



AW-LAKE
PROCESS FLOW MEASUREMENT



APPLICATION SPOTLIGHT

Bi-Directional Positive Displacement Flow Meters Used to Track Exact Cylinder Position in Mobile Vehicles



Bi-Directional Positive Displacement Flow Meters Used to Track Exact Cylinder Position in Mobile Vehicles



APPLICATION:

AW-Lake has successfully used bi-directional positive displacement flow meters to precisely determine automotive wheel position or other mechanical appendages within an engine. By measuring the direction and volume of hydraulic fluid within the cylinder, the exact position of wheels can be pinpointed.

This particular application measured the position of tractor wheels during operation. Measurement of this operation was incredibly important to the end user to determine vehicle position for an auto-steering system. By not only relying on their GPS signal, vehicle position could be controlled to within inches, not feet. This meter and sensor application exceeded the customer's expectations based on the accuracy consistently met and the ease of installation. Also, by calibrating the meter as often as needed, there was virtually no drift experienced at all.

PRODUCT SUPPLIED:

- JVM-30BBV-NS Positive Displacement Gear Flow Meters with custom integral sensor.

CHALLENGE:

It is important to continually calibrate the full stroke of the cylinder to the pulse count of the meter to eliminate drift, which is inherent to flow measurement. This is accomplished simply by establishing a static, consistent position within that cylinder that is recorded and checked periodically. This re-calibration can be set to

occur as frequently as determined necessary by the end user, depending upon their requirements. Because the volume of hydraulic fluid within an engine's cylinder remains constant, this method of cylinder positioning is very accurate and long-lasting.

SOLUTION:

AW Flow Meters manufactures the JV Series of positive displacement meters, particularly well-suited for this application due to their ability to maintain consistent accuracy despite changing viscosity conditions. The basic principal the PD meter runs on is that of a gear pump, but in reverse. The medium flowing through the meter drives the gears inside. A non-intrusive sensor detects that movement and produces a square wave pulse for each gear tooth. The bi-directional meter not only measures the amount of fluid, but the direction of the flow as well. The JV Series meter's solid construction and excellent dynamic response are well suited to the measurement of non-abrasive lubricating fluids, such as in this application, and is available in both stainless steel and high-strength aluminum.

RESULTS:

The manufacturer is highly satisfied with the custom solution designed by AW-Lake and has standardized on the JVM PD meter.