



HYUNDAI Technical Service Bulletin

		Group CAMPAIGN	
		Number 09-01-020	
Subject EF SONATA, XG300, XG350 - FRONT SUBFRAME CORROSION TREATMENT (CAMPAIGN 089)		Date JULY, 2009	
		Model SONATA / XG300 / XG350	
CIRCULATE TO:	<input type="checkbox"/> GENERAL MANAGER	<input checked="" type="checkbox"/> PARTS MANAGER	<input checked="" type="checkbox"/> TECHNICIAN
<input checked="" type="checkbox"/> SERVICE ADVISOR	<input checked="" type="checkbox"/> SERVICE MANAGER	<input checked="" type="checkbox"/> WARRANTY MGR	<input type="checkbox"/> SALES MANAGER

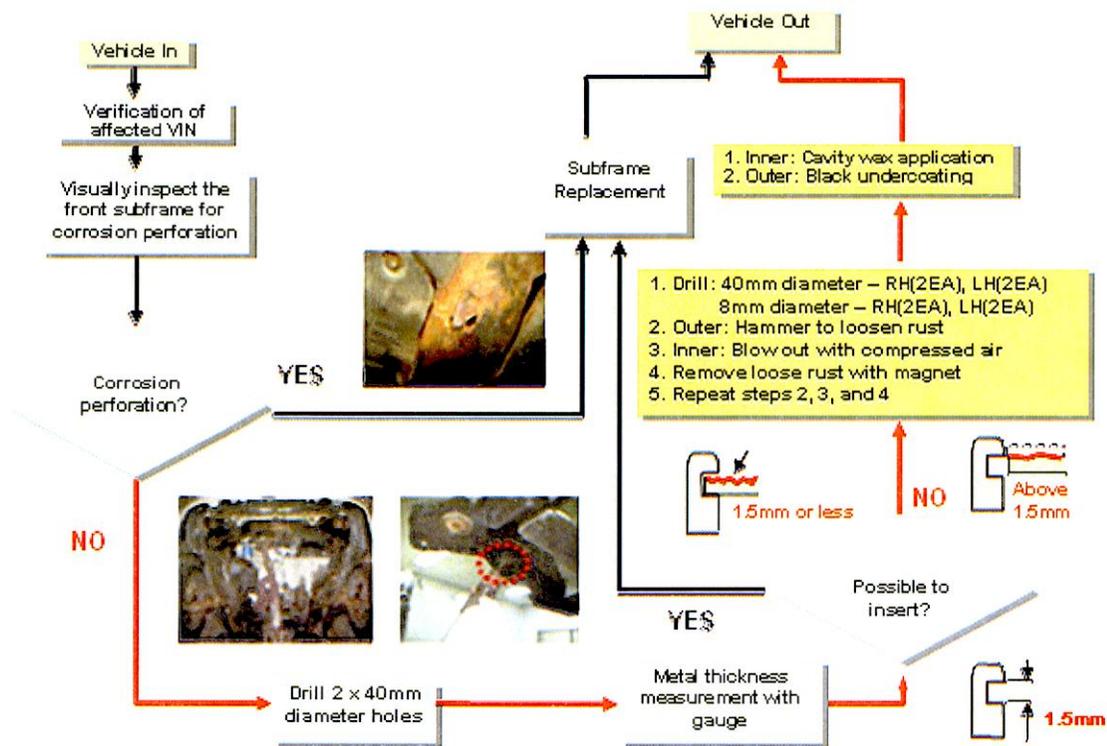
IMPORTANT: DEALERS MUST PERFORM THIS CAMPAIGN ON ALL AFFECTED VEHICLES WHENEVER AN AFFECTED VEHICLE IS IN THE SHOP FOR ANY MAINTENANCE OR REPAIR.

IMPORTANT: WHEN A VEHICLE ARRIVES AT THE SERVICE DEPARTMENT, ACCESS HYUNDAI MOTOR AMERICA'S "WARRANTY VEHICLE INFORMATION" SCREEN VIA WEBDCS TO IDENTIFY OPEN CAMPAIGNS.

DESCRIPTION:

- Some 1999-2004 SONATA (EF) and 2001-2004 XG300/XG350 (XG) vehicles that are registered and operated in specified "salt belt" states may exhibit corrosion damage to the subframe assembly.
- Inspect the front subframes for corrosion damage. Measure the thickness of the subframe steel. If specified levels of corrosion damage have occurred as described in this bulletin, replace the front subframe with a new subframe that incorporates additional holes in the upper and lower panels. If a front subframe does not require replacement, add drainage holes and treat the subframe with rust-proofing material.

SUMMARY OF SERVICE PROCEDURE:



APPLICABLE VEHICLES - VERIFY THAT THE VEHICLE IS IDENTIFIED AS AFFECTED BY THE CAMPAIGN VIA WEBDCS.

- Model : SONATA (EF), XG300 and XG350 (XG)
- Applicable vehicle production date range : From Job#1 through November 20, 2003
- Area : Salt belt states as follows:

Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, Wisconsin, and the District of Columbia.



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PARTS REQUIRED:

SUBFRAME ASSEMBLY REPLACEMENT

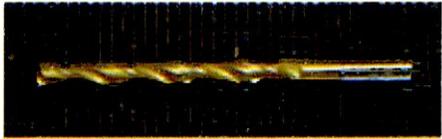
Model	Kit #	Components	Remark
EF	62405-38300QQH	Subframe, 4 spring washers, 2 spring washers, 3 bolts, 1 bolt, 2 studs, 2 stud nuts	Only required for vehicles produced from Job#1 through Apr. 13, 1999
	21910-38100QQH	Front roll mount, I4/V6 M/T	
	21910-38600QQH	Front roll mount, V6 A/T	
	21910-38650QQH	Front roll mount, I4 A/T	
XG	62405-39003QQH	Subframe, 4 spring washers, 2 spring washers, 3 bolts, 1 bolt, 2 studs, 2 stud nuts	
EF/XG	54569-38000QQH	Bolt M14 x 86; 2 EA Washer 2.5T 4 EA.	For subframes replaced on vehicles built from Job#1 through Aug. 13, 2000

WAX APPLICATION FOR CORROSION PREVENTION

Model	Kit #	Components	Remark
EF/XG	62466-38000QQH	Rubber plug; 4 EA.	For subframe wax procedure; one kit required per vehicle

TOOLS REQUIRED (not supplied in tool kit - Dealer supplied)

No.	Name	Image	Remark
1	Hammer		

2	Electric drill		
3	Drill bit (8mm diameter)		Center-pointed type
4	File		For removing burrs from around the drilled holes
5	Air gun		Straight nozzle type

NOTE: Additional drill bits should be obtained from your local Parts Supply vendor when needed.

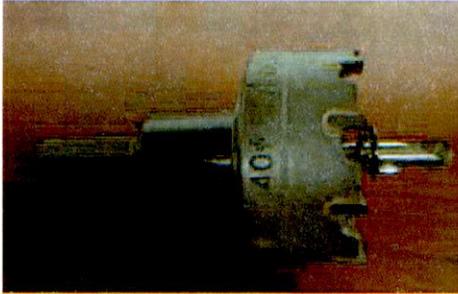
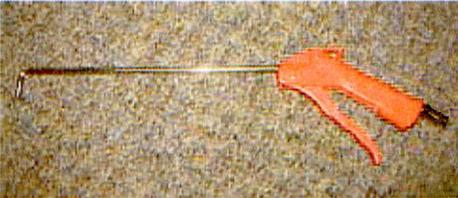
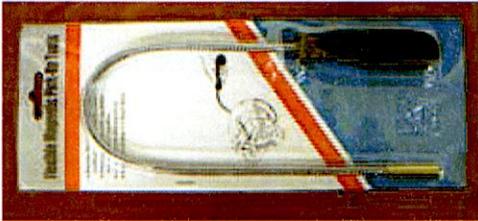


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TOOL KIT (supplied to dealers by HMA)

No.	Name	Image	Remark
1	Hole saw (40mm diameter)		Provided in tool kit; recommend use of carbide tipped saw Usage tips: 1. Remove plug ejection spring from arbor. 2. Use anti-seize compound on arbor threads when replacing hole saw. 3. Spin hole saw cutter before contacting cutting surface to minimize tooth damage.
2	Air gun		90 degree nozzle type; provided in tool kit
3	Thickness gauge		Measuring thickness of panel (Common use for EF, SM, XD and GK); provided in tool kit
4	Flexible magnet		Flexible type; provided in tool kit

5	Subframe drilling template		2 templates for each side, right and left; provided in tool kit.
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NOTE: Dealers will be automatically supplied with a Tool Kit from HMA.

NOTE: Additional hole saws and arbors should be obtained by calling SPX at 800-345-2233. Please note the replacement hole saws from SPX are compatible with the arbors in the supplied tool kit.

Part Number	Description
J-50236	1 5/8" (40mm) Hole Saw
J-50237	1/2" Hex Shank Arbor
J-50238	13/16" (20mm) Hole Saw
J-50239	3/8" Hex Shank Arbor

CHEMICAL KIT:

No.	Name	Image	Remark
1	Wax injection gun		P/N 00232-19036



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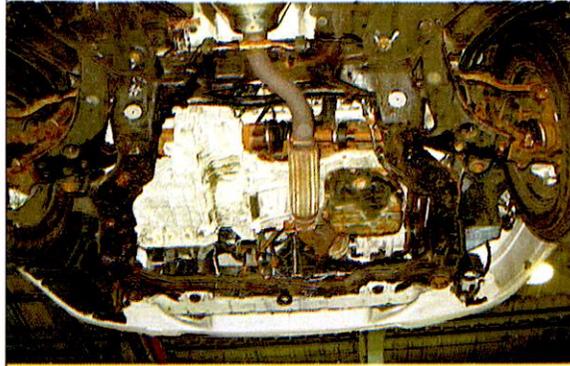
2	Cavity wax		P/N 00232-19034 1 bottle per vehicle
3	Undercoating spray		P/N 00232-19035 Black color 1 can per 10 vehicles

NOTE: Dealers will be supplied with an initial order of the Chemical Kit. Additional product should be ordered through your facing PDC.

SERVICE PROCEDURE:

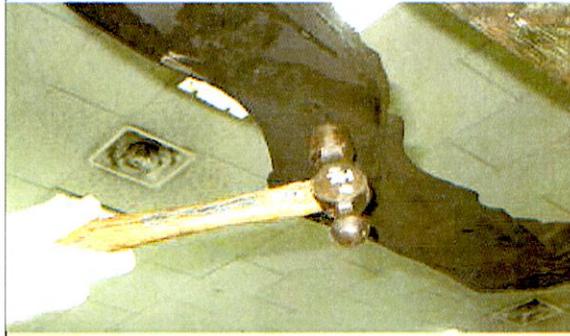
- SUBFRAME INSPECTION

1. Lift up vehicle



2. Lightly strike the subframe throughout with a hammer.

CAUTION: Be careful **DO NOT** strike the subframe too hard to prevent deformation damage.



3. Inspect the subframe for corrosion perforation.

The photo on the right shows corrosion perforation.

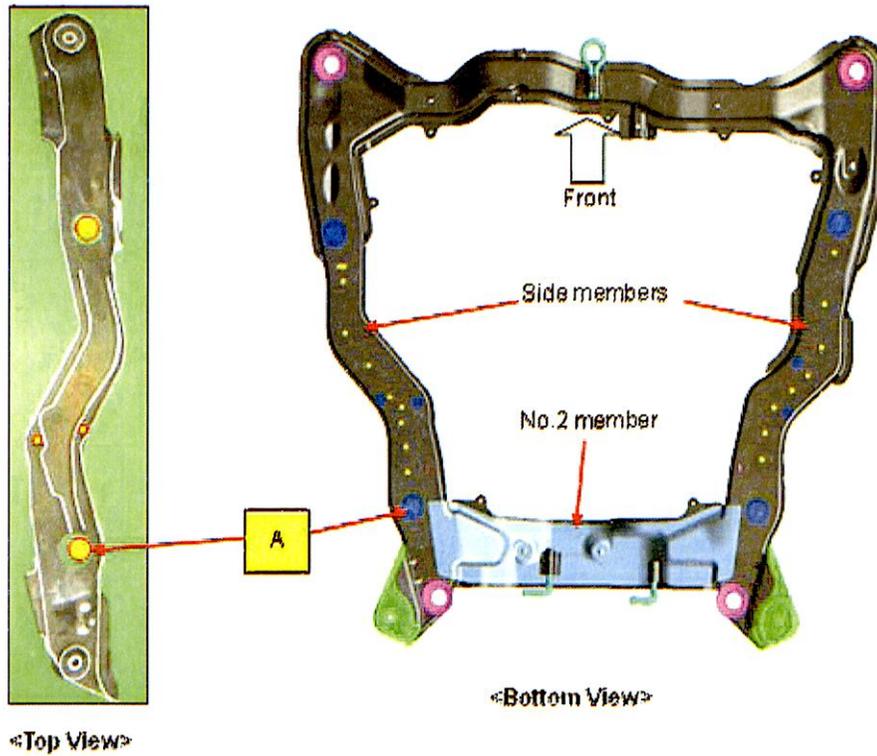
CAUTION: Make sure to thoroughly inspect for corrosion perforation throughout the subframe including the sides.

NOTE: If any corrosion perforation is found, replace the subframe assembly with a new one. If not, proceed to the next step to further inspect the subframe for corrosion.

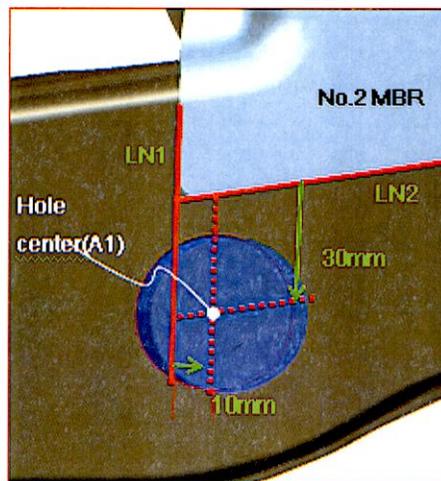
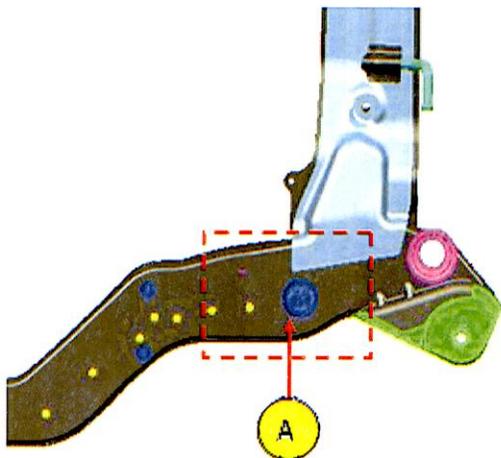




4. Drill a hole 40mm (A) in diameter on the rear of the right side member by following the detailed procedures below.



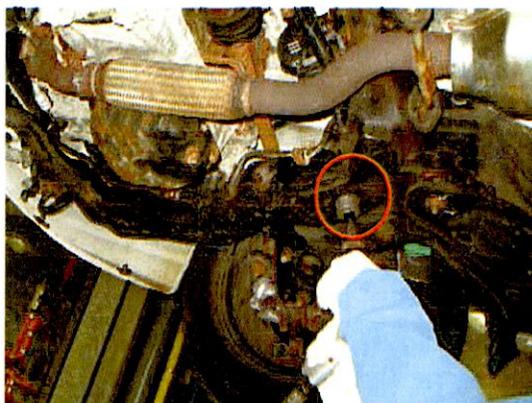
5. Put a marking point (A1) on the right side member as indicated in the photo.



6. Center the 40mm hole saw on the mark and drill a hole in the right side member.



CAUTION: Protect yourself by wearing goggles, a respirator, gloves, etc.



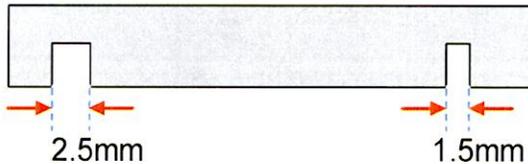
7. Use a file to remove burrs around the hole.

CAUTION: If the burrs are not fully removed, it may prevent the thickness gauge from being inserted over the edge of the drilled hole in step 8.





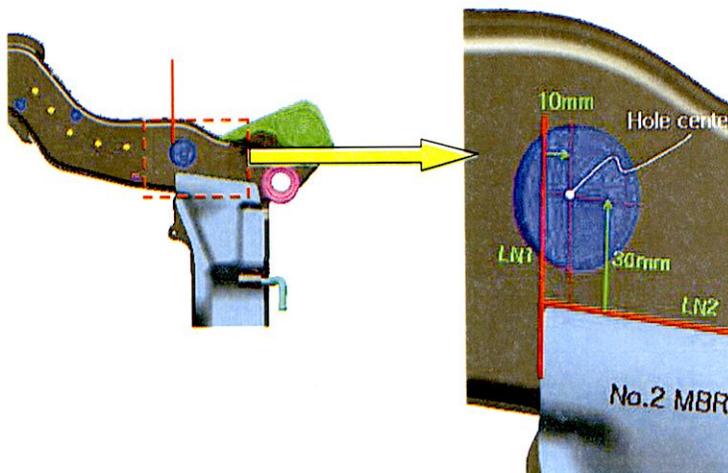
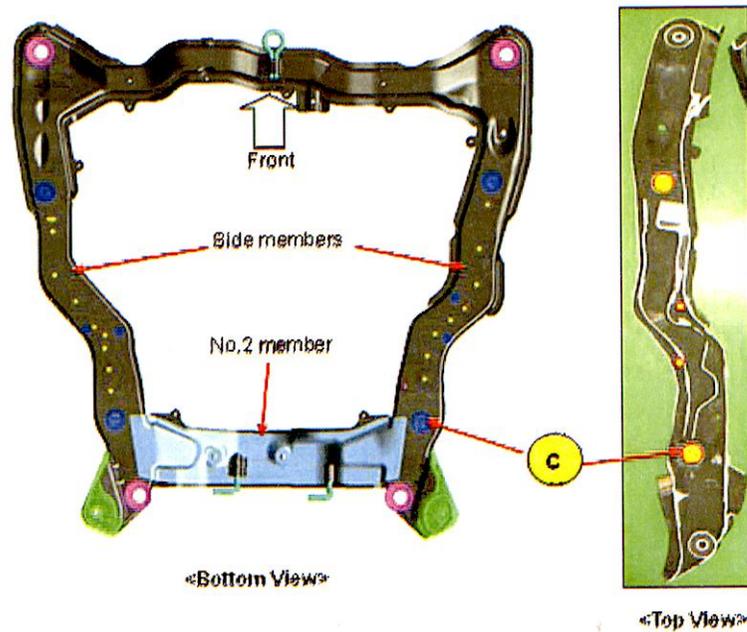
8. Insert the 1.5mm groove of the thickness gauge through the hole. Check the thickness of the subframe at as many points around the hole as possible.



9. If the subframe metal fits into the 1.5mm groove of the thickness gauge, replace the subframe assembly. Reference the SUBFRAME REPLACEMENT PARTS CHART on page 17. If the subframe metal does not fit into the thickness gauge, continue to the next step.



10. Drill a hole 40mm (C) in diameter on the rear of the left side member and check the thickness of the subframe metal of the left side member, as before.



11. If the subframe metal fits into the 1.5mm groove of the thickness gauge, replace the subframe assembly. Reference the SUBFRAME REPLACEMENT PARTS CHART on page 17. If the subframe metal does not fit into the thickness gauge, continue to the WAX APPLICATION FOR CORROSION PREVENTION procedure on page 24.



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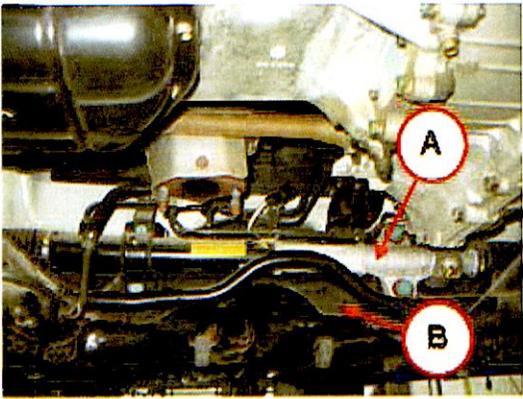
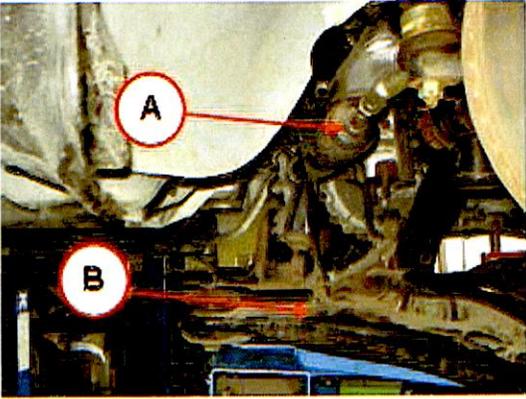
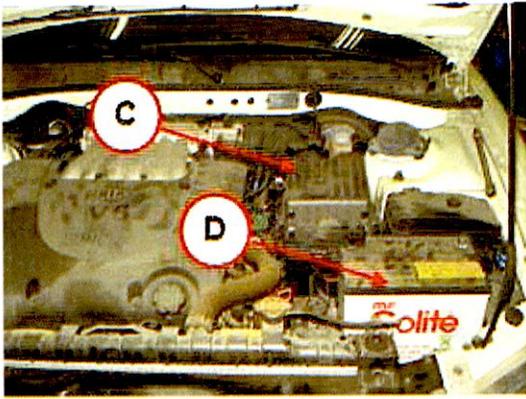
SUBFRAME REPLACEMENT PARTS CHART:

Production Range	Replacement Parts (Parts Required)		
	Part Name	Part No.	Qty.
From Job #1 through Apr. 13, 1999	Subframe Assembly		62405-38300QQH 1EA
	I4/V6 MT	Front Roll Stopper Bracket Assembly (with white marking)	21910-38100QQH 1EA
	V6 AT	Front Roll Stopper Bracket Assembly (with blue marking)	21910-38600QQH 1EA
	I4 AT	Front Roll Stopper Bracket Assembly (with red marking)	21910-38650QQH 1EA
	Bolt & Washer Kit	Bolt (M14 X 86) x 2EA. Washer (2.5mm) x 4EA.	54569-38000QQH 1EA
From Apr. 14, 1999 through Aug. 13, 2000	Subframe Assembly		62405-383000QQH 1EA
	Bolt & Washer Kit	Bolt (M14 X 86) x 2EA. Washer (2.5mm) x 4EA.	54569-38000QQH 1EA
From Aug. 14, 2000 through Nov. 19, 2003	Subframe Assembly		62405-38300QQH 1EA

CAUTION: If removing and replacing the subframe, a front end alignment **MUST** be performed.

SUBFRAME REPLACEMENT PROCEDURE:

This instruction provides a procedure to replace the SONATA (EF) subframe more easily and efficiently than the original procedure.

Original Procedure	Revised Procedure
<p>To replace the subframe (A), remove it simultaneously with the steering gearbox (B).</p>	<p>It is possible to remove the subframe (A) without detaching the steering gearbox (B) from the vehicle. DO NOT remove the steering gearbox for the subframe replacement.</p>
	
<ol style="list-style-type: none"> 1. Raise the hood. 2. Remove the battery (D). 3. Remove the air cleaner (C). 	

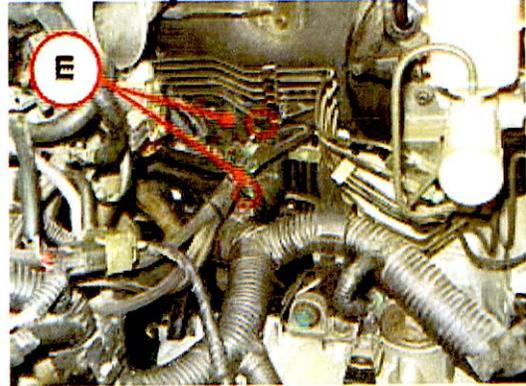


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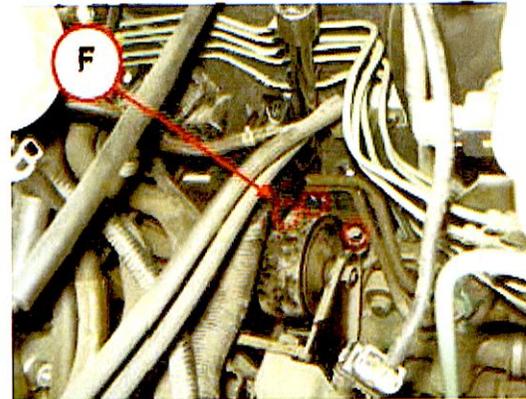
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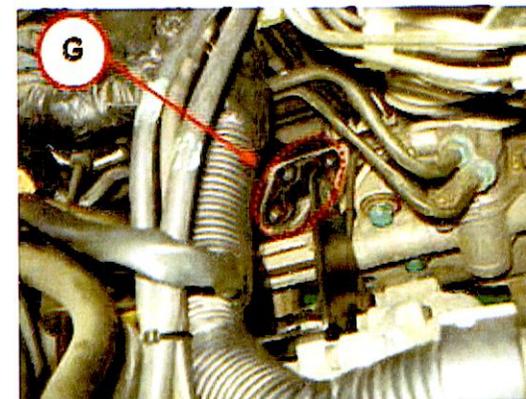
4. Remove the 2 main wiring harness mounting nuts (E) then slacken the wiring harness.



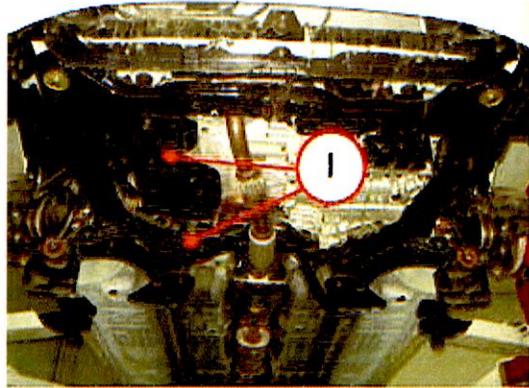
5. Remove the 3 rear roll stopper mounting bolts (F).



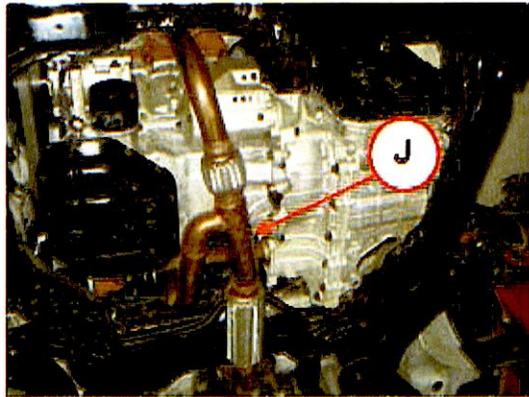
6. Photo of the location where the rear roll stopper mounting bolts had been installed (G).



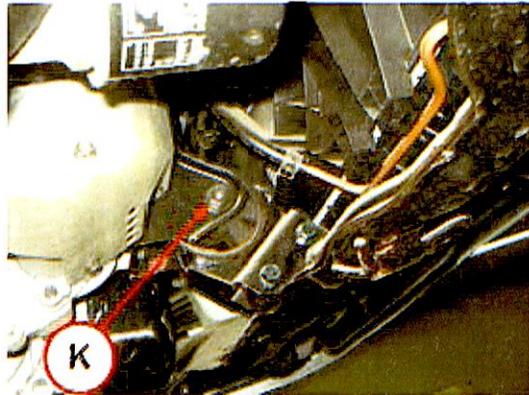
7. Lift the vehicle off the ground.
8. Remove the 2 right under covers (I).



9. Remove the front exhaust pipe (J).



10. Remove the front roll stopper mounting bolt (K).



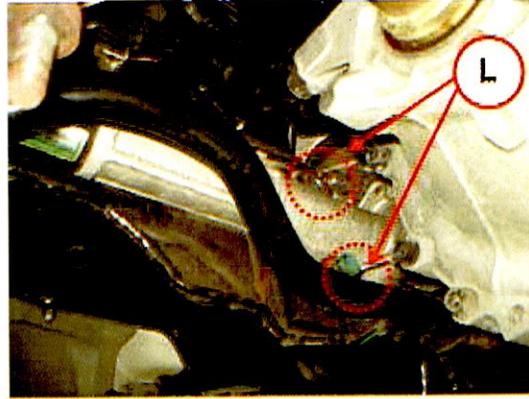


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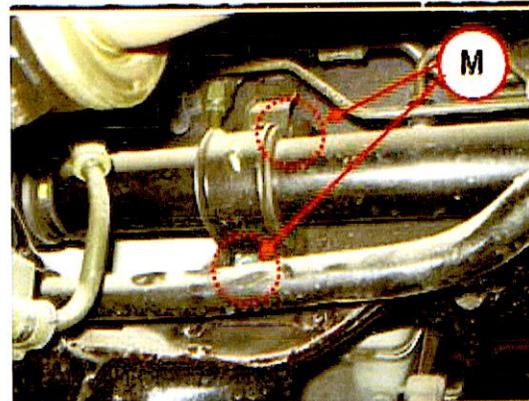
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11. Remove the 2 steering gearbox mounting bolts (L) from the left side.

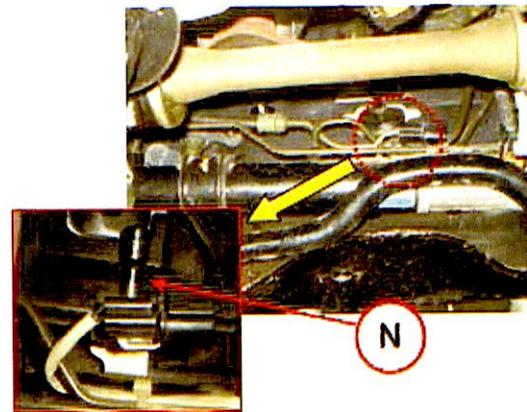


12. Remove the steering gearbox mounting bolts (M) from the right side.

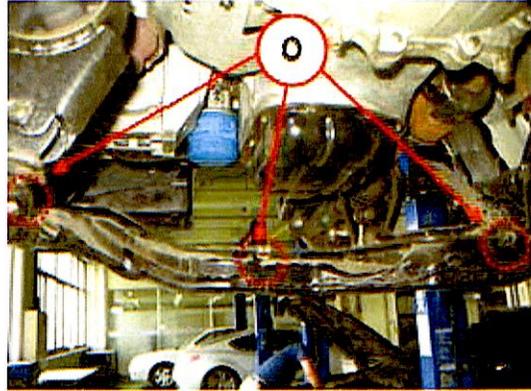


13. Remove the power steering pipe mounting bolt (N) from the top of the steering gearbox.

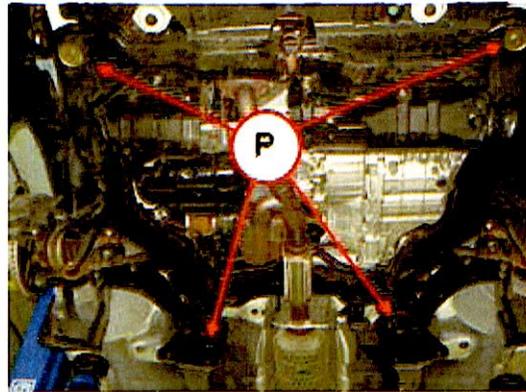
NOTE: The bolt can be difficult to see from under the vehicle.



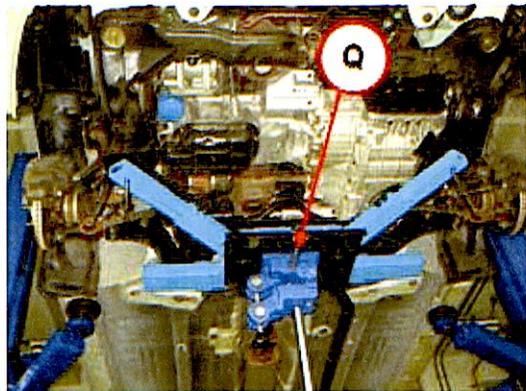
14. Remove the power steering pipe mounting bolts (O) between the steering pump and the steering gearbox.



15. Remove the subframe brackets and mounting bolts (P).



16. Support the subframe with a jack (Q).



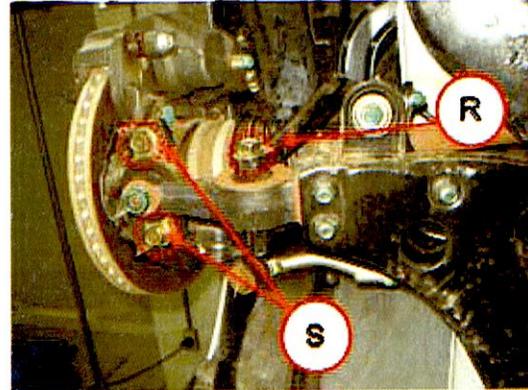


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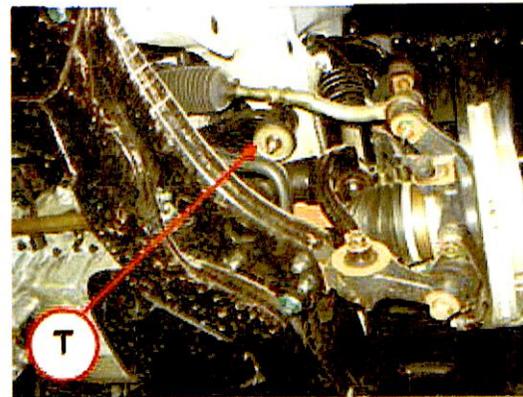
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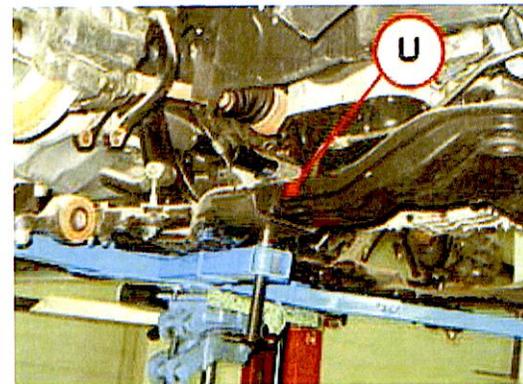
17. Remove the ball joint mounting bolt (R).
18. Remove the bolts (S) from the lower end of the strut assembly.
19. Repeat steps 17 and 18 on the other side.



20. Remove the subframe center mounting nut (T).

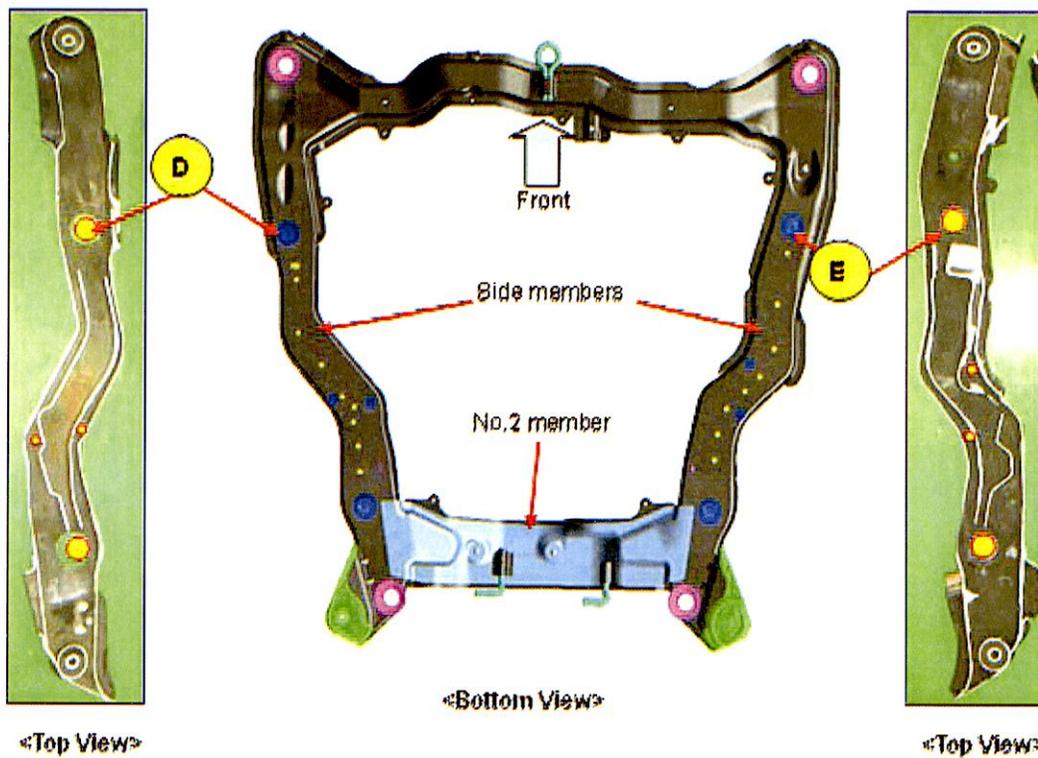


21. Detach the subframe (U) from the steering gearbox and then remove the subframe.
22. Install in reverse order of removal.



WAX APPLICATION FOR CORROSION PREVENTION

1. Drill 2 holes (D, E) 40mm in diameter on the front of the right and left side members by following the detailed procedures below.



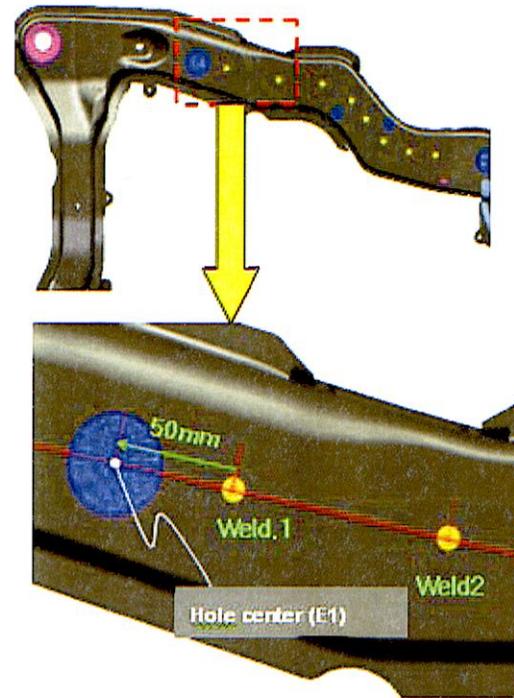
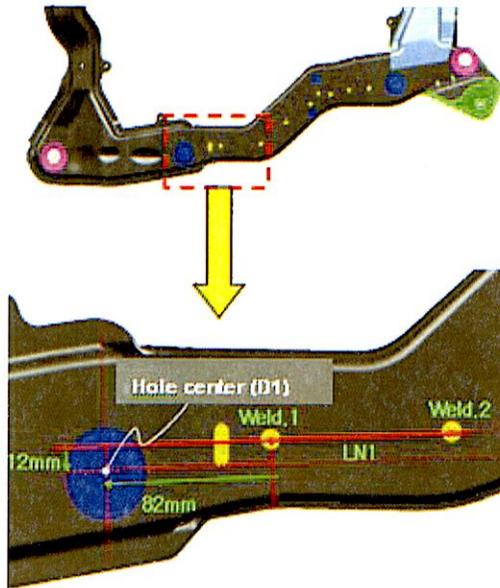


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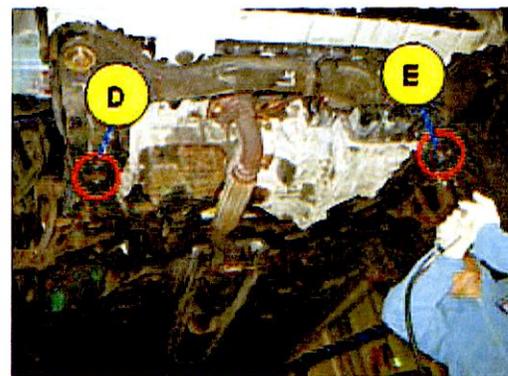
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2. Put marking points (D1, E1) on both the right and left side members as indicated in the photo.

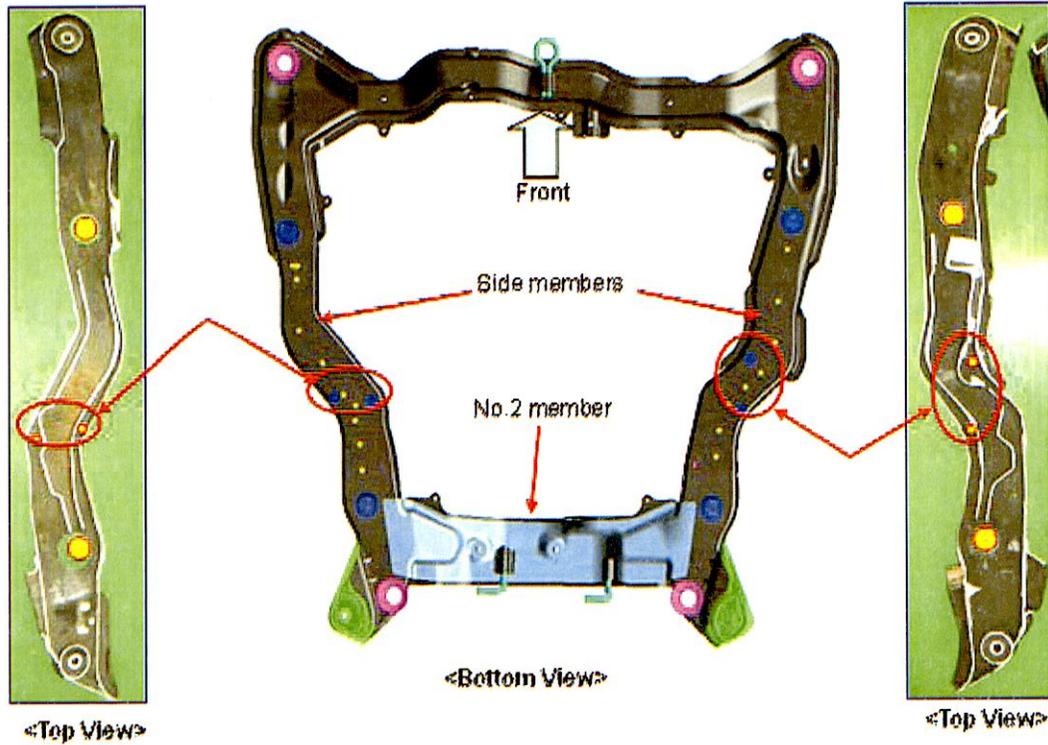


3. Center the 40mm hole saw on the mark and drill a hole in the right side member. Repeat this procedure for the left.

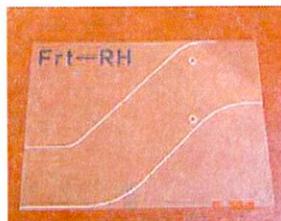
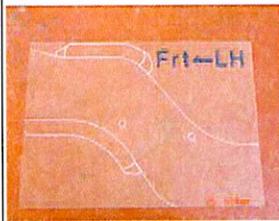
CAUTION: Protect yourself by wearing goggles, a respirator, gloves, etc.



4. Drill four holes 8mm in diameter on the middle of the right and left side members by following the detailed procedures below.

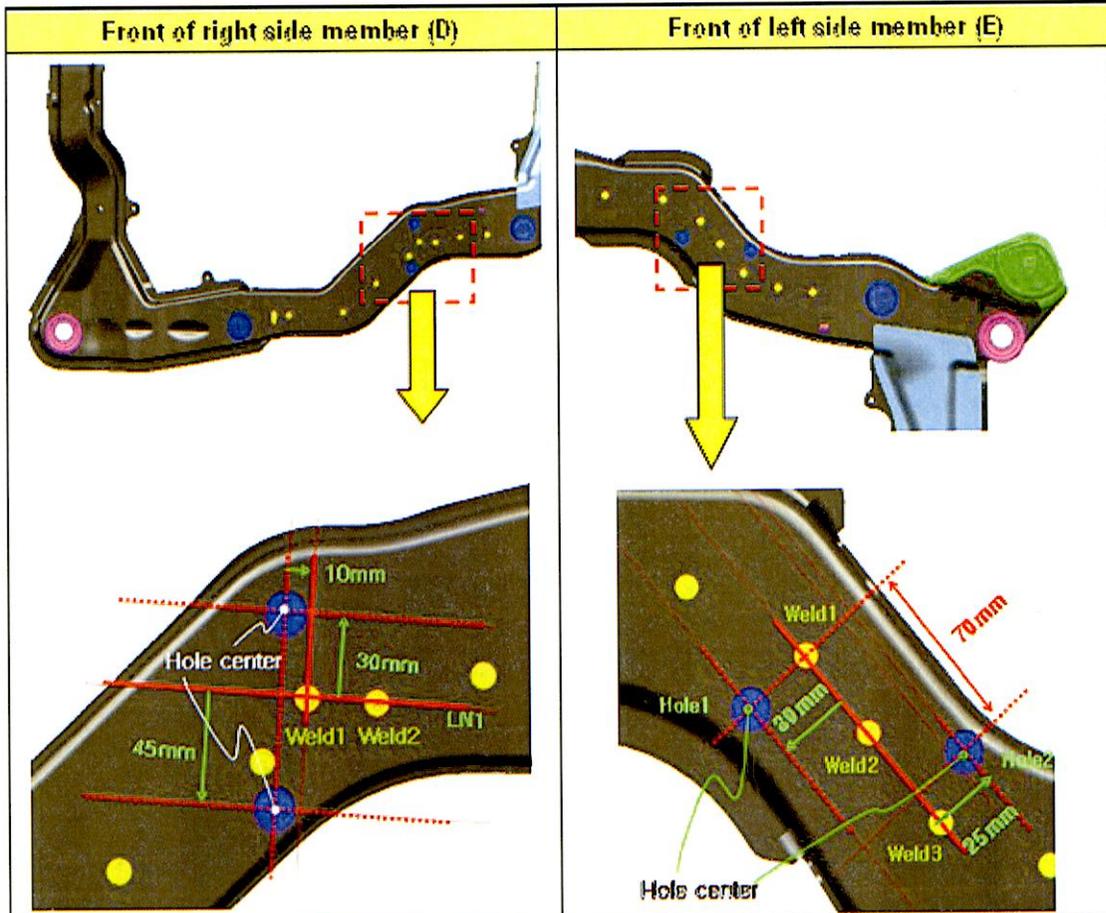


5. Align the hole jig with the right side member as shown in the photo at the right. Put two marks on the right side member. And repeat this procedure for the left.

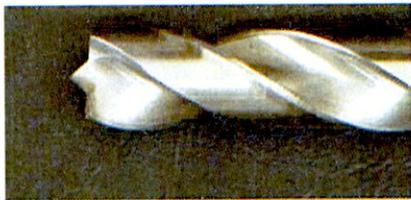




Details of locations

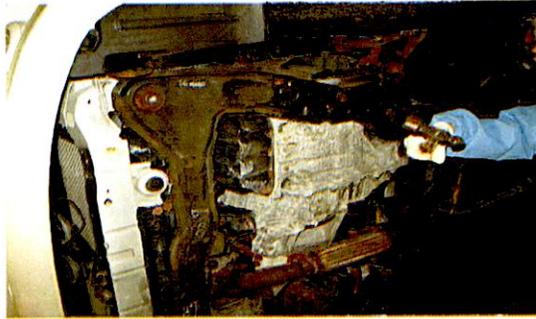


6. Center the 8mm drill bit on the marks and drill two holes in the right side member according to the template. Repeat this procedure for the left.

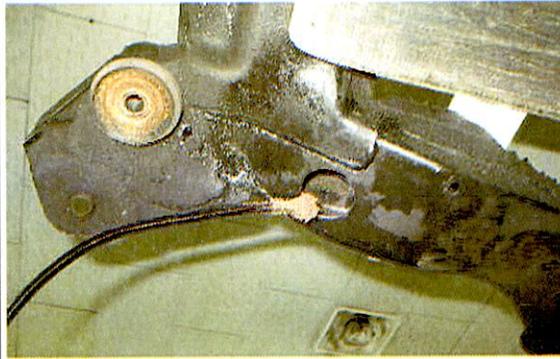


7. Remove fragments of rust from the inside of the subframe by following the detailed procedures below.
8. Strike the subframe throughout with a hammer.

CAUTION: Do NOT strike in the area of the four holes (F, G) 40 mm in diameter to avoid causing deformation damage.



9. Insert a flexible magnet through the 40mm holes and remove any fragments of rust from inside the subframe.





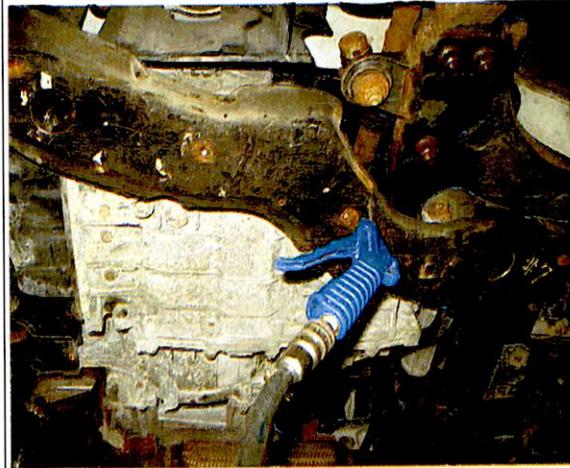
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10. Insert the air gun inside of the subframe through holes in the right and left side members and blow rust from inside the subframe.

Figure	Use
	Use for front and rear holes ($\Phi 40$ holes) of side members - Nozzle is straight.
	Use for center holes ($\Phi 8$ holes) of side members - Nozzle is bent.



11. Thoroughly remove the corrosion in the subframe. If necessary, repeat steps 8 to 10 two or three times.

12. Pour one bottle (1 liter) of cavity wax into the injection gun reservoir. Spray cavity wax into the inside of the subframe through all the holes until wax drains through the holes.

NOTE: Use all the holes and keep spraying cavity wax until the cavity wax in the injection gun reservoir is exhausted. Make sure to use one bottle of cavity wax per vehicle.

CAUTION:

- (1) Protect yourself by wearing goggles, a respirator, gloves, etc.
- (2) Insure proper ventilation of your working area.
- (3) Be careful NOT to contaminate nearby parts and panels with wax or undercoating.



13. Spray undercoating on the subframe, especially around the holes.





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40mm hole	8mm hole
	
14. Cover all four 40mm holes with hole plugs.	Do not cover 8mm holes.

WARRANTY CLAIM INFORMATION:

OP CODE	DESCRIPTION	OP TIME
91B027R0*	Subframe Inspection and Wax Application	0.7 M/H
91B027R1	Subframe Inspection and Replacement (without drilling holes)	3.0 M/H
91B027R2*	Subframe Inspection and Replacement (with drilling holes)	3.2 M/H

IMPORTANT: If removing and replacing the subframe, a front end alignment **MUST** be performed and is included in the campaign labor operation time.

NOTE: Submit claim using the Campaign Entry Screen

NOTE: * Each applicable claim includes a sublet amount for chemical, hole saw, and drill bit reimbursement.

NOTE: * Reimbursement for the Cavity Wax Injection Gun will be processed in Dealership's Parts statement.

PARTS SCRAP INFORMATION:

1. Subframe Inspection and Replacement (without drilling holes) - It is required that digital photos be taken of the replaced parts as well as the VIN plate. These pictures must be attached to their respective repair order for DPSM review. The removed subframe may be scrapped.
2. Subframe Inspection and Replacement (with drilling holes) - It is required to retain the core sample and repair information for DPSM review. The removed subframe may be scrapped.
3. Subframe Inspection and Wax Application - It is required to retain the core sample and repair information for DPSM review.