Parts & Logistics
Backend units

- **DE**: Logistic Center
- **MX**: Repair, Reconditioning
- **JP**: Part Support
- **CZ**: Repair, Reconditioning
- **CN**: Part Support

41 Frontend units
Common Service Support from backend units

Common Offering

- New Parts
- Exchange Parts
- Repair Parts
- Reconditioned Products

Supply Management (Sourcing), Quality Management (certifications), Life Cycle Management, Price Management

Common Management System
Parts and Logistics
Certified Part Repair and Robot Reconditioning

Standardized repair procedures,
e.g. wrist IRB 1400
Focusing countries of Ostrava
Ostrava today
Focusing countries of San Luis Potosi
Certified Center, Parts Repair & Robot Reconditioning Guidelines

- Part repairs and Reconditioning of robots need a high level of competence, tools, test bench and are only handled by the Certified Repair Centers.

- Only ABB original parts are used in the repair process and the reconditioning process.

- Our targeted models are S4C, S4C+, IRC 5,

- The spare parts repair delivery time to customers is 2-3 weeks.
Products definition

- Robots reconditioning: 3 products
  - Reconditioned robots (Premium, Standard, Basic)
  - Customer property refurbishment (after 6-7 years)
  - Mechanical arm exchange
Audit

- Objectives
  - To evaluate the condition of the robot:
    - Decision if refurbishment is possible (YES/NO)
    - Define a detailed refurbishment plan
      - Premium Refurb.
      - Standard Refurb.
      - Basic Refurb.

- Audit
  - Visual inspection
  - Dynamic behavior
  - Play measurement
  - Brake control
  - Motors control
  - Report
Audit
152 checking points
Audit
Visual inspection

- Objectives
  - Check
    - Gearboxes leakage
    - Shocks
    - Cracks foundries
    - Cleanliness
    - ....
Audit
Dynamic behavior

- Objectives
  - To detect
    - Noise, slapping
    - Irregular movements
    - Instability on point: vibrations

- Remarks
  - The slapping, the noise are warning play, wear pinion/bearing, pollution of oil
Audit
Play measurement

- Objectives
  - To measure the play for each axis
  - Measurements taken with dial indicators and with established positions
  - Measurement without load (axis 2 and 3: equilibrium position)

- Remarks
  - References: criteria identical to a new robot
Audit
Oil analysis

- Objectives
  - To determine oil/grease pollution
    - Metal particles

- Remarks
  - The oil analysis is an HELP
  - Allows to determine if a component is in destruction phase (bearing, pinion,...)
Audit
Brakes control

- Objectives
  - To control slippage

- Remarks
  - Test with nominal load
  - Robot in running
Audit Motors control

- Objectives
  - To control insulations
    - Detection degradation of the insolents short cut

- Remarks
  - Controls are taken on the base of the manipulator
  - In the event of wrong values, the cable manipulator and the motor are controlled independently
Refurbishment

- Manipulator refurbishment:
  - Oil and grease replacement
  - Lubrication bearing axis 1
  - Manipulator dismounting
  - Cleaning
  - Manipulator mounting
  - Standard and systematic replacement of some parts
    - SMB Board battery replacement
    - Internal cables
Refurbishment

- Manipulator Refurbishment
  - Bearings replacement
    - Parallel arm
    - Articulations of balancing units
    - Articulation between axis 2 and 3
  - Guiding ring rods on balancing units replacement (IRB6400)
Refurbishment

- Manipulator refurbishment:
  - Standard and systematic replacement of some parts
  - Process “Press standing”, Foundry: bearing axis 1
  - Replacement of other parts according to Audit report
  - Tests
Refurbishment
Wrist unit

- Manipulator Refurbishment
  - Wrist
    - Replacement of the intermediate wheel bearing axis 5
    - Adjustment of play axis 5
    - Replacement of the bearing, sealing articulation motor axis 6
    - Motor axis 6 replacement
Refurbishment Controller

- Cabinet refurbishment:
  - Cabinet dismounting
    - Trafo, cables, …
  - Complete interior and exterior cleaning

- Components cleaning
  - Drive unit
  - Power unit
  - Board
    - Computer
    - I/O
Refurbishment Controller

- Cabinet refurbishment:
  - Standard and systematic replacement of some parts
    - Fans
    - Filter
    - Contactors
    - Batteries
    - Floppy disc
    - Gasket
Refurbishment Teach pendant

- Teach pendant
  - Standard and systematic replacement of some parts
    - Keyboard replacement
    - Top housing replacement
Refurbishment

- Parts replaced
- Oil and grease replacement
- Cleaning
Tests

1 hour

- Running test after refurbishment
- Calibration & TCP test
- Accuracy test before final running test

16/24 hours

- Running test
- Accuracy test after final running test
Refurbishment Safety stickers

- Paint & Safety labels
What you received
As good as new one
Differences from ABB with traders

- Fully refurbished robot (Premium or Standard)
- Customized robot (example CP/CS, I/O board, Cables length…)
- Robots are delivered with CE-IIB document. This is required to be able to create the CE-IIA document.
- We will be in line with the new machine Directive 13849 during 2010
- Robots are delivered with all documentation on CD.
- Robots are delivered with key-disk.
- Warranty: Full warranty on parts and hours.
Quality
Price Management
Categorizing parts on customer value and competition

- New Part
- Exchange Part
- New Cost
- Repair Cost
- Part packages
- Repaired Part
- Global Sales Price
- Delivery time

GM
Discount
Repair Process

Part arrival in Ostrava

Audit at reception

Prepare repair estimate

LDU accept the estimate

Repair process

Return shipment

Cannot be repaired or estimate rejected by LDU:
- Scrapped
- Sent back
- Audit invoiced

Day 2/3

Day 4/13

Day 14
Repair 3 products

- Repairable parts
  - Wrist
  - Motors
  - FlexPendant/TeachPendant
Repair
What we need for a repair

- Traceability
- Components
  - Genuine parts
- Knowledge/skill
  - Training/support from manufacturer
  - Drawings/ technical data
- Tools
- Tests before and after repair
  - Test bench (validated by manufacturer)
Repair Traceability

- All the parts are identified at the arrival
  - LBU
  - Part article number
  - Serial number

- All the documents are stored in a data base

- All the steps for the repair
  - Technician name
  - Date
Repair Processes

- Standard process for each task
Repair Components

- We buy all components directly to the manufacturer or supplier (following manufacturer specifications)
Repair

Technical data

- Drawings and technical data from manufacturer
- Working instructions
Repair Tools

- To assemble and disassemble the parts
- Specific tools, ...
Repair
Test bench

- Allows a fast and reliable diagnosis
- Certify the repair
Our repair workshop

Wrist line
Arguments for Certified Repair & Reconditioning

- Centralized competence
- Controlled processes = Quality
- Investments in Assets / Tools / Test benches
- Access to original data (drawing, BOM…) with support from original manufacturer
- Direct contact with original suppliers for repair
- Use only original components
- Buy back power
- Central inventory available
- Repaired parts available in the reconditioning of robots
Power and productivity for a better world™