

# GENERAL REPAIR INSTRUCTIONS

## Work Precautions

### SAFETY

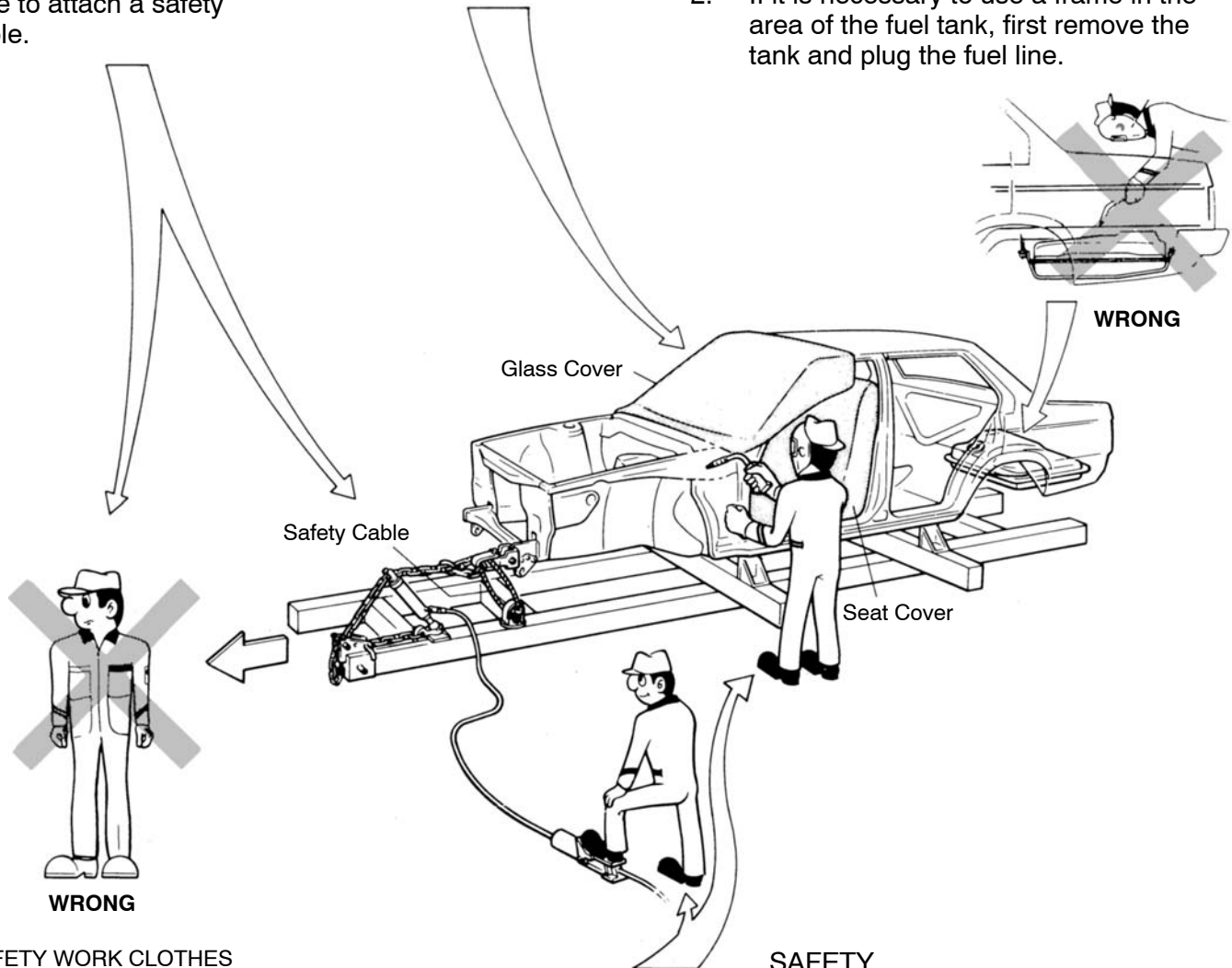
Never stand in direct line with the chain when using a puller on the body or frame, and be sure to attach a safety cable.

### VEHICLE PROTECTION

When welding, protect the painted surfaces, windows, seats and carpet with heat-resistant, fire-proof covers.

### SAFETY

1. Before performing repair work, check for fuel leaks. If a leak is found, be sure to close the opening totally.
2. If it is necessary to use a frame in the area of the fuel tank, first remove the tank and plug the fuel line.



### SAFETY WORK CLOTHES

In addition to the usual mechanic wear, cap and safety shoes, the necessary gloves, head protector, glasses, ear plugs, face protector, dust-prevention mask, etc. should be worn as the situation demands.

Dust-  
Prevention  
Flask



Face  
Protector



Head  
Protector



Safety  
Shoes



Welder's  
Glasses



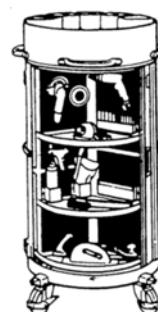
Ear  
Plugs



Welder's  
Gloves



Cotton  
Gloves



Body  
Mechanic  
Stand

**HAND TOOLS**  
Keeping your hand tools in neat order will have an effect on your work efficiency.

### SAFETY

Before performing repair work, disconnect the battery cables.

## Proper and Efficient Work Procedures

### REMOVAL

#### PRE-REMOVAL MEASURING

Before removal or cutting operations, take measurements in accordance with the dimension diagram. Always use a puller to straighten a damaged body or frame.

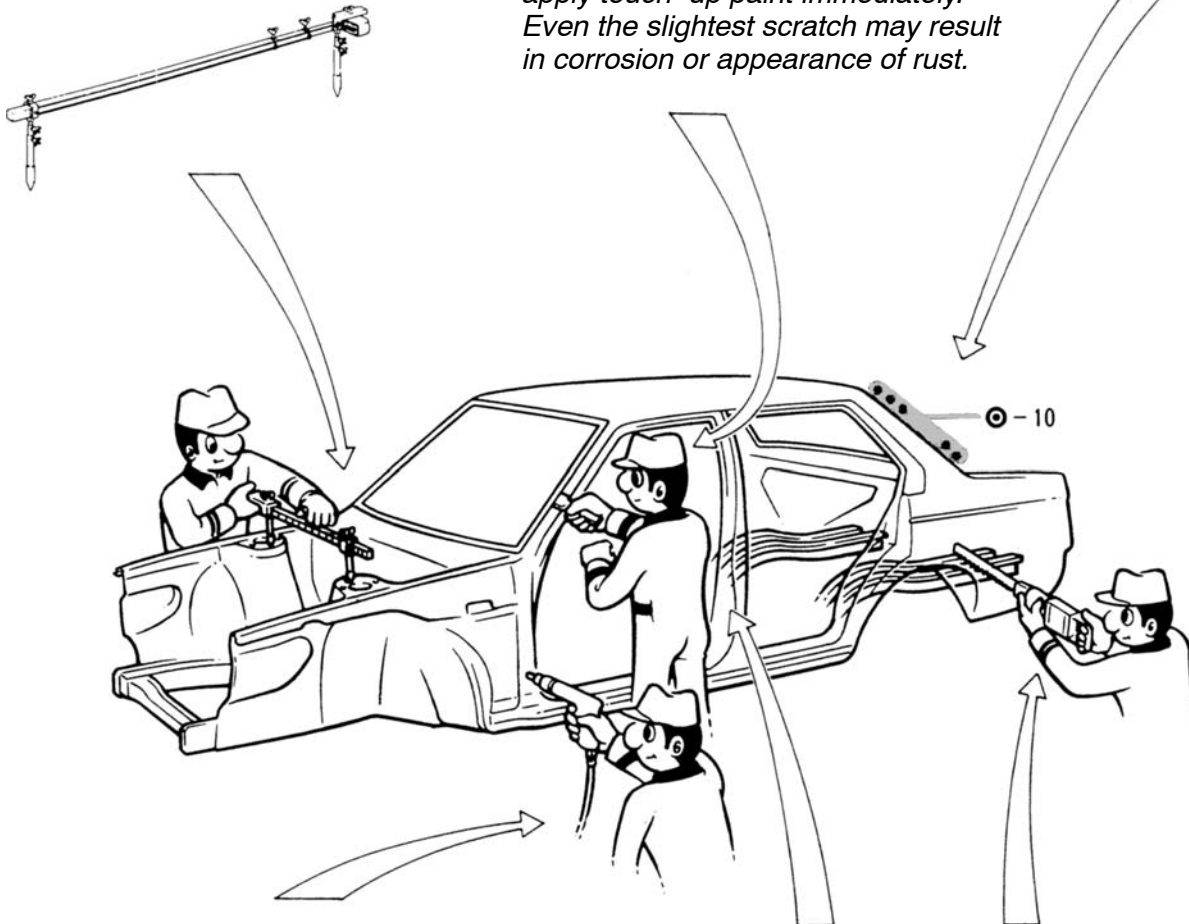
#### REMOVAL OF ADJACENT COMPONENTS

When removing adjacent components, apply protective tape to the surrounding body and your tools to prevent damage. **CAUTION:**

1. *Be especially careful not to damage screw or clip holes.*
2. *If the paint is accidentally scratched, apply touch-up paint immediately. Even the slightest scratch may result in corrosion or appearance of rust.*

**NO. OF SPOT WELDS**  
Make a note of the number of spot welds for later reference.

**NOTE:** The number of spot welds may vary depending on the vehicle.



#### PRECAUTIONS FOR DRILLING OR CUTTING

Check behind any area to be drilled or cut to insure that there are no hoses, wires, etc., that may be damaged.

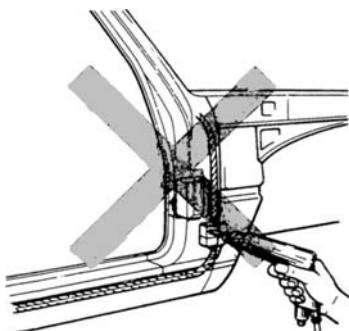
#### REMOVAL OF ADJACENT PARTS

When removing adjacent parts by avoid accidental marring, etc., wrapping the tools used and surrounding body parts in protective tape.

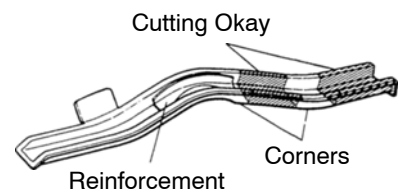
#### NOTE:

- 1) **Take particular care not to damage any screw or clip holes.**
- 2) **If you do scratch a painted surface, retouch immediately after. Even a small scratch will result in rust and corrosion.**

**CUTTING AREA**  
Always cut in a straight line and avoid reinforced areas.

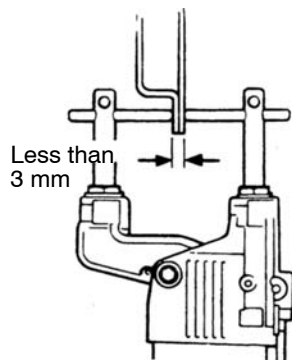


**WRONG**



## PREPARATION FOR INSTALLATION

### SPOT WELD POINTS

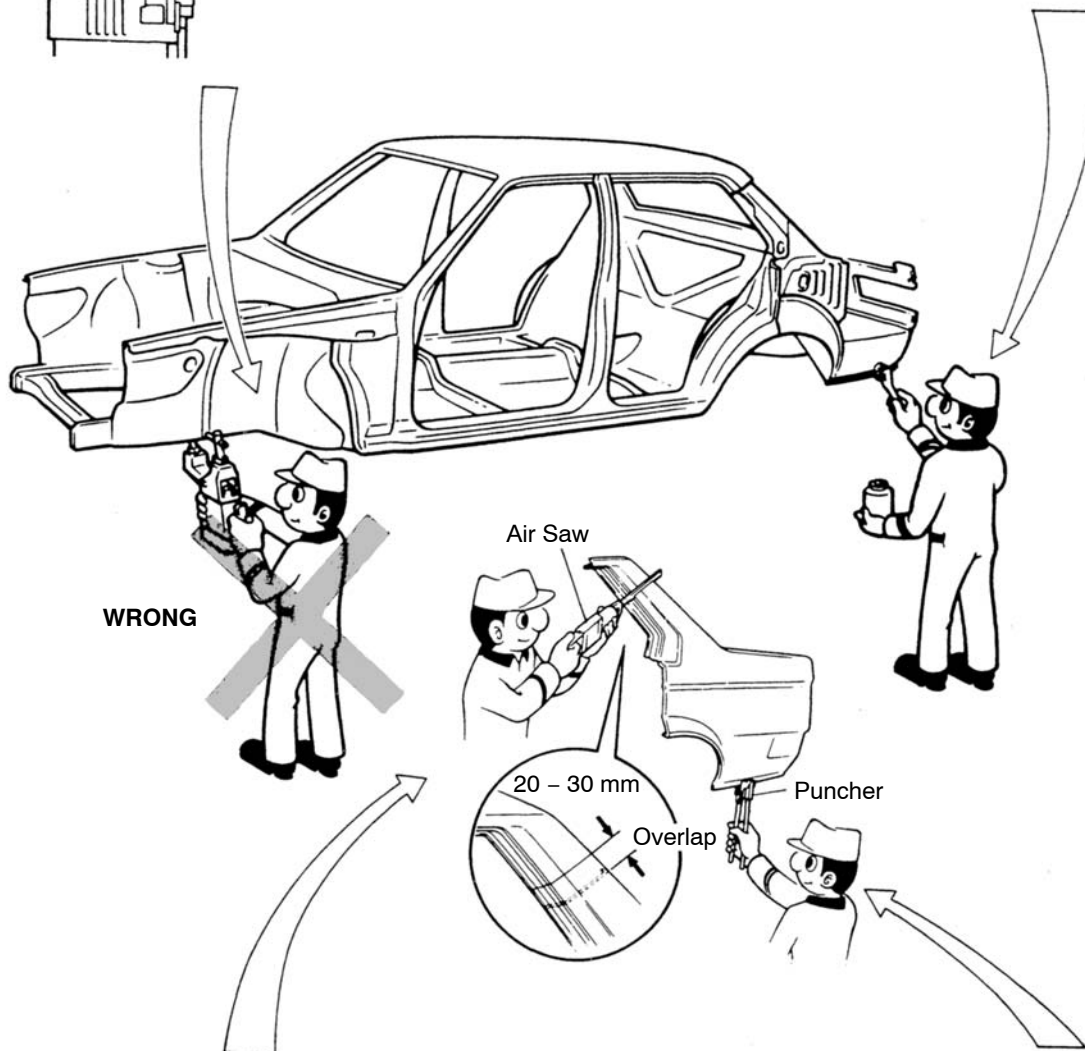


When welding panels with a combined thickness of over 3 mm (0.12 in.), use a MIG (Metal Inert Gas) welder for plug welding.  
**NOTE: Spot welding will not provide sufficient durability for panels over 3 mm (0.12 in.) thick.**

### APPLICATION OF WELD-THROUGH PRIMER



For treatment against corrosion, remove the paint from the portion of the new part and body to be welded, and apply weld-through primer.



### ROUGH CUTTING OF JOINTS

For joint areas, rough cut the new part, leaving 20 – 30 mm (0.79 – 1.18 in.) overlap.

### MAKING HOLES FOR PLUG WELDING

For areas where a spot welder cannot be used, use a puncher or drill to make holes for plug welding.

#### REFERENCE:

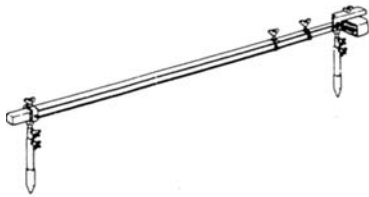
mm (in.)

Thickness of welded portion	Size of plug hole
1.0 (0.04) under	5 (0.20) $\phi$ over
1.0 (0.04) over	6.5 (0.26) $\phi$ over

## INSTALLATION

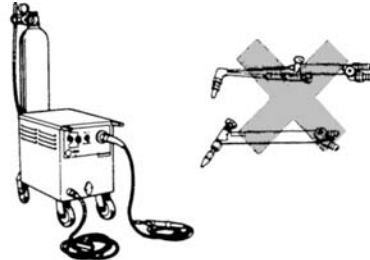
### PRE-WELDING MEASUREMENTS

Always take measurements before installing underbody or engine components to insure correct assembly. After installation, confirm proper fit.



### WELDING PRECAUTIONS

1. The number of welding spots should be as follows.  
Spot weld: 1.3 x No. of manufacturer's spots.  
Plug weld: More than No. of manufacturer's plugs.



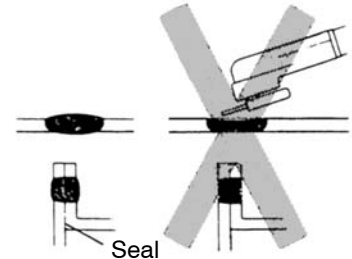
OKAY

WRONG

2. Plug welding should be done with a MIG (Metal Inert Gas) welder. Do not gas weld or braze panels at areas other than specified.

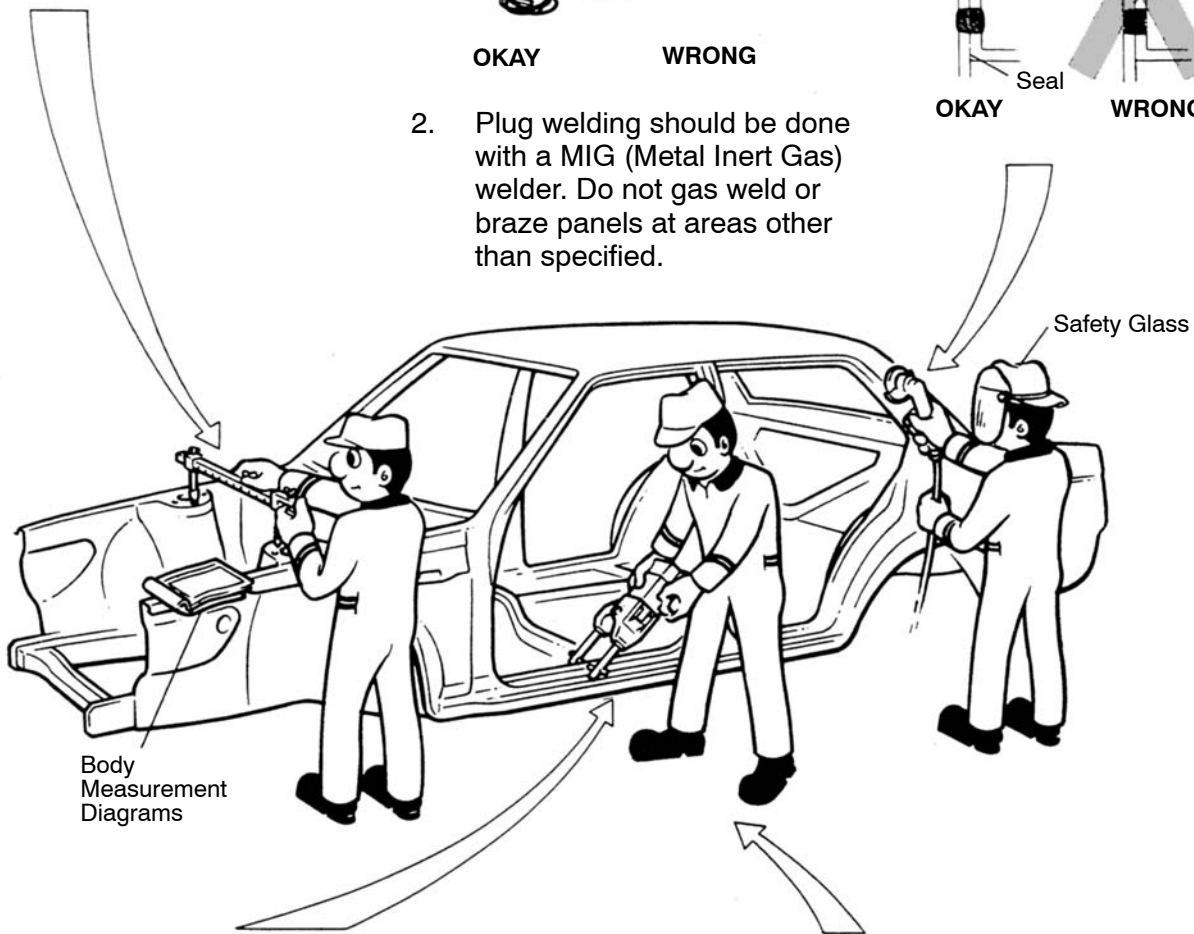
### POST-WELDING REFINISHING

1. Always check the welded spots to insure they are secure.
2. When smoothing out the weld spots with a disc grinder, be careful not to grind off too much as this would weaken the weld.



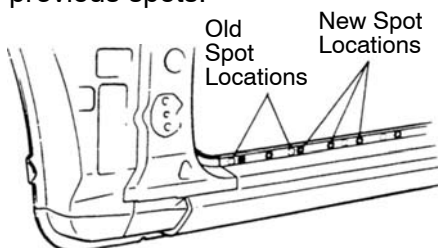
OKAY

WRONG



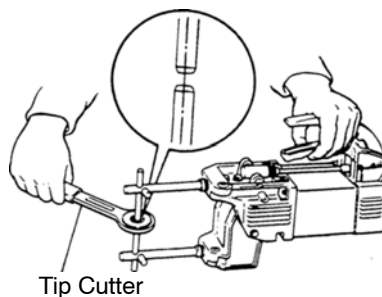
### SPOT WELD LOCATIONS

Try to avoid welding over previous spots.



### SPOT WELDING PRECAUTIONS

1. The shape of the welding tip point has an effect on the strength of the weld.
2. Always insure that the seams and welding tip are free of paint.



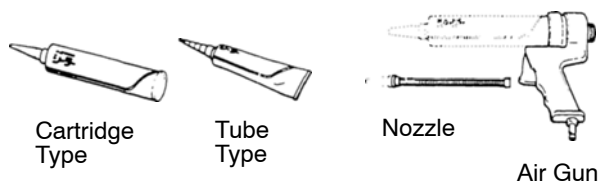
Tip Cutter

## ANTI-CORROSIVE TREATMENT

When replacing body panels, always apply body sealer, anti-rust treatment or undercoating according to the requirements of your country.

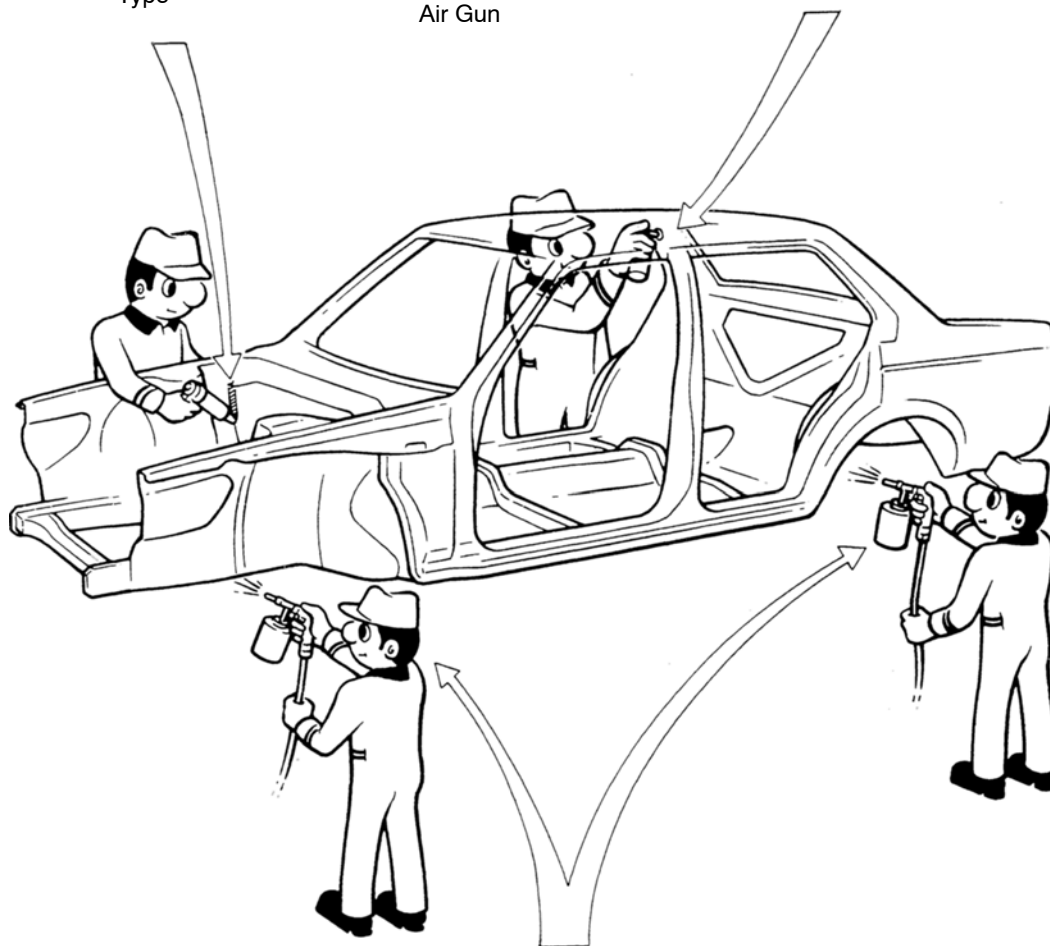
### BODY SEALER

Apply body sealer to the required areas.



### CHASSIS RUST-PROOFING

Anti-rust treatment for welding spots or inside brazed areas (torque box).



### UNDERCOATING

Anti-rust treatment for underbody welding spots and wheel housings.



Undercoating  
(Oil base)

Undercoating  
(Water base)

Spray Gun