

COLLISION REPAIR INFORMATION

FOR THE TOYOTA DEALER

TITLE: SOUND INSULATION METHODS
AND MATERIALS

PAGE 1 of 4

SECTION: GENERAL INFORMATION BULLETIN #28

MODELS: ALL

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As we know, interior quietness has become an increasingly important factor in a customer's overall satisfaction with his or her vehicle ownership experience. Toyota vehicles now incorporate many noise reduction features to improve interior quietness. Body shop technicians must be increasingly aware of these methods to ensure repairs provide equivalent sound deadening performance to the original factory specification.

Much of the background noise in a vehicle is caused by various types of body vibration. These vibrations are primarily related to three sources; road roughness transmitted by the suspension, engine and drivetrain vibration and airflow against the body.

Toyota uses three basic methods to reduce interior noise:

- Isolation – Vibration sources are isolated from the passenger compartment as much as possible. Sub-frames, fluid filled engine mounts and rubber exhaust hangers are all used to prevent drivetrain vibration from passing into the vehicle body. Aerodynamically designed moldings and air seals are used to minimize wind noise.
- Dampening – Many parts are strengthened or have additional pieces attached to them to change their vibration characteristics. Examples of strengthened parts are braces welded into body sections and reinforcement ribbing added to floor pans. Asphalt sheeting and exhaust tube weights are examples of pieces attached to parts to alter their vibration frequency.
- Absorption – Once noise has been generated, different materials are used to absorb or contain the sound energy. Cotton/felt materials muffle noise under seats, rear deck panels and roofs. Engine compartment and dash silencer pads also act as sound absorbers. Vinyl sheeting and tape cover holes in pillars to contain sounds within the pillars.

Examples of these types of components and materials are illustrated on pages 3 and 4 of this bulletin.

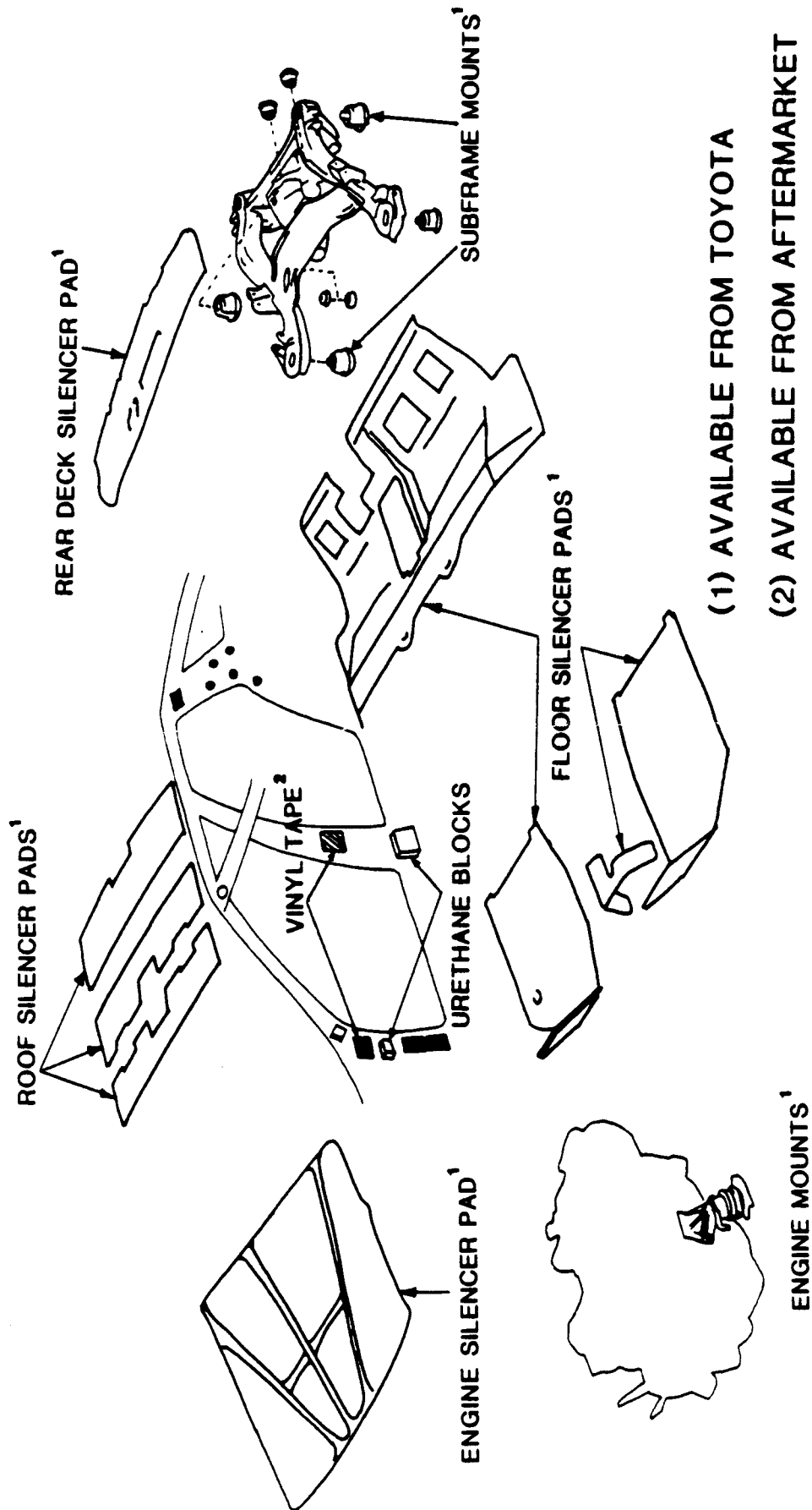
Each of these methods contribute to overall vehicle quietness. Therefore, it is critical that a thorough inspection be performed during collision repair to ensure the original performance is restored. Check for the following:

<u>Problem Area</u>	<u>Possible Cause</u>
<u>Isolation</u>	<ul style="list-style-type: none">• worn or broken engine and differential bushings• missing or broken exhaust hangers• missing or torn door and window seals or trim• incorrect body dimensions
<u>Dampening</u>	<ul style="list-style-type: none">• deformed or broken engine, transmission and differential mount or carriers• deformed or broken suspension components• loose parts such as exhaust shields• missing asphalt sheeting on replacement floorpan or wheelwell sections• uncovered holes in roof or pillar sections• broken or missing vibration dampening attachments on exhaust system• inadequate or insufficient welding of replacement parts
<u>Absorption</u>	<ul style="list-style-type: none">• missing floor and trunk silence pads• missing, deformed or torn dash silencer pad• uncovered holes in roof and pillar sections• missing engine compartment hood pad• missing deck trim silencer pads• loose door panels

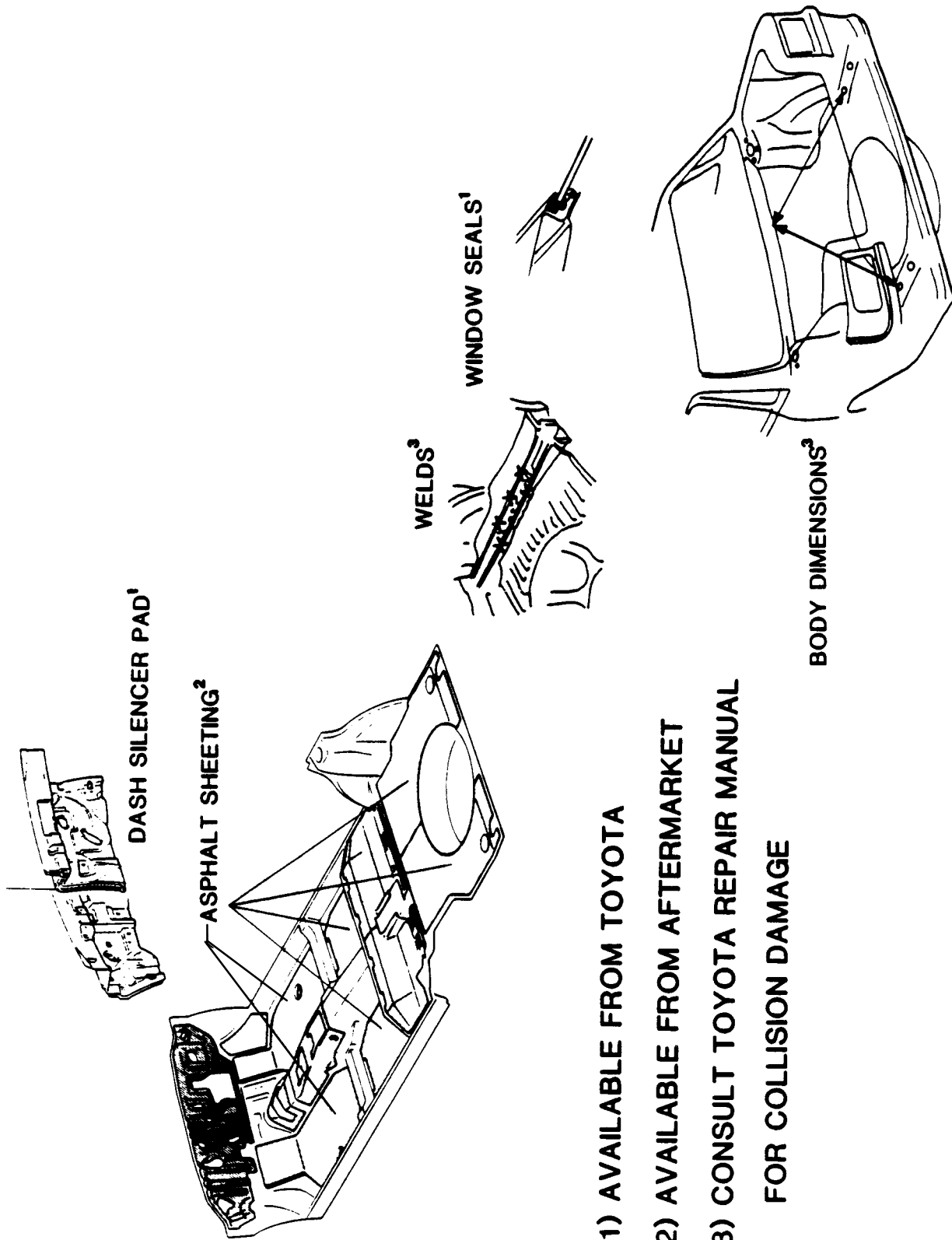
Although most noise problems can be traced to missing or damaged components, it is important to not overlook noise problems caused by inadequate welding or incorrect body dimensions. The following procedures are good standard practice.

- Consult the Toyota Repair Manual for Collision Damage for the appropriate Toyota model during all collision repairs. Remember, the number of plug welds should exceed the number of manufacturer's welds, and the number of spot welds should be 30% greater on replacement parts than on the original. Using more welds on replacement parts will help ensure the structural rigidity of the repair, thereby minimizing the possibility of body flexing.
- Double check the body dimensions during and after repairs. Door and window seals are designed to bridge certain sized openings. If the openings are too large or small, these seals become ineffective for noise reduction.
- Test drive the vehicle after repair over various road surfaces and at various speeds for squeaks, rattles, vibrations, wind noise, etc. which may be related to the repair, and correct any deficiencies as necessary prior to returning the vehicle to the customer.

AREAS TO CHECK



AREAS TO CHECK



(1) AVAILABLE FROM TOYOTA

(2) AVAILABLE FROM AFTERMARKET

**(3) CONSULT TOYOTA REPAIR MANUAL
FOR COLLISION DAMAGE**