MOTOMAN-SSF2000R
INSTRUCTIONS

TYPE: YR-SSF6R-A00 (STANDARD SPECIFICATION)
YR-SSF6R-A01 (WITH LIMIT SWITCHES FOR S-, L-, U-AXES)

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

The NX100 operator’s manuals above correspond to specific usage. Be sure to use the appropriate manual.

Part Number: 154786-1CD
Revision: 0
This instruction manual is intended to explain operating instructions and maintenance procedures primarily for the MOTOMAN-SSF2000R.

General items related to safety are listed in the Section 1: Safety of the NX100 instructions. To ensure correct and safe operation, carefully read the NX100 instructions before reading this manual.

Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.

The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.

YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.

If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.

YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product's warranty.
Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the NX100.

In this manual, the Notes for Safe Operation are classified as "WARNING", "CAUTION", "MANDATORY", or "PROHIBITED".

⚠️ **WARNING**  
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.

⚠️ **CAUTION**  
Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.

⚠️ **MANDATORY**  
Always be sure to follow explicitly the items listed under this heading.

🚫 **PROHIBITED**  
Must never be performed.

Even items described as "CAUTION" may result in a serious accident in some situations. At any rate, be sure to follow these important items.

**NOTE**  
To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as "CAUTION" and "WARNING".
• Before operating the manipulator, check that servo power is turned off when the emergency stop buttons on the front door of the NX100 and programming pendant are pressed. When the servo power is turned off, the SERVO ON LED on the programming pendant is turned off. Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.

• Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator. Then turn the servo power ON. Injury may result from unintentional or unexpected manipulator motion.

• Observe the following precautions when performing teaching operations within the working envelope of the manipulator:
  - View the manipulator from the front whenever possible.
  - Always follow the predetermined operating procedure.
  - Ensure that you have a safe place to retreat in case of emergency.

Improper or unintended manipulator operation may result in injury.

• Confirm that no persons are present in the manipulator's work envelope and that you are in a safe location before:
  - Turning on the NX100 power
  - Moving the manipulator with the programming pendant
  - Running check operations
  - Performing automatic operations

Injury may result if anyone enters the working envelope of the manipulator during operation. Always press an emergency stop button immediately if there are problems. The emergency stop button is located on the right of the front door of the NX100 and programming pendant.
Definition of Terms Used Often in This Manual

The MOTOMAN manipulator is the YASKAWA industrial robot product. The manipulator usually consists of the controller, the programing pendant, and manipulator cables. In this manual, the equipment is designated as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX100 Controller</td>
<td>NX100</td>
</tr>
<tr>
<td>NX100 Programing Pendant</td>
<td>Programing Pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and controller</td>
<td>Manipulator Cable</td>
</tr>
</tbody>
</table>
Explanation of Warning Labels

The following warning labels are attached to the manipulator.
Always follow the warnings on the labels.
Also, an identification label with important information is placed on the body of the manipulator. Prior to operating the manipulator, confirm the contents.

![Diagram of warning labels on the manipulator]

**Nameplate**

<table>
<thead>
<tr>
<th>MOTOMAN</th>
<th>WARNING label A:</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>![WARNING icon] Moving parts may cause injury</td>
</tr>
<tr>
<td>PAYLOAD</td>
<td>![WARNING icon] Do not enter robot work area.</td>
</tr>
</tbody>
</table>

**WARNING label A:**

- Moving parts may cause injury

**WARNING label B:**

- Do not enter robot work area.
1 Product Confirmation
   1.1 Contents Confirmation ........................................... 1-1
   1.2 Order Number Confirmation ................................. 1-2

2 Transporting
   2.1 Transporting Method ........................................... 2-1
      2.1.1 Using a Crane ............................................ 2-2
      2.1.2 Using a Forklift ........................................ 2-3
   2.2 Shipping Bolts and Brackets ............................... 2-3

3 Installation
   3.1 Installation of the Safeguarding ........................... 3-2
   3.2 Mounting Procedures for Manipulator Base ............... 3-2
      3.2.1 Mounting Example ...................................... 3-3
   3.3 Location ........................................................... 3-4

4 Wiring
   4.1 Grounding .......................................................... 4-2
   4.2 Cable Connection ............................................... 4-3
      4.2.1 Connection to the Manipulator ........................... 4-3
      4.2.2 Connection to the NX100 ................................. 4-3

5 Basic Specifications
   5.1 Basic Specifications ........................................... 5-1
   5.2 Part Names and Working Axes ............................... 5-2
   5.3 Baseplate Dimensions ......................................... 5-2
   5.4 Dimensions and P-Point Maximum Envelope ............... 5-3
   5.5 Alterable Operating Range ................................... 5-4

6 Allowable Load for Wrist Axis and Wrist Flange
   6.1 Allowable Wrist Load .......................................... 6-1
   6.2 Wrist Flange ..................................................... 6-3
7 System Application

7.1 Mounting Equipment .............................................. 7-1
7.1.1 Allowable Load ................................................. 7-1
7.1.2 Installation Position .......................................... 7-1
7.2 Internal User I/O Wiring Harness and Air Lines .......... 7-3

8 Motoman Construction

8.1 Position of S-Axis Limit Switch ......................... 8-1
8.2 Internal Connections ........................................... 8-2

9 Maintenance and Inspection

9.1 Inspection Schedule ............................................ 9-1
9.2 Notes on Maintenance Procedures ...................... 9-6
9.2.1 Battery pack Replacement ................................. 9-6
9.3 Notes on Grease Replenishment/Exchange Procedures ........................................... 9-7
9.3.1 Grease Replenishment/Exchange for S-Axis Speed Reducer . 9-7
  ■ Grease Replenishment (Refer to "Fig. 28 S-Axis Speed Reducer Diagram "). ....................... 9-8
  ■ Grease Exchange (Refer to "Fig. 28 S-Axis Speed Reducer Diagram "). ............................... 9-9
9.3.2 Grease Replenishment/Exchange for L-Axis Speed Reducer . 9-9
  ■ Grease Replenishment (Refer to "Fig. 29 L-Axis Speed Reducer Diagram "). ....................... 9-10
  ■ Grease Exchange (Refer to "Fig. 29 L-Axis Speed Reducer Diagram "). ............................... 9-10
9.3.3 Grease Replenishment/Exchange for U-Axis Speed Reducer 9-11
  ■ Grease Replenishment (Refer to "Fig. 30 U-Axis Speed Reducer Diagram "). ....................... 9-11
  ■ Grease Exchange (Refer to "Fig. 30 U-Axis Speed Reducer Diagram "). ............................... 9-12
9.3.4 Grease Replenishment for R-Axis Speed Reducer .... 9-13
9.3.5 Grease Replenishment for B- and T-Axes Speed Reducers . 9-14
9.3.6 Grease Replenishment for T-Axis Gear .................. 9-15
9.3.7 Grease Replenishment for R-Axis Cross Roller Bearing ................................................. 9-16
9.3.8 Notes for Maintenance .................................... 9-17
  ■ Wrist Axes .................................................. 9-17
  ■ Encoder Connector (with CAUTION label) ............. 9-17
  ■ Battery Pack Connection (for S-, L-, U-axes Motors) .... 9-17
  ■ Battery Pack Connection (for R-, B-, T-axes Motors) .... 9-18

10 Recommended Spare Parts
1 Product Confirmation

1.1 Contents Confirmation

Confirm the contents of the delivery when the product arrives.
Standard delivery includes the following four items (Information for the content of optional goods is given separately):

- Manipulator
- NX100
- Programing Pendant
- Manipulator Cable (Between Manipulator and NX100)

**CAUTION**

- Confirm that the manipulator and the NX100 have the same order number. Special care must be taken when more than one manipulator is to be installed.

  If the numbers do not match, manipulators may not perform as expected and cause injury or damage.
1.2 Order Number Confirmation

Check that the order number of the manipulator corresponds to the NX100. The order number is located on a label as shown below.

Fig. 1 Location of Order Number Labels
2 Transporting

CAUTION

• **Sling applications and crane or forklift operations must be performed by authorized personnel only.**
  Failure to observe this caution may result in injury or damage.

• **Avoid excessive vibration or shock during transporting.**
  Failure to observe this caution may adversely affect the performance as the system consists of precision components.

2.1 Transporting Method

NOTE

• The weight of the manipulator is approximately 145 kg including the shipping bolts and brackets. Use a wire rope strong enough to withstand the weight.
• Mount the shipping bolts and brackets for transporting the manipulator.
• Avoid putting external force on the arm or motor unit when transporting by a crane, forklift, or other equipment. Failure to observe this instruction may result in injury.
2.1 Transporting Method

2.1.1 Using a Crane

As a rule, when removing the manipulator from the package and moving it, a crane should be used. The manipulator should be lifted using wire rope. Be sure the manipulator is fixed with the shipping bolts and brackets before transporting, and lift it in the posture as shown in "Fig. 2 Transporting Position".
2.1.2 Using a Forklift

When using a forklift, the manipulator should be fixed on a pallet with shipping bolts and brackets as shown in "Fig. 3 Using a Forklift". Insert claws under the pallet and lift it. The pallet must be strong enough to support the manipulator. Transporting of the manipulator must be performed slowly in order to avoid overturning or slippage.

![Fig. 3 Using a Forklift](image)

2.2 Shipping Bolts and Brackets

The manipulator is provided with a shipping bracket and 2 screws. (See Fig. 2 Transporting Position?).

- The shipping bracket and screws are painted yellow.
- The shipping bracket is fixed with the hexagon socket head cap screw M10 (2 screws).

** NOTE **

Before turning on the power, make sure that the shipping bolts and brackets are removed. The shipping bolts and brackets then must be stored for future use, in the event that the manipulator must be moved again.
3 Installation

![WARNING]

- **Install the safeguarding.**
  Failure to observe this warning may result in injury or damage.

- **Install the manipulator in a location where the manipulator's tool or the workpiece held by the manipulator will not reach the wall, safeguarding, or NX100 when the arm is fully extended.**
  Failure to observe this warning may result in injury or damage.

- **Do not start the manipulator or even turn on the power before it is firmly anchored.**
  The manipulator may overturn and cause injury or damage.

- **When mounting the manipulator on the ceiling or wall, the base section must have sufficient strength and rigidity to support the weight of the manipulator. Also, it is necessary to consider countermeasures to prevent the manipulator from falling.**
  Failure to observe these warnings may result in injury or damage.

![CAUTION]

- **Do not install or operate a manipulator that is damaged or lacking parts.**
  Failure to observe this caution may cause injury or damage.

- **Before turning on the power, check to be sure that the shipping bolts and brackets explained in “Fig. 2 Transporting Position” are removed.**
  Failure to observe this caution may result in damage to the driving parts.
3.1 Installation of the Safeguarding

To insure safety, be sure to install safeguarding. They prevent unforeseen accidents with personnel and damage to equipment. The following is quoted for your information and guidance.

**Responsibility for Safeguarding (ISO10218)**

The user of a manipulator or robot system shall ensure that safeguarding is provided and used in accordance with Sections 6, 7, and 8 of this standard. The means and degree of safeguarding, including any redundancies, shall correspond directly to the type and level of hazard presented by the robot system consistent with the robot application. Safeguarding may include but not be limited to safeguarding devices, barriers, interlock barriers, perimeter guarding, awareness barriers, and awareness signals.

3.2 Mounting Procedures for Manipulator Base

The manipulator should be firmly mounted on a baseplate or foundation strong enough to support the manipulator and withstand repulsion forces during acceleration and deceleration. Construct a solid foundation with the appropriate thickness to withstand maximum repulsion forces of the manipulator as shown in "Table. 1 Maximum Repulsion Forces of the Manipulator at Emergency Stop" and "Table. 2 Maximum Torque of Acceleration and Deceleration". If the mounting face is out of plane, the manipulator shape may change and its functional ability may be compromised. Out of the plane for installation must be kept at 0.5mm or less. Mount the manipulator base as in the following way: " 3.2.1 Mounting Example ".

<table>
<thead>
<tr>
<th>Table. 1 Maximum Repulsion Forces of the Manipulator at Emergency Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal rotating maximum torque (S-axis moving direction)</td>
</tr>
<tr>
<td>Vertical rotating maximum torque (LU-axis moving direction)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table. 2 Maximum Torque of Acceleration and Deceleration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal maximum torque of acceleration and deceleration (S-axis moving direction)</td>
</tr>
<tr>
<td>Vertical maximum torque of acceleration and deceleration (LU-axis moving direction)</td>
</tr>
</tbody>
</table>
### 3.2 Mounting Procedures for Manipulator Base

#### 3.2.1 Mounting Example

Fix the baseplate onto the floor. The baseplate should be rugged and durable to prevent shifting of the manipulator or the mounting fixture. The thickness of the baseplate is 40mm or more, and an M16 size or larger anchor bolt is recommended.

Fix the manipulator base onto the baseplate with the hexagon socket head cap screws M16 (mm). The plate is tapped for M16 (length: 50mm) screws. Tighten the screws and anchor bolts securely so that they will not work loose during operation. See Fig. 5 Mounting the Manipulator Baseplate for the method.

![Mounting Diagram](image-url)
3.3 Location

When installing the manipulator, it is necessary to satisfy the undermentioned environmental conditions:

- Ambient Temperature: 0° to +45°C
- Humidity: 20 to 80%RH (non-condensing)
- Free from dust, soot, or water
- Free from corrosive gas or liquid, or explosive gas
- Free from excessive vibration (less than 4.9m/s² [0.5G])
- Free from large electrical noise (plasma)
- The flatness for installation is 0.5mm or less
4 Wiring

**WARNING**

- **Ground resistance must be 100 Ω or less.**
  Failure to observe this warning may result in fire or electric shock.

- **Before wiring, make sure to turn the primary power supply off, and put up a warning sign. (ex. DO NOT TURN THE POWER ON.)**
  Failure to observe this warning may result in fire or electric shock.

**CAUTION**

- **Wiring must be performed by authorized or certified personnel.**
  Failure to observe this caution may result in fire or electric shock.
4.1 Grounding

Follow the local regulations and electrical installation standards for grounding. The recommended grounding wire size is 5.5 mm² at minimum.

For grounding, connect the ground wire directly to the manipulator as in "Fig. 6 Grounding Method".

- Do not use this line in common with other ground wires or grounding electrodes for other electric power, motor power, welding devices, etc.
- Where metal ducts, metallic conduits, or distributing racks are used for cable laying, ground in accordance with the local electrical installation standards.

Fig. 7  Gounding Method
4.2 Cable Connection

Two manipulator cables are provided; a signal cable (1BC) and a power cable (2BC). Connect these cables to the manipulator base connectors and to the NX100. Refer to “Fig.8 (a) Cable Connection to the Manipulator” and “Fig.8 (b) Cable Connection to the NX100”.

4.2.1 Connection to the Manipulator

Before connecting the manipulator cables to the manipulator, verify the numbers: 1BC and 2BC on both the cables and the manipulator base connectors. Connect 2BC first, and then 1BC. After inserting the cables, set the lever until it clicks.

4.2.2 Connection to the NX100

Before connecting the manipulator cables to the NX100, verify the numbers: 1BC and 2BC on both the cables and the NX100 connectors. Connect 2BC first, and then 1BC. After inserting the cables, set the lever until it clicks.
4.2 Cable Connection

Fig. 9 (a) Details of the Manipulator Cable Connectors (Manipulator Side)

View A ; Connector details (Manipulator side)

Fig. 9 (b) Manipulator Cable Connections to the NX100
## 5 Basic Specifications

### 5.1 Basic Specifications

<table>
<thead>
<tr>
<th>Table. 3 Basic Specifications*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation Mode</strong></td>
</tr>
<tr>
<td>Degree of Freedom</td>
</tr>
<tr>
<td>Payload</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Repetitive Positioning Accuracy</strong>^2</th>
<th>±0.08 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motion Range</strong></td>
<td></td>
</tr>
<tr>
<td>S-Axis (turning)</td>
<td>±105°</td>
</tr>
<tr>
<td>L-Axis (lower arm)</td>
<td>+100°, -120°</td>
</tr>
<tr>
<td>U-Axis (upper arm)</td>
<td>+300°, -115°</td>
</tr>
<tr>
<td>R-Axis (wrist roll)</td>
<td>±180°</td>
</tr>
<tr>
<td>B-Axis (wrist pitch/yaw)</td>
<td>±135°</td>
</tr>
<tr>
<td>T-Axis (wrist twist)</td>
<td>±360°</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Maximum Speed</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>S-Axis</td>
</tr>
<tr>
<td>L-Axis</td>
</tr>
<tr>
<td>U-Axis</td>
</tr>
<tr>
<td>R-Axis</td>
</tr>
<tr>
<td>B-Axis</td>
</tr>
<tr>
<td>T-Axis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Allowable Moment</strong>^3</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Axis</td>
</tr>
<tr>
<td>B-Axis</td>
</tr>
<tr>
<td>T-Axis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Allowable Inertia (GD²/4)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Axis</td>
</tr>
<tr>
<td>B-Axis</td>
</tr>
<tr>
<td>T-Axis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mass</strong></th>
<th>137 kg</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Ambient Conditions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
</tr>
<tr>
<td>Humidity</td>
</tr>
<tr>
<td>Vibration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Others</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Free from corrosive gas or liquid, or explosive gas</td>
</tr>
<tr>
<td>• Free from dust, soot, or water</td>
</tr>
<tr>
<td>• Free from excessive electrical noise (plasma)</td>
</tr>
</tbody>
</table>

| **Power Capacity** | 1.5 kVA |

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*1 SI units are used in this table. However, gravitational unit is used in ( ).

*2 Conformed to ISO9283

*3 Refer to "6.1 Allowable Wrist Load" for details on the permissible moment of inertia.
5.2 Part Names and Working Axes

Fig. 10 Part Names and Working Axes

5.3 Baseplate Dimensions

Fig. 11 Baseplate Dimensions
5.4 Dimensions and P-Point Maximum Envelope

Fig. 12 Dimensions and Operating Range
5.5 Alterable Operating Range

The operating range of the S-Axis can be altered as in "Table. 4 S-Axis Operating Range" in accordance with the operating conditions. If alteration is necessary, contact your Yaskawa representative in advance.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-Axis Working Range</td>
<td>±105° (standard)</td>
</tr>
<tr>
<td></td>
<td>±90°</td>
</tr>
<tr>
<td></td>
<td>±75°</td>
</tr>
<tr>
<td></td>
<td>±60°</td>
</tr>
<tr>
<td></td>
<td>±45°</td>
</tr>
<tr>
<td></td>
<td>±30°</td>
</tr>
</tbody>
</table>
6 Allowable Load for Wrist Axis and Wrist Flange

6.1 Allowable Wrist Load

The allowable wrist load is 6 kg. If force is applied to the wrist instead of the load, force on R-, B-, and T-Axes should be within the value shown in "Table. 5 Moment and Total Inertia". Contact your Yaskawa representative for further information or assistance.

When the volume load is small, refer to the moment arm rating shown in "Fig. 12 Moment Arm Rating". The allowable total inertia is calculated when the moment is at the maximum. Contact your Yaskawa representative when only inertia moment, or load moment is small and inertia moment is large. Also, when the load mass is combined with an outside force, contact your Yaskawa representative in advance.

Table. 5 Moment and Total Inertia

<table>
<thead>
<tr>
<th>Axis</th>
<th>Moment N•m (kgf•m)</th>
<th>GD²/4 Total Inertia kg•m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Axis</td>
<td>11.8 (1.2)</td>
<td>0.24</td>
</tr>
<tr>
<td>B-Axis</td>
<td>9.8 (1.0)</td>
<td>0.17</td>
</tr>
<tr>
<td>T-Axis</td>
<td>5.9 (0.6)</td>
<td>0.06</td>
</tr>
</tbody>
</table>

*: Gravitational unit

*1: ( ): Gravitational unit

When the volume load is small, refer to the moment arm rating shown in "Fig. 12 Moment Arm Rating". The allowable total inertia is calculated when the moment is at the maximum. Contact your Yaskawa representative when only inertia moment, or load moment is small and inertia moment is large. Also, when the load mass is combined with an outside force, contact your Yaskawa representative in advance.

Fig. 13 Moment Arm Rating
6.1 Allowable Wrist Load

Fig. 14 The Diagram Moment/Inertia for R-Axis

Fig. 15 The Diagram Moment/Inertia for B-Axis

Fig. 16 The Diagram Moment/Inertia for T-Axis
The wrist flange dimensions are shown in "Fig. 17 Wrist Flange". In order to see the alignment marks, it is recommended that the attachment be mounted inside the fitting. Fitting depth of inside and outside fittings must be 5 mm or less.

- **Note:** Wash off anti-corrosive paint (solid color) on the wrist flange surface with thinner or light oil before mounting the tools.
  - Mount the attachment with the mounting bolts (length: 9 mm or less).
  Failure to observe this instruction may affect the manipulator performance.
7 System Application

7.1 Mounting Equipment

The peripheral equipment mounts are provided on the U-Axis (upper arm) and S-Axis (rotary head) as shown in "Fig. 18 Installing Peripheral Equipment" for easier installation of the users' system applications. The following conditions should be observed to attach or install peripheral equipments.

7.1.1 Allowable Load

• The allowable load on the U-Axis is a maximum of 15 kg, including the wrist load. For instance, when the mass installed in the wrist point is 6 kg, the mass which can be installed on the upper arm becomes 9 kg.
• The allowable load on the S-Axis is a maximum of 20 kg. Install the peripheral equipment on the S-Axis so that the moment of inertia (GD^2/4) from the S-Axis rotation center becomes 1.25 kg\(\cdot\)m^2 or less.

7.1.2 Installation Position

There is a limitation also on the installation position. "Fig. 19 Allowable Load on U-Axis" shows the distance between the U-Axis rotation center and the load gravity.
7.1 Mounting Equipment

Fig. 18 Installing Peripheral Equipment

Fig. 19 Allowable Load on U-Axis
7.2 Internal User I/O Wiring Harness and Air Lines

Wires and an air line are incorporated into the manipulator for user application. An internal user I/O wiring harness (0.2mm² x 8, 1.25mm² x 6) and an air line are used in the manipulator for the drives of the peripheral devices.

- The allowable current for wires must be 3A or below for each wire. (The total current value for pins 1 to 16 must be 40A or below).
- The maximum pressure for the air line is 490 kPa (5 kgf/cm²) and its inside diameter is 6.5mm.

![Fig. 20 Internal User I/O Wiring Harness and Air Lines](image-url)
7.2 Internal User I/O Wiring Harness and Air Lines

The same pin number (1-16) of two connectors is connected in the lead line of single 0.2 mm² or 1.25 mm².

**NOTE**
- For the standard specification, the pins No.7 and No.8 of 3BC connector on the U-Arm are respectively connected with the shock sensor power supply and shock sensor signal input port of the NX100 controller.
- The pins No.7 and No.8 of respective 3BC connectors on the connector base side and the U-Arm side are not connected with each other.
- For the wiring, refer to "Fig.24 (b) Internal Connection Diagram".
8 Motoman Construction

8.1 Position of S-Axis Limit Switch

The limit switches are optional and are located as shown in "Fig. 22 Location of Limit Switches". The overrun limit switches for the S-Axis and L-Axis, and LU-Axes interference limit switch are applied to the robot type: YR-SSF6R-A01.

Fig. 22 Location of Limit Switches
8.2 Internal Connections

High reliability connectors which can be easily put on and removed are used with each connector part. For the numbers, types, and locations of connectors, see "Fig. 23 Location and Numbers of Connectors".

![View A](image)

**Fig. 23 Location and Numbers of Connectors**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type of Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Connector for Internal User I/O Wiring Harness</td>
<td>JL05-2A20-29PC (JL05-6A20-29S: Optional)</td>
</tr>
<tr>
<td>U-arm Connector for Internal User I/O Wiring Harness</td>
<td>JL05-2A20-29SC (JL05-6A20-29P: Optional)</td>
</tr>
</tbody>
</table>
8.2 Internal Connections

- For the limit switch specification, the connection of the section (A) is changed as follows:

- The pins No.7 and No.8 of 3BC connector on the U-arm are respectively connected with the shock sensor power supply and shock sensor signal input port of the NX100 controller.

In case of connecting the pin No.7 and No.8 of respective 3BC connectors on the U-arm and connector base, the connection in the section (B) should be changed as shown in the section (C) below.

(Contact your Yaskawa representative in case of modifying the wiring before use.)
図 24 (b) Internal Connection Diagram
9 Maintenance and Inspection

![WARNING]

- Before maintenance or inspection, be sure to turn the main power supply off, and put up a warning sign. (ex. DO NOT TURN THE POWER ON.)

Failure to observe this warning may result in electric shock or injury.

![CAUTION]

- Maintenance and inspection must be performed by specified personnel.

Failure to observe this caution may result in electric shock or injury.
- For disassembly or repair, contact your Yaskawa representative.
- The battery pack must be connected before removing detection connector when maintenance and inspection.

Failure to observe this caution may result in the loss of home position data.

9.1 Inspection Schedule

Proper inspections are essential not only to assure that the mechanism will be able to function for a long period, but also to prevent malfunctions and assure safe operation. Inspection intervals are displayed in six levels. Conduct periodical inspections according to the inspection schedule in "Table 7 Inspection Items".

In "Table 7 Inspection Items", the inspection items are classified into three types of operation: operations which can be performed by personnel authorized by the user, operations which can be performed by personnel being trained, and operations which can be performed by service company personnel. Only specified personnel are to do inspection work.

- The inspection interval must be based on the servo power supply on time.
- These inspections were developed for applications where the manipulator is used for arc welding work. For any different or special applications, the inspection process should be developed on a case-by-case basis.
- For axes which are used very frequently (in handling applications, etc.), it is recommended that inspections be conducted at shorter intervals. Contact your Yaskawa representative.
### Table 7 Inspection Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Schedule</th>
<th>Method</th>
<th>Operation</th>
<th>Inspection Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
<td>1000 H Cycle</td>
<td>6000 H Cycle</td>
<td>12000 H Cycle</td>
</tr>
<tr>
<td>1</td>
<td>Alignment mark</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>External lead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Working area and manipulator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>BLU-axes motor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Baseplate mounting bolts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Cover mounting screws</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Base connectors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>BT-axes timing belt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Wire harness in manipulator (SLURBT-axes leads)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Battery pack in manipulator</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Method:**
- Visual
- Spanner Wrench
- Screwdriver, Wrench
- Manual
- Visual Multiplier

**Operation:**
- Check for damage and deterioration of leads.
- Check for grease leakage.
- Check for damage and outside cracks.
- Check for damage and outside cracks.
- Check the work area for dust or spatter is present. Check for damage and outside cracks.
- Clean the work area for dust or spatter is present. Check for damage and outside cracks.
- Check for grease leakage.
- Visual Check for grease leakage.
- Visual Multiplier Check for conduction between the main connector of base and intermediate connector with manually shaking the wire. Check for wear of protective spring.
- Visual Multiplier Check for conduction between terminals and wear of protective spring.
- Visual Multiplier Check for conduction between terminals and wear of protective spring.
- Visual Multiplier Check for conduction between terminals and wear of protective spring.
- Visual Multiplier Check for conduction between terminals and wear of protective spring.

**Inspection Charge:**
- Specified Person
- Licensee
- Service Company

---

1. Replace
2. Replace
### 9.1 Inspection Schedule

#### Table. 7 Inspection Items

<table>
<thead>
<tr>
<th>Items&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Schedule</th>
<th>Method</th>
<th>Operation</th>
<th>Inspection Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
<td>1000 H Cycle</td>
<td>6000 H Cycle</td>
<td>12000 H Cycle</td>
</tr>
<tr>
<td>T-axis gear</td>
<td>O</td>
<td></td>
<td>Grease Gun</td>
<td>Check for malfunction. (Replace if necessary.) Supply grease&lt;sup&gt;3&lt;/sup&gt; (6000H cycle). See Par. <em>9.3.6 Grease Replenishment for T-Axis Gear</em></td>
</tr>
<tr>
<td>R-axis cross roller bearing</td>
<td>O</td>
<td></td>
<td>Grease Gun</td>
<td>Check for malfunction. (Replace if necessary.) Supply grease&lt;sup&gt;3&lt;/sup&gt; (6000H cycle). See Par. <em>9.3.7 Grease Replenishment for R-Axis Cross Roller Bearing</em></td>
</tr>
<tr>
<td>Overhaul</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.1 Inspection Schedule

*1 When checking for conduction with multimeter, connect the battery to “BAT” and “OBT” of connectors on the motor side for each axis, and then remove connectors on detector side for each axis from the motor. Otherwise, the home position may be lost. (Refer to * 9.3.8 Notes for Maintenance *)

*2 Wire harness in manipulator to be replaced at 24000H inspection.

*3 For the grease, refer to "Table. 8 Inspection Parts and Grease Used ".

*4 Inspection No. correspond to the numbers in "Fig. 25 Inspection Parts and Inspection Numbers ".

*5 The occurrence of a grease leakage indicates the possibility that grease has seeped into the motor. This can cause a motor breakdown. Contact your Yaskawa representative.

Table. 8 Inspection Parts and Grease Used

<table>
<thead>
<tr>
<th>No.</th>
<th>Grease Used</th>
<th>Inspected Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>②, ③</td>
<td>VIGO Grease RE No.0</td>
<td>S-, L-, and U-axis speed reducers</td>
</tr>
<tr>
<td>④, ⑤</td>
<td>Harmonic Grease SK-1A</td>
<td>R-, B-, and T-axis speed reducers, T-axis gear</td>
</tr>
<tr>
<td>⑥</td>
<td>Alvania EP Grease 2</td>
<td>R-axis cross roller bearings</td>
</tr>
</tbody>
</table>

The numbers in the above table correspond to the numbers in "Table. 7 Inspection Items ".

...
Note: The manipulator is in the home position.
9.2 Notes on Maintenance Procedures

9.2.1 battery pack Replacement

If the battery alarm occurs in the NX100, replace the battery in accordance with the following procedure:

1. Turn off the NX100 main power supply.
2. Uninstall the plate from the base connector and pull the battery pack out to replace with a new battery pack.
3. Remove the battery pack from the battery holder.
4. Connect the new battery pack to the unoccupied connectors on the board.
5. Remove the old battery pack from the board.
6. Mount the new battery pack on the battery holder.
7. Reinstall the plate.

Remove the old battery pack after connecting the new one so that the encoder absolute data does not disappear.
### 9.3 Notes on Grease Replenishment/Exchange Procedures

Make sure to follow the instructions listed below at grease replenishment/exchange. Failure to observe the following instructions may result in damage to a motor and a speed reducer.

**NOTE** Do not pinch the cable when the plate is installed.

**9.3.1 Grease Replenishment/Exchange for S-Axis Speed Reducer**

- If grease is added with a plug on, the grease will go inside the motor or an oil seal of the speed reducer will come off, resulting in damage to the motor and speed reducer. Make sure to remove the plug before the grease injection.
- Do not install a joint, a hose, etc. to a grease exhaust port. Failure to observe this instruction may result in damage to the motor due to coming off of an oil seal.
- Make sure to use a grease pump to inject grease. Set air supply pressure to the grease pump at 0.3 MPa or less, and the grease injection rate at 8 g/s or less.
- Make sure to fill a hose on the grease inlet with grease to keep air from entering into the speed reducer.

**Fig. 28 S-Axis Speed Reducer Diagram**
Grease Replenishment (Refer to "Fig. 28 S-Axis Speed Reducer Diagram ")

Replenish the grease in accordance with the following procedure:

1. Remove plugs from the grease exhaust port and grease inlet.

2. Install the grease zerk PT1/8 to the grease inlet. The grease zerk is provided at factory. Inject the grease into the inlet using a grease gun.

3. Move the S-axis for a few minutes to discharge the excess grease.

4. Remove the grease zerk from the grease inlet, and reinstall the plug. Before installing the plug, apply Three Bond 1206C to the thread part of the plug. Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).

5. Wipe the grease exhaust port with a cloth, and reinstall the plug. Before installing the plug, apply Three Bond 1206C to the thread part of the plug. Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).

Grease Exchange (Refer to "Fig. 28 S-Axis Speed Reducer Diagram ")

1. Remove a plug from the grease exhaust port.

2. Install the grease zerk PT1/8 to the grease inlet. The grease zerk is provided at factory.
3. Inject the grease into the grease inlet using a grease gun.

<table>
<thead>
<tr>
<th>Grease type: VIGO Grease RE No.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of grease: 410cc</td>
</tr>
<tr>
<td>Grease pump air supply pressure: 0.3 MPa or less</td>
</tr>
<tr>
<td>Grease injection rate: 8 g/s or less</td>
</tr>
</tbody>
</table>

4. The grease replacement is complete when new grease appears in the exhaust port. The new grease can be distinguished from the old grease by its color.
5. Move the S-axis for a few minutes to discharge the excess grease.
6. Remove the grease zerk from the grease inlet, and reinstall the plug.
   Before installing the plug, apply Three Bond 1206C to the thread part of the plug.
   Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).
7. Wipe the grease exhaust port with a cloth, and reinstall the plug.
   Before installing the plug, apply Three Bond 1206C to the thread part of the plug.
   Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).

9.3.2 Grease Replenishment/Exchange for L-Axis Speed Reducer

For ceiling mounted manipulators, the grease exhaust port and the grease inlet are inverted.
9.3 Notes on Grease Replenishment/Exchange Procedures

- **Grease Replenishment** (Refer to "Fig. 29 L-Axis Speed Reducer Diagram ".)

1. Make the L-arm vertical to ground.
2. Remove a plug from the grease exhaust port.
3. Remove bolts from the grease inlet.

   - If grease is injected with the exhaust plug on, the grease will go inside the motor and may damage it. Be sure to remove the plug.
   - Do not install a joint, a hose, etc. to a grease exhaust port. Failure to observe this instruction may result in damage to the motor due to coming off of an oil seal.

4. Install the grease zerk A-MT6 x 1 to the grease inlet. The grease zerk is provided at factory.
5. Inject grease into the grease inlet using a grease gun.

   | Grease type: VIGO Grease RE No.0 | Amount of grease: 55cc  |
   |                              | (110cc for 1st supply) |
   | Grease pump air supply pressure: 0.3 MPa or less | Grease injection rate: 8 g/s or less |

6. Move the L-Axis for a few minutes to discharge the excess grease.
7. Remove the grease zerk from the grease inlet and reinstall bolts.
   Apply Three Bond 1206C to screwed parts when installing the bolts.
   Then tighten the bolts with a tightening torque of 5 N·m (0.51 kgf·m).
8. Wipe the waste grease with a cloth and reinstall the plug to the exhaust port.
   Apply Three Bond 1206C to screwed parts when installing the plugs.
   Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).

- **Grease Exchange** (Refer to "Fig. 29 L-Axis Speed Reducer Diagram ".)

1. Make the L-arm vertical to ground.
2. Remove a plug from the grease exhaust port.
3. Remove bolts from the grease inlet.

   - If grease is injected with the plug on, the grease will go inside the motor and may damage it. Be sure to remove the plug.
   - Do not install a joint, a hose, etc. to a grease exhaust port. Failure to observe this instruction may result in damage to the motor due to coming off of an oil seal.

4. Install the grease zerk A-MT6 x 1 to the grease inlet. The grease zerk is provided at factory.
5. Inject grease into the grease inlet using a grease gun.

| Grease type: VIGO Grease RE No.0  
| Amount of grease: approx. 360cc  
| Grease pump air supply pressure: 0.3 MPa or less  
| Grease injection rate: 8 g/s or less |

6. The grease replacement is complete when new grease appears in the exhaust ports. The new grease can be distinguished from the old grease by its color.

7. Move the L-Axis for a few minutes to discharge the excess grease.

8. Remove the grease zerk from the grease inlet and reinstall bolts to the grease inlet. Apply Three Bond 1206C to screwed parts when installing the bolts. Then tighten the bolts with a tightening torque of 5 N·m (0.51 kgf·m).

9. Wipe the waste grease with a cloth and reinstall the plug to the exhaust port. Apply Three Bond 1206C to screwed parts when installing the plug. Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).

9.3.3 Grease Replenishment/Exchange for U-Axis Speed Reducer

- For ceiling mounted manipulators, the exhaust port and the grease inlet are inverted.

- Grease Replenishment (Refer to "Fig. 30 U-Axis Speed Reducer Diagram ".)  
  1. Make the U-arm horizontal to ground.  
  2. Remove bolts from the grease exhaust port.
3. Remove a plug from the grease inlet.

**NOTE**
- If grease is injected with the bolts on, the grease will go inside the motor and may damage it. Be sure to remove the bolts.
- Do not install a joint, a hose, etc. to a grease exhaust port. Failure to observe this instruction may result in damage to the motor due to coming off of an oil seal.

4. Install the grease zerk PT1/8 to the grease inlet. The grease zerk is provided at factory.

5. Inject grease into the grease inlet using a grease gun.

6. Move the U-Axes for a few minutes to discharge the excess grease.

7. Remove the grease zerk from the grease inlet and reinstall the plug. Apply Three Bond 1206C to screwed parts when installing the plug. Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).

8. Wipe the waste grease with a cloth and reinstall the bolts to the exhaust port. Apply Three Bond 1206C to screwed parts when installing the bolts. Then tighten the bolts with a tightening torque of 5 N·m (0.51 kgf·m).

**Grease Exchange (Refer to "Fig. 30 U-Axis Speed Reducer Diagram ").**

1. Make the U-arm horizontal to ground.
2. Remove bolts from the grease exhaust port.
3. Remove a plug from the grease inlet.

**NOTE**
- If grease is injected with the bolts on, the grease will go inside the motor and may damage it. Be sure to remove the bolts.
- Do not install a joint, a hose, etc. to a grease exhaust port. Failure to observe this instruction may result in damage to the motor due to coming off of an oil seal.

4. Install the grease zerk PT1/8 to the grease inlet. The grease zerk is provided at factory.

5. Inject grease into the grease inlet using a grease gun.

6. The grease replacement is complete when new grease appears in the exhaust ports. The new grease can be distinguished from the old grease by its color.

7. Move the U-Axes for a few minutes to discharge the excess grease.

Grease type: VIGO Grease RE No.0
Amount of grease: 30cc
(60cc for 1st supply)
Grease pump air supply pressure: 0.3 MPa or less
Grease injection rate: 8 g/s or less
8. Remove the grease zerk from the grease inlet and reinstall the plug. Apply Three Bond 1206C to screwed parts when installing the plug. Then tighten the plug with a tightening torque of 5 N·m (0.51 kgf·m).

9. Wipe the waste grease with a cloth and reinstall the bolts to the exhaust port. Apply Three Bond 1206C to screwed parts when installing the bolts. Then tighten the bolts with a tightening torque of 5 N·m (0.51 kgf·m).

### 9.3.4 Grease Replenishment for R-Axis Speed Reducer

1. Remove a plug from the exhaust port.
2. Remove the cover plug.
3. Inject grease into the grease inlet using a grease gun. (Refer to "Fig. 31 R-Axis Speed Reducer Diagram ".)

**Grease type: Harmonic grease SK-1A**
Amount of grease: 8cc
(16cc for first supply)

**NOTE**
The exhaust port is used for air flow. Do not inject excessive grease into the grease inlet.

4. Reinstall the cover plug.
5. Reinstall the plug on the exhaust port. Apply Three Bond 1206C to screwed parts when installing the plug.
9.3.5 Grease Replenishment for B- and T-Axes Speed Reducers

1. Remove plugs from the exhaust port.

**NOTE** Remove the U-arm cover side of the B-axis speed reducer.

2. Remove bolts from the grease inlets and install the grease zerk A-MT6 x 1. The grease zerk is provided at factory.

3. Inject grease into the grease inlets using a grease gun. (Refer to "Fig. 32 B- and T-Axes Speed Reducers Diagram ".)

<table>
<thead>
<tr>
<th>Grease type: Harmonic grease SK-1A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of grease:</td>
</tr>
<tr>
<td>For B-axis: 10cc (20cc for 1st supply)</td>
</tr>
<tr>
<td>For T-axis: 5cc (10cc for 1st supply)</td>
</tr>
</tbody>
</table>

**NOTE** The exhaust port is used for air flow. Do not inject excessive grease into the grease inlets.

4. Remove the grease zerk form the grease inlets and reinstall the bolts. Apply Three Bond 1206C to screwed parts when installing the bolts. Then tighten the bolts with a tightening torque of 5 N·m (0.51 kgf·m).

5. Reinstall the plugs to the exhaust ports. Apply Three Bond 1206C to screwed parts when installing the plugs.

**NOTE** Mount the U-arm cover side of the B-axis speed reducer. (Refer to "9.3.8 Notes for Maintenance ")
9.3.6 Grease Replenishment for T-Axis Gear

1. Remove a plug from the grease exhaust port.
2. Remove bolts from the grease inlet, then install the grease zerk A-MT6 x 1. The grease zerk is provided at factory.
3. Inject grease into the gear grease inlet using a grease gun. (Refer to "Fig. 33 T-Axis Gear Diagram ".)

| Grease type: Harmonic grease SK-1A  
| Amount of grease: 5cc  
| (10cc for 1st supply) |

**NOTE** The exhaust port is used for air flow. Do not inject excessive grease into the gear grease inlet.

4. Remove the grease zerk from the grease inlet and reinstall the bolts. Apply Three Bond 1206C to screwed parts when installing the bolts. Then tighten the bolts with a tightening torque of 5 N·m (0.51 kgf·m).
5. Reinstall the plug to the exhaust port. Apply Three Bond 1206C to screwed parts when installing the plug.
9.3.7 Grease Replenishment for R-Axis Cross Roller Bearing

1. Remove bolts of the exhaust port.
2. Remove bolts of the grease inlet, then install the grease zerk A-MT6 x 1. The grease zerk is provided at factory.
3. Inject grease into the grease inlet using a grease gun. (Refer to " Fig. 34 R-Axis Cross Roller Bearing Diagram ").

Grease type: Alvania EP grease 2
Amount of grease: 3cc
(6cc for 1st supply)

NOTE: The exhaust port is used for air flow. Do not inject excessive grease into the gear grease inlet.

4. Remove the grease zerk from the grease inlet and reinstall the bolts. Apply Three Bond 1206C to screwed parts when installing the bolts. Then tighten the bolts with a tightening torque of 5 N·m (0.51 kgf·m).
5. Reinstall the bolts to the exhaust port. Apply Three Bond 1206C to screwed parts when installing the bolts.
9.3.8 Notes for Maintenance

■ Wrist Axes

The motor and encoder units are provided with the wrist unit. To prevent fumes from penetrating into the wrist unit, the matched parts are sealed with sealing bond. Therefore, if the wrist cover is disassembled, be sure to reapply the sealing bond when reassemble the cover again (Three Bond 1206C, refer to "Table. 9 Spare Parts for YR-SSF6R-A00 and YR-SSF6R-A01").

![Fig. 35 Sealing Part of Wrist Unit](image)

■ Encoder Connector (with CAUTION label)

Connect the new battery pack before removing the old one so that the encoder absolute data will not disappear.
Connect the battery pack according to "Fig. 36 Battery Pack Connector Diagram".

■ Battery Pack Connection (for S-, L-, U-axes Motors)

The connectors for the battery pack connection of each motor are attached to the main body of respective motors.
Connect the battery pack according to the following procedure.

1. Remove the cap attached to the battery backup connector of the motors.
2. Connect the battery packs (HW9470932-A) with the battery backup connectors located at the end point of the cables for the encoder. (Under this condition, remove the encoder connector and carry out the maintenance checks).
3. After the maintenance check, verify that all the connectors are connected and remove the battery pack. Install the caps attached to the battery backup connector of the motor.
9.3 Notes on Grease Replenishment/Exchange Procedures

**Battery Pack Connection (for R-, B-, T-axes Motors)**

The connectors (crimped contact-pin) for the battery backup are installed at the end point of each motor (marked as BAT and OBT).

Connect the battery pack according to the following procedure.

1. Connect the battery pack (HW9470932-A) with the battery backup connectors located at the end point of the encoder cable. (Under this condition, remove the encoder connector and carry out the maintenance checks).
2. After the maintenance check, verify that all the connectors are connected and remove the battery pack. Install the caps attached to the battery backup connector of the motor.

**NOTE**

Do not remove the battery pack in the connector base.

---

**Fig. 36 (a) Battery Pack Connector Diagram for SLU-Axes**

- **Encoder connector**
- **Motor**
- **Power connector**
- **Connector for battery backup**
- **Battery pack (HW9470932-A)**

**CAUTION**

Connect battery to encoder to save the data before removing connector.

a: Crimped contact-pin (pin)
b: Crimped contact-pin (socket)
Connect battery to encoder to save the data before removing connector.

Fig. 36 (b) Battery Pack Connector Diagram for RBT-Axes
10 Recommended Spare Parts

It is recommended that the following parts and components be kept in stock as spare parts for the MOTOMAN-SSF2000R. The spare parts list for the MOTOMAN-SSF2000R is shown below. Product performance cannot be guaranteed when using spare parts from any company other than Yaskawa. The spare parts are ranked as follows:

- Rank A: Expendable and frequently replaced parts
- Rank B: Parts for which replacement may be necessary as a result of frequent operation
- Rank C: Drive unit

For replacing parts in Rank B or Rank C, contact your Yaskawa representative.

Table 9  Spare Parts for YR-SSF6R-A00 and YR-SSF6R-A01

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Grease</td>
<td>VIGO Grease RE No.0</td>
<td>Yaskawa Electric Corporation</td>
<td>16kg</td>
<td>-</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>Grease</td>
<td>Harmonic Grease SK-1A</td>
<td>Harmonic Drive System Co., Ltd.</td>
<td>2.5kg</td>
<td>-</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>Grease</td>
<td>Alvania EP Grease 2</td>
<td>Showa Shell Sekiyu K.K.</td>
<td>16kg</td>
<td>-</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>Liquid Gasket</td>
<td>Three Bond 1290C</td>
<td>Three Bond Co., Ltd.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A</td>
<td>5</td>
<td>Battery Pack</td>
<td>HW0470360-A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>for SLU-axes</td>
</tr>
<tr>
<td>A</td>
<td>6</td>
<td>Battery Pack</td>
<td>HW0470932-A</td>
<td>Yaskawa Electric Corporation</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>7</td>
<td>B-Axis Timing Belt</td>
<td>60S4.5M558</td>
<td>Mitsubishi Belt-    ing Limited</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>T-Axis Timing Belt</td>
<td>60S4.5M387</td>
<td>Mitsubishi Belt-    ing Limited</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>9</td>
<td>S-Axis Speed Reducer</td>
<td>HW0388621-B</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
<td>S-Axis Input Gear</td>
<td>HW0310786-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>11</td>
<td>L-Axis Speed Reducer</td>
<td>HW0280732-B</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>L-Axis Input Gear</td>
<td>HW0303276-1</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
### Table 9  Spare Parts for YR-SSF6R-A00 and YR-SSF6R-A01

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parts No.</th>
<th>Name</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Qty</th>
<th>Qty per Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>13</td>
<td>U-Axis Speed Reducer</td>
<td>HW0280738-B</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td>B</td>
<td>14</td>
<td>U-Axis Input Gear</td>
<td>HW0303277-1</td>
<td>Yaskawa Electric Corporation</td>
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<td>1</td>
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<tr>
<td>B</td>
<td>15</td>
<td>R-Axis Speed Reducer</td>
<td>HW0382277-A</td>
<td>Yaskawa Electric Corporation</td>
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<tr>
<td>B</td>
<td>16</td>
<td>B-Axis Speed Reducer</td>
<td>HW0381646-A</td>
<td>Yaskawa Electric Corporation</td>
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<tr>
<td>B</td>
<td>17</td>
<td>T-Axis Speed Reducer</td>
<td>HW0382917-A</td>
<td>Yaskawa Electric Corporation</td>
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</tr>
<tr>
<td>B</td>
<td>18</td>
<td>R-Axis Cross Roller Bearing</td>
<td>HW0381872-A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td>B</td>
<td>19</td>
<td>Wire Harness in Manipulator</td>
<td>HW0171939-A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>For B- and T- axes</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>B- and T-Axis Wire Harness in Manipulator</td>
<td>HW0270375-A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td>C</td>
<td>21</td>
<td>S-and U-Axes AC Servomotor</td>
<td>HW0382153-A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>2</td>
<td>With brake, with key, lead terminal treatment completion</td>
</tr>
<tr>
<td>C</td>
<td>22</td>
<td>L-Axis AC Servomotor</td>
<td>HW0382155-A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>1</td>
<td>With brake, with key, lead terminal treatment completion</td>
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<tr>
<td>C</td>
<td>23</td>
<td>R-, B-, and T-Axes AC Servomotor</td>
<td>HW0382151-A</td>
<td>Yaskawa Electric Corporation</td>
<td>1</td>
<td>3</td>
<td>With brake, no key, lead terminal treatment completion</td>
</tr>
</tbody>
</table>
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