

In the following section, the main differences between aluminium and steel are itemised and notes on work safety are provided.

### 1.0 Mounting

Special measures	Reason
Store aluminium components in dry situation, and always store separately, or isolated from, steel components.	In damp atmosphere and in contact with steel, contact corrosion occurs.
Do not damage protective surface layer since this would cause oxidation.	Tendency for contact corrosion and paint migration. Extra work involved in painting. Restricted storage life.

### 1.1 Properties of aluminium

Comparisons with steel	Effects
Aluminium parts are non-magnetic and by up to 50 % lighter.	Aluminium components are easy to distinguish from steel parts by using a magnet.
The electrical conductivity is almost 4 times higher.	All electrical welding operations require higher currents and therefore more advanced equipment.
The elasticity module is only 1/3 as high.	Convertibility is limited in comparison with steel.
Elongation failure is approx. 50 % slighter.	When the material is stretched, cold strengthening, restriction of plate thickness and increased tendency to crack result.
Heat conductivity is 3 times higher, expansion is 2 times higher.	Heat dissipates more rapidly and the material expands more markedly.
At temperatures of between 200 °C and 250 °C, convertibility of the material is improved, but the original properties of the material are altered at the same time	Strength is reduced, elongation characteristics are improved.
Aluminium shows no thrust traces, the melting point is 650 °C.	The temperature can only be checked on the basis of paint discoloration, bulging of the surface and with the help of thermocouple pins.

### 1.2 Formation of corrosion

Cause	Effects
Through contact with materials with no special coating, e.g. copper, tin, nickel, iron and zinc, a plating (galvanic) process can initiate when moisture is introduced to the environment.	This plating process causes aluminium to be removed from the joint. Holes appear (corrosion).

Spare parts and accessories approved by BMW AG for aluminium manufacture (screws, washers, nuts, sealing materials etc.) are all subjected to a special form of surface treatment.  
Damaged parts lose their protective coating.

Contact corrosion takes place.

**Note:**

	Damage which occurs through contact corrosion is not included in the warranty.
A special tool kit is required for working with aluminium. Materials also used for work on steel components can implant steel particles in the softer surface of an aluminium component. Brass and copper-based tools aggravate the formation of these elements.	This gives rise to contact corrosion and holes can appear as a result.
The use of liquid compounds attacks the surface.	Risk of corrosion from chemical factors.

### 1.3 Work safety/safety precautions

Risks	Cautionary notes/specifications
There is a danger of explosion with fine aluminium dust in particular concentrations and quantities.	Refer to BMW-special tool Workshop Equipment.
Fine aluminium dust impairs health (respiratory diseases).	Note national regulations. In addition, comply with relevant regulations of UVV and BG (in Germany). During grinding work, always work with tools with integrated suction facilities.
Grinding through coated parts to the base material and grinding away large areas of the surface of uncoated parts generates a high concentration of fine aluminium dust. If this dust comes into contact with a naked flame, an explosion can result.	Use approved Explosive-Proof suction equipment. If the same suction equipment is also used when working on steel components, clean/empty any aluminium from the system before and after each operation, and even in the course of an operation if a great deal of dust is created.
Spontaneous combustion possible if the suction system draws in combustible items such as glowing chips from materials which produce sparks, cigarettes etc.	Do not allow fire sources of this kind to enter the vicinity of suction equipment. Danger of explosion!
When cleaning work surfaces before and after working with aluminium - a vital requirement - do not allow dust to swirl up.	No not use compressed air!