

operator's manual



56008

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MC8 Crusader

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TO THE DRIVER

This manual has been prepared to give you the necessary information to successfully operate the CRUSADER MODEL MC-8 Intercity Coach with a **standard** or **automatic transmission** installation.

To obtain the most satisfactory coach performance and assure your passengers maximum safety and comfort, complete knowledge of your coach and its correct operating practice is important.

This manual contains information useful in normal operation or when emergencies or abnormal conditions occur. Any malfunction which interferes with satisfactory operation of the coach should be reported to responsible service personnel for immediate attention, particularly if safety may be affected.

DRIVING CONTROLS

All hand and foot controls used in the normal operation of the coach, and all gauges, tell-tale lights and switches are located in the driver's compartment. They are so arranged as to be conveniently reached by you while in the driver's seat.

These, as well as other controls and equipment which you may need to use under abnormal or emergency conditions, are described and illustrated throughout this manual.

Information is included concerning minor service and maintenance procedures with which you should be familiar.



MOTOR COACH INDUSTRIES, INC.

PEMBINA □ NORTH DAKOTA □ U.S.A.

IN CANADA—

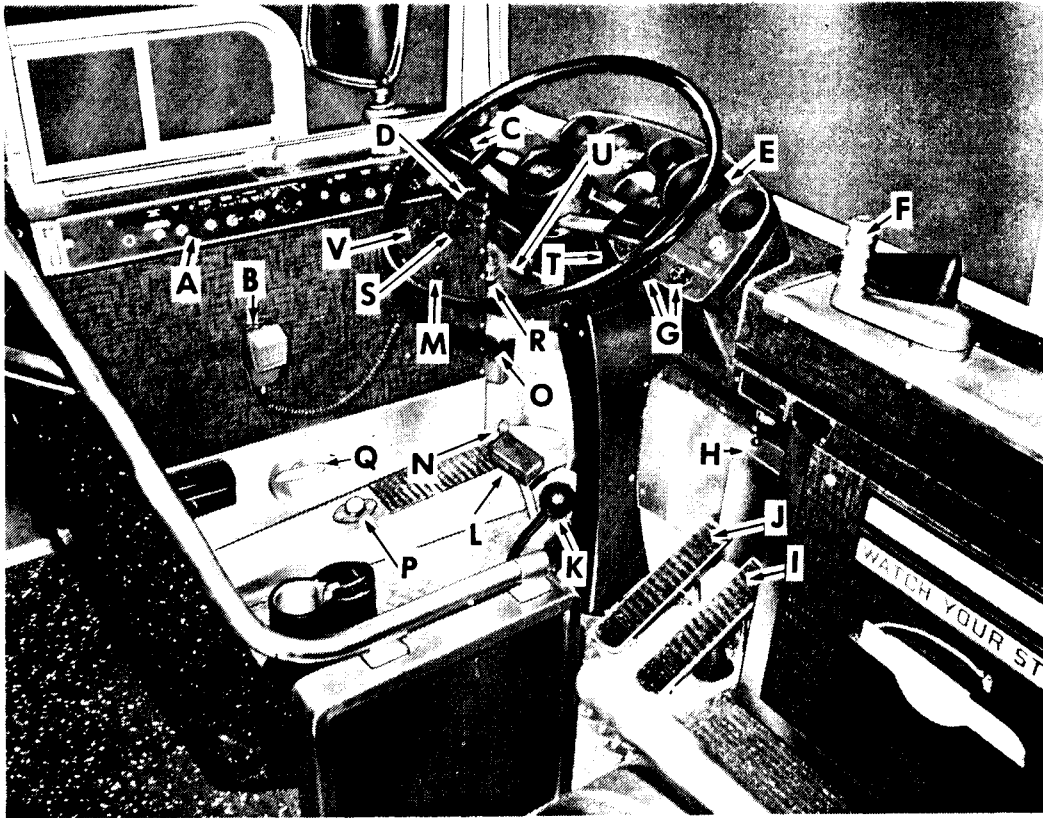
MOTOR COACH INDUSTRIES LIMITED

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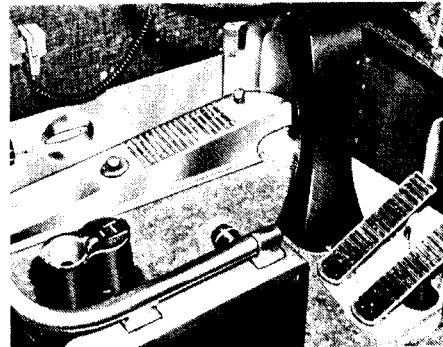
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OPERATOR'S COMPARTMENT



The above operator's compartment applies to a coach with either a standard or automatic transmission except symbol letter "L" (Clutch Pedal) which is not applicable to an automatic transmission and symbol letter "K" (Gear Shift Lever) which is a range selector lever when an automatic transmission is installed.



- | | |
|---|---------------------------------|
| A. SWITCH PANEL..... | See Page 6. |
| *B. P.A. SYSTEM/ MICROPHONE | Used to address passengers. |
| C: HORN BUTTON..... | Sounds electric horn. |
| D. DIRECTIONAL SIGNAL SWITCH LEVER | Used to signal turns. |
| E. INSTRUMENT PANEL ... | See Page 4. |
| F. ENTRANCE DOOR CONTROL HANDLE | Opens and closes entrance door. |

*Optional

- G. WINDSHIELD WIPER CONTROLS..... Controls windshield wiper motors.
- H. ENTRANCE DOOR LOCK OVERRULE SWITCH Releases door air lock if it fails to do so when door control handle is operated.
- I. ACCELERATOR PEDAL . Controls engine speed.
- J. BRAKE PEDAL Applies service brakes.
- K. GEAR SHIFT LEVER Selects transmission gear for standard transmission only.

RANGE SELECTOR LEVER ... FOR AUTOMATIC TRANSMISSIONS ONLY. SEE PHOTO

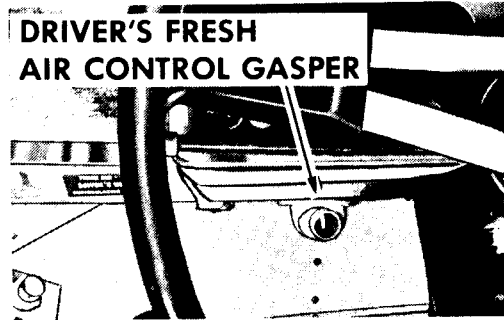


- L. CLUTCH PEDAL Engages and disengages engine clutch with standard transmissions only.
- *M. P.A. SYSTEM VOLUME CONTROL..... Adjusts P.A. System.
- N. HEADLIGHT DIMMER SWITCH Selects headlights high or low beam.
- * FOGLIGHT SWITCH (NOT SHOWN) NEXT TO HEADLIGHT DIMMER SWITCH Controls foglights.
- O. SLOTTED FASTENER KEY Opens all compartments closed with slotted fasteners.
- *P. AIR HORN VALVE Sounds air horn.
- Q. DRIVER'S HEATER WATER VALVE..... Controls water flow to driver's heater and defroster.
- R. TURN LIGHT FLASHER . Operates turn signal lights.
- S. DASH LIGHT CONTROL Controls instrument panel gauge lights.
- T. WINDSHIELD WASHER CONTROL..... Operates windshield washers.

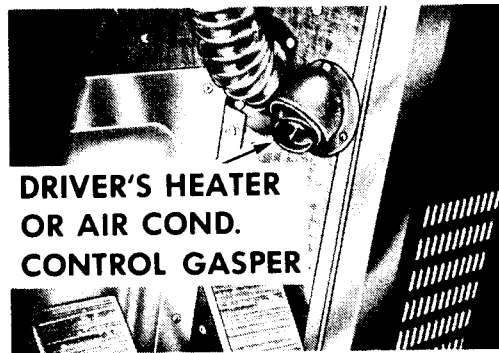
*Optional

- U. **DRIVER'S HEATER AIR CONTROL** Selects fresh or recirculated air into driver's heater/ defroster system.
- V. **ILLUMINATION CONTROL** Controls instrument & switch panel legend lights.

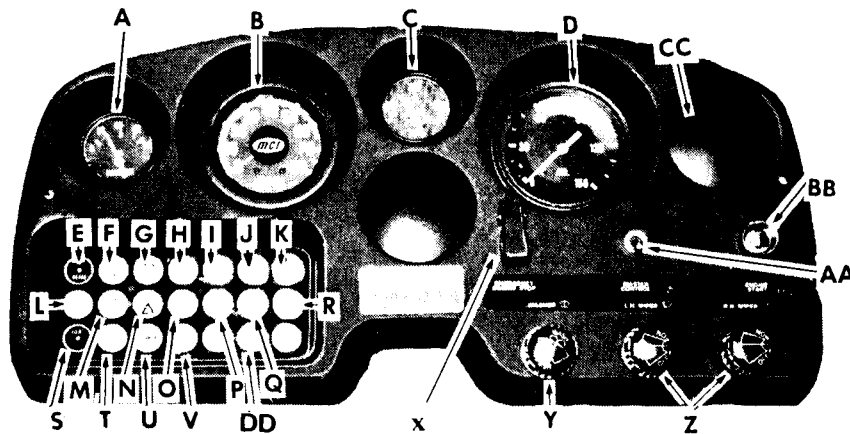
- W. **DRIVER'S FRESH AIR GASPER**
When opened, allows fresh air into driver's compartment.



- X. **DRIVER'S HEATER OR AIR COND. GASPER**.....
When opened, allows selected heated or cooled air into lower driver's compartment area.



INSTRUMENT PANEL



- A. **OIL PRESSURE GAUGE** . Indicates oil pressure.
- B. **SPEEDOMETER** Indicates vehicle speed.

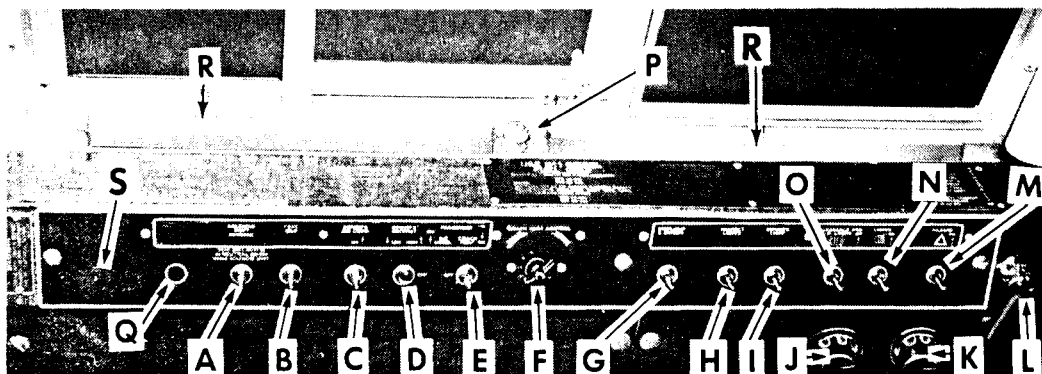
*Optional

| | |
|---|---|
| C. WATER TEMP. GAUGE.. | Indicates engine temperature. |
| D. AIR PRESSURE GAUGE . | Indicates coach air system pressure. |
| E. HEADLIGHT HI-BEAM TELL-TALE | Glowes when headlight hi-beams are on. |
| F. "HOT ENG" TELL-TALE | Flashes and buzzes when engine overheated. |
| G. "LOW OIL" TELL-TALE | Flashes and buzzes when oil pressure too low. |
| *H. "LOW WATER" TELL-TALE | Flashes and buzzer operates when water level too low. |
| I. "LOW AIR" TELL-TALE | Flashes and buzzes when coach air pressure too low. |
| J. TRAILING AXLE BELLOWS LOW AIR TELL-TALE | Glowes when air pressure low in trailing axle bellows. |
| K. "EMERG. BRAKE" TELL-TALE | Flashes when emergency brakes are applied. |
| L. "A/C HI-LO" TELL-TALE | Glowes or flashes when air conditioning system malfunctions |
| M. "TURN LIGHT" TELL-TALE | Flashes when turn signals are on. |
| N. "HAZARD WARNING" TELL-TALE | Flashes when hazard warning is operated. |
| *O. "LOW FUEL" TELL-TALE | Glowes when fuel supply is low. |
| P. "B.U. LITE" TELL-TALE | Flashes when back-up lights are on. |
| Q. "NOT GEN." TELL-TALE | Glowes when generator not charging. |
| *R. "LAV. EMERG." TELL-TALE | Glowes and buzzes if emergency button in lavatory is pressed. |
| S. "HEAT ON" TELL-TALE | Glowes when heating system operating. |
| T. "STOP LIGHT" TELL-TALE | Glowes when both rear stoplights are on. |
| *U. "RETARDER" TELL-TALE | Glowes when switched on. |

*Optional

- *V. "FIRE ALARM"
TELL-TALE Glows and operates buzzer.
- X. "EMERG. STOP" SWITCH Stops engine if master control switch in "OFF" position fails to do so.
- Y. WINDSHIELD WASHER CONTROL Operates windshield washers.
- Z. WINDSHIELD WIPER CONTROLS Controls windshield wiper motors.
- AA. "MASTER CONTROL" SWITCH Allows operation of engine and accessories when in "ON" position. Stops engine in "OFF" position.
- BB. STARTER BUTTON & ENGINE OVERRULE Engages starter and in emergency press button and hold to overrule automatic engine shutdown controls if necessary to move to safety if automatic controls stop engine.
- *CC. FUEL GAUGE Indicates amount of fuel in tank.
(NOT SHOWN)
- *DD. "FOGLIGHT" TELL-TALE Glows when switched on.

SWITCH PANEL



- A. SOLENOID SHIFT REVERSE Engages reverse solenoid for shift into reverse gear **with standard transmission only.**
- B. FAST IDLE Engages engine fast idle.

*Optional

| | |
|---|---|
| C. DRIVER'S AIR CONDITIONING | Controls driver's air conditioning system. |
| D. DRIVER'S HEATER/ DEFROSTER FAN SWITCH | Controls driver's heater and defroster fans. |
| E PASSENGER AIR COND/HEATING | Controls air conditioning and heating system. |
| F. COACH HEAT CONTROL | Controls interior temperature. |
| G. STEPLIGHT AND CHIME | Illuminates step light and allows use of passenger chime. |
| H. INDIRECT LIGHTS | Controls interior indirect lights. |
| I. DRIVER'S LIGHT | Controls light above driver's compartment. |
| J. ILLUMINATION CONTROL | Controls instrument and switch panel legend lights. |
| K. DASH LIGHT CONTROL | Controls instrument panel gauge lights. |
| *L. LAVATORY DOOR KEY | Locks or unlocks lavatory door. |
| M. "HAZARD" SWITCH | Operates all front and rear turn signal lamps. |
| N. HEADLAMPS | Controls headlights. |
| O. CLEARANCE AND IDENTIFICATION LAMPS | Controls exterior clearance, identification, license, tail and destination sign lights. Also interior aisle and running lights. Allows passenger to turn on prefocused reading light. |
| P. VENT CONTROL KNOB | Opens or closes air vent. |
| *Q. EMERGENCY BRAKE RELEASE SWITCH (NOT SHOWN) | NOTE: Coaches prior to Unit No. 31843 only In an emergency to release parking brakes push & hold to overrule the parking brakes. |
| R. AIR DEFLECTOR | Directs air flow to driver or driver's window. |
| *S. TRAILING AXLE UNLOADING SWITCH ... (NOT SHOWN) | When engaged unloads air pressure from trailing axle bellows from 35 P.S.I. to 15 P.S.I. |

*Optional

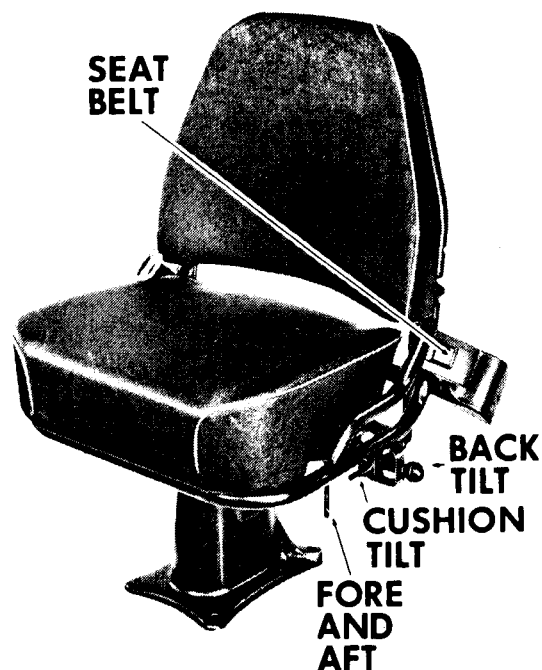
ALARM SYSTEM

The coach is equipped with an alarm system of "TELL-TALE" lamps and in some cases a buzzer signal which immediately warns the driver of any abnormal operating conditions. The "TELL-TALE" lamps are located on the instrument panel in front of the driver.

| TELL-TALE LIGHT | BUZZER | CONDITION |
|-------------------------|--------|--|
| "LOW AIR" | Yes | Air pressure low |
| "HOT. ENG." | Yes | Engine overheated |
| **"LAV. EMERG." | Yes | Emergency in lavatory |
| "EMERG. BRAKE" | | Emergency brake on |
| "LOW OIL" PRESSURE | Yes | Engine oil pressure low |
| "NOT GEN." | | Generator not charging |
| "HI-BEAM" | | Headlight high beam on |
| **"FOG" | | Fog Lights on |
| "STOP" | | Both rear stop lights on |
| "B.U." | | Back up light on |
| **"FIRE ALARM" | Yes | Overheating (Engine Compt.) |
| **"LOW WATER" | Yes | Low water level |
| **"LOW OIL LEVEL" | Yes | Oil level low |
| **"LOW FUEL LEVEL" | | 12% fuel remaining |
| "TRAILING AXLE BELLOWS" | | Low air pressure |
| "A/C HI-LO" | | If light stays on continuously, system is malfunctioning |

DRIVER'S SEAT

Driver's seat may be adjusted fore and aft by pushing in lock lever located at left front of seat. When seat is positioned, release lever. The seat back may be tilted by pulling the back tilt knob at the left rear side of seat. To return seat back to a forward position, grasp seat back and pull forward while pulling tilt knob. The back of seat cushion can be tilted up or down by grasping the cushion tilt lever at left center of driver's seat and turning forward to lower and backward to raise. Seat may be raised by grasping and firmly pulling seat frame up. To lower, raise seat to highest position then, lower seat to lowest position. From there raise seat to desired height.



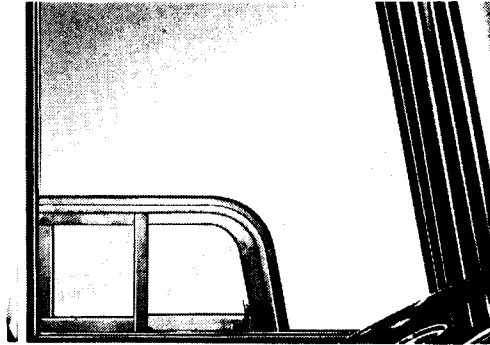
The seat is supplied complete with a retractable seat belt as required by

***Optional**

State and Federal Regulations. The seat belt may be fastened by slowly pulling the buckle over and across the lap to engage the buckle on the tongue. Sudden pulling of the belt will lock the reel. No special adjustment is required as the reel device is self adjusting. If seat belt assembly operation becomes defective, report to maintenance personnel.

DRIVER'S WINDOW

The driver's window has a small sliding section at the lower rear of window. The front section slides rearward to open. The optional drivers window is similar except the unit is double glazed.



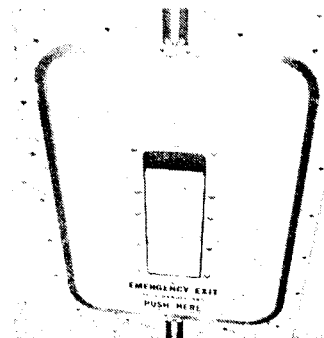
EMERGENCY ESCAPE



All side passenger windows can be opened from the inside for emergency escape purposes. Window sash is hinged at the top and can be opened by pulling out and up on the release bar, then pushing window sash out. Instruction plates are mounted below the sash on release bars at each seat location.

EMERGENCY EXIT HATCH

An emergency escape hatch is located in the roof at the rear of coach. The opening size is 18" x 25". To open, pull handle to unlock and push hatch open. To close, pull handle to open position and pull until hatch is in the closed position. Push handle to lock hatch.



ENTRANCE DOOR CONTROL

The entrance door is provided with an air-operated lock. The door is opened or closed by means of a door control handle on the dash to the driver's right. To open, turn handle clockwise; counterclockwise to close.

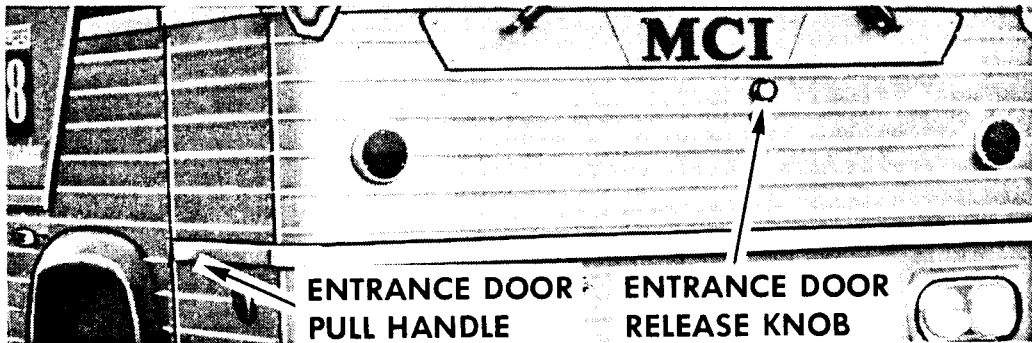
The air lock engages automatically when the door is closed, disengages to open.

In the event that the air lock mechanism does not release when an attempt is made to operate the entrance door handle, depress the overrule switch located under the dash near the center of the coach. This will release the air lock regardless of the position of the door control handle.

IMPORTANT

If air lock fails to engage when entrance door is closed, immediately advise service personnel at next service stop. Do not attempt to engage while coach is in motion.

The entrance door can be opened from outside the coach by means of a release knob located below front windshield. After pushing release knob, pull door handle and open.



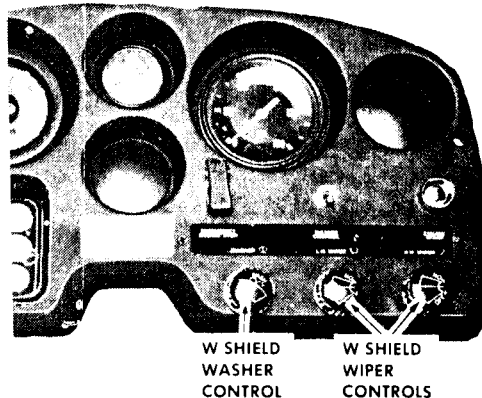
WINDSHIELD WIPERS & WASHERS

Two air-operated windshield wipers are provided, controlled by two small knobs situated at the lower right side of the instrument panel. Each knob controls its corresponding windshield wiper.

To operate wipers, turn control knob for wiper desired toward direction indicating "ON" until required speed is reached. To stop wipers, turn knob to "OFF" position.

Air operated windshield washers have an independent washer control knob situated on the lower right side of the instrument panel alongside the two windshield wiper knobs.

To operate windshield washers, press control knob. The washers will operate for a period of time while the control knob is held in this position. Release knob for approximately 1/2 minute to allow pump to refill before operating windshield washer again. Turn windshield wipers on when using windshield washers. The windshield washer reservoir is located in the left front compartment below driver's floor.



TACHOGRAPH (OPTIONAL)

Some coaches are equipped with either a self electrical wound "ARGO" or a manual wound "SANGAMO" tachograph. The tachograph is an option in addition to the usual speedometer located in the front instrument panel. It is located in the right rear baggage compartment.

Some coaches are equipped with an optional "ARGO" electronic tachograph which is located on the dash to the left of driver. The tachograph head illumination is controlled by the instrument and dash light illumination switch.

The Tachograph is a recording speedometer indicating driving speed, mileage covered and the time of day.

The speeds driven, the driving and stopping periods and the mileage covered are simultaneously recorded on a wax coated diagram chart that is rotated by the instrument's clock movement.

Refer to Figure 1 (Argo Unit)

SETTING CLOCK & CHANGING CHART

NOTE: It is most important that the tachograph never be opened or closed while the coach is in motion to avoid damaging the chart and the instrument.

1. Open the instrument by turning the key or knob type lock at the top, counterclockwise.

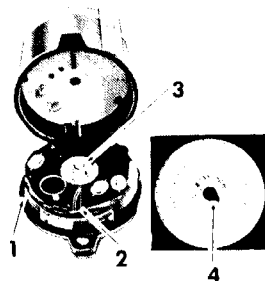
2. Set the time by turning setting wheel No. 1. Fill in name, date, mileage and starting time on chart.

3. To install chart lift clamping lever No. 3, place chart over center hub and flip down clamping lever. Reverse procedure to remove chart.

NOTE: When installing chart, the hours on chart from 1-12 are AM hours. The hours from 13-24 are PM hours. The clock should be set and the chart hours will match the time of day at arrow No. 2. **Example:** 3 P.M. (time of day) should match on chart (15) at arrow No. 2.

4. Insert only charts that are applicable to the Unit 0-80 MPH and refer to center hole No. 4 for proper type (refer to Figure 1).

FIGURE 1



ARGO TACHOGRAPH WITH CHART.
NOTE: CHART MUST HAVE CENTER HOLE AS SHOWN. DO NOT SUBSTITUTE WITH OTHER TYPE CHARTS.

CAUTION: Always keep a chart in the tachograph.

Refer to Figure 2 (Sangamo Unit)

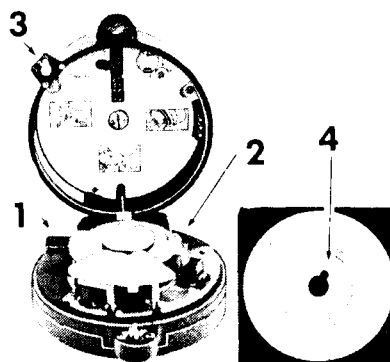
WINDING, SETTING CLOCK & CHANGING CHART

NOTE: It is most important that the tachograph never be opened or closed while the coach is in motion to avoid damaging the chart grid and the instrument.

1. Open the instrument by turning the key or knob counterclockwise.

2. Wind the clock by pulling and pushing the plastic covered lever No. 1 located to the left rear of the clock door assembly.

FIGURE 2



SANGAMO TACHOGRAPH WITH CHART.
NOTE: CHART MUST HAVE CENTER HOLE AS SHOWN. DO NOT SUBSTITUTE WITH OTHER TYPE CHARTS.

Note: Be careful not to overwind the main spring.

3. To set the correct time rotate the metal gear No. 2, located at the right rear of the clock door assembly. Fill in the name, date, mileage & starting time on chart.

4. To install, place chart (face side up) on the chart drive. Close tachograph door and turn key or knob clockwise.

5. When an individual driver record is required the stylus No. 3 selection lever for positions 1, 2 or 3 is used to indicate a change in drivers. The stylus will record events in any of the three positions.

6. Insert only charts that are applicable to the Unit 0-90 MPH and refer to center hole No. 4 for the proper type (refer to **Figure 2**)

CAUTION: If the unit is to be idle and no charts used, a protective paper or chart should always be placed between the styli and recording plate. This will protect the styli when the door is closed.

DESTINATION SIGN OPERATION

Open sight hole and move destination sign to desired designation. Rotate handle counterclockwise to take up slack in mechanism. This will lock upper roller to prevent sign from moving while coach is in motion.

ENGINE OPERATION

Controls necessary to start and stop engine from the operator's compartment are mounted on the instrument panel in front of driver. These controls are:

"MASTER" switch: must be in the "ON" position when starting engine. When switch is pushed "OFF" the engine will stop.

"STARTER" switch: is of the "momentary-on" type, and must be held in the depressed position to engage the starter. When released, switch will return to normal position.

"EMERGENCY STOP" switch: is of the "momentary-on" type used to stop engine if it fails to do so when the "MASTER" switch is moved to the "OFF" position. The switch must be pushed up to operate the emergency stop mechanism.

"ENGINE OVERRULE" is obtained by holding the "STARTER" switch in the depressed position (on coaches equipped with optional automatic engine shutdown system). Switch should be held only long enough to move coach to safety.

"GAUGES AND TELL-TALE LAMPS" Oil pressure and temperature gauges, together with "LOW OIL" and "HOT ENG." tell-tale lamps, are located in instrument panel in front of operator. A buzzer sounds when "HOT ENG." or "LOW OIL" tell-tale flashes.

STARTING THE ENGINE

1. Make sure that the parking brake control button is pulled up, applying air-operated parking brakes.

2. Make sure the remote control switch in rear panel is set for front operation. Transmission shift lever should be in neutral position.

3. Place "MASTER" switch in the "ON" position.

4. Press "START" button to engage starter. Release button when the engine starts.

NOTE: When the "MASTER" switch is in the "ON" position the "LOW OIL" tell-tale lamp will flash and buzzer will sound. The "LOW AIR" tell-tale lamp will flash and buzzer will sound if air pressure is below 60-65 lbs. and the low air tell-tale lamp will flash and buzzer will sound until the air pressure of 100 lbs. is reached. If the air system pressure is reduced below 100 lbs., the buzzer and tell-tale will not come on until the air pressure is reduced below 60-65 lbs. Lamps will remain illuminated and buzzer will sound after the engine has started until oil pressure is over 3 lbs. and air pressure is increased above 65 lbs. and up to 100 lbs. Generator lamp and buzzer will remain on until air pressure is over 65 lbs. and up to 100 lbs. The "Gen" tell-tale and buzzer will not come on until air pressure is reduced below 60-65 lbs.

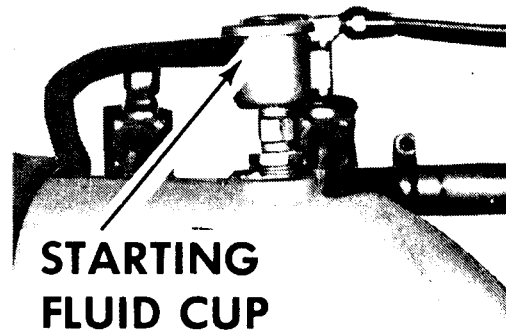
CAUTION:

Do not engage starter continuously for longer than 15 seconds at a time for starting purposes of engine only. Allow starter motor to cool before a second attempt. Continuous use of the starter without allowing a cooling period may damage the starter motor.

5. Refer to "EMERGENCY CONDITIONS" for instructions regarding starting engine at rear of coach.

COLD WEATHER STARTING

The coach is equipped with a cold weather starting fluid cup, located on top of the engine blower housing. If temperature is below 35 degrees F., it may be necessary to use starting fluid capsules. Use one 7 c.c. capsule at temperatures above zero, or two at lower temperatures. **DO NOT USE MORE THAN TWO FLUID CAPSULES.** To use capsule, lift cover of starting fluid cup, insert capsule, force down over pointed tube in cup and squeeze until all fluid enters cup. Remove capsule and start engine.



FIRE WARNING

Starting fluid used in the capsules is highly inflammable, poisonous and is an anaesthetic: Do not smoke while using or handling capsules, and keep away from flame or high temperatures. Avoid inhaling fumes produced by starting fluid.

ENGINE IMMERSION HEATER (OPTIONAL)

Some coaches are also equipped with an electric engine immersion heater to assist in cold weather operations. A receptacle is located to the right of the rear engine service door for a 110 volt AC power source. The engine heater should be used whenever the coach is parked for an extended period in cold weather and a suitable power source is available.

CAUTION

Only 110 volt AC power should be used, and the power cable must be grounded (three-prong) type.

Make sure power cable is disconnected before moving coach.

WARM-UP

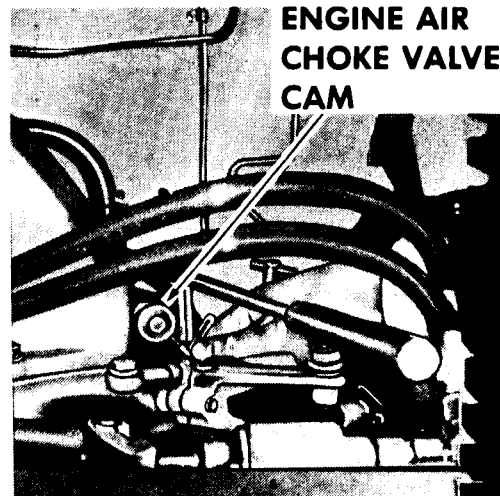
After starting the engine, operate it at a fast idle speed by engaging "FAST IDLE" switch on driver's panel. Air-operated parking brakes must be on before the "FAST IDLE" control will operate; and should be kept applied during warm-up. Observe gauges and tell-tale lamps frequently during warm-up and subsequent operation. If abnormal conditions develop stop engine immediately and determine cause.

STOPPING ENGINE

1. Apply parking brake and place transmission shift lever in neutral.
2. Idle engine for about 30 seconds, then move the "MASTER" switch to the "OFF" position.

ENGINE EMERGENCY STOP

The "EMERG. STOP" switch on the instrument panel is provided for stopping the engine ONLY when placing the "MASTER" switch to the "OFF" position fails to stop the engine. When the "EMERG. STOP" switch is moved to the "ON" position, it energizes a solenoid which releases a cam on the engine air choke valve permitting it to close, shutting off the air supply to the engine.



IMPORTANT

When the "EMERGENCY STOP" switch has been used to stop the engine, the choke valve must be reset manually before the engine can be operated. Rotate cam until shoulder engages cam lock.

The emergency stop is to be used ONLY when pushing the "MASTER" switch fails to stop the engine. Do not re-start until the reason for loss of control has been corrected.

AIR PRESSURE

The brakes, air suspension system and other systems and controls of the coach depend on adequate air pressure for their operation. Air pressure in the coach air system is therefore extremely important.

After the engine has been started, "LOW AIR" tell-tale light will flash and buzzer will sound until air pressure is built up to 60-65 lbs. and up to 100 lbs. To assure safe braking, DO NOT MOVE COACH UNTIL AIR PRESSURE IS AT LEAST 100 LBS.

If during the normal operation the "LOW AIR" tel-tale light flashes and buzzer sounds it will indicate that air pressure has reduced below 60-65 lbs. and that air pressure is too low, stop the vehicle at once and determine reason for pressure loss.

ENGINE OIL PRESSURE

Engine oil pressure gauge is mounted on instrument panel in front of operator. Normal readings with engine hot are: IDLING: 3-4 lbs. minimum: GOVERNED SPEED: 30 lbs. minimum. Engine must not be operated when oil pressure falls below 30 lbs. at governed speed under full load. If oil pressure drops below a safe level, the "LOW OIL" tell-tale light will flash, buzzer will sound and automatic shut-off system (if so equipped) will stop the coach engine. Refer to "ALARM SYSTEM."

ENGINE TEMPERATURE

A gauge marked "WATER TEMP." is located on the instrument panel to indicate engine temperature. The most efficient operating temperature range is 170-185 degrees F. If possible, do not move the coach after starting a cold engine until temperature reaches at least 140 degrees F. If the engine overheats the "HOT ENG." tell-tale light on the instrument panel will flash and warning buzzer will sound. If the coach is equipped with automatic shut-down system, the controls will stop the coach engine.

GENERATOR

A tell-tale lamp marked "NOT GEN." is located on the instrument panel to indicate when generator is not charging. With "MASTER" switch on and engine not running or with engine running and generator not charging, this light will be illuminated. If the light goes on during normal operation, proceed as outlined later in this manual under "EMERGENCY CONDITIONS." Note: The generator will not charge with air pressure below 65 lbs. The generator will not charge until the air is built up to 100 lbs. When air pressure drops below 100 lbs. but not under 65 lbs., the generator will continue charging.

ENGINE ALARM SYSTEM

The engine is equipped with an alarm system to signal low oil pressure, low air pressure and high engine temperature. "LOW OIL" "LOW AIR" and "HOT ENG." tell-tales are located on the instrument panel. A buzzer sounds if any of these conditions occur. Some coaches have an automatic shut-off system inter-connected with the engine alarm system to shut off the engine in case of oil pressure drop or abnormal temperature rise. This feature is provided to prevent damage to the coach engine if either of these abnormal conditions arise.

The action of the automatic shut-down controls can be overruled in order to move the coach to a safe location by use of the "STARTER-OVERRULE SWITCH" on the driver's instrument panel. If engine is shut off automatically, turn "MASTER" switch to "OFF" position momentarily and switch on again. Depress "STARTER-OVERRULE SWITCH" to start coach and hold after engine is started in order to move coach to a safe location.

Under no circumstances should the engine be operated longer than absolutely necessary after the engine has been stopped by automatic shut-down controls.

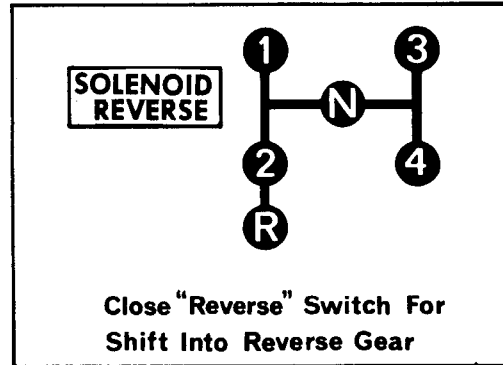
USE OF TRANSMISSION

(STANDARD)

CAUTION: When parking vehicle, gearshift should always be left in "NEUTRAL POSITION".

The transmission has four forward and one reverse speeds. A conventional shift lever located to the right of the operator's seat is used to select forward transmission gears. The shift into reverse gear is made by using the shift lever and an electric solenoid controlled by the "REVERSE" switch on the driver's switch panel.

Always start coach in motion at the lowest possible engine speed to prevent unnecessary clutch wear.



REVERSE SHIFTING

The "MASTER" switch must be in the "ON" position before "REVERSE" switch will be operative.

To shift into reverse gear stop coach completely. Depress clutch pedal and, while holding the "REVERSE" switch in the "ON" position, move shift lever into the second gear position from neutral.

To shift out of reverse gear stop coach completely. With clutch pedal depressed, move gear shift lever into the neutral position.

It is not necessary to use the solenoid switch when shifting out of reverse.

CAUTION

Solenoid switch should be used only when gear shift lever is in neutral position, otherwise possible locking of gears may result.

UP SHIFTING

Always start the coach in motion first gear, then change progressively into second, third and fourth. Do not skip gears. Double-clutching is recommended when making each gear change. Remain in each transmission speed until the engine reaches full governed speed before shifting into the next highest gear.

DOWN SHIFTING

Double-clutching in downshifting is recommended. Always change to a lower gear to avoid engine "lug". Lower gears should be used in driving up or down grades, when operating in ice, snow or mud.

Lower gears should be used when going down grade in order to make use of the engine as a brake in controlling vehicle speed. The same transmission gear should be used to go down a grade as would be used in clim-

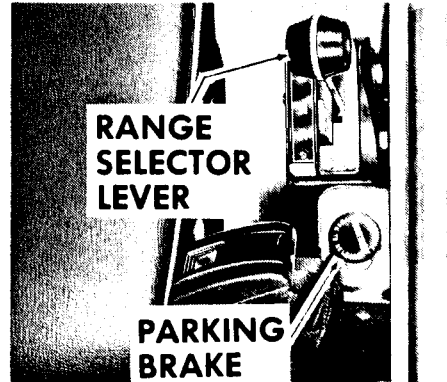
bing it. However, the engine should never be allowed to operate at a speed higher than the maximum governed speed.

Use color bands on speedometer for maximum speeds in each gear.

USE OF TRANSMISSION AUTOMATIC (OPTIONAL)

CAUTION: When parking vehicle, gearshift should always be left in "NEUTRAL POSITION."

The operation and driving of the MC-8 coach with an automatic transmission is similar to that of a normal automobile automatic transmission. In order to attain better vehicle performance proper ranges should be selected for speeds to be driven depending on driving conditions. Each forward range starts in 1st gear and automatically shifts up thru the gear range selected.



N—NEUTRAL RANGE is used when starting the engine. If the engine starts in any other position, the neutral start switch is malfunctioning. Use this position and apply the parking brake when vehicle is left unattended with the engine running.

CAUTION:

When shifting from neutral to a drive range, the engine should be at idle speed.

D—FOURTH RANGE is used for normal driving conditions. Upshifting and downshifting is automatic, depending on speed and load.

3—THIRD RANGE is used when traffic conditions do not permit top speed. Upshifting and downshifting is automatic.

2—SECOND RANGE is used in congested traffic. Upshifting and downshifting is automatic. It can also be used effectively on downgrades to take advantage of engine braking.

1—FIRST RANGE is used when starting the vehicle with an extra heavy load, pulling through mud and snow, or driving up steep grades. It may also be used in very heavy or slow moving traffic.

R—REVERSE RANGE is used for backing the vehicle. The vehicle should be completely stopped before shifting from a forward range to reverse or vice versa. Reverse has only one gear position.

USING THE ENGINE TO SLOW THE VEHICLE

To use the engine as a braking force, shift to the next lower range. However, if the vehicle is exceeding the maximum speed of that lower range, use the service brakes to reduce speed before the downshift is made.

CAUTION:

PARKING BRAKE: There is no "park" position in the tran-

mission shift pattern. Therefore, apply the parking brake to hold the vehicle when it is unattended. Be sure the selector lever is at neutral position.

CAUTION:

TOWING COACH: Before towing a coach, the drive line must be disconnected. This applies to coaches that are towed on the road to a repair station. Engines cannot be started by towing or pushing. Only a solid type link can be used between towing vehicle and coach. A safety chain should also be attached between vehicles.

AUTOMATIC TRANSMISSION OIL LEVEL CHECK

Transmission oil level should be checked at regular service intervals by maintenance personnel.

OIL SPECIFICATIONS

Only Dexron[®] automatic transmission fluid is recommended.

CAUTION:

INDICATIONS OF ABNORMAL CONDITIONS: Any indication of possible abnormal conditions should immediately be brought to the attention of maintenance personnel. The transmission should not be operated when it is overheating or over 250° F, when clutches are slipping, or when noises indicate damage.

USE OF SERVICE BRAKES

The coach is equipped with air-operated brakes which are applied using the foot pedal to the left of the accelerator pedal. The amount of foot pressure applied to the pedal determines the extent of brake application.

The best braking action is obtained by making the initial application gradually to obtain the degree of braking required, then gradually reducing foot pressure as the speed of the coach is reduced, so that only slight pressure remains in the brake chambers at the end of the stop.

Stop lights on the rear of the coach are automatically applied when the brake pedal is depressed. A tell-tale light on the dash shows when both rear lamps are functioning. If the tell-tale light does not go on when the brake pedal is depressed, check for faulty rear stop lights at once.

IMPORTANT

“Fanning” or “Pumping” the brake pedal is not recommended. This practice does not increase the effectiveness of the brake system, but wastes air and causes unnecessary wear on brake parts. Brake chamber and line pressure is not increased, instead reservoir and line pressure is reduced.

Before the brakes can develop their full effectiveness, coach air system pressure must be at least 100 lbs. Observe the air pressure indicated on the air pressure gauge at frequent intervals during operation. If the “LOW AIR” tell-tale light flashes and buzzer sounds, stop vehicle immediately and determine cause before proceeding.

PARKING & EMERGENCY BRAKES

The coach is equipped with air-operated parking and emergency brakes. The control valve for parking and emergency brakes is located to the right of the driver's seat on a bracket attached to the grab rail. Operation of the system is as follows:

NORMAL OPERATION: The control valve button should be pushed in allowing service brakes to operate normally.

PARKING BRAKES: Pull control valve button all the way up. This applies rear wheel brakes until control valve button is pushed in.

EMERGENCY OPERATION: If normal application of service brakes fails to stop the coach, emergency brakes can be applied by pulling the control valve button all the way up. This procedure will produce a sudden, severe stop and should **ONLY** be used in an emergency.

LOSS OF AIR PRESSURE: A warning tell-tale light will flash and buzzer will go on when air pressure drops below 60-65 lbs. Cause of pressure loss should be corrected before further operation.

NOTE: Air pressure gauge on dash does not show parking brake reservoir pressure. If pressure on gauge drops during operation, **four parking brake applications can still be made.** Parking and emergency brakes will not apply automatically until parking reservoir pressure drops below 40 lbs. If pressure on gauge drops below 60-65 lbs. during operation, "LOW AIR" tell-tale will flash and warning buzzer will sound. **Coach should be stopped immediately** and cause of air loss corrected before proceeding.

IMPORTANT

BEFORE STARTING ENGINE:

1. Make sure that parking brake is applied (control knob at your right is "up").
2. Gearshift lever in "neutral."
3. **DO NOT** Depress clutch when starting engine. (Except on coaches with "Auto" Trans).

BEFORE MOVING COACH:

1. Air pressure gauge must read 100 lbs. or more.
2. Move parking brake control knob "down" to release brakes.
3. Make **FULL** service brake application, holding pedal down for 3-5 seconds. Parking brakes should release.
4. If brakes do not release, reduce air pressure to below 75 lbs. by pumping brake pedal. Operate engine until compressor cuts out, then repeat above procedure.

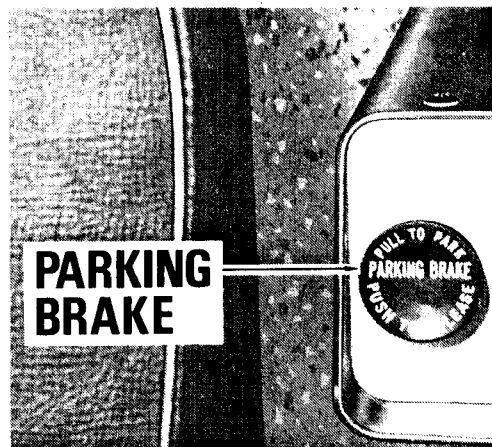
**DO NOT ATTEMPT TO BREAK COACH FREE
IF BRAKES FAIL TO RELEASE**

PARKING (GEARSHIFT IN NEUTRAL)

1. Always apply parking brakes (control knob up) before leaving coach. Brakes will remain applied even if coach air pressure is lost.

RELEASE OF PARKING BRAKE: Air pressure should be at least 100 lbs. Push control button all the way down, then make full service application, holding down for 3-5 seconds. Brakes should then be completely released.

IF BRAKES FAIL TO RELEASE when above procedure is followed, reduce air system pressure to below compressor cut-in point by pumping brake pedal and operating engine until air compressor cuts out. Then repeat normal parking brake release procedure.



USE OF LIGHTS

All interior and exterior lamps except headlamps can be illuminated with "MASTER" switch in either position.

HEADLAMPS

Headlamps are controlled by a switch on the panel to the left of the driver. High or low headlight beam is selected by means of a floor-mounted dimmer switch. When high beams are on, a tell-tale lamp marked "HI BEAM" on the instrument panel will glow.

HEADLAMPS, CLEARANCE & I.D. LAMPS: Headlamps, clearance and I.D. lamps are interconnected so that they are on at all times that headlights are on. Tail and license lights are also on. Lights operate as follows:

| LIGHTS ON | MASTER SWITCH | HEADLIGHT SWITCH | CLEARANCE & I.D. LIGHT SWITCH |
|---|---------------|------------------|-------------------------------|
| Clearance Lights, I.D. and Tail Lights Only | On or Off | Off | On |
| Headlights, Clearance & I.D. Lights and Tail Lights | On | On | On or Off |
| Headlights Only | NOT POSSIBLE | | |

BACK-UP LAMPS: Back-up lights go on automatically when the shift to reverse is made. Tell-tale on dash indicates when back-up light is "ON".

LIGHT SWITCHES

STEP LIGHT & CHIME: Passengers can signal driver using pull cord-operated chime and entrance stepwell light will go on when door is opened only when this switch is in the "ON" position.

CLEARANCE I.D., SIGN AND READING LIGHTS: located on switch panel, energizes clearance, I.D., sign, aisle, Running, Tail, License, Lavatory, Instrument Panel Gauge, Switch Legend Illumination and reading light circuits. Individual reading lights cannot be turned on by passengers unless the CLEARANCE, I.D., SIGN AND READING LIGHT switch is placed in the "ON" position.

INDIRECT LIGHTS: Indirect lights are controlled by switch marked "INDIRECT LIGHTS" located on the switch panel. Lights can be illuminated with master switch in any position.

LAVATORY LIGHTS: Closing and locking the lavatory door from the inside illuminates the ceiling and "OCCUPIED" sign lights. The lavatory night light is controlled by the Clearance and I.D. lights switch.

BAGGAGE COMPARTMENT LIGHTS: Baggage compartment lights are illuminated automatically when any of the baggage compartment doors are opened.

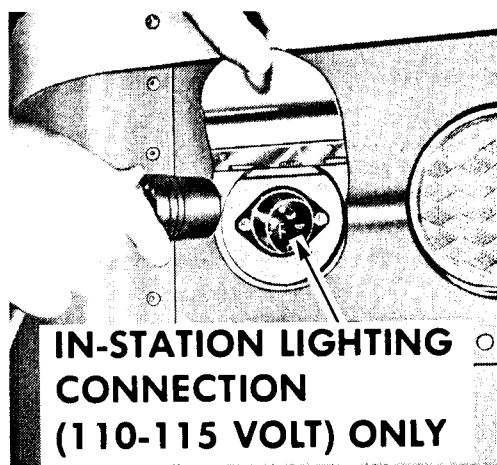
DIRECTIONAL SIGNAL SWITCH: Turn indicator lights are controlled by a switch lever on the left side of the steering column. Moving this lever in the direction of the intended turn will operate the corresponding front and rear flashing signal lights. When turn lights are on, a tell-tale light will flash in the instrument panel to the left of the steering column.

HAZARD WARNING FLASHER SWITCH: Located to the left of driver and when turned on flashes all turn lights simultaneously. Tell-tale glows with this switch in the "On" position.

IN-STATION LIGHTING (OPTIONAL)

Some coaches are equipped with connection to permit use of 110-volt lights when the coach is parked at the terminal.

The receptacle for in-station lights is located above the service compartment door at the left front of the coach. When a power cable is connected at this point, interior fluorescent lights, destination sign and underfloor baggage compartment lights are illuminated. A circuit breaker panel is located on the rear vertical wall of the compartment below the drivers floor. They must be manually reset if they open.



CAUTION

The external connection must be 110 volt 60-cycle AC power only, and the power cable must be grounded (three prong) type.

Make sure power cable is disconnected before moving coach.

HEATING AND AIR CONDITIONING

The coach is equipped with a heating and air conditioning system. A three-position switch located on the driver's switch panel is used to select either heating or air conditioning system operation depending on outside temperature. Moving the switch to the "A/C" position will place the air conditioning system in operation. Moving the switch to the "HEAT" position will operate the coach heating system. In the "OFF" position, neither heat nor air conditioning is operative. The "MASTER" switch must be "ON" and engine running before either system will function.

The "HEAT CONTROL" knob located on the driver's switch panel to the left of the driver is used to select interior temperature within the range of 68°-78°F. Once a temperature is selected the system will automatically maintain this temperature within close limits.

An A/C signal light is located at the front in the driver's instrument panel to the driver's left. A plate mounted above the switch panel at front reads "CAUTION: If Signal Light Flashes or Stays on Continuously Switch A/C Off and Report Condition to Service Department." If this should happen, turn air conditioning system off and do not use until the cause of trouble has been located and corrected by service personnel.

The flow of hot water from the engine cooling system to the heating and air conditioning system can be stopped in an emergency by the use of gate valves located in the engine compartment. See "ENGINE COOLING SYSTEM."

When it is necessary to operate air conditioning system with coach stationary, operate engine at fast idle by engaging the "FAST IDLE" switch on the driver's switch panel.

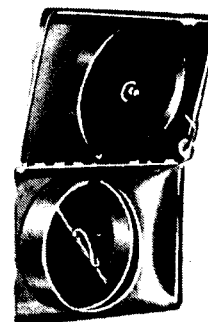
The optional auxiliary A/C evaporator will operate automatically when the main air conditioning system is switched on. The location of this unit is above the rear cross seat at the rear of the left hand parcel rack. It is controlled by its own coach temperature sensing unit.

IN-STATION HEATING & AIR CONDITIONING (OPTIONAL)

Some coaches are equipped with a duct connection to permit heating or cooling of the coach interior from a remote unit while the vehicle is parked at a terminal where such facilities are available. The connection is located at the front of the coach below and slightly to the rear of the driver's window.

A door secured by a latch closes and seals the opening when not in use. **The door must be properly closed and locked during normal operation, otherwise loss of heated or cooled air will result.**

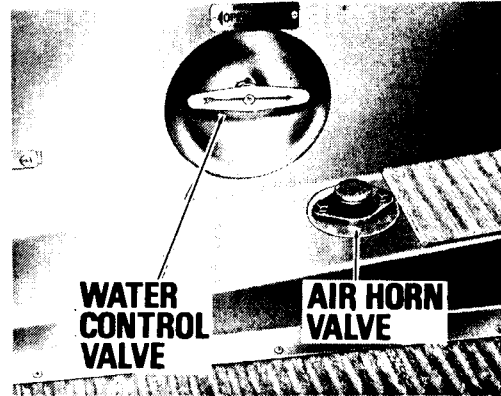
Make sure that the connection has been removed and the door closed and locked before moving coach.



DRIVER'S HEATER AND DEFROSTER

A heater and defroster system is provided for the driver. This system is independent of the main heating system. Fans are controlled by one toggle switch for high and low speeds located on driver's switch panel.

The flow of water to the driver's heater system is controlled by a manual driver's heater water control valve located at the driver's left just above the floor. When the valve handle is in the horizontal position the valve is open; it is closed when the valve is turned clockwise to the vertical position. Partial flow can be obtained by moving the valve handle to an intermediate position.



A control located below the dash to the left of the instrument panel regulates the flow of fresh or recirculated air into the driver's heater system as required.

In the event of water valve failure or to isolate the engine cooling system, the flow of hot water to the driver's heater may be stopped by turning off a small gate valve located toward the rear of the engine at the left-hand side of the engine compartment.

The flow of heated or cooled air to the driver's feet area is controlled by an adjustable gasper located under dash to the right of driver. The air flow to the windshields is continually open to prevent the possibility of fogging.

CAUTION

Avoid too high temperature in the driver's area. This tends to induce drowsiness, affecting your ability to operate the coach safely. It may also affect the temperature in the passenger compartment. See "DRIVER'S AIR CONDITIONING."

DRIVER'S AIR CONDITIONING

The main air conditioning system switch must be in the "ON" position and system in operation to operate the driver's air conditioning system. The driver's air conditioning switch controls the air conditioning in the driver's area only. In humid weather, conditioning system will assist in defrosting the windshields.

CAUTION

The driver's heater and defroster motor fans are controlled and operate independently of the driver's air conditioning system. The motor fan switch has two positions for high or low speed control. To control temperature in the driver's area, with driver's air conditioning on, turn water valve to closed position to lower temperature and open

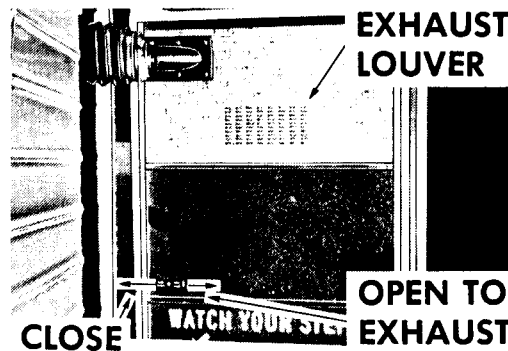
to raise temperature. The water valve is located to the driver's left above the floor. When the driver's air conditioning is switched on, the fans will cut in automatically on low speed with fan switch at "low speed" or "off" position.

NOTE: Refer to "DRIVER'S HEATER AND DEFROSTER" system for introduction of outside or inside recirculated air. The damper for outside air must be closed when the driver's air conditioning system is turned on.

VENTILATION

The operator should always attempt to introduce as much outside air as possible without seriously affecting the operation of the heating or air conditioning systems. It should be remembered that outside air can only enter the coach if air is being exhausted. Also, the interior of the coach should be slightly pressurized to prevent dust and moisture from entering the vehicle.

When outside temperature is very high and maximum cooling is required, all adjustable intakes in drivers area (see Page 4 "U" & "W") and exhaust openings in entrance door should be closed. This is also true in extremely low outside temperatures when maximum heating is needed.



Provision is made to introduce fresh air into the coach heating system. Certain controls are included to regulate the amount of fresh outside air supplied to the air distribution system. Air intakes are provided at each side of the vehicle below the windows through which outside air enters the blowers and is mixed with recirculated air. Fresh air can be introduced through an adjustable intake in the driver's heater and defroster system. (See "DRIVER'S HEATER AND DEFROSTER") and through a "GASPER" located under the dash to the left of the driver.

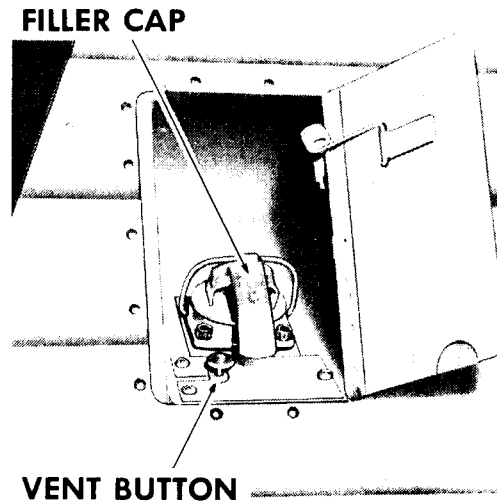
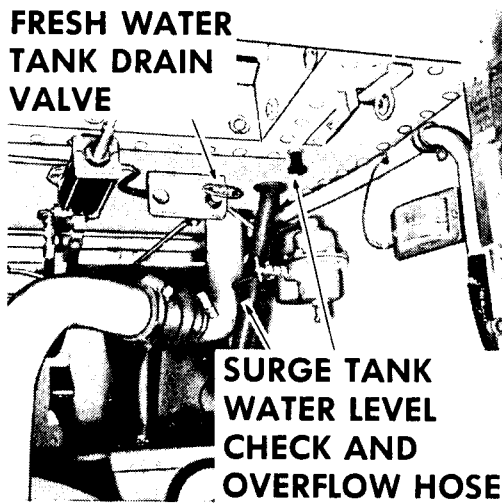
Provision is made for emergency ventilation in case of air conditioning system failure; refer to "Emergency Conditions" elsewhere in this manual.

ENGINE COOLING SYSTEM

CAUTION:

The Heating and Engine Cooling System cannot be completely drained and therefore when replenishing the system a proper mixture of antifreeze and water must be installed to prevent any possible damage to system due to freezing conditions. The coolant capacity is shown under "GENERAL DATA" at the end of manual.

The engine cooling system controls the operating temperature of the coach engine and also provides a supply of heated water for the coach heating system.



(EARLY COACHES ONLY)

The filler cap is located on the right hand side of the coach at the rear above radiator compartment.

On early coaches a water level check cable is located in the right rear engine compartment. To check water level, pull cable, if water does not flow from water level check drain hose, then additional water and or antifreeze is required.

On later coaches a sight gauge is located on the rear face of surge tank. Correct water and or antifreeze level is approximately half way in sight glass.

To add water and or antifreeze, open the radiator filler door, depress the vent button at the lower inside of fill box to relieve pressure, if any and open fill cap. Fill coolant to the required level.

Two gate valves are located in heater lines to separate the heating system from the engine cooling system. This feature is provided for emergency and maintenance purposes.

CAUTION

Cold water and or antifreeze should never be poured into the cooling system when engine is hot. Wait until engine has cooled, then add water and or antifreeze slowly with engine running.

ENGINE CRANKCASE OIL

Engine oil dipstick is accessible through the rear engine service door. Oil filler pipe is at left hand side of coach on engine.

Always check engine oil level with engine at normal operating temperature and with the coach in a level position.

CAUTION

Leave engine stopped for at least three minutes before checking oil level.

To open rear engine service door, turn handle counterclockwise; clockwise to close.

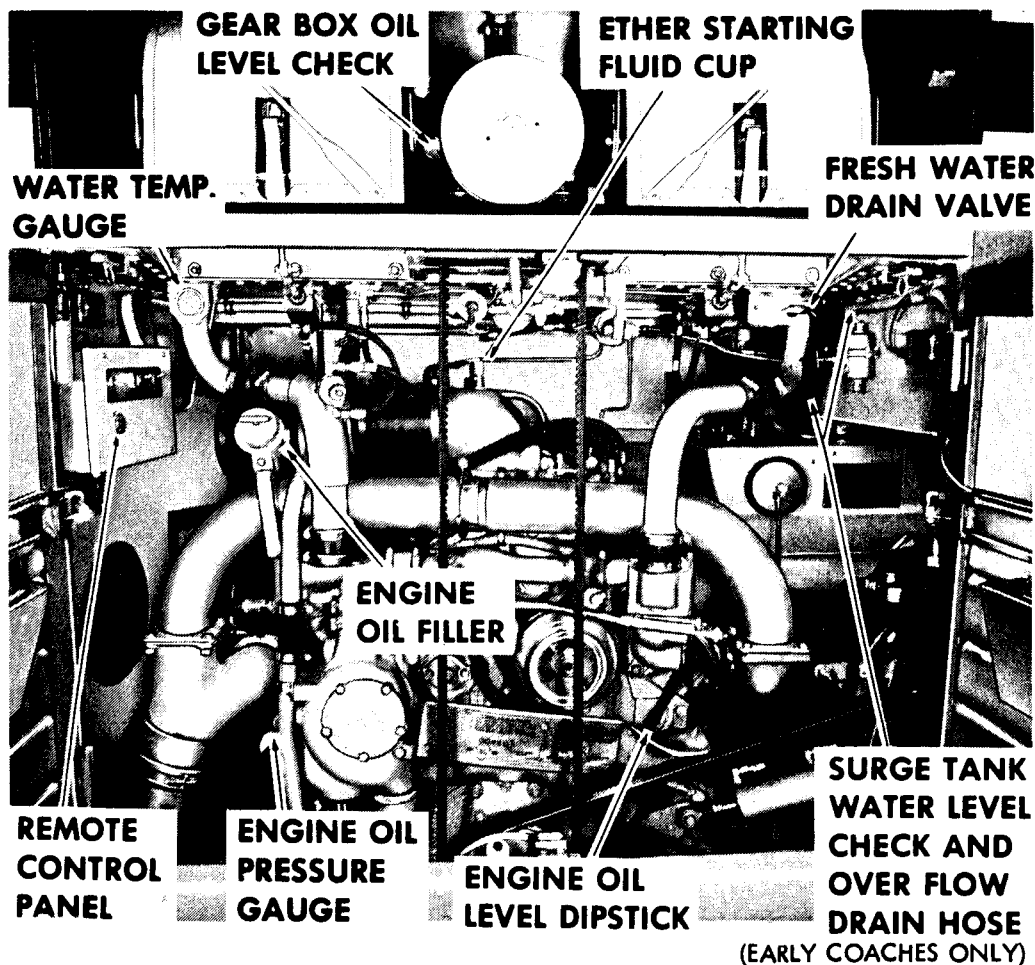
Withdraw the dipstick and wipe clean. Insert dipstick, then withdraw and note oil level. If down to "LOW" mark, sufficient oil must be added to bring level up to "FULL" mark. Add crankcase oil of proper grade and viscosity.

Sight gauges are provided for checking the oil level in the engine cooling blower gear box and the power steering fluid reservoir. Correct level is maintained when oil is at the center of the glass. Levels should be checked occasionally and fluid added if necessary.

ENGINE FUEL OIL

The engine fuel oil tank is accessible through an access door at right side of coach.

The fuel tank is equipped with a device, which whistles while tank is being filled and stops when tank is full. Use only clean diesel fuel of the correct grade. Close fuel tank filler cap and tighten securely after filling.



EXTERIOR COMPARTMENTS

Exterior views on following page identify all exterior compartments and access doors. Method of opening and function of main compartment doors are as follows:

CONDENSER DOOR

Condenser door is located at left side of coach giving access to air conditioning condenser blowers and other components for service purposes

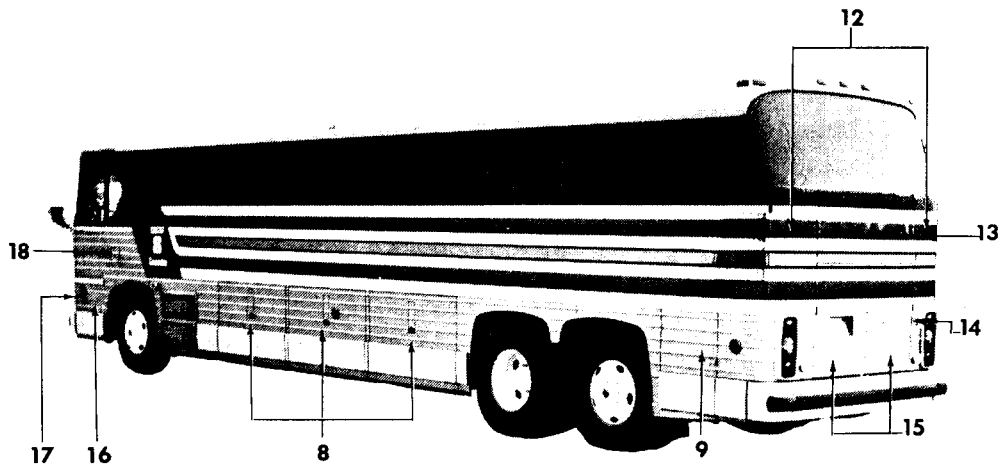
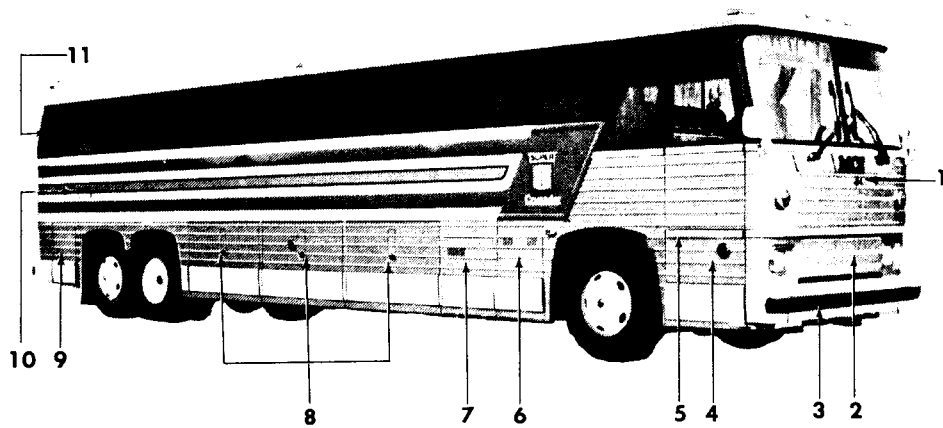
only. It is fastened by four slot-type fasteners and is held in the out position by a hinged metal strap. Break lock on strap before closing door.

TACHOGRAPH COMPARTMENT (OPTIONAL)

On coaches so equipped, the tachograph is reached through the right rear baggage compartment door. The Electronic Tachograph if so equipped is located on the dash to the left of driver.

BATTERY COMPARTMENT

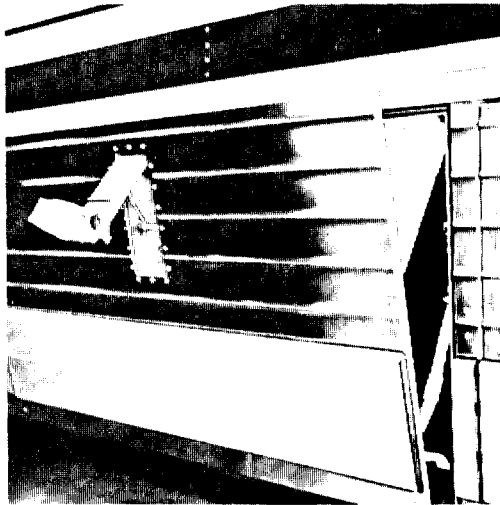
The battery compartment is located on the right-hand side of coach. Access is through a separate compartment door located behind the front wheelhousing. The door is secured by a spring type lock. In the open position it is held by a self spring locking device.



- | | | |
|--|---|--|
| 1. Entrance door release knob | 9. Side engine compartment service doors | 15. Rear engine compartment service doors |
| 2. Front license plate location | 10. Lavatory service panel door (Opt. Equip.) | 16. Left front side compartment door |
| 3. Bumper and spare tire compartment door | 11. Cooling system filler door | 17. In-Station lighting plug door 110V (Opt. Equip.) |
| 4. Entrance door | 12. Radiator compartment doors | 18. In-Station heating door (Opt. Equip.) |
| 5. Entrance door pull handle | 13. Blower compartment door | |
| 6. Fuel tank filler door | 14. Immersion heater plug | |
| 7. Battery and tool compartment door | | |
| 8. Baggage compartment doors (Opt. Equip.) | | |

BAGGAGE COMPARTMENT DOORS

Insert fingers under latch handle, then pull out and up on handle to release latch. To lock, lift up on door latch, push door closed, and push latch down until it snaps into the closed position.



SIDE ENGINE COMPARTMENT DOORS

Side engine compartment doors are located at the right and left rear corners of the coach. Access is gained by turning handle counterclockwise; open door. To close, hold door in closed position and turn clockwise until lock latches. These compartments provide access to right and left hand side of engine.

Engine cooling blower compartment is located above the engine compartment. Access is gained by first opening the rear engine service doors as explained, then pulling down on the two spring-type catches on bottom edge of door. Pull door out at bottom. Reverse procedure to close.

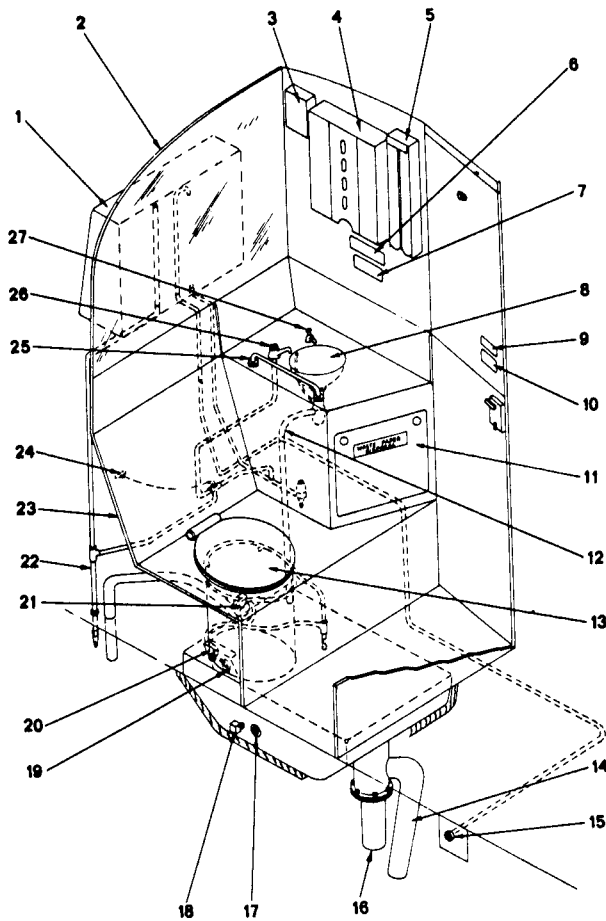
CAUTION

Checks should be made at regular intervals to be certain that the blower compartment door is closed securely. Serious loss of engine cooling capacity may result if the door is not properly latched.

LAVATORY (OPTIONAL)

Lavatory compartment, located at right rear of coach, contains a chemical toilet, wash basin with running water, waste paper container and mirror.

Lavatory compartment ventilation blower runs whenever "MASTER" switch is in the "ON" position. Closing and locking door from inside illuminates the "OCCUPIED" sign on outside of door and illuminates ceiling lamp. Emergency buzzer switch used on some coaches provided with the Lavatory Option is located on wall of compartment with clearly marked instruction plates. When emergency buzzer switch is depressed, lavatory tell-tale lamp on instrument panel illuminates and buzzer sounds.



1. Fresh Water Tank
2. Mirror
3. Deodorizer
4. Towel Dispenser
5. Wet Towel Dispenser
6. Nameplate (waste paper disposal)
7. Nameplate (do not drink this water)
8. Wash Basin
9. Nameplate (lavatory door lock)
10. Nameplate (lock door to turn on light)
11. Waste Paper Container
12. Sink Trap Drain Line
13. Toilet Seat
14. Lavatory Chemical Tank Dump Tube
15. Fresh Water Tank Fill
16. Air Cylinder
17. Sight Gauge
18. Immersion Heater (If So Equipped)
19. Chemical Tank Drain Valve
20. Chemical Tank Flush
21. Exhaust Fan & Motor
22. Overflow Line-Fresh Water Tank
23. Lavatory Seat & Side Wall
24. Fresh Water Tank and Faucet Drain
25. Grab Rail
26. Faucet
27. Soap Dispenser

DRAINING

In the event of engine or heating system failure in freezing weather, tanks must be drained to prevent damage from freezing. Valve necessary to drain tank is located in the rear engine compartment and is accessible when rear service doors are opened.

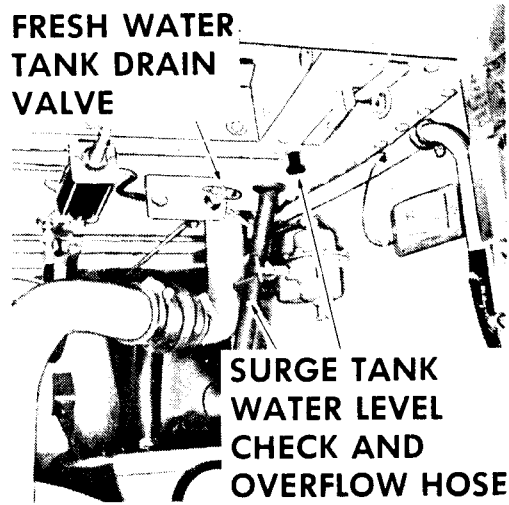
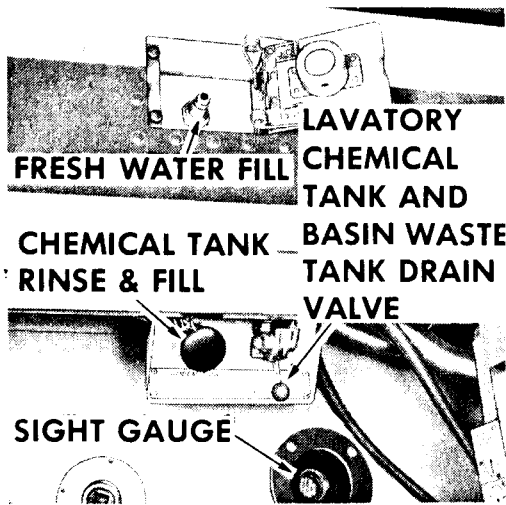
IMPORTANT

Servicing lavatory tanks must normally be accomplished where proper facilities are available. Draining instructions included in this book are for use only in case of an emergency requiring draining of tanks.

Before draining chemical waste tank, if at all possible, position coach over a receptacle or sewer inlet or other facilities to comply with local health regulations. To drain chemical waste tank open lavatory dump air cylinder control valve. This valve can be reached by opening the right-hand side engine service door.

To drain fresh water supply if necessary in freezing conditions, locate water drain line valve control handle mounted in right engine compartment on plate marked "LAVATORY DRAINS." Lever marked "FRESH WATER TANK AND FAUCET" is turned to the left and pulled.

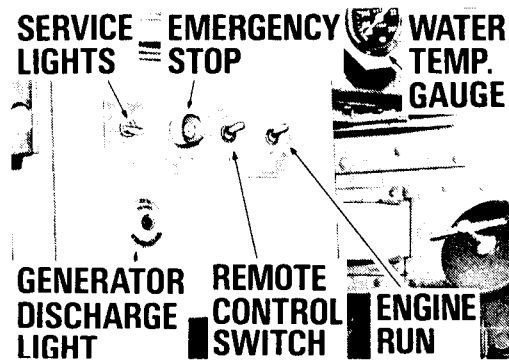
NOTE; After emergency drain, the lavatory should be serviced properly where suitable facilities are available before it is used again. In freezing weather, the chemical waste tank should be charged with 2 gallons of antifreeze solution and 4 gallons of water.



(EARLY COACHES ONLY)

REMOTE CONTROL ELECTRICAL PANEL

The remote control electrical panel used for rear operation of the engine is located in the engine compartment at the left hand side. To gain access to the panel open rear engine compartment doors.



EMERGENCY CONDITIONS

IMPORTANT

Gauges and tell-tale lamps are provided so that the operator can observe the operation and condition of various components and equipment. If abnormal conditions are indicated, **TAKE ACTION AT ONCE** to locate and correct the cause before serious damage can occur. **DO NOT IGNORE** warnings of abnormal operating conditions. During operation, regularly check all gauges and tell-tale lamps.

OPERATION OF ENGINE AT REAR

Switches for starting and stopping the engine at the rear are mounted on switch panel at left side of engine compartment. Open rear engine service doors as directed under "ENGINE-CRANKCASE OIL" to gain access to switch panel.

STARTING ENGINE AT REAR

IMPORTANT: Before attempting to start engine at rear of vehicle make sure transmission shift lever is in neutral and apply parking brake.

1. In operator's compartment place "MASTER" switch in the "ON" position.
2. In the engine compartment, put engine switch in upper position (RUN).
3. Move remote switch to bottom position and hold until engine starts. Use the same precautions regarding use of starter as explained under "STARTING ENGINE."

CAUTION

If necessary to work on engine without engine running, place "REMOTE CONTROL" and "RUN" switches in "OFF" positions. This breaks circuit to front and rear starter and prevents accidental starting of engine.

STOPPING ENGINE AT REAR

To stop engine at rear, place "ENG. RUN" switch to "ENG. OFF" position.

IMPORTANT

In emergency only, if "STOP" switch does not stop engine, push in "EMERGENCY STOP" switch to release air choke valve cam. Reset emergency stop after engine has stopped, as explained under "ENGINE OPERATION."

ENGINE OIL PRESSURE LOW

If during operation the engine oil pressure drops below a safe level, the "LOW OIL" tell-tale light on the driver's instrument panel will go on, and the warning buzzer will sound. If the coach is equipped with automatic shut-off controls, these controls will stop the engine. The automatic shut-off system can be overruled to move the coach to safety. See "ENGINE ALARM SYSTEM."

ENGINE OVERHEAT

If engine becomes overheated during operation, the alarm buzzer will sound and the "HOT ENG." tell-tale will flash. If coach is equipped with automatic shut-off system, the safety control relay will stop the engine. The automatic shut-off system can be overruled if necessary to move the coach to safety as outlined under "ENGINE ALARM SYSTEM." If overheating takes place, check water level of engine cooling system as directed under "ENGINE COOLING SYSTEM" and for other possible causes.

GENERATOR NOT CHARGING

If, during normal operation, the "GEN." tell-tale light goes on, it indicates that the generator is not charging. Turn off all electrical accessories, except driving lights at night, to reduce electrical load on batteries, and obtain service attention as soon as possible.

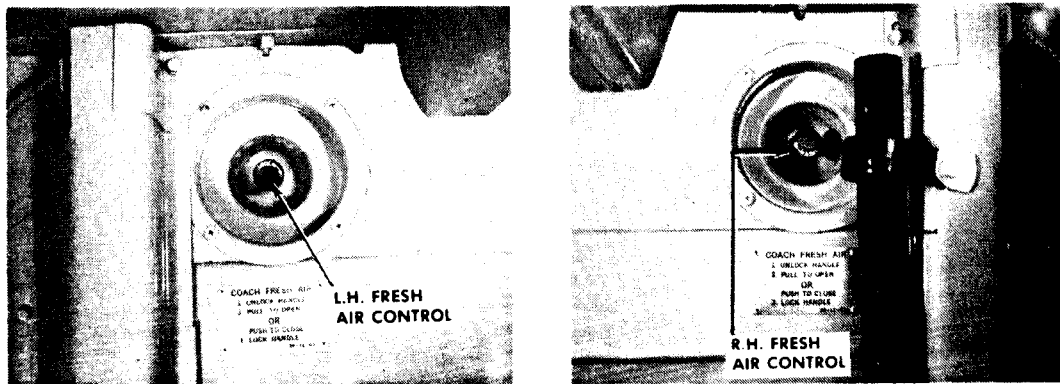
EMERGENCY FLASHING SIGNAL

The coach is equipped with a flashing signal system which flashes all directional signal lights simultaneously to warn traffic in an emergency. The hazard warning flasher switch mounted to the left of the driver is used

to energize this signal system. A tell-tale light flashes when the system is operating.

EMERGENCY VENTILATION

Emergency exhaust can be achieved by opening fully the "FRESH AIR INTAKE" controls in the front baggage compartments.



The emergency ventilation controls are intended for use **only** to enable the vehicle to reach a service point in case of air conditioning system failure. Cause of air conditioning loss should be located and corrected before further operation.

When trouble has been corrected, make sure that emergency ventilation controls are returned to the normal operating positions.

DRAINING LAVATORY TANKS

CAUTION

Servicing lavatory tanks must normally be accomplished where proper facilities are available. Draining instructions included in this book are for use only in case of an emergency requiring draining of tanks. (Refer to "LAVATORY DRAINING" elsewhere in this manual.)

EMERGENCY TRAILING AXLE UNLOAD (OPTIONAL)

A switch is mounted at the rear of switch panel to the left of driver for partially unloading the trailing axle when drive axle requires added weight to provide the necessary traction to move coach in extreme slippery road conditions. A buzzer and low air tell-tale light will stay on to remind the driver to turn off system as soon as conditions permit.

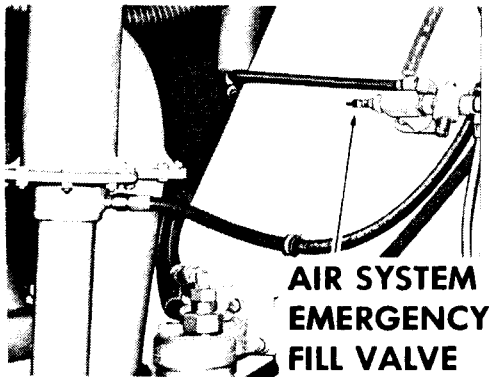
FOGLAMPS (OPTIONAL)

The foglights can be turned on only when the headlight switch is in the "On" position. The foglight switch is located next to the headlight dimmer switch. Note: Headlights automatically are turned off and foglights on, when the foglight switch is pressed. To return to headlights, press foglight switch again.

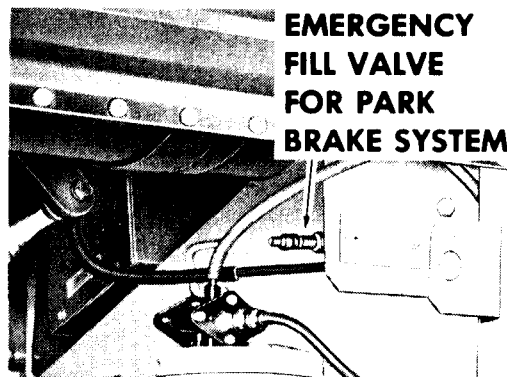
AIR SYSTEM EMERGENCY FILL

If coach air system pressure is low and it is impossible to operate engine, system may be filled from an external air source by attaching an air line to

the "ping" tank located at the right rear of the engine compartment and accessible when the right-hand engine compartment door is open.



**AIR SYSTEM
EMERGENCY
FILL VALVE**



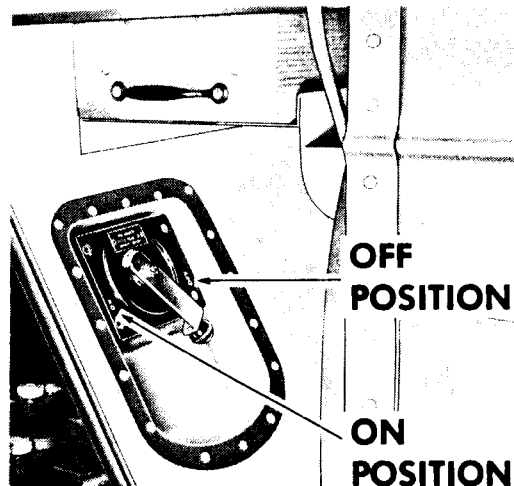
**EMERGENCY
FILL VALVE
FOR PARK
BRAKE SYSTEM**

PARK BRAKE SYSTEM EMERGENCY FILL

Park brake air system may be filled from an external source by applying air to the valve located in the front left side compartment. This will fill the park brake system only.

BATTERY DISCONNECT

A main battery disconnect switch is provided to shut off all electrical supply from the batteries. The switch is located in the compartment ahead of the right hand front baggage compartment. To disconnect batteries, pull knob to "OFF" position.



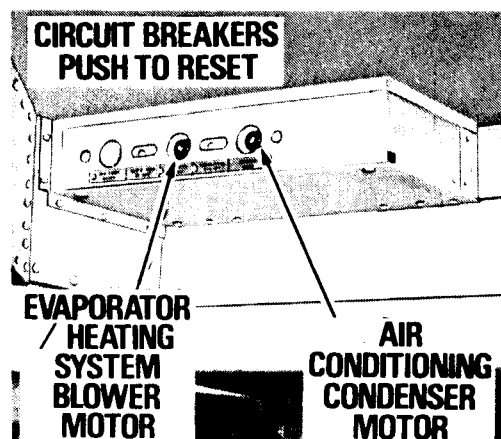
**OFF
POSITION**

**ON
POSITION**

CIRCUIT BREAKERS

All electrical circuits are protected by circuit breakers. The main circuit breaker is automatic and the two large circuit breakers protecting the air conditioning condenser blower motor and heating system blower motor are located at the front of the baggage compartment and can be reached through the left front baggage door.

The two motor circuit breakers must be manually reset, if they open, by pressing the button.



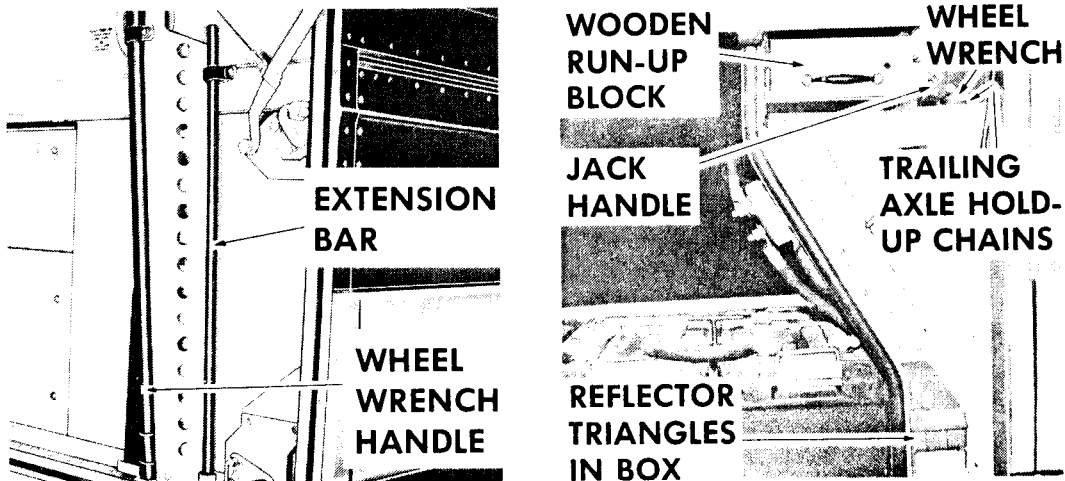
**EVAPORATOR
/ HEATING
SYSTEM
BLOWER
MOTOR**

**AIR
CONDITIONING
CONDENSER
MOTOR**

Smaller circuit breakers of the self-resetting type are located in the junction panel to the left of the operator's compartment. When one of these circuit breakers opens due to a shorted circuit, it will automatically reset itself when the breaker element cools. As long as the short exists, the breaker will continue to open and close intermittently. In this case turn the defective circuit off, if possible, until the cause can be located and corrected.

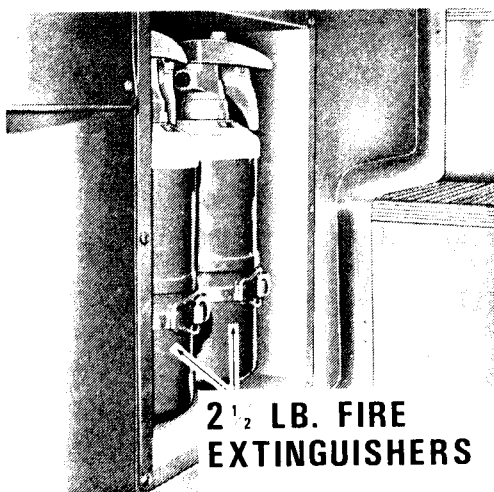
TOOLS AND SAFETY EQUIPMENT

The wheel wrench handle and extension bar are mounted in the right front baggage compartment and the jack handle, wheel wrench, wooden run up block and trailing axle holdup chains are located ahead of the right front baggage compartment. The jack is located behind the spare wheel in the tire compartment behind the front bumper. The spare wheel must be removed to gain access to the jack.



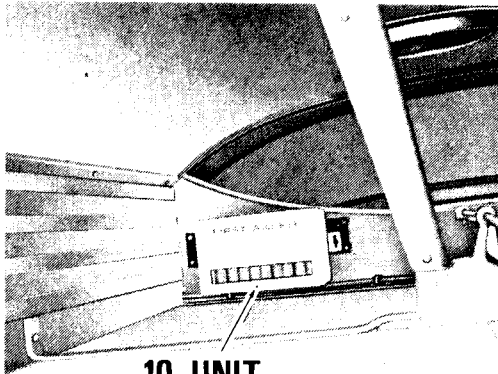
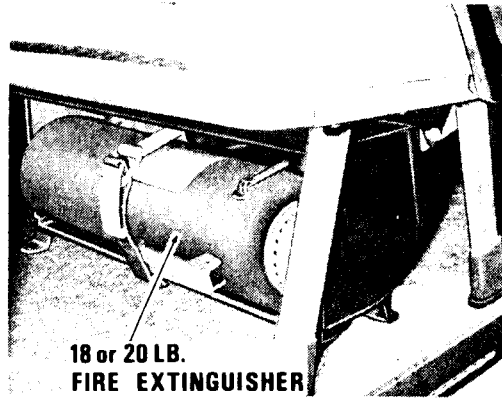
Three reflector triangles in a container are located in the lower compartment ahead of the right front baggage compartment.

Optional reflector or oil type flares in addition to the triangular reflectors are in a box mounted to the inside left front side service door.



The standard 2-1/2 lb. unit fire extinguishers are mounted in a compartment in the rear wall of stepwell. To remove unit from this area, pull latch to release, disengage catch and pull out unit.

The optional 18 or 20 lb. fire extinguisher is installed under the right hand front passenger seat. To remove unit, lift latch to release, disengage catch and pull out unit.



**10 UNIT
FIRST AID
KIT**

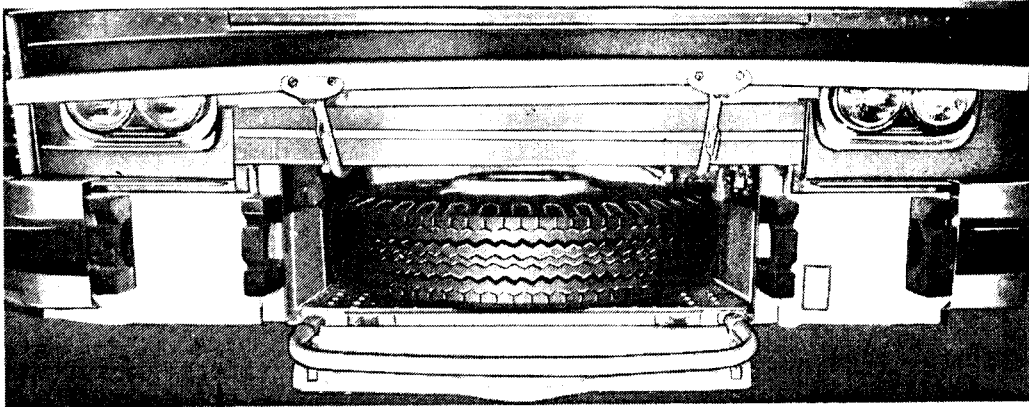
The 10 unit first aid kit is mounted in the left front parcel rack. Optional 16 or 24 unit kits, if so equipped, are also mounted in this location.

Fuses are mounted to the left rear of the driver's seat and the fire axe is mounted in a horizontal position behind the driver's seat.



SPARE WHEEL AND TIRE

Spare wheel and tire are carried in a compartment immediately behind the front bumper. Access is gained by removing retaining locks located directly beneath the bumper, then pulling bumper out and up. Bumper will lock in the open position.



Make sure that both bumper locks are firmly in place after closing compartment door.

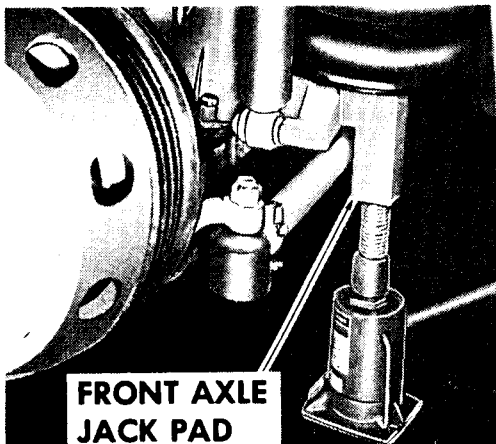
CHANGING WHEELS

USE OF RUN-UP BLOCK AND JACK

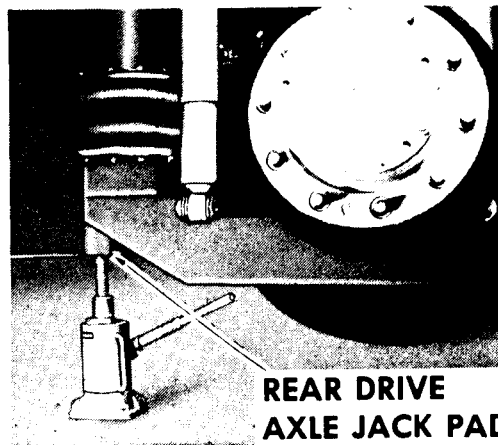
TO CHANGE FRONT WHEEL: Place the wooden run-up block in front of the deflated tire and drive coach onto the block. Apply parking brakes. Position jack under front jack pads and jack up coach. Remove run-up block and change wheel.

TO CHANGE OUTSIDE DUAL: Place wooden run-up block in front of the inside dual. Drive coach onto run-up block. Apply parking brakes then change wheel.

TO CHANGE INSIDE DUAL: Apply parking brakes. Position jack under the rear jack pad. Jack up axle and change wheel.



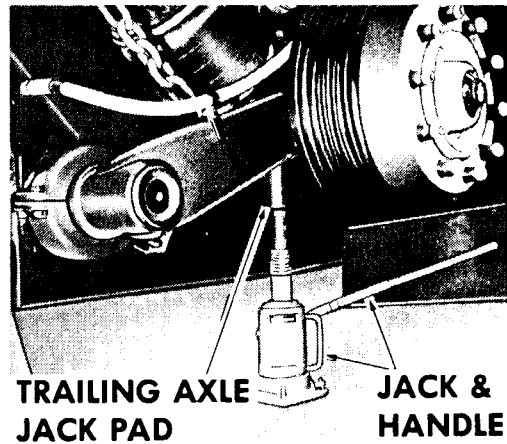
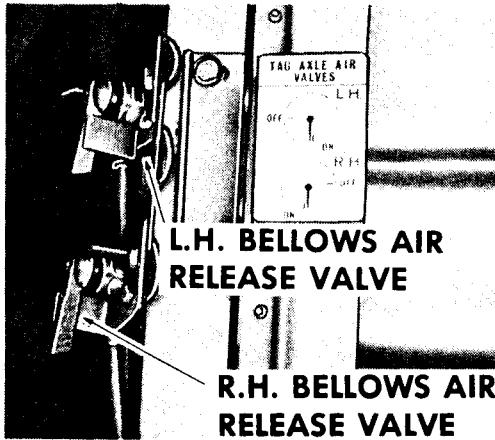
**FRONT AXLE
JACK PAD**



**REAR DRIVE
AXLE JACK PAD**

REAR TRAILING WHEELS

In case of a flat tire at this location, release air pressure from bellows by turning the air release valve to the off (lever is horizontal position) until air is released from bellows. Jack up trailing wheel and change wheel using spare wheel in the tire compartment.



IMPORTANT (If no spare wheel)

Raising a deflated rear trailing wheel is an emergency measure only to enable the vehicle to reach a service point. The tire should be raised and hold-up link installed to hold wheel off ground level. The flat tire should be repaired or replaced as soon as possible to permit normal operation. Reduce road speed to minimum when it is necessary to operate the coach with trailing wheel in raised position. **NOTE:** It is recommended that the flat tire be removed and hold-up link placed in position and the bellows air release valve be left in "on" position.

GENERAL DATA

| | |
|---|----------------------|
| VEHICLE HEIGHT (MAXIMUM) | 129 inches |
| VEHICLE WIDTH (MAXIMUM) | 96 inches |
| TIRE SIZE (FRONT, DRIVE & TRAILING) | |
| | TUBE TYPE 11.5 x 20 |
| | TUBELESS 12.5 x 22.5 |
| † FUEL TANK CAPACITY | 144 U.S. Gal. |
| † AUXILIARY FUEL TANK (OPTIONAL) | 35 U.S. Gal. |
| FUEL TYPE | ASTM No. D975 |
| | No. 1D & 2D |
| | Distillate Fuels |
| *ENGINE CRANKCASE CAPACITY | U.S. 28 qts. |
| (Engine Oil SAE 30 MIL-L-2104B supplement 1) | |
| HYDRAULIC SYSTEM CAPACITY | |
| (POWER STEERING) | U.S. 7-1/2 qts. |
| (Warm oil level half way in sight gauge after system is bled) | |
| (Engine Oil SAE 10 MS or DS Service) | |
| **STANDARD TRANSMISSION CAPACITY | U.S. 10 qts. |
| (Engine Oil SAE 30. H.D. MS or DS) | |
| REAR AXLE LUBE CAPACITY | U.S. 18 qts. |
| (Incl. hub cavities) (SAE 90 Oil-0°F and SAE 140+ 0°F) | |
| COOLING SYSTEM CAPACITY | U.S. 30 Gal. |

*When filling or adding oil, fill to "Full" mark on dipstick after running engine. The capacity applies with complete system empty, including oil filters.

**Fill or add to "Full" mark on dipstick.

†Fill rate must not exceed 95% of these capacities or see nameplate for fill rate capacities on top of the driver's switch panel.

LIGHT BULB DATA

All bulbs in the coach (except in-station ceiling, destination sign and baggage lights on coaches so equipped) are 24-volt; Do not attempt to replace with 12-volt.

| EXTERIOR LAMPS | NUMBER | QTY. |
|-------------------------------------|---------------|------|
| *Fog lamps (amber - bulb type .. | 1271 | 2 |
| (Sealed Beam - clear) | 4880 | 2 |
| Headlamps - Inner | 4619 | 2 |
| Headlamps - Outer | 4624 | 2 |
| Turn Signal Lamps | 1638 | 4 |
| Side Turn Signal Lamps (Front Side) | 1638 | 2 |
| Stop Lamps | 1683 | 2 |
| Destination Sign Lamps | 1691 IF | 5 |
| Tail Lamps | 1252 | 2 |
| Rear License Plate Lamps | 624 | 1 |
| Center Identification Lamps | 624 | 6 |
| Roof Corner Clearance Lamps ... | 624 | 4 |

*Optional

| | | | |
|--------------------------------------|---------------|--------------|-------------|
| Side Marker Lamps | 624 | | 4 |
| Back-Up Lamps | 1638 | | 2 |
| Intermediate Side Marker Lamps | 624 | | 2 |
| INTERIOR LAMPS | NUMBER | COLOR | QTY. |
| | | CAP. | |
| *Lavatory Main Lamp | 1638 | | 1 |
| *Lavatory Night Lamp | 1495 | | 1 |
| Reading Lamps | 1691 IF | | 44 |
| Driver's Lamp | 1203 | | 1 |
| Indirect Lamps | 623 | | 22 |
| Aisle Lamps | 1251 | Blue | 6 |
| Instrument Panel Lamps | 757 | Green | 3 |
| Switch Illumination Lamps | 1450 | Green | 10-11 |
| *Tachograph Lamps (Sangamo) .. | 193 | | 2 |
| *Tachograph Lamps (ARGO) | 15617 | | 2 |
| Step Lamp | 624 | | 1 |
| Baggage Compt. Lamps | 308 IF | | 6 |
| Engine Compt. Lamps | 456 | | 4 |
| Running Lamps | 1251 CB | Blue | 2 |
| Speedometer Lamp | 456 | Green | 1 |
| *In-Station 115V—Ceiling— | | | |
| Fluorescent | F40CW | | 6 |
| *In-Station 115V—Baggage— | | | |
| Slantline 33 | 25T8 | | 6 |
| *In-Station 115V—Destination— | | | |
| Slantline 33 | 15T7 | | 3 |
| Heat On | 1450 | Green | 1 |
| Air Conditioning | 456 | Red | 1 |
| Low Oil | 456 | Red | 1 |
| Not Generating | 1450 | Amber | 1 |
| Emergency Brake | 456 | Green | 1 |
| *Lavatory Emergency | 1450 | Red | 1 |
| Low Air | 456 | Red | 1 |
| Hot Engine | 456 | Red | 1 |
| Back-up Lamps | 456 | Green | 1 |
| High Beam | 1450 | Blue | 1 |
| Hazard Warning Flasher | 1450 | Green | 1 |
| *Fog Lamp | 1450 | Green | 1 |
| Stop Lamp | 1450 | Green | 1 |
| Turn Lamp | 1450 | Green | 1 |
| Gen. Discharge—Remote | | | |
| Control Panel | 456 | | 1 |
| *Lavatory "Occupied" Sign | 1450 | | 2 |
| Trailing Axle | 1450 | Red | 1 |
| *Low Water Level | 1450 | Red | 1 |
| *Low Fuel Level | 456 | Amber | 1 |
| *Fire Alarm | 1450 | Red | 1 |
| *Side Turn Lamps (Rear) | 1638 | | 2 |
| Auto Trans Illumination | 1450 | | 1 |
| *Optional | | | |

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