

MOTOMAN-MPK50 SUPPLEMENTAL INSTRUCTIONS

TYPE:**YR-MPK0050-F00 (FOR FOOD GRADE GREASE)**

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

Part Number: 157450-1CD

Revision: 2

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Introduction

This supplementary instruction manual describes how YR-MPK0050-F00 (hereinafter referred to as MPK0050-F00) is different from the YR-MPK0050-A00 (hereinafter referred to as MPK0050-A00).

Read this supplementary instruction manual thoroughly together with the following instruction manual:

“MOTOMAN-MPK50 INSTRUCTIONS”

(Type: YR-MPK0050-A00 for standard specification, 156865-1CD)

Points of Differences

The MPK0050-F00 differs from the MPK0050-A00 in the following points:

- (1) Specification for food grade grease

The differences are described based on "MOTOMAN-MPK50 INSTRUCTIONS" (156865-1CD). Read this manual thoroughly replacing the subject matters for changes with this supplementary instruction manual.

9 Maintenance and Inspection

9.1 Inspection Schedule (Page 9-3)

Table 9-1: Inspection Items (Sheet 1 of 2)

Items ¹⁾	Schedule						Method	Operation	Inspection Charge		
	Daily	1000H Cycle	3000H Cycle	9000H Cycle	18000H	36000H			Specified Person	Licensee	Service Company
1	Alignment mark	●					Visual	Check alignment mark accordance and damage at the home position.	●	●	●
2	External lead	●					Visual	Check for damage and deterioration of leads.	●	●	●
3	Working area and manipulator	●					Visual	Clean the work area if dust or spatter is present. Check for damage and outside cracks.	●	●	●
4	Motors for L- and U-axes	●					Visual	Check for grease leakage. ²⁾	●	●	●
5	Baseplate mounting bolts		●				Spanner Wrench	Tighten loose bolts. Replace if necessary.	●	●	●
6	Connector base		●				Manual	Check for loose connectors and tighten if necessary.	●	●	●
7	LU-axis connectors		●				Manual	Check for loose connectors and tighten if necessary.	●	●	●
8	Connectors in S-head			●			Manual	Check for loose connectors.	●	●	●
9	Wire harness in manipulator (Wires for S-, L-, and U-axes) (Wires for T-axis)			●			Multimeter, Visual	Check for conduction between the main connector of base and intermediate connector with manually shaking the wire. Check for wear of protective spring. ³⁾		●	●
					●			Replace. ⁴⁾			●
10	Links/Connections			●			Visual, Manual	Move the L- and U-axes back and forth, up and down to check any backlash. Replenish grease. ⁵⁾ See <i>section 9.3.6</i> .		●	●
11	Battery pack in manipulator					●	Screwdriver, Wrench	Replace the battery pack when the battery alarm occurs or the manipulator drove for 36000H. See <i>section 9.2.1</i> .		●	●
12	S-axis speed reducer		●				Grease Gun	Check for malfunction. (Replace if necessary.) Exchange grease ⁵⁾ (3000H cycle). See <i>section 9.3.1</i> .		●	●

Table 9-1: Inspection Items (Sheet 2 of 2)

Items ¹⁾	Schedule						Method	Operation	Inspection Charge		
	Daily	1000H Cycle	3000H Cycle	9000H Cycle	18000H	36000H			Specified Person	Licensee	Service Company
13	Speed reducers for L- and U-axes			●			Grease Gun	Check for malfunction. (Replace if necessary.) Exchange grease ⁵⁾ (3000H cycle). See section 9.3.2 and section 9.3.3.		●	●
14	T-axis speed reducer			●			Grease Gun	Check for malfunction. (Replace if necessary.) Exchange grease ⁵⁾ (3000H cycle). See section 9.3.4.		●	●
15	Bearing			●			Grease Gun	Replenish grease ^{5) 6)} Exchange grease ⁵⁾		●	●
16	Overhaul					●					●

- 1 Inspection item numbers correspond to the numbers in Fig. 9-1 "Inspection Items".
- 2 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.
- 3 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 section 9.3.7 "Notes for Maintenance".
- 4 Wire harness in manipulator to be replaced at 18000H inspection.
- 5 For the grease, refer to Table 9-2 "Inspection Parts and Grease Used (Page 9-6)".
- 6 Replenish grease to the U-axis cross-roller bearing at 3000 H or after a year, whichever comes first.

9.1 Inspection Schedule (Page 9-3)

Table 9-2: Inspection Parts and Grease Used (Page 9-6)

No.	Grease Used	Inspected Parts
12, 13, 14	Cassida Grease EPS 00	Speed reducers for S-, L-, U- and T-axes
10, 15	Cassida Grease EPS 2	Bearings

The numbers in the above table correspond to the numbers in *Table 9-1 "Inspection Items"*

9.3 Notes on Grease Exchange Procedures (Page 9-9)

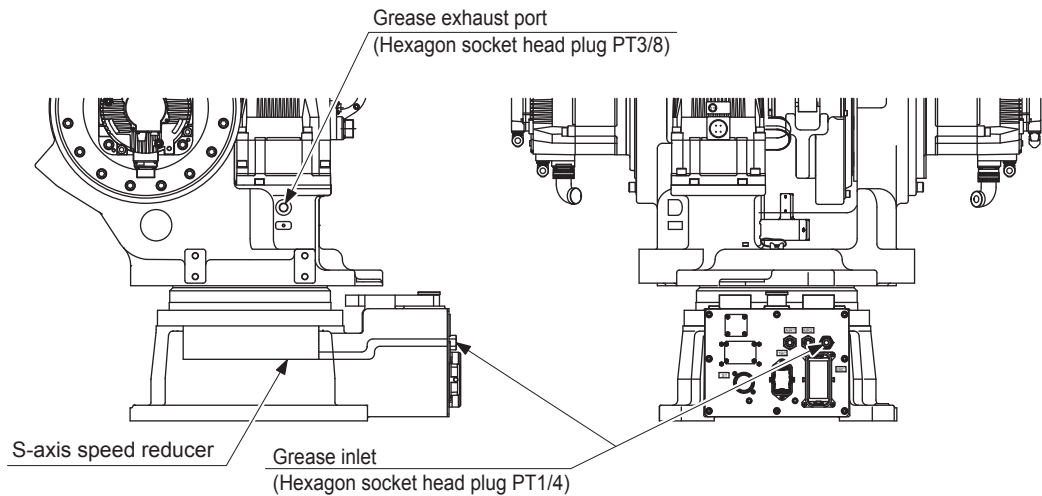
Make sure to follow the instructions listed below at grease replenishment. Failure to observe the following notes may result in damage to motor and speed reducer.



- If grease is added without removing the plug/screw from the grease exhaust port, grease will leak inside a motor or an oil seal of a speed reducer will come off, which may result in damage to the motor. Make sure to remove the plug/screw.
- Do not install a joint, a hose, etc. to the 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 hoses, which are joined to the grease inlet, with grease beforehand to prevent air from intruding into the speed reducer.

9.3.1 Grease Exchange for S-Axis Speed Reducer and Gear

Fig. 9-4: S-Axis Speed Reducer and Gear Diagram



9.3.1.2 Grease Exchange (Page 9-10)

(Refer to Fig. 9-4 “S-Axis Speed Reducer and Gear Diagram” .)

1. Remove the hexagon socket head plugs from the grease inlet and grease exhaust port.



If grease is injected with the plug on, grease will leak inside the motor and may cause a damage. Make sure to remove the plug before the grease injection.

2. Install a grease zerk A-PT1/4 to the grease inlet. (The grease zerk is delivered with the manipulator.)
3. Inject grease through the grease inlet using a grease gun.
 - Grease type: Cassida Grease EPS 00
 - Amount of grease: approx. 2600 cc
 - Air supply pressure of grease pump: 0.3 MPa or less
 - Grease injection rate: 8 g/s or less
4. The grease exchange is completed when new grease appears in the grease exhaust port. (The new grease can be distinguished from the old grease by color.)
5. Move the S-axis for a few minutes to discharge excess grease.
6. Wipe the discharged grease with a cloth, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 23 N•m (2.34 kgf•m).



If the plug is installed while grease is being exhausted, grease will leak inside the motor and may cause a damage. Make sure to install the plug when the grease exhaust is completed.

7. Remove the grease zerk from the grease inlet, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 12 N•m (1.2 kgf•m).

9.3.2 Grease Exchange for L-Axis Speed Reducer (Page 9-11)

Fig. 9-5(a): L-Axis Speed Reducer Diagram

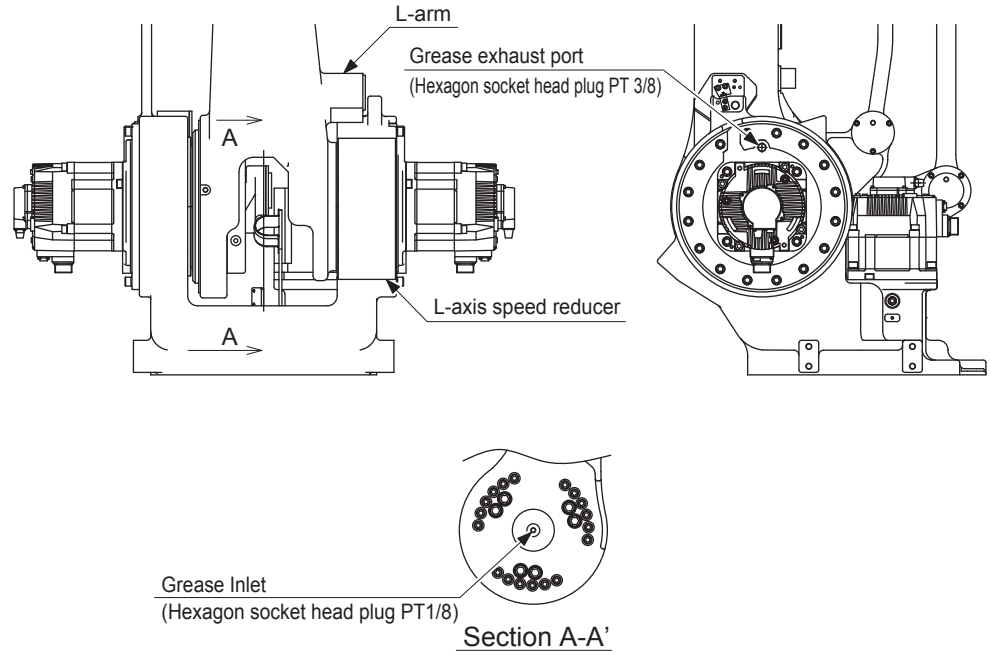
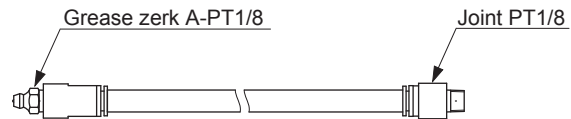


Fig. 9-5(b): Hose for Grease Replenishment



9.3.2.2 Grease Exchange (Page 9-12)

(Refer to Fig. 9-5(a) "L-Axis Speed Reducer Diagram" .)

1. Remove the hexagon socket head plugs from the grease inlet and grease exhaust port.



If grease is injected with the plug on, grease will leak inside the motor and may cause a damage. Make sure to remove the plug before the grease injection.

2. Install a grease zerk A-PT1/8 to the grease inlet. (The grease zerk is delivered with the manipulator.)
3. Inject grease through the grease inlet using a grease gun.
 - Grease type: Cassida Grease EPS 00
 - Amount of grease: approx. 1800 cc
 - Air supply pressure of grease pump: 0.3 MPa or less
 - Grease injection rate: 8 g/s or less
4. The grease exchange is completed when new grease appears in the grease exhaust port. (The new grease can be distinguished from the old grease by color.)
5. Move the L-axis for a few minutes to discharge excess grease.
6. Wipe the discharged grease with a cloth, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 23 N•m (2.34 kgf•m).

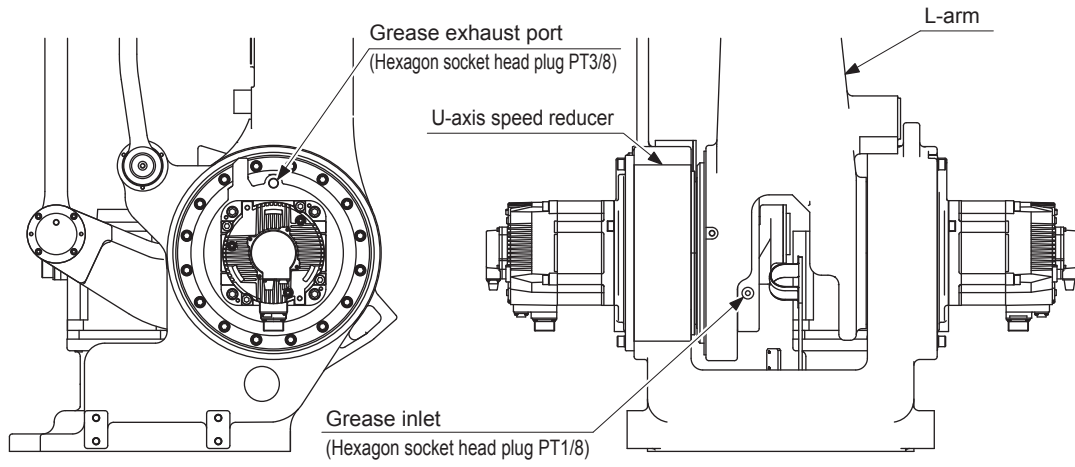


If the plug is installed while grease is being exhausted, grease will leak inside the motor and may cause a damage. Make sure to install the plug when the grease exhaust is completed.

7. Remove the grease zerk from the grease inlet, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).

9.3.3 Grease Exchange for U-Axis Speed Reducer (Page 9-13)

Fig. 9-6: U-Axis Speed Reducer Diagram



9.3.3.2 Grease Exchange (Page 9-14)

(Refer to Fig. 9-6 “U-Axis Speed Reducer Diagram” .)

1. Remove the hexagon socket head plugs from the grease inlet and grease exhaust port.



If grease is injected with the plug on, grease will leak inside the motor and may cause a damage. Make sure to remove the plug before the grease injection.

2. Install a grease zerk A-PT1/8 to the grease inlet. (The grease zerk is delivered with the manipulator.)
3. Inject grease through the grease inlet using a grease gun.
 - Grease type: Cassida Grease EPS 00
 - Amount of grease: approx. 1600 cc
 - Air supply pressure of grease pump: 0.3 MPa or less
 - Grease injection rate: 8 g/s or less
4. The grease exchange is completed when new grease appears in the grease exhaust port. (The new grease can be distinguished from the old grease by color.)
5. Move the U-axis for a few minutes to discharge excess grease.
6. Wipe the discharged grease with a cloth, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 23 N•m (2.34 kgf•m).

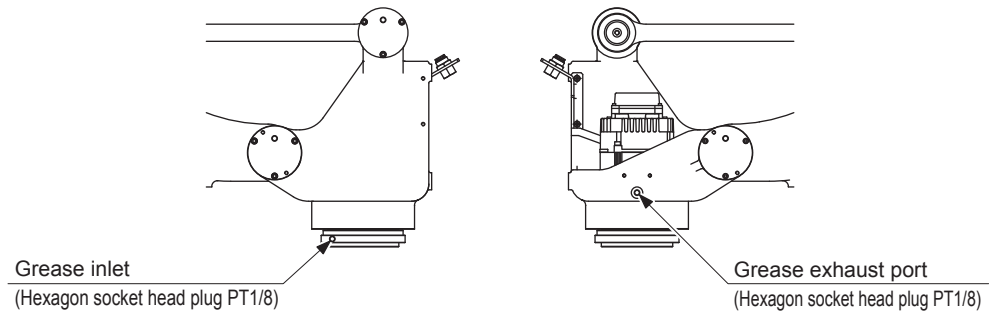


If the plug is installed while grease is being exhausted, grease will leak inside the motor and may cause a damage. Make sure to install the plug when the grease exhaust is completed.

7. Remove the grease zerk from the grease inlet, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).

9.3.4 Grease Exchange for T-Axis Speed Reducer (Page 9-15)

Fig. 9-7: T-Axis Speed Reducer Diagram



9.3.4.2 Grease Exchange (Page 9-16)

(Refer to Fig. 9-7 "T-Axis Speed Reducer Diagram" .)

1. Remove the hexagon socket head plugs from the grease inlet and grease exhaust port.



If grease is injected with the plug on, grease will leak inside the motor and may cause a damage. Make sure to remove the plug before the grease injection.

2. Install a grease zerk A-PT1/8 to the grease inlet. (The grease zerk is delivered with the manipulator.)
3. Inject grease through the grease inlet using a grease gun.
 - Grease type: Cassida Grease EPS 00
 - Amount of grease: approx. 100 cc
 - Air supply pressure of grease pump: 0.3 MPa or less
 - Grease injection rate: 8 g/s or less
4. The grease exchange is completed when new grease appears in the grease exhaust port. (The new grease can be distinguished from the old grease by color.)
5. Move the T-axis for a few minutes to discharge excess grease.
6. Wipe the discharged grease with a cloth, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).

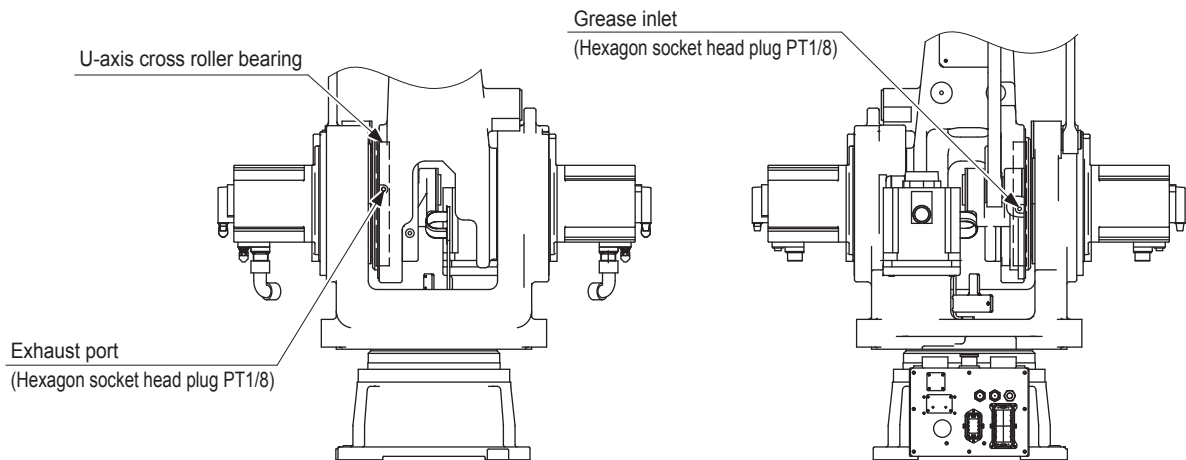


If the plug is installed while grease is being exhausted, grease will leak inside the motor and may cause a damage. Make sure to install the plug when the grease exhaust is completed.

7. Remove the grease zerk from the grease inlet, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).

9.3.5 Grease Replenishment for U-axis Cross Roller Bearing (Page 9-17)

Fig. 9-8: U-Axis Cross Roller Bearing Diagram



1. Remove the hexagon socket head plug of the exhaust port. (Refer to Fig. 9-8 “U-Axis Cross Roller Bearing Diagram”.)
2. Remove the hexagon socket head plug of the grease inlet and install the grease zerk A-PT1/8. Inject grease through the grease inlet using a grease gun. (The grease zerk is delivered with the manipulator.)
 - Grease type: Cassida Grease EPS 2
 - Amount of grease: approx. 60 cc
 - Air supply pressure of grease pump: 0.3 MPa or less
 - Grease injection rate: 8 g/s or less
3. Reinstall the plug into the exhaust port. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).



The exhaust port is for AIR flow: Grease is not exhausted from the exhaust port.

Do not inject excessive grease through the grease inlet.

4. Remove the grease zerk from the grease inlet, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).

9.3.6 Grease Replenishment for Links (Page 9-19)

1. Remove the hexagon socket head plug PT1/8 from the exhaust port of each link. (Refer to *fig. 9-9 "Grease Replenishment for Links"* .)
2. Remove the hexagon socket head plug PT1/8 from the grease inlet of each link and install the grease zerk A-PT1/8. Inject grease through the grease inlet using a grease gun. (The grease zerk is delivered with the manipulator.)
 - Grease type: Cassida Grease EPS 2
 - Amount of grease for links 2, 3, 9: 6 cc (12 cc for 1st supply)
 - Amount of grease for link 1: 12 cc (24 cc for 1st supply)
 - Amount of grease for links 4, 5, 6, 7, 8: 3 cc (6 cc for 1st supply)
 - Air supply pressure of grease pump: 0.3 MPa or less
 - Grease injection rate: 8 g/s or less



The exhaust port is for AIR flow: Grease is not exhausted from the exhaust port.

Do not inject excessive grease through the grease inlet.

3. Reinstall the plug into the exhaust port of each link. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).
4. Remove the grease zerk from the grease inlet, and reinstall the plug. Before installing the plug, apply Three Bond 1206C on the thread part of the plug. Then tighten the plug with a tightening torque of 4.9 N•m (0.5 kgf•m).

10 Recommended Spare Parts (Page 10-1)

It is recommended to keep the parts and components in the following table in stock as spare parts for the MOTOMAN-MPK50. 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 10-1: Spare Parts for the YR-MPK0050-F00 (Sheet 1 of 2)

Rank	Parts No.	Name	Type	Manufacturer	Qty	Qty per Unit	Remarks
A	1	Grease	Cassida Grease EPS 00	Showa Shell Sekiyu K.K.	19 kg	-	For speed reducers
A	2	Grease	Cassida Grease EPS 2	Showa Shell Sekiyu K.K.	19 kg 400 g	-	For cross roller bearing and links
A	3	Battery Pack	HW0470360-A	Yaskawa	1	1	For connector base
A	4	Battery Pack	HW9470932-A	Yaskawa	1	1	For replacement of wire harness in manipulator
A	5	Liquid Gasket	Three Bond 1206C	ThreeBond Co., Ltd.	1	1	
B	6	S-axis Speed Reducer	HW0387752-A	Yaskawa	1	1	
B	7	S-axis Input Gear	HW0312836-A	Yaskawa	1	1	
B	8	Speed Reducer for L- and U-axes	HW0388209-C	Yaskawa	1	2	
B	9	Input Gear for L- and U-axes	HW0414560-1	Yaskawa	1	2	
B	10	T-axis Speed Reducer	HW9280780-B	Yaskawa	1	1	
B	11	T-axis Input Gear	HW0314769-1	Yaskawa	1	1	
B	12	U-axis Cross Roller Bearing	HW9482144-A	Yaskawa	1	1	
C	13	AC Servomotor for S-axis	HW0388669-A (SGMRV-30ANA-YR11)	Yaskawa	1	1	
C	14	AC Servomotor for L- and U-axes	HW0388937-A (SGMRV-37ANA-YR11)	Yaskawa	1	2	
C	15	AC Servomotor for T-axis	HW0388663-A (SGMRV-05ANA-YR11)	Yaskawa	1	1	

MPK50 with Food Grade
Grease

Table 10-1: Spare Parts for the YR-MPK0050-F00 (Sheet 2 of 2)

Rank	Parts No.	Name	Type	Manufacturer	Qty	Qty per Unit	Remarks
C	16	Wire Harness in Manipulator	HW0175129-A	Yaskawa	1	1	
C	17	Connector Base Unit	HW0374338-A	Yaskawa	1	1	
C	18	Circuit board	SGDR-FEBA02A	Yaskawa	1	1	

MOTOMAN-MPK50 INSTRUCTIONS

SUPPLEMENTARY FOR YR-MPK0050-F00 (FOR FOOD GRADE GREASE)

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