SECTION B

LIGHTING SYSTEMS
ALL SERIES

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DIVISION I

TROUBLE DIAGNOSIS

120-11A TEST OF LIGHTING SWITCH, THERMO-CIRCUIT BREAKER, AND EXTERIOR LIGHTING TROUBLE CHARTS

a. Test of Lighting Switch

If the lighting switch is suspected of being faulty, the contacts can be tested by connecting a low reading voltmeter between the wire supplying current to the contact and the wire conducting current away. This must be done with the switch in a position where the contact under test is closed.

1. To check the switch contact for the headlights, pull switch knob out to last notch and also make sure dimmel switch is in upper beam position. Connect voltmeter prods between battery and headlight terminals of switch (between red and light blue wires). If voltage loss through switch contacts if over .2 volt, switch must be replaced.

2. To check the contact for the tail and front parking lights, connect voltmeter between tail lights and tail light fuse terminals (between the brown wire and the brown with white stripe wire). If voltage loss is over .1 volt, switch must be replaced.

b. Test of Light Switch Thermo Circuit Breaker

To test the thermo circuit breaker, remove lighting switch from instrument panel to avoid possible damage to adjacent instruments.

Since the current required to open the circuit breaker contacts depends somewhat on outside temperature, the circuit breaker should be tested at normal temperature (70 degrees to 80 degrees F.).

1. Connect an ammeter and a carbon-pile rheostat in series with the battery terminal of lighting switch and positive terminal of a 12-volt battery, and set rheostat to provide maximum resistance. Rheostat must have capacity for 50 amperes and be adjustable down to .3 ohms.

2. With switch on, connect the headlight terminal of lighting switch and the negative post of battery.

3. Adjust rheostat to give 26 amperes. The circuit breaker should open within 60 seconds.

4. Adjust rheostat to give 15 amperes on ammeter. The circuit breaker should remain closed indefinitely at 15 amperes.

5. If circuit breaker does not operate as specified, the lighting switch assembly must be replaced, since internal repairs cannot be made.

c. Exterior Lighting Trouble Diagnosis Charts

BACKUP LAMP DIAGNOSIS

Condition	Possible Cause	Correction
1. INOPERATIVE	1. Check Turn Signal/Backup Lamp Fuse	1. Replace fuse if burnt out.
	2. Check Bulb(s)	1. Replace bulb(s) if burnt out.
	3. Check Ground Connection at Bulb Socket And/Or Ground Wire Terminal	1. Secure ground connection as necessary.
	4. Check Wire Connections	1. Secure connections as necessary.
	5. Check Neutral-Start Switch Function and Adjustment	1. Adjust neutral-start switch.
2. WILL NOT TURN OFF	1. Check Neutral-Start Switch	1. Readjust neutral-start switch. 2. Replace neutral-start switch if detective.

120-14

Figure 120-14 Back-Up Lamp Diagnosis Chart

STOP OR BRAKE LAMP DIAGNOSIS

Condition	Possible Cause	Correction
1. INOPERATIVE	1. Check Stop and Hazard Lamp Fuse	1. Replace fuse if necessary.
	2. Check Bulb(s)	1. Replace bulb(s) if burnt out.
	3. Check Ground Connection at Bulb Socket And/Or Ground Wire Terminal	1. Secure ground connection.
	4. Check Stop Lamp Switch Function, Adjustment, and Wire Connections	1. Replace stoplamp switch if defective. 2. Adjust stoplamp switch if necessary. 3. Secure wire connections.
	5. Check Turn Signal Switch Operation and Wire Connections	1. Replace turn signal switch if defective. 2. Secure connections if necessary.
2. WILL NOT TURN OFF	1. Check Stop Light Switch Function	1. Readjust stop light switch if necessary.
	2. Check Stop Light Switch Function	1. Replace stop light switch if defective.

120-15

Figure 120-15 Stop Lamp Diagnosis Chart

SEALED BEAM HEADLAMP DIAGNOSIS

Condition	Possible Causes	Correction
BROKEN, CRACKED, OR DISCOLORED INSIDE.	1. Impact (rock) Damage 2. Improperly Installed 3. Damaged Terminals	1. Replace sealed beam. 2. Replace sealed beam. 3. Replace sealed beam.
TOO BRIGHT AND/OR BURNS OUT QUICKLY	1. 6-Volt Unit Installed in 12-Volt System.	1. Replace with correct sealed beam.
DOES NOT LIGHT OR LIGHTS INTERMITTENTLY	1. Check Car Wiring Connections to Terminals 2. Check Voltage at Upper and Lower Beam Terminals. 3. Check Ground Connection of Sealed Unit Connector to Body.	1. Repair terminal connections. 2. Charge or replace energizer as necessary. 3. Secure ground connection.
FILAMENT GLOWS DIM	1. Check for Open Ground Connection. 2. Check for Wrong Sealed Beam.	1. Secure ground connection. 2. Install correct sealed beam if if necessary.
WILL NOT AIM PROPERLY	1. Check for Broken or Chipped Aiming Pad on Lens. 2. Check for Proper Calibration and Floor Compensation of Mechanical Aimers. 3. Check Capsule Retaining Components.	1. Replace sealed beam. 2. Calibrate aimers being used. 3. Replace capsule components as necessary.

120-16

Figure 120-16 Sealed Beam Headlamp Diagnosis Chart

TAIL, PARK, SIDEMARKER, LICENSE, OR CORNERING LAMP DIAGNOSIS

Condition	Possible Causes	Correction
1. INOPERATIVE (ONE SIDE)	1. Check for Burned out Bulb(s)	1. Replace necessary bulb(s).
	2. Check Ground Connection at Bulb Socket or Ground Wire Terminal	1. Repair ground.
	3. Check Wire Harness Connections	1. Correct connections as necessary.
	4. If Cornering Lamp, Check Turn Signal Switch	1. Replace turn signal switch if defective.
2. INOPERATIVE (BOTH SIDES)	1. Check Applicable Fuse	1. Replace fuse if necessary.
	2. Check Wiring Connections Between Lamps and Light Switch	1. Secure connections as necessary.
	3. Check for Multiple Bulb Burnout	1. Replace necessary bulbs.
	4. If Cornering Lamp, Check Turn Signal Switch	1. Replace turn signal switch if defective.

120-17

Figure 120-17 Tail, Park, Side-Marker, License, or Cornering Lamp Diagnosis Chart

DIVISION II

DESCRIPTION AND OPERATION

120-12 HEADLIGHTS AND CONTROLS

a. Description of Lighting Switch

The switch uses a multiple push-on type connector. It is a "push-pull" type which also incorporates a manually-operated rheostat for controlling the intensity of the instrument panel lights, and a detent position which completes the dome light circuit. Three "push-pull" positions of the switch knob provide control of the exterior lights as follows:

1. *Off Position* (Knob all the way in) Cuts off all lights controlled by the switch.

2. *Parking Position* (Knob pulled out to first notch) Turns on the parking lights, tail lights, and license light and side marker lights. The instrument panel lights also will be turned on if the rheostat is set for these lights.

3. *Driving Position* (Knob pulled out to last notch) Turns headlights on, while the other lights remain as in the parking position. The headlights will be on the upper or lower beams, depending on the position of the separate dimmer switch.

In the parking and driving positions, the instrument panel lights are controlled by rotating the light switch knob. With the knob turned counterclockwise, these lights are on maximum brightness. As the knob is turned clockwise, they gradually dim until they are off at the full clockwise position of the knob.

4. *Dome Light Position* (Knob turned fully counterclockwise) Turns the dome and courtesy lights on. These lights can be turned on, regardless of the in or out position of the switch.

b. Description of Thermo Circuit Breaker

A thermo circuit breaker is incorporated in the lighting switch assembly to protect wiring from damage due to short circuits in the headlight circuits only.

The thermo circuit breaker consists of a bi-metal blade and set of contact points connected in series with the lighting circuits. An abnormal flow of current through the circuit breaker, such as would be caused by a short circuit in a lighting circuit, heats the bi-metal blade sufficiently

to separate the points and cause them to vibrate. The vibrating blade alternately opens and closes the circuit, thus reducing the flow of current and protecting the wiring against overheating and burning. The flickering light produced by the vibrating circuit breaker serves as a warning to the operator of vehicle that a short circuit exists.

c. Dual Headlamp Assembly

A dual headlamp system is standard equipment on all series and consists of two dual headlamp assemblies, one mounted on each side of the car.

Each dual headlamp includes two 5 3/4" T-3 sealed beam units mounted in a single housing enclosed by headlamp doors. The inboard unit is used for bright lights only and has a single filament. The outboard unit is used for both high and low beams and has two filaments. For identification, the inboard unit is marked "1"; the outboard unit is marked "2".

When the dimmer switch is in the dim or lower beam position only, the outboard unit of each dual headlamp is on. Both outboard and inboard units of each headlamp are on when the dimmer switch is in the bright or high beam position.

The T-3 sealed beam unit has three projections equally spaced around the perimeter of the lens. These projections are ground off at the factory to provide a mounting surface for aiming devices. These aiming devices are used without having headlights on.

d. Dimmer Switch

The driver may select the upper or lower headlight beam as traffic and road conditions demand by operating the dimmer switch mounted on the toe panel in a convenient position for the left foot.

The dimmer switch opens and closes the circuits to the upper and lower lamp filaments in the sealed beam units, thereby alternately raising and lowering the headlight beams with each successive operation of the switch. Depression of switch button turns the rotary contact one position within the switch. The spring- loaded button automatically returns to the reset position when released.

The wiring connection to the dimmer switch is made by a multiple connector. The dimmer switch is mounted on the inner side of the toe pan, so the switch, connector, and wiring are all inside the car.

e. Headlight Beam Indicator

Whenever the upper headlight beams are lighted, a beam indicator bulb in the instrument cluster also lights, producing a small spot of red light in front of the driver. *For safety reasons, never pass an approaching car with the beam indicator showing red.*

120-13 NEUTRAL START SWITCH AND EXTERIOR LIGHTS

NOTE: *See Figures 120-20 to 120-23 for lamp bulb and fuse specifications.*

a. Back-Up Lamps and Neutral-Start Switch

On manual transmission cars, the back-up light switch is mounted on the upper side of the steering column mast jacket in approximately the same location as the combined neutral-start back-up light switch on automatic transmission cars. The manual back-up light switch has a tang that fits into a slot in the shift tube. When the transmission is shifted into reverse, the shift tube rotates, moving the tang to the left, closing the back-up switch contacts.

To check for proper operation of the back-up light switch, turn on the ignition switch, place the shift lever in reverse, and make sure the back-up lights are lit. Then place the shift lever in neutral and make sure the back-up lights are out. Next, place the shift lever in second gear and make sure the lights are *not* lit. The switch mounting screw holes are slotted slightly, allowing some adjustment, if necessary.

On all column shift automatic transmission cars, the back-up light switch is combined with the neutral start switch. It is mounted on the steering column under the instrument panel. The switch is actuated by the transmission control shaft.

On cars with automatic transmission and console shift, the back-up light switch is combined with the neutral start switch. It is mounted on the steering column under the instrument panel. When the neutral-start portion of the switch is correctly timed, the back- up portion is properly timed automatically. Slotted mounting screw holes permit sidewise movement of the switch for proper timing.

The back-up light circuit is protected by a fuse on the fuse block.

b. Clutch Start Switch

A clutch start switch is installed in all manual transmission cars. This switch is located on the clutch pedal bracket. See Figure 120-18.

When the clutch pedal is released, the clutch start switch is open; when the clutch pedal is depressed, the clutch start switch is closed. Since the switch is connected in series in the solenoid circuit between the ignition switch and the starter solenoid, this means that the engine cannot be started unless the clutch pedal is depressed.

The purpose of the clutch start switch is to prevent the engine from starting under conditions where such starting could cause an accident. For instance, if an engine were started with the transmission in low or reverse gear, and with the clutch pedal released, the car would immediately

move. If any object or person were near, damage would result.

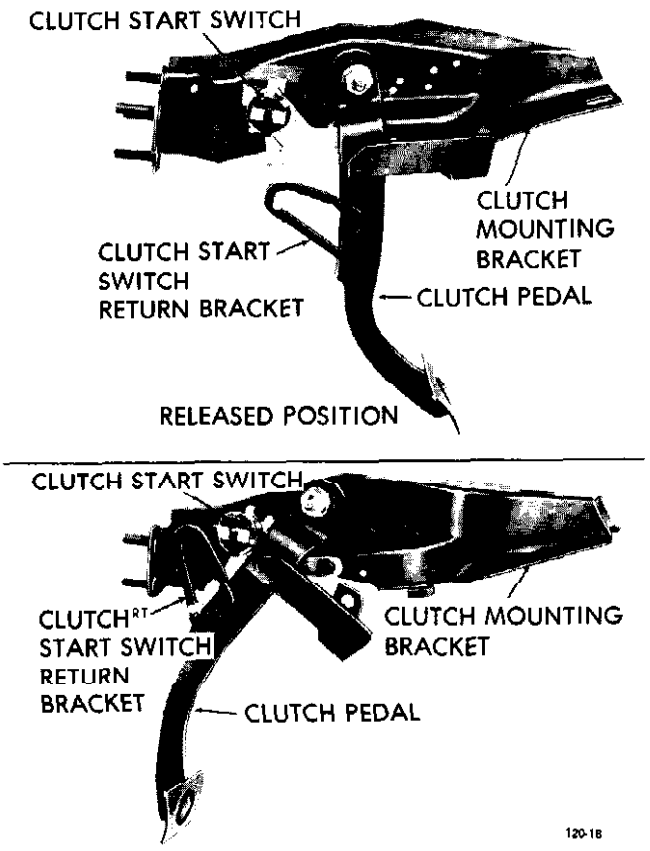


Figure 120-18 Clutch Start Switch

c. Front Parking and Signal Lights

Each front parking and signal lamp contains one 32-3 CP lamp bulb which provides a 3 CP parking light and a separate 32 CP direction signal light. The pins on lamp bulb and slots in socket are offset to prevent improper installation of bulb in socket. The parking light is controlled by the lighting switch and the circuit is protected by the "TAIL" fuse. The turn signal light is separately controlled by the signal switch and the circuit is protected by a fuse on the fuse block under the instrument panel. All front turn signal bulbs have natural amber glass (not painted) and are lighted whenever the light switch is in either the parking light or driving light position.

d. Tail, Stop, and Signal Lights

Each rear lamp assembly contains a 32-3 CP bulb which is used as a combination tail, stop, and direction signal light. The tail lights are controlled by the lighting switch and the circuit is protected by a fuse on the fuse block.

The stop lights are controlled by a mechanical switch mounted on the brake pedal bracket. This spring loaded switch makes contact whenever the brake pedal is applied. When the brake pedal is released, it depresses the switch plunger to open the contacts and turn the brake lights off. The direction signal switch is in the circuit, so the stop lights may be flashing or constant, depending on the position of the switch. The stop light circuit is protected by a fuse mounted on the fuse block.

The combination tail, stop, and directional signal lamp bulb sockets are "twist lock" sockets and can be snapped out from inside the trunk compartment on all 45-46-48-49000 Series.

Since the position of the bulb filaments is important in the rear lamps, these sockets have been provided with a tongue and groove index to insure correct positioning. To change the bulb on the 43-44000 Series and Station Wagons, it is necessary to remove the lamp lens.

e. Rear License Lights (All Series Except 48000)

The rear license lamp is mounted above the license plate to provide adequate lighting of the plate. The lamp contains one 4 CP lamp bulb which operates in conjunction with the tail lights, and its circuit is also protected by the fuse on the fuse block.

The lamp bulb may be replaced by removing the lamp lens.

f. Rear License Light (48000 Series)

The rear license lamp on the 48000 Series is a 2 CP lamp bulb and can be replaced by reaching behind license plate and twisting socket counterclockwise.

g. Side Marker Lights

Four (4) side marker lights are illuminated whenever the light switch is in either the parking light or driving light position. The side marker light circuit is protected by the "TAIL" fuse. The side marker light uses a "twist lock" bulb socket. Rotating the socket assembly counterclockwise will remove it. Replace bulb and reinstall the assembly by rotating it clockwise.

NOTE: *A front side marker lamp that is not lit may be caused by an open filament in turn signal lamp.*

120-14 INTERIOR LIGHTS AND CIGAR LIGHTER

NOTE: *See Figure 120-20 to 120-23 for lamp bulb and fuse specifications.*

a. Instrument Panel Lights

The speedometer, heater-defroster controls, ventilator or air conditioner controls, transmission control dial, clock, and ash tray are illuminated by lamp bulbs mounted to provide indirect lighting.

The instrument panel lights are controlled by the lighting switch, as described in paragraph 120 12, and the circuits are protected by the 4 ampere fuse on the fuse block.

Most instrument cluster bulbs can be removed by reaching under instrument panel and turning socket and bulb assembly counterclockwise. Replace the bulb and reinstall the assembly by rotating it clockwise.

b. Brake Warning Light

The brake warning light functions as a check on three possible brake troubles. If the parking brake is left on while the car is driven, the brake warning light is lit; or, if hydraulic pressure becomes low in either fron or rear half of the dual brake system, the light will light during brake application. The third use will show any electrical malfunction of the wheel lock control system, if the car is so equipped.

1. *The parking brake warning light circuit* will light a red "BRAKE" signal light in the instrument cluster whenever the ignition switch is turned on with the parking brake applied. This circuit is grounded at a plunger-type switch operated by the parking brake lever.

2. *The brake failure warning light circuit* uses the same red "BRAKE" signal light in the instrument cluster to warn that either the front or the rear half of the dual brake system has lost hydraulic pressure and is failing to provide effective braking.

The switch to operate the brake failure warning light is in a simple spring-centered balance valve subjected to front brake line pressure on one side and rear brake line pressure on the other side.

On drum brake cars, a difference of 150 psi between these pressures, as will occur if one system fails, causes the valve to move from center and to contact an electrode which grounds the brake warning light. See Figure 120-19.

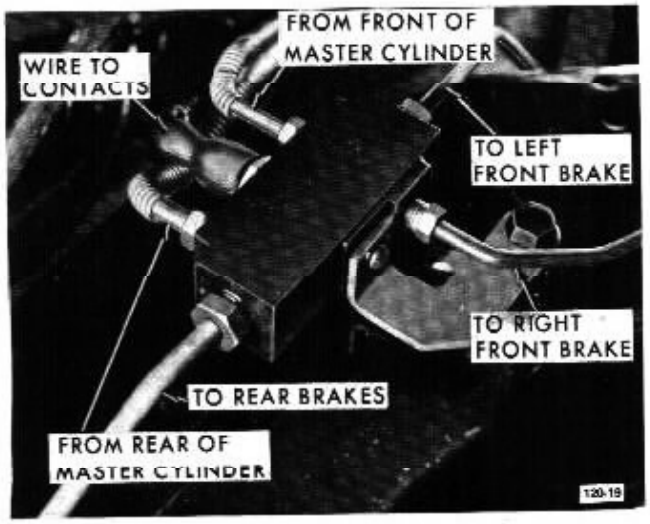


Figure 120-19 Distributor and Brake Failure Warning Switch Assembly - Drum Brakes

On disc brake cars, the switch is part of a hydraulic combination valve assembly. A pressure difference of 100 psi is required to contact and latch the switch in the warning position. See Figure 120-19A.

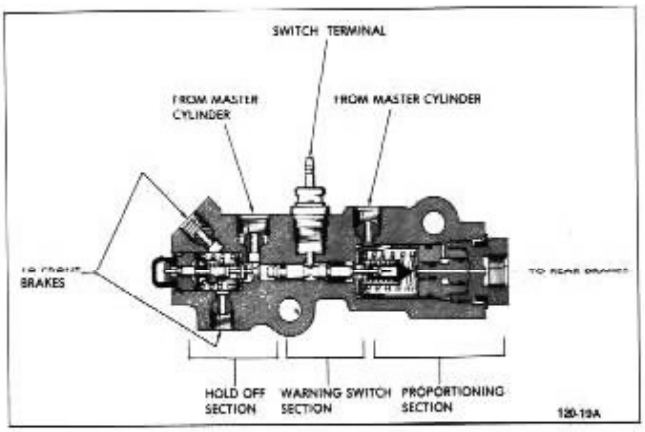


Figure 120-19A Combination Valve Assembly - Disc Brakes

NOTE: *The only way the light can be turned off is to repair the failure and apply a pedal force, as required to develop up to 450 psi line pressure.*

To check the complete system, both hydraulically and electrically, proceed as follows:

a. With ignition switch on, have helper hold foot pressure on brake pedal while watching brake warning light.

b. Hold a rag under front master cylinder fitting to catch brake fluid lost, then crack front brake line fitting. *When brake warning light lights, tighten fitting before helper releases brake pedal to avoid any possibility of drawing air into the brake system.*

c. Repeat step b at *rear* master cylinder fitting to check operation of brake failure warning light from rear half of car brake system.

Since this check causes a loss of brake fluid, always check fluid level of both reservoirs after checking operation of the brake failure warning light. Add fluid as required to bring level within 1/8" of lip of each reservoir.

c. Direction Signal Indicator Lights

The direction signal indicator consists of a 1 or 2 CP bulb mounted at each end of the instrument cluster. See Figures 120-20 to 120-23.

d. Automatic Transmission Control Dial Light

The control dial in the instrument panel is illuminated a a 3 CP lamp bulb mounted in the cluster to provide indirect lighting. The light intensity is controlled by the lighting switch in the same manner as all instrument panel lights.

To replace the lamp bulb, remove the socket and bulb assembly, replace the bulb, and reinstall the assembly.

e. Cigar Lighter

The cigar lighter is heated by pressing the knob in until it latches; the knob will automatically unlatch and pop out when heated to proper temperature.

The lighter is equipped with an ash guard, to prevent ashes and loose tobacco from falling on the user's clothing and to permit the lighter to be passed around without danger of burning the fingers.

f. Courtesy Lights

The two 6 CP courtesy lights are mounted, one on each side, under the instrument panel so that they illuminate the front floor area. They operate, along with the dome light, from the headlight switch, and/or from a door jamb switch.

DIVISION III

ADJUSTMENTS AND MINOR SERVICE

120-15 HEADLAMP AIMING

a. General

The headlamps must be properly aimed in order to obtain maximum road illumination and safety that has been built into the headlighting equipment. With the Guide T-3 type sealed beam units, proper aiming is even more important because the increased range and power of this lamp make even slight variations from recommended aiming hazardous to approaching motorists. The headlamps must be checked for proper aim whenever a sealed beam unit is replaced and after any adjustment or repair of the front end sheet metal assembly.

Regardless of method used for checking headlamp aim, car must be at normal weight, that is, with gas, oil, water, and spare tire. Tires must be uniformly inflated to specified pressure. If car will regularly carry an unusual load in rear compartment, or a trailer, these loads should be on car when headlamps are checked. Some states have special requirements for headlamp aiming adjustment and these requirements should be known and observed.

Horizontal and vertical aiming of each seal beam unit is provided by two adjusting screws which move the mounting ring in the body against the tension of the coil spring. There is no adjustment for focus, since the sealed beam unit is set for proper focus during manufacturing assembly.

b. Pre-Aiming Instructions - Mechanical Aimer J-6878-01

1. Adjusting Aimer for Floor Level

a. To obtain accurate headlight aim, the vehicle must be placed on a flat surfaced floor area.

b. Place transit target on floor at center of rear wheel and place transit at center of front wheel on same side so target is visible in transit viewing port at top. See Figure 120-19C.

c. Adjust screw on back of transit until target split image merges into one unbroken line. See Figure 120- 19B.

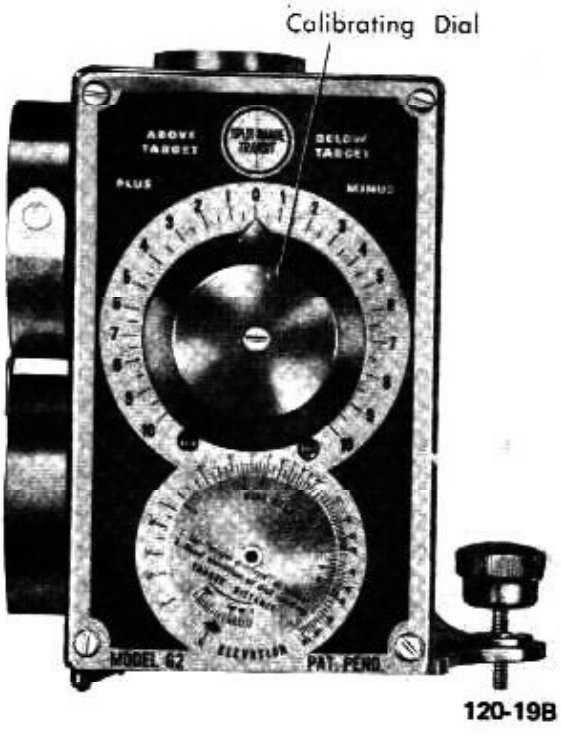


Figure 120-19B Transit

d. Turn dial on side of transit until bubble in spirit level is centered.

e. When bubble is centered, note "plus" or "minus" reading on calibrating dial. See Figure 120-19B. This figure indicates degree of floor slope and must be transferred to each aimer.

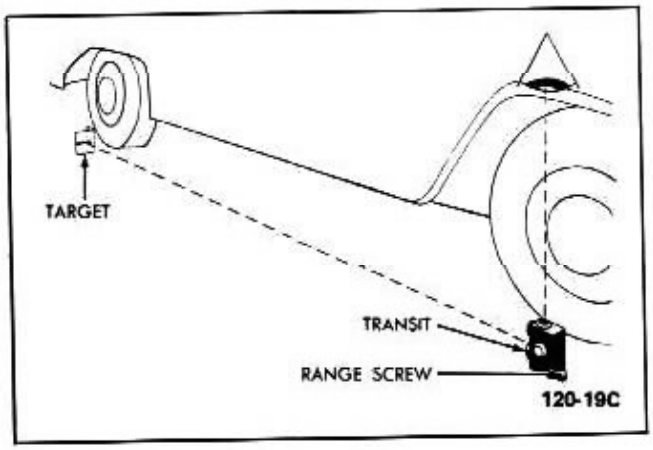


Figure 120-19C Checking Slope of Floor

f. With a screwdriver, turn adjusting slot of floor level compensator in each aimer until adjoining dial reads same as dial on transit. See Figure 120- 19D.

Figure 120-19D Adjusting Aimer to Compensate for Floor Slope

g. Aimers are now adjusted for use on this specific floor area. If operation is moved to a new location, aimers must be readjusted.

2. Vehicle Preparation

a. With vehicle in selected aiming area, turn on headlights and make sure all are functioning.

b. Tires should be properly inflated, gas tank at least half full, spare tire in trunk, and no people in car. Rock vehicle sideways to equalize springs.

c. Clean headlight lenses thoroughly.

3. Installing Mechanical Aimers J-6878-01

a. While holding aimer in alignment with lens of one outer headlight, bring aimer up to and against the lens. The sealed beam guide points must engage smooth inner ring of aimer at alignment points and the sight opening on the side of the aimer must face toward center of vehicle. See Figure 120-19E.

b. Push handle "Y" forward (to expel air from suction cup) and, while holding aimer firmly against the headlight guide points, slowly pull handle "Y" back until spring catch engages and holds it in position. See Figure 120-19E.

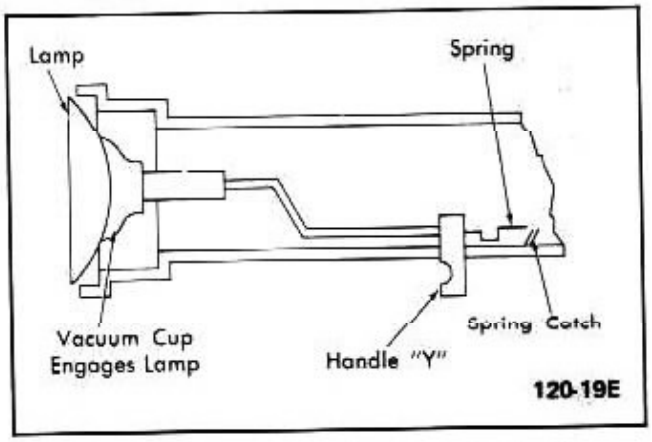


Figure 120-19E Securing Aimers on Sealed Beams

c. Install second aimer on other side of vehicle in the same manner. Rotate aimers until the "up-down" and "right-left" scales are facing straight up and the horizontal aiming target can be seen from the viewing port in top of the opposite aimer. See Figure 120-19F. Aimers are now installed for checking the No. 2 units (low beam) of 4-lamp system or 7" units of 2-lamp system

c. Headlight Aim Test

1. Horizontal Aim Test

Turn the "right-left" scale knob on each aimer until the target split image, as seen in the viewing port, merges into one unbroken line. If the right or left reading on the scale exceeds the following values, lights should be aimed. Values given represent inches at 25 feet. See Figure 120-19F.

	Left	Right
No. 2 Unit - (Outboard)	0"	4"
No. 1 Unit - (Inboard)	4"	4"

2. Vertical Aim Test

Turn "down-up" scale knob on each aimer until the spirit level is centered. If down or up reading on scale exceeds the following values, lights should be aimed.

No. 2 Unit - (Outboard)	1/2" down to 3-1/2" down
No. 1 Unit - (Inboard)	1/2" down to 3-1/2" down

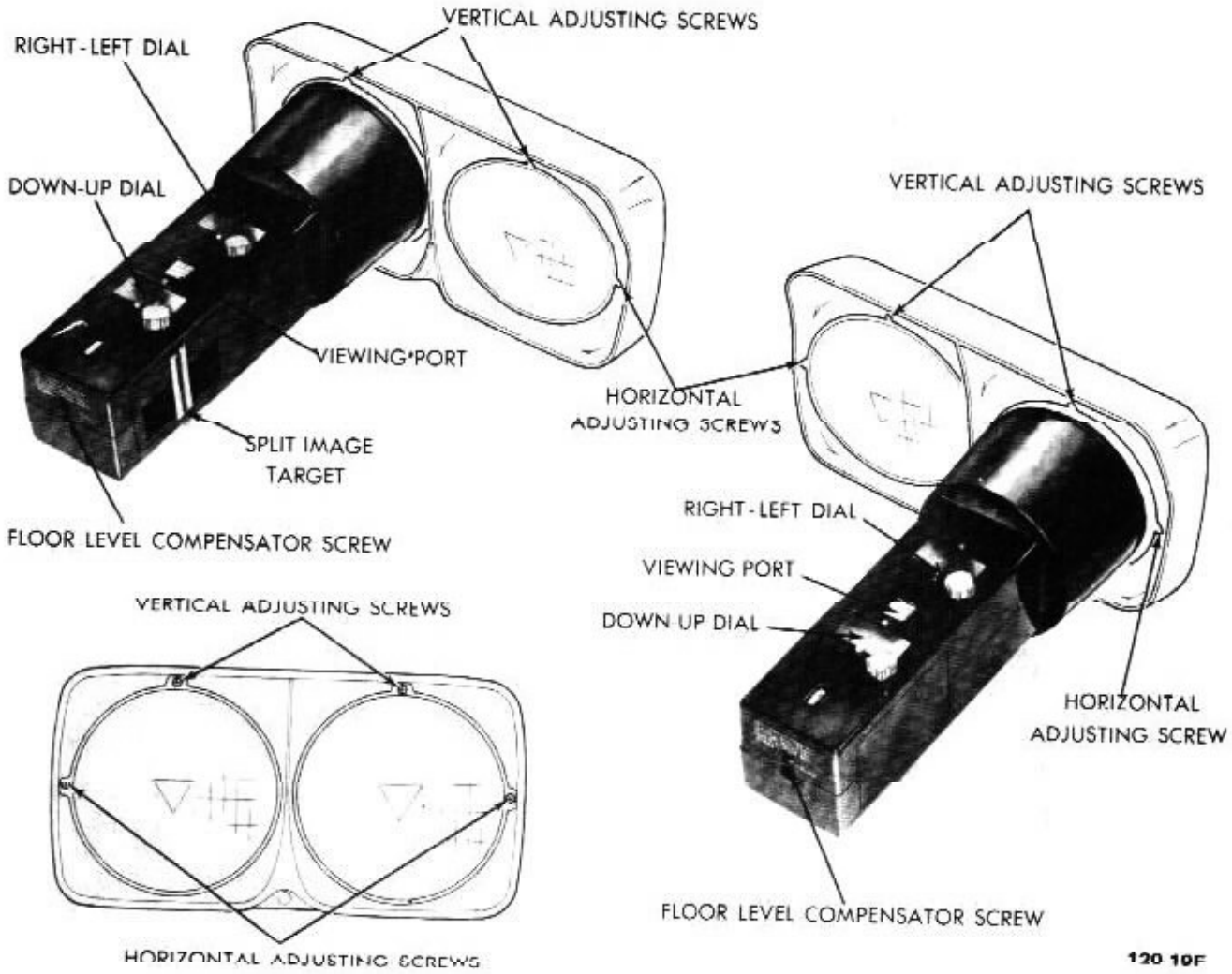


Figure 120-19F Installing Aimers and Aiming Headlamps

d. Headlight Aim

1. Horizontal Aiming

a. Set right-left scale on each aimer to "0". See Figure 120-19F.

b. While sighting through viewing port on top of aimer, adjust headlight horizontal adjusting screw until split target image merges into one unbroken line.

NOTE: *To remove backlash, final adjustment should be made while turning screw clockwise.*

c. Make horizontal adjustment on other side of vehicle in same manner.

2. Vertical Aiming

a. Set "down-up" scale to read "2 down" on both aimers.

b. Turn headlight vertical aiming screw counter clockwise until spirit level bubble is on car side of center.

c. Now, turn aiming screw clockwise until spirit level bubble is centered.

d. Make vertical adjustment on other side of car in same manner.

If vehicle uses the 4-lamp system, proceed to adjust inboard units by repeating the above procedure.

Remove aimers by releasing the spring catch at rear (bottom) of aimer and push handle "Y" forward. Do not attempt to remove aimers by pulling them away from headlight lens - slide suction cup downward and away from lens.

e. Calibrating Aimers - J-6878-01

Aimer J-6878-01 is calibrated at the factory for use on a level floor. They require no readjustment of factory calibration, unless they are dropped or damaged in some manner.

a. Using a carpenter or stone mason spirit level of known

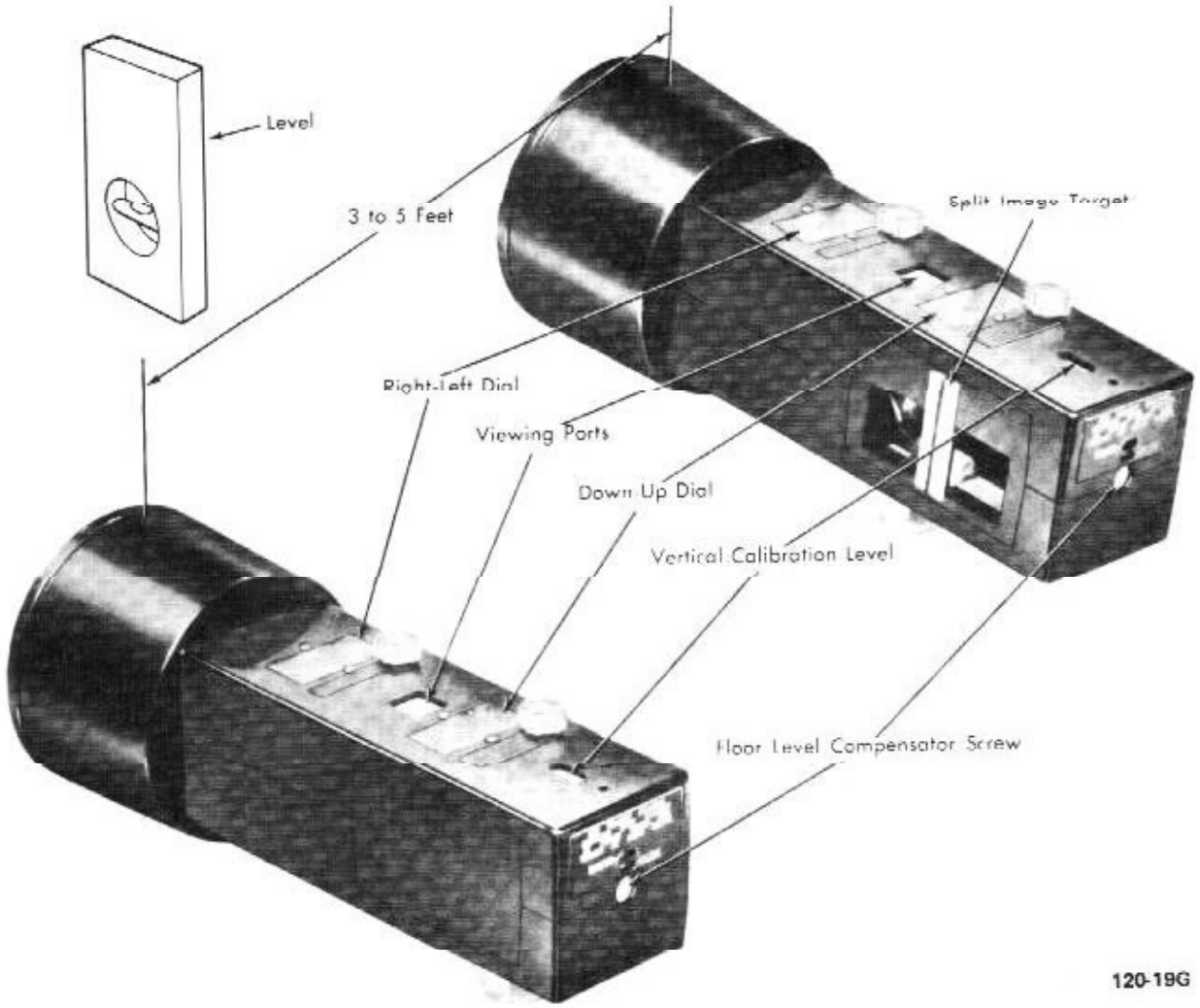


Figure 120-19G Calibrating Aimers

accuracy locate a vertical plate glass window or smooth surface that aimer suction cups will adhere to. See Figure 120-19G.

b. Set aimer "down-up" pointer to read "2 down".

c. Set aimer "right-left" pointer and floor compensator adjustment to read "0".

d. Secure aimers to glass or smooth surface three to five feet apart so split images can be located in viewing ports.

e. If spirit level bubble is centered, vertical calibration is correct. If not, turn level adjusting screw until bubble is centered. See Figure 120-19H.

f. The horizontal calibration is correct if target split images on opposite aimers are aligned as one continuous line in the viewing port. If not, turn mirror adjusting screw until target split image becomes aligned. See Figure 120-19I.

NOTE: *A calibration ring H 5 is now available for installing on aimer before mounting on glass window or smooth surface for calibration.*

This device is equipped with an adjustment screw and spirit level for adjusting to a vertical plane, thus eliminating a need for a perfectly-vertical surface to mount the aimers for calibration and a carpenter's level. In addition, calibration will probably be more accurate, since the calibration ring seats three platforms on the face of the aimer where the sealed beam guide points rest (and any wear occurs) when aiming headlight.

f. Headlamp Aiming - Visual - Screen Method

If it becomes necessary to aim headlights by the screen method, the following specifications are recommended.

However, some States have special requirements for headlight aim adjustment, and these requirements should be observed.

Figure 120-19H Adjusting Vertical Calibration

Figure 120-19I Adjusting Horizontal Calibration

1. Low Beam

Place vehicle on a known level floor 25 feet from aiming screen or light colored wall.

Four lines are required on screen or wall. See Figures 120-19J and 120-19K.

a. A horizontal line at the level of centers of headlights.

b. A center vertical line which must be lined up with vehicle centerline. A good method is to sight through rear window and align center of rear window molding through mirror bracket or hood centerline.

c. A vertical line on left of screen or wall in line with centerline of left headlight.

3. A vertical line on right of screen or wall in line with centerline of right headlight.

Adjust low beam of headlights to match the patterns in Figure 120-19J and the corresponding numbers listed be-

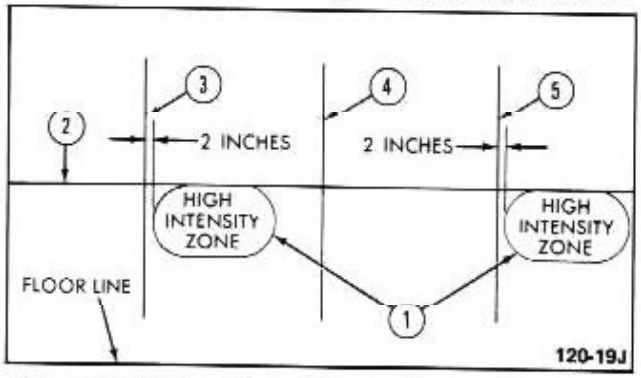


Figure 120-19J Low Beam Adjustment Pattern (Visual Aim at 25 Feet)

(a) Lower beam pattern of both headlights (outboard No. 2 units or 7" units).

(b) Horizontal line at level of headlight centers.

(c) Vertical line in line with center of left headlight.

(d) Vertical line in line with vehicle centerline.

(e) Vertical line in line with center of right headlight.

2. High Beam (4-Beam System)

Adjust high beam of headlights to match patterns in Figure 120-19K and the corresponding numbers listed below:

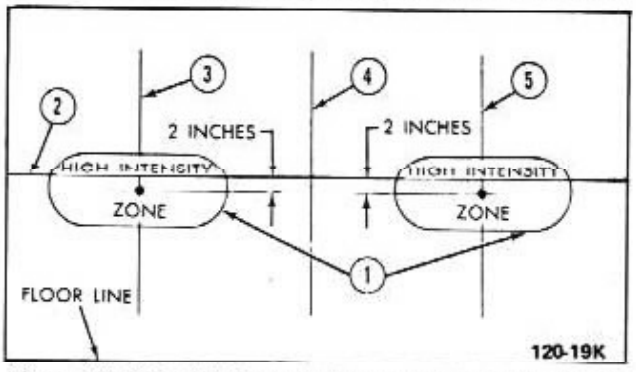


Figure 120-19K High Beam Adjustment Pattern (Visual Aim at 25 Feet)

(a) High beam pattern of both headlights (inboard No. 1 units only).

(b) Horizontal line at level of headlight centers.

(c) Vertical line in line with center of left headlight.

(d) Vertical line in line with vehicle centerline.

(e) Vertical line in line with center of right headlight.

DIVISON IV

REMOVAL AND INSTALLATION

120-15A HEADLAMP, BACK-UP LAMP, CLUTCH START, NEUTRAL START SWITCHES, AND EXTERIOR LIGHTS REMOVAL AND INSTALLATION

a. Replacement of Lighting Switch

1. Disconnect battery to ground cable to avoid a possible short circuit.

2. Pull switch knob out to last notch, then depress the spring-loaded latch button on switch, while pulling knob and rod assembly out of switch.

NOTE: *If latch button is depressed before switch knob is pulled out, knob and rod assembly will not release.*

3. Remove headlight switch escutcheon.

4. Remove left instrument cluster trim panel.

5. Remove headlight switch retaining nut.

6. Unplug multiple connector from lighting switch.

7. Install switch in reverse order of above steps, making sure that switch alignment tang engages slot in cluster and ground plate before tightening escutcheon.

8. Connect battery ground cable.

b. R and R Back-Up Lamp Switch

Manual Transmission

1. On manual transmission, disconnect electrical connection.

2. Remove two screws holding switch to column.

3. Remove switch.

4. To install switch, position shift lever in reverse detent.

5. Holding switch against column grommets, attach switch.

NOTE: *Switch pinned in reverse position during assembly.*

6. Switch adjustment is obtained by moving the switch slightly or by bending the back drive rod.

Automatic Transmission

1. The back-up switch is contained in the neutral- start switch. When the neutral-start switch is correctly timed, the back-up switch is properly timed automatically. See neutral-start adjustment.

c. R and R Clutch Start Switch

1. Remove screws holding switch to clutch mounting bracket.

2. There is no adjustment for the clutch start switch. When the switch is properly installed on the clutch mounting bracket, timing is correct.

d. R and R Nautral-Start Switch

1. Disconnect electrical connector.

2. Remove screws holding switch to steering column.

3. Remove switch.

4. To install switch, position gear shift in neutral position with lever definitely seated in "Neutral Notch" in column.

NOTE: *On console-equipped cars, neutral position is established by the detent in the transmission.*

5. Position switch on column and install screws. Do not tighten.

6. Hold switch tight to column, then tighten right hand screw first.

NOTE: *Switches are assembled pinned in neutral position. Pin is designed to break away with first shift movement.*

7. Check to make sure car starts only in park and neutral positions.

CAUTION: *If a neutral-start switch is removed and the original switch is replaced, the following pre- adjustment procedure must be followed: Insert a .093 (3/32") diameter rod through slotted hole in switch back and into switch actuator while in the neutral position. Fasten switch to column with shift mechanism positioned as described under Step 4.*

HD8 e. Replacement of Sealed Beam Unit

1. Remove headlamp door by removing four retaining screws.

2. Unhook the spring from retaining ring, then remove sealed beam unit and retaining ring, being careful not to disturb the two beam adjusting screws.

3. Install new sealed beam unit by reversing removal procedure. Position lens with the "1" or "2" up. The unit has three lugs which fit into notches in the headlamp mounting ring.

CAUTION: *Make sure that sealed beam unit is marked "1" for an inboard unit or "2" for an outboard unit.*

f. R and R Front Parking and Signal Lights All - All Series

1. Disconnect electrical connections.

2. Remove two screws that hold lamp assembly to bumper. Remove lamp assembly.

3. Install in reverse sequence.

g. R and R Tail Lamp Assembly and Lens
-44-45-46000 Series (Less Wagon)

1. Disconnect twist-lock connectors from tail lamp assembly from beneath vehicle.

2. Remove the two rearmost bumper bracket to frame bolts.

3. Loosen, but do not remove, the two forward bumper bracket to frame bolts.

4. Rotate bumper downward, exposing tail lamp assembly.

5. Disconnect electrical body connector.

6. Remove bolts holding tail lamp assembly to bumper, and remove tail lamp assembly.

7. Remove lens by removing screws holding lens to tail lamp assembly.

8. Install in reverse sequence.

48-49000 Series

1. Disconnect twist lock connectors from tail lamp assembly from inside rear compartment of vehicle.

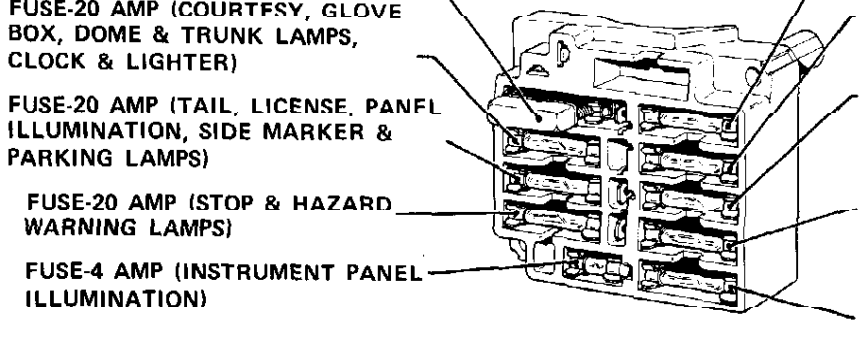
2. Remove the two rearmost bumper bracket to frame bolts.

3. Loosen, but do not remove, the two forward bumper bracket to frame bolts.

4. Rotate bumper downward, exposing tail lamp assembly.

5. Remove lenses by removing screws holding bezel to lamp housing assembly.

6. Install in reverse sequence.



FUSE CHART 43-44000 SERIES

LAMPS

WHERE USED	LAMP NO.	NO. USED	CANDLE POWER	MODEL
FRONT				
HEADLAMP-5-3/4 DIA TYPE 1	4001	2	37.5	ALL
HEADLAMP-5-3/4 DIA TYPE 2	4001-L	2	37.5-55W	ALL
HEADLAMP-5-3/4 DIA TYPE 2 (EXPORT)	4003	2	37.5-55W	ALL
PARK & DIR SIGNAL LAMP	1157NA	2	32 & 3	ALL
SIDE MARKER LAMP	194	2	2	ALL
SPOTLAMP	4404	1	30W	ALL
REAR				
TAIL, STOP & DIR SIGNAL LAMP	1157	4	32 & 3	ALL EXCEPT WAGONS
TAIL, STOP & DIR SIGNAL LAMP	1157	2	32 & 3	WAGONS ONLY
BACK-UP LAMP	1157	2	32 & 3	ALL EXCEPT WAGONS
BACK-UP LAMP	1156	2	32	WAGONS ONLY
LICENSE LAMP	97	1	4	ALL
SIDE MARKER LAMP	194	2	2	ALL
LUGGAGE COMPARTMENT	89	1	6	ALL EXCEPT WAGONS

120-20

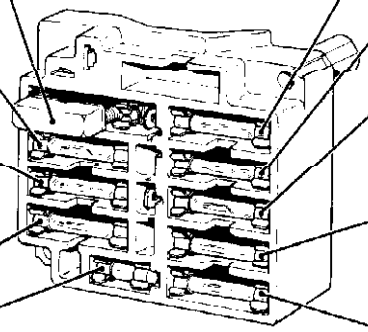
Figure 120-20 Lamp and Fuse Chart - 43-44000 Series

LAMPS

WHERE USED	LAMP NO.	NO. USED	CANDLE POWER	MODEL
INSTRUMENT PANEL				
INDIRECT LAMP (SPEEDO)	194	2	2	ALL
INDIRECT LAMP (GAGES CLUSTER)	168	2	3	ALL
CLOCK OR TACHOMETER	1893	2	2	ALL
INDIRECT LAMP(FUEL GAGE & IND LAMP)	194	2	2	ALL (LOWER BULBS)
INDIRECT LAMP(FUEL GAGE'S IND LAMP)	161	1	1	ALL (UPPER BULB)
TACHOMETER (HOOD MOUNTED)	168	2	3	GSX ONLY
INDICATORS				
HEADLAMP HI BEAM	194	1	2	ALL
DIRECTIONAL SIGNAL	194	2	2	ALL
OIL PRESSURE	168	1	3	ALL
WATER TEMPERATURE	168	1	3	ALL
GENERATOR CHARGE	161	1	1	ALL
BRAKE WARNING	161	1	1	ALL
TAPE PLAYER	2182D	1	.3	ALL
CRUISE CONTROL	181	1	3	ALL
SERVICE ILLUMINATION				
GLOVE COMPARTMENT LAMP	1893	1	2	ALL
RADIO DIAL	1881	1	2	ALL
ASH TRAY ASSEMBLY	1445	1	.5	ALL
HEATER & VENT CONT & CLIMATE CONT (A/C)	1893	2	2	ALL
TROUBLE LAMP	1004	1	15	ALL
MIRROR MAP LAMP	563	1	4	ALL
DOME-ROOF CENTER (OPT WITH 9414045)	211-1	1	15	ALL [1]
DOME-ROOF CENTER (OPT WITH 9423117	211	1	15	ALL [1]
COURTESY-RT & LT SAIL PANELS (OPT WITH 9414049)	212-1	2	6	CUSTOM COUPES ONLY
COURTESY-RT & LT SAIL PANELS (OPT WITH 9423117)	212	2	6	CUSTOM COUPES ONLY
COURTESY-LAMP INST PANEL	89	2	6	ALL
FLASHER DIR SIGNAL (OPT WITH 383637)		1		ALL EXCEPT WAGONS
FLASHER DIR SIGNAL (OPT WITH 383636)		1		ALL EXCEPT WAGONS
FLASHER DIR SIGNAL (OPT WITH 383639)		1		WAGONS ONLY
FLASHER DIR SIGNAL (OPT WITH 383638)		1		WAGONS ONLY
FLASHER HAZARD (OPT WITH 1381303)		1		ALL
FLASHER HAZARD (OPT WITH 3883794)		1		ALL

120-21

Figure 120-21 Lamp and Fuse Chart - 43-44000 Series



FUSE CHART 45-46-48-49000 SERIES

WHERE USED	LAMP NO.	NO. USED	CANDLE POWER	MODEL
INDICATORS				
HEADLAMP HI BEAM	194	1	2	ALL
DIRECTIONAL SIGNAL	194	2	2	ALL
OIL PRESSURE	194	1	2	ALL
WATER TEMPERATURE	194	1	2	ALL
CYLINDER HEAD TEMPERATURE	257	1	2	ALL WITH 455 ENG
GENERATOR CHARGE	194	1	2	ALL
BRAKE WARNING	194	1	2	ALL
CRUISE CONTROL	194	1	2	ALL
RADIO (STEREO INDICATOR)	2128D	1	.3	ALL
REAR WINDOW DEFOGGER (HEATED GLASS)	168	1	3	B&C
SERVICE ILLUMINATION				
GLOVE COMPARTMENT LAMP	1893	1	2	ALL
RADIO DIAL	564	1	2	ALL
ASH TRAY ASSEMBLY	1445	1	.5	ALL
HEATER CONT, CLIMATE CONT, & AUTO CLIM CONT	1893	1	2	ALL
TROUBLE LAMP	1004	1	15	ALL
WINDSHIELD UPPER MAP LAMP	562	1	6	B&C
INTERIOR ILLUMINATION				
DOME - ROOF CENTER (OPT WITH 9422525)	211	1	12	B
DOME - ROOF CENTER (OPT WITH 9414045)	211-1	1	12	B
REAR ARM REST (CONVERTIBLE)	90	2	6	B
COURTESY - SAIL PANEL (OPT WITH 9423117)	212	2	6	C & E
COURTESY - SAIL PANEL (OPT WITH 9414049)	212-1	2	6	C & E
COURTESY - INTERIOR TAILGATE (OPT WITH 9414049)	212-1	1	6	"B" WAGON
COURTESY - INTERIOR TAILGATE (OPT WITH 9423117)	212	1	6	"B" WAGON
COURTESY - INSTRUMENT PANEL	89	2	6	ALL
CENTER CONSOLE - REAR	181	1	3	B&E
FLASHER DIR SIG (OPT WITH 383637)		1		ALL LESS "E"
FLASHER DIR SIG (OPT WITH 383636)		1		ALL LESS "E"
FLASHER HAZARD (OPT WITH 1381303)		1		ALL
FLASHER HAZARD (OPT WITH 3883794)		1		ALL
FLASHER DIR SIG		1		E

120-22

Figure 120-22 Lamp and Fuse Chart - 45-46-48-49000 Series

LAMPS

WHERE USED	LAMP NO.	NO. USED	CANDLE POWER	MODEL
FRONT				
HEADLAMP - 5-3/4 DIA TYPE 1	4001	2	37.5W	ALL
HEADLAMP - 5-3/4 DIA TYPE 2	4002-L	2	37.55W	ALL
HEADLAMP - 5-3/4 DIA TYPE 2 (EXPORT)	4003	2	37.55W	ALL
PARK & DIR SIGNAL LAMP	1157NA	2	32 & 3	ALL
CORNERING LAMP	1295	2	50	ALL
SIDE MARKER LAMP	194	2	2	ALL
SPOTLAMP	4404	1	30 W	B&C
REAR				
REAR TAIL, STOP & DIR SIG LAMP	1157	6	32 & 3	ALL LESS "B" WAG & "E"
REAR TAIL, STOP & DIR SIG LAMP	1157	4	32 & 3	"B" WAGON & "E"
BACK - UP LAMP	1157	2	32 & 3	ALL LESS "B" WAGON
BACK - UP LAMP	1156	2	32	"B" WAGON
LICENSE LAMP	97	1	4	B & E
LICENSE LAMP	194	1	3	C
SIDE MARKER LAMP	194	2	2	ALL LESS "B" WAGON
LUGGAGE COMPARTMENT	89	1	6	ALL LESS "B" WAGON
INSTRUMENT PANEL				
INDIRECT INSTRUMENT LAMP	194	3	2	ALL
CLOCK	1893	2	2	ALL
ACC. SW., WIPER & LIGHTS (SEELITE LAMP SOURCE)	168	1	3	ALL
TRIM PLATE ILL	161	2	1	ALL

120-23

Figure 120-23 Lamp and Fuse Chart - 45-46-48-49000 Series

DIVISION VI SPECIFICATIONS

120-16 LIGHTING SYSTEM SPECIFICATIONS

a. Lamps, Switches, Wiring

Headlamp Make and Type	Guide, Dual T-3 Sealed Beam
Headlamp Lens Diameter	5 3/4"
Tail, Stop, Parking, Signal Lamps, Make	Guide
Lighting Switch, Make	Delco-Remy
Wiring Circuit Type	Single Wire
Wiring Circuit Protection for Head and Front Parking Lights	Thermo Circuit Breaker
Thermo Circuit Breaker Location	In Lighting Switch
Thermo Circuit Breaker Calibration at 75 F.	
Stay Closed Indefinitely at Amps	15
Open Within 60 Seconds at Amps	26

b. Fuses & Circuit Breakers (See Fuse Chart)

c. Lamp Bulbs (See Lamp Chart)

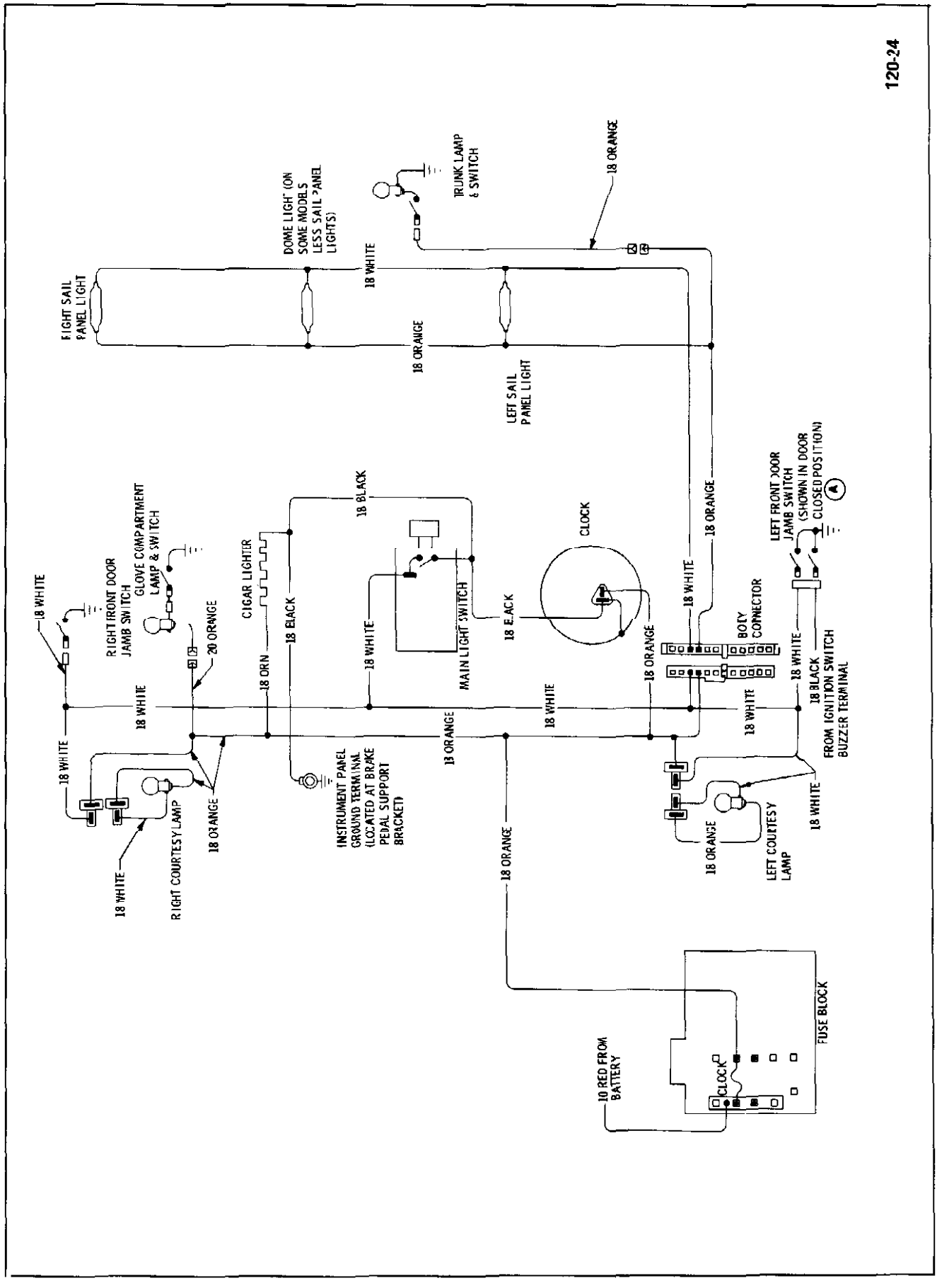


Figure 120-24 Courtesy Lights, Clock, and Dome Light Wiring Diagram - 43-44000 Series

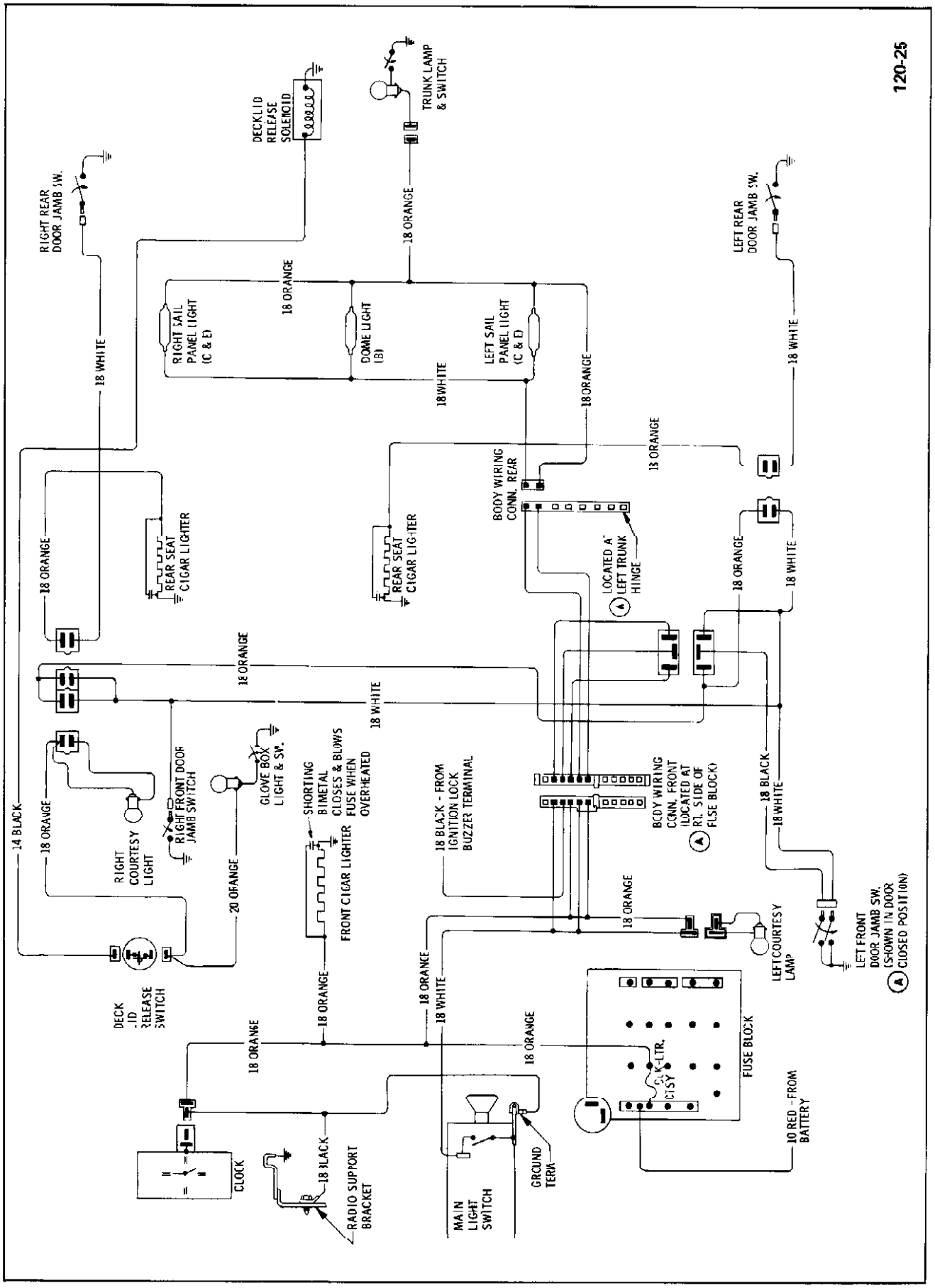


Figure 120-25 Courtesy Lamp and Deck Lid Release Diagram - 45-46-48-49000 Series

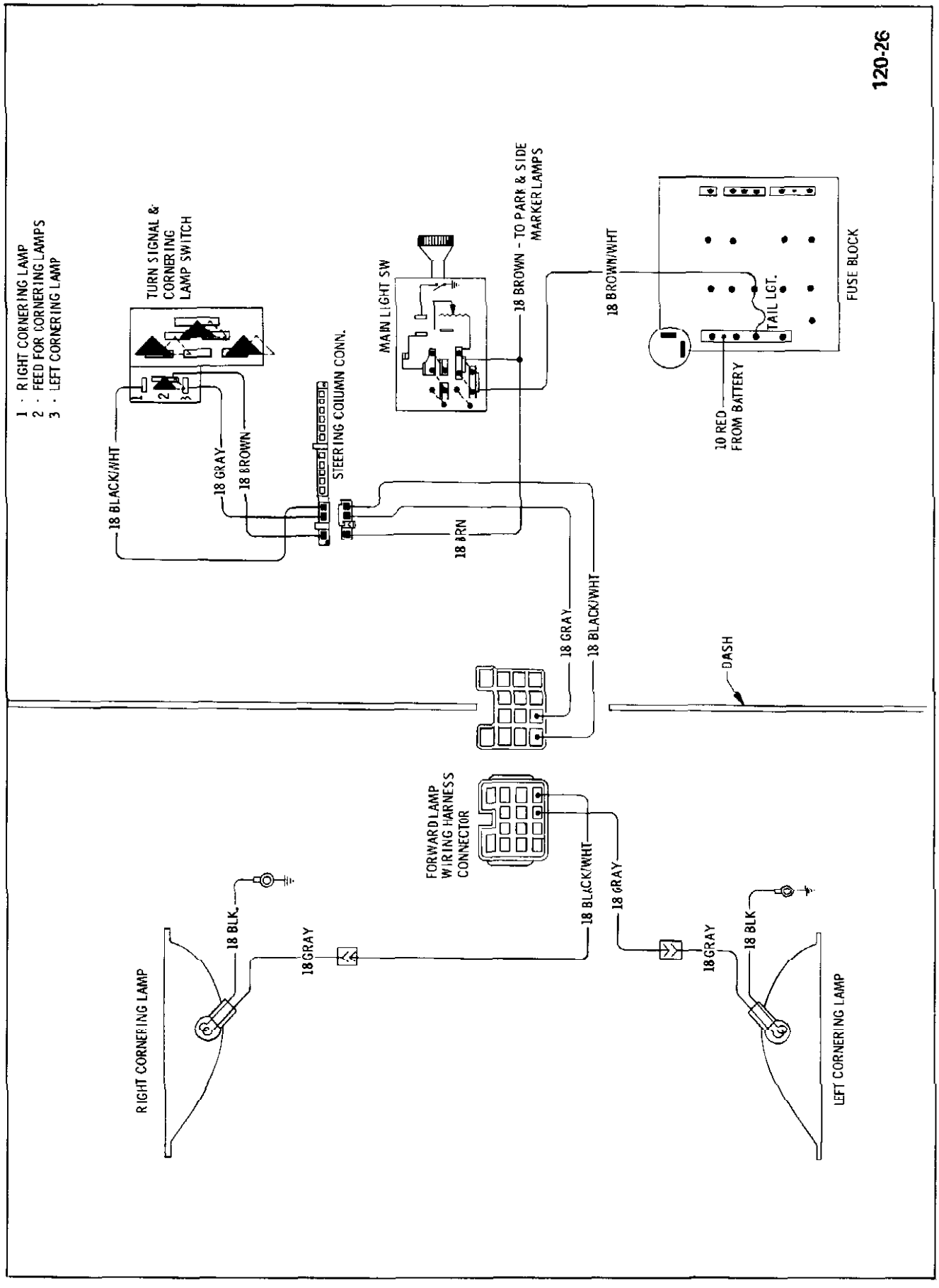
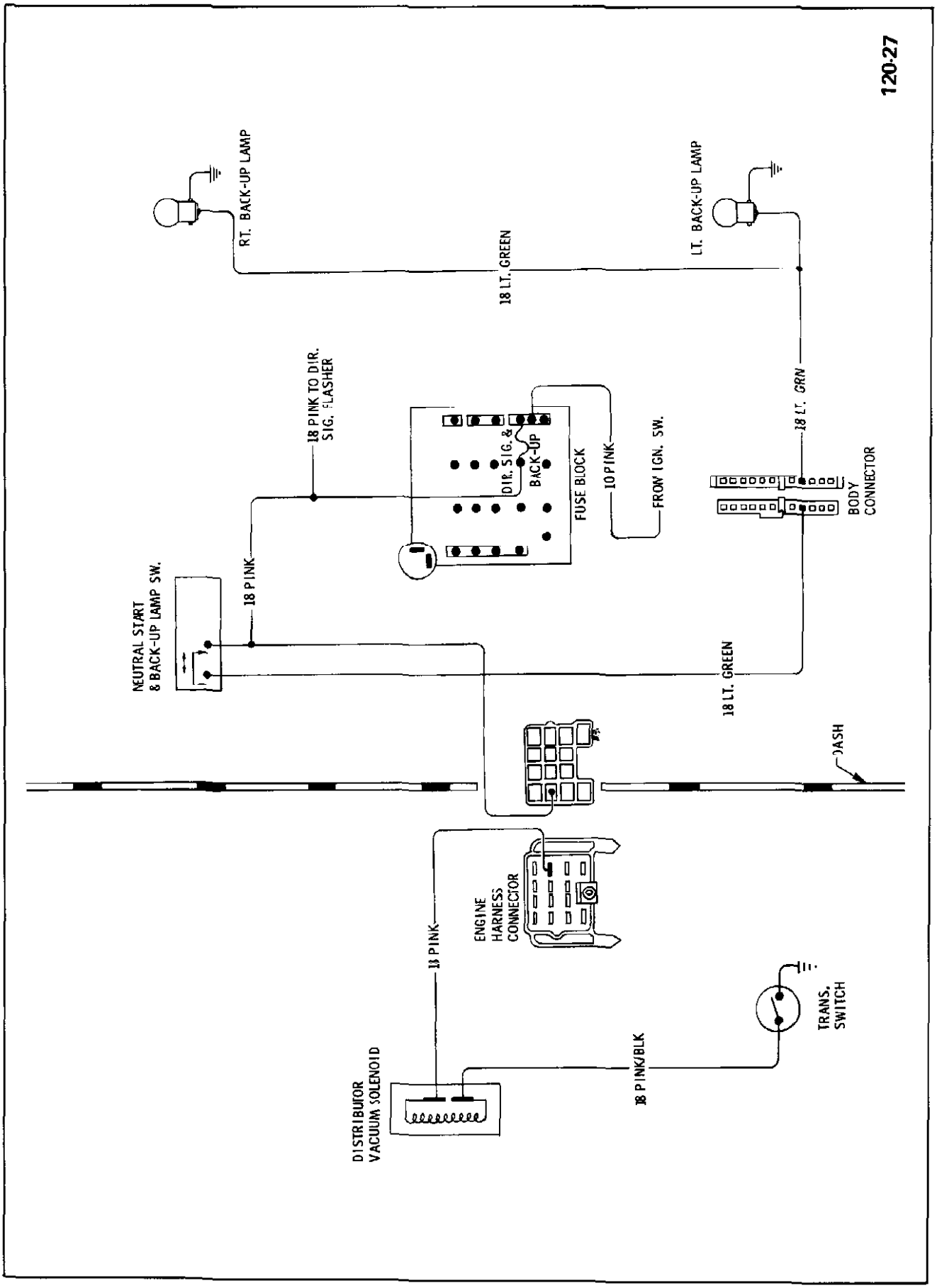


Figure 120-26 Cornering Lights - 45-46-48-49000 Series



Back-Up Lamps and T.C.S. Solenoid (Less L-6) - All Series