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R28 Spyder Technical Training

Conducted by ASC in Cypress, CA
7-10 January 1997

Course Agenda

Day one - Tuesday, 7 January 1997

8:30 - 8:45 am	Introductions
8:45 - 9:00 am	Review agenda for the week
9:00 - 10:00 am	**Operational overview: differences between Spyder and hardtop; ECS ('95 model only); ABS control unit** **Detailed operational description: retractable hardtop; quarter windows; header latches; hard tonneau; object in trunk sensor** **General precautions; special tools**
10:00 - 10:15 am	Break
10:15 - 12:00 noon	**Wiring and connectors; diagnostic computer operation**
12:00 - 1:00 pm	Lunch
1:00 - 3:00 pm	**Inspection and verification: Symptom charts**
3:00 - 3:15 pm	Break
3:15 - 4:30 pm	**Inspection and verification: Troubleshooting hints**
4:30 - 5:00 pm	Review and test questions

Day two - Wednesday, 8 January 1997

8:30 - 10:00 am	**Inspection and verification: DTC log**
10:00 - 10:15 am	Break
10:15 - 12:00 noon	**Inspection and verification: Pinpoint tests**
12:00 - 1:00 pm	Lunch
1:00 - 3:00 pm	**Service adjustment procedures: Hardtop** - *roof panels, up-stops, down-stops, roof hinges, locator pins, strikers, header latch, garnishes, main pivot brackets, balance links;* **quarter window** - *cables, synchronization, fits, switches;* **front rail weatherstrip**
3:00 - 3:15 pm	Break
3:15 - 4:30 pm	**Service adjustment procedures: Hard tonneau** - *hinge, latches, cables, manual release, flipper doors;* **door locating pin; position potentiometers** - *hard tonneau and hardtop*
4:30 - 5:00 pm	Review and test questions

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7-10 January 1997

Course Agenda

Day three - Thursday, 9 January 1997

8:30 - 10:00 am	Removal and installation: **Precautions; hard tonneau** - *panel, hinge, latches, actuators, flipper door, down-stop lock, lift mechanism, hydraulic system, potentiometer*
10:00 - 10:15 am	Break
10:15 - 12:00 noon	Removal and installation: **Hardtop** - *panels, hinges, torsion spring, pivot, hydraulic system, potentiometer*; **hydraulic system bleeding**
12:00 - 1:00 pm	Lunch
1:00 - 3:00 pm	Removal and installation: **Front fender; roof glass; quarter windows** - glass, drive cables, position sensors; **doors** - *glass, locating pin*; **weatherstrips**
3:00 - 3:15 pm	Break
3:15 - 4:30 pm	Removal and installation: **Header latches** - *inspection, drive motor, switches, latches*; **fusible link; hardtop and hardtop switch; chime module; object in trunk sensor; hardtop ECU**
4:30 - 5:00 pm	Review and test questions

Day four - Friday, 10 January 1997

8:30 - 10:00 am	Body structure: **Mitsubishi parts; ASC parts** Exterior: **Rear spoiler; emblems; moldings; rear lights; bumper extension** Interior: **Adjustments** - *rear-view mirror, rear shelf, center closeout, quarter trim, flipper doors*
10:00 - 10:15 am	Break
10:15 - 11:45 am	Interior: **Remove and replace** - *rear view mirrors, visors, quarter panel, rear seat, trunk trim, front seat, seat belt guide loop, headlining, rear seat striker, rear panel close-out, seat belts* Electrical: **Rear view mirror; CD changer; speakers; antenna; HomeLink®; lights; theft alarm; heater; air conditioning; ventilation**
11:45 an - 12:00 noon	Review and test questions
12:00 - 1:00 pm	Lunch
1:00 - 2:45 pm	Program review and feedback
2:45 - 3:00 pm	Wrap-up and adjourn

Recommend the 952 Film

This package contains: Days 1 and 2.

Days 3 and 4 will be sent late Monday for you to have Tuesday.

System Needs 13 V
Especially in Cooler
Weather

Jeff Ordway

Chime - If fault chimes twice the rate

Communication box for computer (PC) lights mean Nothing to tech - just shows ECU → PC Communication (64KB Program off Dos must have 286 or above) 5.16 Latest Software 4.7? was orig production soft

Cycle count is only full open full close. will count open Quarter glass initializes the operation of the top (wakes up computer - starts chime) AS Long as SOMETHING is open (qtr glass example) ECU will not go to sleep Center connector

if the trunk mat sensor is faulted the top goes to 1/2 staff

Tonneau will not operate (Trunk mode) if the Quarter glass is not fully closed

quarter glass fully down operates switch which then signals the

Rick LaVarta

Wayne Barrow inst
Rocky Lee Dist ASC. Rep.

Slides
1 Computer Screen
2 DTC chart 42-44A
3 ECU 42-19

Just Prior to Full down
the Ecu Disregards the trunk switch (sensor)

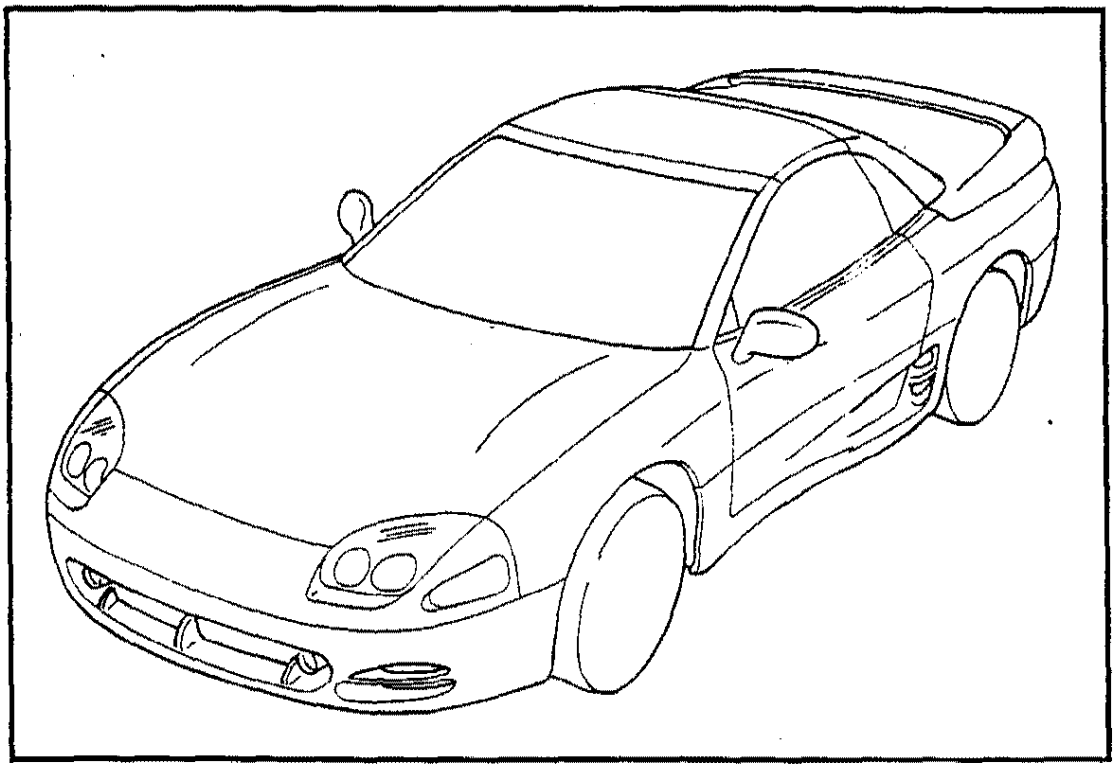
Trunk light comes on with vibration
mercury switch → use hard switch

Slides
1 computer screen
2 DTC chart 42-44a
3 ECU 42-19
Just prior to full down
the ECU disregards the trunk switch (sensor)
Trunk light comes on with vibration
mercury switch -- use hard switch

35000 Front body damage on a N. Car. Car which didn't affect the pass dept.

On programming the ECU is programmed 2 numbers ~~additional~~ subtracted to make the full up/down calculation

1995-1996 3000GT Spyder Service Training



The Service Manual is Pretty good for Diag.

asc. Technical Publications

MITSUBISHI MOTORS Technical Training

Cry Tox – Chrysler tube in Tube

Changing from Reed Magnetic switch
to contact switches replaced on
a need be basis

Reed ~~contacts~~ reads closed open closed
because of overtravel
magnet in the cable (housing) Tube

2500 cycles (lifecycle)

Changing from reed magnet switch
to contact switches replaced on
a need be basis
reed reads closed open closed
because of over travel
magnet in the cable (housing) tube
2500 cycles (lifecycle)

PREFACE

Since the Service Manual Supplement is so comprehensive, it lends itself to self-teaching. If you are familiar with other Mitsubishi training courses you'll notice this training material is strikingly different than what you are used to.

The Service Manual Supplement was designed to be a living document, meaning pages can be inserted or deleted as needed. That also means this training material can be divided up and inserted behind each Group in the service manual supplement, combined into one training module, or even be a stand-alone module.

As a Certified Mitsubishi Technician you are likely to see common or recurring service related issues for other high-volume, non-Spyder vehicle models. Because you see some of the same problems on a regular basis, the need for referring to the Service Manual may not be as frequent. And as with anything, there is a learning curve.

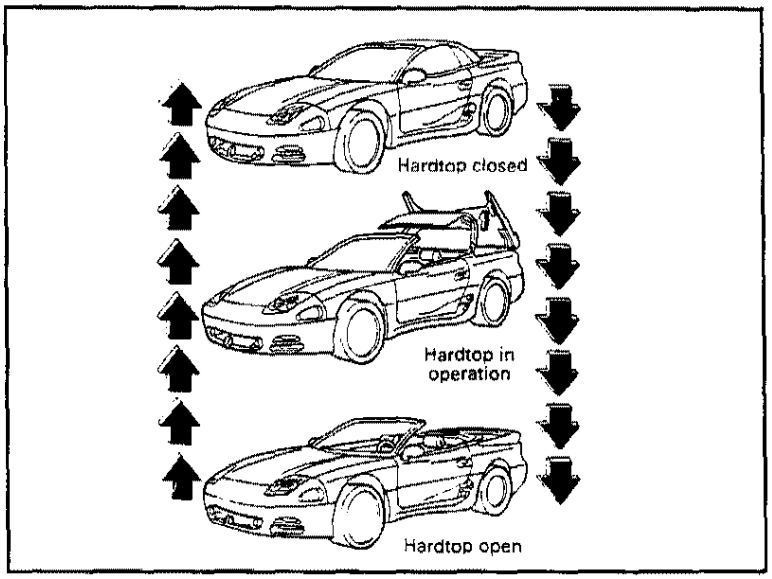
As a limited number of Spyders have been, or will be produced, you may not get a lot of opportunities to service a Spyder. As to be expected, this means your learning curve could be relatively flat.

The writers of the service manual supplement anticipated the technician to have comparatively low exposure of service experience with Spyder. Therefore, the writers endeavored to bring you the most complete, up-to-date and comprehensive service information available. Take some time to leaf through the Service Manual Supplement. You may notice that not a lot is left to the imagination from a service standpoint. Of course, those service issues which are obvious to a skilled technician are not addressed.

DAY 1 -- Tuesday, January 7, 1996

OVERVIEW

3000GT Spyder Design Intent



- Mitsubishi 3000GT Spyder - Retractable Hardtop

The 3000GT Spyder has been designed to provide the experience of open air driving with the handling and performance of the 3000GT Hatchback. Through careful engineering of the retractable hardtop system and chassis improvements, the 3000GT Spyder has achieved its design objectives.

1995 and 1996 model years Spyders were available only as an SL model (front wheel drive, non-turbo charged engine) and a VR-4 model (all-wheel drive, turbo-charged engine). The optional Active Aero package which was available for Hatchbacks, was not available for either SL or VR-4 Spyder model.

Retractable Hardtop Characteristics

For most owners, even a conventional soft top convertible is a new experience. Add to that the uniqueness of a retractable hardtop. After the comparative quiet of a conventional hard-roofed vehicle, in general, owners become more sensitive to wind and road noise, and may complain about it if they are unfamiliar with convertibles, especially a retractable hardtop. However, every attempt has been made to lessen or equal interior noise levels compared to that of the Hatchback.

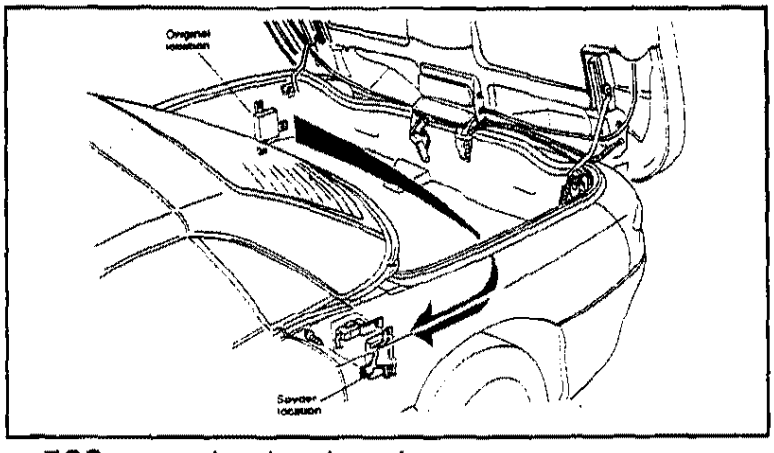
As a technician, you should get accustomed to the noise levels to be expected in the 3000GT Spyder. If a customer complains about the noise, you will know the difference between normal noise levels and noise levels that could indicate a problem.

Another characteristic of the Spyder is that the body may exhibit slight flexing under harsh driving conditions whether from a rough road or aggressive handling. Considerable effort has been made to strengthen the Spyder, but a slight amount of flex is unavoidable. This may show up as creaks and rattles or windshield header shake as inner panels rub.

Differences From Hatchback

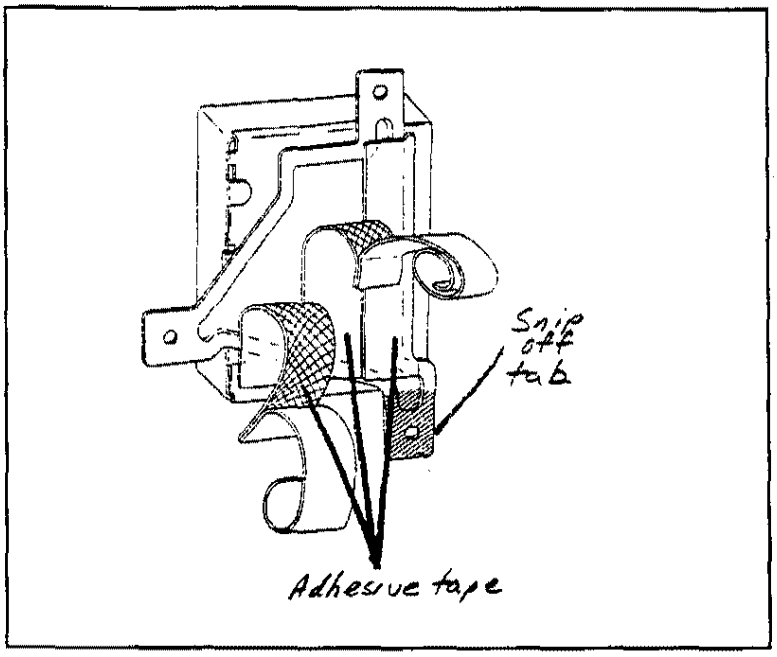
For a summary of the changes and differences by Service Manual Supplement Group, refer to Group 00-General, beginning on page 2 of the Service Manual Supplement.

Group 33B Electronic Control Suspension



- ECS control unit relocation

The 1995 model year Spyder is the only model year to be equipped with the optional Electronic Control Suspension. It is the same system used in the Hatchback. For those 1995 models, the Hatch-back ECS control unit has been relocated from the passenger side in the trunk to the driver side behind the quarter trim panel. This is to accom-modate the tonneau lift arm mechanism.



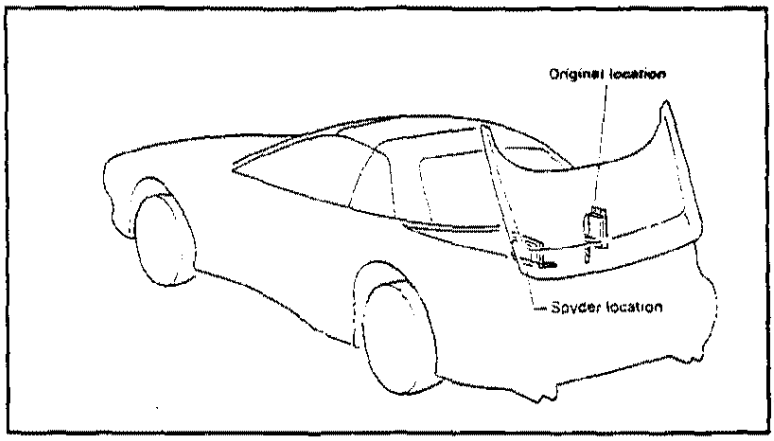
- Bracketry modification of a new ECS control unit
- Foam tape to prevent rattling

When a new Hatchback service part is required for the Spyder, the control unit bracketry must be modified. Otherwise, the part will not fit in the confines of the Spyder body structure. To prevent rattling of the control unit, three pieces of foam tape must be applied to the back of it. Complete instructions for modifying the new part can be found in Group 33B in the Service Manual Supplement.

The original Hatchback ABS wiring harness has been shortened and re-routed for the Spyder.

For more information refer to the appropriate section in the Service Manual and Service Manual Supplement.

Group 35
Service Brakes

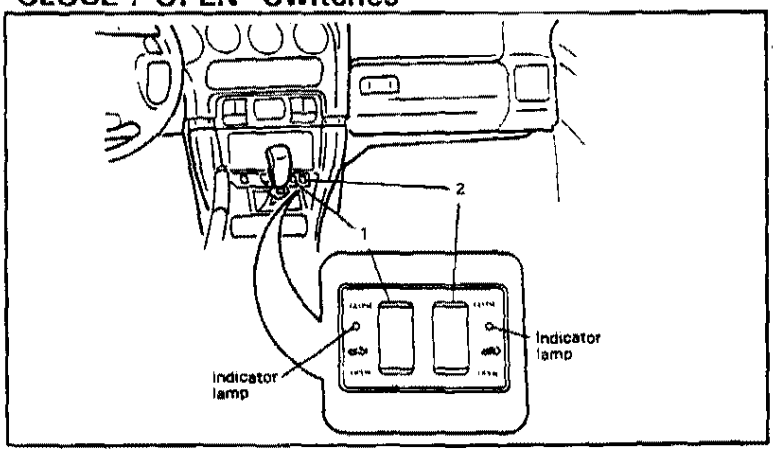


- ABS control unit relocation

The ABS electronic control unit has been relocated from a vertical position on the passenger side in the trunk to a horizontal position behind the quarter trim panel. This is to accommodate the additional body structure for the Spyder. The original wiring harness has been re-routed, but remains unchanged. Unlike the Hatchback, when diagnostics are to be performed on the Spyder's ABS control unit it must be removed first.

Important Information

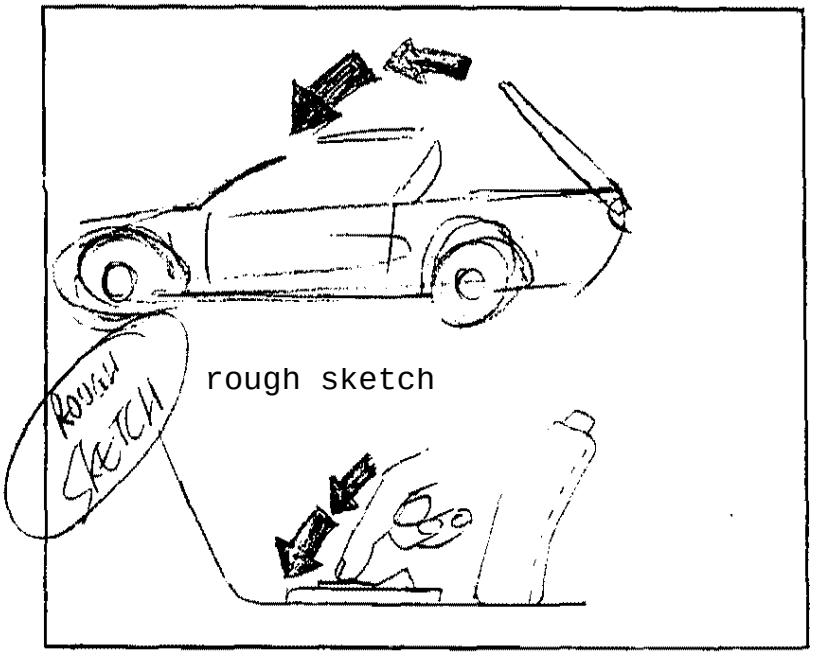
Hardtop "CLOSE"/"OPEN" and Hard Tonneau "CLOSE"/"OPEN" Switches



- Hardtop "CLOSE"/"OPEN" and hard tonneau "CLOSE"/"OPEN" switches

It is strongly recommended to you, the technician, and to anyone who helps you, be familiar with the actions and terminology associated with the hardtop and tonneau switches. The hardtop and tonneau

"OPEN"/"CLOSE" switches are marked this way to avoid confusion.



- Note how the direction of the switch rocker correlates with the hardtop movement
- Tonneau switch has similar correlation to tonneau

The design-intent of the way the rockers of the switch move correlate to the movement of the hardtop and tonneau. For instance, to get the hardtop to move forward to the closed position, push the rocker forward which is labeled "CLOSE". Push the rocker rearward to get the hardtop to move rearward, which is labeled "OPEN", and the hardtop moves rearward to the open position.

Being familiar with the switches and correlating actions of the hardtop system may prevent serious injury when you direct your helper to operate the hardtop system in general.

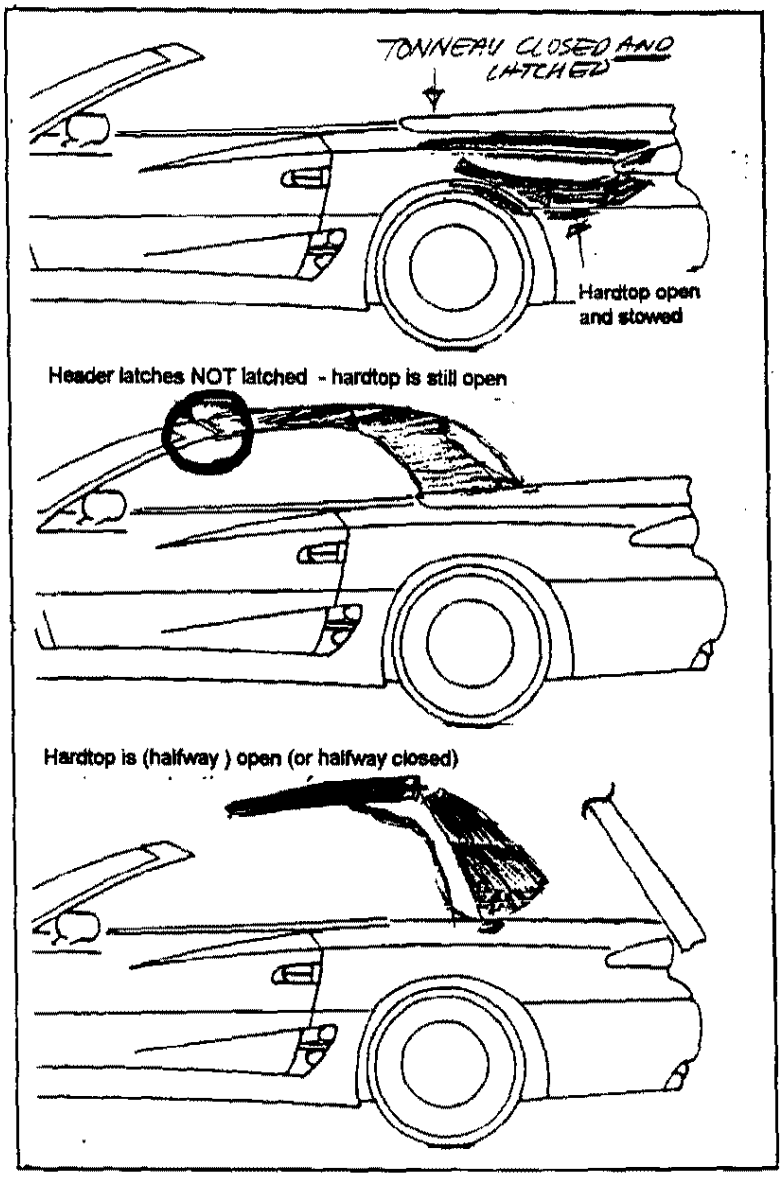
Consider this service scenario where personal injury could likely result as of not understanding the correlation of hardtop switch and hardtop movement: The hardtop is resting on the wind-

shield header, but is unlatched. Mistakenly, you have placed your fingers between the hardtop and the windshield header. You want your helper to the

continue to open the hardtop. Instead of you saying, "open it" (the hardtop), you say, "lower it" (the hardtop). From the helper's perspective, since the hardtop actually is in a position where it can be "lowered"--to the windshield header--not the stowage area like you want, your helper presses CLOSE instead of OPEN. The result could be personal injury to your fingers being caught between the hardtop and the windshield header.

When it comes to operating the retractable hardtop many terms or expressions are used to describe certain actions or stages of hardtop or tonneau operation. You should be familiar with these terms, as it will help in interpreting the customer complaints. And you will have a better comprehension of the Owner's Manual Supplement and the Service Manual Supplement as you read it.

(Continued)

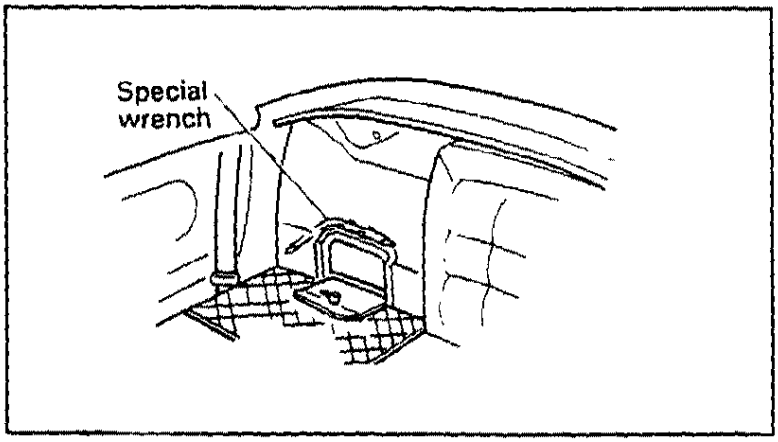


- Illustrations of an "open" hardtop

The term "open" can be confusing or misleading to someone not familiar with convertible technology or terminology. Technically speaking, from an operational and diagnostics point of view, the term "open", when applied to the hardtop and the tonneau, means either are in ANY position ***EXCEPT*** fully latched and closed. This distinction is important to note because this is how the hardtop ECU determines almost all aspects of hardtop or tonneau operation.

Likewise, since the quarter windows are not to be used for ventilation while the hardtop is closed;

they are either fully open or fully closed--there are no intermediate positions.

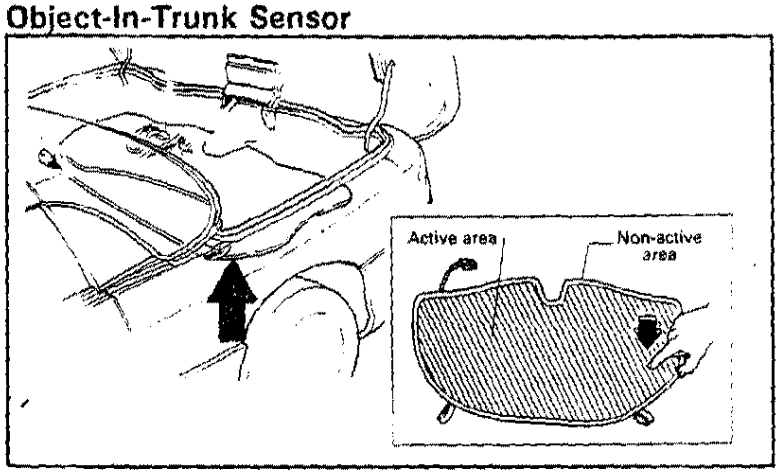


- Manual release wrench for header latch system
- Storage of manual release wrench

In an emergency or when servicing the header latch system the header latches can be released manually. Use a 1/4" drive ratchet or the special wrench which is stored in the CD changer tray behind the right-hand rear seat back. To access it fold down the seat back open the CD changer access door. The wrench is secured by hold down clips.

Technical Highlights

Object-In-Trunk Sensor

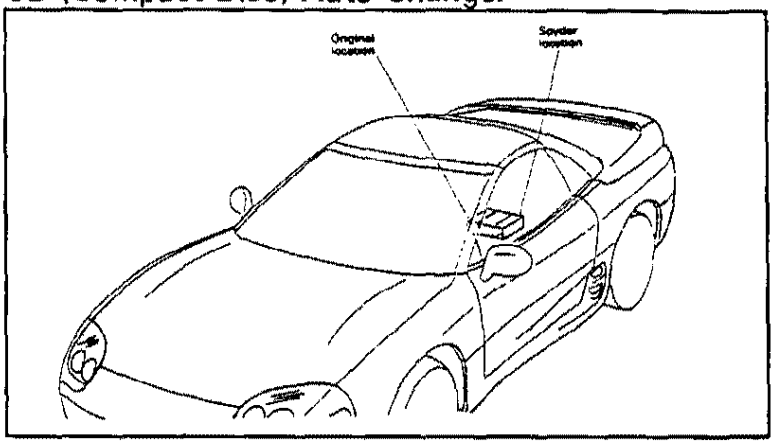


- The Spyder object-in-trunk sensor (floor board)
- Replaces Hatchback floor board

The Spyder's object-in-trunk sensor is a carpet-covered pressure-sensitive switch which doubles as

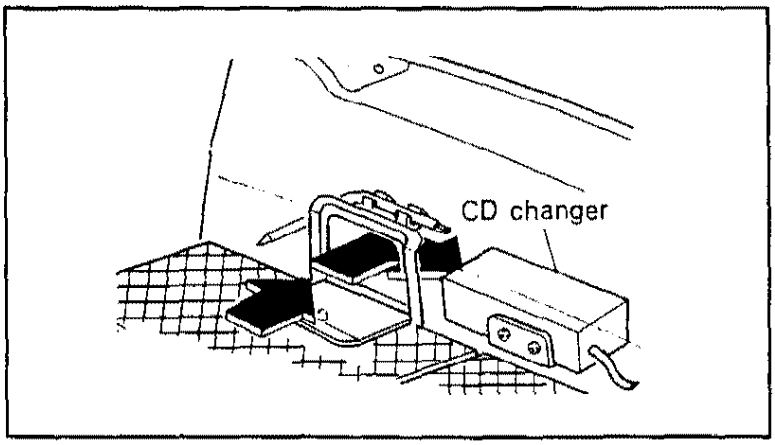
the trunk floor board. It replaces the Hatchback floor board which is only a floor board.

CD (Compact-Disc) Auto Changer



- Relocated Hatchback CD auto changer for the Spyder

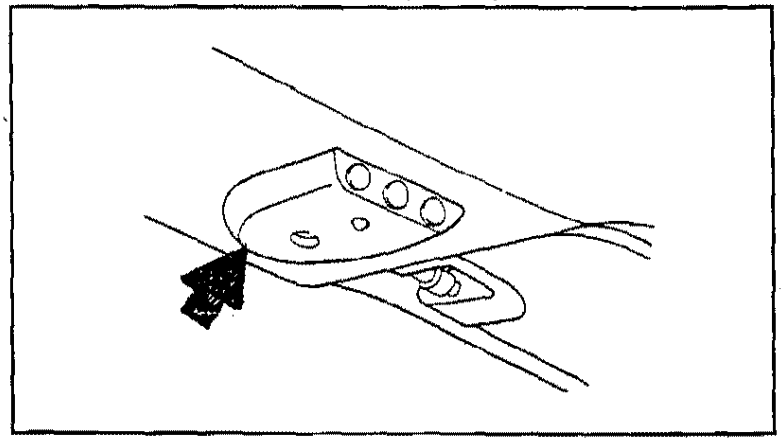
The Spyder uses the same Hatchback CD (Compact-Disc) Auto Changer. The changer has been relocated within a few inches of its original location. The changer cover has been deleted for the Spyder because the changer is surrounded by Spyder body structure.



- Spyder CD changer access

When the changer is in the Hatchback it is easily accessible simply by reaching over the rear seatback. With the Spyder, the passenger side rear seat back must be folded down and a small access door unlatched and opened. Then, the operator must reach around to their right to open the CD changer.

HomeLink® Universal Transmitter



- The Spyder-unique HomeLink® transmitter

The Spyder has what is called a universal transmitter, otherwise known as a HomeLink. It is basically a 3-channel radio transmitter that is used to operate radio frequency-control devices such as, garage doors, security gates and most other radio frequency receivers.

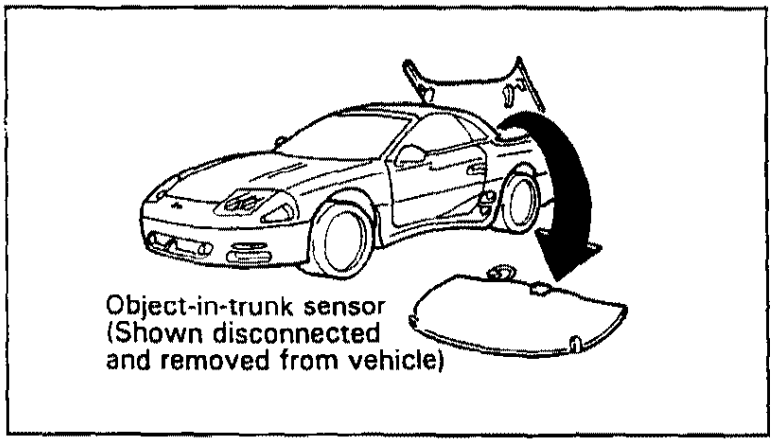
With the exception of the power supply from the vehicle battery, it's a self-contained unit recessed into the center of the front header garnish. It eliminates carrying up to three different radio transmitters.

The HomeLink must be removed in order to use the header latch manual override wrench.

Spare and Full Size Tire

The Spyder uses the same Hatchback aluminum spoked spare. When not in use, it is stowed in the same area of the trunk, and by the same method as the Hatchback.

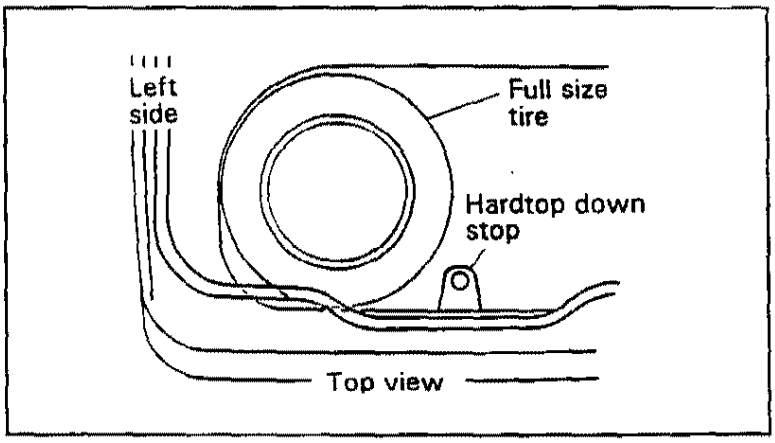
As with the Hatchback floor board, the object-in-trunk sensor covers the spare when it is not in use.



- Removing the Spyder object-in-trunk sensor before removing the spare tire

To remove the spare the object-in-trunk sensor the hardtop must be closed and latched. Then fully open the tonneau using the tonneau "OPEN" switch. Standing at the PASSENGER side of the vehicle, remove the T-nut which secures the spare. Disconnect and remove the object-in-trunk sensor from the vehicle. Note that the reason for standing at the passenger side of the vehicle is that the spare is closer to you, as it is to the right of the center of the vehicle.

After replacing the flat tire with the spare, the object-in-trunk sensor must be placed back in the trunk. Note that at this time it does not matter if the object-in-trunk sensor is re-connected, as the weight of the tire/wheel will depress/activate the object-in-trunk sensor so the hardtop will not operate.



- Proper placement of the full size tire on the trunk floor in the trunk

When it comes time to putting the full size tire in the vehicle, stand at the DRIVER side. The reason for this is that the full size tire must be to the left of the hardtop down stop. Carefully close the tonneau making sure the tire does not contact the underside of the tonneau.

Group 42 Body

General Information

To become familiar with the various systems of the retractable hardtop system and how it operates, read the General Information and Specifications sections in the Service Manual Supplement.

Special Tools

Special tools are required for servicing the Spyder. They are illustrated in the Service Manual Supplement. All tools related to the ASC computerized diagnostic system are available only through ASC Incorporated. To order these tools, call the ASC West Coast Parts Distribution Center at (310) 605-0043.

Special tools are required for removal and installation of hardtop ECU wire connectors. These are available through any AMP dealer.

Diagnostics and Testing

Precautions Before Service

Read and understand this section in the Service Manual Supplement (SMS). If these guidelines are not followed, damage to the vehicle and personal injury may result. Electrical harness grounds for the Spyder harness are illustrated, as are hardtop ECU connector locations, how to service them, and repairing of the wire harnesses themselves.

Configuration Diagrams

These diagrams in the SMS show Spyder-unique wiring harnesses, connector location and numbers, and ground locations.

Retractable Hardtop and Tonneau Operation

In order to diagnose the hardtop system you as technician should be fully aware of the operation

and how it works. Reading and understanding the information in this section will provide you a wealth of information.

Inspection and Verification and Symptom Charts
These are useful in diagnosing the hardtop system. Refer to the Service Manual Supplement for more information.

KNOWLEDGE CHECK **Choose the answer you think is most correct.**

1. The optional Active Aero package was available only for the:

   a. SL Spyder only.
   b. All VR-4 Spyders and a limited number of SL Spyders.
   c. Neither the SL or VR-4 Spyder.

Answer: C.

Circle True or False for the following statements.

2. In general, when it comes to wind and road noise, squeaks and rattles, there may be a perceivable difference to the customer between soft-top convertibles, the hardtop Spyder, and hard-roofed vehicles. True/False.

Answer: True.

3. If the customer complains that the body flexes, or the windshield header shakes while driving under harsh driving conditions or aggressive handling, this does not always indicate a problem with the Spyder body structure. True/False.

Answer: True.

4. Since most of the added weight of the hardtop is over the rear wheels, the front ride height is the same. This means the Hatchback springs are carry-over for the Spyder. True/False.

Answer: False. The Spyder ride height is the same as the Hatch-back because different rate coil springs are used to compensate for the added weight.

5. The ECS control unit used in the Hatchback and the Spyder have different Mitsubishi part numbers. True/False.

Answer: False. The part numbers are the same. However, before installation the technician will have to snip off one of the mounting tabs and apply foam tape to the back of the unit.

6. In order to keep the rear ride-height of the Spyder the same as the Hatchback, due to the added weight of the Spyder hardtop, the Spyder uses 1 in. thick rubber spacers to raise the coil springs. True/False.

Answer: False. The Spyder ride height is the same as the Hatch-back because different rate coil springs are used to compensate for the added weight.

7. Even though the carry-over Hatchback ABS control unit in the Spyder is in a different position, when it requires diagnosis, it does have to be removed first. True/False.

Answer: True. In the Spyder-position the electrical connector is not accessible without removing the unit.

8. All of the Spyder's body structure is installed by ASC in Japan. True/False.

Answer: False. Only certain parts are installed in Japan by Mitsubishi not ASC. ASC installs all other Spyder body structure components in the USA.

9. With the exception of a wire harness hole at the front of the door, a new or used Hatchback door will interchange with the Spyder's. True/False.

Answer: False. The Spyder door has a door striker reinforcement welded in by the Mitsubishi plant.

10. Only the right front fender is Spyder-unique due the radio antenna being relocated there. True/False.

Answer: False. Both front fenders are Spyder unique due to a different mounting system which uses brackets located at the bottom of them.

11. In the Hatchback, the radio antenna relay is mounted together with the antenna in the trunk. In the Spyder, the carry-over radio antenna relay is mounted basically the same way, only it's up side down. True/False.

Answer: False. For the Spyder, the radio relay is mounted behind the glove compartment.

12. All Spyders have two fusible links for the hardtop system. One is an 80 amp, the other is a 60 amp. True/False.

Answer: False. Depending on the model year, the Spyder has one or the other, not both.

13. The hardtop system fusible links have different amperage ratings, and they are located under the instrument panel. True/False.

Answer: False. Depending on the amperage and model year, the fusible links are located in the engine compartment either in, or next to, the relay box.

14. Only certain sizes of bicycle or ski racks may be installed on the Spyder's tonneau. True/False.

Answer: False. The Spyder tonneau must not have any type of rack or luggage carrier installed on it.

Choose the answer you think is most correct.

15. On the Hatchback, the liftgate lock cylinder is at the rear of the vehicle. On the Spyder, where is the tonneau lock cylinder located?

    a. Next to the manual release lever by the driver seat.
    b. In the same location as the Hatchback.
    c. Behind the rear seat back in the CD changer area.
    d. None of the above.

Answer: D. The tonneau cannot be locked or unlocked by a key; the tonneau latches secure the tonneau. To open the tonneau use the switch, or in an emergency the tonneau can be manually unlatched and opened.

16. On the Hatchback, the rear bumper has a diamond star emblem next to the name MITSUBISHI. On the Spyder, what happened to the diamond star?

    a. It's In the same place as the Hatchback.
    b. Relocated to the right-hand side of the vehicle.
    c. None of the above.

Answer: C. The diamond star for the Spyder is not used.

17. Why does the Spyder front seat seat belt guide have a different shape than the Hatchback's?

    a. It is stronger than the Hatchback's.
    b. To clear the quarter trim panels when the front seats recline.
    c. To accommodate the relocation of the front seat belt retractors.
    d. None of the above.

Answer: C.

18. Aside from the front seat seat belt guide, a Hatchback front seat is not a direct replacement for Spyder because:

    a. The seatbacks are stiffer.
    b. The seat's mounting tracks have stops for the Spyder.
    c. The Spyder seats are modified with recline angle stops.

Answer: C.

Circle True or False for the following statements.

19. The Spyder headlining is attached by screws, rivets, and a product known as dual-lock. The dual-lock requires care when releasing it, as it is much stronger than Velcro®. True/False.

Answer: True.

20. The Spyder trunk trim is all-new. True/False.

Answer: False. All the Spyder trunk trim is Spyder-unique.

21. The Spyder's object-in trunk sensor consists of a toggle switch mounted in the center of the carry-over Hatchback floor board. True/False.

Answer: False. The sensor consists of a pressure sensitive switch which covers all the Spyder-unique trunk board.

22. The Spyder has a self-dimming, lighted rear view mirror. For safety when backing, the mirror glare-control will automatically switch off so that it does not darken automatically. True/False.

Answer: True.

Choose the answer you think is most correct.

23. When the Spyder requires a replacement windshield, what do you need to check to install the rear view mirror?

    a. The size of the mirror mounting button(s).
    b. The orientation of the Spyder mirror button should be the opposite of the Hatchback's.
    c. The distance of the Spyder mounting button from the header garnish.
    d. All of the above.

Answer: D.

24. What are the differences between the Hatchback and the Spyder rear seat backs?

    a. The location if the release knob/loop.
    b. The lower mounting brackets.
    c. The cargo nets on the back of them.

Answer: A and C.

Circle True or False for the following statements.

25. Only the Spyder's front seat belts are interchangeable with the Hatchback. True/False.

Answer: False. None of the Spyder seat belts are interchangeable with the Hatchback's.

26. It is okay to switch a rear seat belt from one side of the vehicle to the other, but not from the front to the rear. True/False.

Answer: False. None of the Spyder seat belts are interchangeable with their intended positions.

27. Only the ignition key will unlock the Spyder's CD changer access door. True/False.

Answer: False. The door does not have a key-lock feature.

28. The Hatchback CD changer has an access door relocated behind the right rear seat back.

Answer: True.

29. When the CD changer installed in the Spyder requires service, it can be pulled through the CD changer access door opening behind the rear seats. True/False.

Answer: False. The only way to service the CD changer is by removing the metal access of the body structure.

30. The HomeLink is a communication system used for to sending messages to a home or business. True/False.

Answer: False. The HomeLink is a radio transmitter that can be used to control three radio-frequency devices.

31. The HomeLink does not have its own battery back-up. True/False.

Answer: True.

32. Due to limited space in the rear quarter of the Spyder, the Hatchback radio motor antenna has been relocated to the right front fender. True/False.

Answer: True.

33. Compared with the Hatchback radio amplifier, the Spyder radio amplifier has more bass response. True/False.

Answer: True.

34. The carryover Hatchback rear combination lights used on the Spyder must be modified by the technician before installation. True/False.

Answer: True.

35. The Spyder's theft alarm system, which consists of the light automatic shut off and keyless entry receiver system, is all-new. True/False.

Answer: False. The system is not all-new, as it is carry-over from the Hatchback.

In auto this is true

36. The climate control temperature sensor used on the Spyder shuts off when the hardtop is open (stowed). True/False.

Answer: False. The climate control system remains active regardless of hardtop position. When using A/C with the hardtop open, set the "MODE" to the desired selection, and select the fan speed using "FAN". Set the temperature control to ("TEMP") to a comfortable setting.

37. The Spyder's object-in-trunk sensor (floor board) must be disconnected before it can be removed from the vehicle. True/False.

Answer: True.

DAY 2 -- Wednesday, January 8, 1996

Diagnostic Trouble Codes (DTC's)
The hardtop ECU is designed to retain log and store information for all functions related to hardtop and tonneau operation. One of these functions is to recover fault codes when the hardtop system is not working at its optimum performance, but not necessarily malfunctioning in general. The DTC's are logged according to a predetermined priority. Some DTC's mean nothing to the overall operation of the system. These are referred to as "nuisance DTC's". Other DTC's based on priority indicate a serious problem, and some not so serious. The only way to access these codes is through an ASC computerized diagnostic system. This system is part of the special tools required to service the Spyder.

See also the Troubleshooting Hints, and the DTC Log Identification List in the SMS, and the ASC Incorporated PC User's Manual.

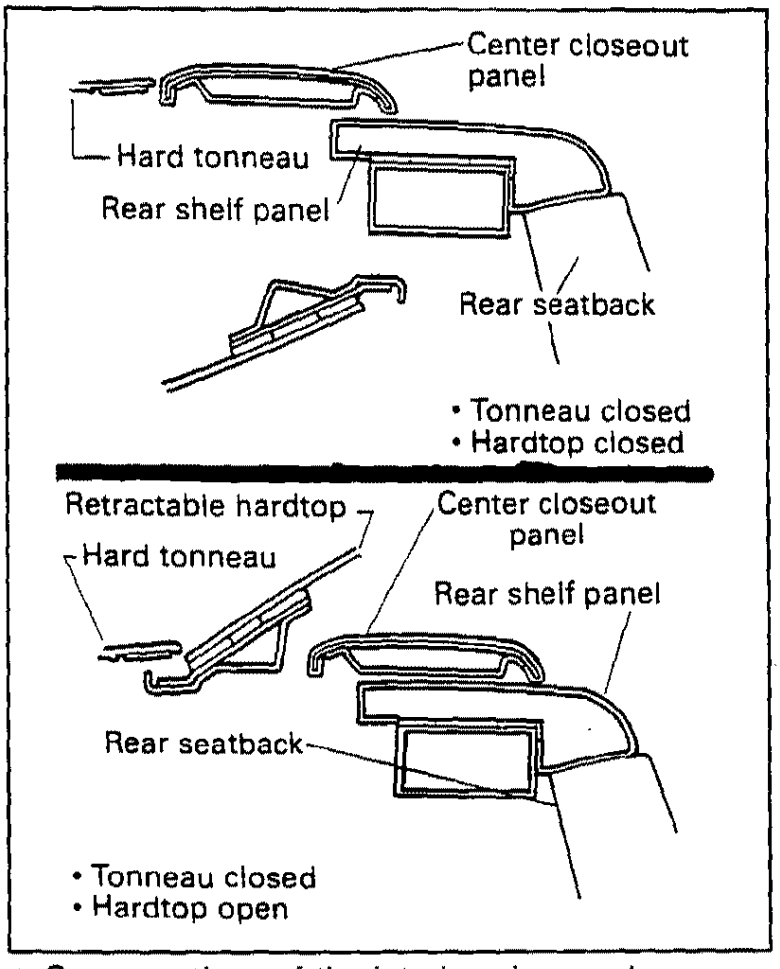
Pinpoint Tests
The format and style of the pinpoint test in the SMS may not be what you are familiar with. Pinpoint Tests are broken down two ways. Tests with an alpha designation (example: "Test A") are not based on a DTC. Tests with a numeric designation are the actual DTC numbers (example: "DTC 08")

Circuit Diagrams
The circuit diagrams in the SMS follow the same format as the diagrams in Volume 2 of the Service Manual. For more information on how to read them, refer to Vol. 2.

(Continued)

Group 52 Interior

Technical Highlights



- Cross-sections of the interior trim panels

Some components of the Spyder's interior trim are active, that is, they move. The center closeout panel above the rear seats and rear shelf panel moves back and forth. As the hardtop opens, the closeout panel moves backward to fill the gap at the front of the tonneau where the hardtop was. When the hardtop closes the closeout moves forward. This is all accomplished by a complex linkage system which is controlled by the hardtop linkage on the hardtop main pivot bracket.

Although separate, but nevertheless just as important, are the flipper doors. They cover the body structure where the hardtop would be if the hardtop were closed. The flipper doors are controlled remotely by cable via the mechanism on the tonneau hinge. The flipper door system is driven by a single cable attached to the hardtop

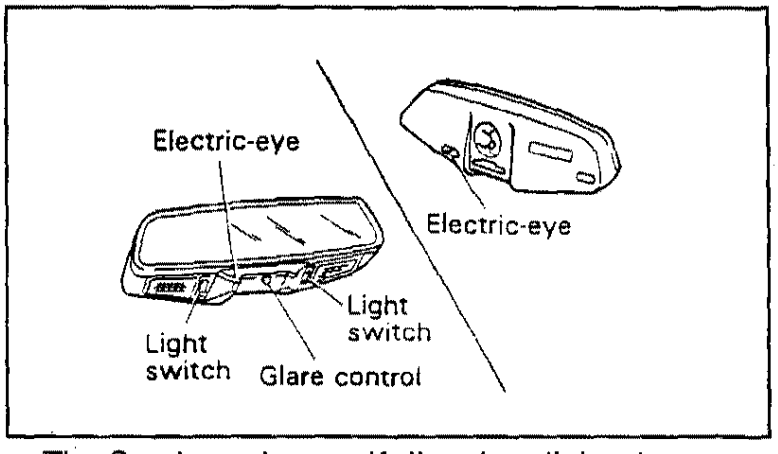
mechanism.

Adjustment of the interior trim system is critical from both an operational and aesthetic standpoint. From an operation standpoint, care must be taken to be sure that, for instance, the closeout panel down stop is adjusted. If it adjusted too low, when the panel moves back and forth, the rear shelf panel will be permanently scuffed as will the quarter trim panels. Left unchecked, the vinyl material on all the components where there is contact will eventually scuff then tear.

Sunvisors

Due to the lowered height of the Spyder header garnish, the Spyder-unique sunvisors are slimmer than the Hatchback's. The Spyder sunvisors mount the same way and use carryover Hatchback mounting clips.

Rearview Mirror



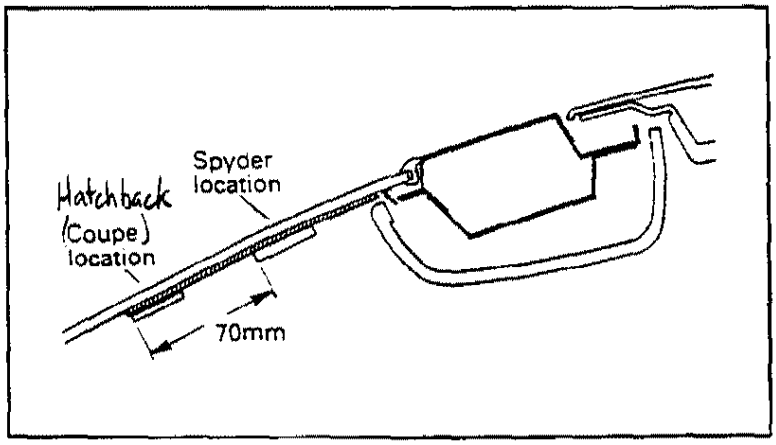
- The Spyder-unique self-dimming, lighted rear view mirror
- Replaces the Hatchback mirror

The lighted, Spyder-unique rearview mirror is self-dimming. It replaces the Hatchback rearview mirror. The self dimming feature means it can control reflected headlight glare from vehicles behind the Spyder. The glare control feature is variable using the sliding switch. In the "MAX" position optimum glare control is available. In the "OFF" position, the mirror is full-bright, or normal (non-glare controlled mode). For safety, the mirror automatically returns

to the normal mode whenever the transaxle gear selector is in the "R" or reverse position. For optimum performance, the front and rear electric-eyes must be kept clean and they should not be covered with stickers or tags.
The mirror has built-in courtesy/map lights. The courtesy lights come on when a vehicle door is open; the map lights can be operated separately.

Spyder-unique wiring has been added to the vehicle harness to accommodate the mirror's two electrical systems.

Replacement of the map light bulbs is addressed in Group 54 of the Service Manual Supplement and in the Owners Manual Supplement.



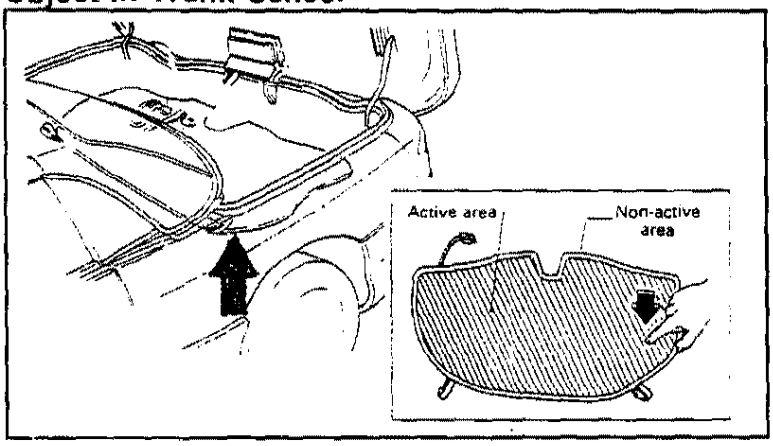
- Spyder-unique mirror relocation on the windshield

The Spyder rearview mirror is heavier and larger than the Hatchback's. In order to reduce mirror vibration, it has been relocated 70 mm upward on the windshield.

1995 model year Spyders have two mirror buttons on the windshield. The lower one is the Hatchback mirror button, which is not used. To cover the unused button a lower garnish is glued to it. This garnish must be removed (by breaking the cement bond) before the mirror can be removed. 1996 model year Spyders have only the Spyder mirror button.

Diagnostics for the mirror are limited to external causes. Other than replacing the two map light bulbs, nothing inside mirror itself is serviceable.

Object-In-Trunk Sensor



- The Spyder object-in-trunk sensor (floor board)
- Replaces Hatchback floor board

The Spyder's object-in-trunk sensor is a carpet-covered pressure-sensitive switch which doubles as the trunk floor board. All but a small band around the perimeter of the sensor is active.

It replaces the Hatchback floor board which is only a floor board.

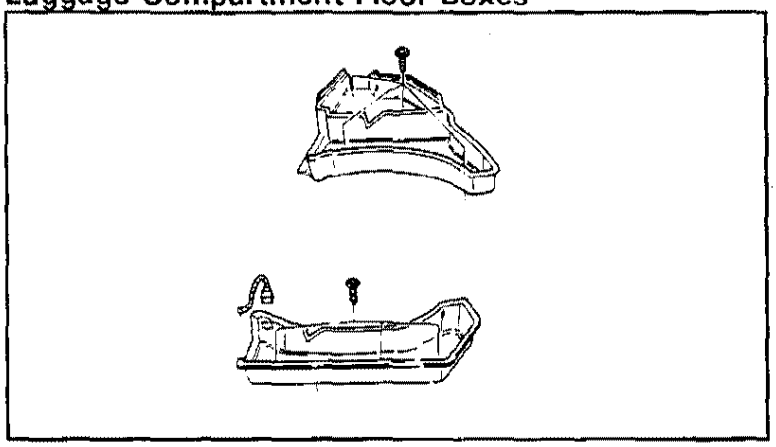
The sensor is made of several different materials. The sensor must be disconnected before it is removed from the trunk.

(Continued)

(Middle to outside wire)
Jumper purple
to yellow
to trick ECU

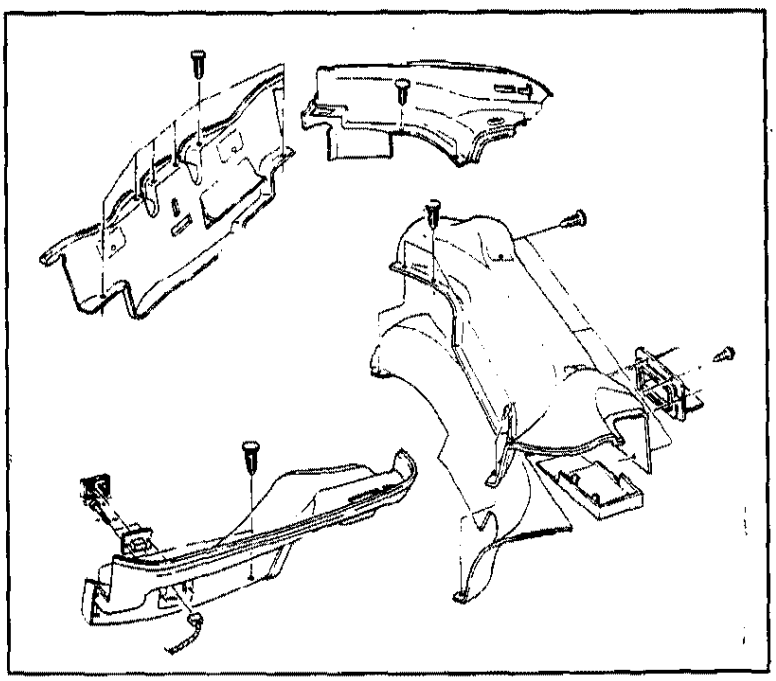
(middle to outside wire)
Jumper Purple
to Yellow
to trick ECU

Luggage Compartment Floor Boxes



- The modified Hatchback luggage compartment floor boxes used in the Spyder

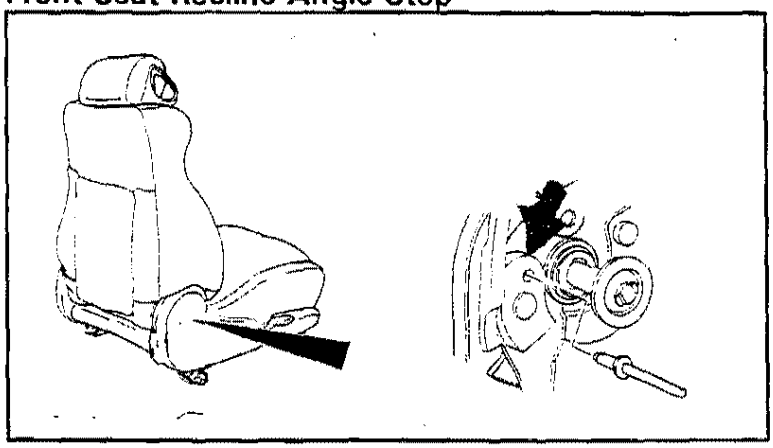
The luggage compartment floor boxes are modified to accommodate the tonneau lift arm mechanisms, latch release actuators, and "L" brackets and hole for object-in-trunk sensor connector.



- The Spyder-unique luggage compartment trim

The Spyder has completely different luggage compartment trim.

Front Seat Recline-Angle Stop

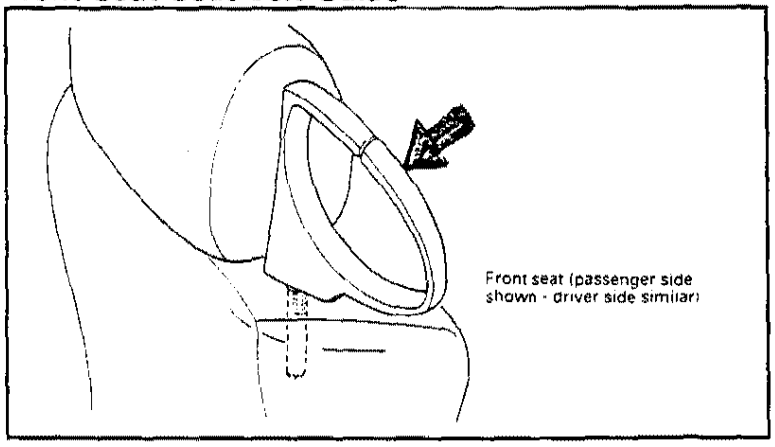


- The recline-angle stops added to the Hatchback fronts seats make them Spyder-unique

The Hatchback front seats have riveted-on recline angle-stops at the outboard pivot mechanism. This prevents the seats from going back too far which could damage the seat coverings and the quarter trim panels.

Do not use a Hatchback seat in the Spyder unless it is modified to accept the recline-angle stop.

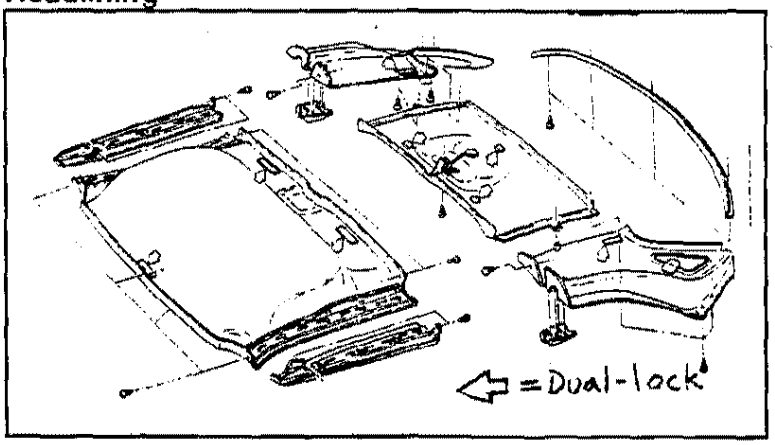
Front Seat Seat Belt Guide



- Spyder-unique seat belt guides replace Hatchback belt guides

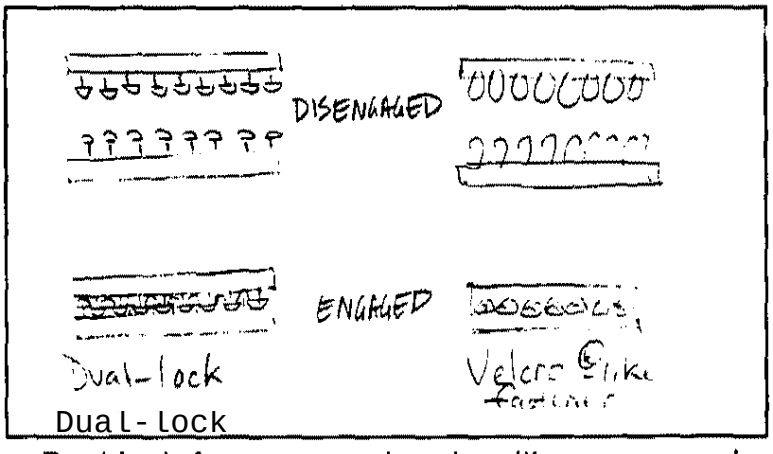
Because the Spyder's front seat belts are located in the quarter trim panel areas instead of the Hatchback roof B-pillar, the Spyder version of the belt guides have a different shape.

Headlining



- The Spyder's hard-molded, multi-section headlining replaces the Hatchback soft-formed headlining

For rigidity and better sound-proofing characteristics the Spyder uses hard-molded headlining. The headliner uses a three different fastening systems to attach it: screws, rivets and a product known as "dual-lock".



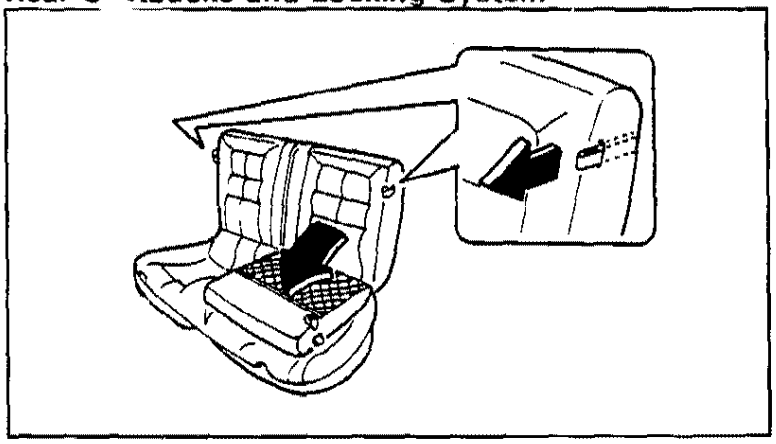
- Dual-lock fastener used on headliner compared to a Velcro®-like fastener

Dual-lock can be released or detached from itself by pulling the halves apart. Use care when doing this because the adhesive/tape securing it to the substrate to the vehicle can be torn away. If this occurs, repair the dual-lock in an appropriate fashion before re-assembly.

Some 1995 and 1996 Spyder models have left- and

right-hand headlining extensions that are each secured to the hardtop by two rivets. When removal is necessary, the rivets must drilled out. Because the drilling process only removes the outside half of the rivet, the other half of the rivet will be trapped inside the hardtop. In order to prevent rattling of the rivet, spray aerosol adhesive into the rivet hole.

Rear Seatbacks and Locking System

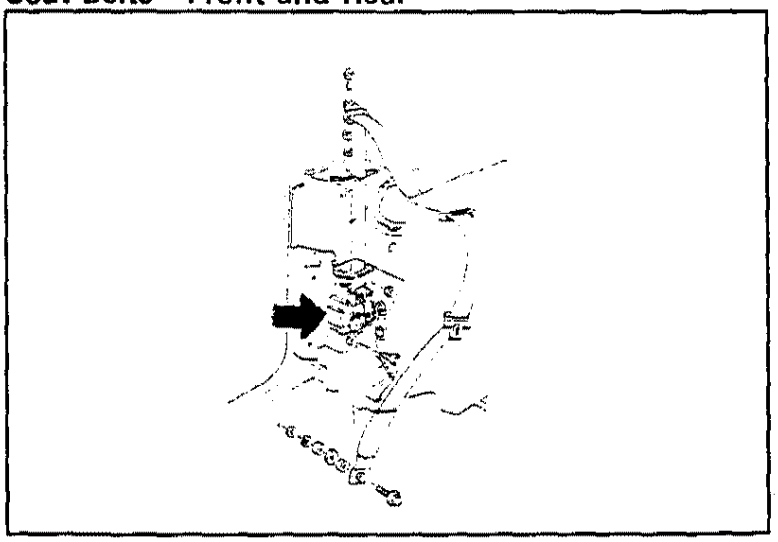


- Spyder-unique rear seatbacks
- Spyder-unique latch system and striker
- Replaces Hatchback seatbacks

The Spyder-unique seatbacks are modeled after the Hatchback's. Some of the obvious differences are that the hatchback's seat release knob, located at the top corner, is a sewn loop for the Spyder which exits from the side of the seat at the top. The back of the Spyder seatbacks have a thicker backing which is carpet covered and feature cargo net pockets.

(Continued)

Seat Belts - Front and Rear



- The Spyder-unique front seat belts
- Replaces Hatchback seat belts

The Spyder-unique front seat belts have D-rings for belts which are located in the quarter panels, not in the roof B-pillar like the Hatchback.

- The Spyder-unique rear seat belts
- Replaces Hatchback seat belts

The Spyder-unique rear seat belts have D-rings for belts which are located in the quarter panels, similar to the Hatchback mounting style.

Caution: The Spyder seat belt assemblies are not interchangeable side-to-side, nor front-to-back.

Service Adjustment Procedures - Body

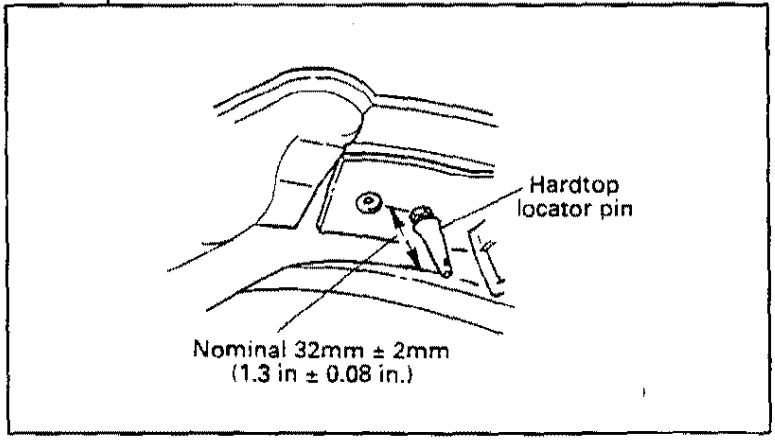
Service adjustment procedures in the SMS are very comprehensive. Before attempting service on an area of the vehicle you are not familiar with, you should read and understand all the information in the Service Adjustment Procedures section. Even though the hardtop system is made of many separate components/systems, they all work in unison. If, for instance, the hardtop is adjusted and the clearances between the tonneau and rear portion of the hardtop are not checked and adjusted, as necessary, water leaks could develop.

Likewise, knowing beforehand what can happen if a balance link is loosened without cause can save literally hours of readjusting that and other components.

Before performing adjustments and/or repairs on the Spyder be sure you have all the necessary ASC computerized diagnostic equipment to run the hardtop ECU through auto-configuration.

Technical Highlights

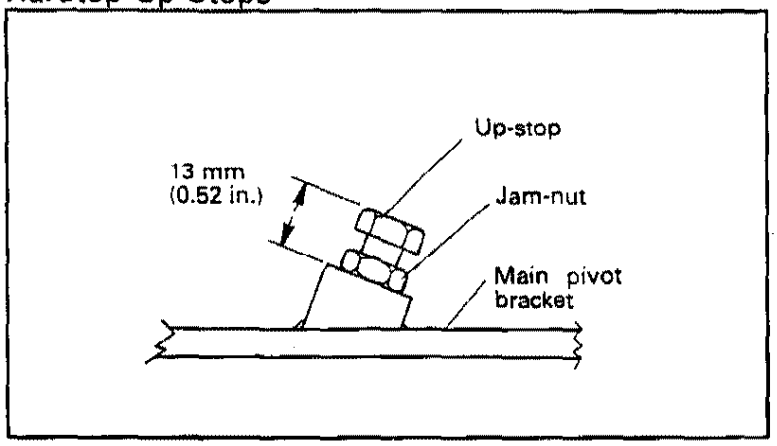
Hardtop Locator Pin



- Proper adjustment of hardtop locator pin

In order for the hardtop to seal properly at the header, the latches to open and close properly, and the flushness of the hardtop to the outside of the header to be correct, the adjustable hardtop locator pin must be correctly adjusted.

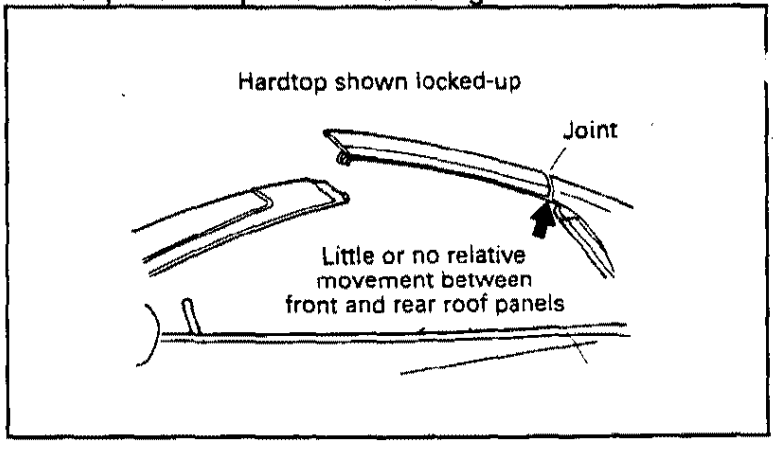
Hardtop Up-Stops



- Hardtop "up-stops" are actually down-limiters for hydraulic cylinders

Even though these are referred to as up-stops they are actually down-limiters for the hydraulic cylinders. Under normal circumstance the hardtop mechanism should not contact the down-limiters.

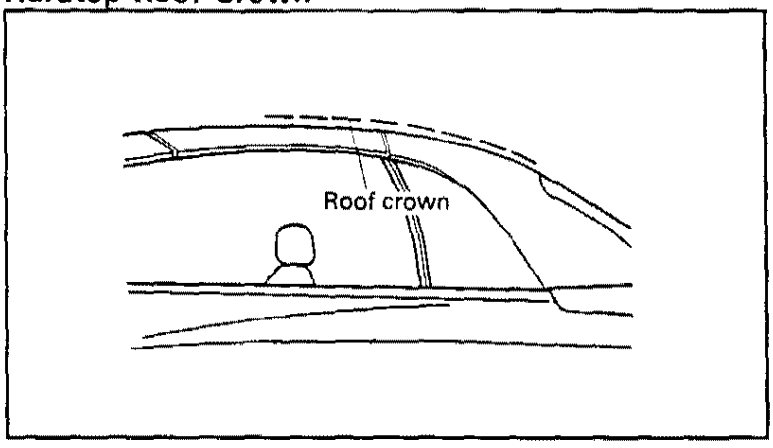
Hardtop Lock-Up Before Closing



- Illustration of a properly locked-up hardtop roof before closing

One of the most important aspects of hardtop operation is hardtop lock-up before closing. What this does is keep the hardtop locator pins in an optimum angle to the header latch garnishes. If the angle is off the hardtop may not enter the header latches. And if does happen to go in, it may not come out as easily or at all.

Hardtop Roof Crown

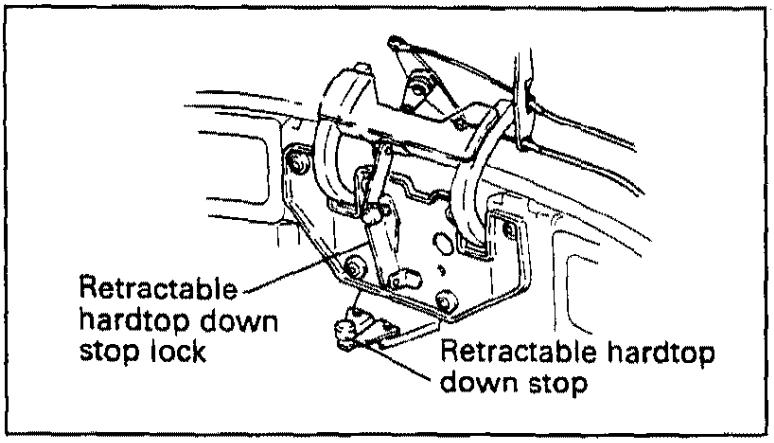


- Illustration of a properly crowned roof

If the hardtop roof is not crowned properly this will cause misalignment of the hardtop locator pins to the header latch garnishes, improper sealing of the door windows to the side rail weatherstrips, improper inconsistent quarter window operation and sealing.

Hardtop Down Stop Lock System

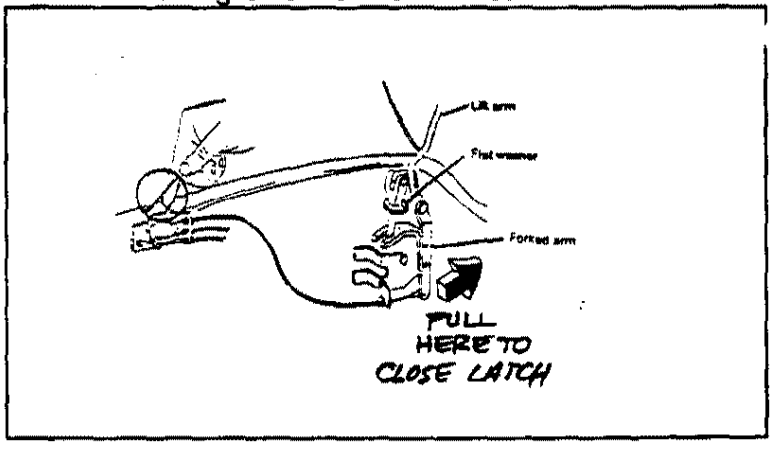
The hardtop uses a down stop lock system to prevent the hardtop from bouncing in the stowage area when it is closed. It consists of an adjustable bracket mounted to the body structure which has an adjustable down stop bumper. When the hardtop opens, a metal tab protruding from the hardtop (it is an extension of the quarter window mounting bracket) comes to rest on the down stop bumper. The other half of system, the down stop lock, which is hinged off the body structure and the tonneau hinge, pinches down on the metal tab and prevents any movement of the hardtop. If the down-stop lock system is set too low, the hardtop will bounce. This could cause the paint finish on the hardtop to rapidly wear or scuff. Likewise if the hardtop down stop system is set to high, the hardtop will rub on the inside of the tonneau.



• The hardtop down stop lock system

The quarter window system uses two Hall-effect position sensors. Only the passenger side window is sensed. The sensors are saddle mounted on the return tube for the drive cable. The sensors must be located on the outside radius of the return tube. This ensures the magnet in the end of the drive cable is as close to the sensor as possible.

Manual Closing of a Tonneau Latch

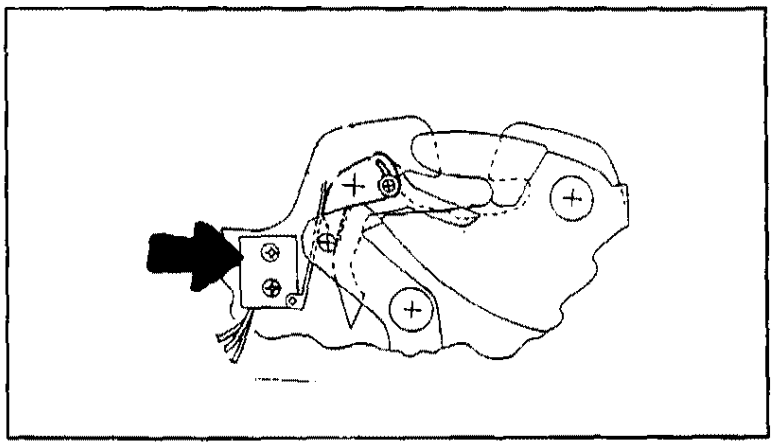


• Proper manual closing of a tonneau latch

When working on or about the tonneau latches, do not manually close the latch catches by hand at the latch. Closing it by hand at the latch will permanently damage the cables attached to them. Instead, grasp the forked arm of the lift arm and pull it rearward until the latch closes.

Tonneau Latch Limit Switches

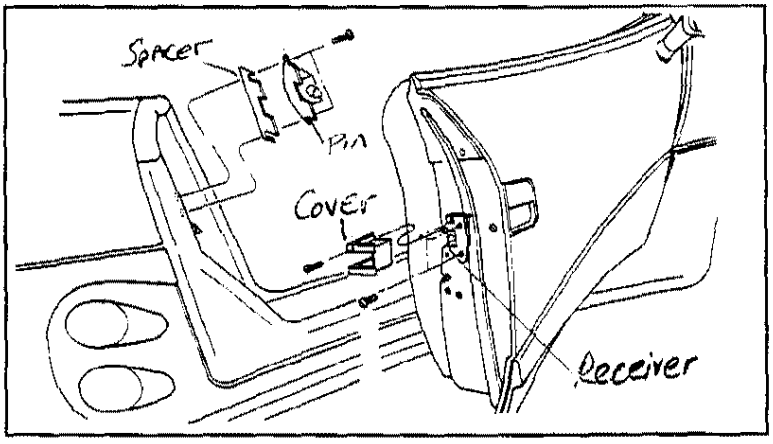
Each tonneau latch has limit switch which is used to the tell the ECU when the tonneau striker has entered the latch. If these limit switches are not adjusted properly, getting the tonneau operate properly and consistently may be extremely difficult.



- Illustration of the tonneau latch limit switch

Door Locating Pin and Receiver

The Spyder uses a spring-loaded door locating pin and receiver. Proper adjustment is critical in order to keep the door from rattling.



- The Spyder door locating pin and receiver to prevent door rattling

KNOWLEDGE CHECK **Circle True or False for the following statements.**

1. The Spyder's Diagnostic Trouble Codes can only be retrieved by using the ASC Diagnostic Computer System. True/False

Answer: True.

2. The Spyder rear view mirror has been moved 70 mm up on the windshield. True/False.

Answer: True.

3. All Spyder front seats must have what is called a seat recline angle stop. True/False.

Answer: True.

4. Spyder seat belts are interchangeable with each other left-to-right or front-to-back. True/False

Answer: False.

Choose the answer you think is most correct.

5. Hardtop locator pins are perform what function(s)?

   a. Promotes good weather sealing along the header.

   b. Promotes good latching and unlatching of the header latches.

   c. Promotes flushness of the hardtop to the header.

   d. All of the above.

Answer: D.

Circle True or False for the following statements.

6. In order for the hardtop to operate properly, it must be what is called "locked-up" properly before it closes. True/False

Answer: True

7. If the hardtop is not crowned properly, that could cause the quarter windows to not open or close consistently. True/False.

Answer: True

8. If the hardtop down stop lock system is not adjusted properly that could cause the hardtop to bounce inside the trunk area, which could lead to damage. True/False.

Answer: True

DAY 3 -- Thursday, January 9, 1996

Removal and Installation Procedures

The removal and installation procedures in the SMS follow the same style and format as Volume 1 of the Service Manual. For more information on how to read them, refer to Vol. 1. Removal and installation procedures are fairly self-explanatory. Familiarize yourself with them to gain a better knowledge of the Spyder.

Important Information

- Be aware that, by loosening a fitting for instance on a hardtop or tonneau hydraulic system could unexpectedly cause the hardtop or tonneau to fall. Damage to the vehicle or personal injury could result.

- Pressure spikes in the hydraulic system can approach as much as 800 psi (for comparison a typical car wash pressure washer is approximately 200-300 psi). Therefore, DO NOT loosen a hydraulic line fitting or place your fingers around a loose fitting while the pump is running. Given the right circumstances, the high pressure hydraulic fluid could slice through flesh.

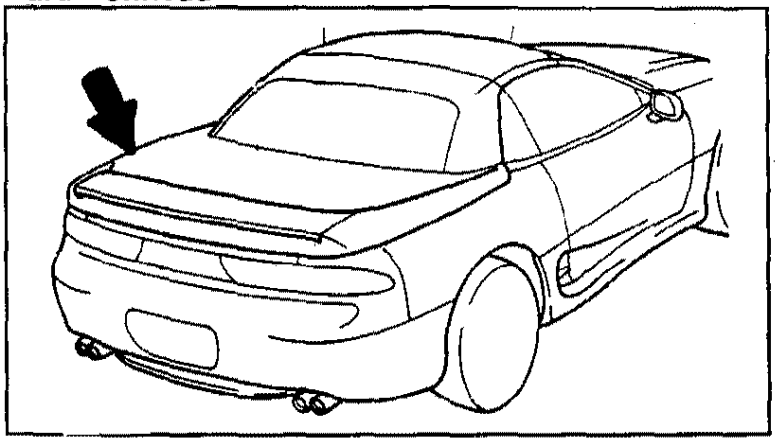
- Keep hands and fingers out of linkages and balance links when working about them. Personal injury could result.

- Before performing adjustments and/or repairs on the Spyder be sure you have all the necessary ASC computerized diagnostic equipment to run the hardtop ECU through auto-configuration.

- When adjusting or manually operating the header latch system, always remove the manual operation wrench first. If it is still in the header latch motor it could spin around when the switch is pressed. This could cause damage to the vehicle or personal injury.

Technical Highlights

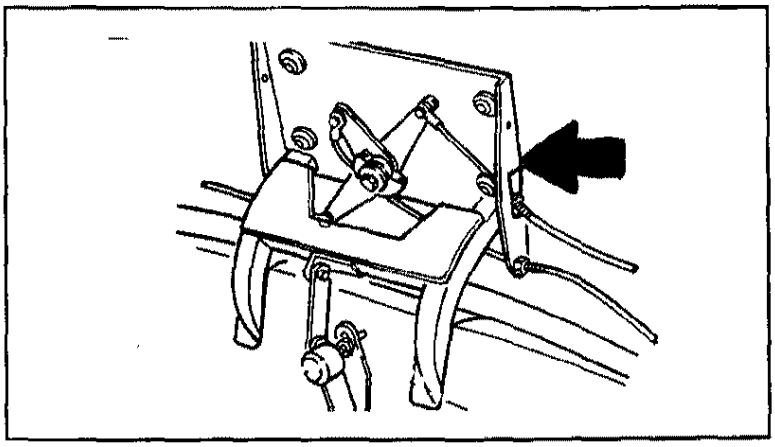
Hard Tonneau



- The Spyder tonneau
- Replaces Hatchback hatch

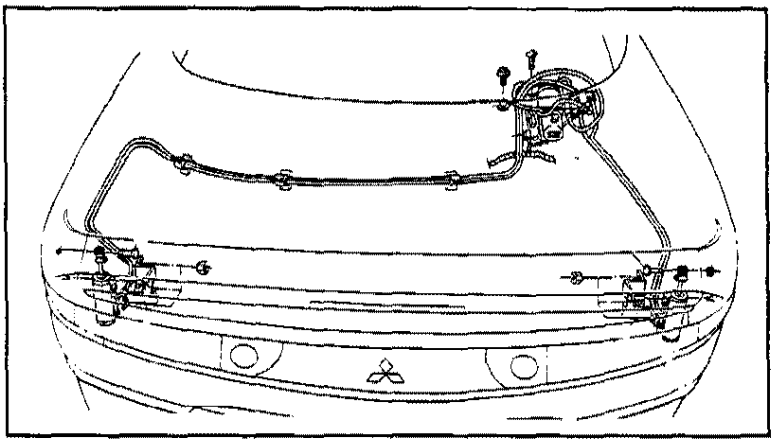
The Spyder hard tonneau replaces the hatch of the Hatchback. The tonneau covers the hardtop when it is open or covers the stowage area when the hardtop is closed.

The tonneau consists of an inner and outer panel made of fiber-reinforced, sheet molded compound (SMC). The inner and outer panels are not serviceable separately, as they are glued together.



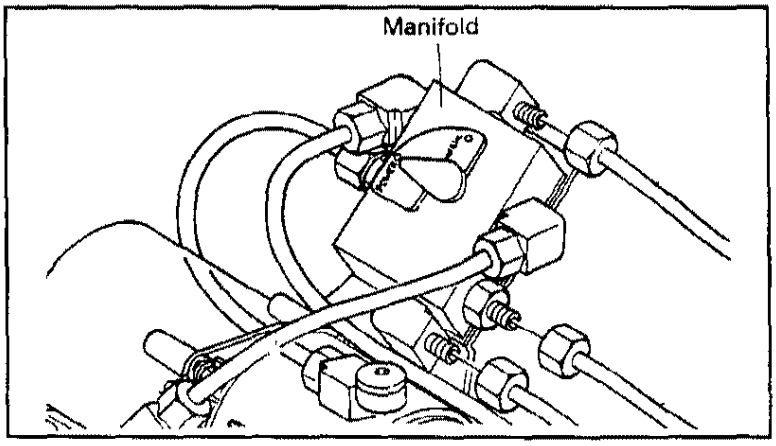
- The Spyder-unique single rear-mounted tonneau hinge

A single rear-mounted hinge allows it to open at the front, instead of the rear like the Hatchback.



• Tonneau hydraulic open and close system

Two hydraulic cylinders open and close the tonneau which is controlled by the hardtop system ECU. The tonneau hydraulic system is entirely separate from the hardtop hydraulic system.



• Tonneau hydraulic system manifold

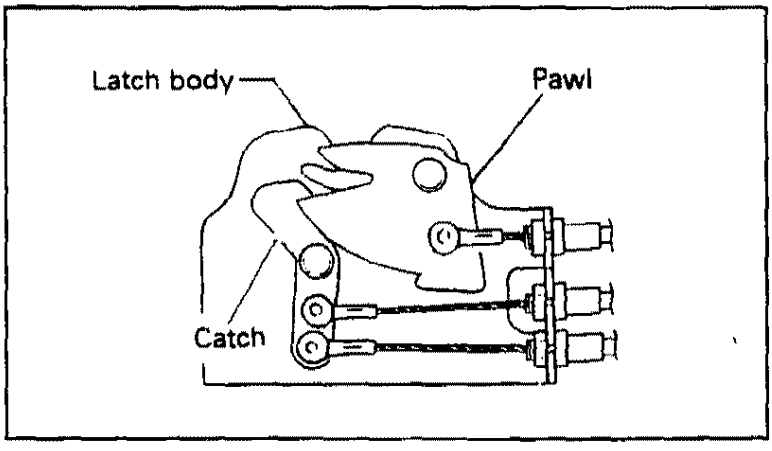
The tonneau and hardtop hydraulic systems each have a manifold. The manifolds are not interchangeable between the two systems. The manifold has three purposes: distribution of hydraulic fluid to and from the pump; provide what is termed "line-lock"; and provide a bypass function for manual operation. The term "line-lock" refers to the ball-check valves inside that essentially block fluid from going to one side of the pump to other. This is to hold the tonneau at a given position for a length of time. (The hardtop has a similar manifold which works the same way.)

The tonneau hydraulic pump motor has two non-serviceable varistors inside. When one fails, the pump motor will only rotate one direction when powered up. If both fail the motor will not operate in either direction. The failed varistor short circuits to ground through the braided ground strap. When this happens simply detach the strap from the pump, and try running the hardtop system. If the pump now runs in both direction, replace the entire pump.

Do not use any other oils or fluids in the hydraulic pumps other than what is specified. Use of any other oil or fluid may cause the seals to swell or deteriorate and hamper tonneau operation. Rapid damage (wear) to the pump could result.

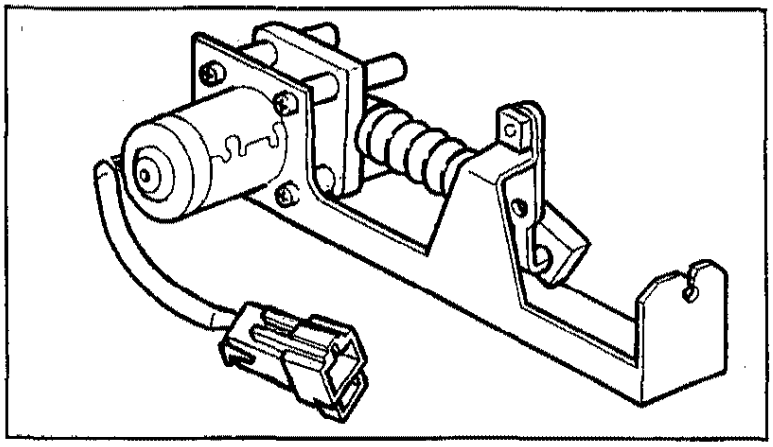
Be aware that the manifolds for each hydraulic system are not interchangeable. Damage to the vehicle or personal injury could result.

As with the manifolds, the hydraulic pumps themselves are not interchangeable. Damage to the vehicle or the logging of numerous DTC's could result.



- One of two tonneau latches

The tonneau is latched by two body-mounted latches.

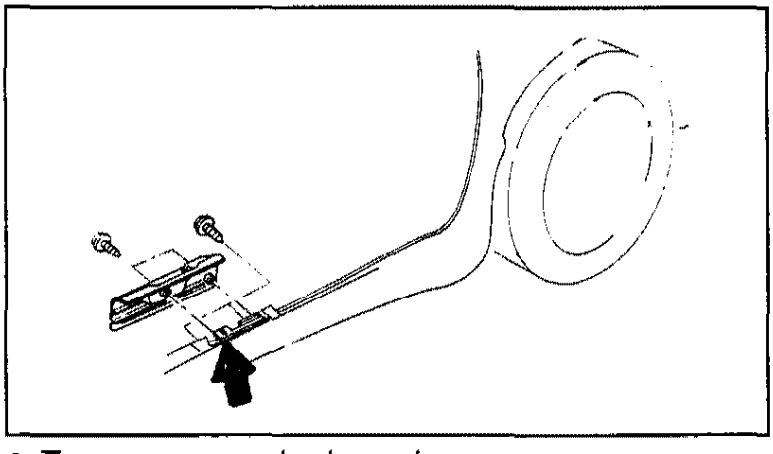


- One two latch release actuators

The latches are released simultaneously by two motor driven, rack-and-pinion style, electrically-operated linear actuators. The actuators are controlled by the hardtop ECU. When the actuators are signaled to release the latches, full battery voltage is applied. But when the actuators are signaled to return, only one-half of battery voltage is applied. This allows the rack to reset itself under power rather than using a spring. The advantage of this is the rack return rate is slower which reduces wear and eliminates the noise of the rack snapping back.

Release Aggressively or lever will bend

Release Aggressively or Lever will bend



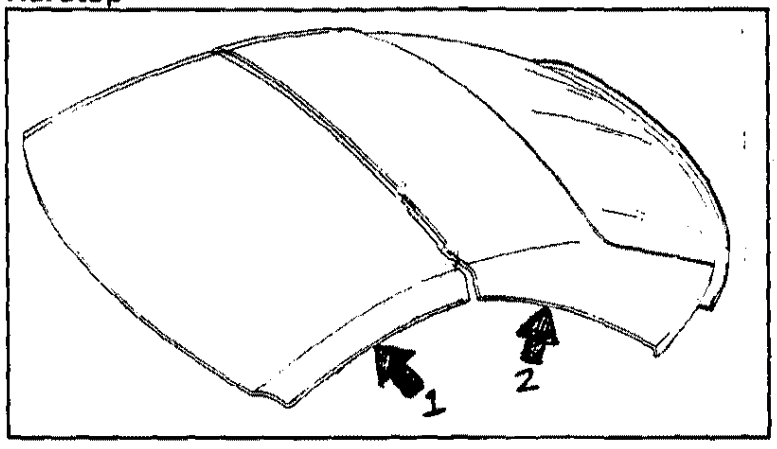
- Tonneau manual release lever
- Release lever is carry-over Hatchback part

In an emergency the tonneau latches can be released manually simultaneously by lifting the handle to the left of the driver side seat. This lever is the same part used to release the hatchback's

liftgate. The grey-colored cable is also a carry-over Hatchback part. The routing of the cable is different, as it serves a different purpose.

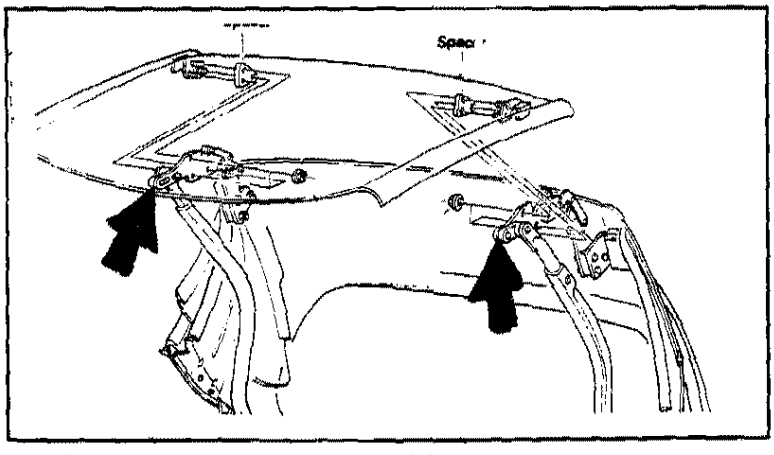
For more in-depth information on adjustments, refer to page 42-149 in the Service Manual Supplement.

Hardtop



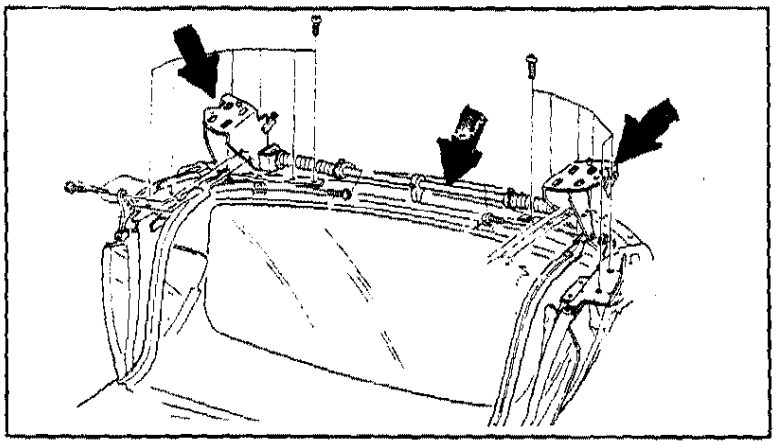
- Two-piece Spyder hardtop
- Replaces Hatchback roof and hatchback

The Spyder hardtop replaces the Hatchback roof and hatchback.



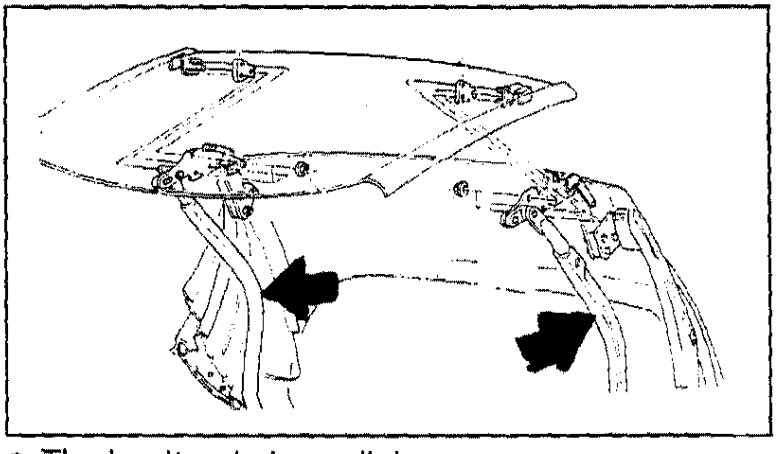
- The two hardtop center hinges

The front and rear roof sections are hinged at the left and right sides with patented articulating hinges.



• Hardtop main pivot brackets and torque tube

The hardtop hinges at the rear by two main pivot brackets, one at each side of the vehicle. To keep the main pivots in sync they are connected by a rigid, cross-car torque tube. The torque tube lessens the possibility of the hardtop skewing as it opens and closes. The hinge pivot point of each main pivot bracket is rubber-isolated to reduce road vibration to the hardtop.

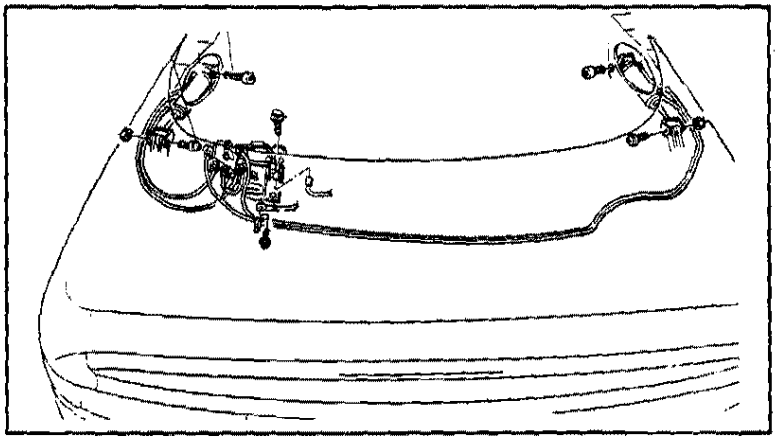


• The hardtop balance links

The hardtop has balance links which connect to main pivot brackets and the roof center hinges. The balance links hold up, or balance, the front roof section as it is being opened or closed.

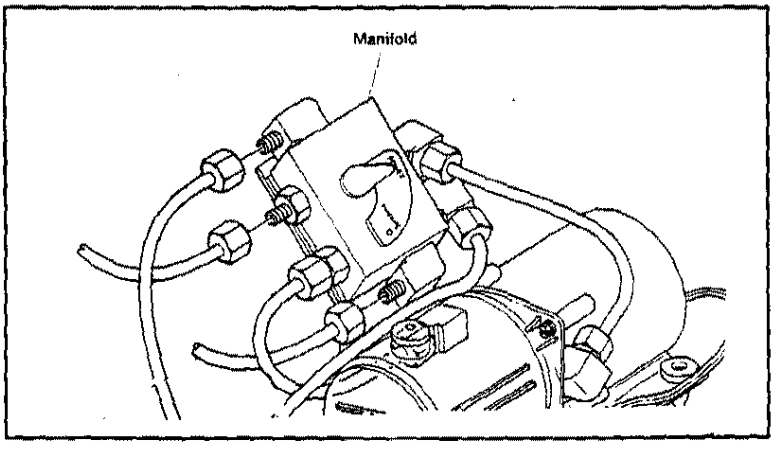
The adjustment of the balance links to the hinges is extremely critical; if one balance link is out of adjustment it will cause the roof to skew to one side or the other, cause the hardtop locator pins and

strikers to over- or under-shoot the receivers in the header, or cause the front hardtop roof section to droop or lock-up prematurely.



- Hardtop hydraulic open and close system

Two hydraulic cylinders open and close the hardtop which is controlled by the hardtop system ECU. The hardtop hydraulic system is entirely separate from the tonneau hydraulic system.



- Hardtop hydraulic system manifold

The manifold has three purposes: distribution of hydraulic fluid to and from the pump; provide what is termed "line-lock"; and provide a bypass function for manual operation. The term "line-lock" refers to the ball-check valves inside that essentially block fluid from going to one side of the pump to other. This is to hold the hardtop at a given position for a length of time. (The tonneau has a similar manifold which works the same way.)

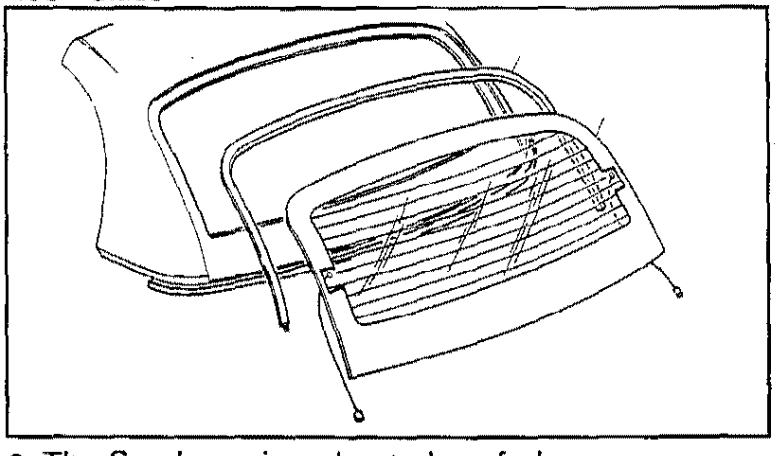
The hardtop hydraulic pump motor has two non-serviceable varistors inside. When one fails, the pump motor will only rotate one direction when powered up. If both fail the motor will not operate in either direction. The failed varistor short circuits to ground through the braided ground strap. When this happens simply detach the strap from the pump, and try running the hardtop system. If the pump now runs in both direction, replace the entire pump.

Do not use any other oils or fluids in the hydraulic pumps other than what is specified. Use of any other oil or fluid may cause the seals to swell or deteriorate and hamper hardtop operation. Rapid damage (wear) to the pump could result.

Be aware that the manifolds for each hydraulic system are not interchangeable. Damage to the vehicle or personal injury could result.

As with the manifolds, the hydraulic pumps themselves are not interchangeable. Damage to the vehicle or the logging of numerous DTC's could result.

Roof Glass



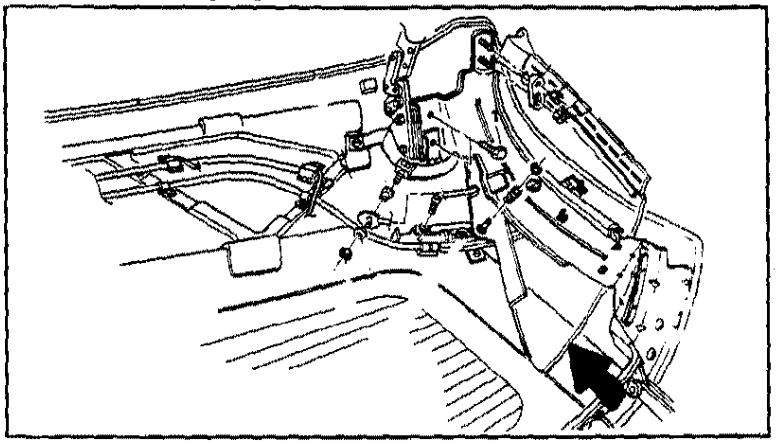
- The Spyder-unique heated roof glass

The standard equipment, Spyder-unique, heated roof glass is a bonded-in type. It replaces the Hatchback glass. The timer used for the Hatchback glass heater is retained for the Spyder. The function remains the same. (Even though the heater timer can be turned on while the hardtop is stowed, it does not create

any problems.)

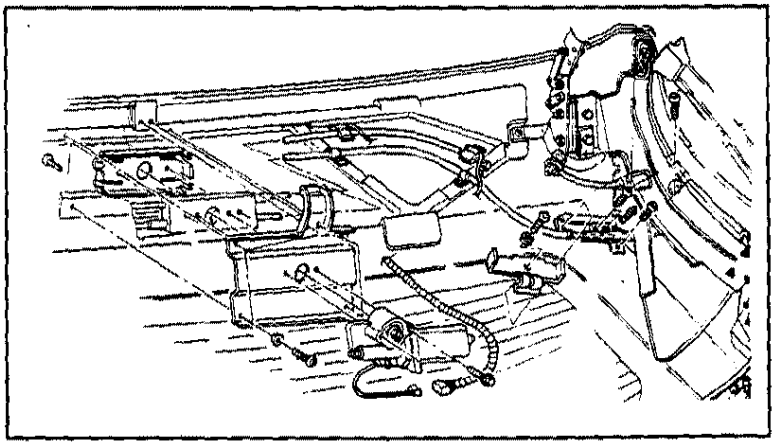
The Spyder roof glass does not use the same adhesives and related products as other Mitsubishi products. Therefore, be sure to use only Essex Specialty Products for installing roof glass. Other products from other manufacturers have not been tested for their compatibility with Essex Products.

Quarter Windows



- Power retracting quarter windows

The Hatchback's fixed quarter windows are replaced by the Spyder's power quarter windows.

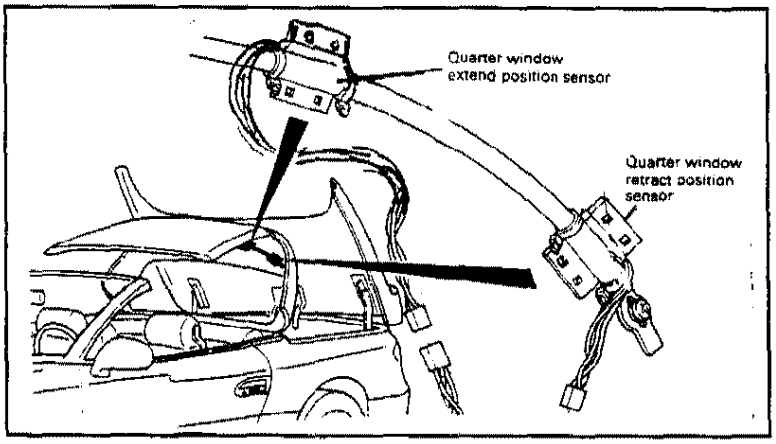


- Quarter window drive motor

The quarter windows operate simultaneously via a single motor located in the rear half of the hardtop.

A spirally-wound drive cable attached to the rear of each window pushes or pulls the window,

depending on the rotation of the drive motor.

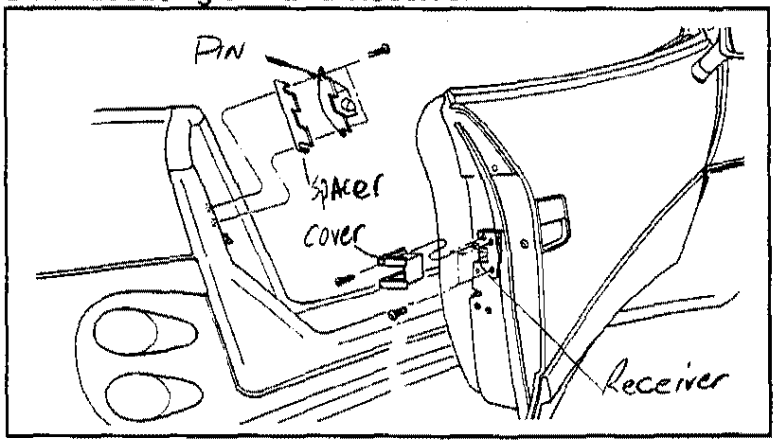


- Hall-effect quarter window position sensors

The two Hall-effect sensors mounted on the cable return tube of passenger side quarter window control the drive motor. The sensors signal the hardtop ECU when the windows are either fully closed or fully open, but not at any other position along their travel. Only the passenger side window is actually sensed; the driver side window has no sensors.

For more in-depth information refer to the Service Adjustment Procedures in Group 42 in the Service Manual Supplement.

Door Locating Pin and Receiver



- The Spyder-unique door locating pin and receiver

The Spyder has spring-loaded door locating pin and

receiver which prevents the doors from rattling.

Vehicle Doors

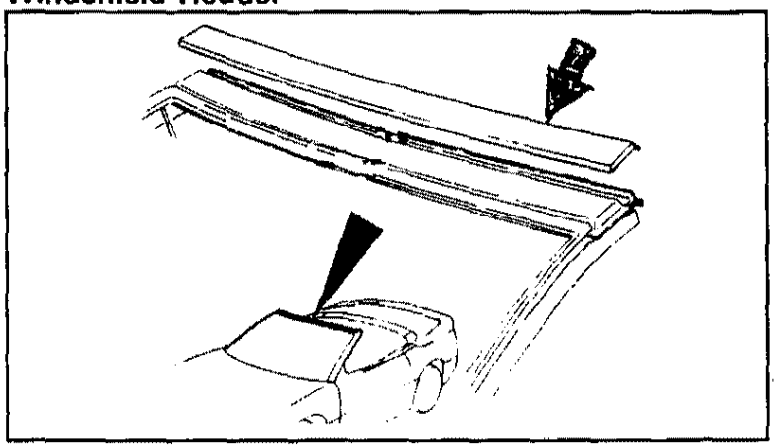
The Spyder shares the same basic door as the Hatchback, only Spyder doors have a reinforcing plate welded in near the door striker. This is for the Spyder-unique spring-loaded door locating pin and receiver which prevents the doors from rattling.

Because of the Spyder-unique reinforcement plate, the doors for the Hatchback are not interchange-able with the Spyder.

Before a new door installed it must have a 32 mm

hole drilled to accommodate the Spyder-unique door wiring harness.

Windshield Header



- Spyder-unique front header outer cover
- Spyder-unique header reinforcement

Once the Hatchback roof has been removed along the windshield header it receives structural reinforcements. To cover the trim line along the header a body-colored header outer cover is glued in place.

KNOWLEDGE CHECK

Circle True or False for the following statements.

1. Loosening a hydraulic fitting on the Spyder while the tonneau or hardtop is open could cause the tonneau or hardtop to unexpectedly to fall. True/False

Answer: True.

2. The Spyder's hydraulic pumps can use any type of oil or fluid. True/False.

Answer: False.

3. The hardtop's balance links play an extremely important role as far hardtop operation are concerned. True/False.

Answer: True.

4. The manifolds for the hydraulic systems should never be interchanged with each other. True/False

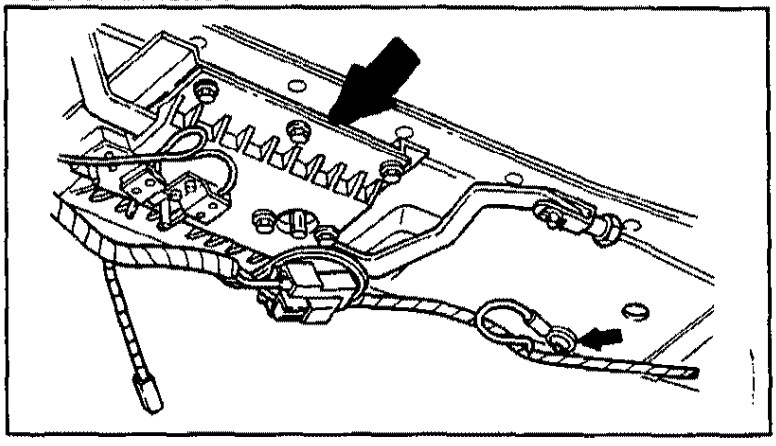
Answer: True.

5. Each Spyder quarter window has is drive motor. True/False

Answer: False.

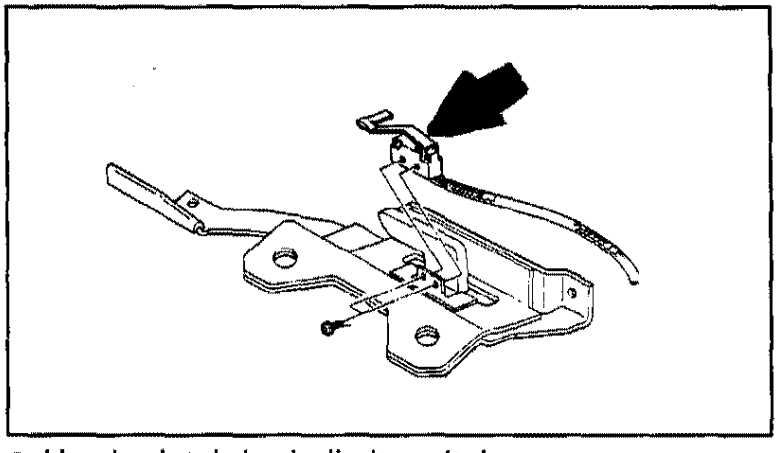
DAY 4 -- Friday, January 8, 1996

Header Latches



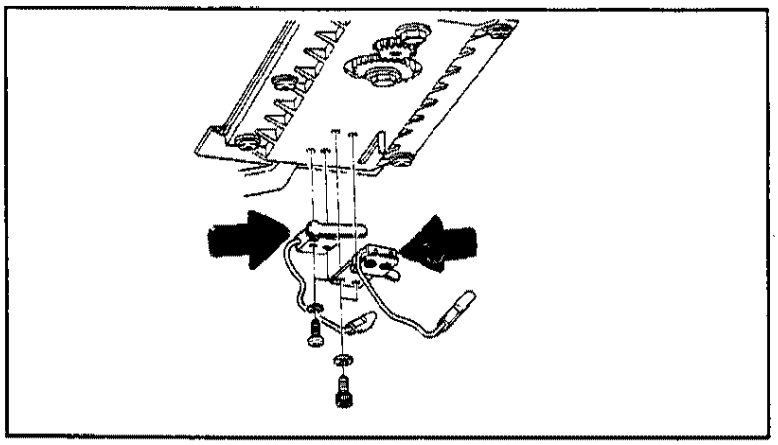
- The Spyder power header latch system

The header contains the hardtop latch system. It consists of a central drive motor that drives two gear racks which are connected to the two outboard latches.



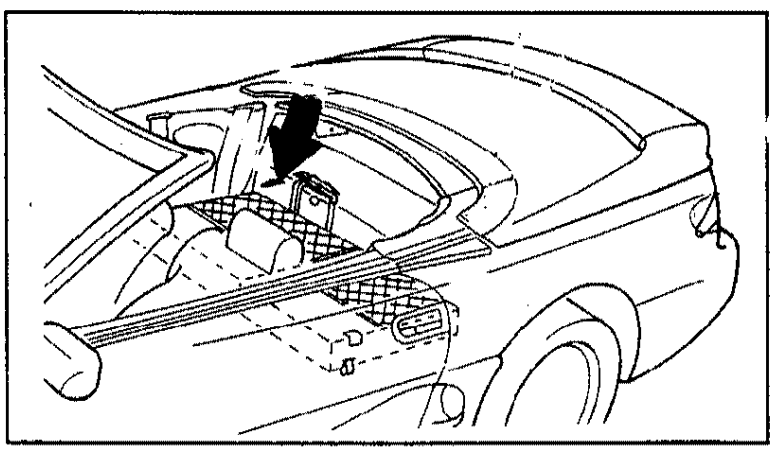
- Header latch body limit switches

The limit switches located on latch body tell the hardtop ECU when the hardtop has released (open mode), or if the hardtop is in a position to activate the latch drive motor to close the header latches (close mode).



- Header latch drive motor open and close limit switches

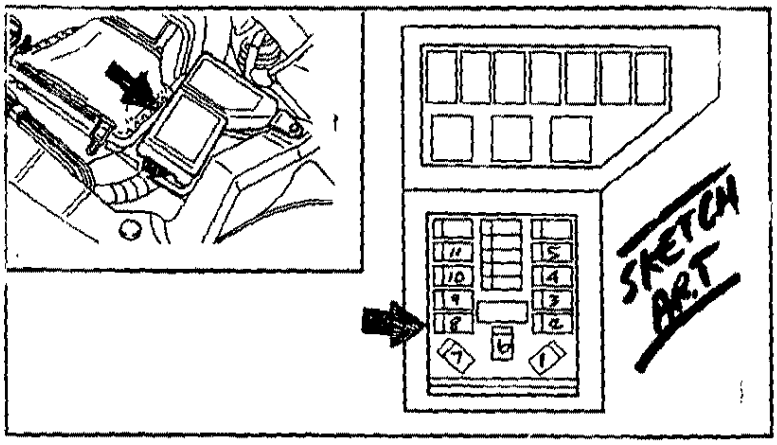
Two limit switches located on the bottom of the header latch drive motor assembly signal the hardtop ECU when the header latches have opened or closed. This signal also tells the ECU to turn off and on the header latch drive motor.



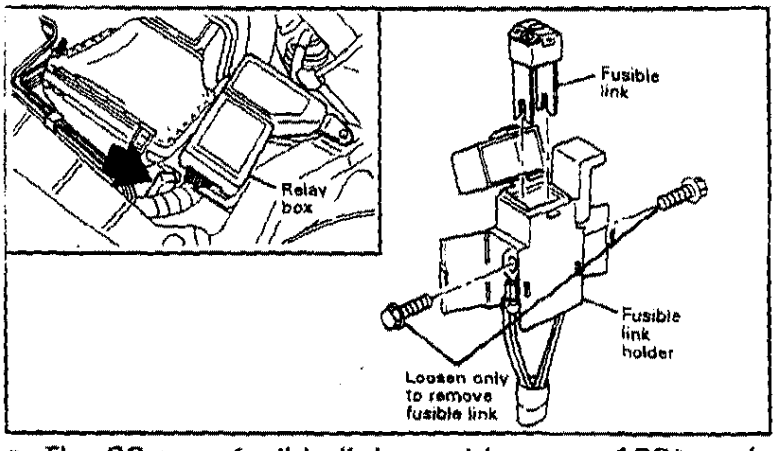
- Manual release wrench for header latch system
- Storage of manual release wrench

In an emergency or when servicing the header latch system the header latches can be released manually. Use a 1/4" drive ratchet or the special wrench which is stored in the CD changer tray behind the right-hand rear seat back. To access it fold down the seat back open the CD changer access door. The wrench is secured by hold down clips.

Fusible Links



- The 60 amp fusible link used in some 1995 and 1996 model year Spyders for the hardtop system

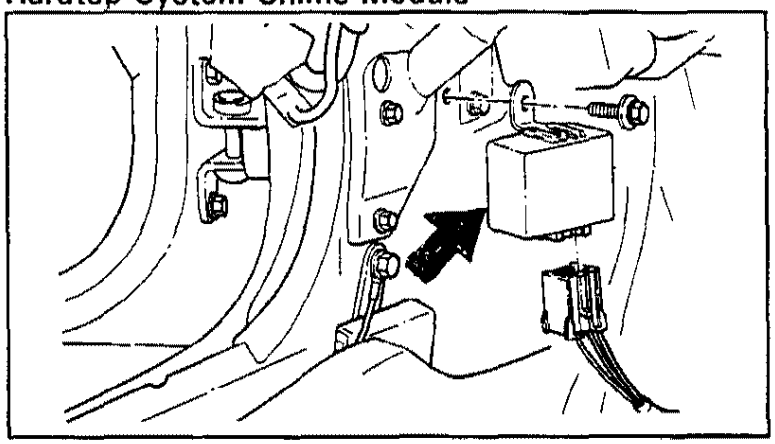


- The 80 amp fusible link used in some 1995 and 1996 model year Spyders for the hardtop system

Some 1995 and 1996 Spyder models have a 60 amp fusible link located in the relay box. The servicing of this fusible link is not addressed in the Service Manual Supplement, however it is in the Owner's Manual Supplement for vehicles so-equipped; refer to the Specifications section.

Some 1995 and 1996 Spyder models have an 80 amp fusible link located in separate holder alongside the relay box. It is addressed in both the Service Manual Supplement (refer to page 42-256) and in the Owner's Manual Supplement of vehicles so-equipped; refer to the Specifications section in the Owner's Manual Supplement.

Hardtop System Chime Module



- The Spyder chime module for the hardtop system

The hardtop chime module is located at the base of the driver side A-pillar. It appears identical to the key reminder warning buzzer. The Spyder unit has been modified internally to produce a different tone/chime. The buzzer unit is not interchangeable with the chime.

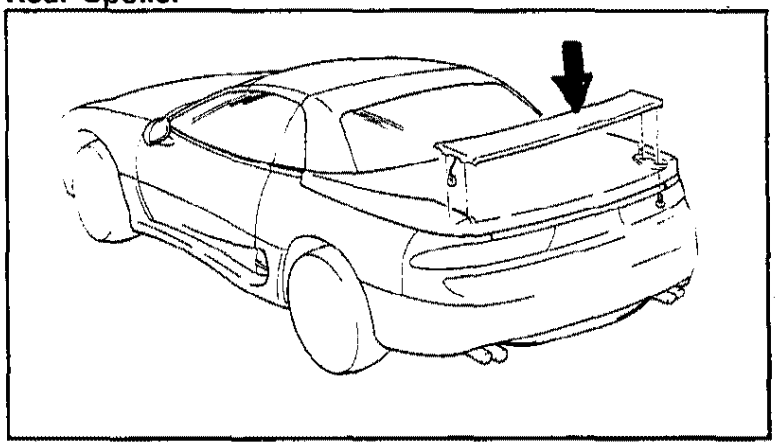
Hardtop ECU

For the hardtop ECU to perform properly, it must be grounded properly. Each hydraulic pump has a braided ground strap that runs from the pump body to the ECU ground bolts. These ground straps are not for polarity or power. Rather they are for reducing or eliminating electronic noise that could be otherwise introduced into the ECU.

Group 51 Exterior

Technical Highlights

Rear Spoiler



- The Spyder-unique rear spoiler

The Spyder's solid rear spoiler is made of a fiber-reinforced resin compound molded around a structural foam core. A metal tube molded into the foam core runs from the center of the stop light cavity and over to the bottom left-hand side. The metal tube provides a conduit in which to run the stop light harness wires. Since the tube is not large enough to pass the stop light electrical connector, the spoiler cannot be removed without snipping off the electrical connector.

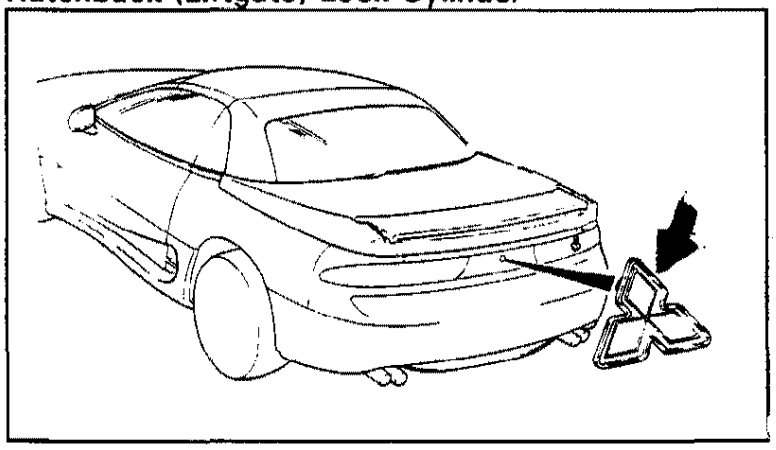
It is important to note that removing the terminals with the wires attached from the electrical connector instead of snipping off the connector, is not recommended. The terminals are long and delicate, and the conduit has two very small inside radii. Therefore, if the wires with the terminals attached are pulled through, they will get jammed inside the conduit.

Upon re-installing the spoiler, the wires will have to be fished back through the tube, the wires stripped, and properly rejoined to the snipped-off connector. It is important to note that because the stop light is made of a series of LEDs (light emitting diodes), the wire polarity (wire colors) must match when reconnected. If the polarity is switched the LEDs will

not light.

In order to weather-seal the wires leading through the tonneau, thumb-grade butyl tape must surround the wires. Because the spoiler may need to be removed in the future, butyl does not create a permanent bond. Do not use sealants such as silicone, any type of caulking, cement, liquid gasket maker, or adhesives; these may create a permanent bond. Do not wrap foam tape around the wires, as it will not provide a sufficient seal.

Hatchback (Liftgate) Lock Cylinder



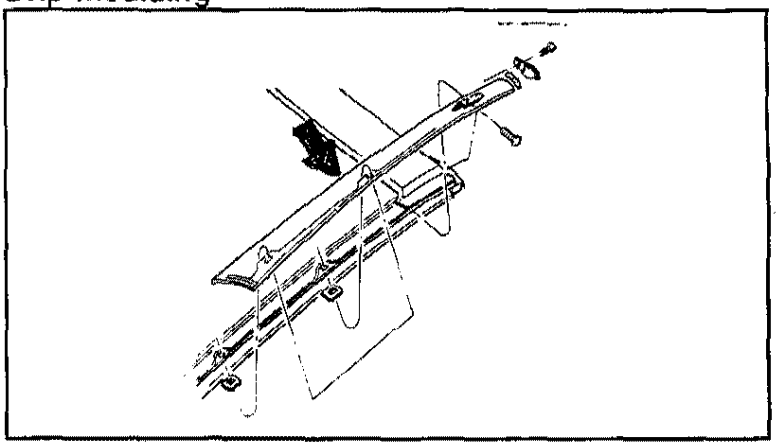
- Spyder-unique emblem cover replaces liftgate lock cylinder

Because the hardtop and tonneau replace the hatchback and its locking mechanism, the Spyder does not need a lock. Instead, an emblem covers the former lock cylinder hole. The emblem cover has a boss on the back of it that locates in the lock hole. The emblem is secured by adhesive-backed foam tape.

Aero Parts

The 1995 and 1996 Spyder models share the same aero parts as the Hatchback.

Drip Moulding

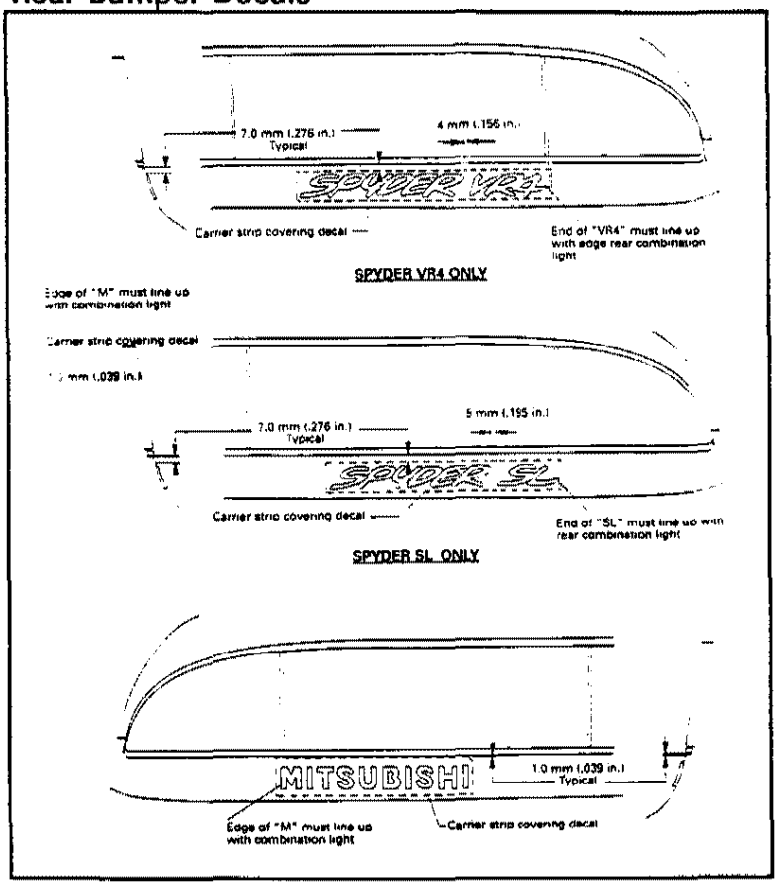


- Spyder drip moulding made from a modified Hatchback drip moulding

The Hatchback's drip moulding gets extensive modifications before it can be used on the Spyder. It gets cut down, a stainless steel tab riveted to the upper end, and a black cap glued to the upper end. It is available as service part pre-modified.

(Continued)

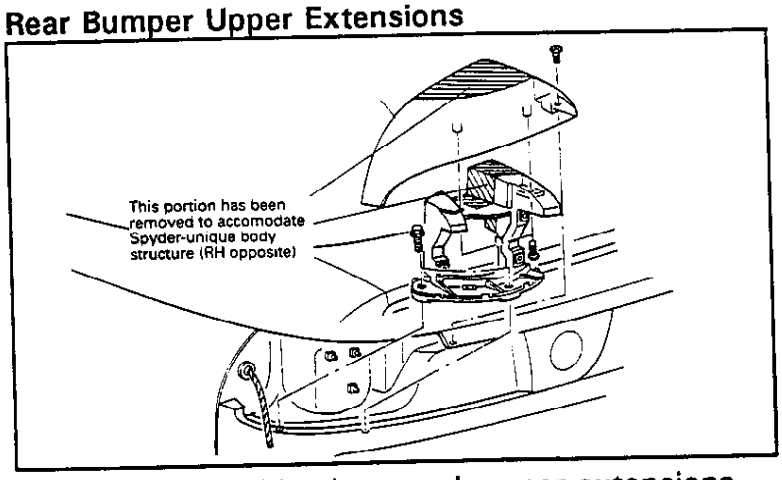
Rear Bumper Decals



- Spyder-unique rear bumper decals
- Replaces Hatchback decals

The rear bumper decals are Spyder-unique as are their locations on the bumper. The "MITSUBISHI" decal is carry-over from Hatchback (the location is not), however the diamond-star portion of the decal is not used.

Rear Bumper Upper Extensions



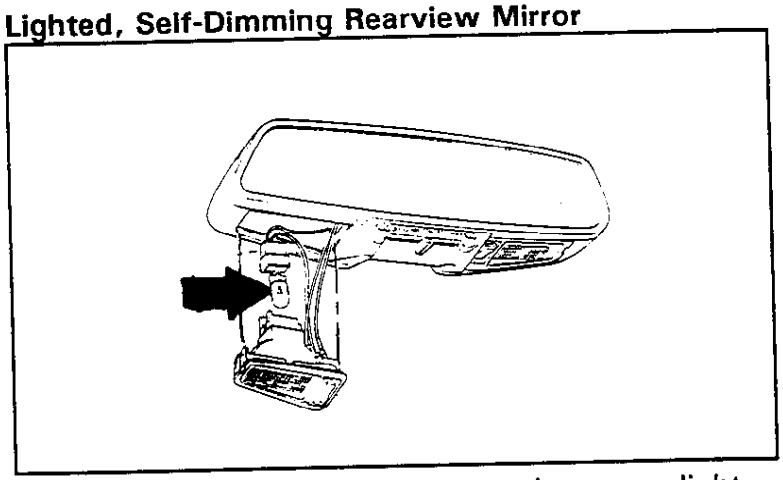
- Modified Hatchback upper bumper extensions used on the Spyder

The upper bumper extensions and the inside supporting brackets are modified Hatchback parts. They are modified because the shape of tonneau and surrounding structure in this area.

Group 54
Chassis Electrical

Technical Highlights

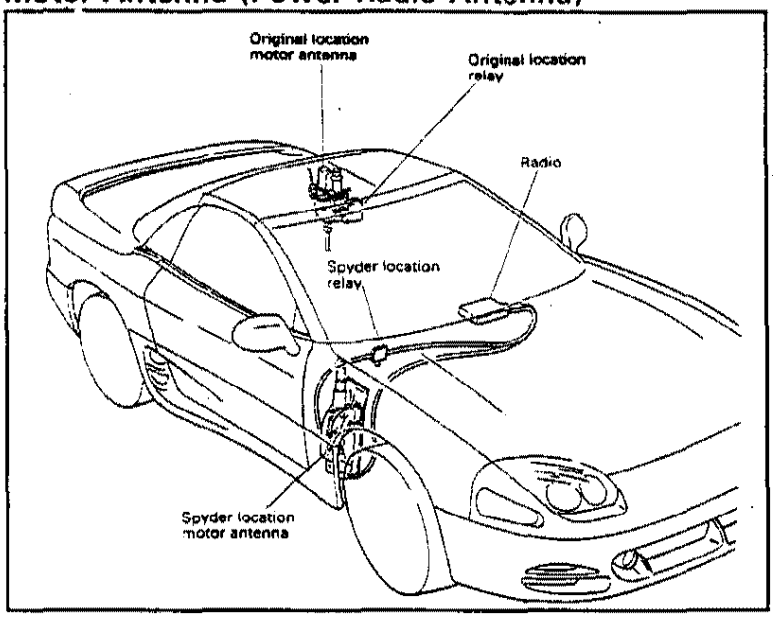
Lighted, Self-Dimming Rearview Mirror



- Servicing the lighted rearview mirror map light bulbs

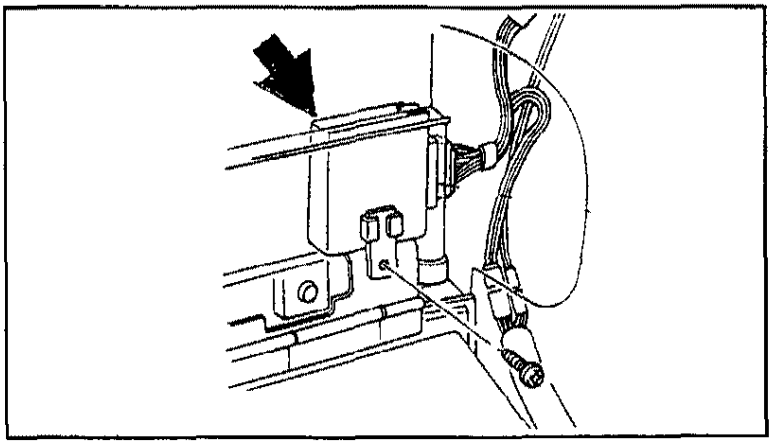
The Spyder-unique rearview mirror has two map lights. No aspect of the glare-control feature of the mirror can be serviced. The bulbs are the only items inside which are serviceable.

Motor Antenna (Power Radio Antenna)



- Relocated Hatchback motor antenna for Spyder

The Spyder's right front fender has been modified, as has the body structure behind it, to accommodate the relocation of the Hatchback motor antenna. It has been moved from the left rear quarter panel to the front right fender. The Spyder uses different mounting hardware for the antenna, including a new grounding ring (provides grounding to the front fender).



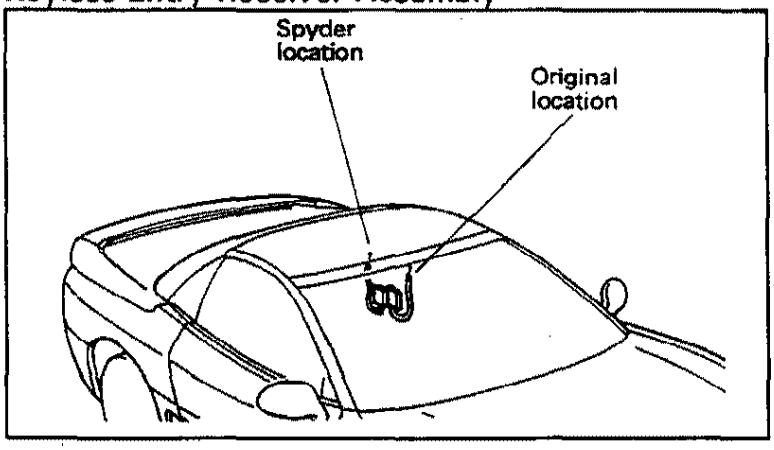
- Relocated radio relay to behind glove box

The radio antenna relay has been relocated from the rear quarter panel to behind the glove box.

The radio wiring harness has been shortened and re routed through the passenger side body structure

behind the front fender.

Theft Alarm System - Light Automatic Shut-Off and Keyless Entry Receiver Assembly



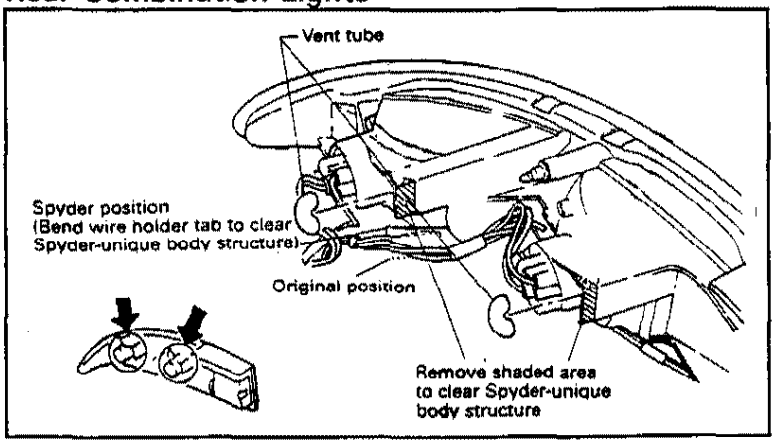
- Relocation of Hatchback light automatic shut-off and keyless entry receiver assembly for the Spyder

The Hatchback theft alarm components have been relocated slightly rearward of their original location, and the antenna has been rerouted around the theft alarm components which are now secured to the Spyder-unique body structure.

The keyless entry receiver mounting bracket has been modified to fit the Spyder. It is available for the Spyder ready-to-install as a service part.

For more removal and installation information refer top the Service Manual Supplement. For diagnostics refer to the appropriate Service Manual.

Rear Combination Lights



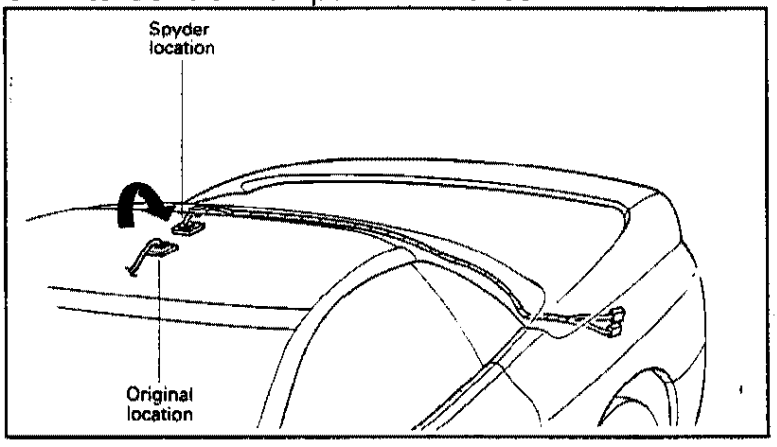
- Modified rear combination lights for Spyder

The carry-over left- and right-hand Hatchback rear combination lights are modified to accommodate the Spyder-unique body structure.

The Hatchback service part combination lights must be modified by the technician before installation.

Group 55
Heater, Air Conditioning, and Ventilation

Climate Control Temperature Sensor



- Relocated Hatchback climate control temperature sensor for the Spyder

The Hatchback temperature sensor for the climate control has been relocated a few inches rearward and in the Spyder-unique rear roof headliner section.

When the hardtop is open, the in-car temperature sensor for the air conditioning is now reading the temperature inside the hardtop stowage area. Therefore, when using the A/C set the "MODE" to the desired selection and select the fan speed using "FAN". Set the temperature control ("TEMP") to a comfortable setting as required. The A/C system is not designed to cool the vehicle with the hardtop open.

KNOWLEDGE CHECK **Circle True or False for the following statements.**

1. Each header latch has its own drive motor. True/False

Answer: False.

2. The header latch system utilizes a total of four limit switches to detect open and close positions. True/False.

Answer: True.

3. The manual release wrench for the header latch system is located in the glove box. True/False.

Answer: False.

4. Two different types of fusible links were used on the Spyder. True/False.

Answer: True.

5. The two ground straps that run from the hydraulic pumps to the hardtop ECU provide an electrical ground to the pumps. True/False.

Answer: False.

6. When removing the Spyder's rear spoiler, the stop light electrical connector must be snipped off first. True/False

Answer: True.

7. The self-dimming rearview mirror cannot be repaired. True/False.

Answer: True.

8. The radio relay has been relocated behind the front fender next to the antenna. True/False.

Answer: False.