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**Příloha 1: Montáž komponent**

| Velký knoflíčky chyby | Neopouštěné pocházkové zásahové zařízení | 6 | SC | Neopouštěné zásahové zařízení | 3 | Časově řízení | Využití kontrol na pracovišti | 7 | 100 | Autoopatření pocházkové zařízení (7/2011) | 5 | 3 | 2 | 45 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Chybná uvolnění knoflíku od koncové plochy | Nesprávné volnění knoflíku | 6 | SC | Nesprávné volnění knoflíku | 2 | Řízení procesu (test výfuků) | Využití kontrol na pracovišti | 7 | 115 | Autoopatření pocházkové zařízení (7/2011) | 5 | 2 | 2 | 32 |

| Knoflík nasouvání otočený | Výpočetová voda, bez vlivu na funkci | 4 | 2 | Jednotlivé díly knoflíku jsou zavěšeny do přístupu | 2 | Časově řízený | Využití kontrol na pracovišti | 7 | 24 | | | | |

| Knoflík nasouvání menší osu plochy | Výpočetová voda, bez vlivu na funkci | 4 | Chyba operátora | 2 | Databáze pracovního postupu | Pelhřimovo právo ochrany | 3 | 24 | | | | |

| Zapada chyby | Ve voze se nelze přesunout | 10 | CC | Nesprávné nástavení stroje | 2 | Řízení operátora | APC automatická kontrola | 3 | 60 | | | | |

| Zaměna komponenty | Ve voze se nelze přesunout | 10 | CC | Nesprávné nástavení švů, švů přístupu | 2 | Řízení operátora | APC automatická kontrola | 3 | 60 | | | | |

| Zásadina různě otočená | Přípojovací zásadina | 8 | SC | Přípojovací zásadina | 2 | Řízení operátora | Pelhřimovo právo ochrany | 3 | 60 | | | | |

<p>| Zásadina různě obrácená | Přípojovací zásadina | 8 | SC | Přípojovací zásadina | 2 | Řízení operátora | Pelhřimovo právo ochrany | 3 | 60 | | | | |</p>
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Request For Quotation

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<th>RFQ No.</th>
<th>002/LM/2011</th>
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**Subject of RFQ:** Pin sewing and pull through webbing automat and Anchor bracket sewing, button and clip press automat

**Project:** BMW F30

**Project:** Line P13

**Requested term for offer:** Cw10/2011

---

1. **GENERAL DESCRIPTION**

We would like to ask your company for a quotation for the new sewing automat machine for pin loop sewing + pin insertion and webbing pull through retractor and new anchor bracket sewing automat machine include button and clip pressing for line P13. Design of machines has to be developed based on this specification and include in the newest P-FMEA analysis and standards of mistake proofing devices.

Complete documentation including P-FMEA and product drawings to the specification is enclosed. Samples will be sent to you immediately after the contract is signed.

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**Working conditions:**

Tact time of this machine: 18 sec per part. (Including loading/unloading of parts).

Three shifts / day.

282 working days / year.

---

**Timing plan:**

<table>
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<tr>
<td>Product Design freeze</td>
<td>June 2010</td>
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<td>January 2011</td>
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<tr>
<td>Tender finishing/line ordering</td>
<td>cw12/2011</td>
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<tr>
<td>Control day – design review</td>
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<td>Customer audit</td>
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Product types:

1. BMW F21,
2. BMW F30,
3. BMW F31.

a) Standard ESA 4.0 (left / right locking site)

b) RP2 IS (left / right locking site)
### c) RP2 IS SLL2 (left / right locking site)

#### Product matrix:

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<th>BMW</th>
<th>3PGA no.</th>
<th>Standard / RP2IS</th>
<th>Drawing no.</th>
<th>Left / Right</th>
<th>Anchor bracket</th>
<th>Upper button</th>
<th>Lower button</th>
<th>Webbing length</th>
<th>Lasered Tongue (33028616)</th>
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Proposed line layout

Layout line P13 - automated button/clip assy + anchor bracket sewing
Installation cw31/2011

- P13-1 automated pin sewing
- P13-2 webbing pull through + webbing guide assy
- P13-3 label printing
- P13-4 ATOS - automatic end of line angle test
- P13-5 automated hardware assy, clip and big button press
- P13-6 anchor bracket sewing
- P13-7 packaging

Proposed machine layout

L. Mildorf 14.2.2011
**P13-1/2 Pin sewing and webbing pull through station**

**Process steps:**

1. Operator picks up the components step by step from supplier pack or from conveyor and puts them into the assy. jig.
2. Operator clamped retractor by the two finger touch control button and remove the locking plastic pin.
3. Take the end of the webbing and found it in the bending mechanism.
4. Automatically performed composition of the loop, puts the pin and subsequently sewing.
5. The operator takes the other end of the webbing and pulls it through retractor and folds it under the feeding system.
6. Operation will automatically start.
7. After pull-through operation the retractor is fixed in the retractor jig and without folding the plastic red fork into the jig(for red fork) can't relese.

**Mistake proofing control - APC:**

1. Check the presence of end of the webbing (pin side).
2. Check the presence and type of the webbing pin.
3. Check the presence of webbing guide.
4. Check the presence of lower thread.
Requested standard controls:

1. POKA-YOKE jigs (prisma and upper fork) for retractor
2. Check the presence of the retractor.
3. Check the right dragging webbing pin into retractor.
4. Sensor for components separation.
5. Check the presence of plastic red fork.

**P13-5/6 Anchor bracket sewing, HW assembly, clip pressing and button riveting station**

**Process steps:**

1. Operator picks up the components step by step from supplier pack or from conveyor and puts them into the assy jigs.
2. Operator clamped retractor by into the “in car” position and release webbing into puller.
3. Operator pick and place webbing loop, tongue and clip from supplier boxes into assy jigs.
5. Machine automatically pulls webbing through HW components till webb. former stop is reached.
6. Machine automatically fix webbing set-up right length for riveting and provide the riveting of button and pressing of clip.
7. Operator releases anchor bracket from jig and fold the webbing end and put it into sewing head and starts sewing process.
8. Operation load next anchor bracket into jig and manually release retractor and all HW components onto conveyor.
9. Machine automatically catches the webbing in webb. former end and pull through it into anchor bracket hole.
10. Machine is automatically unload sewed anchor bracket, and complete 3PGA is transported into next operation – packaging.

**Mistake proofing control - APC:**

1. Check the presence of end of the webbing (anchor side).
2. Check the right length of webbing before button riveting.
3. Check the type of tongue by datamatrix checker Cognex.
4. Check the presence of lower thread.

**Requested standard controls:**

1. POKA-YOKE jigs for webbing loop, tongue, clip, button male and female, anchor bracket.
2. Check the presence of the retractor and webbing.
Main standard requirements for machine design:

1. Direct product handling between stations has to be kept to a maximum distance of 45 cm. If it is necessary to go over the required distance, belt-conveyors or slides will be used.
2. Retractor jigs must be compatible with RP21S and Standard retractors.
3. Sewing pattern according to TRW drawings.
4. Storage space for the jigs in the main frame of the machine.
5. During error the program RESET only by the Key-Box (machine must be blocked and sewing clamps be down until the operator unblocke by the key) not by the buttons on the controller.

Design of machine contains these latest standards:

1. Upper and lower hot cutters.
2. Device for setting the length of the sewing (Thread puller).
3. Pull through part has sensors for checking of presence of webbing guide.
4. Same Touch Opto-Sensors (Finger control) as line P40 for start operation - Pin Puller machine.
5. SMC encoders set are included for checking right position of step motors.
7. Monitoring or detection system for correct folding of bobbin case.
8. Isolate tape (plate) may not cause a fire hazard at the lower hot-cutter (old type - brown)
9. Puller arm is one part (not two parts screwed)
10. Stiffness of whole machine is sufficient for continual production and cyclic loading (supporting angles on the fram of the machine)
11. Critical spot prone to break onto sewing plate (extreme narrowing).
12. Ejector lever and screw must be reinforced (risk of breakage)
13. Escape sheet is attached screws fixed.
14. Stronger screws (often breaking)
15. Clamping piston FESTO ADNGF 80-20-P-A, Puller piston FESTO AND 80-100-I-P-A

Requested design for checking plastic red fork:

Placement jig is designed between retractor and the feeding wheel.
The condition for releasing the retractor is the presence of red fork.
Checking system of presence is controled by main system of machine (SAT controller).
Jig for folding has form for plastic fork according below pictures (middle stick is a little bit lift).
Tact-time with the folding plastic red fork: tact-time machine +1 sec. (Include. loading/unloading of parts).
2. SMED – SINGLE MINUTE EXCHANGE OF JIG REQUIRED

1. SMED (single minute exchange of die) - When changing the product or at the beginning of assembly, it is expected the exchange of jig will be realized within one minute. Having mounted the jig in the operating position properly, no clearance is allowed in the jig mounting. The jig must be constructed in such a way that it can be mounted on the machine in one way only.

2. In case of more complex applications (more SMED jigs on one machine), coding is to be used for correct identification.

3. Each jig shall be marked with a unique number, which will be conveyed by the contractor after completing and approving the design. The marking must be permanent, legible and located on the jig - if possible - in such a way that when mounting the jig into the machine, it is visible from the operator's position - type height of 5-8 mm.

4. When exchanging SMED jigs containing electric (detectors, sensors) + pneumatic elements, multiple connectors are to be used.

5. The drawing documentation of the SMED standard, used in TRW, shall be submitted in electronic form. Any use of a SMED design different from the TRW standard requires consultation with the contractor.

6. The storage of currently unused jigs must be a part of the design concept of the machine (storage directly on the machine or on a separate location).

Jig exchange procedure:
- Unlocking the jig from nest (working position into machine) - securing pin, spring.
- Jig withdrawal and removal to the storage place.
- Withdrawal of a new jig from its storage place.
- Moving the jig to the lower guiding part, which is fixed to the machine structure, and securing it in the operating position.

3. REQUIREMENT FOR ERROR-PROOF DEVICES

Devices (mechanical or electronic) installed in the process, preventing the occurrence of an error that may occur in the course of the process, must be secured so that it is impossible to omit or go around them.

MISTAKE:
- Exchange, omission of components during part production.
- Production of a non-conforming part as a result of an incorrect work procedure (e.g. incorrect mounting of components into the machine, omission of an operation, etc.).

If it is impossible to use MP (avoid the occurrence of errors), a control device is to be installed, which detects the error after the operation realization or in the subsequent steps of the process.
4. SAFETY ELEMENTS

1. All pneumatic machines should be equipped with pressure-reducing valves (FESTO) and air-pressure sensors (FESTO).
2. Safety circuits can be involved in the machine software but must not replace safety hardware elements.
3. Only door safety switches of the type TELEMECANIQUE XCS A711 are to be used.
4. In order to protect the employee and avoid any possibility of an accident, the operation is to be started by closing the area (closing doors, inserting the jig located outside the machine, etc.).
5. Operation start or testing should not be realized before the area has been closed or secured in any other way against any intervention on the part of the employee.
6. Closing the area (doors, socket, optical bar) is an integral part of the control system, and until the area is definitely closed, initiation of the working process is not permitted.
7. An emergency STOP button must be located on an accessible place close to the employee.

5. MECHANICAL ELEMENTS

1. Surface treatment of metal machine parts - blackening.
2. No thread clamping of jigs, holders, frames etc. in duralumin or aluminum material is allowed.
3. Color of steel frames, switchboards etc.: RAL 7035.
4. Aluminum profiles: ITEM, Bosch, Alutop.
5. WEISS rotary tables

6. ELECTRICAL ELEMENTS

- In order to eliminate voltage spikes, RF filters are required on the main switch and PLC.
- The preferred supplier of PLC and related accessories is SIEMENS series S7, plus 20% extra I/O capacities, operator panel OP 7, TP 177.
- The preferred software is: STEP7 V50, STEP7 - Micro/Win V3.02, from the operational series: Pro Tool/lite V5.2
- The preferred supplier of sensors is Baluff, Sick, Wenglor, Keyence. In the case of optical bars: Sick, Honeywell. If possible, the optical cables shall be equipped with protective sheaths to avoid any possible damage. It is required to use metal or plastic protection of electric cables in every possible location.
- Where the application of the designed construction requires, it is only possible to choose a different sensor supplier based on an agreement with the contractor.
- For the sensor connection, conjugate modules are to be used.
- The OP panel must contain a START button with a green light, which releases the power supply of the electric and pneumatic elements after the machine is turned on.
- A RESET system with a key is to be installed on the OP panel.
- Only a MOELLER key switch (key type MS-1) is to be used.
- The RESET with the key is to be used (otherwise, the machine remains locked):
  - in order to bring the machine into the starting position.
  - when resetting an error - identification of a non-conforming part, component
  - when changing the program
- All wiring must be properly marked (I/O, number).
- The supplier is responsible for ensuring that the equipment will meet all the legislative requirements.
- Suitably dimensioned overvoltage protection is required - UPS.
7. GENERAL REQUIREMENTS FOR THE STRUCTURE, SOFTWARE, LAYOUT AND CONSTRUCTION OF THE OP, SWITCHBOARD, WIRING AND REQUIRED ELECTRICAL DOCUMENTATION

a) Software:
   • The algorithm shall be written in functional blocks (FBD) or in LADDER. The STL is to be used only as a last resort (indirect addressing, calculations).
   • It shall be completely annotated (symbols as well as individual networks).
   • The platform setting will be a part of the algorithm.
     o Reason: When changing the automatic, only the software is loaded and it won't be necessary to adjust anything on the OP panel, and even in case of a long-term disconnection from the network, it won't cause any clearing of the settings.
   • By means of a password, the "prototype production" mode will be accessible, enabling the change the current platform for the purpose of sample production. It will be impossible to modify the default platform setting over the OP panel; it will be necessary to enter with the help of PG.
     o Reason: When overshooting to another part, the default platform setting from the manufacturer will be renewed.
   • In the "prototype production", it will be possible to change tolerances and other monitored production parameters. It will be impossible to modify the default tolerance setting over the OP panel; it will be necessary to enter with help of PG.
     o Reason: When overshooting to another part, the default tolerance setting from the manufacturer will be renewed.
   • The default platform setting shall be realized in a single software program block.
   • The supplier shall submit all the software and its accessories enabling the machine operation at the moment it is brought into the plant.
   • Formatting of the name: XXXX_SV_RRRR.MM.DD, where XXXX - indicates the identification number determined by TRW and SV – software version, YYYY - year, MM - month, DD – day of the last modification.

This measure is required due to the reason to maintain the default platform setting from the manufacturer and the impossibility to permanently turn off the sensors using the adjusters during the production. Concerning machines where it is impossible to change the setting, at the moment I know only about inserting a new part, but not afterwards. With machines where it is possible to change the setting over the OP panel, something is always being preset and this endangers the quality of series manufacture products. It often happens that when producing samples, the sensor control is deactivated, the tolerance changes, etc.; however, these changed parameters don't return to the initial values and when starting series manufacture, the machine setting is incorrect.

b) Operating panel
   • The "prototype production" mode will be accessible with a password only, which the production engineer will know from new projects and will be able to edit.
   • It will be possible to edit passwords for the individual levels. This menu will be accessible under the administrator level.
   • At the panel, there will be a connector to Simatic.
   • A specific error message will be displayed, from which it will be obvious what has caused the error and possible measures for remediing the errors.

c) Switchboard
   • In the switchboard, a box will be located for the storage of the electrical documentation.
   • In the switchboard or on the machine, a 220 V socket will be located for the connection of the PG.
   • The switchboard will be clearly marked with an identification number determined by TRW, under which the machine is filed in the maintenance department.
d) Wiring
- All sensors, buttons, indicator lamps, and activators shall be equipped with labels indicating the direct address to a specific input, output.
- The cable distribution shall be designed so that a quick cable exchange is ensured. No cable going from the sensor will lead through the base up to the switchboard. Use of conjugate modules, etc.
  - Reason: The idle time of the machine is expensive and there is no time to draw the cable through the strips and bushings up to the terminal board in the switchboard and then bed the cables back in often inaccessible places.

e) Electrical documentation
- The electrical documentation shall be executed in two copies.
  - Reason: One copy will be kept in the switchboard and the other will be stored in the archive.
- The list of platforms and default parameter settings shall be stated in a well-arranged table. Addresses, description and combination of control sensors, possibly description of their adjustment.
  - Reason: The adjuster simply looks up the combination of control sensors related to the corresponding platform and their utilization (where the given sensor is illuminated), as this is not always obvious at first sight.
- A 3D view of the layout of sensors used on the machine with their addresses and function description.

8. PNEUMATIC ELEMENTS
The preferred supplier is the company FESTO.
To select a different supplier of pneumatic elements, it is necessary to consult with the contractor.

9. VISUAL DISPLAY
The working condition of the machine is to be visualized by means of an indicator lamp or LED-type diode:
- a) initial position,
- b) presence of parts,
- c) error,
- d) selected program - OP panel,
- e) low air pressure,
- f) preventive maintenance required,
- g) detailed error description - OP panel.

10. LOCATION OF WORKING INSTRUCTIONS
The standard format size of the working instructions is A4 (type height). On the machine, there will be a holder for BOSCH working procedures - format 2 x A4. Each station must contain approximately 10 working procedures, depending on the number of parts to be produced on the machine.
The working procedures should be handy to the employee both visually and manually, preferably in a way so that the working instruction can be exchanged easily.
11. ERGONOMICS AND SAFETY OF THE WORKPLACE/EQUIPMENT - REQUIREMENTS FOR MATERIAL HANDLING

a) The ergonomic requirements must be applied in the early stage of machine development. The TPV department will provide more details.

b) The work equipment is an integral part of the workplace; it must enable carrying out the required job as comfortable as possible and meet the ergonomic and safety requirements for machinery according to the valid Government Order.

c) The workplace must be organized in a manner enabling comfortable and safe access and in case of need, the optimal use of mechanical storage and transport means.

d) It is necessary to deliver a proposal related to the method of a solution for eliminating or avoiding predictable or real risks prior to the production initiation by the supplier so that the TRW department can evaluate it.

e) The workplace user must be notified of the hazard, persisting during the operation of the working equipment or the working procedure, and he/she is to be notified of a measure to eliminate incorrect or dangerous activity and a method of effective protection.

f) Specific requirements for the workplace/equipment

- Containers with components will be located in front of the employee operating this machine in such a way that they meet the ergonomic principles and ensure the shortest distance for the part transfer.
- Precise movements with the hand or wrist may be used in operations such as loading, unloading or screwing.
- All the objects should be handy: Working surface - 300 mm; material - 400 mm.
- When loading into and unloading from the machine, the necessity of the employee to rotate the body should be excluded.
- In the case of an assembly workplace, the workplace and the material should be organized to allow the use of both hands.
- The machinery covers must be in matte finish.
- The machinery proposal must meet the requirement for the organization of objects at the workplace, namely scissors, knife, assembly jig.
- In the case of a sewing machine, the pedal is to be separated from the equipment so that no vibration transfer to the employee occurs.
- Controls - convex or finger sensor
- The equipment proposal must respect the working area of the operator, namely according to the legislative requirements (minimum 1m in width and 2m2 free, vacant area).

Additional ergonomic requirements may be required on the basis of the specific organization of the workplace/equipment.

g) Workplace - space and functional solution

Size and layout
The size and layout of the workplace, including the work equipment, dimensional solution of the work plane, handling and foot-manipulating areas, and visual space, must correspond to the type of working activity and dimensions of the people who should work at the given place (men, women). The selection of the necessary workplace equipment and necessary auxiliary working means, particularly mechanization, storage and transport serving to eliminate physically demanding manual manipulation, must be a part of the workplace project.
Dimension parameters
The dimension parameters must be in conformity with the provisions of ČSN EN 547, respecting work wear and working shoes, protective working means, and possibly, other special requirements.

Working position
The workplace must enable a suitable working position (sitting, standing or alternating between both positions) according to the type of the required job, in accordance with the provisions of ČSN ISO 6385 and ČSN EN 614-1. If it is possible to prefer the sitting position, the work seat must be designed together with the workplace and adjusted to the physical dimensions of the employees and the work demands.

Working movements
The working movements must enable fulfilling the required job in the most advantageous way within the functional working range and without an unreasonable physical load or danger of damage to health; movements with increased accuracy demands must also not be exertion-intensive, in conformity with ČSN EN 294, ČSN EN 811.

h) Technical documentation for the design of the workplace and equipment
ČSN ISO 6385  Ergonomic principles in the design of work systems.
ČSN ISO 3864  Safety colors and safety signs.
ČSN EN 292-1.2  General principles for designing.
ČSN EN 294  Safety distances to prevent danger zones being reached by the upper limbs.
ČSN EN 457  Acoustic danger signals.
ČSN EN 547-1, 2, 3  Physical dimensions.
ČSN EN 563  Temperatures of surfaces within reach. Ergonometric parameters for determining temperature limits of hot surfaces.
ČSN EN 614-1  Ergonometric principles for designing.
ČSN EN 811  ČSN EN 811 Safety distances to prevent danger zones being reached by the lower limbs.
ČSN EN 842  Visual danger signals.
ČSN EN 894-1,2,3  Ergonometric requirements for the design of displays and control actuators.
ČSN EN 999  Location of protective devices with respect to the speed of approach of human body parts.
ČSN EN 1050  Principles for risk assessment.
ČSN EN 60073  Coding principles for indication devices and actuators.
ČSN EN 61310-1  Indication, marking and actuation.
ČSN IEC 73  Electrotechnical regulations. Coding of displays and control actuators with help of colors and auxiliary means.
ČSN IEC 416  General principles for the creation of graphic symbols for use on equipment.
ČSN 36 0450  Artificial lighting of indoor spaces.
ČSN 36 0451  Artificial lighting of industrial spaces.
ČSN 36 0008  Glare, its assessment and prevention.

12. MACHINE OPERATING CONDITIONS
The equipment will be used for series production (three-shift operation) and located in the factory building. Thus, it will be exposed to common operating impurities that originate during manipulation with components (dust, textile fibers, etc.).
The air temperature shall vary from +5°C to +40°C.
Vibrations caused by the machine itself must not affect the machine's function.
Machine connection - voltage 230/400 V +/- 10%, 50 Hz.
Air pressure - 0.6 Mpa (6 bar).
13. STANDARD TRW PROCEDURE - THE PRICE QUOTATION DESCRIPTION

The price and dates: Each expense that will be invoiced to the sub-supplier must be specified in the quotation.

The quotation must include:
- the machine price (the construction shall be specified separately),
- prices of tooling and exchange jigs,
- prices of purchased components,
- supplies, installation,
- adequate training,
- part warranty and everything else that could be included in the expenses.

Please specify the price in detail.

a) The supplier's statement on the fabricability of the contracted product in this wording:

"The supplier (the company.................) has been acquainted with the structural design of the contracted products that will be produced on the assembly equipment (production line) specified in this request for a price quotation and confirms their fabricability according to the TRW drawing parameters."

If the supplier's statement on the fabricability of the contracted product is missing, the price quotation will be considered a confirmation of thereof.

b) The price quotation must contain the anticipated detailed production time schedule in individual calendar weeks with these milestones:

1. Ordering/signature of the work contract.
2. Design works (mechanical, electric, pneumatic parts).
3. Approval of structural design/production documentation = inspection day + the equipment design approval record.
4. Production of parts, sub-assemblies, purchase of supplied components.
5. Assembly of machinery, electrical part, PLC programming.
6. Activation, performance test by producer – pre-acceptance of equipment = inspection day + equipment pre-acceptance record required.
7. Installation, testing and series production start by the constructor.
8. Equipment acceptance = execution of completion certificate.
14. MACHINE ACCEPTANCE CONDITIONS

1. The supplier submits to the contractor a proposal of structural design also with respect to the safety and ergonomics of the machine. Only after written approval is it possible to initiate the production. In the case of larger assembly groups, it is possible to approve designs step by step.

2. The complete technical documentation (in printed as well as electronic version) is - unless the purchasing contract states otherwise - the property of TRW.

3. The contractor personally assists at the machine takeover where a test series of parts is produced in the quantity determined by the contractor.

4. When starting series production, the presence of the supplier's representative in the range of approximately 3, eight-hour working shifts is required.

5. The supplier shall also provide the entire machine documentation for the machine acceptance.

6. The complete drawings - production documentation.

7. The electrical + pneumatic scheme.

8. A list of purchased components, suppliers and delivery date.

9. A list of anticipated expendable parts and frequency of their replacement.

10. Instructions for setting and maintenance of the machine, recommendations for preventive maintenance (lubrication, cleaning etc.).

11. Operating and safety instructions for production and maintenance.

12. The acceptance is carried out in conformity with the technical requirements and ergonomic and labor safety requirements. The acceptance is carried out by a representative of the Department of New Investments, ME, Maintenance, a manager of the corresponding production department and furthermore, by a safety inspector, or an ergonomist.

15. SERVICE AND SUPPORT

The high priority is the operational reliability and easy maintainability of machines and jigs. In the quotation, state the manner in which you perform service in the event of defects that cannot be repaired by TRW's internal maintenance.

We request fault diagnosis within 24 hours of reporting a defect. State the range of provided warranties, including the price and explanation of everything that is and is not included in the warranty.

16. PAYMENT CONDITIONS

30% of the work price after the signing of the contract.

60% of the work price after the signing of the completion certificate.

10% of the work price – amount retained for 12 months after the signing of the completion certificate.

For more details, contact the financial department. The invoice is due within 60 days after its receipt.

17. SAMPLES - COMPONENTS

As a part of your quotation, please let us know how many samples you will need to construct and test the machine, including delivery dates.
18. GENERAL QUALITY SYSTEM REQUIREMENTS:

a) General requirements
- All of the technology used must not damage the individual components or the final parts in any way.
- The machine is secured in a manner preventing the operating staff from coming into contact with movable machine parts.
- The machine won't carry out any operations, or will automatically reject parts identified as:
  - incorrectly loaded, incorrectly exchanged, incorrectly oriented, missing, etc.,
  - parts, for which no operation has been carried out or completed,
  - parts that, after the operation realization, were identified as parts not included in the drawing specifications affected or created by the machine.
- The machine may be adjusted quickly to all required produced parts and their required combinations by an operator with minimum knowledge requirements (maximum elementary education).

b) Measuring and measuring systems
- The supplier is obligated to fit the machine or equipment with measuring instruments, gauges and measurement standards that are necessary to set or adjust the machine.
- The supplier is obligated to equip the machine or equipment with the necessary measuring instruments in order to verify the conformity of the individual produced signs on the product (signs/dimensions originating on the equipment or influenced by the equipment) or process parameters (for which the equipment is set up and which have an influence on the signs stated on the product) with the requirements.
- Possible settings, adjustments or calibrations will be realized and retained for each jig (position/cavity/carriage etc.) separately.
- In case of conversion use (conversions, indirect measuring etc.) of the measured quantities, the supplier is obligated to state the method of this conversion. This conversion is to be verified by the producer based on the measured data submitted by the producer.
- The supplier is obligated to submit calibration reports for all produced parts of the equipment influencing the final product dimensions.

c) Measuring system capability
- All measuring instruments, gauges and adjusting and production jigs used must be supplied with drawing documentation. For all these measuring instruments, gauges and adjusting jigs used, the supplier must provide the following documentation:
  - the calibration record,
  - a copy of the certificate of the company carrying out this calibration,
  - the certificate must authorize this company to carry out calibrations for the corresponding area of measurement,
  - the certificate must be issued in conformity with the standard ISO 17025.
- The machine must enable repeated measurements (load) of the identical final product (winch holder) so that it will be possible to carry out an eligibility study of the measuring system according to the requirements of the automotive industry.
  - MSA, 3rd revision, AIAG, Method ANOVA
  - The total error of measurement R&R must be less than 10%.
  - The first eligibility study of the measuring instruments used must be submitted by the producer. This study must be processed in conformity with MSA, 3rd revision, AIAG, Method ANOVA.
d) **Machine capability**
- The first capability study of the production machine (equipment) must be submitted by the producer. The study must be processed in conformity with the requirements of the automotive industry.
  - SPC, 3rd revision, AIAG.
  - $C_m \geq 1.67$, $C_{mk} \geq 1.67$ and for critical dimensions $C_p \geq 2.0$ or at least $C_{pk} \geq 2.0$.

e) **Process capability**
- The first capability study of the production process and machine must be submitted by the producer. The study must be processed in conformity with the requirements of the automotive industry.
  - SPC, 3rd revision, AIAG.
  - $C_p \geq 1.33$, $C_{pk} \geq 1.33$ and for critical dimensions $C_p \geq 1.67$ or at least $C_{pk} \geq 1.67$.

19. **HW and SW standards for shop floor PC’s**

- a) **HW**: DELL, minimal configuration: 1GB RAM, 80GB Disk, DVD-RW, USB.
- b) **HW**: Wifi - Linksys/Cisco card/bridge.
- c) **SW**: OS – Windows XP Professional EN SP3 32bit/ Windows7 Professional EN 32bit with installation disk.
- d) **SW**: OS - user admin with administrator rights and with documented password.
- e) **SW**: Disaster recovery - DVD backup image with delivered system – preferred software Acronis TrueImage.
- f) **SW**: Backup – How to backup application data.
- g) **SW**: Application – Manual, how to install application SW + installation CD.
- h) **SW**: Application – Application SW works with users group rights.
- i) **SW**: Security – IS TRW Carr will install: SW Firewall + Antivirus + Windows update manager.

20. **NOTE**

I believe this request provides summary of our requirements. In the event of any doubts, please contact me.

I am looking forward to receiving your quotation and thank you in advance for your cooperation.

Best regards,

Lukáš Mildorf

New investments manager
On behalf of TRW
Příloha 3  Tabulky koeficientů pro měření chronometráže [47]

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