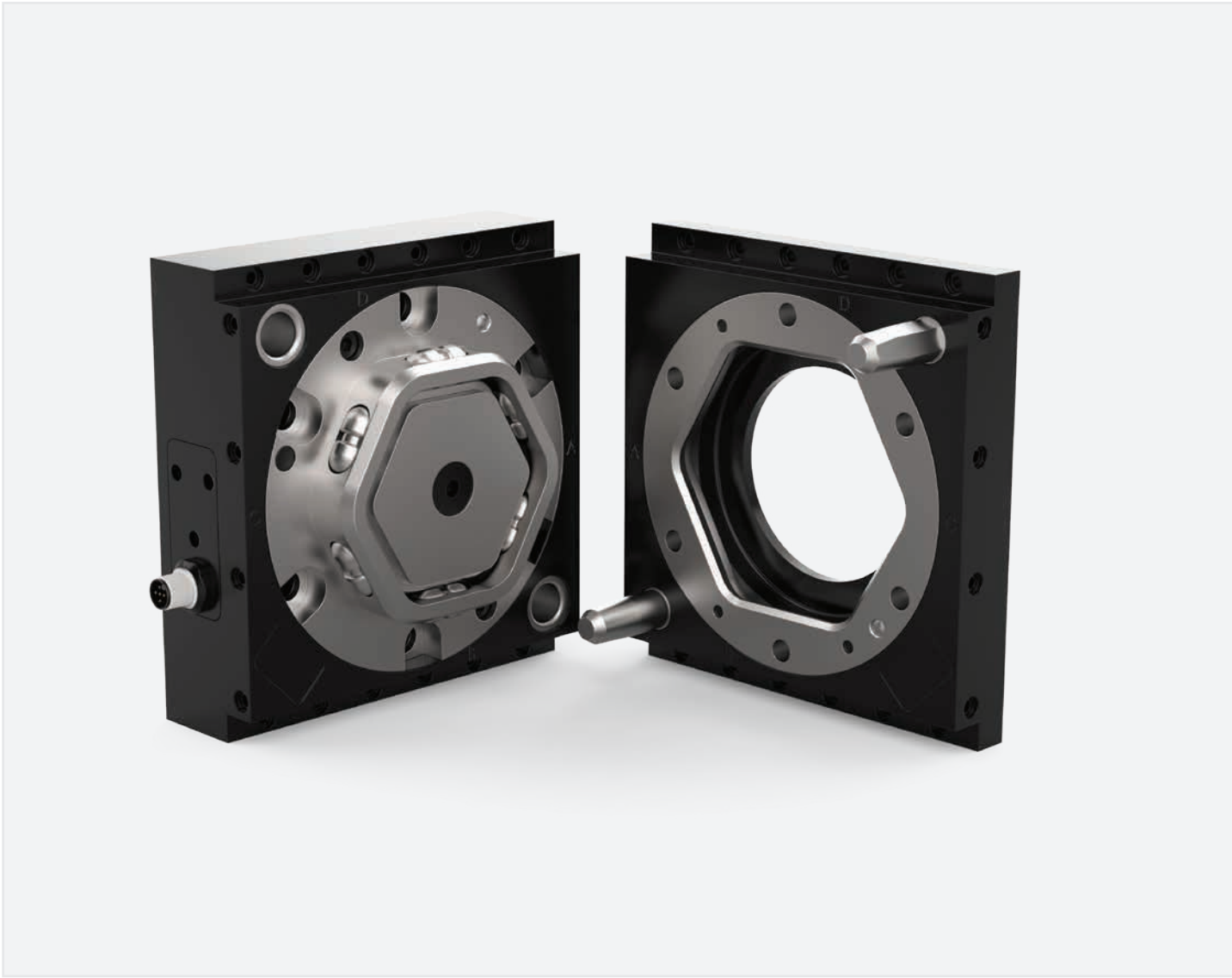
Service Manual

RQC/RTP Series | Automatic Tool Changers

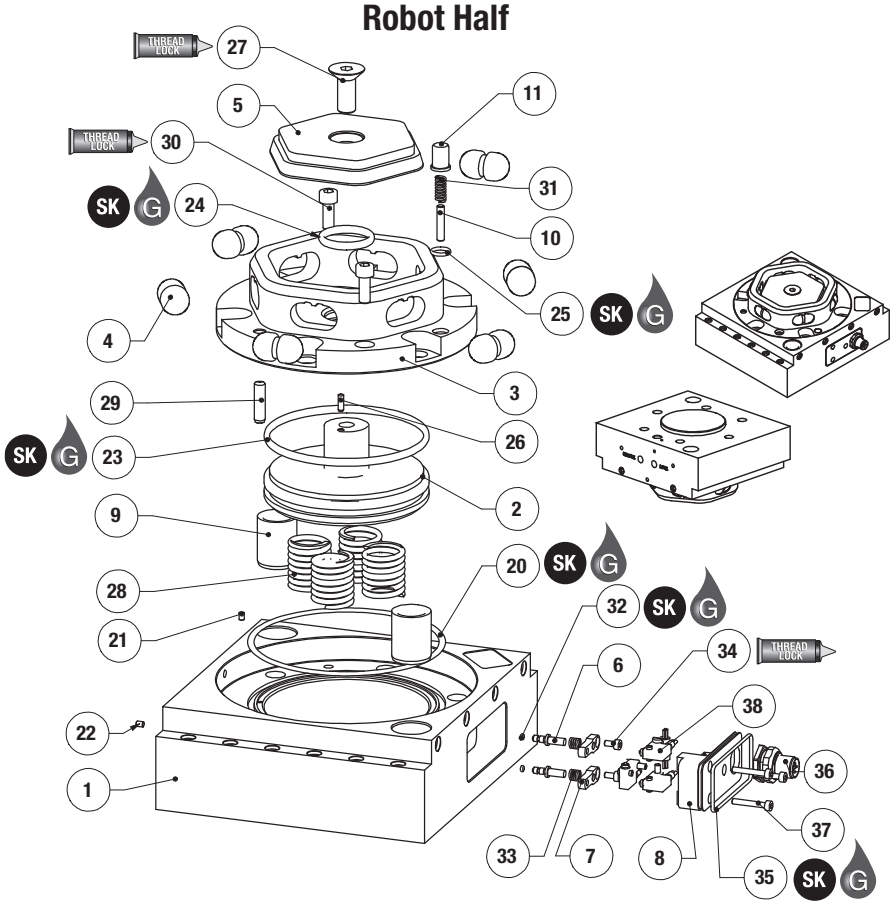


WARNING: This is a controlled document. It is your responsibility to deliver this information to the end user of the DESTACO Robohand product. Failure to deliver this could result in your liability for injury to the user or damage to the machine. For copies of this manual, call your Customer Service Representative at 1.248.836.6700

RQC/RTP SERIES

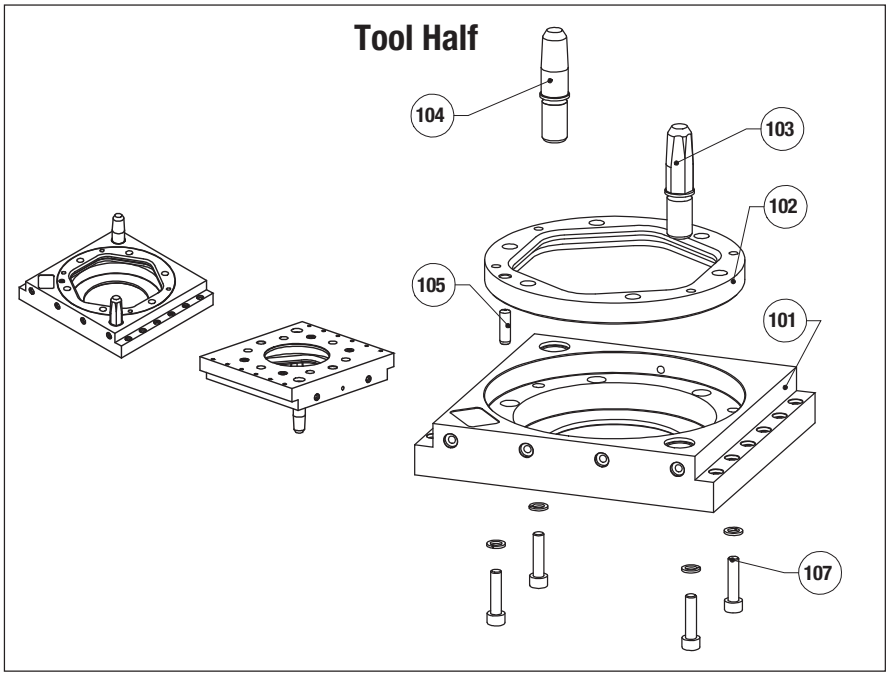
Tool Changers | Maintenance and Assembly Procedure

Robot Half



Item	Qty	Name
Robot Half		
01	1	Body
02	1	Piston
03	1	Pin Retainer
04	6	Pin
05	1	Ram
06	2	Sensing Pin
07	2	Stop
08	1	Bracket
09	2	Bushing
10	1	Pin
11	1	Target
20	1	Body, O-Ring
21	1	Body, Plug
22	1	Body, Plug
23	1	Piston, O-Ring
24	1	Retainer, O-Ring
25	1	Retainer, O-Ring
26	1	Piston, Pin
27	1	Piston, Screw
28	2 to 5	Body, Spring
29	1	Body, Pin
30	2	Retainer, SHC Screw
31	1	Target, Spring
32	2	Pin, O-Ring
33	2	Stop, Spring
34	2	Stop, SHC Screw
35	1	Bracket, O-Ring
36	1	Bracket, M12 Plug (optional)
37	3	Bracket, SHC Screw
38	1	Sensor Kit (optional)

Tool Half

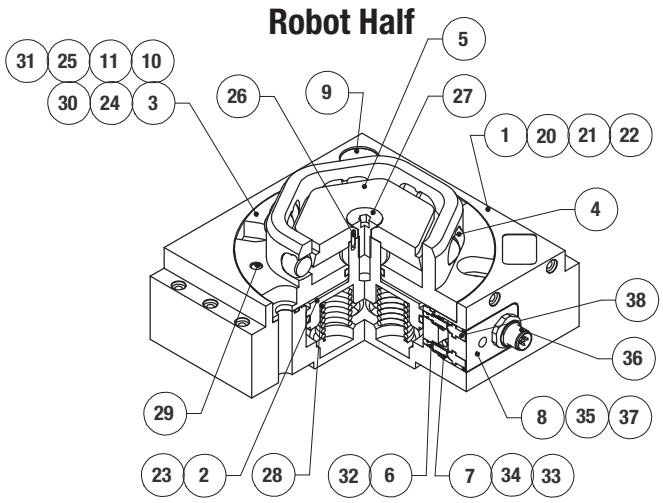


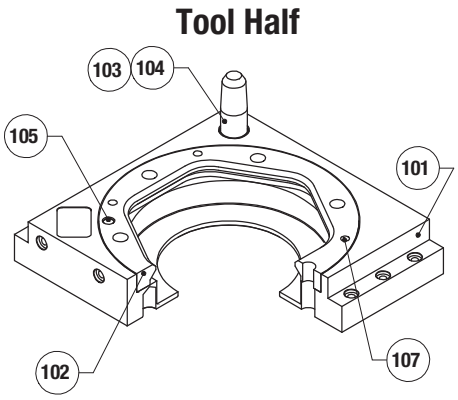
Tool Half		
101	1	Body
102	1	Ring
103	1	Diamond Pin
104	1	Centering Pin
105	1	Pin
107	4	SHC Screw

NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices.

SK Seal Repair Kit Order #'s See Product Data Sheets

SK Seal Kit Items | THREAD LOCK Thread Locker | KRYTOX™ Krytox™ Lubricant | O Lightweight Machine Oil | G Teflon® Based Grease | GLUE Super Bonder | Third Angle Projection





Item	Qty	Name
Robot Half		
01	1	Body
02	1	Piston
03	1	Pin Retainer
04	6	Pin
05	1	Ram
06	2	Sensing Pin
07	2	Stop
08	1	Bracket
09	2	Bushing
10	1	Pin
11	1	Target
20	1	Body, O-Ring
21	1	Body, Plug
22	1	Body, Plug
23	1	Piston, O-Ring
24	1	Retainer, O-Ring
25	1	Retainer, O-Ring
26	1	Piston, Pin
27	1	Piston, Screw
28	2 to 5	Body, Spring
29	1	Body, Pin
30	2	Retainer, SHC Screw
31	1	Target, Spring
32	2	Pin, O-Ring
33	2	Stop, Spring
34	2	Stop, SHC Screw
35	1	Bracket, O-Ring
36	1	Bracket, M12 Plug (optional)
37	3	Bracket, SHC Screw
38	1	Sensor Kit (optional)
Tool Half		
101	1	Body
102	1	Ring
103	1	Diamond Pin
104	1	Centering Pin
105	1	Pin
107	4	SHC Screw

NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices

Assembly Procedure - Robot Half

1) Lubricate and install seal (#20) into the body #1
2) Install the air port plugs (#21) and (#22) with thread-locker into the body (#1)
3) Press in the bushings (#9) into the body
4) Lubricate and install seals (#24) and (#25) - sizes 800 and 1200 only into the pin retainer (#3)
5) Insert the pins (#4) into the pin retainer (#3)
6) Lubricate and install seal (#23) onto the piston #2
7) Press in the pin (#26) into the piston
8) Completely insert the piston (#2) into the pin retainer (#3)
9) Sizes 800 and 1200 only: press in the pin (#10) into target (#11) and install the spring (#31) and insert this sub assembly into the pin retainer
10) Locate and insert the ram (#5) into the piston and fasten with screw (#27) with thread-locker
11) Insert the springs (#28) into the body
12) Press in the pin (#29) into the body
13) Locate and insert the pin, pin retainer and piston sub-assembly into the body and fasten with screws (#30) with thread-locker
14) Lubricate and install seals (#32) into the sensing pins (#6)
15) Insert the sensing pins into the body
16) Install the springs (#33) on the sensing pins
17) Mount stops (#7) with screws (#34) with thread-locker
18) Lubricate and install seal (#35) onto the bracket (#8)
19) Mount the optional sensor kit (#38) to the bracket
20) Mount the optional M12 plug (#36) to the bracket (#8) and connect its connector to the sensor kit connector (#38)
21) Insert the sensor, plug and bracket sub assembly into the body and fasten with screws (#37)

Assembly Procedure - Tool Half

1) Insert the ring (#102) with pressed-in pin #105 into the body (#101) and fasten with lock washer (#106) and screws (#107) with thread-locker
2) Press in the diamond pin (#103) into the body
3) Press in the pin (#104) into the body

Accuracy – The actual positional differential of the locating dowels between two different Robot Halfs or Tool Halfs.

Air Module – Also called pneumatic ports. It refers to the component of the Tool Changer system that passes air through the QuickChange and Tool Plate to the End Effector. The air module is available in face-seal ports and is available with self-sealing or checked valves so that when the QuickChange uncouples, air does not leak and no extra valve is required to shut the air off.

Alignment Pins - Pins located on the tool plate that are used to align the Tool Changer to the Tool Plate during the coupling process. DE-STA-CO uses 2 alignment pins – one diamond shaped and one round. Alignment pins also limit moment about the Z axis.

Checked Valves – Valves designed for either fluid or pneumatic medium that have a self-sealing mechanism that automatically check the fluid when uncoupled. When a checked valve is used an additional valve is not required to shut-off the fluid or air upon disconnection.

Deflection – Defines the amount of movement (slop) expected under a given moment load. This measurement indicates the rigidity of the coupling mechanism.

DeviceNet – A communication protocol common to the North American automotive industry. A DeviceNet system communicates over a serial link (daisy chain) to each component on the system. A component can be anything from a proximity switch to a water saver to a robot controller. Each component has a specific address and can be polled for status by the system. A "communication bus" system like this eliminates the need for thousands of I/O wiring points because all the communication is done over a 5-wire (CAN HIGH, CAN LOW, V+, V-, and DRAIN) cable.

Electrical Module – Also called an I/O Block or I/O Module, it is a component within the QuickChange system. Electrical I/O (Input/Output) communication is done through this module. Also, internal switches for Couple/Uncouple/Ready-to-Couple may be wired to this module.

Face-Seal Ports – Refers to ports used to pass air or vacuum through the Tool Changer such as air for operating the retract feature of a spot weld gun or air to operate a venture vacuum pump on a material handling End Effector. The face-seal ports do not stop air or vacuum flow when the Tool Changer uncouples. They require an additional air valve to shut the air or vacuum off before uncoupling. Face-seal ports only have an O-ring to prevent air or vacuum loss when the Tool Changer is coupled.

Locking Mechanism – The mechanism that locks the Tool Changer to the Tool Plate. It consists of a piston, ram and rollers (rolling pins).

Manual Tool Changer – A Tool Changer that requires manual intervention to couple or uncouple.

Maximum Compression – Refers to the maximum force that can be applied to the Tool Changer in a –Z direction. Not very important for most applications.

Maximum Moment (Mx, My, Mz) – A very important sizing rating because it takes into account the dynamic loads created by the motion of the robot. Mx, My and Mz are the moment created when rotating about the X, Y and Z axis respectively.

Maximum Payload – The maximum amount of weight the Tool Changer can handle. A payload rating is used to give the design engineer a general reference for the size of Tool Changer that should be used for an application.

Maximum Tensile – The maximum amount of pull away (something in tension) that the QuickChange can tolerate before failure.

Moment Rating (N-M, In-Lbs) – The rating given to a QuickChange to describe the maximum amount of moment that the unit can handle and still maintain the published repeatability and performance specifications.

Offset – Refers to total Coupled Height of the Tool Changer and Tool Plate. It is important in calculation of moment as a function of Robot Acceleration. The more offset you have, the more moment that will be created as the Robot accelerates. Offset may limit maximum Payload allowed.

Payload – Refers to the weight of the Tool Changer and/or End Effector and part to be handled by the robot.

Payload Rating (Lbs, Kg) – Refers to the maximum weight that the robot or Tool Changer can carry safely. Maximum Payload Rating is limited by and needs to consider Offset, weight and envelope size of the End Effector and part to be handled as well as robot acceleration in order to calculate proper moment load.

Ready-To-Couple – A switch that indicates the QuickChange is in the proper orientation to couple with the Tool Plate. It indicates that the Tool Changer is close enough to the Tool Plate to activate the Locking Mechanism. It is important for the robot controller to make decisions such as drop-off End Effector, Couple tool, Uncouple tool. Also refers to a switch that reads if the Tool Changer is in a Ready-to-couple position, that is, in close proximity to the Tool Plate (0.100 inch).

Repeatability – The ability to go back to a pre-programmed point. In the context of a Tool Changer this indicates the ability to couple with precision so that additional misalignment is not introduced into the tooling.

Robot Acceleration – Refers to the rate of increase in speed at which the robot will operate. Important for calculating maximum moment rating or maximum payload rating when considering offset, envelope size, weight of end effector and weight of part.

Self-Sealing – A port that seals itself when it uncouples from its mating half. Conversely, the port automatically opens when it couples with it mating half.

Servo Module – Refers to a component within the QuickChange system for special applications using a servo-powered spot weld gun or servo-powered slide/cylinder. Electrical I/O (Input/Output) communication is also done through this module. Bolts on to the tool changer where the Electrical Module would normally mount.

Water Module – Refers to the component of the Gun Changer system that passes cooling water through the QuickChange and Tool Plate to and from the spot weld gun, transformer, kickless cables and shunts. The water module has self-sealing or checked ports so that when the QuickChange uncouples, water does not leak and no extra valve is required to shut the water off.

Weld Module – Also called a 200 Amp Module, it is a component within the Gun Changer system. Weld Current is passed from the Weld Controller to the transformer for use by the spot weld gun. The DE-STA-CO Weld Module is rated for the maximum current rating of 200 Amps at 100% duty cycle (constant power on).

Vacuum Module – Refers to the component of the Tool Changer system that passes vacuum and air through the QuickChange and Tool Plate to the End Effector. The vacuum module comes standard with face-seal ports. An extra valve is required to shut the vacuum and air off.

Notes

DESTACO
A STABILUS COMPANY

WE ARE AUTOMATING TOMORROW

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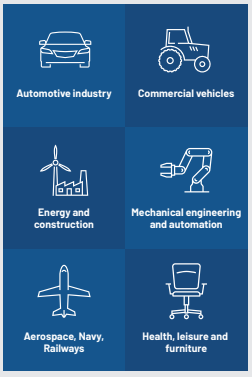
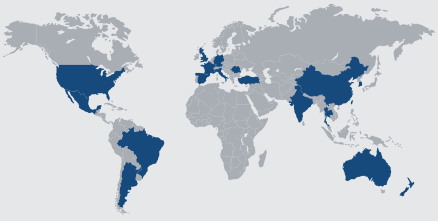


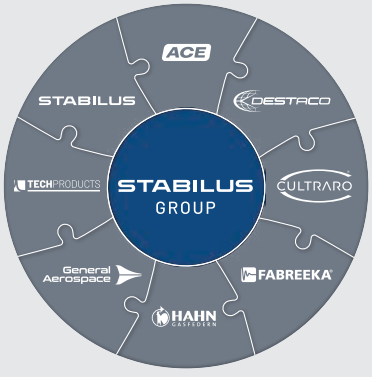
Industries



45 Locations in 19 Countries

8K Employees

2025 Revenues



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