

MAN195

Model 32521

Hand Tool Dexterity Test

Owner's / Operator's Manual



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Hand Tool Dexterity Test

Model 32521

The Hand Tool Dexterity Test Model # 32521 can be used as a general assessment of an individual's skill in using ordinary mechanics tools. Results of the test have been used to determine vocational interest and as an indicator of success where job/tasks require the use of these or similar tools. Reference literature suggests the use of this test to assess performance when hands will be covered when using the tools incorporated in this test. The normative data provided are for guidance only and the user should refer to published literature for additional applications of the test.

PROCEDURE and SCORING

The score on this test is the amount of time that it takes the examinee to remove the nuts and bolts from the left side and mount them on the right side. Make sure that the bolts are mounted on the left side with the bolt heads on the inside.

The test administrator records time by starting the stopwatch as soon as the examinee picks up the first wrench. The examinee removes all of the bolts on each row on the left side, starting at the top row, working down to the bottom row. All of the bolts on each row must be removed before moving on the next row. Once the bolts are loosened with the wrench, the fingers can then be used to further loosen and remove the bolts.

The examinee then mounts the bolts on the right side, starting from the bottom row, working their way to the top row, making sure that the bolt heads are on the inside. All of the bolts on each row must be mounted completely before moving on to the next row. The examinee must tighten the bolts tight enough so that they can not be removed with the fingers.

As soon as the last bolt is tightened on the right side, the examiner stops the stopwatch & records the time.

TABLE 1:

Raw Scores Corresponding to Selected Percentiles on the Hand-Tool Dexterity Test for Large Groups
 Test Scores Given in Minutes and Seconds

Percentile	Maintenance Mechanics at a mass Transportation System in the Northeast ^a	Applicants for Assembly and Maintenance Positions at a Manufacturing Company in New York ^b		Clients at a Vocational Evaluation and Guidance Center in Illinois ^c	Back-Injured Workers in a Vocational Rehabilitation Program in California ^d	Percentile
		Male	Female			
99	4'41" and below	4'22" and below	7'14" and below	4' and below	4'50" and below	99
97	4'42" - 4'57"	4'23" - 5'08"	7'15" - 7'21"	5'	4'51" - 5'07"	97
95	4'58" - 5'18"	5'09" - 5'37"	7'22" - 7'49"	-	5'08" - 5'47"	95
90	5'19" - 5'28"	5'38" - 5'59"	7'50" - 8'06"	-	5'48" - 6'13"	90
85	5'29" - 5'40"	6'00" - 6'17"	8'07" - 8'12"	6'	6'14" - 6'28"	85
80	5'41" - 5'47"	6'18" - 6'39"	8'13" - 8'30"	-	6'29" - 6'38"	80
75	5'48" - 5'55"	6'40" - 6'49"	8'31" - 8'49"	-	6'39"	75
70	5'56" - 6'00"	6'50" - 7'00"	8'48" - 8'57"	7'	-	70
65	6'01" - 6'08"	7'01" - 7'08"	8'58" - 9'15"	-	-	65
60	6'09" - 6'16"	7'09" - 7'20"	9'16" - 9'34"	-	-	60
55	6'17" - 6'24"	7'21" - 7'32"	9'35" - 9'56"	8'	-	55
50	6'25" - 6'38"	7'33" - 7'49"	9'57" - 10'16"	-	-	50
45	6'39" - 6'44"	7'50" - 8'13"	10'17" - 10'31"	9'	6'40" - 6'43"	45
40	6'45" - 6'53"	8'14" - 8'23"	10'32" - 11'24"	-	6'44" - 6'51"	40
35	6'54" - 7'02"	8'24" - 8'42"	11'25" - 11'31"	-	6'52" - 7'11"	35
30	7'03" - 7'12"	8'43" - 9'00"	11'32" - 11'47"	10'	7'12" - 7'20"	30
25	7'13" - 7'17"	9'01" - 9'12"	11'48" - 12'20"	11'	7'21" - 7'28"	25
20	7'18" - 7'23"	9'13" - 9'44"	12'21" - 12'43"	12'	7'29" - 7'51"	20
15	7'24" - 7'40"	9'45" - 10'09"	12'44" - 12'59"	13'	7'52" - 8'35"	15
10	7'41" - 8'24"	10'10" - 10'54"	13'00" - 15'17"	14' - 17'	8'36" - 10'15"	10
5	8'25" - 8'39"	10'55" - 12'44"	15'18" - 16'25"	18' - 22'	10'16" - 12'16"	5
3	8'40" - 10'18"	12'45" - 13'14"	16'26" - 17'48"	23' - 27'	12'17" - 12'56"	3
1	10'19" and above	13'15" and above	17'49" and above	28' and above	12'57" and above	1
N	187	151	110	149	222	N
Mean	6'40"	8'09"	10'39"	9'30"	7'19"	Mean
SD	1'12"	2'13"	2'35"	5'36"	1'50"	SD

^a All male; all white^b Race not reported^c All male; race not reported.^d All male; all white

TABLE 2:

Raw Scores Corresponding to Selected Percentiles on the Hand-Tool Dexterity Test for Medium Size Groups
 Test Scores Given in Minutes and Seconds

Group	Sex	Race	N	Percentile	Raw Score
Backinjured workers in a vocational rehabilitation program in California	Male	Minority	65	75	6'39"
				50	6'39"
				25	7'21"
				Mean	7'22"
				SD	1'39"
Injured workers in a vocational rehabilitation program in California	Male	White	74	75	6'05"
				50	6'39"
				25	7'25"
				Mean	7'17"
				SD	2'26"
Students in prevocational adult basic education classes in Wisconsin	Male	Minority	86	75	5'38"
				50	6'22"
				25	7'45"
				Mean	6'45"
				SD	1'51"
Students in aviation mechanics program at a vocational high school in New York	Male	41 White, 32 Minority	73	75	6'35"
				50	7'53"
				25	8'42"
				Mean	7'47"
				SD	1'30"
Clients at a vocational evaluation and guidance center in Illinois	Female	Not Reported	91	75	8'00"
				50	9'00"
				25	13'00"
				Mean	10'54"
				SD	4'48"
Mentally retarded students (age 16-21) in special education programs in Missouri	Male	38 White, 16 Minority	54	75	9'57"
				50	13'00"
				25	18'30"
				Mean	17'44"
				SD	15'08"

TABLE 3:

Means and Standard Deviations of Hand-Tool Dexterity Test Scores for Various Groups

Group	Sex	Race	N	Mean	SD
Employees and Applicants					
Maintenance Mechanics at a transportation system in the Northeast	Male	White	187 ^a	6'40"	1'12"
	Male	Minority	41	7'02"	1'18"
Applicants for assembly and maintenance positions at a manufacturing company in New York	Male	Not Reported	151 ^a	8'09"	2'13"
	Female	Not Reported	110 ^a	10'39"	2'35"
Technical Trainees					
At a vocational training center in Florida	Male	37 White, 11 Minority	48	6'51"	1'17"
In basic education classes in Wisconsin	Male	Minority	86 ^b	6'46"	1'52"
	Female	Minority	31	9'03"	3'00"
Vocational Evaluation Charts					
At a vocational evaluation and guidance center in Illinois	Male	Not Reported	149 ^a	9'30"	5'36"
	Female	Not Reported	91 ^b	10'54"	4'48"
At a vocational evaluation center for the handicapped in Indiana	Male	22 White, 8 Minority	30	13'16"	8'20"
	Female	16 White, 10 Minority	26	22'11"	9'31"
Injured Workers					
In a vocational rehabilitation program in California: with back injuries	Male	White	222 ^a	7'19"	1'50"
	Male	Minority	65 ^b	7'22"	1'39"
	Male	White and Minority	287	7'19"	1'48"
with arm/hand injuries	Female	White	39	9'16"	2'14"
	Male	White	36	7'26"	1'47"
with other injuries	Male	White	74 ^b	7'17"	2'26"
Physically Handicapped Trainees					
In a rehabilitation program in New Jersey ^c	17 Male, 9 Female	Not Reported	26	7'41"	2'23"
Mentally or Emotionally Handicapped Trainees					
In a vocational rehabilitation program in Ohio	19 Male, 11 Female	19 White, 11 Minority	30	10'32"	4'14"
In a rehabilitation program in New Jersey ^d	20 Male, 11 Female	Not Reported	31	10'19"	4'40"
At a sheltered workshop in Minnesota ^e	Male	White	42	12'06"	5'15"
	Female	White	27	17'50"	8'40"
Mentally or Emotionally Handicapped Students					
In special education programs in Missouri:					
Mentally retarded students	Male	36 White, 16 Minority	54 ^b	17'44"	15'08"
	Female	18 White, 10 Minority	28	21'53"	12'30"
Behavior disorders and learning disabilities	Male	25 White, 11 Minority	36	9'20"	3'21"

^a Included in Table 1^d Neurologically impaired trainees^b Included in Table 2^e Mixed group, but predominantly mentally handicapped^c Sensorially impaired trainees

TABLE 4:Norms for Industrial and Educational Groups ^a

Percentile	Male Job Applicants in a Southern Plant	Male Adults at a Vocational Guidance Center	Airline Engine Mechanics	Apprentice Welders in a Steel Company	Percentile
99	4'21" and below	4'48" and below	4'02" and below	4'17" and below	99
97	4'22" - 4'34"	4'49" - 5'08"	4'03" - 4'32"	4'18" - 4'20"	97
95	4'35" - 4'48"	5'09" - 5'26"	4'33" - 4'44"	4'21" - 4'32"	95
90	4'49" - 5'05"	5'27" - 5'46"	4'45" - 4'49"	4'33" - 4'49"	90
85	5'06" - 5'17"	5'47" - 6'00"	4'50" - 4'53"	4'50" - 5'02"	85
80	5'18" - 5'28"	6'01" - 6'09"	4'54" - 4'59"	5'03" - 5'13"	80
75	5'29" - 5'39"	6'10" - 6'16"	5'00" - 5'12"	5'14" - 5'17"	75
70	5'40" - 5'48"	6'17" - 6'23"	5'13" - 5'23"	5'18" - 5'23"	70
65	5'49" - 5'57"	6'24" - 6'31"	5'24" - 5'30"	5'24" - 5'35"	65
60	5'58" - 6'06"	6'32" - 6'40"	5'31" - 5'38"	5'36" - 5'44"	60
55	6'07" - 6'14"	6'41" - 6'49"	5'39" - 5'43"	5'45" - 5'50"	55
50	6'15" - 6'23"	6'50" - 6'59"	5'44" - 5'45"	5'51" - 5'56"	50
45	6'24" - 6'35"	7'00" - 7'11"	5'46" - 5'47"	5'57" - 6'00"	45
40	6'36" - 6'47"	7'12" - 7'23"	5'48" - 5'51"	6'01" - 6'04"	40
35	6'48" - 7'00"	7'24" - 7'37"	5'52" - 6'01"	6'05" - 6'13"	35
30	7'01" - 7'15"	7'38" - 7'51"	6'02" - 6'16"	6'14" - 6'24"	30
25	7'16" - 7'30"	7'52" - 8'09"	6'17" - 6'24"	6'25" - 6'29"	25
20	7'31" - 7'48"	8'10" - 8'31"	6'25" - 6'30"	6'30" - 6'34"	20
15	7'49" - 8'11"	8'32" - 8'56"	6'31" - 6'52"	6'35" - 6'53"	15
10	8'12" - 8'47"	8'57" - 9'33"	6'53" - 7'21"	6'54" - 7'17"	10
5	8'48" - 9'27"	9'34" - 10'30"	7'22" - 7'48"	7'18" - 7'29"	5
3	9'28" - 10'34"	10'31" - 11'40"	7'49" - 8'08"	7'30" - 7'41"	3
1	10'35" and above	11'41" and above	8'09" and above	7'42" and above	1
N	1123	441	50	50	N
Mean	6'33"	7'14"	5'47"	5'50"	Mean
SD	1'25"	1'32"	0'55"	0'51"	SD

^a Since the raw score on the Hand-Tool Dexterity Test is the amount of time required to complete the test, norms are presented in the form of minutes and seconds.

Thus for the group of male job applicants in a southern plant, the 40th percentile corresponds to all time scores falling between 6 minutes and 36 seconds, and 6 minutes and 47 seconds.

TABLE 4 (continued):Norms for Industrial and Educational Groups ^a

Percentile	Electrical Maintenance Workers	Employees and Applicants in a Manufacturing Company	Boys at a Vocational High School	High School Dropouts in a Metropolitan Center	Percentile
99	4'41" and below	6'39" and below	5'25" and below	4'57" and below	99
97	4'42" - 5'05"	6'40" - 6'55"	5'26" - 5'48"	4'58" - 5'28"	97
95	5'06" - 5'18"	6'56" - 7'17"	5'49" - 6'07"	5'29" - 5'51"	95
90	5'19" - 5'31"	7'18" - 7'39"	6'08" - 6'30"	5'52" - 6'18"	90
85	5'32" - 5'38"	7'40" - 7'56"	6'31" - 6'46"	6'19" - 6'45"	85
80	5'39" - 5'47"	7'57" - 8'13"	6'47" - 7'01"	6'46" - 7'15"	80
75	5'48" - 5'58"	8'14" - 8'28"	7'02" - 7'15"	7'16" - 7'34"	75
70	5'59" - 6'03"	8'29" - 8'40"	7'16" - 7'29"	7'35" - 7'54"	70
65	6'04" - 6'08"	8'41" - 8'54"	7'30" - 7'42"	7'55" - 8'09"	65
60	6'09" - 6'15"	8'55" - 9'08"	7'43" - 7'58"	8'10" - 8'26"	60
55	6'16" - 6'23"	9'09" - 9'20"	7'59" - 8'16"	8'27" - 8'44"	55
50	6'24" - 6'23"	9'21" - 9'38"	8'17" - 8'32"	8'45" - 8'55"	50
45	6'31" - 6'38"	9'39" - 9'55"	8'33" - 8'46"	8'56" - 9'07"	45
40	6'39" - 6'47"	9'56" - 10'07"	8'47" - 8'59"	9'08" - 9'21"	40
35	6'48" - 6'54"	10'08" - 10'21"	9'00" - 9'15"	9'22" - 9'32"	35
30	6'55" - 6'59"	10'22" - 10'42"	9'16" - 9'32"	9'33" - 9'45"	30
25	7'00" - 7'10"	10'43" - 11'05"	9'33" - 9'58"	9'46" - 10'02"	25
20	7'11" - 7'25"	11'06" - 11'39"	9'59" - 10'33"	10'03" - 10'23"	20
15	7'26" - 7'43"	11'40" - 12'18"	10'34" - 11'13"	10'24" - 10'54"	15
10	7'44" - 8'10"	12'19" - 13'09"	11'14" - 12'20"	10'55" - 11'49"	10
5	8'11" - 8'42"	13'10" - 14'34"	12'21" - 13'47"	11'50" - 13'53"	5
3	8'43" - 9'01"	14'35" - 16'30"	13'48" - 15'18"	13'54" - 16'44"	3
1	9'02" and above	16'31" and above	15'19" and above	16'45" and above	1
N	122	338	360	153	N
Mean	6'33"	9'52"	8'44"	8'53"	Mean
SD	1'00"	2'16"	2'16"	2'18"	SD

^a Since the raw score on the Hand-Tool Dexterity Test is the amount of time required to complete the test, norms are presented in the form of minutes and seconds.

Thus for the group of male job applicants in a southern plant, the 40th percentile corresponds to all time scores falling between 6 minutes and 36 seconds, and 6 minutes and 47 seconds.

Terms and Conditions

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Phone, Fax, Email or Mail-in Orders

All orders need to be accompanied by a hard copy of your purchase order. All orders must include the following information:

- Quantity
- Part Number
- Description
- Your purchase order number or method of pre-payment
- Your tax status (include tax-exempt numbers)
- Shipping address for this order
- Billing address for the invoice we'll mail when this order is shipped
- Signature and typed name of person authorized to order these products
- Your telephone number
- Your email address
- Your FAX number

Domestic Terms

There is a \$50 minimum order. Open accounts can be extended to most recognized businesses. Net amount due 30 days from the date of shipment unless otherwise specified by us. Enclose payment with the order; charge with VISA, MasterCard, American Express, or pay COD. We must have a hard copy of your purchase order by mail, E-mail or fax. Students, individuals and private companies may call for a credit application.

International Payment Information

There is a \$50 minimum order. Payment must be made in advance by draft drawn on a major US bank; wire transfers to our account; charge with VISA, MasterCard, American Express, or confirmed irrevocable letter of credit. Proforma invoices will be provided upon request.

Exports

If ordering instrumentation for use outside the USA, please specify the country of ultimate destination, as well as the power requirements (110V/60Hz or 220V/50Hz). Some model numbers for 220V/50Hz will have a "CC" suffix.

Quotations

Quotations are supplied upon request. Written quotations will include the price of goods, cost of shipping and handling, if requested, and estimated delivery time frame. Quotations are good for 30 days, unless otherwise noted. Following that time, prices are subject to change and will be re-quoted at your request.

Cancellations

Orders for custom products, custom assemblies or instruments built to customer specifications will be subject to a cancellation penalty of 100%. Payment for up to 100% of the invoice value of custom products may be required in advance. Cancellation for a standard Lafayette Instrument manufactured product once the product has been shipped will normally be assessed a charge of 25% of the invoice value, plus shipping charges. Resell items, like custom products, will be subject to a cancellation penalty of 100%.

Exchanges and Refunds

Please see the cancellation penalty as described above. No item may be returned without prior authorization of Lafayette Instrument Company and a Return Goods Authorization (RGA#) number which must be affixed to the shipping label of the returned goods. The merchandise should be packed well, insured for the full value and returned along with a cover letter explaining the reason for return. Unopened merchandise may be returned prepaid within thirty (30) days after receipt of the item and in the original shipping carton. Collect shipments will not be accepted. Product must be returned in saleable condition, and credit is subject to inspection of the merchandise.

Repairs

Instrumentation may not be returned without first receiving a Return Goods Authorization Number (RGA). When returning instrumentation for service,

please call Lafayette Instrument to receive a RGA number. Your RGA number will be good for 30 days. Address the shipment to:
Lafayette Instrument Company
3700 Sagamore Parkway North
Lafayette, IN 47904, USA.

Shipments cannot be received at the PO Box. The items should be packed well, insured for full value, and returned along with a cover letter explaining the malfunction. An estimate of repair will be given prior to completion ONLY if requested in your enclosed cover letter. We must have a hard copy of your purchase order by mail or fax, or repair work cannot commence for non-warranty repairs.

Damaged Goods

Damaged instrumentation should not be returned to Lafayette Instrument prior to a thorough inspection. If a shipment arrives damaged, note damage on delivery bill and have the driver sign it to acknowledge the damage. Contact the delivery service, and they will file an insurance claim. If damage is not detected at the time of delivery, contact the carrier/shipper and request an inspection within 10 days of the original delivery. Please call the Lafayette Instrument Customer Service Department for repair or replacement of the damaged merchandise.

Limited Warranty

Lafayette Instrument Company warrants equipment manufactured by the company to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. The original manufacturer's warranty will be honored by Lafayette Instrument for items not manufactured by Lafayette Instrument Company, i.e. resell items. This assumes normal usage under commonly accepted operating parameters and excludes consumable products.

Warranty period for repairs or used instrumentation purchased from Lafayette Instrument is 90 days. Lafayette Instrument Company agrees either to repair or replace, at its sole option and free of part charges to the customer, instrumentation which, under proper and normal conditions of use, proves to be defective within the warranty period. Warranty for any parts of such repaired or replaced instrumentation shall be covered under the same limited warranty and shall have a warranty period of 90 days from the date of shipment or the remainder of the original warranty period whichever is greater. This warranty and remedy are given expressly and in lieu of all other warranties, expressed or implied, of merchantability or fitness for a particular purpose and constitutes the only warranty made by Lafayette Instrument Company.

Lafayette Instrument Company neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service or use of its instrumentation. Lafayette Instrument Company shall have no liability whatsoever for special, consequential, or punitive damages of any kind from any cause arising out of the sale, installation, service or use of its instrumentation. All products manufactured by Lafayette Instrument Company are tested and inspected prior to shipment. Upon prompt notification by the Customer, Lafayette Instrument Company will correct any defect in warranted equipment of its manufacture either, at its option, by return of the item to the factory, or shipment of a repaired or replacement part. Lafayette Instrument Company will not be obliged, however, to replace or repair any piece of equipment, which has been abused, improperly installed, altered, damaged, or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion, or damage incurred during shipment.

Limited Obligations Covered by this Warranty

1. In the case of instruments not of Lafayette Instrument Company manufacture, the original manufacturer's warranty applies.
2. Shipping charges under warranty are covered only in one direction. The customer is responsible for shipping charges to the factory if return of the part is required.
3. This warranty does not cover damage to components due to improper installation by the customer.
4. Consumable and/or expendable items, including but not limited to electrodes, lights, batteries, fuses, O-rings, gaskets, and tubing, are excluded from warranty.
7. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
8. If the original invoice for the instrument is issued to a company that is not the company of the end user, and not an authorized Lafayette Instrument Company distributor, then all requests for warranty must be processed through the company that sold the product to the end user, and not directly to Lafayette Instrument Company.

Export License

The U.S. Department of Commerce requires an export license for any polygraph system shipment with an ULTIMATE destination other than: Australia, Japan, New Zealand or any NATO Member Countries. It is against U.S. law to ship a Polygraph system to any other country without an export license. If the ultimate destination is not one of the above listed countries, contact us for the required license application forms.