

CLOCK SPRING®

Application Note Clock Spring® Marker

Introduction

Pipelines require periodic inspection to detect imperfections in the wall of the pipe that could lead to subsequent failure of the pipeline. This inspection is done by several methods, the most common of which is running an inspection tool through the pipe. These tools are designed to inspect the steel for imperfections by use of various technologies including, but not limited to, ultrasonic and magnetic flux leakage. Magnetic flux leakage is the most common technology used for this inspection task.

It is valuable for a pipeline operator to be able to detect prior repairs on subsequent inspection so that time is not spent determining the disposition of a defect detected by the inspection equipment. The older more traditional repairs are identifiable in the magnetic flux leakage inspection tool data but the Clock Spring® composite repairs are invisible to this technology.

This procedure provides a means by which a magnetic flux leakage inspection tool can detect Clock Spring® composite repairs. Having the Clock Spring® identified in the tool data provides definitive information about previous repairs and serves to identify locations that may be used to verify tool performance. Detailed measurements of the defect should be acquired before installation of the Clock Spring®. This information should then be filed for future reference. On subsequent inspections, this information can confirm the performance of the inspection tool or be used to help calibrate the inspection tool for better data analysis.



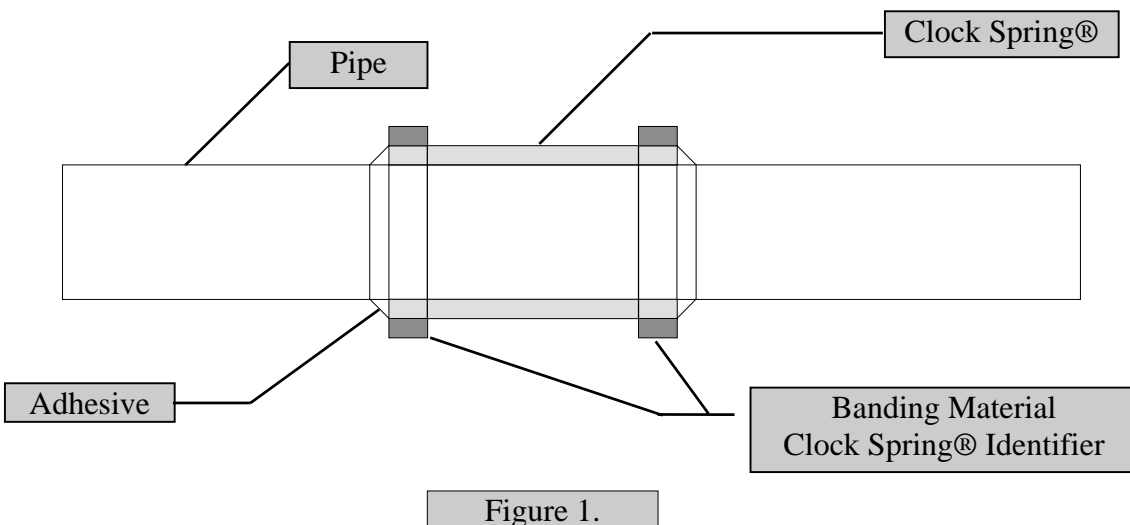
Procedure

The procedure outlined is only effective for Magnetic Flux Leakage (MFL) inspection tools. Because of the varying performance of inspection tools, no guarantee is given or implied. This method has been demonstrated to be effective.

1. Measure the external defect and record results for future reference.
2. Install the Clock Spring® using standard installation procedures.
3. Wrap five (5) layers of steel banding material on top of the Clock Spring® at each end. (See Figure 1.) The banding material is standard 1.25" x .031" steel strap used for material shipping. (Groves Industrial Supply #14031)
4. Coat and back-fill.

The purpose of this procedure is to place additional metal in close proximity to the pipe. Magnetic Flux Leakage (MFL) inspection tools can detect this additional metal and thus provide a Clock Spring® reference signal in the recorded data.

Figure 1 shows metal banding placed on top of the Clock Spring®. While this ensures that the banding is insulated from the pipe, it does require additional material. Alternatively, the metal banding can be placed on the pipe immediately outside the Clock Spring®. In this case, three (3) wraps of banding can be used. The banding in this case should be insulated from the pipe by a thin membrane. Banding in this position will be easier for the inspection tools to detect and is most likely to generate an easily recognizable signal in the data.



Inspection data showing Clock Springs identified by banding material.

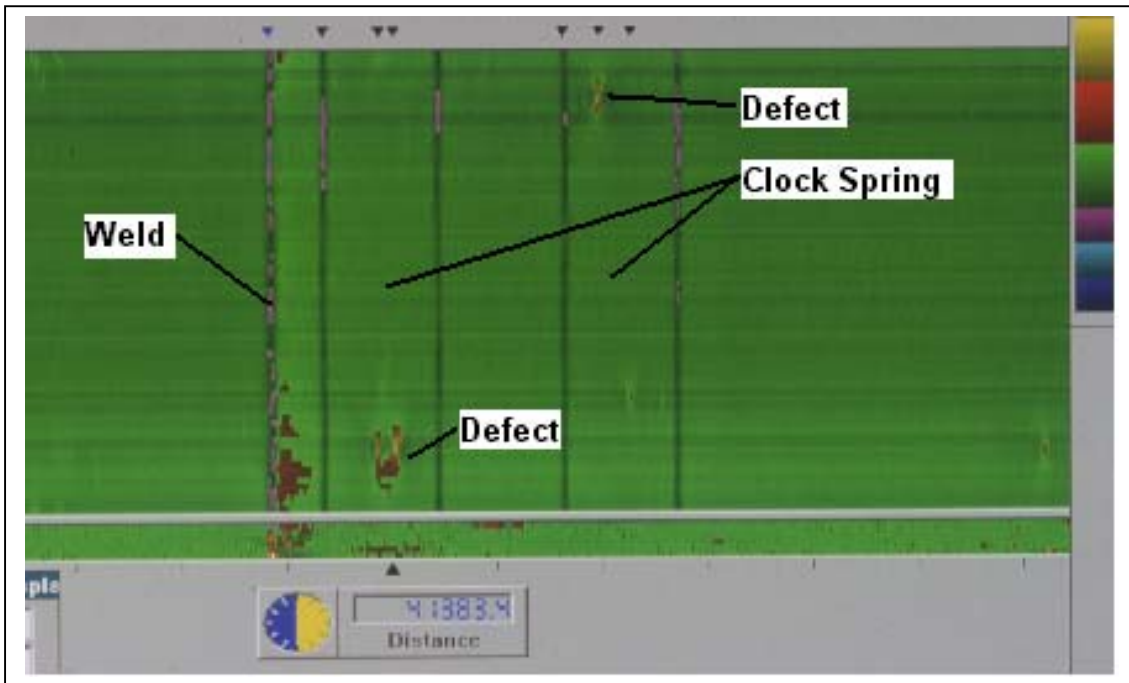


Figure 2
MFL Data Showing Clock Spring® Repairs

Figure 2 shows Tuboscope Magnetic Flux Leakage inspection data of two Clock Springs and a girth weld. The Clock Spring® composite repairs are identified by banding material placed on each edge of each unit. (Each Clock Spring® unit is nominally 1 foot wide.) The defects repaired with the Clock Springs are clearly shown in the data. The signals from the defect are unaffected by the Clock Spring® and can be used on subsequent inspections to calibrate the tool.

Simply the smartest pipeline repair decision you can make!

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