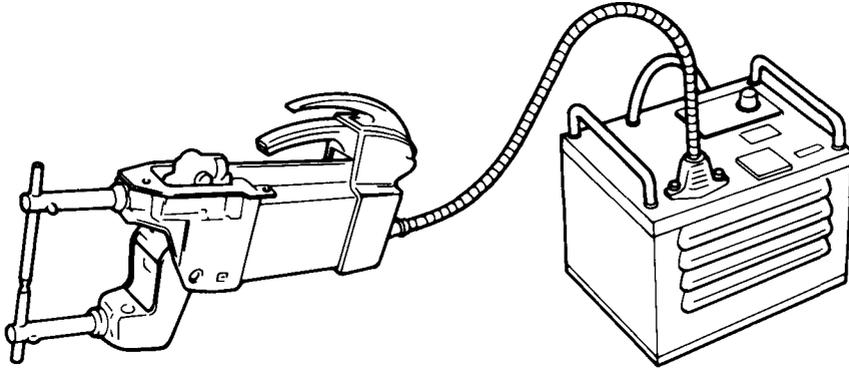


# Welding Methods/Repair Tools

## SpotWelding

Spot welding is also known as resistance spot welding, and it is the most suitable method of welding for automobiles. It has three main features: the welding can be performed instantaneously, it exercises very little effect on the mother material, and it reduces the generation of distortion to the absolute minimum. However, please remember to remove all paint and other impurities from the surface of the material you intend to weld for reliable results.

### Welders:



Spot welder

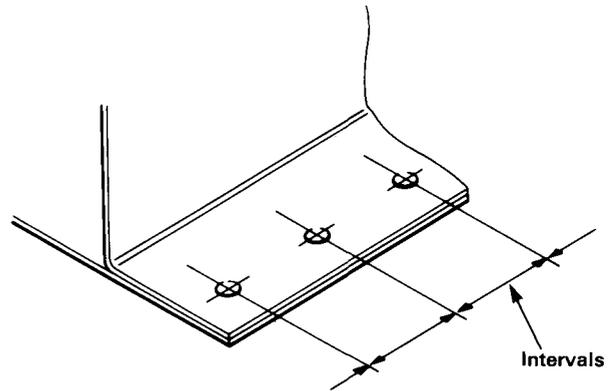
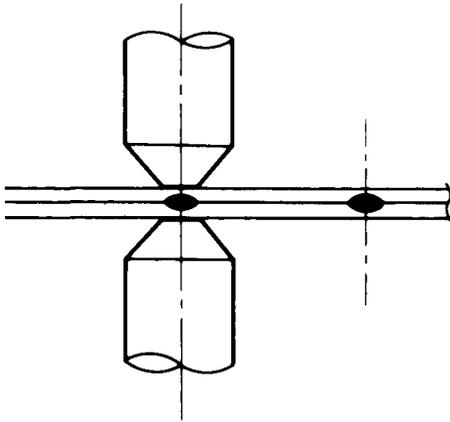
Timer

### Welding Conditions:

When performing spot welding, make absolutely sure that you conform to the conditions governed by the current, conductivity time, welding pressure, holding time, and shutdown time recommended for the spot welder.

Please bear in mind the following points when welding:

- Plate thickness and minimum welding pitch

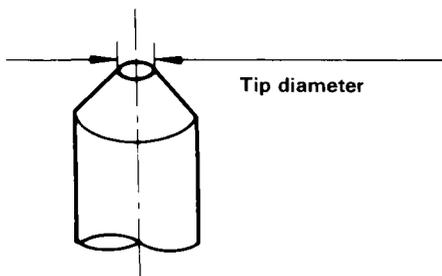


Unit: mm (in)

Plate thickness	0.6 (0.02)	0.9 (0.04)	1.2 (0.05)	1.6 (0.06)
Minimum intervals	11 (0.43)	16 (0.63)	20 (0.79)	24 (0.94)

NOTE: When the welding intervals are too small, this leads to branching, making it impossible to maintain the desired soldering state.

- Plate thickness and tip diameter



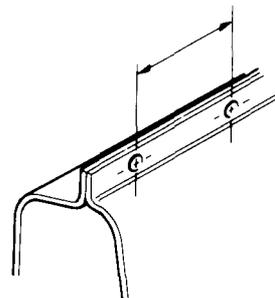
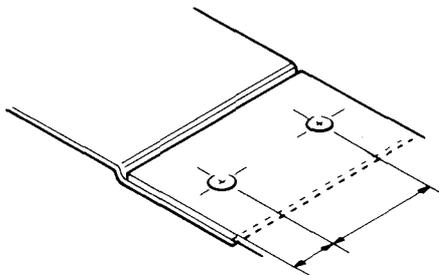
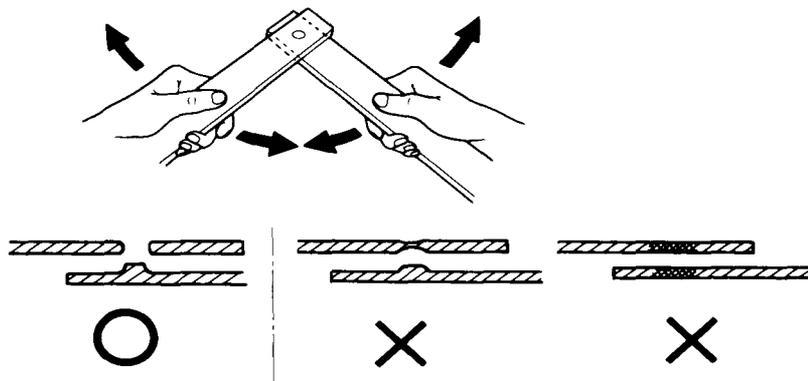
Unit: mm (in)

Plate thickness	0.8 (0.03)	0.9 (0.04)	1.2 (0.05)	1.6 (0.06)
Tip diameter	4.5 (0.12)	5.0 (0.2)	5.5 (0.22)	6.0 (0.24)

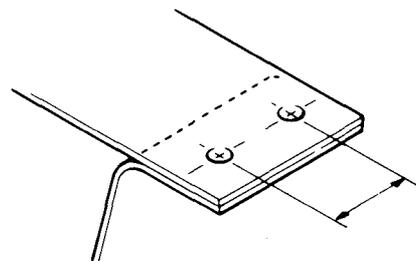
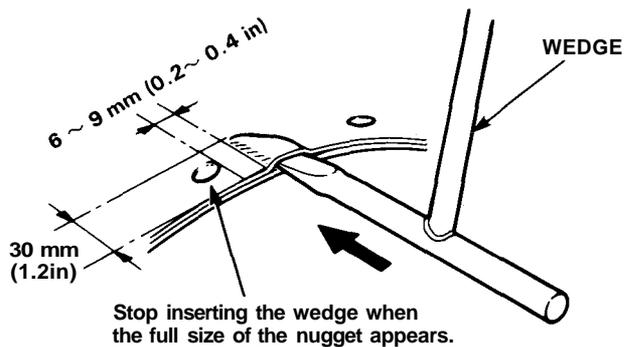
• **Welding Strength Test**

Even if you perform the welding in accordance with the conditions, the strength of the welded sections may fluctuate widely with drops in the voltage and other factors. The quality of the welding cannot be evaluated unless the welded sections are destroyed. Provide yourself with a steel plate of the same thickness and conduct a destruction test.

- If holes appear in the steel plates, this means that the welding is standard strength.



- Drive a wedge between two panels near the nugget. If the welded parts do not come apart and the diameter of the nugget is more than 3mm (0.1 in), the welding should be satisfactory.



**NOTE:**

It is difficult to perform spot welding in the following circumstances:

- When it is not possible to remove any rust or paint attached to the welding surfaces.
- When the tip of the spot welder cannot be inserted into the welding section.
- When the welding surfaces can be seen from the outside and welding will impair the exterior appearance.

In all these cases, the gas welding method should be employed. Moreover, if it is not possible to perform spot welding because of space restrictions, plug welding using on the arc welding method may be performed instead. For plug welding, the sections to be welded must be close together.