Shock Actuators

I have started a new thread on Shock actuators titled simply “Shock Actuators” so that future searchers can find it easily.

I put it in PDF format as an attachment so that anyone can download it.

Evidentially there are several problems that can occur with the actuator that will trigger a suspension light. I deal with the actuator only here, there may be other problems which are beyond the scope of this article.

1) The small gear on the top of the shock shaft is broken. This can be repaired with a replacement from Ricambi. There is an excellent write up on this procedure here. See post by MRONY


2) The plastic drive parts (not the black plastic gears under them) are broken. Take the actuator off and remove the rubber gasket on the bottom. You can look inside and see if the brown and black plastic drive parts are broken, (not easy, but doable). This can be repaired by Captain Z or parts are available separately so you can DIY.
3) The motor is not working.

To test this hold the actuator in your hand while a helper cycles the ignition on and off, or you can make test connectors by cutting the insulation off just at the end on the metal barrel of a red butt connector and crimping a lead on the other end. These will fit the male terminals in the actuator connector and allow bench testing.
You should feel some movement of the motor before it stops due to gears jamming. If there is no movement check the plug for 12 volts with key on. See schematic here http://www.ferrarichat.com/forum/attachment.php?attachmentid=677492&d=1203148110

C (brown) = 12 volt positive or negative depending on rotation.
B (blue) = 12 volt positive or negative depending on rotation.

Probe C (brown) and B (blue) wires for 12 volts/ground (depending on direction of rotation) with key on to prove power supply to actuator. See below for pins/colors.

If there is continuity to the motor and you feel no movement with the key on then there may be a broken wire as 3200GTA found. This is a DIY repair; you must open the top half, not an easy task, but it can be done. http://www.ferrarichat.com/forum/showthread.php?t=137405&highlight=shock+actuator
See post by 3200GTA.

If there is continuity (12 volt power) and no broken wires the motor section has simply failed internally, in which case there is no recourse I can think of but to buy another actuator. The Corvette motor will not work as it has only one Hall Effect sensor.
Pin Labels and wire colors of connector on actuator, *not* the connector from the car harness

As you hold it in your hand looking at the open end with the latch on top

From upper left, D (black), F (yellow), E (green),

From lower left, A (red), B (blue), C (brown)

Use this chart to correspond colors on car harness connector.

Examples:
C (brown) on actuator connector = pink/yellow in car harness connector.
B (blue) on actuator connector = orange in car harness connector.
4) The plastic gears (probably the larger plastic ring gear) in the lower half of the actuator are broken.

This can be repaired by obtaining a new Corvette actuator, separating the gear section from the motor section on both actuators and replacing the broken gears with the new gears from the Corvette lower section. The procedure is outlined below.

You do exactly the same procedure to both the Ferrari actuator and the Corvette actuator.

The first step is to carefully separate the motor section from the gear train section. I used a lathe and a Dremel tool with flex shaft fixed to the tool post with a fine tooth cut-off saw blade in the collet. I tied the pigtail up so it wouldn’t flail about when I chucked up the actuator in the lathe with the gear section facing outwards. The lathe is set on slowest RPM, or you could turn the chuck manually while advancing the cut-off blade with the cross feed.

Then I cut exactly on the center of the recessed section, you must be very careful to cut only the depth of the red/black plastic, (about .070) and not into the underlying brown plastic, which both locates and determines the depth of the gear case.
You must also be careful not to let the parts separate until you are ready to separate them.

Once cut the proper depth, remove the actuator from the lathe and hold with the gear section down and carefully lift off the motor section. The three black plastic gears will
probably stick in the motor section; note their position (equidistant radially) so you can replace them in the gear section correctly. Note orientation of small black plastic spacer.
Once both actuators have been sectioned, and gears have been replaced, lightly coat the inside of the area the joining ring will cover with Devcon Plastic Welder, and join the two sections together, making sure that all the new parts from the Corvette actuator are correctly located in the Ferrari gear section and that no epoxy can get inside the gear section, and that the rubber gasket is in place, then let set for 24 hours.

I made the joining ring by turning down a 1 ½ plastic pipe plug. That was all I could find with the necessary ID and OD. You should be able to get two rings out of one plug.

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OD = 1.750
ID = 1.550
Length = 0.350
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The finished product, it would have looked nicer had I not ripped the motor section apart, but I wanted to see what was there and this one will go on the front where you can’t see it.

This procedure has been tested and it works.