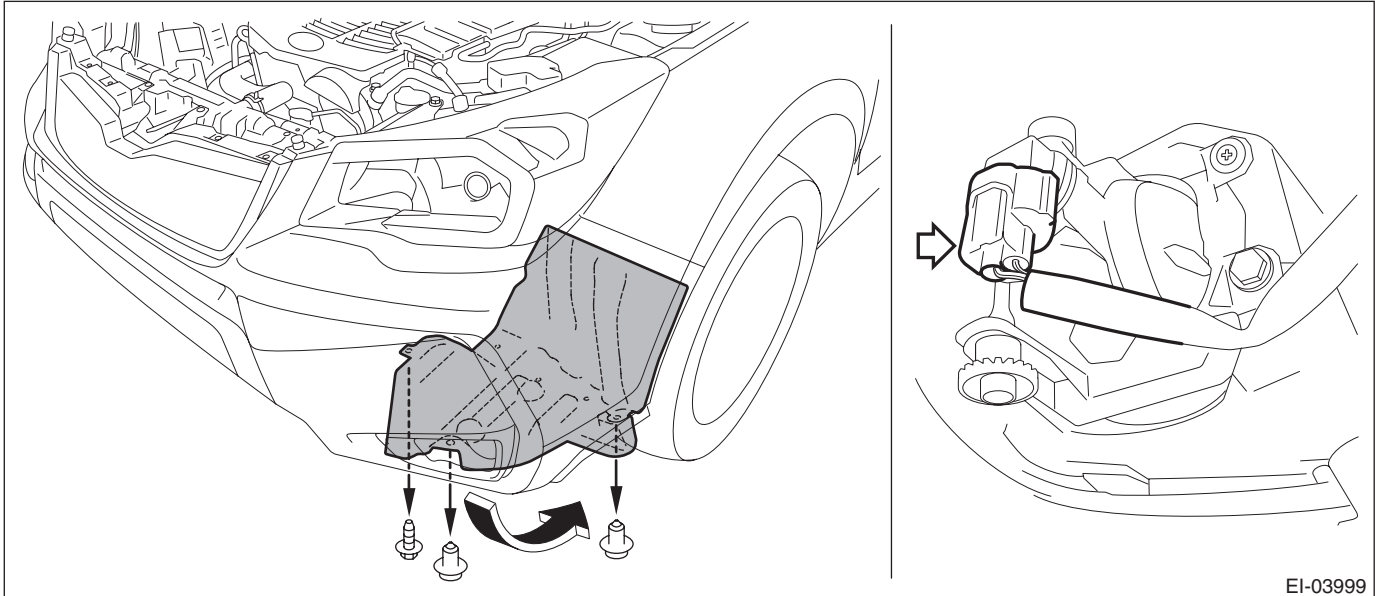


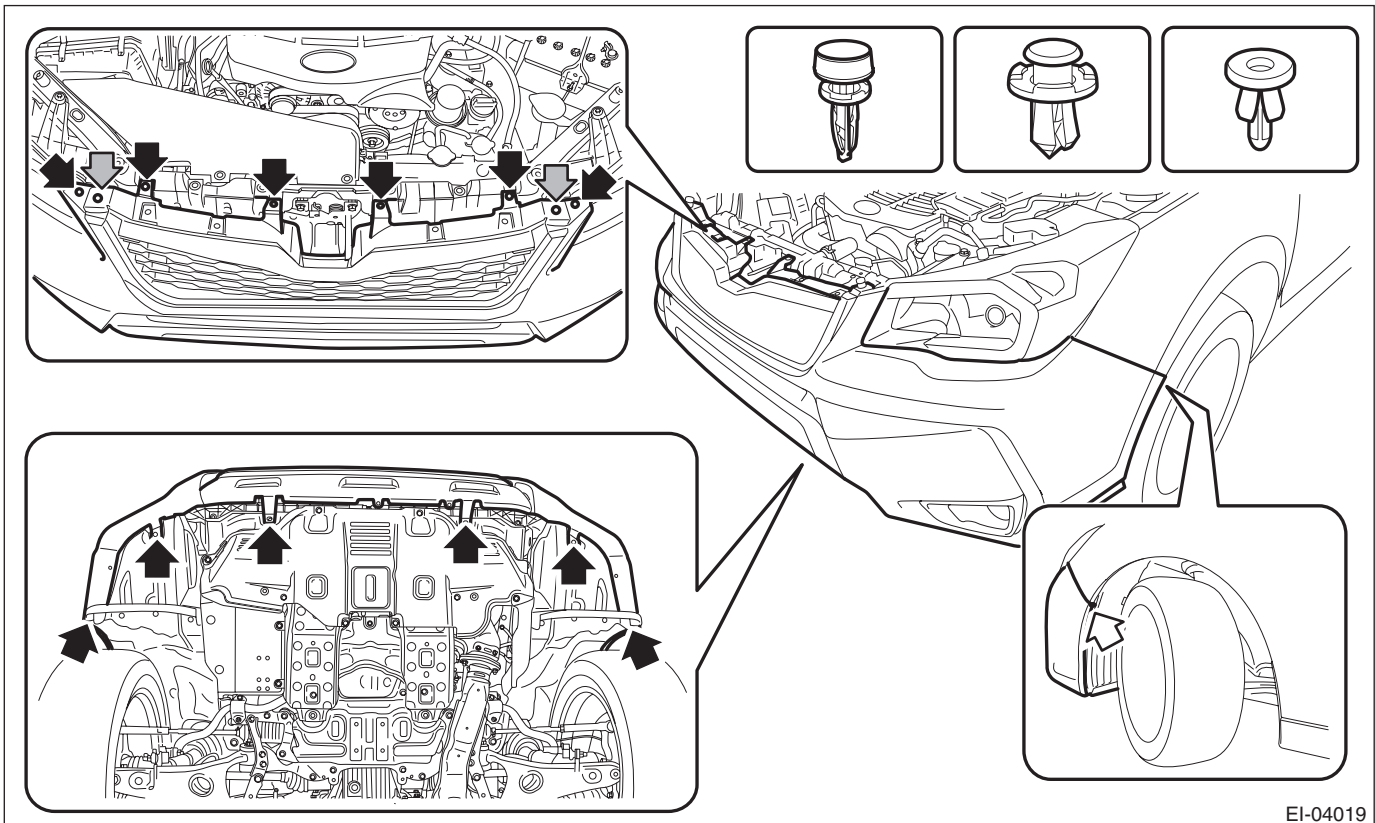
8. Front Bumper

A: REMOVAL

- 1) Disconnect the ground cable from battery.
- 2) Remove the bumper face - front.
 - (1) Remove the screw and clips, and turn over the mud guard - front.



- (2) Disconnect the connector of the left and right fog light assembly - front or the light assembly - daytime running. (If equipped)
- (3) Remove the clips at the upper side of the bumper face - front.
- (4) Remove the clips from the fender.
- (5) Remove the clips at the lower side of the bumper face - front.



Front Bumper

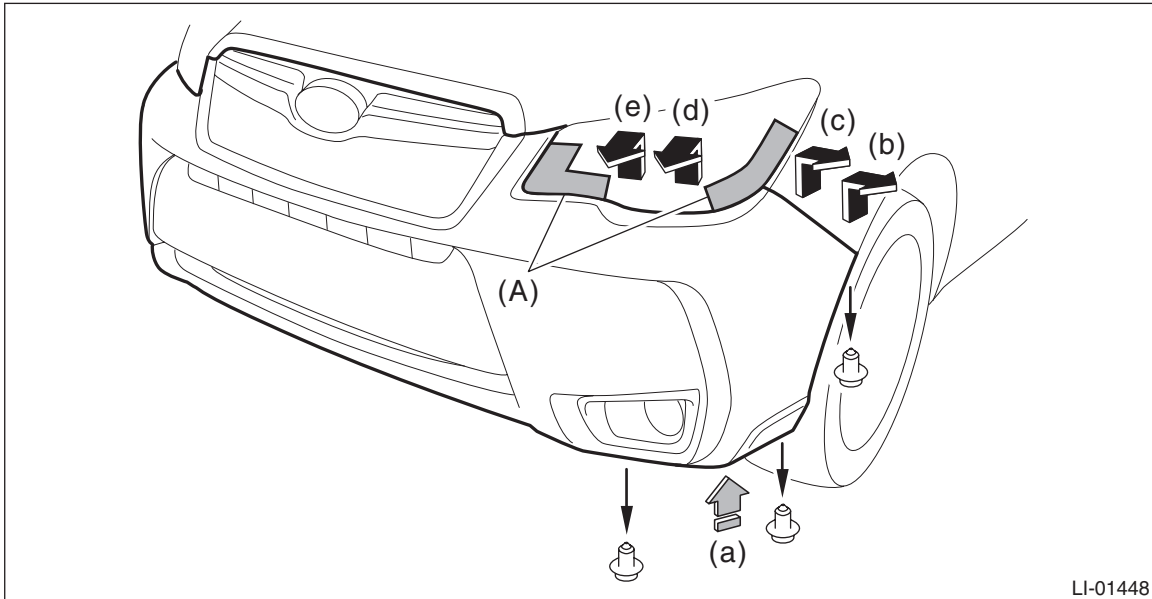
EXTERIOR/INTERIOR TRIM

(6) Apply protective tape (A) to the light assembly - head.

(7) Release the clips, and while pushing up the lower side (a) of the bumper face - front, remove in the order from (b) to (e).

CAUTION:

Do not pull forcibly. It may damage the flange sections of the bumper face - front.

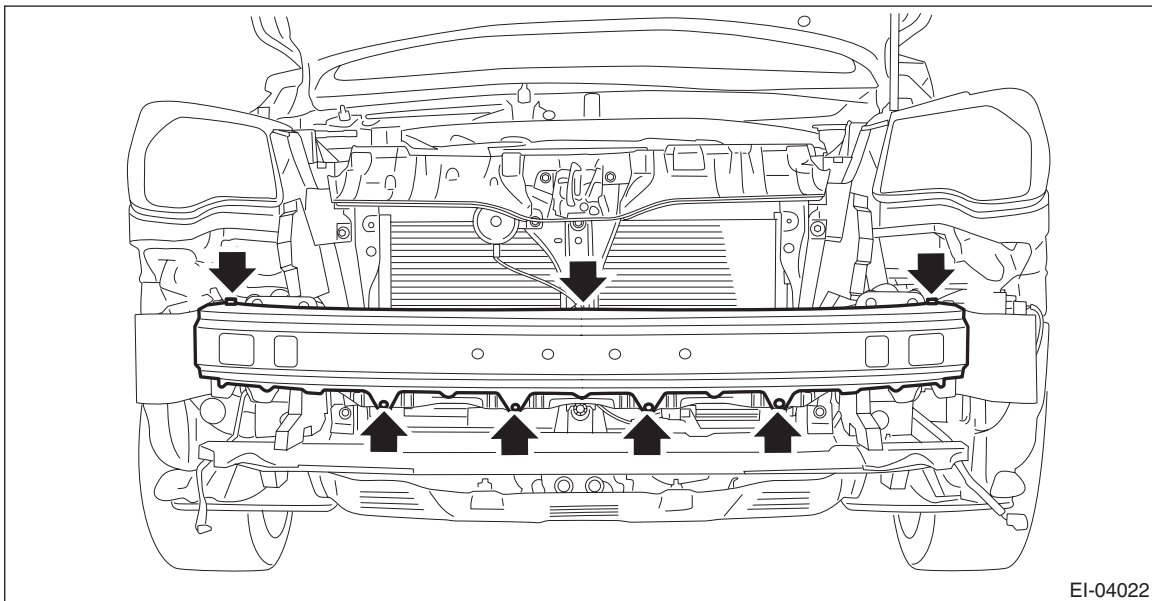


NOTE:

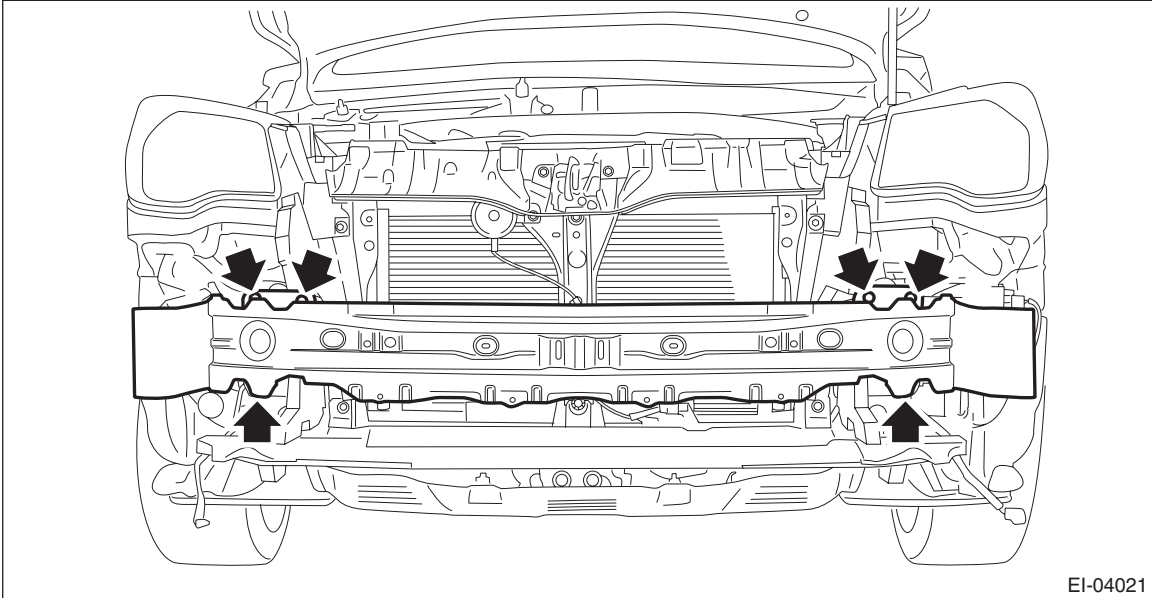
Detach the opposite side in the same manner.

3) Remove the bumper beam COMPL - front.

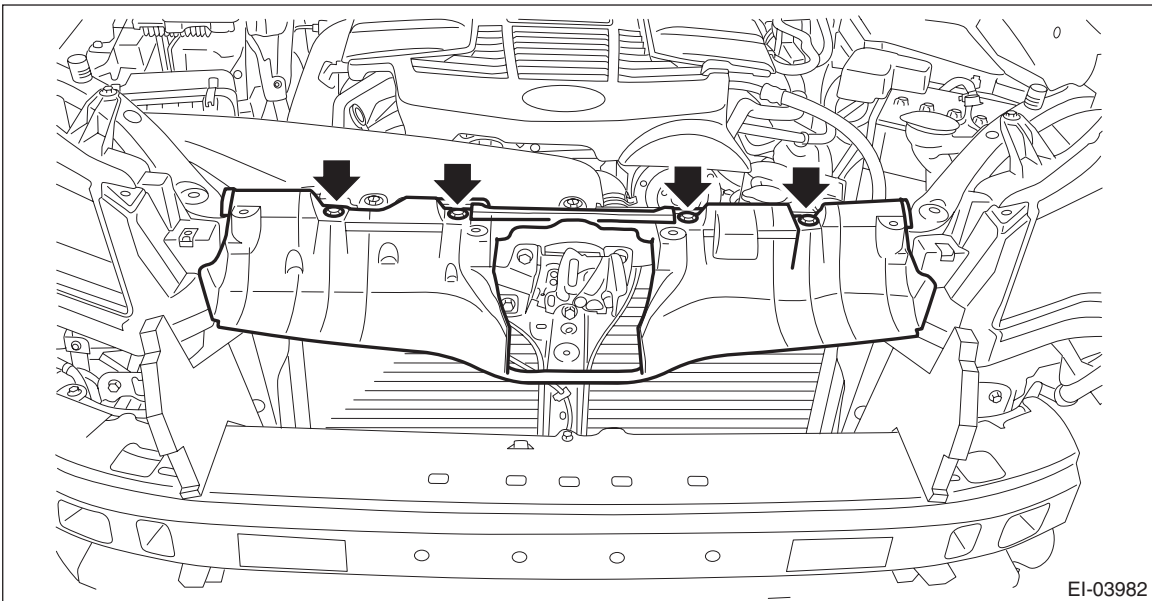
(1) Remove the energy absorber - front bumper.



- (2) Remove the bolts, and remove the bumper beam COMPL - front.



- 4) Remove the clip, and remove the bracket - grille.



NOTE:

The bracket - grille can be removed without removing the bumper face - front by referring to the removal procedure in "Condenser" of "HVAC SYSTEM". <Ref. to AC-55, REMOVAL, Condenser.>

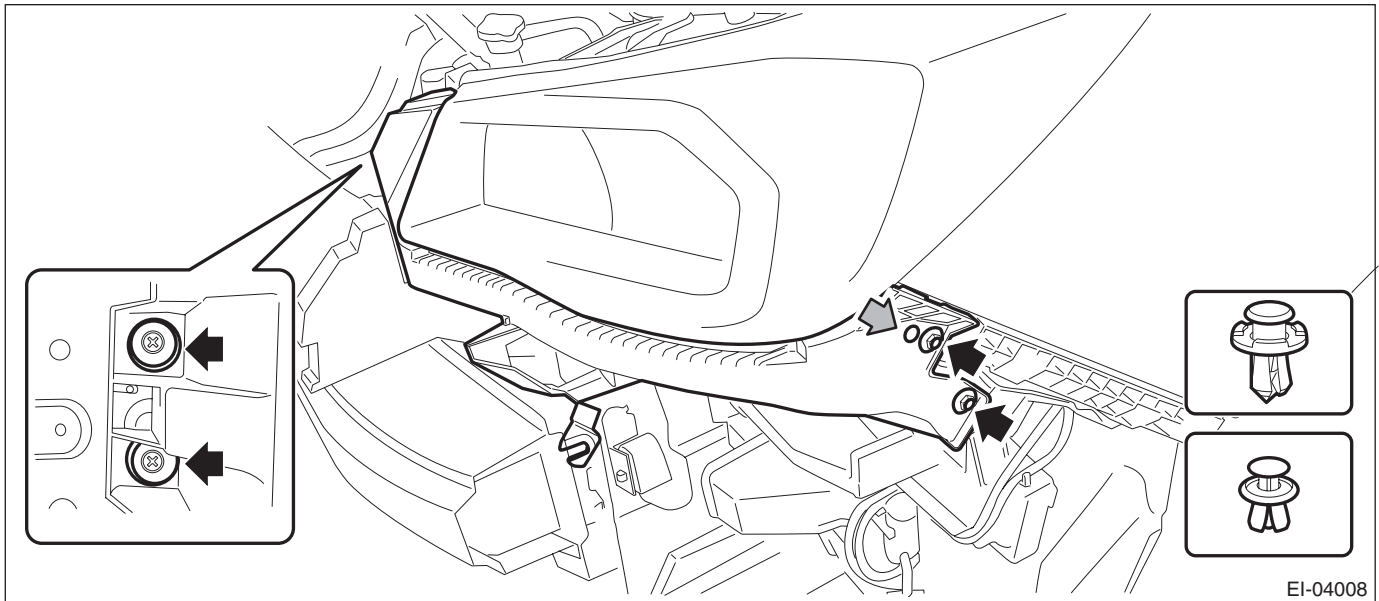
Front Bumper

EXTERIOR/INTERIOR TRIM

5) Remove the bracket - front bumper.

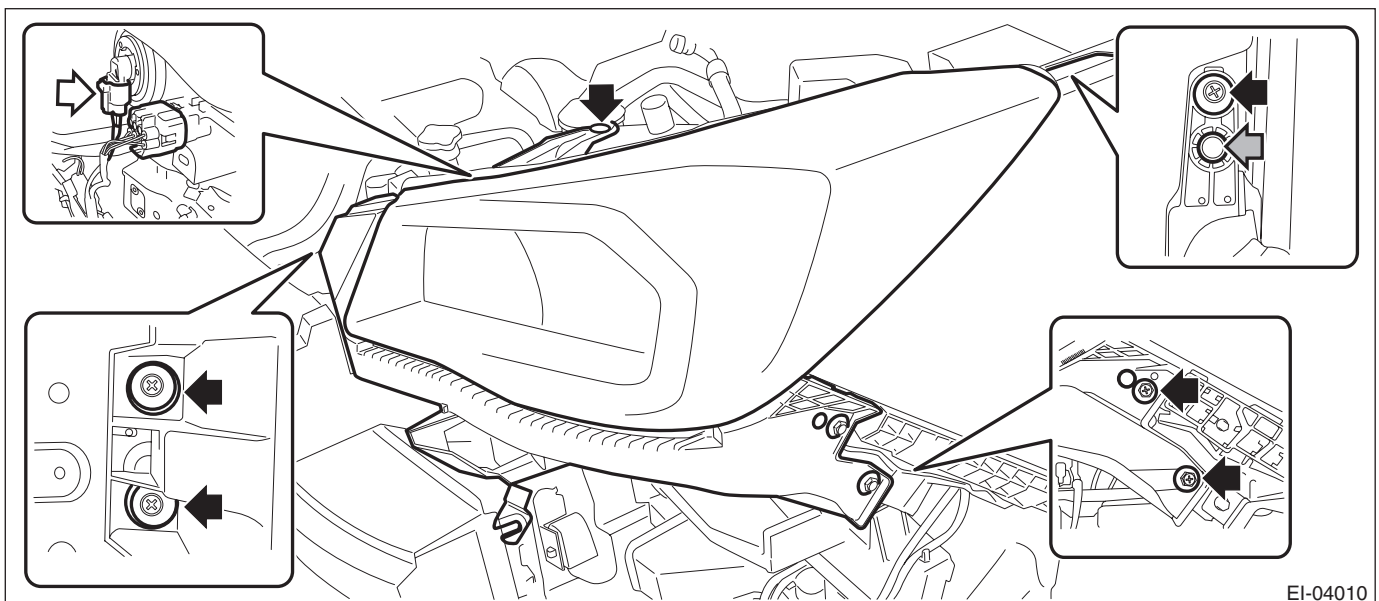
- Removal of the bracket - front bumper corner

1. Remove the bolts and clips, and remove the bracket - front bumper corner.



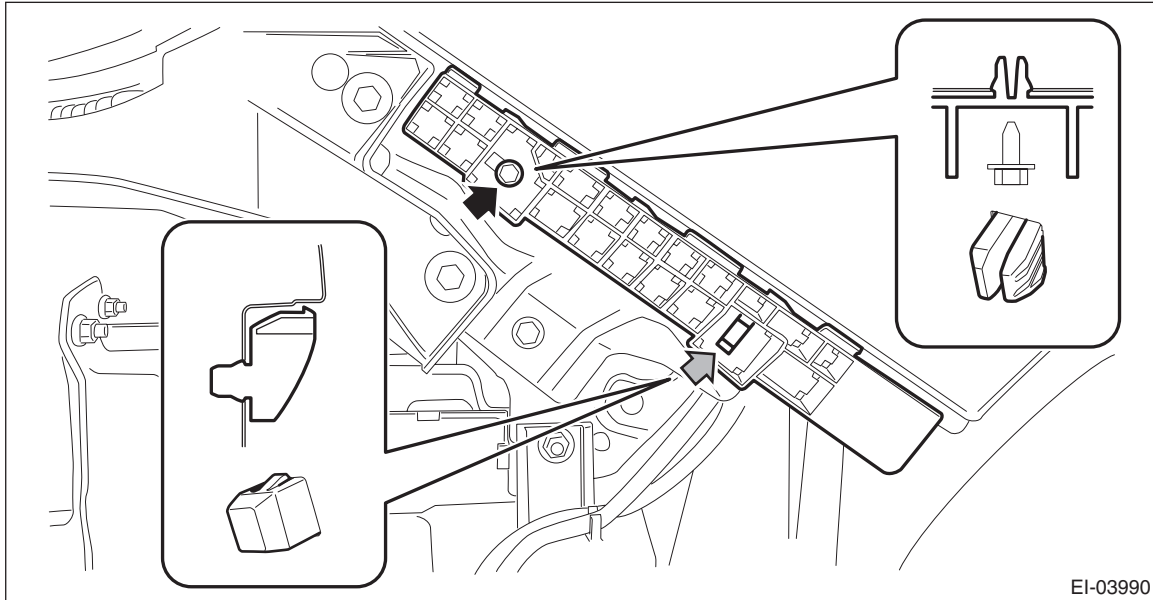
- Removal of the bracket - front bumper side

1. Remove the bolts and clips, and remove the headlight assembly and the bracket - front bumper corner.



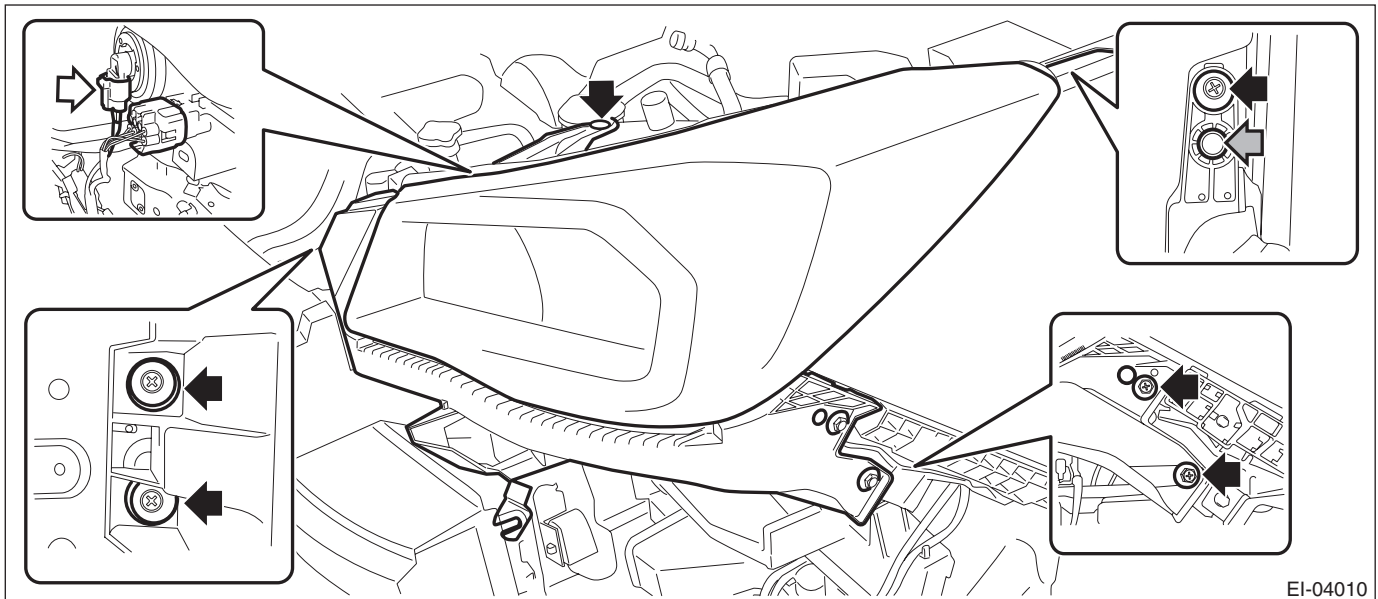
2. Remove the screws.

3. Remove the claws from behind the fender COMPL - front, and remove the bracket - front bumper side.



- 6) Remove the bracket - front bumper side.

- (1) Remove the bolts and clips, and remove the headlight assembly and the bracket - front bumper corner.

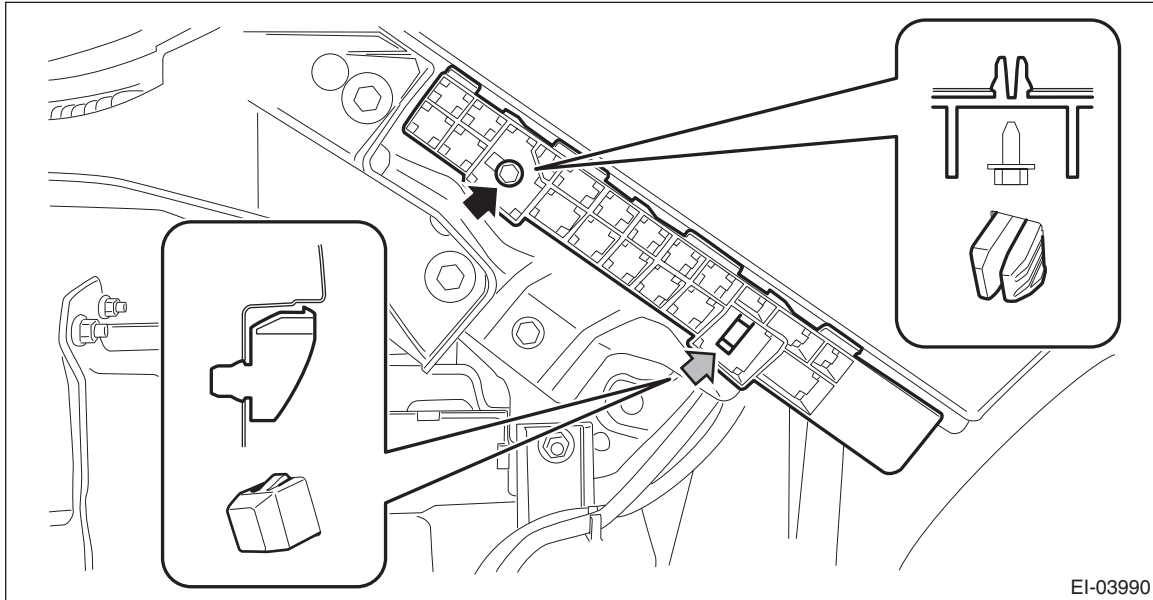


- (2) Remove the screws.

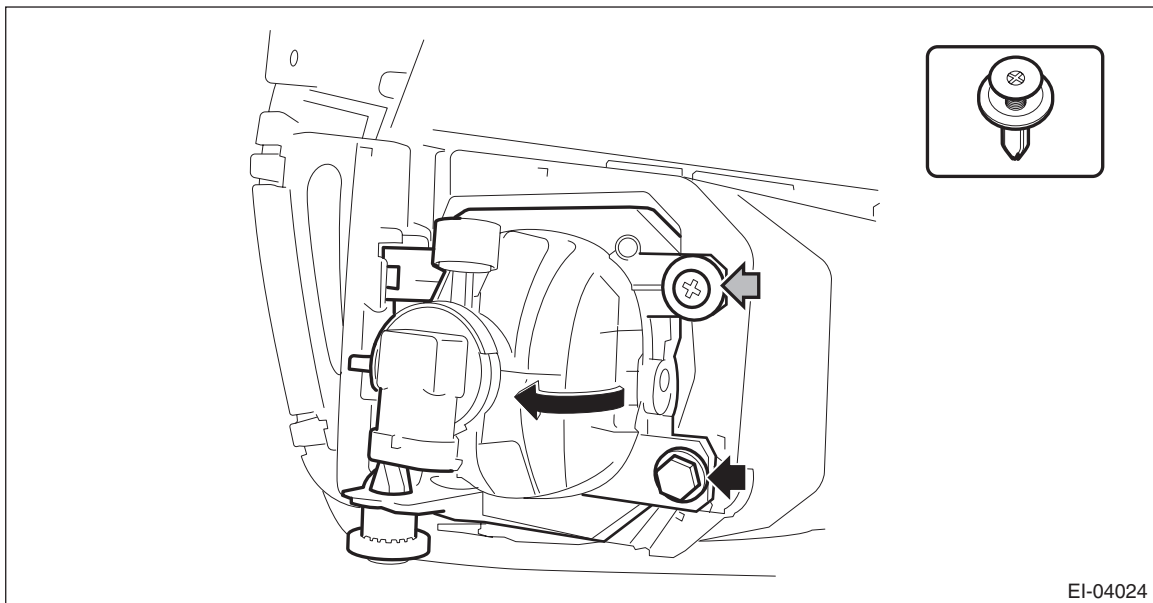
Front Bumper

EXTERIOR/INTERIOR TRIM

- (3) Remove the claws from behind the fender COMPL - front, and remove the bracket - front bumper side.



- 7) Remove the bolt and pin, and remove the fog light assembly - front.



B: INSTALLATION

- 1) Install each part in the reverse order of removal.
- 2) Secure the flange section of the bumper face - front to the bracket - front bumper side.

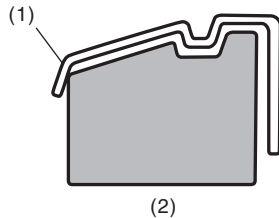
Tightening torque:

Refer to "COMPONENT" of "General Description". <Ref. to EI-4, FRONT BUMPER, COMPONENT, General Description.>

- 3) Install each part in the reverse order of removal.
- 4) Adjust the headlight beam and fog light beam.
 - Adjust the headlight beam. <Ref. to LI-31, HEADLIGHT BEAM ADJUSTMENT, ADJUSTMENT, Headlight Assembly.>
 - Adjust the fog light beam. (Model with fog light) <Ref. to LI-47, FOG LIGHT AIMING, ADJUSTMENT, Front Fog Light Assembly.>

C: REPAIR

1. COATING METHOD FOR PP BUMPER

Process No.	Process name	Job contents	
1	Bumper installation	Place the bumper on a paint worktable as required. Use the paint worktable conforming to inner shape of bumper if possible.	 (1) Bumper (2) Set bumper section EI-00234
2	Masking	Mask specified part (black base) with masking tape. Use masking tape for PP.	
3	Degreasing/cleaning	Clean all parts to be painted with appropriate cleaning solvent, normal alcohol, etc. to remove dirt, oil, grease, etc.	
4	Primer paint	Apply primer to all parts to be painted, using spray gun. Use primer (clear).	
5	Drying	Dry at normal temperature. [10 — 15 min. at 20°C (68°F)] In half-dried condition, PP primer paint is dissolved by solvent, e.g. thinner, etc. Therefore, if dust or dirt must be removed, use ordinary alcohol etc.	
6	Top coat paint (I)	Non-colored	Metallic paint
		Use section (block) paint for top coat. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 10 — 13 sec./20°C (68°F) • Film thickness: 35 — 45 μ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm ² , 36 — 50 psi)	Use section (block) paint for top coat. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 10 — 13 sec./20°C (68°F) • Film thickness: 15 — 20 μ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm ² , 36 — 50 psi)
7	Drying	Not required.	Dry at normal temperature [at least 10 min. at 20°C (68°F)]. In half-dried condition, avoid dust, dirt.
8	Top coat paint (II)	Not required.	Apply a clear coat to parts with top coat paint (I), three times at 5 — 7 minute intervals. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 14 — 16 sec./20°C (68°F) • Film thickness: 25 — 30 μ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm ² , 36 — 50 psi)
9	Drying	60°C (140°F), 60 min. or 80°C (176°F), 30 min. If the temperature is higher than 80°C (176°F), PP may be deformed. Keep maximum temperature at 80°C (176°F) or less.	
10	Inspection	Check paint.	
11	Removal of masking	Remove the masking tape applied in procedure 2.	

Front Bumper

EXTERIOR/INTERIOR TRIM

2. REPAIR INSTRUCTIONS FOR COLORED PP BUMPER

NOTE:

All PP bumpers are provided with a grained surface, and if the surface is damaged, it cannot normally be restored to its former condition. Damages limited to the shallow scratches that cause only a change in the luster of the base material or coating, can be almost fully restored. Before repairing a damaged area, explain this point to the customer and obtain an understanding about the matter.

Repair methods are outlined below, based on a classification of the extent of damage.

- 1) Minor damage causing only a change in the luster of the bumper due to a light touch
Almost restorable.

Process No.	Process name	Job contents	
1	Cleaning	Clean the area to be repaired using water.	
2	Sanding	Grind the repairing area with #500 sand paper in a "feathering" motion.	
3	Finish	Resin section	Coated section
		Repeatedly apply wax to the affected area using soft cloth (such as flannel). Recommended wax: Tire wax or equivalent	Perform either the same procedures as for the resin section or process No. 18 and subsequent in section 3), depending on the degree and nature of damage.
		Polish the waxed area with clean cloth after 5 — 10 minutes.	

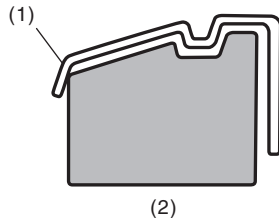
- 2) Deep damage caused by scratching with fences etc.

A dent cannot be repaired but a whitened or swelled part can be removed.

Process No.	Process name	Job contents	
1	Cleaning	Clean the damaged area with water.	
2	Removal of damaged area	Cut off protruding area, if any, due to collision, using a putty knife.	
3	Sanding	Grind the affected area with #100 — #500 sand paper.	
4	Finish	Resin section	Coated section
		Same as process No. 3 in section "1)".	Perform process No. 12 and subsequent operations in section "3)".

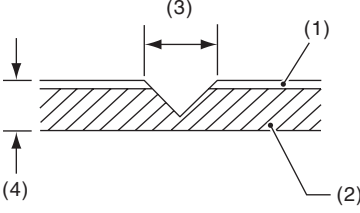
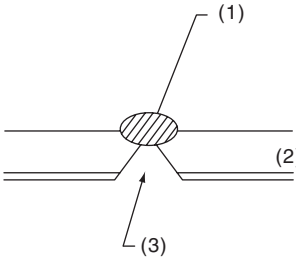
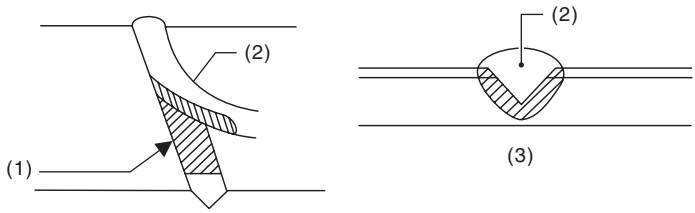
- 3) Deep damage such as a break or hole that requires filling

Much of the peripheral grained surface must be sacrificed for repair. The degree of restoration is not really worth the expense. (The surface, however, will become almost flush with adjacent areas.)

Process No.	Process name	Job contents	
1	Bumper removal	Remove the bumper as required.	
2	Removal of parts	Remove the parts built into bumper as required.	
3	Bumper placement	Place the bumper on a paint worktable as required. It is recommended to use the paint worktable conforming to internal shape of bumper.	 (1) Bumper (2) Set bumper section EI-00234
4	Surface preparation	Remove dust, oil, etc. from areas to be repaired and surrounding areas, using an appropriate solvent (appropriate cleaning solvent or alcohol, etc.).	

Front Bumper

EXTERIOR/INTERIOR TRIM

Process No.	Process name	Job contents	
5	Cutting	If the damage is a crack or a hole, cut a guide slit of 20 to 30 mm (0.79 to 1.18 in) in length along the crack or hole up to the bumper base surface. Next, use a knife or grinder to carve a V-shaped groove in the area for repair.	 (1) Paint surface (2) PP base surface (3) 20 — 30 mm (0.79 — 1.18 in) (4) 3 mm (0.12 in) EI-00235
6	Sanding (I)	Grind beveled surface with sand paper (#40 — #60) to smooth finish.	
7	Cleaning	Clean the sanded surface with the same solvent as used in process No. 4.	
8	Temporary welding	Grind the side just opposite the beveled area with sand paper (#40 — #60) and clean using a solvent. Temporarily spot-weld the side, using PP welding rod and heater gun.	 (1) Welded point (Use heater gun and PP welding rod) (2) PP base surface (3) Beveled section NOTE: - Do not melt welding rod until it flows out. This results in reduced strength. - Leave the welded spot unattended until it cools completely. EI-00236
9	Welding	Using a heater gun and PP welding rod, weld the beveled spot while melting both the rod and damaged area.	 (1) Welding rod (2) Melt hatched area (3) Section NOTE: - Melt the sections indicated by hatched area. - Do not melt the welding rod until it flows out, in order to provide strength. - Always keep the heater gun 1 to 2 cm (0.4 to 0.8 in) away from the welding spot. - Leave the welded spot unattended until it cools completely. EI-00237

Front Bumper

EXTERIOR/INTERIOR TRIM

Process No.	Process name	Job contents	
10	Sanding (II)	Remove excess part of weld with a putty knife. If a drill or disc wheel is used instead of the knife, operate it at a rate less than 1,500 rpm and grind the excess part little by little. A higher rpm will cause the PP substrate to melt from the heat.	
			
		Sand the welded spot smooth with #240 sand paper.	
11	Masking	Mask the black substrate section using masking tape.	
12	Cleaning/degreasing	Completely clean the entire coated area, using solvent similar to that used in process No. 4.	
13	Primer coating	Apply a coat of primer for bumpers to the repaired surface and its surrounding areas. Mask these areas, if necessary. NOTE: Be sure to apply a coat of primer using a spray gun at a pressure of 245 — 343 kPa (2.5 — 3.5 kgf/cm ² , 36 — 50 psi).	
14	Leave unattended	Leave the repaired area unattended at 20°C (68°F) for 10 to 15 minutes until primer is half-dry. NOTE: If dirt or dust comes in contact with the coated area, wipe it off with a cloth dampened with alcohol. (Do not use thinner since the coated area tends to melt.)	
15	Surfacer coating	Apply a coat of surfacer for PP bumpers to the repaired area two or three times at an interval of 3 — 5 minutes. For surfacer/hardener mixture, viscosity and paint thickness, observe the specifications of the surfacers to be used.	
16	Drying	Allow the coated surface to dry for 20 minutes at 20°C (68°F) [or 30 minutes at 60°C (140°F)].	
17	Sanding (III)	Sand the coated surface and its surrounding areas using #400 sand paper and water.	
18	Cleaning/degreasing	Same as process No. 12.	
19	Top coat (I)	Non-colored	Metallic paint
		Use a “block” coating method. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 11 — 13 sec./20°C (68°F) • Coating film thickness: 40 — 50 μ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm², 36 — 50 psi)	Use a “block” coating method. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 11 — 13 sec./20°C (68°F) • Coating film thickness: 20 — 30 μ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm², 36 — 50 psi)
20	Leave unattended	Not required.	Leave unattended at 20°C (68°F) for at least 10 minutes until the topcoated area is half-dry. NOTE: Be careful to keep dust or dirt from coming in contact with the affected area.
21	Top coat (II)	Not required.	Apply a clear coat three times at an interval of 3 to 5 minutes. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 10 — 13 sec./20°C (68°F) • Coating film thickness: 20 — 30 μ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm², 36 — 50 psi)

Front Bumper

EXTERIOR/INTERIOR TRIM

Process No.	Process name	Job contents
22	Drying	Allow the coated surface to dry for two hours at 20°C (68°F) or 30 minutes at 60°C (140°F). NOTE: Do not allow the temperature to exceed 80°C (176°F) since this will deform the PP substrate.
23	Inspection	Carefully check the condition of the repaired area.
24	Removal of masking	Remove the masking tape applied in process No. 11 and 13.
25	Parts installation	Install parts on the bumper in reverse order of removal.
26	Bumper installation	Install the bumper.