Design-In Ergonomics Checklist

U.S. & Canada Population

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Step 3: **Equipment** Design

Date:	

Program: Job/Operation Description: Phase: _____ Design _____ Mock-up _____ Pre-Production _____ Other (list): _____ Analyst:____

	Further information can be found or	pages 12 - 40 of the Design-In Ergonomics Guidelines (DEG) @	http://apollo.delphiauto.net/ergonomics/desgn-in.htm			
				<u>C</u>	Check Circl Outside	<u>le</u> :
	Design Factor	Design Guidelines	Graphic	OK	Guidelines	N/A
3.1	Repetition Operator Cycle Time (seconds)	Repetitive Non-Repetitive*	Seconds 0 Repetitive			
	*If job is > 30 seconds, indicate the percentage of cycle time where same motion(s) is repeated or sustained:	N/A 10 20 33 40 50 60 70 80 90 100	30			
3.2	One Hand Force Neutral Wrist	kg. 0 1 2 3 4 5 6 / 8	Neutral Posture:	0	0	0
	Deviated Wrist (1/2 the force of neutral wrist)		Maximum for Repetitive Work: 0° 5° 5°	0	0	0
3.3	Finger Force/Pinch Grip Neutral Wrist	Ibs. 0 1 2 3 4 5 6 7 8 9 10 kg. 0 1 2 3 4 4.5	Maximum for Non-Repetitive Work:	0	0	0
	Deviated Wrist (1/2 the force of neutral wrist)	lbs.0 1 2 3 4 5 Rep. Non-Repetitive 2 2.3	0° -45° 20° 20° 20° 20°	0	0	0

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	Design Factor	Design Guidelines	Graphic	<u>C</u> OK	Check Circl Outside Guidelines	
3.4	Vertical Hand Height - Measured from st	anding surface to where the work is performed (ha	and height).			
	Heavy Work, > 10 lbs. (5 kg)	in. 32 33 34 35 36 37 38 39 40 cm. 81 91 Preferred 10		0	0	0
	Light Work, <= 10 lbs. (5 kg)	in. 38 39 40 41 42 43 4445 46 cm. 96 101 104 106 Preferred 117		0	0	0
	Precision Work, < 2 lbs. (1 kg)	in. 42 43 44 45 46 47 48 49 cm. ₁₀₆ 112 Preferred 119 124	Precision Light Heavy	0	0	0
	Horizontal Forward Reach (Measured from perform work in front of body.) Non-Rep. in 19	Optimal Non-Rep. Zone Non-Rep. 10 15 19 Right Hand 13 25 38 48	Optimal Work Area for Repetitive and Infrequent Reaches Only 60 in. [152cm] 31 in. [79 cm] 37 in. [89 cm]	0	0	0
	Horizontal Side Reach (Measured from the perform work left and right.) Non-Rep. in. 31 27 25 20 15 10 3 10 3 10 10 10 10 10 10 10 10 10 10 10 10 10	Optimal Non-Rep. Optimal Non-Rep. Right Hand 1 3 25 38 51 64 69 79	Hand	0	0	0

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Step 3: **Equipment** Design

Date:	

Program:			Job/Operation Descript	ion:	Date:
Phase:	Design	Mock-up	Pre-Production	Other (list):	Analyst:

	Further information can be found or	pages 12 - 40 of the Design-In Ergonomics Guidelines (DEG) @	http://apollo.delphiauto.net/ergonomics/desgn-in.htm			
					heck Circl Outside	
	Design Factor	Design Guidelines	Graphic	OK	Guidelines	N/A
3.7	Monitors - Monitors should be easily accessible. Is monitor location adjustable?	Vertically Swing Arm Horizontally Not applicable Tilt Not adjustable*		0	0	0
	* If not adjustable, vertical location of monitor should be 'standing eye height' (measured from standing surface to top of screen).	III. Preferred 63 64 65 66 67 68 69	15 15 15 15 15 15 15 15 15 15 15 15 15 1	0	0	0
3.8	Clearances for Stand Only Foot Height	in. 4" Minimum 5 6+ cm. 10cm Minimum 13 15+		0	0	0
	Foot Depth	in. 5" Minimum 6 7+ cm. 13cm Minimum 15 18+	Knee Clearance Foot Height	0	0	0
	Knee Depth	in. 4" Minimum 5 6+ cm. 10cm Minimum 13 15+	Foot Depth	0	0	0
3.9	Clearances for Sit/Stand Leg Width	in. 24" Minimum 25 26+ cm. 61cm Minimum 64 66+	Leg Width	0	0	0
	Knee Depth	in. 20" Minimum 21 22+ cm. 51cm Minimum 53 56+	Knee Depth	0	0	0
3.10	Noise	See Delphi-A Sound Level Specifications or Industrial Hygiene for further information.	http://apollo.delphiauto.net/health_safety/pr ocedur.htm	0	0	0
3.11	Lighting	Would internal machine lighting aid operator in operation, changeover, set-up, PM, etc.?	No picture	\bigcirc	\circ	\circ

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Further information	on can be found on pages 12 - 40 of the Design	-in Ergonomics Guidelines (DEG) @	http://apollo.delphiauto.net/ergonomics/desgn-in.htm	T.

	Combined information and he found on		ha Danisus Is	- Funnamenta - Out	idaliaaa (DEO) 🙈	http://opelle.delphie.de.ast/compression/decession/http://			
	Further information can be found of	1 pages 12 - 40 of t	ne Design-in	Ergonomics Gui	delines (DEG) @	http://apollo.delphiauto.net/ergonomics/desgn-in.htm	<u>C</u>	Check Circle	<u>e</u> :
	Design Factor		Design	Guidelines		Graphic	OK	Guidelines	N/A
3.12	Single Controls (whisker switch, wobble stick, etc.)	Should be plac vertical location work. Vertical	n as where	hands are pe			0	0	0
3.13	Dual Controls Vertical Location (Measured from standing surface)	am	in. 36 37 38 39 40 41 42			Top View Bench, Rotary Table, Assy Line, Etc.	0	0	0
	Horizontal Location (Measured from center of controls)	Optimal	6 3	Center 0 3 6 i i i ot in Range	9 12 15 Optimal 23 38	4" 18" min. 4"	0	0	0
For	more information on controls and safety, vis		or talk to <u>h</u> 1&S rep.	http://apollo.de <u>h_sa</u>		15" max. 15" max. CL			
3.14	Component Placement into Fixture - Visual Access	OK ————————————————————————————————————	Side	Under or Bottom (guided)	Not Good Under or Bottom (not guided)	Loading a fixture from the top or front is preferable because it requires less operator time. When loading from under or bottom, like the upper mandrel of an arbor press, the load is blind and requires additional time for alignment and placing.	0	0	0
3.15	Component Alignment Options into Fixture	OK ————————————————————————————————————		d/ Rough	Not Good Operator Judgment	Another efficiency factor is the design of the fixture. Positive or self-aligning fixtures are preferred to prevent the operator from having to make assessments on proper part placement.	0	0	0
3.16	Line of Sight Obstructions	Is it possible to without having		•		Design equipment and locate fixtures so operators do not have to bend their neck or back in order to load, see, activate, unload, etc. An awkward posture is an injury risk factor.	0	0	0