



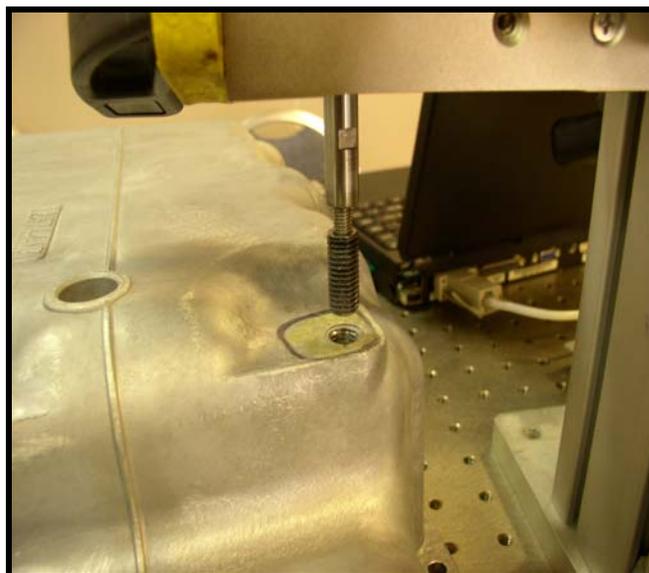
100% Automated Thread Gauging

Strict specifications and acceptance of automotive parts has greatly increased over the past several years. Thread inspection is no exception. Up until recently the common practice has been the use of Eddy Current Probes, lasers, proximity sensors or a vision system. These systems have been successful to some degree in the past but today's end customers need to know more than just the presence of threads. Whether it is blind holes or thru holes, SMAC Linear with Rotary actuators provide a very cost effective solution for 100% inspection and all of the data from the test can be collected by the user letting them know why the part was failed. SMAC automates this basic simple and proven method as well as adds the following checks.



Left: close-up of thread gage mounted on tip of a SMAC LAR Actuator.

Below: A machined automotive part being Thread checked with an SMAC LAR55-100.



Problem	SMAC solution
	Note: For the description below the SMAC actuator is vertical, shaft pointing down.
No threads present or mis-located thread.	After the SMAC has extended and soft-landed on the surface, the rotary motor is run in reverse and a small linear extending force is exerted. If there is no change in linear movement up or down after two turns then the part is failed, as the first thread has not been found. If the thread aligns, there will be a sudden difference in the linear position. (The tapped threads have been located and engaged.)
Cross threading/ Broken Tap, etc.	Rotary torque monitoring while threading into the hole registers an "Over Torque Limit" value indicative of cross threading, a broken tap or excessive debris in the hole prior to reaching specified linear depth and/or rotary turns.
Shallow hole	The starting linear and rotary position is registered at the top of the hole when the threads are aligned, and compared with the final position at the bottom of the hole. The part is rejected if the value is outside of the specified, preset tolerance.
Number of Turns & Thread Depth	The actuator can learn both the linear and rotary location of the beginning thread each time it starts the check. We therefore monitor the rotary to determine the number of threads, and the linear position to determine the depth of thread. This information is available to the user for data collection, etc.
Oversized Thread, Worn or Damaged Tap	After the thread gauge tip has been inserted a pre-set distance/number of turns, the rotary is stopped and the linear motor performs a push/pull (linear) motion to measure micron movement. If this reading is outside the preset window, the part is rejected. This step can be performed at the top and/or bottom of the hole.