

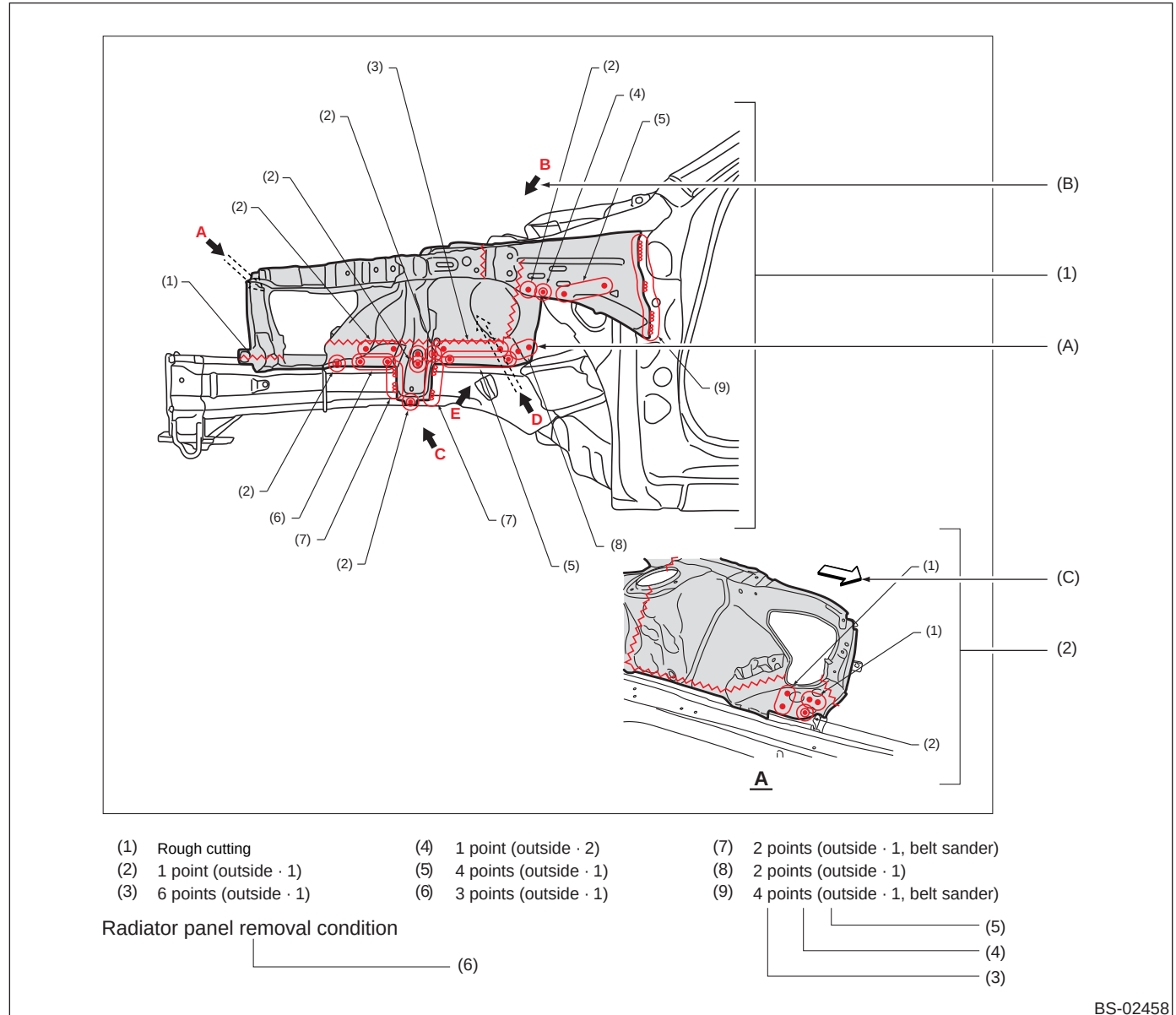
1. Foreword

A: USE OF THIS MANUAL

This manual explains the points to be observed during removal and installation of parts separately by location.

1. ILLUSTRATION EXAMPLE

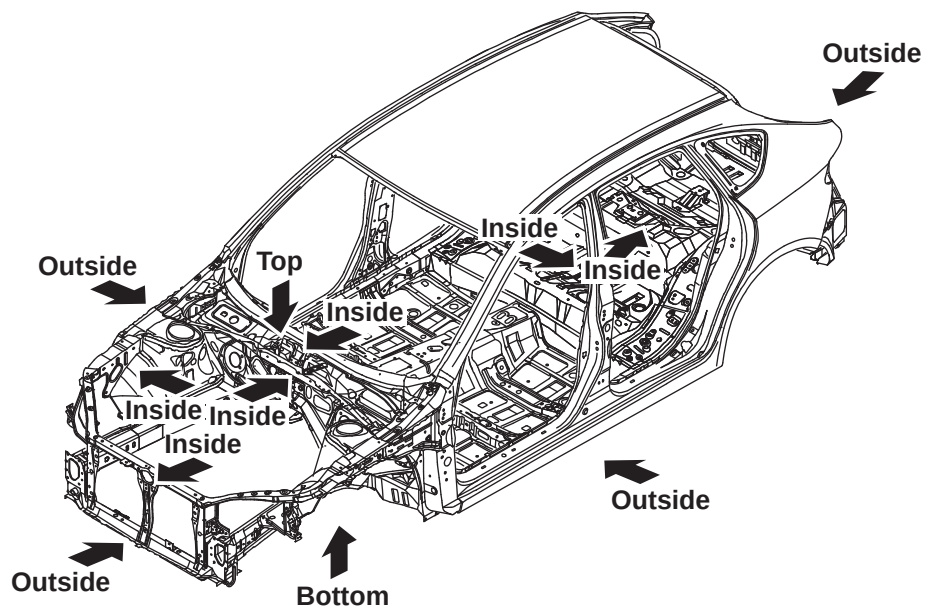
- Symbols and number of points indicate the welding method and the number of welding points. Text in brackets indicates the direction for removal of welded parts, and numbers indicate the number of plates to be drilled in panels of welded parts to be removed.
- An enclosure by a broken line indicates work from the opposite side (rear side).



- | | |
|------------------------------------|--|
| (1) Overall view | (A) Welding method |
| (2) View | (B) View direction |
| (3) Number of welding points etc. | (C) Direction towards the front of the vehicle |
| (4) Removal direction | |
| (5) Number of plates to be drilled | |
| (6) Cautions for the work etc. | |

2. REMOVAL DIRECTION

Division is made into the four groups of inside, outside, top, and bottom, and these directions are defined as shown in the following figure.

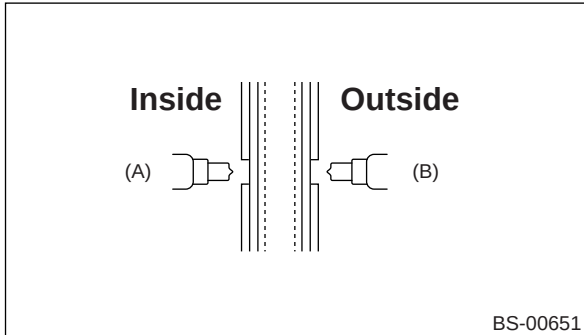


BS-02459

3. NUMBER OF PANELS TO BE DRILLED

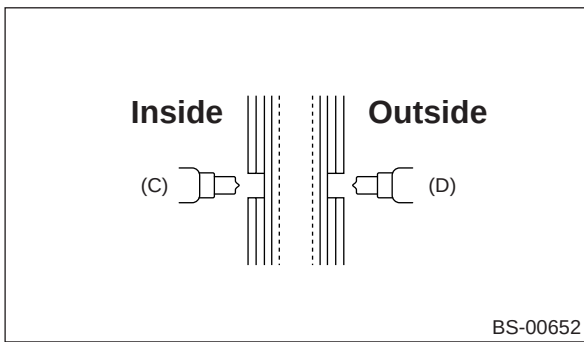
Depending on the number of panels, drilling is done through one panel or two panels, and this number is listed together with the removal direction.

(1) Drilling through one plate



- (A) (Inside · 1)
- (B) (Outside · 1)

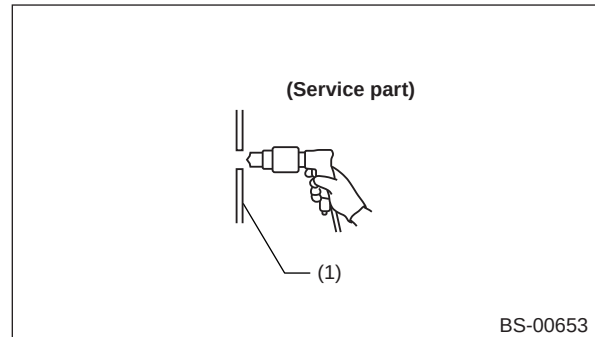
(2) Drilling through two plates



- (C) (Inside · 2)
- (D) (Outside · 2)

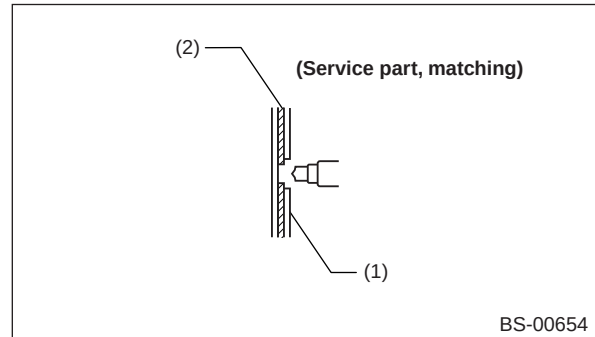
4. HOLE DRILLING FOR PLUG WELDING

(1) Drilling of holes for plug welding in service parts



- (1) Service part

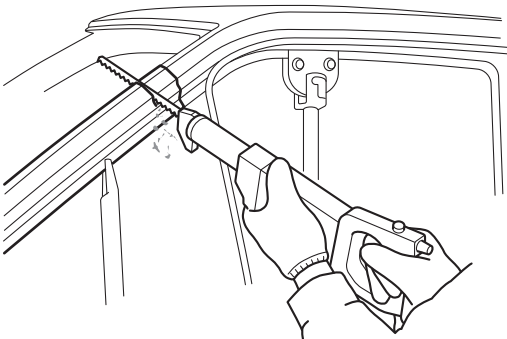
(2) Drilling of holes for plug welding in service parts, matching the holes on the vehicle side



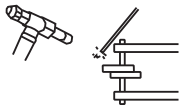
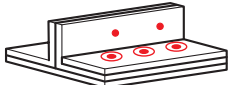
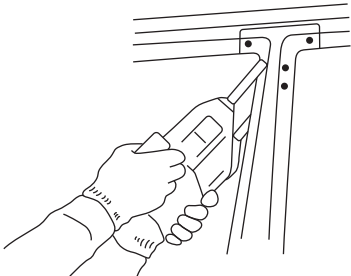
- (1) Vehicle side
- (2) Service part

5. MEANING OF SYMBOLS

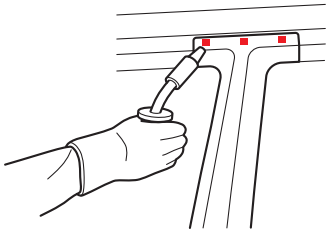
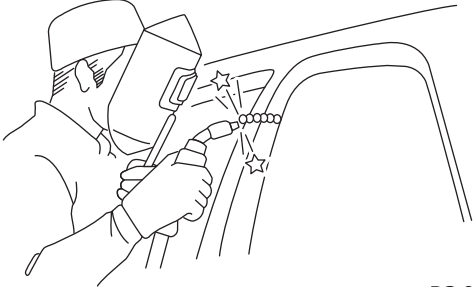
• Cutting

 BS-00352	 BS-00267
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• Spot welding

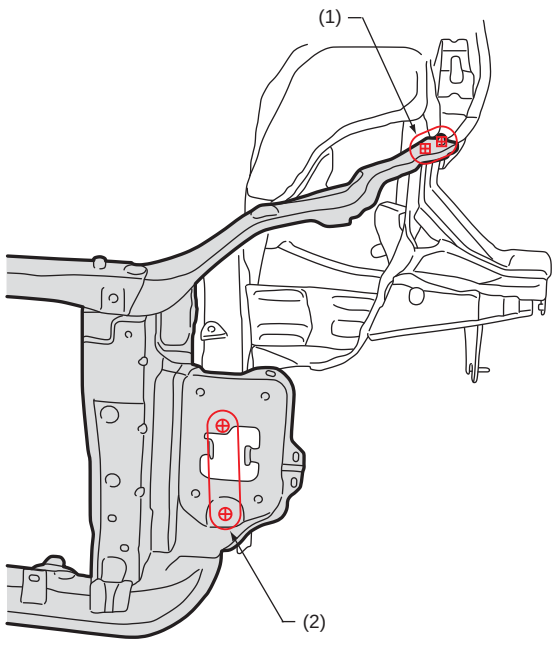
Two over-lapping parts	 BS-00655	 BS-00656	 BS-00657	 BS-00658
Three or more over-lapping parts	 BS-00659	 BS-00660		

• Carbon dioxide gas arc welding (MIG welding)

Plug welding	 BS-00661	 BS-00662	 BS-00663
Continuous welding	 BS-00664	 BS-00665	 BS-00666

Foreword

• Bolt, nut tightening portion

Bolt		
Nut		

BS-04481

BS-04482

BS-04483

(1) Bolt
(2) Nut

B: CAUTION

Since there is a possibility that the required strength will not be obtained, an inverter welder must be used for spot-welding at locations where high-strength steel is used.

C: NOTE

1. About high-tensile steel sheets of 980 MPa class or more

To drill high-strength steel sheets of 980 MPa class and 1,500 MPa class, use a tool that can machine objects of 500 Hv or more hardness (e.g., C-20VR made by Cyutokenzai).

It is recommended to perform the weldings using 980 MPa class and 1,500 MPa class high-strength steel under the following conditions.

- It is recommended to perform spot welding according to board thickness and number of overlapping sheets under the following conditions ([a] — [h]).
- When conditions can't be met, it is recommended to use the plug welding method [y] — A or [y] — B as described below.

Spot welding	[a]	Compression	5.0 kN	Total number of 2 overlapping sheets
		Current	7.5 kA	
		Welding time	18 cyc	
	[b]	Compression	2.6 kN	
		Current	6.0 kA	
		Welding time	17 cyc	
	[c]	Compression	4.4 kN	
		Current	7.5 kA	
		Welding time	16 cyc	
	[d]	Compression	4.0 kN	Total number of 3 overlapping sheets
		Current	8.0 kA	
		Welding time	14 cyc	
	[m]	Compression	3.5 kN	
		Current	7.5 kA	
		Welding time	25 cyc	
	[f]	Compression	3.5 kN	Total number of 3 overlapping sheets
		Current	8.0 kA	
		Welding time	25 cyc	
	[g]	Compression	4.0 kN	
		Current	6.5 kA	
		Welding time	25 cyc	
	[h]	Compression	4.0 kN	
		Current	8.5 kA	
		Welding time	20 cyc	
Plug welding	[y]	A	Plug diameter	Total number of 2 or 3 overlapping sheets
			Wire	
			Gas	
		B	Plug diameter	
			Wire	
			Gas	

CAUTION:

- For new spot welding, avoid previously welded locations.
- After spot welding, inspect the welding locations, and if the weld appears to be insufficient, perform plug welding.
- Shape correction by heating and splice welding shall not be performed for components using 980 MPa class or more higher-tensile steel; otherwise this may decrease the strength of the material.

Foreword

2. Drill holes for plug welding of steel sheet

At locations where spot welding is not possible, use a punch or a drill to open holes for plug welding according to the following table.

Plate thickness of the welding material	Plug welding hole diameter
Less than 1.0 mm (0.04 in)	φ5.0 mm (0.20 in) or more
1.0 — 1.6 mm (0.04 — 0.06 in)	φ6.5 mm (0.26 in) or more
1.7 — 2.3 mm (0.07 — 0.09 in)	φ8.0 mm (0.31 in) or more
2.4 mm (0.09 in) or more	φ10.0 mm (0.39 in) or more

3. Repair work using foam

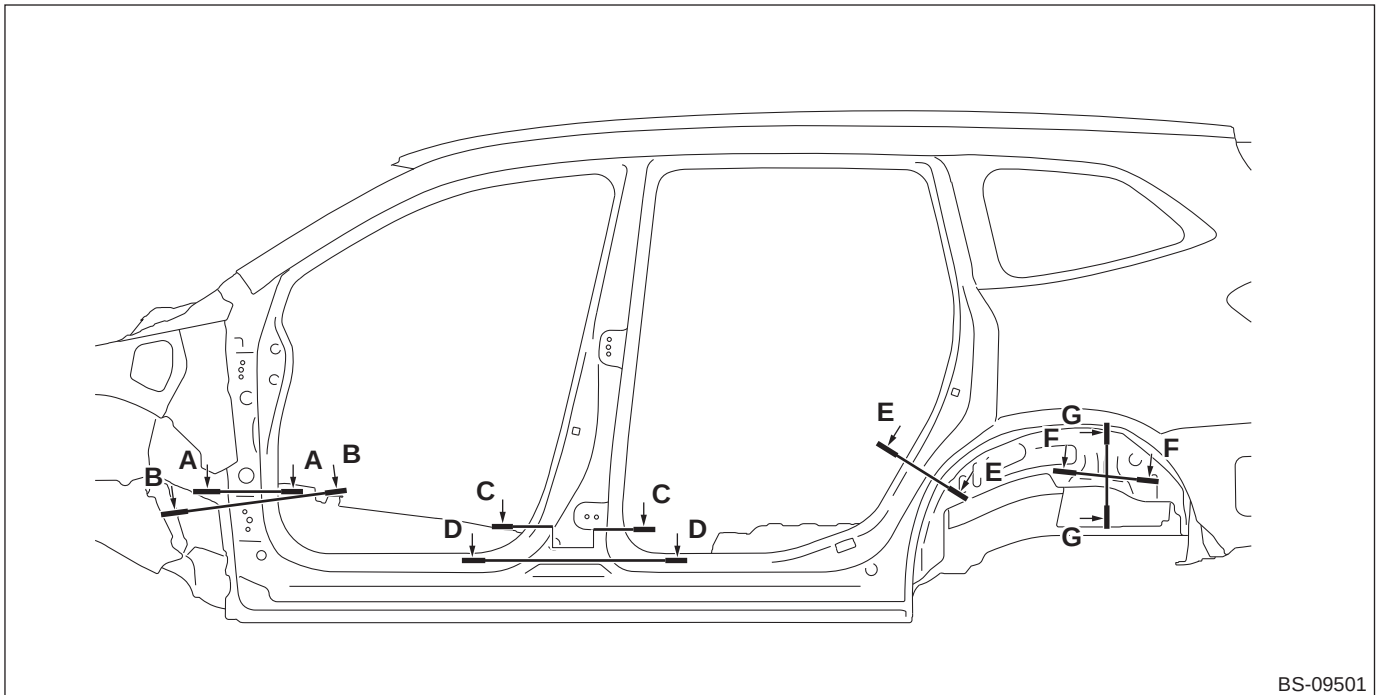
CAUTION:

- Do not perform welding or other work involving high temperatures.
- Do not use an open flame at the time of disassembly.
- Remove residual foam before injecting the new material.
- After completion of work, confirm that there is no danger of igniting the material.
- Spray cans that have been used once cannot be used again.
- Use a narrow nozzle.

Recommended materials: Equivalent to High Span Foam made by Cemedine

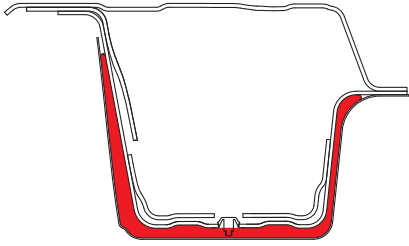
For a clip plate, reuse the plate and inject cold-setting foam.

- **Foam injection locations**



Cross section A — A

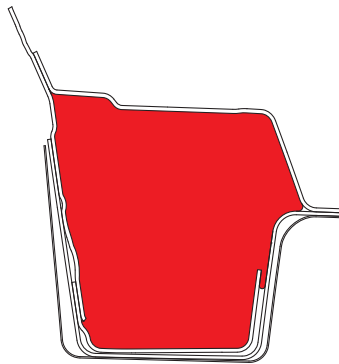
■ : (a)



(a) Urethane foam injection locations

Cross section B — B

■ : (a)

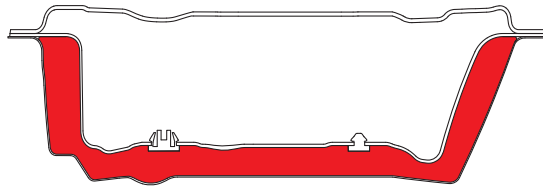


BS-09503

(a) Urethane foam injection locations

Cross section C — C

■ : (a)

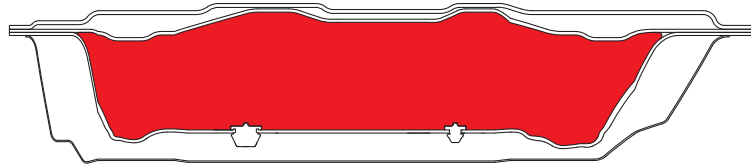


BS-09504

(a) Urethane foam injection locations

Cross section D — D

■ : (a)



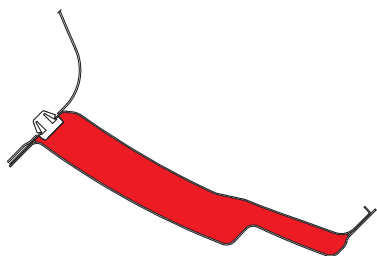
BS-09505

(a) Urethane foam injection locations

Foreword

Cross section E — E

■ : (a)

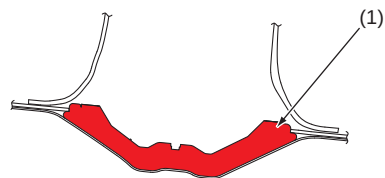


BS-09506

(a) Urethane foam injection locations

Cross section F — F

■ : (a)



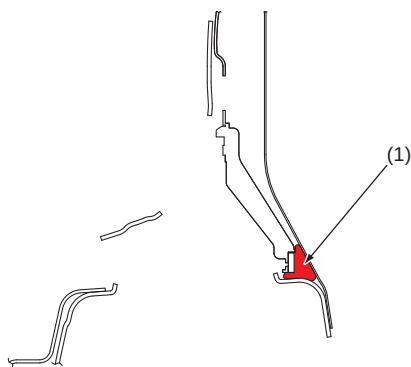
BS-09507

(a) Urethane foam injection locations

(1) Cut the foam to the shape of the body.

Cross section G — G

■ : (a)



BS-09508

(a) Urethane foam injection locations

(1) Cut the foam to the shape of the body.