Canon

Third-party lenses on Canon EOS cameras

A variety of lenses from third-party manufacturers — Sigma, Tokina, Tamron, and others — are available in Canon EF mounts to fit Canon EOS camera bodies. However, contrary to popular belief, these companies are not "licensed" to produce these lenses; instead, their designers must basically take apart and analyze EOS cameras and lenses, and then "reverse-engineer" them to fit and operate on EOS camera bodies.

The Canon EF lens mount

Unlike all previous interchangeable-lens camera mounts, Canon's EF lens mount was the first in the industry to go entirely electronic when the first EOS 650 and 620 cameras were introduced in 1987. This innovative mount relies completely on electronic communication between body and lens, which takes place using the gold contacts on the camera body and those on the lens' rear mount. In spite of numerous technological advances Canon has introduced since 1987 (more on that in a moment), this mount and the gold contacts have remained absolutely the same.

Lens to body communication

All Canon EF lenses have a microprocessor within the lens, that provides a number of items of information to the camera. When you turn on an EOS camera — film or digital — the camera and lens communicate, and the camera "knows" the lens' focal length, if it's a zoom lens the actual zoom setting it's currently set to, and the maximum and minimum apertures, among other things. When the camera is activated, this basic information is transmitted to the camera body's main processor.

When the autofocus and light metering are activated by pressing the shutter button halfway down, additional communication is carried out, cheifly signaling the aperture control motor within the lens to stop the diaphragm down to an amount determined by the camera (or the user, if the camera's used in Av or Manual exposure modes), and a start signal is sent to the lens' built-in focusing motor to begin driving the focusing elements of the lens for autofocus. This is only a thumbnail sketch of what occurs between body and lens. Many additional items are communicated back and forth between the time the camera is turned on and the moment the shutter button is fully depressed.

Evolution of the EOS system

Since the first EOS cameras and EF lenses in 1987, a number of new technologies have been introduced into Canon's EOS system. As new camera and/or lens features have been developed, this has added to the amount of items communicated between body and lens. Canon has been able to do this and maintain practically total compatibility going back to the earliest EOS bodies and lenses. *Most importantly, the lens mount and the gold contacts have not changed one bit!*

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Features introduced since 1987 which have altered the way data is communicated include:

- Predictive AI Servo AF (focus tracking on moving subjects)
- Micro-USMs (extremely small Ultrasonic focusing motors)
- Tilt-shift lenses with Automatic Diaphragm operation
- Multiple-point AF systems, from 3 points up to 45
- Image Stabilization
- E-TTL flash (which relies on instant analysis of a pre-flash)
- Wireless E-TTL flash

Furthermore, as new cameras have been developed, new and faster communication methods have been introduced to give us faster autofocus, more precise light metering, faster shooting speeds (up to 9 fps — with autofocus — on the EOS-1v, for instance), and of course the new features that digital SLRs bring to the table.

Data communication has accordingly changed over time, and occasionally a new camera will be launched that modifies how data is transmitted between body and lens. For example, when E-TTL was launched with the EOS Elan II camera in 1995, its aperture stop-down communication was altered compared to previous EOS cameras. Again, all Canon-made EF lenses had processors able to accomodate the shift in data transmission, and worked without modification.

Communication errors

Whenever an EOS camera cannot complete electronic communication with a lens, or detects an internal disturbance, the camera is designed to lock-up on the first attempt to fire the shutter. Usually, a dead-battery icon blinks in the same manner as a "check engine" light in a car. This assures that there's almost no possibility of a user shooting an entire wedding or vacation, for instance, with a lens that's not stopping down its aperture properly or otherwise not working with the camera properly.

Third-party lenses

The makers of third-party accessory lenses are not given this information when Canon introduces new features or improves the performance of its cameras and lenses. It's up to them to continue to "reverse-engineer" their equipment to enable it to continue to work on new EOS bodies as they're developed. Since Canon designs our own processors and all electronics within the body and lens, we have been able to maintain backward compatibility. This is one of the many advantages of choosing a Canon EF lens.

When changes in communication result in a third-party lens that now produces errors, *it's up to the makers of that lens to update the equipment to work on the EOS camera in question.* Again — Canon's own EF lenses work without modification.

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The meaning of "fully compatible"

Many third-party lenses with EF mounts are sold to customers with the claim by store salespeople or even the lens manufacturer that they're "fully compatible" with all Canon EOS cameras. Canon, Inc. in Japan and Canon USA offer no rebuttal to those claims. Any compatibility is based on the reverse-engineering we described earlier in this document. And if a user mounts this lens on a certain Canon EOS camera and it locks up, it's up to the user to contact the lens manufacturer (after verifying it's a lens issue; see below) and tell the lens maker's service department, "make it right."

If a user encounters lock-ups

The easiest thing to do is remove the battery for a moment, and re-install it, which gives the camera the chance to perform an internal electronic re-set. Try mounting a Canon brand lens on the camera (even if it's a dealer's demo lens off the shelf) and fire it to see if you can repeat the problem. *If lock-ups only occur with a third-party lens, it's a pretty safe bet that it's the lens that must somehow be modified or adjusted.* If, on the other hand, the camera continues to lock up with a Canon-brand lens mounted, then it's likely that something else is wrong with the camera and it should be sent to a qualified repair technician or a Canon Factory Service Center for examination.

Sigma information on-line

Sigma, a large maker of third-party lenses for various SLR cameras, has been up-front with this issue, and frequently announces updates for Sigma lens owners on their web site (www.sigmaphoto.com). As of mid-August, 2003, there's an item in their "News" section of the web site under the heading, "Important Notice For Canon EOS 10D and Canon Elan 7/Elan 7e camera Users", which outlines exactly this need for certain models of their lenses made prior to a certain date to be sent to them for modification. In this instance, Sigma is performing this upgrading of affected lenses at no charge. Of course, it's entirely up to the lens maker whether or not they will charge a fee for any upgrading service performed on one of their lenses.

Other lens manufacturers from time to time post similar information; it's up to owners of these lenses to check the maker's web site or contact their service department if and when any errors resulting in lock-ups occur.