It is getting closer….

Excellence in Automation & Drive : Siemens

It Is BIG ....

Excellence in Automation & Drive : Siemens

It Is VOLVO….

Excellence in Automation & Drive : Siemens

CNCdesign

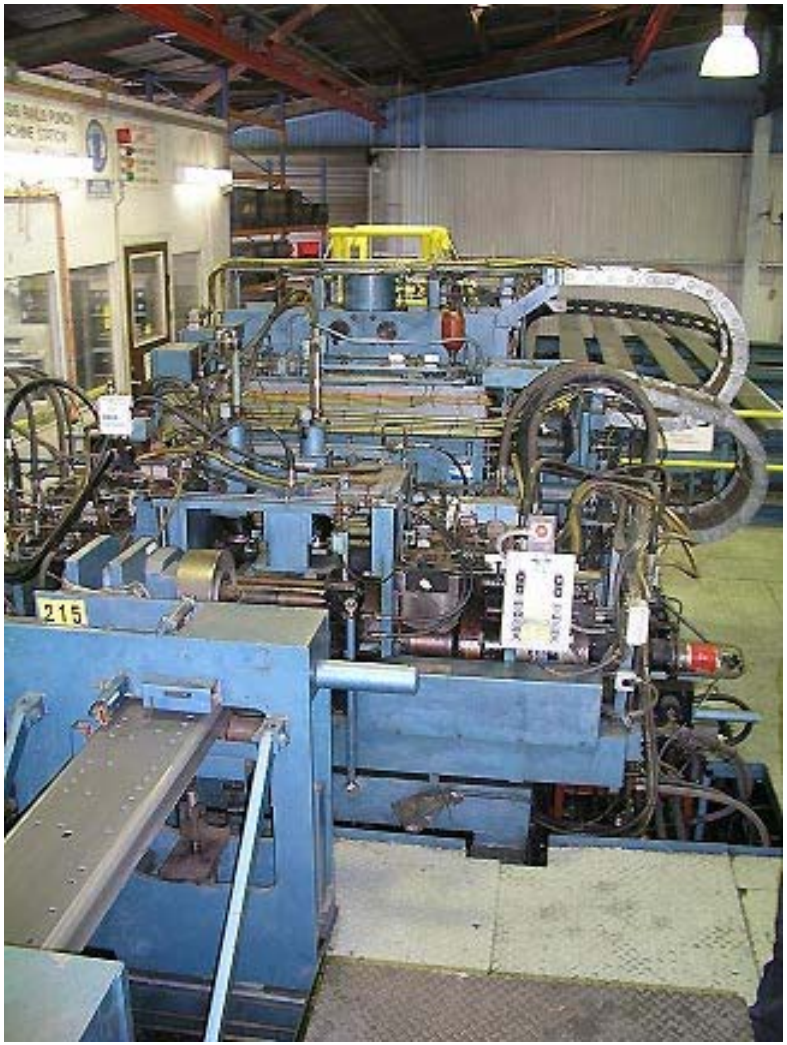
… The Chassis is the back bone of every truck

Excellence in Automation & Drive : Siemens

Volvo Truck Australia

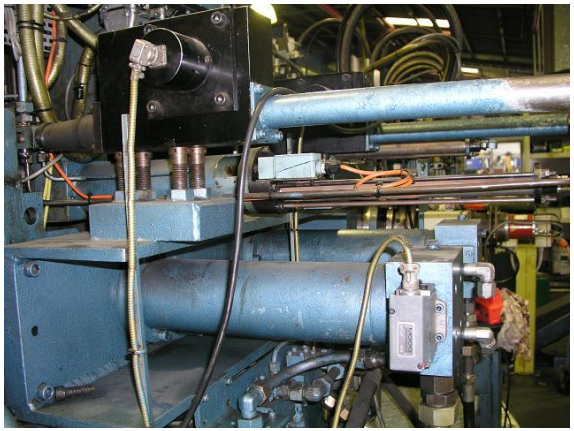
- Well established company and dynamic company.
- Producing trucks under the Volvo, Mack and Renault license
- Quality – trademark in Volvo group.

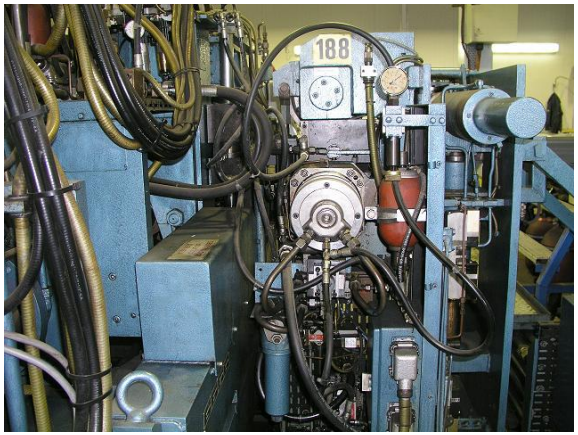
Volvo's Chassis Rail Punching Machine



- Complete transfer line for rail punching
- Automatic rail transfer (loading, positioning for punch, unloading)
- Multiple punching and nibbling stations
- Various rail types and sizes
- Quick start-up
- Easy recovery in case of punch break or any other punching problem
- Easy maintenance
- Safety integrated
- Future development

Old Technology …





- Hydraulic servo controls …
- Old NC controller (Profel) and PLC (Satcon)…
- Un-flexible and Very basic operator interface

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… not quite reliable!

- Spare parts problem…
- Slow process…
- No room for development.
- Growing frustration!

CNCdesign

A new life using Sinumerik 840D

- 840D/611D digital CNC/servo-drive system
- 9 servo axes including 2 hydraulic axes, 10 virtual axes (measuring probes)
- Interfacing Moog servo valves with HLA module
- Incremental/absolute encoders
- Distributed peripheral Inputs/ Outputs via DP Profibus
- Safety system using Safety relay and Sinumerik Safety Integrated technology

Excellence in Automation & Drive : Siemens

Smart Operator Interface

- PCU50 and data handling PC
- OP15 and 17” TFT screens
- Integration in Volvo’s network
- Xerox color Printer integrated via network
- Machine Control Panel
- Full process control from raw data to punch.

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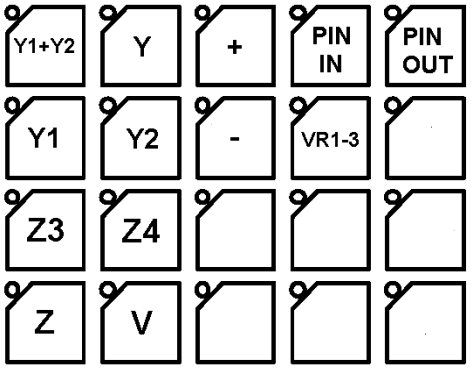
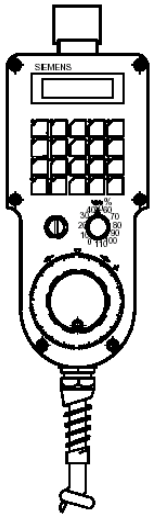
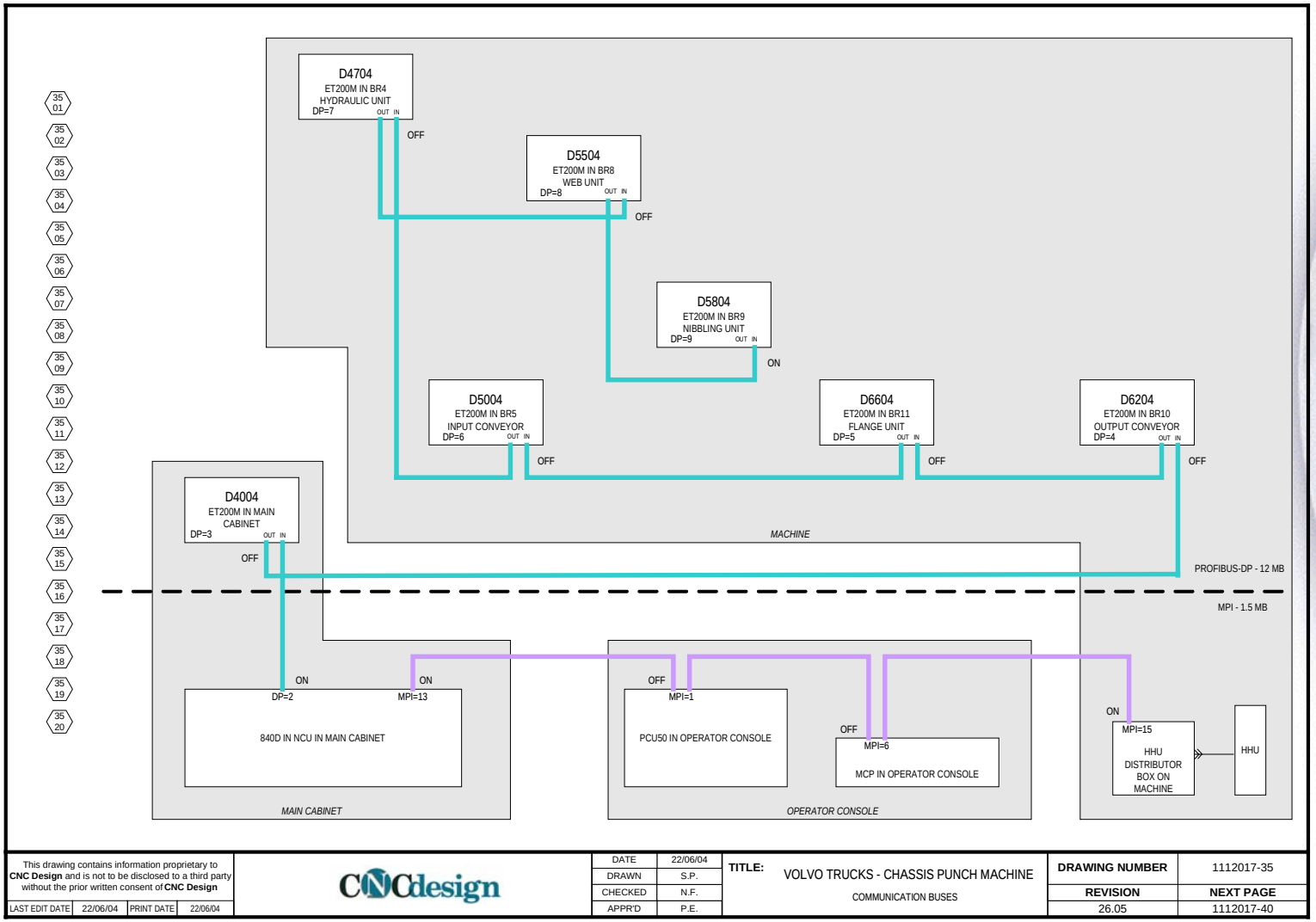
Mobility via Hand Held Unit





- Manual Functions for jogging the axes
- Key Switch for activation
- Enable button
- Hand wheel
- Feed rate override
- Emergency Stop

DP Profibus configuration



LAST EDIT DATE	22/06/04	PRINT DATE	22/06/04

DATE	22/06/04
DRAWN	S.P.
CHECKED	N.F.
APPR'D	P.E.

TITLE: VOLVO TRUCKS - CHASSIS PUNCH MACHINE
COMMUNICATION BUSES

DRAWING NUMBER	1112017-35
REVISION	**NEXT PAGE**
26.05	1112017-40

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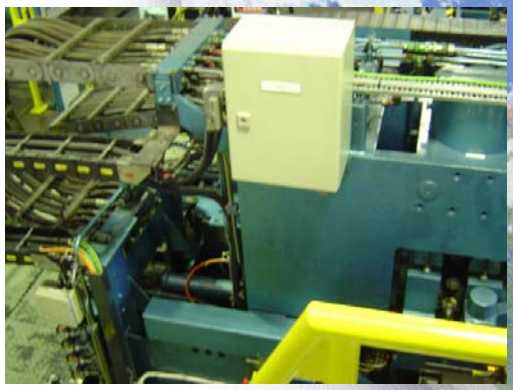
Wiring via ET200M stations

- Local connection for all I/O related to hydraulic units and outputs for web unit



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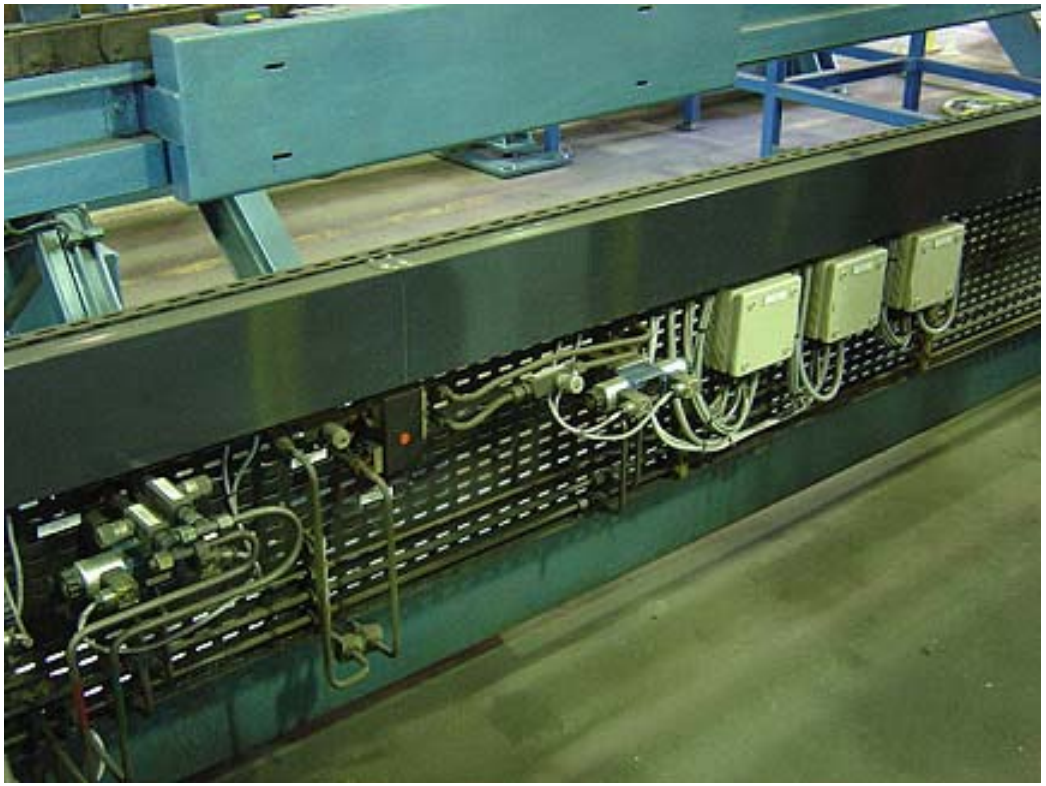
Terminal boxes for local wiring



- Local connection for I/O on Input/Output conveyors

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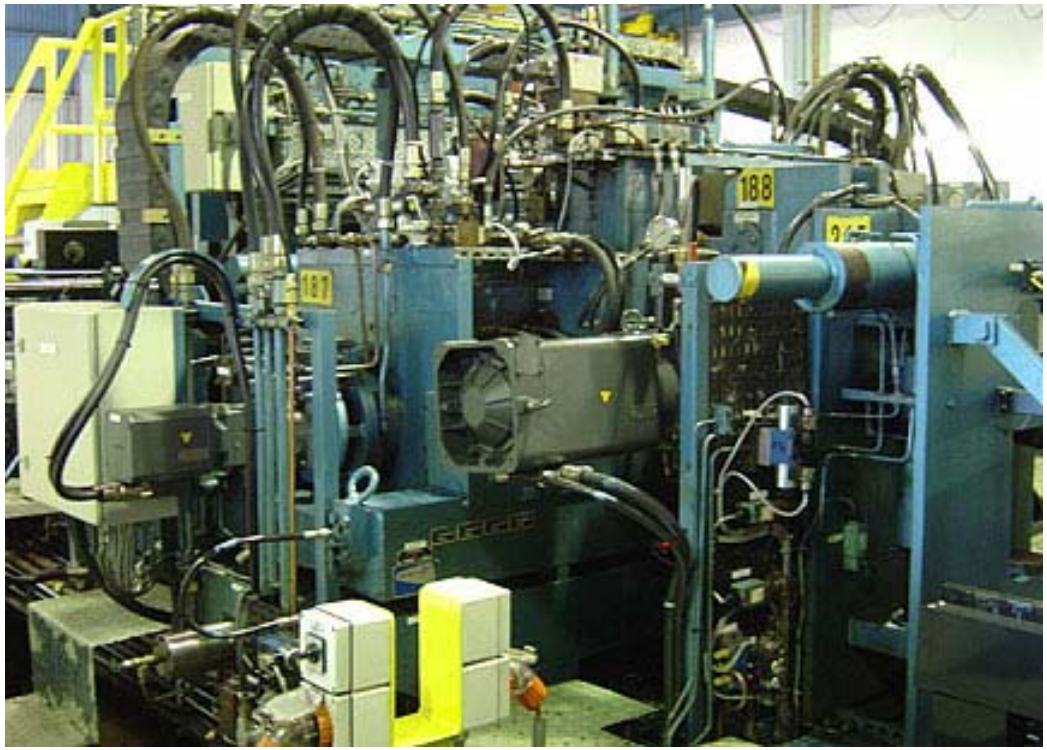
New servomotor system instead hydraulic servos



- X2 servomotor
- X1/X2 swapping
- Right flange unit controls
- Flange unit position control using linear scale measuring system and direct encoders

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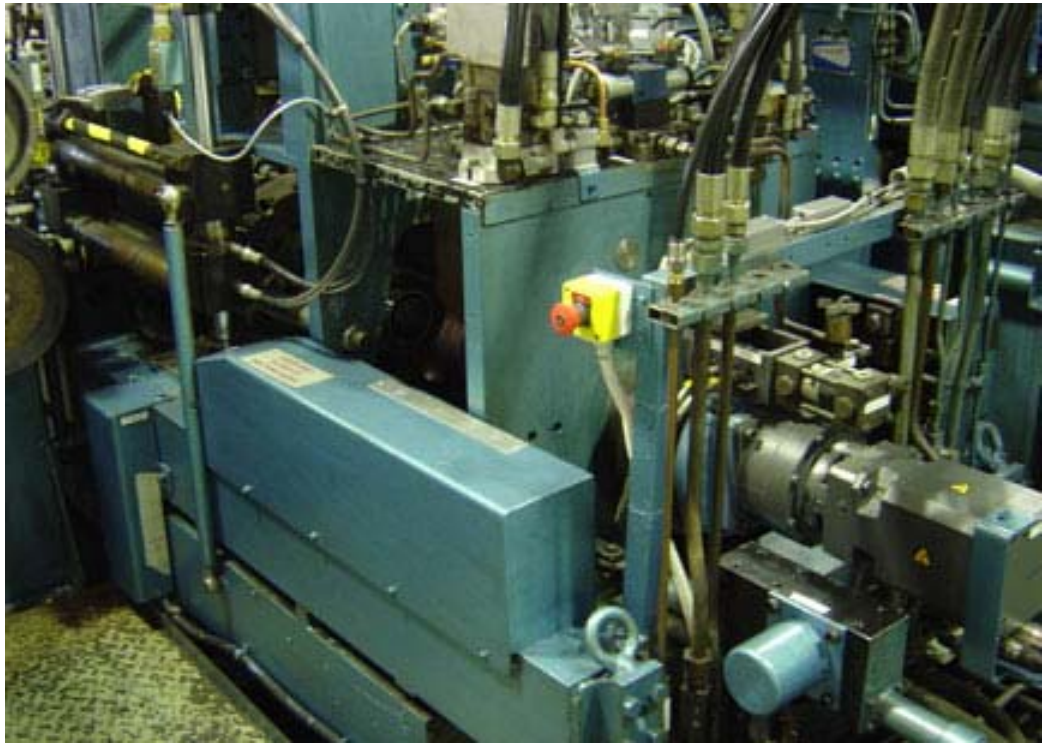
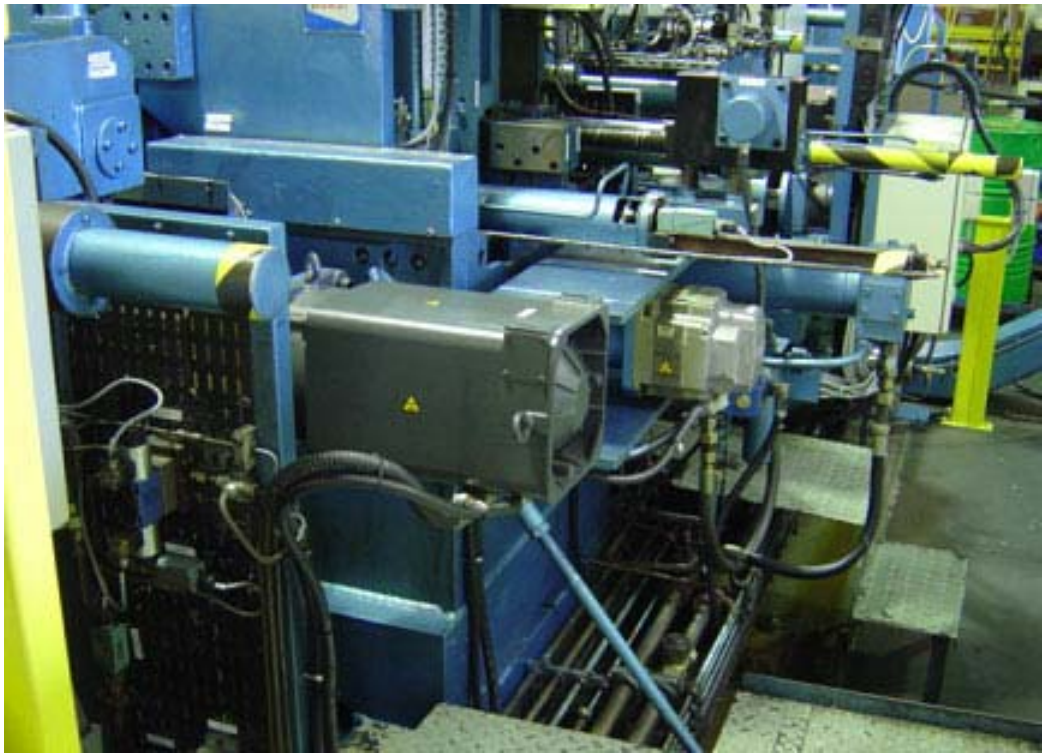
Automatic adjusting for various rail sizes



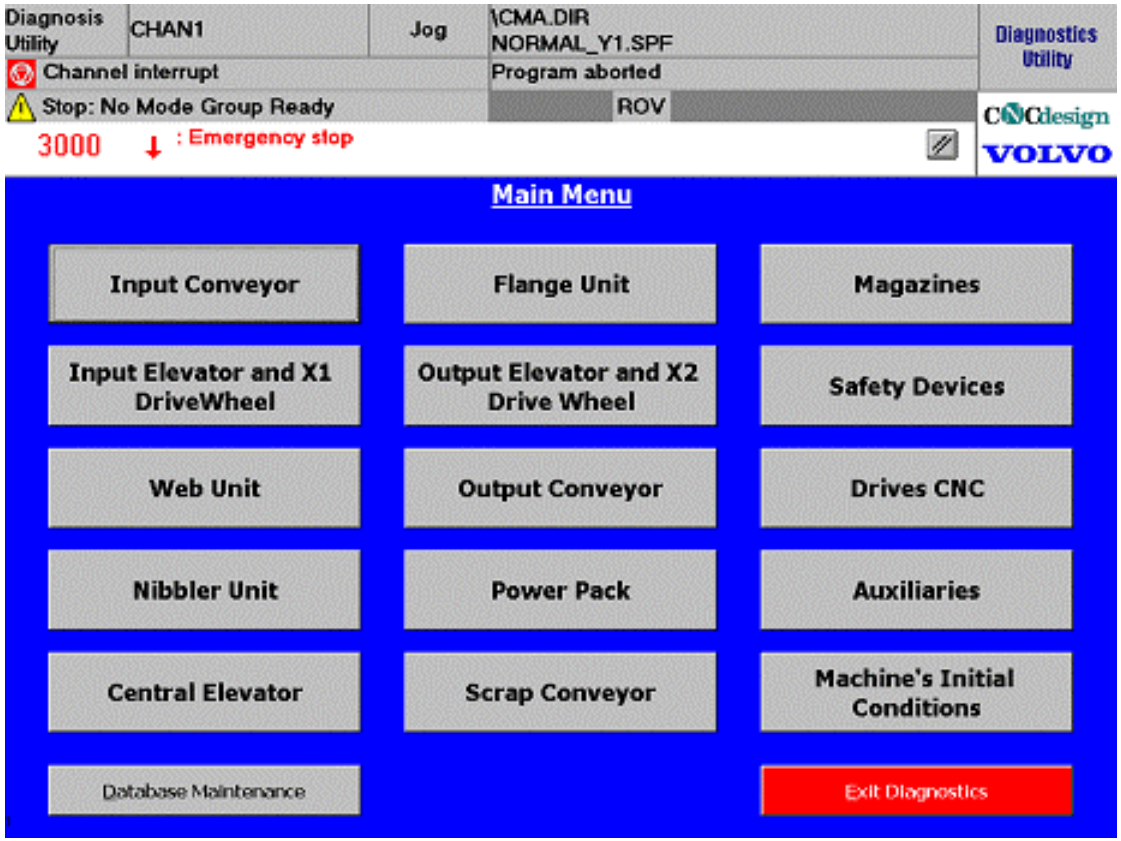
- Left punching head position control using VR1-3 encoder in a pseudo-closed loop position control
- VR1-3 position adjustment based on rail width
- VR1-3 stand by position setup

New servo system replacing hydraulic motors



- X1 servomotor and direct encoder principle
- Y axis servomotors
- Direct measuring probes for precise punching

Diagnose Utility – main screen



- Access to Diagnostic Utility from machine main menu
- Select an particular area for monitoring
- Machine's Initial Conditions monitoring
- Exit the Diagnosis Utility

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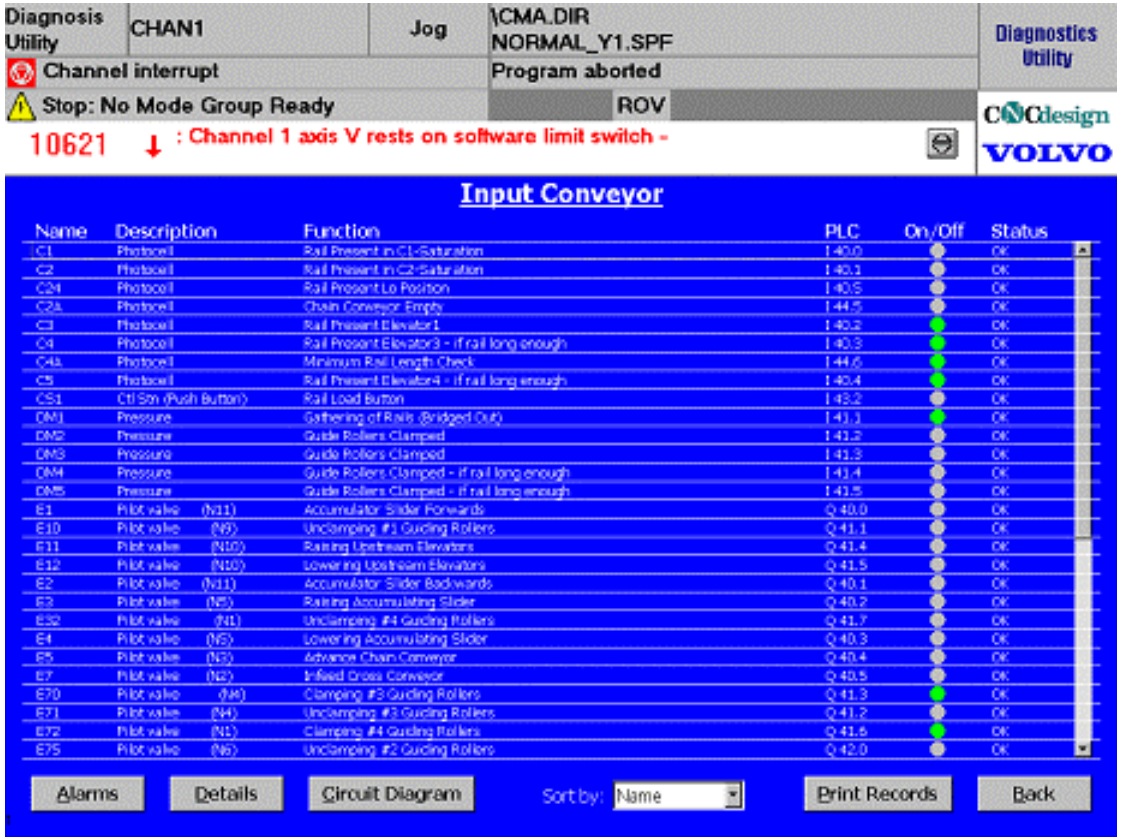
Diagnose Utility – machine area monitoring



- Monitoring individual devices from an machine area
- On/Off state monitoring
- Status intelligent monitoring
- Device details
- Link to electrical drawings
- Alarms logging for every device

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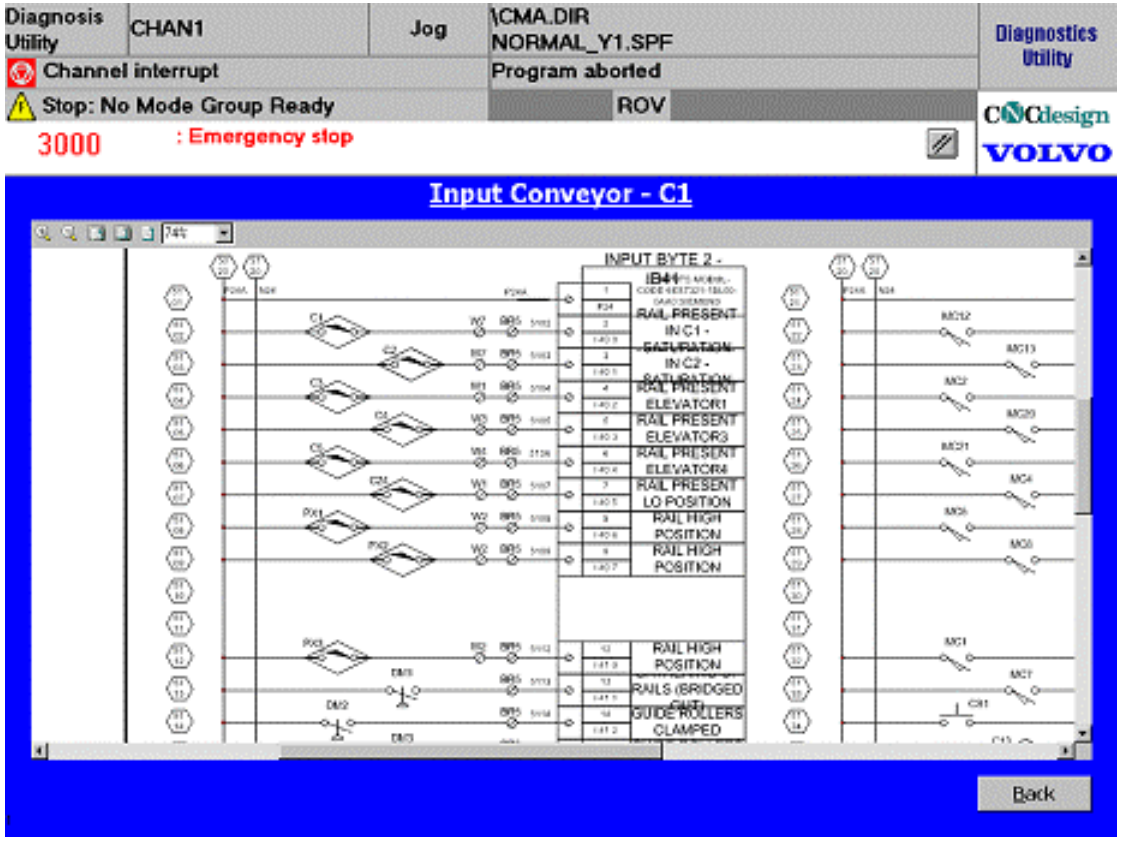
Diagnose Utility – link to electrical drawings



- On screen display of the electrical drawings
- Hyper link to relevant drawing for every device included in Diagnosis Utility
- Drawings easy update
  - E:\software\diagnosis\drawings\electrical

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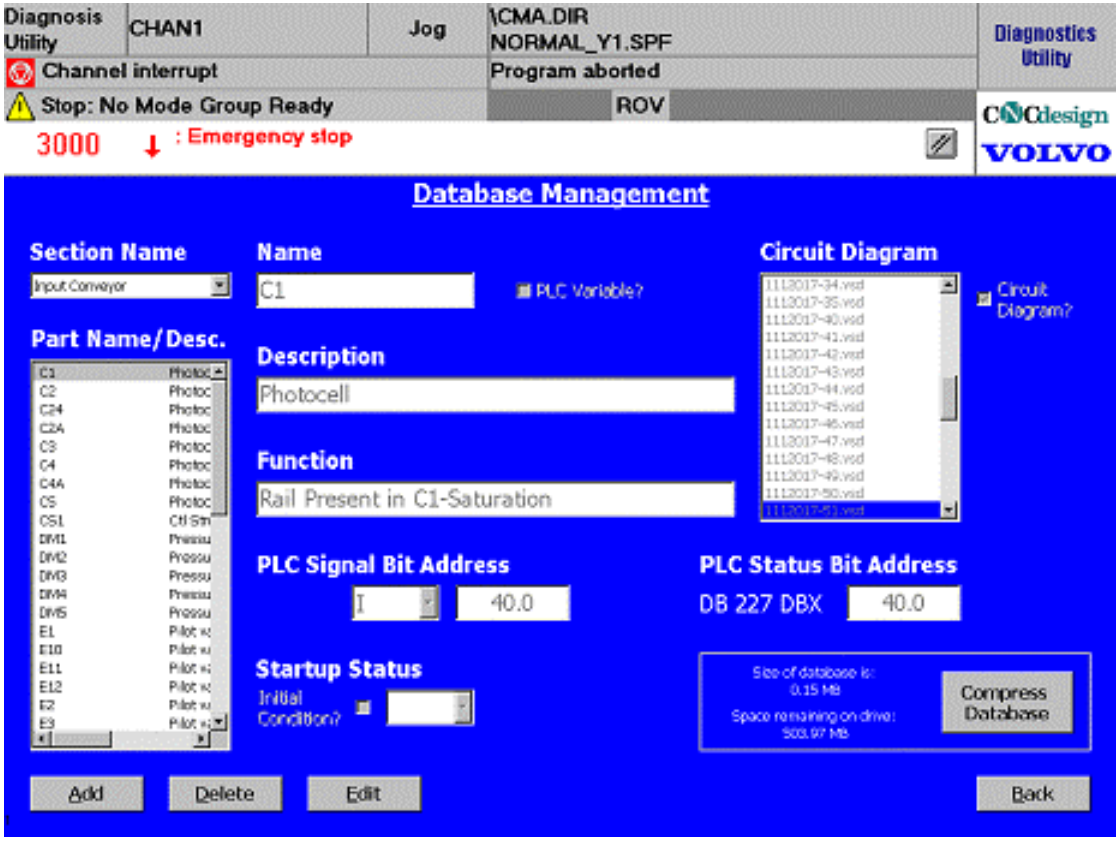
Diagnose Utility – Data base management



- Password protected access to data base management
- Add/Edit/Remove devices from area
- Include device in Initial conditions list
- Select electrical drawings link
- Link to intelligent status monitoring system
- Compressing data base

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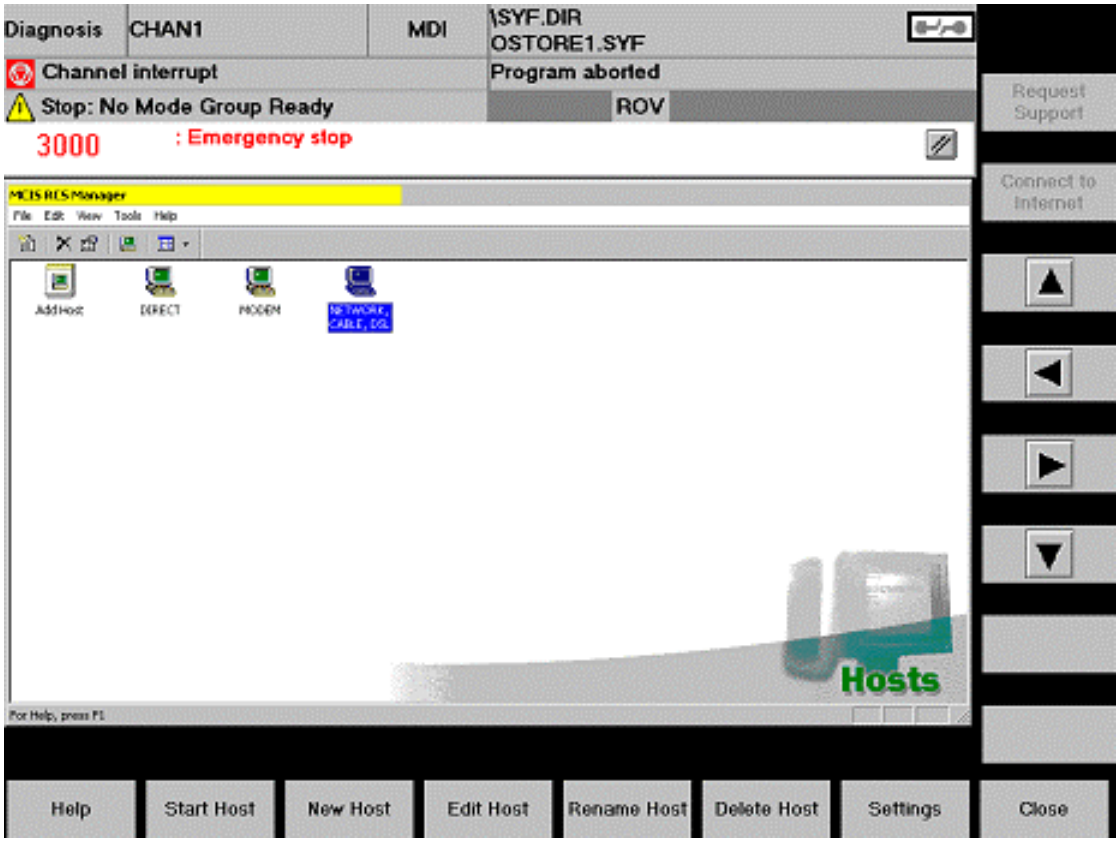
Diagnose – Remote diagnose



- Remote diagnose principle
- Start the Host in Remote Diagnose screen
- Close the Host in Remote diagnose

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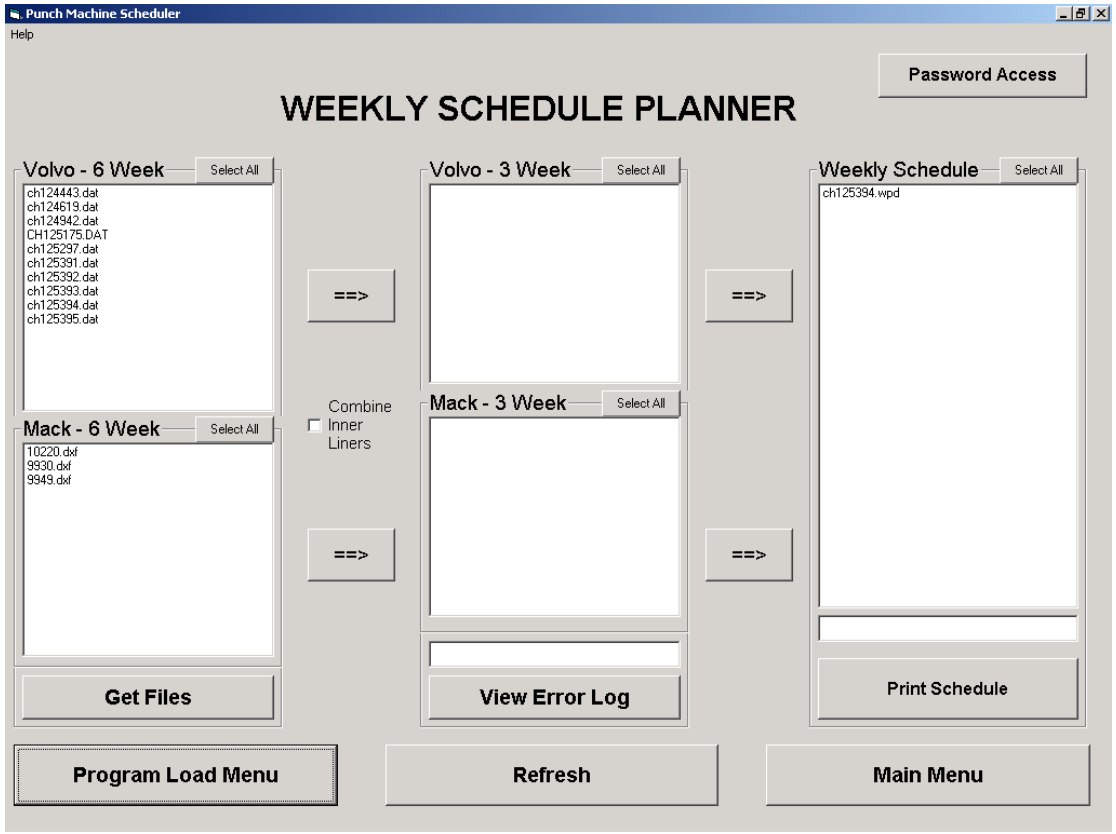
Data Handling – from raw data/DXF to punch



- Creating punching programs from raw data
- Production Scheduling
  - 6 weeks schedule
  - 3 weeks schedule
  - Daily schedule
- Chassis data backup system

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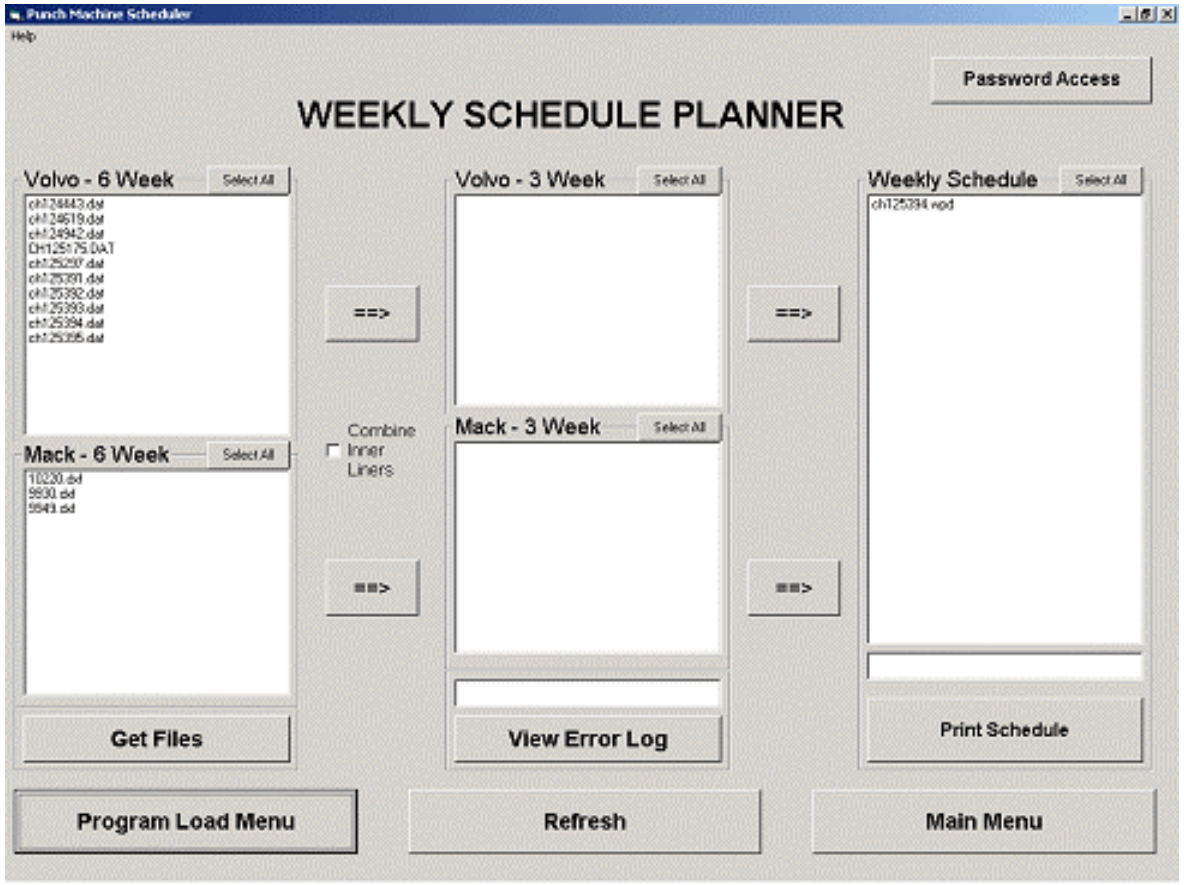
Data Handling – creating part programs from DXF format



- Creating punching programs from DXF formats
- Chassis data backup system

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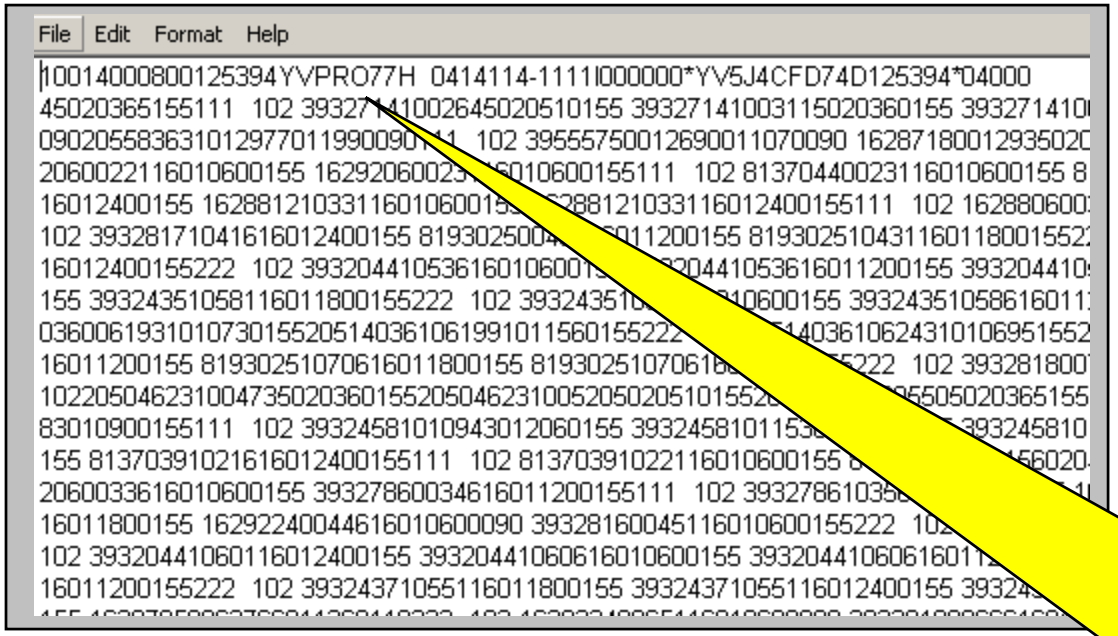
Data Handling – from raw data to punching program



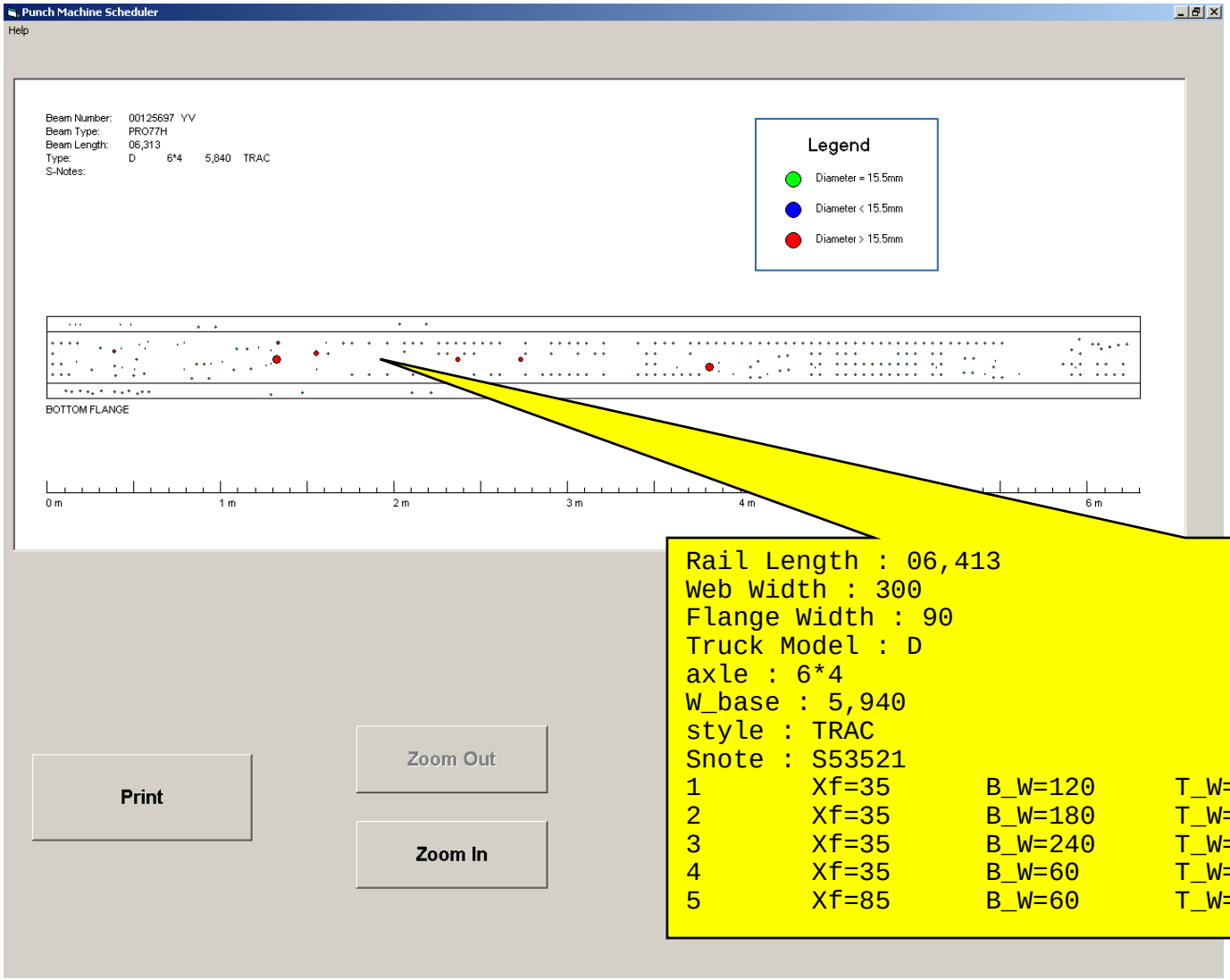
- Creating punching programs from raw data
- Scheduling

```
;Planning Number = 260020
;chassis Number = 00125692
;Rail Position = YV
;Rail Type = PRO77H
;Rail Length = 06,513

;Below is the punching program

LOAD_TO_X1
PROGRAM_INIT
WEB_PUNCH(425.6, -120, 15.5, 10)  ;Hole 1
WEB_PUNCH(425.6, -180, 15.5, 10)  ;Hole 2
WEB_PUNCH(425.6, -240, 15.5, 10)  ;Hole 3
WEB_PUNCH(425.6, -60, 15.5, 10)  ;Hole 4
```

Data Handling – quick test before punching

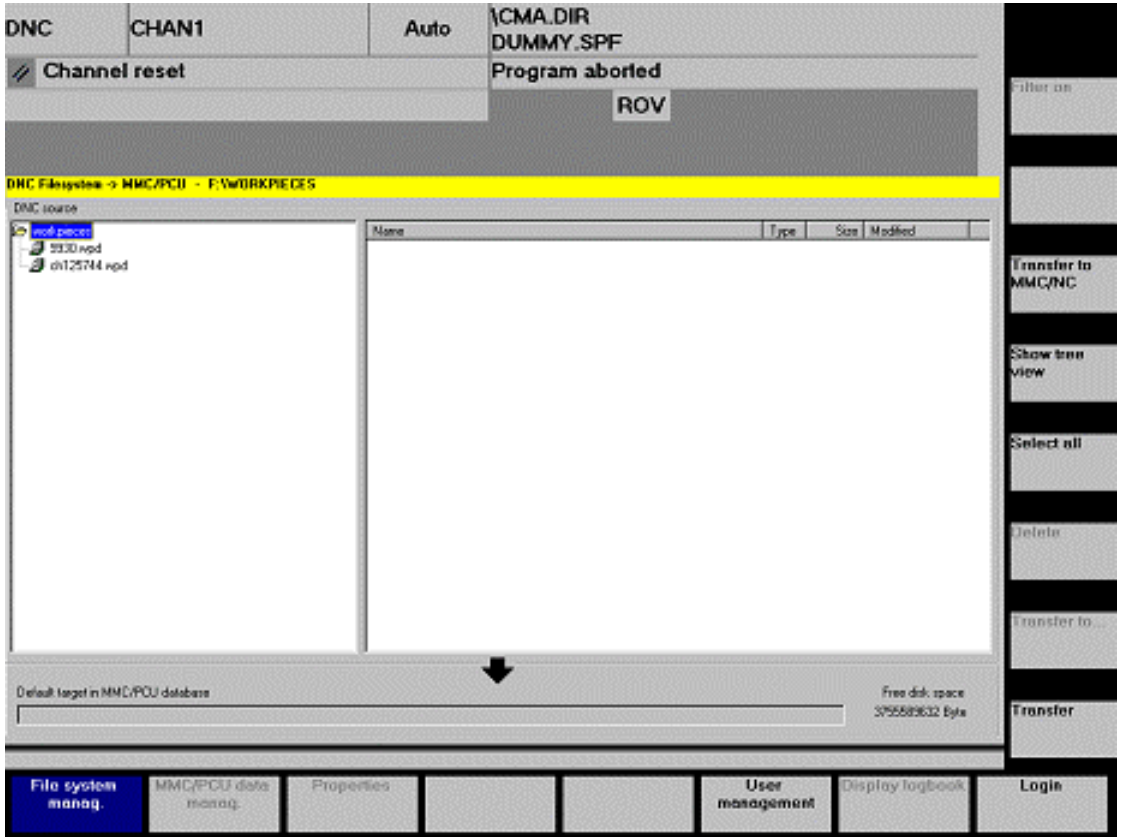



```
Rail Length : 06,413
Web Width : 300
Flange Width : 90
Truck Model : D
axle : 6*4
W_base : 5,940
style : TRAC
Snote : S53521
1       Xf=35      B_W=120     T_W=        B_F=        T_F=        D=15.5
2       Xf=35      B_W=180     T_W=        B_F=        T_F=        D=15.5
3       Xf=35      B_W=240     T_W=        B_F=        T_F=        D=15.5
4       Xf=35      B_W=60      T_W=        B_F=        T_F=        D=15.5
5       Xf=85      B_W=60      T_W=        B_F=        T_F=        D=15.5
```

- Printing rail preview
- Hole quick check list

Automation & Drive
Siemens

DNC – Sinumerik standard programs handling



- DNC system starting
- Configuring the DNC system and link into machine data handling system

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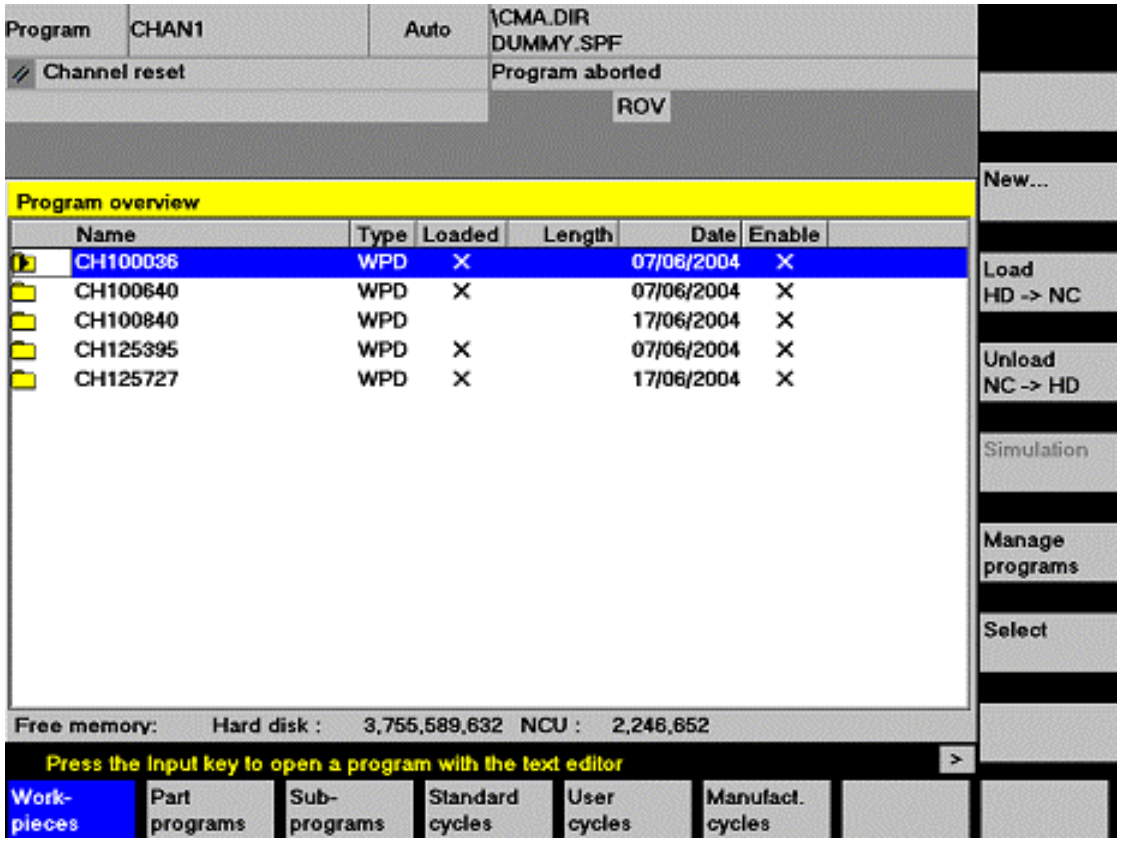
HMI - Program Workpieces (Chassis) selection



- Sinumerik HMI programs storing management

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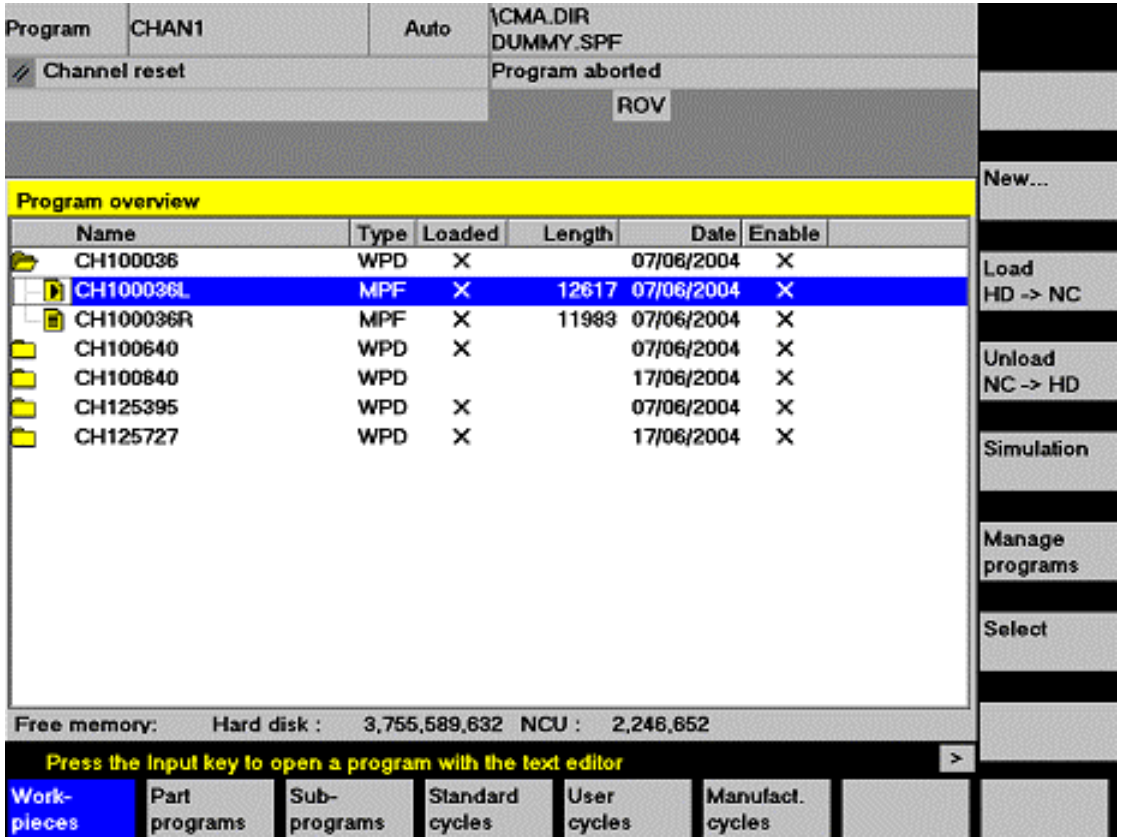
HMI – Programs for a chassis



- Programs for a chassis
- Selecting a particular program

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WEB_PUNCH cycle

- WEB_PUNCH(X position, Y position, Hole diameter, Tool number)

  Example: WEB_PUNCH(2500, -120, 27, 5)

  Obs:

  Y position positive value => datum from right flange

  Y position negative value => datum from left flange

  Hole diameter not important, only for display

  Tool number important for selecting the correct tool

  In MDA mode, the forbidden areas are not evaluate

NIBBLE cycle

- NIBBLE(X position, V position, Hole diameter, Number of steps)

  Example: NIBBLE(4500, 150, 50, 12)

  Obs:

  V position positive value => datum from right flange

  V position negative value => datum from left flange

  Hole diameter and number of steps are selected by converter

  Manual entry also possible (for MDA tests)

  In MDA mode, the forbidden areas are not evaluate

L_PUNCH,R_PUNCH cycle

- L_PUNCH(X position, Z position, Hole diameter, Tool Number)

  Example: L_PUNCH(4500, 150, 11.5, 0)

  Obs:

  Z position only positive

  Hole diameter and Tool number are selected by converter

  Hole diameter not important

  Tool number is the one who selects the hole diameter

  In MDA mode, the forbidden areas are not evaluate

Process Visualisation – main screen

- Process Visualisation – the main screen
- Booting screen for punching machine
- Changing booting screen to Machine screen

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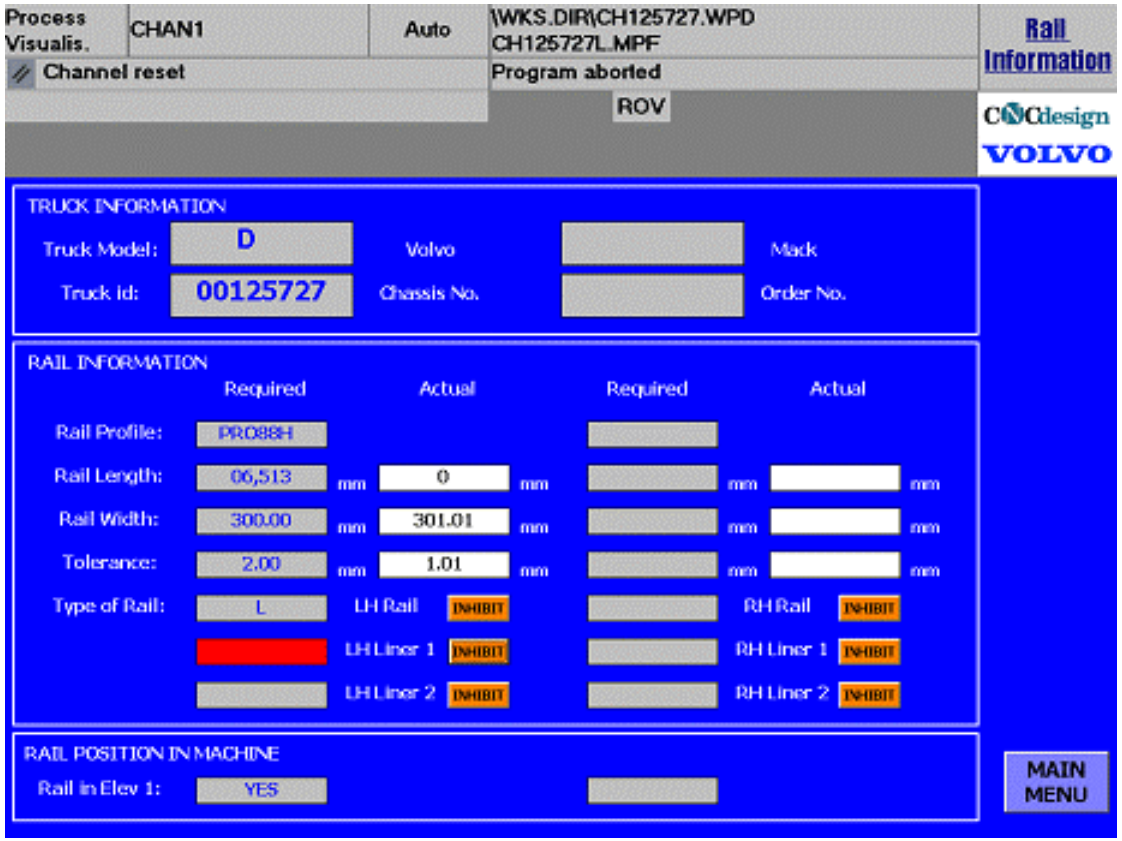
Process Visualisation – Program Information



- Program information
- Rail actual length
- Inhibition for programs

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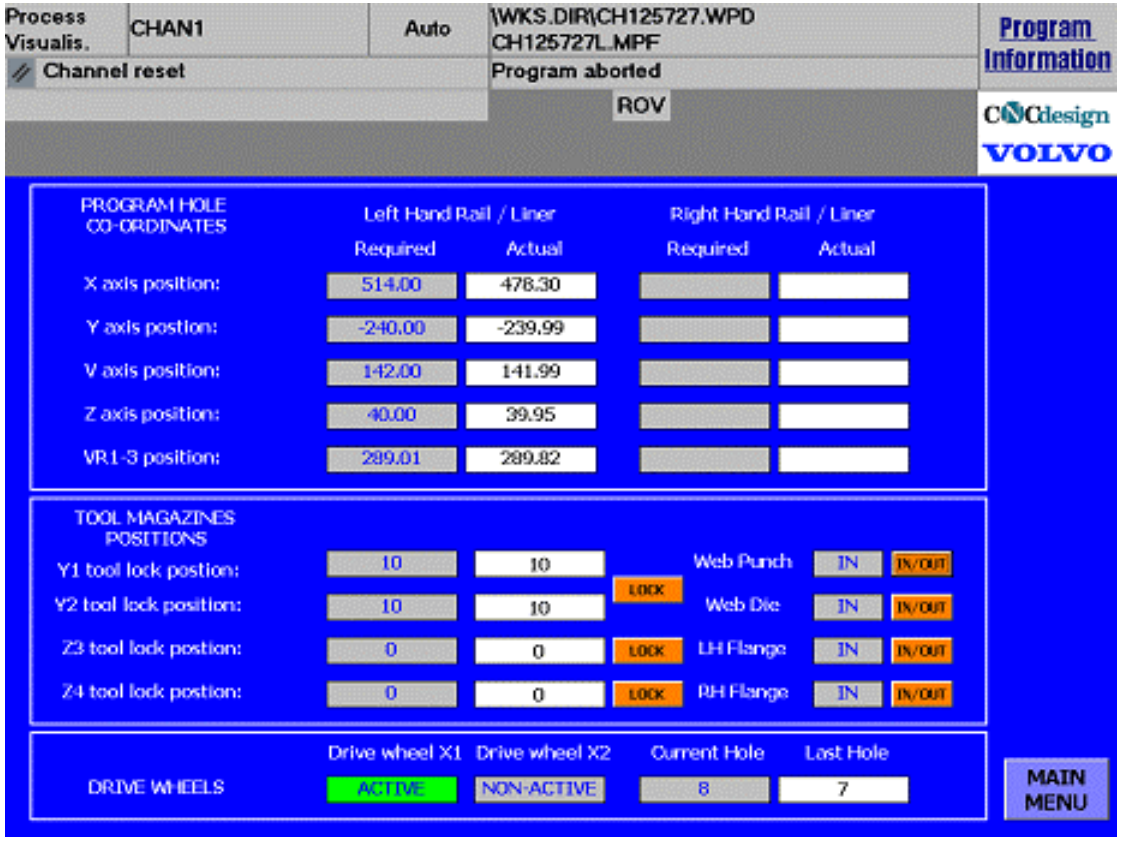
Process Visualisation – Rail Information



- Rail and Heads positions
- Turrets monitoring
- Lock in tools
- Turrets index control
- Punched Holes monitoring

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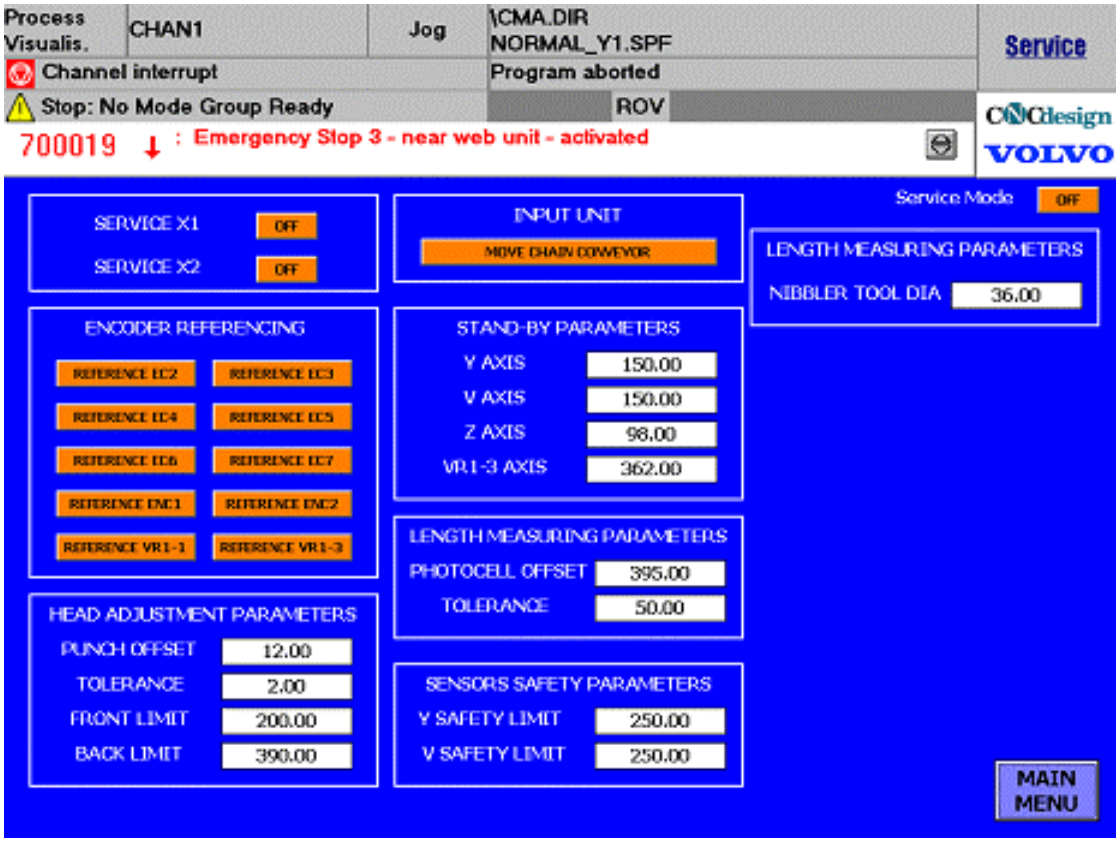
Process Visualisation – Service screen



- Activating Service mode for X1/X2 driving wheels
- Encoders referencing procedure
- Left flange Punching head adjustment
- Machine stand-by parameters adjust
- Rail length parameters
- Nibbling tool diameter
- Web and nibbling Sensors parameters setup

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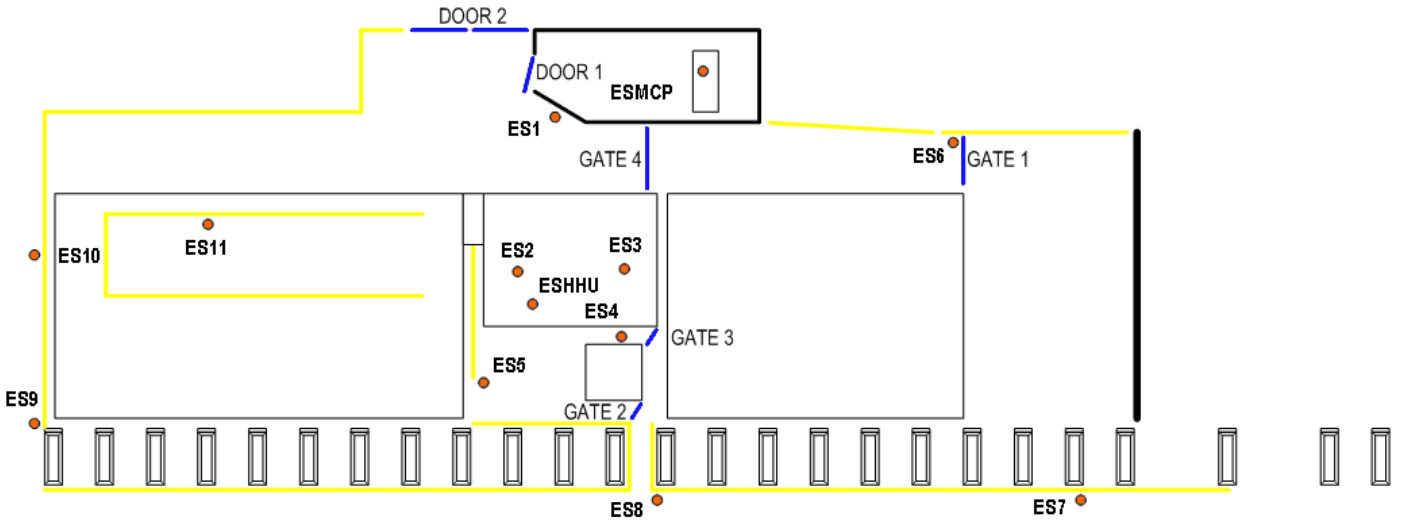
Safety via Safety Integrated option for Sinumerik 840D

- Emergency Stop
- Safety Integrated Technology
- External Gates
- Internal Gates
- Hand Held Unit



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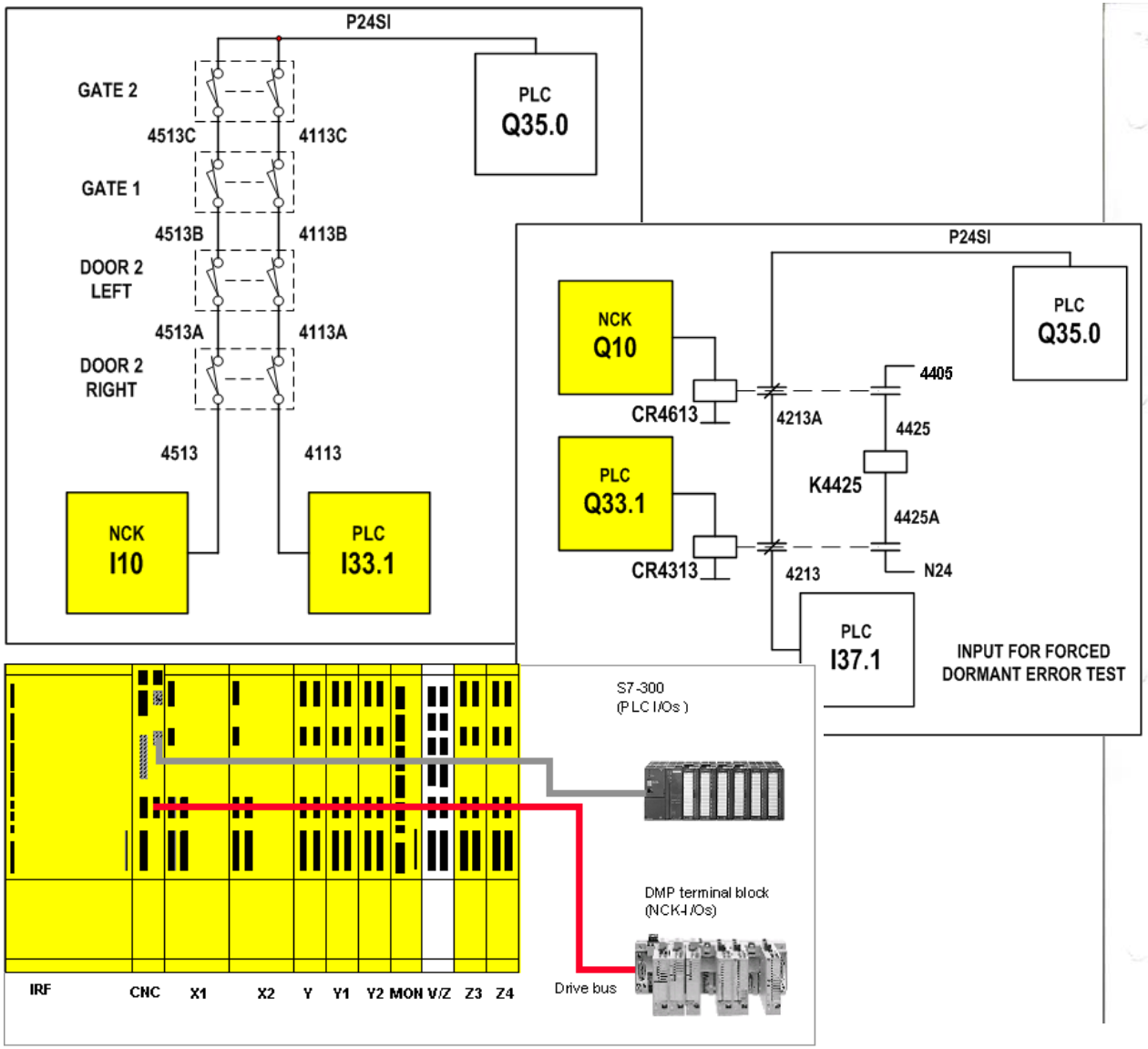
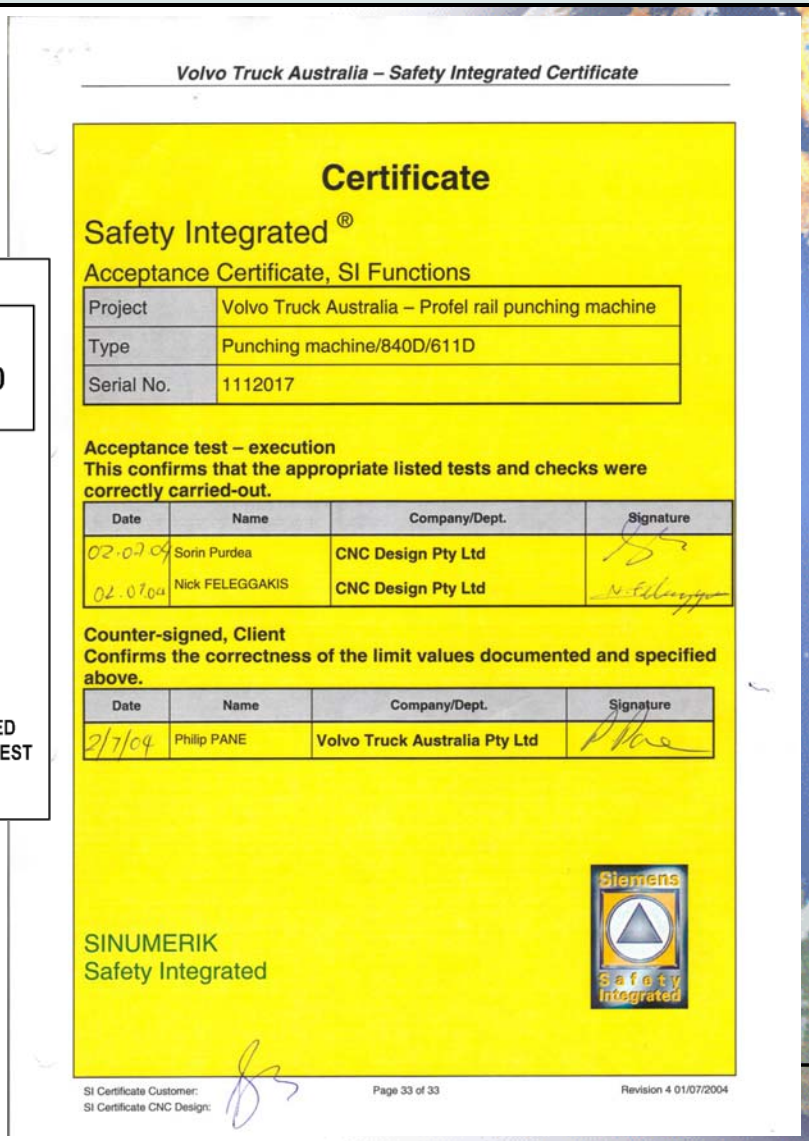
Safety Integrated protecting shield for the operator





Volvo Truck Australia – Safety Integrated Certificate

Certificate

Safety Integrated ®

Acceptance Certificate, SI Functions

Project	Volvo Truck Australia – Profel rail punching machine
Type	Punching machine/840D/611D
Serial No.	1112017

Acceptance test – execution
This confirms that the appropriate listed tests and checks were correctly carried-out.

Date	Name	Company/Dept.	Signature
02.07.04	Sorin Purdea	CNC Design Pty Ltd	
02.07.04	Nick FELEGGAKIS	CNC Design Pty Ltd	

Counter-signed, Client
Confirms the correctness of the limit values documented and specified above.

Date	Name	Company/Dept.	Signature
2/7/04	Philip PANE	Volvo Truck Australia Pty Ltd	

SINUMERIK
Safety Integrated

Siemens Safety Integrated

SI Certificate Customer:
SI Certificate CNC Design:

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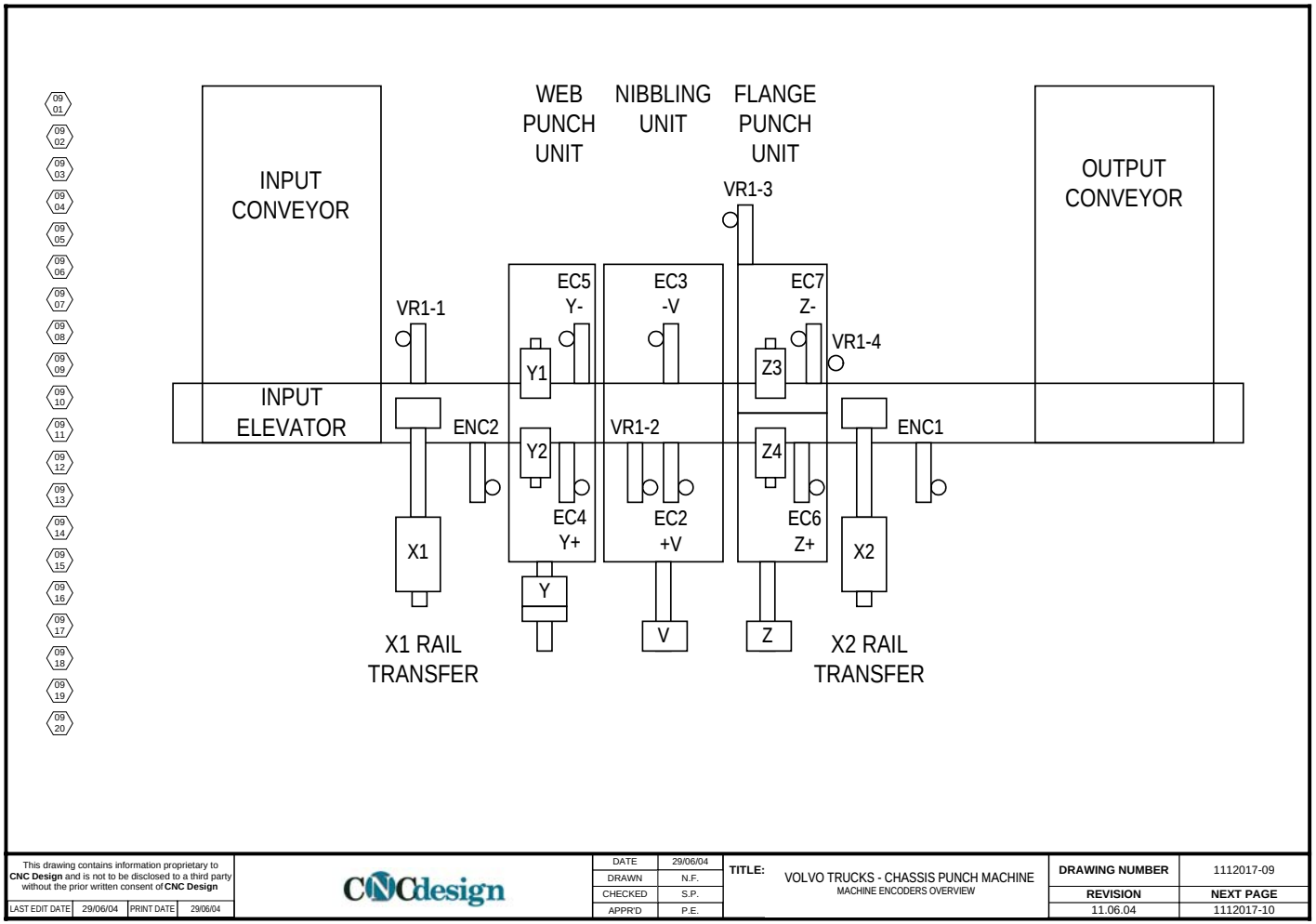
Revision 4 01/07/2004

Punching Machine



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LAST EDIT DATE	29/06/04	PRINT DATE	29/06/04	DRAWN	N.F.		REVISION: 11.06.04 / NEXT PAGE: 1112017-10
				CHECKED	S.P.		
				APPR'D	P.E.		

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