

# Self-Pop Top

THE INS AND OUTS OF THE UPS AND DOWNS OF A SOLID AXLE POWER TOP

BY JOHN HINCKLEY

**Little has been written about the power top option (RPO 473) that was available on 1956-1962 Corvettes, and even less is generally known about exactly how they work. In spite of the relatively large number of them that were built, much less is known on how to restore them.**

This month, we'll detail the operation and restoration of a power top system on a very unique '58 Styling car at Werner Meier's Master Works facility in Madison Heights, Michigan. To see more of this car, check out the feature on page 26.

In 1956 2,682 Corvettes (77 percent of production) had power tops, following that were, 1,336 '57s (21 percent), 1,090 '58s (12 percent), 661 '59s (7 percent),

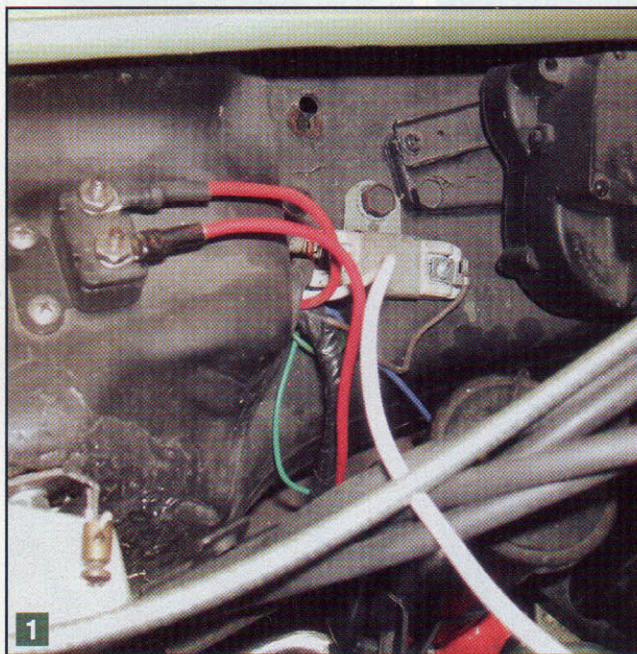
512 '60s (5 percent), 422 '61s (4 percent), and 350 '62s (2.5 percent). The option price of \$140 for the power top was the same for all seven years, and its steadily declining popularity reflected the increasing perception of the Corvette as a true sports car.

**HOW IT WORKS:** To put the top down, the customer unlatched the windshield

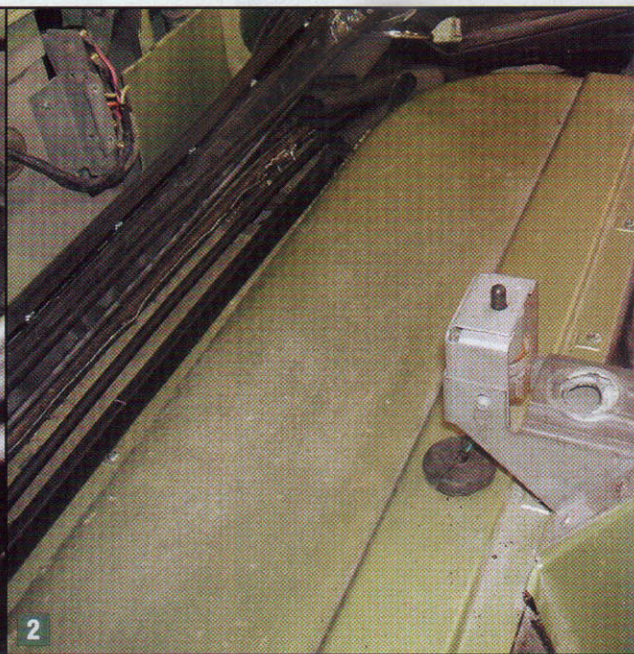
header clamps and the rear bow clamps, raised the rear bow and attached the hold-up strap on each side. Then unsnapped the lid end flaps from the pillars, pushed the button to unlatch the top compartment lid, and pulled the top switch under the dash and held it there for about 20 seconds while the cycle completed. The top compartment lid opened, the top folded down into the compartment, the lid closed, and the customer pushed down on the lid to latch it and snapped the lid end flaps back on the pillars.

To raise the top, the customer pushed the button to unlatch the compartment lid, unsnapped the lid end flaps from





**1** Power for the pump motor comes from the starter solenoid through this 30-amp circuit breaker mounted on the passenger side of the firewall.



**2** This is the top compartment lid safety switch; it prevents the system from operating if the lid is closed and latched.

the pillars, then pushed the top switch under the dash and held it there for about 20 seconds while the cycle completed. The compartment lid opened, the top raised into position at the windshield header, and the lid closed. The customer then pushed down on the lid to latch it, snapped the lid end flaps back on the pillars, closed the header clamps at the windshield, unsnapped the rear bow hold-up straps, and closed the rear bow clamps at the lid.

Many '56 owners forgot to unsnap the lid end flaps from the top of the pillars before operating the top, which tore the flaps off the lid when it raised; the female flap side of the snaps were changed from round to an open channel section in '57 so they would disengage from the male snap on the pillar without tearing the flaps off if the customer forgot to unsnap them before operating the top.

**HOW THE SYSTEM OPERATES:** The heart of the system is an electric motor-driven hydraulic pump with two electrically operated solenoid valves. The valves control the flow of hydraulic fluid to both ends of the cylinder that raises and lowers the compartment lid, and to both ends of the two cylinders that connect to the top linkage and raise and lower the top assembly.

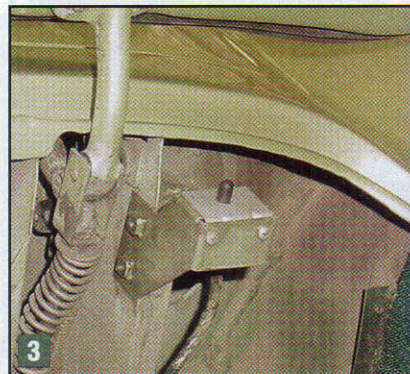
In order to prevent component damage, two safety switches were employed. One was mounted at the right front of the trunk, which prevented the system from operating unless the trunk was fully closed, keeping the opening top compartment lid from colliding with an open trunk lid. A second safety switch was mounted under the center front of the top compartment lid, which prevented the system from operating unless the lid was unlatched and free to be moved.

In order to control the timing of the system and to control the solenoid valves that directed the flow of hydraulic fluid to the cylinders in the proper sequence, limit switches were employed. One pair of switches was located at the bottom of the right side folding top cylinder, operated by a long arm from the top linkage; one signaled the system when the top was fully up, and the other when the top was fully folded down in its compartment. Another pair was located under the top compartment lid, to signal the system when the lid was fully open and when it was fully closed.

When the under-dash power top switch was pushed (to put the top down) or pulled (to put the top up), the hydraulic pump motor was activated, developing 240-280 psi of pressure in the system. Assuming the two safety switch positions said it was OK to proceed, the "closed" limit switch on the compartment lid

activated the lid solenoid valve, which opened and directed fluid to the bottom of that cylinder, which extended the rod, raising the lid.

When the lid was fully open, its "open" limit switch signaled that solenoid valve to close, and signaled the solenoid valve for the top linkage to open, directing fluid either to the bottom of those cylinders (to raise the top) or to the top of those cylinders (to lower the top). When the top reached fully up or fully down, those limit switches signaled the top linkage solenoid valve to close, and signaled the compartment lid solenoid valve to open in the other direction, sending fluid to the top of that cylinder, which retracted the rod and closed the lid. When the lid



**3** The trunk lid safety switch; it prevents the system from operating if the trunk lid is open.



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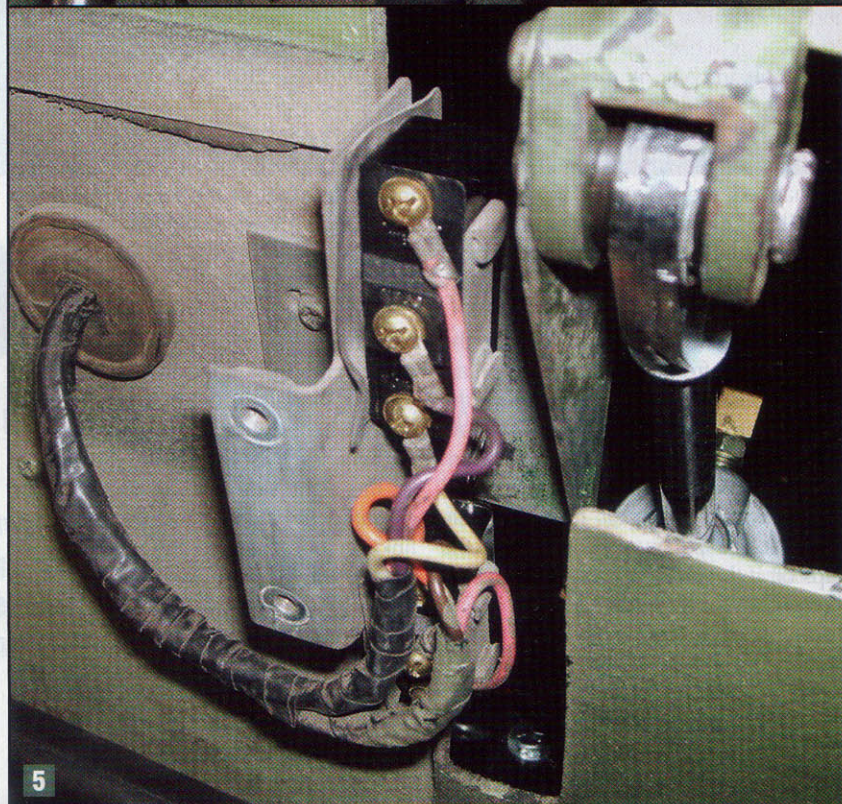
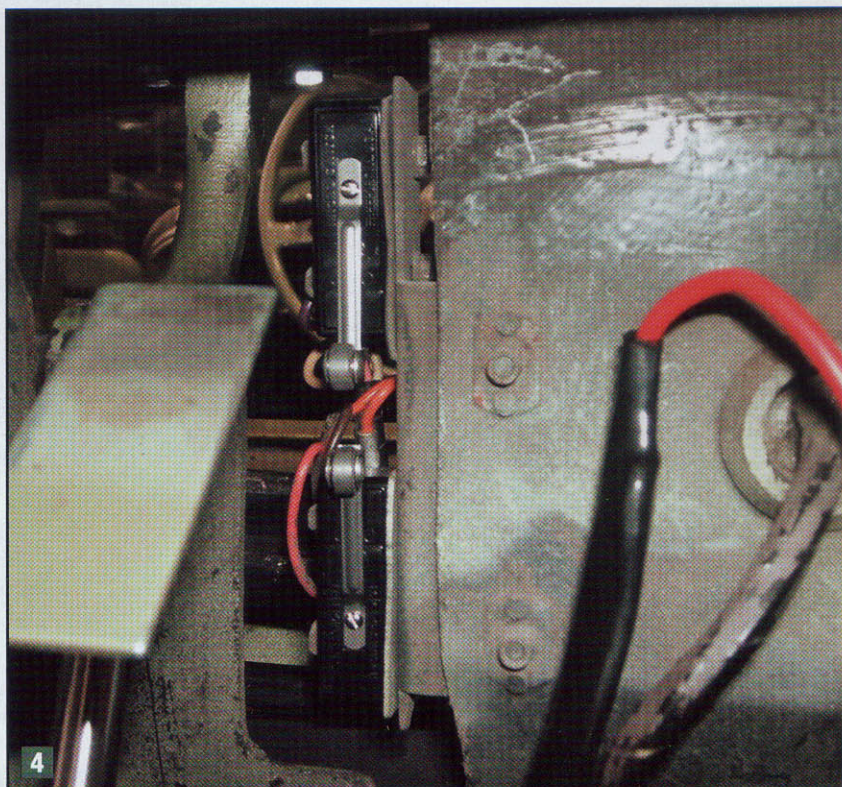
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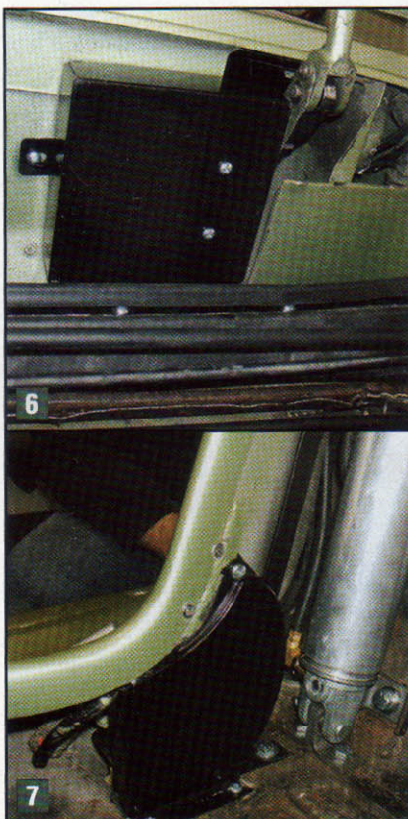
## ■ TECHNICAL SELF-POP TOP



4 The top compartment lid open/closed limit switches, operated by the paddle on the hinge arm, as viewed from the trunk.

5 The top compartment lid open/closed limit switches as viewed from the top compartment, less the protective cover; note the hydraulic cylinder connection to the hinge arm.





**6** The protective stamped cover for the top compartment lid limit switch wiring connections; top folded down in the foreground.

**7** The protective stamped cover for the top linkage limit switches; very rare part, not reproduced.

closed, its "closed" limit switch activated and closed the solenoid valve. When all the motion stopped, the customer released the switch, which shut off power to the pump motor.

The attachments of both of the safety switches and of all four limit switches were adjustable. It takes a lot of trial and error to adjust them such that their circuits are open or closed at the proper points during the opening and closing cycles of the top compartment lid and top linkage in order to control the solenoid valves. At St. Louis, the top was cycled and these switches were adjusted on the Final Line, before the interior trim, seats, and trunk division trim panel were installed. On a finished car, maintenance and adjustments require removal of the seats and the trunk division trim panel. Adjustment, trouble-shooting information, and electrical schematics are detailed in the ST-12 manual.

**RESTORATION PARTS:** Other than the wiring harnesses, virtually none of the other power top parts (dash switch, safety

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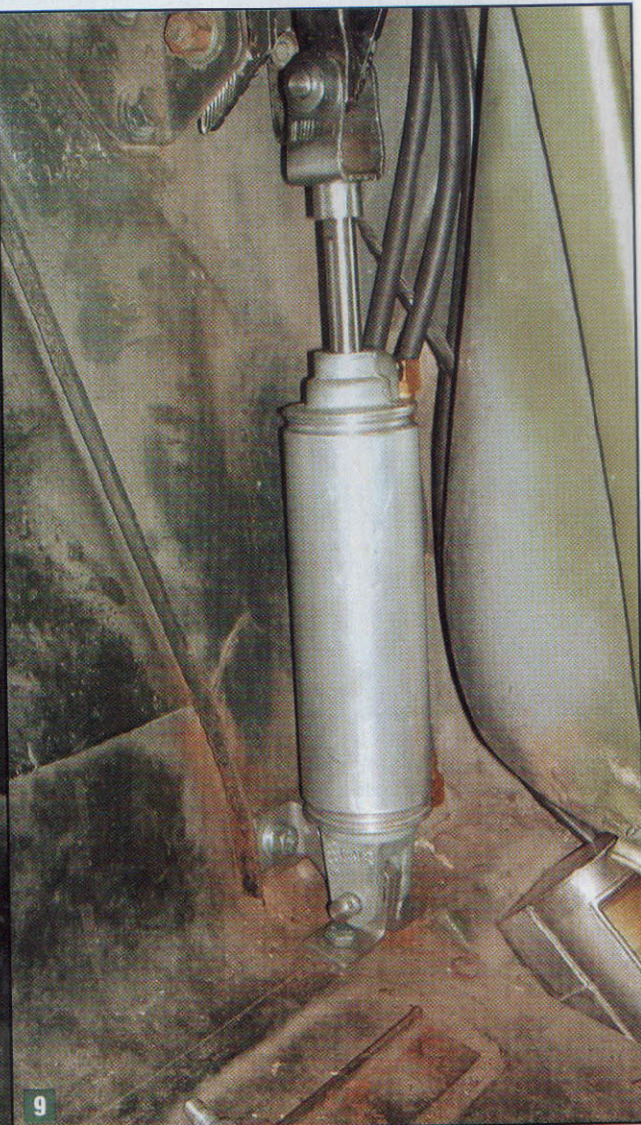
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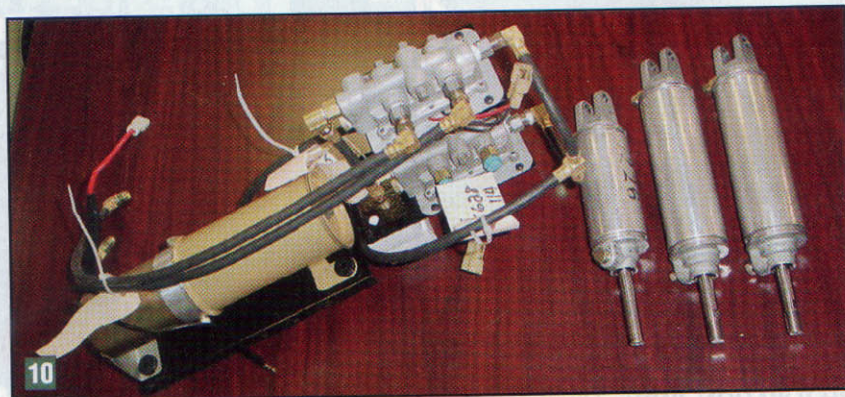


**8** The right-hand top linkage cylinder; note the long vertical linkage arm on the left—it operates the two top up/top down limit switches behind the cover at the bottom.

**9** The left-hand top linkage cylinder; note the hydraulic hose routing behind it. The anchor brackets on the body both required modifications to clear the cylinder mounting eyes and hydraulic fittings.

and limit switches and brackets, hydraulic pump and solenoid valves, lines and fittings, lid and top hydraulic cylinders and linkages, etc.) are reproduced or available from the usual restoration parts suppliers. This results in the need for a high level of creativity, adaptation and persistence with a small number of specialty convertible top hardware suppliers in order to put together a functional power top system, and explains why so few Corvettes are seen with their original power top parts in place or working.

A new pump and motor assembly (#HYDTP57G), the three lift cylinders (two #HYDLC67 and one #HYDLC69),



**10** The pump/motor/solenoid valve assembly from Convertible Top Specialists and their three hydraulic lift cylinder replacements.



and a complete hose set (#HYDTH157) were obtained from Convertible Top Specialists in Inverness, Florida. They also rebuilt the original lid and top solenoid valves.

Rubber bushings for the mounting eyes on the lift cylinders had to be fabricated, and the lower mounting brackets on the body for the top linkage cylinders had to be modified for clearance to the lower hydraulic fittings.

Brake fluid was specified originally for the hydraulics, but power steering fluid was used instead in the restoration to avoid paint damage in the event of a leak or hose failure.

The original safety switches for the top compartment lid and the trunk lid were in place and functional, but the four limit switches were not. Almost identical replacement limit switches (#23F5022) were obtained from NewarkInOne in Chicago, Illinois. The top operating switch in the dash above the radio was also missing and was replaced with a common double-throw double-pole momentary-contact toggle switch. The original stamped metal covers for both sets of limit switches were restored and reused; they're not reproduced, and would be a challenge to fabricate.

**SUMMARY:** Although the power top system appears to be quite complex, its operation is pretty straightforward once you understand how the safety switches, limit switches, and solenoid valves work together in sequence. It just takes time and patience to get the limit switches adjusted properly so the system operates as designed. ■

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