



**ARCON**

*VerNova FCE*

## Product Brochure

[www.fcesoftware.com](http://www.fcesoftware.com)

(734) 904-1895

Our primary focus is to assist physicians and therapists in the objective evaluation of functional abilities by developing, providing, and supporting our industry leading FCE software and instrumentation.

While the Arcon FCE system uses state-of-the-art, automated evaluation tools, it is important to remember that the key to every FCE system is the **software** used to collect, process, and summarize your data.

We guarantee our FCE software and hardware to be:

- Easy to use.
- Widely accepted by insurance companies, physicians, and other referral sources.
- Easy to store and edit all data.
- Intuitive, with menus and help screens describing tests, protocols, system calibration and set-up.
- Complete, automated FCE reports in Microsoft Word with clearly presented data, pictures, and summary.

The Arcon FCE system is the culmination of 40 years of development and refinement. Its performance is reliable and provides a superior clinical tool to enhance your practice.

Our functional evaluation software and testing protocols have been designed with the help of Physical Therapists, Occupational Therapists, Exercise Physiologists, and Kinesiologists, as well as Physicians engaged in Occupational and Physical Medicine.

The Arcon FCE methodology and reports are accepted by disability evaluators and insurance companies as an industry standard.



#### **The Arcon system includes:**

- \* Computerized grip and pinch dynamometer.
  - \* Isometric testing unit with dynamic lifting shelf.
  - \* Electronic goniometer.
- \* Dual range of motion inclinometers.
  - \* MTM dexterity boards.
- \* Computerized wireless heart rate monitor.

#### **Testing protocols include:**

- \* Grip and pinch strength with reliability and comparison to norms.
- \* Whole Body Isometric & Dynamic lifting.
- \* Isometric testing for upper and lower extremities.
  - \* Range of motion testing.
  - \* Dexterity testing.
- \* Movement, balance and postural tolerance.
  - \* Aerobic capacity testing.

## **ARCON Functional Evaluation System**

### **WE PROVIDE INFORMATION THAT REMOVES UNCERTAINTY**

Using the ARCON Functional Capacity Evaluation (FCE) system, we provide information that removes uncertainty in disability claims, workplace injuries, and pre-employment screening. Our primary focus is to provide functional capacity evaluation reports that determine a person's physical ability to perform job-related tasks safely and effectively. Our functional capacity evaluation software and testing protocols were designed with the help of physical therapists, occupational therapists, exercise physiologists, kinesiologists, and Doctor of Physical Medicine. The ARCON functional capacity evaluation results are accepted by disability evaluators and insurance companies as an industry standard.

### **GET REAL TIME MEASUREMENTS**

#### **VERIFIED FCE SOFTWARE**

The ARCON FCE system substantially reduces measurement and calculation errors through control and monitoring by the FCE software, resulting in a high degree of accuracy. Strength measurements are accurate to the nearest pound or to 1% of the full scale. Angle measurements (goniometers and inclinometers) are accurate to the nearest degree.

The ARCON FCE software includes calibration procedures for each instrument and has an internal check to ensure that calibration is verified or performed on at least a bimonthly basis. The evaluator is alerted if measured values are unusually high or low so that equipment problems, while rare, can be quickly detected. By comparison, typical manual FCE systems may only have their tools calibrated once a year or less.

### **WHAT SHOULD YOU EXPECT?**

#### **DIGITAL TOOLS & SOFTWARE DESIGNED FOR YOU**

The ARCON FCE system is designed to collect objective information about a person's physical abilities. The FCE software and hardware augment a clinician's skills by streamlining the time-consuming tasks of data collection and report generation so that the evaluator can focus on the assessment itself. The system tools perform real-time measurements of functional strength, movement, and postural activities while also recording heart rate. The system takes care of stepping through the proper sequence of activities and automatically saves the data for each task, along with any observations that the clinician may wish to add.

The ARCON system is a user-friendly tool to help clinicians perform functional capacity evaluations (FCEs) in a simple, accurate, and consistent manner. The system produces high-quality evaluations by combining three critical components: the evaluation tools (hardware and software), the evaluation protocol, and a competently trained evaluator. These components work together to assure easily understood, reliable, and legally defensible results.

## **The Protocol:**

The ARCON FCE protocol is based on published peer-reviewed research. The component functional tests have been selected based on input from physicians, physical and occupational therapists, exercise physiologists, nurse case managers and vocational professionals. The protocol is designed to provide a comprehensive assessment of the client's functional abilities. A typical evaluation takes approximately 4 hours and is comprised of a variety of components that objectively predict a client's specific physical abilities over the course of an 8-hour day. While the ARCON system allows clinicians flexibility in the selection of component tests, a typical FCE includes the following sections.

***Intake Interview:*** The intake interview is an opportunity for the evaluator to describe the functional evaluation procedure and to identify expectations using an informed consent document. It is also an opportunity to develop a rapport with the client and allay any fears associated with functional testing. During this component of testing the client has an opportunity to tell his or her story. Often times this is the first opportunity that the client has had to describe the injury or illness process fully and how it has impacted both work and activities of daily living. The evaluator is able to collect the client's perception of current capabilities and compare those to demonstrated functional abilities observed later during the evaluation. The evaluator is also able to measure tolerance for sustained sitting during this time.

***Musculoskeletal Screen:*** The client undergoes a brief general screen of functional movement as well as an optional diagnostic specific assessment of injured areas. Range of motion, strength, stability, sensation and other diagnosis specific testing can be correlated with demonstrated functional abilities performed later in the evaluation for consistency. The screen confirms diagnostic criteria, ensures that the client is safe to proceed with more physically demanding portions of the exam and identifies specific deficits. Also, during this component of the evaluation, grip and pinch strength data is collected. This data is compared to population norms based on gender and age. It is also used in determining the client's reliability of effort.

***Strength Testing:*** Whole body lifting, pushing, pulling and carrying capacity is measured both statically and dynamically. Static (isometric) testing is an excellent tool for quickly and safely assessing maximum strength in various work postures. Dynamic lifting is performed utilizing the PILE protocol (Progressive Isoinertial Lifting Evaluation) and has application for both occasional and frequent demand

levels of work. Heart rates are measured during static and dynamic lifting and provide physiological evidence of exertion (reliability of effort) by the client during these tasks. Strength abilities are rated using the standard categories defined in the Dictionary of Occupational Titles published by the U.S. Department of Labor.

***Functional Abilities:*** The ARCON protocol uses Methods-Time-Measurement (MTM) testing to measure a client's abilities in activities that involve movement, dexterity and/or postural tolerance. MTM utilizes the Industrial Standard (IS) criterion as an objective basis for rating ability levels. The Industrial Standard is defined as the time it takes an average worker (male or female), between 18 and 65 with average skills, to perform a task at a rate that he or she can maintain over an 8-hour workday with appropriate allowance for rest, and without undue stress or fatigue. This method of rating functional abilities is based on an extensive body of research published over the past 70 years. Some functional evaluation systems rely on clinical observation of functional tasks, with the rating of a client's ability based on the evaluator's clinical judgment. With MTM testing, the client's ability for each of the functional activities is objectively obtained through direct measurement. ARCON MTM results are reliable, valid and not influenced by evaluator judgment or bias.

***Cardiovascular Assessment:*** Another component used to predict a client's ability to perform work is aerobic capacity. Studies suggest that workers can sustain an energy expenditure rate of 33% of maximum aerobic capacity (VO<sub>2</sub> max) over an 8-hour day. The Arcon system offers three sub-maximal aerobic tests that predict VO<sub>2</sub> max, and thus sustained work capacity. The Canadian Aerobic Fitness Test and the YMCA Step Test are both simple step tests that can quickly and safely predict aerobic capacity, while the Single Stage Treadmill Test uses a motorized treadmill that some clients find easier to tolerate than a step test. When a client has a job with a significant energy demand, the results of a cardiovascular assessment will indicate if he or she is capable of meeting that demand upon return to work.

***Reliability of Effort:*** Essential to every FCE is an objective assessment of the reliability of effort demonstrated by the client during the evaluation. It is also important to identify symptom complaints and/or behaviors that are inconsistent or exaggerated when compared to objective evidence. Reliability is determined based on evidence collected over the entire evaluation and not simply the results a single test. Observed behaviors are compared to the client's perception of abilities and

self-reported symptoms. The ARCON system calculates up to 70 independent measures of reliability over the course of an evaluation. These include a statistical consistency of effort and movement, heart rate responses to exertion, quality and speed of movement patterns, force curve analysis and distraction techniques such as isometric horizontal strength changes, rapid exchange grip testing and Waddell's non-organic signs.

The ARCON FCE system includes instructions for each task as well as suggestions for verbal cues that can be used during testing. Each individual component of the ARCON protocol is well supported with peer reviewed literature.

# Computerized Tools and Protocols



Isometric Lift



Dynamic Lift



Isometric Push



Wireless Isometric Grip



Wireless Inclinometers



Wireless Goniometry



Wireless Heart Rate



Hand and Finger Dexterity



MTM Protocols



## Benchmark Physical Therapy

Phone:

Fax:

## FUNCTIONAL CAPACITY EVALUATION

May 12, 2024

Ms. Edna Benoir  
Hastings Insurance Co.  
100 American way  
New York, NY 10000

### **RE: Evaluee Sample (12345678)**

#### **PURPOSE OF ASSESSMENT**

Mr. Sample was referred for a Functional Capacity Evaluation to determine his ability to perform the duties of his occupation as a Packaging Technician. Mr. Sample has been referred with the diagnoses of Sprain/Strain of Knee/Leg and Sprain/Strain Lumbar Region. He was present for evaluation on 2/6/2015 for a period of 2 hours and 39 minutes.

#### **RELIABILITY AND CONSISTENCY OF EFFORT**

The results of this evaluation suggest that Mr. Sample gave a reliable effort, with 59 consistency measures yielding a reliability score of 123 out of 128 (96%).

#### **FUNCTIONAL ABILITIES**

Evaluee's demonstrated abilities meet essential job demands for the following activities: High Lift, Carrying, Pushing, Pulling, Overall Strength, Sitting, Standing, Walking, Push Cart 40 Lb, Pull Cart 40 Lb, Push Cart 100 Lb, Pull Cart 100 Lb, Balance, Bending, Crouching, Kneeling, Reach Immediate (Front) Right, Reach Immediate (Front) Left, Reach Overhead (Front) Right, Reach Overhead (Front) Left, Handling Right, Handling Left, Fingering Right, Fingering Left.

#### **FUNCTIONAL LIMITATIONS**

Evaluee's demonstrated abilities do not meet essential job demands for the following activities: Mid Lift, Low Lift, Full Lift.

#### **CONCLUSIONS**

Mr. Sample can return to work with a temporary modification of duties. He is limited to the Medium lifting category (less than 50 lb) until a re-evaluation can be performed in six weeks.

Sincerely,

Peter Starr, PT



**Functional Abilities Summary**

Mr. Sample’s demonstrated abilities in this evaluation are summarized below. A value of **n/a** indicates the activity was not included in the evaluation. If job demands were provided with this evaluation, functional abilities are compared to the corresponding job demand level. FCE performance below job demand is shown as a **Yes** in the deficit column, while mixed performance (both above and below the job demand level) is shown as **?** indicating a possible deficit.

Activities Rated by Strength Level						
Activity	FCE Performance (PDC Category)	Equivalent Strength Level			Job Demand (PDC Category)	Deficit
		Occasional 0 to 2.6 hours/day	Frequent 2.7 to 5.3 hours/day	Constant 5.4 to 8 hours/day		
Low Lift (floor to waist)	Medium	21 - 50 lb	11 - 25 lb	1 - 10 lb	Heavy	Yes
Mid Lift (waist to shoulder)	Medium	21 - 50 lb	11 - 25 lb	1 - 10 lb	Heavy	Yes
High Lift (shoulder and above)	Medium	21 - 50 lb	11 - 25 lb	1 - 10 lb	Medium	No
Full Lift (floor to shoulder)	Medium	21 - 50 lb	11 - 25 lb	1 - 10 lb	Heavy	Yes
Carry	Heavy	51 - 100 lb	26 - 50 lb	11 - 20 lb	Heavy	No
Push (static)	Heavy	51 - 100 lb	26 - 50 lb	11 - 20 lb	Medium	No
Pull (static)	Heavy	51 - 100 lb	26 - 50 lb	11 - 20 lb	Medium	No
Overall Strength Category	Medium	21 - 50 lb	11 - 25 lb	1 - 10 lb	Medium	No
Activities Rated by Frequency and Duration						
Activity	FCE Performance			Job Demand	Deficit	
Walk	Constant			Constant	No	
Climb (stairs)	n/a					
Balance	Constant			Frequent	No	
Stoop/Bend	Frequent			Occasional	No	
Kneel	Constant			Occasional	No	
Crouch/Squat	Frequent			Occasional	No	
Crawl	n/a					
Reach Immediate	Left: (Front) Constant	Right: (Front) Constant		Frequent	No	
Reach Overhead	Left: (Front) Constant	Right: (Front) Constant		Frequent	No	
Handling	Left: Constant	Right: Constant	Both: n/a	Frequent	No	
Fingering	Left: Constant	Right: Constant	Both: n/a	Frequent	No	
Feeling (tactile discrimination)	n/a					
Sitting	Frequent			Frequent	No	
Standing	Frequent			Frequent	No	
Push Cart	40 Lb=Constant, 100 Lb=Frequent			Frequent, Occasional	No	
Pull Cart	40 Lb=Frequent, 100 Lb=Frequent			Frequent, Occasional	No	
Other Activities						
Grip/Grasping Strength (Dynamometer Position 2)	Left: 82.3 lb		Right: 84.1 lb			low
Cardiovascular Fitness	not determined					



# Benchmark Physical Therapy

Phone:

Fax:

## FUNCTIONAL CAPACITY EVALUATION

### EVALUEE INFORMATION:

Report Date: May 12, 2024

Evaluee: **Evaluee Sample**

ID#: **12345678**

DOB: **11/29/72** Age: **51**

Address: **1166 Jamestown  
Williamsburg, VA 23185**

Sex: **M** Dom. Hand: **R**  
Height: **71 in** Weight: **185 lb**

Phone (H): **(757) 555-9119**

Phone (W): **(757) 555-1212**

Evaluation Date: **02/06/2015**

Occupation: **Packaging Technician**

Referred by: **n/a**

Employer: **Virginia Printing**

Resting Pulse Rate: **71**

Insurance Co: **Hastings Mutual**

Blood Pressure (sitting): **90/130**

Physician: **Michael Young, MD**

Tested By: **Peter Starr PT**

Attorney: **Roger Thompson**



Injury/Illness: Diagnosis	Side	Onset Date	ICD Code
<b>Sprain/Strain of Knee/Leg</b>	<b>L</b>	<b>8/24/2014</b>	<b>884.8</b>
<b>Sprain/Strain Lumbar Region</b>	<b>n/a</b>	<b>8/24/2014</b>	<b>847.2</b>

Current Medications: Name	Dosage	Indication	Taken Day of Evaluation?
<b>Tylenol w/Codeine</b>	<b>n/a</b>	<b>Back pain</b>	<b>Yes</b>

### JOB INFORMATION:

Company: **Virginia Printing**  
Address: **1004 Industrial Parkway**  
Phone: **(757) 555-1234**  
Job Title: **Packaging Technician**

Contact: **Albert Bessemer**  
**Williamsburg, VA 23185**  
FAX: **(757) 555-1234**  
Job Code (DOT, NOC, etc.): **n/a**

### HISTORY:

#### Mechanism and History of Injury:

Mr. Sample was referred to our clinic as a result of an injury sustained on the assembly line at his place of employment. He stated that he was lifting a carton from a conveyor when he slipped and fell. He reported that as he fell, he tried to push the carton away so that it would not fall on him. He landed in an awkward position and felt a sharp pain in his lower back, as well as his left hip and knee that were under him when he fell. He was sent to the Main Street Clinic where he was diagnosed with a severe Lumbar Strain/sprain and a mild Knee sprain. Mr. Sample reports that his treating physician recommended rest, analgesics, and anti-inflammatory drugs. He was subsequently referred for physical therapy where he has been undergoing treatment to improve lumbar strength and flexibility.

#### Medical History:

Mr. Sample reports a history of Type II diabetes that is well controlled with diet and activity. He also reports a left tibial fracture sustained in an automobile accident in 2004 that has healed with no significant residual effects.

#### Intake Interview:

Subject reported on time, and was cooperative for interview and testing. He indicated that his back was bothering him somewhat as he sat for his interview, and displayed occasional postural adjustments consistent with his symptoms. He said that his physical therapy was helpful, but that the pain in his back has not gone away completely.

**SUMMARY:**

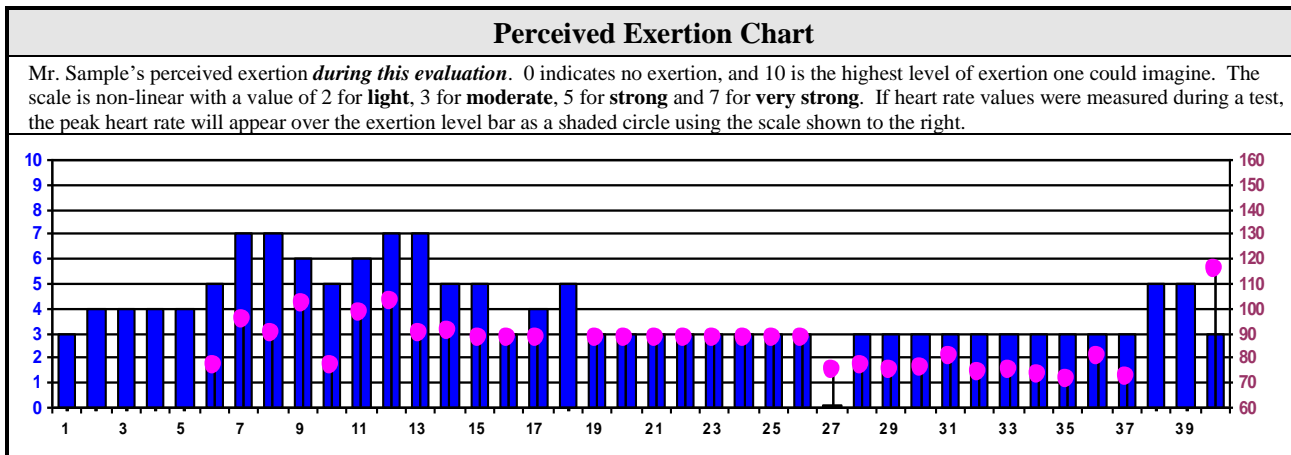
Mr. Sample demonstrated a reliable effort in this evaluation, with 58 of 59 consistency measures recorded as reliable. (*Unreliable measures show “Marginal” or “No” in the **Reliable** column in Table 1, below.*)

<b>Table 1 – Reliability and Consistency of Effort</b>				
<b>Test</b>	<b>Result</b>	<b>Expected</b>	<b>Measure</b>	<b>Reliable</b>
H Torso Lift	104.0 lb	>=115.2 lb	IHSC	No

Mr. Sample’s perceptions regarding his ability to function are illustrated in the Charts presented below.

<b>Activity Rating Chart</b>					
<b>Mr. Sample’s rating of his ability to perform the listed activities over an 8-hour workday</b>					
<b>ACTIVITY</b>	<b>Don’t Know</b>	<b>NOT ABLE</b>	<b>OCCASIONAL</b> not more than 1/3 of workday	<b>FREQUENT</b> between 1/3 and 2/3 of workday	<b>CONSTANT</b> more than 2/3 of workday
Lift/Carry 10 Lbs.				XXX	
Lift/Carry 20 Lbs.			XXX		
Lift/Carry 50 Lbs.			XXX		
Push/Pull Cart				XXX	
Walking				XXX	
Climbing				XXX	
Balancing				XXX	
Stooping/Bending			XXX		
Kneeling				XXX	
Crouching/Squatting				XXX	
Crawling			XXX		
Reaching				XXX	
Handling (objects)					XXX
Fingering (small objects)					XXX
Sitting				XXX	
Standing				XXX	

<p align="center"><b>Pain Drawing Chart</b></p> <p>Mr. Sample's description of his symptoms as he reported on 2/6/2015. (reproduced from chart completed by examinee)</p>	
<p>The evaluator has rated this as a <b>localized</b> pain profile, suggesting symptom management by the examinee that is consistent with his diagnosis.</p> <p><b>Symptom Key:</b></p> <ul style="list-style-type: none"> <li>~ Aching</li> <li>/ Stabbing</li> <li>X Burning</li> <li>• Pins&amp;Needles</li> <li>○ Numbness</li> </ul>	



Mr. Sample's physical capacity (overall body strength, cardiovascular condition and range of movement) is summarized below. Cardiovascular *rating* is the subject's 8-hour sustainable energy capacity expressed as a Physical Demand Level. Range of movement is within normal limits except as reported below.

Strength Rating		Cardiovascular Condition		
Dictionary of Occupational Titles, Physical Demand Level		Evaluated using: <b>CAFT Step Test</b>		
Overall Strength Category	<b>Medium</b>	Rating: <b>not determined</b>		
Range of Movement (degrees)				
Joint/Movement	Measured	Norm	Impairment <sup>1</sup>	Deficit
Cervical Flexion	35	50	2 %	Yes
Cervical Extension	35	60	3 %	Yes
Lumbar Flexion	59	60	5 %	Yes
Lumbar Extension	14	25	3 %	Yes
Knee Flexion Left	105	120	10 %	Yes
Hip Extension Left	15	0	5 %	Yes
Ankle Dorsal Flexion Left	10	20	7 %	Yes

---

<sup>1</sup> Joint impairment percent from the Fifth Edition of the AMA *Guides to the Evaluation of Permanent Impairment*. This value is provided as a reference, based only on observed joint range of motion, and *does not* indicate either the presence or absence of an actual whole body impairment. Such a determination can only be made by a qualified clinician according to criteria presented in the “AMA Guides”.

**ARCON MTM Functional Abilities Summary**

Methods-Time Measurement (MTM) data provides a quantifiable description of the functions required of a worker in the performance of certain physical job demands. An evaluatee’s demonstrated ability in the assessment is compared to the MTM Industrial Standard (IS), which is the time an average worker with average training could perform the listed activity, assuming the activity is performed over an average eight hour day. Percent of Industrial Standard (%IS) is the evaluatee’s demonstrated ability as a percent of the Industrial Standard, where 100% and up indicates performance at or above the Standard, while below 100% indicates performance below the Standard.

**Figure 1 – Percent of Industrial Standard Rating Chart**

Activity	Date	CV <sup>2</sup>	%IS	Percent of Industrial Standard Rating Chart															
				<30	40	50	60	70	80	90	100	110	120	130	140+				
Walking - 12 Ft	2/6/2015	1	122.3	[Bar chart showing 122.3% IS]															
Carrying - 10 Lb	2/6/2015	0.9	109.5	[Bar chart showing 109.5% IS]															
Carrying - 20 Lb	2/6/2015	2.1	109.7	[Bar chart showing 109.7% IS]															
Carrying - 50 Lb	2/6/2015	0.9	94.3	[Bar chart showing 94.3% IS]															
Push Cart - 40 Lb	2/6/2015	3.5	103.9	[Bar chart showing 103.9% IS]															
Pull Cart - 40 Lb	2/6/2015	3.1	90.3	[Bar chart showing 90.3% IS]															
Push Cart - 100 Lb	2/6/2015	2.7	78.7	[Bar chart showing 78.7% IS]															
Pull Cart - 100 Lb	2/6/2015	0.9	73	[Bar chart showing 73% IS]															
Balance - 10 paces	2/6/2015	2.2	106.1	[Bar chart showing 106.1% IS]															
Bending	2/6/2015	1.2	95.6	[Bar chart showing 95.6% IS]															
Crouching	2/6/2015	8.4	97.5	[Bar chart showing 97.5% IS]															
Kneeling	2/6/2015	1.1	114	[Bar chart showing 114% IS]															
Reach Immediate (L)	2/6/2015	<u>1.6</u>	116.1	[Bar chart showing 116.1% IS]															
Reach Immediate (R)	2/6/2015	<u>2.3</u>	125.6	[Bar chart showing 125.6% IS]															
Reach Overhead (L)	2/6/2015	<u>1.4</u>	119.6	[Bar chart showing 119.6% IS]															
Reach Overhead (R)	2/6/2015	<u>1.7</u>	127.1	[Bar chart showing 127.1% IS]															
Handling (L)	2/6/2015	<u>0.9</u>	120	[Bar chart showing 120% IS]															
Handling (R)	2/6/2015	<u>0.6</u>	129.1	[Bar chart showing 129.1% IS]															
Fingering (L)	2/6/2015	<u>0.9</u>	110.5	[Bar chart showing 110.5% IS]															
Fingering (R)	2/6/2015	<u>0.3</u>	127.9	[Bar chart showing 127.9% IS]															
				<30	40	50	60	70	80	90	100	110	120	130	140+				
<b>PDC Category</b> →				<b>Occasional<sup>3</sup></b>				<b>Frequent<sup>4</sup></b>				<b>Constant<sup>5</sup></b>							

<sup>2</sup> **Coefficient of Variance.** If value is underlined, CV calculated for multiple test sets. For CV > 10%, value is shaded to call attention to results that may indicate a problem in consistency or ability to perform this task.

<sup>3</sup> **Occasional** - allows 31-70% Rest Allowance Standard (RAS) from the IS, or activity performed 0 - 2.6 hours/day

<sup>4</sup> **Frequent** - allows up to 30% RAS from the IS, or activity performed 2.7 - 5.33 hours/day

<sup>5</sup> **Constant** - allows no RAS, or activity performed 5.33 - 8 hours/day

**ARCON ST - Static Strength Report:**

The evaluatee was evaluated using the *ARCON ST* static strength test. The results report an individual’s ability to lift, push, or pull in various common work postures as an **Average Force** or strength sustained during the activity. **Peak Force** is also reported for comparison purposes. Demonstrated strength (Average Force) is compared to essential job demands and/or safe lifting recommendations based on research conducted for the National Institute for Occupational Safety and Health (NIOSH). **Occasional Lift** is calculated as 50%\* of the Average Force value (90% for Push and Pull) and represents a suggested safe occasional performance level for this activity.

<i>Individual Test Results</i>		<b>Strength Data</b>			<b>Job Related Strength and Lifting Recommendations<sup>‡</sup></b>		
<b>TASK NAME</b>	<b>DATE</b>	<b>Average Force</b>	<b>CV<sup>†</sup> (%)</b>	<b>Peak Force</b>	<b>Desired Strength</b>	<b>% of Desired</b>	<b>Occasional Lift (Table ST1)</b>
Floor Lift	2/6/2015	75.6 lb	2.7%	94.7 lb	n/a	n/a	38 lb (Medium)
H Floor Lift	2/6/2015	34.3 lb	n/a	38.2 lb	n/a	n/a	17 lb (Light)
Torso Lift	2/6/2015	86.6 lb	4.1%	93.5 lb	100 lb	86 %	43 lb (Medium)
H Torso Lift	2/6/2015	104 lb	n/a	118.1 lb	n/a	n/a	52 lb (Heavy)
Arm Lift	2/6/2015	75.1 lb	1.9%	83.8 lb	n/a	n/a	38 lb (Medium)
High Near Lift	2/6/2015	96.5 lb	4.6%	107.5 lb	n/a	n/a	48 lb (Medium)
H High Near Lift	2/6/2015	46.7 lb	n/a	50.7 lb	n/a	n/a	23 lb (Medium)
Push	2/6/2015	70.6 lb	4.4%	81.3 lb	n/a	n/a	64 lb (Heavy)
Pull	2/6/2015	72.3 lb	2.1%	80 lb	n/a	n/a	65 lb (Heavy)

(“n/a” indicates results that are not available or applicable for the listed task)

As an additional means of determining if the evaluatee gave a full and consistent effort, certain tests were repeated with the evaluatee being asked to move either 10 inches closer to or 10 inches farther away from the lifting handles. Population studies<sup>¥</sup> indicate that such a change should produce a 33% or greater *increase* in strength when moving closer, and a 33% or greater *decrease* in strength when moving farther away. When the expected change of at least 33% is **not** observed, an *Inappropriate Horizontal Strength Change (IHSC)* is reported by assigning a **FAIL** status to indicate inconsistent performance.

<i>I H S C Results</i>		<b>Repeated Test</b>		<b>Strength Change %</b>		
<b>Task Name and Distance</b>	<b>Avg Force</b>	<b>Distance</b>	<b>Avg Force</b>	<b>Expected</b>	<b>Actual</b>	<b>Status</b>
Floor Lift: H = 10 in	75.6 lb	H = 20 in	34.3 lb	< -33 %	-54 %	PASS
Torso Lift: H = 15 in	86.6 lb	H = 5 in	104 lb	> 33 %	20 %	FAIL
High Near Lift: H = 10 in	96.5 lb	H = 20 in	46.7 lb	< -33 %	-51 %	PASS

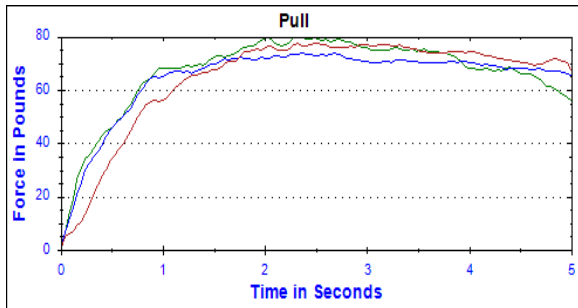
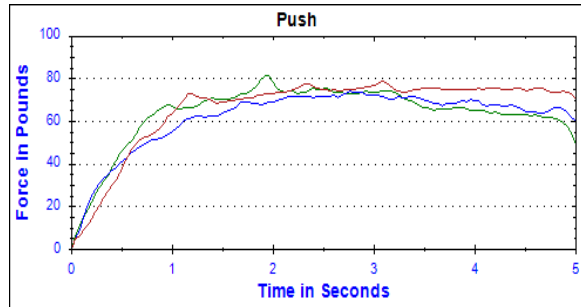
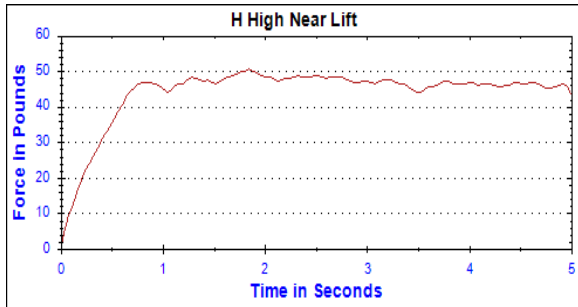
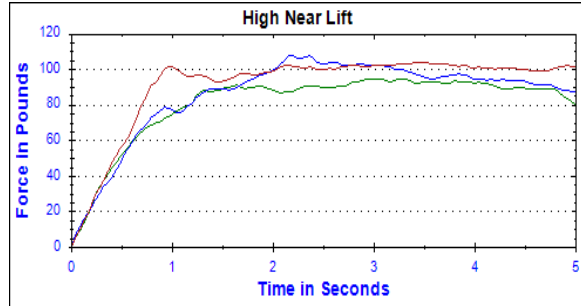
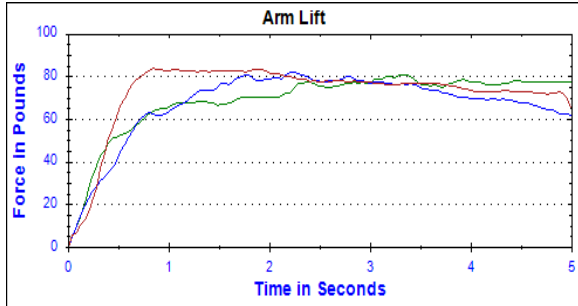
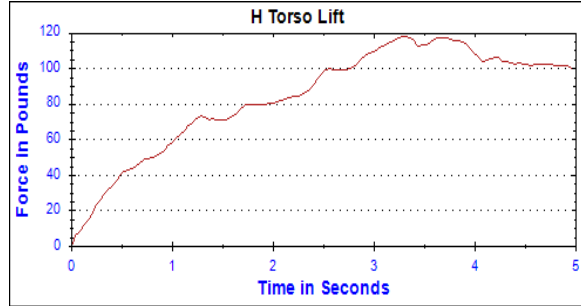
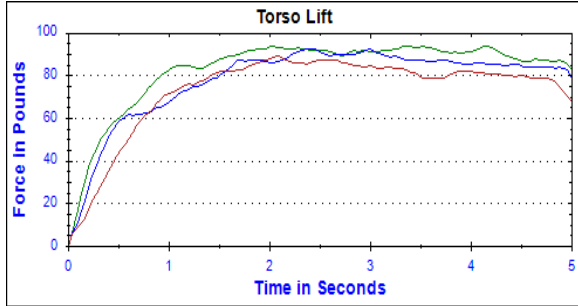
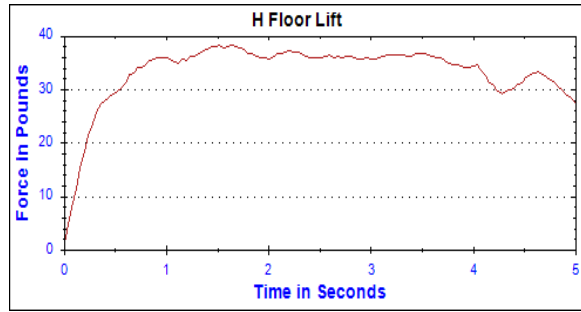
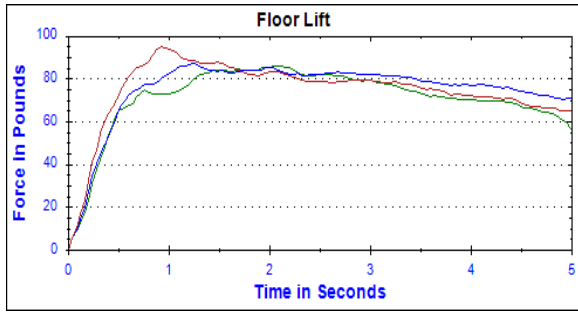
\* For this **lifting safety factor**, 50-55% is considered conservative, 60-65% is considered moderate, and 70-75% is considered moderately aggressive in relation to long-term safety in performing similar activities at work.

‡ Donald B. Chaffin, Ph.D.; Gary D. Herrin, Ph.D.; W. Monroe Keyserling, M.S.; "Pre-Employment Strength Testing, An Updated Position", Journal of Occupational Medicine, Vol 20. No.6, June, 1978.

† Based on the NIOSH guideline for validity, test results that exhibit a coefficient of variation (CV) greater than or equal to 15% cannot be considered as valid, consistent and reproducible.

¥ “Horizontal Strength Changes: An Ergonomic Measure for Determining Validity of Effort in Impairment Evaluations”, Journal of Disability, Volume 3, Numbers 1-4, July, 1993.

**ST Test Graphs (in order of Test Results)**



**Table ST1 - Physical Demand Characteristics Of Work**  
(Dictionary of Occupational Titles - Volume II, Fourth Edition, Revised 1991)



<b>Physical Demand Level</b>	<b>OCCASIONAL</b> 0-33% of the workday	<b>FREQUENT</b> 34-66% of the workday	<b>CONSTANT</b> 67-100% of the workday
Sedentary	1 - 10 lb. (< 5 kg.)	Negligible	Negligible
Light	11 - 20 lb. (5 - 9 kg.)	1 - 10 lbs. (< 5 kg.)	Negligible
Medium	21 - 50 lb. (10 - 22 kg.)	11 - 25 lbs. (5 - 11 kg.)	1 - 10 lbs. (< 5 kg.)
Heavy	51 - 100 lb. (23 - 45 kg.)	26 - 50 lbs. (12 - 23 kg.)	11 - 20 lbs. (5 - 9 kg.)
Very Heavy	Over 100 lb. (> 45 kg.)	Over 50 lbs. (> 23 kg.)	Over 20 lbs. (> 9 kg.)

**ARCON HD - Grip Strength Report:**

The evaluatee was evaluated using the ARCON HD grip strength test. This process is designed to quantify an individual’s grip strength in one or more standard grip positions, and to compare such strength to expected biomechanical patterns and recognized population norms (note: “n/a” for grip positions with no published norms).

<i>Individual Test Results</i>		STRENGTH DATA		NORMATIVE DATA‡		
TASK NAME	DATE	FORCE	CV† (%)	Population Norm	Standard Deviation	Comp. to Norm
Position 1 - MMVE - Left	2/6/2015	65.9 lb	n/a	n/a	n/a	n/a
Position 1 - MMVE - Right	2/6/2015	69.8 lb	n/a	n/a	n/a	n/a
Position 2 - Left	2/6/2015	82.3 lb	2.0%	101.9 lb	+/- 17	low
Position 2 - Right	2/6/2015	84.1 lb	2.5%	113.6 lb	+/- 18.1	low
Position 3 - MMVE - Left	2/6/2015	84.9 lb	n/a	n/a	n/a	n/a
Position 3 - MMVE - Right	2/6/2015	86.1 lb	n/a	n/a	n/a	n/a
Position 4 - MMVE - Left	2/6/2015	72.1 lb	n/a	n/a	n/a	n/a
Position 4 - MMVE - Right	2/6/2015	68.1 lb	n/a	n/a	n/a	n/a
Position 5 - MMVE - Left	2/6/2015	65.5 lb	n/a	n/a	n/a	n/a
Position 5 - MMVE - Right	2/6/2015	62 lb	n/a	n/a	n/a	n/a
Rapid Exchange - Left	2/6/2015	75.7 lb	7.9%	n/a	n/a	n/a
Rapid Exchange - Right	2/6/2015	78.5 lb	8.3%	n/a	n/a	n/a

(“n/a” indicates results that are not available or applicable for the listed task)

The following table compares the evaluatee’s grip strength on opposite body sides, and reports a percent difference in strength for the *weaker hand* compared to the stronger hand. In cases of reported injury, an *expected strength* is calculated based on the measured strength of the uninjured side (note: *right* hand dominant subjects are assumed to be 10% stronger on the right side, while *left* hand dominant subjects are assumed have equal strength on both sides‡). When demonstrated strength is *less* than expected strength, the percent of *strength deficit* is reported.

<i>Left Hand vs. Right Hand</i>		STRENGTH DATA (* indicates Dominant Hand)			INJURED SIDE COMPARISON		
TASK NAME	DATE	LEFT	RIGHT	Weaker Hand	Injured Side	Expected Strength	Strength Deficit
Position 1 - MMVE	2/6/2015	65.9	* 69.8	-6 %	n/a	n/a	n/a
Position 2	2/6/2015	82.3	* 84.1	-2 %	n/a	n/a	n/a
Position 3 - MMVE	2/6/2015	84.9	* 86.1	-1 %	n/a	n/a	n/a
Position 4 - MMVE	2/6/2015	72.1	* 68.1	-6 %	n/a	n/a	n/a
Position 5 - MMVE	2/6/2015	65.5	* 62	-5 %	n/a	n/a	n/a

‡ Virgil Mathiowetz, MS, OTR, Nancy Kashman, OTR, Gloria Volland, OTR, Karen Weber, OTR, Mary Dowe, OTS, Sandra Rogers, OTS, “Grip and Pinch Strength: Normative Data for Adults”, Occupational Therapy Program, University of Wisconsin-Milwaukee, Milwaukee, WI, Arch Phys Med Rehabil 66:69-72, February, 1985.

† Based on common guidelines for consistency of effort, test results that exhibit a coefficient of variation (CV) greater than or equal to 15% are likely to indicate an unreliable or inconsistent performance.

<i>Left Hand vs. Right Hand</i>		STRENGTH DATA (* indicates Dominant Hand)			INJURED SIDE COMPARISON		
TASK NAME	DATE	LEFT	RIGHT	Weaker Hand	Injured Side	Expected Strength	Strength Deficit
Rapid Exchange	2/6/2015	75.7	* 78.5	-4 %	n/a	n/a	n/a

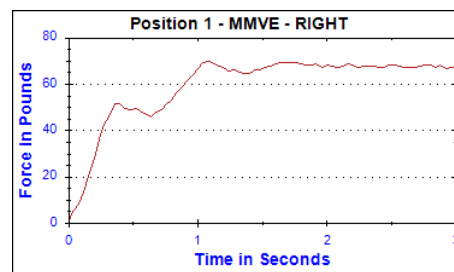
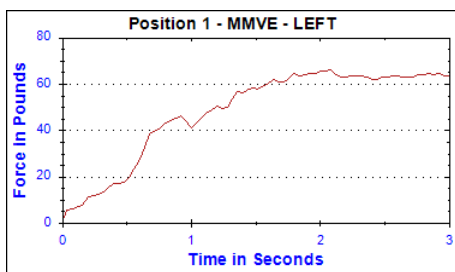
The evaluatee was asked to perform a Rapid Exchange Grip Test (REG test) as a means to assess the reliability of effort in the standard grip test. Research<sup>§</sup> has shown that REG strength *exceeding* the maximum expected grip strength (positive REG score, denoted below as + REG) is a probable indication of submaximal or unreliable effort in the standard test.

<i>Rapid Exchange Results</i>		MAX. EXPECTED		RAPID EXCHANGE TEST			
TASK NAME	DATE	FORCE	DATE	FORCE	% Chg	+ REG	
Rapid Exchange - Left	2/6/2015	93.4	2/6/2015	75.7 lb	-18.5 %	no	
Rapid Exchange - Right	2/6/2015	94.7	2/6/2015	78.5 lb	-16.7 %	no	

The Maximum Voluntary Effort (MVE) protocol was used to determine if the evaluatee exerted a maximal effort during the grip test. This protocol consisted of successive grip tests over the full range of five positions of the hand dynamometer. Research<sup>£</sup> has shown that both normal and injured hand strength should be greater in positions 2, 3 and 4, and less in positions 1 and 5. The table below shows the evaluatee’s MVE results.

<i>MVE Results</i>	Hand Strength vs. Position	
In the graphs to the right, maximal effort is indicated by a “humped” or bell shaped curve (may be skewed toward position 2 or 4, based on evaluatee’s hand size), while sub-maximal effort is indicated by a flat or randomly varying curve.	<p>5-Position Grip Strength - LEFT</p>	<p>5-Position Grip Strength - RIGHT</p>

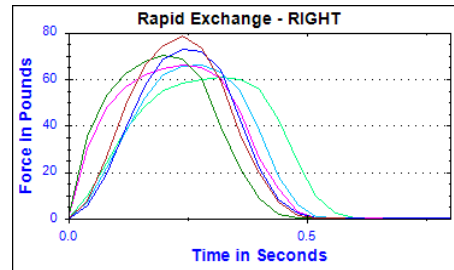
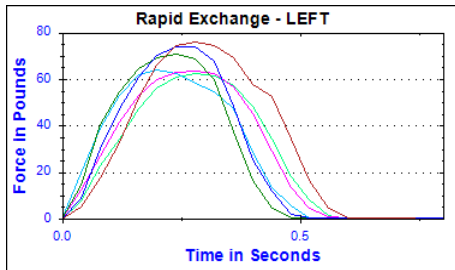
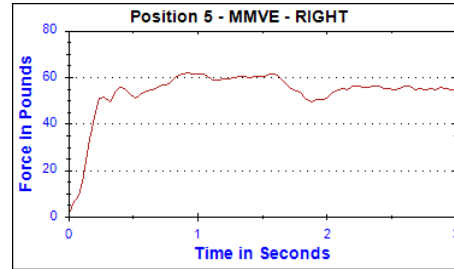
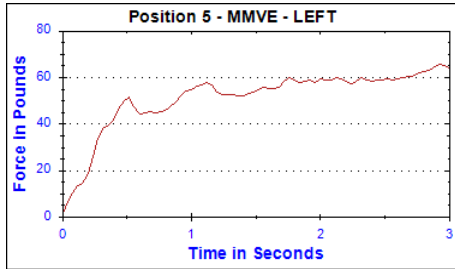
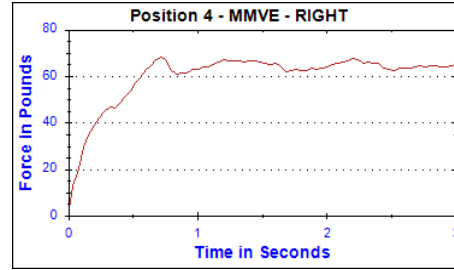
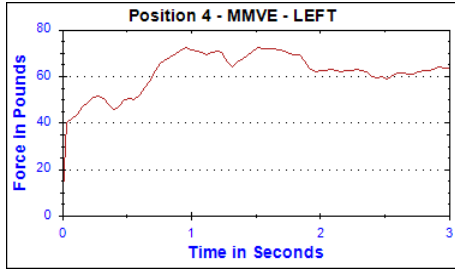
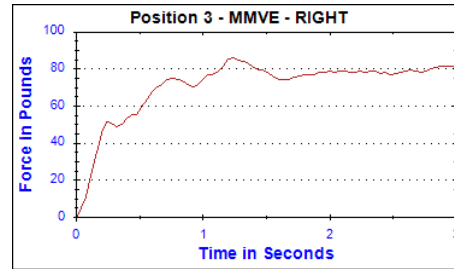
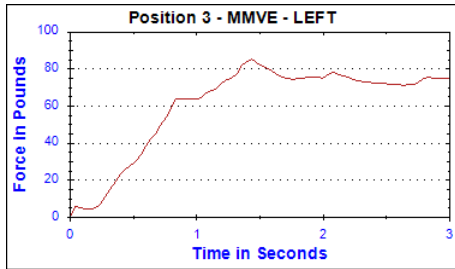
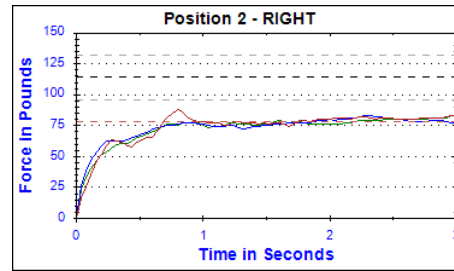
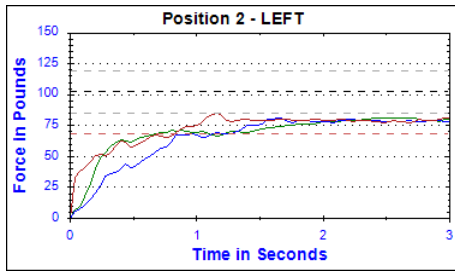
**HD Test Graphs (in order of Test Results)**



<sup>§</sup> Hildreth, D. H. & Lister, G. D. (1989). Detection of submaximal effort by use of the rapid exchange grip. Journal of Hand Surgery, 14A: 742-745.

<sup>£</sup> Harold M. Stokes, M.D., “The Seriously Uninjured Hand - Weakness of Grip”, Journal of Occupational Medicine, Vol. 25, No. 9, Sept. 1983.

**HD Test Graphs (in order of Test Results)**



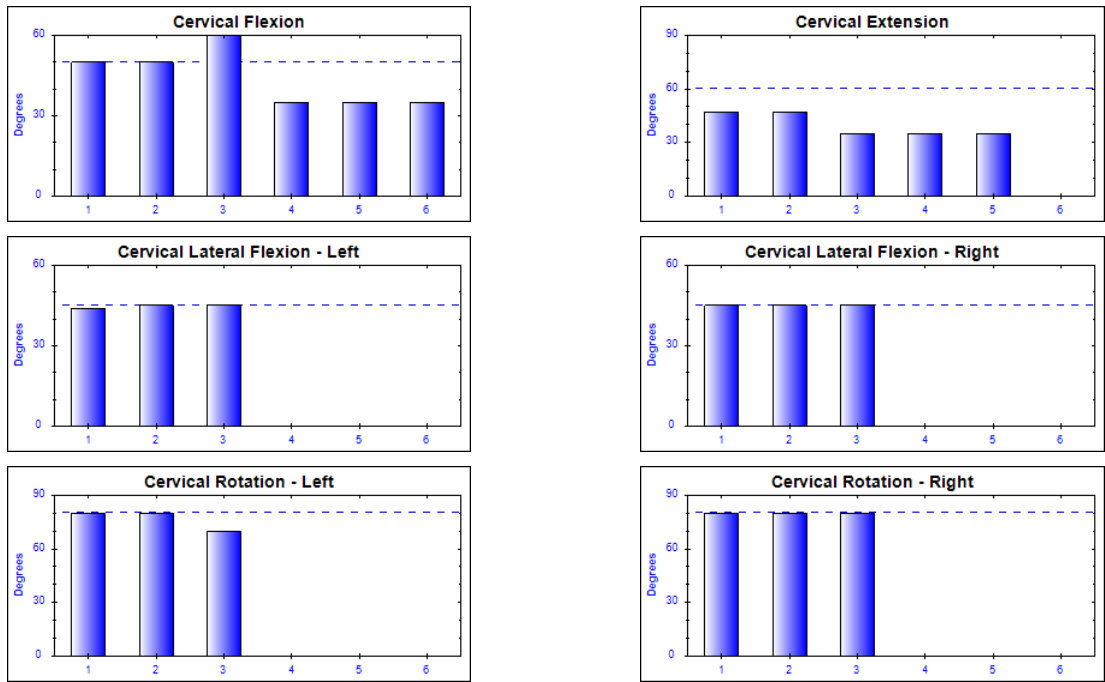
**ARCON ROM - Spinal ROM Inclinator Report:**

The evaluatee was evaluated using the ARCON ROM spinal range of motion inclinometer test. This process is designed to quantify an individual's spinal range of motion (ROM) in the cervical, thoracic and/or lumbar regions, and to compare the resulting ROM values to recognized population norms.

<i>Individual Test Results</i>		Range of Motion		NORMATIVE DATA‡	
Joint/Axis Tested	DATE	ROM Value	Valid†	Population Norm	Percent of Norm
Cervical Flexion	2/6/2015	35 deg	Yes	50 deg	70 %
Cervical Extension	2/6/2015	35 deg	Yes	60 deg	58 %
Cervical Lateral Flexion - Left	2/6/2015	45 deg	Yes	45 deg	100 %
Cervical Lateral Flexion - Right	2/6/2015	45 deg	Yes	45 deg	100 %
Cervical Rotation - Left	2/6/2015	80 deg	Yes	80 deg	100 %
Cervical Rotation - Right	2/6/2015	80 deg	Yes	80 deg	100 %
Lumbar Flexion	2/6/2015	59 deg	Yes	60 deg	98 %
Lumbar Extension	2/6/2015	14 deg	Yes	25 deg	56 %
Lumbar Lateral Flexion - Left	2/6/2015	25 deg	Yes	25 deg	100 %
Lumbar Lateral Flexion - Right	2/6/2015	33 deg	Yes	25 deg	132 %
Straight Leg Raise Left	2/6/2015	62 deg	Yes	n/a	n/a
Straight Leg Raise Right	2/6/2015	72 deg	Yes	n/a	n/a

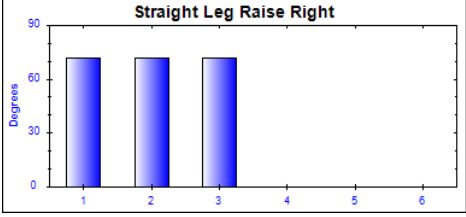
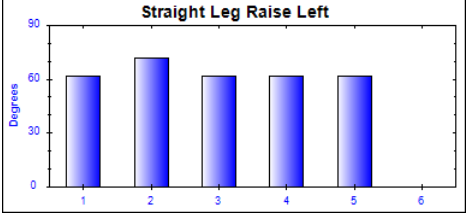
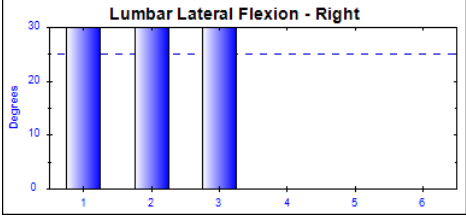
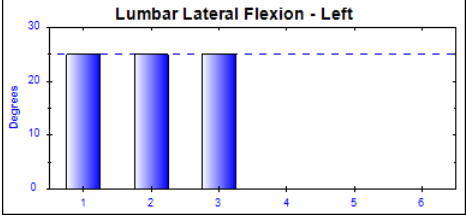
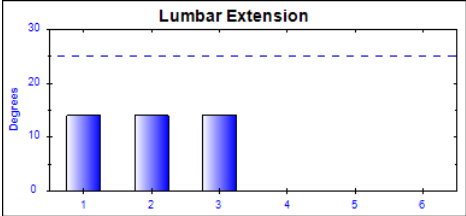
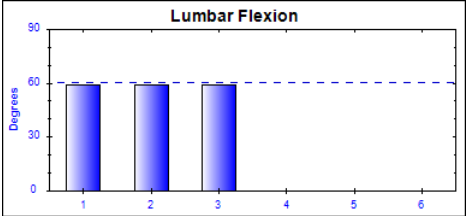
(“n/a” indicates results that are not available or applicable for the listed task)

**RM Test Graphs (in order of Test Results)**



‡ From “Guides to the Evaluation of Permanent Impairment”, Fifth Edition, American Medical Association, 2001.  
† The AMA “Guides” validity criterion is three consecutive measurements within ±5° or ±10% of mean value.

RM Test Graphs (in order of Test Results)



**ARCON EG - Extremity ROM Goniometer Report:**

The evaluatee was evaluated using the ARCON EG extremity range of motion goniometer test. This process is designed to quantify an individual's range of motion (ROM) on one or more of the extremities, and to compare the resulting ROM values to recognized population norms. If the presence of an injured or affected extremity was noted in the evaluation, the results for that side are marked with an \*, however this does not necessarily indicate involvement to that specific joint.

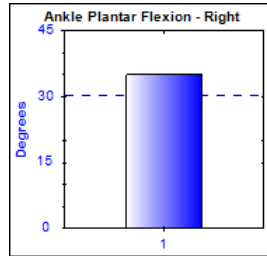
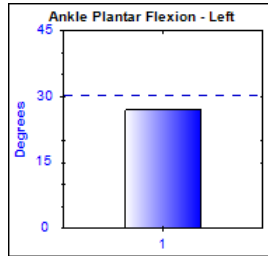
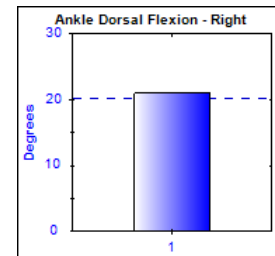
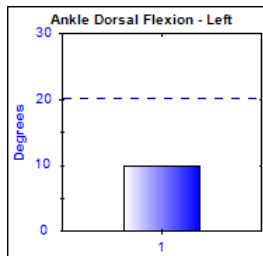
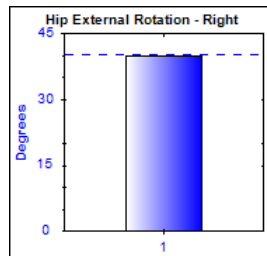
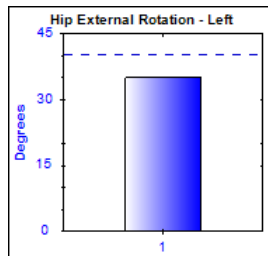
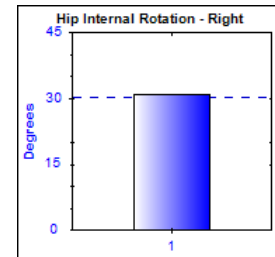
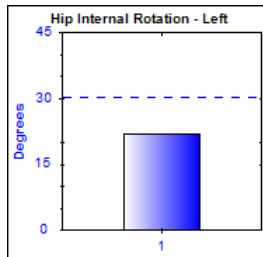
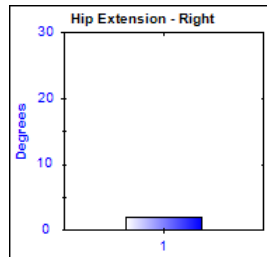
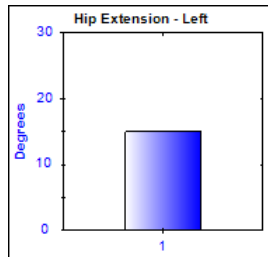
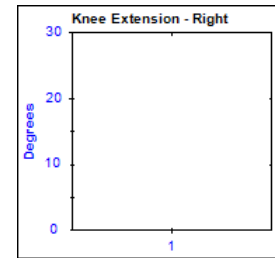
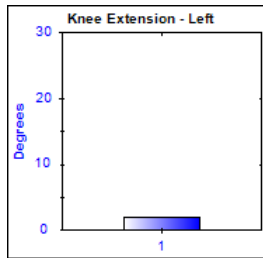
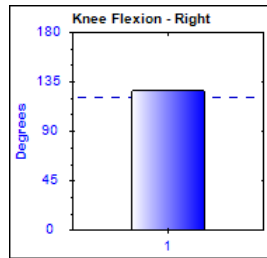
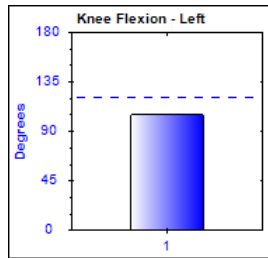
<i>Individual Test Results</i>		Range of Motion		NORMATIVE DATA‡		
Joint/Axis Tested	DATE	LEFT	RIGHT	NORM	LEFT %Norm	RIGHT %Norm
Knee Flexion	2/6/2015	105 deg*	127 deg	120 deg	88 %	106 %
Knee Extension	2/6/2015	2 deg*	0 deg	0 deg	n/a	n/a
Hip Extension	2/6/2015	15 deg*	2 deg	0 deg	n/a	n/a
Hip Internal Rotation	2/6/2015	22 deg*	31 deg	30 deg	73 %	103 %
Hip External Rotation	2/6/2015	35 deg*	40 deg	40 deg	88 %	100 %
Ankle Dorsal Flexion	2/6/2015	10 deg*	21 deg	20 deg	50 %	105 %
Ankle Plantar Flexion	2/6/2015	27 deg*	35 deg	30 deg	90 %	117 %

(“n/a” indicates results that are not available or applicable for the listed task)

---

‡ From “Guides to the Evaluation of Permanent Impairment”, Fourth and Fifth Editions, American Medical Association, 1995 and 2001.

**EG Test Graphs** *(in order of Test Results)*





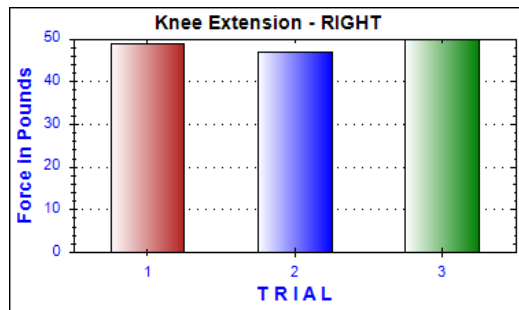
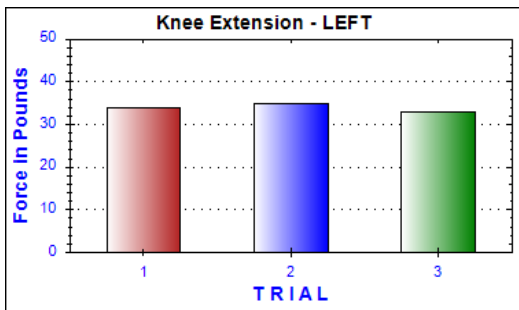
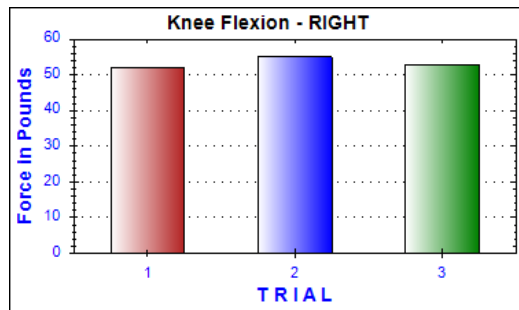
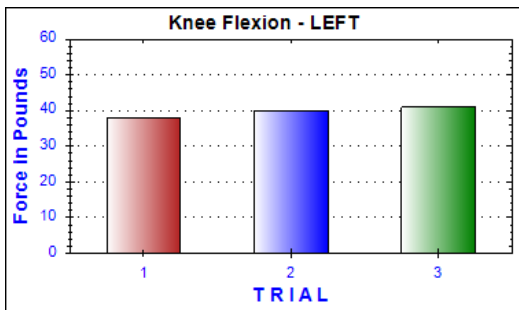
**ARCON CX - Cervical / Extremity Strength Report:**

The evaluatee was evaluated using the ARCON CX static strength testing system. This process is designed to quantify an individual’s cervical and/or extremity strength by isolating a specific body joint and direction of movement and measuring the evaluatee’s maximal isometric exertion. The following table compares the evaluatee’s demonstrated strength on opposite body sides and calculates an **Expected Strength** based on the strength of the stronger side. The **Weaker Side**, if any, is indicated and the percent of **Strength Deficit** is reported. If the presence of an injured or affected extremity was noted in the evaluation, the results for that side are marked with an \*, however this does not necessarily indicate involvement to that specific joint.

<i><b>CX Test Results</b></i>		<b>STRENGTH DATA</b>				<b>WEAKER SIDE COMPARISON</b>		
<b>TASK NAME</b>	<b>DATE</b>	<b>LEFT</b>	<b>CV† (%)</b>	<b>RIGHT</b>	<b>CV† (%)</b>	<b>Weaker Side</b>	<b>Expected Strength</b>	<b>Strength Deficit</b>
Knee Flexion	2/6/2015	39.7 lb*	3.1%	53.3 lb	2.3%	Left	53.3 lb	-26 %
Knee Extension	2/6/2015	34 lb*	2.4%	48.7 lb	2.6%	Left	48.7 lb	-30 %

(“n/a” indicates results that are not available or applicable for the listed task)

**CX Test Graphs (in order of Test Results)**



† Based on the NIOSH standard for validity, test results that exhibit a coefficient of variation (CV) greater than 14% cannot be considered as valid, consistent and reproducible.

**Canadian Aerobic Fitness Test Results:**

The evaluatee was evaluated using the *Canadian Aerobic Fitness Test (CAFT)*. This test is designed to predict an individual’s aerobic capacity (**VO<sub>2</sub> max**) through the use of a simple, submaximal stepping procedure. The test is performed by having the evaluatee step for up to three consecutive three-minute sessions on double 20.3 cm (8 in) steps. The stepping rate increases for each session, and is determined by the evaluatee’s age and gender. The evaluatee’s heart rate is monitored during the test for safety (test is terminated if heart rate exceeds 85% of age-adjusted maximal heart rate). At the end of each session the evaluatee stops stepping for twenty seconds while their heart rate is measured. If the evaluatee’s heart rate is below a predetermined ceiling following each of the first two sessions, an additional session is performed at an increased step rate. The heart rate measured at the end of the *last* completed session is used to calculate a predicted value for the evaluatee’s aerobic capacity (**VO<sub>2</sub> max** in ml/kg/min).

**VO<sub>2</sub> max** is converted to a maximum energy expenditure value in metabolic equivalents (METS) by dividing by a conversion factor<sup>6</sup>. Individuals can generally sustain an energy expenditure rate of 1/3 of their maximum over an 8-hour workday. This is shown in the table, below, as “Sustainable Energy Level”. Also shown is the equivalent category of work (Physical Demand Characteristic or PDC) based on sustainable energy levels as categorized in Table C1, below.

Results	Heart Rate Information				Aerobic Capacity Score			
	DATE	Test Start	End 1st Session	End 2nd Session	End 3rd Session	Predicted VO <sub>2</sub> max	Sustainable Energy Level	PDC Equivalent
	2/6/2015	88	111	110	116	41.7	4.7 METS	Medium

(“n/a” indicates results that are not available or applicable for the listed task)

PDC Category	Sustainable Energy Level
Sedentary	< 2.2 METS
Light	2.2 to 3.5 METS
Medium	3.6 to 6.3 METS
Heavy	6.4 to 7.5 METS
Very Heavy	Over 7.5 METS

<sup>6</sup> Standard conversion factor is 3.5, but factor may be “corrected” for age, gender and body size

**ARCON MTM Functional Abilities Evaluation:**

ARCON MTM evaluates occupational Physical Demand Characteristics (PDC) based on Methods-Time Measurement (MTM) data, the most widely developed and validated work analysis system in the world. MTM data is used to establish fair labor standards by numerous employers and unions and has been accepted in the courts and in arbitration as a valid standard of work performance. The MTM system has been used in personnel selection and disability evaluation for over forty years (Acker and Thompson, 1960; Anderson and Edstrom; Birdsong, 1972; Birdsong and Chyatte, 1970; Brickey, Drewes; 1961; Farrell, 1993; Foulke; Grant et al., 1975; Mink, 1975; McQuaid and Winkler; Poocke; Todd et al., 1979; Wilcock, 1980; Wilcock and Mink, 1982; Yokomizo, 1985).

An evaluatee's demonstrated ability in the assessment is compared to the MTM Industrial Standard (IS), the time it takes an average worker with average skill to perform a specific motion throughout an average eight hour day (Karger and Hancock, 1982; Karger and Bayha, 1987; Maynard et al., 1948; MTM Assoc, 1972, 1980).

The ARCON MTM Report presents data from the evaluation in tabular form, as shown and defined below:

Trial	Body Side	Wgt/Pos.	Dist/Plane	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C

<b>Trial</b>	An ascending <b>count</b> of the number of times a functional activity or task is repeated for determination of consistency and endurance. A series of Trials comprise a <b>Set</b> . MTM tests may consist of several sets of data.
<b>Body Side</b>	Indicating if the activity was performed with the right, left or both body members, if applicable. Dominant side, if applicable, is indicated by "Dom."
<b>Wgt/Pos.</b>	The <b>weight</b> of the object being handled in the activity, or the <b>body position</b> used for this activity (e.g. sitting or standing - varies by activity).
<b>Dist/Plane</b>	<b>Distance</b> over which the activity was performed (for return trips, the distance is one way through the round trip), or the <b>plane</b> in which the activity was performed (e.g. immediate or overhead - varies by activity).
<b>Reps</b>	Number of <b>repetitions</b> of the predefined pattern of movement that comprise a single trial of a functional activity or task. The definition of Reps for each activity is shown in a footnote below the results table.
<b>Time (sec)</b>	The evaluatee's <b>time to perform</b> a single trial (or <b>average time</b> for a set) of the activity.
<b>Effort Factor</b>	The evaluator may optionally note the level of effort exhibited by the evaluatee during the activity, with ascending levels of <b>Poor, Poor-to-Fair, Fair, Average, Good, Excellent</b> and <b>Excessive</b> . The assumed level of effort is <b>Average</b> unless otherwise noted. Levels <b>below</b> or <b>above</b> average will apply an appropriate leveling factor to the average time (and therefore the %IS) for the current set ( <b>Avg</b> row).
<b>% IS</b>	The evaluatee's time compared to the Industrial Standard (IS) time, and reported as a <b>percent of Industrial Standard</b> . An evaluatee can score at, above or below 100% IS, representing an ability that meets, exceeds or falls below the Industrial Standard for that activity.
<b>CV (%)</b>	<b>Coefficient of variance (CV)</b> is a statistical representation of consistency of evaluatee trial times. A minimum of three trials must be collected to calculate a CV. The empirically derived CV for MTM data is 8%. This evaluation uses a consistency threshold of 10% to allow for a 'learning curve' that is present in these activities. Many factors can affect test scores. CV's slightly greater than 10% should not automatically be interpreted as indication of lack of evaluatee reliability. Reliability must be determined by a suitably qualified evaluator. This data is computed at the end of a set, hence the CV is presented in the <b>Avg</b> table row for sets with three or more trials. When multiple sets are performed, the CV reported in the MTM Summary Table is calculated from all trials and thus does NOT represent the consistency within sets.
<b>HR</b>	<b>Heart Rate</b> , if present, is the evaluatee's peak measured heart rate during that trial or set.
<b>PE</b>	The Borg <b>Perceived Exertion (PE)</b> Scale is a self-report scale of degree of exertion by the evaluatee during the activity. Perceived exertion "integrates various information, including the many signals elicited from the peripheral muscles and joints, from the central cardiovascular and respiratory functions, and from the central nervous system" (Borg, 1982). This data is collected at the end of a set, hence PE is shown in the <b>Avg</b> row.
<b>IM</b>	If checked, <b>Inappropriate Body Mechanics</b> were exhibited by the evaluatee during this set ( <b>Avg</b> row).
<b>SC</b>	If checked, <b>Symptom Complaints or Behaviors</b> were exhibited by the evaluatee during this set ( <b>Avg</b> row).
<i>The following items appear within or below the table of results</i>	
<b>Avg: S1</b>	The <b>averages per set</b> (ie. S1 represents Set 1). Evaluatee time is averaged across all trials. The average time forms the basis for a comparison to the Industrial Standard to calculate the average percent IS.
<b>Comments</b> (shown below results table)	Comments in reference to the performance of this activity, if any, as noted by the evaluator. Pictures associated with the activity are presented to the right of the comments box if included by the evaluator.

**Walking:** (tested 2/6/2015)

Trial	Body Side	Weight	Distance	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	None	None	12 Ft	3	21.2		120.7		78			
2	None	None	12 Ft	3	20.9		122.5		82			
3	None	None	12 Ft	3	20.7		123.7		88			
<b>Avg: S1</b>	<b>None</b>	<b>None</b>	<b>12 Ft</b>	<b>3</b>	<b>20.9</b>		<b>&gt; 122.3 &lt;</b>	<b>1.0</b>	<b>88</b>	<b>3</b>		

(Reps indicates Return Trips for this activity)

Comments for Walking	Comment Picture
	(none)

**Carrying:** (tested 2/6/2015)

Trial	Body Side	Weight	Distance	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Both	10 Lb	12 Ft	1	9.2		108.3		88			
2	Both	10 Lb	12 Ft	1	9.1		109.5		88			
3	Both	10 Lb	12 Ft	1	9.0		110.7		88			
<b>Avg: S1</b>	<b>Both</b>	<b>10 Lb</b>	<b>12 Ft</b>	<b>1</b>	<b>9.0</b>		<b>&gt; 109.5 &lt;</b>	<b>0.9</b>	<b>88</b>	<b>4</b>		
1	Both	20 Lb	12 Ft	1	9.3		108.1		94			
2	Both	20 Lb	12 Ft	1	9.3		108.1		97			
3	Both	20 Lb	12 Ft	1	8.9		113.0		104			
<b>Avg: S2</b>	<b>Both</b>	<b>20 Lb</b>	<b>12 Ft</b>	<b>1</b>	<b>9.1</b>		<b>&gt; 109.7 &lt;</b>	<b>2.1</b>	<b>104</b>	<b>4</b>		
1	Both	50 Lb	12 Ft	1	13.4		93.4		92			
2	Both	50 Lb	12 Ft	1	13.3		94.1		111			
3	Both	50 Lb	12 Ft	1	13.1		95.5		115			
<b>Avg: S3</b>	<b>Both</b>	<b>50 Lb</b>	<b>12 Ft</b>	<b>1</b>	<b>13.2</b>		<b>&gt; 94.3 &lt;</b>	<b>0.9</b>	<b>115</b>	<b>3</b>		

(Reps indicates Return Trips for this activity)

Comments for Carrying	Comment Picture
Lower back burning.	

**Push/Pull Cart:** (tested 2/6/2015)

Trial	Body Side	Weight	Distance	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Push	40 Lb	12 Ft	1	3.5		104.9					
2	Push	40 Lb	12 Ft	1	3.4		108.0					
3	Push	40 Lb	12 Ft	1	3.7		99.2					
<b>Avg: S1</b>	<b>Push</b>	<b>40 Lb</b>	<b>12 Ft</b>	<b>1</b>	<b>3.5</b>		<b>&gt; 103.9 &lt;</b>	<b>3.5</b>		<b>n/a</b>		
1	Pull	40 Lb	12 Ft	1	4.2		87.4					
2	Pull	40 Lb	12 Ft	1	4.1		89.6					
3	Pull	40 Lb	12 Ft	1	3.9		94.2					
<b>Avg: S2</b>	<b>Pull</b>	<b>40 Lb</b>	<b>12 Ft</b>	<b>1</b>	<b>4.0</b>		<b>&gt; 90.3 &lt;</b>	<b>3.1</b>		<b>5</b>		
1	Push	100 Lb	12 Ft	1	4.8		76.5					
2	Push	100 Lb	12 Ft	1	4.7		78.1					
3	Push	100 Lb	12 Ft	1	4.5		81.6					
<b>Avg: S3</b>	<b>Push</b>	<b>100 Lb</b>	<b>12 Ft</b>	<b>1</b>	<b>4.6</b>		<b>&gt; 78.7 &lt;</b>	<b>2.7</b>		<b>5</b>		
1	Pull	100 Lb	12 Ft	1	5.1		72.0					
2	Pull	100 Lb	12 Ft	1	5.0		73.4					
3	Pull	100 Lb	12 Ft	1	5.0		73.4					
<b>Avg: S4</b>	<b>Pull</b>	<b>100 Lb</b>	<b>12 Ft</b>	<b>1</b>	<b>5.0</b>		<b>&gt; 73.0 &lt;</b>	<b>0.9</b>		<b>5</b>		

(Reps indicates One Way Trips for this activity)

Comments for Pull Cart	Comment Picture
	(none)

**Balance:** (tested 2/6/2015)

Trial	Body Side	Weight	Distance	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	None	None	10 paces	1	5.9		103.7		74			
2	None	None	10 paces	1	5.8		105.5		75			
3	None	None	10 paces	1	5.6		109.3		73			
<b>Avg: S1</b>	<b>None</b>	<b>None</b>	<b>10 paces</b>	<b>1</b>	<b>5.7</b>		<b>&gt; 106.1 &lt;</b>	<b>2.2</b>	<b>75</b>	<b>3</b>		

(Reps indicates One Way Trips for this activity)

Comments for Balance	Comment Picture
	(none)

**Bending:** (tested 2/6/2015)

Trial	Body Side	Weight	Distance	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Dom	<2 Lb	None	6	14.0		94.0		79			
2	Dom	<2 Lb	None	6	13.6		96.7		81			
3	Dom	<2 Lb	None	6	13.7		96.0		83			
<b>Avg: S1</b>	<b>Dom</b>	<b>&lt;2 Lb</b>	<b>None</b>	<b>6</b>	<b>13.7</b>		<b>&gt; 95.6 &lt;</b>	<b>1.2</b>	<b>83</b>	<b>3</b>		

(Reps indicates Return Trips for this activity)

Comments for Bending	Comment Picture
	(none)

**Crouching:** (tested 2/6/2015)

Trial	Body Side	Weight	Distance	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Dom	<2 Lb	None	6	8.4		87.4		78			
2	Dom	<2 Lb	None	6	7.3		100.6		80			
3	Dom	<2 Lb	None	6	6.9		106.4		85			
<b>Avg: S1</b>	<b>Dom</b>	<b>&lt;2 Lb</b>	<b>None</b>	<b>6</b>	<b>7.5</b>		<b>&gt; 97.5 &lt;</b>	<b>8.4</b>	<b>85</b>	<b>3</b>		

(Reps indicates Return Trips for this activity)

Comments for Crouching	Comment Picture
	(none)

**Kneeling:** (tested 2/6/2015)

Trial	Body Side	Weight	Distance	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Dom	<2 Lb	None	6	8.3		114.9		80			
2	Dom	<2 Lb	None	6	8.5		112.2		88			
3	Dom	<2 Lb	None	6	8.3		114.9		94			
<b>Avg: S1</b>	<b>Dom</b>	<b>&lt;2 Lb</b>	<b>None</b>	<b>6</b>	<b>8.3</b>		<b>&gt; 114.0 &lt;</b>	<b>1.1</b>	<b>94</b>	<b>3</b>		

(Reps indicates Return Trips for this activity)

Comments for Kneeling	Comment Picture
	(none)

**Reach Immediate:** (tested 2/6/2015)

Trial	Body Side	Position	Plane	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Right	Sitting	Front	6	5.5		121.7		78			
2	Right	Sitting	Front	6	5.3		126.3		78			
3	Right	Sitting	Front	6	5.2		128.8		80			
<b>Avg: S1</b>	<b>Right</b>	<b>Sitting</b>	<b>Front</b>	<b>6</b>	<b>5.3</b>		<b>&gt; 125.6 &lt;</b>	<b>2.3</b>	<b>80</b>	<b>3</b>		
1	Left	Sitting	Front	6	5.9		113.5		74			
2	Left	Sitting	Front	6	5.7		117.5		77			
3	Left	Sitting	Front	6	5.7		117.5		83			
<b>Avg: S2</b>	<b>Left</b>	<b>Sitting</b>	<b>Front</b>	<b>6</b>	<b>5.7</b>		<b>&gt; 116.1 &lt;</b>	<b>1.6</b>	<b>83</b>	<b>3</b>		

(Reps indicates Return Trips for this activity)

Comments for Reach Immediate	Comment Picture
	(none)

**Reach Overhead:** (tested 2/6/2015)

Trial	Body Side	Position	Plane	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Right	Sitting	Front	6	5.4		124.0		77			
2	Right	Sitting	Front	6	5.2		128.8		81			
3	Right	Sitting	Front	6	5.2		128.8		85			
<b>Avg: S1</b>	<b>Right</b>	<b>Sitting</b>	<b>Front</b>	<b>6</b>	<b>5.2</b>		<b>&gt; 127.1 &lt;</b>	<b>1.8</b>	<b>85</b>	<b>3</b>		
1	Left	Sitting	Front	6	5.7		117.5		74			
2	Left	Sitting	Front	6	5.5		121.7		80			
3	Left	Sitting	Front	6	5.6		119.6		83			
<b>Avg: S2</b>	<b>Left</b>	<b>Sitting</b>	<b>Front</b>	<b>6</b>	<b>5.6</b>		<b>&gt; 119.6 &lt;</b>	<b>1.5</b>	<b>83</b>	<b>3</b>		

(Reps indicates Return Trips for this activity)

Comments for Reach Overhead	Comment Picture
	(none)

**Handling:** (tested 2/6/2015)

Trial	Body Side	Position	Plane	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Right	Standing	Immediate	12	12.8		128.1		80			
2	Right	Standing	Immediate	12	12.6		130.1		83			
3	Right	Standing	Immediate	12	12.7		129.1		88			
<b>Avg: S1</b>	<b>Right</b>	<b>Standing</b>	<b>Immediate</b>	<b>12</b>	<b>12.7</b>		<b>&gt; 129.1 &lt;</b>	<b>0.6</b>	<b>88</b>	<b>3</b>		
1	Left	Standing	Immediate	12	13.7		119.7		77			
2	Left	Standing	Immediate	12	13.8		118.8		81			
3	Left	Standing	Immediate	12	13.5		121.5		85			
<b>Avg: S2</b>	<b>Left</b>	<b>Standing</b>	<b>Immediate</b>	<b>12</b>	<b>13.6</b>		<b>&gt; 120.0 &lt;</b>	<b>0.9</b>	<b>85</b>	<b>3</b>		

(Reps indicates Peg Turns for this activity)

Comments for Handling	Comment Picture
	(none)



**Fingering:** (tested 2/6/2015)

Trial	Body Side	Position	Plane	Reps	Time (sec)	Effort Factor	% IS	CV (%)	HR	PE	I M	S C
1	Right	Standing	Immediate	10	12.5		127.2		75			
2	Right	Standing	Immediate	10	12.4		128.3		77			
3	Right	Standing	Immediate	10	12.4		128.3		79			
<b>Avg: S1</b>	<b>Right</b>	<b>Standing</b>	<b>Immediate</b>	<b>10</b>	<b>12.4</b>		<b>&gt; 127.9 &lt;</b>	<b>0.4</b>	<b>79</b>	<b>3</b>		
1	Left	Standing	Immediate	10	14.6		108.9		73			
2	Left	Standing	Immediate	10	14.3		111.2		74			
3	Left	Standing	Immediate	10	14.3		111.2		77			
<b>Avg: S2</b>	<b>Left</b>	<b>Standing</b>	<b>Immediate</b>	<b>10</b>	<b>14.4</b>		<b>&gt; 110.5 &lt;</b>	<b>1.0</b>	<b>77</b>	<b>3</b>		