BASELINE® EVALUATION INSTRUMENTS

BIMS™ digital (load-cell) 5-position grip and pinch dynamometers

Instructions for Use

digital grip dynamometer

REF	
12-0072	grip, functional model
12-0070	grip, clinic model
12-0071	grip, deluxe model
12-0082	pinch, functional model
12-0080	pinch, clinic model
12-0081	pinch, deluxe model
12-0092	3-piece set, functional model
12-0090	3-piece set, clinic model
12-0091	3-piece set, deluxe model

digital pinch dynamometer

FEI
Fabrication Enterprises Inc
250 Clearbrook Road, Suite 240
Elmsford, NY 10523 (USA)
tel: +1-914-345-9300 • 800-431-2830
fax: +1-914-345-9800 • 800-634-5370
FabEnt.com

CE 2862

EC REP
AJW Technology Consulting GmbH
Breite Strasse 3
40213 Dusseldorf Germany

MD
MedEnvoy
NL-IM-000000248
Prinses Margrietplantsoen 33, Suite 123
2595 AM, The Hague (NL)

Intended Purpose

The BIMS (Baseline® Instruments Measurement System) is a medical/therapeutic device designed to perform and record detailed grip and pinch strength measurements with advanced testing protocols and data management capabilities.

Baseline® BIMS™ digital (load-cell) 5-position grip and pinch dynamometers

Baseline® BIMS™ dynamometers have adjustable 5-position handles (grip) or paddles (pinch) that allow the dynamometers to fit all hand sizes and enable testing at various grip / pinch positions. They digitally record **accurate** and **repeatable** grip or pinch strength measurements. Subject information can be inputted at the time of test: hand, handle/paddle position, exertion/rest times and test type.

Dynamometers are available in three models: **functional**, **clinic** or **deluxe.**
The functional unit performs as the standard hydraulic dynamometer.
Clinic and Deluxe units allow the grip and pinch testing results to be stored.

Grip dynamometers measure grip strength.

Pinch dynamometers measure pinch strength using 3 methods:

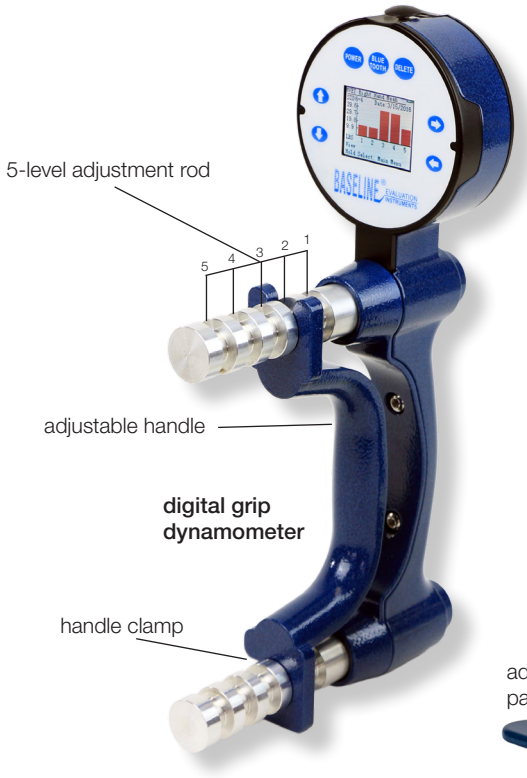
- **Tip (Pulp)**
- **Palmar (Chuck)**
- **Key (Lateral)**

Bluetooth enables connection to future apps.

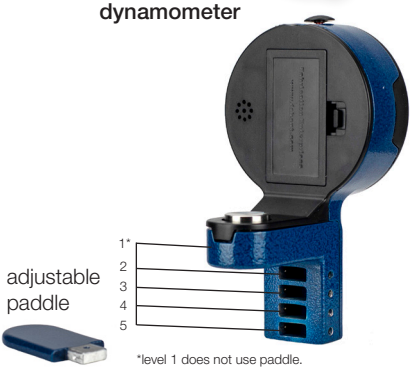
⚠ WARNING:

- Ensure proper hand position and posture during testing
- Clean grip surfaces between patients
- Do not exceed maximum force capacity
- Stop testing if patient reports pain
- Store in protective case when not in use
- Inspect for damage before each use
- Keep moving parts clean and free of debris
- Monitor digital display function

Parts / Specifications



digital pinch dynamometer



*level 1 does not use paddle.
Use paddle for levels 2-5.

Testing protocols

- **Max Force Test (Live Test):** Shows real time strength readings and maximum value. Test result is not stored. (Same as current hydraulic tests)
- **Quick Test:** Shows real time strength readings and maximum value. Result is stored. Timed on/off.
- **GST (General Strength Test):** 3 strength trials are performed at the same handle position. Peak readings, mean, SD,and COV are stored. Timed on/off.
- **RET (Rapid Exchange Test):** 6 strength trials (alternating hands) are performed at the same handle position. Peak readings, Mean, SD, and COV are stored. Timed on.
- **MMVE (Modified Maximum Voluntary Effort Test):** 10 strength trials are performed, switching hands, 2 trials at each handle position. Peak readings at each position are stored. Timed on.
- **MVE (Maximum Voluntary Effort Test):** 15 strength trials are performed per hand, three at each handle position. Peak readings, Mean, SD, and COV are stored. Timed on/off.
- **Fatigue (Work Test):** 1 extended time trial is performed. Results are used to compare strength exerted (total work performed) over 2 or more user-defined time periods. Segment work readings are stored. Timed on.

Functional Model

Use as a direct substitute for hydraulic dynamometers. It gives more **accurate** and **repeatable** measurements. Shows strength readings in real time. Holds peak value until reset. **Max Force** test only.

12-0072 grip (300 lb / 135 kg)
12-0082 pinch (100 lb / 45 kg)
12-0092 3-piece hand set*

Clinic Model

Ideal for the hands-on practitioner. Shows results in real time and stores subject /test information and test results for recall. Includes **Max Force**, **Quick**, and **GST** tests.

12-0070 grip (300 lb / 135 kg)
12-0080 pinch (100 lb / 45 kg)
12-0090 3-piece hand set*

Deluxe Model

Expands clinic usage and includes tests that are ideal for Workers' Comp, FCE (Functional Capacity Evaluation), research application and day-to-day testing. Shows results in real time and stores subject / test information and test results for recall. Includes **Max Force**, **Quick**, **GST**, **RET**, **MMVE**, **MVE**, and **Fatigue** tests.

12-0071 grip (300 lb / 135 kg)
12-0081 pinch (100 lb / 45 kg)
12-0091 3-piece hand set*

***3-piece hand sets include grip dynamometer, pinch dynamometer, plastic finger goniometer (12-1014), carry case, instructions and norms.**

Information / Main Menu

Press and hold power button (5 seconds) until device turns on. This will display the device's information screen (1a,1b or 1c) listing the device Version, Mode (model), and SN (serial number). Press SELECT to go to the device's main menu.

The Functional model will only display the Max Force Test (1d) upon pressing SELECT. Clinic and Deluxe models will display an extended Main Menu (1e).

On most screens, press and hold the SELECT button for 5 seconds to go back to the main menu.

RIGHT and LEFT arrow buttons work to navigate between screens. They are disabled during tests.

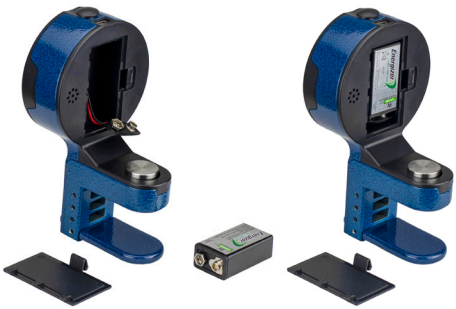
Hold power button for 5 seconds to turn off. Dynamometer automatically turns off after 5 minutes.

Functions

Replacing the battery

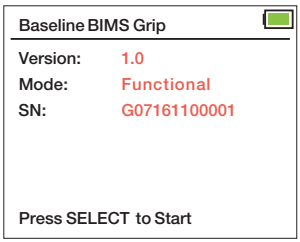
Locate the battery compartment on the back of the dynamometer head. Open the battery compartment and replace battery with a new rechargeable 9V battery. Close battery compartment.

9V, 600mah rechargeable battery recommended. Attempting to change a non-rechargeable batteries could damage unit and / or cause fire.



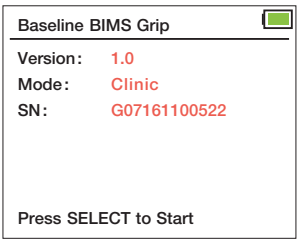
information screen

1a



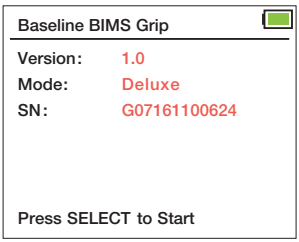
Functional Model

1b



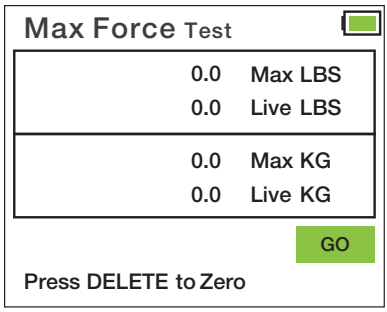
Clinic Model

1c



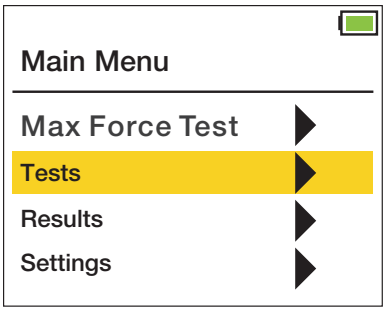
Deluxe Model

1d



Functional Model

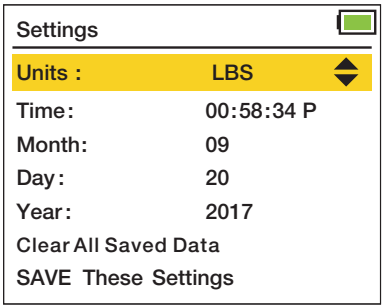
1e



Clinic and Deluxe Models

Using UP / DOWN buttons

Certain screens will have UP / DOWN indicator arrows appear on a highlighted line. When this happens, use the UP and DOWN buttons to modify the data on the line. Then hit the SELECT button to confirm your line selection.



Check accuracy of dynamometers

To check the accuracy of any dynamometer (electronic, hydraulic, or spring-operated) it is best to use the BIMS gauge tester (12-0347) or equivalent dynamometer / stand device.

Secure the dynamometer to the stand base so it won't move when force is applied. Lower the electronic reference dynamometer to the first test force by turning the vertical motion wheel on the stand. Compare the reading on the electronic reference dynamometer to the reading on the unit being tested. Mark both readings and the difference. Repeat for the other test forces. If readings are out of specification, consider recalibration of the dynamometer (the BIMS electronic dynamometers can be recalibrated following the procedure outlined below). Hydraulic, spring and other electronic dynamometers should be sent to an authorized source for recalibration.

Testing stand

Calibrate BIMS electronic dynamometers

The software to calibrate the BIMS dynamometer is preprogrammed into the dynamometer.

To calibrate the BIMS dynamometer, perform the following steps and follow the instructions that appear on the screen located on the head of the dynamometer:

- Place dynamometer at grip position two (2)
- Secure the dynamometer to the stand base so it won't move when force is applied
- Dynamometer must be powered off
- Simultaneously hold the UP, DOWN and POWER buttons to initiate calibration mode
- Press the DELETE button one (1) time to start the calibration process
- With no weight applied to the dynamometer, press the DELETE button to set the first reference force (0kg / 0lb)
- Repeat for each additional reference force
  - **GRIP** (50lb, 100lb, 200lb) / (22kg, 45kg, 90kg)
  - **PINCH** (25lb, 50lb, 75lb) / (11kg, 22kg, 34kg)
- When the last reference force has been applied, the dynamometer will beep to indicate that the calibration is finished
- Turn unit off (press power button) to exit calibration mode
- Verify calibration by following the "check accuracy of dynamometers" procedure outlined above


Testing stand in use

Using the charging / data cable

To use the transformer to operate the dynamometer and / or to charge the battery (9V, 600mAh, 6F22) simply plug the charging / data cable (micro USB) into the plug receptacle on the dynamometer head and the other end (USB-A) into the transformer. Plug the transformer into any 110V outlet.

Plug charging / data cable (micro USB) into plug receptacle on dynamometer head

Product information: Functional Model

Baseline® BIMS™ functional dynamometers have an adjustable 5-position handle (grip) or paddle (pinch) that adjusts to fit all hand sizes. The functional units do not record or store any subject or test data.

They do provide **accurate** and **repeatable** measurements.

Each unit can be calibrated on site. (See page 6 for calibration instructions)

Results are shown in both lbs and kgs.

The functional models can only perform the Max Force Test / Live Test.

Max Force Test / Live Test

This test (2a) shows real time strength reading and displays the maximum value in both lbs and kgs.

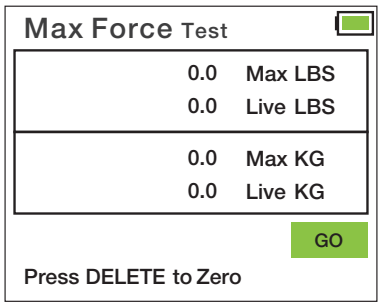
Press SELECT to begin. Press DELETE to zero out maximum value. Test results are not stored. Test is not timed.

Test Methodology

Rx or Lx

x = handle / paddle placement (level): 1, 2, 3, 4 or 5

2a



Accessing Testing Protocols / Subject Screen

All operations start from the Main Menu screen (3a). From the main menu use the DOWN arrow to highlight Tests and press SELECT.

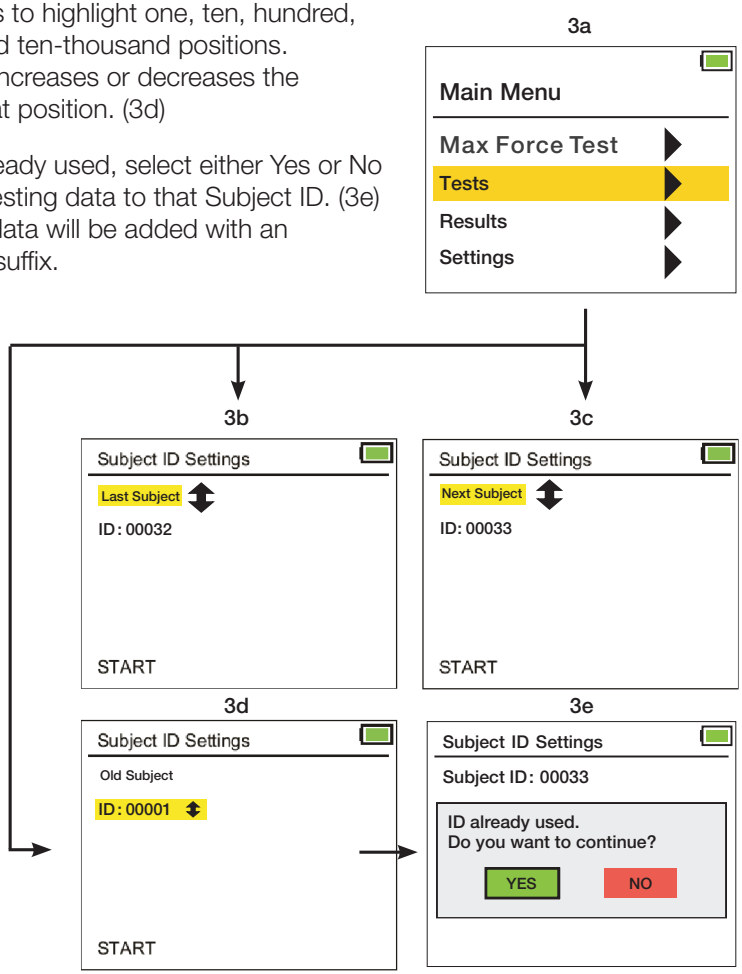
The Subject ID Settings screen will be shown. Press SELECT and toggle the UP and DOWN buttons to choose between Last Subject, Next Subject, or Old Subject.

Last Subject will display the last Subject ID that was tested. (3b)

Next Subject will display the next highest available Subject ID number. (3c)

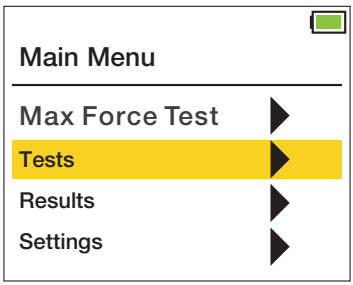
When Old Subject is chosen, the Subject ID number is selectable. Toggle the LEFT, RIGHT, UP, and Down arrows to select the desired Subject ID. LEFT / RIGHT moves to highlight one, ten, hundred, thousand, and ten-thousand positions. UP / DOWN increases or decreases the number in that position. (3d)

If the ID is already used, select either Yes or No to add new testing data to that Subject ID. (3e) New testing data will be added with an incremented suffix.



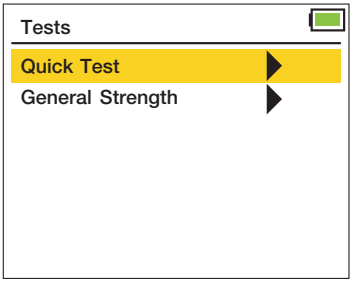
Accessing Testing Protocols

3a

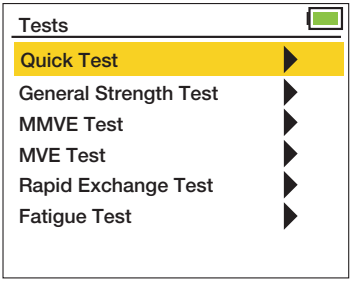


After Subject ID is chosen (see page 8), press SELECT and use the Down button to highlight START. (3b, 3c, 3d) Press SELECT, to access the Max Force Test or the Tests menu screen on the device. Use the UP and DOWN arrows to highlight the desired test. Press the SELECT button to take the test. (3f, 3g)

3f, Clinic Model

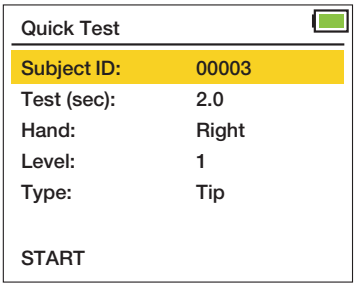


3g, Deluxe Model

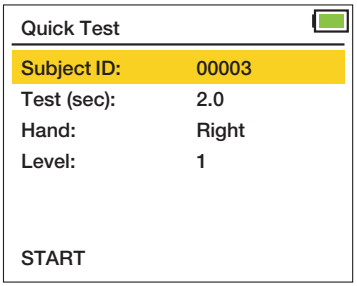


When a test is selected, the test input screen appears and you can select and modify testing details. For the pinch dynamometer, you can select the test Type (Tip, Key, Palmer). (3h) The grip dynamometer only has one testing type (grip) therefore Type is not an option on grip dynamometers. (3i)

3h, Pinch Dynamometer



3i, Grip Dynamometer



Max Force Test / Live Test

This test shows real time strength reading and displays the maximum value in lbs and kgs.

Press SELECT to begin (4b). Perform test. Results are shown in lbs and kgs. Max is visible until reset. Live reading is instantaneous and changes with force applied.

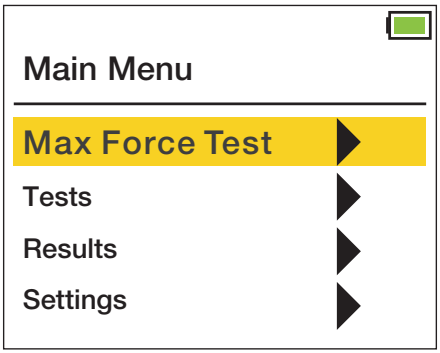
Upon hitting SELECT, two options will appear (4c). Press DELETE to zero out maximum value. Press LEFT to return to main menu. Test results are not stored. Test is not timed.

Test Methodology

Rx or Lx

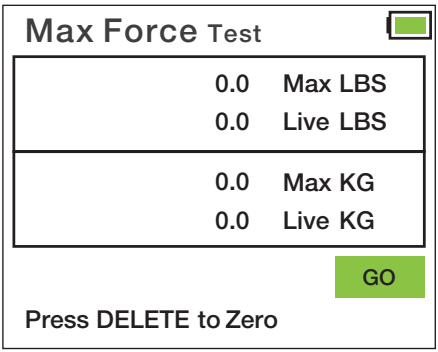
x = handle / paddle placement (level): 1, 2, 3, 4 or 5

4a

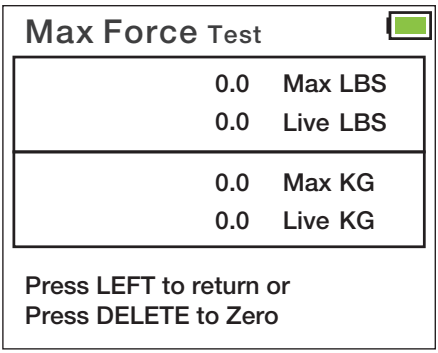


Max Force Test / Live Test

4b



4c



Quick Test (QCK)

The Quick Test is the same as the Max Force / Live test, except the Quick Test is timed and subject settings and trial values can be stored. It displays real time timed trial strength readings and stores peak value.

Use the UP and DOWN buttons to highlight and press SELECT to input testing details (5c, 5d): Test (sec) inputs testing time. Hand inputs right or left hand. Level inputs the grip position number. Type (shown on pinch dynamometers only) inputs the type of test: Tip, Palmar, and Key. (5c) Select desired line using the UP and DOWN buttons. Hit SELECT button then use UP, DOWN, LEFT and RIGHT arrows to make selection. Press SELECT button to save. Units (lbs / kgs) are set on the Settings Screen (see page 32).

Highlight start and press SELECT. Have the patient perform the test. Press SELECT to start trial. Trial begins after 3 warning beeps. Trial ends and 1 beep sounds. Quick Test Results (5f, 5g) will be shown after the preset testing time (Test sec) has elapsed. Press SELECT and toggle UP or DOWN to save or delete results.

The Test Options screen is then shown. Toggle UP and DOWN to select Repeat Same Test, Select Different Test, View Results, or Main Menu. (5i)

View Results will give you the options: Last Results and Past Results. (5j) Last Results will show you the results of the test just taken. (5f, 5g) Past Results will open the View Results Screen (see pgs 24 - 25). (12f)

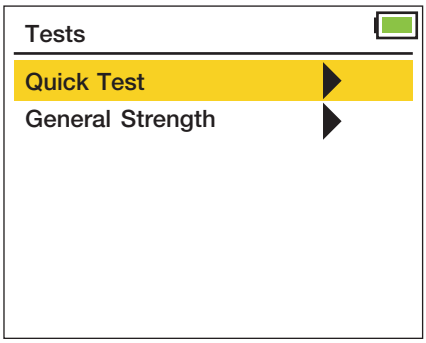
Test Methodology

Rx or Lx Test time (sec)

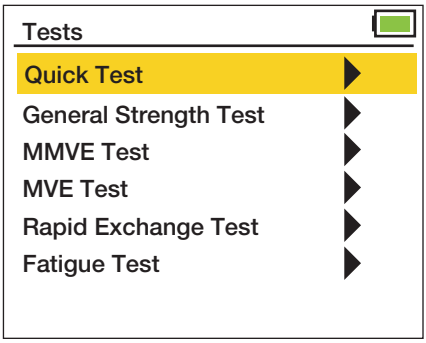
x = handle / paddle placement (level): 1, 2, 3, 4 or 5

3 warning beeps announce each trial. 1 beep tells you trial has ended.

5a Clinic Model

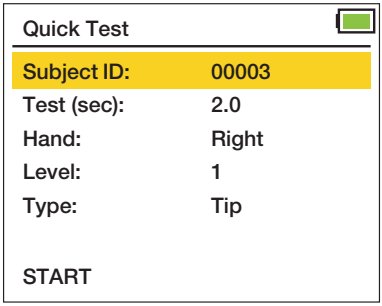


5b, Deluxe Model

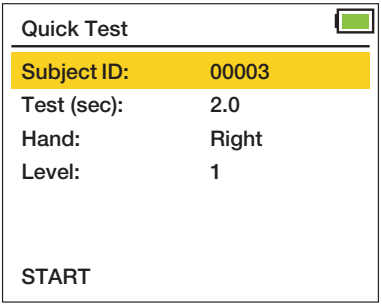


Quick Test (QCK)

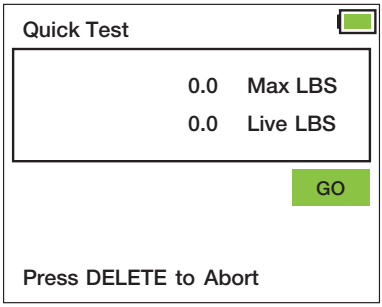
5c (Pinch Dynamometer)



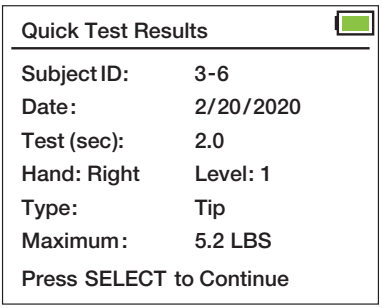
5d (Grip Dynamometer)



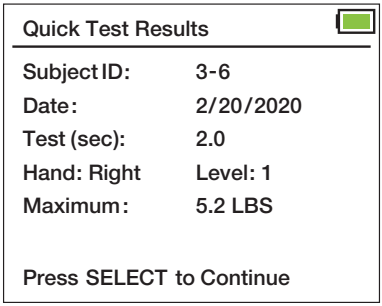
5e



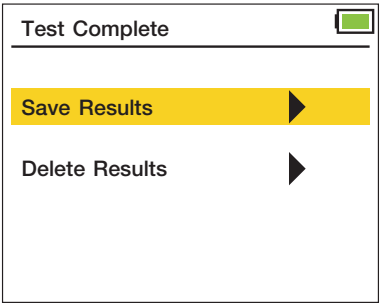
5f (Pinch Dynamometer)



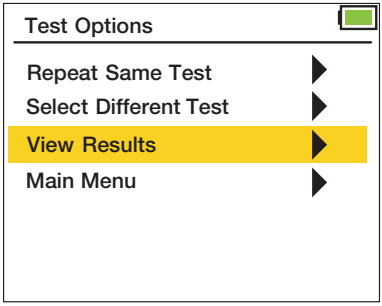
5g (Grip Dynamometer)



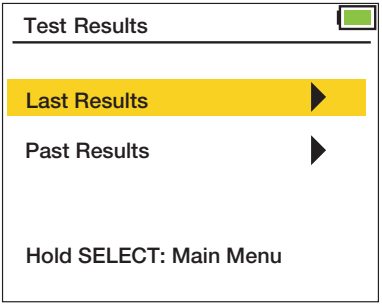
5h



5i



5j



General Strength Test (GST)

The General Strength Test (GST) has the subject perform 3 strength trials. From these trials the 3 Peak readings (6e) and the statistical readings, Mean, SD (Standard Deviation) and COV (Coefficient of Variation) (6f) are displayed and stored.

Use the UP and DOWN buttons to highlight and press SELECT to input testing details. (6c) Test (sec) inputs testing time. Rest (sec) inputs the amount of rest time between tests. Hand inputs right or left hand. Level inputs the handle position number. Type inputs the type of test. Highlight start and press SELECT.

Have the patient perform the GST test. The testing trials begin after 3 warning beeps. 1 beep signals the end of a trial. Cycle repeats for trials 2 and 3.

GST Results will be shown after trials are completed. Press SELECT to view full results, then toggle UP or DOWN to save or delete results.

The Test Options screen is then shown. Toggle UP and DOWN to select Repeat Same Test, Select Different Test, View Results, or Main Menu.

View Results will give you the options: Last Results and Past Results. Last Results will show you the results of the test just taken. Past Results will open the View Results screen (see pgs 24 - 25).

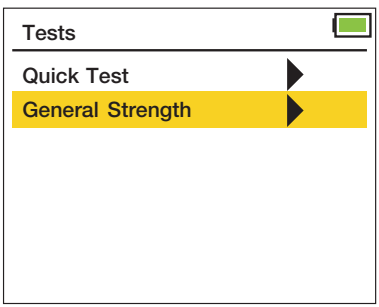
Test Methodology Test time (sec) Rest time (sec)

3 trials: Rx, Rx, Rx or Lx, Lx, Lx

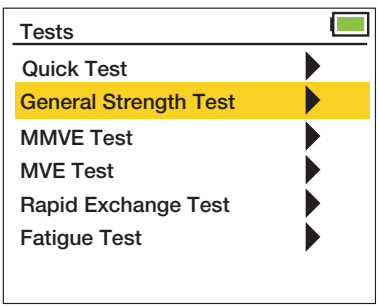
x = handle / paddle placement (level): 1, 2, 3, 4 or 5

3 warning beeps announce each trial. 1 beep tells you trial has ended.

6a, Clinic Model

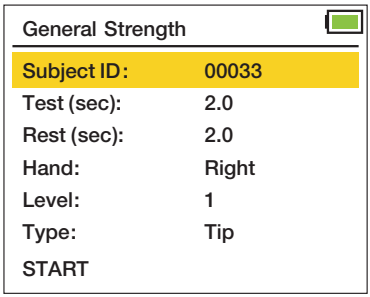


6b, Deluxe Model

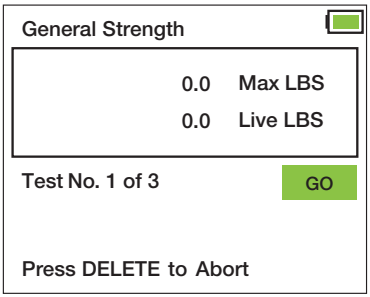


General Strength Test (GST)

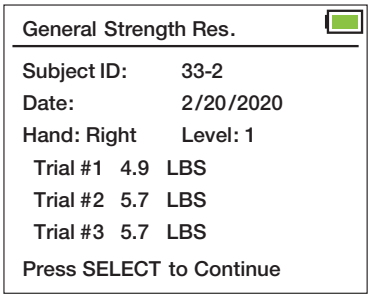
6c



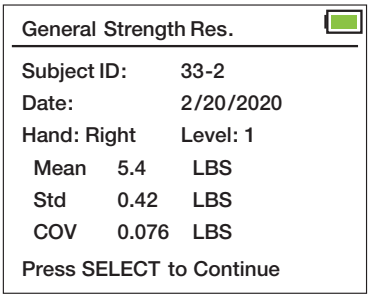
6d



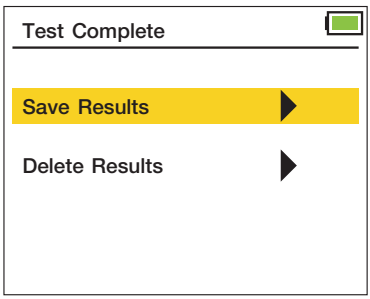
6e (Peak Results)



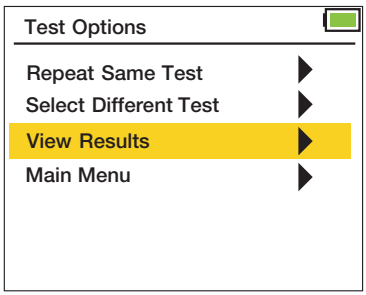
6f (Statistical Results)



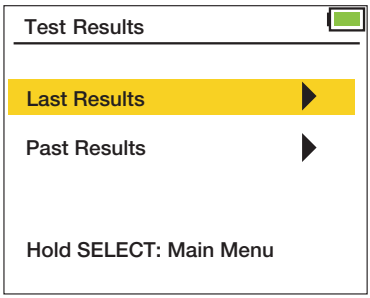
6g



6h



6i



Rapid Exchange Test (RET)

The Rapid Exchange Test (RET) has the subject perform 6 strength trials (alternating hands) at the same handle position. The Peak readings (7e) and the statistical readings, Mean, SD and COV (7f) are displayed and stored.

Use the UP and DOWN buttons to highlight and press SELECT to input testing details. (7b) Test (sec) inputs testing time. No rest time because you change hands after each trial. Level inputs the gauge position number. Type inputs type of test. Highlight start and press SELECT.

Have the patient perform the RET test. The testing trials begin after 3 warning beeps. 1 beep signals the end of a trial. When prompted, switch hands after each trial and press SELECT to continue with next trial.

RET Results are shown after the trials are completed. Press SELECT to view full results, then toggle UP or DOWN to save or delete results.

The Test Options screen is then shown. Toggle UP and DOWN to select Repeat Same Test, Select Different Test, View Results, or Main Menu.

View Results will give you the options: Last Results and Past Results. Last Results will show you the results of the test just taken. Past Results will open the View Results screen (see pgs 24 - 25).

Test Methodology Test time (sec)

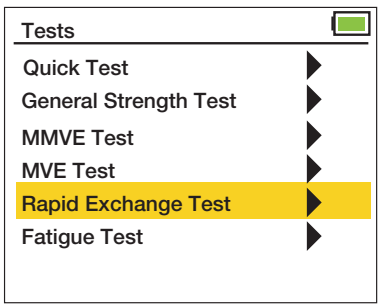
6 trials: Rx o Lx o Rx o Lx o Rx o Lx

x = handle / paddle placement (level): 1, 2, 3, 4 or 5

o = stop then switch hands and press SELECT to continue (3 warning beeps sound before trial)

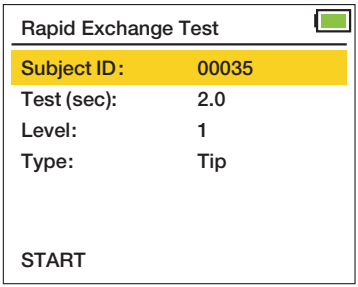
3 warning beeps announce each trial. 1 beep tells you trial has ended.

7a

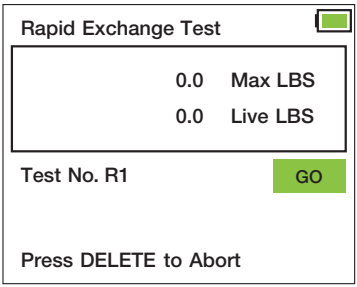


Rapid Exchange Test (RET)

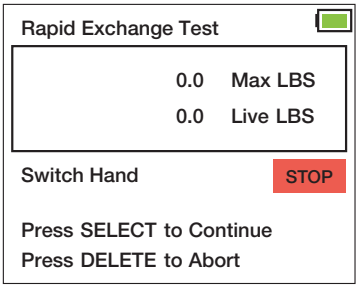
7b



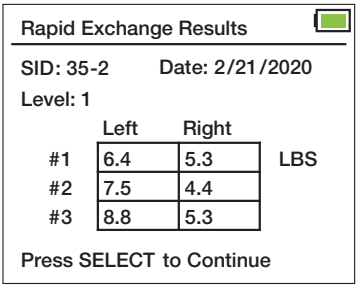
7c



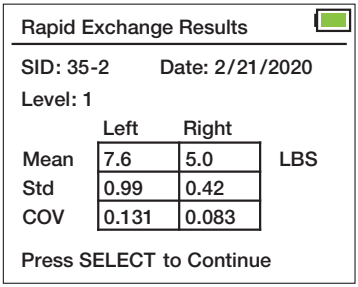
7d



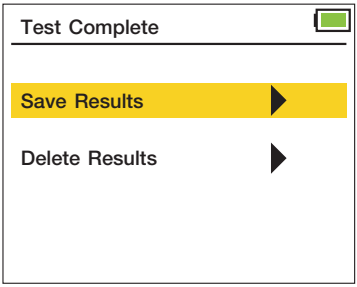
7e (Peak Results)



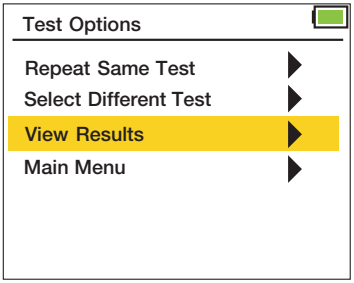
7f (Statistical Results)



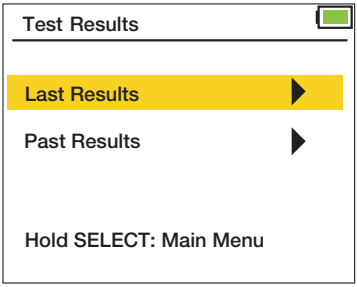
7g



7h



7i



Modified Maximum Voluntary Effort Test (MMVE)

The Modified Maximum Voluntary Effort Test (MMVE) has the subject perform 5 strength trials per hand, one trial at each handle position (or 10 trials, 2 trials at each handle position: 1 left hand, 1 right hand). Peak readings at each position are displayed and stored. (8e)

Use the UP and DOWN buttons to highlight and press SELECT to input testing details. (8b) Test (sec) inputs testing time. Rest (sec) inputs the amount of rest time between tests. Hand inputs right, left, or both hands. Type inputs type of test. Highlight start and press SELECT.

Have the patient perform the MMVE test. The testing trials begin after 3 warning beeps. 1 beep signals the end of a trial. When prompted, switch hands and/or change handle/paddle placement (level) after each trial and press SELECT to continue with the next trial.

MMVE Peak results will be shown after the trials are completed. (8e) Mean, SD, and COV are not calculated in this test. Press SELECT to view full results, then toggle UP or DOWN to save or delete results.

The Test Options screen is then shown. Toggle UP and DOWN to select Repeat Same Test, Select Different Test, View Results, or Main Menu.

View Results will give you the options: Last Results and Past Results. Last Results will show you the results of the test just taken. Past Results will open the View Results screen (see pgs 24 - 25).

Test Methodology	Test time (sec)	Rest time (sec)
One hand, 5 trials:	R1 a R2 a R3 a R4 a R5 **or** L1 a L2 a L3 a L4 a L5	
Both hands, 10 trials:	R1 o L1 b R2 o L2 b R3 o L3 b R4 o L4 b R5 o L5	

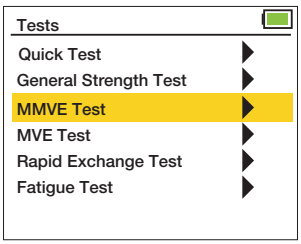
o = stop then switch hands and SELECT go to continue, 3 beeps will sound

a = stop then change handle / paddle placement (level). Press SELECT to continue. (3 warning beeps will sound before trial begins)

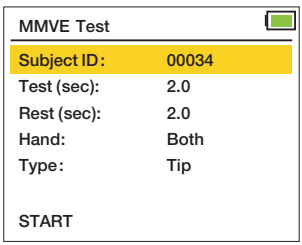
b = stop then switch hands and handle / paddle placement (level). Press SELECT to continue. (3 warning beeps will sound before trial begins)

3 warning beeps announce each trial. 1 beep tells you trial has ended.

8a

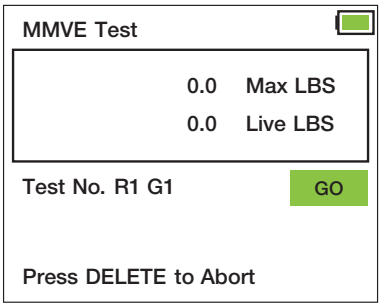


8b

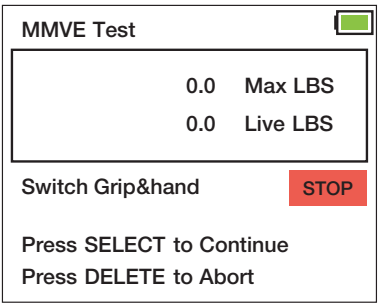


Modified Maximum Voluntary Effort Test (MMVE)

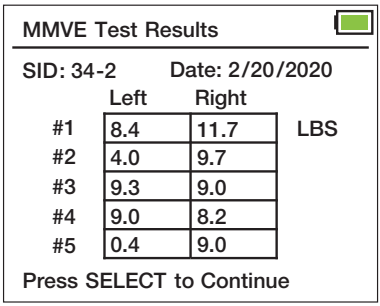
8c



8d

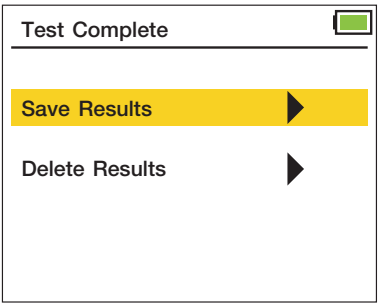


8e (Peak Results)

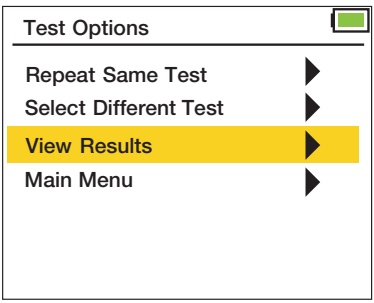


Screen may show results for only Left or Right hand if just one hand is tested.

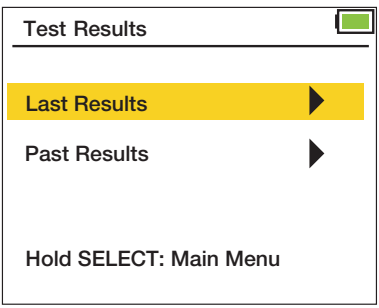
8f



8g



8h



Maximum Voluntary Effort Test (MVE)

The Maximum Voluntary Effort Test (MVE) has the subject perform 15 trials, three trials at each handle position (or 30 trials, 6 at each handle position: 3 left hand, 3 right hand). Peak strength readings for each of the 3 trials for each grip level (9f) along with statistical results for Mean, SD and COV (9g, 9h, 9i) are displayed and stored.

Use the UP and DOWN buttons to highlight and press SELECT to input testing details. Test (sec) inputs testing time. Rest (sec) inputs the amount of rest time between tests. Hand inputs right, left, or both hands. Type inputs the type of test. Highlight start and press SELECT.

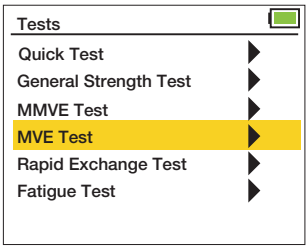
Have the patient perform the MVE test. The testing trials begin after 3 warning beeps. 1 beep signals the end of a trial. When prompted, switch hands and/or change handle/paddle placement (level) and press SELECT to continue with the next trial.

MVE Results will be shown after the tests are completed. Press SELECT to view full results, then toggle UP or DOWN to save or delete results.

The Test Options screen is then shown. Toggle UP and DOWN to select Repeat Same Test, Select Different Test, View Results, or Main Menu.

View Results will give you the options: Last Results and Past Results. Last Results will show you the results of the test just taken. Past Results will open the View Results screen (see pgs 24 - 25).

9a



Test Methodology	Test time (sec)	Rest time (sec)
One hand, 15 trials:	R1, R1, R1 a R2, R2, R2 a R3, R3, R3 a R4, R4, R4 a R5, R5, R5 **or** L1, L1, L1 a L2, L2, L2 a L3, L3, L3 a L4, L4, L4 a L5, L5, L5	
Both hands, 30 trials:	R1, R1, R1 o L1, L1, L1 b R2, R2, R2 o L2, L2, L2 b R3, R3, R3, o L3, L3, L3 b R4, R4, R4 o L4, L4, L4 b R5, R5, R5 o L5, L5, L5	

o = stop then switch hands and SELECT go to continue, 3 beeps will sound

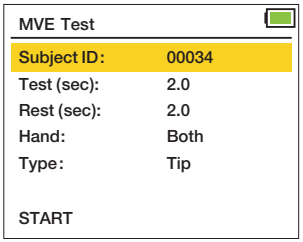
a = stop then change handle / paddle placement (level). Press SELECT to continue. (3 warning beeps will sound before trial begins)

b = stop then switch hands and handle / paddle placement (level). Press SELECT to continue. (3 warning beeps will sound before trial begins)

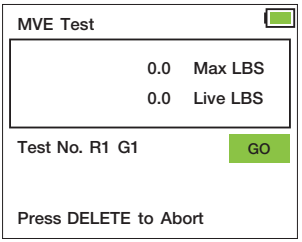
3 warning beeps announce each trial. 1 beep tells you trial has ended.

Maximum Voluntary Effort Test (MVE)

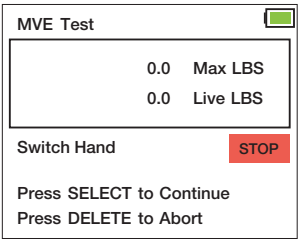
9b



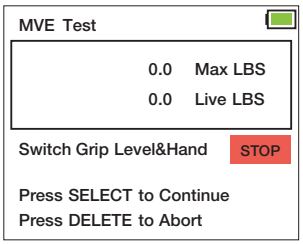
9c



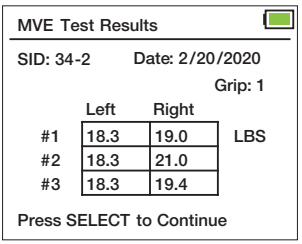
9d



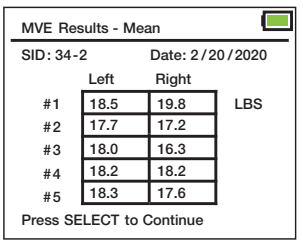
9e



9f (Peak Results)

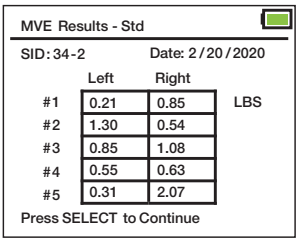


9g (Statistical Mean)

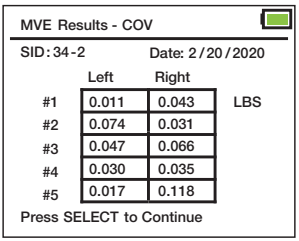


Results are shown for each of the 5 handle positions

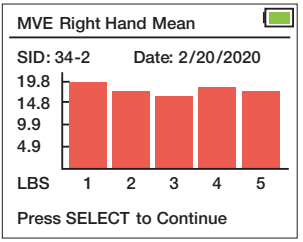
9h (Statistical Std)



9i (Statistical COV)

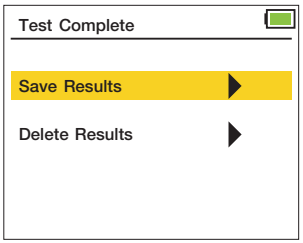


9j

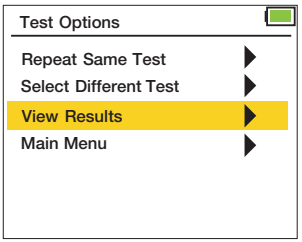


Graphs will display data for hands tested. Both hands, left hand, or right hand.

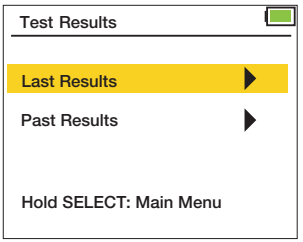
9k



9l



9m



Fatigue Test (Work Test)

The Fatigue Test (Work Test) has the subject perform one extended timed strength trial. Results shown are total work over the time period (11d) and work generated in each timed segment is shown. (11e) There may be many segment results screens depending on the number of segments chosen. 5 segments are shown per screen. Press SELECT to toggle through segment screens.

This test allows comparison between different timed segments. Comparison calculations are done outside test environment.

Use the UP and DOWN buttons to highlight and press SELECT to input testing details. (11b) Test (sec) inputs testing time. Segment inputs the amount of time periods the user wants the test to be divided into. Hand inputs right or left hand. Level inputs the gauge position number. Type inputs the type of test. Highlight start and press SELECT.

Have the patient perform the Fatigue Test. 3 warning beeps will announce the start of the test. Time remaining will be shown in seconds. 1 beep will sound when test is complete.

Fatigue Test results will be shown after the test is completed. Press SELECT to view full results, then toggle UP or DOWN to save or delete results.

The Test Options screen is then shown. Toggle UP and DOWN to select Repeat Same Test, Select Different Test, View Results, or Main Menu.

View Results will give you the options: Last Results and Past Results. Last Results will show you the results of the test just taken. Past Results will open the View Results screen (see pgs 24 - 25).

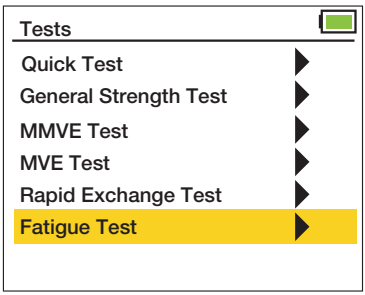
Test Methodology Test time (sec) Segment #

Rx or Lx

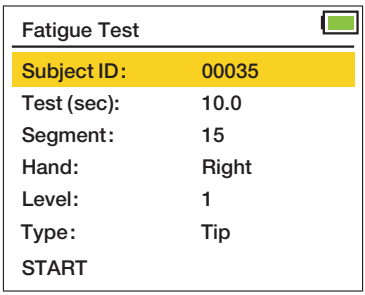
x = handle / paddle placement (level): 1, 2, 3, 4 or 5

3 warning beeps announces trial. 1 beep tells you trial has ended.

11a

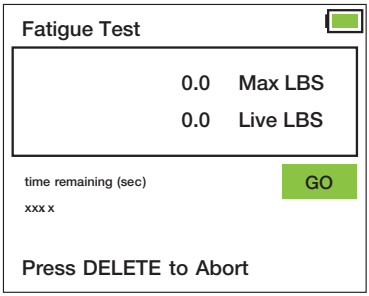


11b

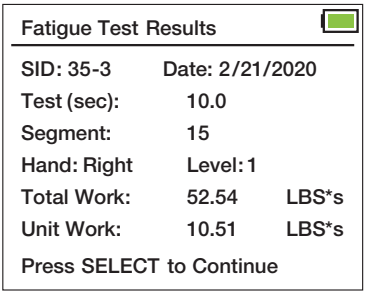


Fatigue Test (Work Test)

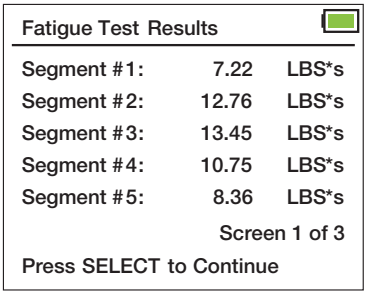
11c



11d

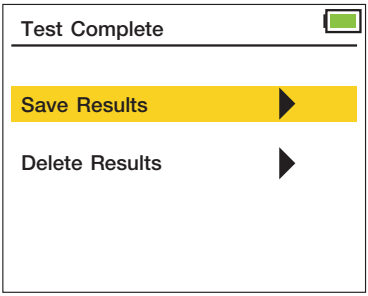


11e (Results per segment)

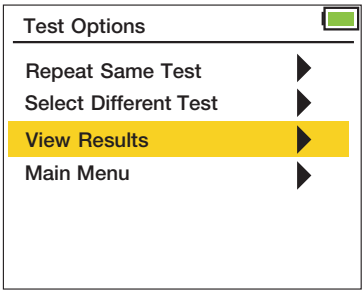


Note: 5 segments are shown per screen. Many screens may be necessary. Press SELECT toggle through segment screens. (5 segments / screen)

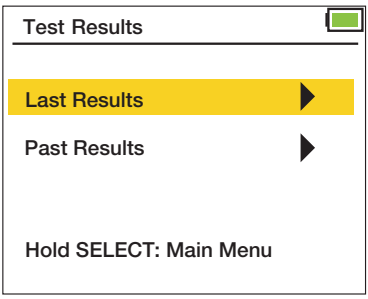
11f



11g



11h



View Results Screen

Access the View Results screen through the Main Menu (Main Menu, Results) (12c) or from the Test Options screen (Test Options, View Results, Past Results) (12d, 12e) that appears after a test is completed. Use the UP or DOWN button to select a search option.

Search Results Archive through using the following 4 options:

1. **Newest to Oldest:** Use the UP and DOWN arrows to search through results from newest to oldest testing date. (12g) All subjects, all tests.
2. **Oldest to Newest:** Use the UP and DOWN arrows to search through results from oldest to newest testing date. (12g) All subjects, all tests.
3. **Date:** Search test results on a specific date by entering Month, Day, and Year. (MM / DD / YYYY) (12h) All subjects, all tests.
4. **Subject ID:** Search test results by entering a specific Subject ID. (12i) An error screen will appear if ID is not found. (#####) (12j) Press the LEFT button to go back to the Subject ID search screen. All dates, all tests.

Use the UP or DOWN button to scroll through results after choosing a search option. Hold the UP or DOWN button to fast scroll.

Search results return the date the test was taken, Subject ID (SID) plus the segmented trial number of the subject (12k), and test type. SID does not show leading zeros.

QCK = Quick Test

RET = Rapid Exchange Test

MVE = Maximum Voluntary Effort Test

GST = General Strength Test

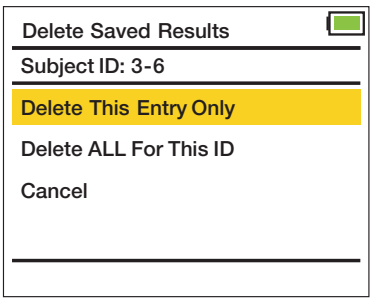
MMVE = Modified Maximum Voluntary Effort Test

FT = Fatigue Test (Work Test)

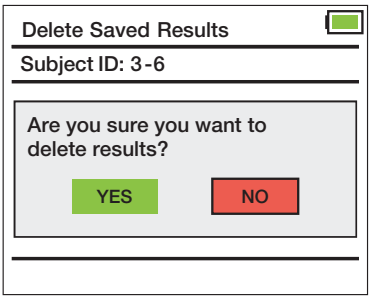
Deleting Saved Results

Highlight the saved test result you want to delete. Press the DELETE button. Use the UP and DOWN arrow to select “Delete this Entry Only” or “Delete All for this ID”. (12a) Select YES or NO to confirm. (12b)

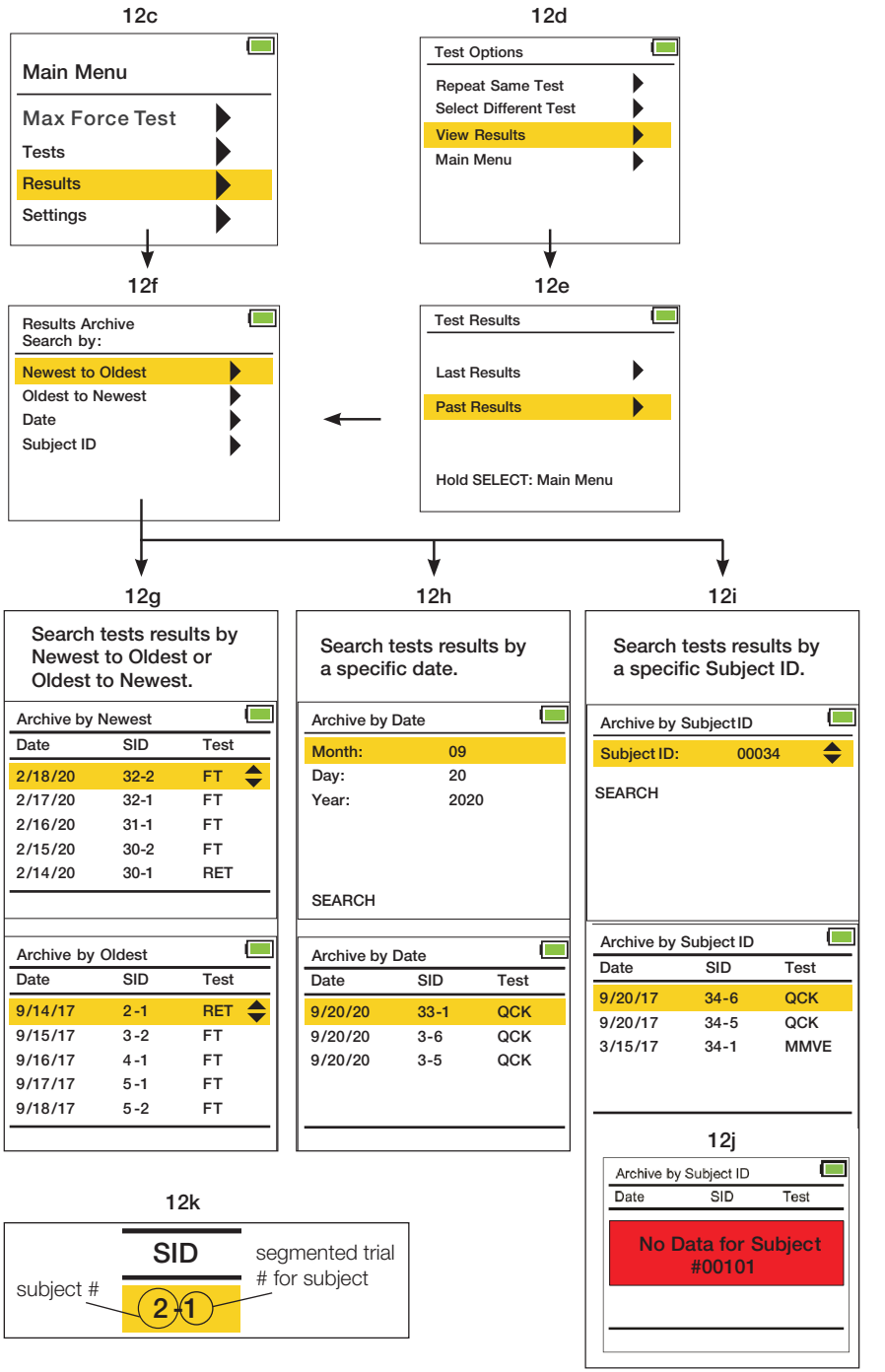
12a



12b



View Results Screen



Grip Dynamometer Norms for Adult Grip Strength (lbs)

A recent study determined norm data is interchangeable between Baseline® and Jamar® units. Dr. Virgil Mathiowetz indicates in his study that "... individuals using the Baseline® dynamometer are justified in using the normative data collected with the Jamar® dynamometer..."

For each test of grip strength, the subject was seated with shoulder adducted and neutrally rotated with the elbow between 0˚ and 15˚ ulnar deviation.

The standard test protocol used the mean of three strength trials as a resultant score. A score was taken with both the dominant and non-dominant hands.

The test results show a relationship between:

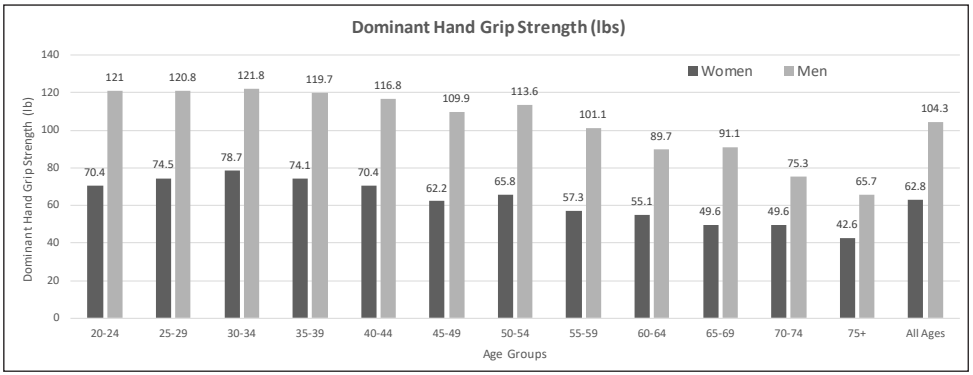
- hand strength vs. age
- hand strength of men vs. hand strength of women
- dominant hand strength vs. non-dominant hand strength

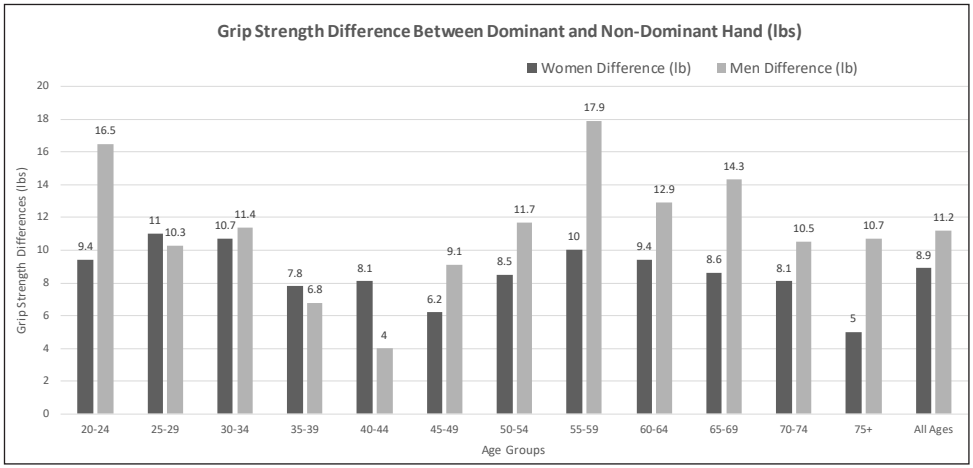
Average Performance of all Subjects on Grip Strength (pounds) - Test results (Level 1)

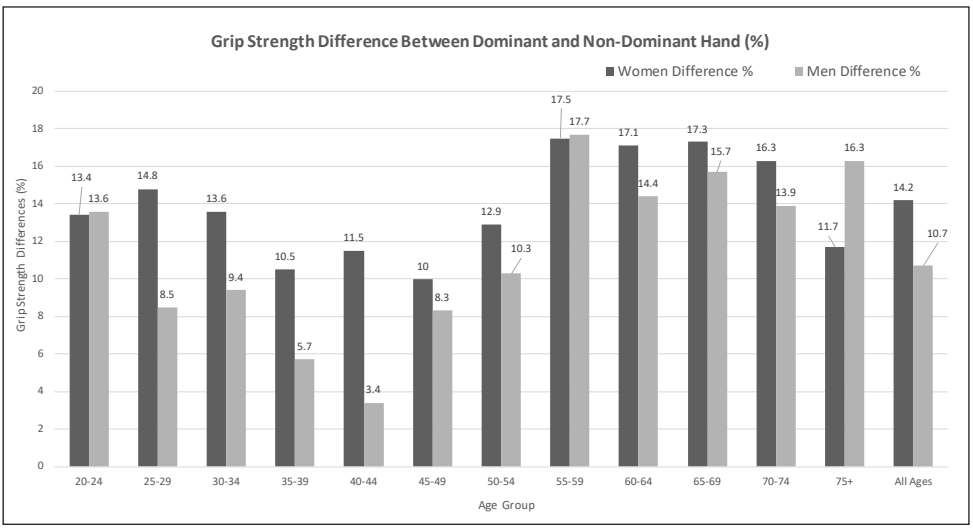
		Men				Women			
age	**hand**	**mean**	**SD**	**SE**	**low-high**	**mean**	**SD**	**SE**	**low-high**
20-24	dominant	121.0	20.6	3.8	91-167	70.4	14.5	2.8	46-95
	non-dominant	104.5	21.8	4.0	71-150	61.0	13.1	2.6	33-88
25-29	dominant	120.8	23.0	4.4	78-158	74.5	13.9	2.7	48-97
	non-dominant	110.5	16.2	4.4	77-139	63.5	12.2	2.4	48-97
30-34	dominant	121.8	22.4	4.3	70-170	78.7	19.2	3.8	46-137
	non-dominant	110.4	21.7	4.2	64-145	68.0	17.7	3.5	36- 115
35-39	dominant	119.7	24.0	4.8	76-176	74.1	10.8	2.2	50 -99
	non-dominant	112.9	21.7	4.2	73-157	66.3	11.7	2.3	49-91
40-44	dominant	116.8	20.7	4.1	84-165	70.4	13.5	2.4	38-103
	non-dominant	112.8	18.7	3.7	73-157	62.3	13.8	2.5	35-94
45-49	dominant	109.9	23.0	4.3	65-155	62.2	15.1	3.0	39-100
	non-dominant	100.8	22.8	4.3	58-160	56.0	12.7	2.1	37-83
50-54	dominant	113.6	18.1	3.6	79-151	65.8	11.6	2.3	38-87
	non-dominant	101.9	17.0	3.4	70-143	57.3	10.7	2.1	35-76
55-59	dominant	101.1	26.7	5.8	59-143	57.3	12.5	2.5	33-86
	non-dominant	83.2	23.4	5.1	43-128	47.3	11.9	2.4	31-76
60-64	dominant	89.7	20.4	4.2	51-137	55.1	10.1	2.0	37-77
	non-dominant	76.8	20.3	4.1	27-116	45.7	10.1	2.0	29-66
65-69	dominant	91.1	20.6	4.0	56-131	49.6	9.7	1.8	35-74
	non-dominant	76.8	19.8	3.8	43-117	41.0	8.2	1.5	29-63
70-74	dominant	75.3	21.5	4.2	32-108	49.6	11.7	2.2	33-78
	non-dominant	64.8	18.1	3.7	32-93	41.5	10.2	1.9	23-67
75+	dominant	65.7	21.0	4.2	40-135	42.6	11.0	2.2	25-65
	non-dominant	55.0	17.0	3.4	31-119	37.6	8.9	1.7	24-61
ALL	dominant	104.3	28.3	1.6	32-176	62.8	17.0	0.96	25-137
	non-dominant	93.1	27.6	1.6	27-160	53.9	15.7	0.88	23-115

References:

1. Gill D., Reddon J., Renney C., Stefanyk W.: Hand Dynamometer: Effects of Trials and Sessions. Perpetual and Motor Skills 61: 195-8, 1985.
2. Everett P., Sills F.: The relationship of Grip Strength to Stature, Somatotype Components, and Anthropometric Measurements of the Hand. The Research Quarterly 23: 161-6, 1952
3. Mathiowetz V., Federman S., Wiermer D.: Grip and Pinch Strength: Norms for 6 to 19 Year Olds. The American Journal of Occupational Therapy 40: 705-11, 1986
4. Mathiowetz V., Donahoe L., Renells C.: Effect of Elbow Position on Grip and Key Pinch Strength. The Journal of Hand Surgery 10A: 694-7, 1985
5. Mathiowetz V., Kashman N., Volland G., Weber K., Dove M., Rogers S.: Grip and Pinch Strength: Normative Data for Adults. Archives of Physical Medicine and Rehabilitation 66: 69-74, 1985.







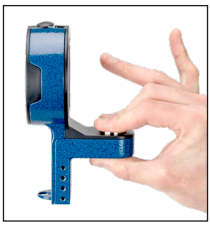
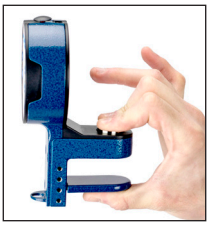
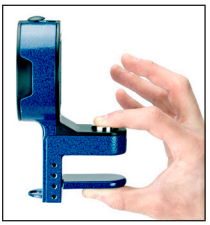
* charts generated from data published in Mathiowetz's article "Grip and Pinch Strength: Normative Data for Adults", Archives of Physical Medicine and Rehabilitation 66: 69-74, 1985

Pinch Dynamometer Norms

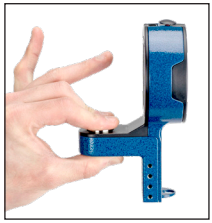
5-Position Pinch Gauge is used to measure pinch strength. It is calibrated in pounds and kilograms of force. Apply pinch force at the pinch surface while holding the pinch gauge between your thumb and finger(s). When force is applied further toward the tip the reading will be slightly higher.

Use the pinch gauge to perform the three basic pinch tests:

- **Palmar Pinch** (chuck pinch) – thumb pad to pads of the index and middle fingers
- **Tip Pinch** (thumb-index pulp pinch) – thumb pad to index fingertip
- **Key Pinch** (lateral pinch) – thumb tip to lateral aspect of middle phalanx of index finger

	Palmar Pinch (chuck)	Tip Pinch (pulp)	Key Pinch (lateral)
without paddle (Distance is the same as a standard fixed-width pinch gauge: hydraulic and mechanical. Level 1)			
with paddle (Distance is increased to test for levels 2 - 5)			

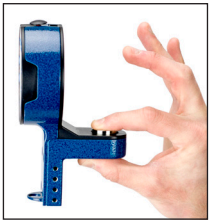
	PATIENT START POSITION	PLACEMENT OF PINCH GAUGE	POSITION OF THERAPIST	TEST
PALMAR PINCH (CHUCK) (RIGHT/LEFT)	- seated or upright - test arm at side with elbow flexed 90° - palm facing down - rest fingers on button	Pinch gauge between thumb on bottom and the index and middle fingers on top.	In front of patient, to the side, stabilizing pinch gauge.	Have patient squeeze after 3 beep warning, hold and release after 1 beep.
TIP PINCH (PULP) (ON EACH FINGER) (RIGHT/LEFT)	- seated or upright - test arm at side with elbow flexed 90° - palm facing down - rest finger on button	Pinch gauge between thumb on bottom and test finger on top (make sure other fingers do not interfere).	In front of patient, to the side, stabilizing pinch gauge.	Have patient squeeze after 3 beep warning, hold and release after 1 beep.
KEY PINCH (LATERAL) (RIGHT/LEFT)	- seated or upright - test arm at side with elbow flexed 90° - palm facing inward - rest thumb on button	Pinch gauge between thumb on top and flexed PIP joint of index finger and thumb on bottom.	In front of patient, to the side, stabilizing pinch gauge.	Have patient squeeze after 3 beep warning, hold and release after 1 beep.



PALMAR PINCH NORMS (LBS)

NORMS FOR ADULT PINCH STRENGTH (based on standard pinch width without paddle; level 1) Palmar Pinch strength performance of all subjects (pounds)								
		men			women			
age	**hand**	**mean**	**SD**	**low-high**	**mean**	**SD**	**low-high**
20-24	dominant	26.6	5.3	18-45	17.2	2.3	14-23
	non-dominant	25.7	5.8	15-42	16.3	2.8	11-24
25-29	dominant	26.0	4.3	19-35	17.7	3.2	13-29
	non-dominant	25.1	4.2	19-36	17.0	3.0	13-26
30-34	dominant	24.7	4.7	16-34	19.3	5.0	12-34
	non-dominant	25.4	5.7	15-37	18.1	4.8	12-32
35-39	dominant	26.2	4.1	19-36	17.5	4.2	13-29
	non-dominant	25.9	5.4	14-40	17.1	3.4	12-24
40-44	dominant	24.5	4.3	17-37	17.0	3.1	10-23
	non-dominant	24.8	4.9	15-37	16.6	3.5	14-25
45-49	dominant	24.0	3.3	19-33	17.9	3.0	12-27
	non-dominant	23.7	3.8	8-33	17.5	2.8	12-24
50-54	dominant	23.8	5.4	15-36	17.3	3.1	12-23
	non-dominant	24.0	5.8	16-36	16.4	2.9	12-22
55-59	dominant	23.7	4.8	16-34	16.0	3.1	11-26
	non-dominant	21.3	4.5	12-25	15.4	3.0	11-21
60-64	dominant	21.8	3.3	16-28	14.8	3.1	10-20
	non-dominant	21.2	3.2	15-27	14.3	2.7	10-20
65-69	dominant	21.4	3.0	15-25	14.2	3.1	8-20
	non-dominant	21.2	4.1	14-30	13.7	3.4	8-22
70-75	dominant	18.1	3.4	14-27	14.4	2.6	9-19
	non-dominant	18.8	3.3	13-27	14.0	1.9	10-17
75+	dominant	18.7	4.2	9-26	12.0	2.6	8-17
	non-dominant	18.3	3.8	10-26	11.5	2.6	6-16
ALL	dominant	23.4	5.0	9-45	16.3	3.8	8-34
	non-dominant	23.0	5.3	10-42	15.7	3.6	6-32

TIP PINCH NORMS (LBS)



NORMS FOR ADULT PINCH STRENGTH (based on standard pinch width without paddle; level 1) Tip Pinch strength performance of all subjects (pounds)								
		men			women		
age	**hand**	**mean**	**SD**	**low-high**	**mean**	**SD**	**low-high**
20-24	dominant	18.0	3.0	11-23	11.1	2.1	8-16
	non-dominant	17.0	2.3	12-33	10.5	1.7	8-14
25-29	dominant	18.3	4.4	10-34	11.9	1.8	8-16
	non-dominant	17.5	5.2	12-36	11.3	1.8	9-18
30-34	dominant	17.4	6.7	12-25	12.6	3.0	8-20
	non-dominant	17.6	4.8	10-27	11.7	2.8	7-17
35-39	dominant	18.0	3.6	12-27	11.6	2.5	8-19
	non-dominant	17.7	3.8	10-24	11.9	2.4	8-16
40-44	dominant	17.8	4.0	11-25	11.5	2.7	5-15
	non-dominant	17.7	3.5	12-25	11.1	3.0	6-17
45-49	dominant	18.7	4.9	12-30	13.2	3.0	9-19
	non-dominant	17.6	4.1	12-28	12.1	2.7	7-18
50-54	dominant	18.3	4.0	11-24	12.5	2.2	9-18
	non-dominant	17.8	3.9	12-26	11.4	2.4	7-16
55-59	dominant	16.6	3.3	11-24	11.7	1.7	9-16
	non-dominant	15.0	3.7	10-26	10.4	1.4	8-13
60-64	dominant	15.8	3.9	9-22	10.1	2.1	7-17
	non-dominant	15.3	3.7	9-23	9.9	2.0	6-15
65-69	dominant	17.0	4.2	11-27	10.6	2.0	7-15
	non-dominant	15.4	2.9	10-21	10.5	2.4	7-17
70-75	dominant	13.8	2.6	11-21	10.1	2.6	7-15
	non-dominant	13.3	2.6	10-21	9.8	2.3	6-17
75+	dominant	14.0	3.4	7-21	9.6	2.8	4-16
	non-dominant	13.9	3.7	8-25	9.3	2.4	4-13
ALL	dominant						
	non-dominant						

KEY PINCH NORMS (LBS)

NORMS FOR ADULT PINCH STRENGTH (based on standard pinch width without paddle; level 1)
Key Pinch strength performance of all subjects (pounds)

		men			women		
age	**hand**	**mean**	**SD**	**low-high**	**mean**	**SD**	**low-high**
20-24	dominant	26.0	3.5	21-34	17.6	2.0	14-23
	non-dominant	24.8	3.4	19-31	16.2	2.1	13-23
25-29	dominant	26.7	4.9	19-41	17.7	2.1	14-22
	non-dominant	25.0	4.7	19-39	16.6	2.1	13-22
30-34	dominant	26.4	4.8	20-36	18.7	3.0	13-25
	non-dominant	26.2	5.1	17-36	17.8	3.6	12-26
35-39	dominant	26.1	3.2	21-32	16.6	2.0	12-21
	non-dominant	25.6	3.9	18-32	16.0	2.7	12-22
40-44	dominant	25.6	2.6	21-31	16.7	3.1	10-24
	non-dominant	25.1	4.0	19-31	15.8	3.1	8-22
45-49	dominant	25.8	3.9	19-35	17.6	3.2	13-24
	non-dominant	24.8	4.4	18-42	16.6	2.9	12-24
50-54	dominant	26.7	4.4	20-34	16.7	2.5	12-22
	non-dominant	26.1	4.2	20-37	16.1	2.7	12-22
55-59	dominant	24.2	4.2	18-34	15.7	2.5	11-21
	non-dominant	23.0	4.7	13-31	14.7	2.2	12-19
60-64	dominant	23.2	5.4	14-37	15.5	2.7	10-20
	non-dominant	22.2	4.1	16-33	14.1	2.5	10-19
65-69	dominant	23.4	3.9	17-32	15.0	2.6	10-21
	non-dominant	22.0	3.6	17-28	14.3	2.8	10-20
70-75	dominant	19.3	2.4	16-25	14.5	2.9	8-22
	non-dominant	19.2	3.0	13-28	13.8	3.0	9-22
75+	dominant	20.5	4.6	9-31	12.6	2.3	8-17
	non-dominant	19.1	3.0	13-24	11.4	2.6	7-16
ALL	dominant	24.5	4.6	9-41	16.2	3.0	8-25
	non-dominant	23.6	4.6	11-42	15.3	3.1	7-26

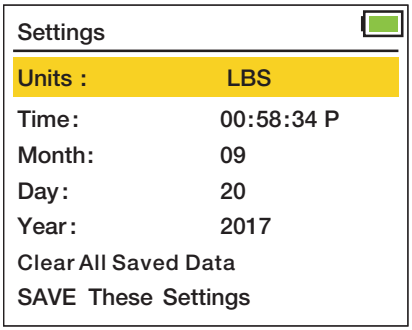
Settings Screen

From the Main Menu, select Settings. On this screen use the UP and DOWN arrows to select the following:

- Units: (LBS or KGS)
- Time: (HH:MM:SS AM/PM)
- Month (MM)
- Day (DD)
- Year (YYYY)

Highlight and SELECT menu option. Use the UP, DOWN, LEFT and RIGHT buttons to modify selected menu option. Press SELECT to save option. Scroll down “Save These Settings” and press SELECT button to save these settings.

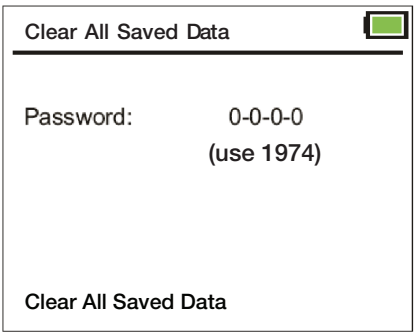
13a



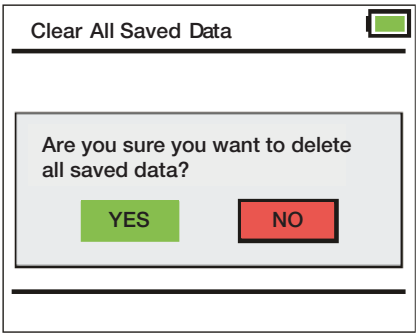
Clearing Saved Data

Clear ALL Saved Data clears all saved subject settings in device. Use password **1974**. Toggle the LEFT and RIGHT arrows to select Yes or No.

13b



13c



Tolerances:
The BIMS® hand dynamometers have a tolerance of +/- 3 lbs (1% of the full scale).
The BIMS® pinch dynamometers have a tolerance of +/- 1.5 lbs (1.5% of the full scale).

Disposal Method
Dispose of item in accordance with the local/regional/national/international regulations.

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