

Power windows

Summary

1. By operating the PW system on each trim panel, the PW system can rise or lower the corresponding window glass.
2. The main switch on the driver-sided trim panel enables the driver to lift or lower each occupant-sided window glass and lock up all independent switches on the doors.
3. The PW system can accept the battery voltage through the circuit breaker in the junction box only when the ignition switch is on the position “ON”.
4. The PW system includes the PW switch and ETACS control module on every trim panel and PW motor inside each door.
5. The PW motor and window glass regulator is an assembly. If necessary to renew the PW motor, then the window glass regulator should be replaced.

Component description

1. PW switch

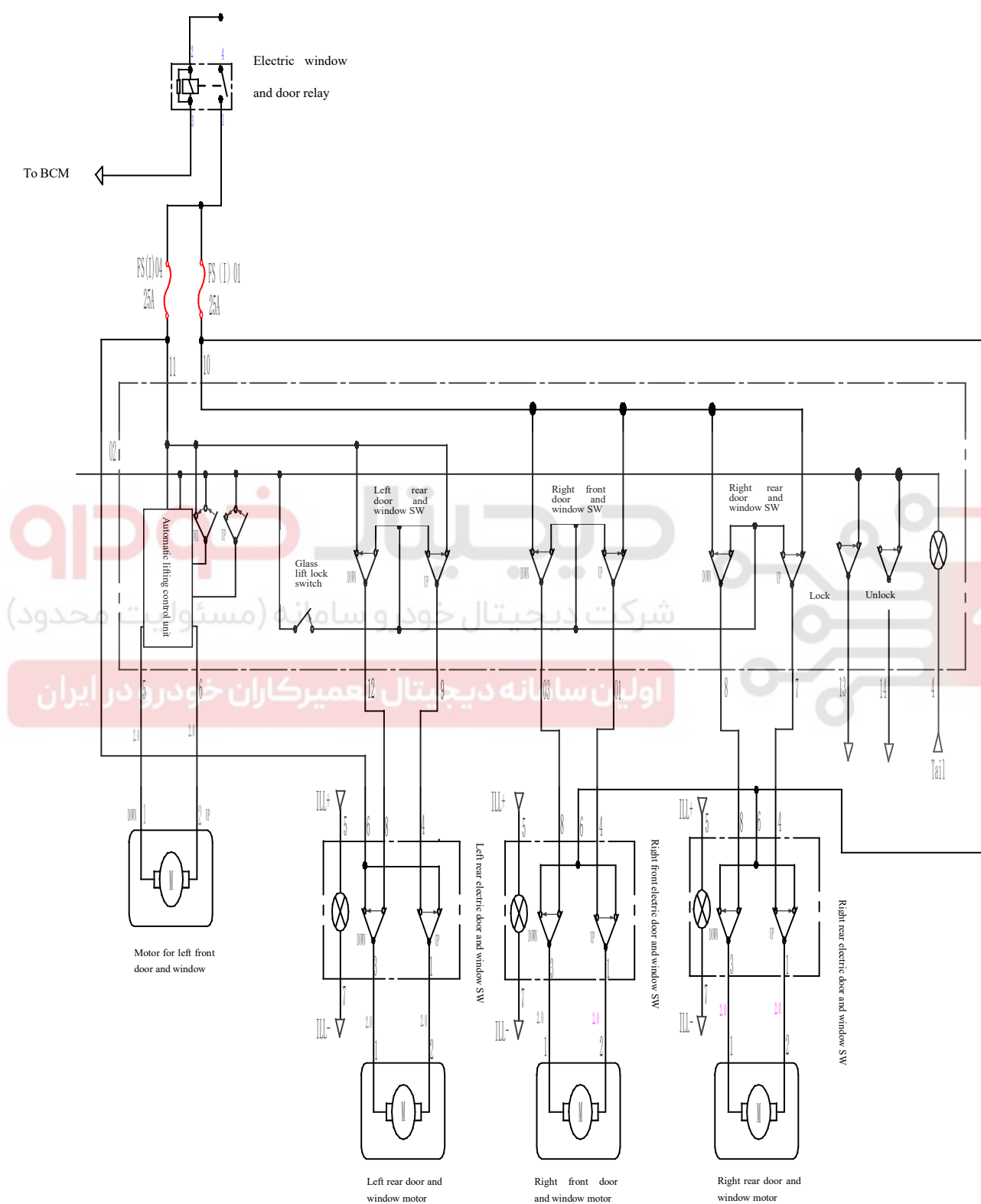
The PW are controlled by the PW switches on each front trim panel. The driver-sided PW switch enables the driver to control all PWs. All occupant-sided windows are powered and grounded by the battery through the PW switch circuit. When the lock-up switch of driver-sided PW switch is on the position “Lock Up”, the battery power supply on other door PW switches are interrupted except the driver-sided PW switch.

2. PW motor

The reversible permanent magnet motor drives the window glass regulator through the incorporated gear box mechanism. Both battery positive and negative are connected to two terminals of the motor, which orientate the motor rotation in the same direction. The motor may rotate in reverse driven by the reverse current from two of the same junctions. In addition, all PW motors are equipped with the incorporated self-reset circuit breaker so as to prevent the excessive motor load.

Function Description

1. PW rise and drop



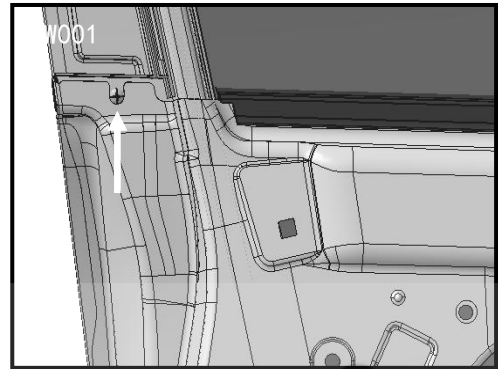
Schematic diagram

Component replacement

1. Outside water splitting of front window replacement

1) Removal

- ① Lower window glass to the bottom
- ② Remove fixing bolt of outside water splitting.
- ③ Remove rear mirror.
- ④ Remove outside water splitting of front door.



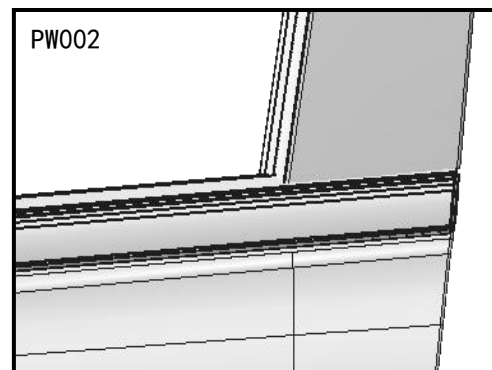
Note:

■ Please do not apply excessive force during removal, otherwise it may result in parts deformation.

■ After removal, check gib with eyes. If it is found deformed, please replace.

2) Installation.

① Array outside water splitting of front door with door frame of B pillar, install it from one end to the other end slowly.



② Fix bolt of outside water splitting of front door.

■ Tightening torque: 3~5 N.m

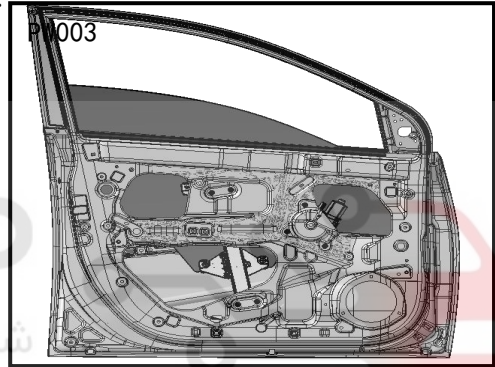
③ Install rear mirror, refer to "Replacement of rear view mirror".

2. Replacement of front window glass

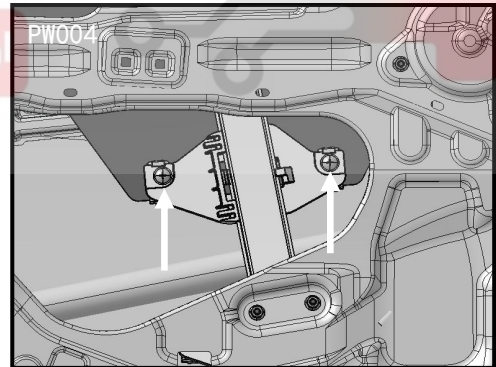
1) Removal

- ① Remove door trim panel. Refer to "Front door trim replacement"
- ② Remove waterproof membrane. Refer to "Front door waterproof membrane replacement"
- ③ Take off inside rubber strip of front door. Refer to "The replacement of inside rubber strip of front door"
- ④ Refit the window glass regulator switch.

Regulate the window glass on the appropriate position so as to ease the removal/installation of front window glass fixing bolts.



- ⑤ Remove bolts securing front window glass.



- ⑥ Take off window glass.

2) Installation.

- ① Reinstall window regulator switch, and lift glass to an appropriate position to facilitate installation of bolts securing window glass.
 - ② Put window glass onto door, right to installation hole.
 - ③ Install bolts securing window glass.
- Tightening torque: (7~11) N.m
- ④ Install inside rubber strip of front door refer to "The replacement of inside rubber strip of front door"

⑤ Install waterproof membrane refer to "Front door waterproof membrane replacement"

⑥ Install door trim panel. Refer to "Front door trim replacement"

3. Replacement of the front window glass regulator

1) Removal

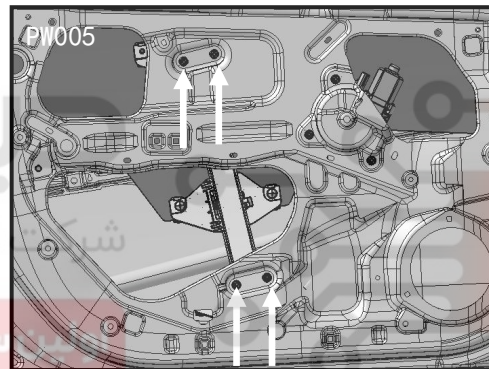
① Remove door trim panel. Refer to "Front door trim replacement"

② Remove waterproof membrane. Refer to "Front door waterproof membrane replacement"

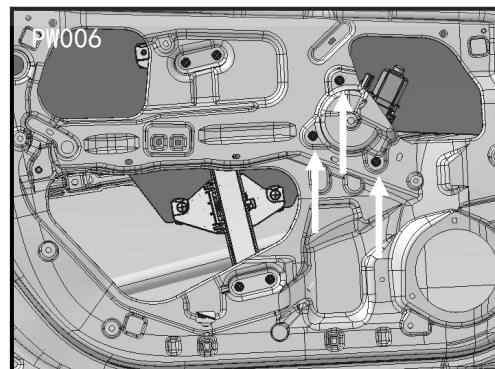
③ Take off inside rubber strip of front door. Refer to "The replacement of inside rubber strip of front door"

④ Remove window glass. Refer to "Front window glass replacement".

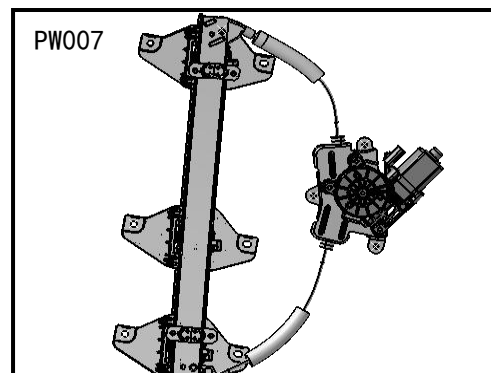
⑤ Remove the 4 fixing nut of glass support.



⑥ Remove 3 nuts securing window regulator motor.



- ⑦ Disconnect window regulator motor connector.
- ⑧ Take out window regulator.



2) Installation.

① Install glass hatchway, connect connector of front glass regulator, put into glass assembly.

② Install the fixing nut of front window glass support.

■Tightening torque: 7~11 N.m

③ Install the fixing nuts on the glass regulator motor.

■Tightening torque: 7~11 N.m

④ Install bolts securing window glass. Refer to "Front window glass replacement".

⑤ Install inside rubber strip of front door refer to "The replacement of inside rubber strip of front door".

⑥ Install waterproof membrane refer to "Front door waterproof membrane replacement"

⑦ Install door trim panel. Refer to "Front door trim replacement"

4. Replacement of front window glass slot

1) Removal

① Remove door trim panel. Refer to "Front door trim replacement"

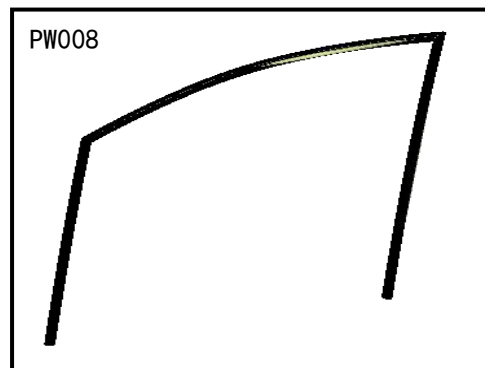
② Remove waterproof membrane. Refer to "Front door waterproof membrane replacement"

③ Take off inside rubber strip of front door. Refer to "The replacement of inside rubber strip of front door"

④ Remove rear view mirror, refer to "Replacement of rear view mirror".

⑤ Remove outside water splitting of front window. Refer to "outside water splitting of front window replacement:

- ⑥ Remove window glass. Refer to "Front window glass replacement".
- ⑦ Remove the front window glass regulator Refer to "Front window regulator replacement".



- ⑧ Remove the front window glass slot.

2) Installation.

- ① Install front window glass slot, install 2 foot part first.
- ② Install outside water splitting of front window Refer to "outside water splitting of front window"

■ Tightening torque: 3~5 N.m

- ③ Front door window regulator Refer to "Front window regulator replacement".

■ Tightening torque: 7~11 N.m

- ④ Install bolts securing window glass. Refer to "Front window glass replacement".

- ⑤ Install outside rear view mirror. Refer to "Replacement of outside rear view mirror".

- ⑥ Install inside rubber strip of front door Refer to "The replacement of inside rubber strip of front door".

- ⑦ Install waterproof membrane Refer to "Front door waterproof membrane replacement"

- ⑧ install door trim panel. Refer to "Front door trim replacement"

5. Replacement of male drawer guide of front window glass

1) Removal

- ① Remove door trim panel. Refer to "Front door trim replacement"
- ② Remove waterproof membrane. Refer to "Front door waterproof membrane replacement"
- ③ Take off inside rubber strip of front door. Refer to "The replacement of inside rubber strip of front door"

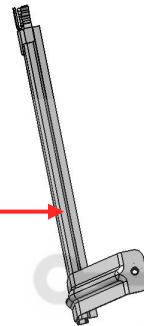
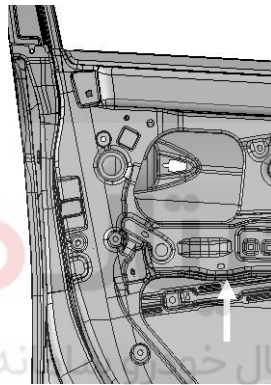
④ Remove outside water splitting of front window. refer to "outside water splitting of front window replacement:

⑤ Remove window glass. Refer to “Front window glass replacement”.

⑥ Remove the front window glass regulator Refer to “Front window regulator replacement”.

⑧ Remove the front window glass slot. Refer to "Replacement of front window glass slot".

Loosen fixing bolt of male drawer guide, remove the guide.



2) Installation.

① Install guide, tighten fixing bolt of guide.

■Tightening torque: 6~10 N.m

② Install front window glass slot, install 2 foot part first.

③ Install outside water splitting of front window, refer to "water splitting of front window".

■Tightening torque: 3~5 N.m

④ Install Front window regulator, refer to “Front window regulator replacement”.

■Tightening torque: 7~11 N.m

⑤ Install window glass. Refer to “Front window glass replacement”.

⑥ Install inside rubber strip of front door Refer to "The replacement of inside rubber strip of front door".

⑦ Install waterproof membrane Refer to "Front door waterproof membrane replacement"

⑧ Install door trim panel. Refer to "Front door trim replacement"

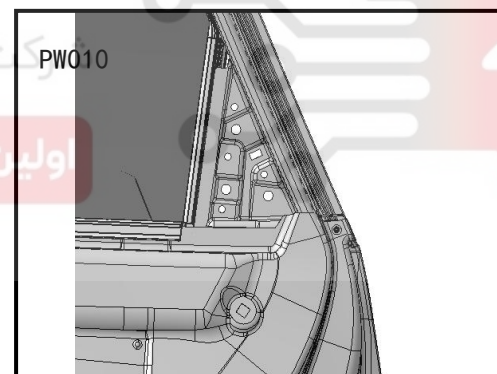
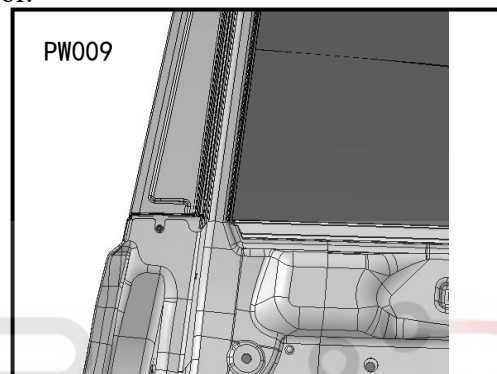
6. Outside water splitting of rear window replacement

1) Removal

① Lower window glass to the bottom

② Remove 2 fixing bolts of outside water splitting.

③ Remove outside water splitting of rear door.



Note:

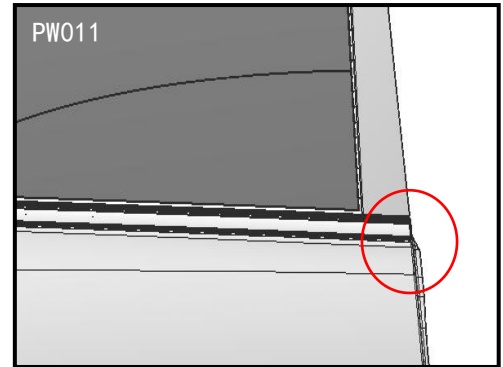
■ Please do not apply excessive force during removal, otherwise it may result in parts deformation.

2) Installation.

① Array outside water splitting of front door with door frame of B pillar, install it from one end to the other end slowly.

② Fix bolt of outside water splitting of rear door.

■ Tightening torque: 3~5 N.m



7. Replacement of the rear window glass

1) Removal

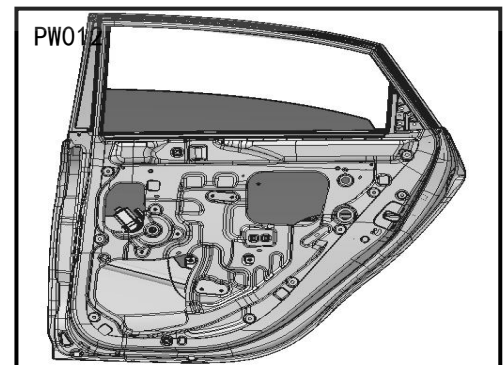
1. Remove door trim panel. Refer to The replacement of the interior trimming panel of rear door.

② Remove waterproof membrane. Refer to "rear door waterproof membrane replacement"

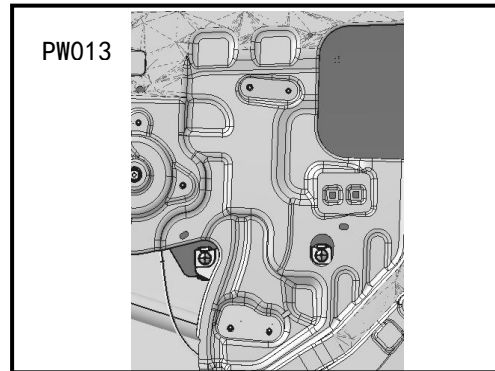
③ take off inside rubber strip of rear door. Refer to "The replacement of inside rubber strip of rear door".

④ Refit the window glass regulator switch.

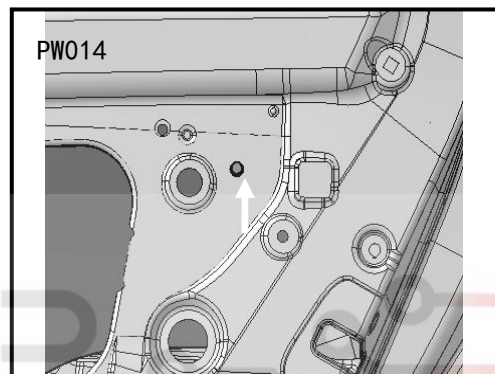
Regulate the window glass on the appropriate position so as to ease the removal/installation of rear window glass fixing bolts.
removal of fixing bolts



- ⑤ Remove bolts securing rear window glass.



- ⑥ Remove fixing bolt of male drawer guide of rear window glass.



- ⑦ Take off window glass.

2) Installation.

- ① Reinstall window regulator switch, and lift glass to an appropriate position to facilitate installation of bolts securing window glass.

- ② put window glass in the door, right to installation hole.

- ③ Install bolts securing window glass.

■Tightening torque: 7~11 N.m

Install fixing bolt of rear guide

■Tightening torque: 6~10 N.m

- ⑤ Install inside rubber strip of rear door Refer to "The replacement of inside rubber strip of rear door".

- ⑥ Install waterproof membrane Refer to "rear door waterproof membrane replacement"

⑦ Install door trim panel. Refer to The replacement of the interior trimming panel of rear door.

8. Replacement of the rear window glass regulator

1) Removal

① Remove door trim panel. Refer to The replacement of the interior trimming panel of rear door.

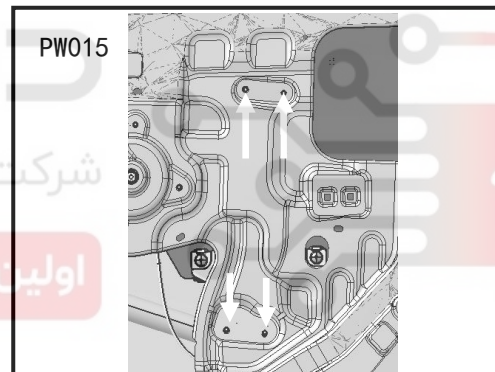
② Remove waterproof membrane. Refer to "rear door waterproof membrane replacement"

③ Take off inside rubber strip of rear door. Refer to "The replacement of inside rubber strip of rear door".

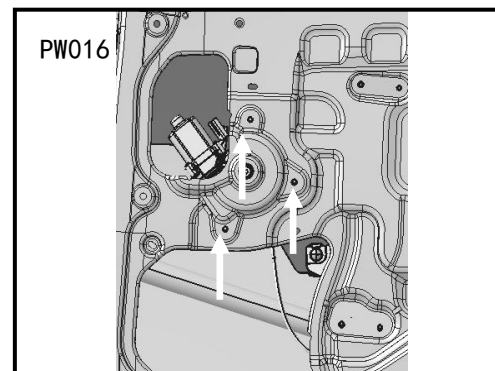
④ Remove window glass. Refer to “rear window glass replacement”.

⑤ Disconnect window regulator motor connector.

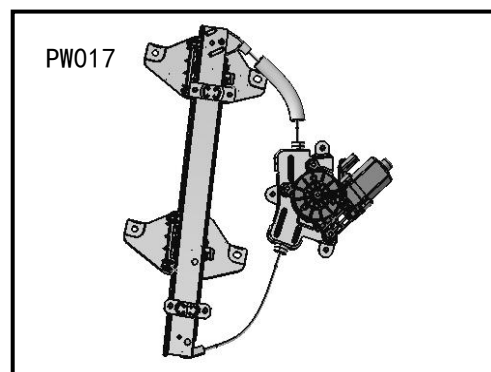
⑥ Remove the fixing nut of glass support.



⑦ Remove nuts securing window regulator motor.



- ⑧ Take out window regulator.



2) Installation.

- ① Put in window regulator, install the fixing nut of rear window glass support.

■ Tightening torque: 7~11 N.m

- ② install the fixing nuts on the rear glass regulator motor.

■ Tightening torque: 7~11 N.m

- ③ Install rear window glass. Refer to “rear window glass replacement”.

- ④ Connect connector of rear glass regulator.

- ⑤ Install waterproof membrane Refer to "rear door waterproof membrane replacement"

- ⑥ Install inside rubber strip of rear door refer to "The replacement of inside rubber strip of rear door".

- ⑦ Install door trim panel. Refer to The replacement of the interior trimming panel of rear door.

9. Replacement of the rear window glass slot.

1) Removal

- ① Remove door trim panel. Refer to The replacement of the interior trimming panel of rear door.

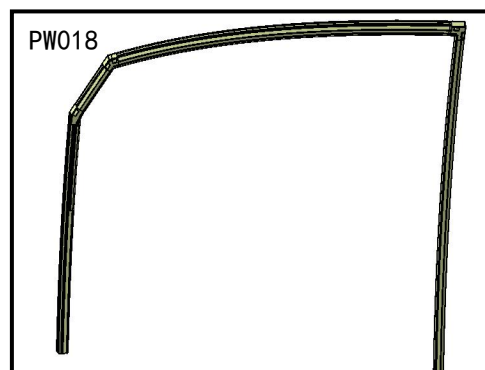
- ② Remove waterproof membrane. Refer to "rear door waterproof membrane replacement"

- ③ Take off inside rubber strip of rear door. Refer to "The replacement of inside rubber strip of rear door".

- ④ Remove window glass. Refer to “rear window glass replacement”.

⑤ Remove outside water splitting of rear window. refer to "outside water splitting of rear window replacement"

⑥ Remove the rear window glass slot.



2) Installation.

① Install rear window glass slot, install 2 foot part first.

② Install window glass. Refer to “rear window glass replacement”.

③ Install inside rubber strip of rear door refer to "The replacement of inside rubber strip of rear door".

④ Install outside water splitting of window glass. Refer to "outside water splitting of rear window replacement"

■Tightening torque: 3~5 N.m

⑤ Install waterproof membrane refer to "rear door waterproof membrane replacement"

⑥ Install door trim panel. Refer to The replacement of the interior trimming panel of rear door.

10. Replacement of male drawer guide of rear window glass

1) Removal

① Remove door trim panel. Refer to The replacement of the interior trimming panel of rear door.

② Remove waterproof membrane. Refer to "rear door waterproof membrane replacement"

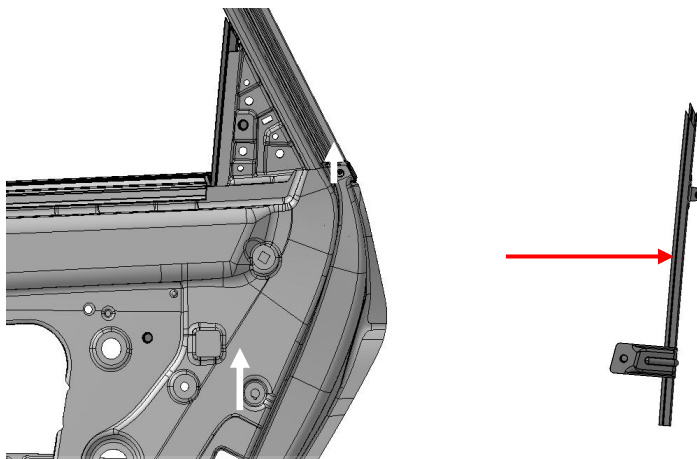
③ Take off inside rubber strip of rear door. Refer to "The replacement of inside rubber strip of rear door".

④ Remove window glass. Refer to “rear window glass replacement”.

⑤ Remove outside water splitting of rear window. Refer to "outside water splitting of rear window replacement"

⑥ Remove the rear window glass slot.

⑦ Loosen fixing bolt of male drawer guide, remove the guide.



2) Installation.

① Install male drawer guide, tighten upper fixing bolt, not lower one.

■Tightening torque: 6~10 N.m

② Install rear window glass slot, install 2 foot part first.

③ Install rear window glass. Refer to "rear window glass replacement".

④ Tighten fixing bolt of the guide

■Tightening torque: 6~10 N.m

⑤ Install inside rubber strip of rear door refer to "The replacement of inside rubber strip of rear door".

⑥ Install outside water splitting of window glass. Refer to "outside water splitting of rear window replacement"

■Tightening torque: 3~5 N.m

⑦ Install waterproof membrane Refer to "rear door waterproof membrane replacement"

⑧ Install door trim panel. Refer to The replacement of the interior trimming panel of rear door.

Fault diagnosis

1. All door PW inoperable

Steps	Measures	Yes	No
1	Check if the 30A fuse No. F31 of engine compartment fuse box, the 15A fuse No. F29, 10A fuse No. F12 and 10A fuse No. F7 of instrument fuse box are Disconnected.	To step 8	To step 2
2	Check if the power supply of ETACS is normal. (1) Turn down the ignition switch, The voltage between the terminal No.10 of ETACS plug M36 and the grounding should be equal to the battery voltage. (2) Turn on ignition switch, The voltage between the terminals No.18 & 9 of ETACS plug M37 and the grounding should be equal to the battery voltage.	To step 3	To step 9
3	Check if the ETACS grounding is normal. Turn down the ignition switch, disconnect ETACS plug. The terminal No.19 of plug M36 should be conductive with the grounding.	To step 4	To step 10
4	Check if the PW relay operates normally. (1) The terminals No. 2 & 4 of relay are of the city power supply. (2) Turn ignition switch to on. The terminal No. 1 of relay should be equal to the battery voltage.	To step 7	To step 5
5	Turn on the ignition switch and check if the terminal No.3 of PW relay is grounding.	To step 11	To step 6
6	Check if the ETACS is conductive with the PW relay harness. The terminal No.15 of ETACS plug M36 should be conductive with the terminal No. 3 of relay.	To step 13	To step 14
7	Check if the power supply and ground line of PW switch on the front door LH are normal. (1) Turn on ignition switch, The battery voltage should exist between the terminal No.11 of plug D04 on the PW switch of front door LH and the grounding (2) The terminal No. 10 of Plug D04 on the PW switch of front door LH should be conductive with the grounding.	To step 12	To step 15
8	After the failure due to the circuit reason checked, change the fuse to see if the failure has been eliminated.		To step 2
9	Repair the open/short-circuit of ETACS power line to see if the failure has been eliminated.		To step 3
10	Check if the ETACS grounding circuit is open-circuited.		To step 4
11	Repair the circuit failure and change the PW relay to see if failure has been eliminated.		To step 7
12	Replace the PW switch of front door LH.		
13	Replace ETACS.		To step 7
14	Repair the connection line between the ETACS and PW to see if the failure has been eliminated.		To step 13

15	Repair the PW switch harness of front door LH to see if the failure has been eliminated.		To step 12
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2. PW of front door LH inoperable

Steps	Measures	Yes	No
1	Check if the signal output of PW main switch of front door LH is normal. Disconnect the motor plug of PW of LH door, when the PW main switch of front door LH is shifted up, the voltage between the terminal No. 2 of PW motor plug D08 of front door LH and the grounding should be equal to the battery voltage, 0V between the terminal No.1 and the grounding, and vice versa when shifted down.	To step 2	To step 3
2	Change the PW motor of front door LH		

Steps	Measures	Yes	No
3	Check if the harness connection between the PW switch of front door LH and motor is normal.	To step 2	To step 4
4	Repair the harness connector between the PW switch of front door LH and the motor to see if the failure has been eliminated.		To step 2

3. PW of front door RH inoperable

Steps	Measures	Yes	No
1	Check if the signal output of PW main switch of front door LH is normal. Disconnect the motor plug of PW of RH door, when the PW main switch of front door RH is shifted up, the voltage between the terminal No. 1 of PW motor plug D15 of front door LH and the grounding should be equal to the battery voltage, 0V between the terminal No.2 and the grounding, and vice versa when shifted down.	To step 2	To step 3
2	Change the PW motor of front door RH		
3	Check if the conductivity of the PW switch on the front door RH is normal. Disconnect the PW switch plug 12 of front door RH and check the conductivity between the terminals 4, 6, 8 and 1, 3. Going up, terminal 1 & 6 are conductive, 2 & 8 also; going down, terminal 3 & 6 are conductive, 1 & 4 also; when stable, terminal 3 & 8 are conductive, 1 & 4 also.	To step 5	To step 4
4	Change the PW switch of front door RH.		
5	Check if the harness connection between the PW switch of front door RH and PW motor of front door RH is normal.	To step 7	to step 6

	The terminals No.3 & 1 of PW switch plug D12 on the front door RH should be conductive respectively with the terminals No.2 & 1 of PW motor plug D15 on the front door RH.		
6	Repair or replace the PW switch of front door RH and PW motor harness of front door RH To see if the fault has been eliminated.		To step 7
7	Check the power supply of the PW switch on the front door RH is normal turn on ignition switch, the voltage between the terminal No. 6 of PW switch plug D12 on the front door RH and the grounding should be equal to the battery voltage,	To step 4	To step 8
8	Check if the terminal No.1 of PW switch plug D04 on the front door LH is conductive with the terminal No.6 of PW switch plug D12 on the front door RH.	To step 10	To step 9
9	Repair or replace the PW switch plug on the front door LH And PW switch plug connecting cable on the front door RH to see if the fault has been eliminated.		To step 10
10	Change the PW switch on the front door LH.		

4. PW of rear door RH inoperable

steps	Measures	Yes	No
1	Check if the signal output of PW main switch of front door LH is normal. Disconnect the motor plug of PW of rear RH door, turn on ignition switch, when the PW main switch of front door RH is shifted up, the voltage between the terminal No. 2 of PW motor plug D21-2 of front door LH and the grounding should be equal to the battery voltage, 0V between the terminal No.1 and the grounding, and vice versa when shifted down.	To step 2	To step 3
Steps	Measures	Yes	No
2	Change the PW motor of rear door RH		
3	Check if the conductivity of the PW switch on the rear door RH is normal. Disconnect the PW switch plug 18-2 of rear door RH and check the conductivity between the terminals 4, 6, 8 and 1, 3. Going up, terminal 3 & 6 are conductive, 1 & 8 also; going down, terminal 1 & 6 are conductive, 3 & 4 also; when stable, terminal 1 & 8 are conductive, 3 & 4 also.	To step 5	To step 4
4	Change the PW switch of rear door RH.		
5	Check if the harness connection between the PW switch of rear door RH and PW motor of rear door RH is normal.	To step 7	To step 6

	The terminals No.1 & 3 of PW switch plug D18-2 on the rear door RH should be conductive respectively with the terminals No.1 & 2 of PW motor plug D21-2 on the rear door RH.		
6	Repair or replace the PW switch of rear door RH and PW motor harness of rear door RH To see if the fault has been eliminated.		To step 7
7	Check the power supply of the PW switch on the rear door RH is normal. Turn on ignition switch, the voltage between the terminal No. 6 of PW switch plug D18-2 on the rear door RH and the grounding should be equal to the battery voltage,	To step 4	To step 8
8	Check if the terminal No. 1 of PW switch plug D04 on the front door LH is conductive with the terminal No.6 of PW switch plug D18-2 on the rear door RH.	To step 10	To step 9
9	Repair or replace the PW switch plug on the front door LH And PW switch plug connecting cable on the rear door RH To see if the fault has been eliminated.		to step 10
10	Change the PW switch on the front door LH.		

5. PW of rear door LH inoperable

Steps	Measures	Yes	No
1	Check if the signal output of PW main switch of rear LH door is normal. Disconnect the motor plug of PW of rear LH door, turn on ignition switch, when the PW main switch of front door LH is shifted up, the voltage between the terminal No. 1 of PW motor plug D21-1 of front door LH and the grounding should be equal to the battery voltage, 0V between the terminal No.2 and the grounding, and vice versa when shifted down.	To step 2	To step 3
2	Change the PW motor of rear door LH		
3	Check if the conductivity of the PW switch on the rear door LH is normal. Disconnect the PW switch plug D12 of rear door LH and check the conductivity between the terminals 4, 6, 8 and 1, 3. Going up, terminal 3 & 6 are conductive, 1 & 8 also; going down, terminal 1 & 6 are conductive, 3 & 4 also; when stable, terminal 3 & 4 are conductive, 1 & 8 also.	To step 5	To step 4
4	Change the PW switch of rear door LH.		
5	Check if the harness connection between the PW switch of rear door LH and PW motor of rear door LH is normal. The terminals No.1 & 3 of PW switch plug D18-1 on the	To step 7	To step 6

	rear door LH should be conductive respectively with the terminals No.1 &2 of PW motor plug D21-1 on the rear door LH.		
6	Repair or replace the PW switch of rear door LH and PW motor harness of rear door LH To see if the fault has been eliminated.		To step 7
Steps	Measures	Yes	No
7	Check the power supply of the PW switch on the rear door LH is normal Turn on ignition switch, the voltage between the terminal No. 6 of PW switch plug D18-1 on the front door RH and the grounding should be equal to the battery voltage,	To step 4	To step 8
8	Check if the terminal No.1 of PW switch plug D04 on the front door LH is conductive with the terminal No.6 of PW switch plug D18-1 on the front door RH.	To step 10	To step 9
9	Repair or replace the PW switch plug on the front door LH And PW switch plug connecting cable on the rear door RH To see if the fault has been eliminated.		To step 10
10	Change the PW switch on the front door LH.		

6. PW lock-up switch ineffective

Steps	Measures	Yes	No
1	Replace the PW switch on the front door LH and check its normal operation. If the PW lockup is operable?	To step 2	To step 3
2	Replace the PW switch of front door LH.		
3	Check the harness and connectors.		

7. PW Auto-Down on the front door LH ineffective

Steps	Measures	Yes	No
1	Replace the PW switch on the front door LH and check its normal operation. If the Auto-Down is operable?	To step 2	
2	Replace the PW switch of front door LH.		