



Service Bulletin No. 1091

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COACH MODEL	: S2145
BULLETIN TYPE	: Product Improvement
MANUAL & SECTION	: Maintenance Manual : Chapter 11 - Body and accessories Spare Parts Manual : Section 730609 - Doors : accessories
PARTS BOOK REVISION	: Yes
DATE	: December 14th, 2001
SUBJECT	: Entrance door - door lock mechanism
TERMS & CONDITIONS	: Parts and labor allowance will be provided as per warranty information in this Bulletin.

APPLICATION :

The modification subject of this Bulletin is applicable to the following units :

Model	Engine	VIN
S2145	Not specified	42201 → 42217

DESCRIPTION :

On the above-mentioned vehicles, it is necessary to change the entrance door lock mechanism to improve system reliability.

The procedure in this Bulletin provides step-by-step instructions to properly convert a standard TriMark door lock assembly to the new specifications.

Also included in this Bulletin is a fragment of the Operator's Guide Book explaining door lock operation.

Service personnel : please read, initial and circulate

Service Manager	Parts Manager	Warranty Administrator	Workshop Foreman	Service Technician

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PARTS :

- Local purchase

Part No.	Description	Qty.
30-900 Series	TriMark door lock assembly Includes : inside plate assembly, latch assembly, foam gasket, outside housing assembly, cage nut assembly and striker bolt	1

- Order the parts below for one S2145 coach to be modified.

Part No.	Description	Qty.
VH 10752900	Door latch adapter linkage (A)	1
VH 660291900	Allen bolt, 8x1.25x15 mm for VH 10752900	2
VH 10753057	Door lock adapter linkage (B)	1
VH 10709078	Flat head bolt, Allen, 5x0.8x5 mm for VH 10753057	2
VH 10753209	Nut, striker bolt	1
VH 10759356	Base plate assembly, striker bolt	1
VH 660284964	Bolt, 5x0.8x30 mm	2
VH 10756499	Guard, dead bolt	1
VH 10678337	Flat head bolt, Allen, 4x0.7x8 mm for VH 10756499	2
No reference	Weld-on flat stock, 20x10x5 mm	1
VH 660282403	Inside plate assembly flat head mtg-screw, 5x0.8x30 mm	1
VH 10732978	Adhesive, Loctite 270.1 studlock	1
No reference	Operation decal	4

- Following metric tools are also required

Part No.	Description	Qty.
VH 313080164	Drill bit, 3 mm	1
VH 313080169	Drill bit, 4 mm	1
VH 313080175	Drill bit, 5 mm	1
VH 313080184	Drill bit, 6.5 mm	1
VH 313080146	Drill bit, 10 mm	1
VH 314590295	Tap M4	1
VH 314590309	Tap M5	1
VH 314590311	Tap M6	1
VH 314590323	Tap M8	1

- Parts may be obtained from your nearest ABC/ICP Inc. dealer at no charge. Locally purchased TriMark lock will be reimbursed.
- Always use genuine maintenance products and parts. Do not accept imitations.

PROCEDURE : To change the entrance door lock mechanism

1. General :

- The time required to change the door lock assembly is approximately 12 hours.
- The metalworking/welding part should be executed by an experienced welder.

2. Special tools, equipment or services :

- 3" Cutter
- Angle grinder
- Die grinder
- Grinding burrs
- MIG welding equipment.

3. Basic safety rules for MIG welding and grinding :

MIG welding

The following information pertaining to welding should be read before beginning any such procedure.

The prohibitions and requirements contained herein must be followed during such procedure.

- Welding must be done by a qualified and experienced person only.
- It is the responsibility of the welder to make sure that his/her personal safety equipment and the welding equipment he/she is using are in a condition which will not endanger his/her health and safety or the health and safety of others.
- Adequate ground contact and barriers must be positioned as required to protect components (wiring, air-lines, hydraulic lines etc.) from damage due to heat, contact by weld spatter, arcing or other potentially damaging events associated with welding.
- The following precautions must be taken to protect the vehicle's electronic equipment:
 - FIRST disconnect the wires from the GND (ground) terminal of the battery equalizer;
 - disconnect the batteries (disconnect ground cable first; reconnect ground cable last);
 - disconnect engine, transmission and brake system ECU's;
 - disconnect HVAC ECU's;
 - on shell units, also disconnect the suspension ECU;
 - for any other electronic equipment (radio, video, ...) refer to the OEM prescriptions;
 - keep the ground clamp as close as possible to the work and make sure the clamp makes perfect contact with the chassis or body.
- Never look at the arc, unless you are wearing a suitable helmet or face shield.

- Do not permit bystanders, unless they are wearing protective gear.
- Wear protective clothing and gloves.
- Make certain the MIG welder is properly grounded.
- Never weld, while standing in water or on damp ground.
- Have adequate ventilation.
- Do not adjust machine settings, while the machine is under load.
- Keep cables/lines coiled, when not used.
- Keep cables tight in the sockets.
- Do not attach ground clamps to chrome parts, brake lines, hydraulic/pneumatic/heating tubes, wheels...
- Take great care, when handling hot metal.
- Make sure there is nothing flammable near the working area.
- Always have a fire extinguisher of the correct type available.

Grinding

Grinders improperly used are dangerous. They are responsible for many serious and lasting injuries to the eyes, hands and face. Therefore you must ALWAYS observe the following safety rules:

- Always wear eye protection (safety goggles, face shield).
- Keep abrasive discs tight, clean and true.
- Allow grinder to reach full rpm before using.
- Wear leather gloves.
- Never strike a grinding wheel, while it is revolving. It may shatter and explode.
- Do not grind in the presence of explosive vapors (gasoline, paint thinner, batteries...)
- Before installing a new grinding disc, disconnect the electric mains or air supply line.

- When installing a new disc, make certain:
 - it is designed for the rpm of the grinder and for the material to be ground;
 - it has the correct size;
 - it is properly fixed.
- Never remove the grinding disc guard.

4. Preparations :

- Park the coach on a level surface, apply the parking brake and shut down the engine.
- Switch off all systems and turn off the battery master switch.
- Put a “DO NOT OPERATE” tag on the instrument panel.
- Protect the entrance door B post against damage.
- Read the entire procedure before beginning to work.

5. To remove the non-adjustable striker bolt and threaded bush:

The non-adjustable striker bolt screws into a threaded bush, which has been welded into the B post. This bush should be removed to be replaced by striker bolt base plate assembly VH 10759356. Proceed as follows:

- 1) At the entrance door, remove trim and hardware from the B post, including the non-adjustable striker bolt and washer (see Figure 1).



Figure 1: B post to left of stepwell

- 2) With a scribe, mark the vertical and horizontal center lines of the striker bolt hole as shown in Figure 2.



Figure 2: Striker bolt hole horizontal and vertical center lines

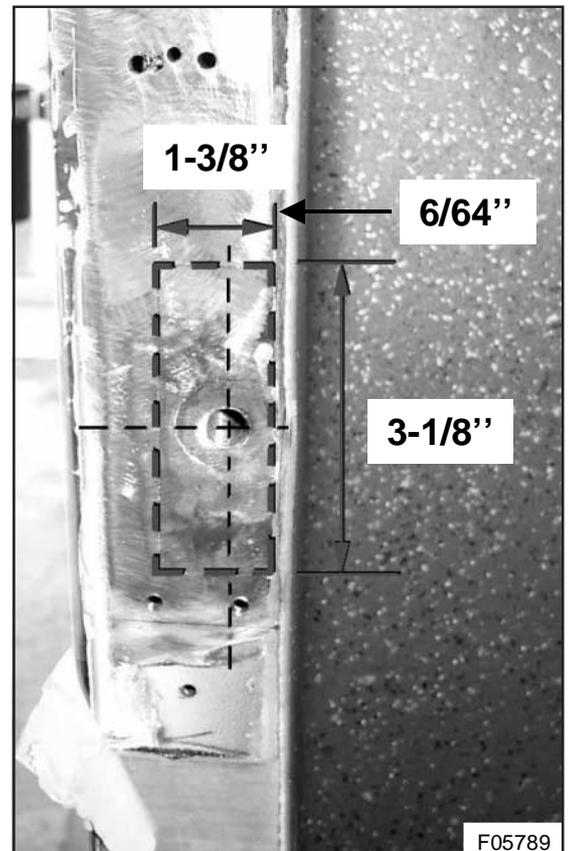


Figure 3: Location of cut-out and dimensions

- 3) Mark the cut-out for the new striker bolt base plate as shown in Figure 3. Make sure the cut-out is positioned so that its center coincides with the center of the striker bolt hole, horizontally and vertically, and against (but not through) the interior side wall of the B post tube.

NOTE: The wall thickness of the B post tubing is $5/64$ inch (2 mm).

CAUTION: Before and during grinding, observe the basic safety rules for grinding, provided in item 2.3.

- 4) With an angle grinder, grind off the factory weld connecting the threaded bushing to the door side wall of the B post (see Figure 4).
- 5) With a 3" cutter, carefully cut out the opening for the striker bolt base plate assembly (see Figure 5).

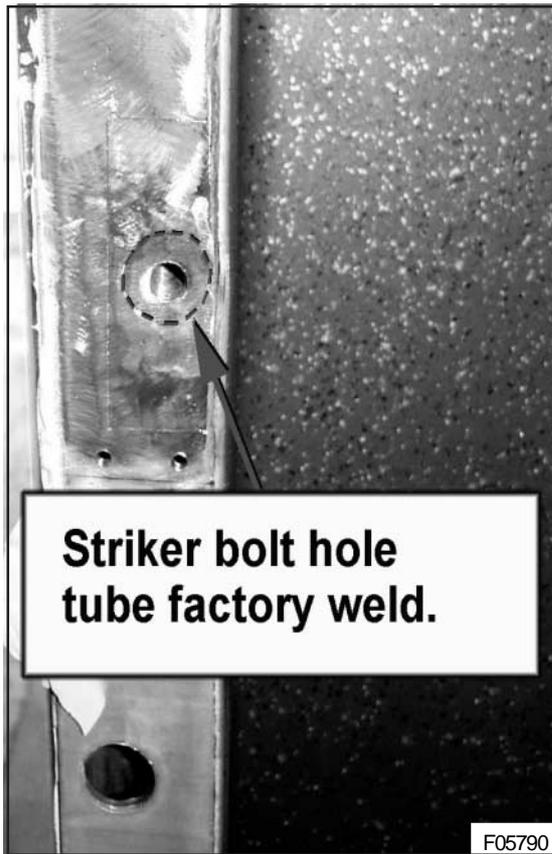


Figure 4: Location of the threaded bushing and factory welds



Figure 5: Cutting the B post to accept the striker bolt base plate assembly

- 6) With the cut-out piece removed from the B post, grind off any remaining welds securing the striker bolt bushing to the B post. Remove the bushing (see Figures 6 and 7).



Figure 6: Striker bolt bushing removal

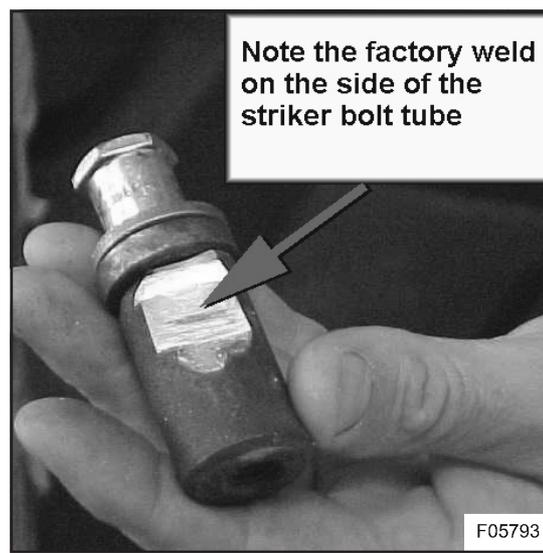


Figure 7: Factory weld on side of striker bolt bushing

- 7) Below the cut-out opening, drill two holes large enough to insert two small screwdrivers in order to prevent the new striker bolt base plate assembly from falling down the B post, when fitting it in place. Drill two more holes diagonally to accept the base plate installation screws (see Figure 8).

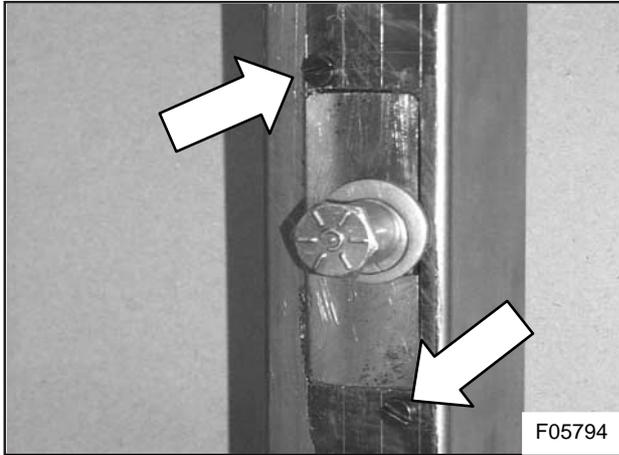


Figure 8: Location of base plate assembly installation screws

- 8) Deburr and chamfer the cut-out edges with a die grinder to provide a beveled seam for maximum welding penetration. Round-off the corners and modify as necessary to accept the new base plate assembly. Insert two small screwdrivers in the holes below the cut-out. Trial-fit the assembly (see Figures 9, 10, 11 and 12).

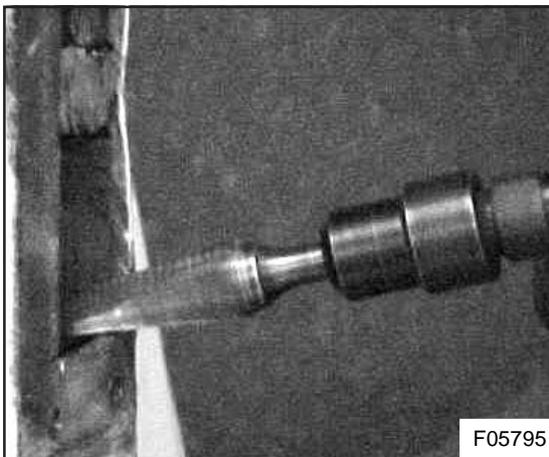


Figure 9: Deburring cut-out edges to provide beveled welding seam



Figure 10: Trial-fitting the striker bolt base plate assembly

6. To install the adjustable striker bolt :

- 1) The parts required to provide for an adjustable striker bolt are shown in Figure 11. Insert two small screwdrivers in the holes below the cut-out to prevent the base plate assembly from dropping into the B post. Insert the striker bolt nut into the base plate assembly (see Figure 12). Insert both into the B post aperture and secure the base plate with the installation screws.

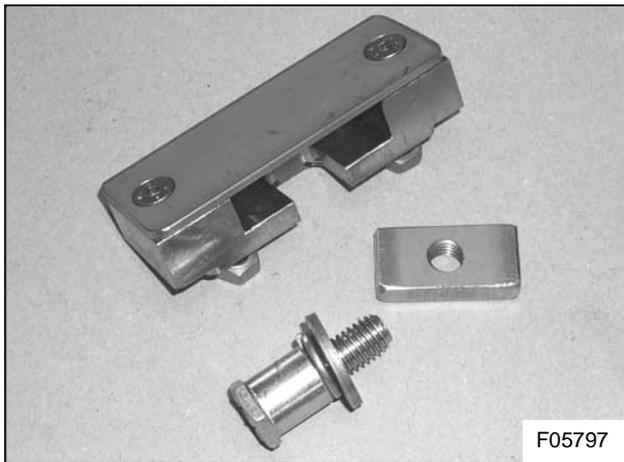


Figure 11: Parts VH 10759356 base plate assembly, VH 10753209 striker bolt nut, and TriMark striker bolt and washer



Figure 12: Base plate and striker bolt nut installation

- 2) Run up the striker bolt and washer. Check that there is sufficient travel horizontally and vertically to catch the door latch. Add or remove shims as necessary to obtain proper clearance of the striker bolt within the cage nut assembly (see Figure 13). There should be a clearance of approximately $\frac{1}{8}$ inch (3 mm) between the striker bolt head and the door frame.

CAUTION : Before and during welding, follow the basic safety rules for MIG welding provided in item 2.3. Disconnect batteries and all electronic equipment to avoid damage to sensitive electrical components.



Figure 13: Striker bolt and cage nut assembly. Add or remove shims to obtain a clearance of approximately $\frac{1}{8}$ inch (3 mm) between the striker bolt head and the door frame.

- 3) Once the correct position of the striker bolt base plate is confirmed, tack weld, then finish weld into place (see Figure 14). Remove the installation screws.



Figure 14: striker bolt base plate assembly spotwelded in place

- 4) Prime and paint all exposed metal surfaces.
- 5) Reinstall the B post trim and hardware. Enlarge the opening in the door seal for the adjustable striker bolt so the full range of adjustment can be made. Adjust the striker bolt for proper clearance within the cage nut assembly. Tighten the striker bolt to a torque of 35 ft.lbf (45 Nm)

7. To remove the entrance door handle and interior trim :

- 1) Undo and remove the three screws securing the interior door handle (see Figure 15).

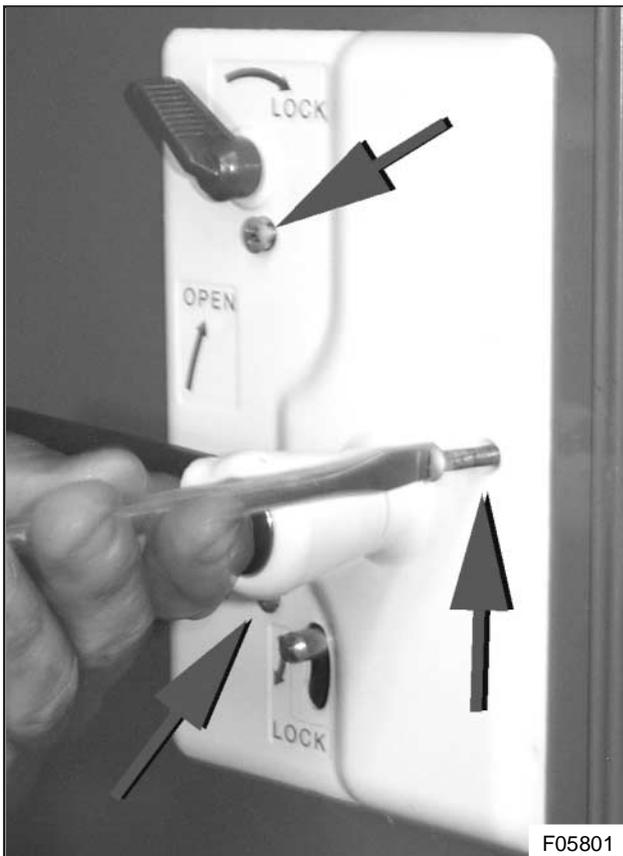
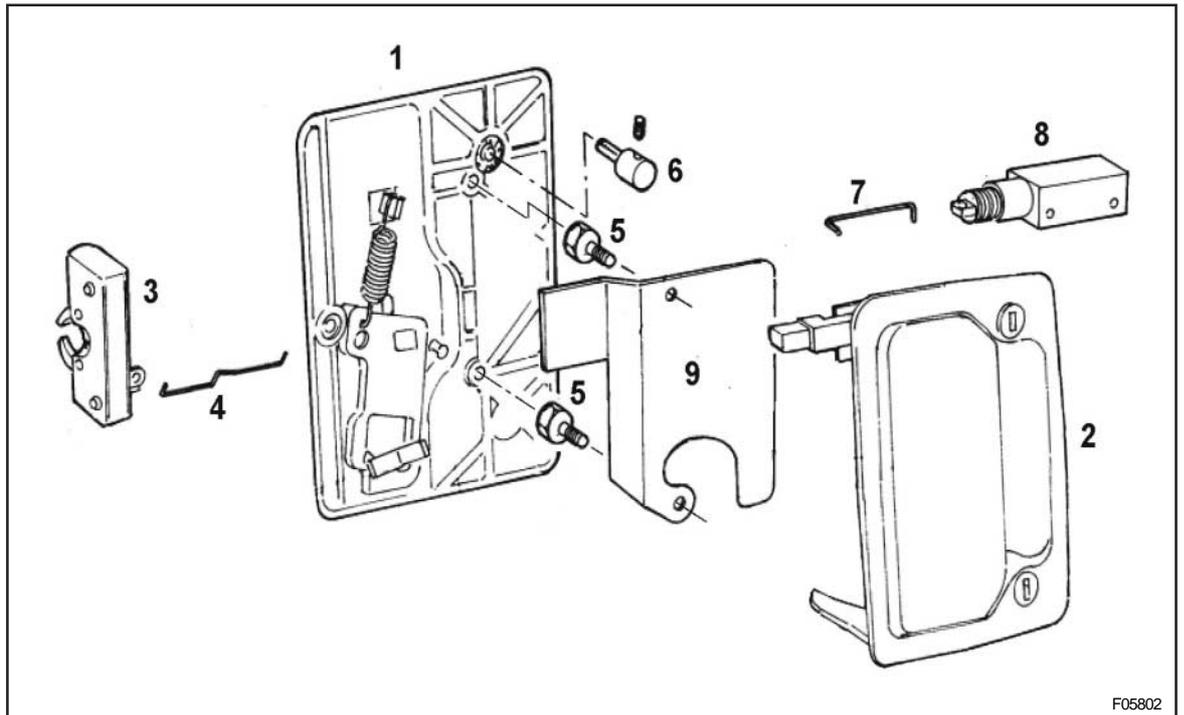


Figure 15: Interior door handle removal

- 2) Pull the inner handle away from the door to remove linkage rod (4, Figure 16). Remove the inside plate assembly (1, Figure 16). Remove linkage rod (7, Figure 16), deadbolt lock adapter (6, Figure 16) and both handle spacers (5, Figure 16). Remove the outside housing assembly (2, Figure 16) and foam gasket. Save the deadlock bolt adapter and both handle spacers for reuse. Discard the remaining old parts.



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Figure 16: door lock exploded view

1. Inside plate assembly
2. Outside housing assembly
3. Cage nut assembly
4. Linkage rod
5. Handle spacer
6. Deadbolt lock adapter
7. Linkage rod
8. Door lock actuator
9. Lock assembly mtg plate (welded to door frame)

- 3) Remove the interior grab handle and the door locking switch (see Figures 17 and 18). Remove the interior trim panel from the door (see Figure 19).



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Figure 17: Grab handle removal



Figure 18: Door locking switch removal



Figure 19: Interior trim panel removal

8. To modify and install the outside housing assembly :

- 1) Using the new outside housing assembly, grind the narrow end of the upper bracket to a taper as shown in Figure 20. Use the old handle as a reference.

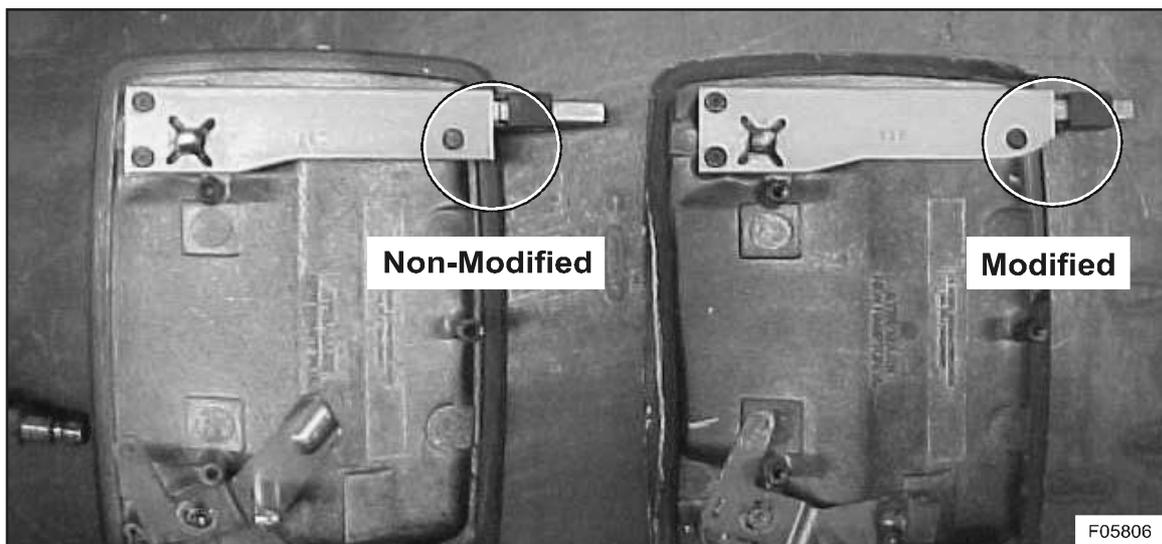


Figure 20: Modification of outside housing upper bracket

- 2) Tap the inside plate assembly mounting holes (see Figure 21) with a 5 mm tap.

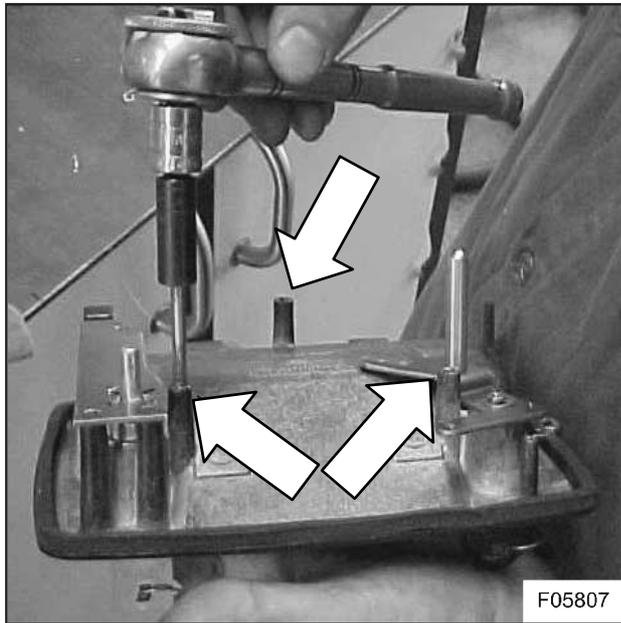


Figure 21: Tapping the inside plate assembly mounting holes

9. To install adapter linkages A and B :

Install door latch adapter linkage A (VH 10752900) as follows:

- 1) Temporarily install the outside housing assembly onto the door using the two salvaged handle spacers VH 10715866 (item #5, Figure 16). Position adapter linkage A as shown in Figure 22. Make sure the adapter linkage sits up flat against the rearward doorframe. Scribe a mark on the adapter to indicate the beginning of the gap between lock assembly mounting plate and the adapter (see bold arrow). In step two of this procedure this gap will be filled with a piece of flat stock.

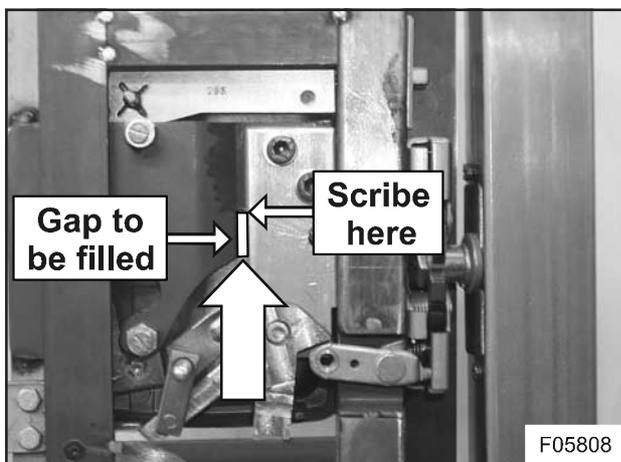


Figure 22: Gap between lock assembly mounting plate and adapter A

- 2) Weld the piece of flat stock square, and below the scribe mark on adapter linkage A. Position adapter linkage A again. Using a file, trim the piece of flat stock as necessary, until the adapter fits snugly (see Figure 23). Mark the two adapter holes on the mounting plate with a scribe. Also verify the clearance of the upper bracket of the outside housing assembly as shown.

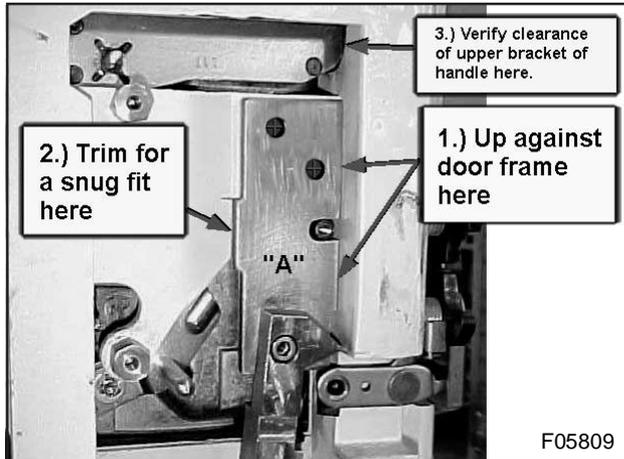


Figure 23: Adapter A installation check

- 3) Remove the outside housing assembly. Center punch and drill the two scribed holes on the mounting plate with a 6.5 mm drill bit. Tap the holes with an 8 mm tap.
- 4) Reinstall the outside housing assembly. Tighten the handle spacers VH 10715866 to a torque of 7 ft.lbf (10 Nm).
- 5) Fit door latch adapter linkage A. Apply a few drops of Loctite 270.1 on the threads of the two Allen bolts VH 660291900. Run up the bolts until finger-tight, then tighten to a torque of 22 ft.lbf (30 Nm). Figure 24 shows the completed installation.



NOTE : Make sure the Allen bolts do not protrude through the backside of the lock assembly mounting plate. This will interfere with the outside housing assembly.

Figure 24: Door latch adapter linkage A installation (shown with hex bolts)

To install door lock adapter linkage B (VH 10753057) proceed as follows :

- 1) Slide adapter linkage B over the handle locking pin as shown in Figure 25.

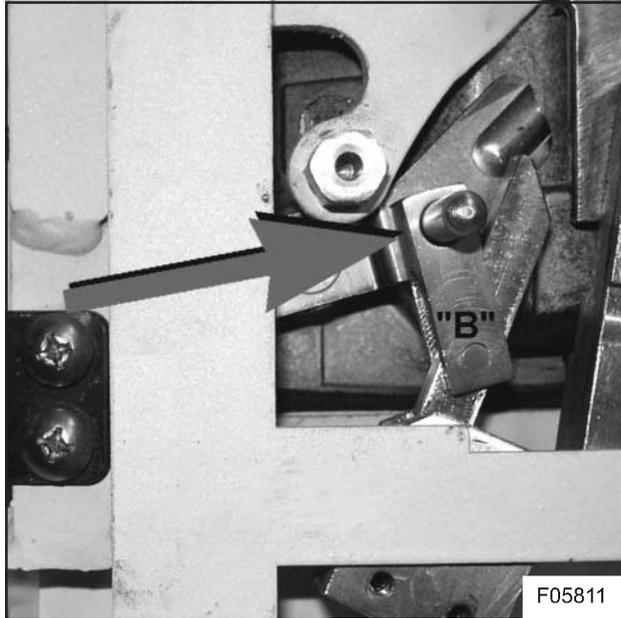


Figure 25: Adapter linkage B installation step 1

- 2) Place the mounting base of adapter linkage B snug against the door lock actuator mounting bracket as shown in Figure 26. Position the base so that the bottom mounting hole is located $\frac{3}{16}$ inch (4,8 mm) from the top edge of the door frame.

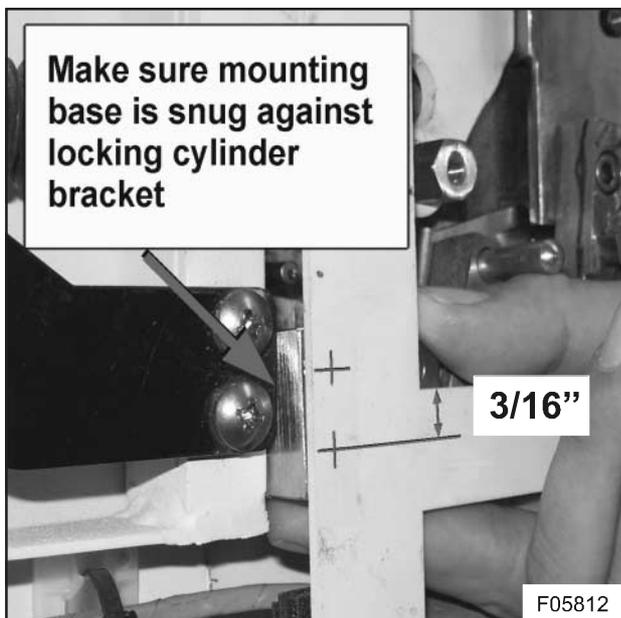


Figure 26: Adapter linkage B installation step 2

- 3) Before marking the holes, make sure the linkage is running slightly downwards, when the handle is in the locked position (see Figure 27). Move the position of the holes up or down as necessary.

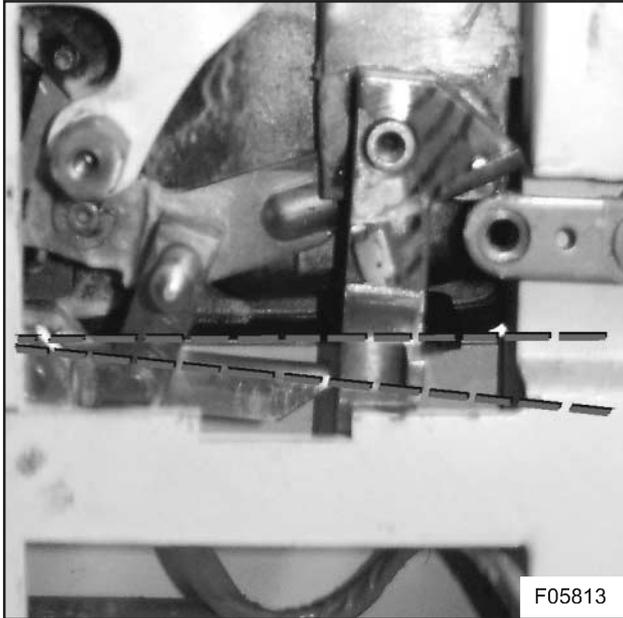


Figure 27: Adapter linkage B installation step 3

- 4) With a 5 mm drill bit, drill the mounting holes for the base of adapter linkage B and countersink for flat head bolts VH 10709078 (see Figure 28). Apply a few drops of Loctite 270.1 on the screw threads. Run up the bolts until finger tight, then tighten to a torque of 7 ft.lbf (10 Nm). Figure 29 shows the completed installation.

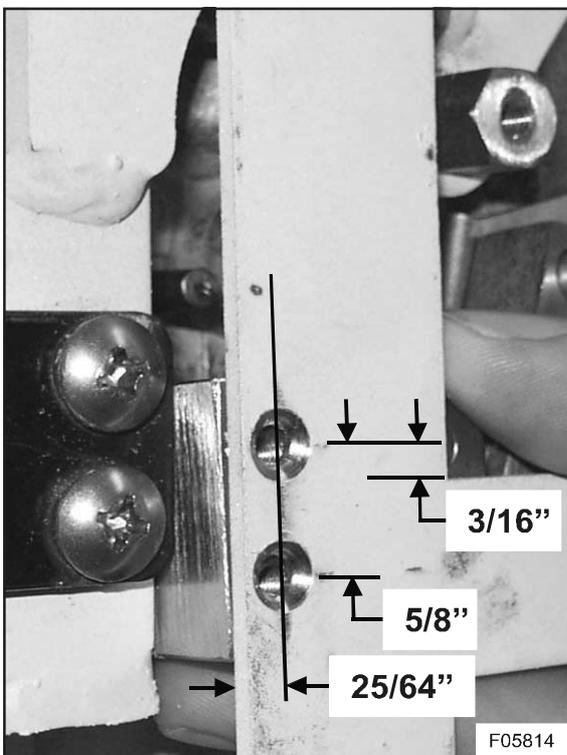


Figure 28: Drilling dimensions for door lock adapter linkage B base

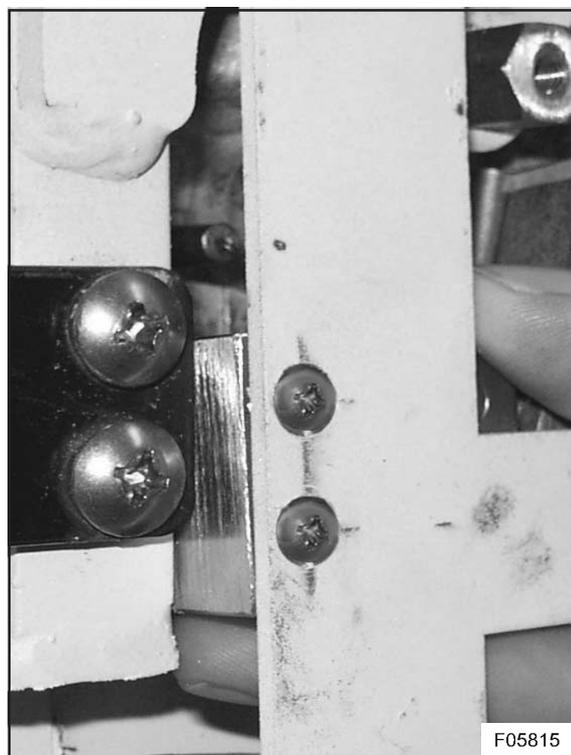


Figure 29: Door lock adapter linkage base final installation

10. To install the inside plate assembly :

- 1) With a straight edge, measure the distance between the handle spacers VH 10715866 and the door frame as shown in Figure 30. Adjust this distance using shims, until the handle spacers protrude $\frac{1}{16}$ inch (1.6 mm) from the door frame surface.

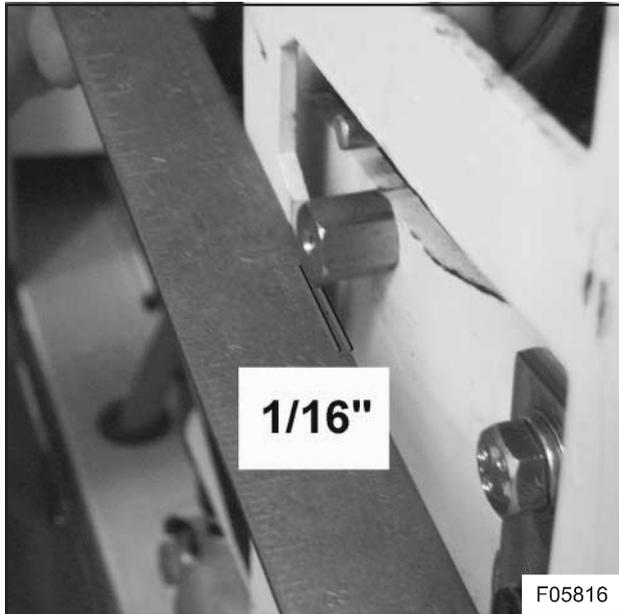


Figure 30: handle spacer adjustment

- 2) Reinstall the salvaged deadbolt lock adapter VH 10715856 (item # 6, Figure 16) and reconnect door locking actuator linkage VH 10715873 (item #7, Figure 16). Discard linkage rod #4, Figure 16.
- 3) Reinstall the interior door panel, the door locking switch, and the grab handle.
- 4) Lubricate all moving parts with white lithium grease (see Figures 31 and 32).



Figure 31: Door lock lubrication

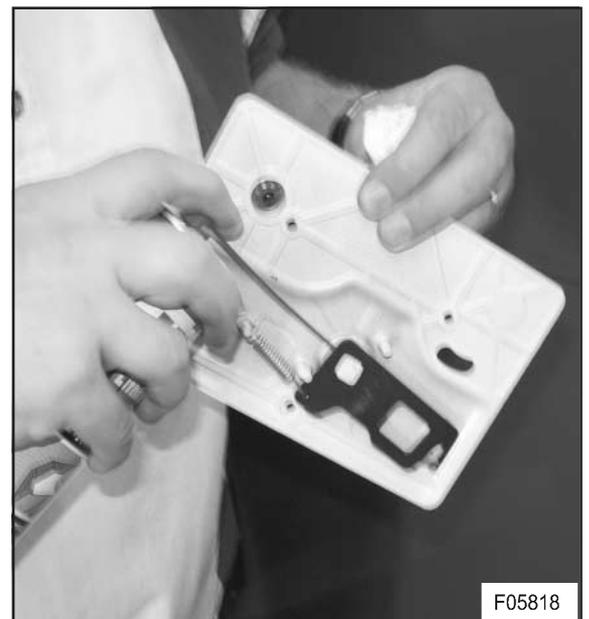


Figure 32: Inside plate assembly

- 5) Install the interior handle, making sure the upper and lower tabs of adapter linkage A are positioned properly with the actuator on the backside of the inside plate assembly (see Figure 33).

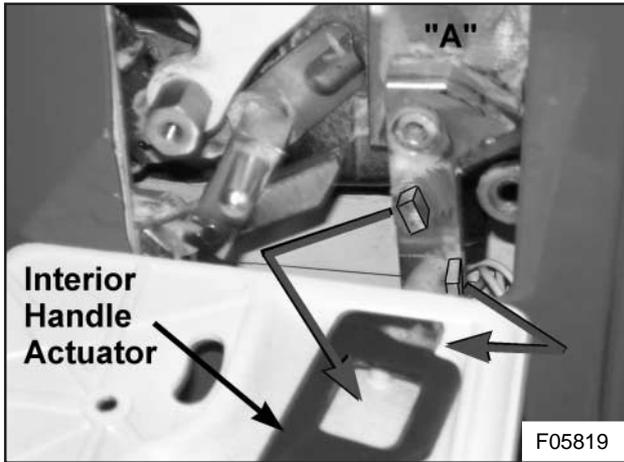


Figure 33: Position of upper and lower adapter linkage A tabs

- 6) Secure the inside plate assembly using two #8-32 UNC x $\frac{5}{8}$ screws for the upper and lower mounting holes. Use flat head screw VH 660282403 for the middle mounting hole.
- 7) Check door handle for smooth operation.
- 8) Install operation decals as shown in Figure 34.



Figure 34: Inside plate assembly decals

11. To install deadbolt guard VH 10756499 :

- 1) Slide guard VH 10756499 (see Figure 34) over the deadbolt with the open end (see arrow) pointing towards the coach exterior. Center the guard with the deadbolt and mark the holes with a scribe. Remove the guard.

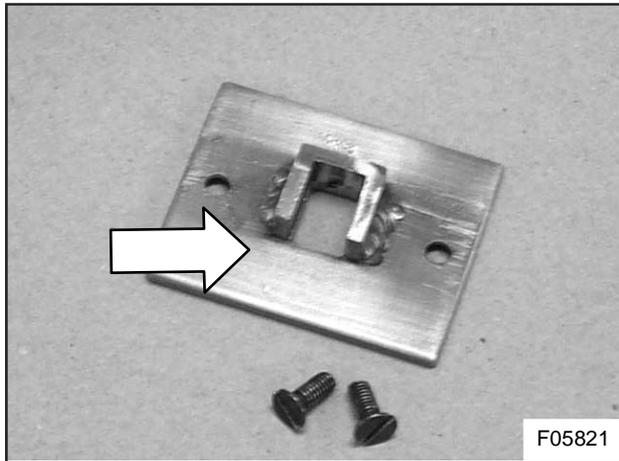


Figure 35: Deadbolt guard VH 10756499 and mounting screws VH 10678337

- 2) Center punch and drill the two scribed holes with a 3 mm drill bit. Tap the holes with a 4 mm tap. Reinstall the deadbolt guard. Apply a few drops of Loctite 270.1 on the threads of the two mounting screws VH 10678337. Run up the screws and tighten to a torque of 21 in.lbf (2.4 Nm). Figure 35 shows the completed installation.



Figure 36: Dead bolt guard installation

12. Entrance door lock operation :

To unlock the entrance door

- 1) Enter a valid code through the keyboard.
- 2) The entrance door will be unlocked. Pressing #7 within 5 seconds of entering a valid code will also unlock the luggage compartment doors.

To open the entrance door from the outside

- 1) Make sure both locking systems are in the unlocked position.
- 2) Pull the opening handle to release the latch, then pull the door open.

To lock/unlock the entrance door from the inside with the inside plate assembly

The interior entrance door handle is equipped with two locking levers (see Figure 37). The upper lever (1) controls the deadbolt locking system, the lower lever (3) locks/unlocks door handle (2).

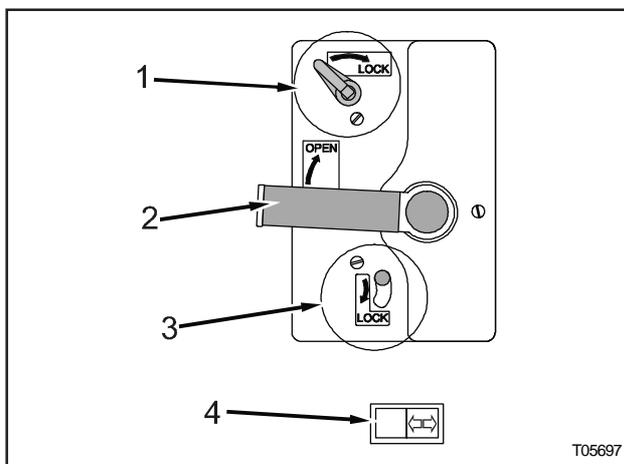


Figure 37: Interior entrance door controls

1. Deadbolt locking lever
2. Door handle
3. Door handle locking lever

- 1) To lock the entrance door, push lower locking lever (3) down in the direction of the arrow.
- 2) To lock the entrance door additionally with the deadbolt, turn locking lever (1) in the direction of the arrow.
- 3) To unlock the entrance door with both systems in the locked position: turn locking lever (1) to the left, and push locking lever (3) up.

To lock/unlock the entrance door from the inside with rocker switch (4)

With rocker switch (4) it is possible to:

- Lock the entrance door and the luggage compartment doors simultaneously.
 - Unlock the entrance door.
- 1) Push the right-hand part of the switch momentarily to lock the entrance door and the luggage compartment doors.

- 2) Push the left-hand part of the switch momentarily to unlock the entrance door.

NOTE: This step does not unlock the deadbolt.

To open the entrance door from the inside

- 1) Make sure both locking systems are in the unlocked position.
- 2) Pull the door handle up to release the latch, then push the door open.

NOTE: An air cylinder installed in the B post will keep the entrance door locked, when driving speeds exceed 2 mph, thus preventing accidental opening of the door. The system unlocks automatically at speeds below 2 mph.

Procedure complete.

SERVICE INFORMATION :

Service Bulletins are issued to supplement or supersede information in the Van Hool manuals. Note Service Bulletin number, date and subject on the register at the end of the relevant chapter(s). File Service Bulletin separately for future reference.

WARRANTY INFORMATION :

- Causal part : VH 10715901
- Job code : L1 0922V
- Parts disposition: discard according to applicable environmental regulations.

Van Hool will accept warranty claims for this repair as follows :

- Parts : parts may be obtained from your nearest ABC/ICP Inc. dealer at no charge. Locally purchased TriMark door lock assemblies will be reimbursed as a warrantable claim upon receipt of an invoice duplicate.
- Labor allocation : 12 hours per coach.
- Expiration date : November 30th, 2002.

Contact ABC Coach Inc. for guidance on claim submission.

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