refer to "Shoreline Power Cord Replacement."

POWER CORD REMOVAL

1. Disconnect power cord from shoreline or generator power.
2. Remove power cord plate retaining screws (6) (located in left rear cap trunk). Pull plate free of rear cap.
3. Disconnect power cord wires at load center. Note location of wire connections for ease of later installation.
4. Loosen power cord connector at load center. Pull cord free of load center. Remove connector from cable.
5. Remove any clamps retaining the power cord.
6. Pull power cord free of the vehicle.

POWER CORD REPLACEMENT

1. Place connector for power plate into cord.
2. Route cord through rear cap and back wall up to the load center.
3. Place connector for load center into cord. Route cord into load center.
4. Make wire connections at load center. Tighten cord connector at load center.
5. Install any power cord retaining clamps.
6. Install power plate into power plate connector, tighten connector.
7. Install power plate to rear cap. Secure with (6) retaining screws.



LOAD CENTER

The load center functions as a distribution point at which the various 110-volt AC and 12-volt DC circuits branch off from their main power supplies.

110-volt AC power is fed into the load center via the power cord which is connected to either stationary shoreline power or the generator receptacle.

12-volt DC power is fed into the load center from the auxiliary battery via Wire J, or when the 110-volts AC is available from the converter via Wire M. (NOTE: Wires J and M are not physically marked. Reference "Wiring Diagrams" in this section.)

The load center also houses the circuits overcurrent protection; 110-volt circuit breakers and 12-volt fuses.

TROUBLESHOOTING THE CONTROL CENTER AND ITS CIRCUIT

SYMPTOM	COURSE OF ACTION
<p>1. One or more 110-volt loads are inoperative. 110 volts available from shoreline hook-up or generator.</p>	<ol style="list-style-type: none"> 1. Reference appropriate 110-volt wiring diagram to determine what other loads are on the affected circuit. Proceed to Step 2. 2. Attempt to operate other loads on the circuit. Do other loads function? (Yes) Proceed to Step 3. (No) Proceed to Step 5. 3. Check for 110 volts at the load. Are 110 volts present? (Yes) Failure is in the load. Repair or replace. (No) Proceed to Step 4. 4. Disconnect motor home from shore power. Disconnect negative leads from batteries to render generator set inoperable. Use an ohmmeter to test for resistance and continuity on individual wires between last operative load in the circuit and the first inoperative load. Does this test indicate high resistance or an open in any wire? (Yes) Replace or repair the wire. (No) Visually inspect the wire to determine the cause of voltage loss. Repair or replace as necessary. 5. Locate circuit breaker for affected circuit in control center. Reset. If loads are not functional, test for 110 volts at breaker output. Are 110 volts present? (Yes) Proceed to Step 6. (No) Proceed to Step 7. 6. Disconnect motor home from shore power. Disconnect negative leads from batteries to render generator set inoperative. Use an ohmmeter to check for high resistance or "open" in individual wires in the circuit between circuit breaker and first inoperative load. Does this test indicate high resistance or an open? (Yes) Replace or repair affected wiring. (No) Using a self-powered test, check for continuity between the hot wire and ground. The hot wire and the neutral wire and the neutral wire-to-ground. Continuity indicates a wire-to-ground or wire to wire short. Repair or replace wiring as necessary. 7. Check for 110 volts at input to breaker. Are 110 volts present? (Yes) Replace the breaker. (See 110-Volt Breaker Removal/Installation this section.) (No) Proceed to Step 8.

SYMPTOM	COURSE OF ACTION
	<ol style="list-style-type: none"><li>8. Locate main circuit breaker in control center. Reset. If loads are not functional, check for 110 volts at main breaker output. Are 110 volts present? (Yes) Proceed to Step 9. (No) Proceed to Step 10.<li>9. Disconnect motor home from shore power. Disconnect negative leads from batteries to render generator set inoperative. Note location of breakers. Remove breakers from control center. (See Breaker Removal/Replacement this section.) Inspect breakers and bus bar for damage. Repair or replace as necessary.<li>10. Check for 110 volts at the control center main breaker input. Area 110 volts present? (Yes) Replace the breaker. (See 110-volt Breaker Removal/Installation this section.) (No) The failure is between the shore power connection input and the control center (See Shoreline Power Cord Troubleshooting in this section).

TROUBLESHOOTING

SYMPTOM	COURSE OF ACTION
<p>1. 12-volt DC loads are inoperative from battery power, but function properly when vehicle is connected to 110-volt AC power.</p> <p><i>*10, 8, and 6 gauge wires are not imprinted. Codes listed for heavy gauge wires are for wiring diagram reference only.</i></p>	<ol style="list-style-type: none"> 1. Check auxiliary battery terminals. Are they clean and tight? (Yes) Proceed to Step 2. (No) Clean and tighten as necessary. 2. Check auxiliary battery voltage. Is battery fully charged? (Yes) Proceed to Step 3. (No) Recharge or replace as necessary. 3. Disconnect vehicle from 110-volt AC power. Check for 12 volts DC on Wire J* at the circuit breaker in the auxiliary battery box. Is voltage present? (Yes) Proceed to Step 4. (No) Proceed to Step 5. 4. Check for 12-volts DC on Wire J* at the load center. Is voltage present? (Yes) Check connections at load center for tightness and corrosion. Tighten and clean as necessary. (No) Troubleshoot Wire J to determine the cause of voltage loss. Repair or replace as necessary. 5. Check for 12-volts DC on Wire A* at the circuit breaker located in the auxiliary battery box. Is voltage present? (Yes) Proceed to Step 6. (No) Troubleshoot the circuit back to auxiliary battery to determine the cause of the voltage loss. Repair or replace as necessary. 6. Reset the circuit breaker by removing Wire A*. Then reconnect Wire A.

LOAD CENTER REMOVAL

CAUTION

Disconnect motor home from shore power or generator. Disconnect negative lead from auxiliary battery.

1. Access backside of load center by removing the lower seat cushion of the left dinette seat. Reference "Dinette Seat Removal" in Interior Section.
2. Open load center cover. Remove (4) screws retaining load center.
3. Note the locations of the following wires:
 - A. Power cord input
 - B. 110-volt AC outputs to branch circuits
 - C. Wire J auxiliary battery input
 - D. Wire M converter input
 - E. 12-volt DC outputs to branch circuits
4. Loosen and remove wires from appropriate connectors.
5. Remove load center retaining strap by removing (4) retaining screws.
6. Pull load center forward out of its enclosure.

LOAD CENTER REPLACEMENT

CAUTION

Disconnect motor home from shoreline or generator power. Disconnect negative lead from auxiliary battery.

1. Position load center into opening. Secure with (4) retaining screws.
2. Position retaining strap over load and secure with (4) screws.
3. Reconnect wires to proper locations as noted in Step 3 of "Load Center Removal."
4. Reconnect auxiliary battery negative lead.
5. Close load center cover.

110-VOLT AC CIRCUIT BREAKERS

The 110-volt AC circuit breakers are housed in the load center. They provide overcurrent protection for the various 110-volt AC branch circuits.

110-VOLT CIRCUIT BREAKER REMOVAL

CAUTION

Disconnect motor home from shore power. Disconnect negative cables from batteries to render generator set inoperative.

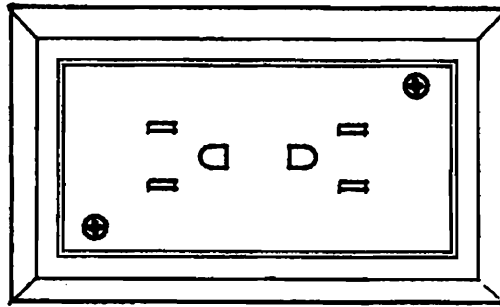
1. Access breakers by removing control center cover.
2. Grasp the individual breaker to be removed at the upper portion of its housing. Pull the breaker outward until it comes free of the bus bar. Then lift the breaker upward slightly to clear the retaining tab.
3. Loosen terminal set screw at bottom side of breaker. Remove wire from terminal.

110-VOLT CIRCUIT BREAKER INSTALLATION

CAUTION

Disconnect motor home from shore power. Disconnect negative leads from batteries to render generator set inoperative.

1. Insert appropriate wire into terminal at bottom side of breaker. Tighten terminal set screw.
2. Position breaker onto retaining tab.
3. Apply pressure to the upper face of the breaker, pushing it back until it seats on the bus bar tab.
4. Replace control center cover.



RECEPTACLES

The 110-volt AC receptacles are self-contained units. They do NOT require the use of a standard electrical outlet box. The outlet has two pieces, the box assembly and the snap-on cover. It is held in place by two pawl clamps.

RECEPTACLE REMOVAL

CAUTION

Vehicle must be DISCONNECTED from 110-volt shore power!

1. Loosen screws (2) on box assembly.
2. Pull outlet forward out of mounting hole.
3. Pry snap-on cover locking tabs outward to remove snap-on cover.

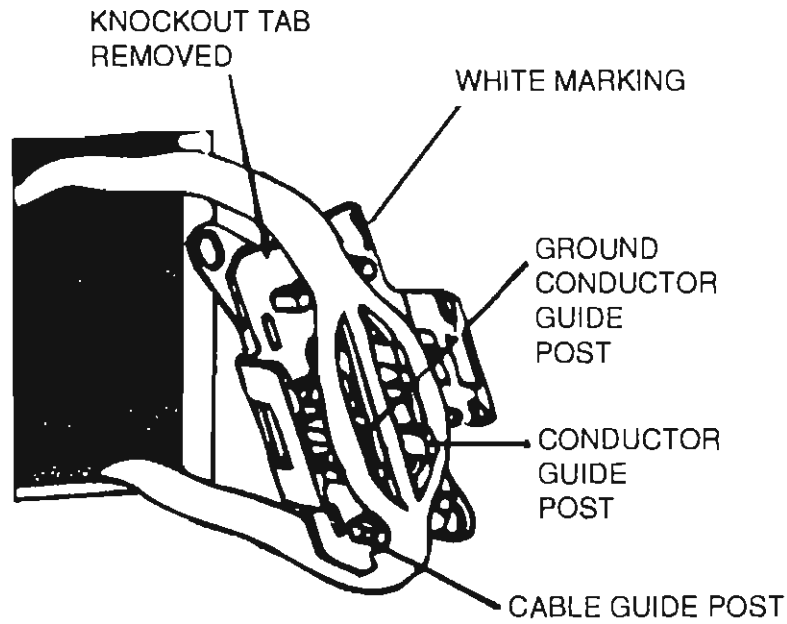
RECEPTACLE REPLACEMENT

CAUTION

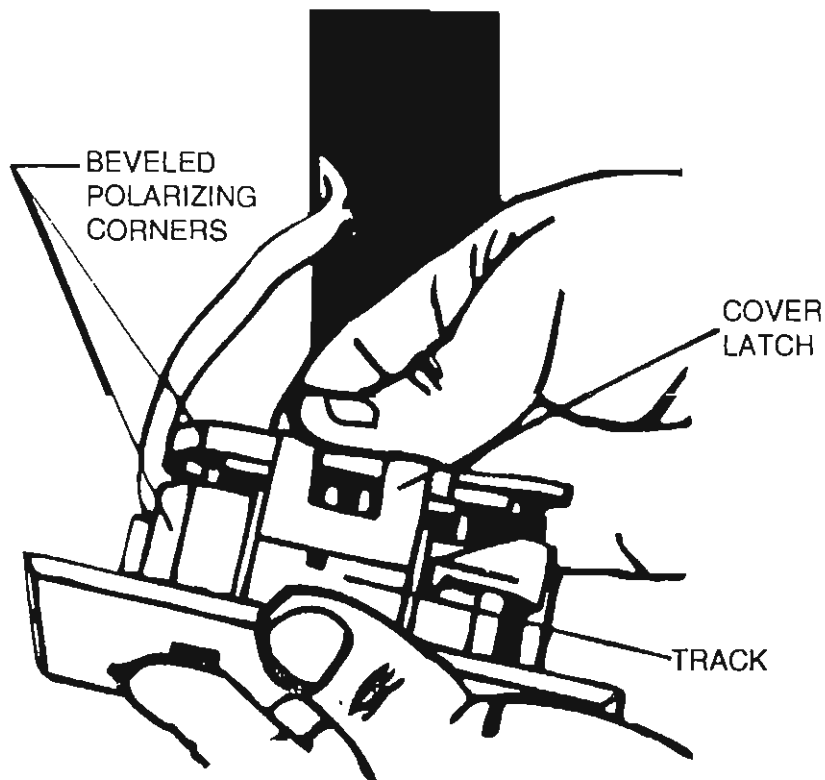
Vehicle must be DISCONNECTED from 110-volt shore power!

NOTE: If you are installing new non-metallic sheathed cable, the following conditions must be observed:

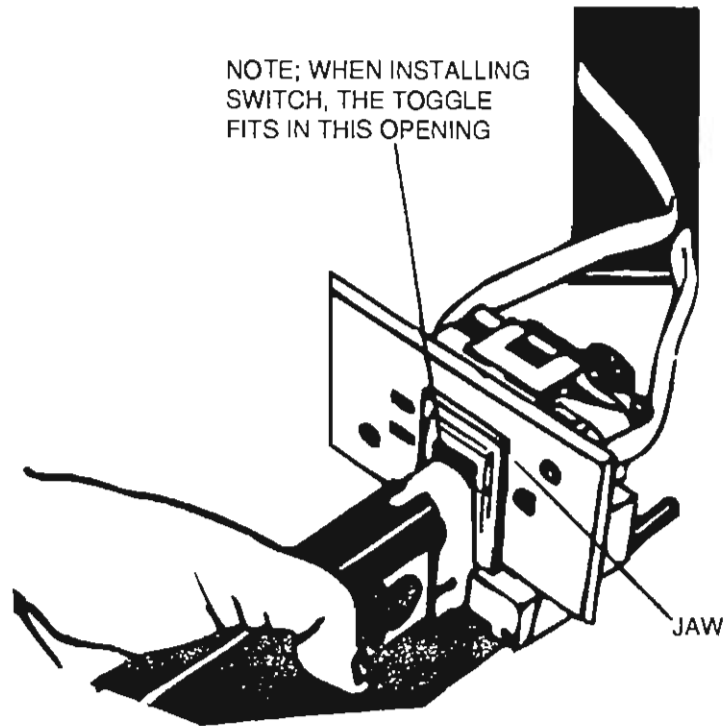
- A. Slit cable sheathing 1 1/2 inches from connection point.
- B. Leave at least 4 inches of spare cable.



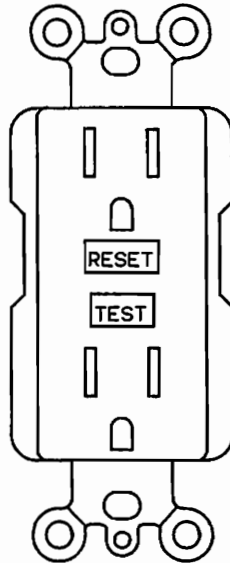
1. Place 110-volt wires into position as indicated on the snap-on cover.



2. Place snap-on cover and box assembly into proper position; taking care to align the beveled corners of the box assembly and the snap-on cover.



3. Use an outlet press (Winnebago Part Number 801627-01-000) to press the snap-on cover and body assembly together.
4. Place outlet in wall opening.
5. Tighten mounting screws (2).



RECEPTACLE WITH GFI ASSEMBLY

The GFI device protects against hazardous electrical shock that may be caused if the human body becomes a path through which electricity travels to reach ground. This could happen when touching an appliance or cord that is "live" through faulty mechanism, damp or worn insulation, etc. You don't even have to be on the ground itself to be shocked, you could be touching metal or other material that leads to ground.

When protected by the GFI, a person may still feel a shock, but the GFI should cut it off quickly enough so a person in normal health should not have serious electrical injury. (Infants and very small children may still be affected.)

WARNING

The GFI will NOT protect against:

- Line-to-line shocks (the kind you would receive when touching metal inserted into the straight slots of an electrical outlet);
- Current overloads or line-to-line short circuits. The fuse or circuit breaker at the distribution box or panel must provide such protection.

CAUTION

If the GFI trips of its own accord, this indicates a possible ground fault condition, which is potentially hazardous. Investigate the ground fault condition at once by making a thorough check to determine where the ground fault exists in the equipment plugged into the GFI. Correct the defect at once. Carry out the test procedure outlined below to ensure that the GFI is operating properly. If the GFI does not reset, this indicates a ground fault still exists and must be corrected.

GFI TEST PROCEDURE

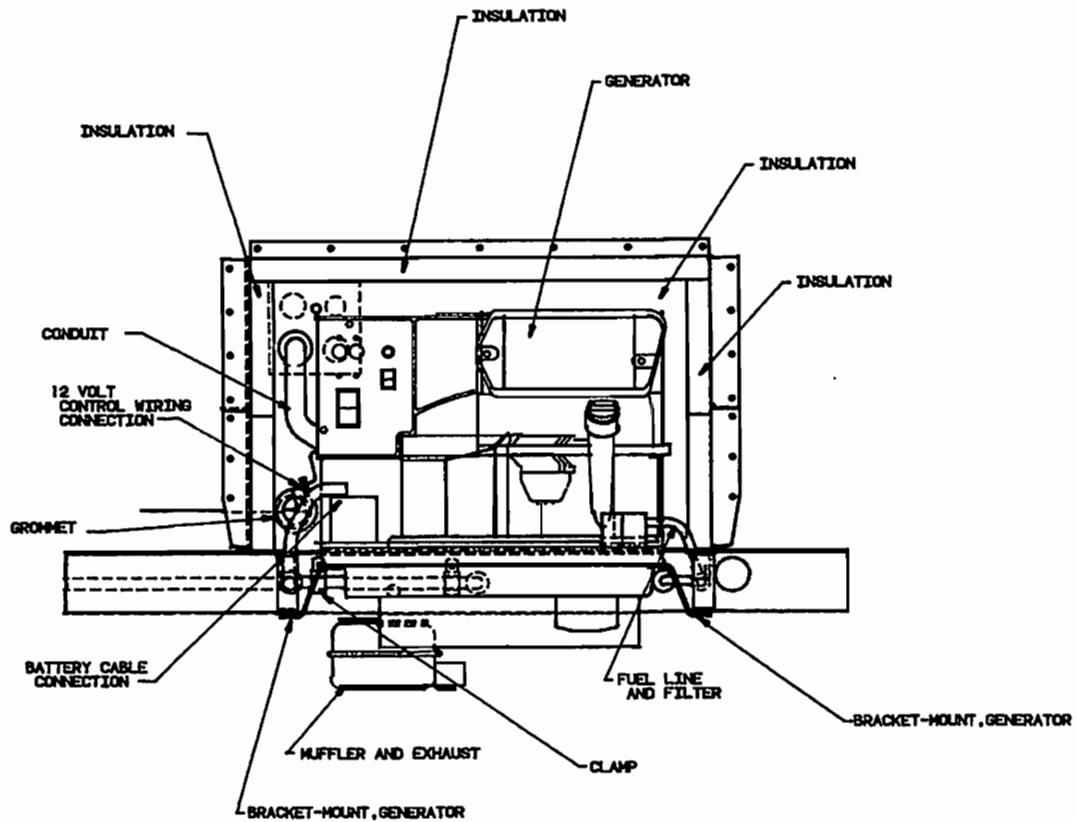
The GFI outlet should be checked every month to make sure it is operating properly.

1. With shoreline power connected, push the TEST button. The RESET button should pop out from the inner surface. This should result in power being OFF at all outlets. Verify by plugging test lamp into every outlet.

CAUTION

If RESET button does not pop out or if test lamp remains lit when RESET button does pop out, **DO NOT USE ANY OUTLETS ON THE CIRCUIT.** Troubleshoot the electrical system to determine cause of fault. Repair as necessary.

2. If the GFI tests okay, restore power by pushing the RESET button back in. **THE RESET BUTTONS MUST BE PUSHED FIRMLY AND FULLY INTO PLACE UNTIL IT LOCKS AND REMAINS DEPRESSED AFTER PRESSURE HAS BEEN REMOVED. IF THE GFI FAILS TO RESET PROPERLY, DO NOT USE.** Troubleshoot the electrical system to determine cause of fault. Repair as necessary. Test lamp should again light.
3. **IF GFI TRIPS BY ITSELF at any time, rest it and perform Test Procedures 1 and 2 above. IF RESET BUTTON DOES NOT POP OUT WHEN TEST BUTTON IS DEPRESSED, DO NOT USE.**



GENERATOR

The auxiliary generator is powered by gasoline drawn via a pick-up tube in the sending unit from the vehicle gas tank.

NOTE: The pick-up tube is positioned so that the generator will not draw out the gasoline in the bottom 1/4 of the tank.

110-volt power from the generator is supplied to the shoreline receptacle box. To supply the coach with power from the generator, it is necessary to plug the shoreline cord into the shoreline receptacle box.

GENERATOR TROUBLESHOOTING

SYMPTON	COURSE OF ACTION
1. If no generator output is suspected.	<ol style="list-style-type: none">1. Check breaker(s) on generator. Reset. Is generator output available? (Yes) Proceed to Step 2. (No) Proceed to Step 3.2. A blown breaker may be evidence of trying to use more amperes than are available on the circuit. Reduce total amperage draw. If the breaker(s) continue to open, proceed to Step 3.3. Generator set Troubleshooting and repair should be performed only by trained technicians. Trained technicians should refer to the appropriate manufacturer's specifications and shop manuals. <div style="border: 1px solid black; text-align: center;">CAUTION</div> <div style="border: 1px solid black; padding: 5px;">Generator set troubleshooting, repair, and adjustment should NOT be performed by unauthorized personnel.</div>

GENERATOR REMOVAL

1. Place ignition key in OFF position.
2. Disconnect negative lead from chassis battery.
3. Disconnect tailpipe from generator muffler.
4. Disconnect battery cable from generator.
5. Disconnect 12-volt control wiring connector at generator.
6. Disconnect fuel line from filter at generator.
7. Remove the junction box cover from junction box containing generator output wiring (located under the left dinette seat). Note the location of connections for ease of later installation. Remove wire nuts from ground wire, neutral wire, and hot wire. Loosen the cable retaining clamp located at the junction box. Remove generator output wiring from junction box by gently pulling on sheathed cable.
8. Support the generator set using a drivetrain removal lift.

CAUTION

Generator set must be supported prior to removal of generator retaining bolts due to the weight of the generator set.

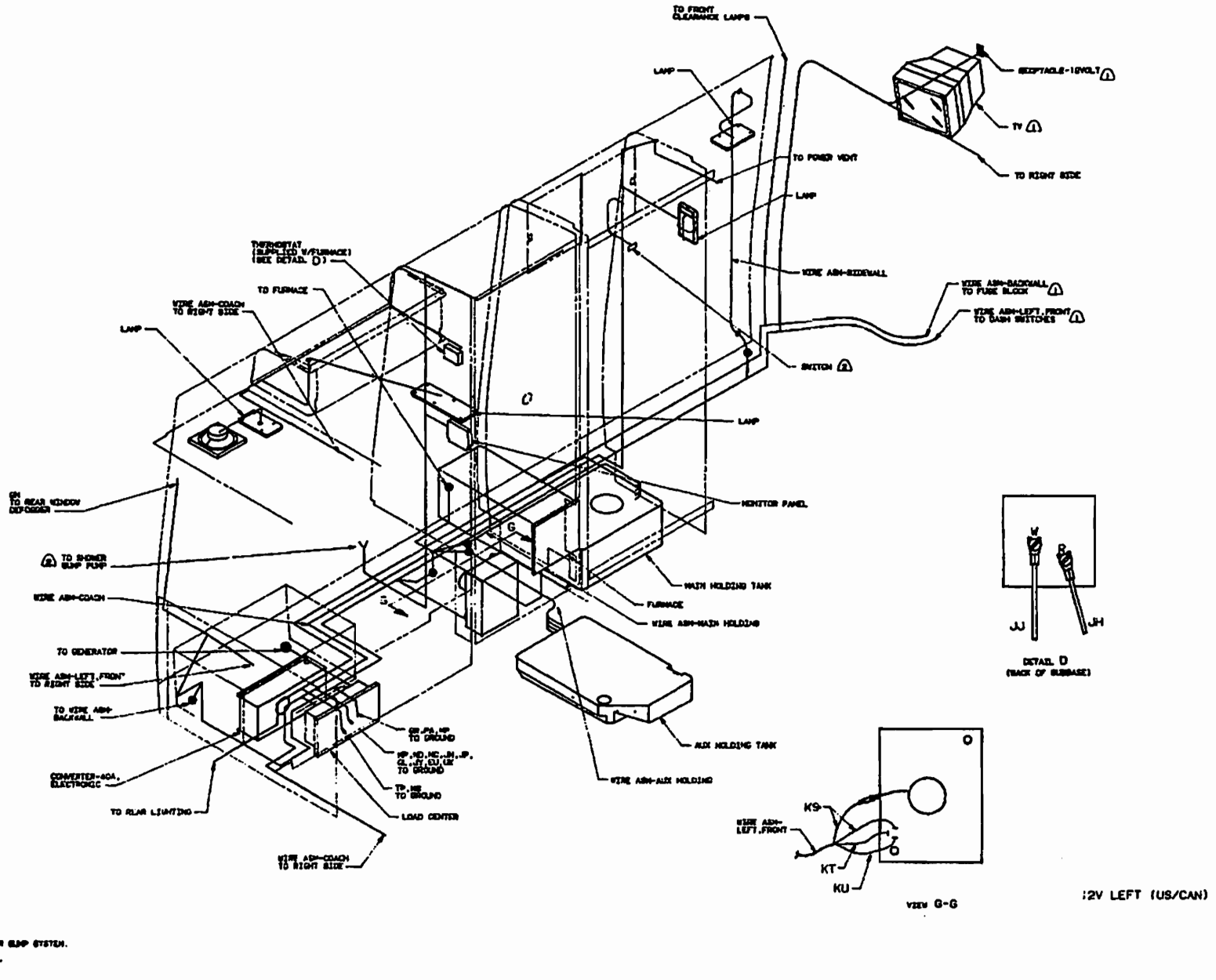
9. Remove generator (4) retaining bolts. Lower generator set. Remove from vehicle.

GENERATOR REPLACEMENT

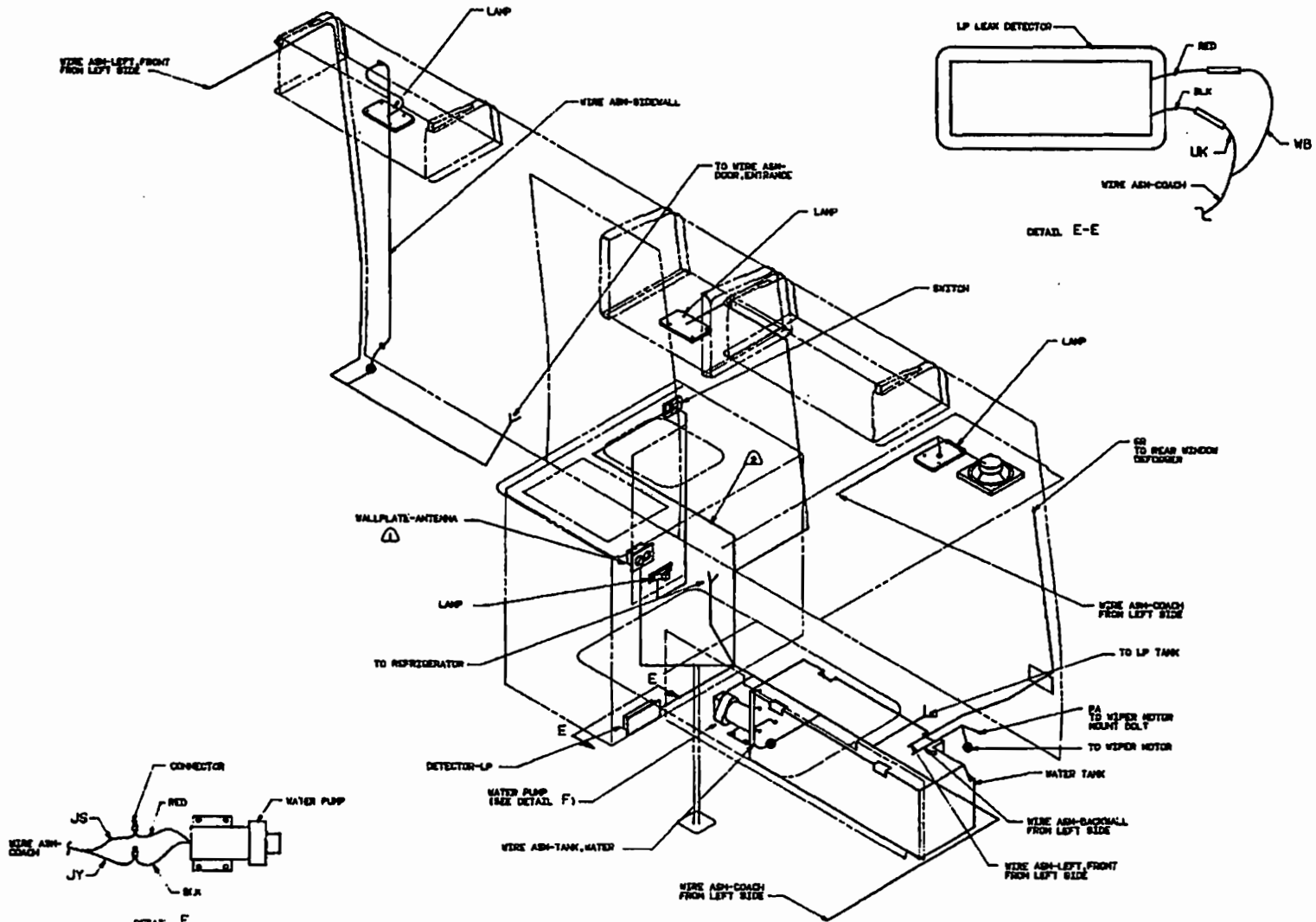
1. Lift generator set into position using a drivetrain remove lift or equivalent.
2. Insert (4) generator retaining bolts. Tighten.
3. Route sheathed cable to junction box. Insert generator output wiring through the cable connector into junction box. Connect wiring as noted during removal. Apply wire nuts. Tighten the cable retaining clamp.

NOTE: The sheathed protective cable should be firmly seated in the connector. Do NOT apply clamp pressure directly to unprotected wires. Install the junction box cover.

4. Attach and secure fuel line to fuel filter on generator.
5. Connect 12-volt control wiring to connector at generator.
6. Connect and secure battery cable to generator.
7. Connect and secure tailpipe to generator muffler.
8. Connect negative lead to chassis battery.



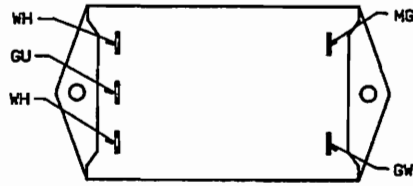
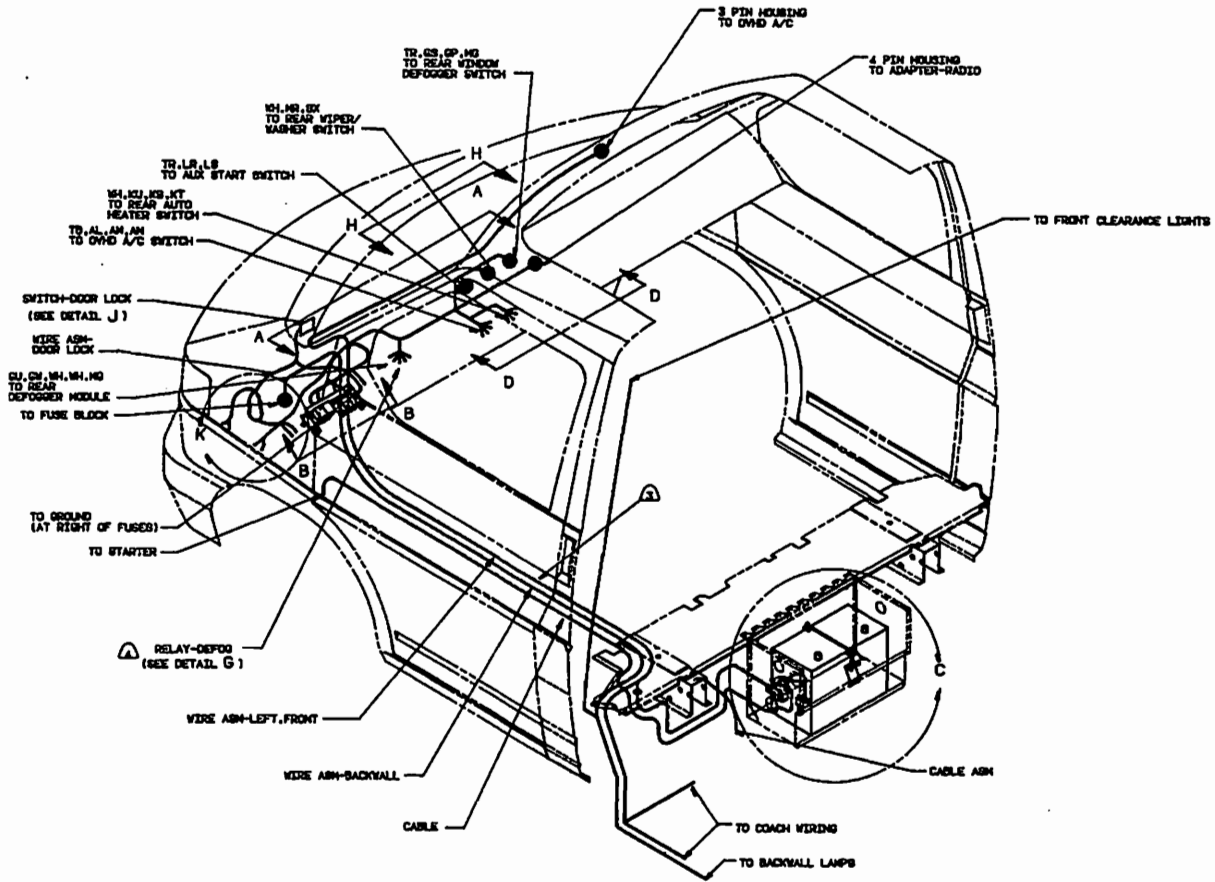
Rialta



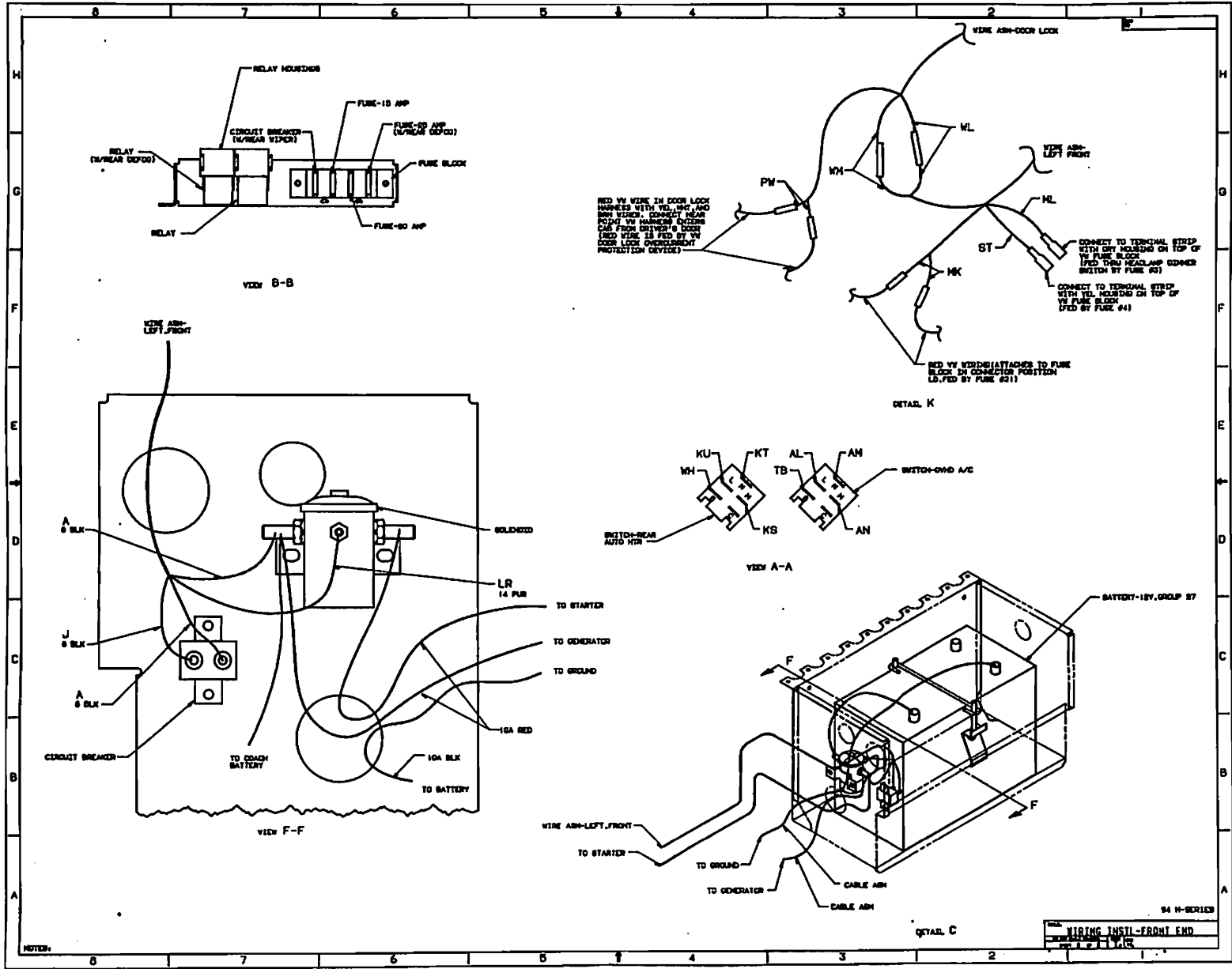
12V RIGHT (US/CAN)
94 H-SERIES

WIRING INSTL-BODY

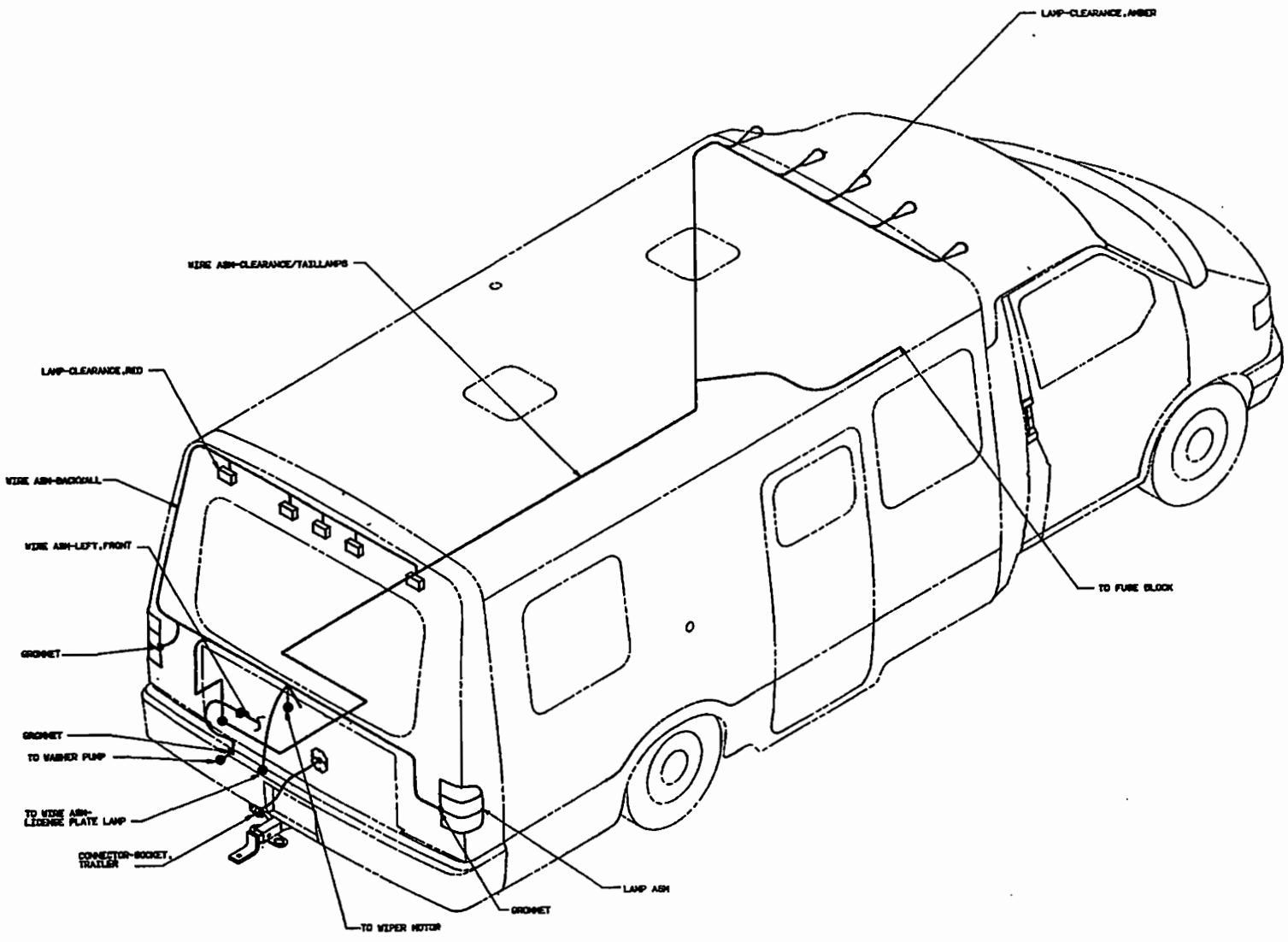
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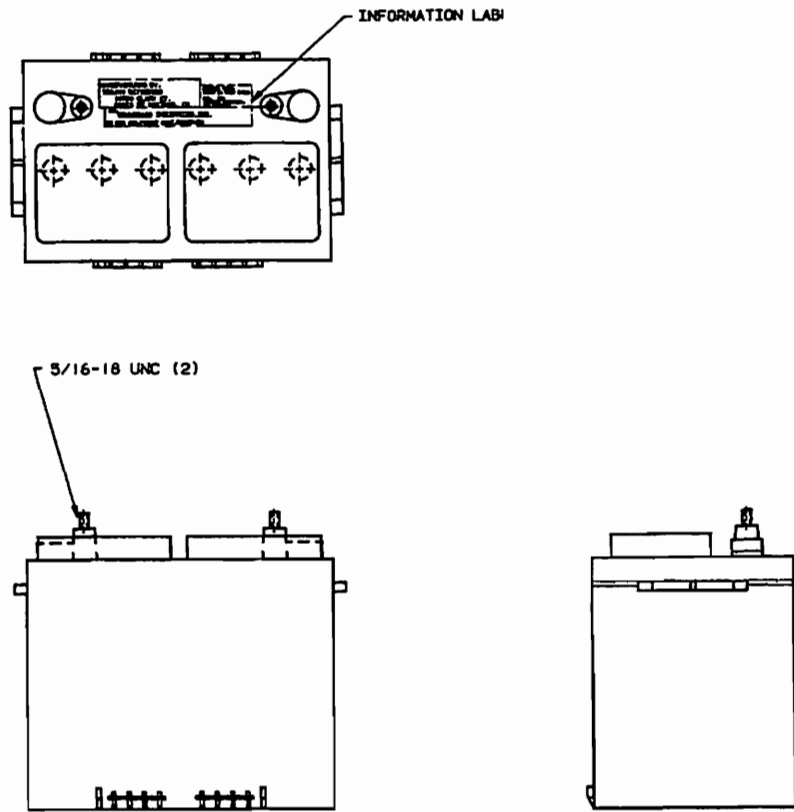


DETAIL G
TOP VIEW



EXTERIOR LIGHTING





GEN.MOTORHOME

Battery - 12V, Storage, GRP 31
130 Amp Hour
225 Minutes Reserve Capacity

AUXILIARY BATTERY

The auxiliary (house) battery is a 12-volt deep-cycle battery. It is located in the auxiliary battery compartment which is in the floor of the vehicle behind the cab area.

Access to the battery is gained by removing the auxiliary battery compartment cover.

The auxiliary battery is charged by the following two methods:

1. When the vehicle is connected to shoreline or generator 110-volt AC power, the converter provides a "trickle" charge to the auxiliary battery.
2. When the vehicle engine is running, the alternator provides a charge to the auxiliary battery. This is accomplished with the auxiliary start system. Reference "Auxiliary Start System" in this section.

AUXILIARY BATTERY REMOVAL

1. Ignition key in the OFF position.
2. Unlatch and remove the auxiliary battery compartment cover.
3. Loosen and remove the battery cables.

CAUTION

Remove the negative battery cable **FIRST** to reduce chances of arcing.

4. Loosen and remove (2) battery tie-down nuts.
5. Remove battery tie-down bracket.
6. Remove battery.

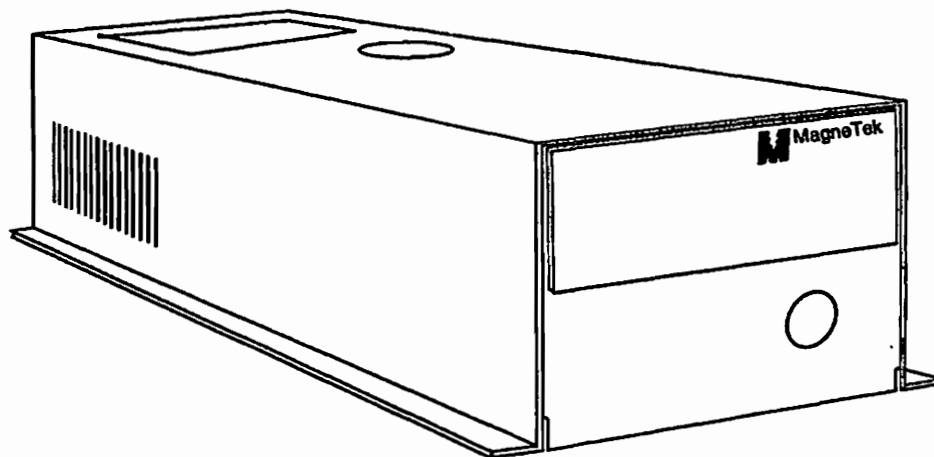
AUXILIARY BATTERY REPLACEMENT

1. Place battery into auxiliary battery compartment.
2. Position battery tie-down bracket over battery. Secure with (2) battery tie-down nuts.
3. Connect and tighten battery cables.

CAUTION

Connect the negative cable **LAST** to reduce chances of arcing.

4. Replace auxiliary battery compartment cover and latch.



CONVERTER

The converter is located in the left rear of the vehicle, beneath the left dinette seat. It accepts 110-volt AC and outputs 12-volts DC which is used to charge the auxiliary (house) battery and to operate the 12-volt DC loads. The convertor is rated for 40 amp output.

TROUBLESHOOTING THE CONVERTER

SYMPTOM	COURSE OF ACTION
<p>1. Auxiliary battery is not being charged when vehicle is connected to 110-volt AC power.</p>	<p>1. Turn ignition key to OFF position. Disconnect vehicle from shoreline or generator 110-volt AC power.</p> <p>Fully charge auxiliary battery, clean and tighten battery connections. Proceed to Step 2.</p> <p>2. Access converter, remove converter cover plate by removing (1) retaining screw.</p> <p>Check for 12-volts DC between the positive and negative lugs on converter. Is voltage present? (Yes) Proceed to Step 7. (No) Proceed to Step 3.</p> <p>3. Check for 12-volts DC on Wire J at load center. Is voltage present? (Yes) Troubleshoot Wire M back to converter to determine cause of voltage loss. Repair or replace as necessary. (No) Proceed to Step 4.</p> <p>4. Check for 12-volts DC on Wire J at the circuit breaker located in the auxiliary battery compartment. Is voltage present? (Yes) Troubleshoot Wire J back to the load center to determine cause of voltage loss. Repair or replace as necessary. (No) Proceed to Step 5.</p> <p>5. Check for 12-volts DC on Wire A at circuit breaker located in the auxiliary battery compartment. Is voltage present? (Yes) Proceed to Step 6. (No) Troubleshoot circuit back to battery to determine cause of voltage loss. Repair or replace as necessary.</p> <p>6. Reset the circuit breaker by removing Wire A, then reconnect Wire A.</p> <p>7. Connect vehicle to 110-volt AC power. Check voltage at positive and negative lugs of the converter. Voltage should rise to 13-volts DC or higher. If it does not, proceed to Step 8.</p> <div style="border: 1px solid black; padding: 5px;"> <p>NOTE: In time, the system voltage should rise to 14-volts DC with no loads on. Depending on battery condition, it could take 24 hours to completely recharge the battery.</p> </div> <p>8. Check both converter ground circuits. If grounds are good, converter is defective.</p>

CONVERTER REMOVAL

1. Turn ignition key to the OFF position.
2. Disconnect vehicle from 110-volt AC power.
3. Remove left dinette seat. Reference "Dinette Seat Removal" in Interior Section.
4. Remove left dinette cover panel. Reference "Left Dinette Cover Panel Removal" in Interior Section.
5. Unplug converter.
6. Open converter access panel by removing (1) retaining screw.
7. Note location of black wire and green wire for ease of later installation. Disconnect wires, loosen wire connector at converter, and pull wires free. Disconnect case ground wire.

CAUTION

Do NOT let black wire short to ground.

8. Remove (4) converter retaining screws. Remove converter.

CONVERTER REPLACEMENT

1. Place converter into position. Secure with (4) retaining screws.
2. Insert connector and wires into converter.
3. Connect wires as noted in Step 7 of "Converter Removal." Secure connector.
4. Replace converter access panel and secure with (1) retaining screw.
5. Plug in converter.
6. Replace left dinette cover panel. Reference "Left Dinette Panel Cover Replacement" in Interior Section.
7. Replace left dinette seat. Reference "Dinette Seat Replacement" in Interior Section.

AUXILIARY START SYSTEM

The auxiliary start system has two functions:

1. To allow energy from the auxiliary battery to be used to start the engine in the event of chassis battery failure.
2. It allows the auxiliary battery to be charged by the engine alternator while the vehicle is running.

Major components of the system are:

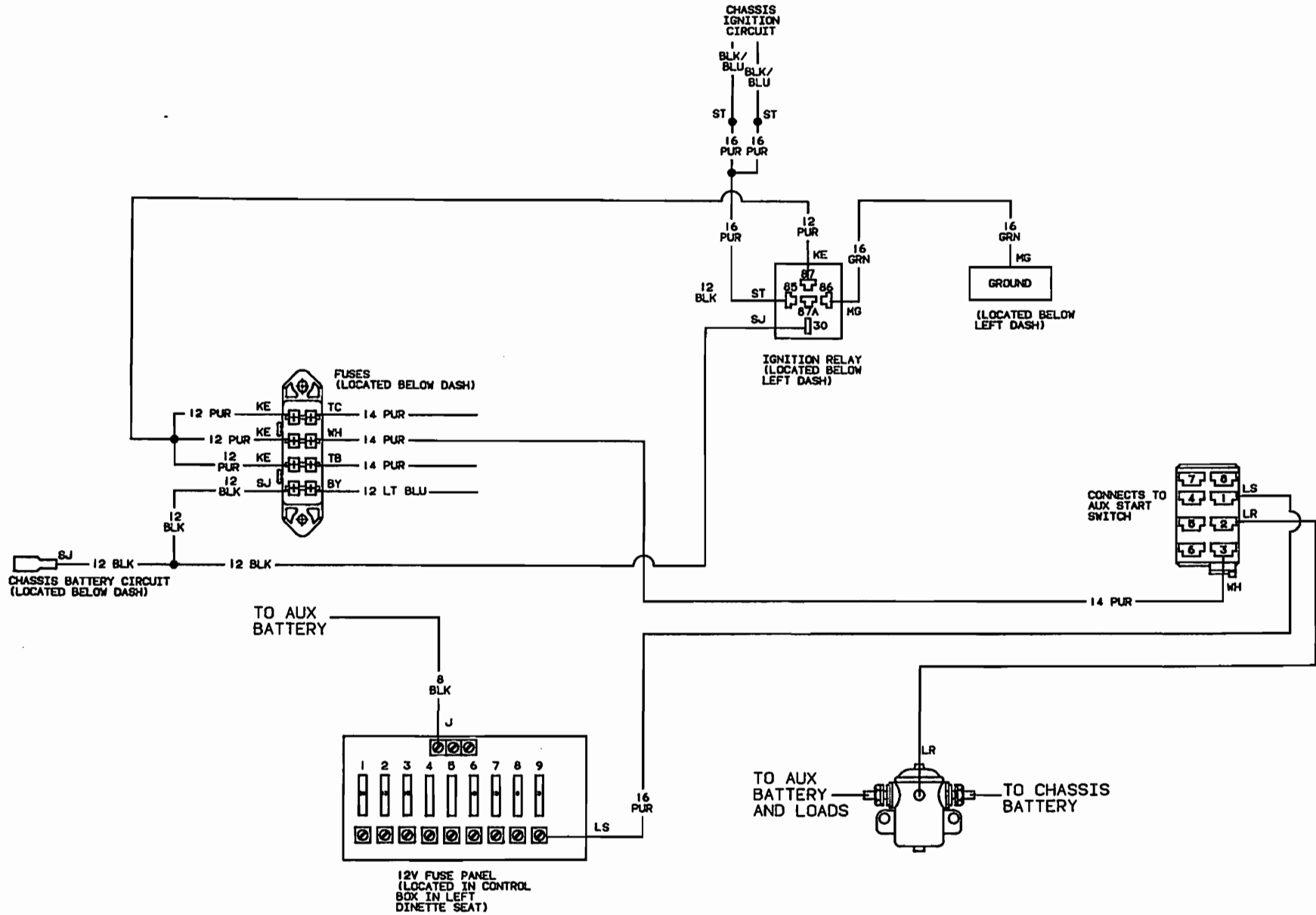
Auxiliary Start Switch
Auxiliary Start Solenoid

When the ignition key is placed in the RUN position, 12-volts DC is fed out on Wire WH to the switch. It passes through the switch on Wire LR to the solenoid. Energizing it, allowing continuity between the two solenoid posts, and the auxiliary battery can be charged.

When the chassis battery is depleted, the solenoid cannot energize because of a lack of current on Wire WH to the switch.

Therefore, 12-volts DC is fed to the switch via Wire LS from the auxiliary battery. When the switch is engaged, current flows out on Wire LR to the solenoid. Energizing it, allowing continuity between the two solenoid posts, and the energy from the auxiliary battery can now be used to start the vehicle.

AUXILIARY START SYSTEM

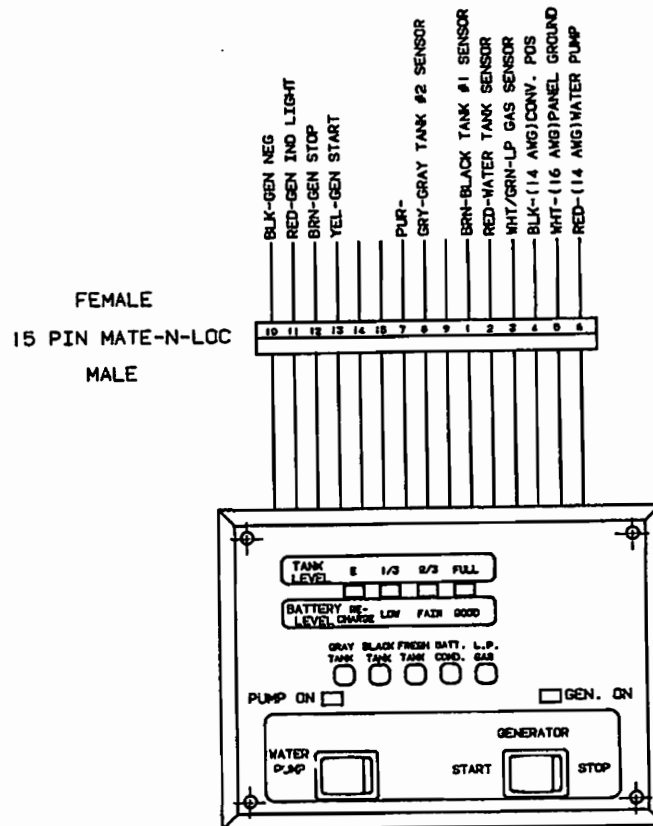


TROUBLESHOOTING

SYMPTON	COURSE OF ACTION
<p>1. Auxiliary battery does not charge when vehicle is running.</p> <div style="border: 1px solid black; padding: 5px;"> <p>NOTE: Test auxiliary battery to determine that it is capable of holding a charge before beginning troubleshooting.</p> </div>	<p>1. Access auxiliary battery. See "Battery Removal" in this section. Disconnect negative and positive battery cables.</p> <div style="border: 1px solid black; text-align: center; padding: 5px;"> <p>CAUTION</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>Disconnect negative battery terminal FIRST to reduce the chances of arcing.</p> </div> <div style="border: 1px solid black; text-align: center; padding: 5px;"> <p>CAUTION</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>Isolate positive battery cable from possible grounds to prevent arcing.</p> </div> <p>2. Place ignition key in RUN position. Connect a voltmeter between auxiliary battery positive and negative cables. Are 12-volts DC indicated? (Yes) Test auxiliary battery. Replace as necessary. (No) Proceed to Step 3.</p> <p>3. Check for 12-volts DC at auxiliary battery post of solenoid with key in RUN position. Are 12 volts present? (Yes) Trace cable back to auxiliary battery to determine cause of voltage loss. Repair or replace as necessary. (No) Proceed to Step 4.</p> <p>4. With ignition key in RUN position, check for 12-volts DC at center terminal of solenoid. Is voltage present? (Yes) Proceed to Step 13. (No) Proceed to Step 5.</p> <p>5. With ignition key in RUN position, check for 12-volts DC on Wire WH at fuse panel located below the dash. Is voltage present? (Yes) Proceed to Step 11. (No) Proceed to Step 6.</p> <p>6. With ignition key in the RUN position, check for 12-volts DC on Wire KE feeding wire WH at the fuse panel. Is voltage present? (Yes) Replace fues. (No) Proceed to Step 7.</p> <p>7. With ignition key in the RUN position, check for 12-volts DC on Wire KE at Pin 87 of the ignition relay. Is voltage present? (Yes) Trouble Wire KE to determine cause of voltage loss. Repair or replace as necessary. (No) Proceed to Step 8.</p>

SYMPTOM	COURSE OF ACTION
	<p>8. Check for 12-volts DC on Wire SJ at Pin 30 of the ignition relay. Is voltage present? (Yes) Proceed to Step 9. (No) Troubleshoot Wire SJ back to power source to determine cause of voltage loss. Repair or replace as necessary.</p> <p>9. With ignition key in the RUN position, check for 12-volts DC on Wire ST at Pin 85 of the ignition relay. Is voltage present? (Yes) Proceed to Step 10. (No) Troubleshoot Wire ST to determine cause of voltage loss. Repair or replace as necessary.</p> <p>10. With ignition key in the RUN position, jumper a wire from Pin 86 of the ignition relay to a known good ground. Check for 12-volts DC on Wire KE at Pin 87 of ignition relay. Is voltage present? (Yes) Troubleshoot wire MG to ground to determine cause for loss of voltage. Repair or replace as necessary. (No) Replace the relay.</p> <p>11. With ignition key in the RUN position, check for 12-volts DC on Wire WH at the switch. Is voltage present? (Yes) Proceed to Step 12. (No) Troubleshoot Wire WH to determine cause of voltage loss. Repair or replace as necessary.</p> <p>12. With ignition key in the RUN position, check for 12-volts DC on Wire LR at the switch. Is voltage present? (Yes) Troubleshoot Wire LR to determine cause of voltage loss. Repair or replace as necessary. (No) Replace switch.</p> <p>13. Disconnect the negative battery cable from the auxiliary battery. Disconnect the positive cable from the auxiliary battery at the solenoid.</p> <p>With the ignition key in the RUN position, check for 12-volts DC on the auxiliary battery side of the solenoid. Is voltage present? (Yes) Troubleshoot circuit back to auxiliary battery. (No) Proceed to Step 14.</p> <p>14. With the positive cable from the auxiliary battery still disconnected at the solenoid and with the key in the RUN position, jumper a wire from the case of the solenoid to the known good ground.</p> <p>Check for 12-volts DC on the auxiliary battery side of the solenoid. Is voltage present? (Yes) Remove solenoid from vehicle, clean up ground contacts, and reinstall solenoid. (No) Replace the solenoid.</p>

SYMPTOM	COURSE OF ACTION
<p>2. Auxiliary start function is inoperative. Cannot use auxiliary battery to start engine.</p>	<ol style="list-style-type: none"> 1. Check auxiliary battery. Is it fully charged? (Yes) Proceed to Step 2. (No) Recharge or replace as necessary. 2. Rocker the switch to the auxiliary START position and hold. Check for 12-volts DC on Wire LR at the solenoid. Is voltage present? (Yes) Proceed to Step 7. (No) Proceed to Step 3. 3. Rocker the switch to the auxiliary START position. Check for 12-volts DC on Wire LR at the switch. Is voltage present? (Yes) Troubleshoot Wire IR to determine the cause of the voltage loss. Repair or replace as necessary. (No) Proceed to Step 4. 4. Check for 12-volts DC on Wire LS at the switch. Is voltage present? (Yes) Replace the switch. (No) Proceed to Step 5. 5. Check for 12-volts DC on Wire LS at the fuse panel (located in the load center). Is voltage present? (Yes) Troubleshoot Wire LS to determine cause of voltage loss. Repair or replace as necessary. (No) Proceed to Step 6. 6. Check for 12-volts DC on Wire J at the fuse panel. Is voltage present? (Yes) Replace the 5-amp fuse at Position 9 of the panel. (No) Troubleshoot Wire J back to the auxiliary battery to determine cause of voltage loss. Repair or replace as necessary. 7. Disconnect the negative cable from the chassis battery. Disconnect the chassis battery positive cable from the solenoid. Rocker the switch to the auxiliary START position and hold. Check for 12 volts DC on the chassis battery post of the solenoid. Is voltage present? (Yes) Troubleshoot circuit to starter. (No) Proceed to Step 8. 8. With the chassis battery positive cable still disconnected from the solenoid, jumper a wire from the case of the solenoid to a known good ground. Rocker the switch to the auxiliary START position and hold. Check for 12-volts DC at the chassis battery post of the solenoid. Is voltage present? (Yes) Remove solenoid from vehicle, clean up ground contacts, and reinstall solenoid. (No) Replace the solenoid.



1. UNLESS OTHERWISE SPECIFIED ALL WIRE IS 22 AWG.

PANEL-MONITOR

NOTES:

MONITOR PANEL

The monitor panel is located on the wardrobe cabinet wall. Its primary function is to allow monitoring of the following six functions:

1. Holding tanks content level.
2. Fresh water tank contents level.
3. Liquid propane gas tank contents level.
4. Auxiliary battery condition.
5. Water pump condition.
6. Generator condition.

When the level test switch is engaged, the appropriate level is indicated by the indicator lights. This is achieved by the following:

For Fresh Water and Holding Tanks;

The circuit board in the monitor panel sends a voltage signal down the appropriate sensor wire (one per tank). The voltage seeks ground through the probes mounted in the tank. (See schematic).

If the tank is below 1/3 capacity, fluid in the tank allows an electrical connection between the lower set of probes. Now the voltage sent down the sensor wire can seek ground, but first must pass through two resistors.

The circuit board "senses" the resistance on the sensor wire and lights the appropriate indicator lights.

At 2/3 full, the voltage must pass through only one resistor and at full, the voltage passes directly to ground.

For LP Gas:

The circuit board in the monitor panel sends a voltage down the sensor wire to the sending unit located on the LP tank. As the fluid level in the tank changes, so does the resistance in the sending unit. Again, the circuit board "senses" the resistance in the circuit and lights the appropriate indicator lights.

For Battery Condition

The circuit board simply monitors auxiliary battery voltage and then lights the appropriate indicator light.

For the Water Pump:

The water pump indicator light is lit when the water pump is on.

For the Generator

The generator ON indicator lamp is lit when the generator is running.

The monitor panel also contains a water pump switch and a generator START/STOP switch.

MONITOR PANEL REMOVAL

1. Remove (4) monitor panel retaining screws and pull panel outward to access back of panel.
2. Disconnect 15-pin connector from back of panel.
3. Remove monitor panel.

MONITOR PANEL REPLACEMENT

1. Position monitor panel in front of opening.
2. Connect 15-pin connector to panel.
3. Place monitor panel into opening. Secure with (4) retaining screws.

REAR WINDOW WIPER/WASHER

The rear wiper/washer system allows for two functions:

1. Operation of the rear window wiper.
2. Rear window washing with wiper action.

MAJOR COMPONENTS

Rear Window Wiper/Washer Switch
Rear Window Wiper Motor
Rear Window Washer Pump

OPERATION

The wiper feature functions are as follows:

- Key ON power is supplied to the switch at Terminal 2 via Wire TC.
- When the switch is depressed in the WIPER position, 12-volts DC is supplied to the wiper motor via Wire MR. The wiper motor will run until the switch is deactivated or the ignition key is turned OFF.
- When the wiper motor is energized, 12 volts DC is supplied to the indicator lamp via an internal connection. Ground for the indicator light is supplied via wire MG.

NOTE: When the switch is deactivated and the motor is not yet in the PARK position, the motor receives it power from Wire TC allowing it to return to PARK.

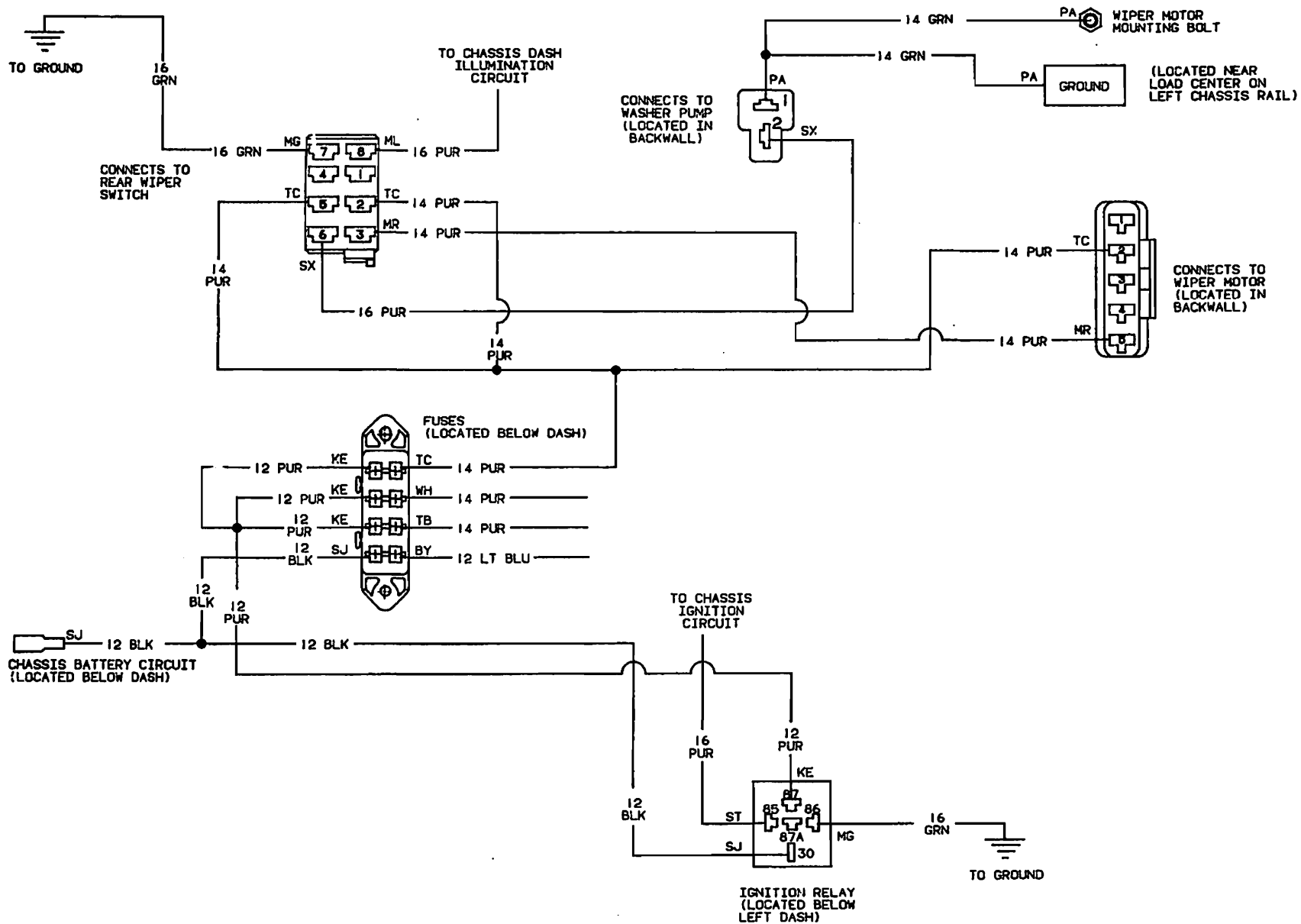
The washer feature functions are as follows:

- Key ON power is supplied to the switch at Pin 5 via Wire TC.
- When the switch is depressed in the WASH position, 12-volts DC is supplied to the washer pump via Wire SX.

NOTE: The WASH position on the switch is spring loaded and, therefore, a momentary position.

- The WASH position also triggers the rear wiper in the same manner as described in Wiper Operation.
- When the headlight switch is in the "on" position, 12 volts DC is supplied to the switch illumination bulb via wire ML. Ground for the indicator light is supplied via wire MG.

REAR WIPER/WASHER SYSTEM



TROUBLESHOOTING

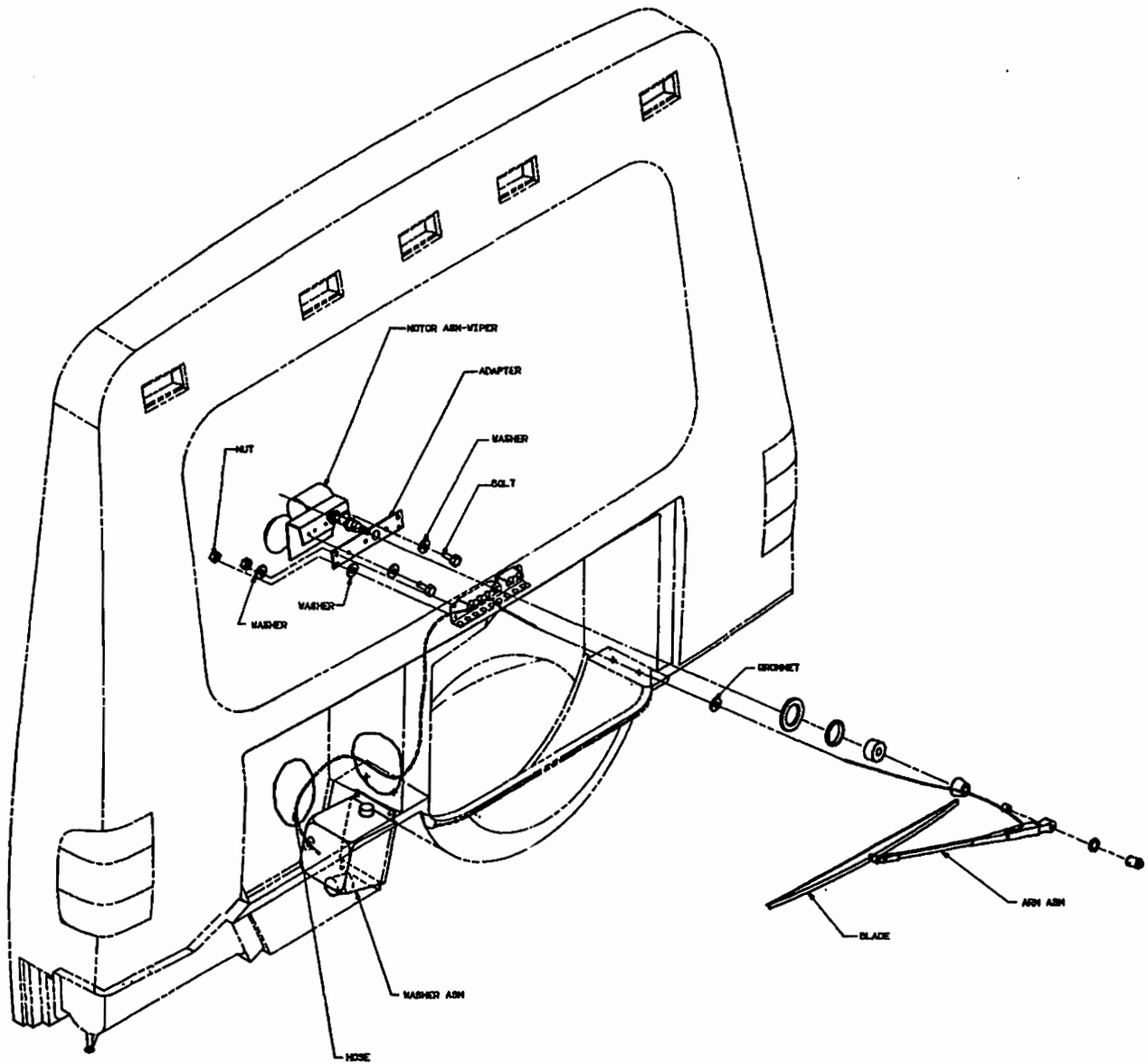
SYMPTOM	COURSE OF ACTION
<p>1. Rear wiper and washer functions are inoperative.</p>	<ol style="list-style-type: none"> 1. With ignition key in the RUN position, check for 12-volts DC on Wire TC at the automotive fuse panel. Is voltage present? (Yes) Proceed to Step 7. (No) Proceed to Step 2. 2. With ignition key in RUN position, check for 12-volts DC on Wire KE that feeds Wire TC at the automotive fuse panel. Is voltage present? (Yes) Replace the fuse. (No) Proceed to Step 3. 3. With ignition key in the RUN position, check for 12-volts DC on Wire KE at Pin 87 of the ignition relay. Is voltage present? (Yes) Troubleshoot Wire KE to determine cause of voltage loss. Repair or replace as necessary. (No) Proceed to Step 4. 4. Check for 12-volts DC on Wire SH at Pin 30 of ignition relay. Is voltage present? (Yes) Proceed to Step 5. (No) Troubleshoot Wire SJ to determine cause of voltage loss. Repair or replace as necessary. 5. With ignition key in RUN position, check for 12-volts DC on Wire ST of Pin 85 of the ignition relay. Is voltage present? (Yes) Proceed to Step 6. (No) Troubleshoot Wire ST to determine cause of voltage loss. Repair or replace as necessary. 6. With ignition key in RUN position, jumper a wire from PIN 86 of the ignition relay to a known good ground. Check for 12-volts DC on Wire KE at Pin 87 of the relay. Is voltage present? (Yes) Troubleshoot Wire MG to determine cause for loss of ground. (No) Replace relay. 7. With ignition key in RUN position, check for 12-volts DC on wire TC at Pins 5 and 2 of the switch. Is voltage present? (Yes) Proceed to Step 8. (No) Troubleshoot Wire TC to determine cause of voltage loss. Repair or replace as necessary.

SYMPTOM	COURSE OF ACTION
	<ol style="list-style-type: none"><li>8. With ignition key in RUN position, hold switch in the WASH position. Check for 12-volts DC on Wire SX at Pin 6 and Wire MR at Pin 3 of the switch. Is voltage present? (Yes) Proceed to Step 9. (No) Replace switch.<li>9. With ignition in RUN position, hold switch in the WASH position. Check for 12-volts DC on Wire SX at the washer pump and Wire MR at the wiper motor. Is voltage present? (Yes) Proceed to Step 10. (No) Troubleshoot Wires SX and MR to determine cause of voltage loss. Repair or replace as necessary.<li>10. Check and clean ground connections. If system does not operate after establishing good grounds, replace the washer pump and wiper motor.

SYMPTOM	COURSE OF ACTION
2. Wiper function inoperative. Washer functions properly.	<ol style="list-style-type: none"><li>1. With ignition key in RUN position, check for 12-volts DC on Wire TC at Pin 2 of the switch. Is voltage present? (Yes) Proceed to Step 2. (No) Troubleshoot Wire TC to determine cause of voltage loss. Repair or replace as necessary.<li>2. With ignition key in the RUN position, place switch in the WIPER position. Check for 12-volts DC on WIRE MR at Pin 3 of switch. Is voltage present? (Yes) Proceed to Step 3. (No) Replace switch.<li>3. With ignition key in the RUN position, place switch in the WIPER position. Check for 12-volts DC on Wire MR at the wiper motor. Is voltage present? (Yes) Proceed to Step 4. (No) Troubleshoot Wire MR to determine cause of voltage loss. Repair or replace as necessary.<li>4. Check and clean ground connection. If the wiper function is still not operational after establishing a good ground, replace the wiper motor.

SYMPTOM	COURSE OF ACTION
<p>3. Washer function inoperative. Wiper functions properly.</p>	<p>1. First, make certain that the washer bottle contains fluid.</p> <p>With the ignition key in RUN Position, check for 12-volt DC on Wire TC at Pin 5 of the switch. Is voltage present? (Yes) Proceed to Step 2. (No) Troubleshoot Wire TC to determine cause of voltage loss. Repair or replace as necessary.</p> <p>2. With ignition key in RUN position, hold switch in WASH position. Check for 12-volts DC on Wire SX at Pin 6 of the switch. Is voltage present? (Yes) Proceed to Step 3. (No) Replace switch.</p> <p>3. With ignition key in RUN position, hold switch in WASH position. Check for 12-volts DC on Wire SX at the washer pump. Is voltage present? (Yes) Proceed to Step 4. (No) Troubleshoot Wire SX to determine cause of voltage loss. Repair or replace as necessary.</p> <p>4. Check and clean ground connection for washer pump. If the washer function is still not operational after establishing a good ground, replace the washer pump.</p>

SYMPTOM	COURSE OF ACTION
4. Wiper does not park.	<ol style="list-style-type: none"><li>1. With ignition key in RUN position, check for 12-volts DC on Wire TC at the wiper motor. Is voltage present? (Yes) Proceed to Step 2. (No) Troubleshoot Wire TC to determine cause of voltage loss. Repair or replace as necessary.<li>2. Inspect wiper motor. Is green jumper wire connected between Pins G and 3 of terminal block on motor housing? (Yes) Proceed to Step 3. (No) Connect jumper wire between Pins G and 3 of terminal block.<li>3. Adjust wiper arm.
5. Rear wiper switch dash light inoperative.	<ol style="list-style-type: none"><li>1. Is the headlight switch turned on? (Yes) Proceed to Step 2. (No) Turn on headlight switch.<li>2. Check for 12 volts DC on wire ML at terminal 8 of switch. Is voltage present? (Yes) Proceed to Step 3. (No) Trace wire ML back to power source to determine cause of voltage loss. Repair or replace as necessary.
6. Rear wiper switch indicator light inoperative.	<ol style="list-style-type: none"><li>1. Does the rear wiper function properly? (Yes) Proceed to Step 2. (No) Troubleshoot rear wiper.<li>2. Turn ignition key OFF. Check for continuity to ground on wire MG at terminal 7 of the switch. Is there continuity to ground? (Yes) Replace the switch. (No) Trace wire MG to grounding terminal to determine cause for loss of ground. Repair or replace as necessary.



VTPFR INSTL-REAR

REAR WIPER MOTOR REMOVAL

1. Remove wiper arm retaining nut. Remove wiper arm and related hardware.
2. Remove wiper assembly retaining nut.
3. Access the wiper motor by removing access panel located in the upper inner back wall panel.

NOTE: Early production units did not have an access panel. It will be necessary to remove the upper inner back panel to access the wiper motor. Reference "Upper Inner Back Wall Removal" in Interior Section.

4. Note location of 12-volt DC wiring connections for ease of later installation. Remove 12-volt DC wires.
5. Remove (4) motor assembly retaining nuts with washers.
6. Remove wiper motor through access hose.

NOTE: If you are replacing the motor with a new assembly, it will be necessary to remove the adapter plate from the old motor and attach it to the new motor.

REAR WIPER MOTOR REPLACEMENT

NOTE: If you are installing a new wiper motor, it will be necessary to attach the adapter plate from the old motor onto the new motor.

1. Place wiper motor assembly in proper position and secure with (4) retaining nuts with washers.
2. Reconnect 12-volt DC wiring as noted in Step 4 of "Rear Wiper Motor Removal."
3. Replace access panel.
4. Install wiper assembly retaining nut.
5. Align and install wiper arm assembly. Secure with wiper arm retaining nut.

REAR WINDOW DEFOGGER

The rear window defogger dissipates moisture from the surface of the rear window by heating the glass.

Major Components

- Rear Window Defogger Switch
- Rear Window Defogger Module
- Rear Window Defogger Relay
- Rear Window Defogger Grid

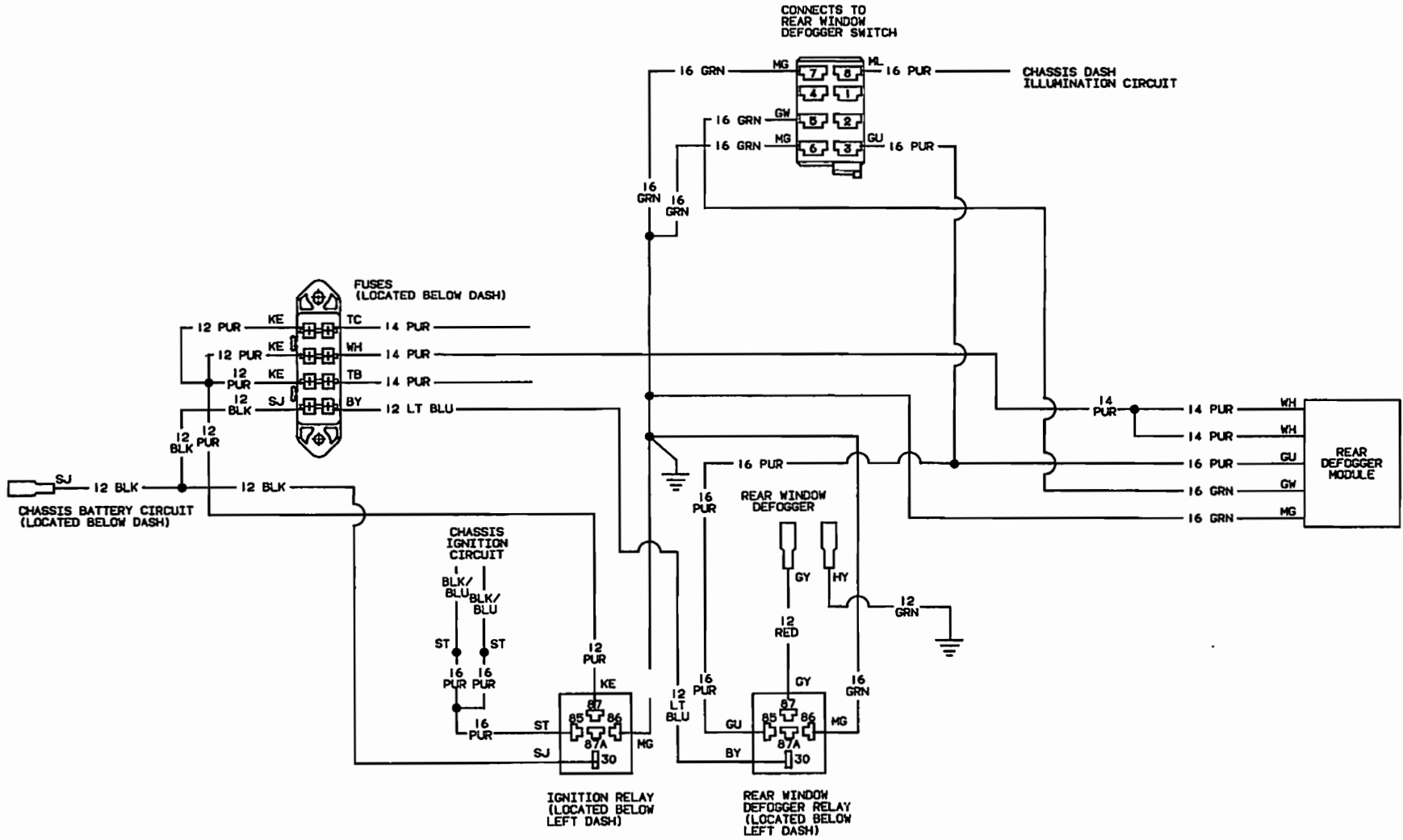
Operation

- When the defogger switch is depressed, it momentarily grounds the defogger module via Wire GW.
- This causes the module to turn ON and send voltage out on Wire GU which triggers the defogger relay and lights the indicator light in the defogger switch.
- When the relay is triggered by GU, 12-volts DC on Wire BY is allowed to pass through the relay and out on Wire GY to the defogger grid.

NOTE: Once the module is turned ON, it will keep power on Wire GU for ten minutes (+ 1 minute) unless the switch is engaged, which will momentarily ground the module shutting it off.

- When the headlight switch is in the on position, 12-volts DC is supplied to the switch illumination bulb via wire ML. Ground for the indicator light is supplied via wire MG.

REAR WINDOW DEFOGGER



TROUBLESHOOTING

SYMPTOM	COURSE OF ACTION
<p>1. Rear window defogger is inoperative.</p>	<ol style="list-style-type: none"> 1. Is the ignition key in the RUN position? (Yes) Proceed to Step 2. (No) Place key in RUN position. 2. Does the indicator light in the switch come on when the switch is activated? (Yes) Proceed to Step 16. (No) Proceed to Step 3. 3. Is the rear window wiper operational? (Yes) Proceed to Step 8. (No) Proceed to Step 4. 4. Check for 12-volts DC at Pin 87 of the ignition relay. Is voltage present? (Yes) Troubleshoot Wire KE to determine the cause of voltage loss. Repair as necessary. (No) Proceed to Step 5. 5. Check for 12-volts DC on Pin 30 of the ignition relay. Is voltage present? (Yes) Proceed to Step 6. (No) Troubleshoot Wire SJ to determine cause of voltage loss. Repair or replace as necessary. 6. Check for 12-volts DC on Pin 85 of the ignition relay. Is voltage present? (Yes) Proceed to Step 7. (No) Troubleshoot Wire ST to determine cause of voltage loss. Repair or replace as necessary. 7. Jumper a wire from Terminal 86 of the ignition relay to a known good ground. Does the relay function? (Yes) Troubleshoot Wire MG to determine the cause for loss of ground. Repair or replace as necessary. (No) Replace relay. 8. Check fuse feeding Wire WH. Is fuse okay? (Yes) Proceed to Step 9. (No) Replace fuse. 9. Disconnect Wire WH from module. Check for 12-volts DC on wire. Is voltage present? (Yes) Proceed to Step 10. (No) Troubleshoot Wire WH to determine cause of voltage loss. Repair or replace as necessary. 10. Reconnect Wire WH. Disconnect Wire GW from module. Attach test light lead to 12 volts and probe connector of Wire GW. Rocker defogger switch. Does test light momentarily light? (Yes) Proceed to Step 13. (No) Proceed to Step 11.

SYMPTOM	COURSE OF ACTION
	<ol style="list-style-type: none"> <li>11. Disconnect Wire GW from defogger switch. Ohm test Wire GH. Does test indicate an open or high resistance? (Yes) Repair or replace Wire GW. (No) Reconnect Wire GW to switch and module. Proceed to Ste 12. <li>12. Disconnect Wire MG from switch. Attach test light lead to 12 volts and probe connector of Wire MG. Does the test light? (Yes) Replace switch. (No) Troubleshoot MG circuit to determine cause for loss of ground. Repair or replace as necessary. <li>13. Reconnect Wire GW. Disconnect Wire MG from the module. Attach test light lead to 12 volts and probe connector on Wire MG. Does the test light light? (Yes) Reconnect Wire MG. Proceed to Step 14. (No) Troubleshoot Wire MG to determine cause for loss of ground. Repair or replace as necessary. <li>14. Reconnect Wire MG. Activate switch to turn defogger on. Check for 12-volts DC at Pin 85 of defogger relay. Is voltage present? (Yes) Proceed to Step 16. (No) Proceed to Step 15. <li>15. Disconnect Wire GU from the module. Ohm test Wire GU. Does test indicate an open or high resistance? (Yes) Repair or replace Wire GU. (No) Replace the module. <li>16. Check for 12-volts DC at Pin 87 of the defogger relay. Is voltage present? (Yes) Proceed to Step 19. (No) Proceed to Step 17. <li>17. Check for 12-volts DC at Pin 30 of the ignition module. Is voltage present? (Yes) Proceed to Step 18. (No) Troubleshoot Wire BY to determine cause of voltage loss. Repair or replace as necessary. <li>18. Jumper a wire from PIN 86 of the ignition relay to a known good ground. Does the relay function? (Yes) Troubleshoot Wire MG to determine the cause for loss of ground. Repair or replace as necessary. (No) Replace the defogger relay.

SYMPTOM	COURSE OF ACTION
	<p>19. Check for voltage on Wire GY of the defogger. Is voltage present? (Yes) Proceed to Step 20. (No) Troubleshoot Wire GY to determine cause of voltage loss. Repair or replace as necessary.</p> <p>20. Disconnect Wire HY at the defogger. Connect test light lead to 12-volt DC power. Probe Wire HY with test light. Does the test light light? (Yes) Troubleshoot the defogger grid. Repair or replace as necessary. (No) Troubleshoot Wire HY to determine cause for loss of ground. Repair or replace as necessary.</p>

SYMPTOM	COURSE OF ACTION
<p>2. Rear window defogger will not turn OFF.</p>	<ol style="list-style-type: none"> 1. Check for 12-volts DC at Pin 85 of the defogger relay. Is voltage present? (Yes) Proceed to Step 3. (No) Proceed to Step 2. 2. Remove the defogger relay. Check for DC voltage on Wire GY. Is voltage present? (Yes) Troubleshoot Wire GY to determine cause of voltage. Repair as necessary. (No) Replace the defective relay. 3. Disconnect Wire GU at the module. Check Wire GU for voltage. Is voltage present? (Yes) Troubleshoot Wire GU to determine cause of voltage. Repair as necessary. (No) replace the module.
<p>3. Rear window defogger switch dash light inoperative.</p>	<ol style="list-style-type: none"> 1. Is the headlight switch turned on? (Yes) Proceed to Step 2. (No) Turn on headlight switch. 2. Check for 12 volts DC on wire ML at terminal 8 of switch. Is voltage present? (Yes) Proceed to Step 3. (No) Trace wire ML back to power source to determine cause of voltage loss. Repair or replace as necessary. 3. Turn ignition key OFF. Turn headlight switch OFF. Check for continuity to ground on wire MG at terminal 7 of the switch. Is there continuity to ground? (Yes) Replace the switch. (No) Trace wire MG to grounding terminal to determine cause for loss of ground. Repair or replace as necessary.
<p>4. Rear window defogger switch indicator light inoperative.</p>	<ol style="list-style-type: none"> 1. Does the rear window defogger function properly? (Yes) Proceed to Step 2. (No) Troubleshoot rear window defogger. 2. With rear window defogger actuated, check for 12 volts DC on wire GU at terminal 3 of the switch. Is voltage present? (Yes) Proceed to step 3. (No) Troubleshoot wire GU back to defogger module to determine cause of voltage loss. Repair or replace as necessary. 2. Turn ignition key OFF. Check for continuity to ground on wire MG at terminal 7 of the switch. Is there continuity to ground? (Yes) Replace the switch. (No) Trace wire MG to grounding terminal to determine cause for loss of ground. Repair or replace as necessary.

Entrance Door Power Lock with Dash Mounted Switch (Early 1995 Production)

Beginning with Winnebago serial number 802295229819 all Rialta's will employ a Volkswagen compatible entrance door lock. Refer to the appropriate Volkswagen information for troubleshooting procedures.

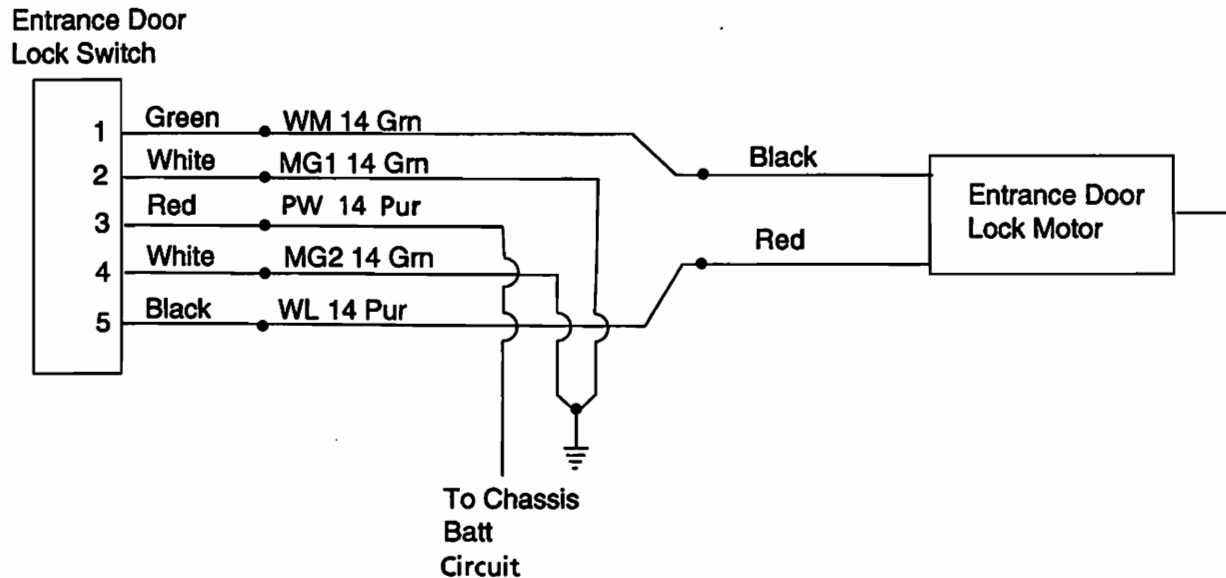
The entrance door power door lock allows the entrance door to be locked or unlocked from the drivers area.

Major Components

Power Door Lock Switch
Lock Motor

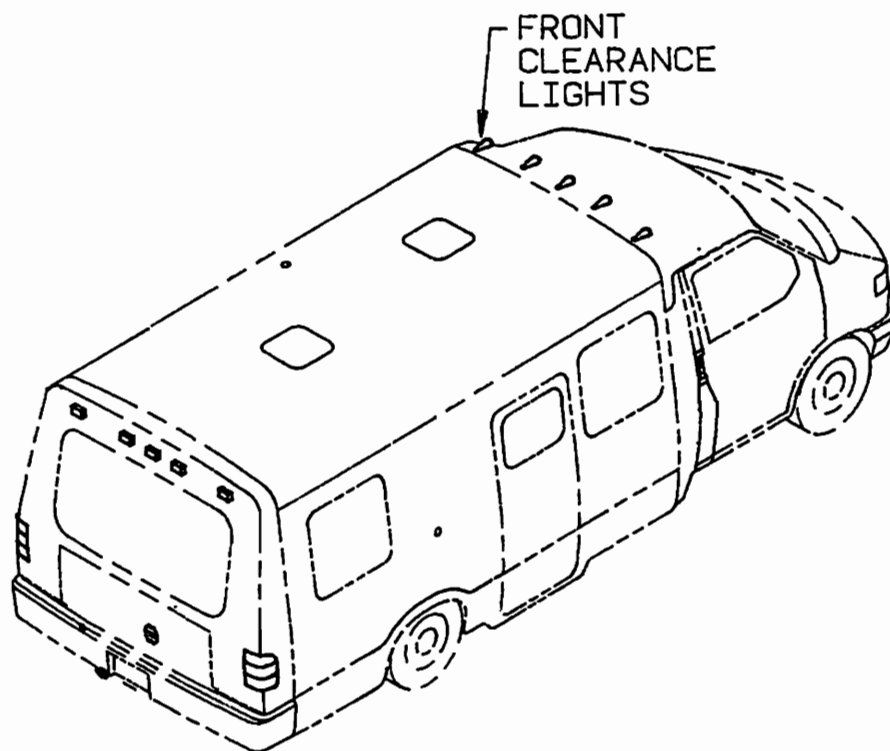
Operation

- Chassis battery voltage is supplied to terminal 3 of the switch via wire PW*. NOTE: On early production units wire PW may be labeled as wire MK.
- When the switch is rockered to the lock position, 12-volts DC is supplied to the lock motor via wire WL. Ground is supplied on wire WM to the switch which supplies a connection to wire MG to complete the ground path.
- When the switch is rockered to the unlock position, 12 volts DC is supplied to the lock motor via wire WM. Ground is supplied on wire WL to the switch which supplies a connection to wire MG to complete the path to ground.



**TROUBLESHOOTING ENTRANCE DOOR POWER LOCK, DASH MOUNTED SWITCH
(Early 1995 Production)**

SYMPTOM	COURSE OF ACTION
<p>1. Entrance door power door lock inoperative.</p>	<ol style="list-style-type: none"> 1. Check for 12 volts DC or wire PW at terminal 3 of the switch. Is voltage present? (Yes) Proceed to Step 2. (No) Troubleshoot wire PW to power source to determine cause of voltage loss. Repair or replace as necessary. 2. With the door lock switch in the neutral position, check for continuity to ground on wires MG1 at terminal 2 and MG2 at terminal 4 of the switch. Is continuity to ground present? (Yes) Proceed to Step 3. (No) Troubleshoot wires MG1 and MG2 to determine cause for loss of ground. Repair or replace as necessary. 3. Rocker switch to lock position and hold. Check for 12 volts DC on wire WL at terminal 5 of the switch. Is voltage present? (Yes) Proceed to Step 4. (No) Replace the switch. 4. Rocker switch to the unlock position and hold. Check for 12 volts DC on wire WM at terminal 1 of the switch. Is voltage present? (Yes) Proceed to Step 5. (No) Replace the switch. 5. Access entrance door lock motor. Disconnect wire leads at motor. Rocker switch to lock position and check for 12 volts DC on wire WL at motor connector. Is voltage present? (Yes) Proceed to Step 6. (No) Troubleshoot wire WH back to switch to determine cause of voltage loss. Repair or replace as necessary. 6. Rocker switch to unlock position. Check for continuity to ground on wire WL at motor connector. Is continuity to ground present? (Yes) Proceed to Step 7. (No) Replace switch. 7. Rocker switch to unlock position. Check for 12 volts DC on wire WM at motor connector. Is voltage present? (Yes) Proceed to Step 8. (No) Troubleshoot wire WM back to switch to determine cause of voltage loss. Repair or replace as necessary. 8. Rocker switch to lock position. Check for continuity to ground on wire WM at motor connector. Is continuity to ground present? (Yes) Replace motor. (No) Replace switch.

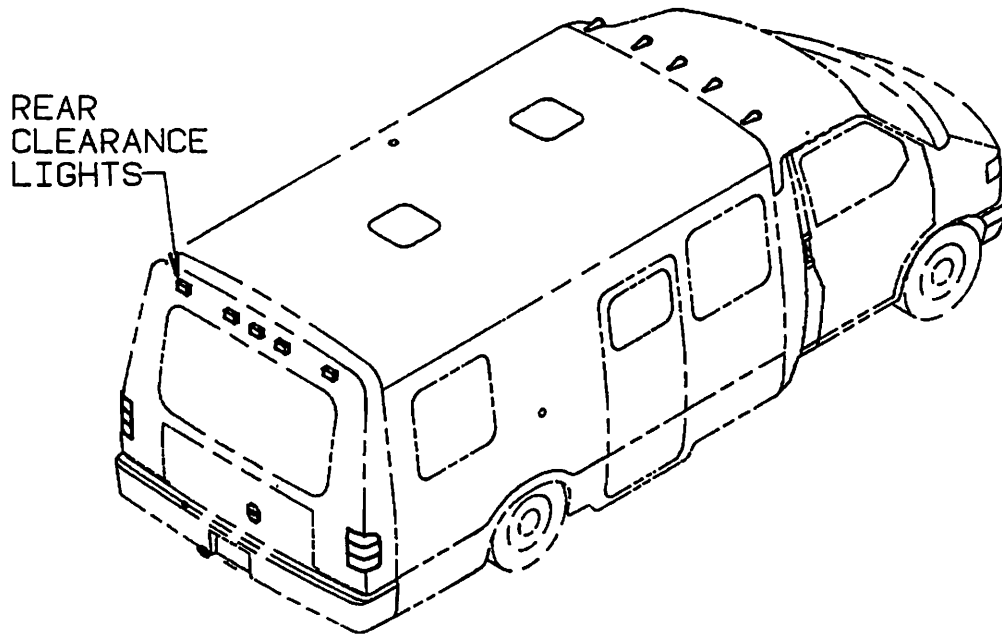


FRONT CLEARANCE LIGHT REMOVAL

1. Gently pry lens off of light.
2. Remove (2) lightbase retaining screws.
3. Use a putty knife to carefully break the seal between the light base and roof cup.
4. Lift light base away from roof cap.
5. Disconnect 12 volt DC wiring from light base.
6. Remove light base.

FRONT CLEARANCE LIGHT REPLACEMENT

1. Connect 12 volt DC wiring to light base.
2. Place light base in proper position. Secure with (2) retaining screws.
3. Place lens on light base. Push down to secure.
4. Cap seal the perimeter of the light with sealant. (Winnebago Part #107828-01-000)



REAR CLEARANCE LIGHT REMOVAL

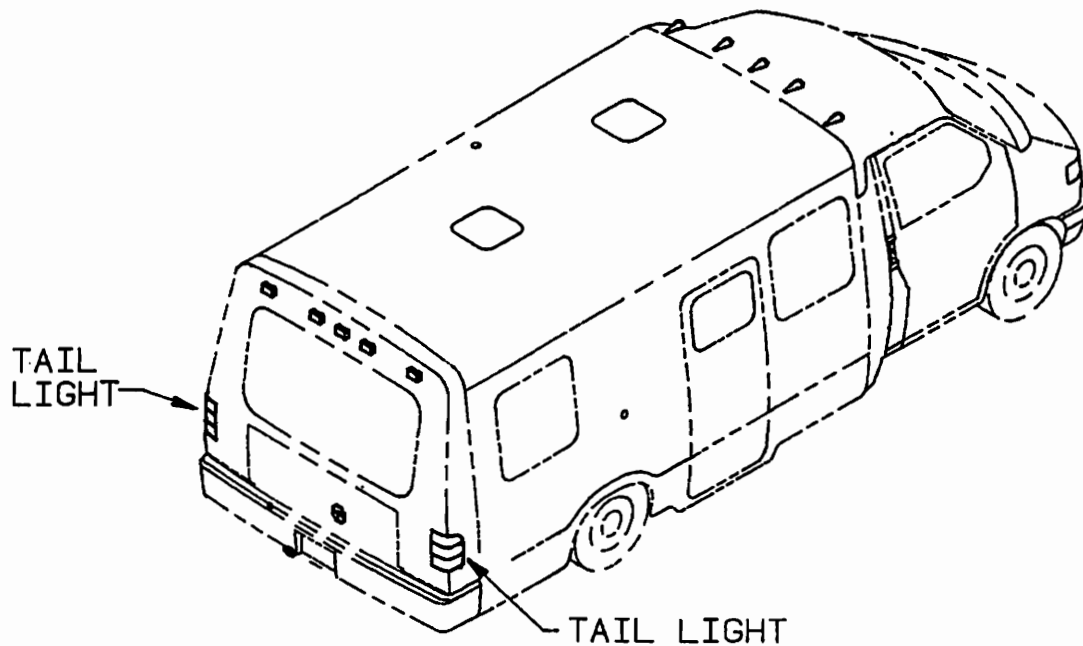
1. Remove (2) retaining screws.
2. Pull light away from rear cap.
3. Disconnect 12 volt DC wiring from light.

REAR CLEARANCE LIGHT REPLACEMENT

1. Connect 12 volt DC wiring to light.
2. Place light in proper position.

NOTE: The lens seal must be located between the light assembly and the lens.

3. Secure light with 2 retaining screws.



TAIL LIGHT REMOVAL

1. Remove (2) tail light retaining screws.
2. Pull tail light free of rear cap.
3. Disconnect 12 volt DC wiring at tail light.
4. Remove tail light.

TAIL LIGHT REPLACEMENT

1. Place tail light near opening in rear cap.
2. Connect 12 volt DC wiring at tail light.
3. Place tail light in proper position and secure with (2) retaining screws.

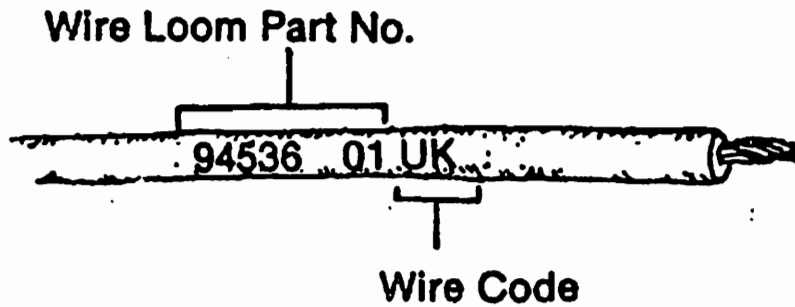
WIRING DIAGRAMS

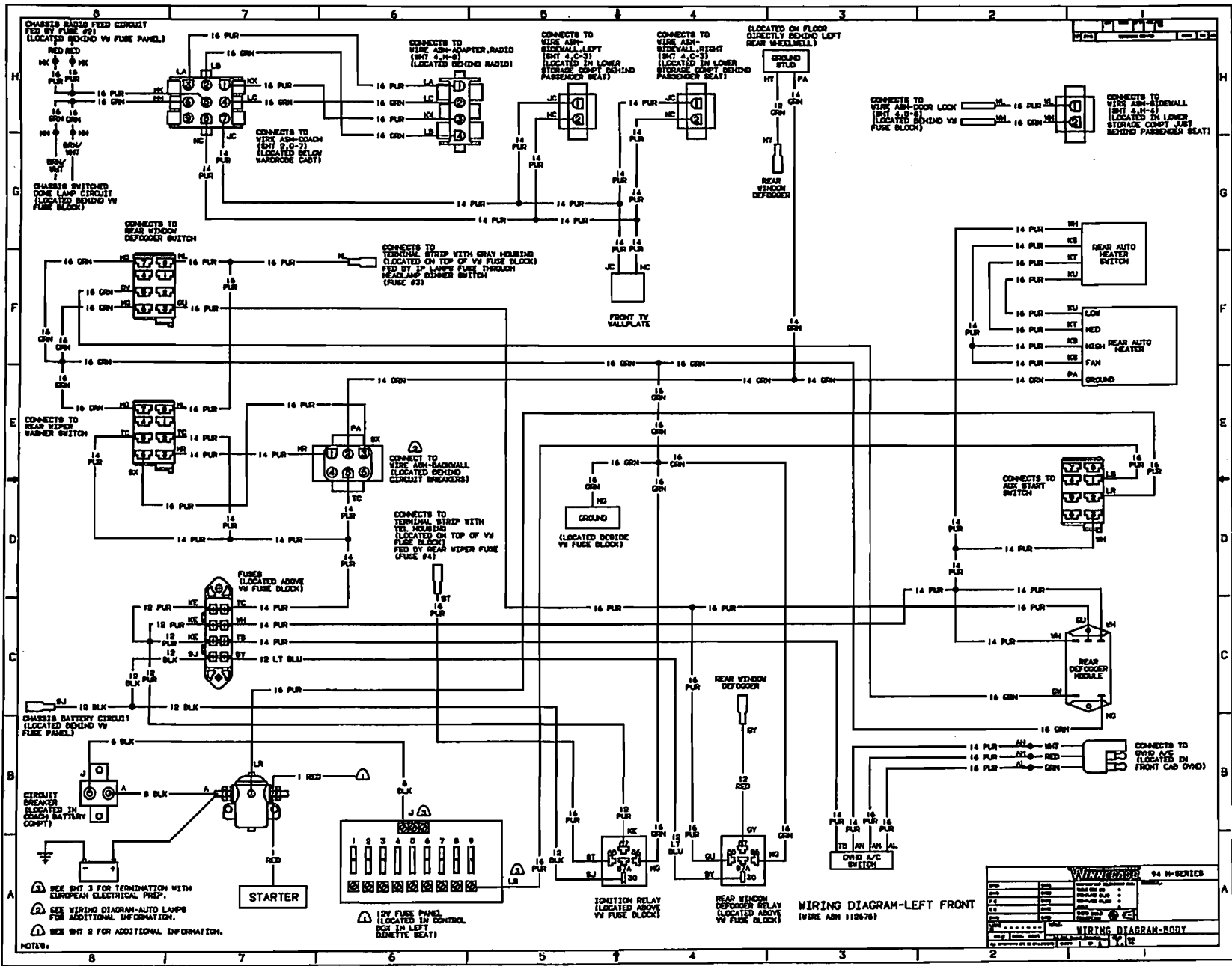
Winnebago Industries employs a two-color wiring system. With this system, the majority of Winnebago installed 12-volt wiring will be comprised of purple wires and green wires. As a general rule of thumb, purple wires indicate the positive side of a circuit and green wires are grounds.

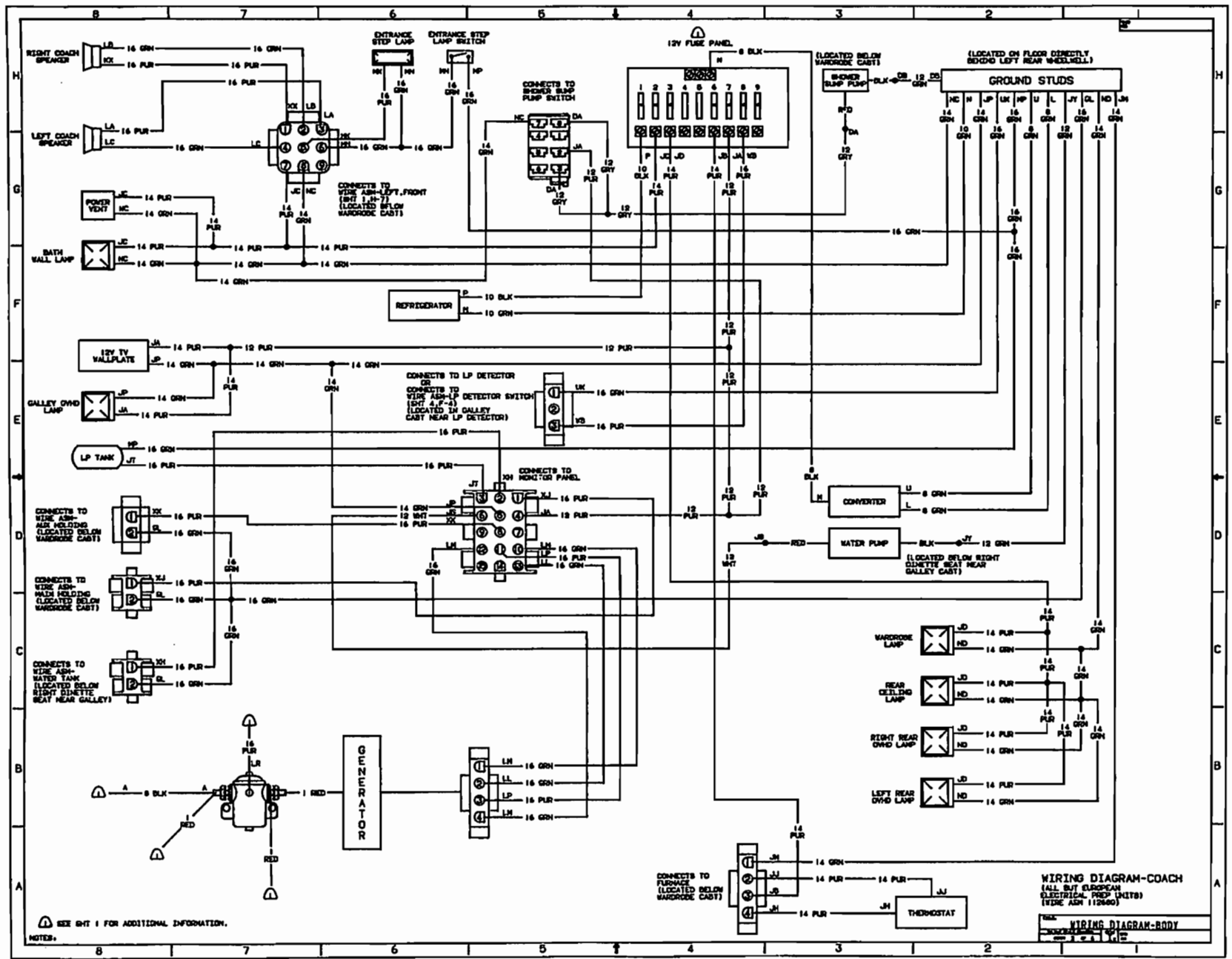
For ease of service, all 12-, 14- and 16-gauge wires are imprinted with wire identification numbers of predetermined intervals throughout the length of the wire. (See Figure Below). The two- or three-digit letter code is the individual wire identifier.

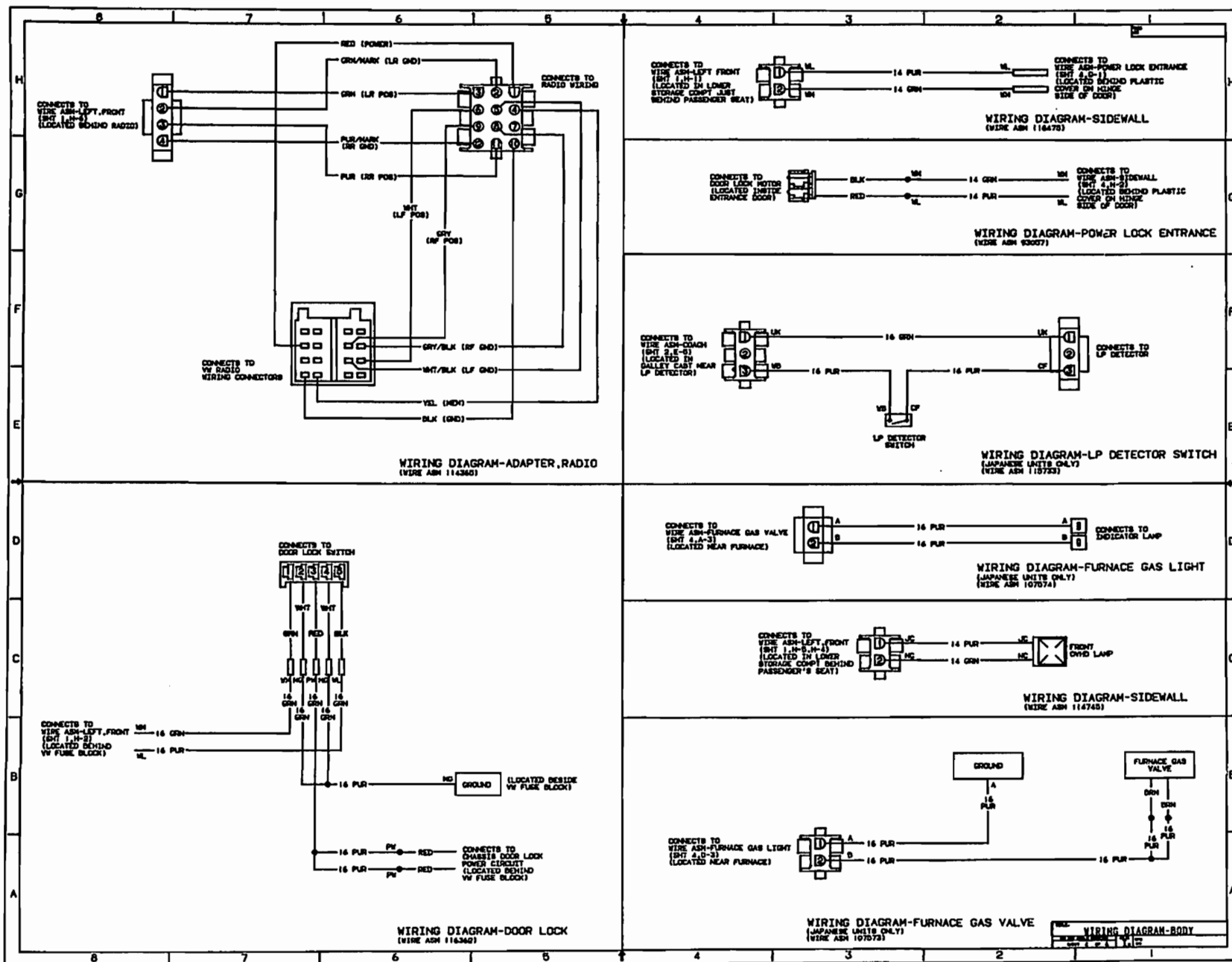
Only 12-, 14- and 16-gauge wires are imprinted with code numbers. Heavy gauge wires (10, 8, and 6 gauge) are not imprinted. Codes listed for heavy gauge wires are for wiring diagram reference only.

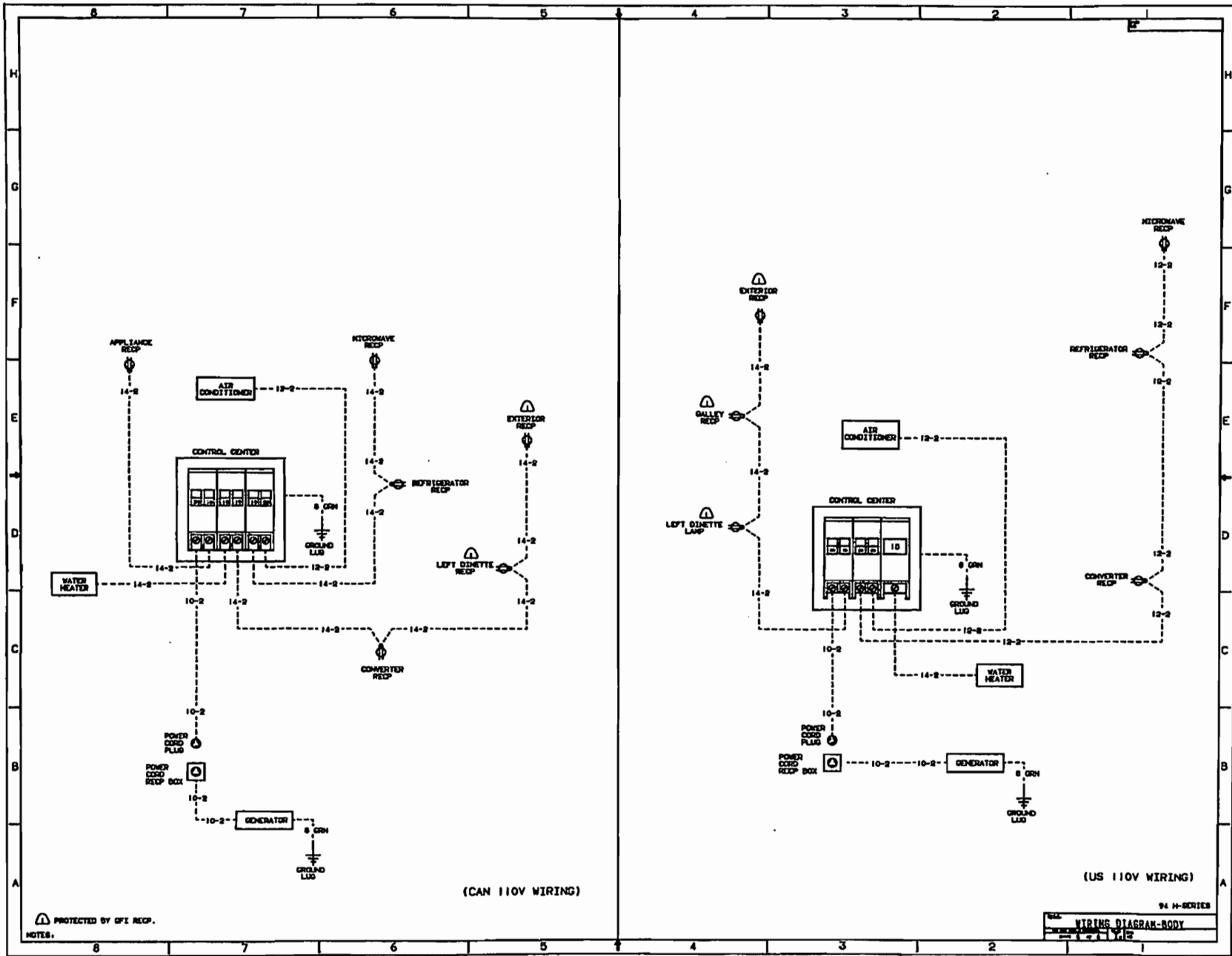
The following wire identification chart lists the individual wire code, where the wire originates, wire color, and where the wire terminates. When consulting this information, be aware that this is only a guide. Certain manufacturing conditions may cause variations to exist on some models.





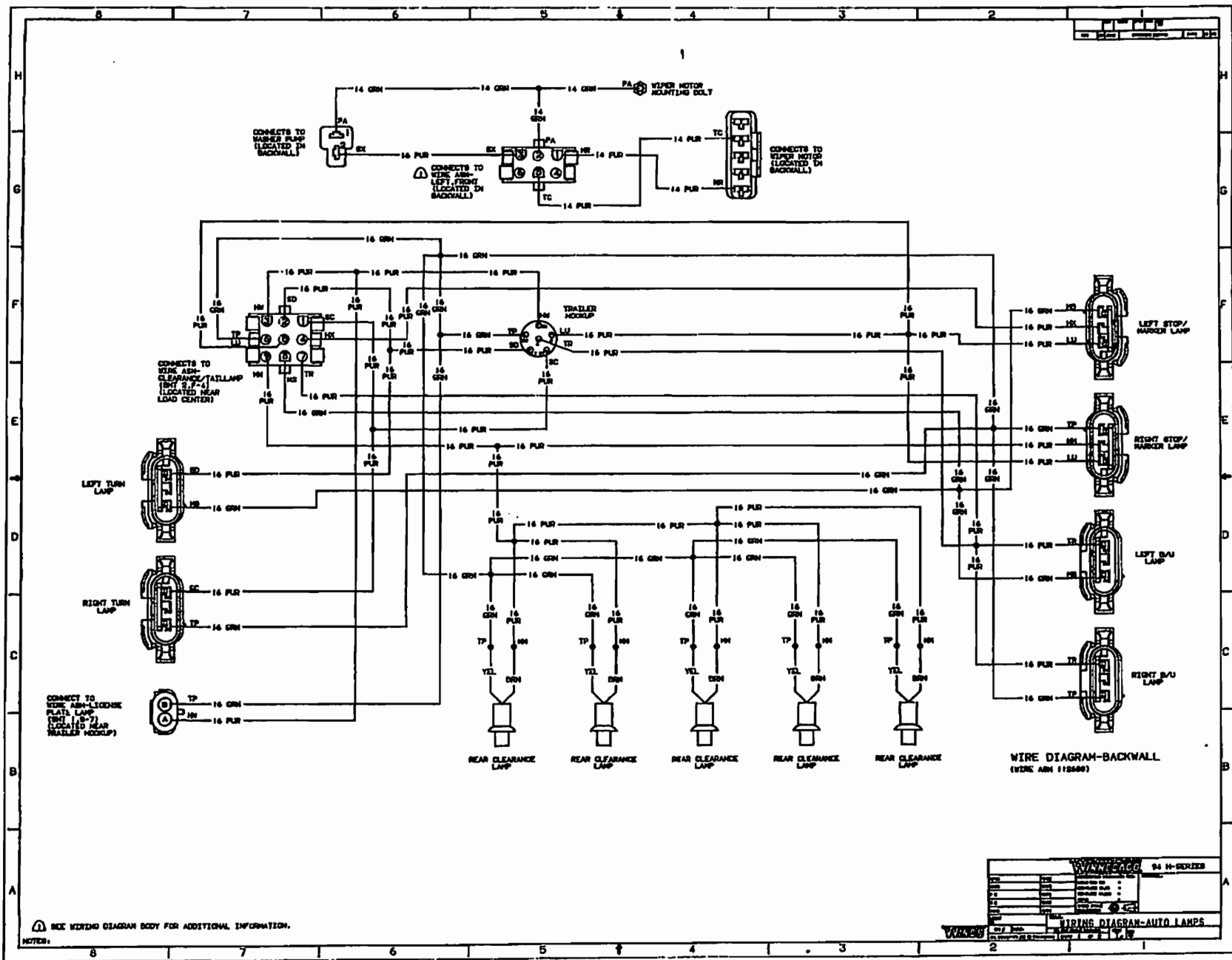


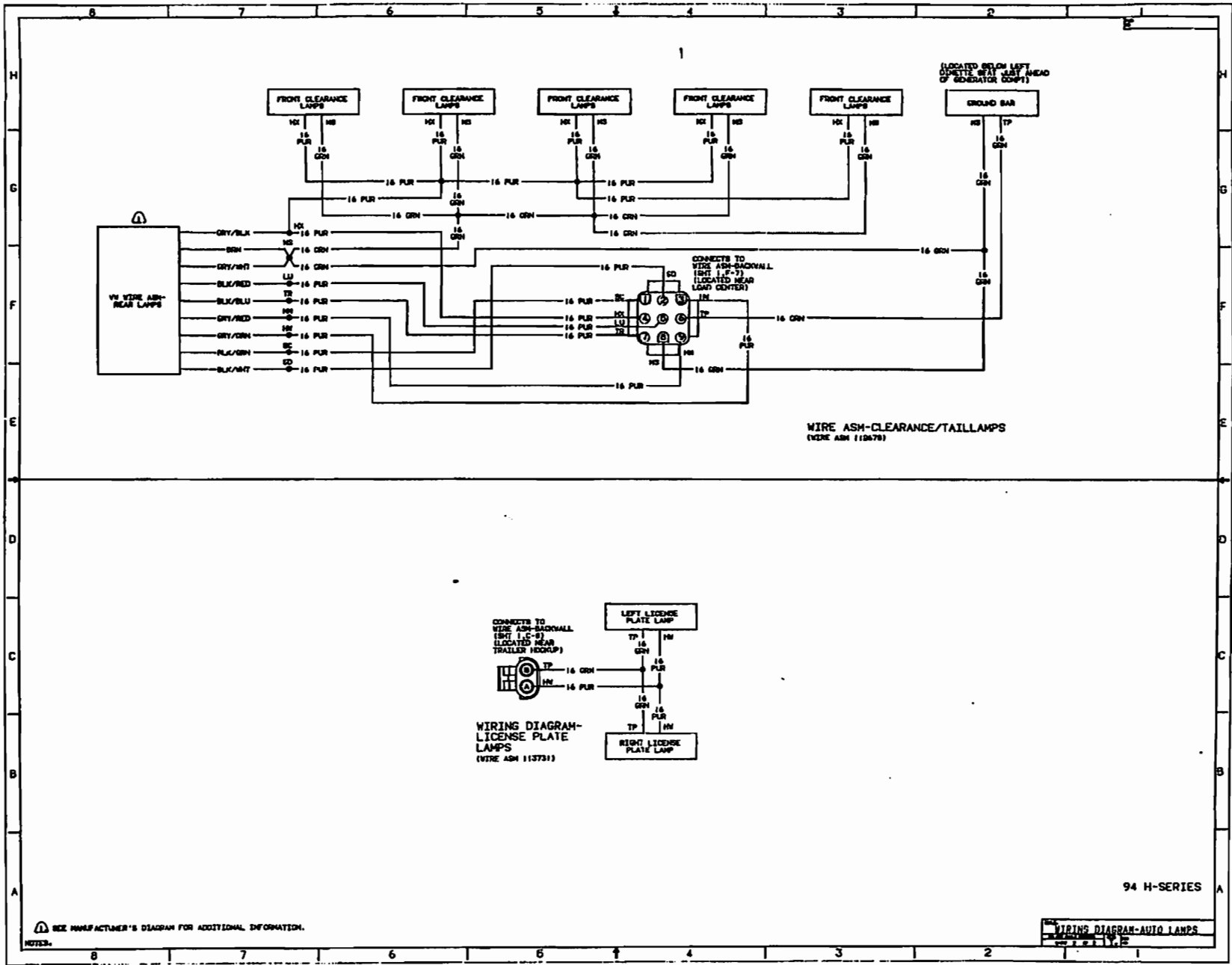




NOTES:
 ⚠ PROTECTED BY GFI RECP.

94 H-SERIES
 WIRING DIAGRAM-BODY
 1-1-12





WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
A	Galley Ceiling Lamp Switch	14 Pur	Galley Ceiling Lamp	
B	Over Current Protection (30A Breaker Typical)	12 Red	Power Passenger Seat (Buddy Seat)	
C	Power Passenger Seat	12 Green	Ground	
D				
E	Phone Input Jack	Phone Cord	Rear Phone Jack	
F	Phone Input Jack	Phone Cord	Exterior Phone Jack	
G	Circuit Brkr. (30 Amp)	10 Blue	Instr. Panel (Heater)	
H	Phone Input Jack	Phone 95038-01-000	Front Phone Jack	
J	(40 Amp.) Batt. Circuit Brkr. or Conver.	8 Blk.	Coach 12V Panel/Converter Battery Charge	
K	Circuit Brkr. (40 Amp) Batt.	8 Blk.	Coach 12V Panel	
L	Converter	8 Grn.	Ground	
M	Circuit Breaker (40 Amp)	8 Pur. (Blk)	Converter Battery Charger	
N	Refrigerator	10 Grn.	Chassis Grd. (Bat./Comp.)	
P	Circuit Breaker (20 Amp)	10 Blk.	Refrigerator (3-Way)	
R	Refrigerator Chassis	8 Grn.	Ground	
S	Ground Bar - Left	8 Grn.	Ground	
T	Ground Bar - Right	8 Grn.	Ground	
U	Converter Chassis	8 Grn.	Ground	White
W				
X				
Y				

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
AA	Service Eng. Soon Lamp	16 Grn.	Vehicle Service Engine Soon Lamp Circuit	Pink/Tan
AB	Tank (Water) Level Sensors	16 Grn.	Ground	
AC	Tank (Main Holding)	16 Grn.	Ground	
AD	Tank (Aux. Holding #1)	16 Grn.	Ground	
AE	Tank (Aux. Holding #2)	16 Grn.	Ground	
AF	Water Pump Switch #1	12 Red	Monitor Panel Water Pump Switch #2	
AG	Water Pump Switch #1	12 Blu.	Water Pump Switch #2	
AH	Breaker - Run, Start (10A Fuse)	14 Pur.	Brake Light Switch Brake Warning Light	
AJ	Chassis Ground	12 Grn.	Body Ground	
AK	Chassis Ground	12 Grn.	Body Ground	
AL	Heater Control - Low	12 Pur.	Blower Motor - Low	Brown
AM	Heater Control - Med.	12 Wht.	Blower Motor - Med.	Orange
AN	Heater Control - High	12 Gry.	Blower Motor - High	Gray
AP	Ignition Switch - Acc.	14 Pur.	Circuit Breaker	
AR	Horn	14 Grn.	Ground	
AS	Radio	16 Grn.	Speaker - Right Front, Gnd.	
AT	Radio	16 Grn.	Speaker - Left Front, Gnd.	
AU	Over Current Protection (15A Fuse Typical)	16 Pur.	Front Cargo Light Switch	
AW	Front Cargo Light Switch	16 Pur.	Rear Cargo Light Switch	
AX	Front Cargo Light Switch	16 Pur.	Rear Cargo Light Switch	
AY	Rear Cargo Light Switch	16 Pur.	Cargo Lights	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
BA	Windshield Wipers	14 Grn.	Ground	
BB	ACC Power	16 Pur.	I/P Gauges	
BC	Indicator Lights	14 Grn.	Ground	
BD	Over Current Protection (10A Fuse Typical)	14 Pur.	Brake Lamp Switch	
BE	Blower Motor	12 Grn.	Ground	
BF	WSW Pump/Horn	14 Grn.	Ground	
BG	Fuel Sender	14 Pur.	Fuel Gauge	
GH	Run Only Pwr. (Relay 150)	14 Pur.	Engine Wiring	
BJ	Over Current Protection (10A Fuse)	16 Pur.	Engine Wiring	
BK	Over Current Protection (10A Fuse)	16 Pur.	Feed Horn Relay	
BL	Cigar Lighter	16 Pur.	Ground	
BM	Battery Power	16 Pur.	Cigar Lighter	
BN	AAC Power	16 Pur.	Spotlight	
BP	Ground	14 Grn.	Heated, Motorized Mirror	
BR	Motor Mirror Switch	14 Pur.	Motorized Mirror (R)	
BS	Heat Mirror Switch	14 Pur.	Heated Mirror	
BT	Motor Mirror Switch	14 Pur.	Motorized Mirror (L)	
BU	Run Power	14 Pur.	Heat, Motor Switches	
BW	Ignition Switch	12 Pur.	ACC Feed	
BX	Ignition Switch	12 Pur.	Run Feed	
BY	Fuse Link	12 Pur.	Battery Supply	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
CA	Fuse Link	12 Pur.	Battery Supply	
CB	Ignition Switch	12 Pur.	Start	
CC	Alternator	16 Pur.	Alternator Warning Lamp	
CD	Oil Pressure Warning Lamp	16 Pur.	Sender (Warning)	
CE	Water Temp. Warning Lamp	16 Pur.	Sender (Warning)	
CF	Switch	14 Pur.	TV Jack (Rear)	
CG	Clutch or Neutral Gear Switch	14 Pur.	Start Isolation Relay	
CH	Start Relay	14 Pur.	Engine Wiring	
CJ	Windshield Washer Pump	14 Pur.	Wiper/Washer Switch	
CK	Speaker TV Positive	16 Pur.	TV	
CL	Speaker TV Negative	16 Grn.	TV	
CM	Inverter - Positive	10 Grn.	15-Amp Circuit Breaker	
CN	Inverter - Negative	16 Grn.	Ground	
CP	Inverter - Ground Lug	12 Grn.	Ground	
CR	Check Engine Lamp	16 Grn.	Ground/GM Wire Asm.	
CS	Thermostat, Remote	16 Grn.	Ground	
CT	DRL Output	16 Pur.	Low Beam Headlights	
CU	DRL Enable	16 Pur.	Run/Start Circuit	
CW	DRL Power	14 Pur.	Solenoid- Chassis Battery Side	
CX	DRL Module	16 Grn.	Ground	
CY	DRL High Beam Disable	16 Pur.	High Beam Headlights	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
DA	Personal Computer	10ga Blk.	Battery Power (Pos.)	
DB	Personal Computer	10ga Grn.	Battery (Ground)	
DC	A/C-Roof, Rear (Exh.)	16 Pur.	Thermostat	
DD	A/C-Roof, Rear (Cool)	16 Pur.	Thermostat	
DE	A/C-Roof, Rear (High)	16 Pur.	Thermostat	
DF	A/C-Roof, Rear (Low)	16 Pur.	Thermostat	
DG	Ignition Switch	12 Pur.	ACC/Run	
DH	Gauge-Emergency Shutdown	14 Pur.	Fuel Solenoid (Diesel)	
DJ	Exhaust Fan Switch (Low)	14 Pur.	Exhaust Fan(s)	
DK	Exhaust Fan Switch (High)	14 Pur.	Exhaust Fan(s)	
DL	Exhaust Fan	14 Grn.	Ground	
DM	Auto Htr. Switch (Common)	10 Blue	Accessory/Accessory Relay	
DN	Relay	12 Pur.	Condensor Fans	
DP	TV/Radio Speaker Feed Select Switch	14 Pur.	TV/Radio Speaker Switching Relay (Oil Input)	
DR	Slideout Room Switch	16 Pur.	HWH Wiring (Extend)	
DS	Rear A/C Condensor	12 Grn.	Ground	
DT	Fuse or Ckt. Bkr.	14 Pur.	Rear Htr.	
DU	Slideout Room Switch	16 Pur.	HWH Wiring (Retract)	
DW	Slideout Room Switch	16 Grn.	HWH Wiring	
DX	HWH Wiring	16 Grn.	Slideout Room Switch	
DY	HWH Wiring	16 Grn.	Slideout Room Relay	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
EA	HWH Wiring	16 Pur.	Slideout Room Relay (Accessory Power)	
EB	Slideout Room Relay	16 Pur.	Slideout Room Switch	
EC				
ED				
EE	Air Ride Suspension Left Down Switch Position	16 Pur.	Air Ride Suspension Left Height Control Box	
EF	Air Ride Suspension Left Up Switch Position	16 Pur.	Air Ride Suspension Left Height Control Box	
EG	Air Ride Suspension Loom Ground	16 Grn.	Air Ride Suspension Control Lamp Grounds	
EH	Air Ride Suspension Right Down Switch Position	16 Pur.	Air Ride Suspension Right Height Control Box	
EJ	Air Ride Suspension Right Up Switch Position	16 Pur.	Air Ride Suspension Right Height Control Box	
EK	Air Ride Suspension Auto Mode Switch Position	16 Pur.	Air Ride Suspension Height Control Boxes	
EL	Ignition Switch	16 Pur.	Air Ride Suspension Auto/Manual Mode Switch	
EM	Air Ride Suspension Compressor	16 Pur.	Warning Compressor On Lamp	
EN	Air Ride Suspension Manual Mode Switch Position	16 Pur.	Level Control Switches and Indicator Lamp	
EP	Circuit Breaker (15 Amp)	14 Pur.	Spot Lamp	
ER	Circuit Breaker (6 Amp)	14 Pur.	Electric Step - Kill Sw.	
ES	Electric Step - Kill Switch	14 Pur.	Electric Step - Wiring	
ET	Circuit Breaker (6 Amp)	16 Pur.	Refrigerator (2-Way)	
EU	Refrigerator (2-Way)	16 Grn.	Ground	
EW	Fuel Heater Switch	14 Pur.	Fuel Heater (ds)	
EX	Switch Television	14 Pur.	Wall Plate - TV	
EY	Overcurrent Protection (16 qa Fuselink Typical)	12 Pur. Lt. Blue	Ignition Switch Feed #2	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
FA	Driver's Door Passenger Side Power Window Switch (Down)	(Pin 2) 14 Pur.	Passenger's Power Window Switch (Pin 2)	
FB	Driver's Door Passenger Side Power Window Switch (Up)	(Pin 4) 14 Pur.	Passenger's Power Window Switch (Pin 4)	
FC	Passenger's Door Power (Pin 1) Window Switch	14 Pur.	Power Window Motor (Pass. Door) (Down)	
FD	Passenger's Floor Power (Pin 5) Window Switch (Pin 5)	14 Pur.	Power Window Motor (Pass. Door) (Up)	
FE	Water Pump Latching Relay Coil Ground Contract	16 Grn.	Ground	
FF	Water Pump Momentary Switch	16 Grn.	Ground	
FG	Water Pump Latching Relay Switch (Normally Open)	12 Pur. (Gray)	Water Pump	
FH	Overcurrent Protection (10 A Braker Typical)	12 Pur. Lt. Blue	Water Pump or Latching Relay Common	
FJ	Switch - Pump, Bath	12 Lt. Blue	Switch - Pump, Shower, Ext.	
FK	Switch - Pump, Bath	12 Gray	Switch - Pump, Shower, Ext.	
FL	Switch - Second Porch Lamp	14 Pur.	Second Porch Lamp	
FM	Solenoid Mounting Bolt	14 Grn.	Ground	
FN	Electric Door Indicator Switch	16 Pur.	Door Open Lamp Switch (Dash)	
FP	Circuit Breaker/Relay	14 Pur.	Aux. Fans/Heater	
FR	Ford Acc./Run Circuit (Wht./Pur. 10A)	14 Pur.	Docking Lights, Relay Rear Monitor	
FS	Docking Lights Relay (Pin 87)	14 Pur.	Docking Lights	
FT	Docking Lights	14 Pur.	Ground	
FU	Automotive Air Wiring	14 Pur.	A/C Clutch Switch	
FW	Switch - Docking Lights	14 Pur.	Relay - Docking Lights (Pin 85)	
FX	Overcurrent Protection (30 A Breaker Typical)	12 Pur. Lt. Blue	Power Driver Seat (6-Way)	
FY	Power Driver Seat (6-Way)	12 Grn.	Ground	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
GA	Wiper Control Module	16 Pur.	Wiper Switch (Power Feed)	
GB	Wiper Control Module	16 Pur.	Wiper Switch (Speed Control)	
GC	Wiper Control Module	16 Pur.	Wiper Switch (Washer Bottle Pump Feed)	
GD	Wiper Control Module	16 Pur.	Wiper Motor (S Terminal)	
GE	Switched Dome Lamp Feed	16 Pur.	Dome Lamp	
GF	Common Rear Channel Speaker Return	16 Grn.	Rear Speakers	
GG	Cruise Set	16 Pur.	Speed Control Amplifier	
GH	Glow Plug Wart Lamp (Diesel Engine)	14 Grn.	Engine Sender	
GJ	Couch Battery Power	16 Pur.	LP Detector Overcurrent Protection	
GK	Air Horn Switch	14 Pur.	Chassis Horn	
GL	Water/Holding Tanks Level Sensors	16 Grn.	Ground	
GM	Jet Air Ride Suspension Pressure Sensors	16 Pur.	Check Rear Air Suspension Dash Warning Lamp	
GN	Rear TV Speaker Output (Positive)	16 Pur.	Rear TV Speaker (Positive)	
GP	Rear TV Speaker Output (Negative)	16 Grn.	Rear TV Speaker (Negative)	
GR	Thermostatically Controlled Roof Vent (Send)	14 Pur.	Thermostat (Return)	
GS	Thermostatically Controlled Roof Vent (Return)	14 Pur.	Thermostat (Return)	
GT	Radio Power Switch (Memory Feed)	16 Pur.	Radio (Memory Feed)	
GU	Defog Module Output	16 Grn.	Defog Relay, Indicator Lamp	
GW	Defog Switch On/Off	16 Grn.	Defog Module On/Off	
GX	XX XXX			
GY	Defog Relay	12 Red	Defog Unit	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
HA	Reading Lamps Switch (93 Vans)	14 Pur.	Reading Lamps	
HB	Mood Lamps Switch	14 Pur.	Mood Lamps	
HC	12 V Power Source	14 Pur.	Over Current Protection (15A Fuse Typical)	
HD	Sofa Slide Motor (Positive)	14 Pur.	Sofa Monoplex Controller	
HE	Sofa Slide Motor (Negative)	14 Grn.	Sofa Monoplex Controller	
HF	Sofa Recline Motor (Positive) 94 Vans	14 Pur.	Sofa Monoplex Controller	
HG	Sofa Recline Motor (Negaive)	14 Grn.	Sofa Monoplex Controller	
HH	Sofa Monoplex Switch	16 Pur.	Sofa Monoplex Controller	
HJ	Sofa Monoplex Switch	16 Grn.	Ground	
HK	Sofa Monoplex Controller	14 Blk.	Ground	
HL	Flood Lamp Switch	14 Pur.	Flood Lamp	
HM	Rear TV Speaker Output (Positive)	16 Pur.	Rear TV Speaker (Positive)	
HN	Rear TV Speaker Output (Negative)	16 Grn.	Rear RV Speaker (Negative)	
HP	Over Current Protection	16 Pur.	Rear A/C	
HR	Switch (94 1200 Modem Van)	14 Pur.	12 Volt Receptacle	
HS				
HT				
HU				
HW				
HX				
HY				

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
JA	Control Center/Fuse Block	12 Pur.	Monitor Panel/Isolated	
JB	Control Center/Fuse Block	14 Pur.	Main Furnace	
JC	Control Center/Fuse Block	14 Pur.	Light Circuit No. 1	
JD	Control Center/Fuse Block	14 Pur.	Light Circuit No. 2	
JE	Control Center/Fuse Block	14 Pur.	Light Circuit No. 3	
JF	Control Center/Fuse Block	14 Pur.	Light Circuit No. 4	
JG	Control Center/Fuse Block	14 Pur.	Light Circuit No. 5	
JH	Main Furnace (+ 12 VDC)	16 Pur.	Main Furnace Thermostat	
JJ	Main Furnace (Heat)	16 Pur.	Main Furnace Thermostat	
JK	Auxiliary Furnace	16 Pur.	Auxiliary Furnace Therm.	
JL	Auxiliary Furnace	16 Pur.	Auxiliary Furnace Therm.	
JM	Main Furnace	14 Grn.	Chassis Ground	
JN	Light Circuit No. 5	14 Grn.	Chassis Ground	
JP	Light Circuit Devices	14 Grn.	Chassis Ground	Grey
JR	Monitor Panel	16 Pur.	LP Tank #2	
JS	Monitor Panel	12 Wht.	Water Pump	White
JT	Monitor Panel	16 Pur.	LP Tank #1	Red/Wht.
JU	Monitor Panel	14 Pur.	Water Heater	Blu./Wht.
JW	Monitor Panel	14 Pur.	Water Heater	Brn
JX	Water Heater	14 Grn.	Chassis Ground	Green
JY	Water Pump	12 Grn.	Chassis Ground	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
KA	Circuit Breaker 25 Amp	10 Pur.	Electric Step	(Red)
KB	Circuit Breaker 25 Amp	10 Wht.	Step Kill Switch	
KC	Step Kill Switch	10 Wht.	Electric Step	(White)
KD	Door Jamb Step Switch	14 Grn.	Electric Step	(Brown)
KE	Auto Fuse Block	14 Pur.	Elec. Step/RR Auto Htr SW	(Yellow)
KF	Aux. Battery Discon. SW	16 Grn.	Ground/Instr. Panel	
KG	Vent-Lift, Power (Red)	14 Pur.	Switch-(Up-Position)	Red
KH	Vent-Lift, Power (Blue)	14 Pur.	Switch-(Down-Position)	Blue
KJ	Vent-Lift, Power (Blk)	14 Pur.	Switch-Fan	Brown
KK	Radio-Rear	16 Pur.	Speaker-Right	
KL	Radio-Rear	16 Grn.	Speaker-Right (Ground)	
KM	Vent-Light	14 Pur.	Switch-Light	Yellow
KN	Radio-Rear	16 Pur.	Speaker-Left	
KP	Radio-Rear	16 Grn.	Speaker-Left (Ground)	
KR	Antenna-Rear, Radio	14 Grn.	Ground	Chassis
KS	Switch-Heater, High Speed	14 Pur.	Rear Auto Heater (2)	Orange
KT	Switch-Heater, Med. Speed	14 Pur.	Rear Auto Heater (3)	Yellow
KU	Switch-Heater, Low Speed	14 Pur.	Rear Auto Heater (4)	Red
KW	Radio	16 Pur.	Speaker-Right Front	
KX	Radio	16 Pur.	Speaker-Right Rear	
KY	Radio	16 Pur.	Speaker-Left Front	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
LA	Radio	16 Pur.	Speaker-Left Rear	
LB	Radio	16 Grn.	Speaker-Right Rear, Ground	
LC	Radio	16 Grn.	Speaker-Left Rear, Ground	
LD	Fuse Block-Auto	16 Pur.	Accessory Power	
LE	Switch-Fans, Defogger	14 Pur.	Fans-Defogger, Hi Speed	Black
LF	Switch-Fans, Defogger	14 Pur.	Fans-Defogger, Low Speed	Red
LG	Relay-Terminal I	16 Pur.	Switch-Disconnect, Bat.	
LH	Relay-Terminal S	16 Pur.	Switch-Disconnect, Bat.	
LJ	Relay-Battery Side	16 Pur.	Switch-Disconnect, Bat.	
LK	Relay-System Side	16 Pur.	Indicator Light	
LL	Generator (Start) Red (2)	16 Grn.	Instru. Panel (See Dia)	
LM	Generator (Stop) Orn (2)	16 Grn.	Instru. Panel (See Dia)	
LN	Generator (Ground) Grn (1)	16 Grn.	Instru. Panel (See Dia)	
LP	Generator (Run) Blue (6)	16 Pur.	Instru. Panel (See Dia)	
LR	Switch-Mode, Battery	14 Pur.	Solenoid-Battery	
LS	Circuit Breaker 6 Amp	16 Pur.	Switch-Mode/Cond. Battery	
LT	Switch-Cond., Battery	16 Pur.	Voltmeter-12 Volt DC	
LU	Brake Switch, Chev-Wht/Wlre	14 Pur.	Brake Lights/4 Light Sys.	
LW	Wiper Control Mod/Park	14 Pur.	Windshield Wipers-Front	
LX	Wiper Control Mod/Low Spd	14 Pur.	Windshield Wipers-Front	
LY	Wiper Control Mod/High Spd	14 Pur.	Windshield Wipers-Front	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
MA	Wiper Control Mod	16 Pur.	Bottle-Washer, Windshield	
MB	Fuse Panel-Auto, WSW	14 Pur.	Circuit Breaker 6 Amp	
MC	IP Lamp Circuit	16 Grn.	Chassis Ground	
MD	Circuit Breaker (15 Amp)	14 Pur.	Relay/Remote, Mirror	
ME	Circuit Breaker (15 Amp)	14 Pur.	Relay/Air Horns	
MF	Circuit Breaker (15 Amp)	14 Pur.	Relay/Fog Lights	
MG	Ground Bolt	14 Grn.	Remote Mirror, Fog, Air Horns	
MH	Fuse Panel-Choke Conn.	16 Grn.	Choke Light	Blue/White
MJ	Fuse Panel-Auto, WSW (*-05)	14 Pur.	Wiper Control Mod	
MK	Fuse Panel-Auto, Bat (*-03)	14 Pur.	Battery Power	
ML	Fuse Panel-Auto, LPS (*-02A)	16 Pur.	Instr. Panel Lamps (Reostat)	
MM	Clearance Lights	14 Pur.	Clearance Lights	
MN	Dome Light, Switched Grd.	16 Grn.	Door Switch	
MP	Stepswitch	14 Grn.	Ground	
MR	Rear Wiper, Switch	14 Pur.	Rear Wiper (Low)	
MS	Clearance Lights	14 Grn.	Ground	
MT	Step-Electric	8 Grn.	Ground	Chassis
MU	Radio Cigarette Lighter (Battery Circuit)	14 Grn.	Ground	
MW	Fuse Panel-Chec Eng Conn	16 Pur.	Check Engine Light	Brn/Wht
MX	Wiper Switch (High)	16 Pur.	Relay-Wiper	
MY	Headlight (Power)	14 Pur.	Smart Stick Module	Yellow

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
NA	Headlight (Low)	14 Pur.	Smart Stick Module-Relay	GM-Tan
NB	Headlight (High)	14 Pur.	Smart Stick Module-Relay	GM-Lt. Grn.
NC	Light (Circuit #1)	14 Grn.	Ground	
ND	Light (Circuit #2)	14 Grn.	Ground	
NE	Light (Circuit #3)	14 Grn.	Ground	
NF	Light (Circuit #4)	14 Grn.	Ground	
NG	Foglight Switch	16 Pur.	Relay-Fog Lamps	
NH	Relay-Fog Lamps	14 Pur.	Fog Lamps Relay	
NJ	Chassis Horn Feed Circuit	16 Pur.	Air Horn Switch	Dk. Grn.
NK	Air Horn Switch	16 Pur.	Air Tank	
NL	Relay-Air Horn	14 Pur.	Compressor	
NM	Control Center/Fuse Block	14 Pur.	Front Lights-RH Light Circuit #6	
NN	Remote Mirror, Left	16 Pur.	Switch-N, Switch-Horiz-P	Yellow
NP				
NR	Remote Mirror, Left	16 Pur.	Switch-N, Switch-Vert-P	White
NS	Switch-Heating Element	14 Pur.	Remote Mirror/Htg. Ele.	Orange
NT	Relay-Remote Mirror	14 Pur.	Switches	Black
NU	Switch-Aisle Lights	14 Pur.	Switches-Aisle Lts	
NW	Switch-Comp Lts/Instr Panel	14 Pur.	Compartment Lights	Black
NX	Switch-ICC Blink	14 Pur.	Clearance Lights-Frt & Rr	
NY	Switch-Aisle Lights	14 Pur.	Switch-Aisle Lts.	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
PA	Rear Auto Heater (1)	14 Grn.	Ground	Green
PB	Rear Wiper Motor	14 Grn.	Ground	
PC	Light-Bedroom Ceiling	14 Pur.	Switch	
PD	Light-Make-Up #1	14 Pur.	Switch-Make-Up #1	
PE	Light-Bath Ceiling	14 Pur.	Switch	
PF	Light-Shower	14 Pur.	Switch	
PG	Light-Wardrobe	14 Pur.	Switch	
PH	Light-Aisle (Floor)	14 Pur.	Switch-Aisle Lights	
PJ	Light-Porch	14 Pur.	Switch	
PK	Light-Strip	14 Pur.	Switch	
PL	Light-Front Ceiling	14 Pur.	Switch	
PM	Light Circuit #6	14 Grn.	Ground	
PN	Remote Mirror, Right	16 Grn.	Switch-N//Switch-Common	Black
PP	Remote Mirror, Right	16 Pur.	Switch-N//Switch-Horiz-P	Yellow
PR	Remote Mirror, Right	16 Pur.	Switch-N//Switch-Vert-P	White
PS	Map Light Switch	14 Pur.	Map Light	
PT	Switch, Beverage Tray	14 Pur.	Light, Beverage Tray	
PU	Switch-Dump Light	16 Pur.	Dump-Light	
PW	Circuit Breaker (15 Amp)	14 Pur.	Relay-Door Lock (30)	
PX	Switch-Door Lock (2)	16 Pur.	Relay-Door Lock (86)	Lock
PY	Switch-Door Lock (3)	16 Grn.	Relay-Door Lock (86)	Un-Lock

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
RA	Turn Signal Switch	14 Pur.	Lt. Front Turn/Side Marker	
RB	Turn Signal Switch	14 Pur.	Rt Front Turn/Side Marker	
RC	Front Lights	14 Grn.	Ground	
RD	Fuse Panel	14 Pur.	Hazard Flasher/Horn Relay (NO & Coil)	
RE	Radiator Fan Relay (Common)	12 Pur.	Radiator Fan #1	
RF	Radiator Fan Relay #2 (Com)	12 Pur.	Radiator Fan #2	
RG	Radiator Fan Relays (Coil)	14 Grn.	Tad. Fan Thermo Switch	
RH	#1 Radiator Fan Cir/Brkr	12 Blk.	#1 Rad. Fan Relay (No)	
RJ	#2 Radiator Fan Cir/Brkr	12 Blk.	#2 Rad. Fan Relay (No)	
RK	Radiator Fan #1	12 Grn.	Ground	
RL	Radiator Fan #2	12 Grn.	Ground	
RM	Low Air Ind./I. Cluster Brk Warning Light	14 Grn.	Brk Eq/Park Brk Lvr/Ignition Switch Ground	
RN	A/C Cutoff Thermo Switch	14 Pur.	A/C Compr. Clutch	
RP	A/C Cutoff (Compr. Clutch)	14 Pur.	A/C Cutoff Thermo Switch	
RR	Brake Light Switch	14 Pur.	Turn Signal Switch	
RS	Headlamp Switch	14 Pur.	Fuse Panel (Instr. Lights)	
RT	Horn Relay (Common)	14 Pur.	Horn	
RU	Horn Relay (Coil)	14 Pur.	Horn Button (Ground)	
RW	Hazard Flasher	14 Pur.	Turn Signal Switch	
RX	EUL Warning Lamp	14 Pur.	EUL Module	
RY	I. Cluster/EUL Module	14 Grn.	Ground	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
SA	Engine Water Temp. Gauge	14 Pur.	Engine Water Temp. Sender	
SB	Engine Oil Pres. Gauge	14 Pur.	Engine Oil Pres. Sender	
SC	Turn Signal Switch	14 Pur.	Rt Rear Turn/Brake Lite	Green
SD	Turn Signal Switch	14 Pur.	Lt Rear Turn/Brake Lite	Yellow
SE	Speed Senser	16 Wht. Twisted	Spedo/Cruise	
SF	Speed Senser	Pair 16 Blk.	Spedo/Cruise	
SG	Ignition Switch (Start)	14 Pur.	Neutral Safety Switch/Fuel Pump Relay (Coil)	
SH	Ignition Switch (Start/Run)	14 Pur.	Fuse Panel (Ign. ID)/Eng. Wiring/Ing Coil Relay (No)	
SJ	Chassis Battery Fuse Link	12 Blk.	Fuse Panel (Battery)	
SK	Chassis Battery Fuse Link	14 Pur.	Headlamp Switch	
SL	Chassis Battery Fuse Link	12 Blue	Ignition Switch	
SM	Chassis Battery Fuse Link	12 Blk.	Radiator Fan Cir/Brkr #1	
SN	Chassis Battery Fuse Link	12 Blk.	Radiator Fan Cir/Brkr. #2	
SP	Fuse Panel Marker Light Fuse	12 Pur.	Headlamp Switch	
SR	Ignition Switch	12 Grn./Wht.	Fuse Panel (Ignition 3)	
SS	Ignition Switch	12 Wht.	Fuse Panel (AAC)	
ST	Fuse Panel Ignition I	14 Pur.	Turn Flasher/Backup Switch	
SU	Starter Solemoid Bat Term		Alternator (Bat Term)	
SW	Turn Signal Flasher	14 Pur.	Turn Signal Switch	
SX	Rear Window Washer Switch	14 Pur.	Rear Window Washer	
SY	Ignition Coil (Tachometer)	14 Pur.	I. Cluster Tachometer	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
TA	Fuse Panel Ignition 3	14 Pur.	Radiator Fan Relays (Coil)	
TB	Fuse Paenl Ignition 3	12 Pur.	Heater Blower Lo/Med	
TC	Fuse Panel Ignition 3	14 Pur.	Door Locks	
TD	Fuse Panel Battery	14 Pur.	Open	
TE	Generator Set	16 Grn.	Gen Set Low Oil Indicator	
TF	Generator Set	16 Pur.	Gen Set Low Oil Indicator	
TG	Cruise Control (1)	14 Pur.	Servo Valve Common	Orange
TH	Cruise Control (2)	14 Pur.	Throttle Position Feedback	Tan
TJ	Cruise Control (3)	14 Pur.	Ground	Black
TK	Cruise Control (4)	14 Pur.	Dump Valve	Pink
TL	Cruise Control (5)	14 Pur.	Servo Vent Valve	White
TM	Cruise Control (6)	14 Pur.	Servo Charge Valve	Mar
TN	Starter Solenoid Bat Term	14 Pur.	Alternator Regulator	Red
TP	Rear Lights	14 Grn.	Ground	White
TR	Backup Light Switch	14 Pur.	Backup Lights	Black
TS	Starter Solenoid (I Term)	14 Pur.	Eng. Wiring (Ing. Module)	
TT	Safety Neutral Switch	14 Pur.	Starter Solenoid (S Term)	
TU	Ignition Coil Relay (Coil)	14 Grn.	Ground	
TW	Ignition Switch (Start/Run)	20 Red Resistor Wire/14 Pur.	Ignition Coil (TX)	
TX	Ignition Coil Relay (Common)	14 Pur.	Ignition Coil	
TY	Alternator (T Term)	14 Pur.	Choke Heater	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
UA	Fuel Pump Fuse	14 Pur.	Oil Pressure Cutout Switch/Fuel Pump Relay (NO)	
UB	Inertia SW (Fuel Pump)	14 Pur.	Fuel Pump Relay (NC)	
UC	Fuel Pump Relay (Common)	14 Pur.	Fuel Pump	
UD	Fuel Gauge	16 Grn.	Fuel Sender	
UE	Inertia SW (Fuel Pump)	14 Pur.	Oil Pres. Cutoff Switch	
UF	Fuel Pump	14 Grn.	Ground	
UG	Fuel Pump Relay	14 Grn.	Ground	
UH	LP Leak Detector (Yel.)	16 Pur.	LP Safety Valve	Black
UJ	LP Leak Detector (Yel.)	16 Pur.	LP Safety Valve	Black
UK	LP Leak Detector (Blk.)	14 Grn.	Ground	
UL	EUL Lamp	16 Grn.	EUL Module	
UM	Door Switch	16 Grn.	Ground	
UN	Seat Belt Lamp	16 Grn.	EUL Module	
UP	Seat Belt Lamp	16 Pur.	Seat Belt Buzzer	
UR	Parking Brake Lamp	16 Grn.	Parking Brake Switch	
US	Circuit Breaker (Main Batt)	16 Pur.	Batt. Cond. Switch	
UT	Door Switch (+ 12V Positive)	14 Pur.	Dome Light	
UU	Water Heater	16 Pur.	Vacuum Valve Solenoid	
UW	Vacuum Valve Solenoid	16 Grn.	Ground	
UX	LP Leak Detector (Yel.) #2	16 Pur.	LP Safety Valve	Black
UY	LP Leak Detector (Yel.) #2	16 Pur.	LP Safety Valve	Black

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
WA	Exterior Servicelight Switch	14 Pur.	Exterior Servicelight	
WB	Circuit Bkr. (6A)	16 Pur.	LP Leak Detector	
WC	Circuit Bkr. (15A)	14 Pur.	Compartment Lights	
WD	3-Way Aisle (Courtesy) Light Circuit	16 Grn.	Ground	
WE	Compartment Lights	14 Grn.	Ground	
WF	30 Amp Circuit Breaker	12 Wht.	Parking Brake Compressor Solenoid	
WG	Circuit Breaker	12 Blk.	Relay-Ignition	(30) or (87)
WH	Circuit Breaker-Ing. (15A)	14 Pur.	Ignition Power	
WJ	Circuit Breaker	12 Blk.	Relay-ACC	(30) or (87)
WK	Circuit Breaker-ACC (15A)	14 Pur.	ACC-Power	
WL	Relay-Power Door Lock	14 Pur.	Door Lock Motor (Lock)	Red
WM	Relay-Power Door Lock	14 Grn.	Door Lock Motor (Unlock)	Orange
WN	Switch-Radio Power	16 Pur.	Radio	Orange/White
WP	Circuit Breaker (15 Amp)	14 Pur.	Switch-Spot Lamp	Yellow
WR	Circuit Breaker (15 Amp)	14 Pur.	Switch-Power Seat, Lift	
WS	Switch-Power Seat, Lift	14 Grn.	Ground	
WT	Switch-Power Seat, Lift	14 Pur.	Motor (Up)	14 Red
WU	Switch-Power Seat, Lift	14 Grn.	Motor (Down)	14 Black
WW	Switch-Spot Lamp	14 Grn.	Ground	Black
WX	Switch-Hallway Ceiling	14 Pur.	Hallway Ceiling Light	Black
WY	Auto A/C Motor	10 Grn.	Ground	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
XA	Fuse Panel 04*	10 Blk.	Auto A/C Fan	
XB	Switch-Power Window Driver's Door	14 Pur.	Motor (Up)	Green
XC	Switch-Power Window Driver's Door	14 Grn.	Motor (Down)	Red
XD	Monitor Panel	16 Grn.	Tank Sensor (Full)	Orange
XE	Monitor Panel	16 Grn.	Tank Sensor (3/4)	White
XF	Monitor Panel	16 Grn.	Tank Sensor (1/2)	Yellow
XG	Monitor Panel	16 Grn.	Tank Sensor (1/4)	Blue
XH	Monitor Panel	16 Pur.	Water Tank Level Sensor	Brown
XJ	Monitor Panel	16 Pur.	Main Holding Level Sensor	Green
XK	Monitor Panel	16 Pur.	Aux. Holding Tank #1 Level Sensor	Red
XL	Monitor Panel	16 Pur.	Aux. Holding Tank #2 Level Sensor	Pink
XM	Chassis Battery Fuse Link	14 Pur.	Ignition Start Relay	
XN	A/C-Roof, Front (EXH)	16 Pur.	Thermostat (EX)	Orange
XP	A/C-Roof, Front (Cool)	16 Pur.	Thermostat (Y)	Yellow
XR	A/C-Roof, Front (High)	16 Pur.	Thermostat (GH)	Green
XS	A/C-Roof, Frint (Low)	16 Pur.	Thermostat (GL)	Gray
XT	Ignition Start Relay 1 (NC)	14 Pur.	Ignition Start Relay 2 (Com)	
XU	Light Switch	14 Pur.	Light	
XW	Accessory Relay Circuit	14 Grn.	Ground	
XX	Light Switch-Galley	14 Pur.	Light	
XY	Light Switch-Make-Up #2	14 Pur.	Make-Up Lamp #2	

WIRE	FROM	WIRE COLOR	TO	WIRE COLOR
YA	Tag Axle Pes. Control Switch	14 Pur.	Comp. Solenoid and Solenoid Air Valve	
YB	Low Air Pressure Switch	14 Grn.	Ground	
YC	Circuit Breaker (30 Amp)	10 Blue	(Tag Axle) Compressor Solenoid	
YD	Tag Axle Mounting Plate Screw	14 Grn.	Ground	
YE	Tag Axle Compressor	10 Grn.	Ground	
YF	Tag Axle Brake Control and Brake Magnet	12 Grn.	Ground	
YG	Circuit Breaker 20 Amp	12 Blk.	Tag Axle Brake Control	Black
YH	Tag Axle Control	12 Blue	Tag Axle Brake Magnet	Blue
YJ	Tag Axle Compressor Solenoid	10 Wht.	Tag Axle Compressor	
YK	Bedroom Ceiling Switch (3-Way)	14 Pur.	Bedroom Ceiling Switch (3-Way)	
YL	Bedroom Ceiling Switch (3-Way)	14 Pur.	Bedroom Ceiling Switch (3-Way)	
YM	Hallway Ceiling Switch (3-Way)	14 Pur.	Hallway Ceiling Switch (3-Way)	
YN	Hallway Ceiling Switch (3-Way)	14 Pur.	Hallway Ceiling Switch (3-Way)	
YP	Valance Light Switch (3-Way)	14 Pur.	Valance Light Switch (3-Way)	
YR	Valance Light Switch (3-Way)	14 Pur.	Valance Light Switch (3-Way)	
YS	Valance Light Switch (3-Way)	14 Pur.	Valance Light Switch (3-Way)	
YT	Valance Light Switch-Front	14 Pur.	Valance Light-Front	
YU	Valance Light Switch-Rear	14 Pur.	Valance Light-Rear	
YW	Door Bell (F)	14 Grn.	Door Bell Switch	
YX	Ignition Switch (Run/Start)	14 Pur.	Alternator Warning Lamp	Red/Grn
YY	Alternator Voltage Reg.	14 pur.	Alternator Warning Lamp	Grn/Red

SECTION 2

EXTERIOR BODY

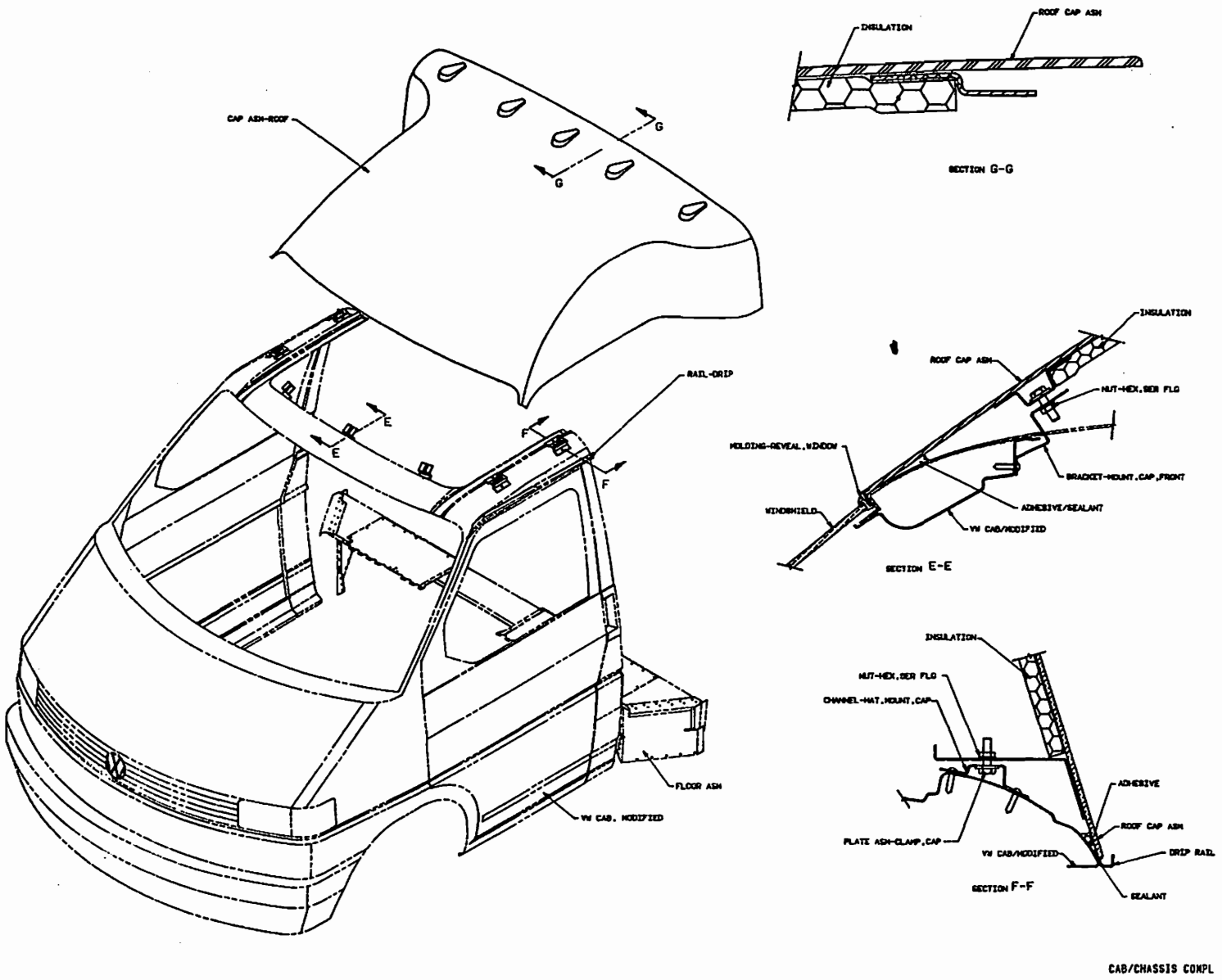
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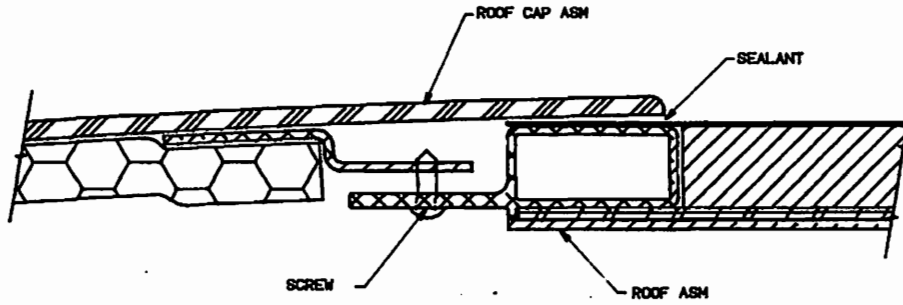
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Right Rear Valance Panel Removal Replacement	2-9
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SECTION 2 EXTERIOR BODY

Front Roof Cap Removal





WARNING

Removal of the front cap is a destructive process. You will need to replace the front cap with a new assembly.

1. Remove head liner. Reference "Headliner Removal".
2. Disconnect 12 volt DC wiring clearance lights.
3. Remove (7) retaining nuts along front edge of roof cap.
4. Remove (17) retaining screws along rear edge of roof cap.
5. Remove front cap from vehicle by breaking the roof cap to cab adhesive bond with a chisel.
6. Remove clearance lights for use on new roof cap. Reference "Front Clearance Lights Removal" in Electrical Section.
7. Carefully remove any adhesive and sealant left on vehicle by scraping or lightly sanding.

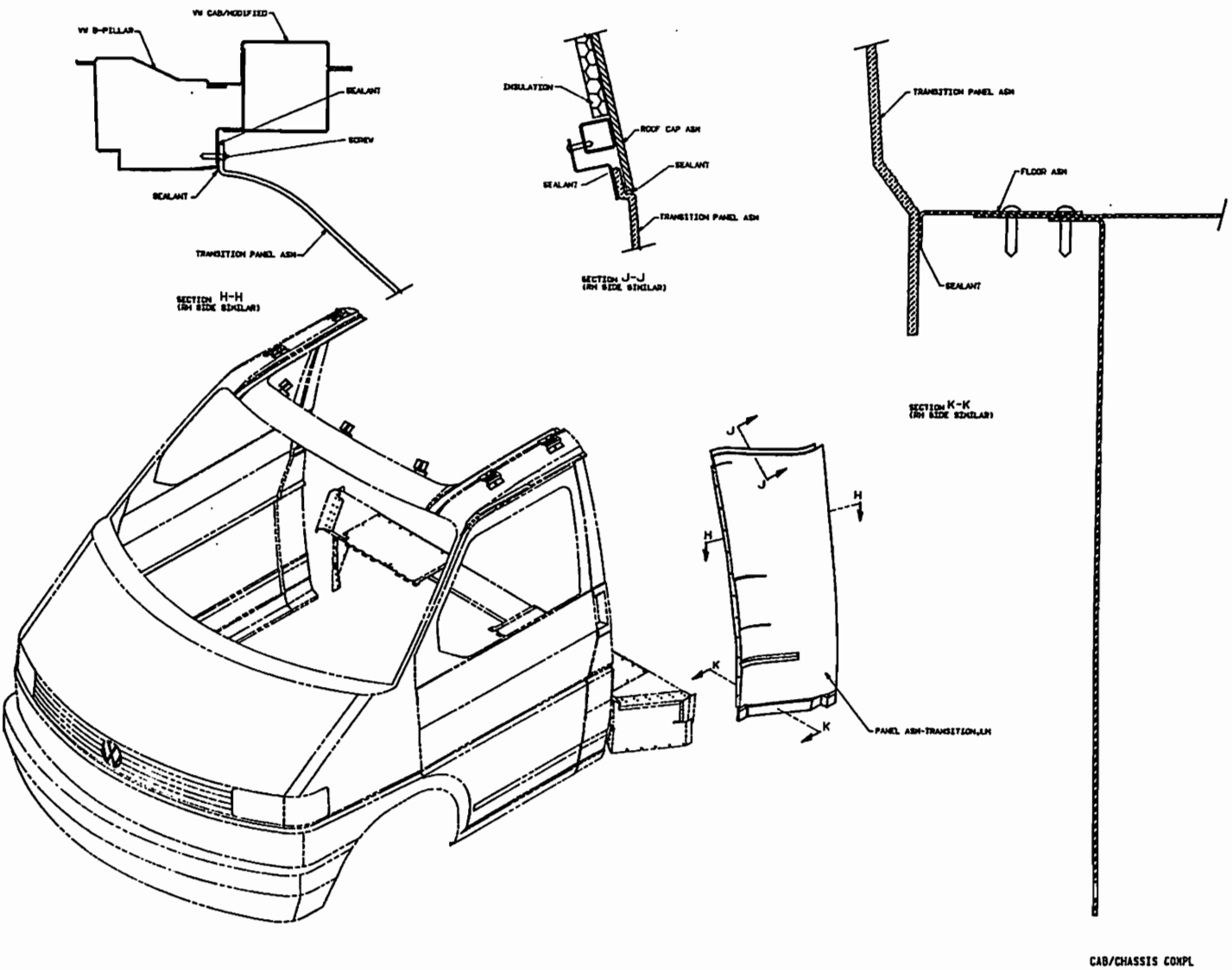
NOTE: Any bare metal exposed by this process must be primed and painted prior to installation of a new roof cap.

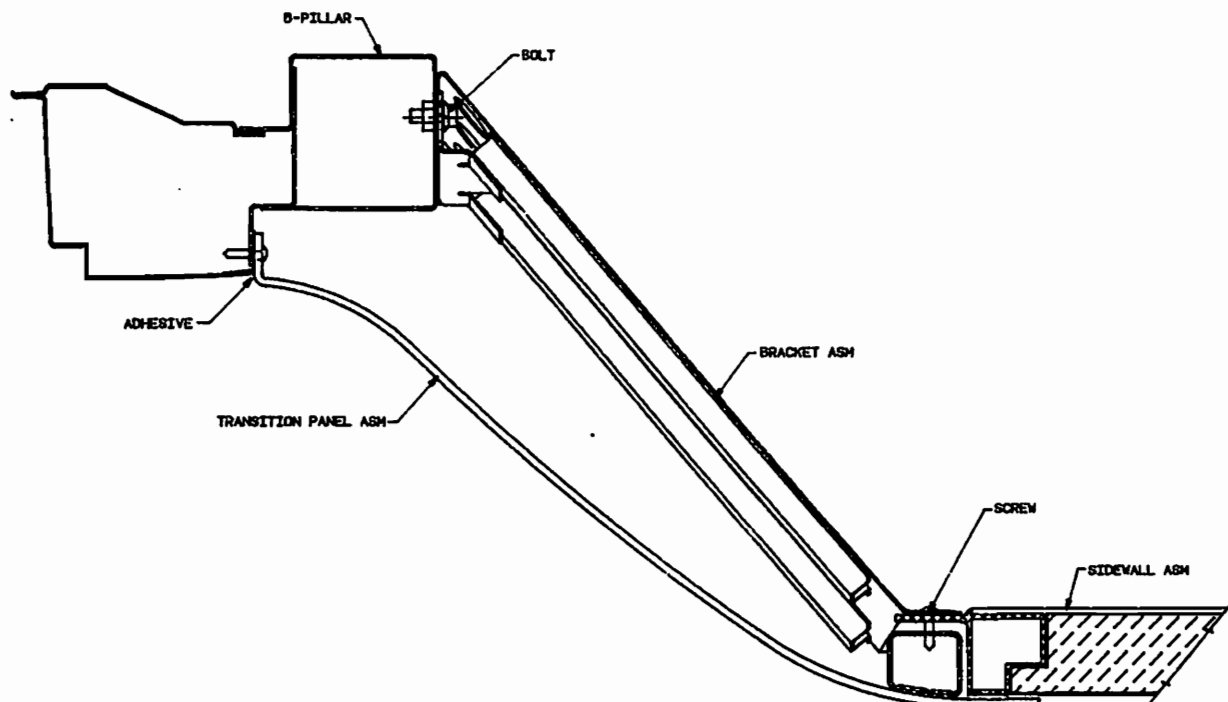
Front Roof Cap Replacement

1. Install clearance lights on new roof cap. Reference "Front Clearance Light Replacement" in Electrical Section.
2. Apply adhesive (Winnebago part #112901-01-000) to roof cap to cab contact surfaces.
3. Apply sealant (Winnebago part #034552-14-000) to the top edge of the transition panel.
4. Apply sealant (Winnebago part #034552-14-000) to the inside rear edge of the roof cap.
5. Place roof cap in the proper position.
6. Secure roof cap with (7) retaining nuts and (17) retaining screws.
7. Remove excess sealant from roof cap to transition panel seam.

Mask both sides of cap to cab, cap to roof seams.
8. Cap seal roof cap with sealant (Winnebago part #108716-01-000) trowel per aesthetic requirements.
9. Remove mask.

Transition Panel Removal





WARNING

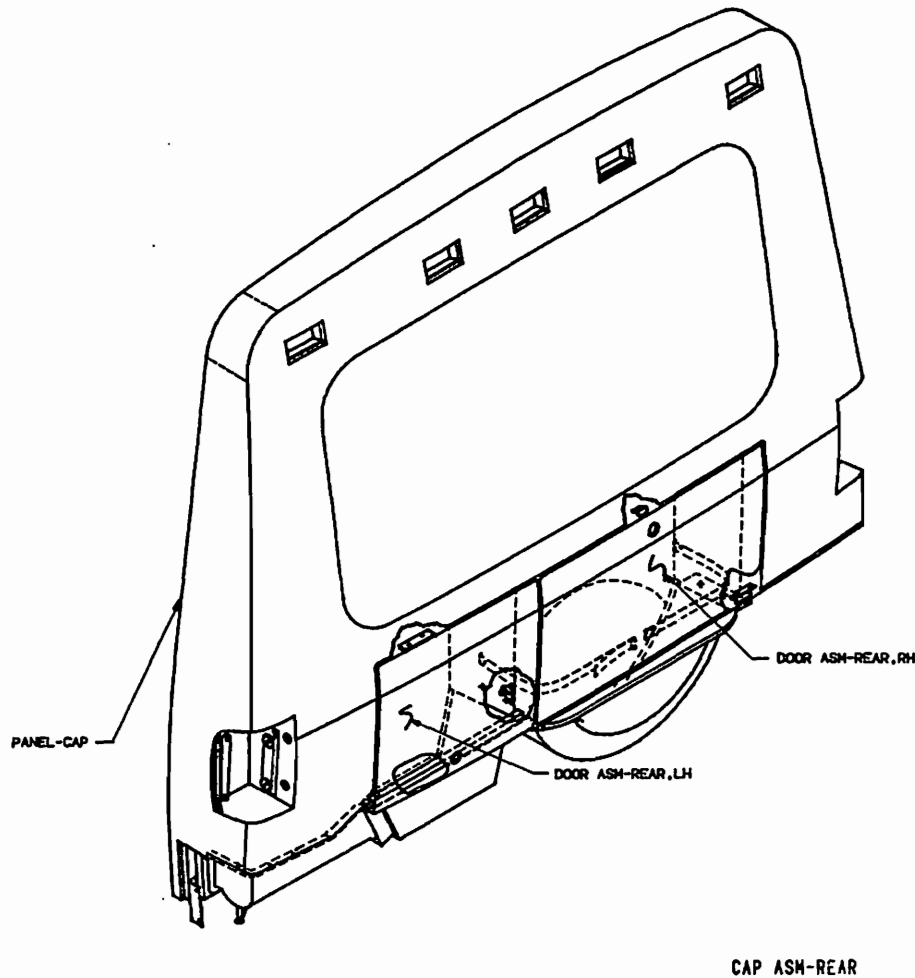
Removal of a transition panel is a destructive process. You will need to replace the transition panel with a new assembly.

1. Remove headliner. Reference "Headliner Removal" in Interior Section.
NOTE: When you remove the headliner, you will also remove the transition panel covers.
2. Remove (25) transition panel retaining screws.
3. Use a putty knife to carefully cut the sealant around the perimeter of the transition panel.
4. Pull bottom of transition panel out and pull panel down to remove.
5. Remove remaining sealant from vehicle.

Transition Panel Replacement

1. Apply mask around all mating edges of transition panel and the rear edge of the B-pillar, bottom edge of roof cap where it mates to the panel and the leading edge of the sidewall.
2. Apply foam tape (Winnebago part #100128-02-000) to the flange of the transition seating plate. (Where the transition panel mates to the floor line.)
3. Apply sealant (Winnebago part #034552-14-000) to the B-pillar transition joint area to the upper edge of the transition panel, and the surface of the panel attachment tube that mates to the sidewall.
4. Install transition panel by inserting the upper edge of panel under the roof cap seam. Then fitting transition panel into proper position.
5. Secure transition panel with (25) retaining screws.
6. Cap seal transition panel joints with sealant (Winnebago part #034552-14-000). Trowel per aesthetic requirements.
7. Remove masking.
8. Install headliner. Reference "Headliner Replacement" in Interior Section.
9. Install transition panel covers. Reference "Transition Panel Cover Replacement" in Interior Section.

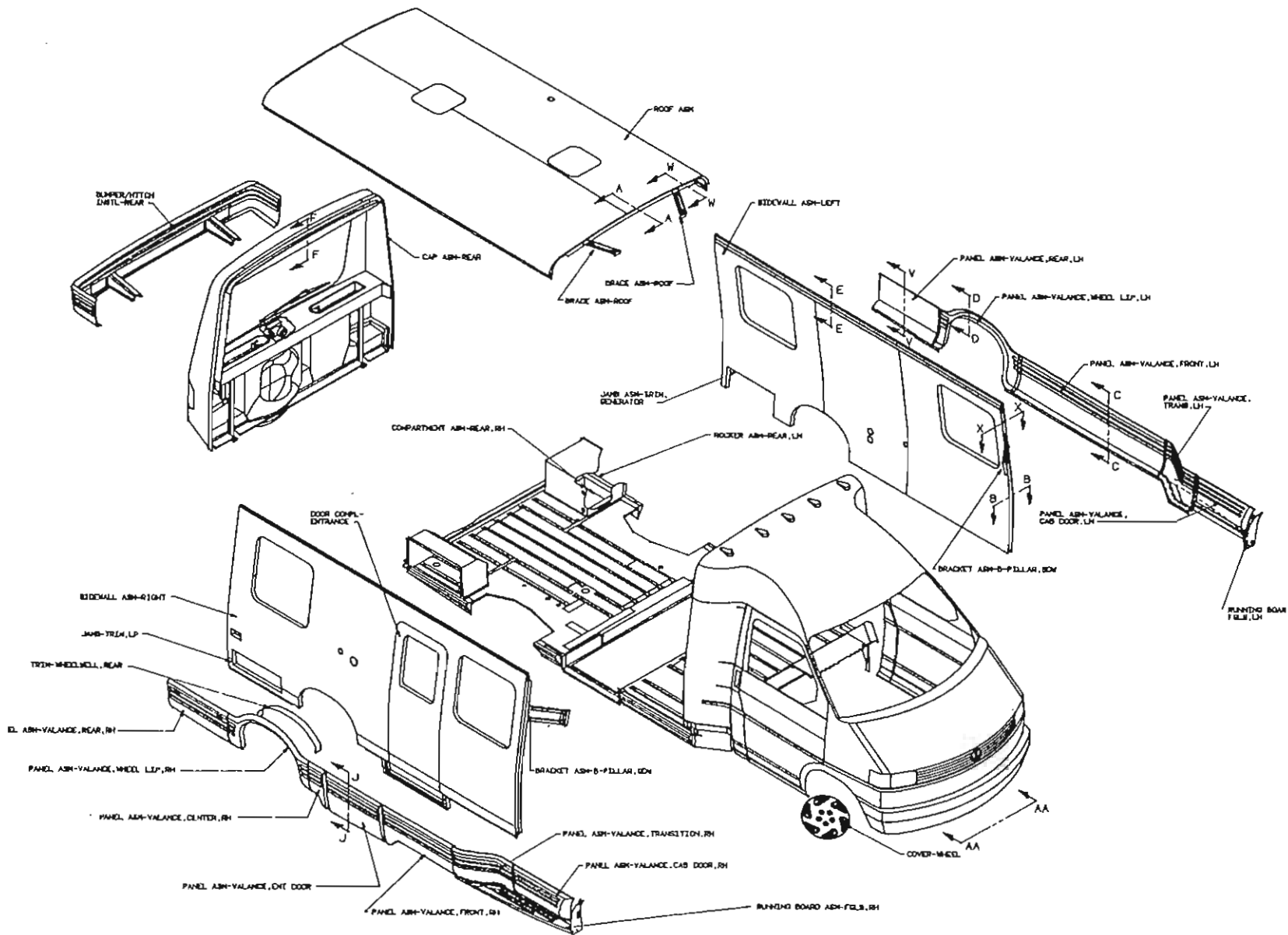
Rear Cap Removal



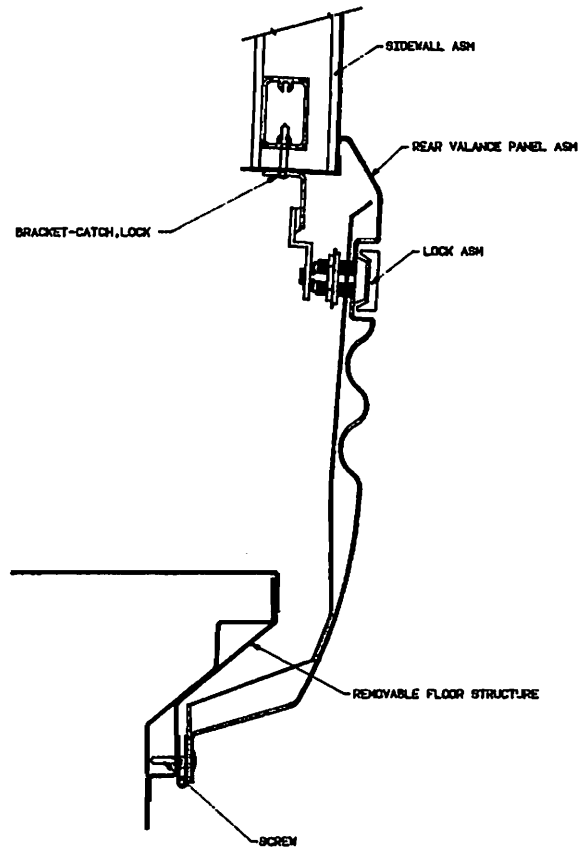
1. Loosen rear window wiper arm retaining nut and remove rear wiper arm assembly if applicable.
2. Remove spare tire.
3. Remove (6) power cord plate retaining screws.
4. Remove left and right tail light assemblies. Reference "Tail Light Removal" in Electrical Section.
5. Remove upper backwall panel. Reference "Upper Backwall Panel Removal" in Interior Section.
6. Remove lower backwall panel. Reference "Lower Backwall Panel Removal" in Interior Section.
7. Remove rear cap retaining screws.
8. Use a putty knife to carefully cut the sealant around the perimeter of the rear cap.
9. Pull rear cap away from vehicle to allow access to 12 volt DC wiring.
10. Disconnect 12 volt DC wiring from clearance lights. Disconnect coax from exterior cable input jack. Pull power cord free of rear cap.
11. Remove rear cap from vehicle.

Rear Cap Replacement

1. Position rear cap to allow for wire connections. Connect coax to exterior cable input jack. Connect 12 volt DC wiring to clearance lights. Feed power cord through opening in rear cap.
2. Apply sealant (Winnebago part #072889-08-000) to the underside of the leading edge of rear cap.
3. Place rear cap in proper position. Secure with retaining screws.
4. Install lower backwall panel. Reference "Lower Backwall Panel Replacement" in Interior Section.
5. Install upper backwall panel. Reference "Upper Backwall Panel Replacement" in Interior Section.
6. Place power cord retaining plate in proper position. Secure with (6) retaining screws.
7. Install tail lights. Reference "Tail Light Replacement" in Electrical Section.
8. Install spare tire.
9. Mask both sides of the roof to rear cap and sidewalls to rear cap joints. Cap seal roof to rear cap joint with sealant (Winnebago Part #108716-01-000). Cap seal sidewall to rear cap joints with sealant (Winnebago part #034552-14-000). Trowel as per aesthetic requirements.
10. Remove masking.



BODY INSTL-PANEL & TRIM



SECTION V-V
(RSH SIDE SIMILAR)

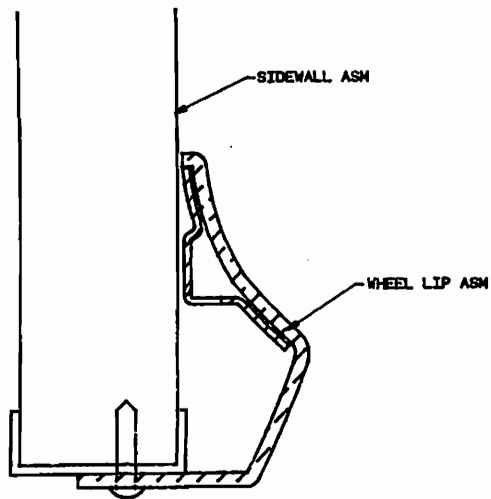
Right Rear Valance Panel Removal (Door Assembly)

1. Open compartment door.
2. Remove (1) screw retaining the lanyard to door asm.
3. Remove (6) hinge retaining screws.
4. Remove the door assembly.

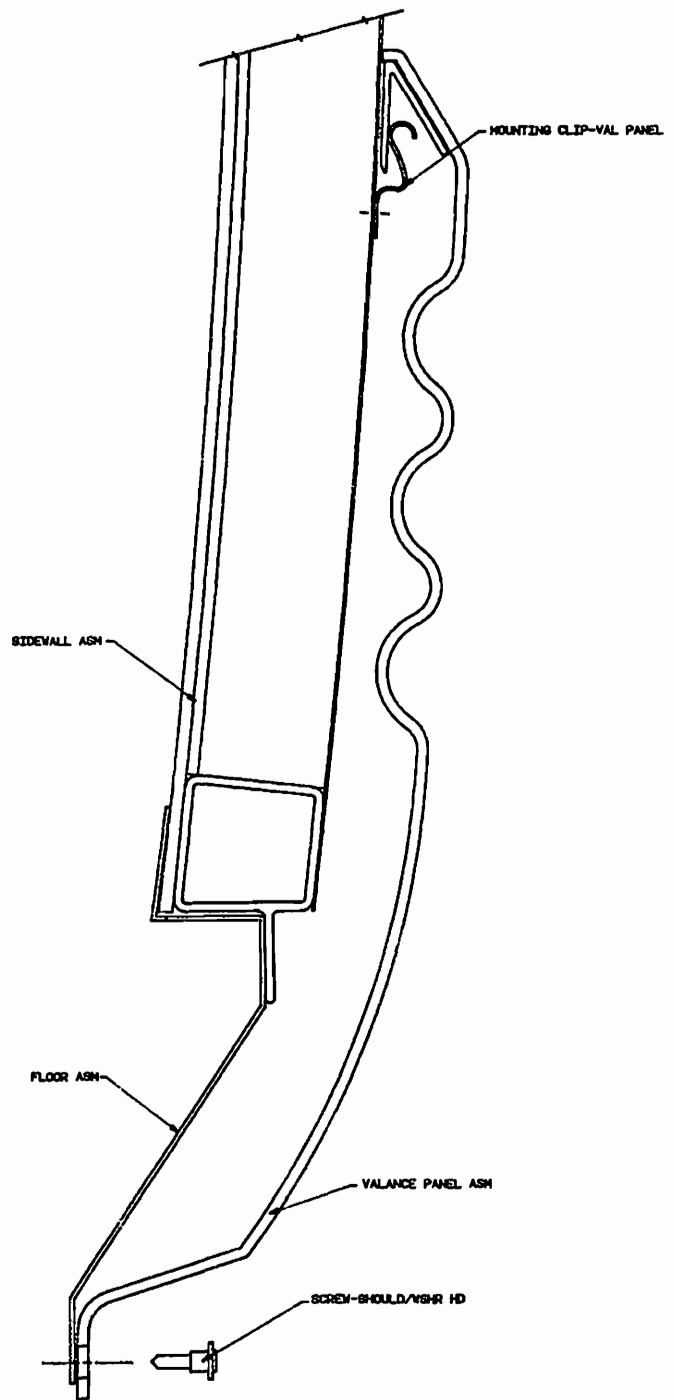
Right Rear Valance Panel Replacement

1. Place door assembly in proper position.
2. Secure with (6) hinge retaining screws.
3. Attach lanyard with (1) retaining screw.

Refer to Panel & Trim art on page 2-9.



SECTION D-D
(RH SIDE SIMILAR)



SECTION C-C
(OTHER VALANCES SIMILAR)

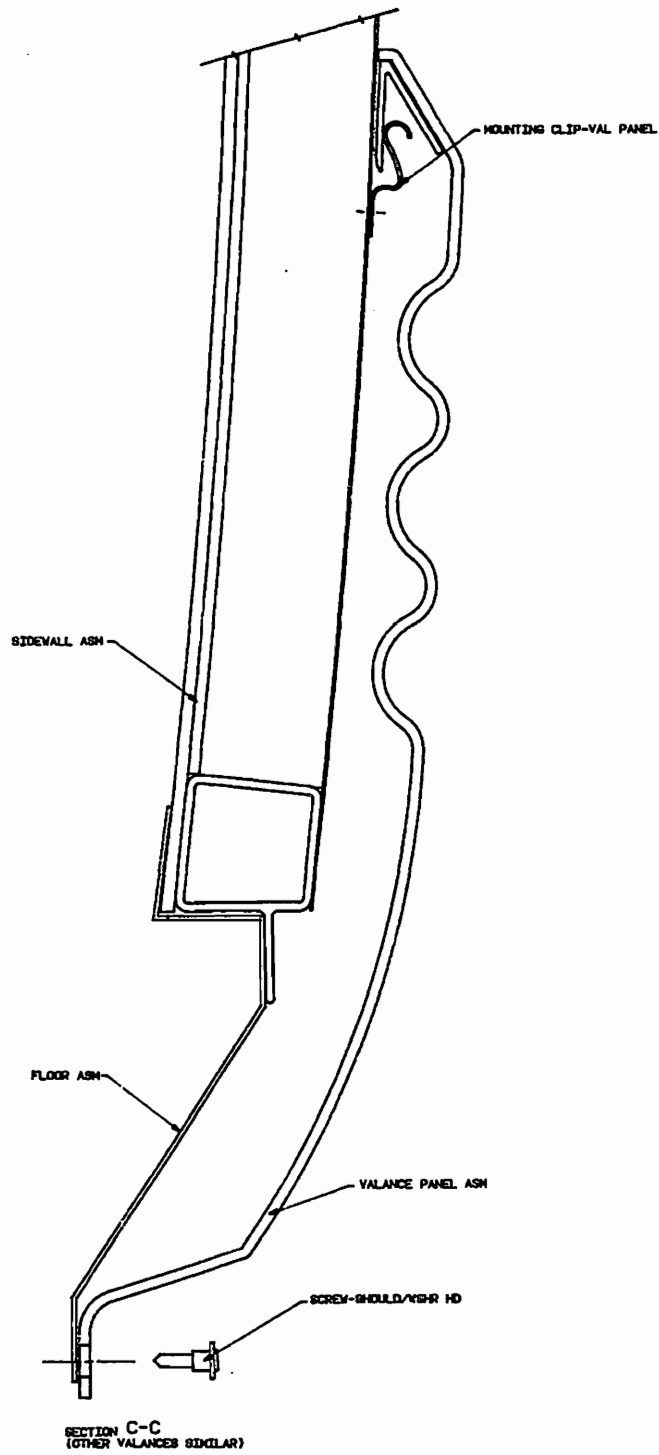
Right Wheel Lip Valance Panel Removal

1. Remove (4) retaining screws from lower edge of valance panel.
2. Lift valance panel upward to clear retaining clips. Remove from vehicle.

Valance Panel Replacement

1. Align valance panel in position above retaining clips.
2. Gently push valance downward to engage retaining clips.
3. Secure valance panel with (4) retaining screws on lower edge of valance panel.

Refer to Panel & Trim art on page 2-9.



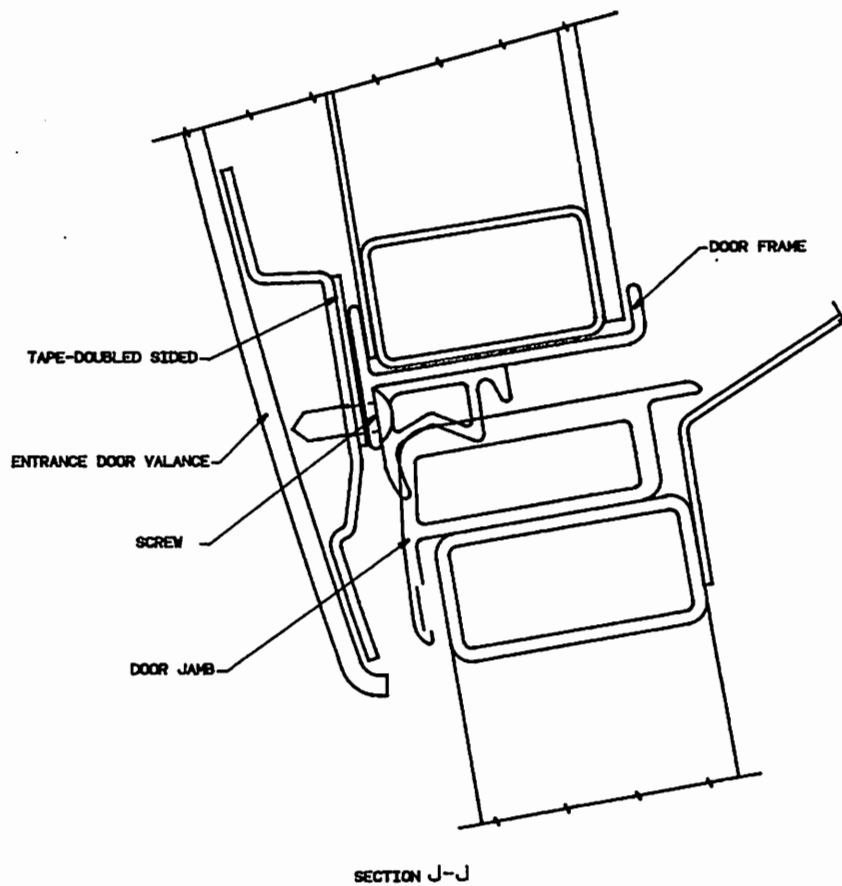
Right Center Valance Panel Removal

1. Remove (2) retaining screws from lower edge of valance panel.
2. Lift valance panel upward to clear retaining clips. Remove from vehicle.

Valance Panel Replacement

1. Align valance panel in position above retaining clips.
2. Gently push valance downward to engage retaining clips.
3. Secure valance panel with (2) retaining screws on lower edge of valance panel.

See Panel & Trim art on page 2-9.



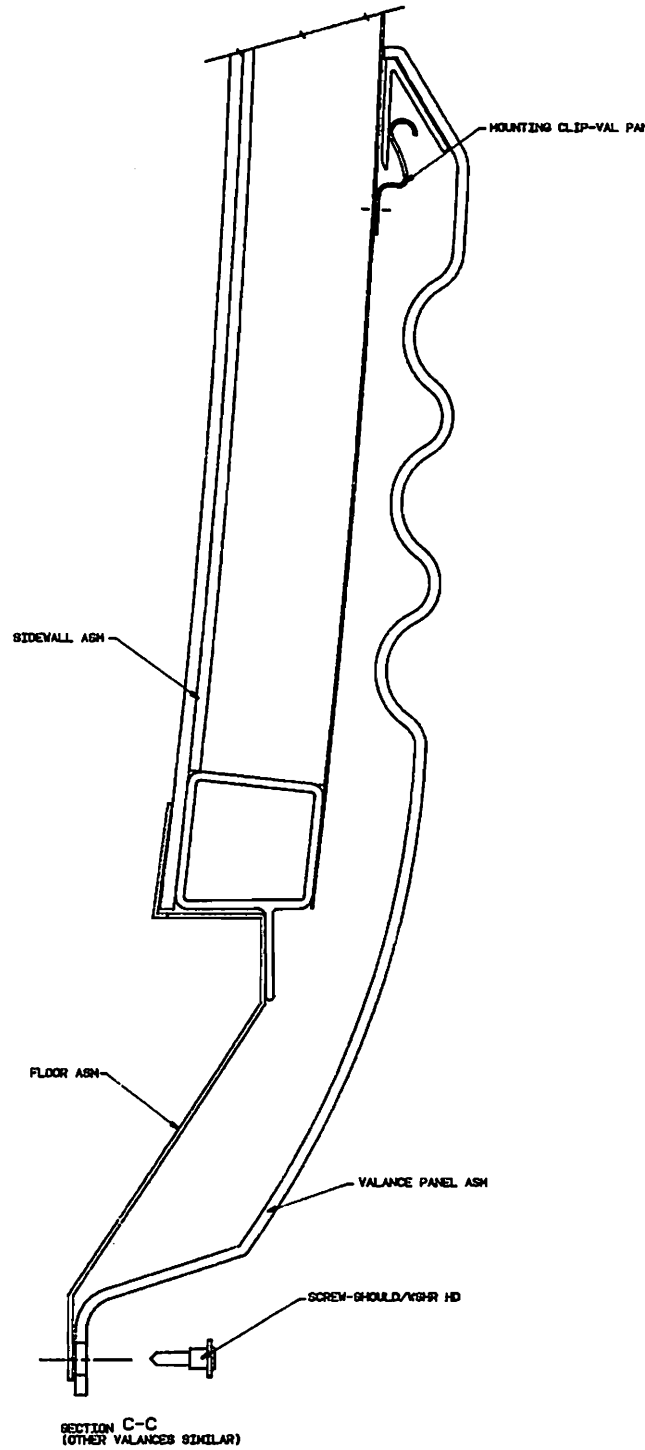
Entrance Door Valance Panel Removal

1. Open entrance door.
2. Remove (4) retaining screws from lower inside edge of door.
3. Lift valance panel upward to clear retaining clips.
4. Remove panel from vehicle.

Door Valance Panel Replacement

1. Apply sealant tape (Winnebago part #069640-14-000) to lower inside edge of valance panel.
2. Align valance panel on door slightly above the retaining clips.
3. Gently push valance downward to engage retaining clips.
4. Secure valance panel with (4) retaining screws on the lower edge of door.

See Panel & Trim art page 2-9.



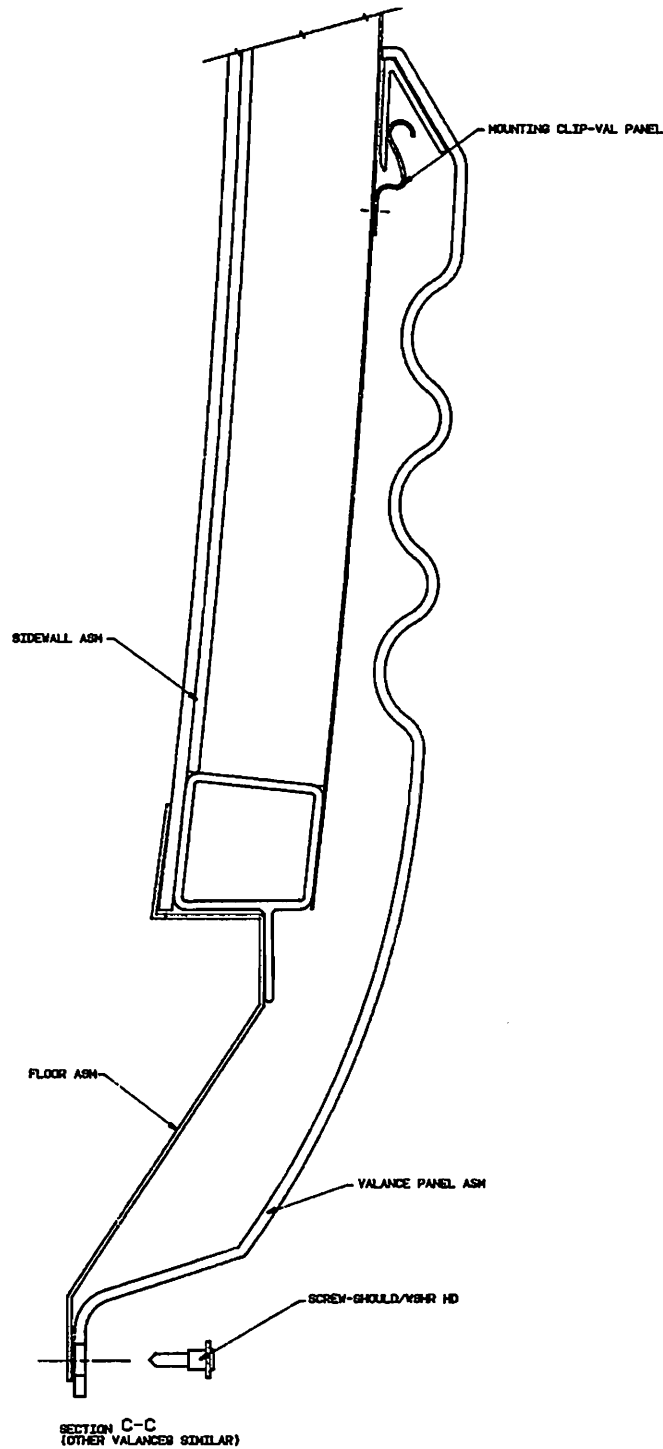
Right Front Valance Panel Removal

1. Remove (5) retaining screws from lower edge of valance panel.
2. Lift valance panel upward to clear retaining clips. Remove from vehicle.

Valance Panel Replacement

1. Align valance panel in position above retaining clips.
2. Gently push valance downward to engage retaining clips.
3. Secure valance panel with (5) retaining screws on lower edge of valance panel.

See Panel & Trim art on page 2-9.



Right Transition Valance Panel Removal

1. Remove appropriate running board. Reference "Running Board Removal" in this section.
2. Remove (2) retaining screws from lower edge of valance panel.
3. Lift valance panel upward to clear retaining clips. Remove from vehicle.

Valance Panel Replacement

1. Align valance panel in position above retaining clips.
2. Gently push valance downward to engage retaining clips.
3. Secure valance panel with (2) retaining screws on lower edge of valance panel.
4. Install running board. Reference "Running Board Replacement" in this section.

See Panel & Trim art on page 2-9.

Passenger Door Valance Panel Removal

1. Open passenger door.
2. Remove (3) retaining rivets from lower inside edge of door.
3. Lift valance panel upward to clear retaining clips.
4. Remove panel from vehicle.

Door Valance Panel Replacement

1. Apply sealant tape (Winnebago part #069640-14-000) to lower inside edge of valance panel.
2. Align valance panel on door slightly above the retaining clips.
3. Gently push valance downward to engage retaining clips.
4. Secure valance panel with (3) retaining rivets on the lower edge of door. Seal rivets with sealant (Winnebago part #034552-14-000).

See Panel & Trim on page 2-9.

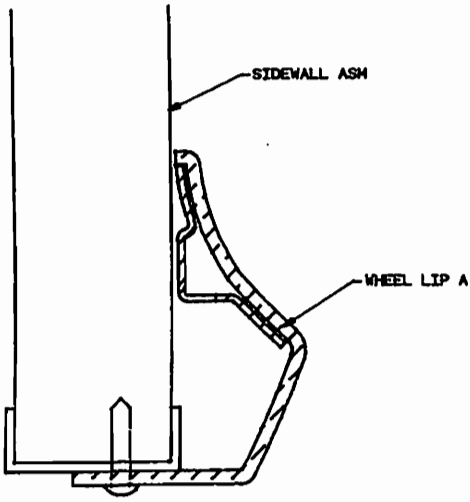
Left Rear Valance Panel Removal (Generator Door Assembly)

1. Open compartment door.
2. Remove (1) screw retaining lanyard to door assembly.
3. Remove (6) hinge retaining screws.
4. Remove the door assembly.

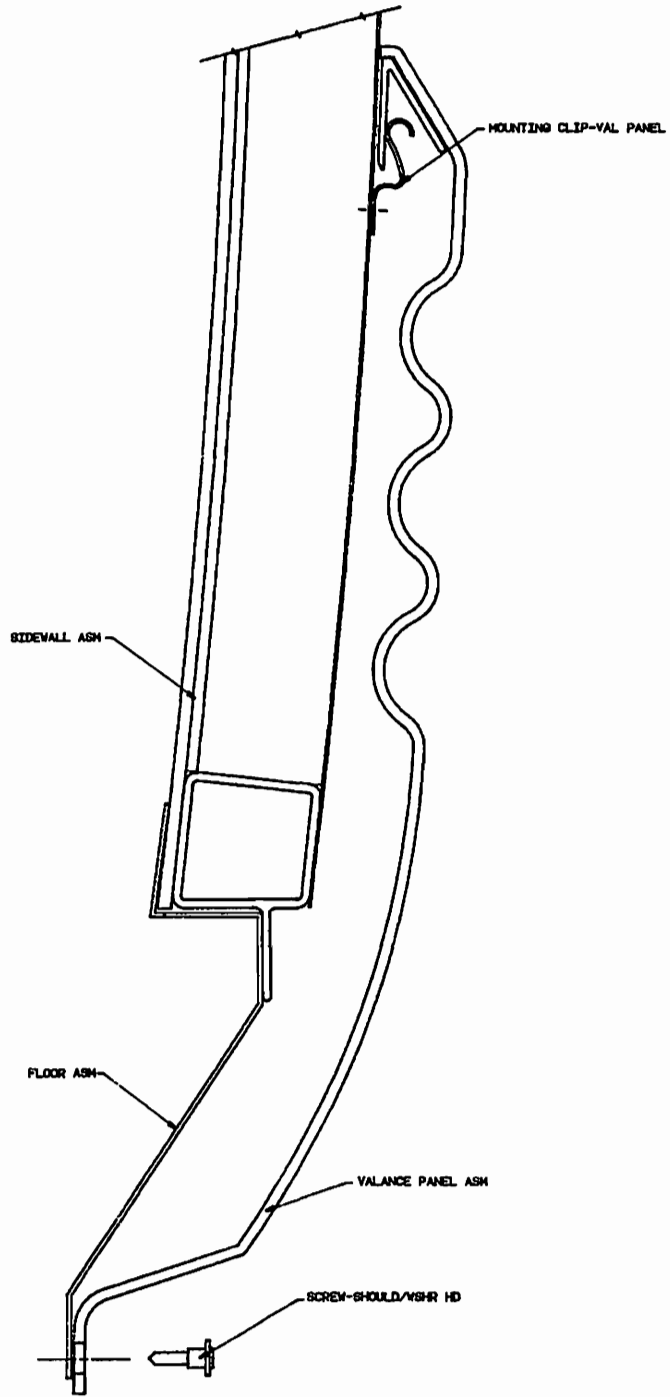
Left Rear Valance Panel Replacement

1. Place door assembly in proper position.
2. Secure with (6) hinge retaining screws.
3. Attach lanyard with retaining screws.

See Panel & Trim art on page 2-9.



SECTION D-D
(RH SIDE SIMILAR)



SECTION C-C
(OTHER VALANCES SIMILAR)

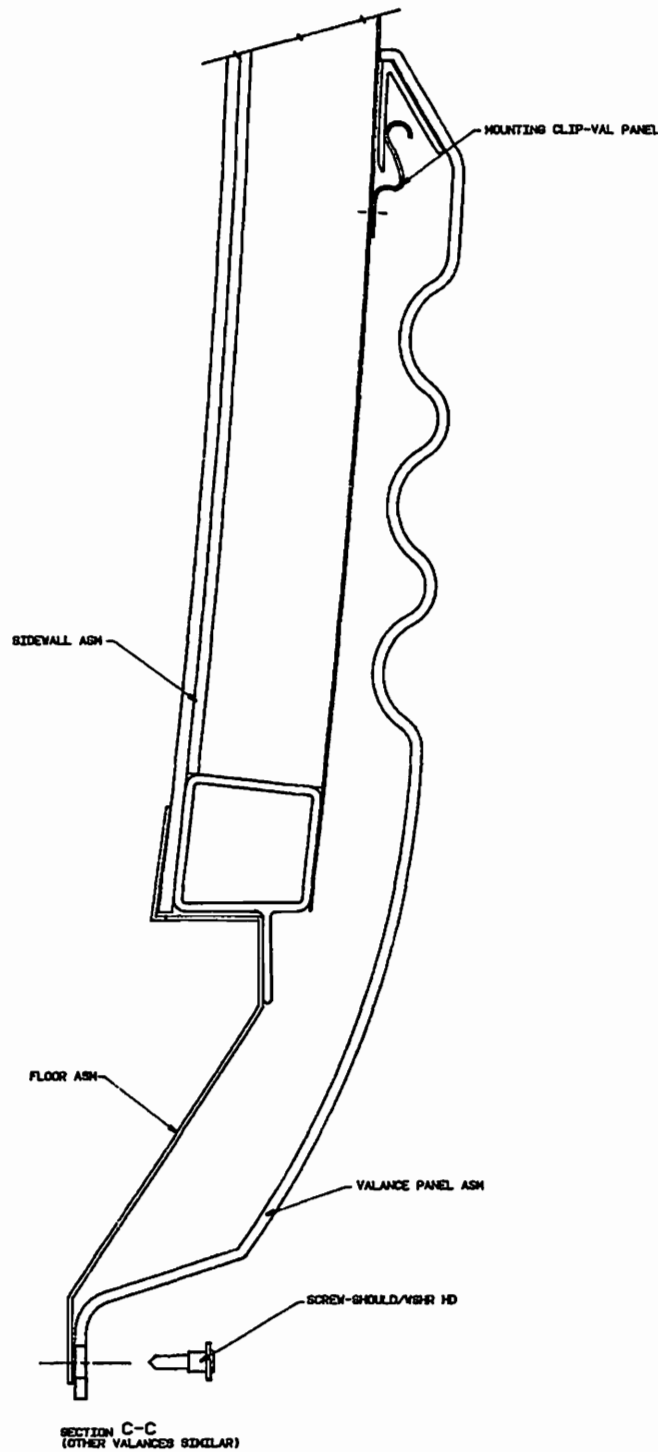
Left Wheel Lip Valance Panel Removal

1. Remove (3) retaining screws from lower edge of valance panel.
2. Lift valance panel upward to clear retaining clips. Remove from vehicle.

Valance Panel Replacement

1. Align valance panel in position above retaining clips.
2. Gently push valance downward to engage retaining clips.
3. Secure valance panel with (3) retaining screws on lower edge of valance panel.

See Panel & Trim art on page 2-9.



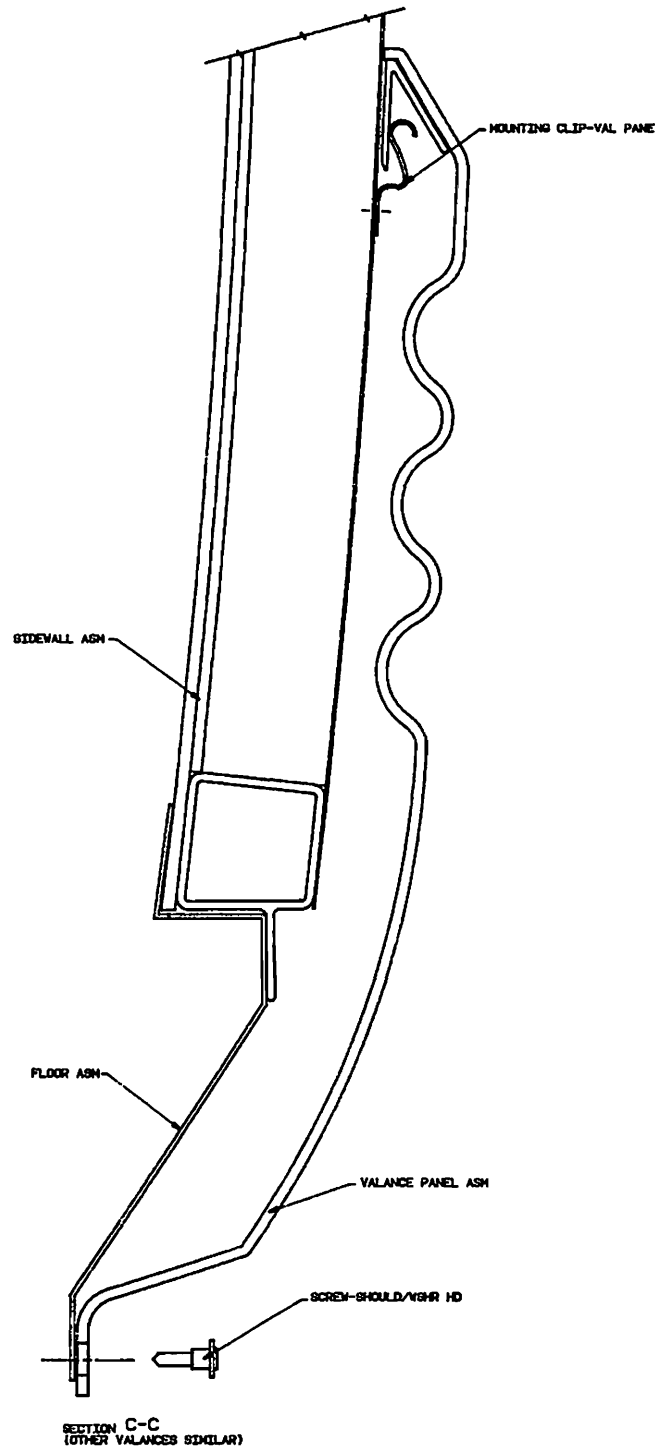
Left Front Valance Panel Removal

1. Remove (7) retaining screws from lower edge of valance panel.
2. Lift valance panel upward to clear retaining clips. Remove from vehicle.

Valance Panel Replacement

1. Align valance panel in position above retaining clips.
2. Gently push valance downward to engage retaining clips.
3. Secure valance panel with (7) retaining screws on lower edge of valance panel.

See Panel & Trim art on page 2-9.



Left Transition Valance Panel Removal

1. Remove (2) retaining screws from lower edge of valance panel.
2. Lift valance panel upward to clear retaining clips. Remove from vehicle.

Valance Panel Replacement

1. Align valance panel in position above retaining clips.
2. Gently push valance downward to engage retaining clips.
3. Secure valance panel with (2) retaining screws on lower edge of valance panel.

See Panel & Trim art on page 2-9.

Driver Door Valance Panel Removal

1. Open driver door.
2. Remove (3) retaining rivets from lower inside edge of door.
3. Lift valance panel upward to clear retaining clips.
4. Remove panel from vehicle.

Door Valance Panel Replacement

1. Apply sealant tape (Winnebago part #069640-14-000) to lower inside edge of valance panel.
2. Align valance panel on door slightly above the retaining clips.
3. Gently push valance downward to engage retaining clips.
4. Secure valance panel with (3) retaining rivets on the lower edge of door. Seal rivets with sealant (Winnebago part #034552-14-000).

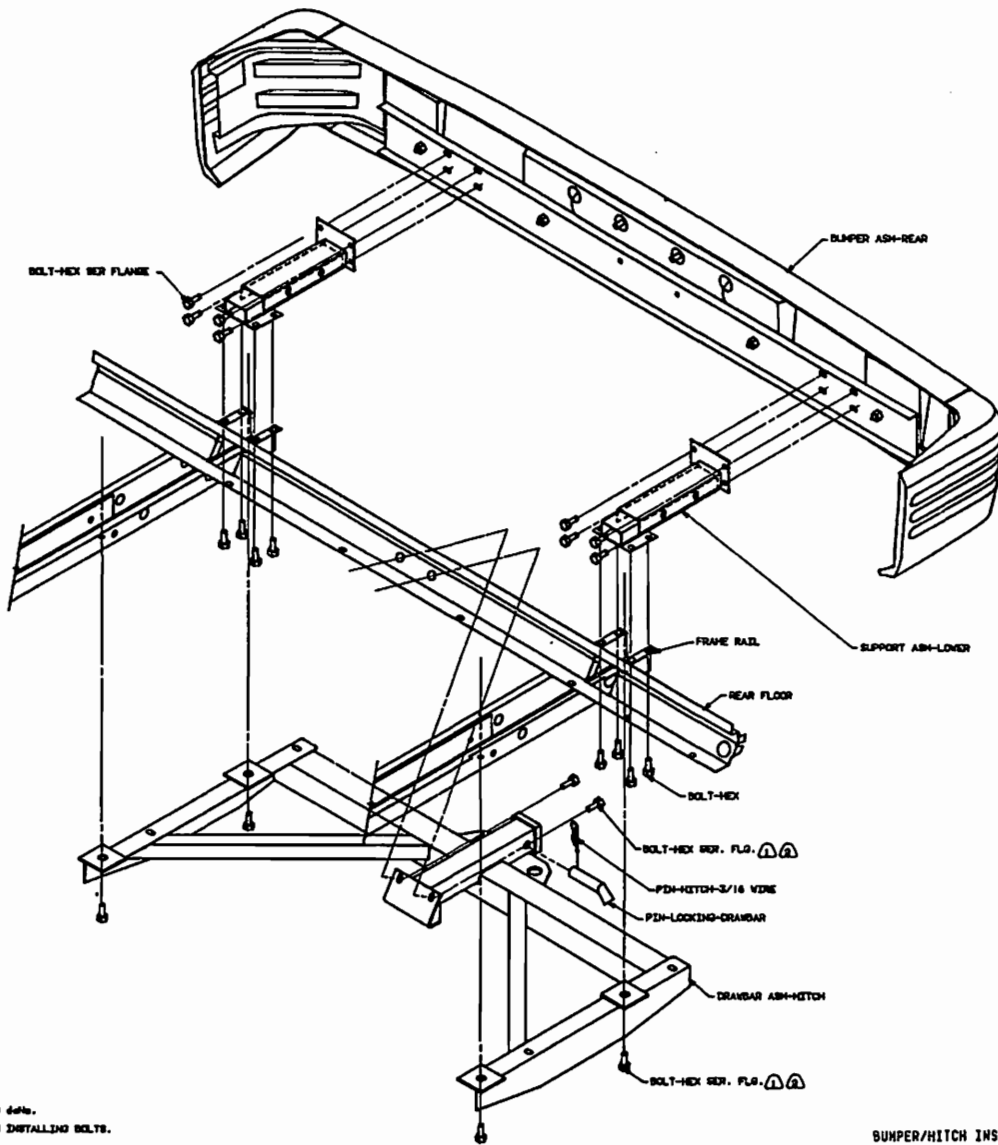
See Panel & Trim art on page 2-9.

Running Board Removal

1. Remove (2) retaining screws attaching front mud flap support to vehicle.
2. Remove (4) retaining screws attaching middle mounting bracket to running board.
3. Remove (4) retaining screws attaching rear mounting bracket to running board.
4. Remove running board from vehicle.

Running Board Replacement

1. Place running board in proper position.
2. Secure running board to middle mounting bracket with (4) retaining screws.
3. Secure running board to rear mounting bracket with (4) retaining screws.
4. Secure mud flap support to vehicle with (2) retaining screws.



BUMPER/HITCH INSTL-REAR

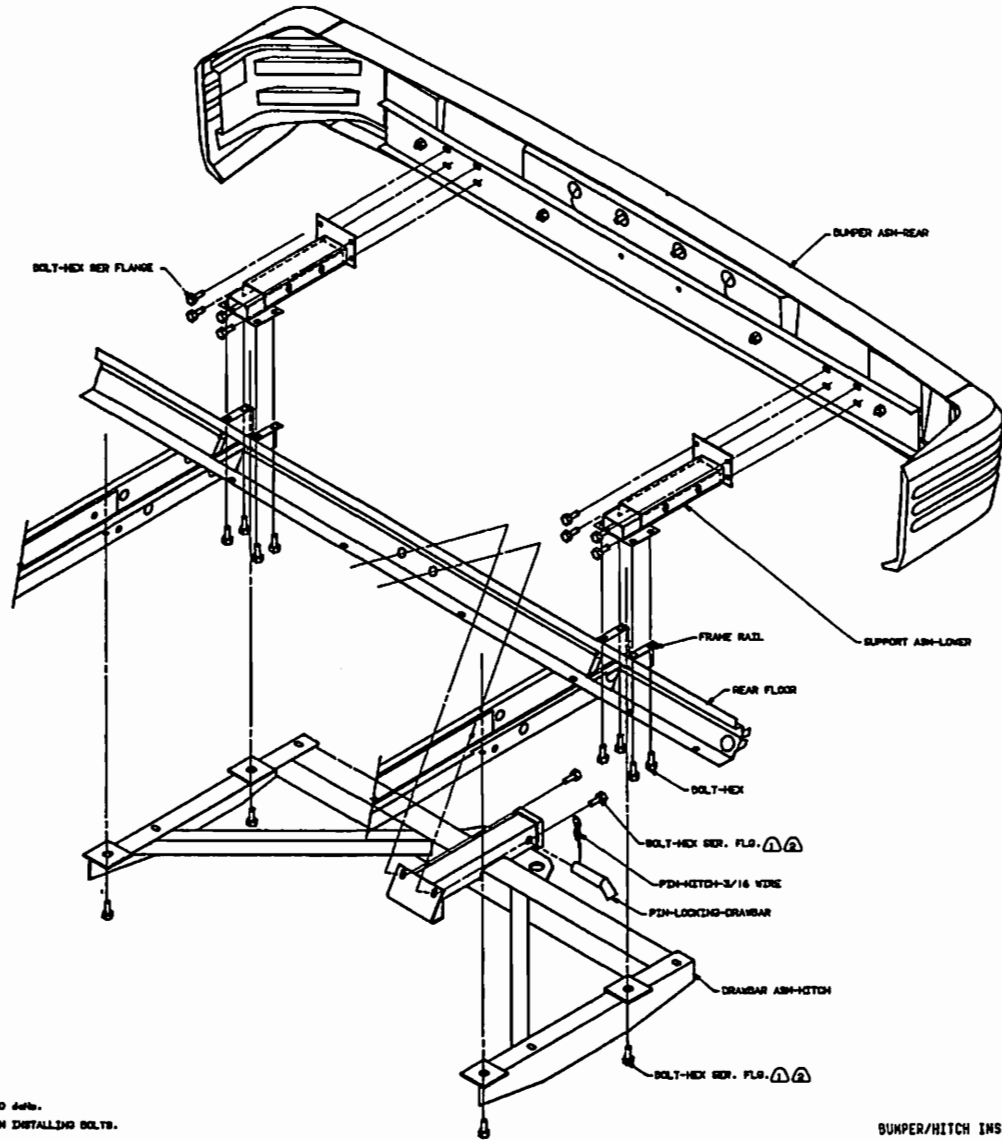
TORQUE BOLTS TO 6.0 @1.0 64in.
 USE LOCKTITE RC/680 WHEN INSTALLING BOLTS.
NOTES:

Rear Bumper Facia Removal

1. Disconnect 12 volt DC wiring to license plate lights.
2. Remove (4) facia retaining nuts.
3. Remove facia.

Rear Bumper Facia Replacement

1. Place facia in proper position.
2. Secure facia with (4) retaining nuts.
3. Connect 12 volt DC wiring to license plate lights.



TORQUE BOLTS TO 81.0 ±1.0 Lbf-ft.
 USE LOCKITE RC/660 WHEN INSTALLING BOLTS.
 NOTES:

BUMPER/HITCH INSTL-REAR

Rear Bumper Removal

1. Disconnect 12 volt DC wiring to license plate lights.

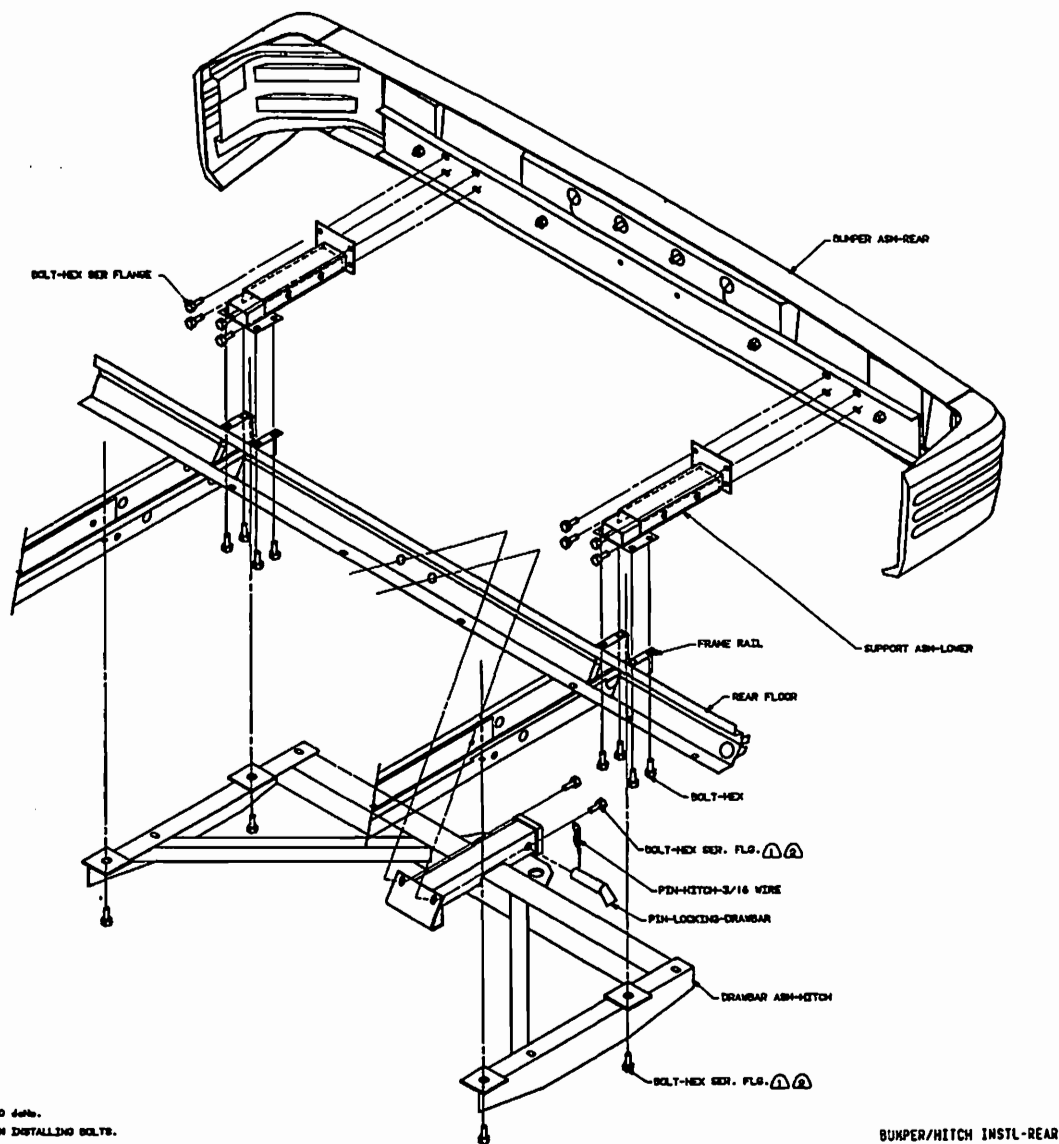
CAUTION

Support bumper to prevent it from falling before performing step 2.

2. Remove (8) bumper retaining bolts.
3. Remove bumper from vehicle.

Rear Bumper Replacement

1. Place rear bumper in proper position.
2. Secure bumper to vehicle with (8) retaining bolts.
3. Connect 12 volt DC wiring to license plate lights.



⚠ TORQUE BOLTS TO 8.0 ft.-lb.
⚠ USE LOCKTITE RC/660 WHEN INSTALLING BOLTS.
NOTES:

Drawbar

The drawbar is a class I hitch with a towing capacity of 2000 lbs. and a maximum tongue weight rating of 200 lbs.

Drawbar Removal

CAUTION

Support drawbar assembly during removal to prevent injury.

1. Remove (8) retaining bolts and nuts.
2. Remove trailer wiring connector.

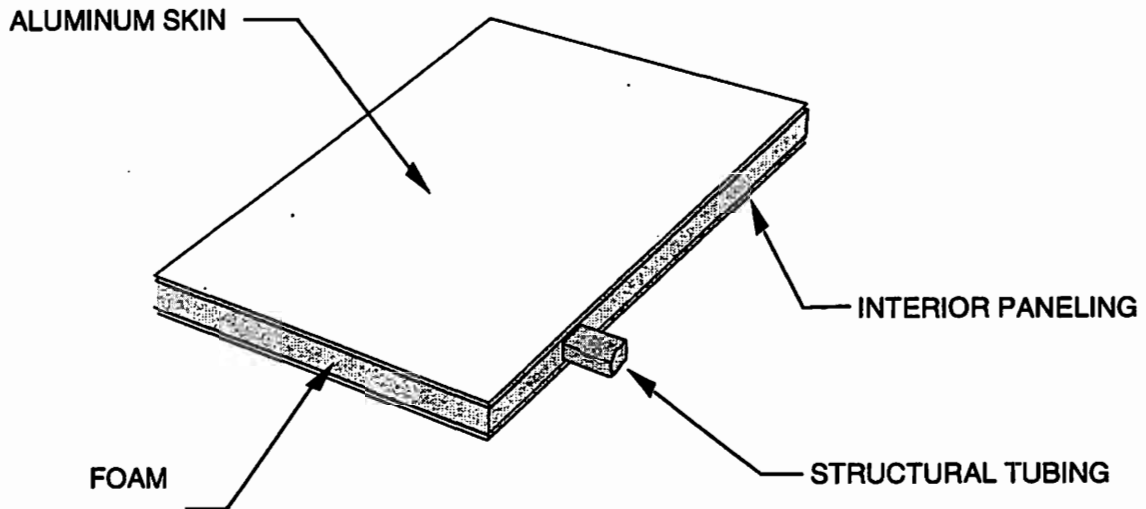
3. Remove drawbar.

Drawbar Replacement

CAUTION

Support drawbar assembly during removal to prevent injury.
--

1. Place drawbar in proper position.
2. Secure with (8) retaining bolts and nuts. Apply Loctite 680 to bolts and torque to 4-6 daNm (30-44 ft. lb.)
3. Install trailer wiring connector.



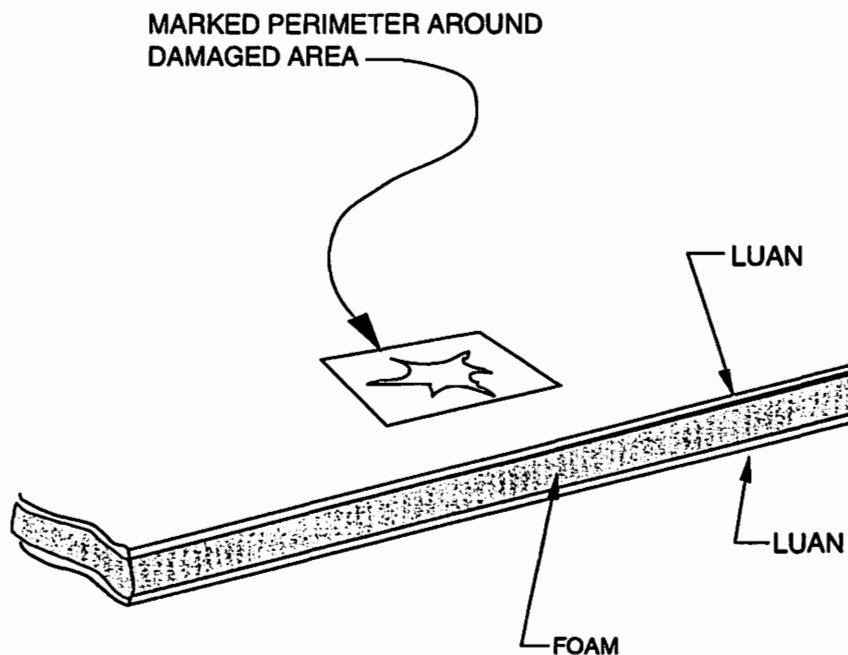
ROOF REPAIR

The primary objective of roof repair is to establish an adequate weather seal at the patched area. However, a clean and neat appearance should also be considered when generating a patch repair.

Inspect the area to be repaired to determine the extent of damages.

The following procedure is for the repair of puncture or impact damage to the roof. When extensive damage or damage to the roof cove that cannot be repaired with standard body repair is present, a roof reskin should be performed.

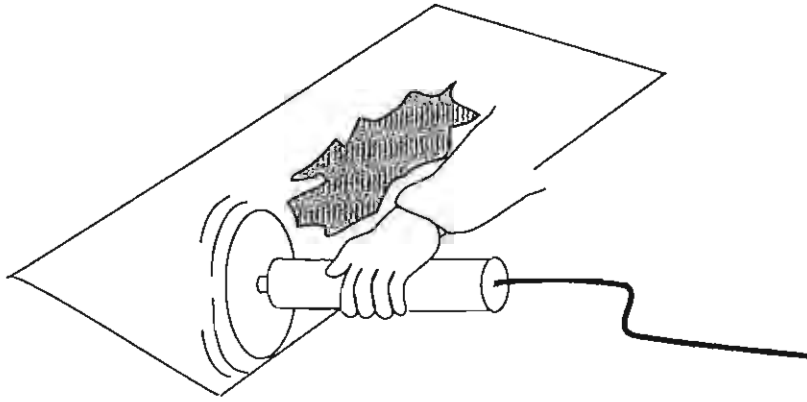
1. Remove all equipment such as vents, air conditioners, etc., that may be mounted in the damaged area.



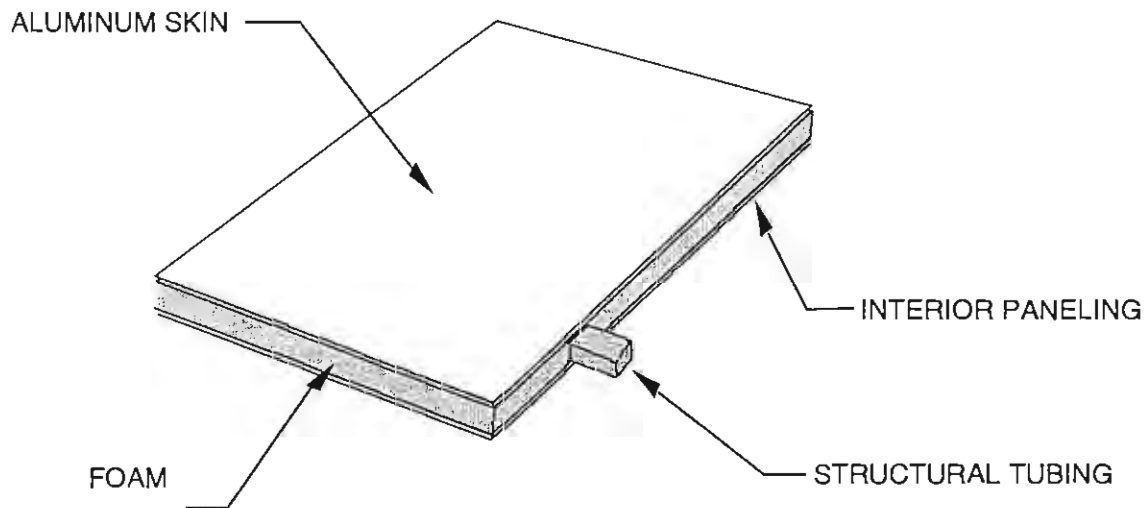
2. Mark an area that encompasses the damage.

NOTE: Use of straight lines and ninety-degree corners will aid in later replacement.

CUTTING OUT DAMAGED AREA



3. Use a die grinder to cut along marks. Do NOT cut into the foam as it contains structural tubing and electrical wiring.
4. Peel away cutout aluminum skin.



5. Use a hole saw to carefully cut foam along previous marks.

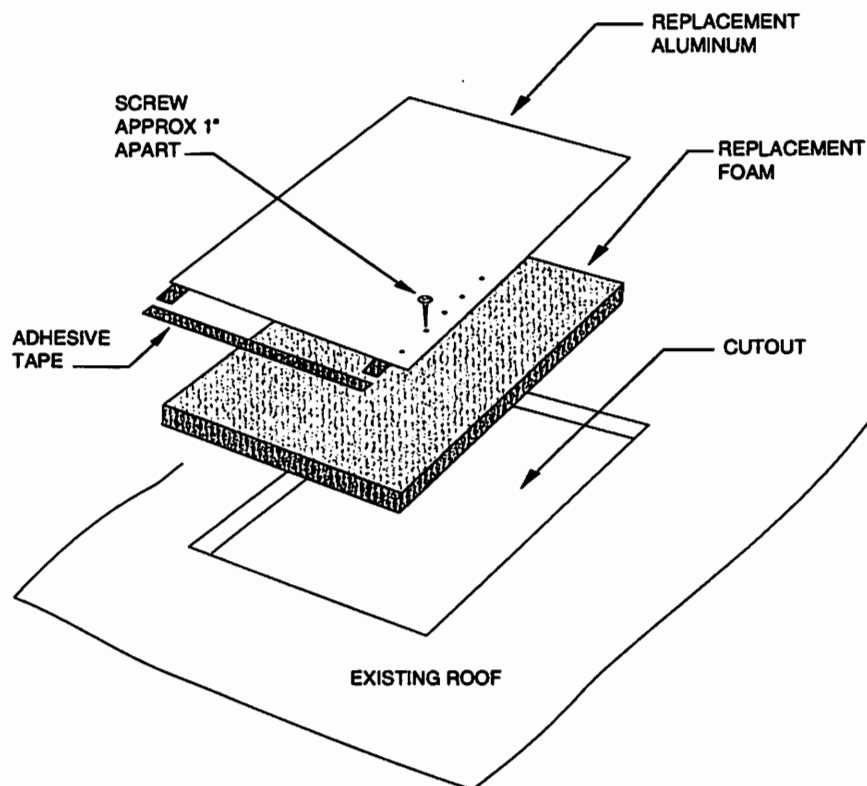
CAUTION

Vehicle must be disconnected from 110 volt AC power.

WARNING

Do NOT cut through interior paneling.

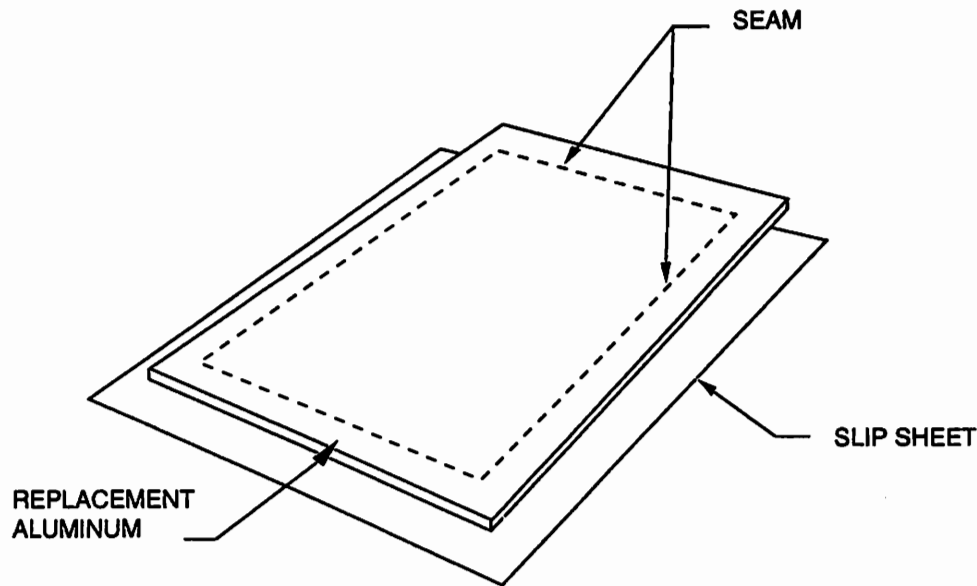
6. Use a putty knife to remove foam from cutout area.



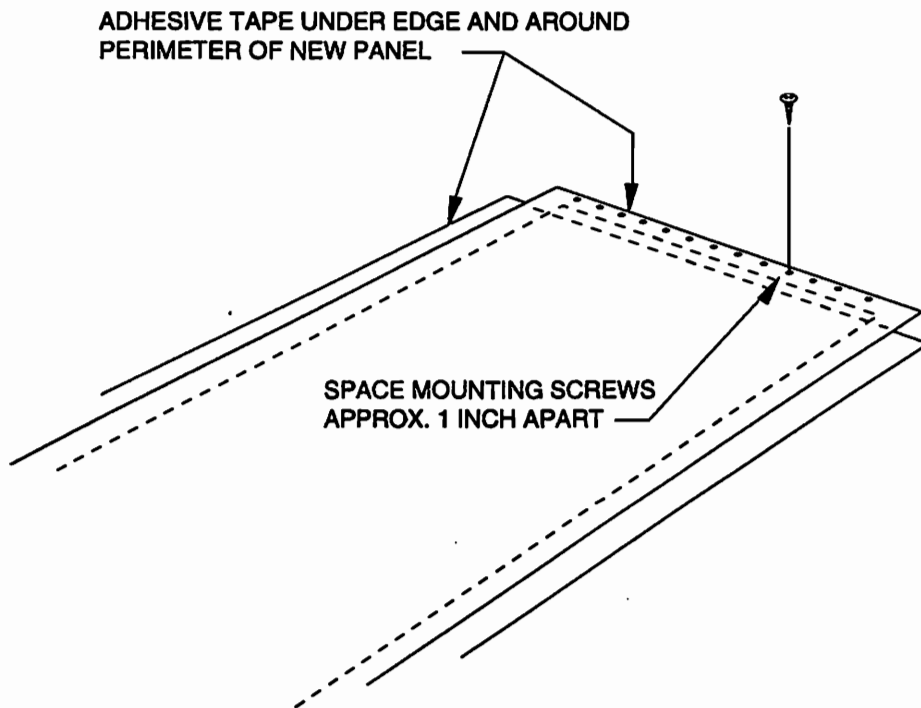
7. Cut replacement foam to fit cutout. (Winnebago part #083574-03-000).
8. Mask off the repair area.
9. Apply adhesive to the cutout area and backside of replacement foam. Reference Appendix I "Adhesive Application".
10. Install replacement foam into cutout area.
11. Cut a piece of replacement aluminum one inch wider than the cutout perimeter.
12. Apply adhesive tape. (Winnebago part #076322-02-000) to the perimeter of the backside of the replacement aluminum.

Do NOT remove the mask from the tape.
13. Remove previous mask around repair area and mask an area one inch out from the perimeter of the cut out.
14. Apply adhesive to the cutout area and the backside of the replacement aluminum. Reference Appendix I "Adhesive Application".

15. Remove mask from around repair area.
16. Remove mask from adhesive tape.



17. Use a slip sheet to position replacement aluminum over cutout.
18. Remove slip sheet and adhere replacement aluminum to the roof. Insure adhesion by lightly tamping aluminum skin with a mallet using a "Body Board". Reference Appendix J "Body Board Construction".



19. Install self-tapping screws every one inch around the edge of the replacement aluminum.

NOTE: Screws must pass through adhesive tape.

20. Cap seal screws and perimeter of repair with sealant. (Winnebago part #108716-01-000).

Roof Reskin

A roof reskin should be performed when damage to the roof is too extensive to be repaired with standard body repair techniques.

For repair of less extensive roof damage, reference "Roof Repair" in this section.

NOTE: Due to special manufacturing processes, the aluminum skin of the Rialta roof must be purchased from Winnebago Industries. Contact Winnebago Part Sales for the proper part numbers.

1. Remove roof from vehicle. Reference "Roof Removal" in this section.
2. Remove aluminum skin from roof.
3. Remove fascia from roof. Note locations of any steel backing plates that come loose during this process for later installation.

WARNING

Do NOT remove interior paneling from roof.

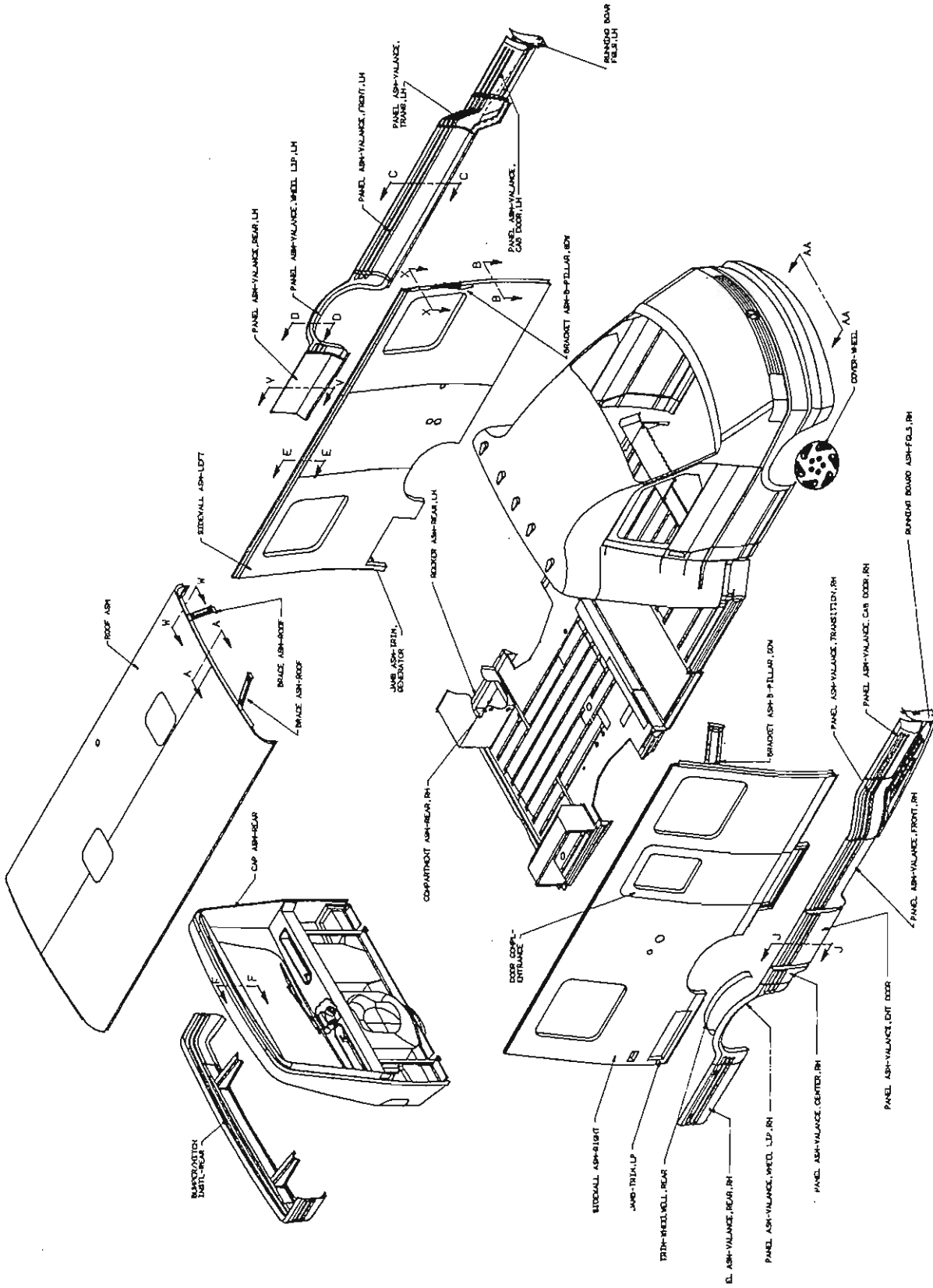
4. Remove any remaining foam by lightly sanding with 180 grit sand paper.
5. Cut replacement foam to size. (Winnebago part #083574-03-000).
6. Mark foam for routing of tubing and wiring paths.
7. Route paths for tubing and wiring in foam.
8. Clean roof and foam pieces to remove all dust and foreign matter.
9. Mask off all openings and edges of roof to prevent overspray.
10. Apply adhesive to sidewall and any steel backing plates that were removed during Step 3. Reference Appendix I "Adhesive Application".
11. Install steel backing plates in proper position, if necessary.
12. Apply adhesive to inner surface of foam pieces. Reference Appendix I "Adhesive Application".
13. Install foam pieces into roof.
14. Insure proper adhesion by lightly tamping the foam with a rubber mallet using a "Body Board". Reference Appendix J "Body Board Construction".
15. Cut out openings for roof, vents, and antenna by using a hole saw. Saw from the outside of the roof and use the cutout opening in the interior paneling as a guide.
16. Smooth edges of styrofoam by gently hand sanding with 180 grit paper.

17. Clean foam and aluminum skin to remove all dust and foreign matter.
18. Apply adhesive to the roof and the backside of (1) piece of roof aluminum. Reference Appendix I "Adhesive Application".
19. Install (1) piece of roof aluminum onto roof by first engaging the retaining edge of the aluminum onto the lip of the roof cove. Then working the aluminum to the center of the roof.

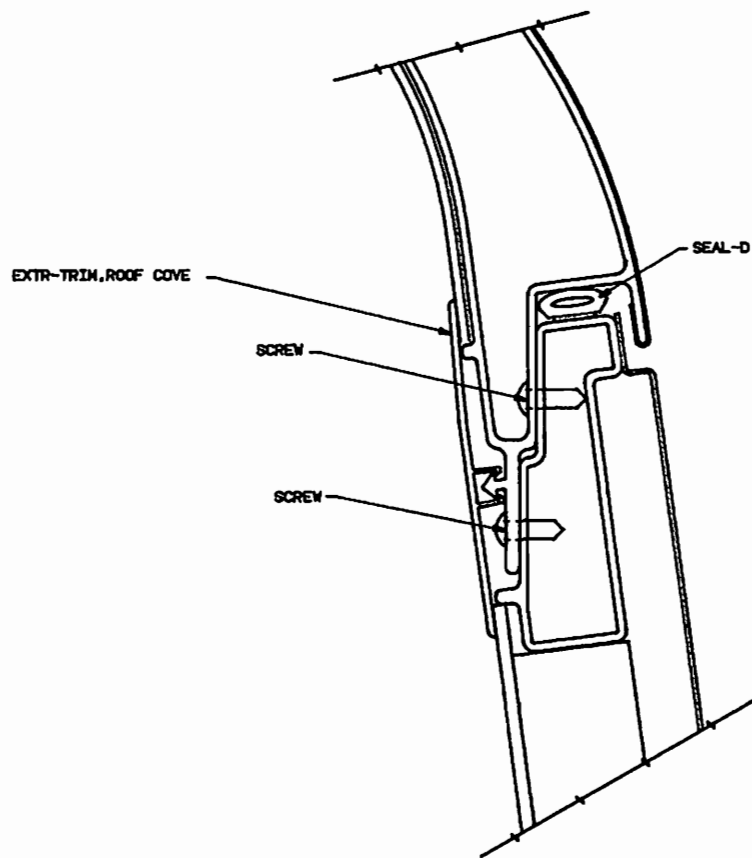
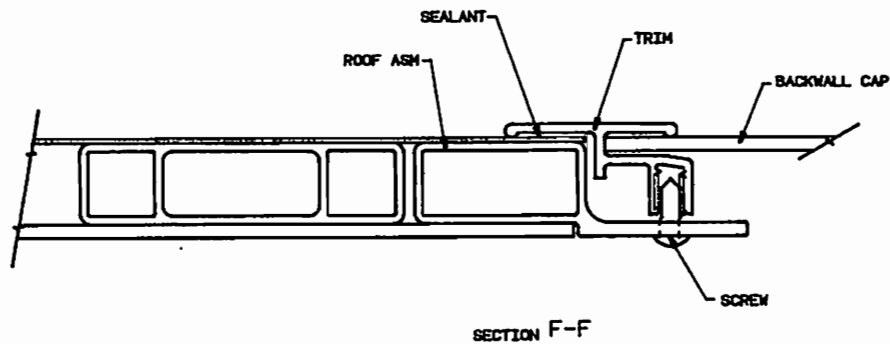
NOTE: It is helpful to use a slip sheet(s) to prevent accidental adhesion during installation.

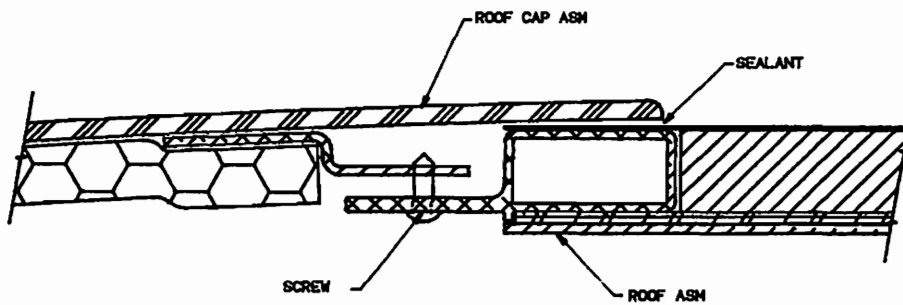
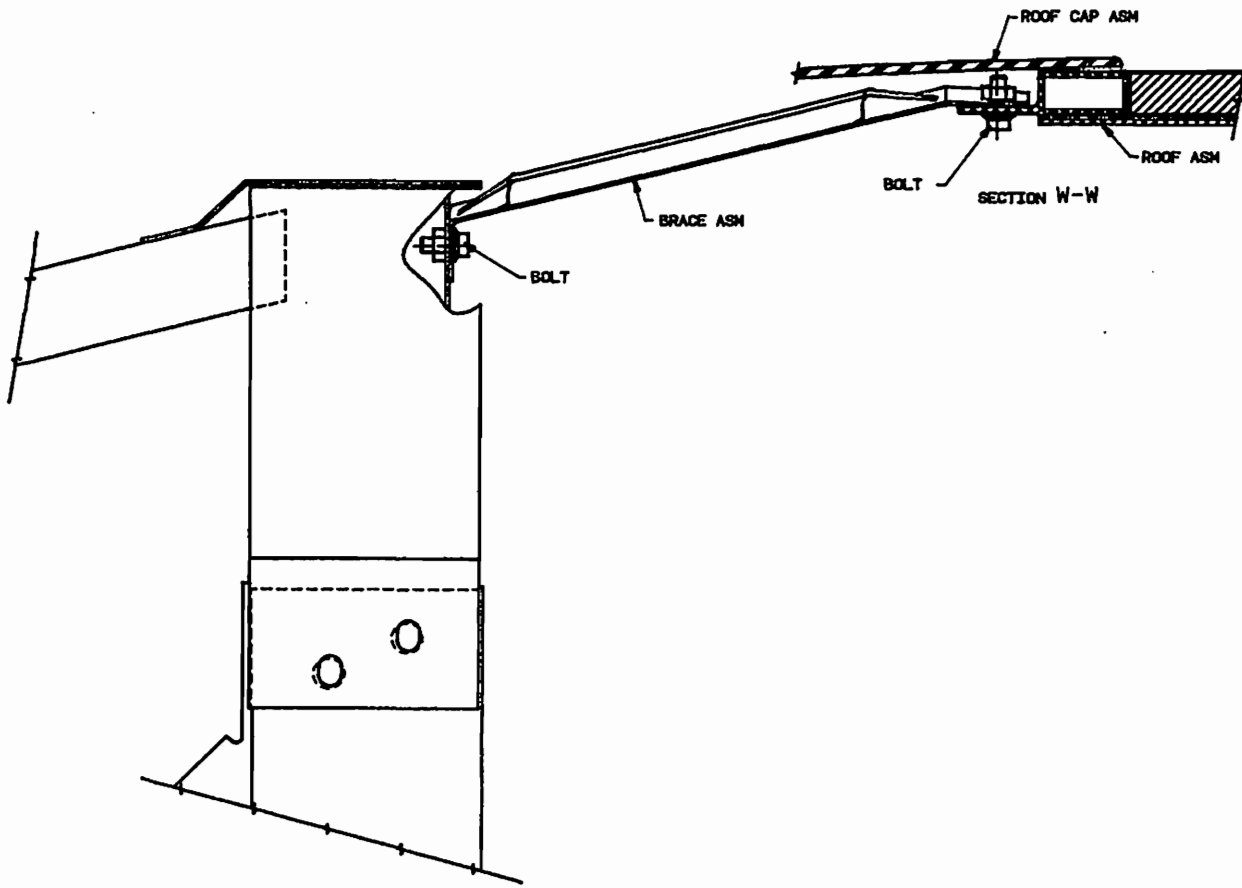
20. Apply adhesive tape (Winnebago part #063642-01-000) to the upper inside edge of the remaining roof skin. Do NOT remove the mask from the tape.
21. Apply adhesive to remaining piece of aluminum. Reference Appendix I "Adhesive Application".
22. Remove mask from tape. Install aluminum onto roof as in Step 19.
23. Insure adhesion by lightly tamping on aluminum skin with a rubber mallet using a "Body Board". Reference Appendix J "Body Board Construction".
24. Install roof on vehicle. Reference "Roof Replacement" in this section.
25. Seal center seam of roof with sealant (Winnebago part #108716-01-000).

NOTE: Front and rear caps MUST BE sealed with appropriate sealants before application of sealant to center seam of roof.



BODY INSTL-PANEL & TRIM





Roof Removal

1. Remove black waste tank vent. Reference "Black Waste Water Tank Vent Removal" in Plumbing Section.
2. Remove roof air conditioner. Reference "Roof Air Conditioner Removal" in Appliance Section.
3. Remove television antenna. Reference "Television Antenna Removal" in Appliance Section.
4. Remove overhead cabinets. Reference appropriate "Overhead Cabinet Removal" in Interior Section.
5. Remove microwave cabinet. Reference "Microwave Cabinet Removal" in Interior Section.

6. Remove wardrobe cabinet. Reference "Wardrobe Cabinet Removal" in Interior Section.
7. Remove bath cabinet walls. Reference "Bath Cabinet Wall Removal" in Interior Section.
8. Remove headliner. Reference "Headliner Removal" in Interior Section.
9. Remove (11) retaining screws from roof to front cap joint.
10. Remove (4) retaining bolts from (2) braces at roof to front cap joint.
11. Remove rear cap. Reference "Rear Cap Removal" in this section.
12. Remove interior roof cove trims by greatly prying loose.
13. Remove retaining screws from roof cove to sidewall joint on both sides of vehicle.
14. Carefully cut sealants at (2) roof to sidewall joints and roof to front cap joint.
15. Disconnect coax at roof (above microwave), disconnect 110 volt wires to roof air conditioner at load center, disconnect 12 volt wiring to power roof vent and overhead light at roof.
16. Lift up on rear of roof. Slide it towards back of vehicle to clear roof caps.
17. Remove roof from vehicle.

Roof Replacement

Prepare for roof replacement by:

- Applying D-seal (Winnebago part #099418-01-000) to the top edge of upper sidewall extrusion.
- 1. Place roof in proper position. By bringing roof in from rear of vehicle and sliding its leading edge under the roof cap.
- 2. Connect coax, 110 volt wiring and 12 volt wiring.
- 3. Secure roof to sidewalls with retaining screws along (2) roof cove to sidewall joints.
- 4. Install interior roof cove trim.
- 5. Secure roof (2) braces with (4) retaining bolts.
- 6. Secure front cap to roof with (11) retaining screws.
- 7. Install rear cap. Reference "Rear Cap Replacement" in this section.
- 8. Install headliner. Reference "Headliner Replacement" in Interior Section.
- 9. Install bath cabinet walls. Reference "Bath Cabinet Wall Replacement" in Interior Section.
- 10. Install wardrobe cabinet. Reference "Wardrobe Cabinet Replacement" in Interior Section.
- 11. Install microwave cabinet. Reference "Microwave Cabinet Replacement" in Interior Section.
- 12. Install overhead cabinets. Reference appropriate "Overhead Cabinet Removal" in Interior Section.
- 13. Install television antenna. Reference "Television Antenna Replacement" in Appliance Section.
- 14. Install roof air conditioner. Reference "Roof Air Conditioner Replacement" in Appliance Section.
- 15. Install black waste water tank vent. Reference "Black Waste Water Tank Vent Replacement" in Plumbing Section.
- 16. Mask both sides of roof to sidewall joint and roof to front cap joint. Seal sidewall to roof joints with sealant (Winnebago part #034552-14-000). Trowel per aesthetic requirements. Seal roof to front cap joint with sealant (Winnebago Part #108716-01-000). Remove mask.

Aluminum Skin Repair

Inspect the area to be repaired to determine the extent of damages.

- The following procedure is for the repair of minor dents, scratches, and gouges.
- If the damage results in crushed foam or areas of missing skin or foam, Do NOT attempt this repair. Refer to "Sidewall Reskin" in this section.

Step 1 - Pre-Cleaning

- Clean dust from area using compressed air and a clean towel.

CAUTION

Always use proper safety equipment and procedures when using compressed air.

Remove containments with Dupont 3919S or equivalent using the two cloth method. Reference Appendix G "The Two Cloth Method".

Step 2 - Sanding

- Lightly sand the repair area immediately around the scratch/gouge with 180-grit sandpaper. This allows for the proper adhesion of the filler to the substrate.

Step 3 - Cleaning

- Clean dust from repair area using compressed air and a clean shop towel.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method. Reference Appendix G "The Two Cloth Method."

Step 4 - Body Filler

- Use Tack-Free 296 by Evercoat or equivalent. Mix as per manufacturer's directions.
- Use a squeegee to apply filler to the repair area. Allow to cure.

NOTE: It is preferable to slightly mound the filler.

Step 5 - Sanding

- Sand the repair area smooth using 180 grit sandpaper.

Step 6 - Cleaning

- Clean dust from repair area using compressed air and a clean shop cloth.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method. Reference Appendix G "The Two Cloth Method."

Step 7 - Sanding

- Block sand the repair area with 320 grit sandpaper to feather the repair edge.

Step 8 - Cleaning

- Clean dust from repair area using compressed air and a clean towel. Reference Appendix G "The Two Cloth Method."
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 9 - Priming

- Spray the repair area with a medium coat of primer. Allow to dry.

Step 10 - Spot Putty

- Inspect the repair surface for pinholes. Fill imperfections with Red Cap DFL17 or equivalent. Allow to dry.

Step 11 - Sanding

- Wet sand the repair area using 400-grit sandpaper.

Step 12 - Cleaning

- Clean dust from area using compressed air and a clean towel.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method. Reference Appendix G "The Two Cloth Method."

Step 13 - Buffing

- Compound beyond blend edge 8 to 12 inches with Dupont 606S compound or equivalent.

Step 14 - Cleaning

- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method. Reference Appendix G "The Two Cloth Method."

Step 15 - Tack Wipe

- Use a tack cloth to wipe down the repair area.

Step 16 - Paint

- Paint the repair area.

Sidewall Reskin

A sidewall reskin should be performed when damage to the sidewall is too extensive to be repaired with standard body repair techniques.

NOTE: Due to special manufacturing processes, the aluminum skin of the Rialta sidewalls must be purchased from Winnebago Industries. Contact Winnebago Part Sales for the proper part #'s.

1. Remove the damaged sidewall from the vehicle. Reference "Sidewall Removal" in this section.
2. Remove aluminum skin from sidewall.
3. Remove foam from sidewall. Note locations of any aluminum backing plates that come loose during this process for later installation.

WARNING

Do NOT remove interior paneling from sidewall.

4. Remove any remaining foam by lightly sanding with 180 grit sandpaper.
5. Cut replacement foam to size. (Winnebago part #100619-10-000).
6. Mark foam for routing of tubing and wiring paths.
7. Route paths for tubing and wiring in foam.
8. Clean sidewall and foam pieces to remove all dust and foreign matter.
9. Mark off all openings and edges of sidewall to prevent overspray.
10. Apply adhesive to sidewall and any aluminum backing plates that were removed during Step 3. Reference Appendix I "Adhesive Application".
11. Install aluminum backing plates in proper position, if necessary.
12. Apply adhesive to inner surface of foam pieces. Reference Appendix I "Adhesive Application".
13. Install the foam pieces into the sidewall.
14. Insure proper adhesion by lightly tamping the facia with a rubber mallet using a "Body Board". Reference Appendix J "Body Board Construction".
15. Cut out window openings, door openings etc. By using a hole saw. Saw from the outside of the vehicle and use the cutout opening in the interior paneling as your guide.
16. Smooth edges of cut styrofoam by gently hand sanding with 180 grit sand paper.
17. Clean foam and aluminum skin to remove all dust and foreign matter.

18. Apply adhesive to sidewall and the backside of the lower and upper aluminum skins. Reference Appendix J "Adhesive Application".
19. Install lower aluminum skin on to sidewall.

NOTE: It is helpful to use a slipsheet(s) to prevent accidental adhesion during installation.

20. Apply adhesive tape to upper edge of lower aluminum skin. (Winnebago part #063642-01-000).
21. Install upper aluminum skin onto sidewall.

NOTE: Align top of sheet to top of wall first. To assure proper alignment of skin to upper sidewall extension.

NOTE: It is helpful to use a slipsheet(s) to prevent accidental adhesion during installation.

Work your way to the bottom of the wall by sliding out the slip sheets.

As you get closer to the bottom, remove the covering from the adhesive tape and press skin to tape.

22. Insure proper adhesion by lightly tamping the sidewall skin using a rubber mallet and a "Body Board". Reference Appendix J "Body Board Construction."

WARNING

Make certain the cloth on the body board is clean to prevent scratching the aluminum skin.

23. Cut out sidewall openings with a tin snips.
24. Install sidewall on motor home. Reference "Sidewall Replacement" in this section.
25. Install valance clips. Reference Appendix K "Valance Panel Clips Installation".

Sidewall Removal

1. Remove valance panels from sidewall. Reference "Valance Panel Removal" in this section.
2. Remove dinette assembly from appropriate side of vehicle. Reference "Dinette Assembly Removal" in Interior Section.
3. Remove bedding shelf. Reference "Bedding Shelf Removal" in Interior Section.
4. Remove overhead cabinets from appropriate side of vehicle. Reference appropriate "Overhead Cabinet Removal" in Interior Section.
5. Remove cabinet(s) from appropriate side of vehicle. Reference appropriate "Cabinet Removal" in Interior Section.
6. Remove companion seat seatbelt from sidewall of appropriate side of vehicle. Reference "Shoulder Strap Seat Belt Removal" in Interior Section.
7. Remove transition panel cover from appropriate side of vehicle. Reference "Transition Panel Cover Removal" in Interior Section.
8. Remove windows, doors, vents, etc.
9. Remove rear cap. Reference "Rear Cap Removal" in this section.
10. Loosen transition panel on appropriate side of vehicle by removing (12) retaining screws from rear edge of panel and (2) retaining screws from panel to roof cap joint.
11. Loosen roof cap by removing (11) retaining screws from rear edge of cap.
12. Carefully cut sealant at sidewall to transition panel joint, roof to roof cap joint, and sidewall to roof joint.
13. Support the roof with ceiling jacks.
14. Remove exterior retaining screws from sidewall to floor joint.
15. Remove retaining screws from the sidewall to backwall joint.
16. Remove interior retaining screws from sidewall to floor joint.
17. Remove interior roof cove cover trim by gently prying loose.
18. Remove retaining screws from roof cover to sidewall joint.
19. Remove sidewall from vehicle by pulling sidewall to back of vehicle while pulling out on the bottom of sidewall.

Sidewall Replacement

1. Prepare sidewall for installation by.
 - Applying foam tape (Winnebago part #100128-02-000) to wheel well lip.
 - Applying D-seal (Winnebago part #099418-01-000) to the top edge of the upper sidewall extrusion.
 - Applying sealant (Winnebago part #039518-01-000) to floor flange.
2. Place sidewall into position on vehicle by coming from the rear of the vehicle and sliding the sidewall forward and upward.
3. Install retaining screws into roof cove to sidewall joint, exterior retaining screws into sidewall to floor joint, interior retaining screws into sidewall to floor joint, retaining screws into sidewall to backwall joint, and retaining screws into transition panel to sidewall joint.
4. Install retaining screws along rear edge of roof cap. Install (2) retaining screws at roof cap to transition panel block.
5. Seal roof cap. Reference "Roof Cap Replacement Step 8" in this section.
6. Seal transition panel. Reference "Transition Panel Replacement Step 6" in this section.
7. Mask along both sides of the roof to sidewall joint. Seal roof to sidewall joint with sealant. (Winnebago part #034552-14-000). Trowel per aesthetic requirements. Remove mask.
8. Install windows, doors, vents, etc.
9. Install rear cap. Reference "Rear Cap Replacement" in this section.
10. Install interior roof cove cover trim.
11. Install transition panel cover. Reference "Transition Panel Cover Replacement" in Interior Section.
12. Connect companion seat seatbelt to sidewall. Reference "Shoulder Strap Seat Belt Replacement" in Interior Section.
13. Install cabinet(s). Reference appropriate "Cabinet Removal" in Interior Section.
14. Install overhead cabinets. Reference appropriate "Overhead Cabinet Replacement" in Interior Section.
15. Install bedding shelf. Reference "Bedding Shelf Replacement" in Interior Sections.
16. Install dinette assembly. Reference "Dinette Assembly Replacement" in Interior Section.
17. Install valance panel clips. Reference Appendix K "Valance Panel Clips Installation."
18. Install valance panels. Reference appropriate "Valance Panel Replacement" in this section.

Repair of Gel-Coat Cracks

Inspect the area to be repaired to determine the extent of damages.

- The following procedure is for the repair of cracks in the gel-coat that do not penetrate the fiberglass. Commonly referred to as "spider webbing", or stress cracks.
- If the damage extends into the fiberglass itself, reference "Repair of Fiberglass Cracks".

Step 1 - Pre-Cleaning

- Clean dust from area using compressed air and a clean towel.

CAUTION

Always use proper safety equipment and procedures when using compressed air.

- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method. Reference Appendix G "The Two Cloth Method".

Step 2 - Grinding

- Use a die grinder to grind out and feather the individual cracks.

Step 3 - Cleaning

- Clean dust from repair area using compressed air and a clean cloth.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 4 - Sanding

- Lightly sand the repair area immediately around the crack(s) with 180-grit sandpaper.

Step 5 - Cleaning

- Clean dust from repair area using compressed air and a clean cloth.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 6 - Body Filler

- Use Evercoat Tack-Free 296 or equivalent. Mix as per manufacturer's directions.
- Use a squeegee to apply filler to the repair area. It is preferable to slightly mound the filler.
- Allow filler to cure.

Step 7 - Sanding

- Sand the repair area smooth using 180 grit sandpaper.

Step 8 - Cleaning

- Clean dust from repair area using compressed air and a clean cloth.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 9 - Priming

- Spray the repair area with a medium coat of sandable primer. Allow to dry.

Step 10 - Spot Putty

- Inspect the repair surface for pinholes. Fill imperfections with Red Cap DFL17 or equivalent. Allow to dry.

Step 11 - Sanding

- Wet sand the repair area using 400 grit sandpaper.

Step 12 - Cleaning

- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 13 - Priming

- Spray the repair area with a medium coat of sandable primer. Allow to dry.

Step 14 - Sanding

- Wet sand the repair area using 600 grit sandpaper.

Step 15 - Cleaning

- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 16 - Tack Wipe

- Use a tack cloth to wipe down the repair area.

Step 17 - Paint

- Paint the repair area.

Repair of Fiberglass Cracks

Inspect the area to be repaired to determine the extent of damages.

- The following procedure is for the repair of cracks that penetrate into the fiberglass.

Step 1 - Pre-Cleaning

- Clean dust from area using compressed air and a clean towel.

CAUTION

Always use proper safety equipment and procedures when using compressed air.

- Remove contaminants with DuPont 38125 or equivalent using the two-cloth method. Reference Appendix G "The Two Cloth Method".

Step 2 - Drilling

- Drill the ends of the crack(s) to prevent further spreading.

Step 3 - Grinding

- Use a small hand-held grinder to grind out and taper the repair area.

Step 4 - Cleaning

- Clean dust from repair area using compressed air and a clean shop cloth.
- Remove contaminants with DuPont 38125 or equivalent using the two-cloth method.

Step 5 - Sanding

- Lightly sand the repair area immediately around the scratch/gouge with 180 grit sandpaper. This allows for the proper adhesion of the filler to the substrate.

Step 6 - Cleaning

- Clean dust from repair area using compressed air and a clean shop towel.
- Remove contaminants with DuPont 38125 or equivalent using the two cloth method.

Step 7 - Body Filler

- Use Tack-Free 296 by Evercoat or equivalent. Mix as per manufacturer's directions.
- Use a squeegee to apply filler to the repair area. Allow to cure.

NOTE: It is preferable to slightly mound the filler.

Step 8 - Sanding

- Sand the repair area smooth using 180 grit sandpaper.

Step 9 - Cleaning

- Clean dust from repair area using compressed air and a clean towel.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 10 - Priming

- Spray the repair area with a medium coat of sandable primer. Allow to dry.

Step 11 - Spot Putty

- Inspect the repair surface for pinholes. Fill imperfections with Red Cap DFL17 or equivalent. Allow to dry.

Step 12 - Sanding

- Wet sand the repair area using 400 grit sandpaper.

Step 13 - Cleaning

- Clean dust from area using compressed air and a clean towel.
- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 14 - Priming

- Spray the repair are with a medium coat of sandable primer. Allow to dry.

Step 15 - Sanding

- Wet sand the repair area using 400 grit sandpaper.

Step 16 - Cleaning

- Remove contaminants with DuPont 3812S or equivalent using the two-cloth method.

Step 17 - Tack Wipe

- Use a tack cloth to wipe down the repair area.

Step 18 - Paint

- Paint the repair area.

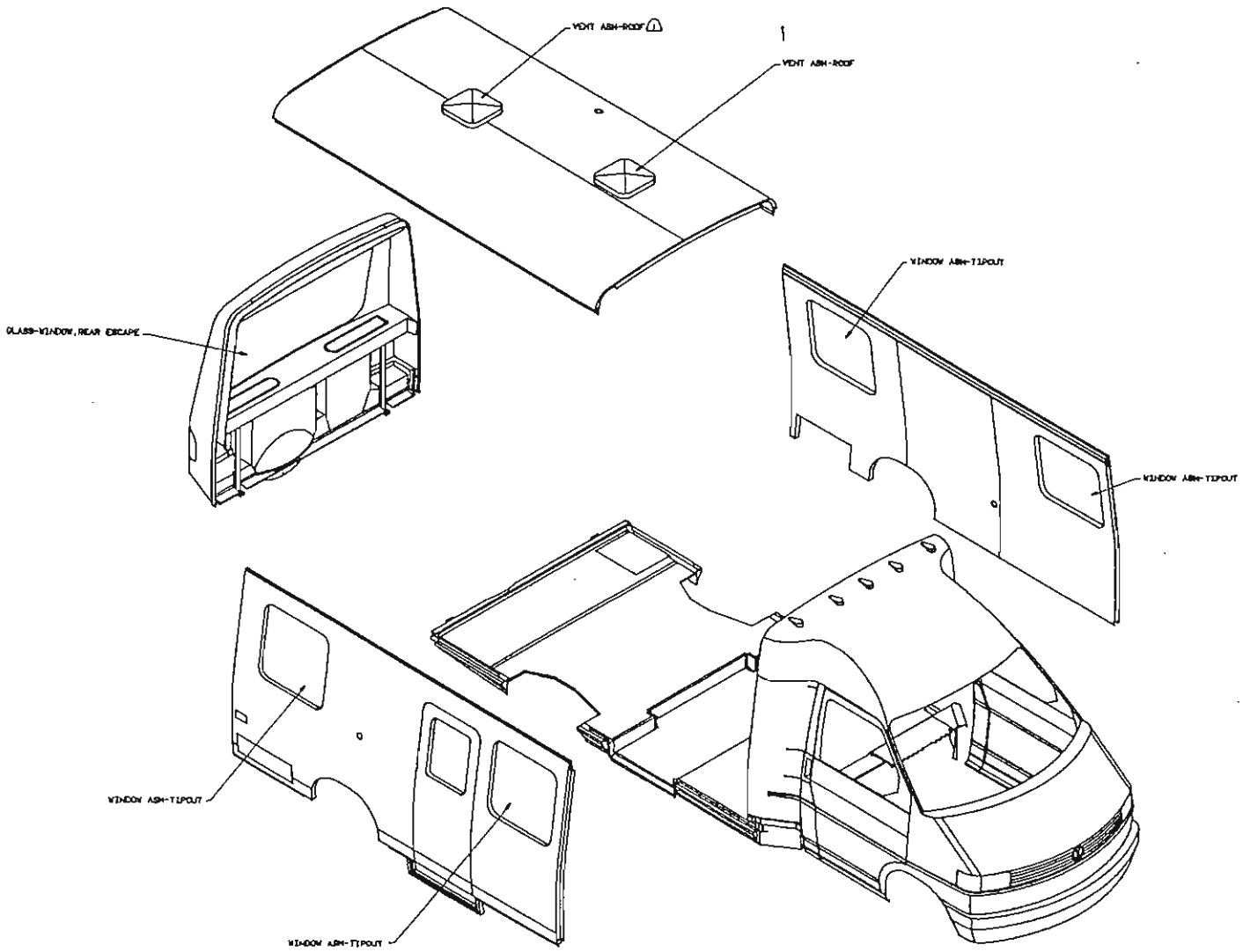
SECTION 3 BODY OPENINGS

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SECTION 3 BODY OPENINGS



Windows

Winnebago installs six windows in the Rialta.

- Four tip-out windows located in the sidewalls
- Stationary window located in the entrance door
- Rear escape window located in the rear cap.

Main components of the (4) tip-out and (1) stationary windows are:

- Window assembly
- Interior frame
- Sealant (butyl tape)

Stationary and Tipout Window Removal:

1. Remove interior frame retaining screws.
2. Remove the interior frame.
3. Use a putty knife to gently separate the window from the sidewall.

Stationary and Tipout Window Replacement

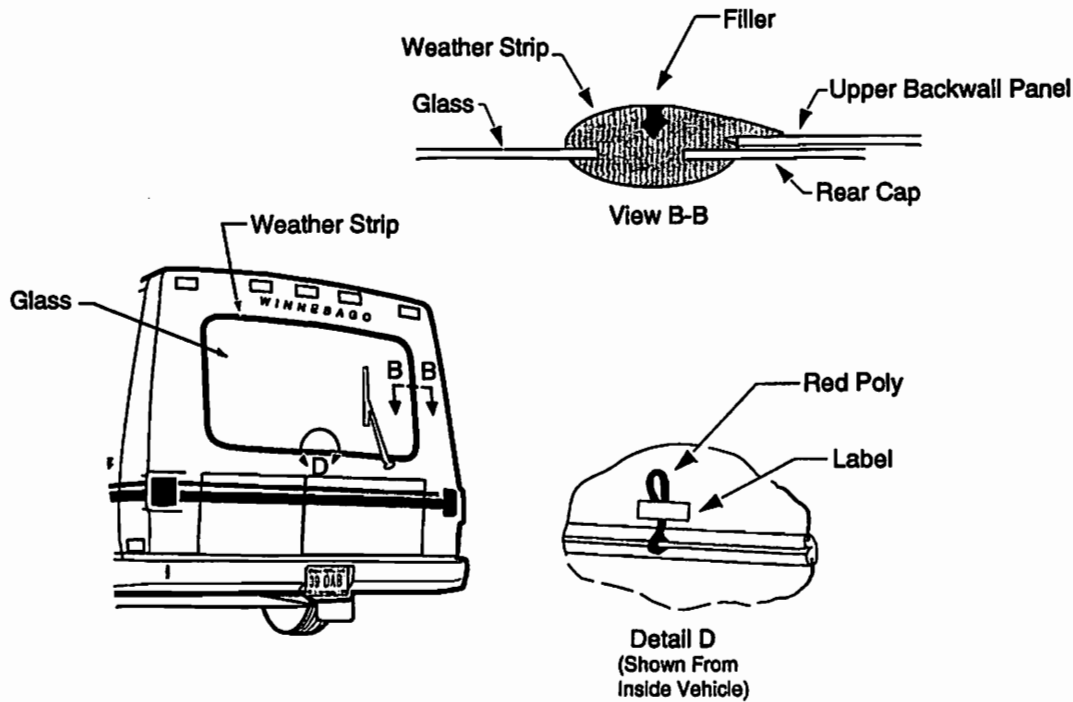
1. Attach sealant to window assembly lip. (If reinstalling old window, make sure all old sealant has first been removed.)
2. Position the window assembly into the opening. Have one person hold window in place.
3. Position interior frame into window assembly and install retaining screws.
4. Tighten screws to compress seal.

Water Leakage Around Stationary and Tipout Windows

If water leakage is apparent around one of the windows. First, check the tightness of the interior frame retaining screws. Lack of proper seal compression can cause leakage.

If this process does not remedy the leakage, then one of the following methods should be used:

1. Apply a thin bead of clear silicone around the perimeter of the window. Use the tip of a finger to level and remove excess silicone.
2. Replace sealant. Reference "Stationary and Tipout Window Removal and Replacement."



Rear Escape Window

The rear escape window is designed to be used as an emergency escape exit in the event of an emergency.

The glass is installed in a rubber molding and secured with a rubber "cord". The window is opened by pulling on the red plastic loop at the bottom of the window until the rubber "cord" is completely removed from the molding. Then the window can easily be pushed out.

Main Components of the Escape Window Are:

- Window
- Rubber weather strip
- Filler (rubber cord)

Escape Window Removal

1. Have another person hold the window from the outside.
2. Pull on the red plastic loop to loosen and remove the filler.
3. Gently push the window out of it's weatherstrip and remove window.
4. Remove rubber weatherstrip from rear cap.

Escape Window Replacement

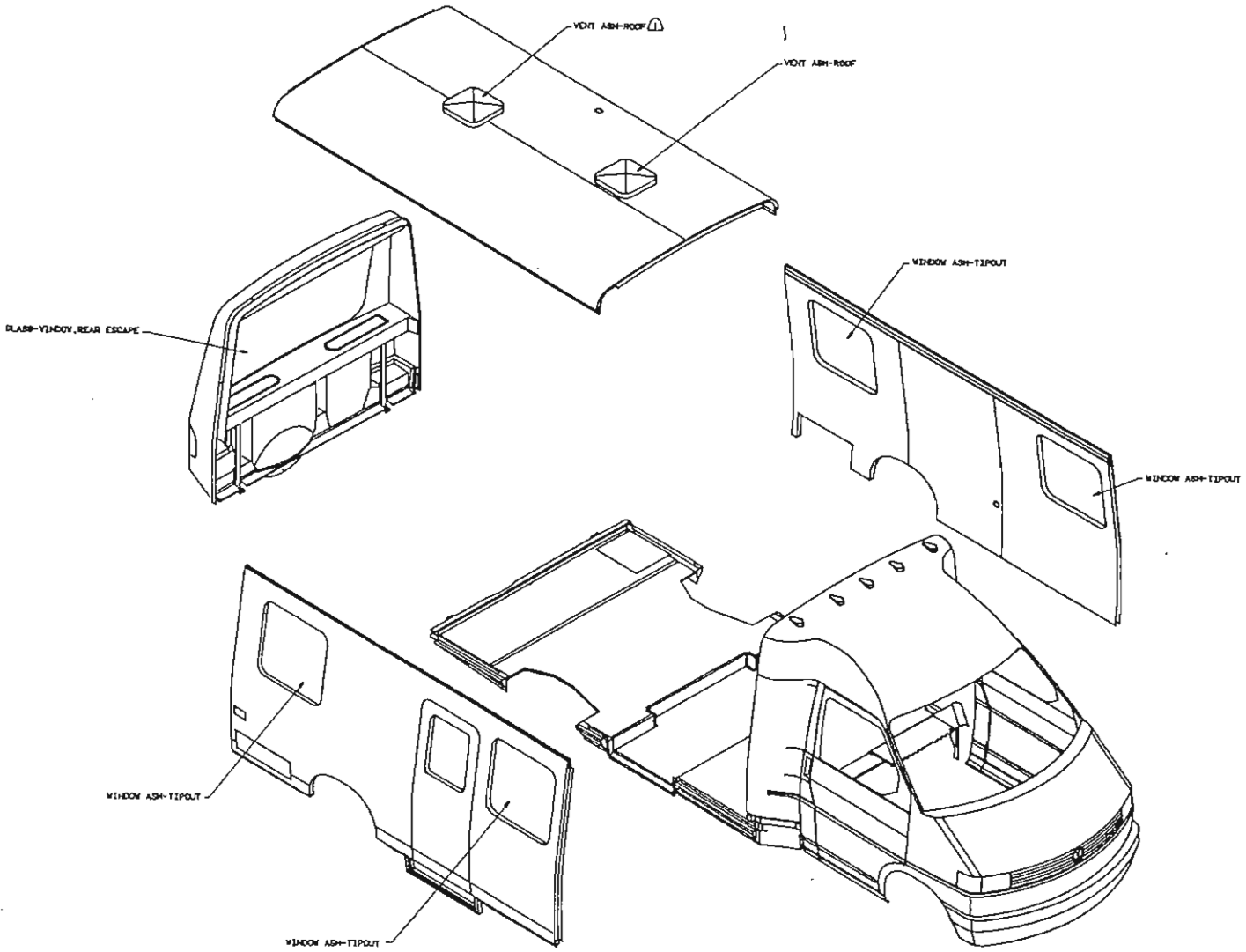
1. Install window weatherstrip into rear cap opening. (If previously removed.)

Fit window into weatherstrip by rolling back the weatherstrip top with a window spatula tool (Winnebago Part # 800438-01-000 or equivalent.) And working your way around the window.

2. Position window into weatherstrip. Have one person continue to support the window from the outside.

Lubricate weatherstrip with a soapy water solution.

3. Install the filler using glass insert tool (Winnebago Part #801572-01-000) Reference Appendix F "Use of Glass Insert Tool".
4. Secure red plastic loop with new label (Winnebago Part #107571-01-000)



Roof Vent

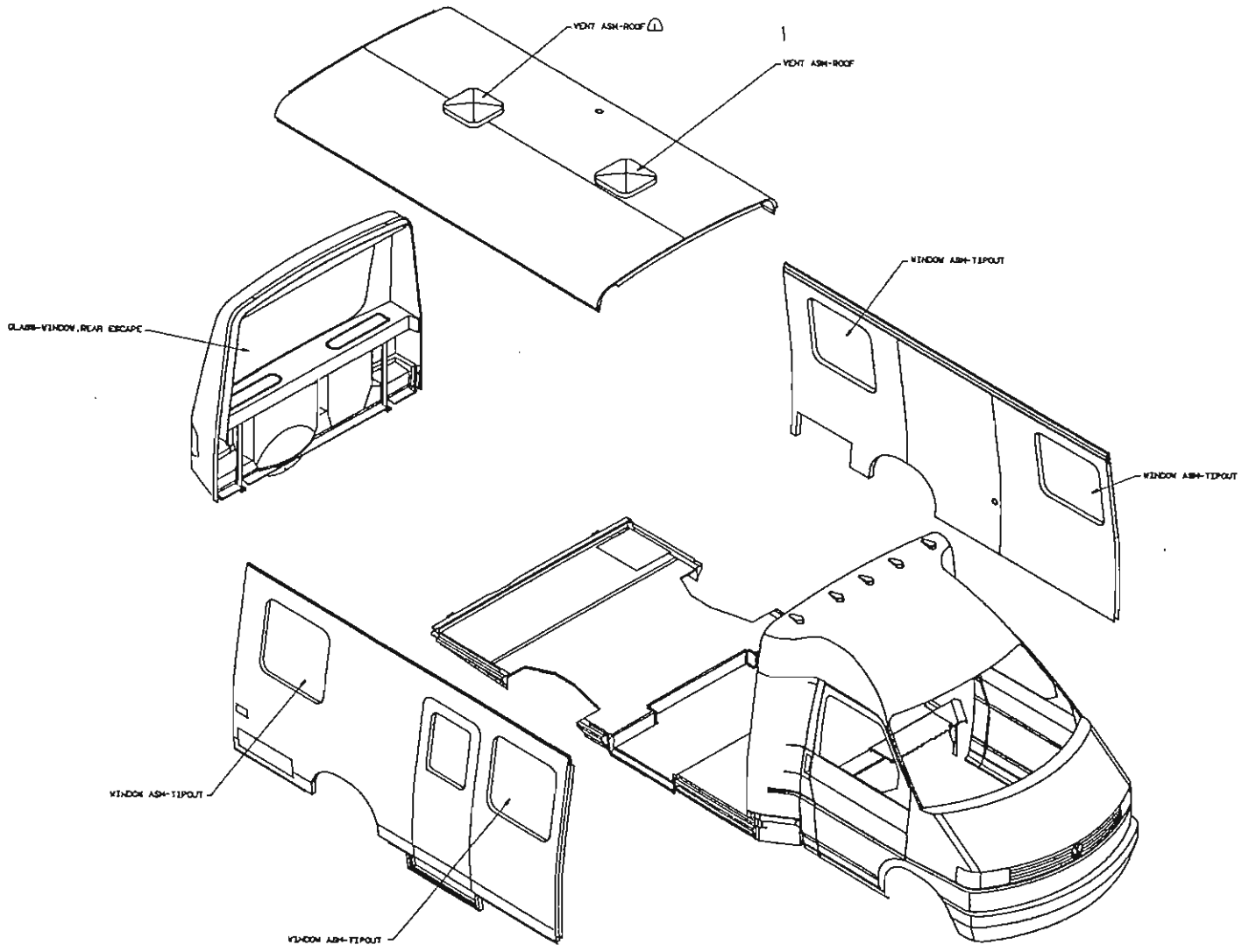
The roof vent assists in air circulation. It may be open when the vehicle is stationary or in motion.

Standard Vent Removal:

1. Remove inner trim ring retaining screws.
2. Remove inner trim ring.
3. Use a putty knife to carefully separate sealant from vent assembly.
4. Remove roof vent assembly.
5. Remove any remaining sealant from roof.

Standard Vent Replacement:

1. Wipe down the bottom side of the roof vent assembly mounting flange with Isopropyl alcohol.
2. Apply sealant (Winnebago Part Number 034552-14-000) to the base of the roof vent assembly.
3. Position vent assembly into opening.
4. Attach inner trim ring and secure with retaining screws. Tighten screws. *Sealant should squeeze out around the perimeter of the vent.
5. Apply sealant (Winnebago Part Number 108716-01-000) to perimeter of roof vent assembly.



Roof Vent

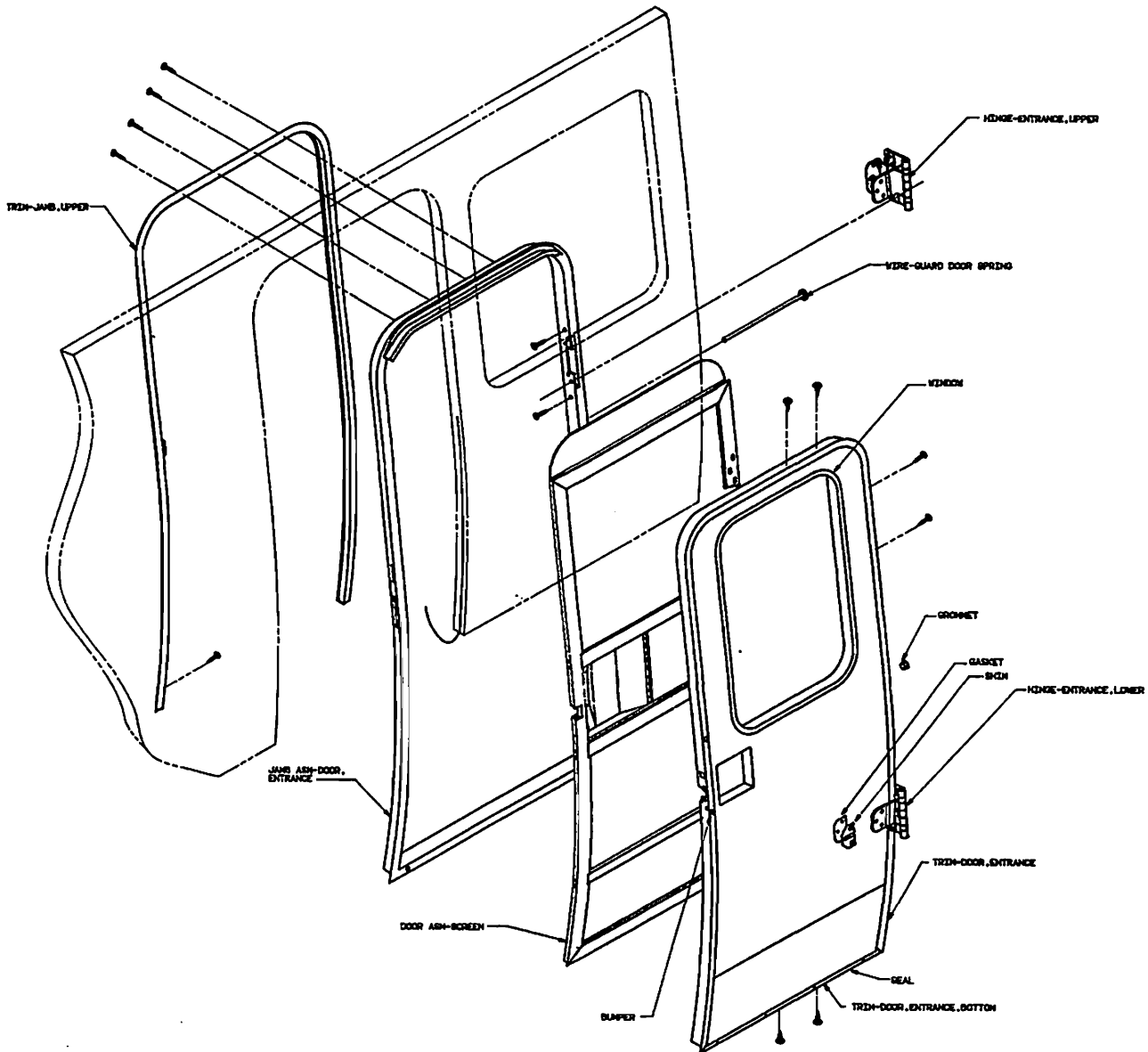
The roof vent assists in air circulation. It may be open when the vehicle is stationary or in motion.

Power Vent Removal:

1. Remove inner trim ring retaining screws.
2. Remove inner trim ring.
3. Disconnect 12 volt DC wiring to vent.
4. Use a putty knife to carefully separate sealant from vent assembly.
5. Remove roof vent assembly.
6. Remove any remaining sealant from roof.

Vent Replacement:

1. Wipe down the bottom side of the roof vent assembly mounting flange with Isopropyl alcohol.
2. Apply sealant (Winnebago Part Number 034552-14-000) to the base of the roof vent assembly.
3. Position vent assembly into opening.
4. Connect 12 volt DC wiring to vent.
5. Attach inner trim ring and secure with retaining screws. Tighten screws. *Sealant should squeeze out around the perimeter of the vent.
6. Apply sealant (Winnebago Part Number 108716-01-000) to perimeter of roof vent assembly.

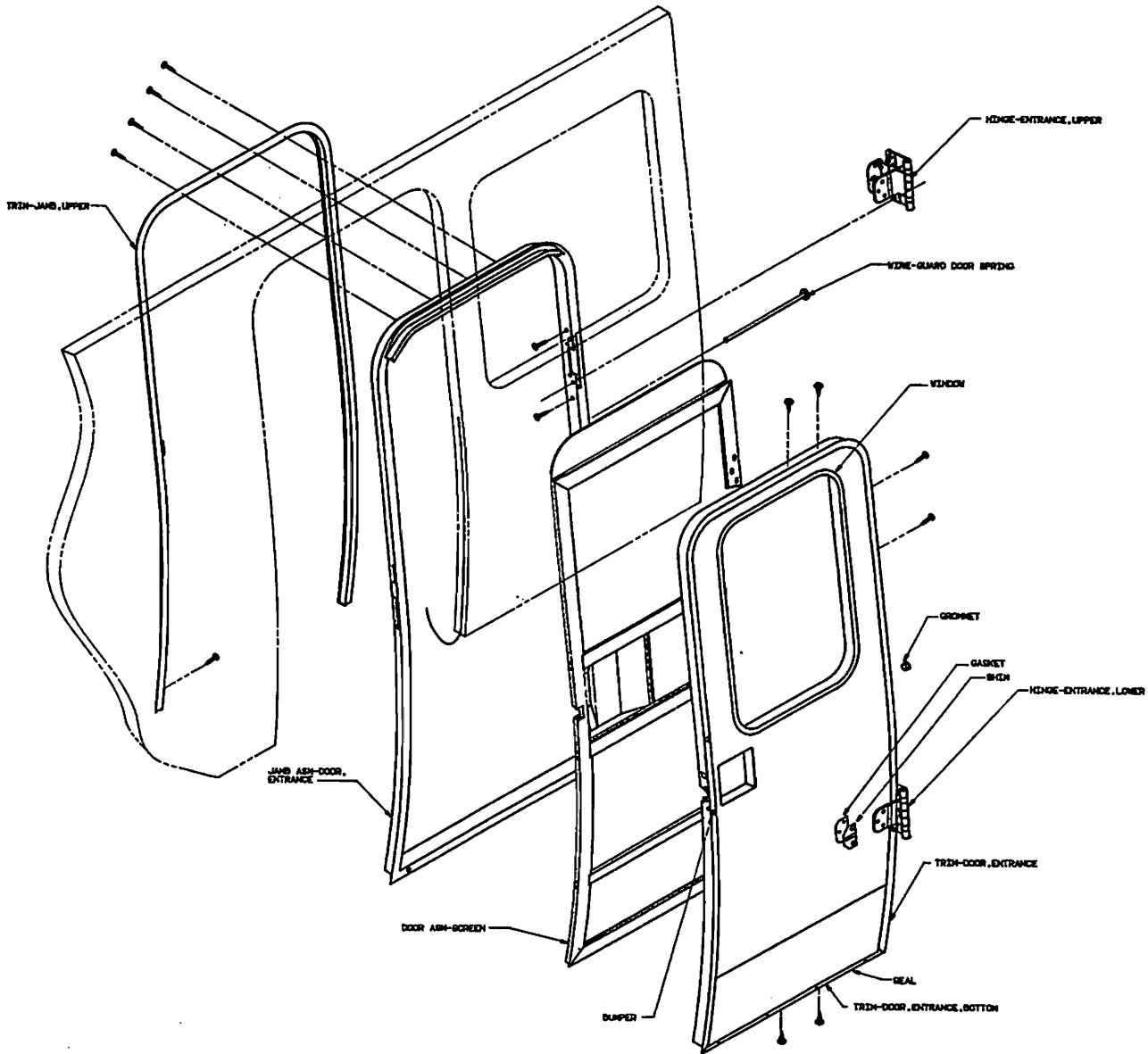


Entrance Door and Jamb Removal

1. Remove (3) retaining screws on lower edge of outer jamb.
2. Remove (5) retaining screws from inside edge of outer jamb.
3. Remove (24) retaining screws from inner jamb.
4. Remove outer jamb and door.
5. Remove old sealant from door and sidewall.

Entrance Door and Jamb Replacement

1. Place door and outer jamb into door opening.
2. Position inner jamb into opening and secure with (24) retaining screws.
3. Install (5) retaining screws into inside edge of outer jamb.
4. Install (3) retaining screws into lower lip of outer jamb.
5. Cap seal door jamb with sealant (Winnebago Part #034552-14-000).

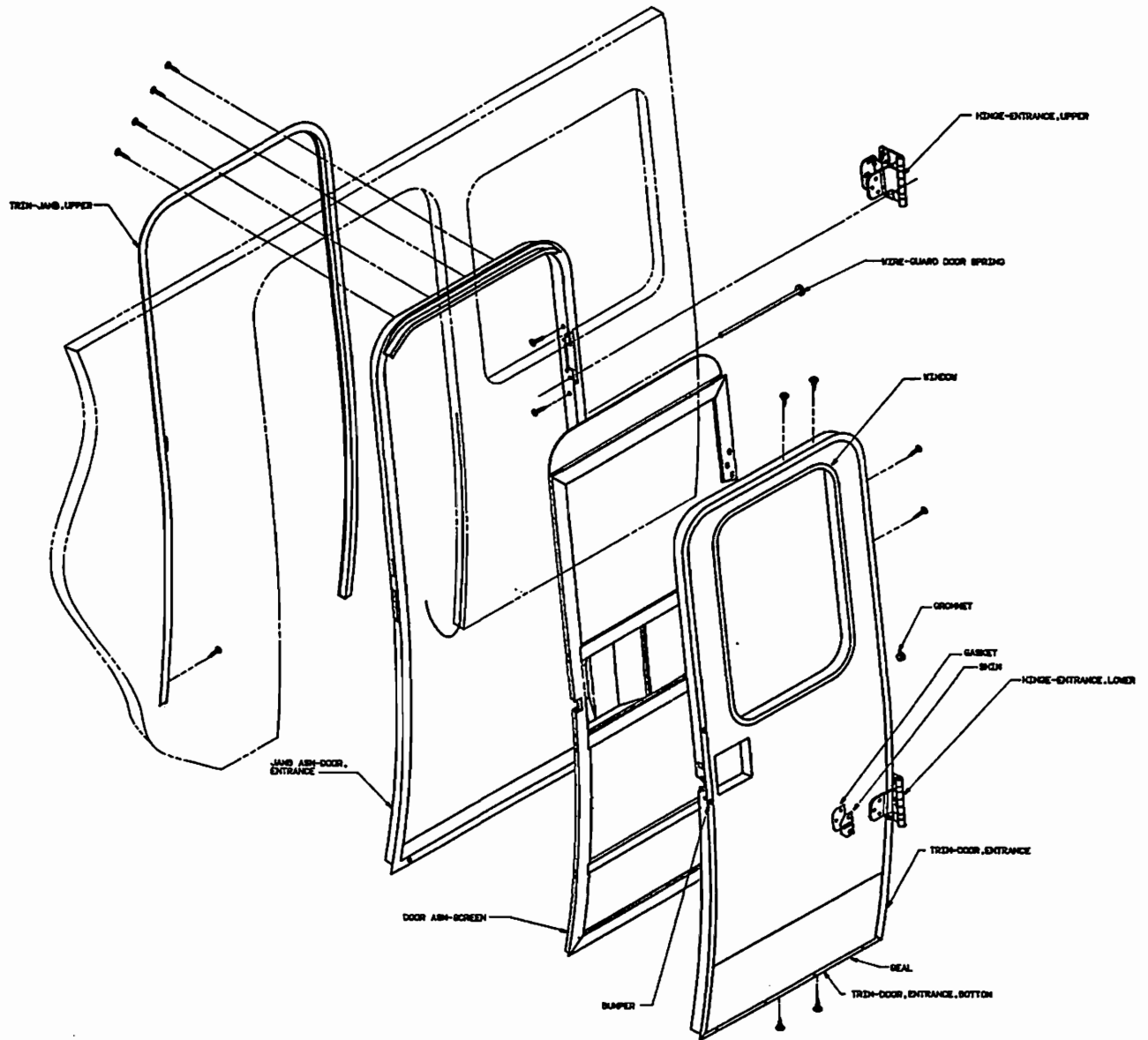


Entrance Door Removal

1. Remove (2) hinge access plates by removing (2) retaining screws per plate.
2. Remove (3) retaining nuts from each hinge.
3. Remove door.

Entrance Door Replacement

1. Position door into hinges. NOTE: Be sure to install shim on lower hinge.
2. Secure door with (3) retaining nuts per hinge.
3. Install (2) access cover panels. Secure with (2) retaining screws per panel.

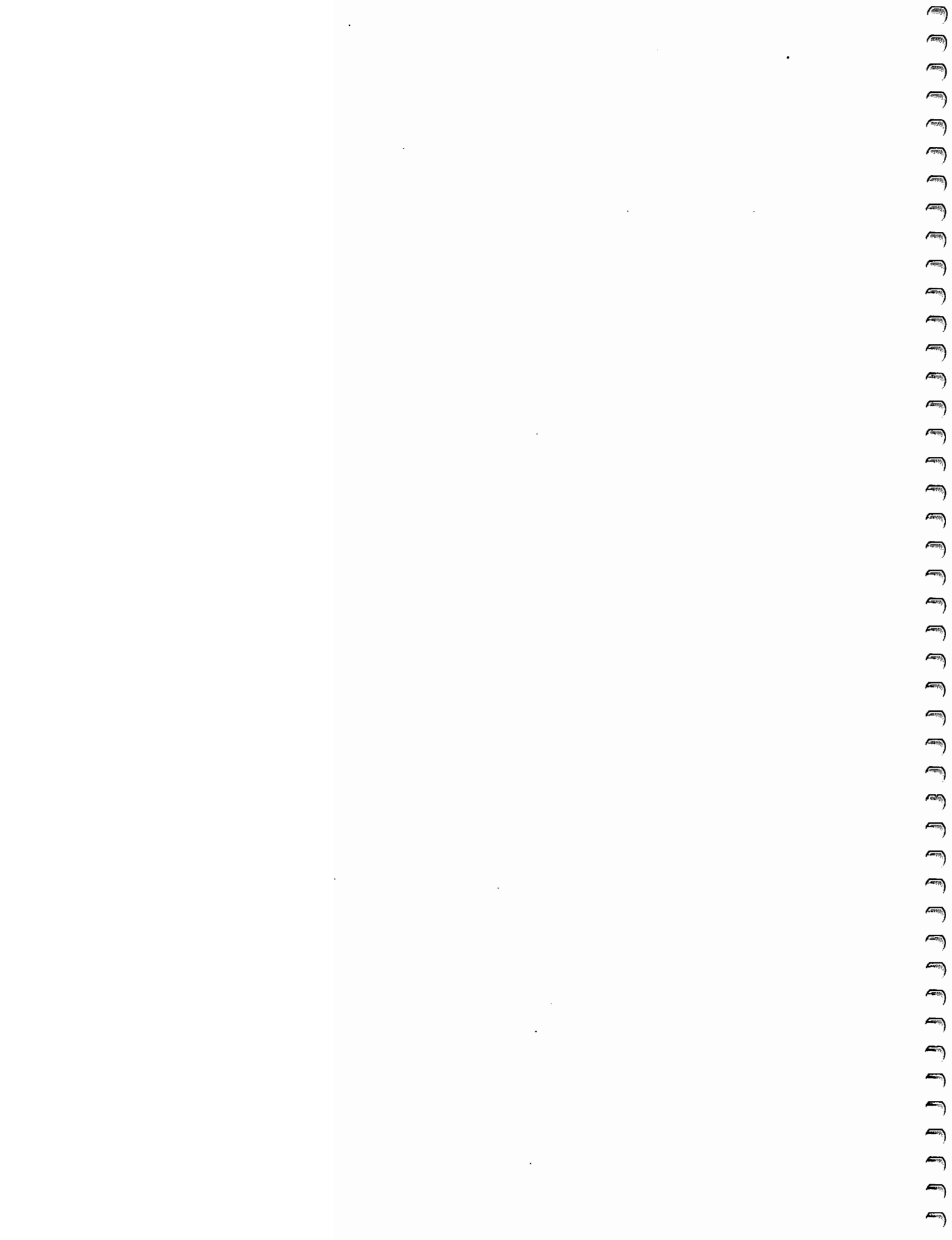


Screen Door Removal

1. Remove (3) retaining nuts from (2) hinges.
2. Remove screen door.

Screen Door Replacement

1. Position door unto hinges.
2. Secure with (3) retaining nuts per hinge.



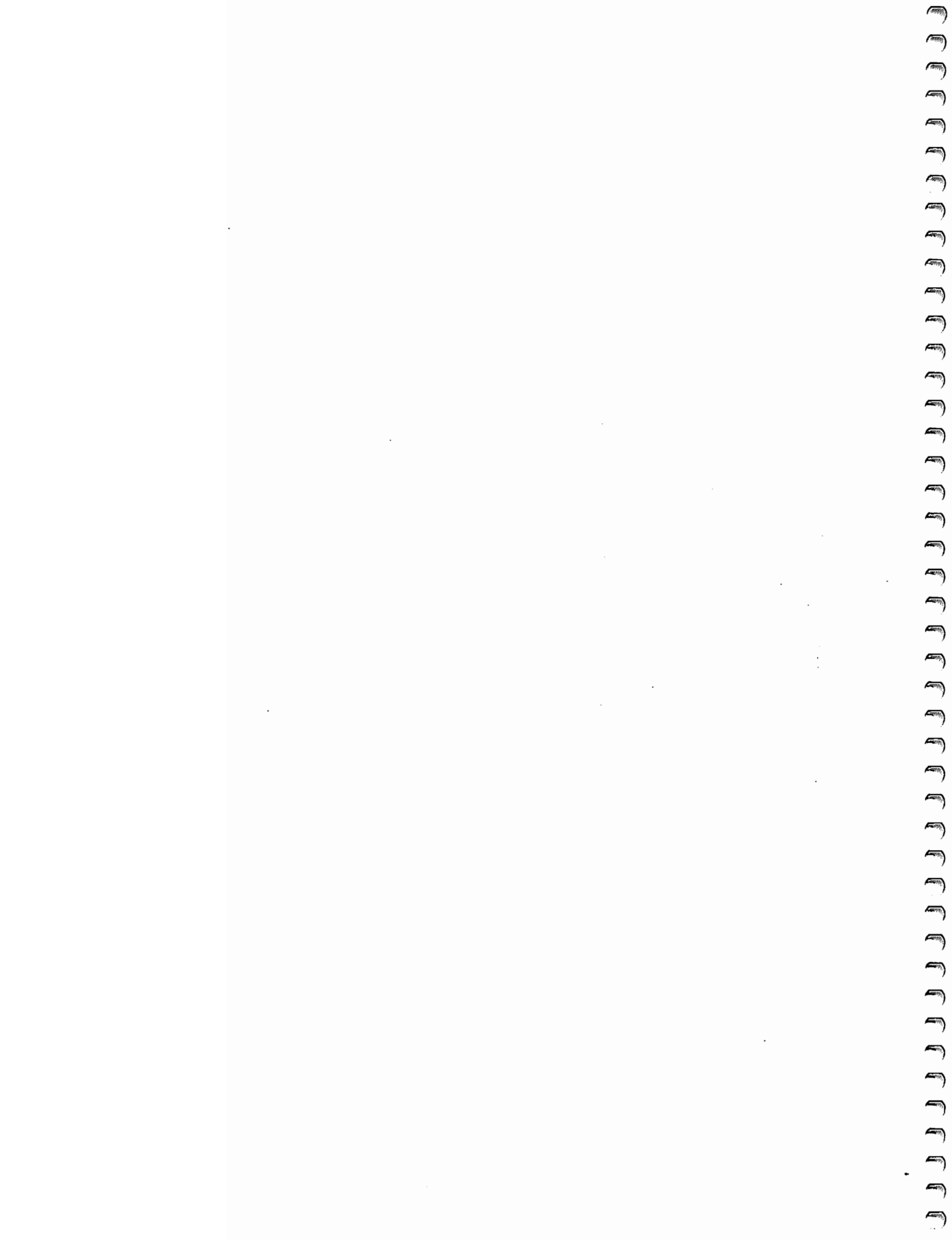
SECTION 4 INTERIOR

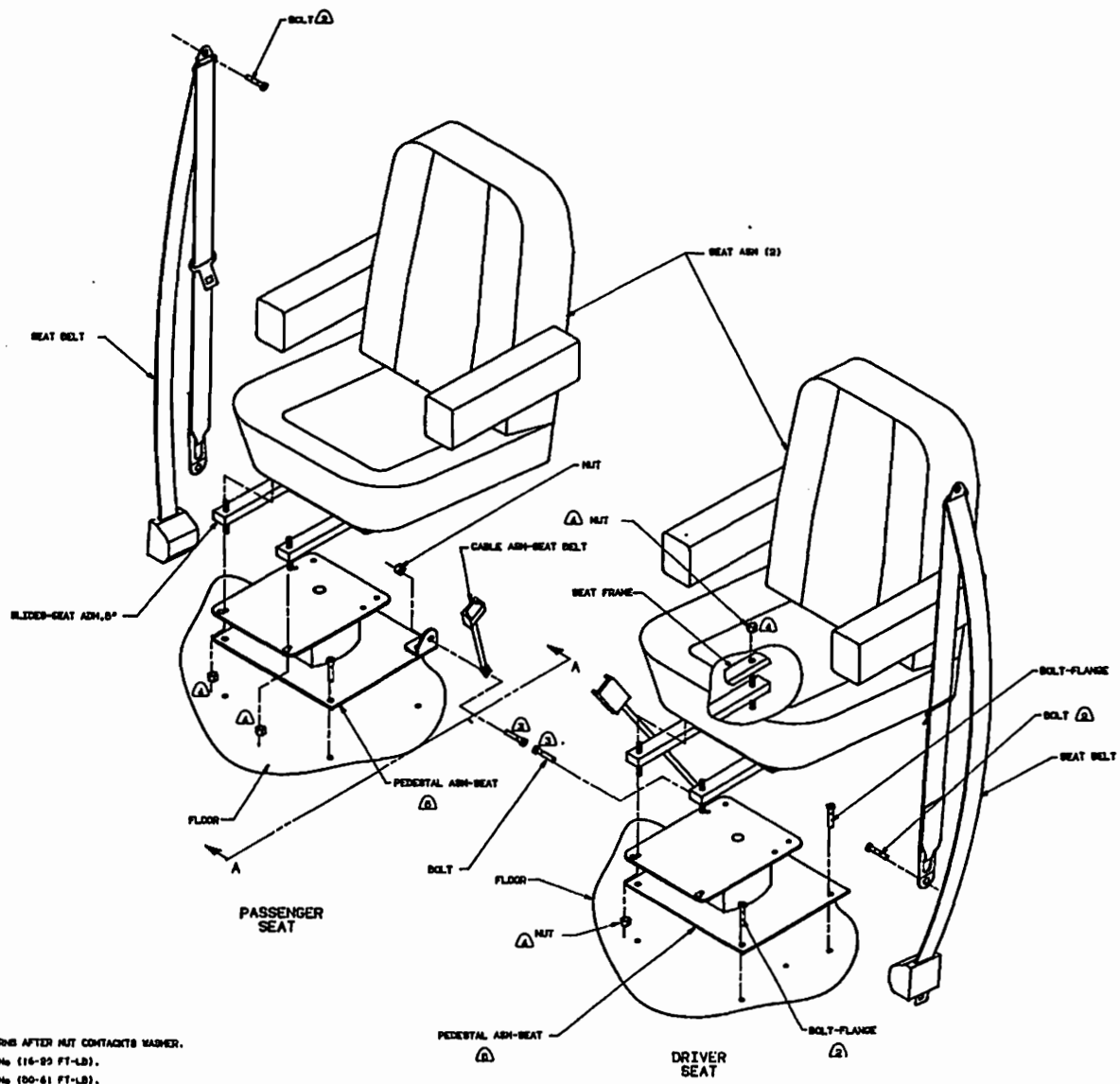
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- 1 TIGHTEN 1 1/2 TURNS AFTER NUT CONTACTS WASHER.
- 2 TORQUE TO 22-27 Nm (16-20 FT-LB).
- 3 TORQUE TO 66-83 Nm (50-61 FT-LB).
- 4 TORQUE TO 38-46 Nm (28-34 FT-LB).

NOTES:

SEAT BELT/PEDESTAL INSTL-CAB

SECTION 4 INTERIOR

SHOULDER STRAP SEAT BELTS

Shoulder strap seat belts are three point belts used on the driver and passenger seats and the two companion seats.

Shoulder Strap Seat Belt Removal

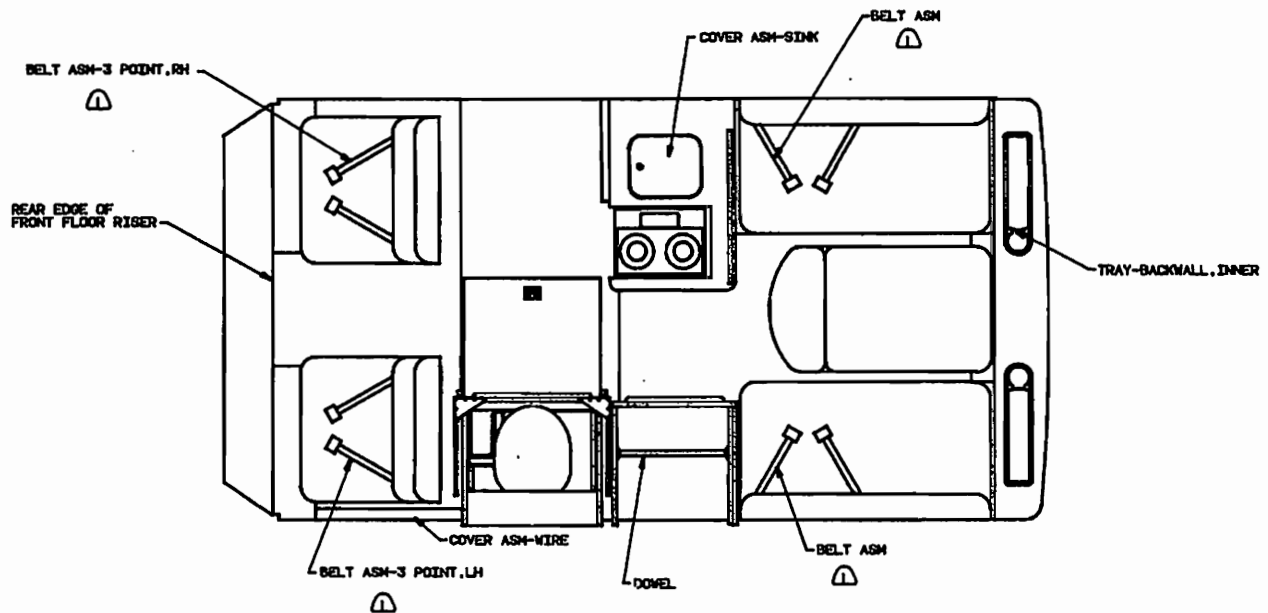
1. Remove (2) bolts that retain belt to sidewall.
2. Remove seat belt.

NOTE: To remove the seat belt cable assembly. (Latching mechanism inbound of the seats) Remove the seat belt cable assembly retaining bolt and nut.

Shoulder Strap Seat Belt Replacement

1. Place the rewind mechanism and retaining strap on other end of bolt in proper position on the lower sidewall. Install retaining bolt through both pieces. Torque bolt to 38-46 Nm (28-34 FT-LB.)
2. Place the upper belt retaining guide in the proper position on the upper sidewall. Install retaining bolt through guide. Torque bolt to 38-46 Nm (28-34 FT-LB.)

NOTE: To install seat belt cable assembly. (Latching mechanism inboard of the seats.) Secure with seat belt cable assembly retaining bolt and nut. Torque bolt to 68-83 Nm (50-61 ft./lbs.)



NOTES: TORQUE ALL SEAT BELT BOLTS TO 94-117 N-m (69-86 Ft-lb).

FLOOR PLAN-INTERIOR TRIM

Lap Seat Belts

Lap seat belts are used with the dinette.

Lap Seat Belt Removal

1. Remove dinette seat cushion. Reference "Dinette Seat Cushion Removal" in this section.
2. Remove seat belt retaining bolts.
3. Remove seat belts.

Lap Seat Belt Replacement

1. Place seat belts in proper position.
2. Secure with retaining bolts. Torque bolts to 94-117 Nm (69-94 ft./lbs.)
3. Install dinette seat cushion. Reference "Dinette Seat Cushion Replacement" in this section.

See art on page 4-1

Driver and Passenger Seats

Driver and passenger seats are high back recliners with armrests and swivel slide pedestals.

Driver or Passenger Seat Removal

1. Remove (4) slide assembly retaining nuts from underside of pedestal.
2. Remove seat from pedestals.

NOTE: If you are replacing a seat, it will be necessary to remove the slide assembly from the seat and install it on the new seat. Proceed to Step 3.

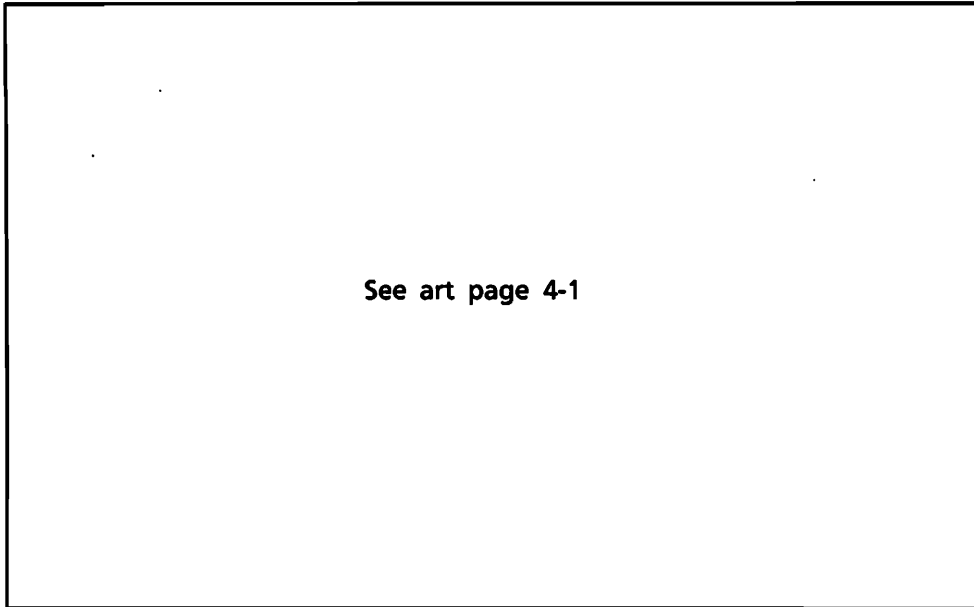
3. Remove (4) slide assembly retaining nuts that hold the slide assembly to the chair. Remove slide assembly.

Driver or Passenger Seat Replacement

NOTE: If you are installing a new seat, start at step 1. If you are installing the old seat, start at step 2.

1. Place slide assembly into position on seat. Secure with (4) retaining nuts. Torque nuts to 22-27 Nm (16-20 ft./lbs.)
2. Place seat assembly into position on pedestal.
3. Secure seat with (4) retaining nuts. Torque nuts to 22-27 Nm (16-20 ft./lb.)

Driver and Passenger Seat Pedestals



Driver and Passenger Seat Pedestal Removal

1. Remove seat Reference "Driver or Passenger Seat Removal" in this section.
2. Remove seat pedestal top plate. Reference "Seat Pedestal Top Plate Removal" in this Section.
3. Lift up cab carpet clear of pedestal and fold back out of the way.
4. Remove (4) pedestal retaining bolts.
5. Remove pedestal.

Driver or Passenger Seat Pedestal Replacement

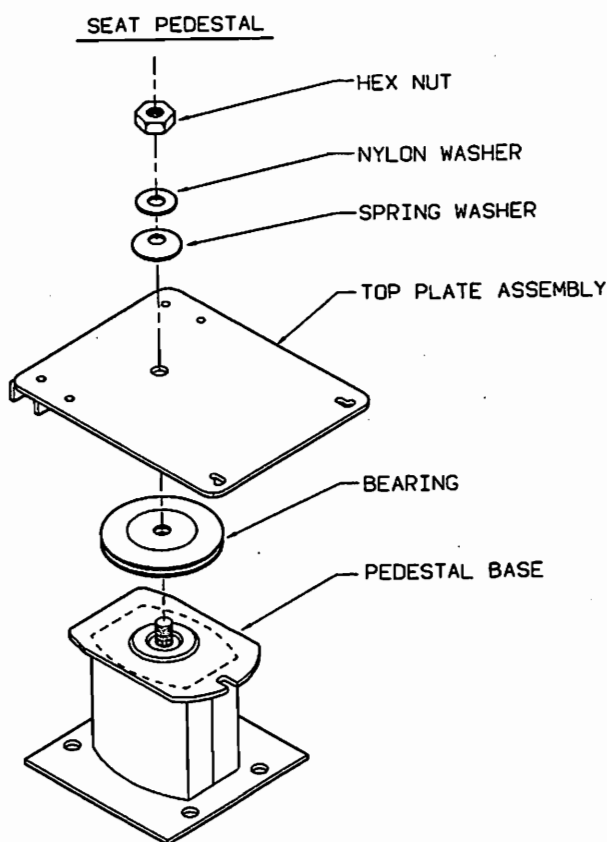
1. Place pedestal in proper position.
2. Secure pedestal with (4) retaining bolts. Torque bolts to 38-46 Nm (28-34 ft./lbs.)
3. Install carpet over pedestal.
4. Install seat pedestal top plate on seat pedestal. Reference "Seat Pedestal Top Plate Installation" in this Section.
5. Install seat assembly on pedestal. Reference "Driver or Passenger Seat Replacement" in this section.

Seat Pedestal Top Plate

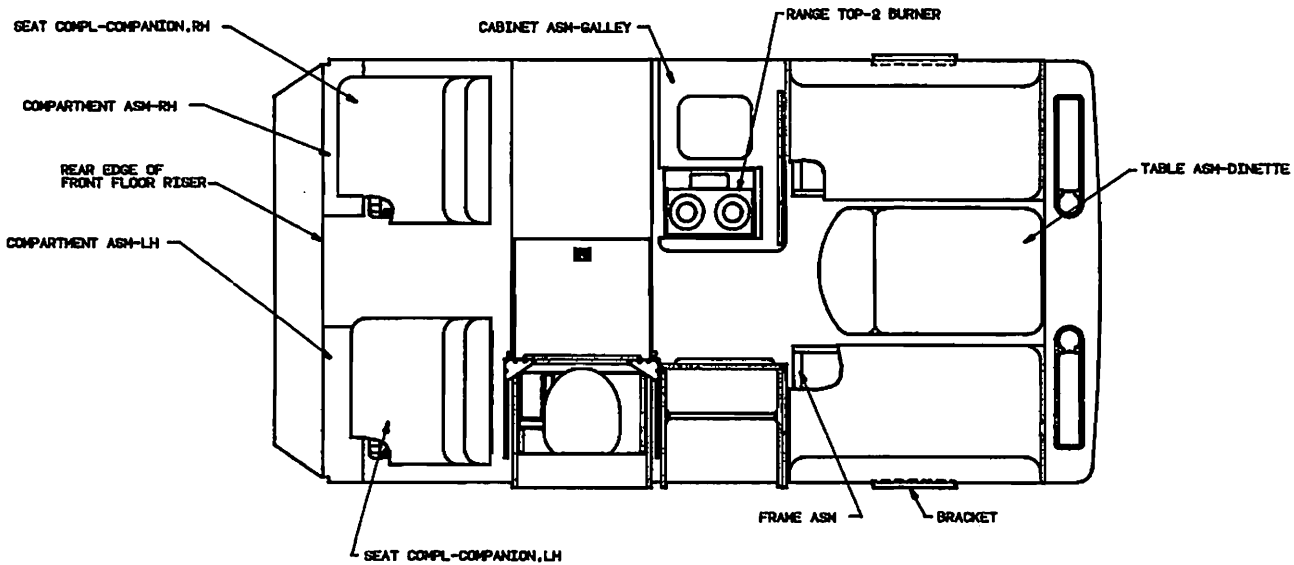
Seat Pedestal Top Plate Removal

1. Loosen and remove hex nut retaining top plate to pedestal.
2. Rotate top plate 90° from locked position.
3. Remove top plate.
4. Remove bearing assembly.

Seat Pedestal Top Plate Replacement



1. Place bearing, with seam down, on the pedestal base.
2. Position the top plate assembly, rotated 90° from the locked position, on the base and install the spring washer (Dome Up), nylon washer, and special lock nut.
3. Tighten nut 1 1/2 turns after it contacts the washers. Do not overtighten as bearing can be damaged.
4. Rotate the top plate to the locked position.



Companion Seat

The companion seats are located directly behind the driver and passenger seats. They offer a reclining back and headrests. They also convert to a bed.

Right Companion Seat Removal

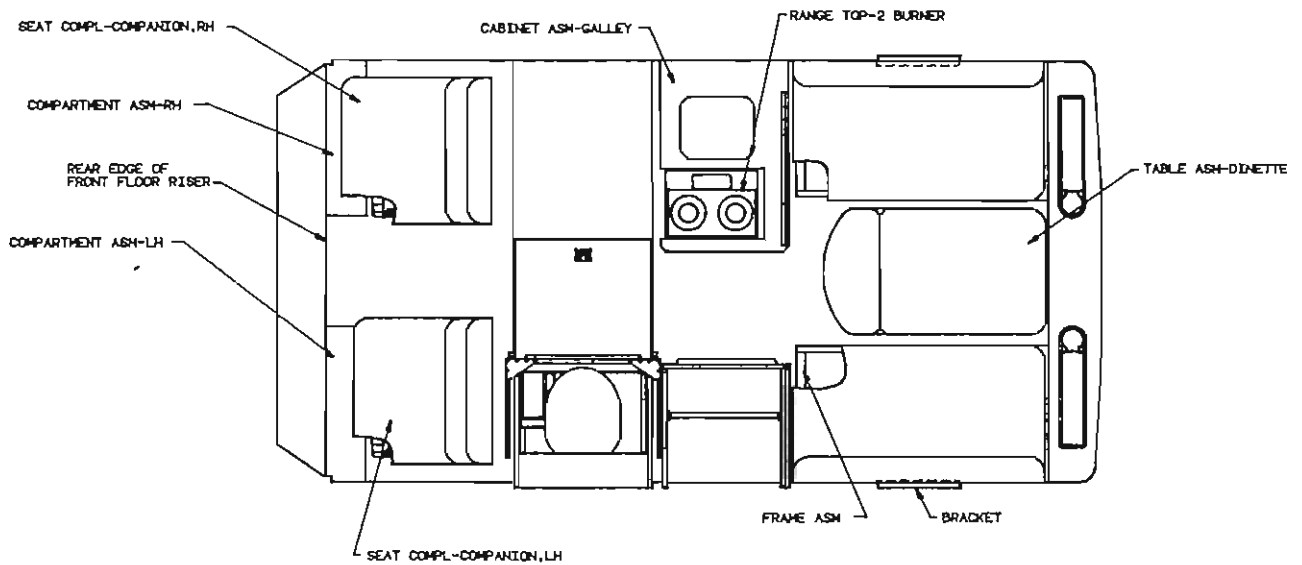
1. Access seat assembly retaining bolts by opening the access door in the rear of the assembly.
2. Loosen and remove (4) bolts that retain the seat to the floor.
3. Remove seat assembly.

Left Companion Seat Removal

1. Access seat assembly retaining bolts by opening the access door on the right side of the assembly.
2. Loosen and remove (4) bolts that retain the seat assembly to the floor.
3. Remove seat assembly.

Companion Seat Replacement

1. Place seat assembly in the proper position.
2. Secure assembly with (4) retaining bolts. Torque bolts to 94-117 Nm (69-86 ft./lbs.)



FLOOR PLAN-CABT & APPLIANCE

Dinette

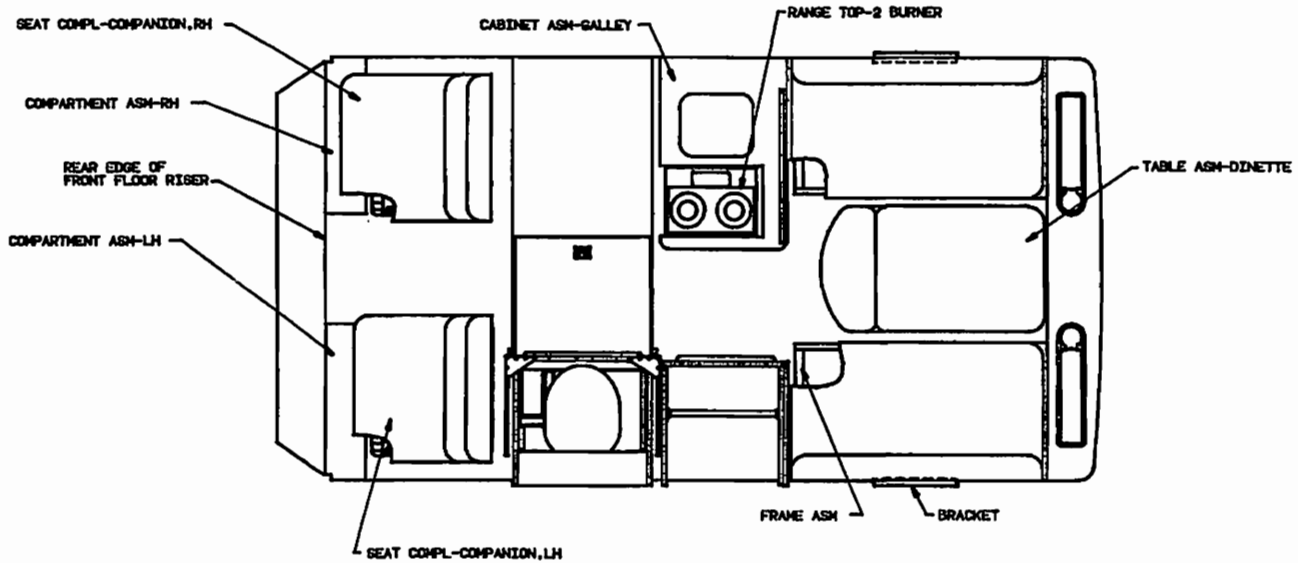
The dinette provides seating for four and also converts into a bed.

Dinette Seat Cushion Removal

1. Remove dinette table. Reference "Dinette Table Removal" in this section.
2. Lift front of dinette seat upward to access seat retaining nuts. Remove (4) seat retaining nuts.
3. Remove dinette seat cushion.

Dinette Seat Cushion Replacement

1. Place seat cushion in proper position.
2. Secure with (4) retaining nuts.



FLOOR PLAN-CABT & APPLIANCE

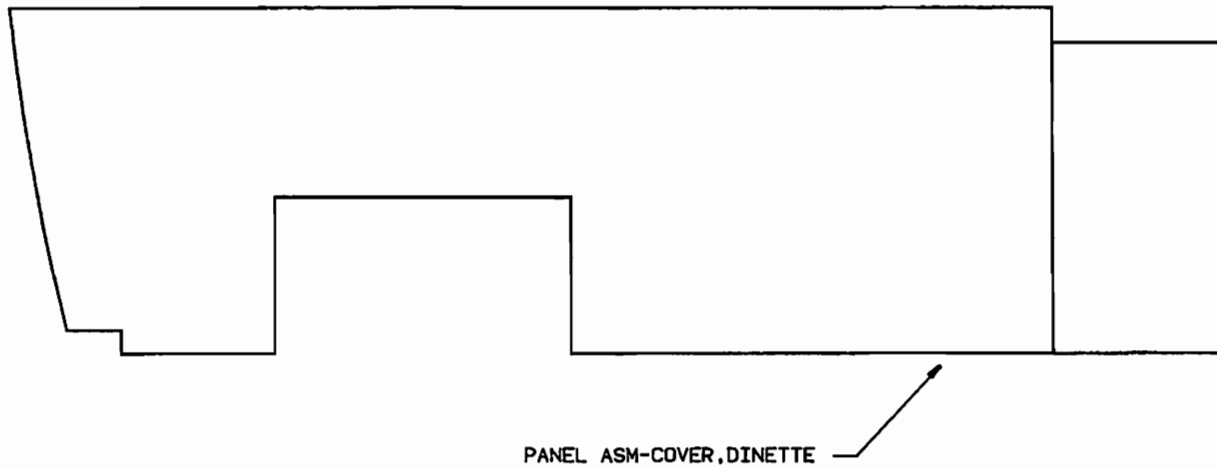
Dinette Assembly Removal

1. Gently pull dinette upper seat back towards the center of the vehicle. This allows access to the outboard dinette seat assembly retaining screws.

Remove (3) outboard retaining screws.
2. Remove dinette assembly cover panel. Reference "Left Dinette Assembly Cover Panel Removal" or "Right Dinette Seat Cover Panel Removal" in this section.
3. Remove (2) in board dinette assembly retaining screws.
4. Remove dinette assembly.

Dinette Assembly Replacement

1. Place dinette assembly in the proper position.
2. Install and tighten (2) in board dinette assembly retaining screws.
3. Gently pull dinette upper seat back towards center of vehicle. This allows access to outboard mounting bracket. Install and tighten (3) outboard dinette assembly retaining screws.
4. Install dinette assembly cover panel. Reference "Left Dinette Assembly Cover Panel Replacement" or "Right Dinette Assembly Cover Panel Replacement" in this section.

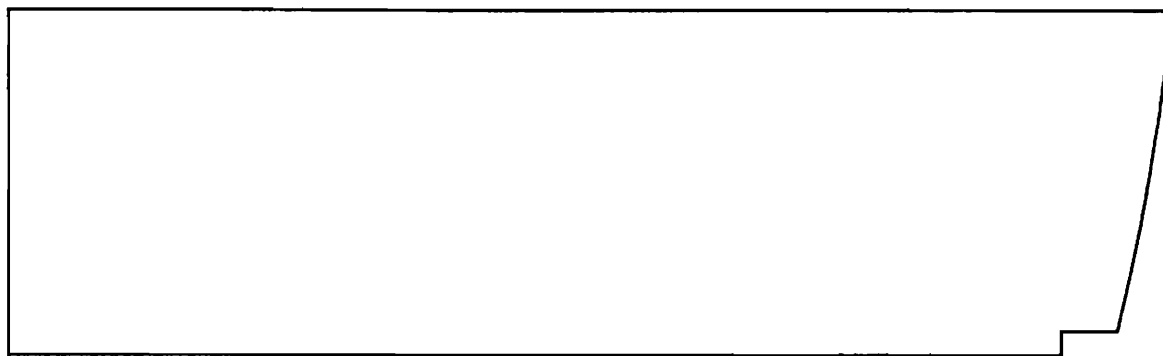


Left Dinette Assembly Cover Panel Removal

1. Open load center cover.
2. Remove (4) load center retaining screws.
3. Lift front of dinette seat upward to access cover panel retaining screws. (Located at the junction of the cover panel and the wardrobe cabinet.)
4. Remove (4) cover panel retaining screws.
5. Pull cover panel out and up to remove.

Left Dinette Assembly Cover Panel Replacement

1. Place cover panel in proper position. Press firmly in place to engage clips.
2. Install (4) load center retaining screws.
3. Install (4) cover panel retaining screws.



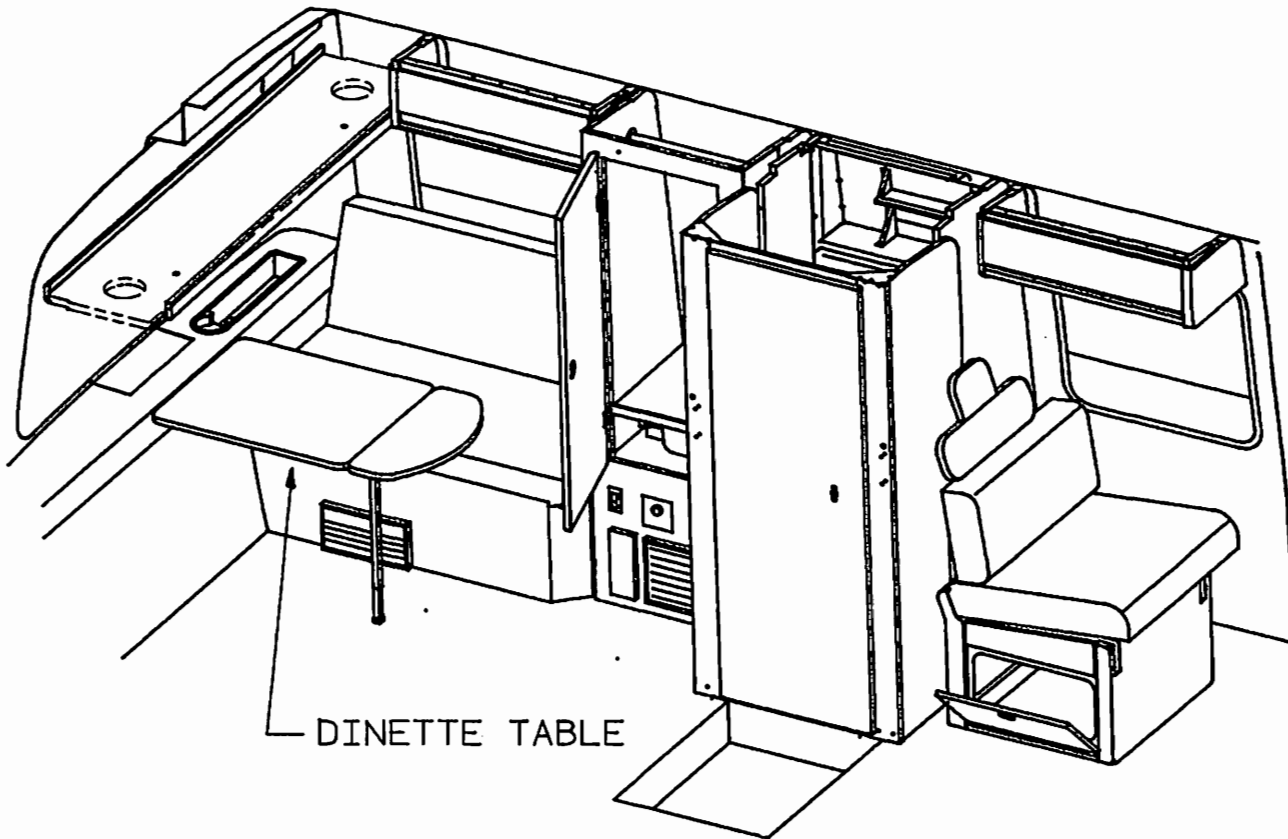
PANEL ASM-
COVER, DINETTE

Right Dinette Assembly Cover Panel Removal

1. Grasp cover panel and pull toward center of the vehicle to loosen velcro.
2. Remove cover panel.

Right Dinette Assembly Cover Panel Replacement

1. Place cover panel in proper position.
2. Press panel firmly into place to seat velcro.



Dinette Table Removal

1. Release dinette table catch mechanism located at center rear of table near backwall.
2. Fold up dinette seat leg.
3. Pull table forward to release it from the backwall.
4. Remove table.

Dinette Table Replacement

1. Place table in proper position. Engaging the posts in the openings in the backwall.
2. Extend the table leg.
3. Engage and secure the table catch mechanism.

Sun Visors

Sunvisor Removal

1. Loosen and remove 2 visor retaining screws. Remove visor.
2. Loosen and remove visor retainer retaining screw. Remove retainer.

Sunvisor Replacement

1. Install visor retainer. Secure with retaining screw.
2. Install visor. Secure with 2 retaining screws.

Dome Light Assembly

The dome light is located in the center of the vehicle above the dash. It contains two lights.

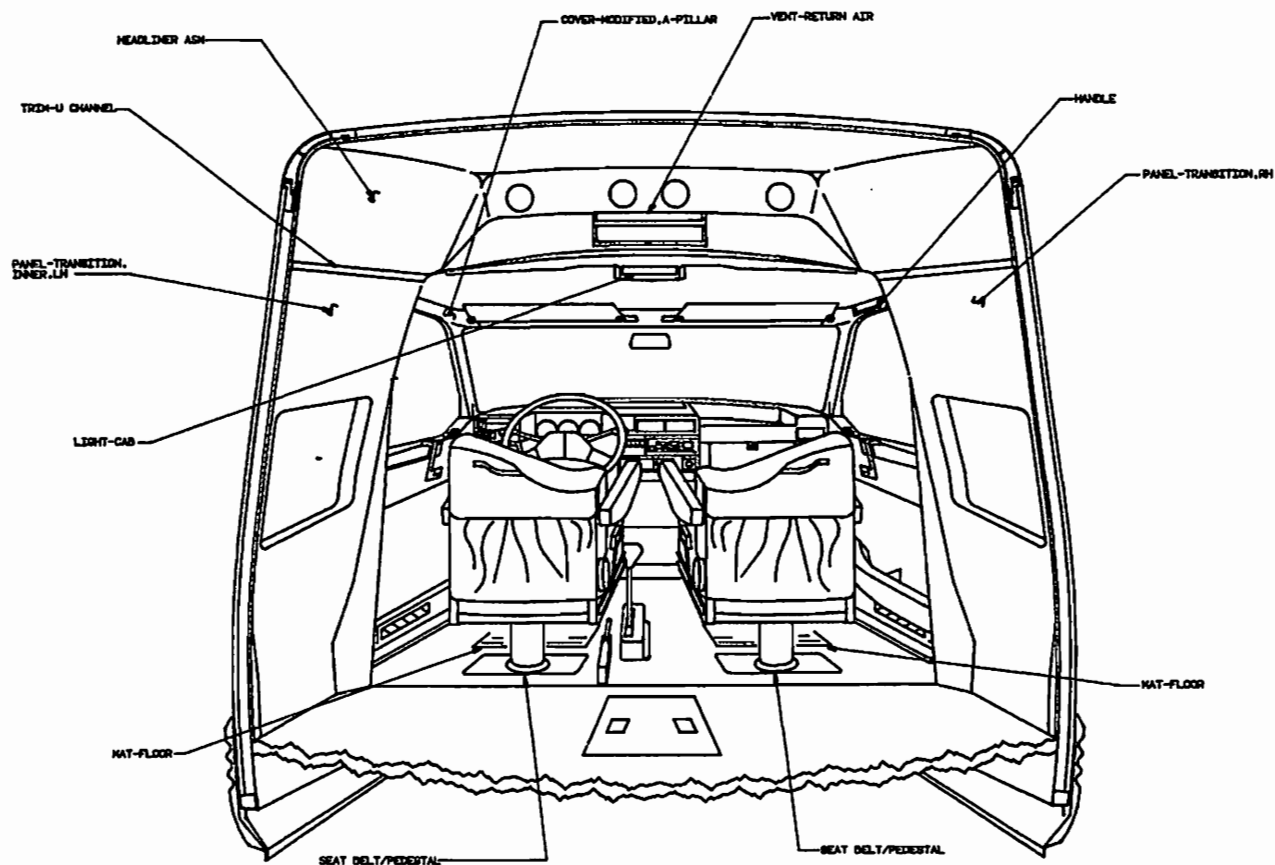
- A map light controlled by an on/off switch.
- A dome light with a three position switch. Off/On/On with opening of driver or passenger door.

Dome Light Assembly Removal

1. Using a putty knife. Push in from either the left or right sides. Between the assembly and the headliner. This will release the retaining clips.
2. Pull dome light assembly down away from headliner.
3. Disconnect 12 volt wiring at connector.
4. Remove the dome light assembly.

Dome Light Assembly Replacement

1. Connect 12 volt DC wiring to assembly.
2. Place assembly in proper position.
3. Gently push assembly against headliner until retainer snaps seat.



A - Pillar Covers

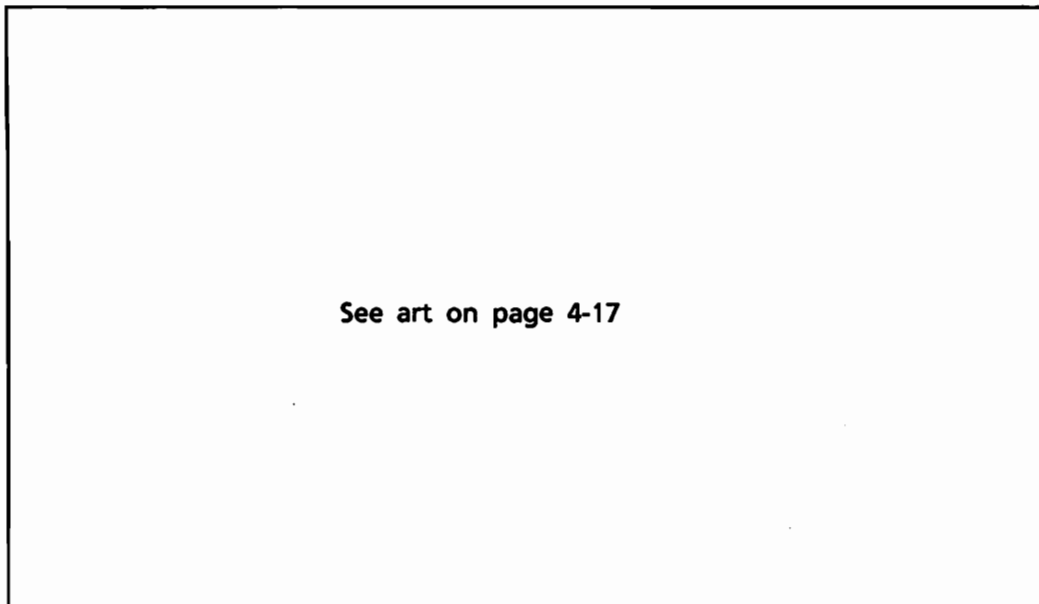
A - Pillar Cover Removal

1. Remove grab assist handle by removing (2) retaining screws. (Passenger side only.)
2. Loosen and remove (1) retaining screw.
3. Remove cover.

A - Pillar Cover Replacement

1. Place cover in position.
2. Gently push cover upward to engage retaining snaps.
3. Secure with (1) retaining screw.

Headliner



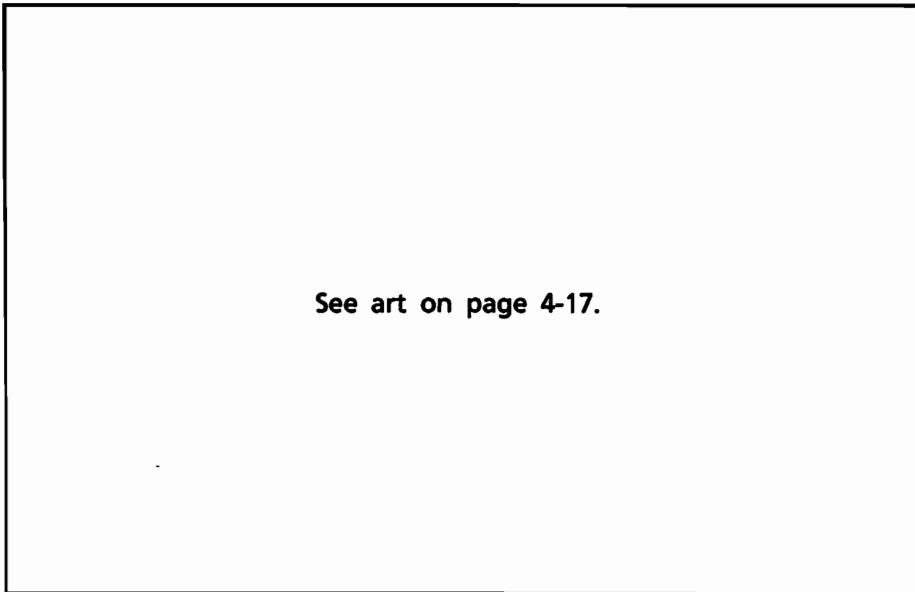
See art on page 4-17

Soft Cloth Headliner Removal (Early 1995 Production)

1. Remove sun visors and their retaining clips. Reference "Sunvisor Removal" in this section.
2. Remove dome light. Reference "Dome Light Removal" in this section.
3. Remove left and right A-pillar covers. Reference "A-pillar Cover Removal" in this section.
4. Remove television enclosure. (If applicable). Reference "Television Enclosure Removal" in this section.
5. Remove left and right transition panel covers. Reference "Transition Panel Cover Removal" in this section.
6. Remove retaining screws at back edge of headliner.
7. Pull headliner down by loosening velcro along back edge.
8. Pull headliner down far enough to access the air conditioner duct hoses. Unscrew (4) duct hoses from louvered vents.
9. Remove headliner.

Soft Cloth Headliner Replacement

1. Position headliner in vehicle.
2. Attach (4) air conditioning duct hoses to louvered vents by screwing them on.
3. Install sunvisors and their retainers. Reference "Sunvisor Replacement" in this section.
4. Firmly press headliner into position to seat the velcro. Install retaining screws.
5. Install left and right transition panel covers. Reference "Transition Panel Cover Replacement" in this section.
6. Install television enclosure (if applicable). Reference "Television Enclosure Replacement".
7. Install left and right A-pillar covers. Reference "A-Pillar Cover Replacement" in this section.
8. Install dome light Reference "Dome Light Replacement" in this section.



Transition Panel Covers

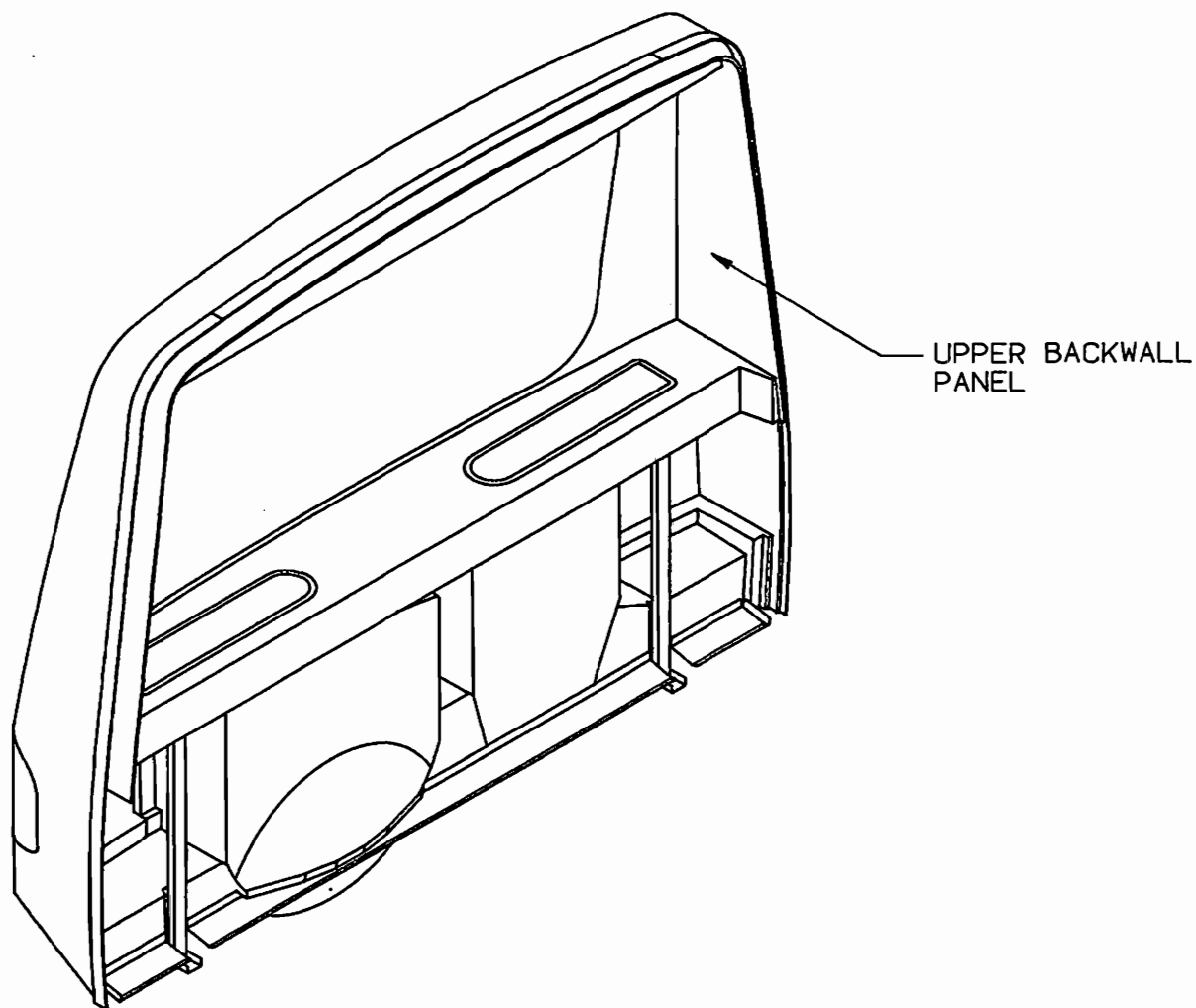
There are two transition panel covers. They are cloth covered panels located in the area between the cab and body of the vehicle.

Transition Panel Cover Removal

1. Remove shoulder strap seat belt. Reference "Shoulder Strap Seat Belt Removal" in this section.
2. Remove (3) transition panel cover retaining screws. (2 along back edge and 1 near lower seat belt attachment.)
3. Transition panel cover is retained by velcro. Pull on cover to loosen velcro. Remove transition panel cover.

Transition Panel Cover Replacement

1. Place cover in proper position. Secure with (3) retaining screws.
2. Firmly press on edges of transition panel cover to seat the velcro.
3. Install shoulder strap seat belts. Reference "Shoulder Strat Seat Belt Replacement" in this section.

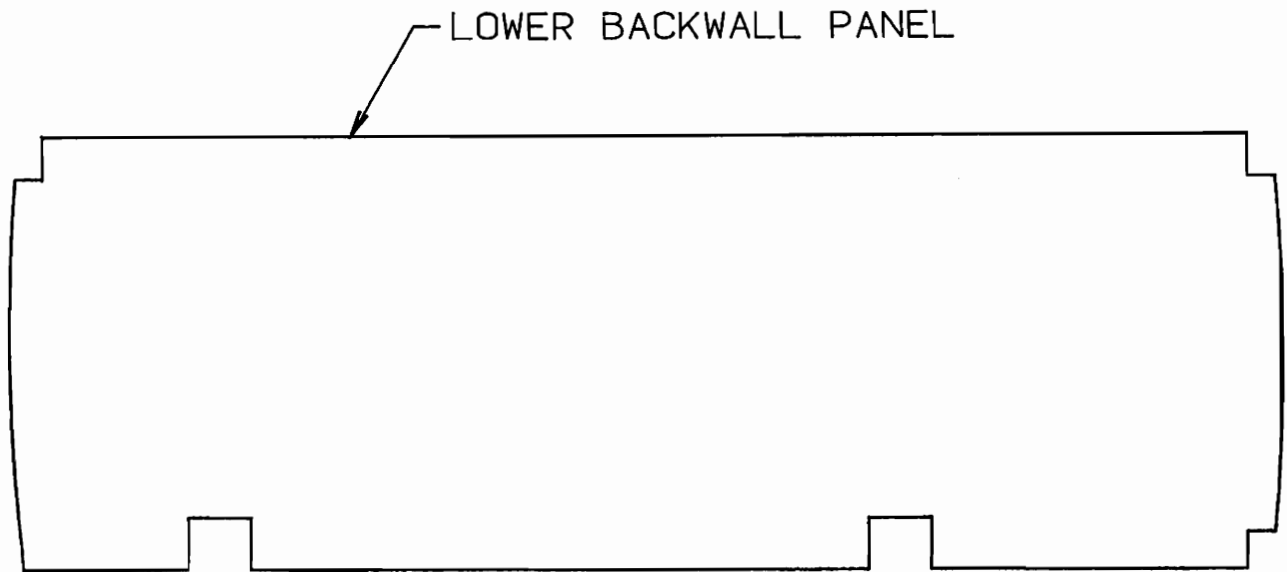


Upper Backwall Panel Removal

1. Remove dinette table Reference "Dinette Table Removal" in this section.
2. Remove bedding shelf. Reference "Bedding Shelf Removal" in this section.
3. Remove dinette table bracket by removing (2) retaining screws.
4. Remove (15) panel retaining screw cups by prying out with a small screw driver. Remove (15) panel retaining screws.
5. Gently pull panel away from backwall. Use a window spatula tool (Winnebago part #800438-01-000) to work the panel free of the escape window molding.

Upper Backwall Panel Replacement

1. Place panel in proper position.
2. Use a window spatula (Winnebago part #800438-01-000) to work the panel around the escape window molding.
3. Install (15) panel retaining screws.
4. Install (15) panel retaining screw caps. By gently pushing them over screw heads.
5. Install dinette table bracket and secure with (2) retaining screws.
6. Install dinette table. Reference "Dinette Table Replacement" in this section.

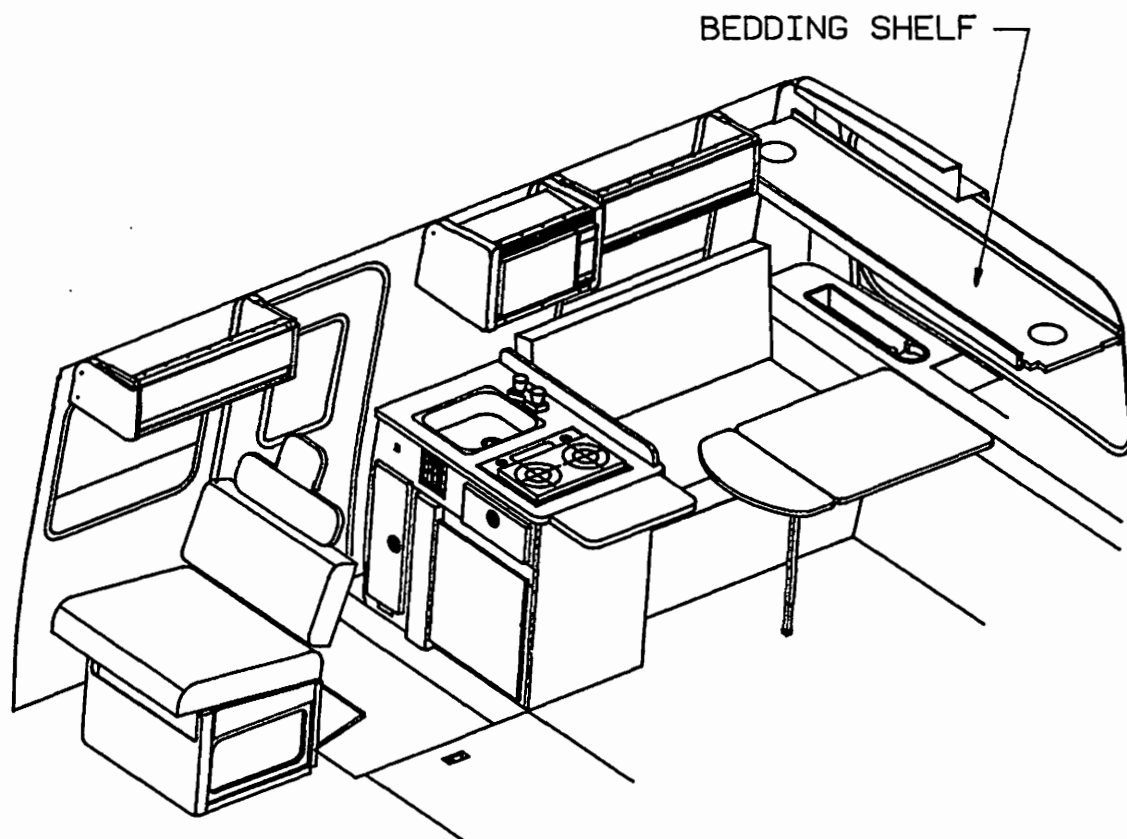


Lower Backwall Panel Removal

1. Remove upper backwall panel. Reference "Upper Backwall Panel Removal" in this section.
2. Remove water line cover at base of backwall by removing (3) retaining screws.
3. Remove (2) panel retaining screws (located at bottom edge of panel), between dinette assemblies.
4. Remove panel.

Lower Backwall Panel Replacement

1. Place panel in proper position.
2. Install (2) panel retaining screws.
3. Install water line cover and secure with (3) retaining screws.
4. Install upper backwall panel. Reference "Upper Backwall Panel Replacement" in this section.



Bedding Shelf

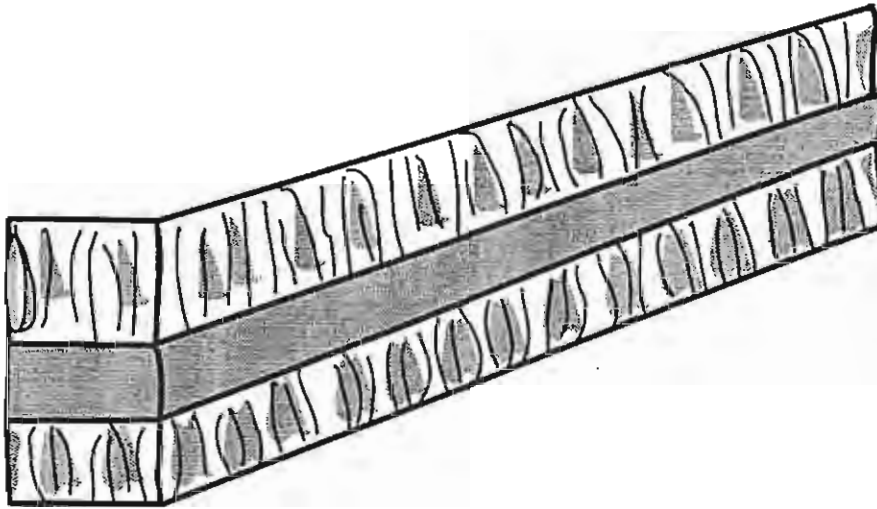
The bedding shelf is located along the backwall of the vehicle directly above the dinette.

Bedding Shelf Removal

1. Gently pry up the top cover of the bedding shelf.
2. Disconnect wires to (2) speakers and (2) lights.
3. Remove (3) retaining screws from each end of the shelf.
4. Remove the bedding shelf.

Bedding Shelf Replacement

1. Place bedding shelf in proper position.
2. Secure with (6) retaining screws.
3. Connect wires to (2) speakers and (2) lights.
4. Install top cover of bedding shelf. Secure with brads.



Window Valances

Window valances are used on the (4) tip out windows and the entrance door. They provide an attractive cover for the pleated blind or roller shade mechanisms.

Tipout Window Valance Removal

1. Come in from the bottom side of the valance. Remove (2) retaining screws.
2. Remove valance.

Tipout Window Valance Replacement

1. Place valance in proper position.
2. Secure with (2) retaining screws.

Entrance Door Valance Removal

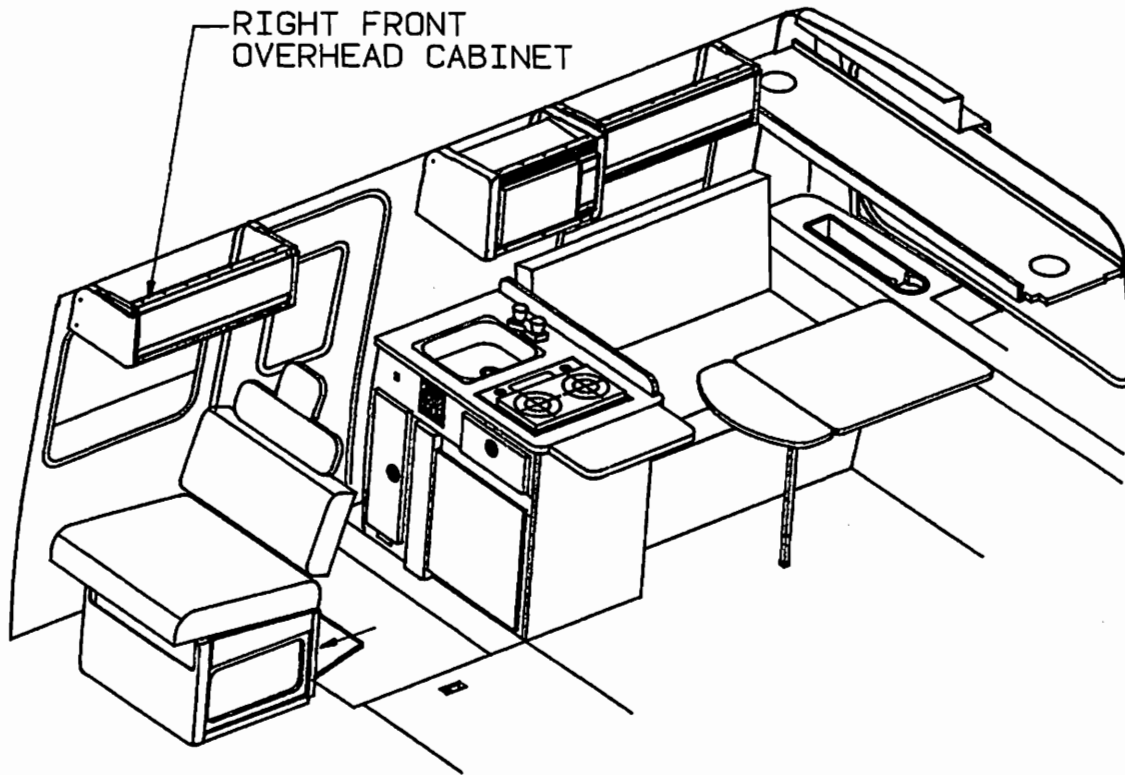
1. Remove roller shade from it's retaining brackets.
2. Come in from the bottom side of the valance. Remove (4) retaining screws.
3. Remove valance.

Entrance Door Valance Replacement

1. Place valance in proper position.
2. Secure with (4) retaining screws.
3. Install roller shade in it's retaining brackets.

Overhead Cabinets

There are four overhead storage cabinets in the vehicle. Left front, right front, left rear and right rear.

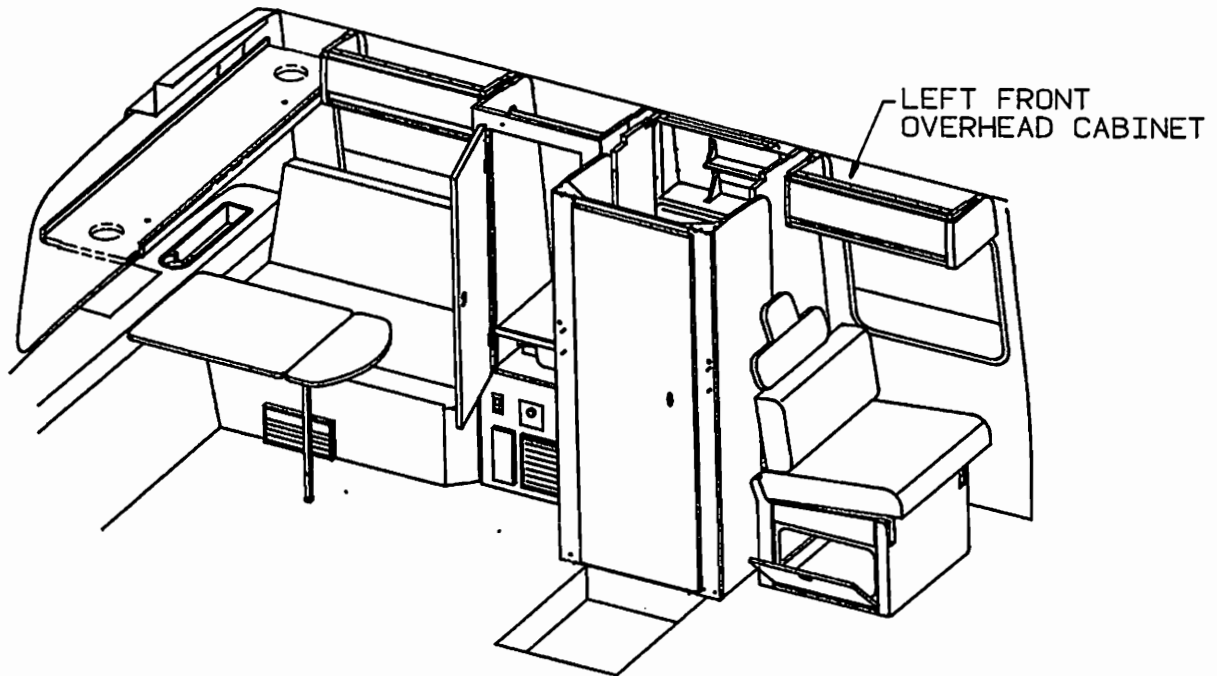


Right Front Overhead Cabinet Removal

1. Open cabinet door. Remove (3) retaining screws holding down the floor of the cabinet. Gently lift the floor of the cabinet to access the (2) outboard retaining screws.
2. Disconnect wiring to 12 volt light.
3. Remove (11) remaining retaining screws.
4. Remove cabinet.

Right Front Overhead Cabinet Replacement

1. Place cabinet in proper position.
2. Secure with (13) retaining screws.
3. Connect wiring to 12 volt light.
4. Install floor of cabinet with double faced tape. (Winnebago part #076322-02-000). Secure with (3) retaining screws.

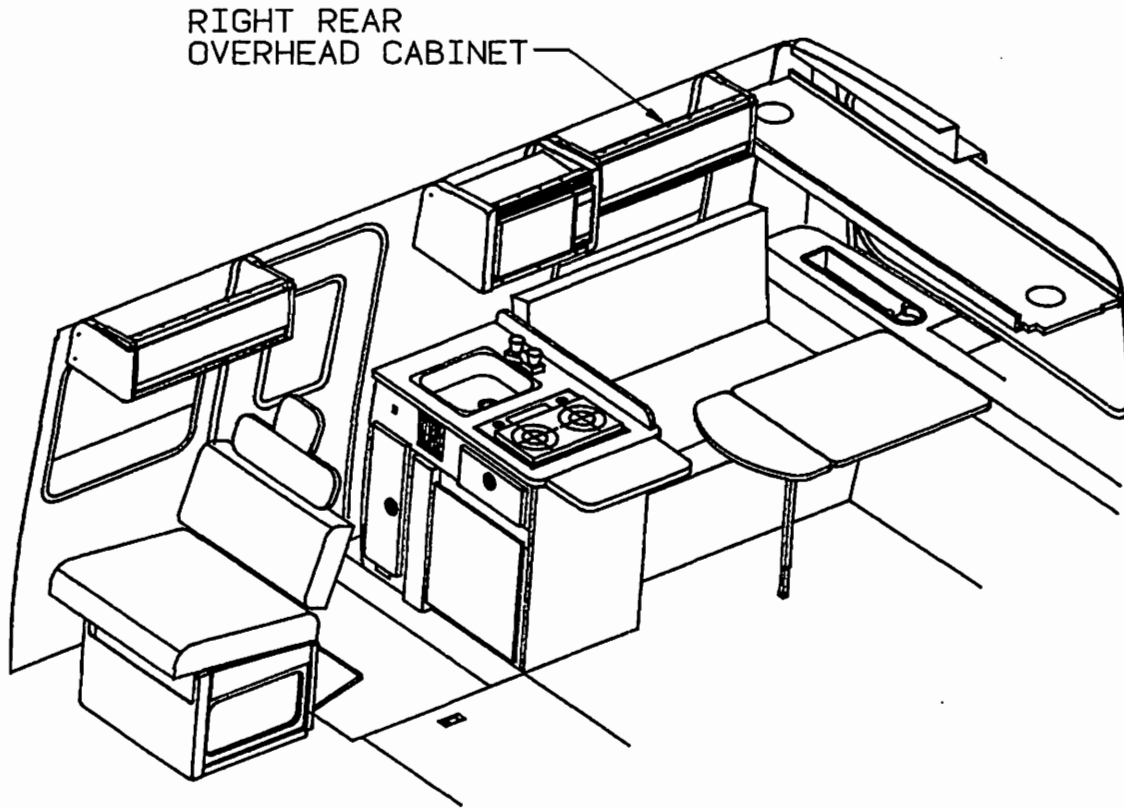


Left Front Overhead Cabinet Removal

1. Open cabinet door. Remove (3) retaining screws holding down the floor of the cabinet. Gently lift the floor of the cabinet to access the (2) outboard retaining screws.
2. Disconnect wiring to 12 volt light.
3. Remove (11) remaining retaining screws.
4. Remove cabinet.

Left Front Overhead Cabinet Replacement

1. Place cabinet in proper position.
2. Secure with (13) retaining screws.
3. Connect wiring to 12 volt light.
4. Install floor of cabinet with double faced tape. (Winnebago part #076322-02-000). Secure with (3) retaining screws.

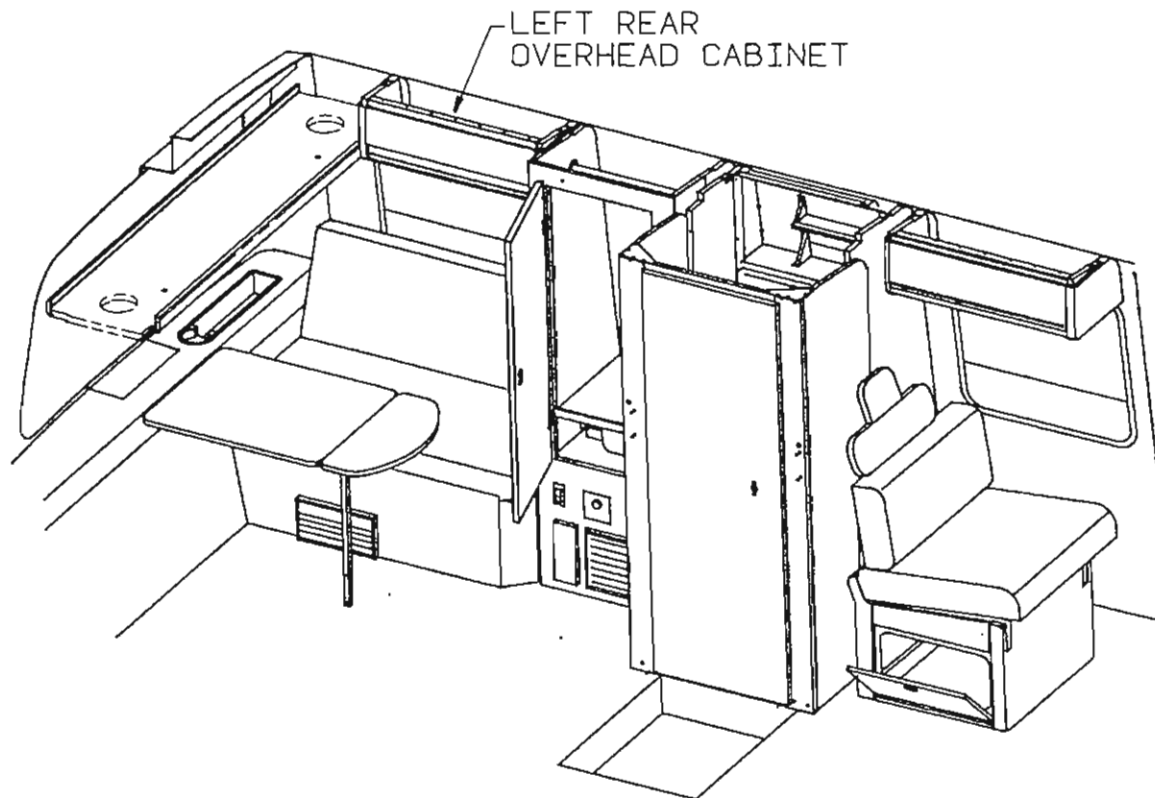


Right Rear Overhead Cabinet Removal

1. Open cabinet door. Remove (3) retaining screws holding down the floor of the cabinet. Gently lift the floor of the cabinet to access the (2) outboard retaining screws.
2. Remove (11) remaining retaining screws.
3. Remove cabinet.

Right Rear Overhead Cabinet Replacement

1. Place cabinet in proper position.
2. Secure with (13) retaining screws.
3. Install floor of cabinet with double faced tape. (Winnebago part #076322-02-000). Secure with (3) retaining screws.



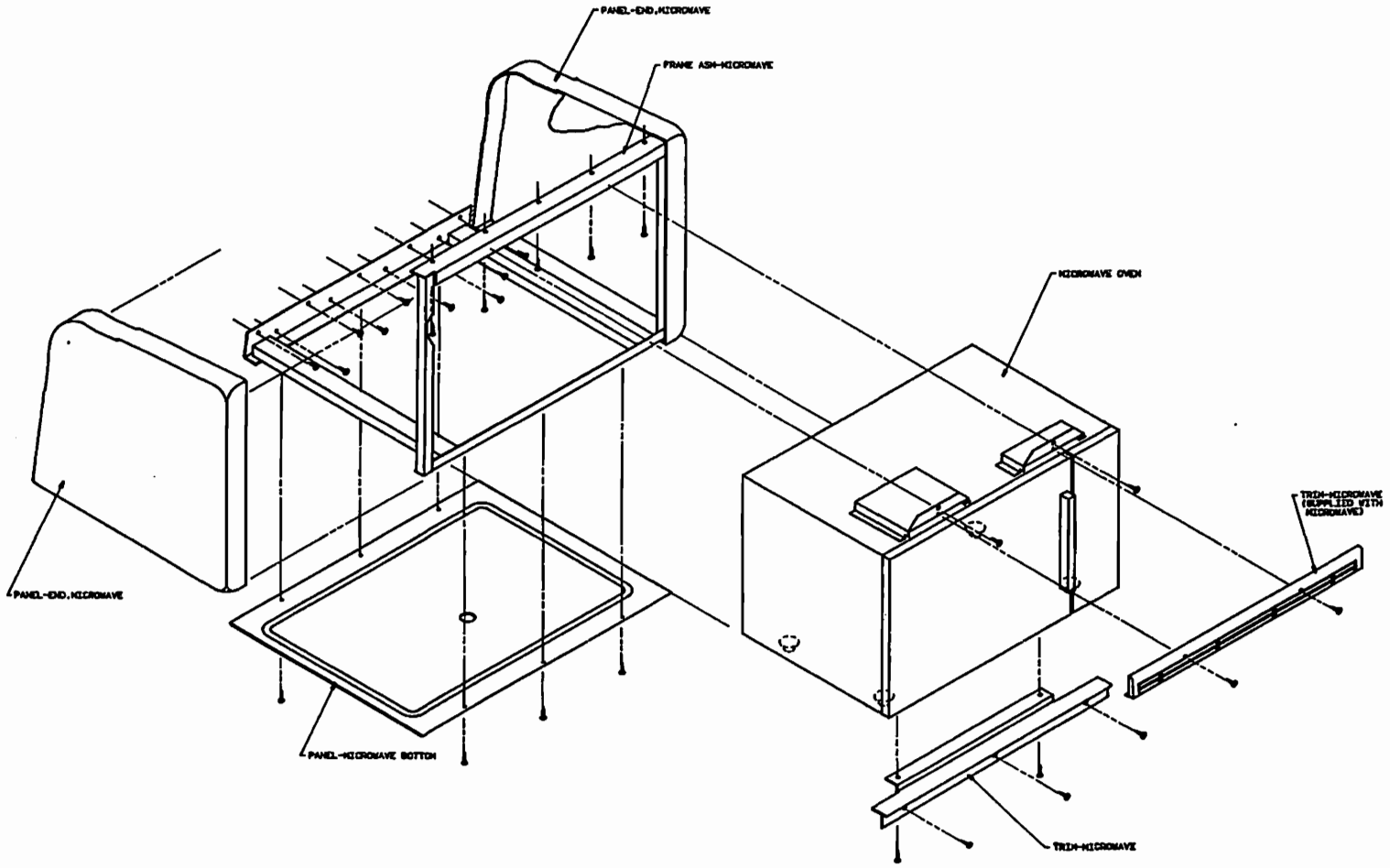
Left Rear Overhead Cabinet Removal

1. Open cabinet door. Remove (3) retaining screws holding down the floor of the cabinet. Gently lift the floor of the cabinet to access the (2) outboard retaining screws.
2. Remove (11) remaining retaining screws.
3. Remove cabinet.

Left Rear Overhead Cabinet Replacement

1. Place cabinet in proper position.
2. Secure with (13) retaining screws.
3. Connect wiring to 12 volt light.
4. Install floor of cabinet with double faced tape. (Winnebago part #076322-02-000). Secure with (3) retaining screws.

Microwave Cabinet



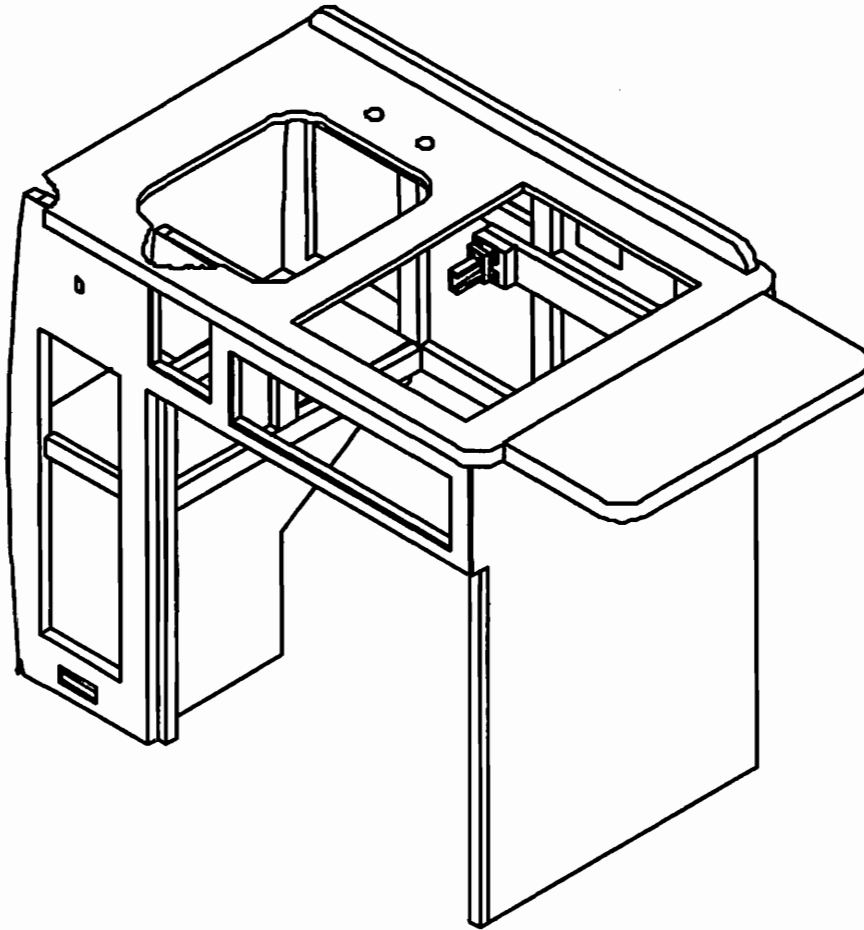
MICROWAVE INSTL

Microwave Cabinet Removal

1. Remove microwave. Reference "Microwave Removal" in Appliance Section.
2. Remove (5) screws retaining cabinet to roof.
3. Remove (9) screws retaining cabinet to sidewall.
4. Remove cabinet.

Microwave Cabinet Replacement

1. Place cabinet in proper position.
2. Secure with (14) retaining screws.
3. Install microwave. Reference "Microwave Replacement" in Appliance Section.



Galley Cabinet

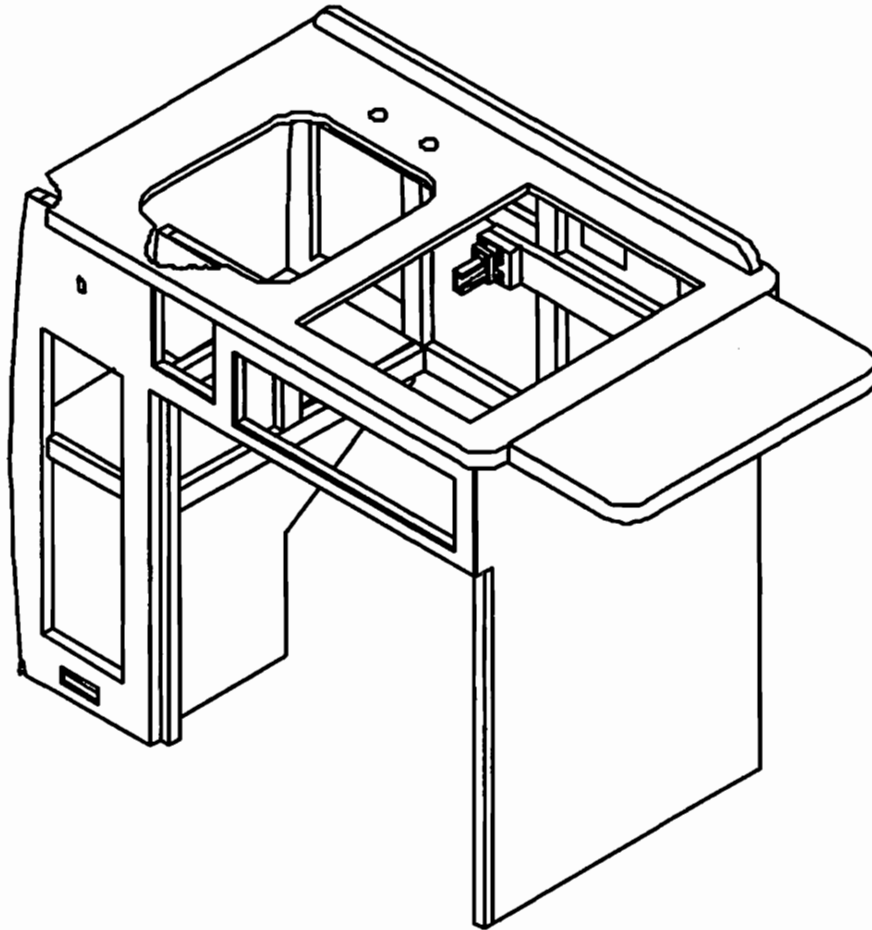
The galley cabinet houses the refrigerator, sink, and range.

Galley Cabinet Removal

1. Remove refrigerator. Reference "Refrigerator Removal" in Appliance Section.
2. Remove range. Reference "Range Removal" in Appliance Section.
3. Remove galley faucet. Reference "Galley Faucet Removal" in Plumbing Section.
4. Remove galley sink. Reference "Galley Sink Removal" in Plumbing Section.
5. Remove 110 volt AC receptacle. Reference "Receptacle Removal" in Electrical Section.
6. Disconnect coax and 12 volt DC wires from television receptacle.
7. Remove (2) inboard retaining screws. (Located in refrigerator opening.)
8. Remove (10) outboard retaining screws securing cabinet to sidewall.
9. Remove cabinet.

Galley Cabinet Replacement

1. Place cabinet in proper position.
2. Secure with (10) outboard and (2) in board retaining screws.
3. Connect coax and 12 volt DC wires to television receptacle.
4. Install 110 volt AC receptacle. Reference "Receptacle Replacement" in Electrical Section.
5. Install galley sink. Reference "Galley Sink Replacement" in Plumbing Section.
6. Install galley faucet. Reference "Galley Faucet Replacement" in Plumbing Section.
7. Install range. Reference "Range Replacement" in Appliance Section.
8. Install refrigerator. Reference "Reference Replacement" in Appliance Section.

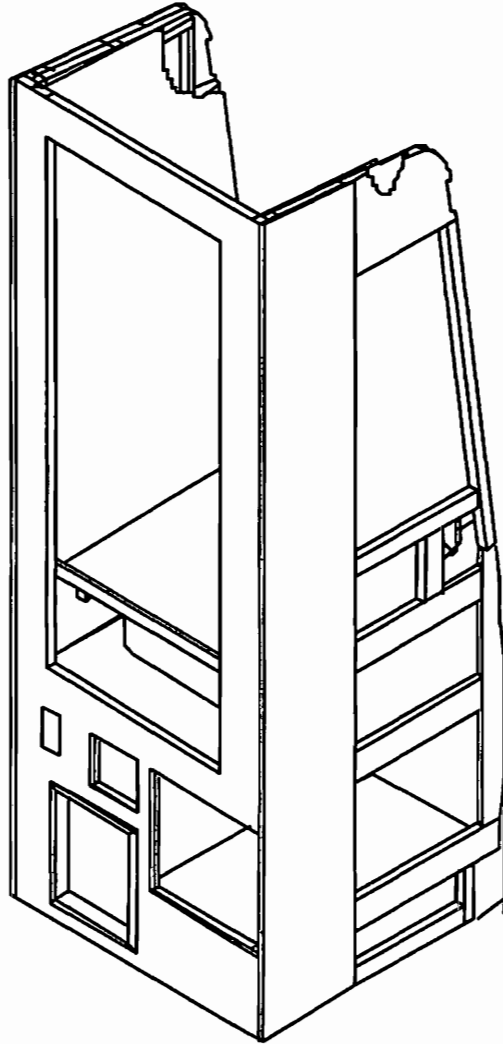


Galley Countertop Removal

1. Remove range. Reference "Range Removal" in Appliance Section.
2. Remove galley faucet. Reference "Galley Faucet Removal" in Plumbing Section.
3. Disconnect drain pipe from galley sink by loosening large retaining nut.
4. Remove countertop retaining screws.
5. Remove counter top.
6. Remove sink from countertop. Reference "Galley Sink Removal" in Plumbing Section.

Galley Countertop Replacement

1. Install galley sink in countertop. Reference "Galley Sink Replacement" in Plumbing Section.
2. Place countertop in proper position.
3. Secure with (10) retaining screws.
4. Connect drain pipe to sink. Secure by tightening large retaining nut.
5. Install galley faucet. Reference "Galley Faucet Replacement" in Plumbing Section.
6. Install range. Reference "Range Replacement" in Appliance Section.



Wardrobe Cabinet Removal

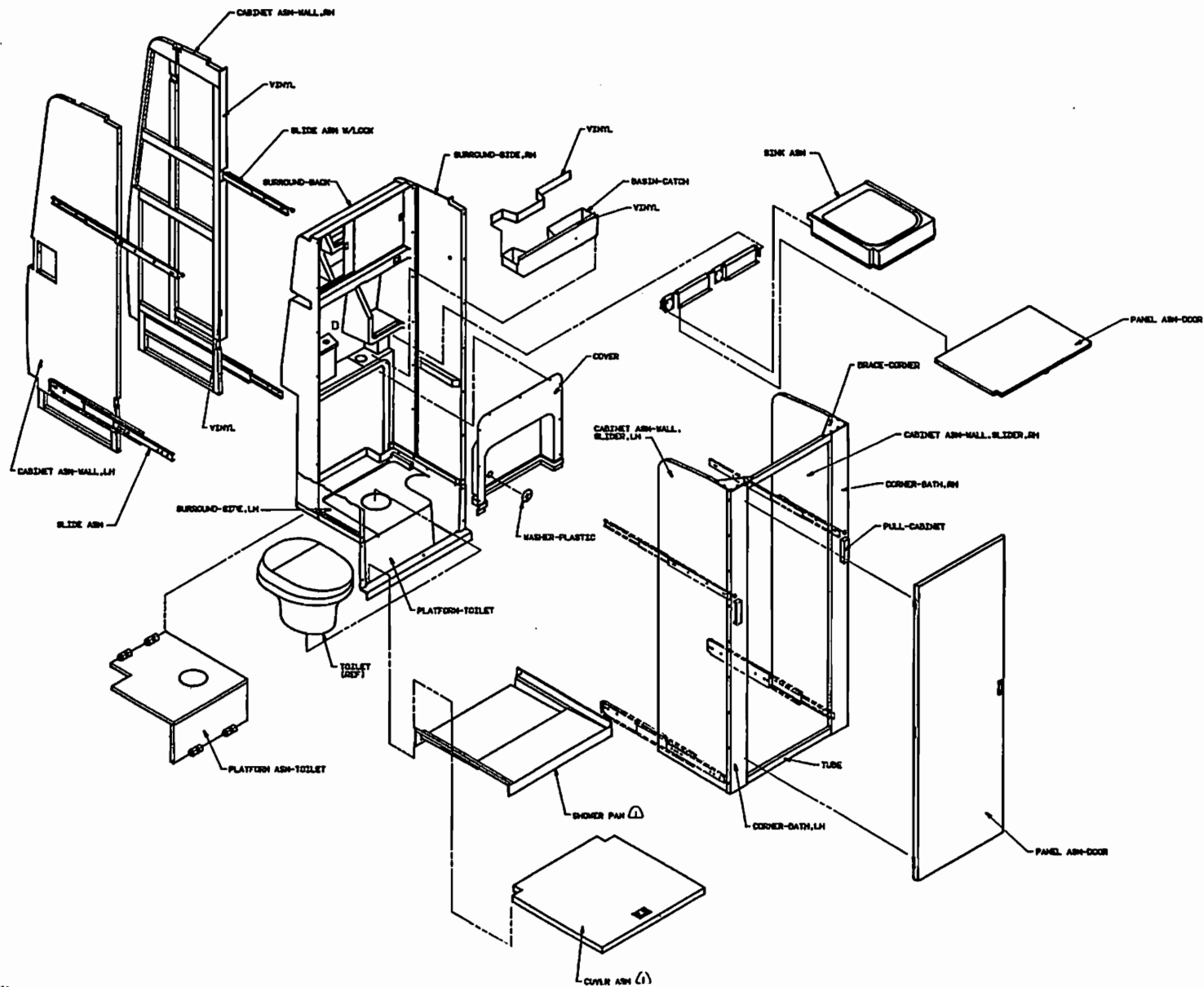
1. Remove the clothes rod by removing the two rod supports (2) retaining screws per support.
2. Remove wardrobe upper shelf by greatly pulling upward to release velcro.
3. Remove (2) upper shelf support brackets by removing retaining screws.
4. Remove the (6) lower wardrobe shelf retaining screws. Remove the shelf.
5. Remove the two piece vent pipe cover panel by gently prying up to loosen brackets.
6. Carefully pry loose and remove the filler panels located on either side of the wardrobe cabinet.
7. Remove (2) shower sump pump retaining screws.
8. Remove furnace. Reference "Furnace Removal" in Appliance Section.
9. Remove water heater control switch from face of wardrobe.

10. Remove motor-aid control cable by
 - loosening set screw in knob
 - removing knob
 - loosen and remove cable retaining nut.
 - pull cable free of cabinet
11. Remove furnace shelf by removing retaining screws.
12. Remove (4) screws retaining motor-aids heater brackets to cabinet.
13. Disconnect 12 volt DC wiring from wardrobe light.
14. Remove retaining screws from perimeter of cabinet.
15. Remove cabinet.

NOTE: Further disassembly of the cabinet may be required if it is necessary to remove the cabinet from the vehicle.

Wardrobe Cabinet Replacement

1. Place cabinet in proper position. Secure with retaining screws along cabinet perimeter.
2. Secure motor aid heater brackets to cabinet with (4) retaining screws.
3. Install furnace shelf. Secure with retaining screws.
4. Install furnace. Reference "Furnace Replacement" in Appliance Section.
5. Install motor aid control cable by
 - Inserting cable in position in cabinet.
 - Secure cable with retaining nut.
 - Install cable knob.
 - Secure knob with set screw.
6. Install water heater control switch.
7. Install (2) shower sump pump retaining screws.
8. Install filler panels on either side of cabinet and secure with brads.
9. Install two piece vent pipe cover panel and secure with screws.
10. Install lower wardrobe shelf and secure with (6) retaining screws.
11. Install the (2) upper shelf support brackets. Secure with retaining screws.
12. Install upper wardrobe shelf. Secure by firmly pushing down to engage velcro.
13. Install the clothes rod and it's (2) supports. Secure with (2) retaining screws per support.
14. Connect 12 volt DC wiring to wardrobe light.



⚠ USE WITH SPECIMEN.
NOTED.

CABINET INSTL-BATH

Shower Pan Removal

1. Remove shower pan cover.
2. Partially extend the slider cabinet assembly.
3. Pull up on the shower pan to clear the toilet platform.
4. Slide the shower pan forward and up to remove.

Shower Pan Replacement

1. Partially extend the slider cabinet assembly.
2. Place the shower pan in proper position by sliding it in place under the slider cabinet assembly.
3. Seat the retaining lip of the shower pan unto the toilet platform.
4. Retract slider cabinet assembly.
5. Install shower pan cover.

See art on page 4-41.

Slider Cabinet Removal

1. Extend the slider cabinet assembly.
2. Remove (2) slide control knobs by removing set screws.
3. Remove screws retaining (4) slides to cabinet (6) screws per side.

NOTE: There are access holes in the slides for screw removal. Move the cabinet forward or backwards to align screws with access holes.

4. Remove slider cabinet.

Slider Cabinet Installation

1. Place slider cabinet in proper position.
2. Extend slides and position them against slider cabinet.
3. Install (6) retaining screws per slide.
4. Install (2) slide control knobs. Secure with set screws.
5. Retract cabinet assembly.

See art on page 4-41.

Shower Stall Rear Cover Removal

1. Make certain water pump is "off".
2. Remove toilet. Reference "Toilet Removal" in Plumbing Section.
3. Remove plastic washer from cover by removing (2) retaining screws.
4. Use a small screw driver to remove (9) retaining screw covers.
5. Remove (9) retaining screws.
6. Use a putty knife to carefully cut sealant around perimeter of cover.
7. Remove cover.
8. Clean all old sealant from shower stall and cover.

See art on page 4-41.

Shower Stall Rear Cover Replacement

1. Feed water line for toilet through opening in cover.
2. Install cover. Secure with (9) retaining screws.
3. Install (9) retaining screw covers by gently pushing them into screw heads.
4. Install plastic washer on cover. Secure with (2) retaining screws.
5. Seal perimeter of cover with sealant. (Winnebago part #034552-06-000).
6. Install toilet. Reference "Toilet Replacement" in Plumbing Section.

See art on page 4-41.

Toilet Platform Cover Removal

1. Remove shower pan. Reference "Shower Pan Removal" in this section.
2. Remove toilet. Reference "Toilet Removal" in Plumbing Section.
3. Remove shower stall rear cover. Reference "Shower Stall Rear Cover Removal" in this section.
4. Use a small screwdriver to remove (10) retaining screw covers.
5. Remove (10) retaining screws.
6. Remove galvanized access panel located underneath the toilet platform cover. Access from underneath coach.
7. Disconnect drain line from strainer assembly at toilet platform cover.

NOTE: If you are going to install a new toilet platform cover, it will be necessary to remove the strainer assembly and install it on the new cover.

8. Use a putty knife to carefully cut sealant around perimeter of cover.
9. Remove cover.
10. Clean old sealant from shower stall and cover.

Toilet Platform Cover Replacement

1. Place toilet platform cover in proper position.
2. Install and tighten drain line to strainer assembly.
3. Replace galvanized access cover and secure with retaining screws.
4. Secure toilet platform cover with (10) retaining screws.
5. Install (10) retaining screw covers by gently pushing them into screwheads.
6. Seal perimeter of toilet platform cover with sealant. (Winnebago part #034552-06-000).
7. Install shower stall rear cover. Reference "Shower Stall Rear Cover Replacement" in this section.
8. Install toilet. Reference "Toilet Replacement" in Plumbing Section.
9. Install shower pan. Reference "Shower Pan Replacement" in this section.

See art on page 4-41.

Toilet Platform Removal

1. Remove shower pan. Reference "Shower Pan Removal" in this section.
2. Remove toilet. Reference "Toilet Removal" in Plumbing Section.
3. Remove shower stall rear cover. Reference "Shower Stall Rear Cover Removal" in this section.
4. Remove toilet platform cover. Reference "Toilet Platform Cover Removal" in this section.
5. Remove (8) platform retaining screws. Remove platform.

Toilet Platform Replacement

1. Place platform in proper position. Secure with (8) retaining screws.
2. Install toilet platform cover. Reference "Toilet Platform Cover Replacement" in this section.
3. Install shower stall rear cover. Reference "Shower Stall Rear Cover Replacement" in this section.
4. Install toilet. Reference "Toilet Replacement" in Plumbing Section.
5. Install shower pan. Reference "Shower Pan Replacement" in this section.



See art on page 4-41.

Shower Side Surround Panel Removal (Right or Left)

1. Use a small screwdriver to remove (7) retaining screw covers.
2. Remove (7) retaining screws.
3. The side surround panels are overlapped by the back surround panel. Therefore it will be necessary to remove the (6) retaining screw covers and (6) retaining screws on the appropriate side of the surround back panel to remove a side surround panel.
4. Use a putty knife to carefully cut sealant around perimeter of side surround panel.
5. Remove side surround panel.

Shower Side Surround Panel Replacement (Right or Left)

1. Place side surround panel in proper position.

NOTE: The back surround panel overlaps the side surround panel.
2. Install side surround panel and secure with (6) retaining screws in back surround panel and (7) retaining screws in side surround panel.
3. Seal perimeter of side surround panel with sealant. (Winnebago part #034552-06-000).

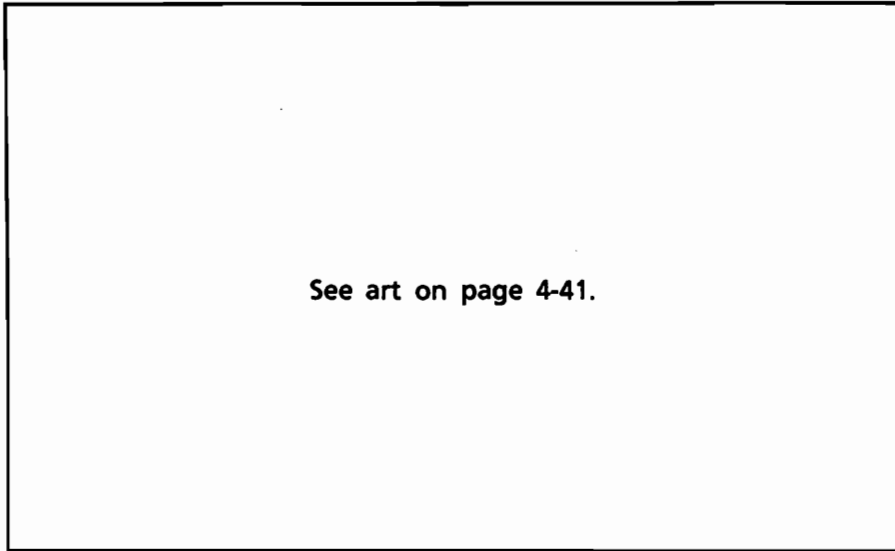
See art on page 4-41.

Shower Back Surround Panel Removal

1. Remove shower slider cabinet. Reference "Slider Cabinet Removal" in this section.
2. Remove toilet. Reference "Toilet Removal" in Plumbing Section.
3. Remove shower stall rear cover. Reference "Shower Stall Rear Cover Removal" in this section.
4. Disconnect water lines to faucet.
5. Disconnect drain pipe from catch basin.
6. Remove shower sump pump switch.
7. Remove (12) retaining screw covers.
8. Remove (12) retaining screws.
9. Use a putty knife to carefully cut sealant around perimeter of shower back surround panel.
10. Remove panel.
11. Clean all old sealant from panel and side surrounds.

Shower Back Surround Panel Replacement

1. Place panel in proper position.
2. Connect sump switch to 12 volt DC wiring and install switch.
3. Connect drain pipe to catch basin.
4. Connect water lines to faucet.
5. Secure panel with (6) retaining screws.
6. Install (6) retaining screw covers by gently pushing them unto screwheads.
7. Install shower stall rear cover. Reference "Shower Stall Rear Cover Replacement" in this section.
8. Seal perimeter of panel with sealant. (Winnebago part #034552-08-000).
9. Install toilet. Reference "Toilet Replacement" in Plumbing Section.
10. Install shower slider cabinet. Reference "Slider Cabinet Replacement" in this section.



Bath Cabinet Wall Removal (Left or Right)

1. Remove shower slider cabinet. Reference "Slider Cabinet Removal" in this section.
2. Remove shower pan. Reference "Shower Pan Removal" in this section.
3. Remove toilet. Reference "Toilet Removal" in Plumbing Section.
4. Remove shower stall rear cover. Reference "Shower Stall Rear Cover Removal" in this section.
5. Remove toilet platform cover. Reference "Toilet Platform Cover Removal" in this section.
6. Remove shower back surround panel. Reference "Shower Back Surround Panel Removal" in this section.
7. Remove shower side surround panels. Reference "Shower Side Surround Panel Removal" in this section.
8. Remove cabinet wall assembly retaining screw. Remove wall.

Bath Cabinet Wall Replacement (Left or Right)

1. Place cabinet wall assembly in proper position. Secure with retaining screws.
2. Install shower side surround panels. Reference "Shower Side Surround Panel Replacement" in this section.
3. Install shower back surround panel. Reference "Shower Back Surround Panel Replacement" in this section.
4. Install toilet platform cover. Reference "Toilet Platform Cover Replacement" in this section.
5. Install shower stall rear cover. Reference "Shower Stall Rear Cover Replacement" in this section.
6. Install toilet. Reference "Toilet Replacement" in Plumbing Section.
7. Install shower pan. Reference "Shower Pan Replacement" in this section.
8. Install shower slider cabinet. Reference "Slider Cabinet Replacement" in this section.



SECTION 5

LP GAS FUEL SYSTEM

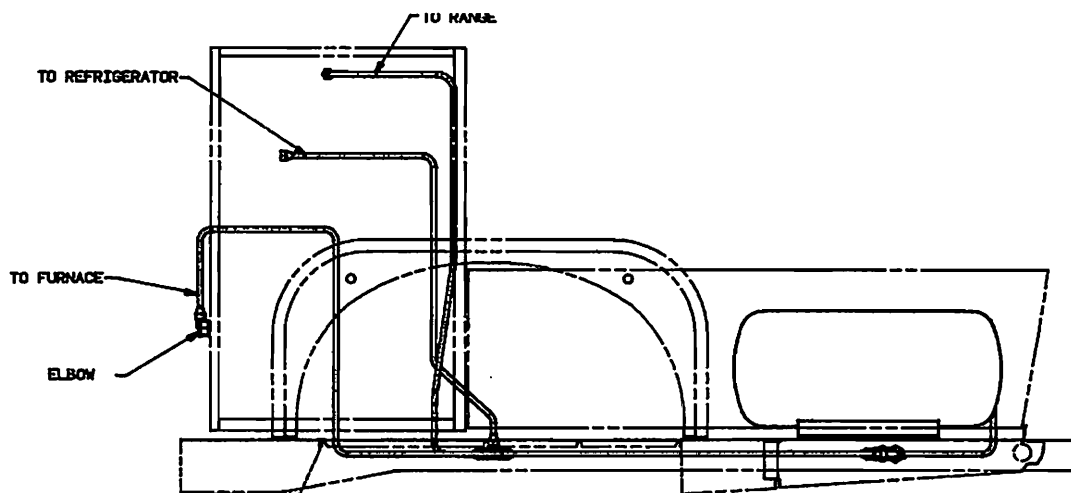
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SECTION 5

LP GAS FUEL SYSTEM



⚠ REGULATOR TO BE POSITIONED WITH VENT POINTING DOWNWARD WITHIN 45° .
NOTES:

LP SYSTEM INSTL

LP SYSTEM

General:

The on-board LP system furnishes fuel for all gas-fired appliances. The system is designed to perform adequately under most conditions encountered in recreational vehicle applications. Extreme care must be taken during the repair and replacement of system components to assure the safety of the motor home owner and service personnel.

Both air and water are contaminants of the LP system. They seriously interfere with system and appliance operation. Proper purging procedure and moisture neutralization before first use of the system will eliminate the major causes of many owner complaints.

Neutralizing Moisture In LP Tank:

Any moisture on the tank walls, or present as water vapor in the LP tank, must be neutralized before filling with LP. Have an LP dealer neutralize any water by injecting one half (1/2) pint of methanol (methyl alcohol) into the tank before purging.

Purging LP Tank:

Have an LP dealer purge air from LP tank with LP vapor prior to the first filling or after a burn down procedure has been performed and the tank has been vented to atmosphere. If the tank is not purged with LP vapor, air present in the tank will dilute any LP vapor produced when the tank is filled for the first time. If air is not purged from the tank, appliances will require constant adjustment and pilot lights will not stay lighted.

Do not allow an LP dealer to attempt to purge the tank by filling with liquid propane. This causes the liquid to flash into a vapor chilling the tank and causing any water vapor in the tank to condense on the inside walls, contaminating the fuel. Also, this method can allow 50 to 75 percent of the air originally in the tank to remain, thereby diluting the LP vapor.

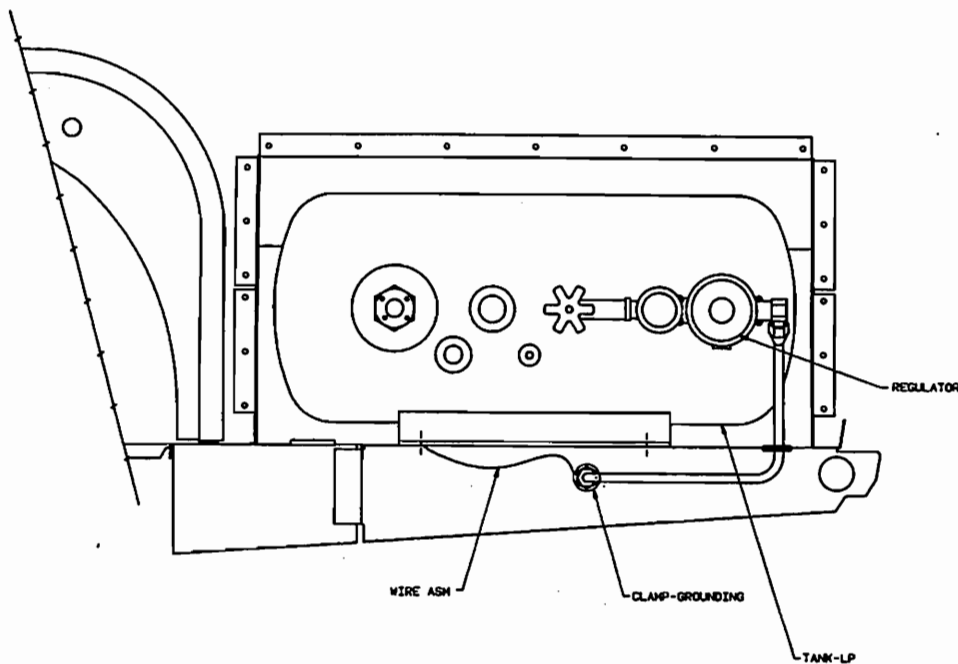
	% Air Remaining	% Propane Remaining
1st Purging	50	50
2nd Purging	25	75
3rd Purging	12.5	87.5
4th Purging	6.25	93.75
5th Purging	3.13	96.87
6th Purging	1.56	98.44

Repeat Purging Procedure:

Even though the residual air content in the tank is reduced by one purging, it is necessary to repeat the purging process four (4) times to reduce the amount of air in the tank to the required level. Experience indicates that a reduction of the residual air content to 6.25% is adequate. This slight volume of air will, to some extent, dissolve in the propane.

Filling LP Tank:

Do not overfill the LP tank. The tank should be filled only until liquid appears at the 20% liquid level gauge. At this point, the tank is filled to 80% of its liquid capacity. If the tank is overfilled, LP in liquid form can flow through the regulator, causing improper regulator operation.



LP STORAGE TANK

General:

The LP storage tank is mounted on two (2) steel brackets attached to the vehicle chassis.

LP TANK REPLACEMENT

Removal:

1. Turn off gas supply at service valve.
2. Disconnect P.O.L. adapter (between regulator and service valve) from service valve by unscrewing large end of P.O.L. adapter from service valve.
3. The P.O.L. adapter has left-hand threads. Turn right to loosen, left to tighten.
4. Place jack in position to support LP tank. Remove four (4) hex bolts, nuts, and lock washers that secure LP tank to mounting brackets and remove tank.

Installation:

1. Using a jack to support the replacement LP tank, position the tank to align holes in the tank with mounting brackets holes.
2. Install four (4) bolts (Grade 5), lock washers and nuts.
3. Torque the nuts to 26-36 ft. lbs. (35-48 N-m) tension if lock washers are used. If serrated flange lock nuts (no lock washers required) are used, torque the nuts to 40-50 ft. lbs. (54-67 N-m) tension.
4. Reconnect P.O.L. adapter to service valve. This is a brass-to-brass seal and no pipe dope is required. Perform a soapy solution leak test on all connections between LP tank and leak detector.

LP TANK SAFETY

General:

1. Never allow LP tank to be filled beyond the legal liquid level indicated by the 80% liquid level gauge.*
2. Do not use wrench or pliers to close service valve or 20% liquid level gauge. These valves are designed to be closed leak-tight by hand. If the valve cannot be made leak-tight by hand, valve requires service.
3. When connecting upper and lower body of service valve (see "Service Valves"), draw connection snug with proper size wrench. Do not jam the nut. This is a machined male brass fitting which seats securely against a female seat in the valve. No gasket material or pipe dope is required.

* Whenever LP tank is filled, it should be on a relatively level surface to ensure that the tank is not overfilled.

4. If a leak is detected, perform soapy solution leak test to pinpoint leak.
5. Inspect LP tank mounting brackets at chassis mounting points. Mounting hardware must be tight and brackets undamaged.
6. Maintain LP tank exterior by removing rust and scale and repaint periodically.

"BURN-DOWN" PROCEDURE

(Suggested Safe Practices to Reduce LP Gas Vapor Pressure in Permanently Mounted LP Gas Tanks on Recreational Vehicles.)

WARNING:

Do not attempt to remove any of the LP tank fittings until tank pressure has been reduced to a safe level.

1. Move vehicle a minimum of 200 feet from any structure.
2. Turn off engine and ignition. Shut down pilot lights for all appliances. Turn LP gas off at service valve on LP tank.

WARNING:

Be certain all personnel are out of the vehicle. Absolutely no smoking, sparks, or open flame should be allowed in the area. Turn off all electrical equipment or disconnect batteries.

3. Disconnect regulator from service valve by disconnecting small end of P.O.L. adapter from service valve (see "P.O.L. Adapter"). Connect an LP torch to the service valve.

WARNING

Torch must be at least 10 feet from the vehicle and should be positioned vertical.

NOTE: Torch should be rated at a minimum of 500,000 BTU's and a larger torch may be desirable as torch size will be directly proportional to the length of time required to "Burn Down" the tank.

4. With valve on torch closed, open the tank service valve and check torch connections for leaks. Repair any leaks as necessary.
5. Place ignition source in front of torch head.

CAUTION:

Keep body parts away from torch to prevent bodily injury.

6. Open valve on torch and ignite.
7. Allow torch to burn until flame diminishes to a point that is barely burning. Then extinguish torch.
NOTE: Flame will diminish extensively as tank burns down.
8. To determine if the tank has been burned down, carefully open the valve on the 20% outage valve. If a white fog appears, pressure is not significantly reduced. Close outage valve and let torch continue to burn. If no white fog is evident, proceed to step 9.
9. Extinguish torch. Leave the outage valve open. When no pressure is evident, proceed to Step 10.

WARNING:

After torch is extinguished, the valve on the tank must remain open to prevent pressure build up in tank.

10. Disconnect torch from tank. Open service valve on tank and leave open until service to the tank is completed. This will prevent a build up of pressure in the tank.
11. Removal or repair of tank fittings (service valve, filler valve, 20% gauge) may proceed.

20% LIQUID LEVEL OUTAGE GAUGE

The purpose of the 20% liquid level outage gauge is to give a positive indication when the LP tank is filled to the 80% level with liquid propane. (20% vapor space remaining.) The gauge is to be opened and left open while the tank is being filled with LP. As the tank fills, LP vapor emits from the gauge outlet. When the liquid level in the tank reaches the level of the gauge, liquid (white fog) will appear at the gauge outlet. At this time, the tank is filled to the legal limit. Stop filling immediately and disconnect fill hose from filler valve. Close outage gauge.

CAUTION:

Vehicle should be parked on a level surface when LP tank is being filled. If tank is not level, overfilling can result.

Gauge Removal:

Perform "burn-down" procedure:

1. Open outage gauge until knob and stem remove from lower valve body.
2. Use proper size wrench to remove lower valve body from LP tank.
3. Reverse this procedure to reinstall gauge in LP tank. Use approved pipe joint compound on male threads of connections into LP tank.

LP TANK SERVICE (VAPOR RELIEF) VALVE

The service valve on the LP tank is equipped with a vapor relief safety device. Should excess pressure build up in the LP tank, the safety valve will vent the pressure off. This valve is set to operate at 310-325 psi and reseal when pressure has been reduced to 290 psi.

WARNING:

Never attempt to adjust or repair the safety release device on service valve.

LP LEVEL INDICATING GAUGE

The LP level indicating gauge on the LP tank consists of the sender unit and the float assembly.

Sender Unit:

The sender unit is mounted in the center of the float assembly bezel. The sender unit contains a meter that monitors the LP liquid level in the tank.

LP GAUGE REPLACEMENT

The sender unit can be removed without disturbing the float assembly. The meter movement of the sender unit is controlled by the action of two (2) magnets, one in the sender unit and one on the float assembly. As the liquid level in the tank varies, the position of the float magnet changes and moves the magnet in the sender resulting in correct LP gauge reading.

Sender Removal:

1. Disconnect transmission wires at sender unit terminal (electronic unit only).
2. Remove two (2) screws that mount sender unit on float assembly bezel.
3. Remove sender from float assembly. It is not necessary to reduce LP tank pressure to remove sender unit. Once removed, sender meter operation can be tested by holding a magnet to the back of the meter and moving the magnet. Meter needle should follow movement of magnet.

Sender Installation:

1. Place sender unit in position in float assembly. Do not install sender upside down. Sender terminal should be on bottom.
2. Install two (2) sender mounting screws.

3. Connect transmission wires to sender terminals.

Float Removal:

1. Perform "burn-down" procedure.
2. Disconnect transmission wires from sender terminal.
3. Remove four (4) float mounting screws from float bezel.
4. Grasp float bezel with pliers and pull float assembly out of LP tank. Sender unit will remove with float assembly. Stand away from tank in case liquid LP flows out. LP will run out and evaporate until the liquid level in the tank reaches the bottom of the float opening.

WARNING:

Wear gloves to protect hands. Do not allow LP to contact exposed skin. Immediate freeze burn can result. There must be absolutely no smoking, sparks, or open flame in the area. LP vapor is highly explosive.

Float Installation:

1. Position float assembly in opening. Be certain assembly is correctly positioned. If float assembly is installed 90 or 180 degrees out of position, incorrect readings will result. No joint compound is required. The gasket under the float bezel will compress to provide seal. (Inspect gasket condition before installing.)
2. Reinstall four (4) mounting screws.
3. Connect transmission wires to sender terminals.
4. Perform soapy solution leak test on seal between LP tank and float bezel. See "Soapy Solution Leak Test" in this section.

P.O.L. ADAPTER

The P.O.L. (presto-lite) adapter, sometimes called a spud and nut, is required to convey LP gas to the regulator. The P.O.L. is inserted into the regulator inlet and service valve outlet. The P.O.L. is equipped with an excess flow device. The excess flow P.O.L. is intended to restrict the flow of escaping gas in the event the regulator is broken off at the P.O.L. It is not designed to detect a leak or totally shut off the system in the event of a leak or failure of the regulator.

Removal:

1. Turn gas supply off at service valve.
2. Using proper size wrench, disconnect P.O.L. adapter from service valve by unscrewing large end of P.O.L. from service valve.
3. Then, disconnect small end of P.O.L. from inlet side of regulator.

IMPORTANT: P.O.L. adapter has a left-hand (counterclockwise) thread. Turn to left to tighten, right to loosen.

Installation:

1. Connect small end of P.O.L. equipped hose to inlet side of regulator.
2. Connect large end of P.O.L. to outlet of service valve. This is a brass-to-brass seal. No pipe dope is required. Perform soapy solution test on connections.

LP HOSES

Hose Inspection:

The major enemies of LP hoses are sunlight (ultraviolet rays) and ozone. Hoses should be checked frequently. Inspect hoses for signs of deterioration and weather checking before each season and each time the LP tank is filled. Protect hoses from direct sunlight when possible. Replace with properly rated U.L. or C.G.A. listed replacement hose assemblies.

LP GAS REGULATOR

General:

The regulator is the heart of the LP gas system. It is an automatic device with working parts that move continuously. It should be protected from the elements which could cause it to malfunction.

Regulator Function:

The function of the regulator is to reduce a high and varied inlet pressure from the LP tank to a safe and consistent low outlet pressure to the gas appliances. Normal tank pressure can vary depending on the outside temperature from a high of 250 psi to a low of 7 psi. The regulator's job is to reduce it to 6.35 ounces, or 11" water column (W.C.) outlet pressure and supply fuel downstream at this pressure in the required volume to efficiently operate each appliance as demand is made.

The LP system is equipped with a two-stage regulator. It is actually two regulators contained in one housing. The first stage or high pressure regulator, reduces the pressure to about 10-13 psi and sends it on to the second stage low pressure regulator which reduces pressure to 11" W.C. or 6.35 ounces per square inch. Use of the two-stage regulator reduces the likelihood of problems such as pilot outages, freeze up, etc.

Regulator Removal:

1. Turn service valve on LP tank to "Off."
2. Disconnect regulator output hose at regulator.
3. Disconnect P.O.L. adapter from LP tank service valve.
4. Remove P.O.L. adapter from regulator.

Regulator Replacement:

1. Install P.O.L. adapter into regulator.
2. Install regulator to LP tank service valve with the P.O.L. adapter. (NOTE: Regulator must be installed with vent pointing downward.)

3. Connect low pressure output hose to regulator.
4. Perform leak test on connections. See "Soapy Solution Leak Test" in this section.

REGULATOR MAINTENANCE

The LP regulator is equipped with a vent because it is constantly "breathing." The diaphragm of the regulator moves down and draws air into the bonnet or adjustment spring housing. The diaphragm then moves up and air is expelled through the vent. In the event that excess pressure builds up in the lower housing or body of the regulator, a relief mechanism vents it to the atmosphere. Check the vent frequently. It should be clean and free of water, corrosion, or obstructions. Clogging of this vent is the most common cause of regulator malfunction. A small particle of dirt, pipe dope, or other foreign matter entering the inlet can result in higher than normal pressure (high lockup) and/or loss of fuel. If the vent becomes clogged, a toothbrush makes an ideal cleaning tool.

REGULATOR FREEZE UP

A regulator does not freeze, nor will LP gas. As the gas passes through the regulator, it expands and cools. Moisture in the gas or in the regulator will condense and turn into ice during any weather. This ice can build up and block the orifice thereby cutting off the fuel supply.

LP SUPPLY SYSTEM

LP is conducted from the chassis mounted storage tank to the appliances through a rigid 1/2" iron pipe manifold and 3/8" flexible copper tubing.

LP System Manifold:

The LP manifold is the portion of the LP supply system that is located beneath the floor of the vehicle. The manifold is 1/2" iron pipe. Any leaks in the manifold are likely to be found at pipe connections.

Replacing Manifold:

Replace damaged portions of the LP manifold by:

1. Disconnect damaged section with pipe wrench and removing suspension straps.
2. Have plumbing supplier furnish new pipe threaded and cut to length.
3. Apply approved pipe joint compound to male threads of new section of pipe and install pipe.
4. Reinstall suspension straps.

COPPER TUBING

Type "F" copper tubing with flare fittings is used to transfer LP from the manifold to the appliance locations. Replacement fittings should match fittings removed. Brass unions may be added to copper line if necessary to facilitate removal and installation. Leaks in copper lines are usually found at fittings where a line runs through the floor or where a line has rubbed against a cabinet, sharp edge, or an appliance.

Certain portions of copper tubing located beneath the motor home floor are encased in vinyl tubing to protect the line from road debris. Be sure to replace this vinyl tubing on any new copper lines installed.

WARNING:

Use flare type fittings on copper portion of LP supply system. Do not use compression or sweat fittings on any portion of a gas supply line. Use double flare on all connections.

Installing Copper LP Supply Lines:

1. Cut tubing to required length with tubing cutter.
2. Remove burr from inside of end of tubing with reamer.
3. Install flare fitting (male or female) over end of tubing.
4. Double flare end of tubing with flaring tool. (See flaring tool manufacturer's instructions.)
5. Connect fittings and perform leak test with leak detector. If leak is indicated, perform soapy solution leak test on all connections worked on.

IMPORTANT: When bending copper tubing, do not make any bends with a radius of less than three (3) inches.

SEALING LP CONNECTIONS

Apply approved pipe joint compound such as "Leak-Lock" to threads of all LP tank fittings (20% liquid level gauge, service valve, filler valve, etc.) and to all connections in LP system that are not brass-to-brass connections or flared copper fittings. Apply "Leak-Lock" uniformly around threads or mating surfaces (usually to male threads only). If time allows, let sealant get tacky before assembling connection. Use alcohol to remove this "Leak-Lock." Once connections are made, perform soapy solution leak test on each.

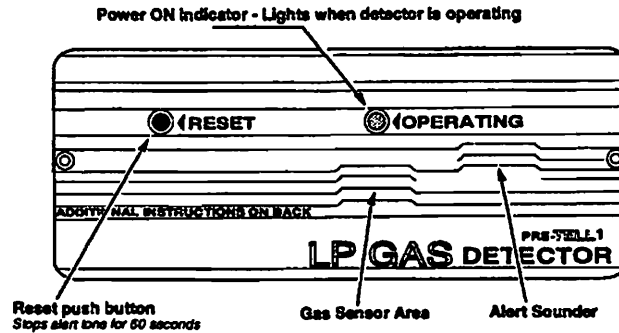
SOAPY SOLUTION LEAK TEST

Test Solution:

To test LP connections for leaks, use an approved leak test solution such as "Sherlock Leak Detector Solution." This solution will not evaporate readily, is non-corrosive, unaffected by extreme temperatures, and is effective over a longer period than a soap and water solution.

Test Procedure:

1. Turn service valve on LP tank to "On."
2. Start at connection nearest LP tank and work into motor home.
3. Apply leak test solution around entire connection by spraying or painting solution on with dauber. Normally, LP leaks will be indicated within ten (10) seconds by foaming at the point of leakage.
4. Once leaks are located, connection must be taken apart, cleaned, resealed, and reconnected.



LP GAS LEAK DETECTOR

The leak detector is located on the rear panel of the galley cabinet. Its function is to sound an audible alarm in the event an LP leak is detected.

The detector is powered from the auxiliary (house) battery and operates continuously until power is interrupted or battery voltage falls below 10 volts. Operation is verified by a green light on the face of the detector.

NOTE: When storing the vehicle for extended periods of time, power to the detector may be disconnected by removing the in-line fuse (see wiring diagram in Electrical section) located at the 12-volt breaker panel.

However, the fuse **MUST BE** reconnected prior to the vehicle being put back in use.

In the event a leak is detected, the detector will sound a pulsating alarm. At this point, the vehicle should be evacuated, doors and windows should be opened, and the LP supply at the tank should be manually turned off.

NOTE: This device is a detector only and will not interrupt the gas supply.

The alarm will continue to sound until the vapors dissipate or the "Reset" button has been pushed. The reset button stops the alarm from sounding for sixty seconds.

Any time an LP leak is suspected, the system must be diagnosed to assure its integrity.

However, the LP gas detector can be triggered by other factors. Including other combustibles which can be detected including alcohol, liquor, deodorants, colognes, perfumes, wine, adhesives, lacquer, kerosene, gasoline, glues, most of all cleaning agents and the propellants of aerosol cans. Most are lighter than air in their vapor state and will only be detected when the coach is closed up.

Also, the detector has a self-check circuit which runs at all times when the detector is powered. In the event that the circuitry fails, a failure alarm will sound. It is a continuous series of short beep tones between long intervals and is distinctively different from the alert sound.

Testing:

The detector must be operating for at least 60 seconds before it can be tested. Expose the detector to gas* and observe that the alarm will begin to sound. The alarm will continue to sound until:

- A. The gas mixture at the detector returns to a safe level.

- B. The reset button is pressed. If the reset button is pressed, the detector cannot be retested for at least 60 seconds.

This test procedure should be repeated every week or every time the vehicle is taken on a trip, whichever occurs first.

* One method of simulating gas is to use a butane lighter. DO NOT rotate the flint wheel. Just press on the gas release button and point the exit nozzle into the gas sensing area below the green light of the detector.

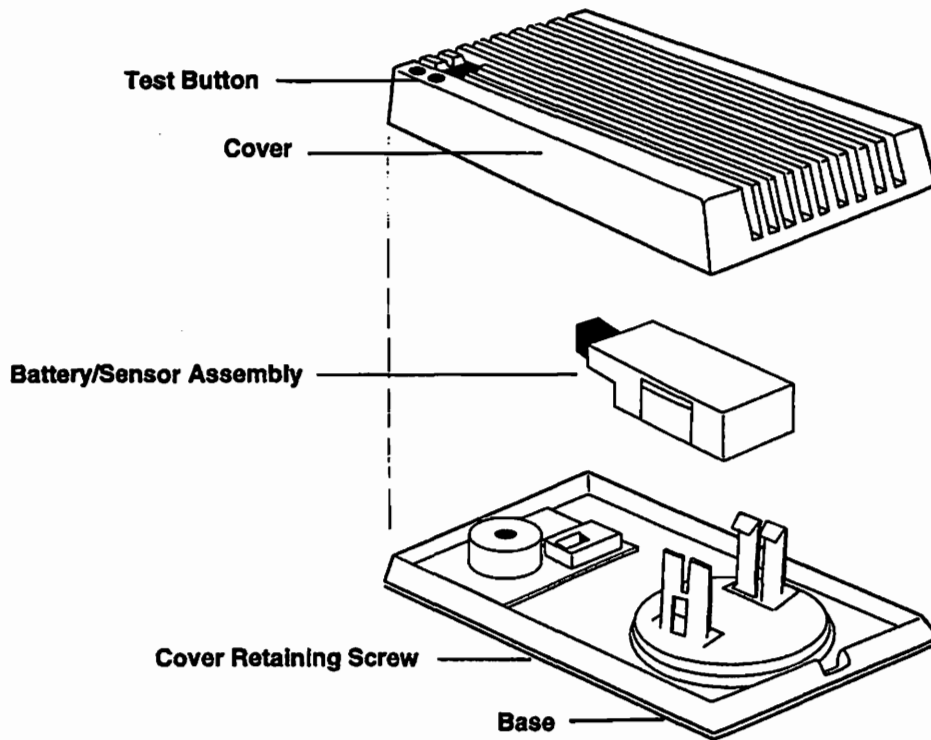
Detector Removal:

1. Disconnect power to detector circuit by removing in-line fuse at 12-volt breaker panel. See wiring diagram in Electrical section.
2. Remove two detector retaining screws. Pull detector away from galley cabinet to expose wires.
3. Cut wires leading to detector.

Detector Replacement:

1. Position detector near opening.
2. Connect wires to detector with butt connectors.
3. Position detector into opening. Secure with two retaining screws.

CARBON MONOXIDE ALARM



Carbon Monoxide Alarm:

The carbon monoxide (CO) alarm is mounted to the underside of the rear overhead cabinet. Its function is to sound an audible alarm in the event of a carbon monoxide build-up in the vehicle.

The alarm is powered by an internal battery (Winnebago Part Number 112320-02-000). When the battery weakens and needs replacement, the alarm will beep once every 40 to 50 seconds.

NOTE: The red LED will flash every 40 to 50 seconds. This indicates the alarm is operating normally.

A continuous beeping and flashing of the red LED indicate the presence of carbon monoxide. Carbon monoxide is colorless, odorless, and tasteless. If alarm sounds, shut down all combusting appliances and open doors and windows to air out vehicle.

Testing:

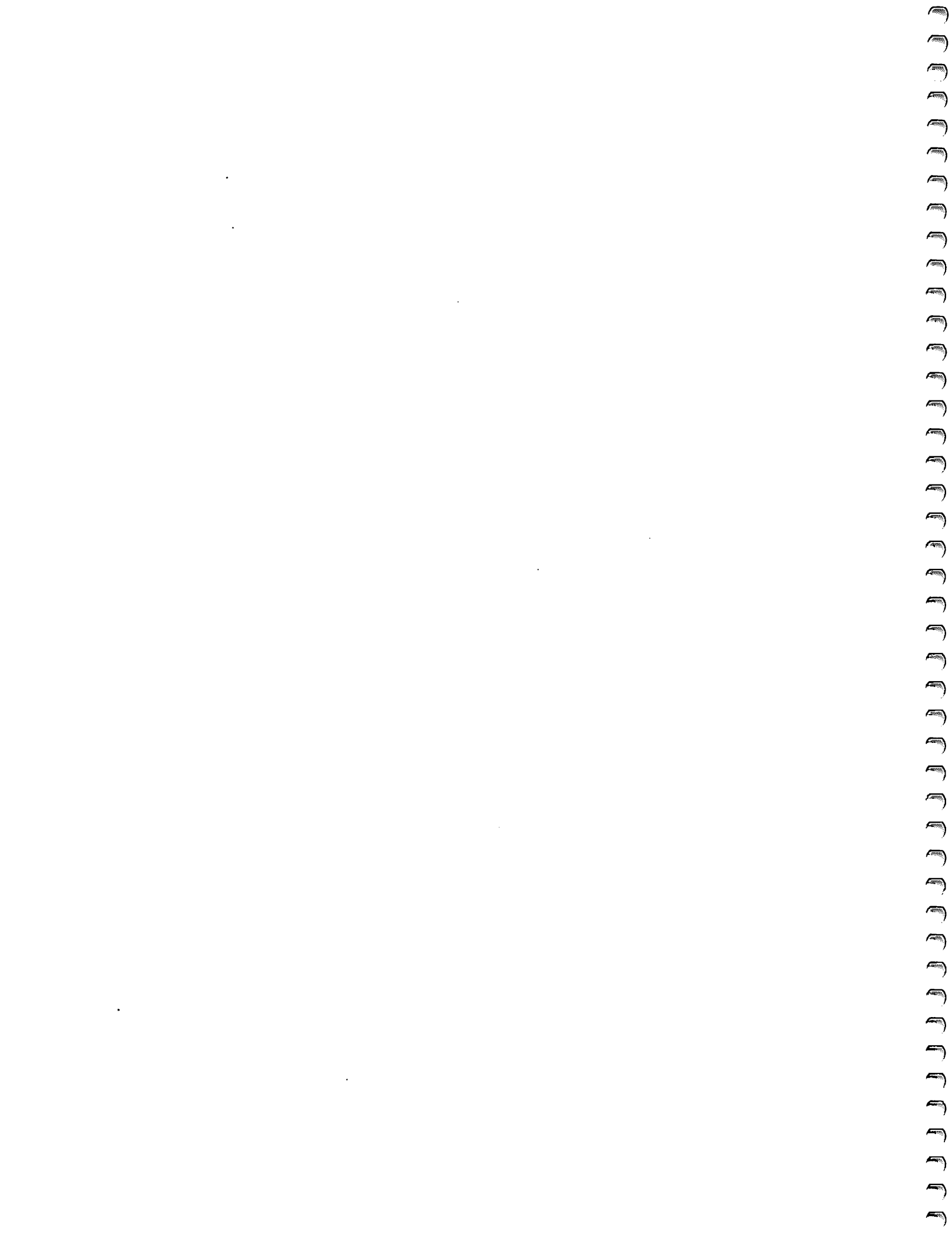
Test the alarm weekly by depressing and holding blue test button until red LED begins to flash and alarm beeps continuously.



SECTION 6 APPLIANCES

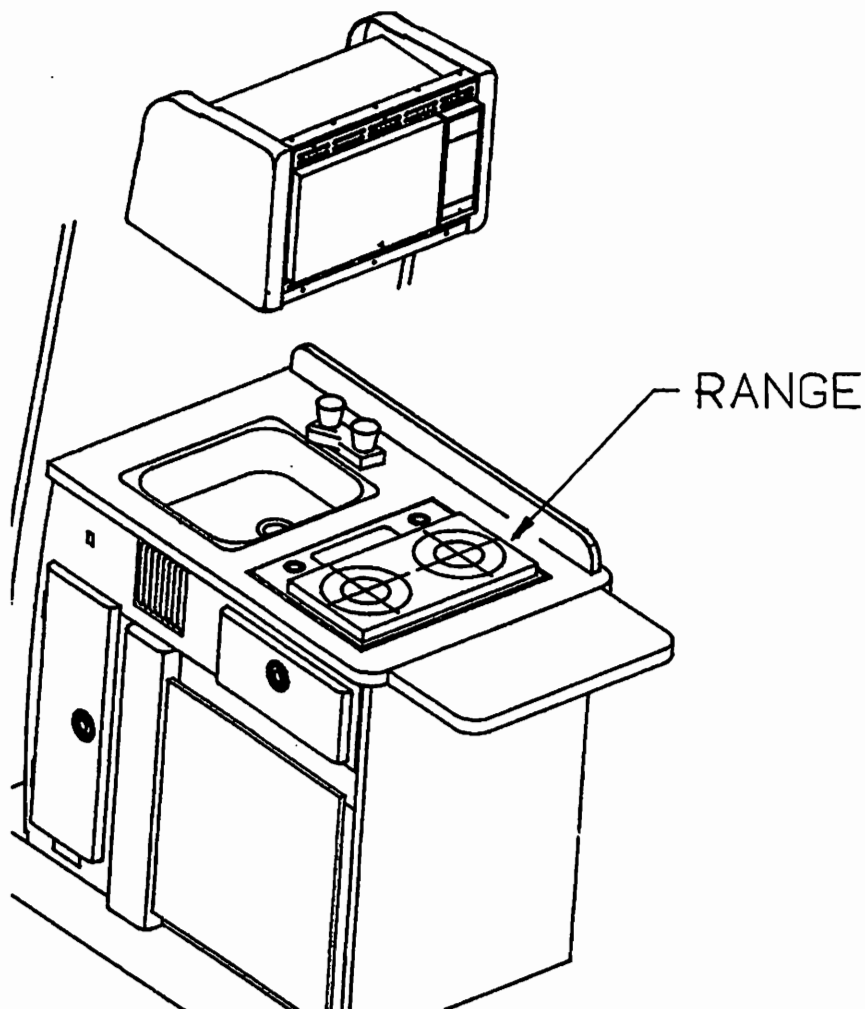
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SECTION 6

APPLIANCES



RANGE

The two-burner range is designed for cooking purposes only. **DO NOT** use as a heating device!

CAUTION: The range should NEVER be used to heat the interior of the vehicle. Failure to comply could result in physical injury or death.

OPERATION

The burner controls operate counterclockwise and must be pressed inward to turn on.

To ignite a burner:

1. Make sure gas supply is turned on at tank.
2. Light ignition source (match, etc.) and hold in position near burner.
3. Depress appropriate burner control down and rotate counterclockwise.

4. Once burner ignites, ignition source may be removed. Adjust flame to desired height by rotating control knob.

NOTE: The range does not utilize a pilot light, so the burners must be normally relit before each use.

Range Removal:

NOTE: For most maintenance and service procedures, it will NOT be necessary to remove the entire range, but only the range cook top. (See Steps 1 and 2.)

1. Remove range lid and remove grate by pulling upward.

CAUTION: Make certain grate is cool before touching.

2. Loosen and remove two cook top retaining screws. Remove cook top.
3. Turn "off" LP at tank. Disconnect LP line at range LP regulator.
4. Remove four (4) range retaining screws. Remove range by lifting up and sliding toward front of vehicle to clear LP line.

CAUTION: Exercise extreme care so as NOT to kink or deform the copper tube.

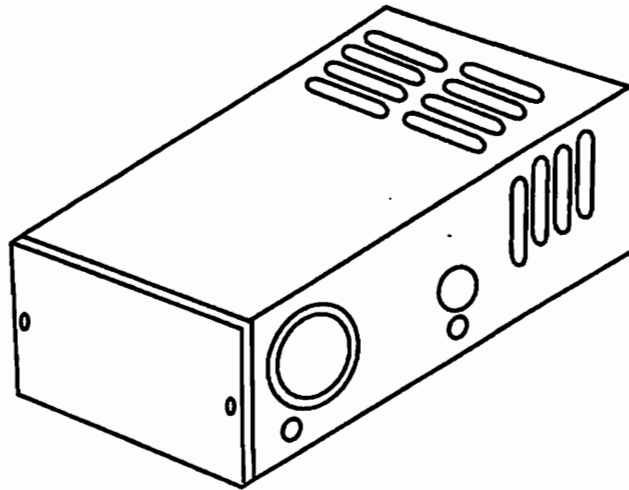
Range Replacement:

1. Position range into counter top opening.

CAUTION: Exercise extreme care so as NOT to kink or deform copper tube.

2. Carefully position LP line into range regulator. Install and tighten four (4) range retaining screws.
3. Tighten LP line connector at range regulator. Turn on gas supply at tank and leak test connections. See "Soapy Solution Leak Test" in Liquid Propane System section.
4. Install cook top and secure with two retaining screws.
5. Install grate into cook top.

FURNACE



The furnace installed in the Rialta is classified as a Forced Draft Furnace. A forced draft furnace utilizes a sealed combustion chamber which is vented to the outside atmosphere. The intake air for combustion is also taken from outdoors and is completely isolated from the exhaust. A motor is used to drive an impeller wheel to draw intake air into the chamber to support combustion and force the exhaust gases through the furnace chamber to the outside atmosphere. A second impeller wheel (driven by the same motor yet totally isolated from the combustion air) is used to circulate room air across the furnace chamber where it is heated. The blower then forces the hot air into the living area.

There are several differences between the forced air furnace in the Rialta and most central furnaces designed for residential use. The major difference is that in a forced draft combustion furnace, a separate combustion air blower must deliver a predetermined volume of air into the burner chamber before ignition of the main burner flame is established, it is sustained by the air supplied by the blower.

The vehicle's furnace operates on 12-volt DC current which is supplied by the 12-volt battery and converter.

The forced draft combustion furnace is designed for use with Liquefied Petroleum (LP) Gas. The operating pressure is between 10.5" - 13.0" of water column.

The operation of the forced draft combustion furnace is controlled through a 12-volt thermostat. When the thermostat is set above room ambient, the contacts close completing a circuit through the coil of the time delay relay. The contacts on the relay then close, completing a circuit through the windings of the motor and the motor comes on.

As the motor reaches approximately 75% of its normal rpm, the airflow generated by the room air blower pushes against the paddle on the sail switch (sometimes referred to as a micro switch) sailing it in and closing the contacts. A circuit is then completed through a high temperature limit switch to the module board on a direct ignition furnace.

On a direct ignition furnace, as current passes through the ignition module to the valve, a high-voltage spark is produced at the electrode assembly located over the burner. Simultaneously, the valve opens, gas flows into the burner and is ignited by the spark.

Direct ignition furnaces must have a flame sensing circuit through the control module which senses the presence of main burner flame. If proper flame sensing is not obtained or if the burner fails to light (on certain models after third attempt), the furnace must go into 100% lockout. When lockout occurs, the valve closes and will remain closed until the thermostat circuit is broken. Reignition will not occur automatically. If it could, it would not be 100% lockout.

While 100% lockout is a safety factor, it can prove to be frustrating for a vehicle owner who has experienced lockout problems. Not only can a lockout problem be difficult at times to diagnose, it will result in continuous operation of the furnace blower (that is, until the thermostat circuit is broken) and can drain the battery if the owner is not in the vehicle. The solution for this complaint is not to try and eliminate the lockout function of the furnace, but rather to find the cause for lockout, and correct it.

The motor circuit contains a time delay relay. The purpose of a time delay relay is to provide a means of the blower operation on initial startup and after the thermostat is satisfied. When the thermostat contacts open, the circuit through the coil of the time delay relay is broken and the contacts open after approximately 3-5 minutes, depending on the furnace model.

ELECTRONIC IGNITION

The electronic ignition system is made up of three main parts: the module board, the electrode assembly, and the electrode wire. The module board is the brain of the electronic ignition system and it has several functions.

1. When the blower reaches approximately 75% of the normal rpm and sufficient airflow is established, the sail switch engages and completes a 12-volt circuit through the limit switch to the module board. (NOTE: Low voltage power supply will not provide sufficient motor rpm to engage the sail switch.)
2. After a 12-18 second delay, 12-volt current will pass through the module board to the solenoid valve. The current to the valve opens it and allows gas to the main burner, simultaneously, the module board sends high- voltage through the electrode wire to the electrode assembly. The voltage seeks a ground between electrode and ground probe and a spark occurs. The spark then ignites the main burner.
3. The module board also performs the lockout function in cases where the spark fails to light the burner. When lockout occurs, the spark stops, the voltage from the module board to the gas valve is discontinued, and the valve closes. The unit will remain in lockout and the blower will continue to run until the thermostat is turned off. (NOTE: Some models are equipped with a 3-try ignition module board and will go through three tries automatically before lockout function occurs.) Turning the thermostat off disengages the lockout function of the module board. After the blower has stopped, the ignition sequence can be started again.

MAINTENANCE

Preventative maintenance is essential if the vehicle owner is to have reliable, safe operation of his furnace. By far, the two most important areas to watch closely in order to assure safe, reliable operation, are the venting and the main burner.

An obstruction in the vent or main burner will reduce the intake of combustion air which results in incomplete combustion. Whenever incomplete combustion occurs, the by-products are carbon monoxide (CO) and soot. If the furnace outside exhaust vent shows black soot may be forming, the furnace should not be operated until the problem is corrected. Possible causes are air restriction combustion air, low gas pressure, dirty burner, slow motor, low voltage, etc.

If operation of the furnace continues under these conditions, it could result in serious injury to the occupants of the vehicle or even death.

Cleaning of the main burner and an inspection of the venting system should be done at least once a year, preferably just before the beginning of the heating season. Some vehicle owners and service personnel have the false assumption that if a furnace has not been used, it will not require cleaning. NOT SO! A furnace which has not been used for some time could be more in need of cleaning than a furnace which has been used extensively.

Dust and lint should be removed from the room air blower wheel and sail switch. A buildup of dust and lint on the blower wheel can cause the motor to drag and not generate enough airflow to engage the sail switch. Dust accumulation on the sail switch will restrict the travel of the actuator arm to where the airflow across the paddle will not sail it in and complete the valve circuit.

A yearly inspection should be made of all gaskets on the furnace. If any gaskets show signs of leakage or deterioration, they must be replaced to assure proper pressurization of the sealed combustion chamber.

The motor used on the Rialta's furnace is permanently lubricated and does not require oiling.

TROUBLESHOOTING

SAFETY

As a part of repairing any gas appliance, be certain to check all gas connections both inside and outside the appliance (furnace) with a proper leak check solution or a leak detector before returning the equipment to service. Also make certain the furnace operation and functions are in accordance with the written instructions supplied with each furnace.

CAUTIONS

1. Never operate the furnace with the electrode wire disconnected nor with the electrode assembly removed from the furnace.
2. Never use a battery charger to checkout an electronic ignition furnace - use a 12-volt battery.
3. Never use a screwdriver on any part of the electrode assembly while the furnace is in operation.
4. Be sure the electrode assembly screws are snug at all times, especially after the electrode has been removed and reinstalled.
5. If the module board is found to be defective, it must be replaced - it is not field repairable. Any attempts to repair the board may alter the board and cause it to operate in an unsatisfactory manner.
6. Ensure that the gap between electrode and ground is always 1/8". The gap between the ground and the flame sensor should be approximately twice the gap between electrode and ground to ensure no sparking to sensor. Sparking to sensor will damage the module board (see Figure 14).

TYPE GAS PROPANE	SERVICE TOOLS REQUIRED
Line Pressure: Minimum 11" WC*, Maximum 14" WC Operating Pressure: Minimum 105" WC, Maximum 13.5" WC *WC - water column	Manometer gauge Voltage multimeter Phillips screwdriver 1/8" Allen wrench 8" length 1" open-end wrench Gas leak detector or approved leak check solution Channel lock pliers Module board tester (Fenwall tester)

Furnaces With Direct Spark Ignition:

Each step in this operation must be completed in the listed order before the next function will occur. To properly diagnose a malfunction and correct it, it must be determined at what step the operation of the furnace failed.

1. When the temperature drops to a set temperature, the wall thermostat contacts close.
2. The fan relay coil is energized in the thermostat relay, completing the circuit to the blower motor. (Some models equipped with a time delay relay have a 5-25 second time delay after the thermostat contacts close).
3. The motor starts and, after reaching 75% of its normal rpm, the room air blower wheel or blade activates the sail switch micro switch), sending current to the temperature limit switch (a normally closed switch), and on to the module board.
4. When energized, the module board has a built-in 15-20 second delay, allowing the combustion air to purge the combustion chamber.

5. The module board supplies a high-voltage spark through high tension wire to the electrode assembly, at the same time sending voltage to the gas valve, opening the valve.
6. Burner ignites.
7. The sensor probe signals the presence of flame and the spark stops. (If flame is not established within 7 seconds, the system closes the gas valve and goes into lockout).
8. The gas valve closes when either the limit switch or thermostat contacts open.
9. The blower motor goes off when the time delay relay opens.

Do not use a battery charger to power or test the furnace, as they sometimes provide more than the 14.5-volts DC that will damage the control module board.

All testing and repair should be done by qualified personnel only. Do not use a screwdriver or touch any part of the electrode assembly while the furnace is running.

Do not operate the furnace with the high-tension lead wire disconnected or the electrode assembly removed from the burner access plate.

Do not perform any high-pot tests on this furnace!

TROUBLESHOOTING

Condition	Course of Action
<p>1. Thermostat is calling for heat, but blower will not run.</p>	<ol style="list-style-type: none"> 1. Check for 12-volts DC on red wire at furnace wire harness connector. Are 12 volts present? (Yes) Proceed to Step 2. (No) Trace circuit back to power source to determine cause of voltage loss. 2. Check wall thermostat for continuity. With thermostat contacts closed, check for 12-volts DC on single blue wire on furnace side of wire harness connector. Are 12 volts present? (Yes) Proceed to Step 3. (No) Trace back circuit to determine cause of voltage loss. Repair or replace as necessary. *3. With thermostat contacts closed, check for 12-volts DC on red wire at blower motor. Are 12 volts present? (Yes) Proceed to Step 4. (No) Proceed to Step 5. *4. Jumper a wire from ground terminal on blower motor to a known good ground, with thermostat contacts closed. Does blower motor operate? (Yes) Repair or replace defective ground wire. (No) Replace defective motor. *5. With thermostat contacts closed, check for 12-volts DC on red wire to blower motor at time delay relay. Are 12 volts present? (Yes) Repair or replace defective wire to motor. (No) Proceed to Step 6. 6. Check for 12-volts DC on red wire from wire harness connector at time delay relay. Are 12 volts present? (Yes) Proceed to Step 7. (No) Trace circuit back to power source to determine cause of power loss. Repair as necessary. 7. With thermostat contacts closed, check for 12-volts DC on brown wire at time delay relay. Are 12 volts present? (Yes) Proceed to Step 8. (No) Trace circuit back to thermostat to determine cause of voltage loss. Repair as necessary. 8. With thermostat contacts closed, jumper a wire to the ground terminal on the time delay relay (where green wire attaches) to a known good ground. Does motor operate? (Yes) Repair or replace defective ground wire. (No) Replace defective relay. * Allow 3-10 seconds for circuit to motor to be energized as time delay relay coil must heat up to close contacts.

Condition	Course of Action
<p>2. Blower is noisy.</p>	<ol style="list-style-type: none">1. Visually inspect the room air blower wheel. Is there any lint or debris on the blower wheel or damage to the wheel? (Yes) Clean and repair or replace as necessary. (No) Proceed to Step 2.2. Refer to appropriate wiring diagram. Check for proper polarity at motor. If polarity is reversed, motor will whine and run backwards. Is polarity correct? (Yes) Proceed to Step 3. (No) Repair as necessary.3. Check combustion air housing and wheel. Remove combustion air housing cover. Inspect for foreign material. Is wheel clean and free of debris? (Yes) Proceed to Step 4. (No) Clean as necessary.4. Inspect combustion air wheel for warpage. Does wheel pass inspection? (Yes) Proceed to Step 5. (No) Replace wheel.5. Inspect housings for evidence of wheels rubbing. Adjust wheels as necessary by using a T-Handle 1/8"-Allen wrench and a 90° angle 1/8"- Allen wrench. <p>If noise persists, check motor for worn bushings and check wheels for balance. Replace as necessary.</p>

Condition	Course of Action
<p>3. Blower runs, but burner does not ignite.</p>	<ol style="list-style-type: none"> 1. Is sparking audible during the ignition cycle? (Yes) Proceed to Step 2. (No) Proceed to Step 12. 2. Is manual gas valve in the "on" position? (Yes) Proceed to Step 3. (No) Turn on manual gas valve. 3. Check for restrictions or blockage of return air. Check furnace ducting for collapsed hoses, kinks, severe bends, or blockage. Does return air and ducting look good? (Yes) Proceed to Step 4. (No) Repair as necessary. 4. Check gas pressure at input to control valve. Does manometer indicate at least 11 inches of water column. (Yes) Proceed to Step 5. (No) Inspect LP system to determine cause of pressure loss. Repair as necessary. 5. During ignition cycle, check for 12-volts DC on brown wire feeding into control valve solenoids. Are 12 volts present? (Yes) Proceed to Step 6. (No) Proceed to Step 10. 6. During ignition cycle. Check gas pressure at tap on control valve. Does manometer indicate 10.2 inches of water column or greater? (Yes) Proceed to Step 7. (No) Proceed to Step 9. 7. Check electrode. Make sure electrode is not grounding to burner, gap between spark probe and ground probe should be 1/8 inch. Electrode ceramic should be free of soot with no cracks or breaks. Does electrode check out okay? (Yes) Proceed to Step 8. (No) Adjust, clean, or replace as necessary. 8. Check the main burner for correct relationship to the electrode assembly (burner should be 3/16" from the spark probe and sawports or charge ports directly under the spark gap). Check main burner for soot build-up in ports. Clean cast-iron burners by passing a hacksaw blade through the sawports, being careful not to enlarge the openings. Wirebrush stainless tube burners to remove build-up.

Condition	Course of Action
	<p>9. Jumper ground wires from ground terminals on control valve solenoids to known good grounds. Initiate ignition cycle. Does manometer indicate 10.2 inches of water column or greater? (Yes) Replace or repair ground wires. (No) Replace defective control valve.</p> <p>10. During ignition cycle, check for 12-volts DC at brown wire out of module board. Are 12 volts present? (Yes) Repair or replace brown wire to control valve solenoid. (No) Proceed to Step 11.</p> <p>11. Clean module board connector with electric contact cleaner. Inspect for bent pins. Reconnect. If 12 volts are not present on brown wire, test module board with Fenwall tester. Replace as necessary.</p> <p>12. During ignition cycle, check for 12-volts DC on red wire at module board. Are 12 volts present? (Yes) Proceed to Step 13. (No) Proceed to Step 18.</p> <p>13. Clean module board connector with electric contact cleaner. Inspect for bent pins. Reconnect. If no spark is audible during ignition cycle, Proceed to Step 14.</p> <p>14. Does small bulb in board flash during ignition cycle? (Yes) Proceed to Step 15. (No) Replace board.</p> <p>15. Test module board with Fenwall tester. Does board test okay? (Yes) Proceed to Step 16. (No) Replace board.</p> <p>16. Disconnect high voltage wire from board and electrode. Perform a continuity test. Does wire test okay? (Yes) Proceed to Step 17. (No) Replace wire.</p> <p>17. Check electrode. Make sure electrode is not grounding to burner, gap between spark probe and ground probe should be 1/8 inch. Electrode ceramic should be free of soot with no cracks or breaks. Adjust, clean, or replace as necessary.</p> <p>18. Check for 12-volts DC on both sides of the limit switch. Are 12 volts present on both sides? (Yes) Proceed to Step 19. (No) Replace defective limit switch.</p>

Condition	Course of Action
	<p>19. Check for low voltage on red wire at wire harness connector leading into furnace. Is voltage 11-volts DC or greater? (Yes) Proceed to Step 20. (No) Inspect 12-volt system for cause of low voltage. Repair as necessary.</p> <p>20. Disconnect wires from sail switch. Initiate ignition cycle. Jumper disconnected wires together. Does furnace ignite? (Yes) Proceed to Step 22. (No) Proceed to Step 21.</p> <p>21. Inspect wiring from limit switch to module board. Is wiring damaged? (Yes) Repair as necessary. (No) Proceed to step 23.</p> <p>22. Replace sail switch. If furnace does not ignite. Proceed to Step 23.</p> <p>23. Inspect room air blower wheel for dirt, debris, or damage. Is any dirt or damage evident? (Yes) Clean and repair or replace as necessary. (No) Proceed to Step 24.</p> <p>24. Inspect room air blower wheel to assure proper rotation and installation. Adjust or repair as necessary.*</p> <p>* If after completing all troubleshooting steps and furnace will still not ignite, suspect a bad gas supply or air in gas lines. Isolate furnace from coach gas supply. Use a known good supply of gas. If furnace operates properly, vent bad gas and refill with gas and proper amount of drying agent.</p>

Condition	Course of Action
<p>4. Burner ignites, but shuts off.</p>	<ol style="list-style-type: none"> 1. Check that flame sensor is over slots in main burner and that main burner flame is burning against tip of flame sensor. (Sensor probe should be in the inner blue cone of burner flame. Approximately 1/4 - 5/6 inch above the burner.) Adjust by bending probe. Does furnace operate properly? (Yes) Return to service. (No) Proceed to Step 2. 2. Check sensor wire connections at sensor and module board. Are connections okay? (Yes) Proceed to Step 3. (No) Clean and repair as necessary. 3. Disconnect sensor wire. Perform continuity test on wire. Does wire pass test? (Yes) Proceed to Step 4. (No) Replace wire. 4. Check sensor output. Attach microamp meter in series with flame sensor and flame sensor wire. (Connect + lead to sensor wire and - lead to sensor probe.) Flame sensor should generate at least seven microamps in seven seconds after burner ignition (on units with separate sparker and flame sensor). For units with local flame sensing (sparker and flame sensor are one probe), attach micro ammeter as per accompanying "Local Flame Sensing" in this section. Once flame is established and spark shuts off, ammeter should indicate a minimum of 1.5-microamps DC. Does the flame sensor pass the test? (Yes) Proceed to Step 6. (No) Proceed to Step 5. 5. Check sensor probe for carbon. If carbon is present, clean off probe. Repeat sensor output test in Step 5. If output is not within specification, replace flame sensor. 6. If flame sensor output is within specification and furnace still is inoperative, replace module board.

Condition	Course of Action
5. Main burner will not shut off.	<ol style="list-style-type: none"><li>1. Check thermostat contacts. Are contacts open? (Yes) Proceed to Step 3. (No) Proceed to Step 2.<li>2. Adjust thermostat to lower temperature. Do contact open? (Yes) Cycle furnace several times. If contacts continue to stick, replace thermostat. (No) Replace thermostat.<li>3. Check for DC voltage on brown wires at gas control valve solenoids. Is there any voltage present? (Yes) Inspect circuit to determine cause of short circuit. Repair as necessary. (No) Replace defective valve.

Condition	Course of Action
6. Blower fan continues to run after thermostat has been satisfied and burner has shut off.	<ol style="list-style-type: none"><li>1. Check for DC voltage on brown wire at time delay relay. Is voltage present? (Yes) Proceed to Step 2. (No) Proceed to Step 3.<li>2. Trace circuit back to thermostat to determine cause of short circuit.<li>3. Replace defective time delay relay.

Condition	Course of Action
<p>7. Fan cuts on and off.</p>	<ol style="list-style-type: none"> 1. Check thermostat. Are contacts open? (Yes) Proceed to Step 2. (No) Proceed to Step 3. 2. Check for voltage on brown wire at time delay relay. Voltage may be intermittent. Is there voltage present? (Yes) Trace circuit back to thermostat to determine cause of short circuit. Repair as necessary. (No) Replace time delay relay. 3. Check for a constant 12-volts DC on red wire at motor. Are 12 volts constant? (Yes) Proceed to Step 4. (No) Proceed to Step 5. 4. Check for intermittent ground at motor. Jumper wire from ground terminal on motor to known good ground. Is condition alleviated? (Yes) Repair or replace ground wire. (No) Replace motor (defective thermal overload switch.) 5. Check for a constant voltage on red wire at time delay relay. Is voltage intermittent? (Yes) Proceed to Step 6. (No) Proceed to Step 9. 6. Check for constant 12-volts DC on red wire from wire harness connector at time delay relay. Is voltage constant? (Yes) Proceed to Step 7. (No) Trace circuit back to voltage source to find cause of intermittent voltage. Repair as necessary. 7. Check for constant voltage on brown wire at time delay relay. Is voltage constant? (Yes) Proceed to Step 8. (No) Trace circuit back through limit switch to thermostat to find cause of intermittent voltage. Repair as necessary. 8. Check for intermittent ground at time delay relay. Jumper wire from ground terminal to known good ground. Is condition alleviated? (Yes) Repair or replace ground wire. (No) Replace time delay relay. 9. Replace or repair red wire.

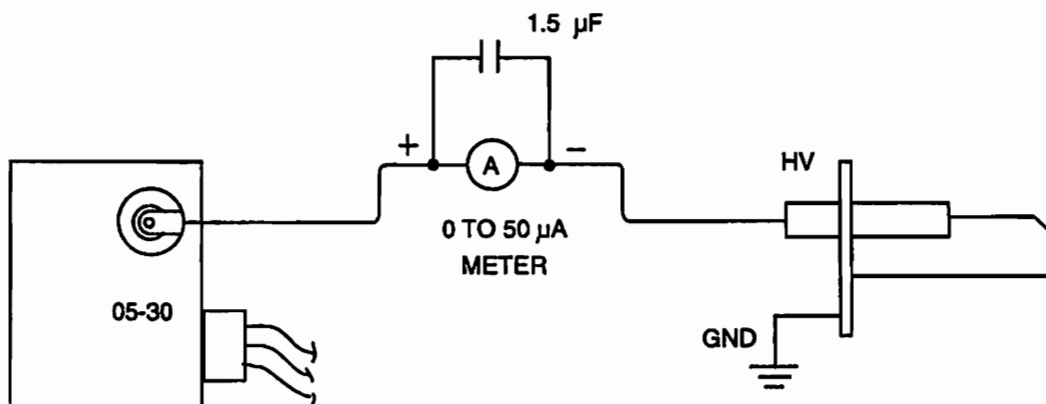
Condition	Course of Action
<p>8. Module board repeatedly fails.</p>	<ol style="list-style-type: none">1. Check for high DC voltage on red wire at furnace wire connector. Maximum operating voltage is 14.5 - volts DC. Is voltage below 14.5 volts? (Yes) Proceed to Step 2. (No) Inspect circuit to determine cause of high voltage. Repair as necessary.2. Check electrode adjustment. Is electrode properly adjusted? (Yes) Proceed to Step 3. (No) Adjust as necessary.3. Inspect module board. Make sure the insulator covering the electrode wire connection on the coil of the module board is in place and the insulator behind the module board is in place. Is the module board or electrode wire "shorting" to other furnace parts? (Yes) Repair as necessary. (No) Proceed to Step 4.4. Check electrode and sensor wire (if applicable). Are connections good? (Yes) Proceed to Step 5. (No) Repair as necessary.5. Inspect 12-volt wires. Wires should not pass over module board. Reroute as necessary. Proceed to Step 6.6. Make sure duct connections to furnace are airtight. Seal duct collar connections to the furnace cabinet with duct tape as necessary to prevent hot air leaks.

Condition	Course of Action
<p>9. Unit goes into lockout intermittently.</p>	<ol style="list-style-type: none"> 1. Check electrode and burner air adjustments. Is electrode in proper position and burner adjusted properly? (Yes) Proceed to Step 2. (No) Adjust as necessary. 2. Inspect sail switch. Does it move freely? (Yes) Proceed to Step 3. (No) Replace defective switch. 3. Inspect the furnace return air and warm air discharge for obstructions or restrictions. Is there sufficient airflow to engage the sail switch each time? (Yes) Proceed to Step 4. (No) Repair as necessary. 4. Remove electrode and burner. Clean them thoroughly. If furnace continues to go into lockout, proceed to Step 5. 5. At this point in diagnosis, one should suspect a faulty gas supply. Using a manometer connected to the pressure tap on the furnace gas valve. Watch for significant pressure drop during the time the thermostat calls for heat. Is there a large pressure drop? (Yes) Inspect LP gas system for cause of pressure drop. Repair as necessary. (No) Proceed to Step 6. 6. Isolate the furnace from the coach gas system by connecting to a known good regulated gas supply. Does furnace operate properly? (Yes) Proceed to Step 7. 7. Corrective measures to remedy a faulty gas supply: <ul style="list-style-type: none"> - Move vehicle outdoors to a well ventilated area with NO open flames or spark hazards. - Shut off vehicle engine. DO NOT operate generator, plug into shore power, or operate electrical loads. - Close valve on LP tank. Remove regulator. - Bleed off tank. - Disconnect and blow out LP gas lines. - Reconnect gas lines and regulator. - Have tank filled and drying agent added. Half pint of methanol alcohol per 100-pound bottle capacity is recommended.

Local Flame Sensing (Single Spark and Sense)

With power off, connect a DC microammeter (D'Arsonval movement type) as shown in Figure 1. (The meter should be protected from high voltage surges which could damage the meter movement. A 1.5 F 200-Volt film capacitor across the meter terminals or lead wires will provide adequate protection.) The lead wires and terminals must be isolated from other surfaces to prevent the H.V. signal from arcing to ground during the trial-for-ignition period.

Apply power. Once the flame is established and the sparks shut off, a flame sense current of 1.5 A DC minimum is required for proper operation.



CAUTION: Due to possible shock conditions, do not touch the microammeter or lead wires during the flame sense test. Always remove power before making any adjustments.

FURNACE

Furnace Removal:

CAUTION: Before removing furnace, the liquid propane must be turned OFF at the tank.

1. Remove (2) furnace face plate retaining screws. Remove face plate.
2. Disconnect LP line at furnace.
3. Remove (2) furnace retaining screws.
4. Slide furnace out of compartment a few inches.
5. Disconnect 12-volt wires at plug near furnace.
6. Slide furnace free of compartment.

Furnace Replacement:

1. Slide furnace partially into compartment and align in proper position.
2. Connect 12-volt wires at plug near furnace.
3. Slide furnace completely into compartment.

IMPORTANT: The furnace must be properly aligned with the air intake/vent tubes.

NOTE: Make sure the LP line is in the proper position, but do not tighten at this time.

4. Secure furnace with (2) retaining screws.
5. Connect and tighten LP gas line. Turn LP on at bottle, test connections for leaks with soapy water solution. See "Soapy Solution Leak Test" in LP Gas Fuel System Section.
6. Test furnace operation.
7. Install furnace face plate. Secure with (2) retaining screws.

FURNACE VENT

The furnace vent is located on the left sidewall. It allows intake air to flow into the furnace and exhaust air to leave the furnace. NEVER obstruct or modify this vent!

FURNACE VENT REMOVAL

1. Remove (4) retaining screws.
2. Carefully cut sealant around vent with a putty knife.
3. Pull vent away from sidewall and furnace intake and exhaust tubes.
4. Remove old sealant from sidewall and vent.

FURNACE VENT REPLACEMENT

1. Position vent into furnace intake and exhaust tube.
2. Push vent tight to sidewall.
3. Install (4) vent retaining screws.
4. Cap seal vent perimeter with sealant. (Winnebago part #034552-02-000)

NORCOLD MODEL 3163 REFRIGERATOR

SPECIFICATIONS		CURRENT DRAWS	
AC Mode:	132-Volts AC Max., 108 Volts AC Min.	AC Heating Element -	1.3 amps @ 110 Volts AC
DC Mode:	15.4-Volts DC Max., 11.5-volts DC Min.		1.4 amps @ 120 Volts AC
Gas Mode:	11" W.C. Max., 10.5" W.C. Min.	DC Heating Element -	11.7 amps @ 12 Volts DC
			13.6 amps @ 14 Volts DC
Ratings		Fuse Replacement Data	
LP Gas Mode:	640 BTU/Hr. Input 11" W.C. Gas Supply .010" Orifice (LP10)	AC Circuit:	3 amp Type 3AG (1/4" x 1/4" Norcold Part No.
AC Mode:	110-Volts AC, 140 Watts	DC Circuit	20 amp Type 3AG (1/4" x 1/4" Norcold Part No.
DC Mode:	12-Volts DC, 140 Watts	Gas Circuit	20 Amp Type 3AG (1/4" x 1/4" Norcold Part No.

GENERAL INFORMATION

WARNING

This refrigerator is not intended to be operated as a Free-Standing refrigerator (i.e., where the products of combustion are not completely sealed off from the living area) or installed in such a way as to conflict with information in these instructions. Unapproved installations could result in safety risks or performance problems.

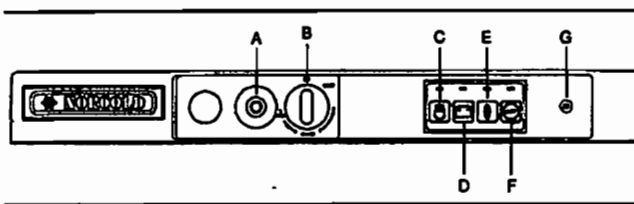
The Model 3163 is designed for built-in installation and operates on propane gas, 120-volts AC or 12-volt DC.

The propane gas mode of operation design is that of a sealed combustion unit. A sealed combustion installation utilizes a single fresh vent-air intake/exhaust assembly to supply fresh air to the burner and to remove the products of combustion. This insures the products of combustion are isolated from the living area of the vehicle. The vent-air intake/exhaust assembly is routed through the vehicle's outside wall and is connected to refrigerator's burner assembly and exhaust flue tube by flexible piping.

The vent-air intake/exhaust assembly used for this installation has been certified for this refrigerator and must not be modified.

Location of Operating Controls

The refrigerator's operating controls are located in a cluster above the refrigerator door.



(A) Safety Valve

The safety valve is designed so that any loss of flame will stop the gas flow to the burner. It is controlled by means of a thermocouple that is positioned in the flame. As long as a flame is detected by the thermocouple, the valve will remain open. Upon flame failure, the valve closes, shutting off the gas flow to the burner. During the gas ignition process, the safety valve button must be held in until a flame is established at the burner.

(B) Thermostat

The thermostat on the Norcold refrigerator controls both the gas and AC electric operations, thereby eliminating the necessity of resetting each time a different power source is selected. Rotate the thermostat knob clockwise to make the refrigerator cabinet colder.

(C) 120-Volts AC Operation

Pressing button (C) selects the AC mode of operation. The refrigerator is equipped with a cartridge heater. When the AC mode is selected and AC voltage is supplied to the refrigerator, the refrigerator will operate on 120 volts AC.

(D) 12 Volts DC Operation

Pressing button (D) selects the DC mode of operation. The refrigerator is equipped with cartridge heater. When DC is selected and DC is available to the refrigerator, the refrigerator will operate at full cooling power. The DC operation is a continuous run (no thermostat control) mode.

(E) Gas Operation

Pressing button (E) selects the Gas mode of operation. The refrigerator is equipped with electronic ignition. When the gas mode is selected,

the electronic ignition is energized and sparking is generated at the burner (NOTE: Push safety valve button in and hold until flame is present at burner). Sparking will continue until a flame is present at the burner. When a flame is sensed by the electronic ignition module, the sparking ceases and the flame indicator (G) illuminates indicating the refrigerator is operating on gas.

(F) Off

Pressing button (F) will interrupt all power sources and cease operation of the refrigerator.

(G) Flame Indicator Light

Lights when refrigerator is operating on LP gas.

Lighting and Start-Up Instructions

The lighting and start-up instructions are located on the top portion of the interior door liner.

Refer to Figure above for location of the operating controls.

Gas Operation

1. Set thermostat (B) to the start setting.
2. Place the mode selector button (E) to the gas position. Ignition spark will be present at the burner.
3. Push and hold the safety valve button (A) until the indicator lamp (G) glows steady. Continue to hold the safety valve button in for 15 seconds and then release. The indicator lamp should remain a steady glow. If the lamp turns off, repeat this step.

NOTICE: On ignition start-up, it may take longer for the burner to light because of air being purged from the gas supply line.

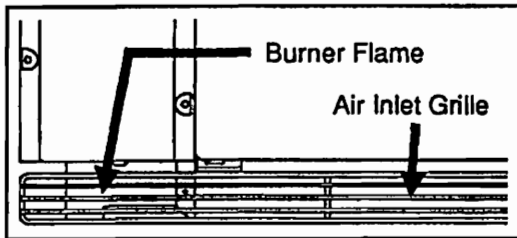
WARNING

Do not hold gas valve in more than 30 seconds. If the flame is not incidated within this time, turn the gas at the selector (F) off, wait two minutes and retry. Continuing to hold the gas valve in will cause gas to build up in the burner area and can result in an explosion which can cause property damage or severe personal injury.

4. Set thermostat to desired temperature setting.

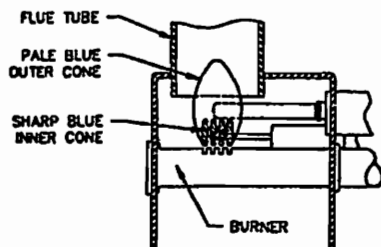
Gas Burner Flame

The gas operation of the refrigerator is controlled by the correct burner flame which supplies the heat input to the refrigerator's cooling system. The correct burner flame is dependent upon correct input gas pressure and the burner and burner orifice being clean. The propane gas piping and the supply pressure must be inspected and tested at least twice a year. All inspections and tests must be performed by the propane gas supplier or a qualified service agency.



A visual check of the burner flame should be made regularly. The burner flame can be observed through the air inlet grille as shown in Figure A.

The flame should be sharp blue as illustrated in Figure B with a stable burning appearance. When there is a constant yellow component observed or if the flame appears erratic and unstable, contact your dealer, gas supplier, or a Norcold authorized service center. Also observe the position of the flame; it must be centered under the flue tube without touching the inner wall of the tube. Norcold strongly recommends that any required adjustments be performed by your dealer or a Norcold authorized service center.



Check Out of Flame Failure Safety Device

1. To verify operation of the flame failure safety device, start the refrigerator in the gas mode (refer to lighting instructions) and verify the presence of a flame.
2. Turn off the gas at the manual shut-off valve or at the main gas supply tank.
3. The flame will go out and within three minutes, the flame safety device will automatically close (an audible click will be heard as this device closes.)
4. Turn the gas on at the manual shutoff valve.
5. Attempt to light the burner by placing the mode selection button to the gas mode. Do not push in the safety valve.
6. If the burner does not relight without holding the safety valve in, the flame failure safety device has operated correctly.

AC Operation

1. Place the model selection button (C) to the AC position.
2. Set the thermostat (B) to the coldest (maximum) setting. Allow to operate at maximum setting for six to eight hours before setting to mid-range.

DC Operation

1. Place the mode selection button (D) to the DC position. There is no need to set thermostat to any setting. The DC operation is a continuous run (no thermostat control) mode.

Shut-Down: All Modes

1. Place the mode selector button to the off position. This will interrupt all AC and DC power and stop operation of the refrigerator.

Important Safety Information

WARNING

Read this information before attempting to perform service on this refrigerator.

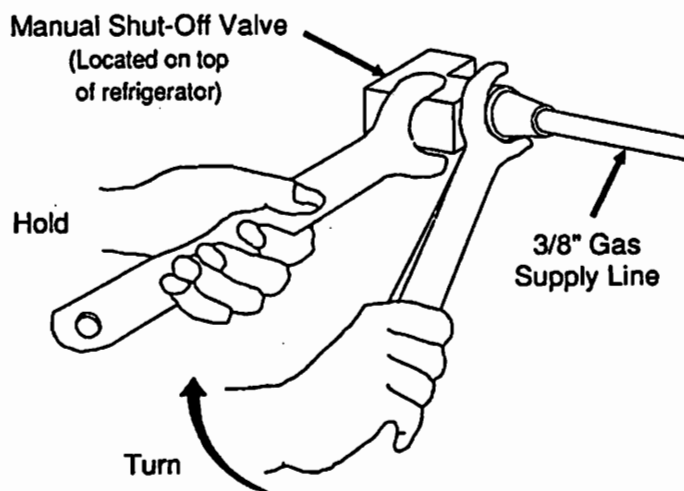
The troubleshooting portion contains wiring pictorials and diagrams. Review both the wiring pictorials and diagrams to understand the electrical circuits, and the circuit relationship to the individual components.

Understand the service procedures before performing the service.

Always apply the safety precautions listed below when servicing this refrigerator. Failure to follow these safety precautions can result in substantial property damage, severe personal injury, or death.

- Hazardous voltage can cause property damage, severe personal injury, or death. Disconnect both the AC and DC electrical sources to the refrigerator before performing service.
- Connect the positive battery lead to the refrigerator first, then the negative lead, to prevent short circuits.
- The 120 VAC circuit must be properly grounded. Never cut or remove the round grounding prong from the refrigerator's AC power cord. Do not use a two-prong adapter. Do not use an extension cord.

- The use of improper rated fuses can lead to an electrical fire. In the event of a circuit overload, replace blown fuses with a fuse specified by Norcold. Fuse specifications are found in the "Specification" section of this manual. The correct fuse size is printed on the refrigerator adjacent to the fuse.
- Keep liquids away from electrical connections. Many liquids are electrically conductive and could cause serious arcing damage and, in some cases, fires.
- Never bend, drop, drill, weld, or hammer the cooling unit. Doing so can cause the cooling unit to rupture, releasing chemicals under high pressure. Contact with these chemicals will cause irritation to the eyes or skin.
- Never attempt to repair or recharge the cooling unit. A defective cooling unit must be replaced.
- Hazardous vapors. Propane gas can cause an explosion resulting in property damage, severe personal injury, or death. Use caution when working with or near a propane gas system. Do not smoke. Do not create sparks or use an open flame to check gas supply lines or gas connections.
- To prevent gas leaks and damage to the gas supply lines and fittings, use two wrenches when connecting or disconnecting gas fitting (See Figure below).



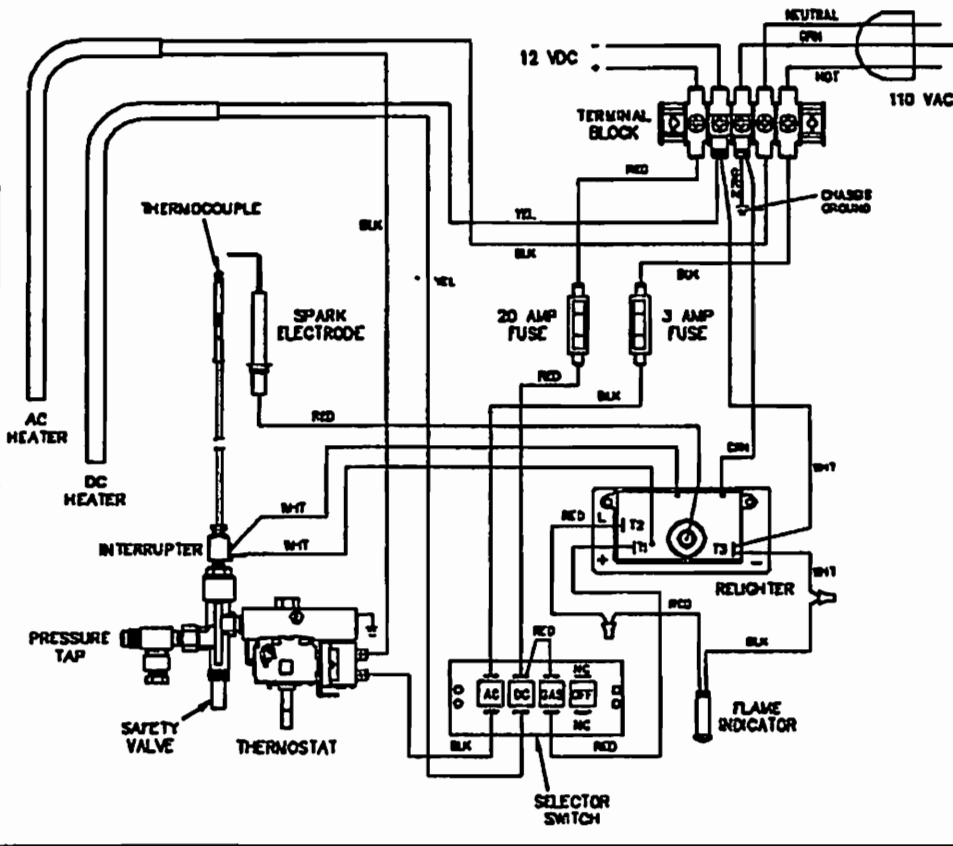
Double Wrenching Gas Fittings

DIAGNOSING COOLING PROBLEMS

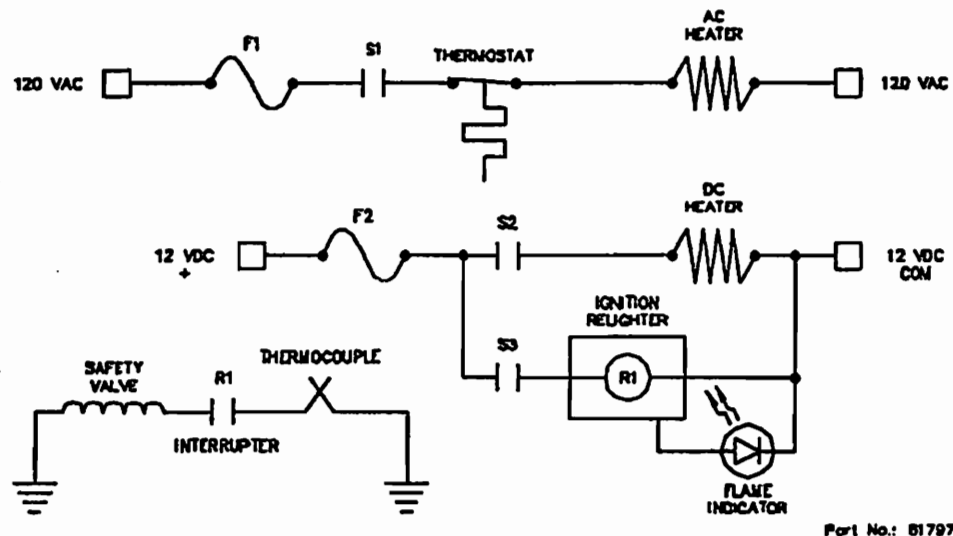
1. Make sure the cooling problem occurs while operating the refrigerator in each mode of operation. If not, the cooling problem is not the cooling unit. Refer to "Trouble Shooting" to determine cause for insufficient cooling on identified mode of operation.
2. Make sure the interior venting is not obstructed and is providing air circulation across the cooling unit's absorber coils and condenser fins.
3. An off-level situation, if the infraction is marginal, will allow the refrigerator to continue to operate at a reduced level of cooling until the refrigerator is leveled. Greater off-level situations will stop the refrigerant circulation and cease cooling. Normal vehicle leveling to provide comfort for the occupants is within the refrigerator's operating limits. The model 3163 installed in the EuroVan operating limits are 3 degrees off-level front-to-back and 6 degrees off-level side-to-side. Operating the refrigerator outside of these operating limits for an extended time will cause irreparable damage to the cooling unit.
4. Check the input voltages and gas pressure to insure correct heat input and voltage limits. The specifications are as follows:
 - a. 120 VAC - 108 VAC min. to 132 VAC max.
 - b. 12 VDC - 11.5 VDC min. to 15.4 VDC max.
 - c. Gas - 10.5" W.C. min. to 11" W.C.

Correct input voltages and propane gas supply are critical for the cooling unit to function properly.
5. Check the area of the cooling unit for refrigerant leaks. The smell of ammonia is a positive sign of a refrigerant leak. When an ammonia smell is detected, the cooling unit must be replaced. Another sign of a refrigerant leak is the appearance of a yellow powder in the vicinity of the cooling unit. When this powder is observed, the cooling unit must be replaced.
6. Check the absorber coils; the bottom coil will be warm and the top coil will be cooler. If the coils are cold and the flue enclosure is too hot to touch, there is a blockage in the cooling unit and the cooling unit must be replaced.

WIRING PICTORIAL - MODEL 3163



WIRING DIAGRAM - 3163



TROUBLESHOOTING

Condition	Course of Action
<p>1. Refrigerator will not operate on AC.</p> <p>Specifications: AC Voltage: 108-132 VAC Current Draw: 1.3 - 1.4 amps Heater Resistance: 81.7 - 90.3 ohms</p>	<ol style="list-style-type: none"> 1. Is the selector switch in the AC position? (Yes) Proceed to Step 2. (No) Set selector switch to AC. 2. Is thermostat at mid-range or higher? (Yes) Proceed to Step 3. (No) Set thermostat to mid-range or higher. 3. Check 15-amp AC circuit breaker. Reference "Load Center" in Electrical Section. Is breaker "tripped"? (Yes) Reset circuit breaker. (No) Proceed to Step 4. 4. Check GFI assembly. Reference "Power Cord with GFI Assembly" in Electrical Section. Is the GFI "tripped"? (Yes) Reset. (No) Proceed to Step 5. 5. Remove monitor panel to access top of refrigerator. See "Monitor Panel Removal" in Electrical Section. NOTE: It is not necessary to disconnect any wiring to the panel. Lift panel out and up and secure. Look through monitor panel opening to inspect the 110 AC cord. Is it plugged into the 110AC receptacle? (Yes) Proceed to Step 6. (No) Plug cord into receptacle. 6. Disconnect vehicle from 110 AC shoreline power. Inspect 3-amp AC fuse in black wire located on top of refrigerator. Is fuse good? (Yes) Proceed to Step 7. (No) Replace fuse. 7. Check for loose wire connections at terminal block located on top of refrigerator. Are connections tight? (Yes) Proceed to Step 8. (No) Tighten connections. 8. Connect vehicle to 110 AC shoreline power. Check for 110 AC voltage on AC wires at terminal block. Is voltage present? (Yes) Proceed to Step 10. (No) Proceed to Step 9. 9. Check for 110 AC voltage at 110-volt AC refrigerator receptacle. Is voltage present? (Yes) Replace 110-volt AC cord on refrigerator. (No) Troubleshoot circuit back to 15-amp breaker to determine cause of voltage loss. Repair as necessary.

10. Access AC heater element. See "Refrigerator Removal" in this section. NOTE: Stop at removal Step 11.

Check for 110-volt AC at AC heater leads. Is voltage present? (Yes) Replace AC heater. (No) Proceed to Step 11.

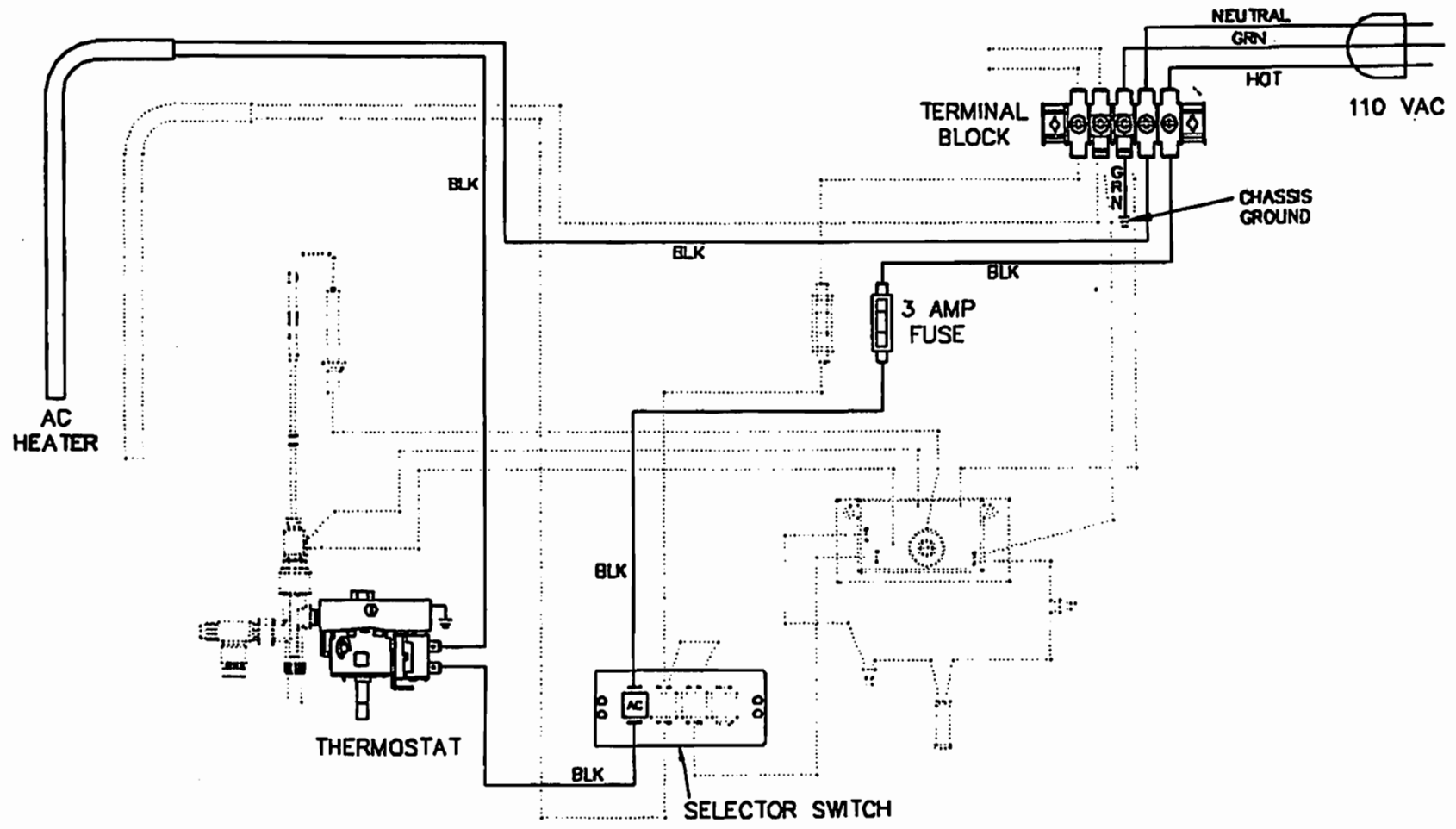
11. Check for 110-volt AC on black wire into selector switch. Is voltage present? (Yes) Proceed to Step 12 (No) Inspect black wire back to terminal block to determine cause of voltage loss. Repair as necessary.

12. Check for 110-volt AC on black wire out of selector switch. Is voltage present? (Yes) Proceed to Step 13. (No) Replace selector switch.

13. Check for 110-volt AC on black wire at input to thermostat. Is voltage present? (Yes) Proceed to Step 14. (No) Inspect black wire back to selector switch to determine cause of voltage loss. Repair as necessary.

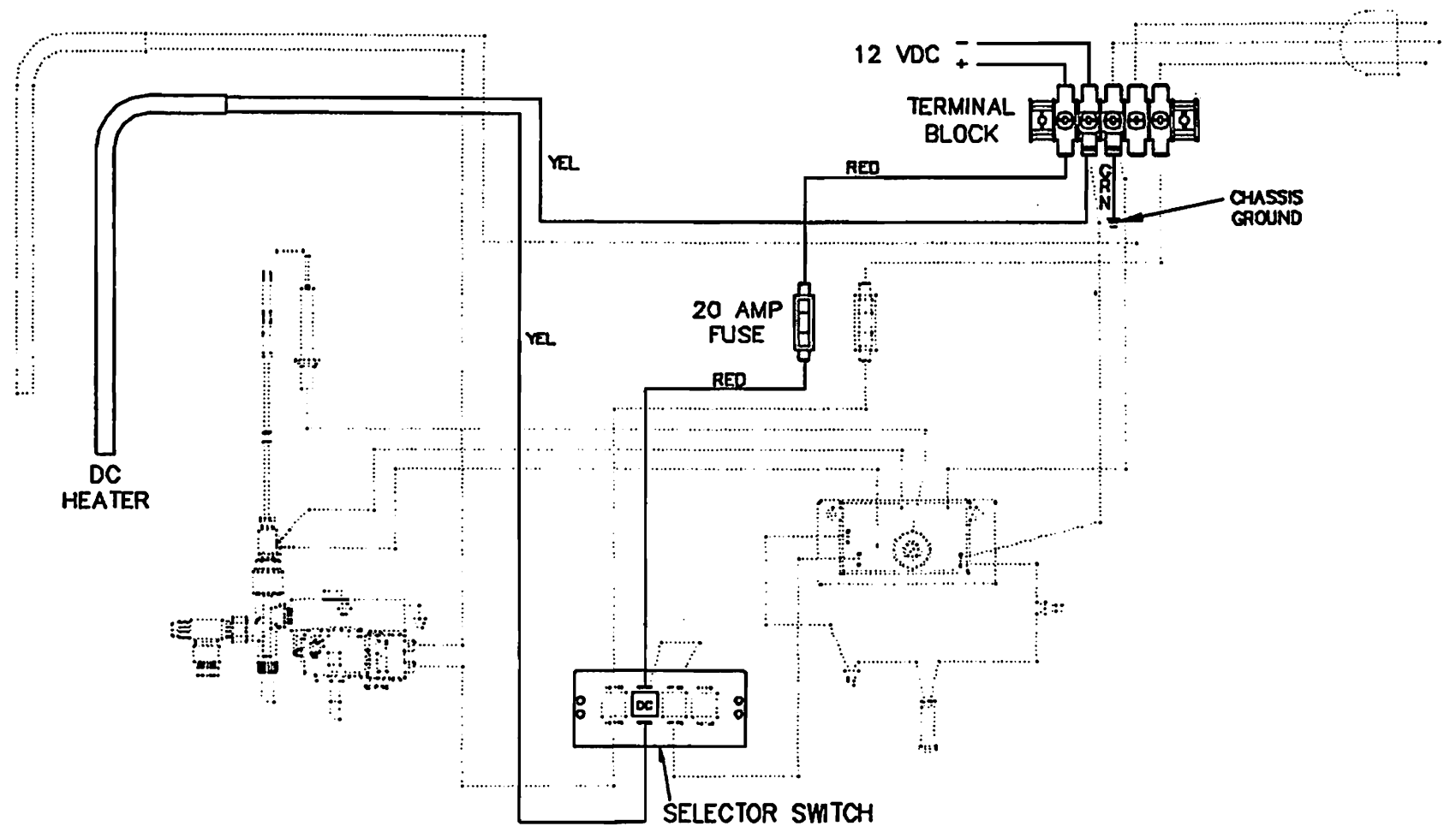
14. Check for 110-volt AC on black wire at output of thermostat. Is voltage present? (Yes) Replace AC heater. (No) Replace thermostat.

WIRING PICTORIAL — AC CIRCUIT MODEL 3163



Condition	Course of Action
<p>2. Refrigerator will not operate on DC electric.</p> <p>Specifications: DC Voltage: 11.5 - 15.45 VDC Current Draw: 11.7 - 13.6 amps Heater Resistance: .95 - 1.05 ohms</p>	<ol style="list-style-type: none"> 1. Is the selector switch set to DC? (Yes) Proceed to Step 2. (No) Set switch to DC. 2. Check 15-amp DC breaker that feeds ET wire. Reference "Load Center" in Electrical Section. Is breaker "tripped"? (Yes) Reset (No) Proceed to Step 3. 3. Remove monitor panel to access top of refrigerator. See "Monitor Panel Removal" in Electrical Section. NOTE: It is not necessary to disconnect any wiring to the panel. Lift panel out and up and secure. Check for loose 12-volt wire connections at terminal block on top refrigerator. Are connections tight? (Yes) Proceed to Step 4. (No) Tighten connections. 4. Check for 12-volt DC between red and yellow wires at terminal block. Is voltage present? (Yes) Proceed to Step 5. (No) Troubleshoot wires ET and EU to determine cause of voltage loss. Repair as necessary. 5. Check for 12-volt DC at input to 20-amp in-line fuse located on top of refrigerator. Is voltage present? (Yes) Proceed to Step 6. (No) Troubleshoot red wire back to terminal block to determine cause of voltage loss. Repair as necessary. 6. Check for 12-volt DC at output of 20-amp in-line fuse. Is voltage present? (Yes) Proceed to Step 7. (No) Replace 20-amp fuse. 7. Check for 12-volt DC on red wire feeding from 20-amp fuse at selector switch. Is voltage present? (Yes) Proceed to Step 8. (No) Troubleshoot red wire back to fuse holder to determine cause of voltage loss. Repair as necessary. 8. Check for 12-volt DC at yellow wire out of selector switch. Is voltage present? (Yes) Replace DC heater. (No) Replace selector switch.

WIRING PICTORIAL – DC CIRCUIT MODEL 3163



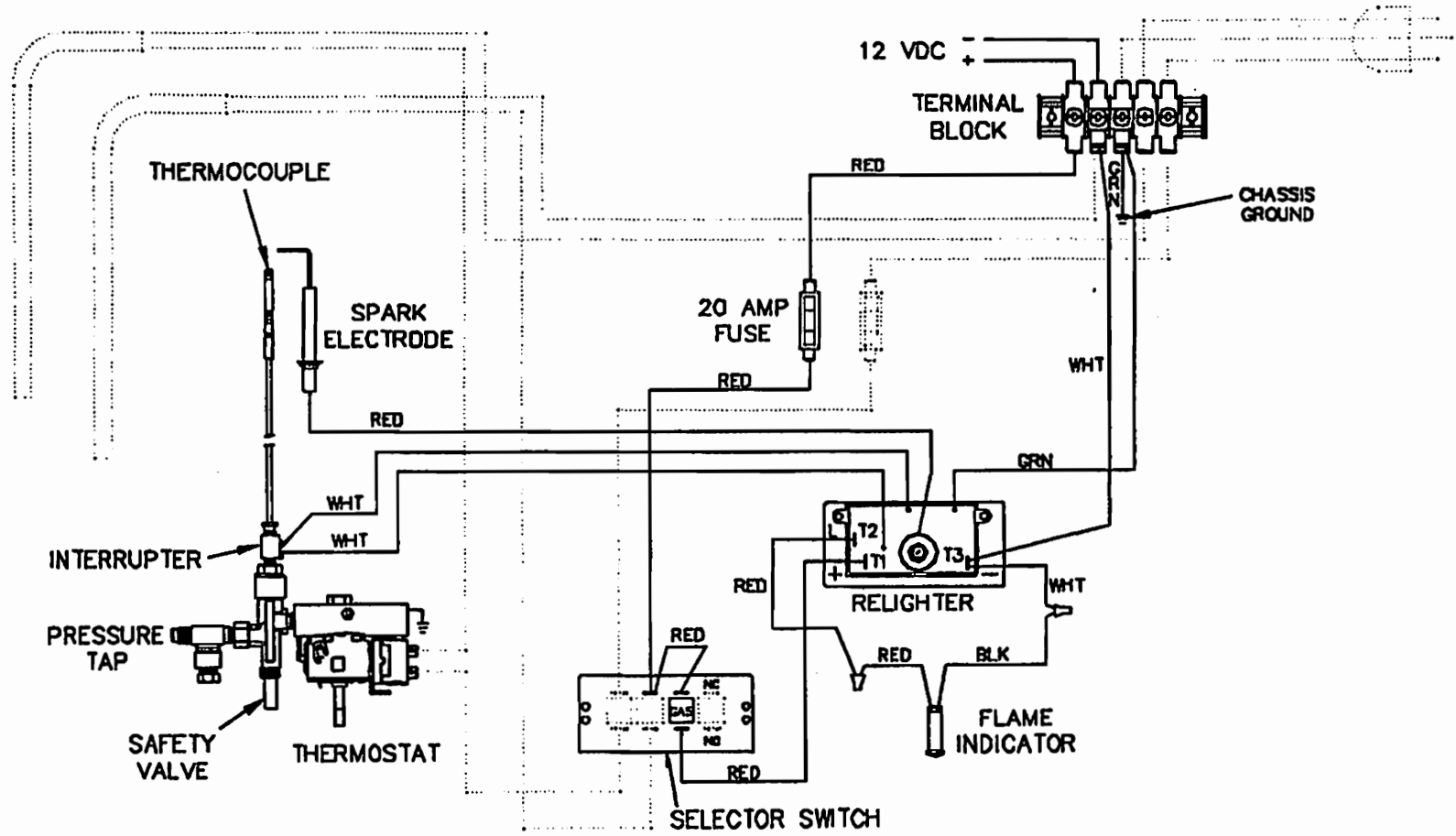
Condition	Course of Action
<p>3. Refrigerator does not operate on gas. No spark at burner.</p> <p>Specifications Gas Pressure: 10.5" W.C. - 11" W.C. DC Voltage: 10.5 - 15.4 VDC</p>	<ol style="list-style-type: none"> 1. Is the selector switch set to gas? (Yes) Proceed to Step 2. (No) Set selector switch to gas. 2. Check 15 amp. D.C. circuit breaker feeding the refrigerator. Breaker is located in the load center. Refer to "Wiring Diagram Body" in the Electrical section. Is the breaker "tripped"? (Yes) Reset circuit breaker. (No) Proceed to Step 3. 3. Remove monitor panel to access top of refrigerator. See "Monitor Panel Removal" in the Electrical section. Check for 12 volts D.C. on wire ET at terminal block on top of refrigerator. Is voltage present? (Yes) Proceed to Step 4. (No) Troubleshoot wire ET back to the load center to determine cause of voltage loss. Repair as necessary. 4. Check for 12 volts D.C. at input of 20 amp. fuse located on top of refrigerator. Is voltage present? (Yes) Proceed to Step 5. (No) Troubleshoot red wire back to terminal block to determine cause of voltage less. Repair as necessary. 5. Check for 12 volts D.C. at output of 20 amp fuse located on top of refrigerator. Is voltage present? (Yes) Proceed to Step 6. (No) Replace fuse. 6. Check for 12 volts D.C. on red wire at input to selector switch. Is voltage present? (Yes) Proceed to Step 7. (No) Troubleshoot red wire back to 20 amp fuse to determine cause of voltage loss. Repair as necessary. 7. Check for 12 volts DC on red wire at output from selector switch. Is voltage present? (Yes) Proceed to Step 8. (No) Replace selector switch. 8. Check for 12 volt D.C. between terminals T1(+) and T3(-) of the relighter. Is voltage present? (Yes) Proceed to Step 9. (No) Troubleshoot red wire back to selector switch and white wire to ground to determine cause of voltage loss. Repair as necessary. 9. Remove spark electrode wire from relighter. Install a short jumper wire from relighter to within 1/8" of ground. Attempt to light the refrigerator. Does the relighter spark? (Yes) Proceed to Step 10. (No) Replace relighter.

Condition	Course of Action
	<p>10. Remove refrigerator. See "Refrigerator Removal" in this section. Place refrigerator on bench. Hook up LP gas and 12 volt electrical connections.</p> <p>Check electrode alignment. Electrode should be positioned between 1/16" to 1/8" above the burner. Is electrode within specification? (Yes) Proceed to Step 11. (No) Adjust electrode.</p> <p>11. Disconnect electrode from relighter. Perform a continuity test on the electrode. Reading must be infinity. If reading is not infinity, replace the electrode.</p>

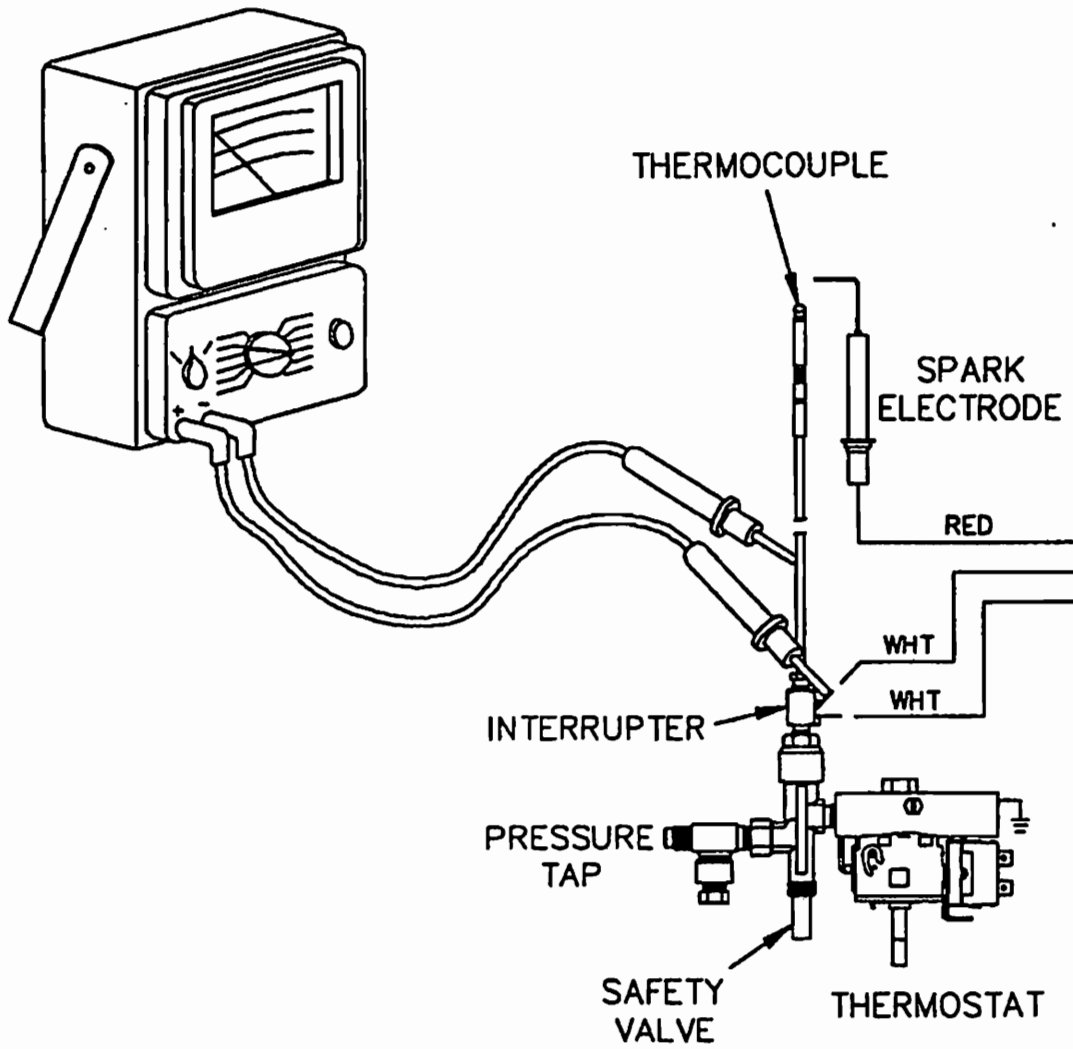
Condition	Course of Action
<p>4. Refrigerator does not operate on gas. Burner ignites but flame will not hold.</p>	<ol style="list-style-type: none"> 1. Remove monitor panel to access top of refrigerator. Refer to "Monitor Panel Removal" in the Electrical Section. Check for D.C. voltage between wires EU and ET at terminal block on top of refrigerator. Is reading between 10.5 and 15.4 volts D.C. (Yes) Proceed to Step 2. (No) Troubleshoot wires EU and ET to determine cause of voltage loss. Repair as necessary. 2. Check valve at LP tank. Is it "on"? (Yes) Proceed to Step 3. (No) Turn on gas supply. 3. Check manual shut-off valve on top of refrigerator. Is it "on"? (Yes) Proceed to Step 4. (No) Turn on manual valve. 4. Check vent terminal housing. Is it free from obstructions? (Yes) Proceed to Step 5. (No) Clean as necessary. 5. Check main gas pressure at line feeding into thermostat. Is pressure between 10.5" - 11" water column? (Yes) Proceed to Step 6. (No) Adjust main gas pressure. 6. Set thermostat to maximum setting. Check gas pressure at pressure tap tee. Is pressure between 10.5" - 11" water column? (Yes) Proceed to Step 7 (No) Replace thermostat. 7. Remove refrigerator. See "Refrigerator Removal" in this section. Place refrigerator on bench. Hookup LP gas and 12 volt electrical connections. Check thermocouple. Tip of thermocouple should be free of carbon and physically located in the flame. Is thermocouple clean and properly positioned? (Yes) Proceed to Step 8. (No) Clean and/or adjust as necessary. 8. Check thermocouple connection at the interruptor. Is it tight? (Yes) Proceed to Step 9. (No) Tighten connection.

Condition	Course of Action
	<ol style="list-style-type: none"> 9. Check interrupter connection at the safety valve. Is it tight? (Yes) Proceed to Step 10. (No) Tighten connection. 10. Inspect (2) white wires from relighter to interrupter. Are they secure, tight, and undamaged? (Yes) Proceed to Step 11. (No) Secure, tighten, or repair as necessary. 11. Remove (2) white wires from the interrupter. Connect a jumper wire across the interrupter terminals. Does the flame hold? (Yes) Replace relighter. (No) Proceed to Step 12. 12. Check for mili-volts at terminals of interrupter. (See Figure "Checking Milli-Volts") <ul style="list-style-type: none"> ● If there are no milli-volts present on both terminals. Proceed to Step 13. ● If there are 10-15 milli--volts present on both terminals. Proceed to Step 14. ● If there are 16-30 milli-volts present on one terminal and 0 milli-volts on the other. Proceed to Step 15. ● If there are 16-30 milli-volts present on both terminals. Proceed to Step 14. 13. Replace thermocouple. 14. Replace safety valve. 15. Replace interrupter.

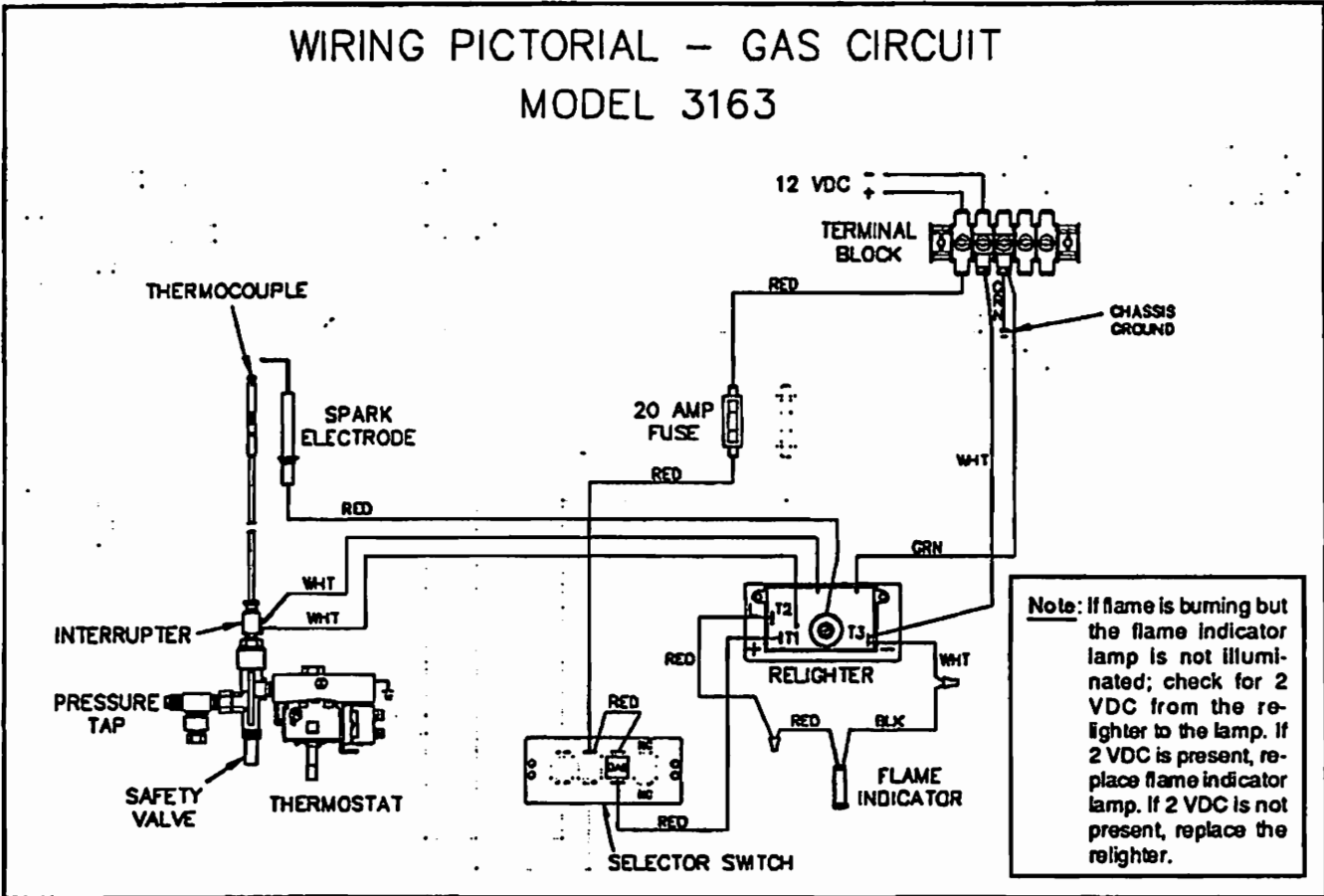
WIRING PICTORIAL – GAS CIRCUIT MODEL 3163



Rialta



Condition	Course of Action
5. Flame is burning but flame indicator lamp is not illuminated.	<ol style="list-style-type: none"> 1. Remove monitor panel. See "Monitor Panel Removal" in Electrical Section. 2. Check for 2 volts DC at terminal T2 of the relighter. Is voltage present? (Yes) Replace indicator lamp. (No) Replace lighter.



Refrigerator Removal:

1. Turn "OFF" gas supply at the main tank and turn refrigerator to "OFF".
2. Remove refrigerator's system cover on left front of refrigerator by removing (5) retaining screws.
3. Remove (5) refrigerator retaining screws.
4. Remove drawer directly above the refrigerator.
5. Turn the refrigerator's manual shutoff valve "OFF" and disconnect the LP gas supply piping at the manual shutoff valve located on top of the refrigerator.
6. Disconnect the 12-volt supply wires to the terminal block located on top of the refrigerator.
7. Disconnect the refrigerator's AC power cord from the receptacle.
8. Open the cabinet door to the left of the refrigerator. Remove access panel at the rear of the cabinet. This allows access to the flexible piping of the vent system.
9. Remove the hex head screw of retaining washer which secures the flexible piping to the vent terminal housing. Remove retaining washer.
10. Remove both flexible piping from the vent terminal housing by pulling forward. Care should be taken as to not damage the "o" ring seal upon removal.
11. Remove right dinette assembly cover panel to access refrigerator retaining bracket. Reference "Right Dinette Assembly Cover Panel Removal" in Interior Section.
12. Loosen and remove refrigerator retaining screws located at rear base of refrigerator.
13. Remove the refrigerator from vehicle.

Refrigerator Replacement:

1. Place refrigerator into enclosure and slide back to permanent location.
2. Secure refrigerator retaining bracket with screws.
3. Install right dinette assembly cover panel. Reference "Right Dinette Assembly Cover Panel Replacement" in Interior Section.
4. Connect the refrigerator's flexible piping to vent terminal housing and secure with retaining washer and screw.

CAUTION: Insure the correct location of piping. The pipe with insulating material must be connected to the bottom opening of the vent terminal housing.

5. Reinstall the cabinet access panel.
6. Connect the AC power cord into the receptacle.
7. Connect the 12-volt supply to the refrigerator's terminal block.
8. Connect the LP gas supply to the refrigerator's manual shutoff valve and turn valve "ON". Turn on gas at main supply tank. Leak test connection at the manual shutoff valve. See "Soapy Solution Leak Test" in Liquid Propane Section. **Do not test for leaks with an open flame.**
9. Secure refrigerator with (5) retaining screws.
10. Reinstall refrigerator's system cover with (5) screws.
11. Restart refrigerator.

ELECTRIC WATER HEATER

The electric water heater utilizes a 110-volt power supply which is supplied to a heating element inside the tank. The element heats the water which is then supplied to the galley and bathroom faucets and the shower.

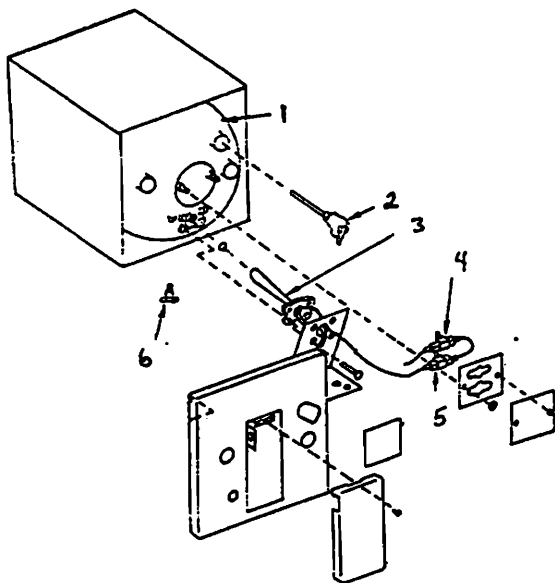
The water heater also contains the motoraid function. Which allows warmed engine coolant to pass around the water tank. This function only applies when the vehicle engine is running.

Major components include:

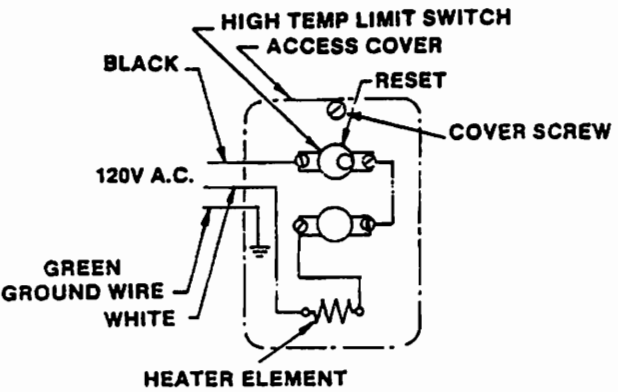
1. Tank
2. Relief Valve
3. Heating Element
4. Hi-Limit Switch
5. Thermostat
6. Drain Plug
7. On/Off Switch

Sequence of operation:

- Remote switch is placed in the "on" position. 110-volt current is then supplied to the thermostat.
- The thermostat senses the temperature of the water. If it is below the set value, the thermostat allows current to pass to the heating element.
- Current passes through the heating element warming the water. When the thermostat senses that water temperature passes above the set value, current to the element is shut off.
- If the thermostat fails to cut off current to the heater element when the water temperature exceeds the set value, the hi-limit switch will cut off power to the element when the water temperature reaches approximately 190°F. *The hi-limit switch has a manual reset button.
- In the event that both the thermostat and the hi-limit switch should fail; the pressure temperature relief valve will open at approximately 210°F or 125 psi.



TROUBLESHOOTING

Condition	Action
<p>1. No heating of water.</p> 	<ol style="list-style-type: none"> 1. Check for 110-volt AC on black wire feeding the hi-limit switch. Is 110-volt AC present? (Yes) Proceed to Step 2. (No) Trace line back to 110-volt AC source to find reason for power loss. Repair as necessary. 2. Manually reset the hi-limit switch by: <ol style="list-style-type: none"> A. Placing the remote switch to the "off" position. B. Depressing the red button on the hi-limit switch. C. Placing the remote switch in the "on" position. <p>Does the water heater produce heated water? (Yes) Proceed to Step 3. (No) Proceed to Step 4.</p> 3. Disconnect 110-volt AC. Remove thermostat from water heater. Use a heat gun to carefully heat thermostat to 140°F. Take a resistance reading across thermostat terminals. Does test indicate any "open"? (Yes) Reinstall thermostat and place water heater back in service. (No) Replace defective thermostat. 4. Check for 110-volt AC at the thermostat end of wire between hi-limit switch and thermostat. Is 110-volt AC present? (Yes) Proceed to Step 5. (No) Replace defective hi-limit switch. 5. Check for 110-volt AC at wire leading from thermostat to heating element. Is 110-volt AC present? (Yes) Proceed to Step 7. (No) Proceed to Step 6. 6. Disconnect 110-volt AC power. Allow water heater to cool down below 100°F. Check for continuity through the thermostat. If there is no continuity, replace defective thermostat. 7. Disconnect 110-volt AC power. Disconnect wires from terminals on heating element. Take a resistance reading across element terminals. Does test indicate an "open"? (Yes) Replace defective element. (No) Visually inspect white wire leading from element for damage.

Condition	Action
<p>2. Excessive water temperature.</p>	<ol style="list-style-type: none"> 1. Please note that before beginning diagnosis, it should be determined that the excessive water temperature condition is occurring when the heater is using 110-volt AC power. On units equipped with the motoraid option, the occurrence of excessively hot water is possible after the vehicle has been driven for two hours. If the condition is not thought to be caused by extended driving, proceed to Step 2. 2. Check thermostat to see if it is loose. Is the thermostat making firm contact with the tank? (Yes) Proceed to Step 3. (No) Tighten thermostat retaining nuts. 3. Disconnect 110-volt AC power. Disconnect and remove thermostat. Using a heat gun, carefully heat the thermostat terminals. Does this test indicate an open circuit? (Yes) Thermostat is operating properly. To lower water temperature, replace thermostat with a lower rated thermostat. (No) Replace defective thermostat.

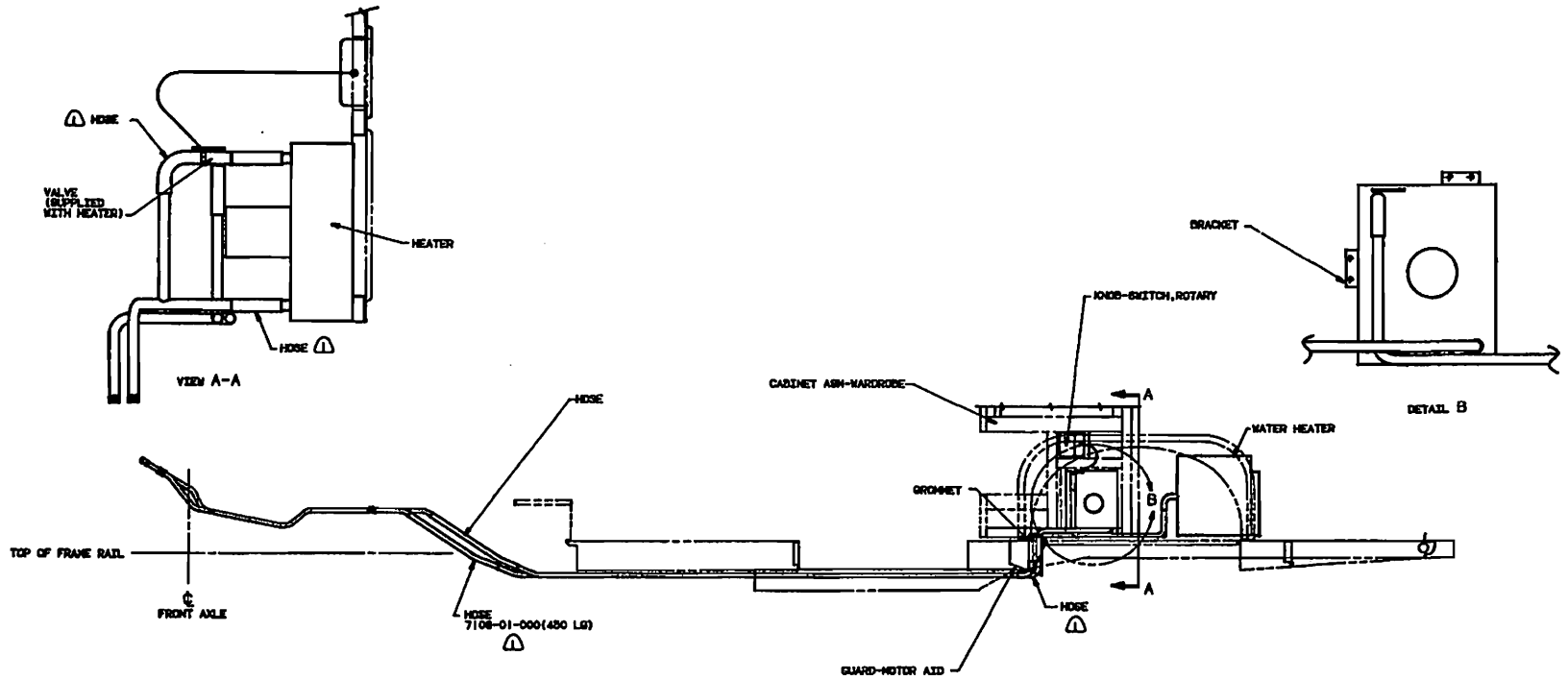
Condition	Action
<p>3. The relief valve leaks or drips.</p>	<ol style="list-style-type: none"> 1. Weeping or dripping of the relief valve during water heater operation does NOT indicate a defective relief valve. The water heater tank is designed with an internal air gap at the top of tank. In time, the normal expansion caused by heating water allows the air cushion to be absorbed. To remedy a weeping or dripping valve, perform the following steps: <ol style="list-style-type: none"> A. Turn off water heater. B. Turn off incoming water supply. C. Open a faucet in the coach. D. Pull handle of relief valve straight out and allow water to flow until it stops. E. Allow relief valve to snap, close faucet, turn on water supply.


WATER HEATER REMOVAL:

1. Disconnect vehicle from 110-volt AC power.
2. Turn water pump off.
3. Allow water heater to cool off.
4. Remove the left dinette seat. Reference "Dinette Seat Removal" in interior section.
5. Remove water heater access panel. Note location of wire connections for ease of later installation. Disconnect 110-volt AC wires.
6. Open a hot water faucet to relieve pressure in water heater. Open water heater drain petcock and drain water heater. (Drain located under converter.)
7. Disconnect water inlet and outlet lines.
8. Disconnect water heater drain line.
9. Disconnect hose from relieve valve.
10. Disconnect (2) motor-aid lines from water heater and clamp them off.
11. Remove (4) water heater retaining screws.
12. Remove water heater.

WATER HEATER REPLACEMENT:

1. Place water heater in position under left dinette.
2. Secure with (4) retaining screws.
3. Connect (2) motor-aid lines and secure with hose clamps.
4. Connect hose to relief valve. Secure with hose clamp.
5. Connect water heater drain line. Make certain drain is closed.
6. Connect inlet and outlet water lines.
7. Connect 110-volt AC wires as noted in Step 5 of Water Heater Removal. Replace water heater access cover.
8. Replace left dinette seat. Reference "Dinette Seat Replacement" in Interior Section.



 TORQUE TO 0.2 ±0.00 de Nm (17.5 AS In-Lb).
NOTES:

MOTOR AID INSTL

Pialta

MOTOR AID HEATER

The motor aid heater uses heat generated by the vehicle engine to provide heated air to the cabin of the vehicle.

The motor aid unit receives heated engine coolant. The coolant passes through a heater core. Where a fan blows air across the core which warms the air. Coolant is then returned to engine cooling system.

Coolant flow into the motor aid unit is controlled by a heater control valve. The control for the valve is located on the face of the wardrobe cabinet.

The blower motor is controlled by a switch in the dash.

MOTOR AID HEATER REMOVAL

CAUTION

Allow vehicle engine coolant system to cool down before attempting any repairs to the motor aid system.

1. Remove the upper shelf from the wardrobe cabinet by gently pulling upward to release the retaining velcro.
2. Remove (6) lower wardrobe cabinet shelf retaining screws. Remove the lower shelf from the wardrobe cabinet.
3. Clamp off the coolant intake and outlet hoses at the motor aid unit with locking pliers.
4. Loosen hose clamps and remove coolant intake and outlet hoses.
5. Disconnect 12 volt DC wiring at connector near motor aid unit.
6. Remove (4) motor aid retaining screws. Lift motor aid unit up and out of cabinet.

MOTOR AID HEATER REPLACEMENT

1. Place motor aid unit in proper position inside the wardrobe cabinet.
2. Secure motor aid unit with (4) retaining screws.
3. Connect 12 volt DC wiring at connector at motor aid unit.
4. Install coolant inlet and outlet hoses to motor aid unit. Secure with hose clamps.
5. Release locking pliers.
6. Install lower shelf in wardrobe cabinet and secure with (6) retaining screws.
7. Install upper shelf in wardrobe cabinet. Secure by firmly pressing down to seat the velcro.

TROUBLESHOOTING REAR MOTOR AID

Condition	Course of Action
<p>1. No low speed fan operation. Other fan speeds normal.</p>	<p>1. With ignition key "on" and heater switch in "low" position. Check for 12 volts DC on wire "KU" at the switch. Is voltage present? (Yes) Proceed to Step 2. (No) Replace switch.</p> <p>2. With ignition key "on" and heater switch in "low" position. Check for 12 volts DC on wire "KU" at the resistor pack on heater. Is voltage present? (Yes) Replace resistor pack. (No) Troubleshoot wire "KU" to determine cause of voltage loss. Repair or replace as necessary.</p>
<p>2. No medium speed fan operation. Other fan speeds normal.</p>	<p>1. With ignition key "on" and heater switch in the "medium" position. Check for 12 volts DC on wire "KT" at the switch. Is voltage present? (Yes) Proceed to Step 2. (No) Replace switch.</p> <p>2. With ignition key "on" and heater switch in the "medium" position. Check for 12 volts DC on wire "KT" at the resistor pack on heater. Is voltage present? (Yes) Replace the resistor. (No) Troubleshoot wire "KT" to determine cause of voltage loss. Repair or replace as necessary.</p>
<p>3. No high speed fan operation. Other fan speeds normal.</p>	<p>1. With ignition key "on" and heater switch in "high" position. Check for 12 volts DC on wire "KS" at the switch. Is voltage present? (Yes) Troubleshoot wire "KS" to splice near rear heater to determine cause of voltage loss. Repair or replace as necessary. (No) Replace switch.</p>

TROUBLESHOOTING REAR MOTOR AID

Condition	Course of Action
<p>4. No fan operation at any speed.</p>	<ol style="list-style-type: none"> 1. With ignition key "on" check for 12 volts DC on wire "WH" at the heater switch. Is voltage present? (Yes) Proceed to step 2. (No) Troubleshoot wire "WH" to determine cause of voltage loss. Repair or replace as necessary. 2. With ignition key on and heater switch in high position, check for 12 volts DC on wire "KS" at switch. Is voltage present? (Yes) Proceed to step 3. (No) Replace switch. 3. With ignition key on and heater switch in high position, check for 12 volts DC on wire "KS" at blower motor. Is voltage present? (Yes) Proceed to Step 4. (No) Troubleshoot wire "KS" to determine cause of voltage loss. Repair or replace as necessary. 4. With ignition key on and heater switch in high position, jumper a wire from wire "PA" connection at motor to a known good ground. Does fan operate? (Yes) Troubleshoot wire "PA" to determine cause for loss of ground. Repair or replace as necessary. (No) Replace motor.
<p>5. Heater continually radiates heat.</p>	<ol style="list-style-type: none"> 1. Is heater control knob in the "off" position. (Yes) Proceed to Step 2. (No) Place knob in "off" position. 2. Adjust heater control valve to allow it to completely close.

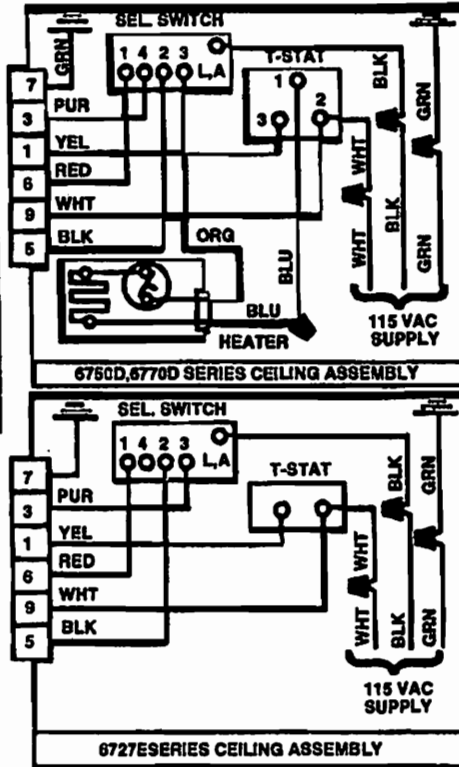
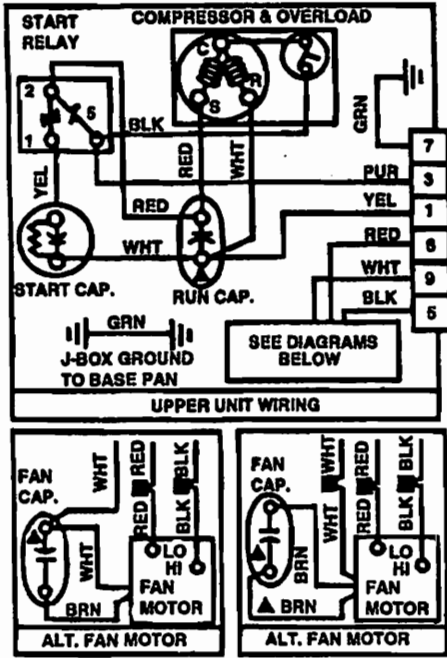
ROOF AIR CONDITIONER

The roof air conditioner is a self contained unit that is powered by 110 volt AC. It provides cooled air to the interior of the vehicle.

The following service information is intended for professional air conditioning technicians who are properly certified as outlined in Section 608 of the Clean Air Act. Do NOT attempt to service the air conditioning unit if you are not properly trained and certified.

IMPORTANT: It is the technicians responsibility to be aware of federal, state, and local regulations regarding the servicing of air conditioning sytem.

FOR 6727D700; 6727-800; 6727A800;
6727-730; 6759D700; 6759E707; 6750-800;
6770D700; 6770-717; 6770A717



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TROUBLESHOOTING

Condition	Course of Action
<p>1. Roof A/C inoperative. No fan or compressor operation.</p>	<ol style="list-style-type: none"> 1. Check for 115-volts AC between the black wire (Hot) feeding into the selector switch and the white wire (Neutral) feeding into the thermostat. (See appropriate wiring diagram.) Is voltage present? (Yes) Proceed to Step 3. (No) Proceed to Step 2. 2. Check for 115-volts AC between black wire feeding selector switch and ground. Is voltage present? (Yes) Inspect white wire from thermostat back to the control center to determine cause of voltage loss. Repair as necessary. (No) Inspect black wire back to control center for cause of voltage loss. Repair as necessary. 3. Check for 115-volts AC between the high speed fan wire at the control switch and the white wire feeding into the thermostat. Is voltage present? (Yes) Check white wire connections at thermostat. Clean and repair as necessary. (No) Proceed to Step 4. 4. Check for 115-volts AC between high speed fan wire at the control switch and ground. Is voltage present? (Yes) Check white wire connections at the thermostat. Clean and repair as necessary. (No) Replace defective control switch.

TROUBLESHOOTING

Condition	Course of Action
<p>2. Inadequate cooling. Compressor and fan run*.</p> <p>*As long as the approximate 15- to 20-degree temperature difference is being maintained, the air conditioner is working at capacity.</p> <p>When the air conditioner is working at capacity and the desired inside temperature cannot be maintained, then the RV is absorbing or gaining heat faster than the air conditioner is designed to remove it.</p> <p>Parking the vehicle in a shaded area, keeping windows and doors shut, and avoiding the use of heat producing appliances will help to reduce the heat gain.</p> <p>If more cooling capacity is desired, then the use of a larger air conditioner, or the addition of a second one is required.</p> <p>When measuring the air temperature difference, all air conditioning components must be installed. Such as: duct collar, ceiling assembly, and the ceiling assembly plastic shroud. Temperature readings must be taken at the ceiling assemblies plastic shroud return air openings and discharge air openings.</p> <p>The ability of the air conditioner to maintain the desired inside temperature depends on the heat gain of the recreational vehicle.</p> <p>The size of the vehicle, amount of window area, amount of insulation, amount of direct exposure to the sun, outside temperature, and the number of people in the vehicle may increase the heat gain to such an extent that the capacity of the air conditioner is exceeded.</p> <p>As a general rule, air entering the ceiling assembly return air grills will be cooled between 15 to 20 degrees (this varies due to fluctuating outdoor temperatures and humidity conditions).</p> <p>For example, if the air entering the ceiling assembly return air grills at 80°F, the air leaving the ceiling assembly discharge openings will be cooled to between 60°F and 65°F.</p>	<ol style="list-style-type: none"> 1. Check control switch, place switch in high cool position, operate air conditioner for 15 minutes, remove shroud, and observe suction line. Is it frosted? (Yes) Evaporator is not picking up the heat load. Proceed to Step 2. (No) Suspect a low charge or a plugged cap tube. 2. Check filters. Are they clean and unrestricted? (Yes) Proceed to Step 3. (No) Clean or replace as necessary. 3. Check for dirt build-up on the evaporator coil. Is the evaporator clean? (Yes) Proceed to Step 4. (No) Carefully clean evaporator with compressed air. If compressed air does not sufficiently clean the evaporator, the unit may be removed from the vehicle and the evaporator washed with detergent and water. (Cover the fan motor and electrical controls with a plastic sheet to protect them.) After system is cleaned, allow several hours for drying time before operation. 4. Check blower wheel for proper operation. Is blower wheel loose or wobbly? (Yes) Repair or replace as necessary. (No) Blower motor may not be coming up to speed, proceed to Step 5. 5. Check for shorted or open fan capacitor. Refer to Capacitor Test Procedure in Appendix E. 6. Check for partially burned motor windings. Refer to Fan Motor Check Procedure in Appendix D.

TROUBLESHOOTING

Condition	Course of Action
<p>3. Fan runs on high or low cool, but compressor does not run or hum.</p>	<ol style="list-style-type: none"> 1. Set thermostat to coldest setting. Make sure coach is at room temperature of higher (72°F +). Refer to appropriate wiring diagram. Disconnect plug from control assembly, perform a continuity between Pins 2 and 3 of the thermostat. Does test indicate continuity? (Yes) Proceed to Step 2. (No) Replace defective thermostat. 2. Place control switch in the high or low cool position. Check for 115-volts AC on purple wire at switch. Is voltage present? (Yes) Proceed to Step 3. (No) Replace defective switch. 3. With control switch in the high or low cool position, check for 115-volts AC on common terminal of the compressor. Is voltage present? (Yes) Test compressor. Refer to Appendix A, replace as necessary. (No) Proceed to Step 4. 4. Check for 115-volts AC on black wire feeding compressor overload. Is voltage present? (Yes) replace overload. (No) Trace circuit back to control switch to determine cause of voltage loss. Repair as necessary.

TROUBLESHOOTING

Condition	Course of Action
<p>4. Fan runs on high or low cool, compressor hums.</p>	<p>1. Check voltage:</p> <ul style="list-style-type: none"> a. Check the voltage between #1 on the overload switch and the R terminal of the compressor while it is not humming. This voltage must be 115 volts plus or minus 10%. b. Check the voltage from 'C' to 'R' of the compressor while it is humming (trying to start). The latter reading will probably be lower, but it still must be 103.5 volts minimum (115 volts - 10%). <p>If the first reading is above 103.5 volts and the second is under 103.5 volts, there is too much voltage drop in the lines - a situation which must be corrected for the air conditioner to perform safely and satisfactorily.</p> <p>Is voltage within specifications? (Yes) Proceed to Step 2. (No) Repair as necessary.</p> <ul style="list-style-type: none"> 2. Check compressor start capacitor (refer to Capacitor Test Procedure in Appendix E). Does capacitor pass test? (Yes) Proceed to Step 3. (No) Replace capacitor. 3. Check potential start relay (refer to Appendix A). Does relay pass test? (Yes) Proceed to Step 4. (No) Replace relay. 4. Check for "open" or "grounded" compressor start winding (refer to Compressor Motor Check Procedure in Appendix L). Does compressor pass test? (Yes) Proceed to Step 5. (No) Replace compressor. 5. Compressor is mechanically stuck, attempt to free using an "Annie" Model 12 or equivalent.

TROUBLESHOOTING

Condition	Course of Action
<p>5. Breaker trips when compressor operation is requested.</p>	<ol style="list-style-type: none"> 1. Check collar connecting blower outlet to ceiling assembly. Is collar allowing ducted air to escape? (Yes) Repair or replace. (No) Proceed to Step 2. <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px 0;"> <p>CAUTION</p> <p>Whenever taking an ohm reading, power to the circuit must be turned off.</p> </div> <ol style="list-style-type: none"> 2. Check resistance on compressor power wire (refer to appropriate wiring diagram). Disconnect compressor power wire from selector switch and Terminal 'C' of the compressor. Take an ohm reading on the power wire. Does test indicate a high resistance? (Yes) Inspect wire to find short. Repair or replace as necessary. (No) Proceed to Step 3. 3. Check for shorted compressor motor winding. Refer to Appendix L Compressor Motor Check Procedure. Does compressor pass test? (Yes) Proceed to Step 4. (No) Replace compressor. 4. Check compressor run and start capacitors. Refer to Appendix E Capacitor Test. Do capacitors pass test. (Yes) Proceed to Step 5. (No) Replace faulty capacitor(s). 5. Disconnect wires from 'S' and 'R' terminals at compressor and from terminals on compressor start and run capacitors. Ohm check wires. Does test indicate high resistance on any wires? (Yes) Repair or replace wires as necessary. (No) Proceed to Step 6. 6. Ohm check wire from compressor run capacitor to thermostat, perform an ohm test on wire. Does test indicate high resistance? (Yes) Inspect wire to determine cause of short. Repair or replace as necessary. (No) Proceed to Step 7. 7. At this point, suspect a faulty circuit breaker. Replace breaker.

TROUBLESHOOTING

Condition	Course of Action
<p>6. Compressor cycles on and off resulting in inadequate cooling.</p>	<ol style="list-style-type: none"> 1. Check thermostat bulb. Is it touching metal? (Yes) Reposition to clear any metal. (No) Proceed to Step 2. 2. Inspect collar connecting blower outlet to ceiling assembly. Is collar too short or bent, allowing ducted air to escape? (Yes) Repair or replace as necessary. (No) Proceed to Step 3. 3. Check compressor amp draw. Take amp reading on black wire from potential relay to compressor with compressor running. Compare reading to FLA rating on air conditioner specification tag. Is amp draw within specification? (Yes) Proceed to Step 4. (No) Proceed to Step 8. 4. When compressor has cycled off, check for AC voltage at Terminal C of the compressor. Is voltage present? (Yes) Proceed to Step 4. (No) Proceed to Step 8. 5. Check thermostat calibrations. While the compressor is not running and with power on, check for voltage between terminals #2 (white wires) and #3 (yellow wires) on A models - between the two terminals on B or dash models. If the meter reads 115 volts, the thermostat is out of calibration and it must be replaced. If thermostat passes test, proceed to Step 6. 6. Inspect yellow wire from thermostat to compressor run capacitor for an intermittent open, pay close attention to connector. Repair or replace as necessary. 7. Suspect a low charge or plugged capillary tube. The compressor is dependent on a good supply of cool suction gas for cooling. If the system charge is low, there will be less than a normal amount of refrigerant passing through the compressor, less compressor heat will be carried away by the refrigerant; and therefore, the compressor will overheat.

TROUBLESHOOTING

Condition	Course of Action
	<p>NOTE: LOW CHARGE WILL NOT CAUSE OVER CURRENT. It will, in fact, cause the current to be low.</p> <p>Indicators of low charge are:</p> <ol style="list-style-type: none"> a. The evaporator will be starved for liquid refrigerant so the suction line and a portion of the evaporator coil will be warmer than normal. This is the condition we refer to as too much super heat. How much of the evaporator coil will be starved for liquid refrigerant depends on the degree of under charge. b. The active portion of the evaporator coil which does have some liquid refrigerant will be colder than normal and many times will frost because the suction pressure will be low. How much of the coil is active also depends on the degree of under charge. c. The discharge temperature will be noticeably higher than normal. d. The compressor temperature will be noticeably higher than normal. <p>NOTE: Unless the thermal current overload switch saves the system, these last two indicators (C and D) are sure to burn the system out. The high temperature at the discharge port will destroy the refrigerant and oil, and the high compressor temperature will burn up the compressor motor windings.</p> <ol style="list-style-type: none"> 8. Check voltage between C and R terminals of the compressor while it is running. Is AC voltage between 103.5 volts and 126.5 volts? (Yes) Proceed to Step 9. (No) Remedy cause of high or low voltage. 9. Check condenser coil. Is it "dirty" or obstructed? (Yes) Clean as necessary. (No) Proceed to Step 10. 10. Check condenser fan for looseness and damage. Repair as necessary. Does condenser fan operate at proper speed? (Yes) Proceed to Step 11. (No) Test fan motor (reference Fan Motor Check Procedure in Appendix D). Test fan capacitor (reference Capacitor Test in Appendix E). Replace as necessary.

TROUBLESHOOTING

Condition	Course of Action
	<p>11. Suspect an overcharge or non-condensables (air) in the system.</p> <p>Either an overcharge of refrigerant or non-condensables in the system will cause <i>high</i> head pressure and consequently excessive current. Be especially suspicious of one or both of these conditions if you discover evidence of the system having been open (service valves in the system, extra pinch off marks, etc.).</p> <p>The indications of overcharge are:</p> <ol style="list-style-type: none"> a. Over current. b. Cooler than normal suction line. With an over-charge, the suction line will usually sweat all the way to the compressor and even the compressor housing can sometimes sweat. c. Cooler than normal discharge line. The discharge line should be highly superheated and, therefore, at high temperature. When the outdoor temperature is above 85°, and the system has been in operation for ten minutes or longer, if you touch the discharge line and it burns your fingers, that is as it should be. If you can hold on to it for a second or two with any degree of comfort, it is probably too cool because the system is over-charged and the compressor is running flooded. This condition will nearly always accompany a cooler than normal suction line. <p>Feeling lines with your fingers is a very inexact method of gathering information and cannot be considered accurate. So use this information only to form judgement in your diagnosis of trouble and consider as many indicators as possible in coming to a conclusion.</p> <p>The indications of non-condensables in the system are:</p> <ol style="list-style-type: none"> a. Over current. b. Higher than normal discharge line temperature. c. Higher than normal liquid line temperature. d. Higher than normal compressor temperature.

TROUBLESHOOTING

Condition	Course of Action
<p>7. Fan will not run regardless of switch setting. Compressor runs on high or low cool.</p>	<ol style="list-style-type: none"> 1. Check for 115-volts AC on high speed fan wire leading from selector switch (refer to appropriate wiring diagram). Is voltage present? (Yes) Proceed to Step 2. (No) Proceed to Step 3. 2. Check for 115-volts AC on 'H' terminal of fan motor. Is voltage present? (Yes) Proceed to Step 6. (No) Inspect wire back to selector switch to determine cause of voltage loss. Repair as necessary. 3. Check for 115-volts AC on low speed fan wire. Is voltage present? (Yes) Proceed to Step 4. (No) Replace switch. 4. Check for 115-volts AC on 'L' terminal of fan motor. Is voltage present? (Yes) Proceed to Step 5. (No) Inspect wire back to selector switch to determine cause of voltage loss. Repair as necessary. 5. Condenser fan. Is fan tight on shaft and free of damages? Does fan spin freely and stop smoothly? (Yes) Proceed to Step 6. (No) Replace or repair as necessary. 6. Check fan motor windings (refer to Fan Motor Check Procedure in Appendix D). Does motor pass test? (Yes) Proceed to Step 7. (No) Replace motor. 7. Check fan capacitor (refer to Capacitor Test in Appendix E). Does capacitor pass test? (Yes) Inspect wires between capacitor and motor, also, between capacitor and thermostat for damage. Repair or replace as necessary. (No) Replace capacitor.

**PRESSURE TEMPERATURE RELATIONSHIP
FOR R22 AT SATURATION**

°F	PSIG	°F	PSIG	°F	PSIG	°F	PSIG
-40	.6	30	55.2	68	118.3	106	216.2
-35	2.7	31	56.5	69	120.4	107	219.3
-30	5.0	32	57.7	70	122.5	108	222.5
-25	7.5	33	59.0	71	124.8	109	225.6
-20	10.3	34	60.2	72	127.0	110	228.7
-15	13.4	35	61.4	73	129.3	111	232.2
-10	16.6	36	62.9	74	131.5	112	235.6
-5	20.2	37	64.4	75	133.8	113	239.1
0	24.1	38	65.9	76	136.0	114	242.5
1	24.9	39	67.5	77	138.3	115	246.0
2	25.8	40	69.0	78	140.5	116	249.3
3	26.6	41	70.5	79	142.8	117	252.6
4	27.5	42	72.0	80	145.0	118	256.0
5	28.3	43	73.6	81	147.6	119	259.3
6	29.2	44	75.1	82	150.2	120	262.6
7	30.1	45	76.6	83	152.8	121	266.2
8	31.1	46	78.2	84	155.4	122	269.8
9	32.0	47	79.8	85	158.0	123	273.3
10	32.9	48	81.5	86	160.4	124	276.9
11	33.9	49	83.1	87	162.8	125	280.5
12	34.9	50	84.7	88	165.3	126	284.2
13	35.9	51	86.4	89	167.7	127	287.8
14	36.9	52	88.1	90	170.1	128	291.5
15	37.9	53	89.8	91	173.0	129	295.1
16	39.0	54	91.5	92	176.0	130	298.8
17	40.1	55	93.2	93	178.9	131	302.6
18	41.1	56	95.1	94	181.9	132	306.4
19	42.2	57	96.9	95	184.8	133	310.3
20	43.3	58	98.8	96	187.4	134	314.1
21	44.5	59	100.6	97	190.0	135	317.9
22	45.6	60	102.5	98	192.7	136	321.9
23	46.8	61	104.4	99	195.3	137	325.9
24	47.9	62	106.3	100	197.9	138	329.9
25	49.1	63	108.2	101	200.9	139	333.9
26	50.3	64	110.1	102	204.0	140	338.0
27	51.5	65	112.0	103	207.0	141	342.3
28	52.7	66	114.1	104	210.1	142	346.6
29	53.9	67	116.2	105	213.1	143	350.9
						144	355.3

ROOF TOP AIR CONDITIONER REMOVAL

CAUTION

Disconnect vehicle electrical system from 110 volt AC power.

1. Remove (2) screws retaining interior cover. Remove interior cover.
2. Remove control box access panel by removing (2) retaining screws.

NOTE: 110 volt AC wire connections to ease later installation.

3. Disconnect 110 volt AC wires. Remove cable clamp at control box. Pull 110 volt AC wires free of control box. Unplug wire book going to roof top unit at connector on control box.
4. Remove (4) ceiling assembly retaining bolts. Remove ceiling assembly and duct collar.
5. Remove (4) exterior air conditioner shroud retaining nuts. Remove shroud.
6. Carefully lift and remove air conditioner assembly from vehicle.

ROOF TOP AIR CONDITIONER REPLACEMENT

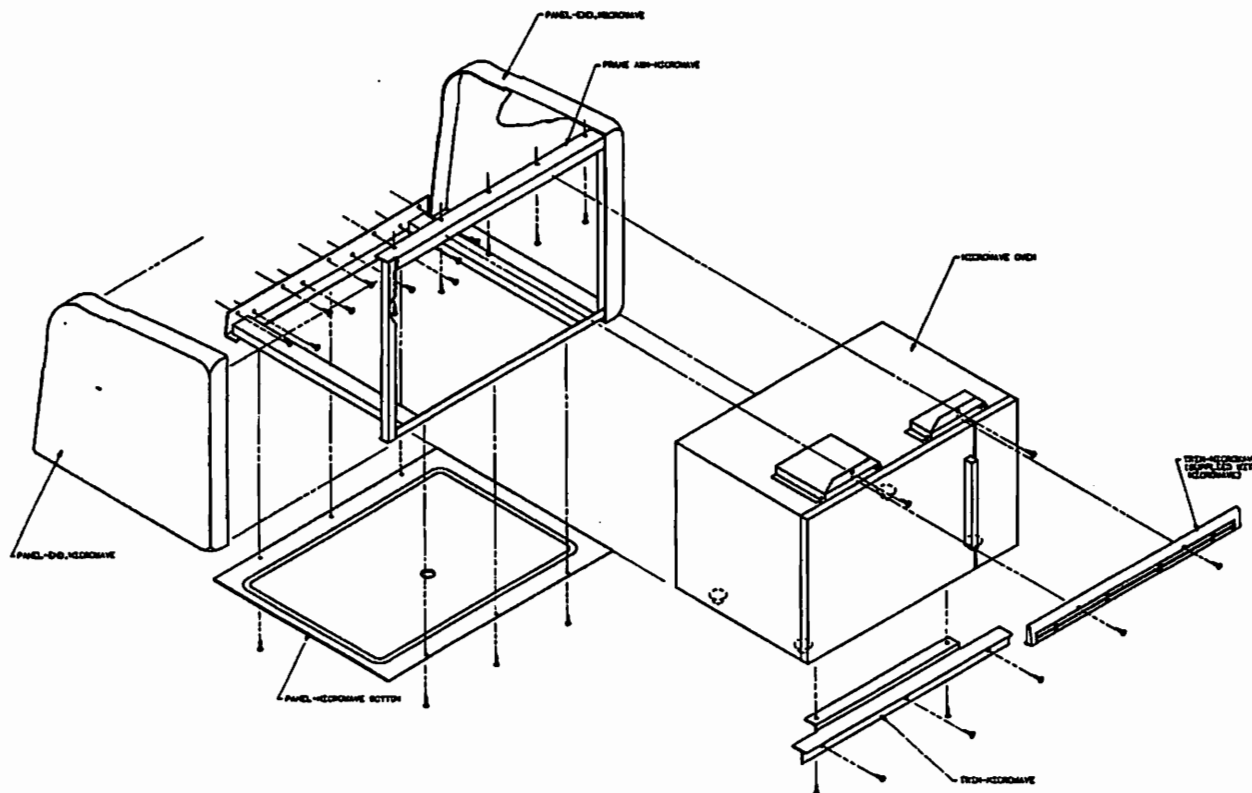
CAUTION

Disconnect vehicle electrical system from 110 volt AC power.

1. Place air conditioner assembly in proper position in roof opening.
2. Install duct collar and ceiling assembly. Secure with (4) retaining bolts.

Tighten retaining bolts until springs are just about completely compressed. Do NOT over tighten.

3. Make 110 volt AC connections at control box. Secure cable with connector at box. Connect wire loom from roof top unit at connector on control box. Replace control box access cover. Secure with (2) retaining screws.
4. Install interior cover. Secure with (2) retaining screws.



MICROWAVE REMOVAL

1. Remove upper trim piece by removing (2) retaining screws.
2. Remove (3) lower trim retaining screws.
3. Remove (2) upper mounting brackets retaining screws.
4. Carefully pull microwave partially out of cabinet to access 110 volt AC receptacle. Disconnect microwave cord from receptacle.
5. Remove microwave.

NOTE: If you will be installing a new microwave, it will be necessary to remove the lower trim piece from the microwave by removing (2) retaining screws and installing it on the new microwave.

MICROWAVE INSTALLATION

NOTE: If you are installing a new microwave, it will be necessary to remove the lower trim from the old microwave and install it on the new unit with (2) retaining screws.

1. Place microwave partially into cabinet.
2. Connect microwave power cord to 110 volt AC receptacle.
3. Slide microwave completely into cabinet.
4. Secure upper mounting brackets to cabinet with (2) screws.
5. Secure lower trim piece to cabinet with (3) retaining screws.
6. Install upper trim and secure with (2) retaining screws.

TELEVISION ANTENNA REMOVAL

1. Remove crank handle by loosening handle set screw.

NOTE: Two washers and a spring will also come loose.

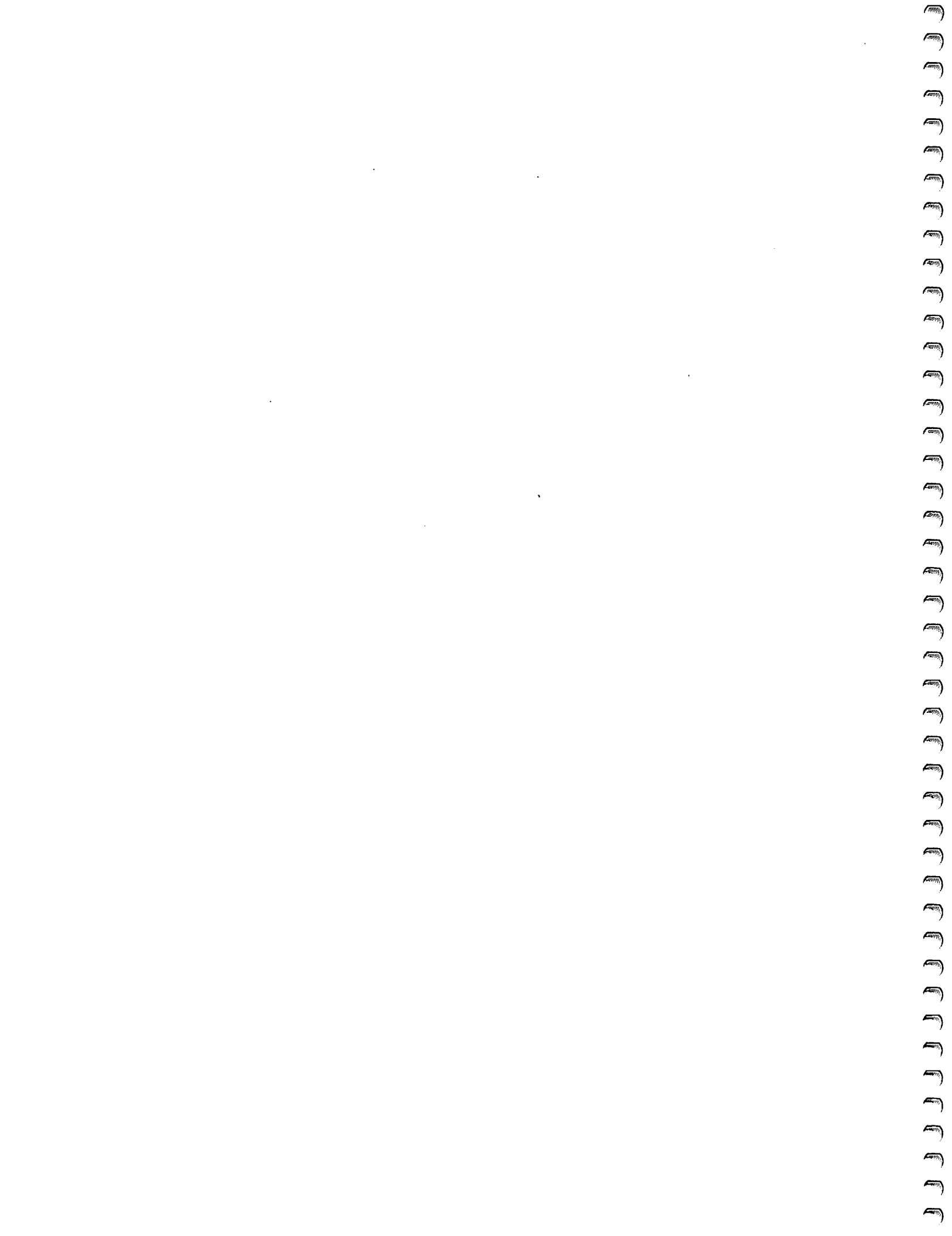
2. Remove directional handle and "ceiling" plate by removing (4) retaining screws from the directional handle.
3. Disconnect coax cable at roof.
4. Remove (6) antenna base retaining screws.
5. Carefully cut sealant around base of antenna. Lift antenna from the roof to remove.

TELEVISION ANTENNA REPLACEMENT

1. Apply sealant to the bottom of the antenna base. (Winnebago part #034552-02-000).
2. Place antenna in proper position on roof. Secure with (6) retaining screws.
3. Cap seal screws and perimeter of base with sealant. (Winnebago part #108716-01-000).
4. Attach coax to connector at roof. Seal boot with sealant. (Winnebago part #034552-02-000).
5. If you are installing a new antenna. Fill the non-used cable hole with sealant. (Winnebago part #034553-02-000).
6. Install directional handle and ceiling plate. Secure with (4) retaining screws.
7. Install crank handle with two washers and a spring. Secure with set screws.

WARNING

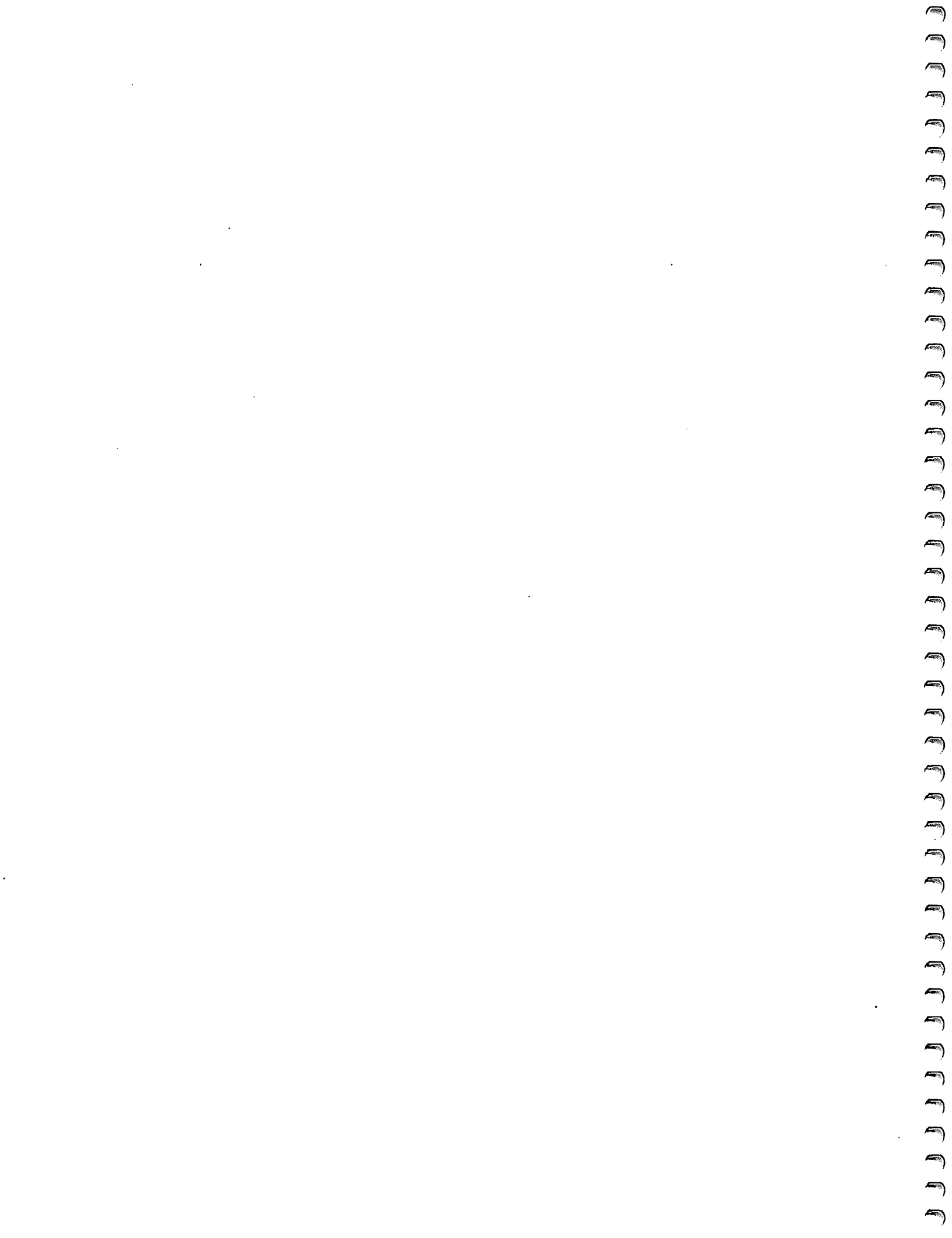
Once set screw touches shaft. Only tighten if 1/4 turn more.



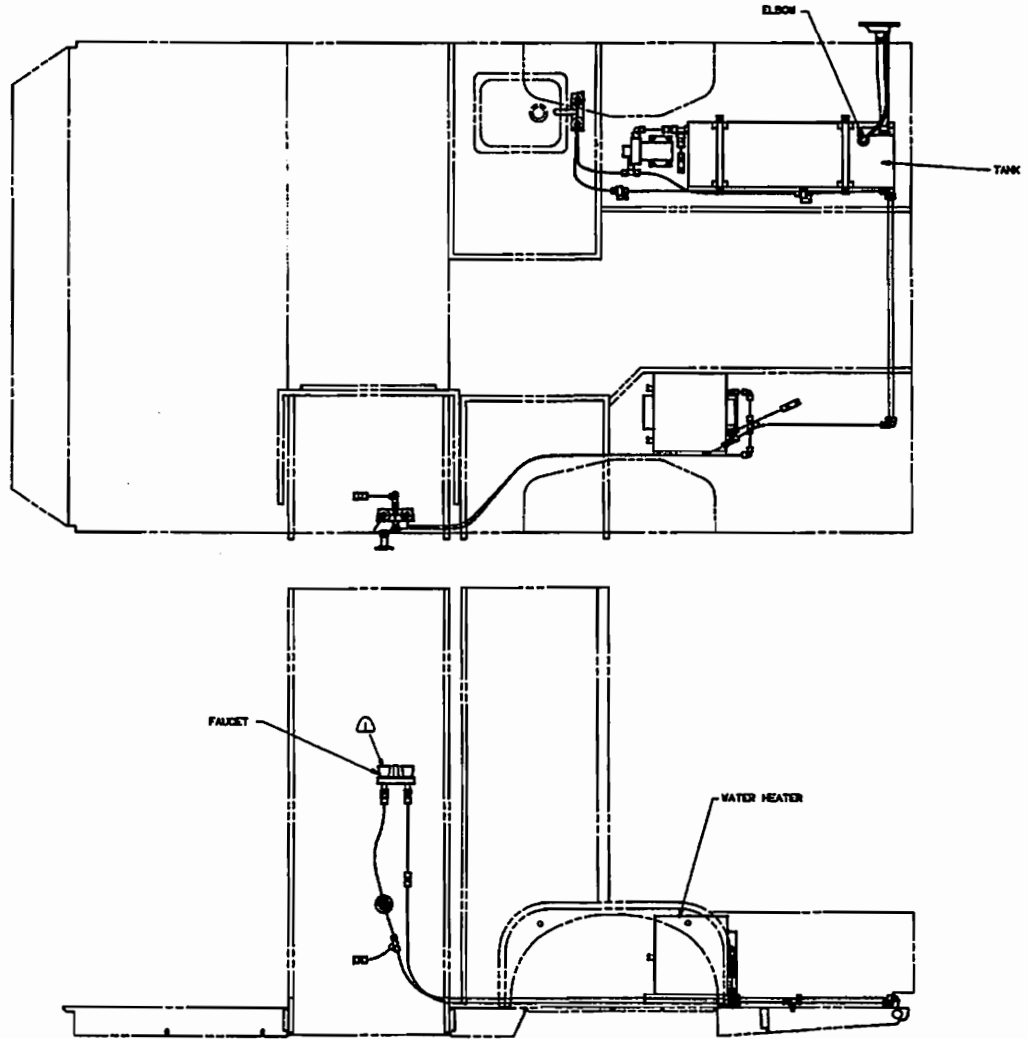
SECTION 7 PLUMBING

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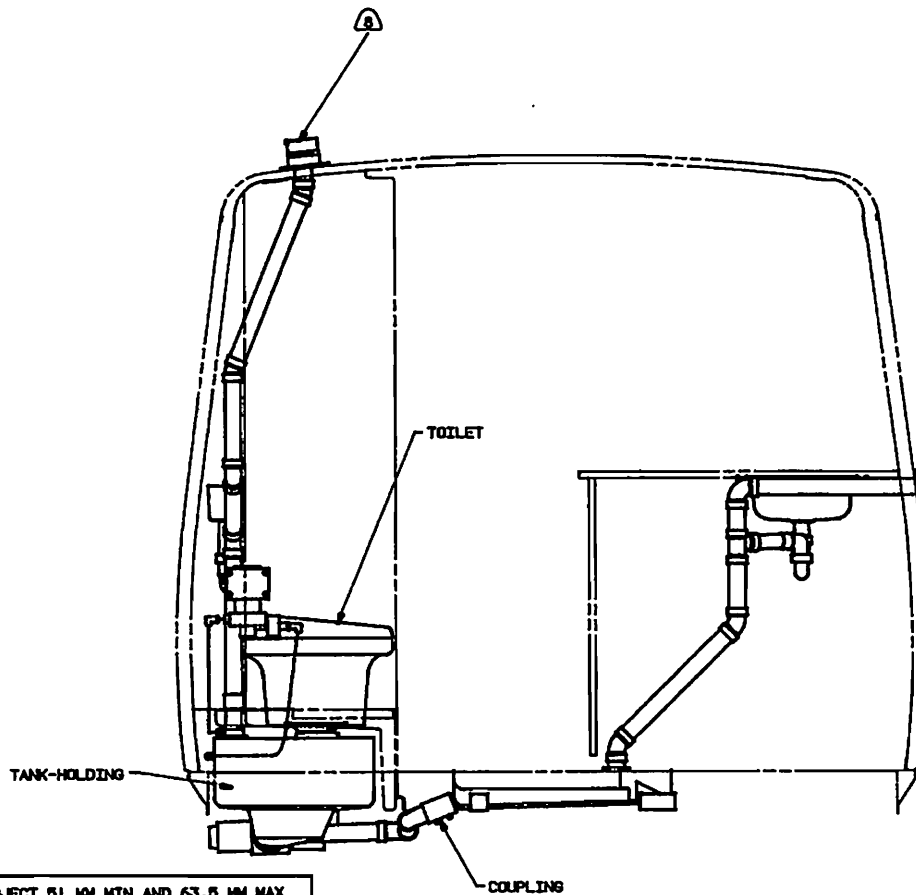
SECTION 7 PLUMBING



⚠ USE WITH SHOWER BUMP SYSTEM.
NOTES:

LEGEND	
MOT	—————
COLD	—————

WATER SYSTEM INSTL



A VENT PIPE MUST PROJECT 51 MM MIN AND 63.5 MM MAX ABOVE ROOF FOR PROPER FIT AND FUNCTION.

The plumbing system is divided into two areas -- one being the fresh water and the other is the waste (gray) water.

Major components of the fresh water system are:

- Fresh Water Tank
- Water Fill
- City Water Connection
- Water Pump
- Galley Faucet
- Bath Faucet
- Water Lines
- Water Drain

Major components of the waste system are:

- Waste Water Tanks
- Vents
- Waste Drains
- Galley Sink
- Bath Sink
- Toilet
- Shower Sump Pump

SANITIZING THE FRESH WATER SYSTEM

Instructions for disinfection of fresh water systems on recreation vehicles.

(As approved by the U.S. Public Health Service)

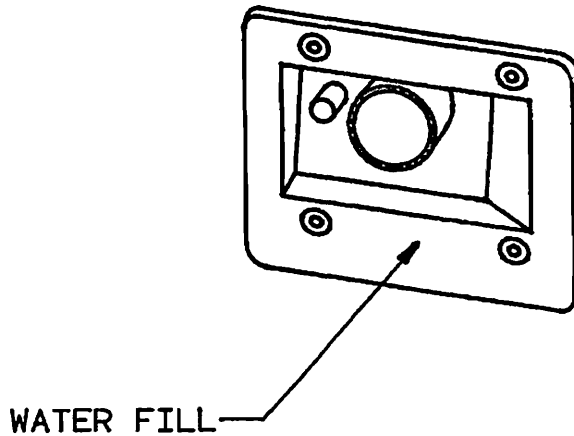
To assure complete disinfection of your fresh water system, it is recommended that the following procedure be followed on a new system, one that has not been used for a period of time, or one that may have become contaminated. This procedure is also recommended before long periods of storage such as over winter.

1. Prepare a chlorine solution using one gallon of water and 1/4 cup of household bleach (sodium hypochlorite solution). With tank empty, pump chlorine solution into the tank. use one gallon solution for each 15 gallons of tank capacity. This procedure will result in a residual chlorine concentration of 50 ppm in the water system. If a 100 ppm concentration is required as discussed in Item 3, use 1/2 cup of household bleach with one gallon of water to prepare the chlorine solution. One gallon of the solution should be used for each 15 gallons of tank capacity.

WARNING

Chlorine is poisonous. Recap bottle and clean utensils after use.

2. Complete filling of tank with fresh water. Open each faucet and run the water until a distinct odor of chlorine can be detected in the water discharge. Do not forget the rear spray nozzle.
3. Allow the system to stand at least four hours when disinfecting the 50 ppm residual chlorine. If a shorter time period is desired, then a 100 ppm chlorine concentration should be permitted to stand in the system for at least one hour.
4. Drain and flush with fresh water.



WATER FILL

The water fill is located on the right sidewall. It allows the fresh water tank to be filled via a hose running to the tank. The fill assembly also is the termination point for the fresh water tank vent hose.

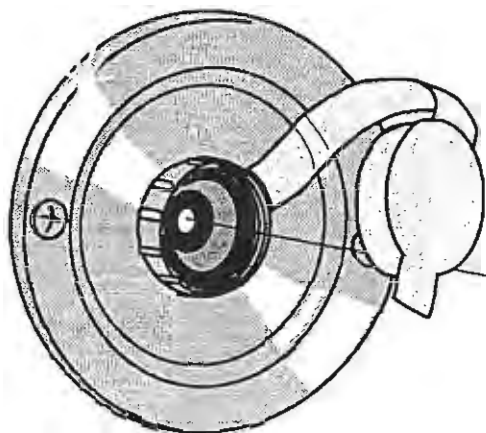
NOTE: If the vent line is kinked or plugged, the lack of pressure equalization in the tank will result in poor water pump performance.

Water Fill Removal:

1. Loosen and remove four retaining screws.
2. Pull water fill out of opening.
3. Disconnect fill line and vent line.
4. Remove water fill.

Water Fill Replacement

1. Position water fill in front of opening.
2. Connect and secure fill and vent lines.
3. Place water fill into opening. Secure with four retaining screws.



City Water Hook-Up

The city water hook-up is located on the left sidewall. It allows for water from an outside pressurized system to be introduced into the vehicle fresh water system.

When connected to a pressurized water system. There is no need to utilize the vehicles water pump.

City Water Hook-Up Removal

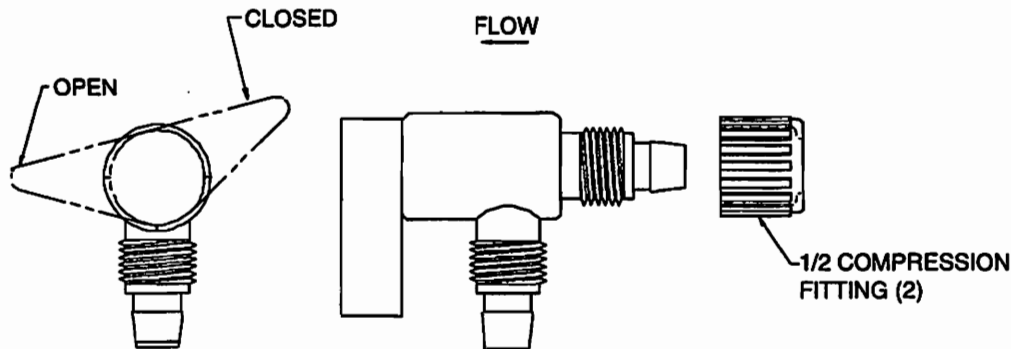
1. Remove (2) retaining screws.
2. Carefully cut sealant with a putty knife.
3. Pull hook-up away from vehicle to access water line connection.
4. Disconnect water line.
5. Remove city water hook-up.

City Water Hook-Up Replacement

1. Connect water line to city water hookup.
2. Place city water hook-up in proper position. Secure with (2) retaining screws.
3. Cap seal city water hook-up with sealant. (Winnebago Part #034552-02-000).

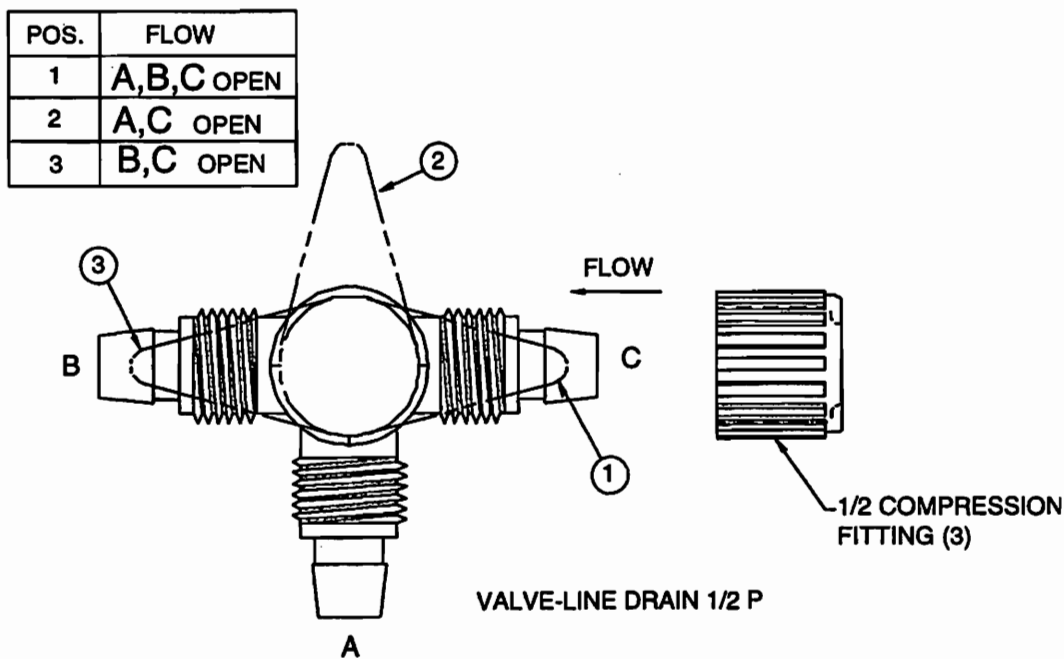
Drain Valves

There are four water drain valves in the Rialta.



VALVE - 1/2 P X 1/2 P

1. Drain for the fresh water tank. Located just forward of the water tank. Access by removing right dinette cover panel. Reference "Right Dinette Assembly Cover Panel Removal" in Interior section.



VALVE-LINE DRAIN 1/2 P

2. Drain for the water pump output line located in board of the fresh water tank. Access by removing right dinette cover panel. Reference "Right Dinette Assembly Cover Panel Removal" in Interior section.
3. Drain for the hot water lines. Located forward of the water pump. Access by removing right dinette cover panel. Reference "Right Dinette Assembly Cover Panel Removal" in Interior section.
4. Drain for the water heater. Located aft of the water heater. Access by lifting up the left dinette seat.



WATER LINES

The water lines are 3/8" and 5/8" plastic tubing. They are secured at their connections by Flair-It connectors.

Water Line Removal:

1. Loosen connector.
2. Disconnect hose at connection.
3. Remove connector.

Water Line Replacement:

1. Place connector onto hose.
2. Slide hose into place.
3. Secure by tightening connector.

GALLEY FAUCET

Galley Faucet Removal:

1. Make certain water pump is turned OFF.
2. Access bottom side of faucet by removing vent on backside of galley cabinet.
3. Disconnect water lines at faucet.
4. Loosen and remove large retaining nuts on underside of faucet.
5. Lift faucet up to remove.

Galley Faucet Replacement:

1. Place faucet in counter top opening and align.
2. Install large retaining nut on underside of faucet and tighten.
3. Connect water line to faucet.

BATHROOM FAUCET REMOVAL

1. Remove toilet. Reference "Toilet Removal" in this section.
2. Remove shower stall rear cover. Reference "Shower Stall Rear Cover Removal" in Interior section.
3. Disconnect water lines from faucet.
4. Reach in through rear cover access. Remove (2) faucet retaining nuts.

NOTE: If you cannot remove the faucet retaining nuts in this manner, it will be necessary to remove the shower back surround panel to gain access. Reference "Shower Back Surround Panel Removal" in Interior section.

5. Remove faucet.

Bathroom Faucet Replacement

1. Place faucet in proper position.
2. Secure faucet with (2) retaining nuts.
3. Connect water lines to faucet.
4. Install shower stall rear cover. Reference "Shower Stall Rear Cover Replacement" in Interior section.
5. Install toilet. Reference "Toilet Replacement" in this section.

Bathroom Faucet Leak Repair

The bathroom faucet is of a washerless design. To repair a leak, proceed as follows.

1. Turn faucet on and off several times to flush out any debris which may be in the line preventing the stem tip from seating properly. In many cases this will completely eliminate a leak or drip. If problem persists, continue with the following steps.
2. Unsnap the "Hot" or "Cold" button (A) on the handle.
3. Remove the screw (B), with a phillips head screwdriver, turning the screw counterclockwise.
4. Lift off the handle (C).
5. Turn stem (G) clockwise until it is fully closed (see figure 1). If leak is eliminated, proceed to steps 16 and 17 for proper replacement of handle. If problem persists, continue with the following steps.
6. Turn off the water supply.
7. Remove the faucet stop (E) by placing a flat screwdriver in slot (F) on the side of the stop and pry it up.
8. Loosen the stem and bonnet assembly (H) with a crescent wrench by turning it counterclockwise and remove it by simply lifting it off with your fingers.
9. If there is foreign debris in the faucet, remove it by flushing or picking it out.
10. Check stem tip and "O" ring (K) for possible damage. If "O" ring is damaged or dislodged, the stem and bonnet assembly must be replaced (see back page for ordering replacement parts.)
11. To re-assemble, turn the stem (G) counterclockwise to a full open position.
12. Screw in the stem and bonnet assembly (H) fingertight.
13. Snug up the stem and bonnet assembly (H) with a crescent wrench. You will notice four slots (I) on the top of the bonnet (J). Turn the stem and bonnet assembly (H) until these slots show white rather than chrome. Do not overtighten.
14. Turn the stem (G) clockwise to a fully closed position (see figure 1.)
15. Place the faucet stop (E) in the slots (I) with raised part (D) at a 12:00 O'clock position. This should snap into place. If it does not, you do not have the slots properly aligned as instructed in step 13. Re-align.
16. Notice the raised molded stop inside the handle (C). This is the handle stop. Position the handle stop at 9:00 o'clock position (see figure 2) over

the faucet stop (E) and replace handle by pushing it down over the stem (G) (It is essential that the handle stop be in the correct position to insure that water flow will stop completely when handle is turned to the off position.)

17. Replace and tighten the screw (B) (clockwise) and replace the "Hot" and "Cold" button (A). Be sure screw is tightened completely so handle is completely down.

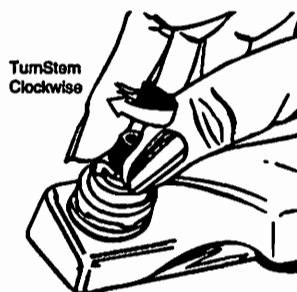
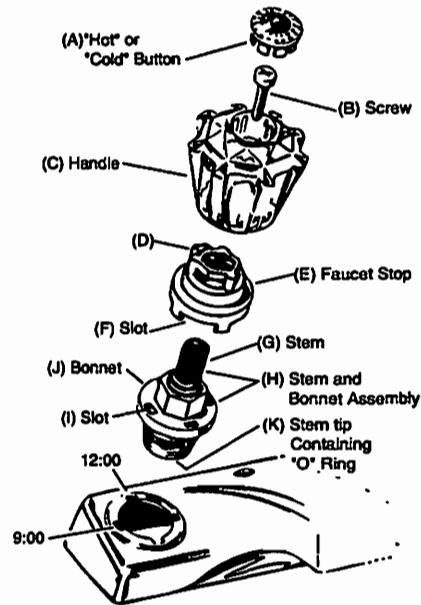


Figure 1

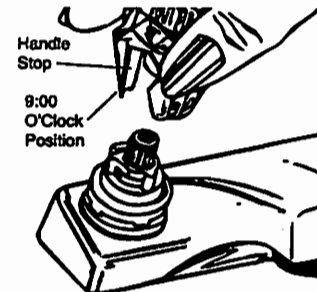
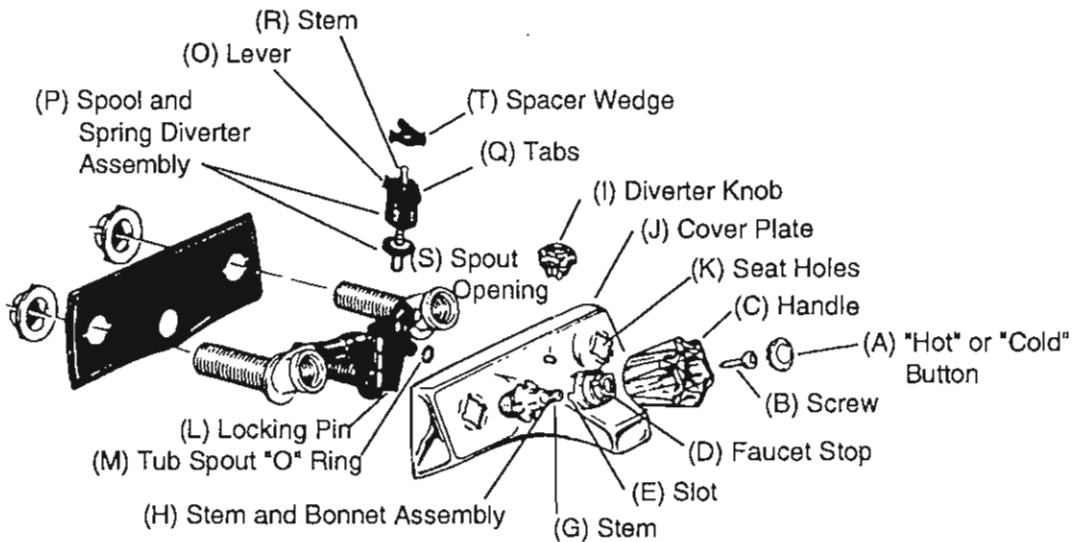
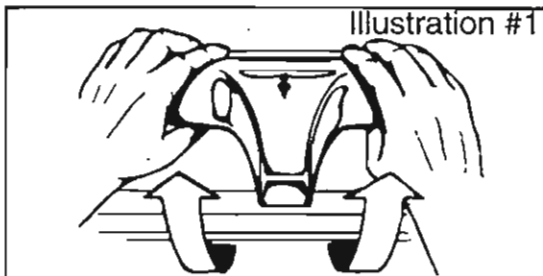


Figure 2



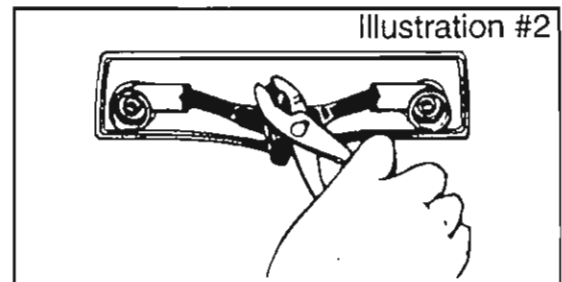
BATHROOM FAUCET DIVERTOR REPLACEMENT

1. Turn off the water supply.
2. Unsnap the "hot" and "cold" buttons (A) on the handle.
3. Remove the screw (B) with a phillips head screwdriver, turning the screw counterclockwise.
4. Lift off the handle (C).
5. Remove the faucet stop (D) by placing a flat screwdriver in slot (E) on the side of the stop and prying it up.
6. Loosen the stem and bonnet assembly (H) with a crescent wrench by turning it counterclockwise and remove it by simply lifting off your fingers.
7. Unscrew and remove diverter knob (I).
8. Remove cover plate (J) by placing hands on top above seat holes (K) and press firmly down. Cover plate will snap out of locking pin (L) on bottom. Lift cover plate. (See illustration #1.)

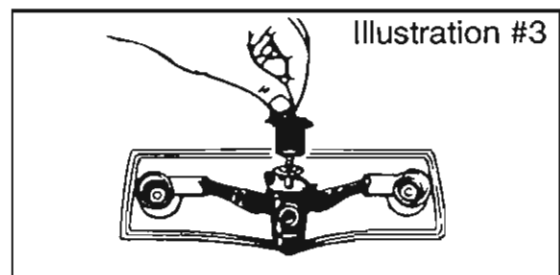


9. Remove and discard the tub spout "O" ring (M). This may have remained inside the cover plate. Replace with new one from kit on spout opening (S).

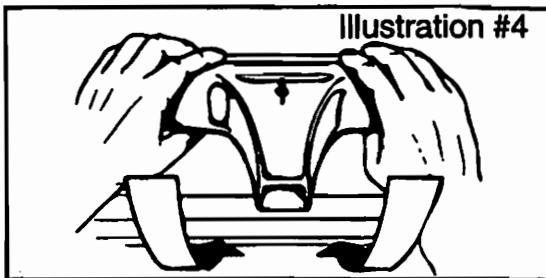
10. Loosen spacer wedge (T) by slipping a screwdriver between it and diverter housing cap. Lift spacer wedge off.
11. Place a pair of pliers across top of diverter housing cap (N) so that it engages the key or lever (O) which extends above the cap. Turn cap to the left until tabs open (See illustration #2).



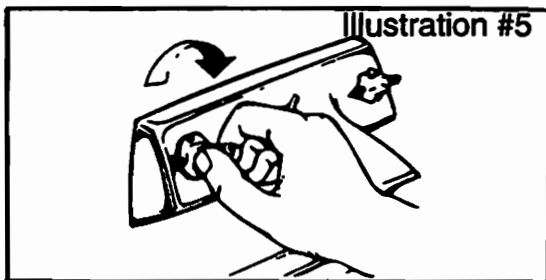
12. Pry cap up with screwdriver and remove entire spool and spring diverter assembly (P).
13. Using new spool and spring diverter (P) in kit, slip unit into center body with lever (O) towards the wall. (See illustration #3.)



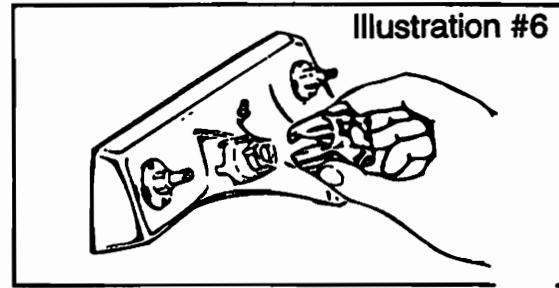
14. Using pliers as described in step number 11 above, turn to the right while pushing gently downward until tabs (Q) are locked in place.
15. Replace spacer wedge (T) tall levers point towards wall.
16. Tip cover plate (J) upward pushing stem (R) through opening on top. Making sure that the "O" ring (M) is securely in place on center body spout (S), gently replace cover plate so that hot and cold openings line up. Press shield downward until you hear locking pin (L) snap into place. (See illustration #4).



17. With stem and bonnet assembly (H) in hand, turn the stem (G) counterclockwise to a full open position.
18. Screw in the stem and bonnet assembly (H) finger-tight.
19. Snug up the stem and bonnet assembly (H) with a crescent wrench. You will notice four slots on the top of the bonnet. Turn the stem and bonnet assembly (H) until these slots show white rather than chrome. Do not overtighten.
20. Turn the stem (G) clockwise to fully closed position. (See illustration #5).



21. Place the faucet stop (D) in the slots with raised part (F) at a 12:00 o'clock position. This should snap into place. (See illustration #6.) If it does not, you do not have the slots properly aligned as instructed in Step 17. Realign.

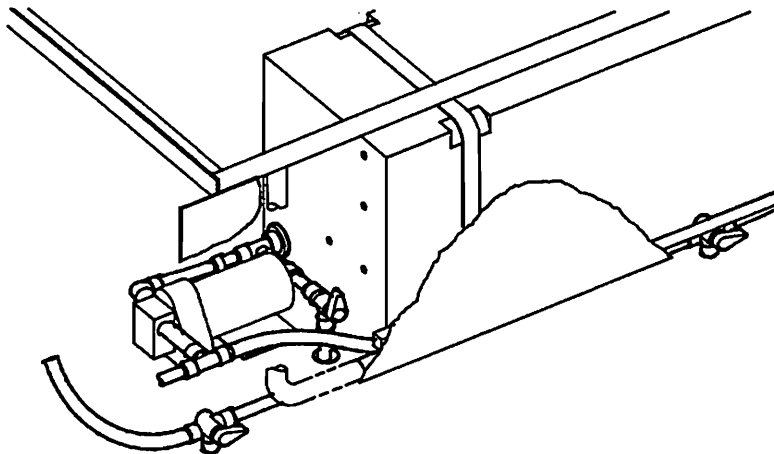


22. Notice the raised molded stop inside the handle (C). This is the handle stop. Position the handle stop at 9:00 o'clock position. (See illustration #6) over the faucet stop (D) and replace handle by pushing it down over the stem (G). (It is essential that the handle stop be in the correct position to insure that water flow will stop completely when handle is turned to the off position.)
23. Replace and tighten the screw (B) (clockwise) and replace the "hot" and "cold" buttons (A). Be sure screw is tightened completely so handle is completely down.
24. Replace diverter knob (I).
25. Turn on water supply. Faucet is now ready for use.

For additional **SERVICE INFORMATION**, call or write: BPC - Division of Bristol Corporation
P.O. Box 278
Bristol, Indiana 46507
Toll Free: 1-800-272-4778
ATTN: Field Service Manager

PLEASE NOTE:

Periodic lubrication of the diverter stem with petroleum jelly will prevent sticking. Lift the diverter knob and apply a small amount to the outside of diverter shaft. Lift up and push down the knob 8 to 10 times to lubricate the shaft and "O" ring inside the diverter spool. This should be done any time the diverter sticks in the shower position.



WATER PUMP

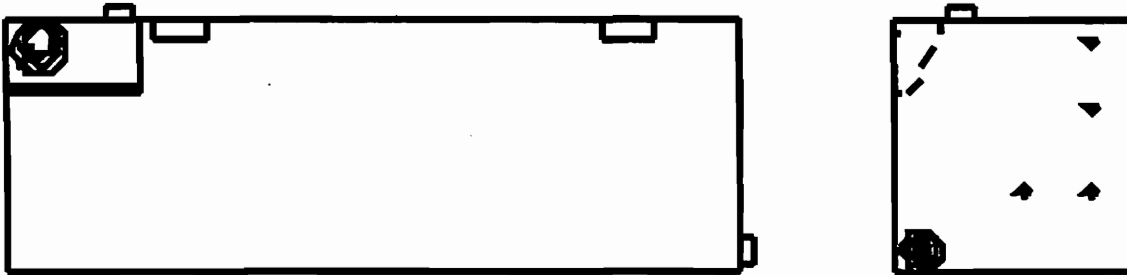
The water pump is a demand pump in that when it is energized, it pumps water until pressure is achieved in the output line. Then the pump shuts down when there is a pressure drop in the line. The pump again energizes. Maximum flow rate is 2.8 gallons per minute.

Water Pump Removal

1. Remove right dinette cover panel. Reference "Right Dinette Assembly Cover Panel Removal" in Interior section.
2. Drain the fresh water tank. Reference "Drain Valves" in this section.
3. Drain the water pump outlet line. Reference "Drain Valves" in this section.
4. Disconnect 12 volt DC wires from pump.
5. Disconnect input and output water lines from pump.
6. Remove water pump retaining screws.
7. Remove pump.

Water Pump Replacement

1. Place water pump in proper position.
2. Secure pump with retaining screws.
3. Connect input and output water line to pump.
4. Connect 12 volt DC wiring to pump.
5. Install right dinette cover panel Reference "Right Dinette Assembly Replacement" in Interior section.



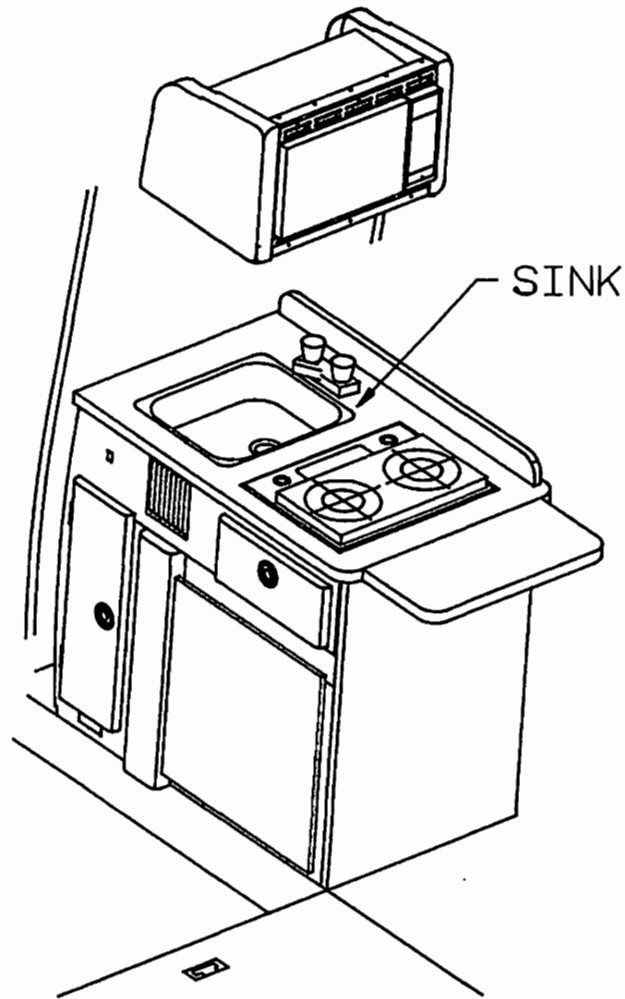
FRESH WATER TANK

The fresh water tank is located on the right side of the vehicle beneath the dinette assembly. The tank has a 16-gallon capacity and is constructed of Linear Low Density Polyethylene (LLPE).

In the event of a tank failure, experience dictates that replacing the tank is preferred over "welding" of the tank to repair it. As oftentimes, the area that is welded fails in a short time.

Tank Removal:

1. Remove right dinette cover panels. Reference "Right Dinette Assembly Cover Panel Removal" in Interior Section.
2. Remove right dinette seat cushion. Reference "Dinette Seat Cushion Removal" in Interior section.
3. Drain water from tank. Reference "Drain Valves" in the section.
4. Disconnect sensor wires at tank by removing retaining screws.
5. Disconnect fill line from tank.
6. Disconnect vent line from tank.
7. Disconnect drain line from tank.
8. Remove (2) tank retaining straps by removing retaining screws.
9. Remove tank.

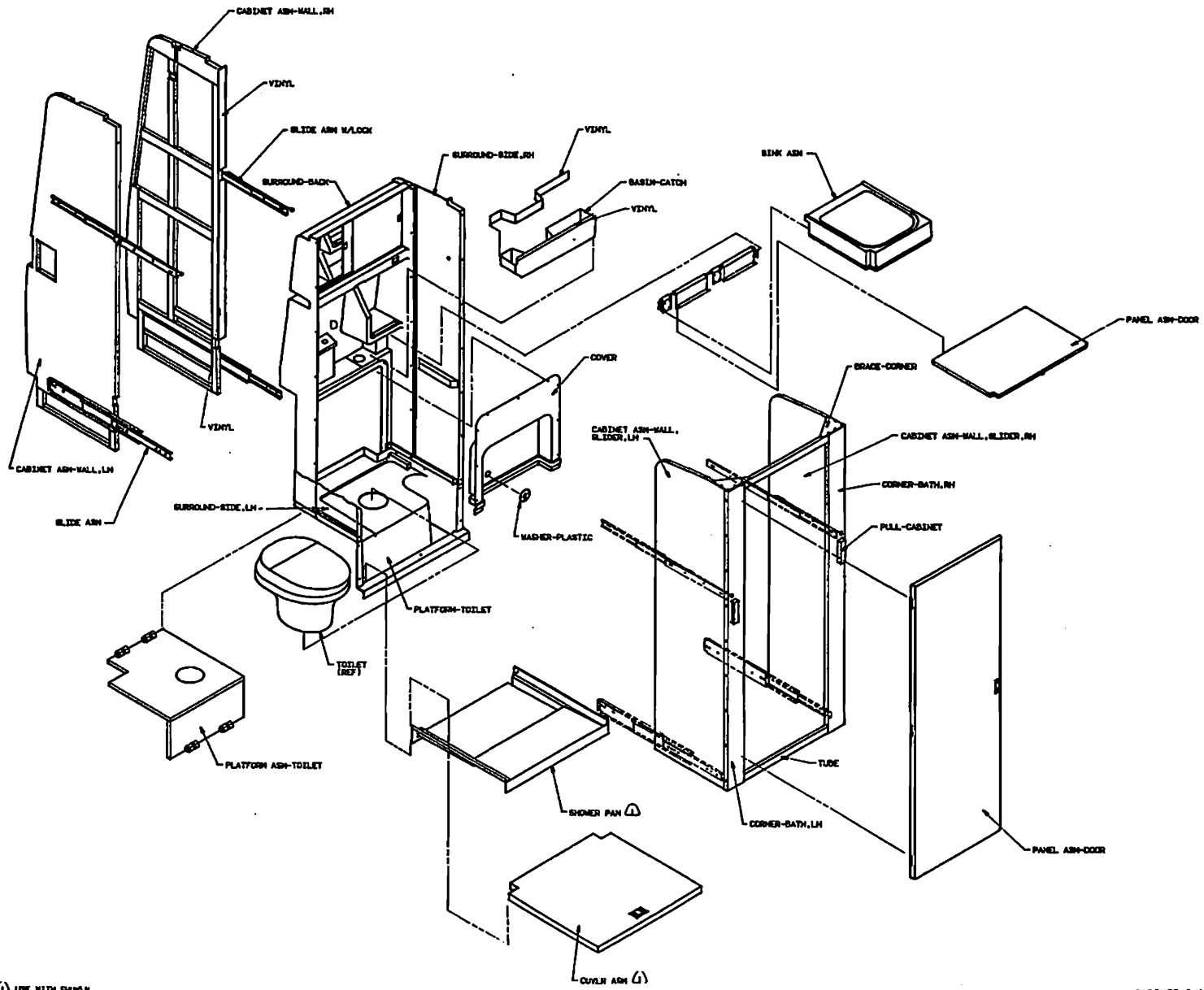


GALLEY SINK REMOVAL

1. Remove galley countertop. Reference "Galley Countertop Removal" in Interior Section.
2. Remove (6) sink retaining blocks by removing (2) retaining screws per block.
3. Remove sink from countertop.

GALLEY SINK REPLACEMENT

1. Place sink in proper position on countertop.
2. Secure sink with (6) retaining blocks by installing (2) retaining screws per block.
3. Replace galley countertop. Reference "Galley Countertop Replacement" in Interior Section.



⚠ USE WITH GEMBL. 47116.

CABINET INSTL-BATH

BATHROOM SINK REMOVAL

1. Remove (4) sink hinge retaining screws.
2. Remove sink assembly.
3. Remove sink from hinge by removing (8) retaining screws.

BATHROOM SINK REPLACEMENT

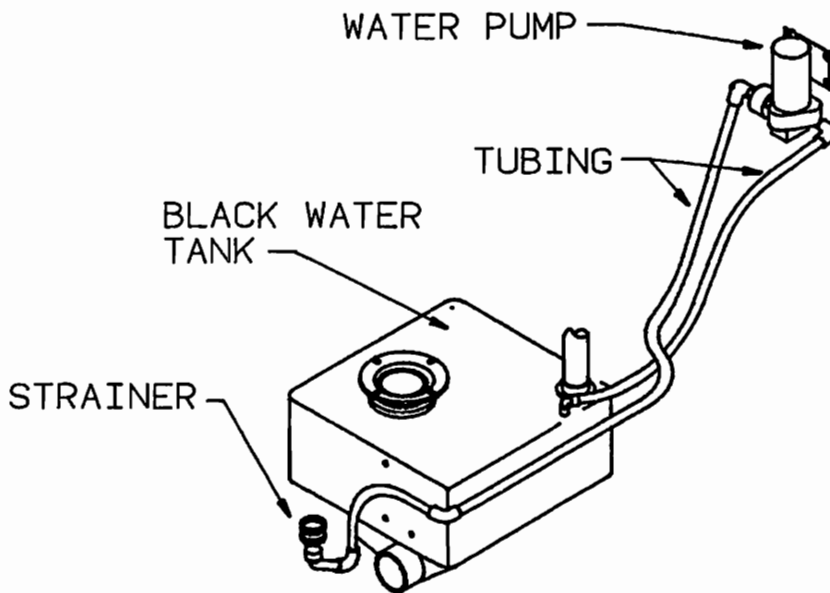
1. Attach sink to hinge with (8) retaining screws.
2. Install sink assembly and hinge. Secure with (4) retaining screws.

SHOWER SUMP SYSTEM

The shower sump system draws waste water from the shower pan and dumps it into the black waste water tank.

Major Components

- Sump pump
- Filter
- Strainer
- Switch



TROUBLESHOOTING SHOWER SUMP SYSTEM

CONDITION	
<p>1. Water will not drain from shower pan.</p>	<ol style="list-style-type: none"> 1. Is sump pump switch "on" (Yes) Proceed to Step 2. (No) Turn switch "on". 2. Is the black water holding tank full? (Yes) Drain tank. (No) Proceed to Step 3. 3. Access pump. Reference "Water Pump Removal" in this section. Is pump running? (Yes) Proceed to Step 8. (No) Proceed to Step 4. 4. Check for 12 volt DC on wire "DA" at the pump. Is voltage present? (Yes) Proceed to Step 5. (No) Proceed to Step 6. 5. Jumper a wire from ground connection at pump to a known good ground. Does pump run? (Yes) Troubleshoot wire "DB" to determine cause for loss of ground. Repair or replace as necessary. (No) Replace pump. 6. Check for 12 volts DC on wire "DA" at pin 3 of the sump switch. Is voltage present? (Yes) Troubleshoot wire "DA" to determine cause of voltage loss. Repair or replace as necessary. (No) Proceed to Step 7. 7. Check for 12 volts DC on wire "IA" at the sump switch. Is voltage present? (Yes) Replace switch. (No) Troubleshoot wire "JA" to fuse panel to determine cause of voltage loss. Repair or replace as necessary. 8. Clean strainer at shower pan. If water does not drain, proceed to Step 9. 9. Remove filter at pump. Back flush filter with water. Reinstall filter. If water does not drain, troubleshoot water line to holding tank and water line to shower for blockage. Repair or replace as necessary.

SHOWER SUMP PUMP REMOVAL

1. Remove upper wardrobe cabinet shelf by gently pulling upward to release velcro.
2. Remove (6) retaining screws from pump access cover located on lower wardrobe shelf.
3. Disconnect 12 volt DC wiring at pump.
4. Remove filter and water output line from pump.
5. Remove pump retaining screws.
6. Remove pump.

SHOWER SUMP PUMP REPLACEMENT

1. Place pump in proper position. Secure with retaining screws.
2. Connect filter and water output line to pump.
3. Connect 12 volt DC wiring at pump.
4. Install pump access cover. Secure with (6) screws.
5. Install upper wardrobe shelf. Secure by gently pushing downward to seat velcro.

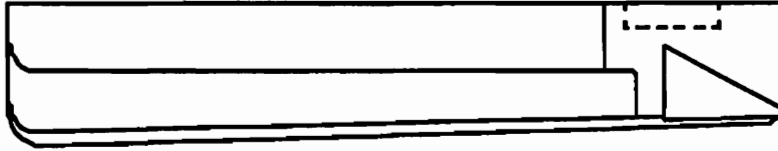
See art on page 7-16.

TOILET REMOVAL

1. Make certain that the water pump is turned off.
2. Disconnect water line from back of toilet.
3. Remove (2) retaining nuts. One located at the front and one at the back of the toilet.
4. Lift toilet up to remove.

TOILET REPLACEMENT

1. Place toilet in proper position.
2. Gently push toilet down to seat on grommet.
3. Secure toilet with (2) retaining nuts.
4. Connect water line at back of toilet.



GREY WASTE WATER TANK

The gray waste water tank is located under the floor in the center of the vehicle just forward of the rear axle. The tank has a 6-gallon capacity and is constructed of Linear Low Density Polyethylene (LLPE). The tank receives and stores waste water from the galley sink.

In the event of a tank failure, experience dictates that replacing the tank is preferred over "welding" of the tank to repair it. As oftentimes, the area that is welded fails in a short time.

Draining the Grey Waste Water Tank

1. Attach drain hose to drain valve.
2. Place other end of hose into sewage receptacle.
3. Open drain valve by pulling on T-Handle and allow tank to drain.
4. Close T-Handle and remove hose and store.

Grey Waste Water Tank Removal:

1. Drain waste water tank.
2. Remove grey waste water tank exterior vent. Reference "Grey Tank Vent Removal" in this section.
3. Disconnect drain pipe at p-trap under galley sink.
4. Remove right dinette assembly cover panel. Reference "Right Dinette Assembly Cover Panel Removal" in Interior Section. This will allow access to the lower portion of the grey waste water tank vent pipe.
5. Grasp the grey waste water tank vent pipe through the access hose in the backside of the galley cabinet and pull it upward to clear the tank.

NOTE: The tank is connected to the vent pipe by a compression seal.

6. Raise vehicle to allow access to vehicle underside.

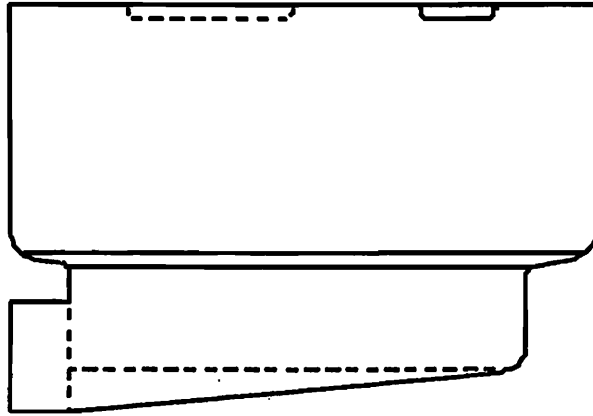
CAUTION

Exercise extreme caution when working under an elevated vehicle. Refer to VW owner's and service manuals for proper lifting procedures.

7. Remove sensor connectors at tank.
8. Disconnect drain pipe from tank.
9. Remove (2) tank retaining straps by removing retaining screws.
10. Gently pull down on tank to remove.

Grey Waste Water Tank Replacement:

1. Inspect compression seal for damage. Replace as necessary.
2. Align tank in proper position, placing compression seal in line with vent pipe.
3. Place tank retaining straps into position and secure with screws.
4. Attach sensor wires to tank.
5. Connect drain pipe to tank.
6. Position vent pipe into compression seal on tank and push down to properly seal.
7. Install right rear dinette assembly cover panel. Reference "Right Rear Dinette Assembly Cover Panel Replacement" in Interior Section.
8. Connect drain pipe at p-trap under galley sink.
9. Install grey waste water tank exterior vent. Reference "Grey Tank Vent Replacement" in this section.



BLACK WASTE WATER TANK

The black waste water tank is located beneath the toilet platform. The tank has a thirteen gallon capacity and is constructed of Linear Low Density Polyethylene (LLPE). The tank receives and stores waste water from the bath sink, toilet and shower.

In the event of a tank failure, experience dictates that replacing the tank is preferred over "welding" of the tank to repair it. As oftentimes, the area that is welded fails in a short time.

Draining the Black Waste Water Tank

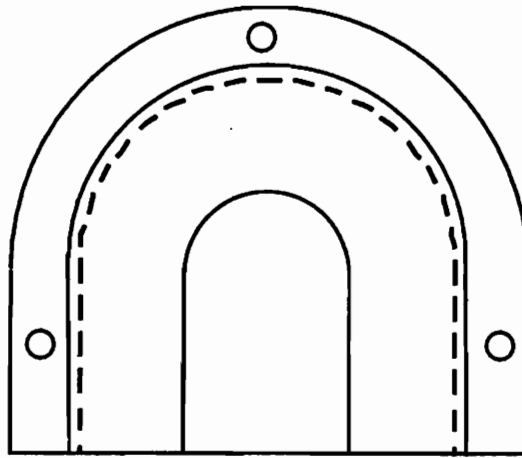
1. Attach drain hose to drain valve.
2. Place other end of hose into sewage receptacle.
3. Open drain valve by pulling on T-Handle and allow tank to drain.
4. Close T-Handle and remove hose and store.

Black Waste Water Tank Removal:

1. Drain waste water tank.
2. Disconnect drain pipe from tank.
3. Access tank by removing toilet platform. Reference "Toilet Platform Removal" in Interior Section.
4. Disconnect shower sump line at tank.
5. Disconnect vent pipe at tank.
6. Disconnect sensor connections at tank.
7. Lift tank out to remove.

Black Waste Water Tank Replacement

1. Place tank in proper position.
2. Connect sensor wires to tank.
3. Connect vent pipe to tank.
4. Connect shower sump line to tank.
5. Secure tank by installing toilet platform. Reference "Toilet Platform Replacement" in Interior Section.
6. Connect drain pipe to tank.



Grey Waste Water Tank Exterior Vent

The vent is located on the right sidewall rear of the refrigerator vent.

Grey Tank Vent Removal

1. Remove (3) retaining screws.
2. Carefully cut sealant with a putty knife.
3. Remove vent by pulling out away from vehicle.

Grey Tank Vent Replacement

1. Align vent in position on vent pipe.
2. Secure with (3) retaining screws.
3. Cap seal perimeter of vent with sealant (Winnebago Part #034552-14-000).

Black Water Tank Exterior Vent

The vent is located on the roof of the vehicle above the wardrobe cabinet.

Black Tank Vent Removal

1. Remove (6) vent retaining screws.
2. Carefully cut sealant with a putty knife.
3. Remove vent.
4. Remove old sealant.

Black Tank Vent Replacement

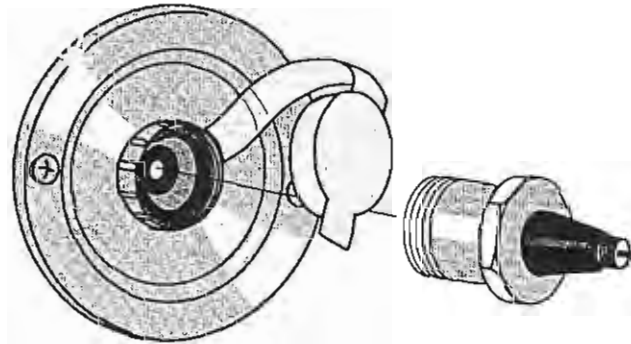
1. Install sealant (Winnebago Part #069640-03-000) to underside of vent.
2. Place vent in proper position.
3. Secure vent with (6) retaining screws.

IMPORTANT: The screws must penetrate through the sealant.

Winterizing the Water System

To prevent damage to the plumbing system, it is necessary to remove the water in the vehicle whenever temperatures are expected to fall below freezing.

1. Park vehicle on a level surface.
2. Open the following drain valves. Reference "Drain Valves" in this section.
 - Fresh water tank drain valve.
 - Water pump output line drain valve.
 - Hot water line drain valve.
3. Turn water pump on.
4. Open galley and bathroom faucets.
5. Operate toilet flush lever until water stops flowing in toilet.
6. Turn off water pump.
7. Open water heater drain valve. Reference "Drain Valves" in this section. Open water heater pressure temperature relief valve. Reference "Water Heater" in Appliance section.



8. After water has drained from water heater. Connect a "blow out" plug (Winnebago part #701705-01-000) to the city water hookup.

Pressurize the water system with compressed air regulated to 30 PSI.

WARNING

Do NOT exceed 30 psi or damage to the water system may result.
--

9. Keep air pressure to the system for five minutes. Disconnect air pressure.
10. Close all faucets and drains. Close water heater pressure temperature relief valve.

11. Operate toilet flush lever until water is drained from toilet.
12. Disconnect the shower hose at the bathroom faucet. Allow all water to drain from hose. Reconnect hose.
13. Pour one cup of NON-TOXIC RV antifreeze (Winnebago Part #701138-01-000) into the galley sink drain and into the bathroom sink catch basin.
14. Turn shower sump pump on. Dump 1/2 gallon NON-TOXIC RV antifreeze (Winnebago Part #701138-01-000) into the shower drain. Turn shower sump pump off.
15. Drain the black and gray water storage tanks.



SECTION 8

AUTOMOTIVE

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SECTION 8

AUTOMOTIVE

AUTOMOTIVE AIR CONDITIONING

WARNING

The following information is provided for the use of qualified air conditioning service technicians who are properly certified as outlined by section 609 of the Clean Air Act.

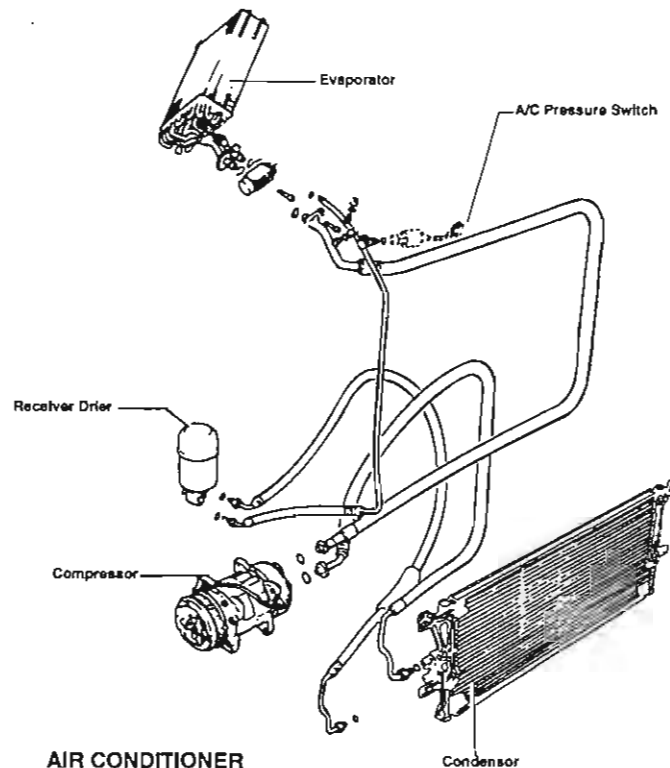
State and local governments may also impose additional requirements regarding the servicing of air conditioner systems. It is the servicing technicians responsibility to comply with all regulations.

DO NOT ATTEMPT to service the vehicle A/C system if you are not properly trained and certified!

The Rialta's automotive air conditioning can be divided into two parts:

1. The Volkswagen supplied system (Dash Air) which is comprised of the following major components

- Condensor
- Compressor
- Receiver Dryer
- Expansion Valve
- Evaporator (located in dash)
- A/C Pressure Switch

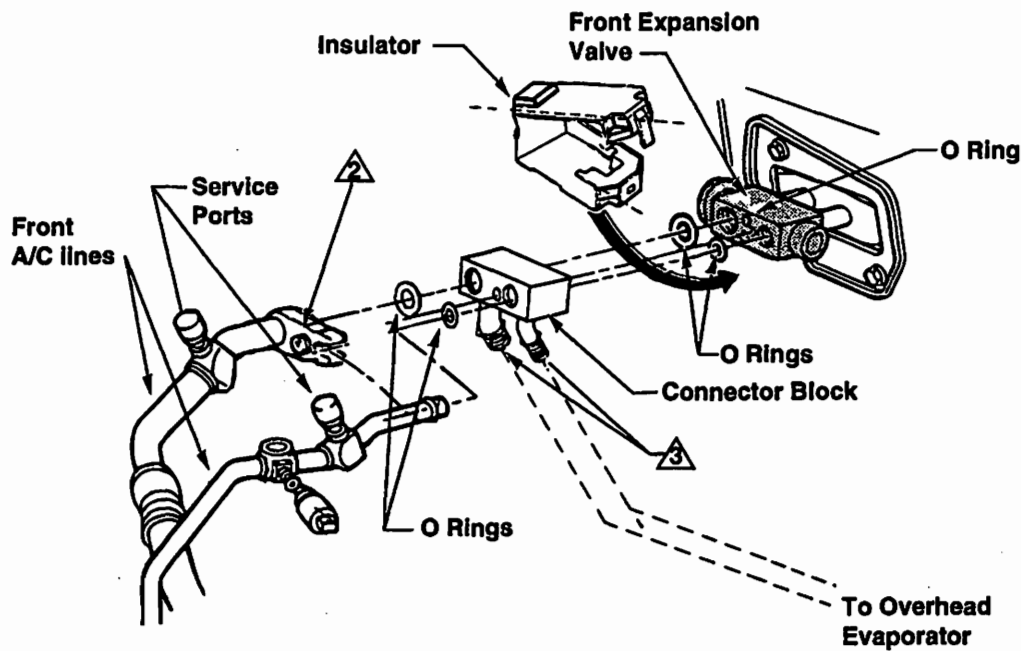


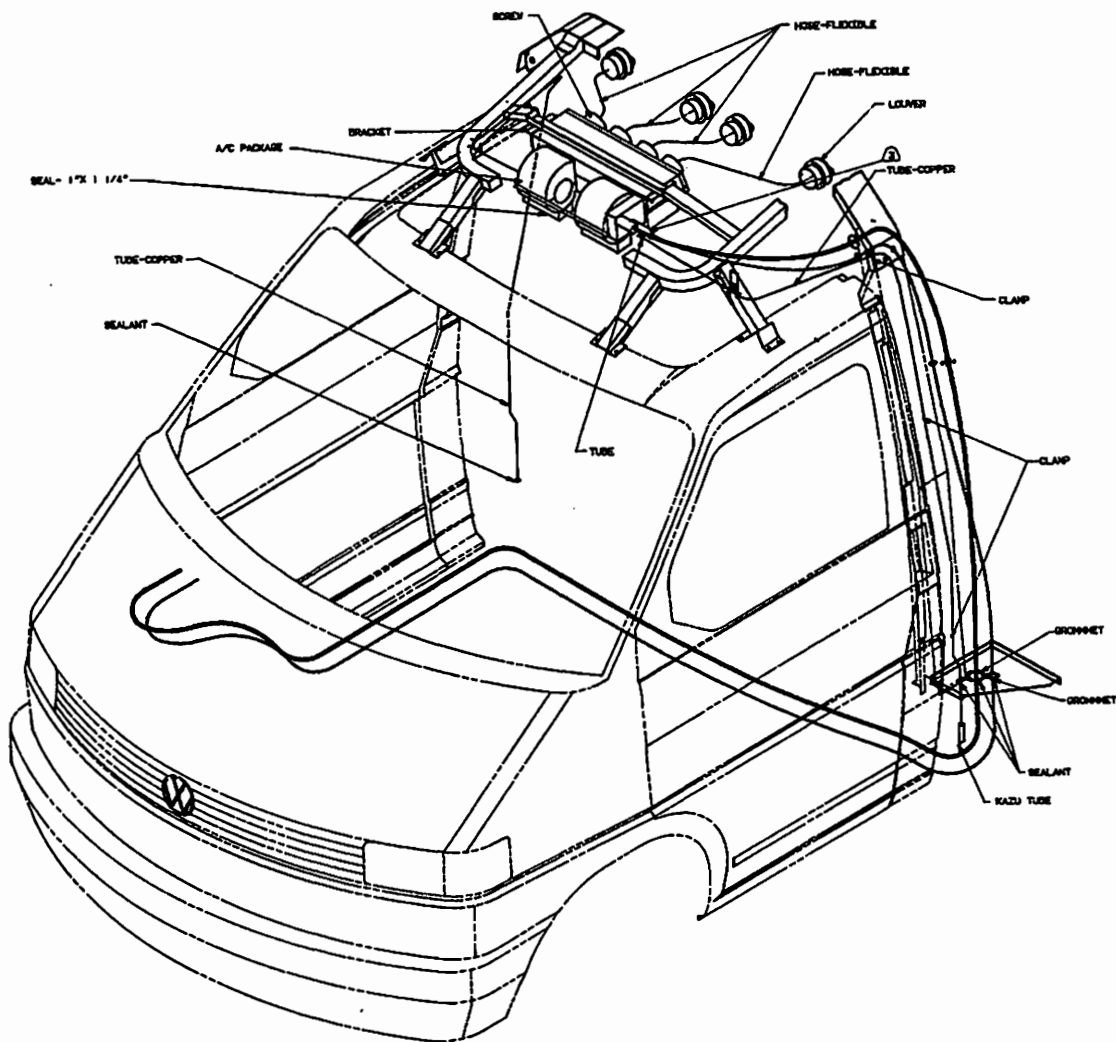
For service information regarding the Volkswagen installed system, refer to the appropriate Volkswagen Service Information. Reference Section O for information regarding procurement of Volkswagen service literature.

2. The Winnebago installed system (Automotive Overhead) which is comprised of the following major components.

- Connector Block
- Overhead Evaporator
- Hoses
- Expansion Valve (at overhead evaporator)

OVERHEAD REAR A/C LINES





- ① TORQUE TO 15 NM (11 FT/LB).
- ② TORQUE TO 7 NM (48 IN/LB).
- 1. EVACUATE AND RECHARGE PROCEDURE:
 - A. RECHARGE R134A IN VW A/C SYSTEM.
 - B. PERFORM REPAIRS.
 - C. EVACUATE COMPLETE SYSTEM AND CHECK FOR LEAKS.
 - D. RECHARGE SYSTEM.

A/C SYSTEM INSTL

NOTES:

The automotive A/C system is filled with refrigerant R-134A. R134A is colorless and invisible as a gas.

Temperature/Pressure Chart

R-134A in an enclosed container will have a specific temperature/pressure relationship.

Temperature in (F)	Pressure in (psi)
(-22)	(0.0)
(-4)	(4.4)
(14)	(14.5)
(32)	(27.5)
(50)	(45.0)
(68)	(68.2)
(86)	(97.2)
(104)	(132.0)
(122)	(177.0)
(140)	(229.2)
(158)	(293.0)

WARNING

- Keep refrigerant away from open flames because poisonous gas will be produced if it burns. Do not smoke when refrigerant gases are present for the same reason.
- Electric welding near refrigerant hoses causes R-134a to decompose from ultraviolet light. Discharge system before electric welding.
- Pressurized R-134A refrigerant in the presence of oxygen may form a combustible mixture. Never introduce compressed air into any R-134A container (full or empty), A/C component or piece of service equipment.

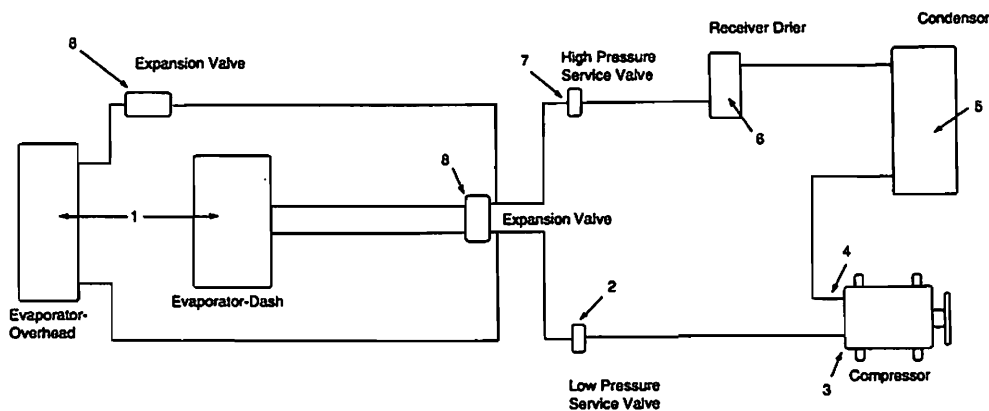
AUTOMOTIVE AIR CONDITIONING SYSTEM PRESSURES AND TEMPERATURES

The pressures and temperatures in the system fluctuate with engine speed, engine temperature, AC clutch on or off, etc.

The following specifications are based on:

- Engine speed at 1500 RPM
- A/C control switch to Max position.
- Dash air blower and overhead blower on high speed.

Refrigerant Circuit



Component	Refrigerant State	Approximate Pressure (psi)	Approximate Temperature (F)
1 - Evaporator, inlet to outlet	Vapor	(26.1 psi)	(30 F)*
2, 3 - Compressor, low pressure side	Gas	(26.1 psi)	(34 F)
4 - Compressor, high pressure side	Gas	(203 psi)	(149 F)
5 - Condenser	Gas Vapor Liquid	(203 psi)	at outlet, (131 F)
6 - Receiver drier	Liquid	(203 psi)	(131 F)
7 - Service valve, high pressure	Liquid	(203 psi)	(131 F)
8 - Expansion valve	Liquid, turns to vapor	inlet, (203 psi) outlet, (17.4 psi)	inlet, (131 F) outlet, (19 F)

* This pressure is maintained in the refrigerant system by cycling the compressor ON and OFF despite changing conditions and varying Engine Speeds.

EVACUATION AND RECHARGE PROCEDURE

1. Use a R134A refrigerant recovery/recycling/recharging unit. Such as a Kent-Moore ACR4 or equivalent to recover the R134A in the automotive A/C system.
2. Perform repairs.
3. Use a Kent-Moore ACR4 or equivalent to pull a vacuum in the A/C system. Check for leaks and repairs as necessary.
4. Recharge system with 48 oz. + 1.8 oz. (1500 grams + 50 grams) of R134A. Add up to 8.1 oz. of P.A.G. oil to system.

WARNING

Polyalkylene Glycol (PAG) synthetic oil is NOT compatible with mineral based oils used in R-12 systems. DO NOT use mineral based oils in a R134A system!

PAG oil is extremely hygroscopic. Keep oil containers sealed to prevent contamination.

NOTE: Any time the system is opened, it is recommended that the receiver drier be replaced. Reference "Receiver Drier Removal" in this section.

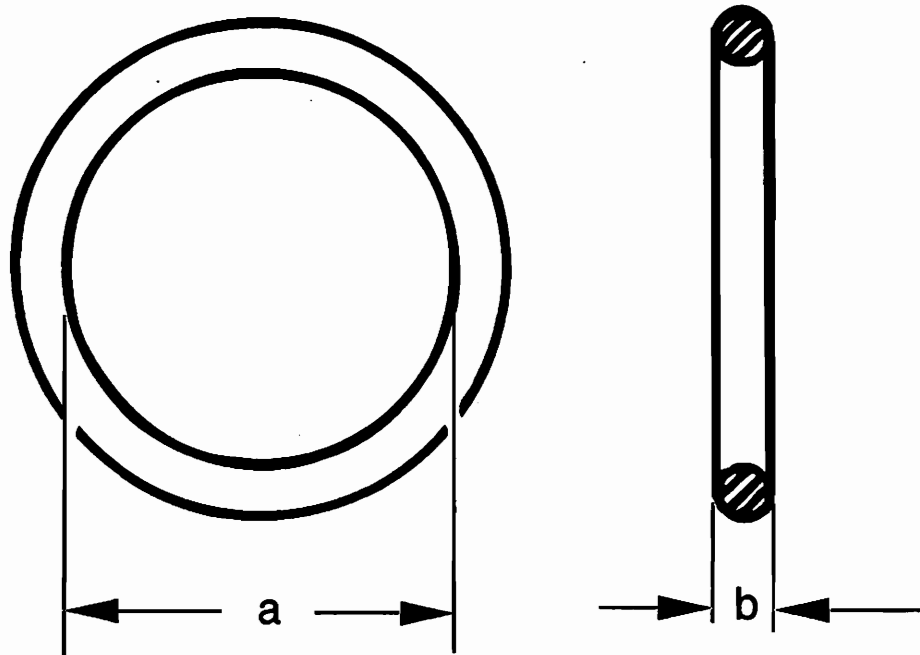
REMOVAL AND REPLACEMENT OF WINNEBAGO INSTALLED AUTOMOTIVE A/C COMPONENTS

WARNING

Do NOT open the refrigerant system without first evacuating the refrigerant. Reference "Evacuation and Recharge Procedure" in this section.

NOTE: Whenever the A/C system is opened up, the receiver drier should be replaced.

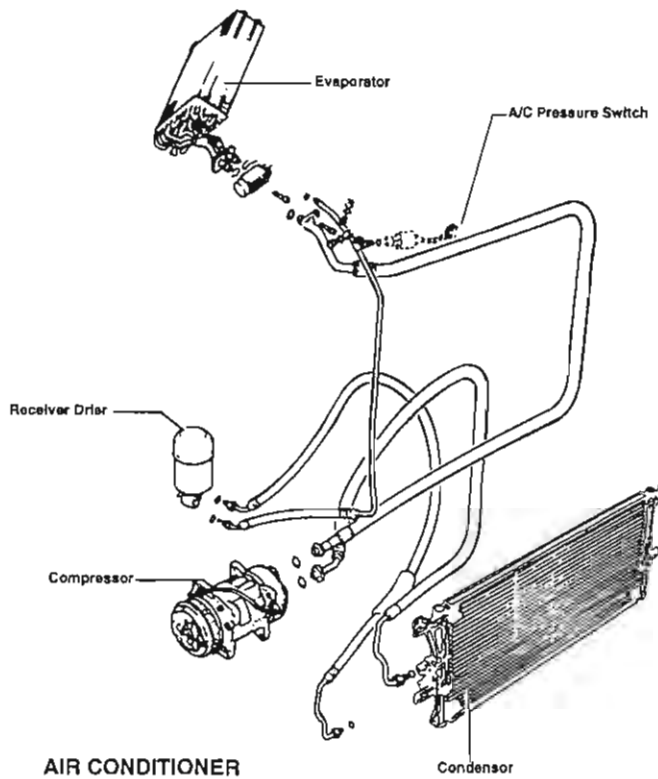
O-Rings



Whenever O-rings are exposed by system disassembly, they should be replaced with new O-rings. It is imperative to use the proper size (dimension a and b) and that the o-ring is R-134A and pag oil compatible.

NOTE: O-rings should be lubricated with P.A.G. refrigerant oil prior to installation.

RECEIVER DRIER



The receiver drier has two functions. It acts as a reservoir for the refrigerant. And it also contains a desiccant that removes moisture from the refrigerant.

NOTE: The receiver drier is a Volkswagen installed component.

RECEIVER DRIER REMOVAL

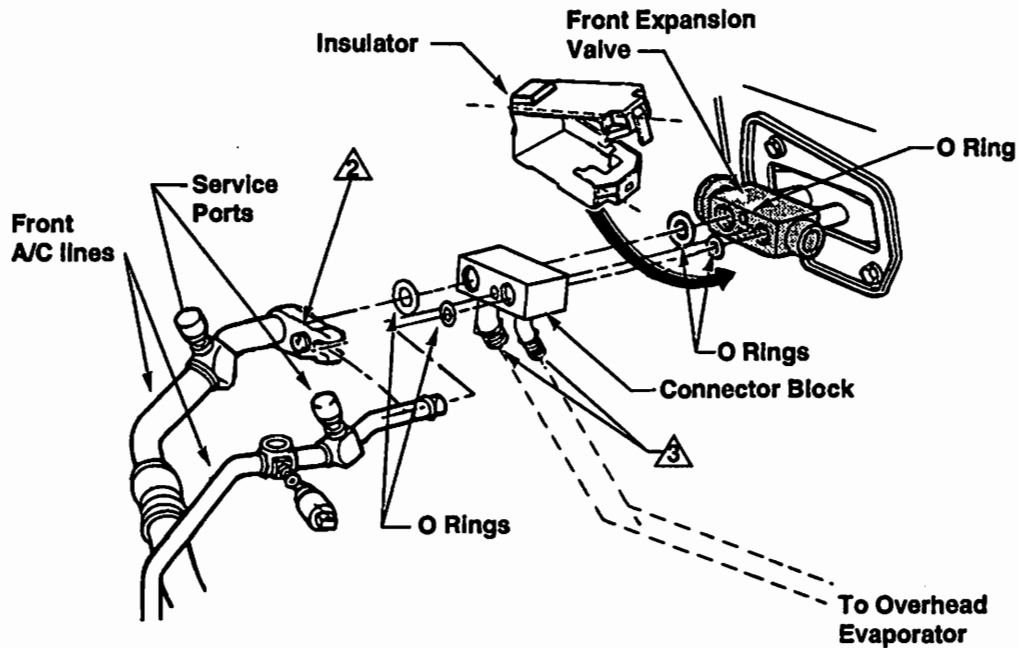
1. Evacuate refrigerant from the system. Reference "Evacuation and Recharge Procedure" in this section.
2. Loosen retaining nuts on inlet and outlet hose at receiver drier. Disconnect hoses.
3. Loosen receiver drier retaining strap. Remove receiver drier.

RECEIVER DRIER REPLACEMENT

1. Place new receiver drier in proper position. Secure with retaining strap.
2. Install two new o-rings on receiver drier inlet and outlet hoses. Reference "O-rings" in this section.
3. Connect inlet and outlet hoses to receiver drier. Torque to 11 ft./lbs. (15 Nm).
4. Recharge system. Reference "Evacuation and Recharge Procedure" in this section.

CONNECTOR BLOCK

OVERHEAD REAR A/C LINES



The connector block is attached to the front expansion valve. It allows the high and low pressure lines for the overhead evaporator to connect into the system.

CONNECTOR BLOCK REMOVAL

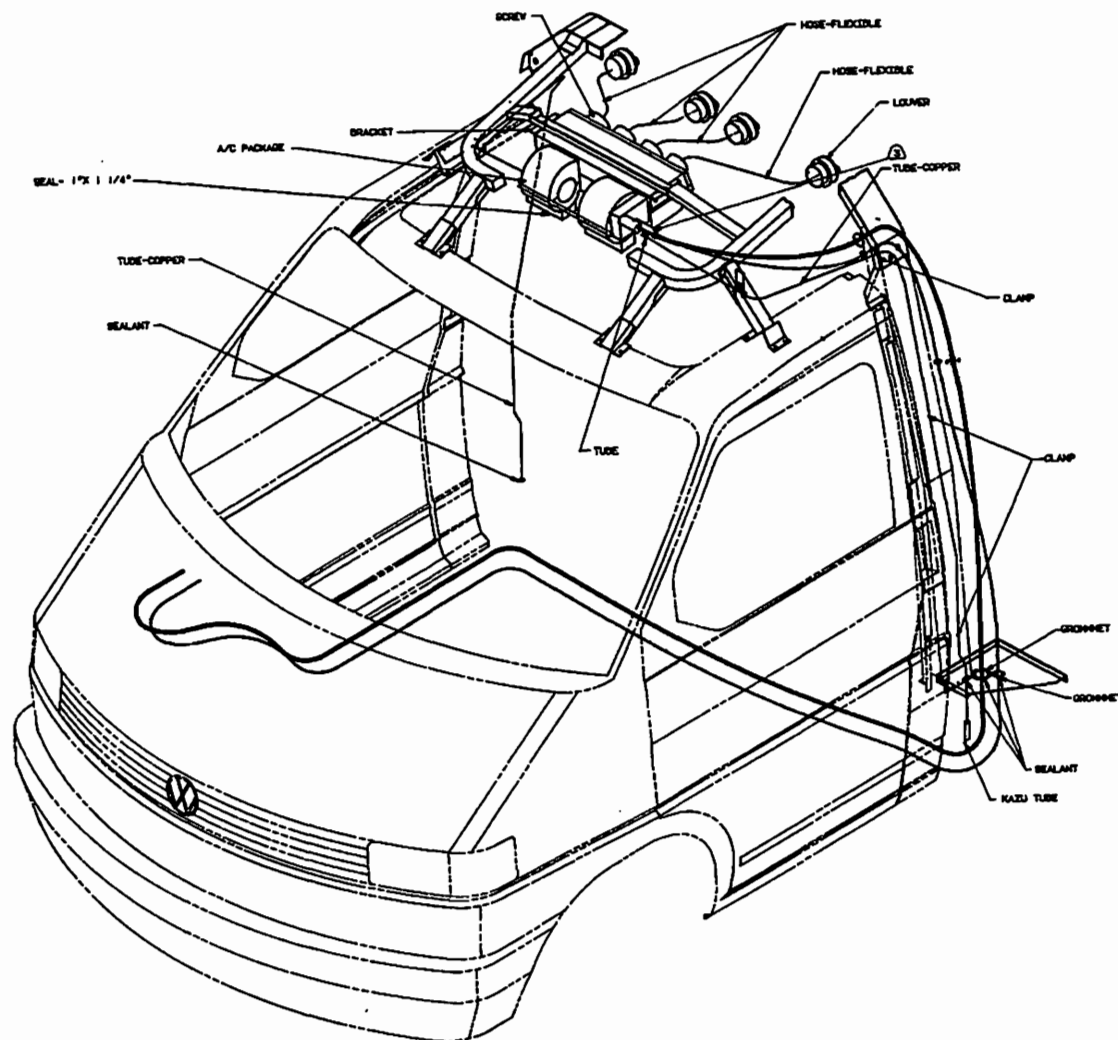
1. Evacuate refrigerant from the system. Reference "Evacuation and Recharge Procedure" in this section.
2. Unsnap and remove insulator from expansion valve.
3. Loosen and remove overhead evaporator high and low pressure lines at the connector block.
4. Loosen and remove connector block retaining bolt. Remove high and low pressure lines from connector block.
5. Remove connector block.

NOTE: This process will also loosen the expansion valve.

CONNECTOR BLOCK REPLACEMENT

1. Install two o-rings at expansion valve to evaporator connection. Reference "O-Rings" in this section. Place expansion valve in proper position.
2. Install two o-rings at connector block to expansion valve connection. Reference "O-Rings" in this section. Place connector block in proper position.
3. Install two o-rings at Volkswagen A/C lines to connector block connections. Secure hoses, connector block, and expansion valve with retaining bolt. Torque to 62 in./lbs. (7 Nm).
4. Install two o-rings at overhead A/C lines to connector block connections. Connect high and low pressure overhead A/C hoses. Torque to 11 ft./lbs. (15 Nm).
5. Recharge system. Reference "Evacuation and Recharge Procedure" in this section.

OVERHEAD EVAPORATOR HIGH PRESSURE HOSE



The high pressure line carries high pressure liquid refrigerant from the connector block to the expansion valve at the overhead evaporator.

HIGH PRESSURE HOSE REMOVAL

1. Evacuate refrigerant from the system. Reference "Evacuation and Recharge Procedure" in this section.
2. Remove fuel tank. Reference appropriate Volkswagen Service Information.
3. Remove headliner. Reference "Headline Removal" in Interior Section.
4. Loose and disconnect hose at connector block.
5. Loosen and disconnect hose at expansion valve of overhead evaporator.
6. Remove retaining clamps along length of the hose.
7. Remove hose.

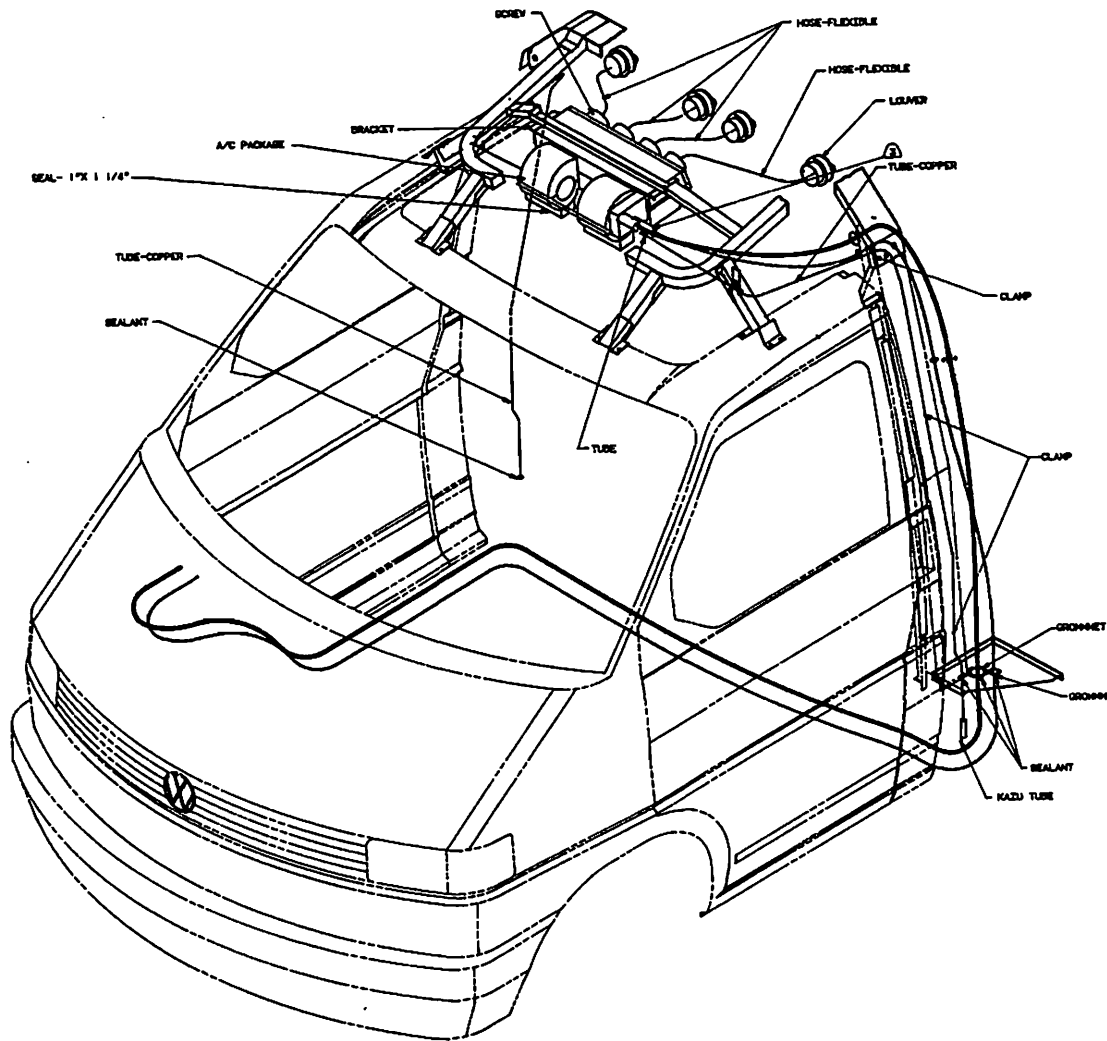
HIGH PRESSURE LINE REPLACEMENT

1. Route hose. Secure with retaining clamps.
2. Install o-ring at hose to expansion valve connection. Reference "O-Rings" in this section.
3. Connect hose to expansion valve at overhead evaporator. Torque to 11 ft./lbs. (15 Nm).

NOTE: Any exposed metal fittings at the overhead evaporator should be wrapped with PRESS TIGHT or equivalent.

4. Install o-ring at hose to connector block connection. Reference "O-Rings" in this section.
5. Connect hose to connector block. Torque to 11 ft./lbs./ (15 Nm).
6. Install fuel tank. Reference appropriate Volkswagen Service Information.
7. Recharge system. Reference "Evacuation and Recharge Procedure" in this section.
8. Install headliner. Reference "Headliner Replacement" in Interior Section.

OVERHEAD EVAPORATOR LOW PRESSURE HOSE



The low pressure line carries low pressure vapor from the evaporator to the connector block.

LOW PRESSURE HOSE REMOVAL

1. Evacuate refrigerant from the system. Reference "Evacuation and Recharge Procedure" in this section.
2. Remove fuel tank. Reference appropriate Volkswagen Service Information.
3. Remove headliner. Reference "Headliner Removal" in Interior Section.
4. Loosen and disconnect hose at connector block.
5. Loosen and disconnect hose at overhead evaporator.
6. Remove retaining clamps along length of hose.
7. Remove hose.

LOW PRESSURE HOSE REPLACEMENT

1. Route hose. Secure with clamps.
2. Install o-ring at hose to overhead evaporator connection. Reference "O-rings" in this section.
3. Connect hose to overhead evaporator. Torque to 11 ft./lbs. (15 Nm).
4. Install o-ring at hose to connector block connection. Reference "O-Rings" in this section.
5. Connect hose to connector block. Torque to 11 ft./lbs. (15 Nm).
6. Install fuel tank. Reference appropriate Volkswagen Service Information.
7. Recharge system. Reference "Evacuation and Recharge Procedure" in this section.
8. Install headliner. Reference "Headliner Replacement" in Interior Section.

OVERHEAD EVAPORATOR ASSEMBLY

See art on page 8-3.

The overhead evaporator assembly contains the following components.

- Evaporator
- Blower Wheels
- Blower Motor
- Expansion Valve

OVERHEAD EVAPORATOR ASSEMBLY REMOVAL

1. Evacuate refrigerant from system. Reference "Evacuation and Recharge Procedure" in this section.
2. Remove headliner. Reference "Headliner Removal" in Interior Section.
3. Disconnect electrical wires at connector on blower motor pigtail.
4. Disconnect (4) air output hoses from evaporator assembly.
5. Disconnect (2) drain hoses from assembly.
6. Disconnect high and low pressure hoses at assembly.
7. Loosen and remove (4) assembly retaining bolts.
8. Remove assembly.

OVERHEAD EVAPORATOR ASSEMBLY REPLACEMENT

1. Position assembly and secure with (4) retaining bolts.
2. Install new o-rings on high and low pressure hoses. Reference "O-rings" in this section.
3. Connect high and low pressure hoses to assembly. Torque to 11 ft./lbs. (15 Nm).
4. Connect (2) drain hoses to assembly.
5. Connect (4) air output hoses to assembly.
6. Connect electrical wires at connector on blower motor pigtail.
7. Recharge system. Reference "Evacuation and Recharge Procedure" in this section.
8. Install headliner. Reference "Headliner Replacement" in Interior Section.

TROUBLESHOOTING THE AUTOMOTIVE A/C SYSTEM

If there is a complaint of inadequate cooling. It must first be confirmed that the system is not operating properly. The following test readily accomplishes this.

DASH A/C PERFORMANCE TEST

1. Start the vehicle engine.
2. Set dash blower and overhead blower on high speed.
3. Set A/C switch to Max. cooling.
4. Hold the engine idle at 1500 RPM. Wait 10 minutes to allow system to stabilize.
5. Continue to hold idle at 1500 RPM. Take a temperature reading of the OUTSIDE ambient air. Record this value.
6. Take a temperature reading at the A/C outlets. Record this value. Turn off the vehicle.
7. Subtract the temperature in Step 6 from the temperature in Step 5.

If the resultant number is 20 or greater, the A/C system is functioning properly.

If the resultant number is less than 20, proceed with troubleshooting steps.

If the system does not pass the performance test, it will be necessary to determine if the problem is mechanical, electrical, or refrigerant related. Proceed as follows:

1. With the vehicle running, dash and overhead blowers on high, set the A/C switch set to Max. cooling. Did the compressor engage?
 - (Yes) Proceed to Step 3.
 - (No) Proceed to Step 2.
2. With the vehicle running, dash and overhead blowers on high, and A/C switch set on Max. cooling, check for 12 volts DC on wire feeding compressor clutch. Is voltage present?
 - (Yes) The problem is in the compressor assembly. Refer to the appropriate Volkswagen service material for repair procedures. Reference Section O of this manual for information regarding the procurement of Volkswagen service material.
 - (No) Troubleshoot the electrical circuit. Refer to the appropriate Volkswagen wiring diagram. Reference Section O of this manual for information regarding the procurement of Volkswagen service material.
3. Connect a Kent Moore ACR4 #J39500 or equivalent to the A/C system. Do NOT power up the ACR4. Start the vehicle. Turn dash and overhead blowers on high, set A/C switch to Max. cooling, and hold the vehicle engine speed at 1500 RPM. After 10 minutes. Continue to hold the engine at 1500 rpm. Perform a visual and audio check of the A/C system.

VISUAL AND AUDIO CHECK STANDARDS

- Compressor should be very warm or hot to the touch.
 - If the compressor sweats or frosts, proceed to Step A.
 - If the compressor thumps, proceed to Step B.
- Condenser should be very warm all over.
 - If the condenser is warm at the top and cool at the bottom, proceed to Step C.
- Expansion valve should be cold at outlet, warm at inlet.
 - If an expansion valve is frosted, proceed to Step D.
- Suction line should be cool with no sweating.
 - If the suction line is frosted or sweating, proceed to Step A.
- Discharge line should be same temperature as compressor.
- Receiver drier should be very warm.
- Liquid line should be very warm.

NOTE: Frosting or cold spots on lines or hoses indicates a blockage or restriction at that point.

After completing the visual and audio checks and the vehicle still running at 1500 rpm, use the ACR4 to check high and low side pressure. Record the high and low pressures.

Approximate pressure should be:

High side 203 psi.

Low side 26.1 psi

If low side and high side pressures are too high, proceed to step B.

If low side pressure is low and high side pressure is low or normal, proceed to step E.

If low side pressure is too high and high pressure is too low, proceed to step F.

If low side pressure drops into a vacuum, proceed to step G.

Step A

Test indicated that an expansion valve is stuck open. Physically feel each expansion valve with the system operating. Inlet should be warm and outlet cool. Replace the defective expansion valve.

Step B

Test indicate a possible dirty condensor, overcharge of refrigerant or incondensables (air) in the system.

Clean the condensor coil. If condition is not alleviate, evacuate system and recharge. Reference "Evacuation and Recharge Procedure" in this section.

Step C

Test indicates a restriction in the high pressure side or a closed expansion valve.

Check the high side hoses and components for a restriction. Note: A frosted or cold spot indicates a restriction. Replace any faulty components. If no restrictions are found, physically feel each expansion valve with the system operating. Inlet should be warm and outlet cool. Replace defective expansion valve.

Step D

Test indicates moisture in the refrigerant. Evacuate system, recycle refrigerant and recharge system. Reference "Evacuation and Recharge Procedure" in this section.

Step E

Test indicates a low refrigerant charge. Check system to determine course of refrigerant loss. Repair the leak. Evacuate and recharge the system. Reference "Evacuation and Recharge Procedure" in this section.

Step F

Test indicates an expansion valve stuck open, or defective valves in the compressor.

Physically feel each expansion valve. Inlet should be warm and outlet cool. If expansion valves are not defective, repair or replace the compressor.

Step G

Test indicates an expansion valve stuck closed or moisture in the system.

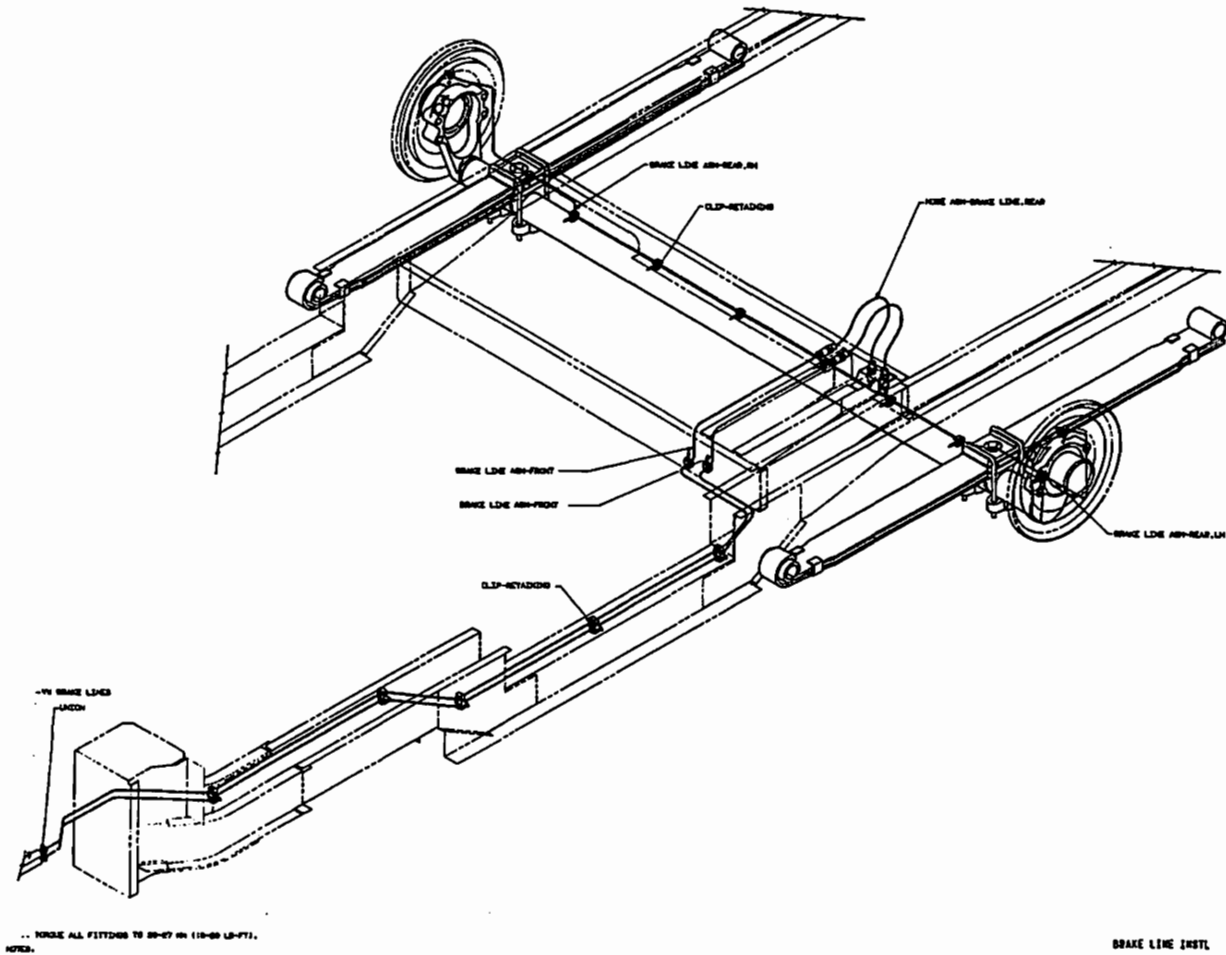
Physically feel each expansion valve with the system operating. Inlet should be warm and outlet cool. A frosted expansion valve indicates moisture in the system.

BRAKES

The Rialta utilizes front disc brakes and rear drum brakes which are manufactured by Volkswagen. For service information regarding the brake system, please refer to the appropriate Volkswagen service information. Reference section O for information regarding the procurement of Volkswagen service literature.

When the chassis is modified at Winnebago, new brake lines are installed from the cab area back to the rear brakes. In this application a rear proportioning valve is not used.

NOTE: When replacing a Winnebago installed brakeline, torque at fittings to 15-20 ft./lbs. (20-27 Nm)



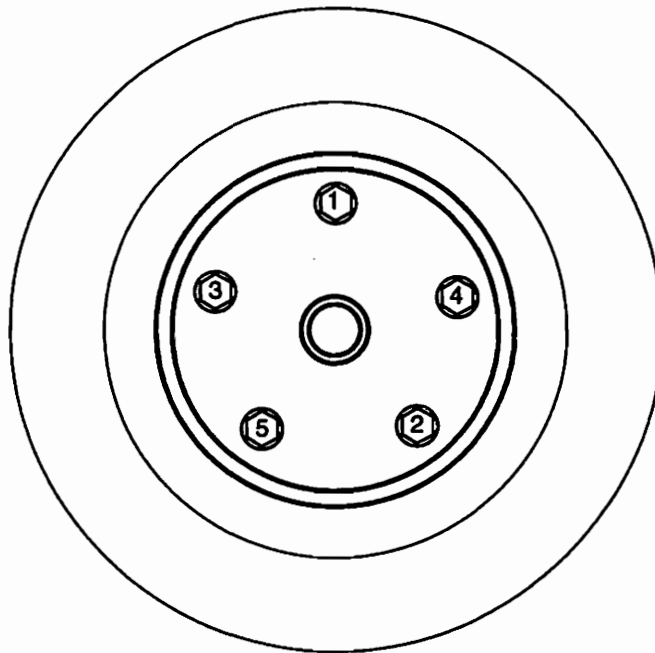
WHEEL

Wheel Removal

1. Prepare vehicle to be raised. Reference "Jacking and Lifting" in Section O.
2. Remove wheel cover by gently pulling it from rim.
3. Loosen all wheel bolts (5) one turn. Do NOT remove wheel bolts.
4. Raise vehicle. Reference "Jacking and Lifting" in Section O.
5. Remove (5) wheel bolts and remove wheel.

Wheel Replacement

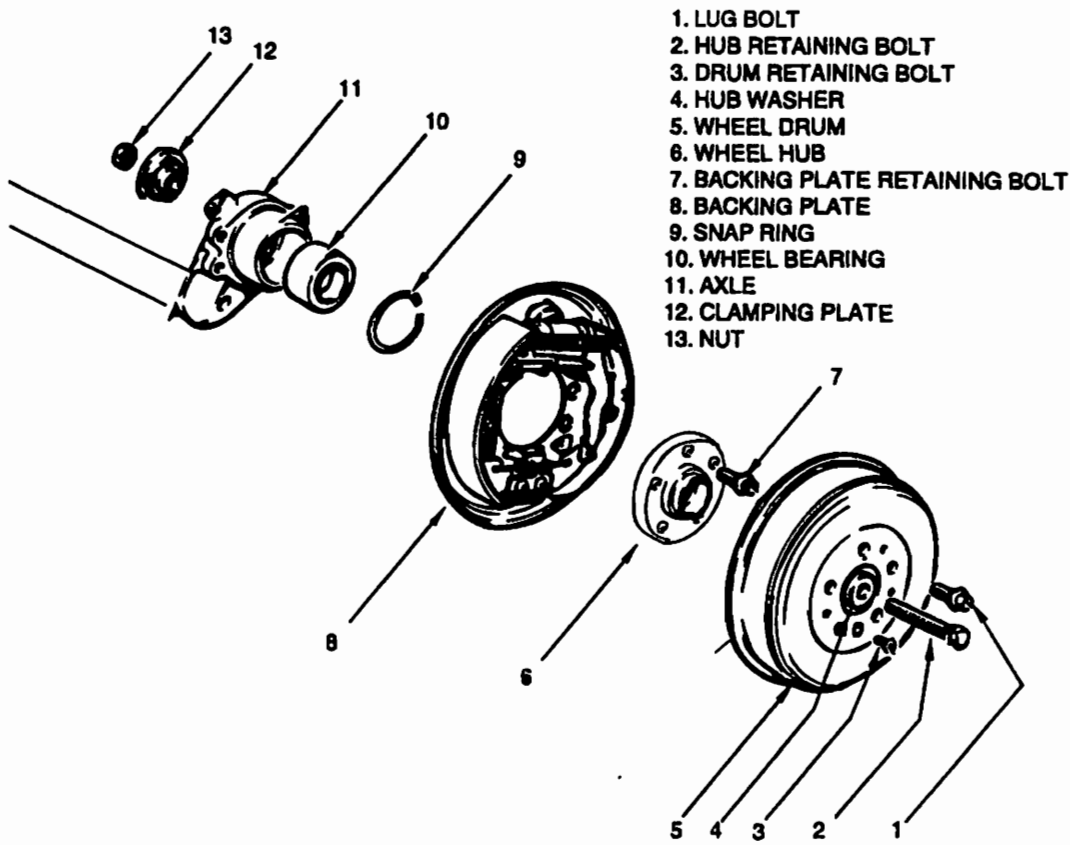
1. Position wheel on hub.
2. Install and tighten (5) wheel bolts. NOTE: Tighten wheels in a crossing pattern.



WHEEL BOLT TORQUING SEQUENCE

3. Lower vehicle.
4. Torque wheel bolts to 116 ft./lbs. \pm 11.6 (16.0 daNm \pm 1.5) using a crossing pattern.
5. Position wheel cover on rim. Secure by gently pushing on to rim.

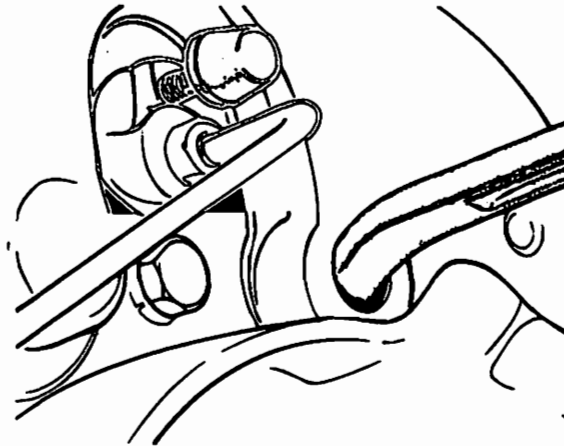
WHEEL DRUM



Wheel Drum Removal

NOTE: Parking brake must be released.

1. Remove appropriate wheel. Reference "Wheel Removal" in this section.
2. Loosen and remove wheel drum retaining bolt.
3. Back off adjuster wheel through hole in backing plate.

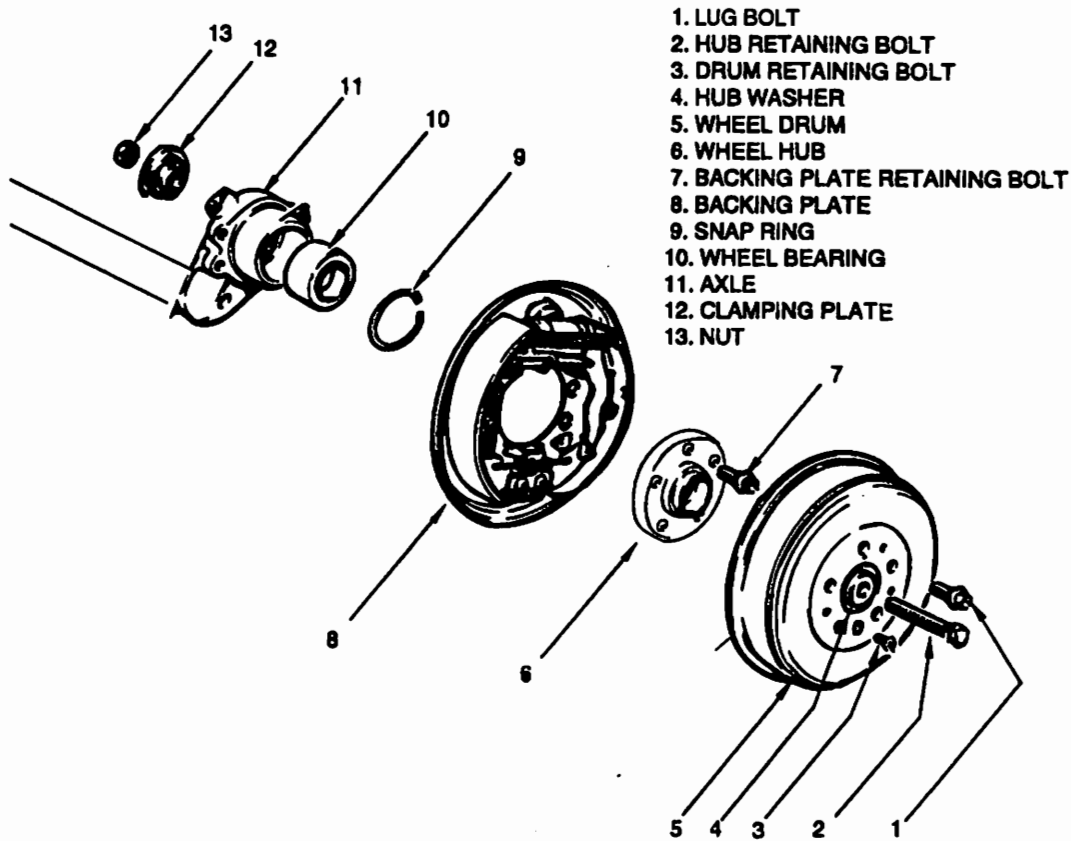


4. Remove wheel drum.

Wheel Drum Replacement

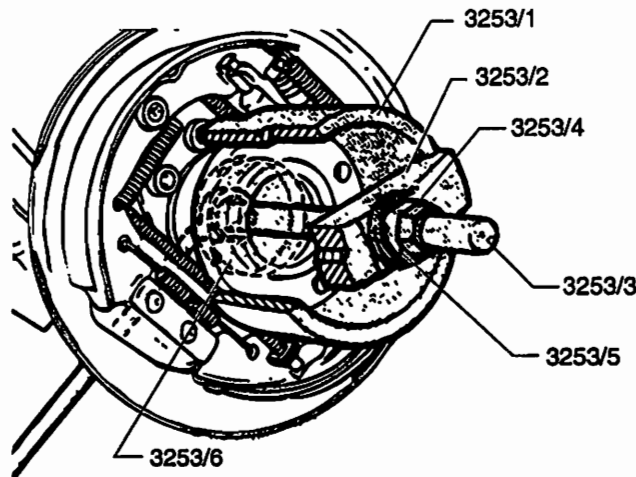
1. Align wheel drum on hub using alignment pin.
2. Install wheel drum retaining bolt. Torque to 44 in./lbs. (5.0 Nm).
3. Install wheel. Reference "Wheel Replacement" in this section.

REAR WHEEL HUB



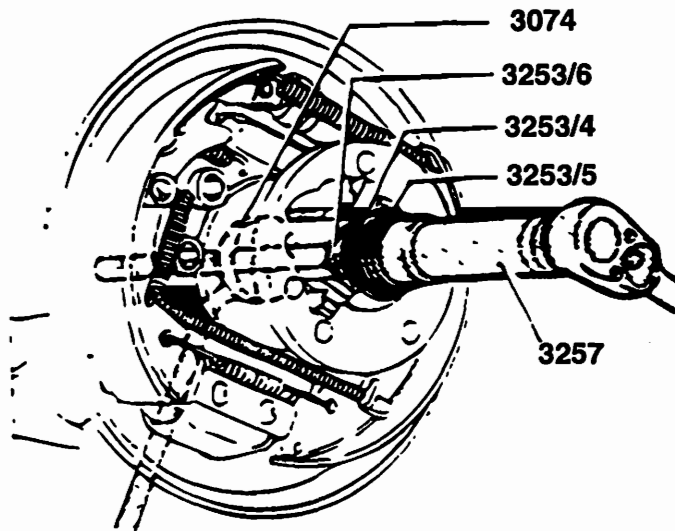
Wheel Hub Removal

1. Remove appropriate wheel. Reference "Wheel Removal" in this section.
2. Remove wheel drum. Reference "Wheel Drum Removal" in this section.
3. Loosen and remove wheel hub retaining bolt. Remove outboard wheel hub washer and clamping plate.
4. Use Volkswagen tools 3253/1, 3253/2, 3253/4, 2353/3, 3253/5 and 3253/6 or equivalent to pull hub.



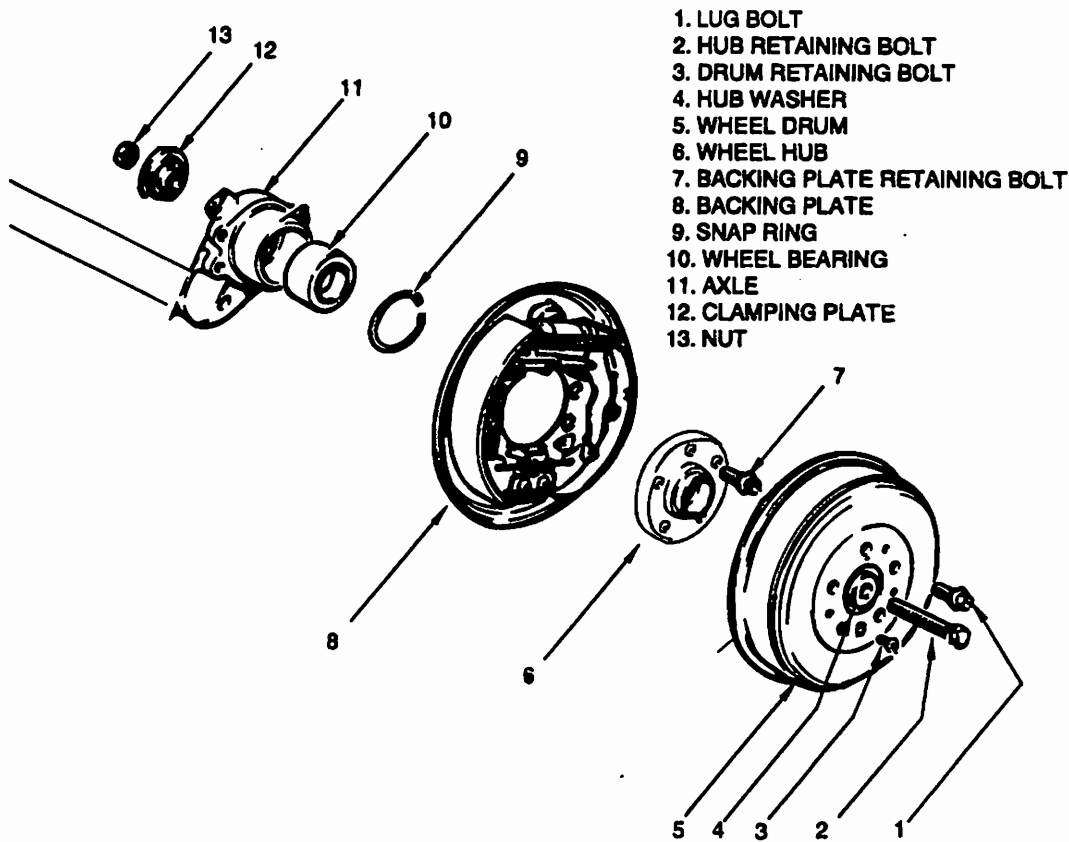
WHEEL HUB REPLACEMENT

1. Place the hub in position against the bearing.
2. Use Volkswagen tools 3074, 3253/6, 3253/4, 3253/5 and 3257 or equivalent to press the hub into the bearing.



3. Place clamping plate and outboard wheel hub washer in position. Install wheel hub retaining bolt. Secure with nut and torque to 145 ft./lbs. \pm 14.5 (20 daNm \pm 2 daNm)
4. Install wheel drum. Reference "Wheel Drum Replacement" in this section.
5. Install wheel. Reference "Wheel Replacement" in this section.

REAR WHEEL BEARING



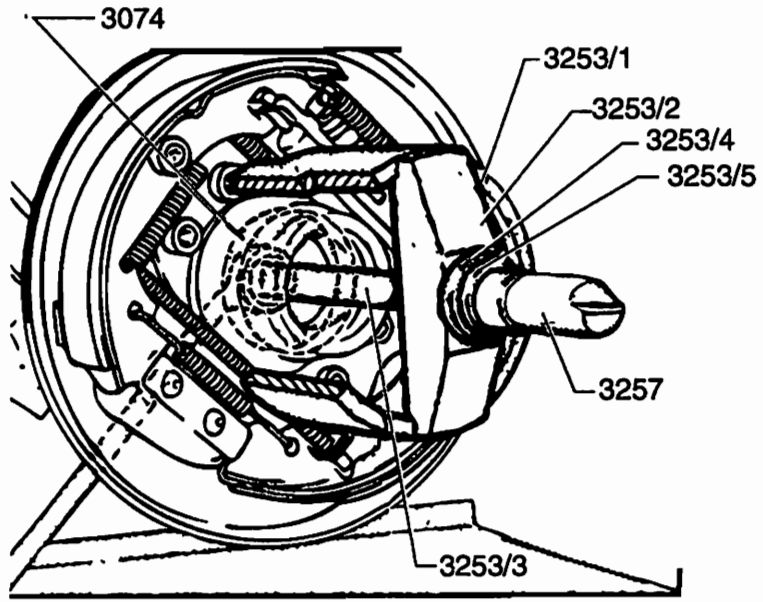
Rear Wheel Bearing Removal

1. Remove appropriate wheel. Reference "Wheel Removal" in this section.
2. Remove wheel drum. Reference "Wheel Drum Removal" in this section.
3. Remove wheel hub. Reference "Wheel Hub Removal" in this section.
4. Use a snap ring pliers to remove snap ring.

CAUTION

Snap ring is under pressure.

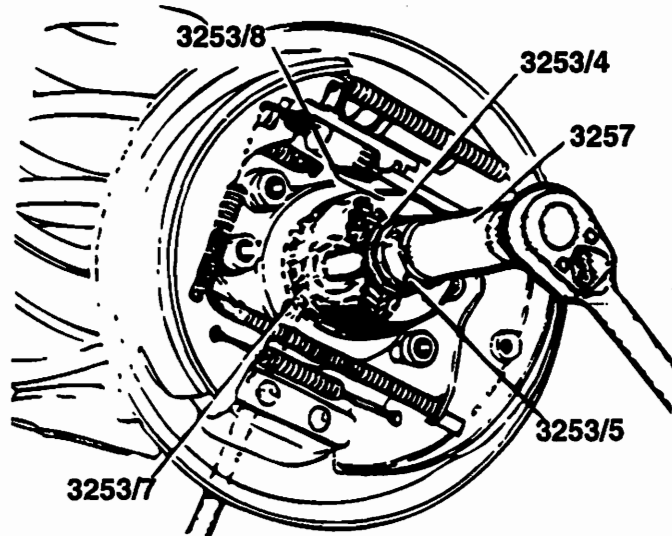
5. Use Volkswagen tools 3253/1, 3253/2, 3253/4, 3253/5, 3257,, 3253/3 and 3074 or equivalent to remove bearing from axle.



REAR WHEEL BEARING REPLACEMENT

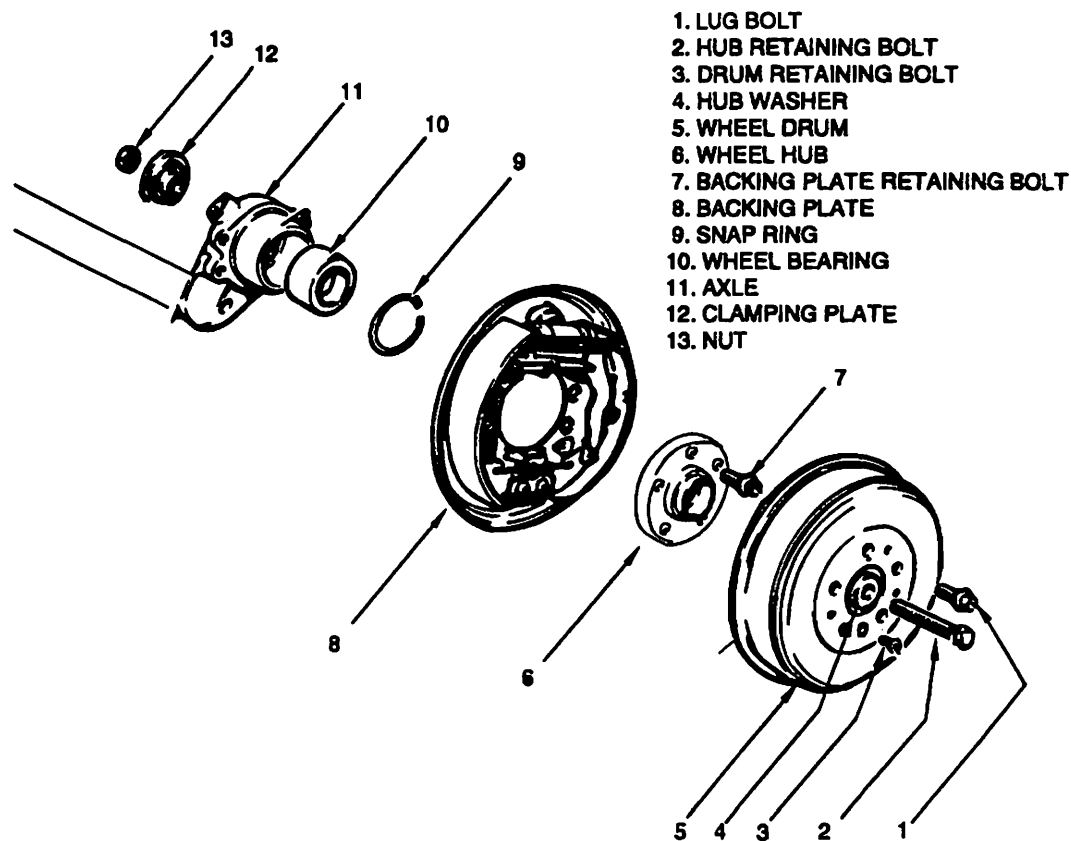
1. Position bearing against axle.

NOTE: Use only heavy duty bearings. Winnebago part #115031-01-000 (VW 701 501 287 F).



2. Pull bearing into axle housing up to stop using Volkswagen Tools 3253/4, 3257, 3253/5, 3253/7 and 3253/8 or equivalent.
3. Install snap ring.
4. Install wheel hub. Reference "Wheel Hub Replacement" in this section.
5. Install wheel drum. Reference "Wheel Drum Replacement" in this section.
6. Install wheel. Reference "Wheel Replacement" in this section.

BACKING PLATE



Backing Plate Removal

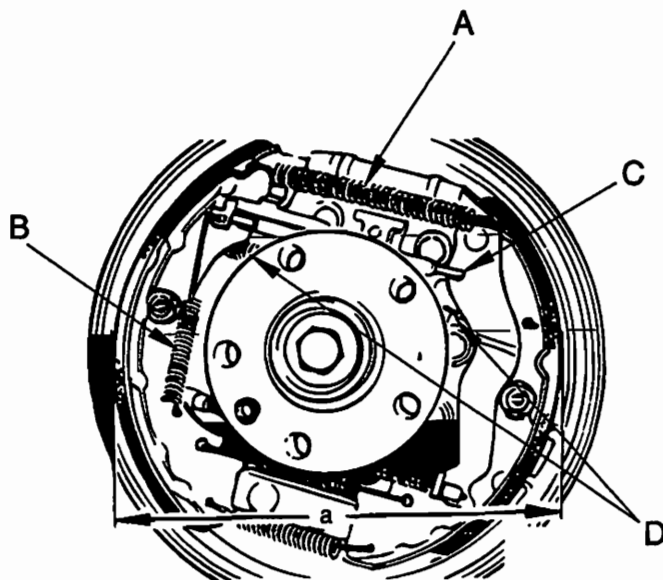
1. Remove appropriate wheel. Reference "Wheel Removal" in this section.
2. Remove wheel drum. Reference "Wheel Drum Removal" in this section.
3. Remove wheel hub. Reference "Wheel Hub Removal" in this section.
4. Remove brake shoes. Reference "Brake Shoe Removal" in this section.
5. Disconnect brake line and parking brake cable from backing plate. NOTE: Cap brake line to prevent contamination.
6. Remove (4) backing plate retaining bolts.
7. Remove backing plate.

BACKING PLATE REPLACEMENT

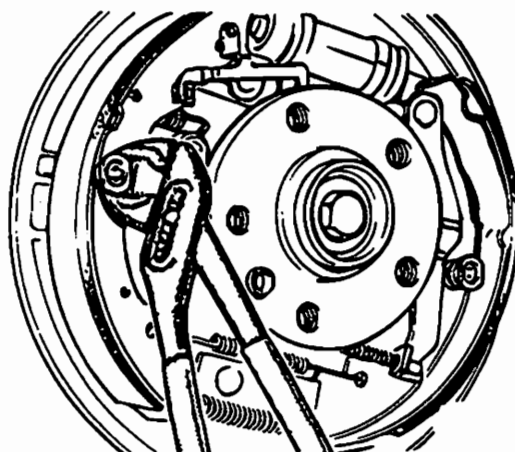
1. Position backing plate unto axle. Secure with (4) retaining bolts. Torque to 107 ft./lbs. + 11.0 (14.5 daNm + 1.5).
2. Connect park brake cable and brakeline to backing plate. Torque brakeline connector 15-20 ft./lbs. (20-27 Nm).
3. Install brake shoes. Reference "Brake Shoe Replacement" in this section.
4. Adjust the rear brakes. Reference "Rear Brake Adjustment" in this section.
5. Adjust the parking brake. Reference "Parking Brake Adjustment" in this section.
6. Install wheel hub. Reference "Wheel Hub Replacement" in this section.
7. Install wheel drum. Reference "Wheel Drum Replacement" in this section.
8. Bleed brake system. Reference "Bleeding the Brake System" in this section.
9. Install wheel. Reference "Wheel Replacement" in this section.

BRAKE SHOES

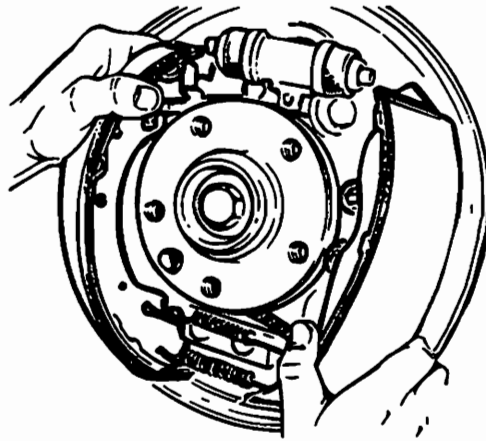
Brake Shoe Removal



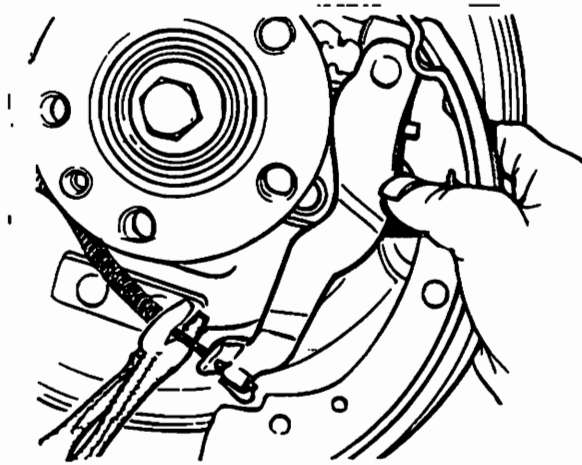
1. Remove spring (A).
2. Remove push/adjusting rod spring (B).
3. Fully back off adjusting wheel (C).
4. Unhook return springs (D).



5. Remove spring retainer and hold down springs.



6. Partially remove brake shoes and unhook lower springs.



7. Disconnect parking brake cable if at lever on brake shoe and remove brake shoes.

BLEEDING THE BRAKE SYSTEM

CAUTION

- Brake fluid is corrosive. Do NOT allow it to contact painted parts.
- Use only clean new brake fluid DOT3/4.

Bleeding (With Volkswagen Tool US 1116)

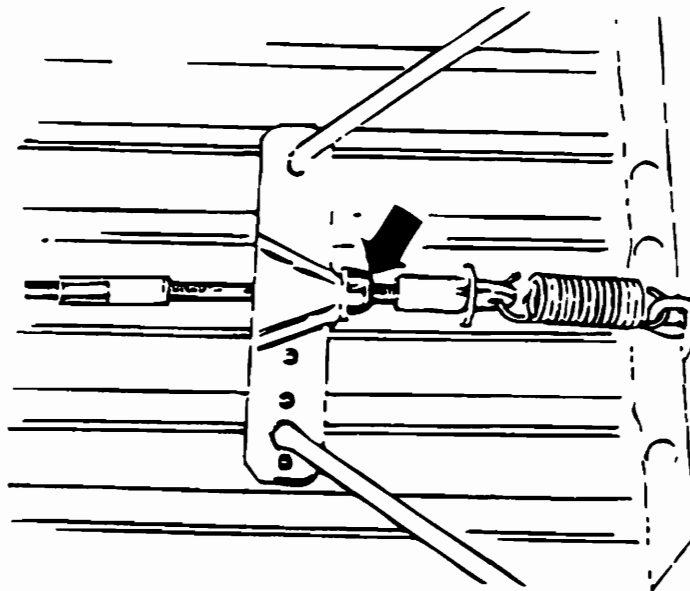
1. Use a suction bottle to draw off as much brake fluid as possible from brake fluid reservoir.
2. Connect US 1116 to brake fluid reservoir and turn on.
3. Connect hose from bleeder bottle to calipers and bleed in the following sequence.
 1. Right rear wheel cylinder.
 2. Left rear wheel cylinder.
 3. Right front brake caliper.
 4. Left front brake caliper.

BLEEDING (WITHOUT VOLKSWAGEN TOOL US 1116)

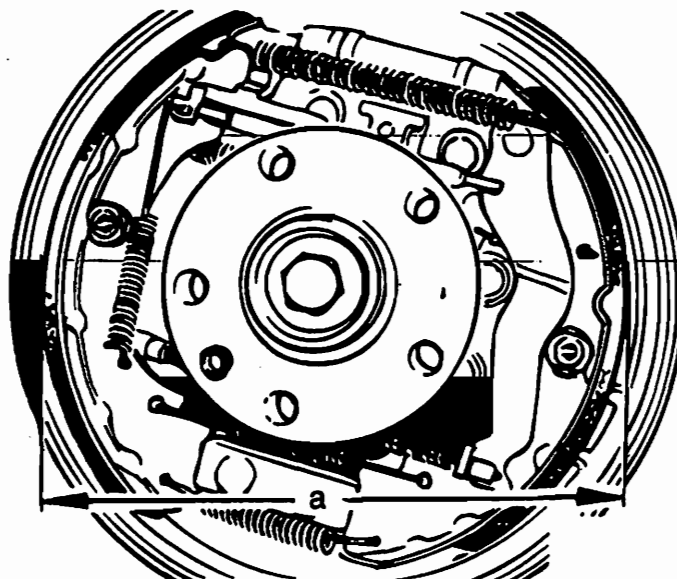
1. Top off brake fluid reservoir with clean new brake fluid DOT 3/4.
2. Connect hose from bleeder bottle to right rear wheel cylinder bleed screw.
3. Pump brake pedal several times and hold pedal down.
4. Open bleeder screw until pressure drops. Close bleeder screw.
5. Release brake pedal.
6. Repeat steps 3, 4 and 5 until brake fluid flows without air bubbles.
7. Repeat this procedure to remaining cylinder/calipers in the following order.
 1. Left rear wheel cylinder.
 2. Right front brake caliper.
 3. Left front brake caliper.

REAR BRAKE ADJUSTMENT

1. Remove appropriate wheel. Reference "Wheel Removal" in this section.
2. Remove wheel drum. Reference "Wheel Drum Removal" in this section.
3. Release parking brake.



4. Loosen parking brake cable at adjusting nut.
5. Centralize brake shoes to backing plate.



6. Set brake shoes to dimension A by turning adjuster wheel.

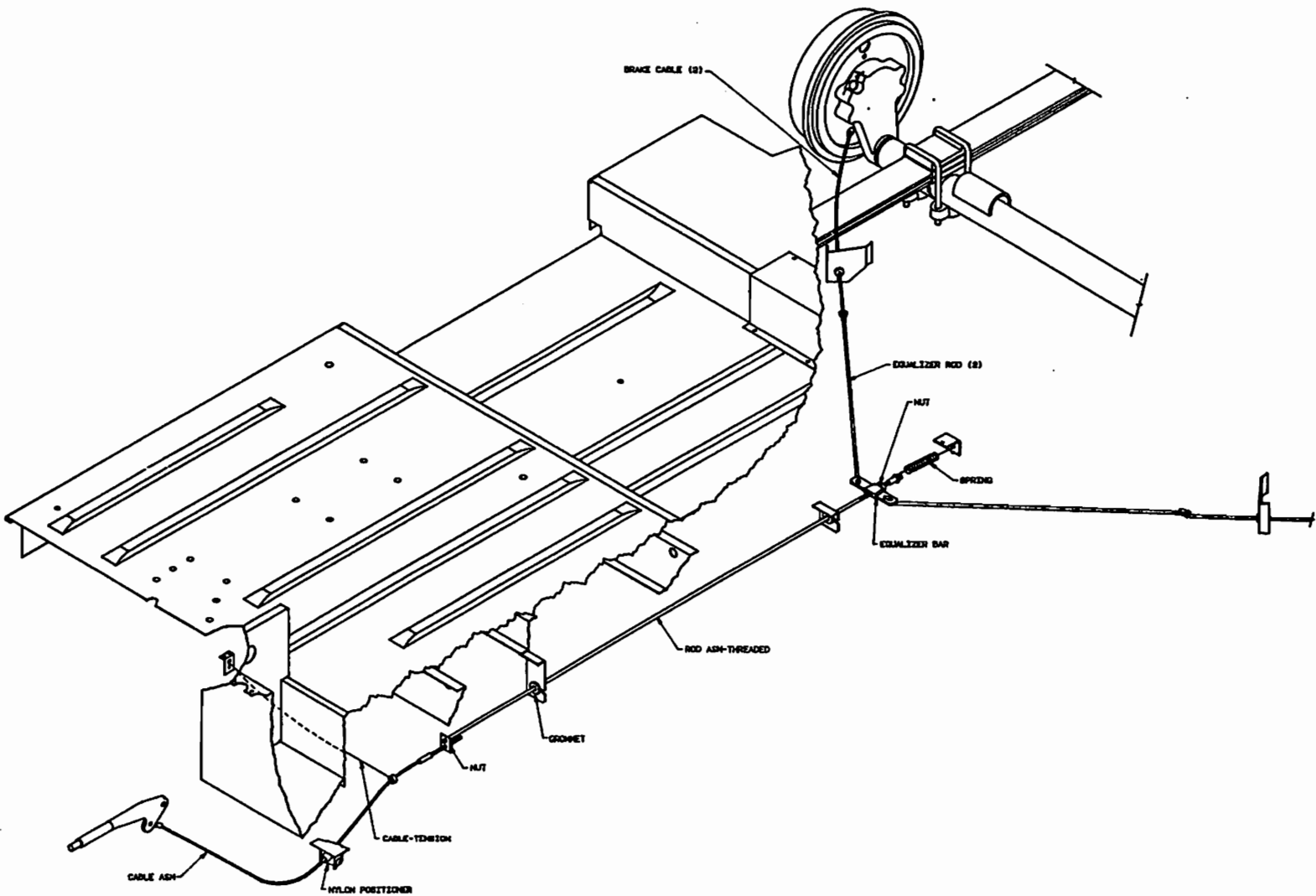
A = Inside diameter of brake drum minus 1.0 mm.

Example:

Inside diameter of brake drum	2680 mm
	<u>1.0 mm</u>
A =	267.0 mm

7. Adjust parking brake. Reference "Parking Brake Adjustment" in this section.
8. Install wheel drum. Reference "Wheel Drum Replacement" in this section.
9. Install wheel. Reference "Wheel Replacement" in this section.

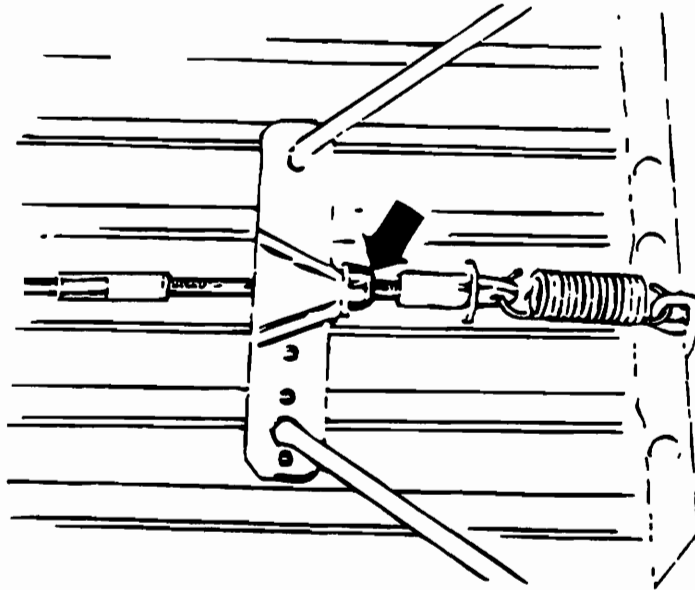
PARKING BRAKE ADJUSTMENT



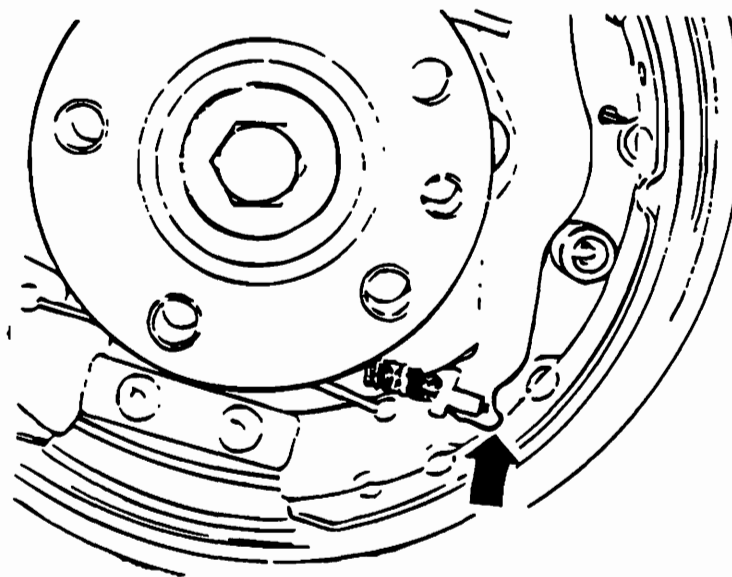
BRAKE INSTL-PARK

NOTE: Due to the self adjusting rear brakes, readjustment of parking brake is usually not necessary. Readjustment is necessary if the parking brake cables or the back plate are replaced.

1. Remove rear wheels. Reference "Wheel Removal" in this section.
2. Remove rear wheel drums. Reference "Wheel Drum Removal" in this section. **NOTE:** Parking brake must be released.



3. Tighten adjusting nut (figure above) until brake lever moves 2.0 mm away from brake shoe (figure below).



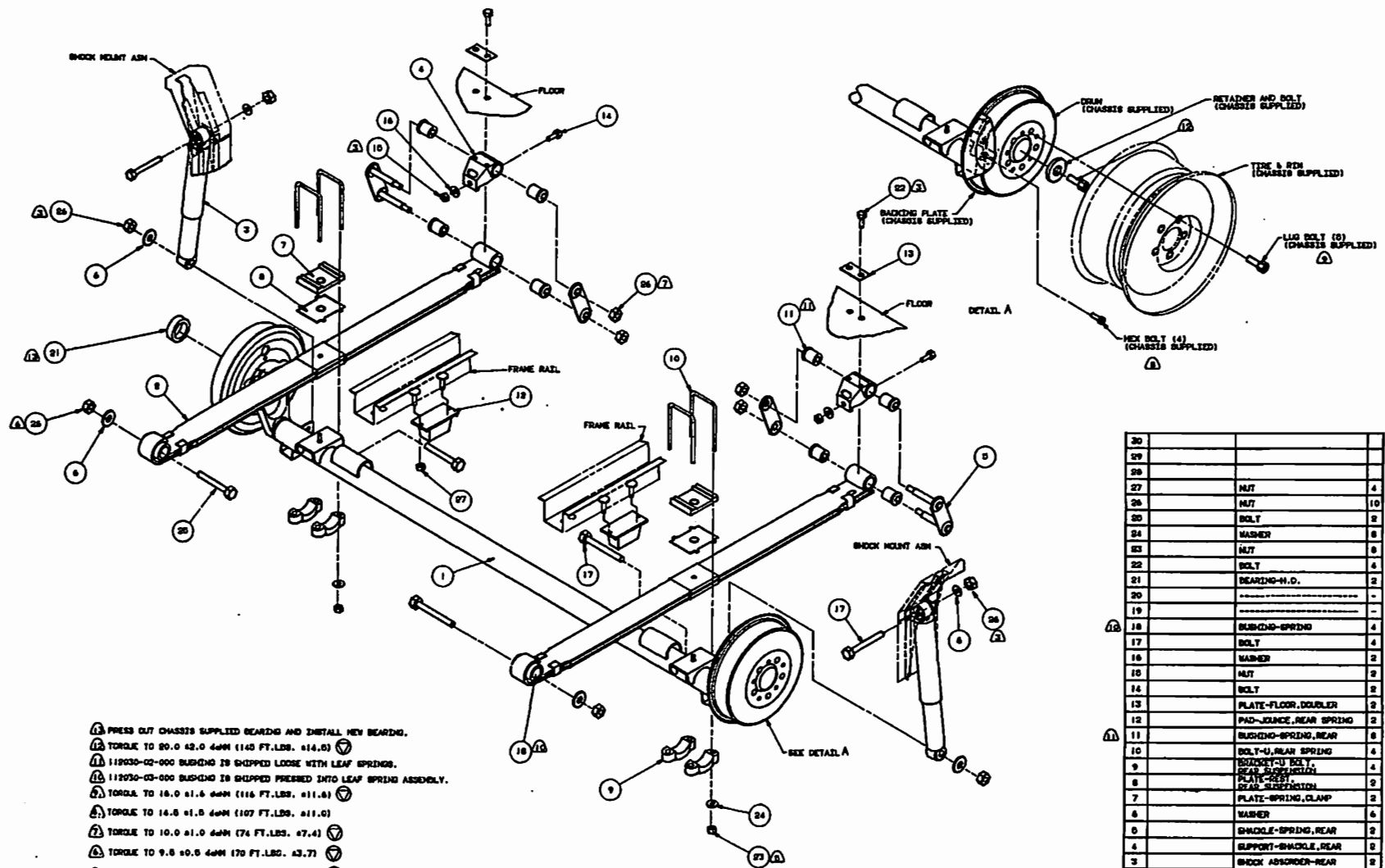
4. Install wheel drums. Reference "Wheel Drum Replacement" in this section.
5. Install wheels. Reference "Wheel Replacement" in this section. Check both rear wheels to ensure they rotate freely.

CAUTION

Adjusting rear brakes will result in slightly increased foot and parking brake travel. This will reduce itself while driving and using the foot brake.

REAR SHOCK ABSORBER

Piaflo



- (A) PRESS OUT CHASSIS SUPPLIED BEARINGS AND INSTALL NEW BEARINGS.
 - (B) TORQUE TO 20.0 ±2.0 dmm (145 FT.-LBS. ±14.6)
 - (C) 112030-02-000 BUSHING IS SHIPPED LOOSE WITH LEAF SPRINGS.
 - (D) 112030-03-000 BUSHING IS SHIPPED PREPRESSED INTO LEAF SPRING ASSEMBLY.
 - (E) TORQUE TO 16.0 ±1.6 dmm (116 FT.-LBS. ±11.6)
 - (F) TORQUE TO 14.5 ±1.5 dmm (107 FT.-LBS. ±11.0)
 - (G) TORQUE TO 10.0 ±1.0 dmm (74 FT.-LBS. ±7.4)
 - (H) TORQUE TO 9.5 ±0.5 dmm (70 FT.-LBS. ±5.7)
 - (I) TORQUE TO 8.0 ±0.8 dmm (60 FT.-LBS. ±5.7)
 - (J) TORQUE TO 6.0 ±0.5 dmm (37 FT.-LBS. ±3.7)
 - (K) TORQUE TO 4.0 ±0.5 dmm (30 FT.-LBS. ±3.7)
 - (L) TORQUE TO 2.0 ±0.5 dmm (16 FT.-LBS. ±3.7)
 - (M) TORQUE TO 1.40 ±0.3 dmm (11 FT.-LBS. ±2.2)
- NOTES: (V) INDICATES CRITICAL SAFETY TORQUE.

30		
29		
28		
27	NUT	4
26	NUT	10
25	BOLT	2
24	WASHER	6
23	NUT	6
22	BOLT	4
21	BEARING-H.D.	2
20		
19		
(A) 18	SUBCHD-SPRING	4
17	BOLT	4
16	WASHER	2
15	NUT	2
14	BOLT	2
13	PLATE-FLOOR, DOUBLER	2
12	PAD-OUNCE, REAR SPRING	2
(A) 11	BUSHING-SPRING, REAR	6
10	BOLT-U, REAR SPRING	4
9	SUBCHD-FLY, REAR SUSPENSION	4
8	PLATE-REST, REAR SUSPENSION	2
7	PLATE-SPRING, CLAMP	2
6	WASHER	6
5	SHOCKLE-SPRING, REAR	2
4	SUPPORT-SHOCKLE, REAR	2
3	SHOCK ABSORBER-REAR	2
2	SPRING ASH-REAR	2
1	AXLE ASH-REAR	1
ITEM	DESCRIPTION	QTY

94 H-SERIES

AXLE/SUSPENSION INSTL-REAR

Rear Shock Removal

1. Raise the vehicle. Reference "Jacking and Lifting" in Section O.
2. Remove appropriate wheel. Reference "Wheel Removal" in this section.
3. Loosen and remove nut from lower shock retaining bolt. Remove bolt and washer.
4. Loosen and remove nut from upper shock retaining bolt. Remove bolt and washer.
5. Remove shock.

Rear Shock Replacement

1. Place shock in proper position.
2. Install upper shock retaining bolt, washer and nut. Torque to 30 ft./lbs. \pm 3.7 (4.0 daNm \pm 5).
3. Install lower shock retaining bolt, washer and nut. Torque to 30 ft./lbs. \pm 3.7 (4.0 daNm \pm 5).
4. Install wheels. Reference "Wheel Replacement" in this section.
5. Lower the vehicle.

REAR AXLE

See art on page 8-40.

Rear Axle Removal

1. Raise the rear of the vehicle and support with junk stands at lifting points directly forward of the rear tires. Reference "Jacking and Lifting" in Section O.
2. Remove rear wheels. Reference "Wheel Removal" in this section.
3. Remove rear shocks. Reference "Rear Shock Removal" in this section.
4. Remove rear wheel drums. Reference "Wheel Drum Removal" in this section.
5. Remove brake shoes. Reference "Brake Shoe Removal" in this section. Remove parking brake cables from backing plates.
6. Disconnect brakelines from backing plates. Cap brake lining to prevent contamination.
7. Disconnect brake line retaining clips from axle.
8. Support the axle to prevent it from falling when u-bolts are removed.
9. Loosen and remove (8) nuts on (4) u-bolts.
10. Drop axle down from springs to remove.

NOTE: If you will be installing a new axle, it will be necessary to remove the hubs and backing plates and install them on the new axle. Reference "Wheel Hub Removal" and "Backing Plate Removal" in this section.

REAR AXLE REPLACEMENT

NOTE: If you are installing a new axle, it will be necessary to install:

- A. The backing plate from the old axle. Reference "Backing Plate Replacement" in this section.
- B. New wheel bearings. Reference "Wheel Bearing Replacement" in this section.
- C. The hubs from the old axle. Reference "Wheel Hub Replacement" in this section.
- D. The wheel drums from the old axle, which will be installed later.

1. Place axle in position under springs. Note: Pins on axle fit into holes in springs.
2. Place clamp plate spring, plate rest, u-bolts and u-bolt brackets in position. Install (8) retaining nuts of (4) u-bolts and torque to 50 ft./lbs. \pm 3.7 (8.0 daNm \pm 0.5).
3. Connect brake lines to backing plates. Torque to 15-20 ft./lbs. (20-27 Nm).
4. Secure brakelines to axle with connectors.
5. Connect park brake cables to backing plates.
6. Install brake shoes. Reference "Brake Shoe Replacement" in this section.
7. Adjust rear brakes. Reference "Rear Brake Adjustment" in this section.
8. Adjust the parking brake. Reference "Parking Brake Adjustment" in this section.
9. Install wheel drums. Reference "Wheel Drum Replacement" in this section.
10. Bleed the brake system. Reference "Bleeding the Brake System" in this section.
11. Install rear shocks. Reference "Rear Shock Replacement" in this section.
12. Install wheels. Reference "Wheel Replacement" in this section.

LEAF SPRINGS

See art on page 8-40.

Leaf Spring Removal

1. Remove rear axle. Reference "Rear Axle Removal" in this section.
2. Loosen and remove nut on forward shackle retaining bolt. Remove retaining bolt and washer.
3. Loosen upper nut of rear shackle. Loosen and remove lower nut from rear shackle.
4. Remove spring.

LEAF SPRING REPLACEMENT

1. Insert rear of spring unto lower bolt of rear shackle. Start retaining nut but do not tighten.
2. Position front of spring into front shackle.
3. Install retaining bolt, washer and nut. Torque to 70 ft./lbs. \pm 3.7 (9.5 daNm \pm 0.5).
4. Torque rear shackle nuts to 74 ft./lbs. \pm 7.4 (10.0 daNm \pm 1.0).
5. Install rear axle. Reference "Rear Axle Replacement" in this section.

REAR AIR BAGS

The optional rear air bags system consists of the following components.

- Two air bag assemblies (one per side)
- Two 1/4" air lines. (one per side)
- Two fill valves (one per side)

Each air bag contains pressurized air independently of the other. The pressurized air is manually introduced to each air bag via each bags fill valve and air line.

NOTE: The fill valves are located on the lower edge of the valance panels directly in front of the rear tires.

The operating range of the air bags is 10-100 psi. However, 20-30 psi is usually adequate.

CAUTION

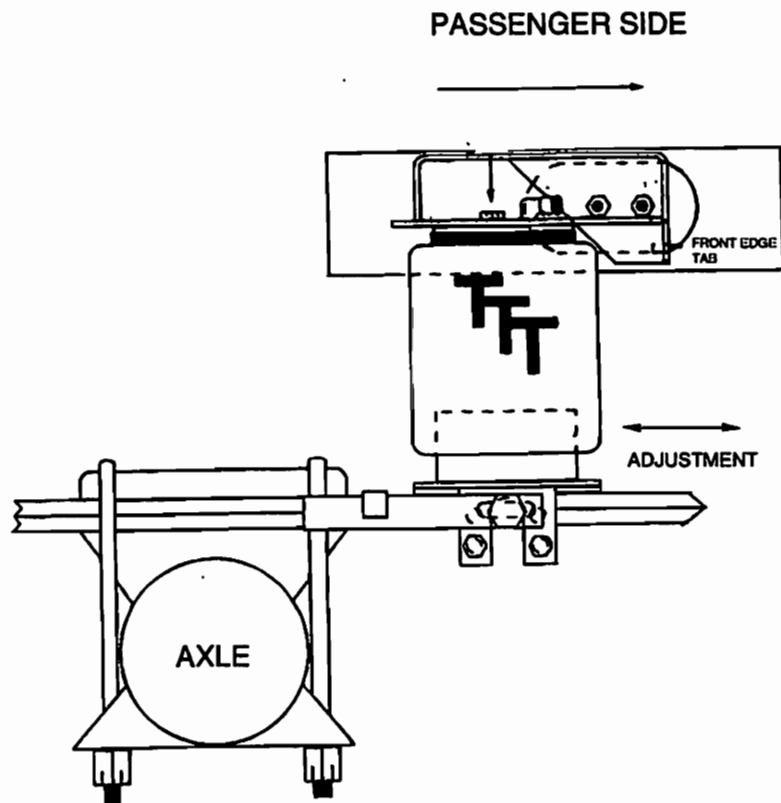
Never raise the rear of the vehicle higher than the front.

REAR AIR BAG REMOVAL

1. Raise the rear of vehicle at the jacking and lifting points directly ahead of the rear wheels. Reference "Jacking and Lifting" in Section O.
2. Remove the appropriate rear wheel(s). Reference "Wheel Removal" in this section.
3. Release all air pressure from air bag by depressing center pin of fill valve.
4. Loosen and remove fill valve retaining nut. Remove fill valve from vehicle.
5. Loosen and remove the retaining nuts on the (2) bolts retaining the air bag assembly to the spring. Remove the retaining bolts. Use a water pump pliers to bend the four metal tabs straight.
6. Loosen and remove (2) retaining nuts on the (2) bolts retaining the air bag assembly to the frame. Remove the retaining bolts.
7. Remove the air bag assembly.

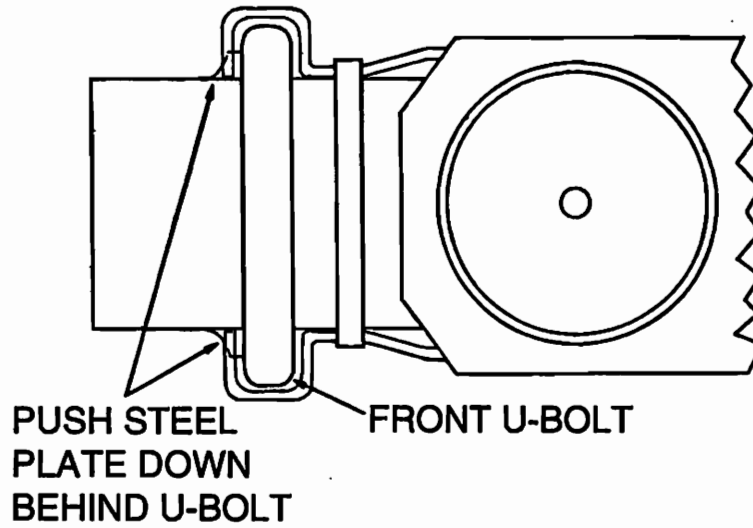
REAR AIR BAG REPLACEMENT

NOTE: Rear axle must be hanging freely.

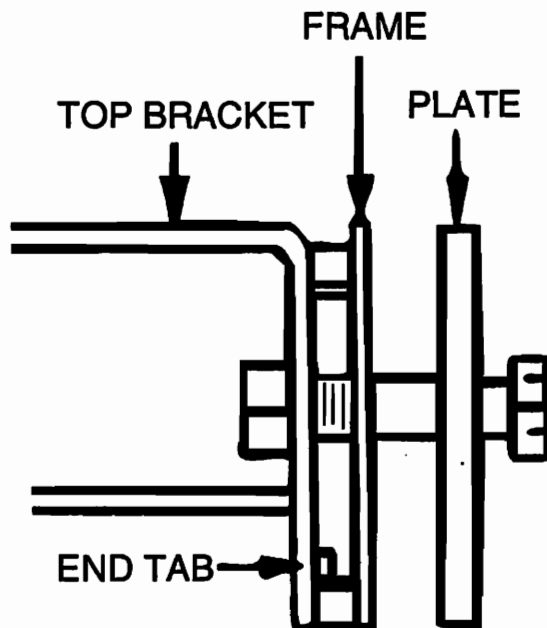


1. Place air spring assembly in position against oval in frame.

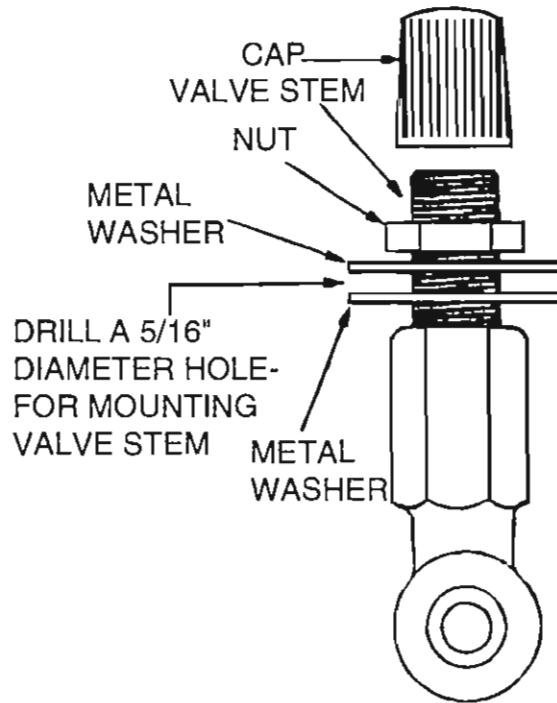
NOTE: The front of the top bracket fits against the frame. The bracket bolt holes face the oval hole. With one 1/4" tab going over the hole and the other going under the hole and the tab going to the outer edge of the oval hole. (See figure above.)



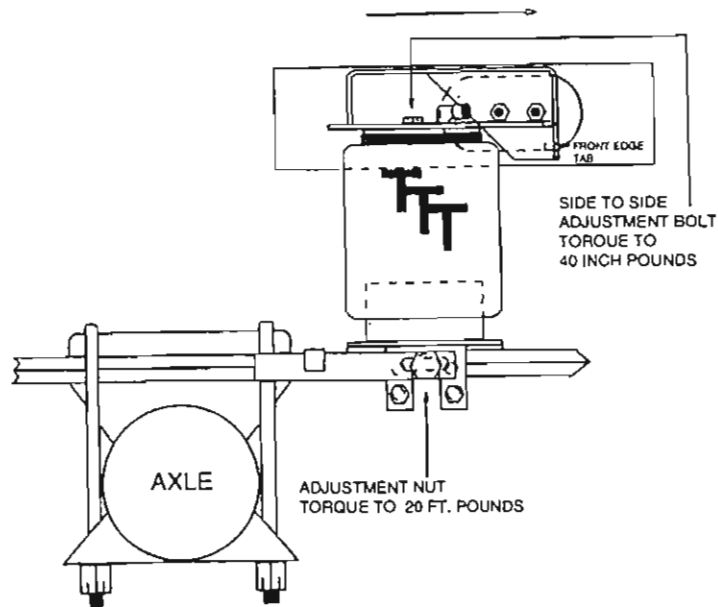
Position the bottom bracket of the airbag so that it straddles the spring and the adjustable slider fits around the front u-bolt PUSHING THE STEEL PLATE DOWN. (See figure above.)



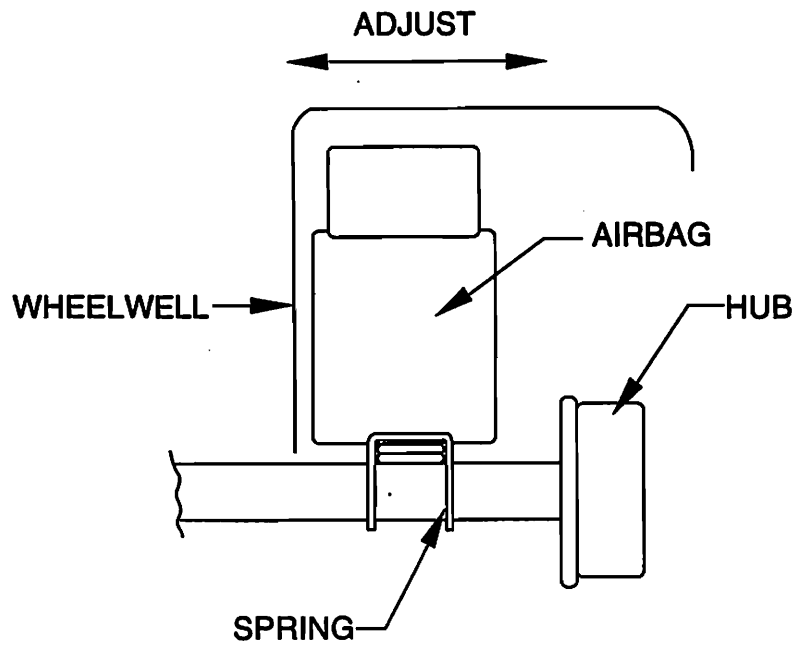
2. Position the retainer plate behind the oval hole in the frame. Install (2) retaining bolts and nuts. Torque to 30 ft./lbs. (41 Nm). (See figure above.)



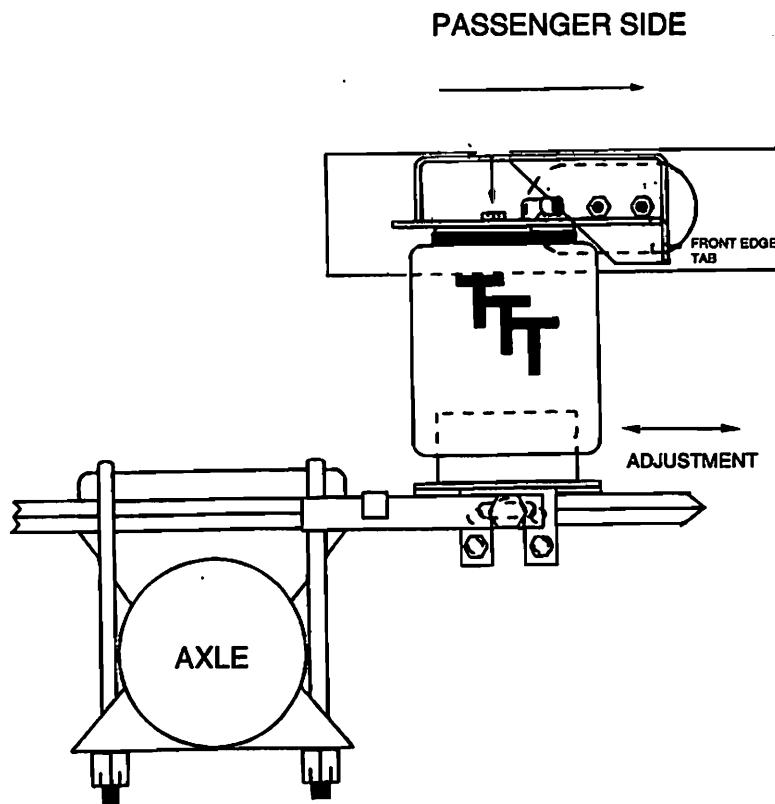
3. Install fill valve into hole in lower edge of valance panel. Secure with retaining nut. (See figure above.)
4. Place jack stands under the rear axle at its outer edges. Lower the vehicle so that the weight of the vehicle compresses the leaf springs.
5. Fill the air bag with 50 psi of compressed air. This will help the assembly to seat against the spring. Lower air pressure in air bag to 20 psi.



6. Make certain that the upper bracket and lower bracket adjustment nuts are loose.

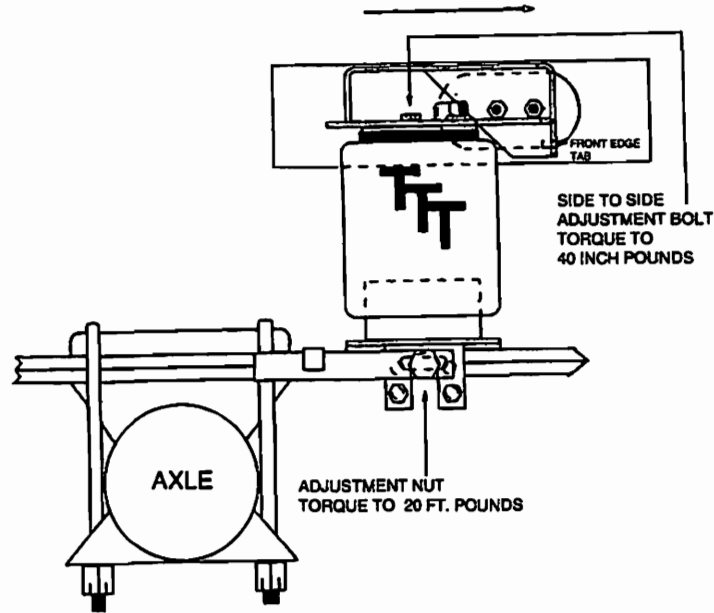


7. Align the air bag vertically. (Side to side). (See figure above.)



8. Align the air bag so that it is straight up and down front to back. (See figure above.) Tap lower bracket with a hammer if necessary. The air bag must be parallel to the top bracket. Tolerance is $\pm 1/8$ ".

NOTE: With 20 psi of compressed air in the air bag and the vehicle weight on the rear axle, you should be able to squeeze the sides of the air bag one inch from the bottom and NOT feel the bottom piston.

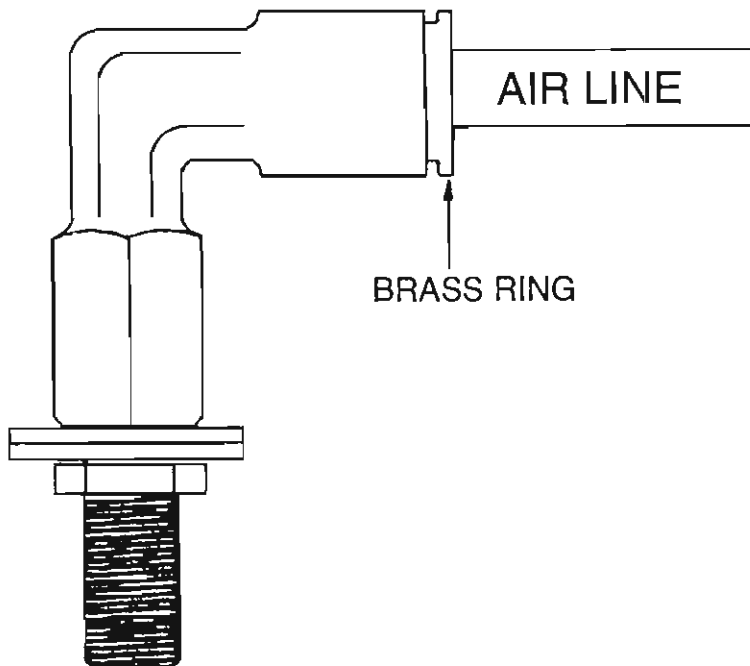


9. Tighten the lower bracket adjusting nut and torque to 10 ft./lbs. (27 Nm).
10. Tighten the upper bracket adjusting bolt and torque to 40 in./lbs. (4 Nm).
11. Install the (2) lower bracket retaining bolts and nuts. Tighten until the nuts bottom out on the threads.

NOTE: The metal tabs must bend inward to assure a good fit.

12. Inflate air bag to 100 psi. Test all connections for air leaks using a soapy water solution.
13. Install wheel. Reference "Wheel Replacement" in this section.
14. Lower the vehicle.
15. Release air pressure from air bag to level vehicle.

REAR AIR BAG AIR LINES



Air Line Removal

1. Release air pressure from air bag.
2. Push in on the brass ring at the end of the fitting.
3. Pull the airline free of the fitting.

Air Line Replacement

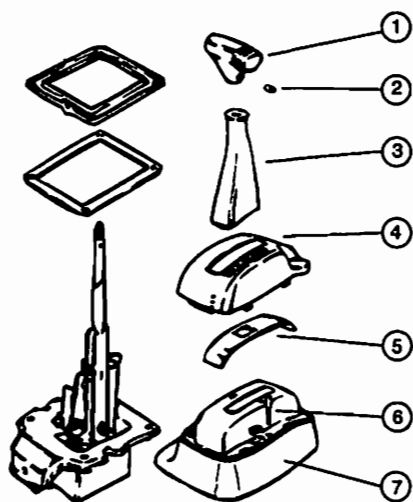
1. Position air line on connector.
2. Push air line into connector until it will go no further.
3. Inflate air bag and leak test connection with a soapy water solution.

Fuel Tank

The automotive fuel tank is Volkswagen supplied. To service the fuel tank, fuel pump, sending unit and generator pickup, it is necessary to access the top of the fuel tank.

Fuel Tank Access Plate Removal

1. Remove the driver seat. Reference "Driver or Passenger Seat Removal" in Interior Section.
2. Remove the driver seat pedestal top plate. Reference "Seat Pedestal Top Plate Removal" in Interior Section.
3. Remove 2 plastic covers from the park brake lever by gently pulling them up and sliding them off the lever.



37-971

1. Selector Lever Handle
2. Set Screw
3. Selector Lever Trim
4. Upper Console Cover
5. Cover Strip
6. Retaining Bolts
7. Console

4. To disassemble and remove the gear shift selector lever trim and console.
 - A. Loosen the set screw on selector lever handle. Remove the handle.
 - B. Remove selector lever trim by sliding up and off of lever.
 - C. Remove upper console cover by gently squeezing in on its sides and pulling upward.
 - D. Remove cover strip by lifting up.
 - E. Loosen and remove 3 console retaining screws. Unsnap console illumination light and remove console by lifting upwards.
5. Lift cab carpet up to clear driver seat pedestal and then lift carpet to clear the seat belt attachment, park brake lever and gear shift selector lever.
6. Remove 3 nuts retaining park brake assembly to cab floor. Lift park brake assembly up to clear studs and position off to one side.
7. Remove 3 access plate retaining screws and remove access plate.

Fuel Tank Access Plate Replacement

1. Place access plate in proper position. Secure with 3 retaining screws.
2. Install park brake assembly. Secure with 3 retaining nuts.
3. Reposition carpet over gear shift selector lever, park brake lever, seat belt attachment, and driver seat pedestal.

NOTE: Push edge of carpet under wheel well trim.

4. To install gear shift selector lever trim and console.
 - A. Reconnect console light. Secure console with 3 retaining screws.
 - B. Install cover strip by placing over selector level.
 - C. Install upper console cover and secure by gently pushing down.
 - D. Install selector lever trim by sliding it on to the selector lever.
 - E. Install selector lever handle and secure by tightening with set screw.

NOTE: Apply VW locking agent D000600 (or equivalent) to the threads of set screw prior to installation.

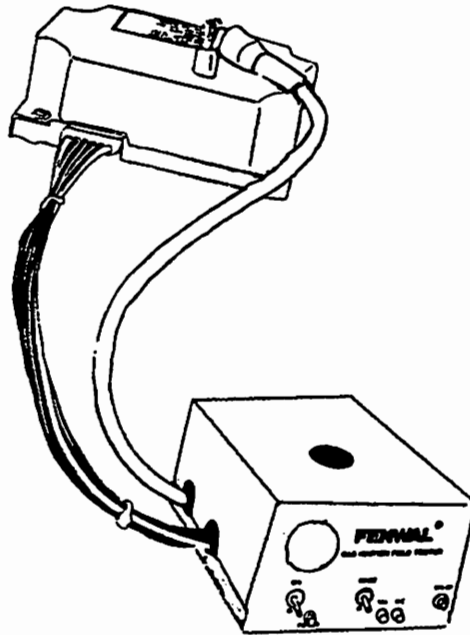
5. Install 2 plastic covers onto park brake assembly by sliding onto the parking brake lever. Secure cover by gently pushing down.
6. Install driver seat pedestal top plate. Reference "Seat Pedestal Top Plate Removal" in Interior Section.
7. Install driver seat. Reference "Driver and Passenger Seat Replacement" in Interior Section.

APPENDIX A

SERVICE TOOLS

The following tools are noted in the Service Training Manual. For your convenience, the descriptions and part numbers are listed.

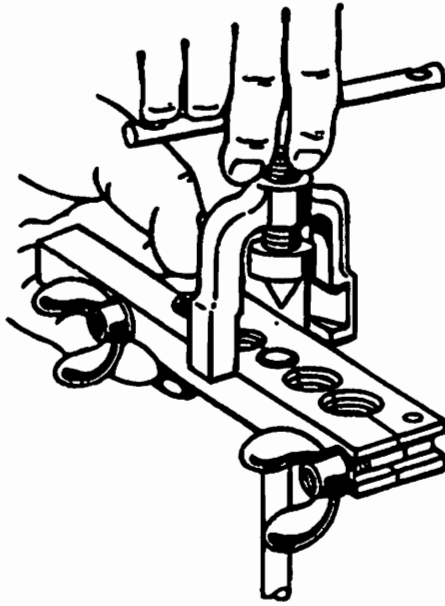
1. Fenwall® 12-Volt DC Gas Ignition Tester. Winnebago Part Number 075697-05-704 tests the operation of the module boards used in the furnace and refrigerator.



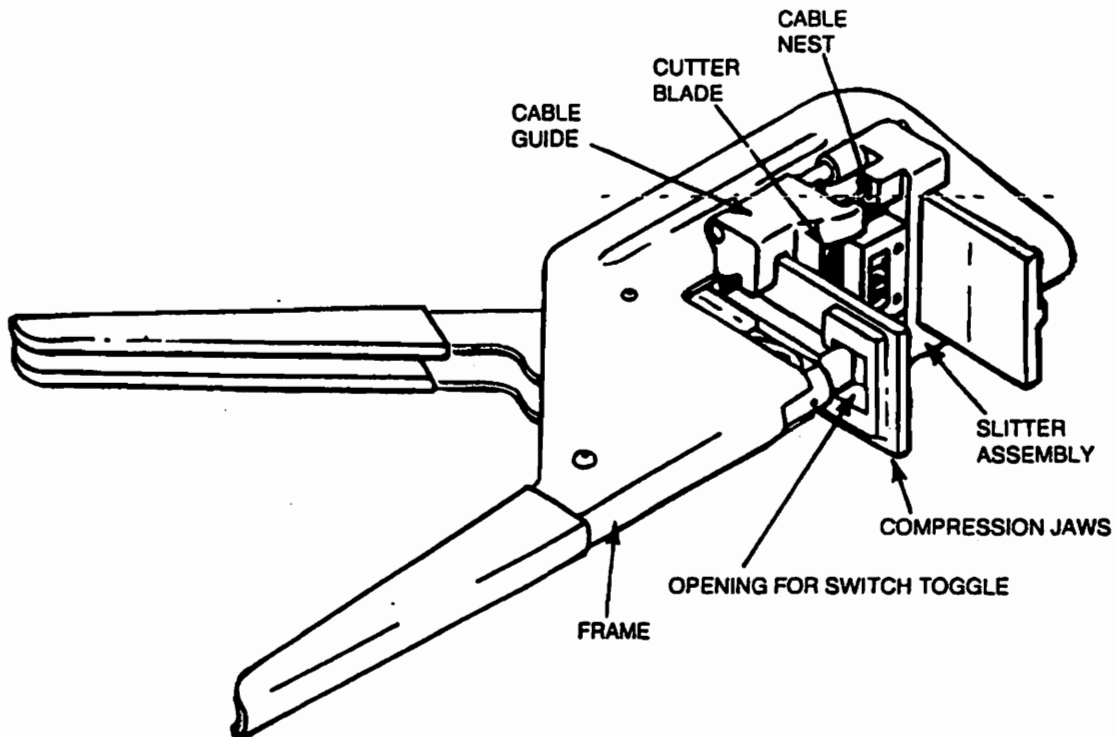
2. Manometer. Winnebago Part Number 075697-05-703 is used to test LP gas lines pressures.



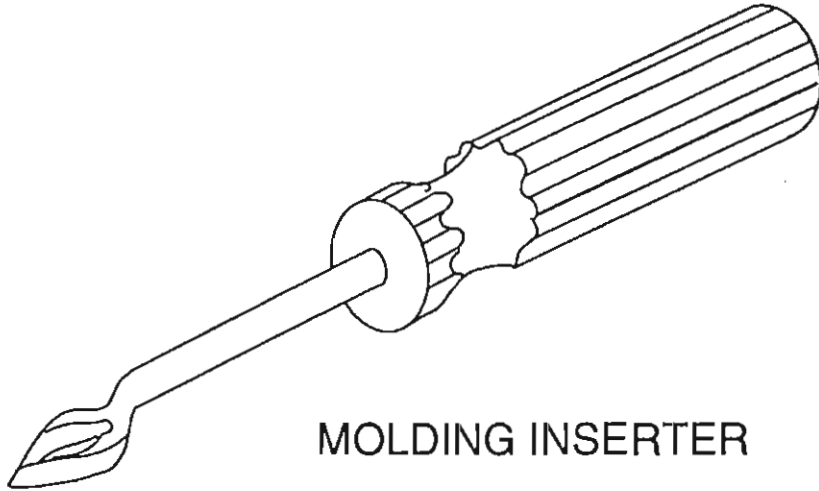
3. Double Flaring Tool. Winnebago Part Number 801633-01-000 is used to put a double flair on copper LP tubing.



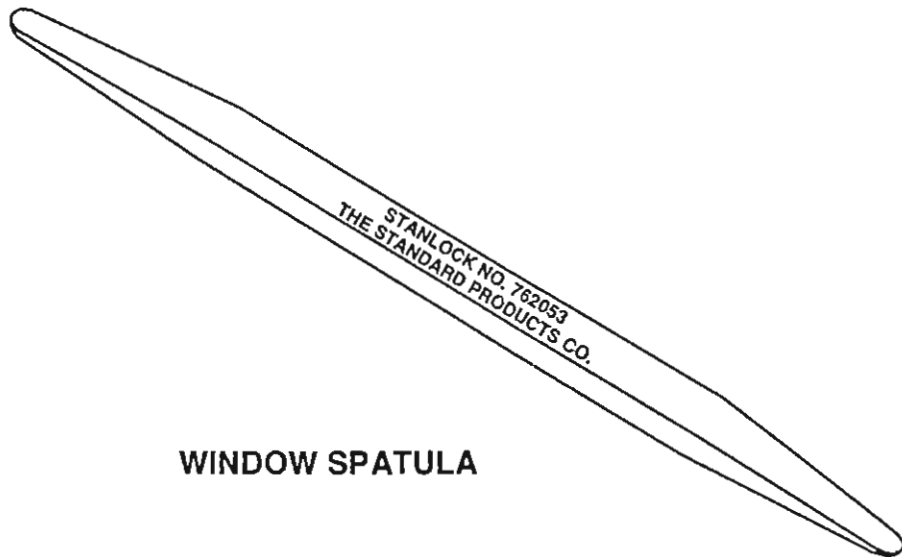
4. Outlet Press. Winnebago Part Number 801627-01-000 is used to press together self-contained 110-volt AC outlets.



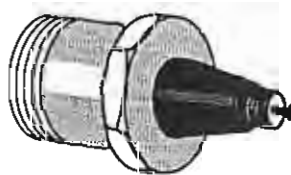
5. Glass Insert Tool. Used to install escape windows. Winnebago Part #801572-01-000.



6. Window Spatula. Used to install escape window molding. Winnebago Part #800438-01-000.



7. Blow out plug. Used to winterize fresh water system. Winnebago Part #701705-01-000.



APPENDIX B**SEALANTS**

Description	Winnebago Part Number	Unit of Measure	Where Used
Sealer Tape 3/16" x 3/8"	069640-11-000	Ft.	Windows
Silicone, VW White	034552-14-000	Tube	Roof Vent
Silicone, Off White	108716-01-000	Tube	Roof Vent
Adhesive	112901-01-000	Tube	Roof Cap to Cab
Urethane, VW White	072889-08-000	Tube	Body Seams
Seal tape	100128-02-000	Ft.	Transition Panel
Silicone, Off White	034552-06-000	Tube	Shower Stall
Silicone, Clear	034552-02-000	Tube	City Water Fill, Furnace Vent
Sealant, Black	039518-01-000	Tube	Sidewall to Floor Joint
Sealant, 190 Everseal	107828-01-000	Tube	Clearance Lights

APPENDIX C

Description	Winnebago Part Number	Unit of Measure	Where Used
Adhesive Tape	063642-01-000	Ft.	Sidewall Skin
Foam Tape	100128-02-000	Ft.	Wheel Well Lip
D Seal	099418-01-000	Ft.	Sidewall to Roof Joint
Sealer Tape 1/16' x 1"	069640-14-000	Ft.	Valance Panel
Tape - Foam Dbl. Coated .045" x 1"	076322-02-000	Ft.	Roof, Center Line

APPENDIX D

Fan Motor Test Procedure

If a fan motor does not operate properly, it can be checked in the following manner:

1. Be sure the motor leads are connected to the proper points. Refer to the appropriate wiring diagrams.
2. To check the winding resistance, first disconnect the three motor leads from the capacitor and the red wire to prevent feed back. Carefully check the resistance between each of the wires and ground (preferably a copper refrigerant tube for a good connection). These readings must be infinity.

Any continuity means the windings are grounded. Compare the resistance between each pair of wires to the following:

Black to White (main winding)	6 ohms
Black to Brown (phase windings).....	45 ohms
Brown to White (both windings)	51 ohms

The winding resistance will vary due to temperature change and inaccuracy of readings, but it should be within 10% of the resistances shown. If there is a reading of 0 or near 0 between any two leads, the motor is shorted and is no good. If there is a reading of infinity between any two leads, the winding is open and the motor is no good.

APPENDIX E

CAPACITOR TEST PROCEDURE

CAUTION

Do not test a pregnant capacitor. If a capacitor is swelled up, it is or has been internally shorted and is no good. Replace it.

If you have access to a capacitor test instrument such as the one incorporated in the Annie, Model A 12, Hermetic Analyzer use it according to manufacturers instructions to test the capacitors.

If the only instrument you have with you is an Amprobe RS 3 or Sperry Snap 8, use it in the following way to test a capacitor.

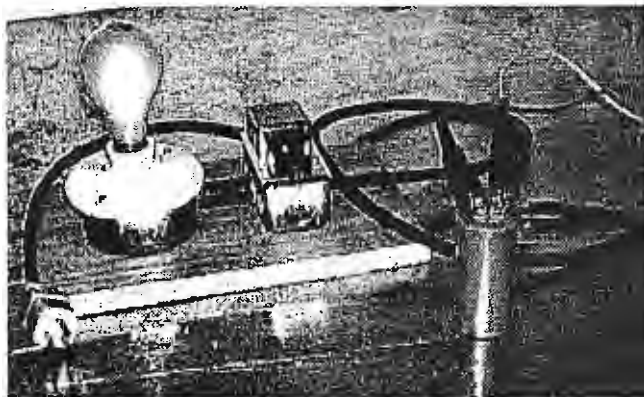


Figure 1
Capacitor Test Cord

Fuse is in black (hot) lead. Green wire is the ground lead to be clipped to capacitor housing.

Connect the circuit as shown in Figure 2 and plug through the energizer into 115 volts.

CAUTION:

1. Always place the capacitor behind a shield while it is being plugged in, to avoid danger from an exploding capacitor. Capacitor explosions are very rare, but they have occurred and people have been hurt.
2. Leave a start capacitor connected to voltage for only a brief period of time - just long enough to get one reading. Always unplug it between readings. A start capacitor heats rather rapidly and will explode if it is left on 115 volts for more than a very few seconds.

Read the line voltage and the current (amperes) to the capacitor. Do not assume voltage - read it for accuracy. Read the current through the X10 hole or connection in the energizer. Divide the current reading by 10 and calculate the micro-farads by the following formula:

$$\text{Mfd} = \frac{2650 \times \text{Amperes}}{\text{Volts}}$$

For instance: If the voltage reads 110 volts and the current reads 11.0 amperes through the X10 energizer, then the micro-farad capacitance is:

$$\text{Mfd} = 24.5$$

If the 24.5 Mfd is within 10% of the rated capacitance, the capacitor is OK.

CAUTION

Now that the capacitor has been tested, it is holding a residual charge that must be discharged to prevent electric shock. Do not short across the terminals with a screwdriver to discharge a capacitor. Use a resistor. You have one, a light bulb. The filament of a light bulb has high resistance and will protect the capacitor. Before disconnecting the capacitor from the test cord, plug the test cord into the light bulb socket.

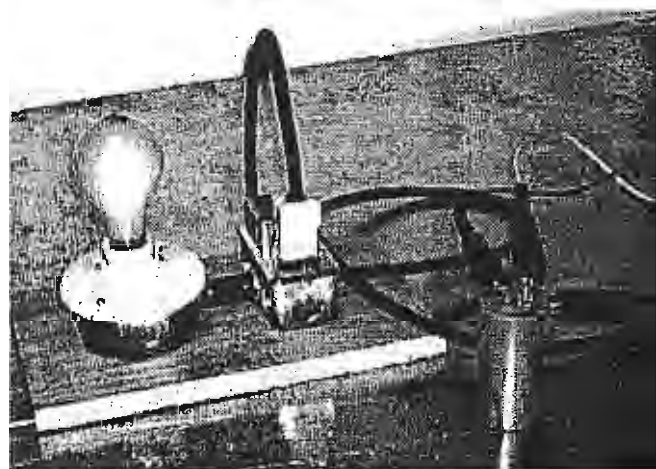


Figure 2
Discharging a capacitor using light bulb filament.

The residual charge will bleed through the filament of the bulb and the capacitor will be safe to handle. As was stated above, "do not short across the

terminals of a capacitor discharge it," but now it is a good idea to short across the terminals with a screwdriver as a safety measure to be sure that it is discharged.

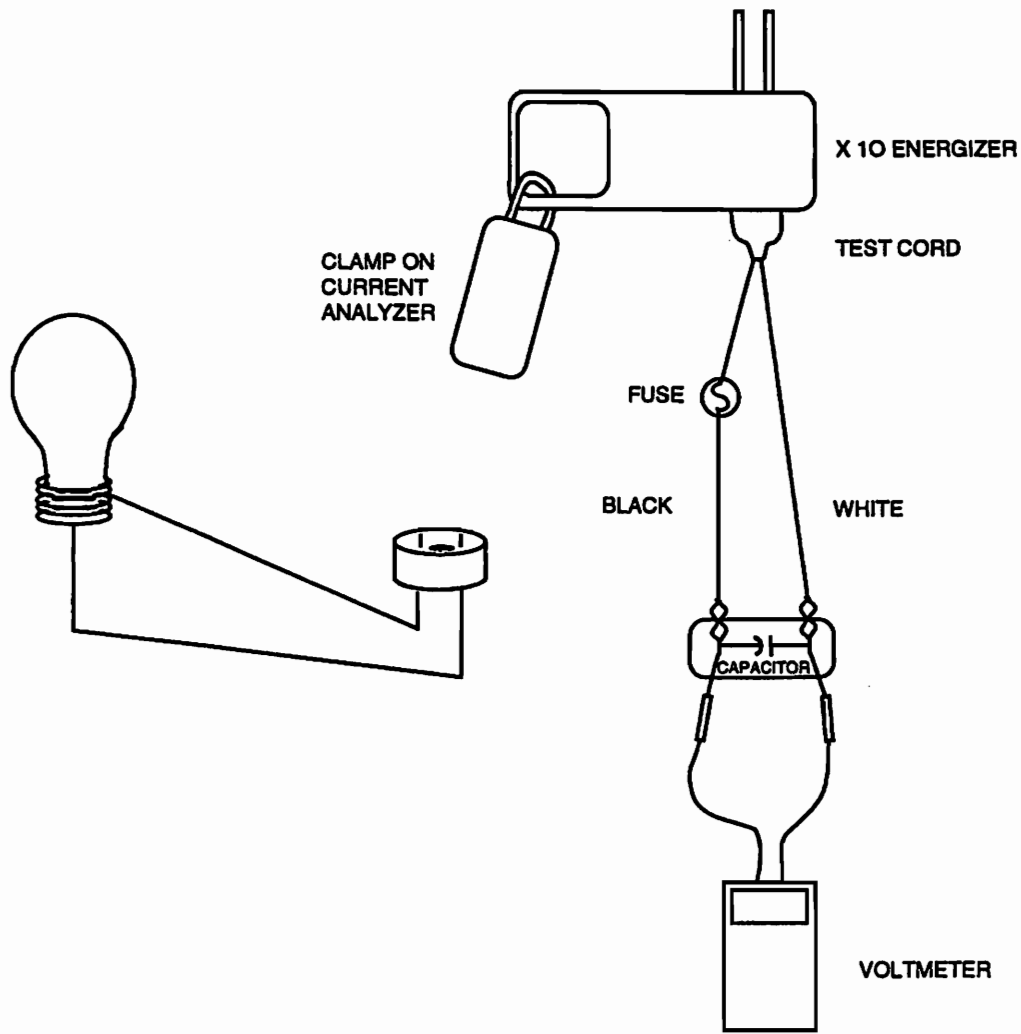
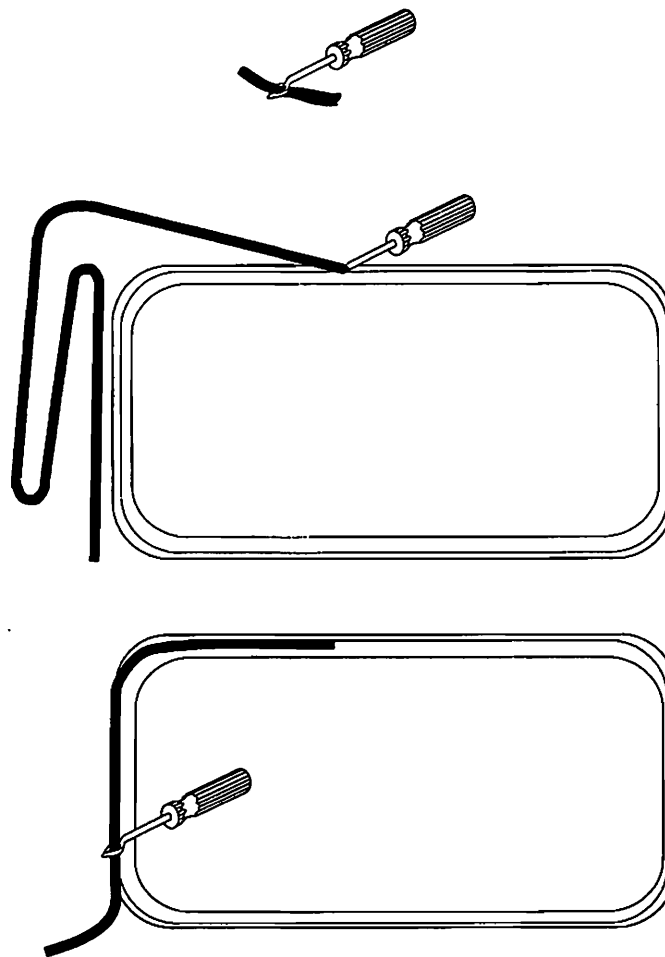


Figure 3
Capacitor

APPENDIX F

USE OF GLASS INSERT TOOL

1. Thread rubber cord into tool.
2. Begin at center top of window. Insert tool into molding.
3. Press tool around molding seating rubber cord into molding.
4. Trim cord to length.



TWO-CLOTH METHOD

The two-cloth method involves wetting a clean, lint-free cloth in a prescribed cleaner and then apply the wetted cloth to the surface to be cleaned. Once the surface has been wetted, it is wiped clean with a fresh, dry, lint-free cloth.

APPENDIX H

DUPONT PAINT CODES

Color	Dupont Number	Where Used
VW White	W9670	Exterior Body
Jute Velvet (Taupe)	F0359	Interior Body

APPENDIX I

ADHESIVE APPLICATION

Winnebago recommends the use of Swift adhesive (Winnebago Part Number 004005-02-000) when laminating during body repairs. This adhesive is a "contact glue" in that both bonding surfaces must be sprayed and the solvents present in the glue must dissipate or "bleed off" before adhesion should be attempted.

The adhesive should be applied using an air-powered spray gun.

NOTE: A two-gallon glue pot is preferred for large jobs such as sidewall reskins.

Optimal results are achieved with 80 percent surface coverage.

NOTE: It is best to reach 80 percent coverage by spraying on three to four lighter coats; allowing for solvent "bleed off" between applications.

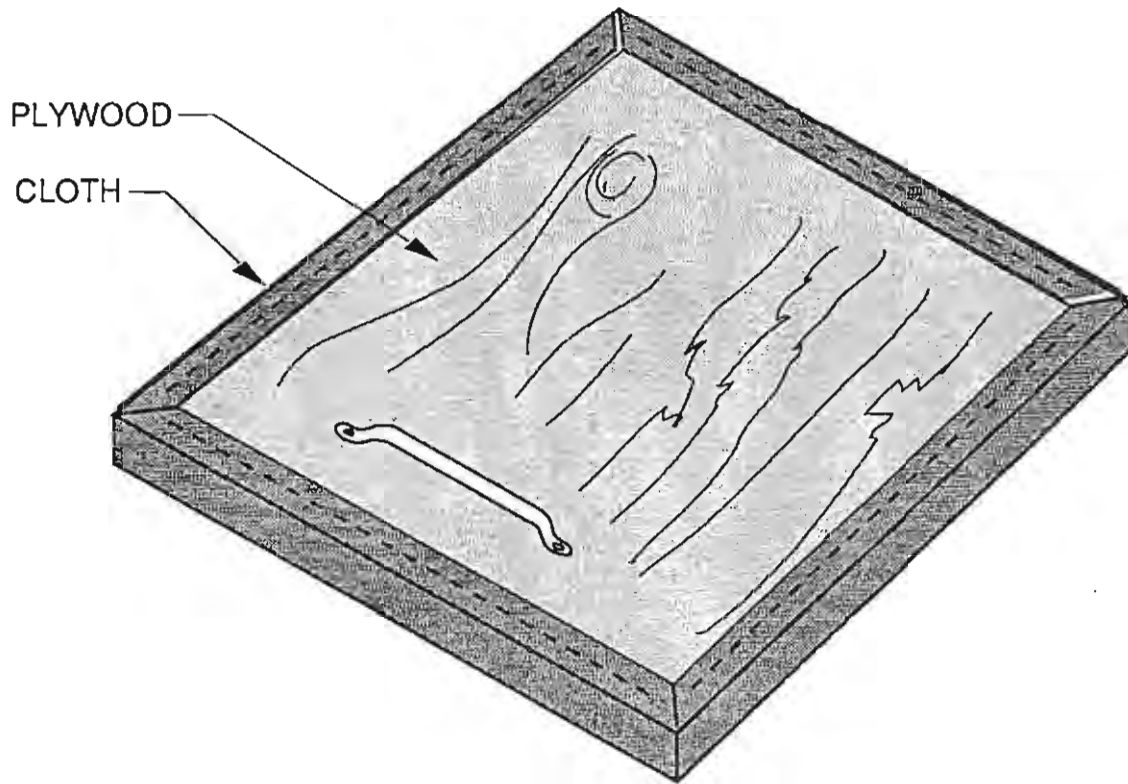
Once this proper coverage has been achieved on both surfaces and the adhesive is "tack free" to the touch, the surfaces may be mated.

NOTE: To protect the foam from solvents in the glue, a base application of Herco Clear sealant is beneficial. Herco Clear Sealant may be purchased in one or five gallon containers from:

Hecht Rubber Corporation
6161 Phillips Highway
Jacksonville, FL 32216
Telephone Number (904) 731-3401

APPENDIX J

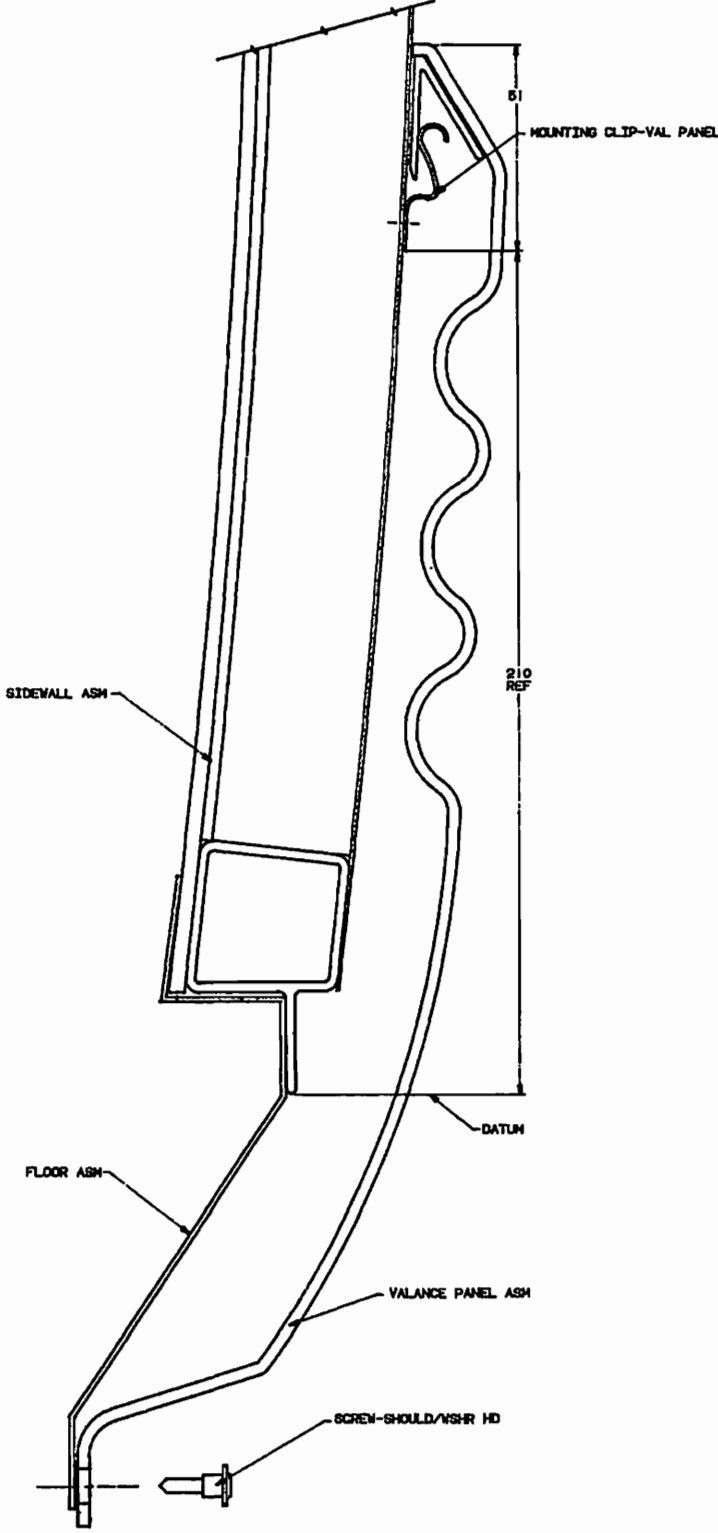
BODY BOARD CONSTRUCTION

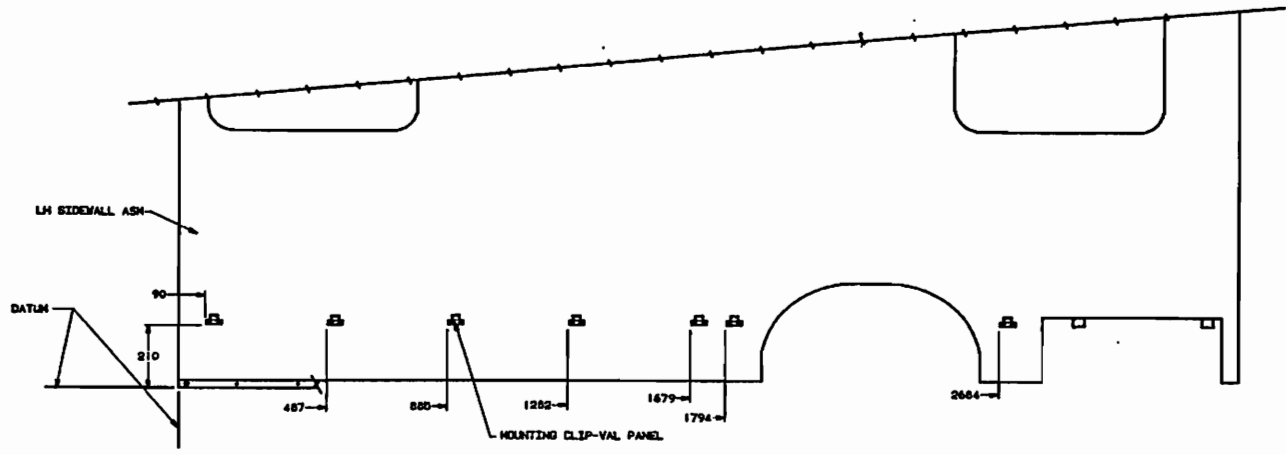


Part	Qty.	Winnebago Part # (If Applicable)
Plywood 3/4" x 24" x 24"	1	
Soft Cloth 27 1/2" x 27 1/2"	1	
Assist Handle	1	009126-02-000
Wood Screws	2	
Staples	As required	

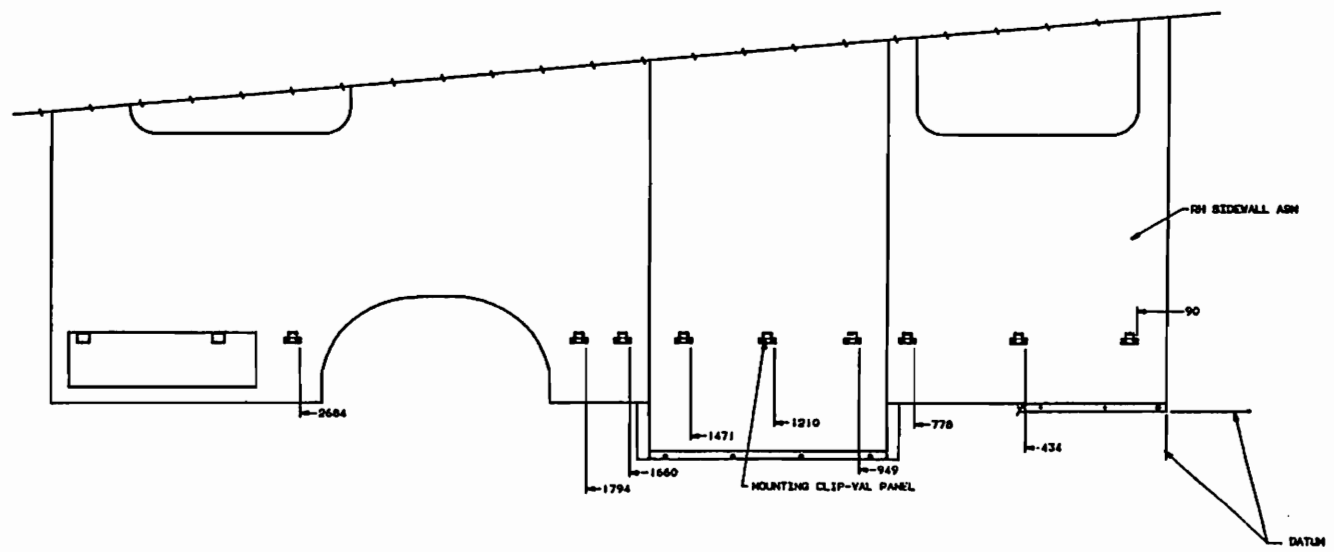
APPENDIX K

VALANCE PANEL CLIPS INSTALLATION

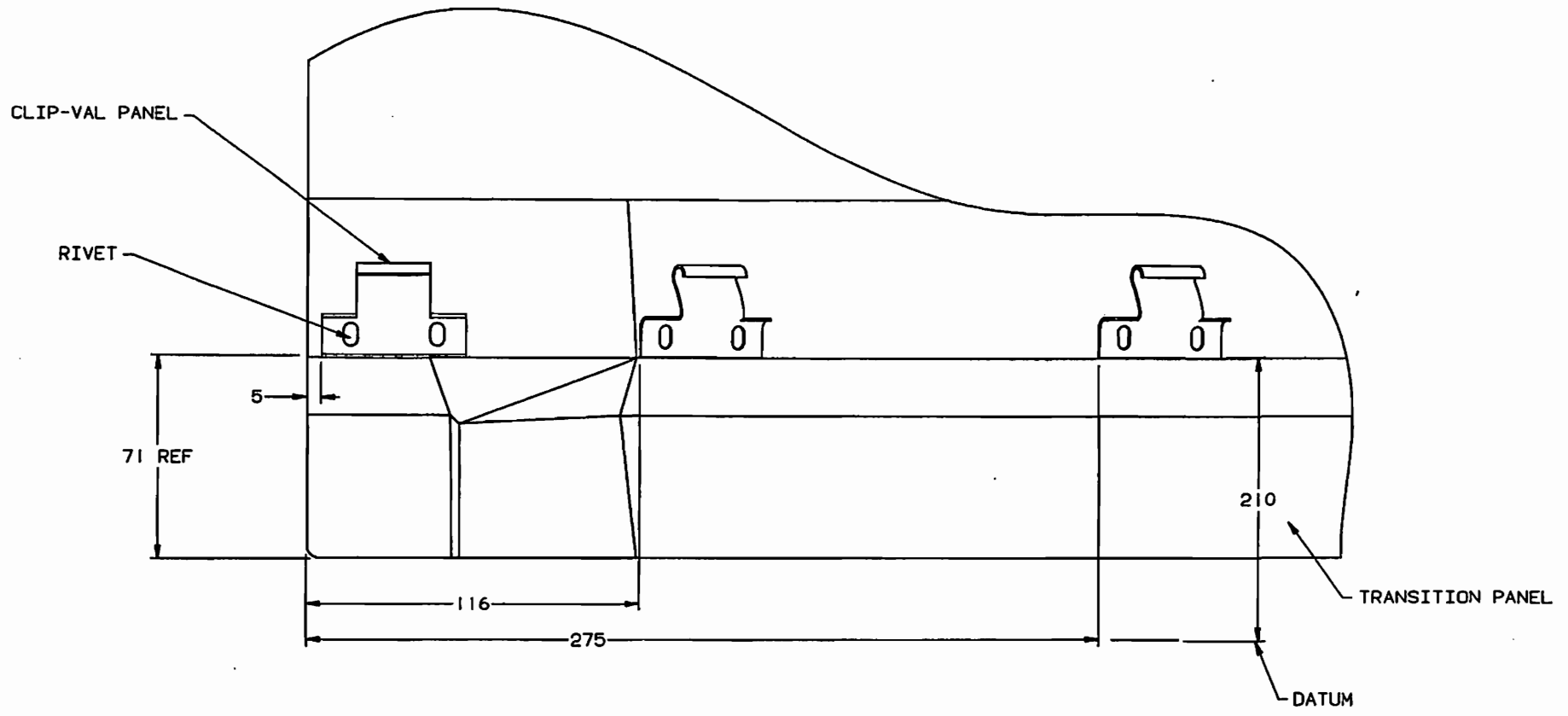




DRIVER'S SIDE



PASSENGER'S SIDE



TRANSITION PANEL

APPENDIX L

COMPRESSOR MOTOR CHECK PROCEDURE

The compressor motor is located inside the hermetic compressor housing and is not accessible for service in the field. However, the motor windings condition can be checked using an ohm meter. Remove all leads from the compressor terminals before performing checks.

1. If the resistance between any two terminals is 0 ohms, the motor windings are shorted.
2. If the resistance between any terminal and the compressor housing is anything but infinity, the winding is grounded.
3. If the resistance between any two terminals is infinity, the winding is open.

On a good compressor, the highest resistance will be between the R (run) and S (start) terminals. The lowest resistance will be between the C (common) and R (run) terminals. The intermediate resistance will be between the C (common) and S (start) terminals.

APPENDIX M

FRONT END ALIGNMENT SPECIFICATIONS

	Specification	Tolerance
Left Camber	0.10"	0.15"
Right Camber	0.10"	0.15"
Caster	1.83"	0.25"
Total Toe	0.00"	0.17"



