

Troubleshooting

Arm origin adjustment (For twin arm robot)

■ Adjustment of rotation direction (Arm extending/retracting direction)

Arm movement direction is on the straight line from the 1st joint to the 3rd joint of the arm. Follow the below procedures to change the arm movement direction.

1. Remove the 1st joint cover of the required arm. Remove 2 of M5 hex socket head cap screws (①) that lock the 1st joint. Then the arm becomes free to move in the extending/retracting direction.
2. Loosen 3 of M5 hex socket head cap screws (②) of the required arm 2nd joint that adjust the rotation direction. Then the 2nd joint becomes free to move so that both Arm 1 and Arm 2 can move independently from each other.
«Note» It is not necessary to remove M5 hex socket head cap screws (②).
3. Overlap Arm 1 and 2 to fit perfectly so that all the 4 values “a” in the figure become equal.
4. Fix Arm 1 and rotate Arm 2 manually to the required position. As checking with a scale, move the arm until the side surface of Arm 1 on the right Arm and the left Arm 1 become in alignment and parallel.
« Note » As the wrist-block mounting direction and the distance between axes have been changed, the setting has to be restored. Refer to other sections for adjusting the wrist-block and the distance between axes.
5. Confirm that the arms are perfectly in alignment and parallel, tighten 3 of M5 hex socket head cap screws (②) of the 2nd joint that have been loosened with the specified torque.
6. Tighten M5 hex socket head cap screws (①) of the 1st joint temporary.
7. Execute the origin search and confirm the theta origin (extending/retracting direction) is correct.
8. Proceed to the procedures for the distance adjustment between axes.

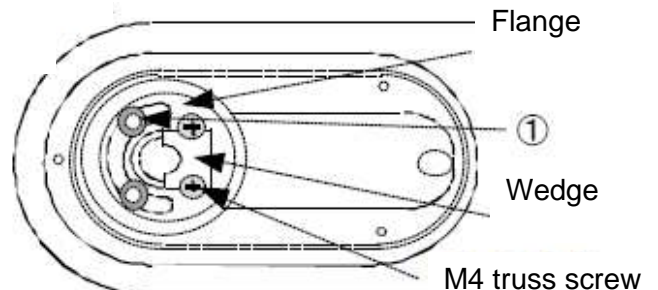


Figure: 1st joint area (Wedge type)

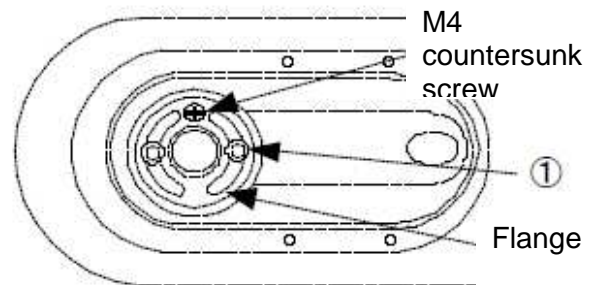


Figure: 1st joint area (Split mold type)

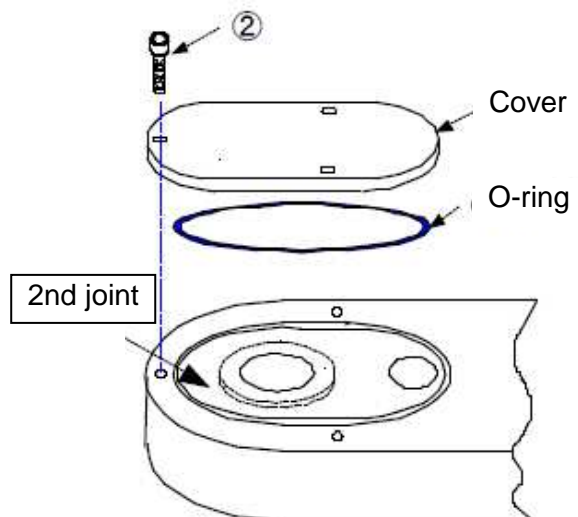


Figure: 2nd joint structure

«Precautions for installation»

Be sure to read “1. PRECAUTIONS” of the maintenance manual before installing O-rings or screws.

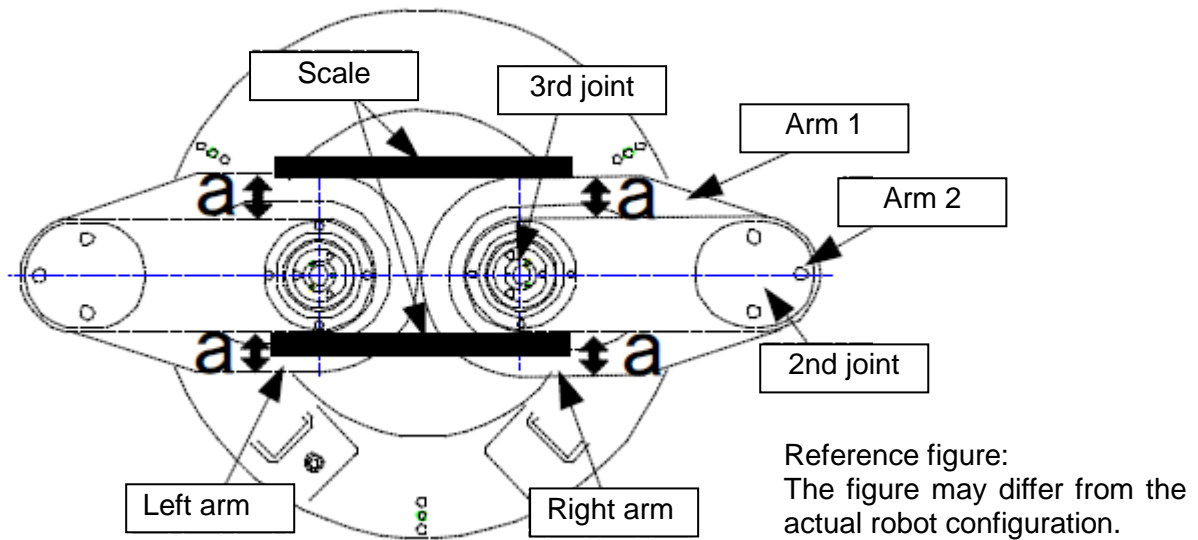


Figure: Theta origin adjustment (extending/retracting direction)

■ Distance adjustment between the axes

This is the procedures of distance adjustment between the center of the arm 1st and the 3rd joints when the arm is at the origin.

1. Execute the arm origin search.
2. Measure the distance between the axes with a scale.

«Note»

Convert the dimension between the 1st and 3rd joints "A" into the dimension "B" (from the 1st joint outer circumference to the 3rd one) to get the dimension, since actual dimension "A"(distance between centers of the 1st and 3rd joints) cannot be measured as shown in the figure below.

[Dimension "B" = Dimension between axes " A " + Radius of 1st joint "C" + Radius of 3rd joint "D"]

3. Follow the procedures below to change the distance.
4. Remove the cover of the 1st joint of the arm to be changed.
5. Loosen 2 of M5 hex socket head cap screws (⑥) that fix the flange (⑩) of the 1st joint. The arm becomes free to move against the drive axis.
«Note» It is not necessary to remove the M5 hex socket head cap screws (⑥) in case of a minor adjustment.
6. Move Arm 1 manually to the drive axis to reach the required distance.
7. Tighten 2 of M5 hex socket head cap screws (⑥) that fix the flange (⑩) of the 1st joint temporarily.
8. Execute the origin search and confirm the distance between the axes. Repeat the adjustment from (5) to (7) until it reaches the required distance.
9. After adjustment, tighten 2 of M5 hex socket head cap screws (①) with the specified torque.

«Precautions for installation»

Be sure to read "1. PRECAUTIONS" of the maintenance manual before installing O-rings or screws.

Reference figure:
The figure may differ from the actual robot configuration.

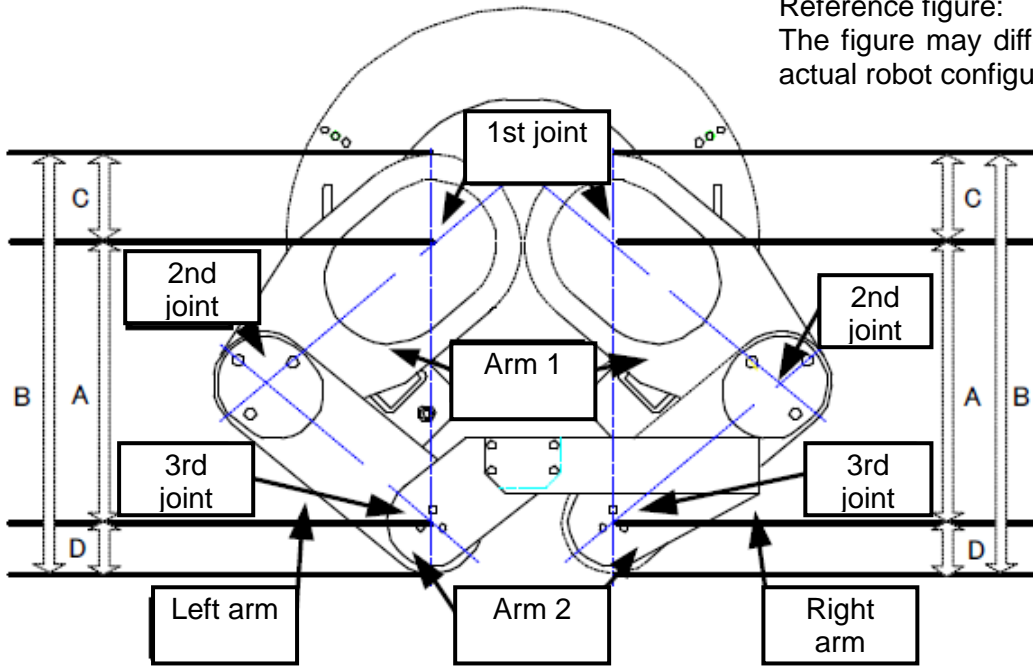
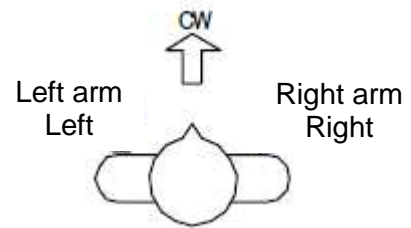


Figure: Measurement of the distance between the axes

* Distinction of the right and left arm: By considering the robot as a human, the direction that the arm expands to CW from the origin is considered as the front; the arm on the right is the right arm and the arm on the left is the left arm.



■ Wrist-block adjustment

The wrist-block is a part that fixes the end-effector. The wrist-block has to be adjusted preliminarily in a way which the central axis of the end-effector and the arm extending/retracting direction are in line.

«Wrist-block right angle adjustment»

1. Loosen M3 hex socket head cap screws (①) lightly to the extent that the underside of the wrist-block can be rotated manually to tighten temporary (position keeping).

«Note» Preliminarily loosen 3 of the leveling setscrews lightly (②). Please note that the leveling needs to be adjusted afterward.

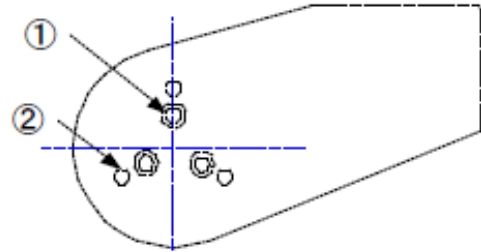


Figure: Right arm wrist-block area

2. Overlap Arm 1 and Arm 2 of both right Arm and left Arm to fit perfectly.
3. Adjust all the 4 values “a” in the figure below “Right angle adjustment “become equal.
4. Adjust the angle so that the wrist-block of the right and left Arm are overlapped and the end of the wrist-block is flat and in alignment.

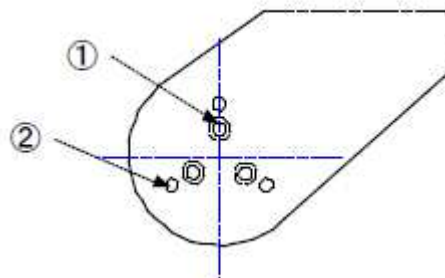


Figure: Left arm wrist-block area

Reference figure:

The figure may differ from the actual robot configuration.

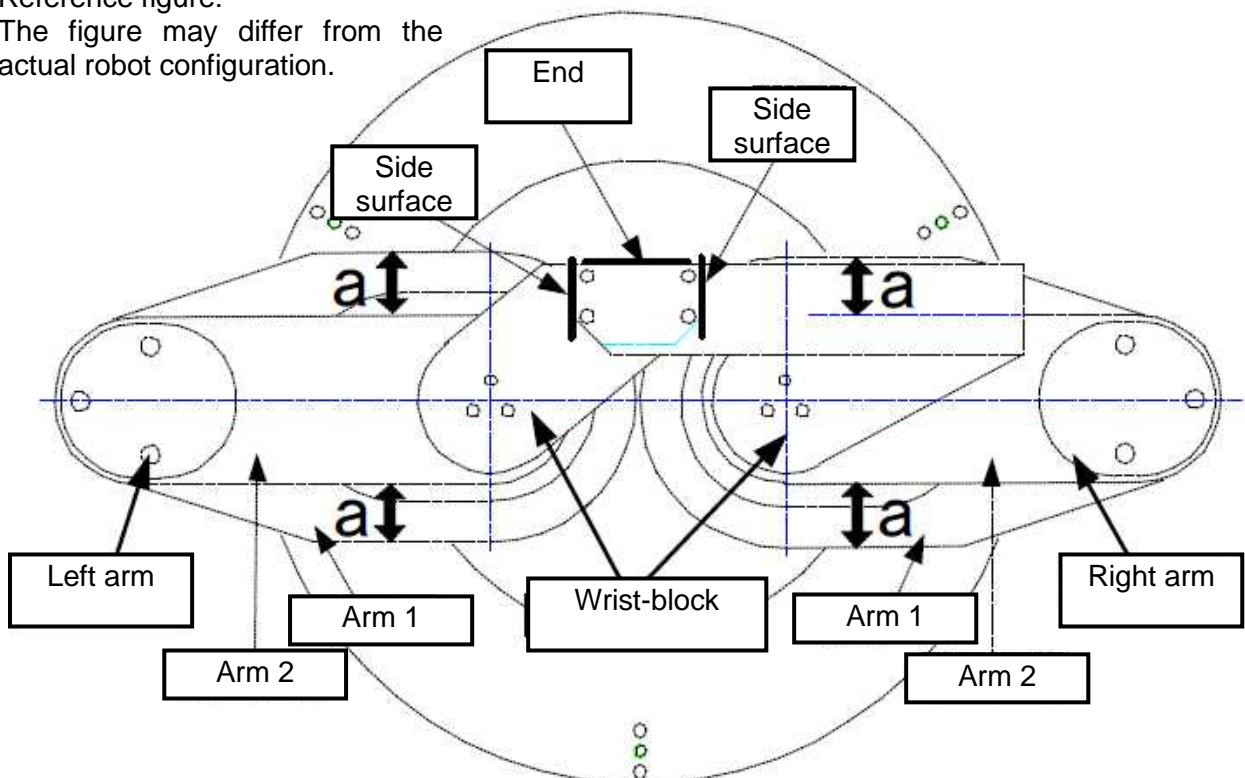


Figure: Right angle adjustment

5. Then adjust the right Arm and the left Arm parallel to each other and overlap the wrist-block of both arms with both arms expanded to the maximum point as specified in the figure below “Arm extension position for a right angle adjustment”. Confirm that the end of the wrist-block is flat and in alignment.
6. Once the angle has been decided, tighten M3 hex socket head cap screws (①) that fix the wrist-block temporarily. Tighten carefully so as not to move the direction.
7. Again, confirm the angle with the procedures from (2) to (5).

«Note» In case the angle is not correct, repeat the wrist-block adjustment from the beginning.

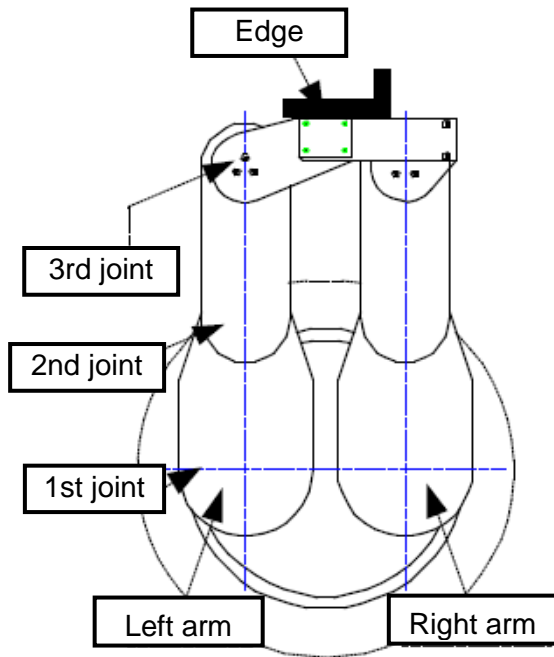


Figure: Arm extension position for a right angle adjustment

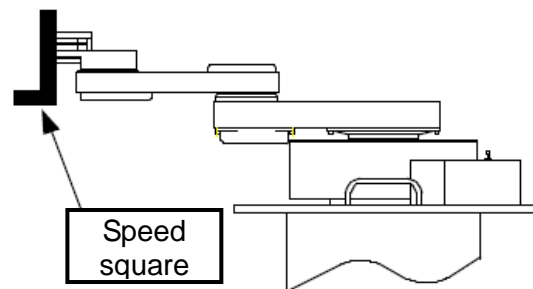


Figure: Lateral view of the Arm extension position

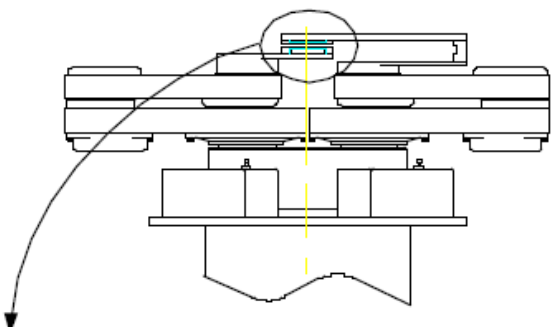
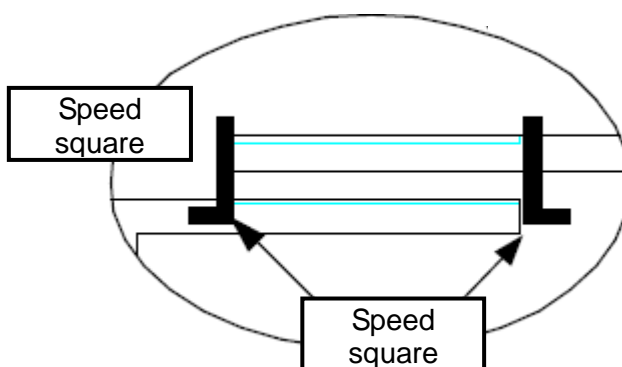


Figure: Front view of the Arm extension position

[Enlarged figure]



Reference figure:
The figure may differ from the actual robot configuration.

«Wrist-block level adjustment»

After acquiring the level of the robot base, adjust the end-effector mounting surface of the wrist-block with 3 leveling setscrews (②) and 3 mounting bolts (①).

The more tightened the leveling setscrews (②), the higher the level becomes.

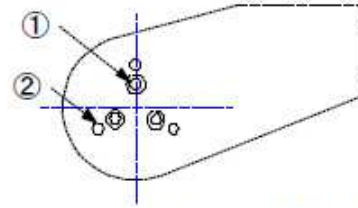


Figure: Right arm wrist-block area

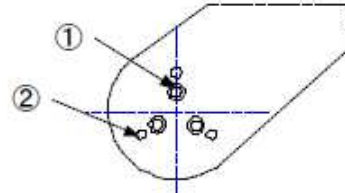


Figure: Left arm wrist-block area