

SECTION 4

FRONT

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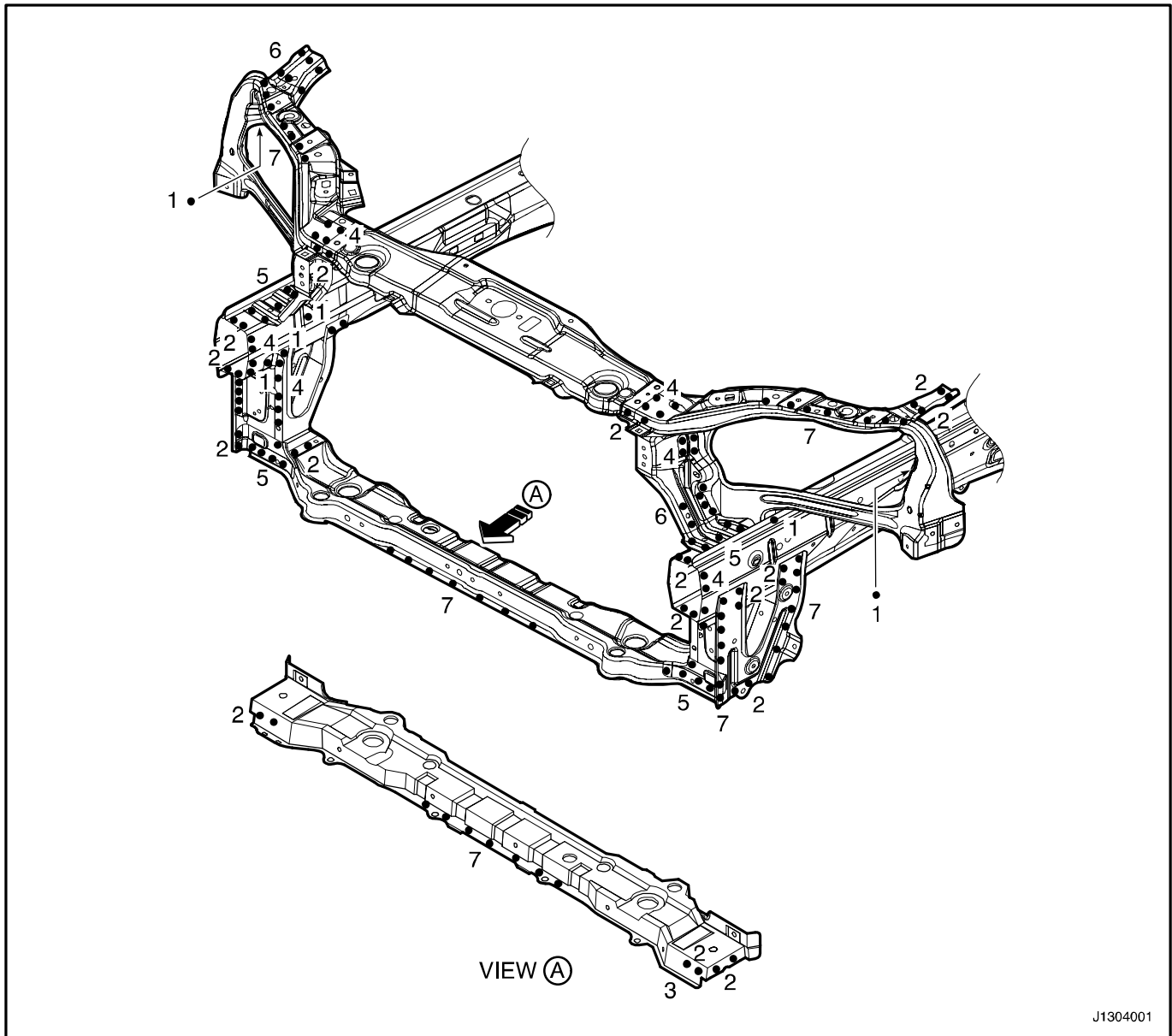
4-15

1. FRONT PANEL

1-1. GENERAL DESCRIPTION

The front panel is joined to the front wheelhouse and front longitudinal. It forms the base for the headlamps

and other parts and maintains the rigidity of the front section of the body. Pay particular attention to twists and parallelism and check mounting of related parts when welding.



J1304001

Fig. 1 Front Welding Assembly

1-2. REPAIR PROCEDURE

1. Remove the related parts.

- Hood, radiator grill and front bumper.
- Head lamps and fender.
- Engine, radiator and related parts.
- Aircon condenser and related parts.
- Others.

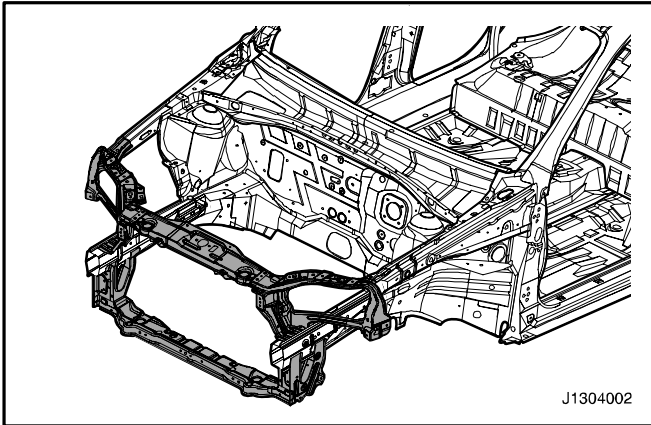


Fig. 2

2. Roughly pull out and straighten the damaged area.

- Check the damage to the front wheelhouse and front longitudinal before removing the front panel. Use the frame straightener to roughly pull out and repair the damaged front panel before removing the front panel.

Note : Check the fit of the door, taking care not to pull the damaged area out more than necessary.

- Use the horizontal pinch weld clamps and attach the car to the frame straightener at the clamping points securely.

3. Keep the body, level.

- Jack up the body, and place safety stands at the four designated places of the frame door opening.

4. Cut and pry off the front panel.

- Center punch around the spot weld imprints.
- Use the special spot cutter to drill holes at the spot weld nuggets on the front wheel house and longitudinal.

Note : When drilling holes be careful not to drill down to the front wheelhouse and longitudinal themselves.

- Cut off the front panel with an air chisel, leaving the welding flanges intact.
- Level and finish the burrs from the pried off spot welds with disc sander.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

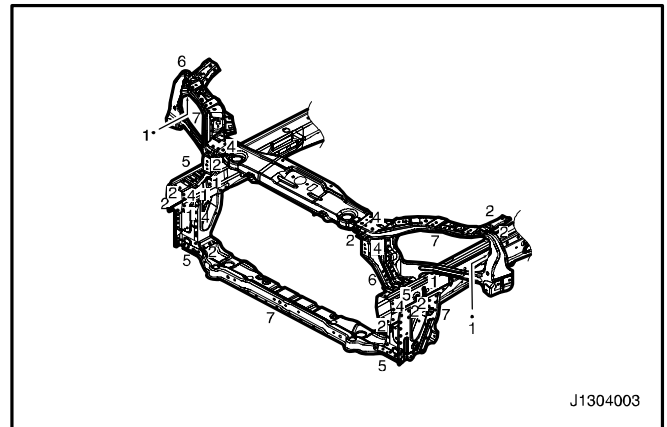


Fig. 3

5. Mold damaged related parts.

- Use a hammer and dolly to mold damaged areas of the front wheelhouse and longitudinal.
- Even out the welding flanges with a hammer and dolly.
- Fill any holes drilled by welding.

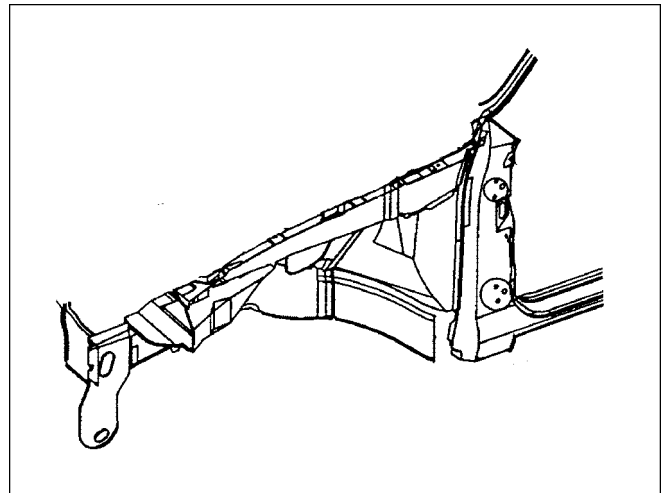


Fig. 4

6. Set the front panel.

- Grind both sides of the welding section of the front panel with a sander to remove the paint and expose the steel plate.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

- Clamp both the right and left sides with the vise grips as shown.
- Weld the clamped sections for temporary installation.

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

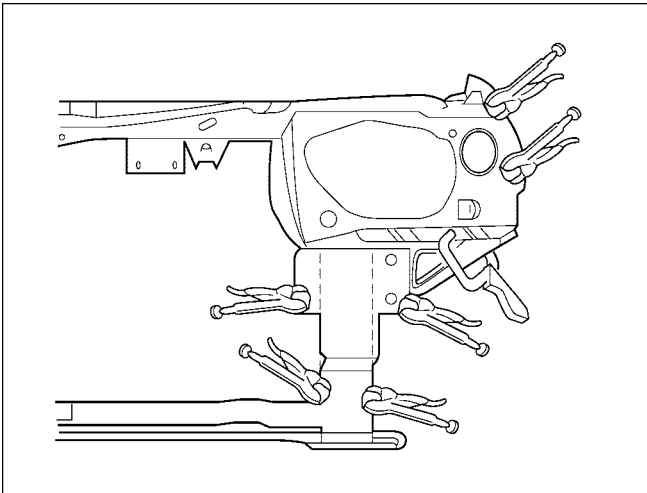


Fig. 5

Note : Make sure that the right and left front panels are in line with each others.

7. Measure the front compartment diagonally.

- Measure the front compartment diagonally with a tracking gauge or convex rule as shown to check it for twisting or bending.
- Temporarily assemble the fender, head lamps and hood, then check the clearances and level differences.

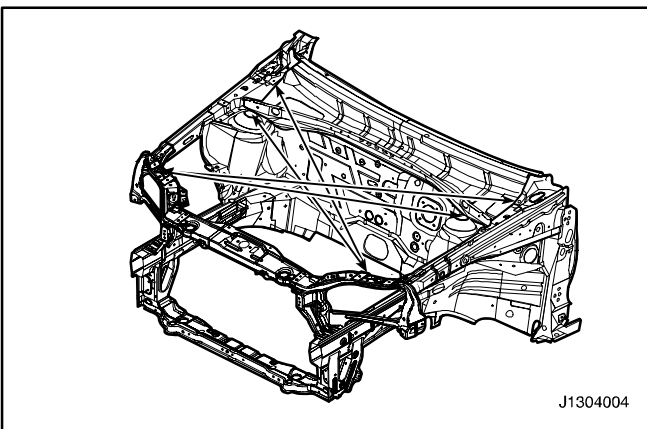


Fig. 6

8. Perform the main welding.

- Spot weld the front panel as shown.

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Perform a trial welding first, and check the welding condition.
- Increase the number of spot by 20% for areas to be spot welded.

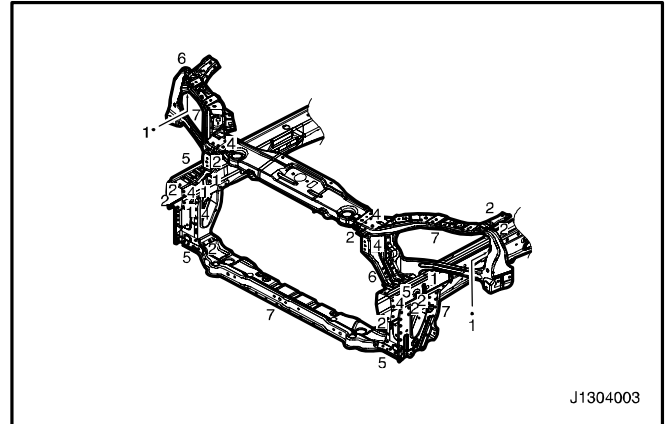


Fig. 7

9. Finish the welding areas.

- Use a hammer and dolly to even out the front wheelhouse and longitudinal flanges for a close fit with the surface of the front panel.
10. Apply the undercoat.

- Undercoat to the damaged areas of front wheelhouse and longitudinal if necessary.

11. Apply the paint.

CAUTION

- Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening paint container.
 - Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
 - Paint is flammable. Store in a safe place, and keep it away from sparks, flames or cigarettes.
12. Coating the anti-rust agents.
- Coating the anti-rust agents to the end of front panel side and the door hinge areas.

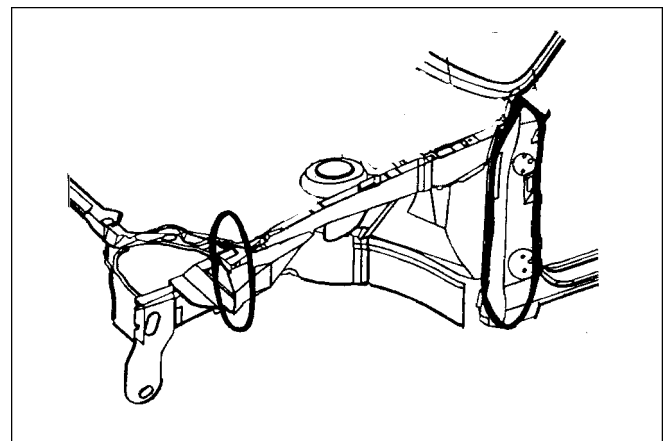


Fig. 8

13. Install the related parts.

- Engine, radiator and related parts.

- Aircon condenser and related parts.
- Head lamps and fenders.
- Hood, radiator grill, and bumper.
- Others
- Install in the reverse order in which they were removed.

Note : After install the all related parts, rub in grease to the moving parts and replenish cooling liquid, break oil, aircon gas and others.

14. Check and adjust

- Check clearances and level differences.
- Check the hood locking and unlocking condition.
- Adjust the head lamp aim.
- Check all operation.
- Check for gas, oil and liquid leaks.

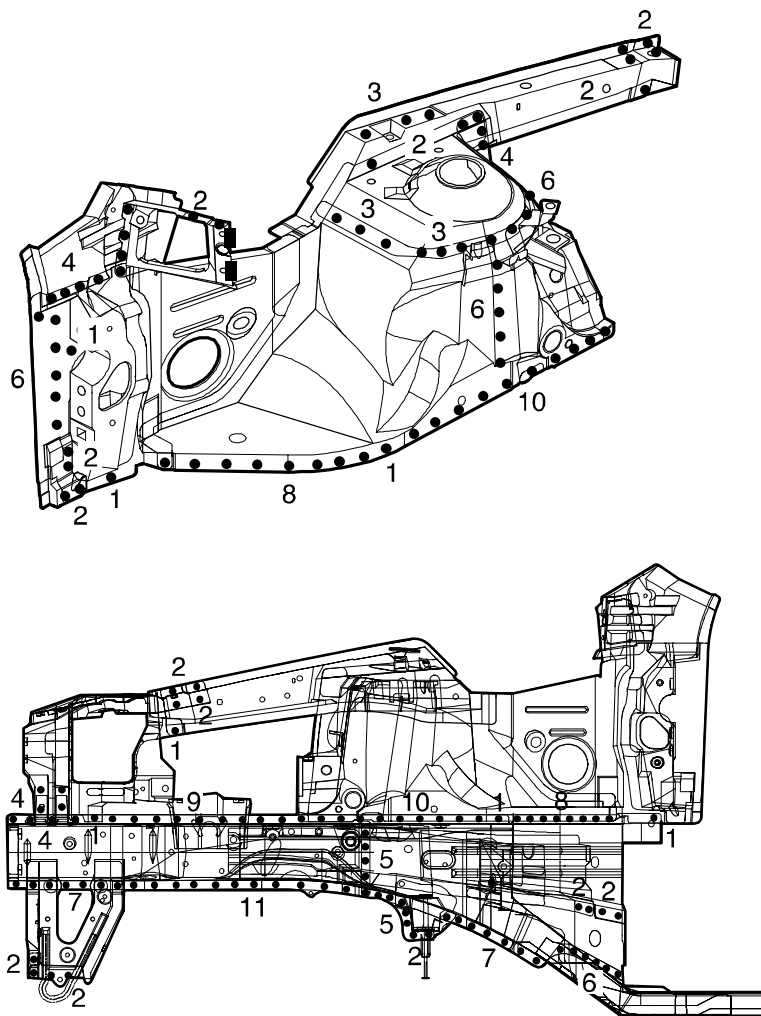
Note : Use specified check sheet for operation check properly.

2. FRONT WHEELHOUSE

2-1. GENERAL DESCRIPTION

The front wheelhouse component is constructed as a unit with the locator shockabsorber. Therefore, replacement of the component affects the front wheel align-

ment. When assembling it, either use a jig or follow dimensions on the body repair chart for positioning. It must be welded carefully.



J1304005

Fig. 9 Front Wheelhouse Welding Assembly

2-2. REPAIR PROCEDURE

1. Remove the related parts.

- Parts on passenger side of dash panel lower which are especially flammable.
 - Instrument panel, wiring harness, related parts and others.
- ### 2. Roughly pull out and straighten the damaged area to approximately the original shape.
- Attach the car to the frame straightener by tightening the underbody clamps at the horizontal pinch weld points.
 - Before cutting off the damaged sections, pull them out so that they are restored to the original shape.
 - Do not pull out more than necessary.
 - Pull out and straighten the damaged areas of the rear wheelhouse and dash panel lower, front fender and other parts.

Note : Check the condition of the door and hinges.

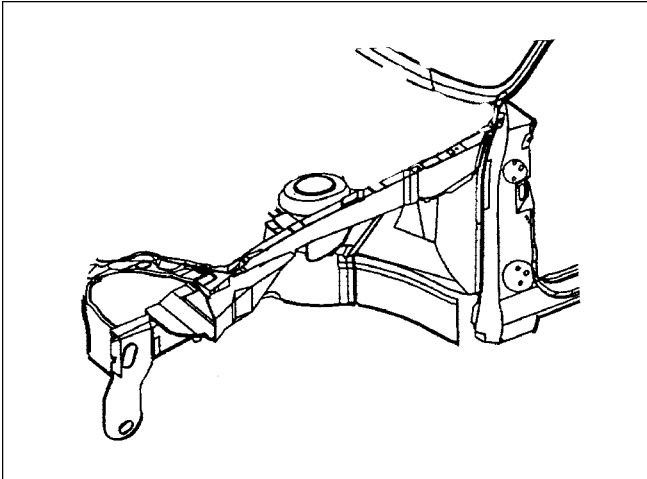


Fig. 10

3. Remove the brace wheelhouse.

- Center punch around the spot weld imprints.
- Use the special spot cutter to drill holes at the spot weld nuggets on the brace wheelhouse.
- Remove the MIG weld areas with a disc sander.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

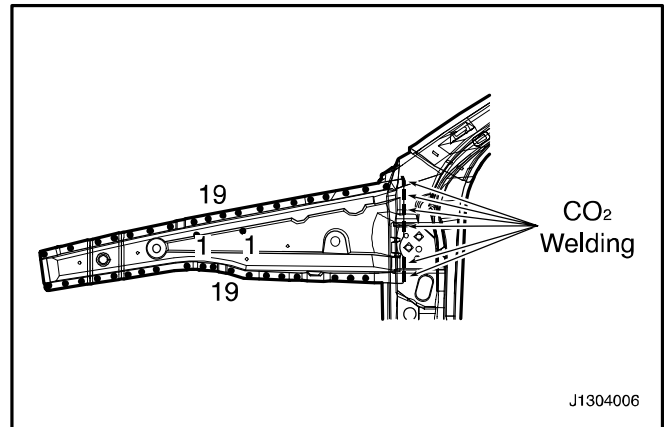


Fig. 11

- Using a chisel, pry off the welded flange from the front body puller and wheelhouse.
- ### 4. Peel off the undercoat and sealer.
- Heat the undercoat and sealer at the welding areas of the wheelhouse and longitudinal with a gas torch and peel off the undercoat and sealer with a steel spatula.
- ### 5. Cut and pry off the front wheelhouse.
- Center punch around the spot weld imprints on the longitudinal and rear wheelhouse.
 - Use the special spot cutter to drill holes at the spot weld nuggets on the center punched areas.
 - Cut off the front wheelhouse with an air chisel, leaving the welding flanges intact.
 - Level and finish the burrs from the pried off spot welds with disc sander.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

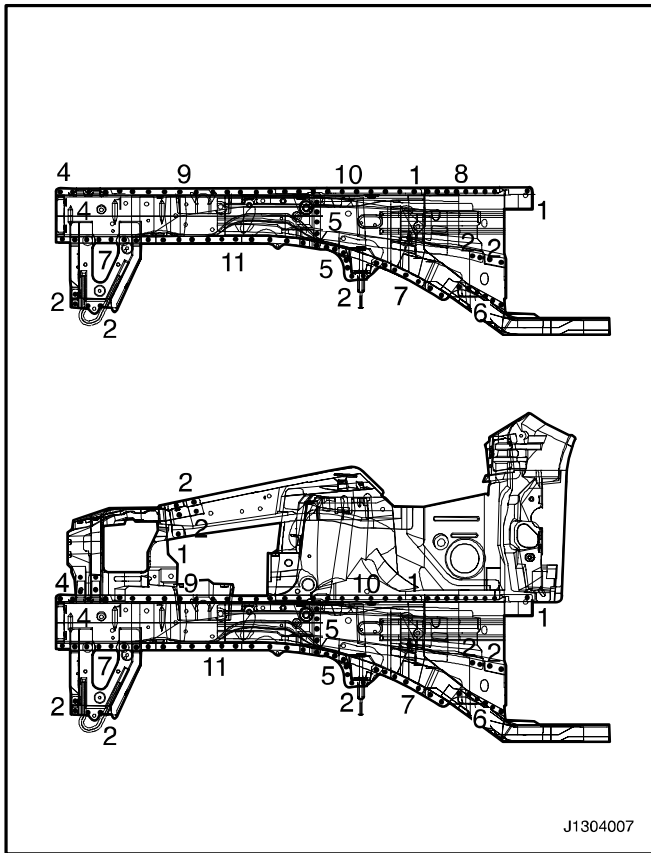


Fig. 12

NOTE :

- If damage has occurred only front side, cut the damaged section of the front wheelhouse, trim the new panel to fit the remaining section, then butt weld both parts at the inner ends.
- 6. Mold damaged related parts.
- Fill any holes drilled by welding.
- Use a hammer and dolly to mold damaged areas of the front longitudinal, rear wheelhouse and other panels.
- Even out the welding flanges with a hammer and dolly.
- 7. Set the new front wheelhouse panel.

- Grind both sides of the welding section of the front, rear wheelhouse and front longitudinal with a disc sander to remove the paint and expose the steel plate.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

- Clamp to the front longitudinal with vise grips and squill vises.
- Clamp the front panel with vise grips.

Note : Use of jigs is recommended.

- Weld the clamped sections for temporary installation.

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves

and safety shoes.

8. Measure the front compartment diagonally.

- Measure the front compartment diagonally with a tracking gauge or convex rule to check it for twisting or bending.
- Temporarily assemble the fender and hood, then check the clearances and level differences.
- 9. Perform the main welding.

- Weld as much as possible with the jig still mounted.
- Perform a trial welding first, and check the welding condition.
- Perform the welding.

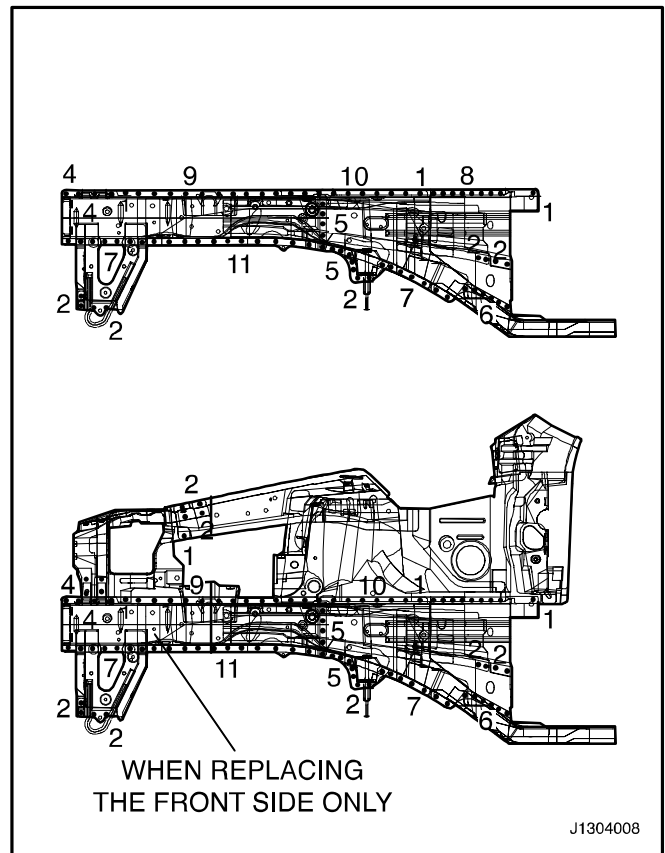


Fig. 13

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Increase the number of spot by 20% for areas to be spot welded.
- 10. Apply the sealer tape.
- Apply the sealer tape to the hinge and brace wheelhouse matching area as shown.

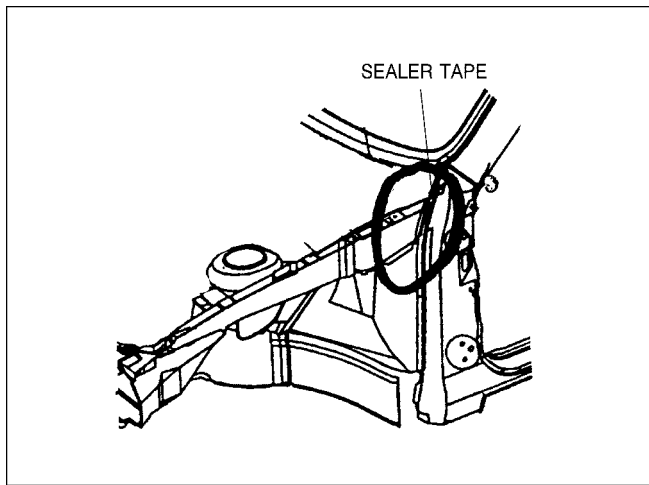


Fig. 14

11. Weld the brace wheelhouse.

- Spot weld the brace wheelhouse as shown.
- Make MIG or gas welds at the door hinge areas.

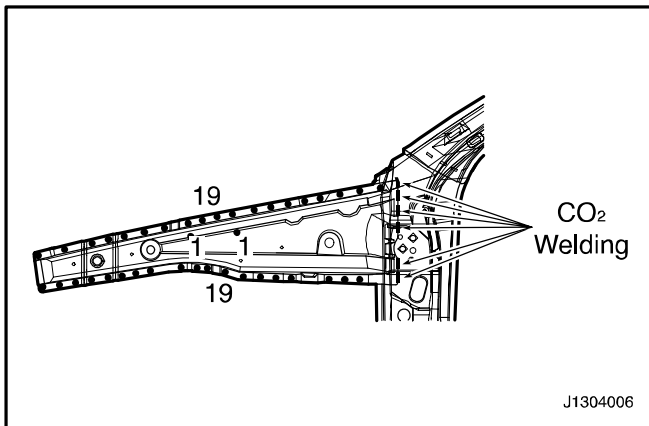


Fig. 15

12. Finish the welding areas.

- Use a hammer and dolly to even out the rear wheelhouse and front longitudinal flanges for a close fit with the surface of the front wheelhouse.

13. Apply the sealer

- Apply the sealer to the matching and overlapped surface.

14. Apply the undercoat.

- Undercoat to the inside of the front, rear wheelhouse and longitudinal.

15. Apply the paint.

CAUTION

- Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening paint container.
- Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.

- Paint is flammable. Store in a safe place, and keep it away from sparks, flames or cigarettes.

16. Coating the anti-rust agents.

- Coating the anti-rust agents to the end of front panel side and the door hinge areas.

17. Install the related parts.

- Wiring harness, instrument panel and related parts.
- Parts of the passenger compartment.
- Parts to be installed when install the front panel.
- Others.
- Install in the reverse order in which they were removed..

Note : After install the all related parts, rub in grease to the moving parts and replenish cooling liquid, break oil, aircon gas and others.

18. Check and adjust

- Measure the front wheel alignment.
- Check clearances and level differences.
- Check the hood locking and unlocking condition.
- Adjust the head lamp aim.
- Check all operation.
- Check for gas, oil and liquid leaks.

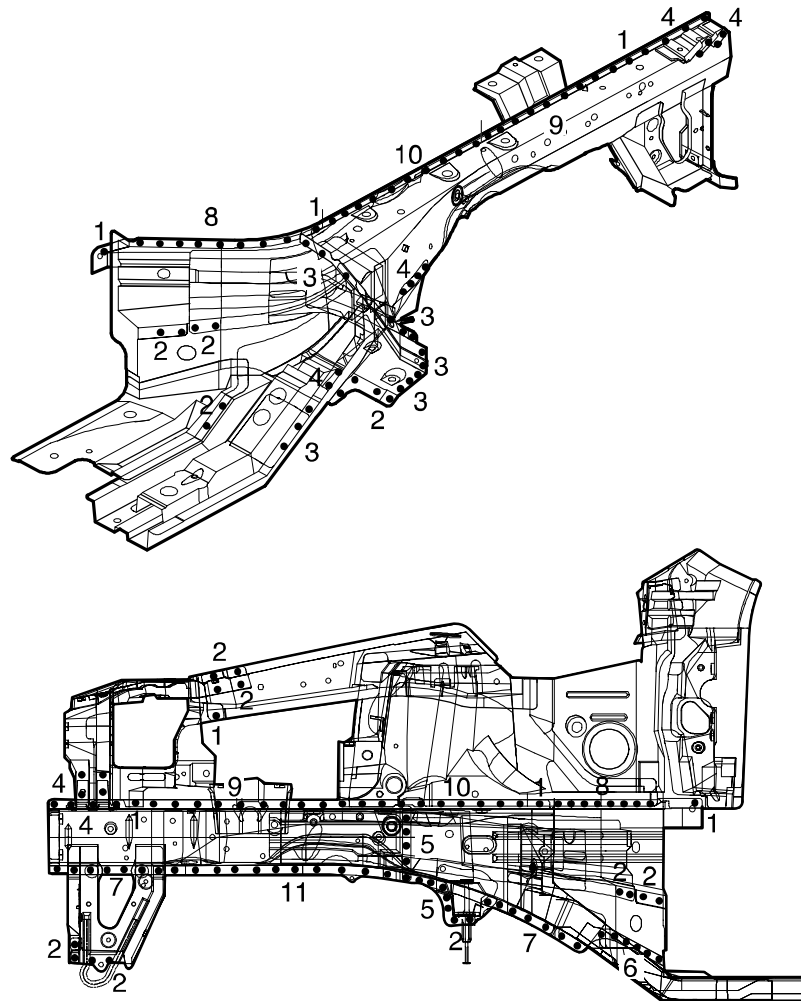
Note : Use specified check sheet for operation check properly.

3. FRONT LONGITUDINAL

3-1. GENERAL DESCRIPTION

The front longitudinal is joined to the wheelhouse and front panel, it forms the base for the front suspension, engine, transmission and others. Therefore, replace-

ment of the component affects the front wheel alignment and maintains the rigidity of the front section. When assembling it, either use a jig or follow dimensions on the body repair chart for positioning. It must be welded carefully.



J1304009

Fig. 16 Front Longitudinal Welding Assembly

3-2. REPAIR PROCEDURE

1. Remove the related parts.

- Parts to be removed when removing the front panel and front wheelhouse.
- Parts on passenger side of dash panel lower which are especially flammable.
- Instrument panel, wiring harness, related parts and others.

Note : Remove according to part damaged.

2. Roughly pull out and straighten the damaged area to approximately the original shape.

- Attach the car to the frame straightener by tightening the underbody clamps at the horizontal pinch weld points.
- Before cutting off the damaged sections, pull them out so that they are restored to the original shape.
- Roughly cut off the front longitudinal according to the extent of damage before roughly pulling out the damage makes repair of the related parts difficult.
- Do not pull out more than necessary.

Note : Check the condition of the door and hinges.

3. Peel off the undercoat and sealer.

- Heat the undercoat and sealer at the welding areas of the damaged parts with a gas torch and peel off the undercoat and sealer with a steel spatula.

CAUTION : Be careful not to burn the fittings inside the passenger compartment when heating.

4. Cut and pry off the front longitudinal.

Note : It's not necessary to separate the wheelhouse from the front longitudinal if the wheelhouse is to be replaced also.

- Center punch around the spot weld imprints on the wheelhouse and other related parts.
- Use the special spot cutter to drill holes at the spot weld nuggets on the center punched areas.
- Cut off the front longitudinal with an air chisel, leaving the welding flanges intact.
- Level and finish the burrs from the pried off spot welds with a disc sander.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

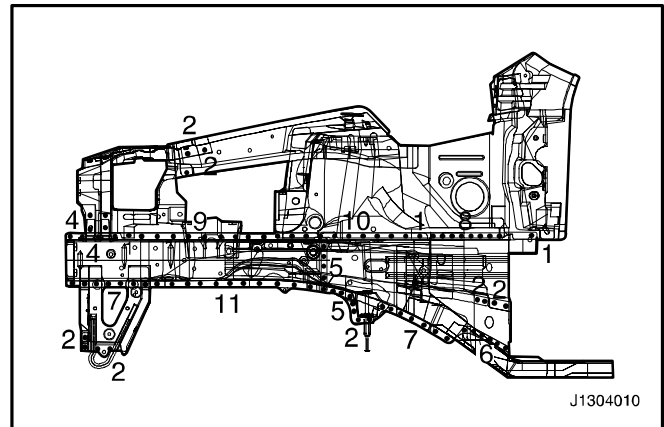


Fig. 17

5. Mold damaged related parts.

- Fill any holes drilled by welding.

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Reshape the wheelhouse and other damaged parts and even out the welding flanges with a hammer and dolly.

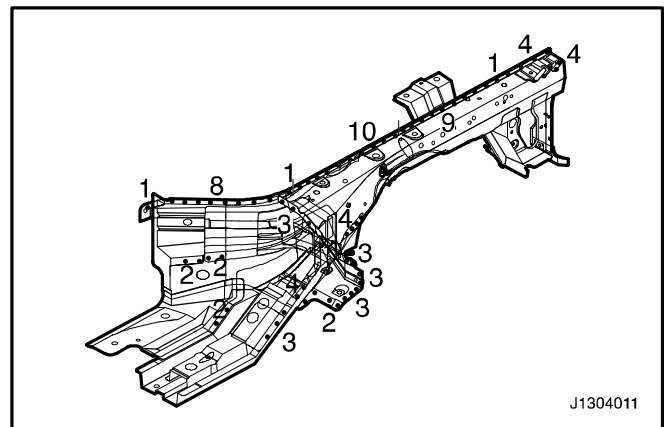


Fig. 18

6. Cut the new front longitudinal to align it with body, then set the wheelhouse and front panel.

- Cut the new front longitudinal with a hand saw and it will be butt welded.
- Grind both sides of the welding section of the front longitudinal and wheelhouse with a disc sander to remove the paint and expose the steel plate.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

- Tighten the new front longitudinal against remaining parts with the vise grips and pliers.
- Place a jack under the front longitudinal end and support it, and measure the positions for correct setting.
- Set and clamp the front panel in place with the vise grips.

Note : Use of jigs is recommended for correct positions and check that the both front longitudinal and wheelhouse are parallel.

- Tack weld the clamped section for temporary installation.
7. Perform the main welding.

- Weld as much as possible with the jig still mounted.
- Make MIG or gas welds at the butt joints at the front longitudinal, carefully.

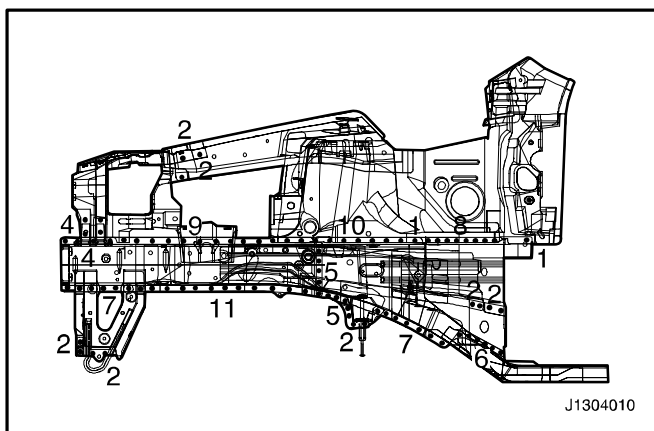


Fig. 19

- Spot weld the wheelhouse with the front longitudinal flange areas and front panel.

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Perform a trial welding first, and check the welding condition.
- Increase the number of spot by 20% for areas to be spot welded.

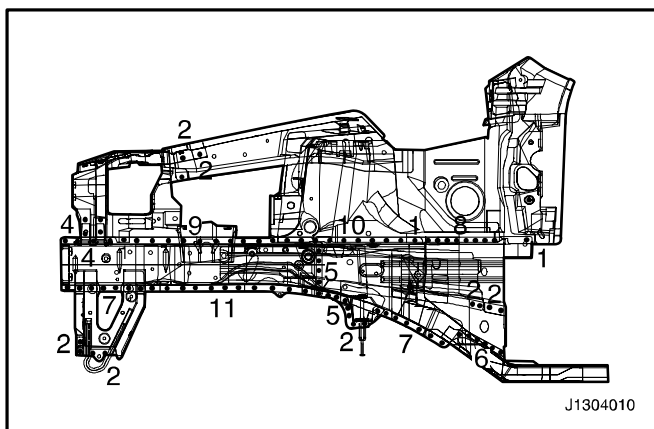


Fig. 20

- Level the weld beads at the longitudinal butt joints area with disc sander.
- Make the stiffener (Thickness: 2.8 mm Min., Width: 80 mm) according to the form of longitudinal butt joint areas

and weld the stiffener at the longitudinal butt joint areas with MIG welder.

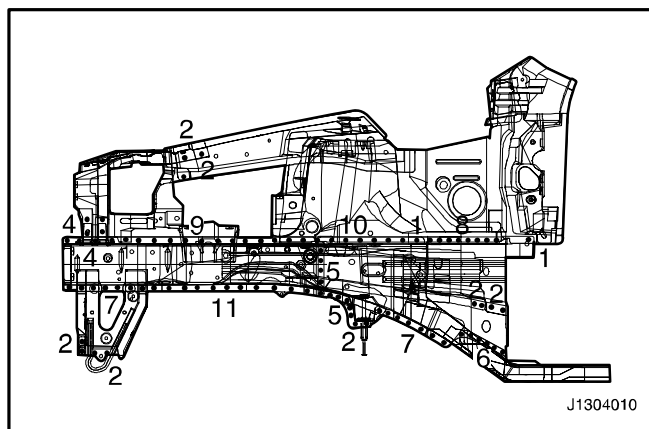


Fig. 21

8. Finish the welding areas.

- Level the gas or MIG welded areas with disc sander.
 - Use a hammer and dolly to even out the wheelhouse and longitudinal flanges for a close fit.
9. Apply the sealer.

- Apply the sealer to the joint areas of the dash panel lower and floor panel areas.

10. Apply the undercoat.

- Undercoat to the joint and overlapped areas of the front floor, longitudinal under side and the inside of front, rear wheelhouse.

11. Apply the paint.

CAUTION

- Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening paint container.
 - Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
 - Paint is flammable. Store in a safe place, and keep it away from sparks, flames or cigarettes.
12. Coating the anti-rust agents.

- Coating the anti-rust agents to the end of front panel side and the front door hinge areas.

13. Install the related parts.

- Clean the passenger compartment.
- Wiring harness, instrument panel and related parts.
- Parts of the passenger compartment.
- Chassis components.
- Engine, radiator and related parts.
- Aircon condenser and related parts.
- Head lamps and fenders.
- Heed, radiator grill, and bumper.
- Others.
- Install in the reverse order in which they were removed.

Note : After install the all related parts, rub in grease o the moving parts and replenish cooling liquid, break oil, aircon gas and others.

14. Check and adjust

- Check clearances and level differences.
- Check the hood locking and unlocking condition.
- Adjust the head lamp aim.
- Check all operation.
- Check for gas, oil and liquid leaks.
- Check for water leaks in the passenger compartment.

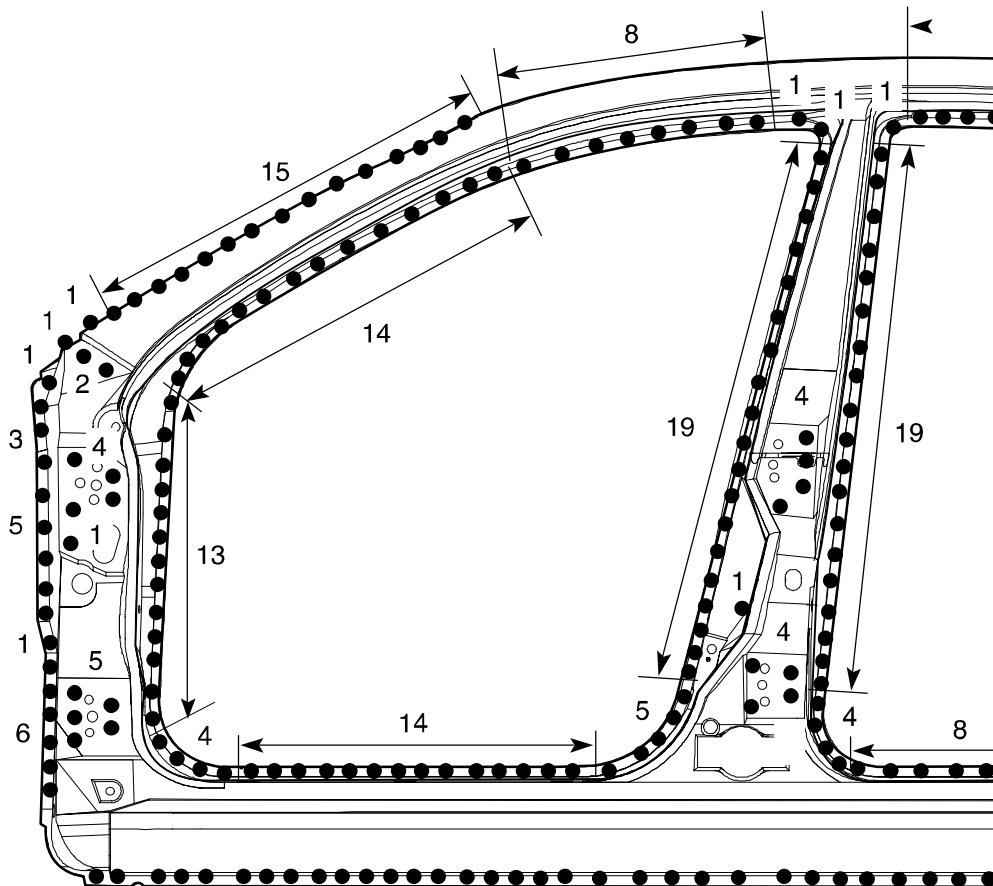
Note : Use specified check sheet for operation check properly.

4. FRONT PILLAR

4-1. GENERAL DESCRIPTION

The front pillar area is part of the frame door opening panel. It's connected to the roof, windshield, door hinges and floor frame and is important as a support for

the front side of the cabin. Connection of the front pillar determines the position of the windshield and front door. Align the fender, door and windshield while the front pillar is temporary mounted, and check the clearances and level differences.



J1304012

Fig. 22 Front Pillar Welding Assembly

4-2. REPAIR PROCEDURE

1. Remove the related parts.

- Hood, radiator grill and front bumper.
- Door and fender.
- Wiper, cowl and windshield.
- Weatherstrip and pillar trims.
- Instrument panel and wiring harness.
- Carpet and others.

2. Roughly pull out and straighten the damaged area.

- Check the damage to the wheelhouse and roof before removing the brace wheelhouse and front pillar and determine the extent of the damage.
- Use the frame straightener to roughly pull out and repair the damaged front pillar before removing the brace wheelhouse and front panel.

Note : Pull out until the pillar is lined up with the surface of the windshield and do not pull out more than necessary.

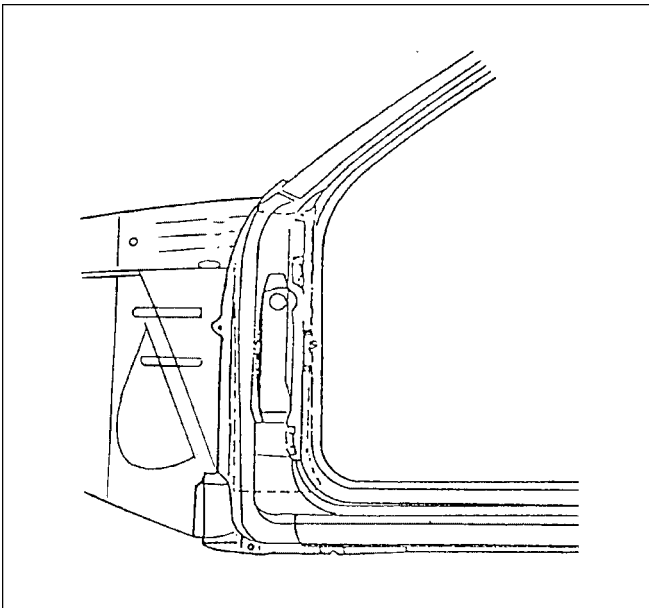


Fig. 23

3. Remove the brace wheelhouse.

- Center punch around the spot weld imprints.
- Use the special spot cutter to drill holes at the spot weld nuggets on the brace wheelhouse.
- Remove the MIG weld areas with a disc sander.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

- Using a chisel, pry off the welded flange from the front body pillar and wheelhouse.

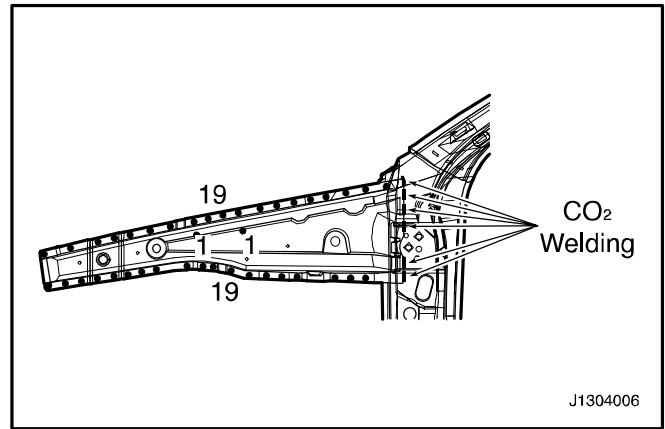


Fig. 24

4. Peel off the undercoat and sealer.

- Heat the undercoat and sealer at the welding areas of the wheelhouse and longitudinal with a gas torch and peel off the undercoat and sealer with a steel spatula.

5. Cut and pry off the front pillar.

- Cut off the front pillar along the bold lines as shown in the figure below with a handsaw and snips carefully.

Note : Be careful not to cut the inner section.

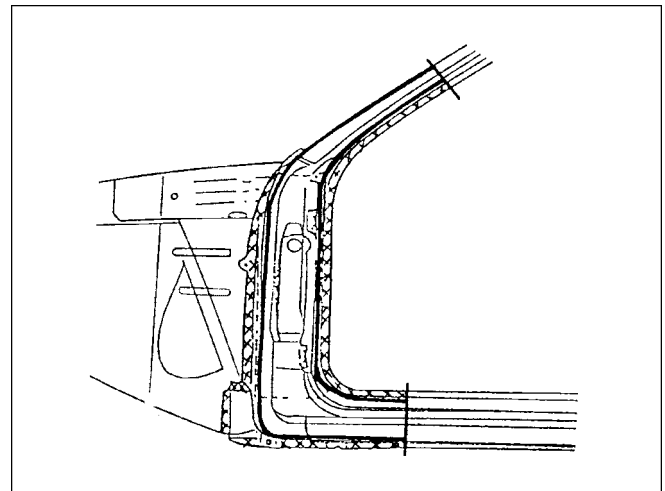


Fig. 25

- Center punch around the spot weld imprints with the rear wheelhouse, front body pillar inner, reinforcement front body pillar inner and floor panel side.
- Use the special spot cutter to drill holes at the spot weld nuggets on the front pillar.

Note : When drilling holes be careful not to drill down to the front body pillar inner, reinforcement front body pillar inner and floor panel side themselves.

- Pry off the remaining flanges from the body with an air chisel and leaving the welding flanges.
- Level and finish the burrs from the pried off spot welds with a hammer, dolly and disc sander.

CAUTION : To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

6. Mold damaged related parts.

- Fill any holes drilled by welding.

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Use a hammer and dolly to mold damaged areas of the remaining inner panel and even out the welding flanges.

7. Set the new front pillar.

- Align the new part with the top section, then cut it with a hand saw.
- Cut the floor panel side joint area so it will overlap by 30mm(1.18in.) in the floor panel side with a hand saw.
- Grind both sides of the welding section with a disk sander to remove the paint and expose the steel plate.
- Clamp the new panel in place with the vise grips.
- Tack weld the clamped section for temporary installation.

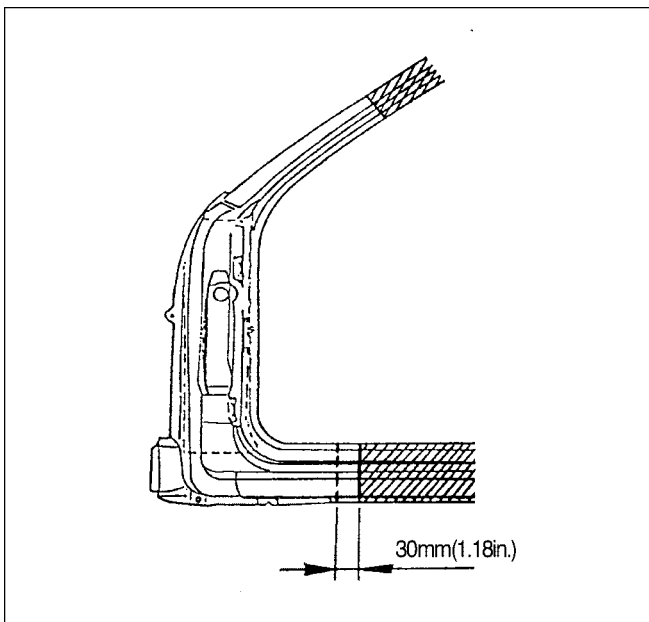


Fig. 26

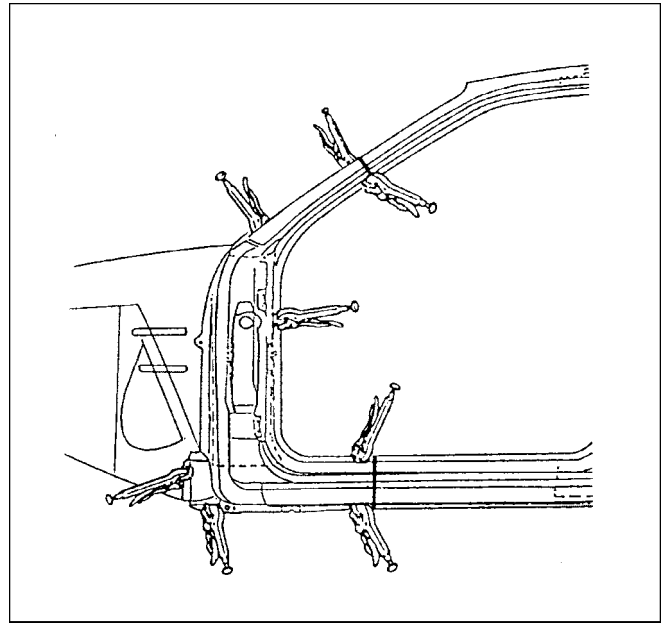


Fig. 27

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Remove the vise grips and temporarily install the fender and doors, then check the clearances, level differences and outer appearance.

8. Perform the main welding.

- Weld the frame door opening area and pillar at the butt joints with a gas or MIG welder.
- Spot weld the flanges of the front pillar as shown.

CAUTION : To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Perform a trial welding first, and check the welding condition.
- Increase the number of spot by 20% for areas to be spot welded.

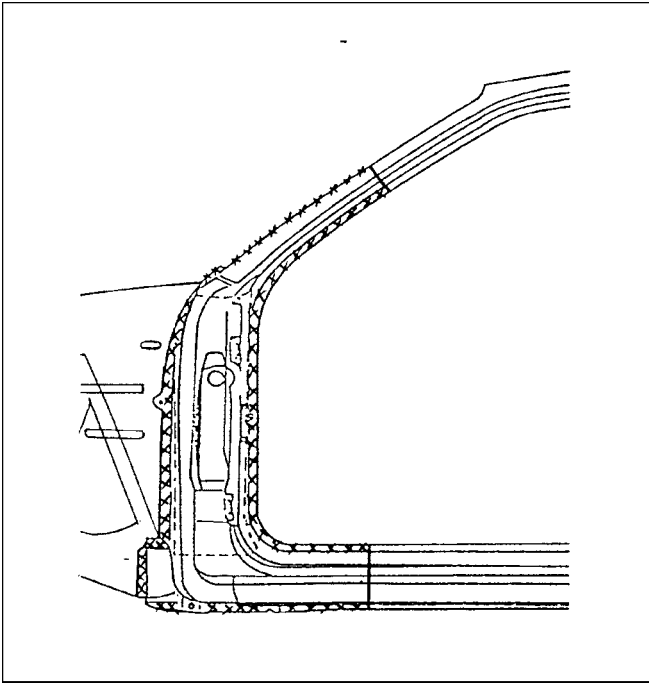


Fig. 28

9. Finish the welding areas.

- Level the gas or MIG welded areas with a disc sander, then even out high areas with a hammer being careful not to deform them.

CAUTION : *To prevent eye injury, wear goggles or safety glasses whenever sanding cutting or grinding.*

- Use a hammer and dolly to even out the spot welded flanges for a close fit with the surface of the inner panel.
- Fill in deformations and level differences of the welded areas with solder or putty, then finish.

10. Apply the sealer tape.

- Apply the sealer tape to the hinge and brace wheelhouse matching area as shown.

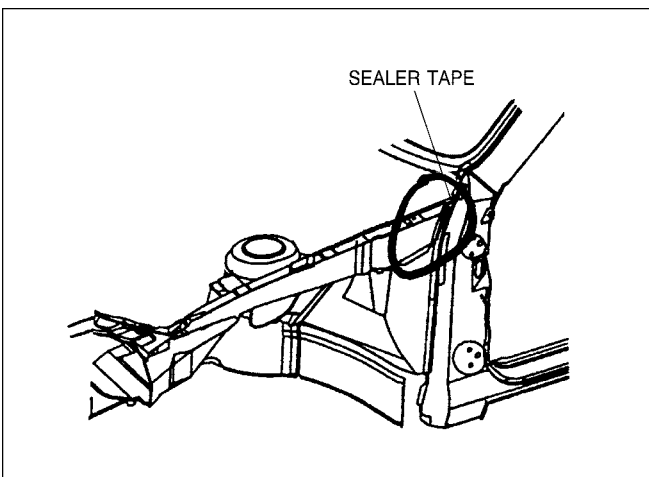


Fig. 29

11. Weld the brace wheelhouse.

- Spot weld the brace wheelhouse as shown.
- Make MIG or gas welds at the door hinge areas.

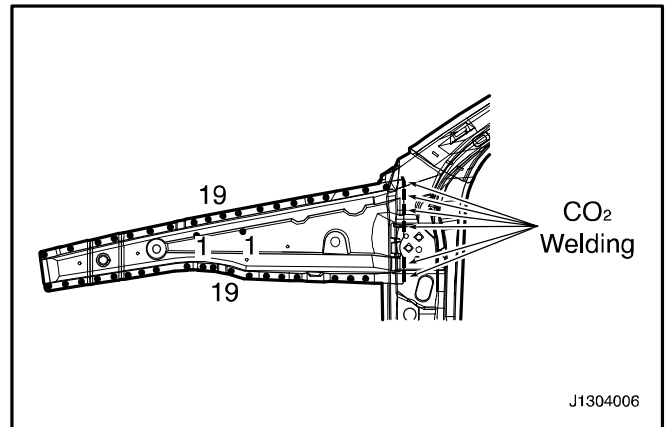


Fig. 30

12. Finish the welding areas.

- Use a hammer and dolly to even out the brace wheelhouse for a close fit with the surface of the wheelhouse.

13. Apply the sealer.

- Apply the sealer to the matching and overlapped surface.

14. Apply the undercoat.

- Undercoat to the inside of the front, rear wheelhouse and longitudinal.

15. Apply the paint.

CAUTION

- Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening paint container.
- Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- Paint is flammable. Store in a safe place, and keep it away from sparks, flames or cigarettes.

16. Coating the anti-rust agents.

- Coating the anti-rust agents to the end of front panel side and the door hinge areas.

17. Install the related parts.

- Clean the passenger compartment.
- Windshield, cowl and wiper.
- Wiring harness, instrument panel and related parts.
- Carpet, trims and weatherstrip.
- Door
- Fender and hood.
- Radiator grill, bumper and others.
- Install in the reverse order in which they were removed.

18. Check and adjust.

- Check the door for proper installation and operation.
- Check clearances and level differences.

- Check the hood locking and unlocking condition.
- Check all operation.
- Check for water leaks in the passenger compartment.

Note : Use specified check sheet for operation check properly.