



SOUTHWEST RESEARCH INSTITUTE®

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Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-4834



Calibration Laboratory
Certificate #0972-01

Certificate of Calibration

Cost Center / Customer: DIV20 / DON BANNON

Mail Stop: B57

Manufacturer/Model: PROTO / 6104

Description: TORQUE SCREWDRIVER

Serial Number: 139072

Asset Number: 009202

Procedure: TORQUE TOOLS - 14 JAN 11

Work Order: 303102554

Date Issued: 14-Jul-2011

Date Calibrated: 14-Jul-2011

*** Date Due :** 14-Jan-2012

**** Results:** FOUND-LEFT

Temperature: 69.0 °F

Humidity: 36 %RH

Barometer: N/A

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 2005, ANSI/NCSL Z540-1-1994 and relevant requirements of the ISO 9000-2000 standard. This certificate shall not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. This certificate shall not be used to claim product endorsement by Southwest Research Institute, American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government. Results of this calibration relate only to the instrument described above at the time of calibration and does not imply any long term stability of the instrument.

*Determined by the customer, does not imply the instrument will remain within tolerance as any number of factors may cause an out-of-tolerance condition before this date. **Data type found in this certificate or attached measurement report must be interpreted as: Found-left - adjustment and/or repair was not performed, As-found - data is before unit is adjusted and/or repaired, As-left - data is after adjusted and/or repaired was performed. The customer has sole responsibility for determination of in-/out-of-tolerance or compliance/noncompliance.

Measurement uncertainty calculated in accordance with the method described in the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM), for a confidence level of approximately 95 percent using a coverage factor of $k=2$.

Remarks: Cal'd Clockwise $\pm 6\%$

Standards Used

<u>Asset #</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Description</u>	<u>Cal Date</u>	<u>Due Date</u>
012699	CDI	2000-5-02	TORQUE TRANSDUCER 15 - 200 INOZ	16-May-2011	16-May-2012


Walt Hill

Laboratory Manager


Scott Kester

Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	303102554	Mfr:	Proto	Technician:	SRK
Asset No:	009202	Model:	6104	Type Data:	Found-left
Serial No:	139072	Type:	Torque Screwdriver 100 in•oz	Cal Date:	14-Jul-11
Remarks: Calibrated Clockwise Only					

Function/Range	Test Point	TI Reading	Difference	± Limit	± Uncertainty	Result	% Limit
Torque Clockwise	in•oz	in•oz	in•oz	in•oz	in•oz		
	20.0	20.0	0.0	1.2	0.56	Pass	0%
	20.0	20.0	0.0			Pass	0%
	20.3	20.0	-0.3			Pass	25%
	19.8	20.0	0.2			Pass	17%
	20.1	20.0	-0.1			Pass	8%
	20.0	20.0	0.0			Pass	0%
	19.9	20.0	0.1			Pass	8%
	19.8	20.0	0.2			Pass	17%
	20.0	20.0	0.0			Pass	0%
	19.8	20.0	0.2			Pass	17%
	19.9	20.0	0.1			Pass	8%
	20.0	20.0	0.0			Pass	0%
	20.0	20.0	0.0			Pass	0%
	19.8	20.0	0.2			Pass	17%
	20.0	20.0	0.0			Pass	0%
	20.0	20.0	0.0			Pass	0%
	19.6	20.0	0.4			Pass	33%
	20.2	20.0	-0.2			Pass	17%
	61.6	60.0	-1.6	3.6	0.58	Pass	44%
	62.3	60.0	-2.3			Pass	64%
	61.1	60.0	-1.1			Pass	31%
	62.0	60.0	-2.0			Pass	56%
	62.5	60.0	-2.5			Pass	69%
	62.1	60.0	-2.1			Pass	58%
	62.5	60.0	-2.5			Pass	69%
	62.3	60.0	-2.3			Pass	64%
	62.1	60.0	-2.1			Pass	58%
	61.6	60.0	-1.6			Pass	44%
	62.2	60.0	-2.2			Pass	61%
	62.1	60.0	-2.1			Pass	58%
	62.1	60.0	-2.1			Pass	58%
	61.9	60.0	-1.9			Pass	53%
	61.7	60.0	-1.7			Pass	47%
	62.5	60.0	-2.5			Pass	69%
	60.4	60.0	-0.4			Pass	11%
	61.4	60.0	-1.4			Pass	39%
	102.4	100.0	-2.4	6.0	0.62	Pass	40%
	102.5	100.0	-2.5			Pass	42%
	103.2	100.0	-3.2			Pass	53%
	101.2	100.0	-1.2			Pass	20%
	103.2	100.0	-3.2			Pass	53%
	103.9	100.0	-3.9			Pass	65%

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Measurement Report

Work Order:	303102554	Mfr:	Proto	Technician:	SRK
Asset No:	009202	Model:	6104	Type Data:	Found-left
Serial No:	139072	Type:	Torque Screwdriver 100 in•oz	Cal Date:	14-Jul-11

Function/Range	Test Point	TI Reading	Difference	± Limit	± Uncertainty	Result	% Limit
Torque Clockwise	in•oz	in•oz	in•oz	in•oz	in•oz		
	102.0	100.0	-2.0	6.0	0.62	Pass	33%
	104.0	100.0	-4.0			Pass	67%
	103.3	100.0	-3.3			Pass	55%
	102.9	100.0	-2.9			Pass	48%
	103.5	100.0	-3.5			Pass	58%
	103.1	100.0	-3.1			Pass	52%
	104.0	100.0	-4.0			Pass	67%
	103.9	100.0	-3.9			Pass	65%
	103.0	100.0	-3.0			Pass	50%
	103.7	100.0	-3.7			Pass	62%
	104.1	100.0	-4.1			Pass	68%
	102.1	100.0	-2.1			Pass	35%

END OF REPORT