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Appropriate Means for Precision-Workers



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Summary

1. Workplace Analysis
 - Deficient Workplace Design
2. Ergonomic Requirements
 - Chair
 - Workbench
 - Armrest
3. Get Moving



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Static awkward postures - forced by deficient workplace design:
Reasons for MSD

1. WORKPLACE ANALYSIS


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Neck

viewing distances:

- with monocular 3-5 cm
- 'naked eye' 20-25 cm

viewing angles:
varying from horizontal to vertical



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Shoulders

short viewing distance + horizontal armrests
 → arms higher than shoulder



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hand operations left ≠ right
 → skewed shoulders

Upper Extremities: Arm / Elbow

fixed, standardised armrests:
 wrong place, bad shape, hard



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no protection against sharp edges

Upper Extremities: Wrist / Hand

free sight; arms laying on table →
 bent wrists adapted to work piece & task



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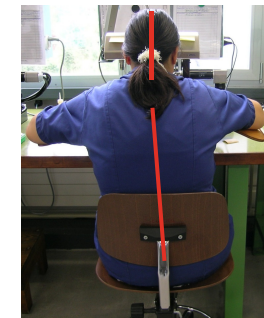
unequal strain on left and right hand:
 static force / repetitive fine movements

Back

inadequate lumbar support:
 backrest hard, fixed or badly placed



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back not in line:
 body adapts for best view,
 limited by armrests

Lower Extremities

footrest not available, not adjustable or not appropriate



insufficient open space;
direct contact with metallic surfaces

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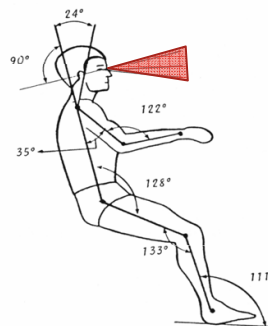
- **Visual Task** determines the position of the head (best viewing position), the rest of the body will cope.
- **Precise Operations** imply fine and firm hand and finger operations which require adequate support of lower arms.
- **Work Place Design** has to account for the needs of varying visual tasks and individual sizes of the operators.

2. ERGONOMIC REQUIREMENTS

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Chair

adapt to visual task → lean forward to have a better viewing angle



- upholstered
- adjustable
 - backrest
 - height
 - angle (< -10°)
 - lumbar sup.
 - seat
 - height
 - depth
 - inclination

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Working bench (adjustable height)



varying types of tasks
(viewing distance and angles)

individual sizes of operators

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Working bench (fixed height)

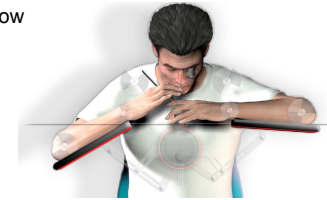


1. Basic height of workbench: for a tall persons and short viewing distance (left)
2. Lift operator by chair to adequate height and compensate with footrest (adjustable in height and inclination)

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Armrests

- armrests to support forearms and allow
- open joints (shoulders, elbow)
 - straight wrists



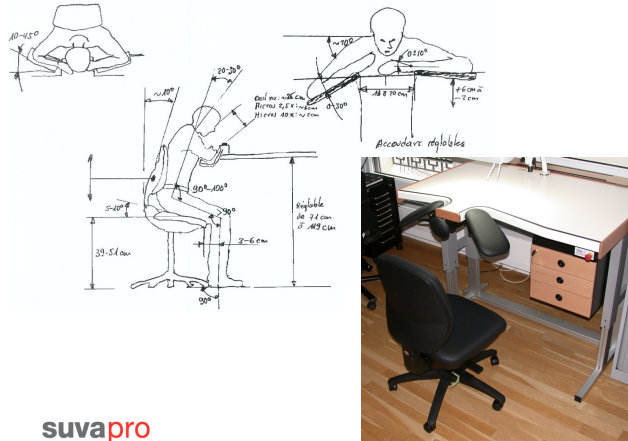
both armrests individually adaptable

- height
- bevel
- horizontal angle

Chest-rest? ☹️ hindering buttons

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New workplace design



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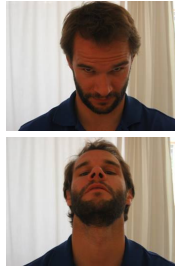
Precision-work is a static job - even under ideal working conditions

3. GET MOVING

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Give them a break

e.g. limit size of batches
→ go and get new material by the hour



relaxing exercises for eyes and body

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Keep Fit



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**Thank you for
your precious time
and attention**

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