Understanding the R-Series Tunnel Detector Gate Signal Settings

When using an R-series tunnel detector with a gate, the detector sends signals to the gate telling the gate when to switch sides to divert a tagged fish. The default position of the gate is to the side of untagged fish. Coordinating the gate and the detector with your sampling speed is necessary to ensure that the fish are correctly diverted. Two adjustments on the detectors are used to do this:

1. ***Gate Signal Delay***: The detection region for coded wire tags is in the center of the tunnel detector. When a tag is detected, a signal is sent to the gate telling the gate when to switch sides to divert the fish. The gate signal delay is the time between the actual tag detection and when the gate switches. When this knob is set to the minimum (shortest delay), the gate will switch immediately after the signal is sent. When the knob is set to the maximum (longest delay), there will be a delay before the gate switches.

2. ***Gate Signal Duration***: This indicates the amount of time the gate will stay switched to the tagged side before it automatically reverts to the default setting. When this knob is set to the minimum (shortest duration), the gate will revert quickly after it is switched. When this knob is set to the maximum (longest duration), there will be a delay before the gate reverts to the default setting.

In most situations, we recommend that the initial setting for the gate signal delay be at the minimum (the knob turned all the way to the left) and the gate signal duration be at the maximum (the knob turned all the way to the right). With this setup, the gate will switch as soon as a tag is detected, and will remain in the switched position for the maximum time.

In the following diagrams, we show a correct diversion (Figure 1), some of the ways that fish will be incorrectly diverted if the gate signals are not properly set (Figures 2,3, and 4) and also show what happens if the fish are put in tail first when the tags are in the snout (Figure 5). In all of these examples, the default gate position is to the left, so that untagged fish are diverted to the left, and tagged fish are diverted to the right. Further, these examples assume that only one fish is in the detector at a time. Faster sampling, in which the fish follow one another so that more than one fish is in the detector at a time, can be easily accomplished by adjusting the signals. Please call NMT if you need assistance.

Figure 1: Correct Diversion
We recommend that samplers initially set up the gate so that the delay is set at the minimum (i.e. the gate opens as soon as a tag is detected), and the duration is set at the maximum (i.e. the gate remains open for the maximum amount of time). (A) A fish is put into the detector and (B) reaches the detection region. The gate immediately switches to divert the tagged fish. (C) Because the gate remains open for the maximum time, the fish is correctly diverted to the right.

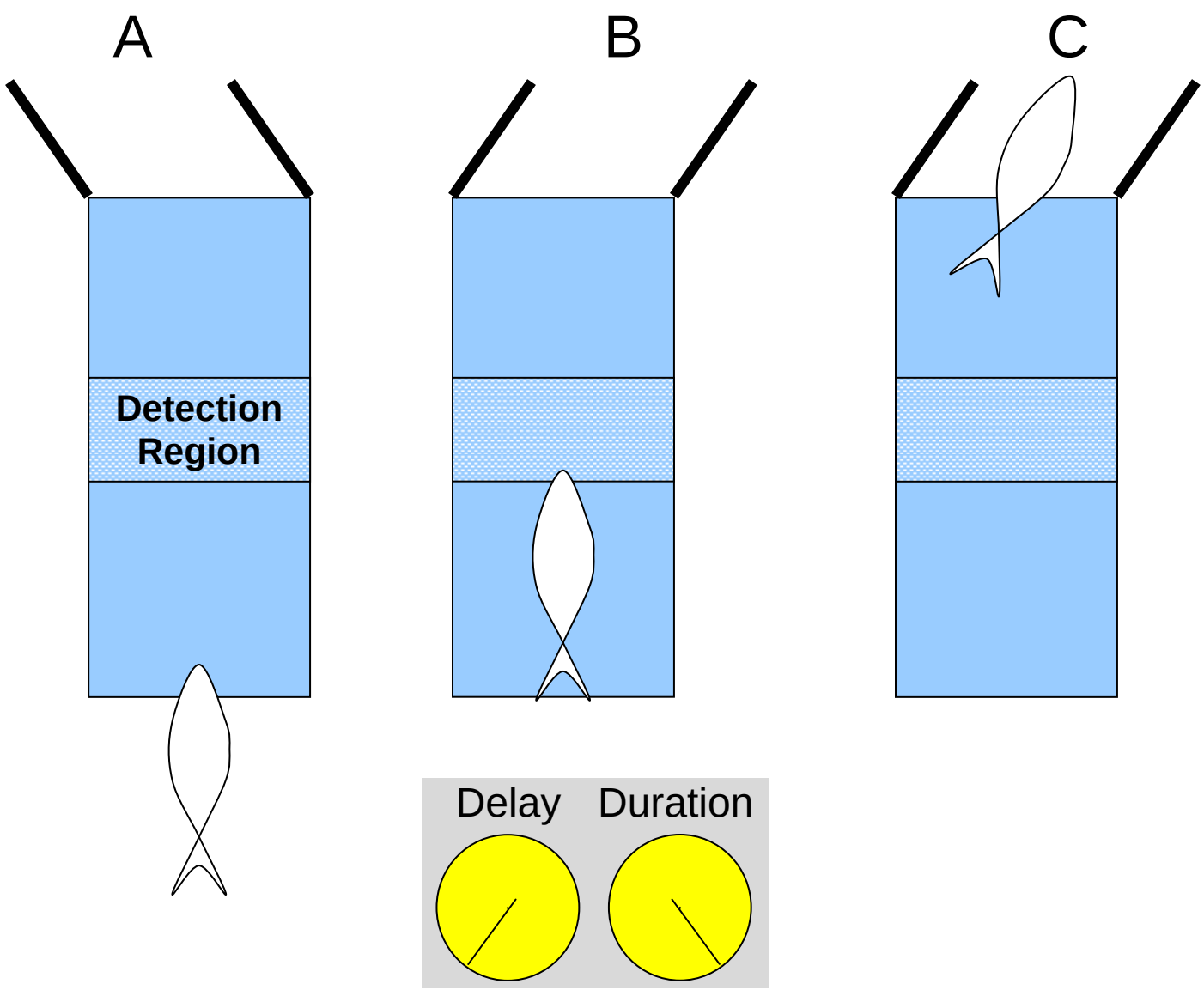

Figure 2: Incorrect Diversion. In this scenario, the sampler has set the gate delay to the maximum (i.e. the gate will not switch for the maximum amount of time), and the gate duration at the maximum. (A) The fish is put into the detector and (B) the tag is detected as soon as the fish reaches the detection region, but there is a delay between the detection and when the gate switches. (C) The fish reaches the gate and is incorrectly diverted before the gate switches. (D) After the fish is out of the detector, the gate switches and remains open for the maximum time.

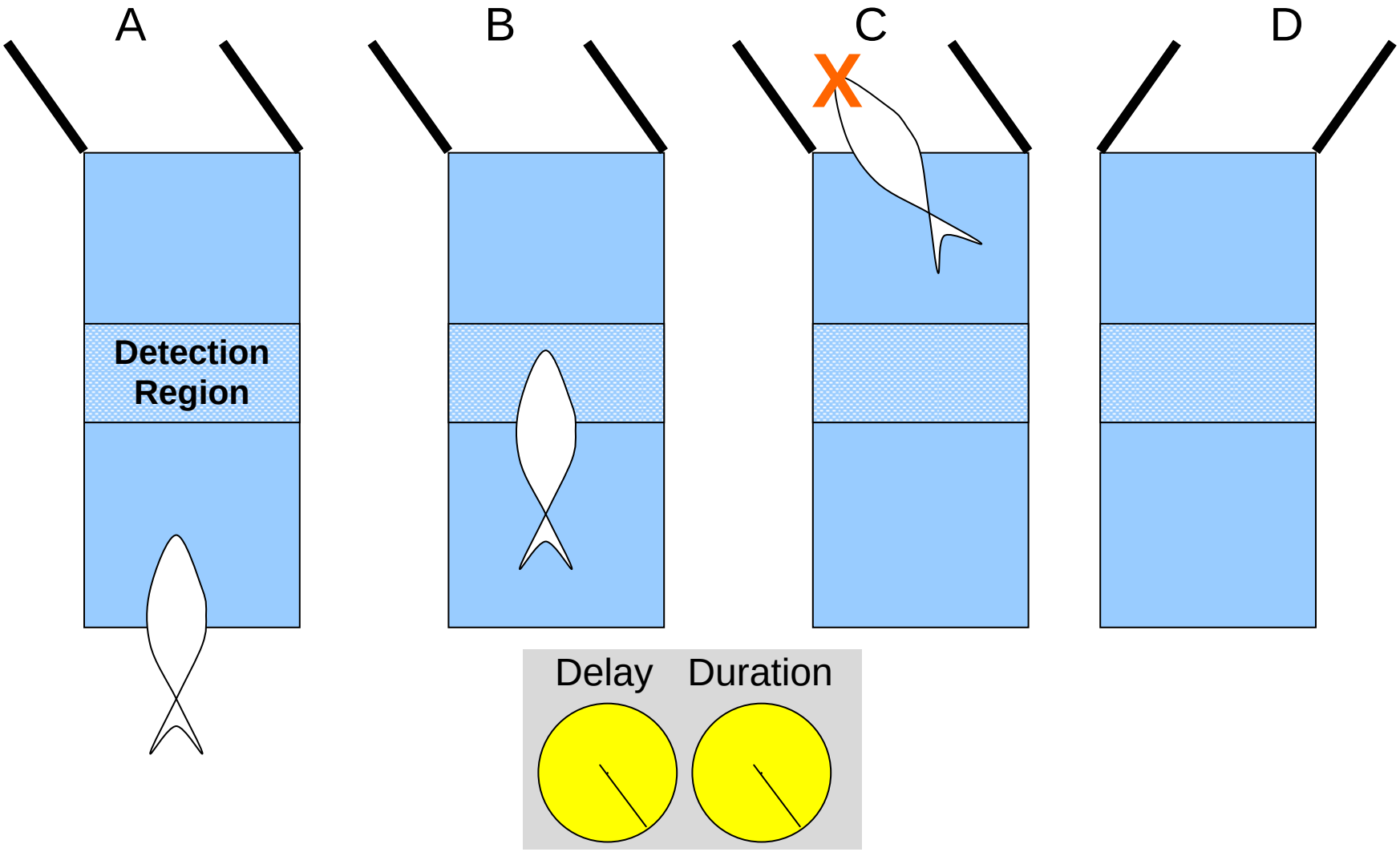

Figure 3: Incorrect Diversion. Here, the sampler has set the gate delay at the minimum, and has set the gate duration at the minimum so that the gate remains open for a very short time. (A) Fish is put into detector. (B) The gate switches to the right as soon as the fish reaches the detection area, but (C) switches back to the left before the fish exits the detector so (D) the fish is incorrectly diverted.

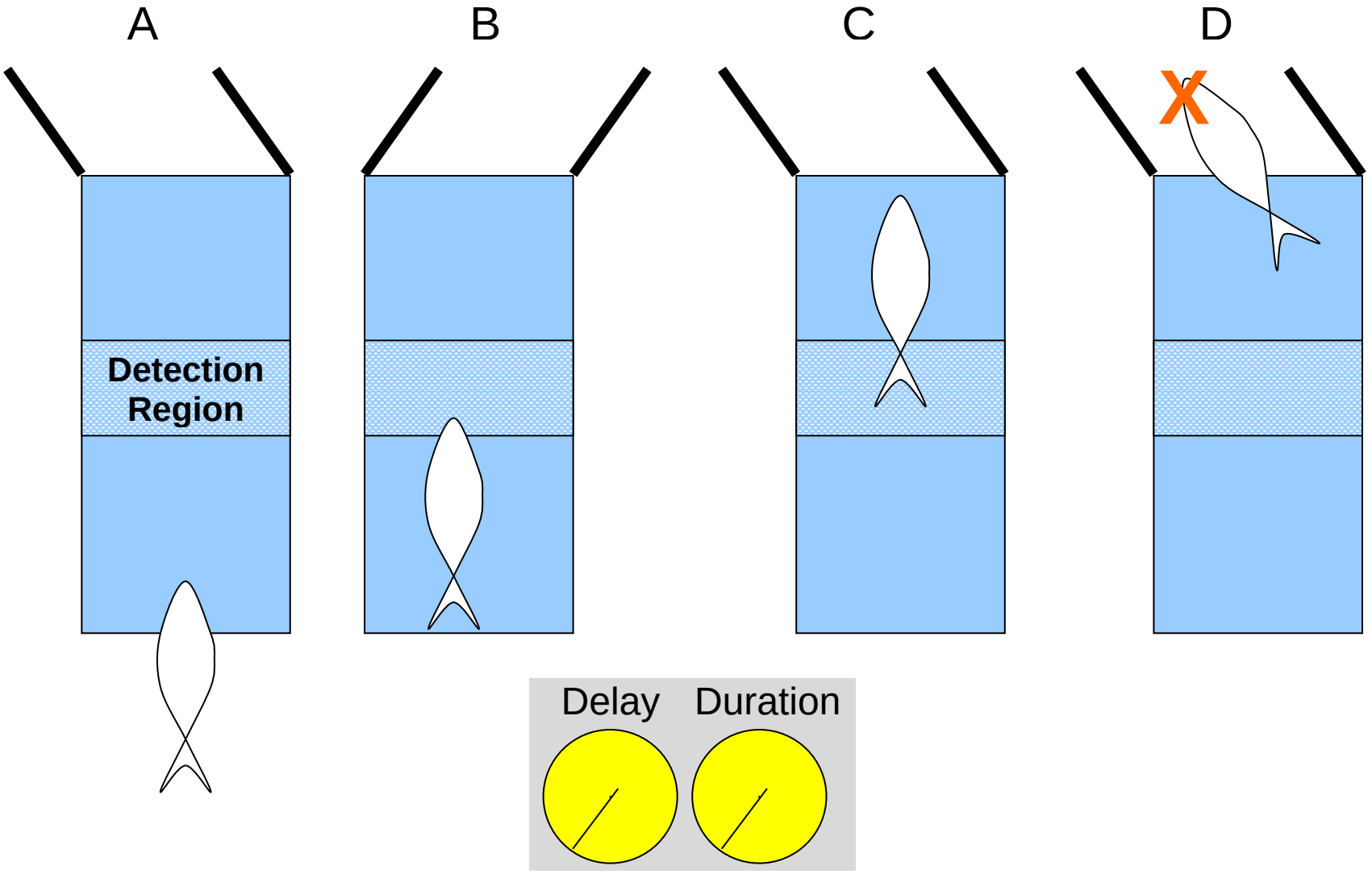

Figure 4: Incorrect Diversion. Here, the sampler has set the gate delay to the maximum (i.e. the gate will not switch for the maximum amount of time), and the gate duration at the minimum. The result is the same as setting the gate delay at the maximum. (A) The fish is put into the detector and (B) the tag is detected as soon as the fish reaches the detection region, but there is a delay between the detection and when the gate switches. (C) The fish reaches the gate and is incorrectly diverted before the gate switches. (D) After the fish is out of the detector, the gate switches and remains open for the minimum time.

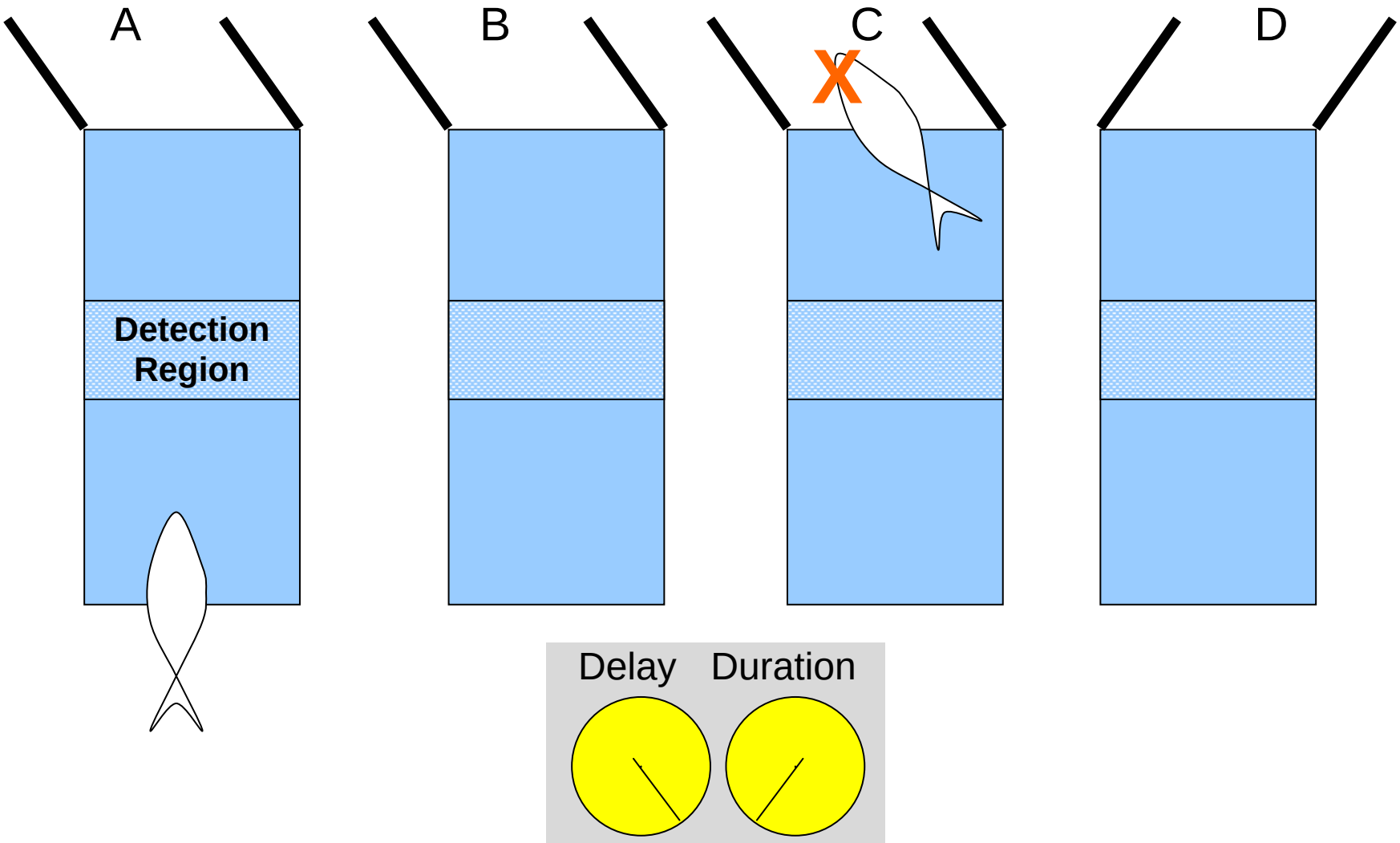

Figure 5: Incorrect Diversion. In this scenario, the detector is correctly set up, but (A) the fish is put in tail first. (B) The tag is not detected until the snout reaches the detection region. If this is a larger fish, the tail will already be going out the gate to the untagged side, and the fish will be incorrectly diverted before (C) the gate switches.