

# Non-Luster Mid-Year Cluster?

A TWO-PART PROCESS FOR A TOP-FLIGHT COCKPIT

BY JOHN HINCKLEY

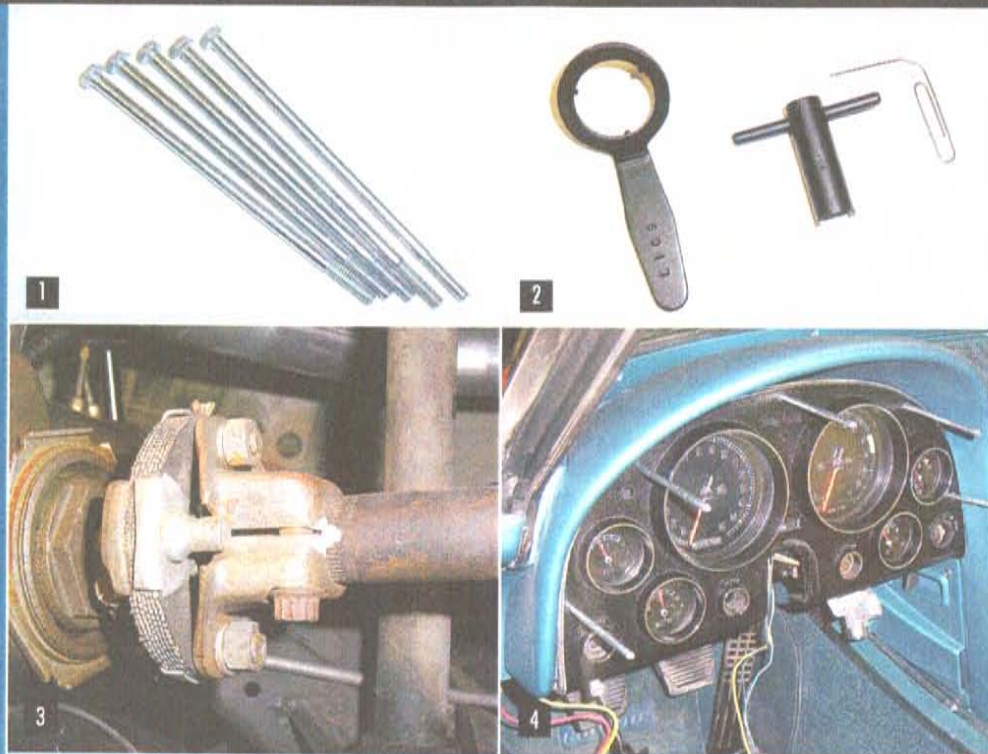
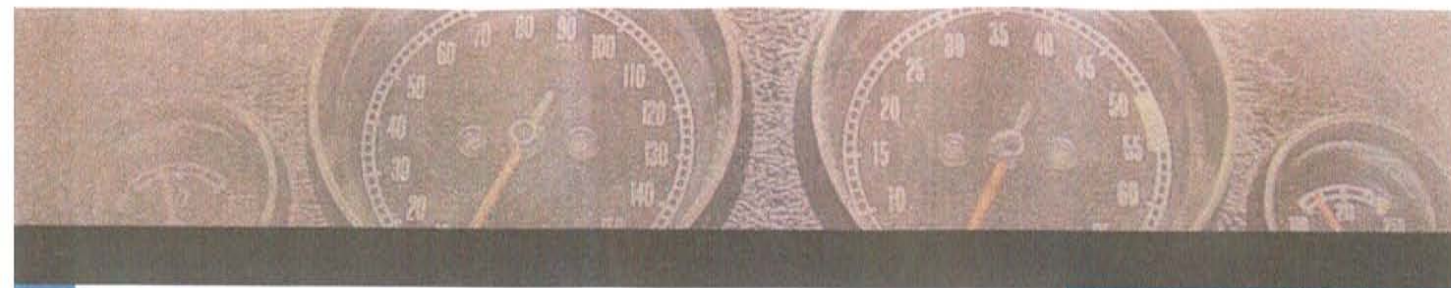


**Y**ou wash your Corvette, wax it, detail it, and maybe you even take the big leap and have it painted and replace the interior trim and carpets. It looks terrific sitting in the driveway or at a show, but what are you looking at when you're driving it?

The instrument cluster and clock are right in front of you when you're driving, and the mid-year cluster is an absolutely classic design, with that big tach and speedo right in the middle, surrounded by the four other gauges, the trip odometer, indicator lights, and the switches. However, after 35 or 40 years, that classic display is usually very much the worse for wear, not to mention function. The lenses get dusty and dirty, the gauge face markings fade (or don't match if one or two have been replaced), the red and yellow areas on the tach fade away, the trip odometer probably doesn't work anymore or is misaligned in its window, several gauge lamps need replacing, the "headlights" bulb doesn't flash any more, the grained black surface has dulled, and the switches show rubbing wear and scratches. The clock may or may not work, and its face has faded as well. Sound familiar?

We're going to take care of these ills in a two-part series. This article will cover the steps required for removal of the instrument cluster and clock, and the next one will cover installation of the flawless rebuilt/restored cluster and clock and the spiffed-up steering column and wheel so everything in the driver's field of view matches. In between the two articles, our cluster and clock will be in the capable hands of Brian Tilles and his crew at Corvette Specialties of Maryland, who enjoy an outstanding reputation in the hobby for their show-quality restoration of instrument clusters, gauges of all types, clocks, wiper and headlight motors, horns, glove box doors, consoles, and radios.

**CLUSTER REMOVAL:** The procedure is outlined in only half a page in the "Electrical" section of the *Chassis Service Manual*, but it doesn't go into much detail, and lacks the tips that simplify the process and make it much less intimidating. Anyone who has ever tried to replace bulbs or disconnect the tach or speedo cables knows how little working room exists behind a mid-year



1. These are 1/4"-20 x 6" bolts. We'll cut the heads off and use them to support the cluster. You can also use cut lengths of 1/4"-20 threaded rod.

2. The ignition switch bezel wrench, headlight/wiper switch nut wrench, and medium paper clip to remove the ignition key cylinder. The wrenches are handy, but not essential; these are from Long Island Corvette Supply.

3. The steering shaft-to-rag joint connection. A dab or two of white paint before disassembly helps to realign the parts when reinstalling the column later.

4. The modified bolts in place after removing the cluster screws. They will support the cluster while you're disconnecting all the wiring on the back side.

cluster for all the wires, connectors, cables, and harnesses, so there's little wonder that cluster maintenance tends to be put off or totally ignored until it's absolutely necessary.

**STEERING COLUMN:** It's folly to pull the cluster without getting the steering column out of the car. You risk scratching up the column and turn-signal bowl. Start by disconnecting the battery, then, with a spot of paint, mark the upper end of the rag joint and steering shaft splines where the shaft enters the coupling to ensure correct alignment when it goes back together later. Remove the 7/16" 12-point clamp bolt from the upper end of the coupling, and twist a wide flat-blade screwdriver in the slot of the clamp section to ease later disengagement of the shaft from the clamp. Leave the rag joint coupling attached to the steering gear.

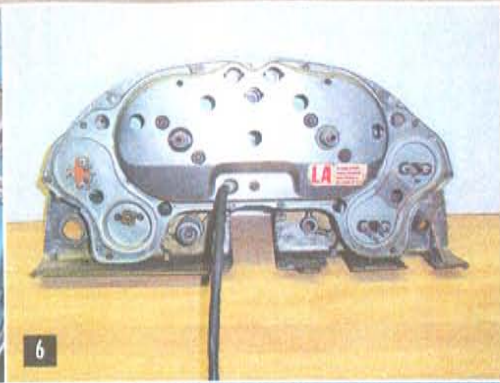
At the firewall, remove the screw on the flat band clamp that secures the column jacket to the protruding tang on the firewall bracket and bend the clamp open a couple of inches. Over the years, there were several variations of retainers, clamps, and collars at the bottom end of the column; on pre-'67 cars, tape up the coil spring that retains the lower column bearing so it doesn't fall out.

On manual-transmission cars, remove the clutch return spring. Remove the two bolts that secure the column seal retainer bracket to the firewall and pull it forward. The separate clutch return spring bracket will come off with the outboard bolt. Move the seal retainer bracket and clamp down off the end of the column and leave them resting against the rag joint. They'll come off when the steering column shaft comes out of the rag joint clamp. We're done under the hood – now we'll go inside and finish removing the column.

If you have an A/C car, you'll need to remove the left side lower air distribution ducts before removing the steering column. Disconnect the curved turn-signal harness multiple-terminal connector from the instrument panel harness, remove the two screws that attach the column trim bezel to the bottom of the cluster, and remove the column mounting bracket and U-bolt (on '63-'66 cars) or the three column mounting bolts through the capsules (on '67s). It simplifies things if you remove the horn button, horn contact, and steering wheel from the hub and set them aside. At this point, you can grasp the jacket tube forward of the turn signal housing and pull the column straight rearward and out of the car.

5. The cluster, pulled rearward and supported by the bolts, as the wiring is labeled and disconnected. Just pull it free when you're done.

6. The first good look at the back of the cluster, with all the bulb socket openings and gauge connections. Take a photo of yours and mark it up for later reference.



**SWITCH AND CABLE REMOVAL:** Remove the two screws retaining the headlamp motor switch (don't lose the two speed nuts) and let it hang from the harness. Remove the two screws attaching the hood release cable (and the vent cables on pre-'67 cars), and let them hang. Pull the headlight switch knob out, press the spring-loaded release button on the metal switch cover, and the knob and shaft will pull straight out. Use a wide-blade flat screwdriver (or the special wiper switch/headlight switch nut tool, if you have one) to loosen and remove the special nut, and push the headlight switch forward through the cluster so it hangs on the harness.

On '63-'66 cars, remove the screws attaching the parking brake handle support bracket from the instrument panel brace. Loosen the set-screw on the wiper switch knob and remove it, then remove the retaining nut (with the special tool or the ends of needle-nose pliers) and push the wiper switch forward out of the cluster so it hangs on the harness. Pull out the lighter element, remove the power connector on the back of the housing and the snap-on illumination lamp hood, and unscrew the round housing from the back of the lighter assembly, which will then come out from the front (or you can remove the housing after the cluster is out of the car).

Insert the ignition key, turn it to the accessory position, then use the end of a bent-open medium-size paper clip in the little hole next to the key. Push the paper clip in against light spring pressure,

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7. Here's the identification label applied by AC when the cluster was built, with the assembly broadcast code denoting the correct tach rodline and oil pressure gauge for the application.

8. The date stamp applied by AC showing the day the cluster was assembled. This one is original to the car it came out of.

and turn the key counter-clockwise - the key and cylinder will then pop out. Then use an ignition switch bezel tool (or other suitably padded tool) in the flutes on the outside of the bezel to unscrew and remove the bezel, and push the ignition switch forward out of the cluster so it hangs on the harness. Then use a nut driver to remove the screw holding the ignition switch illuminating lamp support from the back side of the cluster and let the lamp hang from the harness. Use a 3/8" wrench to disconnect the oil pressure line fitting from the gauge, and have a baggie and rubber band handy to place over the end of the fitting so it doesn't drip on the carpet. Remove the odometer reset cable knob and nut, and push the cable up through the bracket and out of the way.

**CLUSTER REMOVAL:** Carefully remove the five cluster attaching screws, one at a time, and as each is removed, thread in one of the six-inch lengths of 1/4"-20 threaded rod or modified bolts in its place. When all five have been done, the cluster is ready to be pulled out slightly; use the threaded rods to support it while you disconnect the multitude of wires.

Properly identifying and marking each of the wires so you know where they go is extremely important, as there are about 20 of them to deal with, and there isn't much spare wire length on any of them. Use masking tape, paper tags, or sticky colored dots to identify each wire, connector,

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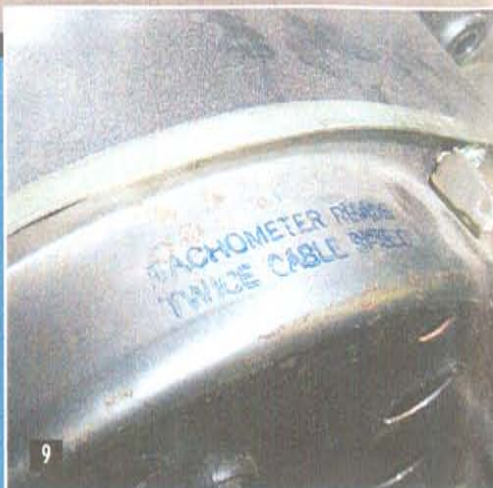
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9. "Tachometer reads twice cable speed" stamp. It's driven by the distributor, which runs at half of crankshaft rpm, so the tach compensates for that.

10. The faded and dusty clock face, also inoperative. Brian's crew will restore it and install a new electro-mechanical movement, as this car will be judged. They will also install a quartz movement if you prefer.

11. Rear view of the original Borg clock. Note the two bulb socket holes, power and ground terminals, retaining pins at the sides, and the alignment pin at the bottom.

12. Here's all the wiring that was buried behind the cluster. Now there's time and easy access to do all sorts of "while you're in there" work while you can get at everything. We'll get it all back together in Part II.



or bulb socket when you remove it, and make notes or a sketch if you find that helpful. The wiring diagram in the Assembly Manual shows all the correct colors for each wire if you get lost.

Starting from the top, remove the black cluster ground wire from the spade above the tachometer (Note: At reassembly, don't confuse this wire with the single brown wire that connects to the radio capacitor near the bottom of the cluster – the brown wire is HOT, and the black one is ground). You can also do this bulb-removal procedure from below, starting from the bottom; you don't have to pull the cluster out as far to get started.

#### Remove:

- The parking brake indicator bulb adjacent to the ground spade.
- The headlight warning indicator bulb next to it.
- The high-beam indicator bulb.
- The speedo and tach cables.
- The illumination bulbs above and outboard of the tach cable connection.
- The illumination bulbs above and outboard of the speedo cable connection.
- The illumination bulb between the tach and speedo.
- The left and right turn signal indicator bulbs.
- The temperature gauge connector, then the

illumination bulb below it.

The fuel gauge connector, then the illumination bulb below it.

The ammeter connector. Be careful of the capacitor lead – it's fragile.

Finally, disconnect the brown hot wire carefully from the other capacitor near the ignition switch.

Check again to make sure all wires and cables are disconnected, carefully pull the cluster toward you and place it face down on a pad or towel to protect the chrome gauge bezels.

Before sending the cluster out, remove the capacitor adjacent to the ammeter and the one adjacent to the ignition switch, and reinstall the screws. These capacitors are very rare, expensive, and are not reproduced. This is a good time to take "before" pictures of the front and back of the cluster for reference. You won't believe it's the same cluster when it comes back from a professional restoration. The original cluster will have a glued-on AC label below the speedo connection that identifies it, will be ink-stamped with the AC assembly date below the high-beam light socket hole, and will have "Tachometer reads twice cable speed" ink-stamped above the tachometer.

#### FOR YOUR INFORMATION:

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(410) 795 3180  
[www.corvettespecialtiesofmd.com](http://www.corvettespecialtiesofmd.com)

**CLOCK REMOVAL:** The clock has an electrical connector (hot and ground), two illumination bulbs. It's retained to the panel by two long spring clips that engage pins on the clock case. Reach in from the cluster opening, disconnect the electrical and bulbs, squeeze the ends of the spring clips and pull them off the pins, and the clock will pull straight out of the front of the panel.

**PACKING IT UP:** You'll need a sturdy shipping box about 28" x 18" x 9". Put about a two-inch layer of plastic "peanuts" in the bottom, wrap the cluster and clock separately in bubble-wrap, place them in the box, and pack more plastic peanuts tightly around and over the wrapped parts until the box is slightly overfull. Fill out the Corvette Specialties of Maryland work order form, specifying exactly what you want done (don't forget your phone number in case they need to call you), place it in the box, close it up, and seal the box thoroughly with shipping tape. It will weigh about 15 pounds. When you ship it, insure the package for at least \$1,000 - that's what it'll cost you to replace it if the shipper loses it, and their standard no-cost insurance won't begin to cover it.

**WHAT NOW?** In a classic example of the "while you're in there" syndrome, you'll find all sorts of things you can spiff up or refurbish now that you're staring at that big, empty hole where the cluster was and the parts you've set aside. While you're waiting for your cluster and clock to come back, you'll have four to six weeks to clean up and refinish the steering column and steering wheel hub. Pull and rebuild the pedal support assembly; inspect all that wiring and make any necessary repairs to any "Bubba" splices and connections you find; check all the connector terminals and clean them up; clean/lube or replace the inner speedo and tach cables; and get all new bulbs and test each one before installing them in the sockets. Don't forget that the "Brake" warning light on '63-'66 cars and the "Lights" warning light on all mid-years both use a special #257 flashing bulb, not the regular #1816 cluster illumination bulb. You DON'T want to find that out after you've reinstalled the cluster. ■



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