

# Ryobi Limited, Tokyo Branch

## TEST REPORT

### SCOPE OF WORKs

REPORT OF <Door Closer > IN ACCORDANCE WITH ANSI/BHMA A156.4: 2019 STANDARD FOR DOOR CONTROLS - CLOSERS

### REPORT NUMBER

211027165GZU-001

### TEST DATE(S)

2022-03-23 — 2022-11-11

### ISSUE DATE

2022-12-01

### REVISED DATE

/

### RECORD RETENTION END DATE

2026-11-30

### PAGES

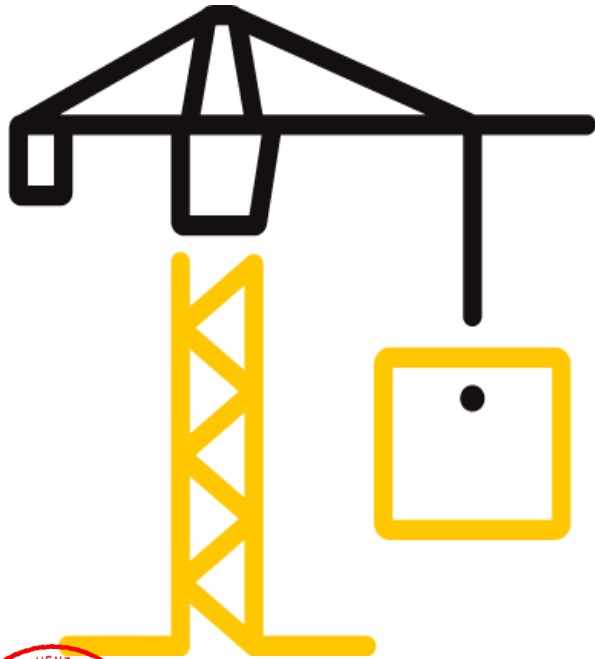
23

### DOCUMENT CONTROL NUMBER

TTRF\_ANSI/BHMA A156.4\_c

Effective date: 2022-6-24

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Intertek Testing Services (Shenzhen) Ltd. Guangzhou Branch

## Test Report

**Report Number: 211027165GZU-001**

**Report Date: 2022-12-01**

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- 5.All the tests results give the statement of conformity refer to the decision rule of "Procedure 2 Accuracy Method" as stated in the IEC Guide 115:2007.



## Test Report



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**Report Date: 2022-12-01**

<b>Applicant:</b>	Ryobi Limited, Tokyo Branch
<b>Applicant Address:</b>	5-2-8 Toshima, Kita-Ku, Tokyo 114-8518

<b>Sample information</b>	
Product:	Door Closer
Trade Mark:	RYOBI
Model and/or type reference:	D-4550
Manufacturer:	Ryobi Limited, Mitsugi Center
Manufacturer Address:	Kaigahara, Mitsugi-Cho, Onomichi-Shi, Hiroshima prefecture
Sample ID:	S211027165GZU.001~004
Date of receipt of test item:	2022-03-22 & 2022-07-06
Situation of receipt samples:	Received in good condition
Date (s) of performance of tests:	2022-03-23 & 2022-11-11

<b>Testing information</b>	
Standard:	ANSI/BHMA A156.4: 2019
Rating(s):	Grade 1
Testing Laboratory name:	Intertek Testing Services Shenzhen Ltd. Guangzhou
Address:	Room 4103 & 4203, No. 63, Punan Road, Huangpu District, Guangzhou, China.
<b>Possible Test Case Verdicts</b>	
Test Case does not apply to the Test object:	Not applicable
Test object does meet the requirement:	Compliant
Test object does not meet the requirement:	Non-compliant

<b>Conclusion:</b>			
Compliant with all applicable sections of ANSI/BHMA A156.4:2019 of <b>Grade 1</b> . Item 4.10 of initial static tests was compliant after retest with the second time received samples. See following pages for full test data.			
<b>Subsection</b>	<b>Test Description</b>	<b>1<sup>ST</sup> Test Results</b>	<b>2<sup>nd</sup> Test Results</b>
4	INITIAL STATIC TESTS	Non-compliant	Compliant
5	INTERMEDIATE CYCLE TEST	Compliant	Not applicable
6	INTERMEDIATE STATIC TESTS	Compliant	Not applicable
7	FINAL CYCLE TEST	Compliant	Not applicable
8	FINAL STATIC TESTS	Compliant	Not applicable
9	PIVOT PERFORMANCE TESTS	Compliant	Not applicable
10	FINISH TEST	Compliant	Not applicable
<b>Approved by:</b>		<b>Prepared by:</b>	
			
Name:	Nelson Zhu	Name:	Jaydon Lin
Title:	Reviewer	Title:	Project Engineer

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### TEST RESULTS

Model	Function number	Mounting	Size	Grade	PT Number	Test door weight
D-4550	C02011	Surface in Door	I ~ VI	1	PT1, PT4H, PT4D, PT4F	125 lbs

Section	Result/Requirement	Verdict
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#### 4 TEST PROCEDURES PART 1: INITIAL STATIC TESTS

Compliant

##### 4.1 BREAK-IN CYCLES

Compliant

Requirement:

Prior to performing the static tests, 4,000 break-in cycles are permitted to be performed as designated by the manufacturer. If break-cycles are not performed prior to static tests they shall be added to the intermediate cycles such that the total number of cycles completed does not change.

Counter readings	Date	Technician's initials	Remark
0	2022-07-11	Jayldon Lin	Started
4,000	2022-07-12	Jayldon Lin	Finished

Comment: None

##### 4.2 Static Test 1 - Range of Checking Control

Compliant

PT Number	PT1/PT5	PT2/PT6	PT3/PT7	PT8
Degrees	20°	25°	30°	7°

Degrees of door opened	Degrees where door essentially stopped	Range of control
135°	122°	13°

Comment: None

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### 4.3 Static Test 2 - Two Speeds of Closing Control

Compliant

Test #1	Test Results
The point at which the speed noticeably accelerated between 12" and 2"	6"

Test #2 In lieu of Test #1 at the option of the manufacturer

Not applicable

For floor concealed or Overhead concealed closer, Grade 1 (PT5) only

	Test Results
Release force between 30° and 25° (lbf)	—
Release force between 12" and 2" (lbf)	—
Exceed(%)	—

Comment: None

### 4.4 Static Test 3 -Adjustable Closing Speed

Compliant

Regulating valves adjusted	Test result	Requirement
Fully closed	>5 min	60 Sec. Minimum
Fully opened	2"774	3 Sec. Maximum

Comment: None

### 4.5 Static Test 4 - Closing Force for Fixed Size Closers with 15% to 50% Adjustment

Not applicable

Closer Size	Closing Force between the ½ in. and 3 in. mark (F1)
I	From 2 lbf up to 3 lbf
II	From 3 lbf up to 5 lbf
III	From 5 lbf up to 8 lbf
IV	From 8 lbf up to 11 lbf
V	From 11 lbf up to 14 lbf
VI	14 lbf and above

Maximum(F1)	Maximum (F2)	% of change
—	—	—

Comment: Not Fixed and Adjustable Closers

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- 4.6 Static Test 5 - Closing Force for Closers with Adjustment Through Range of Sizes (lbf) Compliant

	REG	TJ	PA
Size I = From 2 lbf up to 3 lbf	2.1	—	—
Size II = From 3 lbf up to 5 lbf	—	—	—
Size III = From 5 lbf up to 8 lbf	—	—	—
Size IV = From 8 lbf up to 11 lbf	9.1	—	—
Size V = From 11 lbf up to 14 lbf	—	—	—
Size VI = 14 lbf and above	15.5	—	—

Comment: None

Remark: "REG" refers to Regular mounting, "TJ" refers to Top jamb mounting and "PA" refers to Parallel arm mounting, all the brief descriptions found in the following are the same as above.

- 4.7 Static Test 6 - Door Closer Efficiency Compliant

	REG	TJ	PA
Size I 50% Minimum	64%	—	—
Size II 50% Minimum	—	—	—
Size III 60% Minimum	—	—	—
Size IV 60% Minimum	69.3%	—	—
Size V 60% Minimum	—	—	—
Size VI 60% Minimum	61.2%	—	—

Comment: None

- 4.8 Static Test 7 - Checking Cylinder Test Compliant

	REG	TJ	PA
8 seconds Minimum (20 lbf load)	>2min	—	—

Comment: None

- 4.9 Static Test 8 - Backcheck Tests Compliant

	REG	TJ	PA
Damping between 60 & 85 Degrees	80°	—	—
PT4J - Backcheck advanced 15 degrees	—	—	—

Comment: None

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### 4.10 Static Test 9 - Delayed Action Closer Test

Compliant

	REG	TJ	PA
Closing time between 90° and 70° was a minimum of 20 seconds	21"712	—	—
Point of degree where speed is noticeably changed	68°	—	—

Comment: None

### 4.11 Static Test 10 - Dead Stop Tests

Not applicable

	REG	TJ	PA
Degrees specified by client	—	—	—
Point of degree where door dead stops	—	—	—
Force applied (lbs)	—	—	—

Comment: Without dead stop function

### 4.12 Static Test 11 - Overload Abuse Test for Surface and Concealed-in-Door Closers (PT1 and PT2 only)

Compliant

Door Closer Size	I	II	III	IV	V	VI
Overload Test Weight	35lbs	40lbs	45lbs	<b>55lbs</b>	60lbs	65lbs

	REG	TJ	PA
55 lbs load 90° to close 10 cycles	OK	—	—

Comment: None

### 4.13 Static Test 12 - Automatic Hold-Open Test for Concealed-in-Floor Closers or Overhead Concealed Closers

Not applicable

	REG	TJ	PA
Degrees specified by client	—	—	—
Point of degree where hold-open engages	—	—	—

Comment: Without automatic Hold-open function

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- 4.14 Static Test 13 - Selector Hold-Open or Non-Hold-Open Test for Concealed-in-Floor Closers or Overhead Concealed Closers Not applicable

	REG	TJ	PA
Degrees specified by client	—	—	—
Point of degree where hold-open engages	—	—	—
With selector turned off, does hold open still engage? Yes/No	—	—	—

Comment: Without a selector for hold-open or non-hold-open

- 4.15 Static Test 14 - 165 Degree of Door Opening Test for Concealed-in-Floor or Overhead Concealed Closers Not applicable

	REG	TJ	PA
Open door to $165^{\circ} \pm 2^{\circ}$ Does any harm come to trim, closer or mounting? Yes/No	—	—	—

Comment: Not Concealed-in-Floor or Overhead Concealed Closers

### 5 TEST PROCEDURES PART 2: INTERMEDIATE CYCLE TEST

Compliant

Requirement:

Note on Spring Force Adjustment: Once spring force is set, adjust all speed regulating valves for a door closing time from a 90 degree opening to between 3 and 6 seconds. Maintain this time during the cycling by re-regulating all valves if necessary.

- 5.1 For Surface or Concealed-in-Door Closers without Backcheck and Concealed-in-Floor or Overhead Concealed Closers without Backcheck Not applicable

PT Number	PT1/PT5	PT2/PT6	PT3/PT7
Backcheck Cycle	0	0	0
Non-Backcheck Cycle	1,000,000	500,000	496,000
Total Cycles	1, 004,000	504,000	500,000

Date	Counter readings	Technician	Remark
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Comment: With backcheck



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- 5.2 For Surface or Concealed-in-Door Closers with Backcheck and Concealed-in-Floor or Overhead Concealed Closers with Backcheck Compliant

PT Number	PT1/PT5	PT2/PT6	PT3/PT7
Backcheck Cycle - Test 1	100,000	50,000	0
Non-Backcheck Cycle - Test 2	400,000	200,000	496,000
Total cycles	504,000	254,000	500,000

Date	Counter readings	Technician	Remark
2022/7/11	0	Jayldon Lin	Started
2022/7/15	49,833	Jayldon Lin	—
2022/7/19	100,000	Jayldon Lin	—
2022/7/29	227,000	Jayldon Lin	—
2022/8/5	319,000	Jayldon Lin	—
2022/8/10	385,709	Jayldon Lin	—
2022/8/15	451,954	Jayldon Lin	—
2022/8/19	500,000	Jayldon Lin	Finished

Comment: With backcheck

- 5.3 For light screen or combination storm door closers Not applicable

Requirement:  
Install in accordance with the manufacturer's instructions for 90 degrees of door opening. Regulate door closing time from 90 degrees to 0 degrees to between 2 and 5 seconds. Maintain that time during cycling by re regulating if necessary. Mechanically open the door to 90 degrees  $\pm$  5 degrees and release allowing the door closer to close the door. One opening and closing constitutes one cycle. Repeat this action for 100,000 cycles for Grade 1, 75,000 cycles for Grade 2, and 50,000 cycles for Grade 3. At end of cycle test, measure closing speed adjustability. A Grade 1 door closer shall regulate door closing times 90 to 0 degrees smoothly over a range of 2 to 8 seconds. Grades 2 and 3 door closers shall regulate door closing times from 90 to 0 degrees smoothly over a range of 2 to 4 seconds. Hydraulic closers shall not show evidence of leakage.

	Grade 1	Grade 2	Grade 3
Cycles	100,000	75,000	50,000
Closing time	2~8 s	2~4 s	

	Test results
Closing time	—

Comment: For light screen or combination storm door closers

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**6 TEST PROCEDURES PART 3: INTERMEDIATE STATIC TEST** Compliant

Repeat the following tests, as applicable to the closer type, from Part 1: Range of Checking Control (4.2), Adjustment Through Range of Sizes (4.6), Door Closer Efficiency (4.7), Checking Cylinder Test (4.8), Backcheck Tests (4.9), and Delayed Action Closer Test (4.10)

**4.2 Static Test 1 - Range of Checking Control** Compliant

PT Number	PT1/PT5	PT2/PT6	PT3/PT7	PT8
Degrees	20°	25°	30°	7°

Degrees door opened	Degrees where door essentially stopped	Range of control
135	119	16°

Comment: None

**4.6 Static Test 5 - Closing Force for Closers with Adjustment Through Range of Sizes (lbf)** Compliant

	REG	TJ	PA
Size I = From 2 lbf up to 3 lbf	2.23	—	—
Size II = From 3 lbf up to 5 lbf	—	—	—
Size III = From 5 lbf up to 8 lbf	—	—	—
Size IV = From 8 lbf up to 11 lbf	8.60	—	—
Size V = From 11 lbf up to 14 lbf	—	—	—
Size VI = 14 lbf and above	16.07	—	—

Comment: None

**4.7 Static Test 6 - Door Closer Efficiency** Compliant

	REG	TJ	PA
Size I 50% Minimum	55.8%	—	—
Size II 50% Minimum	—	—	—
Size III 60% Minimum	—	—	—
Size IV 60% Minimum	72.6%	—	—
Size V 60% Minimum	—	—	—
Size VI 60% Minimum	75.6%	—	—

Comment: None

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### 4.8 Static Test 7 - Checking Cylinder Test

Compliant

	REG	TJ	PA
8 second Minimum (20 lbf load)	>1 min	—	—

Comment: None

### 4.9 Static Test 8 - Backcheck Tests

Compliant

	REG	TJ	PA
Damping between 60 & 85 Degrees	81°	—	—
PT4J - Backcheck advanced 15 degrees	—	—	—

Comment: None

### 4.10 Static Test 9 - Delayed Action Closer Test

Compliant

	REG	TJ	PA
Closing time between 90° and 70° in 20 seconds	25"276	—	—
Point of degree where speed is noticeably changed	69°	—	—

Comment: None

## 7 TEST PROCEDURES PART 4: FINAL CYCLE TEST

Compliant

### 7.1

Not applicable

For Surface or Concealed-in-Door Closers without Backcheck and  
Concealed-in-Floor or Overhead Concealed Closers without Backcheck

PT Number	PT1/PT5	PT2/PT6	PT3/PT7
Backcheck Cycle	0	0	0
Non-Backcheck Cycle	996,000	496,000	0
Total Cycles	2,000,000	1,000,000	500,000

Date	Counter readings	Technician	Remark
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Comment: With backcheck

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- 7.2 For Surface or Concealed-in-Door Closers with Backcheck and Compliant  
Concealed-in-Floor or Overhead Concealed Closers with Backcheck

PT Number	PT1/PT5	PT2/PT6	PT3/PT7
Backcheck Cycle	0	0	0
Non-Backcheck Cycle	996,000	496,000	0
Total Cycles	1,500,000	750,000	500,000

Date	Counter readings	Technician	Remark
2022-08-19	500,000	Jayldon Lin	Started
2022-08-30	645,089	Jayldon Lin	—
2022-09-15	865,092	Jayldon Lin	—
2022-09-30	1,059,297	Jayldon Lin	—
2022-10-15	1,247,804	Jayldon Lin	—
2022-11-06	1,500,000	Jayldon Lin	Finished

Comment: None

- 7.3 Additional Test Required for Double Acting Floor & Overhead Concealed Closers (Grade1 & 2) Not applicable

Requirement:  
Cycle a grade 1 closer an additional 10,000 cycles and a grade 2 closer for 5,000 cycles from 20 degrees to 0 degrees to 20 degrees (opposite direction) for a total of 40 degrees of door travel.  
Adjust the latch speed to have hydraulic control by making closing speed from the 20 degree open position 1 second +/- 10% slower than that with the valves completely open.  
Cycle with an air actuator exerting 15 lbf (67 N) applied both ways at 30 in. (762 mm) from the pivot point.  
At the conclusion of test, closer shall return to 0 degrees

Date	Counter readings	Technician	Remark
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

Comment: Not Double Acting Floor & Overhead Concealed Closers.

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### 8 TEST PROCEDURE PART 5: FINAL STATIC TESTS

Compliant

- 8.1 Repeat all applicable Initial Static Tests for the closer type except the Dead Stop Tests.

Compliant

- 4.2 Static Test 1 - Range of Checking Control

Compliant

PT Number	PT1/PT5	PT2/PT6	PT3/PT7	PT8
Degrees	20°	25°	30°	7°

Degrees door opened	Degrees where door essentially stopped	Range of control
135°	120°	15°

Comment: None

- 4.3 Static Test 2 - Two Speeds of Closing Control

Compliant

Test #1	Test Results
Release Between 12" and 2"	7.4"

Test #2 In lieu of Test #1 at the option of the manufacturer

For Floor spring only	Test Results
Release Force Between 30° and 25°	—
Release Force Between 12" and 3"	—
Exceed(%)	—

Comment: None

- 4.4 Static Test 3 -Adjustable Closing Speed

Compliant

Regulating valve adjusted	Requirement	Test Results
Fully closed	60 Sec. Minimum	>5 min
Fully opened	3 Sec. Maximum	2"217

Comment: None

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- 4.5 Static Test 4 - Closing Force for Fixed Size Closers with 15% to 50% Adjustment Not applicable

Closer Size	Closing Force between the ½ in. and 3 in. mark (F1)
I	From 2 lbf up to 3 lbf
II	From 3 lbf up to 5 lbf
III	From 5 lbf up to 8 lbf
IV	From 8 lbf up to 11 lbf
V	From 11 lbf up to 14 lbf
VI	14 lbf and above

Minimum (F1)	Maximum (F2)	% of change
—	—	—

Comment: Not Fixed and Adjustable Closers

- 4.6 Static Test 5 - Closing Force for Closers with Adjustment Through Range of Sizes Compliant

	REG	TJ	PA
Size I = From 2 lbf up to 3 lbf	2.03	—	—
Size II = From 3 lbf up to 5 lbf	—	—	—
Size III = From 5 lbf up to 8 lbf	—	—	—
Size IV = From 8 lbf up to 11 lbf	9.02	—	—
Size V = From 11 lbf up to 14 lbf	—	—	—
Size VI = 14 lbf and above	14.47	—	—

Comment: None

- 4.7 Static Test 6 - Door Closer Efficiency Compliant

	REG	TJ	PA
Size I 50% Minimum	58.0%	—	—
Size II 50% Minimum	—	—	—
Size III 60% Minimum	—	—	—
Size IV 60% Minimum	80.5%	—	—
Size V 60% Minimum	—	—	—
Size VI 60% Minimum	77.4%	—	—

Comment: None

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### 4.8 Static Test 7 - Checking Cylinder Test

Compliant

	REG	TJ	PA
8 seconds Minimum (20 lbf load)	1'41"484	—	—

Comment: None

### 4.9 Static Test 8 - Backcheck Tests

Compliant

	REG	TJ	PA
Damping between 60 & 85 Degrees	81°	—	—
PT4J - Backcheck advanced 15 degrees	—	—	—

Comment: None

### 4.10 Static Test 9 - Delayed Action Closer Test

Compliant

	REG	TJ	PA
closing time between 90° and 70° in 20 seconds	20"203	—	—
Point of degree where speed is noticeably changed	69°	—	—

Comment: None

### 4.11 Static Test 10 - Dead Stop Tests

Not applicable

	REG	TJ	PA
Degrees specified by client	—	—	—
Point of degree where door dead stops	—	—	—
Force applied (lbs)	—	—	—

Comment: Without dead stop function

### 4.12 Static Test 11 - Overload Abuse Test for Surface and Concealed-in-Door Closers (PT1 and PT2 only)

Compliant

Door Closer Size	I	II	III	IV	V	VI
Overload Test Weight	35lbs	40lbs	45lbs	55lbs	60lbs	65lbs

	REG	TJ	PA
<u>55</u> lbs load 90° to close <u>10</u> cycles	OK	—	—

Comment: None

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- 4.13 Static Test 12 - Automatic Hold-Open Test for Concealed-in-Floor Closers or Overhead Concealed Closers Not applicable

	REG	TJ	PA
Degrees specified by client	—	—	—
Point of degree where hold-open engages	—	—	—

Comment: Without automatic Hold-open function

- 4.14 Static Test 13 - Selector Hold-Open or Non-Hold-Open Test for Concealed-in-Floor Closers or Overhead Concealed Closers Not applicable

	REG	TJ	PA
Degrees specified by client	—	—	—
Point of degree where hold-open engages	—	—	—
With selector turned off, does hold open still engage? Yes/No	—	—	—

Comment: Without a selector for hold-open or non-hold-open

- 4.15 Static Test 14 - 165 Degree of Door Opening Test for Concealed-in-Floor or Overhead Concealed Closers Not applicable

	REG	TJ	PA
Open door to $165^{\circ} \pm 2^{\circ}$ Does any harm come to trim, closer or mounting? Yes/No	—	—	—

Comment: None

- 8.2 Hydraulic closers shall not show visible indications of fluid greater than SAE J1176 Class 3 – a recurring non-falling droplet. Compliant

Comment: None



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- 8.3 At the conclusion of the tests the closer shall be capable of being adjusted to return the door from 90 to zero degrees in 3 to 6 seconds. Compliant

	Test results
Return the door from 90 to zero degrees	4"501

Comment: None

- 10 FINISH TESTS** Compliant  
10.2 Salt Spray Test Compliant

	Test results
Finish on all products: 24 hours	24 hours

Comment: Test for arms only

- 10.3 Humidity Test For clear coatings only Compliant

	Test results
Grades 1 & 2: 48 Hours	48 hours
Pencil Hardness 2H and Adhesion Classification 4	Compliant

Comment: None

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### Appendix A: Product Documents

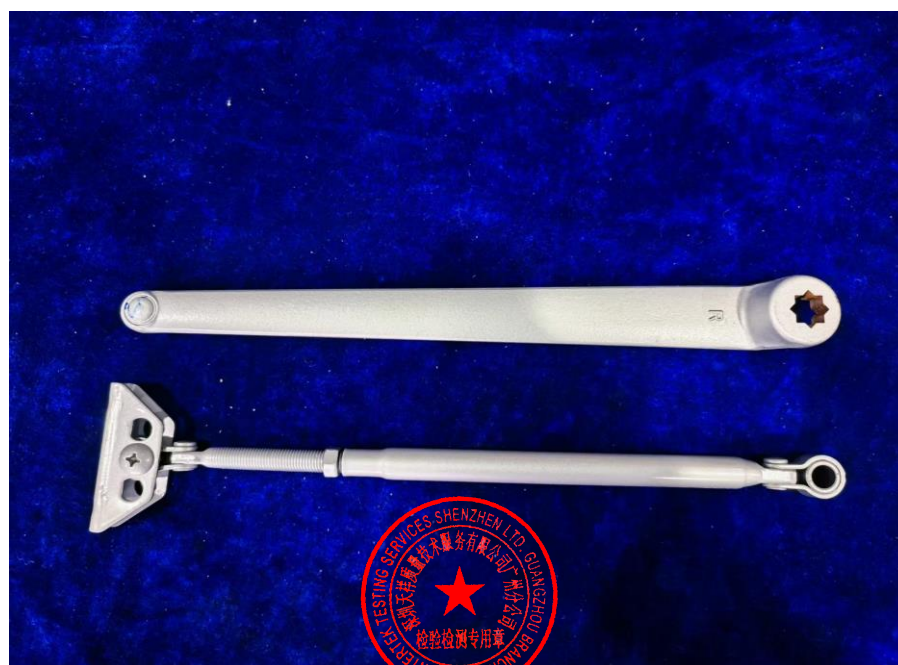
Model No.	Document Ref.	Document Type	Issue Date	Recieved Date
D-4550	D-4550	Installation drawing	2022-04-14	2022-04-14
D-4551	MAIN BODY ASSY FOR (D-4550DA) DOOR CLOSER	Main body assy drawing	2022-04-14	2022-04-14

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### Appendix B: Product Photo



The arms of door closer after 24 hours of salt spray test

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Overall view of D-4550



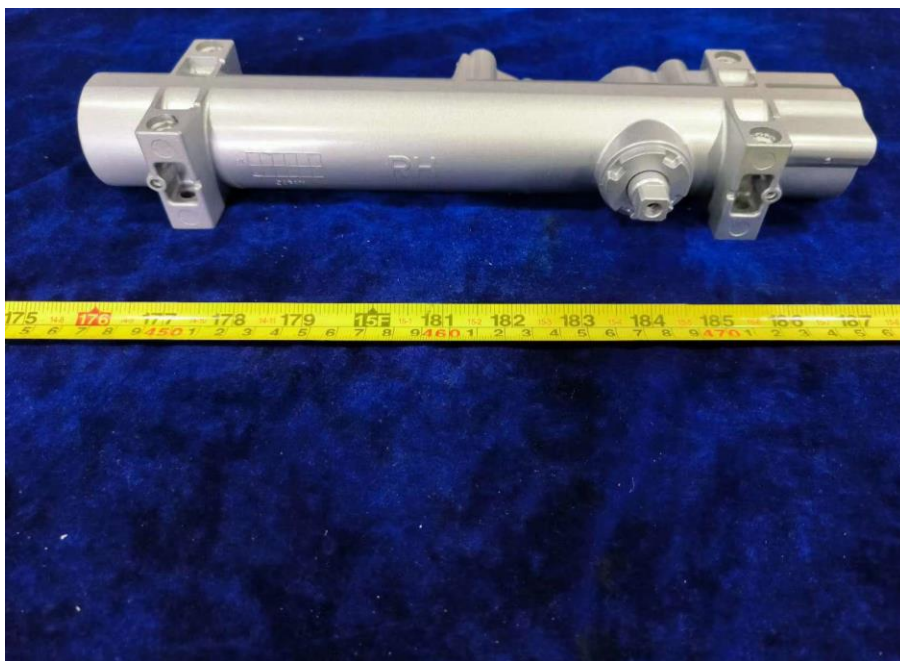
Main body view of D-4550



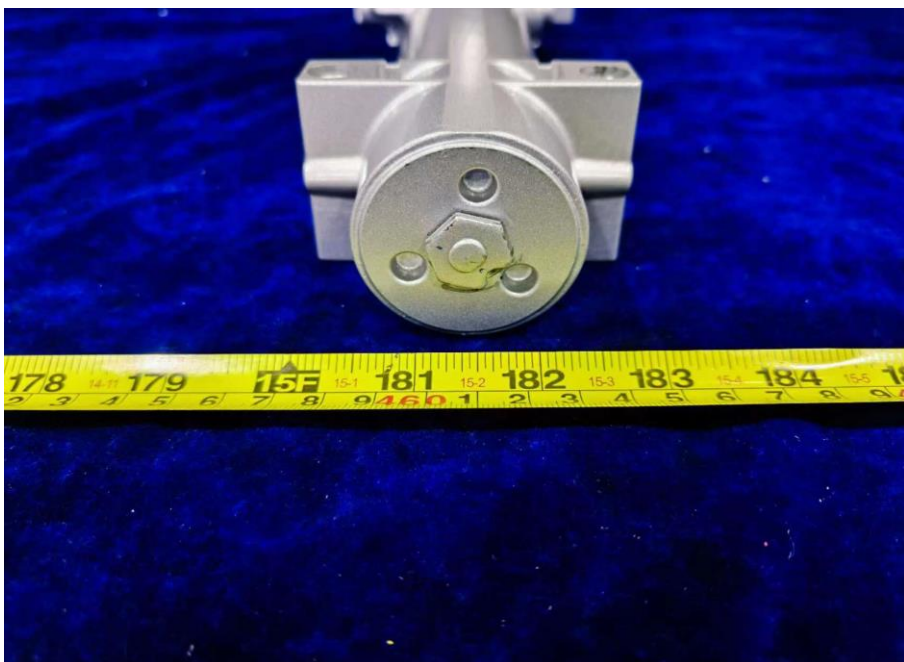
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Main body view of D-4550

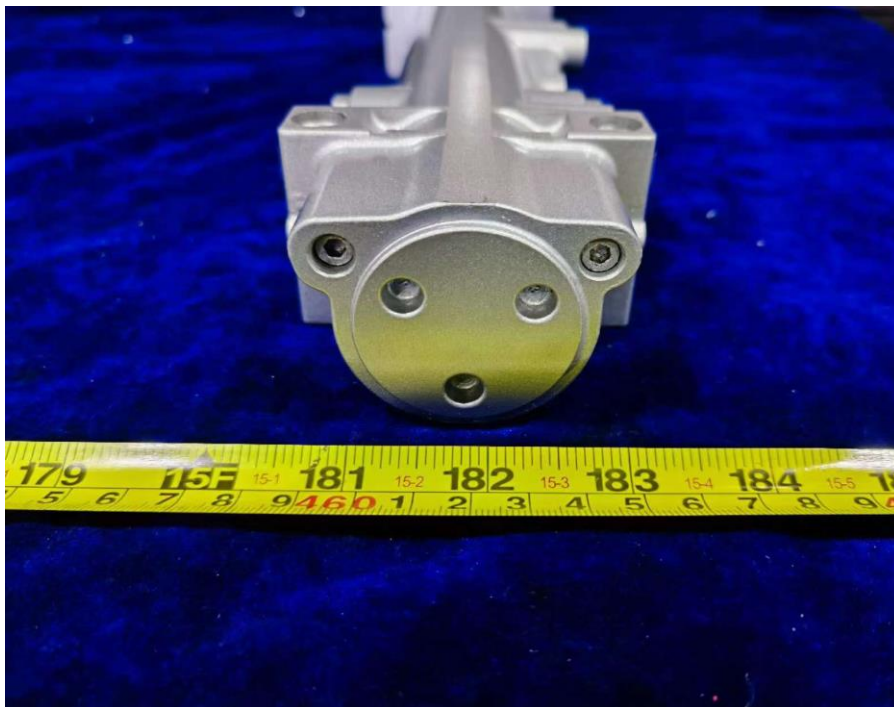


Side view of D-4550

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Side view of D-4550

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### Revision:

Revision No.	Date	Changes	Author	Reviewer
/	/	First issue	/	/

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The End of Report

