

## THE 2009 NISSAN GT-R, HIGH PERFORMANCE AND PRECISION

The 2009 Nissan GT-R is Nissan Motor Company's new "multi-performance supercar." The "supercar" title is because of the capabilities the GT-R has to be driven as a multi-passenger vehicle for everyday driving in all types of weather and road conditions, while also being capable of race car handling and high-speed performance (see Figure 1). A limited number of GT-R vehicles will be sold this year in North America.

Nissan recommends repairs on the GT-R only be done by trained technicians at certified Nissan GT-R collision repair facilities. There is recommended equipment for the facility, and at least one representative of the facility must attend a one-day live program at the I-CAR Tech Centre.

### STRUCTURAL DESIGN

The GT-R uses a multi-material design of high-strength steels, aluminum, and carbon fiber. The mix of materials gives the GT-R a favorable ratio of high power to low weight and helped Nissan achieve a tight build tolerance.

High-strength steel is used for most of the GT-R structure, such as the front and rear lower rails and the A-pillars. Ultra-high strength steel is used in parts of the door opening internal

structure to increase occupant safety (see Figure 2 on page 3). Squeeze-type resistance spot welding is the primary joining method used for the steel structure. Laser welding is used in the front corners of the roof and on the package tray. Laser welding joins panels where they overlap by fusing the materials with a laser beam, welding through the top panel, joining it with the panel underneath (see Figure 3).

Cast aluminum is used for the GT-R front strut towers, door shells, and rear bulkhead (see Figure 4). The front strut towers and rear bulkhead are attached to the steel structure using adhesive and bolts. The adhesive is used to increase structural integrity and to act as an isolator between the dissimilar metals, preventing galvanic corrosion (see Figure 5).

Carbon fiber panels, along with plastic and sheet-molded compound panels, are used to completely close out the GT-R underbody. This gives the GT-R very low drag co-efficiency, increasing the aerodynamics of the vehicle. Carbon fiber is also used for the radiator core support, which is bolted to the front steel structure.

### COLLISION REPAIRS

With the introduction of the GT-R, Nissan dealers that are authorized



Figure 1- The 2009 Nissan GT-R is Nissan's new "multi-performance supercar."

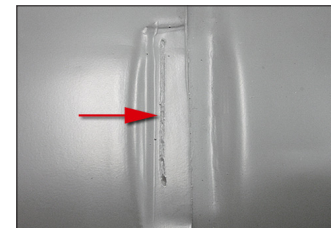


Figure 3- Laser welding is used on areas of the roof, quarter panel, and package tray.

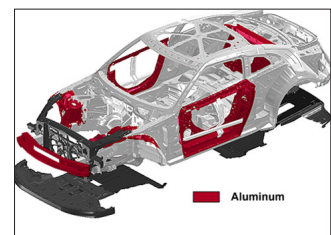


Figure 4- The front strut towers, door shells, and rear bulkhead are cast aluminum.

to sell the GT-R must be affiliated with a Certified Nissan GT-R body shop. Nissan recommends that all structural repairs and other specific repairs be done by Certified Nissan GT-R body shops (see Figure 6).

Nissan North America contracted I-CAR to develop and deliver a one-day live training program for selected collision repair facilities. The one-day live training covers vehicle concept, structural design, and in-depth vehicle repair processes and recommendations (see Figure 7). Along with having one representative attend training, the repair facility must also use a dedicated fixture system for GT-R structural repairs. Nissan recommends the use of a Celette dedicated fixture system to help restore the original accuracy to the vehicle.

The GT-R has a four-stage refinish color available. The four-stage silver metallic, Nissan color code KAB, is applied at the

factory as a basecoat (1), clearcoat (2), ultra-silver-affect basecoat (3), and final clearcoat (4) to make the four-stage finish (see Figure 8). Refinishing technicians should check with their specific product maker for recommendations on replicating this new four-stage color.

### CONCLUSION

The 2009 Nissan GT-R has a high level of accuracy placed throughout the construction and design. While minor cosmetic repairs and refinishing processes may be done by any well established collision repair facility, Nissan has taken steps to promote that structural damage be repaired at a Certified GT-R body shop. The facility must have the recommended equipment to restore the original accuracies of the vehicle and trained technicians that attended the one-day live program at the

I-CAR Tech Centre. Nissan is taking these steps for the benefit of GT-R owners, in the event of collision damage to their GT-R vehicle, that trained technicians will have the skills to achieve a complete and safe repair.

For comments or suggestions on the Advantage Online, please contact I-CAR Senior Instructional Designer Bob Jansen at bob.jansen@i-car.com.



Figure 5– Galvanic corrosion can occur between dissimilar metals if precautions are not taken.

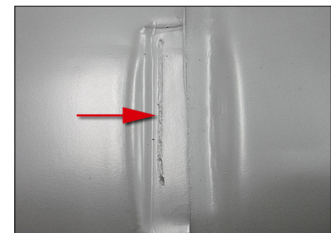


Figure 7– One day live training on the Nissan GT-R is conducted at the I-CAR Tech Centre in Appleton, WI.



Figure 8– Nissan color code KAB is a four-stage refinishing color from the vehicle maker.

Damage Grade	Judgement Standard	Example of Specific Operation	Remarks
A	<ul style="list-style-type: none"> <li>There is damage to frame parts</li> <li>Replacement of door opening parts</li> <li>Damage to the extent that the roof replacement is necessary</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of member</li> <li>Replacement of sill</li> <li>Replacement of lock pillar</li> <li>Replacement of front pillar</li> <li>Replacement of roof</li> <li>Replacement of floor</li> <li>Replacement inner wheelhouse</li> <li>Replacement rear fender</li> <li>Replacement of front-end module (radiator core support)</li> <li>Replacement of windshield glass, side window glass, rear window glass, door glass</li> </ul>	NISSAN recommended "Certified body shop"
	<ul style="list-style-type: none"> <li>Damage of aluminum die-casting parts (other than door)</li> </ul>	<ul style="list-style-type: none"> <li>Removal, installation, and replacement of rear seatback support</li> <li>Replacement of strut housing</li> </ul>	
B	<ul style="list-style-type: none"> <li>Sheet metal and replacement of bolt-on outer plate parts</li> <li>Partial sheet metal and paint of outer plate</li> </ul>	<ul style="list-style-type: none"> <li>Replacement, sheet metal, and paint of front fender</li> <li>Replacement, sheet metal, and paint of hood</li> <li>Replacement, sheet metal, and paint of door</li> <li>Replacement, sheet metal, and paint of trunk lid</li> <li>Replacement, sheet metal, and paint of rear panels</li> <li>Sheet metal and paint of rear fender (outer plate damage only)</li> <li>Sheet metal and paint of roof</li> <li>Replacement, repair, and paint of bumper</li> <li>Replacement, repair, and paint of center mud guard</li> <li>Replacement, repair, and paint of pillar garnish</li> <li>Replacement, repair, and paint of door mirror</li> <li>Replacement of undercovers</li> </ul>	

Figure 6– Nissan recommends certain repairs be done by Certified Nissan GT-R body shops.

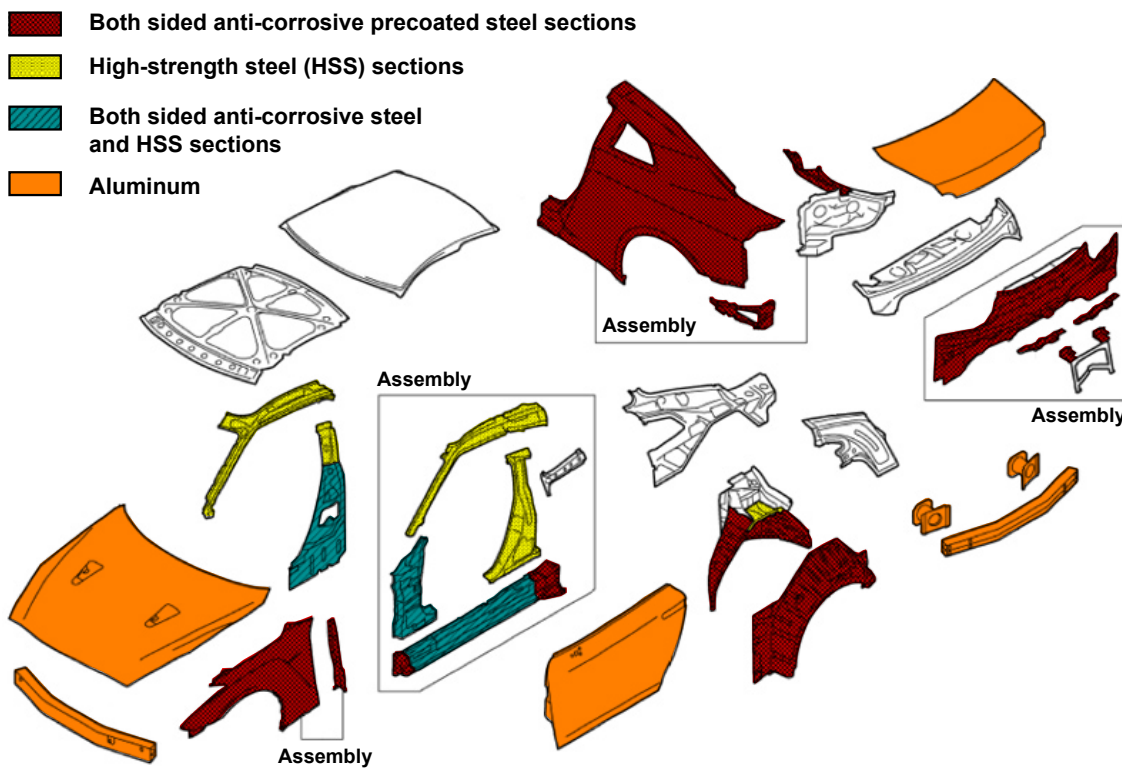
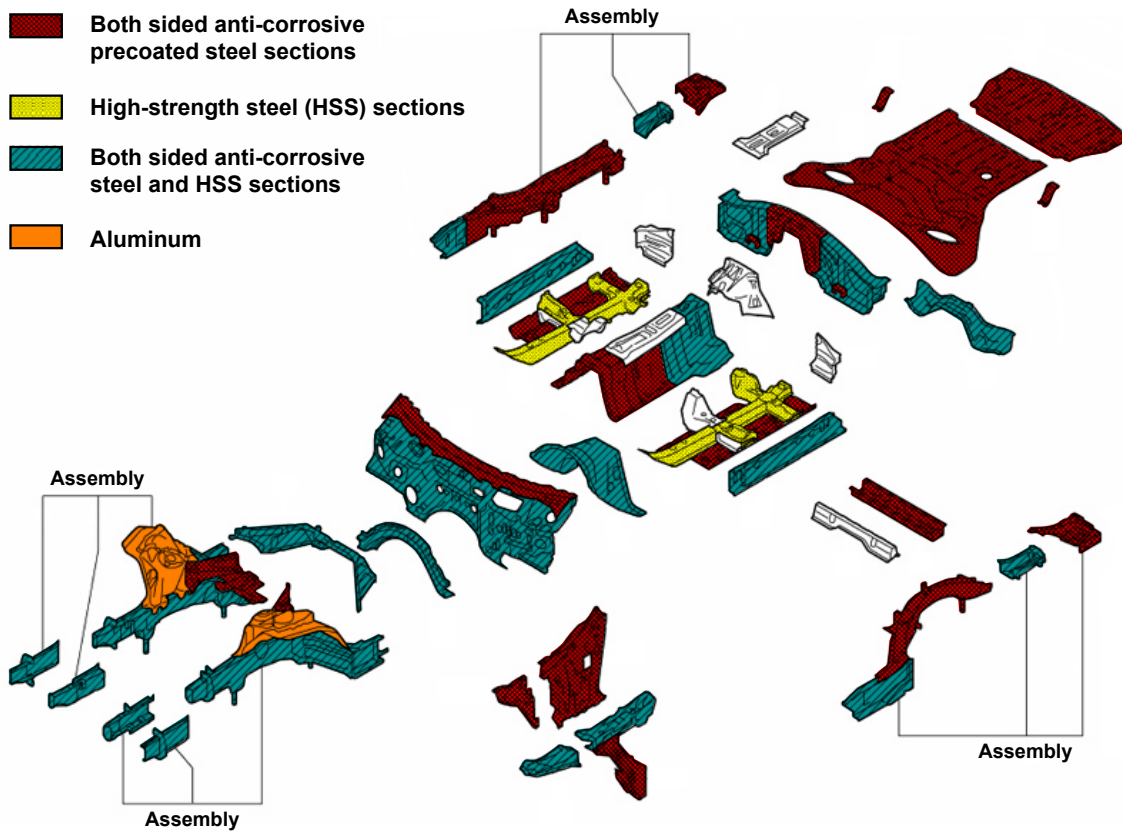


Figure 2- Different grades of high-strength steel are used for the Nissan GT-R structure.