

# Non-Luster Mid-Year Cluster

THE SECOND STEP TO A JEWEL-LIKE MID-YEAR DASH

BY JOHN HINCKLEY



**A**t the end of Part I in the July issue of *Corvette Enthusiast*, the cluster and clock were on their way to Brian Tilles and his crew at Corvette Specialties of Maryland, the pedal support and steering column were on the bench, and there was a spaghetti mess of wiring in the hole where the cluster used to be.

**WHILE YOU'RE IN THERE:** True to the “while you’re in there” and “restoration vortex” theories, the more you look, the more you find that needs to be done. The pedal support had never been out of the car; the pedal pivot bushings were dry and worn out; and it had some squawks and groans from the pedals under load, so it was time to rebuild it (which can only be done while it’s out of the car). After disassembling it and cleaning it up, it went back together with \$2 worth of new plastic bushings and a liberal application of ARP gray moly lube, and it’s smooth and quiet again.

The upper end of the steering column, turn signal bowl, escutcheon, and steering wheel hub needed some help as well so they’d look good against the newly restored cluster, so they were sanded, primed, and refinished with SEM Trim Black. Hint: Before reinstalling the column, make a paper sleeve and wrap it around the upper few inches of the column, just below the plastic housing, so the die-cast escutcheon can slide to its proper fit to the cluster without scratching the outside of the column jacket, and remove it after securing everything.

If you haven’t had speedo or tach cable problems yet, you probably will. Now is the time to remove both flexible shafts, check and clean them, and lubricate them with a graphite-based, speedo-cable lubricant before reinserting them. (Corvette Central has a product called “Kable-Ease” that works well for this application – chassis grease is not a good substitute, especially if you drive your car in cold weather.) This maintenance is nearly impossible to do with the cluster back in the car.

That leaves us with the mass of wiring behind the cluster. Check each wire for nicks or chafed insulation, and repair any wires you find with “Bubba” twist-together splice fixes that are wrapped with electrical tape. I repair “Bubba” splices with all-metal, small butt connectors from M.A.D. Enterprises, (559-539-7128) covered with heat-shrink tubing.

This is also the time to replace ALL the light bulbs, regardless of how new they look. You’ll probably find several that are burned out and were never replaced because they’re so hard to get to with the cluster in place. All the cluster and clock illumination bulbs, turn signal indicators, and the brake

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# Part II



1. The restored '67 cluster, after "the works" show rebuild/restoration by Corvette Specialties of Maryland. It's virtually brand new, inside and out.

2. Brian and his crew do the back side as nicely as the front. It's completely refinished, with the original AC date stamp and broadcast label carefully preserved.

3. The rebuilt/restored original clock, with an NOS electro-mechanical movement – a far cry from the faded, dusty, and inoperative one we sent in.

4. The back of the clock is finished as nicely as the front.

warning light are #1816, the ignition switch, lighter, and high beam lights are #1445, and the headlights-not-fully-open warning light (and the brake warning bulb on '63-'66 cars) is a special #257 flashing bulb (you DON'T want to find out this one is wrong after the cluster is installed). Line up all the new bulbs with a power supply and check every single one before you install them in the sockets; new bulbs can be defective too, and you don't want to find that out later.

Check the #1893 bulb in the "torpedo" housing clipped to the bottom of the clock receptacle that illuminates the heater control bezels too (there are three of them on an A/C car), and note that these bulbs get their ground from the upturned end of their retaining clip contacting the outer metal case of the clock – they won't work unless the clock is installed and its power-and-ground connector is in place.

Now is the time to make sure your diagram of the back of the cluster is updated, showing where each connector and bulb socket goes, with wire colors noted so you can find them while you're lying flat on your back under the cluster with the diagram on your chest. If you didn't do this when you removed the cluster, check the electrical diagram at the end of the UPC 12 section in your Assembly Manual that shows all the wire colors for each connection. All illumination bulb wires are gray; other color wires to a bulb socket indicates a unique application.

**TIME FOR THE CLOCK:** The restored clock from Corvette Specialties of Maryland is a thing of beauty, with little resemblance to the dusty, faded (and inoperative) clock we removed from the car. After checking and installing the "torpedo" lamp (and the two additional on an A/C car, if applicable), install the power/ground connector and bulb sockets, slide the clock into place in its receptacle, and slide the two spring clips into place on the end of the retaining studs. The right-side retaining clip for the clock can be installed by removing the passenger-side console panel – you don't have to remove the glove box to get at it.

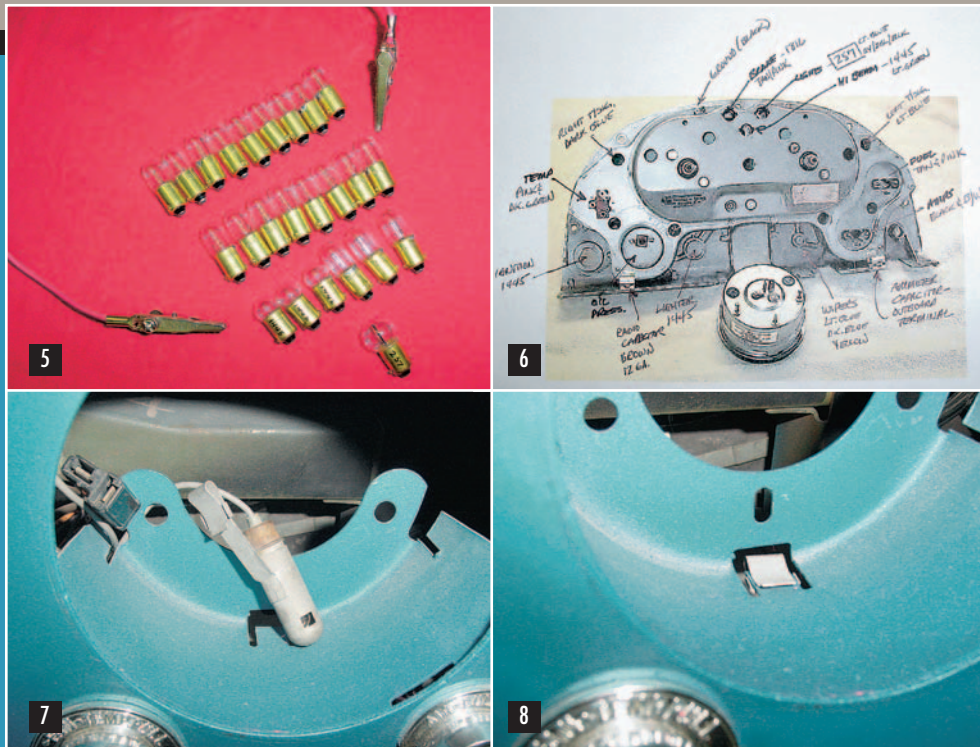
**PEDAL SUPPORT:** Now you can reinstall the pedal support – the two studs on top take the two 3/8"-16 flanged nuts on the engine side of the firewall, and two 5/16"-18 bolts with captured washers secure it to the weld nuts in the bottom of the instrument panel reinforcement bar. When you connect the clutch pedal pushrod to the stud on the pedal, be sure and use plenty of lube (Lubriplate or gray moly lube), and use the special extra-thick washer between the rod and the pedal for proper spacing. Reinstall the master cylinder on the long studs on the engine side with nuts and lock-washers, then

5. Even new bulbs can be defective – replace ALL the old bulbs, and check every single one with a 12V battery before installing them in the sockets.

6. It's not Hollywood, but here's the diagram you should have made when you removed the old cluster. You'll need it while you're on your back connecting all those wires, plugs, and bulb sockets.

7. Here's the “torpedo” lamp for the heater control bezels. It clips into the tabbed slot just below the end of the housing. (A/C cars take two more that clip into the slots at 4 o'clock and 8 o'clock.)

8. Here's the “torpedo” lamp installed. Note that it gets its ground from contact between the upturned end of the clip and the outer case of the clock, and won't work unless the clock is installed and connected.



lube and install the brake pedal pushrod and clevis assembly, with the pivot pin and spring retainer clip. Check the pedal free play at this point – you should have 1/16" to 1/4" of free play between the point where the pedal is up against the rubber bumper and the point where hard contact is felt with the master cylinder when you push on the pedal with your hand. Loosen the lock nut and turn the pushrod at the clevis if necessary to readjust it within that range, and retighten the lock nut.

**THE CLUSTER:** Words can hardly describe how the restored cluster looks compared to its condition when it was removed. It literally looks like new, both front and back, including the original broadcast label and AC date stamps – truly a work of art, thanks to Brian Tilles and his crew.

Install the ammeter capacitor and the radio capacitor adjacent to the ignition switch and the trip odometer reset cable, and we're ready to install the cluster in the car. Thread the five support rods back in place, and locate the cluster on the rods, several inches away from its installed position. If you haven't done so already, remove the driver's seat so you can lie comfortably on your back – you're going to spend a while down there with a drop light at your side and a wiring diagram on your chest. If you don't have a (cool) fluorescent drop light, you'll wish you did. You can clean up and paint your seat tracks later – another “while you're in there” job. Hint: Place a 3/8" open-end wrench on the floor, and leave it there – that'll remind you to connect the oil pressure gauge line after everything else is done. You'll be so happy after you finish connecting all those wires and bulb sockets, you can easily forget the oil pressure line. Really makes a mess if you do.

Find the black cluster ground wire, and connect it first to the spade above the tach. If this isn't connected, almost nothing will work, including the wipers. Snap the two plastic retainers on the instrument panel harness into the two holes (one on each side) near the top of the speedo/tach housing.

#### THEN PLUG IN:

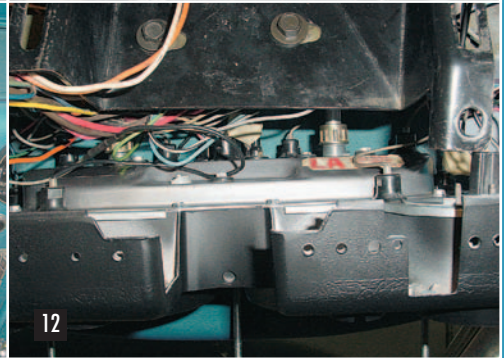
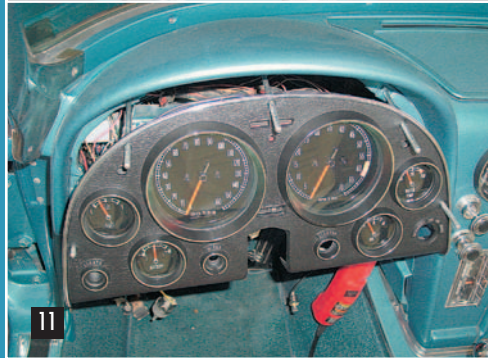
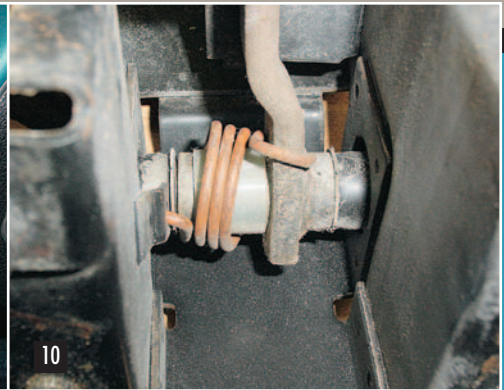
- The tan/pink wire brake warning light.
- The light blue/gray headlight warning light.
- The light green high-beam warning light.
- The light blue left turn-signal indicator light.
- The dark blue right turn-signal indicator light.
- The five gray illumination bulbs in the speedo/tach housing.
- The tan/pink connector on the fuel gauge.
- The pink/dark green connector on the temperature gauge.
- The two gray illumination bulbs (on each side) adjacent to the oil pressure gauge and the ammeter (four bulbs total).
- The plug for the black and black/white connector on the ammeter (the copper “flag” on the capacitor goes in the outboard cavity of the connector, closest to the door).

9. The clock installed – a piece of jewelry, compared to the old one we took out.

10. Here's the source of pedal squeaks and groans – dried-up, old, worn-out pivot bushings. A good cleaning, new wear sleeve, new bushings, and some lube fixed it right up after the photo was taken.

11. The pretty new cluster, hung on the support rods, ready for all the wiring and mechanical connections from below.

12. You'll spend a lot of time from this angle, looking up at the back side of the cluster from below before you slide it home. Just take your time, follow your diagram, and watch for pinched wires.



The brown wire with the male connector goes to the female connector on the radio capacitor adjacent to the ignition switch. If you don't have the capacitor, tape this connector safely away from any ground points – it's hot any time the ignition is on.

Connect the orange/white wire connector to the stop light switch. The two copper "flags" on the capacitor wires go in each cavity of the female connector before you make the connection. Make sure the two locking tabs on the connector are engaged on the tangs on the switch body.

Route the business end of the odometer reset cable to its final position, install the retaining nut and the knob.

Now reach up and connect the speedo and tach cables to the cluster; as tight as you can get the collars with your fingers is fine. You'll have to pull the cluster a little closer to final position to get this done.

At this point, you should have the following wires hanging loose:

One gray wire and bulb socket for the ignition switch lamp.

One gray wire and shrouded snap-in bulb housing for the lighter lamp.

One orange wire with a 90-degree female pin connector for the lighter.

The ignition switch and its wiring.

The wiper switch and its wiring.

The headlight switch and its wiring.

The headlight up/down switch and its wiring.

Take a good look at all the wiring to make sure all are properly routed and won't be pinched or trapped when you slide the cluster into final position, and pull the cluster forward into its final position from underneath. Then check the wiring again to make sure nothing is pinched or trapped. Horse yourself out of the car and take a break featuring your favorite liquid refreshment.

When break time is over, unscrew the top support rod and install a cluster screw. Do the same for the other four screws. See the 3/8" wrench on the floor? Get back under there and connect the oil pressure line fitting to the gauge.

#### **NOW YOU CAN FINISH UP THE FOLLOWING:**

Install the ignition switch and plug in its bulb socket.

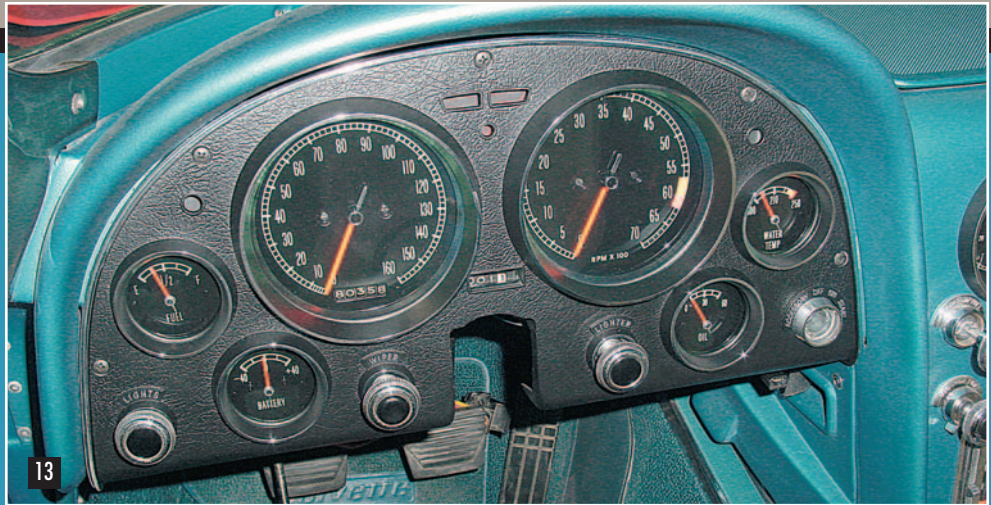
Install the lighter and housing, snap in its lamp housing, and connect the orange wire. Make sure the housing is tight, as the cluster is its ground.

Install the wiper switch, and make sure it's tight – it grounds through the cluster, and the ground connection is what controls the operation of the wiper motor. Install the wiper switch knob, being careful not to over-torque the setscrew in the knob shaft. The same special tool works for both the wiper switch nut and the headlight switch nut; if you don't have one, a pair of needlenose pliers will suffice.

Install the headlight switch and its knob/shaft.

Install the headlight up/down switch; the tabs on the side of the switch go up inside the cluster,

13. Finally, it's done, and it's a thing of beauty. Take a break, install the hood and vent cables, steering column and wheel, and enjoy it!



not below it, so they can't be seen.

Install the hood release, '63-'66 vent cables, and the '63-'66 parking brake support.

This completes the cluster installation. Sit back, take a break, and admire how great that piece of jewelry looks – it really was worth all the work!

**THE STEERING COLUMN:** Now it's time to install the steering column and button things up. It's very handy to have a helper for this phase as you load the column in place on the inside and the helper engages it in the upper portion of the rag joint.

On '63-'66 cars, loose-assemble the lower column support bracket, U-bolt, saddle and nuts to the column, and load it through the hole in the dash. In the engine compartment, have your helper load the foam seal and retaining bracket over the end of the column. Then the helper can slide the splined end of the shaft into the top of the rag joint, using the previously applied paint marks on both parts to assist in aligning the assembly. When the splines are fully engaged, the special 12-point clamp bolt can be installed in the rag joint. Now the column can be secured at the cluster end, positioning it fore-aft first so that the "rag" element in the rag joint is flat and not distorted. With both ends secured, slide the retaining bracket with the foam seal up against the firewall, install the two bolts (and the clutch return spring bracket under the outboard bolt), then install the bolt in the clamp around the column tube and tighten. Now you can come back to the cluster area, position the escutcheon against the cluster, remove the paper sleeve (if you used one to protect the paint on the column tube), and drive its two screws.

The sequence for '67s is similar, except they have an intermediate support bracket (instead of the U-bolt/saddle arrangement) for the column that attaches to the pedal support with four bolts, which must be installed (loose) before the column is loaded. This bracket slides fore-aft and cross-car slightly with (fore-aft slotted holes in the pedal support and cross-car slotted holes in the support). This is to position the column and escutcheon to the cluster. Once the column is positioned to the cluster, tighten the four intermediate support-to-pedal support bolts and torque the three column bracket to intermediate support bolts (with hardened flat washers) to 15-25 lb-ft. These three bolts go through injected-in-place capsules on the column bracket, which are designed to shear out of the bracket on frontal impact so the column jacket can collapse. Then remove the paper sleeve and secure the escutcheon to the cluster with its two screws.

Go back under and mate the curved multiple connectors that join the steering column's turn signal harness to the instrument panel harness, and install the lower ductwork if you have an A/C car. Now you can reinstall the driver's seat, as the "going under" work is all done.

Install the steering wheel to the hub (six screws), the horn contact assembly to the hub (three screws), and snap on the horn button. Install the ignition lock cylinder (with the key in it) back in the ignition switch, and leave it in the "off" position.

Now you can connect the clutch return spring to the firewall bracket, double-check that the bolt in the rag joint connection is tight, reconnect the battery negative cable, and you're back in business. Check out proper operation of the horn, headlights, turn signals, high-beam indicator, parking brake warning light, headlight up/down warning light, instrument lights, wipers, fuel and temperature gauges, set the clock, and you're ready to head out and enjoy that beautiful "new" instrument cluster and clock you see in front of you all the time while you're driving. Watch the road and traffic too, difficult as that may be for the first few miles – and if the top's down, the wind's in your hair, and the sidepipes are blasting, that's a bonus! ■