

23 September 1998

Saint Switch Test Plan TP-1018

Structural Validation Plan for the RL9-K008 REALLOCK_{TM}

References: “P”RL9-K008 “M” drawing, Revision 1

Objective:

The objective of this test plan is to specify the test procedure to verify that the REALLOCK_{TM} RL9-K005 meets the following requirements:

- 1 - 65 lbs-ft of fastener tightening torque
- 2 - 10 lbs-ft of resistive or back off torque at zero clamp load

Written by

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Objective:

The objective of this test plan is to specify the test procedure to verify that the REALLOCK_{TM} RL9-K005 meets the following requirements:

- 1 - 65 lbs-ft of fastener tightening torque
- 2 - 10 lbs-ft of resistive or back off torque at zero clamp load

Background:

The basic design of this REALLOCK_{TM} consists of a two part system, the upper or lobe part containing the lobes which locks the REALLOCK_{TM} to the nut and a lower part or spacer containing the key to lock the REALLOCK_{TM} to the threaded shaft. The two parts are nested using a non circular boss on the spacer and the corresponding opening in the lobe part to prevent relative rotation between them. The two parts are welded together as a matter of convenience for shipping, handling and installation.

The upper or lobe part consists of six lobes which act in pairs. Two lobes are always in contact with the flats of the nut. Four are either partially compressed or not in contact with the nut.

The following table summarizes the capabilities of “P”RL9-K008:

Specification	Value
nut dimension across the flats	.741 to .752 inches
shaft thread	.500 inches
tightening torque	65 ft lbs max.
resistive torque of the lobes (no clamp load)	10 ft lbs min
compressive force to clear lobes from flats	128 lbs

Procedure:

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The procedure for the structural tests are as follows (the test fixture will be similar to that in the photographs at the end of this report):

Test 1: Back off torque measurement with nut tightening torque at 65 lbs-feet (nominal clamp load)

- 1 - record date code or job order reference in Table 2 of the data summary sheet.
- 2 - insert REALLOCK_{TM} on the slotted and threaded shaft
- 3 - insert the shaft in the internally threaded cylinder a minimum of 5 turns and lock to prevent shaft rotation
- 4 - turn the nut finger tight into the REALLOCK_{TM}
- 5 - apply torque to the test value of 65 lbs-ft. Record final value using a torque wrench. Record the approximate degrees of rotation between finger tight and final torque reading in Table 2 on the data summary sheet.
- 6 - loosen nut with the torque wrench until flats are against two of the lobes. Record the torque value in Table 2 on the data summary sheet.
- 7 - loosen nut with the torque wrench until failure of the lobes, i.e., when the lobes are permanently deformed. Record the torque value in Table 2 on the data summary sheet.
- 8 - remove nut and REALLOCK_{TM} from the threaded shaft and record the condition of the internal key of the REALLOCK_{TM} in Table 2 on the data summary sheet

Test 2: Back off torque measurement with nut secured in one pair of lobes but not tight against the flat of the REALLOCK_{TM} (minimum clamp load condition).

- 1 - record date code or job order reference in Table 3 of the data summary sheet.
- 2 - insert REALLOCK_{TM} on the slotted and threaded shaft
- 3 - insert the shaft in the internally threaded cylinder a minimum of 5 turns and lock to

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prevent shaft rotation

- 4 - turn the nut finger tight into the REALLOCK_{TM}
- 5 - apply torque to a maximum of 5 lbs-ft. Record final value using a torque wrench.
Record the approximate degree of rotation between finger tight and final torque reading in Table 3 of the data summary sheet.
- 6 - loosen nut with the torque wrench until flats are against two of the loads. Record the torque value in Table 3 of the data summary sheet.
- 7 - loosen nut with the torque wrench until failure of the lobes, i.e., when the lobes are permanently deformed. Record the torque value in Table 3 of the data summary sheet.

Three samples of the RL9-K008 REALLOCK_{TM} will be used for each of the above tests for a total of six tests.

Equipment Required:

CDI Dial Torque Wrench (0-100 lbs-ft scale)
REALLOCK_{TM} structural test fixture

Data Summary Sheet

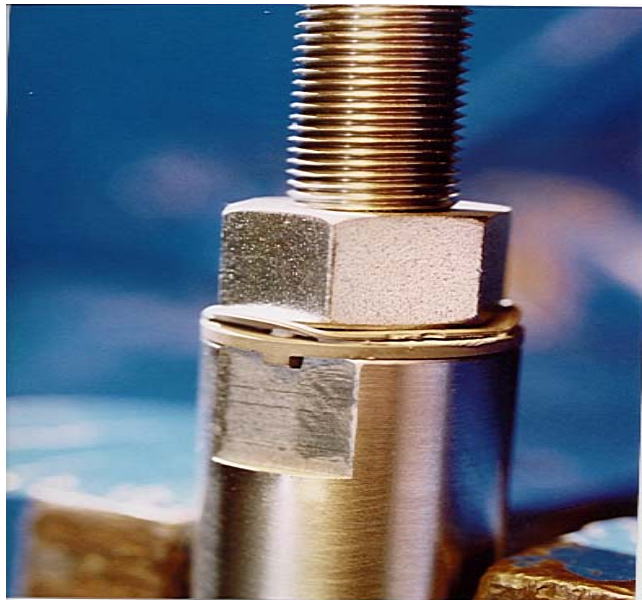
Table 1: Organizational Data	
Start Date	
Operator	
Completion Date	

Table 2: Test 1 Data Summary				
Operation	Operational Measurement	Sample 1	Sample 2	Sample 3
Step 1	Date Code/Job Order Reference			
Step 5	Final torque value			
	Degrees of Rotation from finger tight			
Step 6	Torque measurement			
Step 7	Torque Value			
Step 8	Condition of internal key			

Table 3: Test 2 Data Summary				
Operation	Operational Measurement	Sample 1	Sample 2	Sample 3
Step 1	Date Code/Job Order Reference			
Step 5	Final torque value			
	Degrees of Rotation from finger tight			
Step 6	Torque measurement			
Step 7	Torque Value			

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