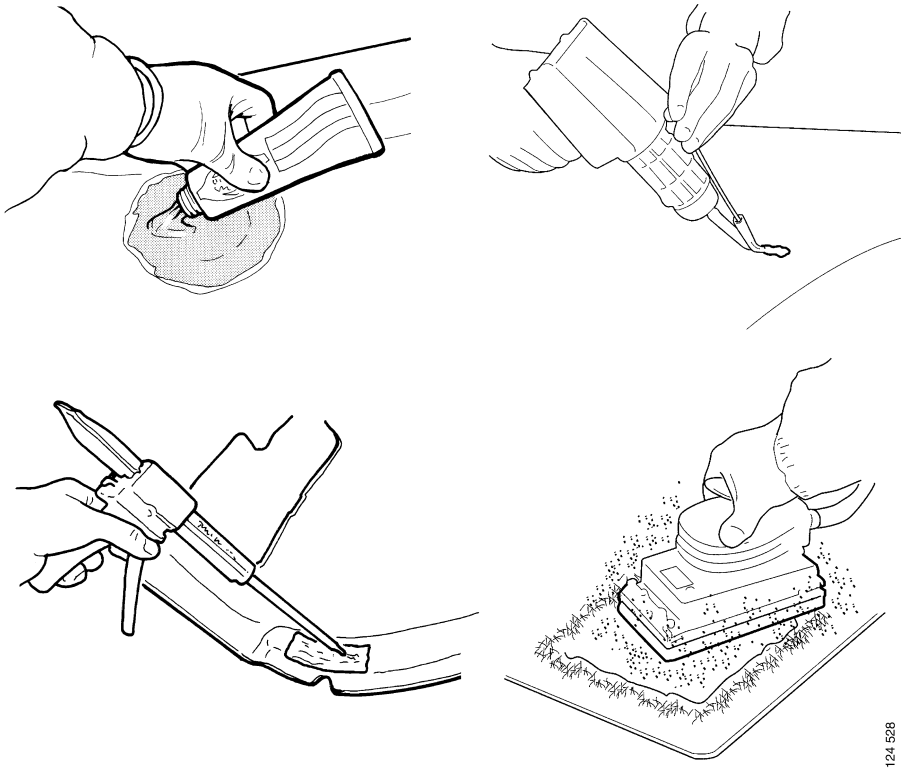
SCANIA

00:04-04

Issue 1 **en**

Plastic parts

External and internal repairs



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Contents

General

The booklet describes the work required to repair a damaged plastic part to regain its original form.

WARNING!

Always read the warning text on the packages of chemicals which you use for plastic repairs.

Plastics and solvents give off hazardous fumes. Work in well ventilated premises and use respiratory protection. Avoid skin contact with solvents and unhardened plastic and use protective gloves.

Grinding in connection with repairs to plastic parts results in dust which is detrimental to health. Use respiratory protection and protective gloves.

When heating plastic, there is a risk that fire will occur and a risk of smoke damage and skin burns.

Never mix more than 4 dl of thermosets at a time. Because of the vigorous heat development when the plastic hardens, fire can arise if a large quantity is left in the mixing container.

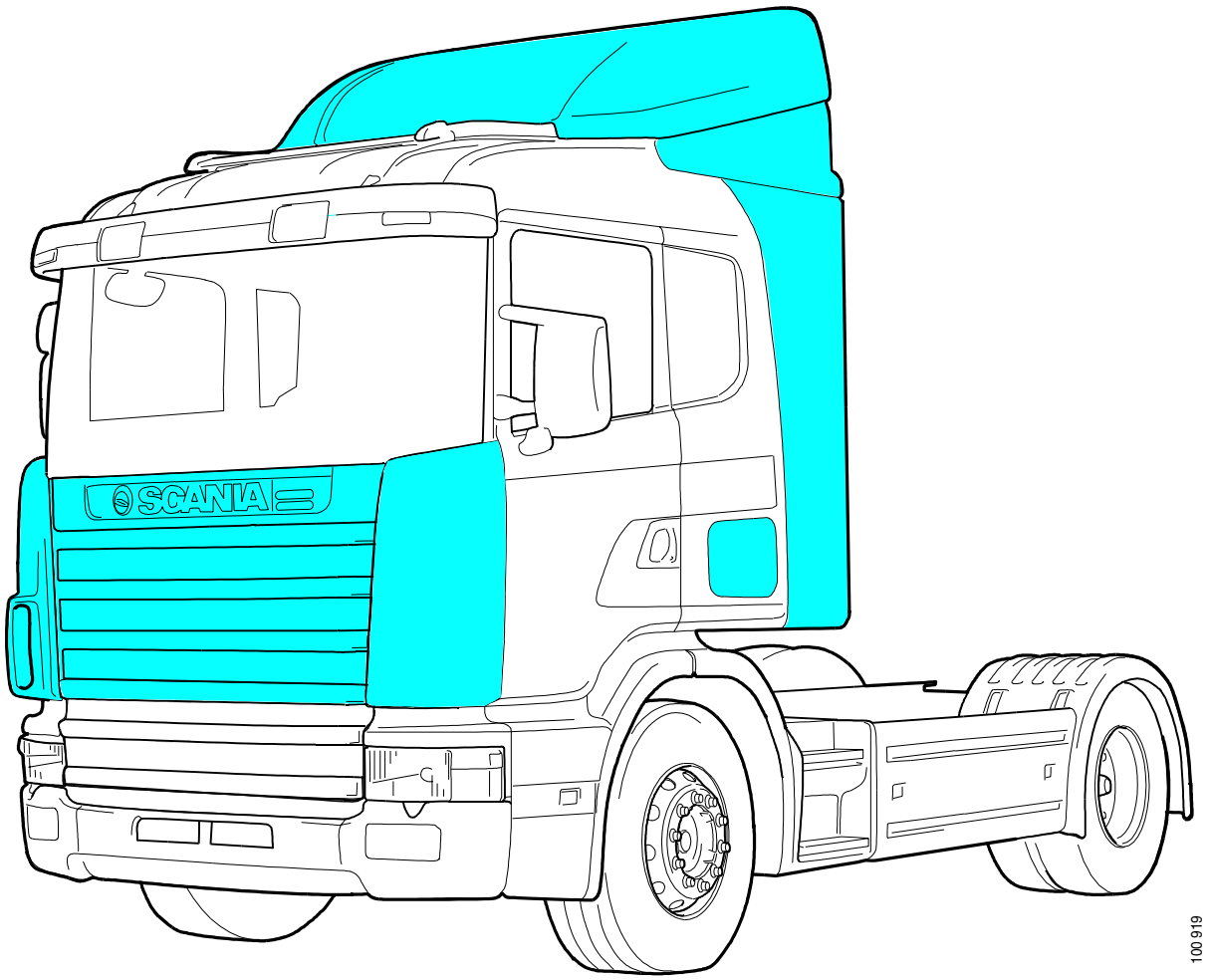
- Repairs to plastic should not be carried out at temperatures below 15°C.
- All surfaces and all material should be free from moisture.
- Carry out all repairs so that they are as free of air as possible to avoid blistering. This applies in particular to plastic parts which are vacuum moulded during production.
- The hardening time when repairing thermoplastics is shortened if the thermoplastics is heated up to a maximum of 70°C.
- Plastic discs, tape and cardboard, wooden boards, aluminium meshes or cast templates can be used as references or templates.
- A small amount of damage takes approximately 1 hour to repair. In the case of more extensive damage, consider whether it is more economical to repair or replace the part.

For painting, see the booklet Painting and Decoration Decals, workshop manual group 0.

For painting a structured surface, see the section Surface Treatment in this booklet.

Thermosets

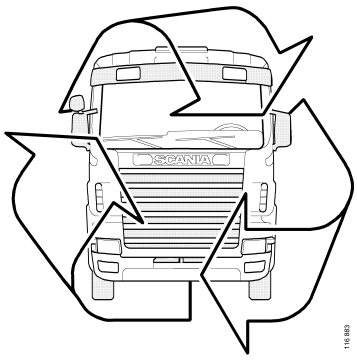
Thermosets are plastic prepared with hardeners which bind the plastic molecules to each other. Thermosets are strong and rigid but brittle. Therefore it is often reinforced with for example glass fibre mat.



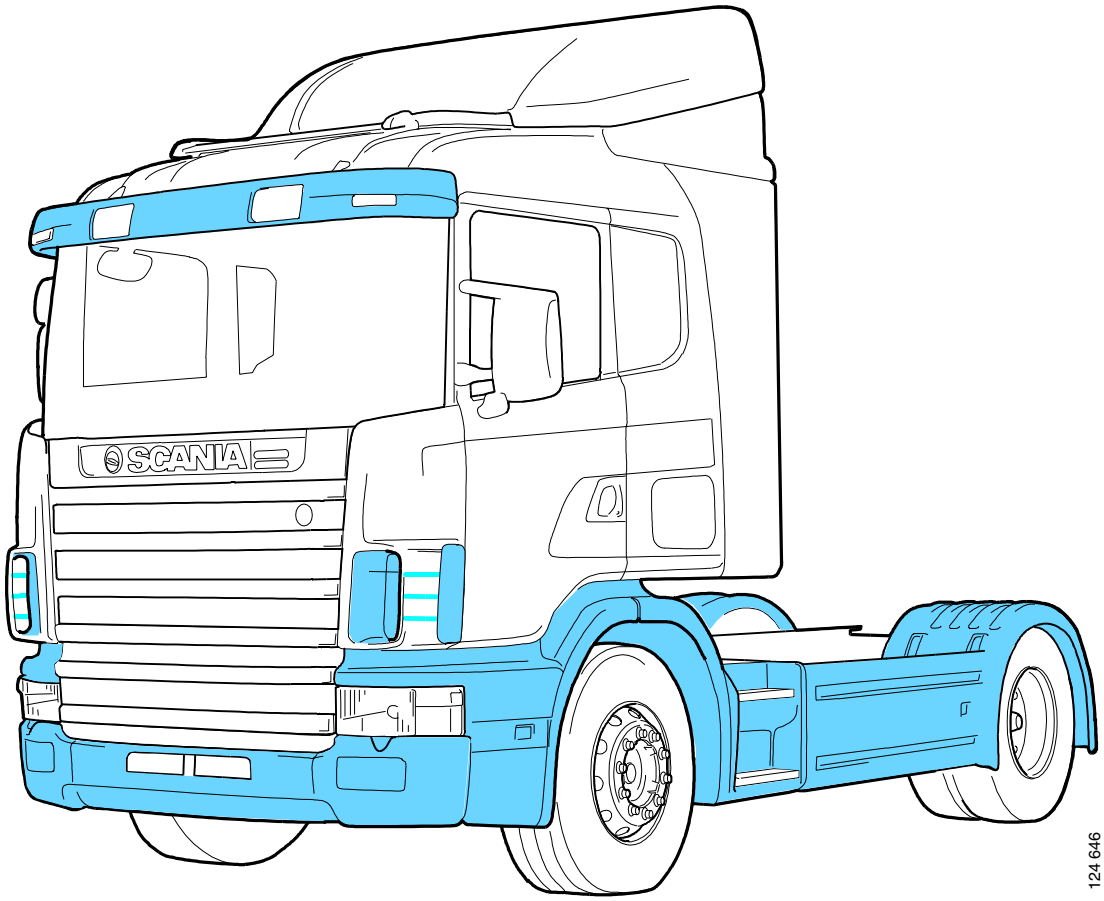
Parts in thermosets

Thermoplastics

Thermoplastics are cast or injection moulded and unlike thermosets they lack bonds between the plastic molecules. Thermoplastics can be repaired with good results, but generally the greasier a thermoplastic is, the harder it is to repair.



See the booklet *Recycling, Identification of polymer material, group 0* for detailed information about the different types of plastic.



Parts made of thermoplastic

Repairing thermosets

WARNING!

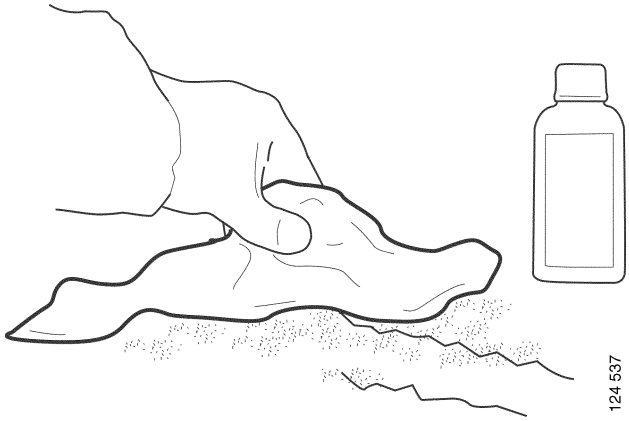
Never mix more than 4 dl of thermosets at a time. Because of the vigorous heat development when the plastic hardens, fire can arise if a large quantity is left in the mixing container.

IMPORTANT!

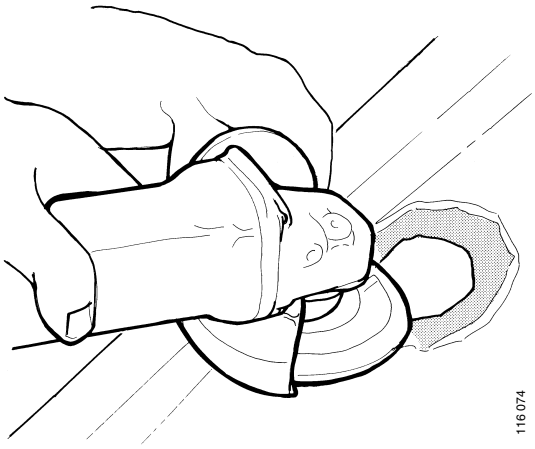
Clean the part before grinding it to prevent dirt from being ground into the plastic.

Do not wait longer than 12 hours between each new layer of plastic. If more than 12 hours have elapsed, the surface must be ground before new plastic can be put on it.

- Clean the area around the damage. Remove oil and grease with e.g. acetone and remove any wax residues with a silicon remover.



- Remove any loosely adhering layered material. Use a grinder with a grinding wheel for plastic.

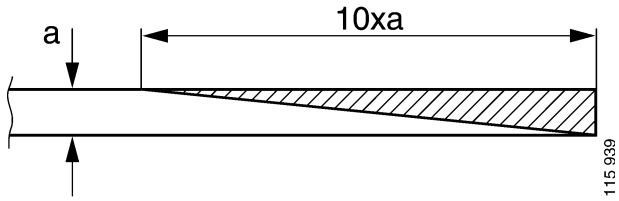


Deep, >2 mm or through damage and joints

1 Clean the damaged area.

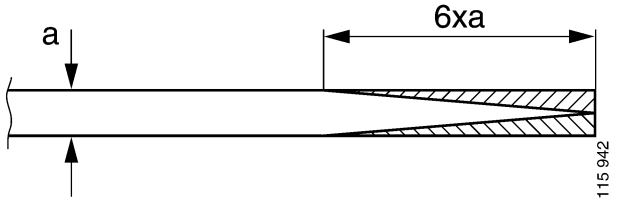
2 Chamfer the edges of the damage depending on the method of repair.

Chamfer 10x the material thickness on one side when repairing from one side.



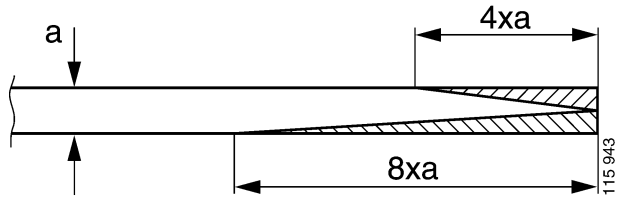
Chamfering of through damage when repairing from one side.

Chamfer 6x the material thickness on both sides when repairing from both sides.



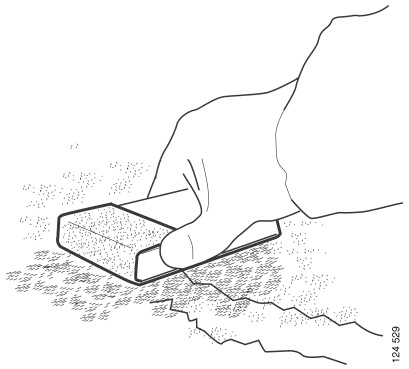
Chamfering of through damage when repairing from both sides.

Chamfer 8x the material thickness on the rear and 4x the material thickness on the front, when splicing.

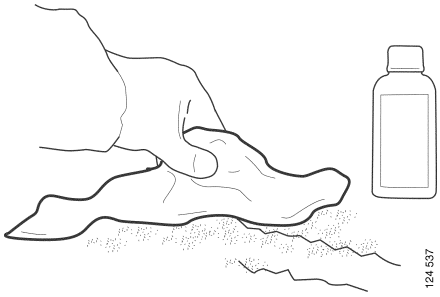


Chamfering joints.

3 Grind up the area in and around the damage with abrasive paper, grade 80.

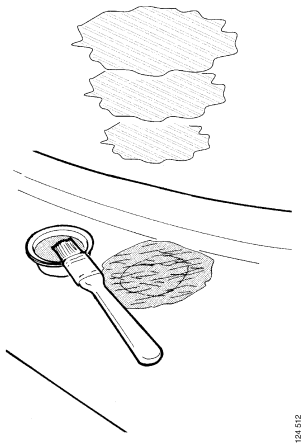


4 Wipe off the grinding dust and clean in and around the damage with acetone.



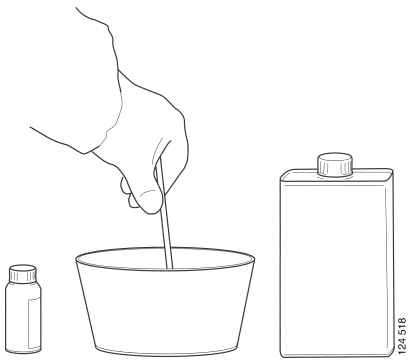
5 Cut the glass fibre mat to the appropriate shape after the chamfering. One layer of glass fibre mat per mm.

Example: Damage which is 3 mm deep should be repaired with 3 layers of glass fibre mat.

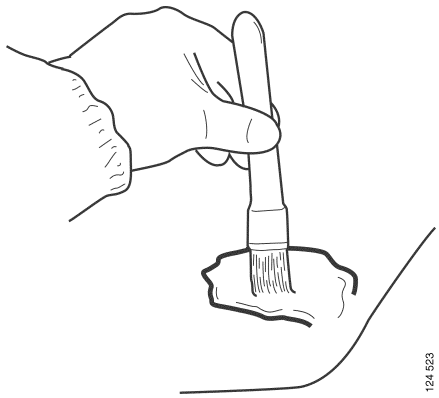


6 Mix plastic for approximately 15 minutes work. Use 2 component laminating epoxy. Bear in mind that 1 dl of plastic gives a surface area of 1 dm² which is 1 cm thick.

Mix a maximum of 4 dl at a time since there is a risk of self-ignition.

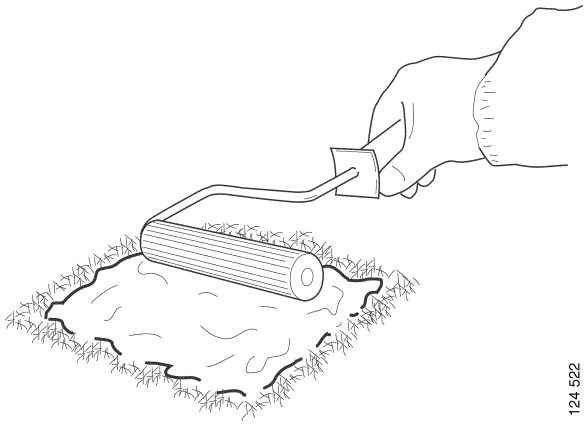


7 Lay a thick layer of plastic on the ground surfaces with a brush.

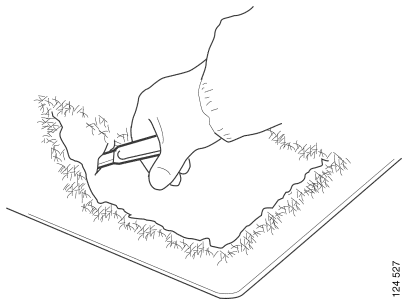


8 Put on the first glass fibre mat and work in the plastic with a brush or metal roller. Apply layer after layer and work the plastic into the glass fibre mat.

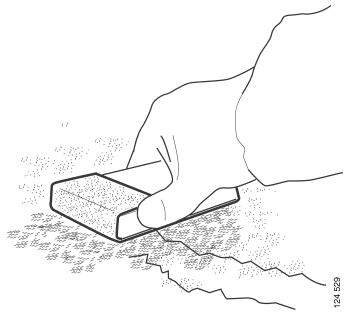
Make sure that no air bubbles are left and that the uppermost layer is as even as possible.



9 Cut off any excess plastic when it is semi-hardened.

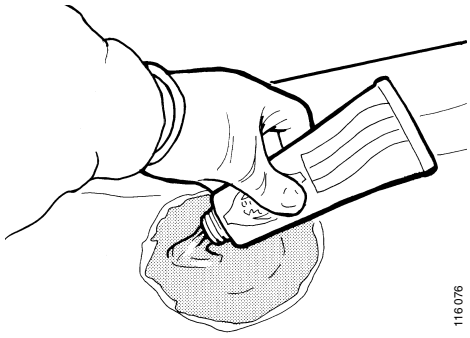


10 When the surface has become rigid, smooth the surface with a grinder or by hand with abrasive paper, grade 60.



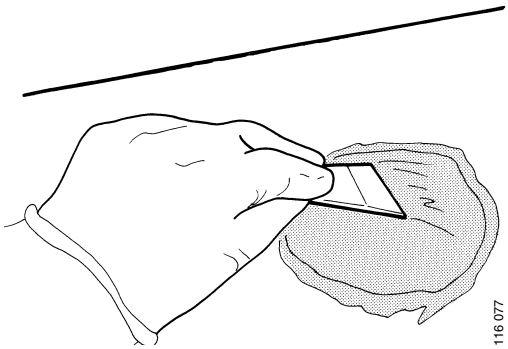
11 Fill the surface with putty.

12 Grind with abrasive paper, grade 120.

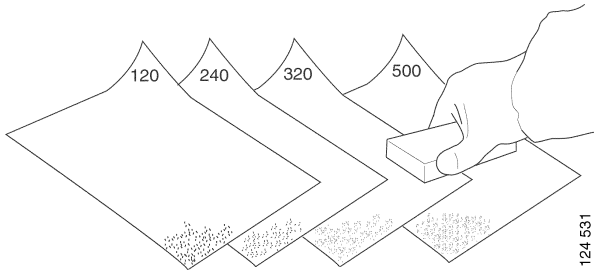


13 Fill the surface with putty, e.g. PP Ultima, PP Elastic, PP Fine putty or equivalent. PP = Plastic Padding.

14 Grind with abrasive paper, grade 240-320.



15 Fill with the final putty and grind with abrasive paper, grade 500. Apply primer to the repair if it will not be painted in connection with the repair. If the surface is left unpainted, the putty can absorb moisture which can destroy the repair and make the surface difficult to treat later on.

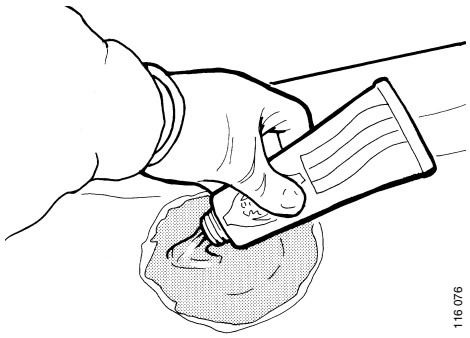


Surface damage, 1-2 mm

1 Clean the surface.

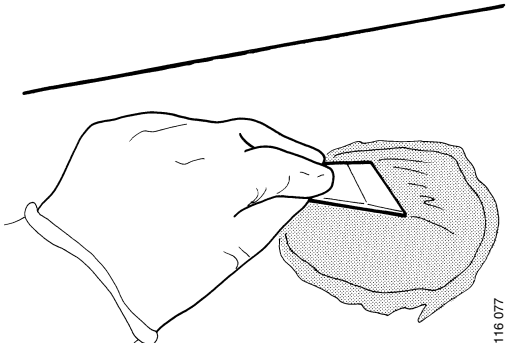
2 Fill the surface with putty.

3 Grind with abrasive paper, grade 120.



4 Fill the surface with putty, e.g. PP Ultima, PP Elastic, PP Fine putty or equivalent. PP = Plastic Padding.

5 Grind with abrasive paper, grade 240-320.



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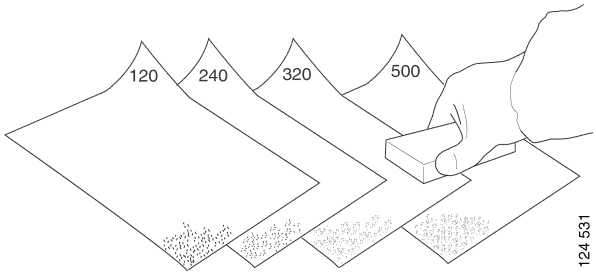
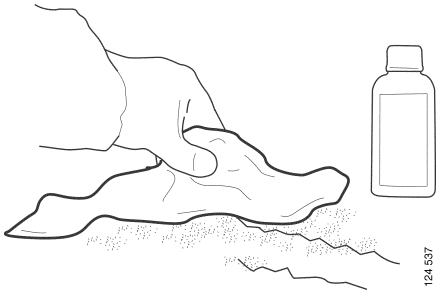
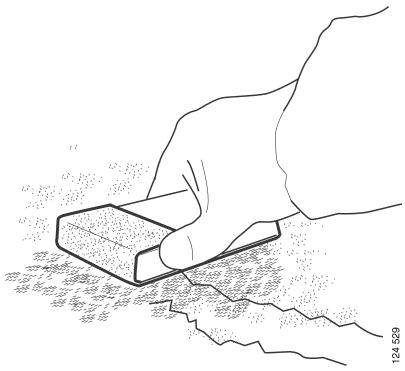


Cracks

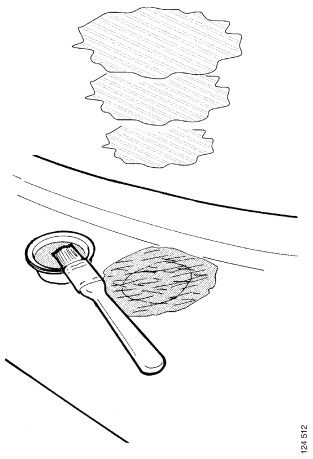
1 Clean the area on both the front and back.



2 Grind the back with abrasive paper, grade 80.

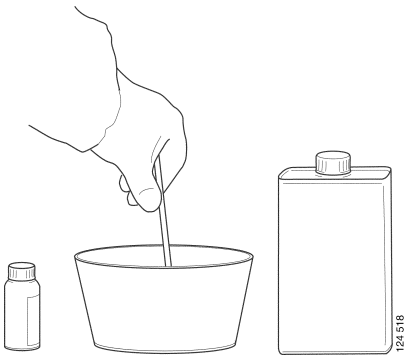


3 The area on the back should be reinforced with plastic and three layers of glass fibre mat. This should provide a reinforcement which is approximately 3 mm thick.

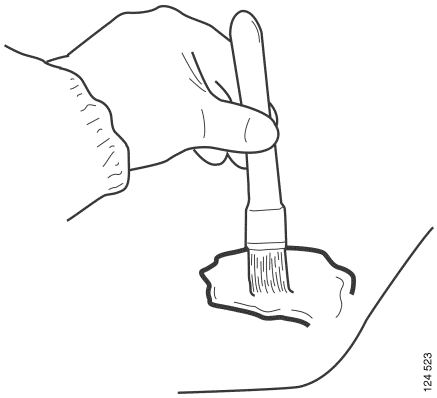


4 Mix plastic for approximately 15 minutes work. Use 2 component laminating epoxy. Bear in mind that 1 dl of plastic gives a surface area of 1 dm² which is 1 cm thick.

Mix a maximum of 4 dl at a time since there is a risk of self-ignition.

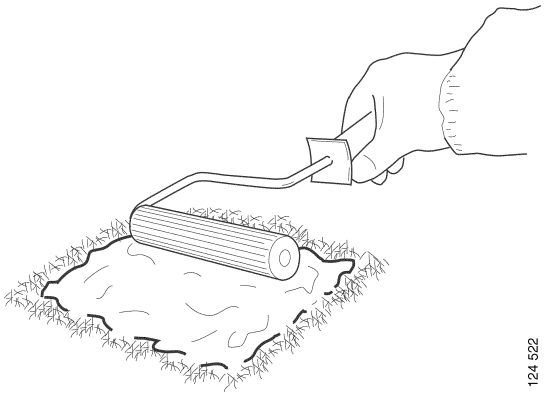


5 Place a thin layer of plastic on the ground back surface with a brush.

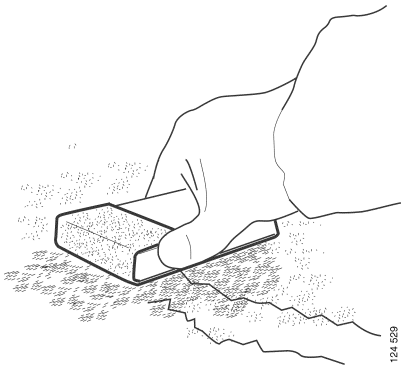


6 Put on the first glass fibre mat and work in the plastic with a brush or metal roller. Apply layer after layer and work the plastic into the glass fibre mat.

Make sure that no air bubbles are left and that the uppermost layer is as even as possible.



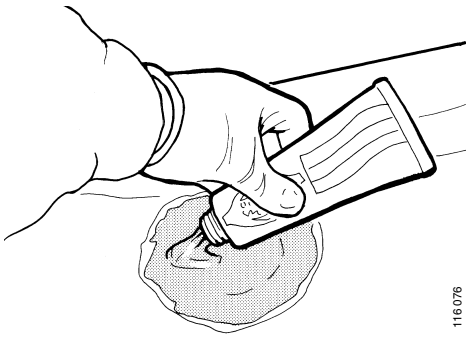
7 Grind up the area on the front around the repair with abrasive paper, grade 80.



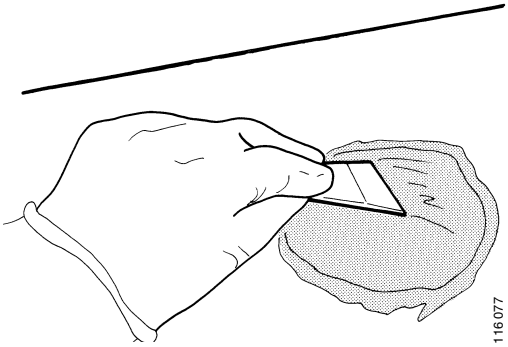
8 Wipe off the grinding dust and clean in and around the crack with acetone.

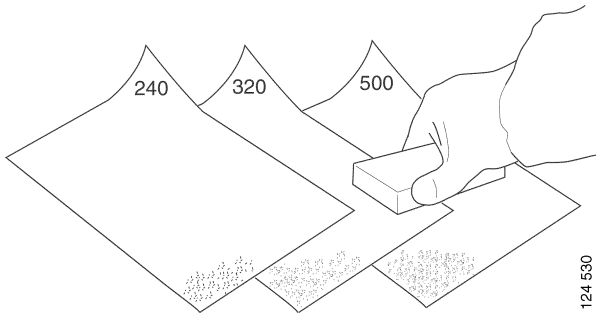
9 Fill the surface with putty, e.g. PP Ultima, PP Elastic, PP Fine putty or equivalent. PP = Plastic Padding.

10 Grind with abrasive paper, grade 240-320.



11 Fill with the final putty and grind with abrasive paper, grade 500. Apply primer to the repair if it will not be painted in connection with the repair. If the surface is left unpainted, the putty can absorb moisture which can destroy the repair and make the surface difficult to treat later on.



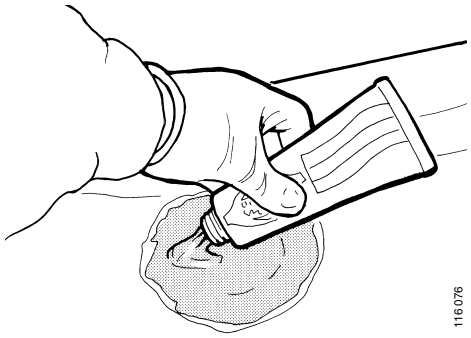


Scores

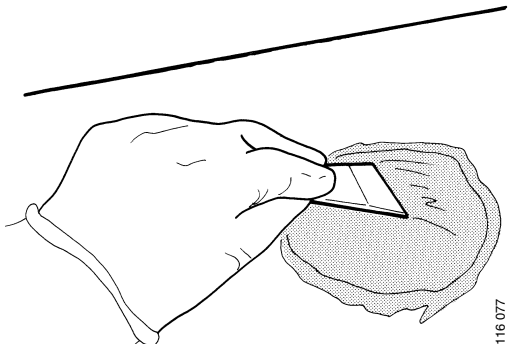
1 Clean the surface.

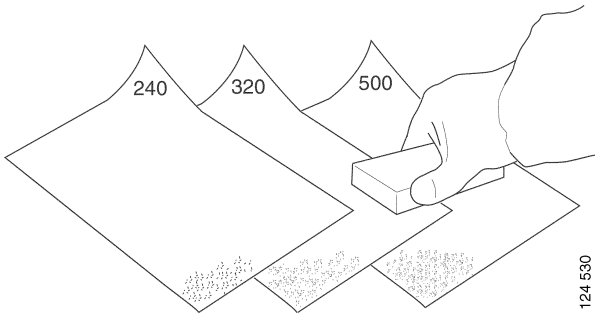
2 Fill the surface with putty, e.g. PP Ultima, PP Elastic, PP Fine putty or equivalent. PP = Plastic Padding.

3 Grind with abrasive paper, grade 240-320.



4 Fill with the final putty and grind with abrasive paper, grade 500. Apply primer to the repair if it will not be painted in connection with the repair. If the surface is left unpainted, the putty can absorb moisture which can destroy the repair and make the surface difficult to treat later on.

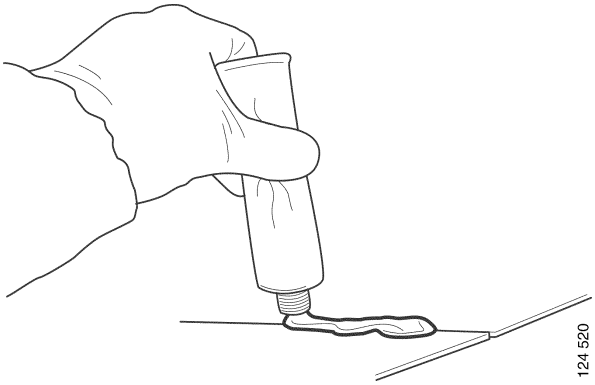




Repairing thermoplastics

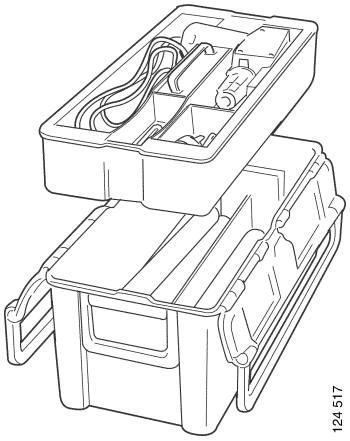
Thermoplastics are generally repaired in two different ways, by gluing or welding.

With gluing, an adhesive is used which after hardening has similar properties to the plastic in other respects.

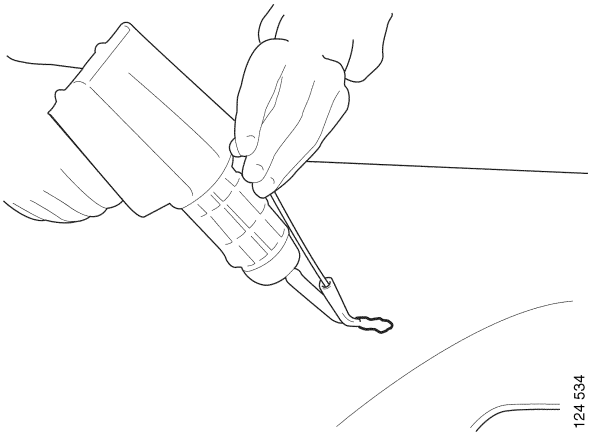


Use tool kit 588 585 when welding plastic parts.

588 585

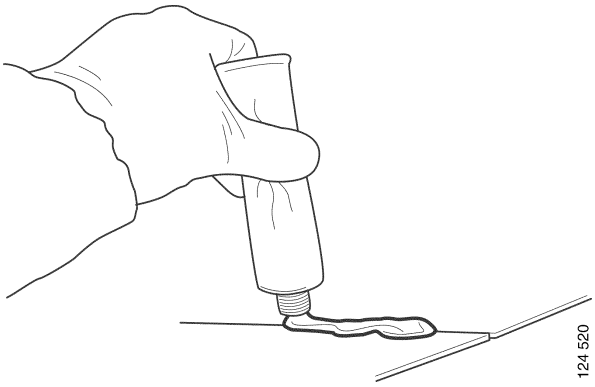


During welding, welding guns are used which heat up the plastic to its melting point at the same time as adding a special fusing wire for the plastic concerned.



Gluing

- The method can be used on most types of plastic.
- Minor damage on internal parts can be glued with good results.
- Do not mix different types of metal when this is used as reinforcement during gluing.



Products which are used in this description

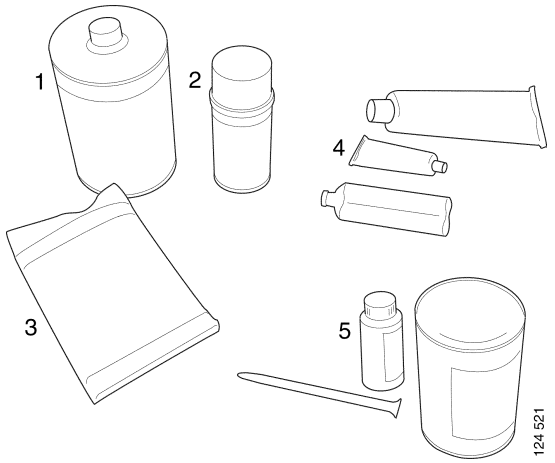
1 *Cleaner Teroson FL.*

2 *Teroson plastic primer, Terokal 150.*

3 *Teroson plastic glue, Terokal 9225.*

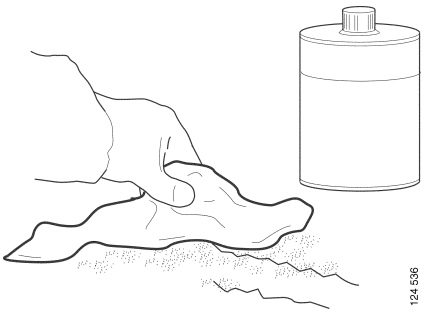
4 *Putty, Plastic Padding Elastic.*

5 *Two-component structural paint.*

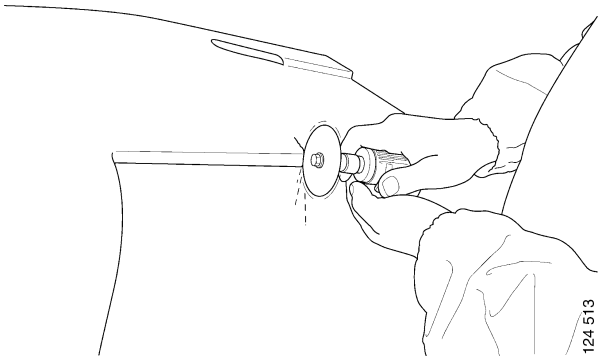


1 Clean the part before it is machined. Remove asphalt splashes, insects, etc. with white spirit. Then clean with degreaser, soap and water.

Make sure that all the detergent is washed off with cold water. If degreaser and detergent are not washed away completely, black plastic parts will become grey-coloured.

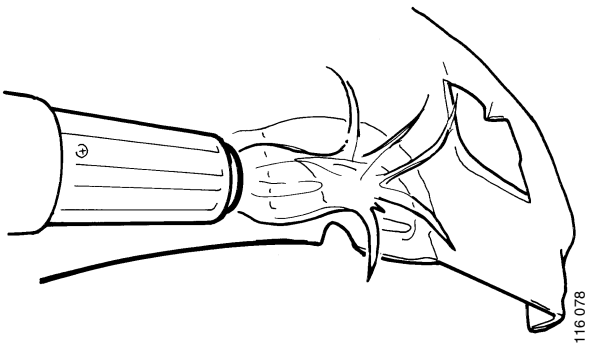


2 Cut off the edges of the damage so that no sharp edges or borders are left.



3 Heat the plastic from both sides with a hot air gun until the plastic becomes workable.

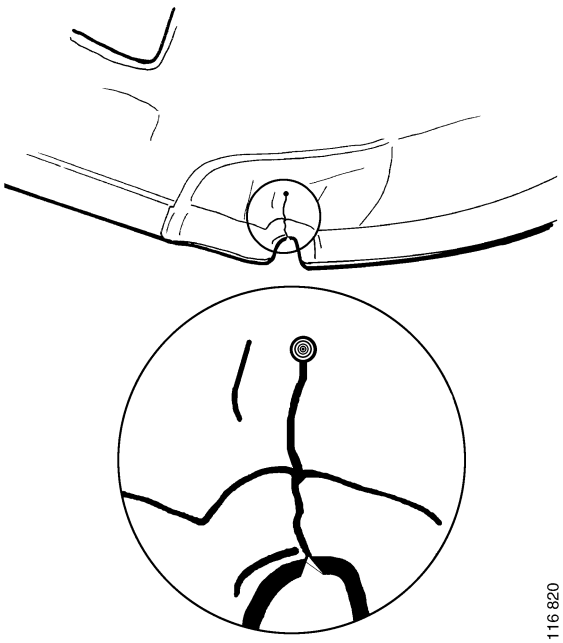
IMPORTANT! Make sure that the plastic does not become too hot. When the temperature approaches the melting point of the plastic, the plastic becomes shiny.

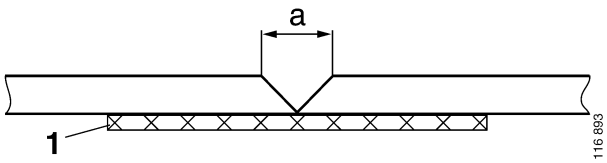


4 Prepare a reinforcement for Terokal 9225 of e.g. woven glass or aluminium mesh.

5 Chamfer the edges of the damage. Grind with abrasive paper 60-80.

•Cracks are chamfered approximately 5 mm from the front and stop drilled on the rear Ø 3-4 mm.

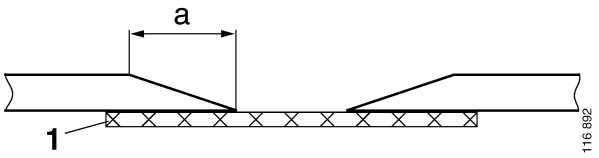




1 Woven glass/aluminium mesh

a = 5 mm

•Through damage is chamfered approximately 10-20 mm on each side of the damage.



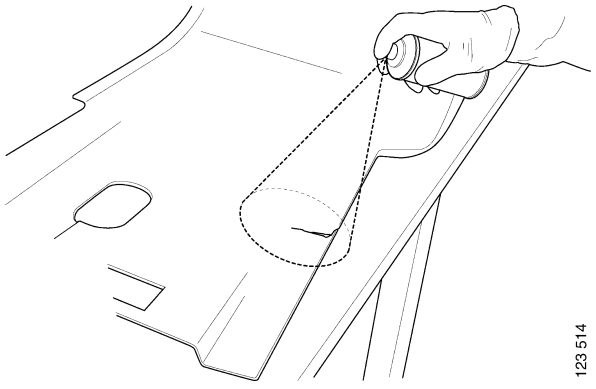
1 Woven glass/aluminium mesh

a = 10-20 mm

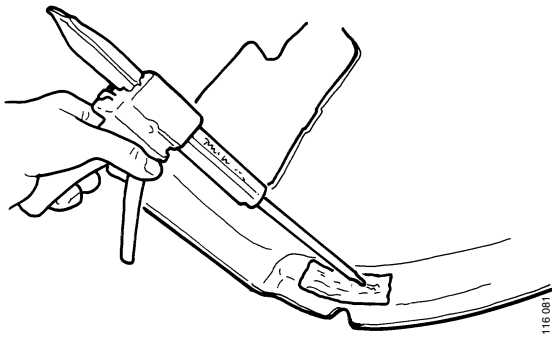
IMPORTANT!

Ground surfaces should always be cleaned with FL, drying time approximately 10 min.

Then prime with Terokal 150, drying time approximately 10-15 min. before each layer of Terokal 9225 which is to be applied.

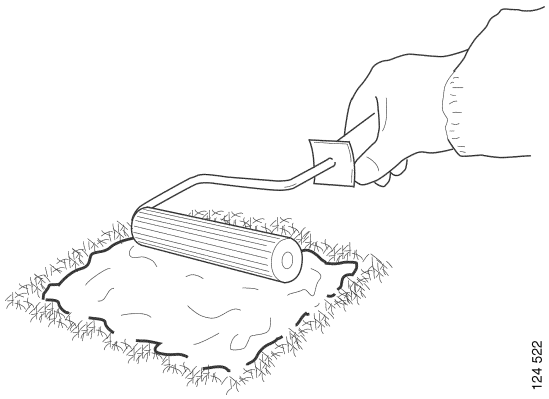


6 Glue the reinforcement on the back with Terokal 9225.

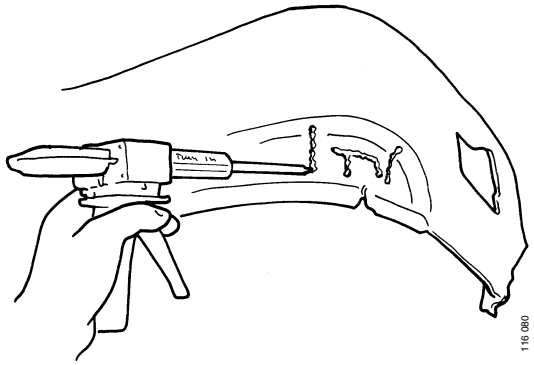


IMPORTANT! After each application of Terokal 9225, the compound should harden for 2 hours at room temperature. The hardening can be accelerated by heating up the part to approximately 60-70°C for 15 min. Cut off any excess glue before the compound has become fully hardened.

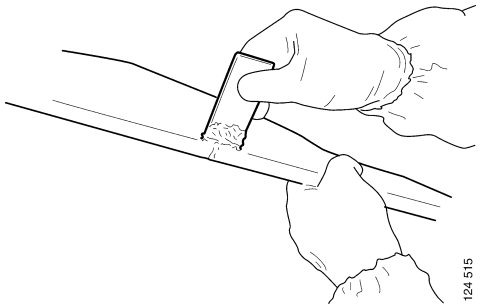
7 Apply another layer with woven glass and Terokal 9225. The woven glass should extend 40-50 mm beyond the edges of the damage. Work the compound into the fabric with a metal roller. Allow the repair to dry.

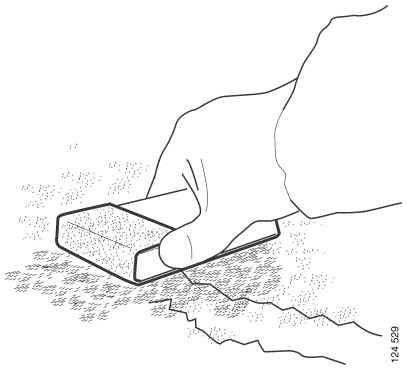


8 Fill visible surfaces with Terokal 9225 putty and grind with abrasive paper 240.



9 Fill air holes and pinholes with Plastic Padding Elastic putty again and grind with the abrasive paper, grade 340 and 500.

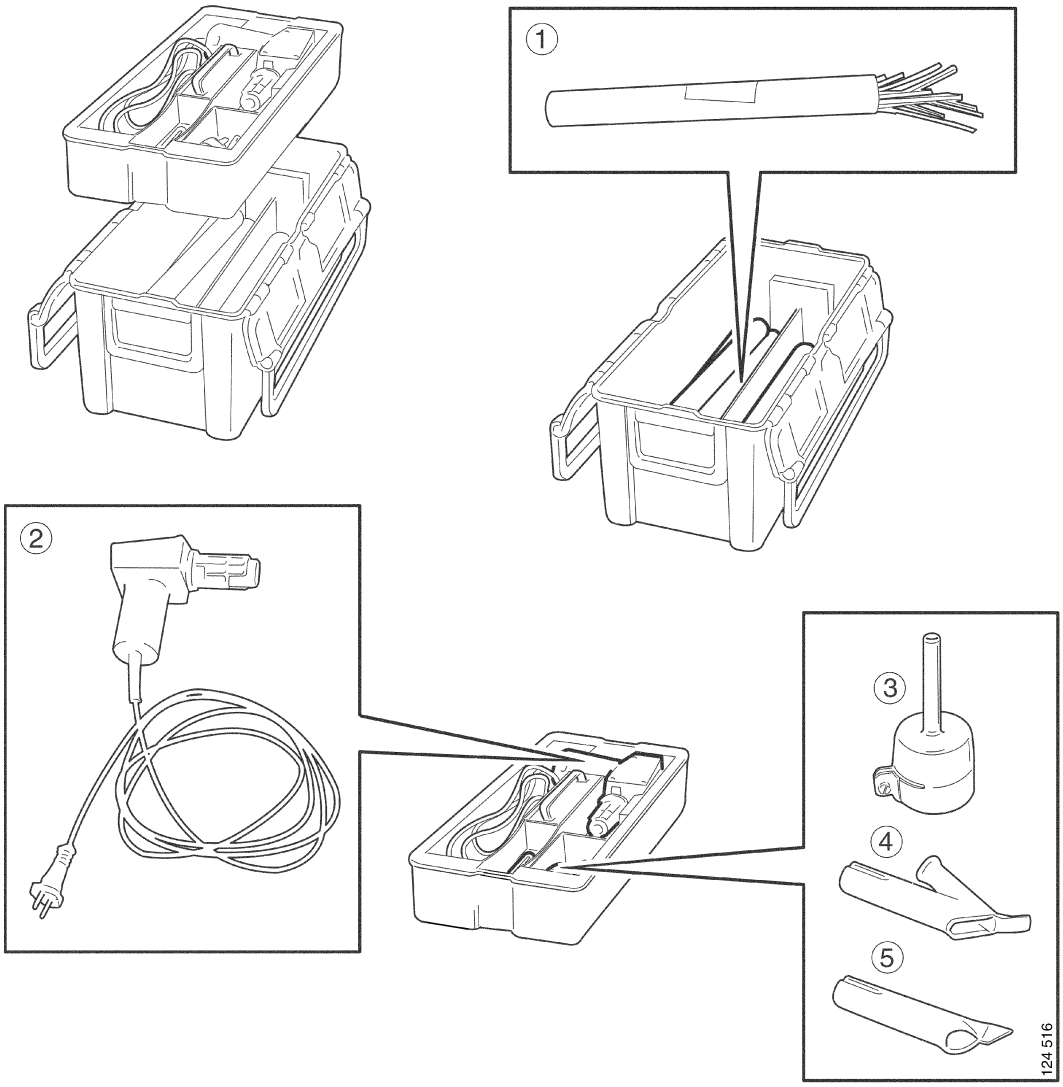




Welding

Welding equipment

588 585



1 *Welding rods, see Overview diagram.*
2 *Welding gun 588 586.*
3 *Blow nozzle 588 587.*
4 *Welding nozzle 588 588.*
5 *Tack welding nozzle 588 589.*

Overview diagram

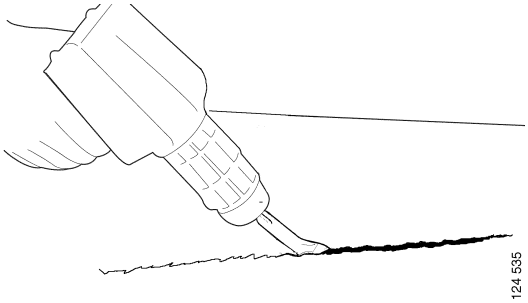
Type of plastic	Welding rod No.	Welding temperature °C
PC/ABS	588 591	350
PC/PBT	588 593	350
PE	588 594	270-300
PP, black	588 590	300
PP, beige	588 592	300

1 Clean around the damaged area on both the front and back.

Use water-based detergent or possibly a mild solvent.

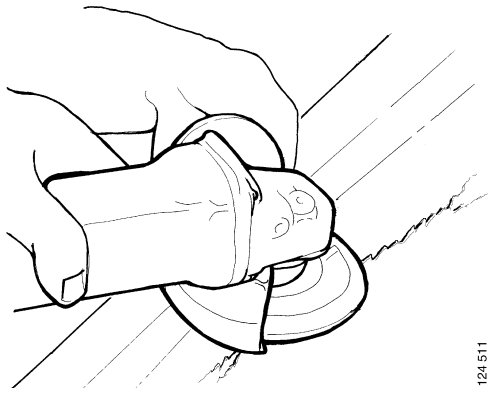
2 Identify the type of plastic. The type of plastic is generally marked with moulded text on the plastic part. See also booklet *Recycling, Identification of polymer material, group 0*.

3 Define the damage on the outside with the tack welding nozzle.

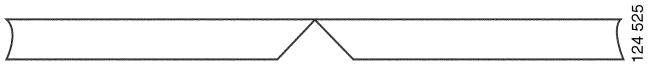


4 Grind off any paint on the inside around the welding area.

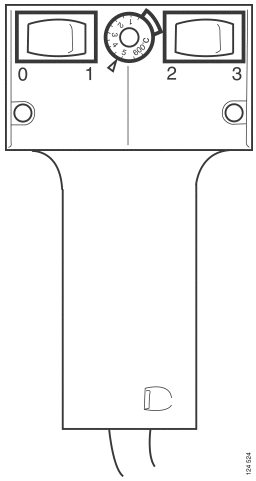
Grinding is also particularly important on PE plastics to remove the oxide layer before welding. The welding rod for PE plastic can also be ground before welding.



5 Mill or cut a 90º V-shaped track on the inside.



6 Choose the correct welding rod and set the correct welding temperature on welding gun 588 586 for the appropriate plastic and welding rod. This is important. See Overview diagram



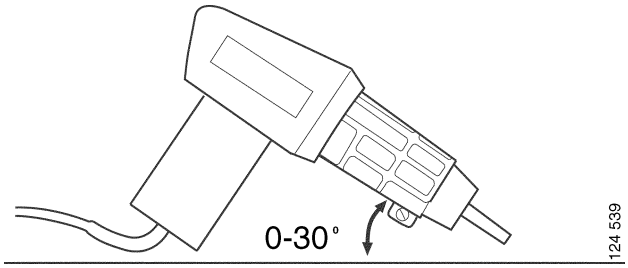
0 - 1: From and To

2 - 3: Fan speed, low and high

Red knob:

Temperature setting

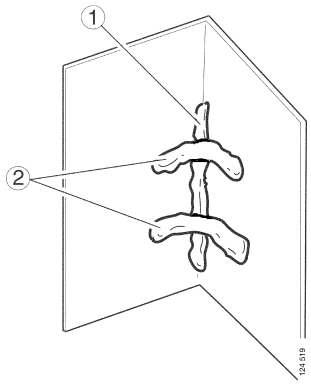
7 Weld the damage. Weld with an angle of 0-30º between the welding gun nozzle and the underlayer.



You should apply reinforcement welds over the weld joints at particularly exposed points. E.g. corners.

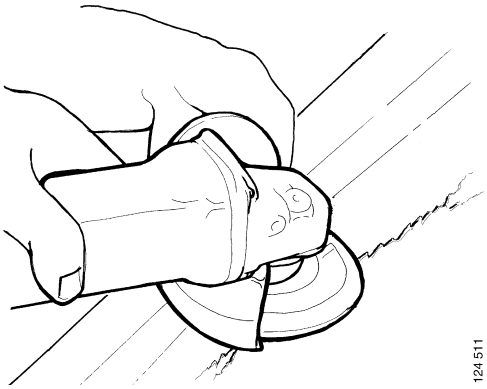
1. Weld joint

2. Reinforcement weld

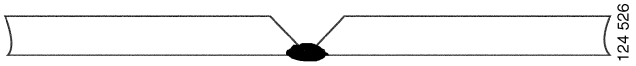


8 Grind off any paint on the outside around the welding area.

Grinding is also particularly important on PE plastics to remove the oxide layer before welding. The welding rod for PE plastic can also be ground before welding.



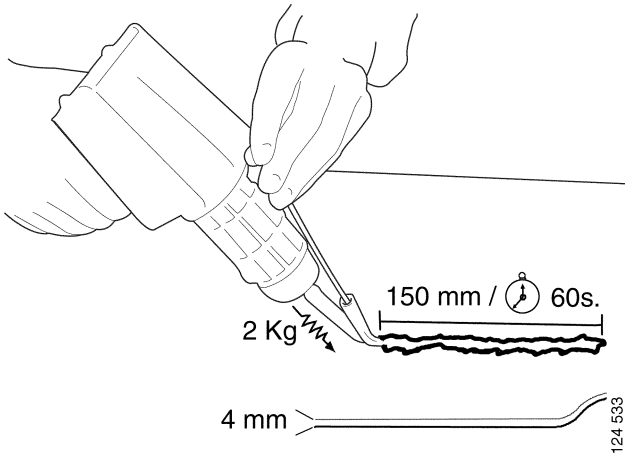
9 Mill or cut a 90º V-shaped track on the outside.



10 Weld the outside.

The welding speed and pressure depend on the wall thickness and how deep the damage is. Approximately 15-20 cm per minute and 2 kg pressure for 3-4 mm wall thickness.

Generally speaking, it can be said that you will see from the welding result whether the welding speed and welding pressure are correct.



11 If the repair is to be surface treated, grind down the repair and fill it with Plastic Padding Elastic.

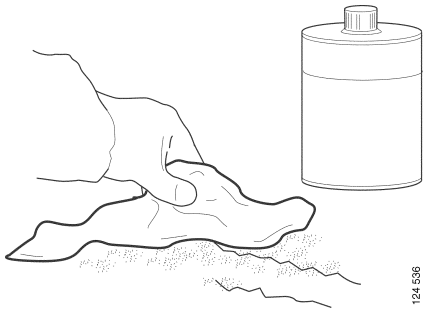
For painting, see the section *Surface Treatment* or see the booklet *Painting and Decoration Decals, workshop manual group 0*.

Surface treatment

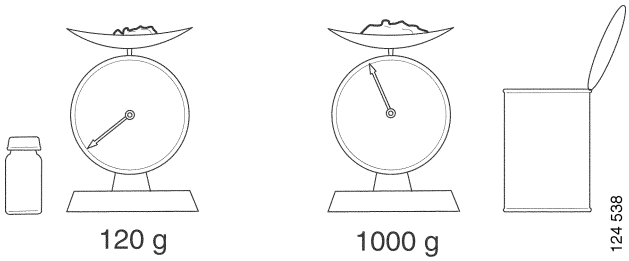
The surface finish of the part is restored by using ready-mixed structural paint for Scania vehicles in the correct shade.

Painting

1 Clean the part with Teroson FL.



2 Mix the structural paint with hardener. 120 g of hardener are added to 1000 g of ready-mixed structural paint.



3 Use a gravity-fed spray gun with nozzle 1.8-2.4 HVLP and spray the part according to the “drop method” until the surface has obtained the correct structure. The higher the air pressure in the sprayer the finer the structure will be.