PRODUCT ADVISORY NOTICE

KEEPING YOU INFORMED OF PRODUCT CHANGES

To: **All Customers, Sales Representatives and Distributors**

Date: **September 27, 2016**

Subject: **Re-tooling 62S Series 16 Position Bushing**

Please forward this notification to the appropriate person(s) in your organization.

Description of Change

Grayhill has re-tooled the 62S series 16 position die cast bushing due to excessive wear on the existing tool. Grayhill has also made a very slight change to the detent profile to improve torque at the end of encoder life. See attached drawing. This change does not affect the initial torque specifications.

Grayhill has successfully completed qualification testing on encoders built with bushings from the new tool. The qualification consisted of an approved supplier PPAP and rotational life testing to the rated cycle life.

Reason for the Change

The die cast bushing had to be re-tooled since the old tool is reaching its end of life.

Test reports summarizing our qualification testing is attached. No change to the form, fit, or function of the encoders will take place.

Effective Date
9/19/16

Part Numbers Affected

62S22-XX-XXX					

Action Required
No action required. Please contact your Grayhill, Inc. customer advocate for further information or to request a sample. The qualification test report can be found on our website at: http://www.grayhill.com/about-us/product-advisory-notices/

Grayhill INC.
Intuitive Human Interface Solutions

Device Under Test:
62S22-H9-020C

Environmental Test:

Physical Test:
Rotational Life

Test Report Number:	**SP02-1491**
Test Start Date:	**04/05/2016**
Test Completion Date:	**05/09/2016**
Test Facility:	**Grayhill Inc.**
Test Requested By:	**Eric Tan**
Test Performed By:	**Greg Dombrowski** **Laboratory Technician**
Report Written By:	**Greg Dombrowski** **Laboratory Technician**
Report Approved By:	**Nicole Jachna** **Quality Lab Manager**

1.0 ROTATIONAL LIFE

Test	Specification	DUT Part Number	DUT Serial Number	Test Location	Test Date
Rotational Life	PS62	62S22-H9-020C	1-29	Grayhill Inc.	04/05/2016 – 05/09/2016

1.1. PURPOSE

Rotationally life test DUT with new Inventix bushing design

1.2. TEST SETUP DETAILS

1. Take initial torque readings
2. Program Smart Motors to rotate DUT at 30 RPM to intervals cycles of 100, 250, 500, 1,000, 2,000, 5,000, 10,000, 100,000, 250,000 and 500,000
3. Mount DUT on test fixture using maximum mounting torque.
4. Check torque readings after each specified interval cycles
5. Torque readings should not be more than 50% of initial readings for the duration of testing and final
6. Perform a final visual inspection and a final torque test.

Table 1 – Equipment List

Equipment ID	Equipment Type	Model Number	Manufacturer	Calibration Due Date
PAL-7	Torque Sensor	BGI	Mark-10	08/2016
GT-400	Torque Wrench	CAL-36/4 Roto Torq	Sturtevant Richmont	04/17
RLS-62 w/fix #12	Rotational Life Cycle Assy.	N/A	Grayhill	N/A
RLS-101 w/fix #100	Rotational Life Cycle Assy.	N/A	Grayhill	N/A
RLS-43 w/fix #36	Rotational Life Cycle Assy.	N/A	Grayhill	N/A

Table 2 – Test Conditions

Test Condition	Units	Parameters
Quantity	DUT	29
Operational Mode		Unpowered
Cycles		500K cycles in CW/CCW
Rotational Speed	RPM	30
Temperature	°C	23
Relative Humidity	%	30

1.3. ACCEPTANCE CRITERIA

There shall be no physical damage to the DUT and torque readings shall not exceed 50% of initial during and after test.

1.4. TEST RESULTS

After 500K cycles all DUTs passed.

Table 3 – Test Results

DUT	100 Cycles Torque	250 Cycles Torque	500 Cycles Torque	1K Cycles Torque	2K Cycles Torque
1	Pass	Pass	Pass	Pass	Pass
2	Pass	Pass	Pass	Pass	Pass
3	Pass	Pass	Pass	Pass	Pass
4	Pass	Pass	Pass	Pass	Pass
5	Pass	Pass	Pass	Pass	Pass
6	Pass	Pass	Pass	Pass	Pass
7	Pass	Pass	Pass	Pass	Pass
8	Pass	Pass	Pass	Pass	Pass
9	Pass	Pass	Pass	Pass	Pass
10	Pass	Pass	Pass	Pass	Pass
11	Pass	Pass	Pass	Pass	Pass
12	Pass	Pass	Pass	Pass	Pass
13	Pass	Pass	Pass	Pass	Pass
14	Pass	Pass	Pass	Pass	Pass
15	Pass	Pass	Pass	Pass	Pass
16	Pass	Pass	Pass	Pass	Pass
17	Pass	Pass	Pass	Pass	Pass
18	Pass	Pass	Pass	Pass	Pass
19	Pass	Pass	Pass	Pass	Pass
20	Pass	Pass	Pass	Pass	Pass
21	Pass	Pass	Pass	Pass	Pass
22	Pass	Pass	Pass	Pass	Pass
23	Pass	Pass	Pass	Pass	Pass
24	Pass	Pass	Pass	Pass	Pass
25	Pass	Pass	Pass	Pass	Pass
26	Pass	Pass	Pass	Pass	Pass
27	Pass	Pass	Pass	Pass	Pass
28	Pass	Pass	Pass	Pass	Pass
29	Pass	Pass	Pass	Pass	Pass

Table 4 – Test Results

DUT	5K Cycles Torque	10K Cycles Torque	100K Cycles Torque	250K Cycles Torque	500K Cycles Torque
1	Pass	Pass	Pass	Pass	Pass
2	Pass	Pass	Pass	Pass	Pass
3	Pass	Pass	Pass	Pass	Pass
4	Pass	Pass	Pass	Pass	Pass
5	Pass	Pass	Pass	Pass	Pass
6	Pass	Pass	Pass	Pass	Pass
7	Pass	Pass	Pass	Pass	Pass
8	Pass	Pass	Pass	Pass	Pass
9	Pass	Pass	Pass	Pass	Pass
10	Pass	Pass	Pass	Pass	Pass
11	Pass	Pass	Pass	Pass	Pass
12	Pass	Pass	Pass	Pass	Pass
13	Pass	Pass	Pass	Pass	Pass
14	Pass	Pass	Pass	Pass	Pass
15	Pass	Pass	Pass	Pass	Pass
16	Pass	Pass	Pass	Pass	Pass
17	Pass	Pass	Pass	Pass	Pass
18	Pass	Pass	Pass	Pass	Pass
19	Pass	Pass	Pass	Pass	Pass
20	Pass	Pass	Pass	Pass	Pass
21	Pass	Pass	Pass	Pass	Pass
22	Pass	Pass	Pass	Pass	Pass
23	Pass	Pass	Pass	Pass	Pass
24	Pass	Pass	Pass	Pass	Pass
25	Pass	Pass	Pass	Pass	Pass
26	Pass	Pass	Pass	Pass	Pass
27	Pass	Pass	Pass	Pass	Pass
28	Pass	Pass	Pass	Pass	Pass
29	Pass	Pass	Pass	Pass	Pass