

# Chapter 8

## PAINTING

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1. GENERAL CAUTIONS
2. CAUTIONS FOR USE OF THINNER AND SOLVENTS CONTAINING THINNER
3. COLOR CODE OF TOP COAT PAINT FOR CAB
4. PROPER PRECAUTION OF THE TOP COAT OF PAINT
5. THE PARTS WHICH HAVE NO RESISTANCE TO HIGH TEMPERATURE AND THEIR TEMPERATURE LIMIT
6. CAUTIONS FOR FORCED DRYING
7. PARTS AND ALLOWABLE HEAT LIMIT
8. HOW TO REMOVE AND REINSTALL THE PARTS OF THE HOOD AND CAB
9. WEATHER STRIP INSTALLATION
10. HANDLING OF ELECTRONIC CONTROL UNIT (ECU)
11. WHEEL PAINTING GUIDE LINES
12. PRECAUTION FOR INSTALLING WHEEL ONTO THE VEHICLE

## 1. GENERAL CAUTIONS

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When treating the finishing coats of paint to the cab and other parts, the following points must be observed.

### **The parts to be masked**

The parts which are not to be painted such as the top mark, ornaments, name plates and caution labels should be thoroughly masked.

DEF - SCR system, the electric wiring connections, batteries, hoses and brake nylon tubes should be covered properly to prevent them from being covered with paint.

Strictly avoid painting rubber hoses and brake pipes including nylon tubes.

Use detergent to clean the inside of cab if needed.

Never use a thinner because it melts the paint. For details, refer to the "Cautions for use thinner and solvents containing thinner".

## 2. CAUTIONS FOR USE OF THINNER AND SOLVENTS CONTAINING THINNER

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Principally no painting should be done on the chassis frame as important parts subject to easy chemical change, like brake hoses, nylon tubes, electric harness coupling, etc., are installed there.

Painting of cab and body

The following parts are damaged by thinner, and when thinner or solvent containing thinner is to be used at the time of painting a cab and a body, attention must be paid to the following items.

- The parts shown “Relevant parts damaged by thinner” in the described here in after must be masked positively.
- If paint etc. should get onto the parts shown in the table, always use kerosene to wipe it off. Do not use thinner or solvents containing thinner.
- As removal with kerosene takes time, always pay attention to positive masking before the start of painting.
- When parts are removed for painting, they must be reinstalled correctly afterwards. The manufacturer (Hino) is not responsible for any concerns caused by defective installation.

Relevant parts damaged by thinner

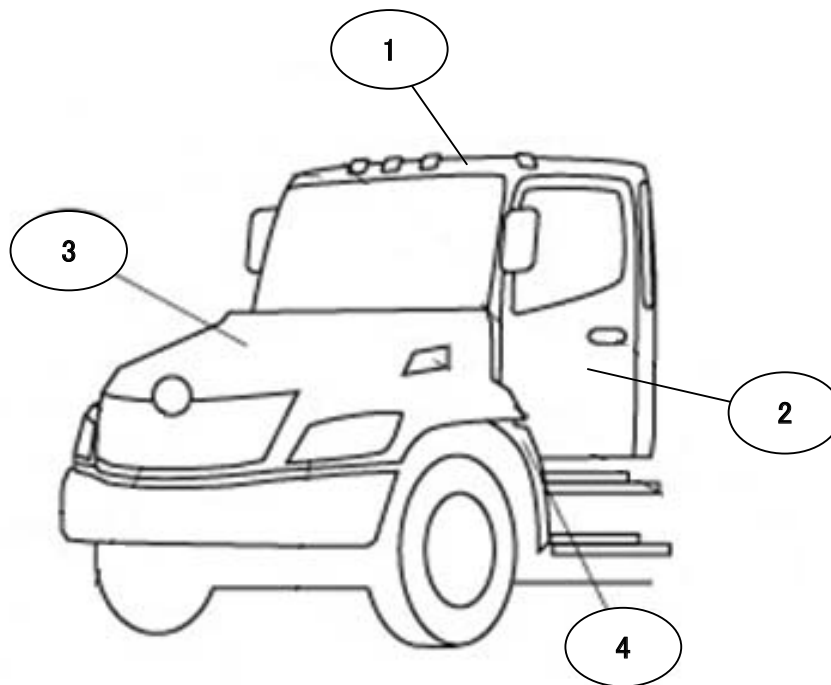
No.	Part name	Remarks	Material
1	Emblem	Hino  mark	P
2	Head lamp		P
3	Clearance lamp	Installed on both sides of the cab roof	P
4	Identification lamp	Installed on the center of the cab roof	P
5	Side turn lamp	At the front fender	P
6	Rear combination lamp		P
7	Licence plate lamp	Built-in rear combination lamp	P
8	Back-up lamp	Built-in rear combination lamp	P
9	Sedimenter body	Engine room	P
10	Fender		P
11	Splash board		P
12	Grille radiator		P
13	Cooling fan	Engine parts	P
14	Battery (indicator parts)	Indicator for liquid level check	P
15	Mudguard (front)		R
16	Rubber parts	All rubber parts to be installed engine & chassis parts including air intake system hoses	R
17	Outside of the cab		S
18	Front bumper		S
19	Caution plates		O
20	Washer nozzle	At the front cowl	P
21	Wiper blade		R
22	Wiper cap	Pivot cover	R
23	Front hood		P
24	Outside mirror cover	At the mirror bracket	P
25	Outside mirror		P
26	Nylon tubes for brake piping	For model NJ and NV	P
27	Rear ventilation cover	At the right side of cab rear	P
28	Air intake cover	At the left side of front hood	P

[NOTE] P: Plastic } When thinner etc. is used, breaking and cracking etc.  
 R: Rubber } can be caused.  
 S: As these are painted steel plate, the luster is lost when thinner etc. is used.  
 O: The writing disappears when thinner etc. is used.

### 3. COLOR CODE OF TOP COAT PAINT FOR CAB

HINO provided the paint color code as following table.

Paint Color	Color Code	Parts
White	HVJ	1. Roof 2. Door 3. Hood 4. Fender
Black	202	
Hino Red	C31	
Penske Yellow	P-150	



## 4. PROPER PRECAUTION OF THE TOP COAT OF PAINT

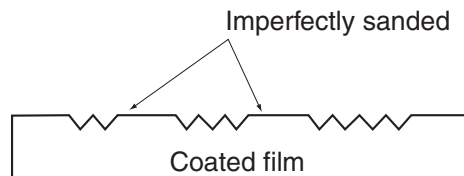
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To make sure that the top coat of paint adheres well, you must sand the original top coat carefully.

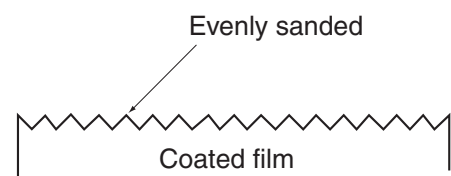
Make sure that the sanding is even and complete.

When you have finished sanding, carefully dust off the shavings.

### SANDING (BAD SANDING)



### (GOOD SANDING)



### How to choose top coat paint

Hino recommends urethane-type paints for the top coat, as they have superior rust-prevention properties to lacquer-type paints.

The top coat should be at  $30\ \mu$  thick and the total paint thickness including undercoat and primers should be at least  $80\ \mu$  thick.

## 5. THE PARTS WHICH HAVE NO RESISTANCE TO HIGH TEMPERATURE AND THEIR TEMPERATURE LIMIT

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There is no particular problem in the case of natural drying because the drying temperature is low.

In the case of forced drying such as drying in an oven, however, drying temperature varies from 80°C (176°F) to 120°C (248°F).

As there are some parts which have no resistance to high temperature, proper measure must be taken to suit the actual condition. For details, refer to the table "Principal parts and allowable heat limit" described here in after.

## 6. CAUTIONS FOR FORCED DRYING

When you use forced drying, a temperature on the surface of any parts to be painted must be 80°C (176°F) as an upper limit.

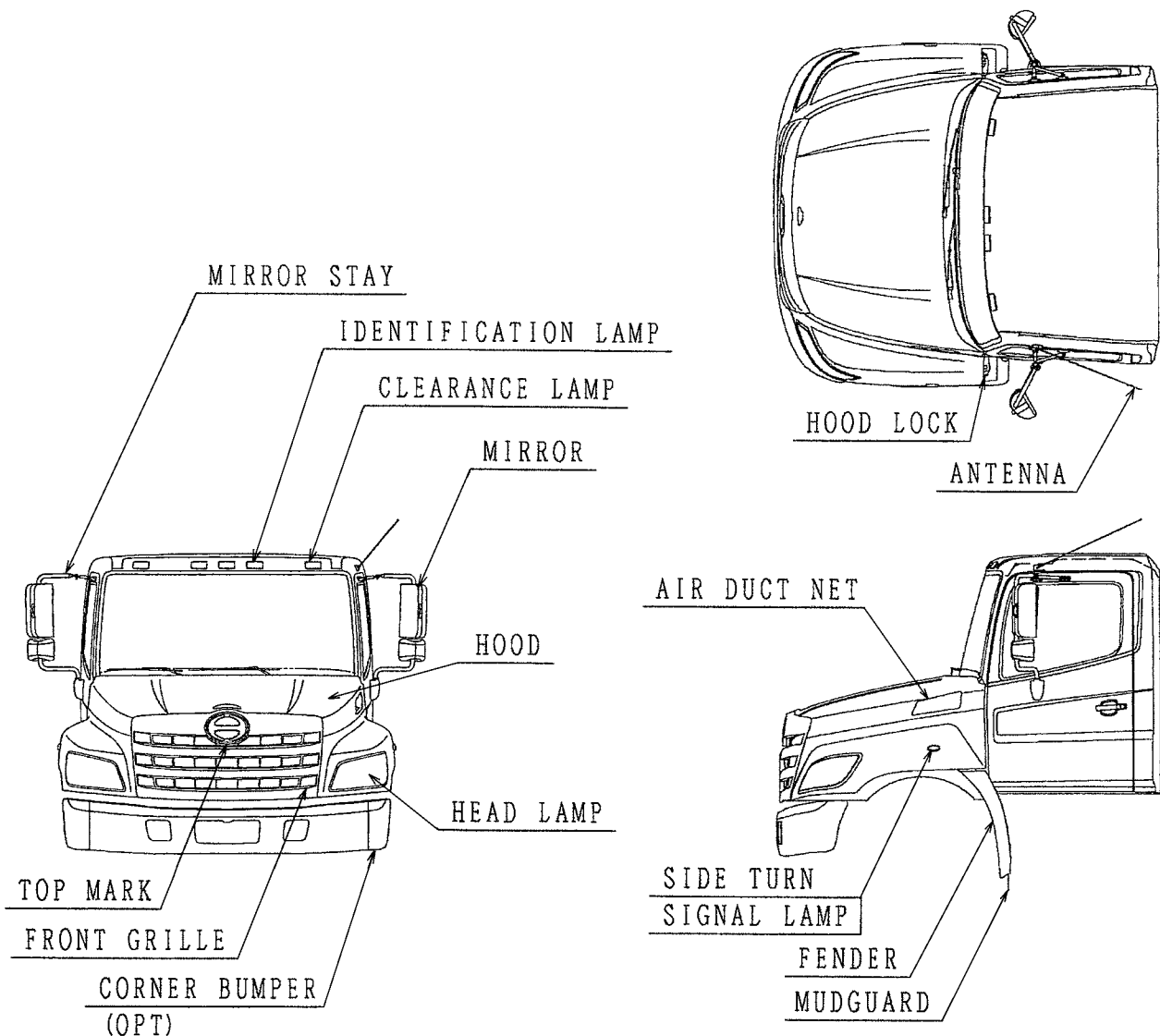
Removal of plastic and rubber parts especially the front grille, hood, fender, air cleaner, etc., from the vehicle when using forced drying over 80°C (176°F). (Refer to the following figure.)

Take care to those as plastic parts like front grille, hood, fender, air cleaner, etc. are much used.

A vehicle equipped with air-conditioning whose refrigerant lines are heated at abnormal temperature [more than 100°C (212°F)], a pressure safety valve may function and expel refrigerant gas.

When removing the air-cleaner assy, seal completely the inlet port side of engine to prevent any penetration of dirt, paint or etc.

### NON-HEAT RESISTING PARTS AT THE HEATED AIR OR MORE THAN 80°C (176°F)





## 7. PARTS AND ALLOWABLE HEAT LIMIT

Numbers the table below correspond with those in the following figures.

### INSTRUMENT PANEL ACCESSORY

No.	Part name	Material	Allowable heat limit	
			°C	°F
1	Panel assy, instrument cluster	Polypropylene	80	176
2	Bezel, instrument cluster	Polypropylene	80	176
3	Cover, instrument panel	Polypropylene	80	176
4	Cover, instrument panel, lower center	Polypropylene	80	176
5	C over, instrument panel, lower RH	Polypropylene	80	176
6	Cover, instrument panel, RH side	Polypropylene	80	176
7	Panel, switch board	Polypropylene	80	176
8	Cover, stereo opening	Polypropylene	80	176
9	Grille assy, air outlet	Polypropylene	80	176
10	Cover, instrument panel, upper	Polypropylene	80	176
11	Cover, steering column, upper	Polypropylene	80	176
12	Cover, steering column hole, center	Polypropylene	80	176
13	Cover, steering column, lower	Polypropylene	80	176
14	Cover, steering shaft	Polypropylene	80	176
15	Cup holder	ABS	80	176

### ROOF ACCESSORY

No.	Part name	Material	Allowable heat limit	
			°C	°F
1	Head lining	Glass fiber reinforced polyurethane + Fabric	80	176
2	Sun visor assy, RH	Vinyl chloride + corrugated cardboard	80	176
3	Sun visor assy, LH	Vinyl chloride + corrugated cardboard	80	176
4	Console assy, over head	Polypropylene	80	176
5	Hanger, sun visor	Nylon	80	176

## DOOR ACCESSORY

No.	Part name	Material	Allowable heat limit	
			°C	°F
1	Trim sub assy, door inside	Polypropylene	80	176
2	Grip assy, door assist	PVC + Steel	80	176
3	Arm rest sub assy, door	PVC & Polypropylene	80	176
4	Trim sub assy, door inside, upper	Polypropylene	80	176
5	Ashtray assy.	Phenol formaldehyde resin	80	176
6	Cover, door ashtray hole	Polypropylene	80	176
7	Panel, door trim base upper	Polypropylene	80	176
8	Seal, front fender, door	Rubber	80	176
9	Weather strip, door glass run	EPDM	80	176
10	Oscillate proof, outer	Rubber	80	176
11	Oscillate proof, inner	Rubber	80	176
12	Switch, power window	ABS	80	176
	Case, door lock	ABS	80	176
	Case, power window switch	ABS	80	176
	Handle, door regulator	POM	80	176

## INSIDE ACCESSORY

No.	Part name	Material	Allowable heat limit	
			°C	°F
1	Trim, body, rear	Polypropylene	80	176
2	Trim sub assy, body, rear	Polypropylene	80	176
3	Trim sub assy, front pillar, RH	Polypropylene	80	176
4	Trim sub assy, front pillar, LH	Polypropylene	80	176
5	Grip, sub assy, inside	Polypropylene + Steel	80	176
6	Cap	Polypropylene	80	176
7	Cap	Polypropylene	80	176
8	Box assy, console	PPF	80	176
9	Cover, gear shift lever	PPF	80	176
10	Box assy, parking brake console	PPF	80	176
	Silencer, dash, front	PVC & COT + PET	80	176
	Plug, hole	Rubber	80	176
	Mat, floor	PVC & Felt	80	176
12	Trim body, rear (UPPER)	Polypropylene	80	176
13	Hanger, coat	Polypropylene	80	176

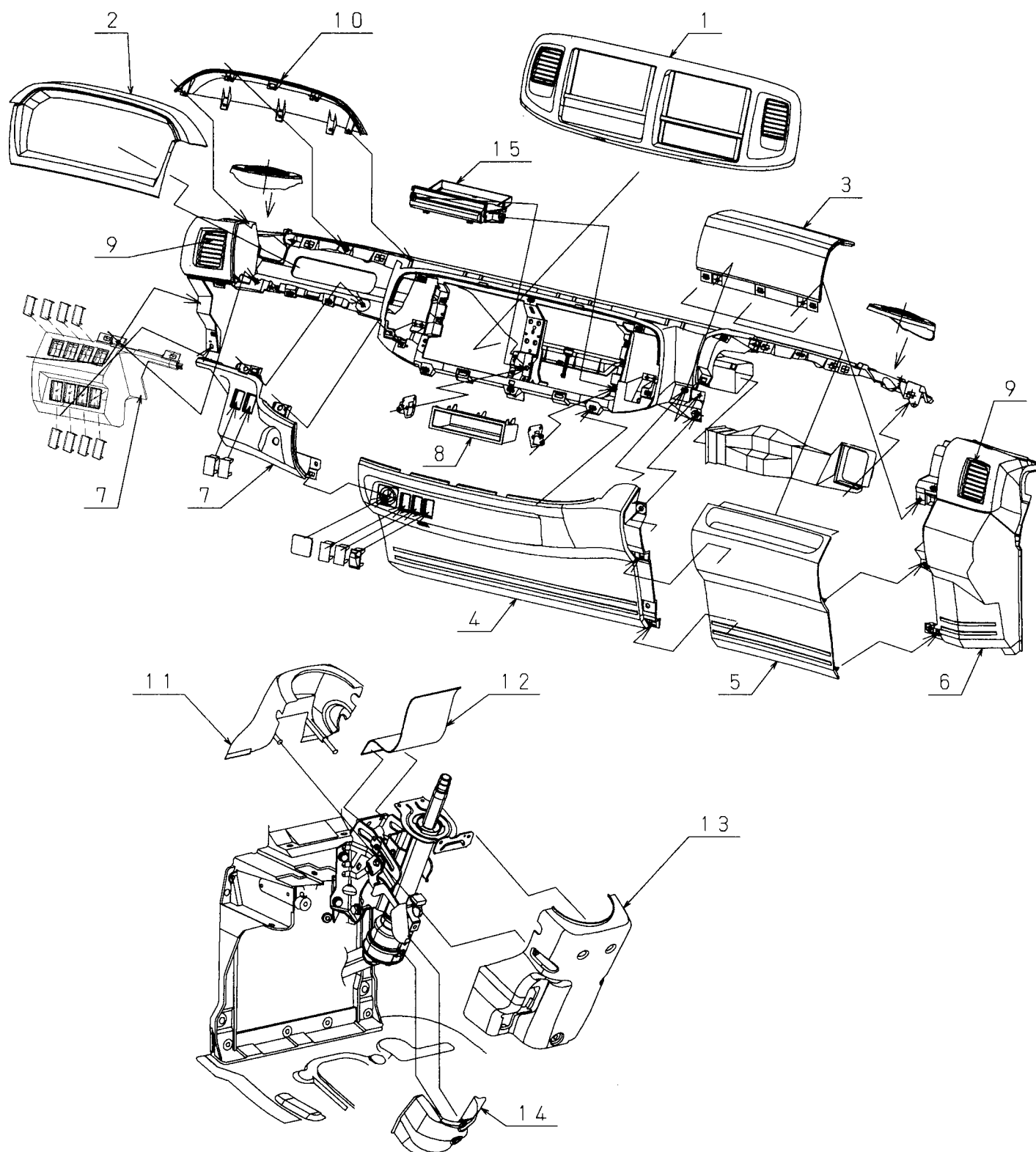
## OUTSIDE ACCESSORY

No.	Part name	Material	Allowable heat limit	
			°C	°F
1	Emblem (Top mark)	ABS	80	176
2	Grille, radiator	ABS	80	176
3	Hood	SMC	80	176
4	Cover, outside mirror stay	Polypropylene	80	176
5	Mirror, outside	ABS	80	176
6	Lens, identification lamp	Polycarbonate	80	176
	Body, identification lamp	Polycarbonate	80	176
7	Lens, clearance lamp	Polycarbonate	80	176
	Body, clearance lamp	Polycarbonate	80	176
8	Head lamp	Acryl	80	176
9	Lens, side turn signal lamp	Acryl	80	176
	Body, side turn signal lamp	ABS	80	176
10	Antenna	Polypropylene	80	176
11	Net, air duct	Polypropylene	80	176
12	Fender	SMC	80	176
13	Mudguard	Rubber	80	176
14	Ventilator assy, air outlet	Polypropylene	80	176
15	Scuff plate	Polypropylene	80	176
16	Lock, hood	Rubber	80	176
17	Handle, door outside	PC & PET	80	176
18	Corner bumper	Polypropylene	80	176
19	DEF tank	HDPE	80	176

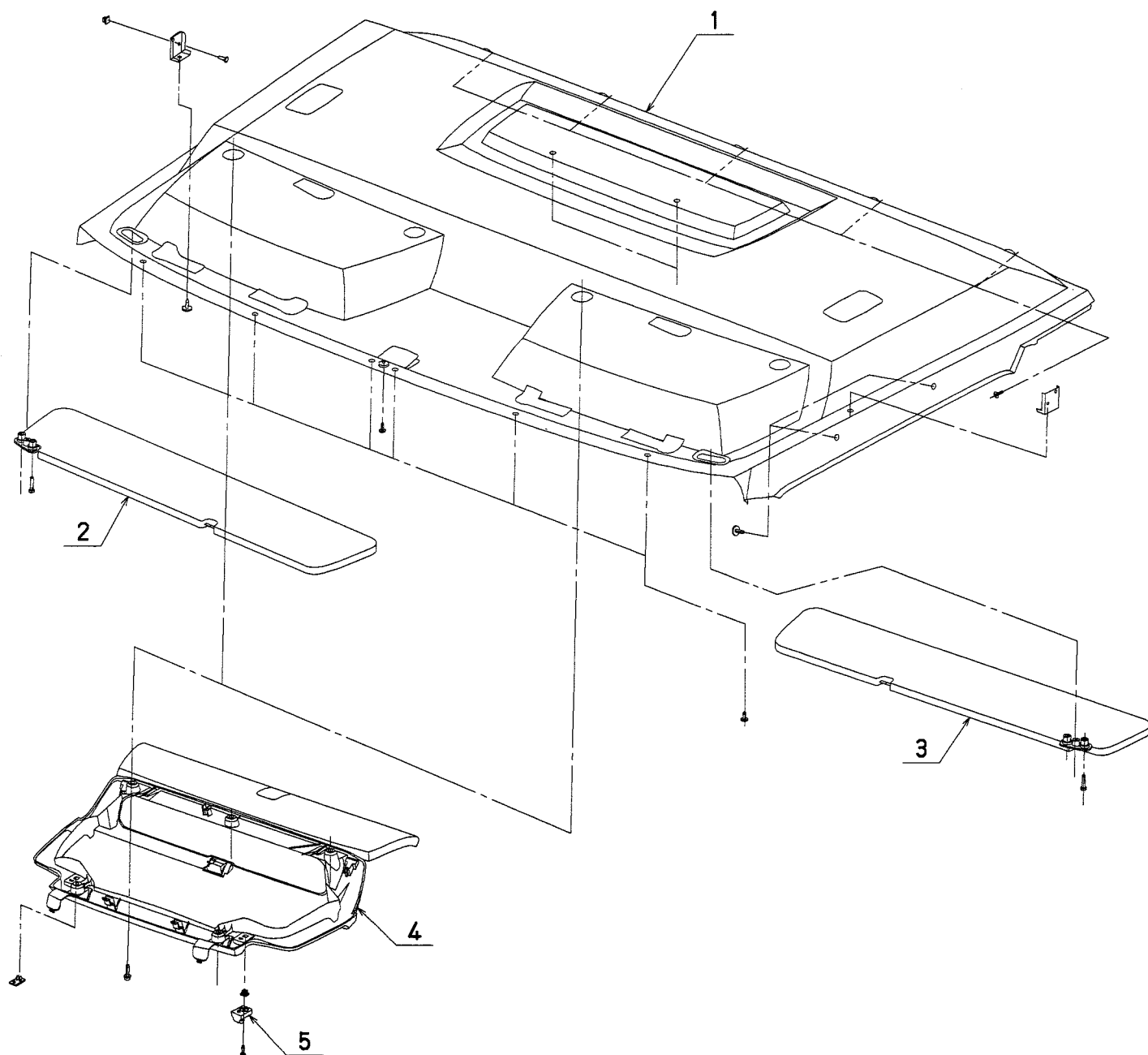
## OTHERS

No.	Part name	Material	Allowable heat limit	
			°C	°F
1	Nylon tubes for brake piping	Nylon	90	194
2	Weather strip	Rubber	80	176
3	Duct, air	Polypropylene	80	176
4	Filter, air	Polypropylene	80	176
	Adjusting lever, steering column	Polypropylene	80	176
	Steering wheel	Urethane form	80	176
	Horn button	TPO	100	212
	Fuel pipes	Special plastic coating	120	248
	Radiator reservoir	Polypropylene	80	176
	Valves for brake system	Rubber & Nylon	90	194
	Fuel hose	Rubber	100	212
	Fuel tank band/support seat	Rubber	100	212
	Radiator hose	Rubber	100	212
	Heater hose	Rubber	100	212
	Brake & clutch hose	Rubber	100	212
	Electric equipment box cover	Polypropylene	80	176
	Electric equipment box proper	Polypropylene	80	176
	Harness wiring	Vinyl chloride	80	176
	Harness wiring clip	Nylon & Polypropylene	80	176
	Battery cable	Vinyl chloride	80	176
	Cable	Polyethylene or Polypropylene	80	176
	Cable boot	Rubber	90	194
	Torsion bar collar	Polyacetals	100	212
	Nylon tubes for brake piping	Nylon	90	194
	(At all parts to be installed chassis)			
	Battery	Polypropylene	80	176
	Battery cover	Polypropylene	80	176
	Gauge, fuel sensor		80	176
	Bush, front spring	Rubber	80	176
	Seat, spring slide (Rear spring)	Polypropylene	80	176
5	Garnish, cowlpanel, CTR	Polypropylene + GF30	80	176
	Cooler hoses	Rubber	100	212
	Resin clips (For brake piping)	Nylon & etc.	90	194
	Computer, Allison ATM	—	125	257
	2200 and 2500 series			
	Computer, Allison ATM	—	105	221
	3000 and 3500 series			
	Propeller shaft	—	80	176
	Brake & clutch pipes	Special plastic coating	120	248

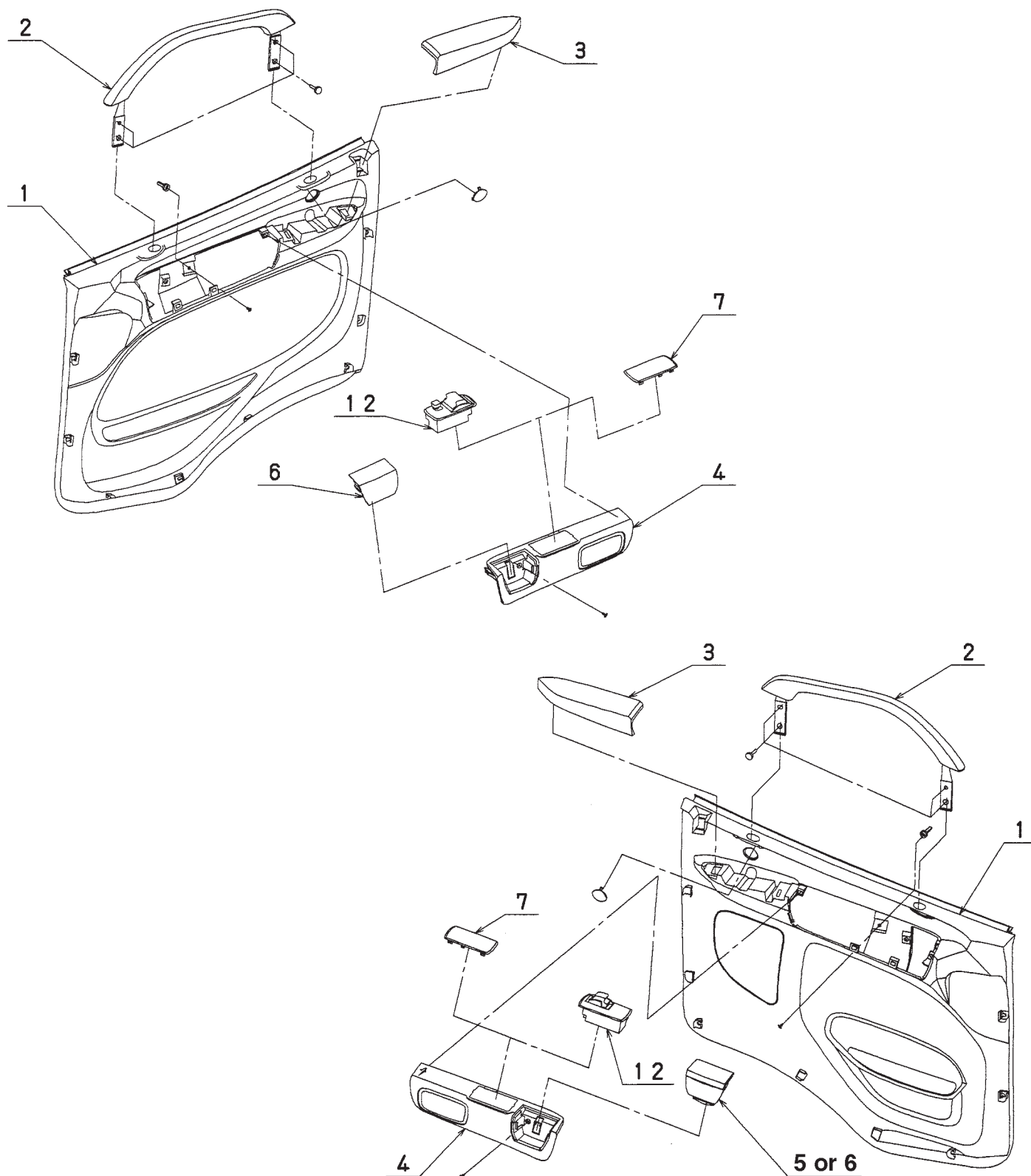
## INSTRUMENT PANEL ACCESSORY



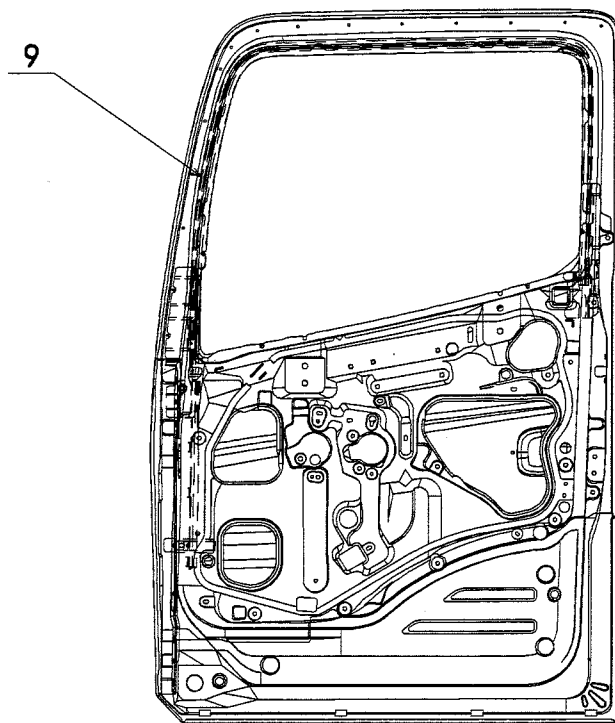
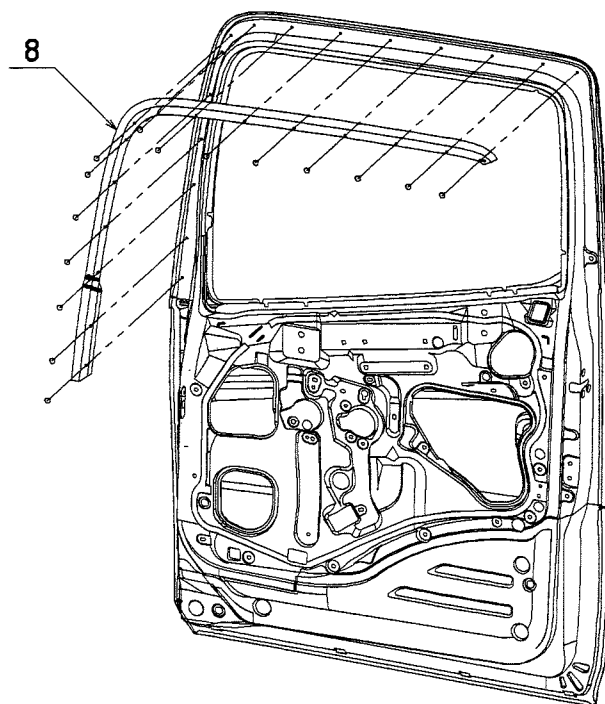
## ROOF ACCESSORY



## DOOR ACCESSORY -1

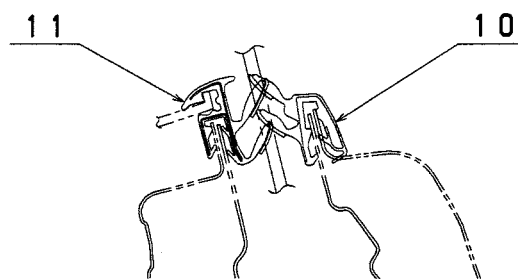
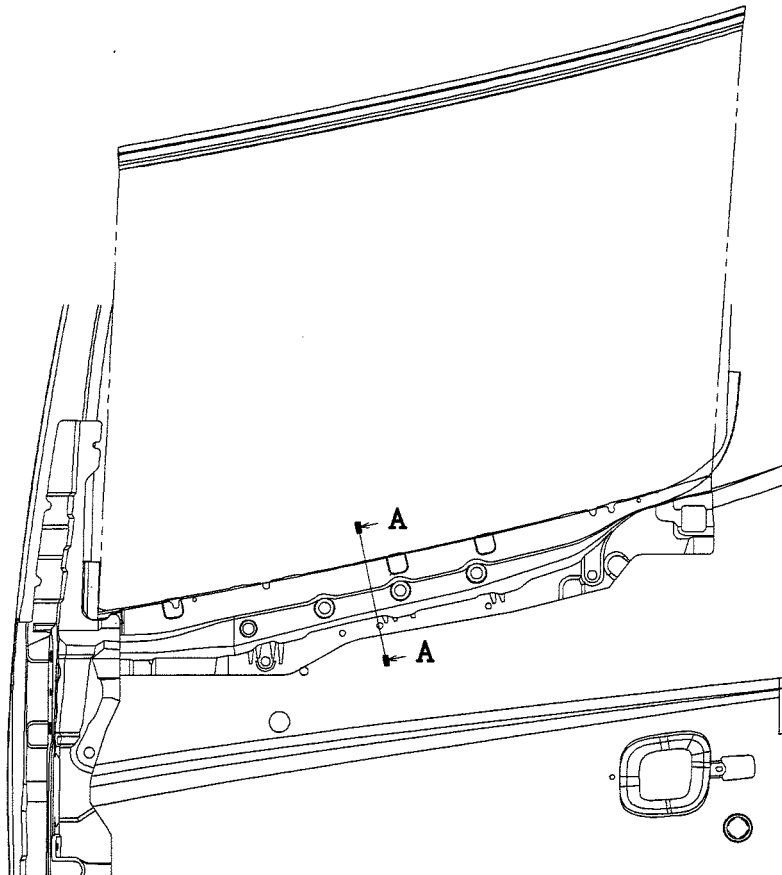


## DOOR ACCESSORY -2



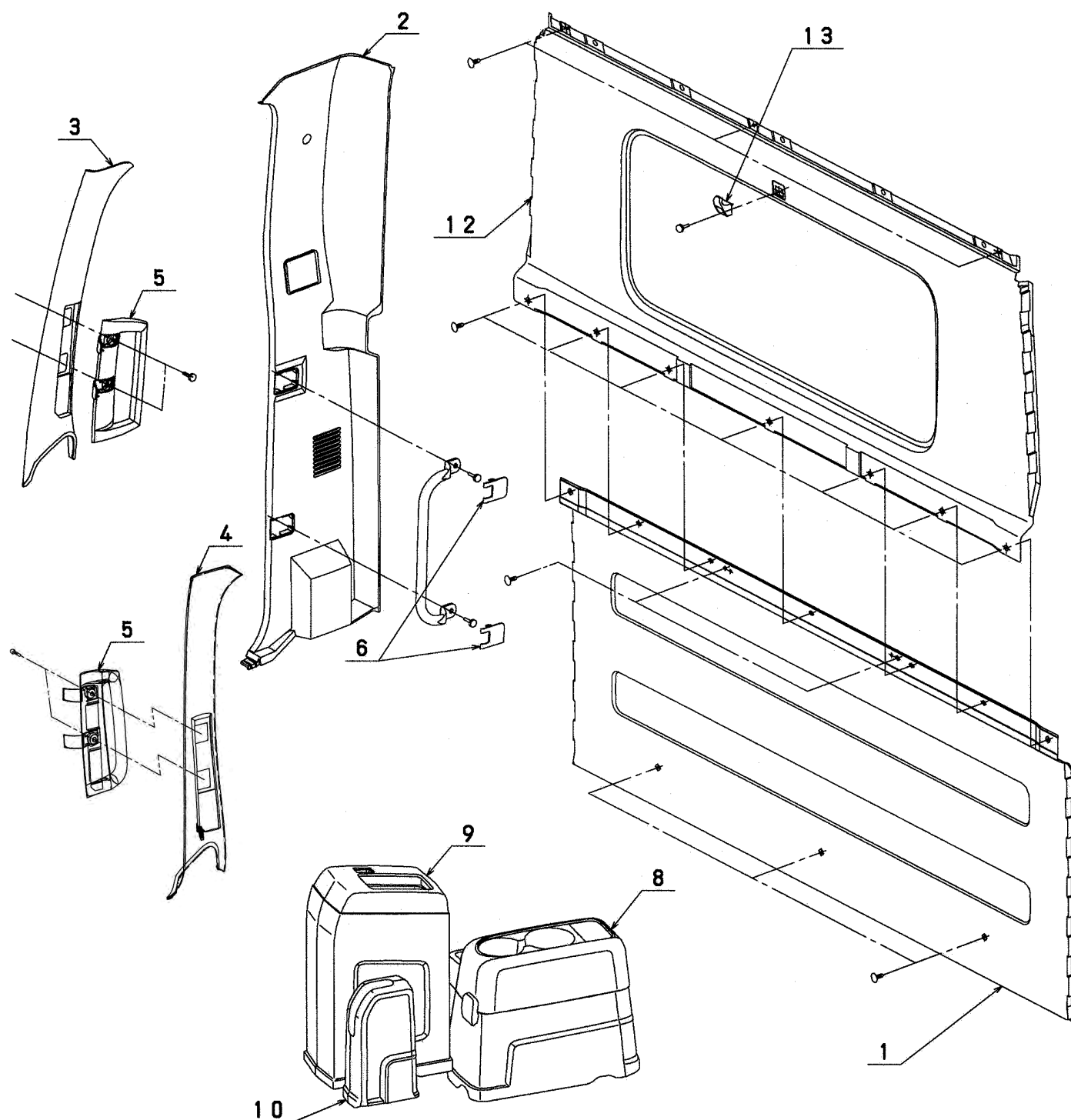


## DOOR ACCESSORY -3

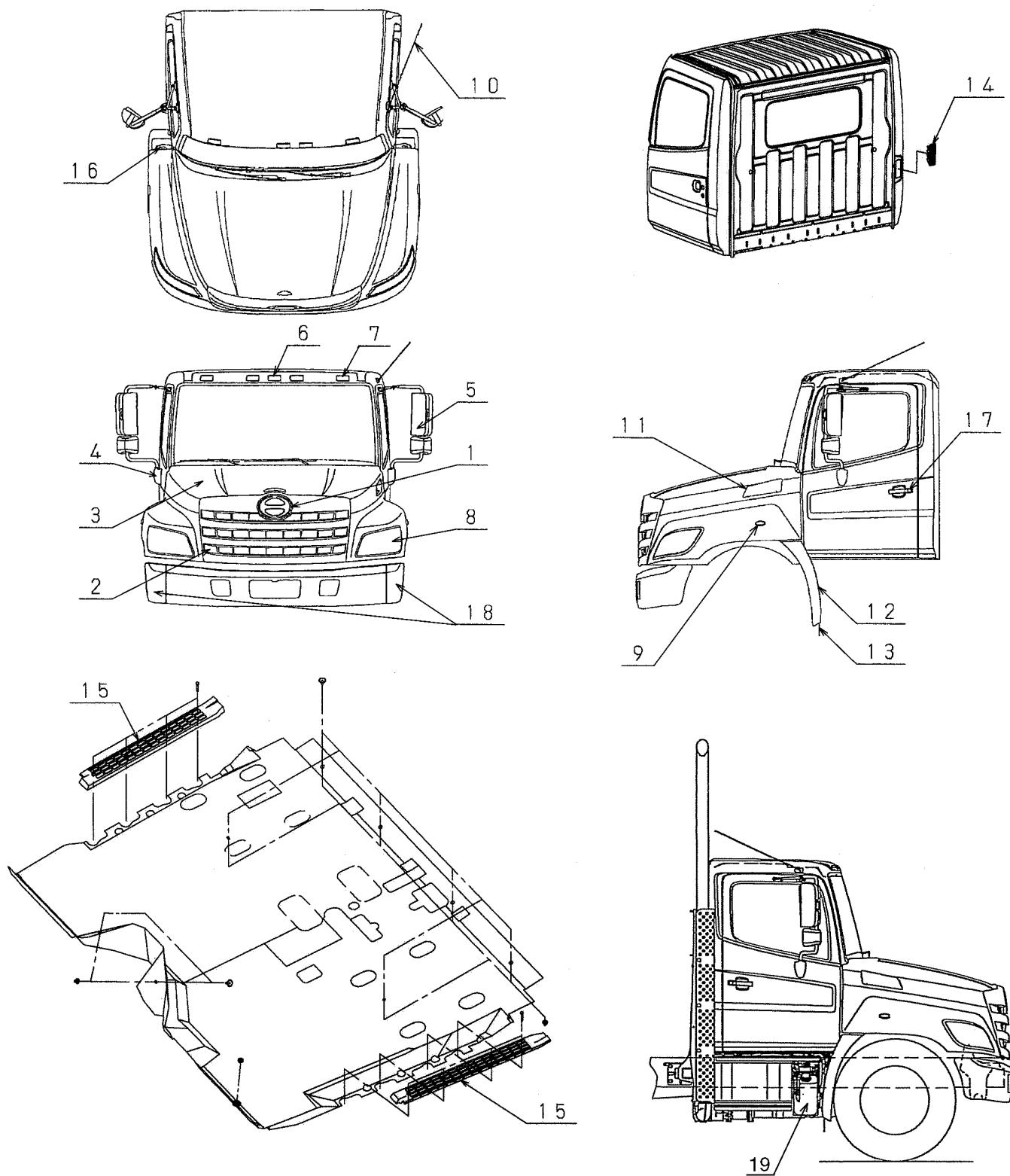


SECTION A-A

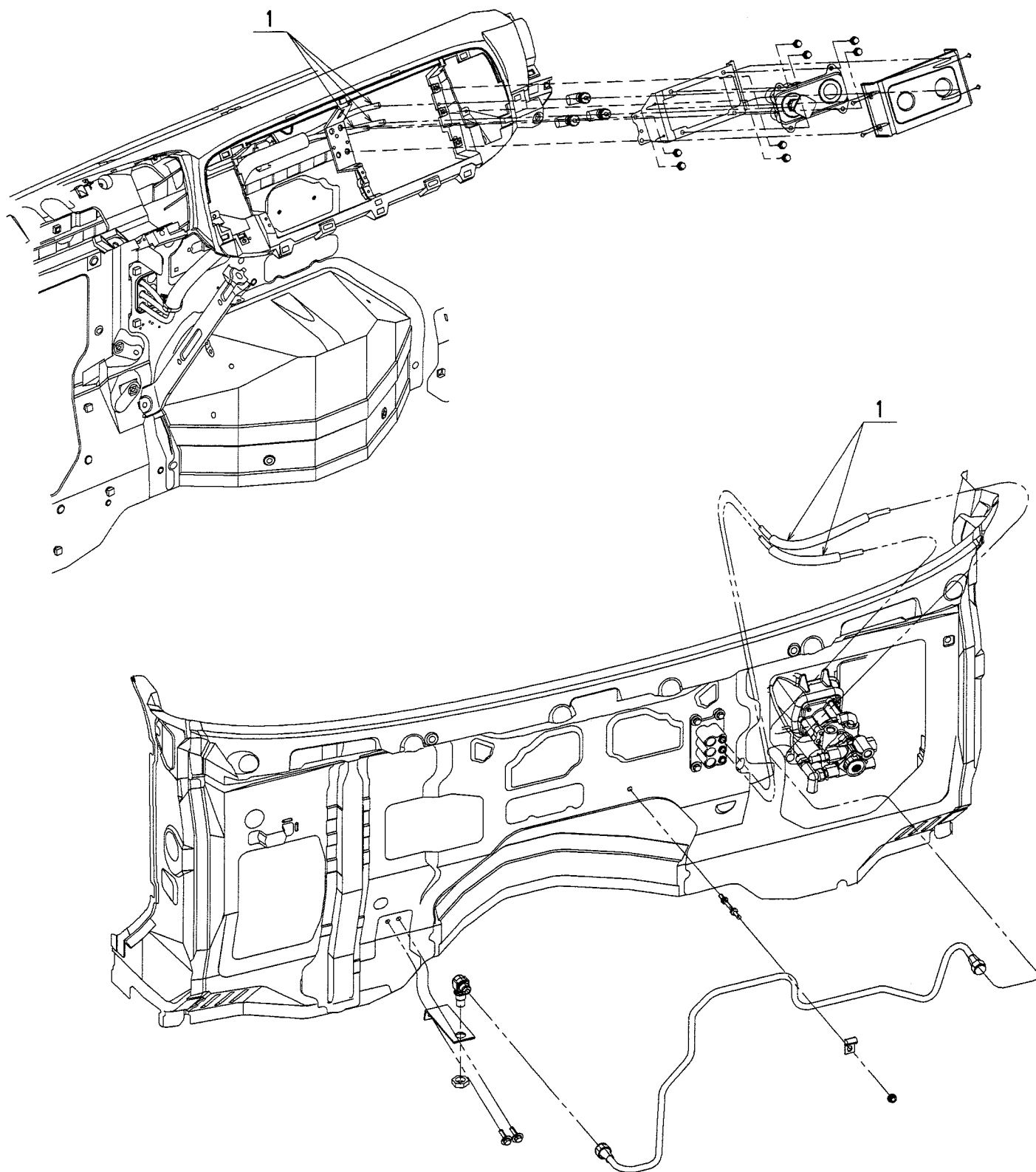
## INSIDE ACCESSORY



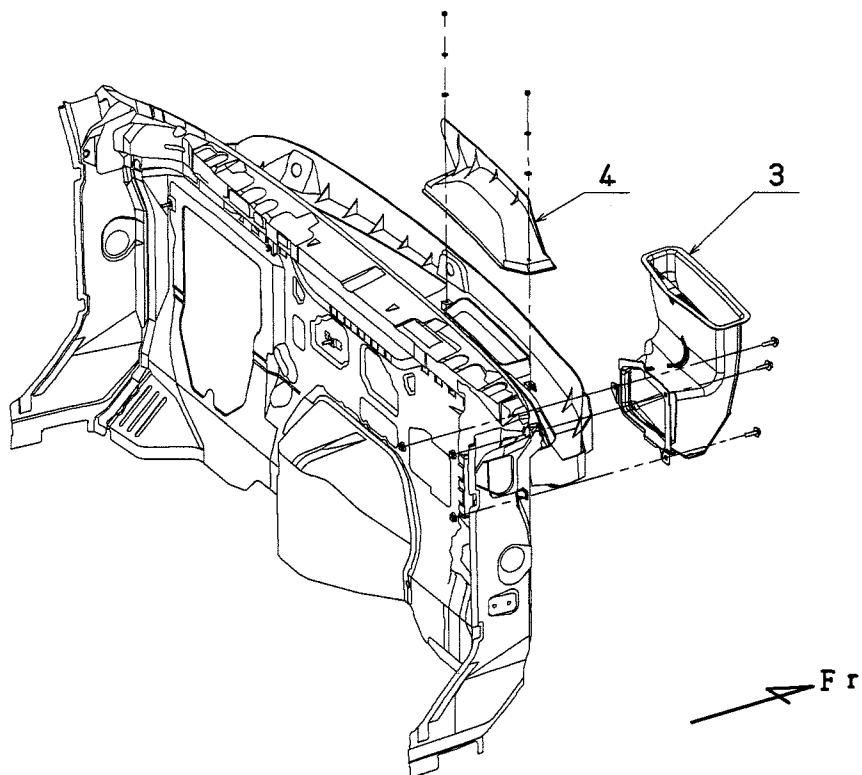
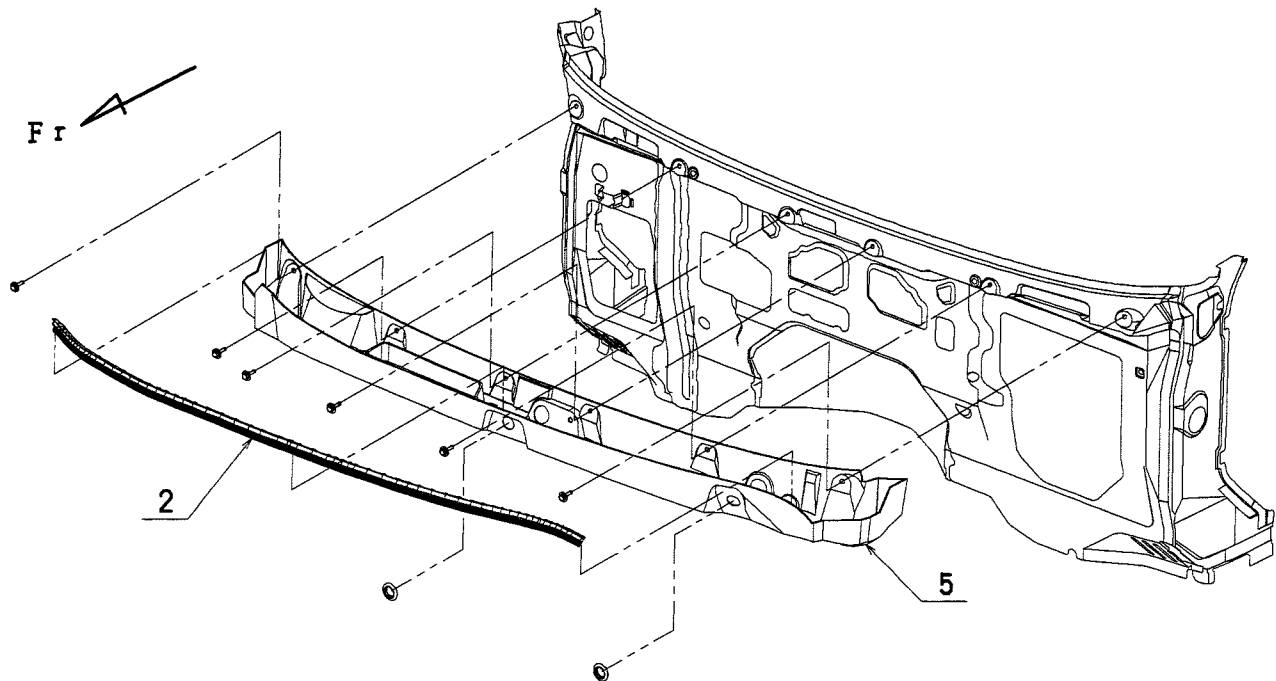
## OUTSIDE ACCESSORY



## OTHERS -1



## OTHERS -2



## 8. HOW TO REMOVE AND REINSTALL THE PARTS OF THE HOOD AND CAB

### Radiator grille

#### REMOVE RADIATOR GRILLE

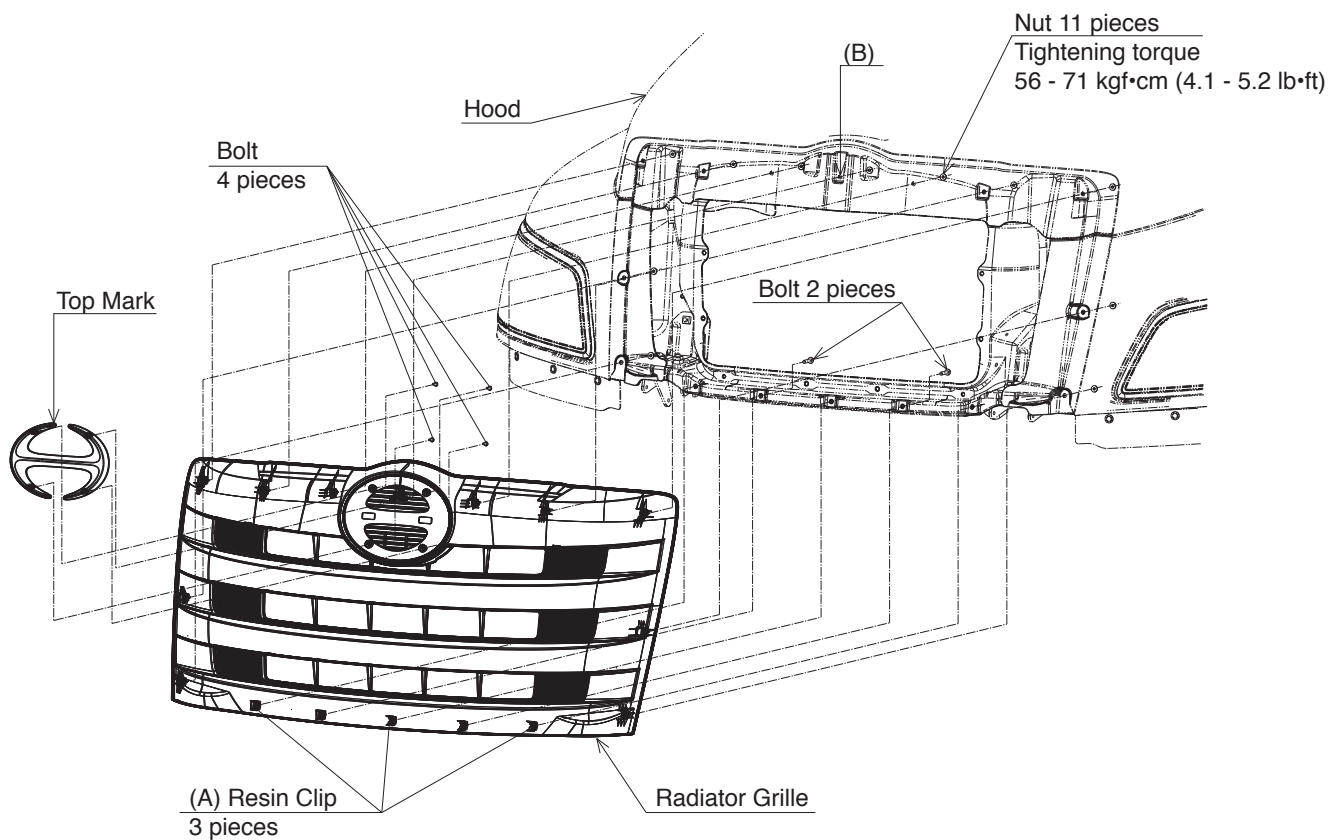
- After loosening the nuts (11 pieces) from behind the radiator grille paying attention not to impact on them, remove resin clips (3 pieces) and bolts (2 pieces) and remove it from the hood.

#### INSTALL RADIATOR GRILLE

- Replace the dry lock fixing bolts and resin clips with new ones.
- First insert (A) resin clips in the hood and fasten the nut at (B) and then fasten other nuts.

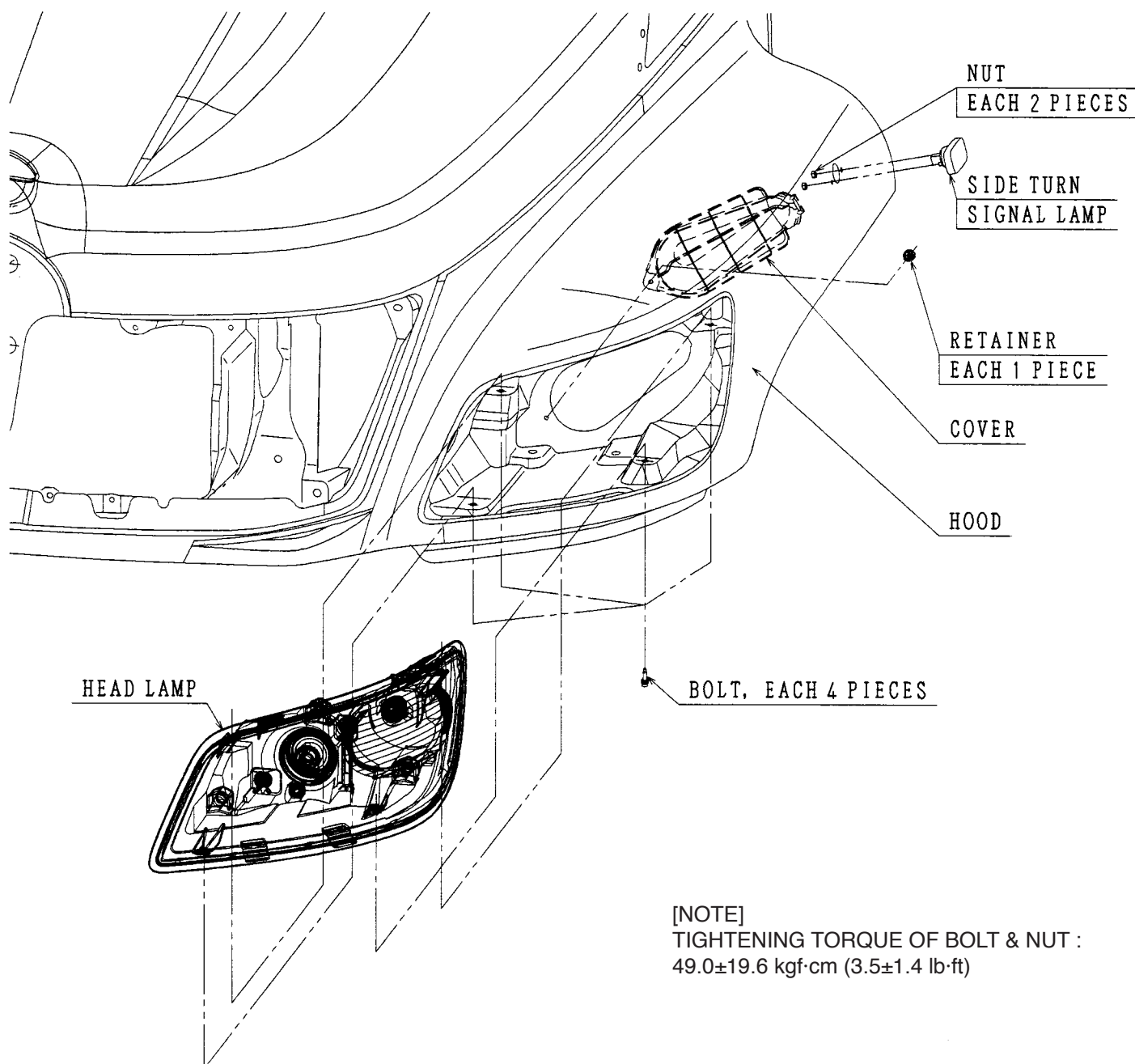
#### [NOTE]

Thread lock hardens in 24 hours, after fastening.

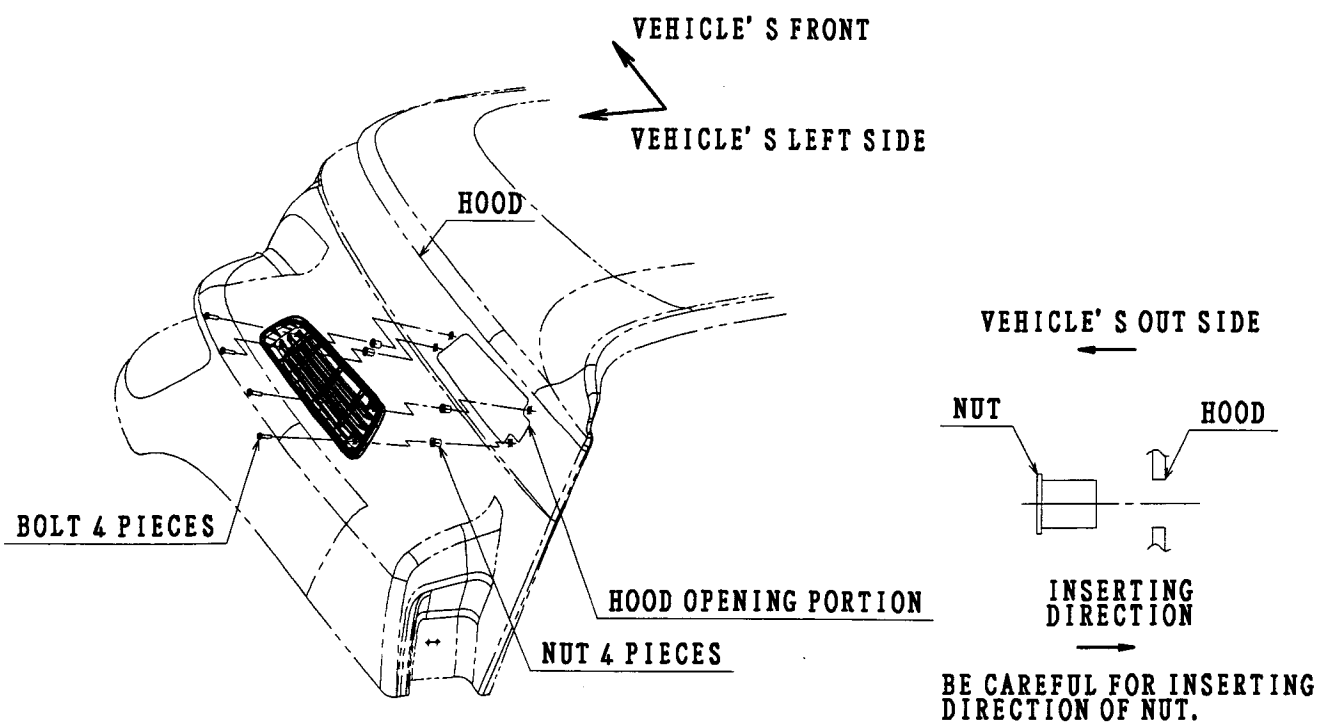
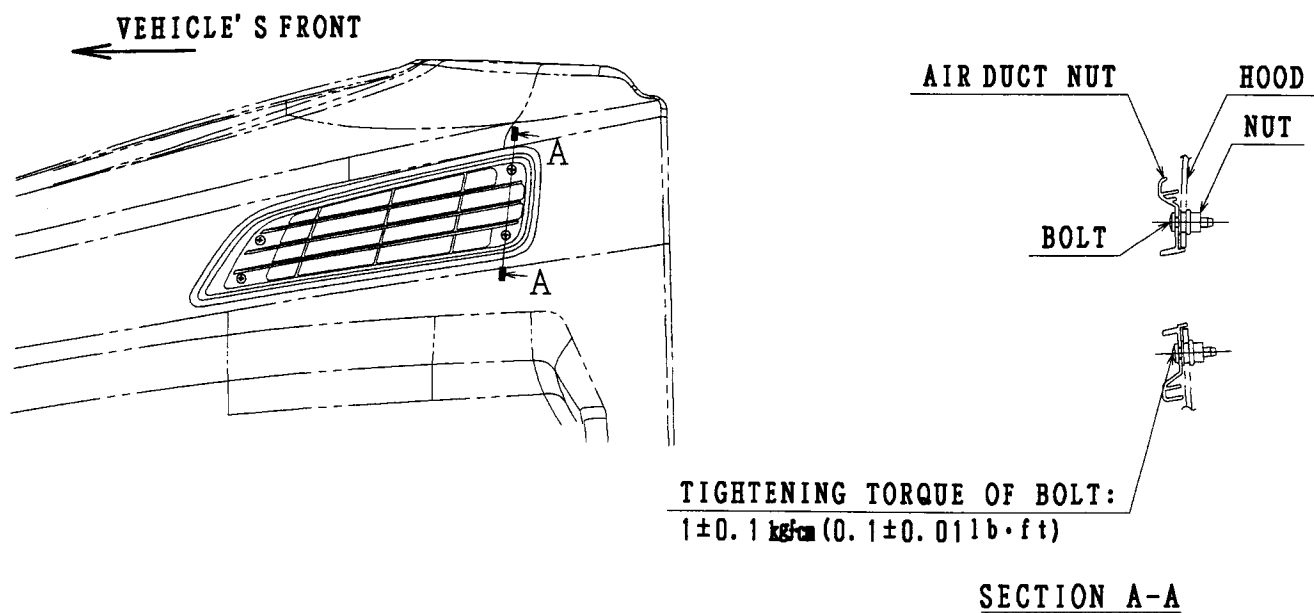


## Head lamp and side turn signal lamp

- Open the hood.
- Loosen the bolts from back side of the hood.



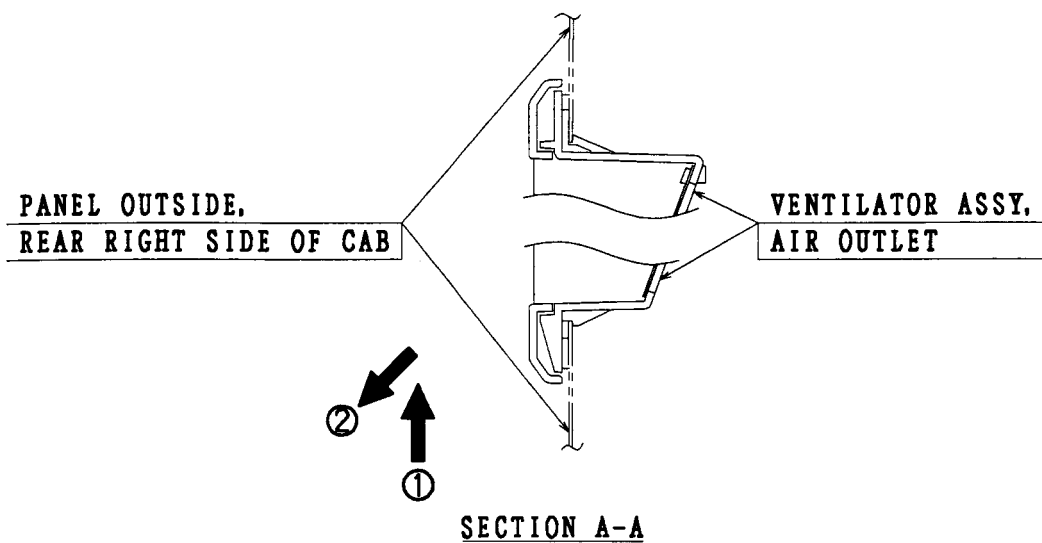
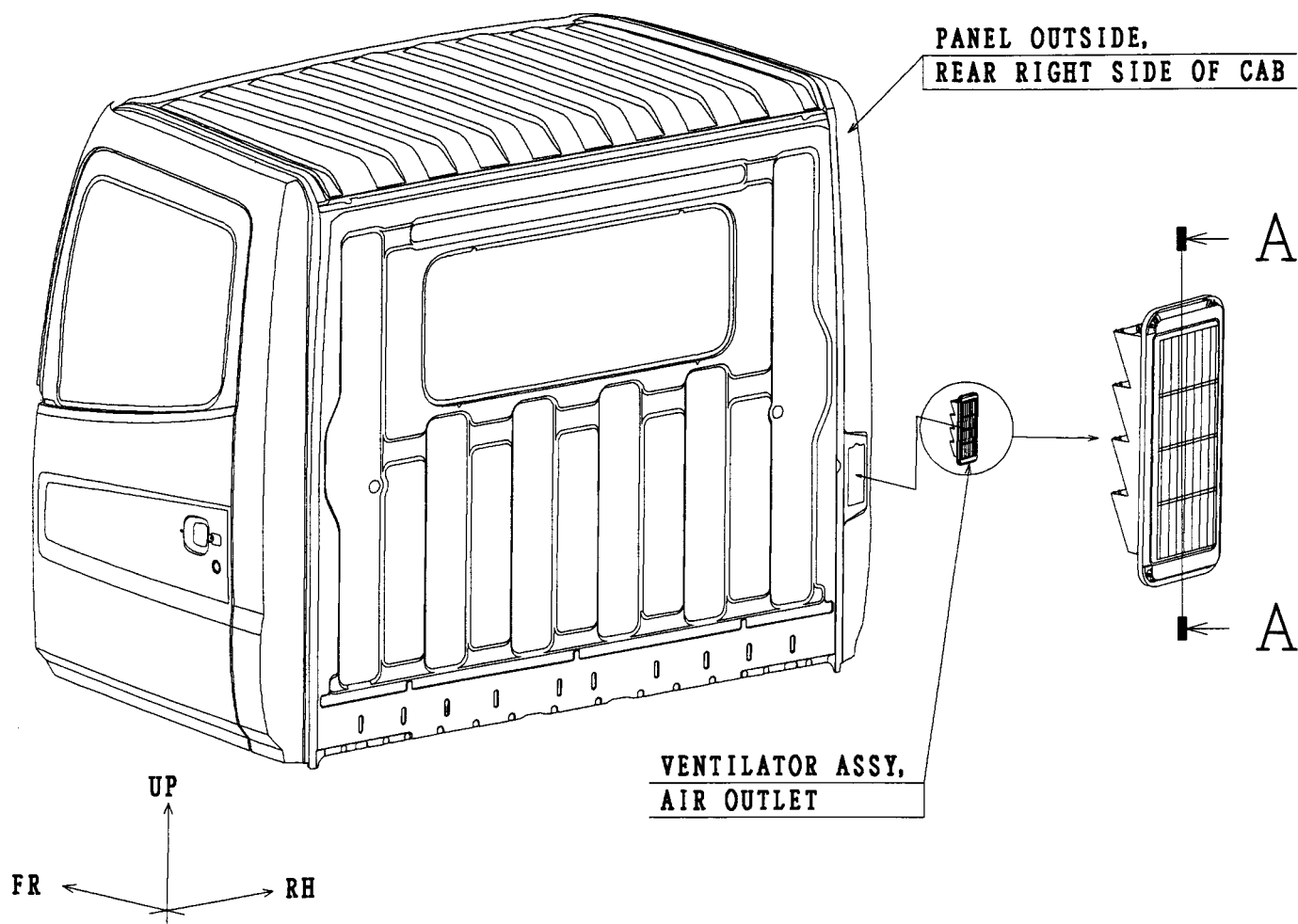
## Air duct inlet





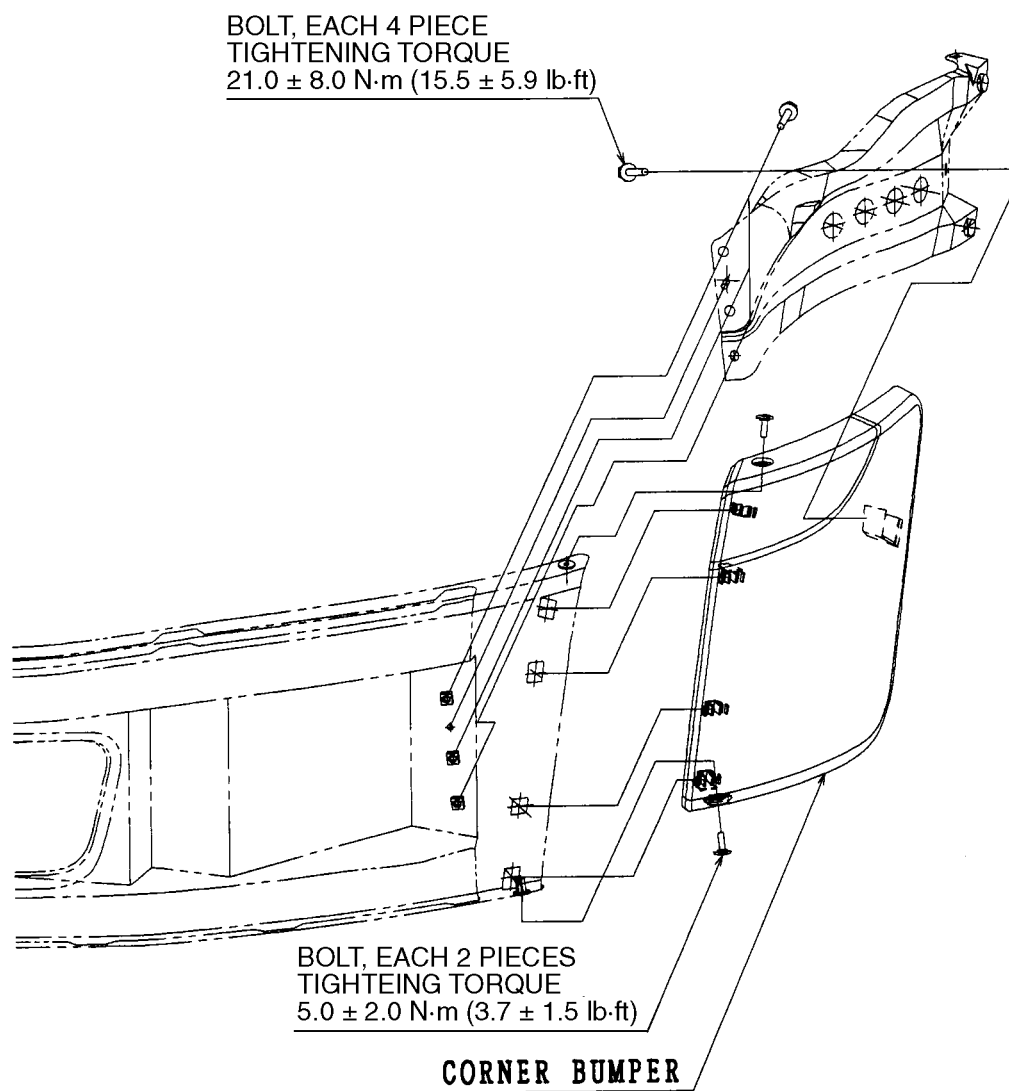
## Ventilator

- Place hand under the side of the ventilator.
- Push ventilator up. More up 1 to 2 mm (0.039 to 0.078 in.) only.
- Pull ventilator away from cab to remove.



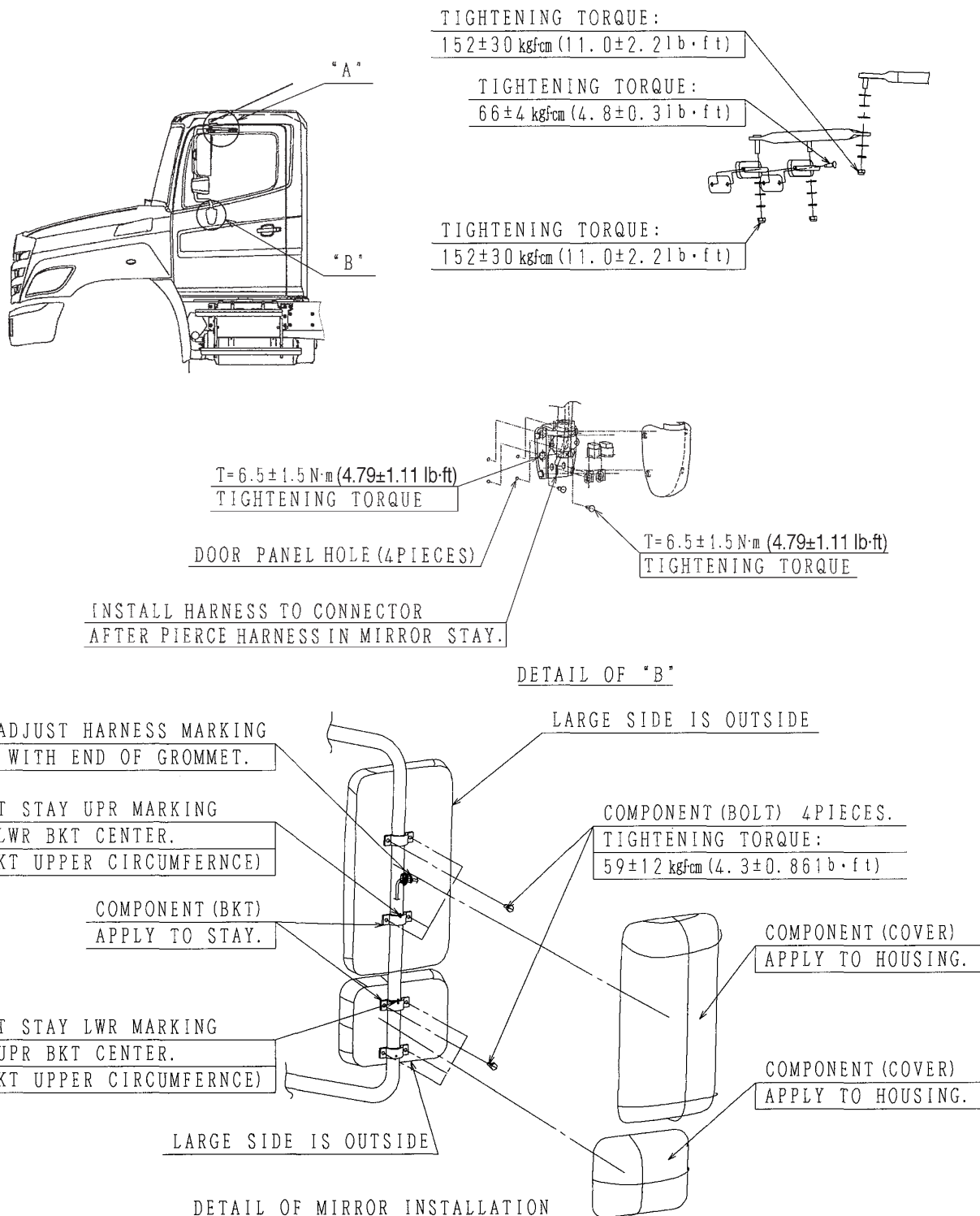
## Corner bumper

- Loose the bolts



## Outside mirror and mirror stay

- When remounting the mirror stay, mount it after the paint has completely dried.
- When tightening the mirror stay, be careful not to scratch the painted surface.
- When remounting the mirror stay, torque to specification(s) shown in the following figures.



## Windshield wiper

When dismounting and remounting the wiper, confirm before the remounting, that the wiper stays at the park position.

(After turning ON the wiper motor switch to motor, turn OFF the wiper switch and the motor stops at the park position.)

### [NOTE]

- Operate the wiper with the hood shut down.
- With the hood opened, you may risk to have your hand pinched by the wiper links.
- Also after stop of the wiper motor, remove the key from the ignition.

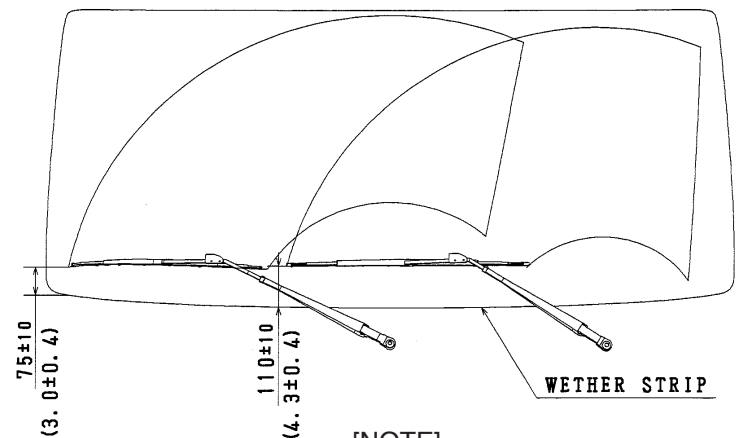
When tightening the wiper arms, tighten them by adjusting the blade position (height) with in the limit as shown as the following figure.

Adjust the wiper arms and the pivot positions to the following tightening torque values.

- Wiper arm tightening torque  
 $200 \pm 20 \text{ kgf}\cdot\text{cm}$  ( $14 \pm 1.4 \text{ lb}\cdot\text{ft}$ )
- Wiper pivot tightening torque  
 $140 \pm 20 \text{ kgf}\cdot\text{cm}$  ( $10 \pm 1.4 \text{ lb}\cdot\text{ft}$ )

### WIPER BRADE SET POSITION

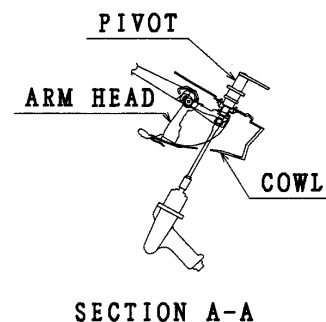
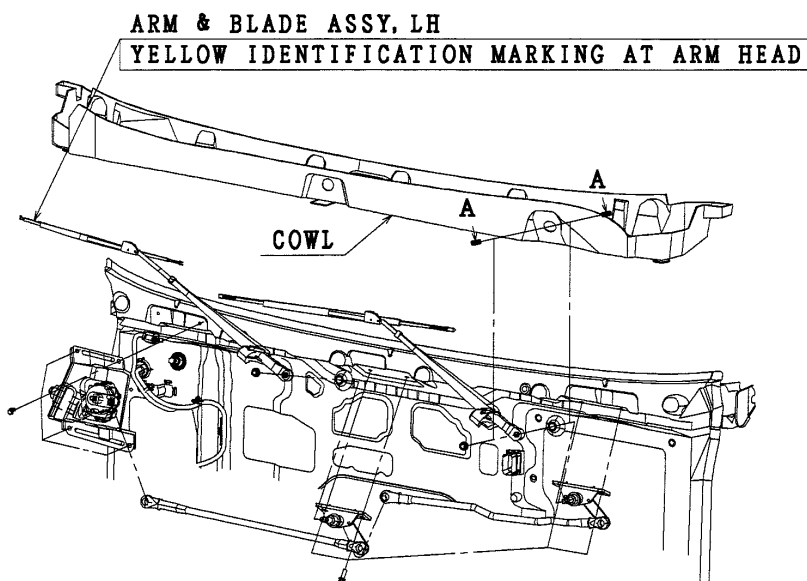
Unit: mm (in.)



### [NOTE]

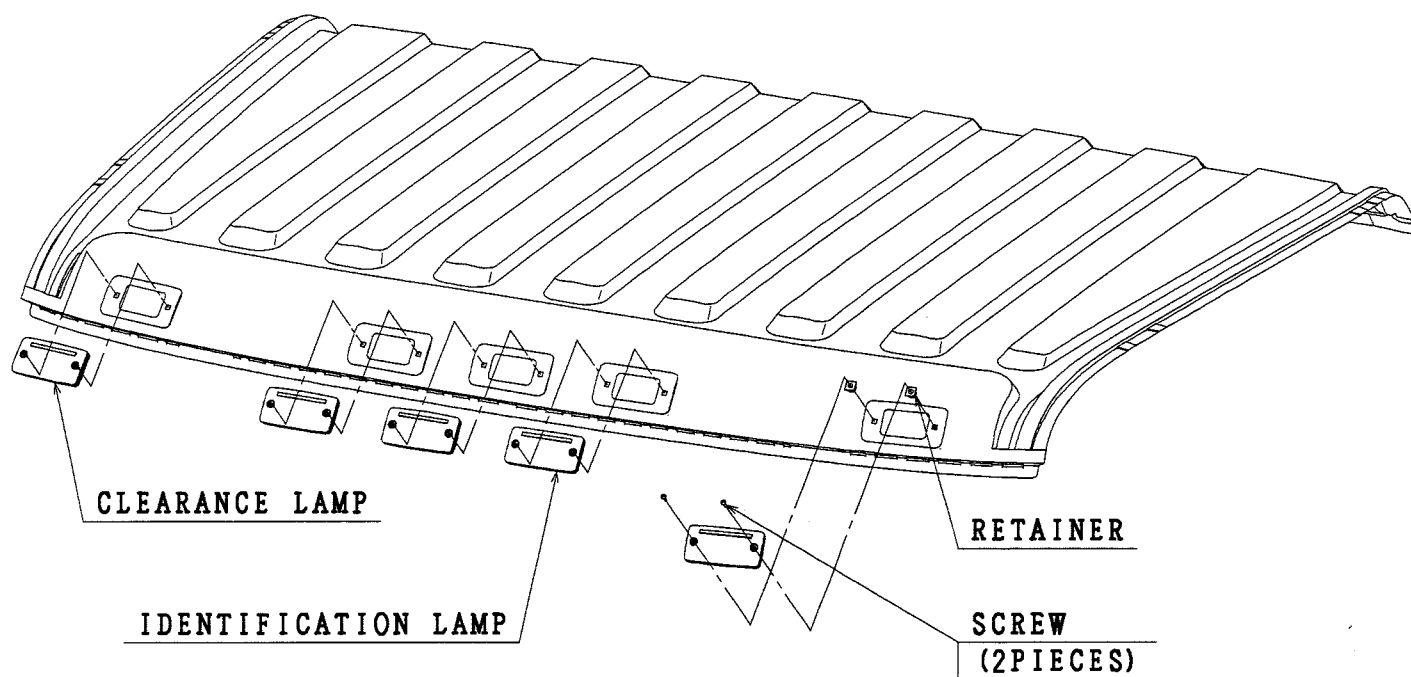
The set positions show the gaps at the top end of the blades.

### DETAIL OF WPER ARM INSTALLATION



### Front cab roof clearance & Identification lamps

- Tighten the bolts securely.
- Push in the retainers securely.

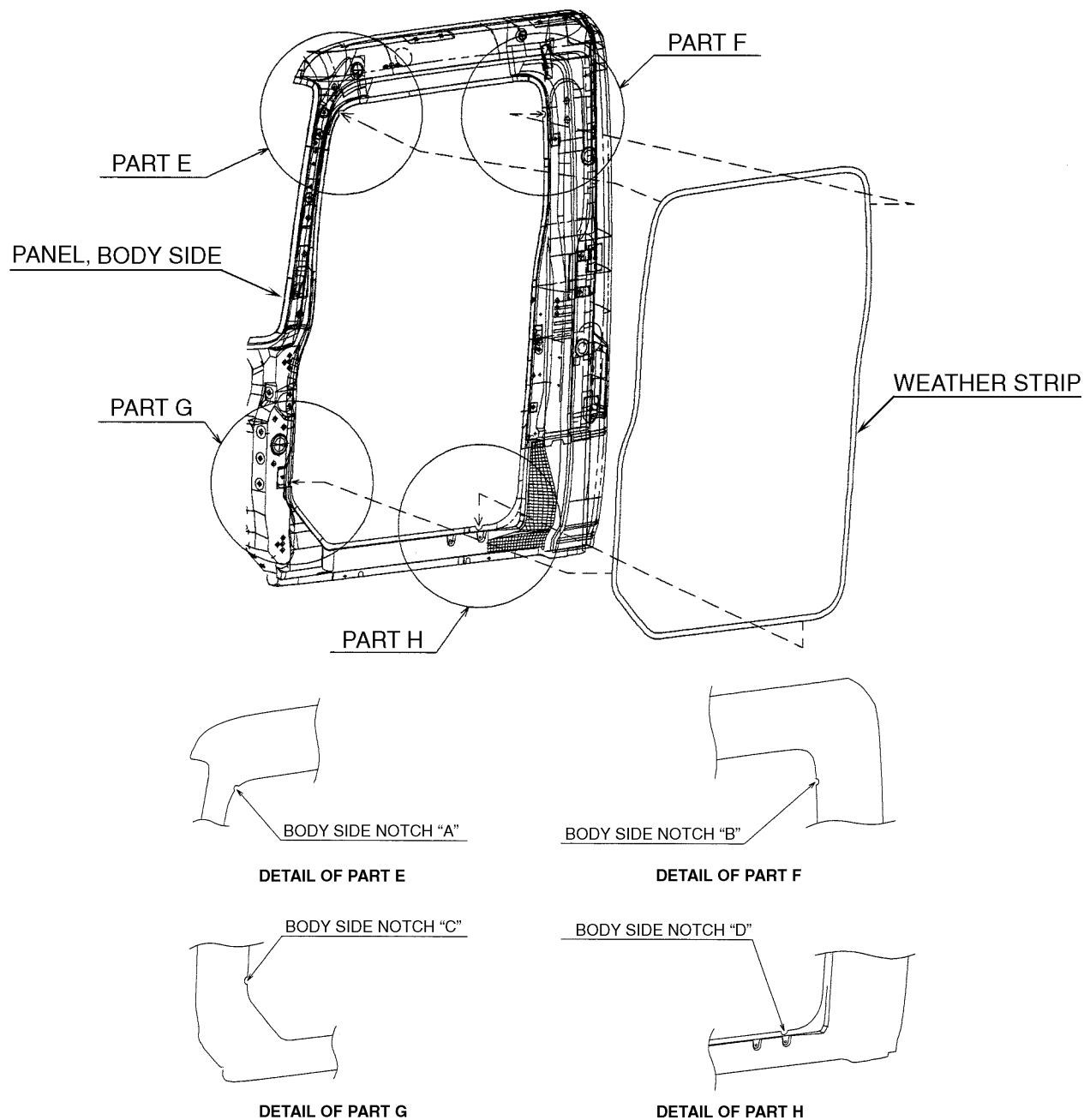


## 9. WEATHER STRIP INSTALLATION

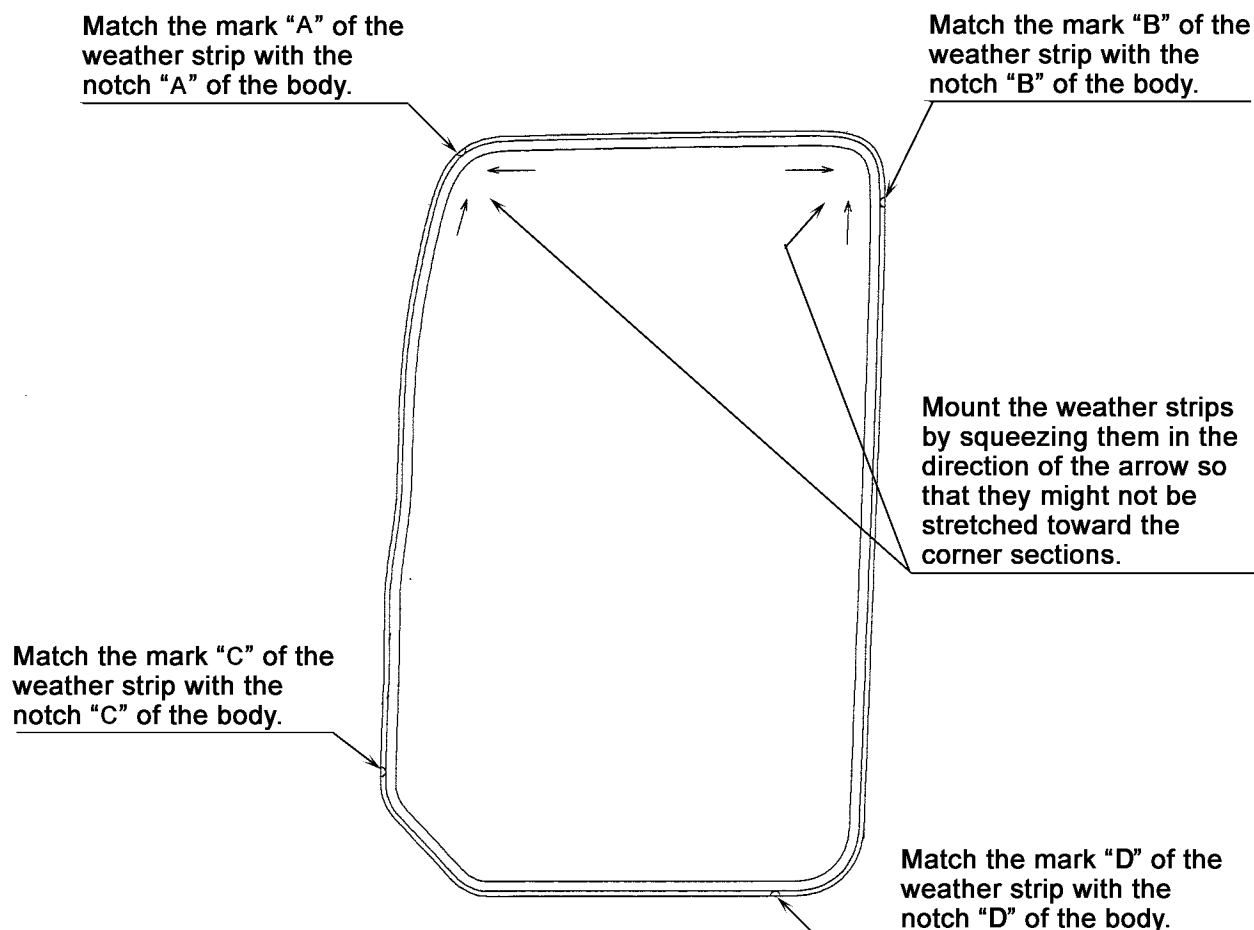
### Weather Strip Installation

- Match the marks A, B, C and D on body side and the marks on the weather strip and start mounting from this point.
- Mount the weather strips on general positions after having finished mounting of parts A, B, C and D and stick them in such a way that the slack of the weather strips concentrate on corners of the parts A, B, C and of the parts D. Execute this operation by squeezing them in the direction of the arrow in the illustration of the weather strip mark position.

#### ILLUSTRATION OF THE WEATHER STRIP MOUNTING POSITION



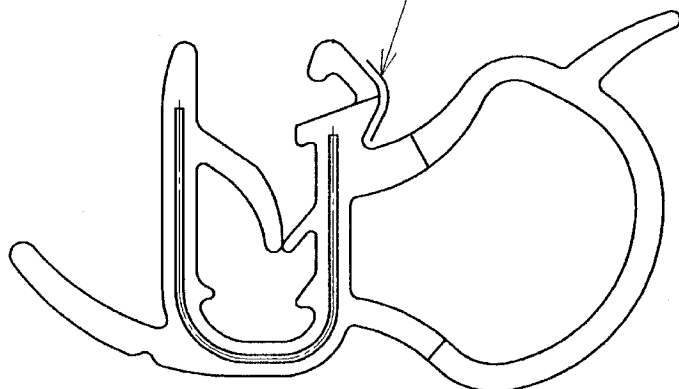
### ILLUSTRATION OF THE WEATHER STRIP MARK POSITION



### SECTIONAL VIEW OF THE WEATHER STRIP

Position to apply paint for marking.

POSITION	MARKING COLOR	
A	LH : WHITE	RH : WHITE
B, C, D	LH : PINK	RH : LIGHT BLUE



## 10. HANDLING OF ELECTRONIC CONTROL UNIT (ECU)

When drying paint by forced dry method, follow the instructions below to avoid damage to ECU.

	CONDITION OF FORCED DRYING PAINT	HANDLING OF COMPUTER
1	<ul style="list-style-type: none"> <li>• INSIDE TEMPERATURE OF THE FORCED DRYING BOOTH : 100°C (212°F)</li> <li>• INSIDE TEMPERATURE OF THE CAB : LESS THAN 80°C (176°F) (PLACE AT THE 50mm (2.0 in.) HEIGHT FROM UPPER SURFACE OF CAB FLOOR.)</li> </ul>	INSTALLED
2	WHEN UNKNOWN THE TEMPERATURE OF THE FORCED DRYING BOOTH OR USE INFRARED LAMP  INSIDE TEMPERATURE OF THE CAB : LESS THAN 80°C (176°F) (PLACE AT THE 50mm (2.0 in.) HEIGHT FROM UPPER SURFACE OF CAB FLOOR.)	
3	WHEN EXPECT MORE HIGH TEMPERATURE THAN ABOVE MENTIONED CASES.	REMOVE COMPUTER

[NOTE]

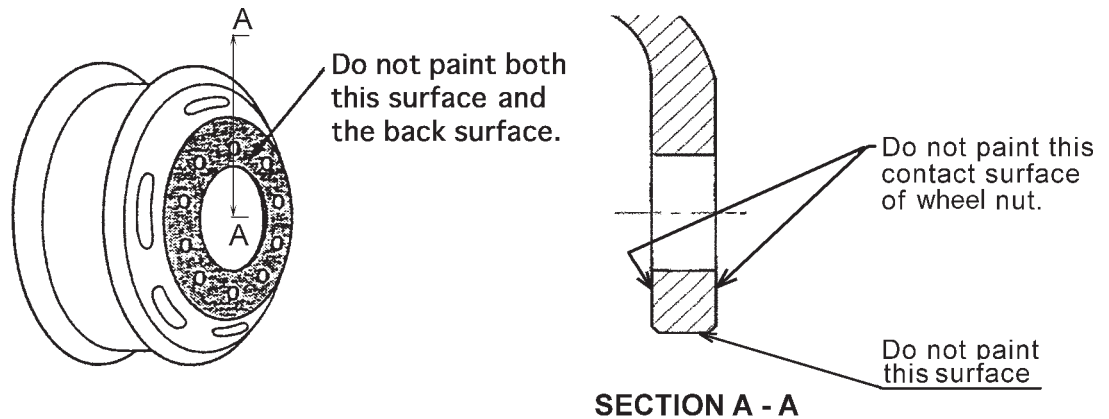
In case of allowable heat limit of the auto transmission control computer for transmission model Allison 2200, 2500, 3000 and 3500 series, refer to the table OTHERS of "PARTS AND ALLOWABLE HEAT LIMIT".



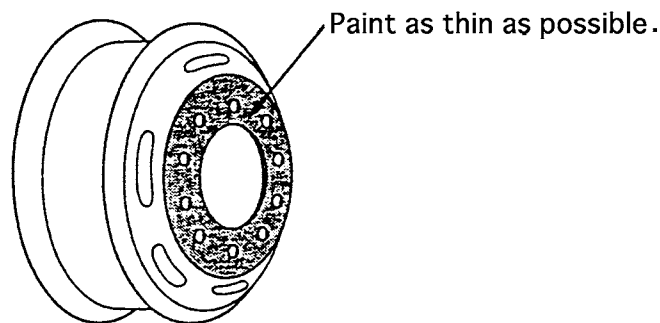
## 11. WHEEL PAINTING GUIDELINES

Before painting the wheel, mask surfaces that will contact the wheel, hub brake drum, and wheel nuts.

Refer to the illustration below concerning the covering portions.



After installing the wheel onto the vehicle, paint the remained portions with same color.



Consideration should be taken when rotating the tires and wheels

Sometimes, the installing position of tire disc wheel may be changed and paint coated face may become contact face.

At this moment, if the thickness of the painted layer is excessively thick, this may lead to the loosening of the wheel nuts.

Therefore observe the following instructions when carrying out the tire rotation.

- Take off the paint on the contact face (including the contact surface of wheel nut) of the tire disc wheel and after having completely cleaned the face with a wire brush etc., apply thin layer of paint for rust preventive purpose.
- If you use the tire disc wheel without taking off the paint, even if the face is completely cleaned with wire brush, etc., the thick painted layer may lead to the loosening of wheel nuts.

## 12. PRECAUTION FOR INSTALLING WHEEL ONTO THE VEHICLE

Remove foreign material from the threads of the bolt.

Replace with new bolt when the thread of the bolt is damaged.

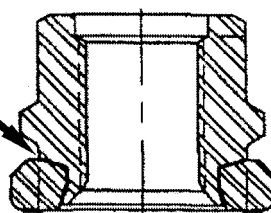
Lightly apply oil onto the thread of bolt.

Make sure that there is no foreign material on the contact surface of the hub, brake drum, and/or wheel.

Make sure that there is no foreign material on the contact surface of the wheel where the nut contacts the wheel.

Apply grease between seat metal and nut of the wheel nut when tightened by two piece nut.

APPLY GREASE



### • Tightening torque of wheel nut

MODEL		NE (LOW PROFILE)	NE, NJ, NF, NV & NH
NUMBER OF BOLT		8	10
TIGHTENING DIRECTION	RH	CLOCKWISE	CLOCKWISE
	LH	CLOCKWISE	CLOCKWISE
TIGHTENING TORQUE	kgf·cm	6,200 – 6,900	6,200 – 6,900
	lb·ft	450 – 500	450 – 500