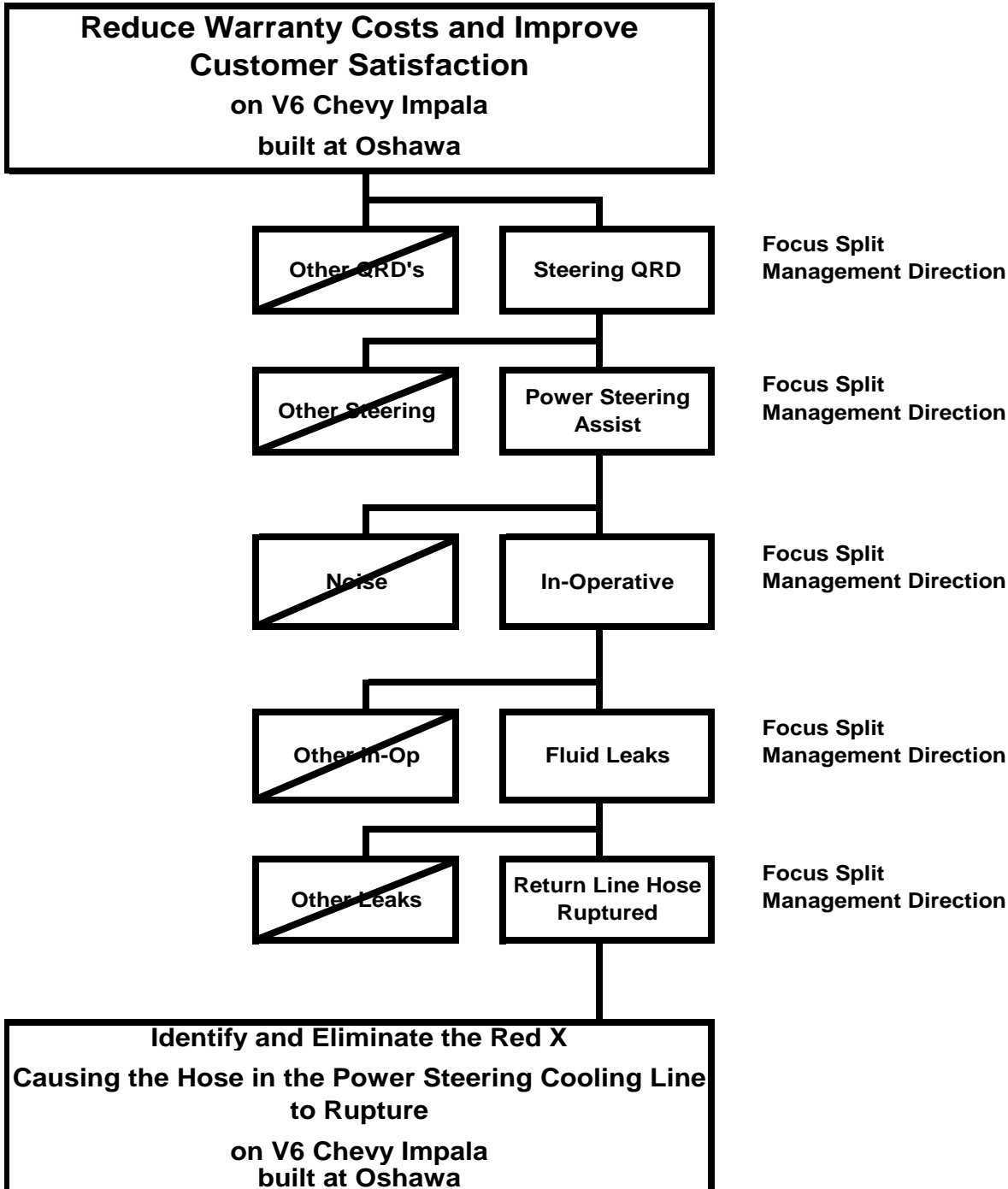


Statistical Engineering Summary Report

Chevy Impala Power Steering Cooling Line Hose Rupture

Problem Definition Tree

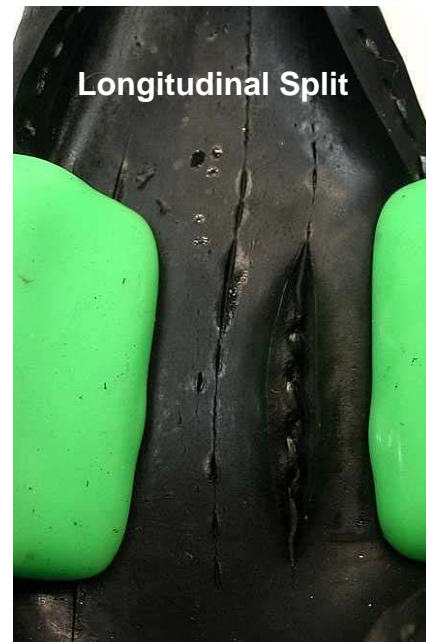
Chevy Impala V6 Power Steering Cooling Line Hose Rupture



Statistical Engineering Summary Report

Chevy Impala Power Steering Cooling Line Hose Rupture

Characteristics of Failure



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Project Summary

Problem Description:

A hose in the power steering return line is rupturing in service causing warranty claims for loss of power steering assist. This is only happening in northern climates in the winter on 2006 V6 Chevy Impala.

Project Description:

Identify and eliminate the Red X Causing the Hose in the Power Steering Cooling Line to Rupture on 2006 V6 Chevy Impala's.

Strategy:

Initially followed a Region to Region Same Hose Strategy to understand why the hose was failing in some areas and not others. Features on the interior surface of the inner tube, caused by the flexible mandrel used in the extrusion process, create a straight path along the length of the tube that a longitudinal split was using to propagate along. This mark is present in all hoses produced in the process and is not specific to just failing hoses. Currently utilizing a vehicle to vehicle strategy same model because of the concentration of failures in northern climates in winter.

Measurement System:

At this point I have not been able to make connectivity to a green Y which allows me to develop an variable measurement system.

Status of progress:

Vehicle data, physics, and developed data utilizing bench testing of hoses at ambient temperatures and cold temperatures have identified a set of variables which need to be tested. This failure is most likely an interaction of several variables, testing can begin as soon as the test stand and fixture has been built. Variables which need testing include pressure, cold, alternating hot and cold cycles, and axial stress as contraction occurs. In addition there is a possibility that the strength properties of the hose have been compromised by introduction of contamination between the inner tube and the cover while in the vehicle.

Some combinations of variables can be tested on equipment which can be built in a matter of hours this afternoon and I should be able to run some preliminary testing later today and tomorrow.

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