



MULTIPHASE FLOW SECTION

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Mechanical and Materials Engineering Division

July 31, 2003

Mr. John Calvert
Mailcode VB-A4
NASA Kennedy Space Center
Kennedy Space Center, Florida 32815

Subject: Quick Look Test Report, SDRL 010
STEREO Tank Spin Tests
SwRI Project 18.06404, Contract NAS1003002

Dear John:

This letter constitutes the Quick Look Test Report, which is the project deliverable SDRL 010, and serves as a cover for the Test Log, SDRL 008.

Test Synopsis

The STEREO spin tests were split into two phases in accordance with the test plan. The sweep tests were conducted between June 23, 2003 and July 7, 2003. The steady sine dwell tests were conducted between July 14, 2003 and July 25, 2003.

Test Data

The sweep test data are summarized in the graphs in Attachment A. All of these tests were conducted at a spin rate of 114 rpm over a simulated nutation frequency range of 5.7 rpm to 102.6 rpm. The raw data were processed in a Mathcad® program in which a tracking filter was used to highlight the amplitude of the oscillating forces and torques at select frequencies. The results of the filtering process are presented here in the form of graphs produced in a Mathcad® worksheet. There are five graphs for each of the seven tank fill levels tested. The fill level for each set of graphs is indicated in the top right corner of each page in Attachment A. For example "FL=71" corresponds to the 71.2% fill level.

A sample of the steady sine dwell test results is found in Attachment B. These graphs show the load amplitudes computed from the raw data for both the rigid deadweight and the tank test article for only the 114 rpm spin rate. The results for the 106 rpm and 123 rpm spin rates are similar and are not shown for the sake of brevity.

Both the sweep and the steady sine dwell test results follow the expected trend with respect to the simulated nutation frequency (e.g., upper drive shaft speed). There is possibly a low amplitude resonance at fill levels greater than 61% at a frequency equivalent to 75% of the spin rate.

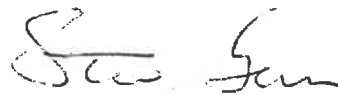


Closure

The features of the data that are presented here will be more fully investigated as the data processing continues and the slosh model parameters are deduced. The data processing methods developed earlier for the CONTOUR Spin Tests, including the resonating oscillator, can be applied to these data.

As always, you can contact me at 210-522-3519 or sgreen@swri.org, to discuss any questions you have with this report. The many technical questions that exist at this time will be the focus of the continuing data processing efforts here and will certainly be the topic of conversations between SwRI and NASA-KSC.

Sincerely,



Steve Green
Mechanical and Fluids Engineering

APPROVED:



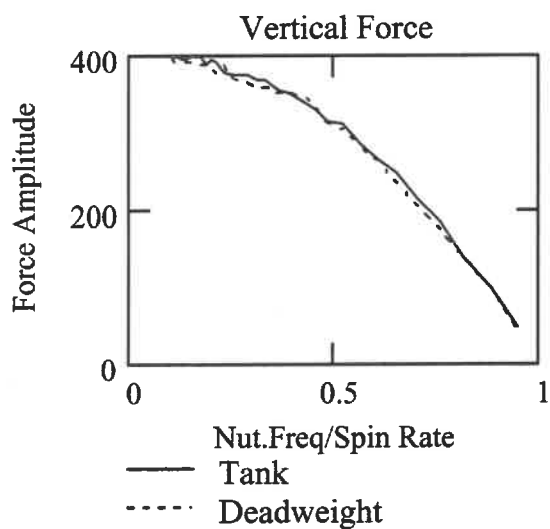
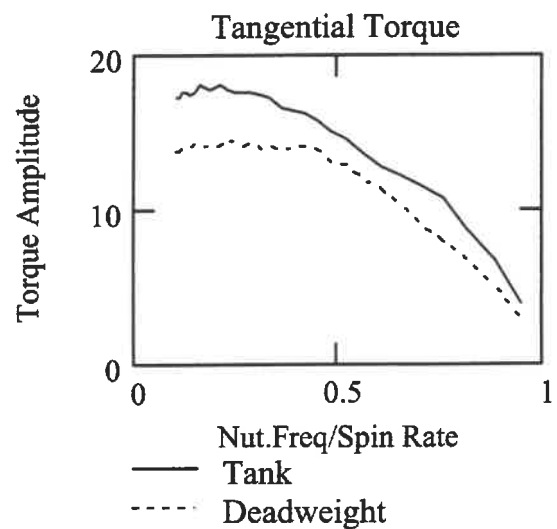
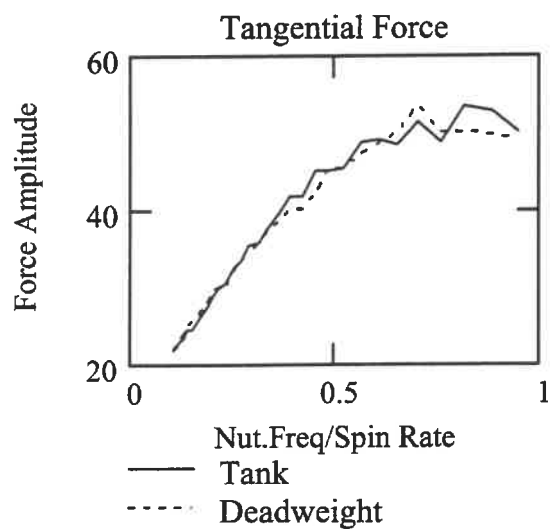
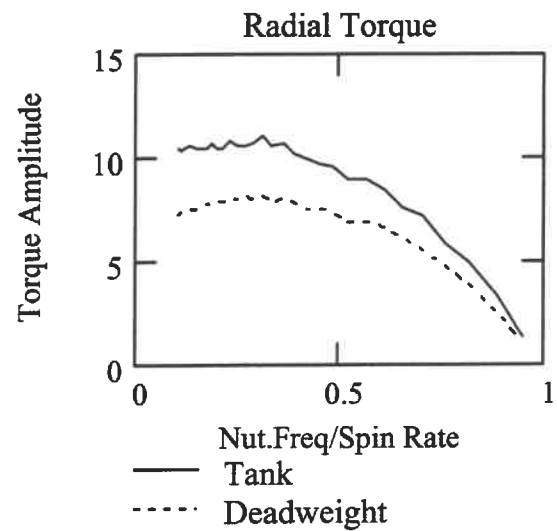
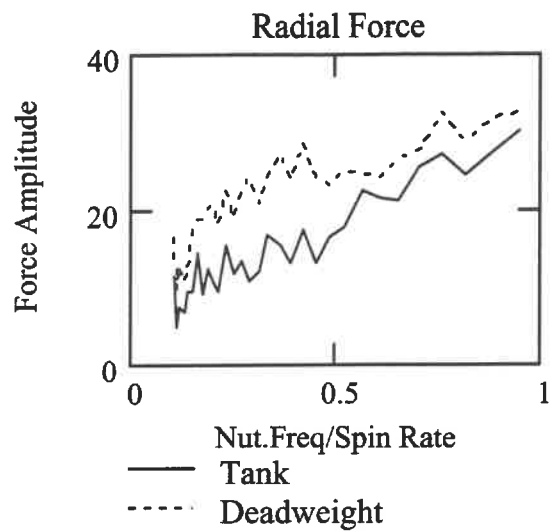
J. Christopher Buckingham
Manager, Multiphase Flow

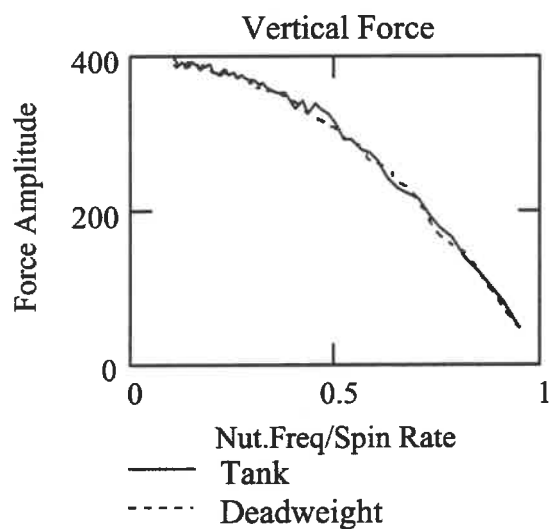
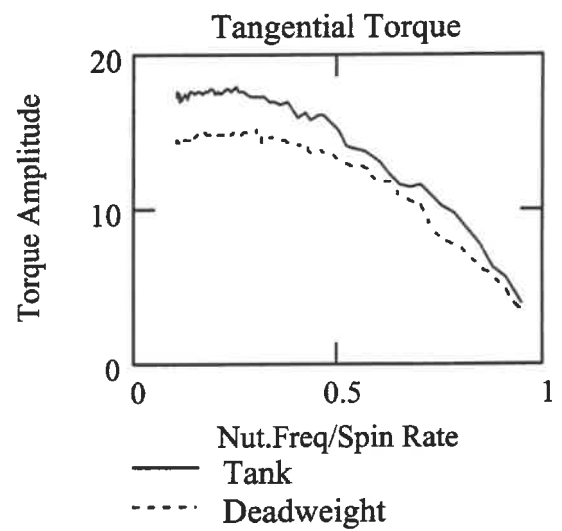
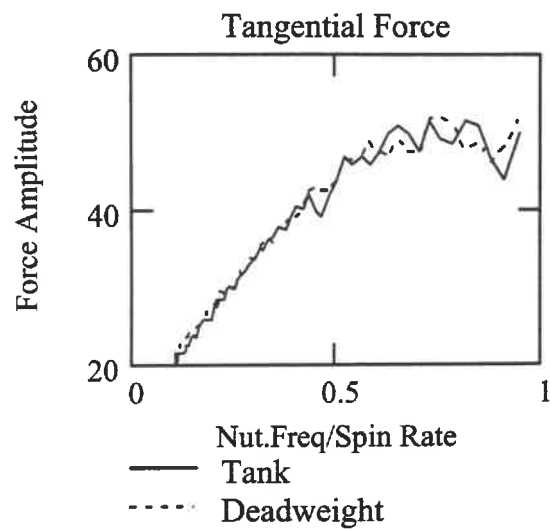
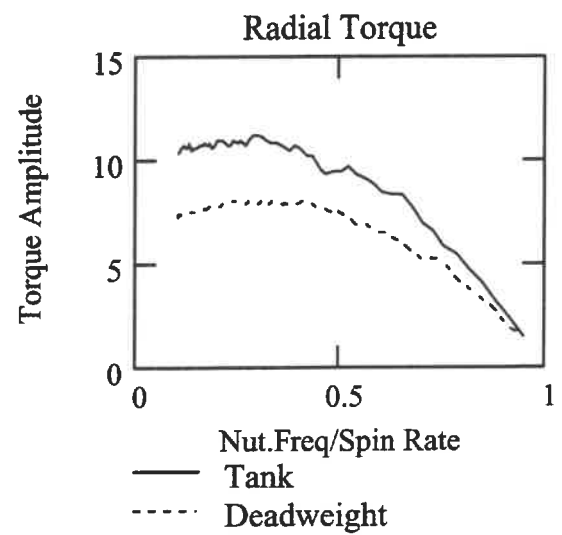
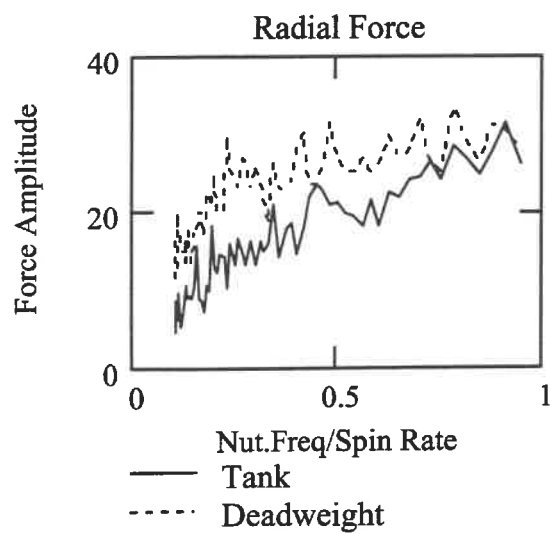
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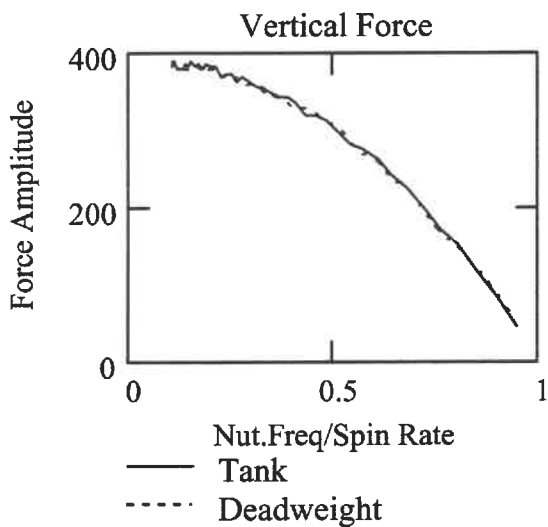
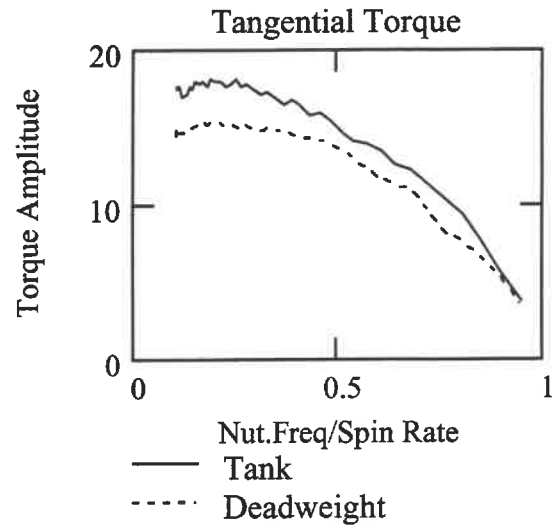
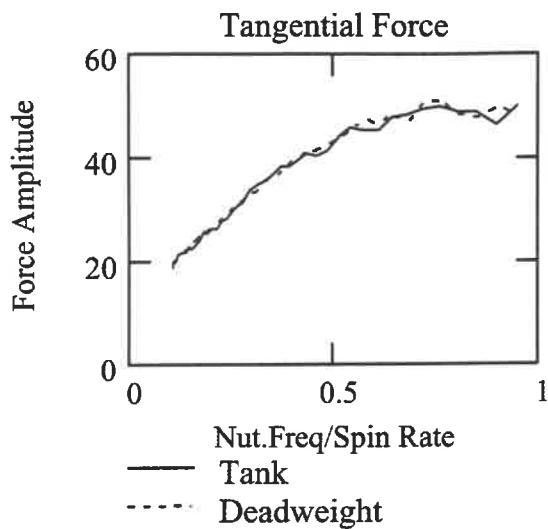
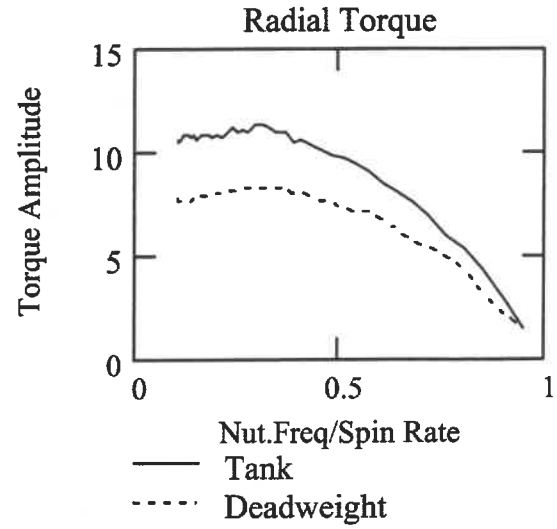
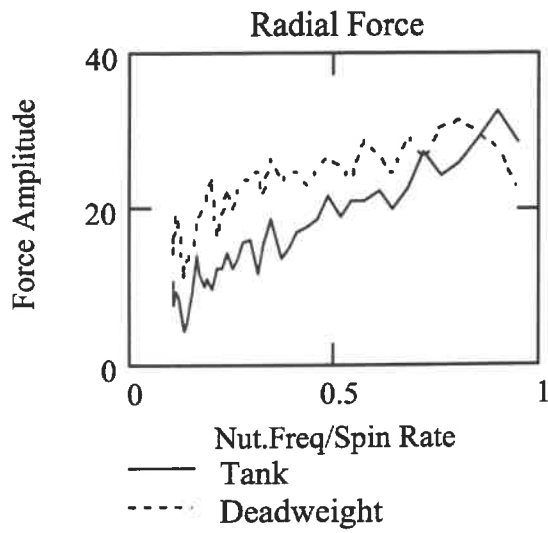
Enclosure

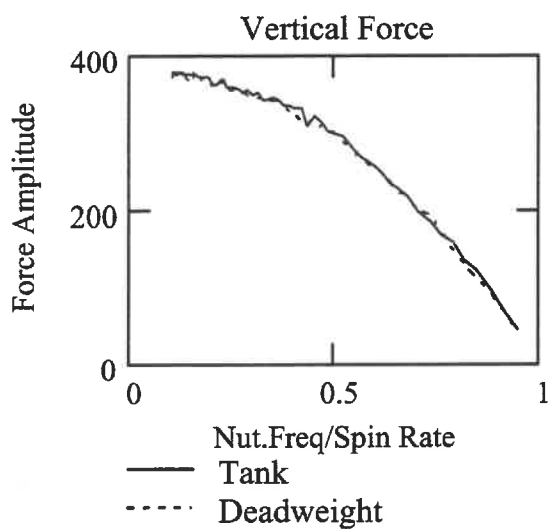
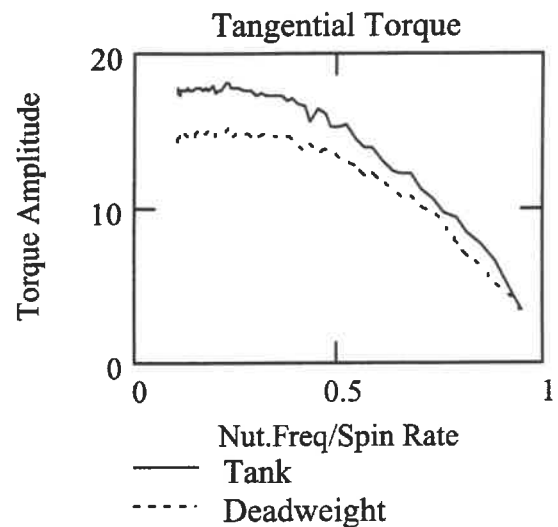
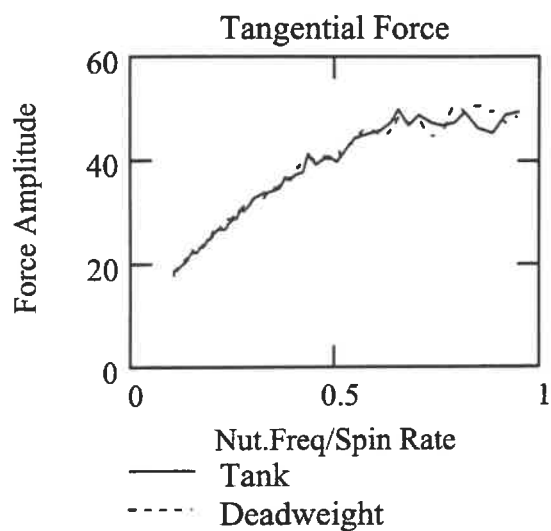
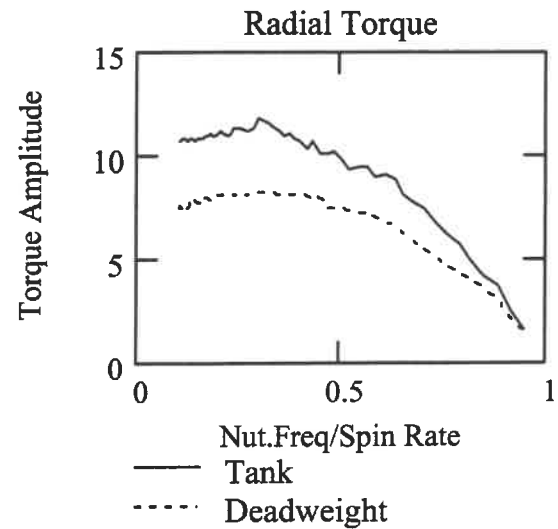
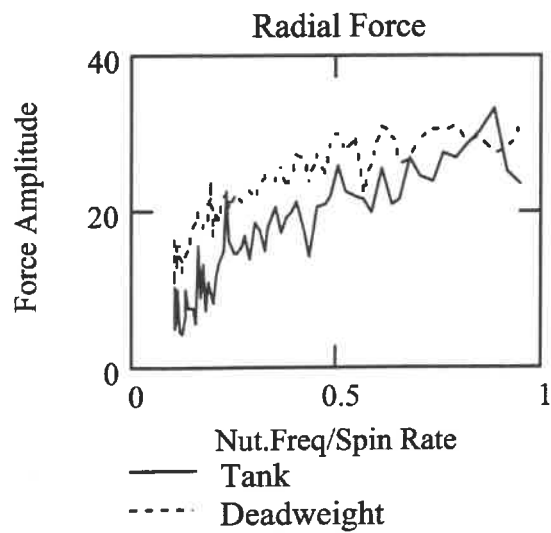
cc: J. Sudermann, NASA-KSC
D. Deffenbaugh, SwRI
R. Bass, SwRI
F. Dodge, SwRI
D. Walter, SwRI
R. Burkey, SwRI
S. Domine, SwRI

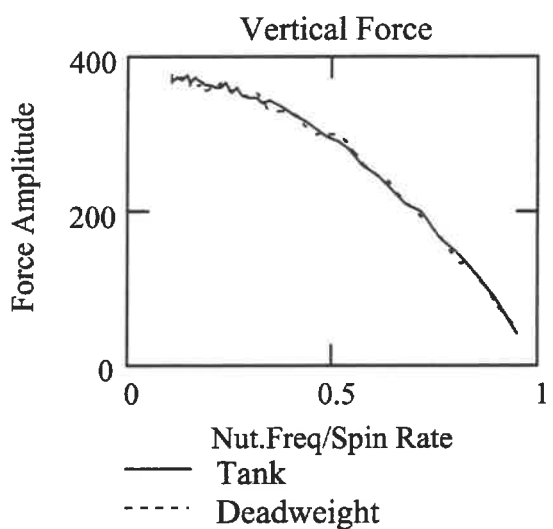
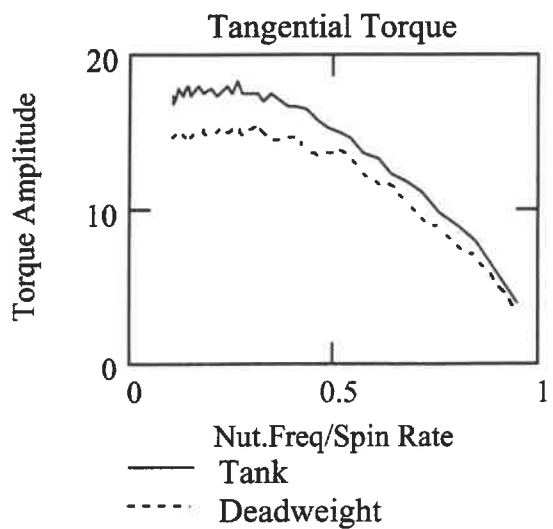
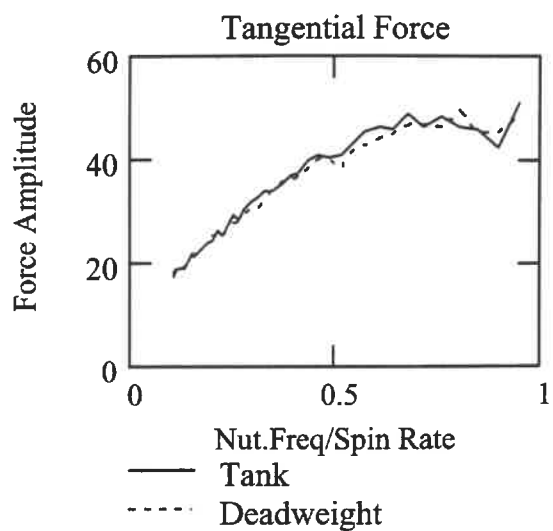
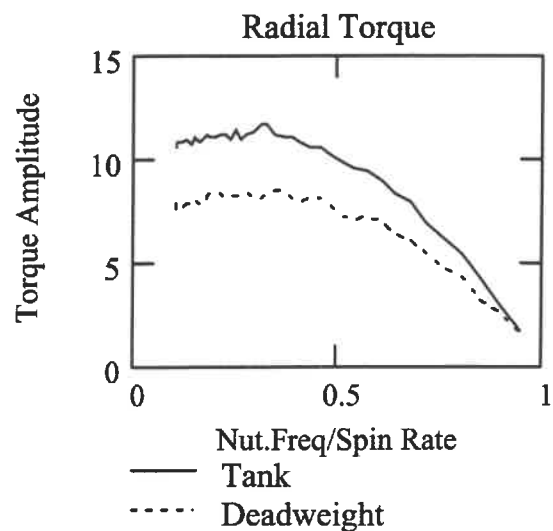
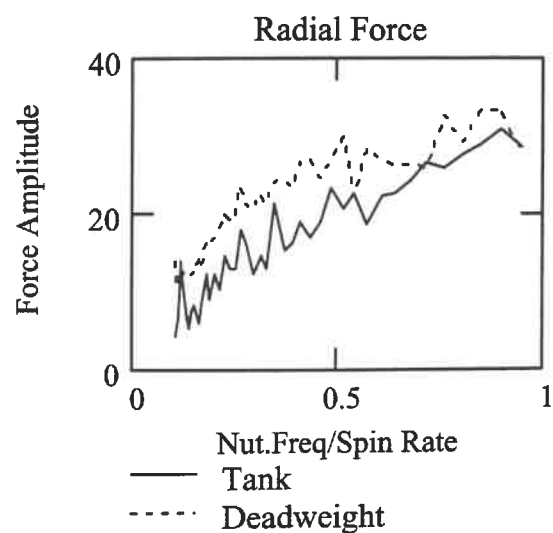
Attachment A
STEREO Sweep Test Data

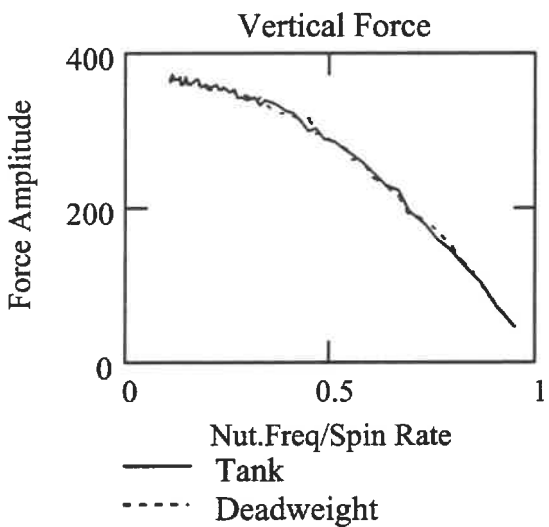
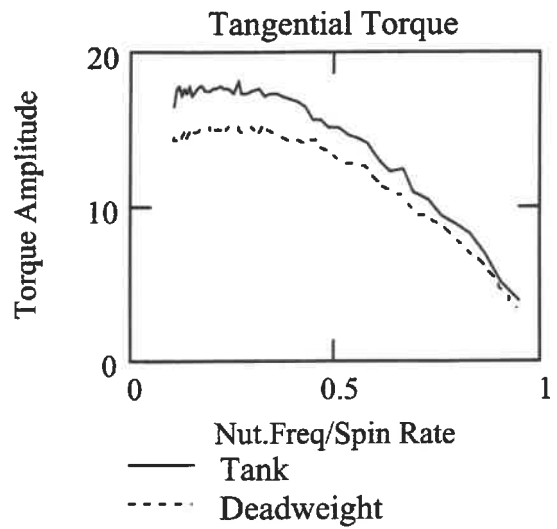
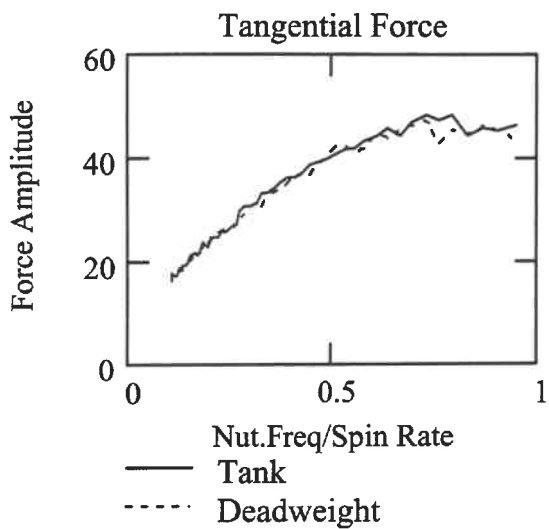
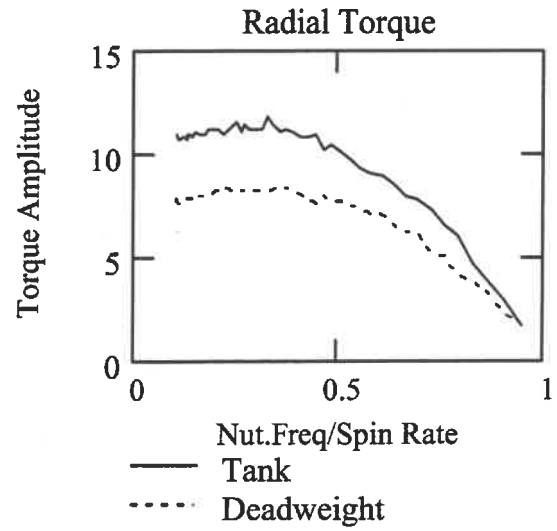
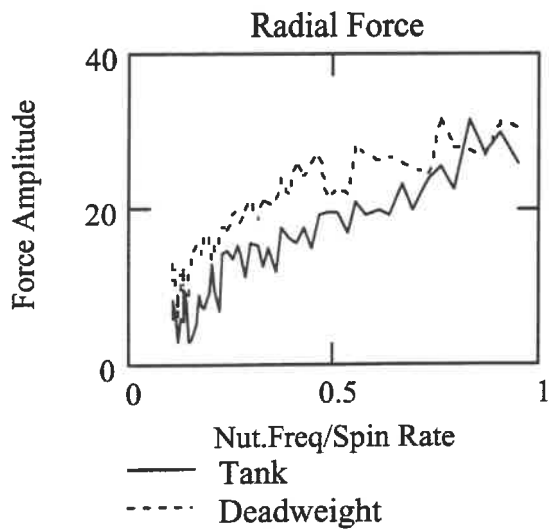


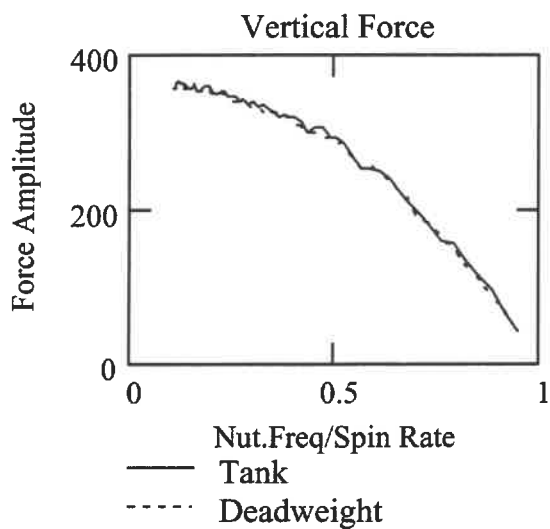
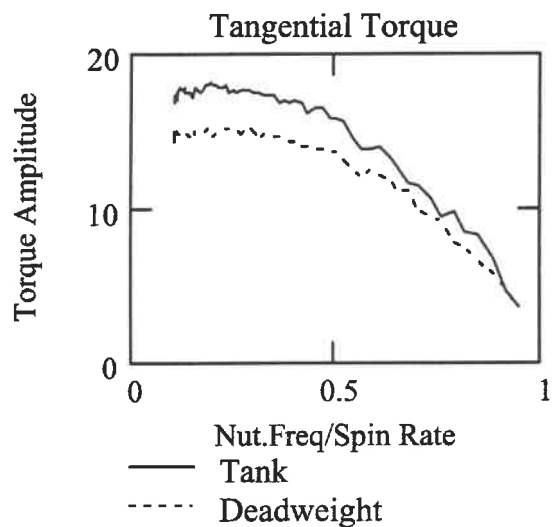
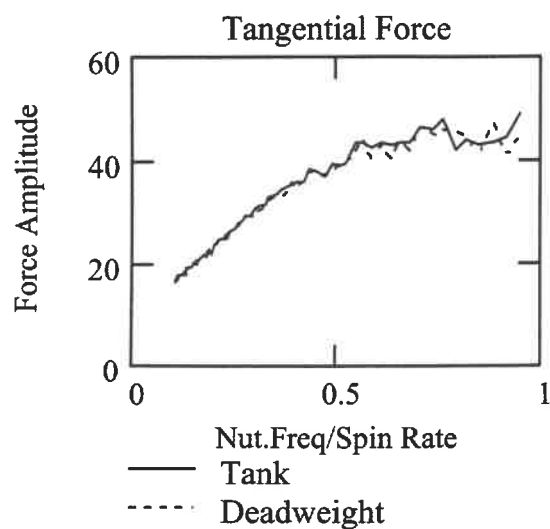
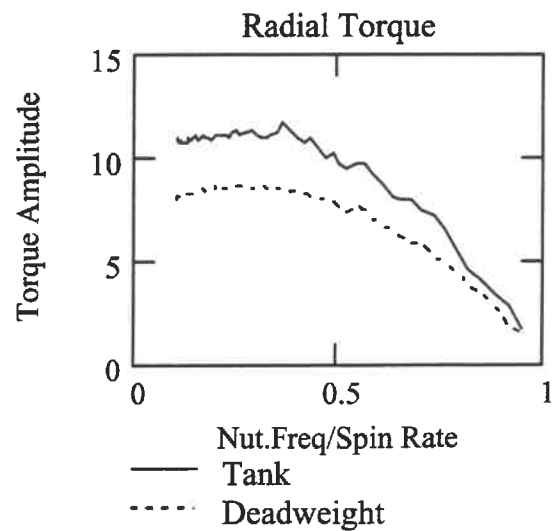
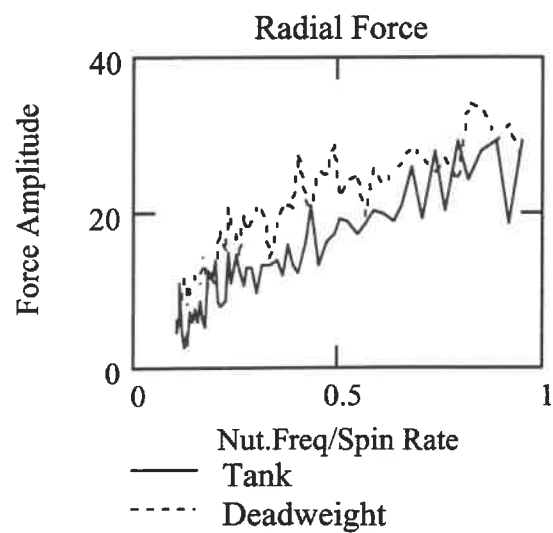






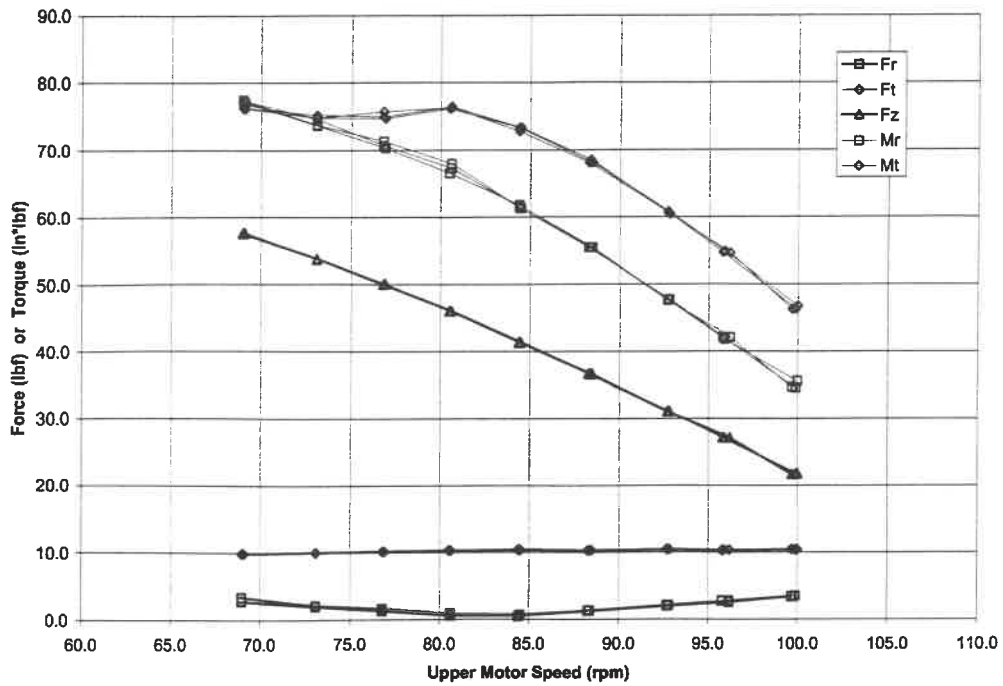




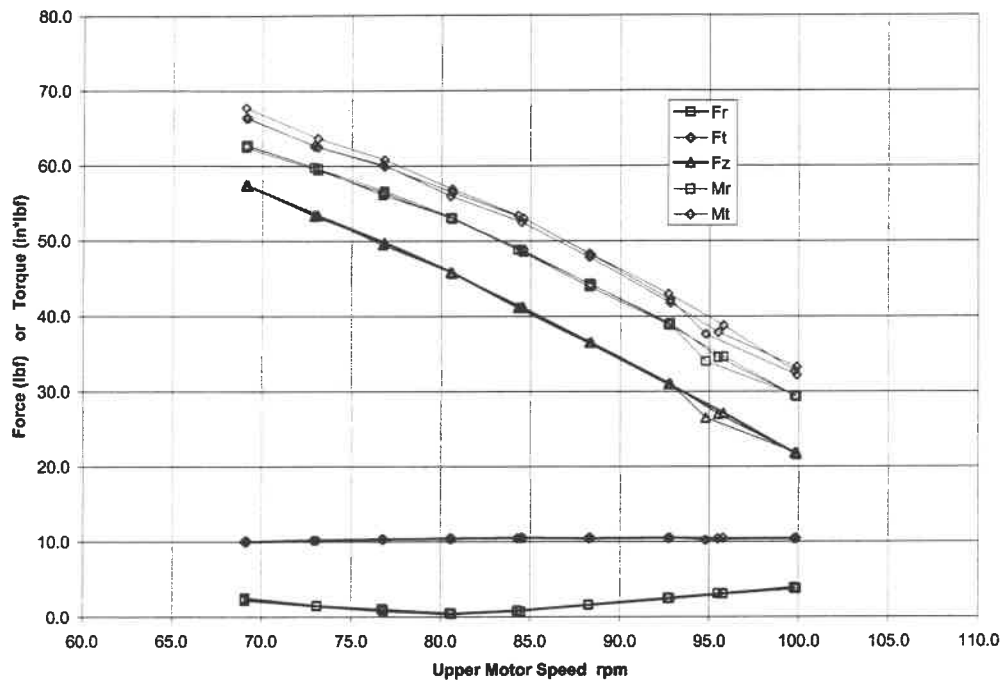


Attachment B
STEREO Steady Sine Dwell Test Data

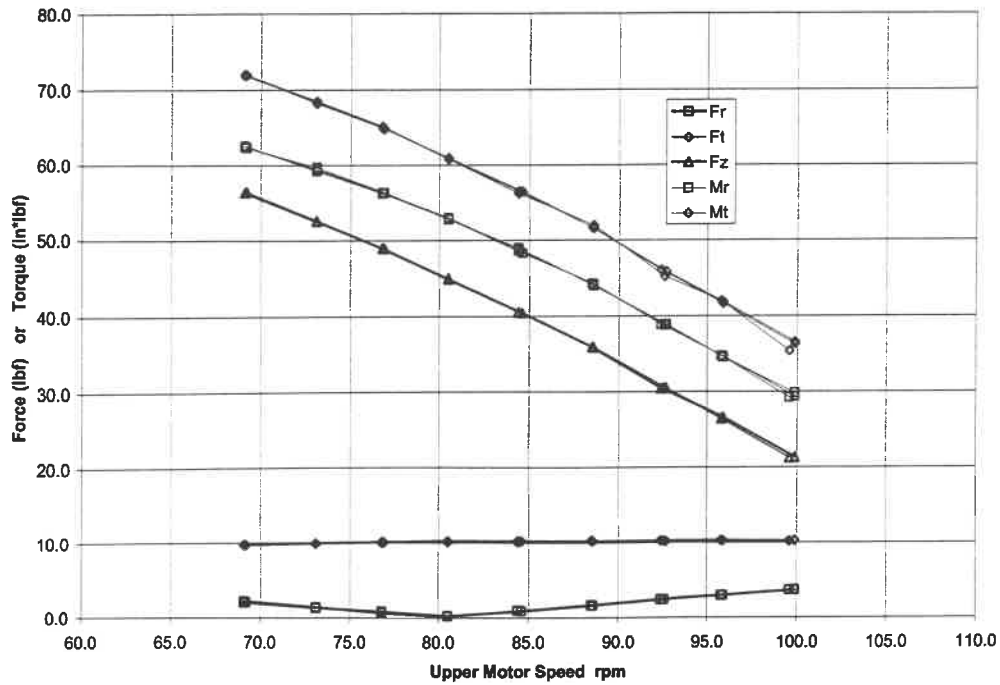
Tank Test Results
Speed = 114 rpm, FL=71.2%



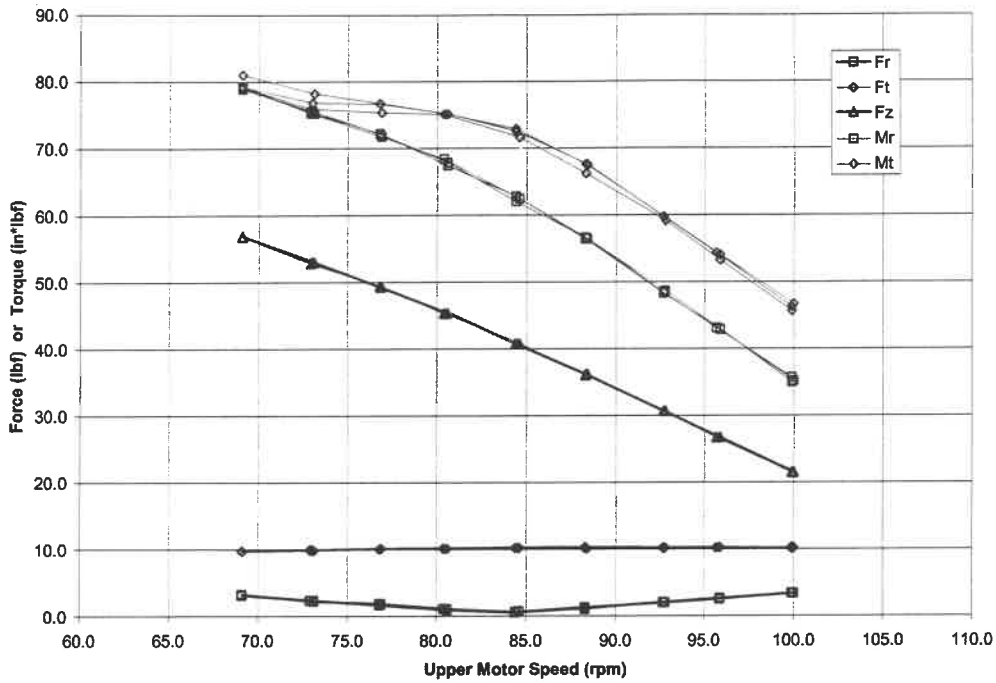
Deadweight Test Results
Speed = 114 rpm, FL=71.2%



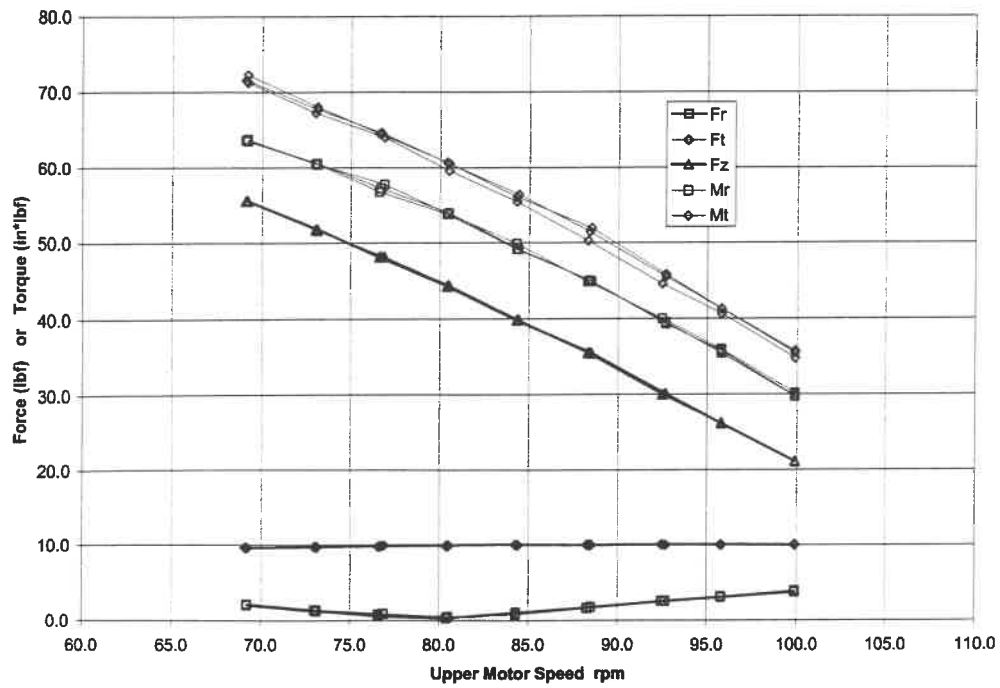
Deadweight Test Results
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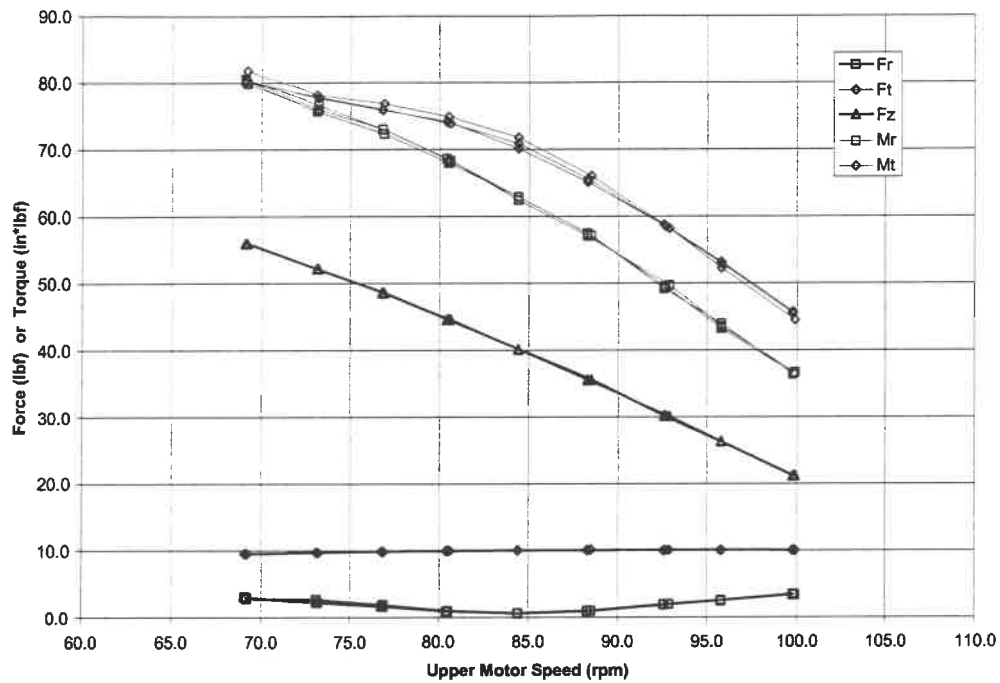
Tank Test Results
Speed = 114 rpm, FL=68.7%



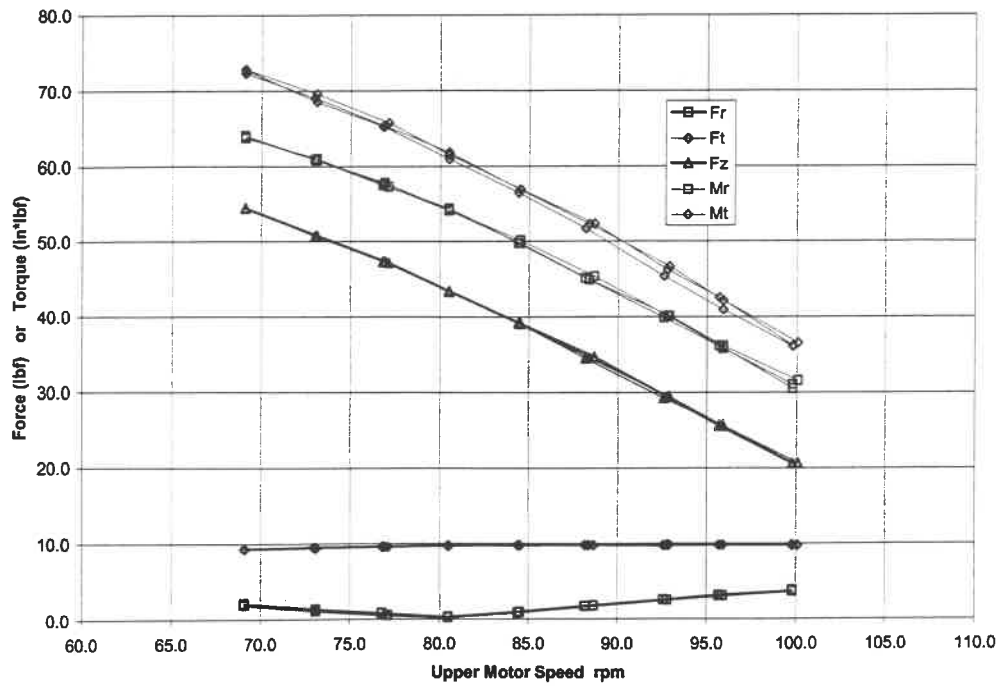
Deadweight Test Results
Speed = 114 rpm, FL=66.2%



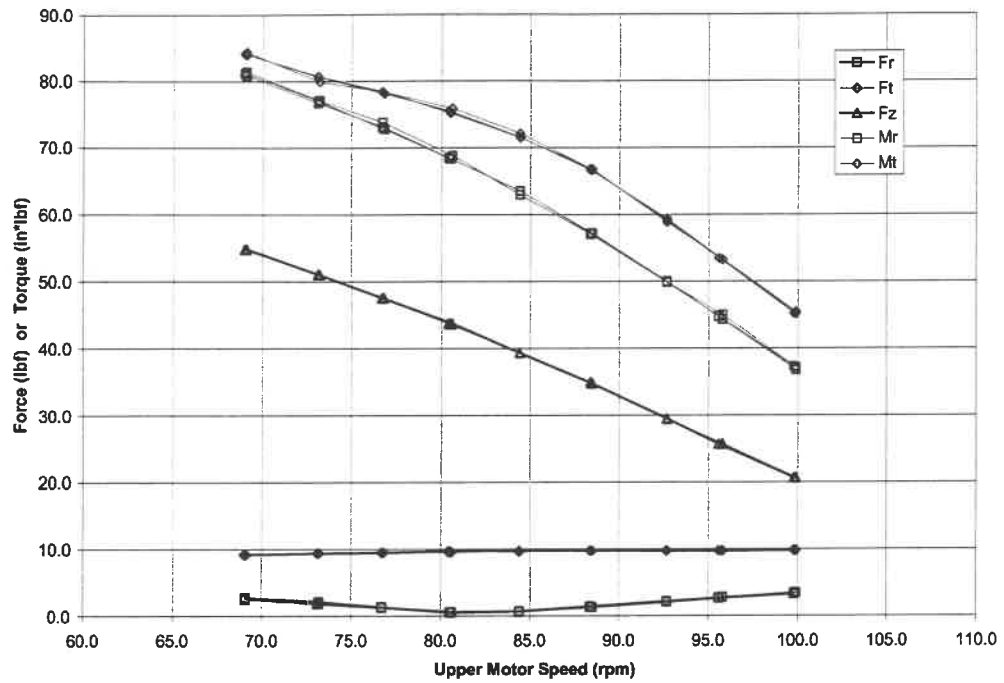
Tank Test Results
Speed = 114 rpm, FL=66.2%



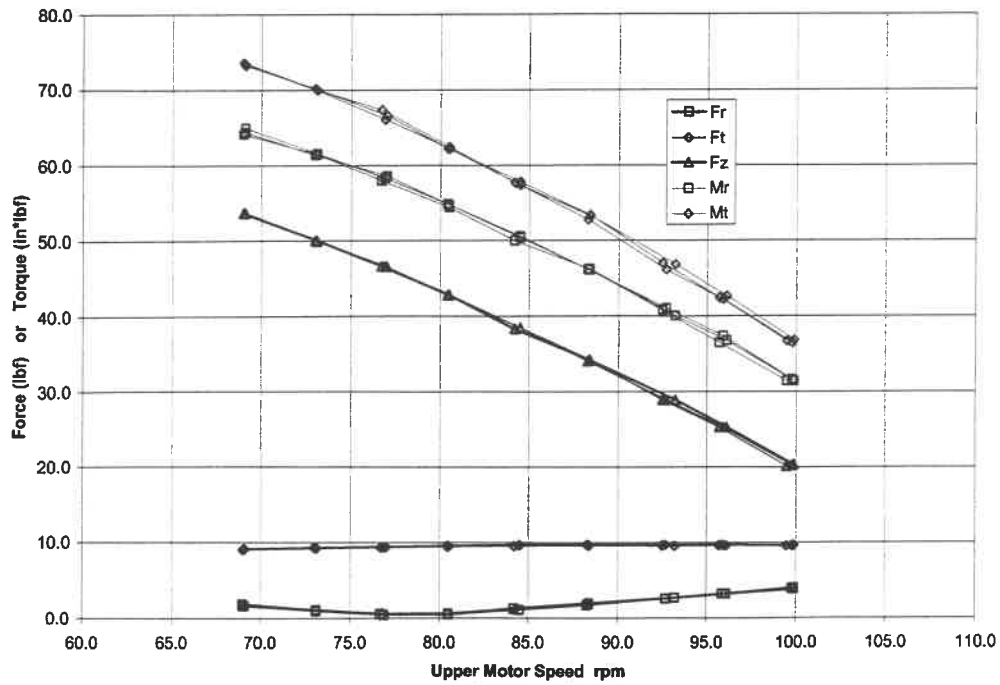
Deadweight Test Results
Speed = 114 rpm, FL=63.1%



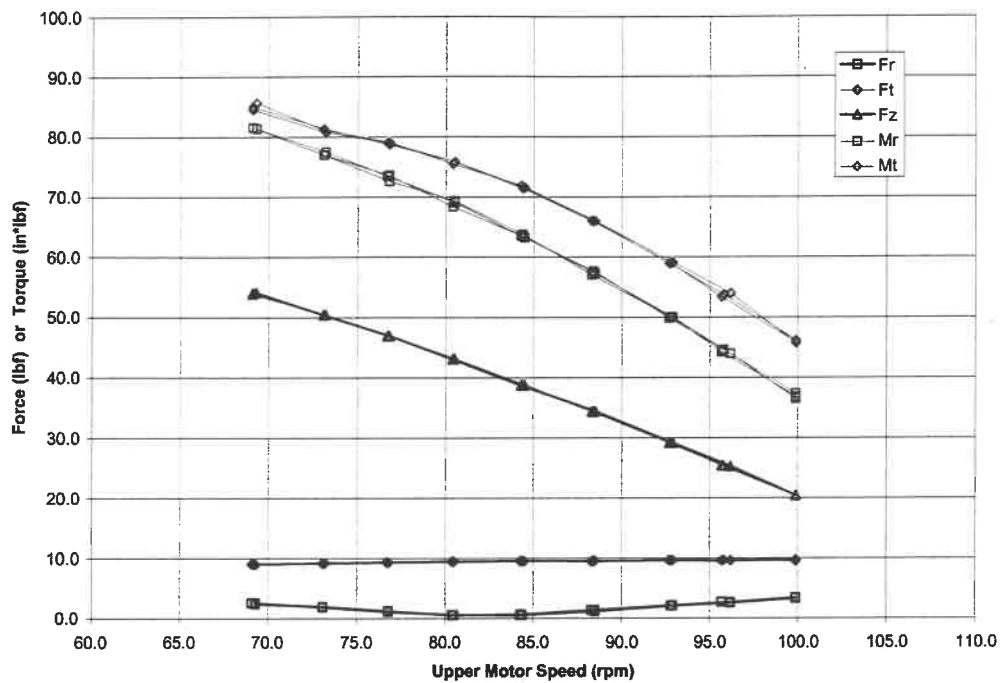
Tank Test Results
Speed = 114 rpm, FL=63.1%



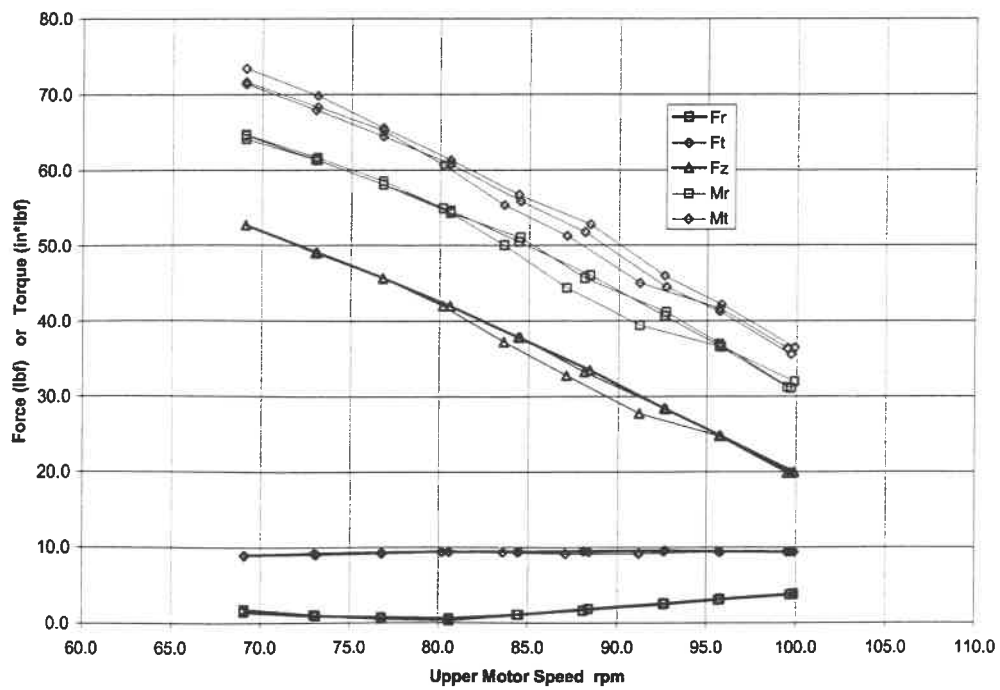
Deadweight Test Results
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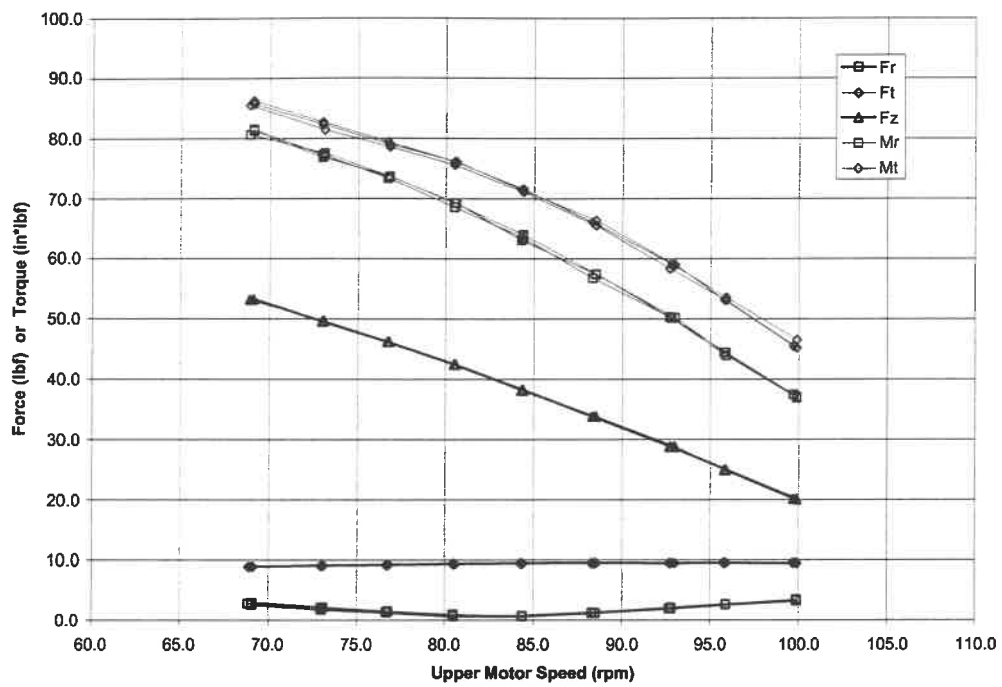
Tank Test Results
Speed = 114 rpm, FL=61.1%



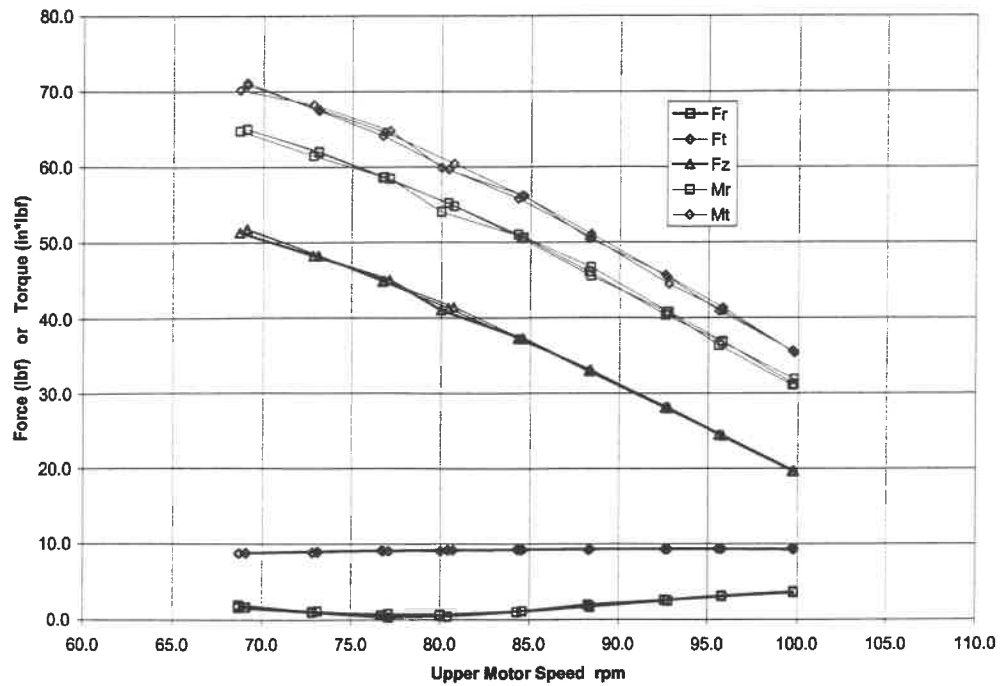
Deadweight Test Results
Speed = 114 rpm, FL=58.6%



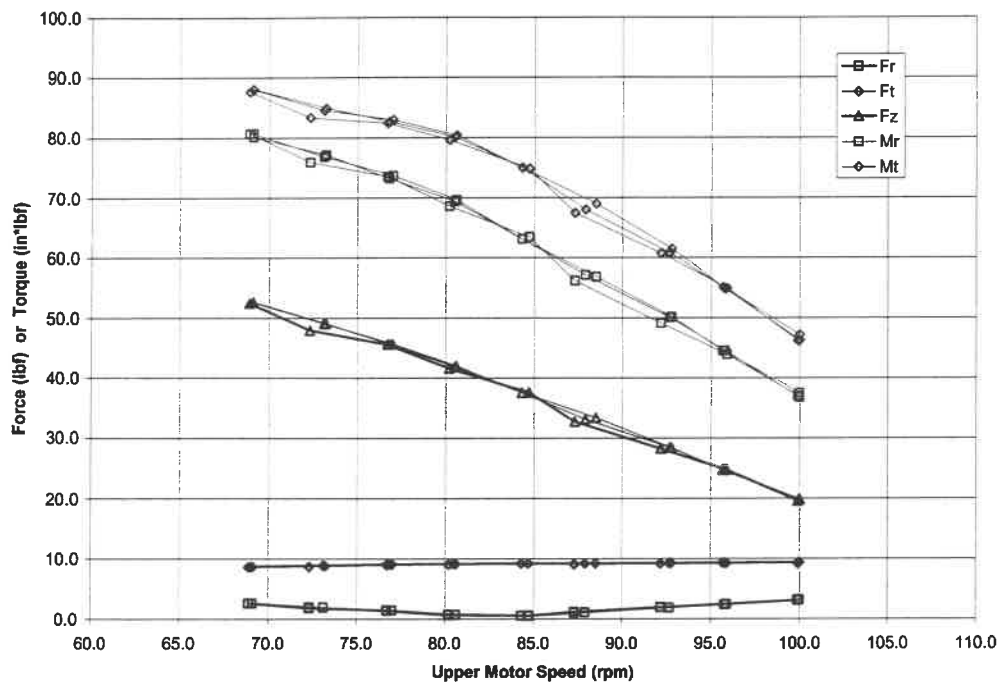
Tank Test Results
Speed = 114 rpm, FL=58.6%



Deadweight Test Results
Speed = 114 rpm, FL=56.1%



Tank Test Results
Speed = 114 rpm, FL=56.1%

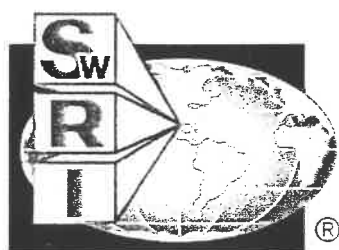


SSTR Operating Log

STEREO Tank Testing

SwRI Project No. 18.06404

June 2003



SOUTHWEST RESEARCH INSTITUTE®

**SAN ANTONIO
DETROIT**

**HOUSTON
WASHINGTON, DC**

- revision by -
R. Burkey 6/12/03

SSTR Integrity Inspection

The SSTR is an assembly of many structural elements that is subjected to large oscillating loads during its operation. Periodic inspection and maintenance of the SSTR is required to maintain in a safe operating condition.

Objective

The objective of this inspection procedure is identify any structural integrity anomalies and electrical wiring problems in the SSTR. The maintenance of the moving components (e.g., belt tension, lubrication, slip ring condition), safety device verifications (e.g., emergency stop switches, overspeed switches), and sensor calibrations are covered by separate procedures.

Inspection Frequency

This inspection shall be conducted no more than one month prior to conducting test activities in the SSTR and no less frequent than once per year. Passing all criteria of this inspection is required before the SSTR can be operated for test activities.

Inspection Record Archiving

The record generated by this inspection process shall be maintained by the SSTR SwRI Project Manager and delivered to the SSTR KSC Project Engineer. The record shall be reviewed at the next SSTR Test Readiness Review immediately after the inspection date..

Inspection Criteria

This procedure includes the visual inspection of the SSTR structural elements in the areas of surface conditions, weld integrity, and fastener integrity. This procedure also includes the visual inspection of the SSTR wiring and wiring connections. The following guidelines shall be used by the inspector for this procedure.

Surface Condition

Visually inspect for general condition of the metal surface or paint condition. Light, localized oxidation of structural components is acceptable. Heavy corrosion that could reduce the strength of the component or other wise impair its operation will require that component to be repaired or replaced prior to SSTR test operations. Especially note the following:

- Presence of corrosion.
- Level of corrosion (Is the corrosion localized or overall?; light or heavy?; Color?).
- Paint integrity.
- Cracks at fastener holes and other interfaces between components.

Welds

Visually inspect the overall condition of all welds. The SSTR shall not be permitted to operate if any weld has evidence of cracking that is detected by the unaided eye. The inspection shall include the condition of the weld material and the base material immediately surrounding the weld in the following areas:

- Weld termination points (if any).
- Weld throat.
- Weld toe.

Fasteners

Visually inspect the overall condition of all fasteners. The SSTR will not be permitted to operate if any fastener is compromised in accordance with the conditions listed here

- Heavy corrosion on visible surfaces of the screw and nut.
- Distorted fastener head or nut or bent fasteners.
- Heavy corrosion on washers and other load distribution devices.

- Shims must be intact and firmly in place where used.
- Torque stripes on Dynamometer fasteners must be in place.

Wiring

Visually inspect the overall condition of all wiring connections, cabling, and junction boxes. Especially note the following.

- Condition of the insulation, wire nuts, and ground connections inside the motor junction boxes.
- Condition of the contactor thickness, wire terminations and strain reliefs in the high voltage slip ring on the Lower Drive Shaft.
- Presence of rub strips in feed-throughs and the condition of wires passing through feed-throughs.
- Condition load cell amplifier connectors and cabling to the Dynamometer.
- Condition of wiring entering the instrument slip ring housings and encoder housings.
- Condition of wiring in the motor controllers and motor power disconnect boxes and the condition of all cabling and conduit between the motor controllers and the motors. Also note the condition of the cabling between the overspeed switch and the overspeed switch controller.

Problem Dispensation

Problems of unsafe conditions identified by this inspection shall be resolved or corrected prior to conducting SSTR test activities. The level of problem review and the resolution process for each inspection areas are described here.

Surface Condition

Light and localized corrosion is acceptable. Heavy and general corrosion shall be repaired or mitigated before SSTR testing is allowed. Engineering judgment of the level of corrosion is acceptable. The resolution of a heavy corrosion condition shall be reviewed by the SSTR SwRI Project Manager and the SSTR KSC Project Engineer prior to acting on the resolution method.

Welds

SSTR test operations will not be permitted if a crack is visually detected in any weld. The resolution of a weld crack shall be reviewed by the SSTR SwRI Project Manager and the SSTR KSC Project Engineer prior to acting on the resolution method.

Fasteners

SSTR test operations will not be permitted if a fastener is heavily corroded or deformed. Light surface corrosion is permitted but heavy corrosion is not permitted. If any fastener or washer does not meet the respective inspection criteria, it shall be replaced as soon as possible with a new part of the appropriate type and strength rating. The replacement of the affected device shall be noted in the inspection record and reviewed with the SSTR SwRI Project Manager.

Wiring

SSTR test operations will not be permitted if there are any exposed wires, missing wire nuts, or frayed insulation in the motor junction boxes, high voltage slip ring, or the motor controller housings. All feed throughs must provide for protection against rubbing for the contained wires. Exposed wiring is permitted at the data acquisition terminal block on the Spin Table. The cabling and conduits for all wiring between the motors and the motor controllers must be sound and free of kinks or abrasions.

SSTR Drive System Structural Inspection Record

Assembly/Component	Mark as Pass or Fail						Comments/Actions
	Surface Condition	Welds	Fasteners	Wiring	Date	Inspector	
Base Structure Weldment 18-03513-001 Include shims on floor	Pass	Pass	Pass	N/A	6-12-03	STG	Localized paint scuffing & scratches Light corrosion on fasteners & washers Shims are intact and firmly held. No visible cracks/voids in welds.
Lower Motor Assembly 18-03513-505 Include wiring Include shims on motor base	Pass	Pass	Pass	Pass	6-12-03	STG	Paint scuffs on riser plates & motor. Light corrosion on fasteners. Shims intact and firm. Wiring OK inside motor connection box. Cable & connector OK on encoder.
Lower Gearbox Shaft 18-03513-028 Include pulley	Pass	Pass N/A	Pass	Pass N/A	6-12-03	STG	Light corrosion on shaft. Key is intact & in place. Light corrosion on pulley. Bushing is firmly in place engaged. Belt is sound - no fraying or undue wear.
Lower Bearing Support Plate 18-03513-002	Pass	N/A	Pass	N/A	6-12-03	STG	Minor paint scrapes & scratches. the Corrosion between plate and bearing. Light Corrosion on fasteners
Lower Bearing	Pass	N/A	Pass	N/A	6-12-03	STG	Light corrosion on exposed surfaces. Lip seal shows evidence of rubbing. Some loose seal particles present. Light corrosion on fasteners
Upper Base Drive Shaft 18-03513-004 Include pulley Include wiring on components mounted to the shaft	Pass	N/A	Pass	Pass FAIL	6-12-03	STG	Very light corrosion on shaft. Little or no corrosion on fasteners. Light corrosion on pulley. Bushing engagement OK. Belt looks sound - no fraying or undue wear. Instrumentation slip ring wiring & encoder wiring are OK.

H.V. slip ring rotor wiring needs wear tape
or harness inside aluminum tie down.

Assembly/Component	Mark as Pass or Fail					Comments/Actions
	Surface Condition	Welds	Fasteners	Wiring	Date	
Upper Base Drive Disk 18-03513-003	PASS	N/A	PASS FAIL	PASS FAIL	6.12-03	STG Minor paint scrapes & scuffs. Light corrosion on fasteners. Wiring rub strip OK.
Cone Angle Weldment 18-03513-505	PASS	PASS	PASS	N/A	6.12-03	STG Little or no corrosion on fasteners. ALL All visible welds intact - no cracks. NOTE: welds inside cone are not visible Minor paint scrapes.
Upper Base Frame Weldment 18-03513-010 18-03513-009	PASS	PASS	PASS	N/A	6.12-03	STG Minor paint scrapes. Little corrosion on fasteners. (BARE) Counterweight have moderate corrosion but these are not structural elements. Welds intact - No cracks, but there is an incomplete weld in an outer corner miter joint in S.W. corner. This is <u>not</u> a crack.
Upper Motor Assembly 18-03513-504 Include wiring in motor and in J-box on baseplate.	PASS	PASS	PASS	PASS	6.12-03	STG Motor paint OK. Little or no corrosion on fasteners. Encoder cable is OK - no scrapes, connector is good. Function in J-Box are solid. Rub strips are in place & good.
Upper Gearbox Shaft 18-03513-029 Include pulley	PASS FAIL	N/A FAIL	PASS FAIL	N/A	6.12-03	STG Light corrosion on shaft. Can be removed w/ wire brush leaving minor surface roughness. Light corrosion on pulley & fasteners. Bushing shows good engagement

Assembly/Component	Mark as Pass or Fail						Comments/Actions
	Surface Condition	Welds	Fasteners	Wiring	Date	Inspector	
Spin Table Encoder Mount 18-03513-018 Include encoder	PASS	N/A	PASS	PASS	6.12.03	STG	(Aluminum) shaft surface is good. Light corrosion on fasteners. Encoder bushing has no corrosion. Encoder connector is intact & solid.
Upper Bearing Support Plate 18-03513-001	PASS	N/A	PASS	N/A	6.12.03	STG	Paint scrapes & scuffs. No cracks at edges or near holes. Light corrosion on fasteners Possible light corrosion under bearing
Upper Bearing	PASS	N/A	PASS	N/A	6.12.03	STG	Light corrosion on bore surface. No corrosion on the plated bolts. Light corrosion on nuts & washers. Lip seal is rubbing - small particles distributed around outer race.
Spin Table Drive Shaft 18-03513-004 (Including pulley)	PASS	N/A	PASS	PASS	6.12.03	STG	Light corrosion on shaft & fasteners. No fraying or undue wear on drive belt. Bushing engagement is good. Wire harness & rub strip are OK
Spin Table Drive Disk 18-03513-003	PASS	N/A	PASS	PASS 6.12.03	6.12.03		Minor paint scrapes Light corrosion on fasteners. Wire harness & rub strip are OK.

Assembly/Component	Mark as Pass or Fail						Comments/Actions
	Surface Condition	Welds	Fasteners	Wiring	Date	Inspector	
Spin Table 18-03513-027	PASS	PASS	FAIL	PASS	6-12-03	STG	Moderate paint scrapes & scratches. Welds are solid - no visible cracks. TORQUE STRIPPING NOT COMPLETE WIRE HARNESS OK
Counterweight Assembly 18-03513-506	PASS	N/A	PASS	N/A	6-12-03	STG	Minor paint scrapes. Light corrosion on fasteners Light corrosion on 2" Rod & Nut
Load Cell Amplifier Mount 18-03513-034 18-03513-020 Include wiring	PASS	N/A	PASS	PASS	6-12-03	STG	Light corrosion on fasteners. Aluminum brackets show no corrosion. All wiring is intact, no fraying all connectors look solid. DAC terminal block wiring looks solid.
Spin Table Slip Ring Include wiring	PASS	N/A	PASS	PASS	6-12-03	STG	Light corrosion on fasteners Wiring connections (solder) looks solid. Wire tie-downs are OK.
Dynamometer Assembly 18-06414-602	PASS	N/A	PASS	PASS	6-12-03	STG	No visible surface cracks or corrosion on Al parts. Light corrosion on fasteners. Load Cell wiring and tie-down all look OK.

Assembly/Component	Mark as Pass or Fail						Comments/Actions
	Surface Condition	Welds	Fasteners	Wiring	Date	Inspector	
Motor Controllers Include mounting and wiring	PASS	N/A	PASS	PASS	6/12/03	STB	All wiring connections are solid No frayed insulation. At Light corrosion on mounting fasteners.

Additional Comments and Follow-Up Activities.

NOTES : 1. "Light corrosion" defined as easily removable with wire brush and leaves minor surface roughness.

ACTION ITEMS :

1. Install wear tape or rub strip around wiring under the tie down on the lower drive pulley (Motor power wiring)

- Replace before next spin
- Note date of repair on this form:

REPAIRED BY A. Bunker DATE 6/13/03.

2. Complete torque striping on SPIN TABLE.

- Complete and inspect before next spin.
- Note date of repair on this form.

REPAIRED BY A. Bunker DATE 6/13/03.

NOTE : SSTR WILL BE LOCKED OUT BY S. GREEN UNTIL THESE ACTIONS ARE COMPLETED.

Test Article: STEREOProject No.: 06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations		Init
6/13/03 1:00	Emergency Shutdown Procedure Review		✓		RCB
"	Pre-Test Hardware Check		✓		RCB
"	Pre-Test DAC Check and Emergency Stop Verification		✓		RCB
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
6/13/03					
1:08				Perform overspeed Switch Verification start verification procedure, accelerate lower motor to 40 rpm; accelerate upper motor to 85 rpm in 5 to 10 rpm increments (total = 40 + 85 = 125). Command upper motor to go to ^{89 rpm} (129 rpm ^{total}). Overspeed switch stopped motors on overspeed (>128 rpm). SSTR coasted safely to a stop. Overspeed switch successfully verified.	RCB
~5.5 min				Test Duration	RCB
Ave ~ 75				Total Spin Rate (rpm - average given by processing software)	
412				Approximate Number of Cycles (Test Duration x Total Spin Rate)	
412				Approximate Cumulative Number of Cycles	

↗ for stereo program only. See SSTR Notebook for total number of cycles for all programs prior to STEREO

Test Article: STEREOProject No.: 18-06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations		Init
6/23/03 10:06	Emergency Shutdown Procedure Review		NONE		DBW
6/23/03 10:05	Pre-Test Hardware Check		NONE		DBW
6/23/03 10:10	Pre-Test DAC Check and Emergency Stop Verification		10 REV / 30 SEC ✓		DBW
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
10:14		106	matrix-check-106	SPIN UP	DBW
10:17:30				START MATRIX "STEREO106-C.csv"	DBW
~10:40				END OF MATRIX (27 FILES)	DBW
~10:41		114	matrix-check-sweep	TRANSITION TO SWEEP TEST	DBW
10:46:30			SAME	START SWEEP TEST	DBW
11:00:00				END OF SWEEP (2 FILES)	DBW
11:01:00			matrix-check-sweep	SPIN DOWN (	DBW
				003	
11:51		114	matrix-check-114	Spin up	ACB
11:55:15	45	69		Start Matrix "STEREO114-C.csv"	ACB
11:57				"F22" not giving signal, shutdown	ACB
				(2 files written)	
				"F22" was in "reset" mode, "operate" set to	
12:01:30		114	matrix-check-114	Spin up	ACB
12:04:15	45	69		start matrix "STEREO114-C.csv"	ACB
				12:21:35 changed tapes (Tape2)	ACB
12:27:39				End of matrix (27 files)	ACB
12:29:15				Spin down (1 file)	ACB
see above	Test Duration				
see above	Total Spin Rate				
8448	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
10618	Approximate Cumulative Number of Cycles				

Test Article: STAREOProject No.: 06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations		Init
11:10:00	Emergency Shutdown Procedure Review		OK		DBW
11:11:00	Pre-Test Hardware Check		OK		DBW
11:12:00	Pre-Test DAC Check and Emergency Stop Verification		OK - 10 CYCLE/30 SEC = 20RPM		DBW
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
				WILL PERFORM 123 RPM CHECK OUT TEST WITH MAX WEIGHT (7190) TO VERIFY GAINS ON LOAD CELL AMPLIFIERS	
11:18:45	123			START SPINUP TO 48.6 L , 74.4 U	DBW
11:23:00				GOT TO FULL SPEED NOTICED FT-2 NOT GIVING SIGNAL - SHUT DOWN TO INVESTIGATE	
11:24:00			dw12671ck.001	WROTE TO MEMORY/DISK	DBW
				FT-2 AMPLIFIER RESET DURING RUN (UNCLEAR WHY)	
11:27:30				STARTED SPIN UP TO 48.6L , 74.4 U	DBW
11:31:53	123		dw12671ck	STARTED MATRIX "STAREO123C.CSV"	DBW
11:40:00			Files .002 - .010	STOPPED MATRIX AFTER 1 TEST	DBW
11:40:50				SPIN DOWN - WROTE DATA	DBW
				Amplifiers all looked OK	
11:44:30	114		dw11471 ^{sw} a.001	Started spin up for sweep	DBW
11:51:35				STARTED SWEEP	DBW
12:05			* dw11471sw-a.002	FINISHED MATRIX	DBW
			dw11471sw-b.001	TRANSITIONED BACK TO BEGINNING OF SWEEP	
12:09:25	114		dw	Started Sweep	DBW
12:22:20			* dw11471sw-b.002	FINISHED SWEEP	DBW
			dw11471sw-c.001	TRANSITION TO BEGINNING OF SWEEP	DBW
12:26:40				START SWEEP	DBW
12:39:00			* dw11471sw-c.002	FINISH SWEEP	DBW
12:40:50			dw11471sw-c.003	SHUT DOWN	DBW
8475	Test Duration				
8475	Total Spin Rate				
8475	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
23275	Approximate Cumulative Number of Cycles				

* DATA FILES

Test Article:

STEREO

Project No.:

06404

SSTR Operating Log

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity			Comments/Observations	Init
-	Emergency Shutdown Procedure Review			continuation	RCB
-	Pre-Test Hardware Check			continuation	RCB
-	Pre-Test DAC Check and Emergency Stop Verification			continuation	RCB
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
6/30/03				Tape 3	
				switched weights to 58.6%	
9:58:46			dws9sw-a.001	start spin up	RCB
10:02:05	114			start sweep	RCB
10:14:57			dws9sw-a.002	finish sweep	RCB
			dws9sw-b.001	transition to beginning of sweep	RCB
10:19:15	114			start sweep	RCB
10:32:06			dws9sw-b.002	finish sweep	RCB
10:32:06			dws9sw-c.001	transition to beginning of sweep	RCB
10:36:15	114			start sweep	RCB
10:49:06			dws9sw-c.002	finish sweep	RCB
10:51:45			dws9sw-c.003	shutdown	RCB
53	Test Duration				
114	Total Spin Rate				
6042	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
53713	Approximate Cumulative Number of Cycles				

Test Article: STEREOProject No.: 06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations	Init	
7/2/03 7:00	Emergency Shutdown Procedure Review		OK	DBW	
7:00	Pre-Test Hardware Check		OK	DBW	
	Pre-Test DAC Check and Emergency Stop Verification				
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7/2/03				Changed counter card in computer to see if it fixes the upper encoder signal problem	
7:09:00				(w/IV) HAD BIAS VOLTAGE ON LOW SIGNAL OF 2 FOR UPPER ENCODER - PUT HIGH PASS FILTER IN TO REMOVE BIAS. FILTER SETTING = 50 Hz	
9:35:50			TANK FILL LEVEL = 71% upper-enc-check2	STARTED SPIN UP TO HIGH SPEED TO TEST ENCODER - LOOKED OK	DBW
Test Duration					
Total Spin Rate					
Approximate Number of Cycles (Test Duration x Total Spin Rate)					
Approximate Cumulative Number of Cycles					

Test Article: STEREOProject No.: 06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity

Date/Time	Activity	Comments/Observations	Init
7/2/03	Emergency Shutdown Procedure Review	Continuation	DBW
	Pre-Test Hardware Check	I	DBW
	Pre-Test DAC Check and Emergency Stop Verification		DBW

Test Activity

Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7/2/03				Tape 4 - ON BOARD TAPE 2 drained 2.736 lb of water from tank	
2:13:00	114		tank69sw-a.001	SPIN UP Pressure = 8 psi	DBW
2:16:55			tank69sw-a.002	START SWEEP (16.5)	DBW
2:29:45			tank69sw-a.003	STOP SWEEP	
				Pressure reset to 10 psi	
2:46:00	114 total		tank69sw-b.001	Spin Up	STG
2:50:45	SPIN RATE		tank69sw-b.002	START SWEEP (18.5)	✓
3:03:34			tank69sw-b.003	Stop Sweep	✓
3:09:50				write file	
				Swapped Fc1 & Fc1 AMPLIFIERS	
~3:19:00			tank69sw-c.001	SPIN UP	DBW
3:23:05			tank69sw-c.002	START SWEEP (18)	DBW
3:35:55				STOP SWEEP	DBW
3:37:10			tank69sw-c.003	SHUTDOWN	DBW
53	Test Duration				
114	Total Spin Rate				
6042	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
78679	Approximate Cumulative Number of Cycles				

Order
 Fir BLIPS
 ② tank71-swe
 ① tank71-swd.
 ③ tank69-swq.002

Upper Sp. R.
 15.12 - 15.14 rpm
 13.5 - 17.7 rpm
 12.47 - 18.68 rpm

Project No.: 06404

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

[illegible]

Test Article: StereoProject No.: 06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations	Init	
7.3.03/7:10 am	Emergency Shutdown Procedure Review			PJA	
7.3.03/7:15 am	Pre-Test Hardware Check			PJA	
7.3.03/7:21 am	Pre-Test DAC Check and Emergency Stop Verification			PJA	
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
				changed to 63.1 % Fall	RCS
				Removed 3-286 # water	7/3/03
				pressurized to 10 psi	
	11K/		tank 63sw-a.001	start spin up	
7:31:20 am				start sweep (14.5)	PJA
7:44:15			tank 63sw-a.002	stop sweep	PJA
7:45:42			tank 63sw-a.003	shut down	PJA
				no data taken - file not found	
7:53:05 am	11K/		tank 63sw-a.001	start spin up	
8:00:11				start sweep	
8:02:45			tank 63sw-a.002	stop sweep	
			tank 63sw-a.003	shut down	
				start spinning again	
8:04:35 am	11K/		tank 63sw-a.003	start sweep	
8:17:26			tank 63sw-a.004	stop sweep (14)	PJA
8:18:44			tank 63sw-a.005	shut down	PJA
38	Test Duration				
114	Total Spin Rate				
4332	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
91390	Approximate Cumulative Number of Cycles				

Test Article: StereoProject No.: 06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations	Init	
<i>continued</i>	Emergency Shutdown Procedure Review				
	Pre-Test Hardware Check				
	Pre-Test DAC Check and Emergency Stop Verification				
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7.3.03				changed to 61.1% Full Removed 2.192 lbs water pressured to 10 psi Tape 5 On Board Tape #	PJD 7/3/03 ↓
9:41:40	114		tank6lsw-a.001	start spin up	PJD
9:45:55				start sweep (18.5)	PJD
9:58:48			tank6lsw-a.002	stop sweep	PJD
10:00:07			tank6lsw-a.003	shut down	PJD
10:11:25	114		tank6lsw-b.001	start spin up	PJD
10:14:30				start sweep (18)	PJD
10:28:23			tank6lsw-b.002	stop sweep	PJD
10:29:40			tank6lsw-b.003	shut down	PJD
10:37:50	114		tank6lsw-c.001	start spin up	PJD
10:42:55			tank6lsw	start sweep (19)	PJD
10:55:47			tank6lsw-c.002	stop sweep	PJD
10:57:00			tank6lsw-c.003	shut down	PJD
55.5	Test Duration				
114	Total Spin Rate				
6327	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
101878	Approximate Cumulative Number of Cycles				

Test Article: STEREOProject No.: 06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity			Comments/Observations	Init
continued	Emergency Shutdown Procedure Review				
	Pre-Test Hardware Check				RCB
	Pre-Test DAC Check and Emergency Stop Verification				
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7/3/03				changed to 56.1 % full	
				removed 2.724 # water	RCB
				pressurized to 10 psi	
				tape 5	
				on-board tape 5	
12:40:45			tank 56 sw - a.001	start spin up	RCB
12:46:05	114		tank 56 sw - a.002	start sweep	DBW (19.5)
12:58:58				stop sweep	DBW
13:00:05			tank 56 sw - a.003	shut down	DBW
13:42:10	114		tank 56 sw - b.001	start spin up	DBW
13:46:40				start sweep	DBW (18.5)
13:59:32			tank 56 sw - b.002	stop sweep	DBW
14:00:50			tank 56 sw - b.003	shut down	DBW
2:07:25	114		tank 56 sw - c.001	start spin up	DBW
2:12:50				start sweep	(19.5)
2:24:42			tank 56 sw - c.002	stop sweep	
2:27:00			tank 56 sw - c.003	shut down	
57.5	Test Duration				
114	Total Spin Rate				
6555	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
114646	Approximate Cumulative Number of Cycles				

Test Article:

SSTR50

Project No.:

18.06404**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations	Init	
7/7/03 3:05	Emergency Shutdown Procedure Review		OK	RS	
"	Pre-Test Hardware Check		OK	RS	
"	Pre-Test DAC Check and Emergency Stop Verification		OK	DBW	
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7/7/03				removed upper hemisphere; pushed diaphragm to "ging-gang" shape (see pictures in pre test j directory); replaced hemisphere; pressurized to 10psi	
				tape G; on board tape S	
15:18:45	114		tank 71sw-j.001	start spin up	DBW
15:17:55				START SWEEP (18)	DBW
15:17:55			tank 71sw-j.002	STOP SWEEP	DBW
15:30:48			tank 71sw-j.003	SHUT DOWN	DBW
15:32:00					
15:44:25	114		tank 71sw-k.001	Start SPIN UP	DBW
15:48:35				START SWEEP (18.5)	DBW
16:01:25			tank 71sw-k.002	STOP SWEEP	DBW
16:02:50			tank 71sw-k.003	SHUT DOWN	DBW
4:07:05 pm	114		tank 71sw-L.001	start spin up	DBW
4:12:20			XXXXXXXXXXXXXXXXXXXX	start sweep	DBW
4:25:14			tank 71sw-L.002	stop sweep	DBW
4:26:30			tank 71sw-L.003	shut down	DBW
57.5	Test Duration				
114	Total Spin Rate				
6555	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
127414	Approximate Cumulative Number of Cycles				

Test Article: STEREOProject No.: 18.0644**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations	Init	
7/11/03 6:55	Emergency Shutdown Procedure Review		OK	ACB	
"	Pre-Test Hardware Check		OK	ACB	
"	Pre-Test DAC Check and Emergency Stop Verification		OK	DBW	
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
			Overhead Tape 6	removed tank; replaced w/ 71.2% deadweight stock	
				Fine Dwell Test	
				dwell w/ upper motor at 11 rpm to 109 rpm in 2 rpm increments; 114 rpm total speed	
07:01:37			dw71fd-a.001	start spin	DBW
07:06:10		114 (total)		start "auto dwell"	ACB
08:07:45				stop "auto dwell"	ACB
8:09:05				stop spin	ACB
				50 files written	
67.5	Test Duration				
114	Total Spin Rate				
7695	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
142861	Approximate Cumulative Number of Cycles				

Test Article: STEREOProject No.: 18.0640A**SSTR Operating Log**

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations	Init	
7/14/03 11:48	Emergency Shutdown Procedure Review		OK	SR	
"	Pre-Test Hardware Check		OK	SR	
"	Pre-Test DAC Check and Emergency Stop Verification		OK	SR	
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7/14/03	106			OVERHEAD TAPE 6	SR
				DEADWEIGHT SINE DWELL TESTS	
— REGULAR TEST MATRIX — 71% DEADWEIGHT					
11:50:05 APPROX				START SPIN	SR
11:53:25	106		TOTAL	START AUTO DWELL @ 106 RPM	
12:17:00 APPROX			dw 71sd-106	STOP AUTO DWELL	
			.002 to .028		
12:20:15	114		RPM	START AUTO DWELL @ 114 RPM	
12:43:00 (APPROX)			dw 71sd-114	STOP AUTO DWELL	
			.001 to .027		
12:45:50	123		RPM	START AUTO DWELL @ 123 rpm	
13:08:50			dw 71sd-123	STOP AUTO DWELL	
			.001 to .027		
13:09:55			.028	STOP SPIN	
80	Test Duration				
114	Total Spin Rate (average)				
9126	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
159847	Approximate Cumulative Number of Cycles				

Project No.: 06404

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

[illegible]

Test Article:

SSTR20

Project No.:

06404

SSTR Operating Log

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity						
Date/Time	Activity			Comments/Observations	Init	
7-16-03 6:35	Emergency Shutdown Procedure Review			OK	DSW	
6:35	Pre-Test Hardware Check			OK	DSW	
6:35	Pre-Test DAC Check and Emergency Stop Verification			OK	DSW	
Test Activity						
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init	
			OVERHEAD TAPE A			
			61% DEND WEIGHT			
6:42:18				start spin	RCB	
6:44:45	106		dw61sd-106	start auto dwell @ 106 rpm	RCB	
~ 7:01:50			(.001 - 0.027)	stop auto dwell	RCB	
				transition	RCB	
7:04:00				start auto dwell @ 114 rpm	RCB	
7:20:28	114		dw61sd-114	stop auto dwell	RCB	
			(.001 - .027)	transition	RCB	
				start auto dwell @ 123 rpm	RCB	
7:22:00	123		dw61sd-123	stop auto dwell	RCB	
7:37:56			(.001 - .027)		RCB	
7:38:55			dw61sd-123.028	stop		
57 min	Test Duration					
114 rpm	Total Spin Rate 114 average					
6498	Approximate Number of Cycles (Test Duration x Total Spin Rate)					
188746	Approximate Cumulative Number of Cycles					

Project No.: _____

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

[illegible]

Project No.:

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity			Comments/Observations	Init
7/17/02 12:00	Emergency Shutdown Procedure Review			O/C	SIG
	Pre-Test Hardware Check				
	Pre-Test DAC Check and Emergency Stop Verification				
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
11		Liquid Removed was 2.9 lb.		Noticed the Shield was rubbing on slip Ring. Moved it away; video problem still around. Problem seems to decay as time goes by ?? & it is harder to notice being on.	SIG
Target was 2.74 lb Actual Fill level ~ 68.5%					
12:12:00 / 12:12:30				Start Spin-up Starter Auto Dwell @ 106 RPM	
12:14:55 →		tank 69 sd - 106 tanked 106			
12:32:38				Transition to 114 RPM	
12:34:05		tank 69 sd - 114		Stop + Auto Dwell @ 114 RPM	
12:51:02				Transition to 123 RPM	
12:52:45				Starter Auto Dwell @ 123 RPM	
13:08:55		tank 69 sd - 123		Stop Auto Dwell	
				Spin Down	
56	Test Duration				
114	Total Spin Rate				
6384	Approximate Number of Cycles (Test Duration x Total Spin Rate)				
214510	Approximate Cumulative Number of Cycles				

Project No.: _____

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity			Comments/Observations	Init
06:30:00	Emergency Shutdown Procedure Review			OK	DBW
1	Pre-Test Hardware Check			OK	DBW
	Pre-Test DAC Check and Emergency Stop Verification			OK	DBW
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
6-18-03				Drained water from tank for 63% FILL LEVEL	
6:43:45	106		-tank63sd-106	START SPIN UP	DBW
6:47:05			(.001 - .027)	START AUTO DWELL	DBW
7:04:42				STOP AUTO DWELL	DBW
				TRANSITION	
7:06:30	114		-tank63sd-114	START SPIN START AUTO DWELL	DBW
7:23: -			(.001 - .027)	Stop Auto Dwell	DBW
				TRANSITION	DBW
7:26: -	123		-tank63sd-123	START AUTO DWELL	DBW
7:42:30			(.001 - .027)	STOP AUTO DWELL	DBW
7:43:20			(.028)	TRANSITION SHUT DOWN	DBW
Test Duration					
Total Spin Rate					
Approximate Number of Cycles (Test Duration x Total Spin Rate)					
Approximate Cumulative Number of Cycles					

Test Article: _____

Project No.: _____

SSTR Operating Log

Instructions: Enter date and the initials of the personnel conducting activities in appropriate blanks.

Pre-Test Activity					
Date/Time	Activity		Comments/Observations	Init	
	Emergency Shutdown Procedure Review				
	Pre-Test Hardware Check				
	Pre-Test DAC Check and Emergency Stop Verification				
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7-18-13				Drained tank for 59% fill overhead tpe, onboard tpe	
1:36:30				start up	PLG
1:38:45	106		tank 59sd-106	start auto dwell	Redo PH
1:56:23			(.001-.027)	stop auto dwell	PLG
				transition	
			tank 59sd-114	start autodwell	
			(.001-.027)	stop autodwell	
				transition	
			tank 59sd-123	start autodwell	FR2 not working
			(.001-.027)	stop autodwell	
10:00:00				spinning down to look at F2R	PLG
10:00:18				shutdown	
10:17:35				start spin up	PLG
10:19:35	106		tank 59sd-106a	start autodwell @ 106rpm	PLG
10:37:20			(.001-.027)	stop autodwell	PLG
			tank 59sd-114.001	transition	PLG
10:39:45	114		tank 59sd-114	start autodwell	PLG
10:56:42			(.002-.028)	stop autodwell	PLG
				transition	PLG
Test Duration					
Total Spin Rate					
Approximate Number of Cycles (Test Duration x Total Spin Rate)					
Approximate Cumulative Number of Cycles					

Test Article: _____

Project No.: _____

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Pre-Test Activity					
Date/Time	Activity			Comments/Observations	Init
	Emergency Shutdown Procedure Review				
	Pre-Test Hardware Check				
	Pre-Test DAC Check and Emergency Stop Verification				
Test Activity					
Date/Time	Lwr Mtr RPM	Upr Mtr RPM	Test Data File	Comments/Observations	Init
7-18-03				Drained tank to 56% fill level overhead tape 6, onboard tape 11	PJG
1:03:00				start up	PJG
1:05:20	106		tank56sd-106 (.001-.027)	start auto dwell @ 106 rpm	PJG
1:22:56				stop auto dwell transition	PJG
1:24:40	114		tank56sd-114 (.001-.027)	start auto dwell @ 114 rpm	PJG
1:41:48				stop auto dwell transition	PJG
1:43:25	123		tank56sd-123 (.001-.027)	start auto dwell @ 123 rpm	PJG
1:59:32				stop auto dwell	PJG
2:00:45			tank56sd-123.028	shut down	PJG
Test Duration					
Total Spin Rate					
Approximate Number of Cycles (Test Duration x Total Spin Rate)					
Approximate Cumulative Number of Cycles					