

1485-1489

*ALLEGRO*<sup>®</sup>

*ALLEGRO*<sup>®</sup>

MOTOR HOME OWNERS MANUAL

BUILT BY TIFFIN MOTOR HOMES, INC

P.O. Box 596  
Red Bay, Alabama 35582

# MOTOR HOME OWNERS MANUAL

## TO THE OWNER

Congratulations, we welcome you to the exciting world of motor home travel and camping. You will find it convenient and enjoyable to have all the comforts of home and still enjoy the great outdoors, wherever you choose to go.

Your motor home has been carefully designed, engineered and manufactured to provide dependability as well as safety. Before sliding into the driver's seat, take a few minutes to become familiar with its features and operation. This manual has been prepared to aid you in the proper care and operation of the vehicle and equipment aboard. We urge you to read it completely. In addition, spend some time with the dealer when you take delivery, you will want to learn all you can about your new Allegro.

Your Allegro motor home is covered by a factory warranty against defects in material and workmanship. This warranty should be validated at once and returned to the factory by your dealer.

Throughout this manual, reference is made to the following terms: Important, Caution and Warning. These terms indicate important information which should be understood and followed. The definition of these terms are:

### IMPORTANT

Indicates a special point of information.



Indicates that a failure to observe can cause damage to equipment.



Indicates that failure to observe can cause damage to equipment or personal injury.

## TABLE OF CONTENTS

INTRODUCTION .....	
ALL ALUMINUM CONSTRUCTION .....	
ALLEGRO LIMITED WARRANTY .....	
SAFETY PRECAUTIONS .....	
HOW TO TOW .....	
CHASSIS—OPERATION .....	
Instruments & Controls .....	
Ignition Switch .....	
Keys .....	
Power Steering .....	
Tilt Steering .....	
Headlight Switch .....	
Turn Signals .....	
Hazard Warning Flasher .....	
High Beam Indicator Light Switch .....	
Automatic Transmission .....	
Power Brakes .....	
Automatic Brake Adjustment .....	
Parking Brake .....	
Heater & Air Conditioner Controls .....	
Windshield Washer & Wiper .....	
Instrument Panel .....	
Battery Condition Meter & Switch .....	
Auxiliary Generator Switch .....	
Auxiliary Generator Hourmeter .....	
Brake Warning Light .....	1
Speedometer .....	1
Cigarette Lighter .....	1
Clock .....	1
Oil Pressure Gauge .....	1
Temperature Gauge .....	1
Fuel Gauge .....	1
Voltmeter Gauge .....	1
Choke Light .....	1
Dual Battery Insulator .....	1
Spot Light .....	1
Radios .....	1
Air Horn .....	1

Seat & Door Panel Controls	18
Dead Bolt Door Locks	18
Lock Door Handle	18
Exterior Entrance Door Handle	19
Seats	19
Seat Belts	20
Optional Equipment-Operation	21
Cruise Control	21
TV Antenna	22
Roof Air Conditioning	23
Filters	24
Vacuum Cleaner (Option)	24
Microwave Oven	24
Circuit Breaker	24
Emergency Exits	25
Pre-Travel Checklist	25
Carbon Monoxide Warning	26
Starting the Engine	26
Cold Engine	27
Extremely Cold Weather or After Vehicle has been Standing Idle Several Days	27
Warm Engine	27
Engine Flooded	27
Warm-Up	27
Gear Selection	28
New Vehicle Break-In	29
Weighing the Motor Home	29
Vehicle Towing	31
Trailer Towing	31
Roof Loading	32
Vehicle Maintenance	32
Fuel Requirements	32
Engine Access	32
Engine Cover	32
Brake Fluid Reservoir	33
Engine Oil & Filter	33
Checking Oil Level	33
Oil Change	33
Drive Belts	33
Engine Cooling System	34
Automatic Transmission	34

Brakes	
Power Steering	
Tires	
Tire Rotation	
Fuses	
Windshield Washer & Wipers	
Lights	
Electrical	
12-Volt DC System	
110-Volt AC System	
110-Volt AC Utility Supply	
Power Converter	
Control Panel	
Monitor Panel	
Battery Access	
Battery Maintenance	
Emergency Start Button	
Auxiliary 110-Volt Generator	
Overload Protection Devices	
Onan 110-Volt Generator-Operation	
Starting	
Stopping	
Service Schedule for all Onan Generators	
Onan-110-Volt Generator-Maintenance	
Oil Check	
Oil Change	
Oil Capacity for each of the Onan Model Units	
Oil Filter Change	
Air Cleaner Element	
Cooling System	
Fuse Replacement	
Storage Procedure	
LP Gas System	
LP Gas Supply	
Trouble-free & Safe use of the LP Gas System	
Bulk Tank System	
Refilling Bulk LP Tank	
LP Gas Dealership	
Travel with LP Gas	
Regulator Freeze-up	

LP Gas System Maintenance .....	54
Leak Detector .....	54
Air in the LP Gas Line .....	56
Equipment Operation & Maintenance .....	56
Gas Furnace-Operation .....	56
Limit Switch .....	56
Lighting Instruction .....	56
Shut Down Instruction .....	57
Thermostat .....	57
Furnace Maintenance .....	57
Furnace Troubleshooting .....	57
Range and Oven .....	58
Use of Top Burners .....	58
Use of the Oven .....	58
Operating the Thermostat .....	59
Using Low Temperature .....	59
Shut Down Instructions .....	59
Range Troubleshooting .....	59
Power Range Hood & Vent .....	60
Refrigerator Operating & Users Instructions .....	61
Bar-B-Q-Grill .....	68
Water Heater .....	68
Temperature & Pressure Relief Valve .....	69
Burner Compartment Maintenance .....	69
Drainage & Storage .....	69
Warranties .....	69
Water System .....	70
Internal Water System .....	70
Filling Procedure .....	70
Water Pump .....	71
Initial Start-Up .....	71
Demand Water Pump Maintenance .....	71
Trouble Shooting Demand Pump .....	72
Sanitizing the Portable Water System .....	72
External Water Supply-Operation .....	73
Drainage System .....	74
Use of In-Park Sewer System .....	74
Fresh Water Toilet .....	75
Foot pedal Model-Operation .....	75
Toilet Maintenance .....	75
Toilet Trouble Shooting .....	77

Interior Furnishings .....	
Spring Balanced Pull-Down Bunk .....	
Pull-Out Gaucho Bed .....	
Pedestal Dinette Table .....	
Motor Home Care & Maintenance .....	
Roof .....	
Underbody Maintenance .....	
Exterior .....	
Fiberglass Care .....	
Upholstery & Carpeting .....	
Work Surfaces .....	
Drapery .....	
Galley Sink .....	
Wall & Ceiling .....	
Range & Refrigerator .....	
Bathroom .....	
Doors & Windows .....	
Storage .....	
Winterization .....	
Removal from Storage & New Season Preparation .....	8
Summer Maintenance .....	8
Winter Camping .....	8
Travel Tips .....	8
Equipping for Travel .....	9
Emergency Equipment Checklist .....	9
Quick Loading Checklist .....	9
Code of Ethics .....	9

## INTRODUCTION

Driving a motor home the first few times will require a somewhat different driving attitude than when driving an automobile. Your Allegro motor home has been equipped with such standard features as power steering and power brakes to make it handle as easily as your family car. You must remember the weight, length, width and height are greater.

The motor home will require greater stopping distances, more space for parking and maneuvering, and more acceleration time when passing other vehicles than an automobile. However, after a few miles of careful and alert driving, you should easily adapt to the larger size of the motor home.

This manual was written with the owner in mind. It is intended to provide you with information needed to properly operate and care for your new motor home. It also contains tips and information that will help you enjoy your motor home while on trips.

Before getting into the driver's seat, always observe the area around your motor home. A small auto or motorcycle may have parked behind or to the side of your vehicle and remain unseen until it is too late. It is advisable to have a passenger check the area around your vehicle as you maneuver out of a difficult parking space, especially when backing.

Always be aware of the dimensions of your motor home. These are listed in the specifications section of this manual. Low hanging canopies and signs in service stations and restaurants can cause clearance problems. Keep in mind the added height of any options on the roof such as air conditioner units or a TV antenna. Remember that some old bridges may not accept the weight of your Allegro.

When planning a trip to another state, write ahead for a booklet detailing the laws for the state. Some states have specific laws pertaining to recreational vehicles.

For safety sake, always use your seat belt and instruct your passengers to do so as well. Frequent rest stops are advised to relieve stress on the driver, the family, and the vehicle.

After reading this manual, be sure to keep it in your motor home as a reference. Your Allegro dealer will be glad to provide any further information you feel you need, as well as answer any questions about operating the equipment in your motor home. Your dealer is also prepared to perform any service or repair work required to maintain your Allegro motor home in top condition.

NOTE: The description, illustrations, and specifications in this manual were correct at the time of printing. We reserve the right to change specifications or design without notice and without incurring obligation

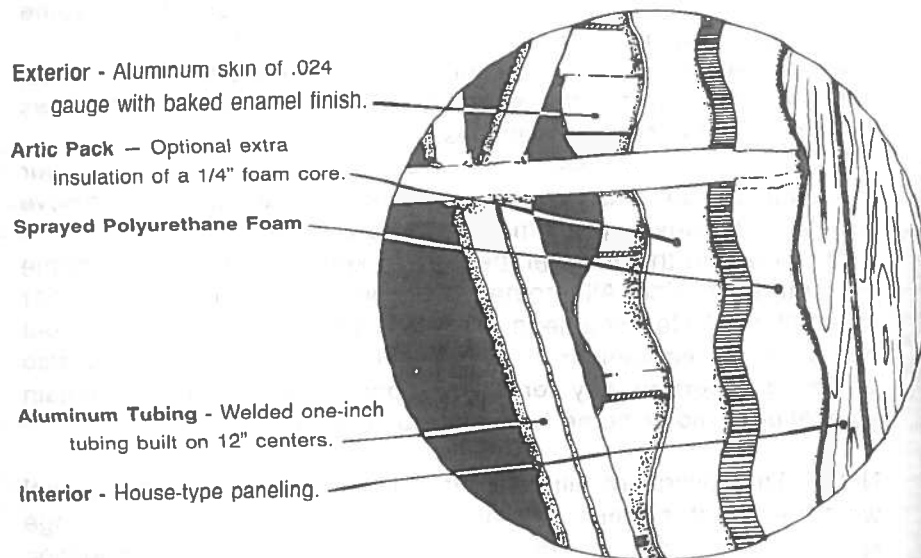
to install the same on motor homes previously manufactured.

Since Allegro motor homes are built in several models and sizes, some accessories and components may be standard or optional on some models. Therefore, some equipment described in this manual may not apply to your vehicle.

**IMPORTANT:** This manual refers only to Class A Motor Homes manufactured by Tiffin Motor Homes, Inc.

## ALL ALUMINUM AND STEEL CONSTRUCTION

IT ALL STARTS HERE . . . with the careful consideration seen in each Tiffin motor home. The all steel and aluminum construction is your assurance of maximum safety and durability. Each step in the construction process is a further effort to provide better, safer motor homes. The body of the unit begins with aluminum cage construction of one inch aluminum tubing built on twelve inch centers. Before the final stage is completed the entire unit is insulated with a jet spray of urethane foam. In addition to providing a quieter, safer ride, this insulation keeps out noise, dust and moisture . . . while reducing heating and cooling costs. Using the best, long life insulation available, combined with all steel and aluminum construction, is further evidence of the Tiffin standard. A standard to strive for the highest quality in the construction of every Tiffin product.



## REPAIRS

One of the many outstanding features of all aluminum and steel construction is the ease of repairs. If your motor home should receive extensive damage, to a section of one side, for example, that section can be cut out and another panel quickly cut to size and spliced into place. Many Allegro dealers are prepared to make the repair.

If there is extensive damage, we recommend your motor home be delivered to the Red Bay factory or to a factory-recommended repair shop. For prompt service at Red Bay, schedule six weeks in advance by telephone or letter to our Customer Service Department.

## ALLEGRO LIMITED WARRANTY

### WARRANTY COVERAGE TO OWNER

A. Warranty Coverage - Tiffin Motor Homes, Inc. of Red Bay, Alabama, warrants each new Allegro motor home to the owner as follows:

### Warranty Period

For the period of one year or 12,000 miles of use, whichever occurs first, from date the vehicle is delivered to the first retail purchaser or first placed in service as a demonstrator or company vehicle, whichever is earlier.

### Items Covered

The all aluminum and steel construction as pertains to the outer skin metal to the side wall and roof construction.

Plus the following list of equipment.

Auxiliary Batteries	Toilet
Air Compressor	Water Heater
Air Conditioner (auto)	Carpet
Air Conditioner (115-v)	Cushion Foam
T.V. Antenna	Compartment Doors
Converter (110-12V)	Driver and Passenger Seats
Speed Control	Electrical Systems
Demand Pump	Cushion Fabric
Furnace	Fire Extinguisher
L.P. Gas Bottle(s)	Light Fixtures
Power Range	Plumbing System
Pre-finished Paneling	Switches
Range	Shower Door
Radio	Vinyl
Refrigerator	Sealants
Sink	Windows
Stereo	Showerhead
Vacuum Cleaner	Gauges

Headlight Seal Beams  
Fuses

Interior and Exterior Light Bulbs  
L.P. Gas Valves

### Items Not Covered

Chassis  
Tires  
Service Items  
-Oil or air filters  
-Vacuum cleaner bags  
-Oil or lubricants  
-Windshield wiper blades  
(115V Power Plant ONAN)

This warranty shall not apply to failures due to normal wear, accident, misuse, abuse or negligence.

### Implied Warranties

In addition, each new Allegro home shall be subject to warranties implied by law including the implied warranties of merchantability and fitness for any particular purpose but such implied warranties are limited to the owner for the period of one year or 12,000 miles, whichever occurs first, from date the vehicle is delivered to the first retail purchaser or first placed in service as a demonstrator or company vehicle, whichever is earlier. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

### Allegro's Responsibility

B. Any part of the Allegro Motor Home subject to this warranty which is found to be defective in material or workmanship, will be repaired or replaced at Tiffin Motor Homes' option, within thirty (30) days of notice of defect by the selling dealer without charge to the customer for parts or labor. If the owner of the motor home has moved to a different locality and cannot return to the selling dealer, the owner may obtain warranty repairs or replacement of such items at any authorized Allegro dealership. If the owner of the motor home is traveling and is in excess of 100 miles from the selling dealer, or if the selling dealer has ceased to do business as an authorized Allegro dealer, the owner may obtain warranty repairs or replacement of such items at any authorized Allegro dealership.

### Care and Maintenance

Under this warranty the owner must perform the care and maintenance duties discussed in the Owner's Manual which accompanied your Allegro motor home. Any damage which results to your motor home as a result of your failure to perform such duties, will not be covered by this warranty. The care and maintenance duties described in the Owner's Manual will be done at your expense.

### Installation Not Covered

Tiffin Motor Homes, Inc., cannot, however, and does not accept any responsibility in connection with any of its motor homes for additional equipment or accessories installed at any dealership or other place of business, or by any other party other than Tiffin Motor Homes, Inc. Such installation of equipment or accessories by any other party will not be covered by the terms of this warranty.

### If Repairs Are Needed

C. If a part of the system covered by this warranty fails to function or requires service during the warranty period:

1. Take the motor home to the selling dealer or other authorized Allegro dealer, as specified in this warranty, for repair.
2. If the dealer is incapable of making the repair, request that he contact Tiffin Motor Homes, Inc., Owner Relations Department, for technical or parts assistance.

### Customer Responsibility

If, after the above steps are completed and the repair is not made, the customer should contact Tiffin Motor Homes, Inc., P.O. Box 596, Red Bay, Ala. 35582. Attention: Owner Relations Department, and furnish the following information:

- The complete serial number of the motor home
- Date of retail purchase
- Selling dealer's name

-Nature of the service problem, and a brief explanation of the steps or services the dealer has performed, and the results obtained. The customer may be directed to another dealer or service center for repairs to be completed, if such dealer or service center is better able to complete the repair.

If all attempts to repair the motor home at the dealer level fail to accomplish the repair, Tiffin Motor Homes, Inc. may request that the motor home be allowed to be brought back to Tiffin Motor Homes, Inc., Customer Service Department at Red Bay, Ala. at Tiffin Motor Homes' expense to complete the repairs. In such event, Tiffin Motor Homes, Inc. shall be allowed an additional thirty (30) days to perform its obligations under this warranty.

If the customer refuses to allow the motor home to be brought back to Tiffin Motor Homes, Inc., for such repairs, or refuses to go to the designated service center or dealer for repairs, the warranty on that repair will be voided.

If after the above steps are completed and the repairs are not completed, the customer can:

- Contact the General Service and Parts Manager of Tiffin Motor Homes, Inc. and request a customer relations board meeting to resolve the problem. This action, however, is not mandatory.
- This warranty gives you specific legal rights, which vary from state to state. In the event of a problem with warranty service or performance, you may be able to go to a small claims court, a state court, or a federal district court.

### Dealer Representative Excluded

D. Tiffin Motor Homes, Inc., does not undertake responsibility to any purchaser of its products for any undertaking, representation or warranty made by dealers selling its products beyond those herein expressed.

### Consequential Damages

Without regard to the alleged defect, Tiffin Motor Homes, Inc., under any circumstances, does not assume any responsibility for loss of time, inconvenience, or other consequential damage including expense for gasoline, telephone, travel, lodging, loss or damage to personal property, or loss of revenue. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

### Changes in Design

Tiffin Motor Homes, Inc. reserves the right to make changes in design and changes or improvements upon its product without imposing any obligation upon itself to install the same upon its products theretofore manufactured.

**CAUTION: Do not attempt to lift motor home by the front bumper. Damage to front Fibra-Glass cap is possible.**

### HOW TO TOW

In the event it is necessary to have your motor home towed, have the towing company block down from the frame so no pressure is applied to the front bumper. The bumper is not designed to support the weight of the motor home.

## SAFETY PRECAUTIONS

### WARNING

Read and understand all instructions and precautions in this manual before operating your new motor home. The symbol WARNING is used throughout the manual to alert you to precautions that involves your safety. Read and follow them carefully. Listed are some safety precautions that must be adhered to. These precautions, as well as others that involve damage to equipment are also listed in the appropriate areas in this manual.

Never allow a passenger to stand or kneel on the seats when the vehicle is in motion.

Make sure all passengers have seat belts fastened to a low and snug position so the force exerted by the belt in a collision will be spread across the strong hip area.

Do not attempt to adjust the driver's seat while the vehicle is in motion.

Do not adjust tilt steering in a moving vehicle.

Lock the vehicle doors when traveling for additional safety.

Avoid inhaling exhaust gases. They contain carbon monoxide, which by itself is odorless, colorless and poisonous.

Use care when accelerating or downshifting on a slippery surface. Abrupt speed changes can cause skidding and loss of control.

Do not alter the LP gas system at any time or in any way.

Never use an open flame to test for LP gas leaks. Replace all protective covers and caps on LP system after filling.

Never allow your LP tank to be filled above the 80% level. Make sure the vehicle is level when filling the bulk tank so that it is not accidentally overfilled.

All pilot lights and appliances must be turned off while refilling the fuel or LP tank.

Never load the motor home in excess of the gross vehicle weight rating or the gross axle weight rating for either axle.

Do not remove radiator cap while engine and radiator are still hot. Always check coolant level visually at the see-through coolant reservoir.

Never get beneath a vehicle that is held up by the jack only.

Do not mix different construction types of tires on your vehicle such radial, bias, or belted tires as vehicle handling may be affected.

Do not attempt to start the vehicle by hot wiring.

Never carry extra gasoline inside the motor home.

Driving through water deep enough to wet the brakes may affect stopping distance or cause the vehicle to pull to one side. Check brake



operation in a safe area to be sure they have not been affected.

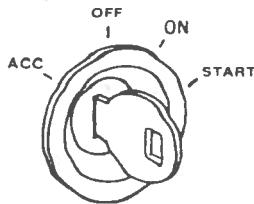
Only seats equipped with seat belts are to be occupied while the vehicle is in motion.

When lighting range burners do not turn burner controls to "On" and allow gas to escape before lighting match.

## CHASSIS - OPERATION - CHEVROLET INSTRUMENTS AND CONTROLS

### Ignition Switch

The key operated ignition switch has four positions-Accessory, Off, On, and Start. When the key is turned on the "Acc" position, all electrical accessories, such as the radio, will operate without the engine running. Turned clockwise the "On" position, the switch activates the ignition system. To engage the starter, turn the key to the "Start" position. As soon as the engine starts, release pressure on the key and it will return to the "On" position. See starting section for additional information on starting the engine under various conditions.



### Keys

An identification number on Chevrolet chassis accompanies each new ignition key and is stamped on a knock out plug in the key head. Record the identification number and discard the plug. Keep the identification number in a safe place, never in the vehicle. Should the original key become lost, your dealer or locksmith can provide a duplicate using the identification number.

### Power Steering

Power steering is provided as standard equipment in your Allegro motor home. By maintaining proper fluid level and insuring that the drive belt is always tight, the power steering system should function properly. However, should the system fail due to a malfunction or because the engine has stalled, the vehicle can still be steered, but with a greater amount of force.

### Tilt Steering

Your motor home is equipped with a tilt steering wheel which can be tilted above the normal position to provide additional room for entrance or exit as well as selected driving positions below normal height. This permits individual selection of the most natural position for driving. On long trips, the steering wheel position can be changed to minimize tension and fatigue.

## WARNING

Do not adjust steering mechanism while vehicle in in motion.

The tilt mechanism is operated by lifting up on the small control lever on the left side of the steering column below the turn signal, moving the steering wheel to the desired position and releasing the lever.

### Headlight Switch

The three position light switch controls the instrument lamps, headlights, marker lights, parking lights, tail lights, tag light and interior lights. When the light switch is pulled out to the first position, all lights with the exception of the interior lights and the headlights come on. Pulling the switch all the way out to the second position turns on the headlights; all other lights remain on as well.

## WARNING

Do not use park lights when vehicle is in motion. Parking lights denote a parked vehicle.

Instrument light intensity can be varied by turning the light switch knob clockwise or counterclockwise. Full counterclockwise rotation will turn on an interior light to illuminate the driver's compartment. The back-up lights operate only when the transmission is in reverse.

## Turn Signals

Turn signals should be used whenever a right or left turn is made, when changing lanes or when pulling away from the curb. Always signal your intentions before making a maneuver.

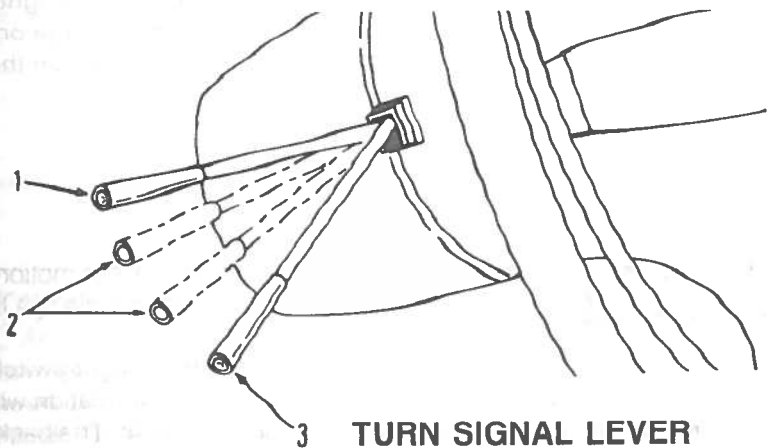
The ignition switch must be in the "On" position for the turn signals to operate. The turn signals can be used in two ways:

**Lane Change** - The first position up or down may be used for changing lanes or when making a gradual turn. The lever must be held in the lane change position; it will return to the neutral position when released.

**Full Turn** - The fully engaged or second position, up or down, is for use when making a normal turn. The turn signal will automatically cancel when the turn is completed.

## IMPORTANT

When the turn indicator lights on the instrument panel do not light, it is an indication that the turn signals are not flashing. The probable cause is a burned out bulb, but until the bulb can be replaced or the system serviced the appropriate hand signals should be used.

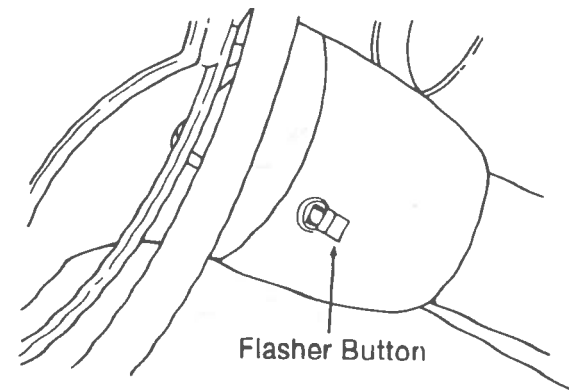


### TURN SIGNAL LEVER

1. Right Turn
2. Lane Change Positions
3. Left Turn

## Hazard Warning Flasher

The hazard warning flasher provides additional safety when you are forced to stop on the side of the roadway and present a hazard to other motorists. When the flasher is on, it serves as a warning to other drivers to approach and overtake your vehicle with caution.



## HAZARD WARNING FLASHER

### WARNING

Operating the hazard warning flasher system while moving on the highway is prohibited by law.

The hazard warning flasher switch is located on the right side of the steering column. Push hazard warning flasher button in to start the flashers and pull button out to cancel.

## High Beam Indicator Light Switch

The foot operated dimmer switch, located on the floor to the left of the brake pedal, is used to change the headlight beams from high to low. Each time the switch is depressed the light beam changes. The high beam indicator light, on the face of the speedometer is lighted when the headlights are on high beam.

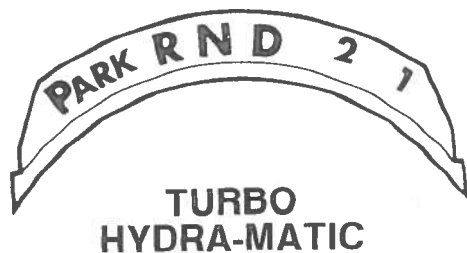
The headlight circuit on your motor home is protected by a circuit breaker in the light switch. An overload on the breaker will cause the lights to flicker on and off. If this condition develops, have your headlight wiring checked immediately.

## Automatic Transmission

An automatic transmission is provided as standard equipment on your Allegro motor home. The gear selector lever is located on the steering column.

The selector lever should remain in Park position when the vehicle is parked. For driving, a choice of Reverse, Drive, 1, and 2 is available. A neutral position can be used when the vehicle is stopped temporarily, such as at a stop light.

For further information on gear selection for various driving conditions refer to the Gear Selection section.



### Turbo Hydra-Matic Shift Positions TRANSMISSION SELECTOR LEVER

#### Power Brakes

Your motor home is equipped with power brakes to make stopping easier and smoother. The braking system is combined with the power steering system which in turn provides power assist to the brakes (hydroboost). However, the fluids in each system are separate. Therefore, DO NOT add hydroboost power steering fluid to the brake master cylinder, or brake fluid to the power steering reservoir. In the event that power assist to the brakes is interrupted due to a stalled engine or a system malfunction, reserve power assist is available for stopping the vehicle. However, the reserve power assist is partially depleted each time the brake pedal is applied and released. Do not pump the brake when stopping in this manner, except when necessary to maintain steering control on slippery surface.

When reserve power assist is exhausted, the motor home can be stopped manually by applying a greater amount of force to the pedal.

#### **WARNING**

Driving through water deep enough to wet brakes can affect braking performance and cause the vehicle to pull to either side. Always test brakes in a safe area if you suspect this condition exists.

#### Automatic Brake Adjustment

All individual wheel brakes with the exception of the parking brake are self adjusting. The rear wheel drum brake adjustment is made each time the brakes are applied while the vehicle is moving backward. Front wheel disk brakes are adjusted automatically each time the brakes are applied.

Should excess brake pedal travel develop, drive alternately in forward and reverse several times and apply the brakes firmly in each direction. See your dealer if this procedure does not restore normal pedal travel.

#### Parking Brake

The parking brake control is mounted under the instrument panel to the left of the steering column. The amount of force required to apply the parking brake can be adjusted by turning the adjustment knob on the end of the lever. This will also adjust the degree of brake application. To set the parking brake, depress the service brake pedal with foot while pulling the lever back past the over center position. To release, apply the service brake and push the lever forward.



Never drive the motor home with the parking brake set, as this can overheat or damage the rear brakes.

#### IMPORTANT

The parking brake should be set before moving the selector lever to "Park" whenever leaving the driver's seat. When this is not done, the weight of the vehicle may exert so much force on the parking pawl in the transmission that it can be difficult to pull the selector out of "Park".

### Heater and Air Conditioner Controls OPERATING YOUR MOTIVAIR AIR CONDITIONER AND HEATER

#### Step 1

Select mode of operation

- A. OFF
- B. MAX—A/C
- C. NORM—A/C
- D. VENT
- E. HRT.
- F. DEF.

#### Step II

Move bottom lever

- A. To the right to increase temperature.
- B. To the left to decrease temperature.

#### Step III

Move lever up or down for desired fan speed.

## Windshield Washer and Wiper

The two speed electric wipers are controlled by individual knobs on the right side of the instrument panel. The right knob controls the right windshield wiper blade. The left knob controls the left wiper blade and both windshield washers. To operate washer, depress left button and hold.

## INSTRUMENT PANEL

### Battery Condition Meter and 110V Onan Generator Switch (Optional)

This gauge is a voltmeter which allows you to monitor the state of charge in all storage batteries in the motor home. To obtain an accurate reading, the automotive engine and optional 110 Volt generator must not be running. This meter and switch are located on the dash of the motor home.

### Auxiliary Generator Switch (On motor homes equipped with 110V generator option)

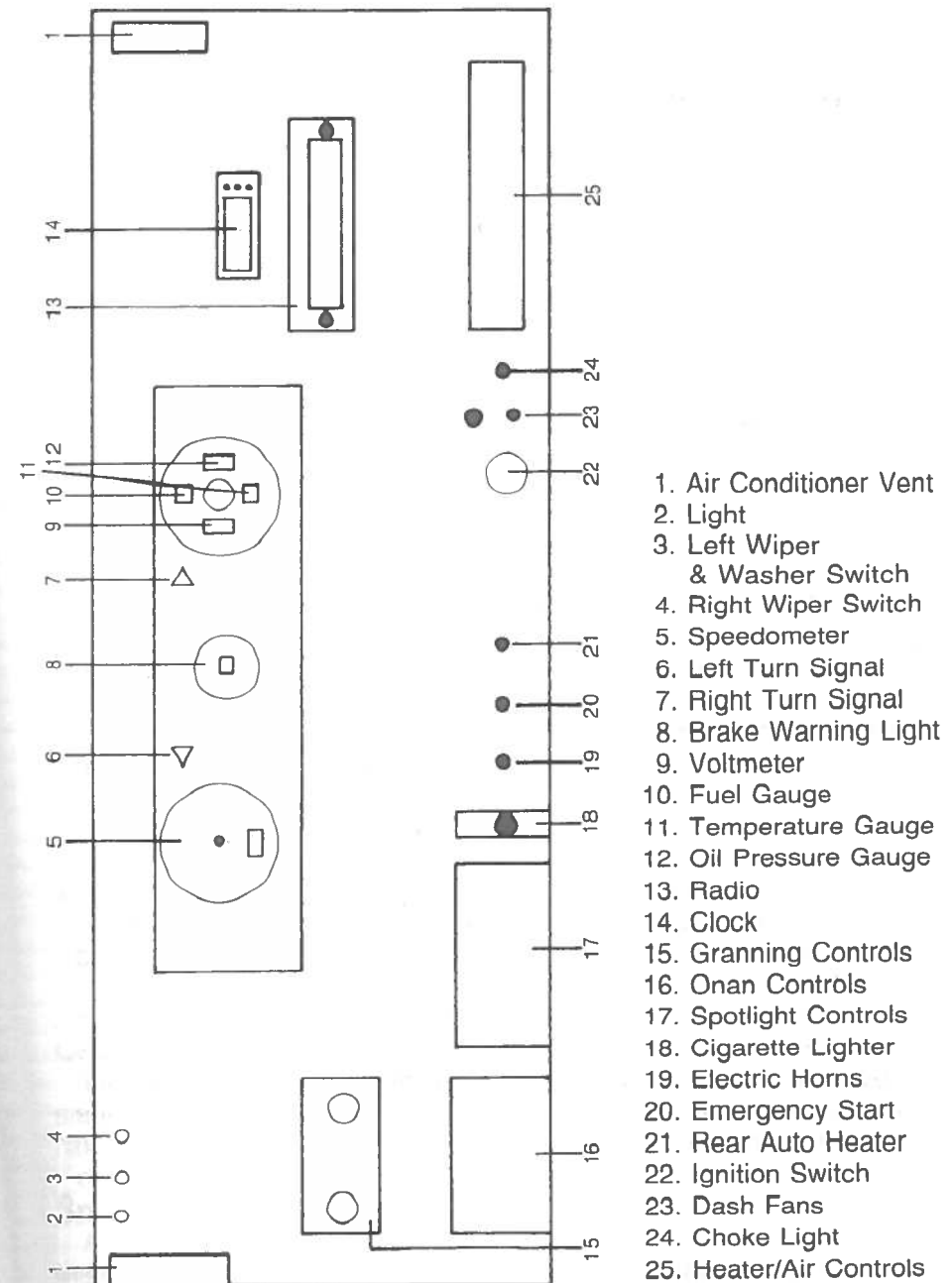
This On, Off, Start switch controls the 110V auxiliary generator allowing the generator engine to be started without leaving the motor home. This also permits the generator engine to be started while the vehicle is in motion.

### Auxiliary Generator Hourmeter (On motor homes with 110V generator option)

This meter registers the number of hours the auxiliary generator has operated. Use it as a reminder of when the generator unit is due for periodic lubrication and routine maintenance. This meter as well as the generator switch and hourmeter and battery condition are located on the dash of the motor home.

### Brake Warning Light

The service brake system in your motor home is a dual system which provides a reserve braking capability in the event of failure of one half. Failure of either half of the dual system is indicated by the brake system warning light, which will glow and remain lit until the brake system failure is corrected. The light is connected to the ignition switch and should glow during engine starting to verify that the bulb is operating properly. The light will then go off when the engine starts unless a brake failure is evident.



## IMPORTANT

This warning light is not to be used as a substitute for the visual check of brake fluid level required as part of normal maintenance.

## WARNING

If brake failure is indicated, immediate repair service is necessary. Continued operation of the vehicle in this condition is dangerous.

### Speedometer

The speedometer hand indicates the vehicle's forward speed in miles per hour. The six figure odometer located in the lower center section of the speedometer indicates the accumulated mileage. The odometer should be used as a reminder of when the vehicle is due for periodic lubrication and routine maintenance.

### Cigarette Lighter

When you wish to use the cigarette lighter, simply push and release the knob. As soon as the element is hot, the knob will "pop" out partway to the normal position and is ready for use.

### Clock

Clock (Dash) - Clock lights up when you turn ignition on or push-in top button on clock. To set time, push-in bottom or middle button. Bottom button changes time slow, middle button changes time fast.

### Oil Pressure Gauge

The oil pressure gauge indicates the pressure at which oil is being delivered to the various parts of the engine. Upon starting the engine, the pointer should move to the normal range of the gauge. However, higher or lower readings may be indicated under different operating conditions such as outside air temperature and weight of oil being used. If the pointer drops below the normal range while the engine is running, it is an indication of a loss of pressure and the motor home should be stopped as soon as possible and the engine shut off.

Check the oil level in the engine and add oil when necessary. The oil pressure gauge should not be used as an indication of the engine's oil level. Several factors could cause loss of oil pressure even though the oil level is normal. Do not operate the engine when the gauge pointer is below the normal operating band. Operating without oil pressure can quickly destroy the engine bearings and other engine parts.

### Temperature Gauge

This gauge indicates the engine coolant temperature. As the engine becomes warm, the pointer will move to the normal range of the gauge.

Coolant temperature and, therefore, gauge readings, may vary depending on weather and traffic conditions. There is no danger to the engine unless the gauge pointer moves all the way right to the H (hot) position. If it does, stop the vehicle or reduce speed to permit the engine to cool.

## WARNING

Never add coolant to the radiator when the engine is overheated. Do not loosen or remove the cap to cool an overheated engine. Refer to section on Cooling System Maintenance for further cautions and instruction on adding coolant to the radiator.

### Fuel Gauge

With the ignition switch in the "On" or "Acc" position, the fuel gauge registers the approximate fuel level in the tank. When the gauge registers empty, some fuel is still available as a reserve and when the gauge registers full, some additional fuel can still be added to the tank. It is good practice to keep the fuel tank at least half full at all times to help prevent condensation in the tank.

### Voltmeter Gauge (Alternator Indicator)

The voltmeter indicates the state of the charging system. A regulator connected to the alternator, controls the amount of voltage produced by the alternator. Under normal conditions, the voltage will range between 11 and 15 volts depending on temperature and electrical requirement. For example, voltage requirements will be higher when operating the lights or the auto air conditioner. When voltage is within this range, it indicates proper alternator operation and consequently will maintain battery at the proper state of charge. A drop in the voltage output could indicate a malfunction in the charging system and should be checked as soon as possible.

### Dual Battery Isolator

The dual battery isolator permits connecting the auxiliary battery to the automatic electrical system permitting it to be charged by the engine alternator as you drive.

### Choke Light

The choke light located on the dash panel beside the steering column should come on when the engine is first started and go off within a few seconds. This indicates the choke is operating efficiently.

### Spot Light

An optional roof mounted spot light is available. To operate, rotate the control switch from "off" to either "spot light" or "flood". Then move the direction of the light up or down and left to right to the desired position. DO NOT operate this light while vehicle is in motion.

## Radios

Basically, all radios are tuned and operated in a similar manner. Refer to the directions in the radio owner's manual.

## IMPORTANT

All radios have an in-line fuse between the radio and the fuse block to protect the radio wiring. A second protection fuse is located in the fuse block itself. If the radio fails to operate, check both fuses and replace with new fuse of the same value if found to be defective.

## Air Horn

Depress button located on dash.

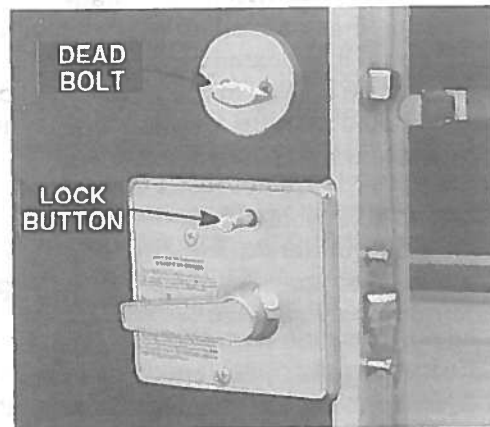
## SEAT AND DOOR PANEL CONTROLS

### Entrance and Driver's Door Locks

Either door can be locked or unlocked from outside the vehicle by inserting the key in the lock and turning. To lock the door from the inside, push the lock button in. Pull the button out to unlock the door. Lubricate the lock periodically with graphite to keep it in good working condition.

## WARNING

Lock the door when driving for greater safety.



### ENTRANCE DOOR HANDLE

### Dead Bolt Lock

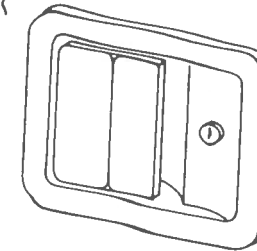
The entrance and driver's door are equipped with a dead bolt lock for your added protection. To lock the dead bolt, turn the lever clockwise one-half turn. To unlock, turn lever one-half turn counter clockwise.

### Entrance Door Handle

The entrance door can be opened from the outside by pulling the

## CAUTION

Do not force the inside door handle down, as damage could occur.



### EXTERIOR ENTRANCE DOOR HANDLE

## IMPORTANT

The keys should always be removed from the motor home when leaving the vehicle. Since the doors can be locked without the keys, make sure they have been removed from the ignition before locking the driver's compartment.

## Seats

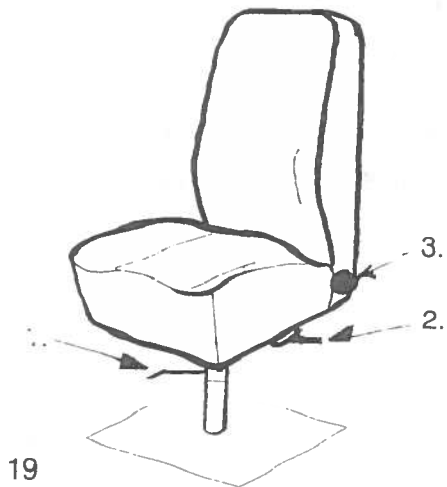
The driver's seat assembly has a one way adjustment which allows the seat to be moved forward or back to obtain the most comfortable position. To move the seat forward or back, push back on the lever located to the left under the seat to release the seat and move the seat to the desired position. Release the lever; it will engage in the closest notch to lock the seat in place.

## IMPORTANT

To swivel the chair, press down on swivel level #1 and hold while you turn the chair.

Reclining seats are standard on all Allegro motor homes. To adjust, rotate the knobs located at either side of the seat until the desired position is obtained.

1. Swivel lever
2. Slider lever
3. Recliner

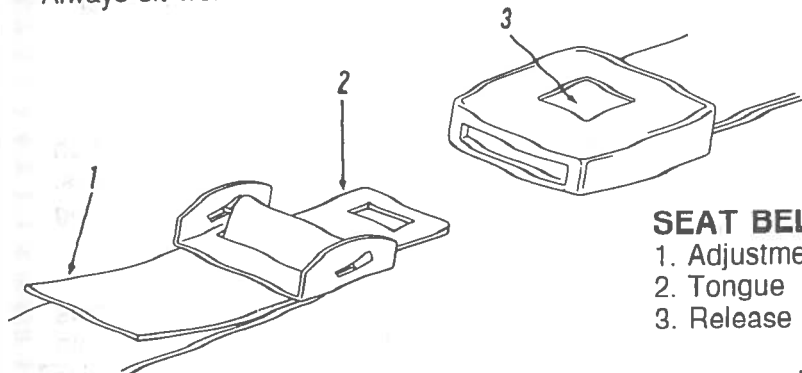


## WARNING

Do not attempt to adjust the driver's seat while the vehicle is in motion. The seat could move unexpectedly, causing the loss of control.

### Seat Belts

The driver and passenger seat and all seats in the motor home designed to carry passengers while in motion are equipped with seat belts. These are installed for the protection of you and your passengers and must be fastened whenever the vehicle is in motion. The lap belts must be worn as low as possible and fit snugly across the hip area. Always sit well back and erect in the seat.



### SEAT BELT

1. Adjustment Strap
2. Tongue
3. Release Button

**Adjustment:** To lengthen belt, turn tongue at a right angle to belt and pull to desired length. To shorten, pull loose end of belt.

**To Fasten:** Be sure belt is not twisted. Grasp each part of the belt assembly and push tongue into buckle. Adjust to a snug fit by pulling the loose end away from the tongue.

**To Unfasten:** Depress button in center of buckle and slide tongue out of buckle.

## WARNING

Snug and low belt positions are essential. This will ensure that the force exerted by the lap belt in a collision is spread over the strong hip area and not across the abdomen, which could result in serious injury.

Only seats equipped with seat belts are to be occupied while vehicle is in motion. Seats not equipped with seat belts will be labeled: "This seat not intended for occupancy when vehicle is in motion."

## OPTIONAL EQUIPMENT - OPERATION

### Cruise Control (Optional on some models)

The cruise control decreases the amount of strain on the driver from constant and steady highway driving. However, the comfort and convenience of the cruise control feature should not substitute for periodic rest stops which allows the driver and passengers to relax.

### IMPORTANT

The cruise control system will not function below 30 miles per hour.

## WARNING

The use of the cruise control is not recommended on icy or wet roads or in congested traffic.

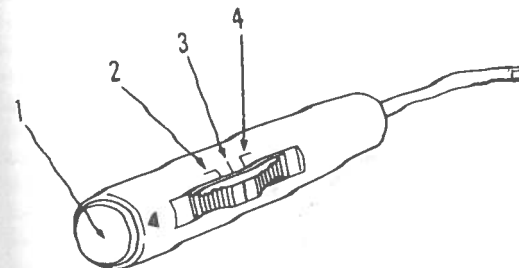
**To Activate Cruise Control** - Slide switch from "Off" to "On" (located on turn signal lever).

**To Engage Cruise Control** - Accelerate to desired speed, maintain, push in the "Set Speed" button (located in the end of the engagement switch), and release. You may also engage the cruise control by moving the slide switch to "Resume" and releasing. As soon as the speed has been set by either method, you may remove your foot from the accelerator pedal and the speed will automatically be maintained to within two miles per hour of the set speed.

**To Disengage Cruise Control** - The cruise control system can be disengaged by two methods; Stepping on the brake, either when stopping or by lightly depressing the brake pedal while driving. Or by returning the slide switch to the "Off" position. The system also disengages when the ignition switch is turned off.

**To Increase Vehicle Speed** - Speed can be increased at any time with normal pressure on the accelerator pedal. When the accelerator pedal is released the vehicle will return to the previously set speed.

**To Resume Previously Set Speed** - When the system is engaged and the brakes have been applied, the previously set speed can be resumed by sliding the switch to "Resume" momentarily and releasing.



### CRUISE CONTROL

1. "Set Speed" Button
2. "Resume" Position
3. "On" Position
4. "Off" Position

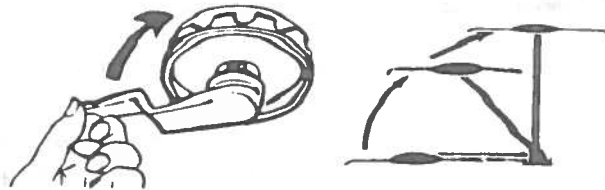
**NOTE:** The greater the difference between the previously set speed and the speed at which engage "Resume", the faster the vehicle will accelerate. Rapid acceleration can be eliminated by accelerating with the gas pedal to within ten miles per hour of the former set speed and then engaging the resume switch.

### IMPORTANT

The resume feature will not operate if the slide switch has been moved to "Off" to disengage the system or if the ignition switch has been turned off.

### OPERATING INSTRUCTIONS

#### Raising Antenna



Turn elevating crank (*clockwise*) in "UP" direction about 13 turns or until some resistance to turning is noted. Antenna is now in operating position. **Check to make sure power supply switch in "ON".**

#### Rotating Antenna

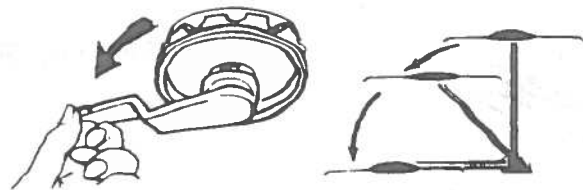


**Make sure antenna is in "UP" position.** Pull down on rotating knob until it disengages ceiling plate and rotate for best picture and sound on television set.

#### Lowering Antenna To Travel Position

Rotate antenna until Pointer on Rotating Knob aligns with Pointer on Ceiling Plate.

**IMPORTANT:** Under no conditions lower antenna in any position except travel position.



Turn elevating crank (*counter clockwise*) in "DOWN" direction until resistance is noted. Antenna is now locked in travel position. Return power supply switch to the "OFF" position.

Count number of turns necessary on elevating crank to lower antenna until head is just resting on roof of RV. Mark position of elevating crank on ceiling or directional handle and number of turns (*about 13*). Use this number of turns when raising or lowering and stop at mark.

**NOTE:** Due to various locations used by motor homes, TV reception will not be consistent as it is in a fixed location because of the variation of terrain encountered throughout the country. Generally, TV and FM radio signals travel in a straight line. Therefore, hills or mountains, etc., between your vehicle and the transmitting station may severely reduce the amount of signal reaching the antenna.

### Roof Air Conditioning

The roof air conditioner is operated totally from the control panel on the inside ceiling assembly. The temperature control regulates the on and off temperature setting at which the compressor (or heater, if you have the Elect-A-Heat model) will operate. The selector switch operates the air conditioner on the desired mode (off, heat on Elect-A-Heat models, fan only and cooling). Those air conditioner units with the controls on one end, have a lever control which operates the damper to regulate the volume of air being circulated during the "Fan Only", "Cooling" or "Heating" (if you have the Elect-A-Heat model) cycle. Those units with two dial controls on the bottom of the ceiling panel, have the damper (air volume) control incorporated in the selector switch. Moving the control within the "Fan Only" or "Cooling" range on these models, opens and closes the damper.

### OPERATING INSTRUCTIONS

FOR COOLED AND DEHUMIDIFIED AIR set the thermostat dial to the desired temperature. The warmest setting (WARM) on the dial is approximately 95 degrees; the coolest setting (COLD) is approximately 70 degrees.

Place blower selector switch in desired position. High-cool, medium-cool or low-cool positions are used when air conditioning is desired. In these positions, the blower will operate continuously and the compressor will come on when the thermostat calls for cooling and off when the desired temperature has been reached.

FOR CIRCULATED AIR ONLY place the thermostat in the warmest position. High-cool, medium-cool and low-cool positions will now circulate inside air and not operate the compressor for cooling.

FOR HEATED AIR, with the optional heat package installed, place selector switch in the LOW HEAT position. This will circulate the air



and allow the heater to cycle on the thermostat that has been set at the desired temperature. Place thermostat in WARM position for maximum heat. NOTE: On units that do not have the optional heat package installed, this position will act to circulate the inside air only.

Adjust the louvers at the air discharge openings for best air distribution. (These louvers should never be completely closed.)

TO COMPLETELY SHUT DOWN THE UNIT, place the blower switch in the "OFF" position.

### Filters

The filters are located in the interior ceiling shroud and are easily accessible for changing and/or cleaning. Remove and clean filters approximately every two weeks of operation:

1. Remove shroud attachment screws.
2. On units with controls on one end, pull down on shroud at end opposite controls.
3. On units with controls on bottom, lower shroud from ceiling.
4. Remove filters and clean with soap and water and rinse clean.
5. Dry the filter carefully and reinstall.
6. Replace ceiling shroud.



Do not operate the air conditioner for extended periods of time without the filters installed

### Circuit Breaker

The air conditioner unit is protected from current overload by a circuit breaker located on the motor home's electrical control panel. Move switch to "Off" position and back to "On" to reset breaker.

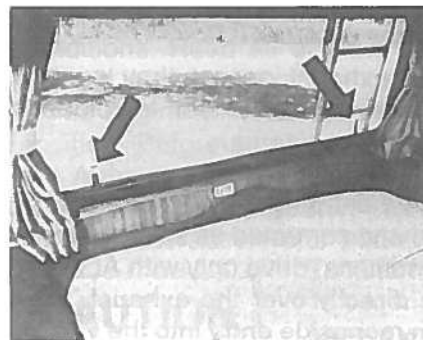
### VACUUM CLEANER

To operate vacuum cleaner, lift the plastic inlet/switch cover, insert hose to start the motor. When you have completed cleaning, remove hose, and close cover.

To remove dust bag from cleaner, lift canister cover, move release lever away from canister and lift canister out of compartment. Remove dust bag from canister and replace with new one of identical size. Always check the dust bag if the vacuum cleaner seems to be losing suction.

### MICROWAVE OVEN

On some models, you have a double throw switch above the microwave oven marked AC and MW. To get power for the microwave oven, flip switch to MW. To get power to the front air conditioner, flip switch to AC. Both items will not work at the same time. This is to keep the circuit from being overloaded.



### EMERGENCY EXIT

An Allegro motor home is equipped with an emergency exit window in the rear. Pull the red tab located at the bottom of the window completely out. Remove the rubber insert from around the window and push firmly at the base of the window. The window will fall outside providing an exit.

### PRE-TRAVEL CHECKLIST

Before starting the engine in preparation for an outing, be sure your motor home has been properly prepared and maintained. This will ensure an enjoyable trip and help avoid delays. Use this checklist as a guide:

- Fluid levels - Check and fill if necessary; engine oil, transmission, power steering, radiator, brake, battery, and windshield washer.
- Wheel lug nuts - Check for tightness.
- Tires - Check for proper cold inflation pressures as specified in pressure chart.
- 110-Volt generator (Option) - Check oil level in generator engine.

### WARNING

Never check oil level in generator while engine is operating.

- Lug Wrench and jack are properly stowed (not furnished with Motor Home)
- Fire Extinguisher - Make sure it is fully charged and secured in mounting bracket.
- Lights - Make sure all headlights, tail lights, and clearance lights are operating.
- Seat - Adjusted for comfortable position.
- Mirrors - Adjust for maximum visibility from driver's seat.
- Exterior doors and step - Make sure doors are closed, locked, and step retracted.
- Sewer and water supply hose - Unhook and stow.
- Loose items inside the coach - Stow or secure items and make sure all doors are closed and latched.
- Pilot lights - Make sure all pilots are off.
- Fuel Tanks - Check level.
- Water Tank - Fill with fresh water.
- LP gas tank or bottles - Make sure valve is closed and door latched securely.

## CARBON MONOXIDE WARNING

### WARNING

Avoid inhaling exhaust gases, they contain carbon monoxide, which by itself is colorless and odorless, and poisonous.

If you suspect that exhaust fumes are entering the passenger compartment, have the cause determined and corrected as soon as possible. If you must drive under these conditions, drive only with ALL windows FULLY open except the ones directly over the exhaust.

The best protection against carbon monoxide entry into the vehicle body is properly maintained engine exhaust and ventilation system. It is recommended that the exhaust system and body be inspected by a competent mechanic:

- Each time the vehicle is raised for oil change.
- Whenever a change is noticed in the sound of the exhaust system.
- Whenever the exhaust system, underbody or rear of the vehicle is damaged.

To allow proper operation of the vehicle's ventilation system, keep front ventilation inlet grille clear of snow, leaves, or other obstructions at all times.

**SITTING IN A PARKED VEHICLE WITH ENGINE RUNNING FOR AN EXTENDED PERIOD IS NOT RECOMMENDED.**

Do not run engine in confined areas such as garages except to move vehicle in or out of area. When vehicle is stopped in an UNCONFINED area with the engine running for any more than a short period, adjust heating or cooling system to force outside air into the vehicle.

1. Set fan to medium or high speed and control for vent to air.
2. On vehicles equipped with air conditioning, set fan to medium or high speed, and set control to obtain maximum vent air.

Doors and rear windows, should be closed while driving to avoid drawing dangerous exhaust gases into the vehicle. If for some reason they must remain open for a period while driving, or electrical wiring or the cable connection to a trailer must pass through the seal between them and the body, the following precautions should be observed:

- Close all windows
- Adjust heating or cooling system to force outside air into the vehicle as described in item 1 or 2 above but with fan set at high speed.
- Fully open outside air vents in or under the instrument panel.

### STARTING THE ENGINE

Different climatic conditions, as well as other factors, can play a part in determining what method should be used when starting the engine.

The following instructions have been provided for various starting conditions. Read all of them carefully and choose the appropriate method.

The engine will start with the selector lever in the Neutral or Park position. Before engaging the starter:

- Apply the parking brake.
- Make sure the gearshift selector is in Neutral or Park position.
- Depress accelerator pedal and activate the starter as outlined.

### CAUTION

The starter should not be operated longer than 15 seconds at a time. If the engine fails to start, always wait a few seconds before trying again to protect the starter from overheating.

### Cold Engine

Fully depress accelerator pedal and slowly release. With foot off the pedal, crank the engine by turning the ignition key to the Start position, and release when the engine starts. If engine starts, but fails to run, repeat this procedure.

When engine is running smoothly (approximately 30 seconds) the idle speed may be reduced by slightly depressing the accelerator pedal and then slowly releasing.

### CAUTION

Extended running of engine (5 minutes or more) without reducing idle speed, could cause damage to engine or exhaust system due to overheating.

### Extremely Cold Weather (Below 0° F.) Or After Vehicle Has Been Standing Idle Several Days

Fully depress and release accelerator pedal two or three times before starting the engine. With foot off the accelerator pedal, start the engine by turning the key to the start position and release when engine starts.

### Warm Engine

Depress accelerator pedal approximately halfway and hold while starting the engine.

### Engine Flooded

Depress accelerator pedal and hold to floor while starting until engine is cleared of excess fuel and is running smoothly. Never "pump" the accelerator pedal.

### Warm-Up

Always let the engine idle for 20 to 30 seconds after starting and drive at moderate speeds for several miles, particularly during the cold weather.

## GEAR SELECTION

When ready to drive, move the selector lever from "P" or "N" to the desired position. Your automatic transmission provides you with either fully automatic operation in the "D" (drive) position or manual control by allowing you to start in the "1" (first) or "2" (second) position and shift to higher gears manually. The explanations of the selector positions will help you determine the best operating position.

**"P" Park** - This position supplements the parking brake by locking the transmission, whether or not the engine is running. The engine may be started in this position. Make sure vehicle is stopped before placing the transmission in "P" (park).

**"R" Reverse** - This position is used to back the motor home from a stopped position. The vehicle should be brought to a stop from forward travel before shifting into reverse except when rocking the vehicle to free it from mud, snow, sand and etc. Do not spin the wheels in excess 35 MPH when freeing a stuck vehicle.

**"N" Neutral** - Shift to neutral when stopping for a prolonged period with the engine running to avoid overheating the transmission. The engine may also be started with the selector in this position.

**"D" Drive** - This position is used for most normal city and highway driving. As stated previously, the transmission will start in first and shift automatically through second and to drive when the selector is in this position. You may downshift for extra acceleration below 65 miles per hour by depressing the accelerator pedal to the floor, or by depressing the pedal halfway to the floor below 30 miles per hour.

**"2" Second** - This position is particularly useful when driving in heavy city traffic or on mountain roads where more control over speed is necessary. Use it also when driving up moderately steep grades and for "engine braking" when descending downgrades. To prevent excessive engine speed, do not exceed 45 miles per hour in this range.

**"1" First** - This position should be used for driving up very steep hills and for "engine braking" at low speeds (25 miles per hour or less) where the "2" position does not prove sufficient. This position is also useful in conditions such as sand, snow or mud where hard pulling at low speeds is required.

To prevent excessive engine speed, do not exceed 25 miles per hour in this range.



Using a driving gear to hold on an upgrade can cause the engine and transmission to become overheated. Do not idle the engine for more than one minute with transmission in gear. Longer periods of idling, while in gear, can cause overheating of the engine. Use service brake to hold vehicle.

## NEW VEHICLE BREAK-IN

By following a few simple break-in precautions, you can contribute greatly to a longer life for your motor home chassis and add to its future performance and economy of operation. The road speed should not exceed 50 miles per hour for the first 500 miles. Work up to this speed gradually during the first 200 miles. Then vary your speed periodically rather than driving a steady rate of speed for long periods. During the next 2,000 miles of operation, the speeds may be gradually increased up to the lawful speed limit to complete the break-in process. Follow the recommended oil change schedule in the maintenance section of this manual during the break-in period.

## WEIGHING THE MOTOR HOME

The frame and load carrying components of your motor home have been designed to provide satisfactory service as long as the vehicle is not loaded in excess of the gross vehicle weight rating (GVWR) or the gross axle weight rating (GAWR) for the front and rear axles. These ratings are listed on the vehicle certification label located on the driver's sidewall to the left of the dash. The GVWR is the total permissible weight of the motor home, including driver passengers, the vehicle itself with all options, and the load it is carrying including all liquids. The GAWR is the total permissible weight allowable for each axle.

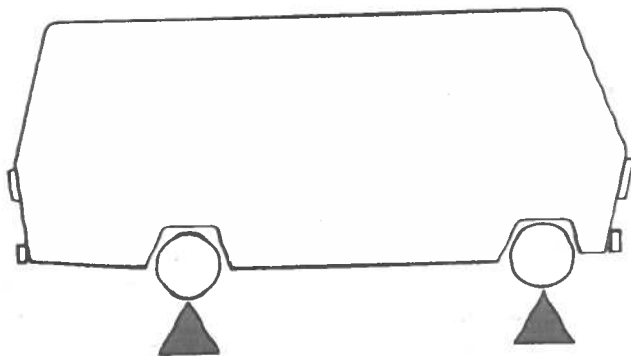
Weigh your motor home periodically at any state weighing scale or at a local weighing station. The front and rear axles must be weighed separately with the vehicle fully loaded (including occupants) and ready for operation. This process will determine the actual gross axle weight (GAW) for front and rear axles. Next weigh the entire motor home fully loaded, or add the front and rear gross axle weights to determine the gross vehicle weight (GVW). The GVW or actual weight of the vehicle must never be allowed to exceed the GVWR, nor should either of the GAW's be allowed to exceed the GVWR figures. Overloading the vehicle can produce safety hazards, poor handling, and also reduce the life of all load carrying components such as tires, springs, shock absorbers, etc.

## IMPORTANT

The vehicle must be level when weighing either of the axles and when weighing any of the wheel locations separately.

The accompanying figure illustrates a typical vehicle in the loaded condition. Note that the front and rear GAWR's and the GVWR are not exceeded.

Maximum GVWR - 12,300 lbs.  
 Front GAWR - 4880 lbs.  
 Rear GAWR - 7500 lbs.



Rear Curb	6130 lbs.	Front Curb	2780 lbs.
Rear Cargo and Passenger Load	<u>1250 lbs.</u>	Rear Cargo and Passenger Load	<u>820 lbs.</u>
	7380 lbs.		4600 lbs.
Total Weight at Ground 11,980 lbs.			

When loading the vehicle, it is important that the load be properly distributed over both the front and rear axles within the GAWR limits. Note that the total of both GAWR figures may exceed the GVWR listed on the certification label. Therefore, both axles must not be loaded to maximum capacity, or the GVWR may be exceeded. If the vehicle weight is greater than capacity, remove unnecessary cargo.

To load the motor home properly, it is recommended that you first determine its empty weight by weighing each wheel and tire location separately. Load the heavier items low and toward the lighter side to distribute the weight as equally as possible from side to side. It is possible for the GAW of an axle to be below capacity and still experience poor vehicle handling if the majority of the weight is on one side.

Always maintain tire inflation pressure at the designated value specified in the tire inflation chart. Check pressures after the motor home has been parked overnight and before driving any great distance. Check tire pressure again anytime the load is increased.

## WARNING

Total loaded motor home weight including options, attachments, personnel, water, and waste must not exceed the GVWR or the gross axle weight rating (GVWR) of either axle.

### VEHICLE TOWING

If towing a vehicle, the maximum tongue weight allowable is 200 pounds with a maximum vehicle weight of 2,500 pounds.

### TRAILER TOWING

Since your motor home was designed and intended to be used primarily as a load carrying vehicle, it is not recommended that it be used for trailer towing; as handling, durability, and economy will all be affected. Maximum safety and satisfaction when towing, depend on proper use of correct equipment and adherence to certain limitations.

Trailers weighing in excess of 1,000 pounds require trailer brakes. The Gross Combination Weight (GCW), which is the weight of the fully equipped motor home with passengers plus the weight of the trailer with cargo, must not exceed the Gross Vehicle Weight Rating (GVWR) of the motor home.

It is important that the trailer tongue load be maintained at approximately 10 percent of the loaded trailer weight not to exceed the tongue load listed in the specifications for your vehicle. Tongue loads can be adjusted by proper distribution of the load in the trailer.

An auxiliary transmission oil cooler connected in-series with the radiator bottom tank cooler is mandatory.

## CAUTION

It is essential that the auxiliary cooler installation does not create an oil flow restriction to the transmission cooling system.

Before descending a steep or long grade when towing a trailer, reduce speed and shift into a lower gear to control vehicle speed. Avoid prolonged or frequent application of the brakes which could cause overheating.

## ROOF LOADING

The roof on your motor home is constructed of 1" aluminum tubing on 12" center, the same as the walls, and is capable of carrying some articles while the vehicle is in motion. However, maximum weight being carried while the vehicle is in motion is not to exceed 80 pounds per square foot. A roof mounted luggage carrier designed for this purpose is available as an option.

When the vehicle is stationary, a load of 225 pounds per square foot or maximum of 1500 pounds is permissible, thus allowing you to walk on the roof to periodically inspect the seams.

Both weight added to the roof and that added to a trailer hitch contribute to the Gross Vehicle Weight which must not exceed the vehicle's GVWR.

Total weight added to the roof, trunk (when existing), hitch and bumper must not exceed 250 pounds.

Note: When figuring the total weight added to the roof, do not include weight of the optional roof air conditioner.

## VEHICLE MAINTENANCE

### FUEL REQUIREMENTS

The engine in your motor home is designed to operate on unleaded or leaded gasoline to minimize spark plug fouling. The engine does not require premium grade fuel. If engine knocking persists, have the engine checked by your dealer. Continuous knocking can result in engine damage.

Use an unleaded or leaded gasoline having a research octane number of at least 91 and an average octane rating of at least 87. It is a requirement of the Federal Energy Administration that the average octane rating be posted on service station pumps.

### WARNING

Make sure all pilot lights have been extinguished before refilling LP gas tanks or bottles.

### ENGINE ACCESS

On all models, the oil dipstick, oil fill, radiator fill, and the windshield washer fluid reservoir are accessible through the grille. To open, simply turn the grille locks to the open position and the grille will swing open.

### Engine Cover

The engine cover is located in the driver's compartment. Adjust the passenger's seat clockwise until it is facing the right side of the motor home and the seat back is vertical. After releasing the clamps, access

to the transmission fluid dipstick, fluid fill tube, air cleaner, and other engine parts can be obtained.

### BRAKE FLUID RESERVOIR

The brake master cylinder is located above and to the right of the left front wheel and is covered by a metal shield for protection against mud and foreign material. Have your dealer or local garage remove the shield and check master cylinder fluid level in both reservoirs every 4 months or 6,000 miles.

### ENGINE OIL AND FILTER

#### Checking Oil Level

The engine oil should be maintained at proper level. The best time to check it is at the last step in a fuel stop. This will allow the oil accumulation in the engine to drain back into the crankcase. To check the level, remove the oil dipstick, wipe it clean, and reinsert it firmly for an accurate reading. The dipstick is marked "FULL" and "ADD." The oil level should be maintained in the safety margin, neither going above the "FULL" line nor below "ADD" line. Reseat the dipstick firmly after taking reading.

#### Oil Change

Engine oil should be changed at regular intervals to ensure a long and troublefree engine life. If the motor home is driven only a few miles at a time and at low speeds, moisture will condense in the crankcase and form a sludge. Under these conditions, which includes frequent or prolonged idling, oil changes are recommended every 1,000 miles. Operating in very dusty conditions also calls for more frequent oil changes. Since the frequency will depend on the severity of dust conditions, no definite recommendation can be made. However, operation in a severe dust storm may require an immediate oil change. When changing engine oil, always use an oil that conforms to the requirements of the API (American Petroleum Institute) classification for Service SE. The oil should also be of the proper SAE number to meet the climatic temperature range that is anticipated before the next oil change. Under normal operating conditions, change engine oil every two months or 3,000 miles, whichever comes first.

Replace the oil filter on all models the first oil change and every second oil change after that time. When changing the oil filter, add one additional quart of oil.

### DRIVE BELTS

Every second oil change the drive belts should be inspected for wear, fraying, cracking, and tension. Belts which are in poor condition should

be replaced immediately. Check tension by applying moderate thumb pressure midway between pulleys. If the center-to-center distance between pulleys is 13 to 16 inches, the belt should deflect approximately 1/2 inch.

## ENGINE COOLING SYSTEM

The engine's cooling system has been filled at the factory with a high quality coolant containing a rust inhibitor. This coolant solution provides freezing protection to at least -20 degrees Fahrenheit. It has also been formulated to be used without replacement for two years or 24,000 miles. At the end of this period, the coolant should be drained to prevent rust or corrosion in the radiator and engine, then refilled with a quality antifreeze/water solution.

To check coolant level, visually inspect the coolant overflow recovery tank. DO NOT remove the radiator cap. With the engine idling and warmed to the normal operating temperature, the level of the coolant in the recovery tank should be between the two marks on the side. When additional coolant is needed, a minimum of 50% concentration of ethylene glycol antifreeze in water should be added to the overflow recovery tank. A higher concentration (not to exceed 70%) should be used if a lower freeze point is required.

## IMPORTANT

Do not use additional rust inhibitors or antirust products, as they may not be compatible with the radiator coolant.

## WARNING

The radiator cap should be removed only when checking coolant freeze point or for complete replacement with antifreeze coolant. DO NOT remove radiator cap until the radiator has cooled completely. Use caution with hot coolant or steam. Place a cloth over the cap, turn left to first stop, pause to allow any pressure to release through overflow tube, then press down and turn left to remove cap.

## AUTOMATIC TRANSMISSION

The fluid in the automatic transmission should be checked at least every oil change. Be sure the engine has been run long enough to thoroughly warm the transmission before checking the fluid level. Also ensure that the engine is running and the vehicle is level. Automatic transmissions are often overfilled because the fluid level is checked when the fluid is cold and the dipstick indicates that fluid should be added.

If fluid is required, use ONLY fluid of the type labeled "DEXRON" Automatic Transmission Fluid, available from your local dealer or service station.

## IMPORTANT

DO NOT OVERFILL. It takes only about one pint to raise the level on the dipstick from Add to Full with a hot transmission.

Whenever the transmission fluid level is checked, especially on a vehicle used in severe conditions, the condition of the fluid should be noted. If the fluid is dark and has a strong odor, fluid and filter should be changed. It is also advisable to have the bands adjusted at this time.

To check the fluid level:

1. Warm transmission thoroughly by driving several miles.
2. Park vehicle on a level surface and engage parking brake.
3. Place gear selection lever in park.
4. Check fluid level by removing the dipstick, wiping clean and reinserting. Remove again for accurate reading. The fluid level should be between "Full" and "Add One Pint."

Refer to the service maintenance schedule in this manual for the frequency of transmission fluid and filter change on your motor home. Fluid should be changed more frequently if the vehicle has been used for off-the-highway operation, towing trailers, or operated frequently under a heavyload, especially in hot weather.

## BRAKES

Brakes should be properly maintained for the correct adjustment by following the instructions under brake operation. If the brakes can no longer be adjusted by backing up and applying the brakes, the brake pads and linings should be checked for wear by your dealer.

The fluid level in the dual master cylinder should be checked at each lubrication period and maintained to within 1/4 inch of the top of the reservoir.

Only brake fluid conforming to DOT-3 specification may be used. Use only brake fluid that has been kept in a closed container to avoid contamination from foreign material or moisture.

## CAUTION

Hydraulic fluids not conforming to this specification must never be used. A fluid with a lower boiling point or one that is unidentified may result in sudden brake failure under hard braking conditions. Never use a petroleum base fluid in the brake fluid reservoir, as seal damage to the system may occur.

## POWER STEERING

Check the power steering fluid level when the engine is warmed to operating temperature. Before removing the reservoir cap, wipe off cap and outside of the reservoir to prevent dirt from contaminating the

fluid. Fluid level should be maintained at the proper level indicated on the cap dipstick. When adding fluid to the power steering reservoir, use only General Motors Power Steering Fluids.

## CAUTION

These models are equipped with a power steering system which also supplies hydraulic power assist to the brake system (Hydroboost). This combined system requires the use of **ONLY** the fluid specified. **DO NOT** put hydroboost fluid in the brake master cylinder or brake fluid in the power steering reservoir.

## TIRES

Properly cared for, the tires on your motor home should last for several thousand miles. One important factor that contributes to tire life is inflation pressure. Low air pressure not only results in the tire overloading and abnormal wear, but also affects handling and fuel economy. The tire flexes more from overload and builds up heat which weakens the tire, making it more susceptible to failure. Excessive air pressure causes the tire to wear abnormally in the center of the tread, produces a rough ride, and increases the chance of a tire failure from a road hazard. After determining the weight of your motor home and the load of each tire by weighing the vehicle at a scales, the proper inflation pressure can be obtained from the chart in this section.

Tire pressure should be checked at least monthly and preferably more often, especially during periods of frequent use. Inspect the tires often for any foreign objects embedded in the tread which could work into the tire and result in failure. Always check inflation pressure when the tires are "cold," when the vehicle has not been driven for three hours or more or driven less than one mile. It is normal for tire pressure to increase a few pounds when the tires become hot from driving. **DO NOT** reduce this pressure, as doing so reduces the "cold" pressure, resulting in under-inflation.

Any excessive or abnormal wear may indicate worn or out of alignment suspension, excessive camber, incorrect toe, out of balance tires, or other tire and suspension problems. Have your dealer inspect the vehicle for the source of the problems and repair it immediately.

## IMPORTANT - AIR BAGS

All Allegro motor homes front suspension are equipped with rubber air bags inside the coil springs. Air pressure in these air bags may be increased or decreased to adjust vehicle trim and minimize "crash through" on large road bumps or depths. Inflation pressure must be maintained between 50 psi minimum and 75 psi maximum. To check the pressure

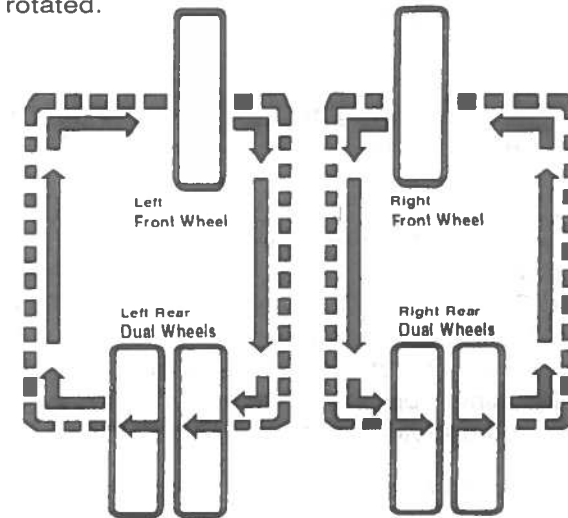
on the front suspension, locate the air pressure check valve on the bottom of the A-Frame.

## CAUTION

Failure to maintain air in the air bags will result in out of alignment condition and will cause the front tires to wear out in about 2000 miles.

## TIRE ROTATION

To control certain types of tire wear which are caused by road crown, type of road, or individual driving habits, the tires on your motor home should be rotated periodically. Rotating the tires as illustrated will even out the amount of wear on each tire and extend the life of the entire set. If excessive or uneven wear on any of the tires occur, have the vehicle checked for tire balance, alignment or suspension problems. Bias or bias-belted tires should be rotated every 6,000 miles. It is suggested that disk brake pads be checked for wear each time the tires are rotated.



## CONVENTIONAL TIRE ROTATION (All tires same ply)

## FUSES

Those accessories, lights, etc., in your motor home which are powered by the automotive battery are protected from short circuits by a group of fuses located in a junction box beneath the driver's side of the dash. Should any of the automotive electrical systems fail because of a blown fuse, replace the fuse at once with one of the same type and size. Repeated blowing of a fuse may indicate a malfunction and should be checked by your dealer immediately.

## CAUTION

Never replace a fuse with one of higher amperage rating than those specified.

## WINDSHIELD WASHERS AND WIPERS

During cold weather, at least half of the windshield washer solution in the reservoir should be an antifreeze formulated for windshield washer use. Inspect the windshield wiper blades periodically for wear and replace when the wipers cause streaking on the windshield.

The windshield washer nozzles should be adjusted so that the stream is directed to the upper part of the wiper pattern when the vehicle is not moving. If you require assistance, contact your dealer.

## LIGHTS

All exterior lights should be checked for proper operation each time the vehicle is prepared for a trip. Any bulbs which fail to light should be checked and replaced, when necessary, with a new bulb of the same size. A failure of more than one light, such as both tail lights not operating, may indicate a burned-out fuse. Check fuse and replace with one of the same value when necessary. If the fuse is not the cause of the problem, have the wiring system checked immediately by your dealer.

The headlight circuit is protected by a circuit breaker. An overload on the breaker will cause the lights to flicker on and off. Have your headlight wiring checked immediately any time this condition develops.

## ELECTRICAL

Your Allegro motor home is equipped with an electrical system consisting of two separate voltages; a 12-volt DC system and a 110-volt AC system. The 12-volt system consists of two internal power sources, while the 110-volt system is operated from an outside power source, or the optional 110-volt generator when installed in the unit. All systems operate through a single power converter control center to provide electrical power to the motor home.

### 12-VOLT DC SYSTEM

The DC voltage system consists of the automotive battery under the 12-volt motor home auxiliary battery. The automotive battery is used solely to operate the engine starter and all of the automotive accessories and control found on the instrument panel. This includes the headlights, horn, speed control, tail lights and all clearance lights, radio, windshield wipers, etc.

The auxiliary battery operates all 12-volt equipment located in the living area of the motor home. This includes; interior lights, range exhaust fan, furnace, water pump, generator starting and the dual voltage refrigerator (on some models).

## 110-VOLT AC SYSTEM

The 110-volt system operates from an outside 110-volt utility service such as those at campgrounds or from the optional 110-volt generator on units so equipped. When the power cord is connected to an outside power source, or when the generator is in operation, the power converter automatically converts 110-volt AC power to 12-volt DC power to operate all equipment in the motor home that is normally powered by the auxiliary battery.

In addition, the following equipment is entirely dependent on the 110-volt generator or outside source: optional roof air conditioner, refrigerator (when placed on 110-volt mode), and other 110-volt electrical equipment used at convenience outlets.

### 110-VOLT AC UTILITY SUPPLY

A U.L. approved heavy-duty cable is provided for the electrical system to connect to a utility supply. The three prong plug is designed to ground the electrical system. The motor home is equipped with a circuit breaker on the 110-volt supply. If the breaker opens (same effect as blowing a fuse), locate the trouble. Either the system is overloaded or there is a short. Reset the circuit breaker to its normal position.

## WARNING

When utilizing the 110-volt AC utility supply cable, the polarity of the motor home utility cable must match that of the power receptacle to which it is to be connected. To accomplish this, it is recommended that a commercial distributed polarity tester be obtained. This is an inexpensive, commercially distributed device available through most retail outlets. Improper polarity matching could cause personal injury or damage to equipment.

There is a transfer switch that changes your source of power automatically from the power cord to the generator when the generator is running. When you stop the generator, the transfer switch changes your source of power automatically to power cord.

### POWER CONVERTER

While operating on an outside 110-volt power source or the 110-volt generator, all 12-volt lights and appliances receive current from the power converter which automatically converts 110-volts AC to 12-volt DC. The power converter is incorporated with the fuse and breaker control panel located beneath one of the cabinets or beds depending on model.



## CAUTION

Do not store anything on or around the power converter, as it requires an unrestricted air flow to dissipate the heat that it generates.

The converter also has a charger which recharges the auxiliary battery while operating from the 110-volt supply.

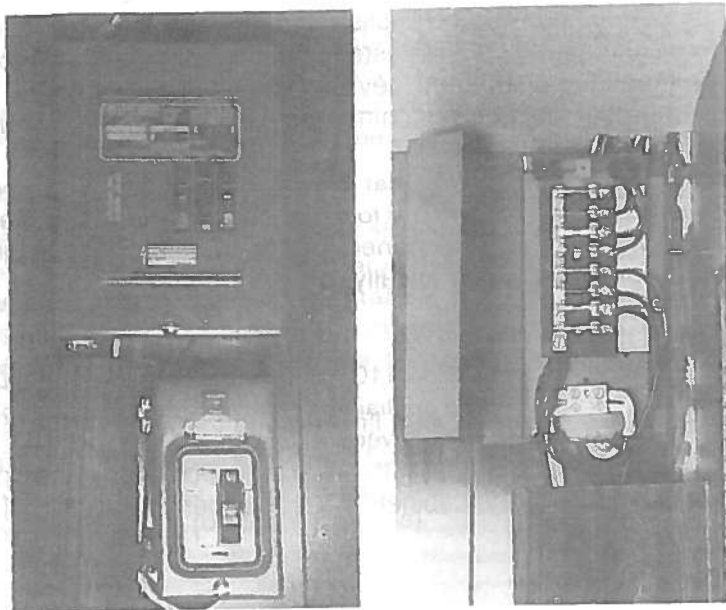
## IMPORTANT

The converter will not change 12-volt DC supply to 110-volt AC.

## CONTROL PANEL

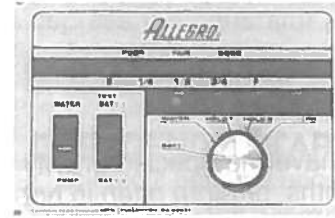
The electrical control center on your motor home contains a 12-volt fuse panel and a 110-volt breaker panel for the protection of all electrical components. When an overload develops on the circuit breaker system, the breaker will open. After correcting the overload, the breaker can be reset. If the breaker is continually thrown and no overload is evident, have the system checked for a short in the wiring or the appliance.

The 12-volt fuse panel protects all 12-volt equipment on the motor home. When a circuit overloads, the fuse will burn out and must be replaced before the system can be operated. A label located on the control panel provides the amperage of each fuse and indicates which circuit or appliance each fuse and breaker protects.



## WARNING

When utilizing the 110-volt supply cord, make sure all three prongs of the supply cord are plugged into the receptacle. If they are not or you suspect for any reason that the motor home is not grounded through the power cord, a ground rod should be securely placed in the ground and attached to the motor home bumper by means of a metal grounding strap. Improper grounding of the motor home could result in personal injury or damage to equipment.



## MONITOR PANEL

Your Allegro motor home is equipped with a monitor panel to check the fluid levels, the LPG level, and the batteries.

The monitor lights read left to right, "Empty — Full". They will light up to indicate the level of fluid or the condition of the batteries.

To check battery strength, turn the main control knob to "BATT" and depress the switch for Battery #1 which is the chassis battery. Depress switch #2 for the house battery. Lights will indicate the amount of charge for each battery.

Turn the main control knob to "WATER" and depress the rocker switch. Lights will indicate the amount of potable water still available.

Rotate main control knob to "HOLD 1" and depress rocker switch to check level of black water holding tank. Following the same procedure, rotate main control knob to "HOLD 2" for grey water holding tank and "LP GAS" for gas.

## BATTERY ACCESS

The auxiliary battery is located in a compartment on the outside of the motor home. A slide-out tray within the compartment makes the batteries easily accessible for checking and maintenance.

To service or remove any of the batteries on the slide-out tray, remove retainer pin and slide tray-out. Be sure to always reinstall retainer pin when sliding the tray back in, so it remains stable while the vehicle is in motion.

## BATTERY MAINTENANCE

The battery is not a source of electricity, but only a storage reservoir. As soon as the energy required to start the engine is removed from the battery, it should be replaced by the alternator system. To ensure that the battery will always properly accept and hold a charge, some minor maintenance practices should be followed.

Make sure that the batteries always remain securely clamped in the battery tray and that the cable clamps are tight on the terminal posts and free of corrosion. Any corrosion build up on the battery can be neutralized by washing with a solution of baking soda and water and then rinsing with clear water.

### IMPORTANT

Make sure vent caps are on securely to prevent baking soda solution from contaminating the battery electrolyte.

Clean and tighten battery terminals and have the specific gravity checked at least once a year. Every two months, or more often in hot weather, check the battery fluid level. Fill to approximately  $\frac{3}{8}$  inch above the plates. **DO NO OVERFILL.** If fluid is added during freezing weather, the motor home should be driven several miles to mix water and electrolyte and prevent freezing.

### CAUTION

To prevent wiring damage, it is essential when replacing the cables on the battery, or when using a "booster" battery, that the positive post and the positive cable be attached and the negative post and negative cable be attached. The posts are marked ( + ) plus and ( - ) minus. If a "fast charger" is used while battery is in the motor home, disconnect both battery cables before connecting the charger. Never attempt to charge or boost a frozen battery.



### EMERGENCY START BUTTON

Your Allegro motor home has an emergency start system as standard equipment.

If the house batteries are discharged and you wish to start the generator, depress the emergency start button and hold while you depress the generator start button.

If the chassis battery is discharged, depress the emergency start button and hold while you turn the ignition switch to the "Start" position.

### EMERGENCY START

Should it become necessary to use assist starting to start your motor home engine, the following instructions and cautions must be followed carefully. Before attempting to use booster or jumper cables for assist starting, always make sure the battery in the other vehicle is 12-Volt and has a negative ground.

### WARNING

Never expose battery to open flame or electric spark. Batteries generate a gas which is flammable and explosive. To avoid personal injury or damage to your clothing, do not allow battery fluid to contact eyes, skin or fabric. Don't lean over battery when attaching clamps or allow the clamps to touch each other.

1. Wear eye protection and remove rings, metal watch bands and other metal jewelry as it could conduct an electric current.
2. Turn off the lights, heater, and other electrical loads. Place transmission in park in both vehicles. Don't let the vehicles touch.
3. Remove the vent caps from the booster and discharge battery and lay a cloth over the vent wells. Of either or both of the batteries are equipped with flame arrestor type filler/vent caps the vents on that battery need not be covered with a cloth and the caps should be left in place to take advantage of the safety feature.
4. Make sure electrolyte is at proper level. If electrolyte is not visible or appears to be frozen- **DO NOT ATTEMPT ASSIST STARTING!** A battery might rupture or explode if the temperature is below the freezing point or the battery is not filled to the proper level.
5. Connect one end of positive jumper cable (red cable) to the positive terminal of the booster battery. Connect the other end to the positive terminal of the discharged battery.
6. Connect the negative cable (black cable) to the negative terminal of the booster battery and then to a location at least 12 inches from the battery on your vehicle.

- Start the engine in the vehicle that is providing the jump start (if it is not already running). Let it run for a few minutes, then start the engine in your vehicle.
- Reverse the above sequence EXACTLY when removing the jumper cables, taking care to remove the cable from the ground location on the motor home fit. Discard the cloth used to cover the filler holes of each battery and replace the filler caps.

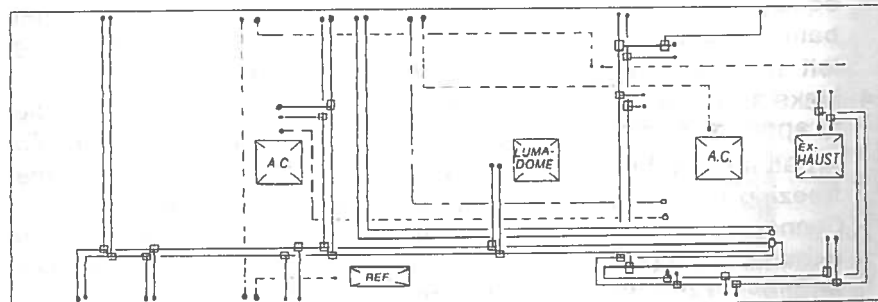
### AUXILIARY 110- VOLT GENERATOR (optional)

The use of the auxiliary 110 V generator in your motor home allows you to use the lights and all 110-volt appliances when utility services are not available. The generator may be operated when the vehicle is moving or stationary and can be run continuously, if necessary.

Gas for operation of the generator engine is taken directly from the vehicle's fuel tank. However, the generator fuel line does not draw from the bottom of the tank. This feature prevents generator operation from draining the tank. There are two start/stop switches which control the generator. The remote control switch, located on the dash, allows you to start the generator engine without leaving the vehicle and permits starting the generator while the vehicle is in motion. A light incorporated in the switch will glow when the generator is running. A second switch, located on the unit itself, can be used to start the engine at the generator location.

### WARNING

To prevent the possibility of electrical shock, properly ground the motor home. Securely drive a metal ground rod into the ground and connect it to the bumper by means of a metal grounding strap.



- 12 gauge wire - overhead lights and power exhaust.
- 12-2 wire- air conditioner, plug-in, and ref.
- ..... 10-2 wire - power plant.

### WARNING

The 110-volt AC generator produces electricity. Careless handling of electrical components can be fatal. Never touch electrical leads or appliances when your hands are wet, when standing in water or on wet ground. Do not attempt to repair the generator yourself. Service should be performed by a dealer or authorized service center.

There is carbon monoxide (CO) in the exhaust of all internal combustion engines. This gas is colorless, odorless, tasteless, lighter than air, and poisonous. The exhaust systems of both your motor home engine and your generator engine have been installed with your safety in mind. However, certain precautions must be taken in their use to protect you from conditions beyond the control of the manufacturer.

- Never operate your motor home engine or engine of any vehicle longer than necessary when the vehicle is parked.
- Do not simultaneously operate your generator engine and a ventilator which could draw air into the vehicle resulting in the entry of exhaust gases.
- Do not open windows or ventilators on the end or side of the vehicle where exhaust of the generator is located.
- When parked, orient the vehicle so that the wind will carry the exhaust away from vehicle. Also, note the position of other vehicles parked nearby.
- Do not operate the generator engine when parked so that vegetation, snow, buildings, vehicles, or any other object can deflect the exhaust under or into the vehicle.

### OVERLOAD PROTECTION DEVICES

The auxiliary 110-volt generator is equipped with either a circuit protection fuse or a circuit breaker to protect the generator unit and wiring from damage by an electrical overload.

## ONAN 110-VOLT GENERATOR - OPERATION

Pre-start checklist:

- Oil level - at or near full mark
- Air inlets - clear and unobstructed
- Compartment interior - clean
- Air cleaner - clean
- Exhaust system - tailpipe clear, muffler and piping tight

### Starting (4000-, and 6500-watt units)

Push in on the start side of start/stop switch; release as soon as the engine starts. Do not hold the switch down for an extended period of time if the engine fails to start. Allow a few seconds interval before re-energizing.

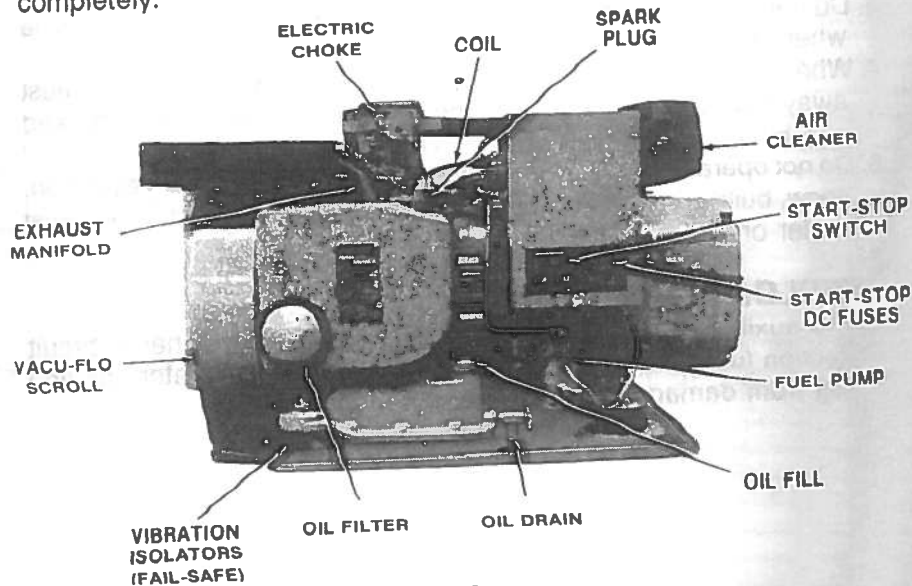
### IMPORTANT

The engine will normally start within five seconds. However, if it fails to start in ten seconds, release the switch and wait a few seconds before trying again. This will allow the automatic choke to reset in the full choke position.

Should the generator engine run out of fuel, activate the start switch at ten second intervals to prime the system and set the full choke.

### Stopping (All Onan Units)

When possible, allow a brief cooling period by running the generator at low or no load for a few minutes just prior to shutdown. Then move the start/stop switch to the "Stop" position and hold until the unit stops completely.



## SERVICE SCHEDULE FOR ALL ONAN GENERATORS

### DAILY (OR BEFORE EACH START UP)

- Check oil level.
- Keep cooling air inlets and outlets clean.
- Remove loose dirt from compartment.

### EVERY 50 HOURS (OR 6 MONTHS--WHICHEVER OCCURS FIRST)

- Change lube oil.
- Service air cleaner.
- Service fuel filter.
- Check battery.

### EVERY 100 HOURS (or 12 MONTHS--WHICHEVER OCCURS FIRST)

- Service spark plug.
- Check breaker points.
- Check generator brushes.
- Retighten electrical connections.
- Check mounting bolts and vibro mounts.
- Replace oil filter (on those units so equipped).
- Replace air cleaner element.

### EVERY 200 HOURS OR EVERY YEAR

- "Tune up" at authorized service center.

## ONAN 110-VOLT GENERATOR - MAINTENANCE (All Onan Units)

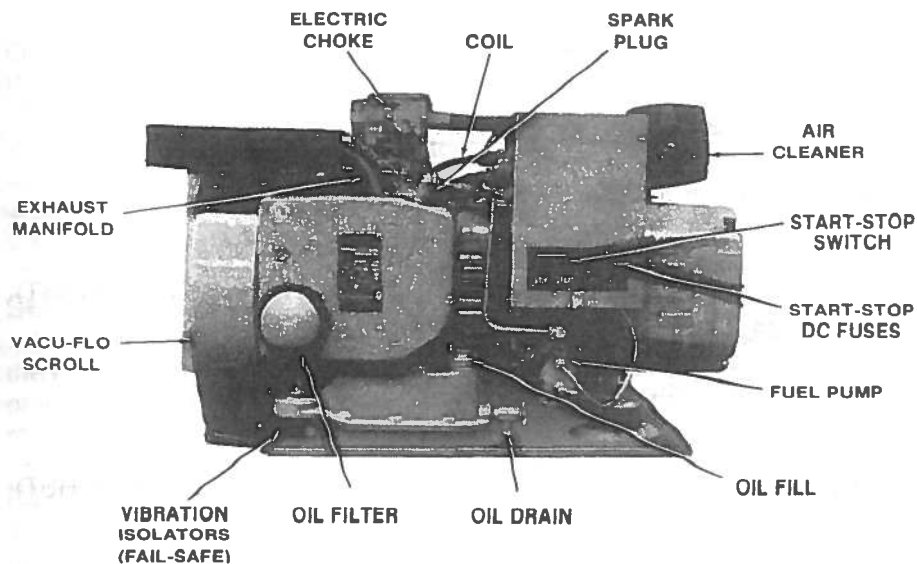
### Oil Check

Check oil level in engine crankcase daily. The oil dipstick is part of the oil fill cap located on the outboard side of the engine. Oil level should be between the "L" and "F" marks on the dipstick. If additional oil is required, add oil to bring the level to the full mark. DO NOT overfill. The generator should not be operated when oil level exceeds the full mark or is below the low mark.

### WARNING

Do not check the oil level when the generator is operating. Hot oil may be forced out the filler neck.

After checking the oil level, always reinsert the dipstick and tighten the oil fill cap securely.



### Oil Change

Change the engine oil every 50 hours or every six months- whichever comes first. Change oil more frequently when operating under dirty or dusty conditions. The lubricating oil used for replacement must meet requirements of the API (American Petroleum Institute) service classification SC. Oil weight should be selected to meet the expected climatic temperature range. Use a single weight SAE 30 oil when temperatures are above 32 degrees F, SAE 10W-30 when temperatures are in the 32° F to 0° F range, and SAW 5W-20 when temperatures are below 0° F.

NOTE: When temperatures are above 32°, a single weight oil is best. However, multi-viscosity 10W-30 may be used, provided it has the API SC or CC rating.

### Oil Capacity For Each Of the Onan Model Units Are:

4000 watt - 3 quarts  
6500 watt - 3 quarts

### Oil Filter Change

On 6500 watt generator it is necessary to change the oil every 100 hours and change oil filter every 200 hours. When the oil filter is changed, it is necessary to add an additional one-half quart of oil to the crankcase.

### AIR CLEANER ELEMENT

Check and clean element at least every 100 hours. Loosen wing nut to remove. Clean by tapping base lightly on a flat surface. Replace element at least every 200 operating hours; clean or replace more often in dusty conditions.

### COOLING SYSTEM

The generator set is cooled by a flywheel blower fan which pulls air over the cylinders and cooling fins. The air path is directed by sheet metal shrouds and plates. These shrouds and plates must always be installed properly so unit does not overheat.

Check and clean (if necessary) the cooling fins at least every 200 hours of operation. Remove any dust, dirt or oil which may have accumulated. Check compartment air inlet and generator set air outlet for buildup of dirt, chaff, etc.

### Fuse replacement on "4000", "6500" Onan Power Plant 110 Volt

When generator will not turn over to start, be sure to check the fuse that is directly over the start and stop switch on the generator.

### STORAGE PROCEDURE (All Units)

If your generator set is to be out of service for more than 30 days, the following steps should be taken to preserve the set before placing it in storage:

1. Run the generator set until thoroughly warm.
2. Shut off fuel supply and allow the engine to run out of fuel. Also operate the choke manually as the engine stops to help drain the carburetor.
3. Drain oil from crankcase (while hot), then flush with clean lightweight oil. Refill crankcase with regular weight oil after flushing with light oil. Refill crankcase with regular weight oil after flushing with light oil. Replace oil filter on those engines so equipped.
4. Remove the spark plugs, pour one tablespoon of oil into the hole, crank the engine several times, then reinstall the spark plugs.
5. Clean exterior surfaces of generator set, then coat any unpainted metallic surfaces with light oil.

## LP GAS SYSTEM LP GAS SUPPLY

LP gas (Liquefied Petroleum Gas) is a true gas, compressed into liquid form for easy transportation and storage. It is also known as bottled gas or tank gas; or simply as butane or propane which are the two types of LP gas.

The LP gas system supplies fuel for the range, water heater, furnace, and 110-volt/LP gas refrigerator (on some models).

Under proper conditions and handling, the system is safe, economical, and provides modern living conveniences wherever you travel.

Butane and propane gas are commonly used in recreational vehicles. Butane burns hotter than propane, but will not become a useable gas vapor at temperatures lower than 32° F. Propane will not become a useable gas vapor at temperatures lower than -44° F. For this reason, propane is popular in cold climates, while butane is used most widely in mild climates. LP is stored in the tank under very high pressure. The pressure is reduced to under one pound when it passes through a regulator. When the LP reaches the atmosphere, it expands many times and turns into a vapor. Your Allegro motor home uses the LP in vapor form only.

### IMPORTANT

Most LP dealers normally handle only the type of LP gas used in their area and climate. Butane will normally be sold in the warmer southern states, while propane, which vaporizes down to -44° F will be sold in the northern states. If you are filling your tank in one of the warmer states, but anticipate traveling into a colder area, it is advisable to request propane. Otherwise your LP system may fail to operate the first time the temperature drops below 32° F. since the butane will not vaporize below this point.

Each gallon of liquid LP gas contains approximately 92,000 BTU's of heat energy; or, putting it another way, each gallon of LP gas produces approximately 36 cubic feet of dry gas for cooking, heating, lighting, water heating, and refrigerating.

To find out how long a gallon of LP gas will last, you should determine the total BTU input on all your LP gas appliances. Let's say you have a heater that has a 10,000 BTU input per hour of operation, a gallon of LP gas would last 9.2 hours of continuous operation. (92,000 ÷ 10,000 = 9.2) To estimate how long a gallon of LP gas lasts, try to determine what your total daily BTU input is, then divide into 92,000 to arrive at an approximately daily LP gas consumption.

### IMPORTANT

All LP gas tanks must bear a red triangular sticker labeled, Flammable Liquefied Petroleum Gas. Have tank properly inspected and labeled if necessary, before making a trip.

### TROUBLE-FREE AND SAFE USE OF THE LP GAS SYSTEM

Be safe at all times. Know the distinctive odor of LP gas. If a leak is suspected, turn off the tank valve immediately. Ask the LP gas dealer to check the system.

Have the entire LP gas system inspected for possible leaks, and missing or damaged parts at the time of filling. Inspect before and after each trip, and any time trouble is suspected.

Do not tamper with the LP gas piping system, pressure regulator, or appliances. Use caution when drilling holes or attaching objects to the wall. Gas lines and electrical wiring could be seriously damaged and present an extreme safety hazard.

Be sure appliance, and outside vents are open and free from obstruction when using LP gas operated appliances.

Never allow your tank to be filled above the 80 percent level indicated by the flow of liquid gas out the overflow valve.

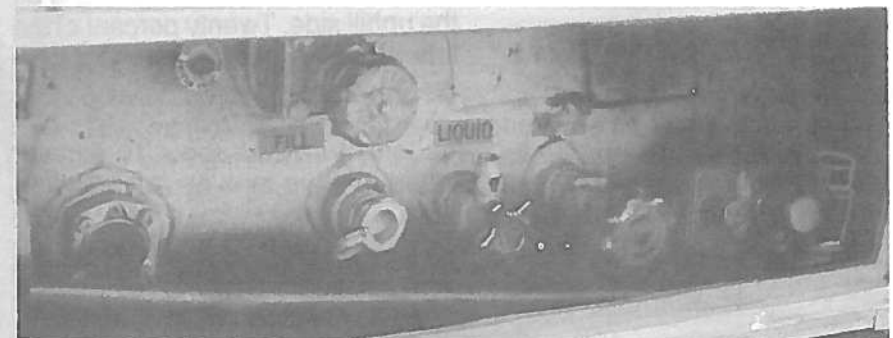
Never attach a lock or device requiring a key to open the LP gas compartment door. In an emergency the tank valve must be accessible.

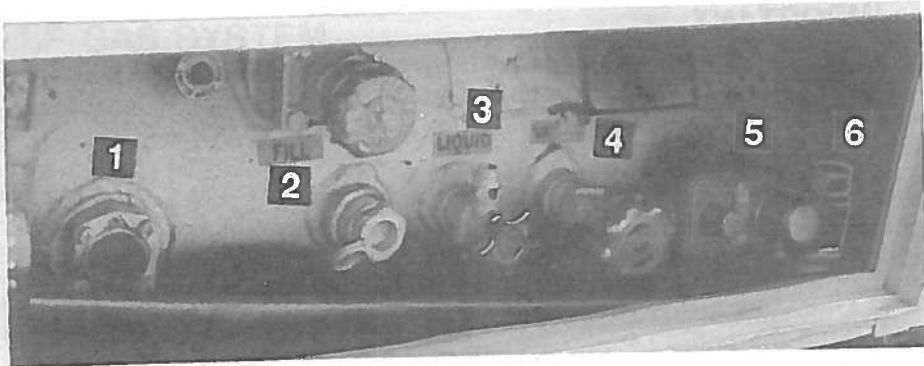
When not using the gas system, turn off the gas at tank.

Never use a wrench to tighten the tank service valve. It is designed to be closed leak-tight by hand. If a wrench is required to stop a leak, replace the valve.

### BULK TANK SYSTEM

The LP bulk tank furnishes gas to the water heater, furnace and on some models, the 110-volt/LP gas refrigerator. The tank is permanently mounted to the vehicle frame. Access to the LP gas tank control valve is through a door on the outside of the motor home.





### BULK LP TANK

- |                                   |                   |
|-----------------------------------|-------------------|
| 1. Float Gauge                    | 4. Shut-Off Valve |
| 2. Filler valve                   | 5. Regulator      |
| 3. 20% Fixed Level Overflow Valve | 6. Leak Detector  |

## WARNING

Do not alter or remove LP tank gauge at any time.

### Refilling Bulk LP Tank

Since the bulk LP container is permanently mounted to the frame, the motor home must be taken to an LP dealership for filling. Do not attempt to remove the LP tank from the motor home. The bulk tank is equipped with a fill adapter with both internal and external threads which allows easy filling by almost any LP filling equipment.

## WARNING

Never allow your LP bulk tank to be filled above the 80 percent level. Make sure the motor home is level when filling. It is possible to accidentally overfill the tank if it is not level; especially if the fill valve is on the uphill side. Twenty percent of the tank area must remain empty to allow the gas to vaporize.

When the pressure gauge on the tank indicates about 10 percent of the full capacity, it is recommended that the tank be refilled at an authorized LP gas dealership.

## WARNING

Never use an open flame to test for gas leaks.

Because of the extreme flammability of LP gas, and its heavier-than-air qualities, you must not smoke or expose the tank to an open flame while near a refueling area.

## CAUTION

Replace all protective covers and caps on LP system after filling.

### LP GAS DEALERSHIP

There are many LP gas refueling stations located throughout the country. These stations are listed in the telephone directory in the Yellow Pages under "Gas-liquefied petroleum-bottled and bulk".

## WARNING

Make sure all pilot lights have been extinguished before refilling LP gas tanks.

### TRAVEL WITH LP GAS

It is recommended that all LP gas appliances be turned off and the valve on the LP tank be closed before traveling for a number of reasons:

**Safety** - Should your vehicle be involved in an accident and a gas supply line broken, LP gas would be free to escape from an open line, creating a fire hazard.

**State Regulations** - Many states are becoming increasingly regulatory about LP tanks and their use. For example, it is illegal for motor homes to pass through certain tunnels in the nation because of the LP tank or bottles aboard, even if the outlet valve is closed. We suggest you always check the local regulations of the states through which you plan to travel.

### REGULATOR FREEZE-UP

Regulator freeze-ups are caused by the presence of moisture in the fuel. This moisture will pass through the cylinder valve and into the regulator where it freezes. Fuel producers, tank manufacturers, and LP gas dealers take every precaution to keep moisture out, but sometimes only a fraction of an ounce in a tank of gas can cause problems. To help avoid the possibility of freeze-up, always keep tank valve closed when not in use, even when tank is empty, to prevent moisture from collecting inside.

If moisture begins causing problems, have your LP gas dealer inject a small amount of dry methyl alcohol in your tank (approximately one ounce to 20 pounds of fuel or one pint to 100 gallons) to help guard against regulator freeze-up.

In very cold weather when a large volume of gas is being used for heat production, it is possible to experience a loss of gas pressure. At first occurrence this problem may appear to be caused by a regulator freeze-up, but is actually caused by failure of the liquid gas to vaporize as fast as it is needed. As the temperature becomes colder it is increasingly harder for the liquid LP gas to "boil off" into a vapor. At the same time, your demand for LP to produce heat increases to the point that the demand becomes too great. The only actual solution to this problem is to reduce the consumption of gas where possible. Adjusting the temperature on the gas/electric refrigerator may be a first step. Reducing the water temperature at the hot water heater and using less hot water will help as well.

## LP GAS SYSTEM MAINTENANCE

### Leak Detector

An LP gas leak detector is installed on all Allegro motor homes as standard equipment to detect gas leakage in the gas plumbing and appliance system. The leak detector is installed next to the regulator with the outlet port of the detector connected to the plumbing system into the motor home. In this way, every joint beyond the leak detector is quickly checked whenever the detector is activated.

#### IMPORTANT

This device does not prevent leaks. It detects leakage only when activated.

The connections at the regulator and at the main shut off valves should be checked with a soapy water solution each time the bulk tank is refilled. The leak detector should also be activated after each tank refill.

1. Close LP gas tank valve.
2. Ventilate motor home by opening doors and windows.
3. Shut off all LP gas appliances, including pilots.
4. Open one stove burner valve and light burner to deplete any pressure in your LP system. (This will take a minute or two depending on the size of your vehicle.) Close valve when the flame goes out. (If the flame continues to burn, your LP gas tank valve may not be closed.)

5. While depressing red button on top of leak detector, open LP gas tank valve. A stream of bubbles will be visible in the leak detector sight glass immediately, but these should disappear in about two seconds. Continue to depress plunger for 5 to 10 seconds.
  - A. If no bubbles are visible during the 5 to 10 second period, your system is secure at this time.
  - B. If bubbles are visible during the 5 to 10 second period, there is a leak.

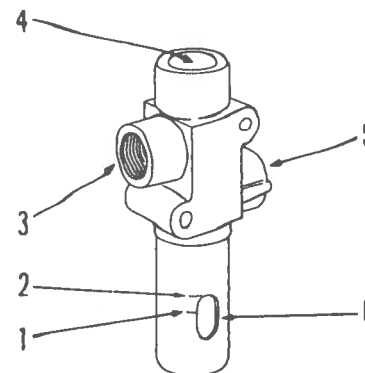
#### IMPORTANT

Liquid level in leak detector must be between minimum and maximum marks to operate properly. Have liquid replenished by your dealer if necessary.

6. Conduct a soapy water test at all joints. Tighten if necessary and retest.
7. If test still indicates a leak, contact your Allegro dealer or a qualified LP gas service facility.

#### IMPORTANT

If detector indicates a leak, recheck to be sure all appliance gas valves have been shut off.



#### LEAK DETECTOR

1. Minimum Liquid Level
2. Maximum Liquid Level
3. Inlet Port from Regulator
4. Red Actuation Plunger
5. Outlet Port to LP Gas System
6. Sight Glass Port

#### WARNING

Never use an open flame to test for gas leaks.



## Air in the LP Gas Line

If your LP gas supply has been depleted, it is possible that air has entered the gas lines. When this is the case, the pilots will be difficult to light. The gas will eventually force the air from the lines, but to speed up the process, light the pilot nearest the supply first and proceed to the furthest. After the first pilot is lit, the increased gas pressure will force the air out of the lines throughout the system.

## EQUIPMENT OPERATION AND MAINTENANCE

### GAS FURNACE-OPERATION (Suburban)

The gas furnace in your Allegro is designed to provide safe and efficient heat in your motor home through the use of the LP gas and 12-volt electrical systems. The LP fuel is converted to heat at the burner and heats the metal heat exchanger. The blower then delivers this heat to the motor home interior through connected heat ducts.

A fan switch, incorporated in the furnace, turns on the blower automatically when the temperature of the heat exchanger reaches a pre-set point. It is normal at the end of an operational cycle for the blower to cycle on once or twice to extract all the heat possible from the exchanger.

### LIMIT SWITCH

The purpose of the limit control is to turn off the gas to the main burner if for any reason the furnace becomes hotter than that which is safe.

### LIGHTING INSTRUCTION

1. To light the furnace, turn the manual valve to the "off" position and wait 5 minutes with blower running. (Set thermostat above actual temperature to operate blower.)
2. After 5 minutes, set the thermostat to the "off" position.
3. Open manual valve. (Correct operating characteristics depend on this valve being positioned fully open. Never attempt to operate with valve partially closed.)
4. Set thermostat on desired temperature.
5. Allow 15 seconds for main burner to light.
6. If burner does not light, set thermostat on "off" and repeat steps 1 thru 5.
7. If after 3 tries and no ignition, go to shut down and determine cause.

### Shut Down Instructions

Furnace shut down is recommended when your motor home is left unused for any length of time.

### To Shut Down

1. Turn Manual valve to the "off" position.
2. Set thermostat on off.

### Thermostat

The operation of the furnace is controlled by the thermostat. The furnace main burner and blower will automatically cycle on and off to maintain the motor home interior temperature at the desired setting.

Since the main burner valve is opened by an electro-magnet, the furnace will not operate unless there is sufficient electrical charge in the auxiliary battery or the 110-volt power cord is connected to an outside electrical source or optional 110-volt generator.

### Furnace Maintenance

We recommend that the furnace be inspected and thoroughly cleaned by a qualified service agency before each heating season. This would include the combustion chamber, the main burner, the blower assembly, and all control parts. A careful inspection of all gaskets should be made and if any gaskets shown signs of leakage or deterioration, they should be replaced.

## WARNING

When performing maintenance on furnace, shut off gas at the tank. Perform a gas leak test on tank valve and check connection using leak detector before relighting.

To keep your furnace in top operating condition, occasionally vacuum out the inside of the furnace casing to remove lint and dust that has accumulated.

### Furnace Troubleshooting

Should difficulties occur with the furnace, it is suggested that you contact your dealer for assistance. However, a great number of service calls are unnecessary and could be avoided by first checking these areas of the LP gas and electrical systems:

1. Make sure there is gas to the furnace. Turn all gas valves to "On" position.
2. Make sure electrical fuse for furnace, located on control panel, is not blown. Replace if necessary.
3. When operating on battery power, make sure auxiliary battery is fully charged.
4. Check gas supply to make certain tank is not empty or that regulator is not frozen.

5. Make sure registers are full open and not blocked, pinched or bent closed.
6. See suburban service instructions.

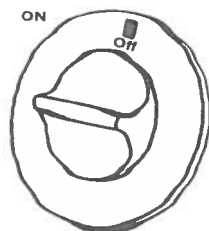
## RANGE AND OVEN

The range and oven in your Allegro motor home are operated in LP gas and will provide nearly all of the functions that the range in your home does. One of the features of gas burners is that heat is available as soon as a burner is lit; as opposed to an electric element heating up. The opposite occurs when the burner is turned off, as no heat remains when the flame is turned off. Your range has a "Pilot Off" position on the oven control which allows the oven pilot to be turned off when traveling or refilling the LP tank.

### Use of Top Burners

To operate top burners:

1. Light match.
2. Turn control knob left (counterclockwise) to the full "On" position.
3. Apply lighted match immediately to the burner.
4. Adjust the flame height by turning the knob toward the "Off" position.



**BURNER CONTROL**

## WARNING

Do not turn burner control knob to "On" and allow gas to escape before lighting match.

### Use of the Oven

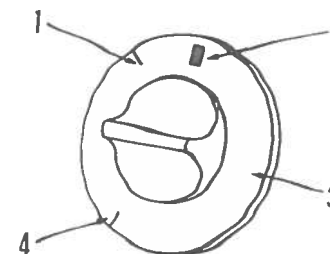
The oven is controlled by a low temperature thermostat which has no by-pass setting and will cycle off and on at all temperatures setting except broil ("B").

Lighting Instructions:

1. Make sure oven thermostat dial is set as "Pilot Off" position.
2. Make sure LP gas tank or bottle valve is open.
3. Depress and turn the oven thermostat dial to the "Off" position.
4. Open door and light oven pilot with a match. A small flame will be noted at the top of the pilot burner.

## Operating the Thermostat

Depress and turn the thermostat dial left (counterclockwise) to the desired temperature setting. There is a delay of about 45 seconds before the main burner ignites; this is normal, no gas is escaping at this time. It is also normal for the oven burner flame to cycle off and on at all set temperatures except broil. This is to maintain a constant temperature in the oven.



### OVEN CONTROL

1. "Pilot Off" Position
2. "Off"
3. Temperature Range
4. "Broil" Position

### Using Low Temperature

The oven in your motor home is capable of maintaining temperatures in the low range of 140 to 225 degrees. Therefore, it can be used as a warming oven.

### Shut Down Instructions

Turn the thermostat dial to the "Off" position. In this position, the oven standby pilot flame will remain lit.

When the motor home is not in use, or while traveling, turn the thermostat dial to the "Pilot Off" position and turn off the main gas supply.

### IMPORTANT

Make sure glass surfaces are cool before wiping with a detergent and water solution.

### Range Troubleshooting

With proper care, your range should give you good service. Should difficulties occur, it is suggested that you contact your dealer for assistance. However, before seeking service, it may save time and money to check to make sure the problem is not caused by misuse:

## REFRIGERATOR OPERATING AND USERS INSTRUCTIONS

1. Air Circulation - Gas ovens must have free circulation of air to operate properly. Heated air comes in through openings in the oven bottom to give even temperature cooking. Anything which blocks or changes this air flow can cause poor results. A pan touching the side of the oven can block air flow as well as conduct heat from the side which it is touching. This can result in uneven baking on one side. The use of pans that are too large or sheets of aluminum foil to catch drippings or spillover will have the same effect and block air flow as well as reflecting heat from the bottom.

### IMPORTANT

There should be at least one or two inches between the edge of a utensil and any oven surface.

2. Oven Cleaners - Oven cleaners (particularly the spray type) can coat the thermostat sensing device and cause it to malfunction. If you must use oven cleaners, protect the sensing device from the spray or wipe it off immediately.

If a commercial oven cleaner is used, protect aluminum gas tubing, thermostat sensing bulb, and electrical components from the cleaner. (Masking tape can be used.) Thoroughly rinse oven with a solution of one tablespoon vinegar to 1 cup of water.



### POWER RANGE HOOD AND VENT

The power range hood is used to eliminate cooking odors and to expel gas fumes. A vent to the outside of the motor home automatically opens and closes when the fan is turned on and off. There are two knobs or switches on the top panel of the hood, one for the light and the other for the fan. The fan should always be operated when the oven is in use.

A filter located on the underside of the vent must be cleaned periodically for efficient operation. Remove the filter and wash hot water in any household detergent, rinse thoroughly and dry. While the filter is removed, clean dust and grease from the fan blades.

### HOW TO START THE REFRIGERATOR

#### Leveling

In the boiler ammonia vapor is distilled from an ammonia-water mixture and carried to the finned condenser, where it liquifies. The liquid flows to the evaporator, where it creates cold by evaporating into a circulating flow of hydrogen gas. If the evaporator coil is not level the liquid readily accumulates, forming pockets which can impair the gas circulation or even block it, in which case, of course, the cooling will stop.

When the recreational vehicle is stationary it must be leveled to be comfortable to live in. If the refrigerator is properly installed, with the freezer shelf parallel to the floor, the refrigerator will then also perform well.

A bubble level should be placed on the freezer shelf. When the vehicle is on tow, the continuous rolling and pitching movement will not affect the refrigerator as long as the movement passes either side of level, but when the trailer is temporarily parked this sensitivity of the refrigerator should be remembered. **So, once more, before you start the refrigerator make sure it is level.**

#### Gas Operation (Fig. 4a) with piezo igniter

1. To start the refrigerator turn the knob A to position "GAS".
  2. Turn the thermostat knob B to setting 4.
  3. Push the button C to stop and push the button D of the piezo igniter. The pushing has to be repeated until the gas is lit at the burner. This can be observed through the reflector E.
  4. After the gas is lit keep the button C pushed for 10 seconds. Release the button and check through the reflector that the burner flame stays burning. If not repeat the lighting procedure.
- To shut off the refrigerator turn the knob A to off position.

NOTE: As soon as the necessary cold temperature inside the cabinet has been reached, adjust the thermostat knob to required setting.

#### Flame Blow Out

If trouble is encountered with the flame blowing out under specially windy conditions, try to avoid the wind blowing against the wall where vent outlets are located. If the trouble persists, set the thermostat to MAX. This later measure can of course only be temporary such as when the vehicle is on tow, for after a day or so at this setting the foodstuffs in the cabinet will freeze.

## Electric Operation (Fig. 4)

1. Check that the attachment plug is correctly connected to the main supply. When the refrigerator is equipped also for 12 Volts DC operation the low voltage connection is made at the marked terminals at the rear of the refrigerator.
  2. Turn the knob A to desired position for electric operation.
  3. Turn the thermostat knob B to setting 4.
- To shut off the refrigerator turn the knob A to off position.

## HOW TO USE THE REFRIGERATOR Food Storage Compartment

The food storage compartment is completely closed and unventilated, which is necessary to maintain the required low temperature for food storage. Consequently foods having a strong odor or liable to absorb odors should be covered. Vegetables, salads, etc. should be covered to retain their crispness. The coldest positions in the refrigerator are underneath the cooling evaporator and at the bottom of the refrigerator, and the least cold positions are on the upper door shelves. This should be considered when different types of food are placed in the refrigerator.

## Defrosting

Some refrigerator models are equipped with an automatic defrosting device incorporated with the cooling unit. This device makes a quick defrost of the finned evaporator section about once a day without affecting the frozen food storage compartment or the frozen foods contained in it. When the frozen food storage compartment is covered with frost the refrigerator must be shut down temporarily till the frost is melted. Before the refrigerator is restarted the compartment should be dried, the ice trays washed and refilled with fresh water.

When the frost on the finned evaporator section has melted water will be collected in the drip tray. The drip tray should be emptied at regular intervals.

Some refrigerators without the automatic defrosting device should be defrosted regularly by turning off the refrigerator.

Empty the refrigerator leaving the drip tray under the finned evaporator and the cabinet and freezer doors open. If desired, defrosting may be speeded up by filling the ice tray with hot water and placing it in the freezer.

When all frost is melted, empty the drip tray and dry the interior of the refrigerator with a clean cloth.

Replace the drip tray and ice tray, replace all food stuffs and set the thermostat to MAX for a few hours. Then reset the thermostat knob to its normal position.

## Frozen Food Storage Compartment

The ice trays should be placed in direct contact with the freezer shelf for fastest ice making. Quick frozen soft fruits and ice cream should be placed in the coldest part of the compartment which is at the bottom of the aluminum liner or, in models with a shelf, on this or just below it. Frozen vegetables, on the other hand, may be stored in any part of the compartment.

The compartment is not designed for the deep or quick freezing of foodstuffs. Meat or fish foods, whether raw or prepared, and provided they are precooled in the refrigerator, can however, also be stored in the frozen food storage compartment. They can then be stored about three times as long as in the fresh food storage compartment. To prevent drying out, keep food in covered dishes, in plastic bags or wrapped in aluminum foil.

## Ice Making

Ice cubes can be made in the ice trays which should be filled with water to within 1/4" (5mm) from the top. To release the ice cubes seize the tray with both hands and twist the tray. Cubes not required should preferably be replaced in the tray. Refill the tray with water and replace the tray on the freezer shelf.

Ice making is accelerated if the thermostat knob is turned to setting "MAX". It is a good idea to do this a few hours before an anticipated need for ice but be sure to turn the knob back to normal setting when the ice is formed or the foodstuffs in the cabinet may become frozen hard.

## To Shut Off the Refrigerator

To shut off the refrigerator turn the knob A to off position. If the cabinet is not in operation over a period of weeks, it should be emptied and cleaned and door left ajar. Some models are provided with interior light, which comes on when the door is opened. To avoid running out of battery the light should be shut off with the knob underneath the lamp housing. The ice trays should also be dried and kept outside the cabinet.

## Cleaning

To clean the interior lining of the refrigerator use lukewarm weak soda solution. The evaporator, ice trays and shelves must, however, be cleaned with warm water only. Never use strong chemicals or abrasives to clean these parts or the protective surface will be spoiled. It is important always to keep the refrigerator clean.

**CAUTION**

Do not store explosive substances in the refrigerator such as cigarette lighter gas, petrol, ether or the like.

## GAS EQUIPMENT

### Flue Top and Baffle

The flue baffle is suspended from the top and must be in position in the central tube of the cooling unit.

### The Flame Failure Safety Device (Fig. 3)

The feeler of the thermo couple shall reach in over two slots of the burner. To replace the thermo couple proceed as follows:

1. Remove the plastic cover 22 (Fig. 5).
2. Unscrew plug 20 and pull thermo-couple straight out.
3. Remove spring 21.
4. Pull out thermo-couple sideways from burner housing.
5. Bend the new thermo-couple to the same shape as the old one.
6. Reassemble in reverse order. Check that feeler has been correctly refitted in relation to burner. See Fig. 3.
7. Mount plug 20, taking care not to damage the threaded hole in the aluminum cap of the housing. The plug must be properly tightened to the valve housing to ensure good contact between the thermo-couple and the magnetic coil within the housing.

### The Thermostat

The refrigerator is equipped with a thermostat which is regulated by turning the knob to different settings in order to obtain the desired controlled cabinet temperature.

**At OFF** Under normal operating conditions the thermostat valve remains closed and the burner is running continuously at the by-pass rate, just enough to keep the burner lit.

**At MAX** The thermostat valve remains open and the burner is running continuously at full gas rate. Lowest cabinet and freezer temperatures are obtained at this setting.

Between these two extremes is a numbered portion of the dial over which various controlled temperatures can be obtained, the higher the number, the lower the temperature.

As soon as the required cold temperature inside the cabinet is reached, the thermostat cuts the burner main flame leaving the by-pass flame to keep the safety valve open.

### The Igniter

The refrigerator is fitted either with a piezo igniter (see fig. 4a) or an automatic re-igniter (see fig. 4b), which does not normally need any maintenance. If the igniter does not work properly contact an authorized service point.

## ELECTRIC EQUIPMENT

### Cartridge heater

The refrigerator is equipped also for electric operation. Most models are equipped for both 120 Volts A C and 12 Volts D C operation.

The heat necessary for the operation of an absorption type cooling unit is supplied by an electric cartridge heater mounted in a pocket of the boiler system.

To replace the heater first, of course, check that the wall plug is disconnected. If the refrigerator is equipped also for 12 Volts D C operation make sure that the 12V leads are disconnected. Then proceed as follows:

1. Remove the plastic cover (22) of the main control structure by loosening the two screws.
2. Disconnect the heater leads.
3. Pull off the metal hose.
4. With a pair of pliers unfold the lug holding the lid of the boiler casing and open the lid.
5. Remove some insulation wool so that the heater is accessible.
6. Turn and lift the heater out of its pocket.
7. Fit the new heater into the pocket and pull on the hose around the leads.
8. Connect the leads and put on the plastic cover.
9. Reset the insulation and close the lid of the boiler casing.

### The Switch

The electric control also comprises an on-off switch operated by the selector knob at the front panel. The switch has two "on"-positions, one for 120 Volts A C (ELEC.) and one for 12 Volts D C operation.

### The Thermostat

The electric thermostat is combined with the gas thermostat and is thus operated by the knob B at the front panel. The temperature in the refrigerator can be regulated by turning the thermostat knob to higher or lower numbers. Although the exact setting is not critical choose a setting at which the frost which gradually forms on the cooling

evaporator is just maintained in dry condition.

It will be necessary to set the thermostat knob one or two numbers higher when the ambient temperature becomes higher or the load unusually heavy.

If less cooling is required, a lower setting should be chosen.

## PERIODIC MAINTENANCE

**NOTE:** Before working on the refrigerator make sure that 120V A.C. and optional 12V D.C. leads are disconnected. Shutoff gas valve.

### The Burner and the Burner Jet (Fig. 2)

The color of the flame shall be clear blue over the slots of the burner (Fig. 3).

Once or twice a year depending on use, it is necessary to clean and adjust the burner assembly. Proceed as follows:

1. Loosen screw and remove cover plate for burner housing.
2. Disconnect lighter cable from the electrode.
3. Loosen burner fixing screw 19 and withdraw burner.
4. Clean burner tube with a brush. Blow with compressed air.
5. Screw off jet and clean with alcohol. Blow with compressed air. Never use a needle or similar.
6. Reassemble.
7. Be careful that the end of the burner fits into the slot on the bracket.

The slots of the burner must be centrally located under the boiler tube.

### The Electrode

For a proper ignition function it is necessary to keep the electrode insulation dry and free from dirt. The gap between burner tube and electrode shall be max. 3/16" (5mm) and min. 1/8" (3mm).

## WARNING

If the refrigerator is used intermittently it should be checked at least once a year.

It is important to keep the appliance area clear and free from combustible materials, gasoline and other flammable vapors and liquids. Check the venting system. The flow of combustion and ventilating air must not be obstructed. Check the flue baffle that it is clean and reasonably free from soot. Heavy soot formation indicates improper functioning of the burner. Clean baffle and flue. Further, clean cooling unit and floor under refrigerator.

The entire gas installation should be checked for leaks at intervals. Test all pipe connections with soapy water, not with an open flame.

**NOTE:** Any service of the gas controls, with exception for the above mentioned replacement, maintenance and cleaning operations must be performed by an authorized service center only.

**NOTE:** Avoid water spraying through the frigerators vents while washing your RV.

## FAULT TRACING

The refrigerator does not freeze satisfactorily

Causes and remedies

- a) Jet orifice clogged. Unscrew jet and blow clear or wash in alcohol. Do not use wire or pin to clean orifice.
- b) Check the leveling of the refrigerator.
- c) Flame has gone out. Remedy: 1) Gas in bottle is used up- refill. 2) Feeler point of the flame failure safety device is not heated enough by flame — check against fig. 2 or 3. 3) Clogged by-pass screw - clean or exchange it.
- d) Air circulation around cooling unit is restricted. Be sure that refrigerator is properly ventilated.
- e) The evaporator is heavily coated with frost. Defrost.
- f) Flue baffle not inserted into the central tube of the cooling unit.
- g) The thermostat is incorrectly used. See paragraph on thermostat. In hot weather the setting should be one or two numbers "colder" than usual.
- h) Gauze in burner head clogged. Clean.
- i) Burner damaged. Replace.
- j) Burner may be dislocated. Relocate.
- k) Wrong gas pressure at the burner. Have pressure checked at burner and at gas bottle. Pressure at burner must not fall below 11" W.G. when thermostat is set on MAX.

## ODOR FROM FUMES

Causes and remedies

- a. The flame touches side of the boiler due to dislocation of the burner. Relocate. Burner dislocation may also cause smoke and discoloring of walls and ceiling.
- b. Burner damaged. Replace.
- c. The flame touches flue baffle. Remedy: 1) Burner damaged. Replace. 2) Flue baffle too low. Correct the position of the baffle.

d. The flue tube is dirty. Clean flue as follows: Cover burner and jet. Remove flue top and baffle. Clean flue with special flue brush. Clean baffle before putting back in place.

All the above instructions are to be followed closely. The refrigerator is quality-guaranteed. However, we are not responsible for any failures caused by improper adjustments and unfavorable installation conditions. Contact service point or distributor service department for assistance.

### **BAR-B-Q GRILL - OPERATING INSTRUCTIONS**

Open the grilled door on the side of the Motor Home and fasten it secure to the side wall with the hook clip that is provided. Pull the grill out far enough so it will not touch the door when the lid of the Bar-B-Q Grill is opened. The compartment beside the grill contains the gas supply line. Inside is a quick connect fitting hose for connecting the grill.



Lid of Bar-B-Q Grill MUST be OPEN to light.

Before lighting check all connections of the gas valve on the Bar-B-Q Grill and flexible line attached to the Motor Home inside the metal compartment for the Bar-B-Q Grill. Make sure the control knob reads "off" on the Bar-B-Q Grill and go inside the Motor Home and turn the inline gas valve "on" that is provided for double safety. Next, go outside and turn the control knob to the "high" position and light the Bar-B-Q Grill from the bottom putting the match flame near the holes on the Bar-B-Q Grill's burner. After cooking is accomplished, let the grill stay on approximately 10-15 minutes in the pulled out position. This lets all the excess grease that drops on the lava rocks burn off. Then turn the inline gas valve inside the Motor Home to the "off" position. Let the grill cool approximately 15-20 minutes before sliding it back into the compartment. Make sure the control valve on the Bar-B-Q Grill is in the "off" position when the grill is slid back in the compartment.

### **WATER HEATER**

Your motor home is equipped with an automatic ignition hot water heater. To ignite, depress the switch located under the kitchen counter. A red light will flash on momentarily while the heater is igniting. Should the light remain on, depress the switch again.

The water heater in your motor home has a capacity of approximately six gallons. Access to the water heater and its controls is on the outside of the vehicle. A safety valve on the water heater automatically shuts off the gas, should the pilot blow out from vehicle motion.

### **TEMPERATURE AND PRESSURE RELIEF VALVE**

The temperature and pressure relief valve is designed to open if the temperature of the water within the heater reaches 210° F., or if the water pressure in the heater reaches 150 pounds. Recreational vehicle water systems are closed systems and during the water heating cycle, the pressure build-up in the water system will reach 150 pounds. When this pressure is reached, the pressure relief valve will open and water will drip from the valve. This dripping will continue until the pressure is reduced to below 150 pounds, and the valve closes. This condition is normal and does not indicate a defective relief valve.

### **BURNER COMPARTMENT MAINTENANCE**

Periodically check control compartment and screen in door to see that no foreign material has accumulated to prevent flow of combustion and ventilating air. Periodically check burner flame visually, and compare with sketch under the burner adjustment section.

### **WARNING:**

Do not store or use combustible materials or liquids near or adjacent to this heater. The appliance shall not be installed in any location where flammable liquids or vapors are likely to be present.

### **DRAINING AND STORAGE INSTRUCTION**

If RV is to be stored during the winter months, the water heater must be drained to prevent damage from freezing.

1. Turn off power and gas.
2. Turn off pressure pump on water system.
3. Open both hot & cold water faucets.
4. Open drain on water heater.
5. Follow RV manufacture instructions for draining entire water system.

NOTE: Be certain to refill water heater with water before re-lighting.

### **WARRANTIES**

If the ignitor is damaged due to mishandling, or is not applied or installed properly, warranties will be voided. The 05-15 and 05-16 ignitors are not field repairable. All ignitors that fail to function properly should be returned to the attention of customer service.

### **CAUTION**

The Fenway series 01-15 (12VDC) and 05-16 (24 VAC) direct spark ignition systems are designed for use on new gas fired equipment or as replacements for an existing Fenwal spark ignitor. Any substitution or other application must be expressly approved in writing by the

manufacturer of the equipment. Improper substitution or application may result in a malfunction of equipment, and the creation of an explosive atmosphere.

## WATER SYSTEM

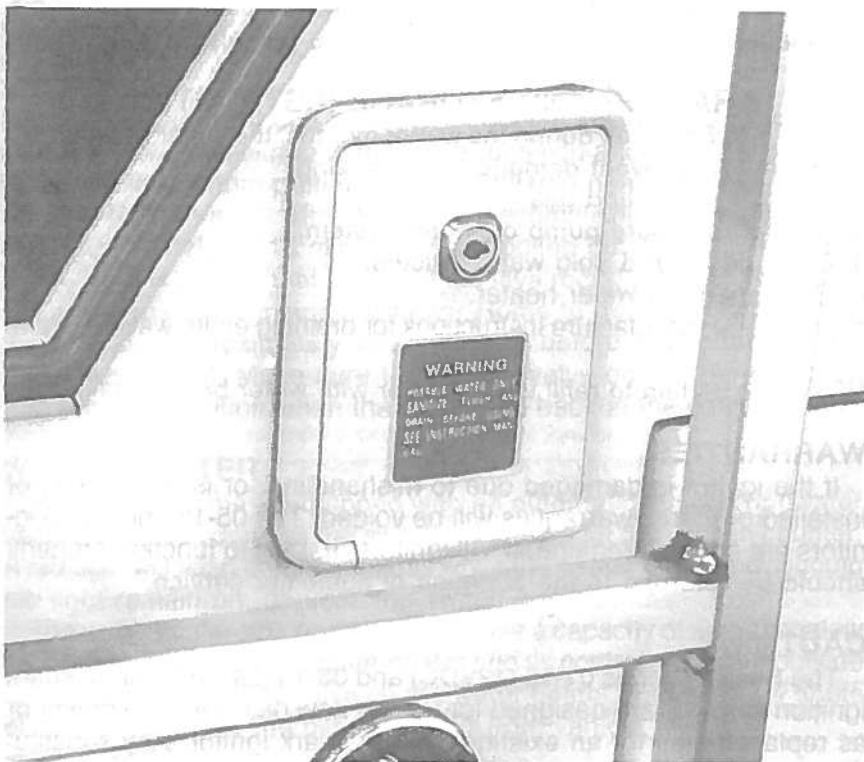
The water system in your motor home can be supplied from either of two sources; a water tank located within the motor home, or from an outside city or campground water source. The water from either source supplies the kitchen sink, shower, bathroom vanity, toilet and water heater.

## INTERNAL WATER SYSTEM

The internal water system consists of a lightweight polyethylene water storage tank and self priming water pump which automatically turns on and off to supply water when the faucets are opened and closed.

### Filling Procedure

The tank fill access is located on the exterior sidewall or rear of the vehicle. The tank may be filled with a hose, or when city water or a hydrant is not available a bucket and funnel may be used.



## Water Pump

Pressure for the water system is supplied by a water system demand pump. The water pump is fully automatic after initial priming. When a faucet is opened, the pump instantly begins operation to provide a constant flow from the tank. As soon as the faucet is closed, the pump automatically shuts off.

The water pump switch is located on the monitor panel. When the switch is in the "On" position, the pump will automatically supply water pressure as it is needed. The switch should be turned off when the motor home is connected to an external water supply. It is advisable to keep the pump switch turned off when you are away from the vehicle or are not using the water system. A slow leak in a faucet could drain your water system, as well as the battery.

## Initial Start-Up

1. Turn water pump power switch to "Off" position. Open water fill spout and fill with hose or suitable container.
2. Open all faucets, hot and cold.
3. Turn on power to pump at control switch.
4. Close each faucet as it starts to deliver a steady stream of water. (Close cold water first). Leave hot water faucets on until they too deliver a steady stream of water. This will ensure that the water heater is filled with water as well. Make sure the water heater drain valve is closed.
5. Check to be sure pump stops soon when all faucets are closed.
6. Pump is now ready for automatic operation. Pump will start when a faucet is opened and stop when a faucet is closed.

A pump guard located between the water storage tank and the water pump contains a screen for filtering out any foreign material that may have entered the water tank. This prevents damage to the pump and avoids clogging of any of the components of the water system.

A check valve is included in the system to prevent backflow through the city water connection when the water pump is operating.

## DEMAND WATER PUMP MAINTENANCE

The sure flow water pump is used in all models of the Allegro motor home. When the water pump switch is in the "On" position, it will pump water on demand through the motor home. The water pump has a built-in pressure switch which turns the pump on and off automatically when water is needed. However, when the water pump is not in use, it is wise to turn the switch off, because you may develop a leak and flood the motor home.



**CAUTION:** Do not run the water pump with no water in the tank. This causes the pump to heat up and may result in interior damages.

### Trouble Shooting Demand Pump

Problem	Probable Cause	Solution
Pump will not prime (It should do this automatically.)	Insufficient water supply.  Insufficient charge in auxiliary battery.	Check water tank level and refill if low.  Recharge battery.
Pump operates but no water flows through faucet.	Insufficient Water Supply	Check water Tank Level and Refill if low Check for leaks and have them repaired immediately.
Pump cycles on and off when faucets are closed.	Toilet valve not shutting off.  Water leak in plumbing.	Check for foreign material in groove into which the blade seats. Remove any material.  Have your dealer check to be sure valve isn't defective.
Pump fails to stop when faucets are closed.	Water tank is empty.	Shut off pump and refill water tank.

### SANITIZING THE POTABLE WATER SYSTEM

To sanitize a new potable water system, systems that have not been used for a period of time, water systems that may be soured due to mineral deposits, a fill-up of bad water or the remains of water system antifreeze, the following procedure is recommended:

1. Prepare a chlorine solution using one gallon of water and ¼ cup of household bleach (5 percent sodium hypochlorite solution). With tank empty, pour chlorine solution into tank. Use one gallon of solution for each 15 gallons of tank capacity.
2. Complete filling of tank with fresh water. Open each faucet and drain cock and operate demand pump until system is filled.
3. Allow to stand for three hours.
4. Drain and flush with potable fresh water.
5. To clean and deodorize the potable water system, add a solution of a cup of baking soda dissolved in five gallons warm water for

every ten gallons of tank capacity. Example: For 30 gallon tank, use 3 cups baking soda and 15 gallons warm water.

6. Agitate the solution by driving vehicle 3-4 miles or more, including stops and starts.
7. Drain the tank and flush with fresh water.
8. For a complete system treatment, run two gallons of clean soda water solution through kitchen and bathroom faucets to clean hoses and connections.

### EXTERNAL WATER SUPPLY-OPERATION

To operate from a city water supply, turn the electric demand pump switch off. Then attach a hose to the city water hose connection on the side of your vehicle and to the source of water. The hose connection should be capped when not in use.



Because of the variance of water pressures, it is suggested you install a pressure regulator. The pressure should not exceed 60 pounds on the line, as the lines could rupture or the fixtures could leak.

A regulator should be installed to the water hook-up where the hose is connected and the hose then connected to the regulator. The pressure will be lowered before it enters the lines.

When connected to an outside source of water. The water bypasses the demand water pump and supplies pressure directly to the individual faucets and toilet. Check valve built into the pump prevents water from entering the pump and filling the storage tank. Therefore, the storage tank must be filled separately.



## DRAINAGE SYSTEM

The drainage system has two separate holding tanks and dump valves; one for sewage waste from the toilet and the other for waste water from the galley, shower, and lavatory sink. Each of the systems and holding tanks empty through a common fitting located on the left side of the vehicle. The drainage system is self contained allowing use of the toilet, sinks, or shower even in areas where sewage hook-up is not available. When the holding tanks become full or when it is convenient to empty a partial filled tank:

1. Remove the drain hose from the rear bumper.
2. Open the dump valve cover door on the driver's side of the vehicle if so equipped.
3. Remove the dust cap from the drain and connect drain hose. Be sure it is firmly attached.
4. Place the other end of the sewer hose into the disposal connection.
5. Open the valve handle access door or unsnap the valve handle clips and open valve with a quick pull. OPEN ONE VALVE AT A TIME. Move the hose gently about to dislodge any waste in the hose and to ensure complete drainage.
6. Close sewage valve and open waste water valve with a quick pull. Make sure there are no sags in the hose during drainage. Close the valve and snap the locks over the handle (on all models so equipped) as soon as the tank is drained.
7. After both tanks have been drained, run several gallons of water into the sewage tank through the toilet. Then open the sewage dump valve and drain the tank again. Close the valve and lock handle in place using clips, on models so equipped, or close handle access door securely.
8. It is also advisable to add approximately a half gallon water and some odor control chemical to the sewage holding tank.

### CAUTION

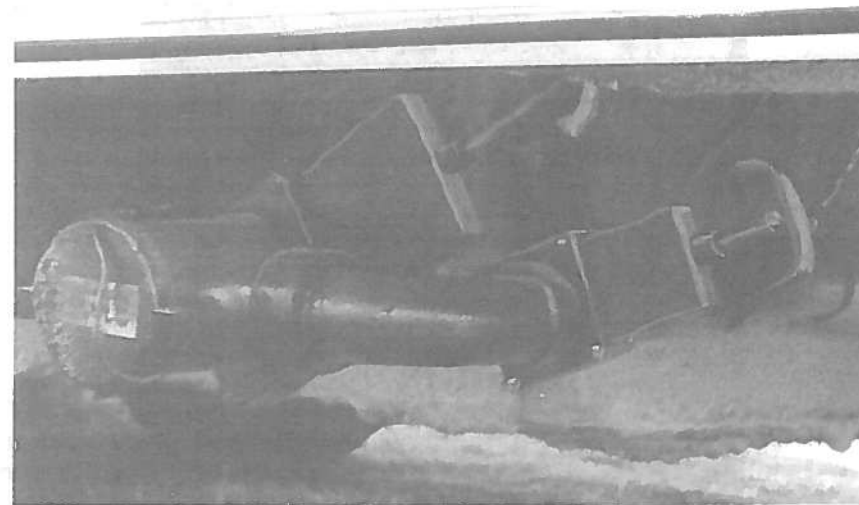
Although many detergents and bleaches have deodorizing effect, they should not be used to clean or deodorize the toilet or holding tank. These could damage the seal in the toilet or the holding tank valve.

9. Rinse the sewer hose thoroughly with water and store.

## USE OF IN-PARK SEWER SYSTEM

When you are using a sewer hook-up while parked, such as in a trailer park, keep the dump valves closed, and open only when preparing to leave or when the tank becomes full. This is important so that the solids in the tank are kept in suspension allowing them to be carried out with the rush of liquids when the dump valve is opened. If

the valve is left open, the liquids will run off leaving the solids in the tank. Should this accidentally happen, disconnect the hose, fill the tank about half full with water, and drive a few miles to dislodge the solids. A few starts and stops will aid in this process. Then reconnect the hose and drain in the normal manner.



## FRESH WATER TOILET

The fresh water toilet operates on the same principle as a household toilet except that it is designed to use a small amount of water. It utilizes high velocity water injection which produces a swirl effect in the bowl. Since each flush uses fresh water, chemical additives are not required. Two types of toilet have been used. Refer to the appropriate instructions for the toilet in your vehicle.

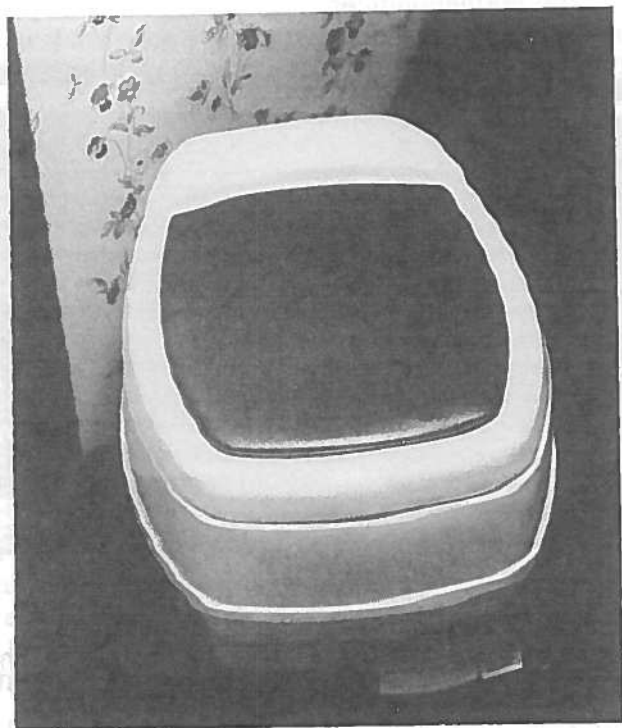
### Foot Pedal Model - Operation

To flush the toilet, step on the large pedal until the water swirls, completely rinsing the bowl, then release the pedal. Additional water may be added to the bowl by depressing the small pedal. This pedal should be used when you want to add water to the holding tank for rinsing the tank.

### Toilet Maintenance

Routine maintenance of the toilet is not required. To clean the fresh water toilet, use a high grade non-abrasive cleaner, or a commercially prepared product intended for use in portable toilets. Do not use conventional bowl cleaners, as they can damage or scratch plastic surfaces.

If after extended use, the bowl sealing blade on the foot operated toilet, does not operate freely, it can be restored to its original smooth operating condition by applying a light film of silicone spray to the blade.



### IMPORTANT

Do not use highly concentrated or high acid content household cleaners on the toilet. They may damage the seal.

### IMPORTANT

Do not put facial tissue or regular toilet tissue in the toilet. They will not deteriorate and often cling to the sides of the holding tank. Toilet tissue made specifically for use in recreational vehicle toilets is available from a recreational vehicle equipment dealer. Do not put automotive antifreeze, laundry bleach, or heavy detergents in the toilet or the sewage holding tank. These products may damage the plastic or rubber parts in the system.

## Toilet Trouble Shooting

### Problem

Water keeps running into bowl.

### Probable Cause

The blade in the bottom of the bowl is not closing completely because the groove into which the blade seats is clogged. This in turn keeps the water control valve partially open.

### Solution

Carefully remove the foreign material. Use care to avoid damaging the rubber seal on the foot pedal model.

Defective valve

Have toilet valve replaced by your dealer.

Foot pedal operates harder than normal or the blade sticks on foot pedal model.

Blade does not slide smoothly in the guide.

Apply a light film of silicone spray to the blade.

Poor flush.

The knob on the hand flush model is not being held fully open.

Hold knob fully open for five seconds.

Foot pedal on pedal model is not being held for sufficient flush.

Fully depress pedal.

## INTERIOR FURNISHINGS

### Spring Balanced Pull-Down Bunk

Spring balanced pull-down bunks can be of either the front or rear type.

The bunk is moved into position by pulling downward in an arc against the counter tensioned springs. The bunks have a velcro type fastener which ensures against bunk movements while traveling. Unsnap them before pulling down on the bunk and be sure they are properly snapped again before traveling. Make sure the sun visors are out of the way before lowering a front bunk. When returning the bunk to the raised position, check to be sure there are no loose items on it that may strike the ceiling when it is raised.

### Pull-Out Gaucho Bed

To convert a gaucho seat into a bed: pull out the support tray by grasping the edge and pulling it out to the full extent as you would a drawer. Then arrange the folded back cushion and seat cushion to make the bed. To convert the gaucho back to a seat, simply reverse the procedure.

### Pedestal Dinette Table

To convert the pedestal dinette table, found in some models, to a bed:

1. Remove the table top by lifting while also giving a gentle twisting or rocking motion to the top.
2. Remove the pedestal(s) from the socket with a gentle lifting, turning motion. The Allegro has two pedestals which support the table.
3. Store the pedestal(s) in one of the closets or wardrobes.
4. Place table top in position to complete base for bed. Cleats on the sides of the dinette benches are provided for this purpose.
5. Arrange seat and back cushions over bed area.
6. Reverse the above procedure to convert the bed back to a table.

NOTE: The double pedestal table found on the rear bath models unit can be moved closer to or away from the benches.

## MOTOR HOME CARE AND MAINTENANCE

### ROOF

The roof, like the walls and floor, is made of all aluminum construction. It will support your weight, should it become necessary to repair the roof or roof mounted components. It is not recommended, however, that very large or heavy objects be carried on the roof when the vehicle is in motion. Always have cracks in the roof seams or damage to

the roof area repaired by your dealer immediately. Putting off roof repairs can result in further damage to interior ceiling panels, upholstery, etc., by water leakage.



IT IS THE RESPONSIBILITY OF THE OWNER TO CHECK ROOF SEAMS AND JOINTS AT LEAST ONCE A YEAR AND HAVE THEM RESEALED IF NECESSARY.

### UNDERBODY MAINTENANCE

Corrosive materials such as those used for ice and snow removal and dust control often accumulate on the underside of the vehicle. The buildup of mud under the body not only can cause rust, but also adds weight which contributes to the gross vehicle weight of the vehicle. This, in effect, reduces the amount of cargo you can carry to stay within the GVWR and GAWR limits.

These materials should be removed by flushing the underbody regularly with water. Be sure to thoroughly flush those areas where mud and other foreign materials collect.

### EXTERIOR

The exterior surface of your motor home has an automotive enamel finish. Frequent washing and thorough cleaning is recommended to prevent damage to the vehicle after exposure to damaging salts, calcium chloride, road tar, tree sap, insects, and other foreign material. Never wash the vehicle with hot water, in the direct rays of the sun, or when the sheet metal is hot. Never wipe dirt from a dry painted surface without first washing the vehicle, as this may scratch the surface.

Do not use strong soaps or detergents for washing the motor home. Always use a mild soap in warm water, a commercially prepared product for cleaning automotive finishes, or your local car wash.



Never use a strong solvent such as lacquer thinners or harsh abrasives on painted surface. Always be sure to check for sufficient overhead clearance before entering a car wash area.

It is recommended that a coat of automotive wax be applied to the surface occasionally to provide added protection against harmful deposits coming in contact with the paint.

## KEEP FIBERGLASS LOOKING LIKE NEW

Fiberglass parts have a shiny beautiful finish when new, but eventually they will dull and fade, even though made from high quality material. Then the basic question is, what has happened and what can be done about it? The following is a brief explanation, and how it can be prevented or slowed down, and what can be done to restore the gel coat.

Outside of the quality of material used and careful procedures to make the fiberglass part, the only secret in keeping fiberglass looking new is maintenance.

The gel coats have been developed over long years of research and provide very durable, water resistant surfaces. Most gel coats are applied 10 times the normal thickness of paints. Even though these surfaces are very durable, they are not indestructable.

Man-made and natural materials, when placed outside, slowly deteriorate. The part is exposed to sun, water, wind, dust and chemicals in the air. The only way to prevent deterioration totally, is to put the part in a vacuum that is dust free and not exposed to light, this is not realistic. When something is used, it will start to show wear and tear. How much wear and tear depends on how you treat the product and how you maintain it. If you let a car go without waxing and washing it, it's surface very quickly deteriorates. If you let the part deteriorate, then you have a very high expense of trying to do all the maintenance as a repair at once. It's easier and cheaper in the long run to do a little maintenance periodically.

## GENERAL PROCEDURES TO MAINTAIN FIBERGLASS FINISHES

The following are some general instructions, which will keep your fiberglass part looking almost like new.

1. Wash monthly or more frequently, if needed. Wash with a mild soap such as dishwashing soap, avoid using strong alkaline cleaners and abrasives.

2. Wax the part two or more times a year.

For parts that have weathered and have chalked:

1. Wash
2. Try a little wax in one area to see if this is sufficient to restore its luster. If not, use a fine rubbing compound, followed by wax.

If the part has been let go for some time and a very severe chalk has developed, rubbing compound alone, may not be strong enough to remove the chalk. You will then be forced to go to a light sanding of 400 to 600 wet or dry paper, followed by fine rubbing compound and wax.

## Materials Recommended

Polyester gel coats are very resistant to water and other chemicals, but it is surprising the harshness of the cleaners that are available on the market. You want to avoid any strong alkaline cleaners (such as tri-sodium phosphate) or highly acidic. Caution: Strong cleaners are used in some commercial washes. Also, to avoid bleach and ammonia. These materials, if left in contact with polyester, may attack or change the color. Any cleaner that is used, should be in contact a minimal amount of time to do the job. All cleaners are meant to attract dirt and remove it. The longer they remain in contact, the more they attack on the dirt and also on the finish. It is best to use mild detergents such as hand dishwashing soap, which will work for a majority of stains and dirt accumulations.

## Rubbing Compounds

There is a wide variety of rubbing compounds. Some are faster cutting, some are slower. A rubbing compound is a fine, gritty material that is used to take off part of the top surface. They come in a number of different types of grits, like sandpaper. The coarser grits are faster cutting compounds, have larger particles, and remove more of the surface quicker. You want to stay with the fine grits. Such as TR 307 fine finish compound, MFG by-TR Industries, 1102 Vulcan St., South Grete, CA 90280, or speedy white buffing compound No. 6360 sold by NAPA Auto Parts Stores.

## GENERAL TIPS ARE:

1. Read directions on use.
2. Do not use in direct sunlight. This makes the rubbing compound dry out.
3. Use clean pads to apply. Do a small area, usually 3'x3' at a time. Use a low speed power buffer, RPM form, 1200 to 2000 RPM range. Keep the buffer moving at all times. Do not apply heavy pressure. Heavy pressure will make the rubbing compound cut quicker, but also leaves gouges, scratches and swirl marks and produces heat. If using the power buffer, keep the buffing pad wet with material. Do not allow the pad to dry out. If it dries out, these coarser particles scratch rather than cut. After a rubbing compound has been used, you must wax the part.

## WAXES

There are a number of waxes out on the market. You should try to use one specifically designed for fiberglass. Put down a thin coat of wax. Do not leave a large residue as a wax build can yellow, causing a streaking pattern later on.

## GENERAL INSTRUCTIONS ON WAXES:

1. Read the directions on the can.
2. Do not use in direct sunlight.
3. Use clean cloths.
4. Work a small area, 3'x3', at a time.

Normally, the harder the wax is in the can, the higher wax content it has. The softer waxes have a higher proportion of silicones and solvents in them. If a power buffer is used, use a low RPM with light pressure. Keep it moving at all times to prevent heat build up.

### Scratches, Nicks and Dents

Scratches occur with normal use. On scratches use the simplest method first. Keep the area that you are working on as small as possible. The first thing to try is a little rubbing compound. This may not completely remove the scratch but may make it hardly noticeable. If rubbing compound does not take it out, then you are forced to go to the wet or dry sandpaper. Again, both these procedures have to be followed by waxing to get the original sheen.

If the scratch has gone all the way through the gel coat, then a repair will have to be done. For instructions on repairs, see our "Repair Guide for Polyesters Reinforced Fiberglass", or contact the manufacturer of the part, (Hamilton Plastic Products, Inc., P.O. Box 530, Hamilton, AL 35570, phone 205-921-7858). Repairs can be done easily, if you have the knowledge on how to work with polyesters. A good repair is almost invisible. If done poorly, it will look worse. These repairs should be done by a professional.

### Painting the Parts

In cases where there is extensive damage, it may be necessary to paint the fiberglass part. In all cases, read the paint manufacturer's literature and directions on the cans. Recommendations should be read and followed.

With a little care and maintenance you can keep your fiberglass parts looking like new.

## UPHOLSTERY AND CARPETING

Dust and loose dirt that accumulates on upholstery and carpeting should be removed frequently with a vacuum cleaner, whisk broom, or soft brush. Wipe any vinyl plastic surfaces with a soft damp cloth. Always remove spots and stains as soon as possible. Stains or soils such as lipstick, inks, grease, and mustard are extremely difficult to remove. Consult a professional carpet and upholstery cleaner for assistance.

## CAUTION

When cleaning upholstery, carpeting, and fabric, do not use lacquer thinner, nail polish remover, laundry soaps, or bleach. Never use carbon tetrachloride, gasoline, or naphtha for any cleaning purpose.

When cleaning any stain, use a small amount of cleaner, light pressure, and a clean cloth. Work from the outside of the stain toward the center, frequently changing the cloth to a clean section. Immediately wipe the area briskly with a clean absorbent towel or cheese cloth to dry the area. Any stains or soils in the carpet should be removed by following the directions on a good quality carpet cleaner or shampoo.

## IMPORTANT

To minimize fading of upholstery caused by excessive sunlight, the drapes should be pulled closed when the motor home is parked for an extended period of time.

## WORK SURFACES

Work surfaces are covered with a plastic laminate that is resistant to solvents and stains. A coat of wax applied to these surfaces on the counter and table will help preserve their beauty and make cleaning easier. Always clean the surface before applying the wax.

## DRAPERY

Drapes must be dry cleaned only.

## GALLEY SINK

The stainless steel sink can be cleaned with soap or detergent. Rinse thoroughly with warm water and wipe dry to avoid streaks.

Use a mild abrasive for stubborn stains. Work in the direction of the polish lines. To keep the original finish, polish with a wax cleaner, and rub with a soft dry cloth.

## CAUTION

Salt, mustard and mayonnaise may cause pitting. If spilled, clean immediately.

## WALLS AND CEILINGS

Walls and panel ceiling can be cleaned with a mild soap or detergent solution. Use a damp cloth but do not saturate the walls with water. To minimize fingerprints and smudges on wood paneling, use a cleaner that leaves a film of thin wax. Wipe the wax cleaner on and then remove any excess with a dry cloth. After this application, fingerprints and etc., can be wiped off with a dry cloth, or one moistened with a little additional wax cleaner. Always clean the wall surface thoroughly before applying wax.

## RANGE AND REFRIGERATOR

For care and appearance maintenance of the range and refrigerator, refer to the operation and maintenance section for each of the individual appliances.

## BATHROOM

The shower walls in the bathroom should be cleaned with a mild soap and water solution or to obtain maximum lustre, use a good quality wash cleaner. Do not use an abrasive cleaner on the shower walls. However, a mild abrasive cleaner may be used to bleach the shower floor or bathtub.

For instructions on the care of the fresh water toilet, refer to Toilet Maintenance.

The bathroom vanity in some models is also constructed of a plastic material and should be cleaned with a mild soap and water solution. Abrasive cleaners or harsh detergents should not be used. If the vanity in your motor home has a stainless steel sink, follow the directions given for care of the kitchen sink.

## DOORS AND WINDOWS

Windows can be periodically cleaned with a good quality glass cleaner or mild soap solution and a soft cloth. Use care when removing ice or frost from the windows. Always use a plastic type ice scraper, never one made of metal. Use care when removing ice from the mirrors to protect the reflective surfaces.

The door locks and hinges should be lubricated periodically with powdered graphite to ensure trouble-free operation and to protect against freeze up.

## STORAGE

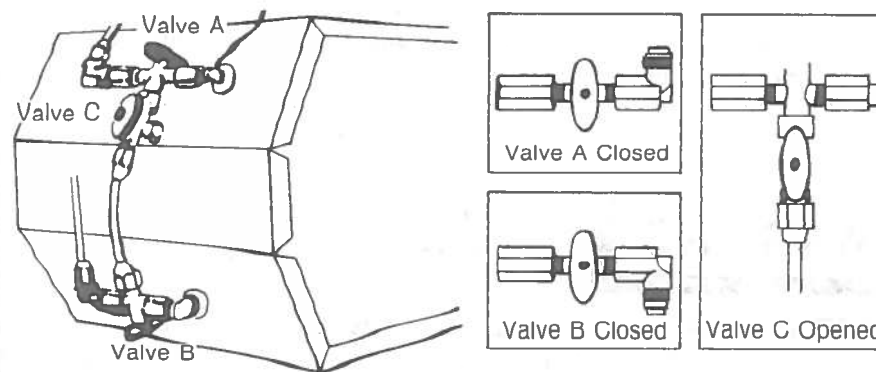
After each use it is advisable to prepare your motor home for non-use just as you would if you left your house or apartment vacant for a period of time. Make sure all perishables have been removed from the motor home and proper ventilation has been provided. Always check to be sure the the LP gas cylinders have been turned off. It is also advisable to drain the water heater, water tank, and holding tanks. Pull the shades closed to protect the upholstery from the direct rays of the sunlight. When preparing the motor home for winter storage in cold climates, it is extremely important that you accomplish the following section on winterization of the motor home. If the water and drain systems are not properly prepared, damage to various components and systems could occur because of freezing.

## WINTERIZING KIT - OPTIONAL

If your Allegro motor home is equipped with the winterizing kit, it will enable you to pump anti-freeze throughout your coach's lines.

To operate:

- Close the valve located beside the water tank.
- Open the valve located at the antifreeze reservoir.
- Close valves A and B as illustrated in the diagram.
- Open valve C.
- Make certain anti-freeze reservoir is filled with anti-freeze for use in drinking water.
- Turn the water pump on to pump the anti-freeze throughout your water lines.
- To prepare for re-use, reverse all valves and flush the lines with several gallons of fresh water.



## WINTERIZATION

The objective in winterization of the motor home is to protect against freezing. The most vulnerable areas are the water system, the waste drain system, the holding tanks, the water heater, and the battery.

- Level the motor home.
- Remove all foods and equipment that could cause odors.
- Clean entire vehicle. Dirt and stains are much easier to remove when they are fresh.
- Close all windows and roof vents.
- Drain the complete water system:
  - Open all faucets.

- b. Open the water tank drain, located between the tank and demand water pump (water drains under the vehicle).
- c. To drain the water heater, use an adjustable wrench to remove the 1/2" drain plug thereby allowing the water to drain.
- d. Allow demand water pump to operate until all water lines have been drained.
- e. With water pump running, operate toilet flush mechanism, hold until water stops flowing.
- f. After water has stopped draining, leave all drain valves and faucets open and force air through the water system. Use a hand pump or pressure pump at a gas station to provide pressure.

### CAUTION

To avoid possible damage to the pump or water lines, limit air pressure to 30 psi.

- g. Disconnect discharge and intake hoses from demand water pump. Start pump and allow to run until all water is expelled from the unit. (Running dry will not harm the pump.) Then reconnect the hoses. Close all drains but leave all faucets open.
- h. Pour dealer recommended non-toxic antifreeze into the bathroom sink drain, shower drain and both the kitchen sink drains.

### WARNING

Do not use automotive type radiator antifreeze. It is poisonous.

NOTE: The water system may also be winterized with the use of non-toxic antifreeze added to the storage tank and pumped throughout the system. Follow the directions on the container to determine the correct amount of antifreeze to be used.

6. Completely drain both the waste water and sewage holding tanks. Thoroughly rinse tanks and drain again. It is recommended that when rinsing the tanks, you drive the vehicle a few blocks to make sure all material has been loosened. The waste valves and caps on the holding tanks should be closed to prevent the dump valve shafts from rusting and to prevent rodents from entering the holding tanks.
7. Turn furnace thermostat to "Off" position.
8. Lubricate all hinges and door locks.
9. Clean refrigerator and leave the door slightly ajar.
10. Seal all appliance vent openings.
11. Disconnect the battery cables from all batteries.

12. Whenever possible, the batteries should be removed and stored indoors. When they are left in the vehicle, the state of charge of all batteries must be checked regularly in areas where freezing temperatures occur. A battery will discharge by itself in time and a discharged battery, or even one with one half charge or less can freeze. Since the discharge time varies with temperatures, battery age and other conditions, batteries should be checked at least every two weeks.
13. Have the chassis completely lubricated.
14. Make sure the antifreeze level in the automotive radiator is sufficient to protect against freezing.
15. After water lines have been drained, winterize the fresh water toilet by one of these methods:
  - a. Leave water supply line valve to toilet open. Depress foot pedal or turn flush knob, and insert a round object such as a soft drink bottle into the outlet located at the bottom of the bowl. Release the pedal or knob slowly until the blade touches and holds the object. This will hold the water control valve open and prevent any residue water from being trapped there where it can freeze.

### IMPORTANT

- Tie the soft drink bottle securely to prevent it from dropping into the holding tank.
- b. Use non-toxic antifreeze to winterize the entire motor home fresh water plumbing system. Follow the directions on the antifreeze container.
  16. To extend the life of the automotive air conditioner unit when so equipped, start the motor home engine and run the air conditioner a few minutes every two weeks.
  17. Prepare the optional 110-volt generator for storage by following the instructions given in the generator maintenance section.

### REMOVAL FROM STORAGE AND NEW SEASON PREPARATION

1. Completely air out the motor home.
2. Check window operation.
3. Check cabinet and door hinges and lubricate with penetrating oil, if necessary.
4. Fill the water tank and check for leaks. Sanitize the water system as outlined under system purification.
5. Check operation of all faucets to be sure faucet washers have not hardened during storage.
6. Check the sealing valve in the toilet for proper operation and lubricate with silicone spray.
7. Add water to the holding tanks and check to be sure dump valves seal tightly.



8. Check the entire LP gas system and appliances for leaks using the leak detector. Check the connections at the LP tank for leaks using soapy water.
9. Check around all appliances for obstructions and ensure that all vent openings are clear.
10. Start refrigerator and check for proper cooling.
11. Clean paneling and counter surfaces and apply a thin coat of wax.
12. Check out the electrical system to make sure all lights and electrical components operate.
13. Check the unit for leaks at all seams, especially the roof. The sealant becomes brittle with age and cold temperatures. If there are any cracks, have them cleaned thoroughly and resealed with silicone. DO NOT use lacquer thinner to clean seams.
14. Check tires for proper cold inflation pressure.

#### **SUMMER MAINTENANCE**

1. Check your wheels and tires often during the summer months.
2. Check the exterior seams periodically and reseal if necessary.
3. Wash and wax the motor home occasionally to protect the finish. This is particularly important if salt, road tar, tree sap, etc., have accumulated on the exterior.
4. Give your motor home a thorough mid-summer cleaning.

#### **WINTER CAMPING TIPS**

1. Cut out transparent heavy plastic sheets and attach to the inside of the window with duct tape, or buy storm windows.
2. The holding tank and plumbing system are the most vulnerable part of your motor home in winter. Exposed piping, etc., can be wrapped with heat tape (12 volt) and covered with insulation and plastic to keep out air and moisture. This same procedure can be used to limited extent on holding tanks. The best protection for holding tanks is the use of non-toxic antifreeze and limited use of the drainage system.
3. Cover vinyl seats and cushions with towels to absorb cold air.
4. Place newspaper under the entrance door throw rug to soak up melting snow.
5. Position throw rugs against the bottom crevice of the entrance door to cut off cold air blowing in from the outside.
6. Place an old rug outside the motor home and another inside to prevent snow and moisture from being carried inside.
7. Carry an adequate supply of LP gas. A partially filled tank may last only a short time.
8. Carry can of lubricant or graphite to free frozen locks, etc.
9. Try to keep a window partially open to prevent carbon monoxide buildup inside the motor home. Roof vents can easily become covered with snow.
10. For added warmth, insulate the window side of the drapes.

11. A temporary skirting can be made by piling snow up along the lower edge of the motor home to keep air from blowing under the unit.
12. Tire chains are helpful when road conditions become bad, and are required in some states.
13. Make sure all heating ducts are clean and lint free. Clogged ducts can restrict air flow and, in some cases, are a fire hazard.

#### **TRAVEL TIPS**

As you travel around the country in your motor home you will pick up various tips from other motor home owners.

A number of tips can also be picked up by reading articles and regular columns in some of the outdoor and camping magazines. Some magazines and publishing companies print an annual park and campground directory. These can be found at your local newsstand or trailer supply dealer. Following are just a few travel tips for you to start out with.

1. Be sure to always check for sufficient clearance. Remember the height and width of your unit.
2. Taste the water before filling the water tank in an unfamiliar location. The water in some areas contains a salt or a sulfur taste.
3. Never use a new hose to fill your water tank. It leaves a distinct taste.
4. Showers can take a lot of water. Conserve water by taking a "sea shower". To do this; wet down, turn off the water, soap thoroughly and then rinse.
5. Put a bucket under the holding tank drain connection for good camp etiquette.
6. Dump sewage only at approved dumping stations.
7. Plastic containers with tight fitting caps should be used for storing liquids.
8. Keep an eye on the water and holding tank levels. It is a good idea to dump the holding tank at least every two days.
9. When traveling with children, it is helpful to plan their wardrobe for a week. Place each day's clothing in a plastic bag and label the name and day on the bag.
10. Use sleeping bags whenever possible. They save laundry and take up less storage space.
11. Make sure all compartment doors have been closed and the door step has been stowed in the correct position before moving the vehicle.
12. Before traveling make sure the refrigerator door has been secured. Use care when opening the refrigerator door after you have stopped. Any articles that have shifted may fall out when the door is opened.
13. During peak tour seasons and holidays, it is best to phone ahead and make reservations at the park where you plan to stop.

14. Some states or cities will not permit you to pass through highway tunnels because of the LP gas containers in your vehicle. If your route includes a tunnel, check with the highway patrol or department of highways before venturing forth.
15. Do not leave food or odor causing material in your vehicle for extensive periods of time. Always allow damp clothing, hunting gear and etc., to dry before putting it away.
16. Become familiar with your fire extinguisher and make sure it is always fully charged. Remove and replace it and read the instructions so you know the correct operating procedure before an emergency.
17. Make a list of all groceries, fresh meats, vegetables, newspapers, and etc. that you may need and try to pick them up during your last gas stop of the day. This will prevent leaving a good parking spot once you have arrived at your destination.
18. When you sit over the front wheels while driving, as in the motor home, you may have a tendency to crowd the middle of the road. Check your rear view mirror frequently to observe how close you are driving to the center line.

### EQUIPPED FOR TRAVEL

When beginning a trip, several items should be taken in addition to the basic clothes, food, and recreational items. A checklist is provided for your convenience. Remember, it is important to distribute weight and store all heavy items near the floor.

### EMERGENCY EQUIPMENT CHECKLIST

Flashlight  
 First Aid Kit  
 Road Emergency Flares  
 Tool Box with Assortment of Hand Tools  
 Plastic Bucket  
 Tow Chain or Rope  
 Wheel Blocks for Leveling or Extra Jacks  
 Water Hose  
 100 - 150 Feet of Electrical Cord  
 with at least 30 amp Capacity  
 Fire Extinguisher  
 Lug Wrench  
 Spare Tire

### QUICK LOADING CHECKLIST

#### LINENS

- \_\_\_ Sleeping Bags
- \_\_\_ Sheets
- \_\_\_ Pillow Cases and Pillows
- \_\_\_ Mattress Pads
- \_\_\_ Extra Blankets
- \_\_\_ Laundry Bags

#### COOKING

- \_\_\_ Can Opener
- \_\_\_ Bottle Opener
- \_\_\_ Spatula
- \_\_\_ Long Fork
- \_\_\_ Service Spoon
- \_\_\_ Measuring Spoon
- \_\_\_ Skillet
- \_\_\_ Pot with Cover
- \_\_\_ Oven Pan
- \_\_\_ Plastic Shaker
- \_\_\_ Mixing Bowl and Cover
- \_\_\_ Aluminum Foil
- \_\_\_ Wood Type Matches
- \_\_\_ Plastic Bags
- \_\_\_ Plastic Waste Baskets
- \_\_\_ Sharp Knife
- \_\_\_ Coffee Pot
- \_\_\_ Scissors
- \_\_\_ Shot Glass
- \_\_\_ Hot Pads and Mitts
- \_\_\_ Paper Towels
- \_\_\_ Storage Dishes

#### PERSONAL

- \_\_\_ Credit Card
- \_\_\_ Traveler's Check
- \_\_\_ Money
- \_\_\_ Driver's License
- \_\_\_ Binoculars
- \_\_\_ Extra Eye Glasses
- \_\_\_ Sun Glasses
- \_\_\_ Pocket Knife
- \_\_\_ Sewing Kit

- \_\_\_ Proof of Citizenship For  
Canadian or Mexican Crossing
- \_\_\_ Camera Equipment and Film
- \_\_\_ Games, Toys, Coloring Book
- \_\_\_ Fishing Equipment

#### CLEANING

- \_\_\_ Scouring Pads
- \_\_\_ Cleanser
- \_\_\_ Dish Soap
- \_\_\_ Sponge
- \_\_\_ Laundry Soap
- \_\_\_ Cleaning Rags
- \_\_\_ Air Freshener
- \_\_\_ Broom and Small Hand  
Vacuum Cleaner

#### BATHROOM

- \_\_\_ Hand Soap
- \_\_\_ Shampoo
- \_\_\_ Tooth Brushes and Paste
- \_\_\_ Combs and Brushes
- \_\_\_ Bath Towels that can double  
as Beach Towels
- \_\_\_ Shower Caps
- \_\_\_ Toilet Kits
- \_\_\_ Shaver/Shaving Cream
- \_\_\_ Toilet Tissue
- \_\_\_ Deodorant

#### BABY NEEDS

- \_\_\_ Porta-Crib
- \_\_\_ Car Bed or Similar
- \_\_\_ Expanding Gate with Rubber  
Bumpers on End-Like Fits  
in Door Jamb
- \_\_\_ Child Back Carrier

#### PET NEEDS

- \_\_\_ Food
- \_\_\_ Leash
- \_\_\_ Water and Food Dishes

## MISCELLANEOUS

- \_\_\_String
- \_\_\_Clothes Line
- \_\_\_Fly Swatter
- \_\_\_Insect Repellent
- \_\_\_Masking Tape
- \_\_\_Small Barbecue Grill
- \_\_\_Charcoal
- \_\_\_Lighter Fluid
- \_\_\_Notebooks
- \_\_\_Pencils
- \_\_\_Crayons or Other
- \_\_\_Books on Areas  
You Plan to Visit

- \_\_\_Bird Watching Books
- \_\_\_Boy Scout and/or Girl  
Scout Manuals
- \_\_\_Geology or Rock and  
Mineral Type Books
- \_\_\_Stamps for Post Cards  
and Letters
- \_\_\_Address Book
- \_\_\_Heavy-Duty Electric  
Extension Cord
- \_\_\_Wash and Dry Napkins

## FOOD

Enough for first couple of days or so-buy as you go. Use plastic, paper or other disposable containers. Remember seasonings,

## CLOTHES TIPS

One "good" outfit for each traveler (hang in plastic bag in closet.) Remember - it can get cold in the mountains even during summer. Send for information on these areas you are going to visit and plan accordingly.

## CODE OF ETHICS For Recreational Vehicle Owners

1. I recognize that everyone will judge all recreational vehicle owners by my own actions.
- When parking I will . . .**
  2. Dispose of sewage in recommended places only, such as approved sanitary dumping stations, and not throw plastic bags into toilets or garbage pits.
  3. Discharge my kitchen sink and shower waste water only in designated and approved places, and watch my drain pail to see that it does not overflow.
  4. Not pollute streams, lakes, and other water supplies.
  5. Use extreme caution with fire, leave no campfire unattended, and put out my campfire before leaving it.
  6. Always thoroughly extinguish matches, cigarettes, cigars, or pipe heels before discarding, not smoke when walking or riding through forest or parks, unless regulations specifically allow otherwise.
  7. In campgrounds, I will place all garbage and other refuse in the receptacles provided, leaving no bottles or broken glass.
  8. Not damage trees, shrubs, or other natural beauty.
  9. Leave my campsite as clean or cleaner than I found it.
  10. Spot my recreational vehicle so that I do not interfere with others.
  11. Keep fire away from my LP gas bottles.
  12. Ask permission to park on private property when no other facilities are available.
  13. Comply with all rules of forests and parks where I am staying.
  14. Encourage my neighbors in parks to follow this Code of Ethics.
- On the highway I will . . .**
  15. Pull off two-lane highways periodically, if I see a string of cars behind me.
  16. Not be a litterbug.
  17. Use my ashtray and not toss flammable material from windows.
  18. Drive in right lane except when passing, and allow extra room for passing.
  19. Comply with and study all traffic regulations.
  20. Watch my speed.
  21. Make every effort to prevent swaying by proper driving, and suitable weight distribution in the recreational vehicle.
  22. Check lights, directional signals, and wheel lugs daily.
  23. Carry sufficient insurance to protect others in case of accident.

## ALLEGRO INFORMATION SHEET PAINT COLORS

Fiberglass Front & Rear Color: Brown  
Brand: Imron  
Number: 7444

Colonial White Skin  
Brand: PPG  
Number: Take sample to paint shop to have it matched.

Brown Skin  
Brand: PPG  
Number: Take sample to pain shop to have it matched.

## ENGINE BELTS

### Power Steering

1974 - Present 9433745

### Fan & Alternator

1973-1978 without Calif. emissions 9433745  
1973-1978 with Calif. emissions 9433752  
1979-Present 9433752

### Compressor

Dayco 15591  
Gates 8590

### Radiator Hose

Upper 1973-1981 6259953  
1982-Present 14049401  
Lower 1974 - 1981 343414  
1982 - Present 14049500

## FRONT AIR BAGS

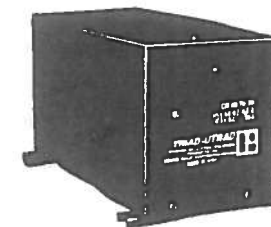
GM part 367-762

## TRIAD-UTRAD Converter/Battery Charger

DISTRIBUTED BY  
Todd Engineering Sales, Inc.  
28706 Holiday Place  
Elkhart, IN 46514  
219-293-8633

30 Amp 40 Amp  
50 Amp 70 Amp  
Models

UL & CSA Listed  
Thermal Protected



## Description

30 YEARS of Triad Utrad transformer design and manufacturing provides the most advanced and trouble free Converter/Battery Charger system in the industry.

The Triad Utrad design employs a Constant Voltage Transformer giving a constantly regulated DC output with any AC line input from 90 to 130 Volts. No more undercharging batteries due to low Park voltage conditions, or overcharging due to high line conditions.

The converter has no electronic regulator circuits, which can burn up, change in value, and cause damage to batteries, water pumps, and fluorescent lights.

The converter provides a full 12.1 Volts output under full load, and a maximum of 14.1 Volts at the battery when it has reached full charge. The converter output cannot exceed this voltage, which is the maximum level necessary to keep a battery fully charged.

The Triad Utrad converter will never be damaged by overloads, up to, and including, a dead short. It will withstand a dead short for an indefinite time, and will resume normal operation as soon as the overload or short is removed.

The converter is exclusively produced with a external fuse distribution panel which permits improved engineering flexibility for the manufacturer. The converter can be mounted in a remote location, and the fuse panel installed for A: electrician and customer accessibility, B: improved cabinet storage, C: centralized service with the 110V breaker panel, and D: improved coach decor.



**TRIAD-UTRAD**  
Litton

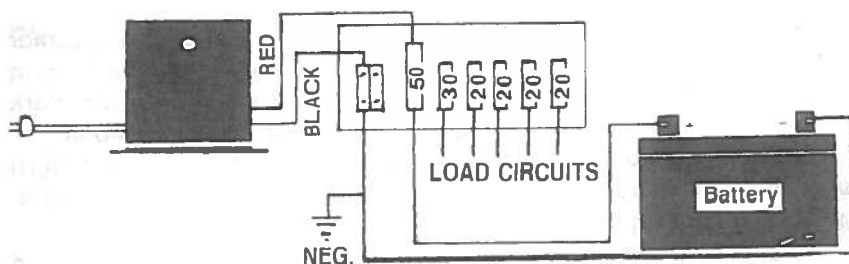
305 North Briant Street, Huntington, Indiana 46750

## Specifications

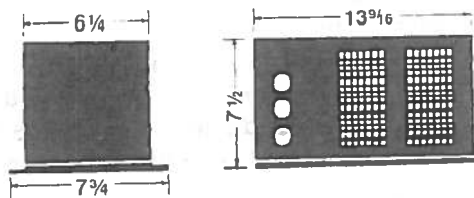
Model	Rating	Max Load*	Output Voltage	Input Voltage	Input Curr.	Unit Weight
TU 430-2T	30 Amp	40 Amp	12.1	90-130V 60 HZ	5.0 A	25 lbs.
TU 440-2T	40 Amp	50 Amp	12.1	90-130V 60 HZ	6.3 A	37 lbs.
TU 550-2	50 Amp	65 Amp	12.5	90-130V 60 HZ	7.3	43 lbs.
TU 470-2T	70 Amp	85 Amp	11.6	90-130V 60 HZ	11.0 A	48 lbs.

\* Current limit point of unit

## Typical connection diagram



## Dimensions



## WARRANTY

TRIAD/UTRAD warrants each new TU Converter/Battery Charger for two years from date of manufacture against any defect in material or workmanship. It agrees to repair or replace any such defects, without charge for parts or labor, provided the defective unit is returned, prepaid, within this two year period.

Responsibility is not assumed for damage due to accident, faulty wiring to vehicle electrical system, use of incorrect wire sizes in conjunction with the converter/battery charger. A code indicating the date of manufacture is on each unit. For example: if the code reads "17-7338" it means that the unit was made in the 38th week of 1973.

## SAFETY REGULATIONS REGARDING LP GAS SYSTEMS AND LP GAS APPLIANCES

The manufacturer of this recreational vehicle is required to furnish the following consumer information as provided by the National Fire Prevention Association and the American National Standards Institute. The information and warnings found here may also be found in other sections of this Owner's Manual. Please see sections titled "Liquid Petroleum Gas System" and "Appliances" for other safety operating information.

### WARNING:

LP GAS CONTAINERS SHALL NOT BE PLACED OR STORED INSIDE THE VEHICLE. LP GAS CONTAINERS ARE EQUIPPED WITH SAFETY DEVICES WHICH RELIEVE EXCESSIVE PRESSURE BY DISCHARGING GAS TO THE ATMOSPHERE.

### WARNING:

IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING, COOKING, APPLIANCES NEED FRESH AIR FOR SAFE OPERATION. BEFORE OPERATION:

1. OPEN OVERHEAD VENT OR TURN ON EXHAUST FAN, AND
2. OPEN WINDOW

THIS WARNING LABEL HAS BEEN LOCATED IN THE COOKING AREA TO REMIND YOU TO PROVIDE AN ADEQUATE SUPPLY OF FRESH AIR FOR COMBUSTION. UNLIKE HOMES, THE AMOUNT OF OXYGEN SUPPLY IS LIMITED DUE TO THE SIZE OF THE RECREATIONAL VEHICLE, AND PROPER VENTILATION WHEN USING THE COOKING APPLIANCE(S) WILL AVOID DANGERS OF ASPHYXIATION. IT IS ESPECIALLY IMPORTANT THAT COOKING APPLIANCES NOT BE USED FOR COMFORT HEATING AS THE DANGER OF ASPHYXIATION IS GREATER WHEN THE APPLIANCE IS USED FOR LONG PERIODS OF TIME.

### WARNING:

PORTABLE FUEL-BURNING EQUIPMENT, INCLUDING WOOD AND CHARCOAL GRILLS AND STOVES, SHALL NOT BE USED INSIDE THE RECREATIONAL VEHICLE. THE USE OF THIS EQUIPMENT INSIDE THE RECREATIONAL VEHICLE MAY CAUSE FIRES OR ASPHYXIATION.

### WARNING:

DO NOT BRING OR STORE LP GAS CONTAINERS, GASOLINE, OR OTHER FLAMMABLE LIQUIDS INSIDE THE VEHICLE BECAUSE A FIRE OR EXPLOSION MAY RESULT.

A warning label has been located near the LP gas container. This label reads: DO NOT FILL CONTAINER(S) TO MORE THAN 80 PERCENT OF CAPACITY. Overfilling the LP gas container can result in uncontrolled gas flow which can cause fire or explosion. A properly filled container will contain approximately 80 percent of its volume as liquid LP gas.

The following label has been placed in the vehicle near the range area: IF YOU SMELL GAS:

1. Extinguish any open flames, pilot lights and all smoking materials.
2. Do not touch electrical switches.
3. Shut off the gas supply at the tank valve(s) or gas supply connection.
4. Open doors and other ventilating openings.
5. Leave the area until odor clears.
6. Have the gas system checked and leakage source corrected before using again.

LP gas regulations must always be installed with the diaphragm vent facing downward. Regulators that are not in compartments have been equipped with a protective cover. Make sure that regulator vent faces downward and the cover is kept in place to minimize vent blockage which could result in excessive gas pressure causing fire or explosion.

*Notes*

## IMPORTANT SERIAL NUMBERS

You Will Want to Make a Record for Future Reference.

Look for Them and Fill in Immediately.

Motor Home Serial Number \_\_\_\_\_

Chassis Serial Number \_\_\_\_\_

Air Conditioner Serial Number \_\_\_\_\_

Range Model and Serial Number \_\_\_\_\_

Refrigerator Model and Serial Number \_\_\_\_\_

Furnace Model and Serial Number \_\_\_\_\_

Water Heater Model and Serial Number \_\_\_\_\_

Converter Model and Serial Number \_\_\_\_\_

Optional 110-Volt Generator Model and Serial Number \_\_\_\_\_

When writing to the factory be sure to include your motor home serial number and chassis number. When writing to a component manufacturer for information, be sure to include the model and serial number of the item.

## EMERGENCY INFORMATION

### Dealer

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

### Insurance Policy

Company \_\_\_\_\_

Policy Number \_\_\_\_\_

Phone \_\_\_\_\_