OPERATING MANUAL

GM
GENERAL MOTORS
COACH

MODEL

PD-4104

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COACH

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TO THE OPERATOR

Information in this manual is written directly to you—the operator. No attempt has been made to teach driving skill, rules of the road, or highway safety practices. Such essential phases of operating a coach must be acquired by the operator through other training facilities.

The primary purpose of this booklet is to acquaint the operator with important operating features of this GM Coach. A knowledge of such features and the practicing of recommended procedures in this book will add to your skill as an operator. In addition, such knowledge will provide passenger comfort and safety.

Some of the items in this manual may or may not be the responsibility of the operator, depending upon regulations of the operating company. Regardless of responsibility, the operator should know the contents of this manual to obtain the best operating efficiency.

OPERATOR'S CONTROLS

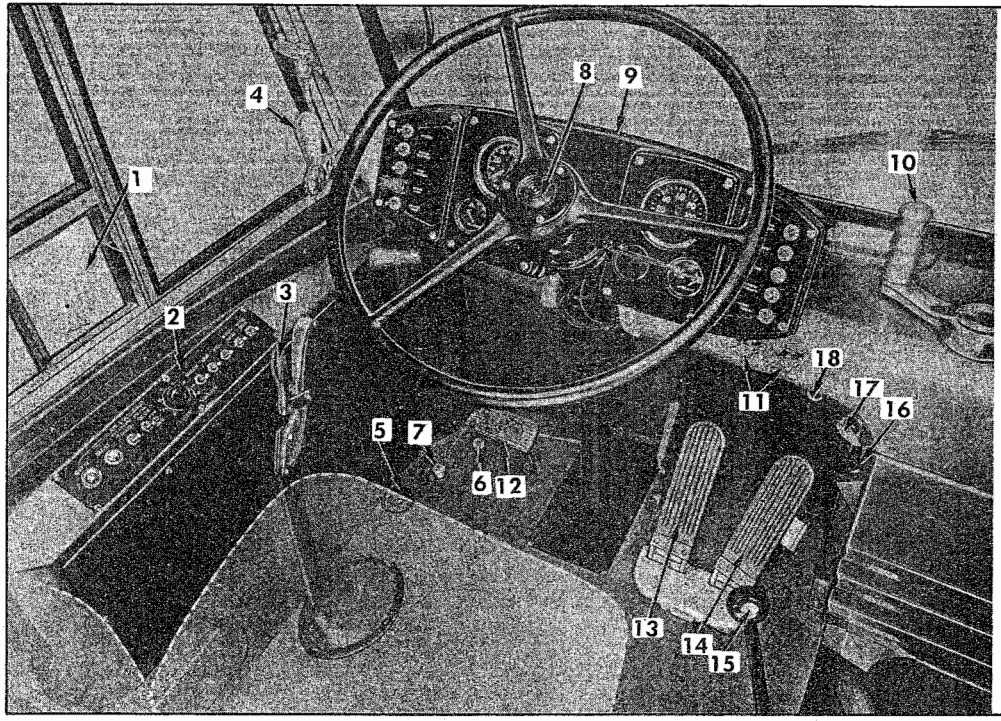
Controls, gauges, and switches used to normally operate and drive the coach are located in the area generally known as the "operator's compartment" as illustrated on opposite page.

All controls necessary for the normal driving of coach, and for passenger comfort and safety are readily accessible to the operator.

Switches, gauges, and tell-tale lights are grouped on the gauge and switch panel in front of the driver and on panel at left of driver (page 4).

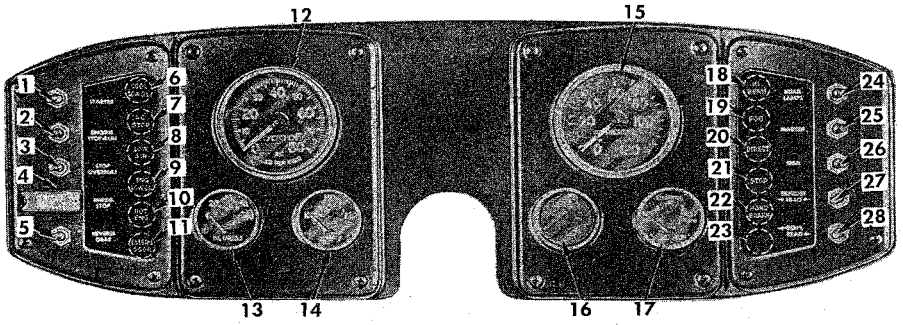
This coach is equipped with gauges, tell-tale lights, and warning devices which warn of abnormal operating conditions. The margin of safety in these instruments is enough to warn the operator of trouble before any serious damage happens. Get the "INSTRUMENT BOARD HABIT"—It's a good practice.

Instructions on the most commonly used special equipment are included in this manual. The operator can, upon inspection of his coach, determine specific instructions to use.

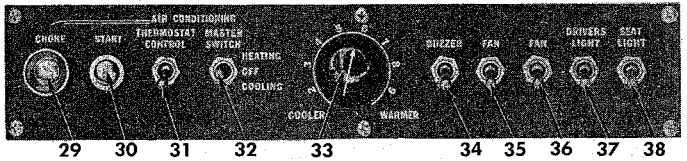


1 Driver's Hand Window
2 Operating Control Panel
3 Hand Brake Lever
4 Spot Light Handle
5 Air Horn Button
6 Fog Light Selector
7 Dimmer Switch
8 Electric Horn Button
9 Switch and Gauge Panel
10 Entrance Door Control
11 Windshield Wiper Controls
12 Clutch Pedal
13 Brake Pedal
14 Accelerator Pedal
15 Transmission Shift Lever
16 Defroster Heater Control
17 Hand Throttle
18 Front Vent Control

OPERATOR'S COMPARTMENT



SWITCH AND GAUGE PANEL



CONTROL PANEL

1 Engine Starter Switch
2 Engine Control Switch
3 Overrule Switch for Moto-Gard
4 Engine Emergency Stop Switch
5 Transmission Reverse Switch
6 Air Cond. Engine Low Oil Tell-Tale (GM)
7 Air Cond. Engine Stop Tell-Tale (Tropic-Aire)
8 Low Air Tell-Tale
9 Engine Low Oil Tell-Tale
10 Engine Temperature Tell-Tale
11 Emergency Door Tell-Tale
12 Speedometer
13 Oil Pressure Gauge
14 Temperature Gauge
15 Air Pressure Gauge
16 Fuel Gauge (when used)
17 Generator Charge Indicator
18 Headlight High Beam Tell-Tale
19 Fog Light Tell-Tale
20 Directional Signal Flasher
21 Stop Light Tell-Tale
22 Hand Brake Applied Tell-Tale
23 For Special Equip.
24 Headlight Switch
25 Marker Light Switch
26 Destination Sign Light Switch
27 Defroster Heater Fan Switch
28 General and Reading Light Switch
29 Choke Button (Air Cond. Engine)
30 Starter Button (Air Cond. Engine)
31 Thermostat Control Switch
32 Master Switch
33 Selector Switch
34 Passenger Chime Buzzer
35 Driver's Fan Switch
36 Windshield Fan Switch
37 Driver's Light Switch
38 Aisle Seat Light Switch

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GAUGE AND SWITCH PANELS

The gauge and switch panels located directly in front of driver include switches and gauges used for the normal operation of the engine and lighting of the coach. Tell-tale lights are mounted in back of each side switch panel, and are only illuminated when certain conditions occur. Uses of the switches, gauges, and tell-tales are explained in other sections of this manual describing specific operating procedures.

The operating panel, located to the left of the operator directly under operators window, includes controls necessary to operate heating and cooling systems, drivers light and fan, and passenger chimes. Further explanations of these controls are covered in other sections of manual.

COMPARTMENTS

The coach is equipped with several interior and exterior compartments in which various units may be serviced. Locations and names of compartments accessible from exterior of coach are indicated in illustrations shown on page 6. Methods of opening the various compartments are explained in manual.

INTERIOR COMPARTMENTS

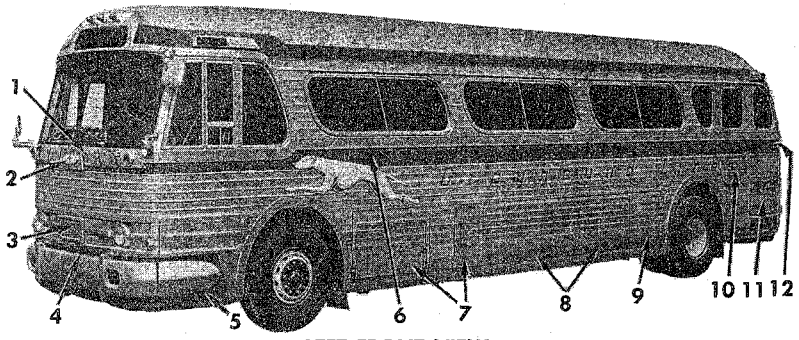
SAFETY COMPARTMENT. Compartment is recessed in dash panel at right side. Open door by pressing two buttons at top of door; then pull door downward. Standard safety equipment is stored in this compartment.

DEFROSTER HEATER COMPARTMENT. Compartment is recessed in dash panel to right of driver, and contains defroster heater and fans. Access to this compartment is not necessary except to drain or bleed defroster heater. Remove three cap screws at right side and three cross-recess screws at left side to remove panel.

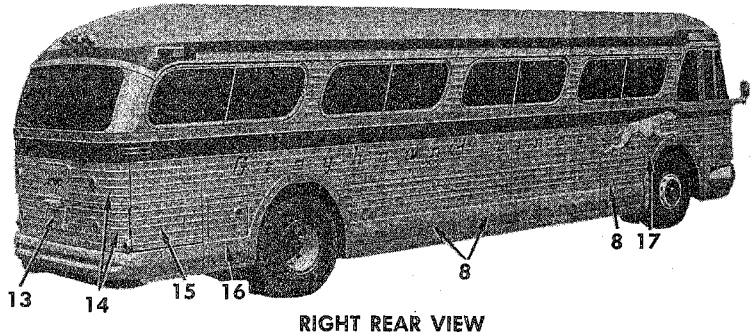
CIRCUIT BREAKERS. Covered panel directly under control panel to left of driver includes automatic reset type circuit breakers, requiring no maintenance.

ACCESS TO ENGINE. Top of engine can be serviced through large opening under rear cross seat cushions.

EXTERIOR LOCATIONS



LEFT FRONT VIEW



RIGHT REAR VIEW

1 Entrance Door Release
2 Front Vent
3 Front License Holder
4 Spare Tire Compartment
5 Tool Compartment
6 Left Air Intake
7 Air Condition Unit Compartments
8 Baggage Compartments
9 Battery Compartment
10 Emergency Door
11 Radiator Grille
12 Radiator Filler Door
13 Rear License Holder (also Access Door to Dipstick)
14 Engine Compartment Doors
15 Transmission Access Door
16 Regulator Compartment
17 Air Cond. Engine Gasoline Filler

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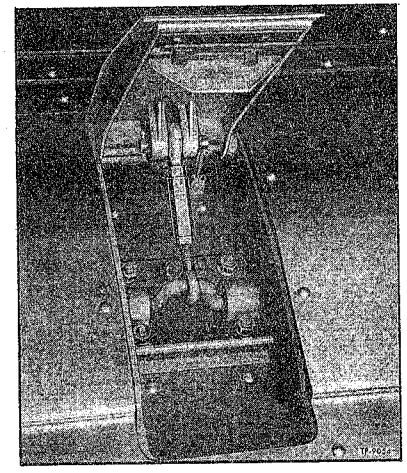
EXTERIOR COMPARTMENTS

Illustrations shown on opposite page show relative locations of various exterior compartments and access doors. Illustration shown includes air conditioning system.

The compartment and access doors are latched by various methods. These methods are explained whenever compartments are referred to in the manual.

BAGGAGE COMPARTMENTS

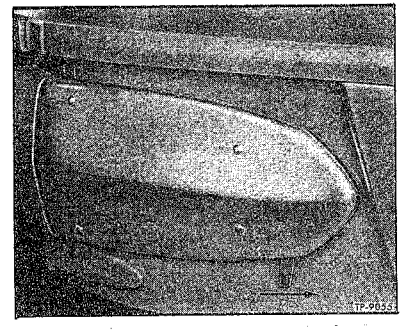


There are three baggage compartment doors on the right side. When air conditioning is used, the two left front compartments are used for the air conditioning units. In addition there are two baggage compartment doors on the left side. If air conditioning is not used, four baggage compartment doors are used on left side. All baggage compartment doors are equipped with flush type latches in lower center of each door.

Insert fingers under latch handle, then pull out and up on handle to unlatch door. Raise door to open position until telescoping braces lock door into open position.

To close door, raise door up slightly to release brace latch. Lower door and at same time lift up on door latch. While holding door in closed position, release and push down on latch to secure door. DO NOT DROP DOOR TO CLOSED POSITION.

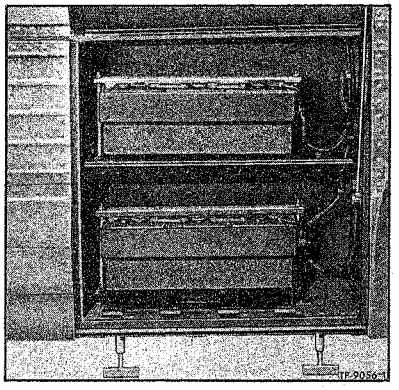
TOOL COMPARTMENT



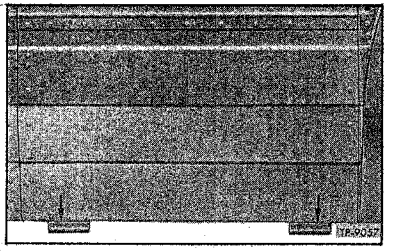
Compartment is located at left front corner of coach. Door latch handle extends below left bumperette. Pull latch handle toward rear of coach, then swing door open. To close, hold latch handle toward rear until door is in closed position; then release latch handle. Compartment is used to store miscellaneous tools.

EXTERIOR COMPARTMENTS

BATTERY COMPARTMENT



Compartment is located on left side of coach toward the rear. Two pull-type release latch handles are located under the door. To open, pull both latch handles outward

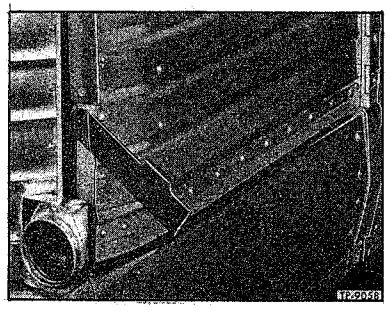


to release door. Raise door to open position; then engage brace rod into catch to hold in open position. To close door, place brace rod in clip and lower door. Pull out the two release latch handles, push door to closed position, and then release latch handles to secure door.

REGULATOR COMPARTMENT

Compartment is located on right side just to rear of rear wheel. Compartment door is equipped with same type latch as used on baggage compartment doors as previously explained.

TRANSMISSION COMPARTMENT



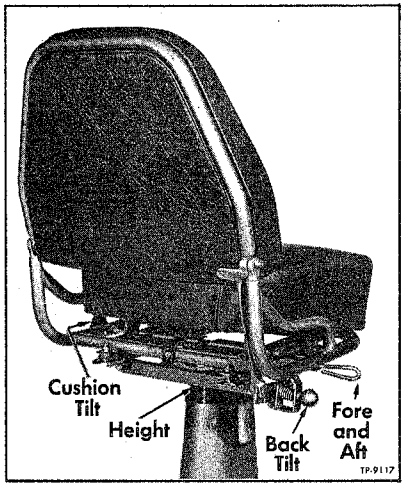
Door is located at right rear corner of coach. Door is equipped with latch at lower rear edge. Pull out latch and swing door open. To close, pull out latch, place door in closed position, and then push latch completely in to secure door.

OPERATORS' SEAT

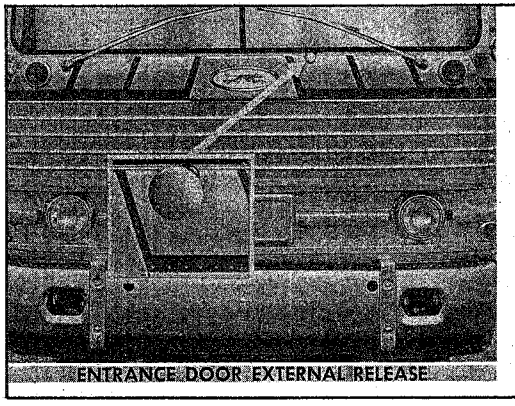
Operator's seat may be moved fore and aft by moving lever at right to rear to release seat. When seat is positioned, release lever. Raise seat by grasping seat frame and pulling upward. To lower, raise completely; then lower.

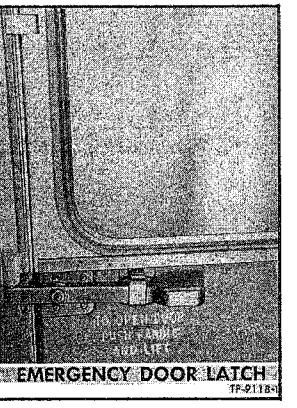
Seat cushion may be tilted by turning knob at left to position seat at right angle.

The seat back may be tilted forward and back by pulling out knob at right to release from notches. Release knob to engage a notch when back is positioned.



DOOR CONTROLS





Passenger entrance door is manually operated by a control lever located on windshield ledge to right of operator (page 3). Pull lever outward and completely swing toward driver. With switch marked "BUZZER" in on position, the front door automatic step light switch is energized. Step light illuminates when front door is opened. Forward half of entrance door window can be partially swung open after releasing latch.

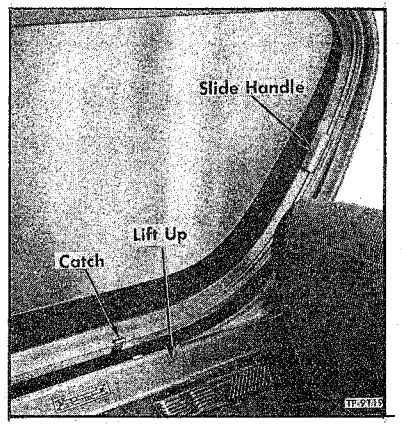
DOOR CONTROLS (Cont.)

Front entrance door can be manually closed from outside after control lever is pulled from latched open position. From outside, push door until closed and latched. Unlatch door from outside by pulling on release button which extends through body at front. After button is pulled, door can be pulled open from outside (see illustration, page 9).

EMERGENCY DOOR

Emergency door is secured shut with lever type latch handle (page 9). When latch handle is lifted or not securely in place, a switch acts to light tell-tale, "EMERG DOOR," on left switch panel in front of operator (page 4). An alarm buzzer also sounds when latch is not secure. On standard coaches, engine control switch must be placed in "RUN" position before tell-tale and alarm buzzer are energized. Some coaches have a constant circuit to emergency door.

SIDE WINDOWS



Front and rear halves of each passenger side window can be opened approximately 8". Release catch on front or rear half, then slide forward half toward rear, or rearward toward front.

In emergency, entire window sash can be opened for escape. Window hinges at top and can be opened at bottom at each seat by pulling up on release bar directly under window. At each seat, a plate is attached to release bar reading: "TO PROVIDE EMERGENCY EXIT, PULL UP BAR AND PUSH OUT AT BOTTOM OF WINDOW."

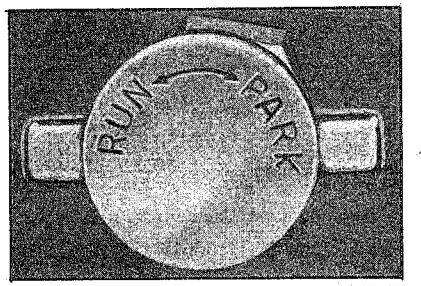
Operator's Window

The forward half and the rearward half of operator's window are hinged in the center. Each window half is held shut with a latch. Each half is positioned open with individual operating levers. The lower part of rear window will slide to the rear to permit hand signals, etc.

WINDSHIELD WIPERS

Two windshield wiper control knobs are mounted directly under right portion of instrument panel in front of driver (page 4). Left knob controls wiper on left half of windshield, while right knob operates right wiper.

To operate either wiper, turn knob toward "RUN" position to degree of blade speed desired. To stop wiper, turn knob to "PARK" position. If blade is not positioned horizontally, give knob an additional turn against spring pressure toward "PARK" position. This will position blade horizontally. Knob will return to "PARK" position when released. Windshield blades should not operate over 140 strokes per minute over thoroughly wet glass (preferably 120 strokes). If blades operate at excessive speed or too slow, report condition for adjustment.



WINDSHIELD DEFROSTER

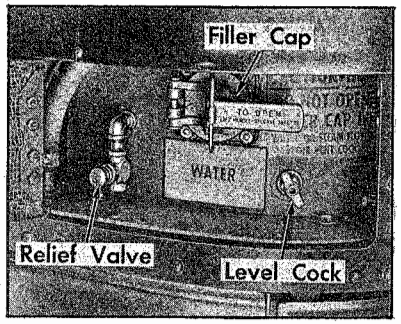
Windshield defroster fan is controlled by three-position toggle switch, marked "DEFROST" on right switch panel in front of operator (page 4). Fan is stopped with switch lever straight out. With switch positioned toward "HI," fan will operate at full speed. With switch toward "LO," fan will operate at low speed. Air is directed over surface of windshield through openings in ledge.

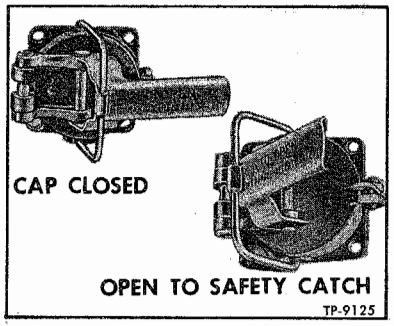
On some coaches, a small fan is mounted to direct air directly on windshield in front of operator. When such a fan is used, right switch marked "DRIVERS FAN" on left control panel (page 4), controls operation of fan.

DEFROSTER TEMPERATURE CONTROL

The defroster heater core is mounted in compartment at front. Heater temperature control knob is located at right of operator directly below hand throttle (page 3). Knob can be turned clockwise in varying degrees to increase heat, or to full counter-clockwise to shut off heat.

COOLING SYSTEM





Engine cooling system (not air conditioning engine) filler cap is accessible after louvered door at left rear upper corner of coach is opened. Door is hinged at forward edge. Pull door open by inserting fingers into louvers at rear edge.

Surge tank is equipped with a push-button type relief valve, a level cock, and a safety-type filler cap.

The relief valve button must be pressed to release steam or pressure before level cock is opened, or filler cap is opened.

The level cock, when turned, indicates need of coolant. If fluid flows from cock, cooling system need not be replenished.

Safety catch on filler cap permits cap to be opened in two stages. Handle of cap should be lifted to first step which permits cap to be held by safety catch. After any existing steam has vented, cap may be completely opened. When cap is closed, handle should be pressed down to securely latch cap.

FILLING EMPTY SYSTEM

If system has been completely drained, the following procedures should be used to refill system.

1. Open vent cock on top of engine thermostat housing. Engine compartment door must be opened to reach this cock.

2. Add coolant through filler cap opening until water flows from thermostat vent cock; then close vent cock. Continue to add coolant until liquid flows from level cock on surge tank.

3. Run engine for few minutes. After engine has started, the water required to fill heaters will be drawn from surge tank. Run engine until temperature is normal, then bleed heating system.

COOLING SYSTEM (Cont.)

BLEEDING HEATING SYSTEM

Whenever cooling system is refilled after a complete drain, bleed heating system with engine running at about ½ throttle in following manner:

1. Turn defroster heater temperature control knob (see location on page 3) completely clockwise.

2. Remove defroster heater compartment panel as previously explained.

3. Defroster heater core bleed plug is located at upper left corner of core. Turn out plug to open. Close plug after all air has been expelled (water runs out of plug).

4. Underfloor heater core is accessible after opening right forward baggage door, then removing left panel for access to heating and cooling compartment. Open bleed valve to expel all air. Close valve after air has ben expelled.

5. Reduce engine speed to normal idle. Replenish cooling system until water runs out of level cock.

REPLENISHING SYSTEM

1. System should be replenished if water does not flow from open level cock on surge tank.

2. Press relief valve button and hold until pressure in system is relieved.

3. As an added precaution, lift filler cap handle to first or safety stage. Stand clear to prevent burns from any existing steam. Open cap completely after pressure has vented.

4. With engine running, add coolant until fluid flows from open level cock. Close level cock, and securely latch filler cap. Make sure safety catch engages cap edge.

Caution

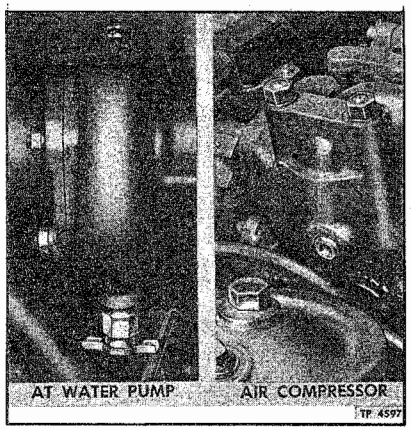
If engine becomes overheated, do not add cold water immediately. Wait until boiling has ceased and engine has cooled; then add liquid with engine running.

DRAINING COOLING SYSTEM

If necessary to completely drain system, (not air conditioning system) the heating system must also be drained. If only the engine cooling system is to be drained, the two heater cut-off gate valves at rear may be shut off. In this manner it is not necessary to bleed heating system when refilling. The gate valves, located on bulkhead back of radiator in engine compartment, are accessible after engine compartment door in raised.

When draining system, press relief valve button to vent all pressure, open radiator filler cap, and then open drain cocks as follows: (Close all cocks and plugs after system has drained).

ENGINE DRAIN POINTS



RADIATOR. Remove plug in radiator outlet connection under coach at lower rear corner of radiator.

WATER PUMP HOUSING. Open cock at lower part of water pump (see illustration). Cock is accessible after engine compartment door is opened.

AIR COMPRESSOR. Remove hollow-head plug located in air compressor head. (see illustration)

HEATER DRAIN POINTS

DEFROSTER HEATER. Remove defroster heater compartment panel as previously explained. Open two wing-type drain cocks on heater return and supply lines. It is necessary to reach down under heater to operate cocks.

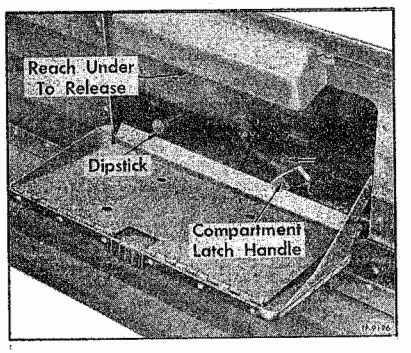
UNDERFLOOR HEATER. Open right front baggage compartment door; then remove left panel for access to heating and cooling compartment. Remove square-head plug, located at bottom of heater core.

ENGINE CRANKCASE OIL

Engine oil dipstick is accessible after rear license door is opened. It is necessary to open engine compartment door to replenish crankcase oil. Filler is located to right of blower above starter.

Always check crankcase level at normal operating temperature and after engine has stopped for approximately three minutes. Dipstick is graduated to show level of oil in crankcase.

To open license plate door, reach under upper ledge to release latch. Lower door. Dipstick is then accessible.

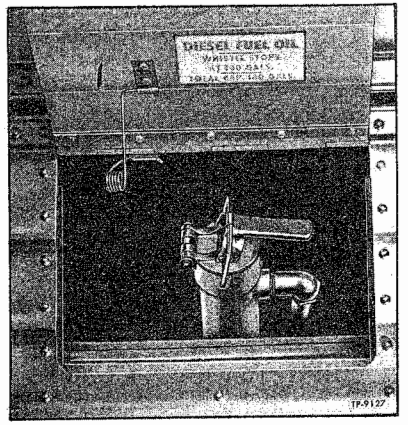


To open engine compartment door, move latch handle, (accessible through license door opening) toward left; then raise compartment door to fully opened position. Latch type telescopic braces will then engage to hold door in open position.

To close compartment door, lift up on door to release brace latches. Lower door to closed position. Hold latch handle to the left and push door in; then release latch handle to secure door. Close license door securely by pushing shut to engage latch.

ENGINE FUEL OIL

The engine fuel oil tank filler door is located on right side of coach between first and second baggage compartment door. Insert finger in door projection, then pull up to open door.



The tank is equipped with a "Ventalarm" system. As tank is being filled, a whistle is audible until capacity reaches 100 gallons. The tank will then hold an additional 40 gallons. Use only Diesel fuel oil of the correct grade.

STARTING ENGINE AT FRONT

Switches used to start and stop engine at operator's compartment are located on left switch panel at front of driver (page 4).

"STARTER" switch is a "momentary-on" toggle switch. Hold to left to operate starter. When switch lever is released, starter is inoperative.

"ENGINE STOP-RUN" switch is a two-position toggle switch. Placing lever in "STOP" position (to the left) activates air-operated injector shut-off to place injector rack in no-fuel position. Placing switch in "RUN" position (to the right) releases air from injector rack shut-off to permit use of accelerator pedal.

"STOP OVERRULE" switch is a "momentary-on" toggle switch. With lever held in right position, action of the MOTO-GARD system is retarded as later explained.

"EMERG STOP" switch is a "momentary-on" toggle switch. This switch is used to stop the engine in case the "ENGINE STOP-RUN" switch does not immediately stop engine. Use of this switch is explained later.

Start the engine at operator's compartment in following manner.

1. Place transmission shift lever into neutral position. Apply hand brake.

2. Place control switch ("ENGINE STOP-RUN") into "RUN" position (to the right). *Note:* When control switch is placed in "RUN" position, the tell-tale lights marked "Eng Low Oil" and "LOW AIR" will illuminate and buzzer will sound. Lights will remain illuminated and buzzer will continue to sound after the engine has started until oil pressure is over 3 lbs. and air pressure is above 54-66 lbs.

3. Disengage clutch, then hold "STARTER" switch to the right to engage starter. Do not engage starter longer than 15 seconds continuously. If engine fails to start, release switch, and wait a few seconds before second attempt. If engine does not start within a reasonable length of time, determine and correct cause.

4. The MOTO-GARD system (explained later) is interconnected with the engine low oil pressure switch. This system will shut-off the injectors approximately 30 seconds after the control

STARTING ENGINE (Cont.)

switch is placed in "RUN" position if the engine has not started. If such is the case, switch marked "STOP OVERRULE" can be used to overrule the MOTO-GARD system until engine is started and oil pressure is above 3 lbs. Hold switch lever to right to overrule MOTO-GARD. As soon as engine is started and "LOW OIL" tell-tale goes out, release switch lever.

5. After engine has started, release clutch, pull up hand throttle to fast idle (approx. 600 rpm) for warm-up period.

STARTING ENGINE AT REAR

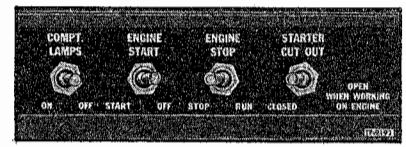
Panel is mounted at right side of engine compartment.

"COMPT LAMPS"—Has "ON" and "OFF" positions to control engine compartment lamps.

"ENGINE START"—"Momentary-on" type—to operate starter.

"ENGINE STOP"—Two positions—"STOP" and "RUN."

"STARTER CUT OUT"—Two positions—"CLOSED" and "OPEN."



Be certain that "starter cutout" is in "open" position when working on engine.

1. At front, place transmission shift lever into neutral position, apply hand brake, then place control switch in "RUN" position.

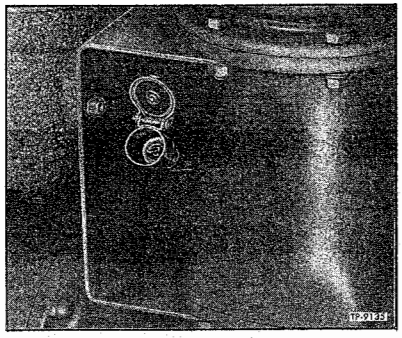
2. At rear, make certain that "ENGINE STOP" switch is in "RUN" position, and "STARTER CUT OUT" switch is in "CLOSED" position.

3. Hold "ENGINE START" switch in "START" position to engage starter. Release switch as soon as engine starts. Use same precautions regarding starter as previously explained under "Starting Engine at Front."

4. As soon as engine has started, set hand throttle at front to fast idle (600 rpm) for warm-up period.

CAUTION: *If necessary to work on engine without engine running, place "STARTER CUT OUT" switch into "OPEN" position. This breaks circuit to starter and prevents accidental starting of engine. After work has been completed, always place "STARTER CUT OUT" switch into "CLOSED" position before closing engine compartment door. Also make sure that "ENGINE STOP" switch is in "RUN" position.*

COLD WEATHER STARTING



To assist in readily starting engine at low temperatures, a small reservoir or cup may be installed (special equipment) in the blower intake manifold to permit the use of ether fluid capsules. The use of such starting fluid should be avoided unless absolutely necessary, and whenever used, the fluid should be applied by capsule method only as described below.

STARTING METHOD

1. Capsules containing 7CC of starting fluid are generally available from local oil and fuel dealers—NOT from GMC Truck & Coach Division.

2. It is recommended that one capsule (7CC) be used at temperatures of 40°F to 0°F. Two capsules (or one 17CC capsule) may be used at temperatures below 0°F.

3. Set controls as previously described under "Starting Engine at Rear."

4. Raise cover of cup and push capsule against pointed tube to rupture capsule. Squeeze capsule empty with fingers; then remove ruptured capsule. Make sure that cap cover is closed tightly before starting engine (or during engine operation).

5. Start engine as previously described under "Starting Engine at Rear."

Cautions

Starting fluid capsules should be stored in accordance with existing fire regulations.

Starting fluid may be toxic, inflammable, and possess anesthetic properties.

Positively NO SMOKING while using starting fluid capsules to start engine.

STOPPING ENGINE

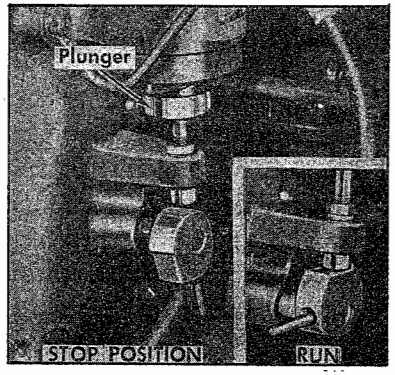
AT FRONT

1. Apply hand brake, and shift transmission into neutral.
2. Idle engine for about 30 seconds; then place control switch into "STOP" position. This will activate injector shut-off mechanism.

EMERGENCY STOP

The engine "EMERG STOP" switch is used only as an emergency measure in the event engine fails to stop when control switch is placed in "STOP" position. The "EMERG STOP" switch is a "momentary-on" type. Guard over switch must be pulled back to expose switch. When lever is held to the left, a solenoid releases cam on air choke valve to close valve, thus shutting off air supply to engine.

When "EMERG STOP" switch has been used to stop engine, the choke valve must be manually reset at the engine (see illustration).



Pull up shaft cam until shoulder on cam engages solenoid plunger.

CAUTION: *Use emergency stop ONLY in emergency. Do not use for normal stopping of engine. Do not restart engine until reason for loss of control has been determined and corrected.*

AT REAR

Place "ENGINE STOP" switch into "STOP" position. After engine has been stopped, place switch into "RUN" position. IN EMERGENCY ONLY, if control switch does not stop engine, lift up emergency stop solenoid plunger with fingers to release air choke valve cam. Reset cam after engine has stopped.

Before closing engine campartment door, make sure that "STARTER CUT OUT" switch is in "CLOSED" position, and that "ENGINE STOP" switch is in "RUN" position. At front, also place control switch into "STOP" position if engine is not to be started immediately.

ALARM AND TELL-TALE SYSTEM

Tell-tale lights are mounted in back of the right and left switch panels in front of the operator (page 4). Designation of each light is visible only when tell-tale illuminates.

With the lighting of some tell-tales, a buzzer will sound to indicate abnormal conditions. These conditions require correction before further operation of the coach.

"AC STOP." Indicates that air conditioning engine is not running.

"LOW AIR." Indicates that air pressure is below safe operation range. A buzzer will sound when tell-tale lights. Engine control switch must be turned to "RUN" position before tell-tale lights or buzzer sounds. When engine is first started (air pressure below 60 lbs), tell-tale and buzzer will operate until air pressure is over safe operation range. If the tell-tale and buzzer operate during operation of coach, vehicle should be stopped and cause of air loss corrected.

"ENG LOW OIL." Indicates that engine oil pressure is below 3 lbs. Buzzer also sounds. When engine control switch is placed into "RUN" position, tell-tale and buzzer will operate until engine has started and oil pressure raises. MOTO-GARD system will stop engine approximately 30 seconds after tell-tale illuminates.

"HOT ENG." Indicates that operating temperature of engine is excessive. Buzzer will also sound. MOTO-GARD system will stop engine approximately 30 seconds after tell-tale illuminates.

"EMERG DOOR." Indicates that emergency door is unlatched. Buzzer will also sound. On standard coaches, the engine control switch must be in "RUN" position before emergency door tell-tale and buzzer will operate. On some coaches, the emergency door alarm system circuit is "hot" and will operate without positioning engine control switch.

"HI BEAM." Indicates when head light high beam is used.

"FOG." Indicates when fog lights are being used.

"DIRECT." This tell-tale will flash intermittently when directional signal is being used.

"STOP." Indicates when stop lights are illuminated.

"HAND BRAKE." Indicates when hand brake is applied.

MOTO-GARD OPERATION

MOTO-GARD system is connected into the engine low oil and hot engine tell-tale and the engine stop circuits in such a manner that it will automatically stop the engine when low oil pressure or hot engine tell-tale circuits are closed. There is however, a delay of approximately 30 seconds from the time the tell-tale illuminates until the engine is stopped. This normally provides the operator with sufficient warning to move coach to side of road.

If coach must be moved, 'STOP OVERRULE" switch on left switch panel is provided to overrule the MOTO-GARD system. While holding switch lever to right, engine can be started and vehicle moved to safety, but this should only be done in case of emergency. Normally, when hot engine or low oil condition stops engine, no attempt should be made to restart the engine until the cause of the abnormal condition has been determined and corrected.

ENGINE WARM-UP AND IDLING

After a cold engine has started, increase speed to a fast idle (approx. one-third throttle—600 rpm) for warm-up period. Always avoid unnecessary idling. Diesel engines have a tendency to run cool at slow idle—causing incomplete combustion. Engine should be stopped if coach is to stand for any length of time. If necessary to run engine while coach is standing, run at fast idle.

ENGINE OIL PRESSURE

Consistency of the oil may cause a slight rise in the oil gauge pressure reading, when engine is first started. As engine warms up, pressure will recede to normal. Normal readings with engine hot are: Idling—4 lbs., minimum. Governed Speed—25 lbs., minimum. Engine must not be operated when oil pressure falls below 25 lbs., at 2000 rpm under full load.

If oil pressure falls below 3 lbs., the "ENG LOW OIL" tell-tale will light and alarm sound. MOTO-GARD system will stop engine approximately 30 seconds after the tell-tale illuminates.

ENGINE TEMPERATURE

Efficient operating temperature range is 160°-180°F. This temperature range should be maintained under all operating conditions. The temperature gauge is graduated into 100°, 180°, and 220° ranges. Avoid moving coach, if conditions permit, until temperature is in 140° range. If engine overheats (220°) "HOT ENG" tell-tale lights and alarm sounds. MOTO-GARD system will stop engine approximately 30 seconds after the tell-tale illuminates.

GENERATOR INDICATOR

The generator indicator (page 4) shows three positions. With pointer in center or "CHARGING" position, generator is charging. With pointer in left segment "NOT CHARGING," generator is not supplying sufficient current. With pointer in right segment "NOT CHARGING," generator circuit is open which might be caused by master circuit breaker opening, or broken wire.

AIR PRESSURE BUILD-UP

Do not race engine to build up air pressure. (Not over 1/3 throttle.) The "LOW AIR" tell-tale will illuminate and the alarm will sound until air pressure is above 54-66 lbs.

It is extremely important that air pressure be brought up to 70 lbs. before coach is moved. Air pressure not only operates brakes, but also operates the air suspension system.

ENGINE SPEEDS

The most satisfactory and economical operation of the engine will be obtained by selecting the transmission gear speed that will permit engine to maintain speeds of 1500 rpm minimum to 2000 rpm maximum, with engine throttle fully open. Do not use full throttle when operating at less than 1500 rpm.

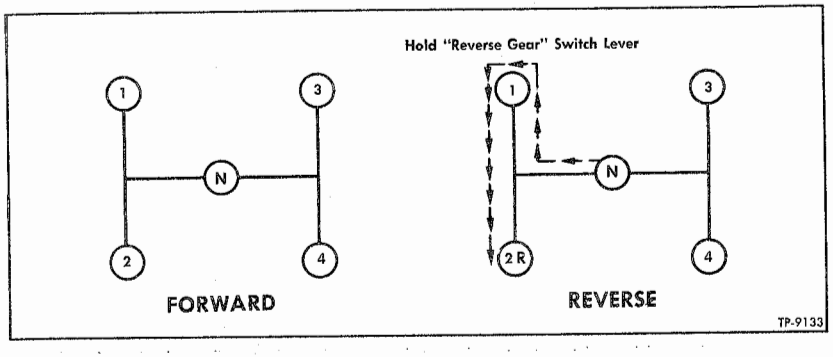
"Lugging" is operating the engine under 1500 rpm with throttle fully opened—or under any condition where black smoke can be noticed from the exhaust. AVOID LUGGING.

USING ENGINE AS BRAKE

The GM Diesel engine is an effective brake in checking vehicle speed when going down grades. Braking effect of the engine increases with its speed; however, the maximum speed must not exceed 2000 rpm. Engine, running at governed speed, will safely hold vehicle going down a grade in the same gear required to go up the grade.

When descending grades with the accelerator in released position, the governor will automatically shut off fuel supply to the injectors. This will allow engine to attain maximum braking effort at all engine speeds up to 2000 rpm.

USE OF TRANSMISSION



Transmission has four forward speeds and one reverse. Shift is made into the various forward speeds with a conventional shift lever. Reverse position in transmission is automatically selected when "REVERSE GEAR" switch is held in position. This switch is located on left switch panel in front of operator (page 4).

LOW TO HIGH. Double-clutching method is recommended when shifting from first to higher gears. Progressively shift from 1st to 4th; do not skip speeds. It is not necessary that top speeds be quickly reached. Hold the highest road speed in the proper gear which will maintain an engine speed of 1500 to 2000 rpm without lugging. Select gears for best operation.

HIGH TO LOW. Always shift into the next lower gear before engine begins to labor or lug. Make use of the lower gears when ascending or descending a grade, or in snow or mud. Always progressively shift into lower gears, using double-clutching method. Proper use of gears will minimize engine lugging. Use same gear to go down a grade as is used to go up.

REVERSING

With coach completely stopped, depress clutch pedal, then move transmission shift lever from neutral into first position.

While holding "REVERSE GEAR" switch in position, move shift lever to reverse position (normally 2nd position). Coach can then be reversed by releasing clutch pedal and accelerating as necessary.

To shift from reverse, the coach must be completely stopped. With clutch pedal depressed, move shift lever from reverse to first position, and then into neutral. It is not necessary to position "REVERSE GEAR" switch when shifting out of reverse.

USE OF BRAKES

Air brakes on this coach are applied by depressing the brake treadle located on toe-board to the left of the accelerator pedal (page 3). Varying degrees of brake application are obtained by varying the distance the treadle is depressed.

Applying Brakes

The most effective braking can be obtained by making original brake application as hard as speed and road conditions permit. The application pressure should then be gradually reduced as speed is reduced. In this manner, only a slight pressure remains in the brake chambers at end of stop.

Do not apply brakes lightly at first, and then increase application pressure as speed decreases. This method not only requires more time for a stop, but final high pressure will produce a severe final stop.

Do not "fan" the brake treadle. This causes poor performance and wastes air pressure.

When brake treadle is depressed stop light switch functions to light stop lights. The tell-tale, "STOP," on right switch panel (page 4) lights. Failure of tell-tale to light indicates defective stop light bulb or shorted circuit.

AIR PRESSURE

Air pressure must be at least 70-75 lbs., before air brakes can develop their full effectiveness. Air pressure also operates air suspension system. The operator should observe the air gauge frequently. When air pressure drops below 54-66 lbs., the "LOW AIR" tell-tale will light and alarm will sound. Coach should be stopped, and cause for air loss determined. Manual pressure on the treadle will not operate the brakes without air pressure.

HAND BRAKE

Hand brake is applied by hand brake lever at left of operator (page 3). Hand brake should always be applied whenever coach is parked, and when operator leaves coach. Hand brake should not be used for normal braking; however, it can be used to assist in stopping coach in cases of emergency. When hand brake is applied, "HAND BRAKE tell-tale will light. Tell-tale is mounted on right switch panel in front of operator (page 4).

USE OF LIGHTS

Light switches controlling external and internal lights are mounted on the right switch panel in front of the driver and to left of driver (page 4). In some instances, a switch on the panel controls several lights other than indicated by markings opposite switches.

"HEAD LAMPS." Toggle switch has two positions, on and off. When switch is turned on, the foot operated selector switch (on floor board) is energized. Operation of the foot-controlled selector switch selects either the fog lights or head lights. The tell-tale, marked "FOG," lights when fog lights are selected. When head lights are selected, a foot controlled switch (on floor board) can be operated to select high or low beam. When high beam is selected, tell-tale marked "HI BEAM" is illuminated.

"MARKER." Toggle switch has two positions, on and off. When switch is turned on, the following lights are illuminated:

Night Lights (inside at rear)
Instrument Panel Light
Emergency Door Light
Right and Left Front and Rear Markers
Michigan Markers (Front and Rear)
Right and Left Taillights
Rear License Lights
Reading Lights — each reading light can be turned on and off with individual switches.

"SIGN." Toggle switch has two positions, on and off. When switch is turned on front destination sign is illuminated as well as side destination sign, when used.

"GENL READ." Toggle switch has three positions; however, only the position marked "GENL" is used.

"GENL."—General illumination lights on both sides are illuminated.

"OFF" (not marked). — With handle of switch lever straight out, general lights are off.

"DRIVERS LIGHT." Two-position toggle switch located on panel to left of driver (page 4) controls operators light just above operator.

"SEAT LIGHT." Control aisle lights at seats.

BAGGAGE COMPARTMENTS. Baggage compartment lights are controlled by automatic switches at each compartment.

ENGINE COMPARTMENT. Engine compartment light at rear is controlled by switch on compartment panel (page 17).

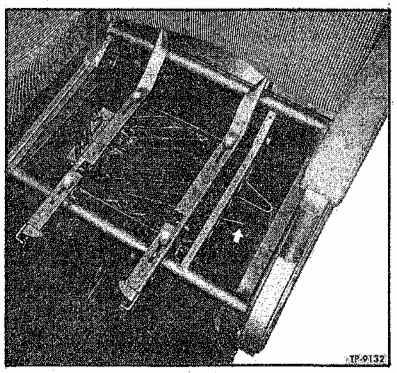
HEATING AND AIR CONDITIONING

The following instructions apply specifically to the systems furnished in the standard Greyhound coach and manufactured by Tropic-Aire, Inc.

CONTROLS

Heating and air conditioning controls used by the operator are mounted on a panel to the left of the operator as shown on page 4. A second control panel similar to the operators panel is located inside the air conditioning compartment in the left side of the coach. This panel is for use in starting, stopping and testing equipment at the compartment. To protect against accidental starting from the driver's station while the unit is being serviced, the compartment panel contains a safety switch which prevents starting from the driver's station. If the unit cannot be started by the operator's controls, this switch should be checked and placed in the "ON" position.

Recirculating Air Inlet



Outside air is admitted into the underfloor heating and cooling ducts through openings on each side of body below forward side windows.

A recirculating air inlet is located under the aisle seat cushion of the second seat from front on right and left sides. A manually operated damper in each of these inlets can be opened or closed to admit or restrict outside air. Access to damper controls is at aisle.

During normal use of either the heating or cooling system, the dampers should remain open to permit maximum circulation of outside air. In the event of extremely cold weather when initial warm-up of the coach is difficult, the dampers may be closed to assist in initial warm-up.

The dampers should, however, be opened as soon as coach is warmed to insure proper fresh air intake.

OPERATING HEATING SYSTEM

When heating system is in operation, inside temperature of the coach is automatically regulated without attention from the operator. Place "BLOWER SWITCH" in "LOW" position ("MASTER SWITCH" in "HEATING" position) and "THERMOSTAT" switch to "ON" position.

Temperature in coach is controlled by setting of "Selector" switch on Operator's Control Panel (See page 4). This control has a range of approximately 8°F from 70°F to 78°F.

If necessary, a small door at left of defroster heater compartment can be opened. This will direct heated air toward operator's feet when defroster is placed into operation as previously explained.

To shut off heating system, place "BLOWER SWITCH" ("MASTER SWITCH") in "OFF" position. The heating system serves as a "reheat" in conjunction with the air conditioning system when the "THERMOSTAT CONTROL" switch is "ON" and the air conditioning system is running. In case of trouble with the heater control valve or thermostat, or when the main engine cooling system is to be drained without draining the heaters, turn off gate valves in engine compartment as explained on page 14.

VENTILATION

If use of heating or cooling system is not required, ventilation can be obtained in the coach in the following manner:

1. Make sure that main coach engine is running. NOTE: In some coaches the blowers are blocked out when main engine is not running to avoid draining batteries.

2. Place "BLOWER SWITCH" in "HIGH" position for full speed blower operation or "LOW" position for reduced speed ("MASTER SWITCH" to "COOLING" or "HEATING" position).

3. In addition to mechanical ventilation, above described, outside air can be admitted at front of coach through a screened opening into defroster heater compartment. Manually operated damper at left of compartment under dash can be positioned to regulate amount of air entering coach. Push lever forward to open. Pull rearward to close.

4. The forward half of entrance door window and driver's window may also be opened. Also see page 26.

OPERATING AIR CONDITIONING

The following instructions apply to Tropic-Aire air conditioning system:

1. Before air conditioning engine can be started, the safety switch in the air conditioning engine compartment must be placed in "ON" position.

2. During operation of air conditioning system, outside air intake dampers must remain open as previously explained. Keep windows closed. Do not leave entrance door open for excessive periods.

3. Place air conditioning "IGNITION SWITCH" in "ON" position if coach has this switch. Place "BLOWER SWITCH" in "HIGH" or "LOW" position ("MASTER SWITCH" in "COOLING" position). "AC STOP" tell-tale, on left switch panel in front of driver (page 4), will illuminate and remain lighted until air conditioning engine starts.

4. Press air conditioning engine "START" button. Also press "CHOKE" button if engine is cold. Do not hold "START" button for over 10 to 15 seconds at a time. Release button as soon as engine starts. If engine starts within the 10 to 15 second period and stops as soon as button is released, failure may be due to heat build-up in engine. The engine can be made to run by holding in the starter button which then overrides the high water temperature control cutout switch. Running the engine for 30 to 45 seconds will usually circulate sufficient water through the radiator to reduce engine temperature to normal.

5. If air conditioning engine fails to start in reasonable time turn "IGNITION SWITCH" to "OFF" ("MASTER SWITCH" to "OFF" position) and report condition for correction.

6. If "AC STOP" tell-tale lights during operation, air conditioning has stopped due to one of the following conditions: Engine low oil pressure, engine overheated, or out of gasoline. Turn "IGNITION SWITCH" to "OFF" position ("MASTER SWITCH" to "OFF" position).

7. If air conditioning engine stops and "AC STOP" tell-tale does not light, the tell-tale bulb has burned out, excessively high or low refrigerant pressure exists, or an open circuit exists. Place "IGNITION SWITCH" in "OFF" position ("MASTER SWITCH" in "OFF" position).

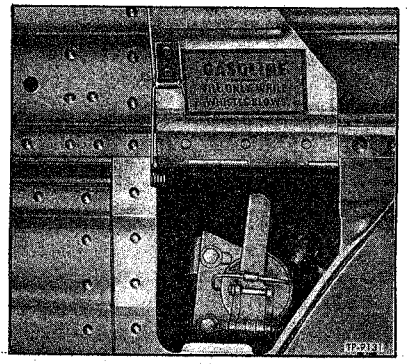
8. If coach becomes too cold or too humid turn temperature selector switch to "WARMER" position.

9. "THERMOSTAT CONTROL" SWITCH MUST BE ON AT ALL TIMES FOR BOTH HEATING AND COOLING.

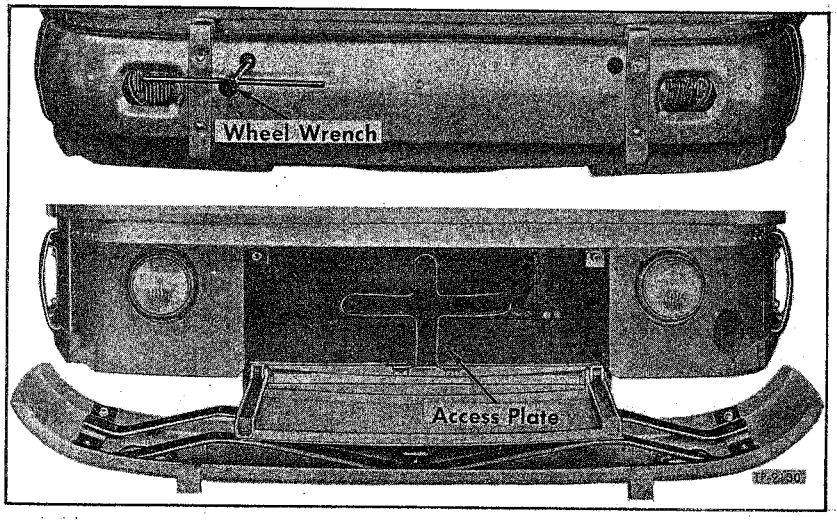
AIR CONDITIONING ENGINE FUEL AND WATER

Air conditioning fuel filler cap is accessible after access door on right side of coach is lifted. Under side of access door is labeled "GASOLINE – FILL ONLY WHILE WHISTLE BLOWS."

Air conditioning engine radiator filler cap is accessible after access door on left side is lifted.



SPARE TIRE COMPARTMENT



Spare tire and wheel is stowed in compartment behind front bumper. Small access door in floor of compartment can be opened to inflate spare tire. With the vehicle wheel wrench, unscrew two bumper supporting bolts. Front bumper and compartment door may then be lowered as shown in illustration.

ELECTRICAL SYSTEM CIRCUIT BREAKERS

All circuits in the electrical system are protected by circuit breakers, all of which are automatic reset type except the charging system master circuit breaker. There are no fuses in the system. The circuit breakers are located in the circuit breaker panel to left of driver, and in the regulator compartment.

Whenever a short exists in a circuit protected by an automatic reset type circuit breaker, action of the circuit breaker opens the circuit, causing protected lights to go out or the system to cease functioning. After the circuit breaker element cools, the circuit will again be closed. As long as the short exists, action of circuit breaker will intermittently open and close the circuit protected.

If it is determined that a short exists in a circuit by the action of a circuit breaker, switch should be turned off to the circuit if possible, and immediate measures be taken to correct the shorted condition.

If the charging system master circuit breaker (in regulator compartment) breaks the charging circuit, the generator indicator pointer will go to right segment marked "NOT CHARGING" (page 22). The circuit breaker, which is manual reset, should not be reset until cause of short is determined and corrected.

ANTI-FREEZE

Engine cooling system should be protected with anti-freeze solutions for temperatures below 32°F. Only ethylene-glycol type solutions should be used. The chart shown below includes only the engine cooling system and heating system, and does not include air conditioning engine cooling system.

Lowest Expected Temp. (Fahr.)	Ethylene-Glycol Required
+10°	18½ qts.
0°	24
−10°	27
−20°	30½
−30°	35

Above is based on 73½ quart capacity.

TOOLS AND SAFETY EQUIPMENT

Standard vehicle tools such as jack and wheel wrench are stowed in container mounted on inside of tool compartment door. Compartment, located at left front corner of coach (page 6), is unlatched as described on page 7. Do not stow tools loose in compartment.

Safety equipment is stowed in compartment inside of coach at front. Standard safety equipment consist of flares, fusee, flags, fire extinguisher, axe, and spare bulb container. This equipment may vary according to operating company regulations.

LIGHT BULBS

Quantity	Location	Trade No.	C.P.	Contact
2	Headlight (Sealed Beam)	4430	45-35 Watt	—
6	Gauge Panel	67	3	S.C.
2	Rear License Plate	89	6	S.C.
2	Front Corner Marker	89	6	S.C.
2	Rear Corner Marker	89	6	S.C.
6	Michigan Marker	67	3	S.C.
3	Front Destination Sign	90	6	D.C.
12	Tell-tale Lights & Switch Bulbs	57	1.5	S.C.
1	Emergency Door	53	1	S.C.
6	Seat Lights (Special)	57	1.5	S.C.
1	Front Step Light	1141	21	S.C.
2	Taillights	67	3	S.C.
5	Baggage Compartments	93	15	S.C.
3	Engine Compartment	93	15	S.C.
1	Air Cond. Engine Compartment	93	15	S.C.
1	Drivers Light	93	15	S.C.
2	Night Light (Blue)	67M	3	S.C.
2	Fog Lights	1011	32	S.C.
1	Spot Light	1141	21	S.C.
2	Front Direct. Lights	1141	21	S.C.
2	Stop Light & Rear Direct.	1141	21	S.C.
40	Reading Lights	93J	15	S.C.
24	General Lights	93J	15	S.C.
1	Lounge Seat Reading Lamps	93J	15	S.C.
1	Freon Receiver Tank Bulb (Air Cond.)	93	15	S.C.

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