

# **DODGE TRUCK**

## **B-4 SERIES**

# **SHOP MANUAL**

**MODELS: B-4-B, B-4-C, B-4-D, B-4-PW, B-4-DU, B-4-EU, B-4-F,  
B-4-G, B-4-GA, B-4-H, B-4-HA, B-4-HM, B-4-HMA, B-4-J, B-4-JA,  
B-4-JM, B-4-JMA, B-4-K, B-4-KA, B-4-KMA, B-4-R, B-4-RA, B-4-T,  
B-4-TA, B-4-V, B-4-VA, B-4-Y, B-4-YA, B-4-YX**

### **SECTION 3**

## **BODY AND SHEET METAL**

**DODGE DIVISION  
CHRYSLER CORPORATION  
DETROIT 31, MICHIGAN**

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# BODY AND SHEET METAL

## 1. REMOVAL AND INSTALLATION OF INSIDE DOOR HANDLE (FIG. 1)

- (1) Press escutcheon plate against trim panel, exposing pin which holds handle to shaft.
- (2) Push the pin out of the shaft with a slim rod, or Tool C-533 (Fig. 1). The handle and escutcheon plate can then be pulled off the shaft.

To install, reverse the operations.

## 2. REMOVAL AND INSTALLATION OF DOOR LOCK CYLINDER (FIG. 2)

### a. Removal

- (1) Loosen retaining screw (Fig. 2) in edge of door frame.
- (2) Pull out lock cylinder.

### b. Installation

- (1) Insert a piece of wire through the lock cylinder holes in the inside and outside door panels.



Fig. 1—Removing Inside Door Handle, Using Tool C-533

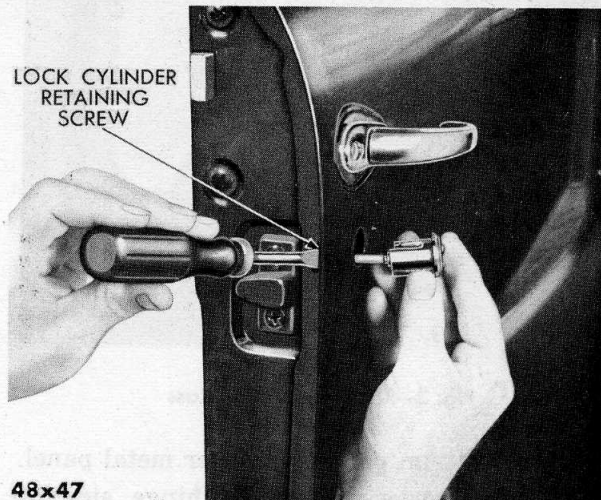


Fig. 2—Removing Door Lock Cylinder

- (2) Fit the outside end of the wire in the small hole in the end of the square shaft and guide the shaft into the hole in the door lock.
- (3) Tighten the retaining screw.

## 3. REMOVAL AND INSTALLATION OF TRIM PANEL

- (1) Remove inside door handles and arm rest (if so equipped).
- (2) Remove screws which hold trim panel to door. Using a screw driver, pry off each snap fastener which holds trim panel to the door. Before installing, be certain that each snap fastener is securely in place.

The door lower panel is removed or installed by removing or installing the bordering screws.

## 4. REMOVAL AND INSTALLATION OF VERTICAL SLIDING GLASS AND FRONT GLASS RUN

- (1) Remove inside door handles.

## TIGHTENING REFERENCE

In general, body bolts should be tightened to a torque of 10 to 20 foot-pounds, at head or nut, whichever is the smallest size.

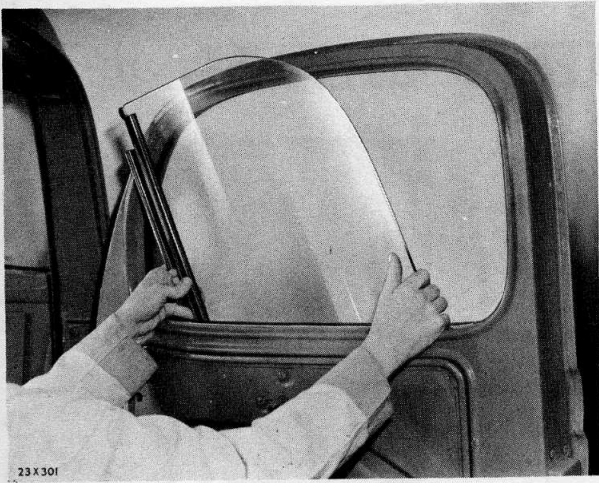


Fig. 3—Removing Door Glass

- (2) Remove trim panel and lower metal panel.
- (3) Remove screws from the hinge side of the door panel which hold the glass front run channel in place. Draw the channel down and out through the opening in the door panel.
- (4) Run the window all the way down, remove the stop screws in the glass lower channel and unhook the window lift rollers from the glass lower channel.
- (5) Remove the weatherstrip from the lower edge of the window opening.
- (6) Tilt the door glass and lift the glass up and out of the window opening (Fig. 3).
- (7) To remove the glass from the base or lower channel, pull it out of the channel.



Fig. 4—Location of Ventilator Window Retaining Screws

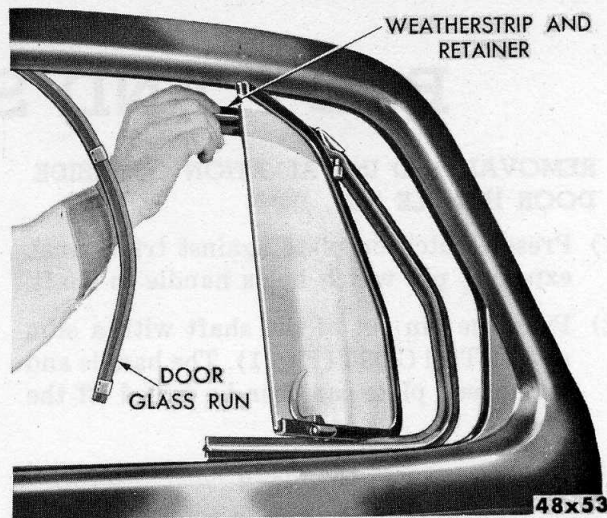


Fig. 5—Removing Ventilator Weatherstrip and Frame from Upper Door Channel

To install the glass in the channel, drive the channel onto the glass with a wooden or rubber mallet. Be certain that the channel is in exactly the correct location on the glass before driving it in place. Install the glass and channel in the door frame by reversing the foregoing operations.

#### 5. REMOVAL AND INSTALLATION OF DOOR VENTILATOR ASSEMBLY

- (1) Lower the door glass to the bottom of its travel.
- (2) Open the ventilator glass and remove the retaining screws indicated in Figure 4.



Fig. 6—Removing Ventilator Assembly

- (3) Pull the top portion of the door glass run down and out of the way.
- (4) Partially close the ventilator glass and pull the ventilator assembly towards the center of the door opening.
- (5) Open the ventilator glass and pull the top portion of the ventilator weatherstrip and retainer down and out of the door channel (Fig. 5).
- (6) Close the ventilator glass and remove the assembly, as shown in Figure 6.

To install, reverse the above procedure.

### 6. REMOVAL AND INSTALLATION OF REAR WINDOW AND REAR CORNER GLASS

The rear window and corner glass are sealed in place by a one piece rubber molding. If it is necessary to replace them, proceed as follows:

- (1) Place a new rubber molding on glass with a sealer.
- (2) Wrap string around outside lip of rubber molding.
- (3) Insert glass from the inside, first positioning curved corner piece.
- (4) Pull rubber lip of molding over outside sheet metal by pulling string.

### 7. REMOVAL AND INSTALLATION OF WINDOW LIFT REGULATOR

- (1) Remove the inside door handles, trim panel (upper and lower), front lower glass run and the glass.
- (2) Remove screws (Fig. 7) which hold regulator base to door panel.
- (3) Pull regulator assembly down and out through opening in the door panel.

To install, reverse the operations.

### 8. REMOVAL AND INSTALLATION OF DOOR LATCH AND REMOTE CONTROL

- (1) Remove the window regulator handle and the remote control handle.
- (2) Remove trim panel.
- (3) Remove metal panel.

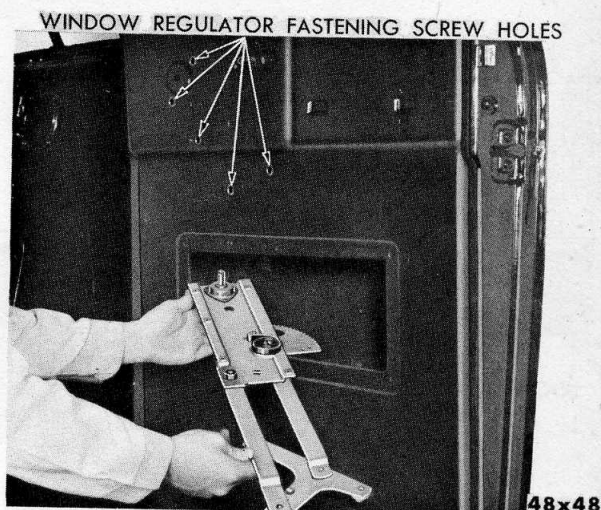
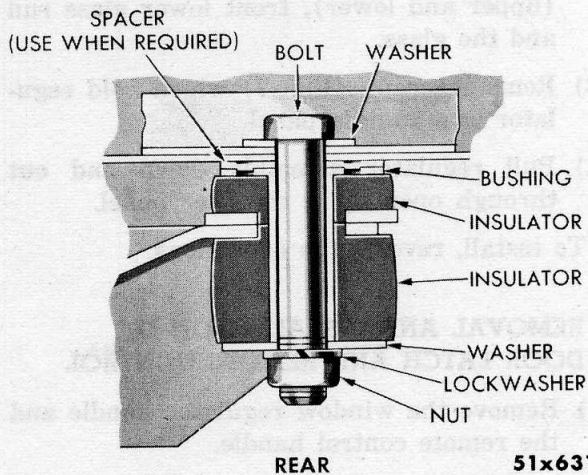
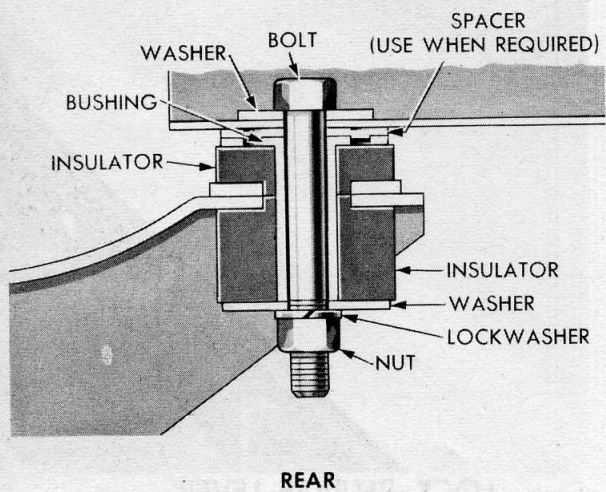
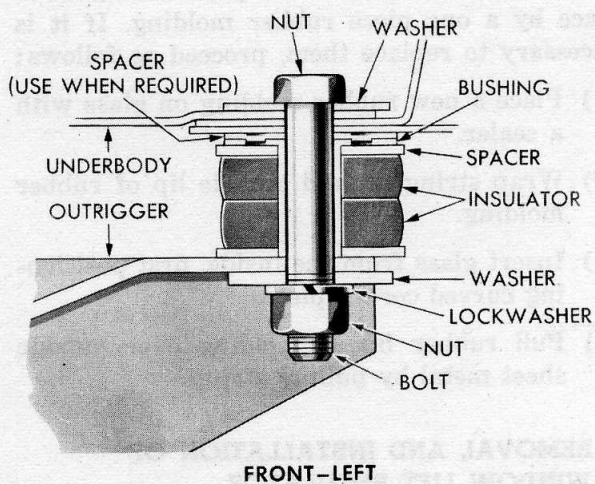
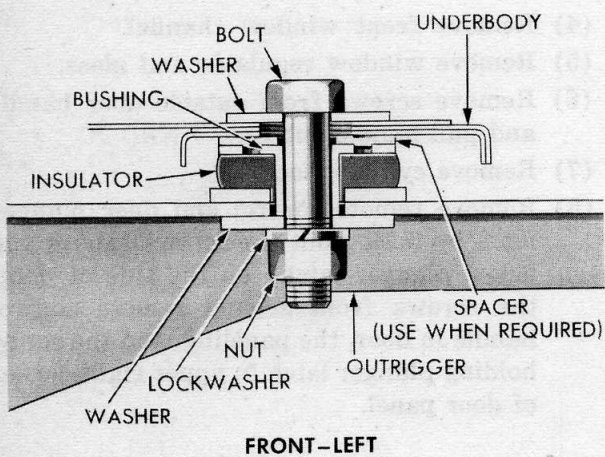
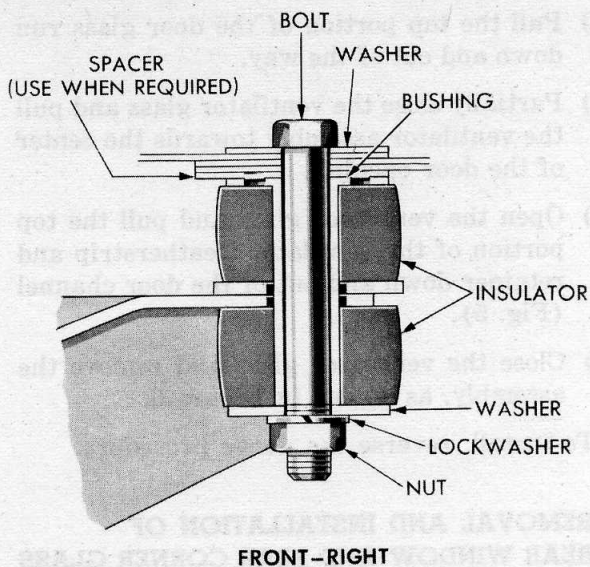
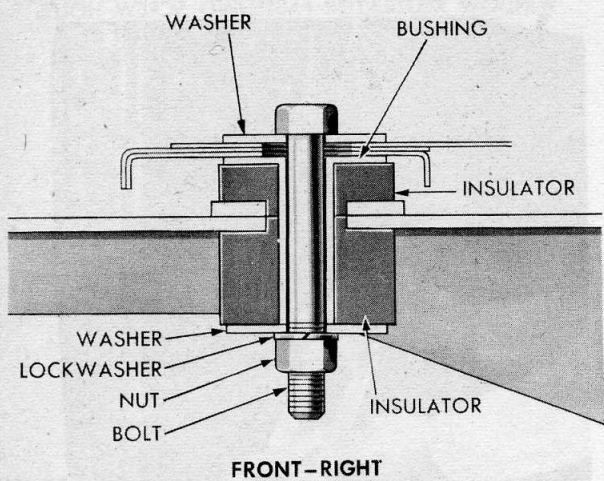


Fig. 7—Removing Door Window Regulator Assembly

- (4) Remove front window channel.
- (5) Remove window regulator and glass.
- (6) Remove screws from outside door handle and pull handle out.
- (7) Remove cylinder lock.
- (8) Remove remote control and door plunger latch by taking out the screws (above and below plunger latch) on the side of door, the screws from around remote control handle in door, the paneling, and the screw holding plunger latch in upper right corner of door panel.



Fig. 8—Seat Adjustment (Except Route Van Models)  
(Refer to page 7)



51x630

51x631

Fig. 9—Cab Mounting Insulators (Except B-4-PW)

Fig. 10—Cab Mounting Insulators (B-4-PW)

(9) Remove remote control and latch through opening made by the removal of the metal panel. When installing the door latch and remote control, the door lock cylinder assembly should be assembled immediately after fastening the latch to the edge of the door. Then, reverse the foregoing operations. Be certain that the inside door handle is locked when the outside handle is locked.

### 9. FENDER ADJUSTMENT (EXCEPT B-4-PW)

The fender housings and front end sheet metal (as an assembly) are completely adjustable for alignment on the trucks (except B-4-PW). The radiator support and rear fender brackets are movable in all directions. Since the mounting holes for the radiator support studs are elongated in the frame cross member, the front end sheet metal and fender housings can be easily moved to obtain a proper fit between the cab doors, cowl, and hood and cowl. The various adjustments to correct misalignment are performed as follows:

#### a. Abnormal Space Between Cowl and Rear of Fender Support

Loosen fender housing upper bracket bolts and lower bracket bolts. Push fender housing toward cowl to position.

#### b. Fender Housing Out of Alignment With Door

If it is necessary to raise or lower the fender housing, loosen the fender housing upper cowl bracket bolts and lower bracket bolt. It may also be necessary to add additional pads between the cab front support and the fender housing lower rear bracket.

#### c. Abnormal Space Between Fender Housing and Door

Loosen the radiator support stud nuts, fender housing upper bracket outer bolts and lower bracket bolts. This will permit the entire sheet metal assembly to be moved back toward the doors. This same procedure can be followed if it is necessary to align the hood panels with the cowl.

It may sometimes be necessary to change the thickness of the radiator support to frame front

cross member pads in order to perform a correct vertical alignment between the fender housings and doors.

### 10. SEAT ADJUSTMENT (EXCEPT ROUTE VAN MODELS) (FIG. 8, PAGE 5)

The driver's seat is adjustable. It can be moved by releasing the locking mechanism and sliding the frame forward or backward on the ways. A lever for releasing the lock (Fig. 8) is located near the floor at the center of the seat. To slide the seat, pull upward on the lever. Release the lever to lock the seat in the desired position.

#### NOTE

*The seat adjustment for Route Van Models is outlined in the Route Van Body Service portion of this section. Refer to Paragraph 19 and Figure 16.*

### 11. CAB MOUNTINGS (FIGS. 9 AND 10)

The cabs are mounted on rubber insulators. The assembly of the various parts should always conform to the sequence shown in Figures 9 and 10, with the hard rubber insulator at the left front and the softer insulators at the other points. The alignment of the cab can be changed, whenever necessary, by adding or removing spacer washers between the insulators and cab floor. It is essential that the mounting bolt nuts be securely tightened and checked for tightness at regular intervals.

### 12. STRAIGHTENING WARPED DOOR

A warped door may be straightened as follows:

- (1) Run the window down (all the way).
- (2) Place a block between the latch post and the door at the top or bottom as required (Fig. 11).
- (3) Then, push the door in at the end opposite the block and bend the door slightly.
- (4) Try the door for fit and repeat the straightening procedure, if necessary.

The flange of the door should have the same clearance from the body at the top and bottom.



Fig. 11—Correcting Warped Door by Use of Wood Block

### 13. ADJUSTING DOOR

Door adjustment is made by bending the hinges if the door is not warped. Eliminate warp first and *always lower the window (all the way) before making any adjustments.*



Fig. 12—Moving Door Down and Closer to Latch Post  
(Typical View)

1 — Block of wood

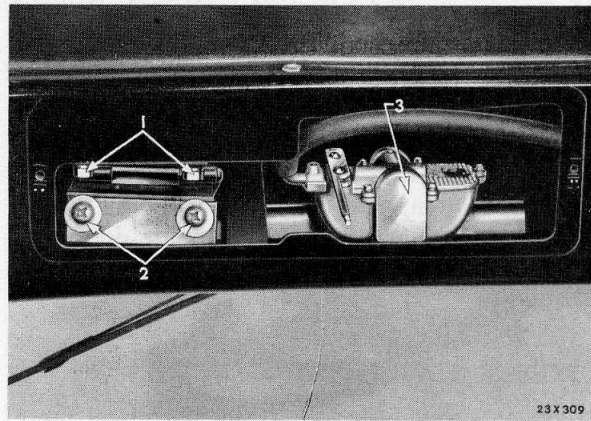


Fig. 13—Adjusting Windshield Hinge

1 and 2 — Windshield hinge screw  
3 — Windshield wiper unit

To move door closer to (or away from) the body, loosen the hinge screws in the pillar half of the flange and move the hinge blade in the pillar post in or out, as required.

To move the lock side of a door "DOWN", put a wrench handle or block of wood (Fig. 12) between the open halves of the upper hinge. Then, press the door toward closed position enough to slightly spring the hinge. Try the door without the block and repeat the operation, if necessary.

To move the lock side of a door "UP", spring the lower hinges in the same way. This also moves the door closer to the latch post.

To move the door closer to the hinge post, put a "C" clamp on the hinge when the door is closed. Then, open the door enough to spring the hinge the desired amount. Next, try the door without the clamp. Repeat if necessary.

Always tighten the hinge screws after springing a hinge. Also, open and close the door several times after making any of the adjustments in order to let the hinge pins work into their natural positions.

### 14. ADJUSTING WINDSHIELD HINGE AND SERVICING THE WINDSHIELD GLASS (B-4-PW)

#### a. Hinge Adjustment

- (1) Remove inspection hole covers from the windshield header panel, right and left.
- (2) Loosen the cap screws in the slotted holes



of hinges (Fig. 13), and move the windshield in the direction required.

- (3) Tighten the cap screws and replace the inspection hole covers.

#### b. Removal of Windshield Glass

- (1) Install masking tape on top of the instrument panel to prevent damaging the finish.
- (2) Remove the garnish molding and welt strip.
- (3) Remove the center strip molding.
- (4) Remove the windshield molding and glass from the body edge.
- (5) Loosen the rubber molding all the way around the body edge and glass (inside and outside) and also at the center bar.
- (6) Work the rubber molding off the upper outside corner of the body edge with a hard wedge.

#### c. Installation of Windshield Glass

- (1) Coat the edges of the glass with a good grade of soft soap, such as linseed oil soap or its equivalent (containing no free alkali). *Do not use oil or grease.*
- (2) Insert the glass in the bottom of the rubber molding and slide it to within about 4 inches of the center bar.
- (3) Hook the rubber molding over glass at the top inside corner and slide the glass toward the center strip and, at the same time, keep the rubber molding on the bottom of the glass.
- (4) Continue working the rubber molding over the top of the glass and, at the same time, slide the glass toward the center bar.
- (5) Using a wood wedge, work the rubber molding over the glass at upper outside corner.

- (6) Work the glass into the groove of the rubber molding at the center strip.
- (7) Hold the glass close to the windshield opening and work the lip of the rubber molding up and over the body edge.
- (8) Seal the rubber channel and glass with MOPAR Windshield Sealer. Be sure the compound goes along the edge of glass between the glass and rubber, making a water tight joint, when the rubber springs back against the glass. Work a thin coating of MOPAR Windshield Sealer between the outside of the body edge and rubber molding to make a water tight joint. Install the garnish molding with welt attached and the center molding.

#### 15. REMOVAL AND INSTALLATION OF VACUUM WINDSHIELD WIPER

- (1) Remove inspection hole cover.
- (2) Unhook wiper arm from shaft.
- (3) Remove nut from outside end of wiper shaft.
- (4) Disconnect vacuum tube from wiper motor.
- (5) Remove wiper motor unit.

To install, follow in reverse order the procedure outlined above.

#### 16. REMOVAL AND INSTALLATION OF ELECTRIC WINDSHIELD WIPER

- (1) Remove nut and wiper arm assembly.
- (2) Remove mounting nut.
- (3) Remove mounting nut spacer and gasket.
- (4) Remove inspection hole cover and lift out wiper motor.

To install, follow in reverse order the procedure above.

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## ROUTE VAN BODY SERVICE

#### 17. REMOVAL, INSTALLATION AND ADJUSTMENT OF FRONT SLIDING DOOR

- (1) With the door in the closed position, remove the sliding door hanger assembly by removing the retaining bolts and lifting assembly off the rail.

- (2) Pull the door out at the top and away from the body (Fig. 14).

When installing the door, place it in position, install the hanger assembly, but DO NOT tighten the mounting bolts. To adjust the door for proper sliding action, proceed as follows:

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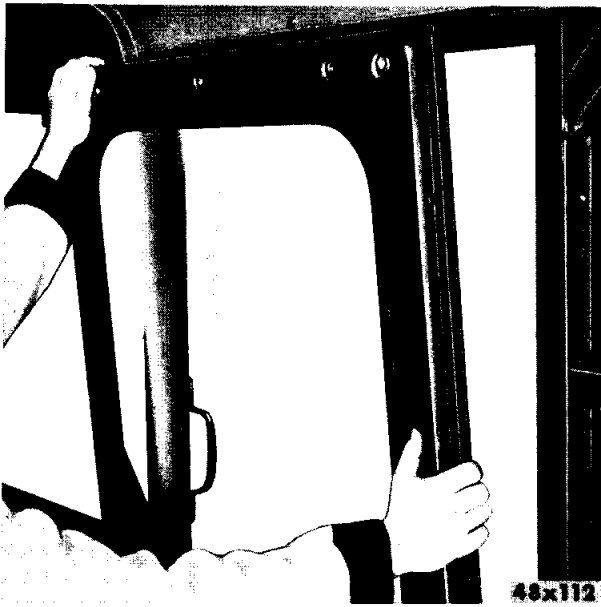


Fig. 14—Removing Sliding Door

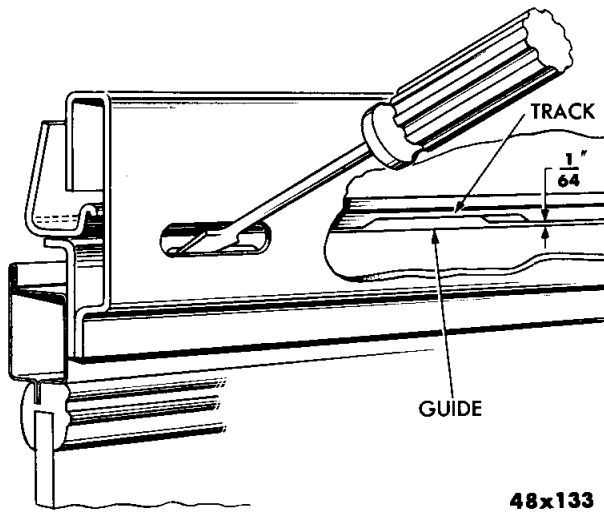


Fig. 15—Adjustment of Sliding Door

- (1) With the door in closed position, align it with the front weatherseal and floor.
- (2) When the door is in the desired position, tighten the first and last door hanger mounting bolts.
- (3) Insert a screw driver or other suitable tool through the slotted hole in the hanger and adjust the door guide within  $\frac{1}{64}$  inch of the lowest point of the track (Fig. 15).
- (4) Slide the door back and forth, checking to see that the guide clears the track in all positions.
- (5) With the guide in position, tighten the remaining bolts and check the door for proper sliding action.

#### 18. REMOVAL AND INSTALLATION OF GRILLE PANEL LOCK ASSEMBLY

- (1) Remove the mounting bolts and the handle retaining nut and handle.
- (2) Spread the clips holding the control linkage and remove the lock.

When the lock is installed, check to see that it properly locks and unlocks the grille panel.

#### 19. REMOVAL, INSTALLATION AND ADJUSTMENT OF DRIVER'S SEAT AND SEAT POST

##### a. Removal and Installation

- (1) Remove the bolt from the hole in the seat post and lift the seat assembly up and off the seat post.
- (2) Remove the seat post retaining screws.
- (3) Remove the seat post assembly.

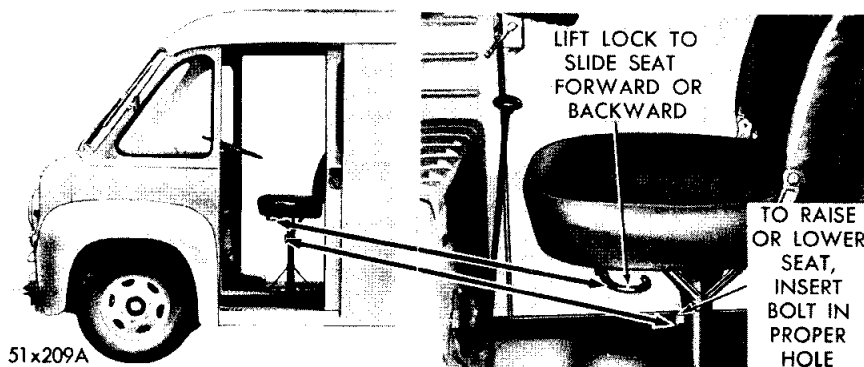


Fig. 16—Seat Adjustment (Route Van)



Fig. 17—Rear Door Holder (Extra Equipment)

When the seat post has been installed, replace the seat assembly.

#### b. Adjustment of Driver's Seat

The driver's seat (Fig. 16) is adjustable for height and for distance from the truck controls. Three holes are provided in the seat post for seat height adjustment. Adjust the seat for height by inserting a bolt in the proper hole. To move the seat forward or backward on its guides, release the lock at the left (below the seat). To slide the seat, lift up on the lock lever. Then, release the lever to lock the seat in the position selected.

### 20. REMOVAL AND INSTALLATION OF REAR DOOR HOLDER

Remove the two mounting screws and then the holder will come off (Fig. 17).

Before installing the holder, check the gasket and rubber section. If either is broken or worn, replace as necessary.

### 21. REMOVAL AND INSTALLATION OF INSIDE BODY PANELS

All of the inside body panels can be easily removed for repair or replacement by removing the sheet metal screws which hold the panels to the body.

The body panels must be replaced exactly in reverse of the order in which they were removed.

### 22. REMOVAL, INSTALLATION AND ADJUSTMENT OF REAR SWINGING DOOR

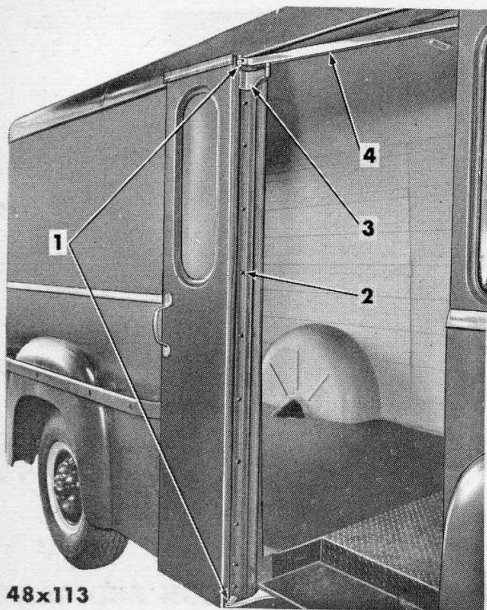
Remove the door-to-hinge mounting bolts and the door will come off.

When installing the door, place it in position and replace the mounting bolts. DO NOT tighten them, but draw them up snug enough to hold the door in place. Close and open the door a few times, checking visually the position of the door in relation to the top, sides, and floor of the body. When the door appears to be adjusted properly, and will open and close easily, tighten the mounting bolts securely. Close the door, and from the inside of the truck, check visually again for large gaps allowing the entry of light at the top, bottom and sides. If any are visible, repeat the above procedure until the door is properly adjusted and no light is visible around the edges of the door.

### 23. REMOVAL, INSTALLATION AND ADJUSTMENT OF FRONT FOLDING DOOR (EXTRA EQUIPMENT) (FIG. 18)

- (1) With the door in open position, remove the clevis pin (1, Fig. 18).
- (2) Lift control link (4) from guide bracket (3).
- (3) Remove the door mounting bolts (2) and the door will come off.

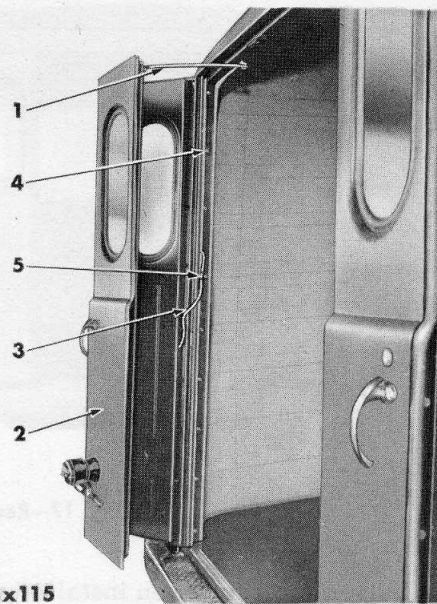
The door-to-hinge mounting bolts are smaller than the holes provided. This arrangement allows for a slight adjustment of the position of the door in relation to the door sill.



48x113

Fig. 18—Front Folding Door (Extra Equipment)

- 1 — Clevis pin
- 2 — Mounting bolts
- 3 — Floating leaf guide bracket
- 4 — Control link



48x115

Fig. 20—Rear Folding Door (Extra Equipment)

- 1 — Guide arm
- 2 — Floating leaf
- 3 — Stop light wire
- 4 — Mounting bolt
- 5 — Wire clip

When installing the door, place it in position and replace the mounting bolts. **DO NOT** tighten them, but draw them all up tight enough to hold the door securely. Close and open the door a few times until it has the desired fit. Then, tighten the bolts. From inside the truck, check visually around the top, sides, and bot-

tom of the door when it is in the closed position. If gaps allowing the entry of light are visible, anywhere around the edges of the door, repeat the above procedure until no light can be seen.

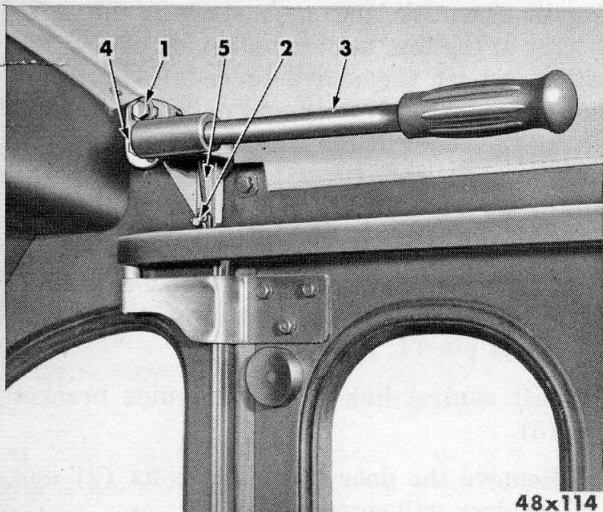
#### 24. REMOVAL, INSTALLATION AND ADJUSTMENT OF FRONT FOLDING DOOR CONTROL MECHANISM (FIG. 19)

- (1) Remove adjusting bolt (1, Fig. 19), pivot bolt (4) and control handle (3).
- (2) Push the door to one-quarter open position, remove the clevis pin (2) and the control arm bracket (5) will be free.
- (3) Remove the control - handle - mounting - bracket bolts and bracket.

When the mechanism is installed, adjust the position of the control handle. To do this operation, loosen the handle-piston-adjusting bolt, place it in the desired position and then tighten the bolt.

#### 25. REMOVAL, INSTALLATION AND ADJUSTMENT OF REAR FOLDING DOOR (EXTRA EQUIPMENT) (FIG. 20)

- (1) Disconnect the stoplight wires by removing



48x114

Fig. 19—Front Folding Door Control Mechanism

- 1 — Handle position—adjusting bolt
- 2 — Handle-to-link clevis pin
- 3 — Control handle
- 4 — Pivot bolt
- 5 — Control arm bracket

the inside body inspection plate so that the connections are visible.

- (2) Remove the stoplight wire clip and pull the wire out.
- (3) Disconnect the floating leaf guide arm.
- (4) Remove the door-to-hinge mounting bolts and door.

To adjust the door, follow the procedure

given for the Adjustment of the Front Folding Door.

Annoying rattles, difficult to locate, may develop around the floorboards, door hinges and body to frame bolts, unless these parts are periodically tightened.

It is advisable to inspect these bolts and screws and tighten as necessary after the first 1,000 miles of operation of a new truck. Tighten them frequently during the breaking-in period.

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## MAINTENANCE

### 26. REMOVING WRINKLES IN CUSHIONS

Sometimes wrinkles in the cushions are caused by the cushion frame having been sprung out of square. This can often be corrected by dropping the cushion down against one corner. If it is necessary to add wadding to fill up a sagged part of the cushion, remove the back and side clips, which hold the trim material to the seat frame. Lay the cover back, add the desired amount of wadding, and install the trim material and clips.

### 27. CLEANING LEATHER OR IMITATION LEATHER

If leather or imitation leather upholstery becomes soiled, its original luster may be restored by rubbing the surface of the material briskly with a cloth slightly dampened in clean water, using castile or other soap of similar type. Next, apply a cloth, which has been moistened in clean water only and finish by rubbing dry with a clean, soft cloth. The friction produced by the dry cloth used in the last operation will restore the surface to its original brilliancy.

#### NOTE

*Do not apply cleaning fluids of any nature to this type of trim material, or immediate deterioration will result.*

### 28. COWL VENTILATOR

This cowl ventilator lid should fit tightly around the rubber seal on the top sides. Slotted holes are provided in the ventilator lid where it is mounted on the hinge. The hinge is mounted on a bracket by means of slotted holes. The lid

may be moved up or down, or forward or backward, as required, to fit the opening in the cowl.

A drain tube runs from the cowl drain trough downward and through the dash. Sometimes, this tube is bent upward in the center when working under the cowl. The tube should be pointing in a continuous downward slant so the water can run out.

### 29. PRESERVATION OF FINISH

The finish on the truck should be washed often enough to keep it free from dust and road scum. Wash with a sponge and plenty of cold or warm water. Dry with a damp chamois. A mild soap may be used occasionally, if desired, with a thorough rinsing afterwards. The vehicle should always be washed in a shaded place. Washing it in strong sunlight may result in water spotting and staining which are difficult to remove.

During winter months, it is particularly important to make sure that anti-freeze preparations do not get on the finish. It is common practice in most communities to use chemicals, particularly calcium chloride, on the streets to melt snow and ice. The use of such chemicals results in a slush which will be harmful to the finish of the truck, unless it is washed off as soon as possible.

If the paint surface is not kept clean, the action of the elements and accumulation of dirt, road scum, corrosive salts, etc., will eventually damage the finish of the truck. The more frequent washings will lessen the necessity of using polish. If, after extended neglect, strong sunlight and the elements have caused the fin-

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ish to dull, MOPAR Liquid Automobile Polish can be used to restore the luster of the finish. Use of paste waxes and abrasive cleaners is not recommended.

### 30. BODY ALIGNMENT

Any condition of misalignment which may develop will, in a majority of instances, be visible only in the body, or noticeable on the road, since the front and rear wheels may not follow in the same track. This can result from a broken spring, bent axle or spring hanger, and can be corrected by straightening or replacing the affected part.

Misalignment of the body can be determined by comparing diagonal dimensions taken from the interior of the body at different heights and at different angles.

For example, the distance from a point on the front of the left body door hinge pillar to a point on the right rear body corner should be exactly equal to the distance from the corresponding point on the right front body hinge pillar to the corresponding point on the left rear body corner. Similar measurements may be taken from other angles when the misalignment is believed to exist on some other plane.

Once the misalignment is located, it is only necessary to straighten the bent or sprung brace or cross member. In extreme cases, it may be necessary to remove the affected cross bracing, align the body, straighten the brace, and gas weld it back in place, or to replace the entire part. This will depend upon the nature of the damage which must be repaired.

Slight body misalignment, indicated by poor fits with wide gaps at the top and interference at the bottom of the door openings (provided the door itself or the door hinges are not sprung), is usually the result of the body settling, or the body becoming distorted as the result of a minor collision. In most cases, misalignment of this nature can be corrected by shimming the body, placing additional shims between the body sill and frame outrigger bracket or frame under the nearest body bolt to the low part of the body.

Careful and thorough analysis of each individual case of body misalignment will help speed adjustment with a minimum of labor.

### 31. REPAIRING BODY PANELS AND BRACES

It is seldom necessary to replace a body panel or stamped type strainers and braces. With the proper welding equipment, an experienced body repair man may splice or replace only the damaged portion of such parts much more efficiently and economically than by making parts replacement. For this reason, only those parts listed in the Parts Book are available from the Service Parts Department, since it is possible to repair any of the other parts much easier than to replace them.

### 32. RESHAPING AND SHEET METAL WELDING

Body bumping and sheet metal welding should be performed by experienced men, using the special tools and equipment found in good body repair shops. Since each individual job of body or sheet metal bumping requires a different method of procedure to accomplish a satisfactory repair, no reference is made to this phase of body maintenance.

If welding or bumping are necessary on sheet metal lined with sound-deadener, remove the heavy felt pads before performing the work. Reinstall them, after completing the job, by cementing them to the interior of the body panel. It is extremely important that every piece of deadener of any size be replaced after completion of the sheet metal work.

### 33. WELDING AND SOLDERING

Welding and soldering are among the most important phases of body maintenance, since they are done in the majority of body repair operations. Every body shop should have the necessary equipment for performing these highly important operations, and should employ an experienced welder, familiar with all-steel body welding and soldering.

In the limited space available in this Shop Manual, it is not possible to present instructions for welding or soldering in any other than an elementary and very general form. Complete and thorough instruction books for welding and soldering, covering in minute detail every phase of this work, are available from welding equipment manufacturers.

### a. Gas Welding

Of the many types of welding employed in steel body manufacture, the oxy-acetylene process is the most important to the repairman.

Oxy-acetylene welding consists of uniting pieces of metal by means of a flame of high temperature, with the addition of metal of the same composition, or one which will fuse to form a better bond between the two sections. The gas welding torch is the tool by which this is accomplished, using acetylene gas and oxygen as heating agents. In making a gas welded joint, the operator applies the tip of the white cone in the center of the torch flame to the edges of the two pieces of metal that are to be fused. The intense heat generated at this point gradually heats up the local surfaces to a point where fusion begins. A suitable welding stock, consisting of a metal rod usually of the same material as the surface to be welded, is then applied (along with the welding flux) to assist the metal surfaces of the joints to intermingle.

### b. Brazing

Brazing, or welding with brass rod instead of iron, may be employed on sheet metal which has been filed so thin that a flame hot enough to weld would burn the panel. This is a process which is particularly valuable when repairing damage to the metal over the corners of the windshield, door frames, etc. A very "soft" flame, much less intense than that required to weld with iron, can be used because of the lower temperature at which brass will flow. With a good grade of brazing flux, a joint may be formed which, while not as strong as a welded seam, does permit joining thin sections of metal without the danger of burning or buckling the metal.

### c. Welding Stock

In repairing steel bodies, a filler rod or stock of the best grade of steel must be used. For general body repair work, rods 36 inches long and  $\frac{3}{32}$  inch or  $\frac{1}{8}$  inch in diameter are the most popular sizes. For brazing, a No. 8 brass rod will prove the most satisfactory in body repair work.

### d. Flux

A welding flux or chemical (usually in powder

form and into which the hot welding rod is dipped for application to the joint) must be used to produce a perfect union of the molten metal. This flux reduces oxidation to a minimum and assists the metal in flowing. The instruction book, which accompanies all welding equipment, lists the best flux to be used, and also describes the methods of application with the particular equipment. However, a different grade of flux must be employed for brazing than that recommended for welding.

### e. Welding Suggestions

- (1) The metal surfaces to be welded must be free from all grease, paint, rust, or other impurities. It is advisable to polish the metal with a polishing wheel to insure removal of all scale.
- (2) Pile wet flake asbestos around the weld to protect painted parts in the region of the repair and to keep the metal from buckling due to expansion.
- (3) Upholstery panels are very easily removed from the steel bodies. To prevent damage to trim in the weld area, remove it before starting the operation.
- (4) For general body repair work, do not use a torch nozzle larger than a No. 3 size. A No. 2 nozzle should be employed on very fine work.
- (5) With a No. 2 or No. 3 nozzle, 10 pounds of pressure is sufficient on both acetylene and oxygen. In extreme cases, where major repairs necessitate the use of a No. 4 or No. 5 nozzle, 30 pounds pressure will give more intense heat.
- (6) When welding metal which has been tinned for soldering, first remove all traces of solder by burning with a torch and scraping with a wire brush. It will be necessary to heat the metal to a cherry red in order to insure complete oxidation of the solder film.
- (7) The two sides of the seam and filler rod should be at the same temperature so that they will reach the molten stage simultaneously.
- (8) Avoid formation of tacks (when welding a seam) by gradually moving the flame

forward until a continuous weld is formed. Good welding on body or fenders is largely a matter of adjusting the torch, lining up the two parts to be welded, and holding the molten heat evenly so that the metal will flow together.

- (9) Eliminate unnecessary smoothing off work (prior to painting) by being careful not to pile up welding rod.
- (10) In smoothing up, it is always advisable to hammer down the weld into a V-shaped groove and flow solder into the depression, rather than to weaken the joint by filing.
- (11) Pillar posts or braces may become so badly bent that straightening would be impossible without weakening the structure. In such a case, it is advisable to cut out the damaged portion of the post with a hacksaw or torch and weld a new piece into place. The new piece should be fabricated from metal of approximately the same thickness.
- (12) If it is necessary to straighten the body at a point where the metal has become thin, cut out the weakened section and weld into place a sheet steel plate of approximately the same thickness. In fitting the plate to the opening, allow clearance on all sides equal to the gauge or thickness of the metal. Secure the plate in place before welding around the edges by tack welding at the four corners. A section of rod may be welded onto the center of the sheet to hold the sheet in place while the tacks are being made.
- (13) To break a spot weld, drill a hole approximately  $\frac{3}{16}$  inch in diameter through the center of the weld and pry the two pieces of metal apart with a cold chisel.

To re-unite these panels, drill additional holes along the point of the union, gas weld the edges of each opening and fill them with welding stock.

#### 34. HEATING AND SHRINKING

To remove a ding or low spot from a panel where it is impossible to reach it from the inside, weld a piece of welding wire to the center of the ding and form a handle in the free end of the rod. Heat the area on and around

the low spot to a cherry red, and then pull the ding or low spot out of the contour of the body.

To heat shrink a panel, heat a small area in the center of the buckle to a cherry red. Hold a dolly block underneath the heated portion and hammer lightly with a wood mallet until the metal is cool.

#### a. Tinning

Before sheet metal can be torch soldered, it must be tinned. In order to tin welded, painted, or corroded surfaces, a polishing wheel must be used to cut such surfaces down to the virgin metal. The surface to be soldered should then be lightly heated and washed with uncut muriatic acid. Then, the soldered flux may be applied. Molten solder should next be wiped over the surface of the heated metal with heavy burlap or cloth.

#### b. Torch Soldering

Torch soldering can be employed to fill with solder uneven surfaces or deep sharp indentations in truck bodies. The solder is heated to the proper temperature by means of a gas or blow torch, applied to the depression in the body panel and the heated metal paddled to an even surface with a wooden paddle or blocks.

#### c. Suggestions for Torch Soldering

- (1) To cold shrink a panel on which the area to be shrunk is comparatively small and can be reached from the opposite side, reverse the high spot by driving the end of a piece of pipe or block into it. Fill the depression with solder. Smooth the soldered surface to conform with that of the body panel with a hardwood paddle, lubricated with palm oil, linseed oil, etc.
- (2) To cold shrink a large area of the body panel, depress a "V" groove or series of grooves through the section to be shrunk, filling the depressions with solder applied by means of a torch.
- (3) In smoothing a welded seam, hammer the weld into a "V" groove and fill the depression with solder.
- (4) Rather than attempt to straighten grooves or deep indentations in beading or en-



bossed moulding, fill with solder and work the molten metal to the shape of the moulding. A file can be used to trim down excess solder to the exact contour of the beading.

- (5) In some instances, it may be necessary to drill holes in the body panel and insert hooks through them in order to pull out dings which cannot be reached from the inside. These holes may be effectively sealed with solder.
- (6) It is very seldom necessary to smooth up with solder any unevenness resulting from patching or dinging. A smooth surface must

be obtained before repainting. If the part cannot be hammered into shape, smooth enough for painting, fill it in with solder.

#### CAUTION

*Remember, solder does not add strength to the body panel, but merely acts as a filler to form a smooth base for application of paint. All soldering flux must be removed from the area of the repair before refinishing. Be sure to wash the surface to be refinished, after soldering, with a solution of bicarbonate of soda and water to neutralize any acid which may be present on the surface of the metal.*

## SERVICE DIAGNOSIS

### CONDITIONS — POSSIBLE CAUSES — REMEDIES

#### 35. WATER LEAKS

When checking a truck cab for water leaks, it is advisable to start with the cowl ventilator lid. Then, spray water on the windshield wiper pivots, the windshield and then the rest of the cab. Start at the bottom and work the stream of water upward. If this procedure is reversed by starting at the top of the cab and working the water stream downward, it will be difficult to isolate a leak.

Also, water test a small section of the cab at a time. Never play a strong force of water directly on the cab because, under such a condition, a cab that is considered perfectly sealed may leak.

#### 36. LEAK AT COWL VENTILATOR

If the cowl ventilator lid does not seal properly against the weatherstrip, loosen the ventilator linkage and adjust. If the sponge rubber strip is loose in the slot, clean the slot and reseal the strip, using an approved cement. Close the ventilator lid tightly and allow ample time for the cement to dry. Be sure to check the ventilator lid trough and drain tube for restrictions.

#### 37. LEAK AT WINDSHIELD WIPER PIVOTS

Inspect the gasket between the windshield wiper pivot housing and cowl to see if it is out of position. If leakage is evident at that point

under the cowl, remove the wiper housing and install a new gasket coated with windshield sealer.

#### 38. LEAK AROUND WINDSHIELD

If a water leak is evident under the cowl, determine whether or not it is coming through the cowl ventilator or windshield wiper pivot housing gasket. If leakage is not coming from these points, it can be assumed that it is due to improperly sealed windshield edges.

Remove the outside windshield division bar moulding by removing the inside screws. (At this point, look for water leakage at the center bar screw holes. If these holes are leaking, water may collect on top of the instrument panel at the center bar.) Then, continuing to loosen the windshield inside garnish moulding (it is not necessary to remove the moulding assembly).

The weatherstrip can be sealed against the body opening by applying a good grade of windshield sealer. Lift the lip of the rubber weatherstrip at the point where it contacts the body metal. Use a nozzle type applicator (sealer gun) to force the sealer deeply around the entire inner edge. It must go deep enough to provide complete protection at the point where the rubber seal fits over the metal body edge. Refer to Figure 21. It is rarely necessary to reseal between the glass and the rubber weatherstrip,

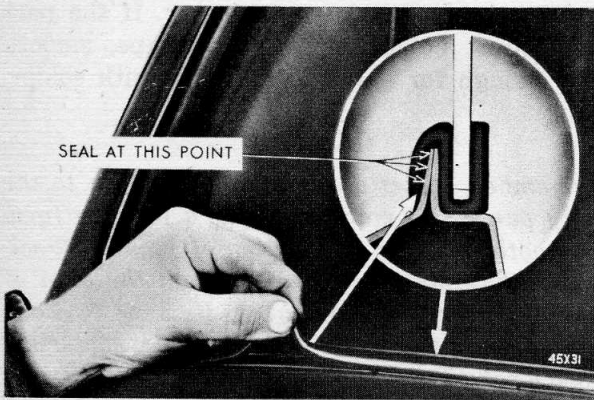


Fig. 21—Windshield Rubber Seal

unless the glass has been replaced. If a leak, caused by faulty weatherstrip to glass sealing, is found, remove the inside windshield garnish moulding and apply sealer with a nozzle type applicator, as far down as possible, between the inner weatherstrip lid and the glass. This should be done for a considerable distance on each side of the spot at which the leak is found. Clean off any excess sealer which squeezes out (after reassembly of the garnish moulding) with a rag moistened with gasoline. Use gasoline sparingly, or it may seep under the weatherstrip and dilute the sealer.

#### NOTE

*The sealer used for weatherstripping on the windshield and rear window should be heavy enough to act as a filler as well as a sealer.*

#### 39. LEAK AT DOOR

Such a condition can be caused by improperly fitted or improperly located windcord, or damaged drip moulding above the door. The windcord is held to the body by drive nails which are driven into holes in the steel framing. Remove the trim before retacking the windcord. When the door is closed, the windcord should fit tightly against it.

#### 40. LEAK AROUND DOOR VENTILATING WINDOW

Leakage, between the ventilating window and the center bar on the front edges of the door glass at the top or bottom of the window, can be corrected by one of the following means:

- (1) Remove the trim panel, loosen the nut and adjust the glass as required. For best operation, the glass should be positioned as far toward the rear as possible.
- (2) If the glass does not move up and down, parallel with the ventilating window glass, remove the door trim panel and adjust the position of the front glass run channel in or out as required, by loosening or tightening the adjusting screw.

#### 41. LEAK AROUND REAR WINDOW GLASS

Follow the same method of sealing as recommended for the windshield. Refer to Paragraph 38.

#### 42. DUST LEAKS AROUND DOOR SILL MATS

Examine the rubber grommets which hold the rubber sill mats in place. Make certain that all grommets are in place in the body holes and that the studs (attached to the mats) go into and fasten to the bottom of the grommets.

#### 43. DUST LEAK AROUND COWL QUARTER PANEL

If dust enters the cab from the openings along the bottom of the inside cowl panel, remove the seat cushion, sill mats, floor mat and cowl trim panels, and reseal the openings.

Dust will have collected at the points of air leakage. This will serve to identify the places requiring attention.

Before sealing, clean the dust from the surface with a gasoline soaked rag and seal all the small welded seams that are open.