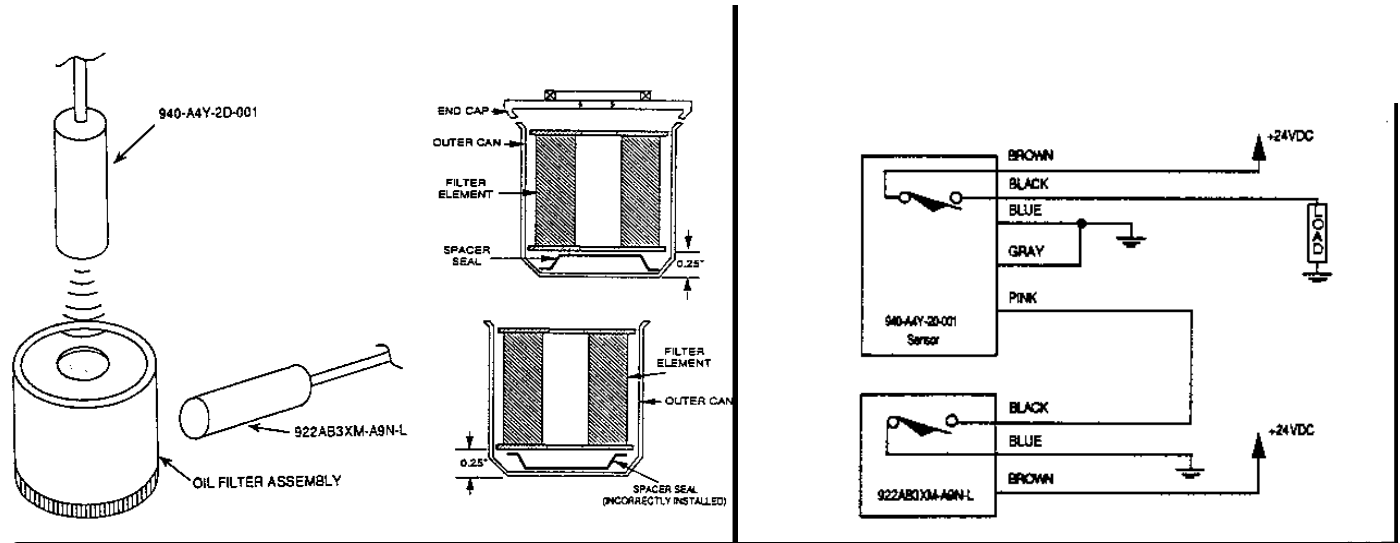


Inspection of Oil Filters

ULTRASONIC

AP 00202



PRODUCT

940-A4Y-2D-001 Ultrasonic Sensor
 923AB3XM-A9N-L 188mm Proximity Sensor- used to gate the ultrasonic

APPLICATION DESCRIPTION

A customer manufactures several sizes of automotive oil filters. The filters are assembled by starting out with the empty can running down the conveyor. At the first station, the spacer seal is dropped into the can. The next operation installs the element. The final operation is pressing the end cap into the can and sealing the oil filter. Just prior to the sealing of the endcap, an inspection process must check the position of the spacer seal while the filter element is installed.

The oil filter and the spacer seal are both made of shiny steel. The filter element has center hole of 1.25" diameter. The filter element height does not indicate whether the seal is in place or not.

Inductive processing sensors can not be used due to the distance required. Photoelectric controls can not be used because the spacer seal is made of a very shiny steel. Solutions use the 940 Series Ultrasonic Sensor. The accuracy of this sensor is +/- 2mm. The ultrasonic is not affected by the shine of the metal. Both sides of the spacer target present a good flat target for the sensor. The narrow beam diameter of the sensor when operated in the maximum rate mode is only 6 degrees. Therefore, the sensor can send the ultrasonic beam down the inside of the filter

element without getting any interference from the side walls of the element. A second sensor either photoelectric, or proximity, should be used to gate the position of the filter. The ultrasonic sensor should be in line with the center of the filter element to take its measurement