

# **BASELINE<sup>®</sup>** **EVALUATION INSTRUMENTS**

## **Hydraulic Hand Dynamometer**

### Instruction Manual

#### **REF**

12-0240 **Standard**

12-0241 **LITE™**

12-0221 **HD™**

12-0243 **Hi-Res™**

12-0246 **ER™**

12-0247 **Digital**

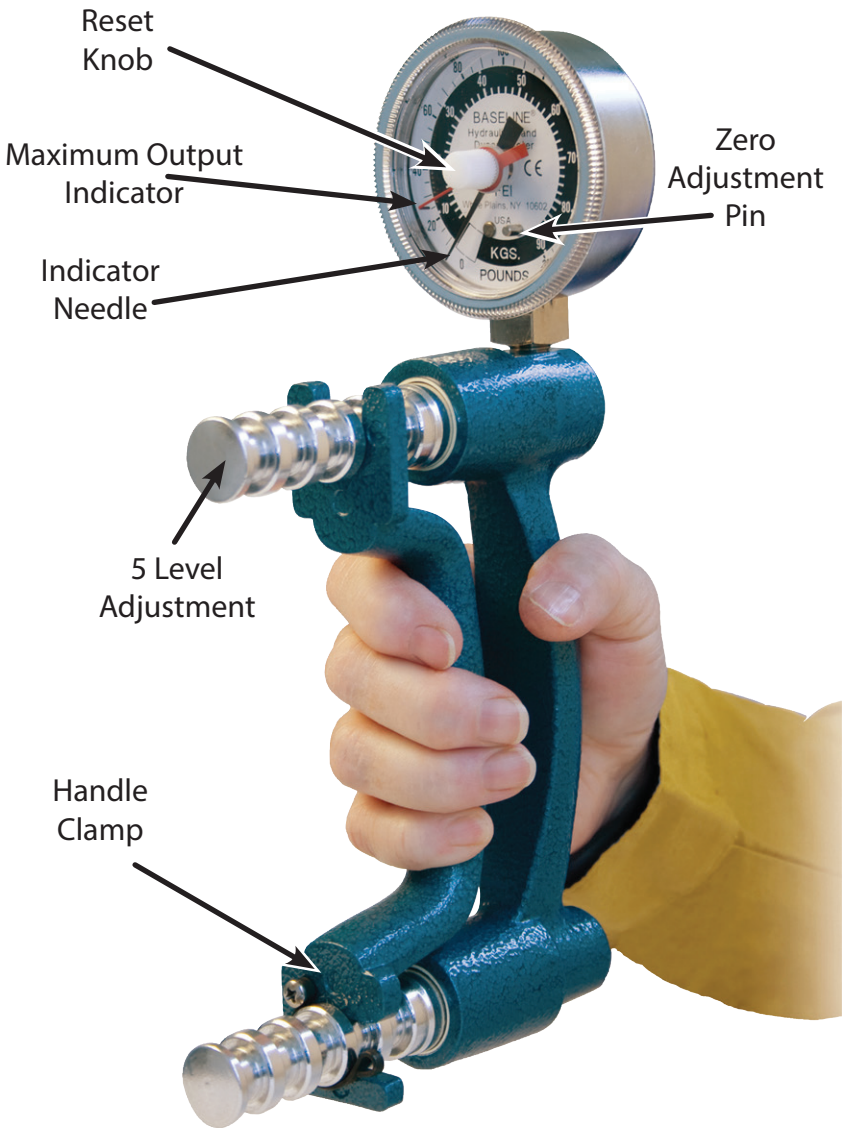


Standard Hydraulic Hand  
Dynamometer  
(12-0240)

**FEI**  
FABRICATION  
ENTERPRISES INC.

Manufacturer and Master  
Distributor of Physical Therapy  
and Rehabilitation Products

## Parts/Specifications



**Specifications**  
**Grip adjust range**  
**Weight**

200 lb / 90 kg capacity  
1.35 in / 3.35 cm  
22.6 oz / 638 gm



## Hydraulic Hand Dynamometer

### Usage

Set handle to comfortable grip for patient. Reset max indicator to zero. Have patient squeeze with maximum force, note reading. Reset to zero for next test.

### Calibration

The Baseline® Hydraulic Hand Dynamometer is a sealed unit and calibrated at the factory. However, if indicator needle is out of "zero-range" it may be reset. Remove the clear cover by turning counter clockwise. Adjustment pin located by 90 kg marking. Turn pin to reset to zero.

If unit is leaking hydraulic fluid it should be returned to the factory for evaluation.

### Components

- Machined aluminum handle, post and body
  - Bronze bellows
  - Stainless steel hydraulic tubing
  - Teflon bushings
  - Non-toxic mechanical hydraulic pump fluid
  - Gauge-Bourdon tube element with spring suspended movement. Constructed to ASME B 40.1 standards.
- Accuracy greater than 98%.

### Data

The Baseline® Hydraulic Hand Dynamometer can utilize same of data pertaining to the Jamar® Hydraulic Hand Dynamometer. The internal workings of both are hydraulic and bellows-operated.

## Norms for Adult Grip Strength

A recent study by Dr. Virgil Mathiowetz indicates 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 tests as a resultant score. A score was taken with both the dominant (right) and non-dominant (left) hands.

The rest results show a relationship between:

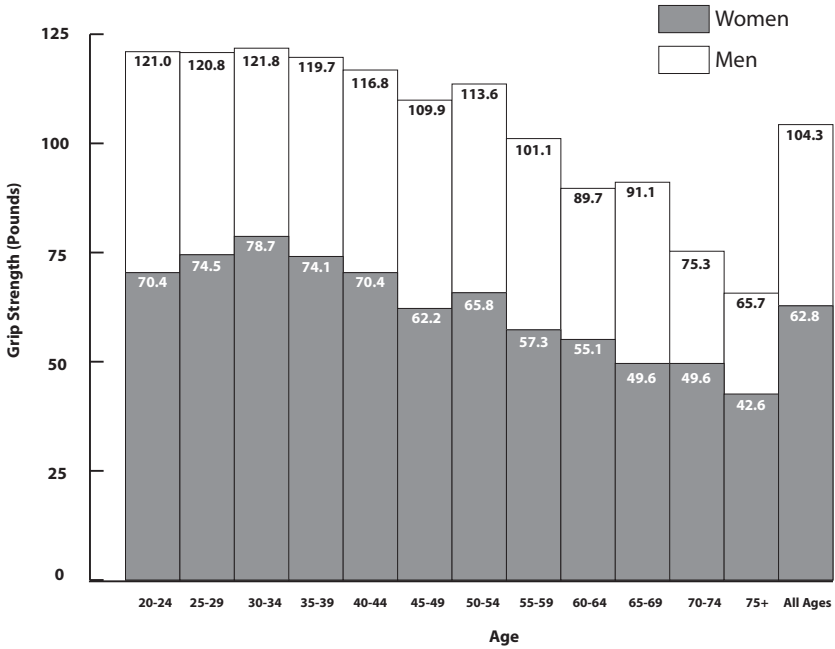
- hand strength vs. age
- hand strength of men vs. hand strength of women
- dominant hand strength vs. non-dominant hand strength

Average Performance of all Subjects on Grip Strength (pounds)- Test results											
Men							Women				
Mean	SD	SE	Low	High	Age	Hand	Mean	SD	SE	Low	High
121.0 104.5	20.6 21.8	3.8 4.0	91 71	167 150	20-24	R L	70.4 61.0	14.5 13.1	2.8 2.6	46 33	95 88
120.8 110.5	23.0 16.2	4.4 4.4	78 77	158 139	25-29	R L	74.5 63.5	13.9 12.2	2.7 2.4	48 48	97 97
121.8 110.4	22.4 21.7	4.3 4.2	70 64	170 145	30-34	R L	78.7 68.0	19.2 17.7	3.8 3.5	46 36	137 115
119.7 112.9	24.0 21.7	4.8 4.2	76 73	176 157	35-39	R L	74.1 66.3	10.8 11.7	2.2 2.3	50 49	99 91
116.8 112.8	20.7 18.7	4.1 3.7	84 73	165 157	40-44	R L	70.4 62.3	13.5 13.8	2.4 2.5	38 35	103 94
109.9 100.8	23.0 22.8	4.3 4.3	65 58	155 160	45-49	R L	62.2 56.0	15.1 12.7	3.0 2.1	39 37	100 83
113.6 101.9	18.1 17.0	3.6 3.4	79 70	151 143	50-54	R L	65.8 57.3	11.6 10.7	2.3 2.1	38 35	87 76
101.1 83.2	26.7 23.4	5.8 5.1	59 43	154 128	55-59	R L	57.3 47.3	12.5 11.9	2.5 2.4	33 31	86 76
89.7 76.8	20.4 20.3	4.2 4.1	51 27	137 116	60-64	R L	55.1 45.7	10.1 10.1	2.0 2.0	37 29	77 66
91.1 76.8	20.6 19.8	4.0 3.8	56 43	131 117	65-69	R L	49.6 41.0	9.7 8.2	1.8 1.5	35 29	74 63
75.3 64.8	21.5 18.1	4.2 3.7	32 32	108 93	70-74	R L	49.6 41.5	11.7 10.2	2.2 1.9	33 23	78 67
65.7 55.0	21.0 17.0	4.2 3.4	40 31	135 119	75+	R L	42.6 37.6	11.0 8.9	2.2 1.7	25 24	65 61
104.3 93.1	28.3 27.6	1.6 1.6	32 27	176 160	All Subjects	R L	62.8 53.9	17.0 15.7	0.96 0.88	25 23	137 115

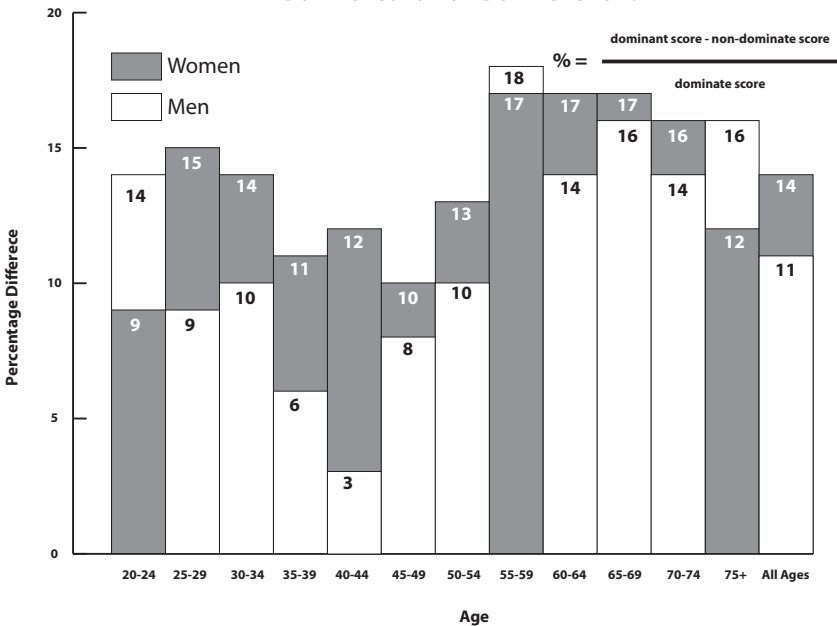
### References:

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.

## Grip Strength (Dominant Hand)



## Grip Strength Difference Between Dominant and Non-Dominant Hand



\* 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

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Virgil Mathiowetz, PhD, OTR  
Associate Professor  
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St. Paul, MN 55105-1794

March 18, 1993

Mr. Elliott Goldberg,  
Marketing Director  
Fabrication Enterprises Inc.  
Trent Building  
South Buckout Street  
Irvington, NY 10533

Dear Mr. Goldberg,

Recently, I completed the study to determine whether the Baseline and Jamar hydraulic dynamometers can be used interchangeable. A draft of the report has been completed and sent to you. In the summary, I concluded that, "The data from this study suggest that the Jamar and Baseline hydraulic hand dynamometers measure equivalently for practical purposes. As a result, individuals using the Baseline Dynamometer are justified in using the normative data, which was collected with the Jamar dynamometer (Mathiowetz et al., 1985; 1986)." This conclusion assumes that the same standard procedures are followed as were used in the original normative data studies.

Sincerely,



Virgil Mathiowetz, PhD, OTR  
Associate Professor &  
Research Consultant



## Hydraulic Hand Dynamometer

### WARRANTY

The Baseline® Hydraulic Hand Dynamometer is warranted for parts and labor from date of purchase. If unit needs repair, contact your local dealer or Fabrication Enterprises, Inc.

Fabrication Enterprises, Inc.  
3 Westchester Plaza Suite 111  
Elmsford, NY 10523  
Tel: 800-431-2830, 914-345-9300



12-0241  
**LITE™** Hydraulic  
Hand Dynamometer



12-0240  
**Standard** Hydraulic Hand  
Dynamometer



12-0221  
**HD™** Hydraulic  
Hand Dynamometer



12-0243  
**Hi-Res™** Hydraulic  
Hand Dynamometer



12-0246  
**ER™** Hydraulic  
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hydraulic push-pull dynamometers



tuning forks



circumference tape



fingertip pulse oximeter



hand volumetric edema gauges



scoliometer



hand held body fat analyzer

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