

4.6.3 Replacing the axis-3 drive unit

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Spare part	Article number	Note
Drive unit, food grade lubrication	3HAC057905-001	Used for robots with food grade lubrication. Includes axis-3 gearbox, AC motor with encoder interface, motor adapter and O-ring (3HAC048939-002).
Drive unit, SafeMove 2-supported	3HAC061275-001	Used for IRB 1200 Type B. See Type B of IRB 1200 on page 908 . Includes axis-3 gearbox, AC motor with resolver interface, motor adapter and O-ring (3HAC048939-002).
Drive unit, food grade lubrication and SafeMove 2-supported. Drive unit, Hygienic	3HAC061276-001	Used for IRB 1200 Type B. See Type B of IRB 1200 on page 908 . Used for robots with food grade lubrication. Used with protection type Hygienic Includes axis-3 gearbox, AC motor with resolver interface, motor adapter and O-ring (3HAC048939-002).
O-ring	3HAC048939-002	Replace if damaged.
M2 variseal sealing	3HAC044641-005	Used with protection class IP67. Used with protection type Foundry Plus. Replace if damaged.
M2 variseal sealing	3HAC044641-006	Used with protection class IP67. Used with protection type Foundry Plus. Replace if damaged.
Radial sealing	3HAC024865-001	Not used with protection class IP40. Replace if damaged.
Gasket on lower arm cover	3HAC056725-001 / 3HAC080703-001	Not used with protection class IP40. Replace if damaged.
Gasket on lower arm cable housing	3HAC044895-001 / 3HAC080696-001	Not used with protection class IP40. Replace if damaged.
Gasket on cable housing cover	3HAC056724-001 / 3HAC080702-001	Not used with protection class IP40. Replace if damaged.

Required tools and equipment

Equipment, etc.	Article number	Note
Guide pin for upper arm	3HAC049705-001	Always use three guide pins together!
Roundsling, 2 m	-	Length: 2 m. Lifting capacity: 100 kg.
24 VDC power supply	-	Used to release the motor brakes.

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Equipment, etc.	Article number	Note
Calibration toolkit, manual calibration	3HAC051256-001	Includes calibration tools, pins and attachment screws for manual calibration method. ⁱ
Standard toolkit	-	Content is defined in section Standard toolkit on page 927 .

- ⁱ The robot is calibrated by either manual calibration or Axis Calibration at factory. Always use the same calibration method as used at the factory.
Information about valid calibration method is found on the calibration label or in the calibration menu on the FlexPendant.
If no data is found related to standard calibration, manual calibration is used as default.

Required consumables

Consumable	Art. no.	Note
Cleaning agent	-	Isopropanol
Locking liquid	-	Loctite 2400 (or equivalent Loctite 243)
Flange sealing	12340011-116	Loctite 574 For robots with protection class IP67 For robots with protection type Foundry Plus
Sealant	3HAC026759-001	Sikaflex 521FC For robots with protection type Clean Room. For robots with food grade lubrication.
Sealant	3HAC073510-001	Trans Clear For robots with protection type Hygienic
Grease	3HAC037302-001	Total amount: 32 g. Used to lubricate the gearbox. The gear is pre-filled at delivery but grease may need to be added depending on the actual condition.
Grease	-	Total amount: 32 g. LUBRIPLATE SYNXTREME FG-0 Used to lubricate the gearbox of robots with food grade lubrication and robots with protection type Hygienic. The gear is pre-filled at delivery but grease may need to be added depending on the actual condition.

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Deciding calibration routine

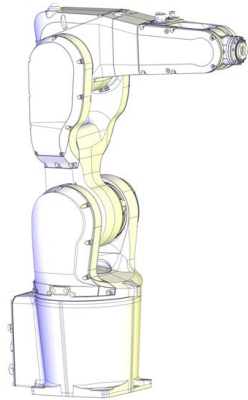
Decide which calibration routine to be used, based on the information in the table. Depending on which routine is chosen, action might be required prior to beginning the repair work of the robot, see the table.

	Action	Note
1	Decide which calibration routine to use for calibrating the robot. - Reference calibration. External cable packages (DressPack) and tools can stay fitted on the robot. - Fine calibration. All external cable packages (DressPack) and tools must be removed from the robot.	 Note Calibrating axis 6 always requires tools to be removed from the mounting flange (also for reference calibration) since the mounting flange is used for installation of the calibration tool.
	If the robot is to be calibrated with reference calibration: Find previous reference values for the axis or create new reference values. These values are to be used after the repair procedure is completed, for calibration of the robot. If no previous reference values exist, and no new reference values can be created, then reference calibration is not possible.	Follow the instructions given in the reference calibration routine on the FlexPendant to create reference values. Creating new values requires possibility to move the robot. Read more about reference calibration for Axis Calibration in Reference calibration routine on page 850 .
	If the robot is to be calibrated with fine calibration: Remove all external cable packages (DressPack) and tools from the robot.	

Removing the drive unit

Use these procedures to remove the axis-3 drive unit.

Preparations before removing the axis-3 drive unit

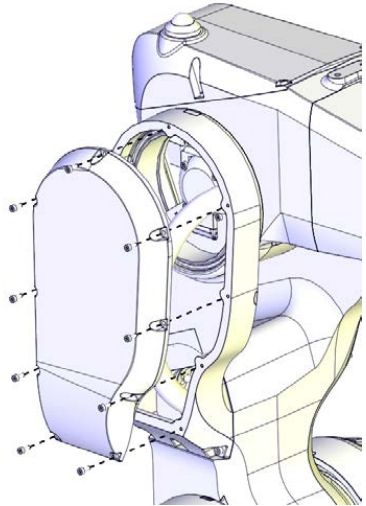
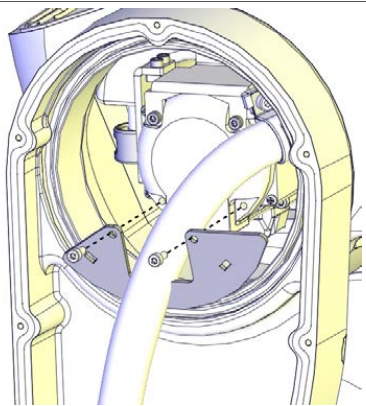
	Action	Note
1	Decide which calibration routine to use, and take actions accordingly prior to beginning the repair procedure.	
2	Jog all axes to zero position.	 xx1300002581

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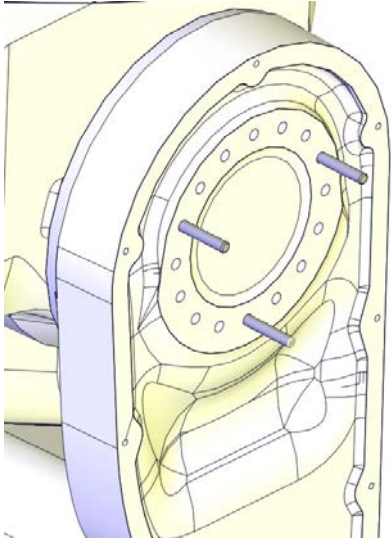
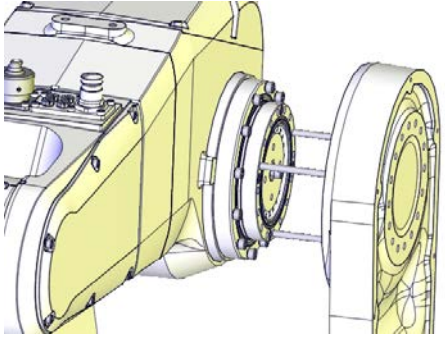
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	Action	Note
3	 DANGER Turn off all: • electric power supply • hydraulic pressure supply • air pressure supply to the robot, before entering the robot working area.	
4	 CAUTION For robots with protection type Clean Room For robots with food grade lubrication For robots with protection type Hygienic Always cut the paint with a knife and grind the paint edge when disassembling parts of the robot! See Cut the paint or surface on the robot before replacing parts on page 177 .	
5	Remove the cable housing cover.	 xx1300002400
6	Remove the plate.	 xx1300002413

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	Action	Note
7	Fit guide pins to the upper arm.	Guide pin for upper arm: 3HAC049705-001 Always use three guide pins together!  xx1400000771
8	Separate the upper and lower arm with guidance from the guide pins.	 xx1300002533

Removing the axis-3 drive unit

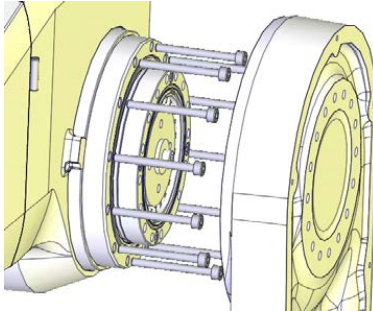
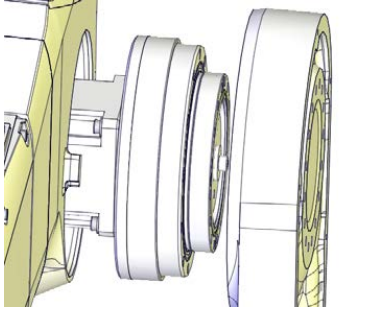
	Action	Note
1	 DANGER Make sure that all supplies for electrical power, hydraulic pressure, and air pressure are turned off.	
2	 CAUTION For robots with protection type Clean Room For robots with food grade lubrication For robots with protection type Hygienic Always cut the paint with a knife and grind the paint edge when disassembling parts of the robot! See Cut the paint or surface on the robot before replacing parts on page 177 .	

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	Action	Note
3	Remove the drive unit screws.	 xx1300002532
4	Carefully pull out the complete drive unit.  CAUTION The axis-3 gear unit and motor adapter are not secured to each other with screws! Be careful when handling the drive unit.	 xx1300002534

Refitting the drive unit

Use this procedure to refit the axis-3 drive unit.

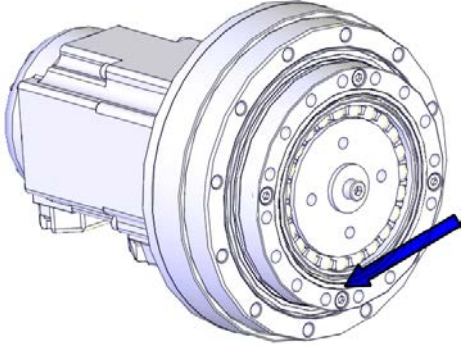
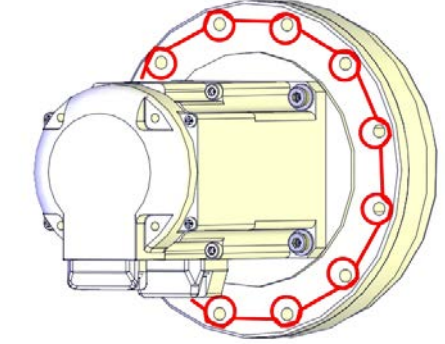
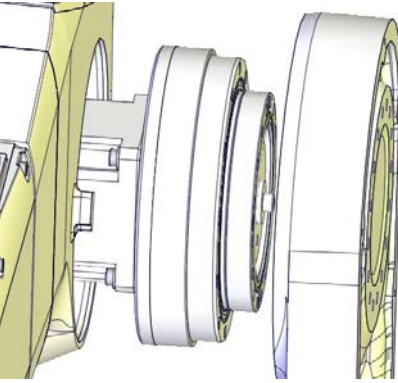
Refitting the axis-3 drive unit

	Action	Note
1	For robots with protection type Clean Room For robots with food grade lubrication For robots with protection type Hygienic Clean the joints that have been opened and wipe the parts free from particles with spirit on a lint free.	
2	Check if there is a sufficient amount of grease on the gear. Apply more grease, if needed.	Grease: 3HAC037302-001. For robots with food grade lubrication For robots with protection type Hygienic Grease: LUBRIPLATE SYNXTREME FG-0

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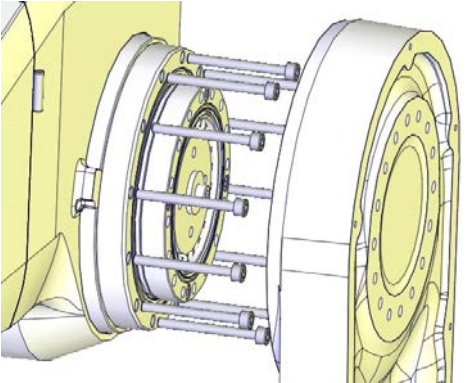
	Action	Note
3	Check the o-ring for damage. Replace if damaged.	O-ring: 3HAC048939-002  xx1400000004
4	Remove the two screws and nuts that secure the axis-3 motor adapter and gear unit to each other during transport.	
5	For robots with protection class IP67 For robots with protection type Foundry Plus Remove residual locking liquid and other pollutants with cleaning agent Loctite 7063. Apply flange sealing Loctite 574 on the mounting surfaces of the motor adapter.	 xx1400000784
6	Refit the drive unit into the upper arm.  Note Make sure to refit the drive unit correctly oriented. When the upper arm is in its zero position (horizontal), the motor connectors should point downwards.	 xx1300002534

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	Action	Note
7	Refit the drive unit screws.	Screws: 3HAB3409-214 (M4x40) Tightening torque: 4.2 Nm  xx1300002532  Note Only use specified screws, never replace them with other screws.
8	Seal and paint the joints that have been opened. See Cut the paint or surface on the robot before replacing parts on page 177  Note After all repair work, wipe the robot free from particles with spirit on a lint free cloth.	

Refitting the upper arm

	Action	Note
1	For robots with protection type Clean Room For robots with food grade lubrication For robots with protection type Hygienic Clean the joints that have been opened and wipe the parts free from particles with spirit on a lint free.	

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	Action	Note
10	For robots with protection type Clean Room For robots with food grade lubrication For robots with protection type Hygienic Clean, seal and paint the joints that have been opened. See Cut the paint or surface on the robot before replacing parts on page 177.  Note After all repair work, wipe the robot free from particles with spirit on a lint free cloth.	
11	Recalibrate the robot.	Calibration is detailed in section Calibration on page 837 .
12	 DANGER Make sure all safety requirements are met when performing the first test run. See Test run after installation, maintenance, or repair on page 123.	