

Removing an ABS sensor (rear) on a Citroen XM

The ABS sensor design using a plastic sensor in an aluminium alloy casting is just asking for trouble. Water penetrates into the gap between the plastic and the aluminium and corrodes the aluminium. The resultant aluminium oxide in crystalline form takes up more room than the original aluminium metal. The only place for the increased volume of material is to invade the sensor space and crush the sensor housing.

You can see the damage to the sensor here:

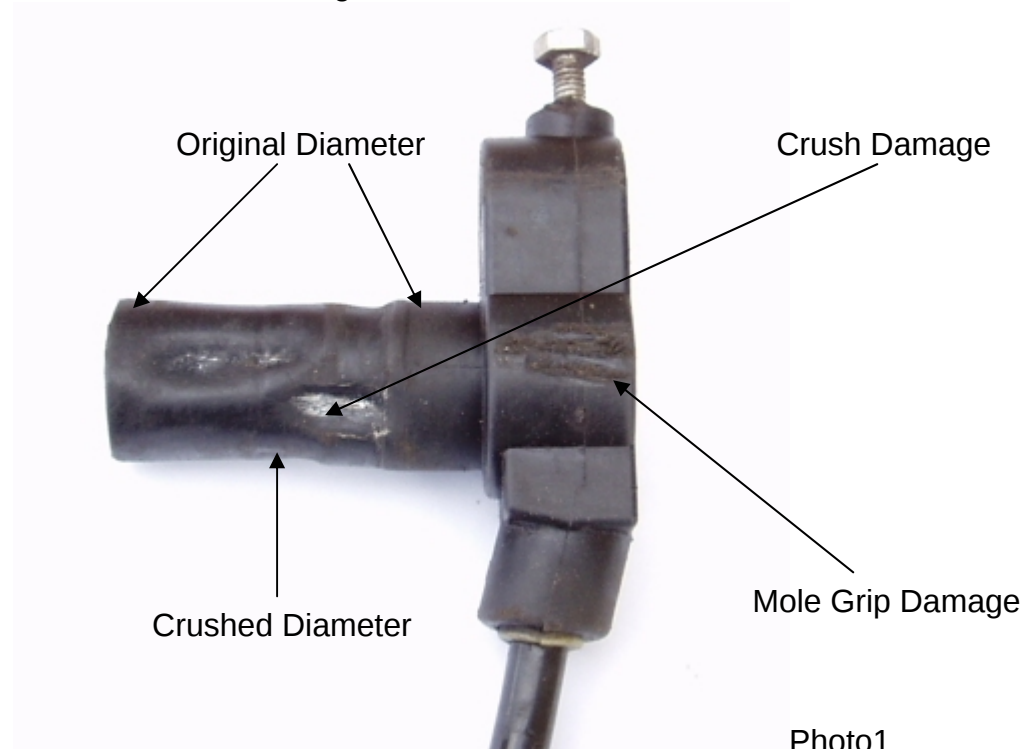
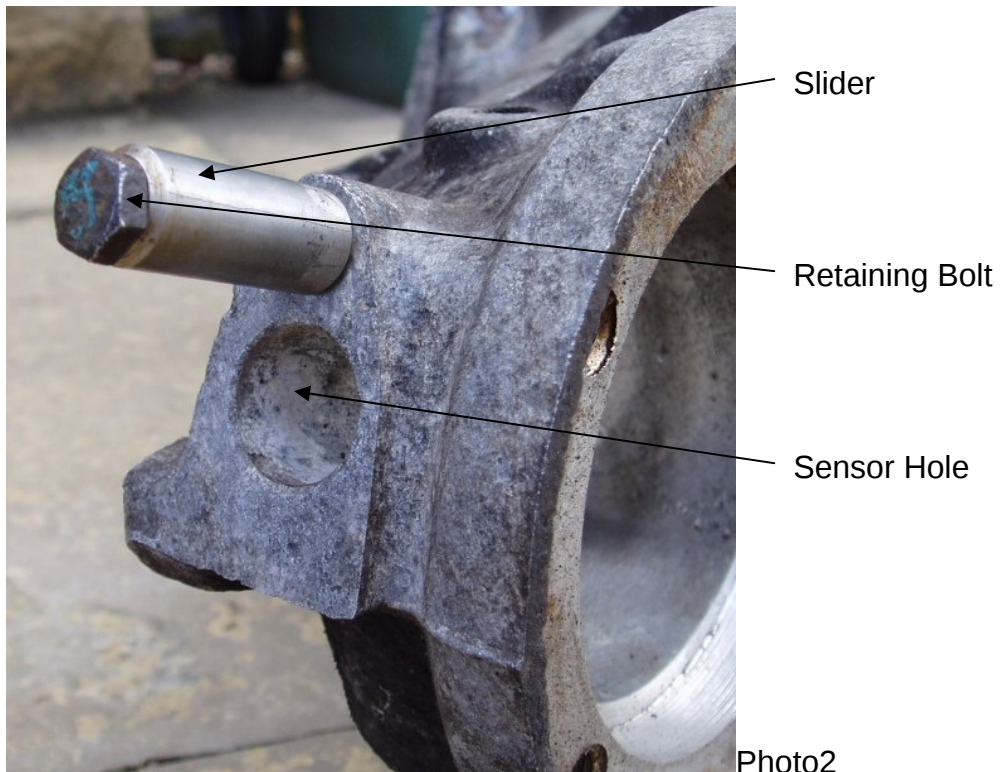


Photo1

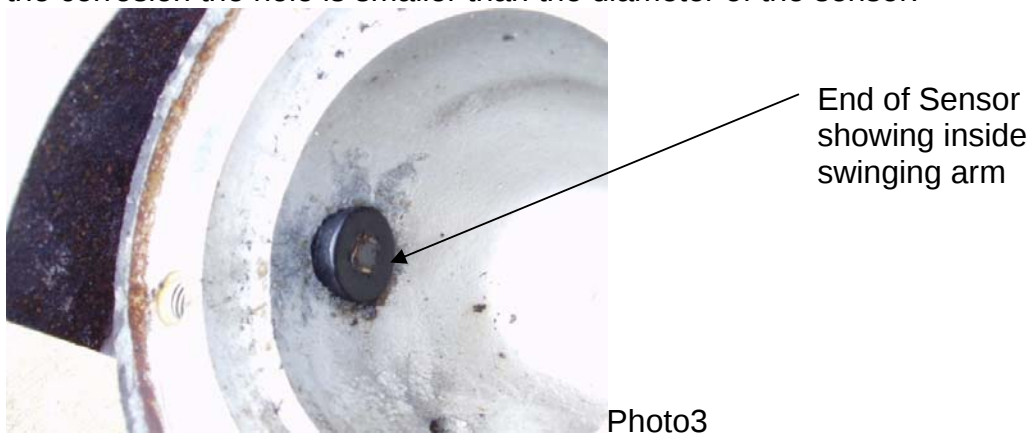
Note the original diameter of the sensor, the crushed diameter as it passed through the aluminium and the small part of the sensor to the left which has retained its original shape/size. The teeth marks on the body in the middle to the right are the marks from the mole grips used to extract the sensor. Given time, more care could be taken to avoid these marks but they are not detrimental to the operation of the sensor.

How the sensor is fitted to the swinging arm

When the sensor is new, it's a sliding fit through the hole in the swinging arm. In order to keep the sensor the specified distance from the toothed wheel it must be able to be adjusted. This is achieved by allowing the sensor to slide in and out of the hole towards and away from the toothed wheel respectively. When the sensor is in the right location the small locking screw at the top of the sensor at right angles to the slider is tightened. This grips the slider barrel and keeps the sensor stationary. The slider itself is bolted to the swinging arm by an M6 bolt. The dust shield has been omitted from the photograph for clarity.



The end of the sensor which protrudes through to the other side of the aluminium remains in its original shape and diameter. Subsequently when you try to extract the sensor through the hole it offers a lot of resistance. Due to the corrosion the hole is smaller than the diameter of the sensor.



The order of the components can be seen here:

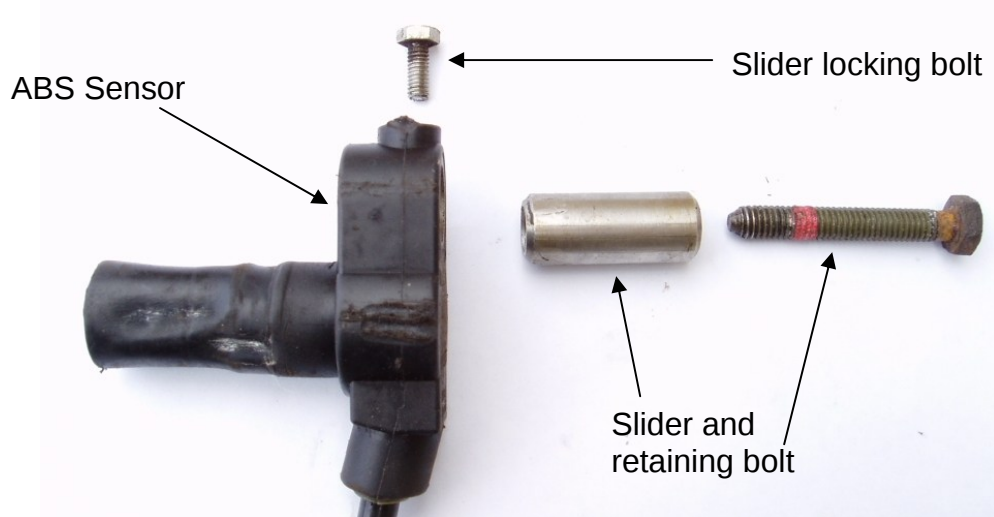


Photo4

To remove the sensor from the swinging arm:

(this assumes that the wheel, brake disk, hub and bearing have all been removed to reveal the other end of the sensor shown in photo3)

Firstly, remove the M3 bolt on the top of the sensor which holds the sensor in the right place.

Next, remove the M6 bolt which holds the slider on to the swinging arm. At this point the slider will be stuck inside the sensor housing.

Next, grip the end of the slider with a pair of mole grips and rotate. The slider will begin to rotate. Working back and forth, slowly extract the slider from the sensor housing until it is completely removed.

Next heat the aluminium with a blowtorch or oxyacetylene torch and spray the sensor on both sides with release oil. This will have to be done several times. Grip the sensor body with mole grips and attempt to rotate. Remember the body is plastic. If you force it too much the sensor will break and have to be drilled out. This process may take several hours during which the release oil is slowly penetrating the aluminium oxide to free the sensor. I didn't manage to rotate the sensor very far. You can see the indentations in the plastic in photo1. These were full of aluminium oxide stuck to the swinging arm and thus prevented the sensor from rotating more than 5-10 degrees in either direction. Keep trying to rotate the sensor until you can feel the other end moving.

If possible use a small file or Dremmel type tool to shave off some of the plastic housing inside the swinging arm. This will aid the removal as it passes through the now reduced size hole.

Once the sensor is relatively free moving, even over the restricted rotational range, use a drift and slowly hammer on the end of the sensor pushing it out of the hole. The sensor is plastic so it will deform enough to clear the hole. The sensor is now removed.

Refitting the sensor

Refitting is the reverse of removal as they say.

Clean out the hole in the swinging arm thoroughly getting rid of all the aluminium oxide.

If refitting the old sensor, just clean it up as best you can again getting rid of as much aluminium oxide as possible.

The sensor will no longer be a tight fit in the hole but it won't affect its operation. The exact position of the sensor in relation to the toothed wheel is determined by the solidity of the slider and the small bolt to hold the sensor in the right position.

Make sure that the inside of the hole in the swinging arm is painted with something to prevent the water getting to it again.

Make sure that the sensor is either well greased or covered in some waterproof, non-setting goo of some sort.

Having replaced the hub with the toothed wheel, the dust shield and the slider, push the sensor back into the hole. Push it all the way in until it hits the toothed wheel.

Pull the sensor back out of the hole by the required distance (0.6 – 1.8mm).

Tighten the M3 fixing bolt to lock the sensor in position.