OPERATING INSTRUCTIONS WITH SPARE PARTS CATALOG

INDUSTRIAL SEWING MACHINE

SADE



JUKI CENTRAL EUROPE Sp. z o.o. Platan Park C ul. Poleczki 21, 02-822 Warszawa, POLAND

Year of manufacture.....

Serial number

EN, Original instructions

Edition I / 2015 CE

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EC DECLARATION OF CONFORMITY OF MACHINERY 15¹⁾

JUKI CENTRAL EUROPE ul. Poleczki 21 Platan Park C, 02-822 Warszawa Poland

acting as manufacturer

declares with full responsibility that the machine:

Industrial sewing machine

Type / Model: SADE Year of production: Serial number:

Description of the machinery and its function:

Industrial sewing machine intended to car airbags sewing. It is designed to work in a standing position,

to which this declaration relates complies with the requirements of:

- Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (OJ L 157, 09.06.2006, p.24-86)
- Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (OJ L 374, 27.12.2006, p. 10-19)
- Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC (OJ L 390, 31.12.2004, p. 24-37)

To assess compliance, which was carried out 12.2015, the following harmonised standards were applied:

EN ISO 12100:2010 EN ISO 10821:2005+A1:2009 EN 60204-1:2006+A1:2009 EN ISO 60204-31:2013

and technical standards, regulations and specifications:

EN 82079-1:2012

Person authorised to compile the technical file:

Name and surname: Kenji Kurata, address: ul. Poleczki 21 Platan Park C, 02-822 Warszawa , Poland

Person empowered to bind the manufacturer:

Name and surname: Kenji Kurata

EC Declaration

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This declaration is no longer valid if the machine is modified or rebuilt without the
permission of the manufacturer.

Warsaw, Poland The place and date of the declaration Kenji Kurata The identity and signature of the person empowered to draw up the declaration

¹⁾ the last two digits of the year in which the CE marking was affixed (according to directive LVD)

EC Declaration

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1 GENERAL

1.1 Introduction

IMPORTANT!

This operating instructions should be attached to Industrial Sewing Machine SADE. We recommend that the supplier of new or of used machine should keep an acknowledgment of receipt this instructions together with a machine signed by the purchaser.

This operating instructions is a basic equipment of the machine and be familiar with its contents prior to machine use. Rules for safe use of the machine, maintenance and safety recommendations contained in the manual will enable the safe work and protect the user against potential hazards. Therefore, it is recommended that you keep the operating instructions for future use.

Please read all of these instructions before using the machine. Reading this entire manual and proceeding carefully with the principles presented here ensures the safe usage of sewing machine and minimizes the risk of accidents or machine malfunctions. Instruction is divided thematically into sections and subsections (see contents) consisting the relevant information to the user.

These instructions are valid only for the machine, which has been delivered with. It is identified with the machinery according to its type, serial number and year of construction.

IMPORTANT!

Before starting work, make sure you read this entire manual. If any information given in these instructions are incomprehensible please contact for help directly to the manufacturer (machine data can be found on the title page of this manual and on the nameplate).

Industrial Sewing Machine SADE has been designed and manufactured in accordance with safety requirements, but inappropriately utilized may cause hazards to the user health and life. Therefore, utilizing the machine you must follow the safety, environmental and occupational medicine regulations. Only persons who are familiar with the machine and its operating instructions can work on it and carry out any servicing and maintenance.

The machine must be used only for its intended purpose. The unauthorized usage and works against the principles set out in this manual will void your warranty. In the event of damage in this respect, the manufacturer may refuse to repair the machine.

IMPORTANT!

Any other use, and use of the machine not described in this operating instructions you must first consult the manufacturer of industrial sewing machine SADE.



IMPORTANT!

Information important for the user is indicated in such a way!



NOTE!

These signs warn of the potential hazard in relation to the machine operator or bystanders, and risk relating to the functioning of the machine itself.

Not following the recommendation marked by any of these signs can cause accidents. Strictly follow the recommendations specified by these signs.

IMPORTANT!

The Company JUKI CENTRAL EUROPE reserves the right to make design changes to improve the product and improve safety. These changes will also be introduced on an ongoing basis to the instructions. This does not mean, however, that will be introduced also for machines previously provided to the users.

The manufacturer provides a complete industrial sewing machine to car airbag sewing with an operating instructions, warranty card and spare parts catalog. Warranty card and spare parts catalog are independent documents.

Making any modifications to the machine without consent, release the manufacturer from the consequences of their implementation and may void your warranty. Details of the warranty and service are stated in the warranty card.

Whenever this manual refers the machine or sewing machine that means the Industrial Sewing Machine SADE.

IMPORTANT!

In case of sale or rental the machine to another user, always give him the operating instructions. In the event of its loss or damage, please contact your dealer to purchase a new copy.

IMPORTANT!

The manufacturer is not responsible for accidents resulting from not following the safety usage rules published in this manual.

IMPORTANT!

We recommend giving permissions for machine operators and servicing staff. They should be trained on the basis of these operating instructions and factory internal requirements.

In case of doubt regarding the operation of the sewing machine, observed malfunctions or defects, please contact the manufacturer at the address:



JUKI CENTRAL EUROPE Sp. z o.o. ul. Poleczki 21 Platan Park C 02-822 Warsaw, POLAND www.juki.pl

1.2 The machine identification

Identification data of the machine is given on the rating plate, which is placed on the left side of the sewing machine.

2 SAFETY OF USE AND WARNINGS

2.1 General safety rules

IMPORTANT!

These instructions do not limit the general health and safety instructions - are merely a supplement.

IMPORTANT!

Accident means "to cause personal injury or death or damage to property."

When operating the machine the user is required to respect the general health and safety regulations and the rules laid down for the working conditions of industrial sewing machines.

For the sewing machine, automatic machine and ancillary devices (hereinafter collectively referred to as "machine"), it is inevitable to conduct sewing work near moving parts of the machine. This means that there is always a possibility of unintentionally coming in contact with the moving parts. Operators who actually operate the machine and maintenance personnel who are involved in maintenance and repair of the machine are strongly recommended to carefully read to fully understand the following **SAFETY**



RULES before using/maintaining the machine. The content of the **SAFETY RULES** include items which are not contained in the specifications of your product.

The constructional solutions for safety aspects adopted in this machine minimize malfunction of sewing machine provided that the machine will be properly connected to the power supply (see section 4.3) and that the safety rules of working and are respected.

The most important elements used in the machine, serving to increase the level of safety during use are:

- o safety devices monitoring whole sewing process,
- solutions which allow controlling the machine by buttons located on the control box and program operated by touch screen,
- o ability to give authorization (card reader and barcode reader),
- the protection against the machine self-starting as a result of the return of power supply after the break,
- engine overload protection.



NOTE!

In the exceptional case and while failure of the machine immediately turn off the machine. Begin to repair the damage after securing the machine against switching on (remove the plug from the mains or by switching the main switch at the control box to "0" and securing it against restarting).



IT IS FORBIDDEN to taking by the User any actions that could lead to a lowering of machine safety (eg. work with a damaged lasers, damaged cables etc.).

Before using the machine read these instructions **and other explanatory documents supplied with accessories of the machine** and follow the rules mentioned below, regarding the elimination of hazards and taking appropriate precautions.

- 1. Use the sewing machine only in the intended manner (see section 3.1).
- 2. Never use the machine for any application other than its intended one and in any manner other than that prescribed in the instruction manual in order to prevent accident that can result in personal injury or death. JUKI assumes no responsibility for damages or personal injury or death resulting from the use of the machine for any application other than the intended one.
- 3. Carefully keep the instruction manual and the explanatory documents at hand for quick reference.
- 4. The machine is designed for indoor operation.
- 5. The machine is not intended for use in explosive atmospheres.



- 6. The sewing machine can handle only adults trained in the safe operation of electrical equipment, safety regulations and familiar with the contents of this manual.
- 7. In order to prevent accident resulting from unfamiliarity with the machine, the machine has to be used only by the operator who has been trained/educated by the employer with respect to the machine operation and how to operate the machine with safety to acquire adequate knowledge and operation skill. To ensure the above, the employer has to establish an education/training plan for the operators and educate/train them beforehand.
- 8. Be sure to wear safety goggles to protect against accident caused by needle breakage.
- 9. The use of the machine by underage and children is forbidden.
- 10. The use of the machine by people who are ill, are under the influence of alcohol or other drugs is forbidden.
- 11. It is forbidden for bystanders to stay near the sewing machine while: working, repaired, cleaned or undergoing maintenance.
- 12. Never modify and alter the machine in order to prevent accident that can result in personal injury or death. JUKI assumes no responsibility for damages or personal injury or death resulting from the machine which has been modified or altered.
- 13. Operate the sewing machine staying at the front of the machine. Regulate the working surface height adapting it to your size.
- 14. All areas of work, traffic and the passage keep in the proper cleanliness.
- 15. Those who use a heart pacer have to use the machine after consultation with a medical specialist.

2.2 Safety rules of the first assembly



NOTE!

Be very careful during the first assembly.

- Make sure the space and means necessary to first assembly of machine comply with safety requirements and these operating instructions.
- Ensure that proper ventilation is provided in the building.
- The building, which will work the machine in, must be protected from lightning discharges, ie. lightning.
- The person responsible for occupational health and safety at the plant should decide on the basis of risk assessment whether there is required to install the smoke, dust and other air contaminants detector in the facility.
- Follow the rules for safe installation described in the section. 4.2.



- Two persons should perform the work associated with the first installation, at the destination.
- For loading and unloading use forklift or other devices for carrying loads with sufficient capacity. The forks must be inserted under the palette that includes wooden box with machine, and during assembly legs under working table.
- Check the tightening of the thread stand or monitor.
- The safety devices should be effective and should not be bypassed.

2.3 Safe working practices for connecting to line power

- User is responsible for the correct execution of the electrical system in the building.
- User is responsible for the correctness of connection points of power consumption and their proper operation.
- User is responsible for proper execution and periodic monitoring of protection against electric in the installation of used machine.
- The machine is supplied with hazardous mains voltage 1 x 230 V / 50 Hz. The user must provide a suitable connection to the electricity grid.
- Before connecting the machine check that the power supply voltage is in accordance with the requirements of the machine. It will avoid of burn its electrical equipment due to insufficient voltage.
- The machine can be connected by plug / socket unit to the electricity grid.
- Check reliability of connection. Be sure to securely connect the plug in order to prevent electrical-shock, earth-leakage or fire accident. In addition, be sure to remove the plug while holding its (not wire).
- Be sure to prevent an extra force from being applied to the cable during the use in order to prevent electrical-shock, earth-leakage or fire accident.
- Be sure to connect the power plug to the grounded outlet without exceptions.

2.4 Safe working practices during operation



The using of all designed protective covers is absolute obligatory.

IMPORTANT! Keep the operating instructions near the machine in order to have it always with you.



IMPORTANT!

Keep a log with notes on any problems encountered, failures, accidents or maintenance carried out on your own responsibility.

Before operation

- Be sure to use the casters with a locking mechanism and lock them to secure the machine during the operation, maintenance, inspection and repair in order to prevent accident that can result in personal injury or death.
- Be sure to make sure that the connectors and cables are free from damage, dropout and looseness before turning the power on in order to prevent accident resulting in personal injury or death.
- Before you put the machine into operation for the first time after the set-up, clean it thoroughly. Remove all dust gathering during transportation and oil it well.
- Never put your hand into the moving sections of the machine in order to prevent accident that can result in personal injury or death.
- In addition, check to be sure that the direction of rotation of the pulley agrees with the arrow shown on pulley.
- Users should know the exact rules of first aid with wounds, crushes, impacts, cuts the various parts of the body, electric shock and with other foreseeable accidents.
- The working of faulty machine or working of machine that has any damages is prohibited.
- Do not turn the machine on with electric cables damaged or deformed, or with guards damaged or deformed, or with safety devices damaged.
- Do not remove covers during operation. Do not operate the machine if the guards are not in place or are damaged.
- The wires are placed in insulation which protects them from damage. They must not be cut, break from fasteners and so on.
- Protect the electrical system from water and moisture. It is unacceptable to wash electrical equipment with water spray.
- Before starting the machine check that in hazardous areas (the area around the machine) are not bystanders. Check the status of warning signs.
- Before turning the machine on check the reliability of connections elements of the machine (tighten loose connections), check the completeness of shields if there is any visible damage (in the particular electrical cables and work items). Repair damages or report to a supplier or manufacturer.
- Before starting work, make sure that the way of turning the machine off is clear in the event of sudden failure.
- Hazardous places were marked with warning pictograms on the machine. The importance of individual signs, see "Safety signs". Check out the meaning of all the following signs, pay attention to the places marked by pictograms during operation.





- The direction of normal rotation of the machine is counterclockwise as observed from the pulley side. Take care not to allow the machine to rotate in the reverse direction.
- Never operate the machine unless the machine head and the oil tank have been filled with oil.
- For a test run, remove the bobbin and the needle thread.
- For the first month, decrease the sewing speed and run the sewing machine at a speed of 80% or less of the maximum sewing speed. As to the maximum sewing speed, see "7.4. Sewing speed table".
- Operate the handwheel after the machine has totally stopped.

During operation

- Do not touch by body parts to electrical wires while machine is running.
- Be sure not to put your fingers, hair or clothing close to the moving sections such as the handwheel, hand pulley and motor or place something near those sections while the machine is in operation in order to prevent accident caused by entanglement that can result in personal injury or death.
- Be sure not to place your fingers near the surround area of the needle or inside the thread take-up lever cover when turning the power on or while the machine is in operation in order to prevent accident that can result in personal injury or death.
- The machine runs at a high speed. Never bring your hands near the moving sections such as looper, spreader, needle bar, hook and cloth trimming knife during operation in order to protect your hands against injury. In addition, be sure to turn the power off and check to be sure that the machine completely stops before changing the thread.
- Keep your hands away from needle when you turn ON the power switch or while the machine is in operation.
- Do not operate your machine with finger guard removed.
- While operating the machine operator should stand on the ground in front of the machine and operate it by pedal placed on the ground.
- Be careful not to allow your fingers or any other parts of your body to be caught between the machine and table when removing the machine from or replacing it on the table in order to prevent accident that can result in personal injury or death.
- A servomotor does not produce noise while the machine is at rest. Be sure not to forget to turn the power off in order to prevent accident caused by abrupt start of the motor
- Before leaving the machine (during any break) always turn the machine off and cut the power supply off by removing the plug from the socket or by switching the main switch at the control box to "0" (be sure to secure it against restarting).
- The safety devices should be effective and should not be bypassed.
- Efficient functioning of safety devices and of machine control are the responsibility of competent workers, who should inform the manager of any hazards or errors that occur during operation.



- To ensure safety, never operate the machine with the ground wire for the power supply removed.
- When inserting/removing the power plug, the power switch has to be turned OFF in advance.
- In time of thunder and lightening, stop your work and disconnect the power plug from the receptacle so as to ensure safety.
- If the machine is suddenly moved from a cold place to a warm place, dew condensation may be observed. In this case, turn ON the power to the machine after you have confirmed that there is no danger of water drops in the machine.
- To prevent fires, periodically draw out the power plug from the plug socket and clean the root of the pins and the space between pins.
- The hook rotates at a high speed while the machine is in operation.
- To prevent possible injury to hands, be sure to keep your hands away from the vicinity of the hook during operation. In addition, be sure to turn OFF the power to the machine when replacing the bobbin.
- To avoid possible accidents due to abrupt start of the machine, be sure to turn OFF the power to the machine.
- Be careful of handling this product so as not to pour water or oil, shock by dropping, and the like since this product is a precision instrument.
- When tilting or returning the sewing machine to the home position, hold the upper side of the machine head with both hands and perform the work quietly so that fingers or the like are not caught in the machine.



CAUTION!

Safety devices such as the "finger guard" are sometimes omitted in the sketches, illustrations and figures included in the Instruction Manual for easy explanation. In the practical use, never remove those safety devices.

2.5 Operating environment

- Be sure to use the machine under the environment which is not affected by strong noise source (electromagnetic waves) in order to prevent accident caused by malfunction of the machine.
- Never operate the machine in any place where the voltage fluctuates by more than "rated voltage ±10 %" in order to prevent accident caused by malfunction of the machine.
- Be sure to verify that the air-driven device such as an air cylinder operates at the specified air pressure before using it in order to prevent accident caused by malfunction of the machine.



To use the machine with safety, be sure to use it under the environment which satisfies the following conditions:

Ambient temperature during operation 5°C to 35°C

Relative humidity during operation 35 % to 85 %

- Dew condensation can occur if bringing the machine suddenly from a cold environment to a warm one. So, be sure to turn the power on after having waited for a sufficient period of time until there is no sign of water droplet in order to prevent accident caused by breakage or malfunction of the electrical components.
- Be sure to stop operation when lightning flashes for the sake of safety and remove the power plug in order to prevent accident caused by breakage or malfunction of the electrical components.
- In order to ensure the work environment, local laws and regulations in the country where the sewing machine is installed shall be followed. In the case the noise control is necessary, an ear protector or other protective gear should be worn according to the applicable laws and regulations.
- Disposal of products and packages and treatment of used lubricating oil should be carried out properly according to the relevant laws of the country in which the sewing machine is used.

2.6 Items for which the power to the machine has to be turned off

Turn the machine off by switching the main switch at the control box to "0", then secure it in position "0".

- Switch off the sewing control motor before threading up, cleaning and first line maintenance. Wear eye protection during the sewing.
- Switch off the sewing control motor and log-off from Sade before you leave the machine. This will prevent unauthorized production and accidents.
- Be sure to immediately turn the power off if any abnormality or failure is found or in the case of power failure in order to protect against accident that can result in personal injury or death.
- To protect against accident resulting from abrupt start of the machine, be sure to carry out the following operations after turning the power off. For the machine incorporating a clutch motor, in particular, be sure to carry out the following operations after turning the power off and verifying that the machine stops completely.
 - For example, threading the parts such as the needle, looper, spreader etc. which have to be threaded, or changing the bobbin.
 - For example, changing or adjusting all component parts of the machine.
 - For example, when inspecting, repairing or cleaning the machine or leaving the machine.
- Be sure to remove the power plug by holding the plug section instead of the cord section in order to prevent electrical-shock, earth-leakage or fire accident.
- Be sure to turn the power off whenever the machine is left unattended between works.



Be sure to turn the power off in the case of power failure in order to prevent accident resulting of breakage of electrical components.

2.7 Rules for safe cleaning, maintenance and repair



NOTE!

When you do not use the grinder for sharpening tools (eg. during service, maintenance, work breaks) turn off the power and remove the plug from the socket or switch the main switch at the control box to "0" (then secure it in position "0") – you will avoid the risk of accidental start by unauthorized persons.



DANGER!

When it is necessary to open the control box containing electrical parts, be sure to turn the power off and wait for five minutes or more before opening the cover in order to prevent accident leading to electrical shock.

- In prevention of accident caused by unfamiliarity with the machine, repair and adjustment has to be carried out by a service technician who is thoroughly familiar with the machine within the scope defined in the instruction manual. Be sure to use JUKI genuine parts when replacing any of the machine parts. JUKI assumes no responsibility for any accident caused by improper repair or adjustment or the use of any part other than JUKI genuine one.
- In prevention of accident caused by unfamiliarity with the machine or electricalshock accident, be sure to ask an electrical technician of your company or JUKI or distributor in your area for repair and maintenance (including wiring) of electrical components.
- At the appropriate time perform periodic inspections and maintenance.
- All activities related to repairs and assembly of spare parts can be made after reading the safety requirements described in this manual.
- The user is responsible for the proper execution of spare parts assembly in the machine.
- When executing any work use appropriate and safe tools.
- Performing any maintenance on machine in move and works which may contribute to lower the safety level of the machine is forbidden.
- When carrying out repair or maintenance of the machine which uses air-driven parts such as an air cylinder, be sure to remove the air supply pipe to expel air remaining in the machine beforehand, in order to prevent accident caused by abrupt start of the air-driven parts.
- Spare parts must be purchased from the manufacturer (see "Spare parts catalog").





- Be sure to check that screws and nuts are free from looseness after completion of repair, adjustment and part replacement.
- Be sure to periodically clean up the machine during its duration of use. Be sure to turn the power off and verify that the machine and motor stop completely before cleaning the machine in order to prevent accident caused by abrupt start of the machine or motor.
- At electrical works disconnect the mains power supplying the machine.
- Be sure to turn the power off and verify that the machine and motor stop completely before carrying out maintenance, inspection or repair of the machine. (For the machine with a clutch motor, the motor will keep running for a while by inertia even after turning the power off. So, be careful.)
- Protective devices should be checked regularly and replaced at appropriate time.
- In case of any damages of electrical installation, disconnect the machine from the mains and call an electrician with appropriate privileges.
- Conduct periodic reviews of the machine functioning, in particular of safety devices - see section 8.1.
- Also after making changes or maintenance carry out checks of the machine and report the results of checks.
- The competent and trained staff must carry out periodic inspections and maintenance program.
- If the machine cannot be normally operated after repair or adjustment, immediately stop operation and contact JUKI or the distributor in your area for repair in order to prevent accident that can result in personal injury or death.
- If the fuse has blown, be sure to turn the power off and eliminate the cause of blowing of the fuse and replace the blown fuse with a new one in order to prevent accident that can result in personal injury or death.
- Be sure to periodically clean up the air vent of the fan and inspect the area around the wiring in order to prevent fire accident of the motor.

Lubrication

- Be sure to use JUKI genuine oil and JUKI genuine grease to the parts to be lubricated.
- If the oil adheres on your eye or body, be sure to immediately wash it off in order to prevent inflammation or irritation.
- If the oil is swallowed unintentionally, be sure to immediately consult a medical doctor in order to prevent diarrhea or vomiting.

2.8 Principles for safe handling, transportation and unpacking

- The machine is transported in the form of a partially disassembled in the wooden box (see clause 4.2).
- Be sure to lift and move the machine in a safe manner taking the machine weight in consideration. Refer to the text of the instruction manual for the mass of the machine.



- For loading and unloading, use a forklift or other device intended to carry a load with sufficient capacity. The forks should be inserted underneath a pallet with the box.
- Persons operating these devices should have a valid permission to operate them.
- Be sure to take sufficient safety measures to prevent falling or dropping before lifting or moving the machine in order to protect against accident that can result in personal injury or death.
- Secure pallet with the box against uncontrolled movement while driving on the transport box.
- Once the machine has been unpacked, never re-pack it for transportation to protect the machine against breakage resulting from unexpected accident or dropping.

Unpacking

- Be sure to unpack the machine in the prescribed order in order to prevent accident that can result in personal injury or death. In the case the machine is crated, in particular, be sure to carefully check nails. The nails have to be removed.
- Be sure to check the machine for the position of its center of gravity and take it out from the package carefully in order to prevent accident that can result in personal injury or death.

2.9 Fire prevention regulations



Do not extinguish any fire at the machine or in its vicinity with water. To extinguish use only funds specialized for this purpose.

- In case of fire:
 - o disconnect the machine from the mains,
 - o evacuate people being in dangerous zone,
 - o notify the fire department,
 - o proceed to extinguish.
- Extinguishing the electrical installation with water or foam fire extinguisher is forbidden.
- Cut off the oxygen supply as soon as possible.
- The user of the machine is responsible to completion of all obligations relating to fire protection.
- Smoking and using open flames near the machine during operation is unacceptable.
- Repairs, and particularly welding can be carried out after a thorough cleaning of the machine of contaminations. Before starting welding work, electrical wires, bearings, plastic parts must be protected from overheating.



2.10 Safety signs

Pictograms (safety signs) on the machine warn against hazards which might arise while operating the industrial sewing machine SADE and give tips on proper use.

Signs should always be clear and clean, unobstructed and visible to the operator and other persons who may find themselves in the vicinity of the working machine.

Be sure to operate the machine after verifying that safety device(s) is correctly installed in place and works normally in order to prevent accident caused by lack of the device(s)

If the sign loses legibility or degraded or lost, replace it with a new, also if it was on the parts, which at the time of repairs were replaced on another.

The risk indications are classified into the following three different categories to help understand the meaning of the labels. Be sure to fully understand the following description and strictly observe the instructions.

Explanation of risk levels

	DANGER :
	This indication is given where there is an immediate danger of death or serious injury if the person in charge or any third party mishandles the machine or does not avoid the dangerous situation when operating or maintaining the machine.
	WARNING :
	This indication is given where there is a potentiality for death or serious injury if the person in charge or any third party mishandles the machine or does not avoid the dangerous situation when operating or maintaining the machine.
	CAUTION :
	This indication is given where there is a danger of medium to minor injury if the person in charge or any third party mishandles the machine or does not avoid the dangerous situation when operating or maintaining the ma- chine.
$\underline{\mathbb{V}}$	Items requiring special attention.



Explanation of pictorial warning indications and warning labels

Pictorial warning indication	There is a risk of injury if con- tacting a moving section.	Pictorial warning indication	Be aware that holding the sewing machine during op- eration can hurt your hands.	
	There is a risk of electrical shock if contacting a high-voltage section.		ctorial warn indication	There is a risk of injury if you
	There is a risk of a burn if con- tacting a high-temperature section.		touch the button carrier.	
	Be aware that eye deficiency can be caused by looking di- rectly at the laser beam.	on label	The correct direction is indi- cated.	
	There is a risk of contact be- tween your head and the sew- ing machine.	Indicatic	Connection of a earth cable is indicated.	

Warning label

1 • There is the possibility that slight to serious injury or death may be caused. • There is the possibility that injury may be caused by touching moving part. **2** • To perform sewing work with safety guard. • To perform sewing work with safety cover. • To perform sewing work with safety protection device. 3 • Be sure to turn the power OFF before carrying out "machinehead threading", "needle changing", "bobbin changing" or "oiling and cleaning". 1 6 2 **Electrical-shock danger label** 頃 🗥 DANGER le Hazardous voltage will cause 高電圧部分に触れて、大けがをする ことがある。 injury. Turn off main switch and unplug power cord and wait 電源を切って、5分以上たってから カバーをはずすこと。 at least 5 minutes before opening this cover.





Fig 1. Industrial sewing machine head LU-2810-7 SADE – pictograms placement



-



	Risk of electric shock.	Signs announcing the risk of elec- tric shock and how to avoid danger by keeping a safe distance from of parts under voltage. Placed on control box.	
	Before starting mainte- nance or repairs, turn off the machine, remove the plug from the outlet, pro- tecting against restarting.	Signs announcing the need to turn power supply off and to protect against unauthorized switching on before conducting any repair, maintenance, cleaning, etc. Placed on control box.	
UP ↑ TABLE ↓ DOWN	Regulating the table height.	Sign informing about controlling buttons used to set the table height. Placed under table near control buttons.	
MAIN SWITCH	Main switch.	Sign informing about main switch. Placed on control box near the main switch.	
COMPUTER START / STOP	Starting and stopping a computer.	Sign informing about controlling button used to start/stop computer. Placed on control box near control button.	



2.11 Residual risk description and assessment

Industrial sewing machine SADE is designed and constructed in accordance with the current state of the art and the applicable standards. Despite the efforts of the manufacturer to ensure the safety and elimination of hazards when using the machine, some elements of risk during operation cannot be avoided. They usually result from sewing: not intended kinds of materials. The residual risk may arise in emergency situations, arising in particular from disregarding the operating instructions or from not paying proper attention during the user-machine interaction.

The highest hazard occurs when conducting the following, prohibited activities:

- operation of the machine by children, persons underage or untrained, or not familiar with the operating instructions,
- operation by persons under the influence of alcohol or other drugs,
- staying bystanders in dangerous zones around machine working,
- checking the technical condition, cleaning, conducting repairs, regulation and maintenance while machine is conducted to power mains or is not-stopped,
- touching by parts of the body to electrical cables, cutting or damaging them,
- cleaning machine by water jet,
- using the machine not as intended and to other purposes than described in the instruction,
- touching by body parts to danger machine zones while machine is running or when it is connected to the power supply,
- using an open flame by the machine.

It is possible to limit the residual risk to minimum provided that the following recommendations are fulfilled:

- carefully reading and following the operating instructions,
- do not touch by parts of the body to danger machine zones while machine is running or when it is connected to the power supply,
- there is forbidden: conducting repairs, regulation and maintenance during operation and while machine is connected to power supply or when machine is running,
- conducting of machine repairs only by authorized and trained persons,
- use of lifting equipment with sufficient capacity,
- machine protection from access by unauthorized persons,
- cutting off power from the machine whenever you're not working the machine (e.g. on downtime), and when you perform maintenance work on the machine,
- following the health and safety rules at work,
- the use of personal protective equipment,
- operation, maintenance and repairing by untrained persons and not in compliance with the operating instructions and general safety rules is forbidden.



3 INDUSTRIAL SEWING MACHINE LU-2810-7 SADE DESCRIPTION

3.1 Intended use

Industrial sewing machine SADE is intended to airbags for cars sewing. It is designed to work in a standing position. The work table height adjustment allows you to adjust the machine to the operator's height.

The JUKI SADE side airbag cover workstation has been developed and constantly improved to meet customer requirements concerning side airbag cover production.

In essence the machine is all about quality monitoring. The actual sewing isn't any different as it would be on standard manually operated sewing machines. The sewing process however is broken into defined aspects and as such monitored and controlled by the JUKI SADE. Approved products will be tagged and relevant data of each production cycle will be recorded. This information serves as source for a product traceability database.

During development, daily practice of the trim plant played a leading role. This resulted in the following philosophy that puts the JUKI SADE machine apart from other similar workstations:

- reduce interference of the monitoring system to a minimum to prevent distraction of the operator;
- record only unambiguous and relevant data;
- flexible implementation of customer requirements, in order to anticipate changes;
- open system architecture to enable integration of 3rd party components;

and most important:

keep it simple... and user friendly.

Work safety regulations, accidents prevention and occupational medicine rules must always be fulfilled.

Unauthorized changes to the sewing machine SADE (including program) without the manufacturer permission exempt him from liability for damages.

Meeting the requirements regarding the use of the machine, operating and repairs in accordance with the manufacturer's instructions and strict compliance with the recommendations is a condition of intended use. Using the machine for other purposes will be considered as improper use.

In particular, the use of machine to purposes other than sewing airbags for cars is unacceptable.

When talking about machine sides it should be considered as at the figure 2.







Fig. 2. The industrial sewing machine SADE – machine sides

Table 1.			
Parameter	Unit	Industrial Sewing Machine SADE	
Model name	-	1-needle, unison-feed, lockstitch machine with automatic thread trimmer	
Machine type	-	stationary, with the possibility of moving to a workplace	
Application	-	Medium- to heavy-weight materials (car airbags)	
Power type	-	electric 1 x 230 V / 50 Hz	
Rating	W	500	
Weight	kg	180	
Machine head weight	kg	61	
Overall dimensions:			
width	mm	958	
length	mm	1460	
total height max	mm	1887	
Sewing speed	sti/min	max 3000 (see "Sewing speed table") *1	
Air pressure rate	bar	5	

3.2 Technical characteristics



Parameter	Unit	Industrial Sewing Machine SADE
Needle	-	GROZ-BECKERT 135 x 17 (Nm 125 to Nm 180) (Standard: Nm 160)
Applicable thread size for sewing	-	#30 to #5 (Europe: 20/3 to 60/3)
Applicable thread size to be cut	-	#30 to #5 (Europe: 20/3 to 60/3)
Stitch length	mm	max 9 (forward/reverse feed)
Stitch length dial	-	2-pitch dial
Presser foot lift	mm	Hand lifter: 10 Automatic presser foot lifter: 20
Stitch length adjusting mechanism	-	By dial
Reverse stitch adjusting method	-	Air cylinder type (with touch-back switch)
Thread take-up	-	Link thread take-up
Needle bar stroke	mm	40
Amount of the alternate ver- tical movement	mm	1 – 9 (alternate vertical dial adjustment type)
Hook	-	Full-rotary vertical-axis 2-fold hook (Latch type)
Feed mechanism		Box feed
Top and bottom feed actua- tion mechanism	-	Timing belt
Thread trimming method	-	Cam-driven scissors type
Lubrication	-	Automatic lubrication by oil tank (with oil gauge)
Lubricating oil	-	JUKI New Defrix Oil No. 1 (equivalent to ISO standard VG7) or JUKI MACHINE OIL No. 7
Bed size	mm	643 x 178
Space under the arm	mm	347 x 127
Hand wheel size	mm	Outer diameter: ø123
Motor/Control box	-	SC-922B
Engine	type	JUKI AC Servo Motor
number	pcs	1
model	-	MV551ND5O2DNN05 032780 B



Table 1. continued

Parameter	Unit	Industrial Sewing Machine SADE
Controls	-	DELL screen, the touch panel
Noise	-	
emission sound pressure level*	dB (A)	83,0
sound power level*	dB (A)	88,5

*1 The speed setting according to the amount of the alternating vertical movement of the walking foot and presser foot is automatically carried out.

* Equivalent continuous emission sound pressure level (L_{PA}) at the workstation: A-weighted value of 83.0 dB; (includes $K_{PA} = 2.5$ dB); according to ISO 10821- C.6.2 - ISO 11204 GR2 at 3,000 sti/min. - Sound power level (L_{WA}); A-weighted value of 88.5 dB; (includes $K_{WA} = 2.5$ dB); according to ISO 10821-C.6.2 - ISO 3744 GR2 at 3,000 sti/min.

3.3 Construction and operations

The industrial sewing machine SADE consists of (see fig. 3):

- sewing machine head (1),
- sewing machine stand (2) designed as a table with adjustable work table height,
- pedal switch (3),
- control box (4),
- control touch panel (5),
- stand for thread spools (6),
- printer (7),
- a set of laser sensors (8),
- card reader (9),
- barcode reader (10),
- electrical installation,
- pneumatic regulator (11).

The machine is powered from the mains current 1-phase 230 V / 50 Hz. The power of sewing machine is 500 W, the total mass is 180 kg.

The machine stand is equipped in 4 wheels with brakes, that allows moving machine to required workplace. The height of work table is adjustable to adjust the machine to the operator's height and to ensure the most ergonomic posture at the standing workstation.

The stands for: thread spools, printer and control touch panel are also adjustable for the ergonomic reasons.

Machine is equipped in a main switch to cut off power supply when machine is not working. A main switch is placed on a control box wall. Next to the main switch is backlit button, that is used to computer switching on.

The driver CP-18 to adjust the machine head is placed in a control box. Only an authorized and qualified person can set parameters on CP-18 driver.





Fig. 3. The industrial sewing machine LU-2810-7 SADE - construction



Fig. 4. CP-18 driver

Each operator receives his own identification card. He logs on to a computer program installed on a machine by a card reader (fig. 3, 9). Detailed description about program configuration and usage see sections 7.1.2, 7.2 and 7.3.



Top thread tension regulator and Top thread tension monitor

The thread tension regulators are similar to the standard LU-2810 machine, but are locked away to prevent unauthorized adjustments as shown on figure 5.

The thread monitor device will measure absolute tension values and evaluate the measurements by pre-set tolerances. The unit consists of a measurement head and an amplifier. JUKI SADE offers the thread tension sensor being from the company BTSR. The connection between the two is done by JUKI and there is an option (not included in the base system) for doing the re-calibration.



1 – top thread tension regulator 2 – top thread tension monitor

Fig. 5. Top thread tension regulator

Bobbin thread monitor

An optical sensor monitors the remaining bobbin thread. The sensor head is mounted near the hook and electrically connected an electronic controller mounted next to the main switch. The signal of this unit is processed by the JUKI SADE to prevent the operator from starting a product cycle with a bobbin running on spare thread.

Once the sensor goes on the sewing operation is temporarily stopped. An alarm and LED light indicate the threads about to be finished. By pressing the green button on the front in the head of the machine the operator can continue the sewing until the heal back function is used. Then the operator has to change the bobbin and confirm the change by scanning the bobbin.



Fig. 6. Bobbin thread monitor



Swivel guide

Main function of the swivel guide is to support the operator in keeping seam to edge distance within tolerance. It can be adjusted sideways and upwards. An optical sensor detects positive notches of the piece in order to trigger the start and end of the actual tear seam area. The guide can be swivelled sideways and upwards to gain access to the bobbin compartment.



Fig. 7. Swivel guide

Stitch length

The actual stitch length is considered to be critical for correct airbag deployment. At the same time stitch length isn't just the result of a certain dial setting. Material properties as thickness and elasticity, presser foot adjustment and operator skills will affect the actual stitch length. In Your machine version manual setting of the stitch length is not possible. You can do this in the SADE software (see clause 7.1.2.13).

Bobbin winding station

The JUKI SADE uses a separate bobbin winding station instead of the sewing head integrated winder. Bobbins have a more consistent winding with a constant tension. The bobbin thread cone is monitored by a barcode reader.

The bobbins of normal LU2810 sewing machines are incompatible with the bobbins used on the JUKI SADE. This is done to avoid the accidental use of standard bobbins with undetermined threads.





Fig. 8. Bobbin winding station

Control unit

The control unit cabinet placed at the left side of the machine is like the heart of the JUKI SADE machine. It connects all components. It will monitor and control all in- and output by programmable logic controller (PLC) with dedicated software. Figure 9 shows the location of various components in the control unit cabinet.



PANEL – CP-18 control panel 5V switch 24V switch Main switch PC switch Machine switch uC – SADE control board Impulse power supply 240W, 24V dc Impulse power supply 30W, 5V dc PC - computer

Fig. 9. Location of various components in the control unit cabinet



WARNING!

Under no circumstances should the life wire (+ DC) of internal terminal and SC922 I/O terminal be connected. Connecting SC922 output directly to the PLC might result in serious damage to the PLC.

Main power terminal

220VAC main power is distributed from the control unit over main power terminal to the sewing motor, height adjustable table and optional equipment. By default the industrial computer has a separate power supply.

With the main switch the control unit and its main power terminal is energized. The 10A fuses protects components against electrical overload and short-circuit.

PLC

The programmable logic controller (PLC) evaluates the sewing process in real-time. It will interact with the SC922 sewing motor control unit in a way that it will block unwanted actions of the operator during the sewing cycle. Outputs of the SC922 are monitored. Evaluation of the seam relies on stitch counting. All stitch number set-points are pre-loaded from the PC into the PLC and the result will be transmitted back to the PC.

Sewing motor control unit

An SC922 sewing motor control unit drives the sewing head.

Compared to normal LU2810 configuration, the difference is the PLC unit. Critical inand output signals of the SC922 unit will pass through the PLC. SC922 outputs are conditionally blocked. The sewing machine head has a direct drive motor build in.

Control panel



Fig. 10. Control panel CP-18

The control panel (OP18) is used to set all specific sewing control parameters.

Needle positions, back tack and presser foot functions are accessible through this panel like on standard LU2810 workstations. Panel is placed inside control unit cabinet to prevent unauthorized changes to the current settings.

Pedal connection

Like on normal sewing machines, a pedal is used for speed regulation. On the JUKI SADE the signal of the pedal is directly connected with the Juki control drive.

The PLC can block the signal so that the machine won't run if the pedal is pressed. Also the PLC can transform the signal to emulate a different position of the pedal.



The standard plug of the pedal is changed.

WARNING!

The SC922 control unit will accept normal speed regulator pedals. The sewing machine can run outside the production cycle. The product cycle will still be monitored and only valid products will receive a traceability barcode label.

An immediate shutdown of the machine in the emergency is possible by releasing the pedal switch.

Computer and peripherals



Fig. 11. Computer

The computer on the JUKI SADE serves two purposes:

- 1. Interface between operator and machine;
- 2. Production data management.

Great effort has been made to keep the configuration and functionality of the computer similar to standard desktop PC's. To keep pace with continues development of hard-ware components like processors and adapters we've used industrial components. As from the beginning, we've implemented a real industrial PC as standard because of uniformity and spare part availability.

Software protection key

Sade is the dedicated software for the JUKI SADE workstation. The software is copyprotected and will not run without a corresponding software protection key reading the hard drive serial number and creating a special access code. During installation time 3 different codes used and an *.ini file is created. This *.ini file can be updated remotely. This enables to release software options at a later stage.


Monitor

The JUKI SADE has touch screen LCD monitor that simplifies operation. You should mount it to the special stand at the rear part of work station.



Fig. 12. Monitor LCD with touch screen

Numeric keypad (Optional)

Est	Eni	AU	4
Num C	÷	×	-
7 Pos 1	8	9 840 †	+
4_	5	6	
1 Ende	2	3 1040 \$	Enter
0 Einfo		i Fait	

Instead of a normal keyboard, a numeric keypad is used. Because of the four freely programmable keys and the cursor movement option, the keypad offers all options for the operator. Further, misuse of certain Windows OS keystrokes is prevented, simply because the keys aren't there.

Fig. 13. Numeric keypad



NOTE!

A full-size keyboard can be connected to the keypad if required. The plug can be used directly without the need to power off, or restart the computer.



Hand held barcode scanner



The hand held barcode scanner provides the operator with a quick way to enter all sorts of data that normally would be entered over a keyboard. The scanner is physically connected to the keyboard input over a keyboard wedge. The scanner accepts all types of barcodes but can be configured to accept only certain types or emulate additional keystrokes. Please refer to the hand held barcode scanner's manual for more information.

Fig. 14. Barcode scanner

Barcode printer

The barcode printer produces the traceability barcode. SADE machine is equipped in Zebra printer model GK420t or GX420t. The printer is connected with the computer over an USB port. Sade uses an own driver to communicate with the printer because we found communication to be faster with our own driver then with Windows OS drivers. As consequence, own made drivers for each type of printer is required.



Fig. 15. Barcode printer

Network adapter

Using Microsoft Windows as operating system for the JUKI SADE makes it easy to implement JUKI SADE production data into a corporate network environment.



Fig. 16. Network adapter

By default the JUKI SADE computer is equipped with a standard networking and wireless adapter. Additionally we supply a USB to Ethernet Adapter.

The standard computer has 4 USB communication ports. Two are occupied by PLC and barcode printer. Additional ports are required to connect bar code scanners, optional equipment like chip card readers and future options. By default 6 extra USB ports and 4 serial to Ethernet connections are installed. The number of ports can be extended with both RS232 and USB ports.



Static barcode scanners

Static barcode scanners provide a way to monitor data prior of, and during the production cycle. Figure 17 shows the scanners mounted under the thread cone stand to check data found on the inside of the top thread cone. It scans both, the top and bottom thread. In addition the thread cones are checked for presence due to sensors.



Fig. 17. Static barcode scanners

Monitoring scanners



Special scanner is mounted at the sewing head (figure 18). Purpose of this scanner is to check for proper application of the traceability barcode label to the piece, the so called scan-back.

Fig. 18. Monitoring scanners

Scanners of proper thread conducting are placed at several places on the machine. By default up to 16 scanners can be configured. For example containers for correct and rejected products can be scanned as well as additional material (batches) that are required during the production process.



Fig. 19. Scanners on the stand for thread spools



A special scanner is mounted at the bobbin winding station (clause 5.7, figure 28). Purpose of this scanner is to check for proper application of the traceability barcode label to the bobbin being winded with the appropriate thread. See section 5.7.

JUKI SADE comes with 4 scanners attached. <u>Optional</u> is a 5th scanner to scan the bobbin after inserting it into the bobbin case.

Scanners on the stand for thread spools give an information about the thread presence and its type (colour, thickness).



Fig. 20. Scanners of proper thread conducting

Scanners of proper thread conducting are placed at several places on the machine.

Chip card reader

The chip card reader offers a secure alternative to the numeric code used to identify users to the JUKI SADE. Simply hold the RFID card to the reader and the user is automatically logged in if his RFID card has been registered in the SADE software under user management.

3.4 Optional equipment

The basic equipment of the machine are: operating instructions, spare parts list and warranty card.

The usual tools such as screwdriver, flat wrench and allen wrench are supplied with the machine. They are used to monitor height regulation.

An optional equipment of the machine is numeric keypad. You can choose a printer model while ordering the machine.

You can also order with the machine a special set of weights for thread tension calibration.



4 PRELIMINARY OPERATIONS AND PUTTING INTO SER-VICE

4.1 Ordering and delivery



NOTE! Carrying on loads over people and animals is forbidden.

The orders for sewing machine SADE can be submitted to the manufacturer or his suppliers.

The sewing machine can be ordered with additional equipment - see section 3.4.

Machine SADE is sent in the form of a partially disassembled – in a wooden box set on a pallet. Only a monitor and stand for thread spools are not fastened.

Additionally support legs of the machine are mounted by metal bands and additional screws to the pallet that prevents damaging the machine while delivering it to the customer (see fig. 21).





Fig. 21. Securing machine support legs

Transportation of machine carries out a producer, dealer or client, on the basis of additional decisions.

During transport, the wooden box with a machine should be protected against unexpected movement.

For loading and unloading, use a forklift or other device intended to carry a load with sufficient capacity. The forks should be inserted underneath a pallet with the box.

The operator of these devices must have a valid permission to operate them.



Take particular care when loading and unloading in the presence of bystanders who should not be in the danger zone (maneuvering the load). For loading and unloading activities there are needed two persons.

Be careful when unpacking the machine out of the wooden box. Unscrew metal band and screws fixing the machine to the palled. Remove the machine from the pallet and set it on a flat, level surface. Remove the stretch film. Remove machine components from cardboard boxes. Mount the stand for thread spools and LCD monitor – see clause 4.2.

4.2 Installing the sewing machine components



NOTE!

Perform the assembly of the sewing machine in 2 persons. These persons must be familiar with the machine structure.



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

It is recommended to set the machine on level ground. Thanks to the wheels the machine can be easily moved. Remember to press the brakes when You pace a machine at the destination.

Pneumatic components



- (1) Installing couplings to the regulator
- Pneumatic regulator 1 is installed under working table regulator on mounting plate 5 by screw 2, spring washer 3 and nut 4.
- Mounting plate 5 is fixed to the table by accessory screws 8.
- 3) You should only install couplings 6 and 7 on regulator 1.
- 4) Connect ø 6 air tube coming from the sewing machine to coupling 6.





(2) Adjusting the air pressure

1) The operating air pressure is 0.5 to 0.55 MPa.

Adjust the air pressure using air pressure regulating knob **1** of the filter regulator.



(3) Exhaust tube

Check whether ø 8 exhaust tube ① coming from the sewing machine passes through hole ② in the table.

In the case of high humidity, water may flow out from the exhaust tube.





Assemble the thread stand, set it up on the machine table using the installation hole in the basis and tighten nut **1** gently.

The scanners are fixed in places, do not move them.



Mounting the LCD monitor

Tighten the LCD monitor by 4 screws to the stand. Thanks to swivel points You can set monitor in most comfortable position.



Fig. 22. Mounting the LCD monitor

Connecting components

Before You connect machine to the electrical power source:

- place a pedal KES 18 on the ground and connect it to the machine by set plug / socket,
- place a printer on the shelf ground and connect it to the machine by set plug / socket,
- connect the LCD monitor to the machine by set plug / socket.

4.3 Electrical connections



NOTE!

During electrical work must exercise all precautions and comply with all safety rules. It is forbidden to perform any work on the electrical system by persons without appropriate documented permissions.



NOTE!

Responsibility for the correct connection of machine, performing connection and periodic inspection of fire protection system of the machine being used lies with the User.





NOTE!

The company JUKI CENTRAL EUROPE Sp. z o.o. assumes no responsibility for damage caused during the execution electrical connection improper with the applicable regulations and subsequent operation of the machine.

The machine must be connected to the mains current single phase 1 x 230 V, a set of plug / socket, by cable which is standard machine equipment.

Before connecting the machine to the mains current check that the switch is in the off position.

Make sure the line voltage is compatible with the specifications of the machine. If not, an electrician should introduce appropriate safety devices. Connect the machine to the power source.

After connecting the machine to the power supply check the correctness of connection and perform a functional test.

Switch machine rotating the main switch to ON position. Then push the backlit button "Computer START / STOP". Wait until the computer system starts. Further details – see clause 7.2 and 7.3.

In case of any problems, contact the machine manufacturer.

Electrical components diagram – see fig. 23. Control block diagram – see fig. 24.

IMPORTANT!

A person with a valid electrical license must perform electrical checkups before the first start, and record the result in a report. These tests should be repeated periodically. Performing checking tests with the positive result is a condition of the

putting machine to use.









Fig. 24. Control block diagram



5 PREPARATION OF INDUSTRIAL SEWING MACHINE SADE

5.1 Preliminary operations - general principles



NOTE!

Never use a machine with a disassembled or damaged guards or scanners.

IMPORTANT!

For working, use protective clothing and safety shoes. Do not use clothing with loosely hanging straps, tie strings, etc.



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

Whenever the sides of the machine are mentioned it should be understood, as shown on Fig. 2.

Before first start make the first lubrication (see clause 5.2). Before each starting (except for short shutdowns) the machine operator must conduct the sequence of checks.

Don't start the machine on until you complete the check as described below.

In the scope of checks are the following steps:

- 1. Visually inspect the machine for external damages, make sure whether it has all guards, safety devices, scanners and all components (especially needle). Tighten loose connections.
- 2. Check electric cables and connections and power cord (it is not acceptable to work with a damaged wire insulation).

Carrying out these checks limits the possibility of machine failure and enables safe operation of the workstation.

After the inspection activities:

- 3. Plug the power cord into the socket and switch the machine on.
- 4. Log in by chip card reader or entering login and password on touchscreen.
- 5. Perform machine components and parameters adjustment depending on the kind of car airbag sewing (see clause 6, 7.1.3 and 7.1.4).



5.2 First lubrication

WARNING!

- 1. Do not connect the power plug until the lubrication has been completed so as to prevent accidents due to abrupt start of the sewing machine.
- To prevent the occurrence of an inflammation or rash, immediately wash the related portions if oil adheres to your eyes or other parts of your body.
- 3. If oil is mistakenly swallowed, diarrhea or vomiting may occur. Put oil in a place where children cannot reach.

Lubrication procedure

LU-2810-7



Fill the oil tank with oil before operating the sewing machine.

- Fill the oil tank with JUKI NEW DEFRIX OIL No.1 (Part No.: MDFRX1600C0) or JUKI MACHINE OIL #7 (Part No.: MML007600CA) using the oiler supplied with the machine from section .
- Fill the oil tank with the oil until the top end of oil amount indicating rod 2 comes between the upper engraved marker line A and the lower engraved marker line B of oil amount indicating window 1.

If the oil is filled excessively, it will leak from the air vent hole in the oil tank or proper lubrication will be not performed. In addition, when the oil is vigorously filled, it may overflow from the oil hole. So, be careful.

3) When you operate the sewing machine, refill oil if the top end of oil amount indicating rod2 comes down to the lower engraved marker line B of oil amount indicating window 1.

1. When using a new sewing machine for the first time or using the sewing machine which has not been used for a long time, run in the sewing machine at a sewing speed of 1,000 sti/min or less and check the oil quantity in the hook before use.

If the quantity of oil in the hook is insufficient, adjust the quantity of oil by turning the oil quantity adjusting screw counterclockwise to ensure that the oil quantity in the hook is adequate. After that, adjust the quantity of oil to the adequate one. (Refer to "Adjusting the oil quantity in the hook")



- For the oil for hook lubrication, purchase JUKI NEW DEFRIX OIL No. 1 (Part No.: MDFRX1600C0) or JUKI MACHINE OIL #7 (Part No.: MML007600CA).
- 3. Be sure to lubricate clean oil.

Adjusting the oil quantity in the hook



- 1) Remove rubber cap 1.
- Loosen nut 2 and turn oil amount adjustment screw 3 to adjust the amount of oil in the hook.

Turning the screw clockwise **A** will decrease the amount of oil in the hook or counterclockwise **B** will increase it.

3) The appropriate amount of oil, when a sheet of paper is placed near the periphery of the hook, is to such an extent that splashes of oil from the hook appear in approximately five seconds as shown in the figure on the left.

Caution

In the case the oil quantity in the hook cannot be adjusted to the proper quantity, it should be adjusted by loosening nut 4 and turning oil quantity adjusting screw 5. The oil quantity in the hook is increased by turning the oil quantity adjusting screw counterclockwise **C**, or is decreased by turning it clockwise **D**.

Also check to be sure that the oil is fed to the hook at the sewing speed of 1,000 sti/min.

5.3 Attaching the needle

Switch "off" the motor. Use 135x17 needles. Scan the needle box bar code.







The dialog will close automatically.



- 1) Turn the handwheel to bring the needle bar to the highest position of its stroke.
- Loosen needle clamp screw 2. Hold the needle so that the long groove on needle 1 faces directly to the right.
- 3) Push needle **1** deep into the needle clamp hole until it will go no further.
- 4) Tighten needle clamp screw **2** firmly.



When replacing the needle, check the clearance provided between the needle and the blade point of hook. (Refer to "6.5. Needle-to-hook relation" p. 61 and "6.6. Adjusting the hook needle guard" p. 63.)

If there is no clearance, the needle and the hook will be damaged.

5.4 Placing thread cones

In many plants top and bottom threads are considered to be critical in relation to the product. Identification of the threads is therefore required and most of the time you'll find barcode readers that will scan for a barcode under the cone.

If so, you'll have to place the cone so that the barcode is aligned with the scanner. The cone is properly placed if the barcode reader starts to beep and flash.







Fig. 26. Placing thread cones

Like on all sewing machines the thread guide should be straight above the cone allowing the thread to come off vertically. SADE uses sensors to sense the thread cone being present at the cone stand and not only scanning the bar code.



NOTE!

The cones can only be read by the stationary scanner underneath the cones once their presence is checked by the sensors.

5.5 Attaching and removing the bobbin

Switch of the sewing control motor first.

Place the bobbin width the "Main chamber" facing the bar codes upwards.



Fig. 27. Attaching and removing the bobbin



1) Lift latch **1** of hook, and take out the bobbin.

2) Put the bobbin into the shaft in the hook correctly and release the latch.

- 1. Do not make the machine run idle with the bobbin (bobbin thread). The bobbin thread is caught in the hook. As a result, the hook may be damaged.
- 2. Be careful so as not to get hurt with the top end of the counter knife.

WARNING!

The bobbin monitor will not work if the bobbin is placed or winded incorrect.

5.6 Threading the hook



- Pass the thread through thread path 1 in the inner hook and thread hole 2 in the lever, and slowly draw the thread. Now, the thread passes under the tension spring.
- 2) Make sure that the bobbin revolves in the direction of the arrow when you draw the thread.





5.7 Winding a bobbin

The bobbin will snap on the winder shaft if placed correctly. If you look at the bobbin, you'll notice a larger and deeper flange on the bobbin. This side has to be put face towards the bobbin winder when winding the bobbin. The bar codes have to be visible on the front facing the bar code scanner.





a) bobbin

b) visible laser beams at the bobbin winding station

Fig. 28. Winding a bobbin

The bobbin will snap on the winder shaft if placed correctly. If you look at the bobbin, you'll notice a larger and deeper flange on the bobbin. This side has to be put face towards the bobbin winder when winding the bobbin. The bar codes have to be visible on the front facing the bar code scanner.

When closing the clamp the bobbin is scanned and after 3 seconds the winding process starts automatically and finished once the bobbin is fully winded with the thread.



NOTE!

The bobbin cannot be scanned by the hand held scanner! The fixed scanner will only start once the bobbin is locked by the clamping like shown in figure above 28. b).

AND the bobbin can only be winded when you are in main menu and not in a sewing process.





- Pass the thread through sections
 to 4 in the numerical order.
- 2) Put the thread until the root of bobbin thread clamp 5 is reached. Then, trim the thread. (The thread end is retained under the looper thread clamp.)
- Load a bobbin on bobbin winder shaft 6.
- Press bobbin winder lever
 in the direction of the arrow.
- 5) When you start the sewing machine, the bobbin rotates to automatically wind the thread on itself.
- 6) When the bobbin is filled up, the bobbin winder lever automatically releases the bobbin and the bobbin winder stops running.

- The bobbin thread winding amount is adjusted by loosening setscrew 8. The bobbin thread winding amount is increased by moving bobbin wider lever 7 upward.
- 2. If the thread comes off the thread tension controller, wind the thread on the intermediate thread guide by one turn.
- 1. This is the one-touch type bobbin winder. When the bobbin is fully wound with thread, bobbin thread clamp **5** automatically returns to the initial position.



- To terminate bobbin winding before the bobbin is fully wound with thread, turn the handwheel, while slightly lifting bobbin winder lever 7, to bring bobbin thread clamp 5 back to its initial position.
- 3. If the thread is not brought to the root of the bobbin thread clamp, the thread slips off the bobbin at the beginning of bobbin winding.

5.8 Threading the machine head

Thread tension is considered to be critical in relation to the product, for that reason the upper thread tension compartment is locked. With the key of this lock comes the responsibility of correct tension setting.





Fig. 29. Threading the machine head

Thread the machine head following the order as illustrated in the figure.

* Pass thread through the right side of thread tension monitor **(II**).



1. Thread tension monitor **(1)** is necessary to monitor tension of top thread and to prevent the thread from slipping off the needle eyelet when performing thread trimming at a position which is outside the material.



2. If thread tangling failure occurs when starting sewing from the material edge, the thread should be removed from the location where it is clamped with the spring of thread tension monitor (1), or thread tension monitor (1) should be changed with another one. The replacement thread tension monitor is separately available.

6 ADJUSTING THE SEWING MACHINE

6.1 Adjusting the stitch length

The stitch length is set automatically by a step motor. To make regulations You should log in to the program and choose menu Setting (see clause 7.1.2.13).



Manual one-touch reverse feed stitching

- 1) Press touch-back switch **5**.
- 2) Reverse feed stitches are made as long as you keep pressing the lever down.
- 3) Release the switch, and the machine will run in the normal feed direction.

Changing over the stitching pitch

 Press stitching pitch changeover switch
 to change over the stitch length to the one corresponding to the scale mark on the 2P feed adjusting dial. (The LED on the switch lights up.)



6.2 Thread tension



Adjusting the needle thread tension

- Turn thread tension nut No. 1 ① clockwise A to shorten the length of thread remaining on the top of needle after thread trimming. Turn the nut counterclockwise B to lengthen it.
- Turn thread tension nut No. 2 2 clockwise C to increase the needle thread tension, or counter-clockwise D to decrease it.

This procedure deals with setting of the BTSR. A special application is available for the BTSR thread tension sensor for re calibration. Contact your Juki service distributor for details.



Fig. 30. Thread tension



Apply the same tension to both of the thread tension nut No. 2.



In the case, the length of thread remaining at the needle tip cannot be increased, replace the spring of tension controller No. 1 with 22945505 which is separately available.





WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



Adjusting the bobbin thread tension

Turn tension adjustment screw ③ clockwise A to increase the bobbin thread tension, or counterclockwise B to decrease it.

6.3 Thread take-up spring



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



(1) When you want to change the stroke of the thread take-up spring
Loosen screw 2. Adjust thread take-up spring 1 by moving it in the slot.





(2) When you want to change the tension of the thread take-up spring

To adjust the tension of thread take-up spring **1**, loosen nut **7** first. Turn spring shaft **8** counterclockwise to increase the tension or clockwise to decrease it.

After the adjustment, fix the stud by tightening nut **7**.

6.4 Adjusting the pressure of the presser foot

Regulating unit is secured by special guard against unauthorised setting changes.



Turn presser spring regulating dial **1** clockwise **A** to increase the pressure of the presser foot, or counterclockwise **B** to decrease it.



Be sure to operate the sewing machine with the pressure of the presser foot minimized as long as the presser foot securely holds the material.

6.5 Needle-to-hook relation





WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



- 1) Adjust the standard feed adjusting dial to "0". (Caution 1).
- 2) Loosen hook driving shaft set collar clamping screw (3), and turn the handwheel counterclockwise to make the needle bar ascend by 2.3 mm from the lowest position of its stroke.
- 3) In the state described in 2), align blade point 1 of the hook with the center of needle 2, and tighten hook driving shaft set collar clamping screw 3. At this time, a clearance of 1.5 mm is provided between the blade point of the hook and the top end of the needle eyelet. (The hook driving shaft set collar should be flush with end face of the hook driving shaft.)
- 4) Loosen setscrews (4) and (5) of the hook driving shaft saddle on the top face of the bed. Adjust the clearance between the blade point of the hook and the needle to 0.05 to 0.1 mm by moving the hook driving shaft saddle to the right or left to change its position. Then, tighten setscrews (4) and (5).
- 5) Align the largest scale mark of the standard feed adjusting dial with the marker dot on the machine arm.

Check to be sure that the blade point of the hook does not come in contact with the needle.



 If stitch skipping and thread breakage occur when using elastic thread such as vinylon, adjust the hook timing with the pitch used for sewing.
 The operation panel could come in contact with the thread stand when



tilting the machine head. To protect the relevant parts from contact, shift the thread stand to a position at which the thread stand does not interfere with the control panel.

To check the needle bar position as described in the aforementioned 2) [i.e., "...the needle bar ascend by 2.3 mm from the lowest position of its stroke"], you may use the display of the main shaft rotation angel under the "machine head adjustment mode" of the SC-922.



Increase the numerical value displayed when the needle bar is in its lowest position of its stroke under the "machine head adjustment mode" by 25 degrees of an angle, the needle bar goes up by 2.3 mm. (When the needle bar ascends by 2.3 mm from its lowest position of its stroke, the main shaft rotation angle is 25 degrees of an angle.)

* In the case of adjusting the needle-to-hook relation under the "machine head adjustment mode", do not press 🕀 switch.

Refer to "6.11. Adjustment of the machine head" in the Instruction Manual for the SC-922 for the machine head adjustment mode.



6.6 Adjusting the hook needle guard



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



When a hook has been replaced, be sure to check the position of the hook needle guard. As the standard position of the hook needle guard, hook needle guard 2 must push the side face of needle 1 to lean the needle by 0.05 to 0.2 mm away from its straight position.

If the state of the hook is not as shown above, fit hexagon wrench 4 into 3 of needle guard adjusting screw and adjust as follows:

- 1) To bend the hook needle guard in direction **a**, turn the needle guard adjusting screw in direction **A**.
- 2) To bend the hook needle guard in direction **b**, turn the needle guard adjusting screw in direction **B**.
- 3) At the final step of procedure, appropriately adjust the clearance provided between the needle and the hook.

6.7 Adjusting the bobbin case opening lever



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.





- Turn the handwheel in the normal direction of rotation to bring bobbin case opening lever 1 to the closest position to inner hook 2.
- Turn inner hook 2 in the direction of the arrow until stopper 3 is pressed against the slits in throat plate 4.
- Loosen bobbin case opening lever crank setscrew **5**. Adjust the clearance provided between the bobbin case opening lever and protruding portion **A** of the inner hook to 0.7 to 0.9 mm.

Tighten setscrew **5** while pressing down bobbin case opening lever crank **6**.

6.8 Adjusting the position of counter knife, knife pressure and clamp pressure



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



• Adjusting the knife pressure

3) Loosen setscrews 2 in the moving knife.

Turn the handwheel to move the moving knife and adjust the knife pressure.

As the standard adjustment, the knife pressure should be applied from the time when the distance from the top end of the moving knife to the top end of the counter knife is 6 to 7 mm.

- Adjust the knife pressure in the state that the clamp spring 4 does not come in contact with the moving knife 5 (the clamp pressure is not developed).
- 2. Be sure to carefully prevent from getting injured by the moving knife (5), counter knife (3), blade point of the hook, etc.

Adjusting the clamp pressure

4) To adjust the clamp pressure, firstly loosen clamp spring setscrew 6. Adjust the lateral position of clamp spring so that a clearance of 3.7 ± 0.1 mm is provided between clamp spring 4 and counter knife 3. Then, adjust the longitudinal position of the clamp spring by tightening setscrew 6 with the clamp spring pressed against the stepped portion of the counter knife base.



Check to make sure that the clamp pressure is applied when moving knife **5** moves to its back end.

 Move the moving knife 5 by hand to its forward travel end.

- Adjusting the counter knife
- 2) Loosen counter knife base setscrews
 1). Adjust the position of the counter knife so that top end of the counter knife
 3) so that it is spaced 1.2 to 1.5 mm from the end face of the throat plate in terms of the lateral direction, and so that it is pressed against the stepped section of hook driving shaft saddle in terms of the longitudinal direction. Then, tighten setscrews 1).

Loosen counter knife setscrews \bigcirc . Adjust the distance between the bed slide mounting plane and the counter knife tip to 37 ± 0.1mm. Then, tighten setscrews \bigcirc .





6.9 Adjusting the amount of the alternating vertical movement of the walking foot and the presser foot

This regulating unit is mechanically locked against unauthorized setting change. To make regulation remove lock at first.



Adjust the amount of the alternating vertical movement of the walking foot and the presser foot using dial **①**. Turn the dial clockwise to increase the amount of the alternating vertical movement of the walking foot and the presser foot, or counterclockwise to decrease it.

Excluding the 1-needle European gauge type sewing machine, the amount of the alternating vertical movement of the walking foot and the presser foot has been factorylimited to 6.5 mm at the time of shipment. To cancel the restriction to the amount of the alternating vertical movement of the walking foot and the presser foot, remove the top cover, loosen setscrews (2) and shift stopper (3) to the right.



To release the stopper by means of the standard gauge, the presser foot may interfere with the walking foot. The presser foot may also interfere with the needle bar when a heavy-weight material is used.

Make sure that the presser foot interferes with neither the walking foot nor the presser bar before operating the sewing machine.



6.10 How to set the model of the machine head

This controller must be operated only by authorized and qualified person.



 Call Function Setting No. 95 in reference to "III-6. Function Setting of SC-922" in the Instruction Manual for the SC-922.

2) The type of machine head can be selected by pressing switch
5 (switch 6).
Select the model of the machine head - for LU-2810-7 it is L81d.



- 3) After selecting the type of machine head, by pressing switch
 3 (switch 4), the step proceeds to 94 or 96, and the display automatically changes to the contents of the setting corresponding with the type of machine head.
- 4) Turn the power OFF.



6.11 Adjusting the machine head







- Simultaneously pressing switch (4) and switch (5), turn ON the power switch.
- 2) **End** is displayed **(a)** in the indicator and the mode is changed over to the adjustment mode.
- Turn the pulley of the machine head by hand until the mainshaft reference signal is detected. At this time, the degree of an angle from the main-shaft reference signal is displayed on the indicator ^(B). (The value is the reference value.)
- 4) In this state, align one of the marker dots 7 on the pulley with marker line 8 on the pulley cover as shown in the figure.
- 5) Press switch **6** to finish the adjustment work. (The value is the reference value.)
- 6) Turn the power OFF.





When checking the adjustment result, set "Function setting No. 90; Initial sewing machine movement function" at "1: Initial operation - Sewing machine stops with its needle up". Then, check whether or not marker dot **7** is aligned with marker line **8**. If they are not aligned, carry out the adjustment again.



After checking the adjustment result, return the setting of No. 90 to the previous setting. (Initial value is "2. Initial operation: Sewing machine turns in the reverse direction and stop with its needle up".)

For the function setting procedure, refer to "6.10. How to set the functions of the SC-922" in the Instruction Manual for the SC-922.

6.12 Backstack setting

This type of setting is equal to normal SC922 driven sewing heads. Use the control panel CP18 to make the adjustments while in "Free sew" mode.



NOTE!

During normal production cycle the PLC might block certain features as back tack, presser foot lift and thread cutter.

6.13 Bobbin thread monitor adjustment

Alignment of the optical sensor and bobbin is critical for correct bobbin thread monitoring. If however alignment is correct and the bobbin can't be detected the sensitivity of the monitor might have to be tuned.

When opening the bobbin monitor amplifier make sure that the screws don't fall out. The sensitivity potentiometer can be adjusted with a small screwdriver as shown on the picture.



7 OPERATION OF INDUSTRIAL SEWING MACHINE SADE

7.1 Control device

Control device is computer program SADE operated from touch screen.

There is an option to translate (or rename) all text of the modules in Sade. In this manual we'll assume the text to be default (English). Read section 7.1.1 to find details on translations.



Fig. 31. SADE configuration screen operated from touch screen



Fig. 32. Language settings



7.1.1 SADE translation (in settings)

Select on the top menu the new language you want to translate SADE to. After the confirmation of the language the list of text appears. You can translate the text directly in SADE by typing the translation on the right side. Try to use not more characters than the English version since the window sizes match these amounts of characters. Alternatively you can export a *.txt file in the menu and do the translation on a different computer by using a text editor. Make sure you save the file in the format *.txt to be able to import it back into SADE.

8		Language Edito	
Edit			
Languagefile	ESPANIOL		
Translation list:			
English		Foreign Lng. (ESPANIOL)	
List of Labels		Lista de etiquetas	
Material		Materiales	
Product name:		Nombre de producto	
Product code:		Codigo de producto	
Safety seam:		Costura de seguridad	
Stitch length:		Largo de puntada	
Connect to Database		Conectar a base de datos	
Error		Error	
Yes		Si	
No		No	
Needle thread		Hilo de aguja	
Needle type:		Calibre de aguja	
unknown		Desconocido	
Bobbin thread		Hilo de bobina.	
Winding station		Devanador	
System settings	3	Configuracion de sistema	
Machine		Maquina	
ID:		D	
Virtual Keyboar	d	Teclado virtual	
Enable "Declar	e OK"	Activar aprobacion	
Language setti	ngs	Configuracion de idioma	
SQL-Connectio	n	Conexion SQL	
Host:		Servidor	
Port:		Puerto	
User:		Usuario	
Password:		Clave	
Database:		Base de datos	
Create Tables		Crear tablas	
Path locations		Ubicacion de rutas	
Images-Users		Imagenes de usuarios	
Images-Materia	al	Imagenes de materiales	
Images-Produc	ts	Imagenes de productos	
Images-Labels		Imagenes de etiquetas	
Printer		Impresora	
Label printer:		Impresora de etiquetas	
Label Width:		Ancho de etiqueta	
Search	in english Search in foreign language		
🖌 ОК	X Abbrechen		

Fig. 33. SADE translation window (in settings)



7.1.2 Configuration

Choosing the right configuration to suit production requirements will decrease difficulty when implementing and using the JUKI SADE. Below a step by step overview of the configuration parameters will follow. Consult Your Juki distributor so he can assist with the configuration to fit requirements.

The configuration screen is only accessible for users who have corresponding rights (section 7.1.5.1 "Users"). There is only one defined user with all access rights. The code for this user would be "1Z".



Fig. 34. SADE program

Click on <u>c</u> in the upper right corner to access the configuration parameters. The screen shown at fig. 35 will appear.

Any number of configurations can be saved independently. A saved configuration can be loaded and transferred to other machines. Once Sade is started a log file is generated. The actual configuration file is listed in this log file (section 7.1.9). To ensure proper logging, the name of a modified configuration file is pre-determined. It is recommended to fill in the "Configuration info"-field to make files recognisable.

The configuration screen has 6 so-called tabs:

- 1) User management
- 2) Material
- 3) Labels
- 4) Sewing and Products
- 5) Search Archive (only if logged in operator is permitted this function)
- 6) Settings




Fig. 35. The configuration screen

7.1.2.1 Machine identification (in settings)

Machine identification is probably the most important code for the product traceability system. The code is alpha-numeric and 60 positions in length.

WARNING! Always make sure the correct machine code is set.



Fig. 36. Machine identification (in settings)

7.1.2.2 Needle change setting

The "Needle change" - parameter offers an option to set a stitch counter. Once the counter has reached the defined amount of stitches.





Fig. 37. Material identification



a pre-set message will appear directly before or after completion of a production cycle.



Fig. 38. The "Needle change" comunicate

Typical use of this counter is to control needle change actions. The counter is interrupted if the machine is stopped and will only count during actual running of the machine. If deactivated in the check box stitchcounter active, the counter is disabled.



7.1.2.3 Login and exit program, changing user, manual operation

On start-up of Sade the operator identification (login) screen will appear. The computer can be switched off by anyone who presses the [Shut down] button.

Exiting the program can be done by clicking on the upper left corner Juki SADE logo. The manual sewing mode can be accessed by clicking on the hand pictogram and the logged in user can be changed by clicking on the double arrow pictogram.



Login Screen

On start-up of Sade the operator identification (login) screen will appear. You can logon by scanning your bar code or by entering your personal ID or by scan of your RFID card (Optional).



Fig. 39. Login Screen

7.1.2.4 Database combination mode

With the "database combination mode"-box checked the codes for new product definitions will be generated as a result of two database files. Please read section 7.1.2.17-7.1.2.18 for details.

7.1.2.5 Peripheral configuration

On the tab [Settings] the peripheral configuration is set. For each physical communication port, a device can be selected. By default COM1 is used for the PLC and COM2 for the barcode printer. Barcode scanners, a BTSR (section 3.3) and various other equipment can be assigned to available ports. Just click on a port and select the device from the appearing list.

If scan-back is used, the desired scanner (1..16) can be selected from the pull-down list.

An uninterruptible power supply unit (UPS) can be connected to the PLC. By default such unit will be connected to the computer using native Windows OS functionality to control and shut-down the system if required. Alternatively an UPS can be used directly on the PLC and bypass the computer. If power fails, the UPS will switch an input on the PLC in order to initiate system shut down.





Fig. 40. The Settings Tab

7.1.2.6 Data source and target configuration

Systemsetti	ngs		
Machine	SQL-Connection	Path locations Printer	Stitchmotor
Images-Users	C:\Users\Andreas\Docun	nents\SADE\Users\	-
Images-Material	C:\Users\Andreas\Docun	nents\SADE\Material\	
Images-Products	C:\Users\Andreas\Docun	nents\SADE\Products\	
Images-Labels	C:\Users\Andreas\Docun	nents\SADE\Labels\	
			

Fig. 41. The Path Locations Tab

On the [Path Locations] tab, source and target of data can be set.

Even when used as a stand-alone machine, the JUKI SADE will check for input and write output to two locations.

To set a desired path, click on the folder pictogram at the right side of the path line. A folder selection window will appear. Make sure to map network drives in order to make them selectable.

Remote Product files can be used to point to a location where product files are stored.

Remote User files can be used to point to a location where the user database files can be found.



WARNING!

At start-up of Sade, all files on this location will be copied into the local folder. Local files with similar filenames will be overwritten without notice. If the assigned folder is empty, only local files will be used.

Remote Dbase and text output is used to point a location where copies of the traceability files are stored. The files will append a record on each approved production cycle. Use this function if a stable networking environment can be guaranteed. Scheduled external synchronisation with the locally stored traceability files will increase security of the files and enabled maximum safety of output data.

Products		Q.
Name	Barcode	
AK leather		🖉 🤤 📋
Juki Test2	3919900371	/ 🥥
Test2	123456	/ 🤤
VW-LH-Seat-4533	JukiPoland	/ 🤤
VW caddy	2	/ 🥥
~		

7.1.2.7 Product selection menu

Fig. 42. Product selection menu

The product identification code enables Sade to load relevant data from the product database into the PC memory and to set the options of seam length, thread tension, and block the machine functions. The operator enters the code of the resulting product. When the product is existing in the database it is shown in the main menu after start up.

The operator either scans a bar code of the product to select it or he selects the product from the menu or he enters the product code.

If the operator tries to enter a product i.d. code that does not exist the SADE it will refuse this code and the operator won't be able to start a product cycle.



Enable declare ok, after the checking of the tear seam sewing and some tension values being outside the limits normally the parts would be rejected and automatically declared as fault part. The Enable declare OK function allows a super user / administrator to declare the part as OK. However the declaration is documented in the database with time date and name of user who declared okay.

chine	SQL-Connection	Path locations	Printer	Stitchmotor
8888				
V	irtual Keyboard			
	Language settings			
(nable "Declare OK"			

Fig. 43. The declare tab



7.1.2.8 Product options

On the [Sewing and products] tab production cycle (select sewing job to be used) and material options can be set.



7.1.2.9 Product definition options



Fig. 44. Product definition options

Under [product] tab options a product definition can be made. The product definition contains all relevant data to perform the sewing of a product.

It has to contain the sewing job which defines the seam length's and the thread tension limits and the stitch length setting, and the materials which should be used. It will be checked by the scanners upon starting the sewing process.

You can activate or deactivate the Stitch counter and define the amount of stitches for the needle wear.

You select the sewing job for the seam length and thread tension settings first, then you give a name under which you want to save the product definition.

You can select the material to be used material from the material database.

Adding material is done by clicking (at the bottom of each material field.

Once you have selected a material in the materials field you can also delete it by

clicking

Editing any entry can always be done by clicking



7.1.2.10 Material definition options

Under [Material] tab options all material definition can be made.

In each material group you can add an unlimited amount of materials.



For an easy selection you can select or deselect the display of material groups.

Simply click on the tab on top, selected material group is highlighted in grey colour.

Cones	Needles	Sewing material	Others
	Fig. 45. Selecte	d parameter group	

You can define up to five different sub materials to be used and checked for presence upon starting the sewing process.

- 1) Cone top thread
- 2) Cone bottom thread
- 3) Needles
- 4) Sewing material
- 5) Others (free definition)



Fig. 46. Material tab options



Sewing job profile editor

Click on [sewing jobs] to access the editor (figure 44 in clause 7.1.2.9). The following screen will appear:

Choose one of the sewing jobs to be edited or add a new one.





Fig. 47. Sewing job profile editor

After selecting either an existing sewing job or creating a new one the following screen appears.

SADE ID: 8880 00 20 Korz 1966		07.07.2015 10:49:37	Capergin 2015 by JCE Jake Control Farmer
Name: <u>Dob 20-30-20</u> Seamsection-1	•	Nextilinge Groz Beckert	Needle t
			hread
10 Stitches = 40,0mm 30 Stitches	120,0mm 10 Stitches = 40,0mm		🔕 Bobb
Seamlengths Note-1 Note-2 Threadenson Rachingarameters	alels Presiam Labels Portseam		in thread
Preseam Safety seam - 10 + sticles - 30 + sticl	Postseam - 10 + stickes	an Bödachimtastatu	
Blind Area		• • • • • • • • • • • • • • • • • • •	Post Bidt Nav Ende Bids Nussen Einfg Pause Nusten
- 3 + vickes			Druck Rollers Andresen Optioneer Hilfe Andresen
1	8		ation

Fig. 48. Screen sewing job profile

The product profile describes the features of a specific side air bag cover seam.

Each record holds the set of parameters that will be pre-loaded into the PLC and additional devices for evaluation during the sewing cycle. A product profile record can be shared by any number of product definitions.





7.1.2.11 Explanation of the product profile parameters

Seam length

Defines the seam lengths of pre seam, safety seam and post seam. You can type the length into the boxes, use the scroll buttons or simply move the stitch graph by hand.

Name: Job 20-30-20	(
-6 7 -7	+7
1 10 10 Stitches = 40,0mm 30 Stitches = 120,0mm	40 metaline 10 Stitches = 40,0mm
Seamlengths Notch-1 Notch-2 Threadtension Machineparameters Labels Preseam Labels Postseam	
Preseam Safety seam Postseam - 10 + stiches - 30 + stiches - 10 + stiches	ches
Blind Area - 3 + stiches	
2	8

Fig. 49. Product profile parameters

Post seam

The maximum number of stitches after recognition of the last notch. This setting won't affect the product traceability as the piece is already validated after the last notch. Still it might be useful to prevent the operator from sewing too much.

Notch 1 types of notches

The system enables you to select normal positive notches, an negative V notch and no notch.

When selecting the no notch option then you need to simply define the amount of stitches from pre seam, safety seam and post seam.

Defines the position and the tolerance for the first Notch (indication of start of the safety seam). Tolerance indicates of how many stitches earlier or later the notch has to be reached. This applies for BOTH normal positive and V notch.

The setting no notches has no tolerance settings.









Blind area and edge offset (safety seam)

During the number of stitches entered here, the positive notch recognition of the guide will be ignored. This feature is useful to suppress threads and materials that might be falsely seen as the first positive notch; the edge offset indicates how many stitches should be added before the new seam section starts to count. This is useful when you want the safety seam to start in the centre or at the end of the notch.

Name: Job 20-30-20 Seamsection-1		(
-6 +7		-7 -7
1 10 Stitches = 40,0mm	30 Stitches = 120,0mm	40 10 Sötches = 40,0mm
Seamlengths Notch-1 Notch-2 Threadtenson	Machineparameters Labels Preseam Labels Postse	am
Tolerance + - 7 + stiches	Edge detection	
Tolerance - 6 + stickes	Edge offset - 0 +	stiches
Ø		0

Fig. 51. Setting blind area and edge offset (safety seam)

Notch 2

The system enables you to select normal positive notches, an negative V notch and no notch.

When selecting the no notch option then you need to simply define the amount of stitches from pre seam, safety seam and post seam.

Defines the position and the tolerance for the first Notch (indication of start of the safety seam). Tolerance indicates of how many stitches earlier or later the notch has to be reached. This applies for BOTH normal positive and V notch.

The setting no notches has no tolerance settings.

The way of parameters setting is similar to parameters shown of fig. 50.

Blind area and edge offset (post seam)

During the number of stitches entered here, the positive notch recognition of the guide will be ignored. This feature is useful to suppress threads and materials that might be falsely seen as the first positive notch; the edge offset indicates how many stitches should be added before the new seam section starts to count. This is useful when you want the post seam to start in the centre or at the end of the notch.





Fig. 52. Setting blind area and edge offset (post seam)

7.1.2.12 Thread tension settings and tolerances

Defines the limit of the thread tension which is measured by the thread tension sensor. In this section there are optional settings for an additional tolerance of the thread tension. If the option of setting max. NOKs and max NOKs in a row are granted as user rights then you can select the settings. Please use these settings carefully as they have a great impact on your product quality. The meaning is as follows:

Max NOKs – define how many not okay stitches (by their thread tension values) are allowed in the safety seam. E.g. you define 2 stitches as max NOKs, then if 7th^s, 8th, 9th stitch is out of limits then the system stops and declares the part as not okay.

Max NOKs in a row – define how not okay stitches (by their thread tension values) are allowed in the safety seam in a row. E.g. you define max 2 stitches as max NOKs in a row then if the 7th^s, 8th, 9th stitch are out of limits then the system stops and declares the part as not okay.





7.1.2.13 Machine parameters – stitch length setting

Seam monitoring by the JUKI SADE is fully based on stitch counting. However a stitch length value has to be entered for reference. Unless the stitch length setting is automated, this value will have to be set manually for production or data in any way. Once the set-point has been reached, there is no alternative but to heal back and end the seam; the stitch length will be automatically set before each production cycle.

The SADE software calculates the length of the pre seam, safety seam and post seam according to the set stitch length multiplied by the amount of stitches.







The stitch length is set automatically to the value entered in the sewing job. In order to keep the stitch length always accurate it is set EVERY time you start a sewing procedure.

After log in to program You should click on icon Settings placed in upper right corner.



Fig. 55. Settings icon

Then click on Sewing and products:



Fig. 56. Sewing and products Tab



Choose Sewing jobs:



Fig. 57. Sewing jobs Tab

Click on pencil icon placed at the left side of sewing program name, that you want to change the stitching length.



Fig. 58. Changing the stitching length Tab

Select the tab Machine parameters and set stich length in mm. After setting it save changes. Since that each time when you choose this sewing program the stitch length will be set automatically.

7.1.2.14 Label Pre seam and machine stop point

There might be a situation or product that requires the scan of an existing label or a label to be printed BEFORE starting the sewing process of the safety seam. You can define a label to be used and click the box to activate the printing AND scanning of the label. However you can select the stop point of the machine meaning when it should receive the command to interrupt the sewing process, print the label and ask for scanning the label.





Fig. 59. Label Pre seam and machine stop point

7.1.2.15 Label Post seam and setting stop point of the machine

This is actually the most important setting of the system. The end label or traceability label is essential part of the documentation of the SADE system. It is unique label that you can define under section label in the settings section. However you can select the stop point of the machine meaning when it should receive the command to interrupt the sewing process, print the label and ask for scanning the label. After you selected the label and its scanning time you can move the label in the seam by clicking at it and moving it side wise.



Fig. 60. Main menu



Label post seam settings:

You select the label, then you select the scanning operation, you select the sewing if it should be done within the post seam or maybe at a different position. Message.



Fig. 61. Post seam label

7.1.2.16 Message – Post check

This checkbox and free text entry enables the possibility to interact with the operator and to make this interaction part of the product evaluation. For example: When the operator arrives at the second notch, a message pops up. The operator is asked to perform some kind of visual inspection of the product. At the same time response of the operator is required. The message might look like: Do you see more than 3 loops in the tear seam area?



Fig. 62. Message – Post check

7.1.2.17 Label position end of automatic mode

After the last notch, once the set-point is reached, the machine will move into **manual mode** until the **next scan** of parts have been performed. The operator will have to release the pedal before sewing can continue. This feature is primarily used to increase awareness of the importance of the product traceability label and give the handling of the label a fixed place in the production cycle. If scan-back is used, a message will appear where the operator is forced to present the barcode to a scanner in order to con-



tinue sewing. An alternative use of this feature is the "Minimum end stitches"-effect. The operator will be able to end the seam and start a new seam without ending the production cycle for as long as the set-point hasn't been reached;

7.1.2.18 Tension monitor

Before start of the production cycle, these settings will be transmitted to the Juki PLC control, and evaluated accordingly. Max NOKs or Max NOKs in a row filter can be used to allow a certain number of successive stitches to be outside tolerance settings. The BTSR thread tension monitor can be calibrated by the optional software license and a set of weights and special stand. Please ask your local Juki distributor for details.



Fig. 63. Tension monitor

7.1.3 Product definition editor

Click on [Products] to access the editor (figure 42, section 7.1.2.7). The following screen will appear:





Fig. 64. Product definition editor

The product definition editor is used to link product profile and materials to a product identification code.

Explanation of the product definition parameters:

7.1.3.1 Cone upper thread

From this field a upper thread for the sewing can be selected (reference to the material database).

7.1.3.2 Cone bobbin thread

From this field a bobbin thread for the sewing can be selected (reference to the material database).

7.1.3.3 Needles

From this field a needle for the sewing can be selected (reference to the material database).

7.1.3.4 Sewing material

From this field a material, being one or multiple parts for the sewing can be selected (reference to the material database).



7.1.3.5 Others

From this field an additional material such as a plastic retainer etc. for the sewing can be selected (reference to the material database).

7.1.3.6 Needle wear

By checking the stitch counter active box in the product configuration the needle change interval time can be set. The needle wear parameter in this screen acts as a counter to count the stitches since the last needle change.

7.1.3.7 Material combinations

The sewing material part of the product definition editor is used to select acceptable material identification codes for the current product. For material different codes can be set and scanned. If no materials are selected for a certain tab, this material number will not be checked in the production cycle. Material tabs where codes have been selected are indicated green.



7.1.4 Material editor

Click on [Materials] to access the editor. The following screen will appear:

Material				
Cones	Needles	Sewing material	Others	
Name	Barcode	Group		
Coats aptan black	901	Cones	1	
Groz Beckert	12345	Needles	1	9
M30-Black	902	Cones	1	9
Needle-3454	454334	Needles	1	9
Serafil black 30/3	900	Cones	1	9
Testneedle2	555	Needles	1	9
Testneedle2	555	Needles	/	9
0				0

Fig. 65. Material editor

Use the material editor to store material identification codes. Each material can be accessed by pressing the corresponding tab on the top.

Needles	Sewing material	Others	
	Needles	Needles Sewing material	Needles Sewing material Others

Fig. 66. Material menu tab

The material code field holds the actual identification code which should match the material code entered for a certain product identification.

The material name serves as a field to enter a description. You can add a photo of the material by clicking on the pencil next to the No image window.



Materia		
Name:		
Barcode:		
Label	Use existing Label	Ų
Group:	Sewing material	~
		3

Fig. 67. Material name field

7.1.5 User Management editor

Click on "Users management" (fig. 40, section 7.1.2.5) to access the editor. The following screen will appear:



Fig. 68. User Management editor

The editor has two tabs, the first lists the names of the users and, the second tab defines the profiles.

On an empty database it is recommended to start with the definitions of the user profiles on the second tab.

7.1.5.1 Users

Select the user you want to edit or click on the green + button to add a new user. When adding the new user you can set the pre defined user profile with its individual rights.



Profilename <mark>Operator</mark>			
Production	Archive	Edit Users	Delete Users
Setupmode	Statictics	Edit Material	Delete Material
Handmode		Edit Labels	Delete Labels
Declare ok		Edit Reports	Delete Reports
Settings		Edit Sewing Jobs	Delete Sewing Jobs
Calibration		Edit Products	Delete Products
Ø			3

Fig. 69. User profile defining Tab

To define a profile click on [+] to add a record.

The first field of the record is the (unique) name of the profile. This name is used to link a user to a profile. The profile name is case sensitive and may contain spaces so make sure to edit profile names properly.

The following fields can be set to True or False by ticking the box next to it and serve the following purpose:

Profile	Individual rights
Production	Allows the user to actually sew a product once valid product i.d. and material i.d. have been given.
Setup mode	Allows the user to edit configuration settings (section 7.1.2).
Handmode	Allows the user to change the sewing status to manual sewing machine
Declare OK	Allows the user to declare a part as ok even though measurements of thread tension or notch positions are not within the limits
Settings	Allows the user to change all settings like SQL database, directories etc. in settings
Calibration	Allows the user to re-calibrate the thread tension sensor (only BTSR sensor)
Archive	Allows the user to search the data archive for sewn parts and view the results
Statistics	Allows the user to search the archive and show the statistics of it
Edit users	Allows the user to edit the user profiles and user rights, User profile editor; allows the user to start the user profile editor



Edit Material	Allows the user to edit the material database, Material profile editor; allows the user to start the Material profile editor
Edit Labels	Allows the user to edit the labels (if option label generator has been purchased)
Edit Report	Allows the user to edit the labels (if option report generator has been purchased)
Edit sewing jobsbs	Allows the user to edit sewing jobs and their content
Edit Products	Allows the user to edit the Product database, Product profile editor; al- lows the user to start the product profile editor

The following have in common that the respective data can be deleted.

Delete Users

Delete Material

Delete Labels

Delete Reports

Delete Sewing jobs

Delete Products

7.1.5.2 User identification

The user identification database editor has the following editable fields:

Personal ID	This is the actual code used to identify a user if no chip card reader is used. If a chip card reader is used, the tag is used to link a user to a RFID card. The code on the card remains hidden. Using a chip card in- creases protection against unauthorized access.
Name	This field is used for the operator name.
Profile	Here the link between operator and profile (user rights) is made by enter- ing the exact description a profile.

7.1.6 Label lay-out editor

Click on [Labels] to access the editor (if option has been purchased). The following screen will appear:







Fig. 70. Label lay-out editor

Sade offers the possibility to create a different traceability label for each product profile. With the editor lay-outs can be made and maintained.

A label can contain any number of elements. There are 5 types of elements available:

- 1) Barcode;
- 2) Text;
- 3) Generic image;
- 4) Image of product;
- 5) Image;

Simply drag and drop them by keeping the button of item pressed. Then position it in the labels range. The sizes can be changed by scrolling the radio buttons or entering numeric value data into the field.

The elements barcode and text can contain fixed information, a variable or a combination of both. There are 34 pre defined fixed information. Simply click on the

Pull down menu source to select the source of information.



The graphic representation of a label at the up right side of the screen should help to clear orientation difficulties.

For accurate editing it is useful to set the size of the label. Remember that it is possible to span the layout over multiple labels. The setting is made on label height and width in settings. - Printer.





NOTE!

For label printers the size of the label has to be set in the Windows printer settings as well.

To place an element on the label lay-out first select the type of element, for example text.

Roughly set the X and Y coordinates.

Height, width, rotation and font settings depend on the type of printer used. At all times it is possible to test-print a label.





If the button is used to test-print a label, keep in mind that assigned variables aren't available for test-print purposes. Because of this the length of barcode and text fields which contains variables aren't representative. Instead of variable values the variable code is printed in the format [variable.length].

The field data is used to enter content of a text or barcode element. A variable can be entered by selecting the desired variable from the pull-down menu. Next press the Insert button and the variable code will appear in the data field. In a single data line fixed characters and variables can be used together.

11		
 н		
 н		
 н		

Pressing the bar code symbol next to the line source opens the dialog to select the type of bar code and the angle at which you want to print the bar code.

For a graphic element the data refers to the memory location of the files where the desired graphic is stored.

Once you're happy with the label, you can save it to the pre defined location (under set-

tings path) by pressing **ball**. The file name which you type into the field on the left side is used and can be selected in the product profile editor to assign a lay-out to a certain profile.



List of Labels
Productlabel
Sewingmaterial
Test1
Userlabel
2

Fig. 71. List of Labels

7.1.7 Search Archive



to access the search archive. The

following screen will appear:

Archive				S	tatictic		0
Date	Time	Part-ID	Seam	Productcode	Productname		
16.12.2014				JukiPoland	VW-LH-Seat-4533	2	
16.12.2014	10:23:34	25	1/1	JukiPoland	VW-LH-Seat-4533	۵.	
16.12.2014				JukiPoland	VW-LH-Seat-4533	۵.	
16.12.2014	10:17:17	23	1/1	JukiPoland	VW-LH-Seat-4533	۵.	
16.12.2014	10:14:58	22	1/1	JukiPoland	VW-LH-Seat-4533	۵.	
15.12.2014	12:18:36		1/1	JukiPoland	VW-LH-Seat-4533	2	
25.11.2014	14:50:38	11	1/1	JukiPoland	VW-LH-Seat-4533	2	
	14:48:27	9	1/1	JukiPoland	VW-LH-Seat-4533	2	
25.11.2014	14:47:15	8	1/1	JukiPoland	VW-LH-Seat-4533	2	
25.11.2014				JukiPoland	VW-LH-Seat-4533	2	
	12:28:08			JukiPoland	VW-LH-Seat-4533	۵.	
25.11.2014	12:26:20	4	1/1	JukiPoland	VW-LH-Seat-4533	2	
25.11.2014	12:25:41	3	1/1	JukiPoland	VW-LH-Seat-4533	2	
25 11 2014	12-20-37	2	1/1	JukiPoland	VW-I H-Seat-4533	2	

Fig. 72. Search Archive

Sade has an onboard routine for product traceability queries. First select a search index and enter the search data or simply scan the bar code of the finished product.



The searching will stop once a match has been found, otherwise it will continue to search for more matches.

The navigation buttons can be used to browse the search result. With the result will be presented as a report. From here data can also be exported in various formats.

The [Log] button will open a text window showing the corresponding log file of the report.

7.1.8 Traceability files

Sade will use production data to generate two types of files for production traceability requirements. Each type is written twice, locally and remote. Additionally a log entry is made for each product cycle (section 7.1.9).

WARNING!

The structure of database is built around the SQL database engine. Although this engine is widely accepted we've seen many small and major changes and improvements to this engine over the last years. There is no guarantee that this (or any other) type of database available today is easy accessible over a longer period of time (10 years or more).

7.1.8.1 Database format

A fresh database output file is automatically generated each day. If a file already has been generated that day, Sade will append data to it.

For short term product traceability (for example events that took place at day or week of production) this format has advantages since it can be used by Sade's Find routine.

7.1.9 Log files

Sade keeps a log file of all events it can monitor. This will start as soon as Sade is started.

First action Sade will take is to see if the previous log was closed properly. If Sade crashed for whatever reason, it won't be able to write a line in the log to say that it closed down properly. If such line isn't found the user is immediately informed about this and can take appropriate measures.

Each day a new log is generated. If a log already was made that day, entries will be appended.



7.1.10 Free sew function



Fig. 73. Free sew function

The free sew button enables users to run the machine freely like a normal sewing machine. This feature is especially useful for maintenance and mechanical fine tuning of the machine. If the free sew button is pressed and the user logs off while the machine is (virtually) inside a seam, the free sew option remains active until the seam is ended. After finishing the operation the user has to log on again.

7.1.11 Exiting the SADE software

Exiting the SADE software is done by double clicking on the upper left corner.

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7.1.12 Translating Sade modules

Almost all text elements of the Sade user interface and editors can be translated or renamed. All modules have their own English original wording.

These files can be found in the user documents SADE folder and are called (language).lng. It is recommended to make backups before translation is started.

These files cannot be edited. The files can be copied onto other SADE systems for changing the language.

Keep in mind that space is limited for most on-screen text items. You'll not find this limitation in the editor, so carefully check the effect of any translation and try to stay within the same amount of character like the English version. Details – see clause 7.1.1.

7.2 Operating - initialisation

Under normal circumstances when you arrive at the JUKI SADE, the computer is on stand-by showing the operator identification screen and the sewing control motor is switched off.



With Initialisation the JUKI SADE is brought into production readiness status.

You'll need "Free sew" rights and the "Top thread tension cover key" to perform this task.

7.2.1 Operator identification

Depending on identification system:

- Type your code on the on screen keypad followed by clicking the green arrow or clicking enter;
- Type your code on the numeric keypad followed by [ENTER];
- Scan your operator ID barcode with the hand held scanner;
- Scan RFID chip card at the scanner.

If the code is correct, Sade will advance into the product identification screen (fig. 74).

Products			
Name	Barcode		
AK leather		<i>/</i>	i 🤤
Juki Test2	3919900371	/	9
Test2	123456	/	9
VW-LH-Seat-4533	JukiPoland	/	9
VW caddy	2	1	9
	-		v
	•		0

Fig. 74. Operator identification

Place thread cones – details see clause 5.4. Thread the machine – details see clauses 5.8. Then carry out a sewing test.



7.2.2 Sewing test

- o Switch on the sewing machine;
- Enter the "Free sew" mode
 Handmode
 Stitchlength

 30 +
 Go
- Sew a couple of seams on a representative piece of test material.
- Take appropriate action to fine tune tension settings and stitch length.

Call for maintenance assistance if tension settings can't be made correctly or if you believe the top thread tension monitor settings are incorrect.

- Once you've successfully completed some seams, switch off the "Free sew" mode;
 - ٧
- you are automatically logged off from the system and the operator has to log in again by placing your RFID card (if you have this option) or type in your ID.

The JUKI SADE is now ready for production.

7.3 Product cycle - operating

In this section you'll find a step by step walkthrough of a production cycle. Based on configuration settings some steps might not be needed but this will pretty much point out itself.

7.3.1 Operator identification

Log in to the program – details see clause 7.1.2.3.





7.3.2 Product selection screen

Products		
Name	Barcode	
AK leather		🥒 🧷 🍵
Juki Test2	3919900371	/ 🤤
Test2	123456	/ 🤤
VW-LH-Seat-4533	JukiPoland	/ 🤤
VW caddy	2	/ 🥥
<u>الج</u>	•	•

Fig. 75. Product selection screen

The number of product identification fields are unlimited and can be scrolled by using your finger on the touch screen once the selection window is full.

 Enter the product identification code(s). Normally the hand held barcode scanner is used to enter the code. After scanning a valid barcode, Sade will advance to the next field.

The sequence of selecting product identification code(s), by clicking or scanning number and batch size is irrelevant.

Once product selection is completed, Sade will evaluate the entry.

7.3.3 Material validation by SADE

If all required fields are validated by Sade, the following window becomes active and you can advance into the material identification screen. Depending on hand held barcode scanner and software configuration, Sade might advance to the material screen automatically if valid data was entered. SADE checks all cones and prompts you at the first start to scan the bobbin inside the case. After all data and components match the selected product the operator can start sewing.



7.3.4 Material identification

Material				9
Cones	Needles	Sewing material	Others	
Name	Barcode	Group		
Coats aptan black	901	Cones	1	
Groz Beckert	12345	Needles	Ø	9
M30-Black	902	Cones	1	9
Needle-3454	454334	Needles	1	9
Serafil black 30/3	900	Cones	1	9
Testneedle2	555	Needles	0	9
				0

Fig. 76. Material identification

Depending on hard- and software configuration, If fixed barcode scanners are used, some or all of these fields might be filled automatically. Sade validates the input and if correct, the corresponding field will show up green. If a field remains red, the corresponding material is not, or no longer, accepted by Sade for the specific product definition. Then Sade will prompt you for a correct material to be placed on in the positions.

• If all input is accepted, the [OK] button becomes active and once pressed, you'll advance into the main production screen, unless a needle change is required.

7.3.5 Needle change

For details see clause 5.3 Attaching the needle.



7.3.6 Sewing



Fig. 77. Main production screen

The main production screen shows relevant product and material data on the right side and the graph of the thread tension, the sewing position in the seam and the Sewing speed.



Fig. 78. Product and material data at mail production screen



o Start sewing;

The indicator of pre-stitches will advance. As it comes closer to the right end, the first positive notch is expected to arrive. If the number of stitches is outside a pre-set toler-ance, the machine will stop.

• Guide the positive notch through the guide. The light in the guide will burn if the notch is recognized;

Continue sewing, the seam indicator will advance. As it comes closer to the right end, the second notch is expected to arrive. Again the number of stitches has to be within tolerance, or the machine will stop.

During sewing the seam is evaluated on upper thread tension. If tension is outside preset tolerance, the machine will also stop. Read section 10 for more info on faults.

Once the second notch has passed the guide, Sade will evaluate the passed seam and print a "Product traceability label".

- Depending on software configuration, you can continue sewing until the machine stops automatically and the "Label position" bar lights up in blue. This is the point where the label can be taken from the printer and applied to the product. If scanback is activated, the machine will stop until the correct label is read by the scanback scanner;
- Now continue or finish the seam according product requirement;
- After ending the seam, depending on software configuration, the machine will either go back to the product identification screen or remain in the main production screen to start a new cycle.

7.3.7 Controls

While in the main operation screen, there are a few buttons available.

Buttons	Assigned functions
Hide	The [Hide] button will bring up additional information on machine status
	and material batch sizes. At the lower left of the screen the actual cycle
	step is shown. This value is useful for technicians in case of problems.
New	The [New] button can be used at start of a product cycle to stop it and will
	bring up the product identification screen. It will interrupt the current batch.
Pause	The [Pause] button can be used at start of the product cycle and will bring
	up the operator identification screen.
Reset	The [Reset] button is to acknowledge bobbin change. If rights are granted,
	the button is used to reset fault status as well.
Reprint	The [Reprint] button can be used to reprint a traceability barcode after the
	label initially should be printed until ending of the seam. Once the seam is
	ended the label can't be printed again. Access rights or the right key switch
	are necessary to use this feature.


7.4 Sewing speed table

Operate the sewing machine at a speed equal to or lower than maximum sewing speed selected from those shown in the table below according to the sewing conditions.

The sewing speed is automatically set according to the amount of the alternating vertical movement of the walking foot and the pressure foot.

In the case the stitch length exceeds 7 mm, change the maximum sewing speed referring to "6. Function setting of SC-922" in the Instruction Manual for the SC-922.

Amount of alternate vertical movement of the walking foot and pressure foot	Stitch length: 7 mm or less	Stitch length: more than 7 mm and 9 mm or less
less than 3 mm	3000 sti/min	2000 sti/min
3,25 mm to less than 4 mm	2400 sti/min	2000 sti/min
4,25 mm to less than 5 mm	2000 sti/min	2000 sti/min
5,25 mm to less than 9 mm	1800 sti/min	1800 sti/min

7.5 Hand lifter



To lift the presser foot manually, pull hand lifter 1 in the direction of the arrow.

This makes the presser foot rise 10 mm and stay at that position.

7.6 Resetting the safety clutch



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.





The safety clutch functions when an excessive load is applied to the hook or the other components during sewing. At this time, the hook will never rotate even if turning the handwheel. When the safety clutch has functioned, remove the cause and reset the safety clutch as given in the following procedure.

- Pressing push button 1 located on the top surface of the machine bed, strongly turn the handwheel in the reverse direction of rotation.
- 2) The resetting procedure completes when the handwheel clicks.



3) At the final step of procedure, check the needle-to-hook relation. (Refer to "6.5 Needle-to-hook relation" p. 61).

7.7 Adjusting the automatic presser foot lifter



WARNING!

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



- Turn the power ON. Carry out thread trimming once. Turn ON the automatic presser lifter.
- 2) Place a 20 mm spacer 1 under the presser foot.
- 3) Turn the power OFF.





4) Remove rubber cap 2 from the rear face of the machine arm. Loosen set-screw 3.

5) Turn presser bar lifting arm 4 in the direction of the arrow until it will go no further. Then, tighten setscrew 3.

For the standard gauge type machine, the top end of the walking foot interferes with the needle bar frame when the auto-lifter is used in the case the amount of the alternating vertical movement of the walking foot and the presser foot is set at 2 mm or smaller and in the case it is set at 7 mm or more and the reverse-rotation needle-up is carried out.

To use the machine with the amount of the alternating vertical movement of the walking foot and the presser foot set at 2 mm or less, set the lifting amount of the presser foot by means of the auto-lifter at 17 mm or less.

7.8 Normal-/reverse-feed stitch needle entry points alignment at the time of automatic reverse feed stitching

When the sewing speed or stitch pitch is changed, the normal- and reverse-feed stitch needle entry points may not be aligned at the time of automatic reverse feed stitching.

In such a case, correct the alignment of needle entry points by changing the ON/OFF timing of the automatic reverse feed cylinder.



In the case the stitch pitch is large and correction of the timing is difficult, it is recommended to decrease the reverse feed sewing speed or use the temporary stop function at each corner section of the sewing pattern.

Refer to "III-8. Detailed explanation of selection of functions (16) Compensation of timing of the solenoid for reverse feed stitching" in the Instruction Manual for the SC-922 for detail. Normal- and reverse-feed stitches may need to be adjusted according to the stitch pitch to be used. Refer to the Engineer's Manual for how to adjust the stitches.

 How to align needle entry points of the reverse feed stitching with those of the normal feed stitching Carry out "correction of the timing of the reverse feed stitching" according to the difference between the needle entry points of the reverse feed stitching and those of the normal feed stitching.

Refer to "III-6. Setting the SC-922 functions" in the Instruction Manual for the SC-922 for how to carry out the "correction of the timing of the reverse feed stitching".





 Stitch-by-stitch reverse feed stitching speed (Function setting No. 8) and the temporary stop function at each corner section of the sewing pattern (Function No. 151). This speed can be changed using Function setting No. 8.

	Default value	Recommended value		
Stitch pitch (mm)	3 to 6	7 to 8	9	10 to 12
Reverse feed stitching speed (sti/min)	600	500	400	400
Temporary stop function at each corner section of the sewing pattern	0 (OFF)	0 (OFF)	0 (OFF)	0 (OFF)

7.9 Operation switches



1 Alternating vertical movement amount change-over switch

If this switch is pressed the amount of the alternating vertical movement of the walking foot and the presser foot will be maximized. (Lamp above the switch lights up) Use this switch when a multilayered portion of the sewing product is not smoothly fed.

2 Automatic reverse feed stitching cancellation/addition switch

- If this switch is pressed when the following automatic reverse feed stitching has been specified, the reverse stitching will not take place (for once immediately after it is pressed). (Example 1)
- If this switch is pressed when no automatic reverse feed stitching has been specified, the reverse feed stitching will take place (once immediately after it is pressed). (Example 2)

(Example 1) In the case where both automatic reverse feed stitching for start and that for end have been specified :			
AB			
⇒	♂× ⇔		
D C D	D		
If the switch ② is pressed before starting sewing, the automatic reverse feed stitching for start (between A and B) will not be carried out.	If the switch ② is pressed during sewing, the automatic reverse feed stitching for end (be- tween C and D) will not be carried out.		







3 Needle lifting switch

When the switch is pressed, the needle moves from its lower-end stop position to its upper-end stop position.



When raising the machine head which has been tilted, do not hold the operation switch to raise it.

4 2P switch

This is not used in SADE for stitch length changing.

In machine SADE stitch length is changed in program – see clause 7.1.2.13.

5 Needle thread tension changeover switch

When the switch is pressed, the double tension function is selected to increase the needle thread tension. (The lamp above the switch is lit up.)

6 This is not used for the LU-2810-7.

7.10 Machine protection when is not in use



NOTE!

At the downtime, switch the machine off (close program and computer, then switch the machine off) – you will avoid the risk of accidental start by unauthorized persons.

At the longer downtime switch the machine off (as mentioned above) and remove the power cord plug from the socket. Fold this cord and put it on the table.

Be sure to thoroughly clean the machine.



7.11 Cleaning the machine during work



NOTE!

It is unacceptable to wash electrical and electronical equipment with water spray.



NOTE!

Before cleaning, absolutely turn off the power and remove the plug from the socket – you will avoid the risk of accidental start by unauthorized persons.



NOTE!

The use of solvents for cleaning the paintwork is unacceptable. There is a risk of damage of the surface being cleaned.

At least once a day, clean the inside of the machine from accumulating the dirt inside.

After removal of the cover clean thoroughly inside and around the looper, needle bar and plate from all pollution. Use a brush for this purpose.

When cleaning is not required:

- dismantling of the entire team working on parts or
- the use of chemicals.

Also remember about cleaning the area around the machine.

Particular care should be taken not to damage the power cord and switch.





8 MAINTENANCE

8.1 Inspections and maintenance



NOTE!

Prior to the adjustment or maintenance and parts replacement, disconnect the power supply (main switch set to position "O") and remove the power plug to prevent accidental starting of the machine.

Long lasting and efficient operation of machine SADE is dependent on the skillful handling, systematic cleaning and the immediate removal of apparent defects.

Check the technical condition of the machine every day, before starting work.

Cleaning and maintenance must be carried out on the machine disconnected from the power supply.

Internal parts of the head clean once a day.

Daily service consists of cleaning dirt located at the sewing head and of defects removal resulting from the machine operation. Repair or replace defective or worn parts with new ones (original).

Use only dry soft cloth and brush for cleaning.

Avoid using chemical and cosmetic solvents, they can damage the lacquer coating machine and/or its safety signs.

If it is found excessive noise, immediately stop the machine and carry out review and repairs.

Do not use a vegetable oil to lubrication because of its ease of solidification at room temperature, which can cause a lack of lubrication and machine damage. Fill the oil tank with JUKI NEW DEFRIX OIL No.1.

Repair major damage should be entrusted with a service point.

Details on cleaning see clause 7.11.

Inspections

Perform regular inspections of the machine functioning, especially of the safety devices.

Also carry out the inspections after the introduction of changes in parameter settings or after replacing components.

Periodic inspection and maintenance program must be carried out by competent and trained personnel.

Regularly (once a month) clean up the oil reservoir of the oil pan and the filter case approximately.



Regularly (at least once a year) check the condition of electrical wiring and other electrical components. When you notice any damage in the protective coating replace the wire with a new one of the same cross-section. Any work on electrical equipment entrust a person with permissions.

If during one of the inspections is detected fault or ineffective operation of safety devices, bring the machine to a safe state or do not connect it to power until safety devices will be restored to a proper operation.

Fundamental maintenance work in hazardous areas must be carried out by competent and trained personnel fully understood the risks.

8.2 Lubrication

The machine has a single point requiring lubrication.

Lubrication procedure

LU-2810-7



Fill the oil tank with JUKI NEW DEFRIX OIL No.1 (Part No.: MDFRX1600C0) or JUKI MACHINE OIL #7 (Part No.: MML007600CA) using the oiler supplied with the machine from section **O**.

 Fill the oil tank with the oil until the top end of oil amount indicating rod 2 comes between the upper engraved marker line A and the lower engraved marker line B of oil amount indicating window 1.

If the oil is filled excessively, it will leak from the air vent hole in the oil tank or proper lubrication will be not performed. In addition, when the oil is vigorously filled, it may overflow from the oil hole. So, be careful.

 When you operate the sewing machine, refill oil if the top end of oil amount indicating rod 2 comes down to the lower engraved marker line B of oil amount indicating window 1.



Air pressure regulator



In the case fluid accumulation is observed in A section of the filter regulator, turn drain cock 2 to drain the fluid.

- If the quantity of oil in the hook is insufficient, adjust the quantity of oil by turning the oil quantity adjusting screw counterclockwise to ensure that the oil quantity in the hook is adequate. After that, adjust the quantity of oil to the adequate one. (Refer to "Adjusting the oil quantity in the hook" p.13.)
 - For the oil for hook lubrication, purchase JUKI NEW DEFRIX OIL No. 1 (Part No.: MDFRX1600C0) or JUKI MACHINE OIL #7 (Part No.: MML007600CA).
 - 3. Be sure to lubricate clean oil.

Cleaning the oil filter





- 1) Remove metal fixture **1** from the filter clamp.
- 2) Remove filter clamp **2**.
- 3) Remove filter **3**.
- 4) Clean up filters 3, 4 and oil reservoir5 of the oil pan.



Be sure to clean up the oil reservoir of the oil pan and the filter case approximately once a month. If the filter is clogged with soil, lubrication fails resulting in trouble.

Adjusting the oil quantity in the hook – see clause 5.2.

9 TRANSPORT AND HANDLING

Transportation applies only to the stage of machine delivery to the client. Details on the delivery and transport are described in the clause 4.1.

When moving the machine on-site work this action can be performed in 2 persons holding the worktop. You can also use lifting equipment with sufficient capacity.



10 TROUBLESHOOTING



NOTE!

Any failure, regardless of whether it turns off the engine or allows you to continue working, should be reported to an authorized service center for its removal.

If any faults have occurred, check whether you are able to correct the problem by yourself. The following overview can help you. Never try to repair the machine by yourself. If it is necessary to repair the machine, contact your authorized service representative.

Troubles	Causes	Corrective measures
1. Thread breakage (Thread frays or is worn out.)	(1) Thread path, needle point, hook blade point or bobbin case resting groove on the throat plate has sharp edges or burrs.	• Remove the sharp edges or burrs on the blade point of hook using a fine emery paper. Buff up the bobbin case resting groove on the throat plate.
	② Needle thread tension is too high.	 Decrease the needle thread tension.
	(3) Bobbin case opening lever provides an excessive clearance at the bobbin case.	 Decrease the clearance provided between the bobbin case opening lever and the bobbin. Refer to "6.7. Adjusting the bobbin case open- ing lever" p. 63.
	④ Needle comes in contact with the blade point of hook.	 Refer to "6.5. Needle-to-hook re- lation" p. 61.
	(5) Amount of oil in the hook is too small.	 Adjust the amount of oil in the hook properly. Refer to "8.2. Lubrication" p. 117.
(Needle thread trails 2 to 3 cm from the wrong side of the fabric.)	6 Needle thread tension is too low.	 Increase the needle thread tension.
	⑦ Thread take-up spring works excessively or the stroke of the spring is too small.	 Decrease the tension of the spring and increase the stroke of the spring.
	(8) Timing between the needle and the hook is excessively ad- vanced or retarded.	 ○ Refer to "6.5. Needle-to-hook re- lation" p. 61.

Table 2.



Troubles	Causes	Corrective measures
2. Stitch skipping	(1) Timing between the needle and the hook is excessively ad- vanced or retarded.	 Refer to "6.5. Needle-to-hook re- lation" p. 61.
	② Pressure of the presser foot is too low.	\circ Tighten the presser spring regulator.
	③ The clearance provided be- tween the top end of the needle eyelet and the blade point of hook is not correct.	○ Refer to "6.5. Needle-to-hook re- lation" p. 61.
	④ Hook needle guard is not func- tional.	 Refer to "6.6. Adjusting the hook needle guard" p. 63.
	(5) Improper type of needle is used.	 Replace the needle with one which is thicker than the current needle by one count.
3. Loose stitches	(1) Bobbin thread does not pass through the tension spring of the inner hook.	 ○ Thread the bobbin thread correct- ly.
	② Thread path has been poorly finished.	 Remove rough parts with a fine emery paper or buff it up.
	③ Bobbin fails to move smoothly.	\circ Replace the bobbin or hook with a new one.
	④ Bobbin case opening lever provides too much clearance at the bobbin.	 Refer to "6.7. Adjusting the bobbin case opening lever" p. 63.
	(5) Bobbin thread tension is too low.	\circ Increase the bobbin thread tension.
	6 Bobbin has been wound too tightly.	 Decrease the tension applied to the bobbin winder.
4. Thread slips off the needle eyelet simul- taneously with thread trimming.	(1) Thread tension given by the tension controller No. 1 is too high.	 ○ Decrease the thread tension given by the tension controller No. 1.
5. Thread slips off the needle eyelet at the start of sewing.	① Thread tension given by the tension controller No. 1 is too high.	 Decrease the thread tension given by the tension controller No. 1.
	② The clamp spring has deformed.	 Replace the clamp spring with a new one or correct the current one.
	③ Bobbin thread tension is too low.	\circ Increase the bobbin thread tension.



Troubles	Causes	Corrective measures
6. Thread is not cut sharply.	(1) The blades of moving knife and counter knife have been im- properly adjusted.	 Refer to "6.8. Adjusting the po- sition of counter knife, knife pressure and clamp pressure" p. 64.
	2 The knives have blunt blades.	 Replace the moving knife and counter knife with new ones, or cor- rect the current ones.
	③ Bobbin thread tension is too low.	 Increase the bobbin thread tension.
7. Thread remains un- cut after thread trimming.	(1) Initial position of the moving knife has been improperly adjusted.	○ Refer to the Engineer's Manual.
(Bobbin thread trim- ming failure when stitch length is com- paratively short.)	2 Bobbin thread tension is too low.	 ○ Increase the bobbin thread ten- sion.
8. Thread breaks at the start of sewing after thread trimming.	(1) The needle thread is caught in the hook.	 Shorten the length of thread re- maining on the needle after thread trimming.
		Refer to "6.2. Thread tension" p. 58.
9. When a heave- weight material is sewn, the material warps.	(1) The feed amount of the top feed is inadequate.	 Decrease the feed dog height and reduce the feed amount of the bot- tom feed. (Refer to the Engineer's Manual for the adjustment proce- dure.)
10. Stitch skipping at the beginning of sewing (in the case of starting sewing from the material edge)	(1) Needle thread and bobbin thread fail to intertwine with each other.	 Refer to "5.8. Threading the machine head" p. 55 Retain the needle thread on the material.

Any repairs associated with electrical equipment of the machine can only be performed by a person with appropriate and valid license.

At start or during the sewing Sade might detect an anomaly. The nature of the fault is indicated with a red bar in the fault column at the left side of the screen.



Fault	Caused by		Action
Bobbin	Bobbin monitor has detected that	0	Replace bobbin;
	the bobbin is running on spare	0	Press [Reset] button to
	thread.		acknowledge replacement (all
			operators).
Tension	Top thread tension was outside	0	Remove piece (reject);
	tolerance.	0	Observe the tension indication
			light to see if tension was too high or low;
		0	Check thread guidance from cone
		_	to machine;
		0	Acknowledge the tension fault by
			ited access rights, change key
			card or use left key switch).
Guide	Vertical flip quide not placed	0	Make sure that the guide is flat on
	properly.		the cover plate while sewing.
Pre seam	Number of stitches out of toler-	0	Remove piece (reject);
	ance.	0	Acknowledge pre seam fault by
			pressing the [Reset] button (lim-
-			ited access rights);
Seam	Number of stitches out of toler-	0	Remove piece (reject);
	ance.	0	Acknowledge pre seam fault by
			pressing the [Reset] button (lim-
Carran			ited access rights);
Cover	Cover plate not closed.	0	Close cover plate.
Photocell	respond properly	0	clean the notch champer of the
	respond propeny.		guiue, Call for maintenance assistance if
		0	sensor has to be readjusted
Back tack	After ending the actual tear	0	No action required Sade will not
Duck tuck	seam, the amount of stitches in		allow reverse sewing into the tear
	reverse direction would enter the		seam. However if this fault shows
	tear seam again.		up regularly ask for quality or
	5		maintenance assistance.

Table 3.

11 DISMANTLING AND WITHDRAWAL

IMPORTANT !

Carry dismantling in two persons. Take special care.







NOTE!

There is required to putting electrical/electronical wastes to the points authorized to receive them.

When disposing follow the safety regulations concerning disassembly of electrical equipment, electronics and disposal procedures to prevent environmental contamination.

All parts of machinery must be segregated and subjected to proper disposal.



WARRANTY

Warranty card and warranty rules are provided as independent machine.

When complaints you must show warranty card.

NOTE FOR THE BUYER!

The purchaser should carefully read a warranty card as well as check the correctness of it filling.

SPARE PARTS CATALOGUE

Spare parts catalog is a separate document, available from the manufacturer.

That catalogue applies to spare machine parts or components, which may require replacement. These parts are available for purchase from the machine supplier. The user can replace components by himself. If you have any doubt how to make parts replacement, please contact the machine manufacturer.

Manufacturer address:

JUKI CENTRAL EUROPE Sp. z o. o. Platan Park C ul. Poleczki 21, 02-822 Warszawa, POLAND