

LOADED SOUND TEST SUMMARY SHEET

NAME OF DEVICE UNDER TEST (DUT)
TOOL OPERATOR
COMPUTER OPERATOR
TEST DATE

Reciprocating Saw
Manual Mode, Brian Kim
Edward Zechmann
5/11/2009

TEST DESCRIPTION

Sound Power Level Measurement

TEST LOCATION

UC anechoic lab

MANUFACTURER

DeWalt

MODEL

DW311

SERIAL NUMBER

029645

MODE OF OPERATION

FULL SPEED, LOADED, WITH OPERATOR

RUN NUMBER

1

YEAR MADE

2008

DIMENSIONS (inches)

Length 18.0", Width 4.0", Height 6.0"

WEIGHT (lbs.)

9.3

TECHNICAL SPECIFICATIONS

1 1/8 inch stroke length

MOUNTING CONDITIONS

1 inch thick oak board mounted on test jig

LOADING CONDITIONS

FULL SPEED, LOADED 1" OAK, WITH OPERATOR

K1 (dBA)

0

K2 (dBA)

0.38

TEMPERATURE (CELSIUS)

24

HUMIDITY %

36

BAROMETRIC PRESSURE ("Hg)

30.14

TEST ENVIRONMENT

SEMI ANECHOIC, SEMI HEMISPHERICAL

TOOL TESTING STANDARD

ANSI S12.15-1992

MEASUREMENT STANDARD

ISO 3744:1994-05-01

MICROPHONE SET-UP

10-MICROPHONES

SURFACE RADIUS

2.00 meters

RATED POWER (WATTS)

1560

ACTUAL INPUT POWER (WATTS)

556

VOLTAGE (VOLTS)

117

CURRENT (AMPS)

6.0

RATED SPM

2700

ACTUAL SPM

-

SOUND POWER LEVEL (dBA)

104.8

SOUND POWER (WATTS) A-weighted

0.03029

SWLA - k2 (dBA)

104.4

SWLA - k2 (WATTS) A-weighted

0.02773

SOUND PRESSURE LEVEL (dBA) @ 2 meters

90.8

AT THE NOMINAL HEARING ZONE OF OPERATOR

SOUND PRESSURE LEVEL (dBA)

94.3

Average Directivity Study

TEST DATE 5/11/2009
DUT Reciprocating Saw
Manufacturer DeWalt
Model Number DW311
Serial Number 029645
Mode FULL SPEED, LOADED, WITH OPERATOR
Run Number 1

A-weighted Sound Pressure Level

	Position1	Position2
Mic #	dBA	dBA
0	88.9	89.2
1	85.8	87.3
2	89.2	89.4
3	87.6	89.4
4	92.2	91.7
5	92.9	89.3
6	89.5	86.9
7	90.5	94.4
8	88.9	92.8
9	94.2	93.0
10	93.9	94.3
dB difference	8.4	7.5

A-weighted Directivity Index

Mic #	dBA	dBA
0	-1.0	-1.1
1	-4.1	-3.0
2	-0.8	-0.9
3	-2.4	-0.9
4	2.2	1.3
5	3.0	-1.1
6	-0.4	-3.5
7	0.5	4.0
8	-1.1	2.5
9	4.3	2.6

SOUND DATA SHEET

PRODUCT INFORMATION

TEST CONDITIONS

TEST DATE	5/11/2009		
DUT	Reciprocating Saw	Actual Power (watt)	556
Manufacturer	DeWalt	Voltage (Volts)	117
Model Number	DW311	Current (Amps)	6.0
Serial Number	029645	Actual RPM	-
Mode of Operation	FULL SPEED, LOADED, WITH OP	Temperature (Deg. F)	24
Run Number	1	Humidity (%)	36

Measurement Data

Baro. Press. (inch of Hg) 30.14

Linear (unweighted) Position 1

Sound Power (dB)	106.79	107.04	107.96	106.92	106.62	106.41	106.01	106.35	107.25	106.67
Sound Power (Watts)	0.04778	0.05053	0.06246	0.04919	0.04593	0.04379	0.03991	0.04317	0.05314	0.04641
Sound Pressure (dB)	92.79	93.03	93.95	92.92	92.62	92.41	92.01	92.35	93.25	92.66

Linear (unweighted) Position 2

Sound Power (dB)	108.08	106.22	106.62	105.93	106.31	106.71	105.27	106.47	106.41	107.27
Sound Power (Watts)	0.06421	0.04188	0.04587	0.03920	0.04280	0.04689	0.03364	0.04434	0.04376	0.05334
Sound Pressure (dB)	94.07	92.22	92.61	91.93	92.31	92.71	91.27	92.47	92.41	93.27

A-weighted Position 1

Sound Power (dBA)	104.20	104.71	105.18	105.00	104.68	104.38	104.07	104.28	105.10	104.71
Sound Power (Watts)	0.02631	0.02957	0.03293	0.03160	0.02938	0.02740	0.02551	0.02681	0.03237	0.02955
Sound Pressure (dBA)	90.20	90.71	91.17	90.99	90.68	90.38	90.06	90.28	91.10	90.70

A-weighted Position 2

Sound Power (dBA)	105.99	104.63	104.87	104.41	104.82	105.22	103.85	104.95	105.03	105.62
Sound Power (Watts)	0.03975	0.02902	0.03070	0.02760	0.03031	0.03324	0.02429	0.03125	0.03187	0.03645
Sound Pressure (dBA)	91.99	90.62	90.87	90.41	90.81	91.21	89.85	90.95	91.03	91.61

Calculations

Average A-weighted Sound Data

Sound Power (dBA)	104.81
Sound Power (Watts)	0.0303
Sound Pressure (dBA)	90.81

Std. Deviation SWLA 0.5163

95 % Confidence Level 0.2417

Mean SPLA-k2 90.43

LOADED VIBRATIONS TEST SUMMARY SHEET

NAME OF DEVICE UNDER TEST (DUT)	Reciprocating Saw
TOOL OPERATOR (SUBJECT OF TEST)	Manual Mode, Brian Kim
COMPUTER OPERATOR	Edward Zechmann
TEST DATE	5/11/2009
TEST DESCRIPTION	Human Exposure to Vibrations
TEST LOCATION	UC ANECHOIC LAB
MANUFACTURER	DeWalt
MODEL	DW311
SERIAL NUMBER	029645
MODE OF OPERATION	FULL SPEED, LOADED, WITH OPERATOR
RUN NUMBER	1
YEAR MADE	2008
DIMENSIONS (inches)	Length 18.0", Width 4.0", Height 6.0"
WEIGHT (lbs.)	9.3
TECHNICAL SPECIFICATIONS	1 1/8 inch stroke length
MOUNTING CONDITIONS	1 inch thick oak board mounted on test jig
LOADING CONDITIONS	FULL SPEED, LOADED 1" OAK, WITH OPERATOR
TEMPERATURE (CELSIUS)	24
HUMIDITY %	36
BAROMETRIC PRESSURE ("Hg)	30.14
TEST ENVIRONMENT	SEMI ANECHOIC, SEMI HEMISPHERICAL
MEASUREMENT STANDARD	ISO 5349-1 and ISO 5349-2
ACCELEROMETER SETUP	2 - ACCELEROMETERS
SETUP DIAGRAM	reciprocating_saw_7_accel_setup.doc
LOCATION ACCEL 1	right hand, right handle, on top of tool, near trigger
ORIENTATION ACCEL 1	X toward left side of tool, Y away from saw blade, Z toward top of tool
LOCATION ACCEL 2	left hand, on top of tool, behind saw blade
ORIENTATION ACCEL 2	X toward left side of tool, Y away from saw blade, Z toward top of tool
ADAPTER TYPE	Accel 1-side adapter, Accel 2-side adapter
OPERATOR POSTURE	Standing over tool, both hands gripping and sliding tool through wood
HAND GRIP FORCE	Band clamp over rubber mechanical low-pass filter
RATED POWER (WATTS)	1560
ACTUAL INPUT POWER (WATTS)	556
VOLTAGE (VOLTS)	117
CURRENT (AMPS)	6.0
RATED RPM	2700
ACTUAL RPM	-
Vibrations	
Accelerometer 1	
X, Y, Z arms m/s ² weighted	5.3, 27.9, 9.2
X, Y, Z arms m/s ² linear	37.2, 107.3, 85.8
Total arms m/s ² (weighted, linear)	29.8, 142.4
Accelerometer 2	
X, Y, Z arms m/s ² weighted	14.9, 26.8, 4
X, Y, Z arms m/s ² linear	94.9, 126, 70.4
Total arms m/s ² (weighted, linear)	32.6, 173.9

VIBRATIONS DATA SHEET

TEST DATE	5/11/2009			
DUT	Reciprocating Saw	Actual Power (watt)	556	
Manufacturer	DeWalt	Voltage (Volts)	117	
Model Number	DW311	Current (Amps)	6.0	
Serial Number	029645	Actual RPM	-	
Mode of Operation	FULL SPEED, LOADED, WITH C		Temperature	24
Run Number	1	Humidity (%)	36	

Accelerometer 1	arms weighted m/s ²																	
Axis	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
X	5.5	4.5	5.0	5.4	5.0	6.1	4.1	4.7	4.4	4.6	5.4	4.3	5.2	6.3	5.5	5.5	6.9	
Y	25.2	25.7	25.7	25.1	24.3	27.0	28.1	25.5	26.7	27.3	29.9	29.1	29.7	29.4	28.4	28.6	27.2	
Z	9.3	10.2	10.0	9.0	9.1	8.0	10.1	9.6	10.1	9.7	9.2	8.4	8.7	9.2	8.4	9.8	9.3	
Total arms	27.4	28.0	28.0	27.2	26.4	28.8	30.1	27.7	28.8	29.3	31.7	30.6	31.4	31.4	30.2	30.7	29.5	

Accelerometer 1	arms linear m/s ²																	
X	38.5	40.7	39.3	37.9	37.0	37.1	33.7	35.5	32.7	34.0	40.1	35.8	37.0	36.1	40.2	35.8	39.6	
Y	108.9	107.5	103.4	102.9	98.8	112.4	115.2	100.7	104.3	109.9	116.0	116.5	114.3	103.5	107.2	106.9	100.2	
Z	79.3	78.9	83.4	78.8	79.3	85.5	95.5	83.8	89.4	91.0	103.1	91.1	88.6	81.3	78.4	93.5	86.8	
Total arms	140.1	139.4	138.5	135.0	132.0	146.0	153.4	135.8	141.2	146.7	160.3	152.2	149.3	136.5	138.7	146.5	138.4	

Accelerometer 2	arms weighted m/s ²																	
Axis	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
X	4.2	16.1	8.2	16.0	22.6	28.3	16.4	18.4	13.3	22.6	4.0	3.3	3.4	4.5	3.7	4.6	5.8	
Y	24.5	24.9	25.0	24.4	23.4	25.8	27.0	24.3	25.3	26.0	29.0	27.9	28.7	28.6	27.3	27.4	25.9	
Z	4.1	4.2	4.0	3.5	3.8	3.5	5.1	3.6	4.3	4.5	3.7	2.8	3.6	3.7	3.3	4.4	4.1	
Total arms	25.2	30.0	26.6	29.4	32.8	38.4	32.0	30.7	28.9	34.7	29.5	28.2	29.2	29.2	27.8	28.2	26.8	

Accelerometer 2	arms linear m/s ²																	
X	75.3	98.5	83.0	86.9	112.1	118.2	101.7	110.7	94.4	112.2	88.8	78.2	75.8	71.0	69.7	76.2	82.1	
Y	122.0	112.7	116.4	118.3	121.4	122.8	130.2	120.1	128.5	128.8	142.0	132.0	124.1	115.9	119.9	141.2	144.4	
Z	74.8	65.0	67.8	67.2	73.3	68.2	72.9	67.5	71.8	71.0	80.2	74.3	69.3	62.2	65.7	77.2	79.0	
Total arms	161.8	163.2	158.2	161.4	180.8	183.6	180.5	176.7	174.9	185.0	185.7	170.5	161.1	149.4	153.4	178.1	184.0	

Average arms						
Weighted m/s ²	Accel 1	Accel 2	Linear	Accel 1	Accel 2	
X	5.3	14.9	X	37.2	94.9	
Y	27.9	26.8	Y	107.3	126.0	
Z	9.2	4.0	Z	85.8	70.4	
Total arms m/s ²	29.8	32.6		142.4	173.9	
Std. Deviation	2.3	9.4		7.2	14.5	
95 % Confidence Level	1.1	4.4		3.4	6.8	

18	19	20
7.1	5.5	4.4
27.7	33.5	33.3
8.3	8.2	8.6
29.7	34.9	34.7

34.5	43.7	34.5
101.5	108.3	107.9
84.6	83.3	80.5
136.6	143.4	139.0

18	19	20
5.1	49.0	48.0
26.2	32.4	32.7
4.2	4.2	4.7
27.0	58.9	58.3

72.4	147.5	143.0
131.2	127.9	119.9
73.9	65.1	61.7
167.0	205.8	196.6