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Introduction

The electromechanical (EM) top on the E30 (325ic) can be lowered or raised from the driver's seat. After unlocking the top from the windshield frame and pushing it up by hand past the pressure point, the operation is fully automatic.

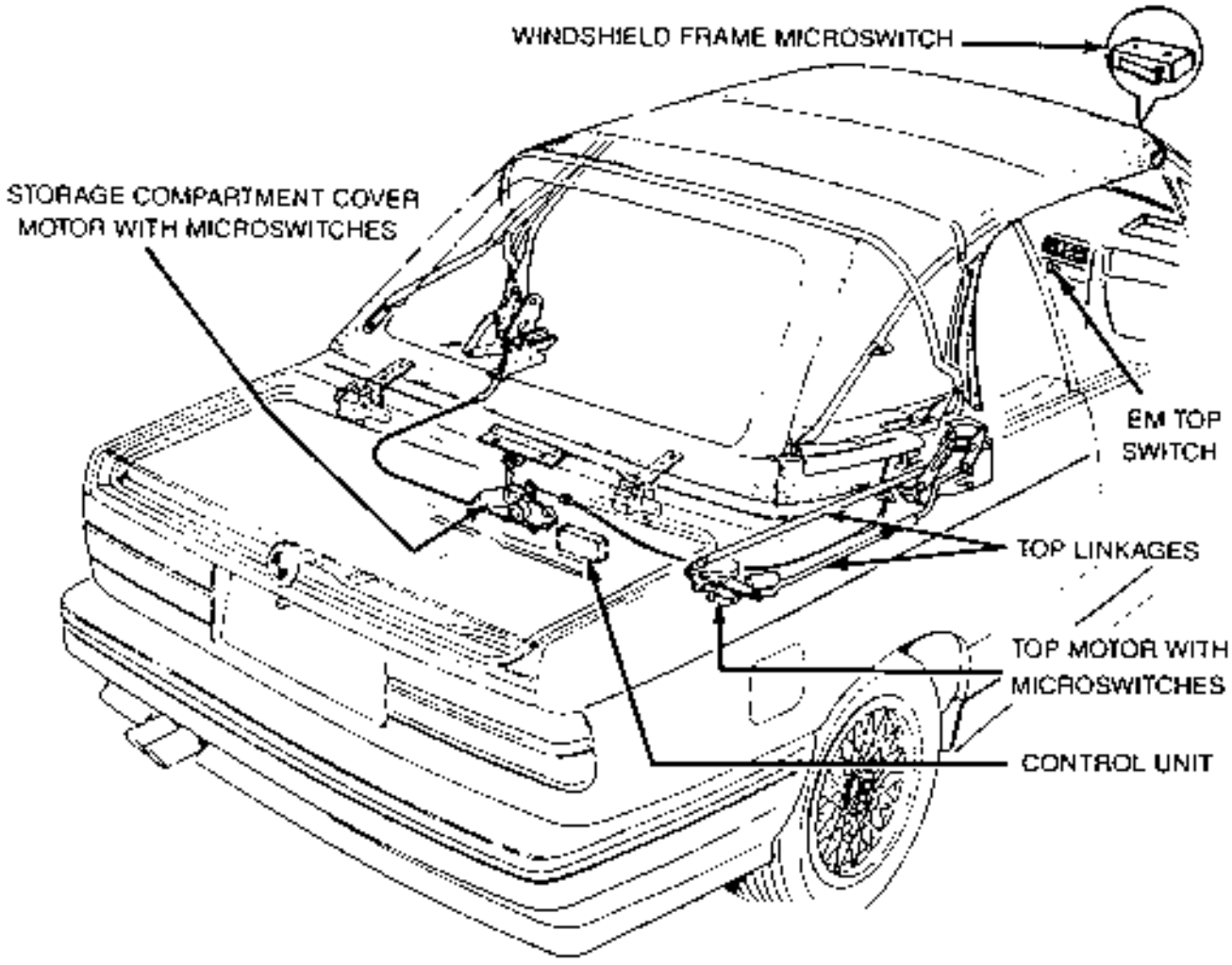
Two electric motors with gears and linkages carry out the automatic operation. This includes unlocking, opening and closing of the storage compartment cover. A control unit, mounted in the trunk, regulates and monitors top operation. The EM top switch is mounted in the center dash above the radio.

Due to loads imposed by the electric motors, the engine should be running while operating the EM top. In the event of an electrical malfunction, the top can be raised or lowered manually, after disengaging the motors.

Components

The electromechanical top system consists of:

- Top motor with linkages
- Storage compartment cover motor with linkages
- Control unit
- EM top switch
- Five microswitches



EM Top Operation

Prerequisites for top operation include:
- Engine running
- Top fabric dry
- Front windows lowered (at least 15 mm)
- Rear windows lowered

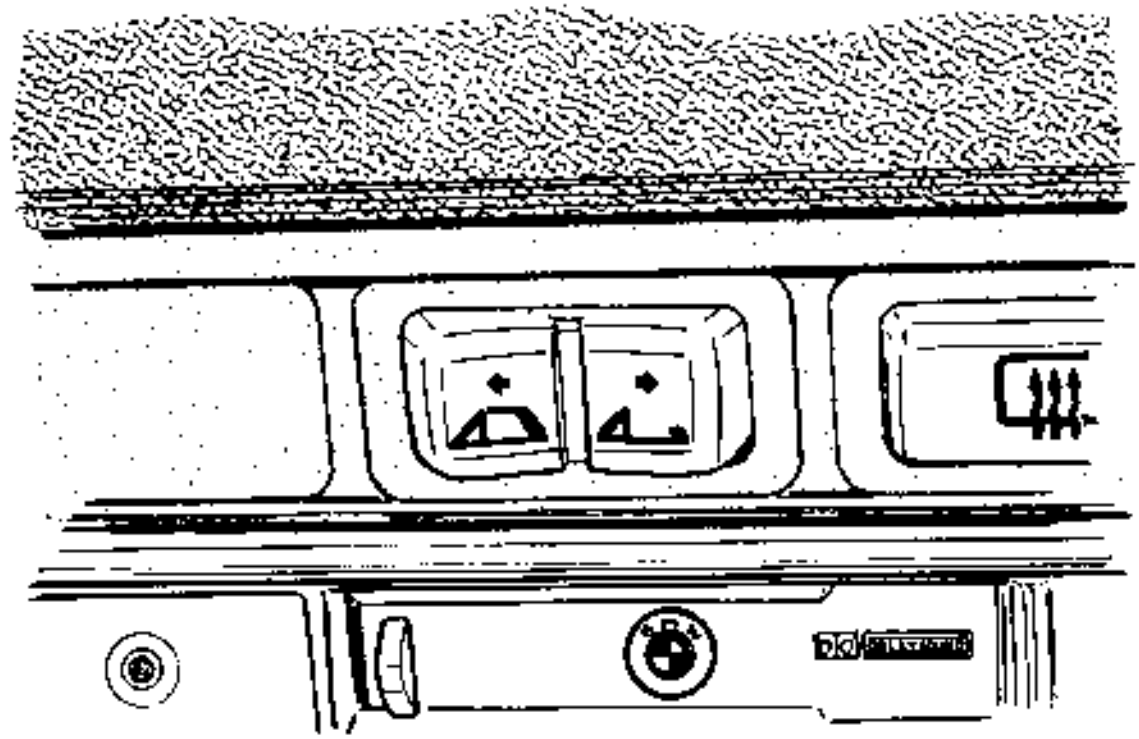
Lowering Top

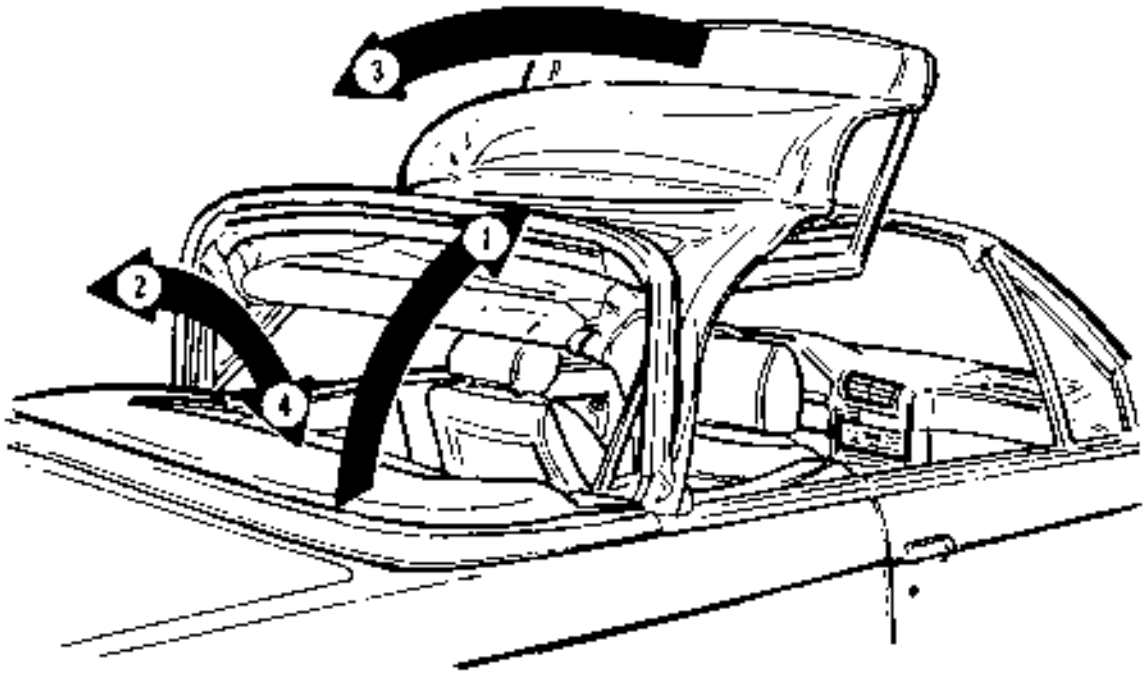
1. Unlock the top from the windshield frame, and push the top up past the pressure point.
2. Press and hold the EM top switch. The automatic sequence starts:
   — the rear tension bow raises
   — the top cover is unlocked and opened
   — the top is lowered into the storage compartment
   — the top cover closes and locks

Raising Top

1. Press and hold the EM top switch.
   — the automatic sequence runs in the reverse direction of lowering
2. Manually pull the top past the pressure point and lock it to the windshield frame.

Operation





ELECTRICAL CONTROL

Inputs

The control unit is located below the top storage compartment in the trunk. It receives the following inputs for top operation:

- Battery power (KL30) and ground through two pins each. One lead each for processor power and ground. The other leads are the load circuit power and ground.
- Operating power (KL-R).
- Speed signal "A", the EM top will not operate when the vehicle is moving > 3 mph.
- EM top switch—input request for lowering and raising.

There are five microswitches installed on the EM top.

- A windshield frame microswitch (located on the right side) is wired in series with the top switch. The microswitch opens when the top is locked on the windshield frame. This prevents system operation when the top is raised and locked.
- Four position microswitches: There are two microswitches on each motor. The microswitches on the top motor detect the up and down positions of the tensioning bow and the top fully lowered in the storage compartment. The microswitches on the storage compartment cover motor detect the open and closed positions of the cover.

The position microswitches are adjustable. Refer to the repair manual for special tools and procedures for microswitch adjustment procedures.

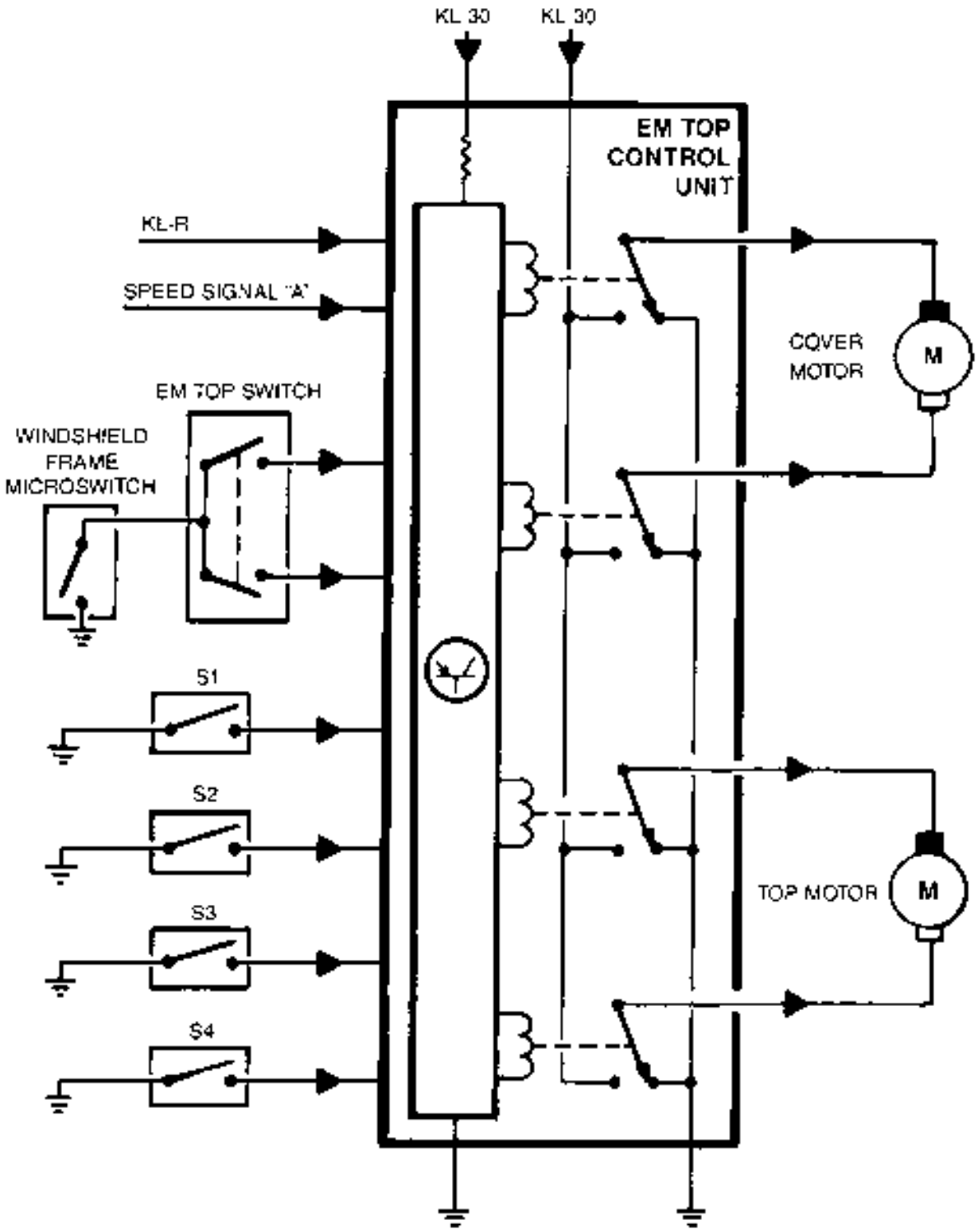
Outputs

Four relays are located in the control unit to operate the two top motors.

An overload protection circuit in the control unit monitors motor operation. In the event of an overload, the motor relays are switched off. If the overload trips three times, a 15 minute arrest time is activated. This arrest can be cancelled by switching the ignition off and back on again.

The control unit is not connected to the diagnostic link. Conventional trouble-shooting methods must be followed for system failures.

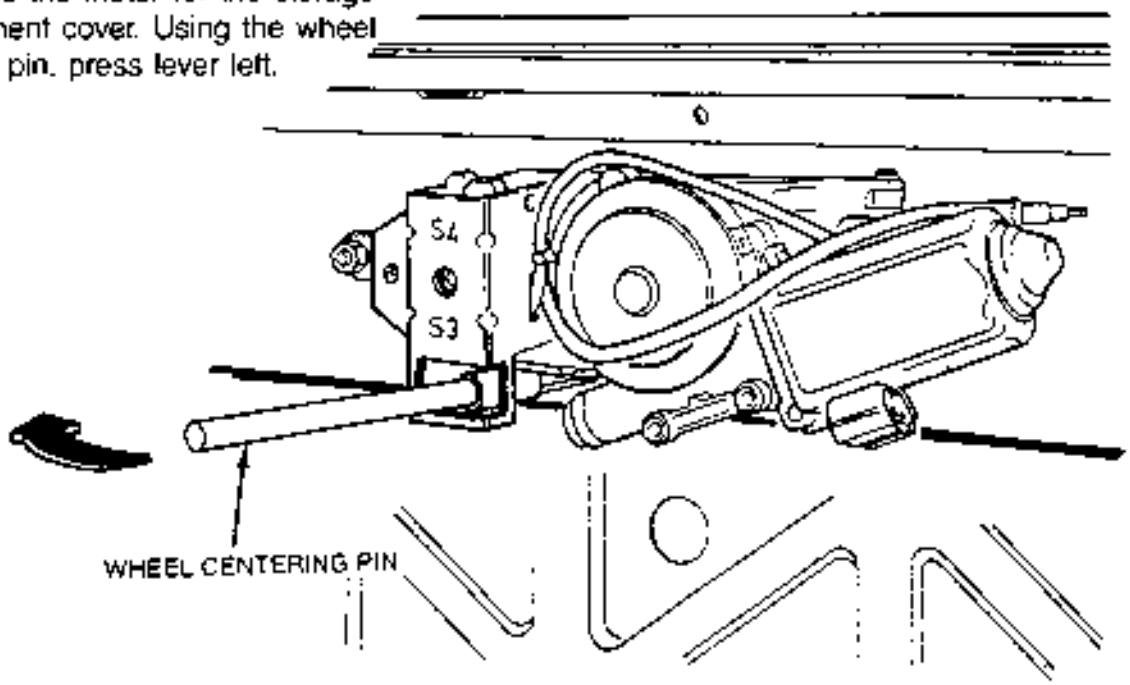
IPO


KL 30
KL 30
EM TOP
CONTROL
UNIT
KL-R
SPEED SIGNAL "A"
EM TOP SWITCH
WINDSHIELD
FRAME
MICROSWITCH
S1
S2
S3
S4
COVER
MOTOR
M
TOP MOTOR
M

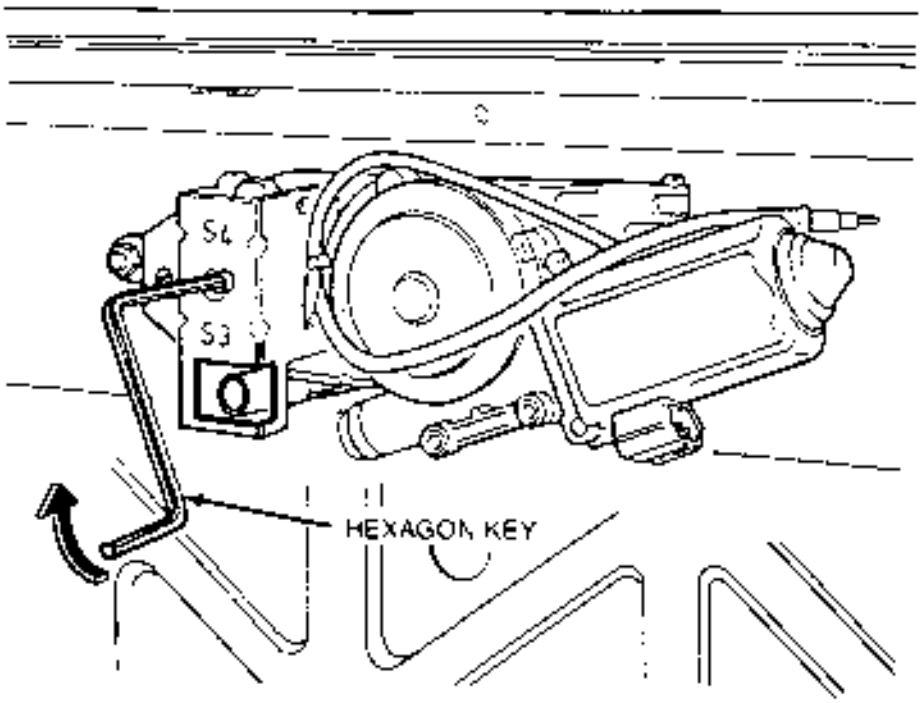
Manual Operation

The top can be raised manually in the event of electrical malfunctions. The following steps must be performed for this purpose:

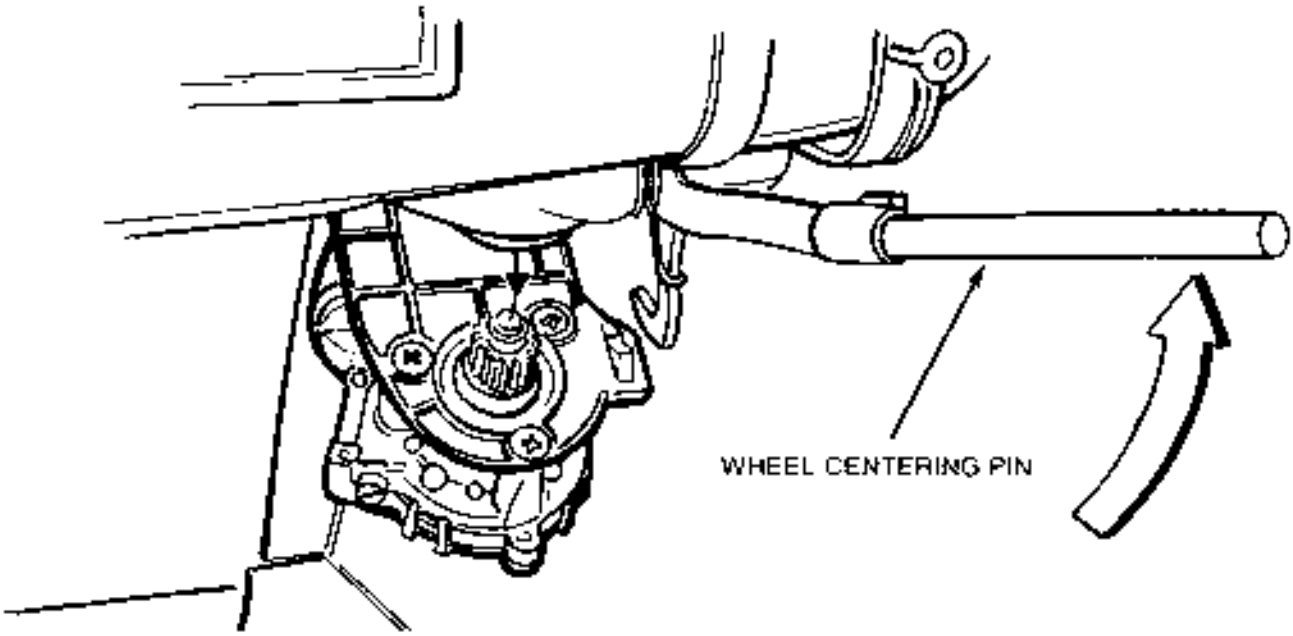
1. Open the trunk and remove the trim covering of the electric motors.
2. Disengage the motor for the storage compartment cover. Using the wheel centering pin, press lever left.



3. Unlock the storage compartment cover with the hexagon key (from the tool kit). Turn the screw clockwise to unlock (1/4 turn).



4. Disengage the motor for the top by pressing the lever up, using the wheel centering pin.
5. Open the top cover by hand and lift the top out of the storage compartment. Follow the steps for automatic raising of the top.

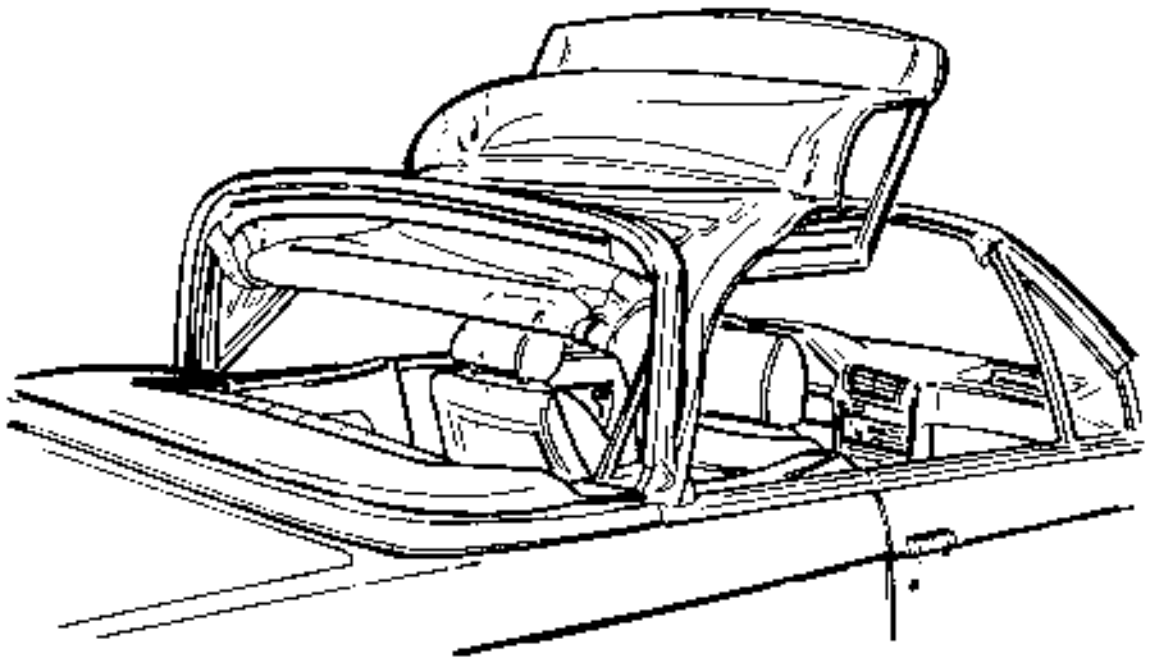


Defined Position

Following mechanical or electrical repairs, the EM top must be placed into the defined position before automatic operation can be resumed.

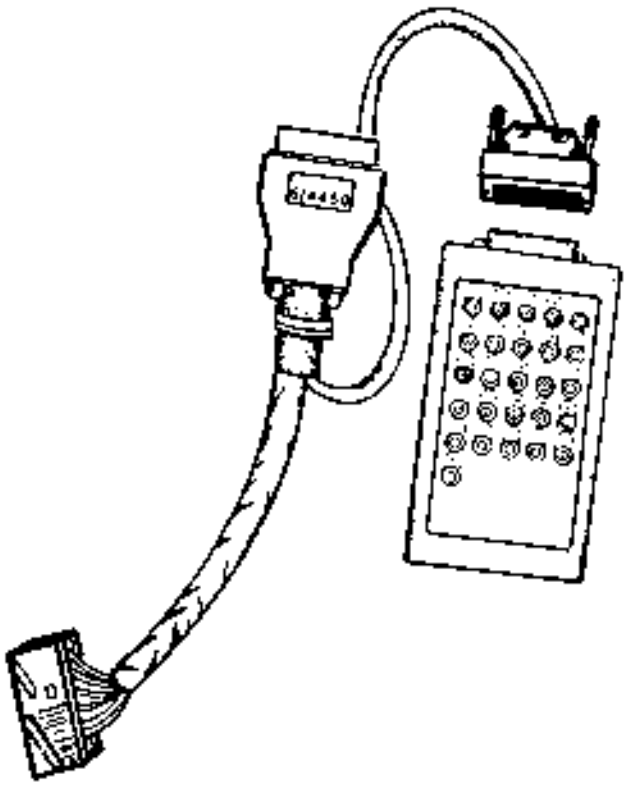
The defined position is the top raised manually to the pressure point with the rear tensioning bar in the vertical position and the top cover is closed.

Note: The microswitches should be adjusted prior to setting the defined position and reconnecting the motors.

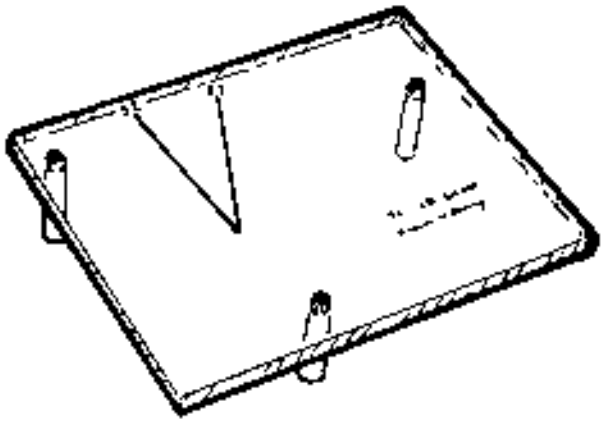


Microswitch Adjustment

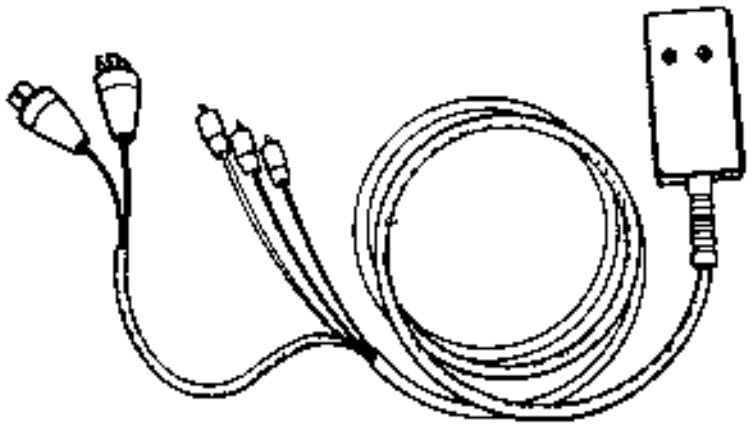
If the top fails to lower or raise fully when operated from the EM top switch, the microswitches should be checked for proper adjustment. To check or adjust the microswitches the following special tools are required:



• 26 pin break out box 614 459
• special adaptor cable 614 450



• microswitch template 543 420

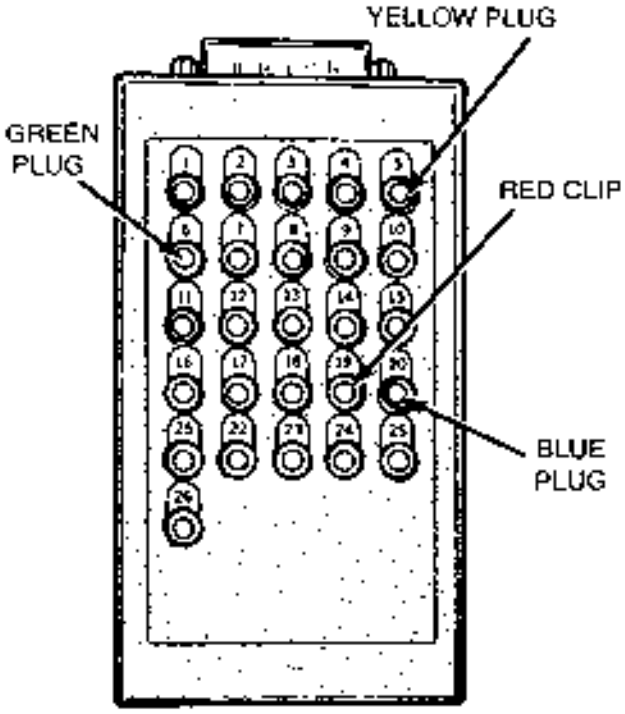


• LED test box 614 440

The adjustment procedure for the microswitches is as follows:
1. Disconnect both motor drive assemblies and unlock the storage compartment cover (procedures for manual closing).
2. Move the top into the "defined" position (tension bow in the verticle position and close the top cover).

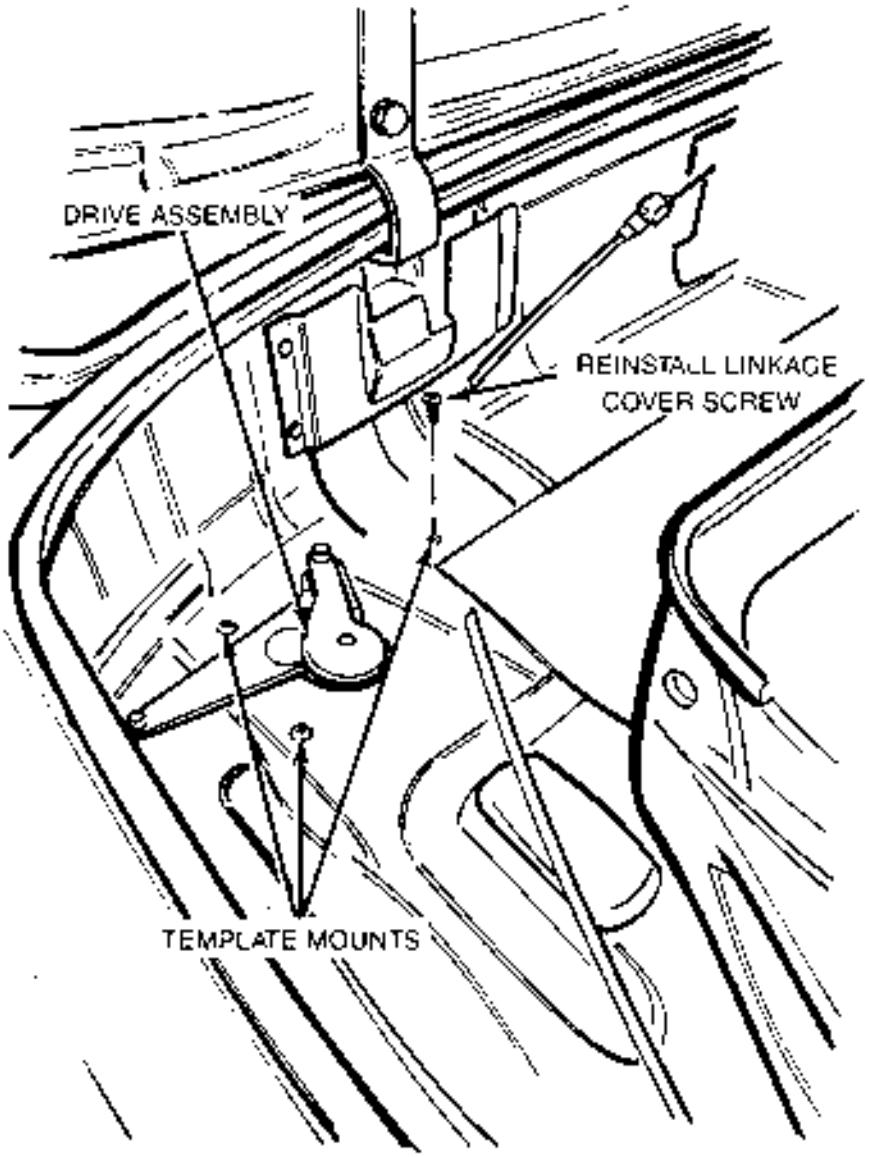
Microswitches S1 and S2

3. Open the trunk and disconnect the control unit. Install the 26 pin breakout box with adapter harness, to the vehicle wiring harness.
- Connect the LED test box to the breakout box as follows:
  - — Red clip to B+ (pin 19)
  - — Black clip to B−
  - — Blue plug to pin 20
  - — Yellow plug to pin 5 (S1)
  - — Green plug to pin 6 (S2)
- Remove the LED test box and close the trunk



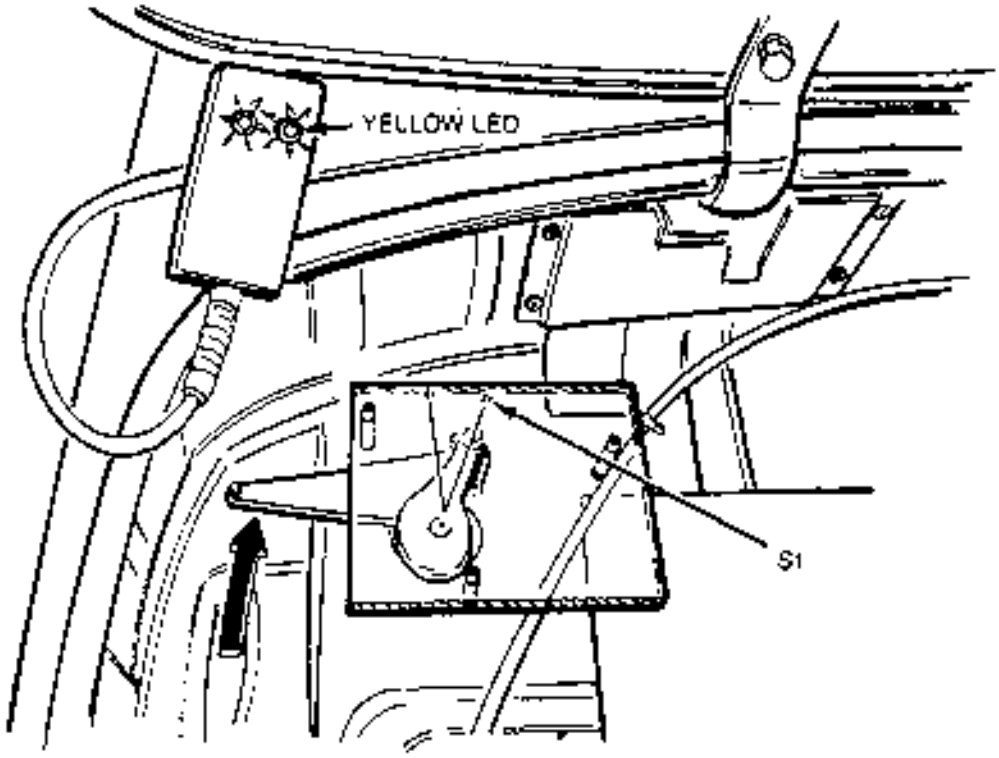
4. Open the storage compartment cover. Remove the top drive linkage cover and reinstall one cover screw as illustrated.

- Remove the two top linkage arms from the drive assembly.
- Position the microswitch template over the drive assembly.
- Center the template over the screws.

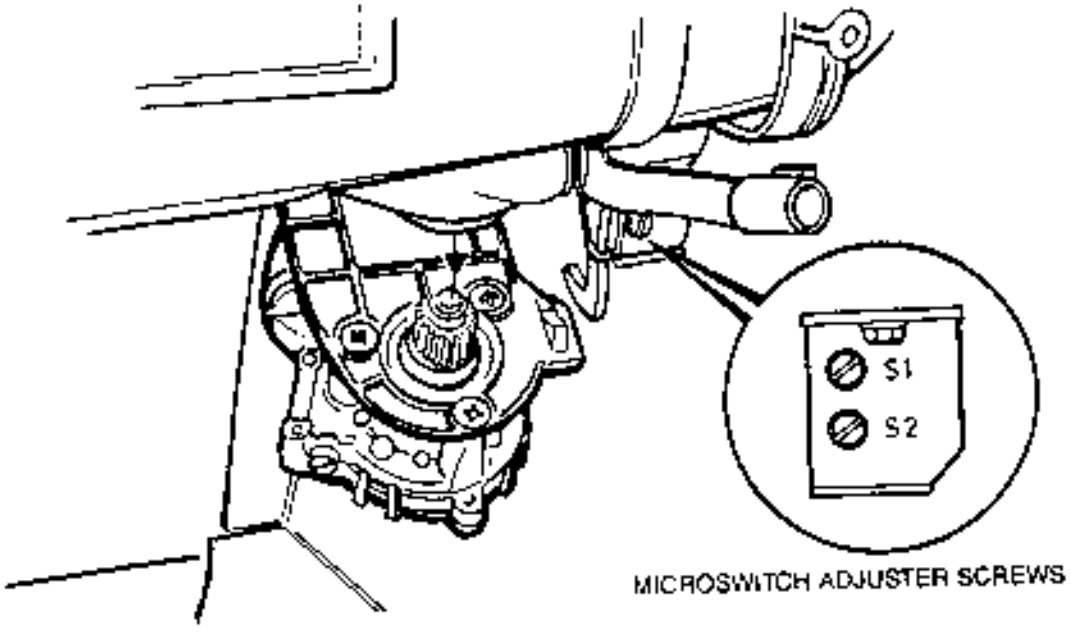


Switching point S1 = Tension bow up.

5. Move the drive assembly by hand to switching point S1. The yellow LED should just light up as the linkage arm lines up with S1.



Note: Turning the adjusting screw clockwise for S1 = LED lights up. Turning counter-clockwise = LED goes out.

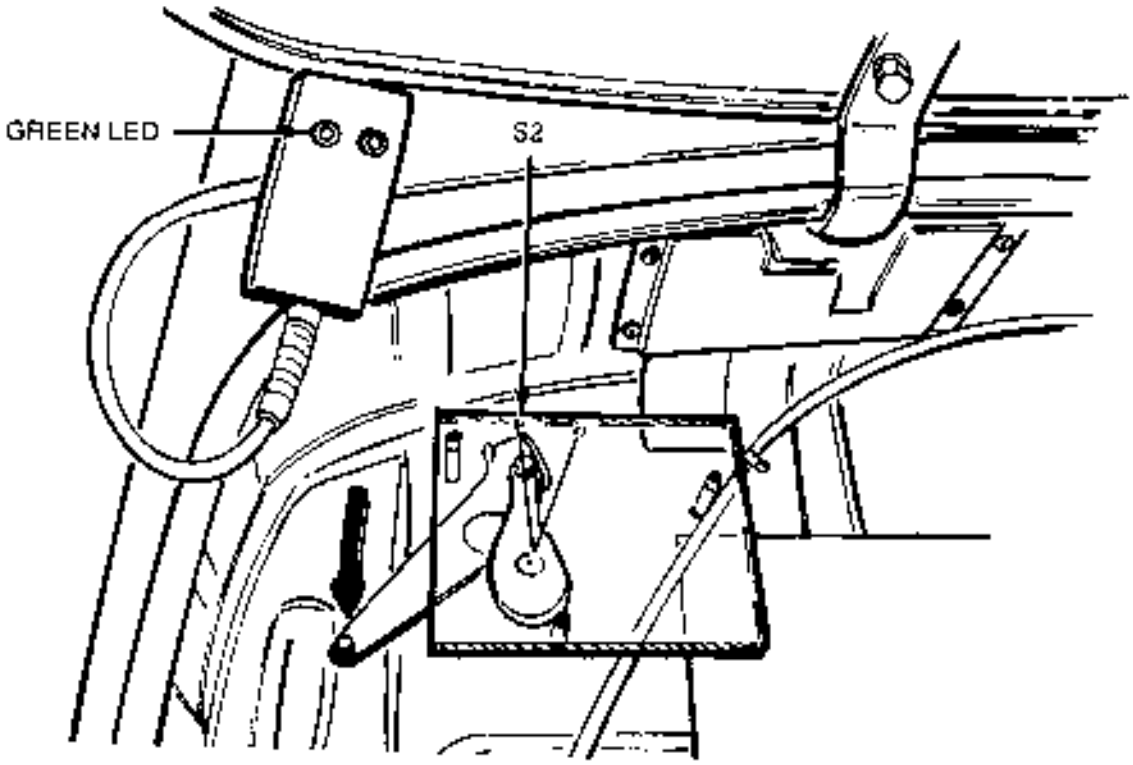


MICROSWITCH ADJUSTER SCREWS

Switching point S2 = Tension bow down.

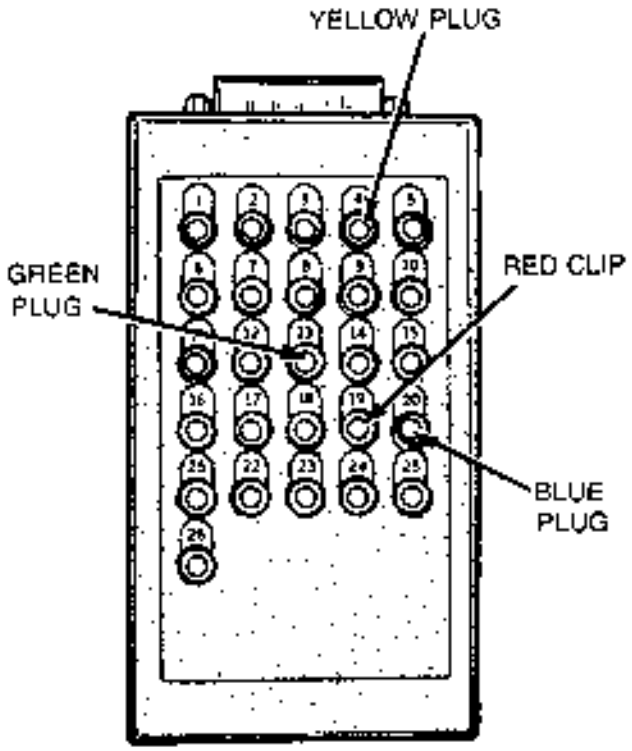
6. Move the drive assembly to switching point S2. The green LED should go out as the linkage arm lines up with S2.

Note: Turning the adjusting screw clockwise = LED goes out. Turning the adjusting screw counterclockwise = LED lights up.

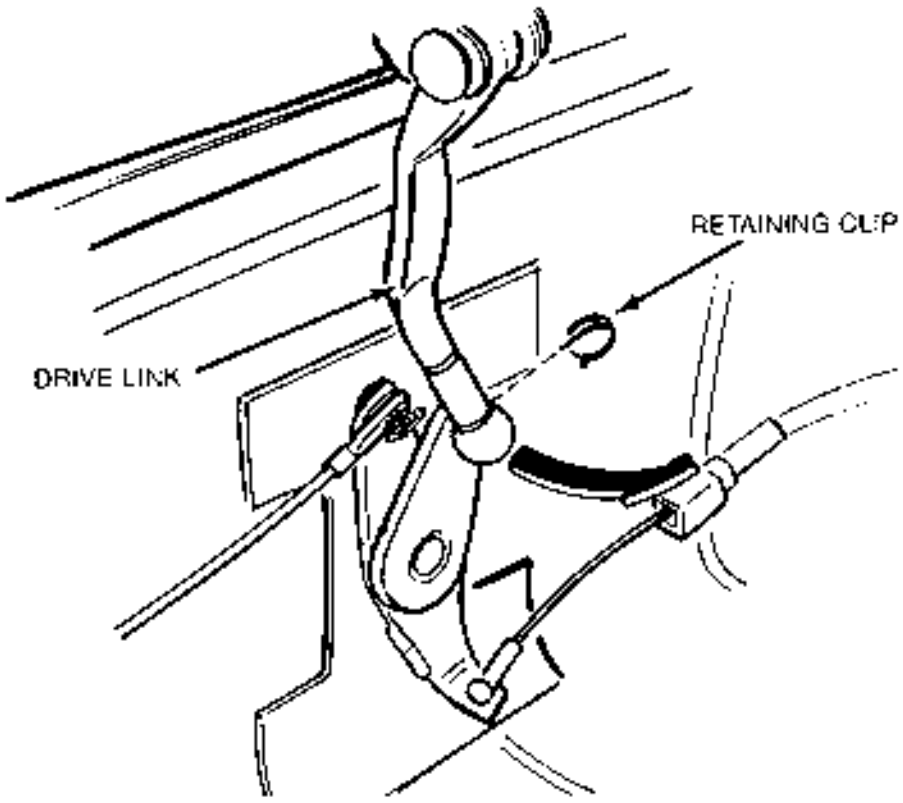


Microswitches S3 and S4

7. Move the green and yellow LED test box plugs as follows:
- Yellow plug to pin 4 (S4)
- Green plug to pin 13 (S3)

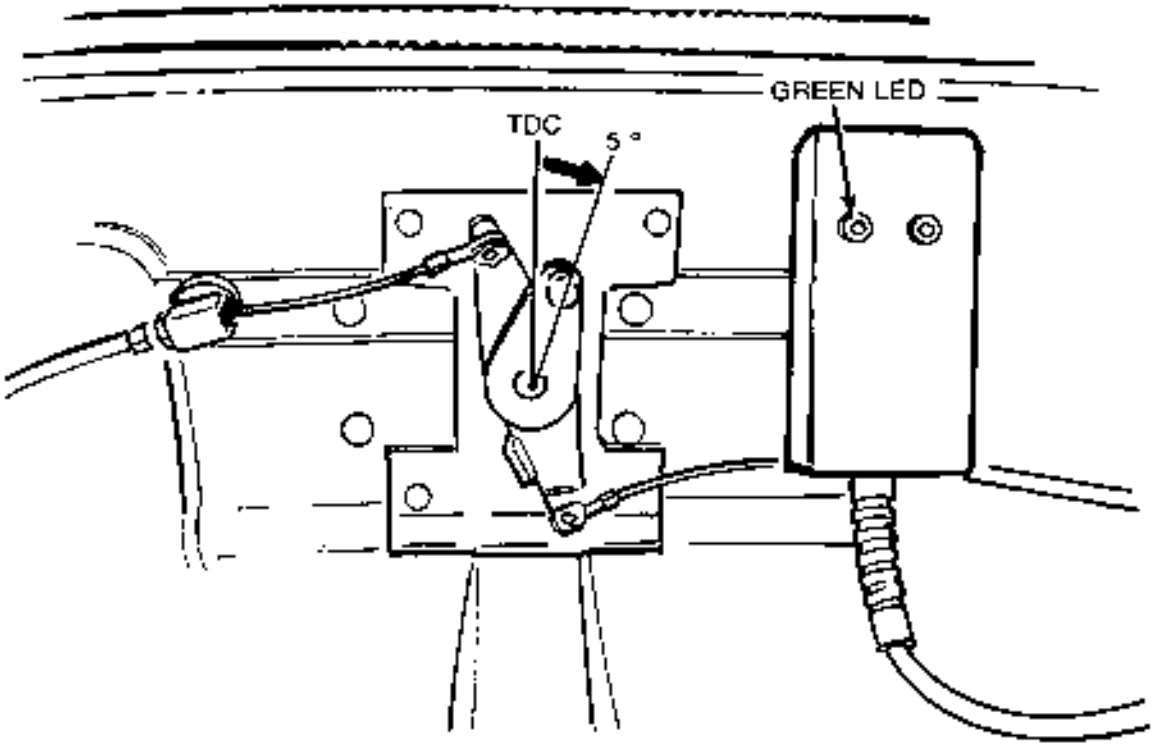


8. Open the storage compartment cover and remove the retainer clip from the top cover drive link.
- Pull the link off of the ballhead.

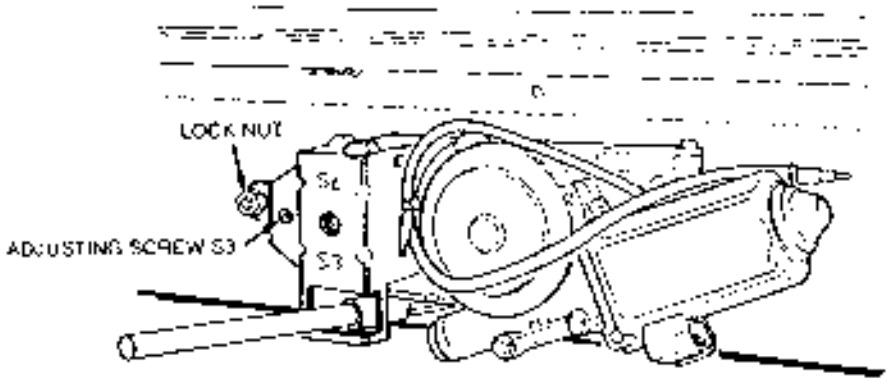


Switching point S3 = cover open.

9. Turn the drive lever counterclockwise until the green LED just goes out.
- The drive lever should be at 5° ATDC in the clockwise direction.



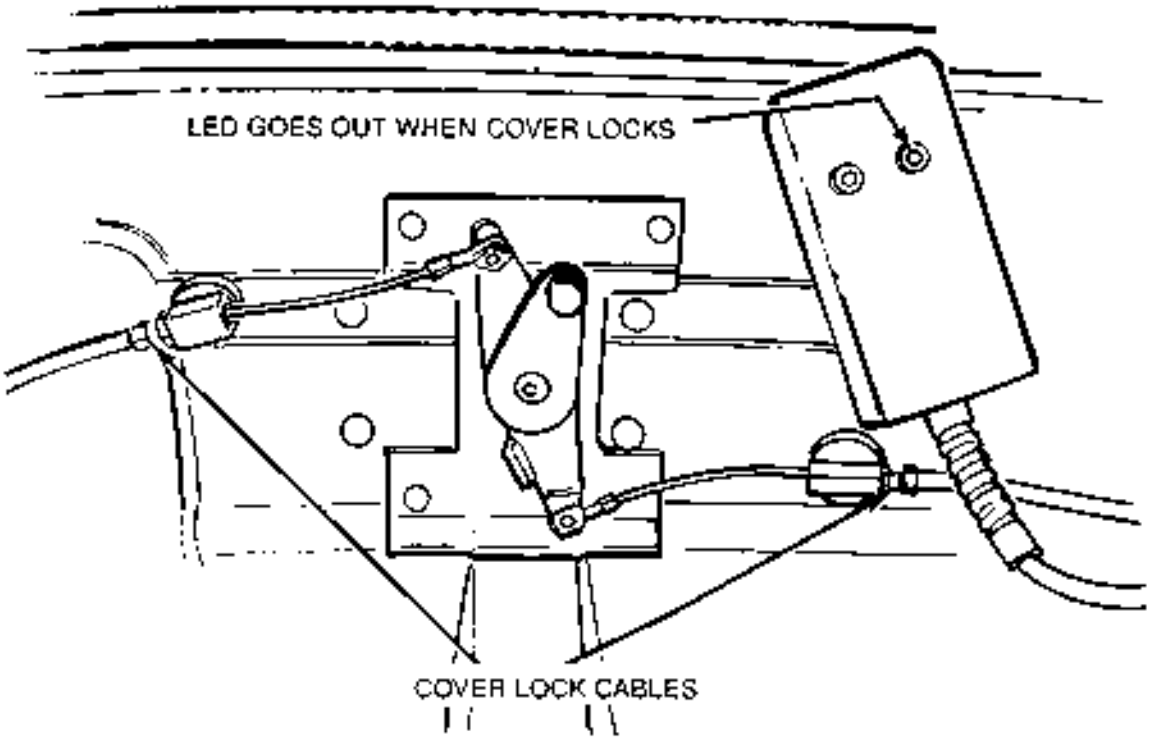
10. To adjust switching point S3, loosen the hex nut and turn the adjustment screw on the cover motor until the green LED goes out.



Switching point S4 = cover locked.

11. Switch S3 and S4 are on the same mounting plate. There is no separate adjustment screw for S4.
12. • Reconnect the cover linkage
    • Reconnect the top linkages and install the cover plate
    • Reconnect the motor drives
    • Connect the control unit with the adapter harness
    • Switch the ignition on and lower the top
    • The yellow LED should go out when the top cover locks

Note: Adjustment of switching point S4 is carried out by adjusting the storage compartment cover lock cables.



Lowering Top

Top & Cover Position	Tension Bow Up/Down S1	S2	Cover Open/Closed S3	S4	Windshield Frame Switch
Top locked on frame	O	O	X	O	O
Top unlocked & lifted	O	O	X	O	X
Tension bow raising	O	X	X	O	X
Tension bow up	X	X	X	O	X
Cover unlocked	X	X	X	X	X
Cover open	X	X	O	X	X
Tension bow lowering	O	X	O	X	X
Top in compartment	O	O	O	X	X
Cover closing	X	O	X	X	X
Cover locked	X	O	X	O	X

Raising Top

Top & Cover Position	Tension Bow Up/Down S1	S2	Cover Open/Closed S3	S4	Windshield Frame Switch
Cover unlocked	X	O	X	X	X
Cover opened	X	O	O	X	X
Raising top	O	X	O	X	X
Tension bow up	X	X	O	X	X
Cover closed	X	X	X	X	X
Cover locked	X	X	X	O	X
Tension bow lowering	O	X	X	O	X
Tension bow down	O	O	X	O	X
Top locked on frame	O	O	X	O	O

X=Closed O=Open

Basic Troubleshooting

- Always personally verify the customer complaint.
- Survey **all** vehicle system fault memories (Brief Test).
- Call up and print the fault codes of the vehicle system **which** produced the complaint.
- Call up the system identification page and verify that the **Correct Control Unit** is installed.
- Follow all Diagnostic Module instructions and perform all tests as specified on the VDU.
- Refer to the Diagnostic Manual and the ETM in the area(s) covering the system fault code(s).
- Systems which malfunction, but fail to set faults in memory, must be checked for basic faults, i.e., operating and memory power supply, grounds, etc.
- Systematic Troubleshooting when conducted properly should not exceed one to two hours.
- System problems which elude Diagnostic Module detection and regular Troubleshooting **must be** brought to the attention of BMW of North America.
- **BMW Technical Assistance Hotline 1-800-472-7222**