MAN
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CLASSEUR CARROSSERIE

MANUEL	CHAPITRE	NUMERO DE L'OPERATION	DESIGNATION
	Généralités Véhicule (0)	ZA 000/1	Caractéristiques générales identification 3 portes
		ZA 000/2	Caractéristiques générales identification 5 portes
		ZA 00/1	Points de levage et de remorquage véhicule → 07/91
		AX 00/2	Points de levage et de remorquage véhicule 07/91 →
		AX 00/3	Protection des organes électriques
		AX 00/4	Ingrédients préconisés
	Eléments soudés (14)	ZA 412-0/1	Contrôle des fixations des bras inférieurs sur caisse
		ZA 800-000	Remise en état de la coque
		ZA 800-00	Préparation d'une coque
		ZA 800-0	Contrôle sur banc d'une coque nue - Equipement CELETTE
		ZA 800-1	Contrôle sur banc mécanique en place - Equipement CELETTE
		ZA 800-2	Contrôle des fixations de direction - Equipement CELETTE
		ZA 800-10	Contrôle sur banc d'une coque nue - Equipement CAROLINER
		ZA 800-11	Contrôle sur banc mécanique en place - Equipement CAROLINER
		ZA 800-12	Contrôle des fixations de direction - Equipement CAROLINER
		ZA 800-20	Contrôle sur banc d'une coque nue - Equipement CELETTE METRO 2000
		ZA 800-21	Contrôle sur banc mécanique en place - Equipement CELETTE METRO 2000
		ZA 800-22	Contrôle des fixations de direction - Equipement CELETTE METRO 2000
		ZA 800-30	Contrôle sur banc d'une coque nue ou avec mécanique en place - Equipement SEFAC
		ZA 800-32	Contrôle des fixations de direction - Equipement SEFAC

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MANUEL	CHAPITRE	NUMERO DE L'OPERATION	DESIGNATION
		ZA 801-1	Remplacement d'une tôle de façade complète
		ZA 802-1	Remplacement d'une joue de passage de roue avant
		ZA 802-2	Remplacement d'une partie avant de passage de roue
		ZA 802-3	Remplacement partiel d'un longeron avant (extrémité AV)
		ZA 802-4	Remplacement d'un longeron avant (coupe en avant du tablier)
		ZA 802-5	Remplacement d'un passage de roue complet
		ZA 802-6	Remplacement d'un passage de roue et longeron complet
		ZA 802-7	Remplacement d'un support de bras inférieur avant
		ZA 812-1	Remplacement d'une traverse d'essieu avant
		ZA 812-2	Remplacement d'un tablier
		AX 812-3	Structure : partie avant
		ZA 821-0	Solutions de coupes sur côté d'habitacle
		ZA 821-1	Remplacement d'un support de charnières de portes avant
		ZA 821-2	Remplacement d'un panneau complet avec pavillon - Version 3 portes
		ZA 821-2/1	Remplacement d'un panneau de côté complet - Version 5 portes
		ZA 821-3	Remplacement d'un panneau complet (Section sous brancard de pavillon) - Version 3 portes
		ZA 821-4	Remplacement d'un panneau partie inférieure avant
		ZA 821-5	Remplacement d'une aile arrière seule - Version 3 portes
		ZA 821-5/1	Remplacement d'une aile arrière - Version 5 portes
		ZA 821-6	Remplacement d'un brancard de bas de caisse complet - Version 3 portes

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MANUEL	CHAPITRE	NUMERO DE L'OPERATION	DESIGNATION
		ZA 821-6/1	Remplacement d'un brancard de bas de caisse complet - Version 5 portes
		ZA 821-7	Remplacement d'une doublure de brancard de bas de caisse
		ZA 821-8	Remplacement d'un panneau de côté partie centrale - Version 5 portes
		ZA 821-9	Remplacement d'un panneau de côté partie arrière - Version 5 portes
		ZA 821-10	Remplacement d'un renfort de pied milieu - Version 5 portes
		ZA 823-1	Remplacement d'un panneau arrière complet
		ZA 823-2	Remplacement d'une tôle de feu arrière
		ZA 824-1	Remplacement d'un passage de roue arrière - Version 3 portes
		ZA 824-1/1	Remplacement d'un passage de roue arrière - Version 5 portes
		ZA 824-2	Remplacement d'une doublure de côté d'habitacle - Version 3 portes
		ZA 824-2/1	Remplacement d'une doublure de côté d'habitacle - Version 5 portes
		ZA 825-1	Remplacement d'un pavillon complet
		ZA 831-1	Remplacement d'un plancher de coffre (section)
		ZA 831-2	Remplacement armature et plancher de coffre
	Eléments Amovibles (15)	ZA 840-0	Jeux des éléments amovibles - Version 3 portes
		ZA 840-0/1	Jeux des éléments amovibles - Version 5 portes
		ZA 840-1	Eléments en matériaux composites
		ZA 840-2	Réparation des matériaux composites renforcés de fibre de verre
		ZA 841-1	Réglage d'une porte latérale - Version 3 portes
		ZA 841-1/1	Réglage d'une porte avant - Version 5 portes

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MANUEL	CHAPITRE	NUMERO DE L'OPERATION	DESIGNATION
		ZA 841-2	Dépose et Pose d'une porte - Version 3 portes
		ZA 841-2/1	Dépose et Pose d'une porte avant - Version 5 portes
		ZA 841-3	Déshabillage et habillage d'une porte latérale - Version 3 portes
		ZA 841-3/1	Déshabillage et habillage d'une porte avant - Version 5 portes
		AX 841-3/1	Déshabillage et habillage d'une porte avant 07/91 → Version 5 portes
		ZA 841-4	Remplacement d'une serrure - Version 3 portes
		ZA 841-4/1	Remplacement d'une serrure avant - Version 5 portes
		ZA 841-5	Remplacement d'une glace de porte latérale - Version 3 portes
		ZA 841-5/1	Remplacement d'une glace de porte avant - Version 5 portes
		ZA 841-6	Remplacement d'un panneau extérieur
		ZA 841-7	Soudage des charnières de portes latérales sur montant de porte
		ZA 842-1	Réglage d'une porte arrière - Version 5 portes
		ZA 842-2	Dépose et Pose d'une porte arrière - Version 5 portes
		ZA 842-3	Déshabillage et habillage d'une porte arrière → 07/91 Version 5 portes
		AX 842-3	Déshabillage et habillage d'une porte arrière 07/91 → Version 5 portes
		ZA 842-4	Remplacement d'une serrure de porte arrière - Version 5 portes
		ZA 842-5	Remplacement d'une glace de porte arrière - Version 5 portes
		ZA 843-1	Pose des portes latérales sur une coque neuve
		ZA 844-1	Remplacement d'un volet arrière
		ZA 844-2	Remplacement d'une glace de volet arrière

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MANUEL	CHAPITRE	NUMERO DE L'OPERATION	DESIGNATION
		ZA 851-1	Remplacement d'une aile avant
		ZA 851-2	Remplacement d'un pare-chocs avant
		ZA 851-3	Remplacement d'un capot
		ZA 853-1	Remplacement d'un pare-chocs arrière
		ZA 853-2	Remplacement d'une glace de custode - Version 3 portes
		ZA 853-2/1	Remplacement d'une glace de custode - Version 5 portes
		ZA 856-1	Dépose et Pose d'une planche de bord → 07/91
		AX 856-1	Dépose et Pose d'une planche de bord 07/91→
		ZA 961-1	Remplacement d'une glace de pare-brise
		ZA 988-1	Remplacement d'une garniture de pavillon
		MR 630-84/21	Crochet d'ouverture de capot

(D) Achtung ! Wichtiger Punkt oder Fehlerquelle
(DK) Pas på ! Vigtigt punkt eller fejlmulighed
(E) Atención ! Punto importante o posible dificultad
(GB) Caution ! Important detail or possible trap
(I) Attenzione ! Punto importante o possibilita di errore
(NL) Let op ! Belangrijk punt, kan gemakkelijk fout gaan !
(P) Atençao ! Ponto importante ou possibilidade de errar
(S) Varning ! Viktigt arbetsmoment eller möjlighet till misstag

(F) Attention ! Point important ou piège possible

(D) Darauf achten, dass keine Teile herunterfallen oder abspringen
(DK) Risiko for at dele falder ud eller forskubber sig
(E) Riesgo de caida o de proyección de piezas
(GB) Parts may drop or spring out
(I) Rischio di caduta o di proiezione di pezzi
(NL) Kans op naar beneden vallen of wegspringen van onderdelen
(P) Risco de queda ou de projecçao de peças
(S) Risk för att delar faller ned eller spritter ut

(F) Risque de chute ou de projection de pieces

(D) Unbedingt Spezialschrauben verwenden
(DK) Special - skruer skal anvendes
(E) Empleo imperativo de tornillos especiales
(GB) Use of special fixing - hardware essential
(I) Uso obbligatorio di bulloneria speciale
(NL) Uitluitend speciale bouten gebruiken
(P) Utilizaçao imperativa de parafusos ou porcas especiais
(S) Specialskruv måste ovillkorligen användas

(F) Emploi imperatif de visserie spéciale

(D) Arbeitsvorgang, falls erforderlich durchführen
(DK) Arbejdsoperation der udføres hvis det er nødvendigt
(E) Operación a efectuar si es necesario
(GB) Operation to be carried out if necessary
(I) Operazione da effettuare se necessario
(NL) Indien noodzakelijk handeling uitvoeren
(P) Operaçao a efectuar se necessário
(S) Arbetsmoment/arbete att utföra vid behov
(F) Opération à effectuer si nécessaire

D Rechts	I Destro	S Höger	
DK Højre	NL Rechts		
E Derecho	P Direita	F Droite	
GB Right			

D Links	I Sinistro	S Vänster	
DK Venstre	NL Links		
E Izquierdo	P Esquerda	F Gauche	
GB Left			

D Oben	I Alto	S Uppåt	
DK Opad	NL Boven		
E Alto	P Alto	F Haut	
GB Up			

D Unten	I Basso	S Nedåt	
DK Nedad	NL Onder		
E Bajo	P Baixo	F Bas	
GB Down			

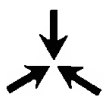
D Hinten	I Dietro (Posteriore)	S Bak (åt). bakre	
DK Bag	NL Achter		
E Trasero	P Traseira	F Arrière	
GB Rear			

D Vorn	I Avanti (Anteriore)	S Fram (åt). främre	
DK For	NL Voor		
E Delantero	P Dianteira	F Avant	
GB Front			

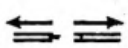
D Ausbau. Ausbauen	I Stacço. Staccare	S Demontering. Demontera	
DK Fjernelse. Fjerne	NL Verwijder. Uitbouwen		
E Quitado. Quitar	P Desmontagem. Desmontar.		
GB Removal. Remove		F Dépose - Déposer	

D Einbau. Einbauen	I Riattacco. Riattaccare	S Återmontering. Återmontera	
DK Anbringelse. Anbringe	NL Monteer. Inbouwen		
E Colocación. Poner	P Montagem. Montar	F Pose - Poser	
GB Fitting. Fit			

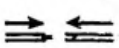
(D) Zerlegen
(DK) Afmontering. Afmontere
(E) Desmontaje. Desmontar
(GB) Dismantling. Dismantle
(I) Smontaggio. Smontare
(NL) Demontage. Demonteren
(P) Desarmar
(S) Isärtagning - Tag isär
(F) Démontage - Démonter



(D) Zusammenbau
(DK) Påmontering. Påmontere
(E) Montaje. Montar
(GB) Assembly. Assemble
(I) Montaggio. Montare
(NL) Montage. Monteren
(P) Armar
(S) Hopsättning. Sätt ihop
(F) Montage - Monter



(D) Lösen
(DK) Adskille
(E) Desconectar
(GB) Disconnect
(I) Disinnestare
(NL) Losmaken
(P) Desligar
(S) Koppla bort
(F) Déconnecter



(D) Verbinden
(DK) Samle
(E) Conectar
(GB) Connect
(I) Innestare
(NL) Aan elkaar maken
(P) Ligar
(S) Koppla in
(F) Connecter

(D) Die Drehung oder Übertragung muss ohne Hartpunkt erfolgen
(DK) Sørg for at drejningen eller bevaegelsen sker jaevnt og ensartet
(E) Asegurarse de que la rotación o la translación se efectua sin punto duro
(GB) Ensure that the rotation or movement is without high spots
(I) Assicurarsi che la rotazione o la translazione avvenga senza sforzo
(NL) Controleer of het draaien of de overbrenging zonder zwaar punt verloopt
(P) Certificar-se que a rotação ou a translação se efectua sem ponto duro
(S) Kontrollera att runtdragningen eller manövreringen kan ske utan kärvning
(F) S'assurer que la rotation ou la translation s'effectue sans point dur

(D) Anschrauben. 1 = Anzahl der Umdrehungen. 180° = Einstellwinkel
(DK) Skruel. 1 = Antal omdrejninger. 180° = Drejningsvinkel
(E) Roscar. 1 = Número de vueltas. 180° = Angulo que se debe efectuar
(GB) Screw In. 1 = Número of turns. 180° = Angular value
(I) Avvitare 1 = Numero di giri. 180° = Rotazione da effettuare
(NL) Aandraaien. 1 = Aantal slagen. 180° = In te stellen hoek
(P) Aparafusar 1 = Número de voltas. 180° = Ângulo a efectuar
(S) Skruva In 1 = Antal Varv 180° = Antal grader
(F) Visser - 1 = Nombre de tours. 180° = Angle à effectuer

(D) Losschrauben. 1 = Anzahl der Umdrehungen. 180° = Einstellwinkel
(DK) Skrue løs. 1 = Antal omdrejninger. 180° = Drejningsvinkel
(E) Desenroscar. 1 = Número de vueltas. 180° = Angulo que se debe efectuar
(GB) Unscrew. 1 = Number of turns. 180° = Angular value
(I) Svitare. 1 = Numero di giri. 180° = Rotazione da effettuare
(NL) Losdraaien. 1 = Aantal slagen. 180° = In te stellen hoek
(P) Desaparafusar. 1 = Número de voltas. 180° = Ângulo a efectuar
(S) Skruva ut. 1 = Antal varv. 180° = Antal grader

(F) Dévisser - 1 = Nombre de tours. 180° = Angle à effectuer

(D) Verbot. Nicht verwenden oder wiederverwenden
(DK) Forbud. Må ikke anvendes eller genbruges
(E) Prohibido. No utilizar o volver a utilizar
(GB) Prohibited. Do not use or reuse
(I) Proibizione. Non usare o riutilizzare
(NL) Verboden Niet gebruiken of niet opnieuw gebruiken
(P) Proibido Não utilizar ou reutilizar
(S) Förbud Använd eller återanvänd ej

(F) Interdiction - Ne pas utiliser ou réutiliser

(D) Federring
(DK) Fjederskive
(E) Arandela Grower
(GB) Spring washer
(I) Rondella Grower
(NL) Veerring
(P) Anilha Grower
(S) Grower - Bricka
(F) Rondelle Grower

(D) Unterlegscheibe
(DK) Kontakt Skive
(E) Arandela de Contacto
(GB) Contact washer
(I) Rondella a Contatto
(NL) Contactring
(P) Anilha de Contacto
(S) Kontaktbricka
(F) Rondelle Contact

(D) Zahnscheibe
(DK) Stjerneskive
(E) Arandela Estrellada
(GB) Serrated washer
(I) Rondella a Ventaglio
(NL) Kartelring
(P) Anilha Recartilhada
(S) Solfjäderbricka
(F) Rondelle Eventail

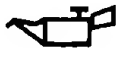
(D) Flachscheibe
(DK) Flad Skive
(E) Arandela Plana
(GB) Flat washer
(I) Rondella Piatta
(NL) Platte Ring
(P) Anilha Plana
(S) Planbricka
(F) Rondelle Plate

(D) Anzahl der Schraubelemente : Schrauben, Muttern, Stiftschrauben usw
(DK) Antal dele I skruesamlingen
(E) Cantidad de elementos de tornilleria : tornillos, tuerca, esparrago, etc.
(GB) Number of threaded components : screw, nut, stud, etc.
(I) Numero di elementi di bulloneria, viti, dadi, prigionieri, ecc.
(NL) Aantal : bouten, moeren, tapeinden enz. . . .
(P) Número de elementos de parafusos ou porcas, porca, perno, etc.
(S) Antal förskruvningspunkter : skruv, mutter, pinnbult, etc.

(F) Nombre d'éléments de visserie : vis, écrous, goujons, etc.

(D) Sichern bzw. Entsichern
(DK) Låse eller frigøre
(E) Frenar o quitar el freno, según el caso
(GB) Lock or unlock as appropriate
(I) Bloccare o sbloccare, secondo i casi
(NL) Borgen of borg verwijderen
(P) Travar ou destravar conforme o caso
(S) Lås eller avlägsna låsningen
(F) Freiner ou défreiner suivant le cas

(D) Unbedingt Neuteile verwenden
(DK) Ny del skal anvendes
(E) Empleo imperativo de una pieza nueva
(GB) Use of new part essential
(I) Uso obbligatorio di un pezzo nuovo
(NL) Noodzakelijk een nieuw onderdeel te gebruiken
(P) Utilização imperativa duma peça nova
(S) Ny del måste ovillkorligen användas
(F) Emploi impératif d'une pièce neuve



(D) Schmieren
(DK) Smøre
(E) Aceitar
(GB) Oil
(I) Oliare
(NL) Oliën
(P) Olear
(S) Anolja
(F) Huiler

(D) Reinigen ...(je nach eventueller Markierung, siehe Tabelle der Klebe-, Schmier-und Dichtmittel)
(DK) Rengøre med ... (afhængig af evt. mærkning af produkt)
(E) Limpiar ... (siguiendo lo señalado eventualmente, ver cuadro de productos)
(GB) Clean ... (according to symbol, if present, see table of recommendations)
(I) Pulire ... (secondo eventuale riferimento, vedere tabella ingredienti)
(NL) Reinigen ... (zoals aangegeven, zie lijts met benodigdheden)
(P) Limpar ... (conforme marca eventual, ver quadro ingredientes)
(S) Rengör ... (enligt eventuell märkning, se listan över olika produkter)

(F) Nettoyer ... (suivant repère éventuel, voir tableau ingrédients)

(D) Mit ... schmieren (gemäss Markierung, siehe Tabelle der Klebe-, Schmier- und Dichtmittel)
(DK) Overstryge med ... (afængig af referance produkt)
(E) Untar con ... (siguiendo lo señalado, ver cuadro de productos)
(GB) Smear with ... (according to symbol, see table of recommendations)
(I) Spalmare di ... (secondo riferimento, vedere tabella ingredienti)
(NL) Insmeren met .,. (zoals aangegeven, zie lijst met benodigdheden)
(P) Untar com ... (conforme marca, ver quadro ingredientes)
(S) Bestryk med ... (enligt mäkning, se listan över olika produkter)
(F) Enduire de ... (suivant repère, voir tableau ingrédients)

OK

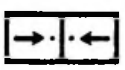
(D) Gut
(DK) God
(E) Bueno
(GB) Serviceable
(I) Buono
(NL) Goed
(P) Bom
(S) Korrekt
(F) Bon

(D) Siehe
(DK) Se ... henvisning til ...
(E) Ver ... dirigirse a ...
(GB) See ... refer to ...
(I) Vedere ... riportarsi a ...
(NL) Zie ... verwijzen naar ...
(P) Ver ... reportar- se a ...
(S) Se ... gå tillbaka till ...
(F) Voir ... se reporter à ...

(D) Sichtprüfung oder Prüfung mit der Hand
(DK) Kontrollere visuelt eller manuelt
(E) Controlar visualmente o manualmente
(GB) Check visually or physically
(I) Controllare visivamente o manualmente
(NL) Visuele of handmatige controle
(P) Controlar visual ou manualmente
(S) Gör en manuell kontroll eller en okulärkontroll
(F) Contrôler visuellement ou manuellement

(D) Mit einem Messgerät prüfen
(DK) Kontrollere med måleinstrument
(E) Controlar con un instrumento
(GB) Check with a measuring instrument
(I) Controllare con uno strumento
(NL) Controleren met een instrument
(P) Controlar com um instrumento
(S) Kontrollera med instrument
(F) Contrôler avec un instrument

(D) Mehrere Einbaumöglichkeiten (1 - 2 - 3)
(DK) Flere monteringsmuligheder (1; 2; 3...)
(E) Varios montajes posibles (1. 2. 3)
(GB) Several assembly possibilities (1, 2, 3)
(I) Diversi montaggi possibili (1; 2; 3)
(NL) Verschillende mogelijkheden voor montage (1 ; 2 ; 3...)
(P) Várias montagens possíveis (1. 2. 3)
(S) Flera monteringsutföranden förekommer (1; 2; 3)
(F) Plusieurs montages possibles (1 - 2 - 3)



(D) Markieren, Biem Wiedereinbau auf Zugehörigkeit der Teile achten
(DK) Afmœrke. Ved genmontering skal delenes rette sammenpasning respekteres
(E) Señalar. Respetar el apareado de las piezas para el nuevo montaje
(GB) Mark. The parts must be kept paired for re-assembly
(I) Segnare. Rispettare l'accoppiamento dei pezzi per il rimontaggio
(NL) Merken. Zorg bij montage dàt de onderdelen bij elkaar komen
(P) Marcar. Respeitar o acasalamento das peças para armá-las
(S) Märk ut. Respektera a delarnas märkning vid återmonteringen
(F) Repérer - Respecter l'appariement des pièces pour le remontage

(D) Einstellen
(DK) Justere
(E) Regular
(GB) Adjust
(I) Regolare
(NL) Afstellen
(P) Afinar
(S) Ställ in
(F) Régler

(D) Abstand, Spiel
(DK) Spil
(E) Juego
(GB) Clearance
(I) Gioco
(NL) Speling
(P) Folga
(S) Spel
(F) Jeu

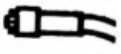
(D) Einbau durch Pressen, Vorspannen oder genaues Einpassen
(DK) Montering med forspænding, prespasning eller itrykning
(E) Montaje con esfuerzo, precarga o apriete ajustado
(GB) Assembly force fit, with preload or interference fit
(I) Montaggio forzato, precarico o accoppiamento serrato
(NL) Montage onder spanning, voorspanning of klemspanning
(P) Armar em esforço, précarga ou encaixe apertado
(S) Montering med förspanning, presspassning eller ihoptryckt
(F) Montage sous contrainte, précharge ou emmanchement serré

(D) Leicht anziehen
(DK) Skrue sammen uden fastspaending
(E) Aproximar sin apretar
(GB) Screw up without tightening
(I) Avvicinare senza serrare
(NL) Aandraaien zonder vast te zetten
(P) Aconchegar sem apertar
(S) Skruva i utan att dra åt
(F) Approcher sans serrer

(D) Vorgeschriebenes Anziehdrehmoment
(DK) Tilspændingsmoment skal overholdes
(E) Par de apriete que se debe respetar imperativamente
(GB) Observation of tightening torque essential
(I) Coppia di serraggio da rispettare obbligatoriamente
(NL) Voorgeschreven aanhaalspanning aanhouden
(P) Aperto a respeitar imperativamente
(S) Åtdragningsmoment som ovillkorligen måste respekteras
(F) Couple de serrage à respecter impérativement

(D) Hartlöten
(DK) Lodde
(E) Soldar con metal
(GB) Braze
(I) Brasare
(NL) Soideren
(P) Soldar a metal
(S) Löd
(F) Braser

(D) Schweissnaht
(DK) Svejsesøm
(E) Cordón de soldadura
(GB) Fillet of weld
(I) Cordone di saldatura
(NL) Lasrups
(P) Cordão de soldadura
(S) Svetssträng
(F) Cordon de soudure



(D) Lochpunktschweissen
(DK) Stubsvejsning
(E) Soldadura por puntos de "tapón"
(GB) Plug weld
(I) Saldatura con punti "a tappo"
(NL) Proplassen
(P) Soldadura por pontos "tampão"
(S) Pluggsvetsning
(F) Soudage par points "bouchon"

(D) Unterbodenschutzmittel auftragen
(DK) Påfør undervognebeskyttelse
(E) Aplicar un producto de protección de bajos de caja
(GB) Apply underbody protection
(I) Applicare un prodotto protettivo al sottoscocca
(NL) Beschermlaag onder carrosserie a anbrengen (undercoting)
(P) Aplicar um produto de protecção
(S) Anbringa skyddsmassa på underredet

(F) Appliquer un produit de protection sous caisse

(D) Auf der Prüfbank bei ausgebauten mechanischen Teilen
(DK) På opretterbænk, uden mekaniske komponenter
(E) Paso por el banco sin mecánica
(GB) Check on jig without mechanical compoents in place
(I) Passaggio sul piano senza la meccanica
(NL) Op richtbank zonder mechanisch gedeelte
(P) Passagem no banco sem mecanica
(S) Montering i riktbänk med mekaniska detaljer borttagna

(F) Passage au banc sans mécanique

(D) Auf der Prüfbank bei ausgebauten hinteren mechanischen Teilen
(DK) På opretterbænk, uden mekaniske komponenter, bagtil
(E) Paso por el banco sin mecánica trasera
(GB) Check on jig without rear mechanical components in place
(I) Passaggio sul piano senza la meccanica posteriore
(NL) Op richtbank zonder achterste mechanisch gedeelte
(P) Passagem no banco sem mecanica traseira
(S) Montering i riktbänk med bakre mekaniska detaljer borttagna

(F) Passage au banc sans mécanique arrière

(D) Auf der Prüfbank bei ausgebauten vorderen mechanischen Teilen
(DK) På oppretterbænk, uden mekaniske komponenter, fortil
(E) Paso por el banco sin mecánica delantera
(GB) Check on jig without front mechanical components in place
(I) Passaggio sul piano senza la meccanica anteriore
(NL) Op richtbank zonder voorste mechanisch gedeelte
(P) Passagem no banco sem mecanica dianteira
(S) Montering i riktbänk med främe mekaniska detaljer borttagna

(F) Passage au banc sans mécanique avant

(D) Auf der Prüfbank mit eingebauten mechanischen Teilen
(DK) På bænk, med mekaniske komponenter
(E) Paso por el banco con mecánica
(GB) Check on jig, complete vehicle
(I) Passaggio sul piano con la meccanica
(NL) Op richtbank met mechanisch gedeelte
(P) Passagem no banco com mecanica
(S) Montering i riktbänk med mekaniska detaljer kvar på vagnen
(F) Passage au banc avec mécanique

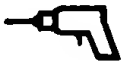
(D) Von Hand sägen
(DK) Manuel savning
(E) Serrado manual
(GB) Cut with a hand saw
(I) Taglio manuale
(NL) Doorzagen met handzaag
(P) Serração manual
(S) Manuell Sågning
(F) Sciage manuel

(D) Mit der Kreissäge trennen
(DK) Save med rundsav
(E) Serrado con sierra circular
(GB) Cut with a circular saw
(I) Taglio con sega circolare
(NL) Doorzagen met cirkelzaag
(P) Serração com serra circular
(S) Sågning med kapskiva
(F) Sciage avec scie circulaire

(D) Mit der Stichsäge trennen
(DK) Save med stiksav
(E) Serrado con sierra alternativa
(GB) Cut with a power jig-saw
(I) Taglio con sega alternativa
(NL) Snijden met knabbelschaar
(P) Serração com serra vertical
(S) Sågning med sticksåg
(F) Sciage avec scie sauteuse

(D) Mit dem Meissel trennen
(DK) Bortmejsle
(E) Cortar con un buril
(GB) Cut with a chisel
(I) Tagliare a scalpello
(NL) Loshakken met beitel
(P) Recortar com buril
(S) Lossa med huggmejsel
(F) Découper au burin

(D) Mit Klemmzangen befestigen
(DK) Fastholde med spænde-tænger
(E) Fijar con pinzas de mordazas
(GB) Fix with sheet-metal clamps
(I) Fissare con pinze morsetto
(NL) Vastzetten met plaatklemmen
(P) Fixar com alicates de pressão
(S) Fäst med plåtklämmor
(F) Fixer par pinces serre-tôles



(D) Bohren
(DK) Bore
(E) Taladrar
(GB) Drill
(I) Forare
(NL) Doorboren, boren
(P) Furar
(S) Borra
(F) Percer

(D) Anreissen
(DK) Opmærke
(E) Trazar
(GB) Mark out
(I) Tracciare
(NL) Aftekenen
(P) Traçar
(S) Märk ut
(F) Tracer

(D) Glätten
(DK) Planere
(E) Aplanar
(GB) Planish
(I) Spianare
(NL) Vlakken
(P) Alisar
(S) Plana
(F) Planer

(D) Auf Stoss ansetzen
(DK) Tilpasse kant mod kant
(E) Ajustar borde con borde
(GB) Trim edges to butt
(I) Accostare bordo a bordo
(NL) Randen op elkaar afstellen
(P) Ajustar bordo a bordo
(S) Passa in kant-i-kant
(F) Ajuster bord à bord

(D) Hohlraumschutzmittel auftragen
(DK) Hulrum sprøjtes med anti-korrosions middel
(E) Pulverizar un producto de protección en los cuerpos huecos
(GB) Spray an anti-corrosion procut into the box members
(I) Nebulizzare un prodotto protettivo negli elementi scatolati
(NL) Anti-corrosieprodukt in holle delen aanbrengen (ML)
(P) Pulverizar um produto de protecção nos corpos ocos
(S) Spruta in rostskyddsmedel i balkarna

(F) Pulvériser un produit de protection dans les corps creux

(D) Mit Blechschere oder Beisszange abtrennen.
(DK) Skær med pladesaks eller klippemaskine
(E) Cortar con la cizalla o con la guillotina
(GB) Cut off with snips or a nibbler
(I) Tagliare con la cesoia o con lo scalpello pneumatico
(NL) Doorknippen met schaar of knabbelschaar
(P) Recortar com tesoura grande ou com tesoura roedara
(S) Kilpp loss med plåtsax eller såga loss med bågfil

(F) Découper à la cisaille ou à la grignoteuse

(D) Mit Zinn oder Epoxyharz ausschwemmen
(DK) Samlingen udfyldes med tin eller epoxy-spartelmasse
(E) Superficie por aportación de estaño o de resina epoxy
(GB) Fill using lead or epoxy resin
(I) Superficie con apporto di stagno o di resine epossidiche
(NL) Opvullen met tin of epoxy-hars
(P) Superficie com aplicação de estanho ou de resina epoxy
(S) Ytan jämnas med tenn eller plastmassa

(F) Surface par apport d'étain ou de résine epoxy

(D) Schweisspunkte mit dem Lochpunktfräser ausbohren
(DK) Skilles ved bortslibning af punktsvejsninger
(E) Desgrapar por fresado la chapa que se va a desmontar
(GB) Mill out the spotwelds from the panel to be removed
(I) Sgraffare fresando la lamiera da togliere
(NL) Losmaken, doorslijpen van de te vervangen plaat
(P) Desprender por frezagem a chapa a desmontar
(S) Lossa plåten genom uppborrning av punktsvetsarna

(F) Dégrafer par fraisage de la tôle à déposer

(D) Widerstandspunktschweissen
(DK) Punktsvejsning
(E) Puntos de soldadura por resistencia
(GB) Resistance spot-welds
(I) Punti di saldatura con resistenza
(NL) Electrisch puntlassen
(P) Pontos de soldadura por resistencia
(S) Punktsvetsning
(F) Points de soudure par résistance

(D) Mit Mastix abdichten (siehe Tabelle der Klebe - Schmier - und Dichtmittel). Nötigenfalls glätten
(DK) Tætningsmasse (sealer) påføres. Glat eventuelt efter
(E) Aplicar una masilla de estanquidad (ver cuadro de productos). Alisar si es necesario
(GB) Apply a mastic sealant (see table of recommendations) smooth out if necessary
(I) Applicare un mastice di tenuta (vedere tabella ingredienti). Lisciare se necessario
(NL) Kit aanbrengen (zoals aangegeven zie lijst met benodigdheden). Eventueel gladstrijken
(P) Aplicar uma massa vedante (ver quadro ingredientes). Alisar se necessário
(S) Anbringa tätningsmassa (se listan över olika produkter). Jämna till vid behov

(F) Appliquer un mastic d'étanchéité (voir tableau ingédients). Lisser si nécessaire

(D) Mastix-Dichtschnur auftragen
(DK) Anvend rund sealer-streng
(E) Aplicar masilla prensada en redondo
(GB) Apply round preformed mastic-strip
(I) Applicare del mastice presagomato tondo
(NL) Aanbrengen voorgevormde ronde kit
(P) Aplicar massa pré-formada redonda
(S) Anbringa tätningsmassa i färdigformade strängar med rund profil
(F) Appliquer du mastic préboudiné rond

(D) Dünnen Mastix-Dichtstreifen auftragen
(DK) Anvend flad sealer-streng
(E) Aplicar masilla prensada en plano
(GB) Apply flat preformed mastic strip
(I) Applicare del mastice presagomato piatto
(NL) Aanbrengen voorgevormde vlakke kit
(P) Aplicar massa pré-formada plana
(S) Anbringa tätningsmassa i färdigformade strängar med platt profil
(F) Appliquer du mastic préboudiné plat

(D) Stromleitenden Karosserieschutz auftragen
(DK) Påføre svejsegrundfarve
(E) Aplicar impresión conductora
(GB) Apply conductive welding primer
(I) Applicare uno strato conduttore
(NL) Aanbrengen van stroomgeleidende vloeistof
(P) Aplicar impressão condutora
(S) Anbringa en svetprimer
(F) Appliquer impression conductrice

(D) Mit Schweissflamme und Drahtbürste reinigen
(DK) Rengøre eller rense
(E) Limpiar o decapar
(GB) Clean or scour
(I) Pulire o decapare
(NL) Reinigen of ontvetten
(P) Limpar ou decapar
(S) Rengör eller avfetta
(F) Nettoyer ou décaper

(D) Mit der Schruppscheibe bearbeiten
(DK) Slibe medhård skive
(E) Esmerilar con disco duro
(GB) Grind with a hard disc
(I) Molare con disco abrasivo
(NL) Slijpen met harde schijf
(P) Desbastar com disco duro
(S) Slipa med hård skiva
(F) Meuler avec disque dur

(D) Mit elastischer Schleifscheibe bearbeiten
(DK) Polere med blød skive
(E) Lijar con disco flexible
(GB) Sand with a flexible disc
(I) Levigare con tampone morbido
(NL) Polijsten met zachte schijf
(P) Polir com disco flexivel
(S) Slipa med mjuk skiva
(F) Poncer avec disque souple

MANUEL DE RÉPARATION MAN 008923

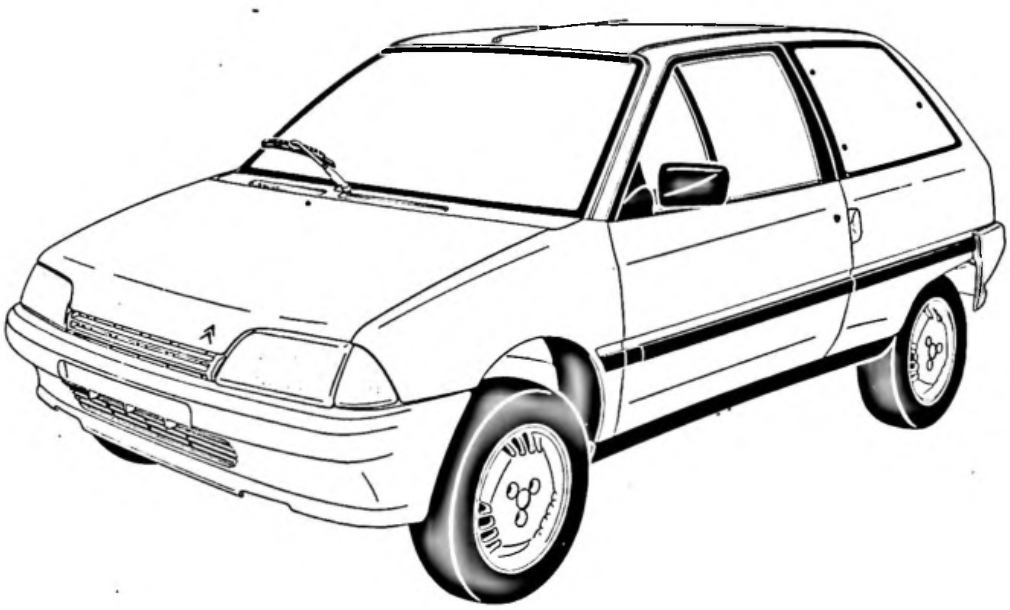
SERVICES A LA CLIENTÈLE
TECHNIQUE APRÈS-VENTE

SEPTEMBRE 1986

VEHICULES
AX

Additif N° 1 : .....
N° 2 : .....
N° 3 : .....

CARROSSERIE



Automobiles Citroën. S.A. au capital de 800.000.000 F
R.C.S. NANTERRE B 642 050 199. SIRET 642 050 199 00644 APE 3111. Télégramme et Télex : CITR 614830 F
ADRESSE POSTALE : 92208 NEUILLY-SUR-SEINE CEDEX FRANCE

UTILISATION DU MANUEL

PRÉSENTATION.

Le **Manuel de Réparation** est présenté dans une reliure à anneaux afin de faciliter le classement des additifs ou le prélèvement d'une opération nécessaire à l'atelier.

Il est divisé en trois chapitres :

(0) : Généralités

(14) : Éléments soudés

(15) : Éléments amovibles et habillage

COMPOSITION D'UN CHAPITRE.

Chaque chapitre comporte :
- la liste des opérations figurant dans celui-ci,
- les opérations classées par ordre numérique,
- éventuellement les plans d'exécution des outils M.R. nécessaires à la réalisation des opérations traitées dans le chapitre.

OPÉRATIONS.

Les numéros d'opérations se composent :
a) de l'indicatif du véhicule : **ZA**,
b) d'un nombre de trois chiffres désignant l'organe ou l'élément d'organe, suivi d'un numéro d'ordre.

Les opérations sont présentées soit :
- par clichés, dessins et texte,
- par clichés, dessins et symboles dont un lexique en neuf langues est placé en tête du manuel.

• *Le titre d'une opération est symbolisé par le premier cliché figurant en page 1 de celle-ci.*

OUTILLAGE.

Les numéros et les illustrations de l'outillage spécial apparaissent dans une opération au fur et à mesure du déroulement des travaux.
L'outillage référencé par **OUT** suivi de **6 chiffres** et terminé par la lettre **T** est **vendu** par le **Département des Pièces de Rechange** pour la FRANCE et l'EXPORTATION.
L'outillage référencé par **4 chiffres** suivi de la lettre **T** est **vendu**, par la Société FENWICK, Département AMA : 69, rue du Docteur BAUER - BP 189 - 93404 ST OUEN CEDEX Tél. (1) 40 10 67 00 - TELEFAX (1) 40 11 06 77 pour la FRANCE, et par CITROEN pour l'EXPORTATION.
L'outillage **MR** devra être fabriqué par le réparateur lui-même.

COUPLES DE SERRAGE.

Ils sont exprimés en mètre décanewton (**m.daN**), unité légale de mesure du couple :
0,981 m.daN = 1 m.kg (ancienne unité de mesure)
En pratique : **1 m.daN = 1 m.kg.**

MISE A JOUR DU MANUEL PAR ADDITIFS.

Les additifs seront à commander dès l'annonce de leur sortie par une NOTE DOCUMENTATION.
Les pages d'un additif s'ajoutent ou se substituent aux pages correspondantes du manuel ; elles sont identifiées par des points situés à la gauche du *numéro simplifié* du manuel en bas et à droite de chaque page recto :
Exemple 1 point • *8923* : additif nº 1 ; 2 points • •*8923* : additif nº 2 etc.

REMARQUES IMPORTANTES.

Pour tous renseignements techniques, veuillez vous adresser au service :
TECHNIQUE APRÈS-VENTE
Chemin Vicinal nº **2** – 78140 VELIZY
Tél. : 45.37.30.30

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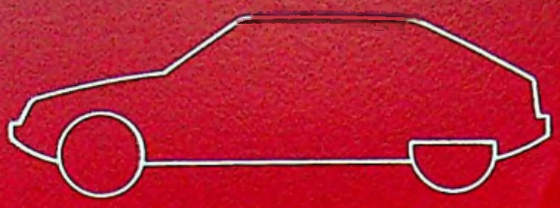

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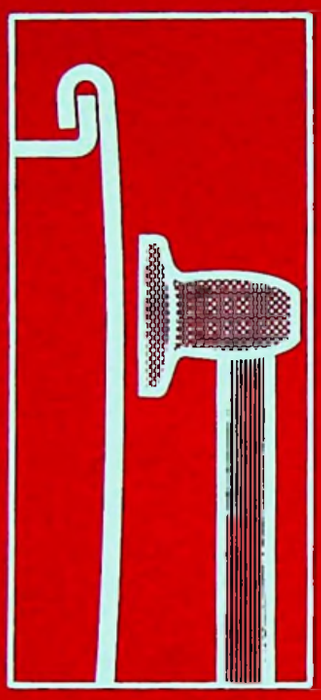

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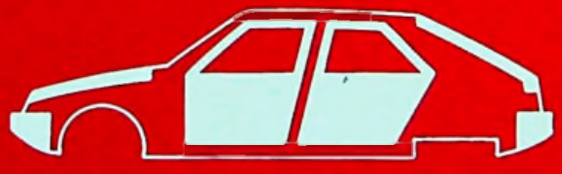


15

IDENTIFICATION MOTEURS

A
FAMILLE MOTEUR
TU TUD XU XUD

B
CYLINDREE (cm³)
9 : 900 à 999 (TU)
1 : 1100 à 1199
2 : 1200 à 1299
3 : 1300 à 1399
5 : 1500 à 1599
7 : 1700 à 1799
9 : 1900 à 1999
10 : 2000 à 2099
11 : 2100 à 2199

C
NOMBRE DE CORPS (Carbu)
1 Monocorps
2 Bicorps
4 Quatre corps

D
TYPE ALIMENTATION
Sans : Carburateur
J : Inj. multipoint
CP : Carbu. piloté
M : Inj. monopoint
T : Turbo
E : Echangeur
D : A.C.A.V.

A	B	C-D	E-F	D		G
TU	3		S		/	* K

A	B	D	E-F	D		G
TU	3	J	2		/	* K

G	
REGLEMENTATION ANTIPOLLUTION	
*** Stades d'évolutions**	**Antipollution**
2 2ème génération **3** 3ème génération etc...	**K** : 15.04 **W** : 15.05 **Y** : US 87 **Z** : US 83 **N** : Davignon - 15 (classe C) **S** : Japon (essence) **R** : Japon (diesel) **V** : 15.06 Europe

E
STADES EVOLUTIONS
A : Amélioré
S : Supérieur
C : Compact

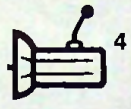
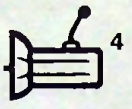
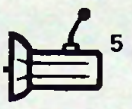
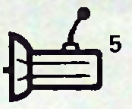
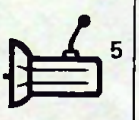
F
NOMBRE DE SOUPAPES
2 : 2 Soupapes
3 : 3 Soupapes
4 : 4 Soupapes

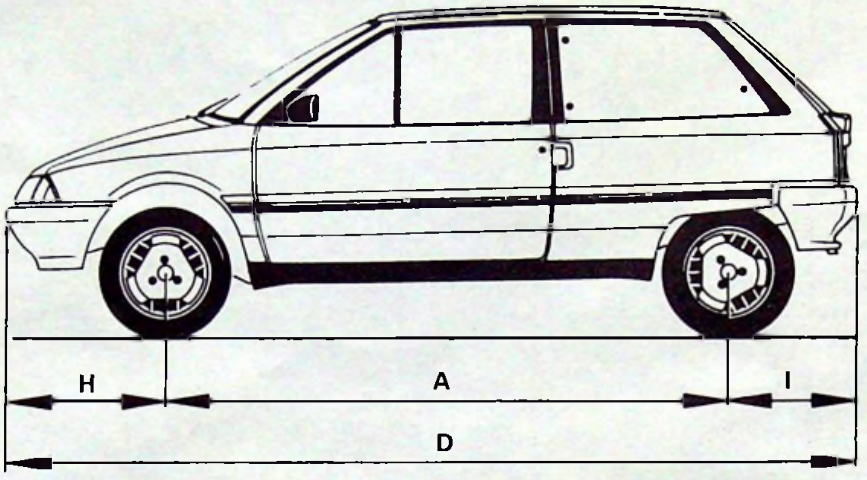
NUMERO DE L'OPERATION	DESIGNATION	
ZA 000/1	Caractéristiques générales identification 3 PORTES	→ 07/91 07/91 →
ZA 000/2	Caractéristiques générales identification 5 PORTES	→ 07/91 07/91 →
ZA 00/1	Points de levage et de remorquage véhicule.	→ 07/91
AX 00/2	Points de levage et de remorquage véhicule.	07/91 →
ZA 00/3	Protection des organes électriques.	
ZA 00/4	Ingrédients préconisés.	

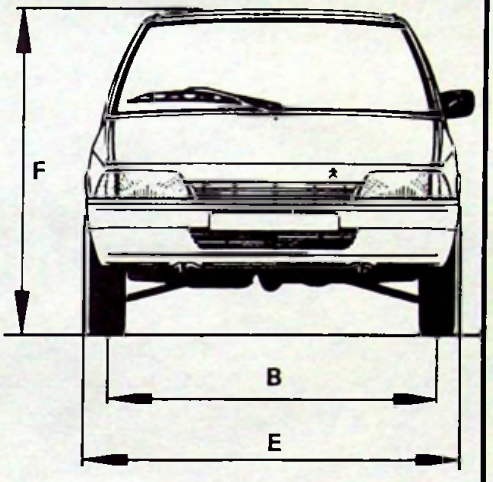
Cyl (cm³) Moteur	→ 07/91						07/91 →					
	10 954 C1A	11 1124 H1A	14 1360 K1A K1G	GT 1360 K2A	Sport 1294 M4A	Diesel 1360 K9A	10 954 C1A	11 1124 H1A	14 1360 K2D	GT 1360 K2A	GTI 1360 K6B	Diesel 1360 K9A
ZA 000/1	X	X	X	X	X	X	X	X	X	X	X	X
ZA 000/2	X	X	X	X		X	X	X	X	X		X
ZA 00/1	X	X	X	X	X	X						
ZA 00/2							X	X	X	X	X	X
ZA 00/3	X	X	X	X	X	X	X	X	X	X	X	X
ZA 00/4	X	X	X	X	X	X	X	X	X	X	X	X

NUMÉRO DE L'OPÉRATION	DÉSIGNATION
ZA 000	Caractéristiques générales – Identification
ZA 00 / 1	Points de levage et de remorquage véhicule
ZA 00 /2	Protection des organes électriques
ZA 00 /4	Ingrédients préconisés

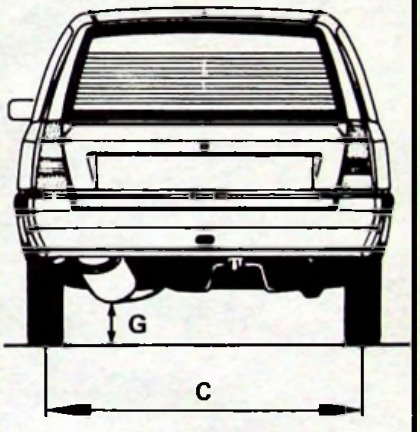
NUMÉRO DE L'OPÉRATION	DÉSIGNATION
ZA. 000/1	Caractéristiques générales - Identification 3 PORTES
ZA. 000/2	Caractéristiques générales - Identification 5 PORTES
ZA. 00/1	Points de levage et de remorquage véhicule
ZA. 00/2	Protection des organes électriques
ZA. 00/4	Ingrédients préconisés

10 Ess.	11 Ess.		14 Ess.	GT	SPORT 2/88 →	14 Dies.
 4	 4	 5	 5	5	 5	5

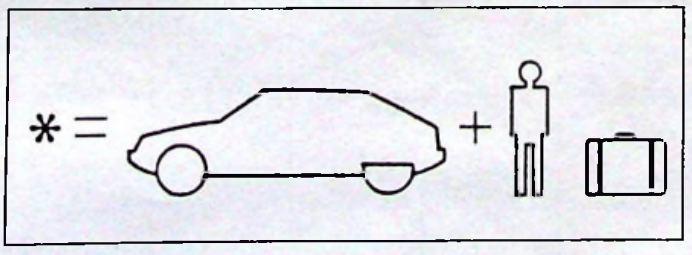


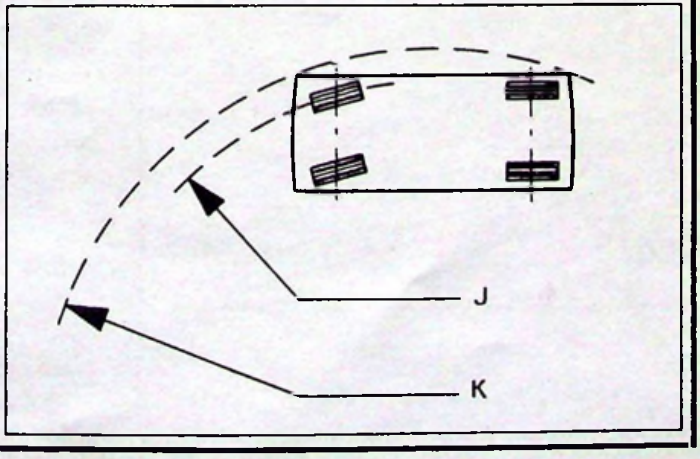


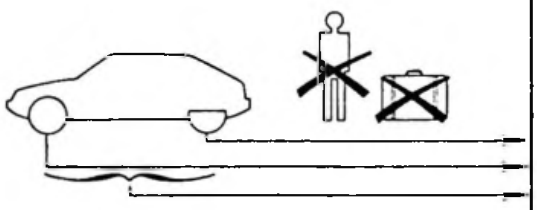
	10 Ess.	11 Ess.	14 Ess.	GT	*SPORT*	14 Dies.
A	2,280 m	2,280 m	2,280 m	2,280 m	2,280 m	2,280 m
B	1,380 m	1,380 m	1,370 m	1,392 m	1,402 m	1,380 m
C	1,300 m	1,300 m	1,290 m	1,312 m	1,322 m	1,300 m
D	3,495 m	3,495 m	3,495 m	3,495 m	3,495 m	3,495 m
E	1,555 m	1,555 m	1,555 m	1,596 m	1,596 m	1,555 m
F	1,355 m	1,355 m	1,355 m	1,344 m	1,350 m	1,355 m
G*	0,096 m	0,096 m	0,110 m	0,090 m	0,114 m	0,096 m
H	0,666 m	0,666 m	0,666 m	0,666 m	0,666 m	0,666 m
I	0,549 m	0,549 m	0,549 m	0,549 m	0,549 m	0,549 m
J	9,230 m	9,230 m	10,200 m	10,210 m	10,240 m	10,180 m
K	9,620 m	9,620 m	10,500 m	10,550 m	10,600 m	10,510 m



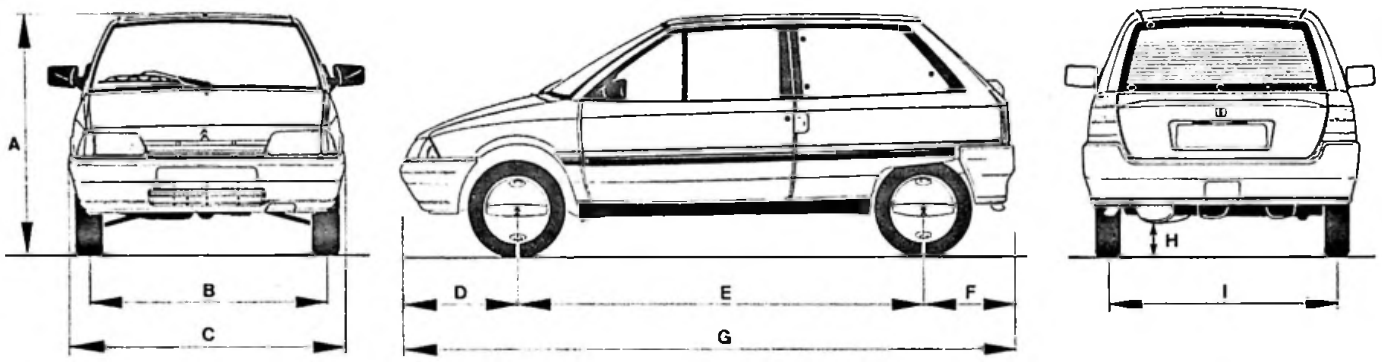
Z 80-4

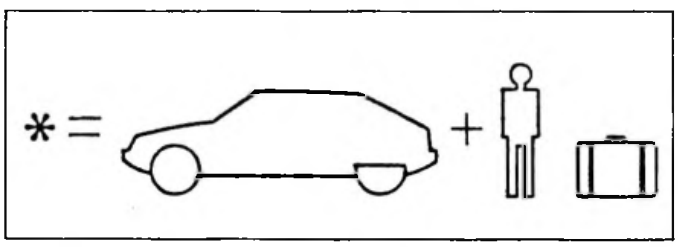


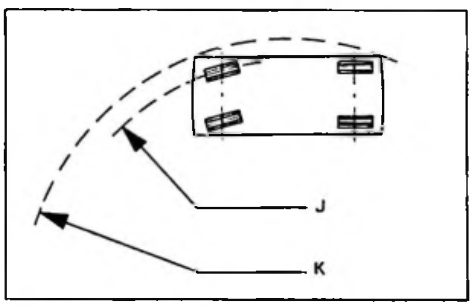




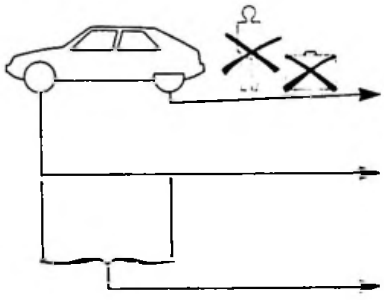
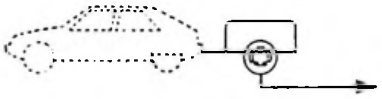
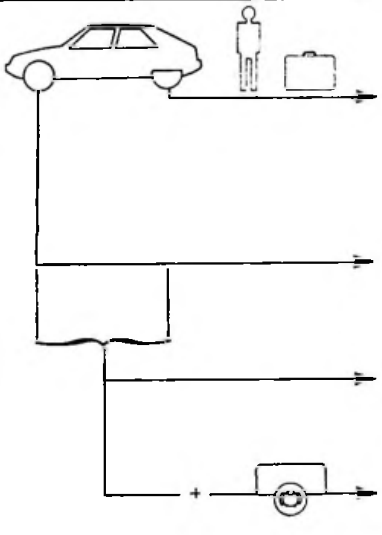
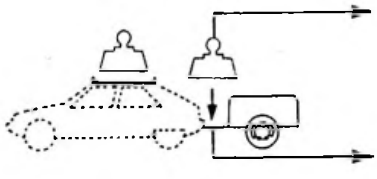
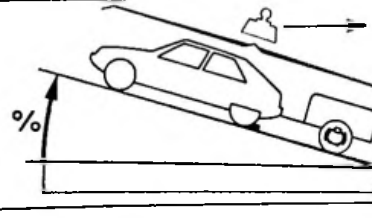
	10 Ess.	11 Ess.	14 Ess.	GT	*SPORT* 2/88 →	14 Dies.
	236 kg	237 kg	256 kg	265 kg	272 kg	253 kg
	404 kg	408 kg	439 kg	455 kg	463 kg	457 kg
	640 kg	645 kg	695 kg	720 kg	735 kg	710 kg
	500 kg	600 kg	700 kg	700 kg	500 kg	700 kg
	320 kg	320 kg	345 kg	360 kg	365 kg	355 kg
	550 kg	560 kg	560 kg	570 kg	510 kg	580 kg
	530 kg	540 kg	560 kg	560 kg	580 kg	600 kg
	1 055 kg	1 085 kg	1 115 kg	1 125 kg	1 065 kg	1 150 kg
	1 555 kg	1 685 kg	1 815 kg	1 825 kg	1565 kg	1 850 kg
	50 kg	50 kg	50 kg	50 kg	50 kg	50 kg
	35 kg	42 kg	49 kg	50 kg	49 kg	50 kg
	1 555 kg	1 685 kg	1 815 kg	1 825 kg	1 565 kg	1 850 kg
	16 %	16 %	16 %	12 %	12 %	12 %

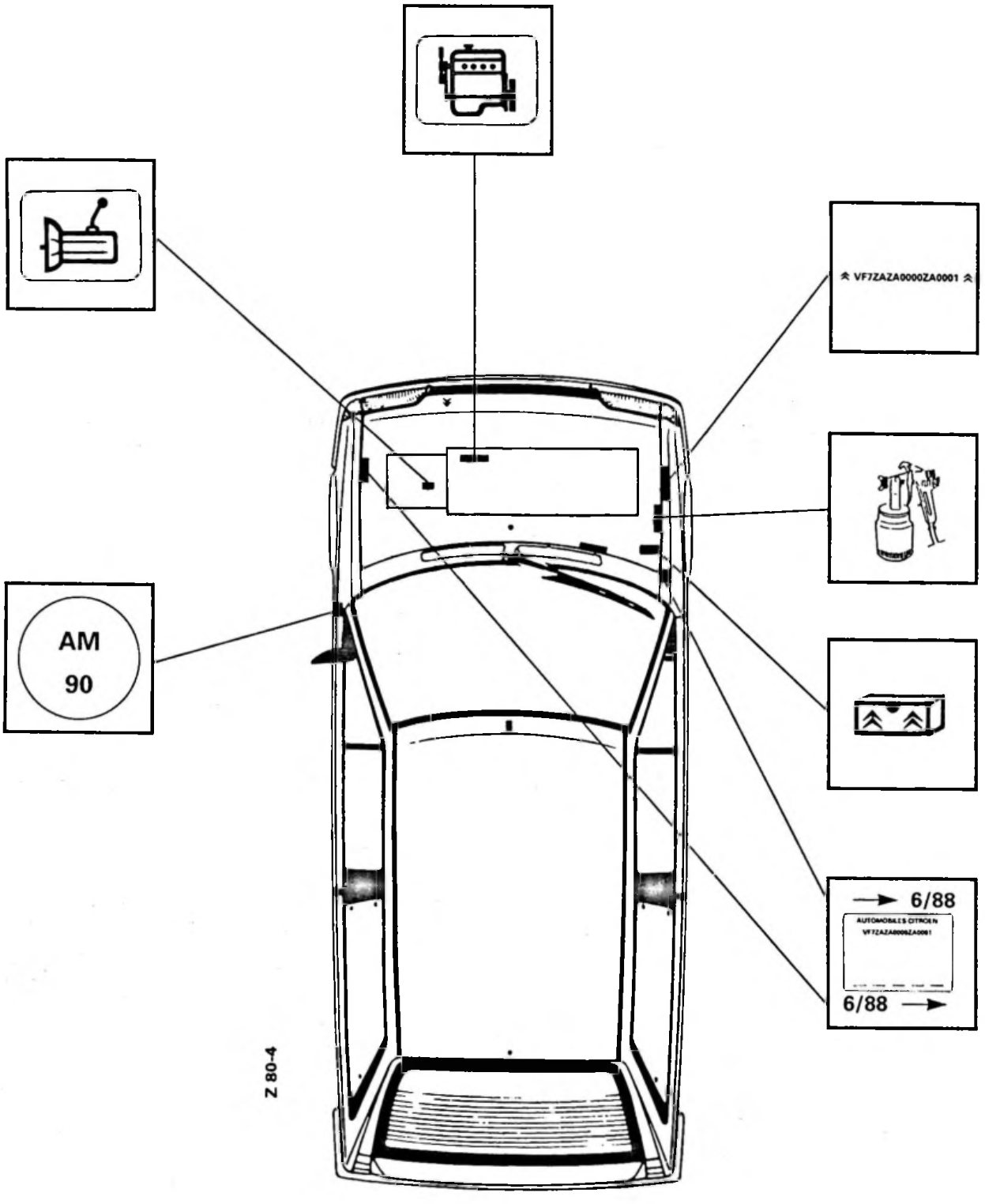


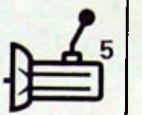


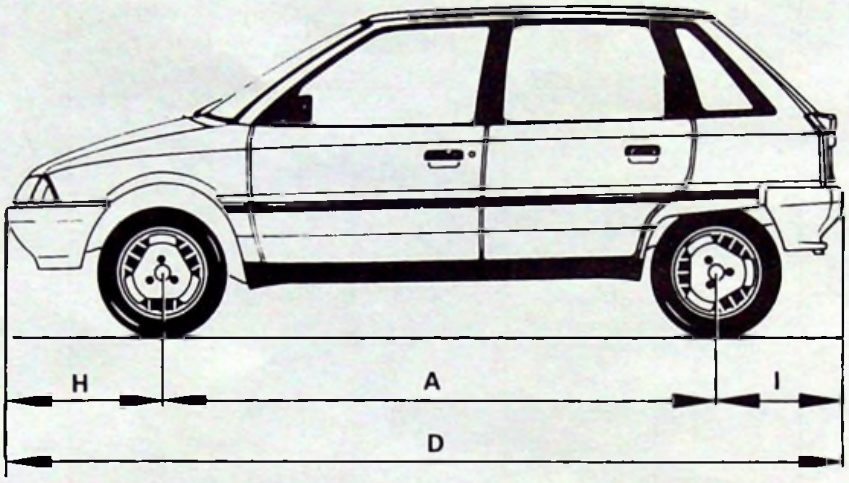


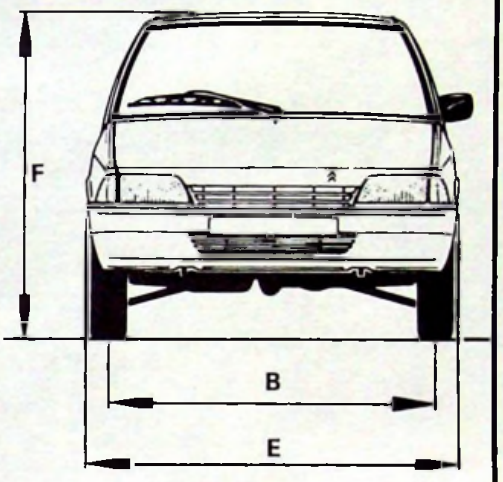
	10 *954 cm³*	11 *1124 cm³*	14 *1360 cm³*	GT *1360 cm³*	GTI *1360 cm³*	DIES *1360 cm³*
A	1,355 m				1,350 m	1,355 m
B	1,380 m		1,370 m	1,392 m	1,390 m	1,380 m
C	1,555 m			1,596 m		1,555 m
D	0,674 m			0,666 m		0,674 m
E	2,280 m					
F	0,571 m					
G	3,525 m			3,517 m		3,525 m
H*	0,096 m		0,110 m	0,090 m	0,097 m	0,096 m
I	1,300 m		1,290 m	1,312 m	1,331 m	1,300 m
J	9,230 m	9,900 m	10,180 m	10,180 m	10,180 m	9,900 m
K	9,620 m	10,300 m	10,590 m	10,510 m	10,590 m	10,300 m

: Kg	10 954 cm³	11 1124 cm³	14 1360 cm³	GT 1360 cm³	GTI 1360 cm³	DIES 1360 cm³
	241	252	272	279	286	258
	414	423	468	466	509	462
	655	675	740	745	795	720
	500	600	700	700	700	700
	325	335	370	370	395	355
 maxi	560	570	575	590	585	580
maxi	580	590	625	625	660	600
maxi	1110	1135	1175	1185	1235	1150
+ maxi	1610	1735	1875	1885	1935	1850
 maxi	50					
maxi	45					50
 maxi	1610	1735	1875	1885	1935	1850
%	12					

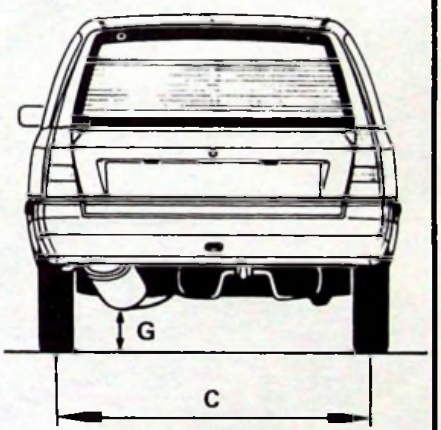

VF7ZAZA0000ZA0001
AM
90
6/88
AUTOMOBILES CITROEN
VF7ZAZA0000ZA0001
6/88
Z 80-4

10 Ess.	11 Ess.		14 Ess.	14 Dies.	GT
4	4	5	5	5	 5

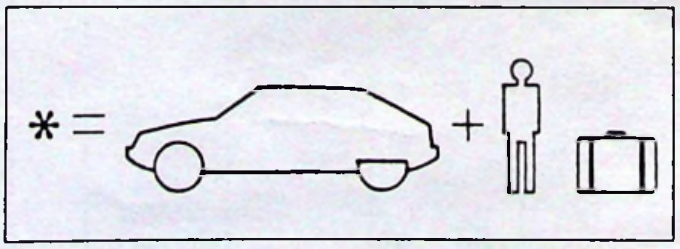


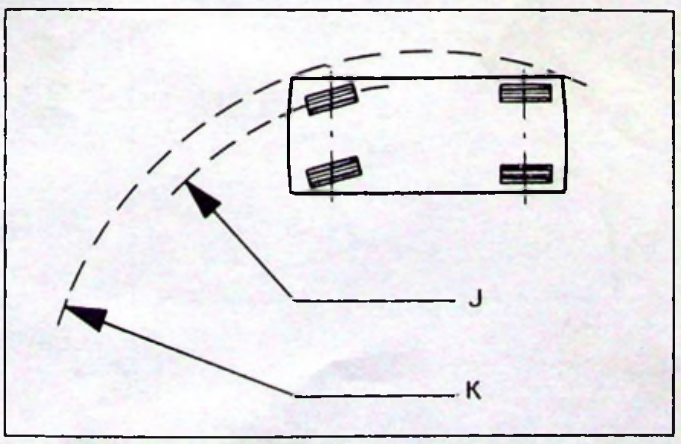


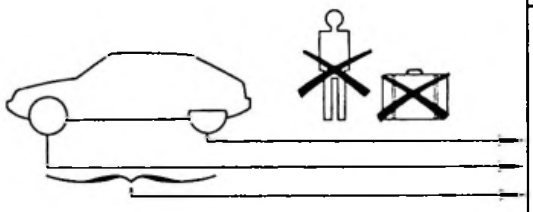
	10 Ess.	11 Ess.	14 Ess.	14 Dies.	GT
A	2,280 m	2,280 m	2,280 m	2,280 m	2,280 m
B	1,380 m	1,380 m	1,370 m	1,380 m	1,392 m
C	1,300 m	1,300 m	1,290 m	1,300 m	1,312 m
D	3,495 m	3,495 m	3,495 m	3,495 m	3,495 m
E	1,555 m	1,555 m	1,555 m	1,555 m	1,596 m
F	1,355 m	1,355 m	1,355 m	1,355 m	1,350 m
G*	0,096 m	0,096 m	0,110 m	0,096 m	0,097 m
H	0,666 m	0,666 m	0,666 m	0,666 m	0,666 m
I	0,549 m	0,549 m	0,549 m	0,549 m	0,549 m
J	9,230 m	9,230 m	10,200 m	10,200 m	10,180 m
K	9,260 m	9,620 m	10,500 m	10,500 m	10,510 m



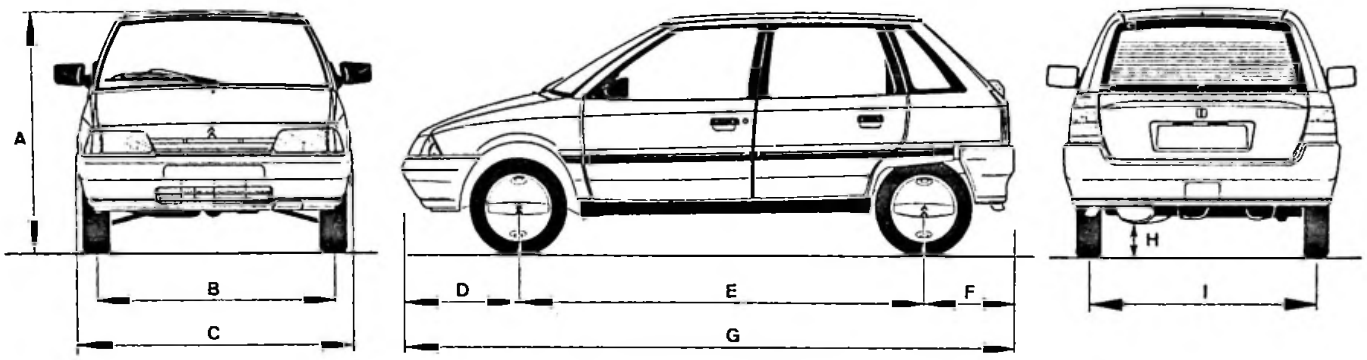
Z 80-48

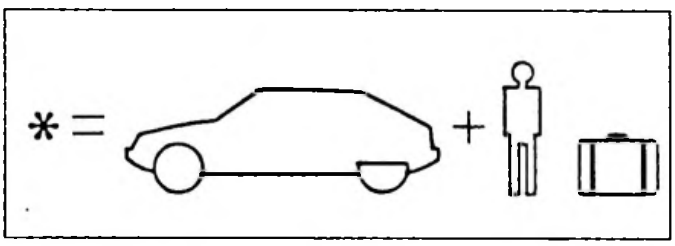


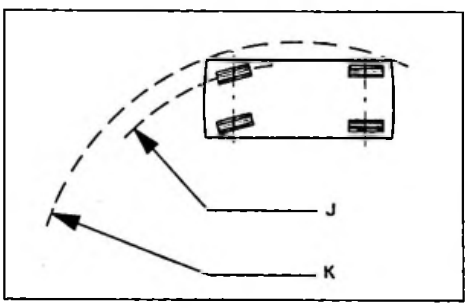




	10 Ess.	11 Ess.	14 Ess.	14 Dies.	GT
	242 kg	244 kg	262,5 kg	260 kg	280 kg
	413 kg	416 kg	447,5 kg	465 kg	470 kg
	655 kg	660 kg	710 kg	725 kg	750 kg
	500 kg	600 kg	700 kg	700 kg	700 kg
	327 kg	330 kg	355 kg	360 kg	375 kg
	550 kg	560 kg	570 kg	580 kg	585 kg
	540 kg	550 kg	570 kg	600 kg	610 kg
	1 070 kg	1 100 kg	1 130 kg	1 165 kg	1180 kg
	1 570 kg	1 700 kg	1 830 kg	1 865 kg	1880 kg
	50 kg	50 kg	50 kg	50 kg	50 kg
	35 kg	42 kg	49 kg	35 kg	50 kg
	1 570 kg	1 700 kg	1 830 kg	1 865 kg	1880 kg
%	12 %	12 %	12 %	12 %	12 %

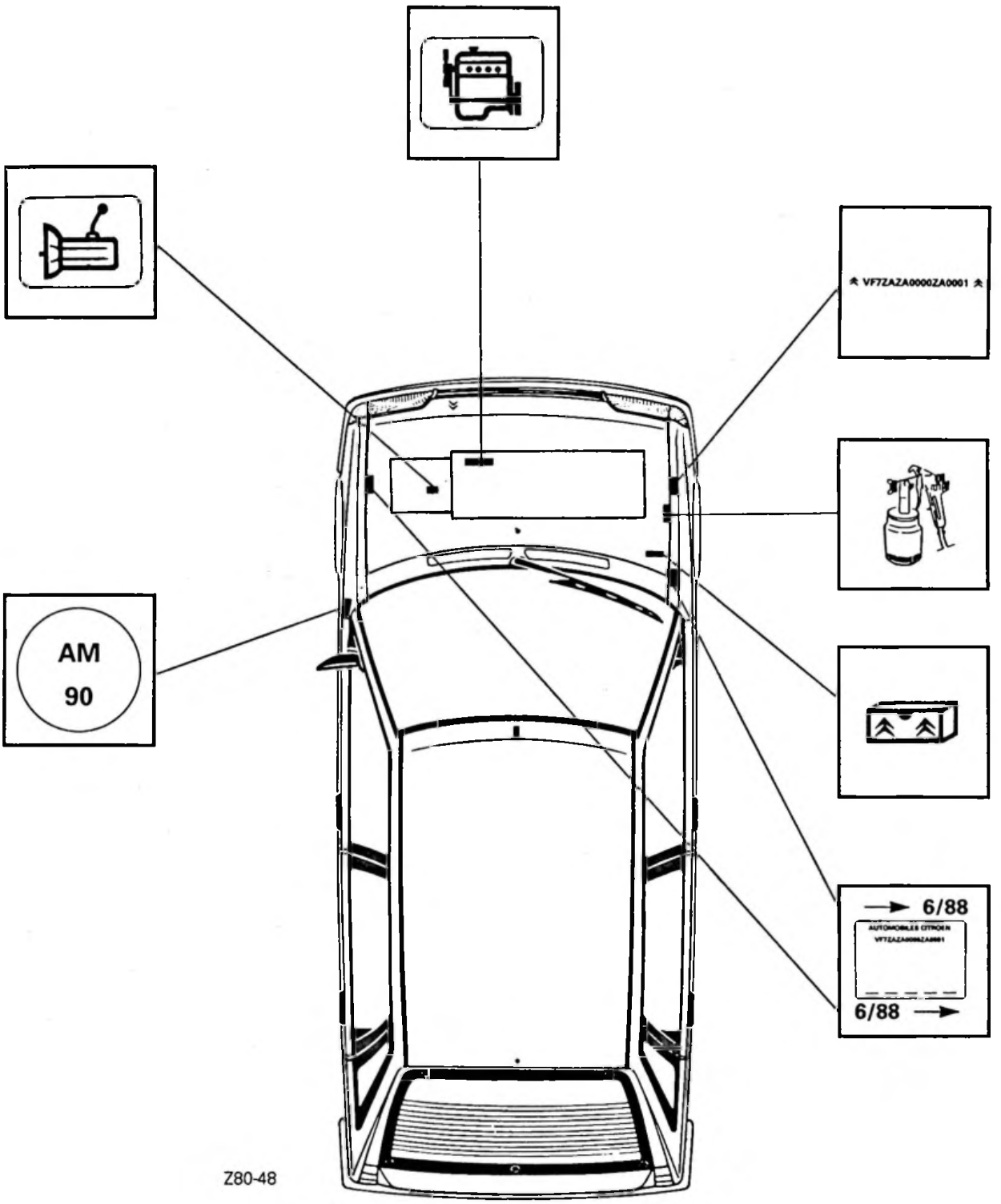






	10 *954 cm³*	11 *1124 cm³*	14 *1360 cm³*	GT *1360 cm³*	DIES. *1360 cm³*
A	1,355 m				
B	1,380 m		1,370 m	1,392 m	1,380 m
C	1,555 m			1,596 m	1,555 m
D	0,674 m			0,666 m	0,674 m
E	2,280 m				
F	0,571 m				
G	3,525 m			3,517 m	3,525 m
H	0,096 m		0,110 m	0,090 m	0,096 m
I	1,300 m		1,290 m	1,312 m	1,300 m
J	9,900 m	10,180 m	10,80 m	10,180 m	9,900 m
K	10,300 m	10,290 m	10,590 m	10,590 m	10,300 m

: Kg	10 *954 cm³*	11 *1124 cm³*	14 *1360 cm³*	GT *1360 cm³*	DIES. *1360 cm³*
	256	263	278	290	265
	428	427	477	473	470
	684	690	755	763	735
	500	600	700	700	700
	340	345	375	380	360
maxi	560	570	575	590	580
maxi	580	590	625	625	600
maxi	1125	1150	1190	1200	1165
+ maxi	1625	1750	1890	1900	1865
maxi	50				
maxi	45				50
maxi	1625	1750	1890	1900	1865
%	12				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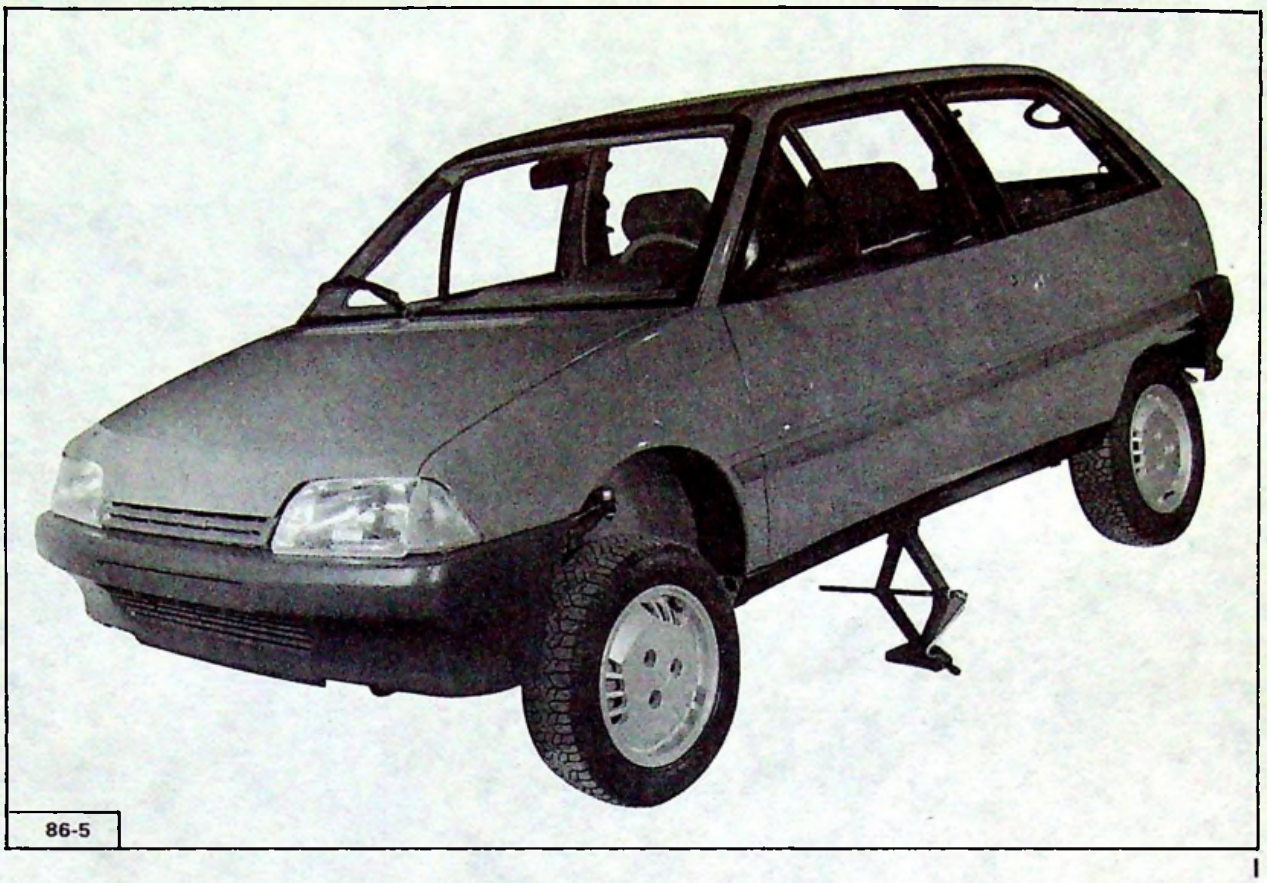
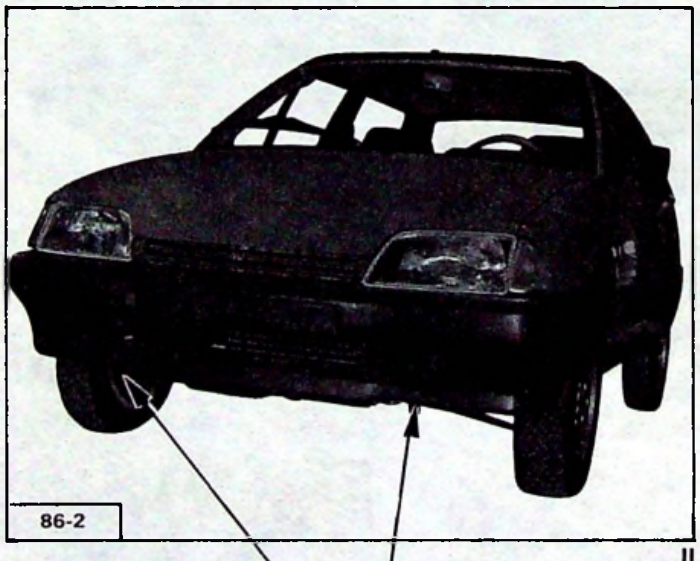
AM
90
6/88
6/88
Z80-48



86-5

I

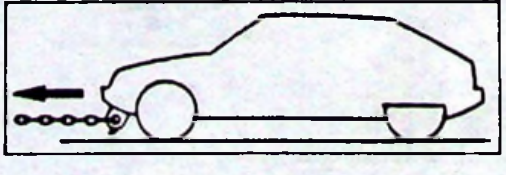


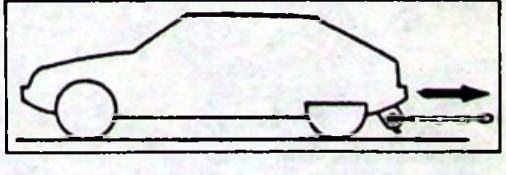
86-2

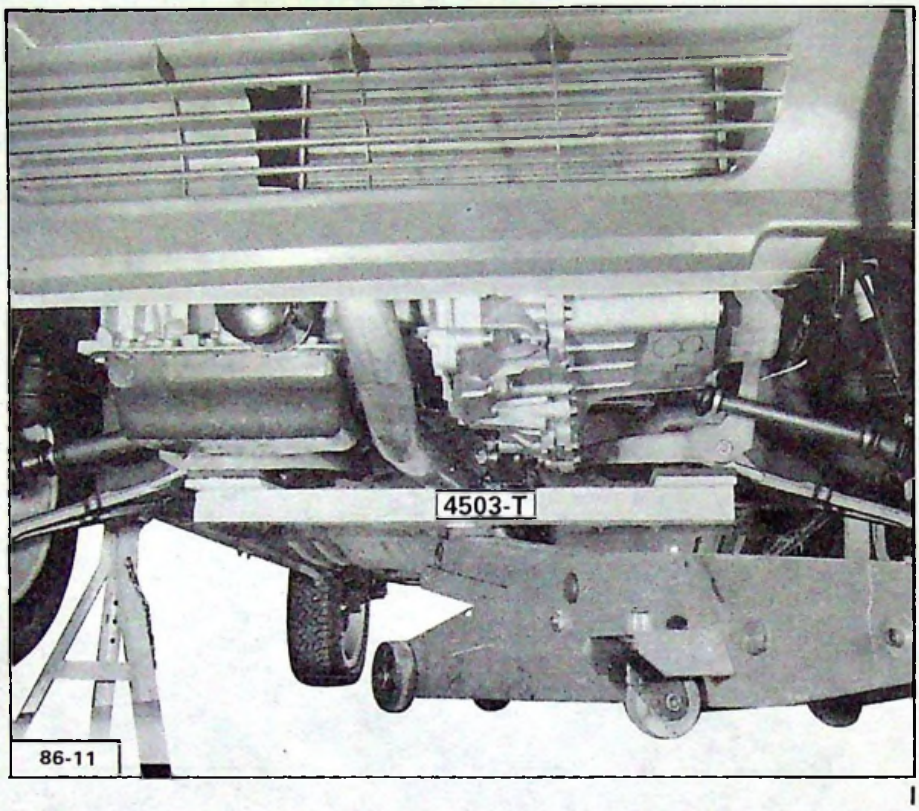
II

86-4

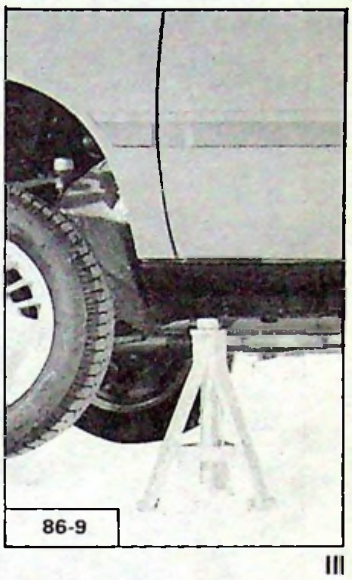
III



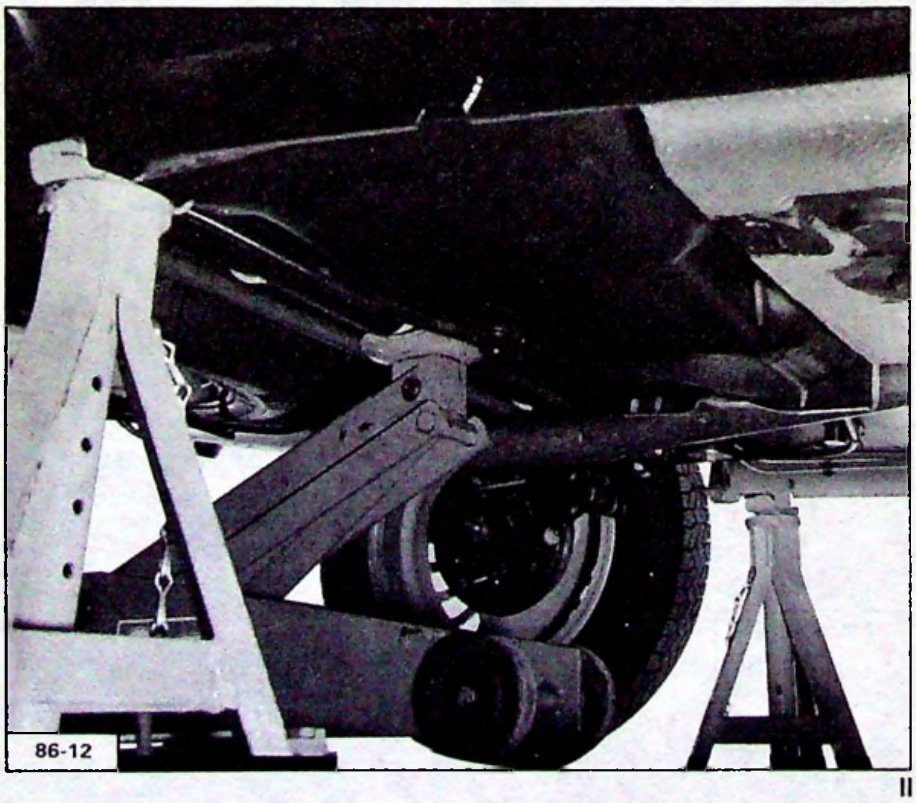




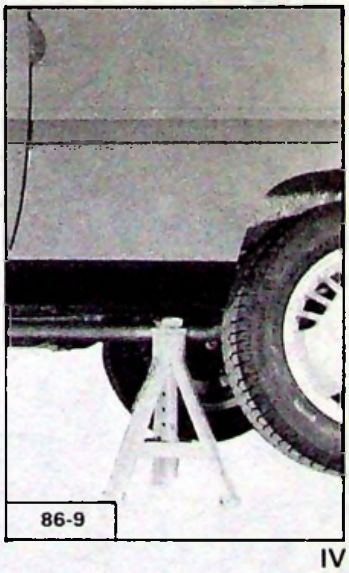
I



III



II



IV

PRECAUTIONS A PRENDRE LORS D'UNE INTERVENTION SUR LE VEHICULE

Il faut absolument éviter certaines fausses manœuvres qui risquent de détruire certains organes électriques ou de provoquer un court-circuit (risques d'incendie).

1. Batterie :

- Déconnecter, en premier lieu, la cosse de la borne négative de la batterie, puis celle de la borne positive.
- S'assurer que la batterie est correctement branchée. La borne négative doit être reliée à la masse.
- Connecter, avec prudence, les deux cosses sur les bornes de la batterie. La cosse du câble de masse doit être connectée en dernier. Avant de serrer la cosse négative, s'assurer qu'il n'y a pas de passage de courant. Pour cela, réaliser des contacts intermittents de la cosse avec la borne négative. Il ne doit pas y avoir d'étincelles. Sinon, un appareil est resté en service ou il y a un court-circuit dans le circuit électrique, et il faut y remédier.
- Avant d'actionner le démarreur, s'assurer que les deux cosses sont correctement serrées sur leurs bornes respectives.
- Ne pas relier les bornes de la batterie à un chargeur et ne jamais souder à l'arc (ou avec une pince à souder) sur le chassis du véhicule, sans avoir déconnecté et isolé les deux câbles positif et négatif de la batterie.

2. Alternateur - Régulateur :

- Ne pas faire tourner l'alternateur sans qu'il soit connecté à la batterie.
- S'assurer, avant de connecter l'alternateur, que la batterie est correctement branchée (borne négative à la masse).
- Ne pas vérifier le fonctionnement de l'alternateur en mettant en court-circuit les bornes positive et masse.

3. Lampe à iode :

- Ne remplacer une lampe à iode que phare éteint. Après utilisation des phares, il est prudent de les laisser refroidir cinq minutes, avant de procéder à une manipulation.

- Ne pas toucher la lampe à iode avec les doigts. Des traces de doigts produites par inadvertance doivent être nettoyées avec un peu d'eau savonneuse et la lampe séchée avec un chiffon non pelucheux.

4. Allumage :

- Utiliser exclusivement un compte-tours « haute tension » (ne jamais « piquer » un fil haute tension du faisceau d'allumage).

- Ne pas utiliser un chargeur rapide pour le démarrage. Utiliser uniquement une batterie de 12 volts.

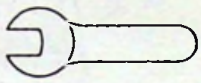
- Ne pas mettre le primaire de la bobine sous tension, circuit secondaire « ouvert » (fil de haute tension bobine/allumeur débranché). Cette manipulation peut détériorer le module transistorisé.

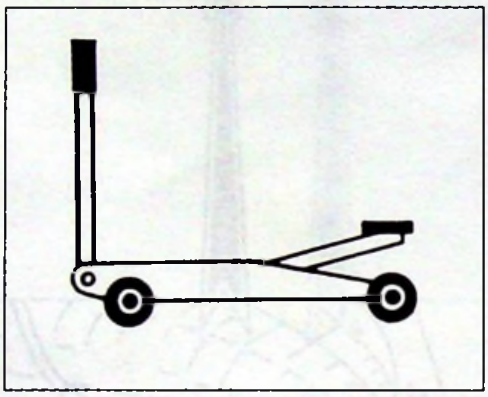
- Si l'entraînement du moteur au démarreur est nécessaire, (mise en pression du circuit d'huile, contrôle des compressions...) déconnecter la bobine (donc plus d'allumage).

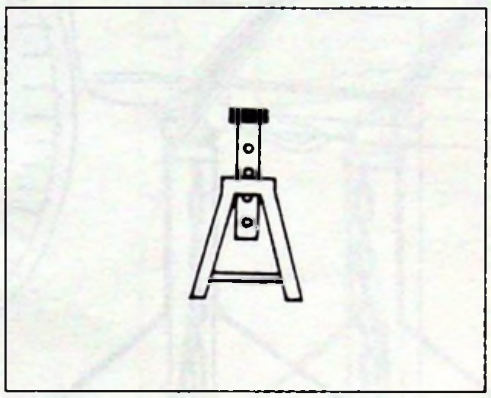
- Après tous travaux nécessitant la dépose de tout ou partie de l'allumage, s'assurer de la bonne connexion des fils et faisceaux : (des disruptures provoquent des « charbonnages », des « fissures » qui altèrent le bon fonctionnement de l'allumage moteur et la fiabilité des différents constituants).

- Éviter les arcs électriques : en cas de soudure électrique, déconnecter l'allumeur et son module.

- Connecter le condensateur d'antiparasitage radio en dérivation sur la borne d'alimentation de la bobine d'allumage. Monter uniquement le condensateur préconisé par l'usine.







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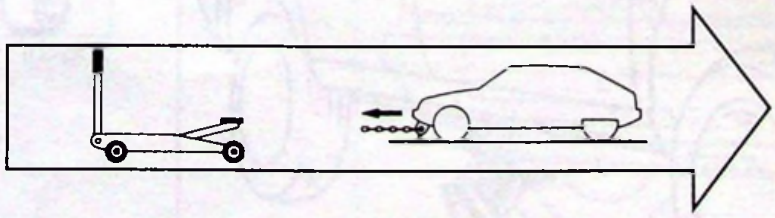
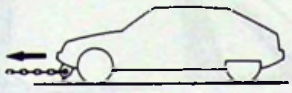
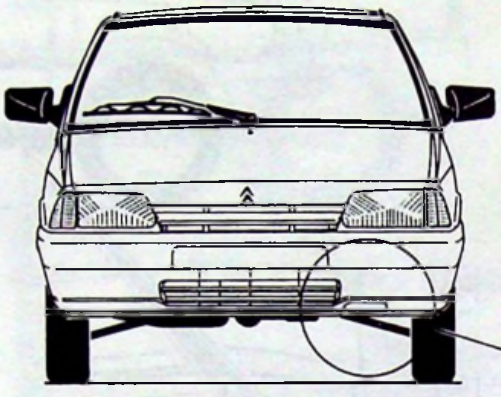
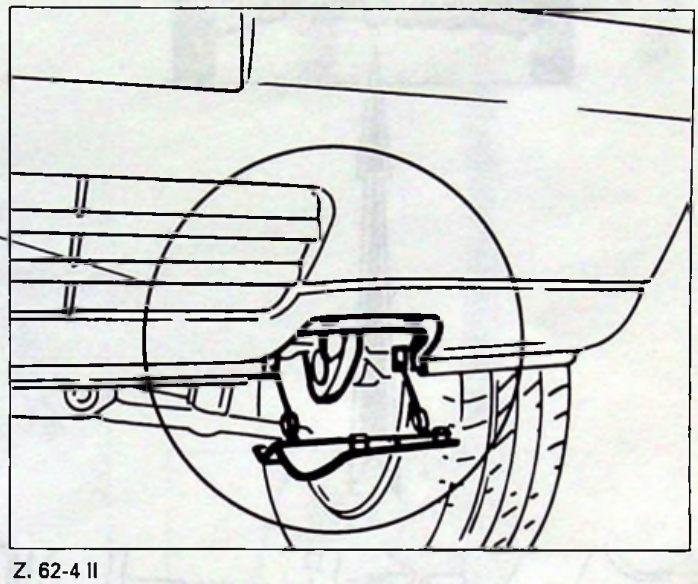
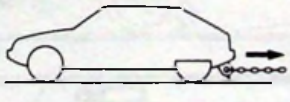


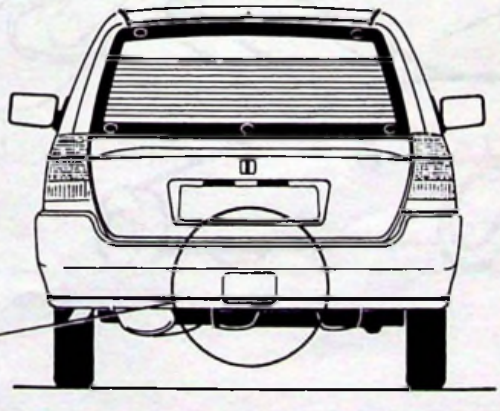


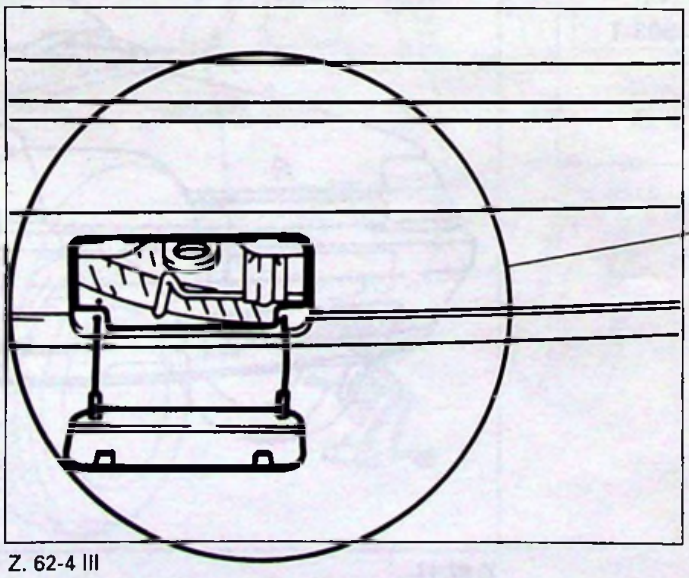




Z. 62-4 II

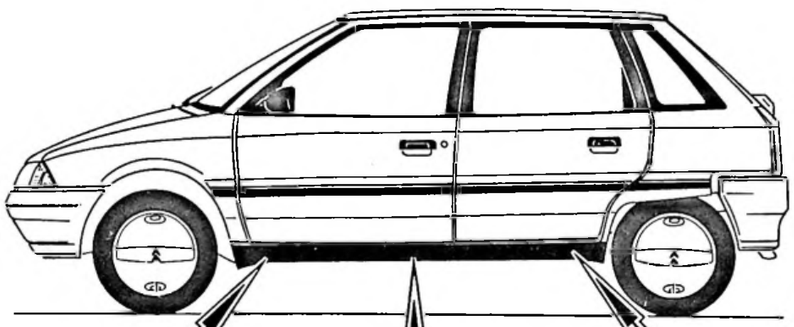


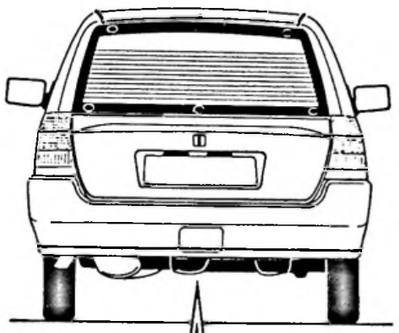


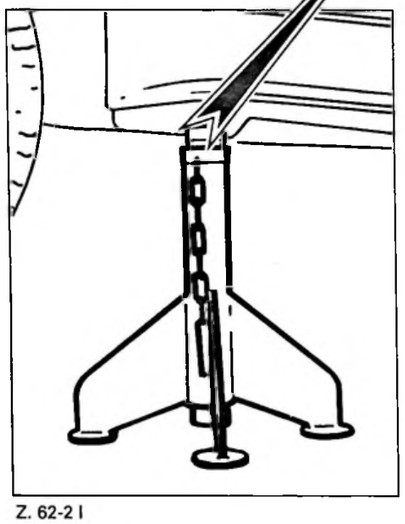


Z. 62-4 III

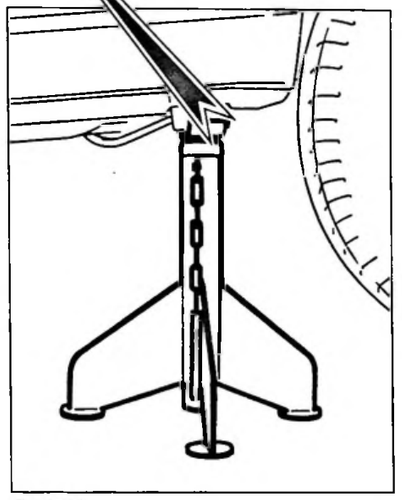
Z. 80-60



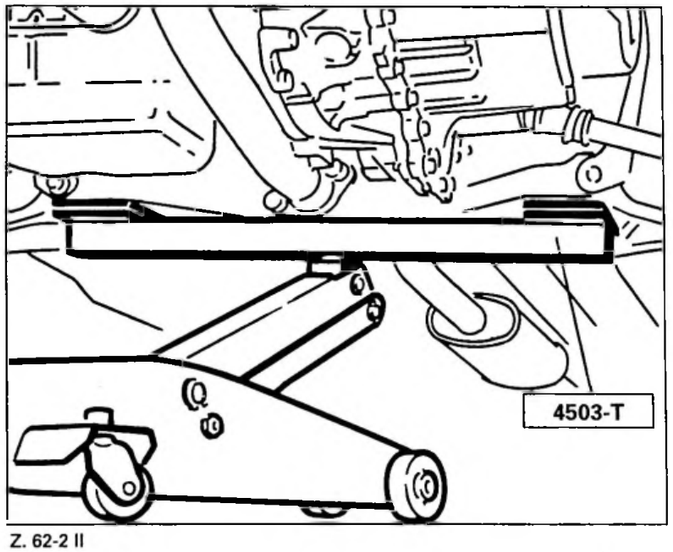




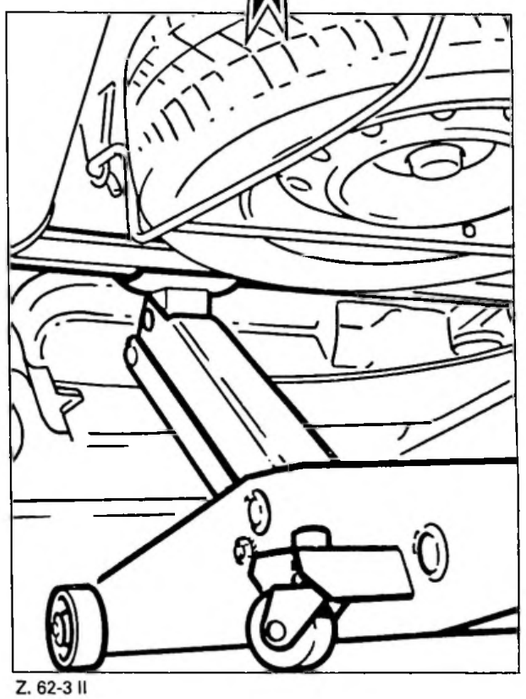
Z. 62-2 I



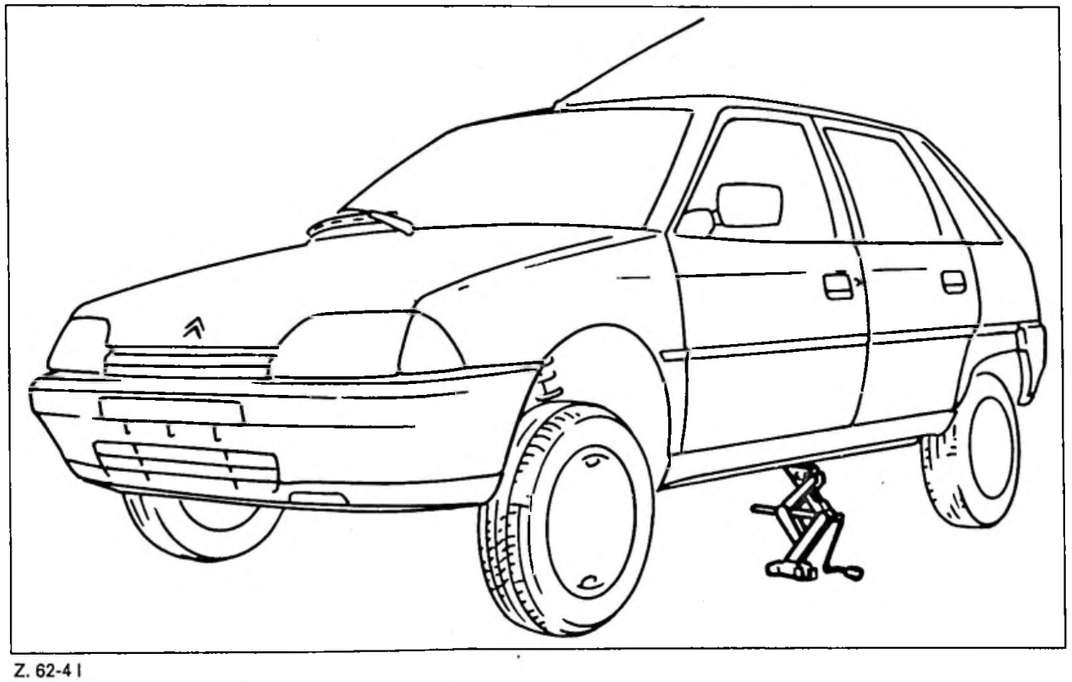
Z. 62-3 I



Z. 62-2 II



Z. 62-3 II



Z. 62-4 I

Z. 80-60

PRECAUTIONS A PRENDRE LORS D'UNE INTERVENTION SUR VEHICULE

Certaines manœuvres risquent de détériorer certains organes électriques ou électroniques ou de provoquer un court-circuit.

Batterie :

a) Déconnecter, en premier lieu, la cosse de la borne négative (à la masse) puis la cosse positive.

b) Avant de connecter la cosse négative à la batterie, après avoir connecté la cosse positive, s'assurer que les organes ayant une forte consommation sont en position repos. Les organes sous tension en permanence, du type montre par exemple, ne présentent pas de risques.

La présence d'étincelles indique un court-circuit ou un appareil en service. Il faut y remédier.

c) S'assurer des bons contacts sur les bornes. Cosses et bornes propres et bien serrées.

d) Déconnecter les deux cosses de la batterie du véhicule en cas de recharge.

e) Ne pas inverser les cosses négative et positive sur la batterie.
(Destruction des diodes de l'alternateur).

Fusibles :

a) Respecter le calibre des fusibles ; ils sont déterminés en fonction des appareils à protéger.

b) Lors du montage d'organes en post-équipement ou d'accessoires, utiliser en priorité les emplacements de fusibles disponibles. Dans le cas de raccordement sur une fonction déjà protégée, tenir compte de l'augmentation de la consommation.

Circuit de charge :

a) Ne pas faire tourner l'alternateur sans batterie. Ne pas débrancher la batterie alternateur tournant.

b) Déconnecter l'alternateur et le régulateur ainsi que la batterie du véhicule (isoler les deux cosses) en cas de soudure électrique sur le véhicule.

c) Ne pas "contrôler" un alternateur en court-circuitant "+" et masse (Destruction des diodes).

Démarrage :

Ne pas utiliser de chargeur rapide ou batterie 24 volts. Utiliser **uniquement une batterie 12 volts** bien chargée (éventuellement de plus forte capacité seulement) : risque de destruction du module d'allumage ou d'autres calculateurs. Pour entraîner le moteur au démarreur, mais sans mise en marche, neutraliser l'allumage et l'alimentation en carburant (injection).

Allumage :

a) Ne pas connecter de condensateur antiparasite à la borne " – " bobine.

b) Ne pas faire fonctionner le module sans son radiateur.

c) Utiliser les condensateurs antiparasites préconisés.

d) Ne pas faire fonctionner l'allumage, circuit haute tension ouvert, mettre le(s) fil(s) HT à la masse.

Lampe à iode :

a) Ne remplacer une lampe que phare éteint, après refroidissement.

b) Ne pas toucher la lampe avec les doigts ; interposer gant ou chiffon sec non gras, ni pelucheux. Les traces peuvent être nettoyées à l'eau savonneuse et essuyées.

Contrôle :

a) Utiliser de préférence un voltmètre grande résistance (10 kΩ / V, ohmmètre à pile...).

b) Ne pas effectuer de mesures par "piquage" dans les fils.

Organes électroniques :

a) Eviter toutes tensions dues à un chargeur mal isolé, arc électrique, connexions sur bobinage créant une surtension. Les appareils comportant des composants électroniques tels que régulateur, module d'allumage, compte-tours, cadenceur d'essuie-glace, centrale clignotante, montre, radio, boîtier de jauge à huile, boîtier de verrouillage de portes, etc. peuvent être détériorés.

b) Eviter de faire fonctionner ou d'exposer les composants électroniques à une température supérieure à 80° C.

c) Ne pas connecter ou déconnecter un appareil ou un boîtier sous tension.

CONNECTEUR ETANCHE

A - PRESENTATION :

Une nouvelle conception de connecteurs est appliquée sur ce véhicule, principalement dans les zones soumises aux agressions atmosphériques (compartiment moteur, dessous de caisse, passage du tablier entre compartiment moteur et habitacle, charnières de portes).

Ceux-ci sont appelés "ETANCHE" et se présentent de la façon suivante :

- L'étanchéité de la partie interne est assurée par un joint dans le fond du connecteur porte-clips.
- L'étanchéité de la partie externe est assurée par de la résine. Celle-ci est coulée dans le porte-clips et le porte-languettes côté fils.

B - BUT :

L'utilisation de ce type de connecteurs dans les zones à risques d'humidité a pour but d'éviter l'oxydation des contacts.

C - ECHANGE D'UN CONNECTEUR ETANCHE :

1. GENERALITES :

- Les interventions en Après-Vente sur les connecteurs ne doivent pas remettre en cause leur étanchéité. Pour ce faire, une nouvelle technique a été mise au point. Elle consiste au remplacement du connecteur défectueux par un connecteur "Réparation", de couleur Violet et acceptant tous les types de détrompage mécanique liés à la couleur.

- Ce connecteur, porte-clips ou porte-languettes, est livré avec l'ensemble de ses voies équipées d'un ou deux fils noirs, de section sélectionnée et repérés par un numéro correspondant à la voie.

- Le Département des Pièces de Rechange fournit une pochette contenant le connecteur, les manchons, les capuchons et le mode d'emploi.

- La réparation consiste à raccorder les fils du faisceau véhicule aux fils du connecteur à l'aide de manchons.

2. UTILISATION DES MANCHONS :

a) **Principe :**

- La liaison mécanique est assurée par le sertissage d'une férule cylindrique à l'aide d'une pince spéciale.

- La partie étanchéité est assurée par une gaine thermorétractable dont la face interne est enduite de colle. Un générateur d'air chaud, muni d'une buse spéciale permet d'effectuer le rétreint.

b) **Mise en œuvre :**

- Le matériel nécessaire est présenté dans une mallette **9001-T** commercialisée par le D.P.R.

- Choix des manchons :

Trois types de manchons sont proposés :

- Réf. : DS 12 - 22 pour sections de 0,35 à 1,2 mm²
- Réf. : DS 14 - 18 pour sections de 1 à 2,6 mm²
- Réf. : DS 10 - 12 pour sections de 2 à 5 mm²

Le manchon retenu est fonction de la section des conducteurs à raccorder.

Il peut être nécessaire d'effectuer un ou deux raccordements intermédiaires.

Suivant les cas, on utilise l'un ou l'autre ou les deux fils disponibles sur la voie du connecteur de réparation.

- **Utilisation du capuchon P.D. 3/16 :**

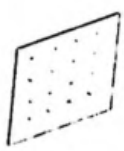
Les fils non raccordés doivent être isolés à l'aide d'un capuchon thermorétractable. Il est recommandé, afin d'améliorer la tenue mécanique, de replier la partie conductrice.

INGRÉDIENTS PRÉCONISÉS EN CARROSSERIE

I - MASTICS EXTRUDABLES

EMPLOIS ET CARACTERISTIQUES	PRODUITS ET N° P.R.	SYMBOLE	INDICE	FOURNISSEUR (éventuel)
- Etanchéité des liaisons de tôle après soudage : Produit séchant à l'air et pouvant être peint après 2 heures de séchage. Couleur : blanc	ZCP 830.183 A		**A 1**	D.P.R
- Etanchéité des liaisons de tôle avant soudage par points. - Etanchéité des glaces avec scellement en caoutchouc. Produit ne séchant pas. Ne peut être peint.			**A 2**	
Collage des glaces GURIT : Nécessaire complet bicomposant Nécessaire complet monocomposant Cartouche avec buse TOGOCOLL : Nécessaire complet monocomposant Cartouche avec buse	ZCP 830.185 A ZC 9867511 U ZC 9867447 U ZCP 830.194 A ZCP 830.195 A		**A 3**	D.P.R.
- Etanchéité des sertissages (Mastic en cartouche couleur : blanc) Laisser sécher avant peinture environ 2 h à 20°C	ZCP 830.183 A		**A 4**	D.P.R.

II - MASTICS PRÉFORMÉS - PLAQUES D'INSONORISATION

EMPLOIS ET CARACTERISTIQUES	PRODUITS ET N° P.R.	SYMBOLE	INDICE Dimensions	FOURNISSEUR (éventuel)
- Mastic de bourrage assurant l'étanchéité entre éléments vissés (ailes...) : appliquer sur tôles protégées d'apprêts ou peinture.				
- Section ronde.	ZCP 830.118 A ZCP 830.119 A ZCP 830.120 A		**H 1** (Ø = 6 mm **H 2** (Ø = 13 mm) **H 3** (Ø = 20 mm)	D.P.R. D.P.R.
- Section rectangulaire.	TEROSTAT 7 8573 Prestik S.S.		**H 4** (2 x 18)	TEROSON 3M FRANCE BOSTIK
- Plaques d'insonorisation. (auto-adhésives). Appliquer sur tôles protégées (peinture ou apprêts)	ZCP 830.028		**H 5** 250 x 500	D.P.R.

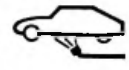
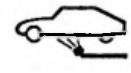
III - COLLES

EMPLOIS ET CARACTERISTIQUES	PRODUITS ET N° P.R.	SYMBOLE	INDICE	FOURNISSEUR (éventuel)
- Collage verre-métal (rétroviseur, bas de glaces de portes)	ZC 9865561 U ou ZC 9856689 U		B 1	D.P.R.
- Colllage des garnitures intérieures (tissus, moquettes, - feutre...)	Gel 44 N 66		B 2	TEROSON
- Nécessaire de collage panneau de porte (valable pour 1 panneau)	ZC 9 867-672 U		B 3	D.P.R.
- Collage matériaux composites SMC ET BMC sur métal ou sur eux-mêmes (Colle epoxy bicomposant CIBA) { Boîte 250 ml / Cartouche 500 ml	ZCP 830.009 ZCP 830.129 A		B 4	D.P.R.
- Collage du plastique (enjoliveur de rétroviseur extérieur)	ZC 9865105 U		B 5	D.P.R.
- Collage monogramme, baguette... Adhésif double-face	ZCP 830.026		B 6	D.P.R.
- Collage des garnitures de pavillon thermoformées (Mastic PU)	ZC 9867 447 U ou ZCP 830.195 A		B 7	D.P.R.
- Collage structural tôle sur tôle - Permet le soudage par points avant séchage. Colle bicomposant CIBA { Boîte / Cartouche	ZCP 830.009 ZCP 830.129 A		B 8	D.P.R.
- Mastic pour surfaçage après collage des tôles avec produit "indice B 8"	ZCP 830.130 A		B 9	D.P.R.

IV - GRAISSES

EMPLOIS ET CARACTERISTIQUES	PRODUITS ET N° P.R.	SYMBOLE	INDICE	FOURNISSEUR (éventuel)
Lubrifiant multifonctions à base de bysulfure de molybdène	M.O.		G 5	TEROSON
Graisse multifonctionnelle	TOTAL MULTIS M.S.		G 6	TOTAL C.F.R.

V - PRODUITS DE PROTECTION

EMPLOIS ET CARACTERISTIQUES	PRODUITS ET N° P.R.	SYMBOLE	INDICE	FOURNISSEUR (éventuel)
- Protection interne des lignes de soudure par points : Impression conductrice appliquée sur face interne des tôles avant leur soudage.	METAL SPAY ZINC		C 7	CEPAC
- Protection anticorrosion des dessous de caisse. Revêtement à appliquer sur tôles prérevêtues d'apprêt ou cataphorèse.	ZCP 830.029 ZCP 830.189 A		C 1	D.P.R.
- Protection des sertis de portes et des encadrements de volets arrière Appliquer sur tôles prérevêtues	ZC 9867264 U		C 2	D.P.R.
- Apprêt antigravillonnage.			C 3	
- Protection antigravillonnage. Revêtement à appliquer sur tôles prérevêtues de cataphorèse ou d'apprêt. Peut être peint après séchage 1/2 h à 20° C	ZCP 830.031 (Blanc) ZCP 830.191 A		C 4	D.P.R.
- Protection des corps creux : A pulvériser dans les corps creux par les orifices prévus à cet effet.	ZCP 830.030 ZCP 830.190 A		C 5	D.P.R.
- Mousse polyuréthane pour corps creux (cartouche).	ZCP 830.192 A		C 6	D.P.R.

VI - RÉPARATION MATÉRIAUX COMPOSITES (SMC)

EMPLOIS ET CARACTERISTIQUES	PRODUITS ET N° P.R.	SYMBOLE	INDICE Dimensions	FOURNISSEUR (éventuel)
- Réparation des cassures légères, rayures, couche d'adhérence. (Mastic polyester chargé de fibre de verre "V. 11").	ZCP 830.004			D.P.R.
- Restructuration de surfaces cassées. (Trousse réparation).	ZCP 830.006			D.P.R.
- Mat de verre à 225 g/m².	ZCP 830.007			D.P.R.
- Mat de verre à 25 g/m².	ZCP 830.008			D.P.R.

VII - PRODUITS DE NETTOYAGE

EMPLOIS ET CARACTERISTIQUES	PRODUITS ET N° P.R.	SYMBOLE	INDICE	FOURNISSEUR (éventuel)
- Nettoyage des surfaces avant collage	SUPERCLEAN ZC 9865039 V		J 1	D.P.R.

LISTE DES OPÉRATIONS FIGURANT AU CHAPITRE : ÉLÉMENTS SOUDÉS

VERSION : 2P : véhicules avec 2 portes latérales
4P : véhicules avec 4 portes latérales

NUMÉRO DE L'OPÉRATION	VERSION 2 P.	VERSION 4 P.	DÉSIGNATION
ZA 412-0/1	X	X	Contrôle des fixations des bras inférieurs sur caisse
ZA 800-000	X	X	**Remise en état de la coque** **I.** Eléments vendus par le Département des Pièces de Rechange **II.** Pièces en tôle électrozinguée ou galvanisée **III.** Pièces en tôle à haute limite élastique (HLE) **IV.** Contrôle d'un véhicule accidenté
ZA 800-00	X	X	Préparation d'une coque
ZA 800-0	X	X	Contrôle sur banc d'une coque nue
ZA 800-1	X	X	Contrôle sur banc, mécanique en place — *Équipement CELETTE*
ZA 800-2	X	X	Contrôle des fixations de direction
ZA 800-10	X	X	Contrôle sur banc d'une coque nue
ZA 800-11	X	X	Contrôle sur banc mécanique en place — *Équipement CAROLINER*
ZA 800-12	X	X	Contrôle des fixations de direction
ZA 800-20	X	X	Contrôle sur banc d'une coque nue
ZA 800-21	X	X	Contrôle sur banc mécanique en place — *Équipement CELETTE (Métro 2000)*
ZA 800-22	X	X	Contrôle des fixations de direction
ZA 800-30	X	X	Contrôle sur banc d'une coque nue ou avec mécanique en place — *Équipement SEFAC*
ZA 800-32	X	X	Contrôle des fixations de direction
			FAÇADE
ZA 801-1	X	X	Remplacement d'une tôle de façade complète.
			PASSAGE DE ROUE - LONGERONS AVANT
ZA 802-1	X	X	Remplacement d'une joue de passage de roue avant
ZA 802-2	X	X	Remplacement d'une partie avant de passage de roue
ZA 802-3	X	X	Remplacement partiel d'un longeron avant (extrémité AV)
ZA 802-4	X	X	Remplacement d'un longeron avant (coupe en avant du tablier)
ZA 802-5	X	X	Remplacement d'un passage de roue complet
ZA 802-6	X	X	Remplacement d'un passage de roue et longeron complet
ZA 802-7	X	X	Remplacement d'un support de bras inférieur avant
			TABLIER - BAIE DE PARE-BRISE
ZA 812-1	X	X	Remplacement d'une traverse d'essieu avant
ZA 812-2	X	X	Remplacement d'un tablier

NUMÉRO DE L'OPÉRATION	VERSION 2 P.	VERSION 4 P.	DÉSIGNATION
			CÔTÉ D'HABITACLE
ZA 821-0	X		Solution de coupes sur côté d'habitacle
ZA 821-1	X	X	Remplacement d'un support de charnières de portes avant
ZA 821-2	X		Remplacement d'un panneau complet avec pavillon
ZA 821-2/1		X	Remplacement d'un panneau de côté complet
ZA 821-3	X		Remplacement d'un panneau complet (Section sous brancard de pavillon)
ZA 821-4	X	X	Remplacement d'un panneau partie inférieure avant
ZA 821-5	X		Remplacement d'une aile arrière seule
ZA 821-5/1		X	Remplacement d'une aile arrière
ZA 821-6	X		Remplacement d'un brancard de bas de caisse complet
ZA 821-6/1		X	Remplacement d'un brancard de bas de caisse complet
ZA 821-7	X	X	Remplacement d'une doublure de brancard de bas de caisse
ZA 821-8		X	Remplacement d'un panneau de côté partie centrale
ZA 821-9		X	Remplacement d'un panneau de côté partie arrière
ZA 821-10		X	Remplacement d'un renfort de pied milieu
			PANNEAU ARRIÈRE
ZA 823-1	X	X	Remplacement d'un panneau arrière complet
ZA 823-2	X	X	Remplacement d'une tôle de feu arrière
			PASSAGE DE ROUE ARRIÈRE
ZA 824-1	X		Remplacement d'un passage de roue arrière
ZA 824-1/1		X	Remplacement d'un passage de roue arrière
ZA 824-2	X		Remplacement d'une doublure de côté d'habitacle
ZA 824-2/1		X	Remplacement d'une doublure de côté d'habitacle
			PAVILLON
ZA 825-1	X	X	Remplacement d'un pavillon complet
			SOUBASSEMENT ARRIÈRE
ZA 831-1	X	X	Remplacement d'un plancher de coffre (section)
ZA 831-2	X	X	Remplacement armature et plancher de coffre

OUTILLAGE PRÉCONISÉ

4503-T : Traverse de levage.

4505-T : Gabarits de contrôle des points d'ancrage des bras de suspension avant.

4506-T : Tube de contrôle.

CONTROLE DES FIXATIONS DES BRAS INFERIEURS SUR CAISSE

DÉPOSE

Lever et caler l'avant du véhicule roues pendantes à l'aide de la traverse **4503-T**.

Soulever, Fig. I et II, la moquette pour donner accès aux écrous (1) de fixation de l'articulation élastique (2).

Déposer, Fig. II, la vis (3) de l'articulation élastique (4).

Dégager, Fig. III, les bras inférieurs, pour permettre la fixation du montage **4505-T**.

Poser, Fig. IV, les gabarits (5) et (6) au point de fixation des bras inférieurs.

Contrôler, Fig. V, la position des fixations de bras inférieurs, en engageant, et en pigeant le tube **4506-T** dans les gabarits **4505-T**.

NOTA. Si le coulissement ou le pigeage du tube s'avère impossible voir **MAN 8923** (⑭ **ZA 800/0 à 800/20**).

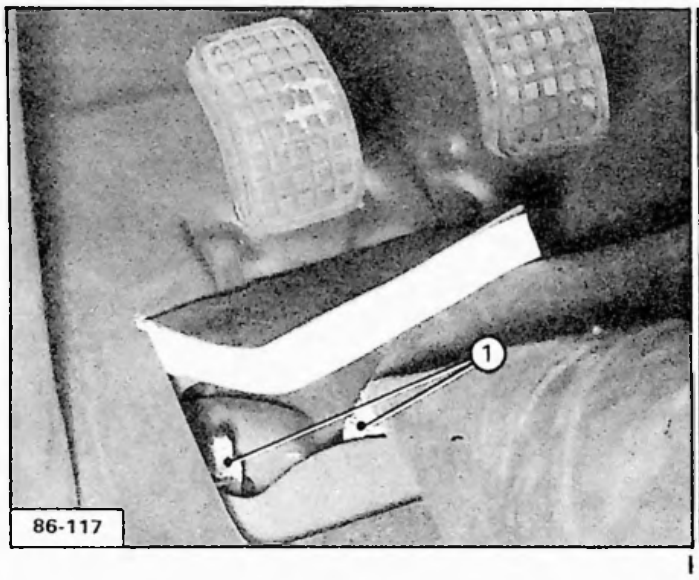
Après contrôle, déposer le tube **4506-T** et les gabarits **4505-T**.

POSE

Engager, Fig. II, les bras inférieurs munis de leurs articulations élastiques (2) et (4) ; poser la vis (3) : **Serrage : 7 m.daN**

Poser, Fig. 1, les écrous (1) : **Serrage : 5,5 m.daN.**

Poser le véhicule au sol.



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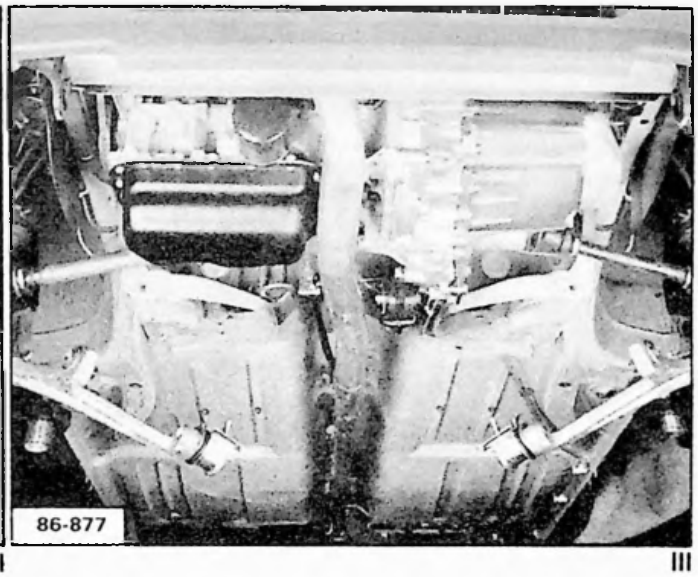

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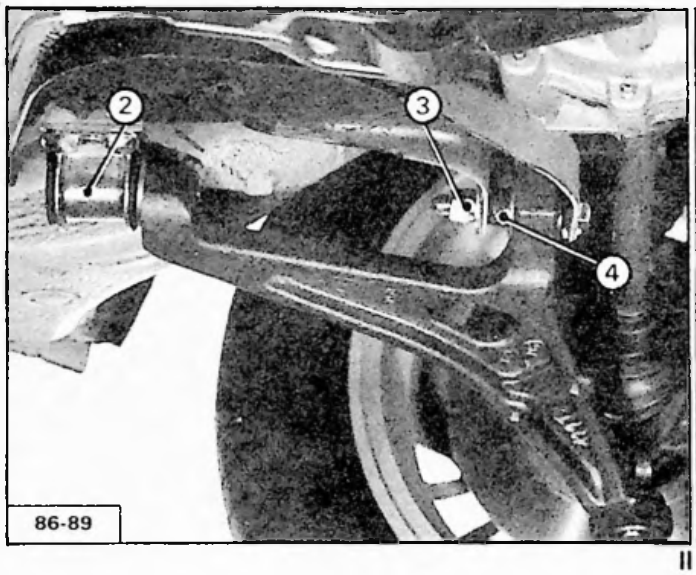

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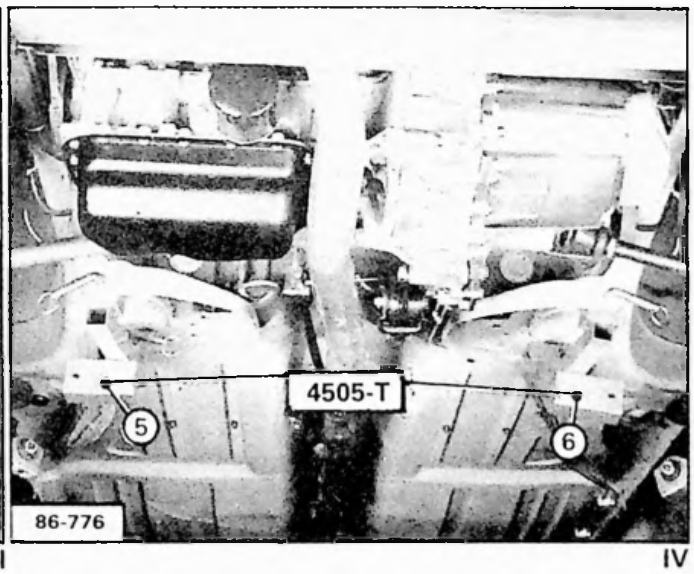

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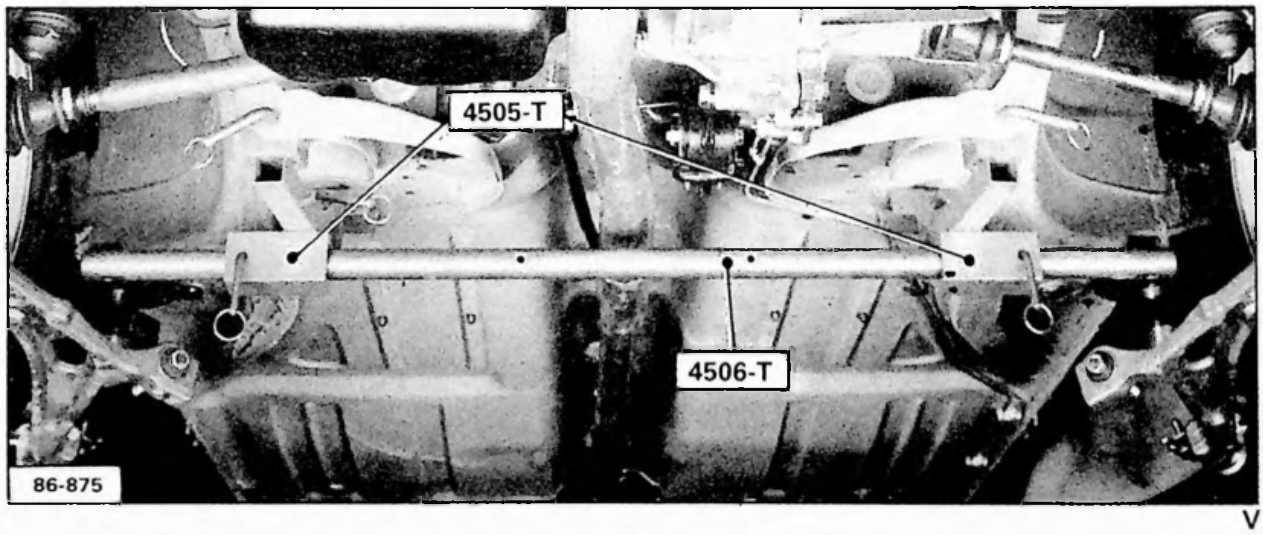


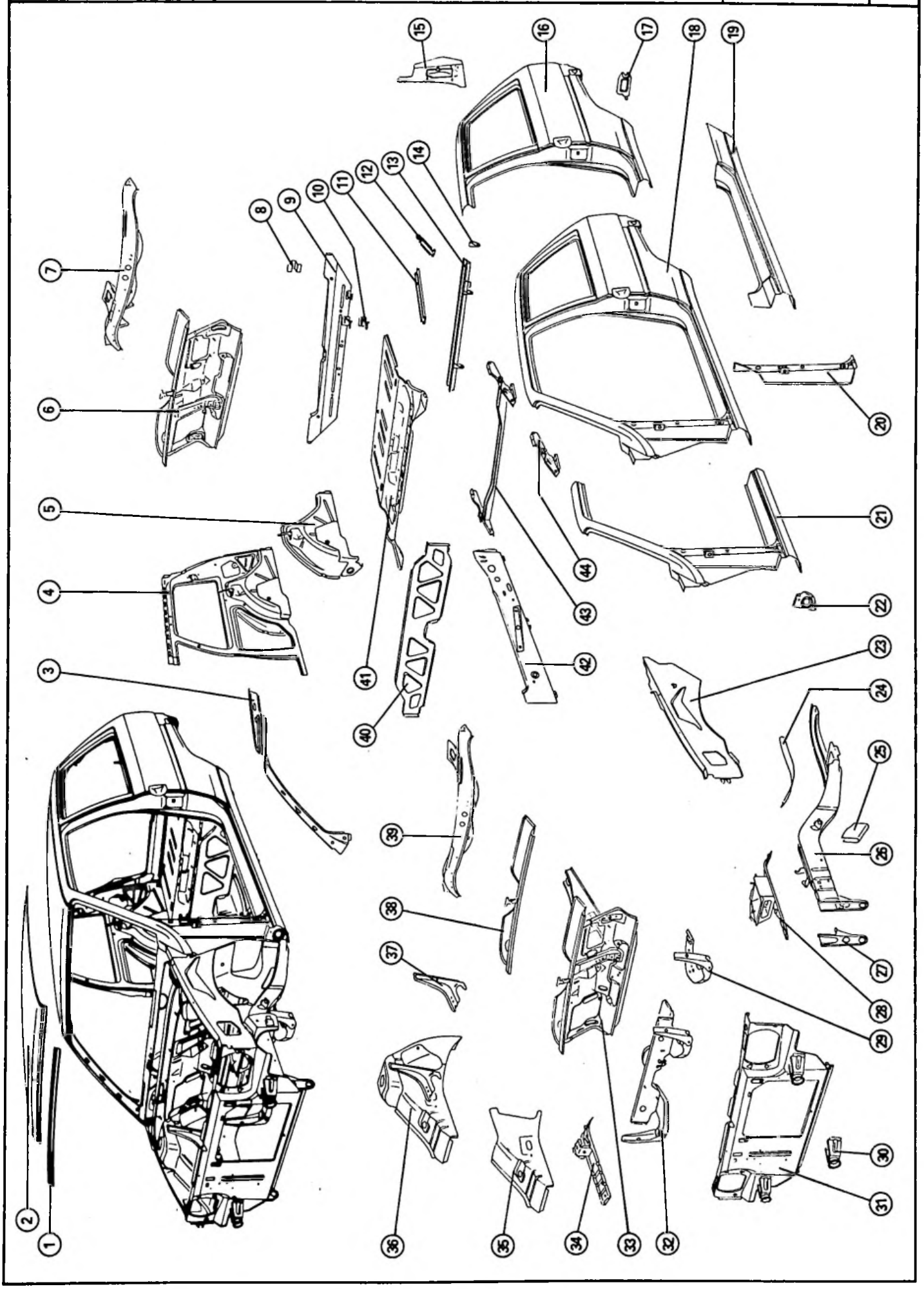
V

REMISE EN ÉTAT DE LA COQUE

I. ELEMENTS VENDUS PAR LE DÉPARTEMENT DES PIECES DE RECHANGE (3 PORTES)

REPERE PIECE	DÉSIGNATION	N° OPÉRATION
1	Doublure de baie partie supérieur	
2	Pavillon	ZA 821-2 – ZA 825-1
3	Doublure de montant de baie	
4	Doublure côté d'habitacle complète	ZA 821-2 – ZA 824-2
5	Passage de roue arrière	ZA 824-1
6	Tablier D à D	
7	Traverse d'auvent D à D	
8	Pontet de fixation pare-chocs	
9	Panneau arrière avec doublure	ZA 823-1
10	Support de silencieux	
11	Renfort droit de plancher arrière	ZA 831-2
12	Renfort gauche de plancher arrière	ZA 831-2
13	Traverse arrière	
14	Support panier de roue de secours	
15	Fermeture d'aile arrière	
16	Côté d'habitacle (partie arrière)	ZA 821-0 – ZA 821-5
17	Gousset de fixation latérale de pare-chocs	
18	Côté d'habitacle complet	ZA 821-0 – ZA 821-2
19	Côté d'habitacle (partie inférieure)	ZA 821-0 – ZA 821-4 – ZA 821-6
20	Pied avant	ZA 821-1
21	Côté d'habitacle (partie avant)	ZA 821-0
22	Fermeture de longeron	
23	Doublure d'aile avant	ZA 802-1
24	Fermeture arrière de brancard	
25	Brancard	ZA 802-3 – ZA 802-4 – ZA 802-6
26	Renfort de brancard (spécif. réparation)	ZA 802-4
27	Anneau de remorquage avant	
28	Fermeture de brancard côté gauche	
29	Support bras avant	ZA 802-7
30	Façade avant	ZA 801-1
31	Support de pare-chocs avant	
32	Traverse sous plancher AV complète	ZA 812-1
33	Tablier	ZA 812-2
34	Fermeture de brancard côté droit	
35	Passage de roue AV. partie AV.	ZA 802-2
36	Passage de roue AV. complet	ZA 802-5
37	Renfort de passage de roue	
38	Collecteur d'auvent	ZA 812-2
39	Traverse d'auvent	ZA 812-2
40	Planche à talon	
41	Plancher arrière	ZA 831-1 – ZA 831-2
42	Longeron	ZA 821-7
43	Traverse avant de plancher AR complète	ZA 831-2
44	Longeronnet arrière	ZA 831-2

N.B. Cette liste n'est pas limitative et est susceptible d'évolution suivant les besoins des carrossiers réparateurs.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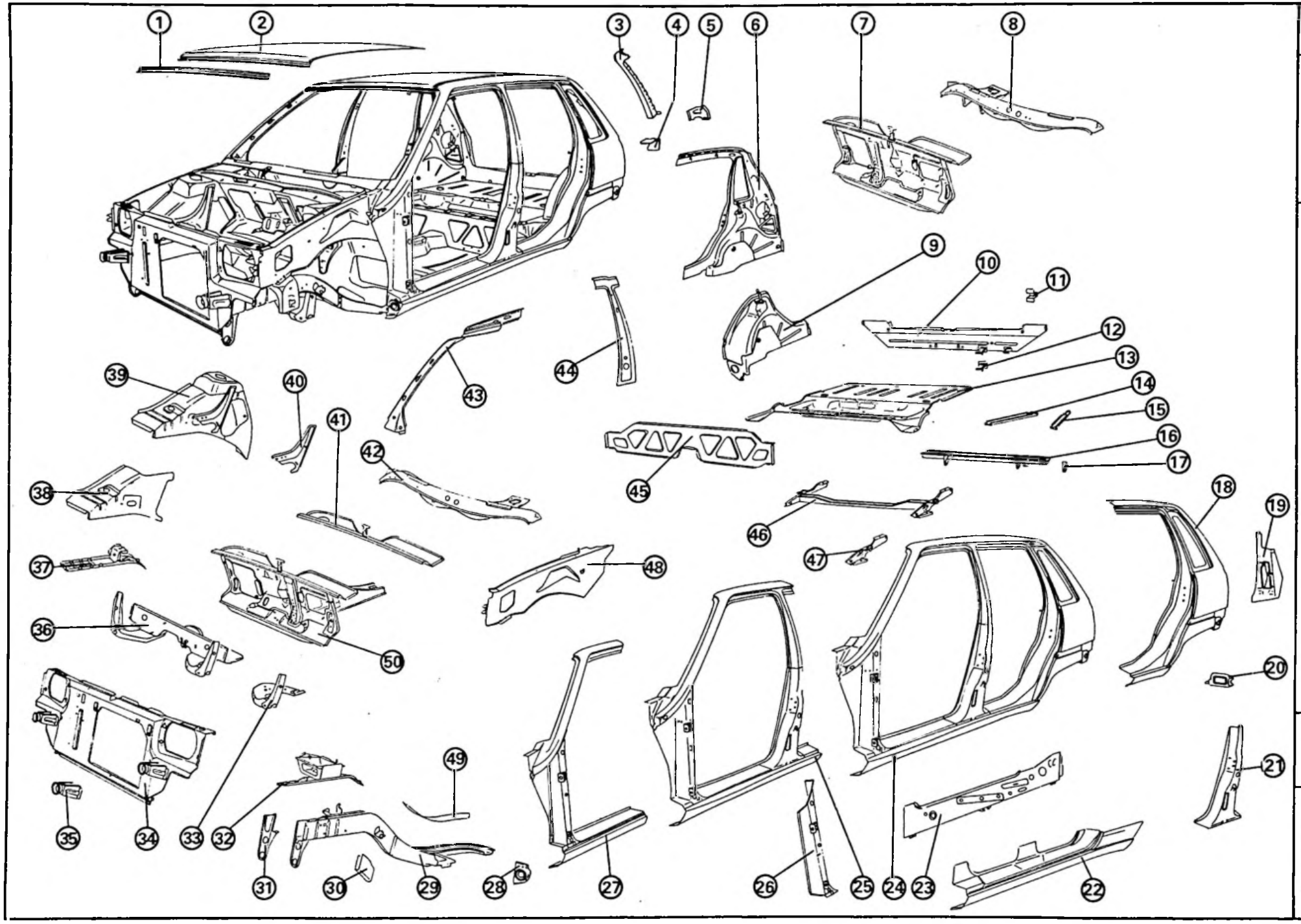
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I. ELEMENTS VENDUS PAR LE DÉPARTEMENT DES PIECES DE RECHANGE (5 PORTES)

REPERE PIECE	DÉSIGNATION	N° OPÉRATION
1	Doublure de baie partie supérieure	
2	Pavillon	ZA 821-2 – ZA 825-1
3	Doublure de montant de volet	ZA 824-2/1
4	Renfort de liaison aile AR. - tôle de feux AR.	
5	Liaison supérieure de fermeture d'aile AR.	
6	Doublure complète de côté d'habitacle	ZA 824-2/1
7	Tablier D à D	
8	Traverse d'auvent D à D	
9	Passage de roue arrière	ZA 824-1/1
10	Panneau arrière avec doublure	ZA 823-1
11	Pontet de fixation pare-chocs	
12	Support de silencieux	
13	Plancher arrière	ZA 831-1 ZA 831-2
14	Renfort droit de plancher arrière	ZA 831-2
15	Renfort gauche de plancher arrière	ZA 831-2
16	Traverse arrière	
17	Support de panier de roue de secours	
18	Côté d'habitacle (partie arrière)	ZA 821-9
19	Fermeture d'aile arrière	ZA 823-2
20	Gousset de fixation latérale de pare-chocs	
21	Renfort de pied central	ZA 821-10
22	Côté d'habitacle (partie inférieure)	ZA 821-6/1
23	Longeron	ZA 821-7
24	Côté d'abitacle complet	ZA 821-2/1
25	Côté d'habitacle (partie avant)	ZA 821-8
26	Pied avant	ZA 821-1
27	Côté d'habitacle (partie avant)	ZA 821-0
28	Fermeture de longeron	
29	Brancard	ZA 802-3 – ZA 802-4 – ZA 802-6
30	Renfort de brancard (spécifique réparation)	ZA 802-4
31	Anneau de remorquage avant	
32	Fermeture de brancard côté gauche	
33	Support bras avant	ZA 802-7
34	Façade avant	ZA 801-1
35	Support de pare-chocs avant	
36	Traverse complète sous plancher	ZA 812-1
37	Fermeture de brancard côté droit	
38	Passage de roue avant, partie avant	ZA 802-2
39	Passage de roue avant complet	ZA 802-5
40	Renfort de passage de roue avant	
41	Collecteur d'auvent	ZA 812-2
42	Traverse d'auvent	ZA 812-2
43	Doublure de montant de baie	
44	Doublure de pied central	ZA 821-8
45	Planche à talon	
46	Traverse avant, de plancher arrière	ZA 831-2
47	Longeronnet arrière	ZA 831-2
48	Doublure d'aile avant	ZA 802-1
49	Fermeture arrière de brancard	
50	Tablier	ZA 812-2

N.B. Cette liste n'est pas limitative et est susceptible d'évolution suivant les besoins des carrossiers réparateurs.

II. PIÈCES EN TOLE ÉLECTROZINGUÉE

Les pièces ombrées dans les vues ci-contre comportent un traitement d'électrozingage afin de prémunir la carrosserie de la corrosion.

Ce choix de pièces est fait en fonction de la vulnérabilité de certaines zones et est susceptible d'évolution.

Les pièces vendues par le Département des Pièces de Rechange comportent également ce même traitement mais il n'apparaît pas aux yeux du réparateur en raison de la couche de cataphorèse qui le recouvre.

RÉPARATION

En réparation, il est nécessaire de détruire la couche de cataphorèse sur les deux faces des tôles dans les zones de soudage, ce qui par la même occasion détériore le revêtement au zinc.

Pour éviter que la réparation (en particulier les zones de soudage) soit le point de départ du processus de corrosion, il convient de prendre certaines précautions.

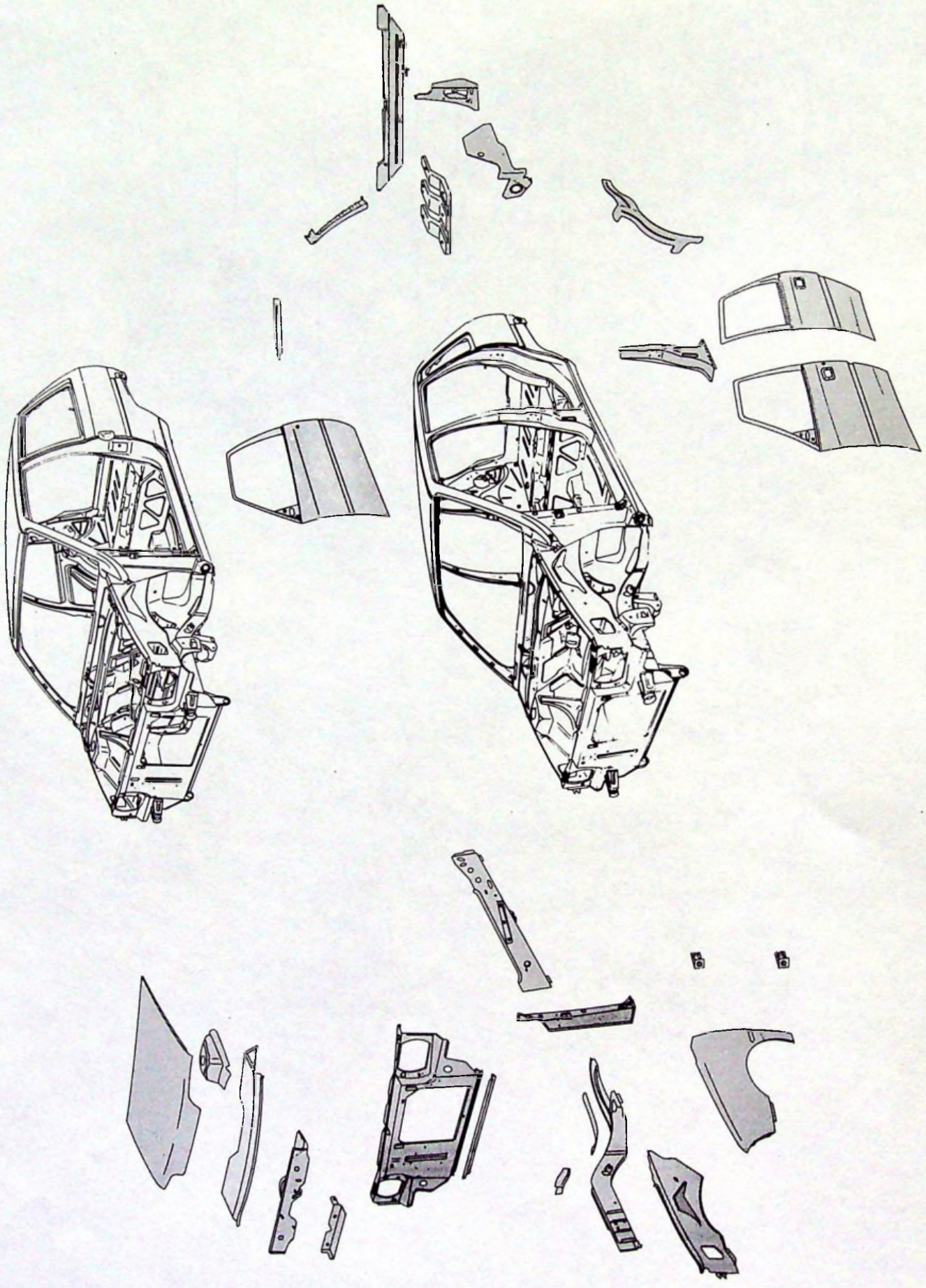
- Éviter de décaper par meulage les zones de soudage de pièces neuves (les disques abrasifs détruisent le revêtement au zinc) mais utiliser plutôt le chalumeau pour chauffer légèrement et brosser à l'aide d'une brosse métallique.
- Limiter le meulage, après dégrafage sur caisse, aux seules zones où il y a surépaisseur de soudure.
- Dégrafer les pièces à remplacer par fraisage des points de soudure, à l'aide de forets spéciaux (affutés à ''plat'')

PROTECTION AVANT SOUDAGE

Pour assurer une protection correcte de la face interne des bords de tôle à souder (électrozingués ou pas) il est indispensable d'appliquer :

- soit une peinture conductrice (au zinc ou à l'aluminium)
- soit un mastic conducteur qui assure protection et étanchéité de la liaison (le mastic ne permet pas le soudage par points MAG et ne peut être peint)

REMARQUE : Les produits de protection indispensables pour ces opérations doivent être commercialisés prochainement par D.P.R.



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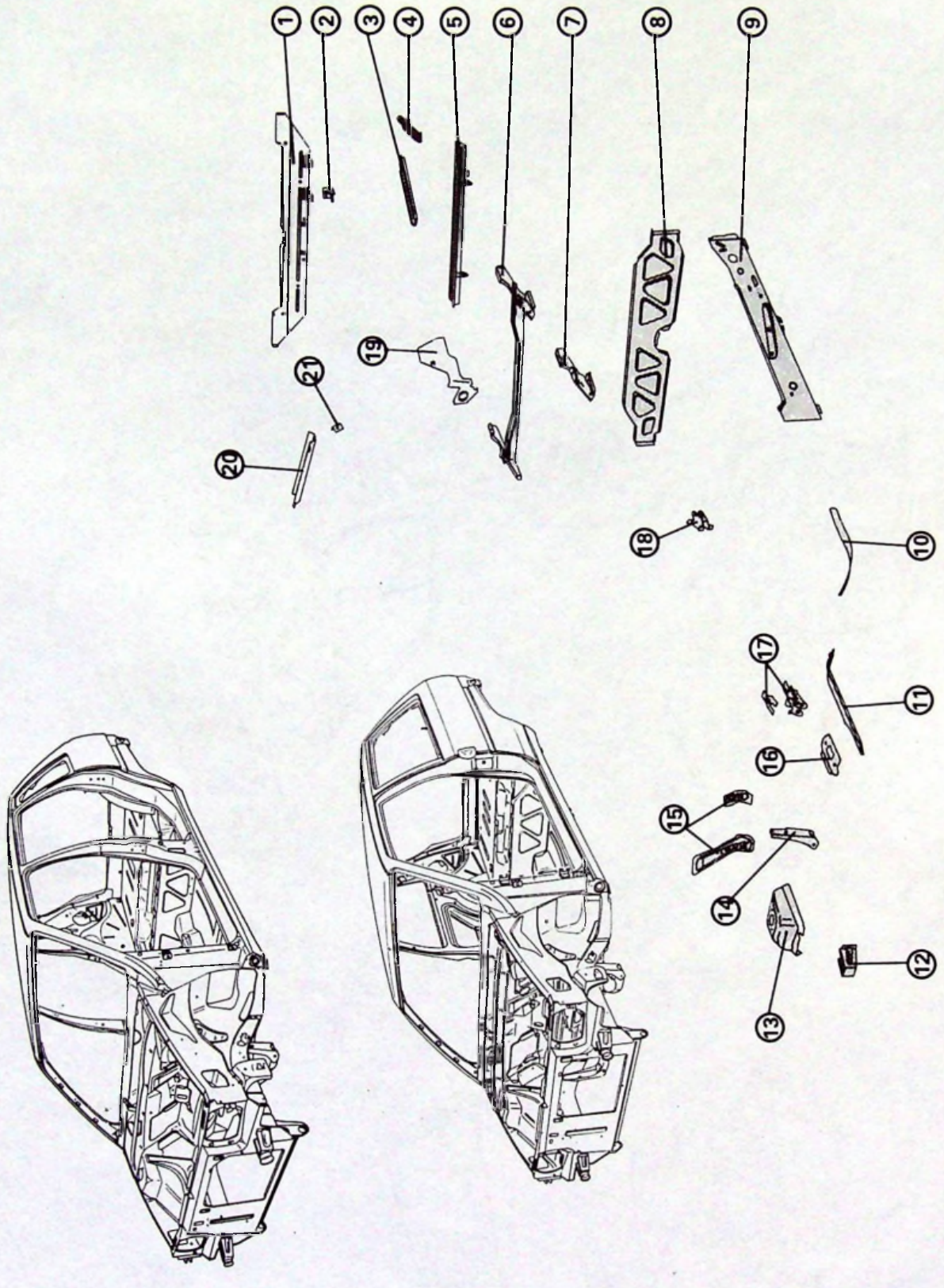

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III. PIÈCES EN TOLE "H.L.E."

La recherche pour l'allègement des véhicules et l'accroissement de la sécurité des occupants conduit les constructeurs automobile à se pencher sérieusement sur la nature des matériaux utilisables pour concevoir la superstructure des carrosseries.

Les essais réalisés sur des pièces en **tôle à haute limite élastique** ont prouvé que la résistance est doublée par rapport à d'autres pièces de forme identique en acier classique, ceci malgré une diminution de l'épaisseur de près de 25 %.

L'évolution de la conception et des méthodes de fabrication des carrosseries permet d'utiliser ces aciers aux caractéristiques extrêmement intéressantes pour la construction automobile. C'est ce qui a été fait dans notre société, notamment pour AX et BX.

RÉPARATION

Les tôles à haute limité élastique (HLE) ne posent aucun problème particulier pour ce qui concerne les solutions d'assemblage par soudure par résistance ou MAG, mais il convient toutefois de respecter les solutions de coupe et d'assemblage préconisés dans les gammes de réparation.
Le soudage au chalumeau et le brasage sont des solutions d'assemblage à proscrire quelle que soit la nature des tôles.

LISTE DES PIÈCES EN TOLE "H.L.E." SUR "AX"

1 : Panneau arrière
2 : Supports de silencieux
3 : Renfort côté droit de plancher arrière
4 : Renfort côté gauche de plancher arrière
5 : Traverse arrière sous plancher arrière
6 : Embouts de traverse avant sous plancher arrière
7 : Longeronnets
8 : Travers à talons
9 : Doublures longerons
10 : Fermetures arrière de brancard avant
11 : Fermetures avant de brancard avant
12 : Support de pare-chocs avant
13 : Supports de suspension
14 : Gousset de fixation bras
15 : Renforts de fixation direction
16 : Renfort de support moteur gauche
17 : Support de biellette anti-couple
18 : Chape de tirant de porte
19 : Renfort de passage de roue arrière
20 : Traverse arrière de pavillon
21 : Renfort de fixation ceinture sur montant

NOTA - Cette liste n'est pas limitative et est susceptible d'évolution.

IV. CONTROLE D'UN VÉHICULE ACCIDENTÉ

Procéder aux vérifications suivantes, en respectant l'ordre ci-dessous :

1) **Contrôle visuel** :
   Recherche de plis, déformations, criques, etc.

2) **Contrôle de la géométrie des essieux** :
   Opérations réalisées à l'aide d'appareils optiques sans dépose mécanique.

3) **Contrôle du soubassement sur banc** :
   Opérations réalisées sur banc de contrôle (de type CELETTE, CAROLINER, etc.) sans dépose mécanique.

1) CONTROLE VISUEL

Tout impact provoque des déformations sur une coque de véhicule, déformations plus ou moins visibles suivant la violence et les zones de ces impacts. La recherche de ces déformations permet dans la plupart des cas de définir un diagnostic précis, ainsi que les opérations à réaliser pour la remise en état de la coque.

En l'absence de toutes déformations visibles il est recommandé de procéder à un contrôle de la géométrie des essieux, voir même à un contrôle de soubassement sur banc (vrillage de la coque).

DÉFORMATIONS, POINTS PARTICULIERS (Opérations à réaliser sur banc de contrôle : ☐)

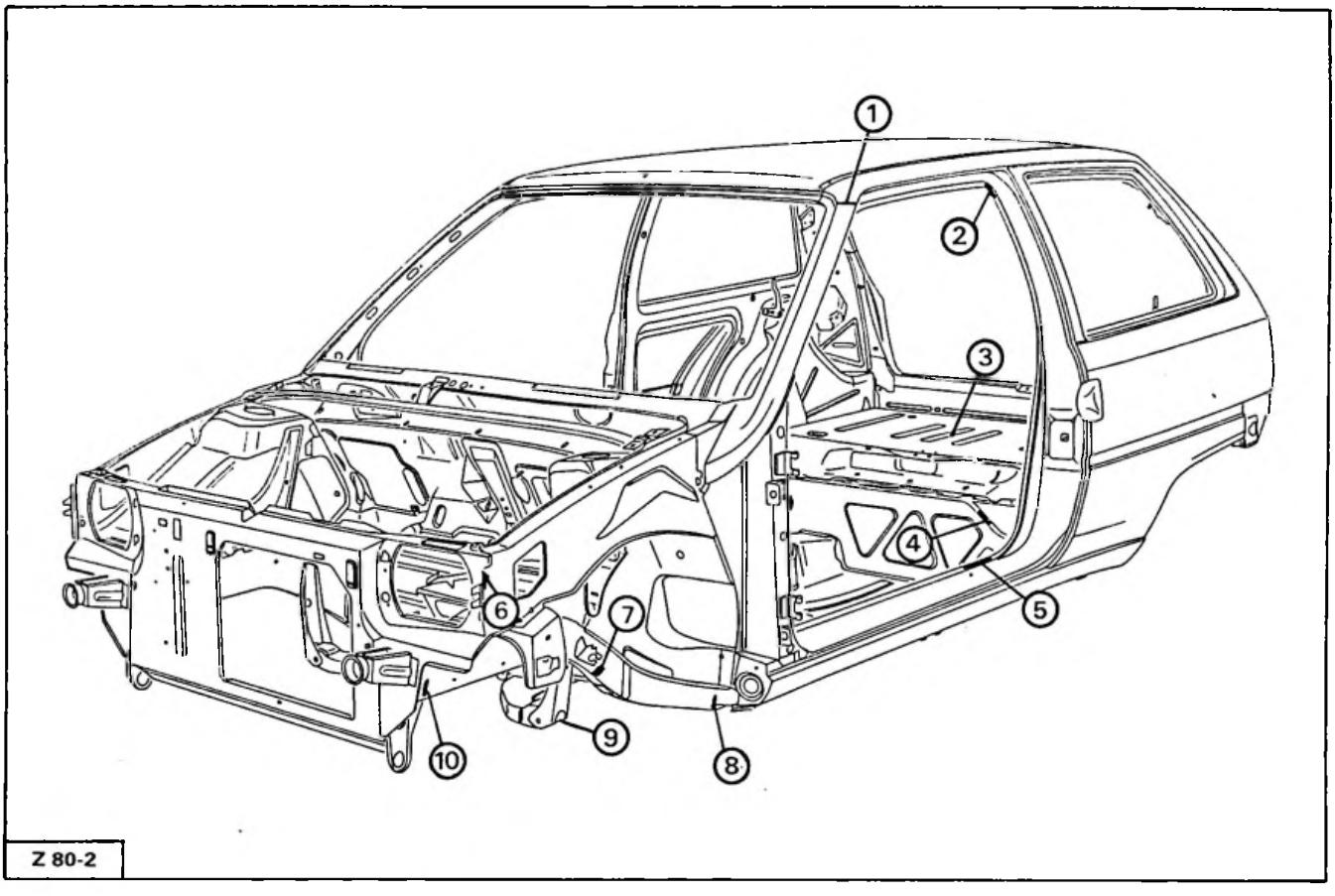
- *SUR CHOC AVANT* :
  - **6** : Tôle support de phare, passage de roue AV. doublure d'aile AV.
  - **10** : Longeron AV. (derrière tôle support de phares)
  - **9** : Support de palier AV. (bras de suspension) ☐
  - **7** : Brancard (derrière equerre fixation flexible de frein) ☐
  - **8** : Tôle de liaison de brancard
  - **11** : Pied AV. (décollement soudure en partie supérieure)
  - **19** : Panneau de côté partie AV. inférieur (décollement soudure et plis partie supérieure)
  - **18** : Traverse AV. sous plancher (plis partie centrale) ☐
  - **1** : Panneau de côté partie supérieure
  - **6-7-8-9-10** : Passage de côté de roue complet AV avec brancard☐
- *SUR CHOC LATÉRAL*
  - **8** : Tôle de liaison de brancard
  - **11** : Pied AV. (enfoncement et décollement soudure en partie supérieure
  - **18** : Traverse AV. sous plancher (plis partie centrale) ☐
  - **19** : Panneau de côté partie AV. inférieure
  - **1** : Panneau de côté partie supérieure
  - **1-11-19** : Panneau de côté AV. + pied AV. (sans 18) ☐
  - **1-11-19-18** : Panneau de côté AV. + pied AV. + traverse ☐
  - **2-5** : Pied milieu (enfoncement et plis partie inférieure et supérieure)
  - **4-18-17** : Enfoncement bas de caisse, plis, planche à talon, traverse AR., longeronnet ☐
- *SUR CHOC ARRIÈRE* :
  - **12-13** : Panneau de côté (plis partie supérieure et niveau supérieur du feu AR.)
  - **14** : Passage de roue AR. et doublure AR.
  - **3-15** : Plancher AR. et renforts gauche et droit
  - **2-3-5-12-13-15-17** : Plancher AR. et panneau de côté ☐

2) CONTROLE DE LA GÉOMÉTRIE DES ESSIEUX

Pour le contrôle des essieux avant et arrière, se reporter au Manuel de Réparation Mécanique :
Voir Opération **ZA 410-0/1** (pour conditions essieux AV. et AR.).

3) CONTROLE DU SOUBASSEMENT SUR BANC

Se reporter aux opérations :
ZA 800-1 : (Équipement CELETTE)
ZA 800-11 : (Équipement CAROLINER)
ZA 800-21 : (Équipement METRO 2000 CELETTE).



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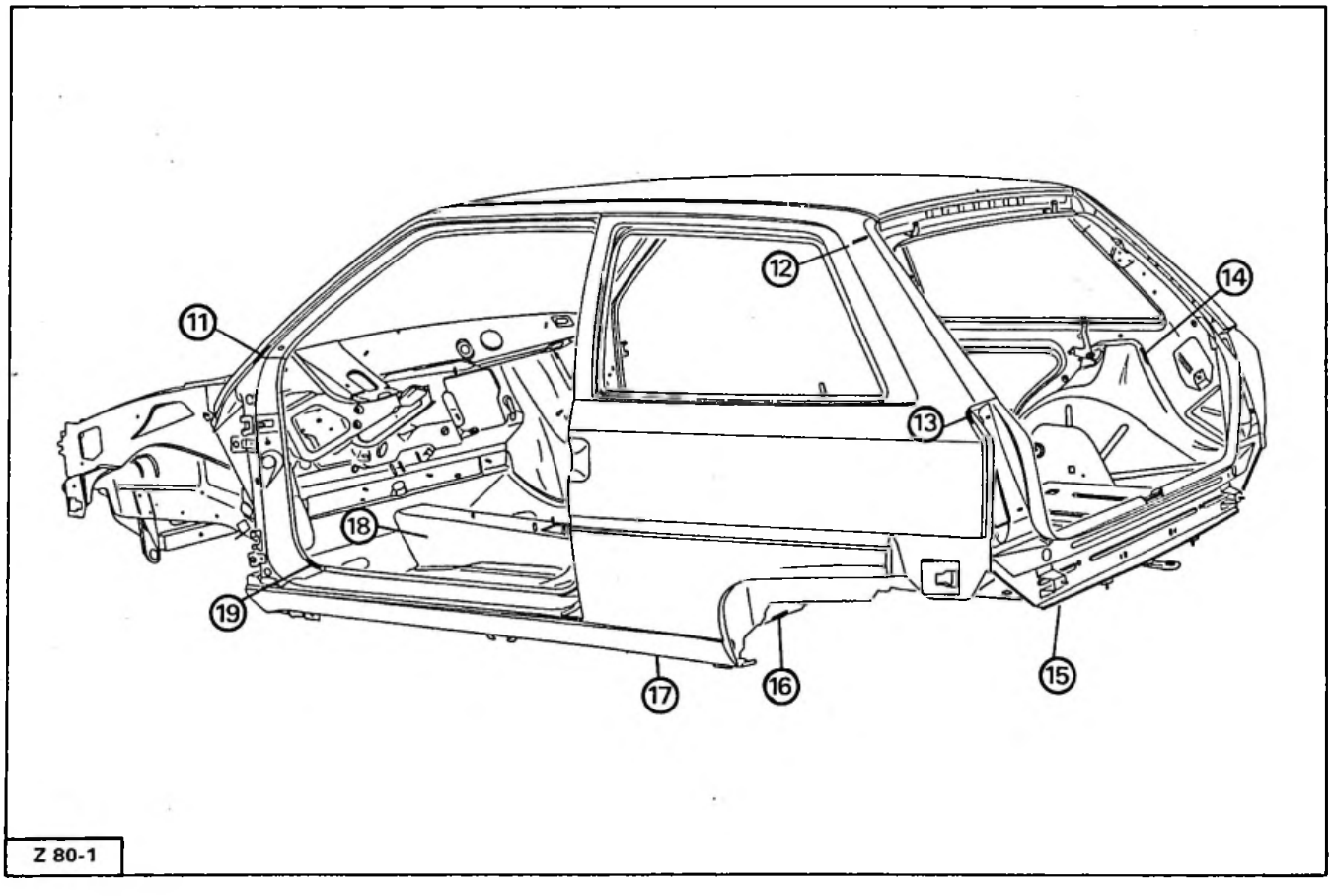

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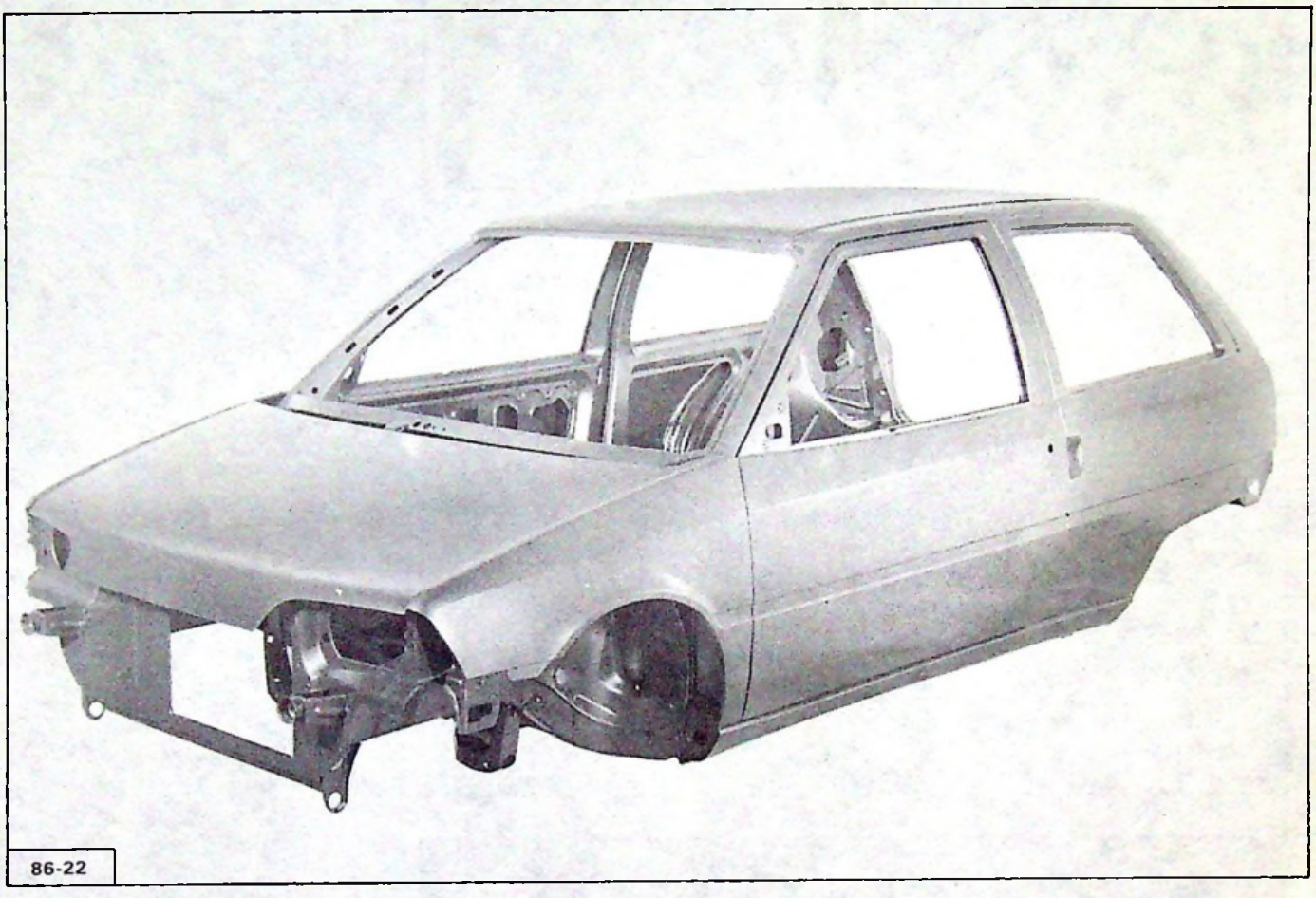

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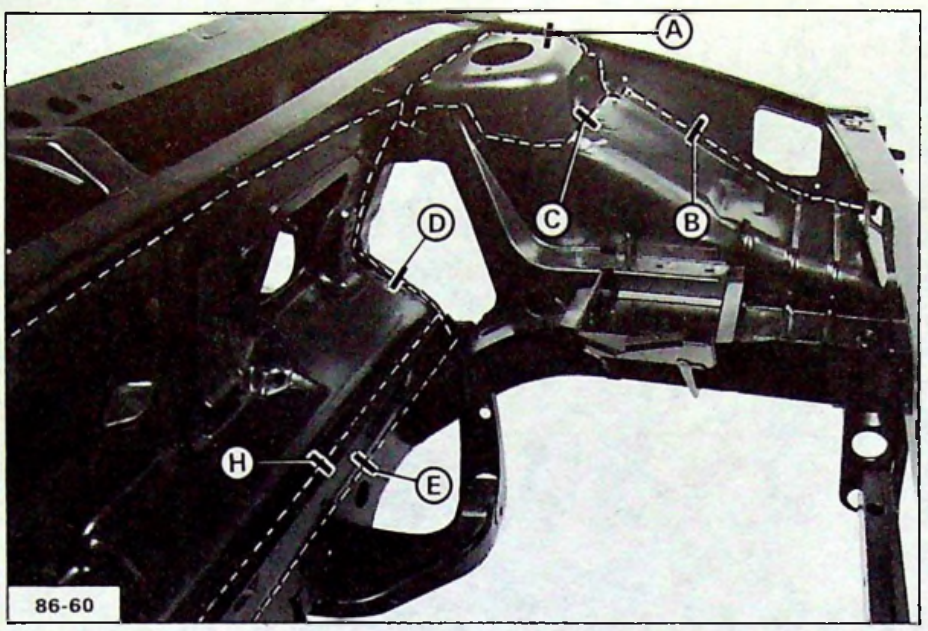
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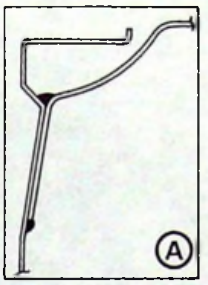
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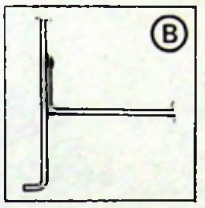
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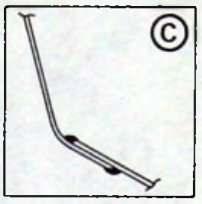
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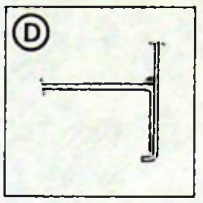
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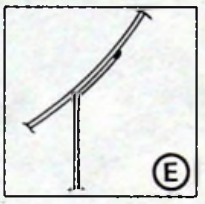
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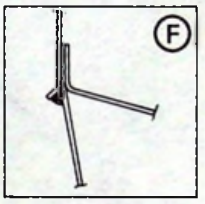
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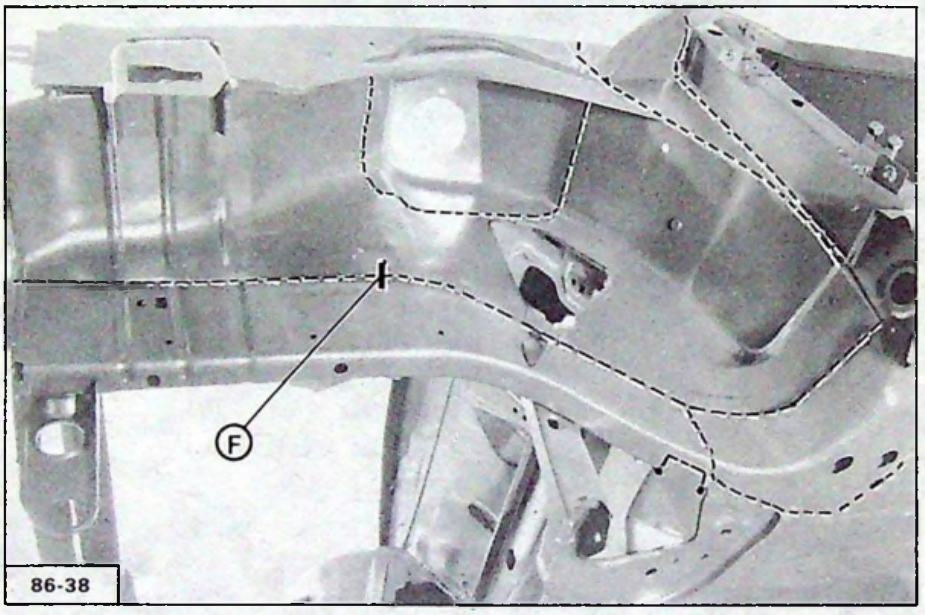
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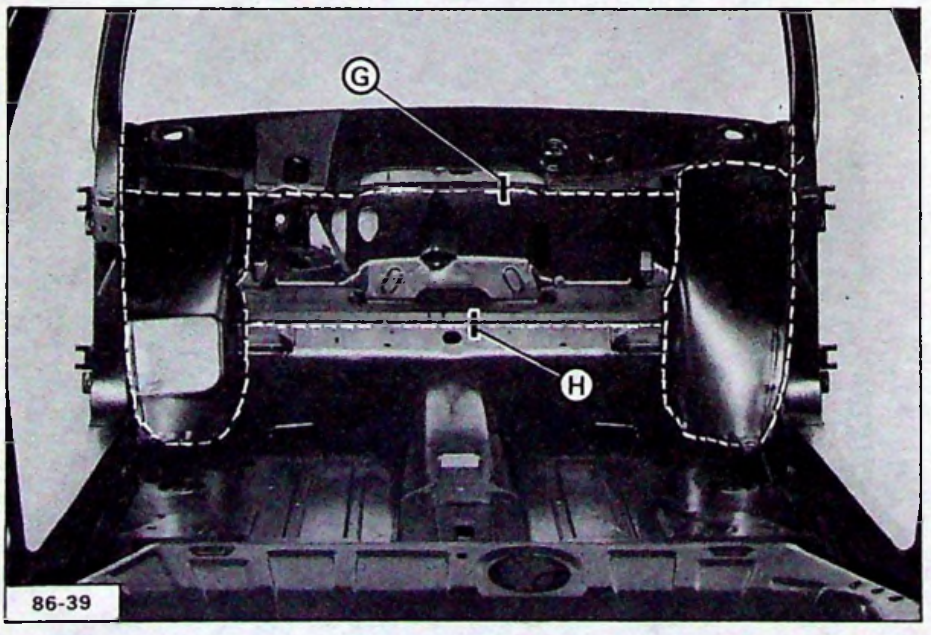
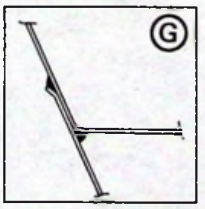
86-38


G
H
86-39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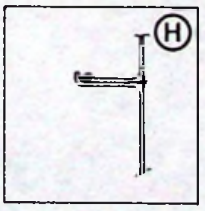
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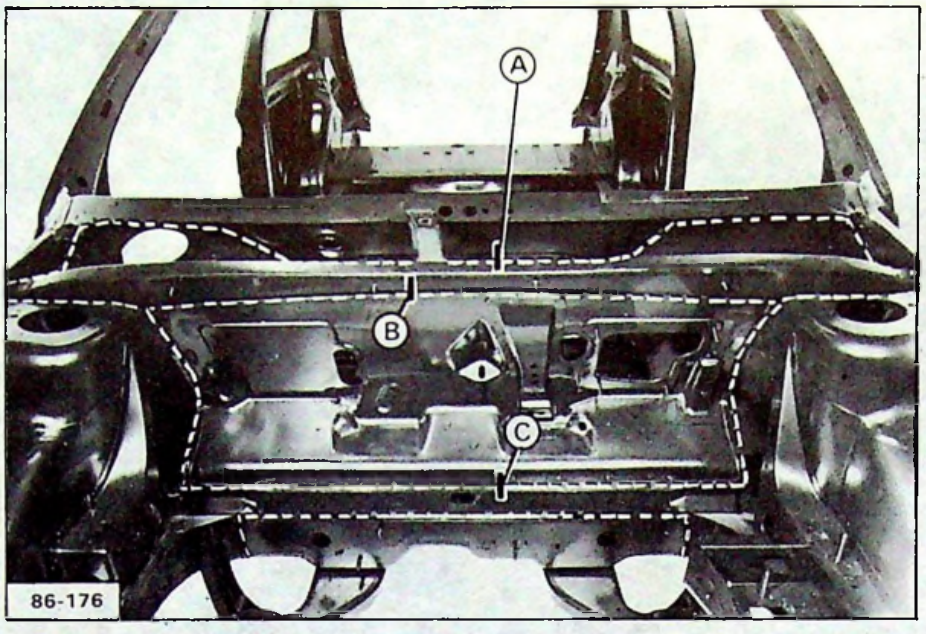

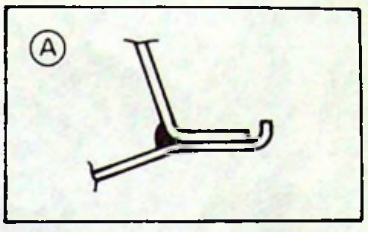

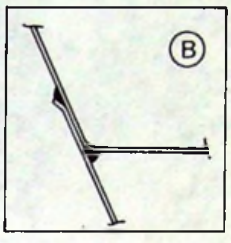

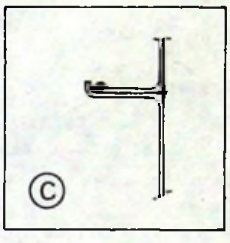

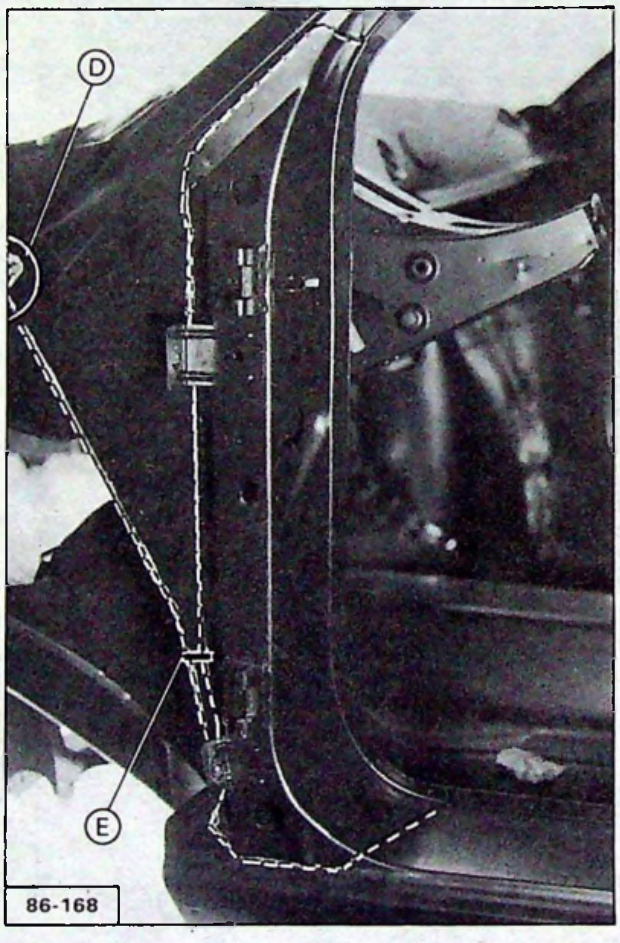

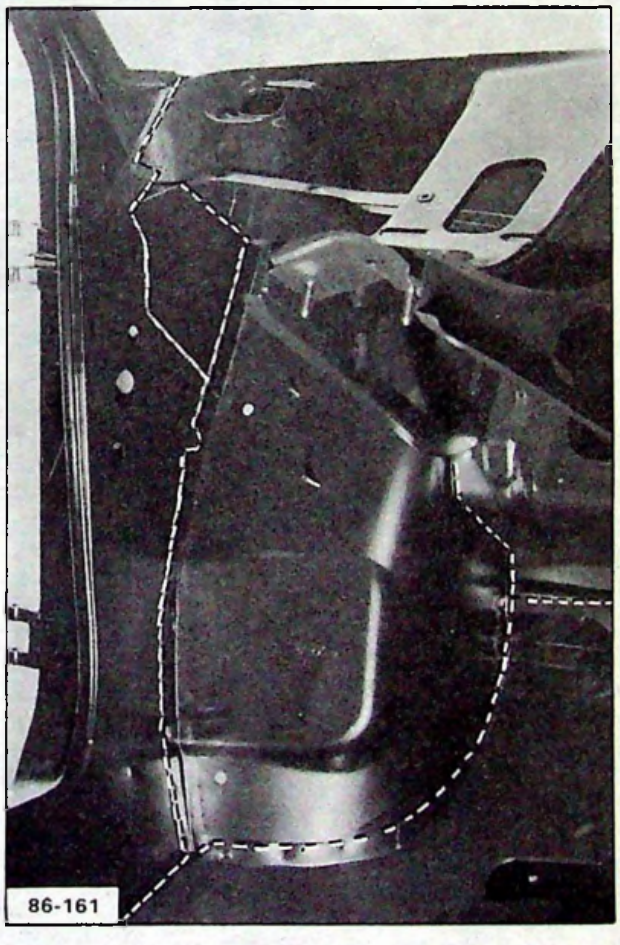

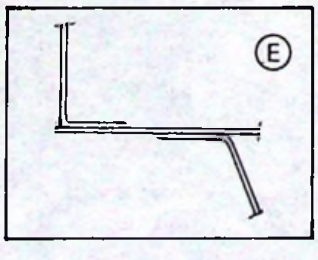

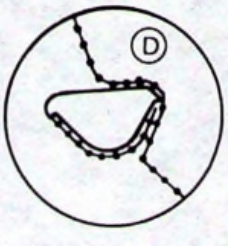

Z 80-5 – Z 80-6

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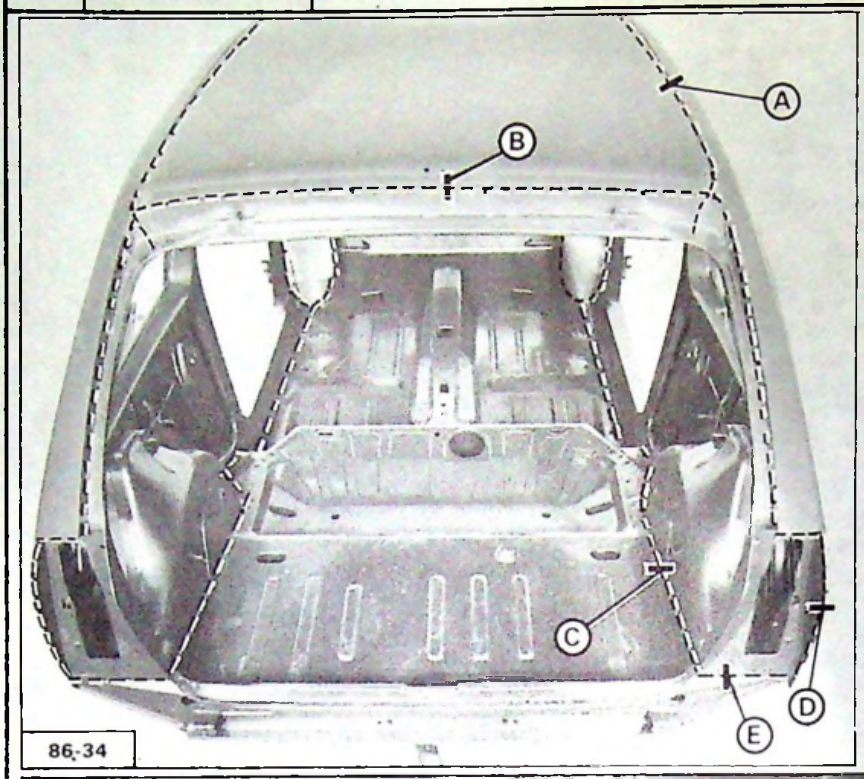
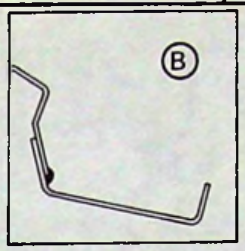

A
B
C
D
E
86-34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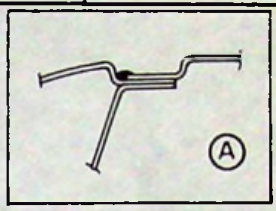
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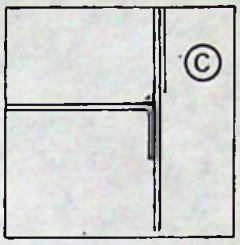
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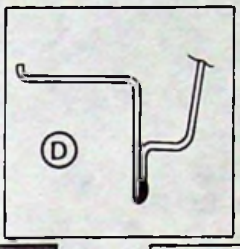
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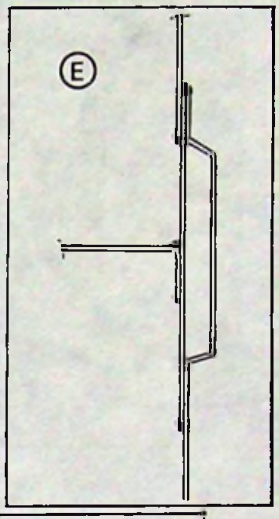
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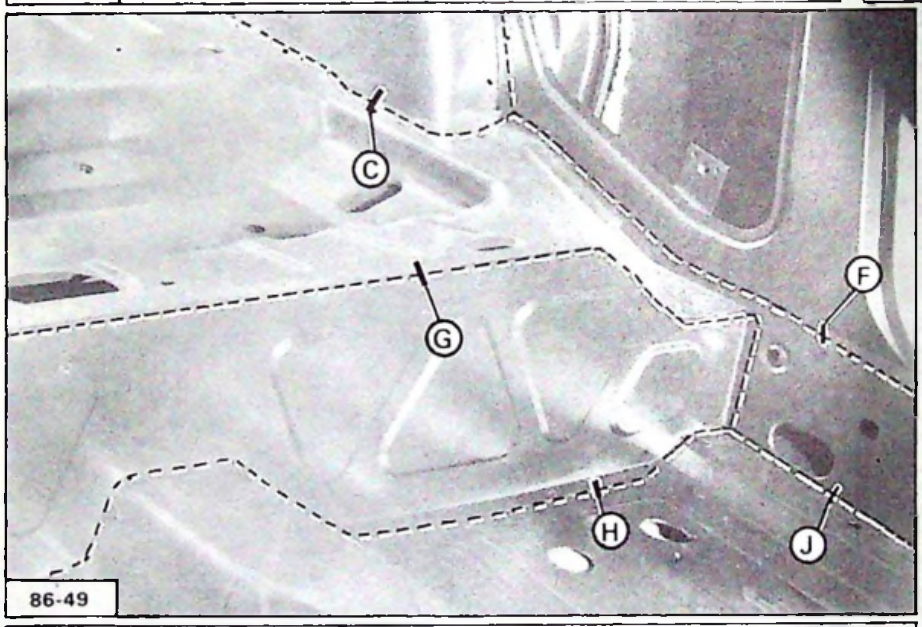
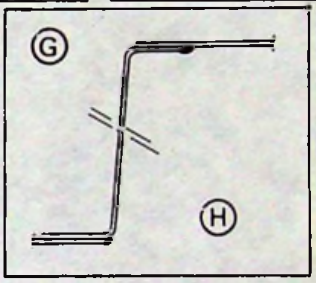
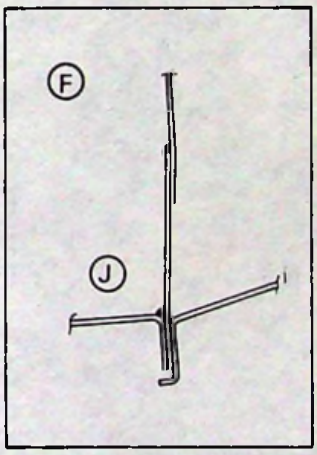

C
F
G
H
J
86-49


G
H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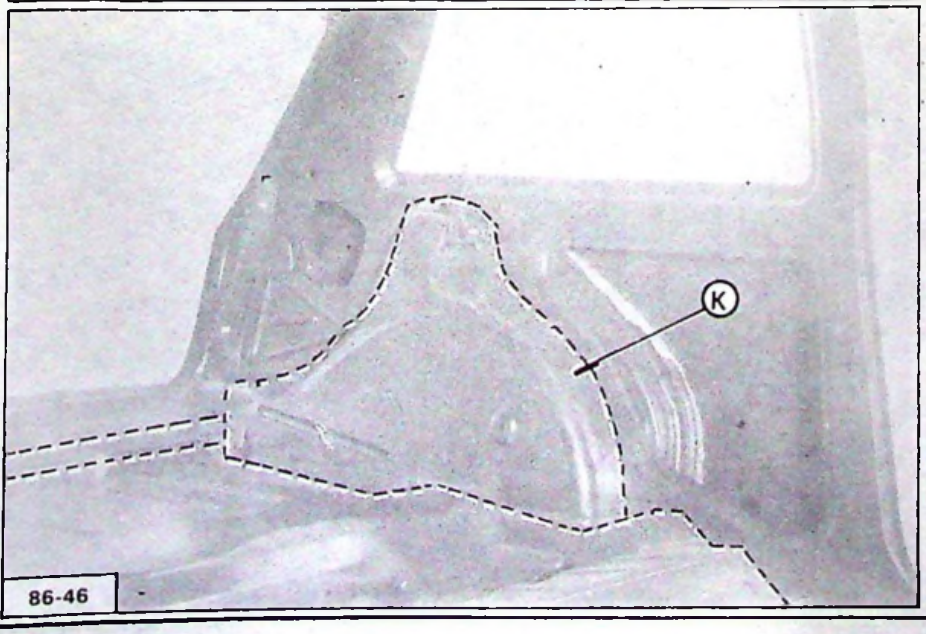
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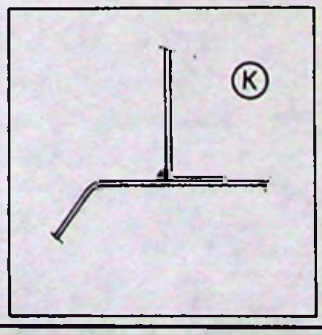
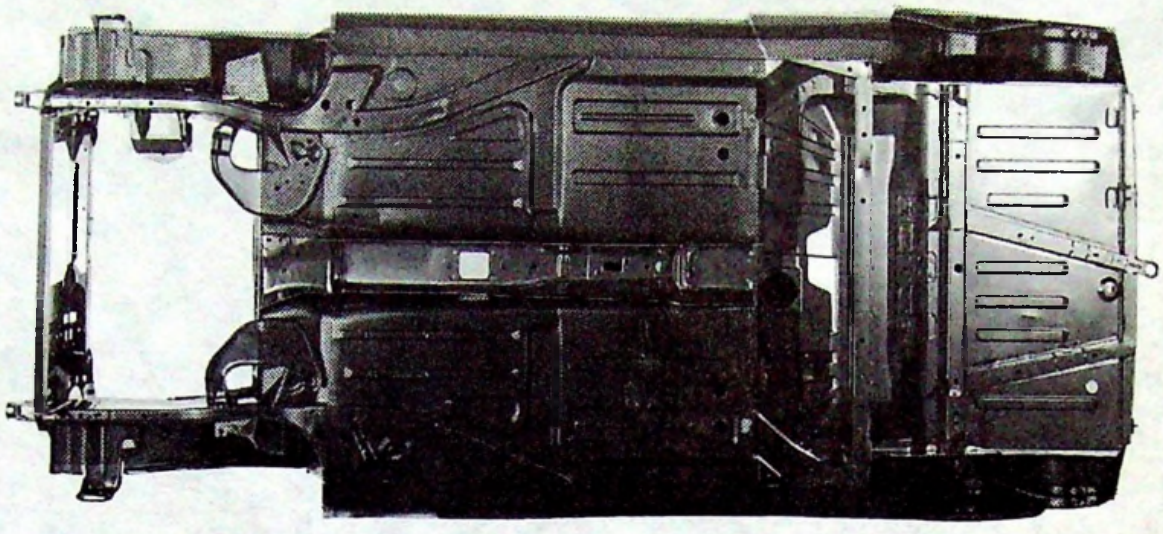
86-46

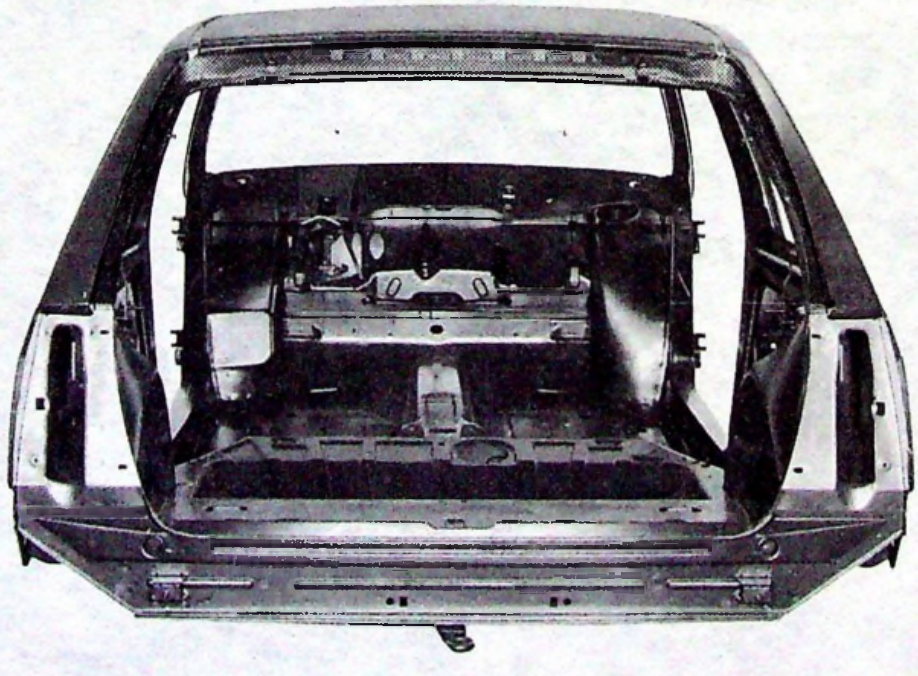

K

C1



86-35

C2



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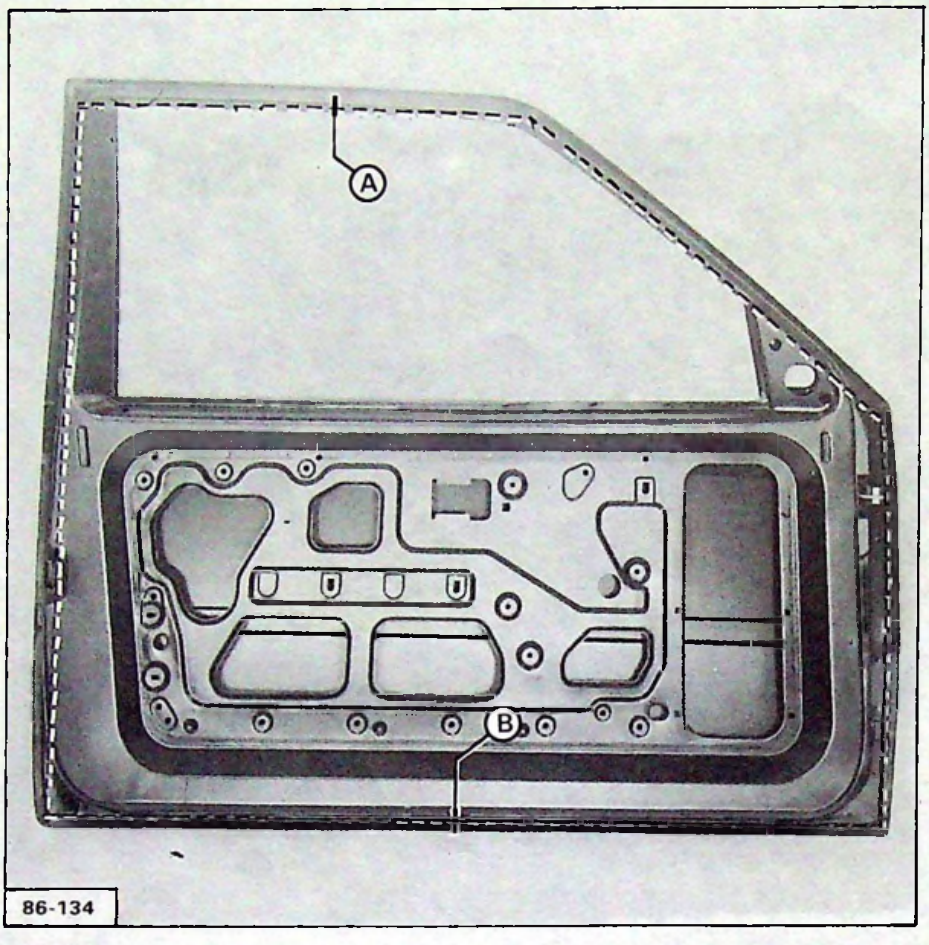
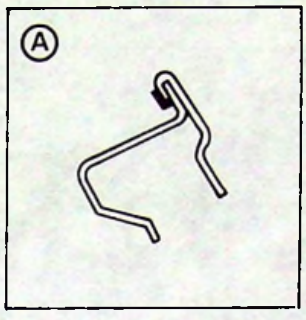

A
B
86-134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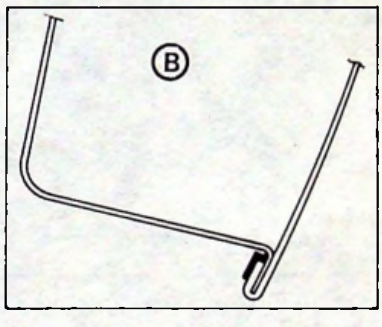
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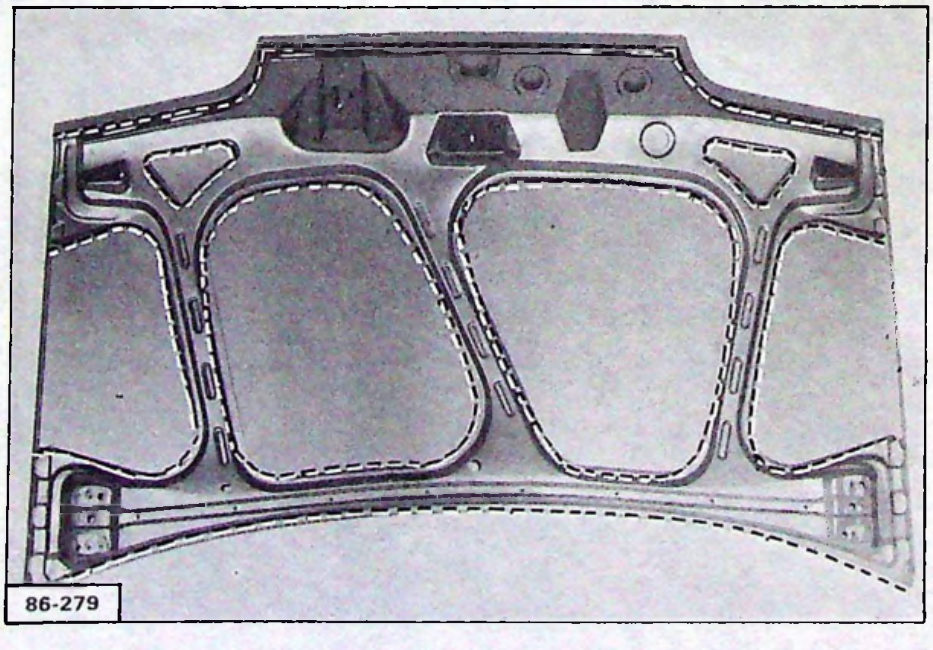
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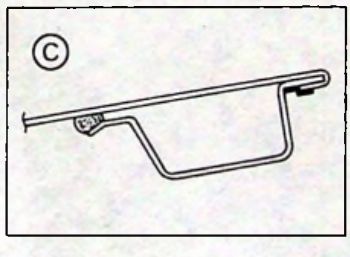
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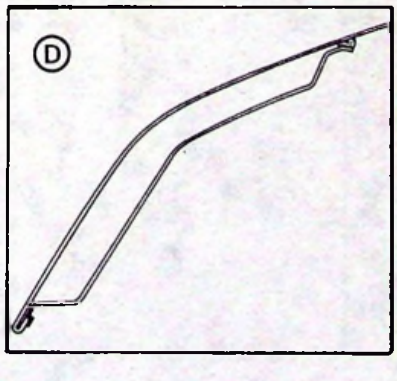
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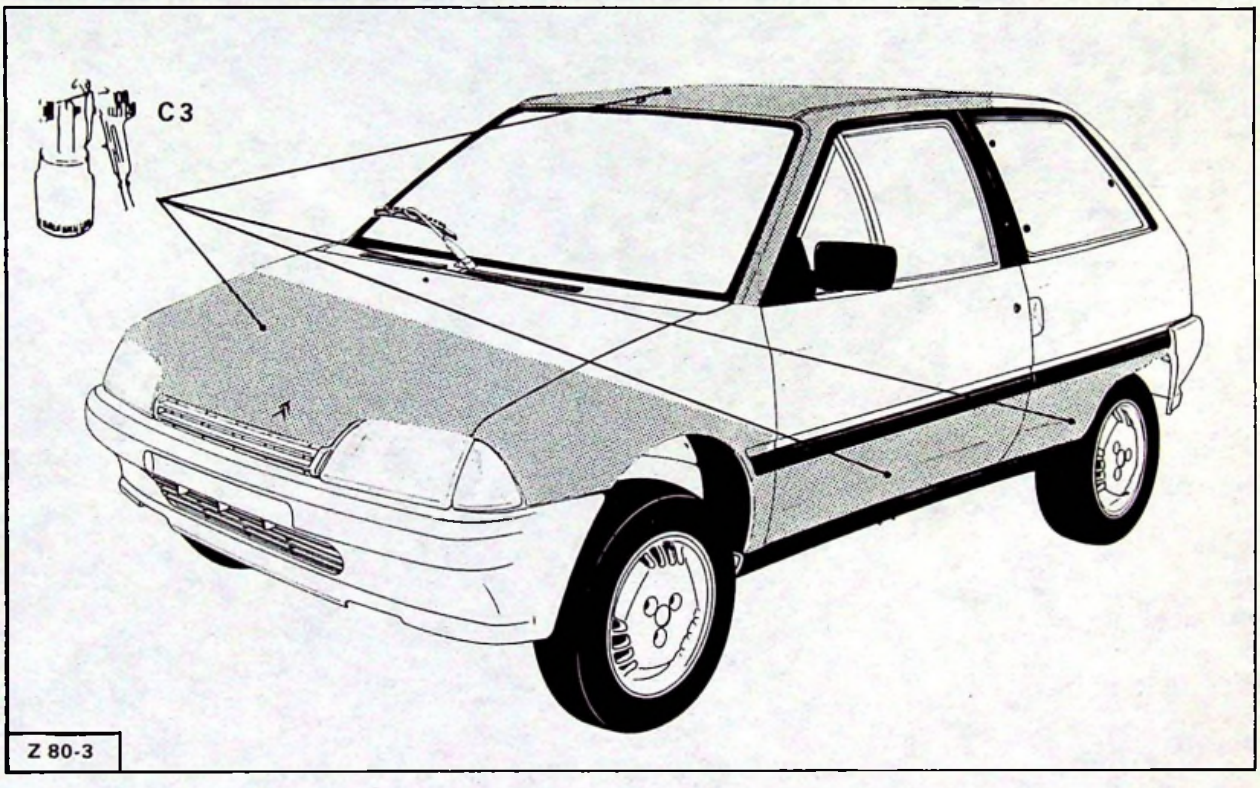
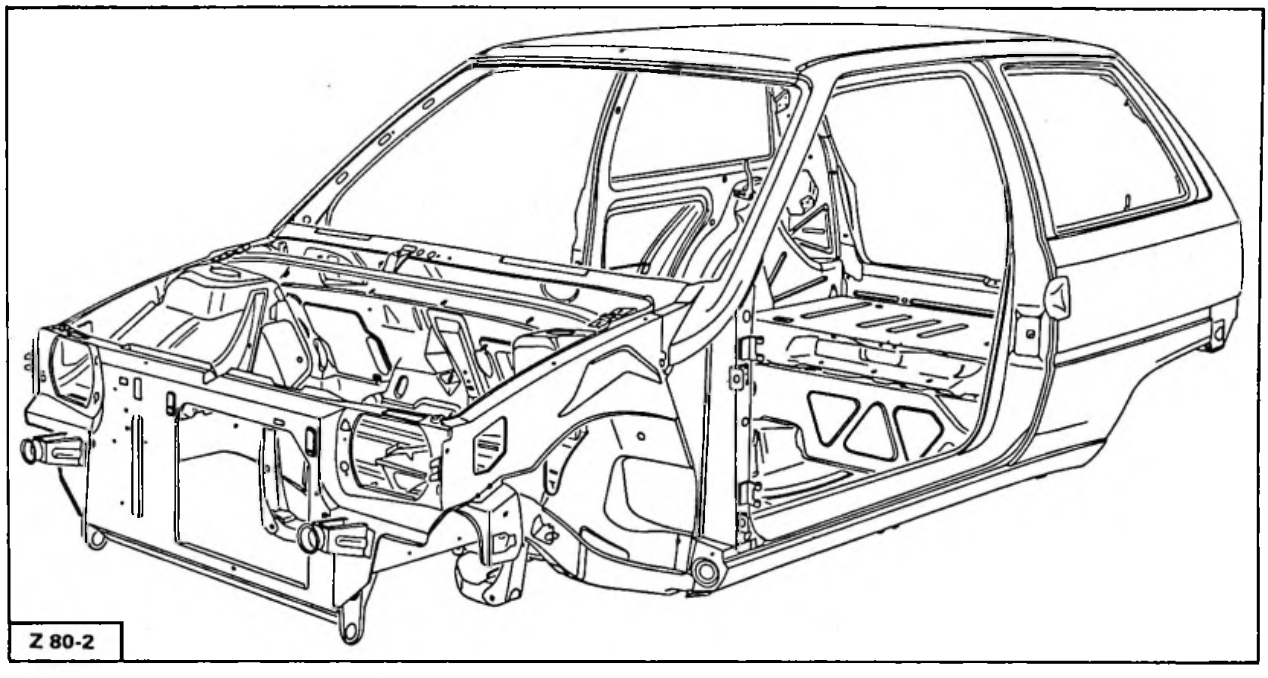
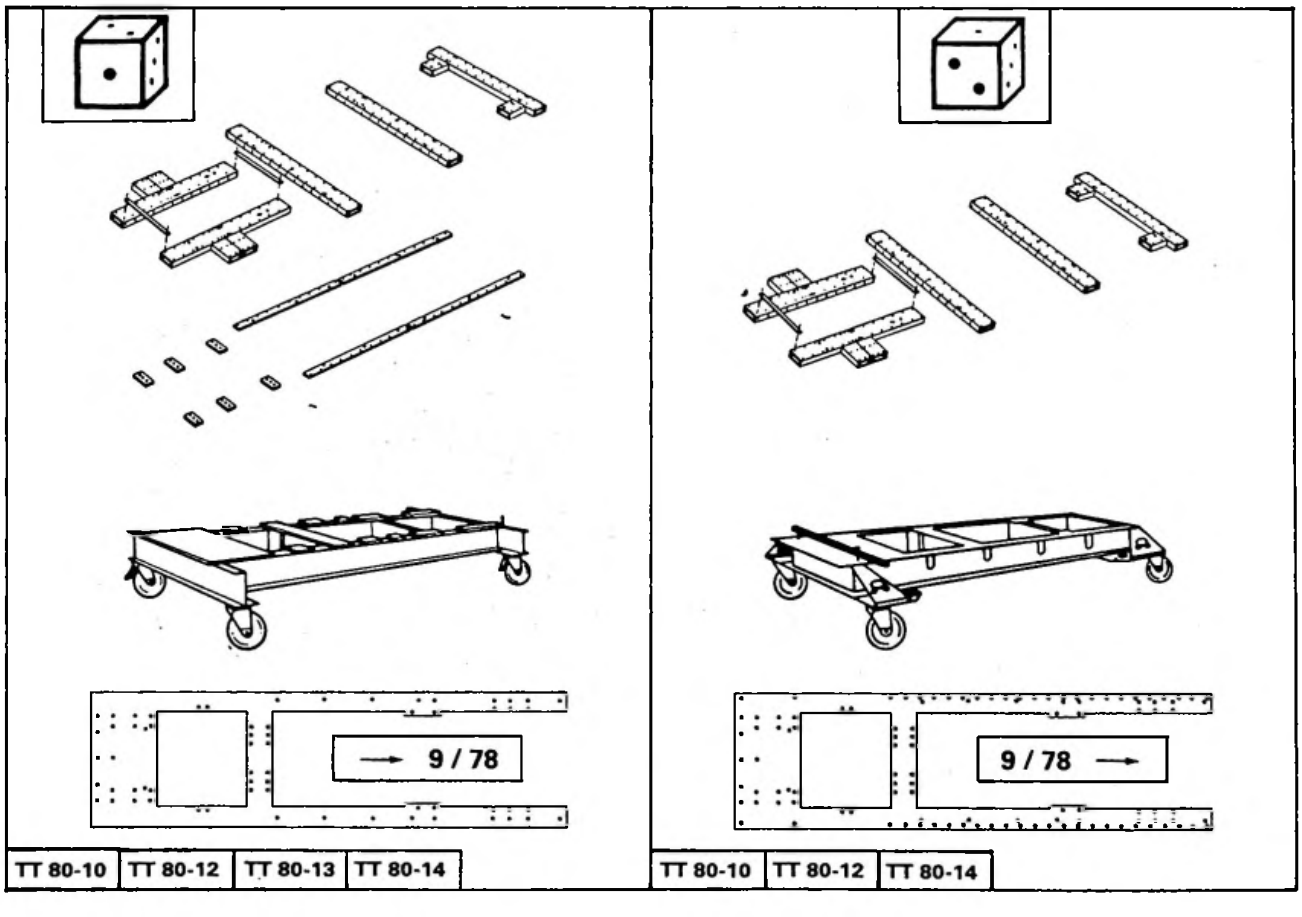


Z 80-3



Z 80-2



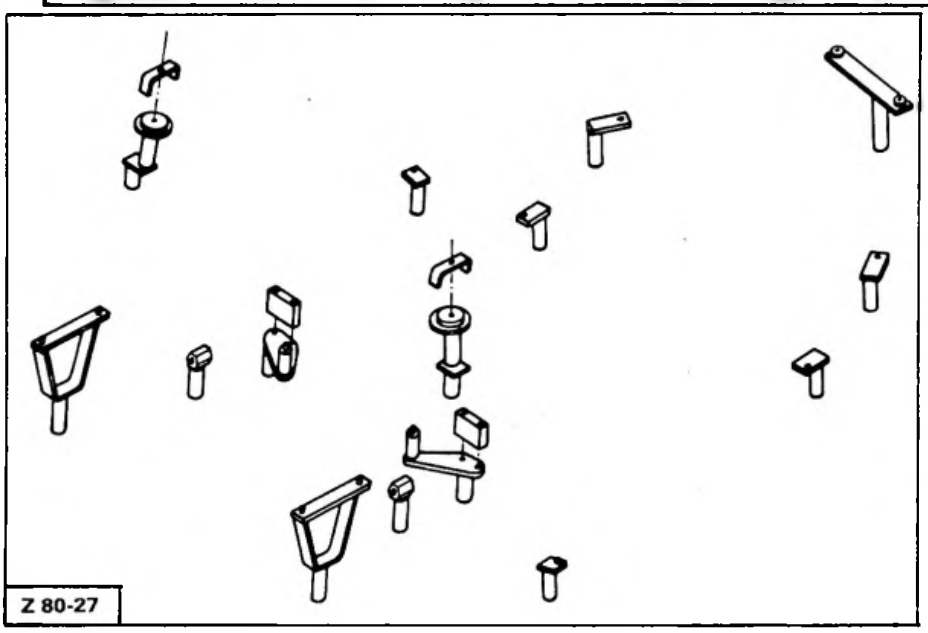
TT 80-10 | TT 80-12 | TT 80-13 | TT 80-14

TT 80-10 | TT 80-12 | TT 80-14

CELETTE MZ

Z 80-22

Détails									
Réf des Détails	MZ080	MZ140	MZ141	MZ142	MZ 200	Z260	MZ601	MZ602	TV400
Quantité	4	4	1	1	1	2	1	1	/

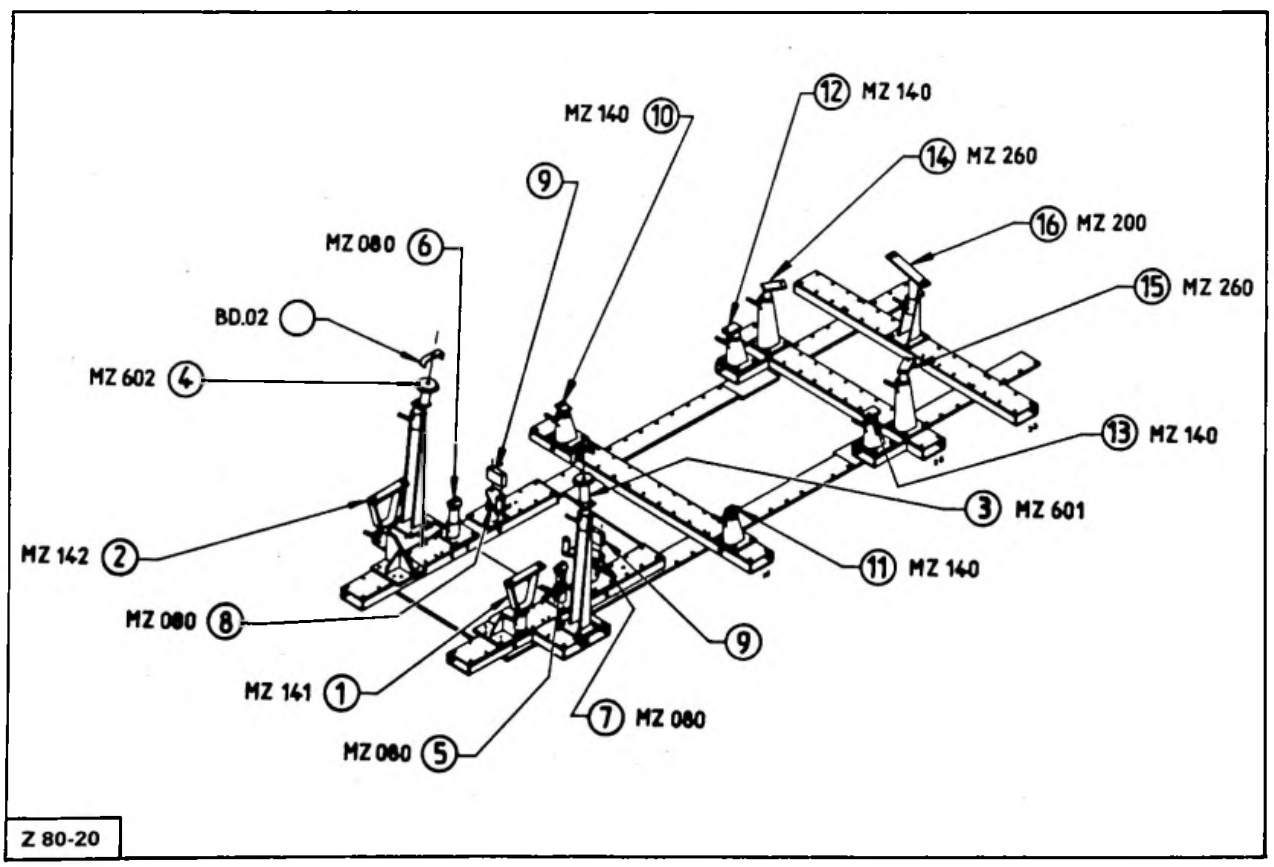


→ 1/90

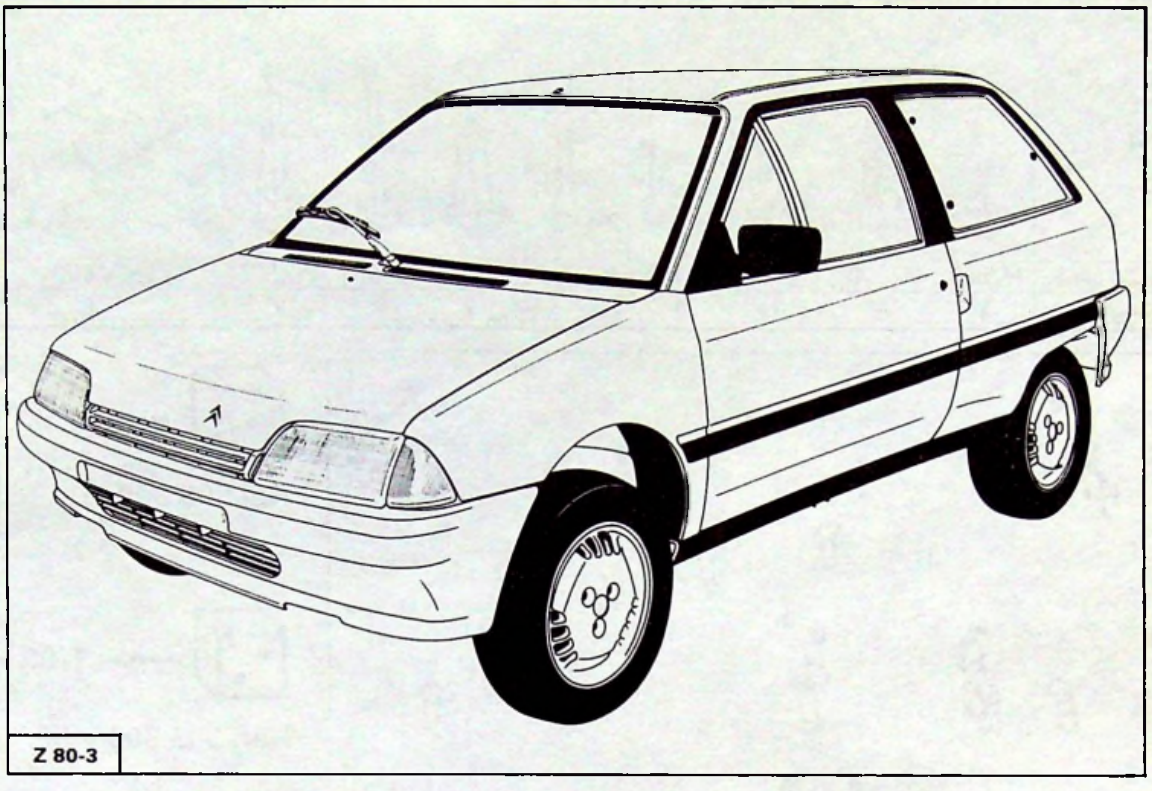
Réf 503.300

→ 1/90 →

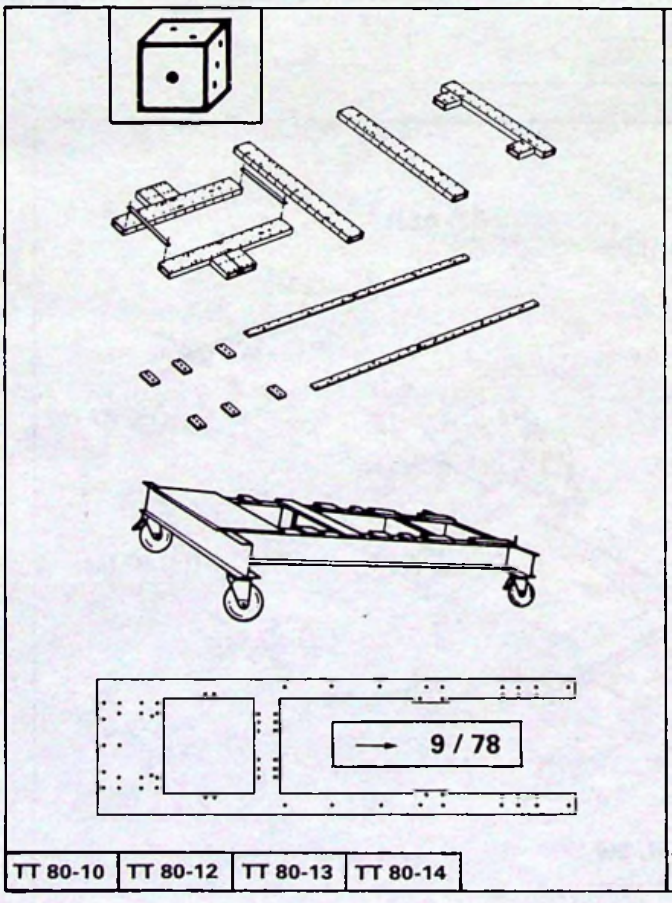
Réf. 503.300 + 503.309
ou
Réf. 503.310



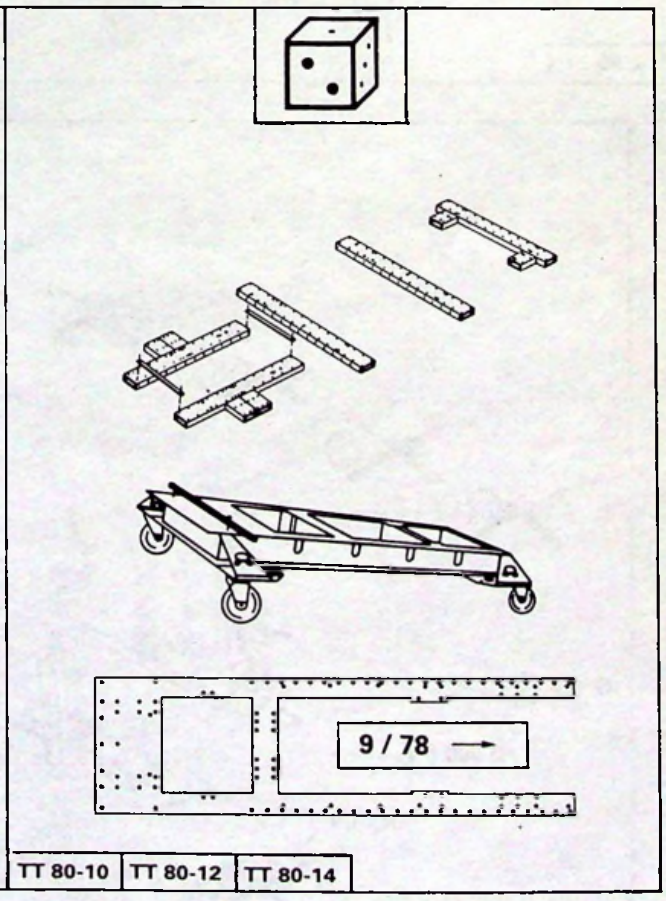
C ••



Z 80-3



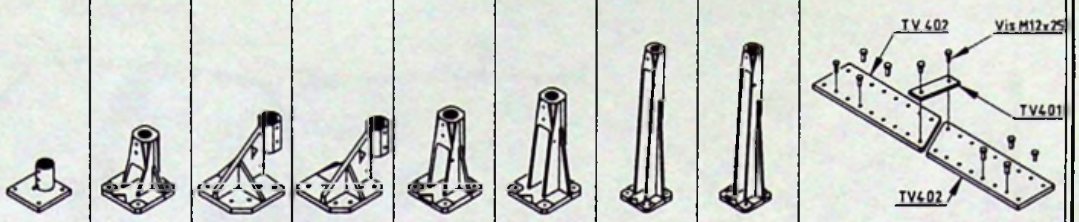
TT 80-10 | TT 80-12 | TT 80-13 | TT 80-14

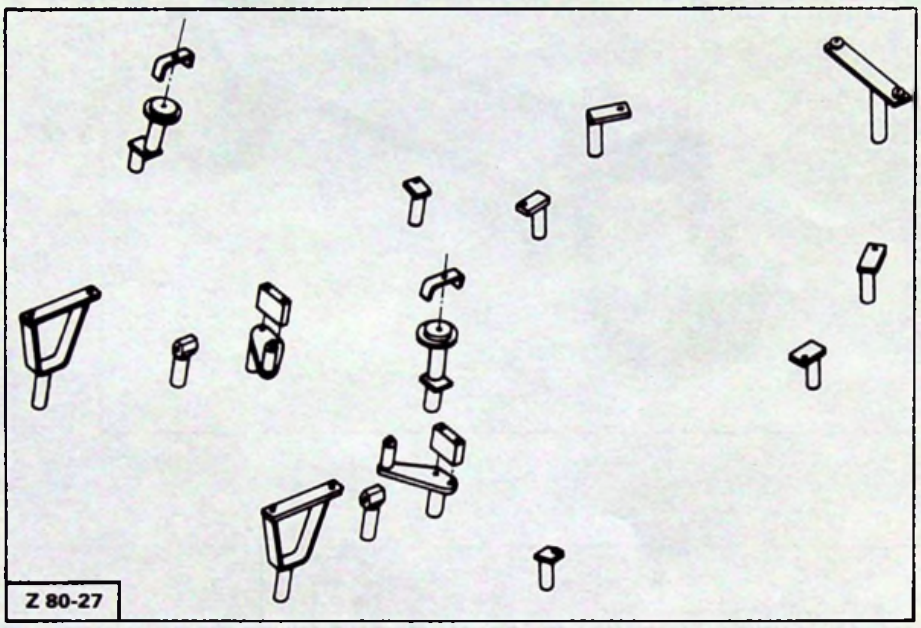


TT 80-10 | TT 80-12 | TT 80-14

CELETTE MZ

Détails									
Réf. des Détails	MZ080	MZ140	MZ141	MZ142	MZ 200	Z260	MZ601	MZ602	TV400
Quantité	2	4	1	1	/	2	/	/	/



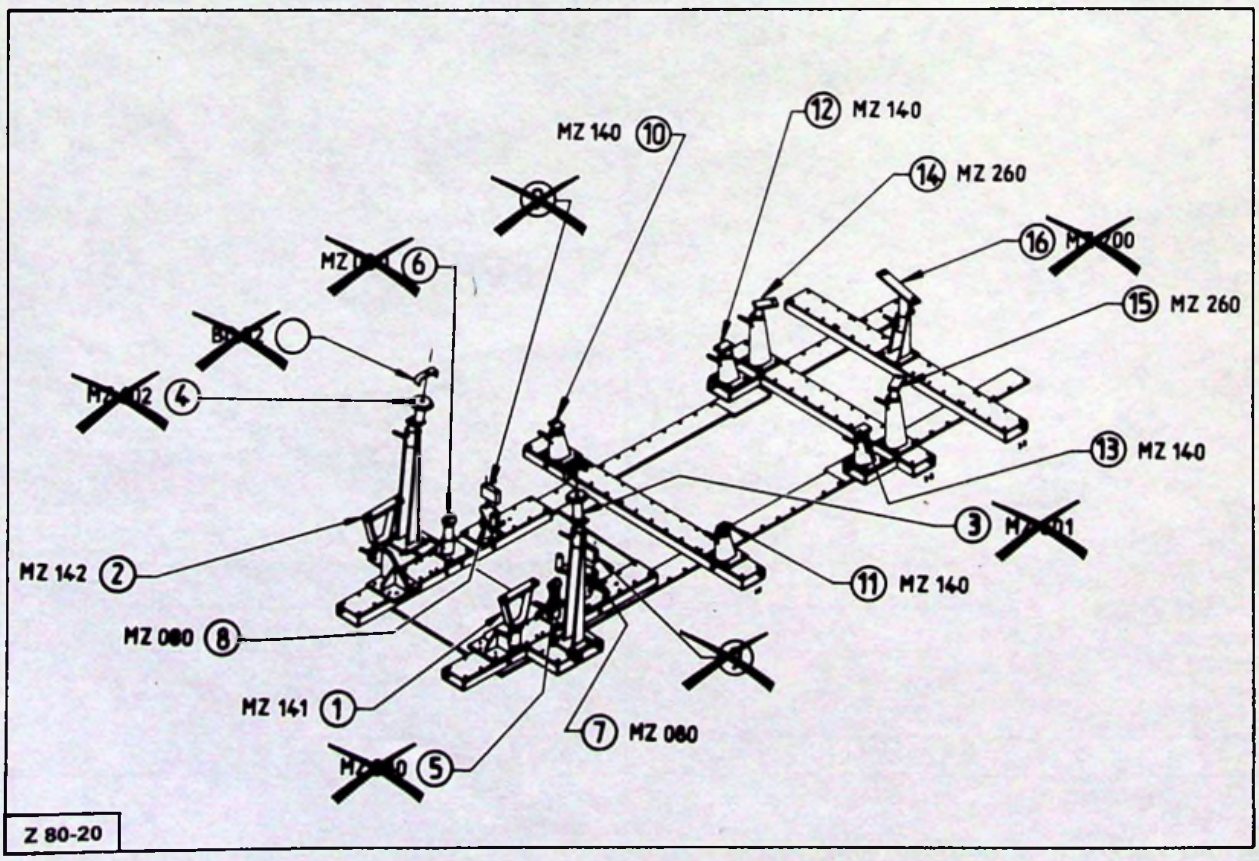


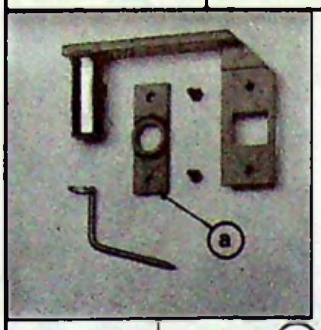
→ 1/90

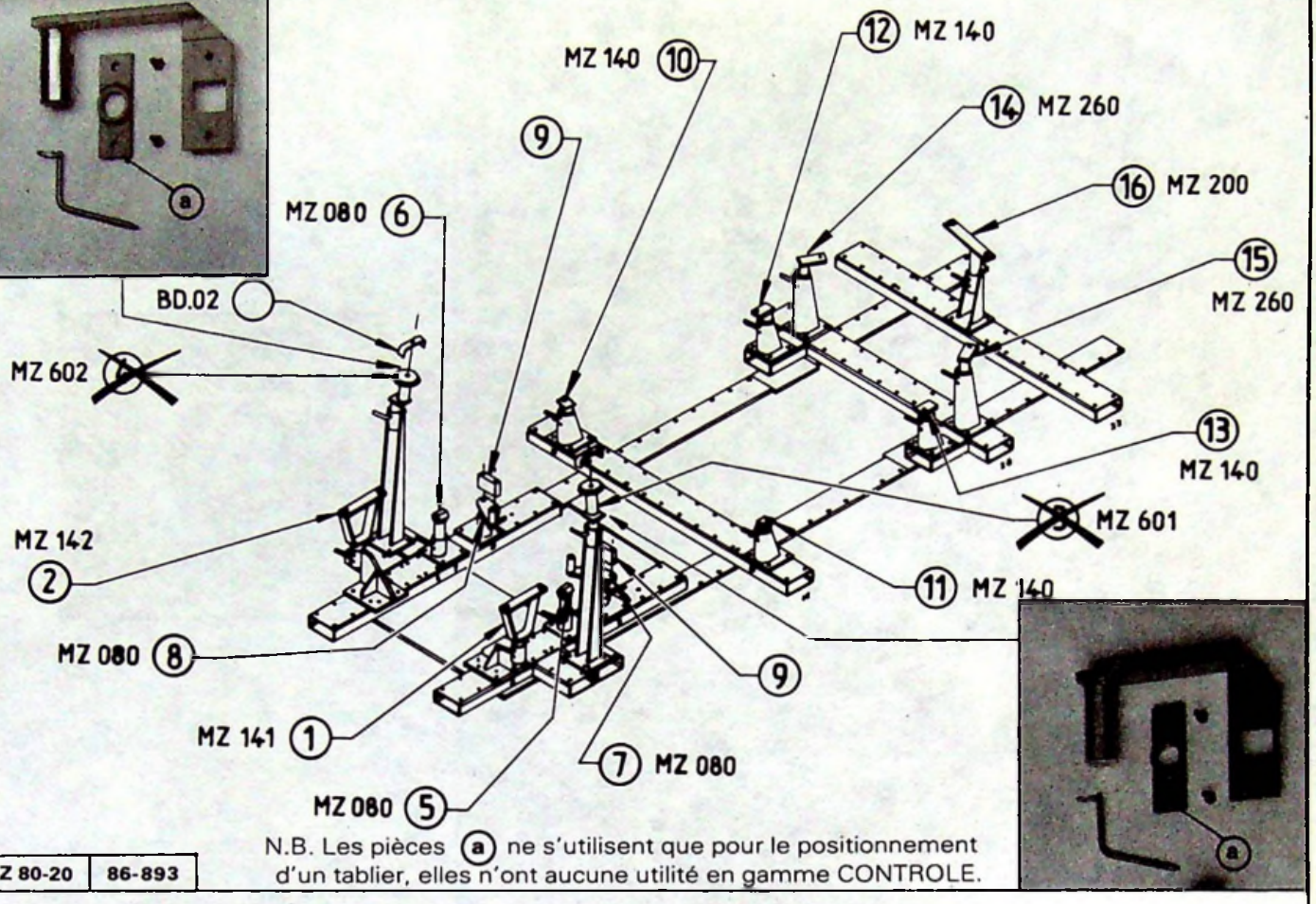
Réf 503.300

→ 1/90 →

Réf. 503.300 + 503.309
ou
Réf. 503.310

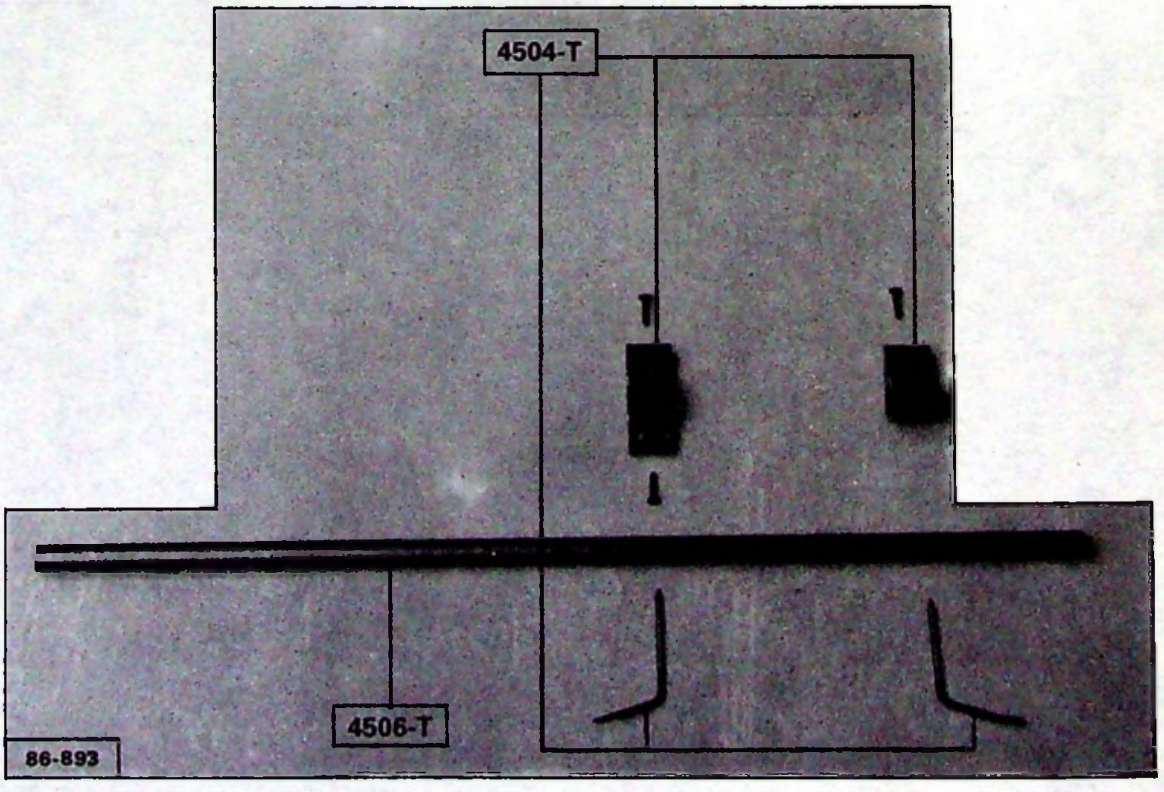


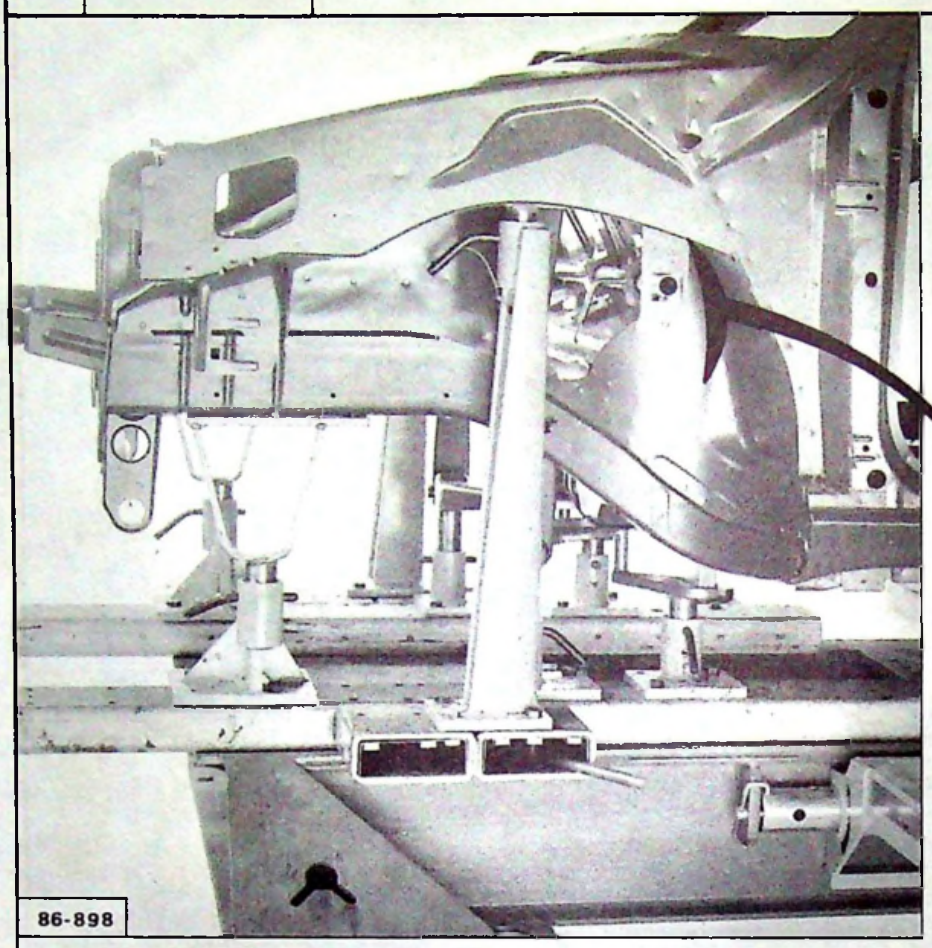


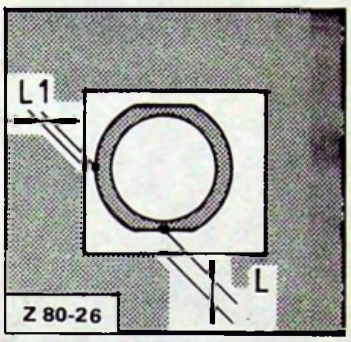


Z 80-20 | 86-893

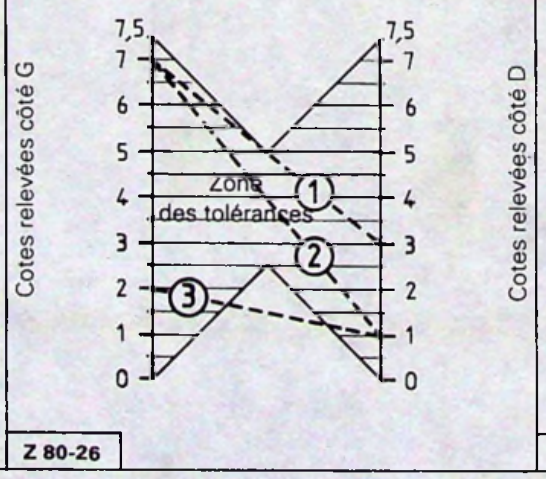
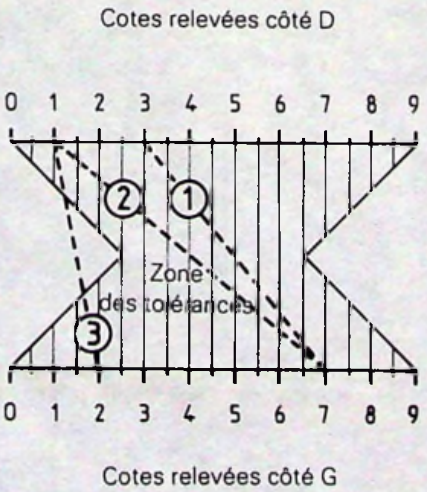
N.B. Les pièces (a) ne s'utilisent que pour le positionnement d'un tablier, elles n'ont aucune utilité en gamme CONTROLE.







CONDITIONS DE CONTROLE

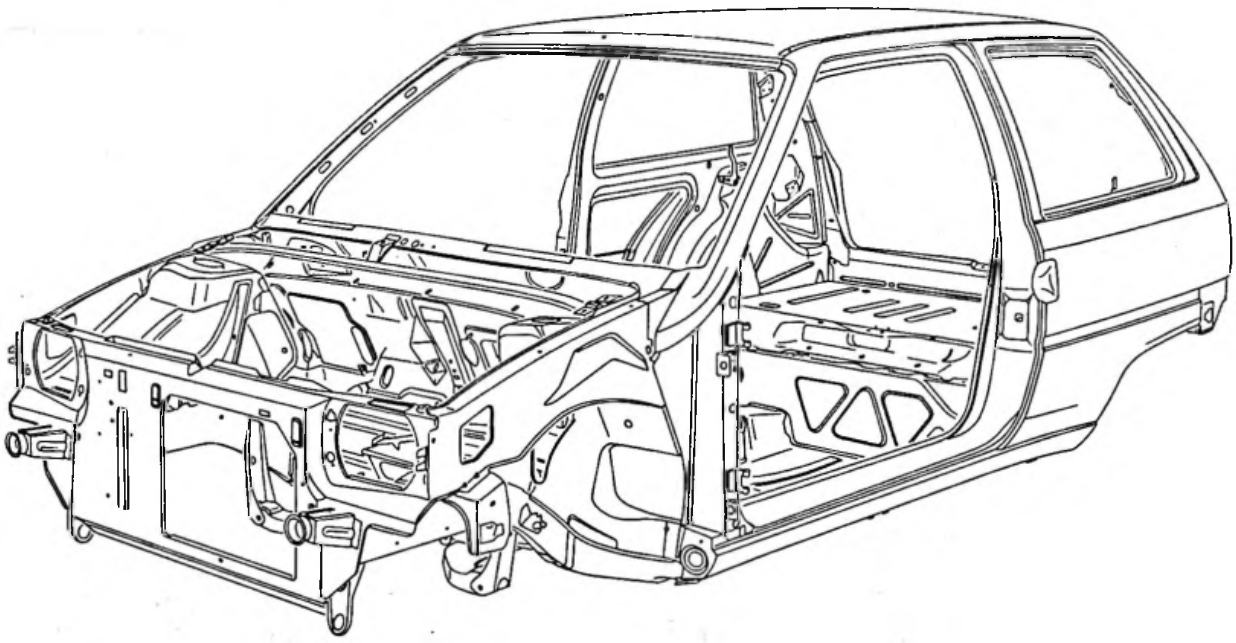
	L (Théorique 3,75 mm)	**L1** (Théorique 4,5 mm)
1re Condition	**L** (Côté G) – **L** (Côté D) ⩽ 5 mm	**L1** (Côté G) – **L1** (Côté D) ⩽ 5 mm
2e Condition		

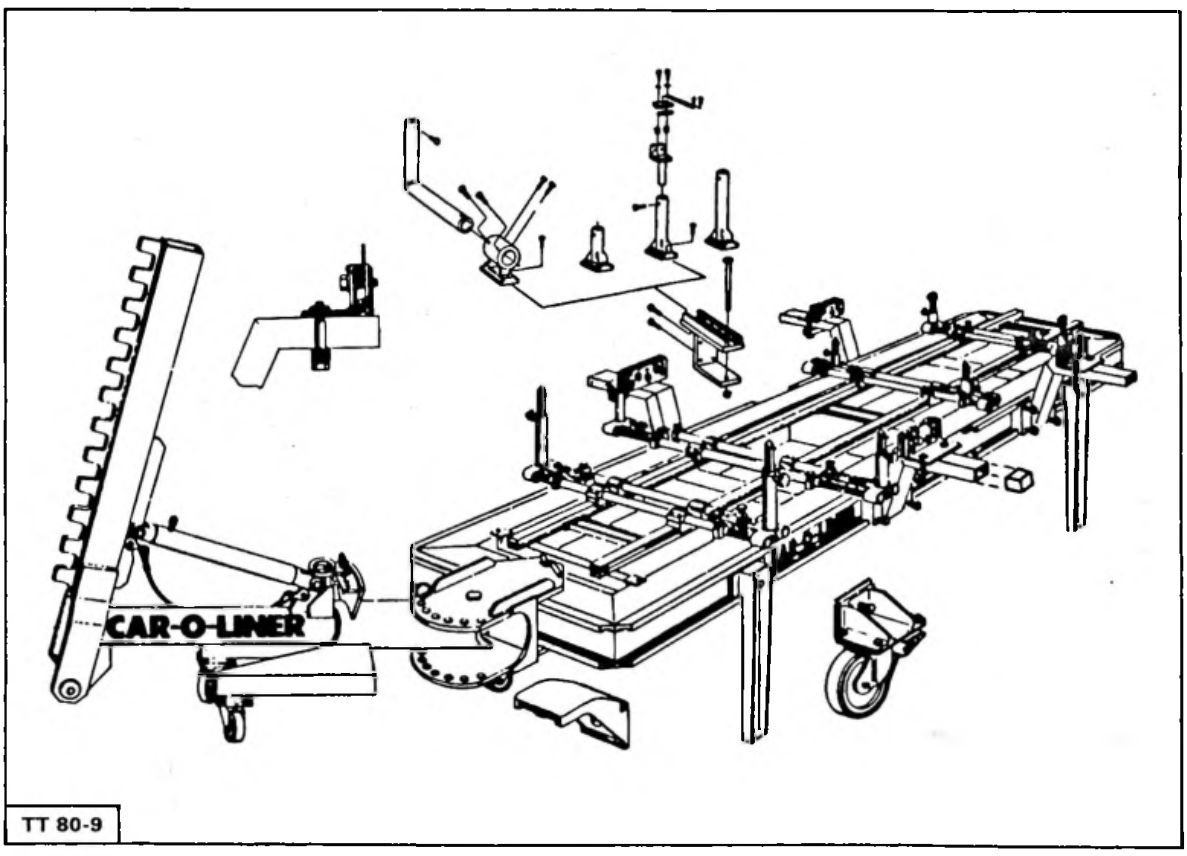
Exemples : (pour **L1**)

① : *Bon.* Les 2 conditions sont respectées :
1re : 7-3 = 4 < 5 — 2e : compris dans la zone des tolérances.

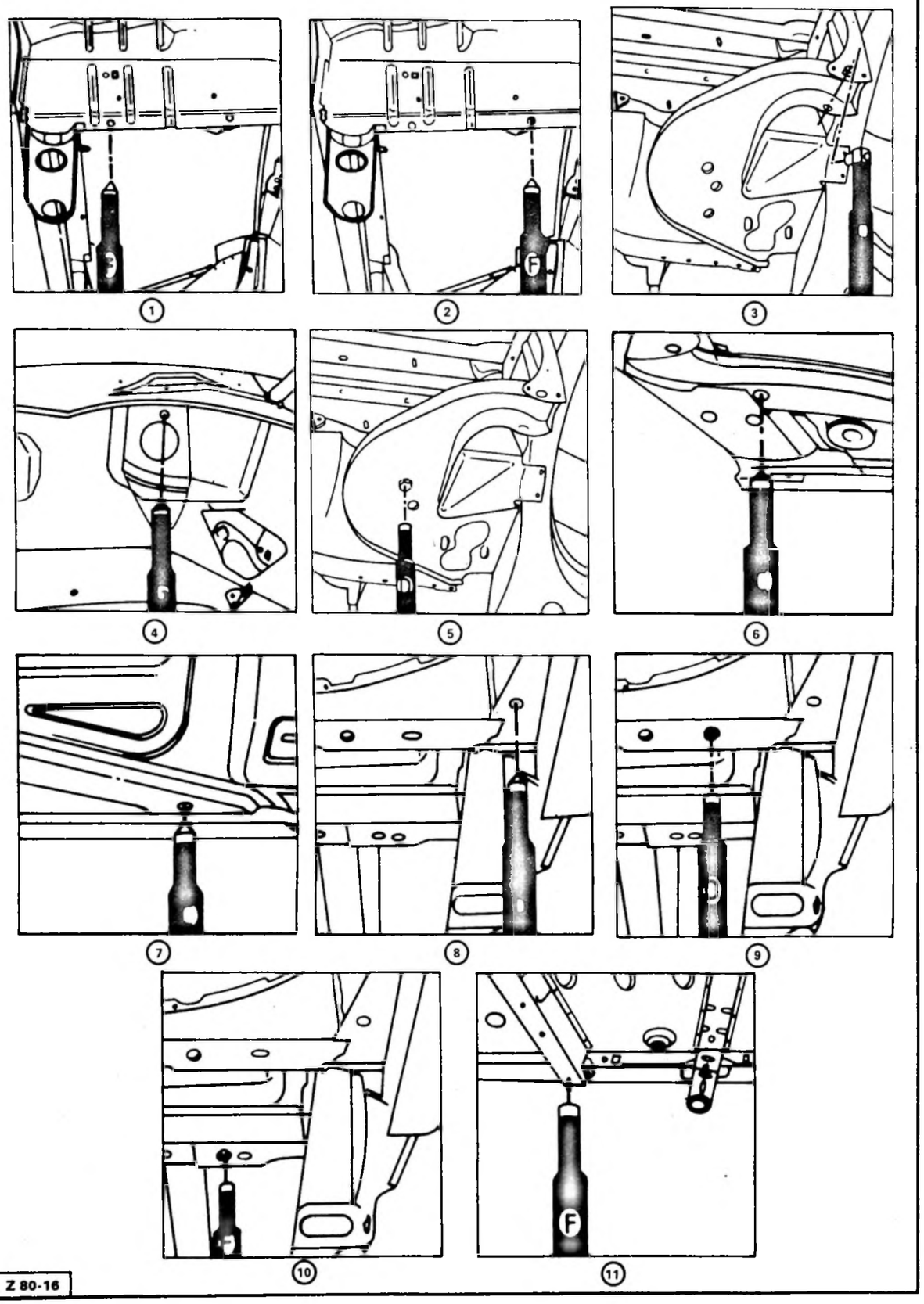
② : *Mauvais.* Une des 2 conditions (*) n'est pas respectée :
* 1re : 7-1 = 6 > 5 — 2e : compris dans la zone des tolérances.

③ : *Mauvais.* Une des 2 conditions (*) n'est pas respectée :
1re : 2-1 = 1 < 5 — (*) 2e : non compris dans la zone des tolérances.



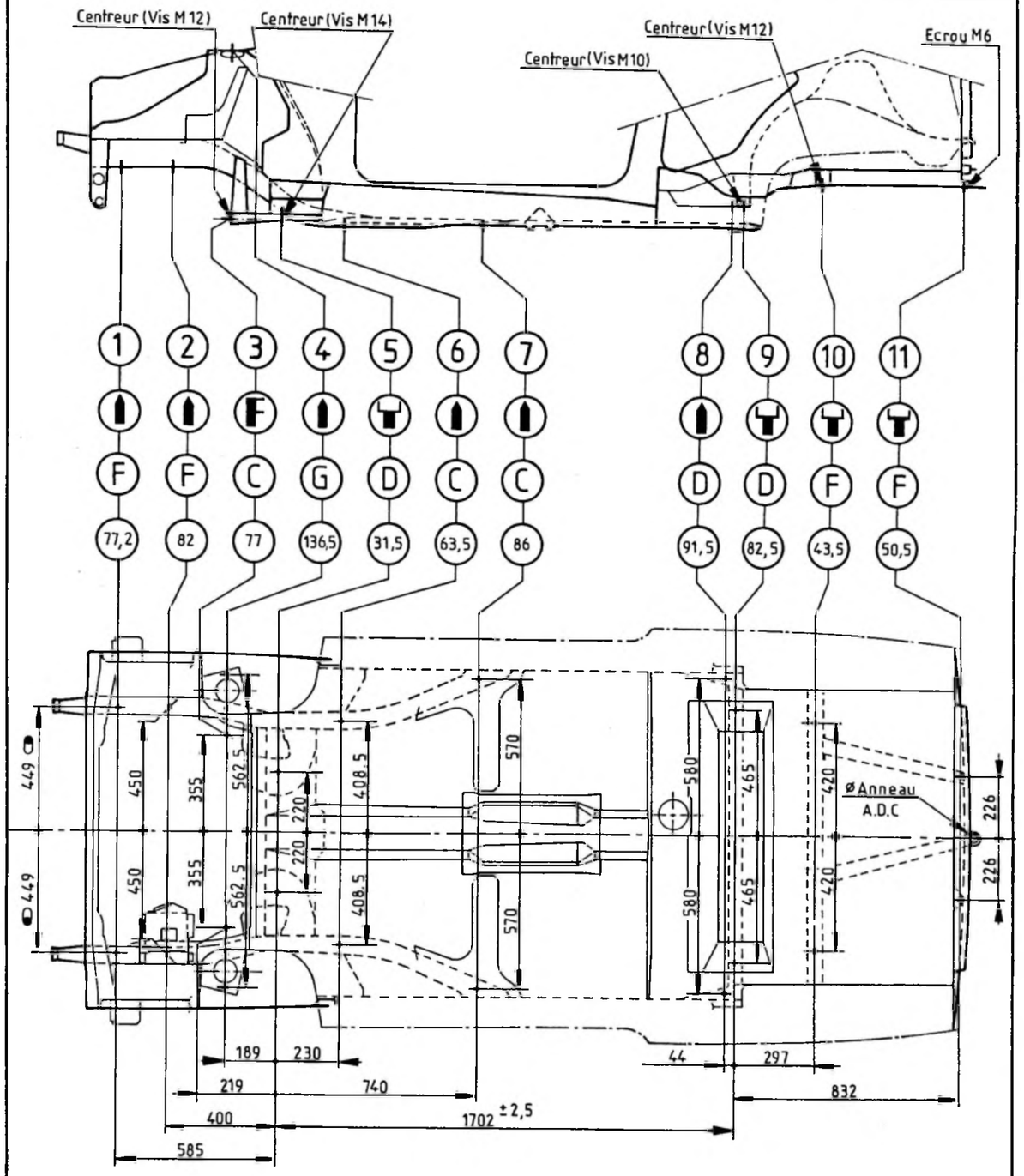


TT 80-9



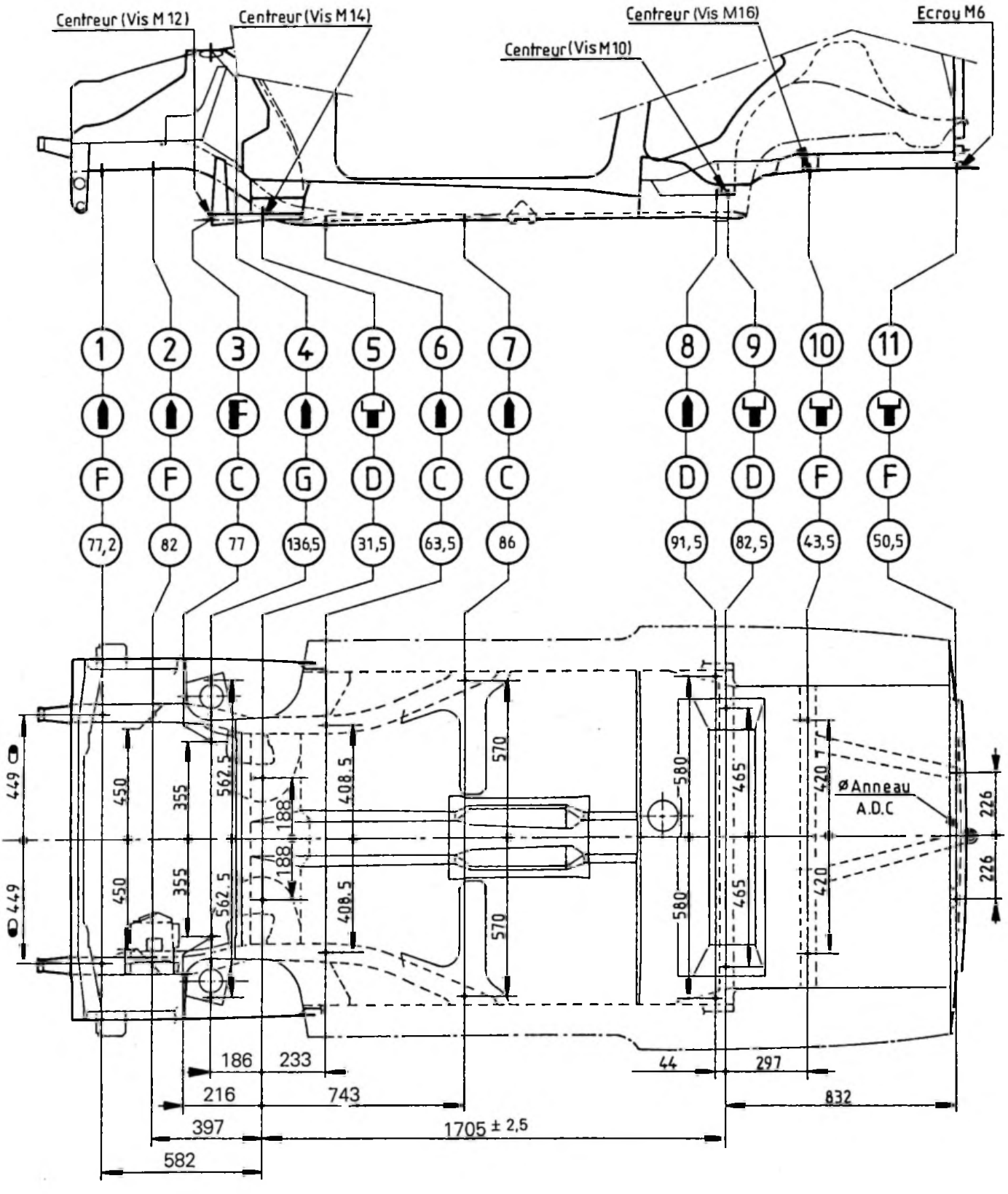
Z 80-16

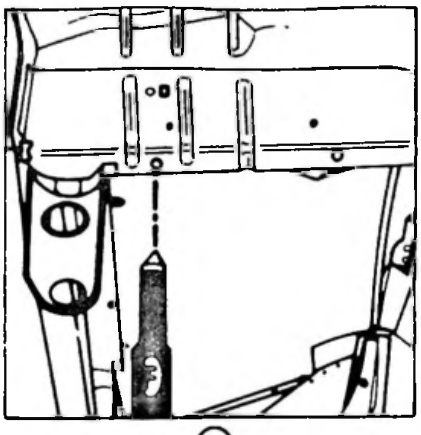
→1/90
ORG 4804



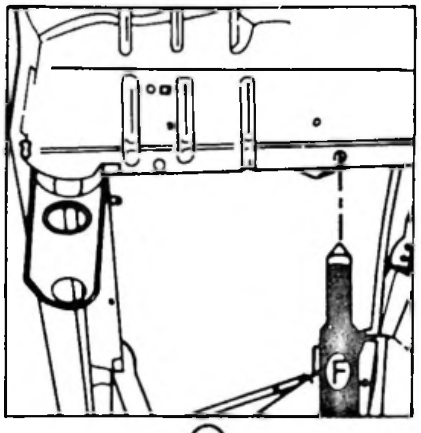
Z 80-11

C ••


Centreur (Vis M 12)
Centreur (Vis M 14)
Centreur (Vis M16)
Ecrou M6
Centreur (Vis M10)
1 2 3 4 5 6 7 8 9 10 11
F F C G D C C D D F F
77,2 82 77 136,5 31,5 63,5 86 91,5 82,5 43,5 50,5
449
449
450
450
355
355
562,5
562,5
188
188
408,5
408,5
570
570
580
580
465
465
420
420
ø Anneau A.D.C
226
226
186
233
216
743
397
1705 ± 2,5
582
44
297
832



1



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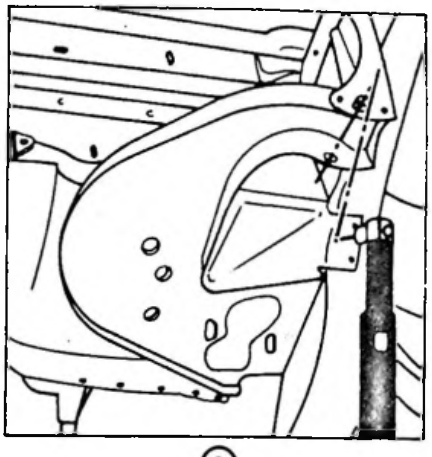

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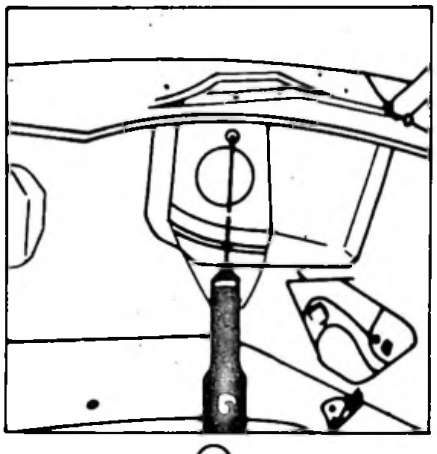

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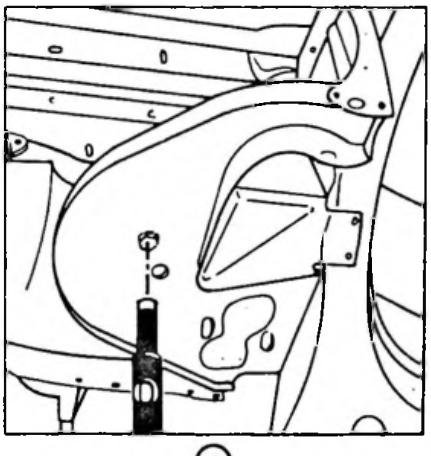

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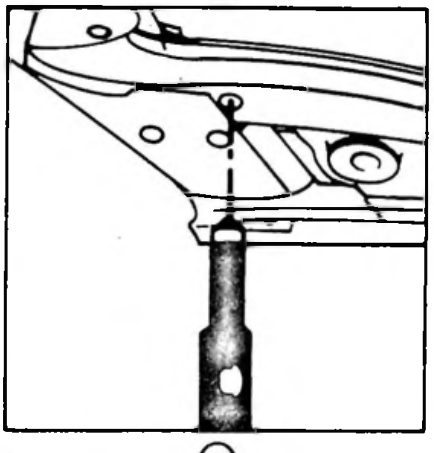

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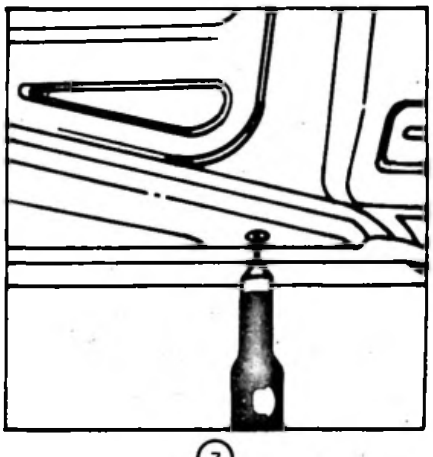

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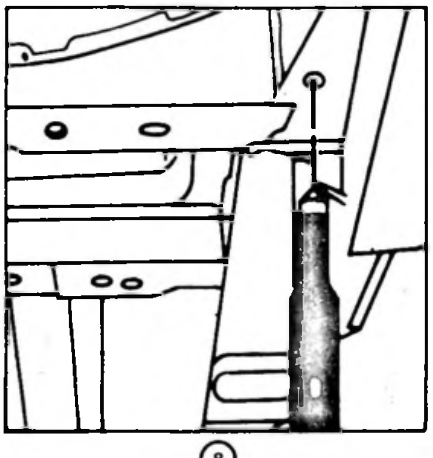

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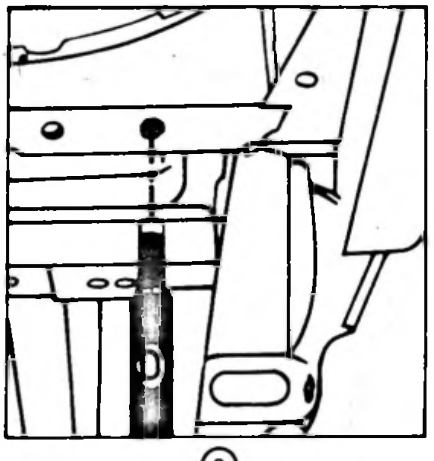

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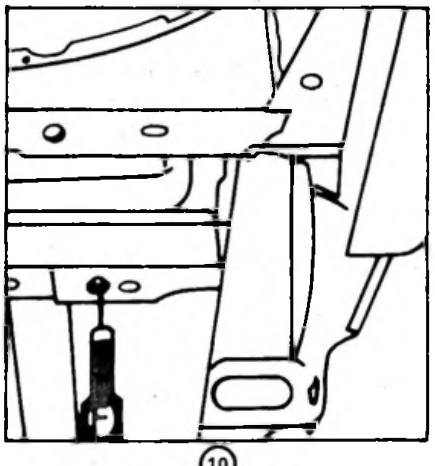

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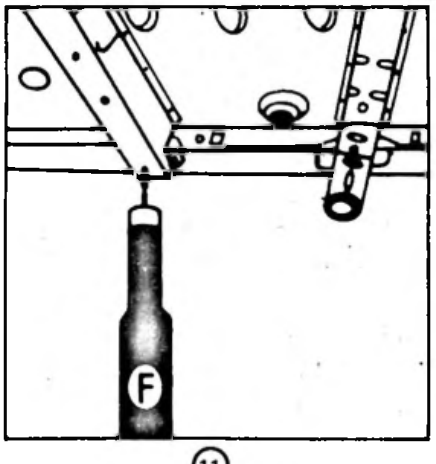

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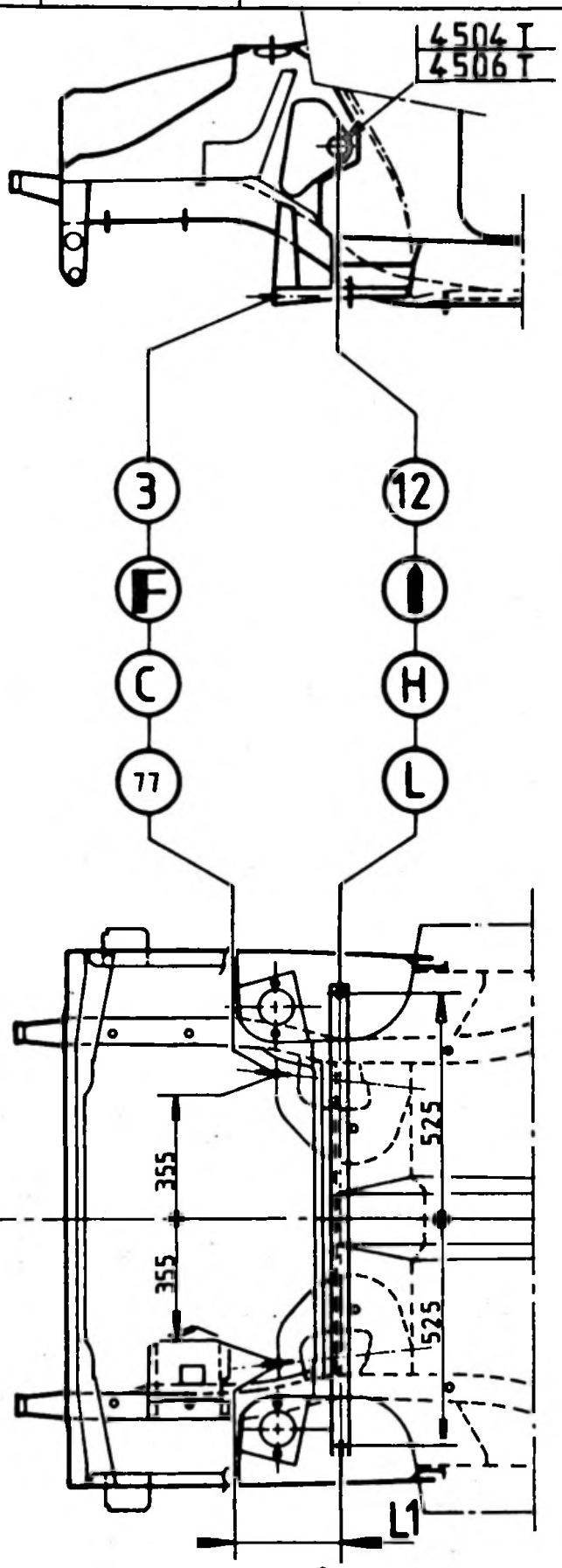
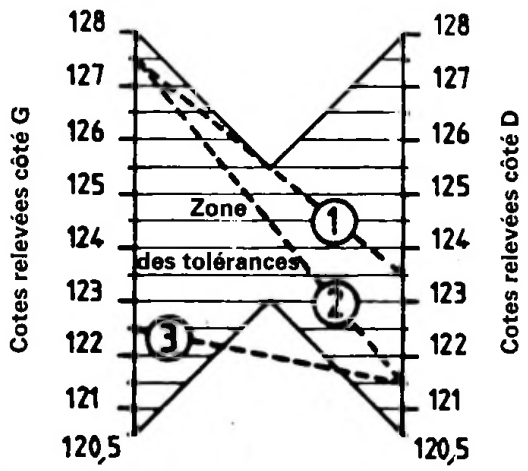


L (Théorique 124,2mm)

CONDITION N° 1

L (Côté G) – **L** (Côté D) ⩽ 5 mm

CONDITION N° 2



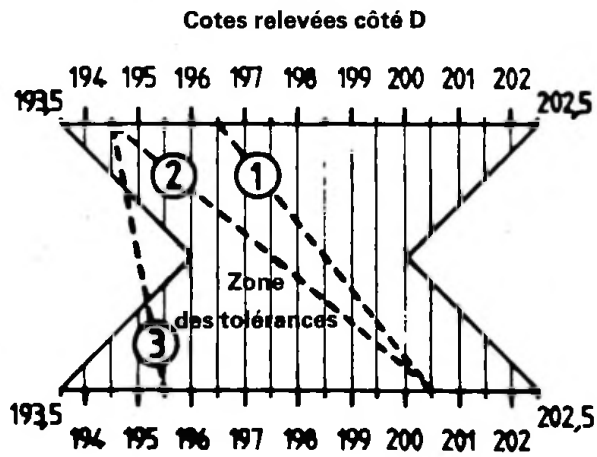
Z 80-25

L1 (Théorique 198 mm)

CONDITION N° 1

L1 (Côté G) – **L1** (Côté D) ⩽ 5 mm

CONDITION N° 2



Z 80-25

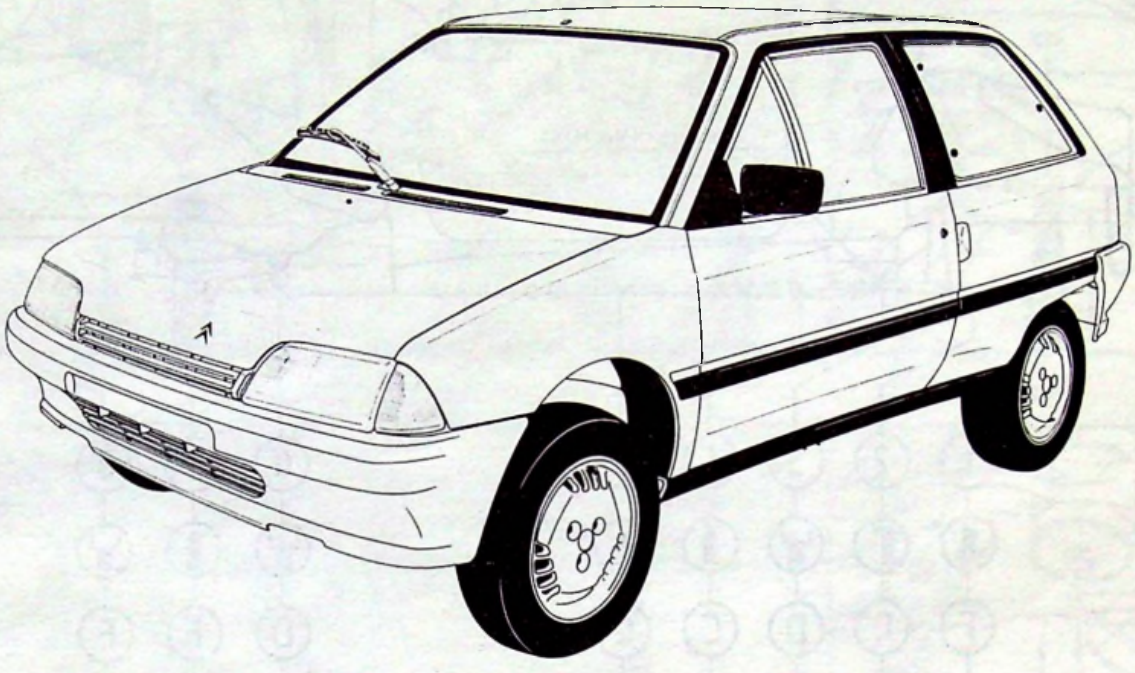
Exemples : (pour **L1**)

① : Bon. Les 2 conditions sont respectées :
1re : 200,5-196,5 = 4 < 5 — 2e : compris dans la zone des tolérances.

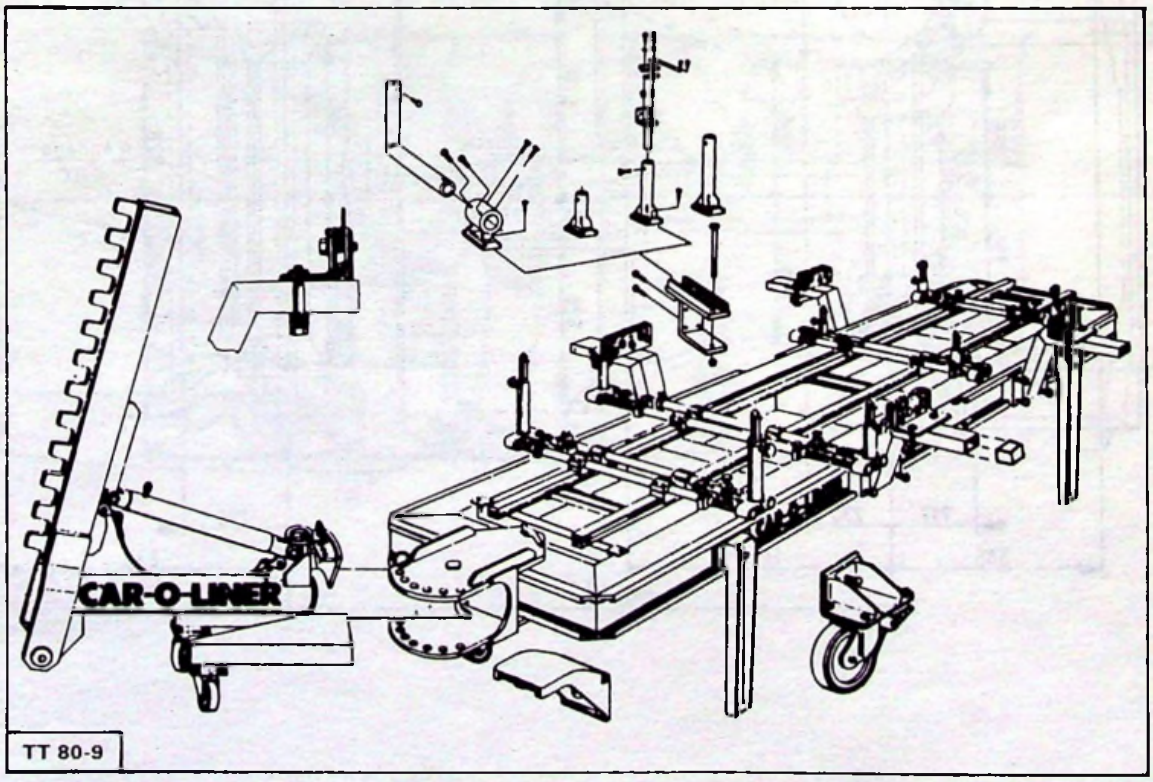
② : Mauvais. Une des 2 conditions (*) n'est pas respectée :
* 1re : 200,5-194,5 = 6 > 5 — 2e : compris dans la zone des tolérances.

③ : Mauvais. Une des 2 conditions (*) n'est pas respectée :
1re : 195,5-194,5 = 1 < 5 — (*) 2e : non compris dans la zone des tolérances.

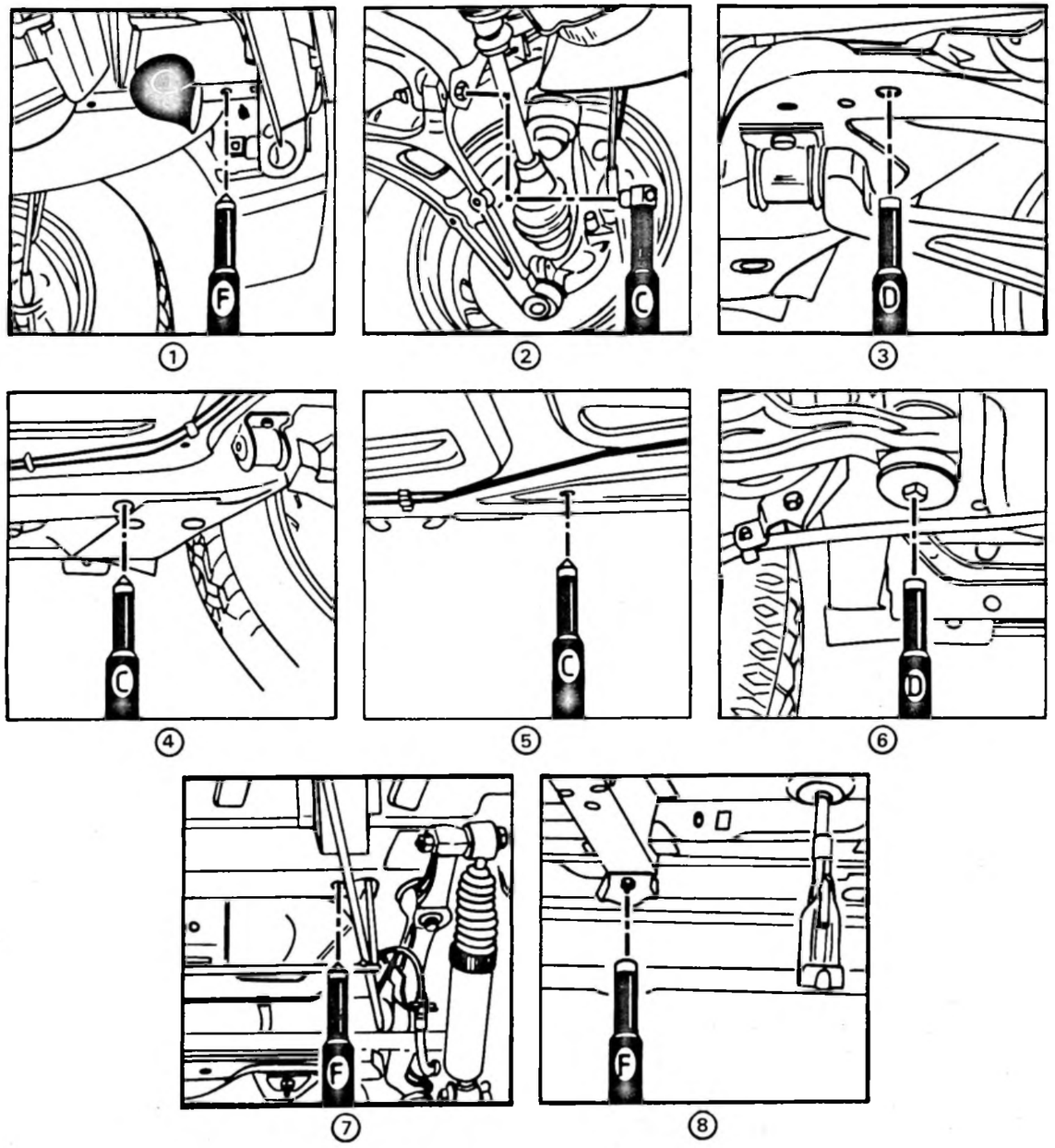
Z 80-28



Z 80-3

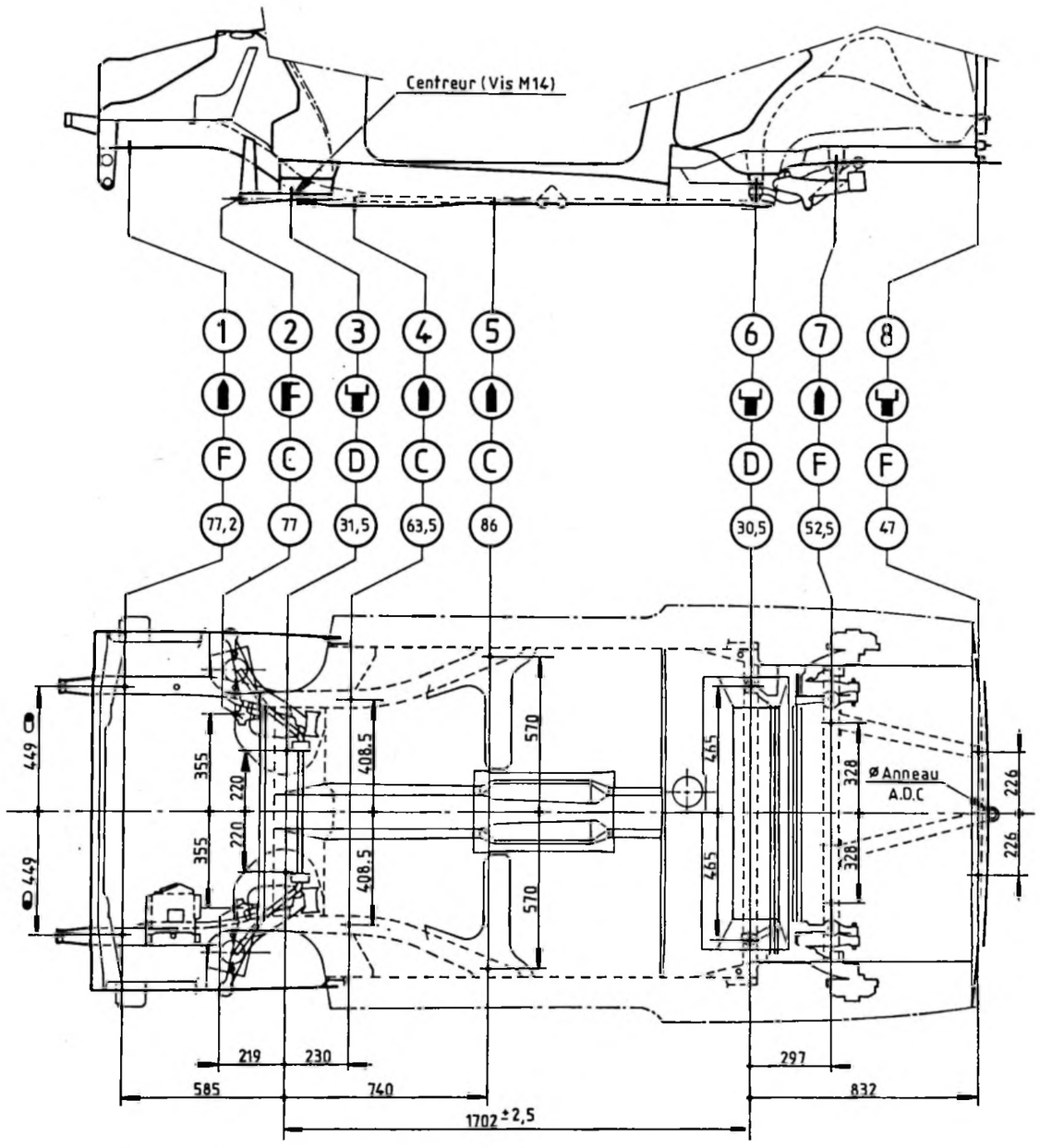


TT 80-9

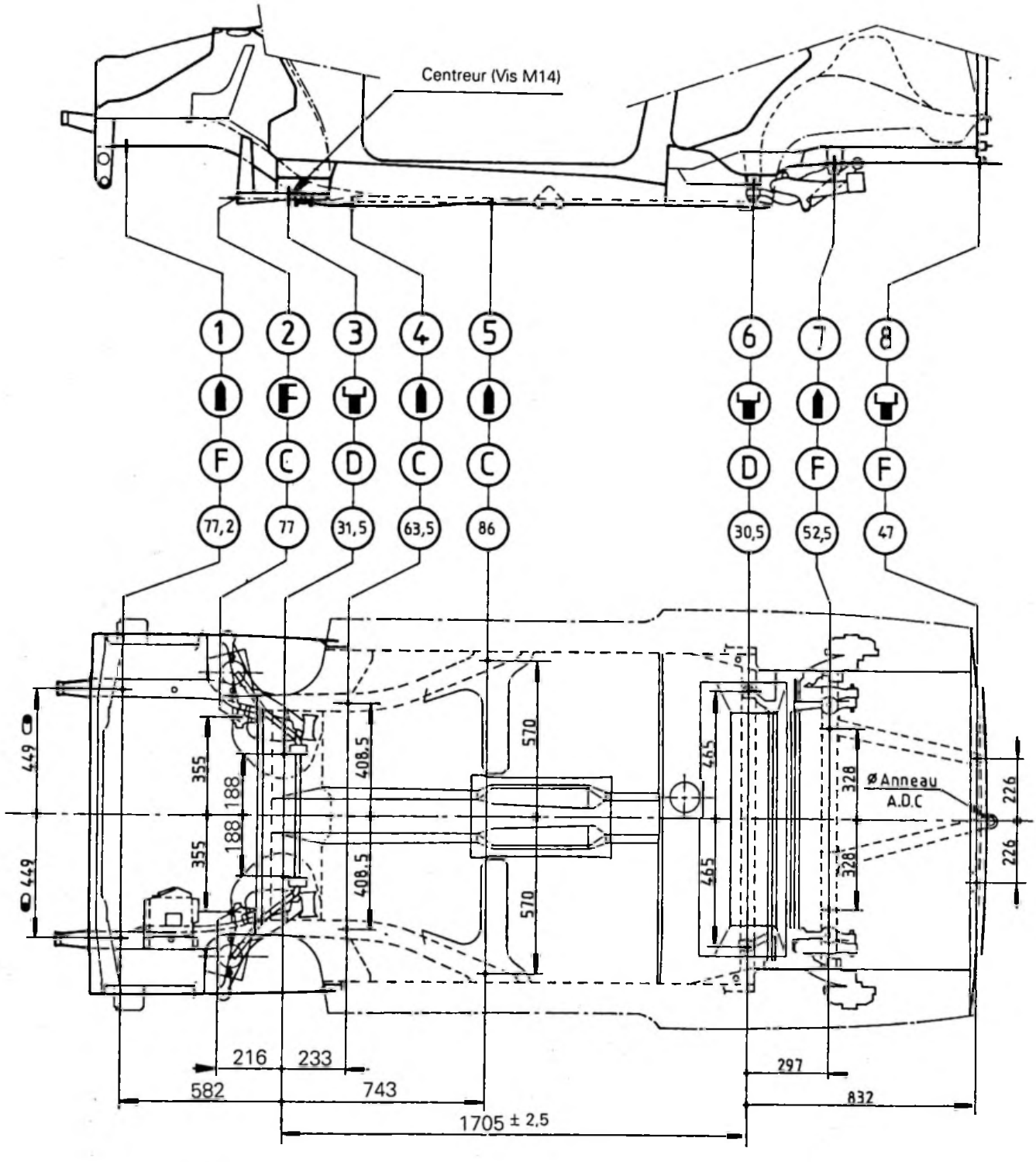


① ② ③ ④ ⑤ ⑥ ⑦ ⑧

→1/90
ORG 4804



C ••


Centreur (Vis M14)
1
2
3
4
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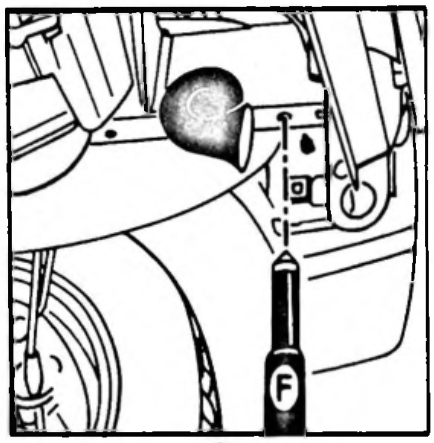
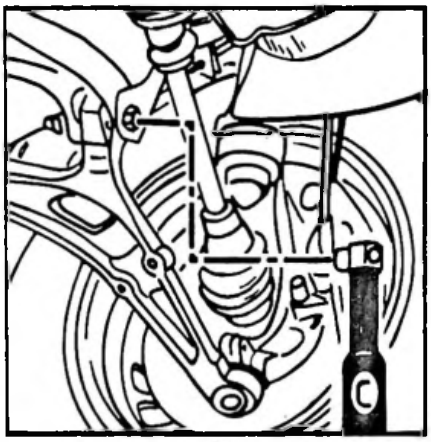
6
7
8
F
C
D
C
C
D
F
F
77,2
77
31,5
63,5
86
30,5
52,5
47
449
449
355
188
188
355
408,5
408,5
570
570
465
465
328
328
ø Anneau A.D.C
226
226
216
233
582
743
1705 ± 2,5
297
832

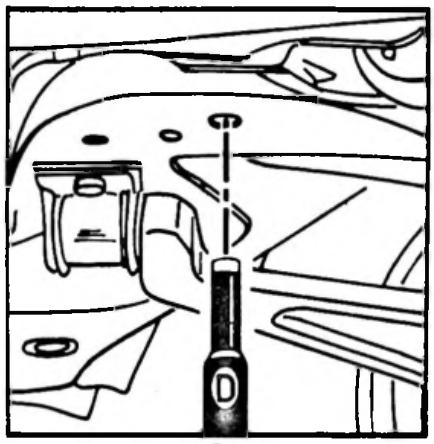
Z 80-12 a



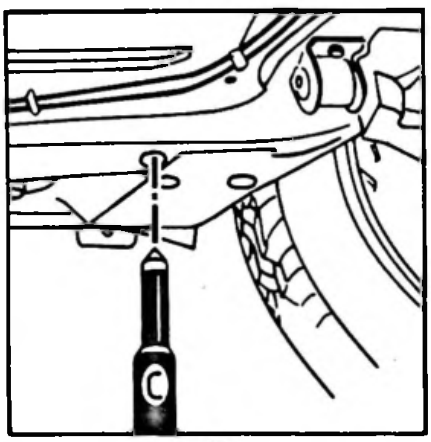
①



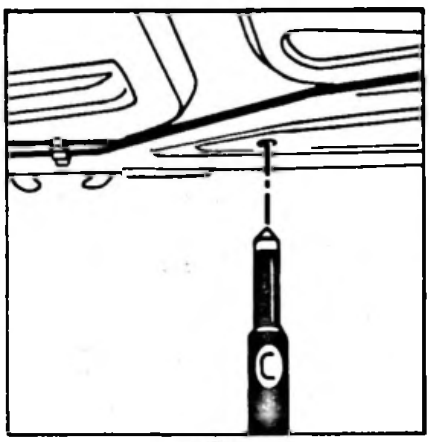
②



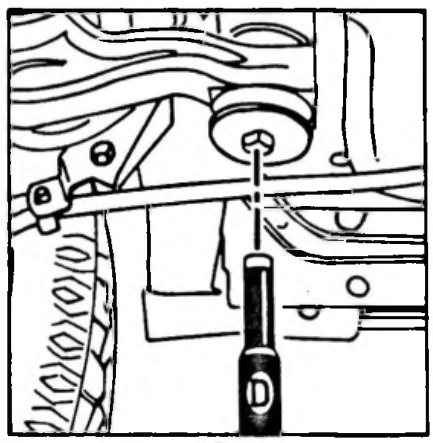
③



④

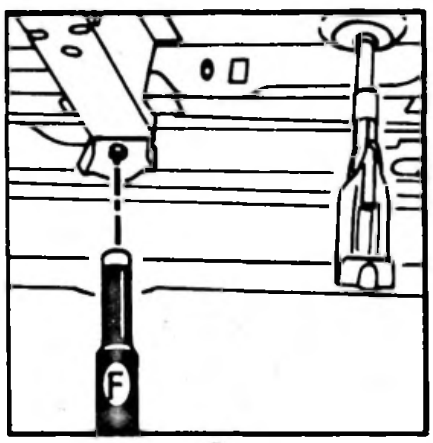


⑤

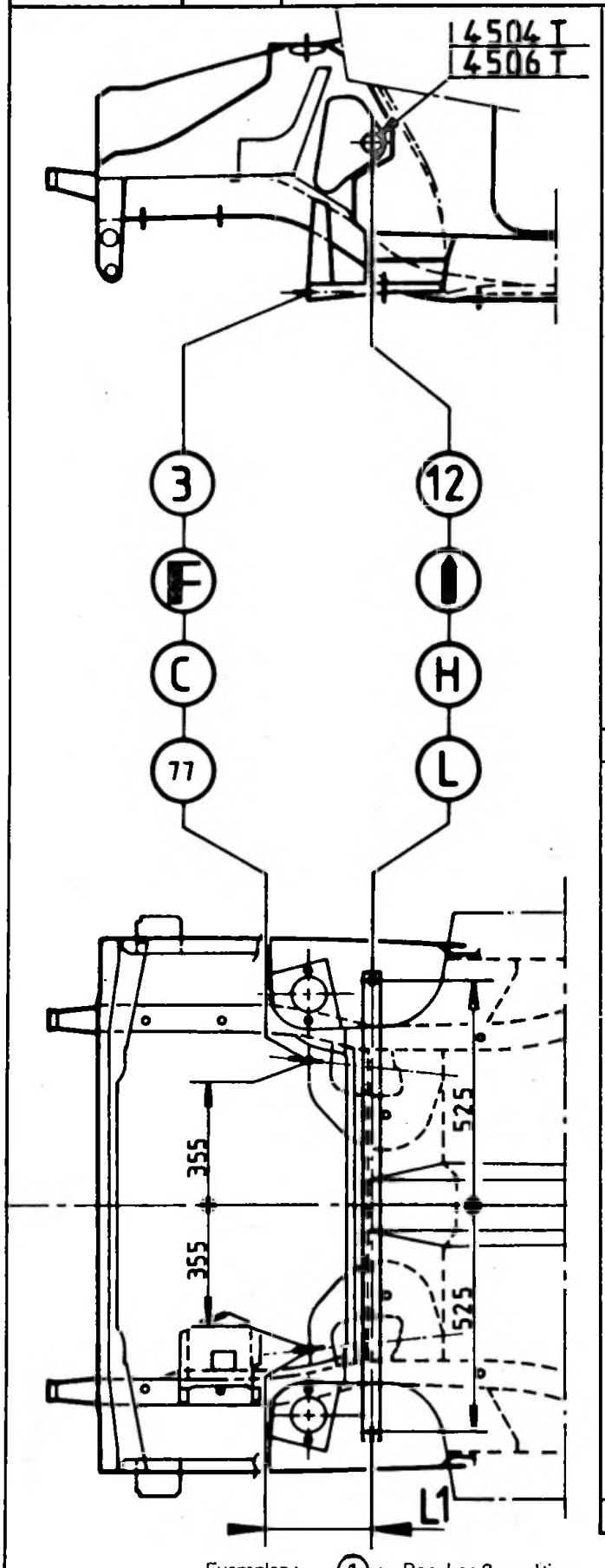


⑥

⑦



⑧

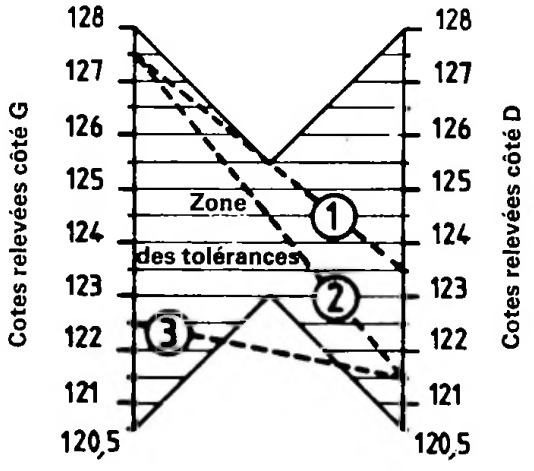


L (Théorique 124,2mm)

CONDITION N° 1

L (Côté G) – **L** (Côté D) ⩽ 5 mm

CONDITION N° 2



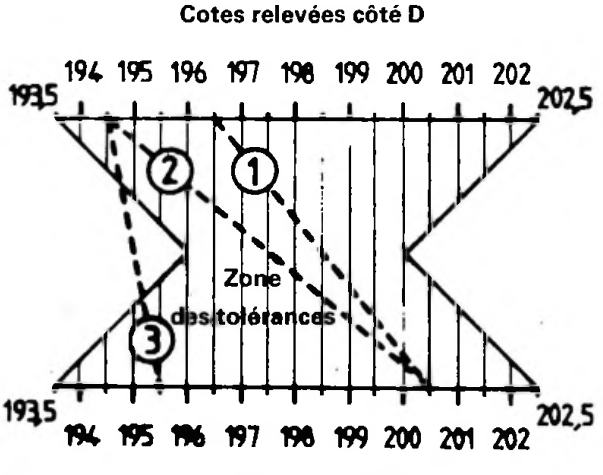
Z 80-25

L1 (Théorique 198 mm)

CONDITION N° 1

L1 (Côté G) – **L1** (Côté D) ⩽ 5 mm

CONDITION N° 2



Z 80-25

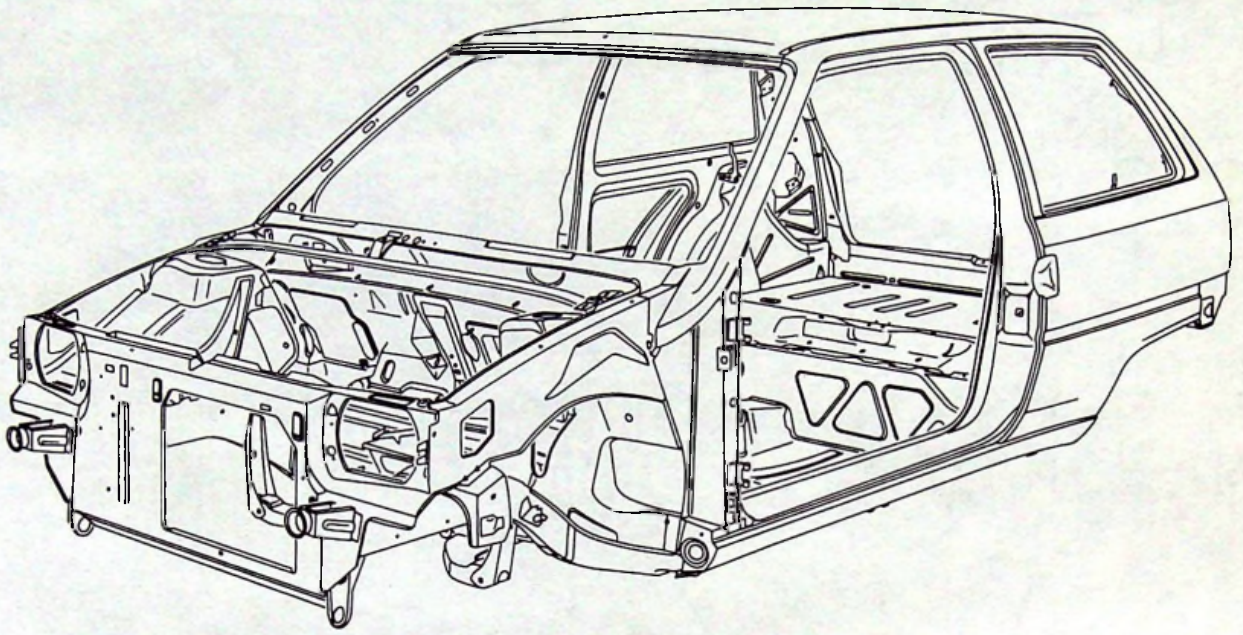
Exemples : (pour **L1**)

① : Bon. Les 2 conditions sont respectées :
1re : 200,5-196,5 = 4 < 5 — 2e : compris dans la zone des tolérances.

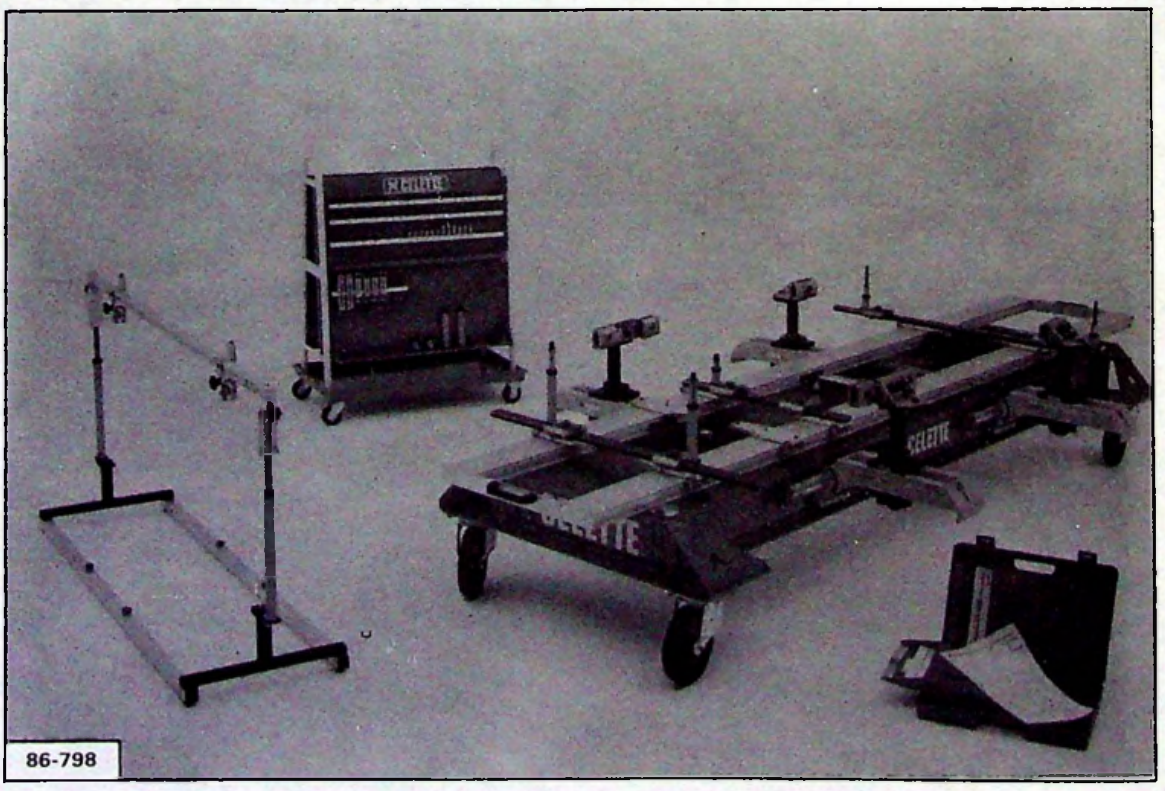
② : Mauvais. Une des 2 conditions (*) n'est pas respectée :
* 1re : 200,5-194,5 = 6 > 5 — 2e : compris dans la zone des tolérances.

③ : Mauvais. Une des 2 conditions (*) n'est pas respectée :
1re : 195,5-194,5 = 1 < 5 — (*) 2e : non compris dans la zone des tolérances.

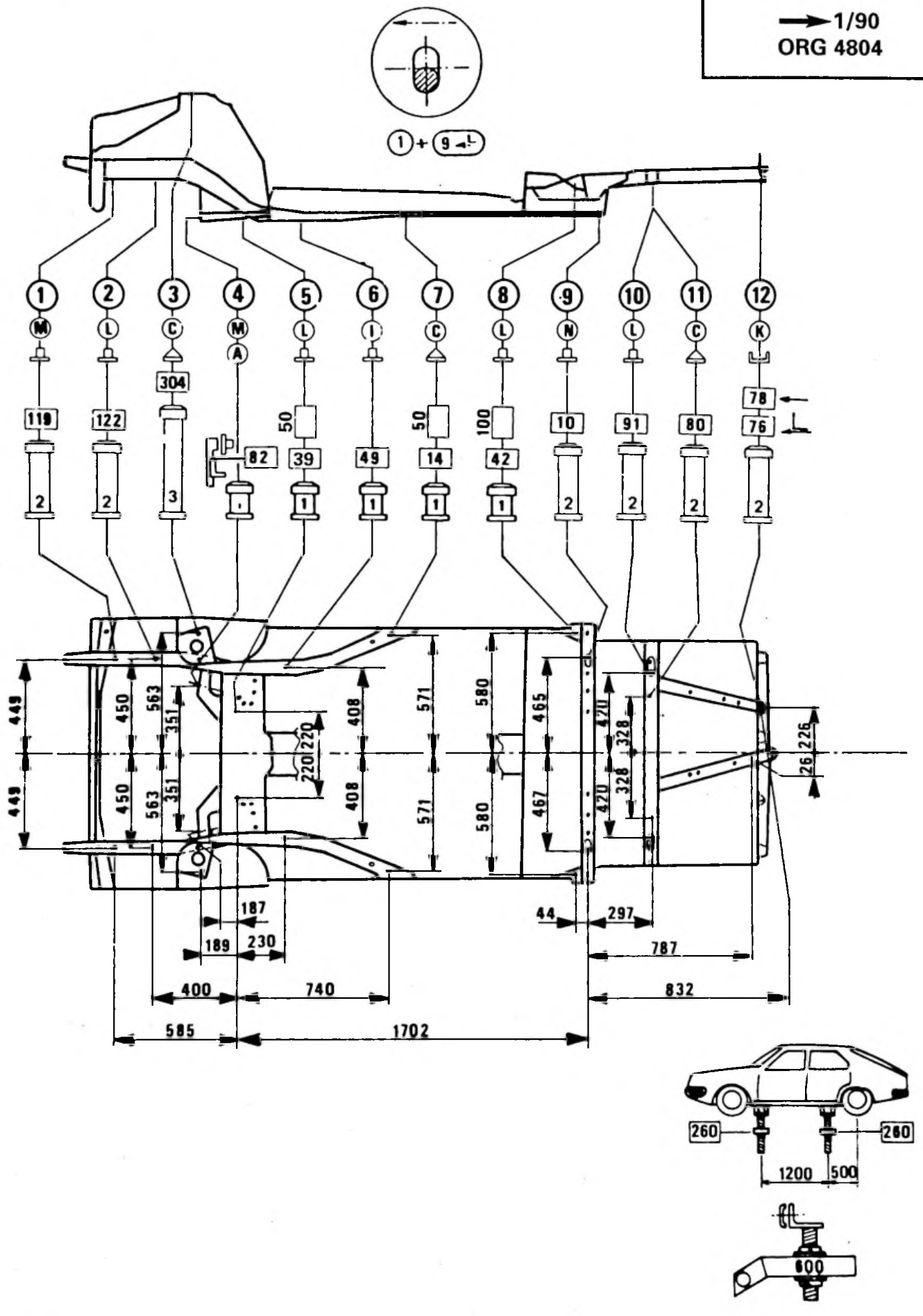
Z 80-28



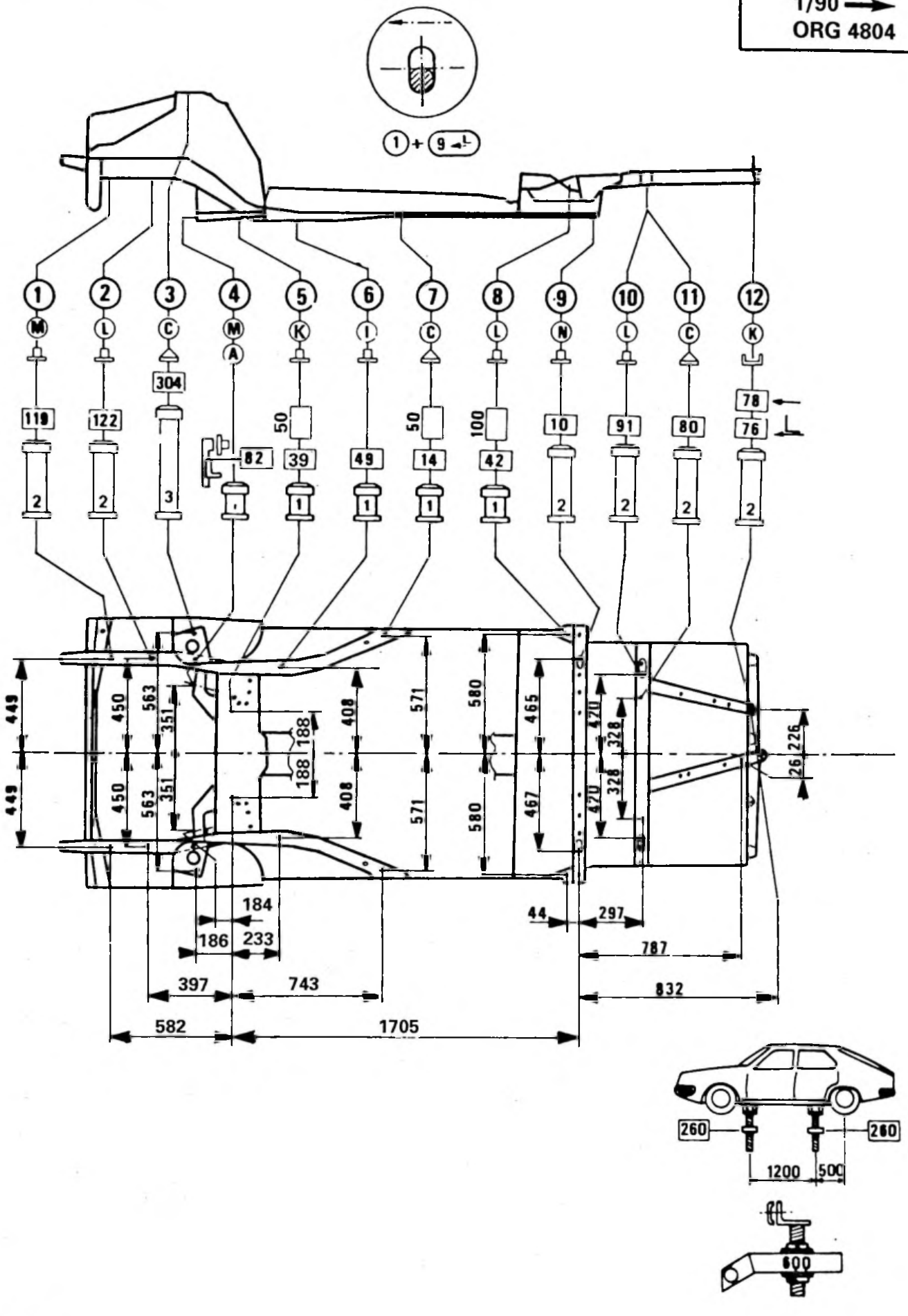
Z 80-2



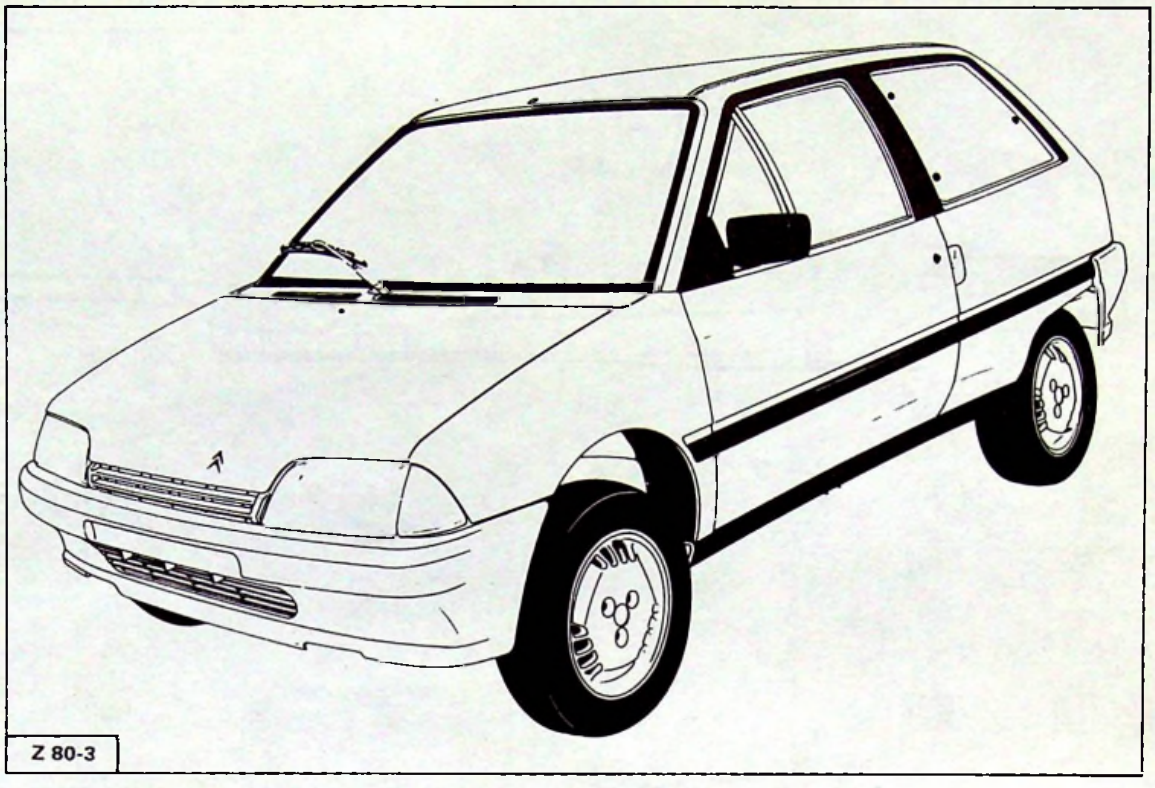
→ 1/90
ORG 4804



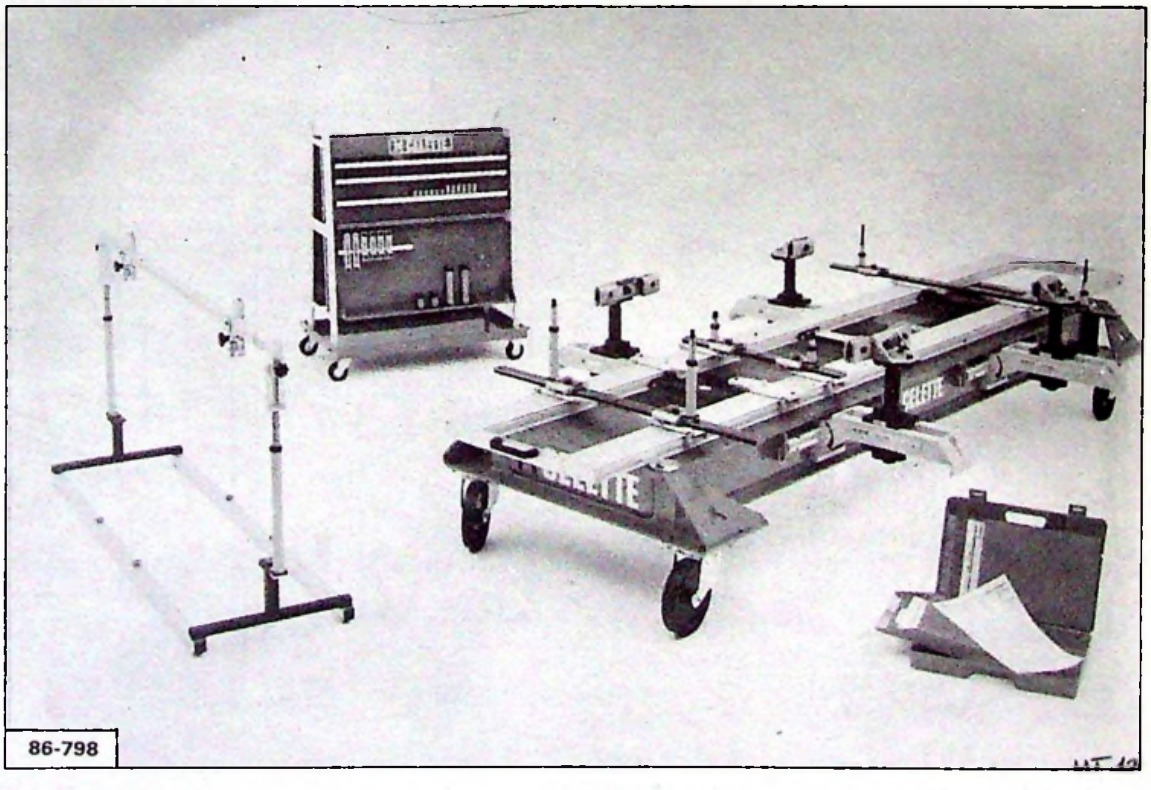
C ••


1 + 9 L
1 M 119 2
2 L 122 2
3 C 304 3
4 M A 82 -
5 K 50 39 1
6 I 49 1
7 C 50 14 1
8 L 100 42 1
9 N 10 2
10 L 91 2
11 C 80 2
12 K 78 76 2
449
450
563
351
188
188
408
571
580
465
470
328
226
26
184
186
233
44
297
787
397
743
832
582
1705
260
260
1200
500
600

Z 80-23 b

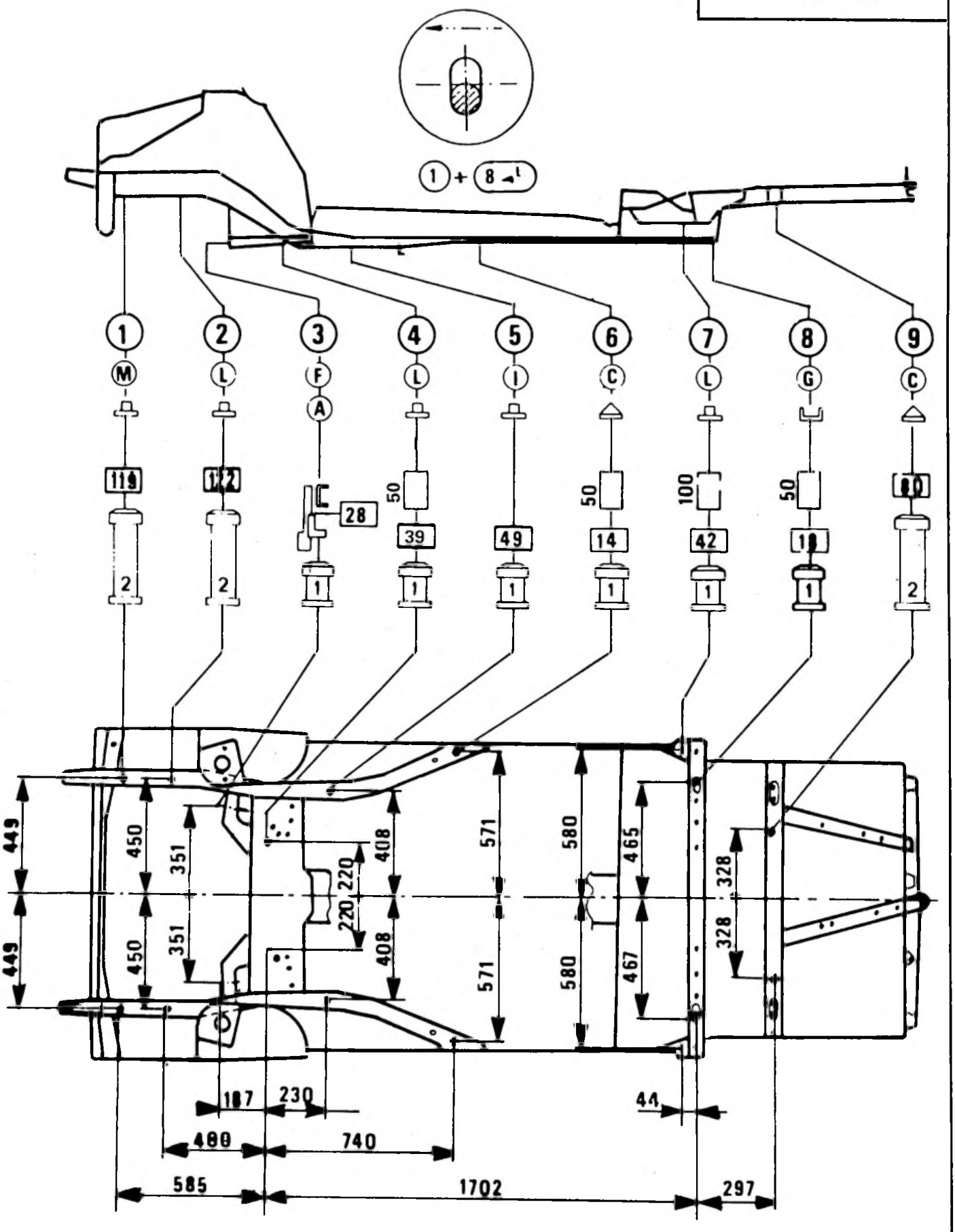


Z 80-3



86-798

→ 1/90
ORG 4804


1 + 8
1
2
3
4
5
6
7
8
9
M
L
F
A
L
I
C
L
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122
28
50
39
49
50
14
100
42
50
80
2
2
1
1
1
1
1
1
1
2
449
450
351
220
408
571
580
465
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450
351
220
408
571
580
467
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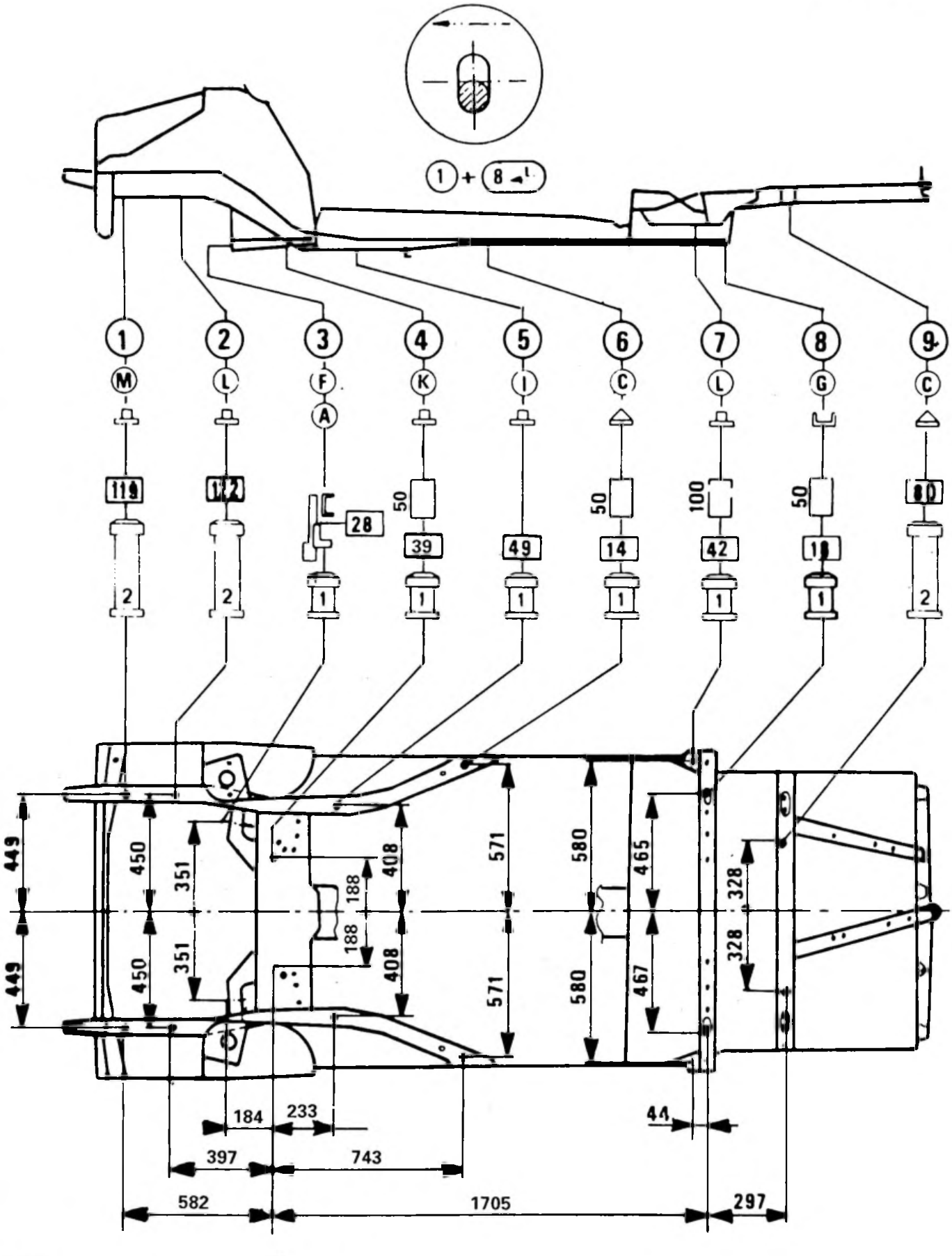
187
230
44
480
740
585
1702
297


1 + 8
1
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5
6
7
8
9
M
L
F
A
K
I
C
L
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C
28
50
39
49
50
14
100
42
50
2
2
1
1
1
1
1
1
1
2
449
450
351
188
408
571
580
465
328
449
450
351
188
408
571
580
467
328
184
233
44
397
743
582
1705
297

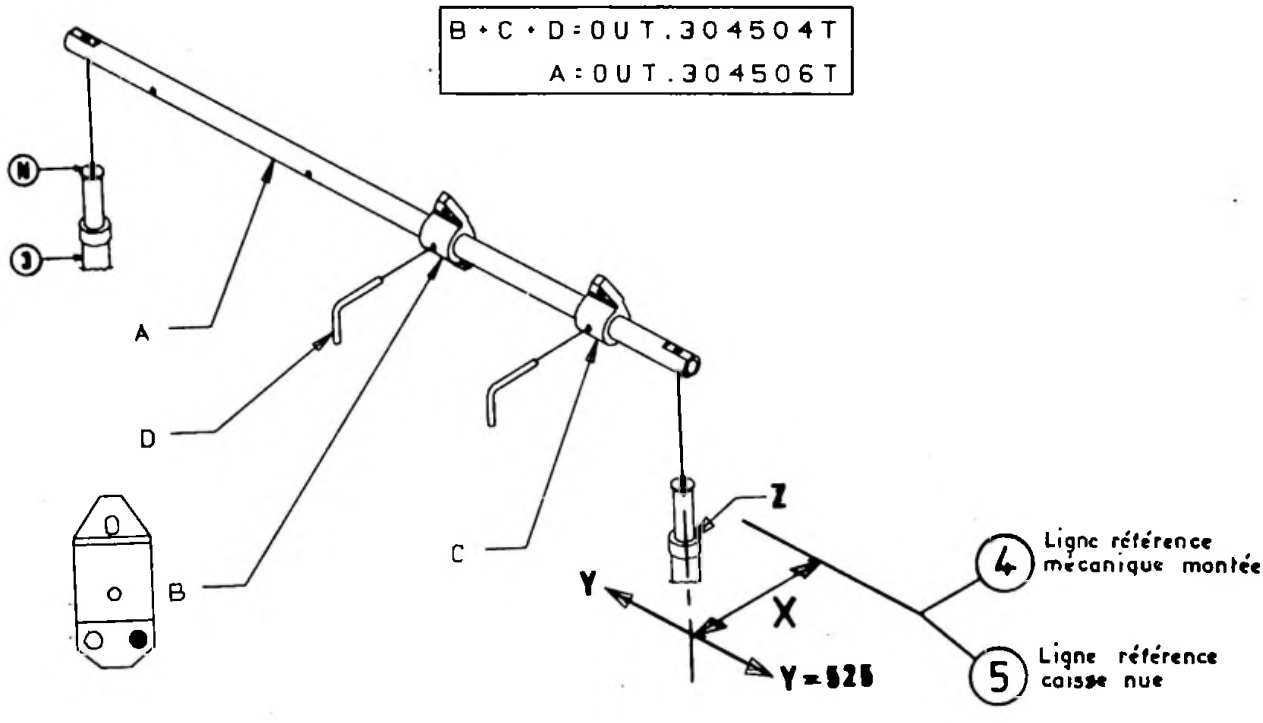
Z 80-24 b

CONTROLE DES FIXATIONS DE LA DIRECTION

(valable pour direction à gauche et direction à droite)

Déposes nécessaire : Roues avant, direction.
CONTROLE : Mettre le véhicule sur le banc (suivant fiche)
Poser les outils **B, C, D** et **A** sur les fixations de direction.
Mesurer les cotes aux extrémités de la barre **A** (pige **(3)** et embout **N**)

B + C + D = 0UT.304504T
A = 0UT.304506T



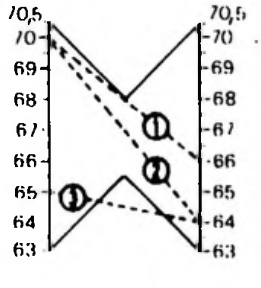
CONDITIONS DES COTES X et Z
Hauteur : Z = 67 (théorique)
Tolérances :

a) **La différence entre les cotes relevées à gauche et à droite ne doit pas être supérieure à 5 mm**

b) La somme des cotes relevées à gauche et à droite doit être comprise entre 131,5 et 136,5.

Exemple : (voir dessin ci-dessous) :

(1)	70 - 66 = 4 ;	70 + 66 = 136	Bon
(2)	70 - 64 = 6 ;	70 + 64 = 134	Mauvais
(3)	65 - 64 = 1 ;	65 + 64 = 129	Mauvais



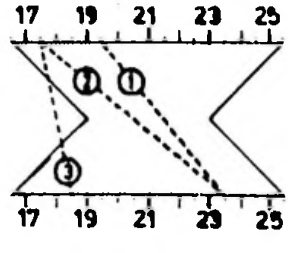
(**Y** = 525 : centré par rapport au véhicule)
Longueur : X = 21 (théorique)

a) **La différence entre les cotes relevées à gauche et à droite ne doit pas être supérieure à 5 mm**

b) La somme des cotes relevées à gauche et à droite doit être comprise entre 38 et 46.

Exemple : (voir dessin ci-dessous) :

(1)	23,5 - 19,5 = 4 ;	23,5 + 19,5 = 43	Bon
(2)	23,5 - 17,5 = 6 ;	17,5 + 23,5 = 41	Mauvais
(3)	18,5 - 17,5 = 1 ;	18,5 + 17,5 = 36	Mauvais



Z 80-47

REMARQUE : Les conditions a et b doivent impérativement être remplies pour satisfaire les normes de la direction.

CONTROLE DES FIXATIONS DE LA DIRECTION

(valable pour direction à gauche et direction à droite)

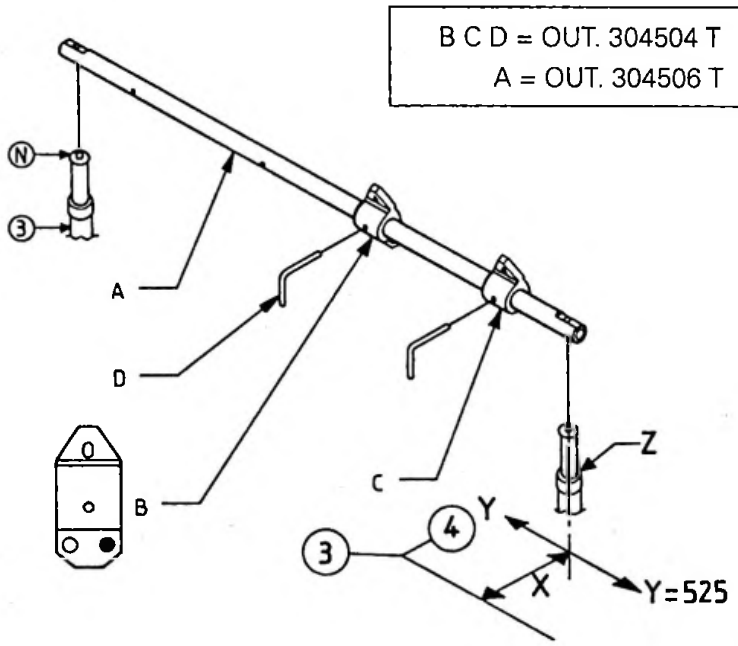
Déposes nécessaires : Roues avant, direction.

CONTROLE : Mettre le véhicule sur le banc (suivant fiche)

Poser les outils **B, C, D** et **A** sur les fixations de direction.

Mesurer les cotes aux extrémités de la barre **A** (pige **(3)** et embout **N**)

B C D = OUT. 304504 T
A = OUT. 304506 T



(3) Ligne référence mécanique montée

(4) Ligne référence caisse nue

CONDITIONS DES COTES X et Z

Hauteur : Z = 67 (théorique)

Tolérances :

a) **La différence entre les cotes relevées à gauche et à droite ne doit pas être supérieure à 5 mm.**

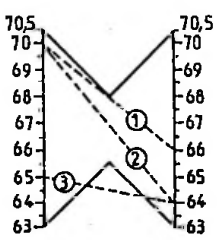
b) La somme des cotes relevées à gauche et à droite doit être comprise entre 131 et 136.

Exemple : (voir dessin ci-dessous) :

(1) 70 - 66 = 4 ; 70 + 66 = 136 Bon

(2) 70 - 64 = 6 ; 70 + 64 = 134 Mauvais

(3) 65 - 64 = 1 ; 65 + 64 = 129 Mauvais



(**Y** = 525 ; centré par rapport au véhicule)

Longueur : X = 166 (théorique)

a) **La différence entre les cotes relevées à gauche et à droite ne doit pas être supérieure à 5 mm.**

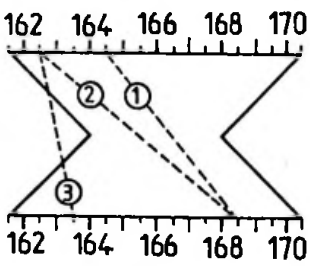
b) La somme des cotes relevées à gauche et à droite doit être comprise entre 328 et 336.

Exemple : (voir dessin ci-dessous) :

(1) 168,5 - 164,5 = 4 168,5 + 164,5 = 333 Bon

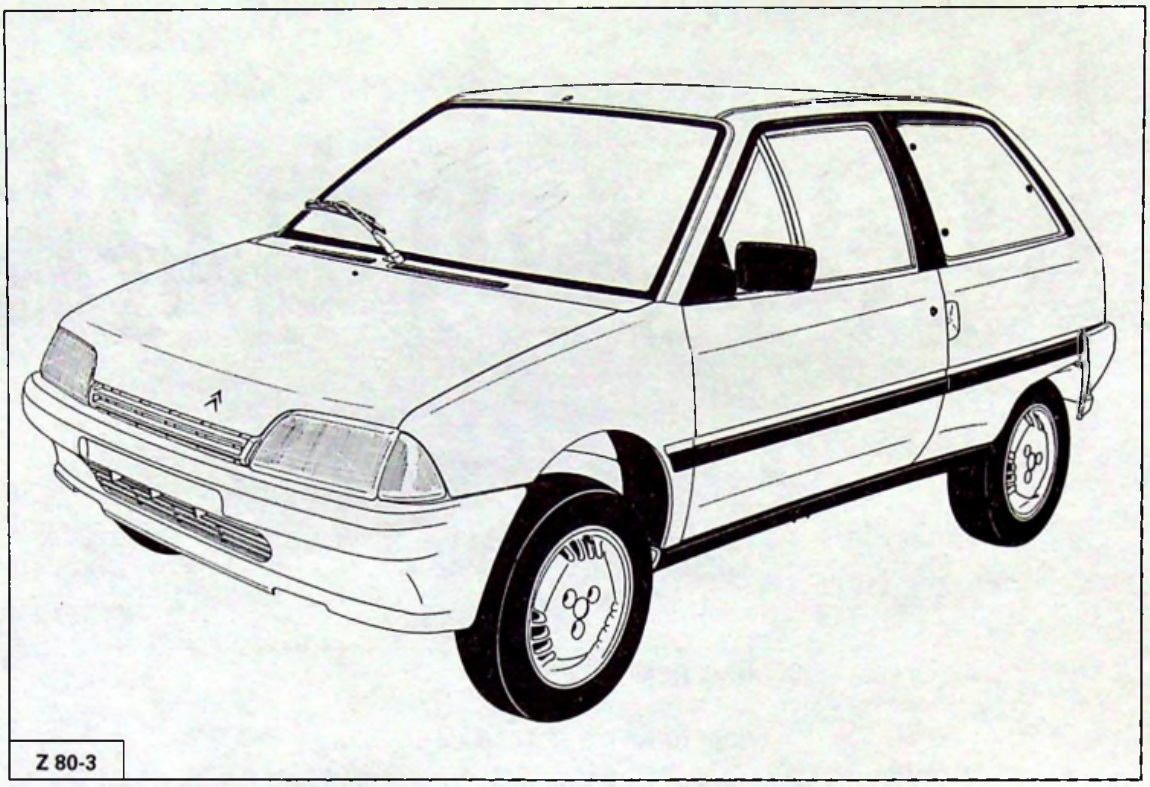
(2) 168,5 - 162,5 = 6 168,5 + 162,5 = 331 Mauvais

(3) 163,5 - 162,5 = 1 163,5 + 162,5 = 326 Mauvais

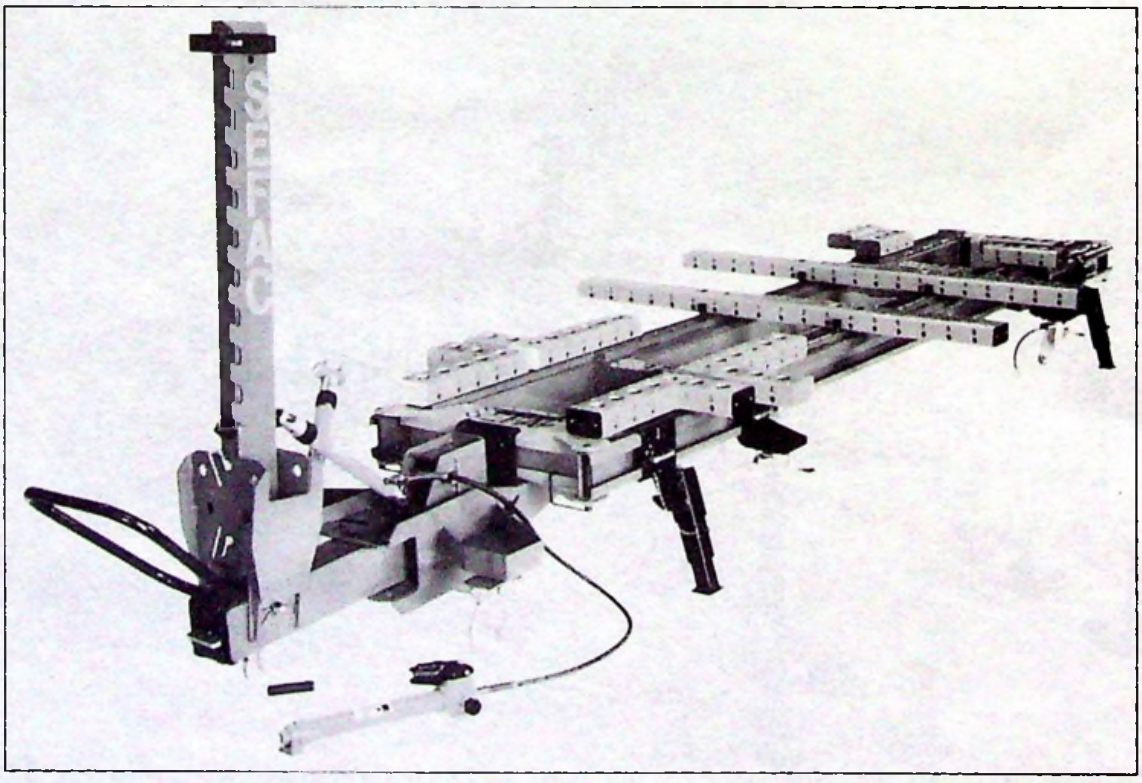


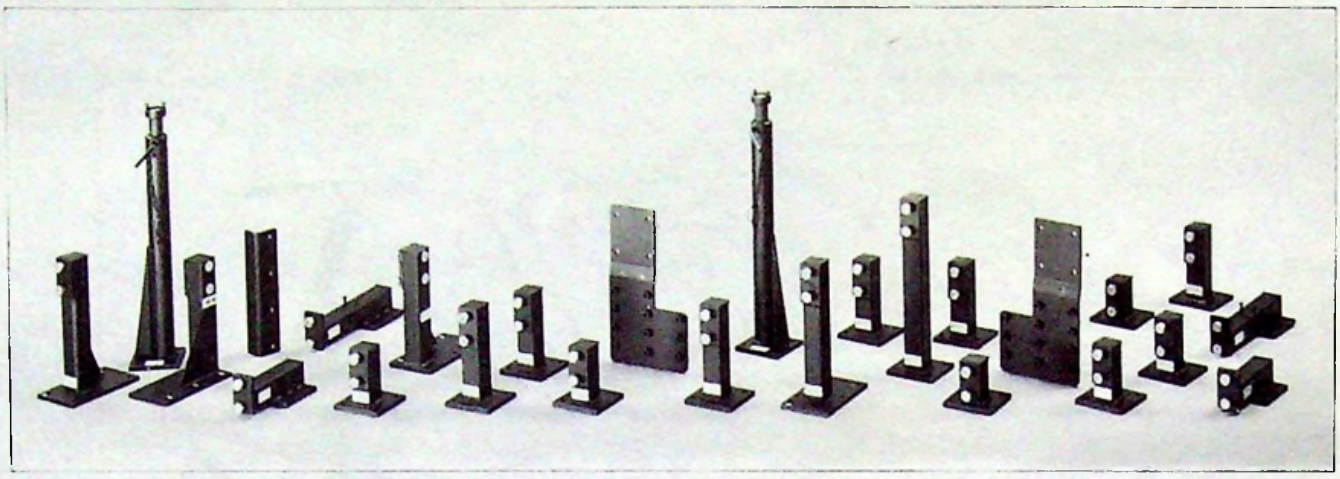
Z 80-57

REMARQUE : Les conditions a et b doivent impérativement être remplies pour satisfaire les normes de la direction.

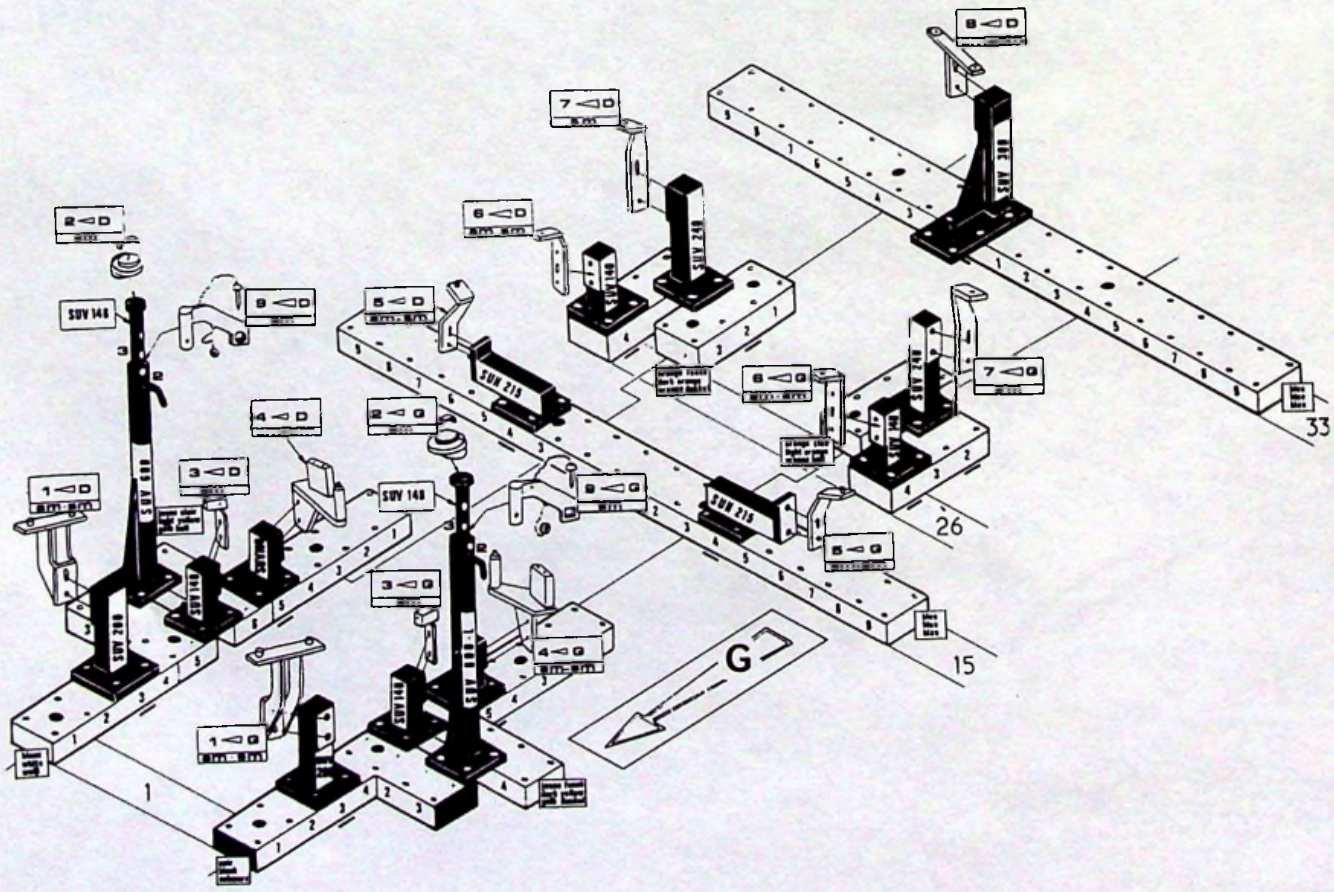


Z 80-3

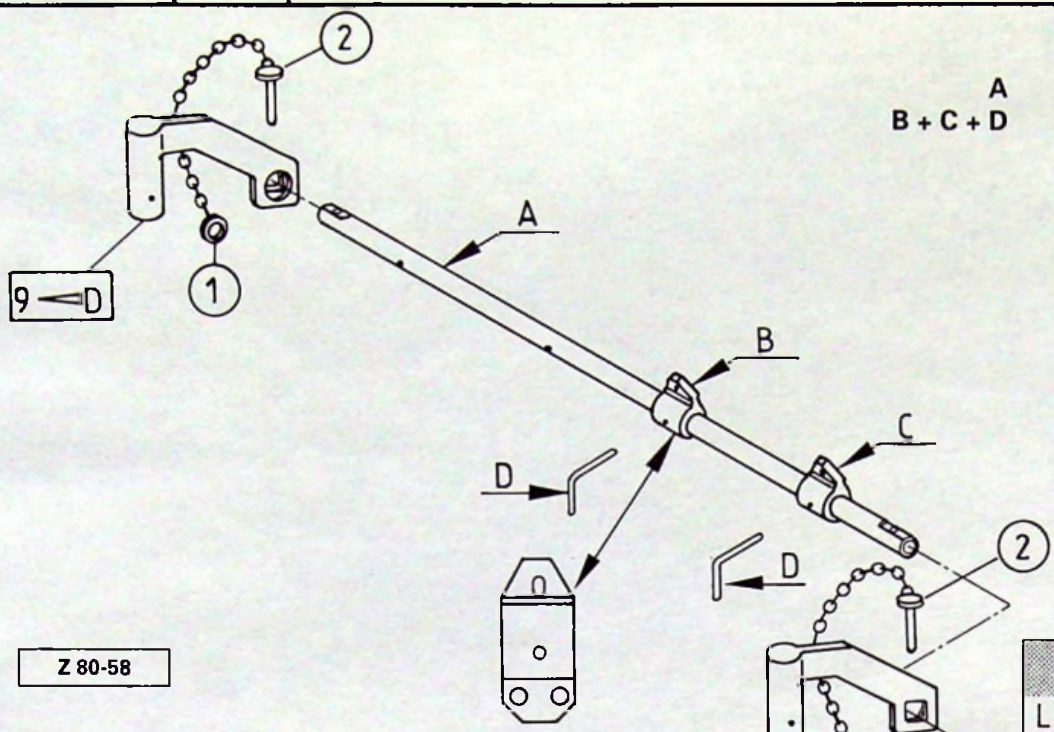




→ 1/90	REFERENCE SEF 2072
1/90 →	REFERENCE SEF 2072 + SEF 2079 OU REFERENCE SEF 2080

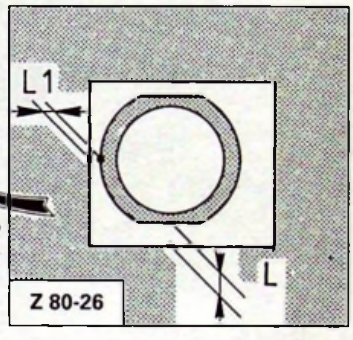


A OUT 304 506 T
B + C + D OUT 304 504 T



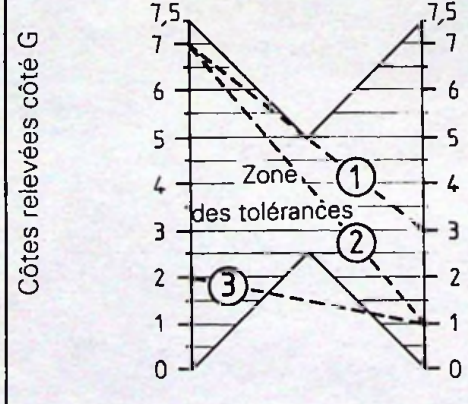
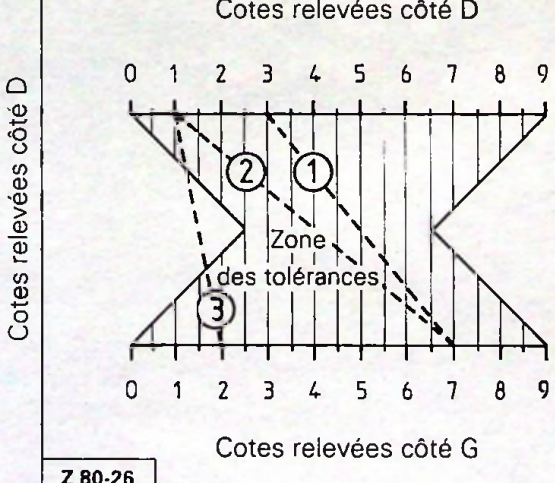
Z 80-58

N.B. Les repères ① et ② des supports 9 G et 9 D ne sont utilisés que pour la remise en place d'un tablier neuf. Ces mêmes repères ne sont pas utilisés en gamme contrôle.



Z 80-26

CONDITIONS DE CONTROLE

	L (Théorique 3,75 mm)	**L1** (Théorique 4,5 mm)
1ère Condition	**L** (Côté G) - **L** (Côté D) ⩽ 5 mm	**L1** (CôtéG) - **L1** (Côté D) ⩽ 5 mm
2ème Condition		

Z 80-26

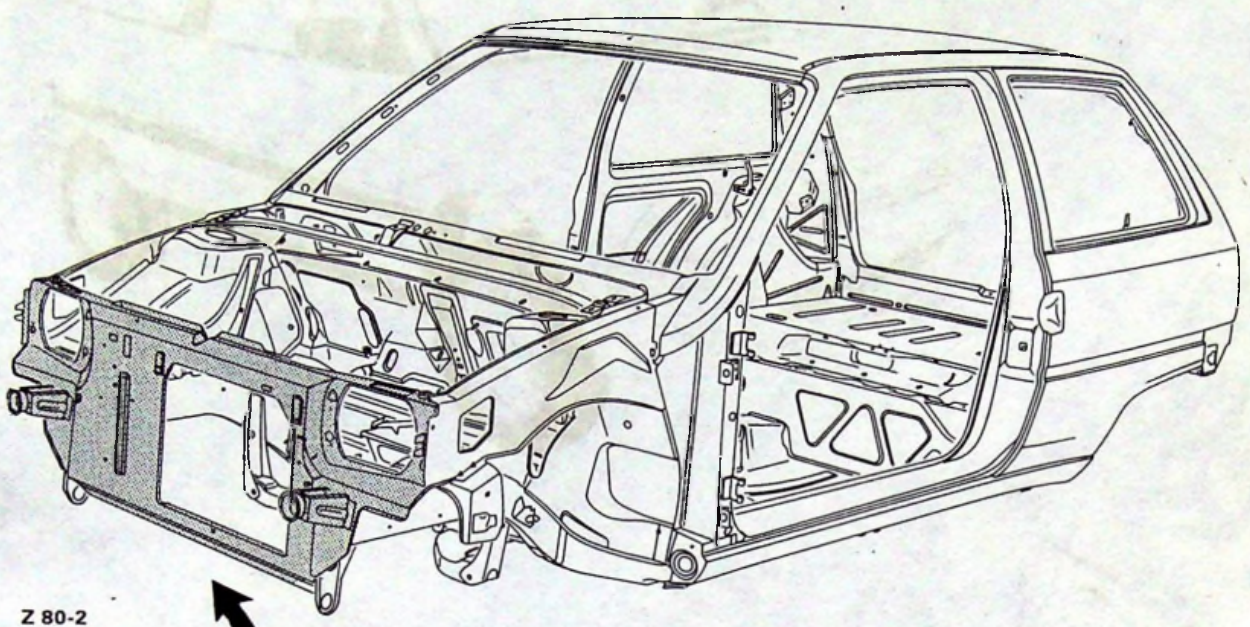
Z 80-26

Exemples : (pour **L1**)

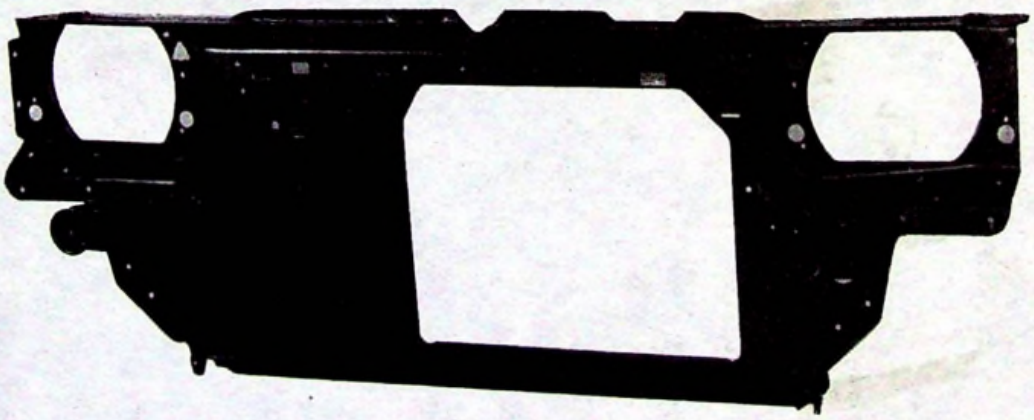
① : *Bon.* Les 2 conditions sont respectées :
1re : 7-3 = 4 < 5 — 2e : compris dans la zone des tolérances.

② : Mauvais. Une des 2 conditions (*) n'est pas respectée :
* 1re : 7-1 = 6 > 5 — 2e : compris dans la zone des tolérances.

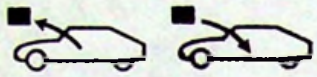
③ : *Mauvais.* Une des 2 conditions (*) n'est pas respectée :
1re : 2-1 = 1 < 5 — (*) 2e : non compris dans la zone des tolérances.

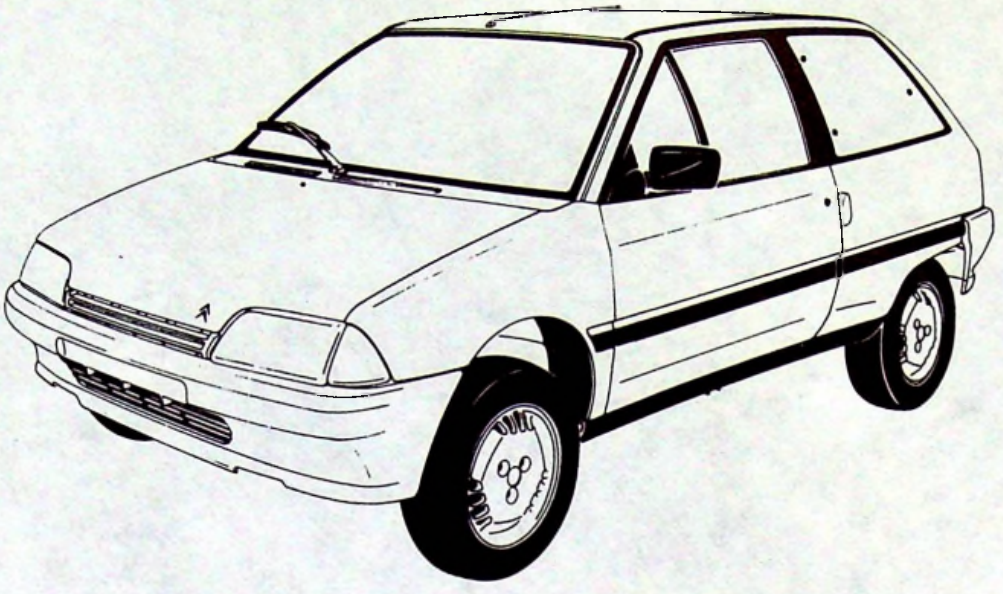


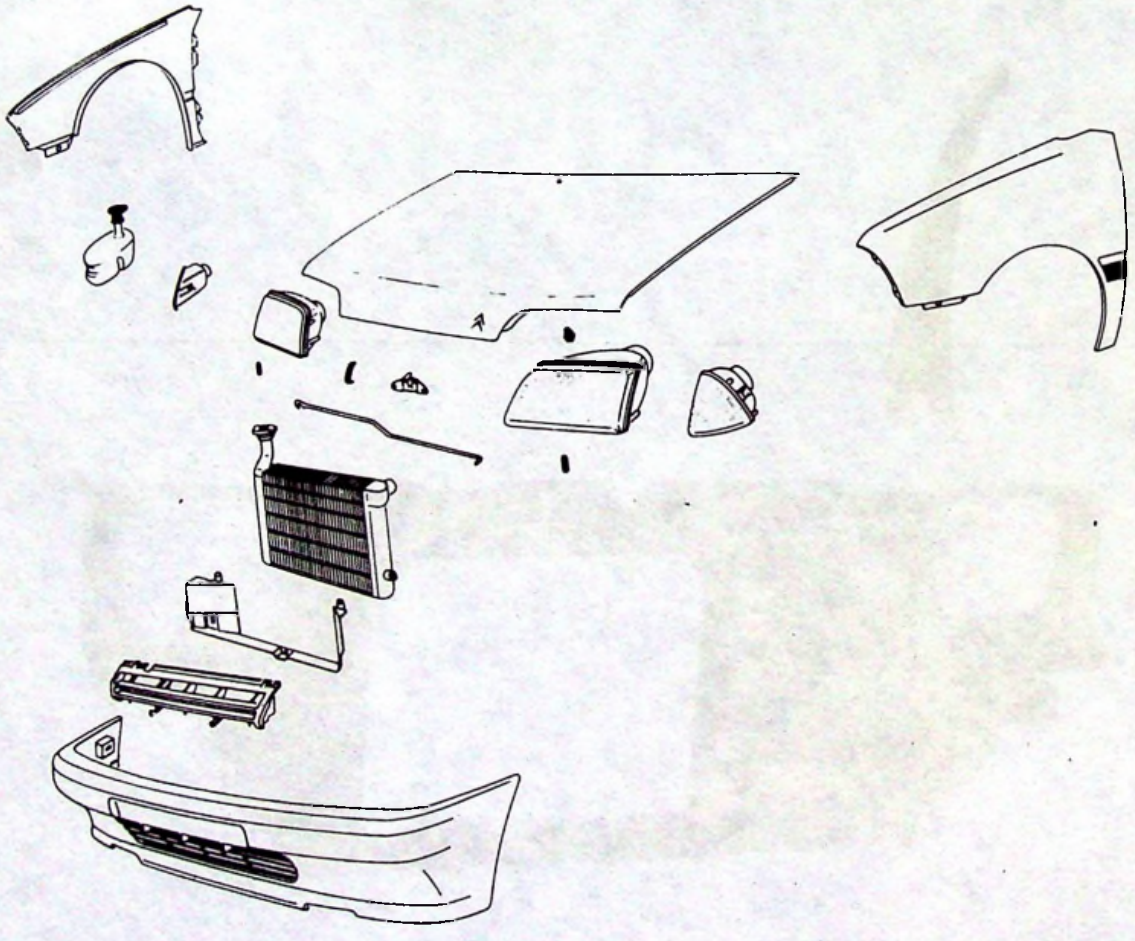
Z 80-2

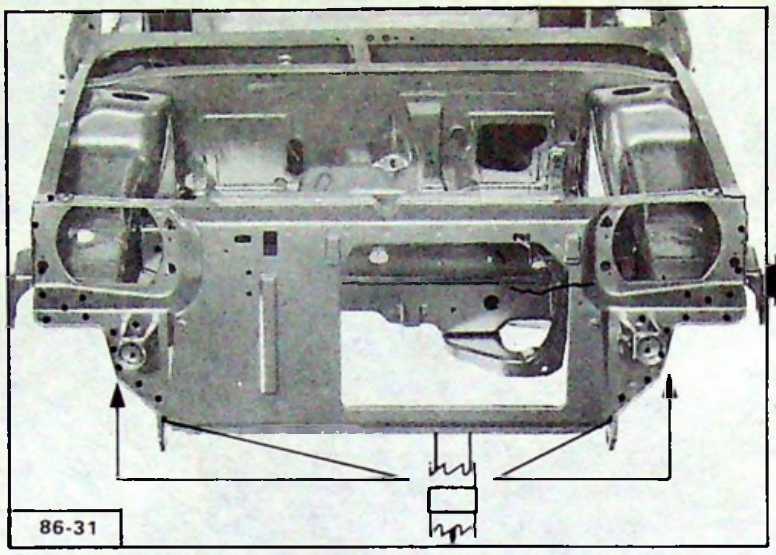


86-167





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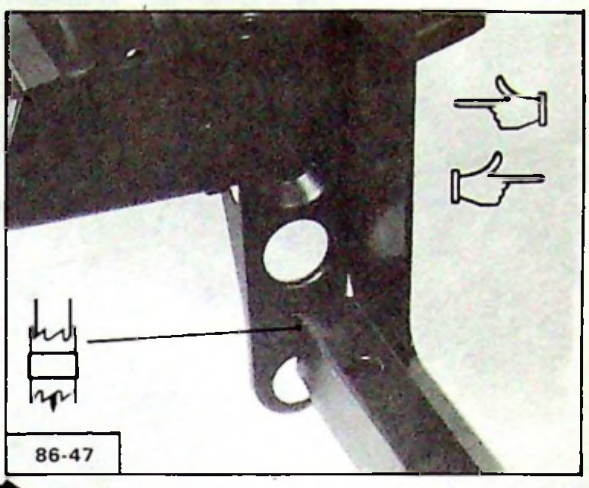
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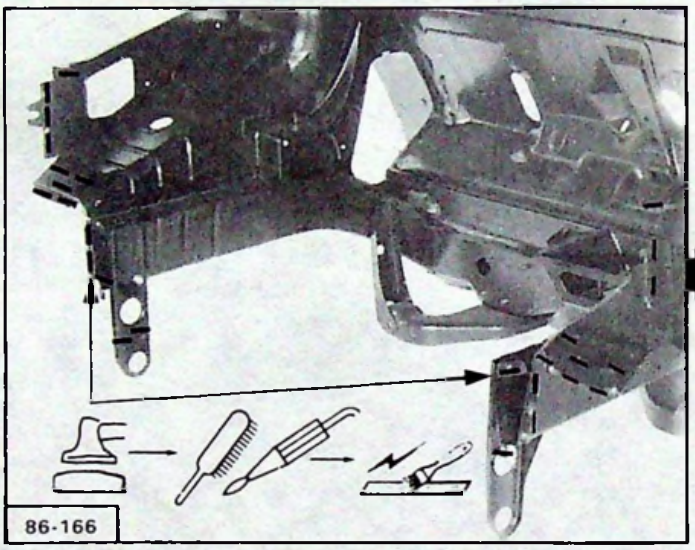
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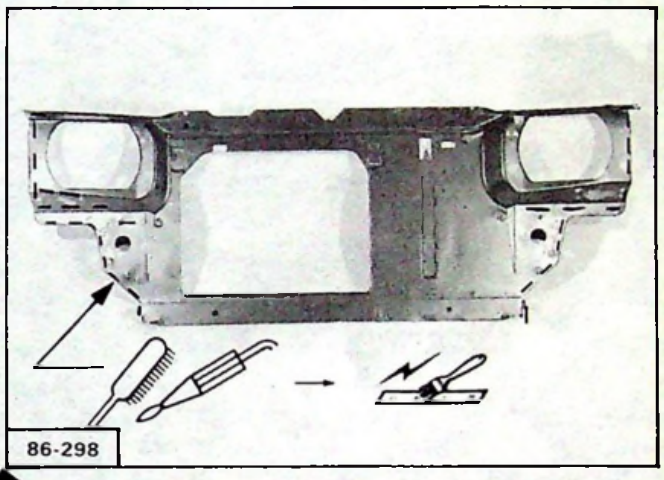
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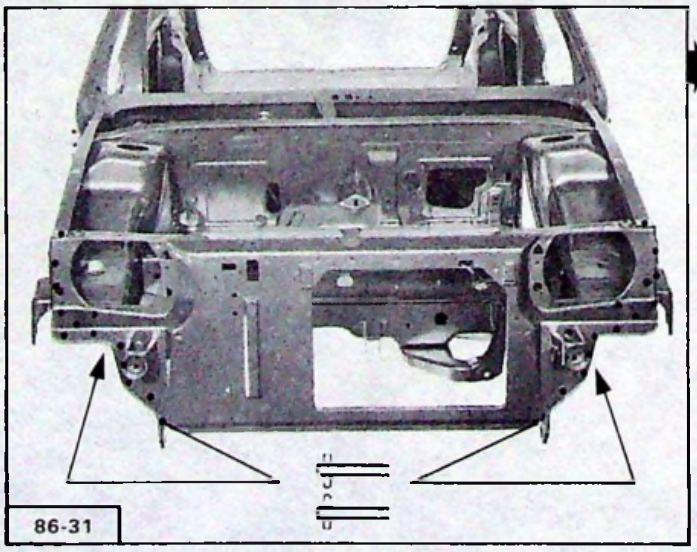
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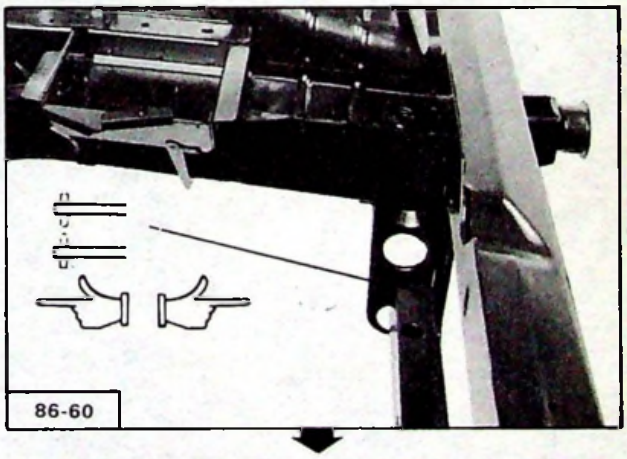
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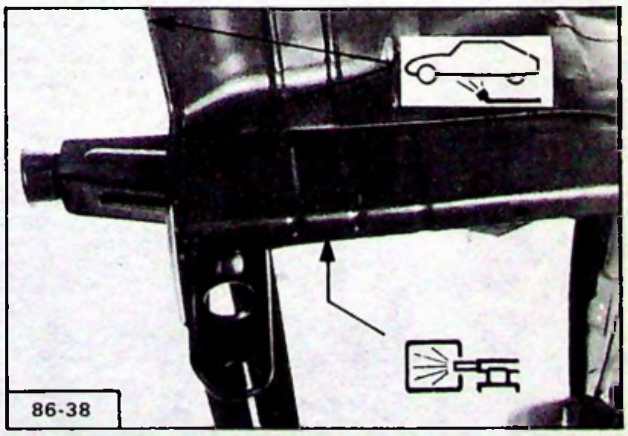
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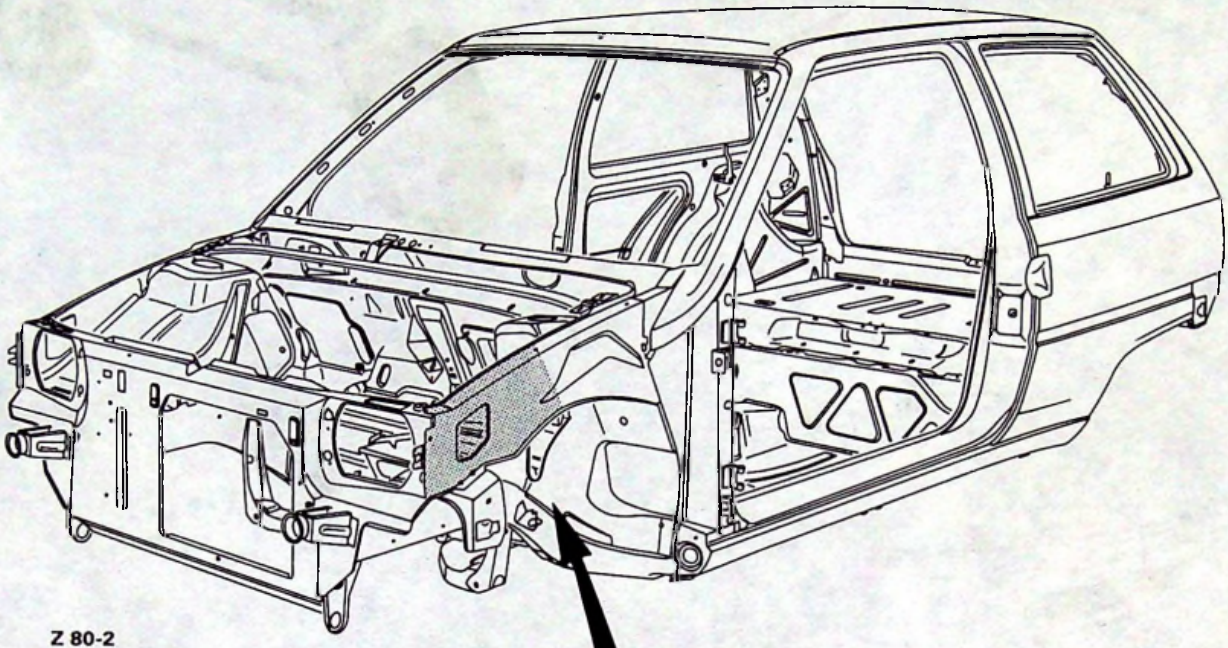
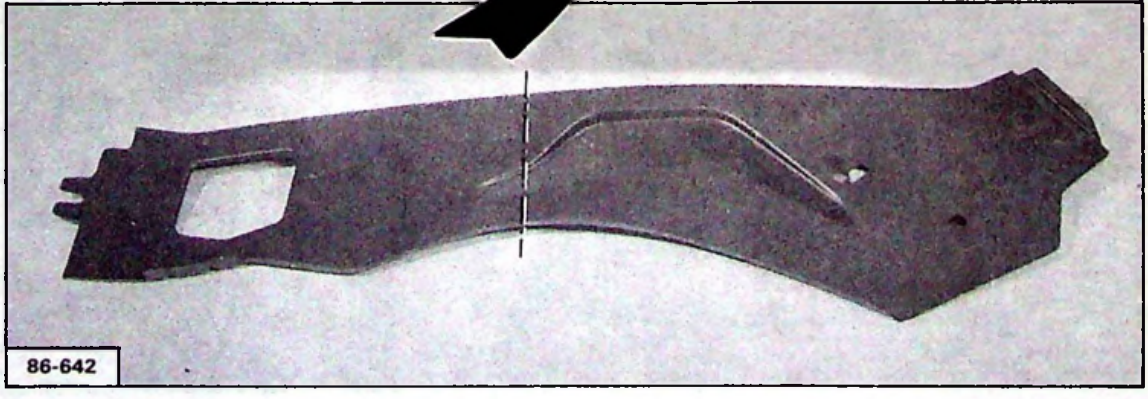


Z 80-2



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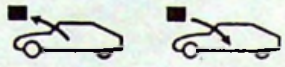
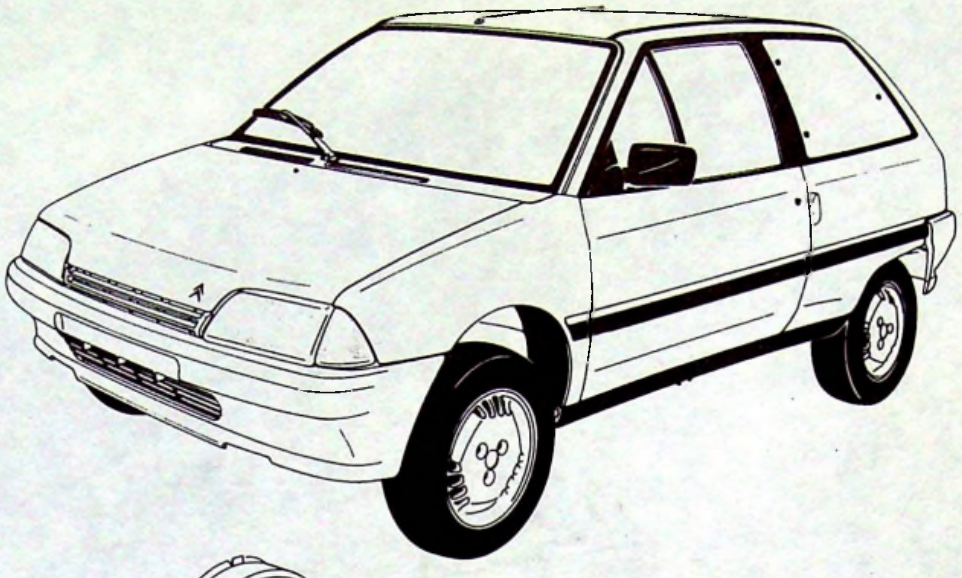
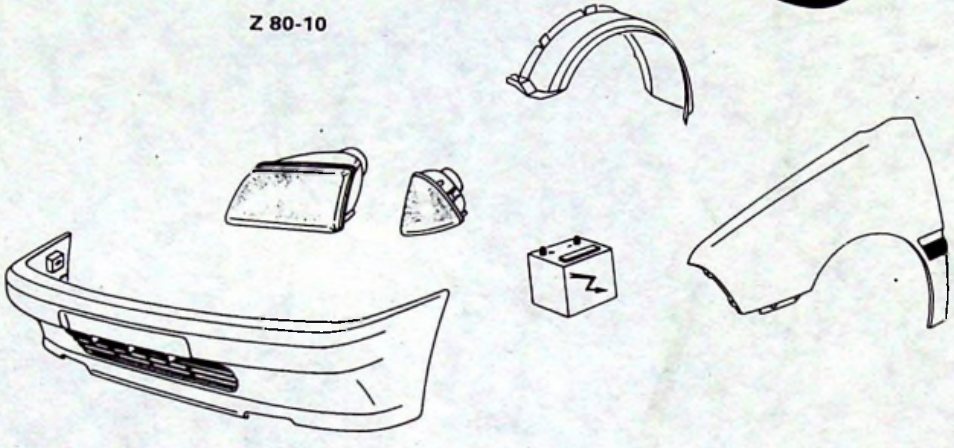
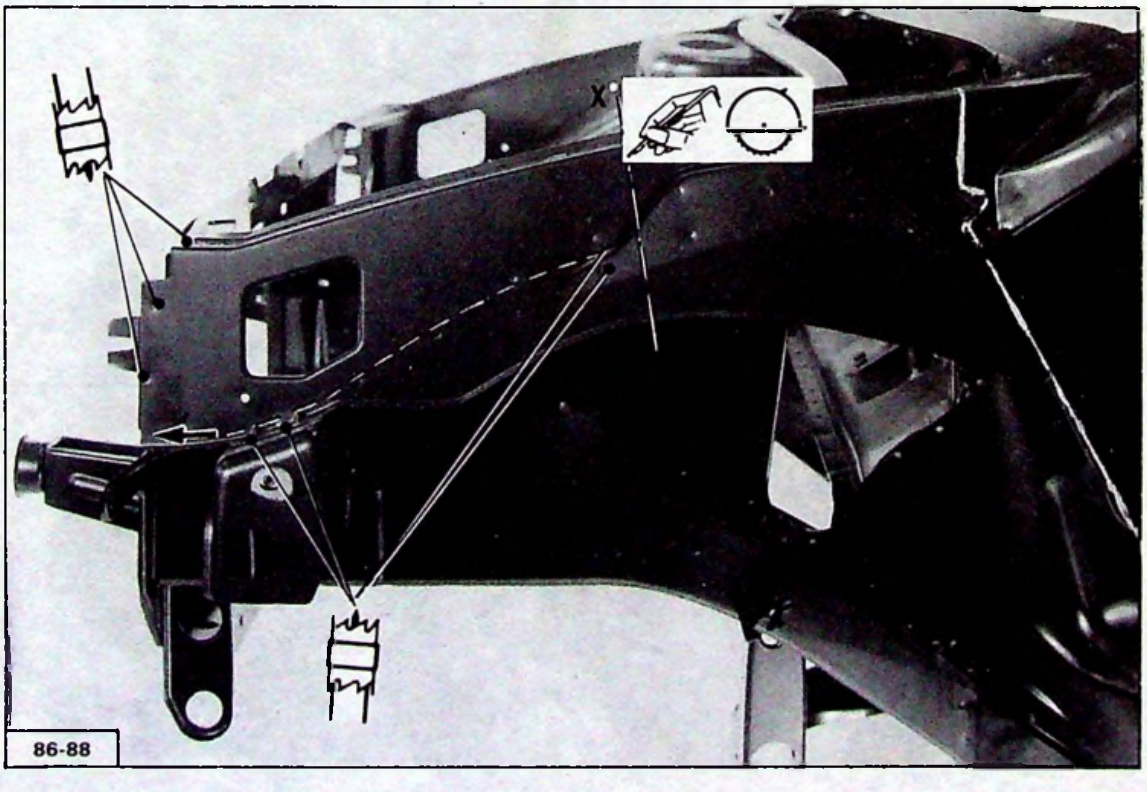
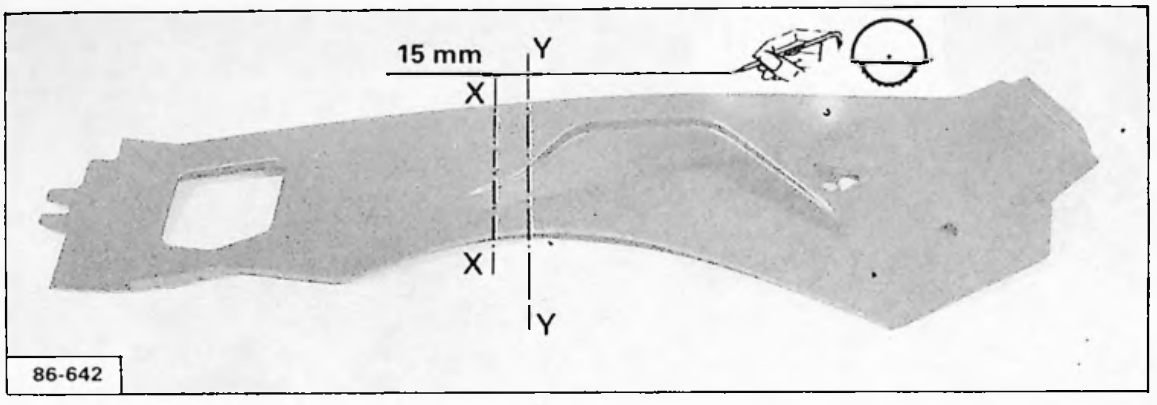




Z 80-10






15 mm
Y
X
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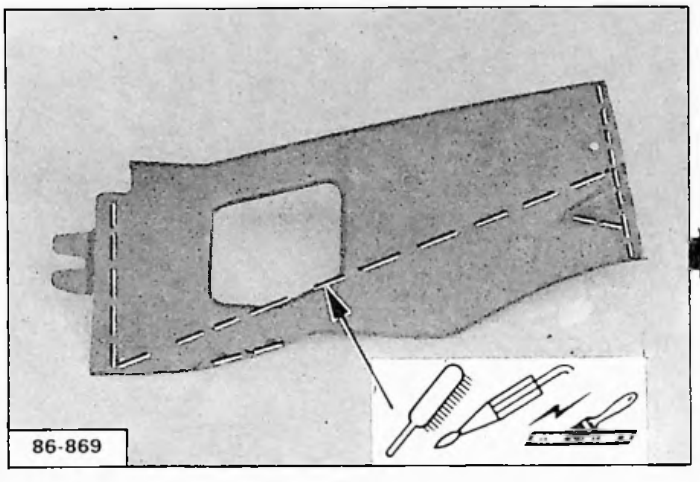
86-642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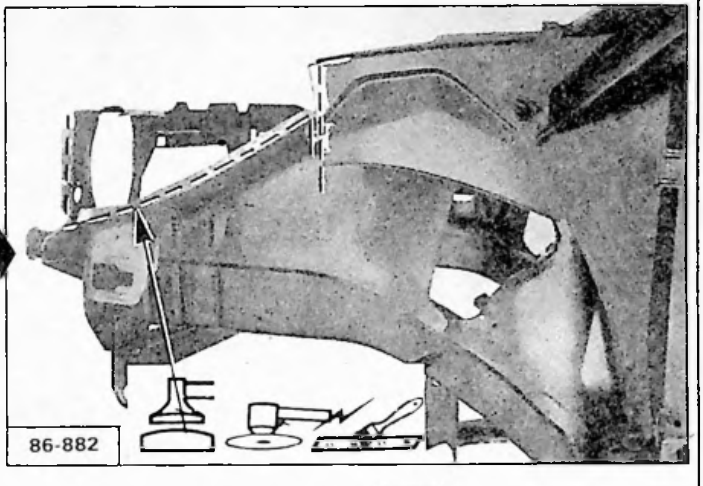
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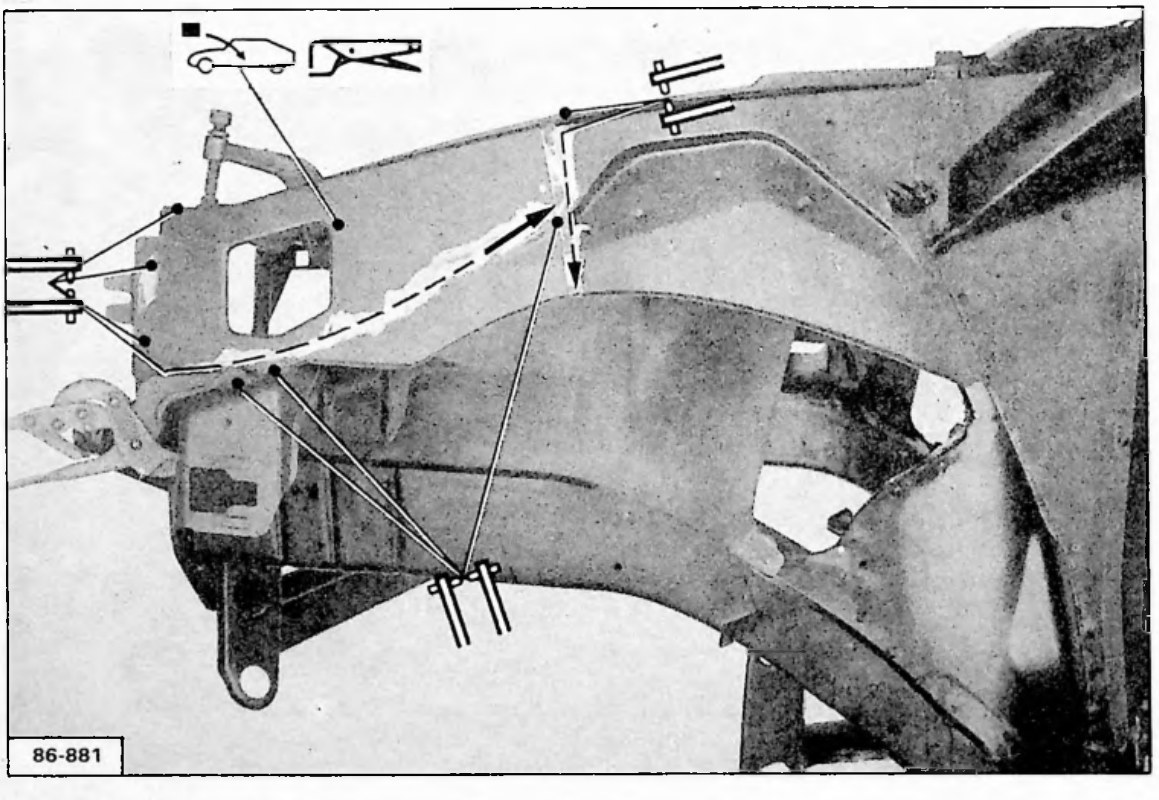
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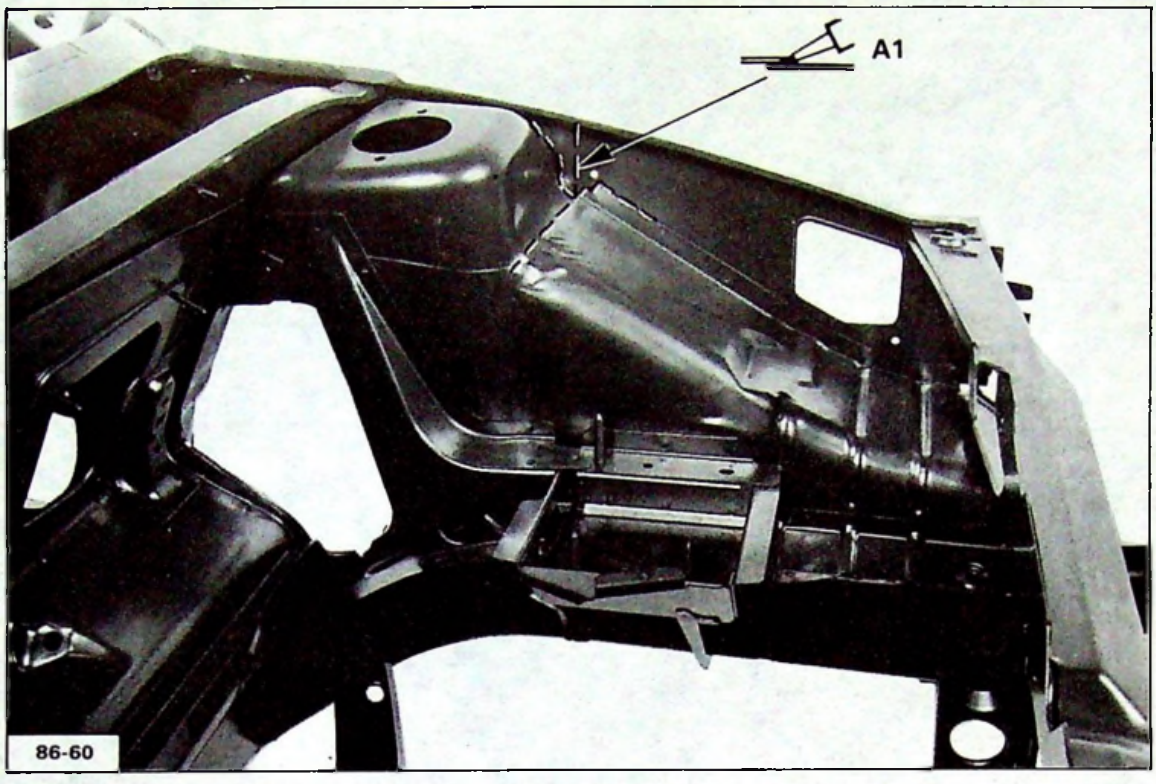
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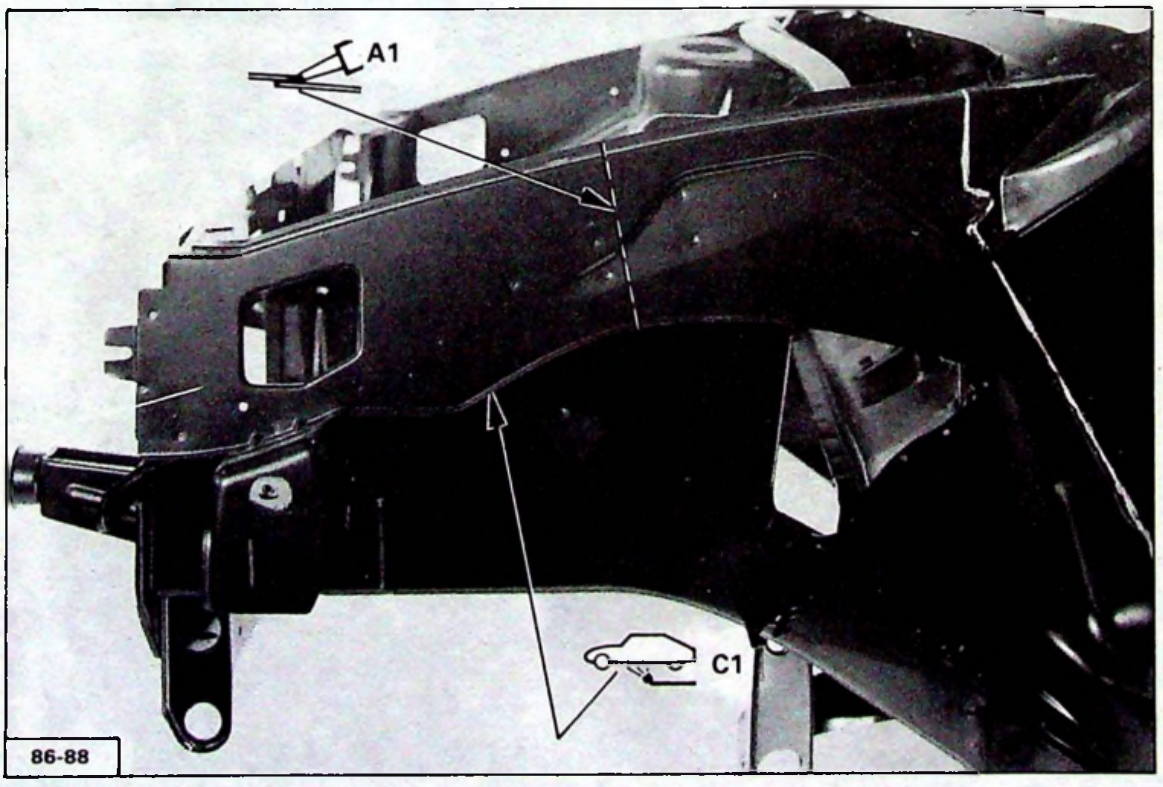
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C1
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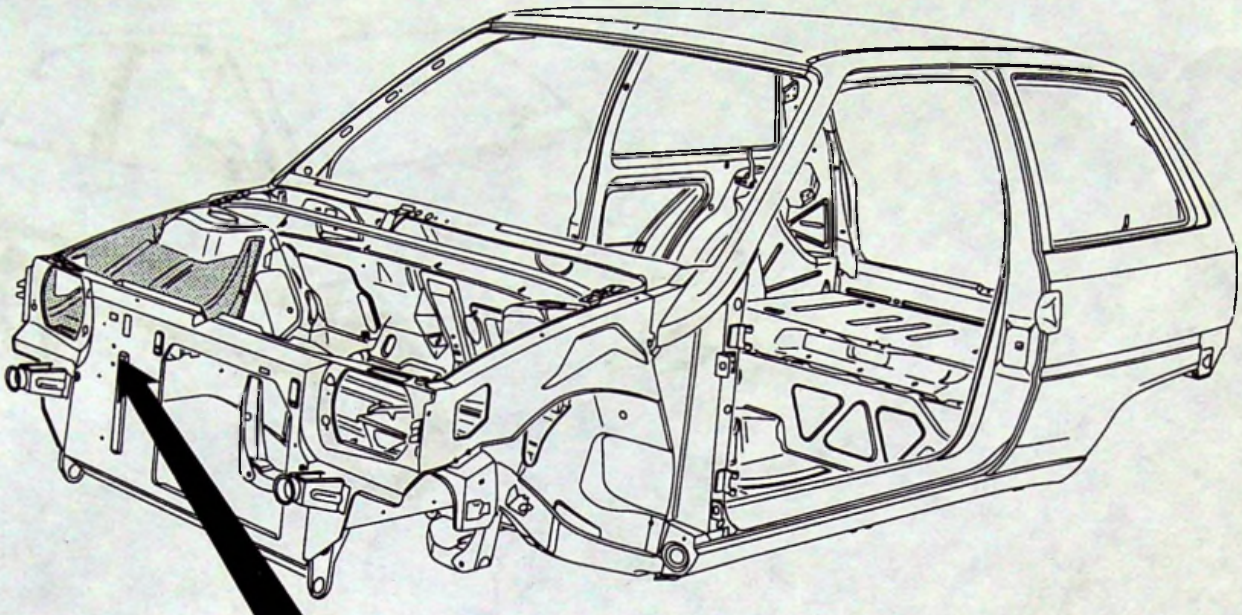
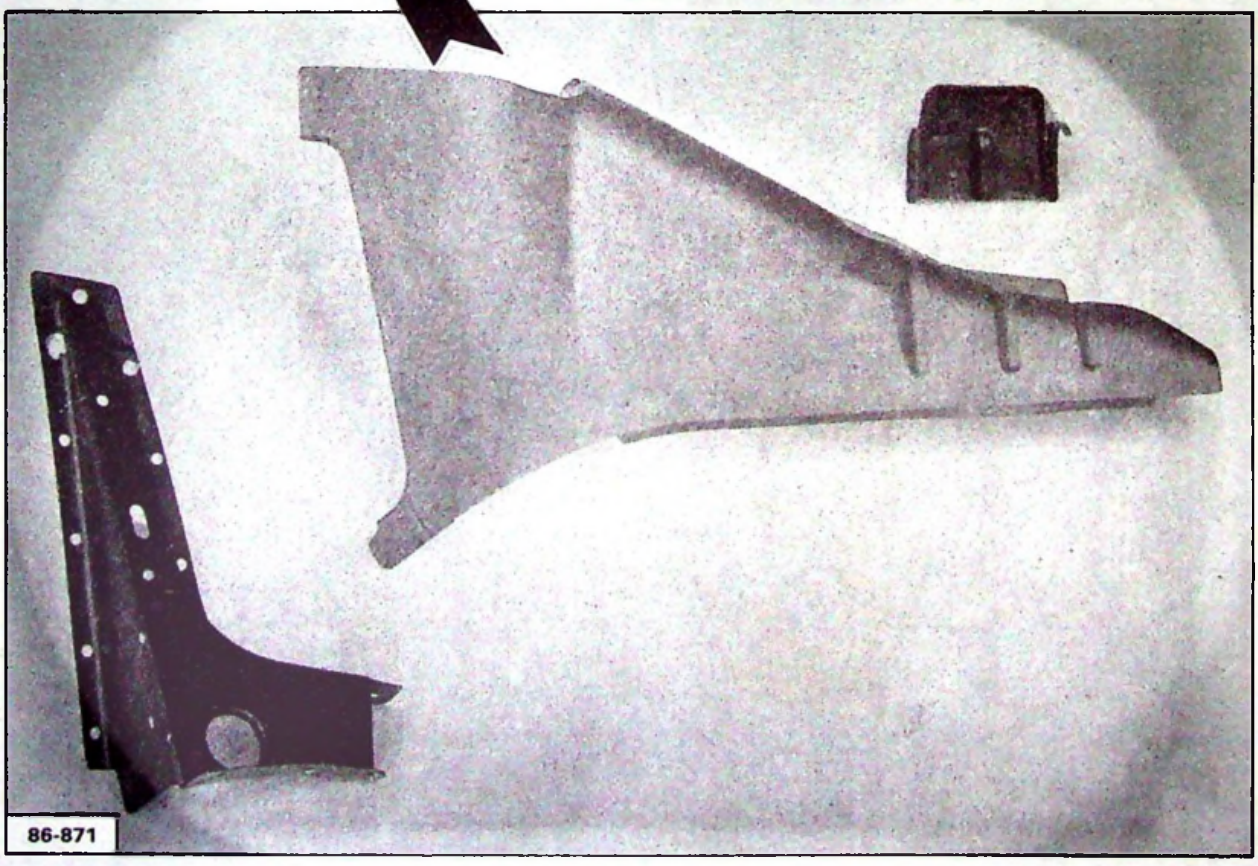


Z 80-2



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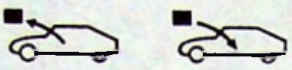

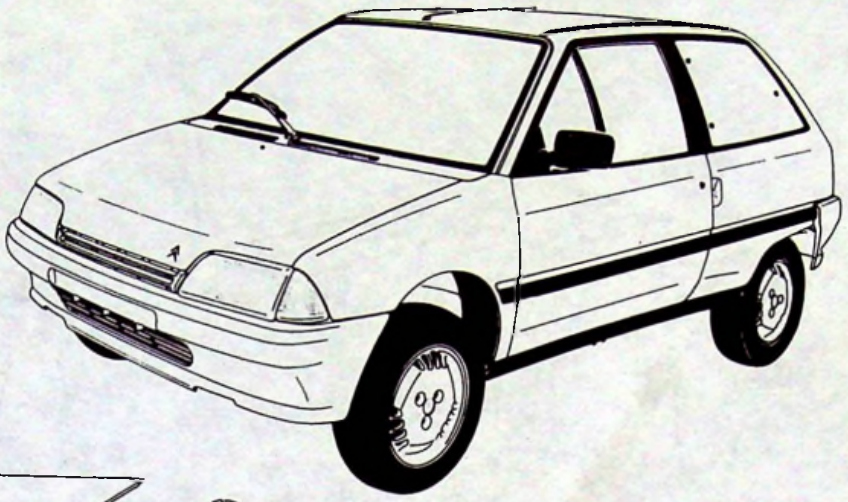

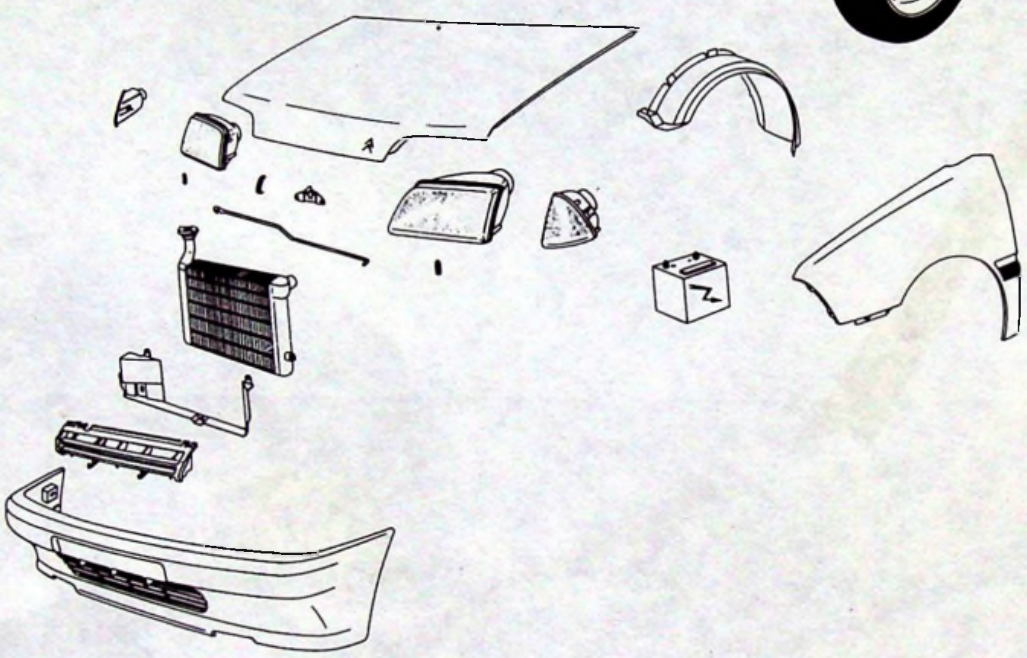

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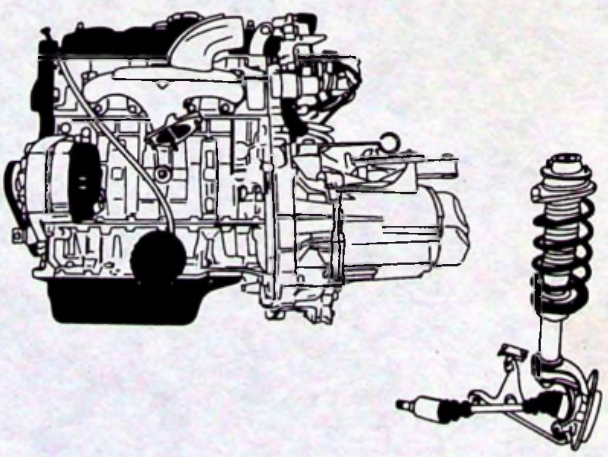

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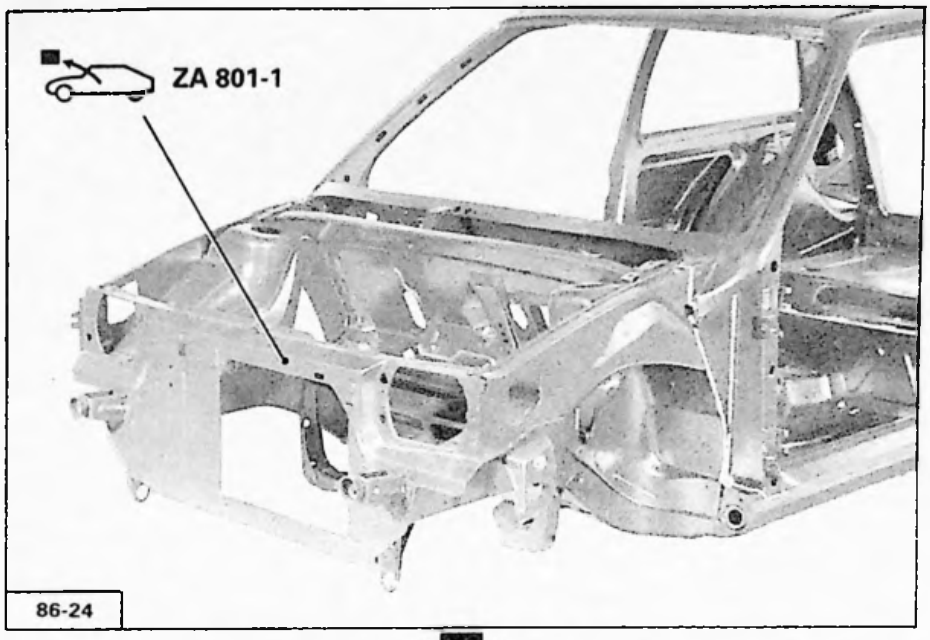
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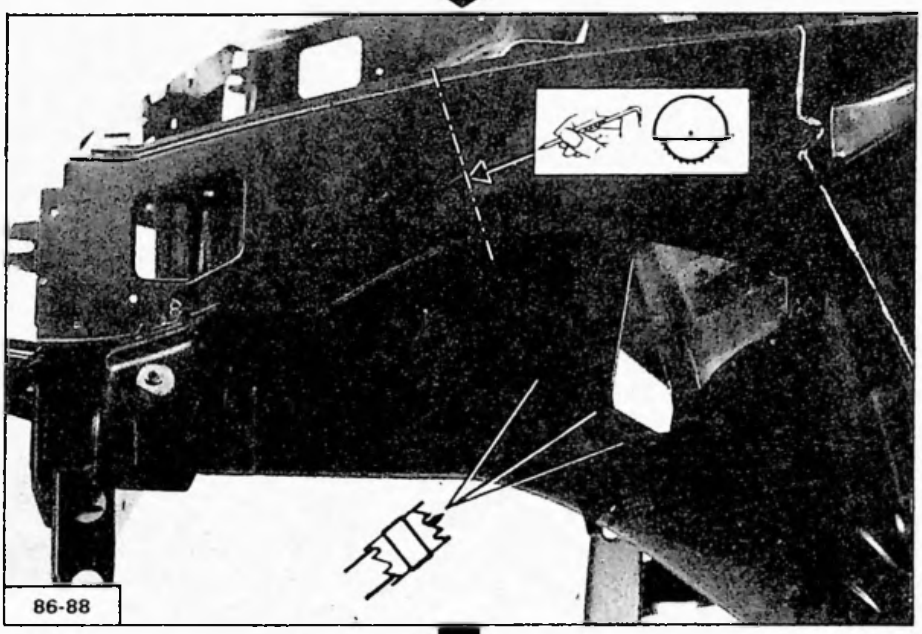
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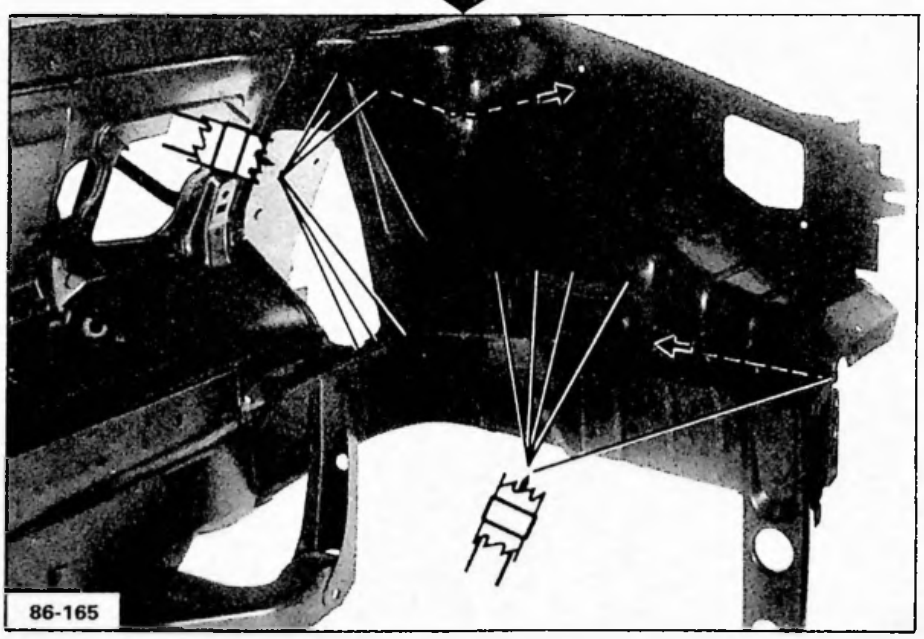
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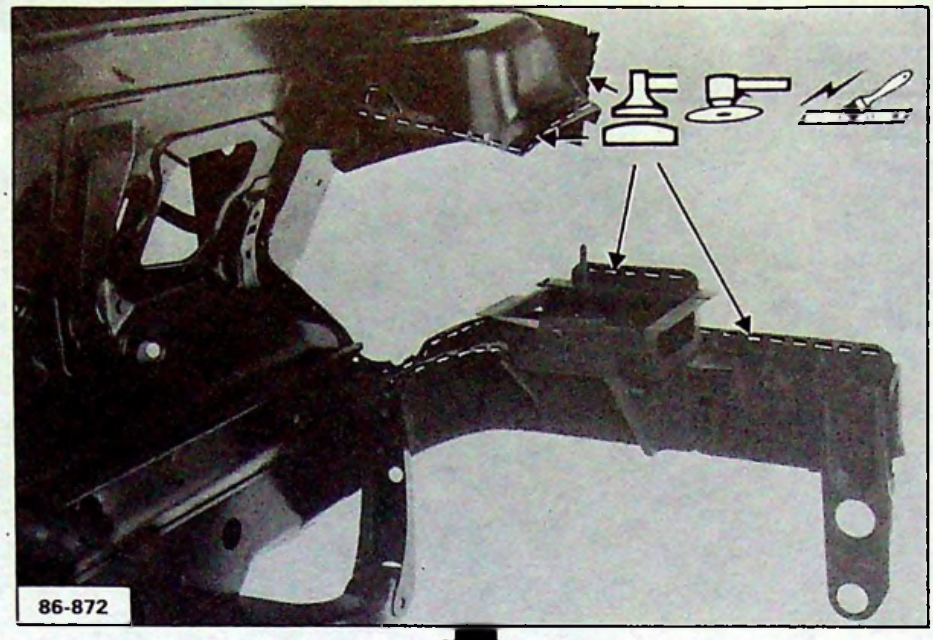
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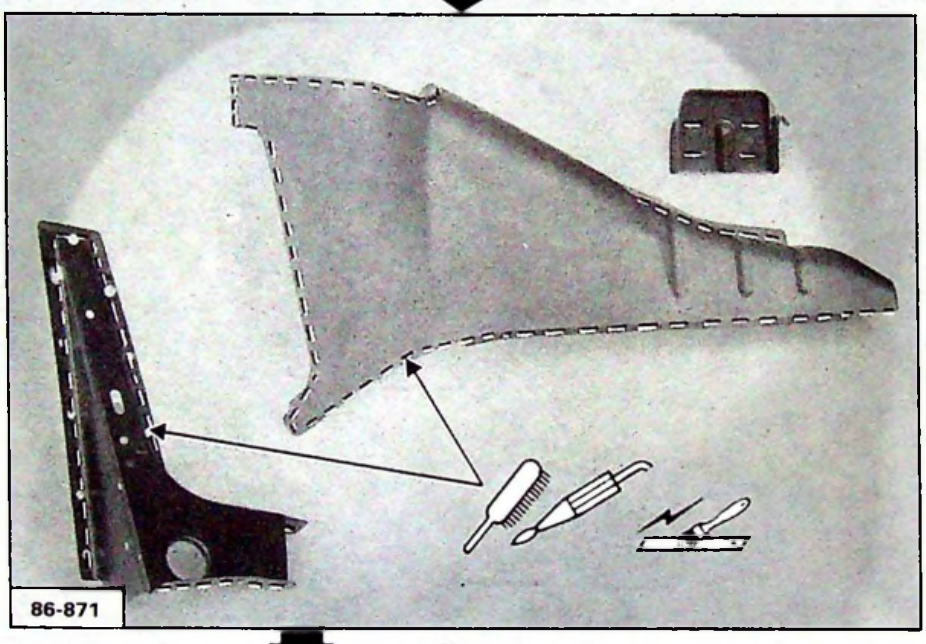
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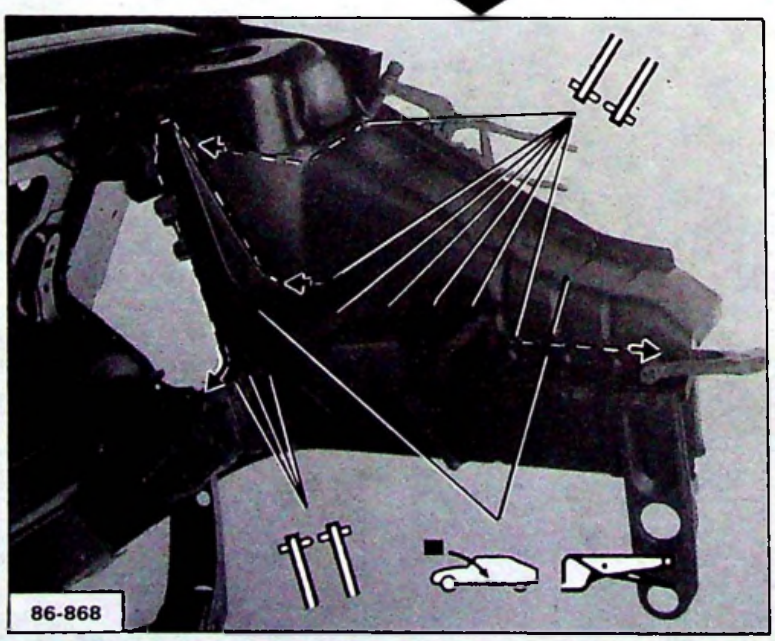
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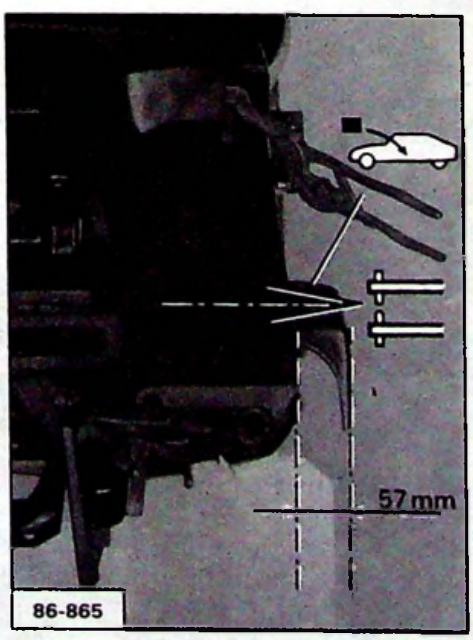
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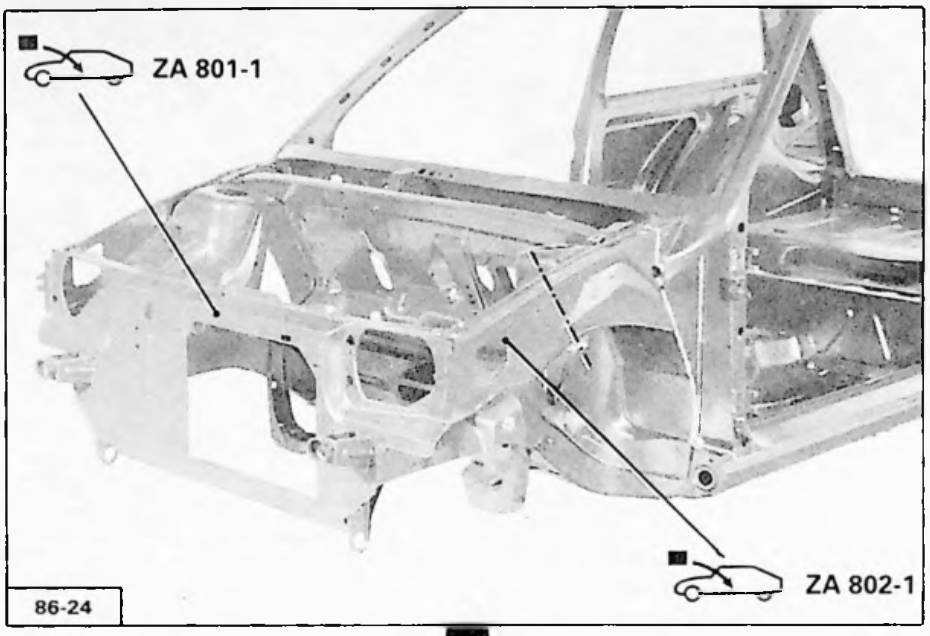
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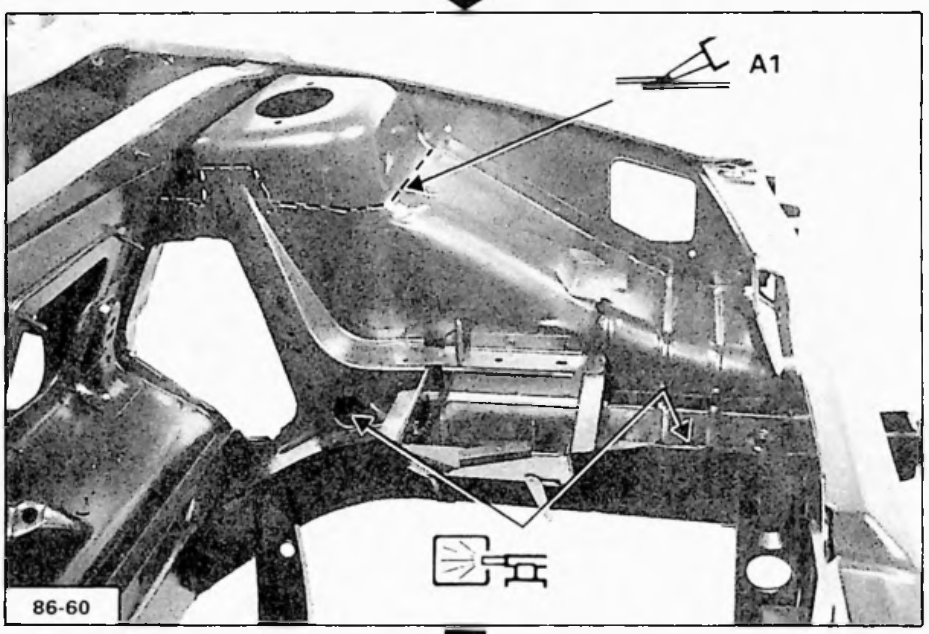
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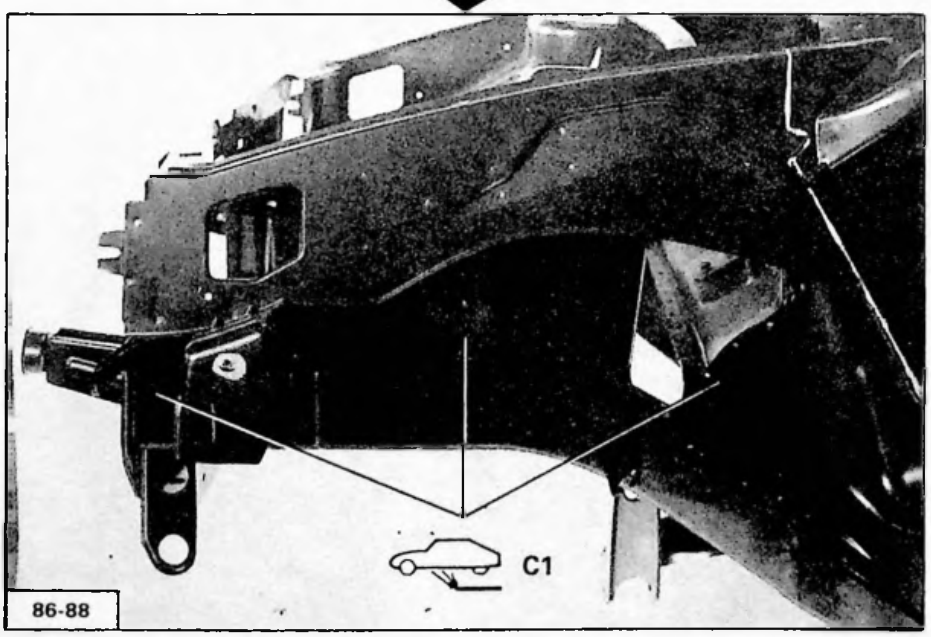
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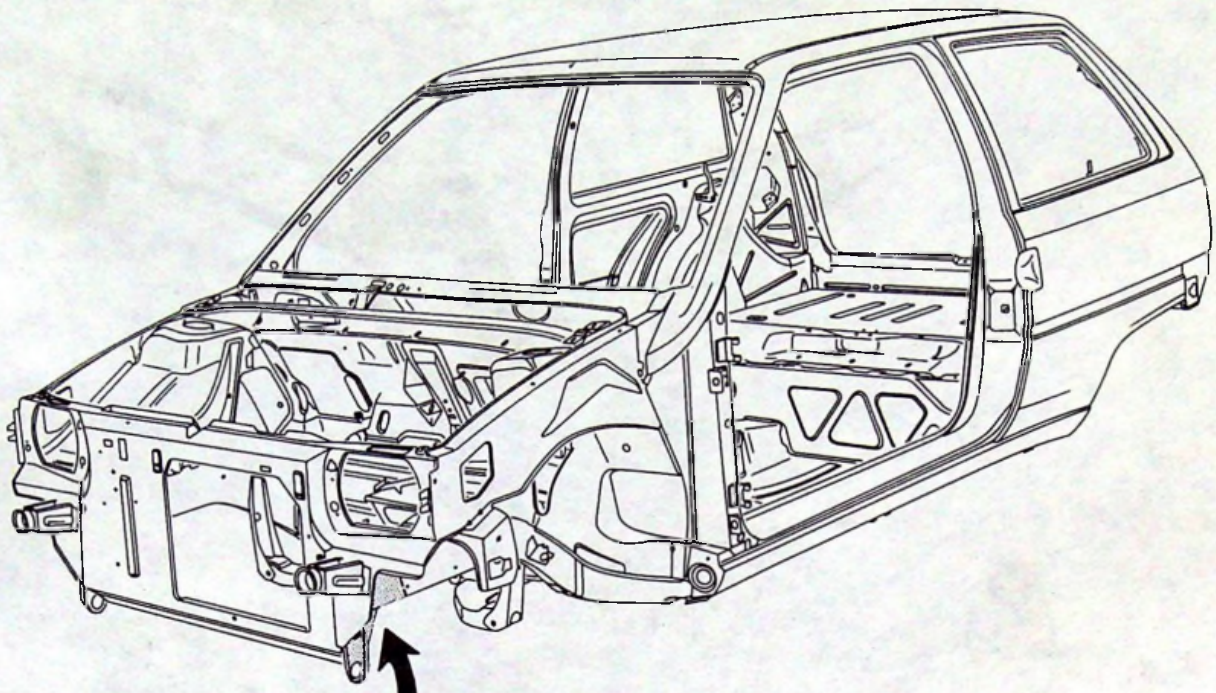

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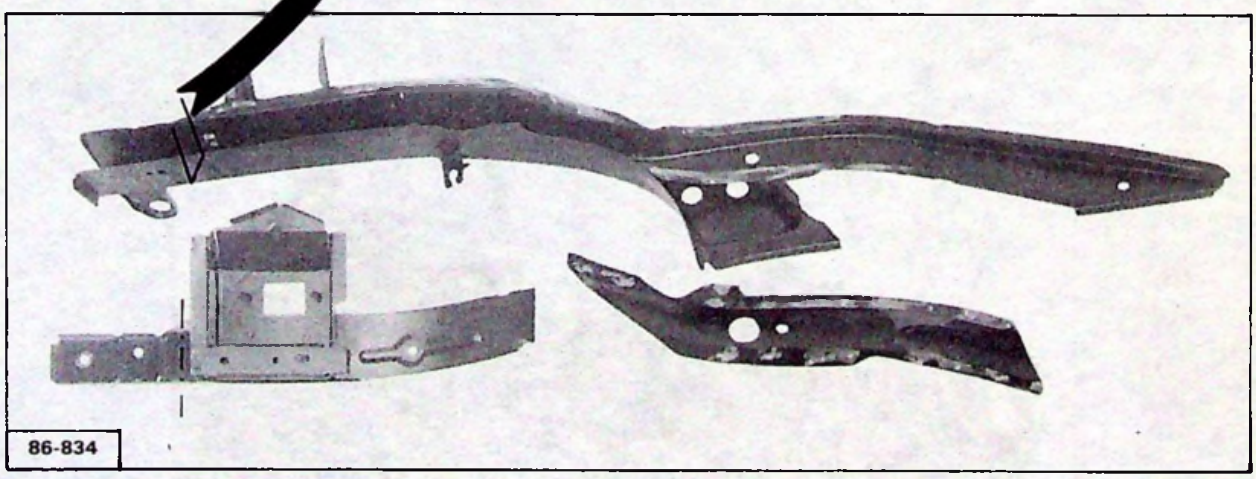

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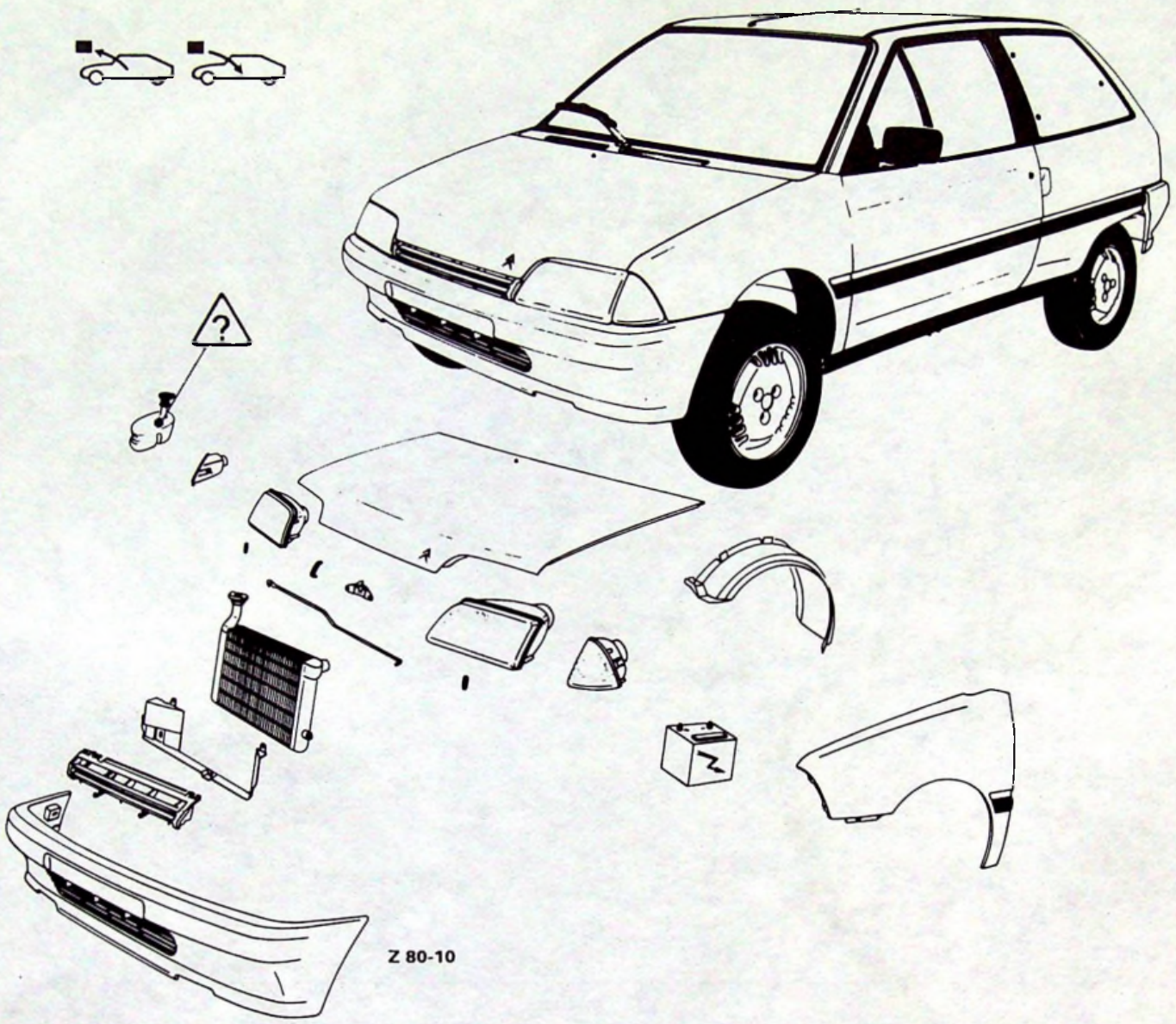

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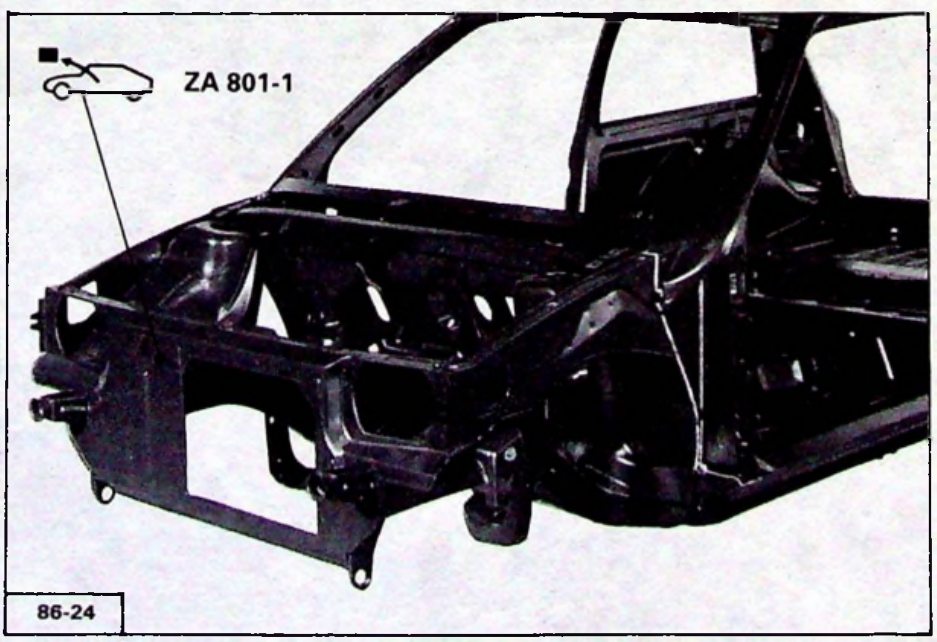

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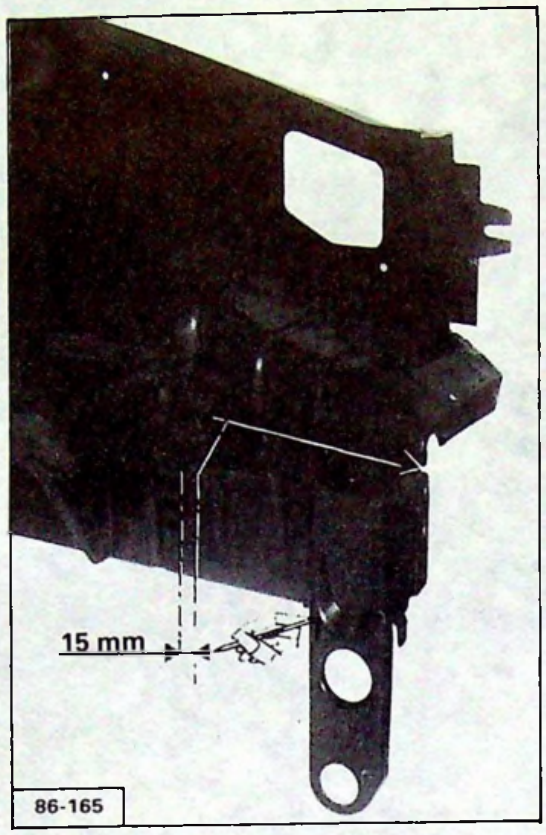
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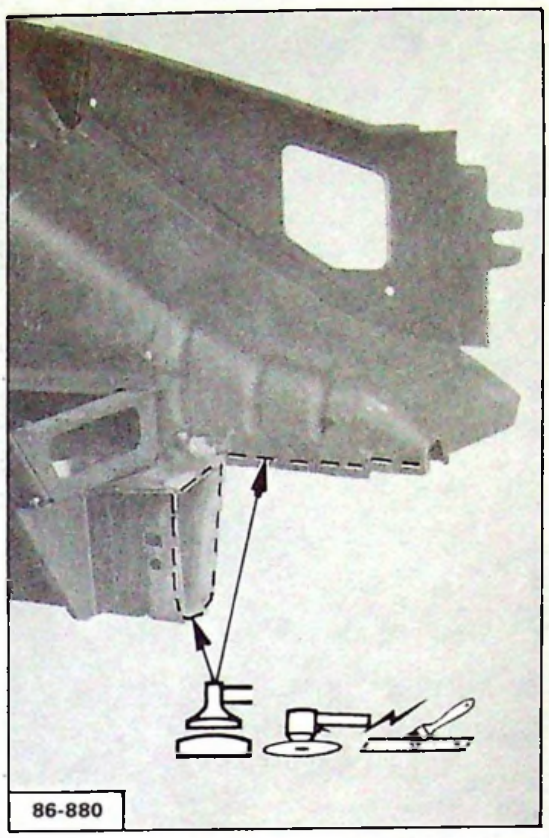
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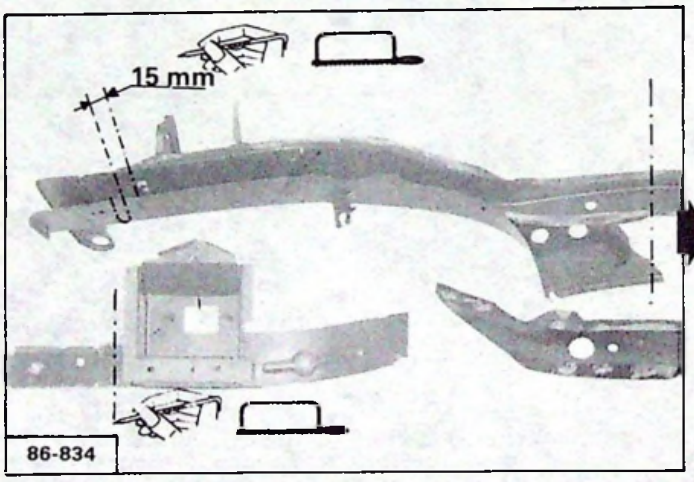
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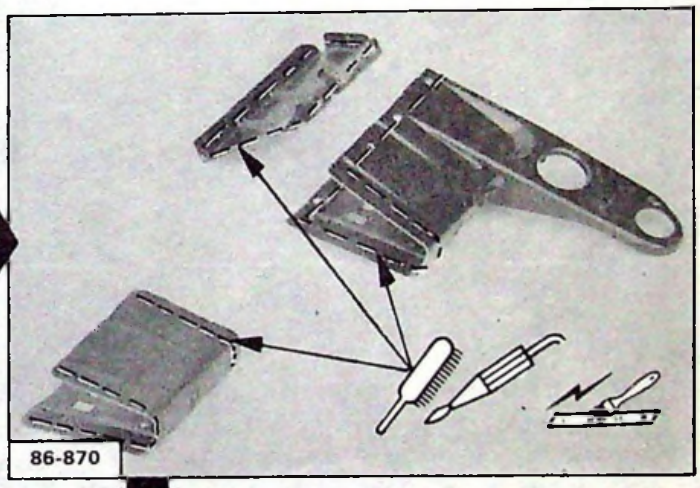
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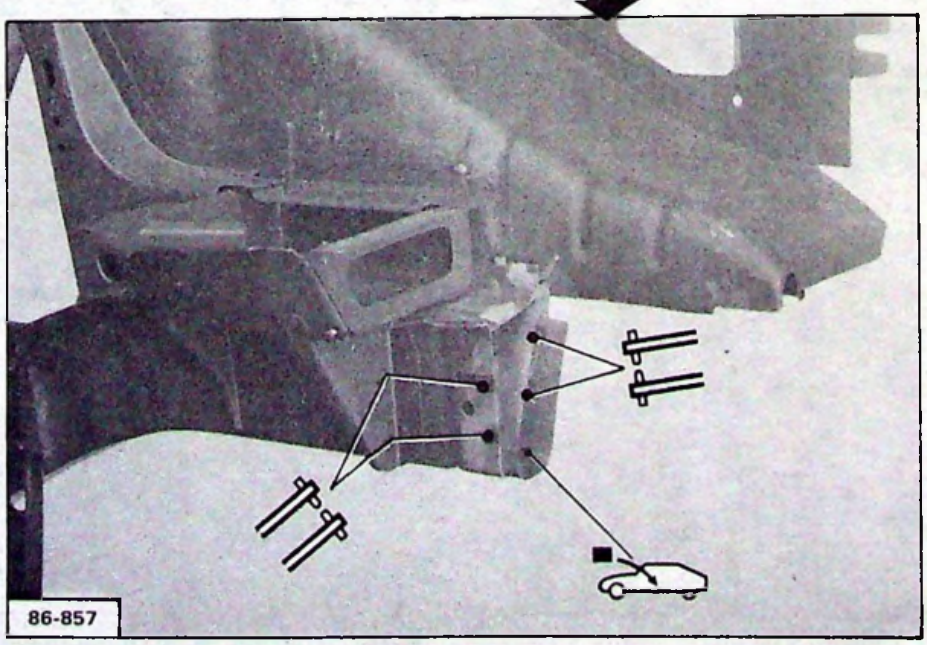
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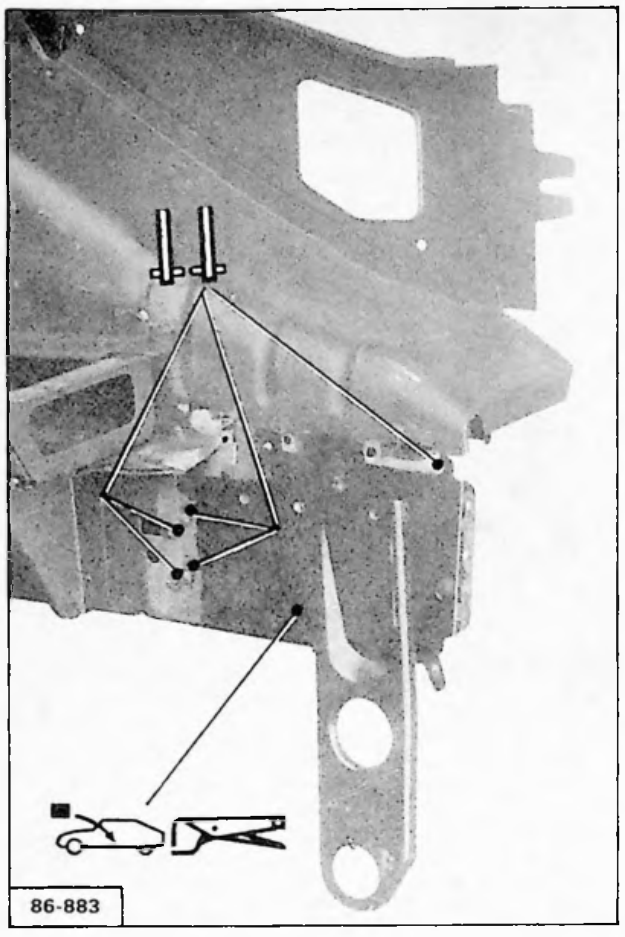
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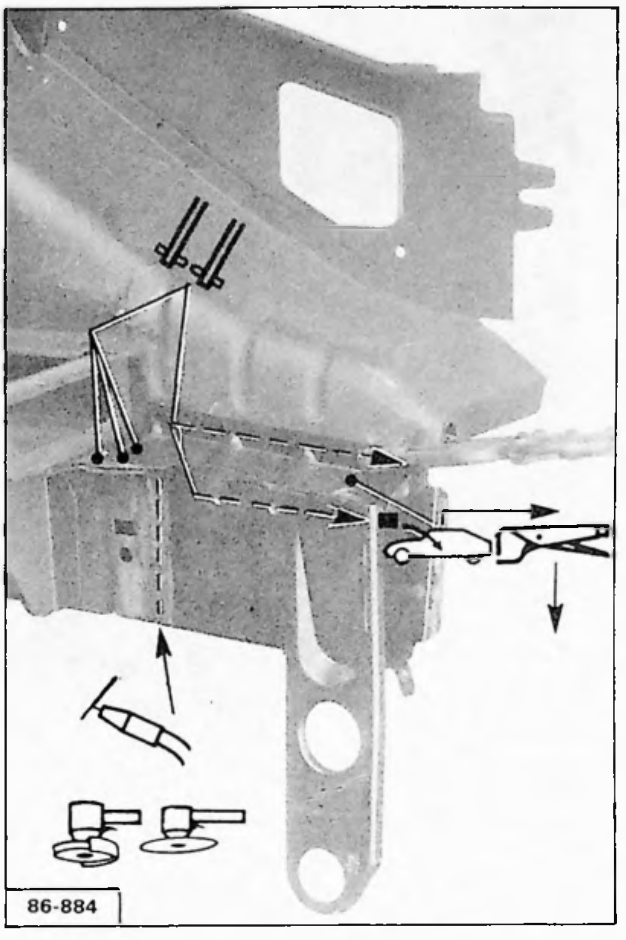
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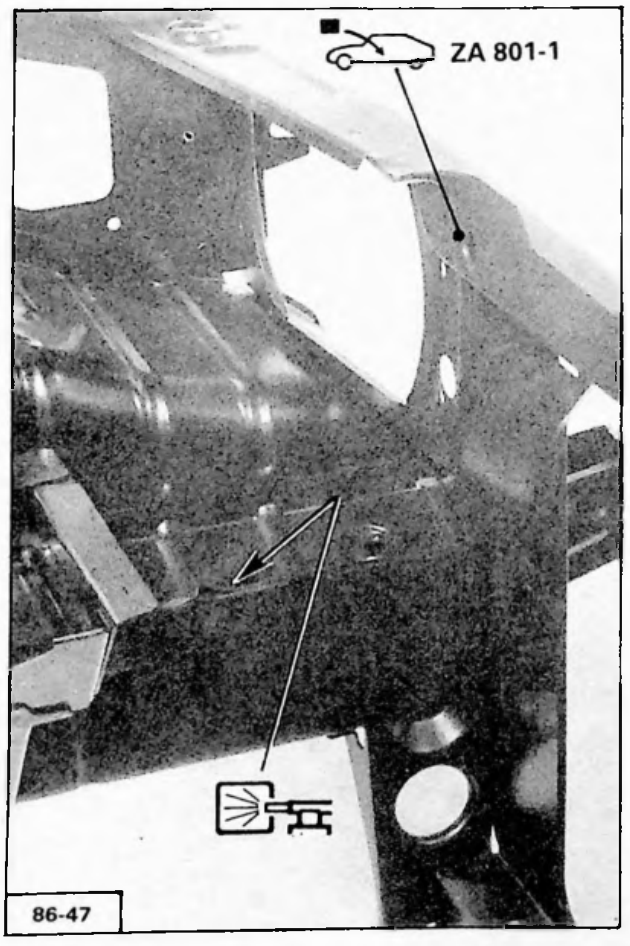
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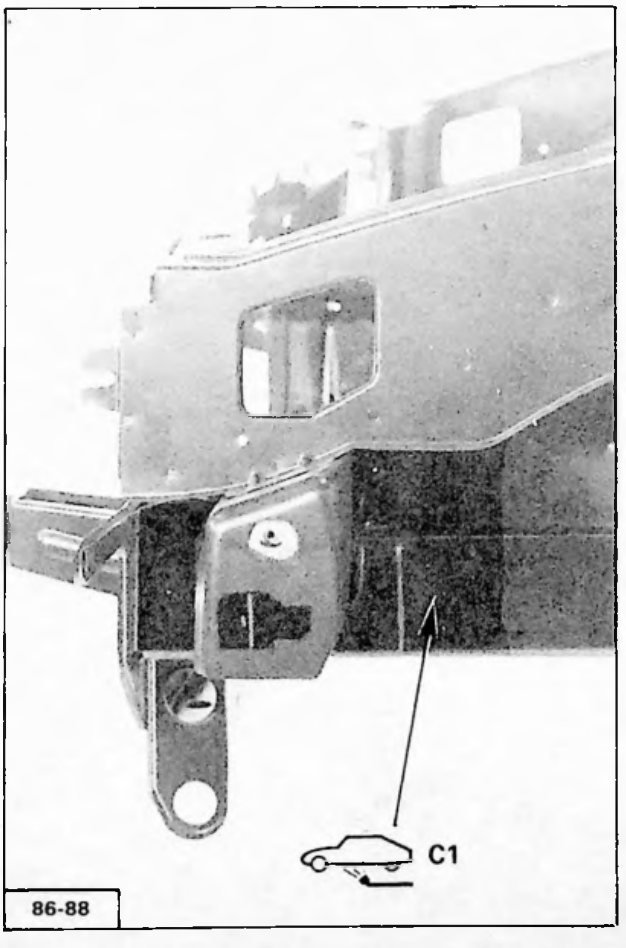
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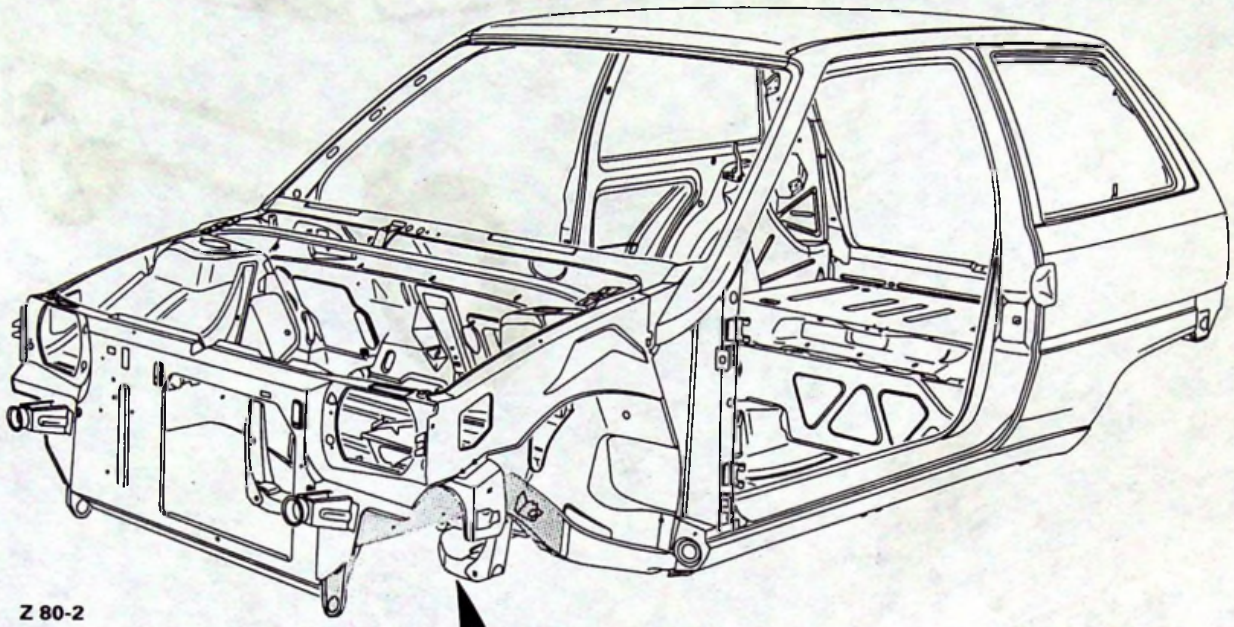

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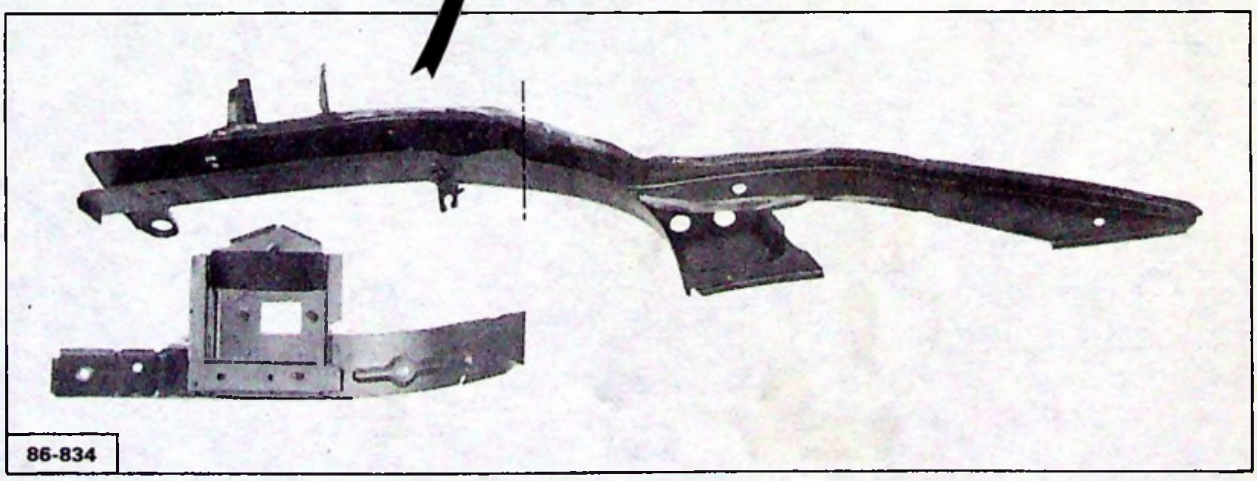

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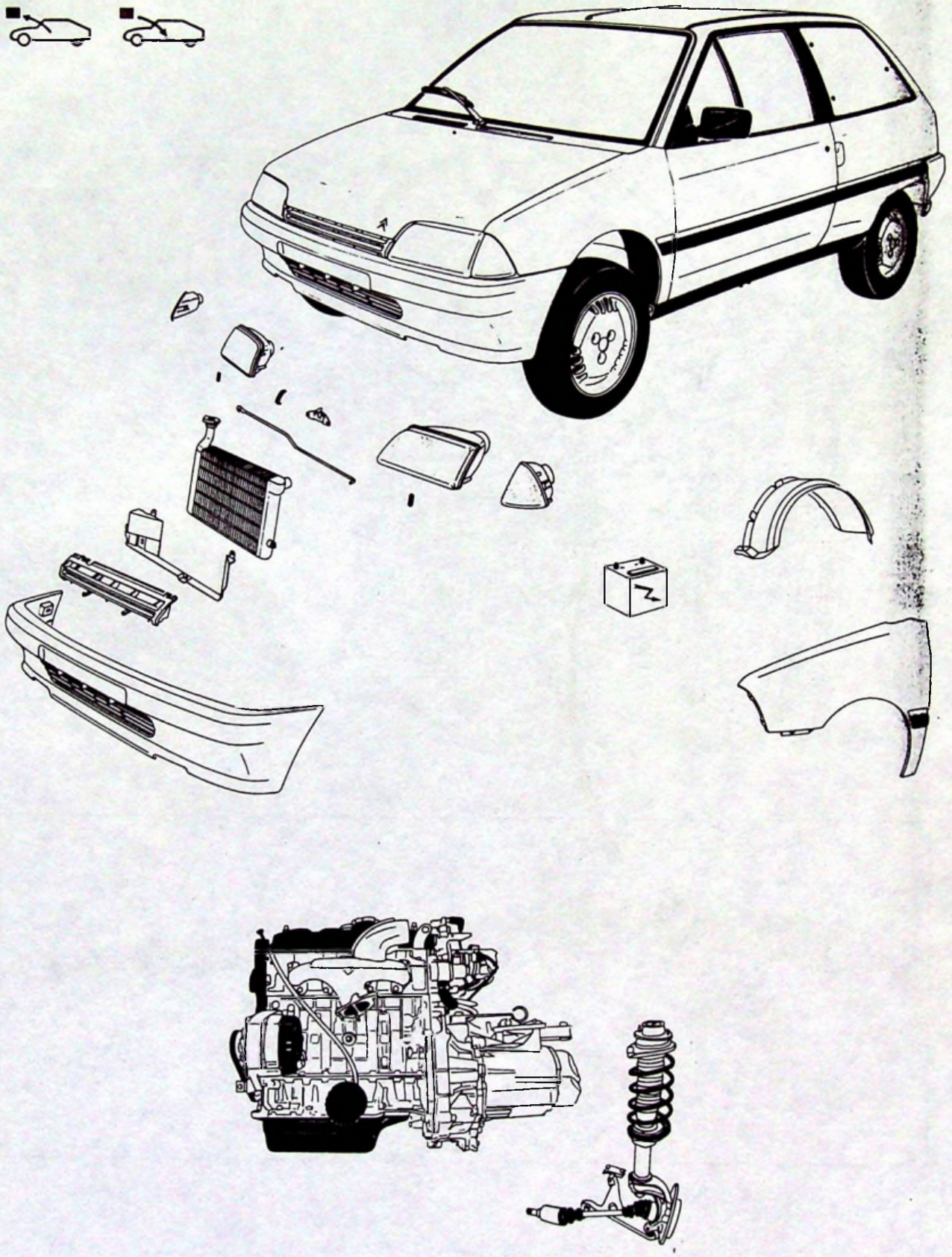

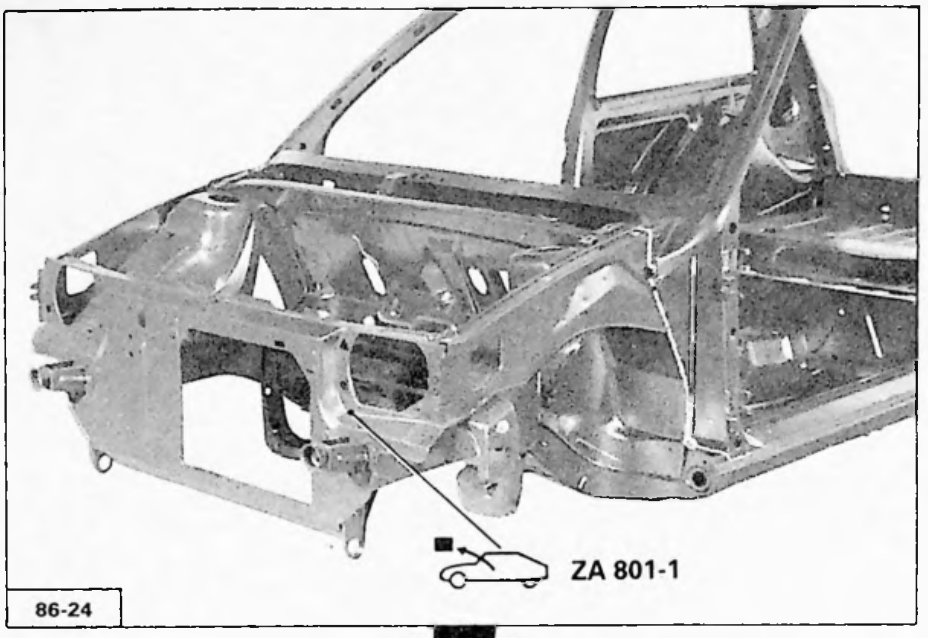
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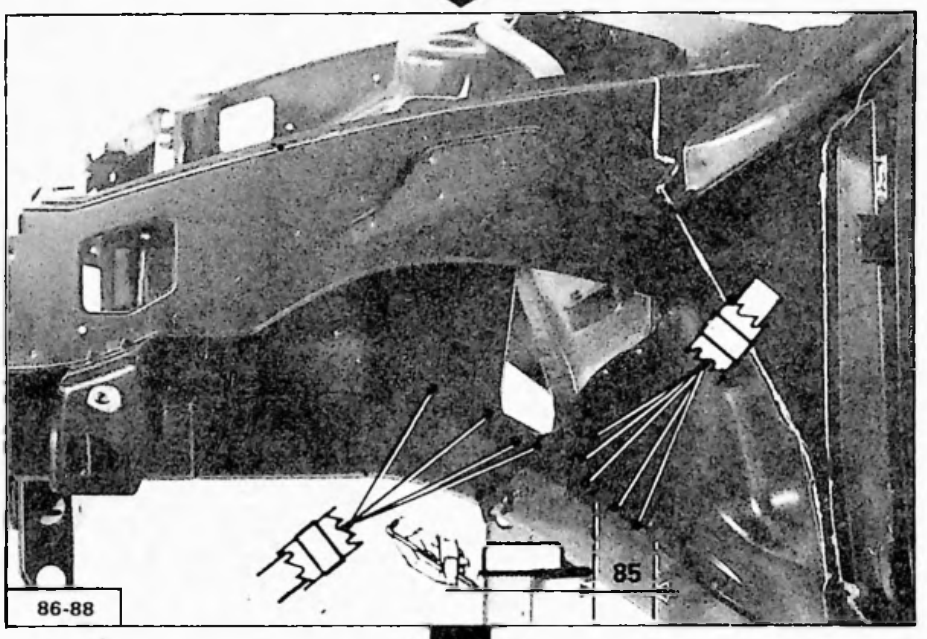
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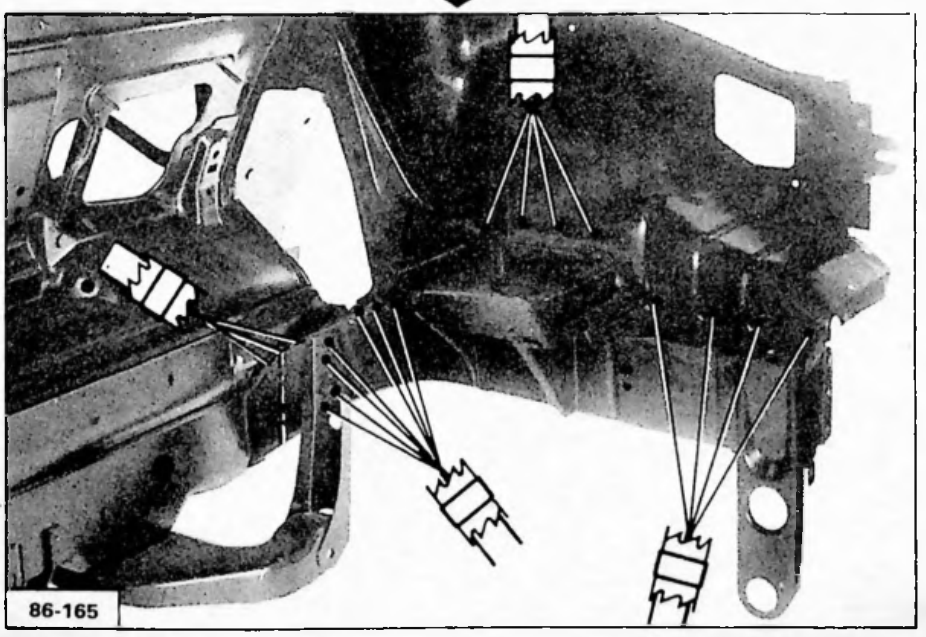
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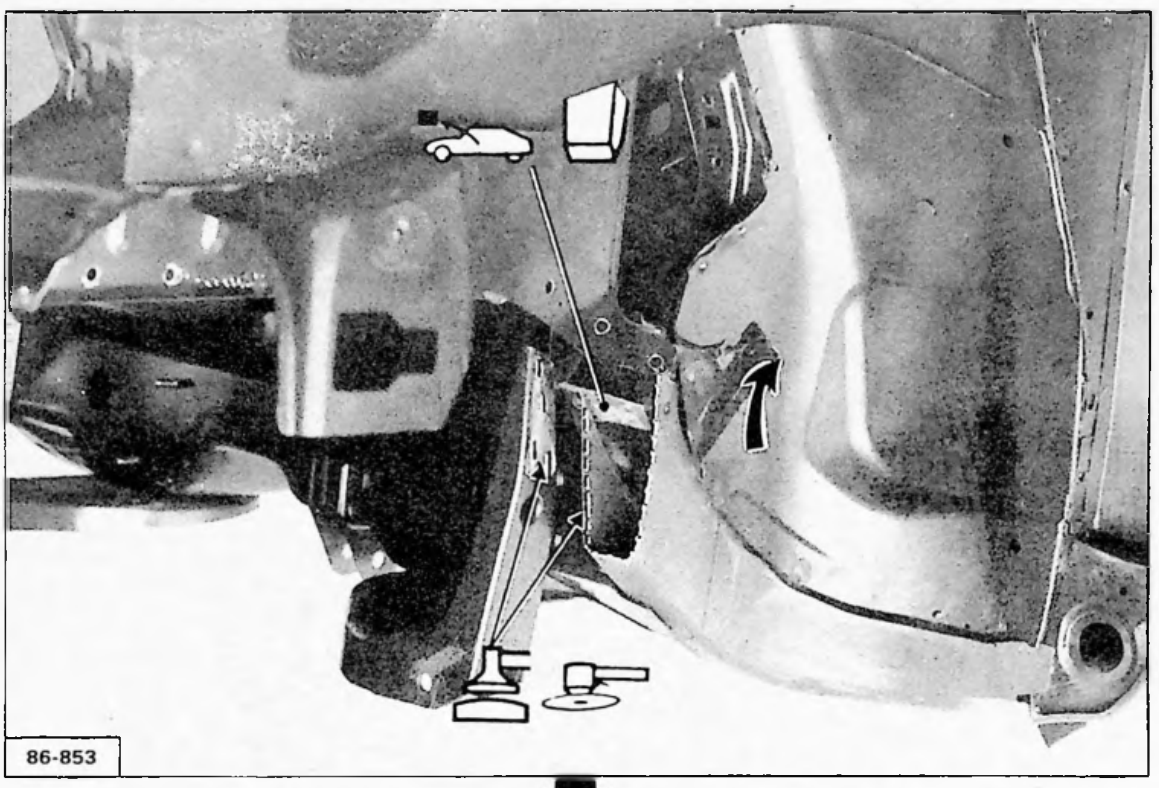
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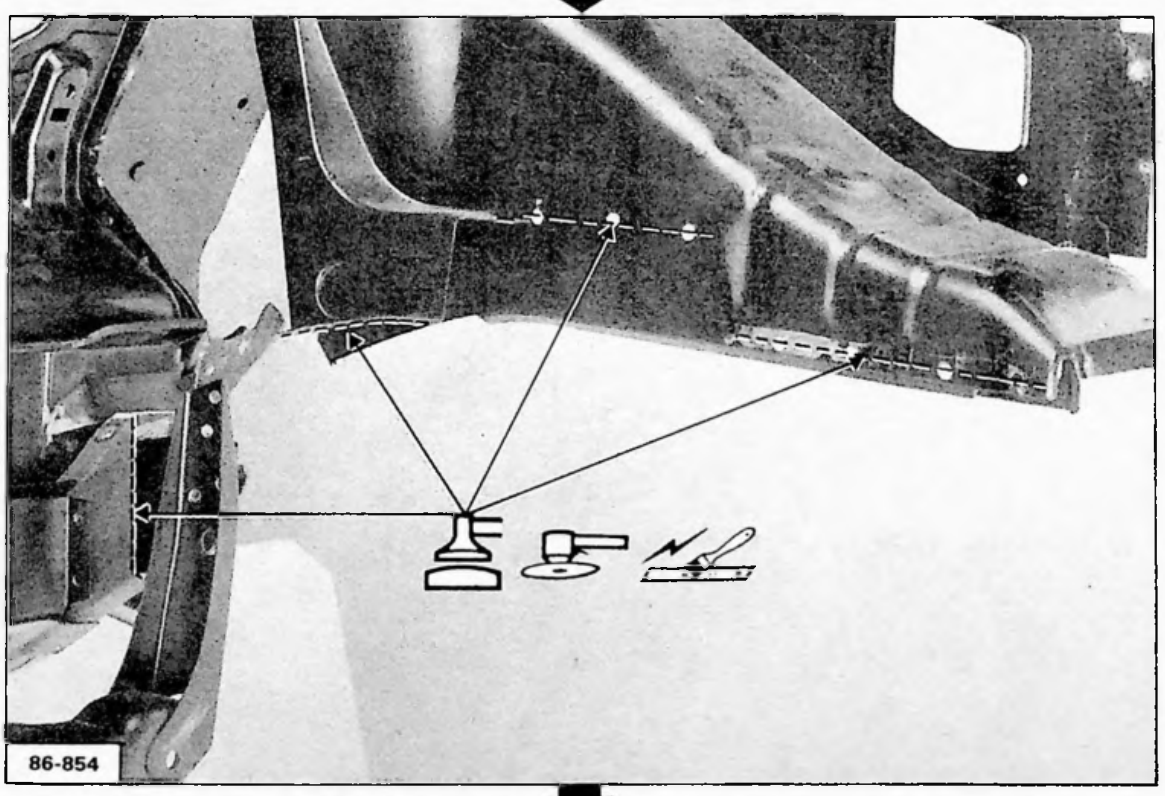
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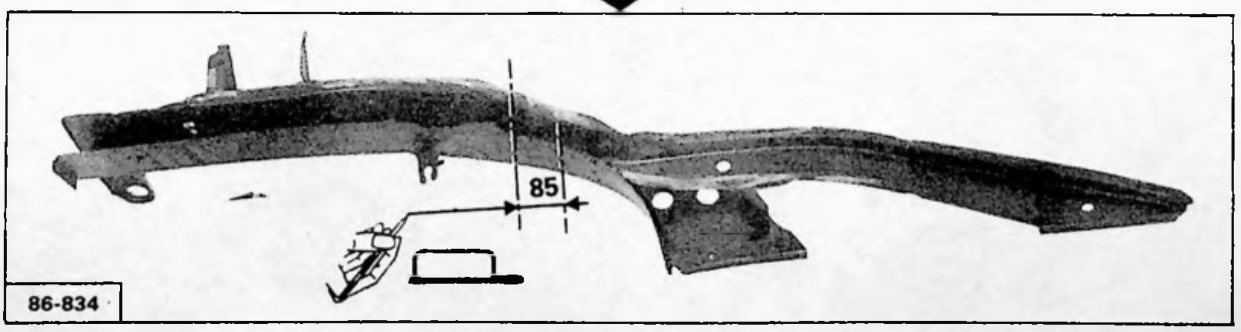
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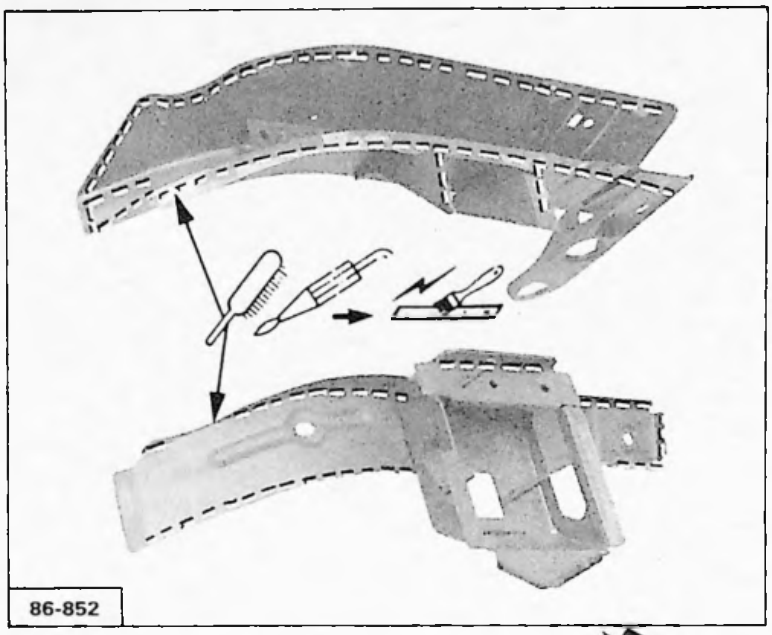
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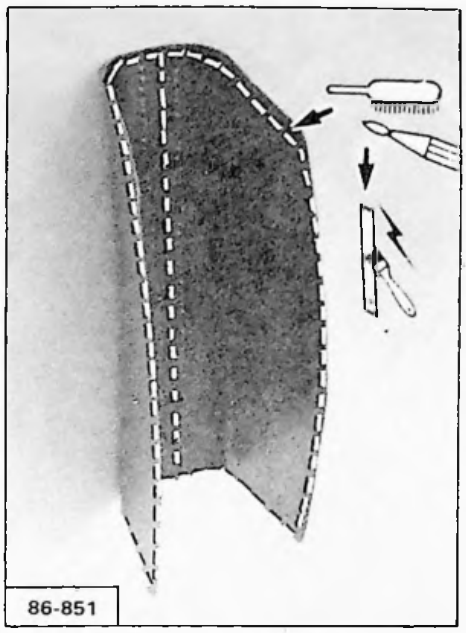
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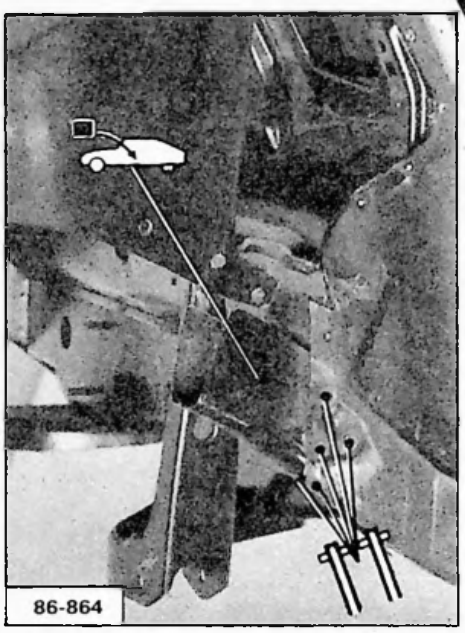
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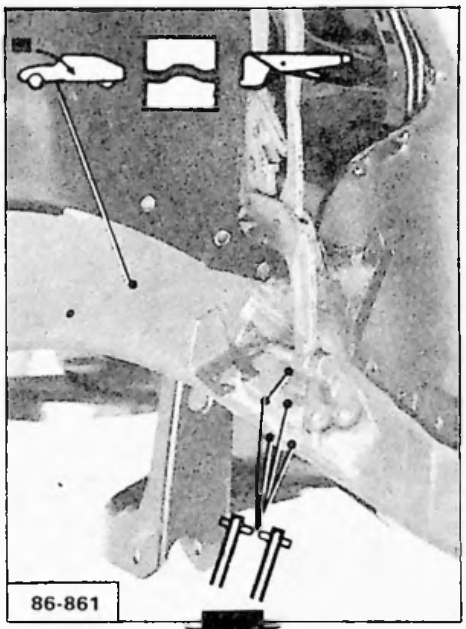
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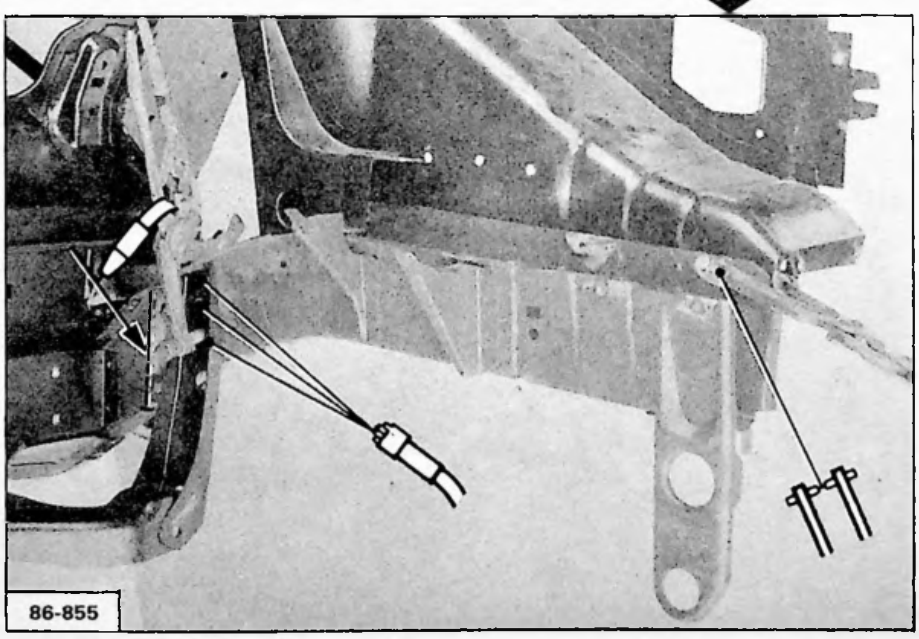
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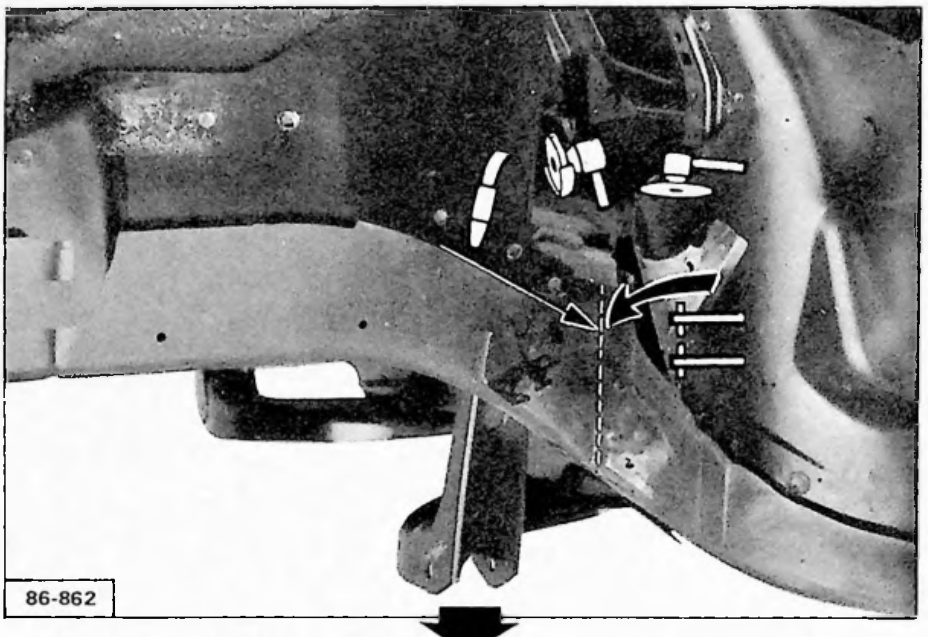
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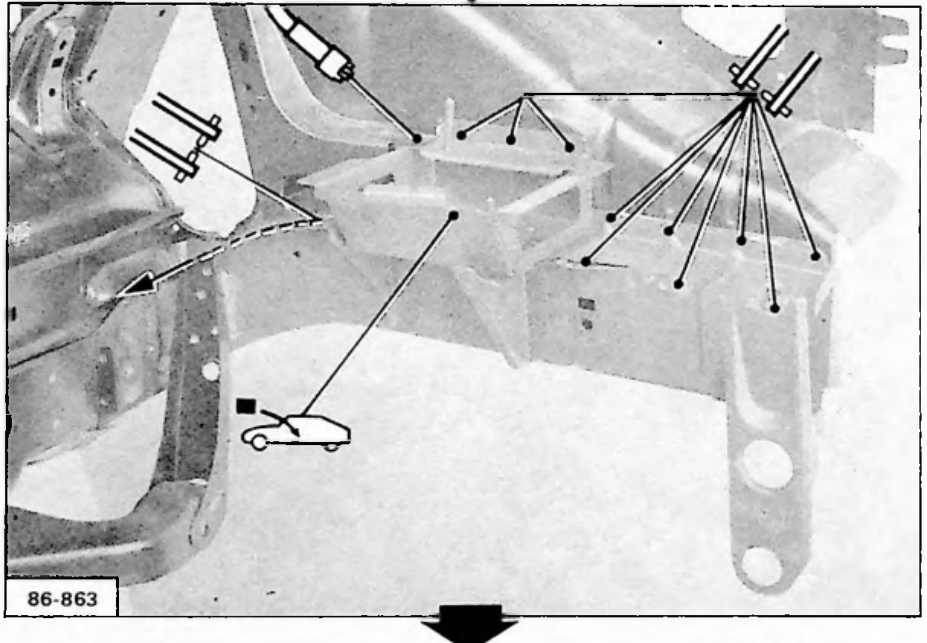
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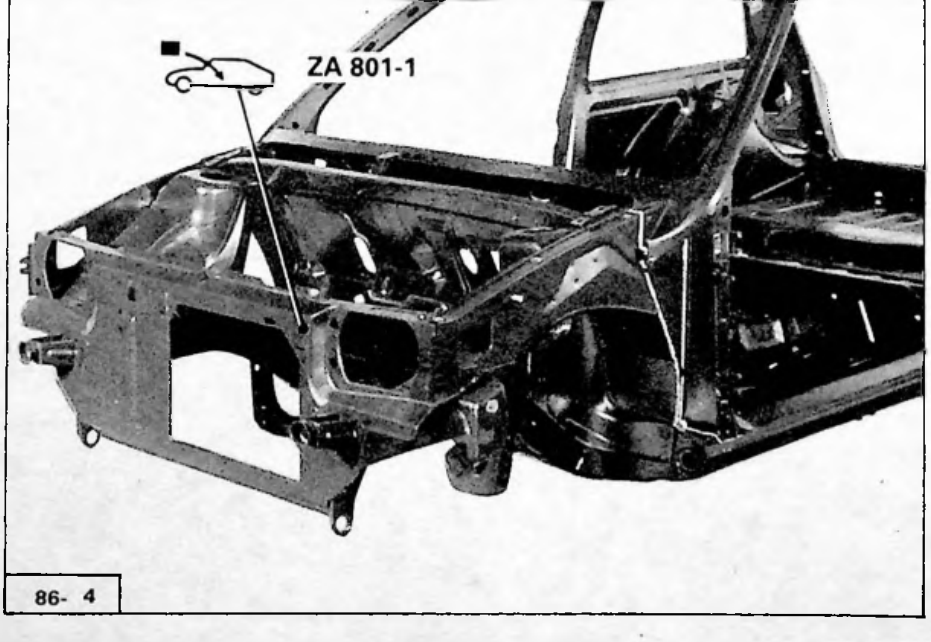
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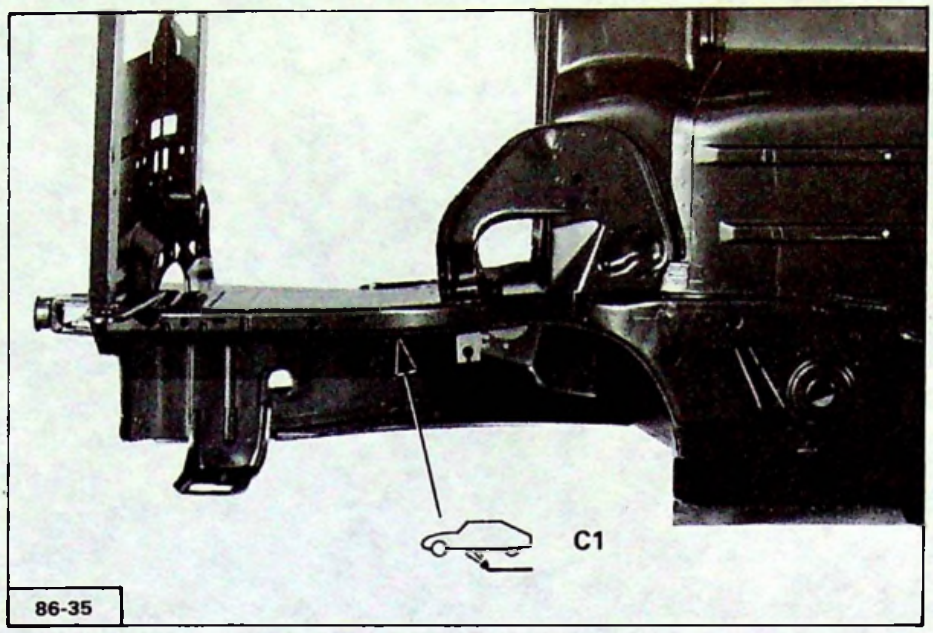
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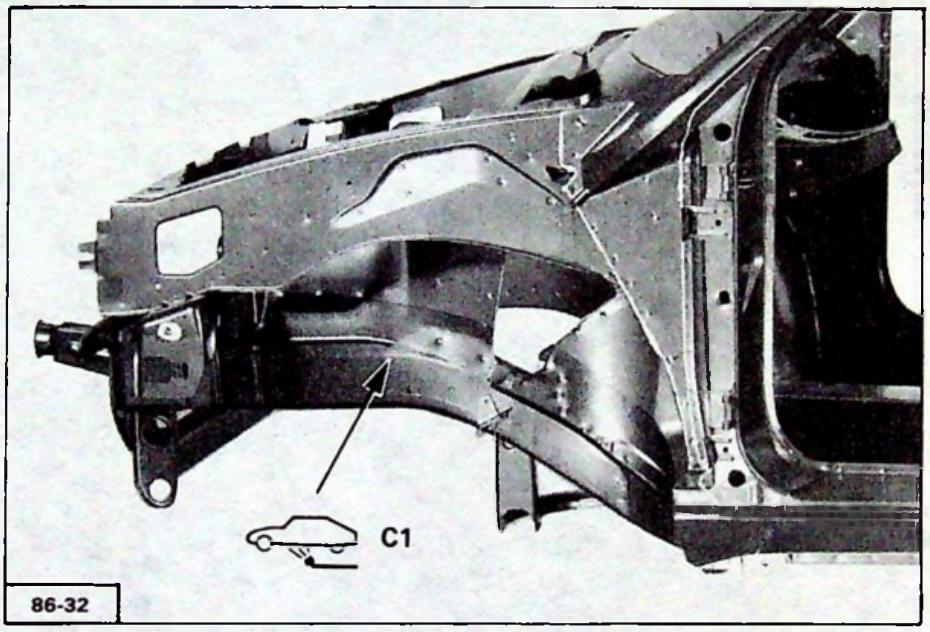
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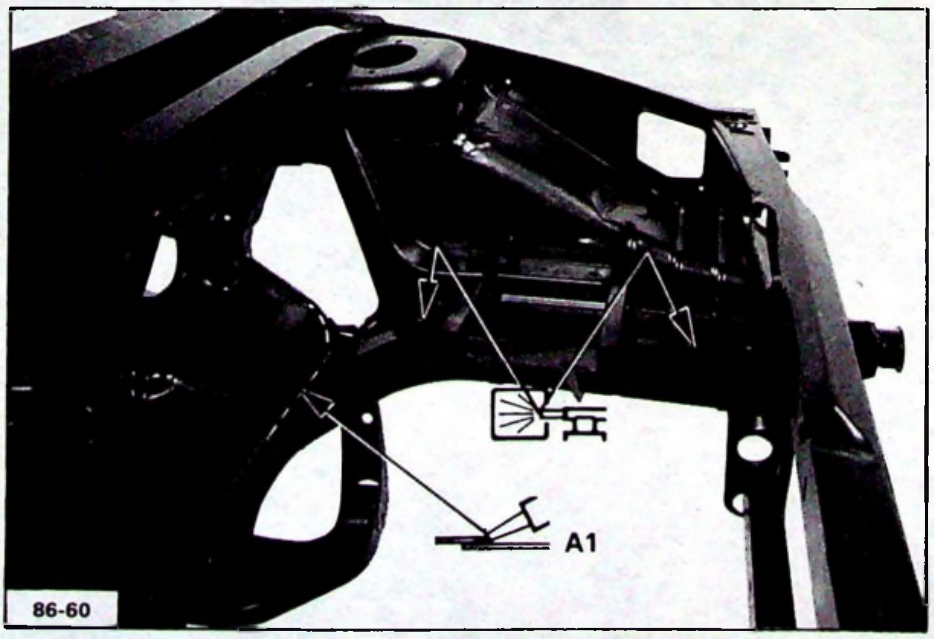
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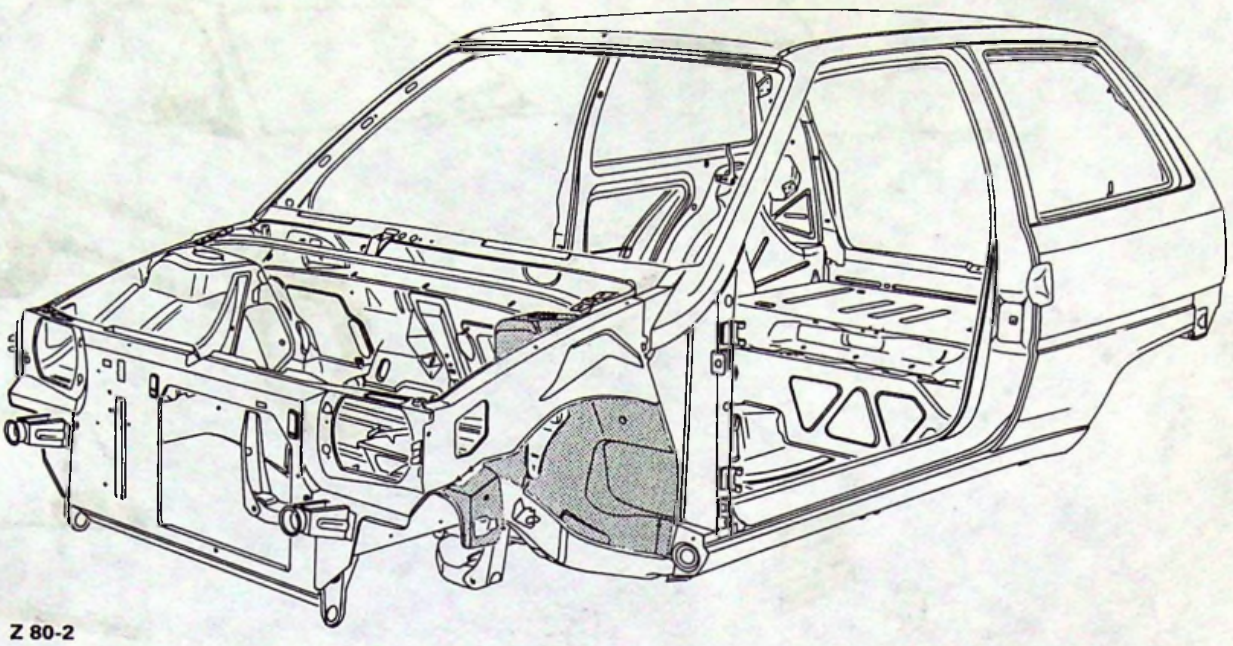

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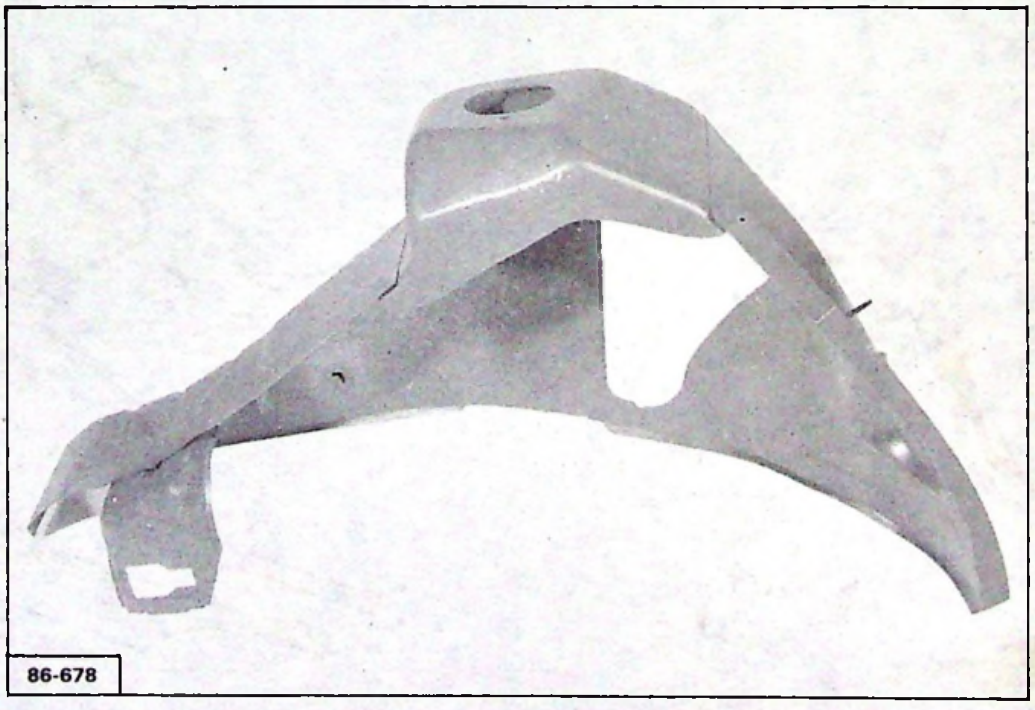

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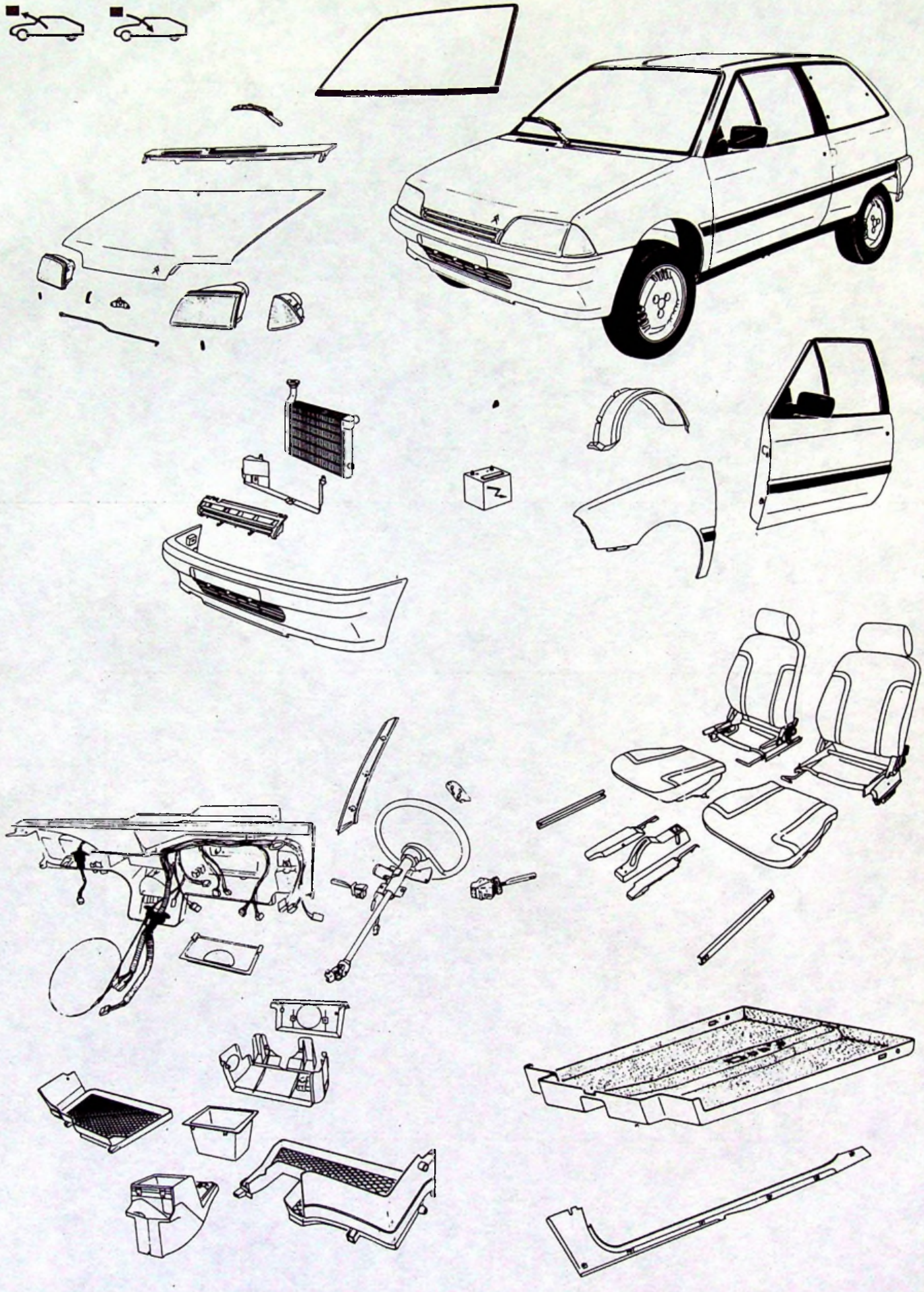

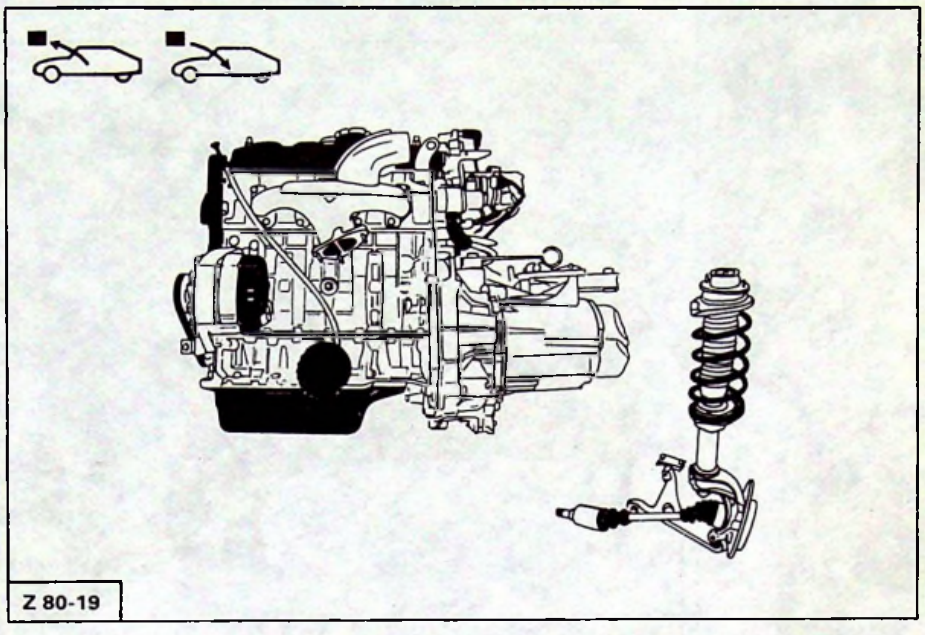
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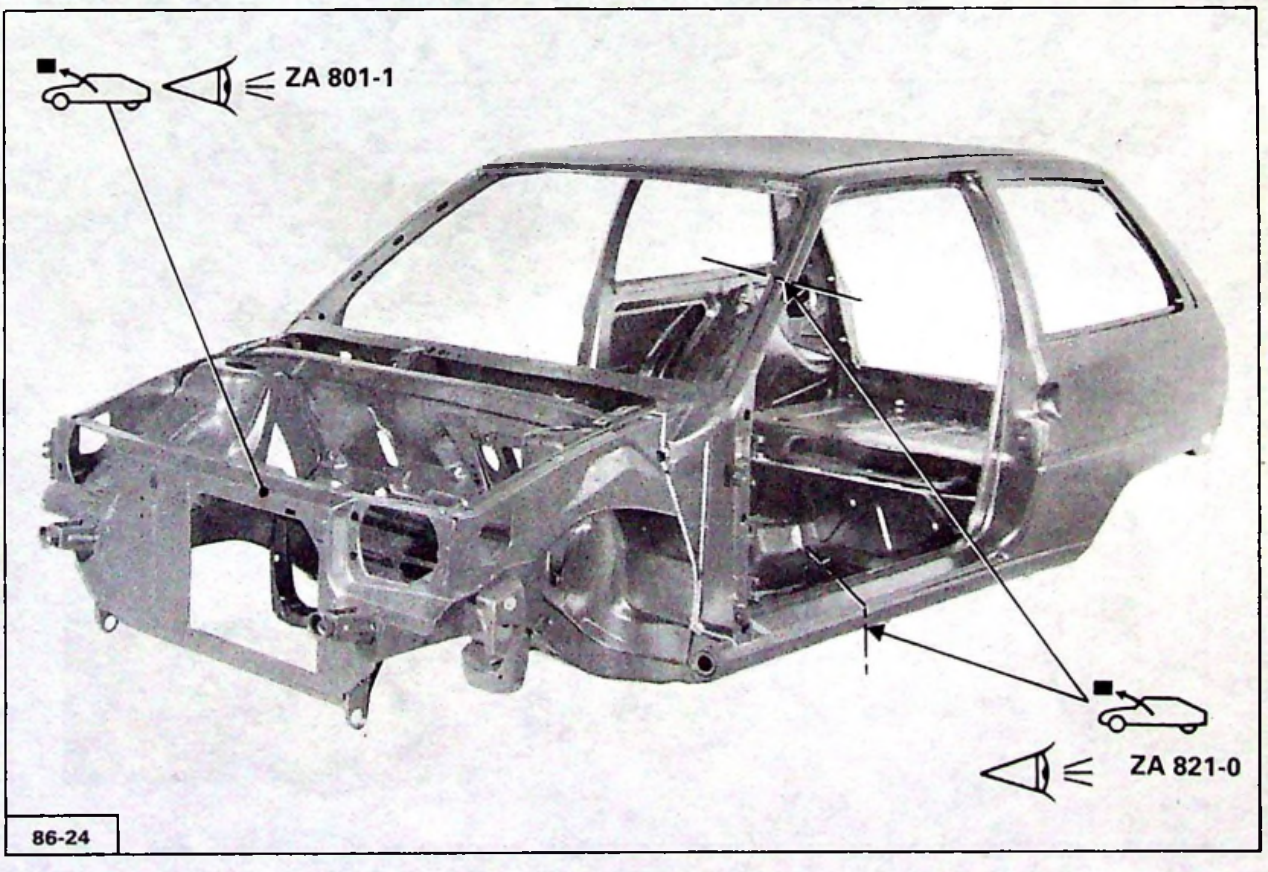
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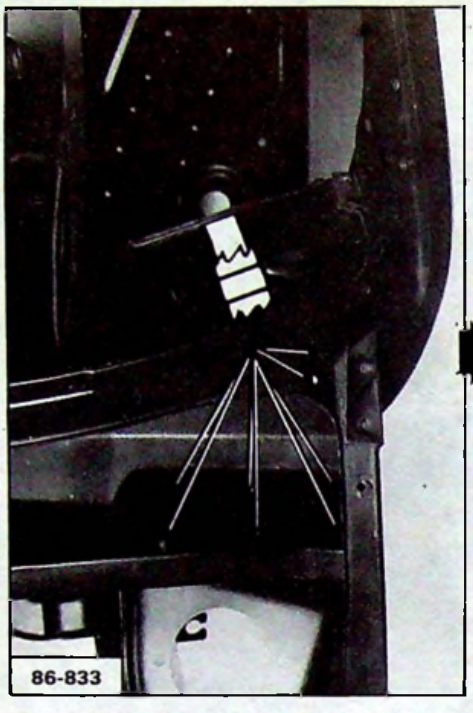
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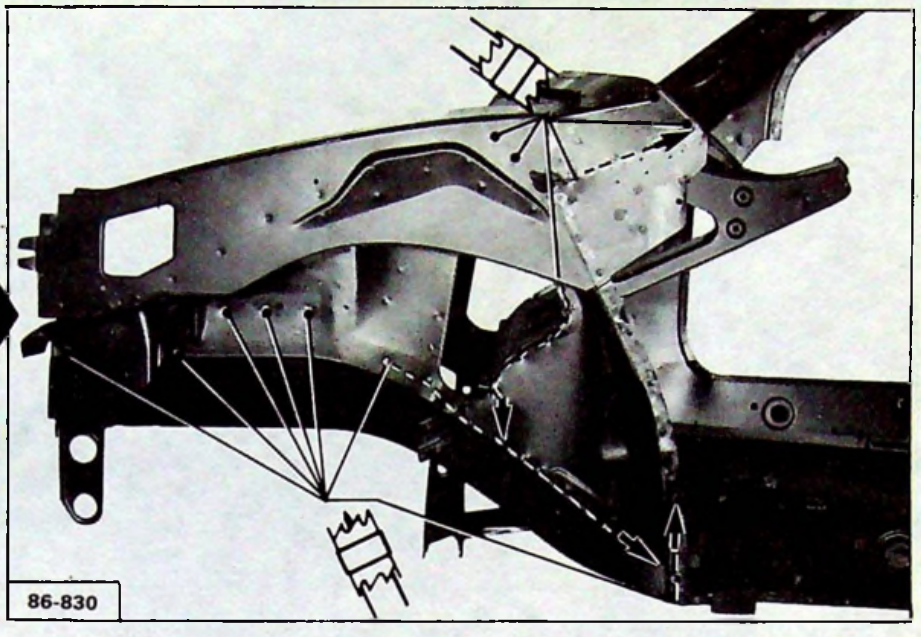
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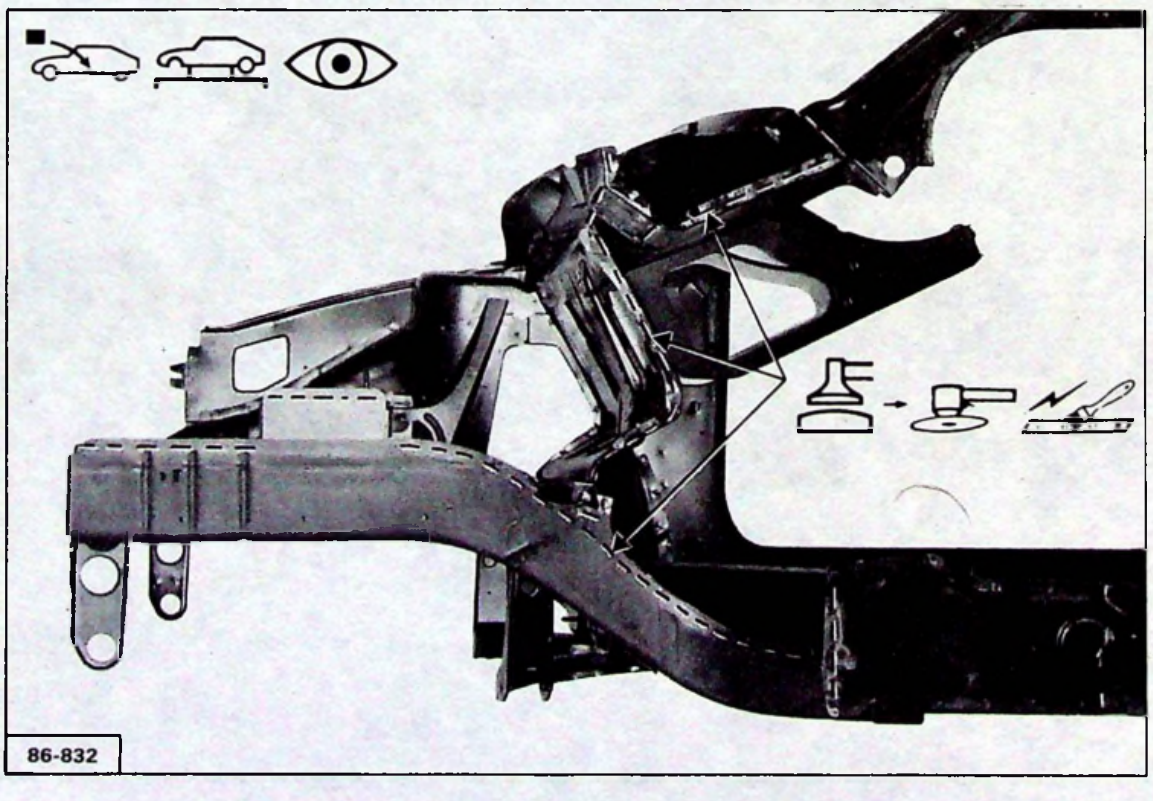
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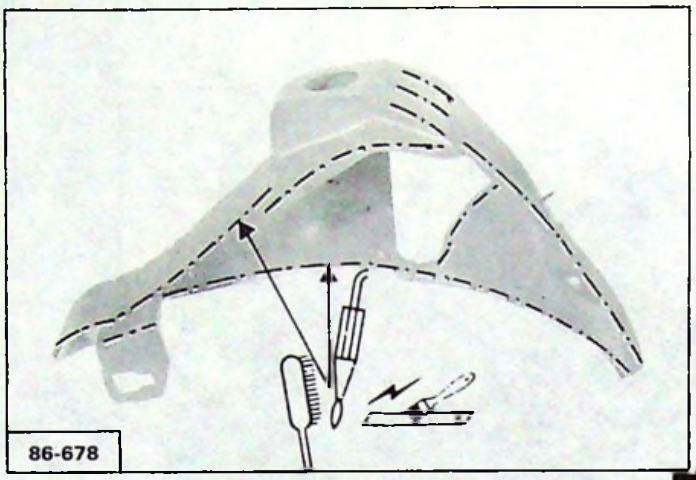
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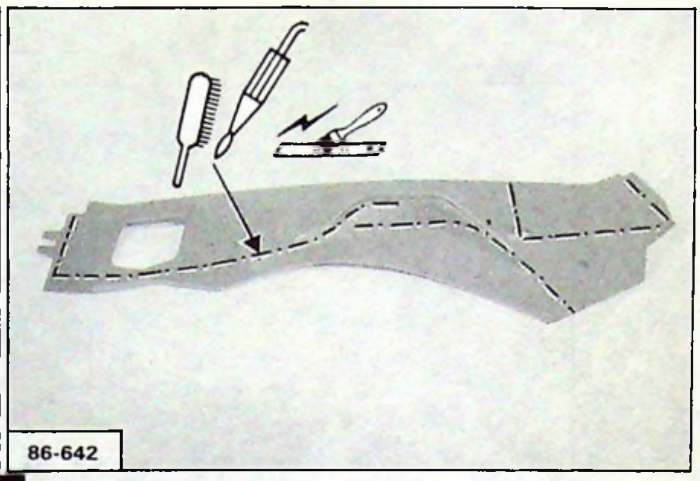
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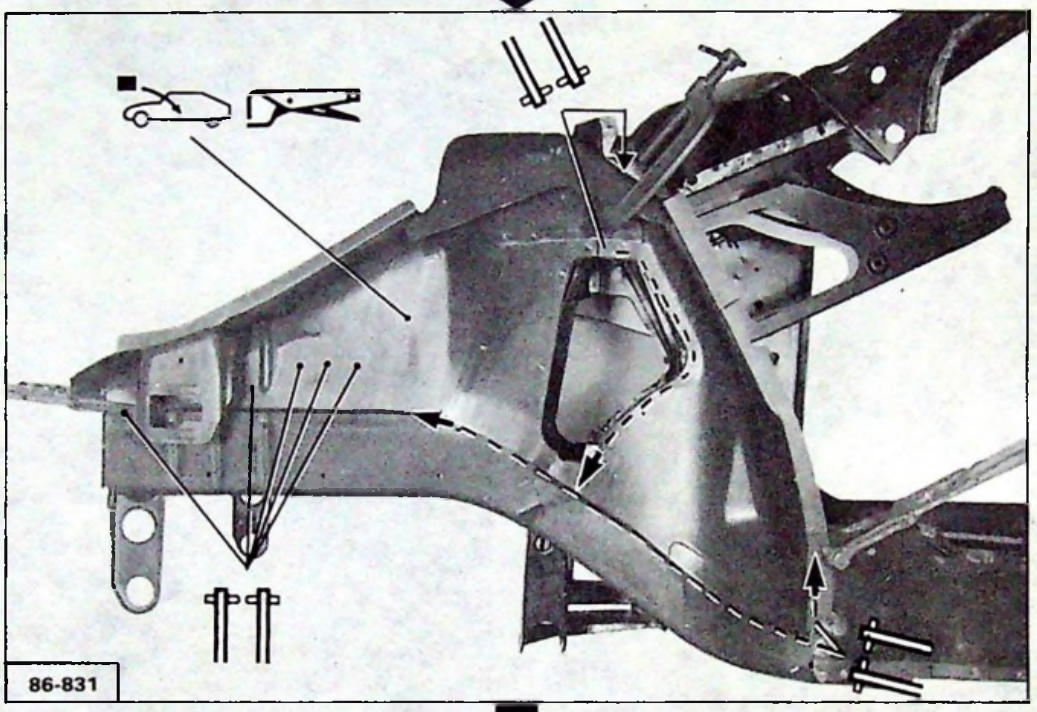
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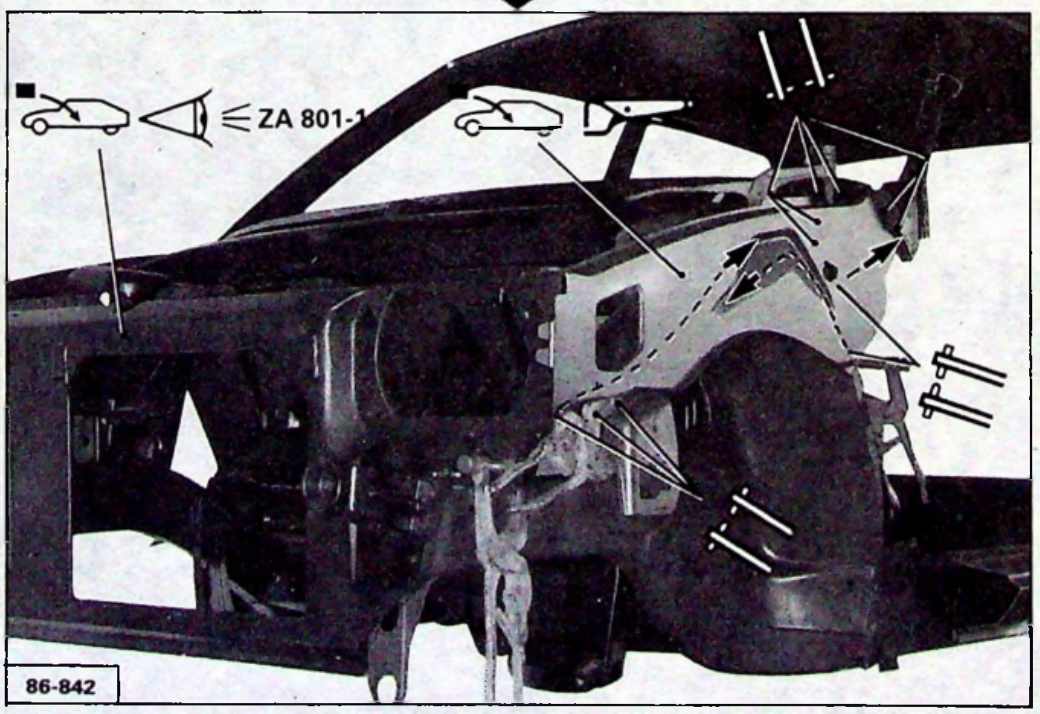
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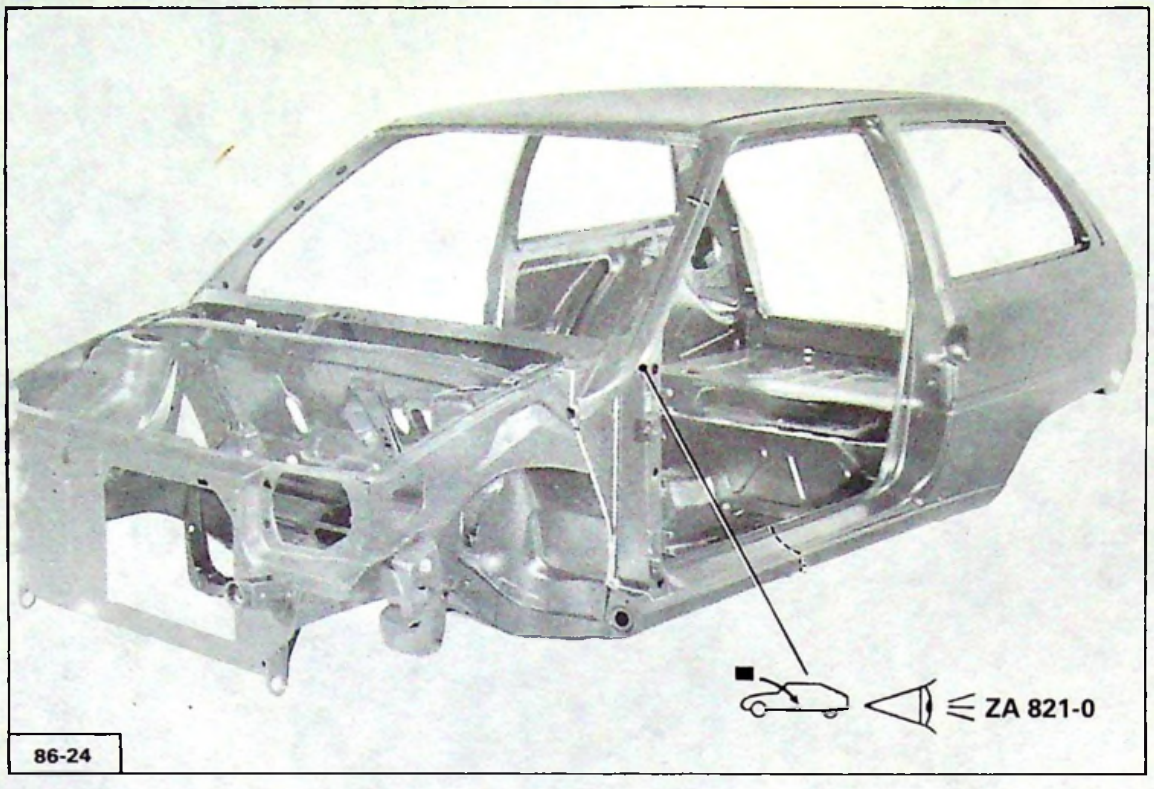
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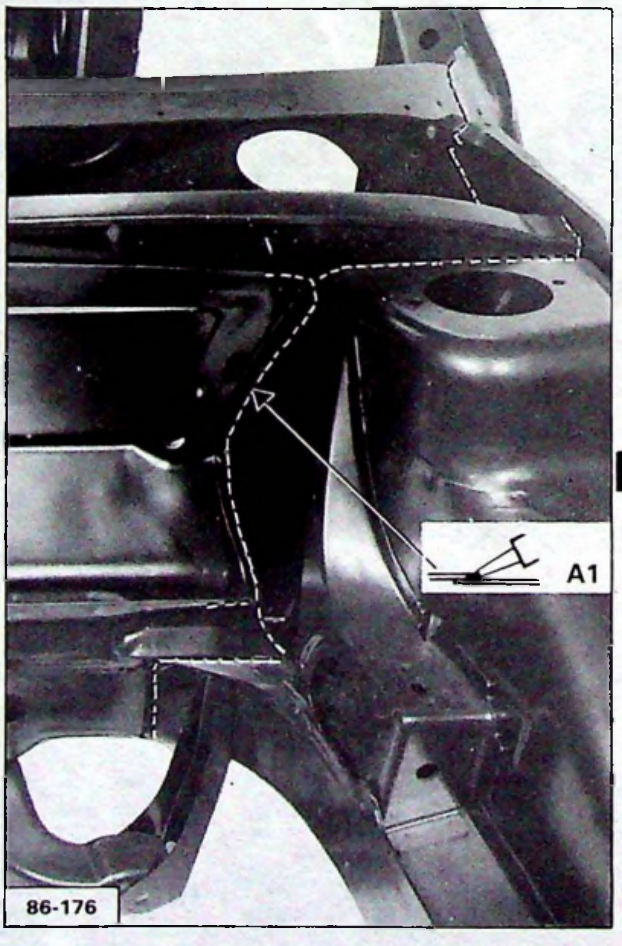
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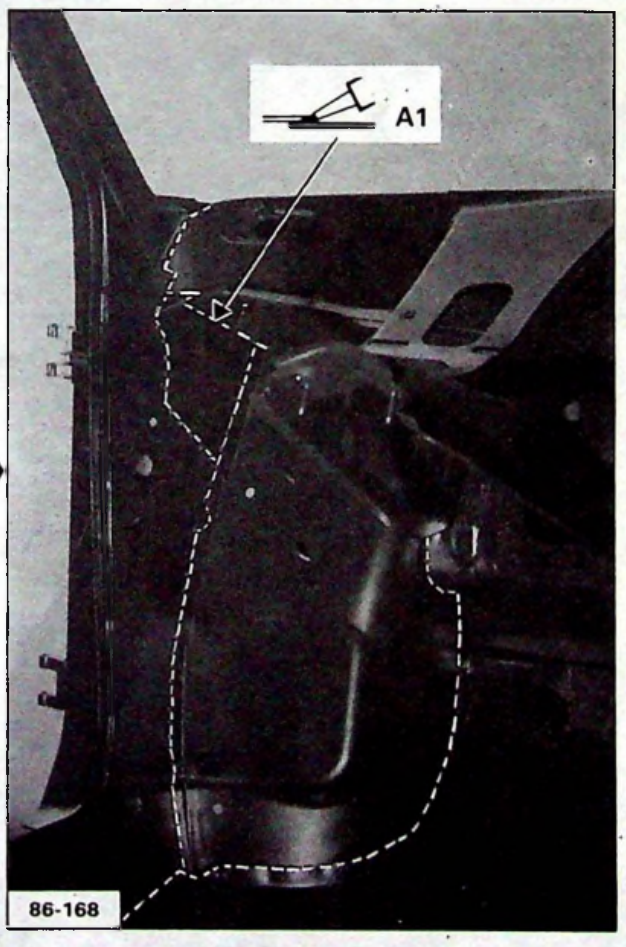
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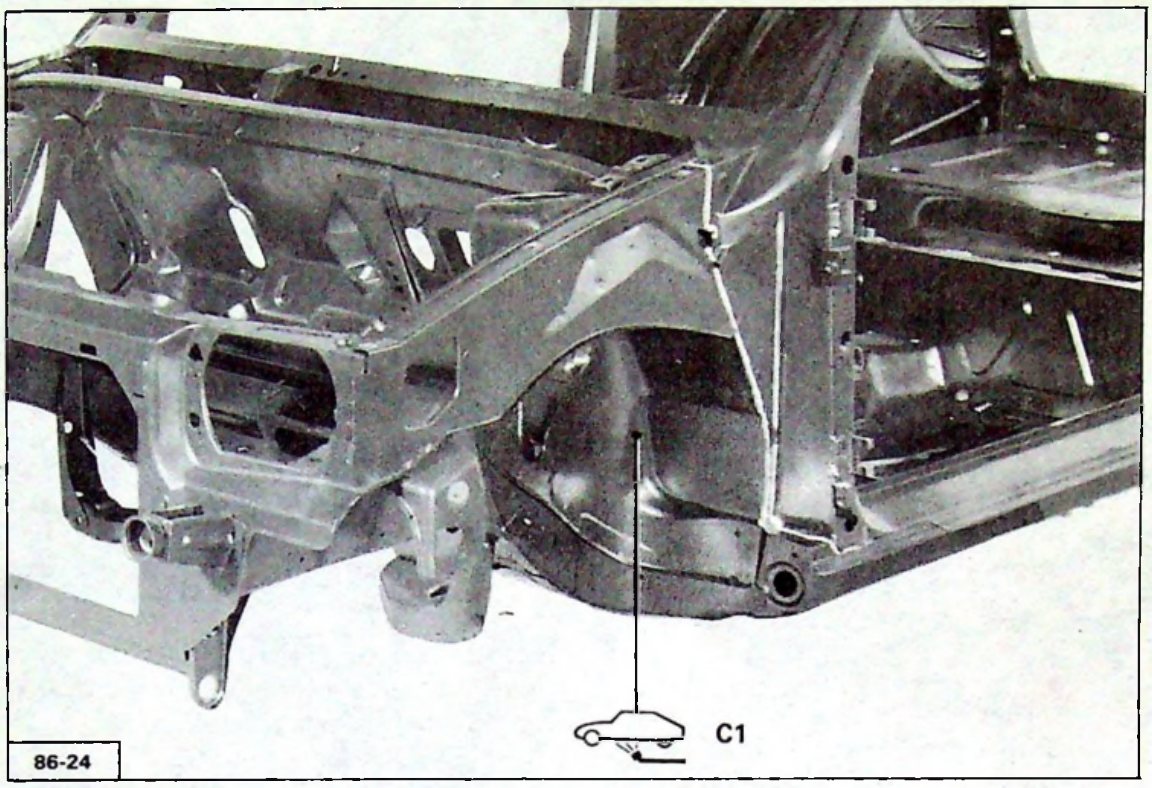
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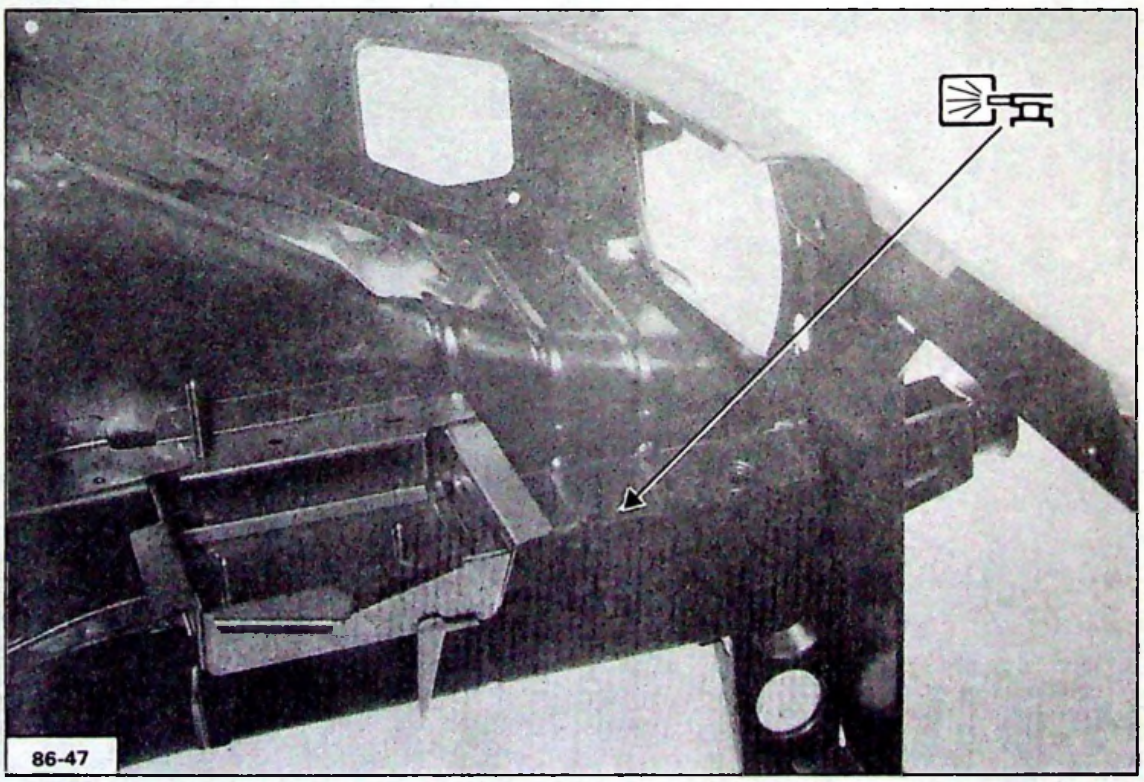
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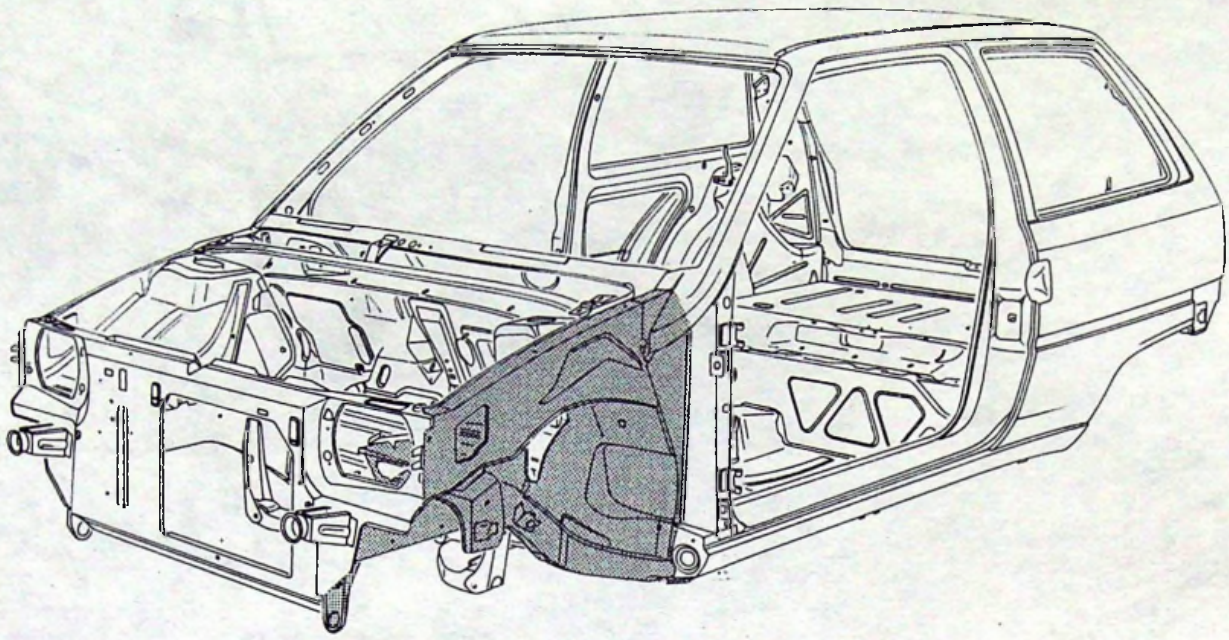
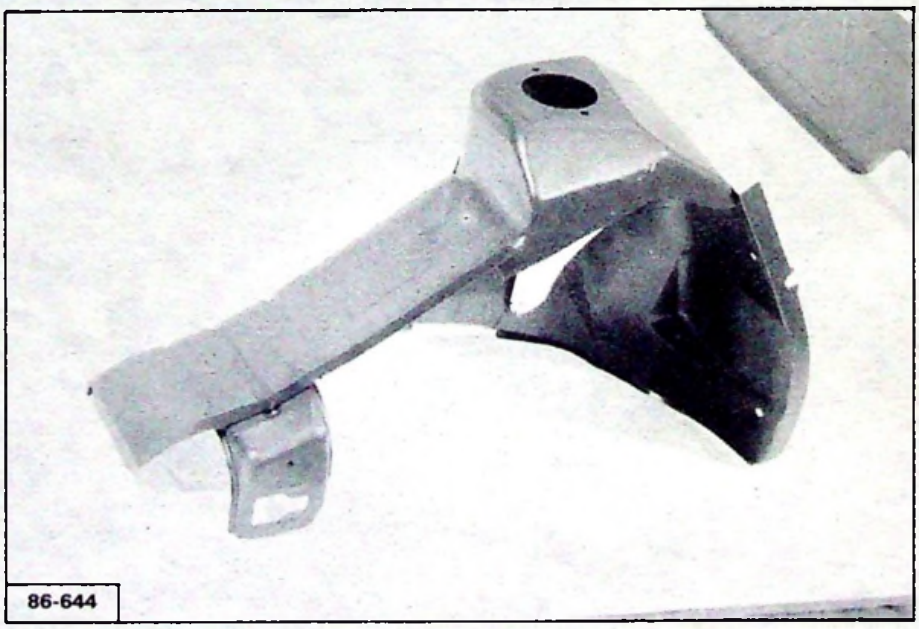


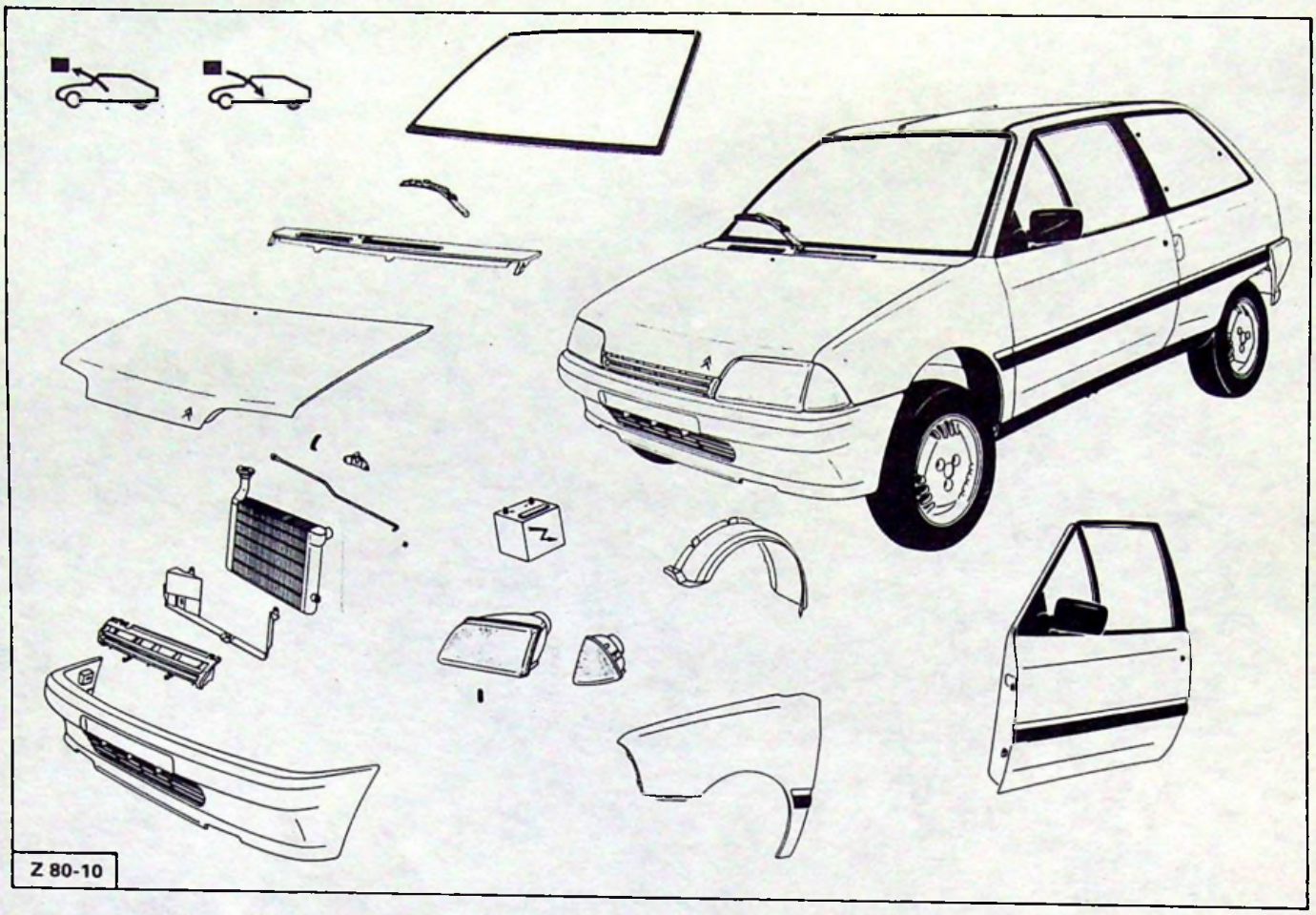
Z 80-2



86-644

86-835

86-642



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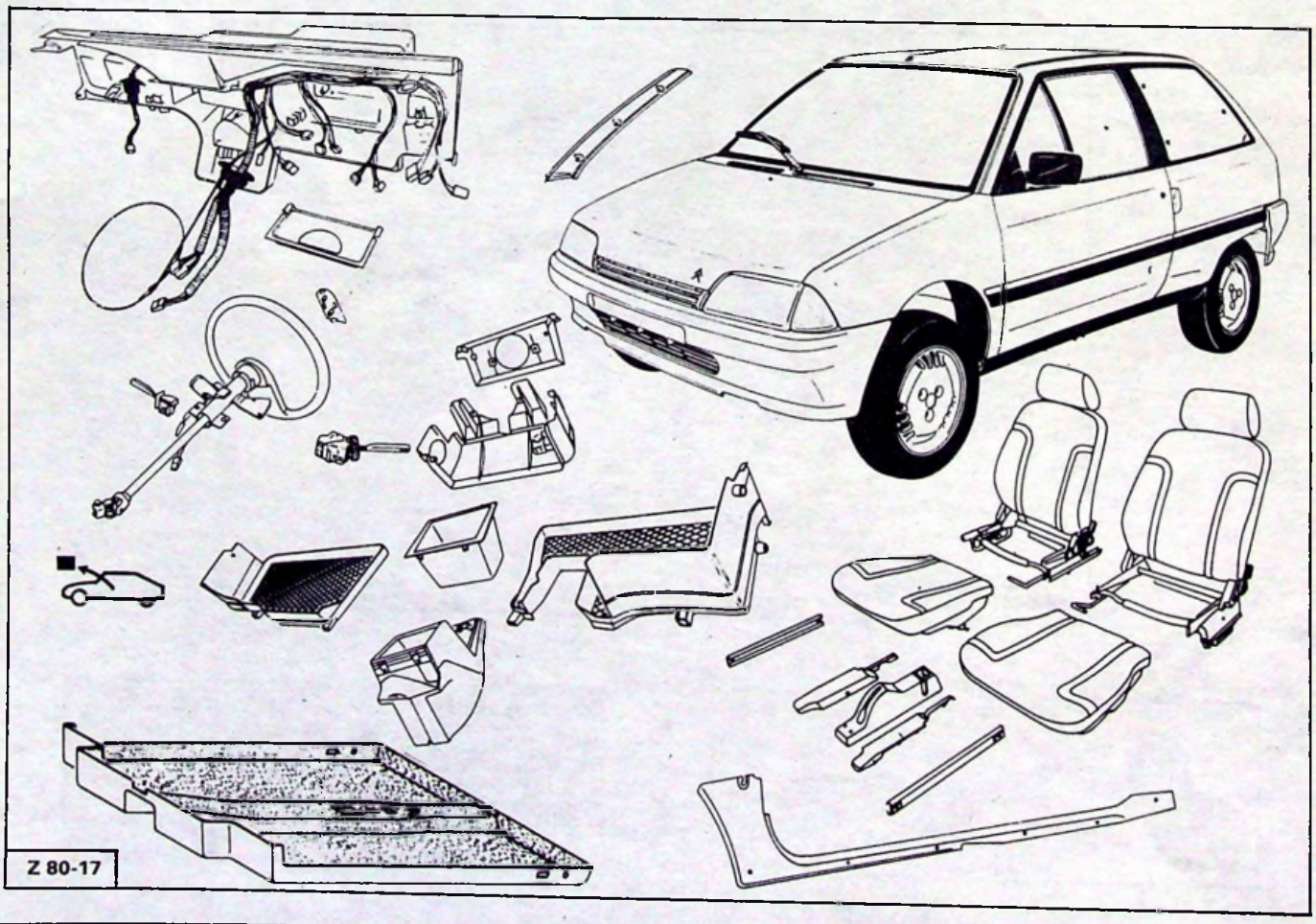

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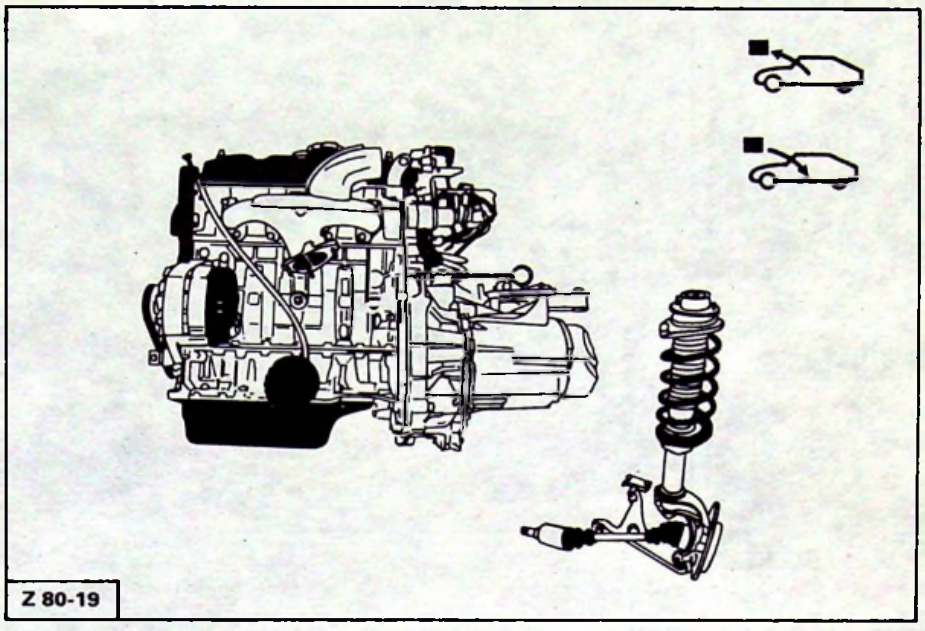

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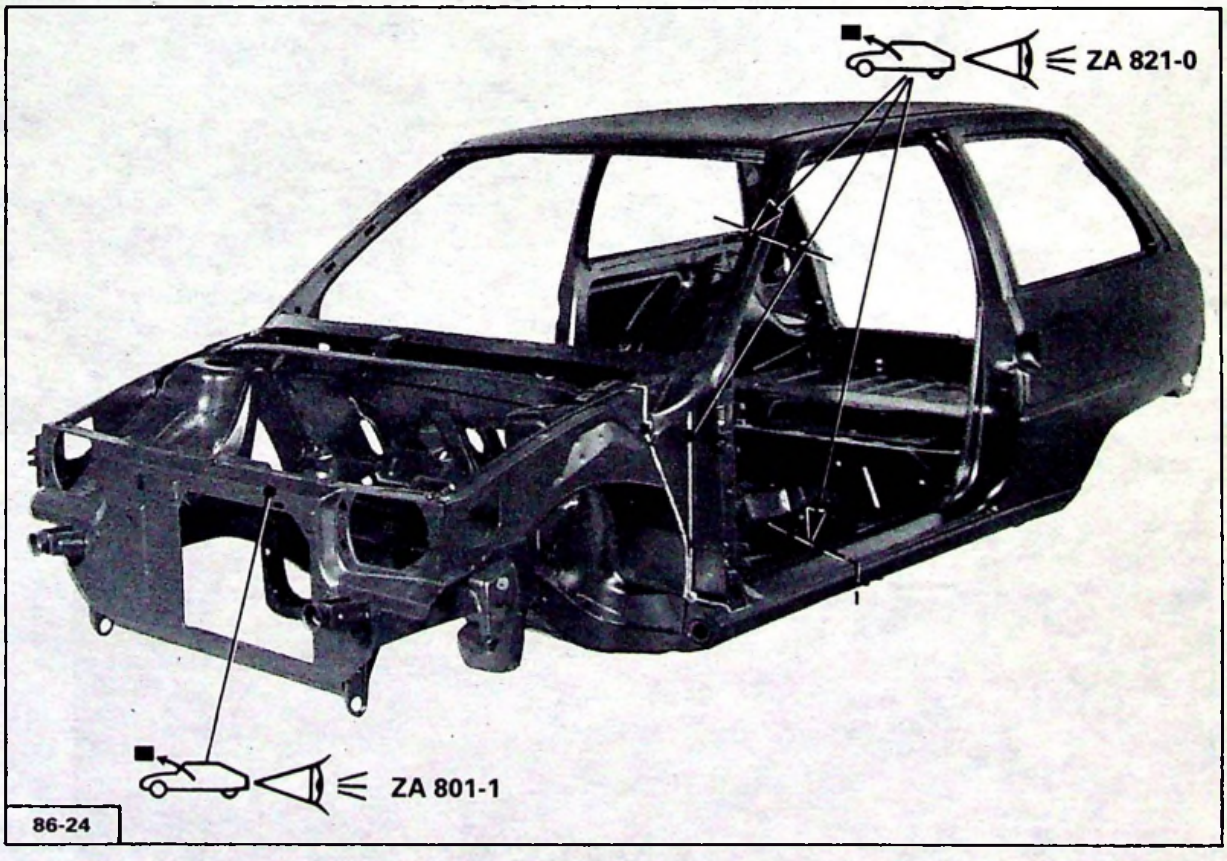

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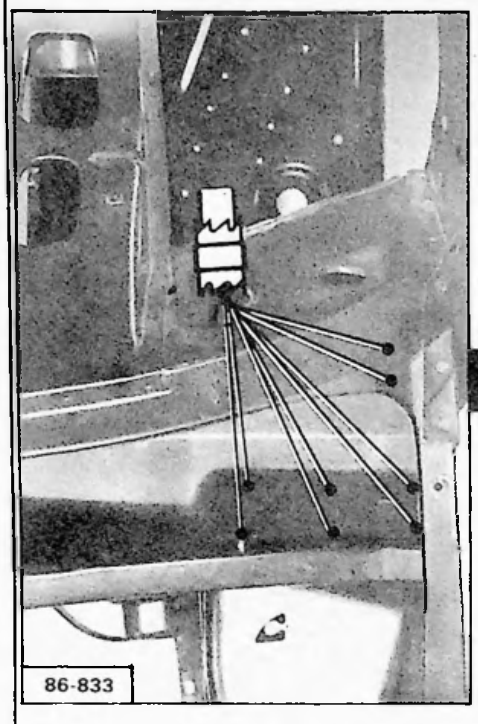
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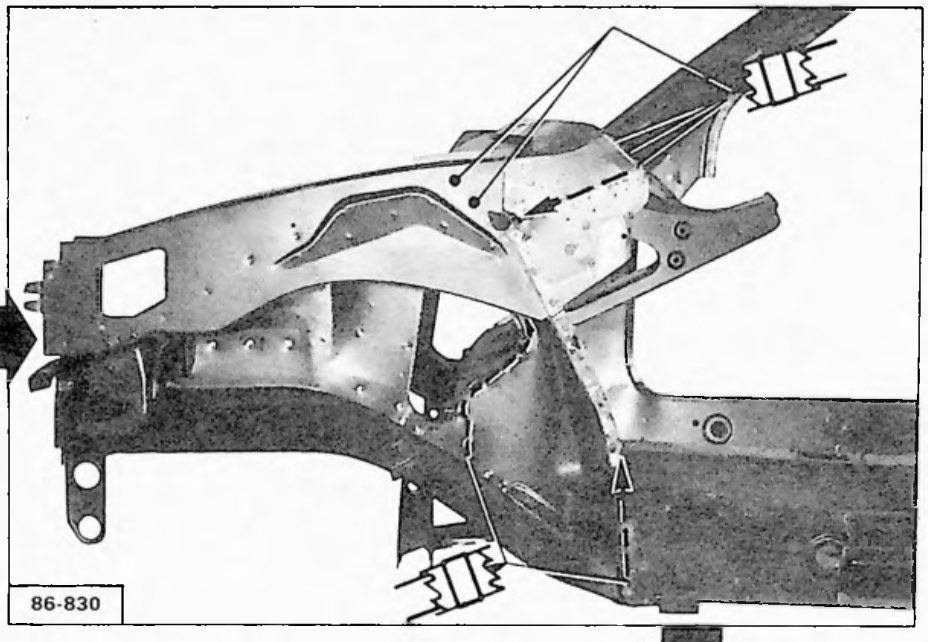
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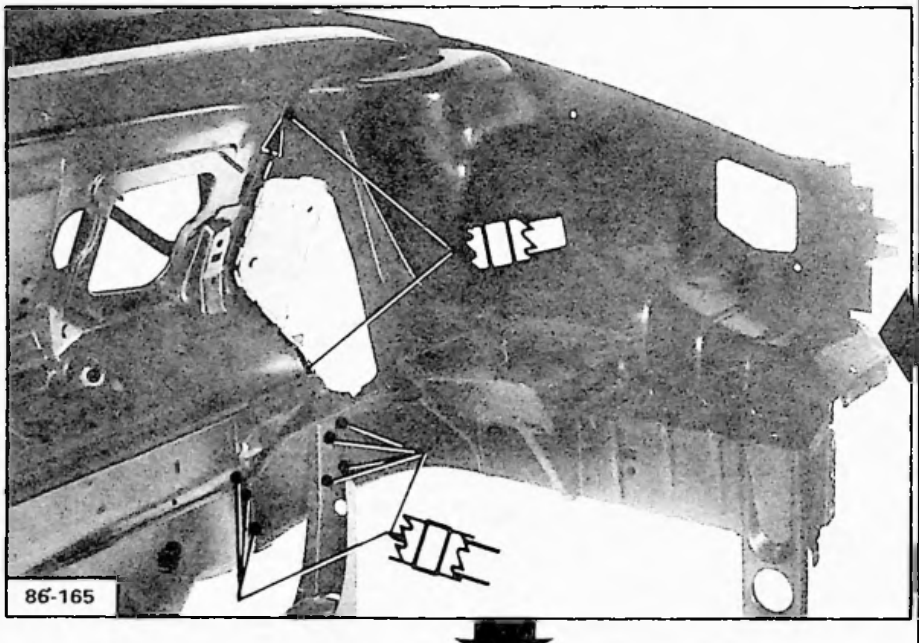
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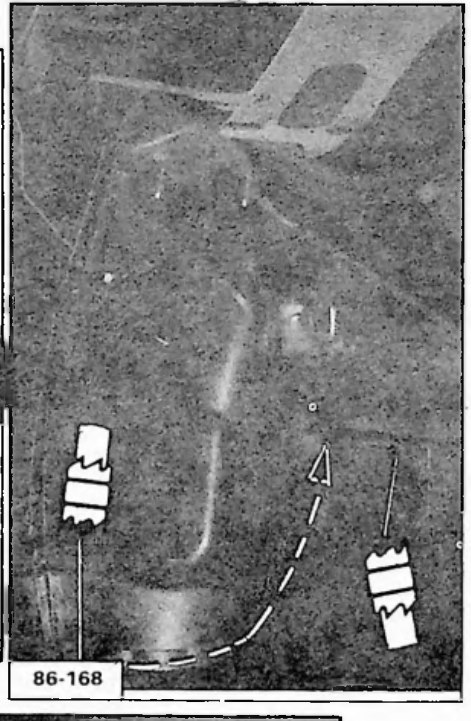
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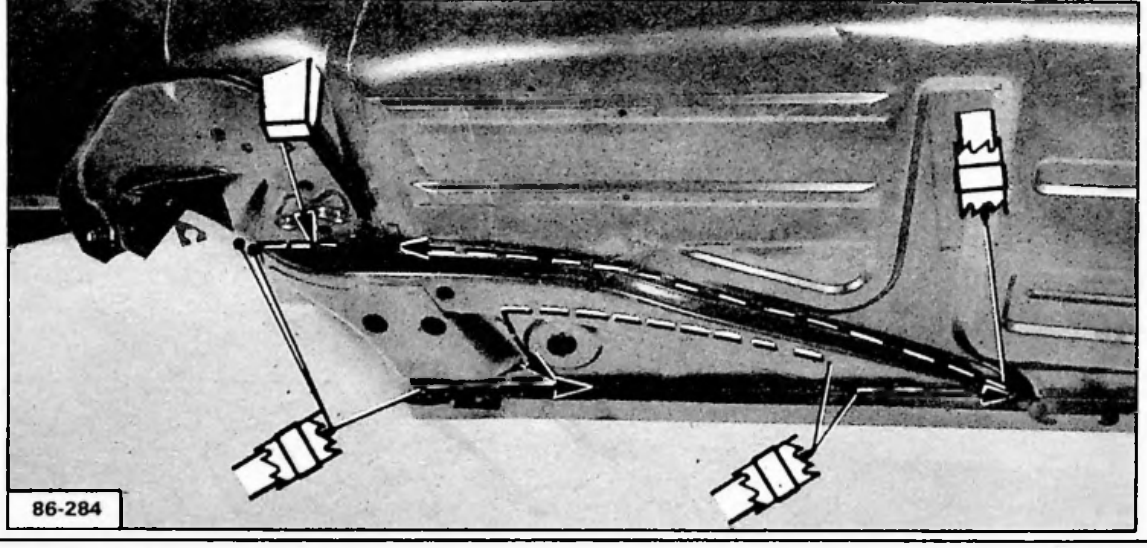
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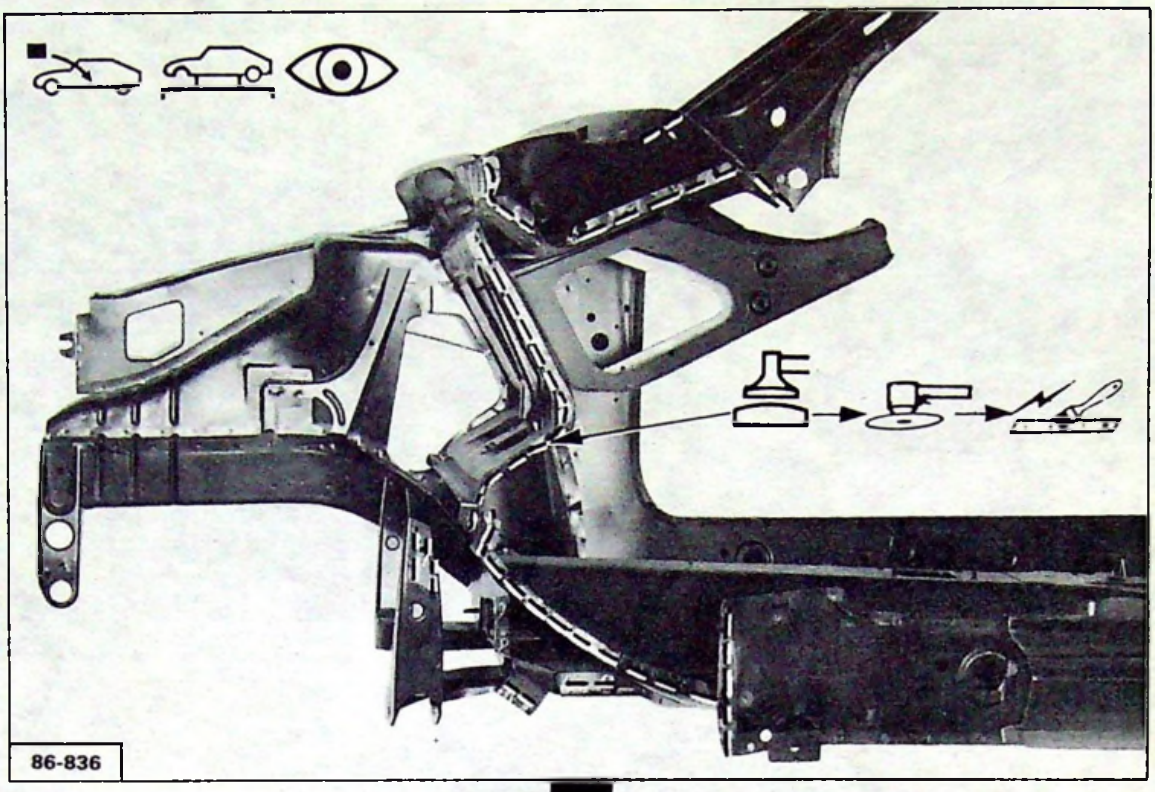

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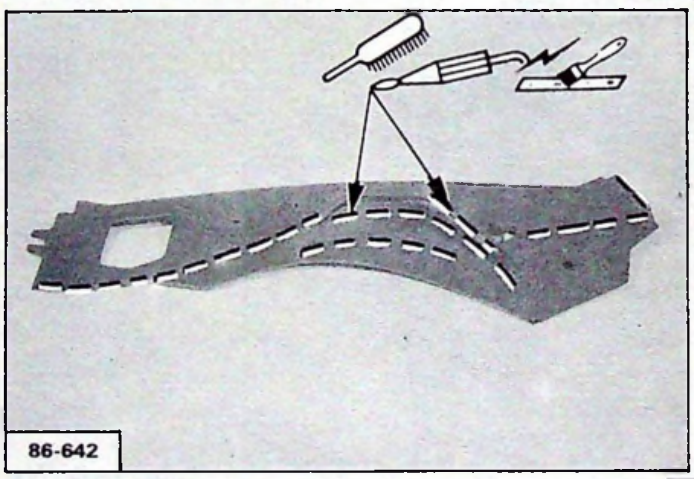

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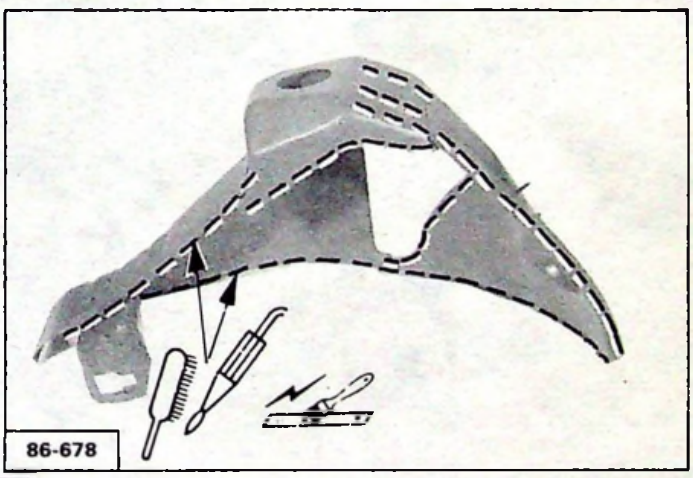

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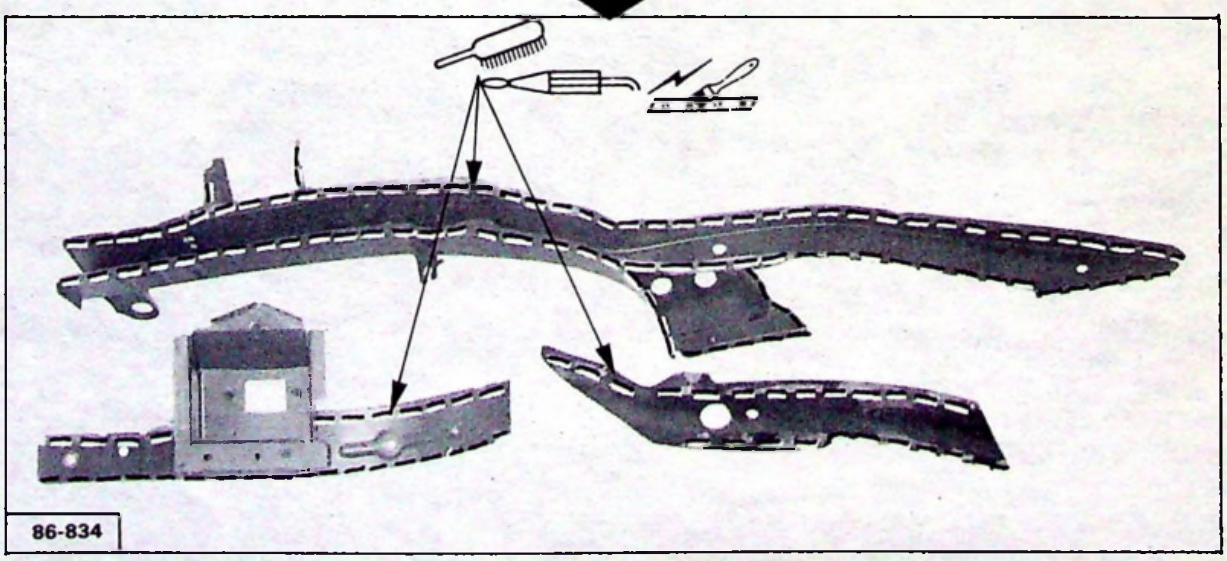

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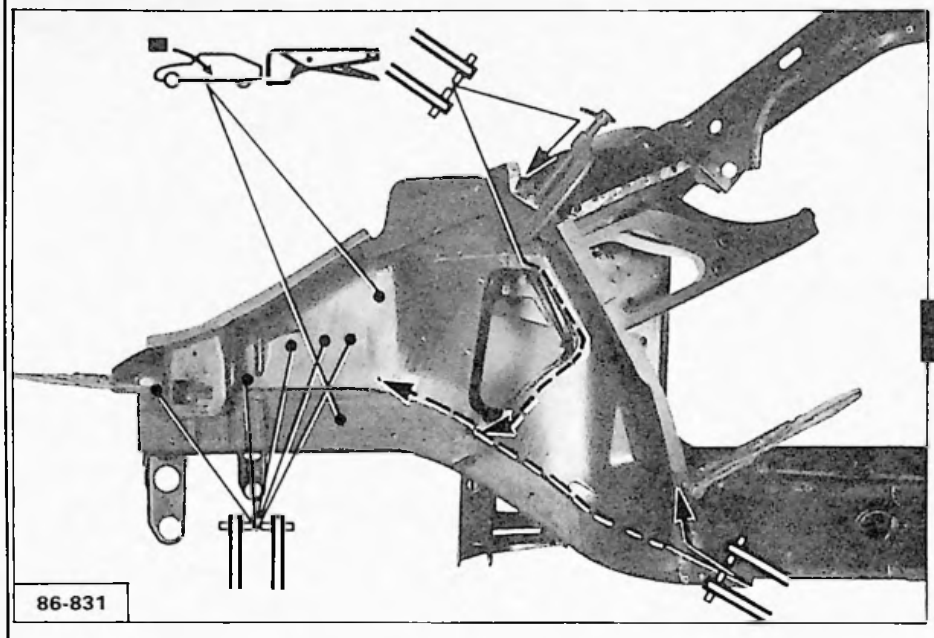
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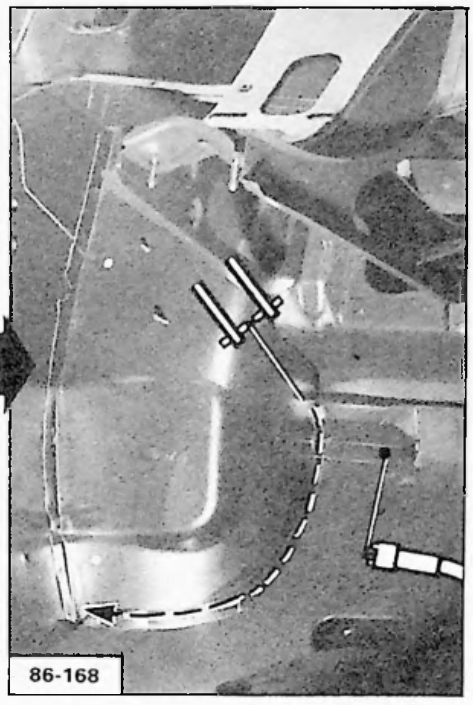
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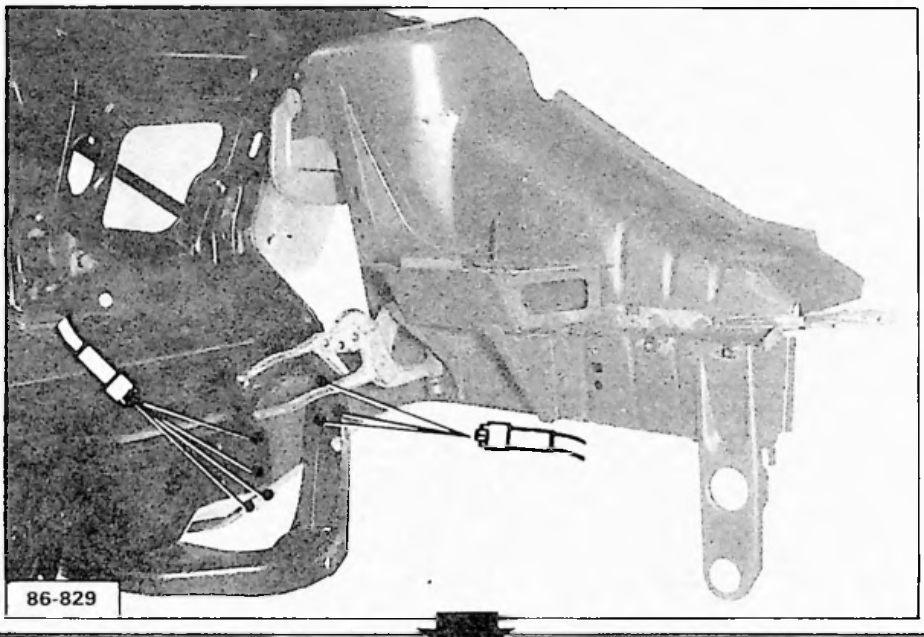
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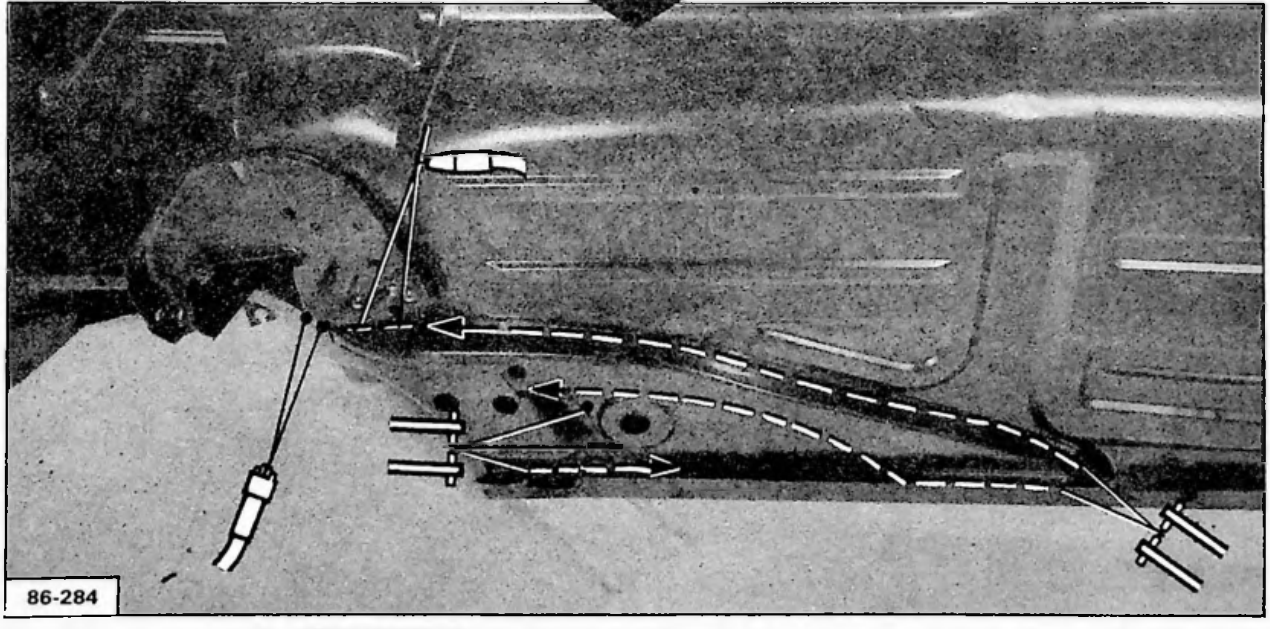
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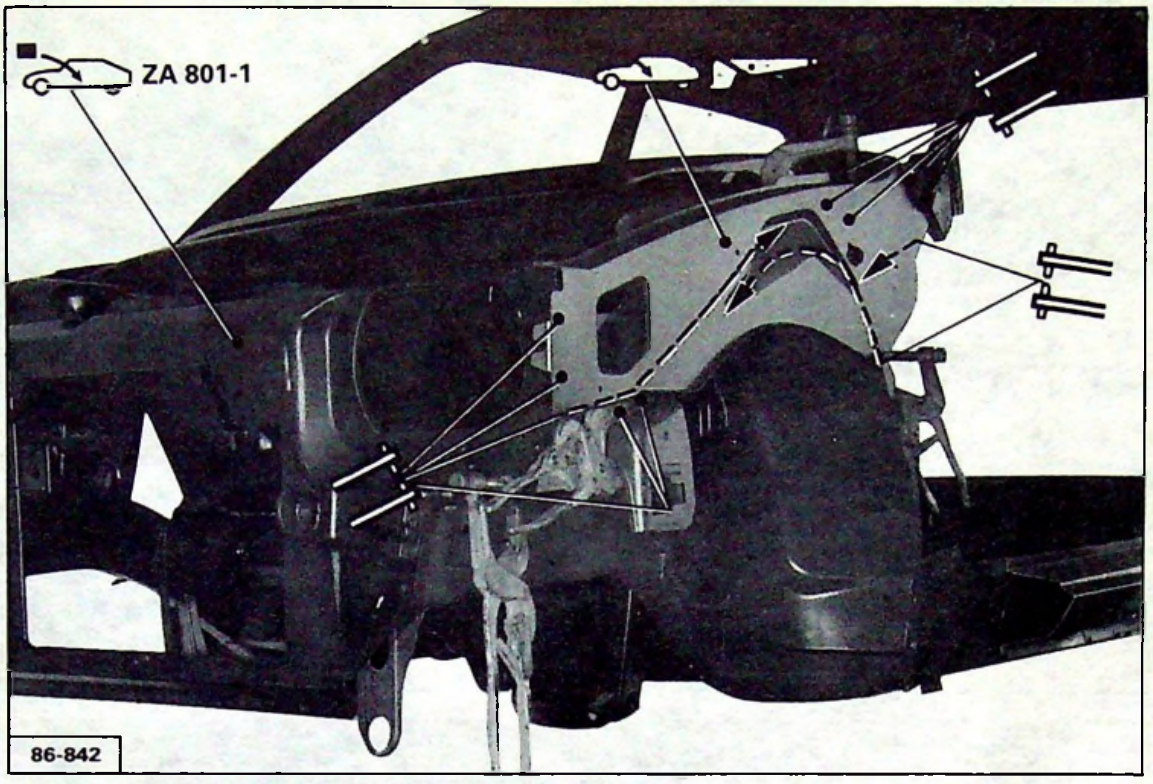
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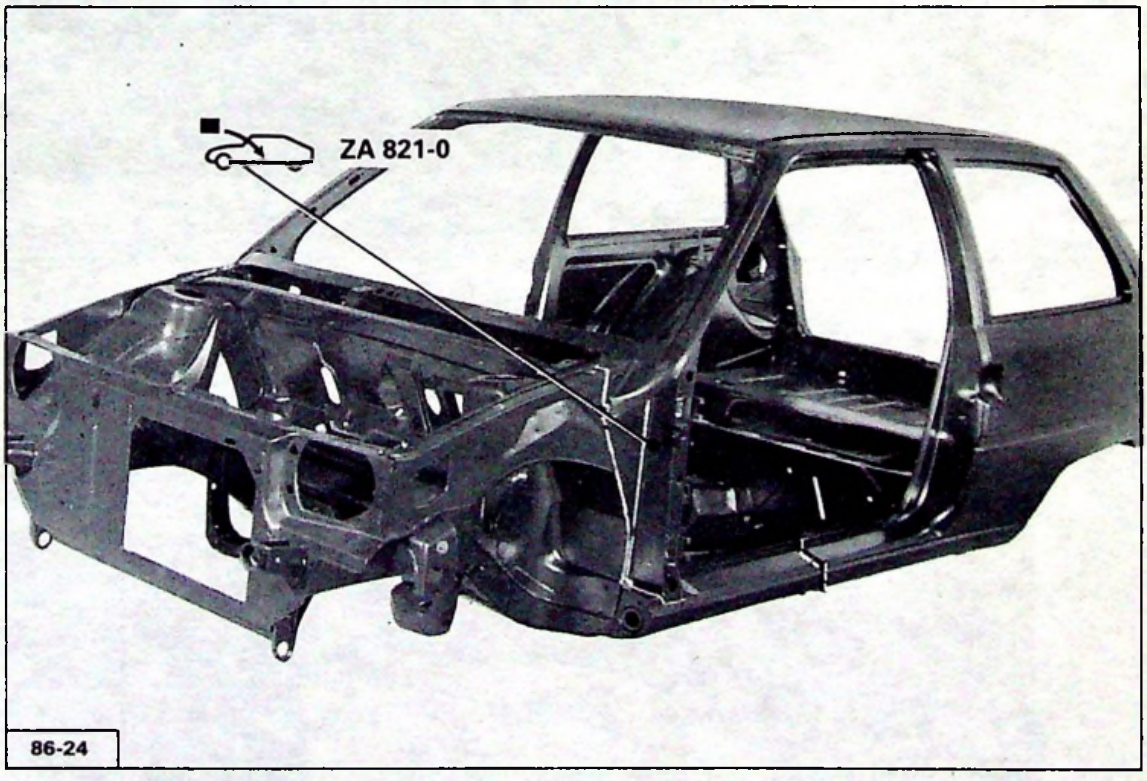
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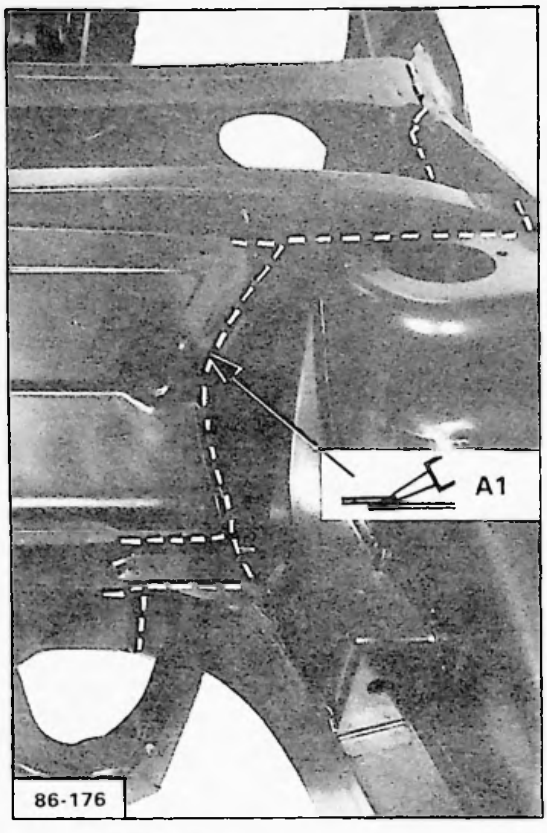
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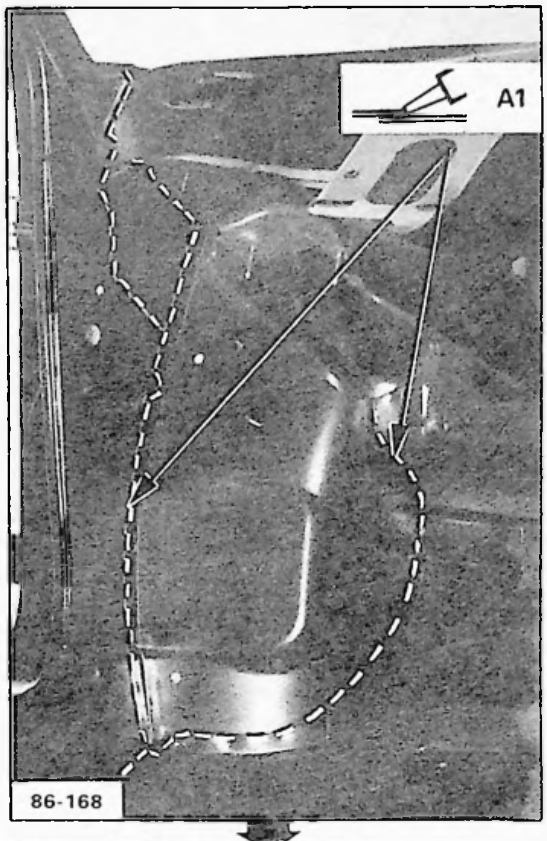
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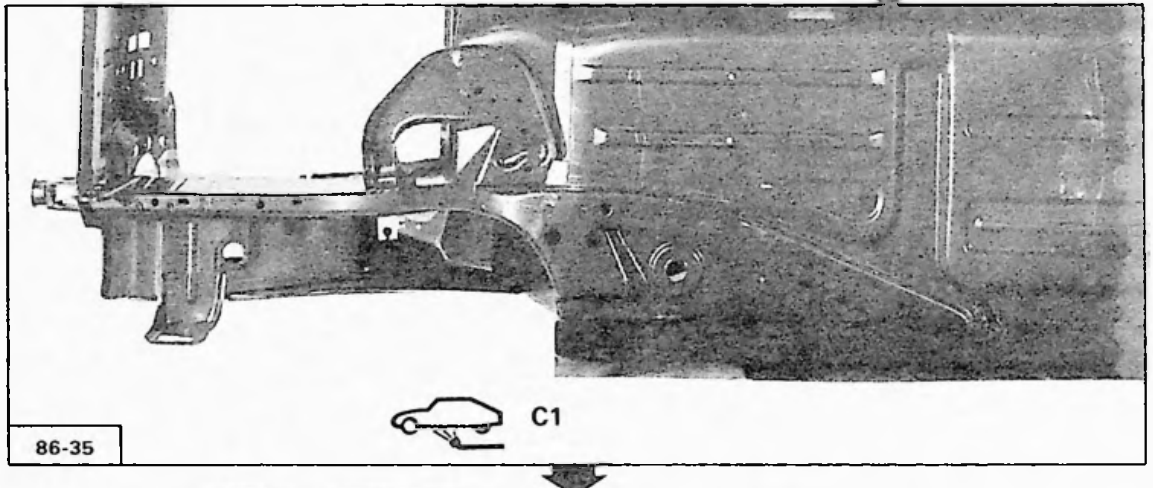
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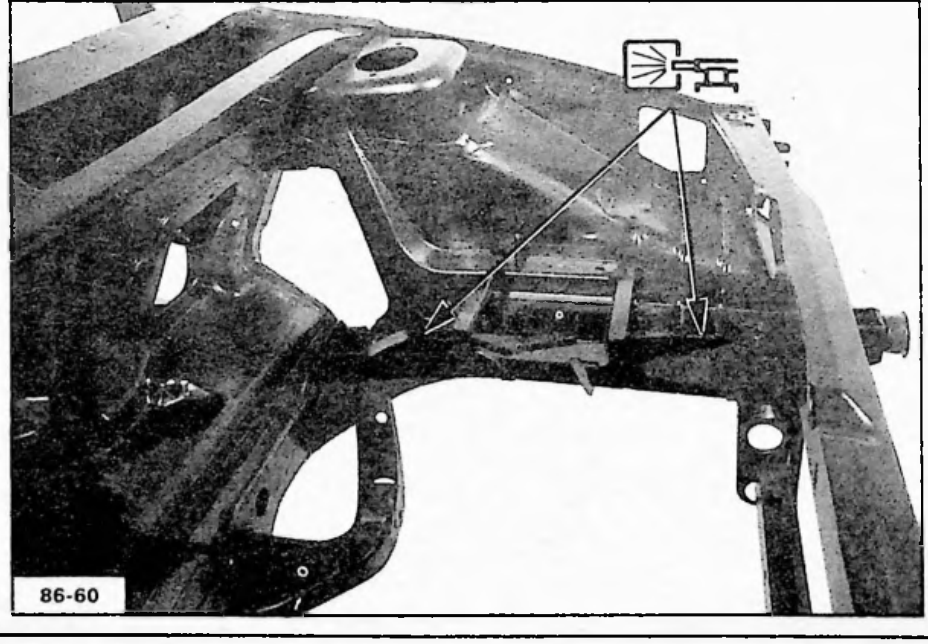
86-35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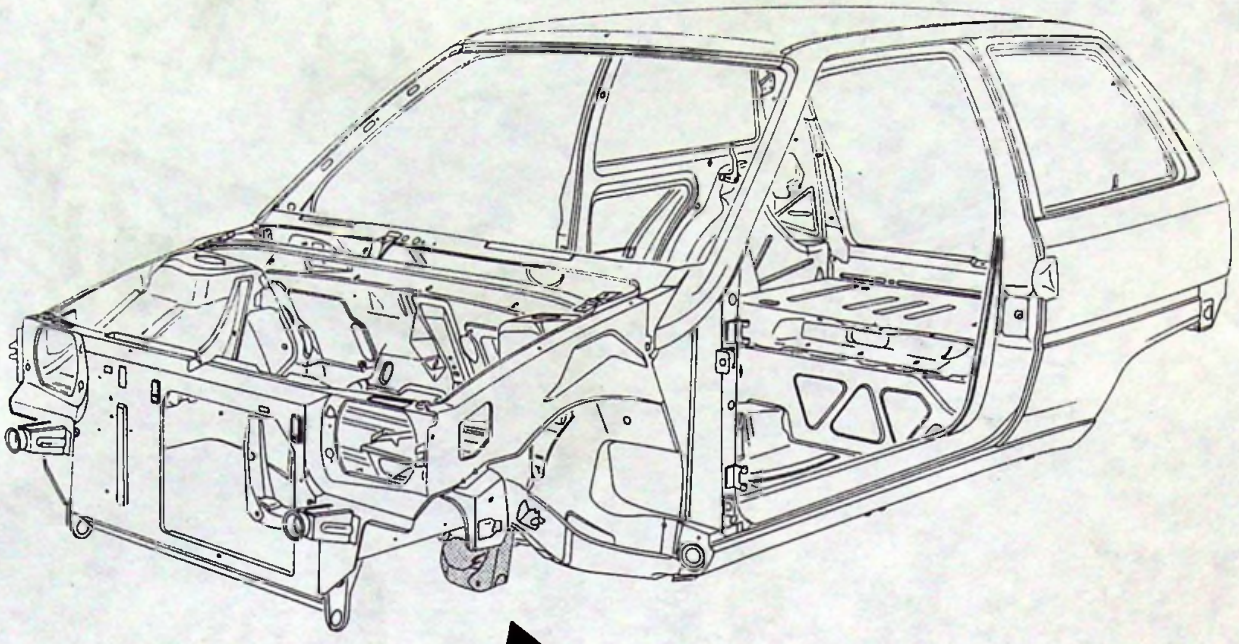

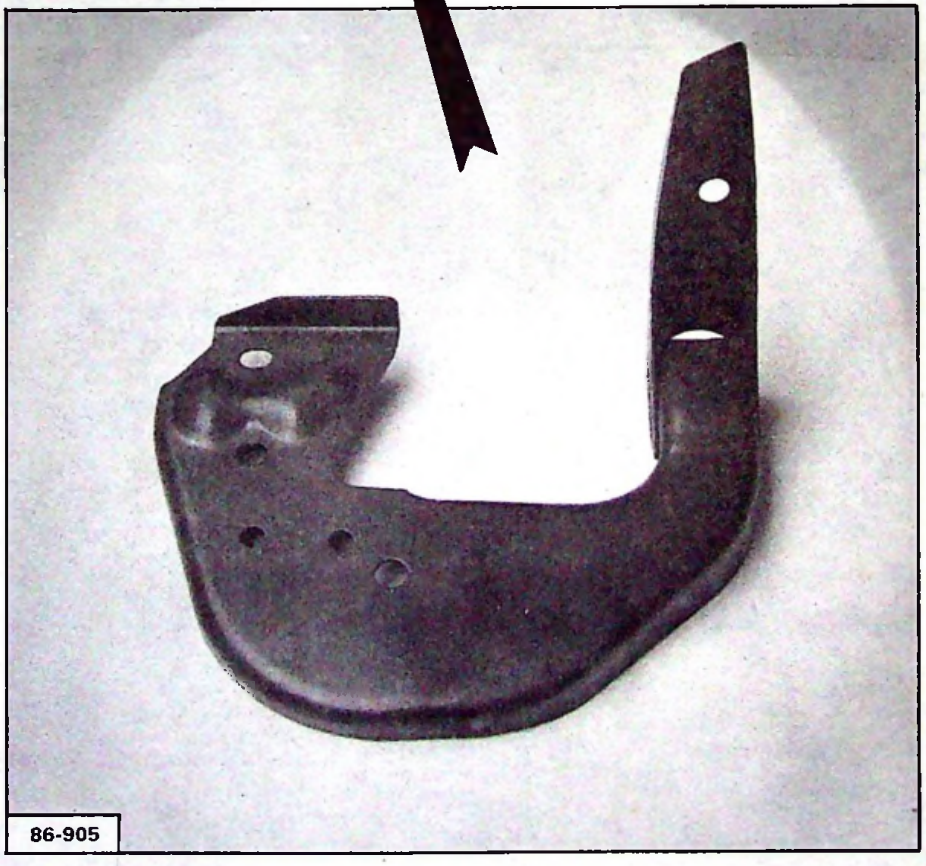
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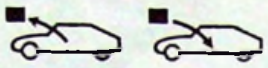
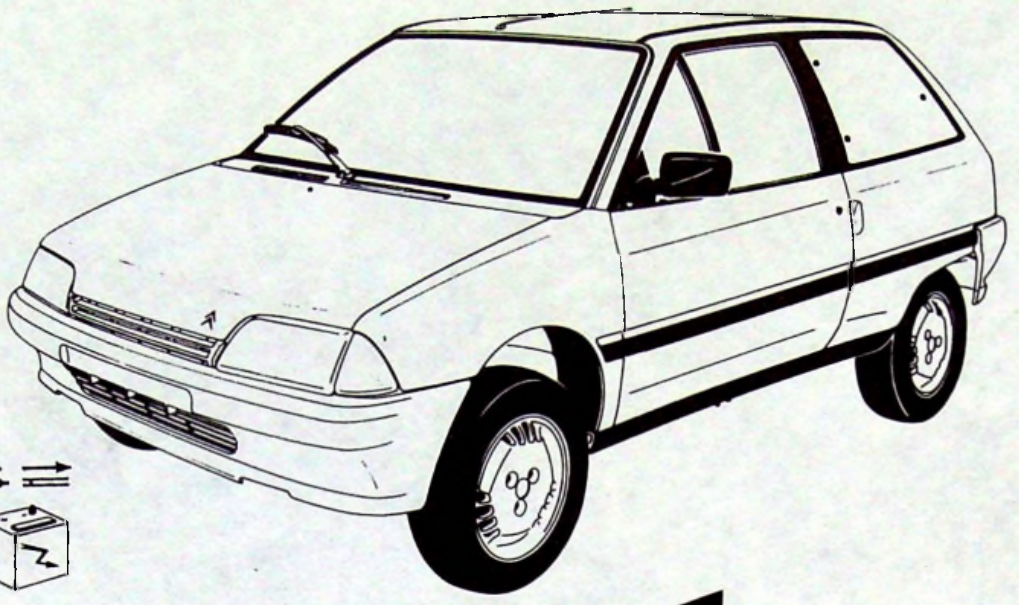
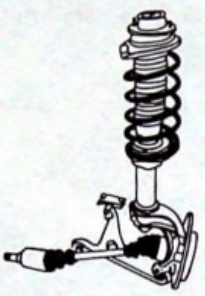


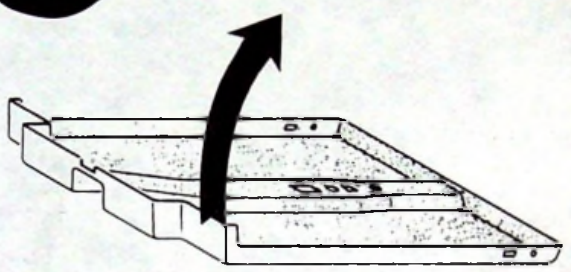


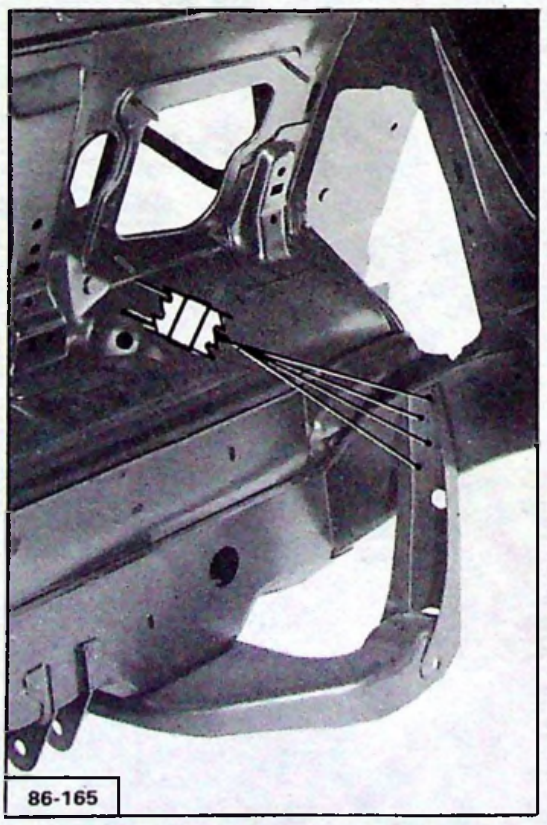
Z 80-10

Z 80-17

Z 80-19







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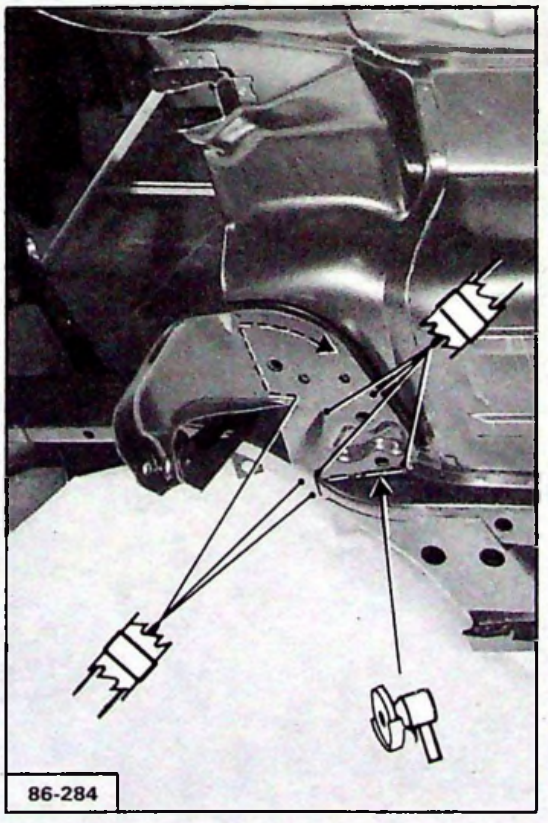

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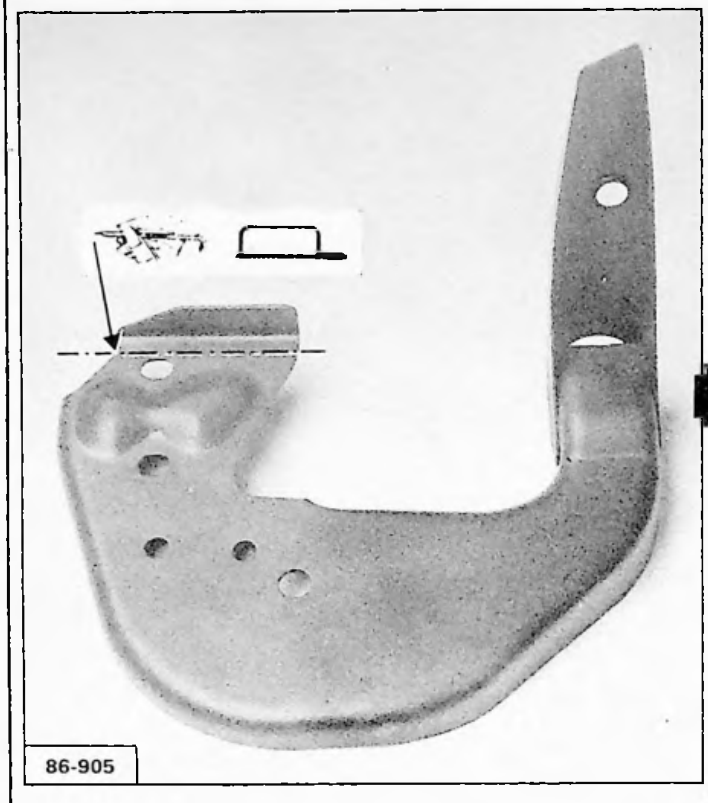
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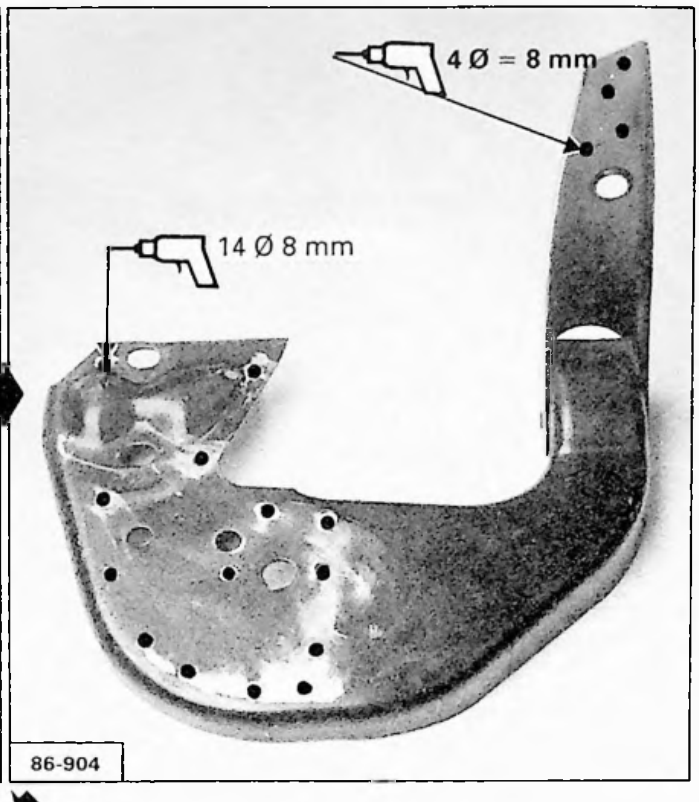

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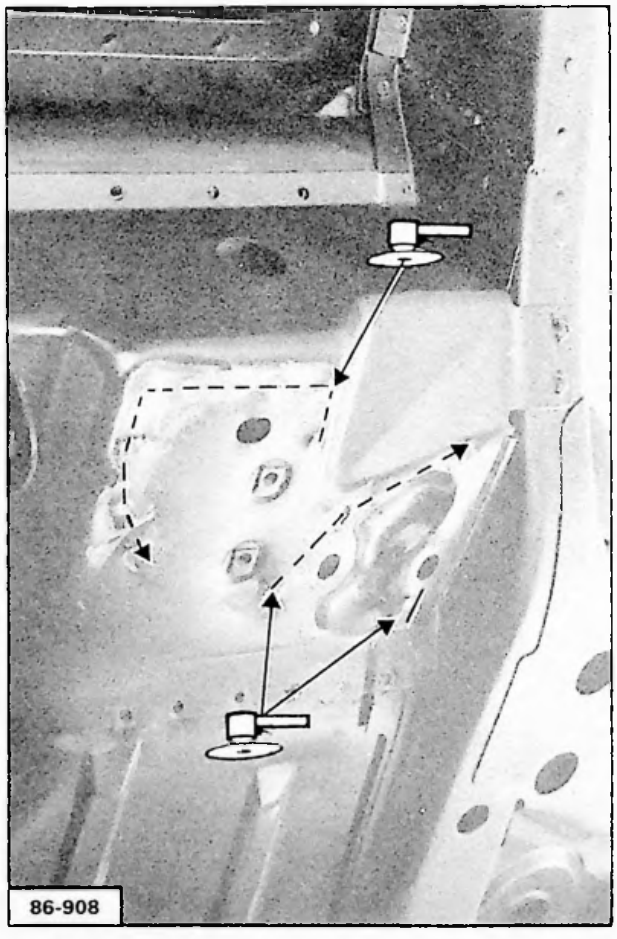
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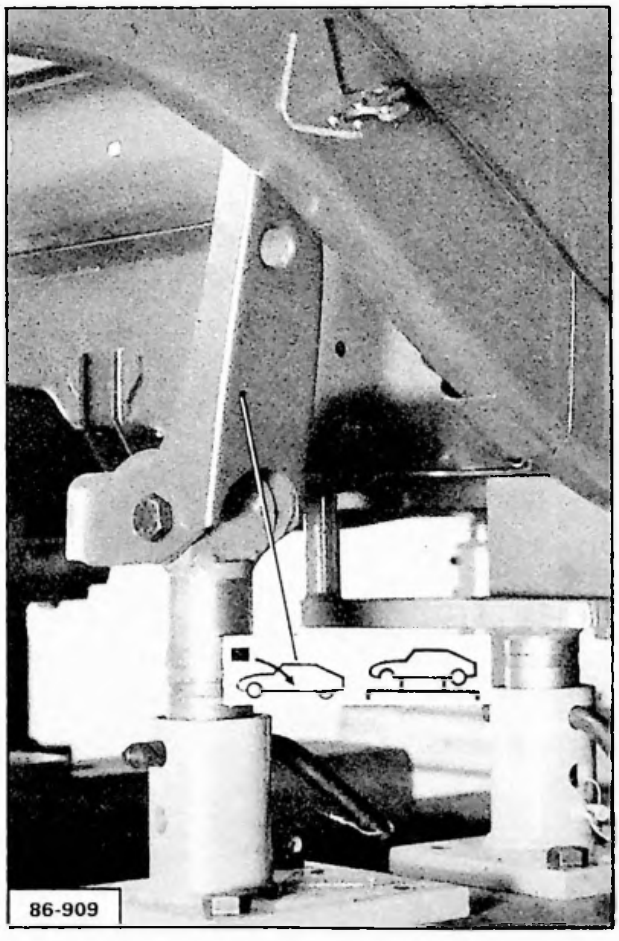
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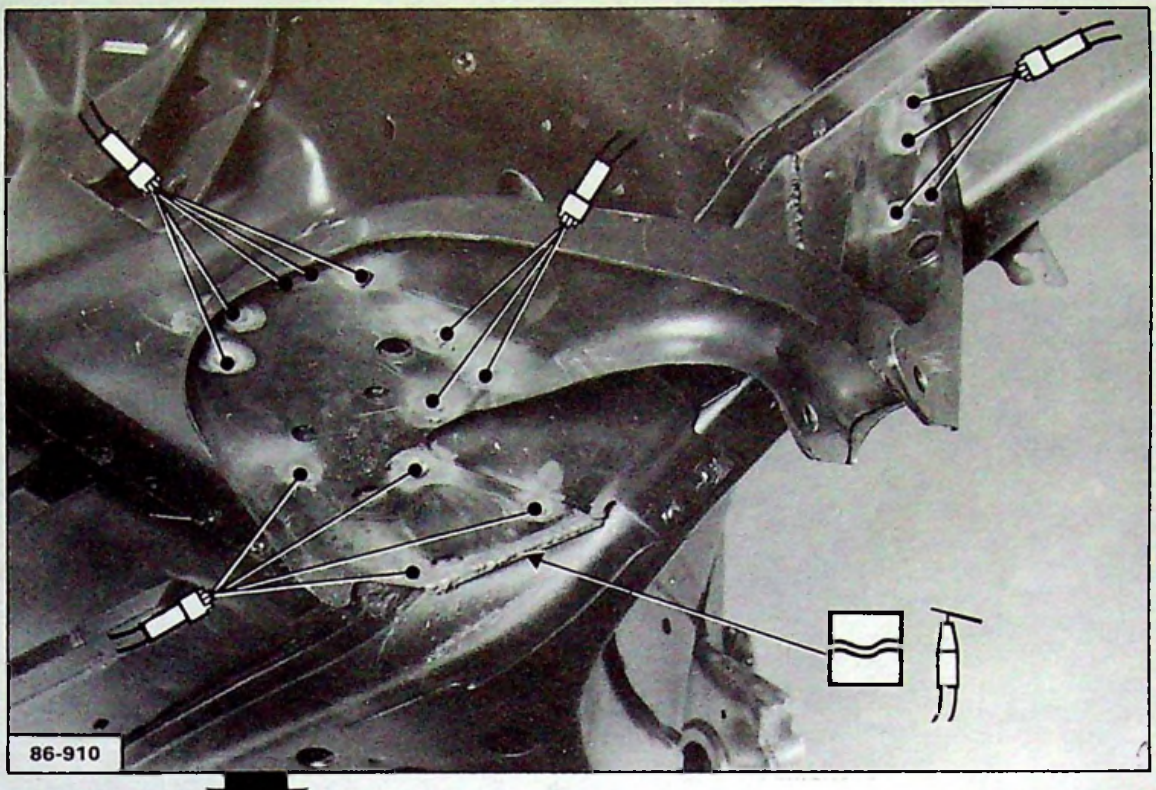
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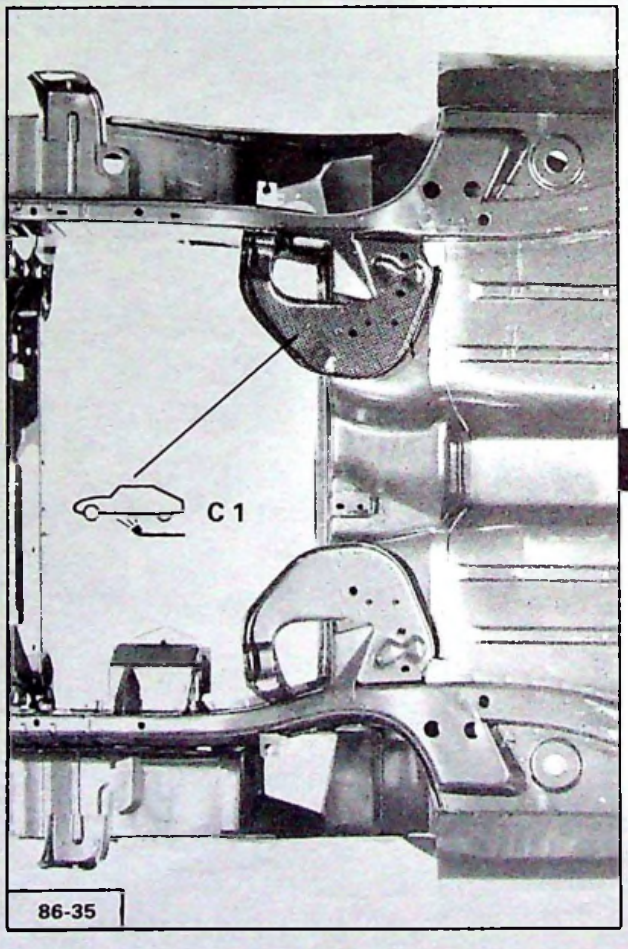
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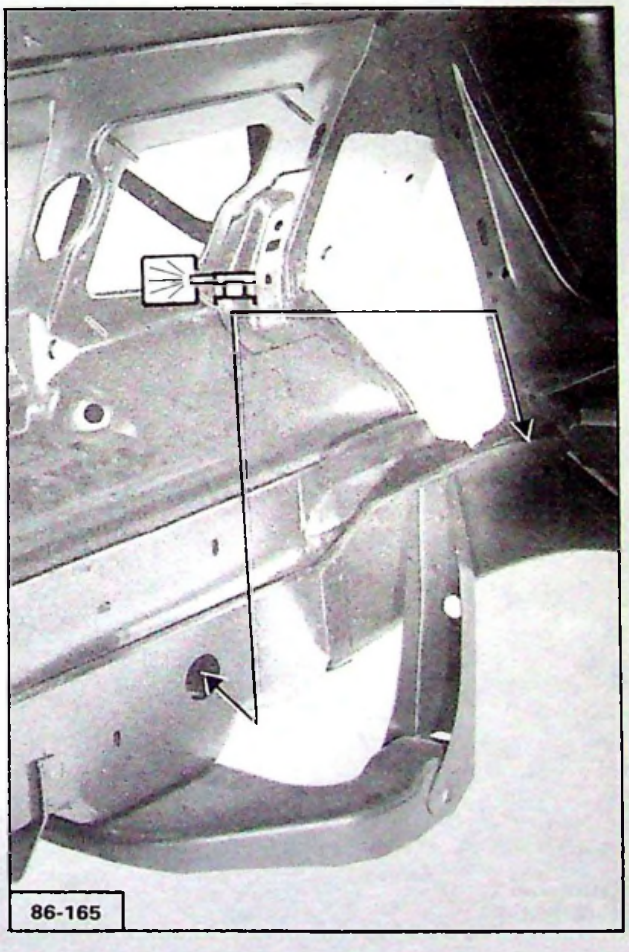
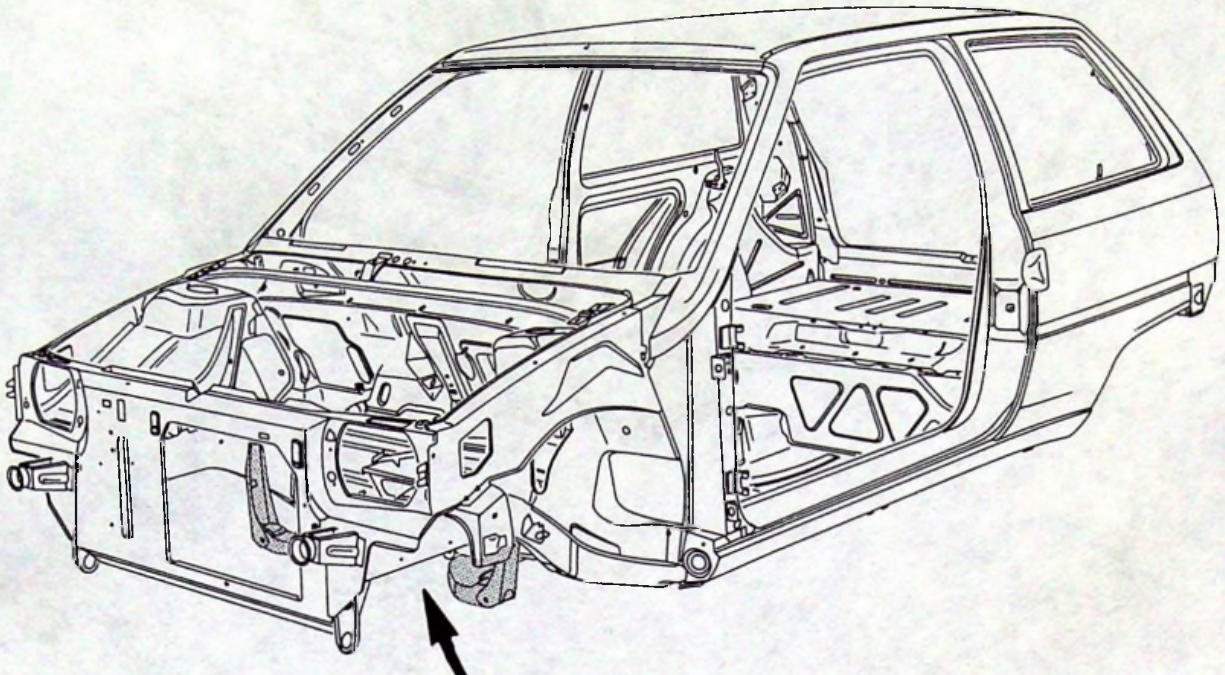
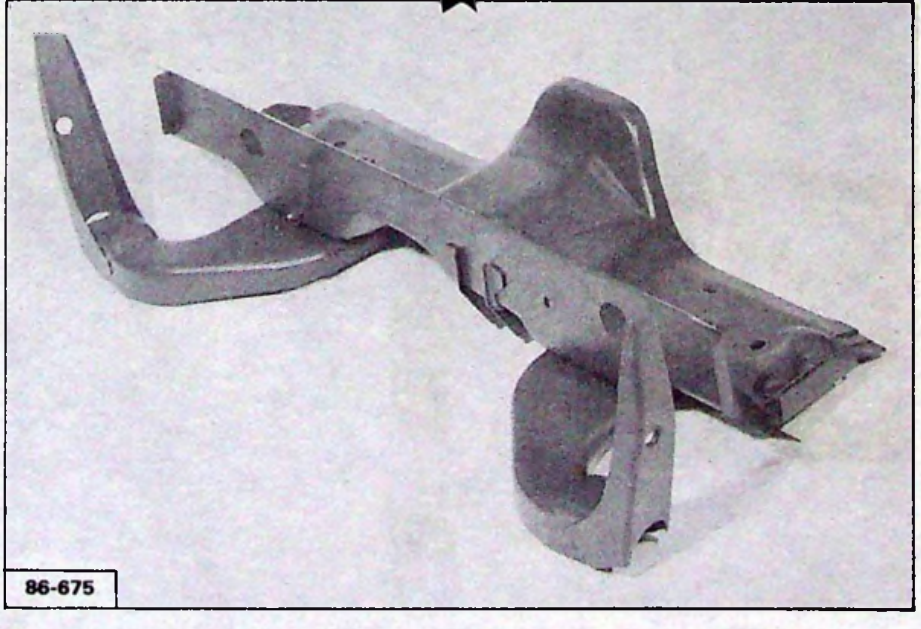
86-35


86-165

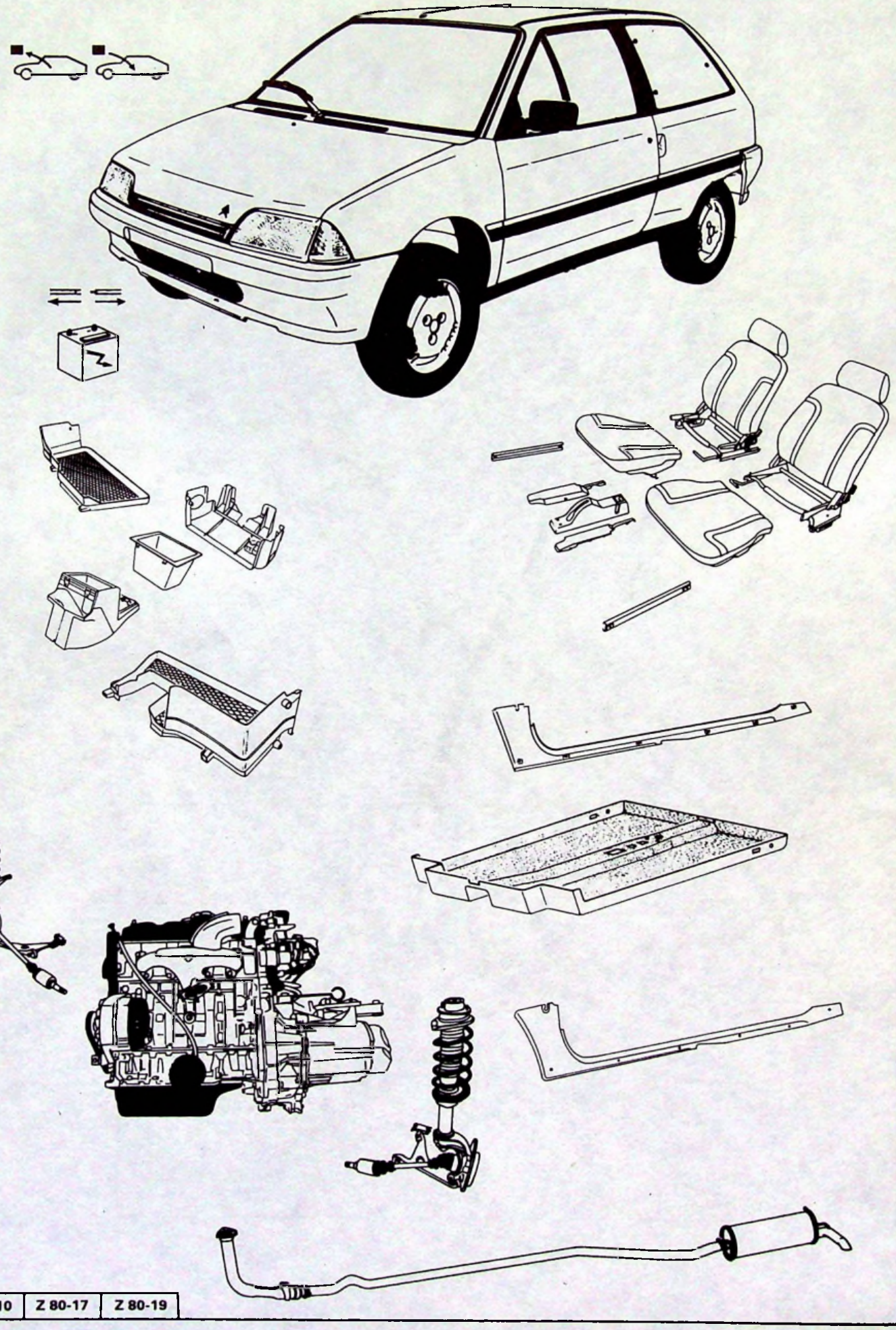
Dans le cas où cette opération est effectuée sur un appareil à contrôle dimensionnel (CAROLINER, CELETTE METRO 2000...), il est indispensable de vérifier la position angulaire du support à l'aide des gabarits **4505-T** et **4506-T** avant de le souder sur la traverse d'essieu avant.

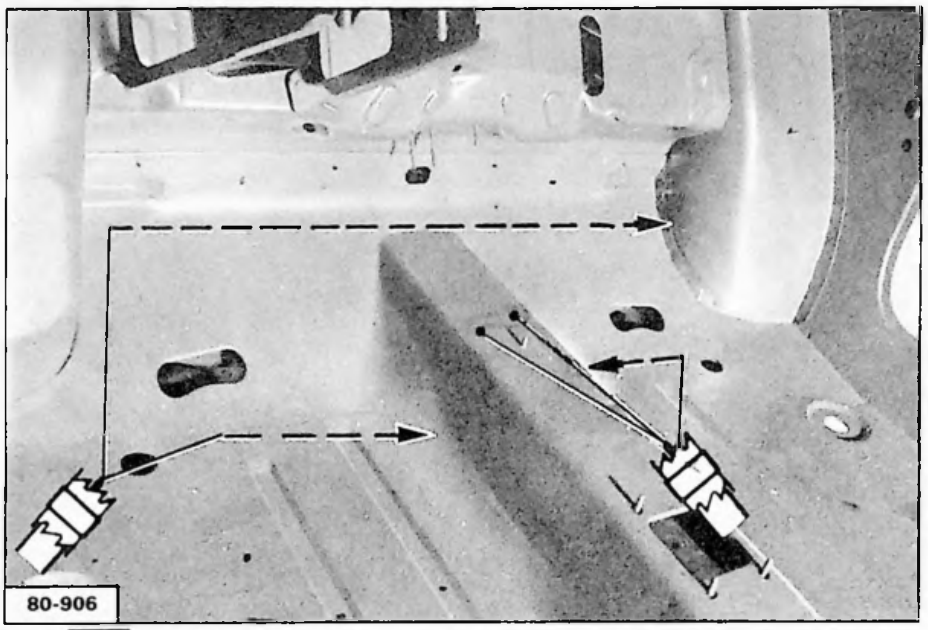


Z 80-2

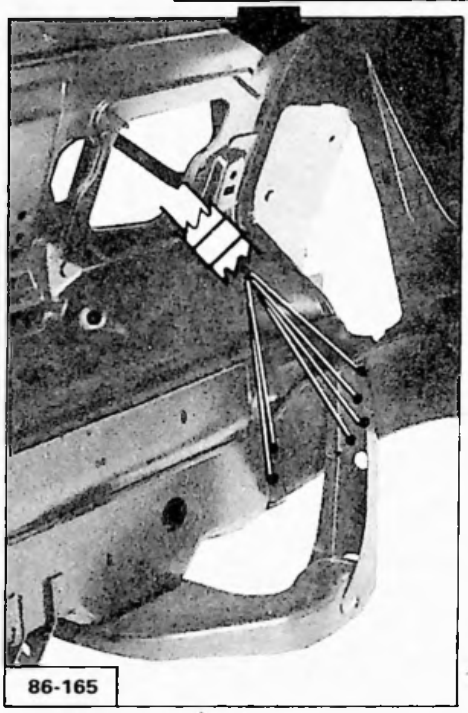


86-675





80-906



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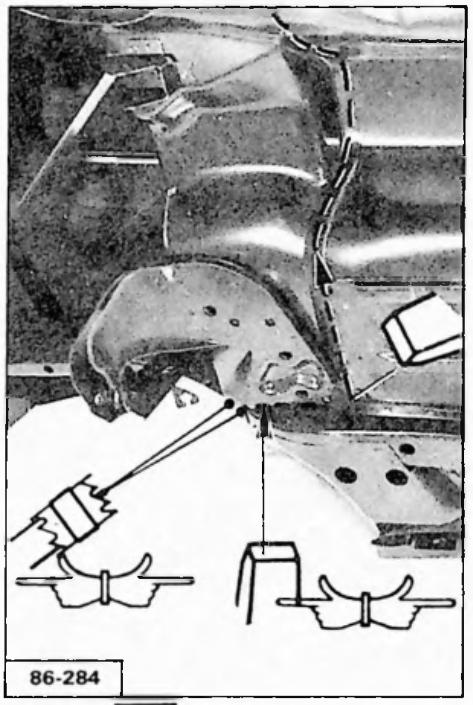

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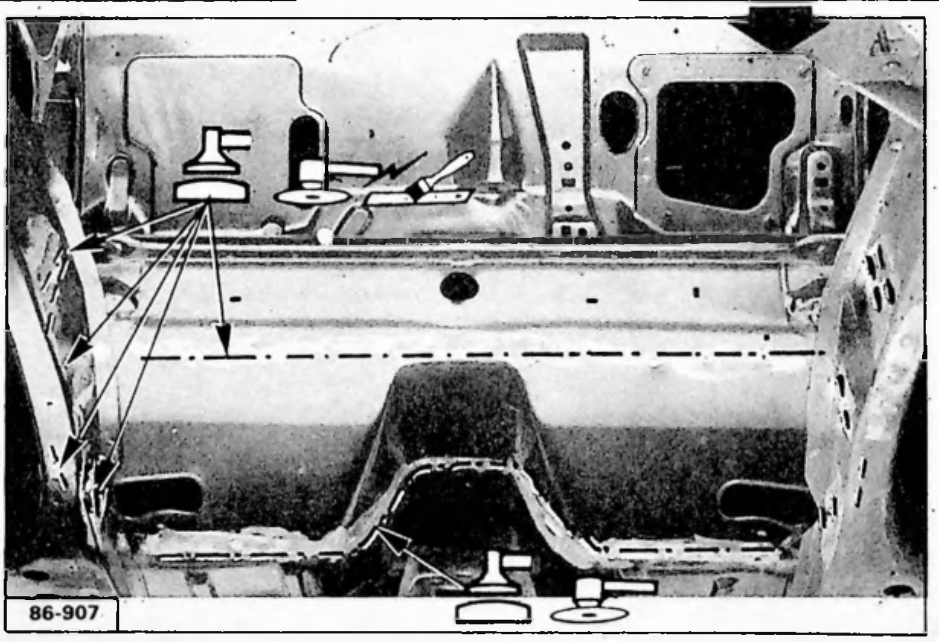
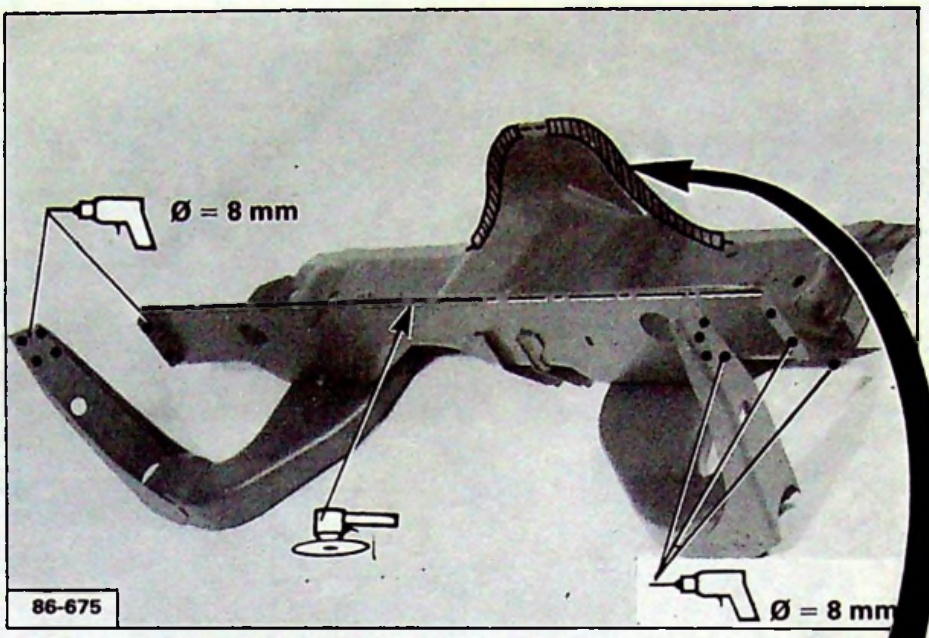
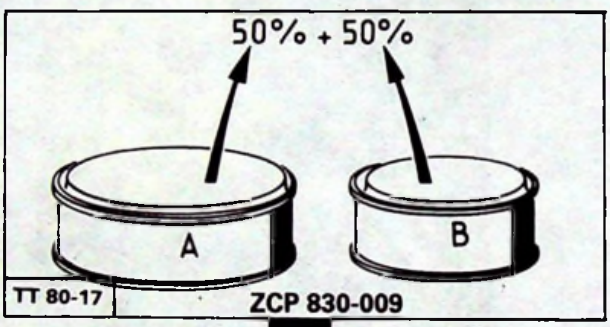
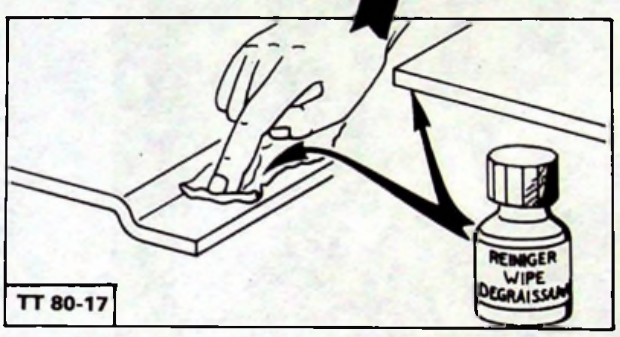
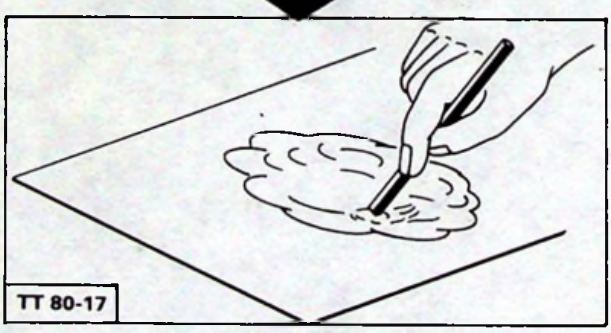


86-907


Ø = 8 mm
Ø = 8 mm
86-675


50% + 50%
A
B
TT 80-17
ZCP 830-009


REINIGER
WIPE
DEGRAISSAN
TT 80-17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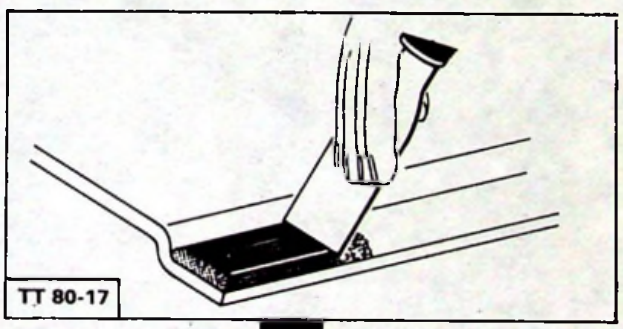
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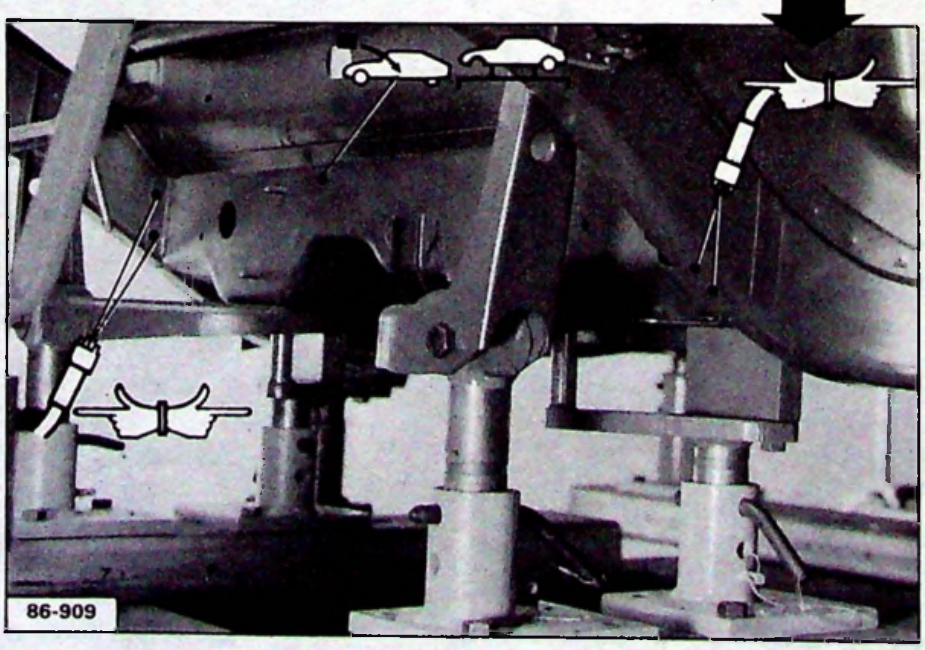
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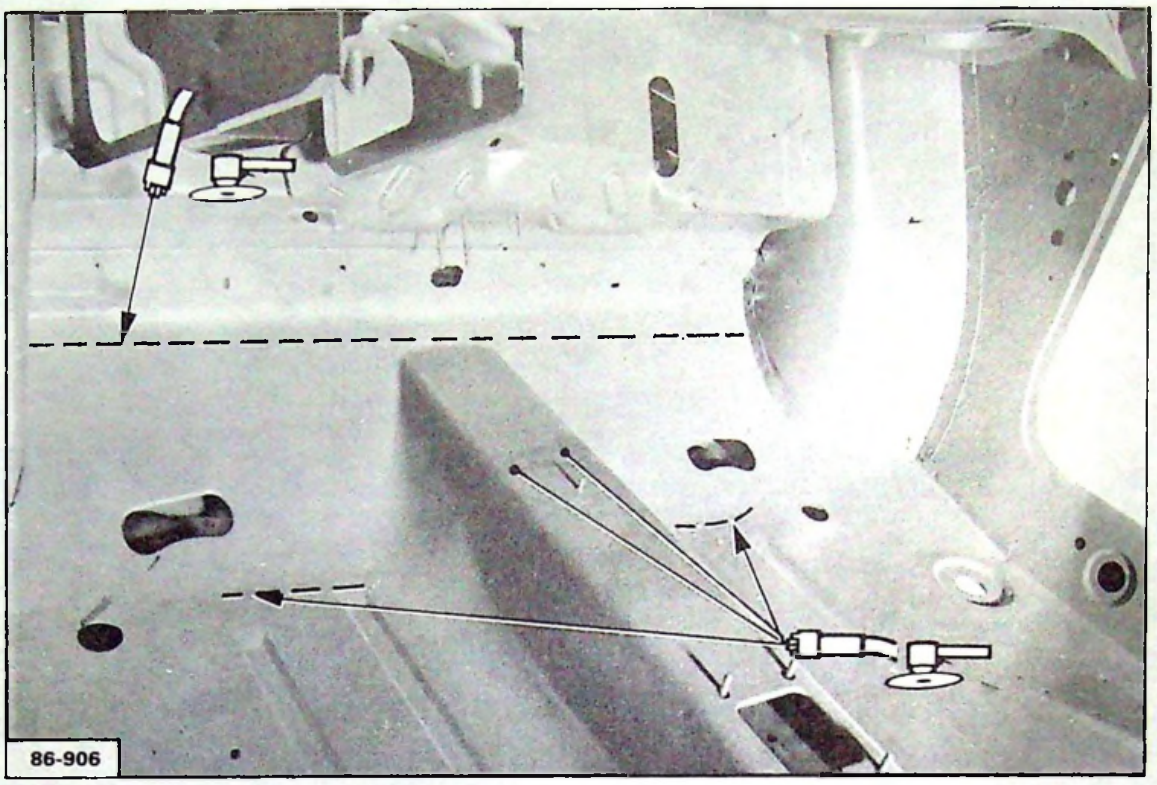
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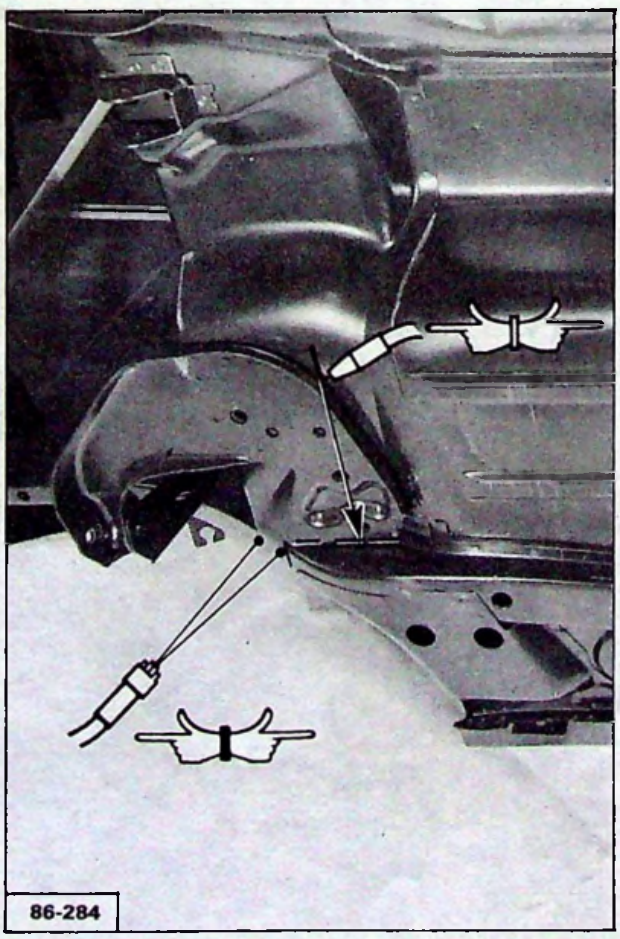
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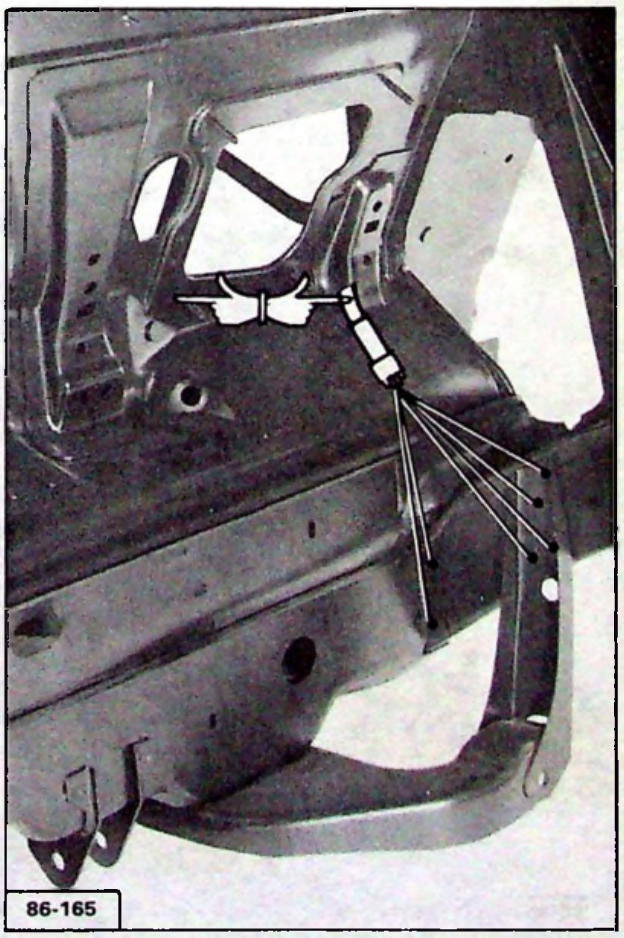
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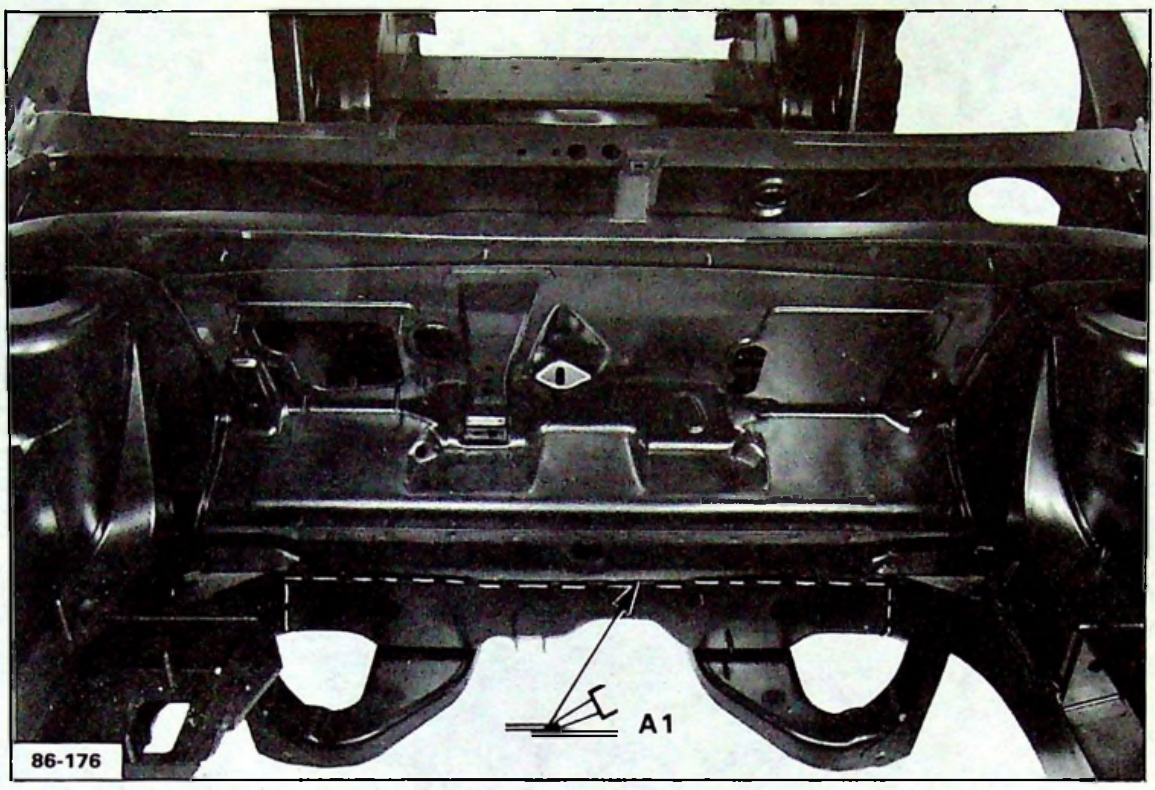
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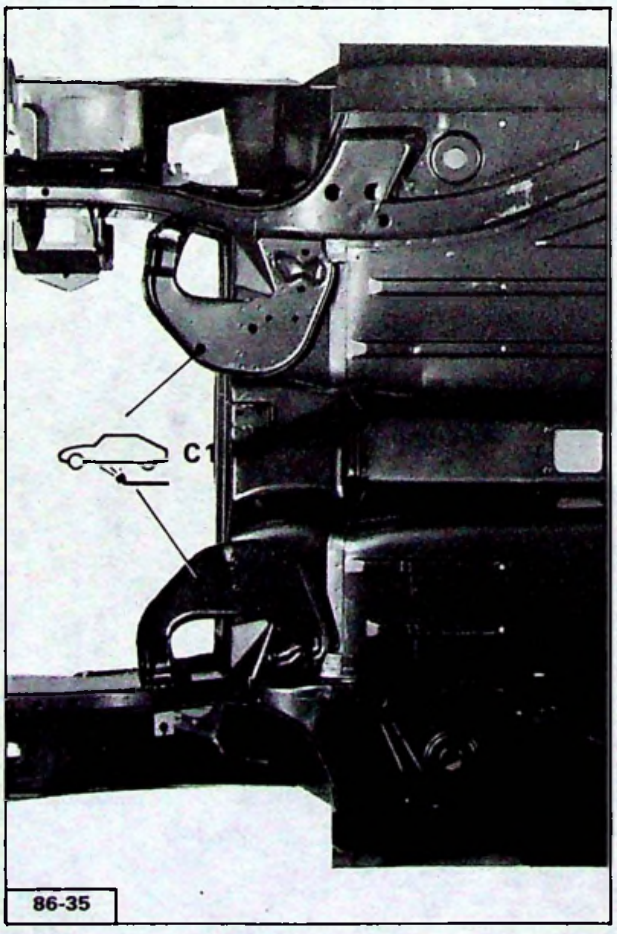
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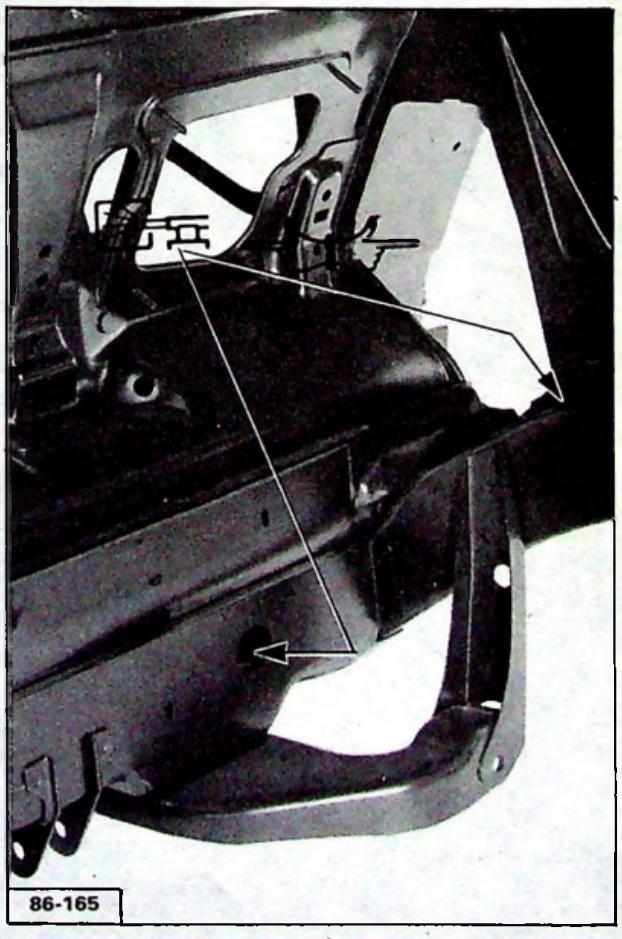
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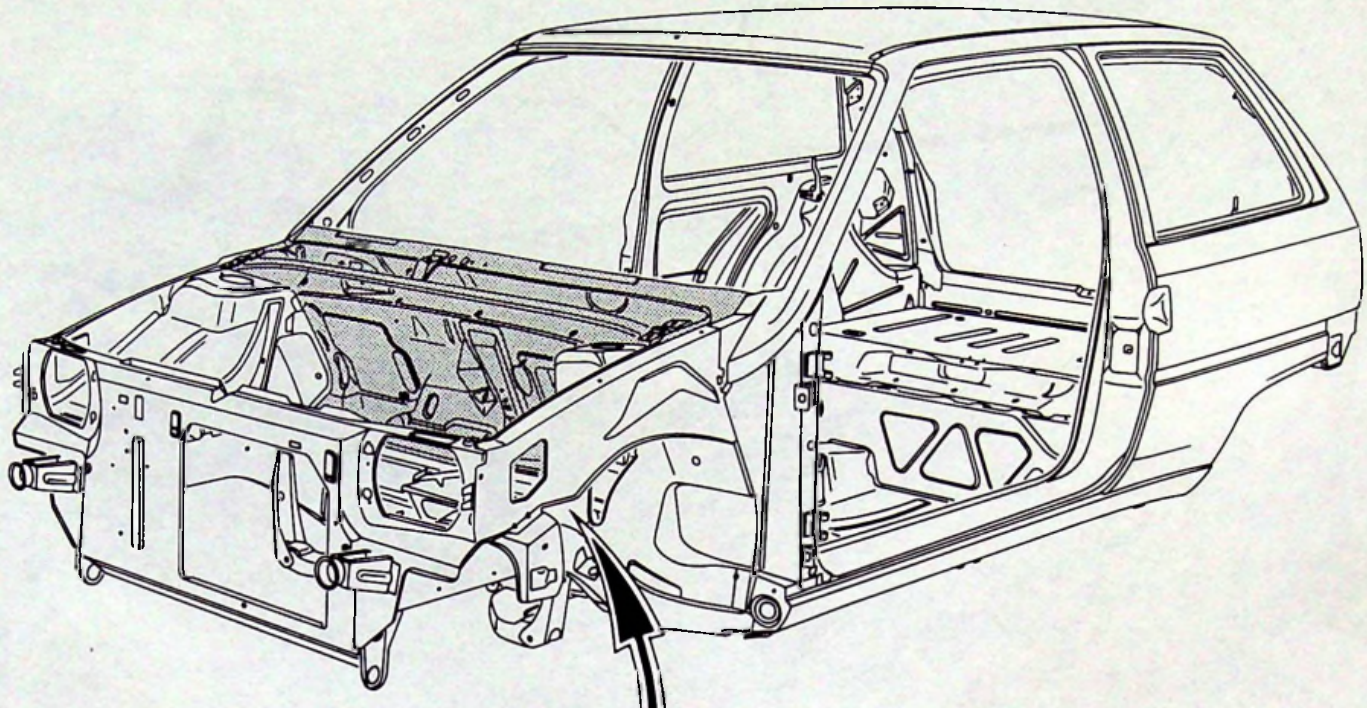

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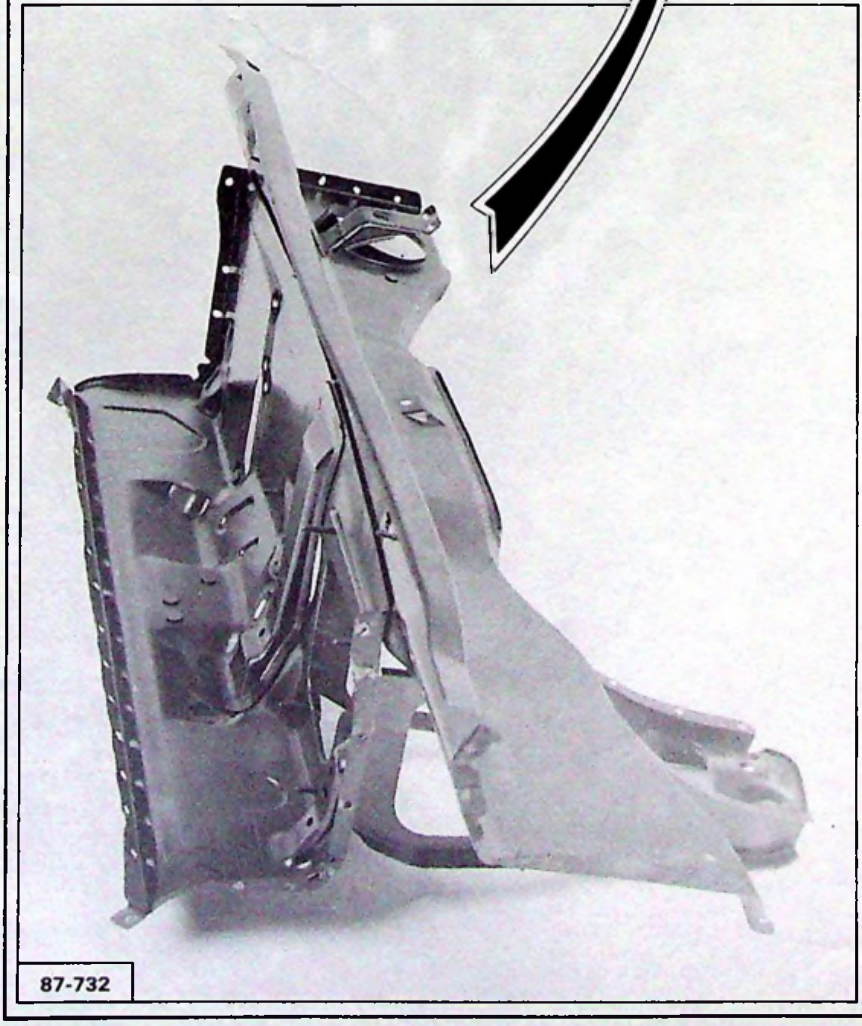

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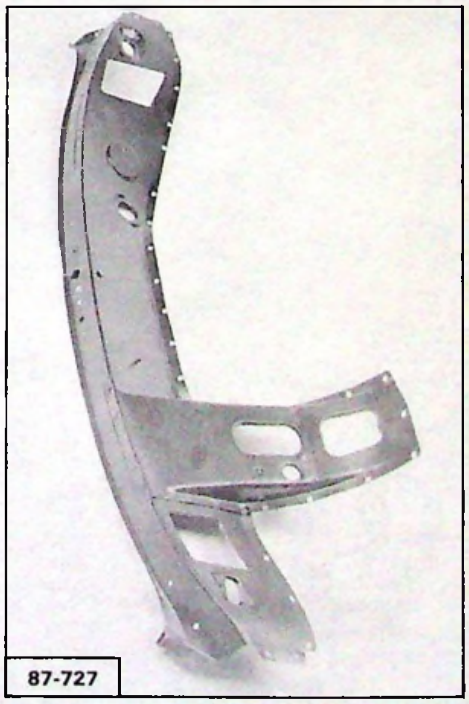

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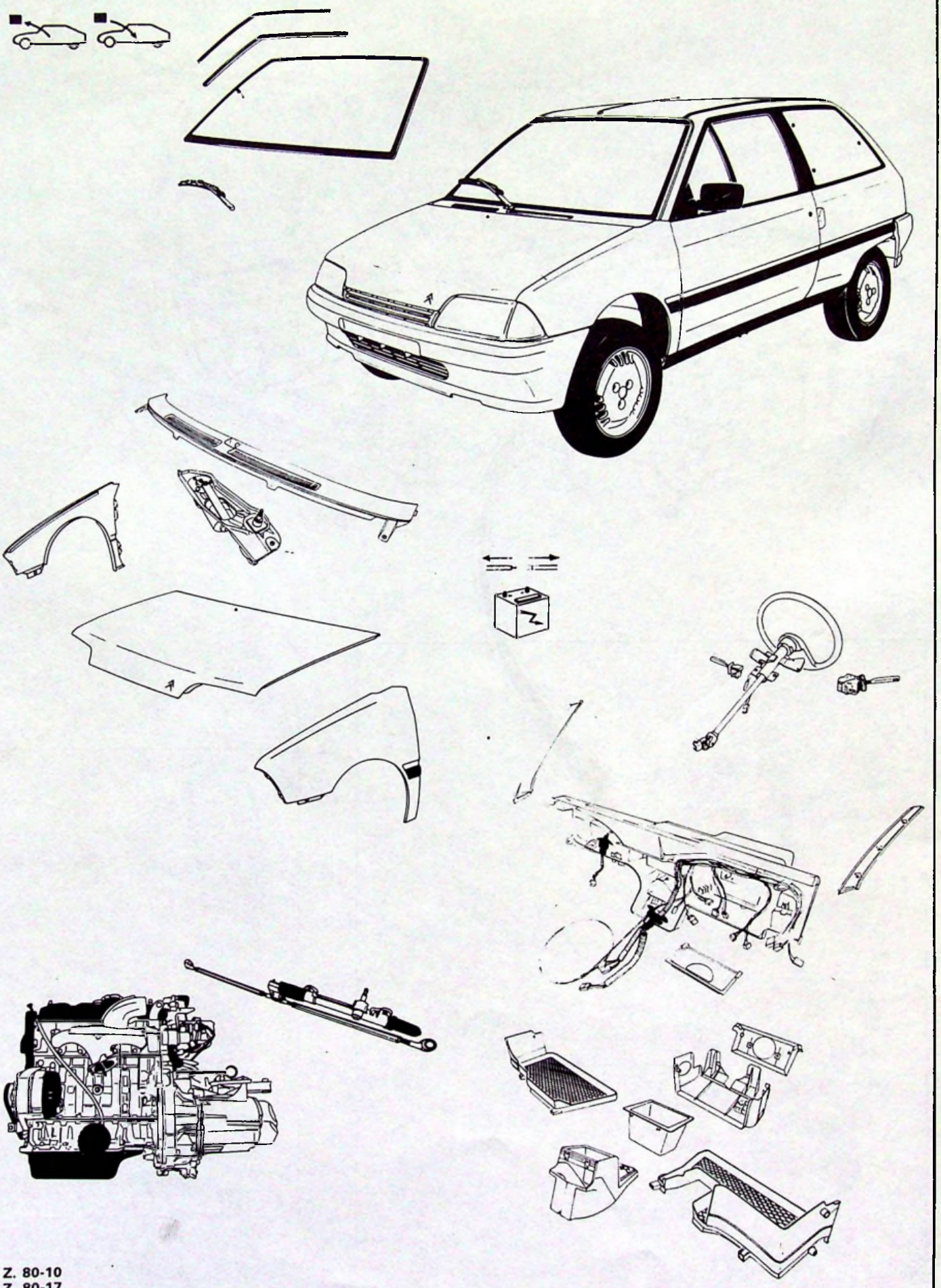

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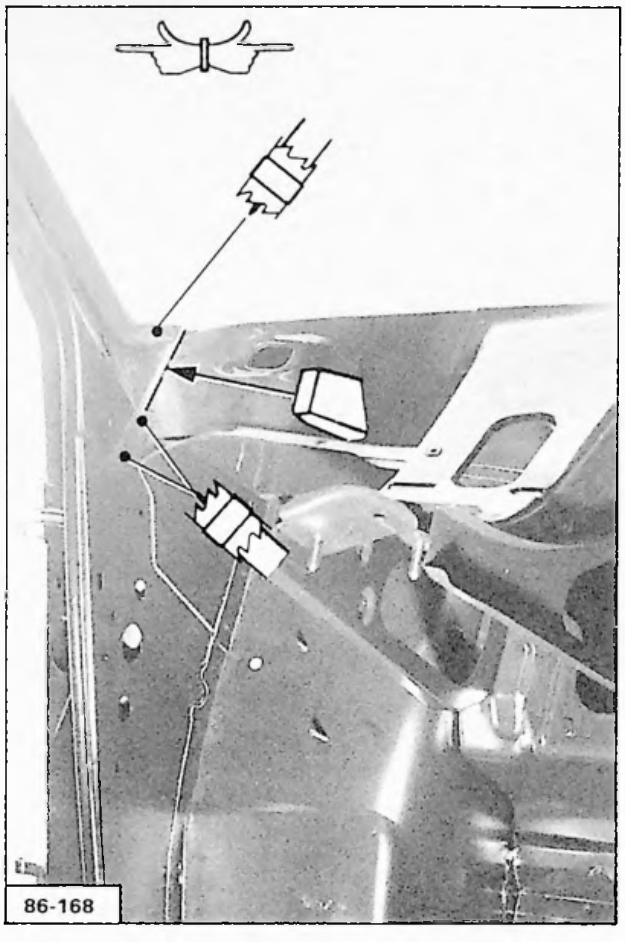

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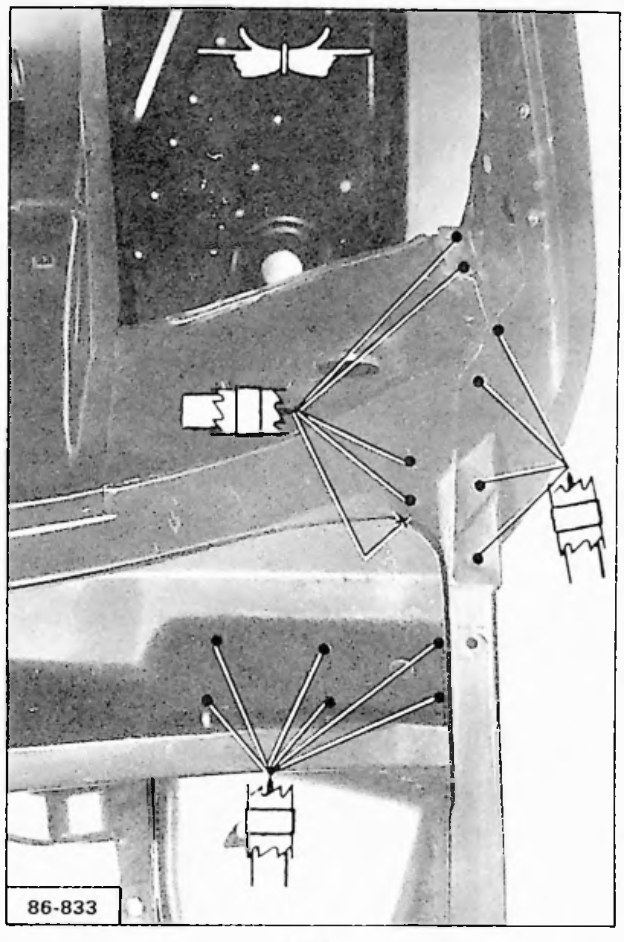

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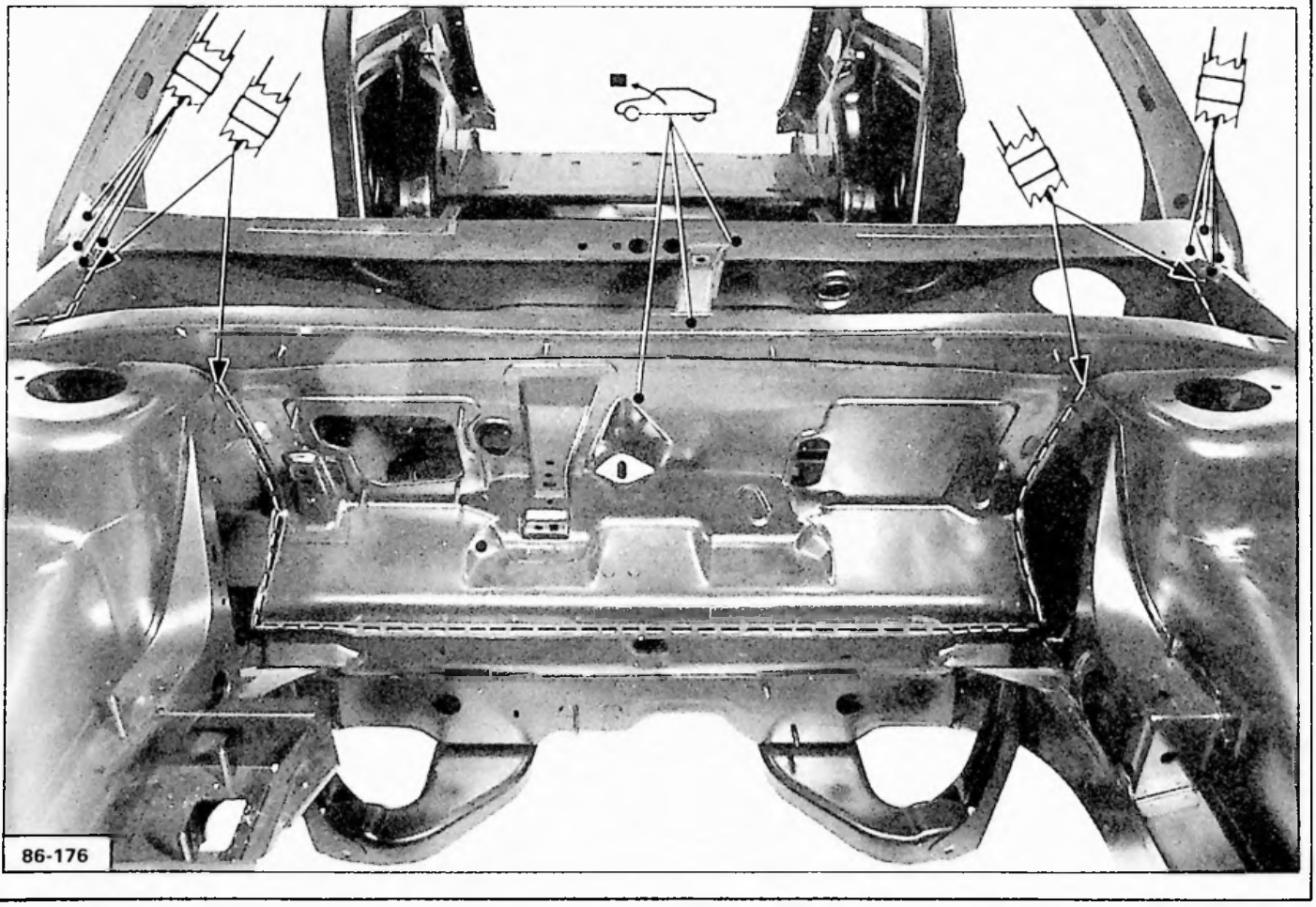

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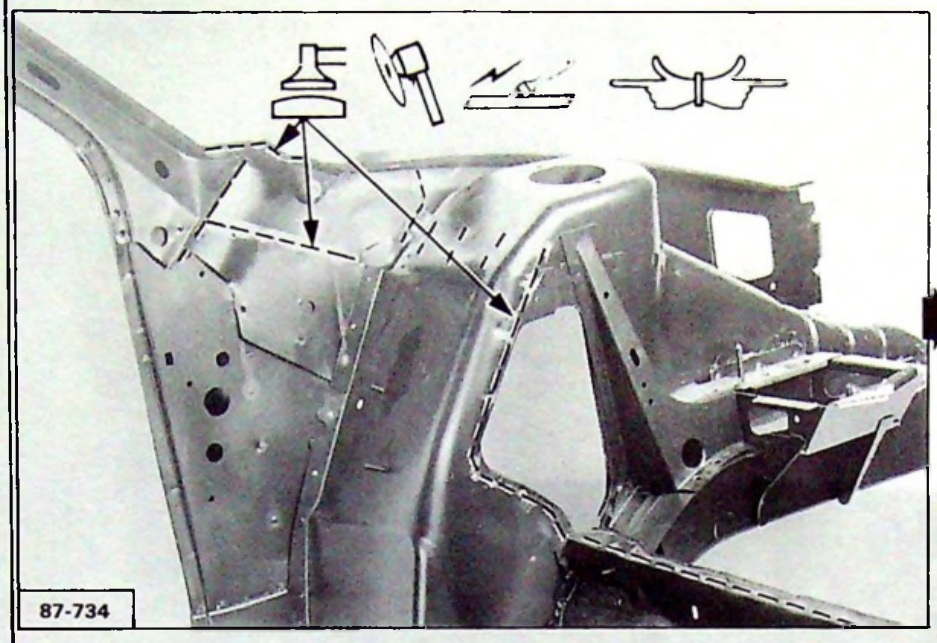
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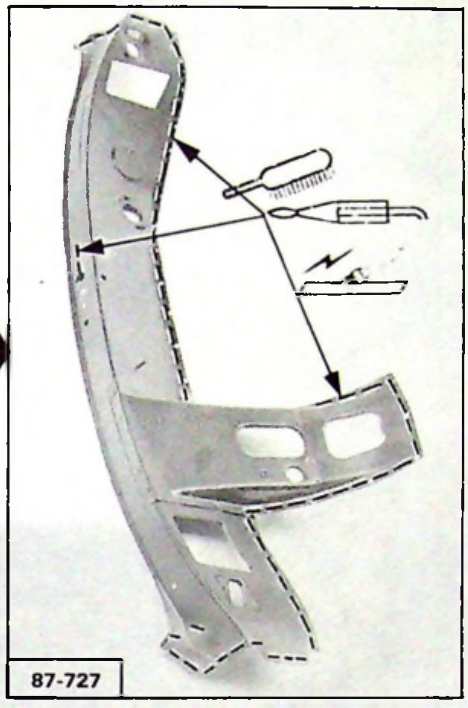
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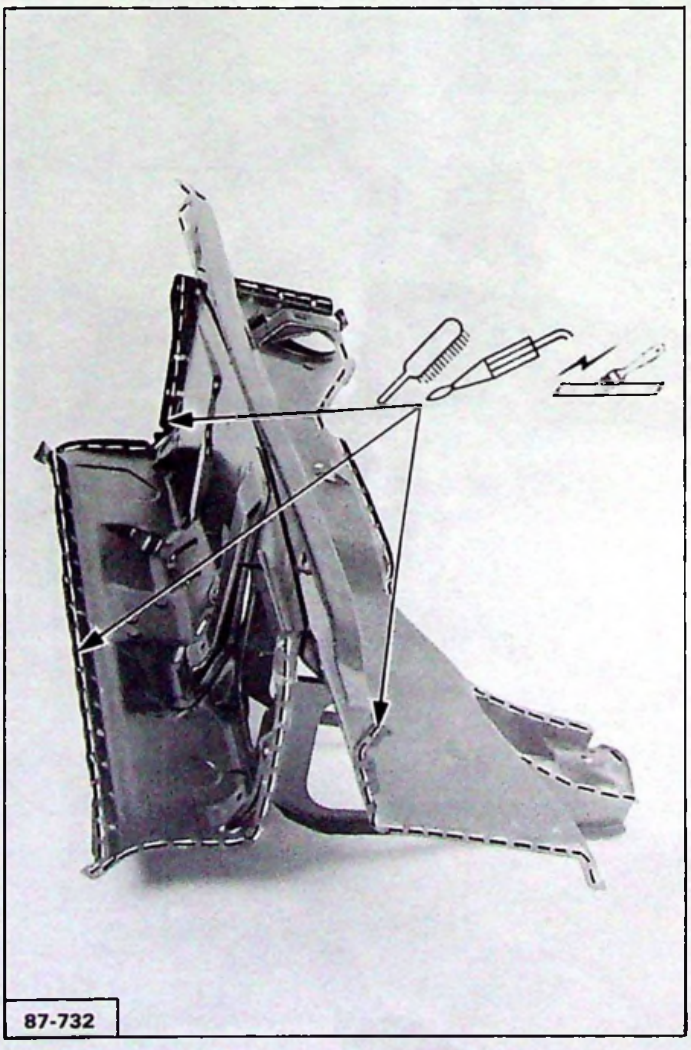
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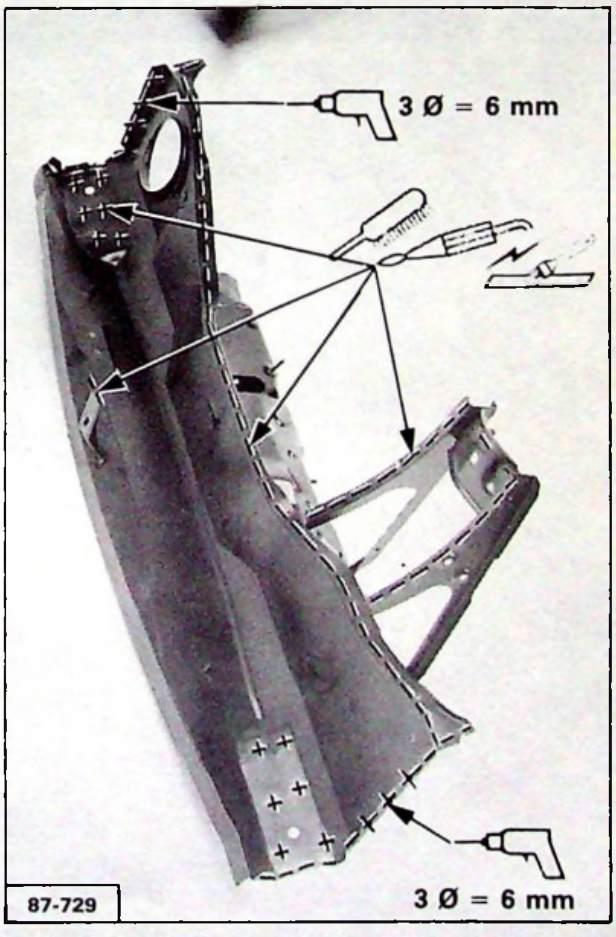
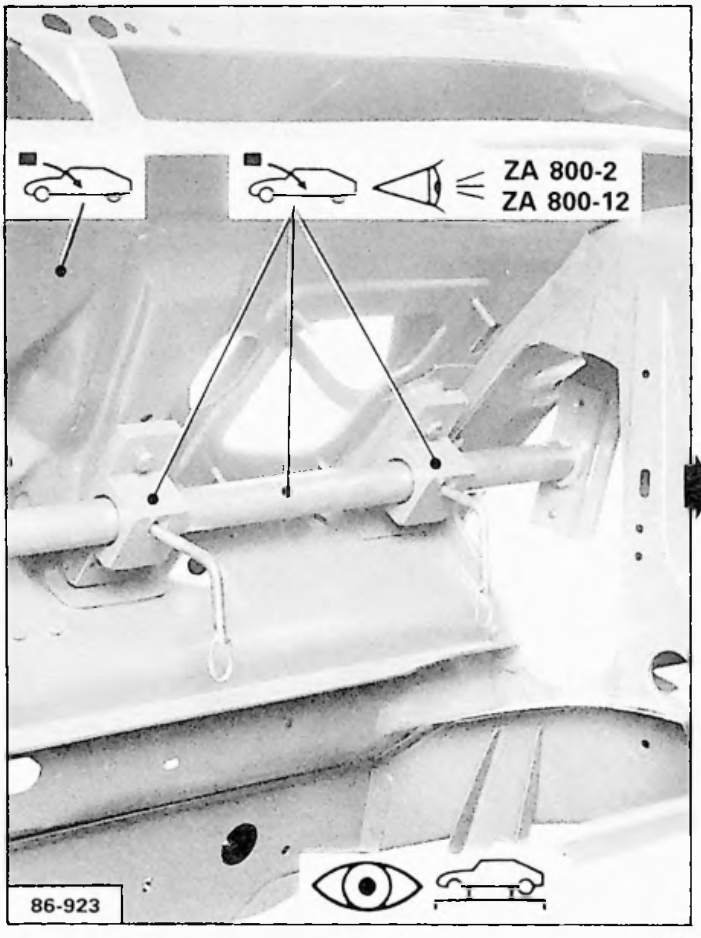

3 Ø = 6 mm
87-729
3 Ø = 6 mm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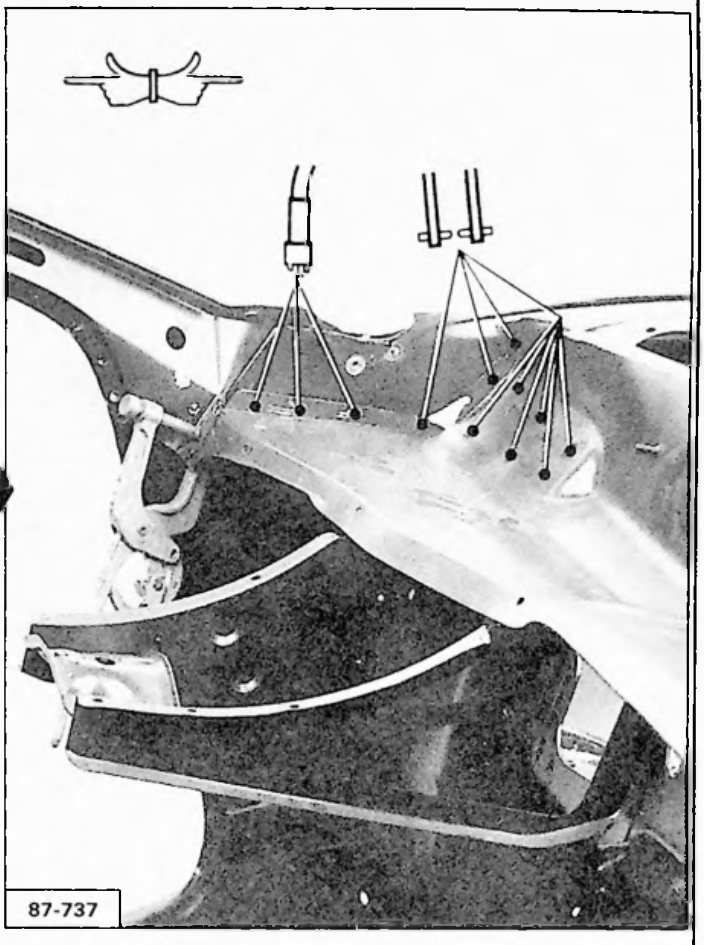
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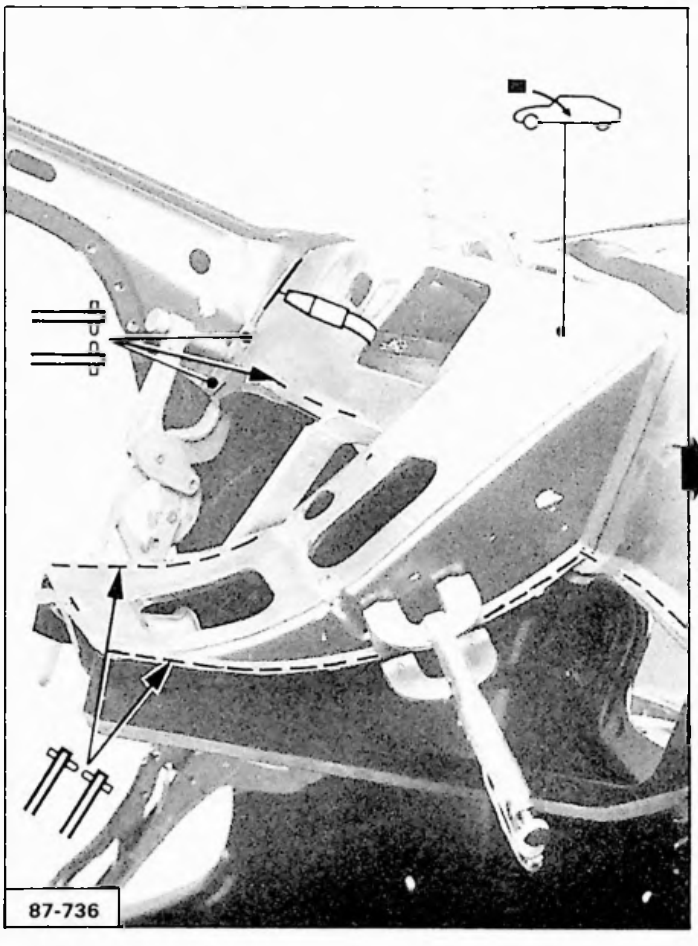
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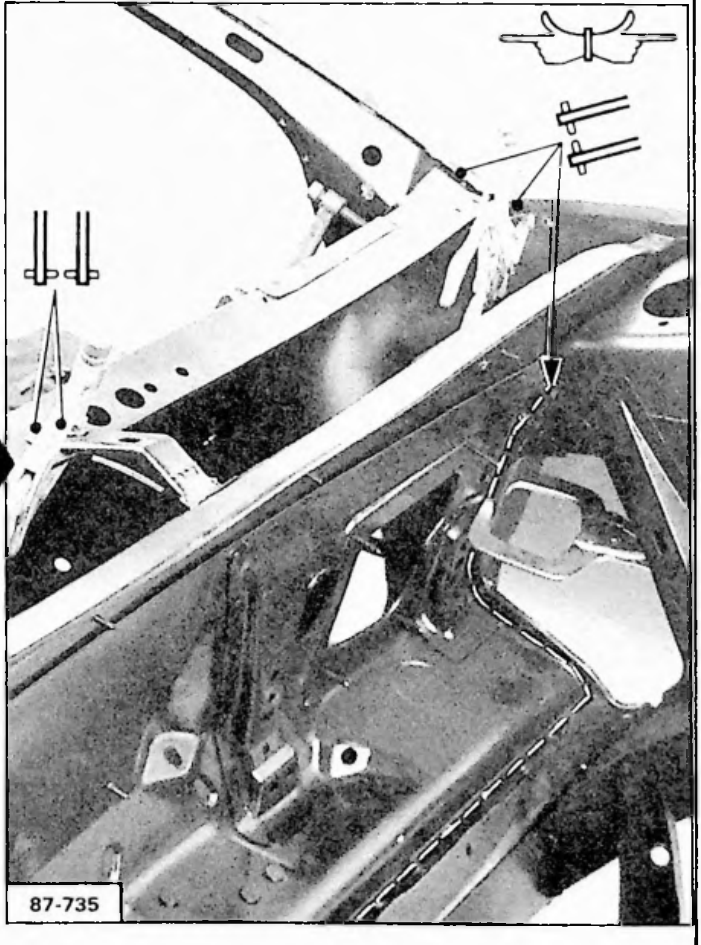
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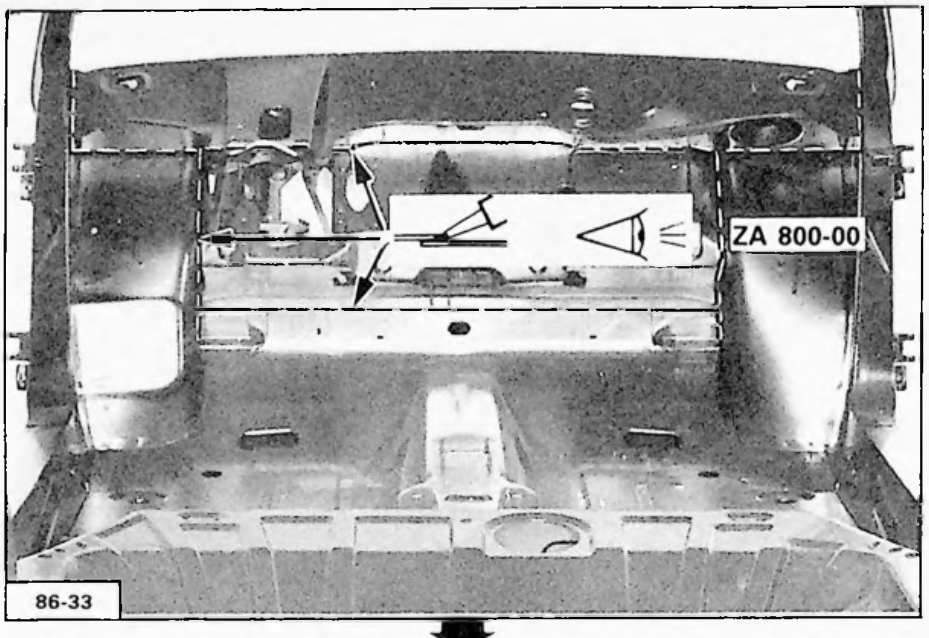
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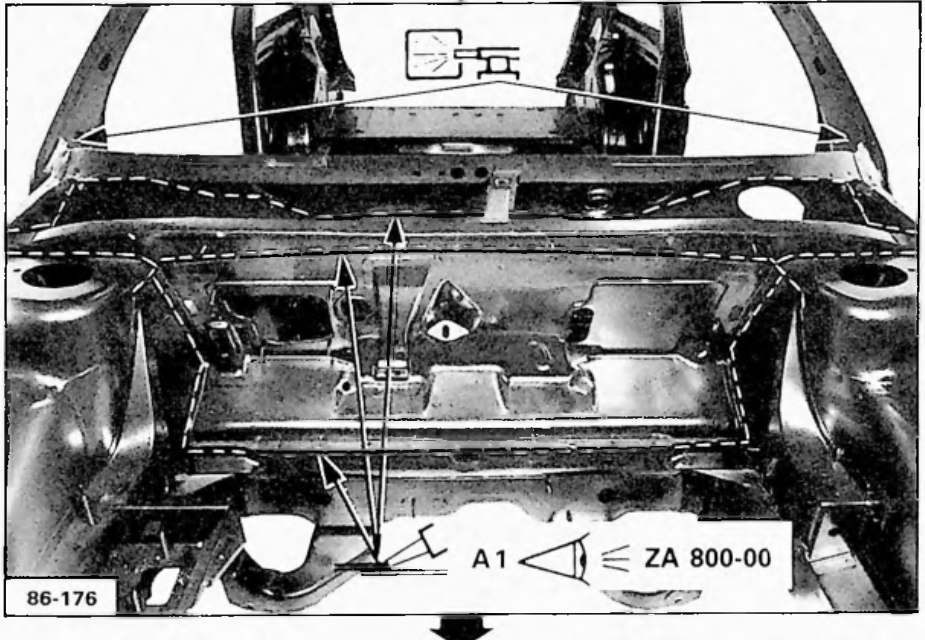
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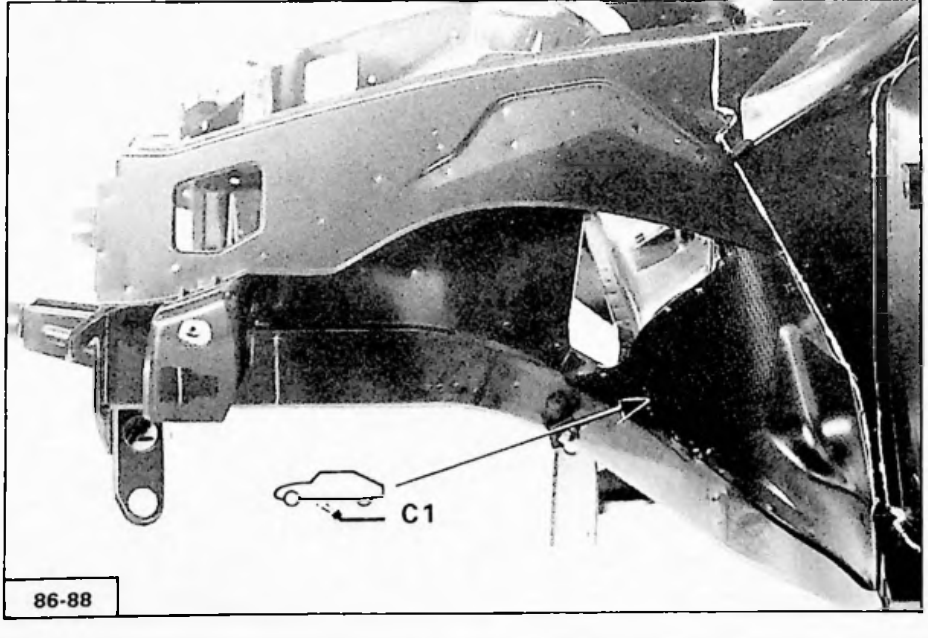
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86-88

CITROËN AX

MARS 1997

ABONNEMENT CAR

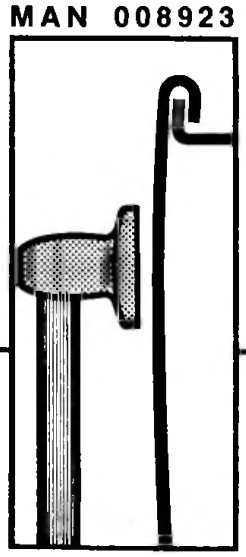
RÉF. 14 N° AX 812-3

STRUCTURE

● PARTIE AVANT

Pose : Renfort d'assise avant sur renfort central de tunnel

MAN 008923



AUTOMOBILES CITROËN
DIRECTION EXPORT EUROPE
DOCUMENTATION APRÈS-VENTE

POSE : RENFORT D'ASSISE AVANT SUR RENFORT CENTRAL DE TUNNEL

1 – OPERATIONS PRELIMINAIRES

Déposer :
- le siège avant et sa glissière
- la console centrale

2 – PREPARATION DES PIECES

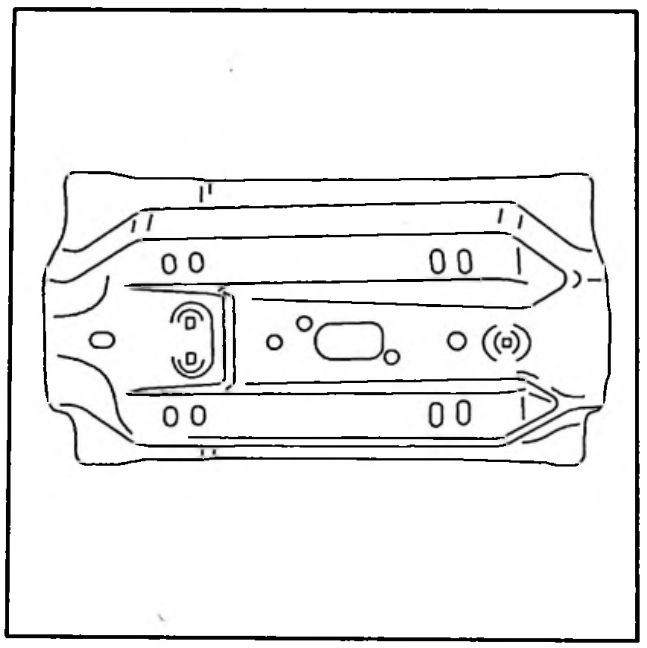


Fig : C4AP08UC

Pièce commercialisée par le service des pièces de rechange.

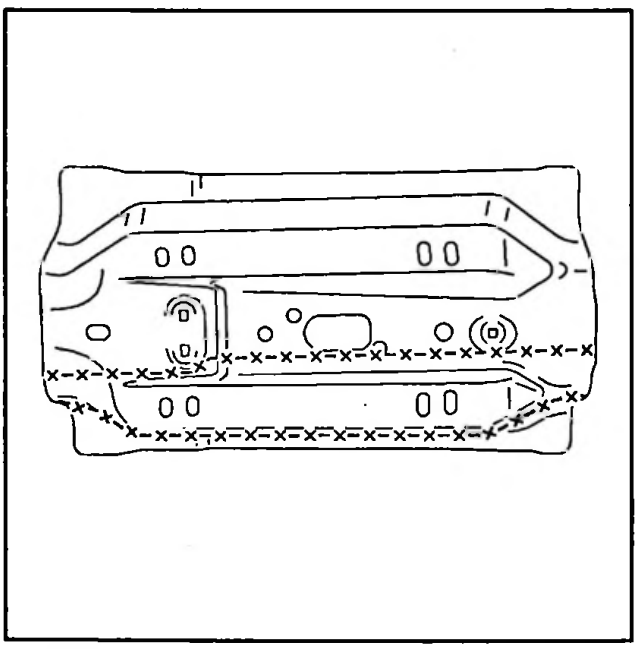


Fig : C4AP08VC

Pièce nécessaire à la réparation.
Tracer et découper.

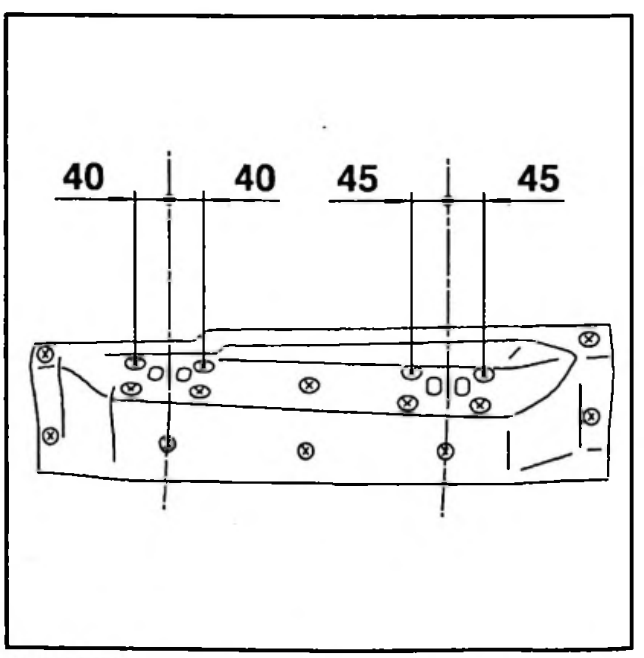


Fig : C4AP08WC

Tracer et pointer l'emplacement des rivets (respecter l'entraxe pour la fixation de l'assise).

3 – PREPARATION DU VEHICULE

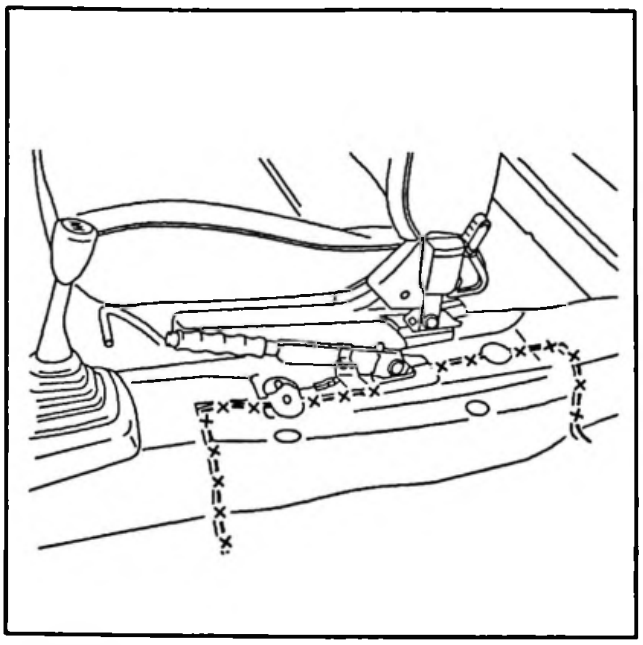


Fig : C4AP08XC

Couper le tapis (pour dégager le tunnel).

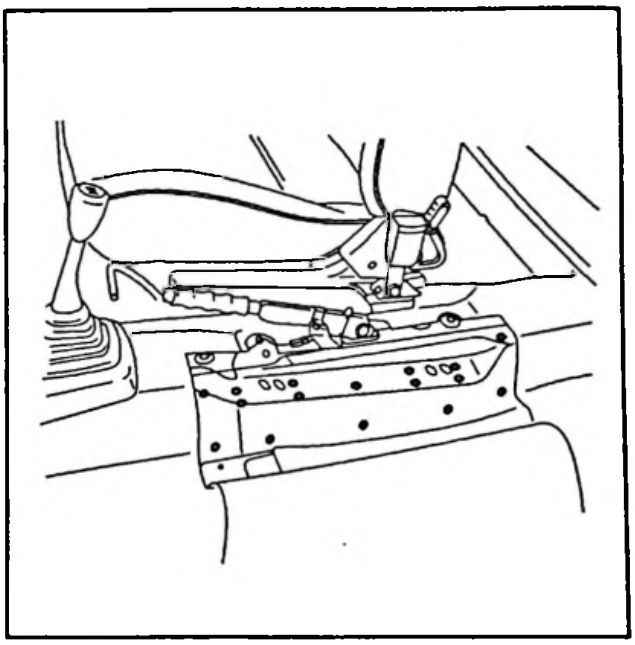


Fig : C4AP08ZC

Positionner le renfort sur le véhicule.

Percer l'emplacement des rivets à Ø 4,2 mm.

Déposer le renfort.

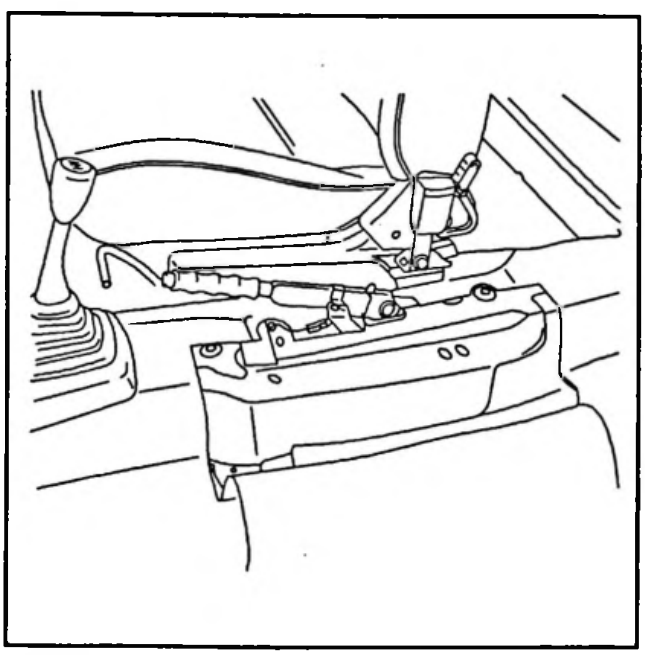


Fig : C4AP08YC

Nettoyer le renfort de tunnel.

Gratter l'insonorisant.

Dépolir et dégraisser la partie à renforcer.

4 – COLLAGE

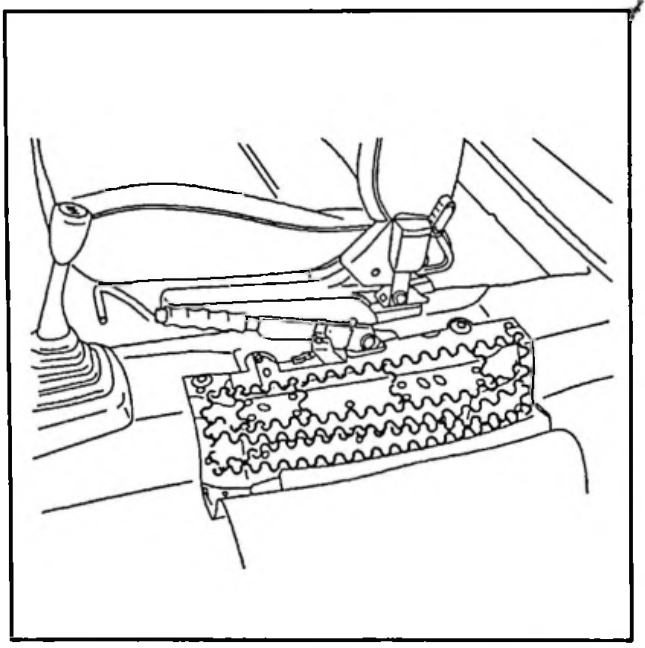


Fig : C4AP090C

Dégraisser la partie à encoller.

Déposer un cordon de colle sur le véhicule.

Lisser légèrement le cordon.

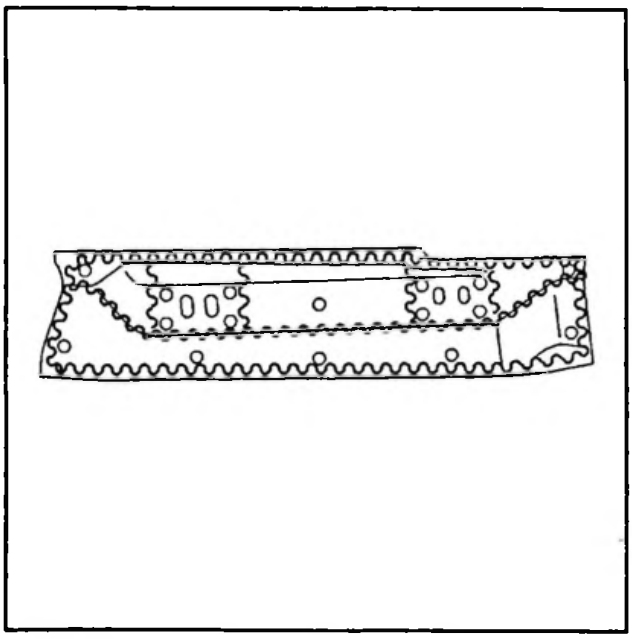


Fig : C4AP091C

Dépolir et dégraisser l'intérieur du renfort.

Déposer un cordon de colle : lisser légèrement le cordon.

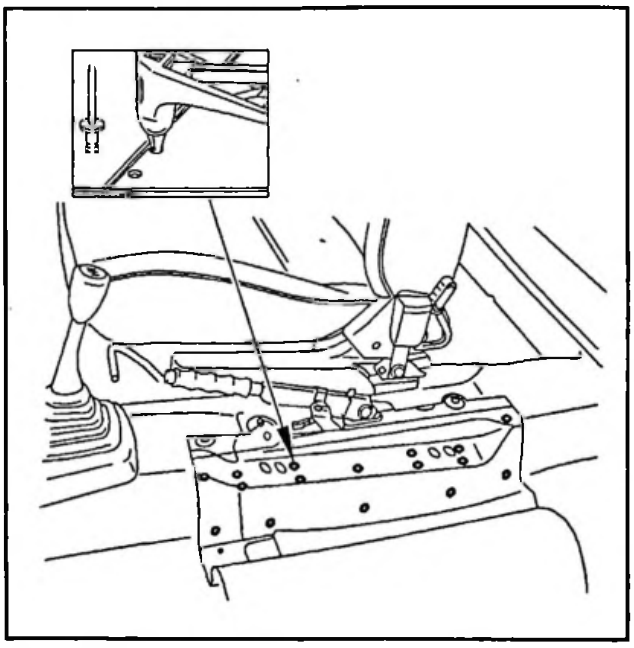


Fig : C4AP092C

Positionner le renfort sur le véhicule.

Poser les rivets (acier Ø 4 mm longueur 9,2 mm).

ATTENTION : S'assurer que les plaquettes des écrous en cages ne restent pas collées.

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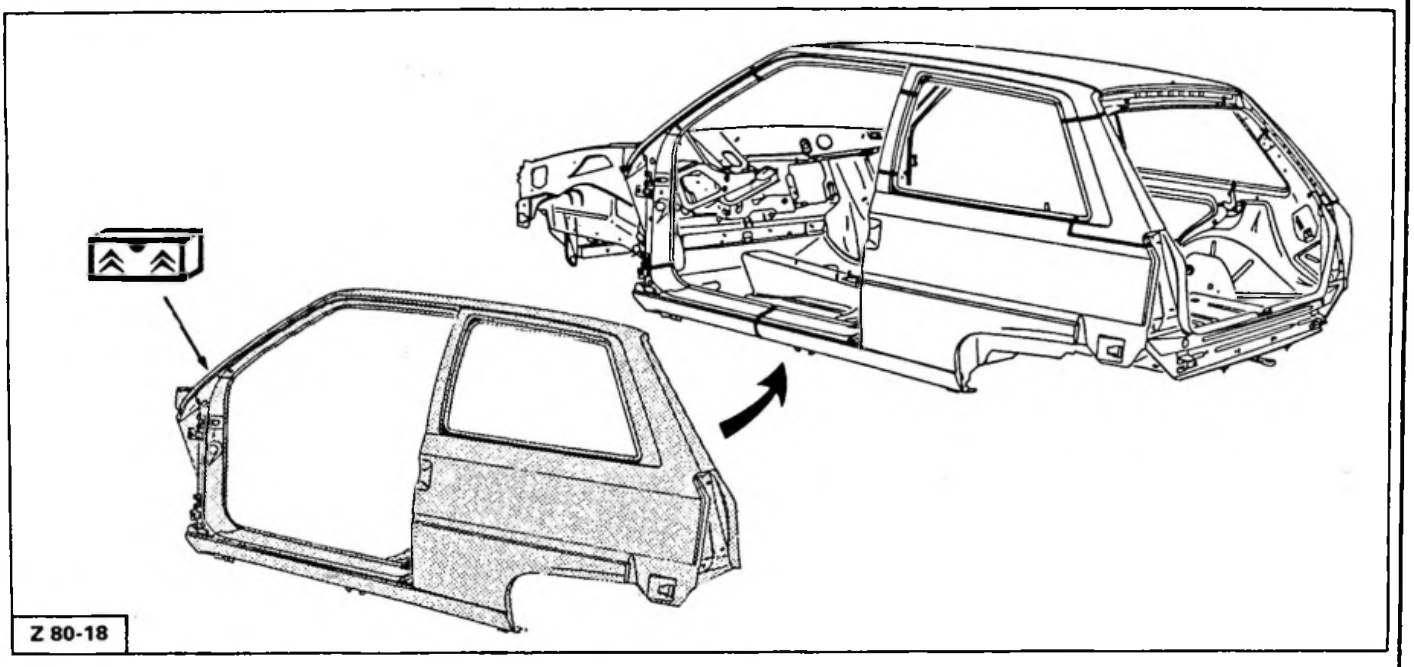

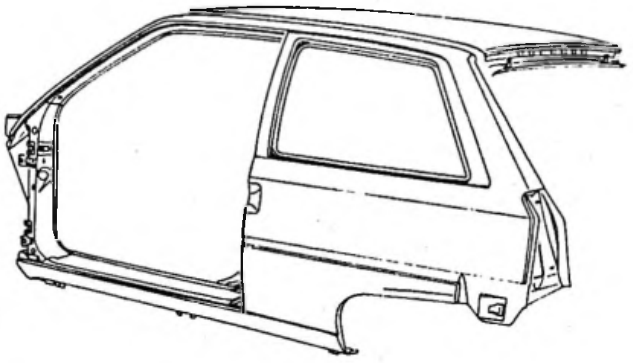

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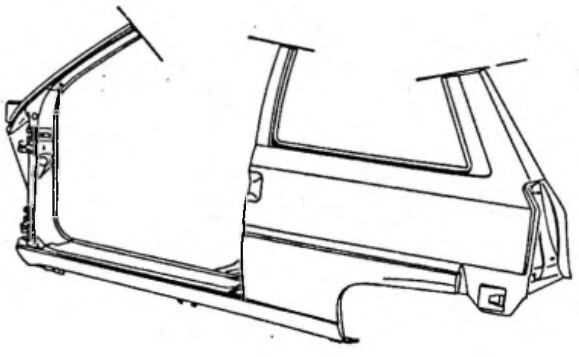

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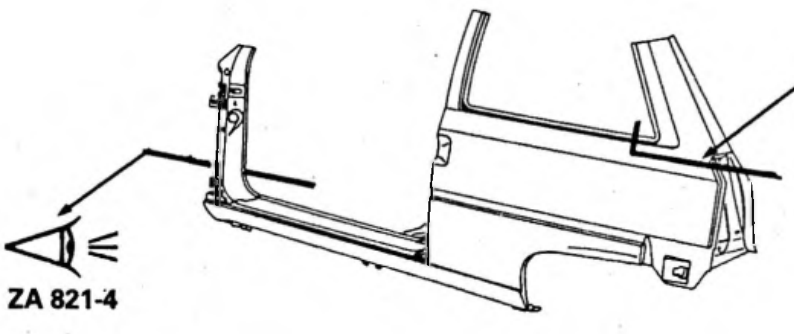

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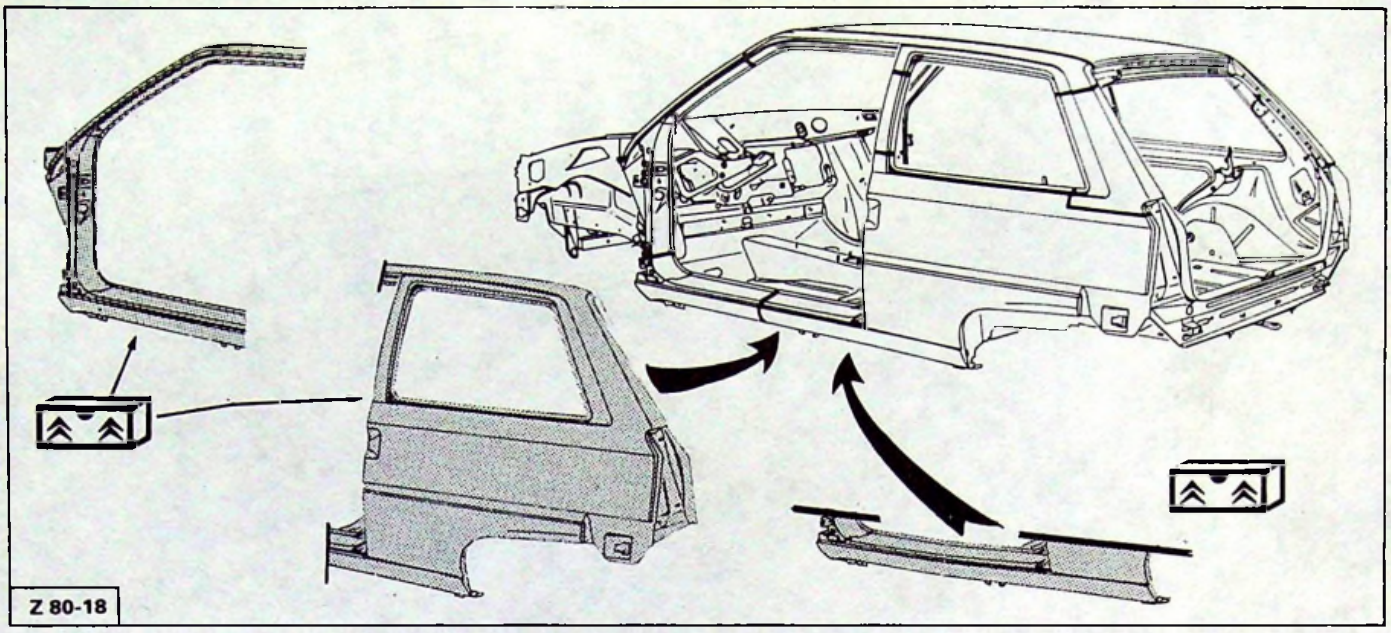
ZA 821-4
ZA 821-5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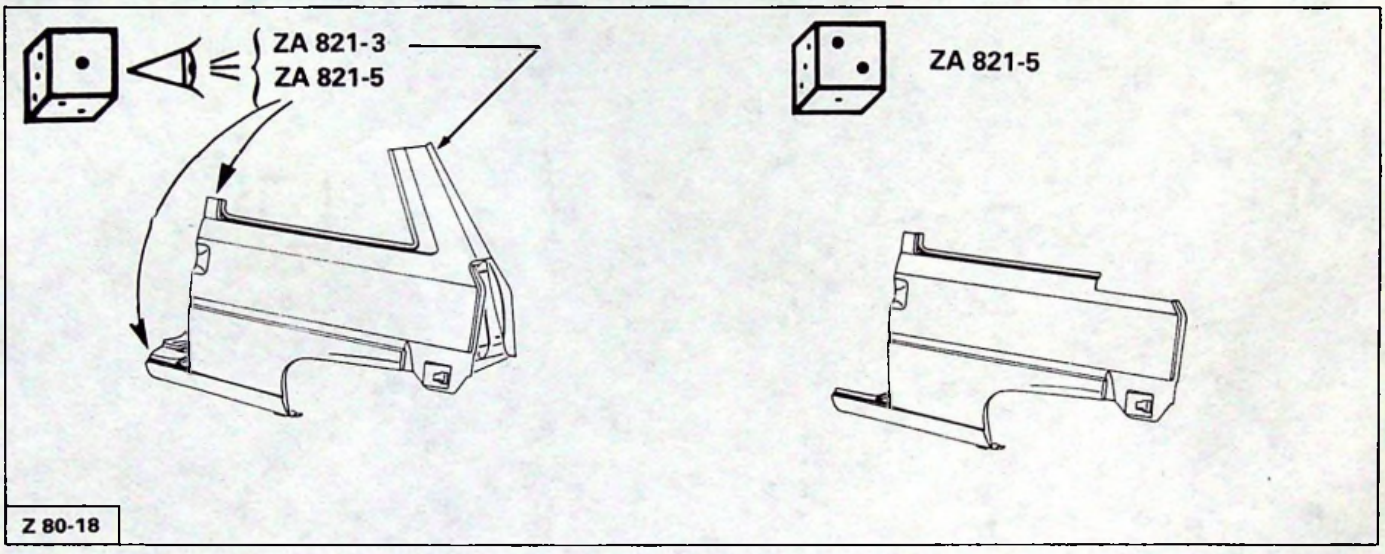
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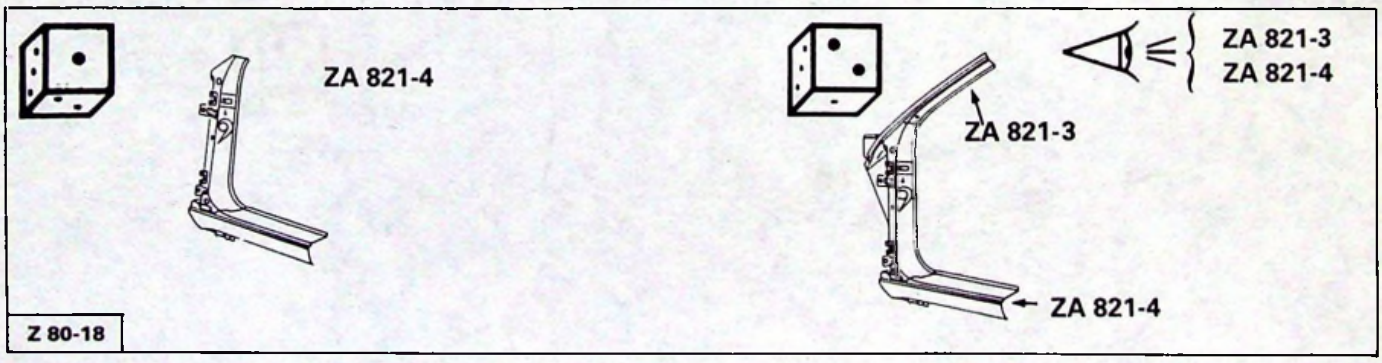
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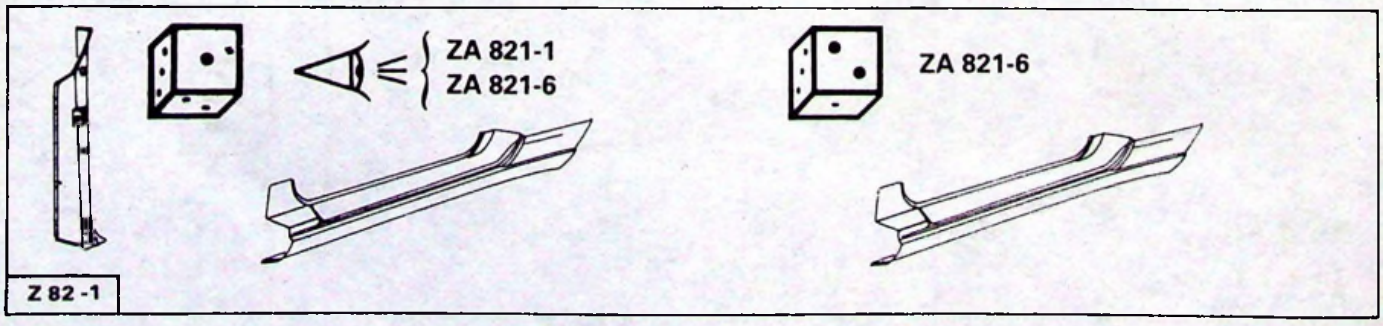
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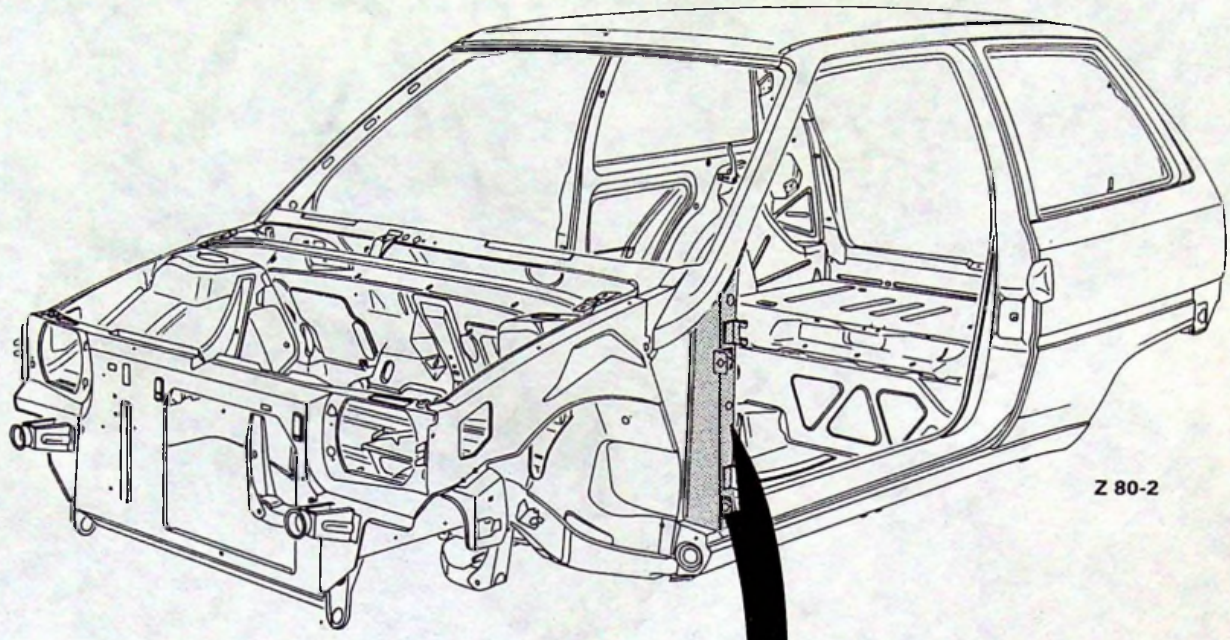

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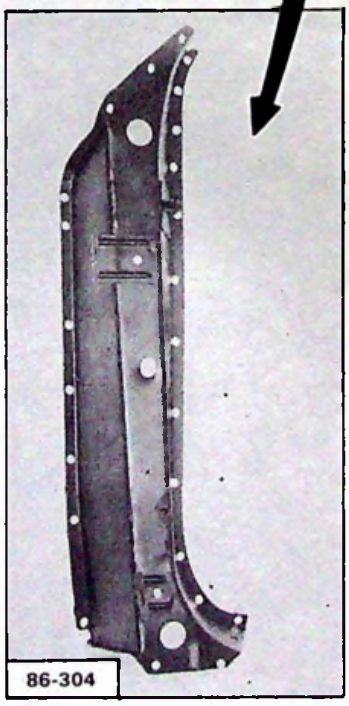

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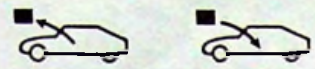

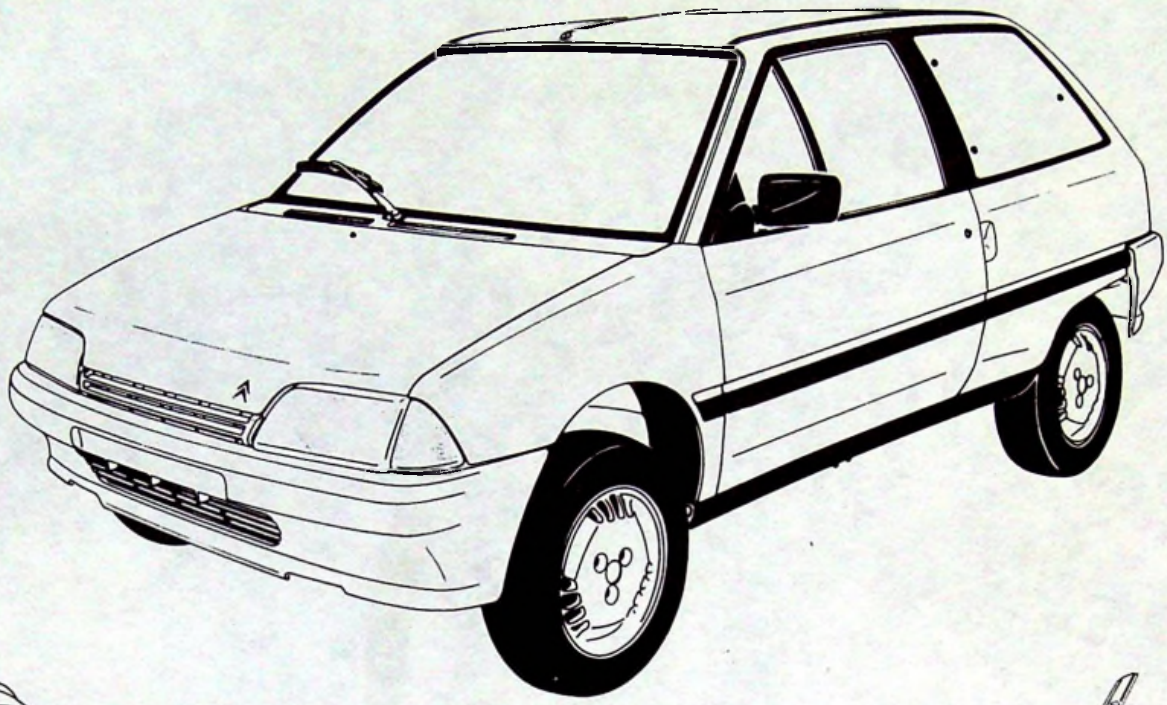

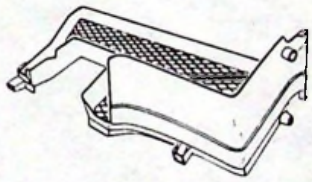

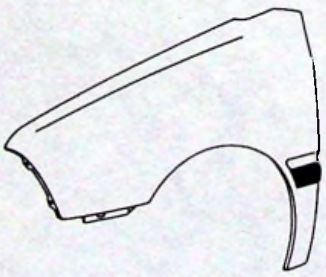

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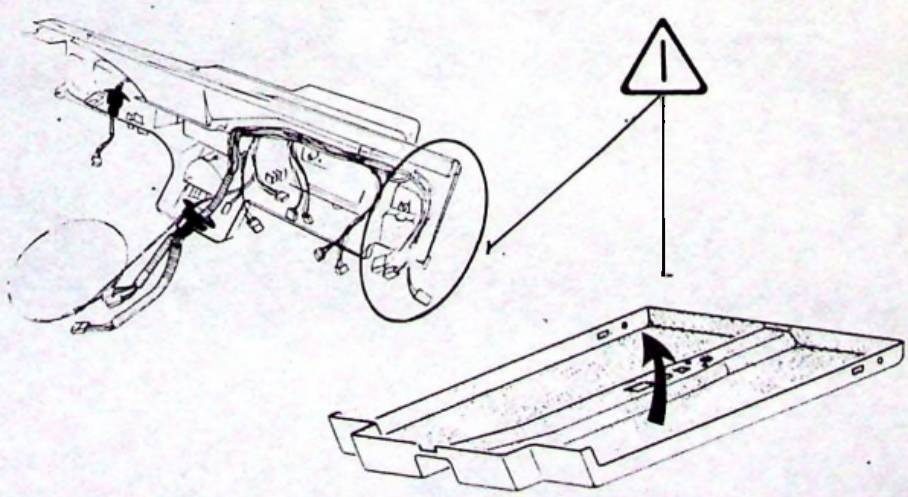

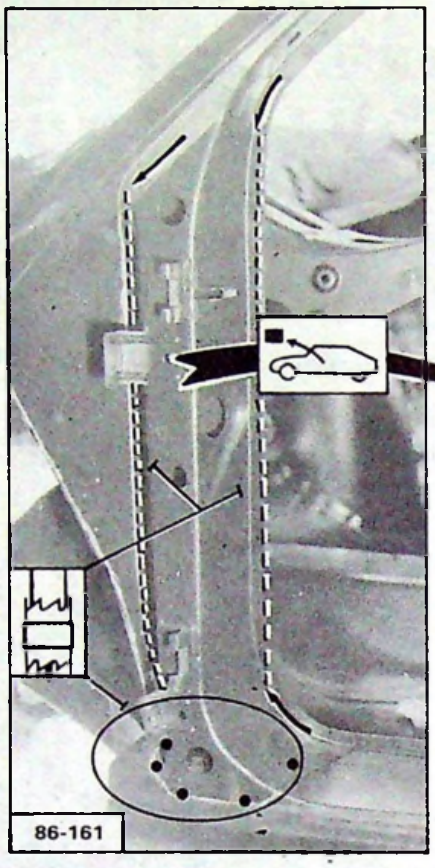
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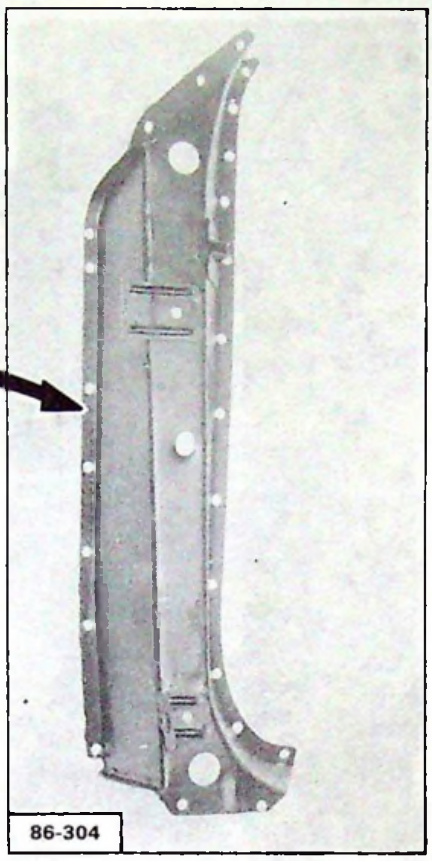
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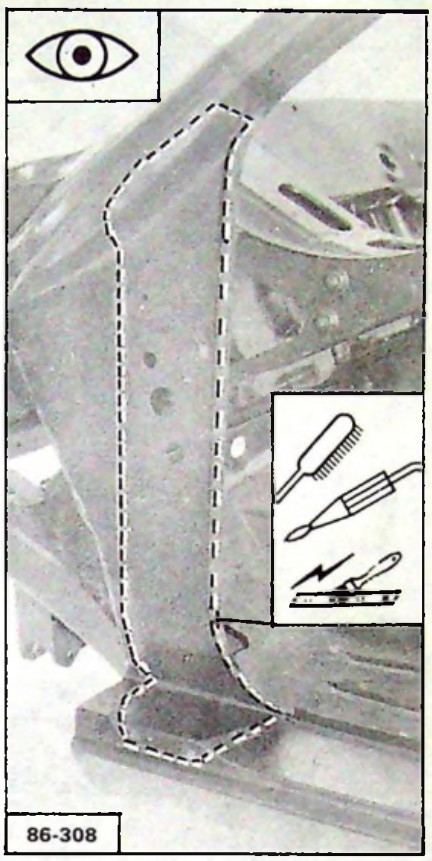
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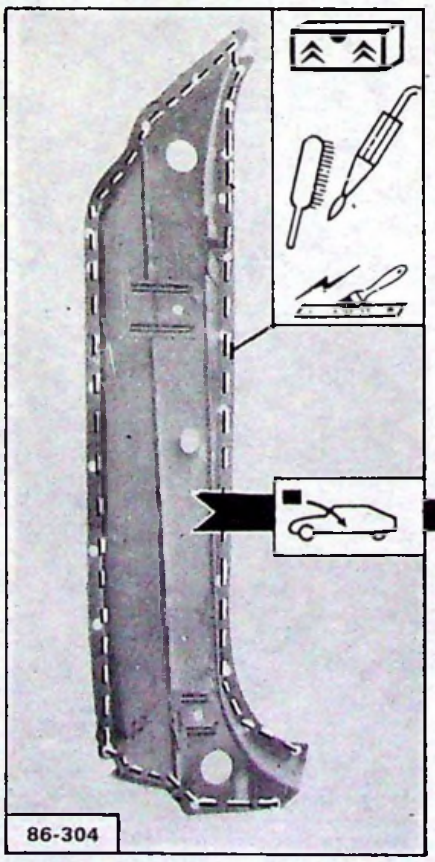
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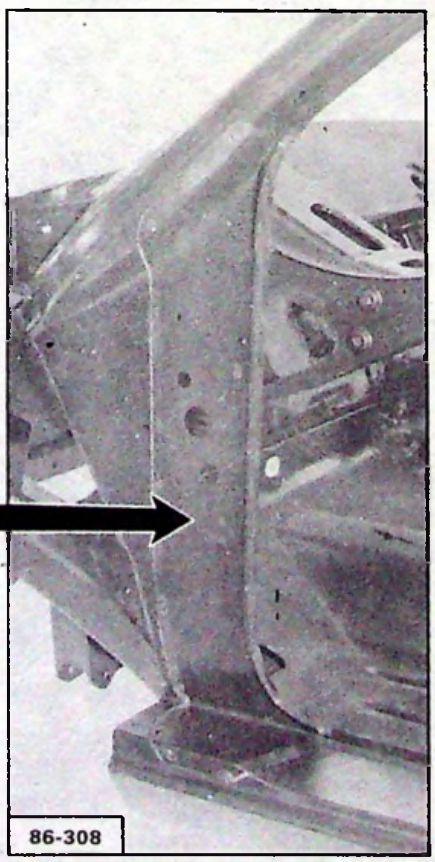
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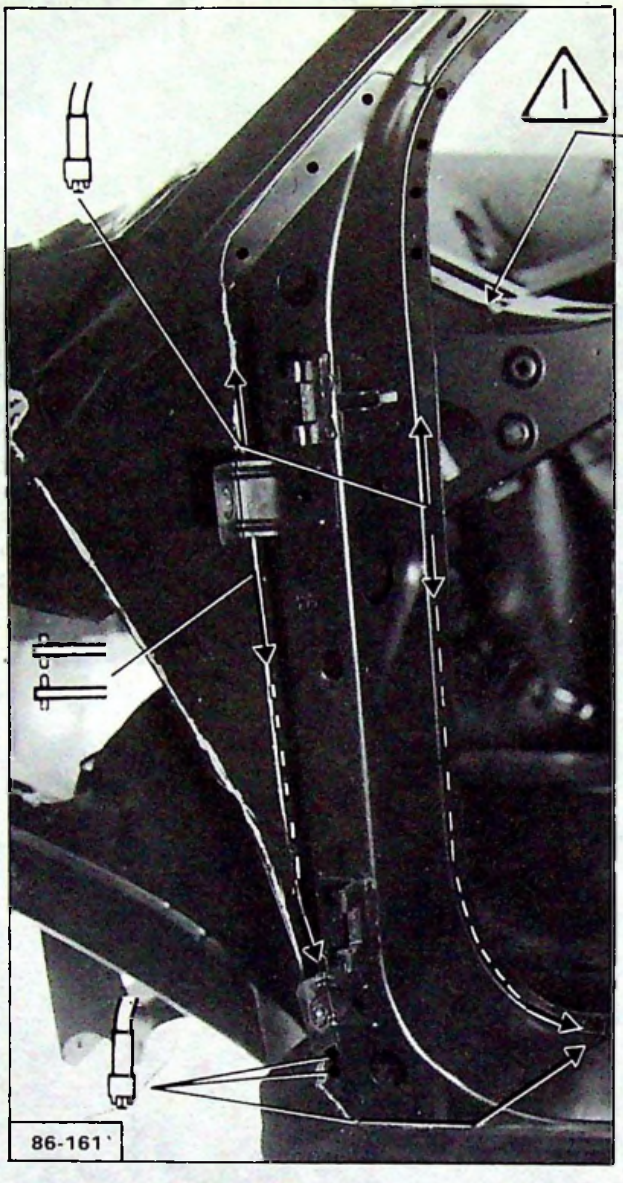
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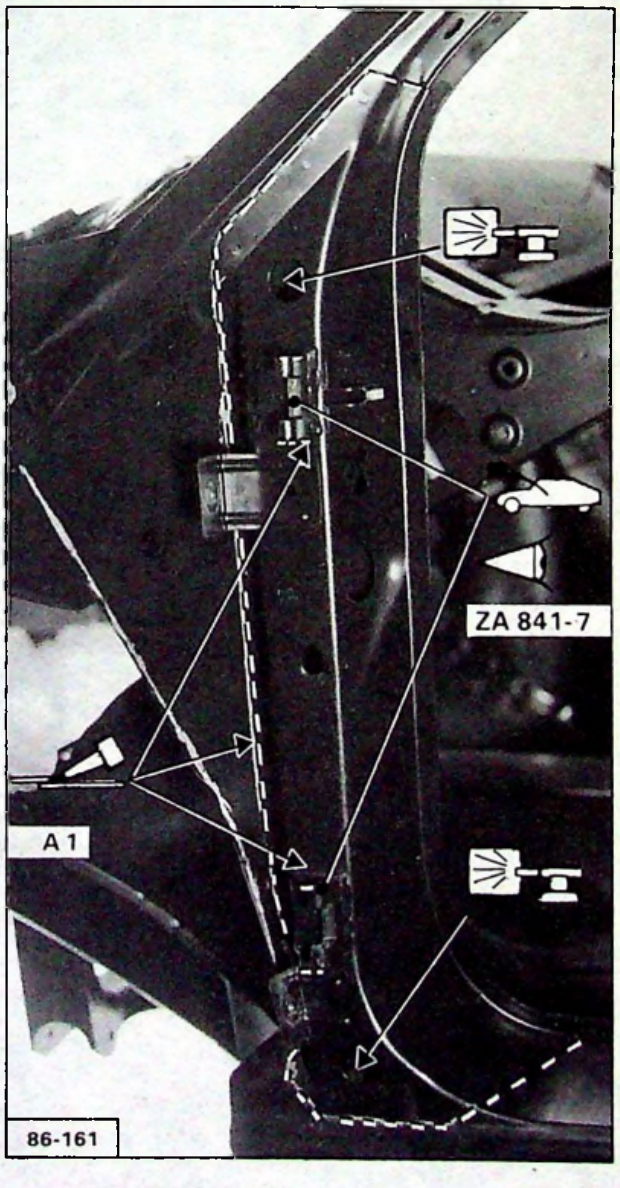
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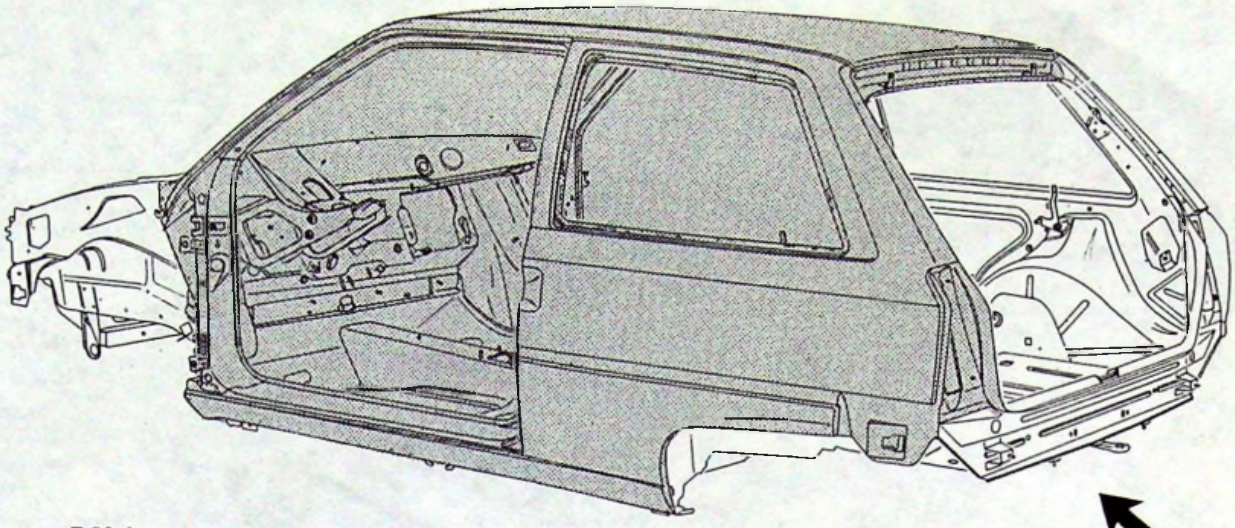

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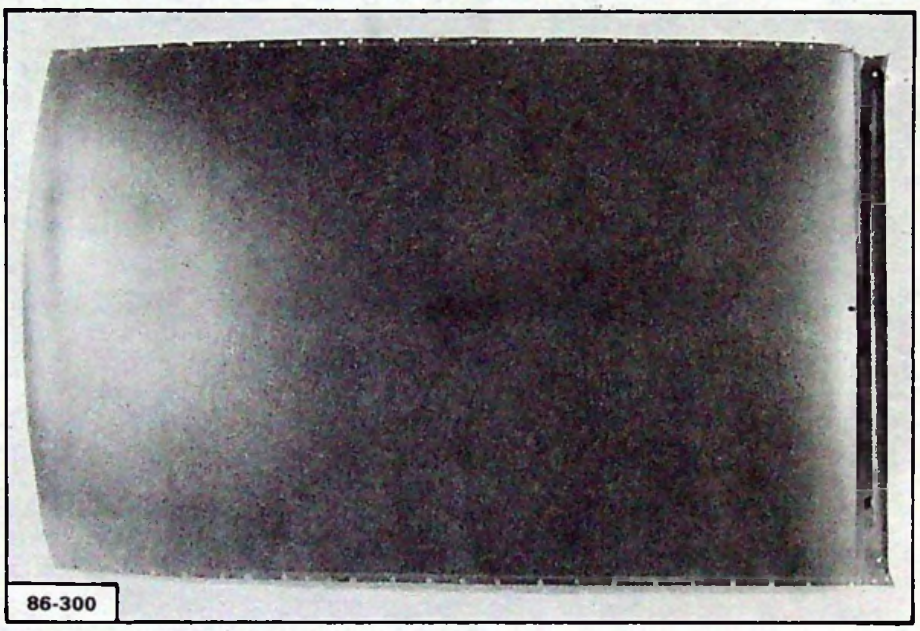

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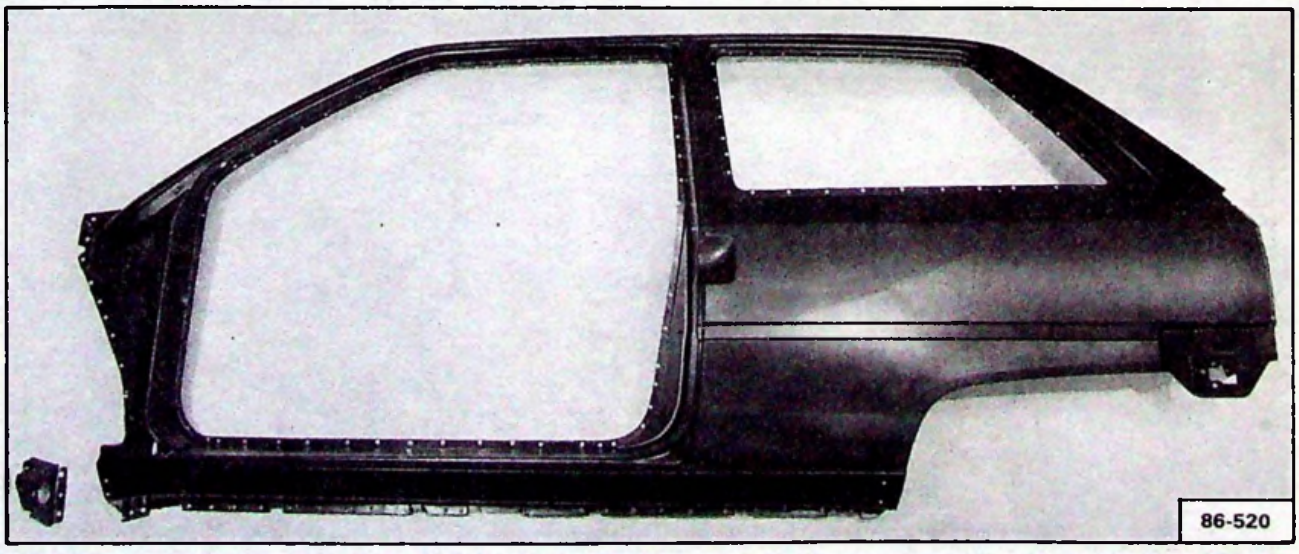

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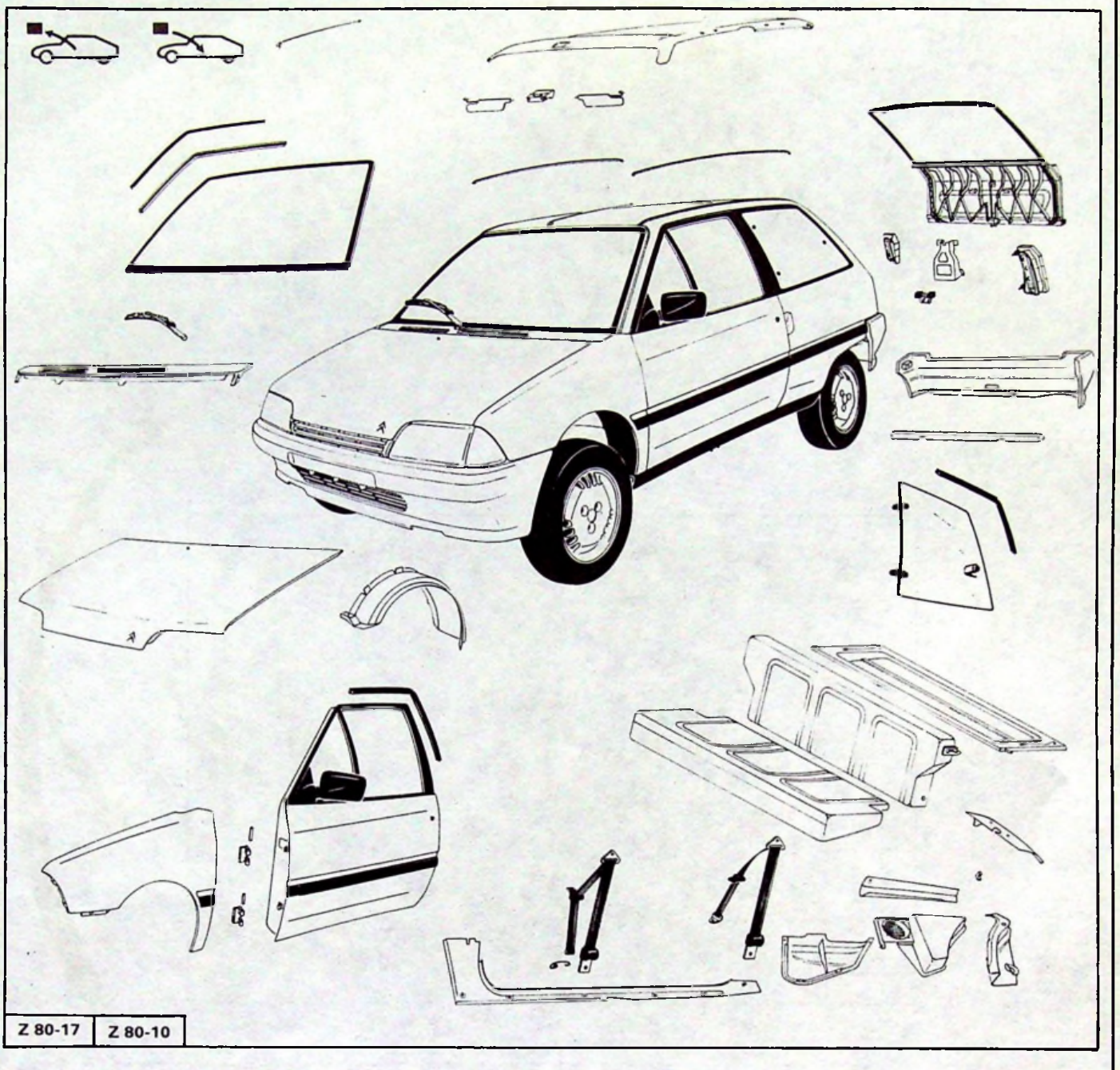

Z 80-17 | Z 80-10

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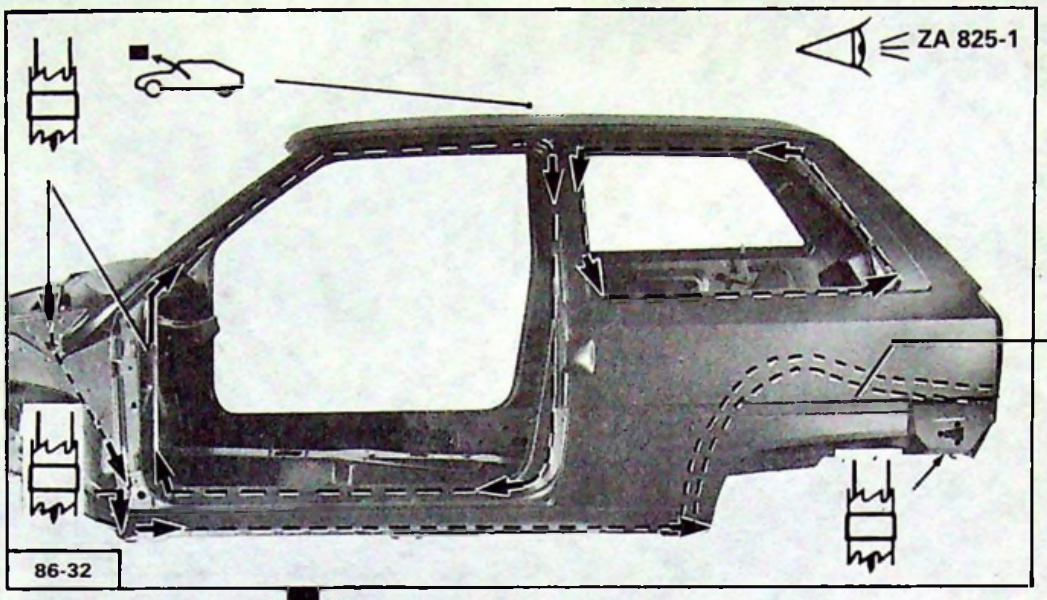
ZA 825-1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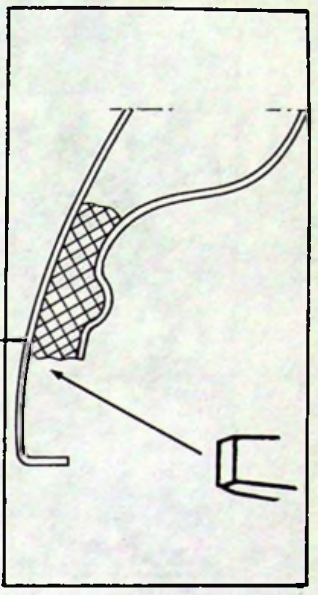

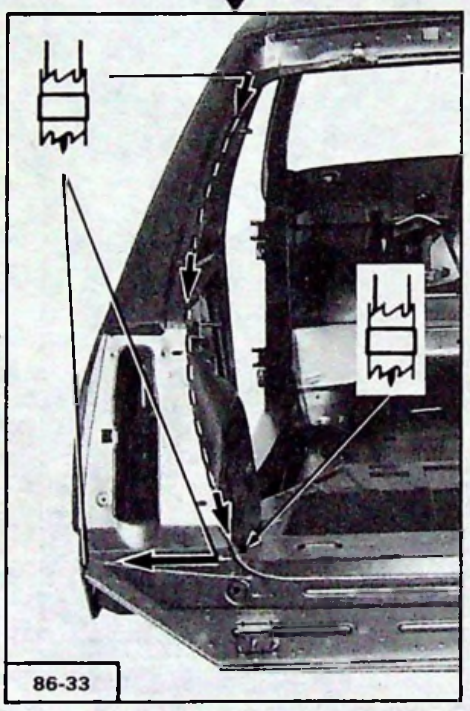
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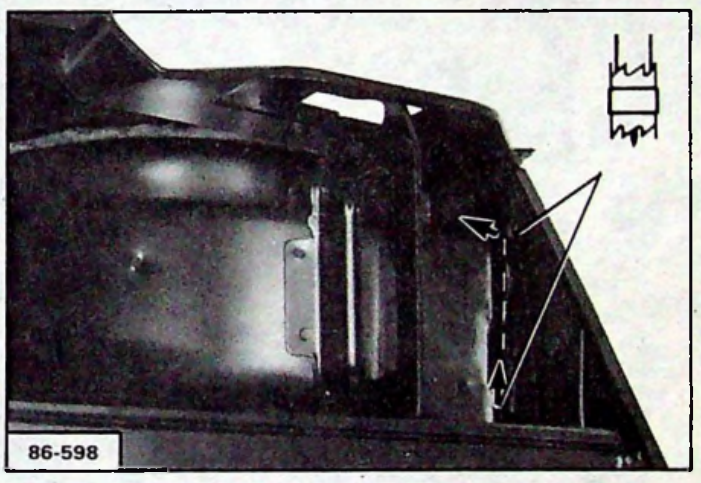
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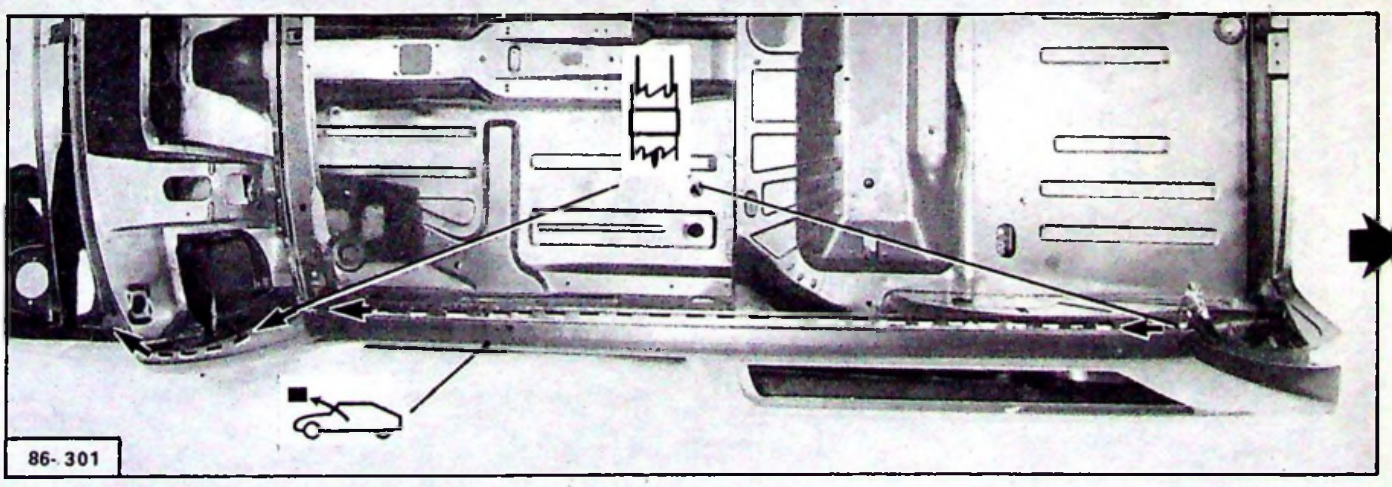
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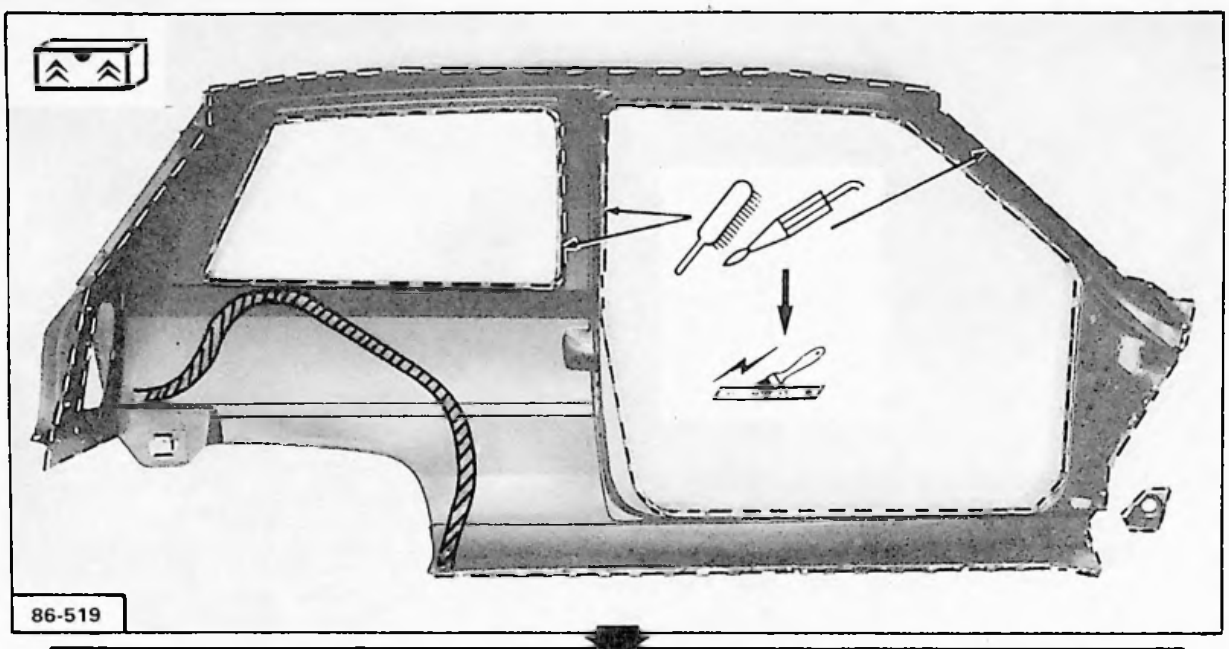

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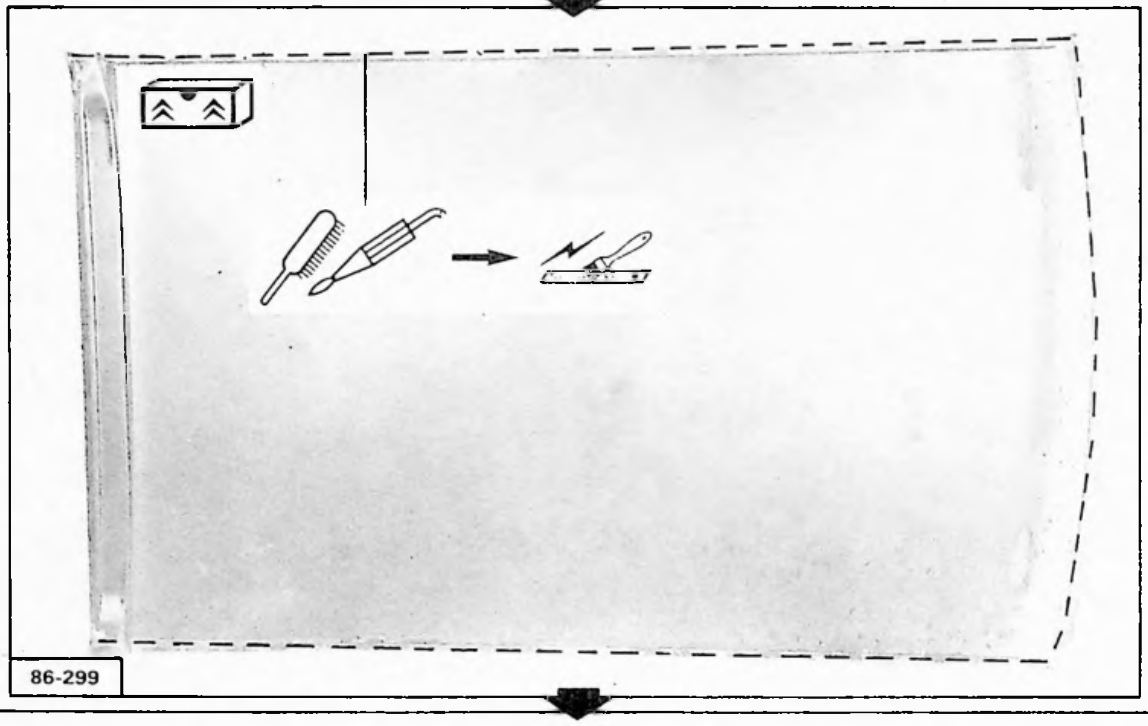

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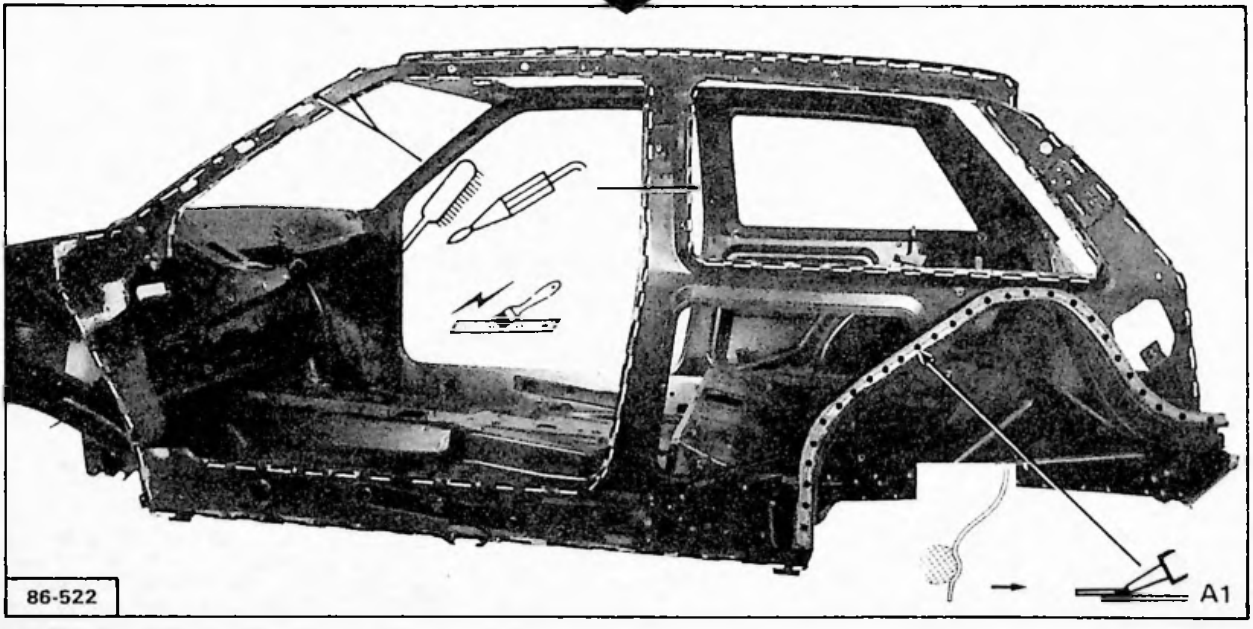

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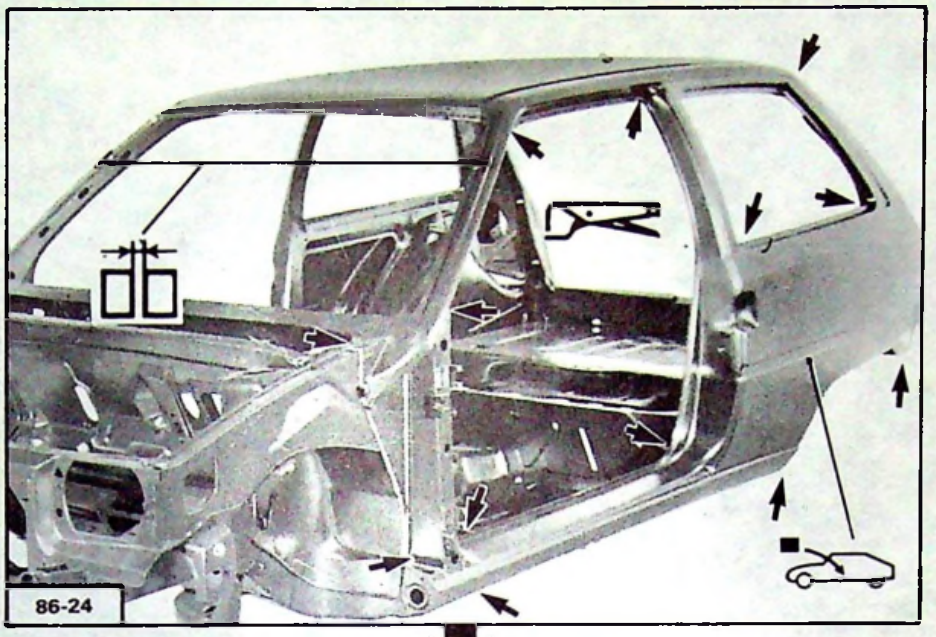
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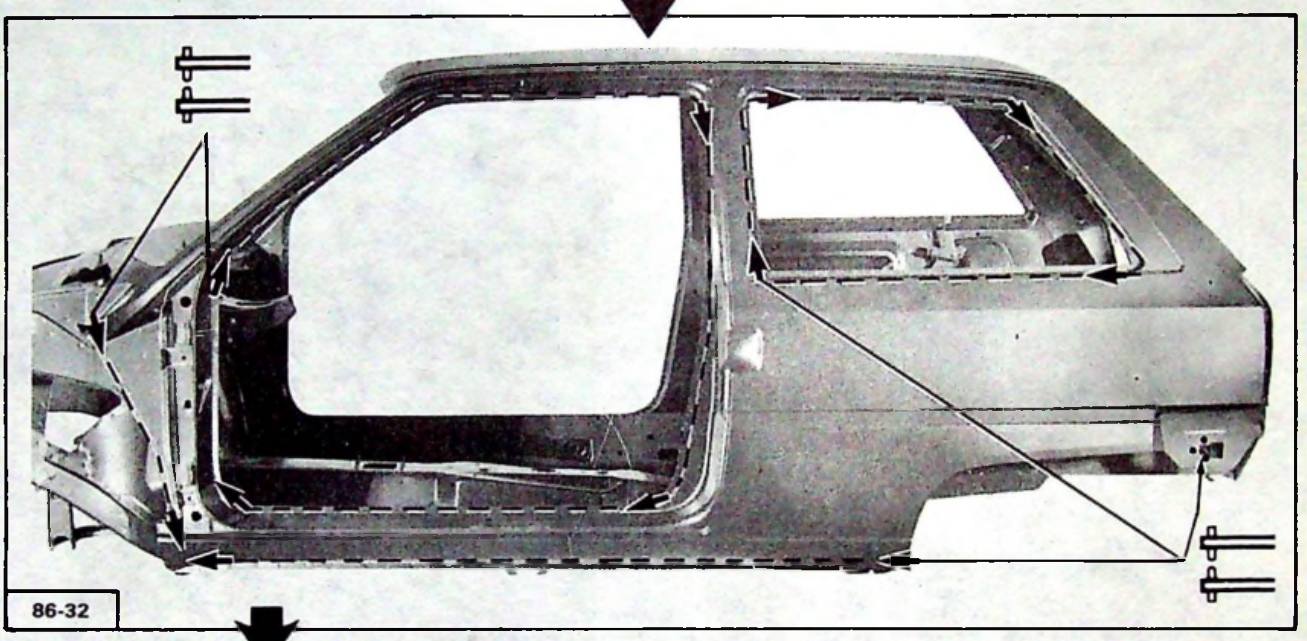
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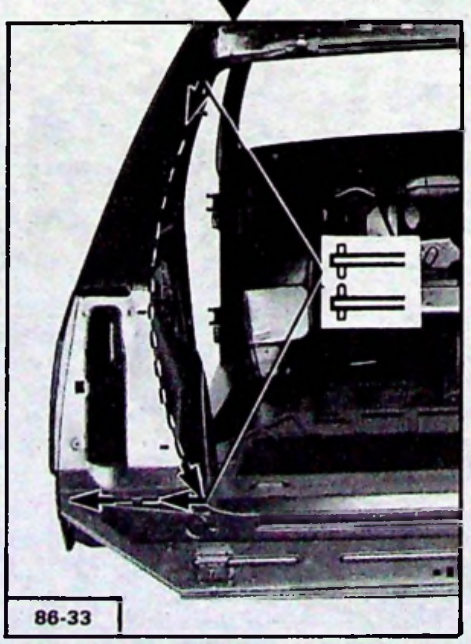
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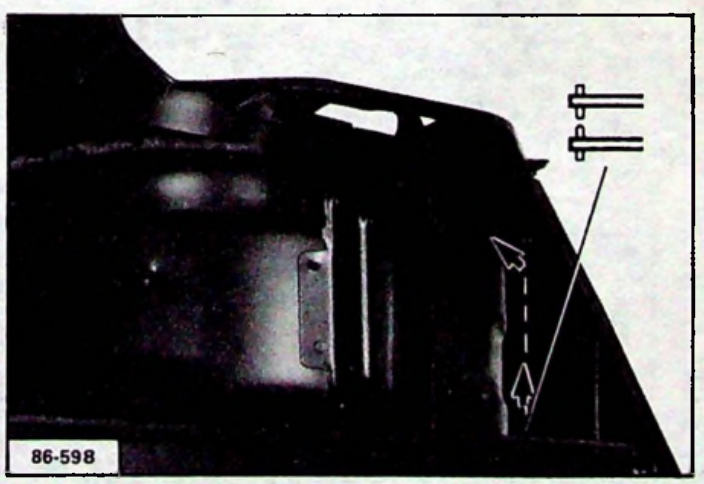
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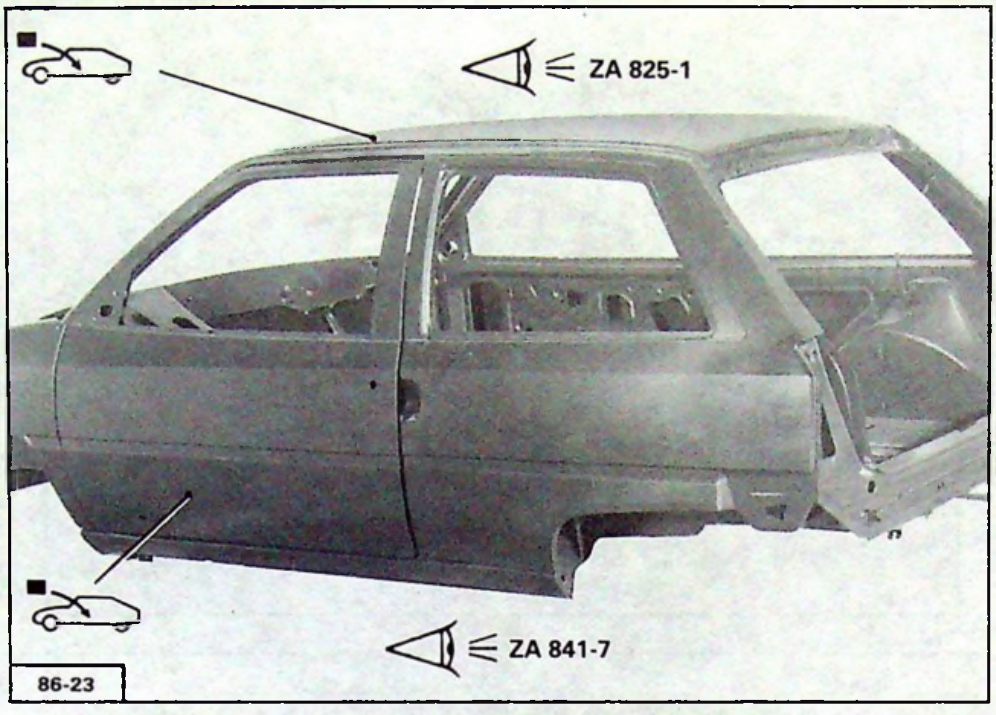
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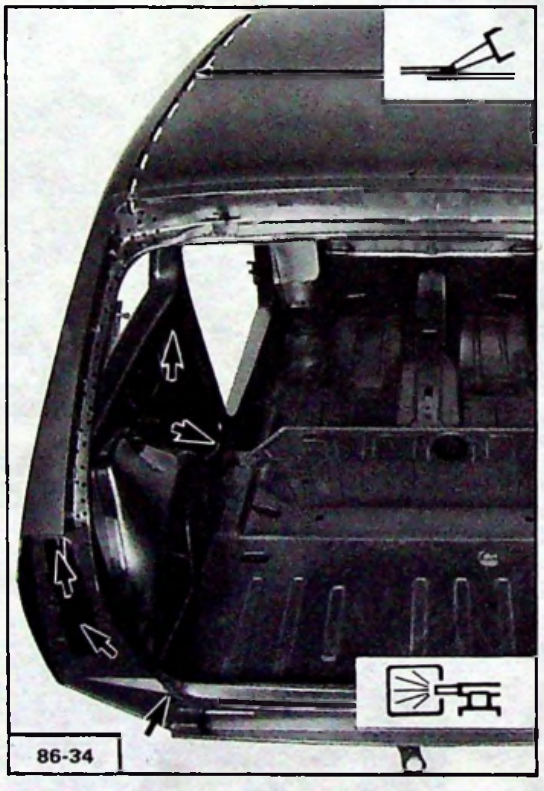
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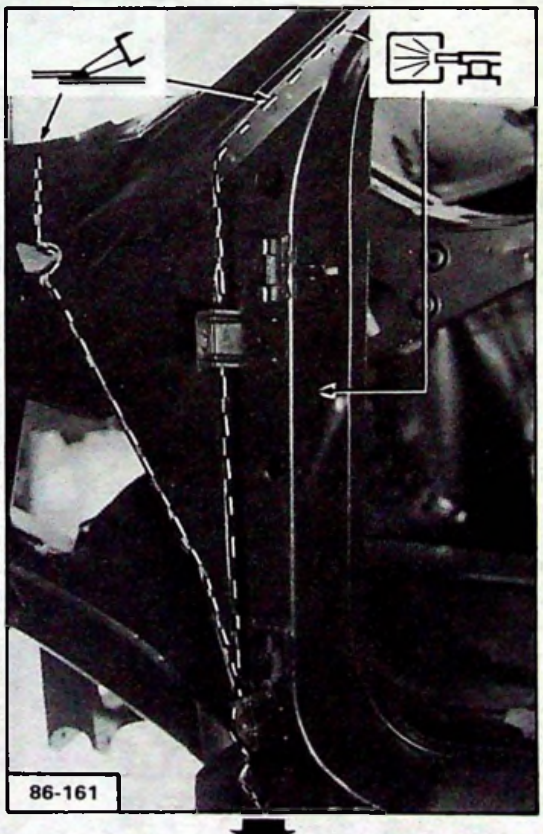
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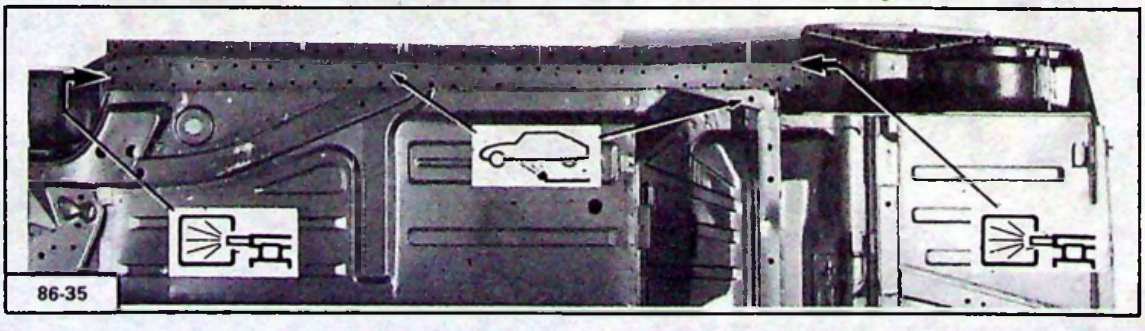
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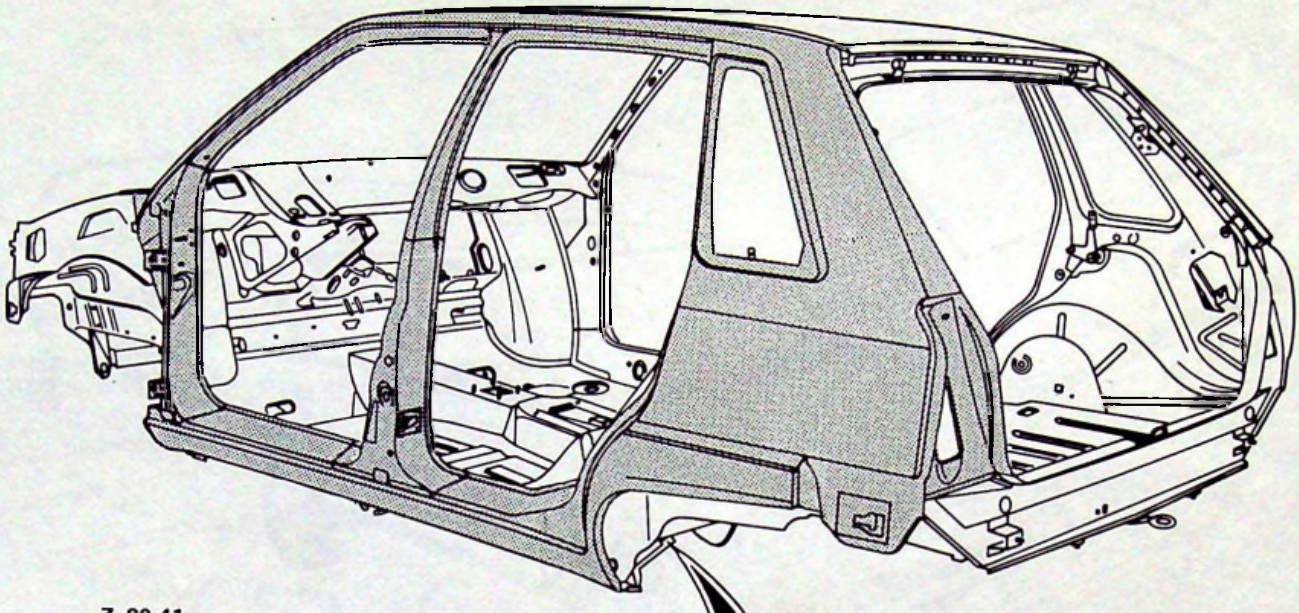
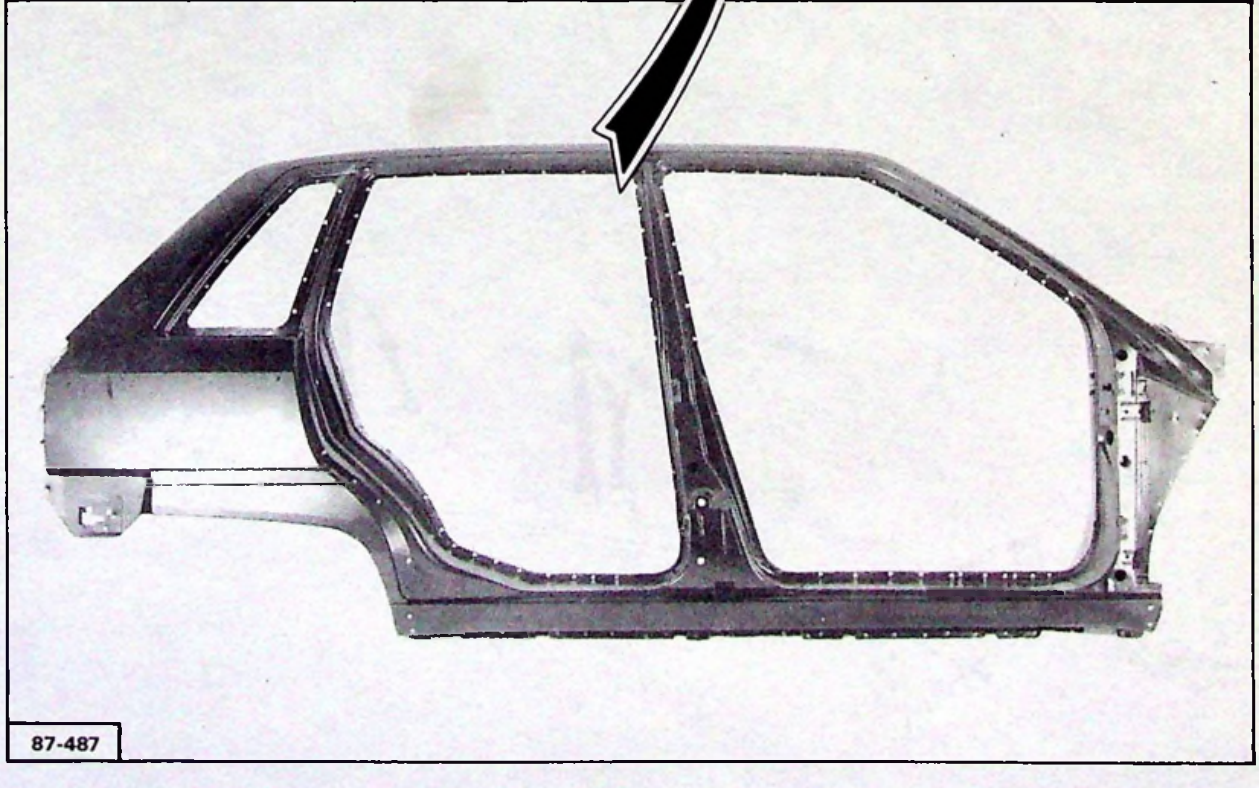


Z. 80-41



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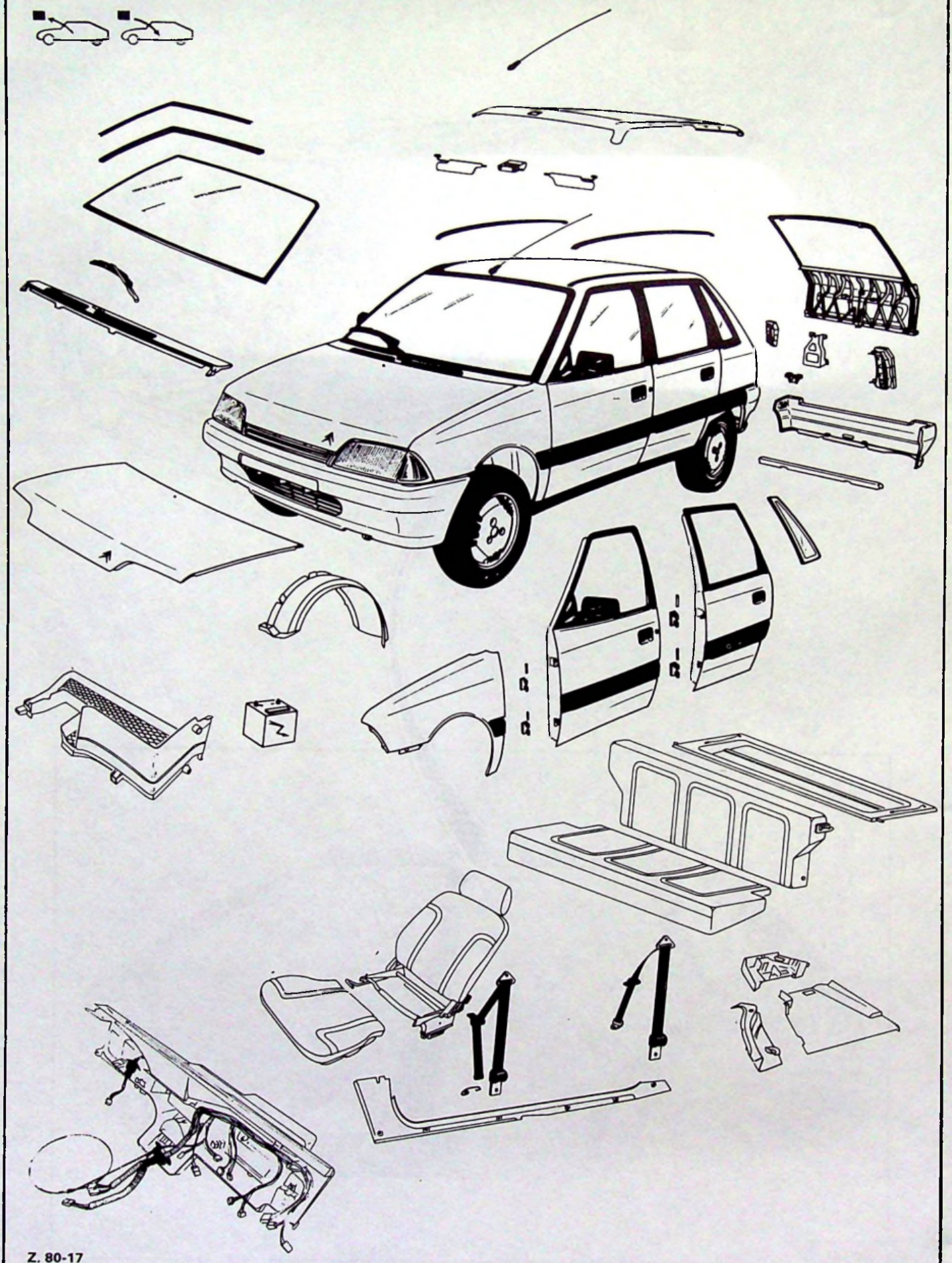
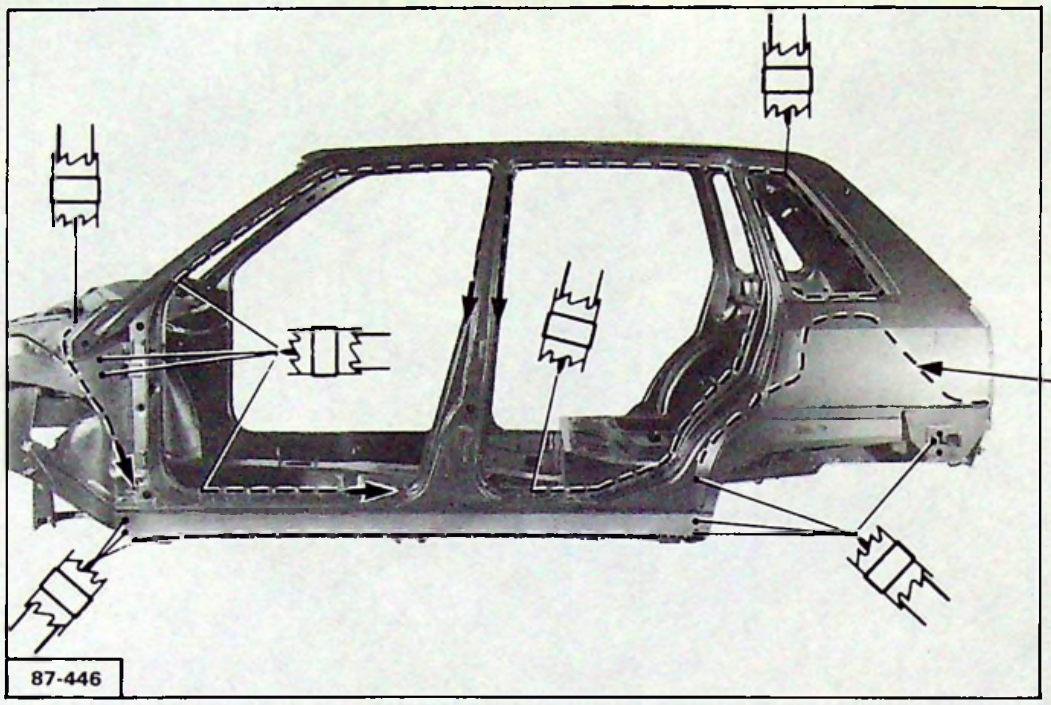


Z. 80-17

Z. 80-45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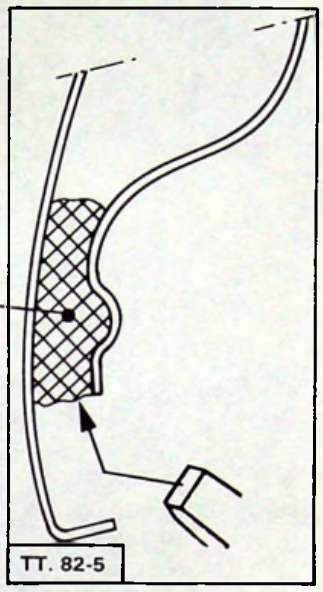
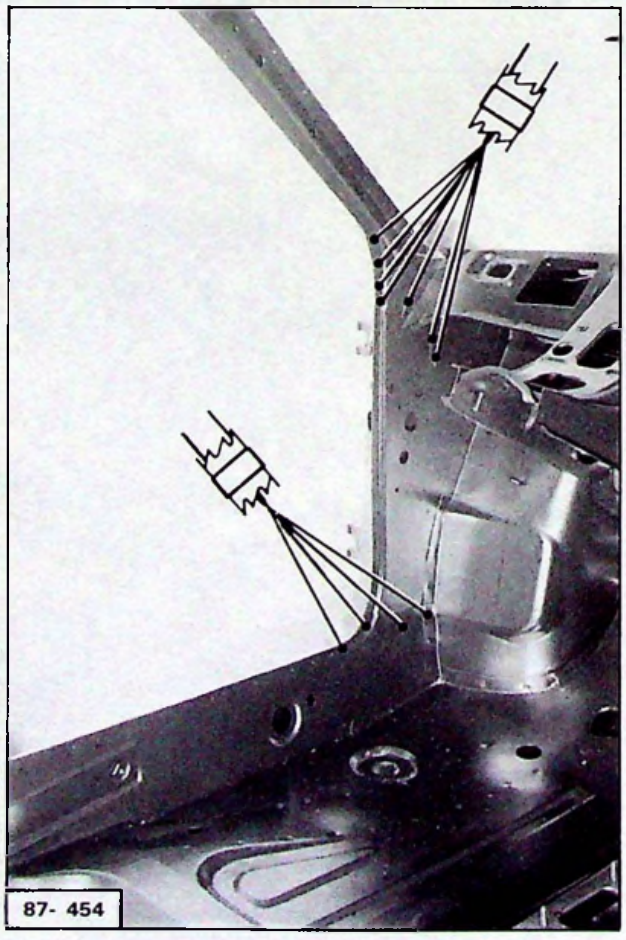

TT. 82-5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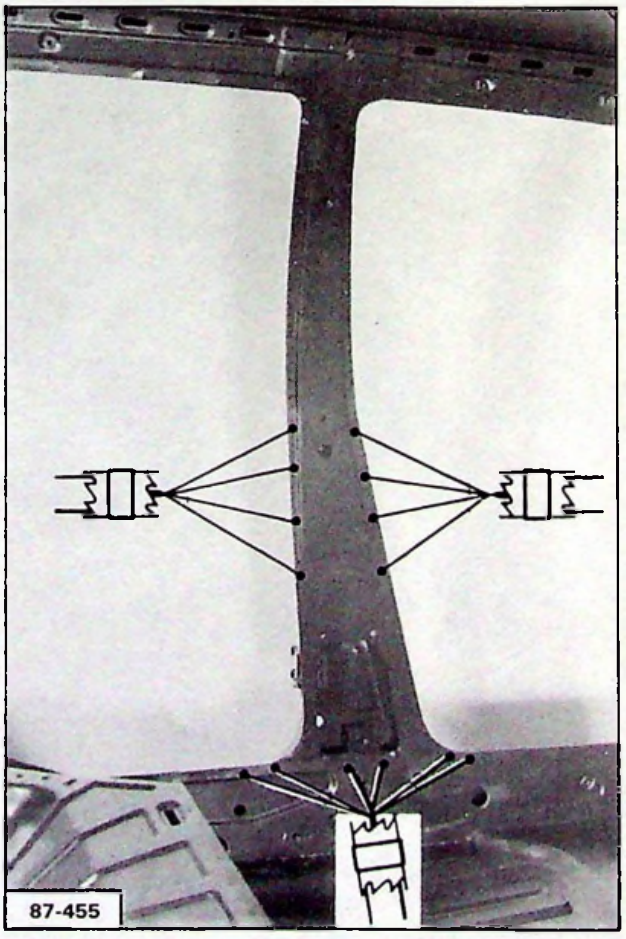
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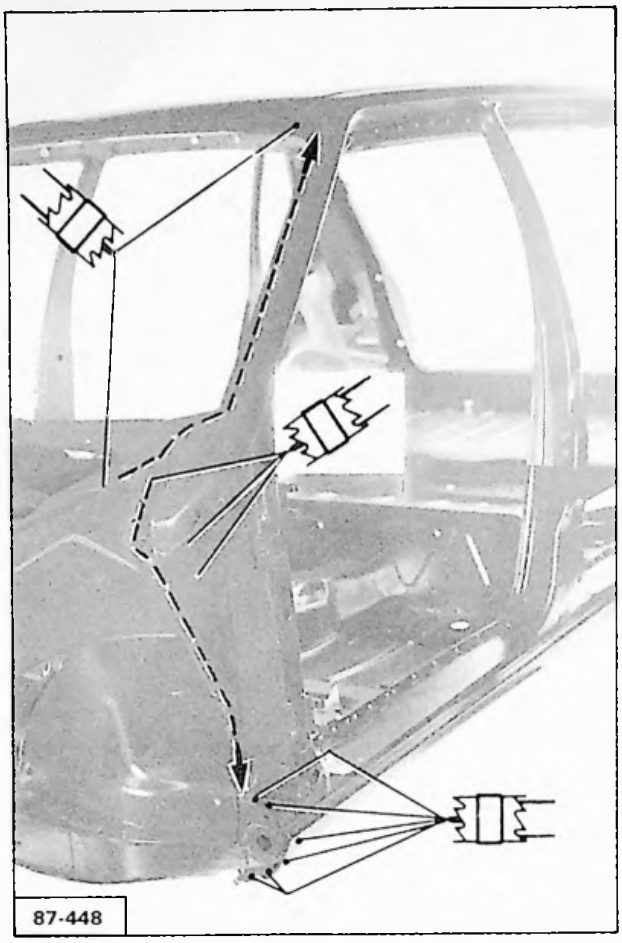
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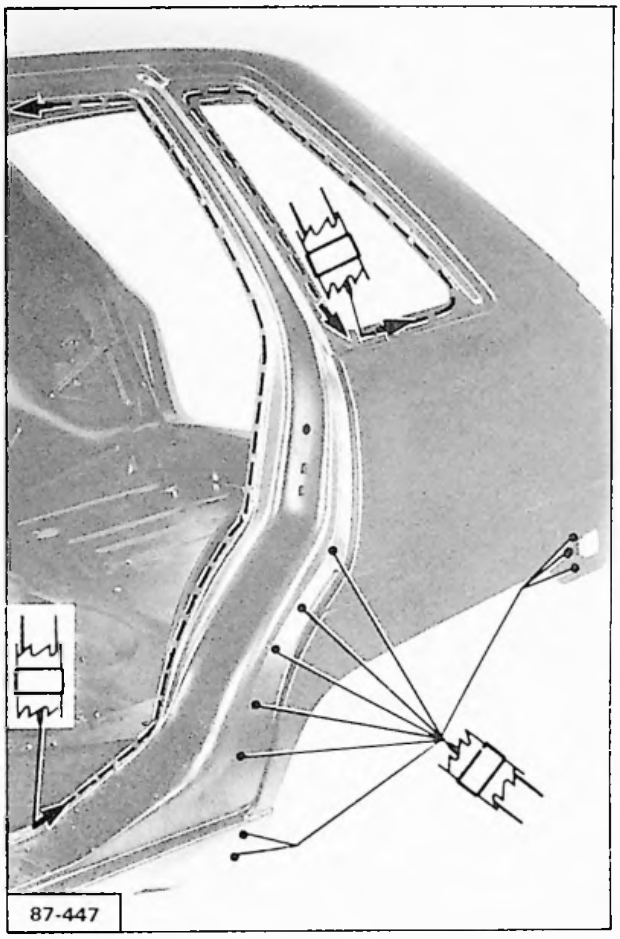
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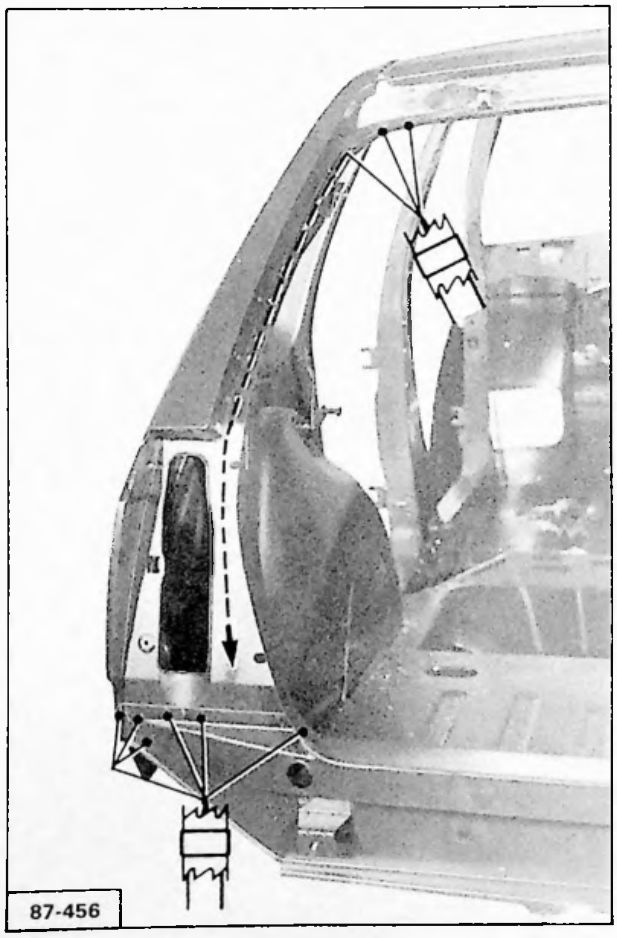
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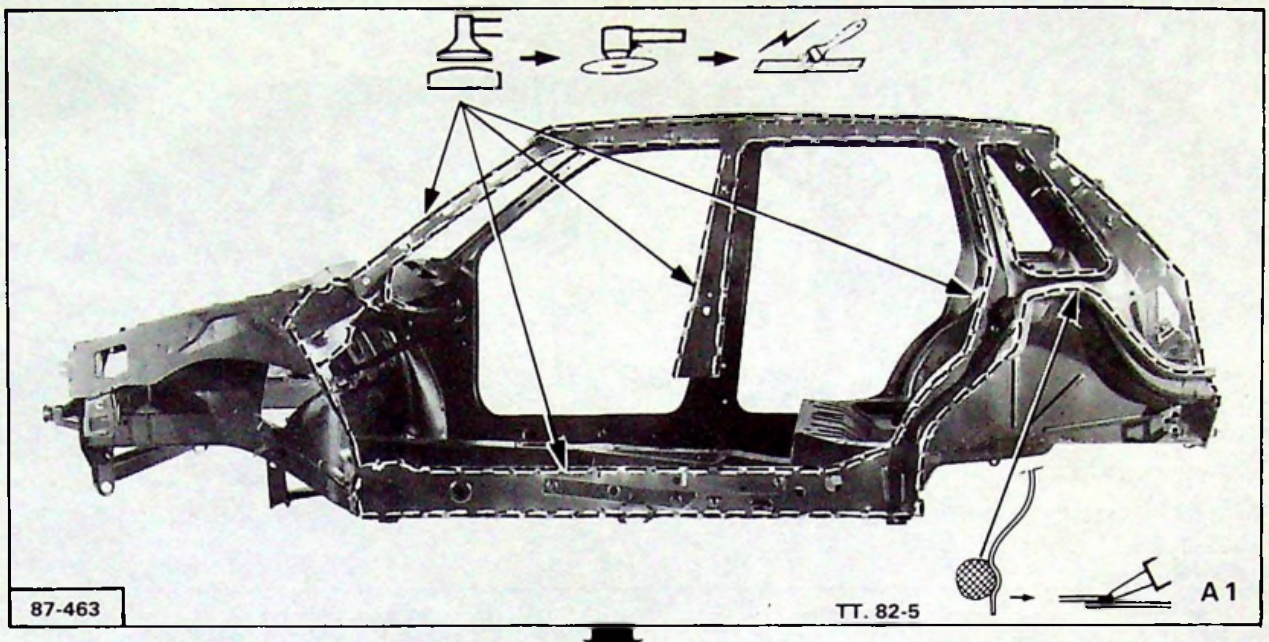
87-457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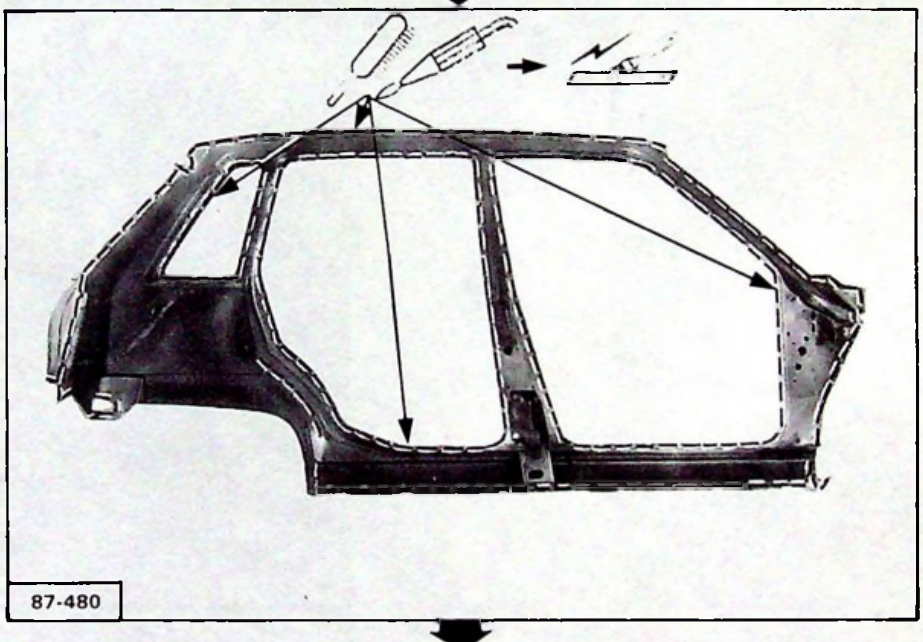
TT. 82-5
A1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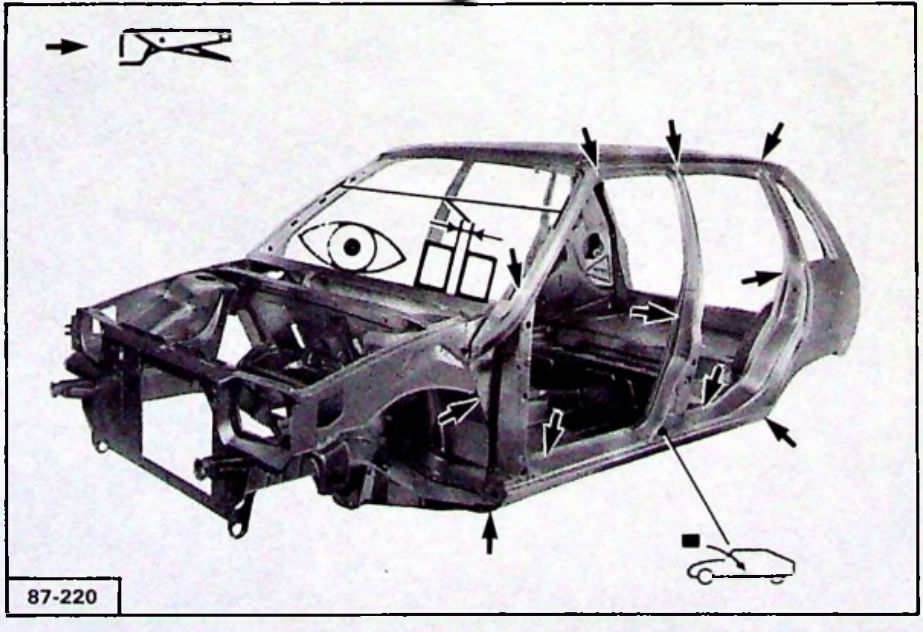
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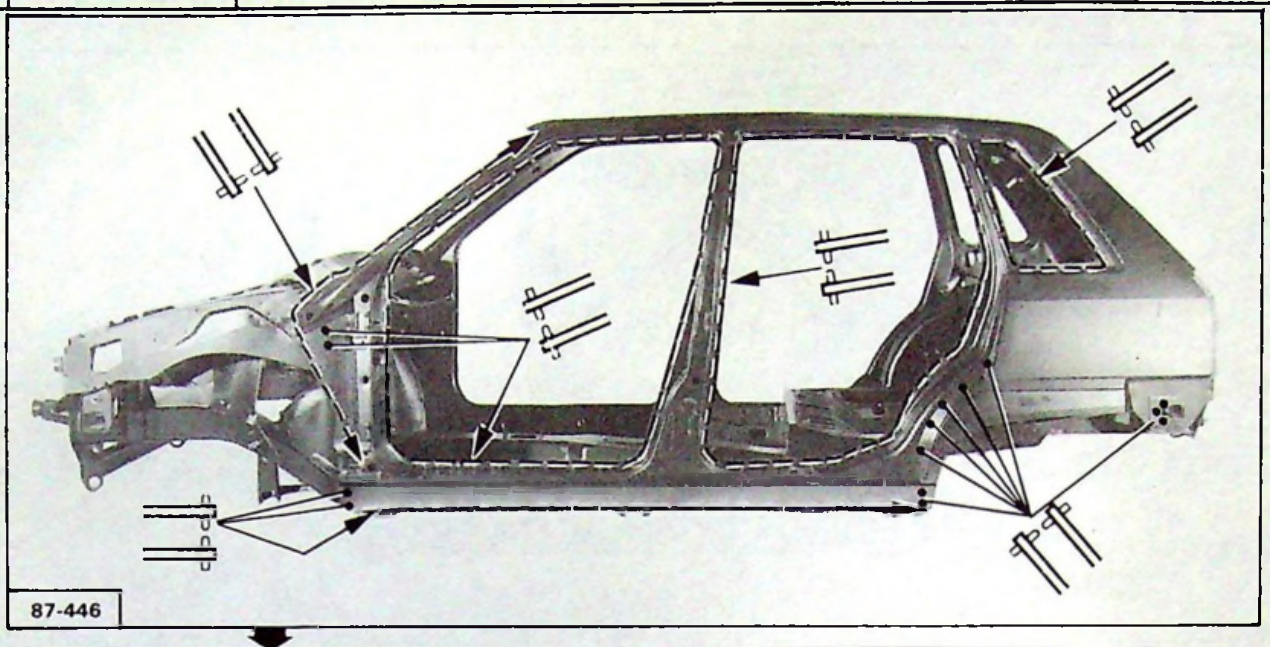
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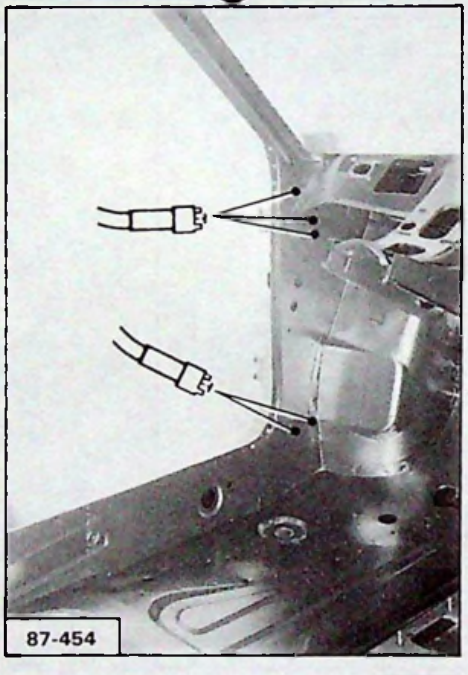
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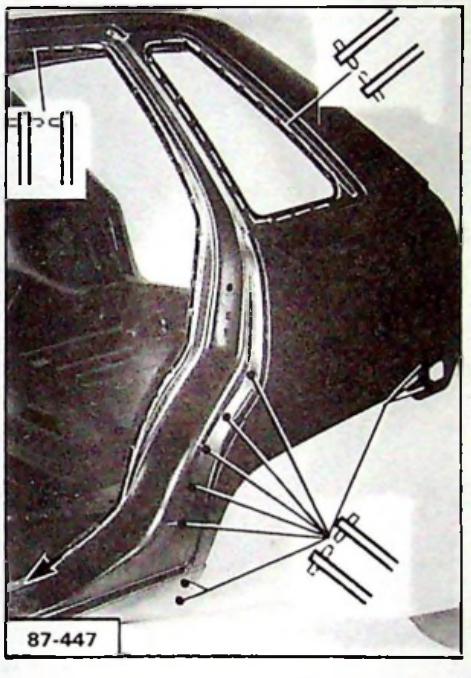
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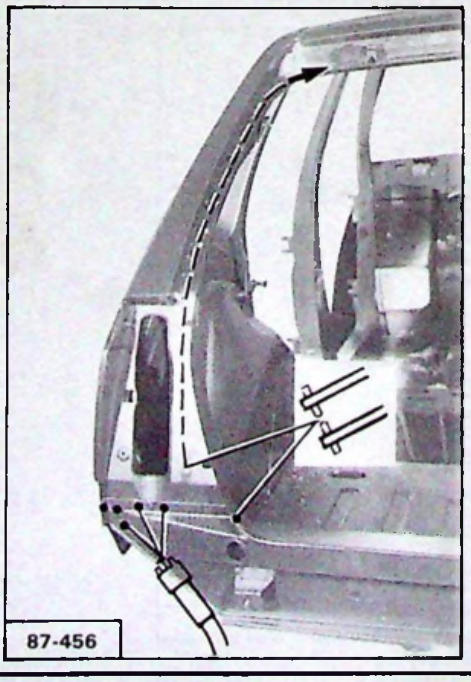
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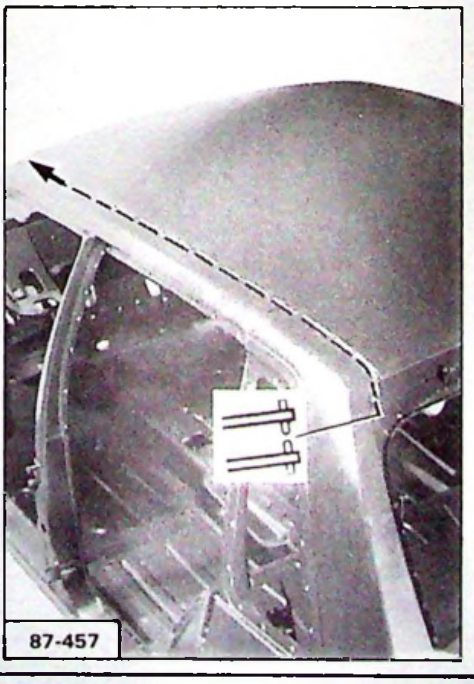
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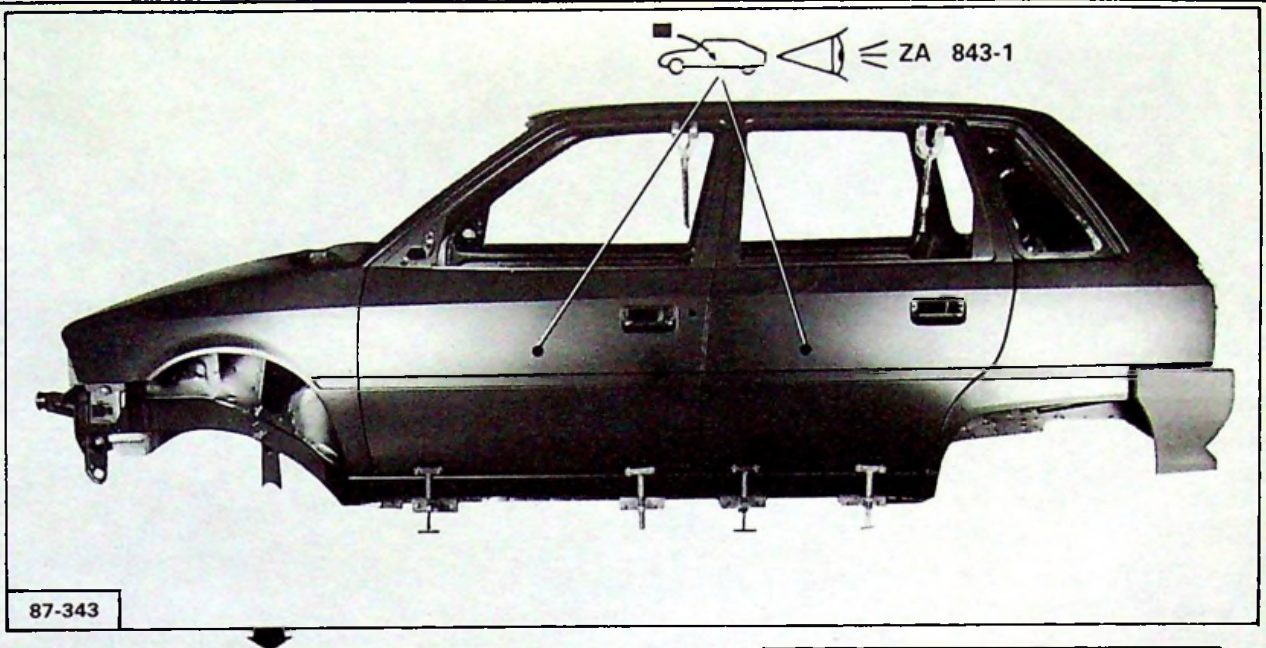
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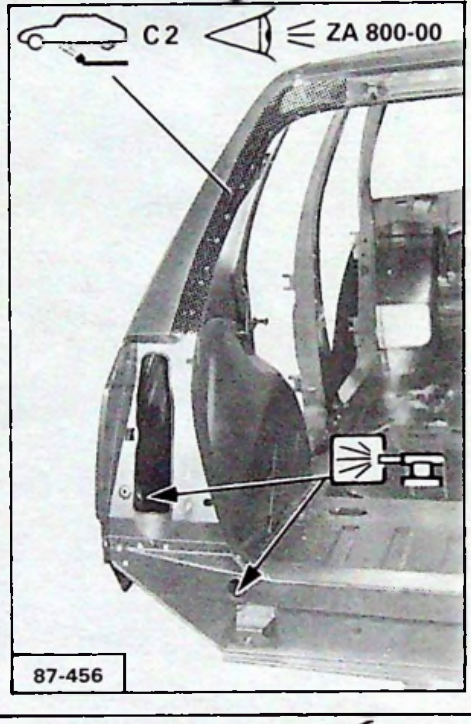
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ZA 800-00
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A1
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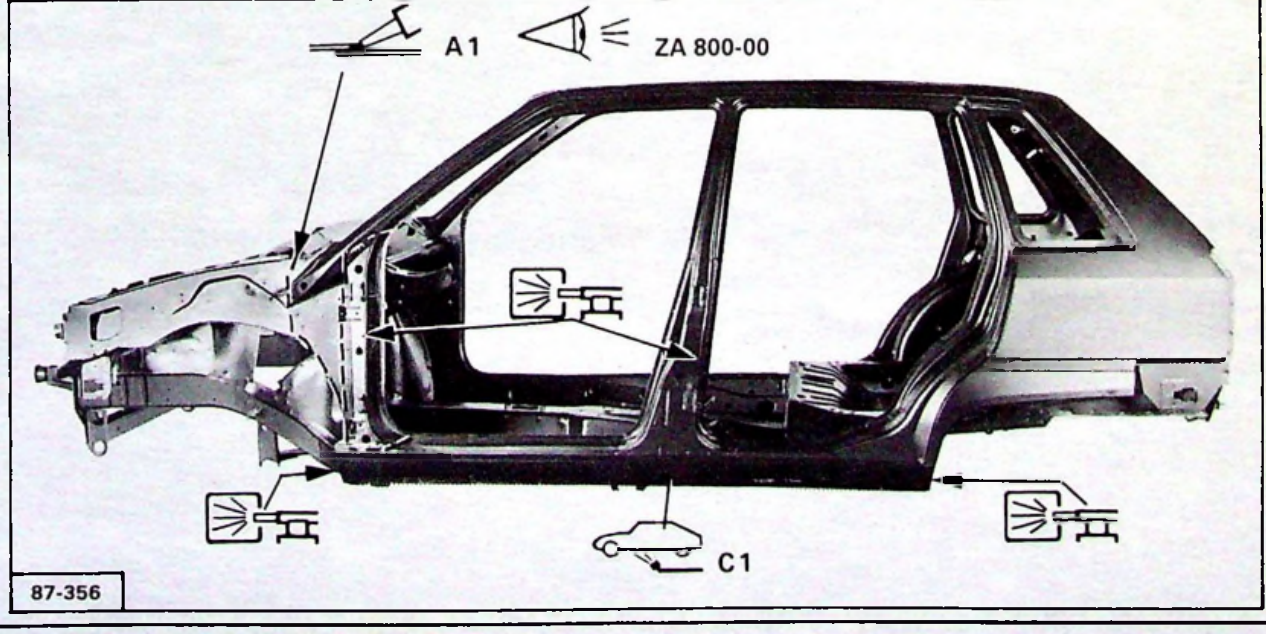
87-457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C1
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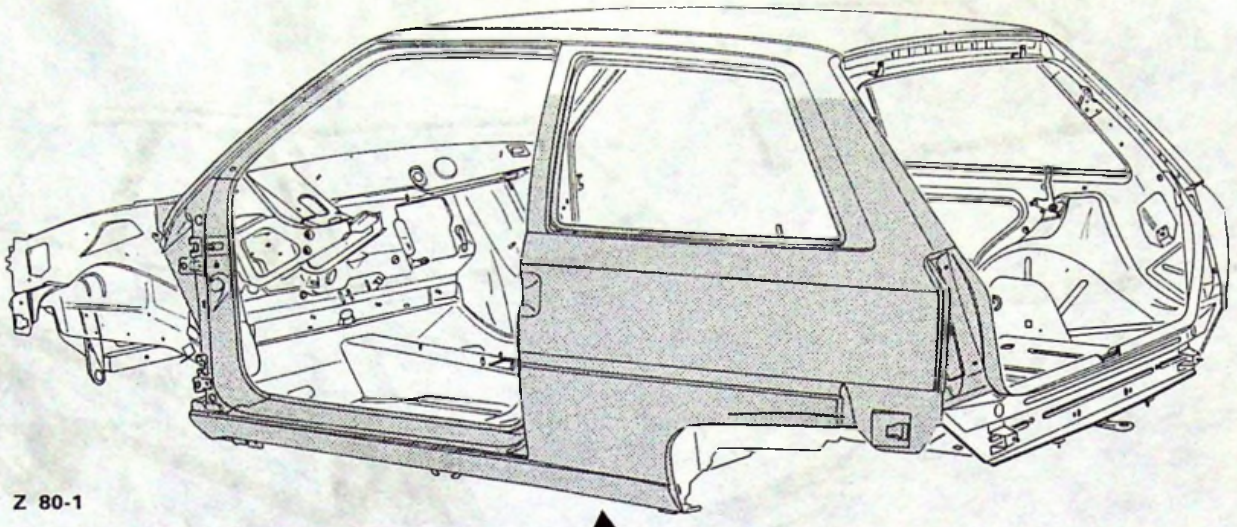
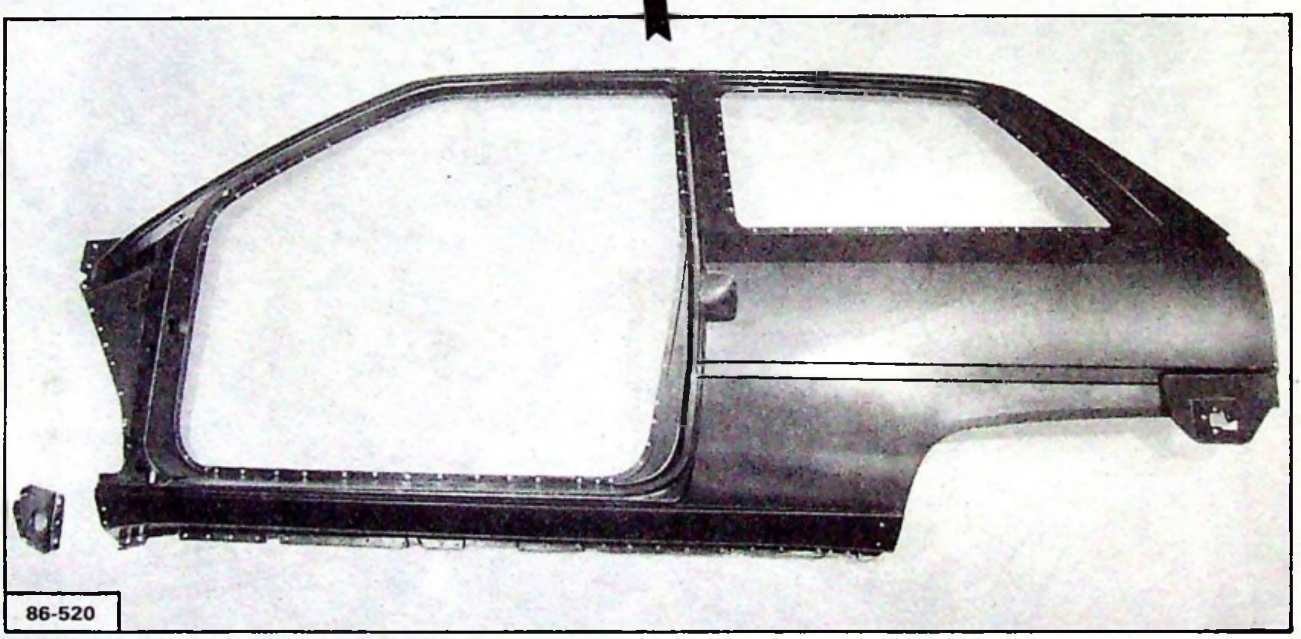


Z 80-1



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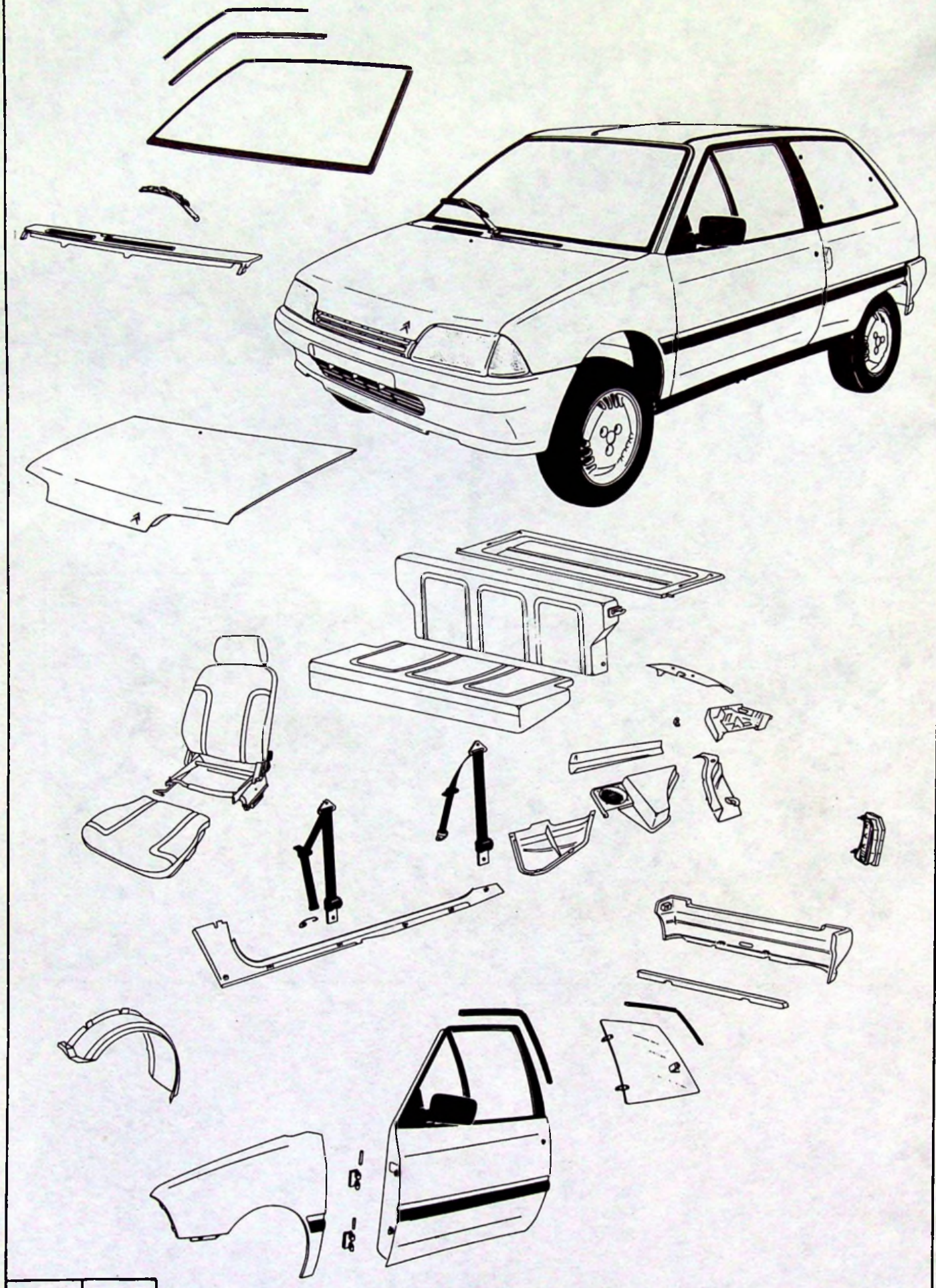

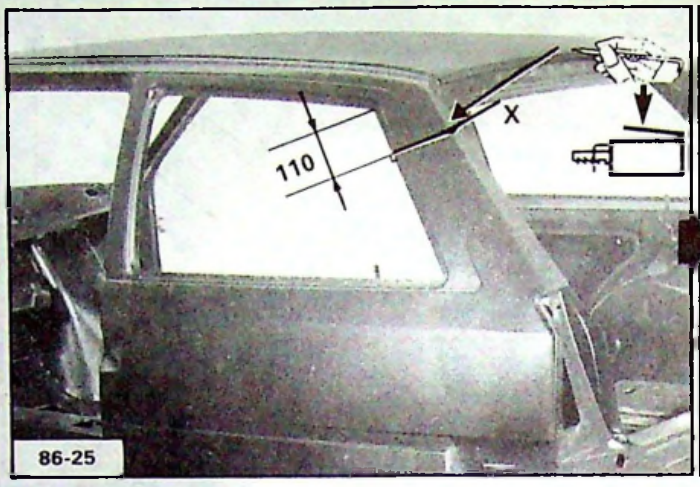
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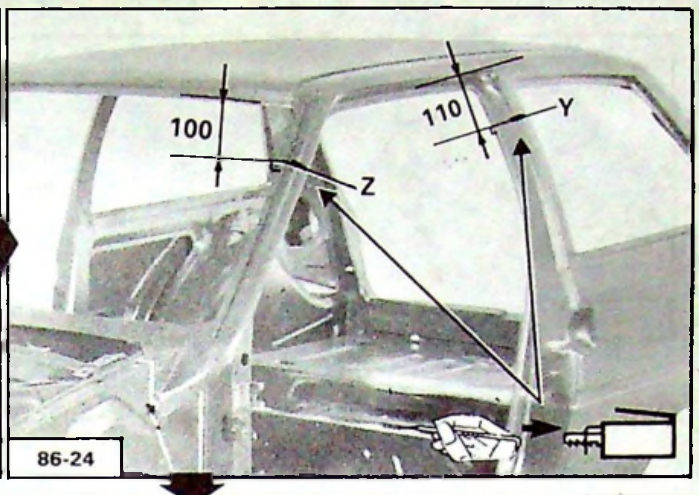
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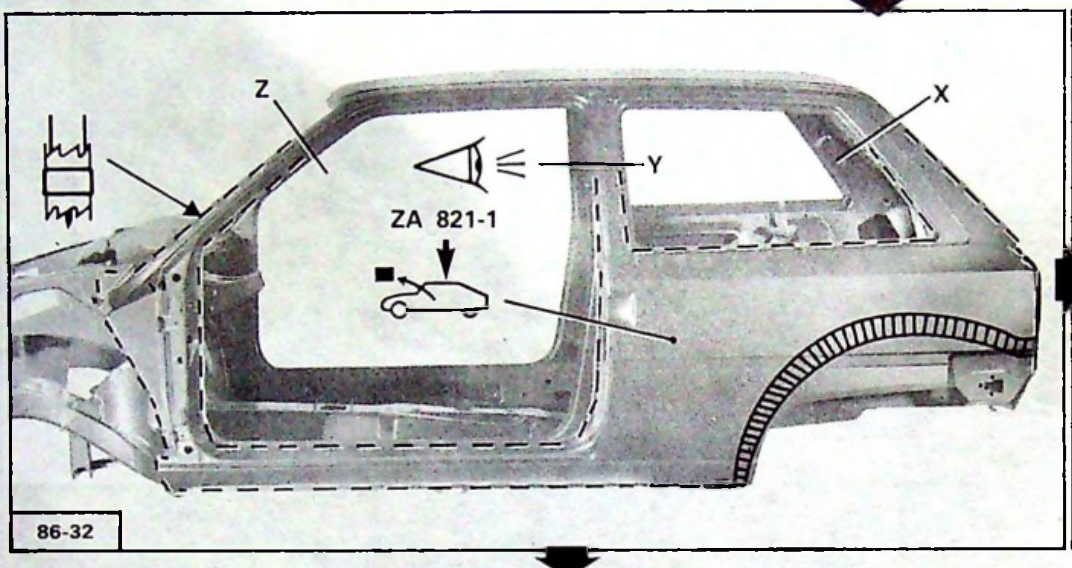
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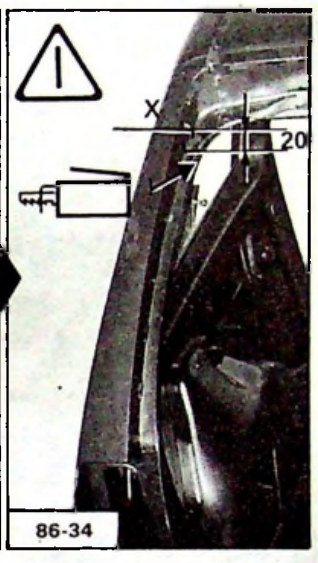
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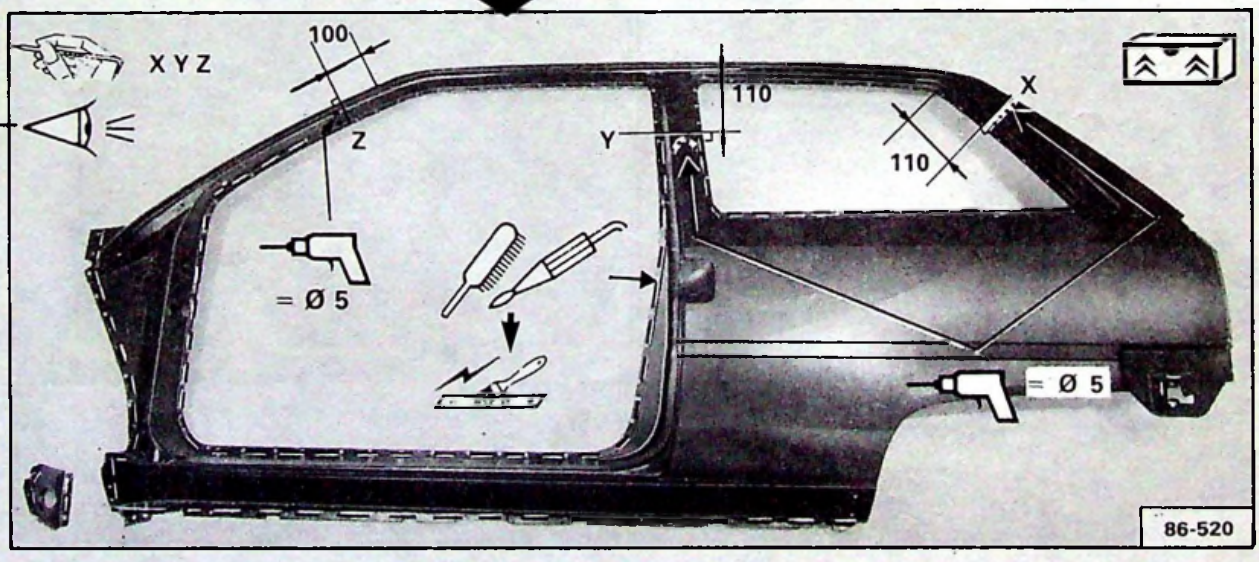
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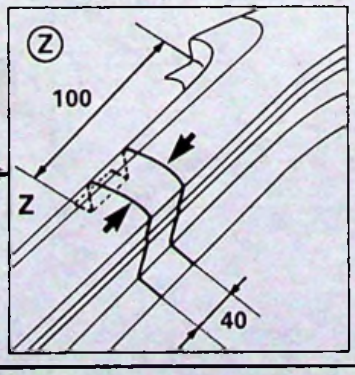
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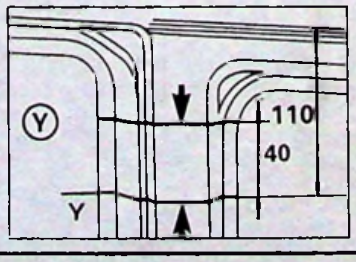
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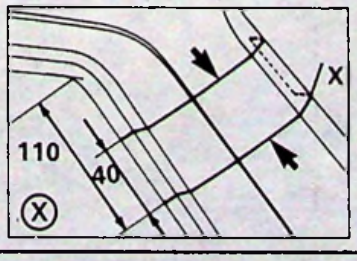
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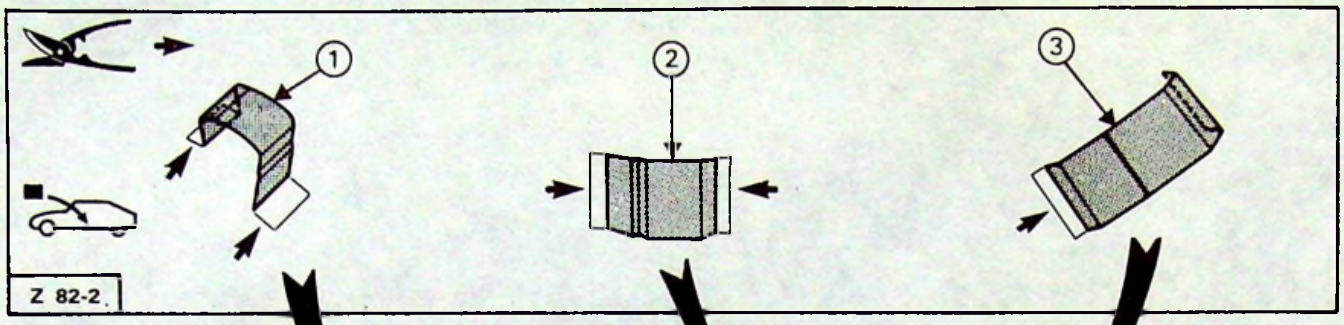
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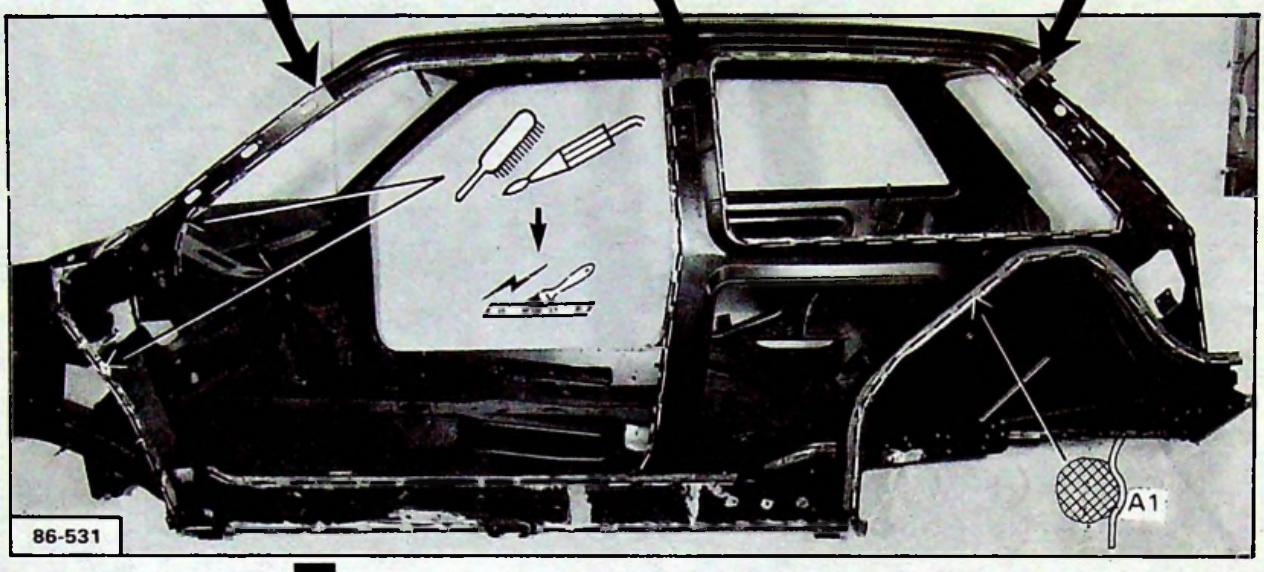
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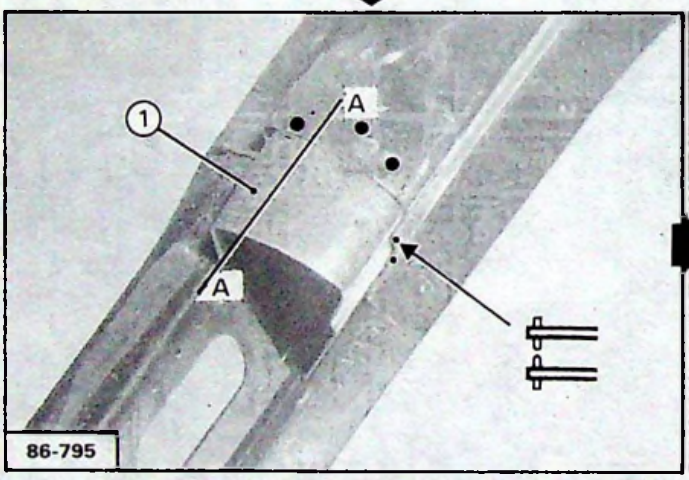
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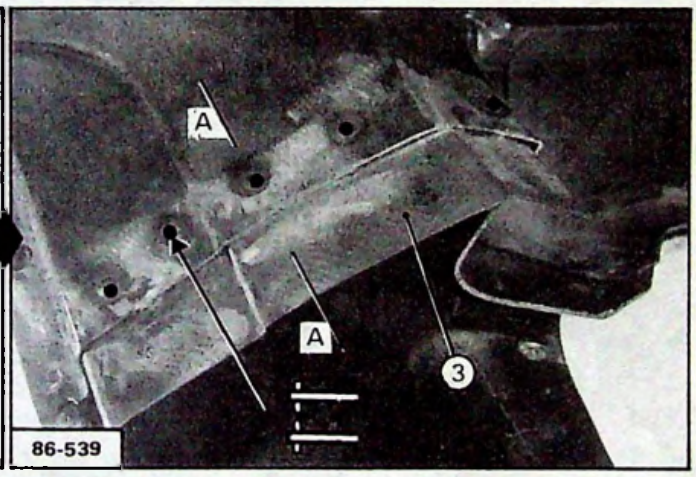
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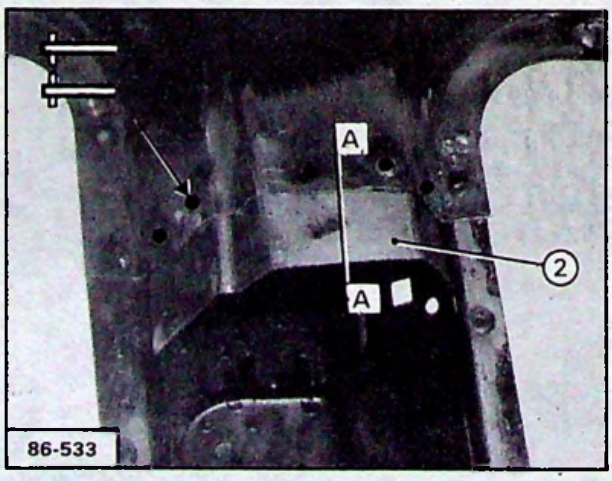
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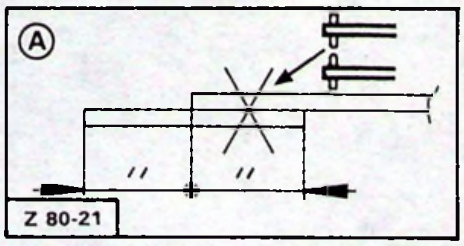
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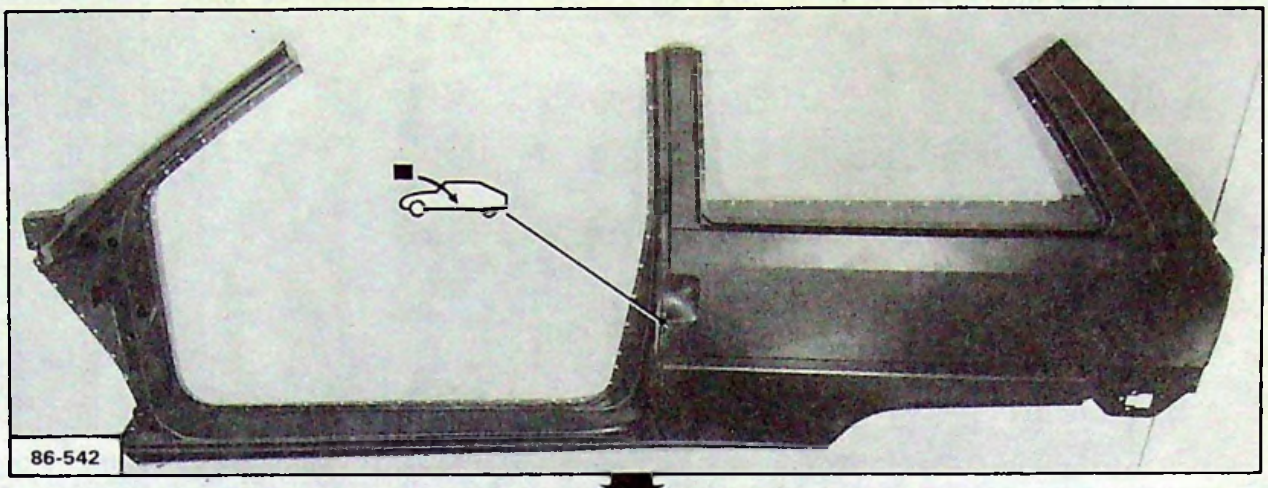
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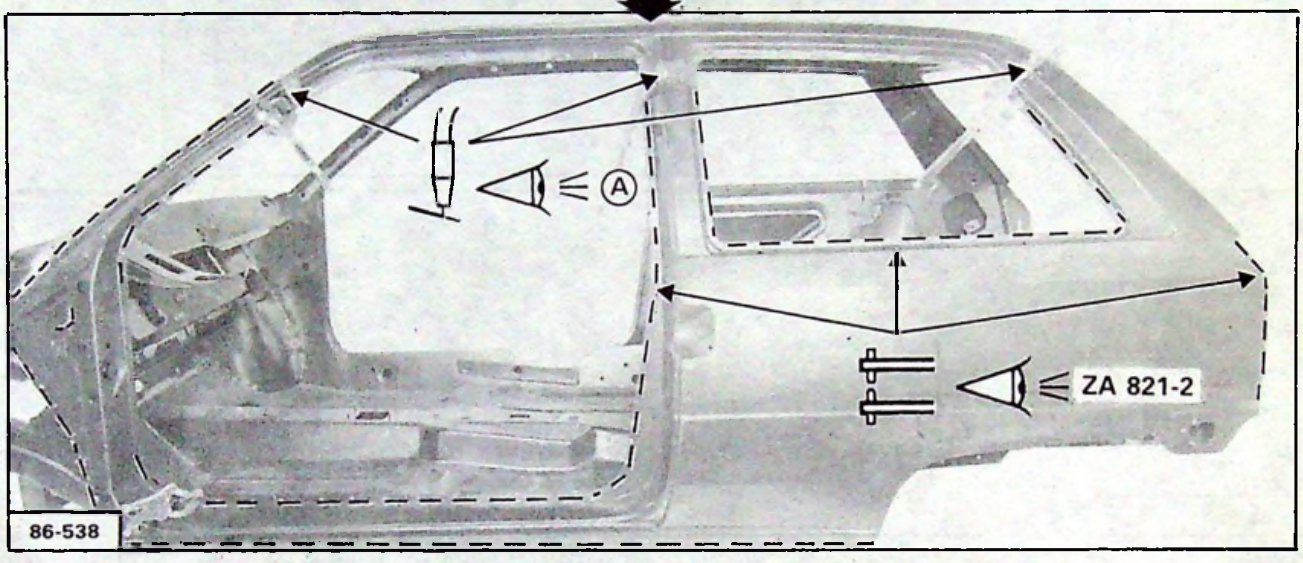
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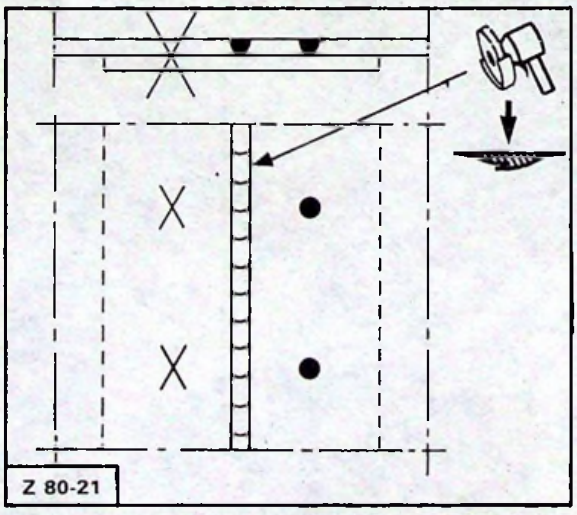
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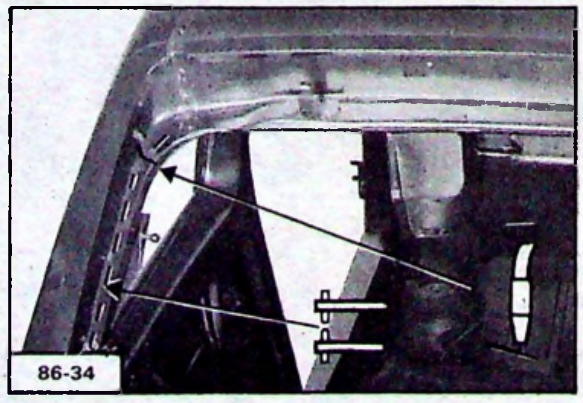
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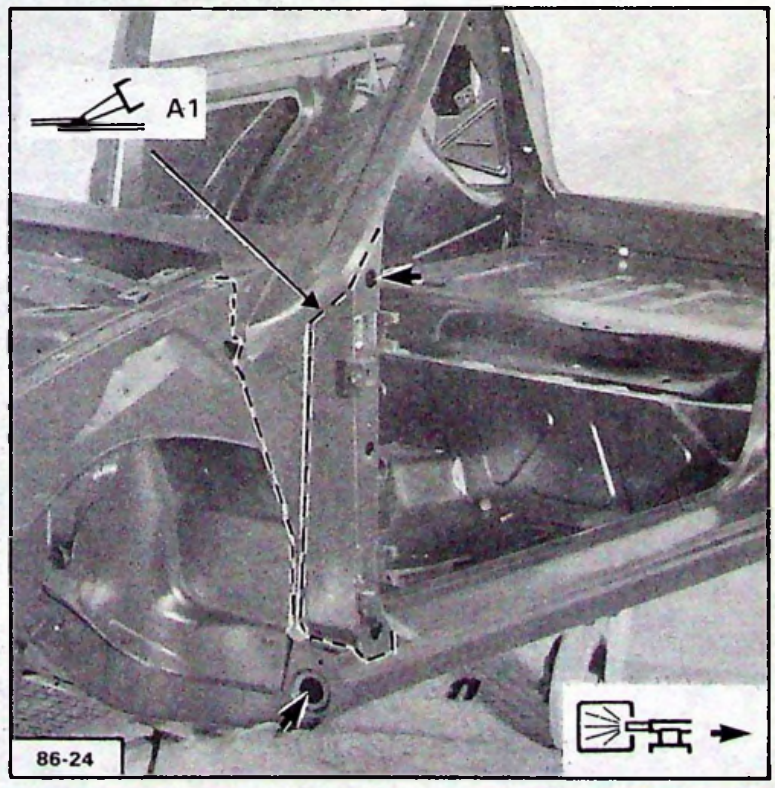
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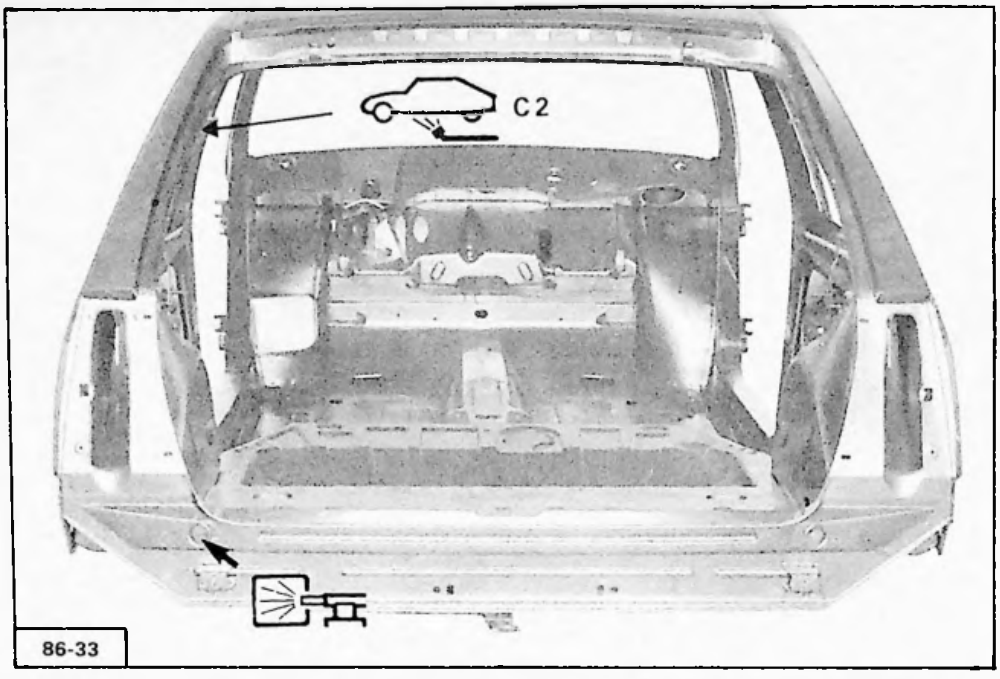

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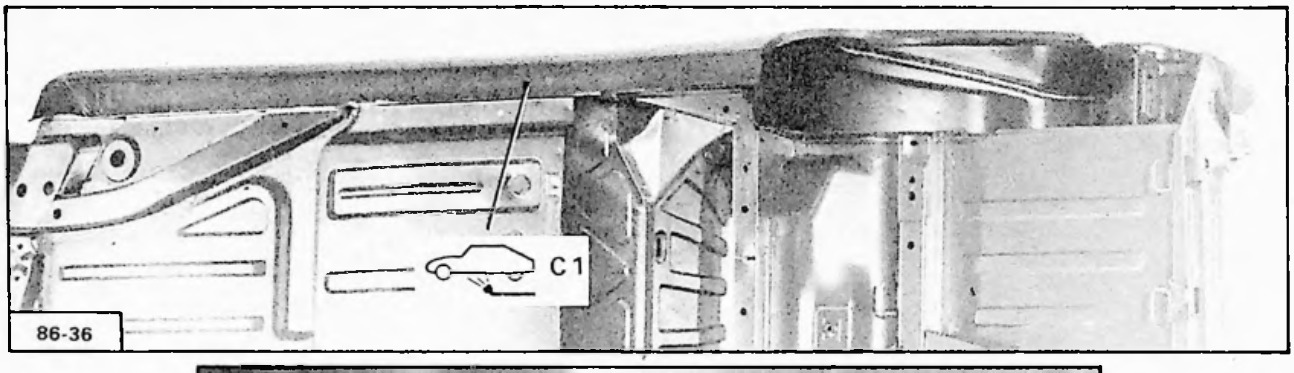

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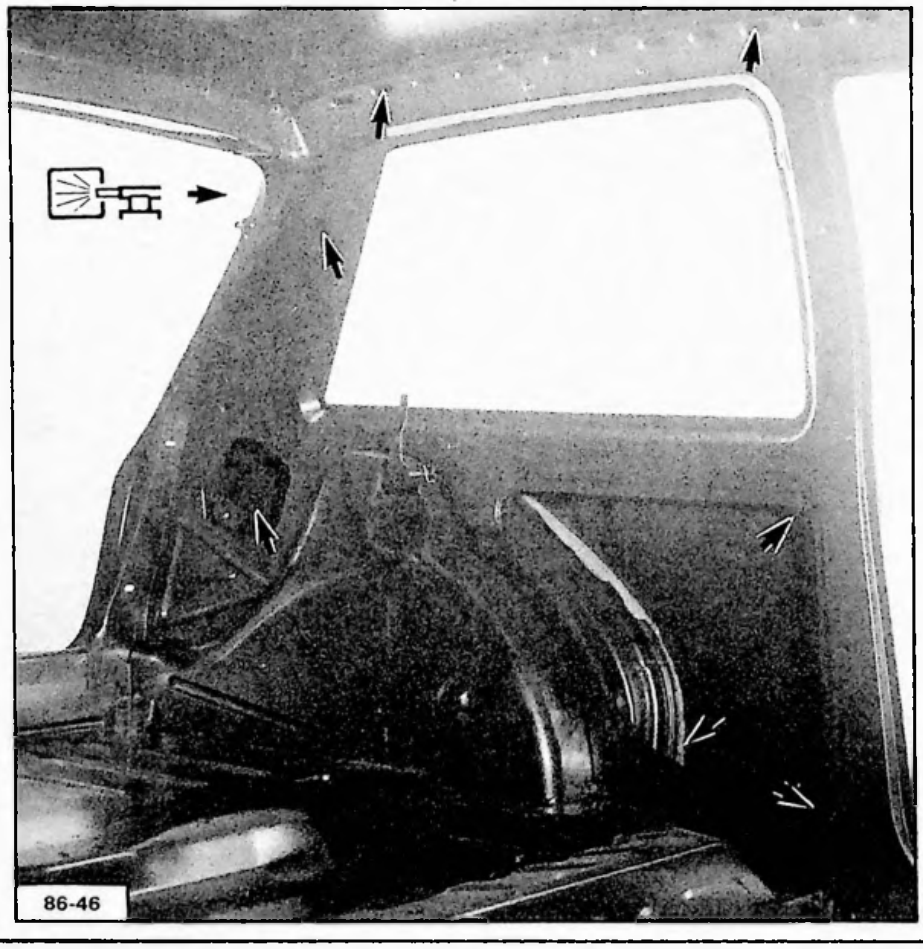

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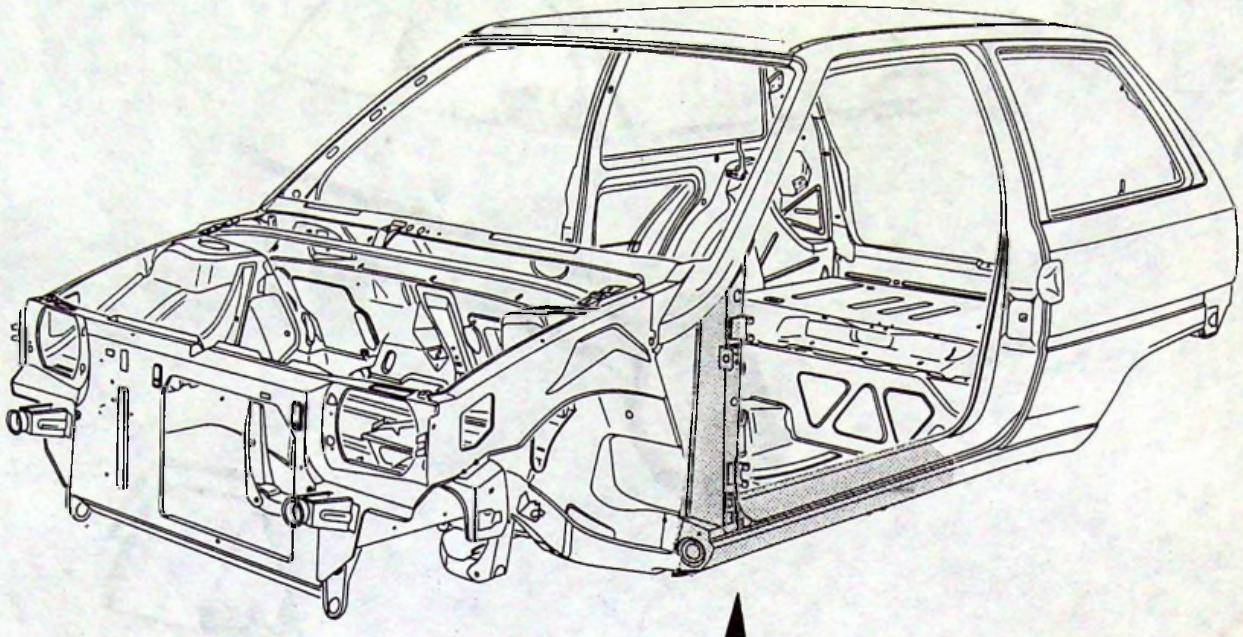

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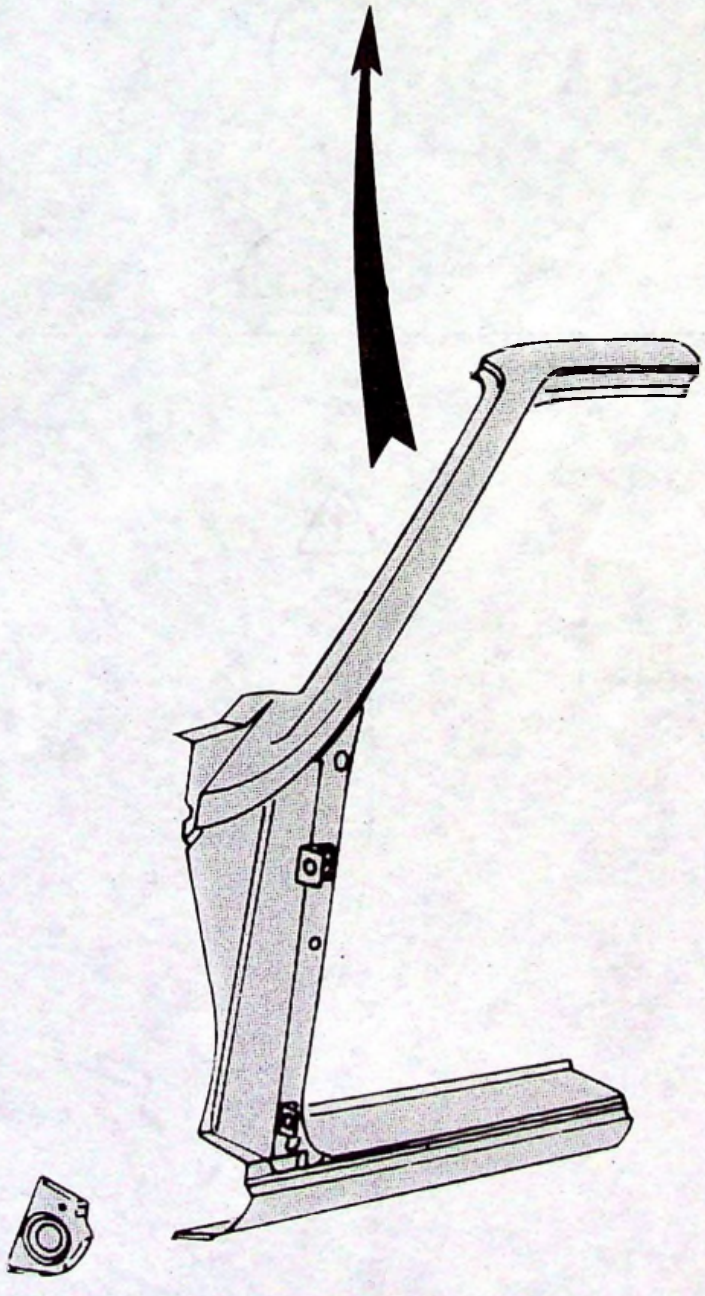

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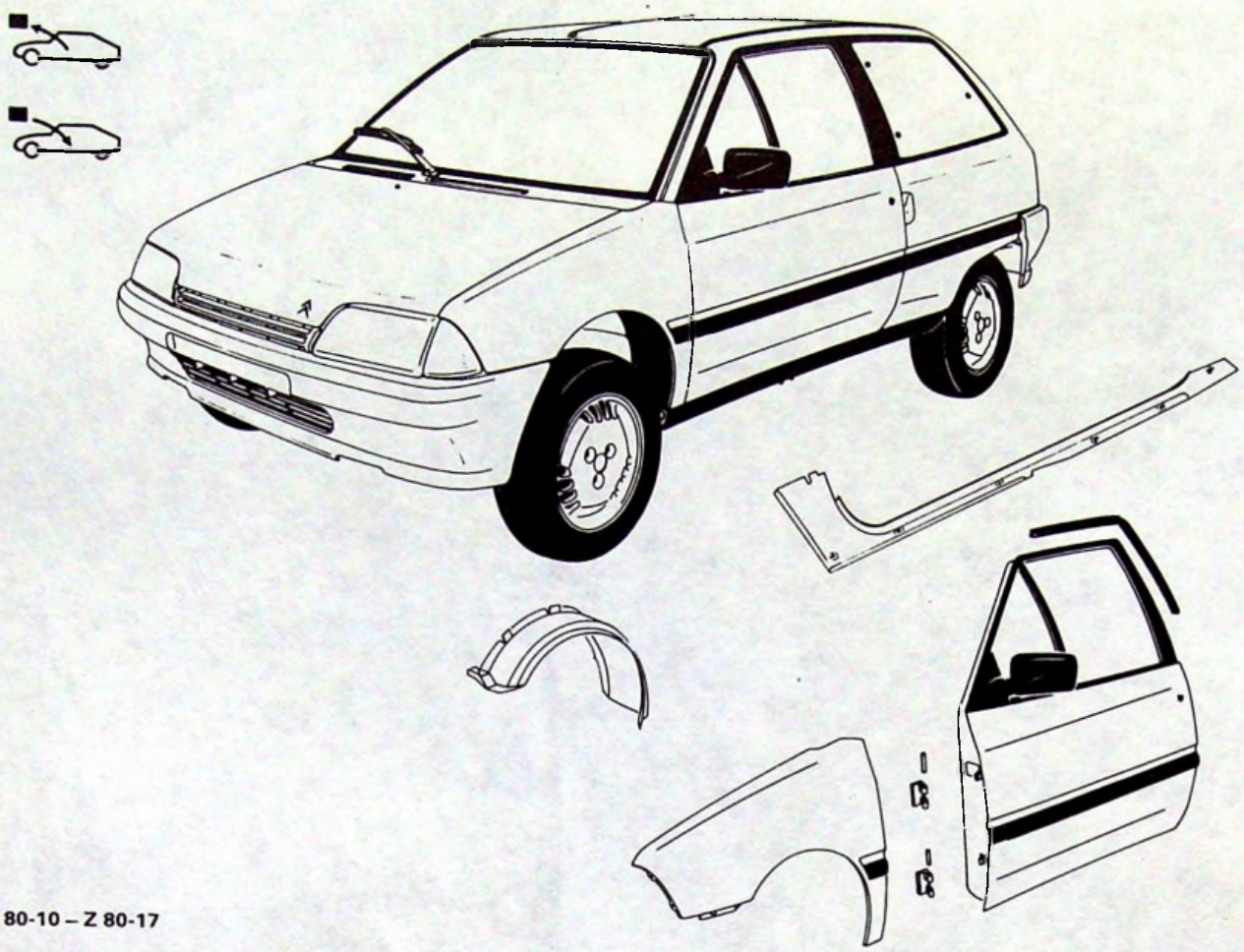

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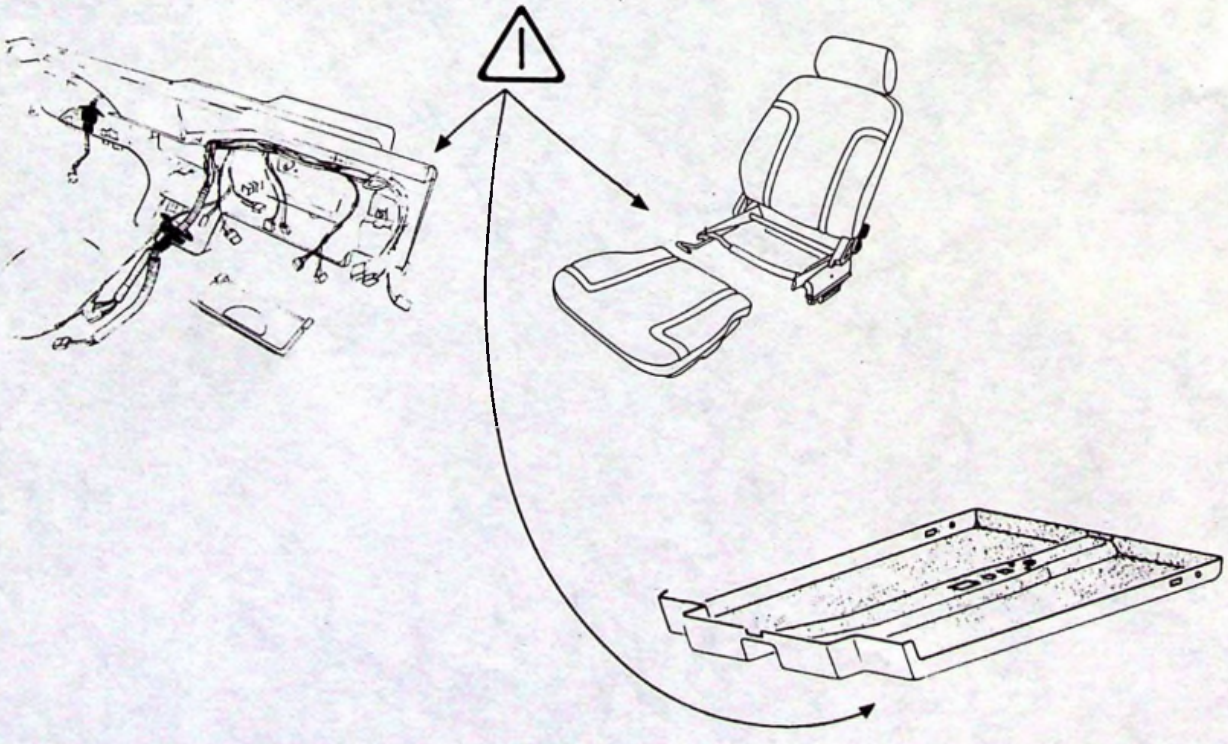

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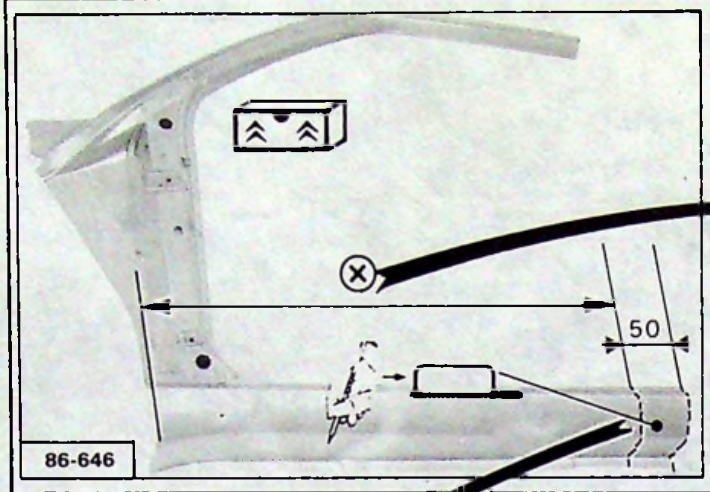
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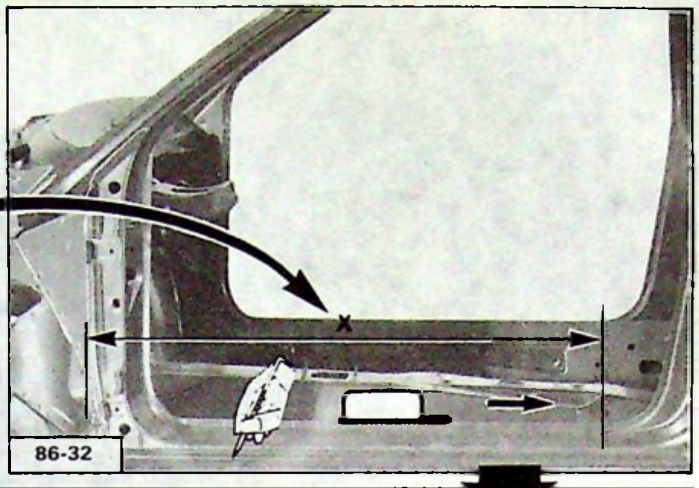
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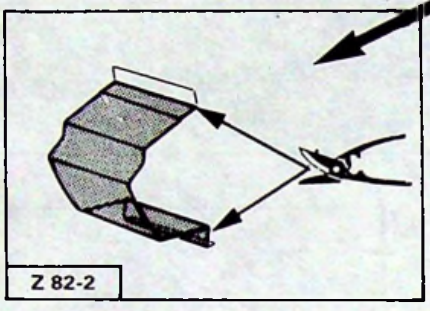
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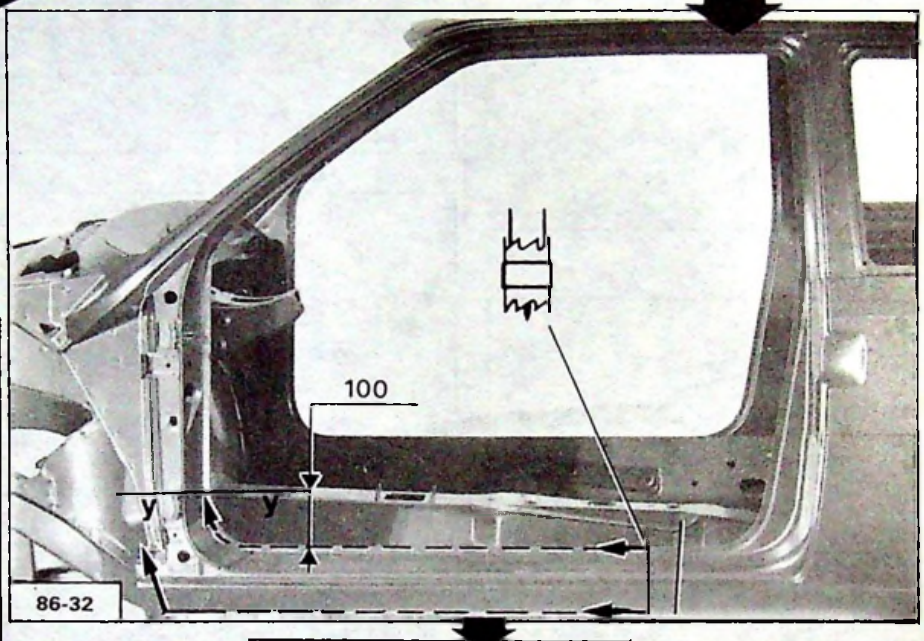
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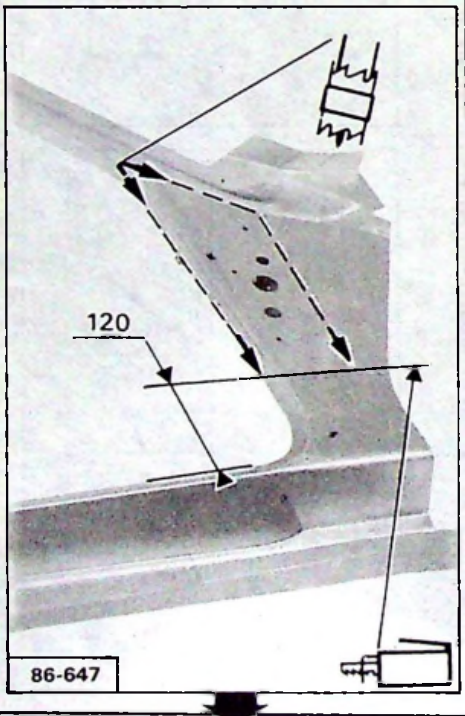
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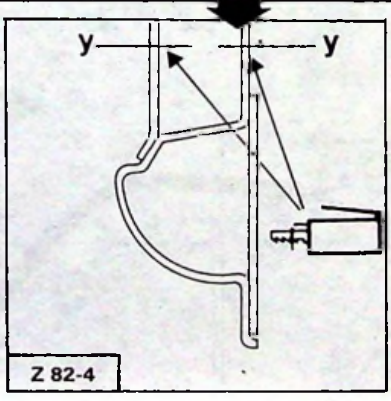
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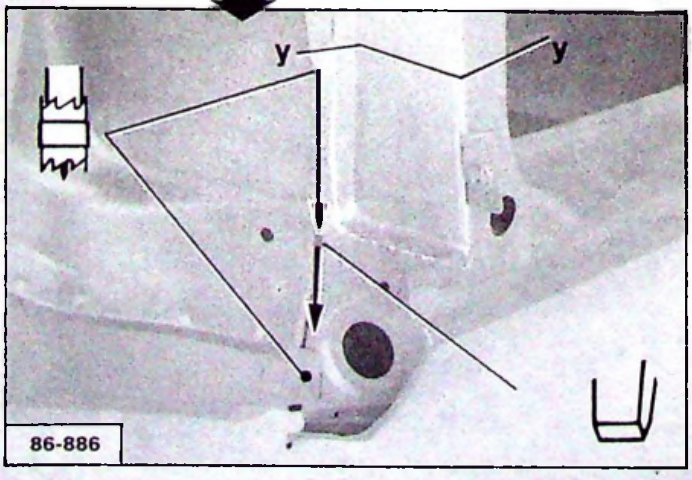
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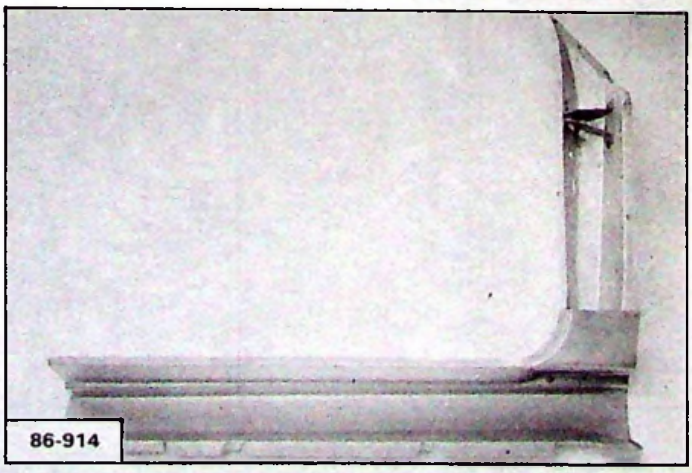
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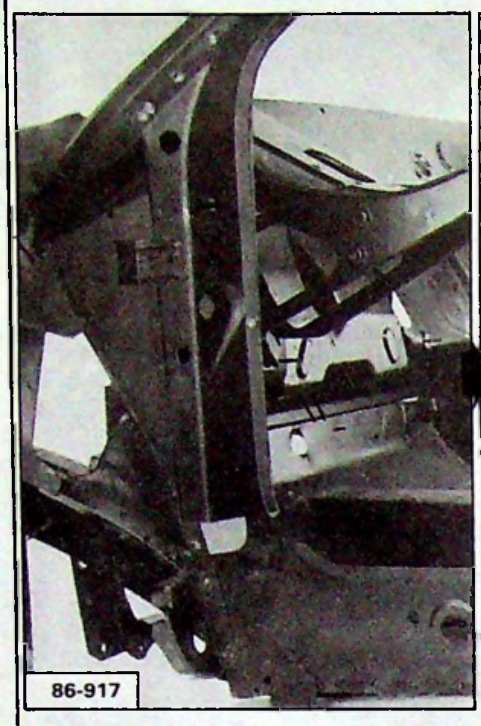
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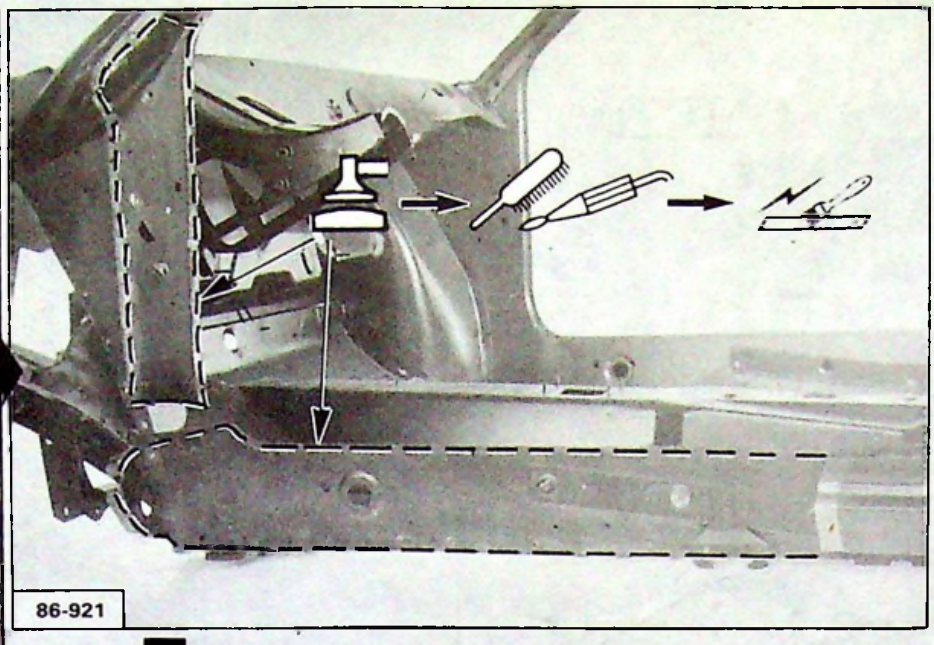
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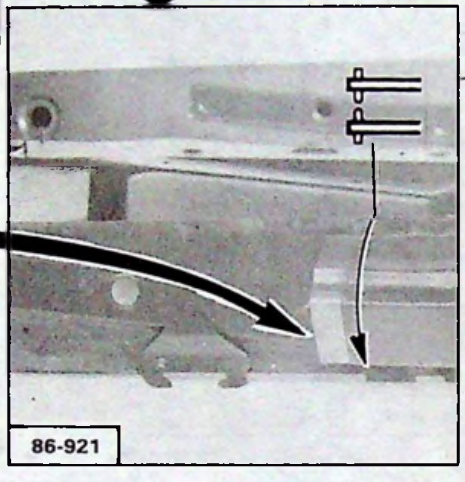
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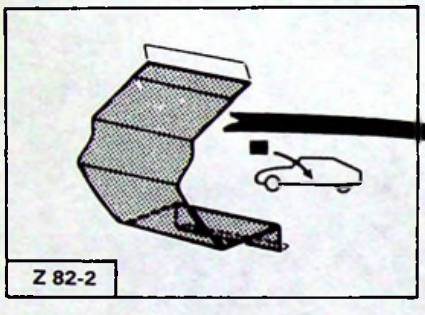
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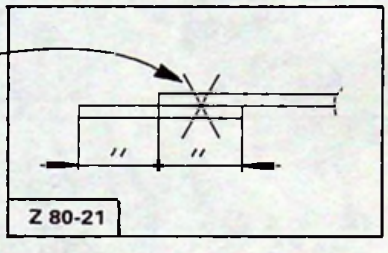
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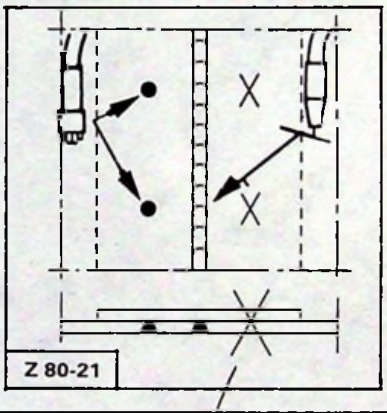
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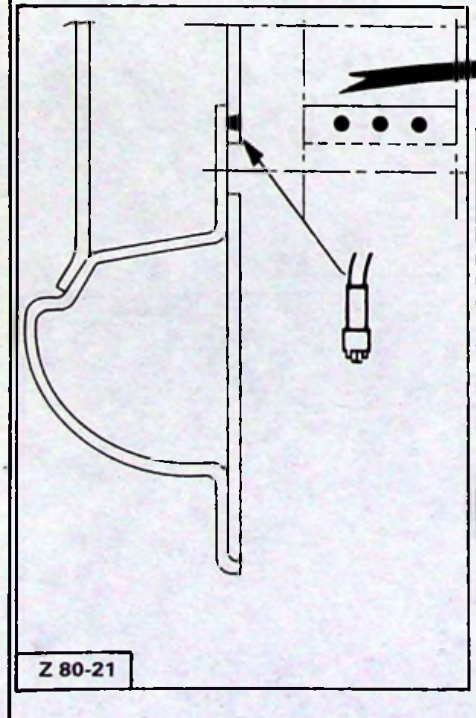
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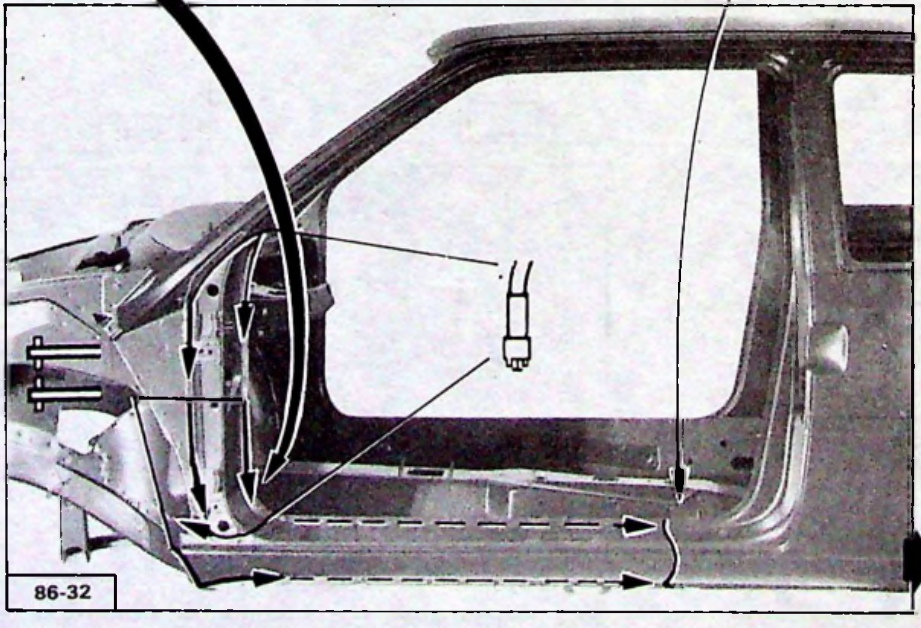
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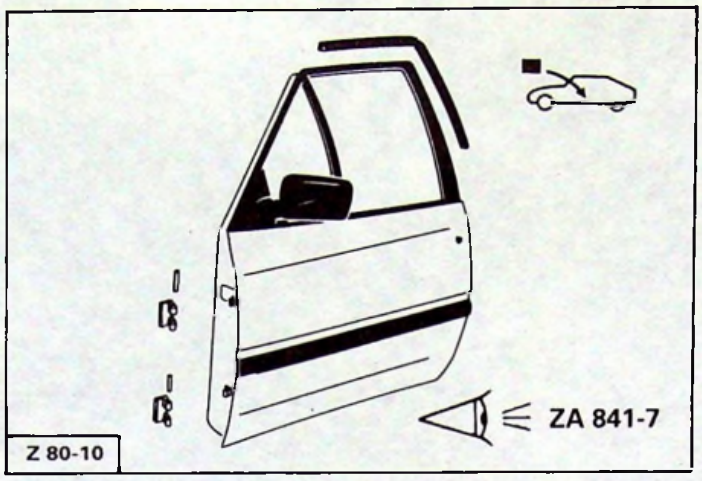
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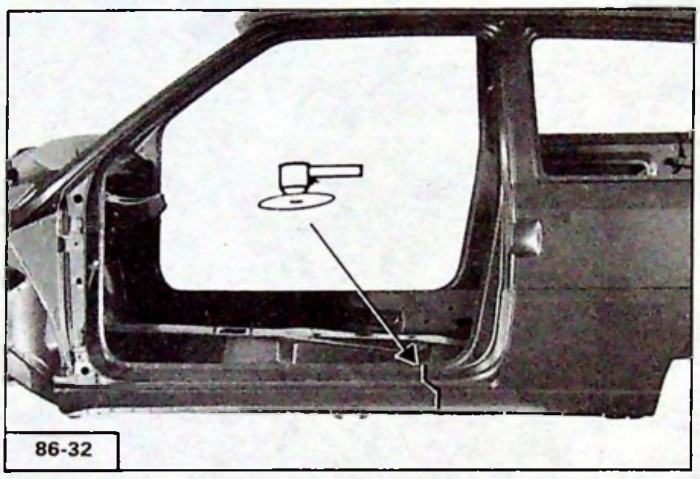
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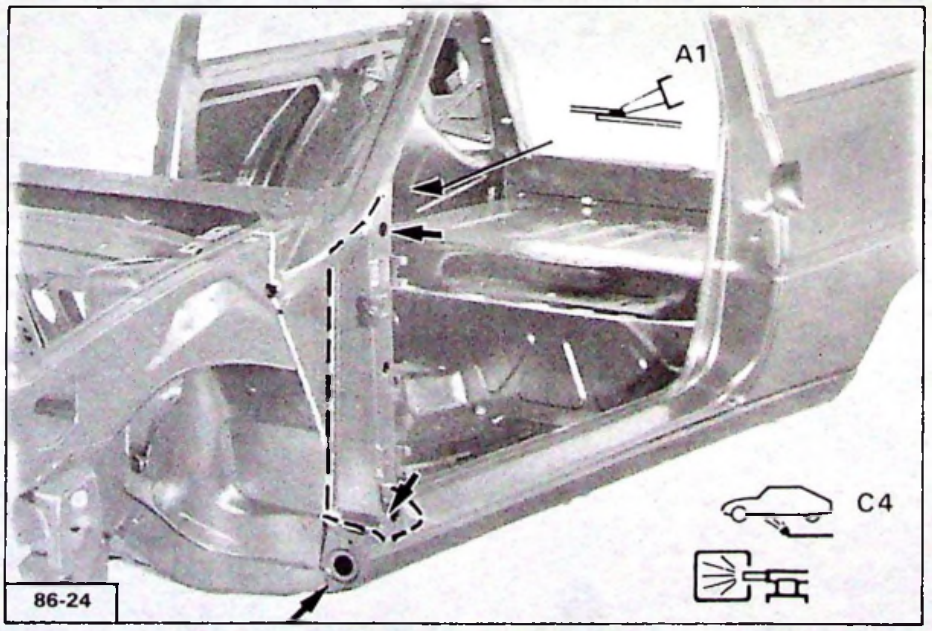
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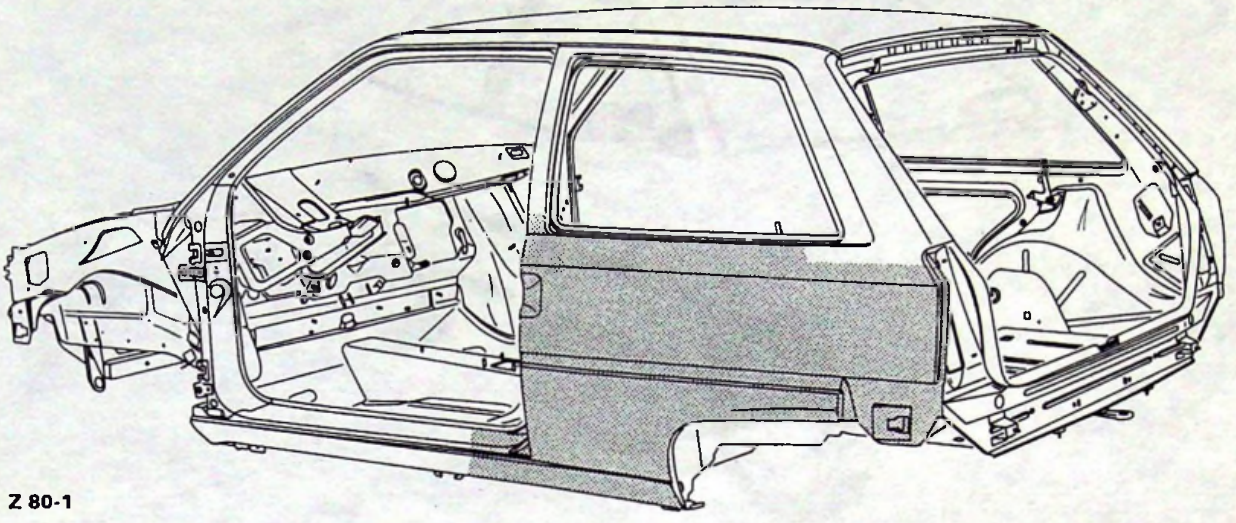
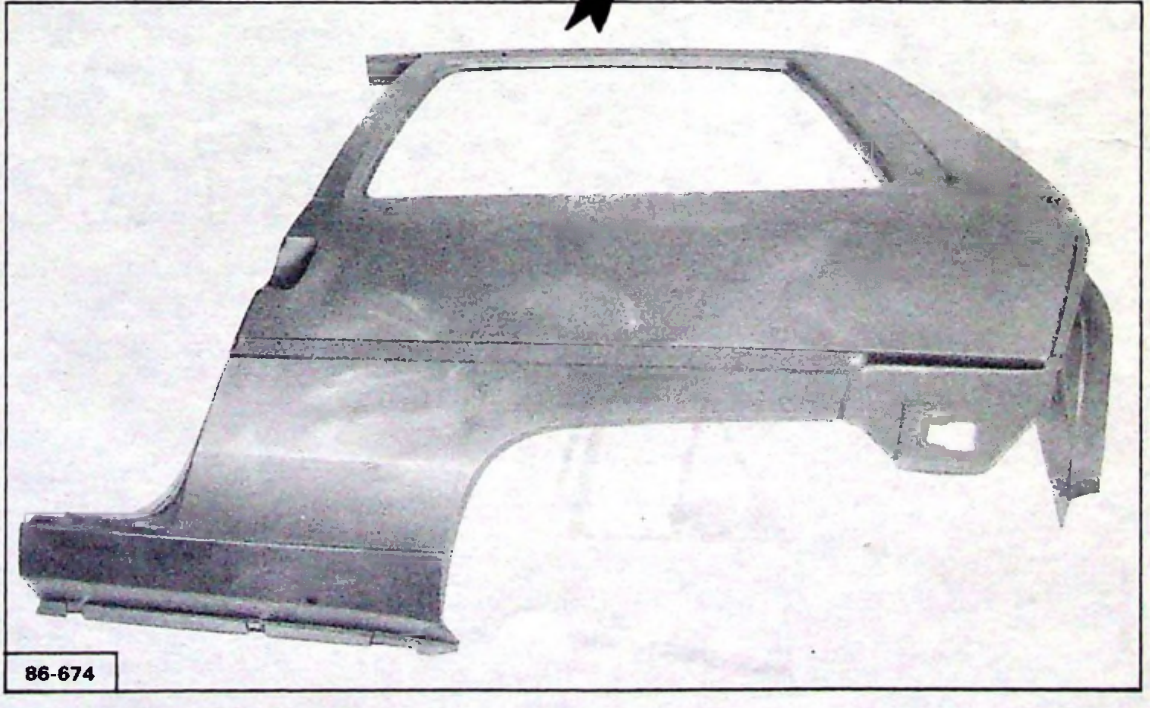
C4
86-24



Z 80-1



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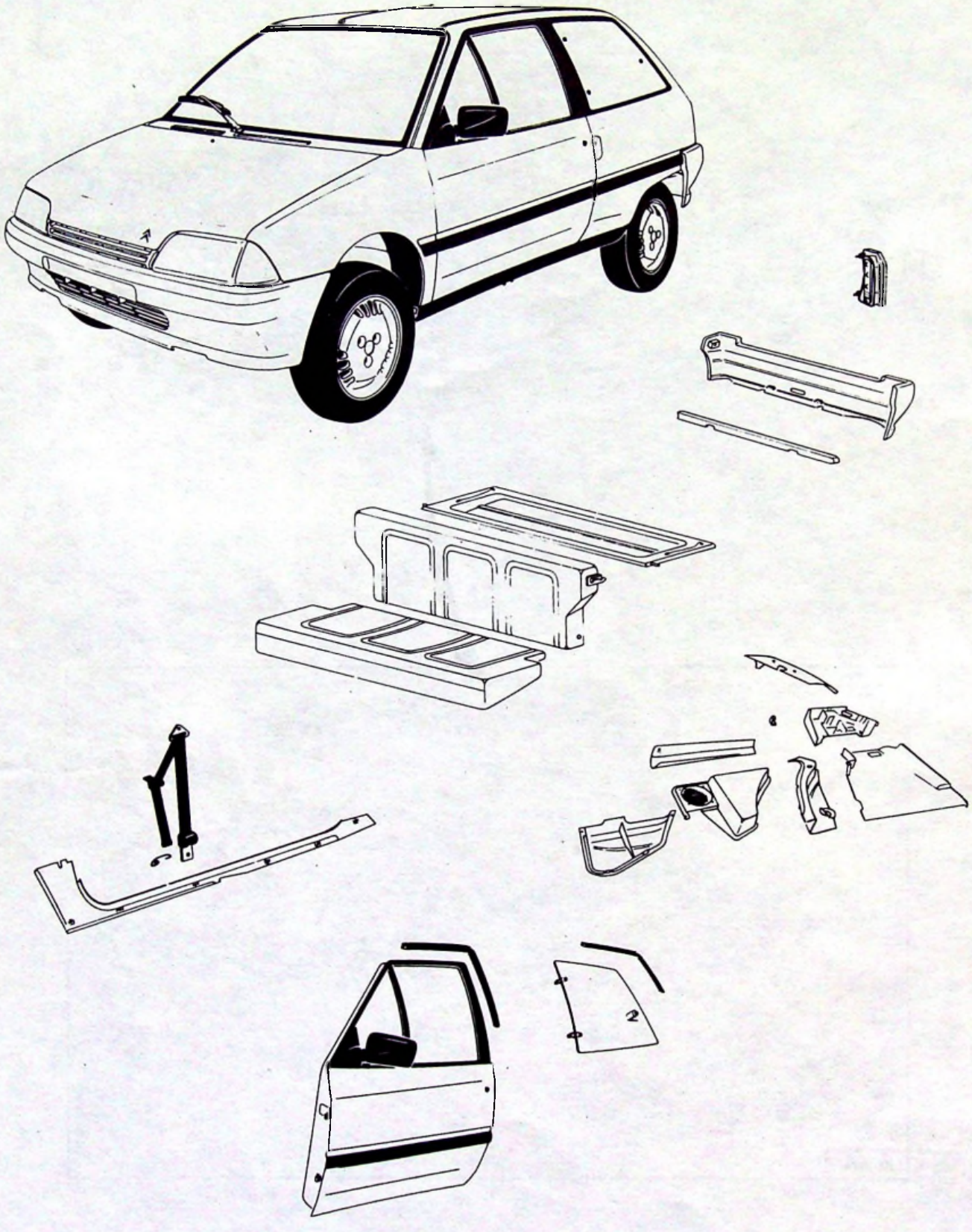

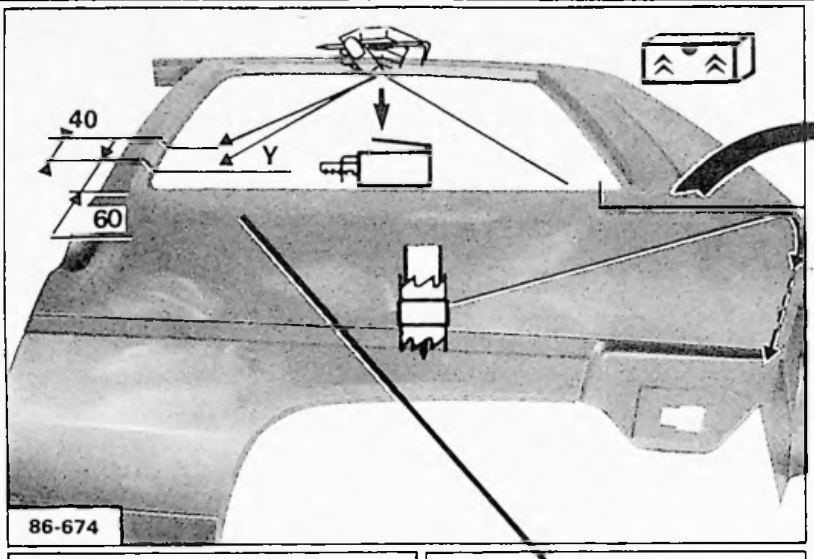
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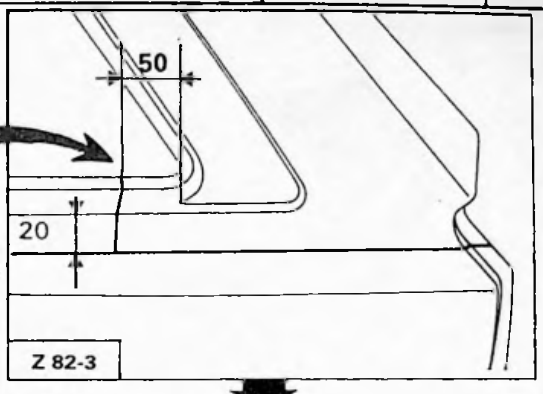
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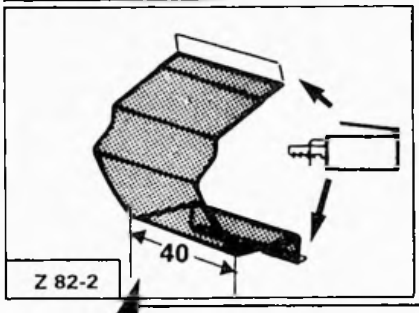
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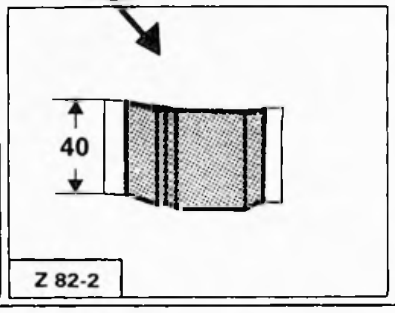
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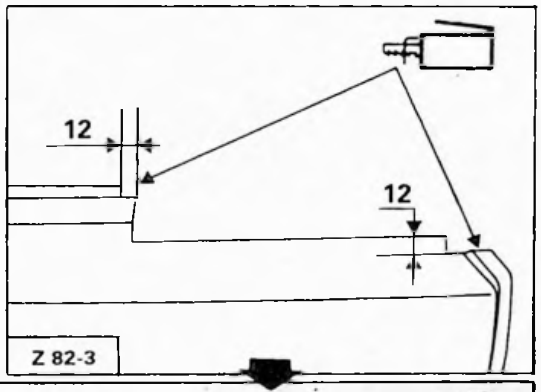
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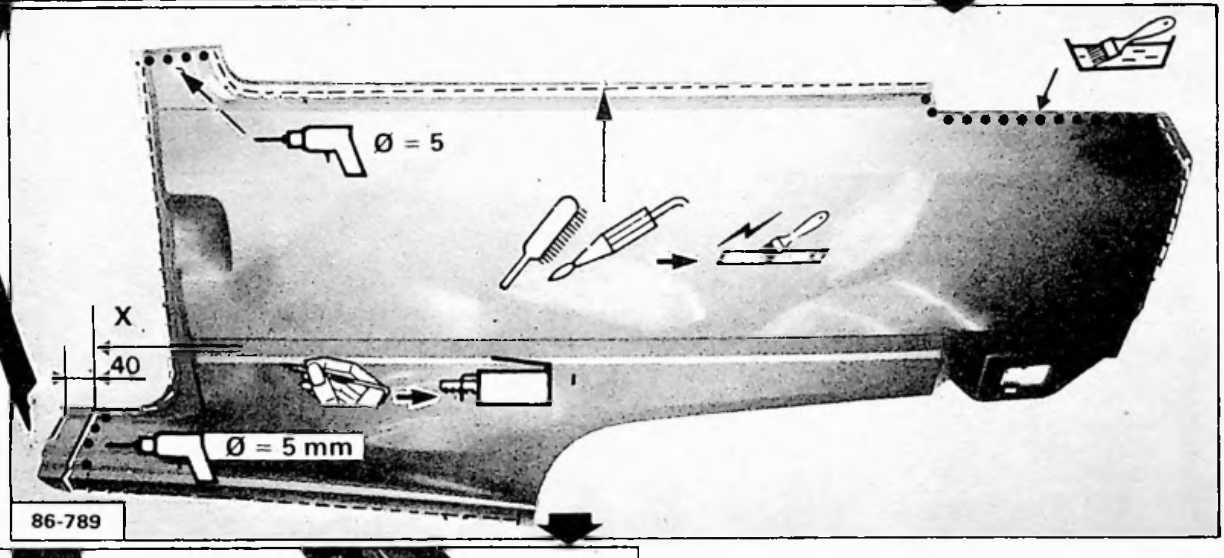
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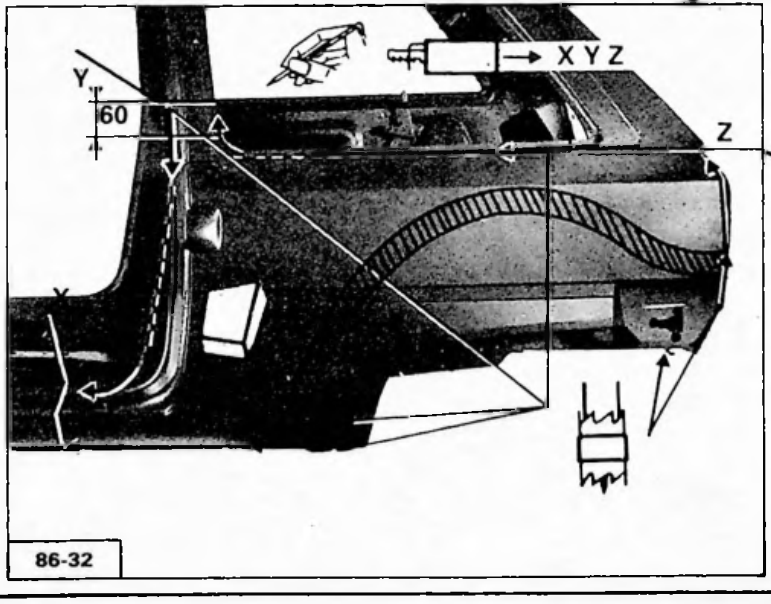
86-789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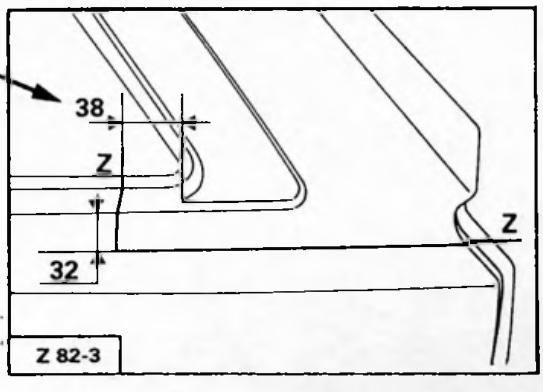
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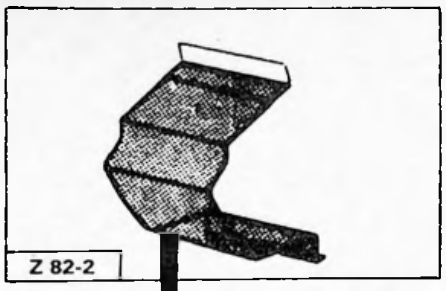
Z 82-3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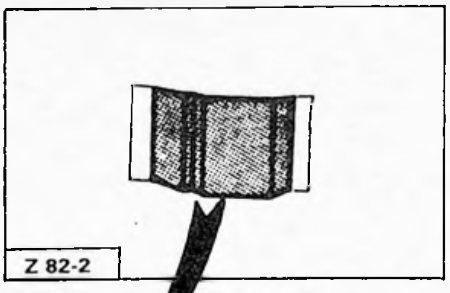
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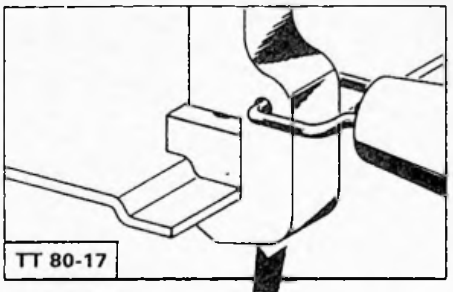
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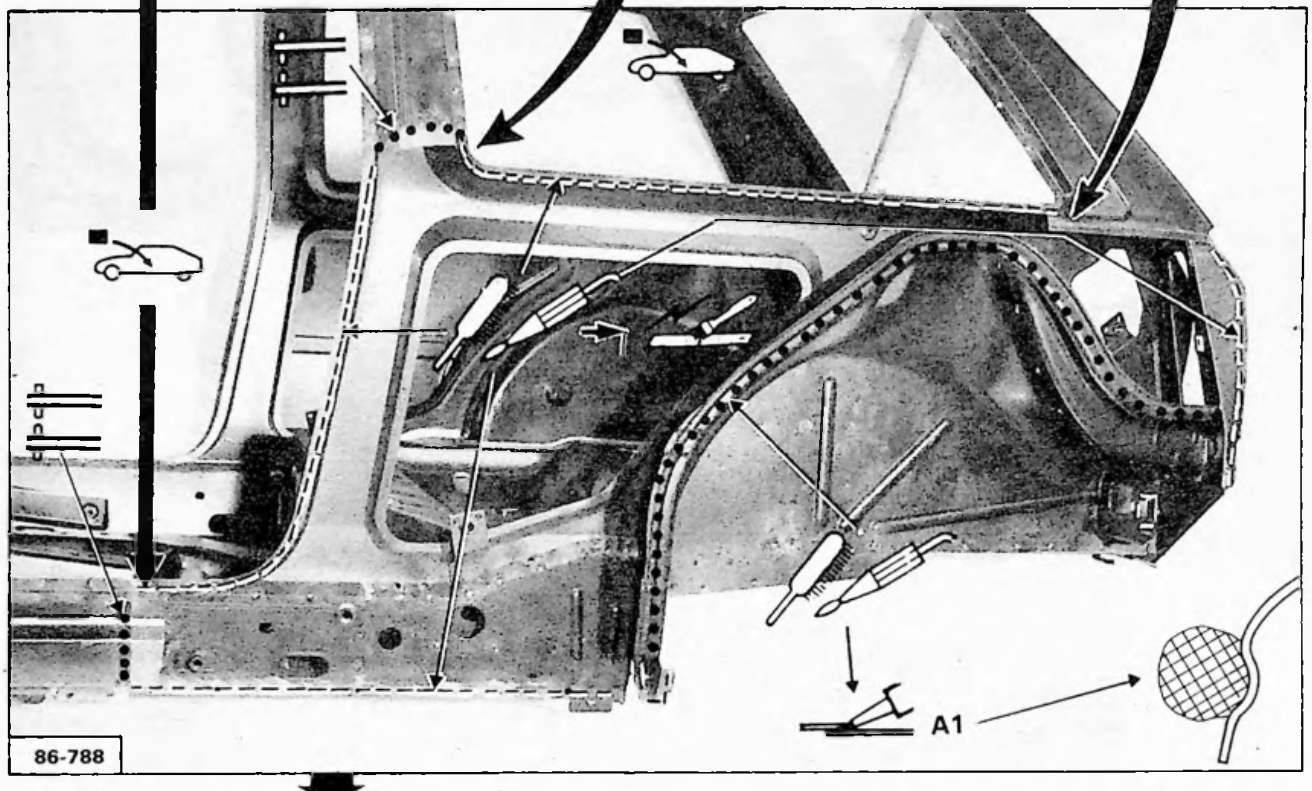

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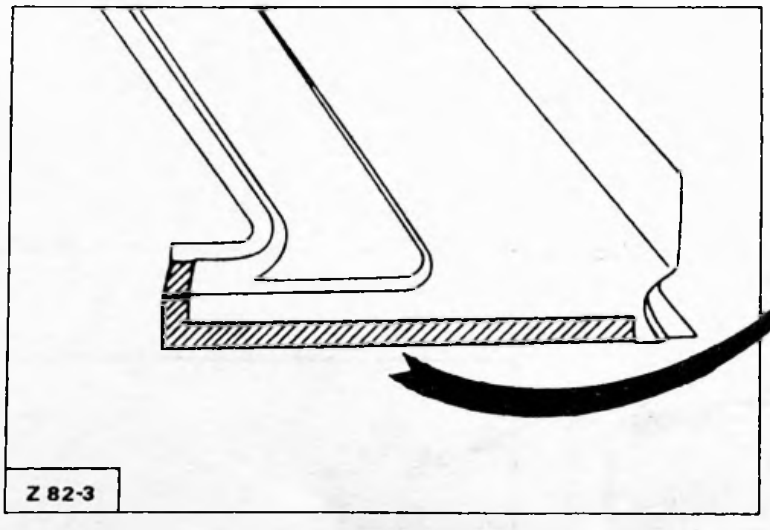
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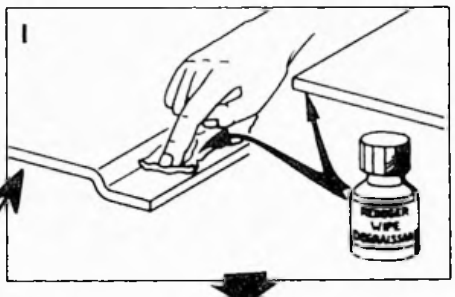

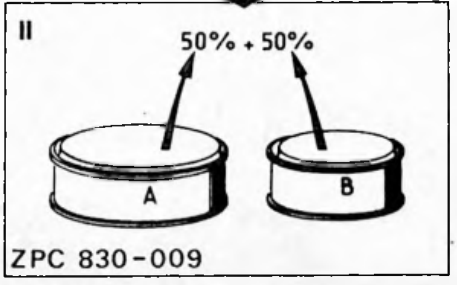

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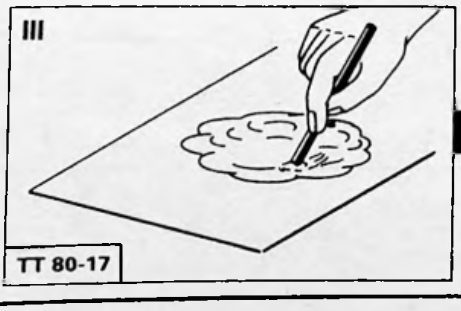

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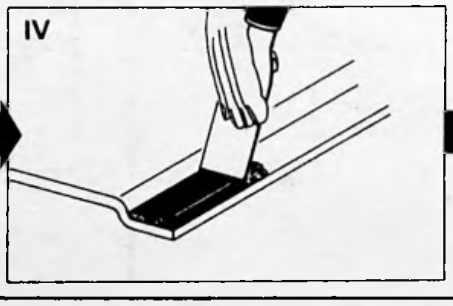

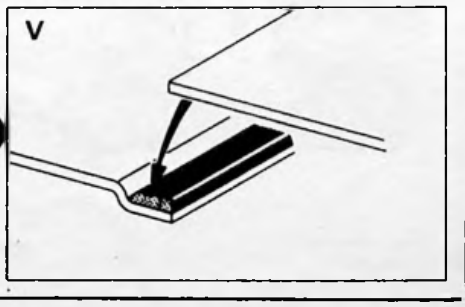

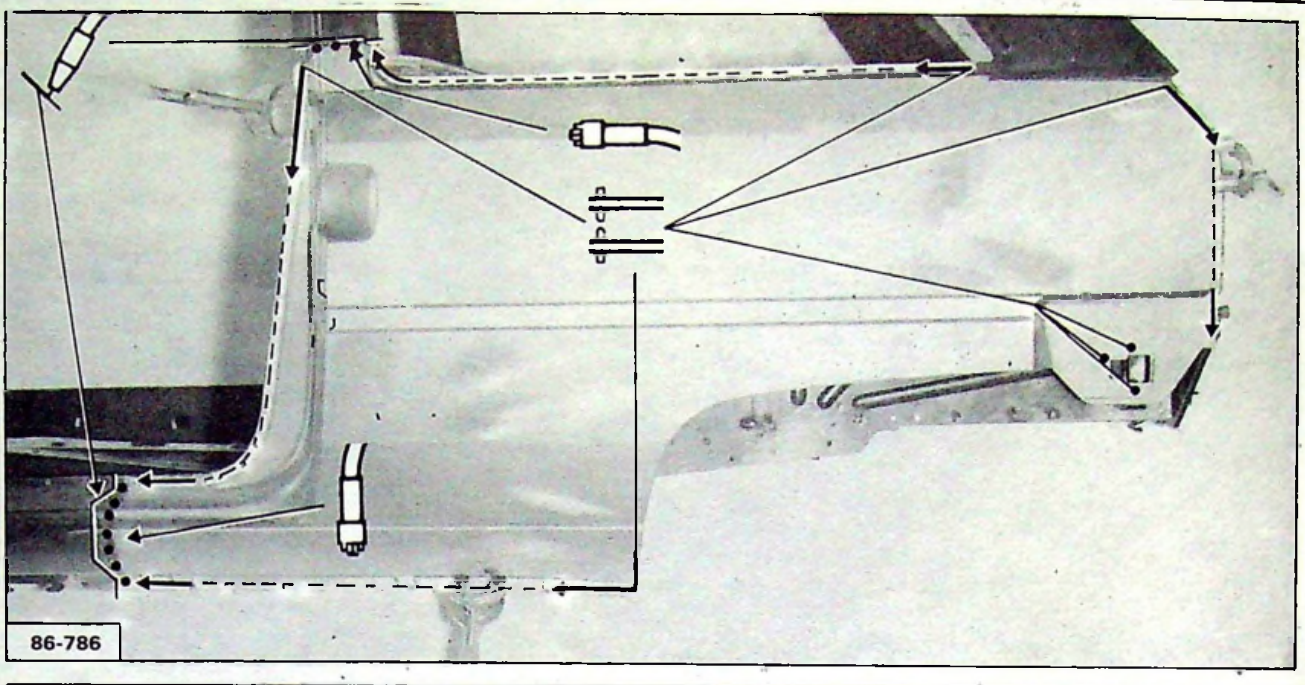
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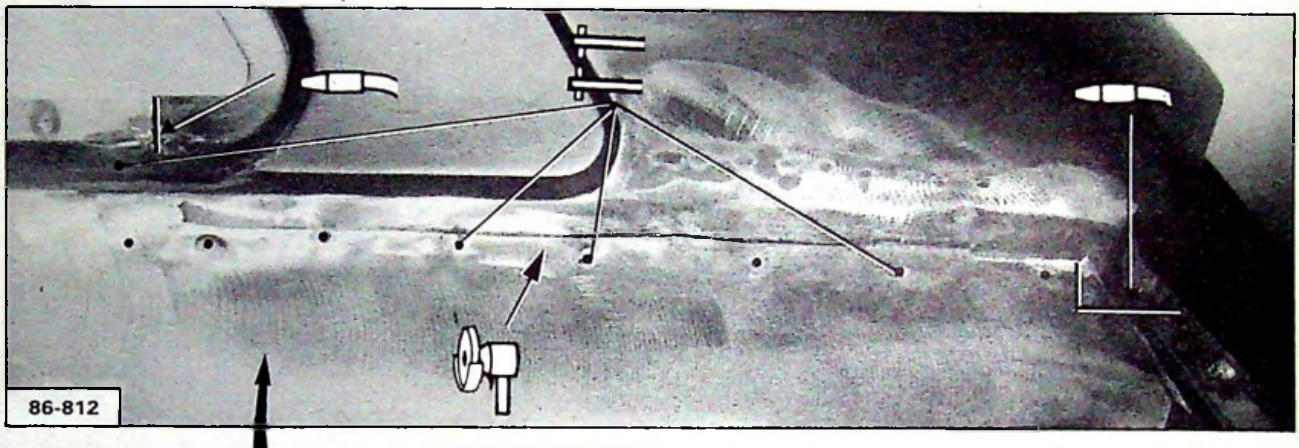
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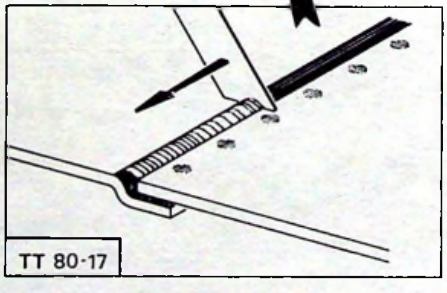
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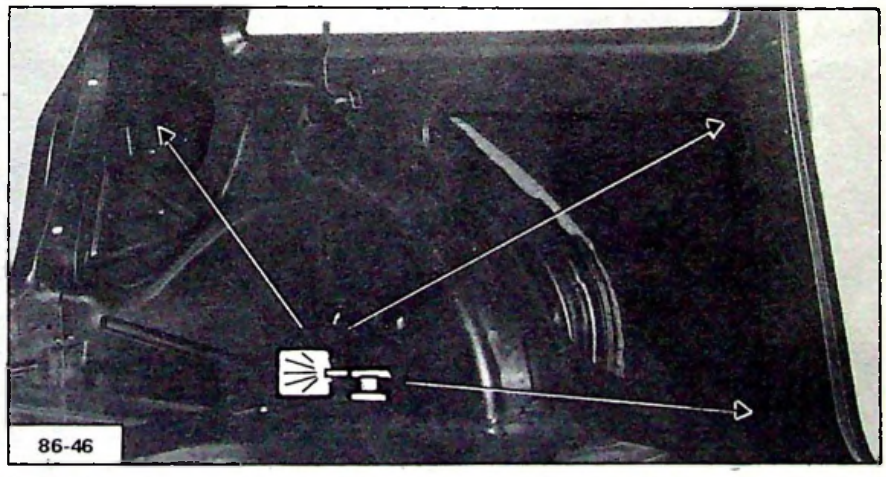
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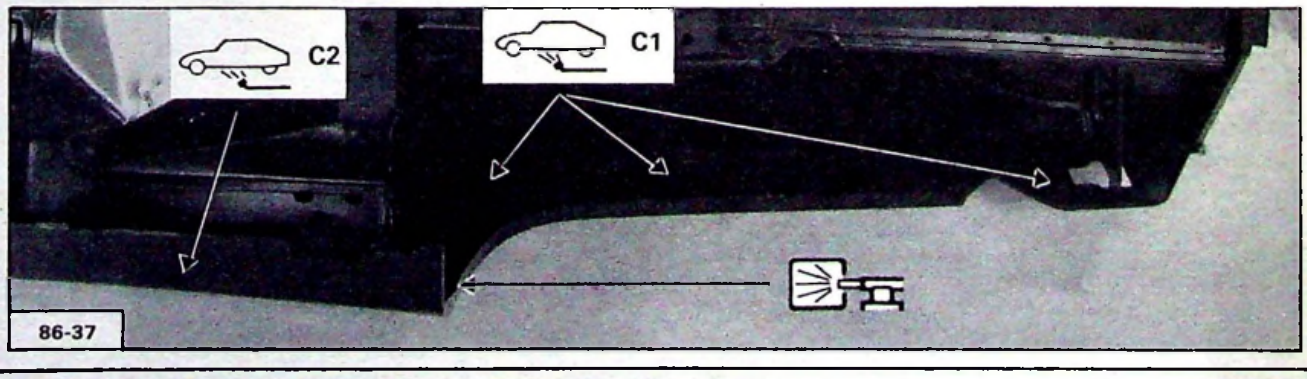
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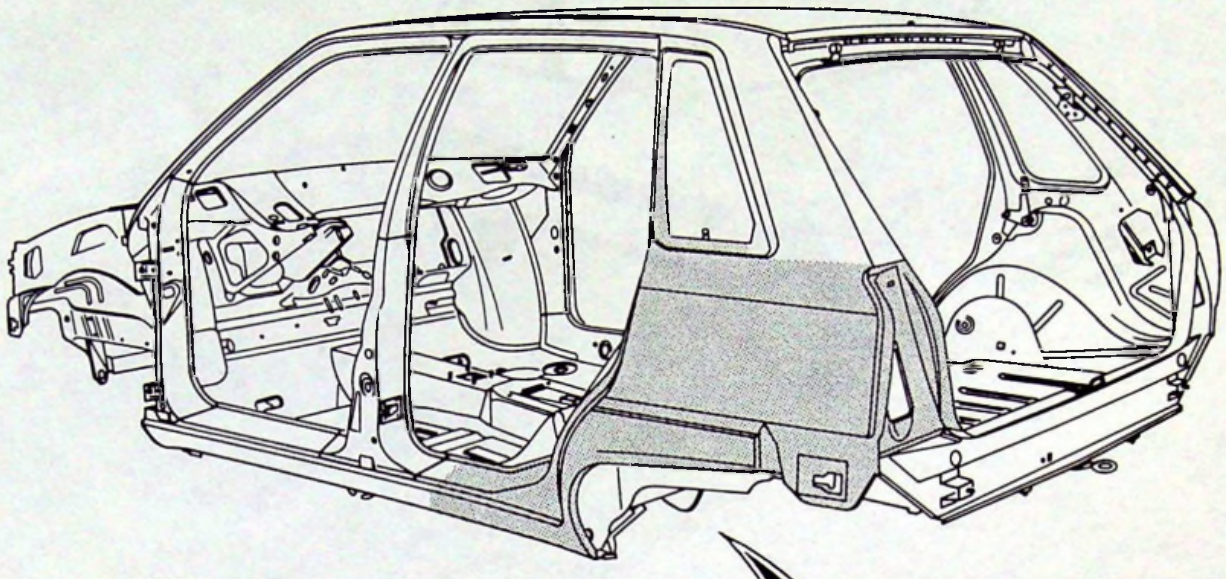
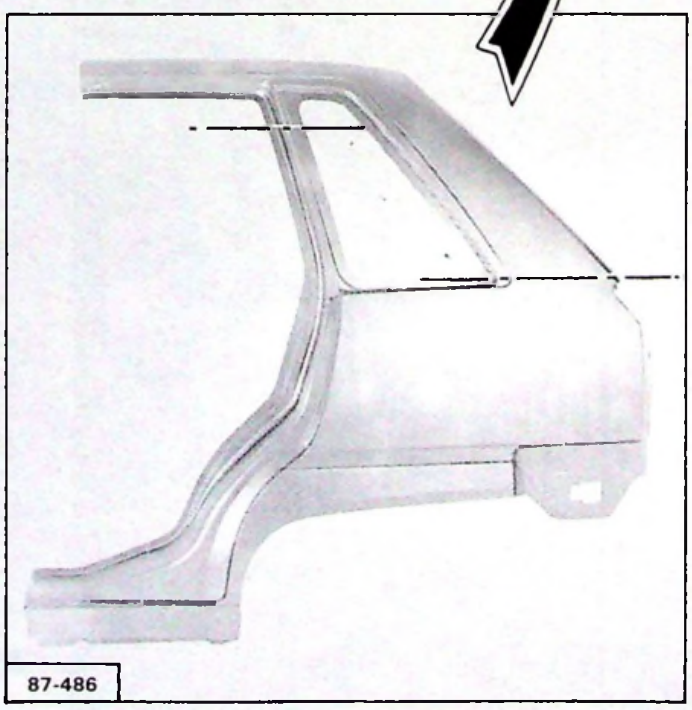


Z. 80-41



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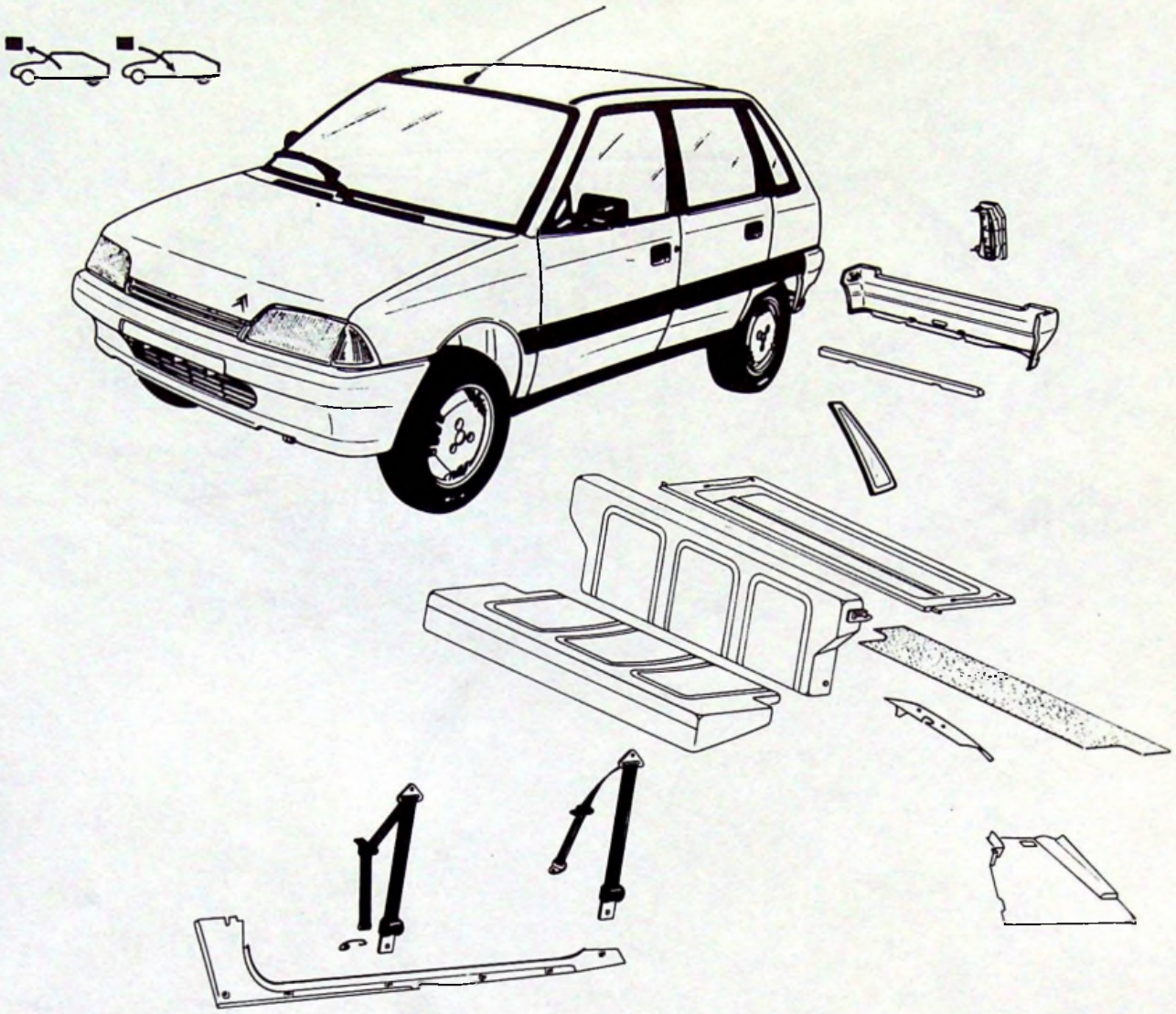

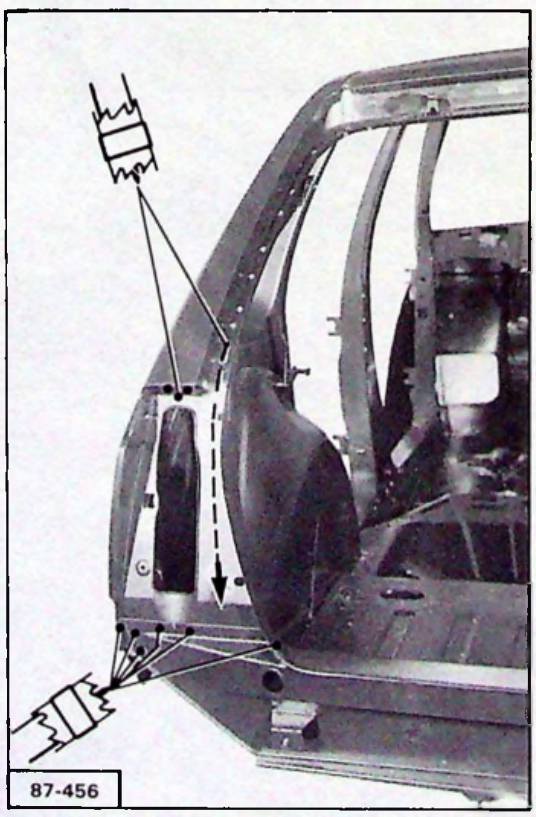
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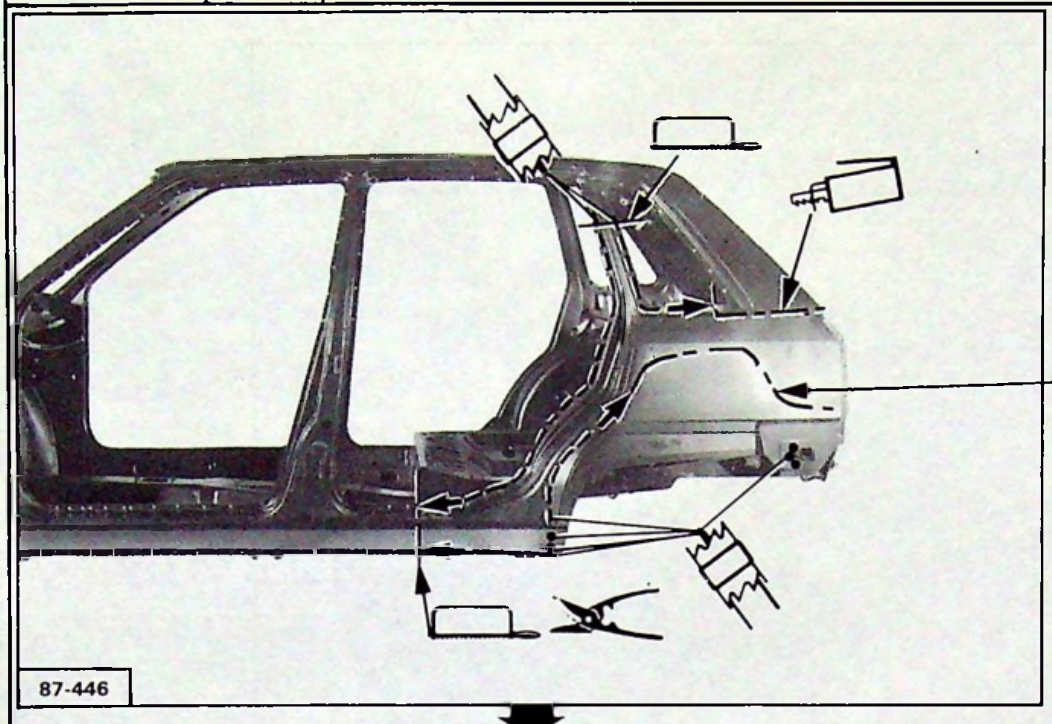

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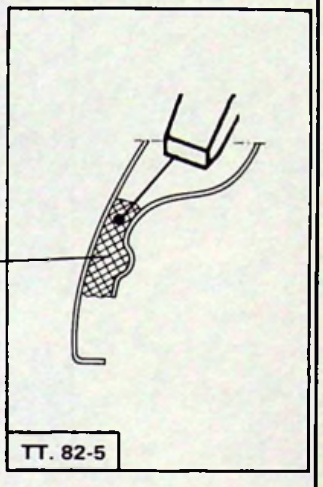

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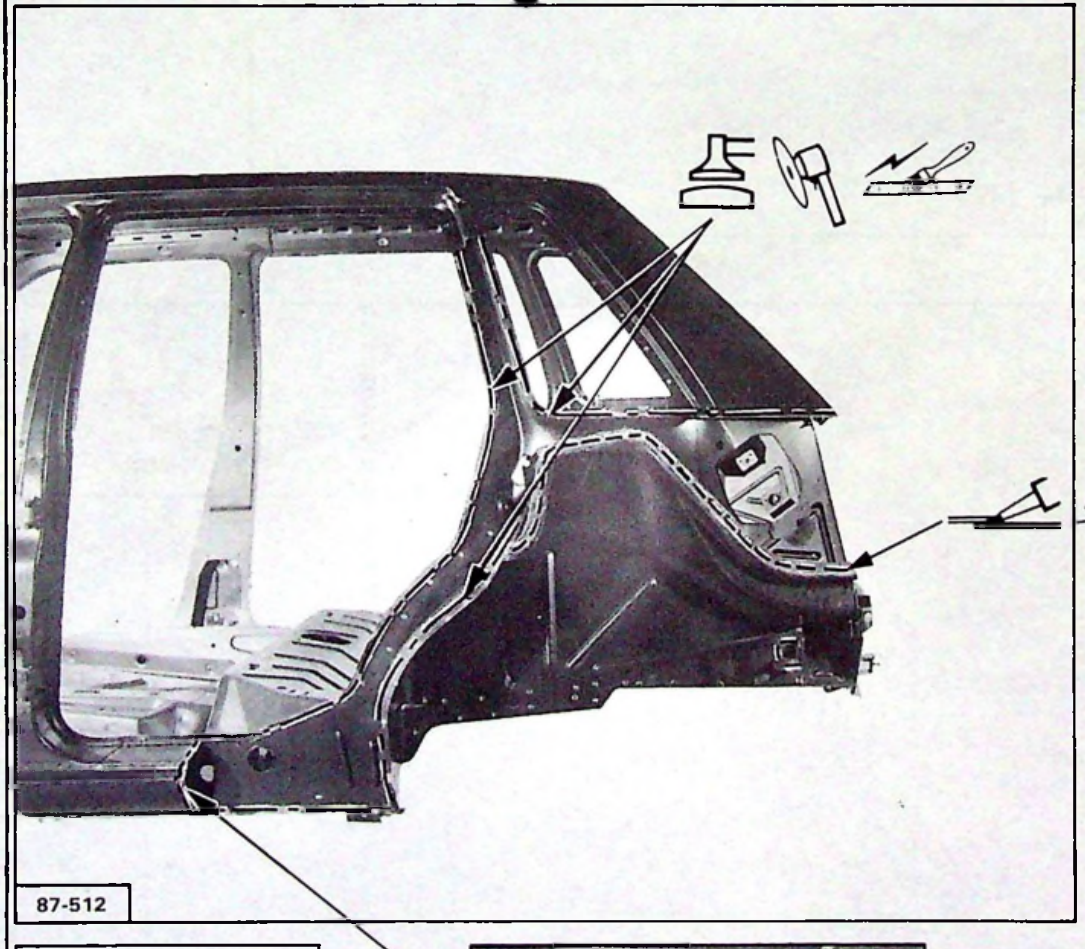

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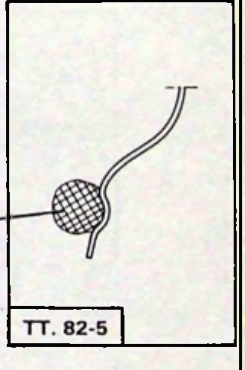

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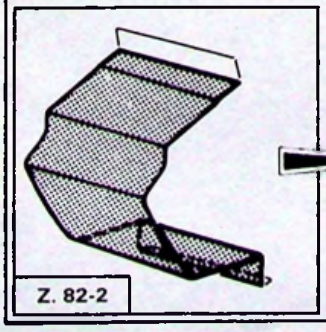

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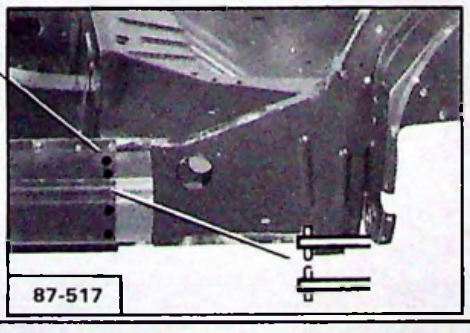

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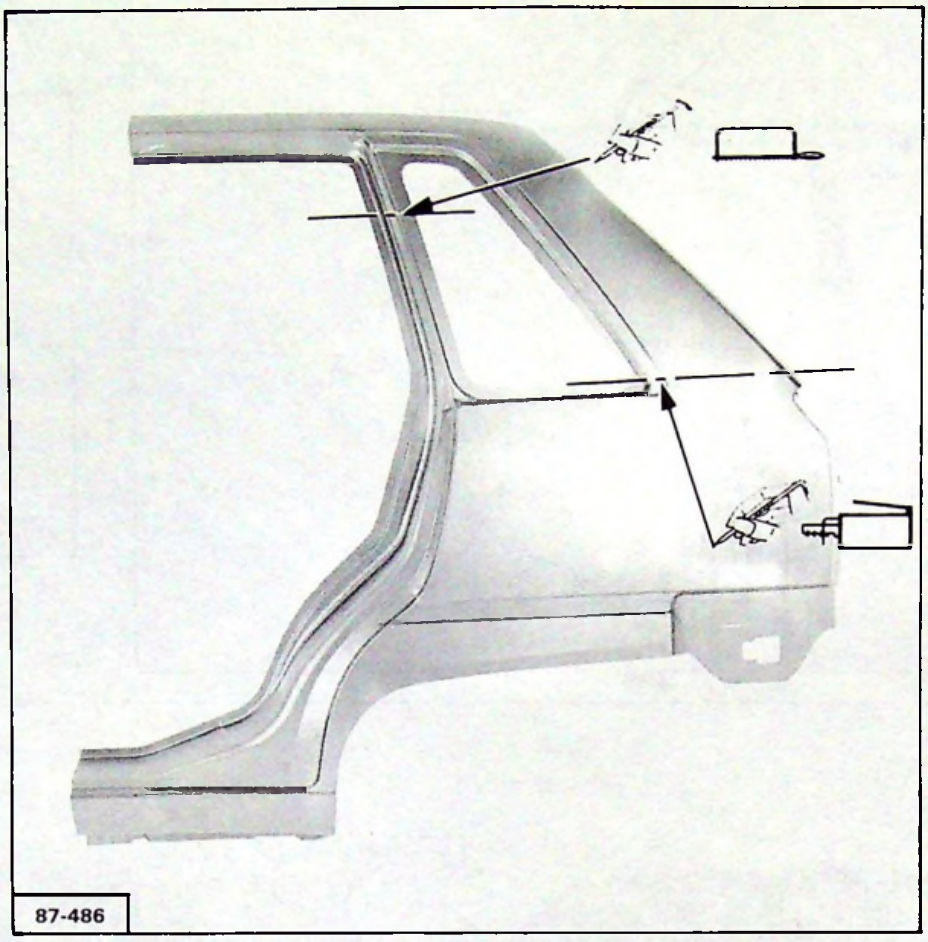
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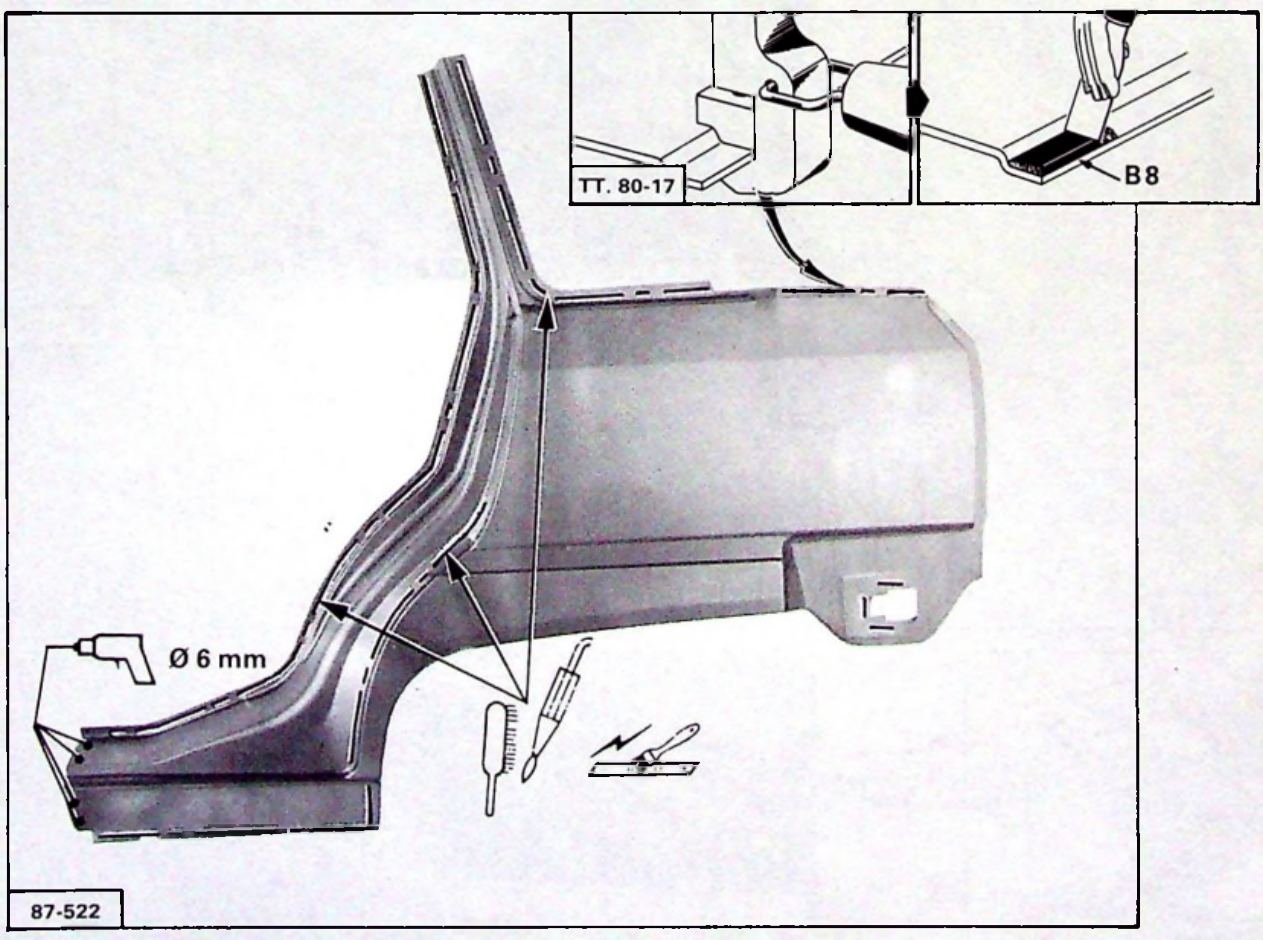
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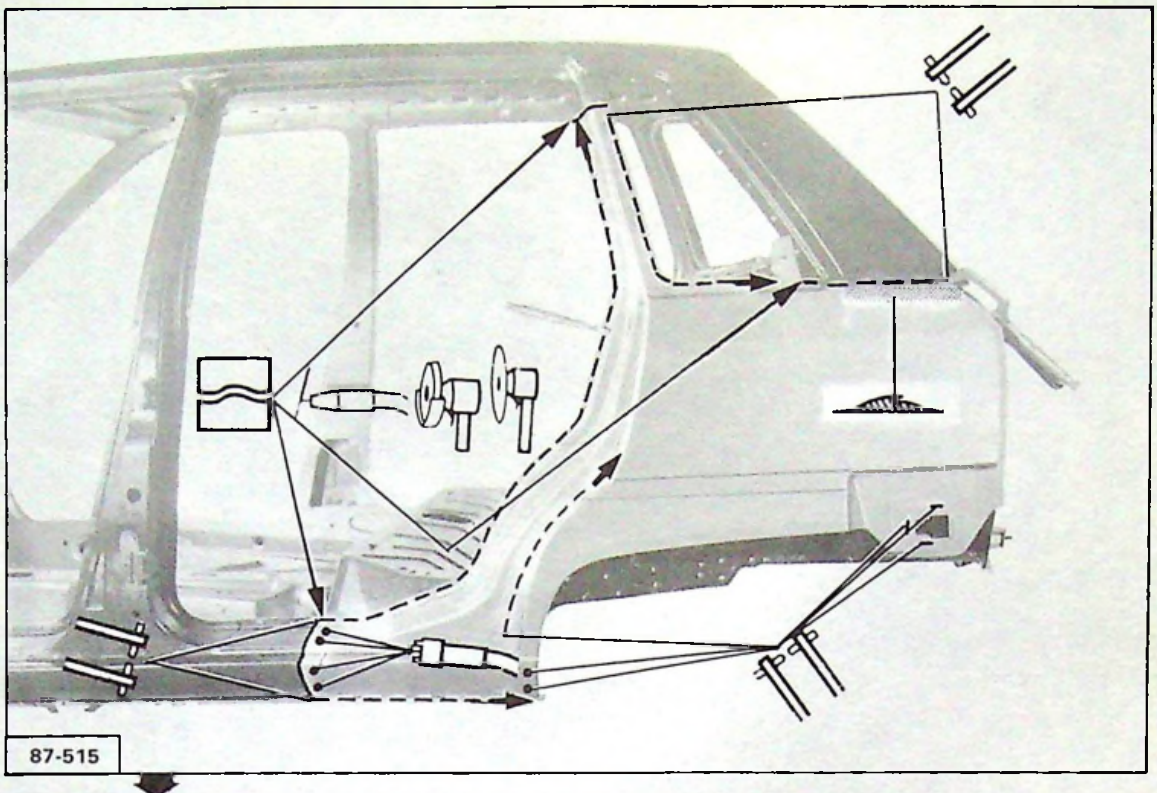
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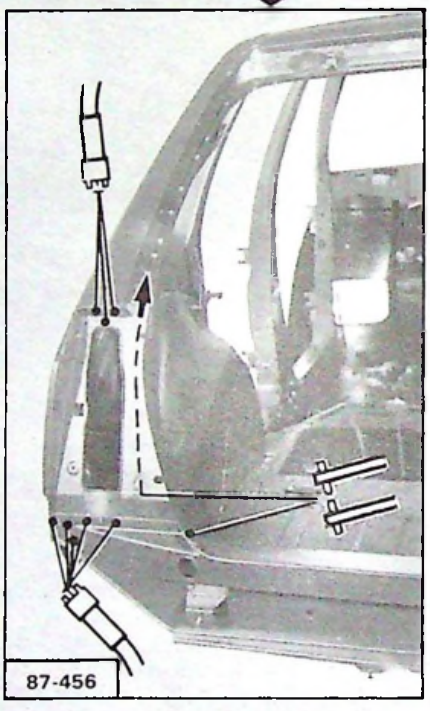
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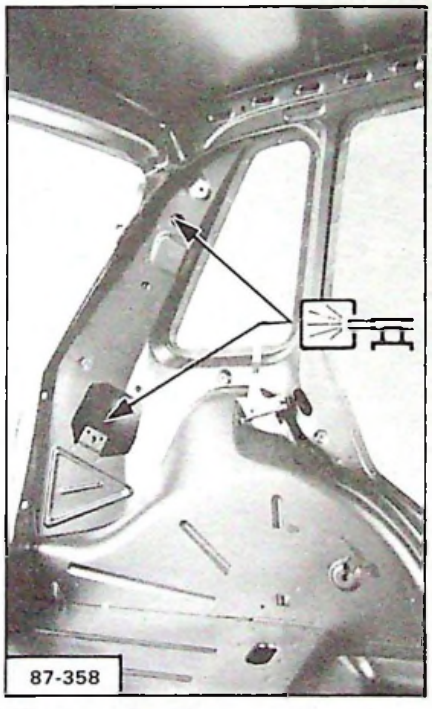
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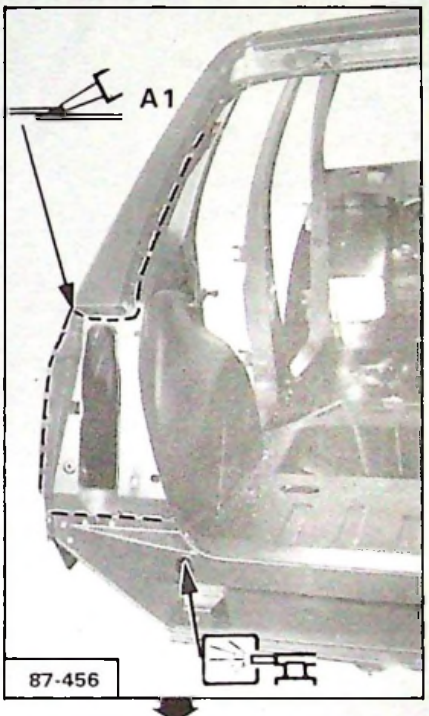
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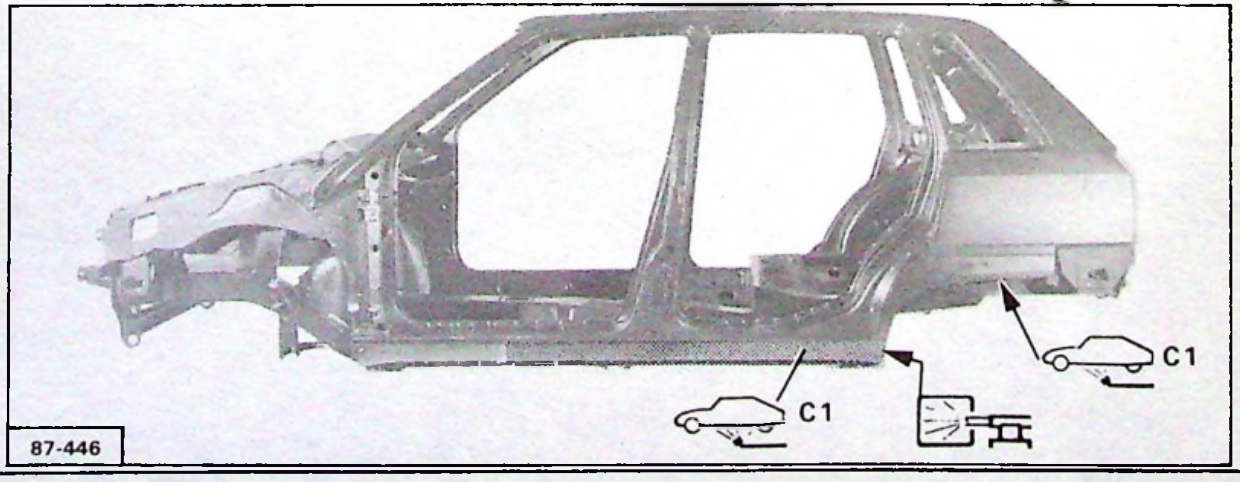
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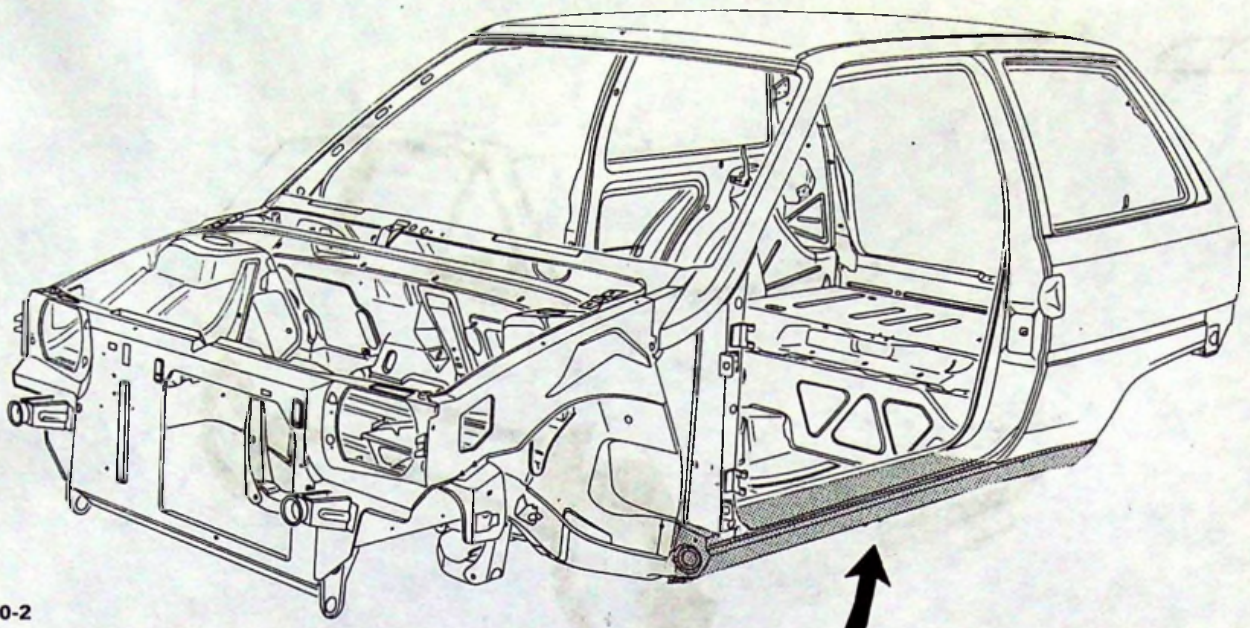

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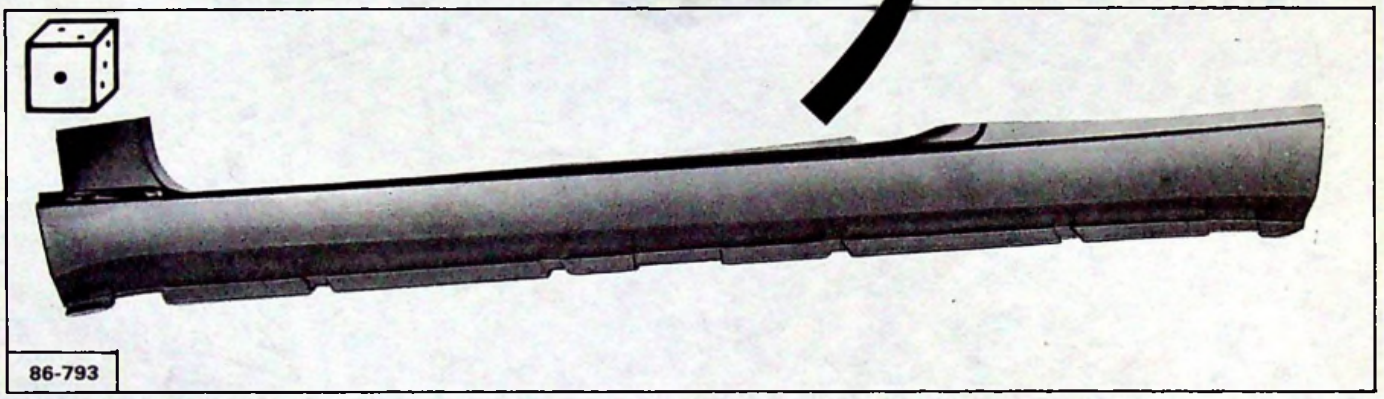

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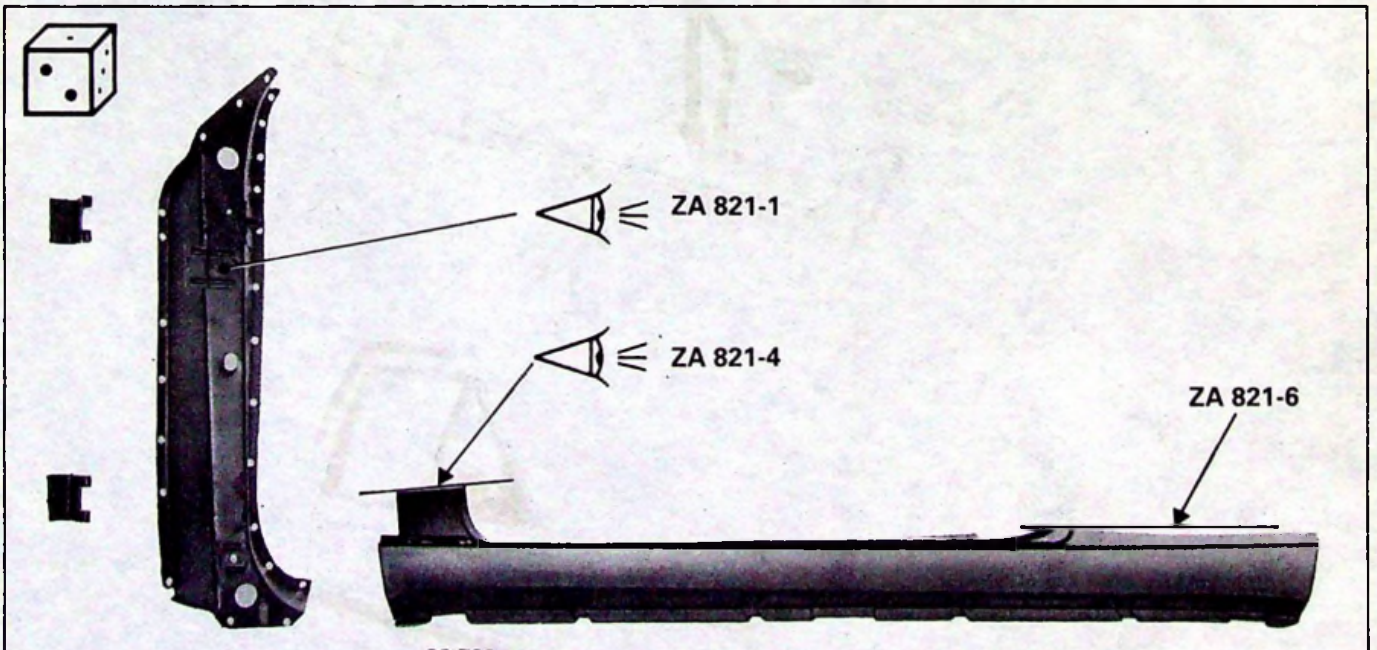

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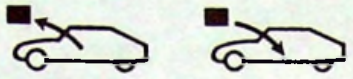
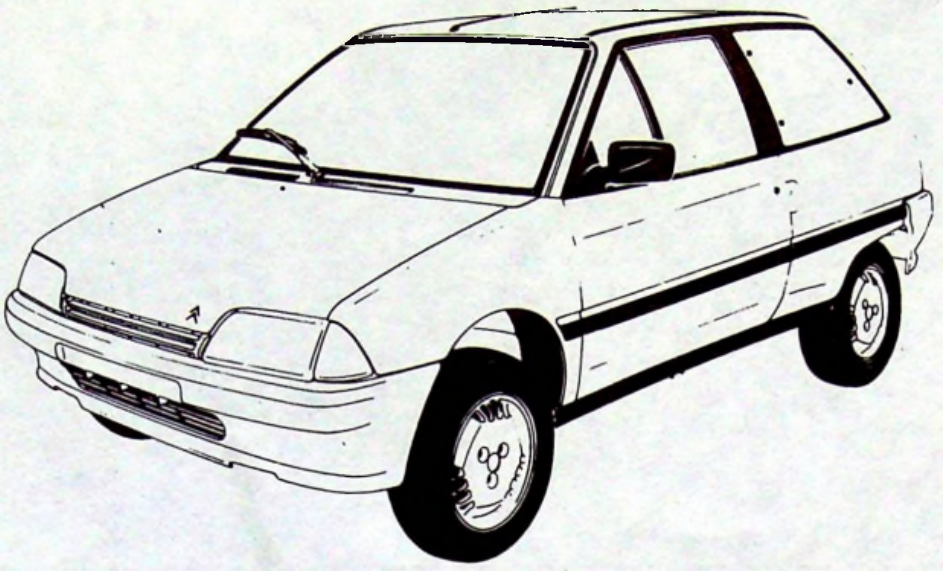
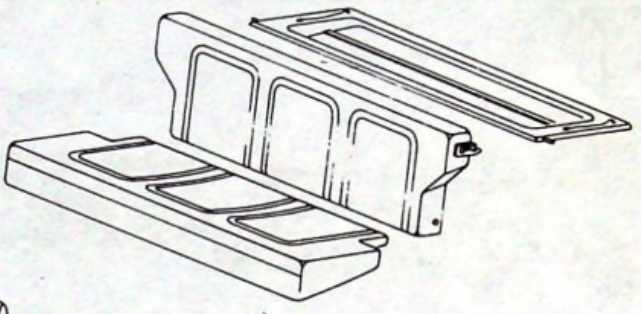
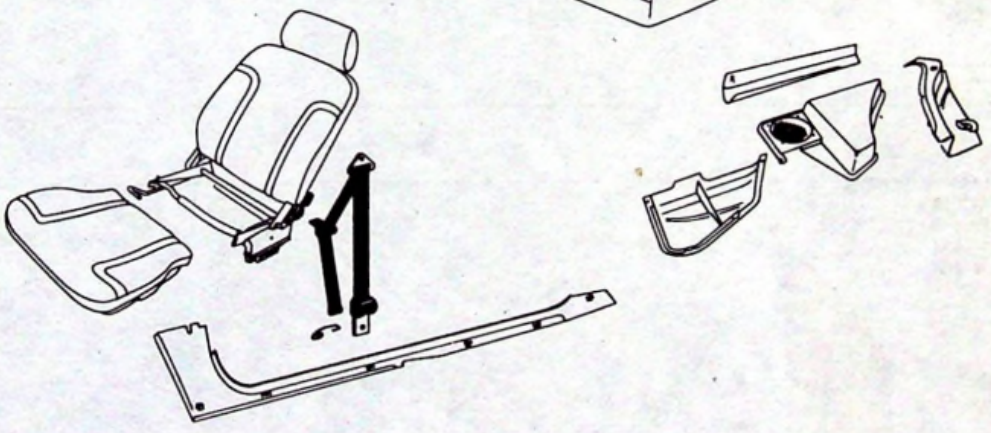
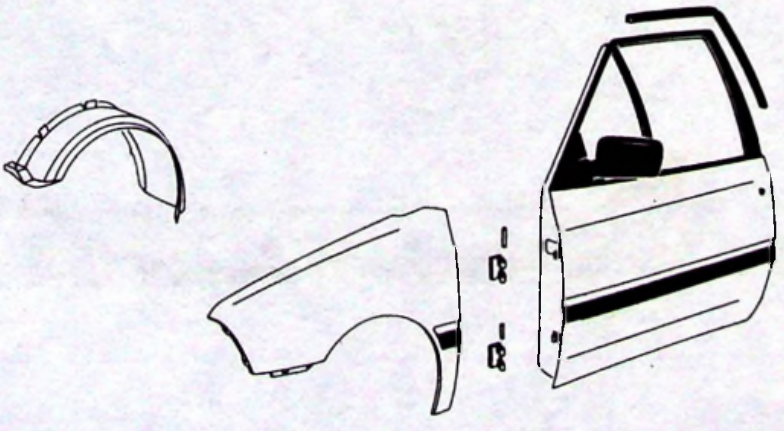
86-304

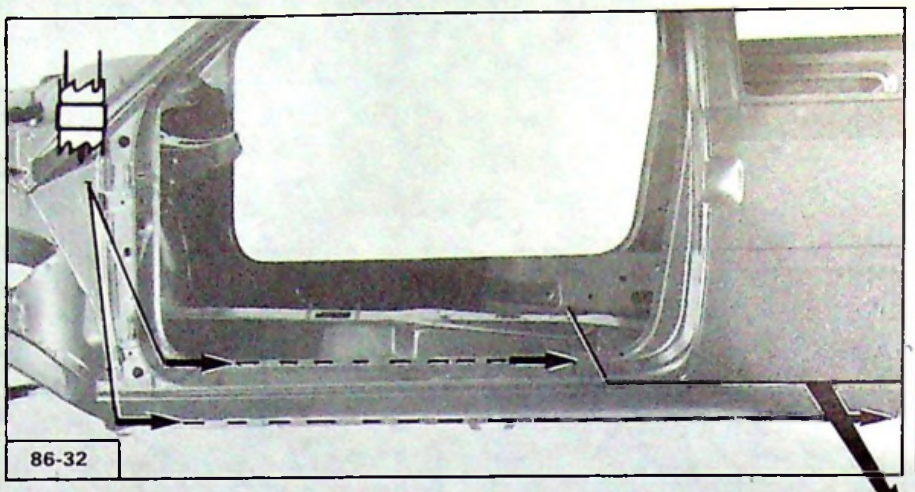








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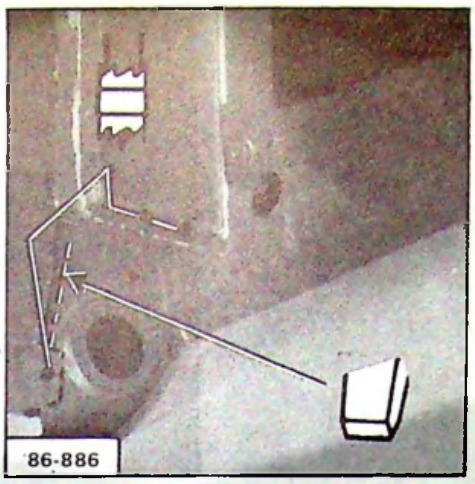
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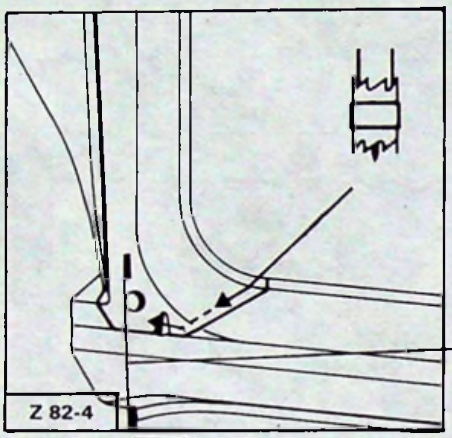
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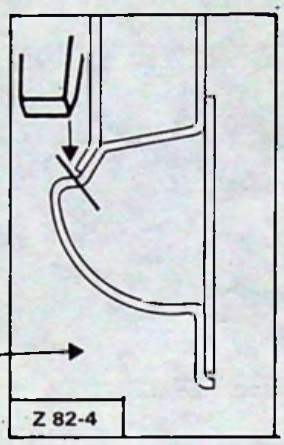
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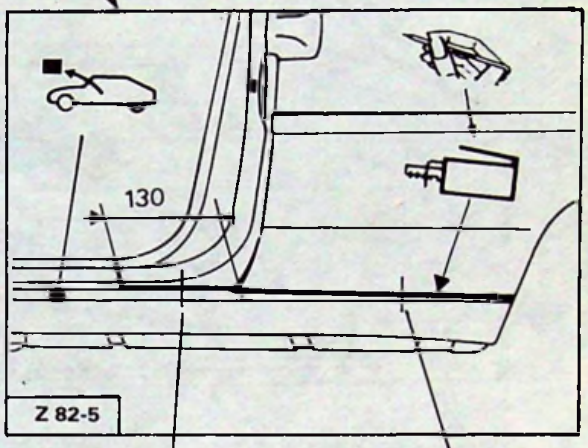
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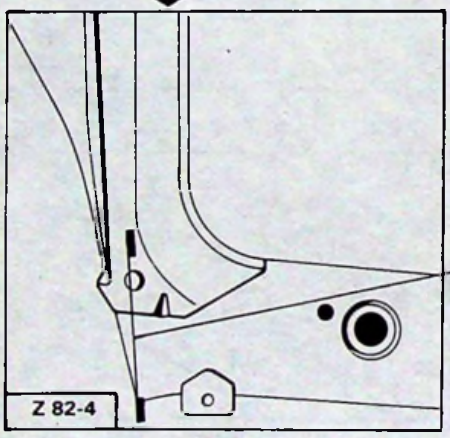
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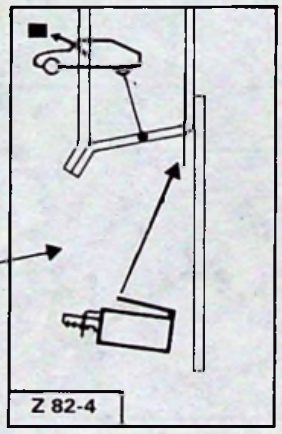
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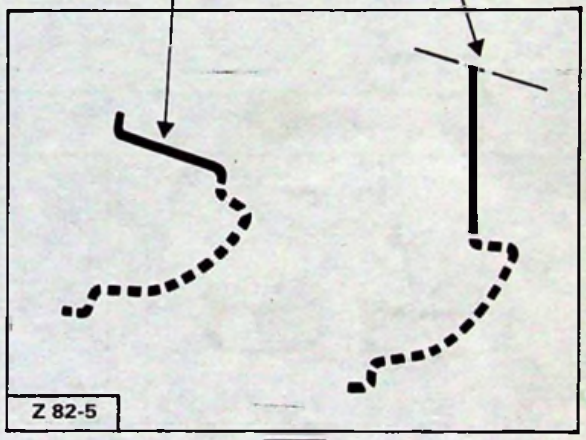
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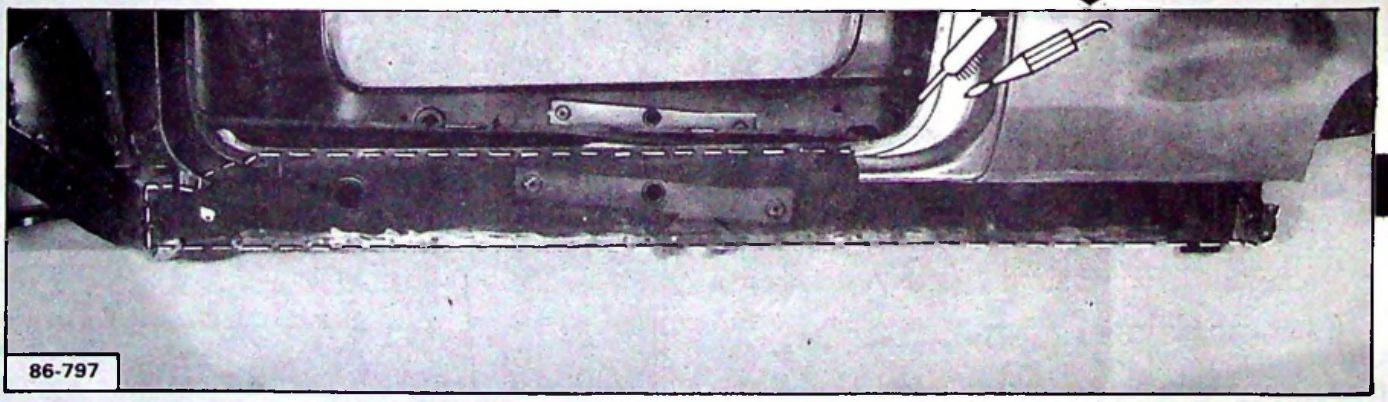
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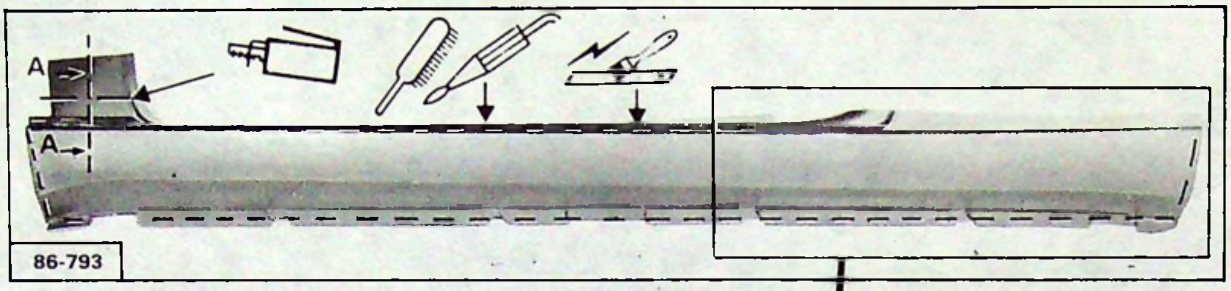
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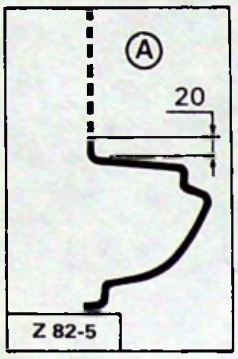
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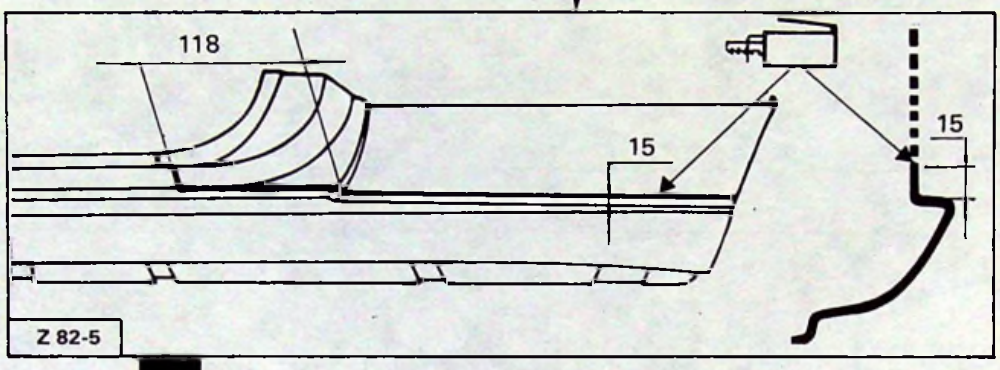
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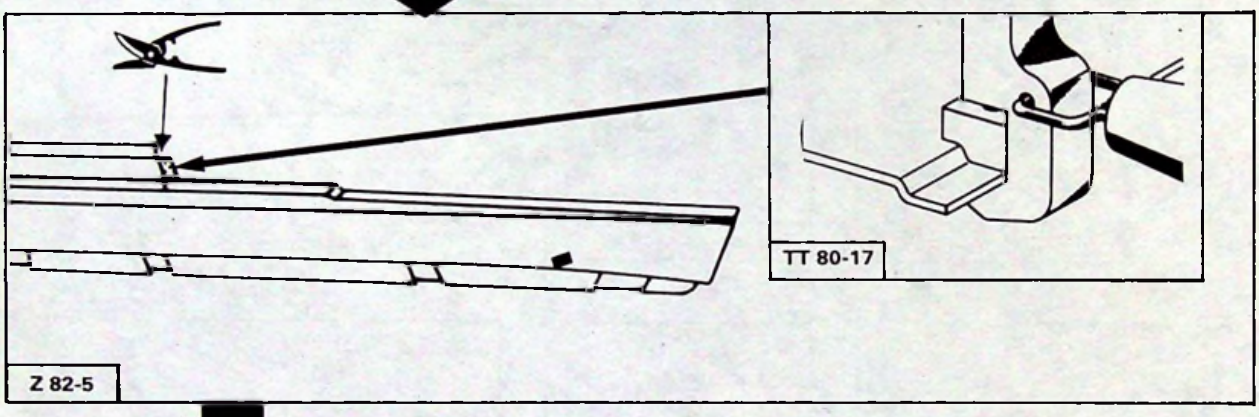
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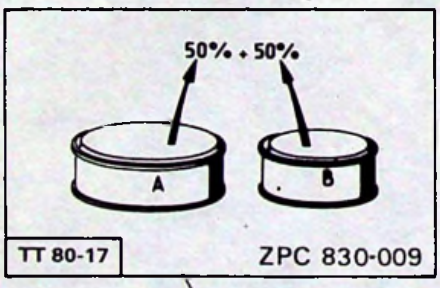
TT 80-17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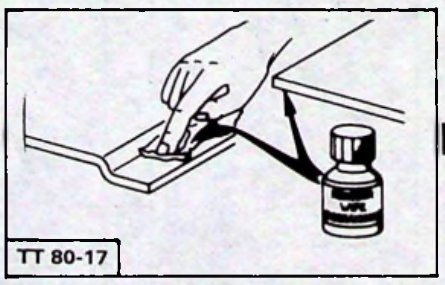
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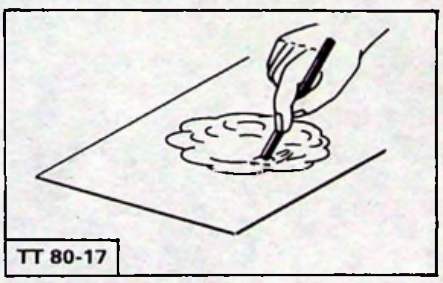
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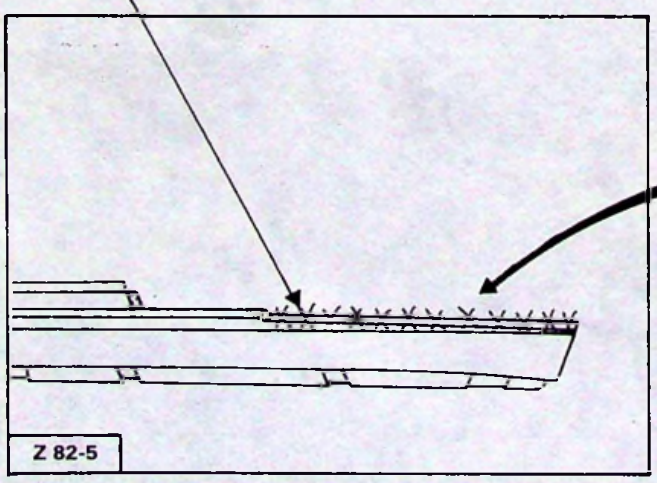
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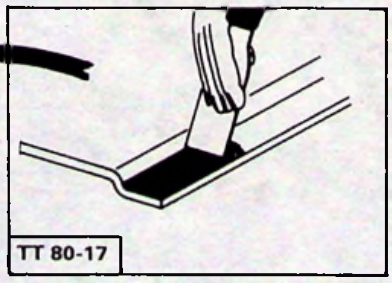
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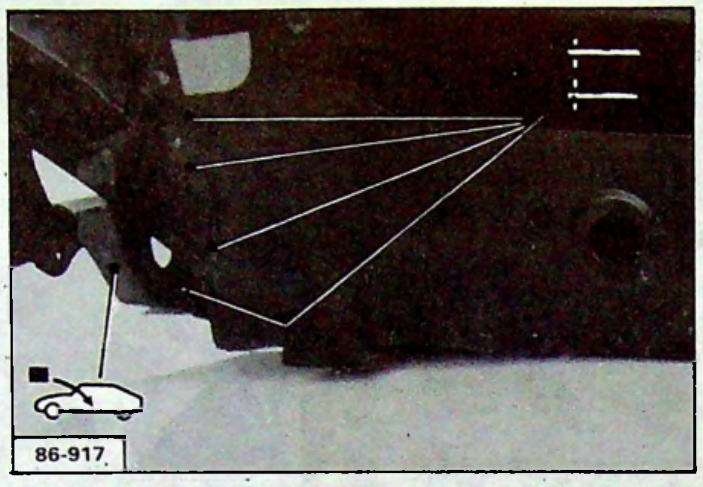
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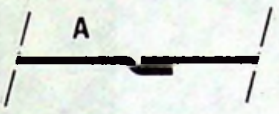
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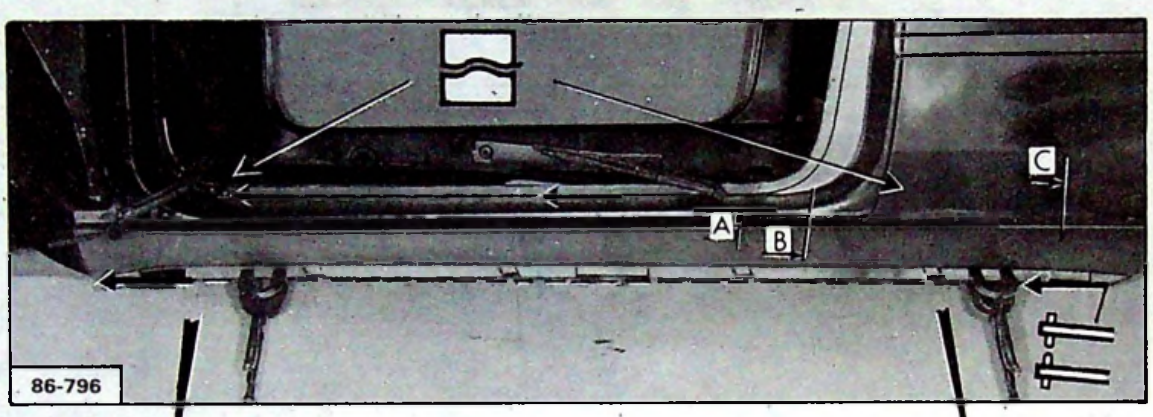
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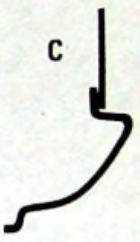
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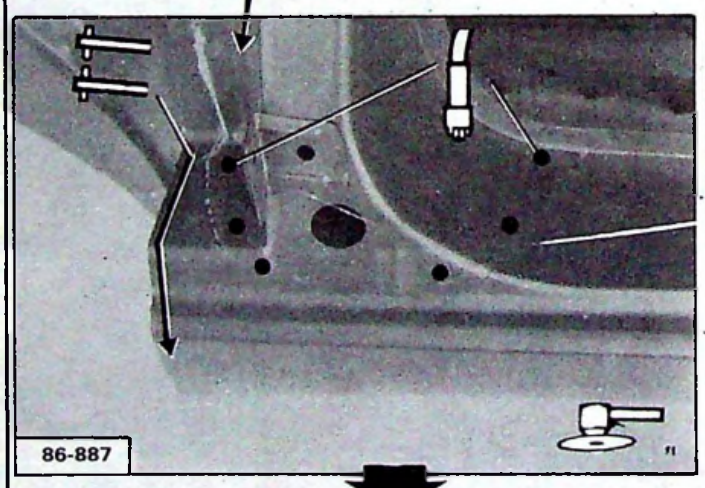
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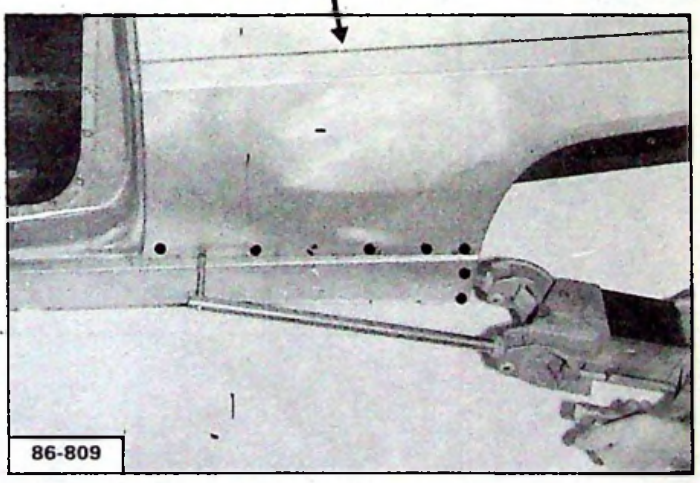
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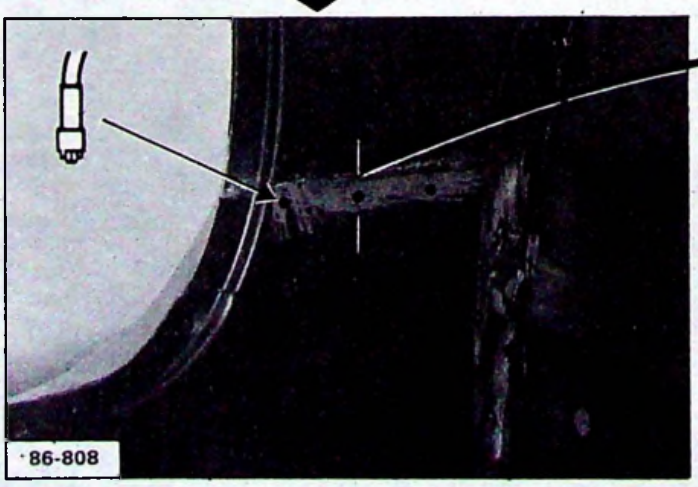
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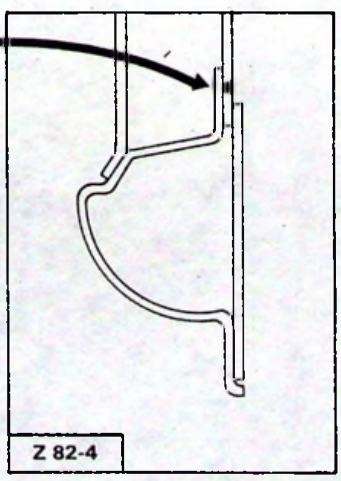
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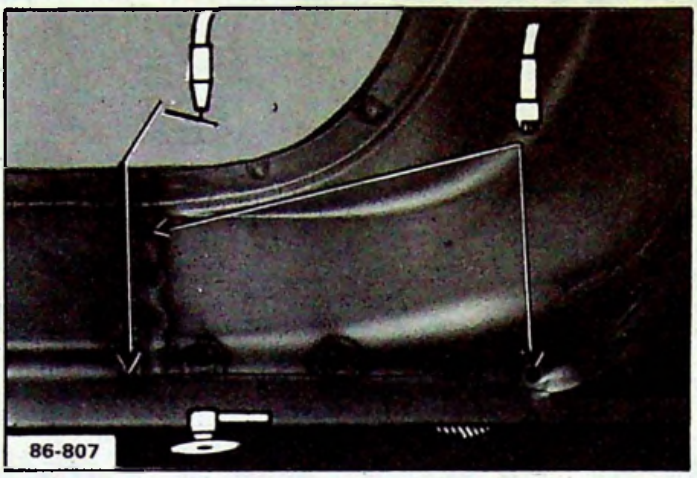
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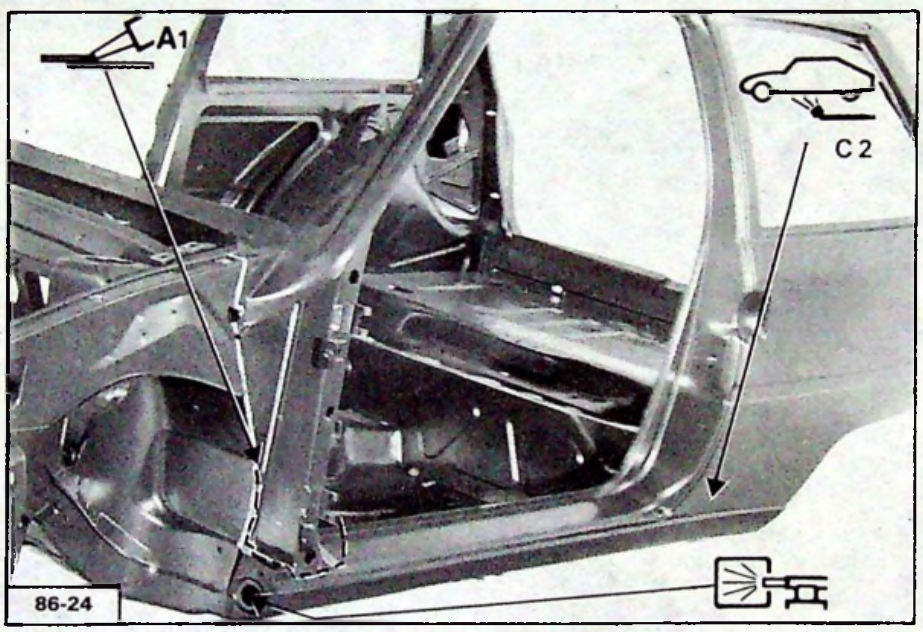
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C2
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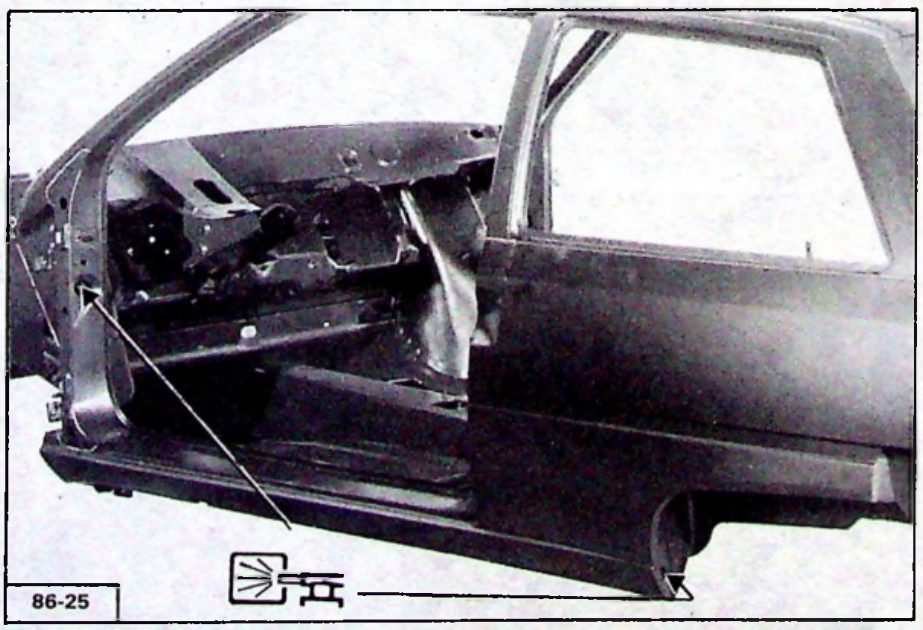
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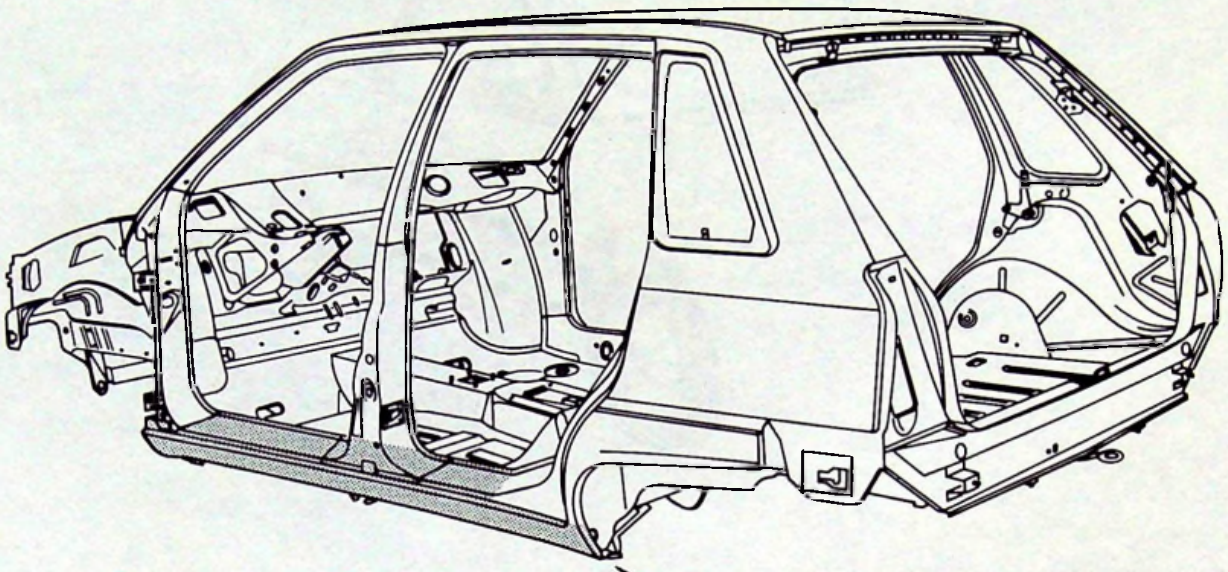

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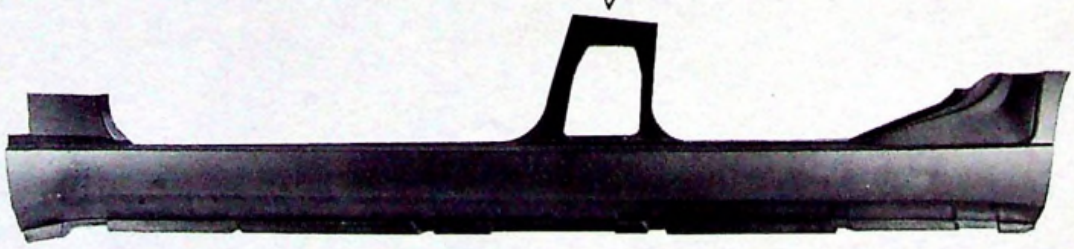

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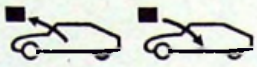
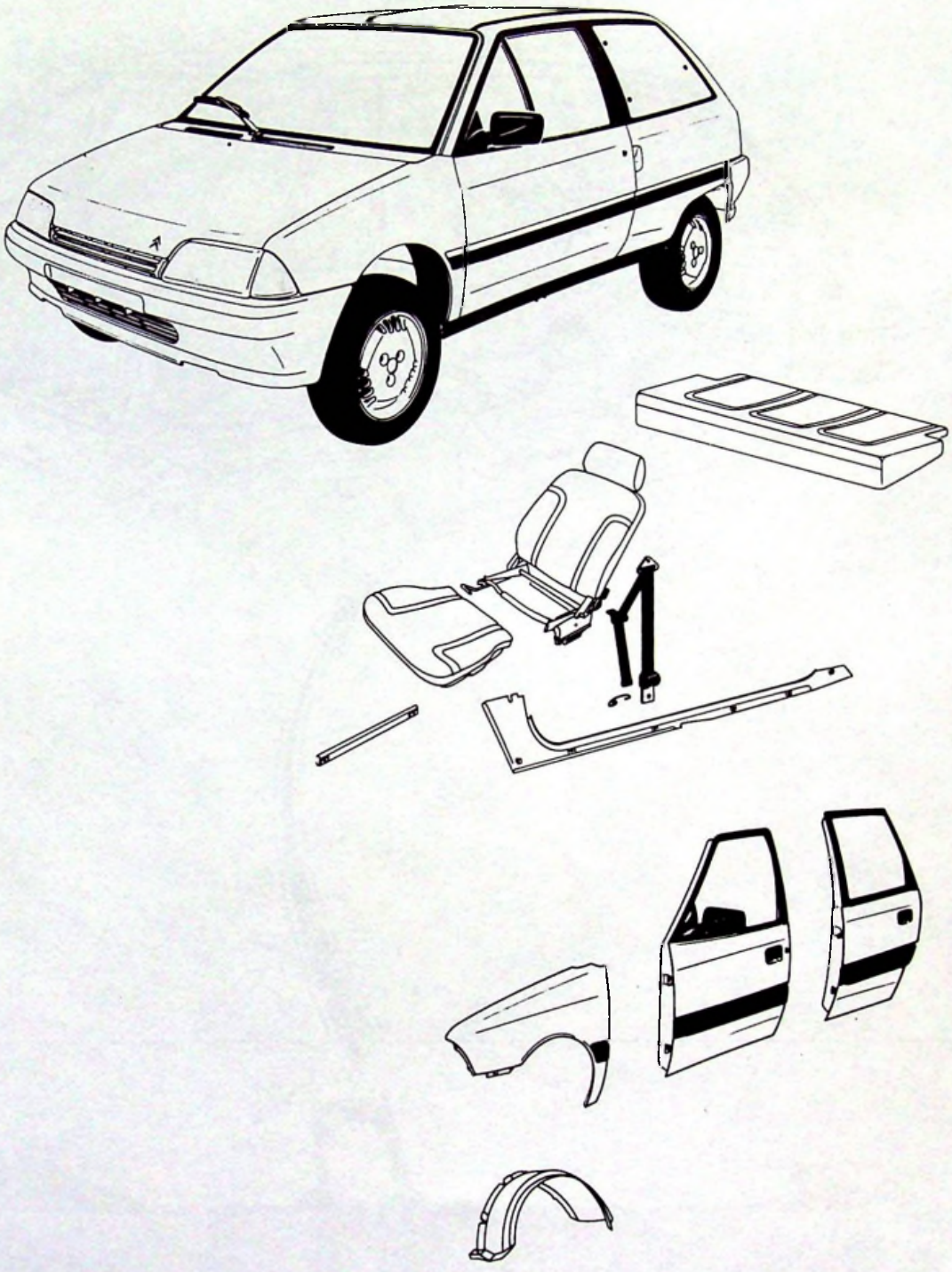
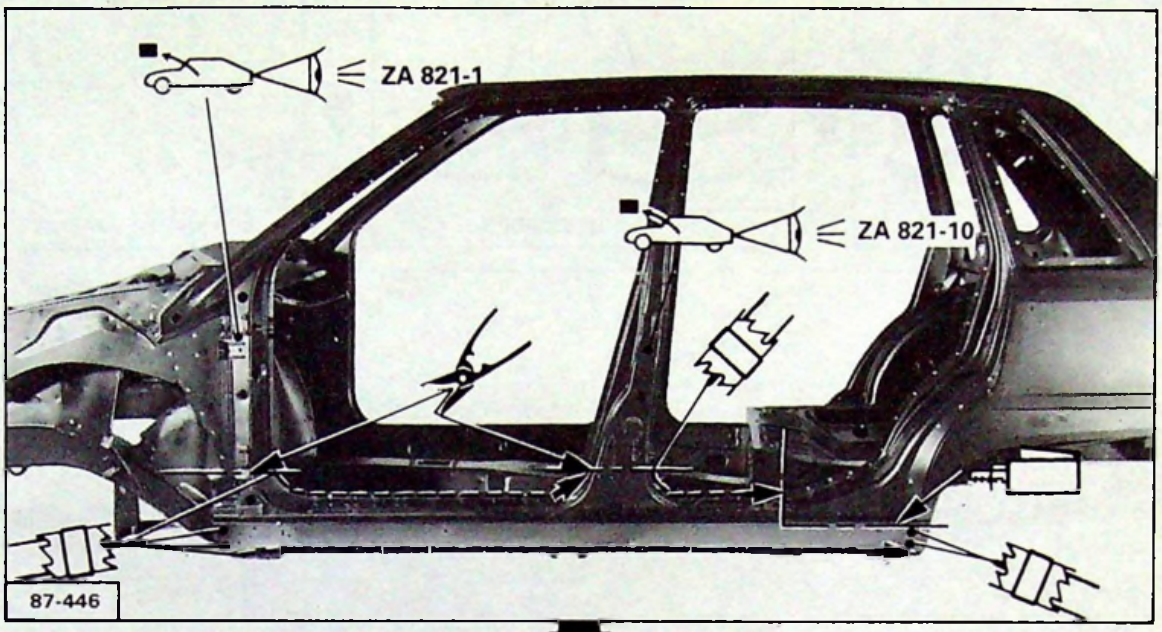




Z 80-17

Z 80-45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ZA 821-10
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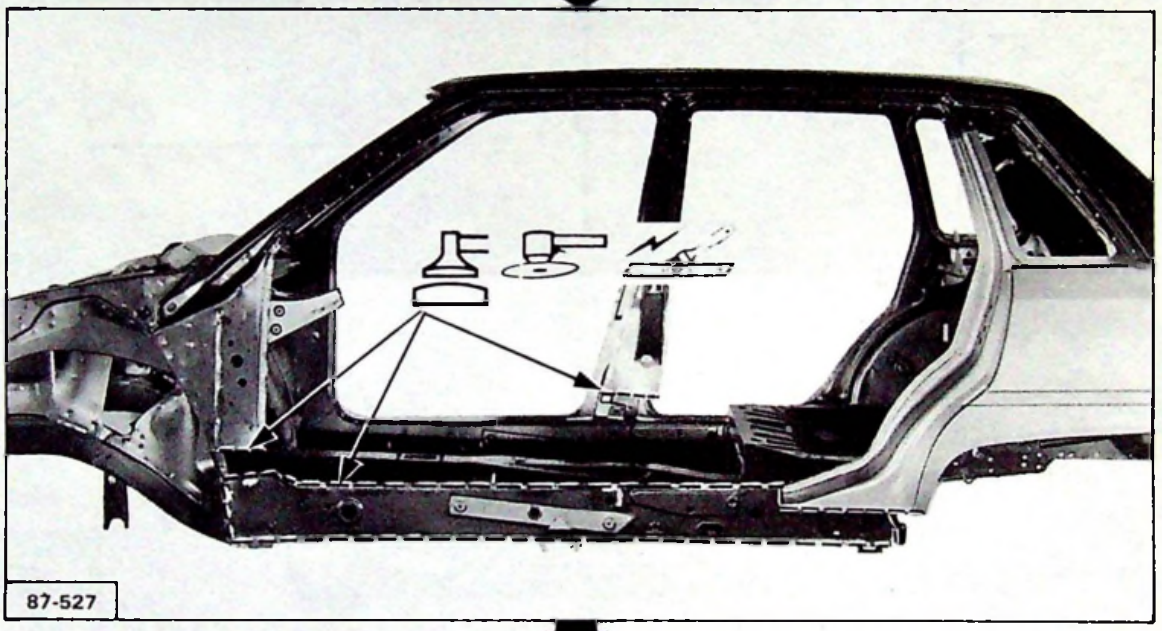
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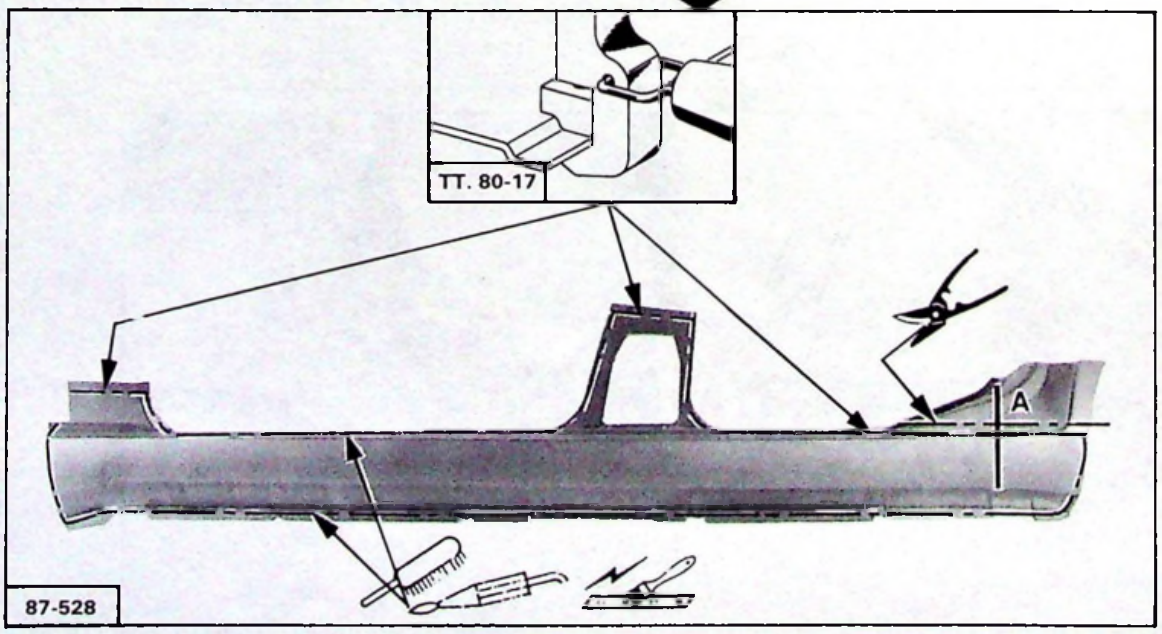
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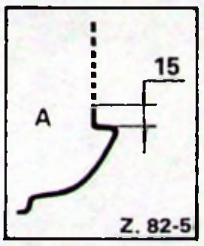
87-528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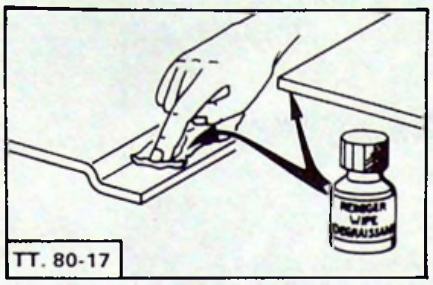
Z. 82-5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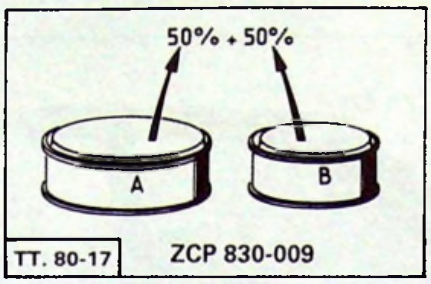
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B
TT. 80-17
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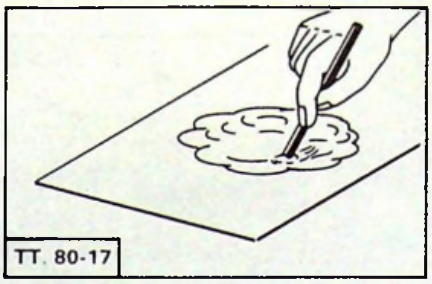
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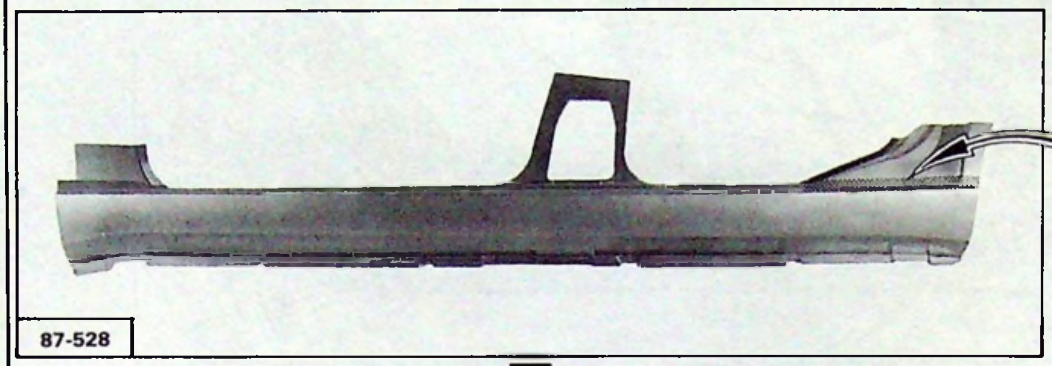
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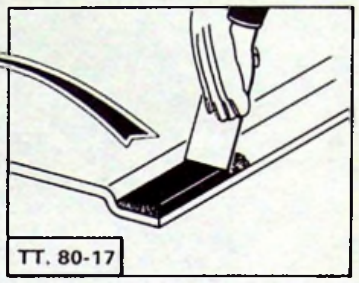
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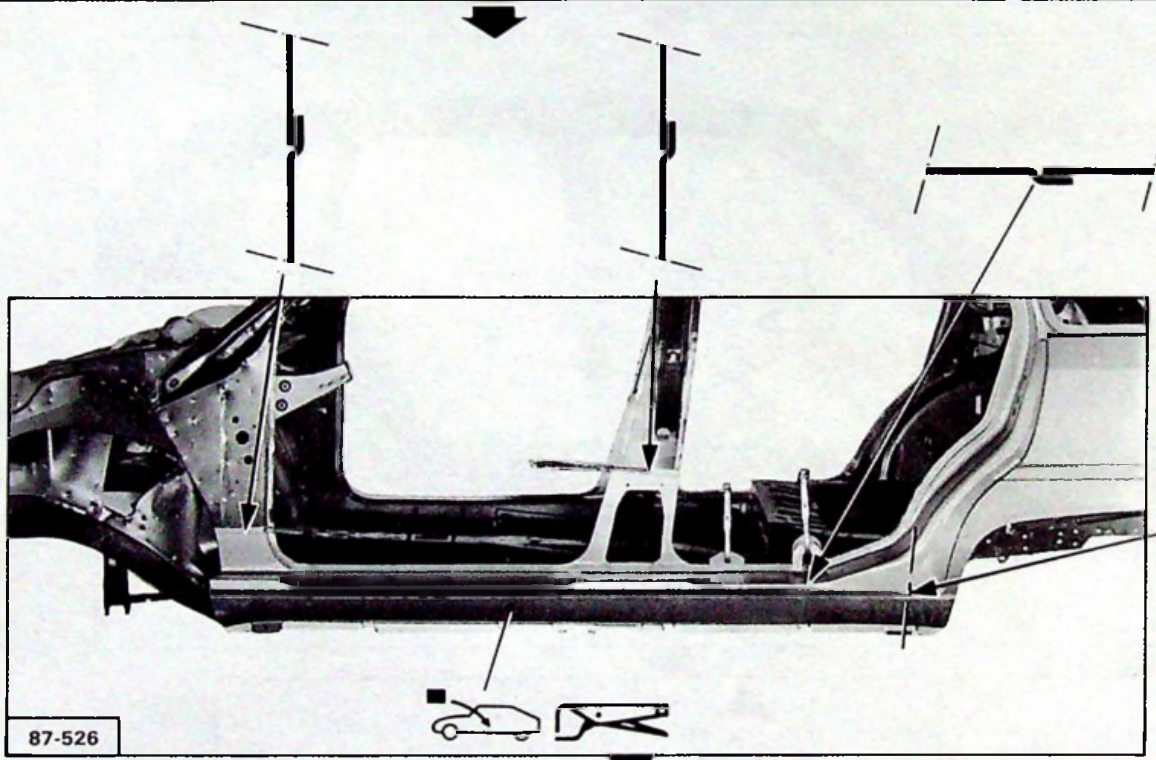
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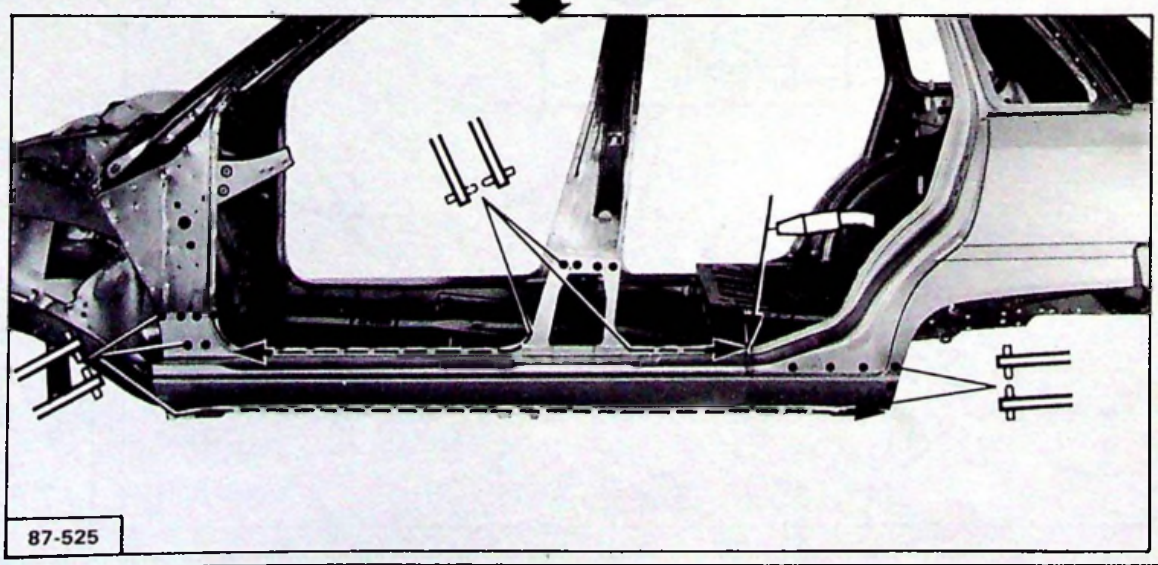
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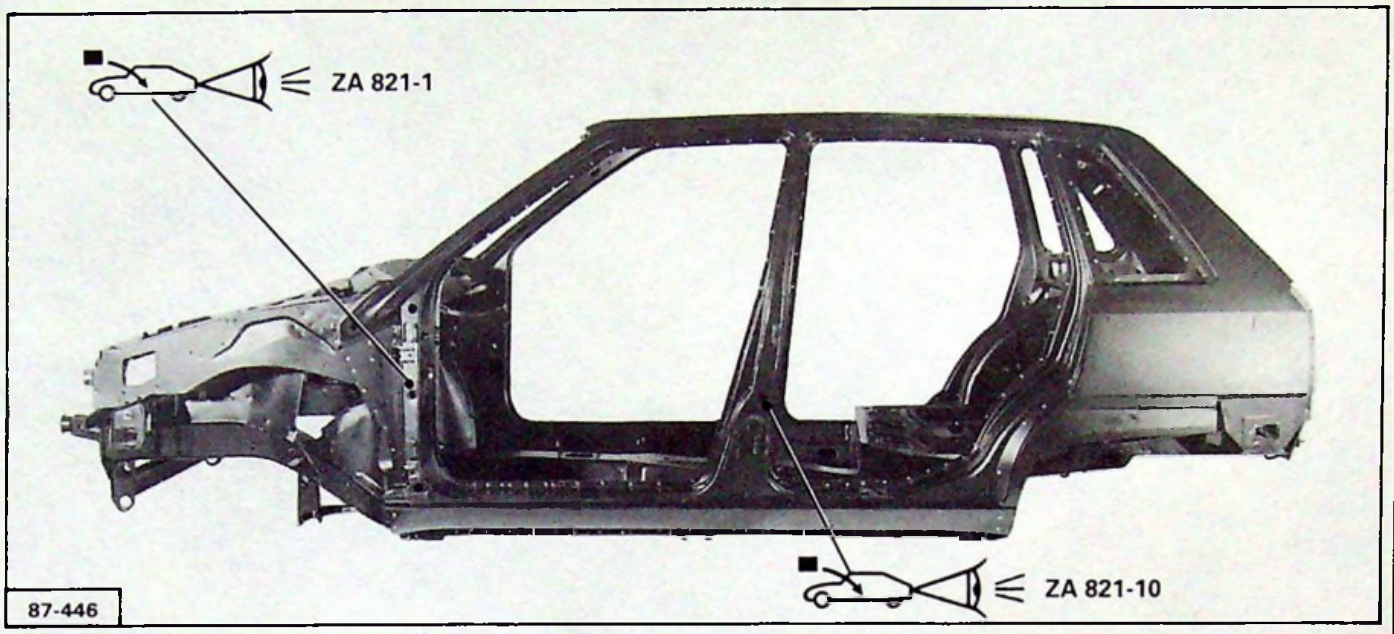
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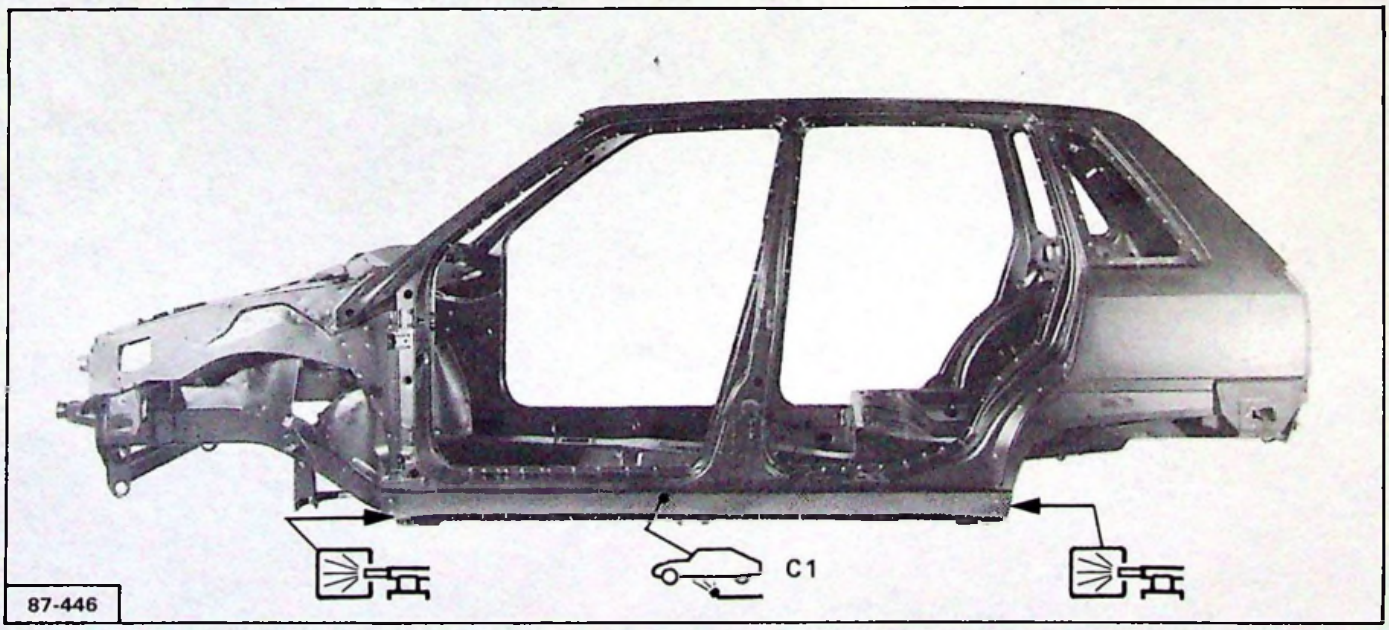
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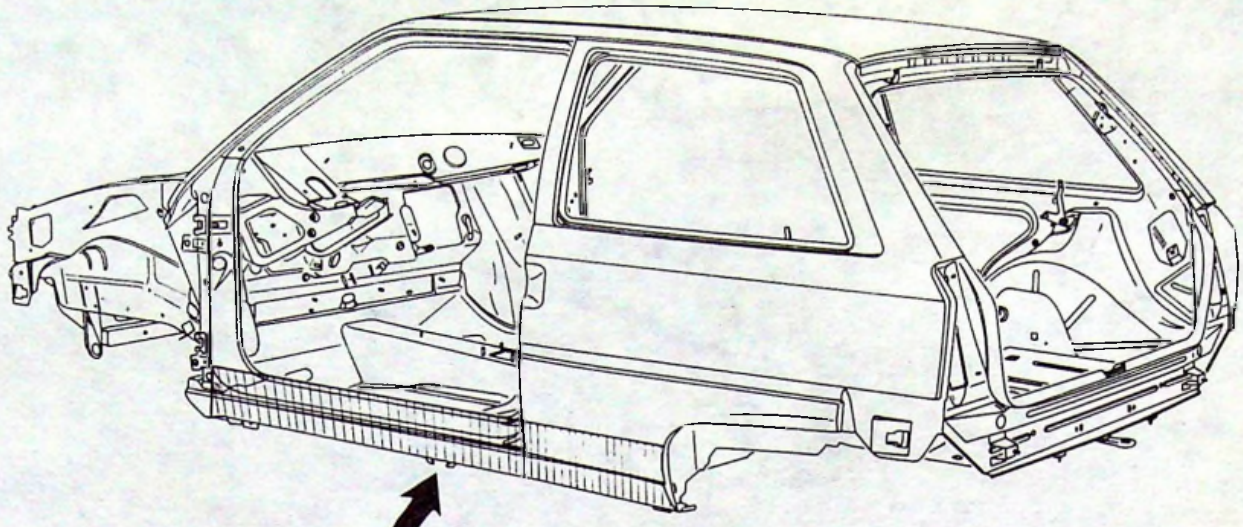
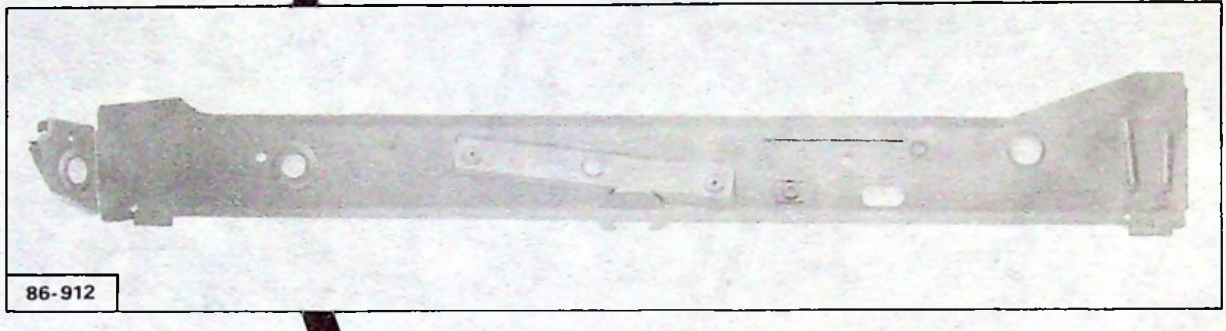


Z 80-1



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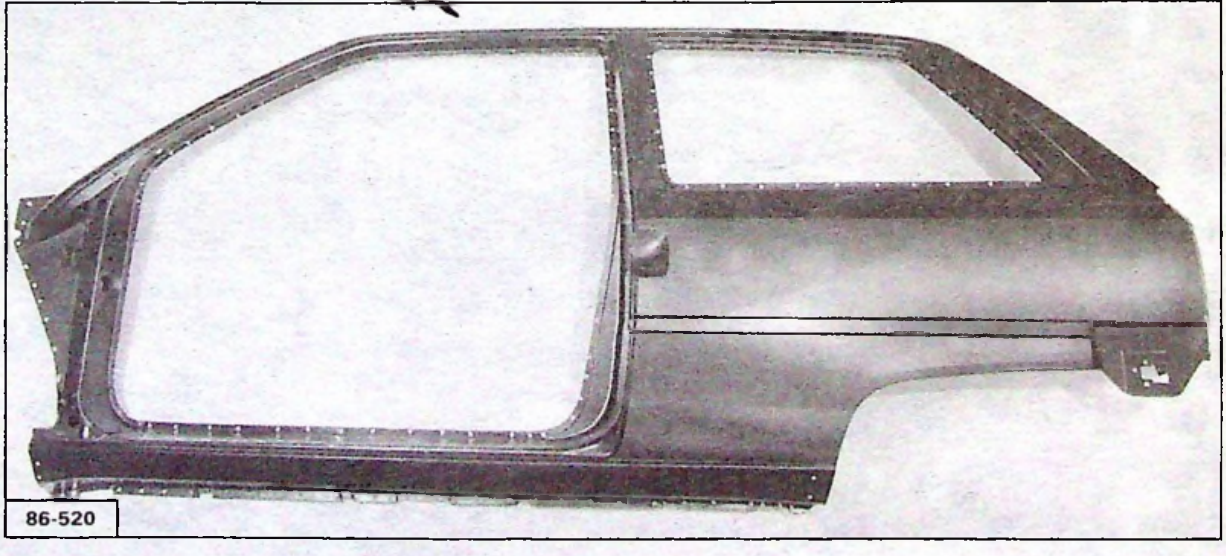

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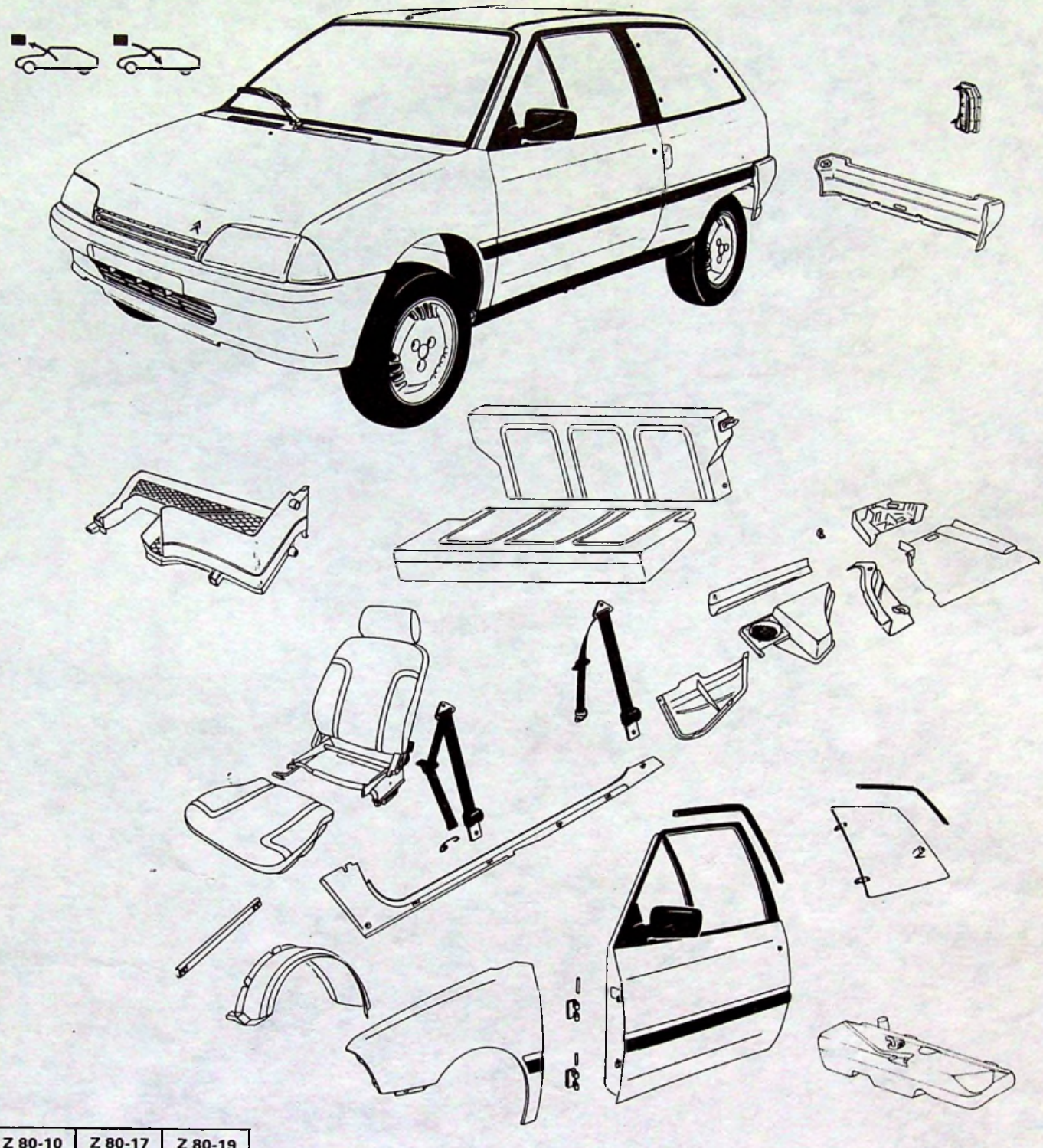
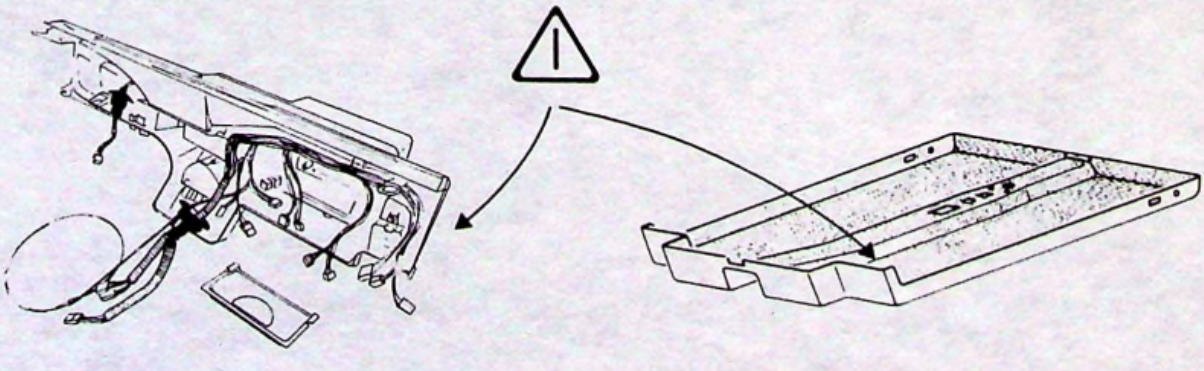
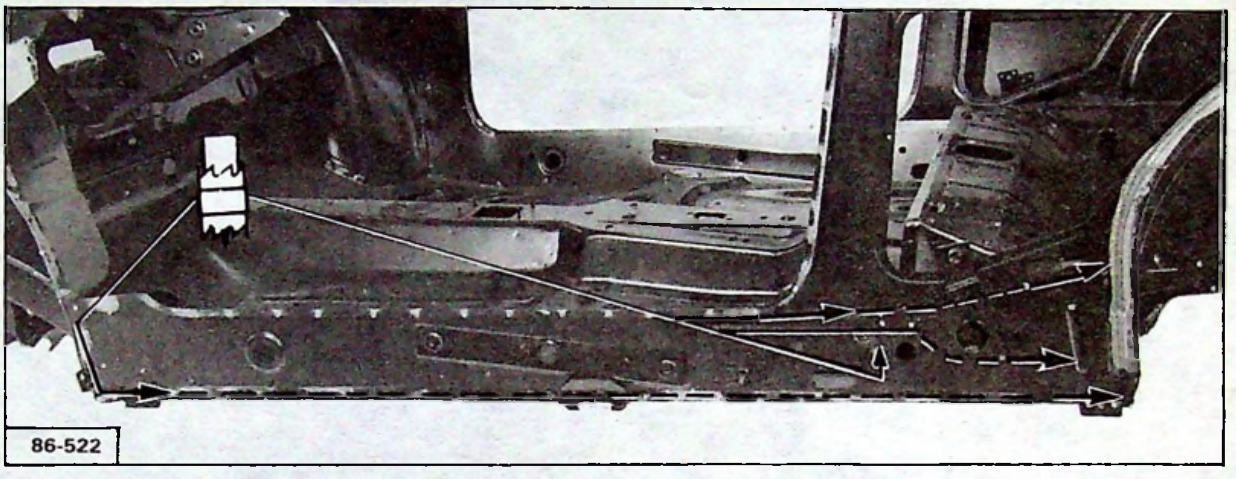


Z 80-10	Z 80-17	Z 80-19



Z 80-17

86-24
ZA 821-0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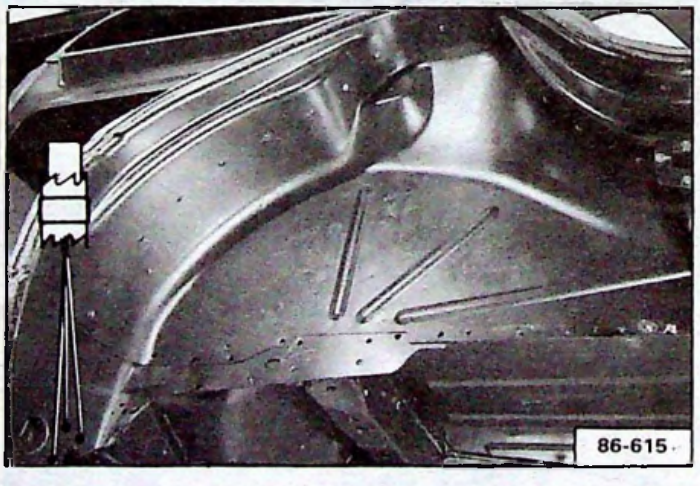
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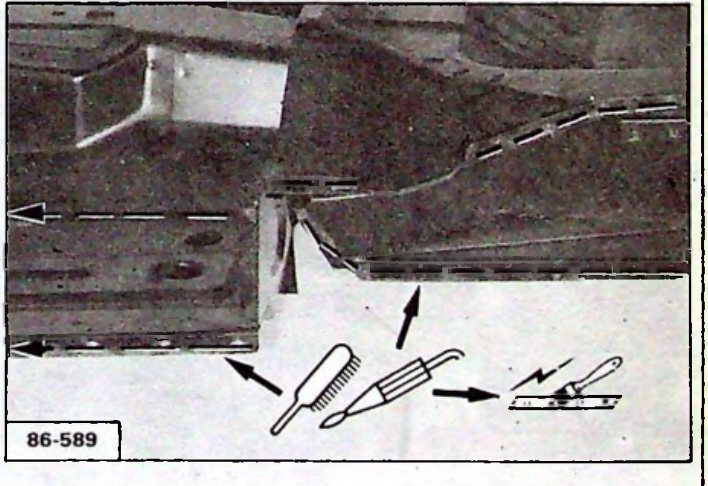
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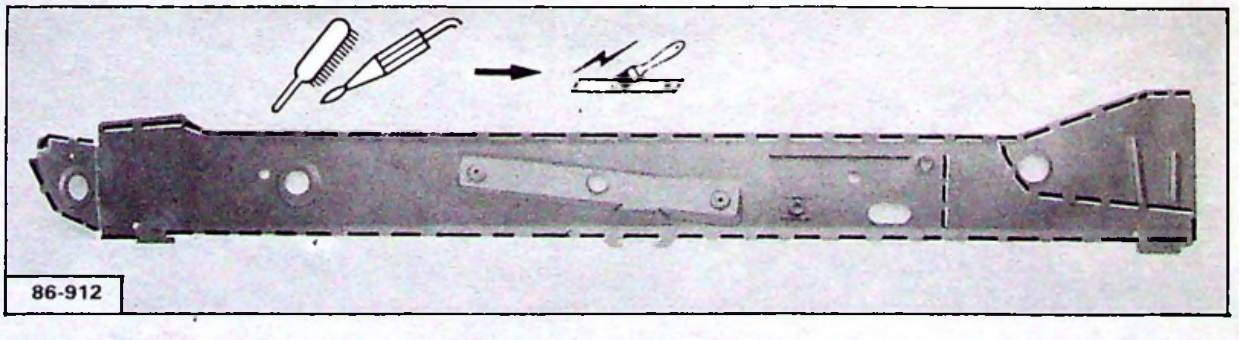
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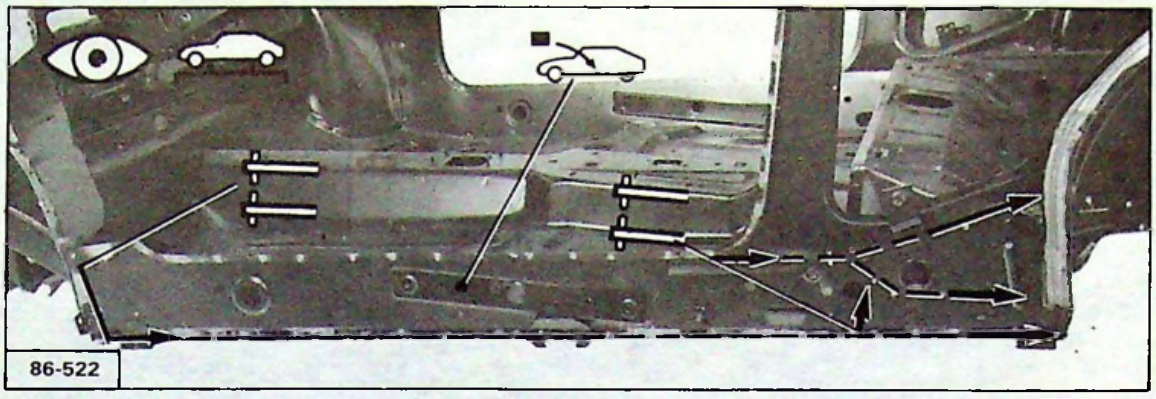
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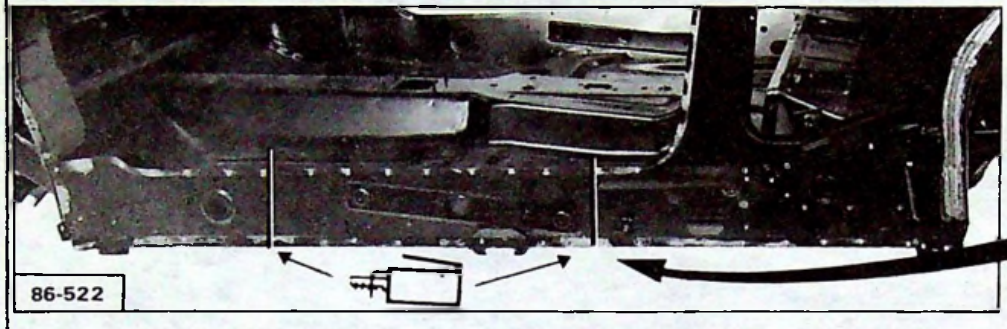
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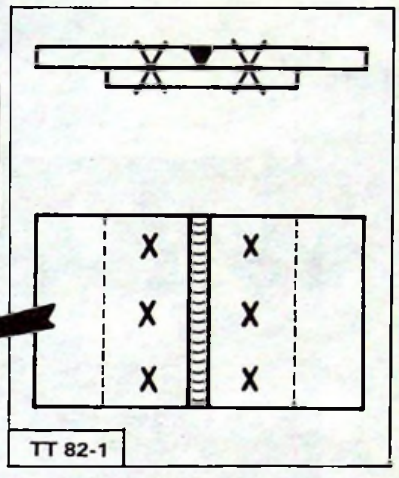
X X
X X
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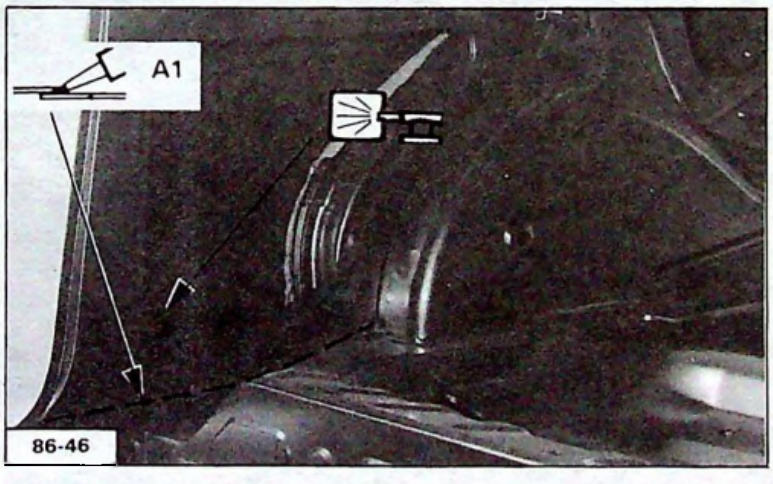
TT 82-1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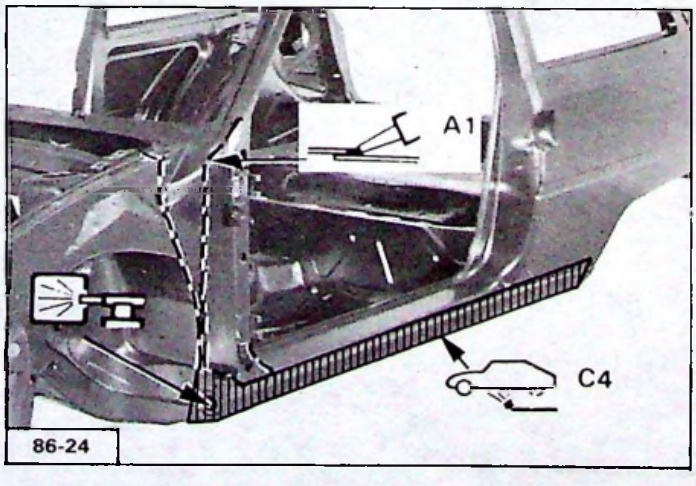
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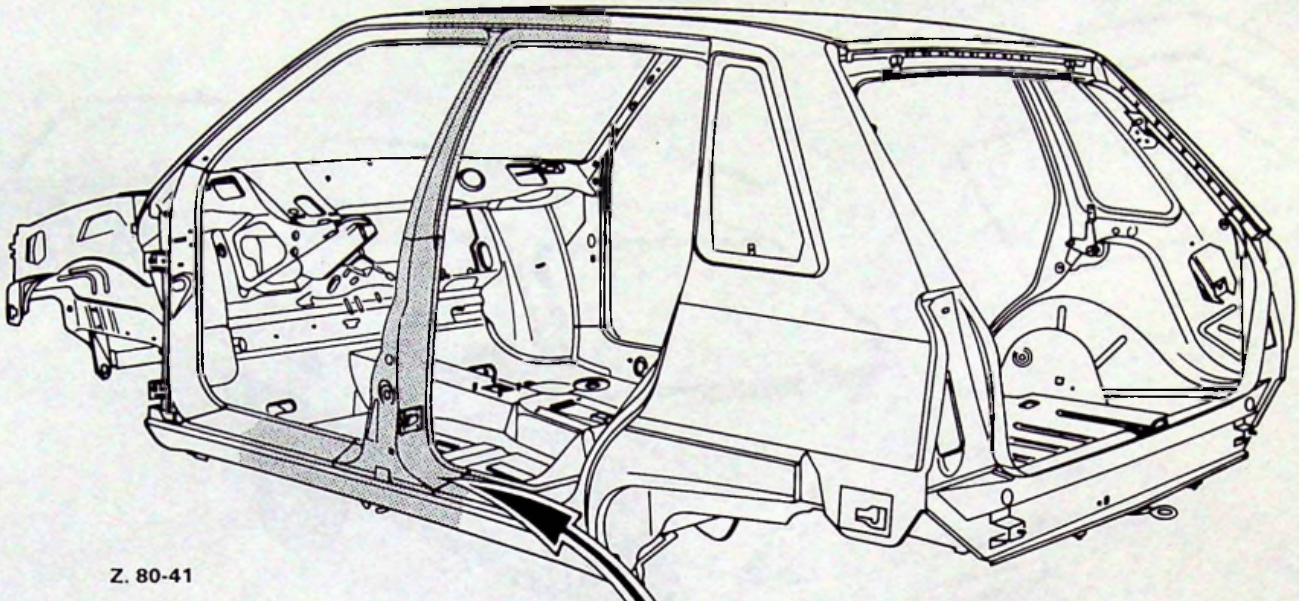
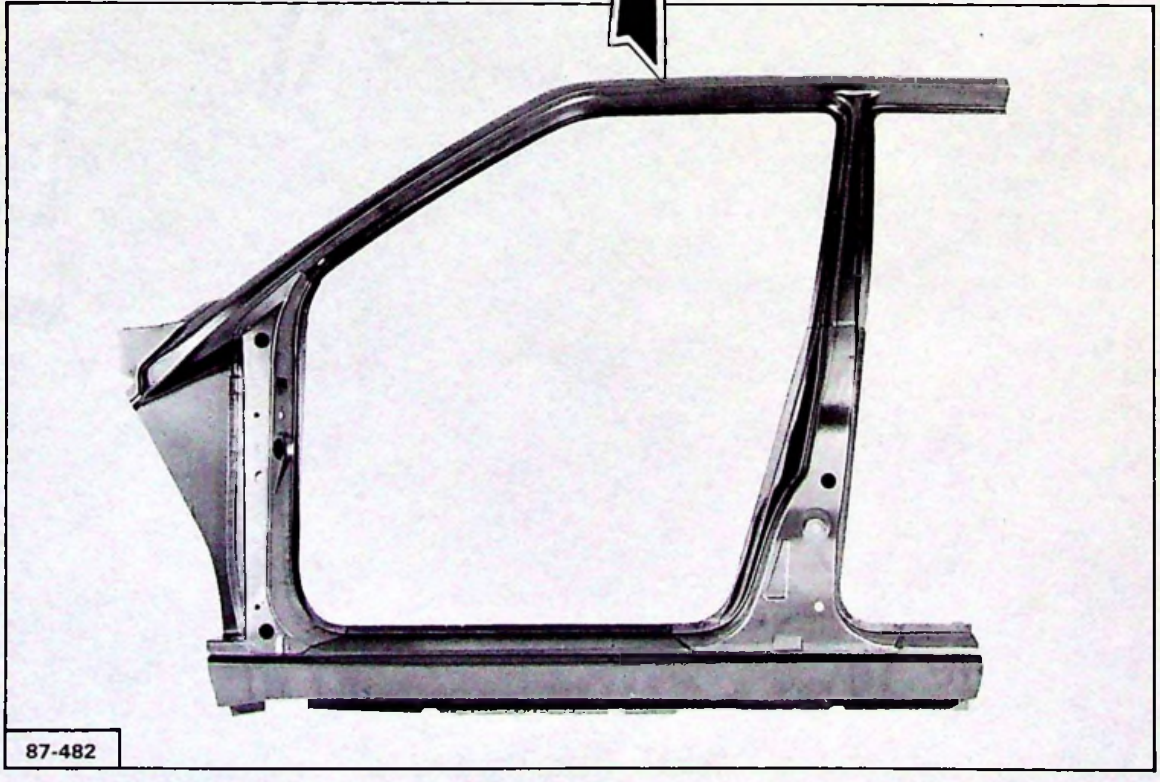
C4
86-24



Z. 80-41



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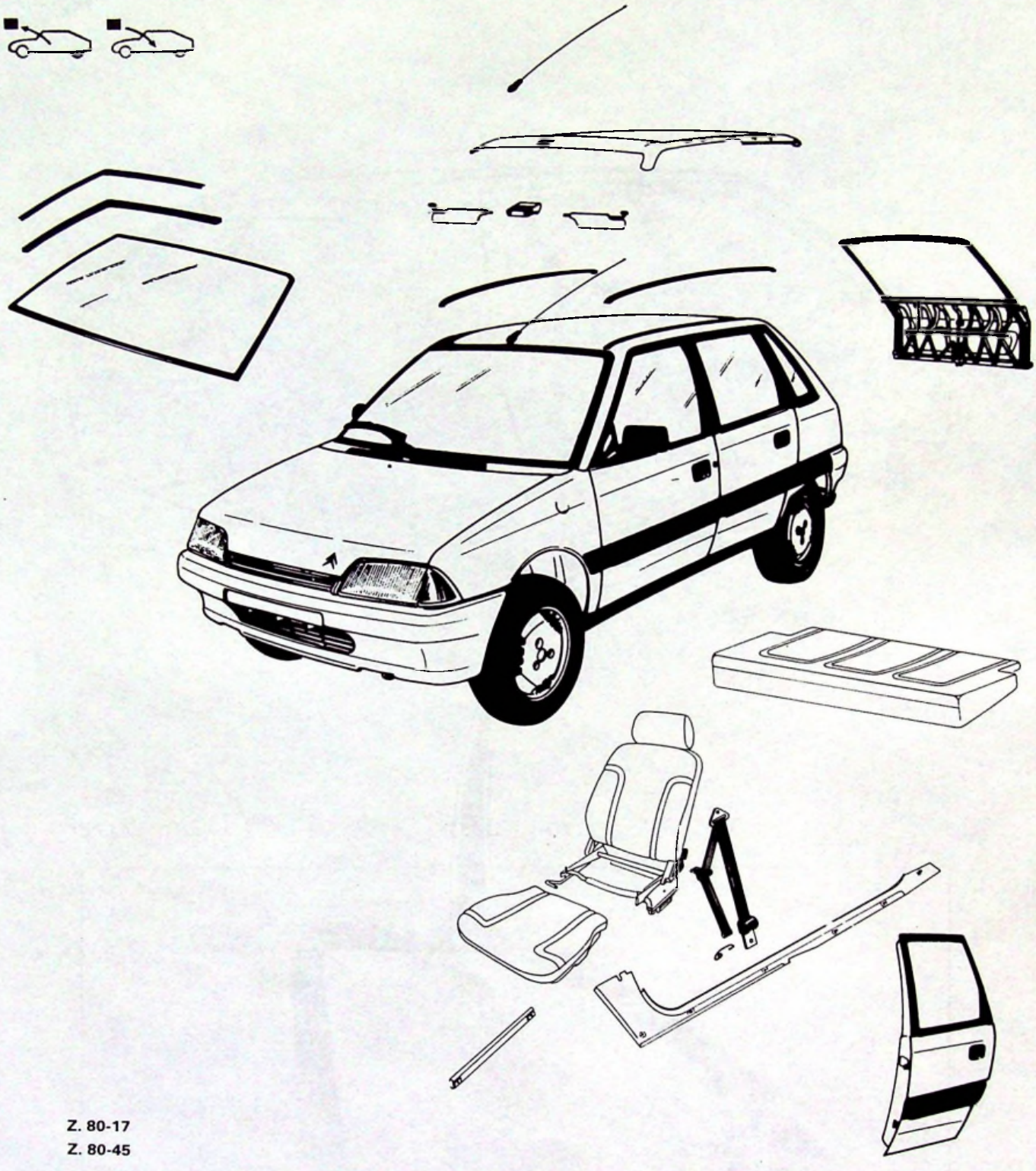
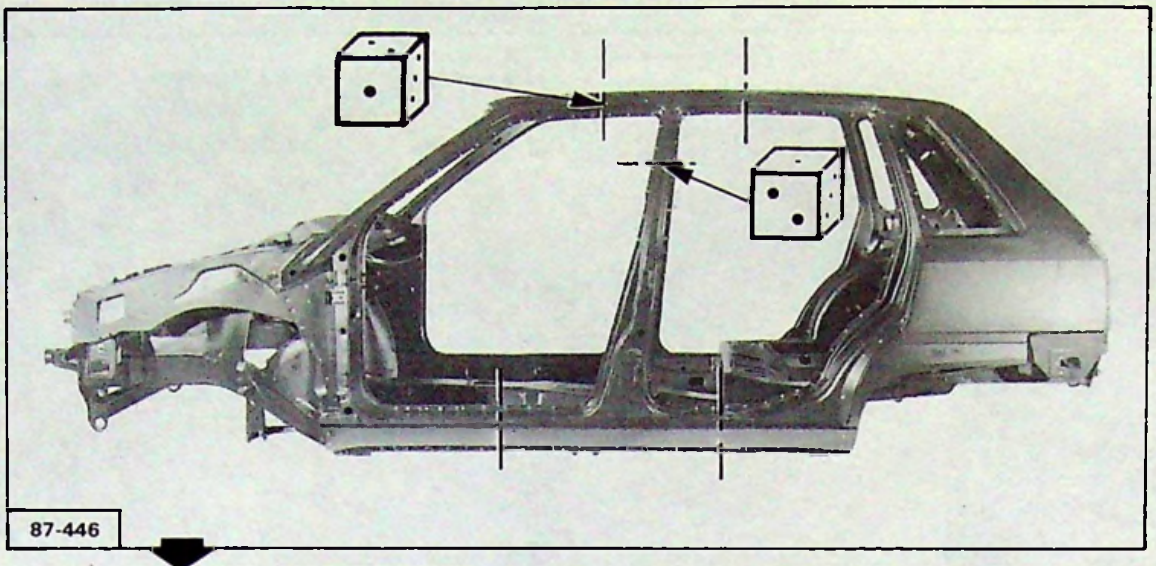


Z. 80-17
Z. 80-45



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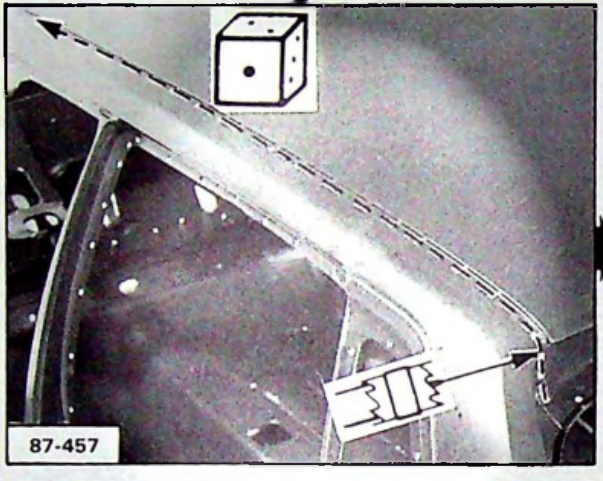

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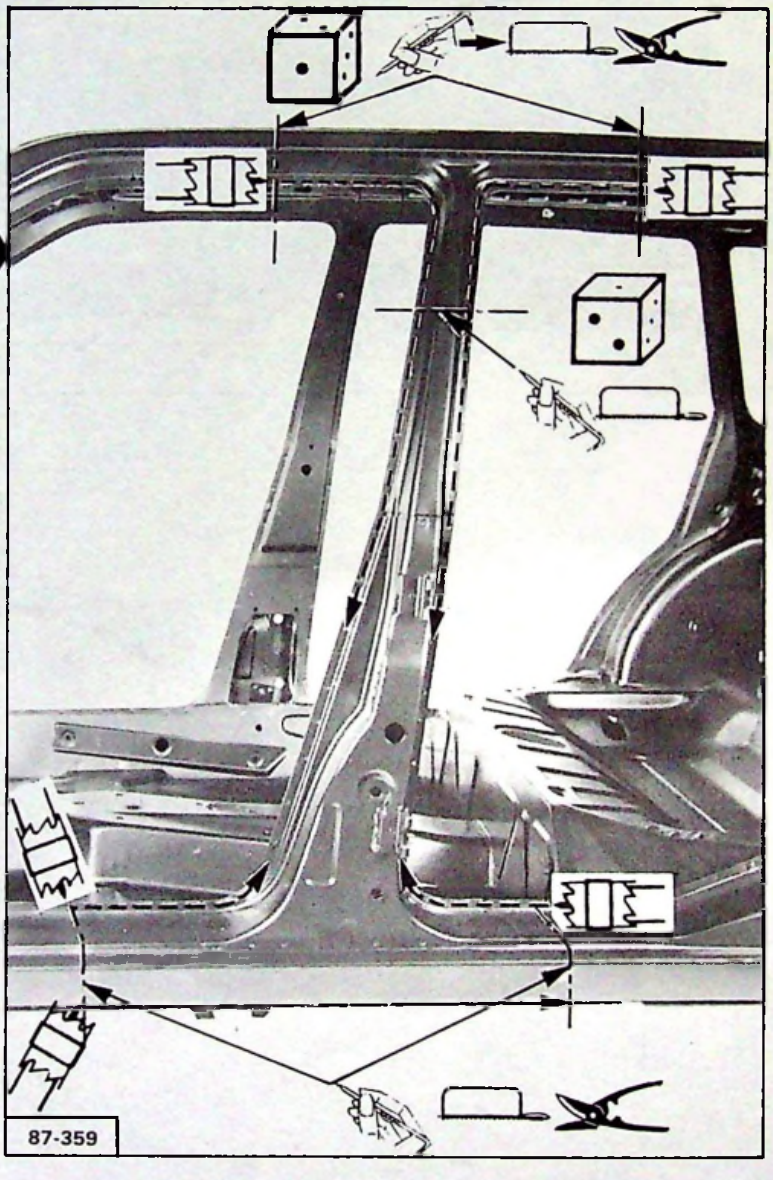

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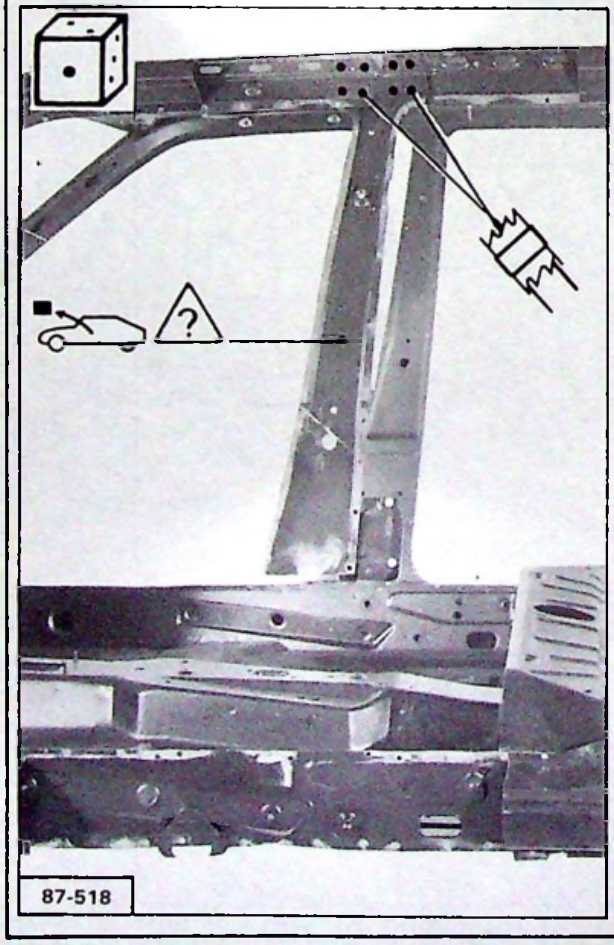

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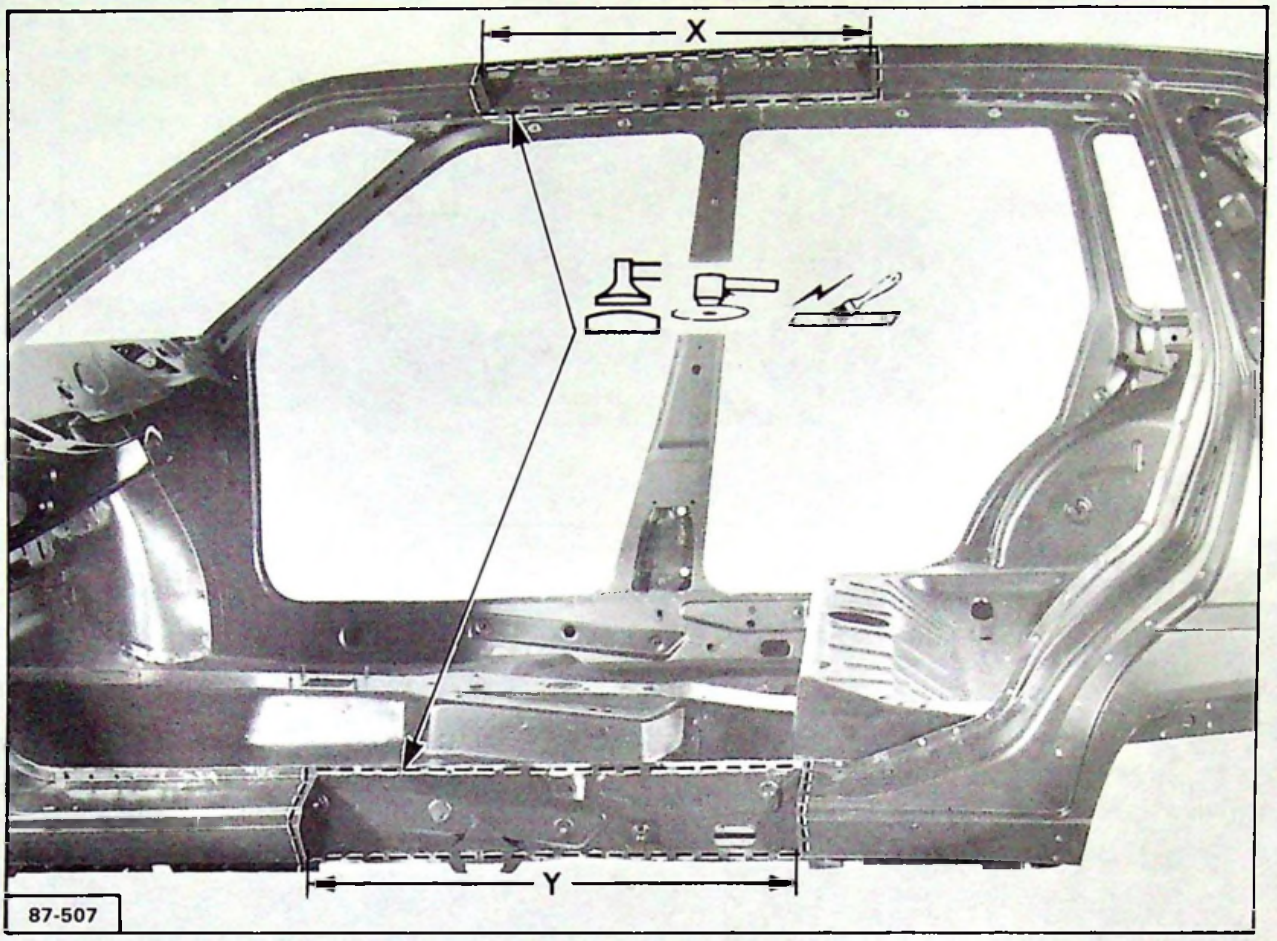
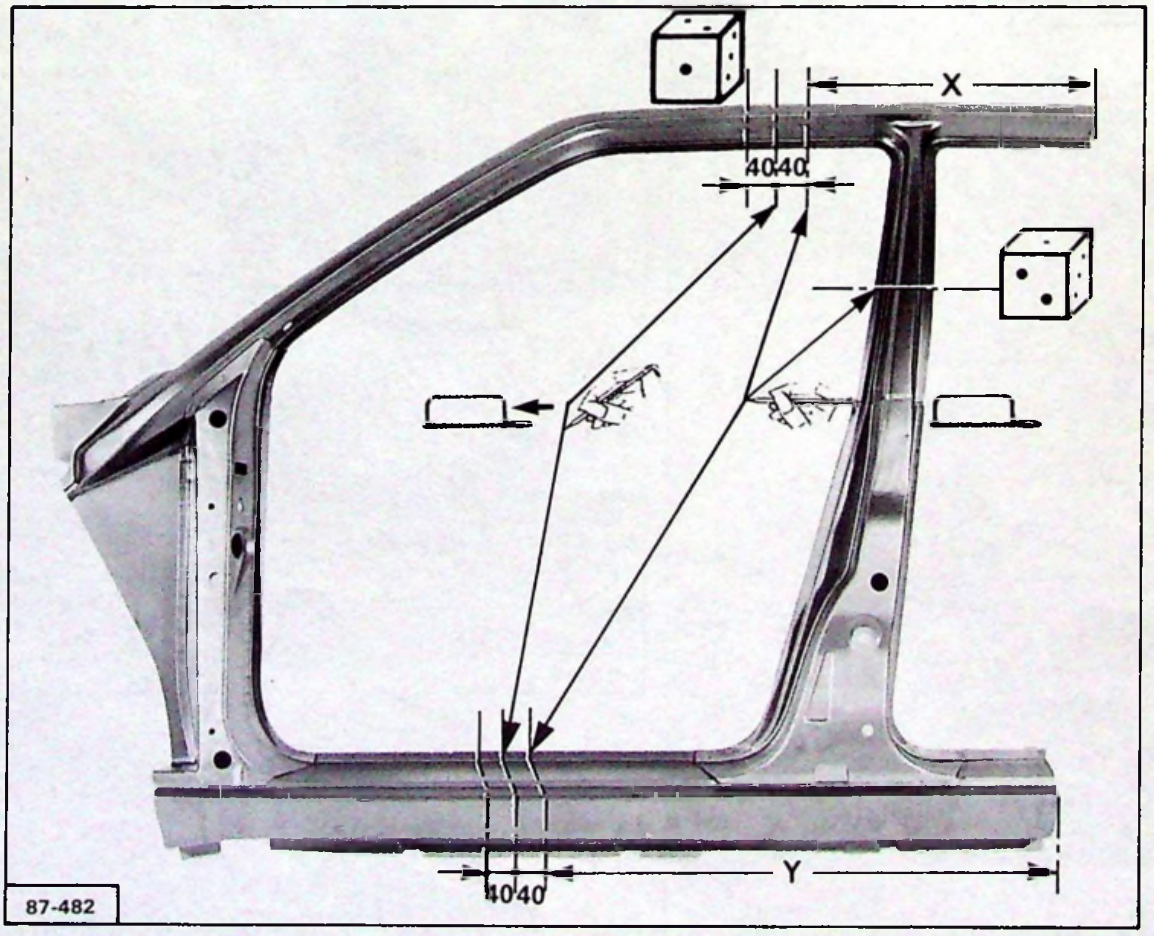

X
Y
87-507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Y
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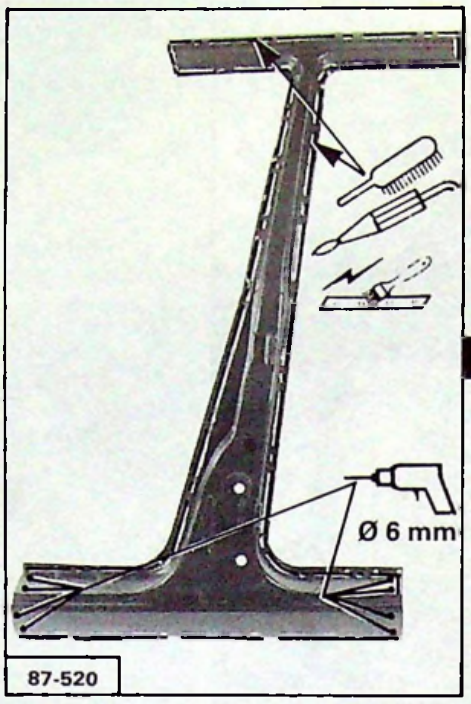
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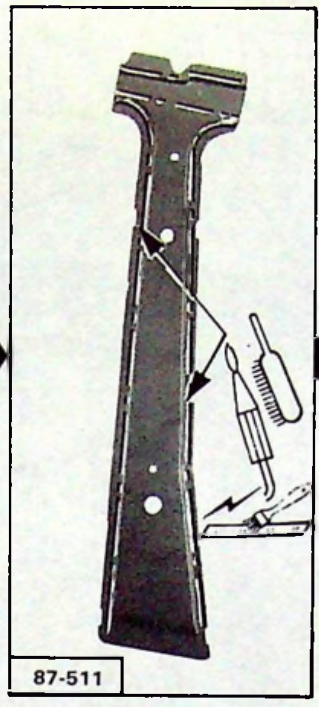
87-520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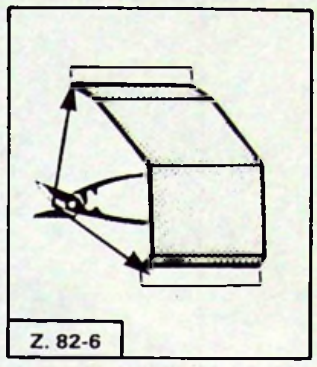
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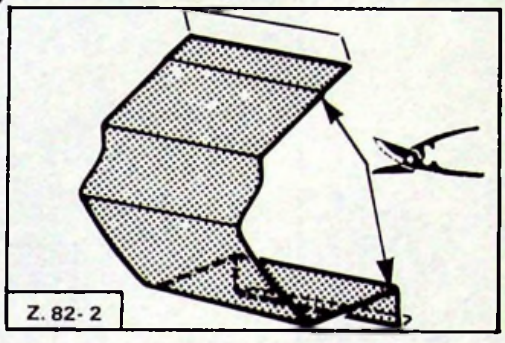
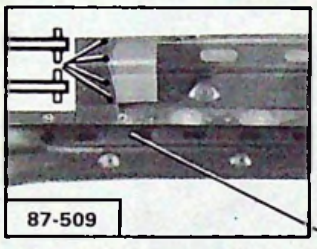

Z. 82- 2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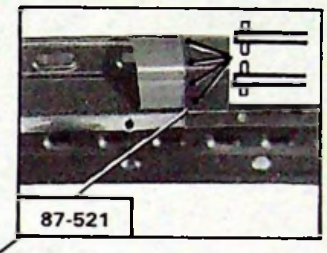
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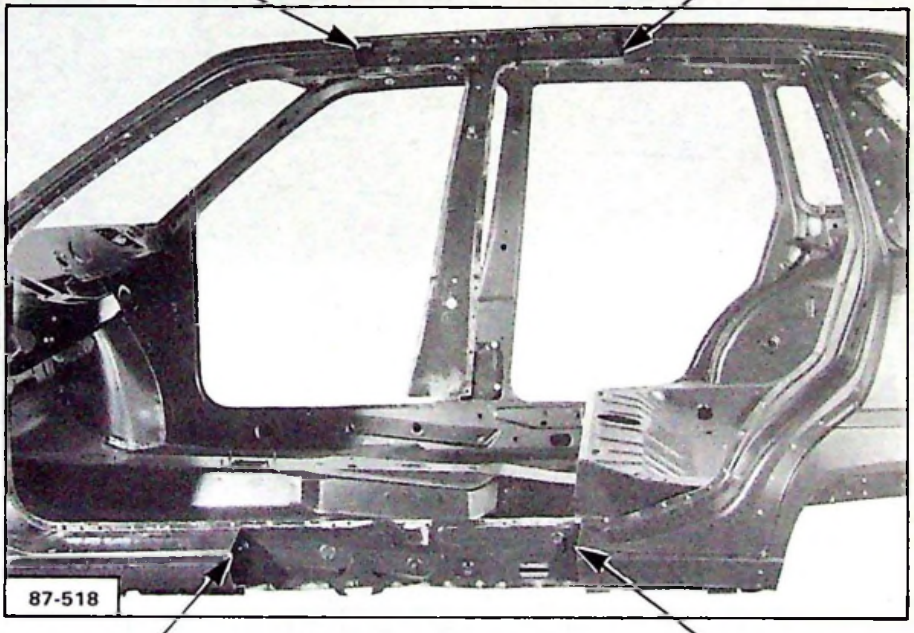
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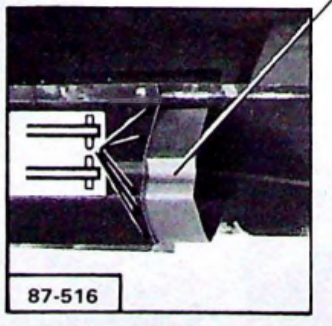
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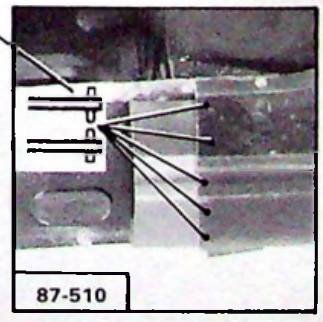
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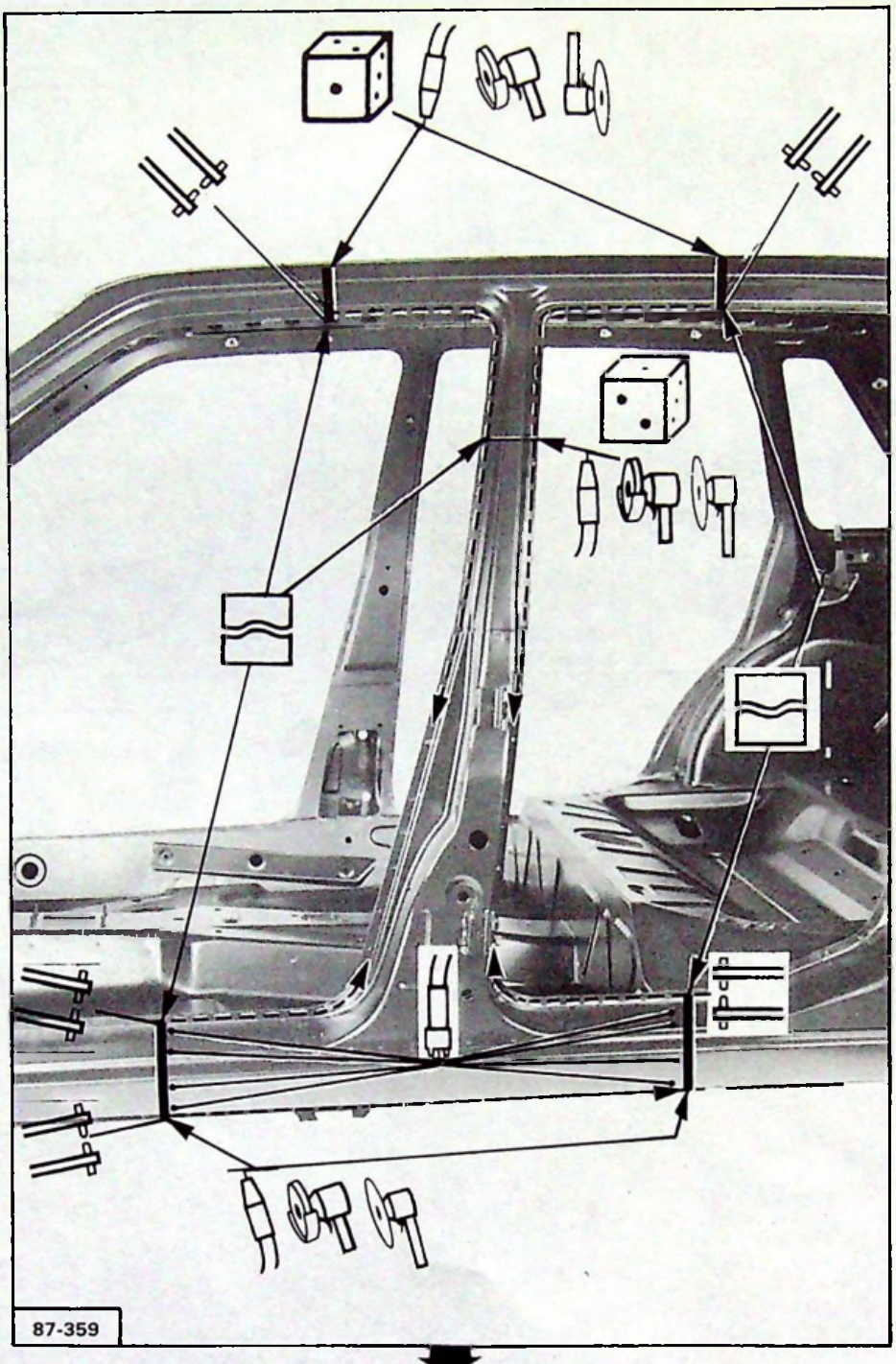
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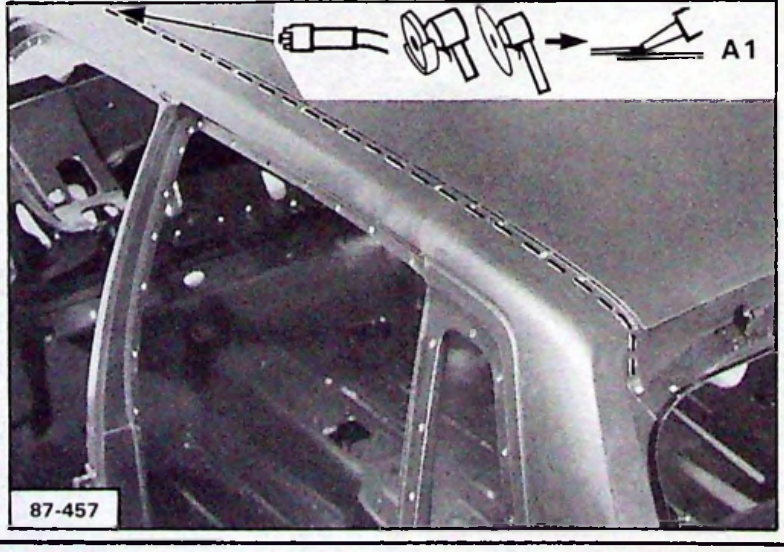
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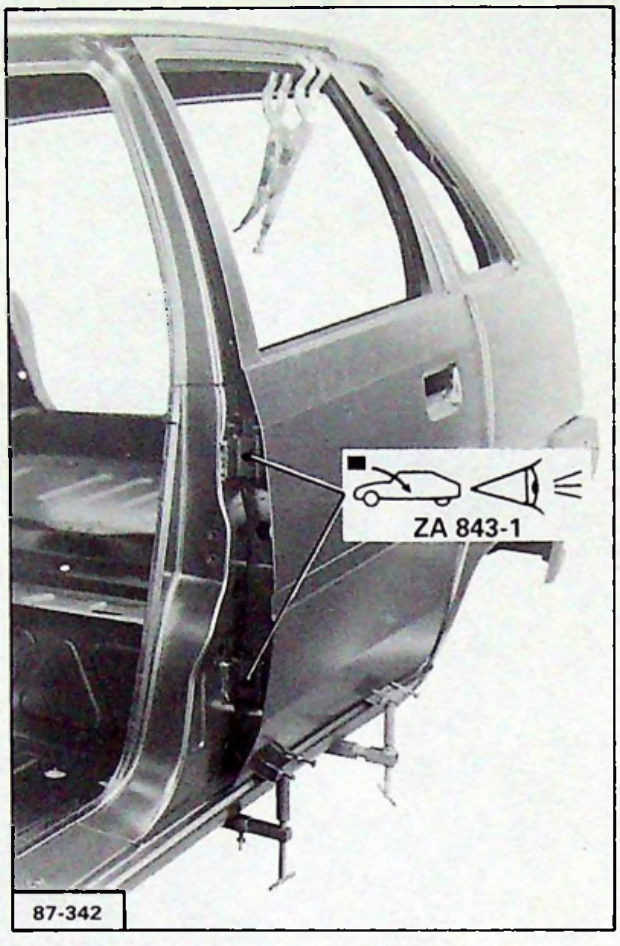
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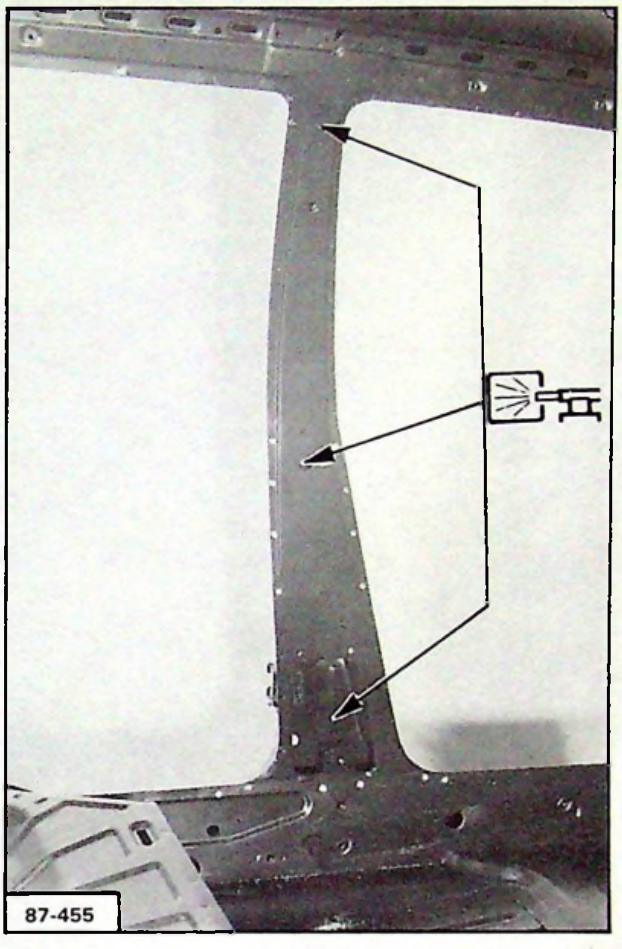
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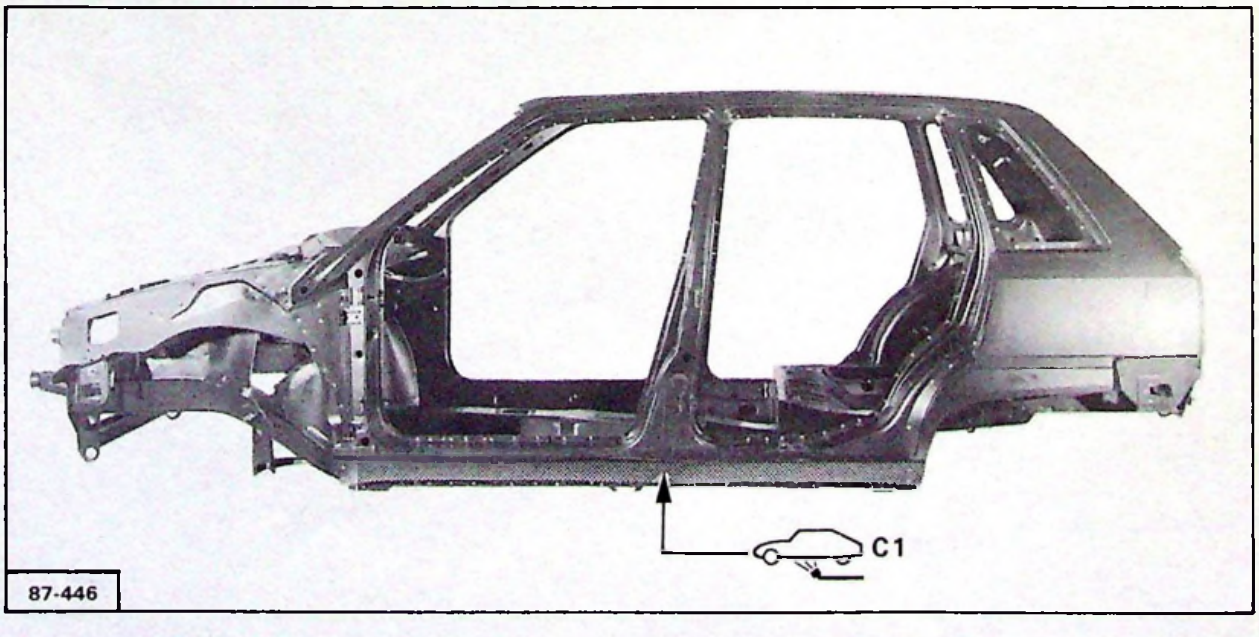
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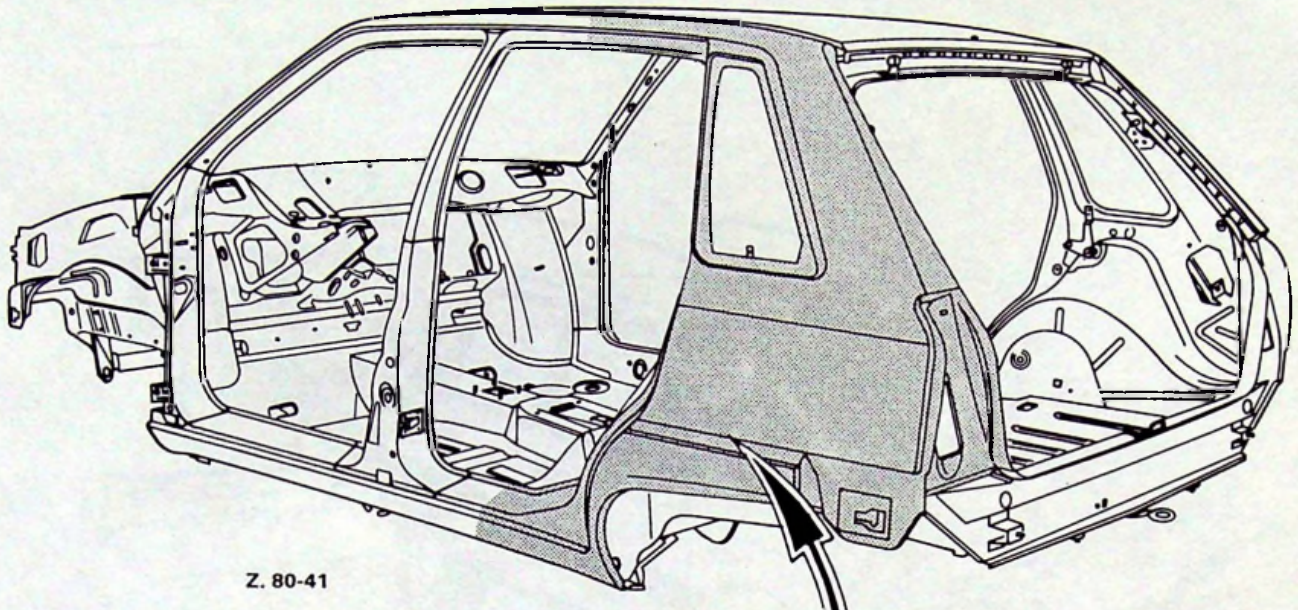
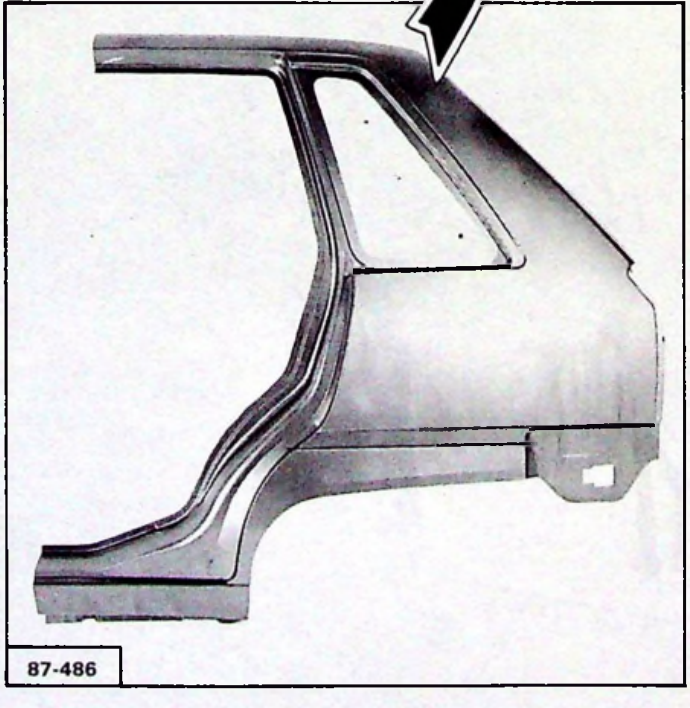
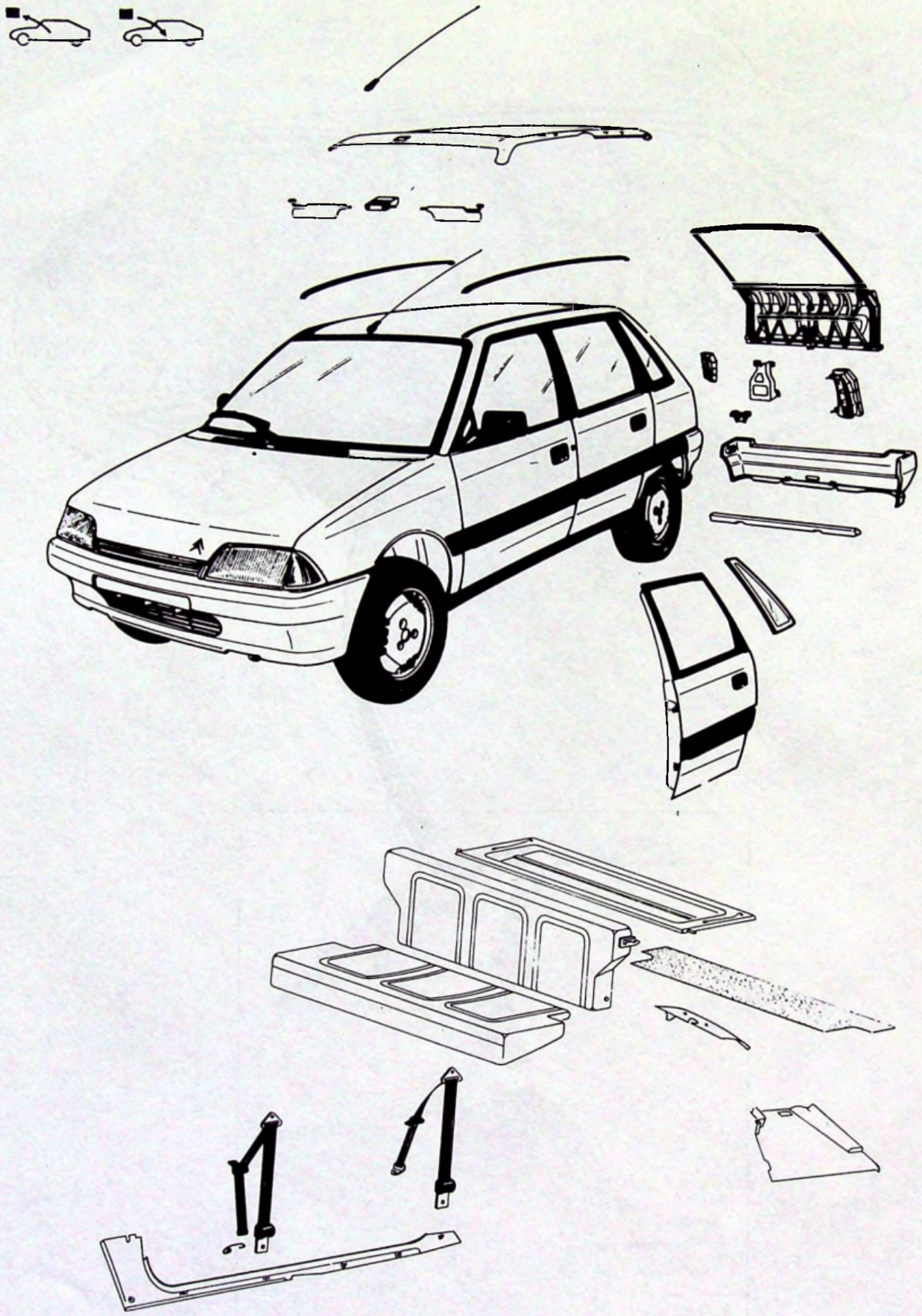


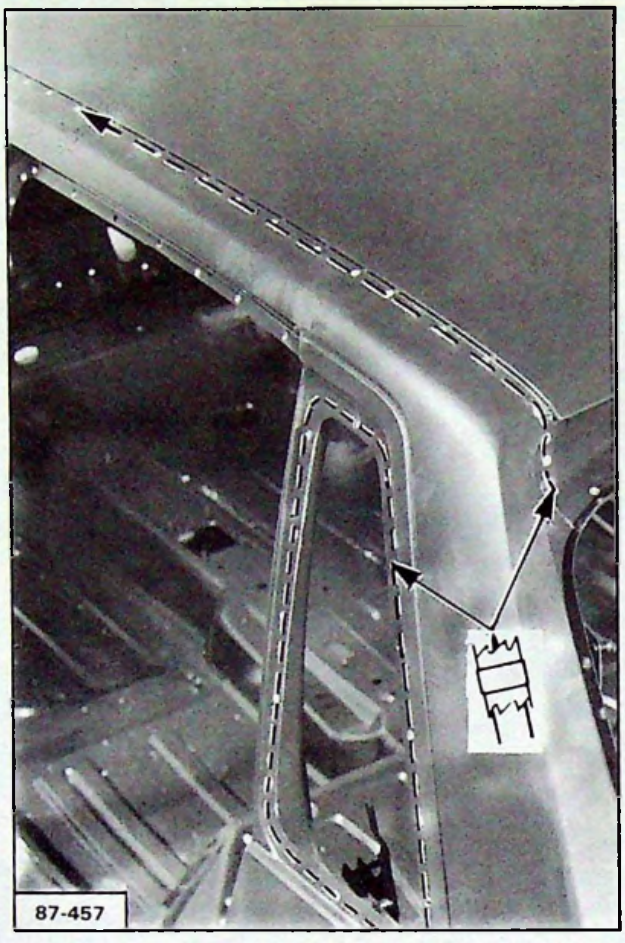
Z. 80-41



87-486

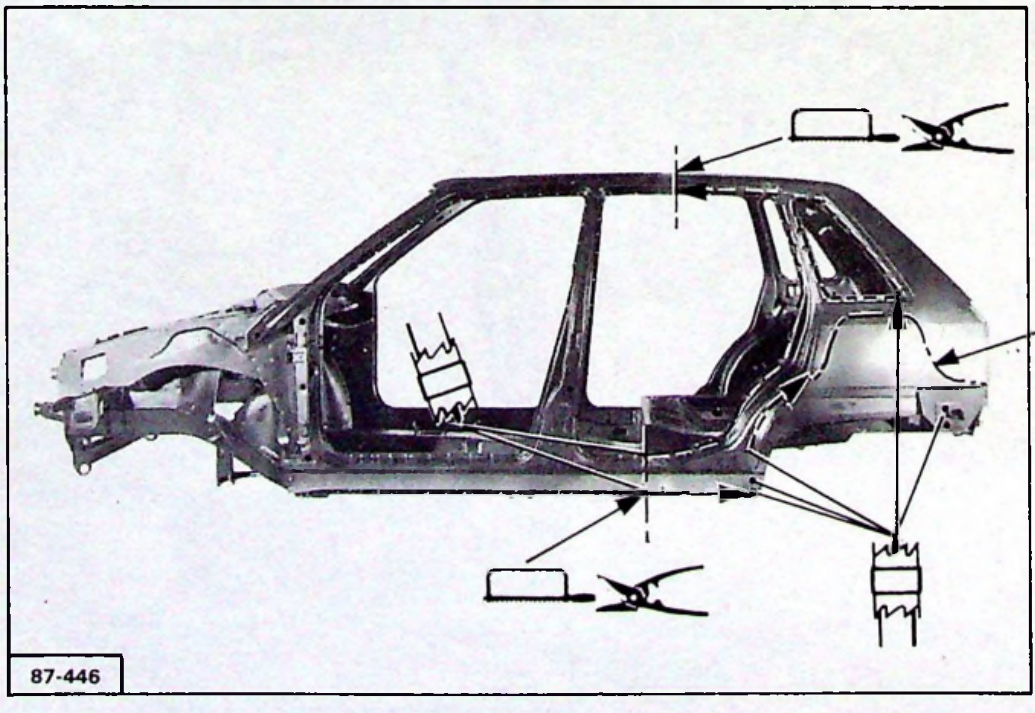


Z. 80-17
Z. 80-45



87-457

87-456



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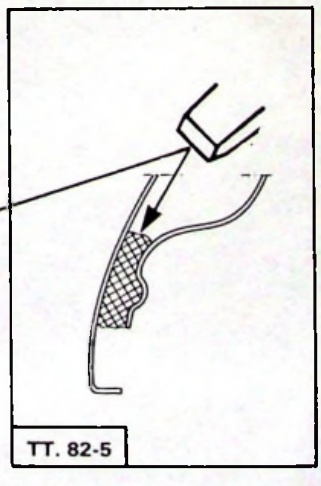
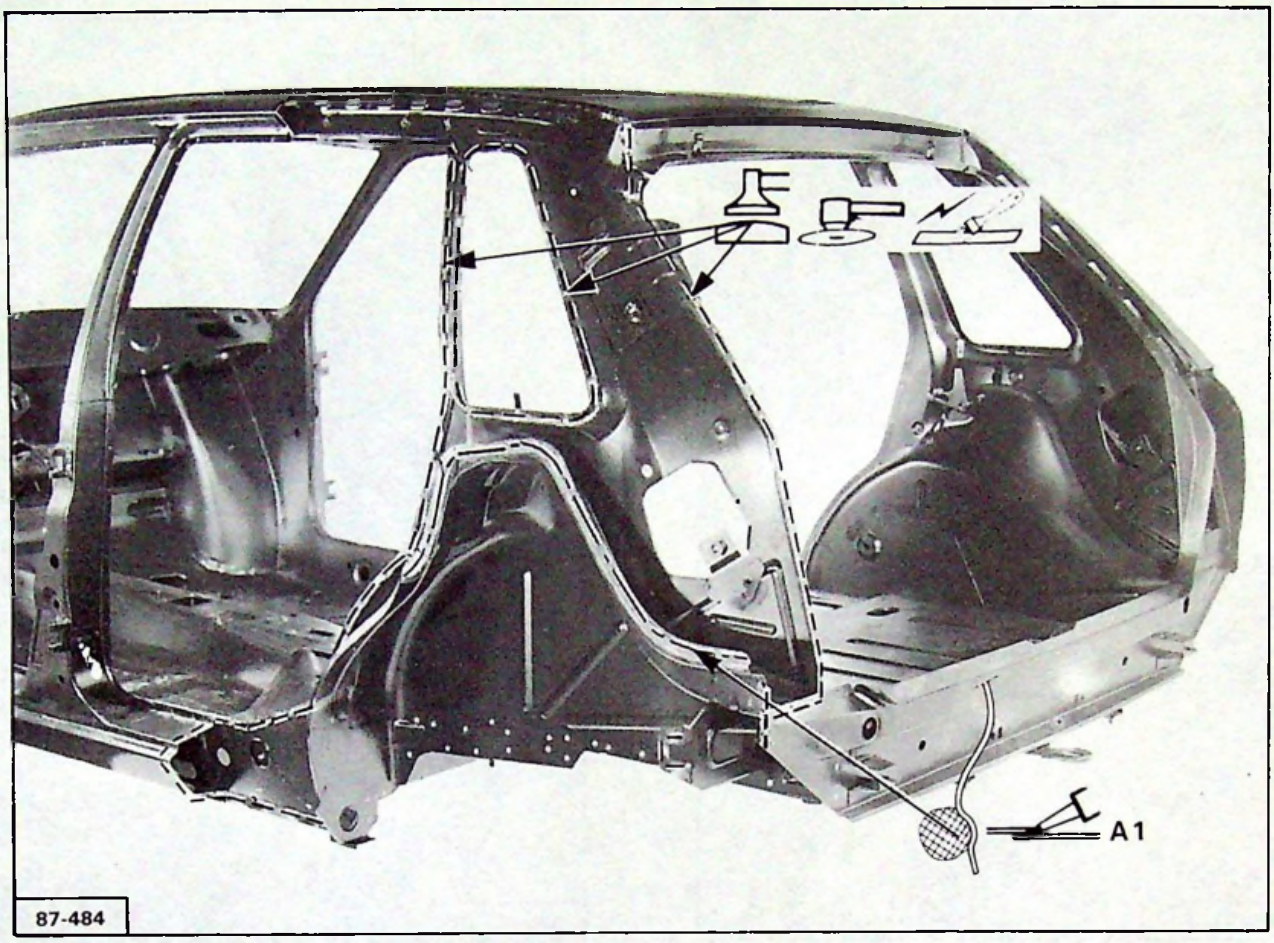


TT. 82-5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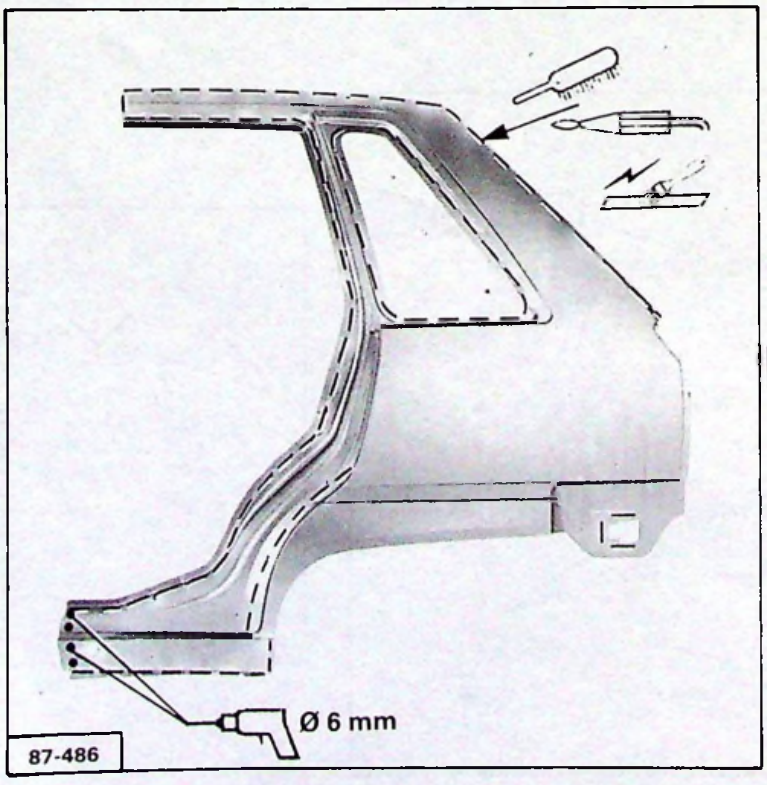
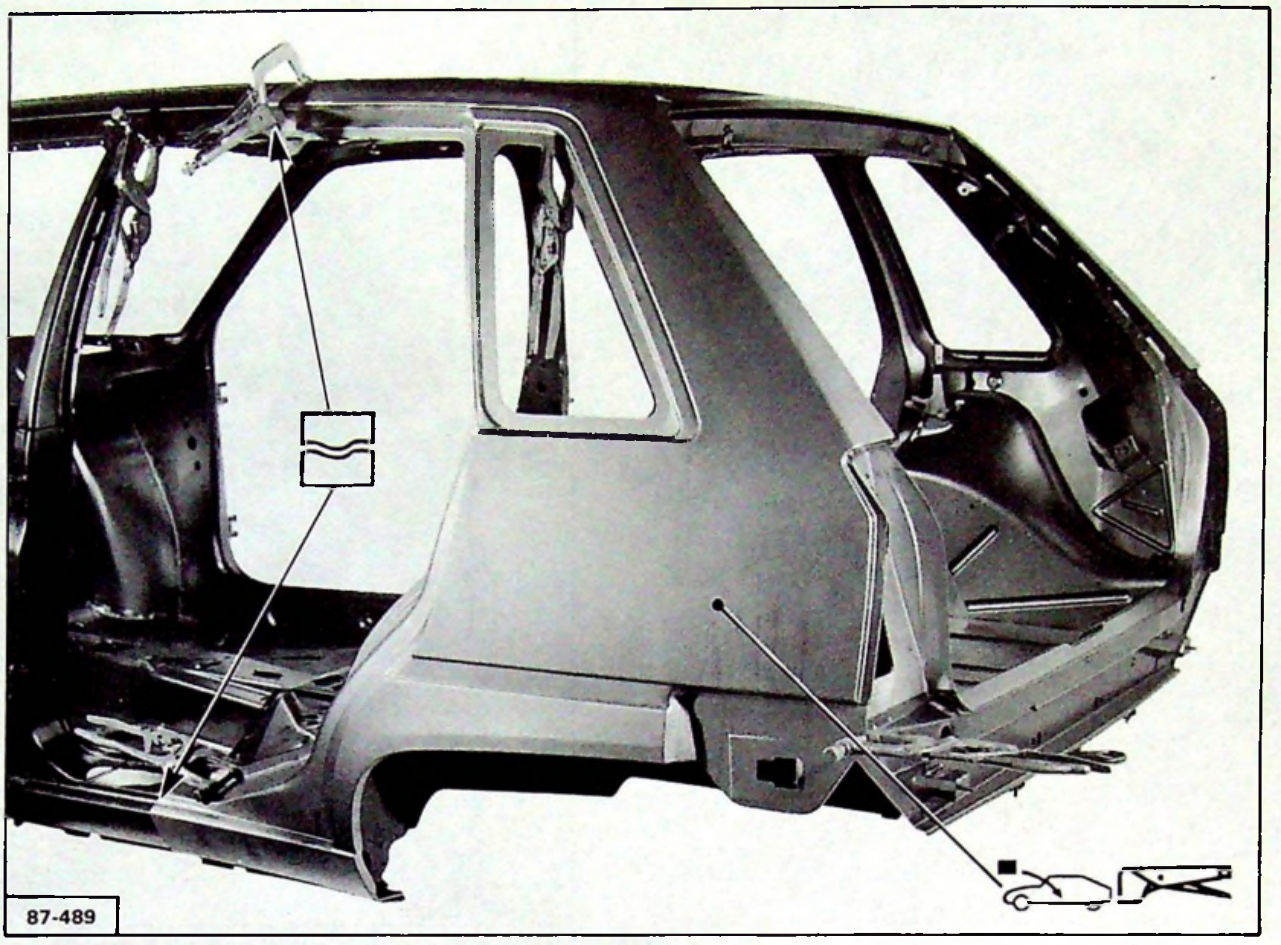
87-484


Ø 6 mm
87-486

87-517



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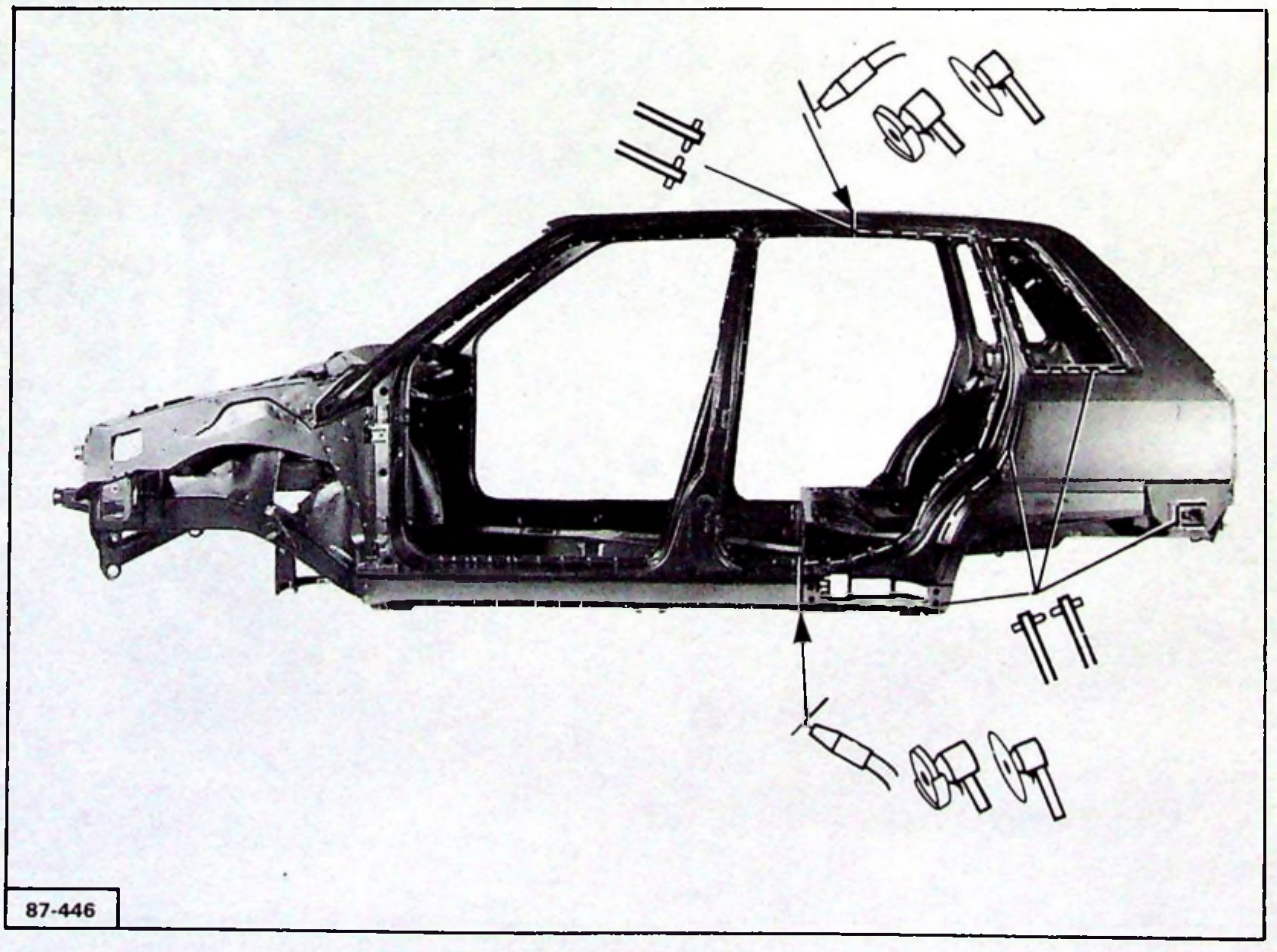

87-446

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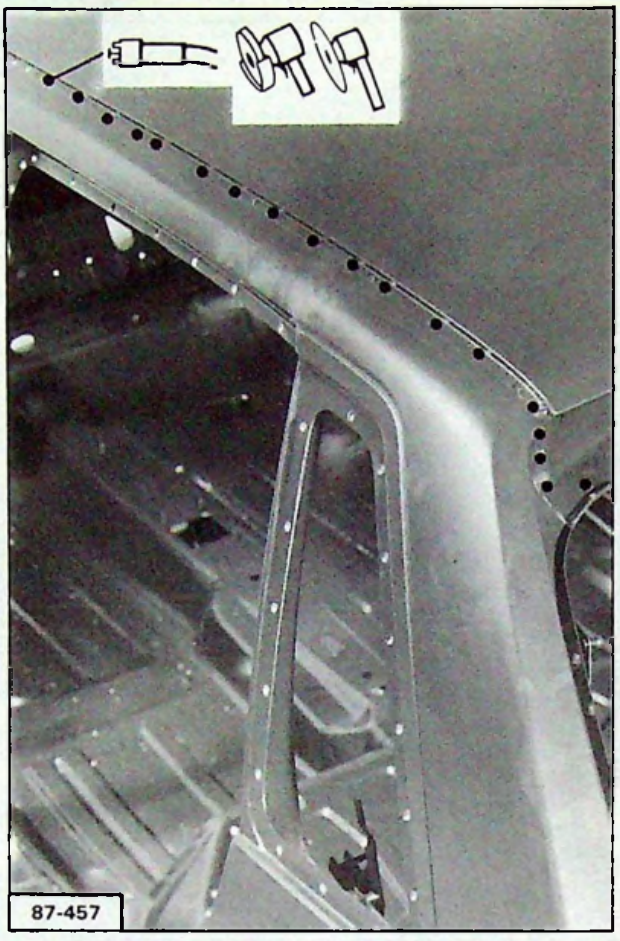
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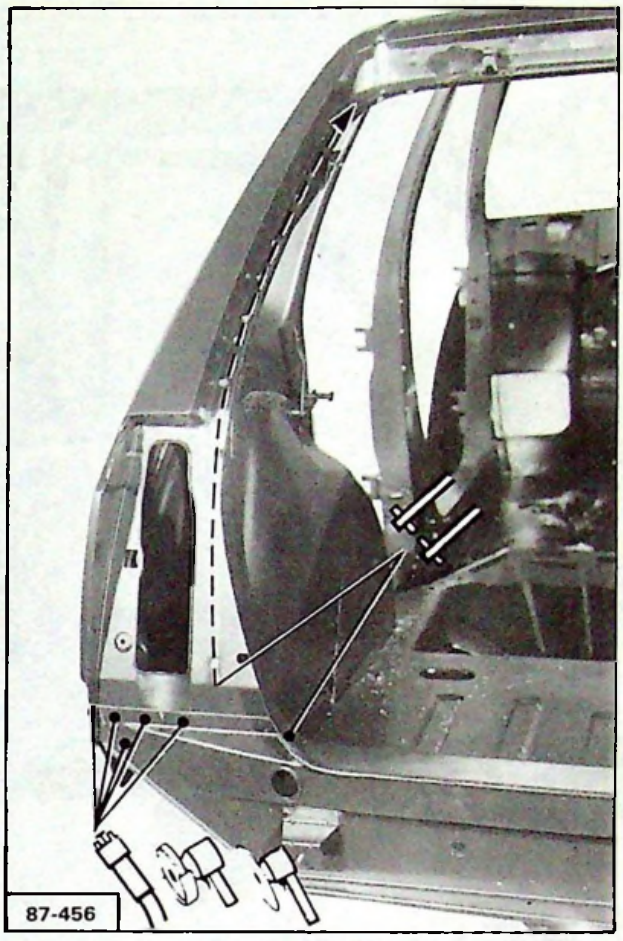
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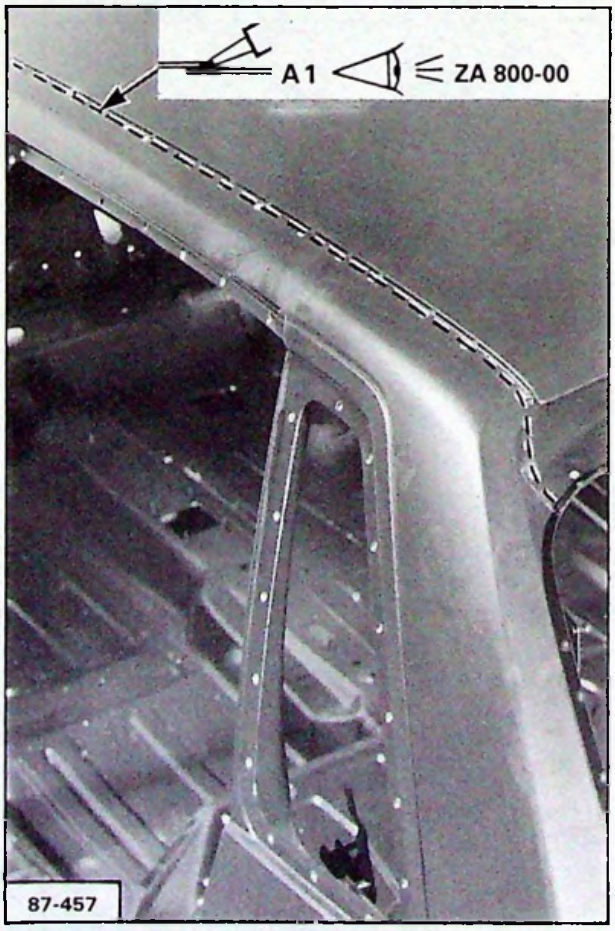
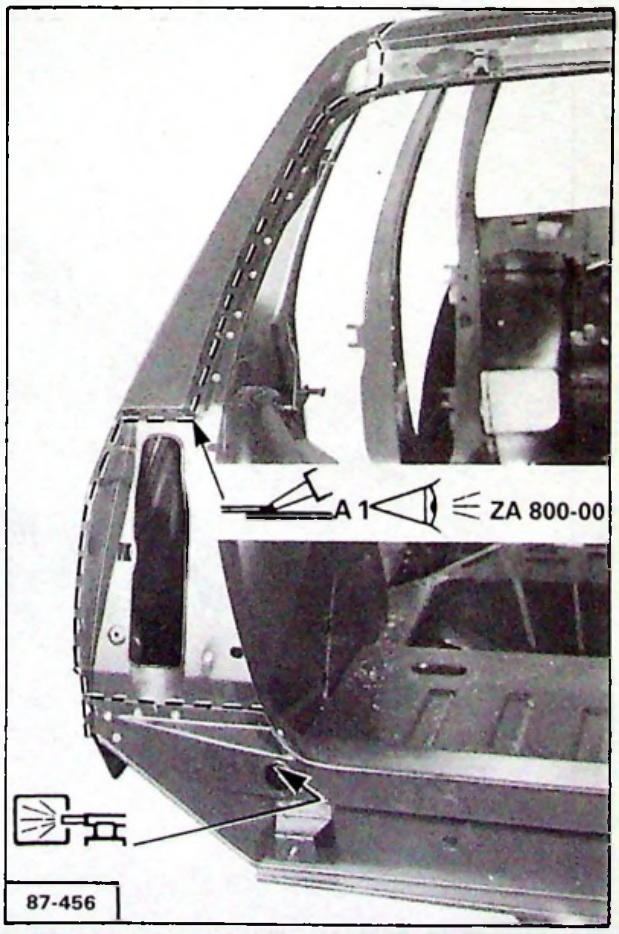

A 1
ZA 800-00
87-457


A 1
ZA 800-00
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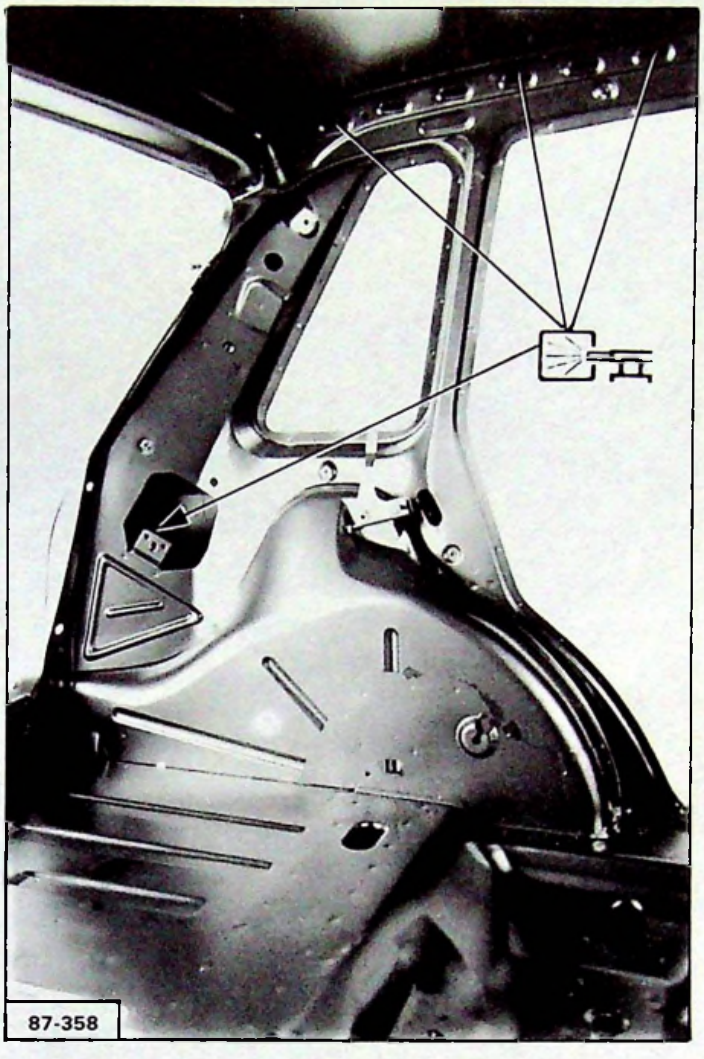

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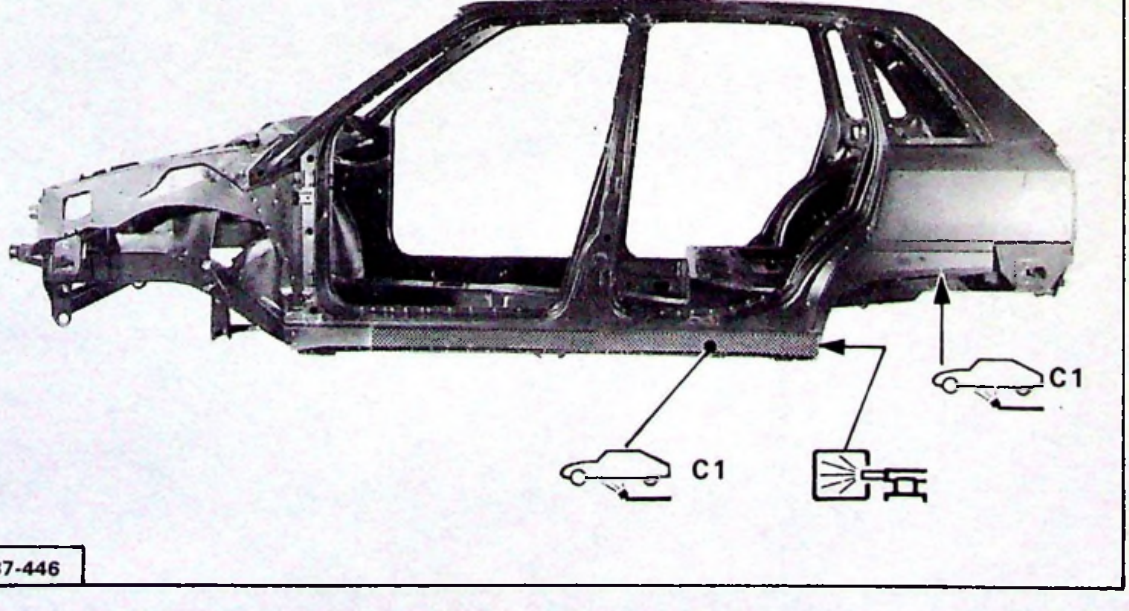
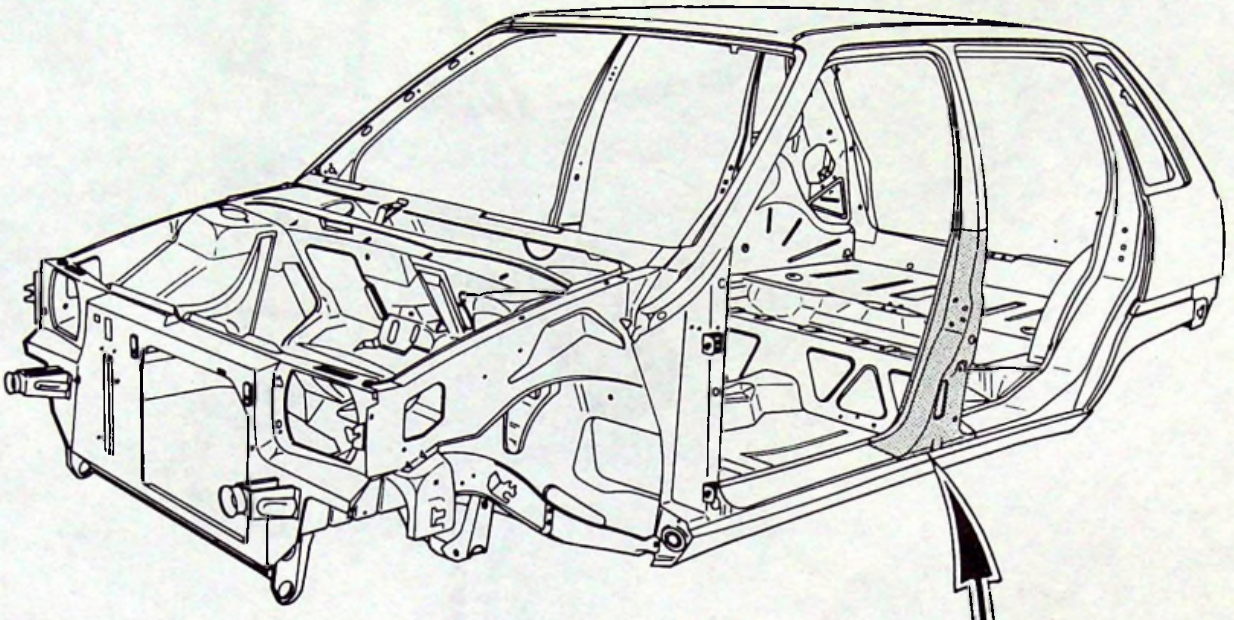
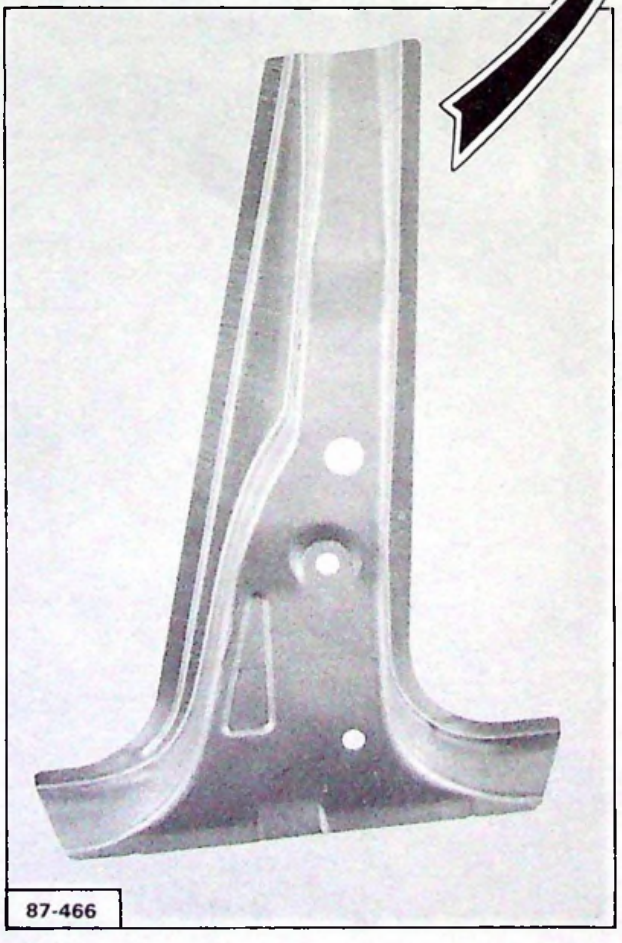


87-446



Z. 80-40



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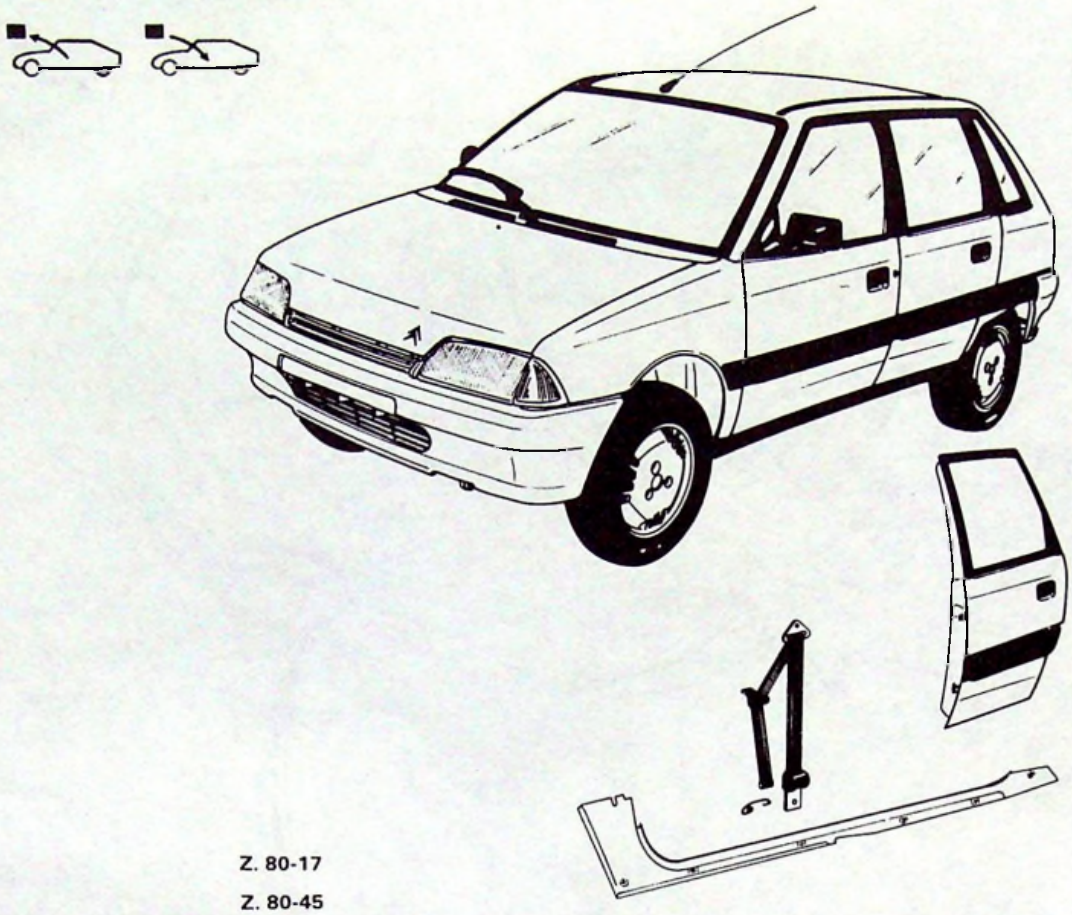
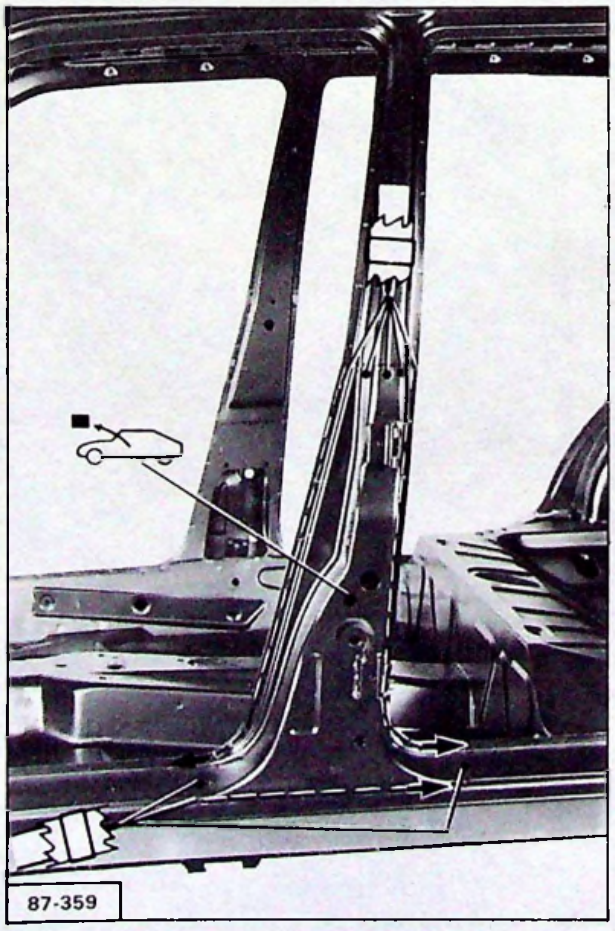


Z. 80-17

Z. 80-45



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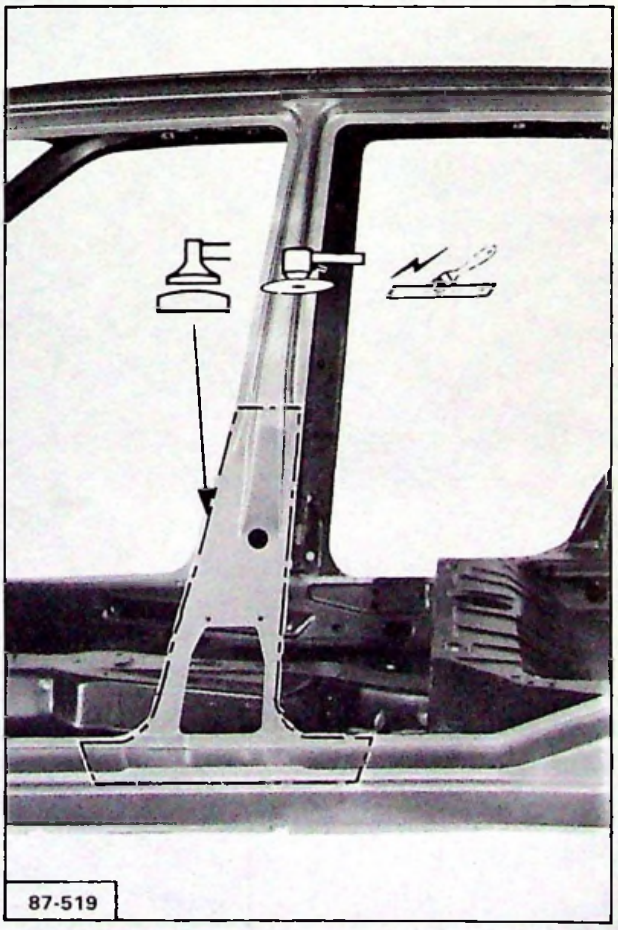

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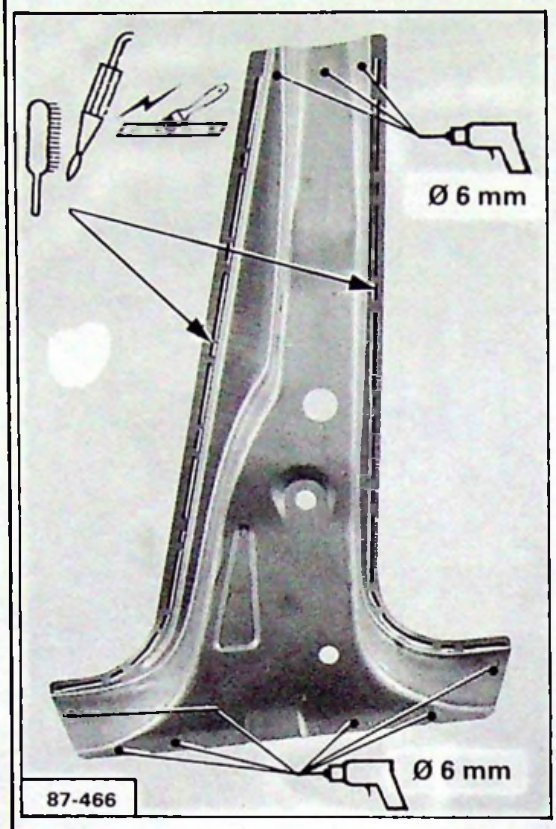
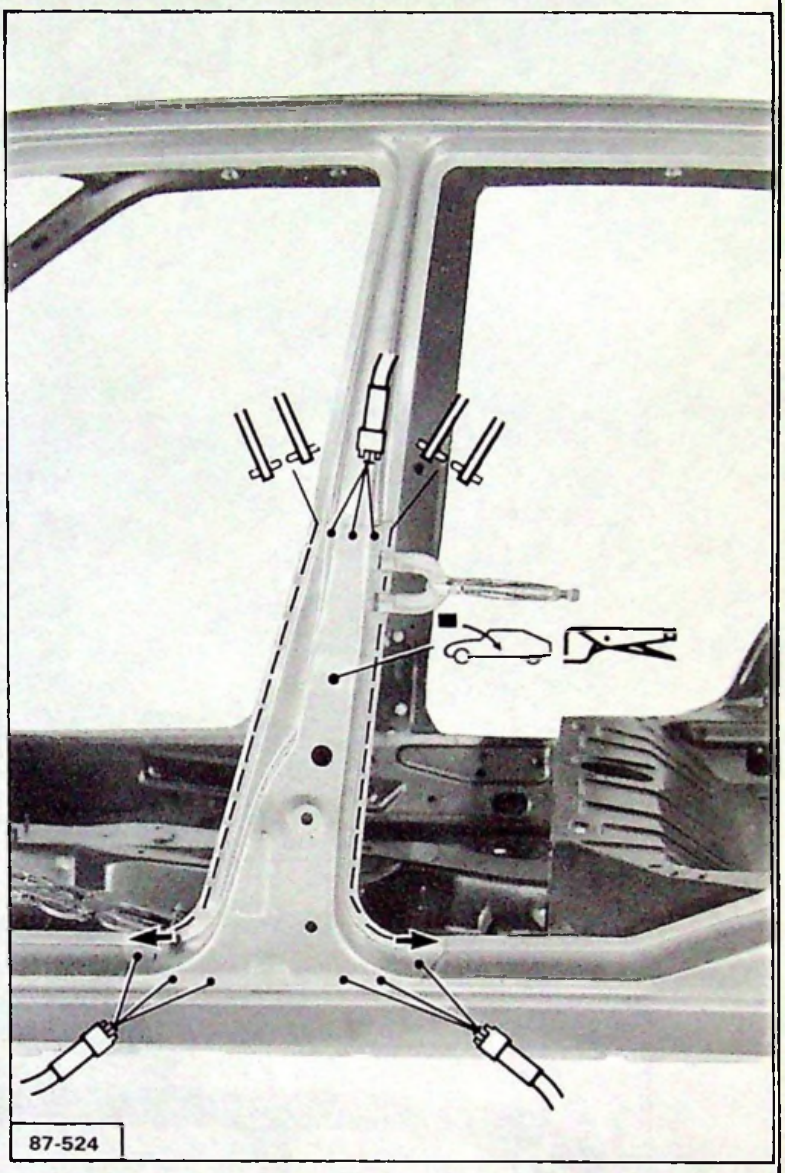

Ø 6 mm
Ø 6 mm
87-466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ZA 843-1
87-342

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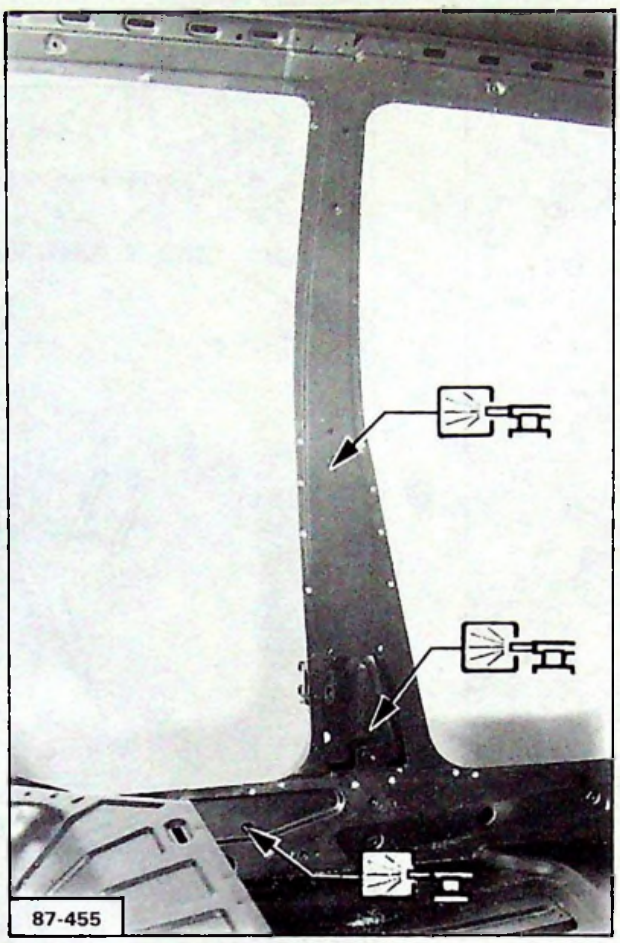
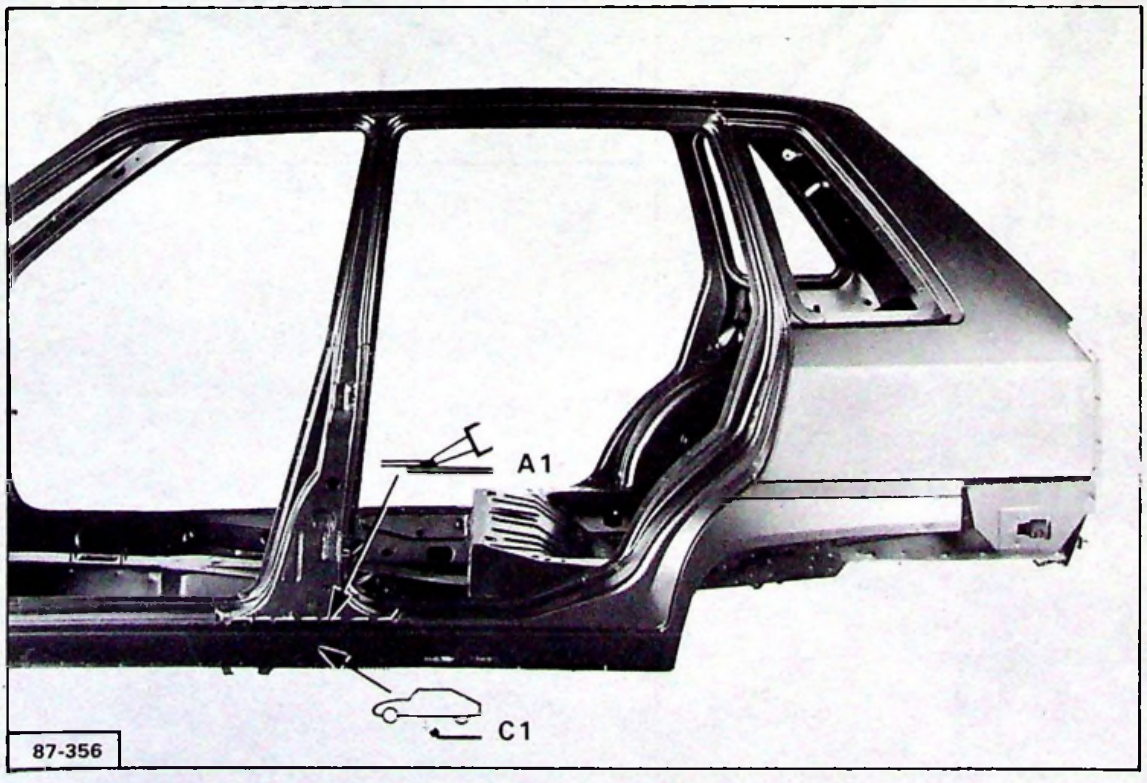
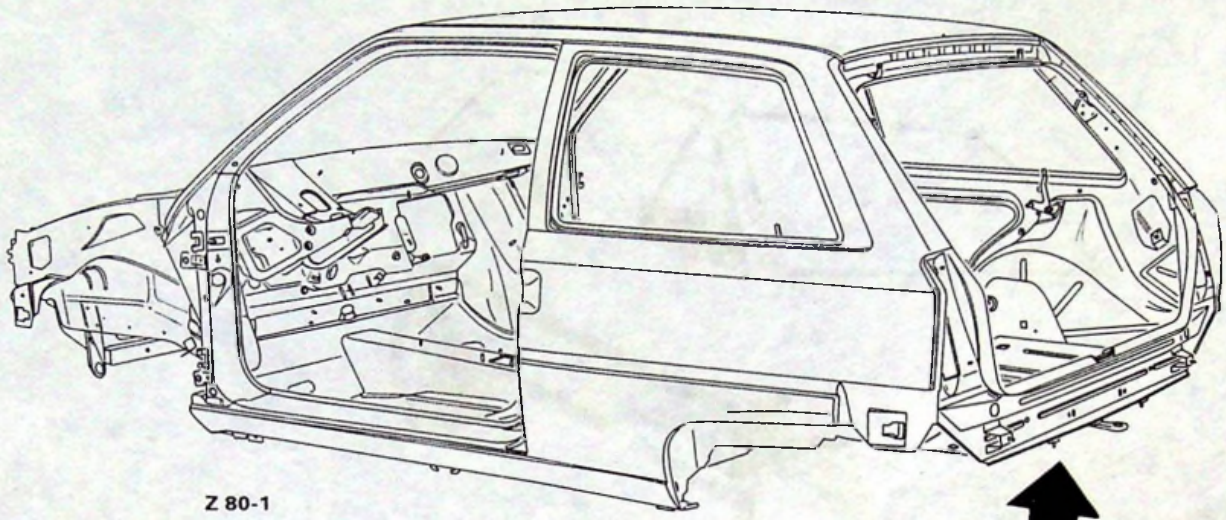
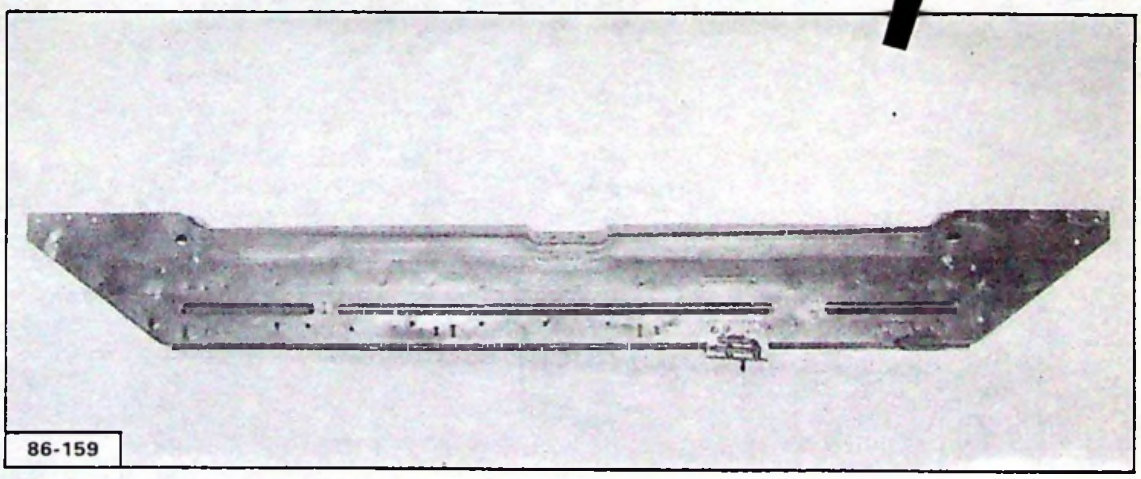

87-455

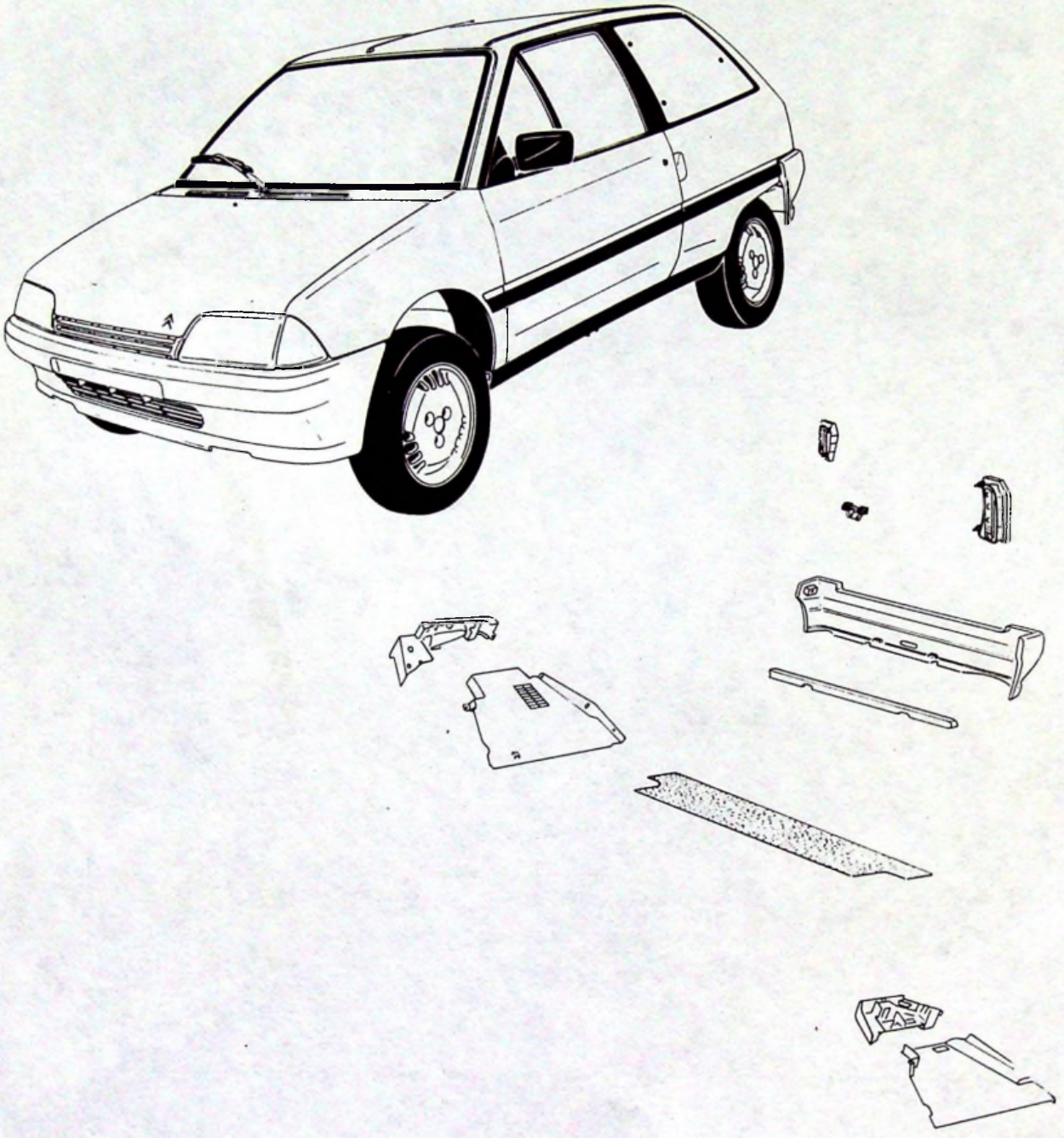

A1
C1
87-356

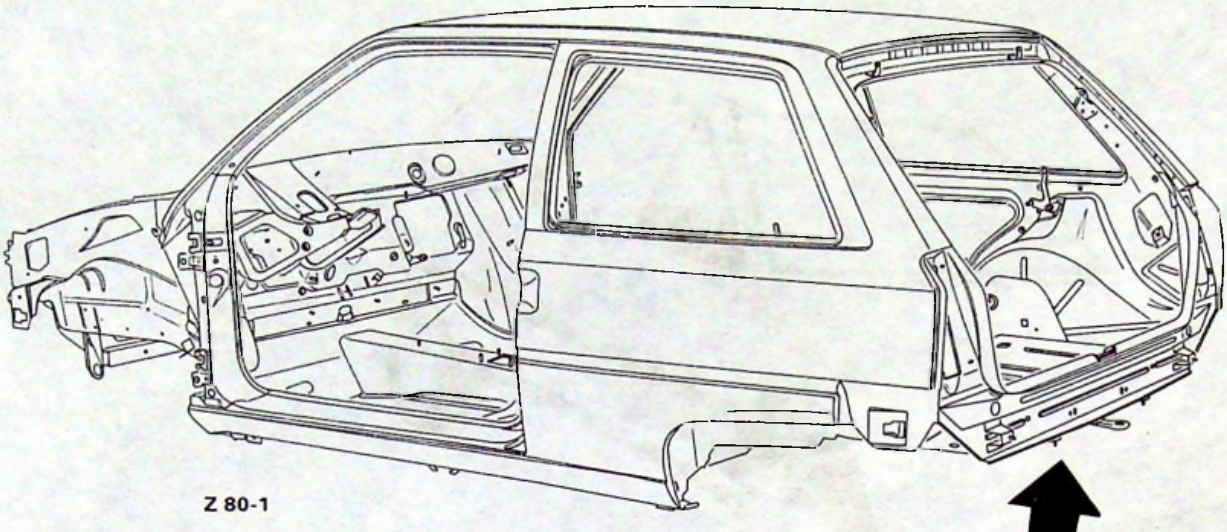


Z 80-1

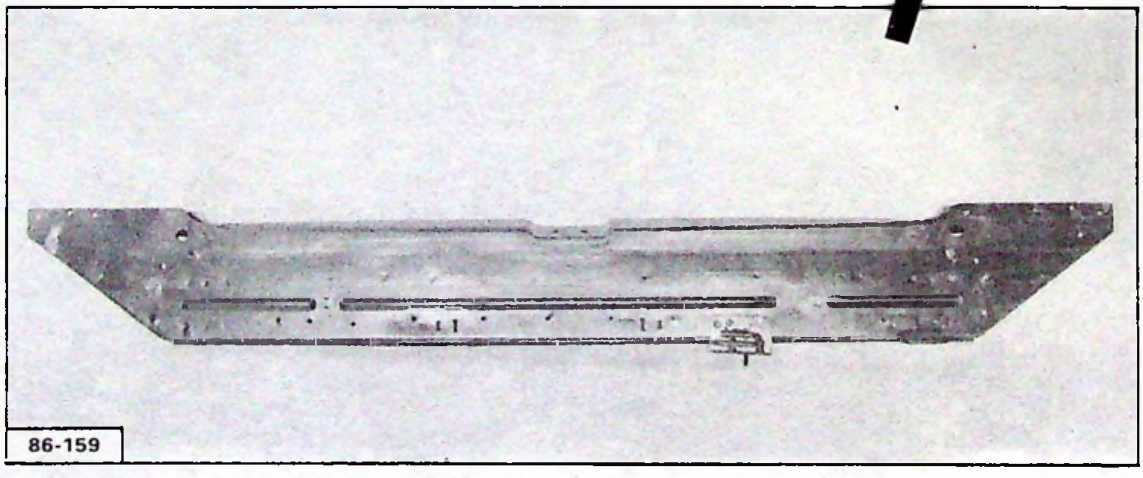


86-159





Z 80-1



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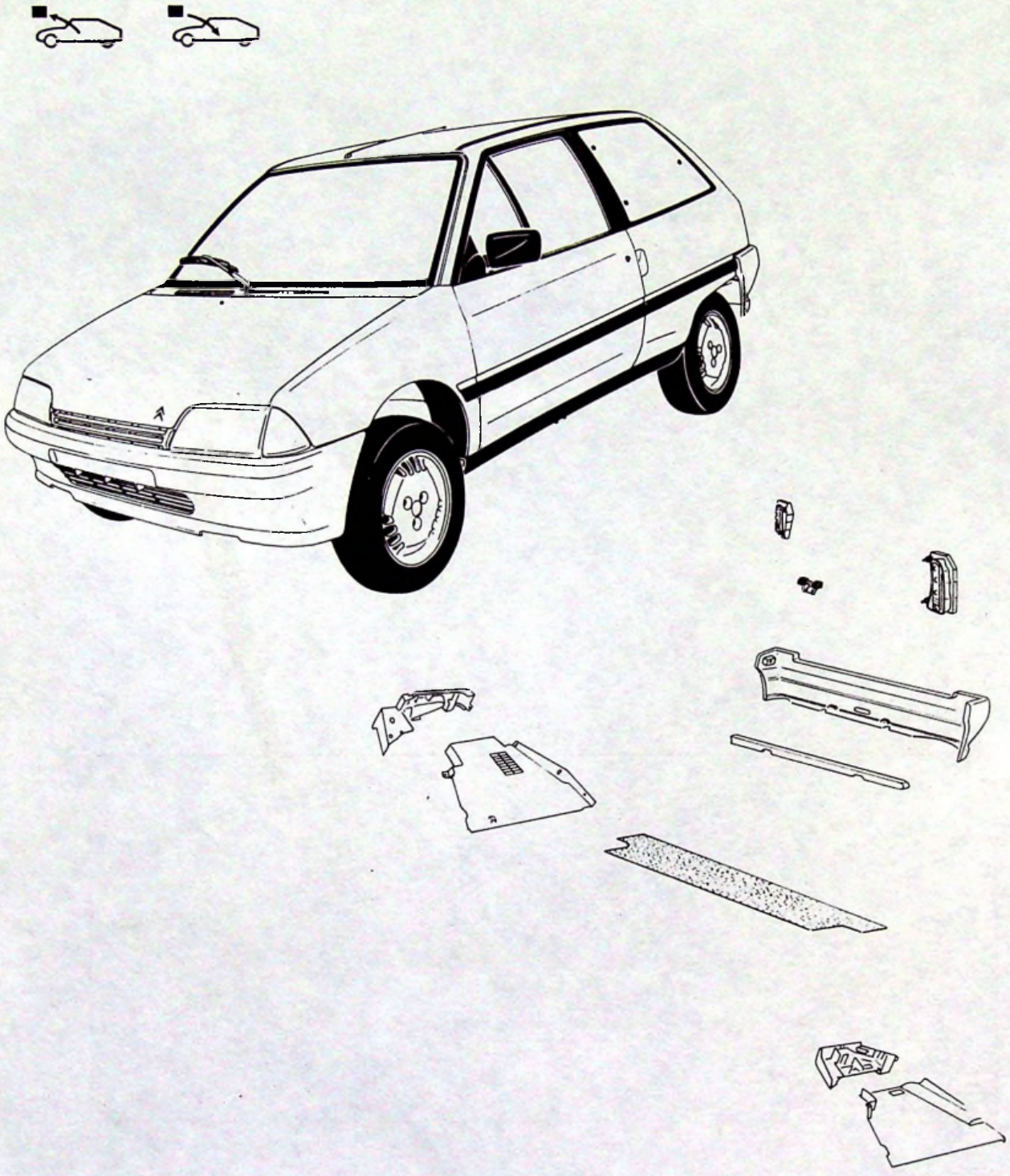
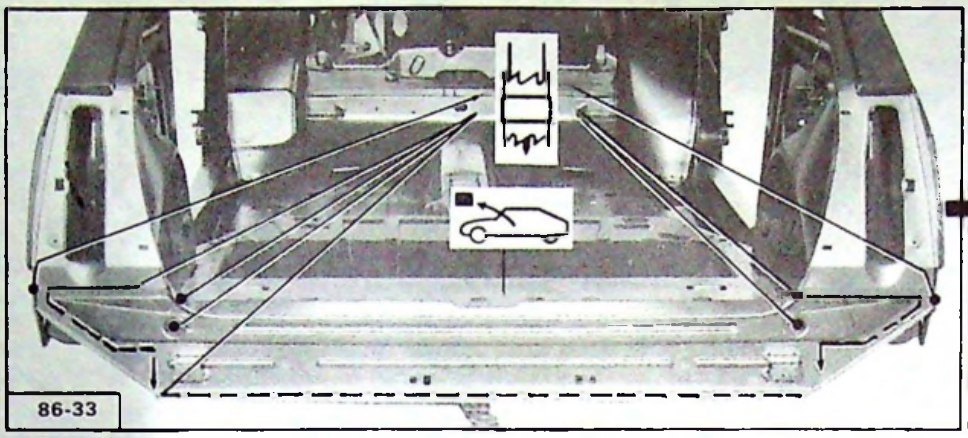
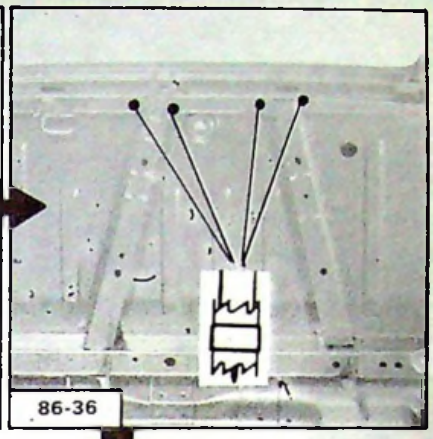
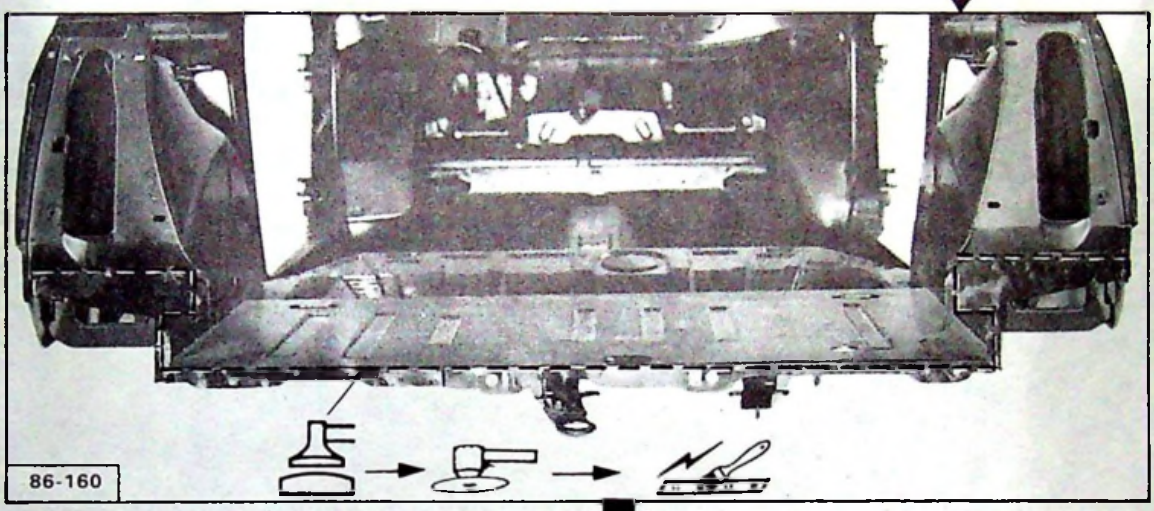
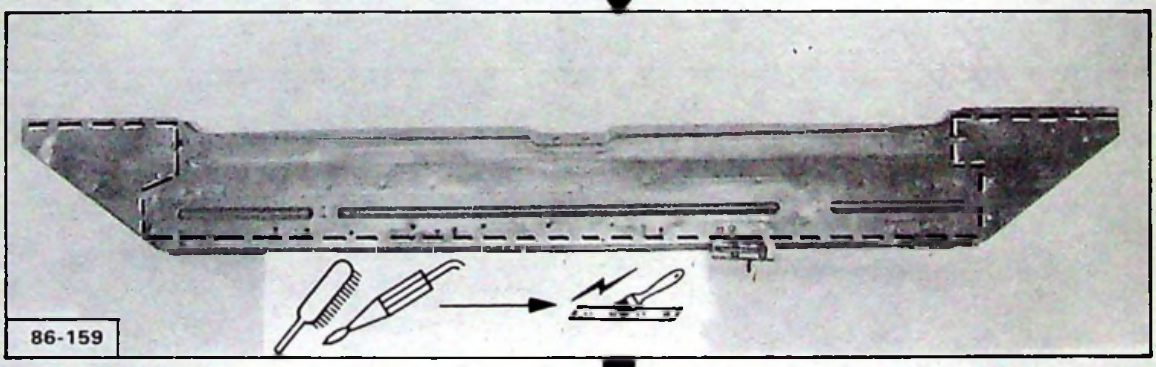
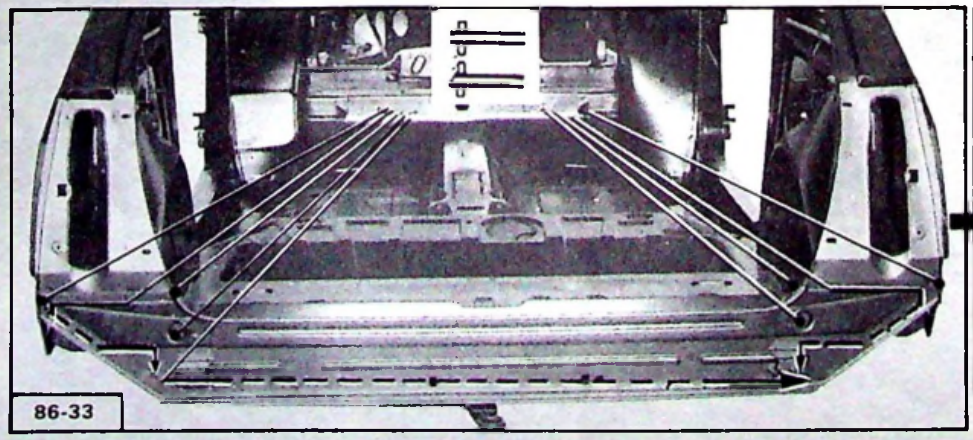


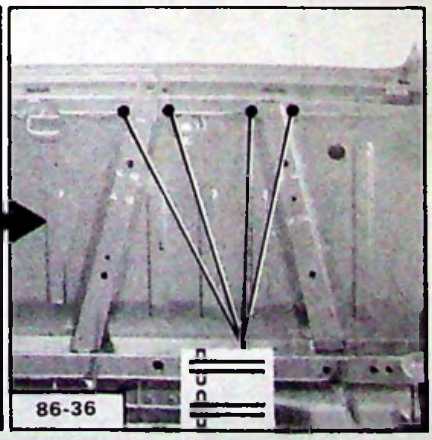

86-33

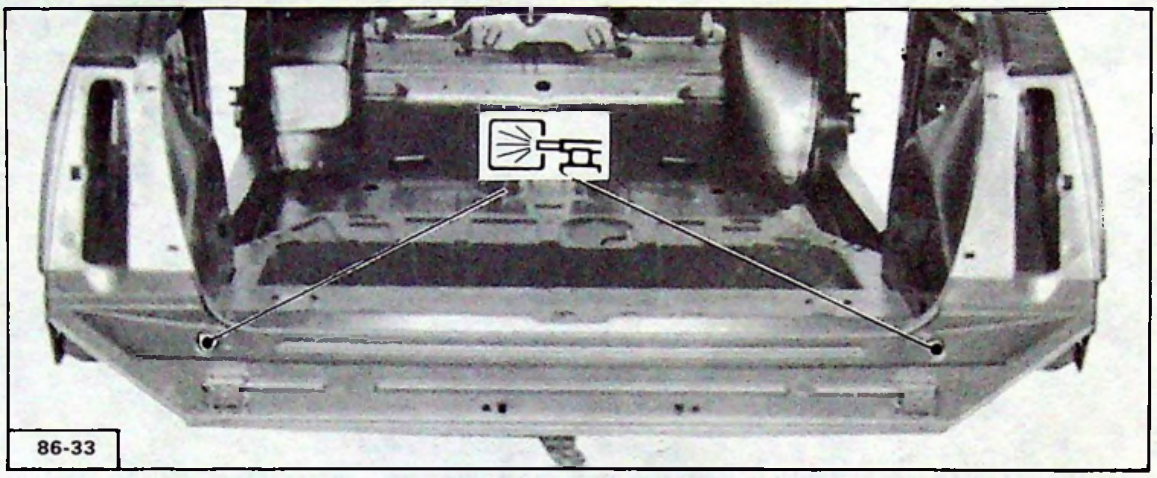

86-36


86-160

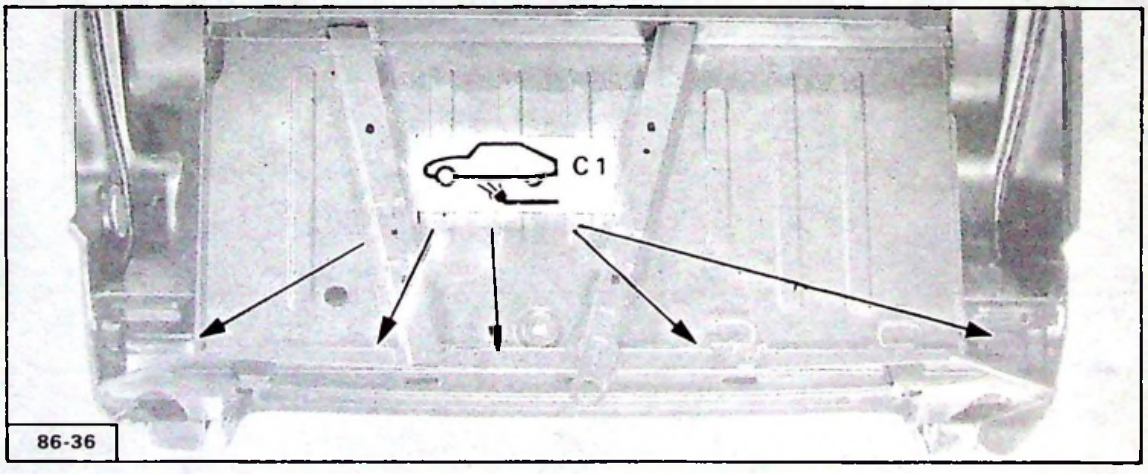

86-159


86-33

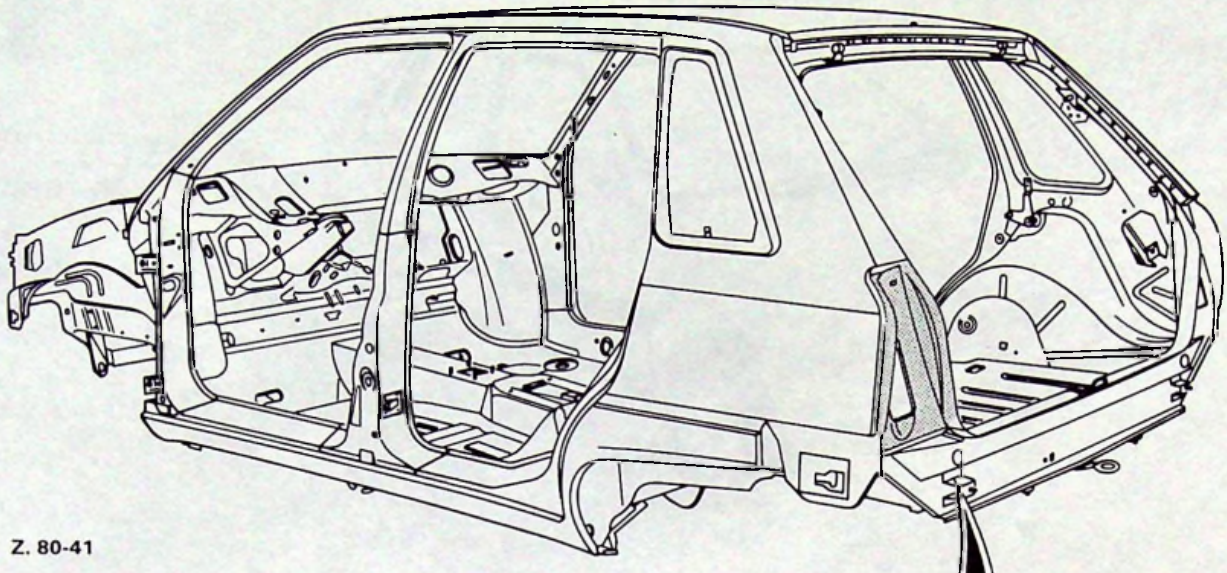

86-36



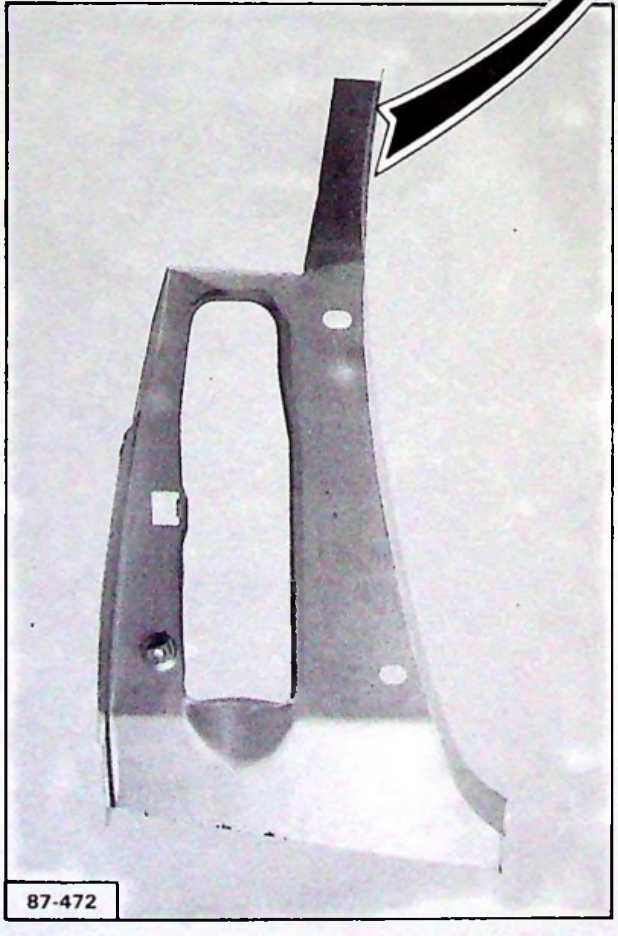
86-33



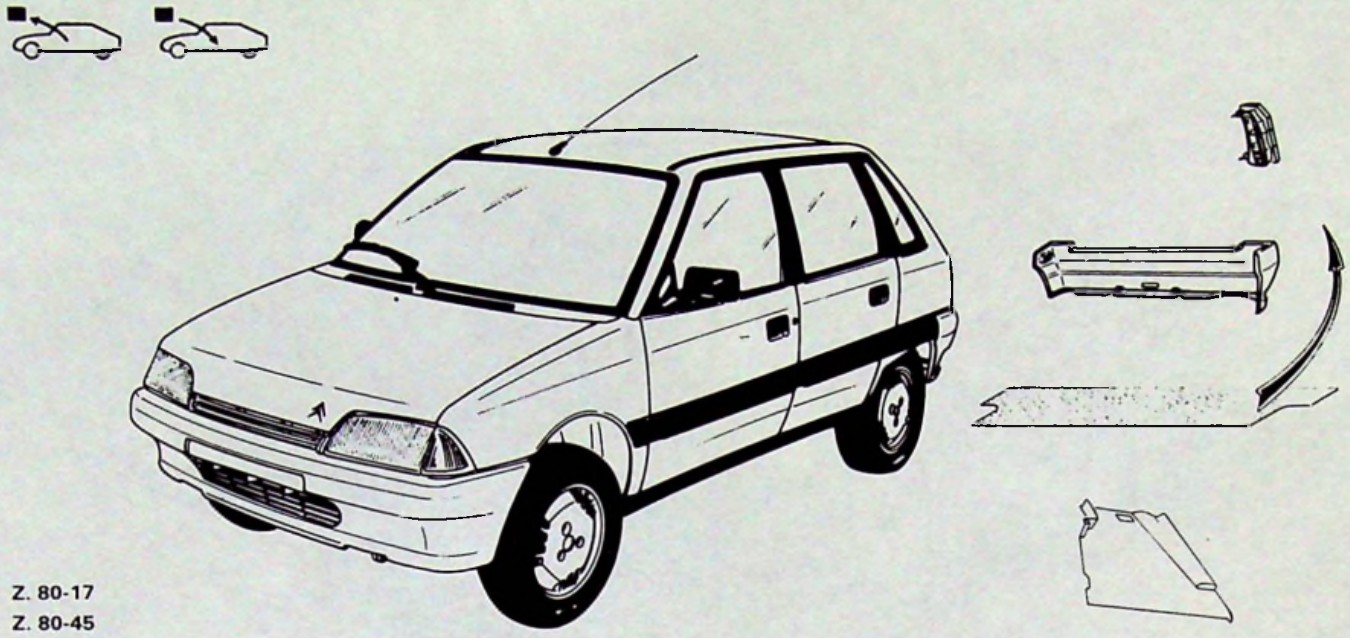
86-36



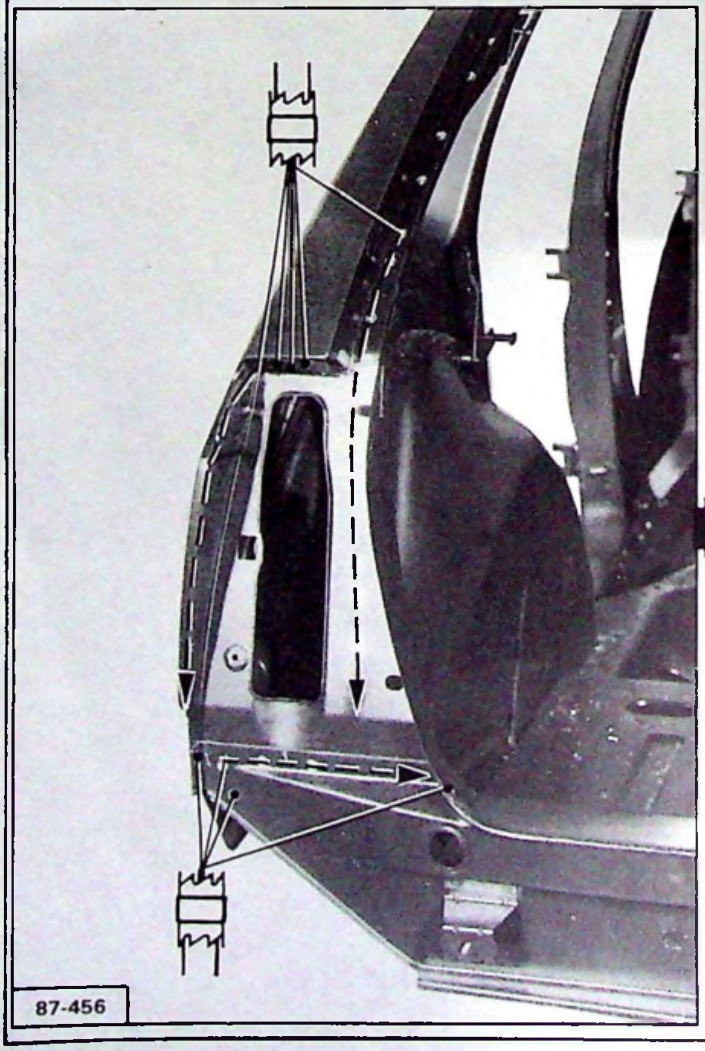
Z. 80-41



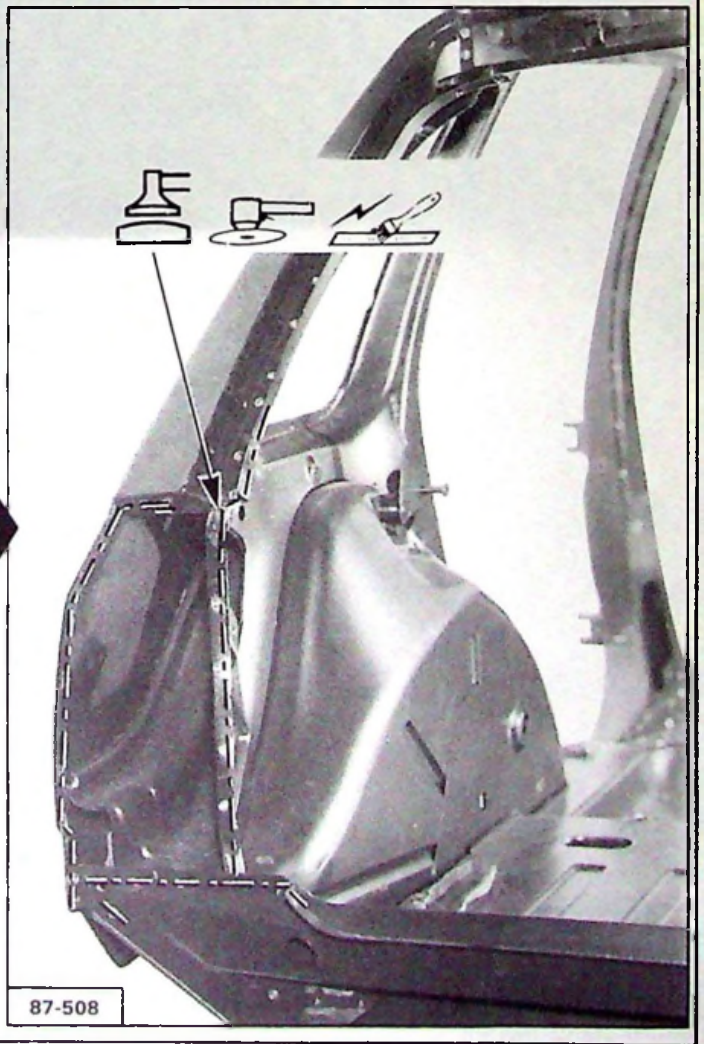
87-472



Z. 80-17
Z. 80-45



87-456



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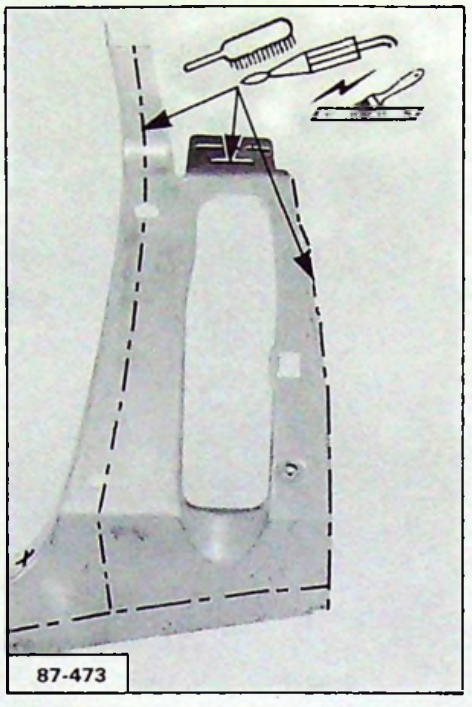
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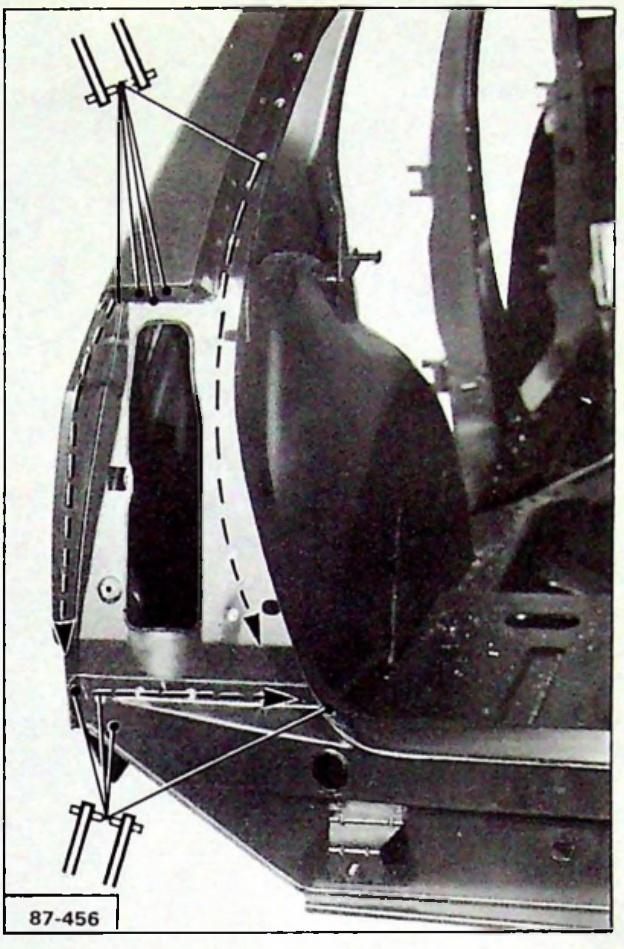
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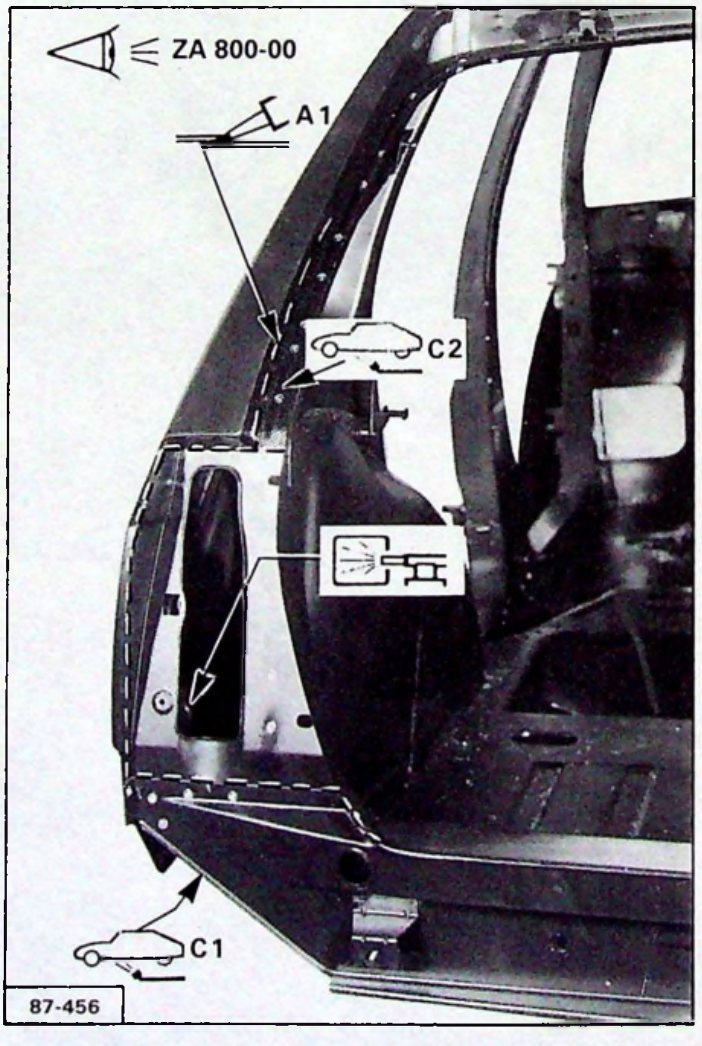
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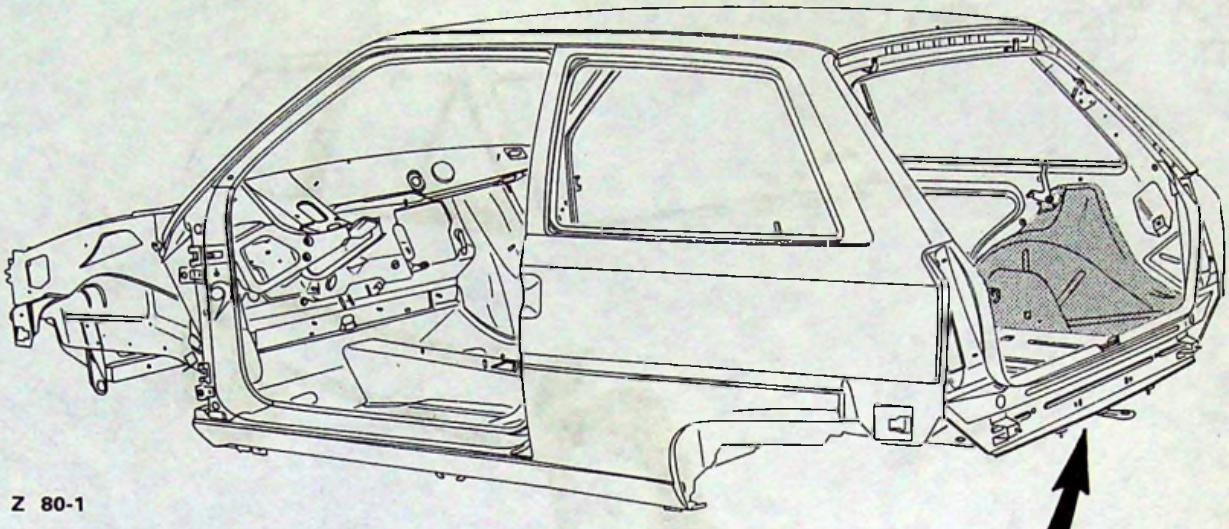

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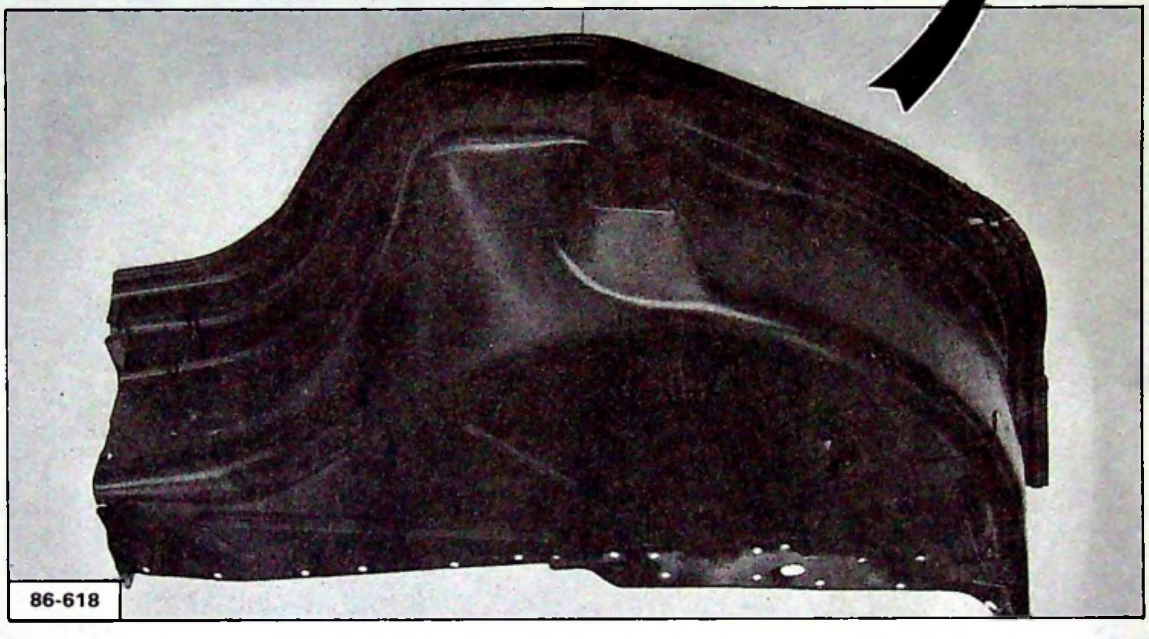

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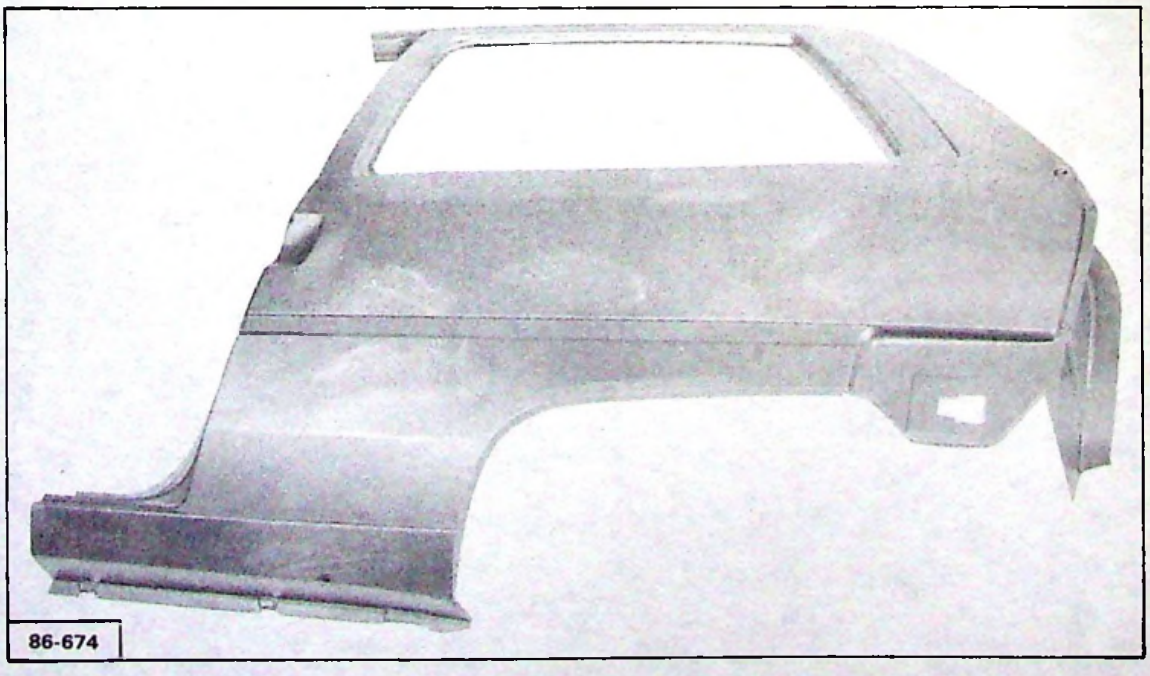

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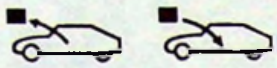

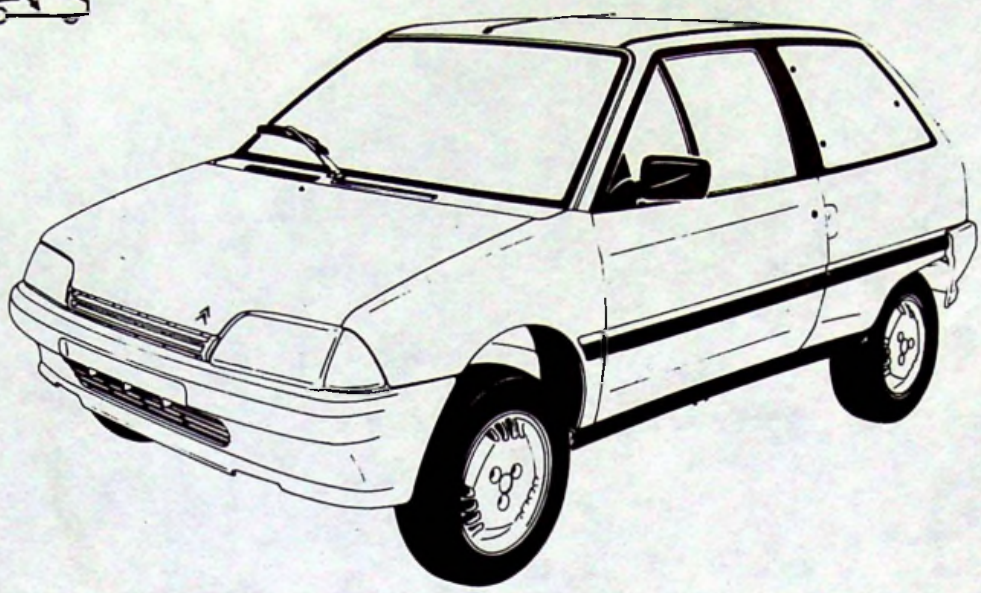

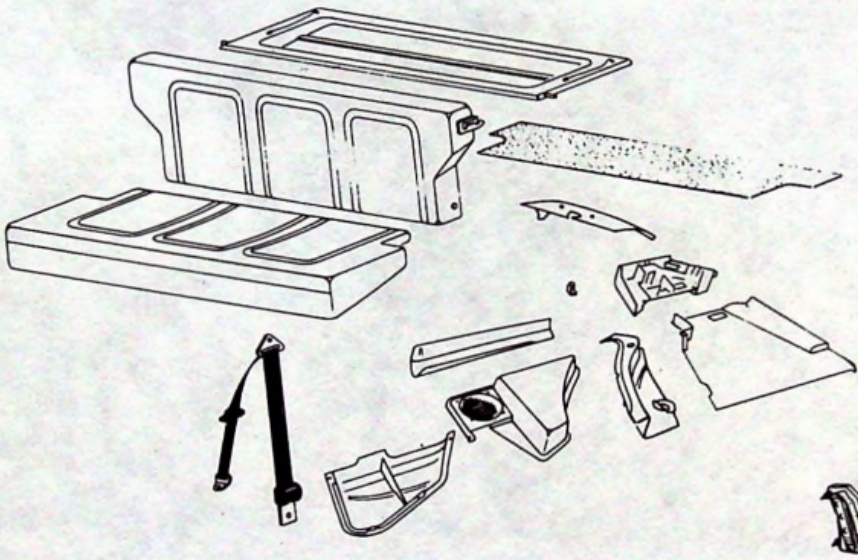

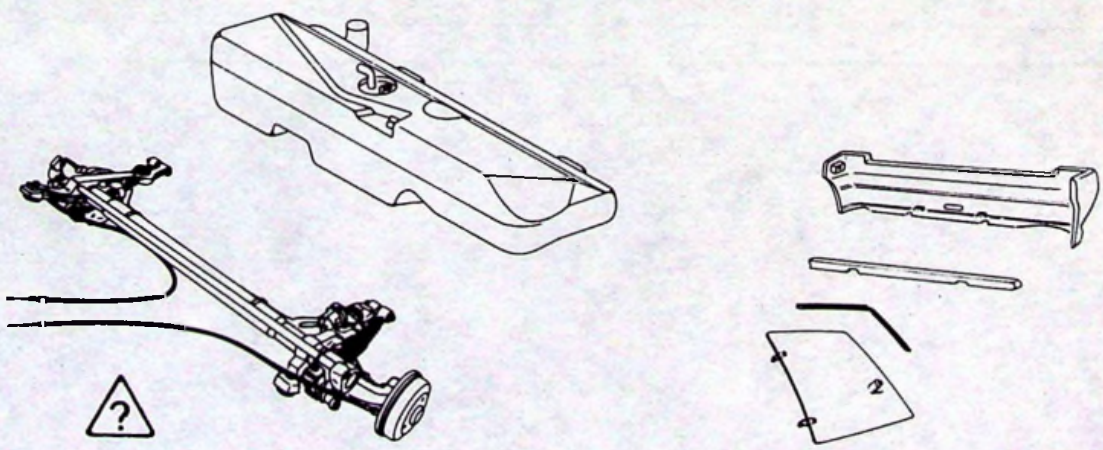

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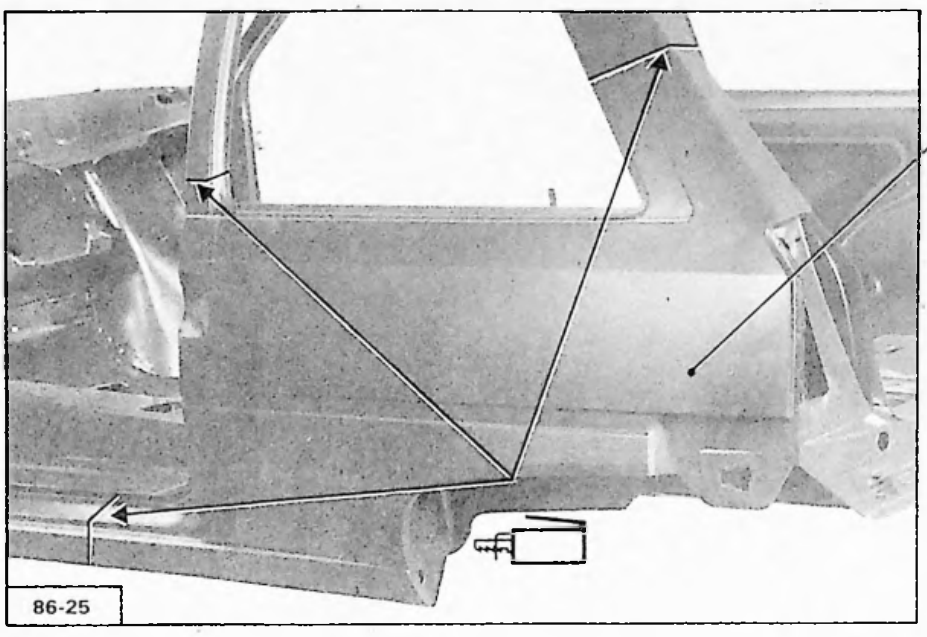
ZA 821-5



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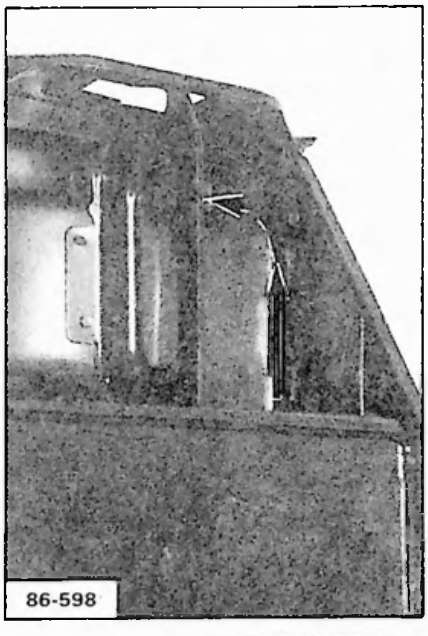

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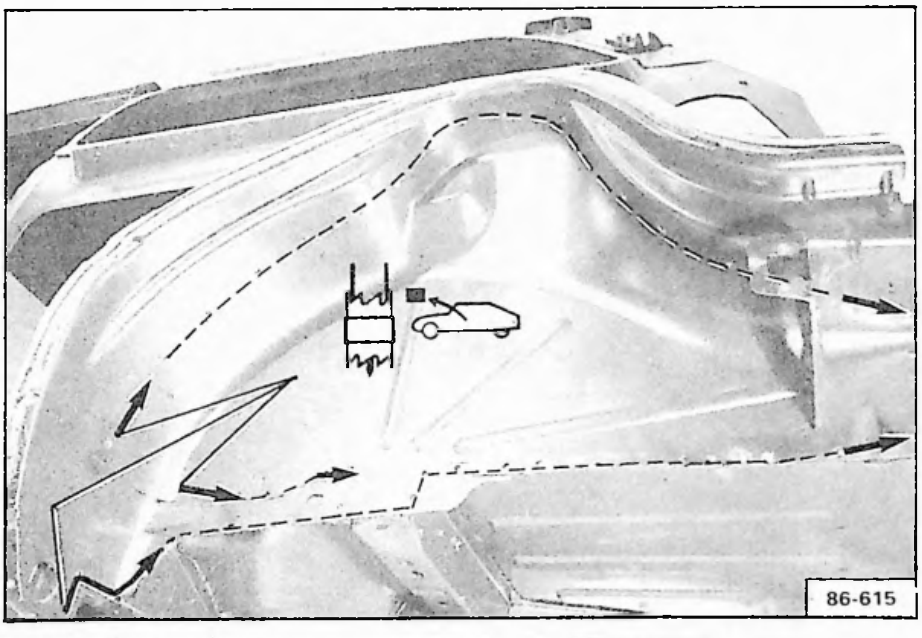

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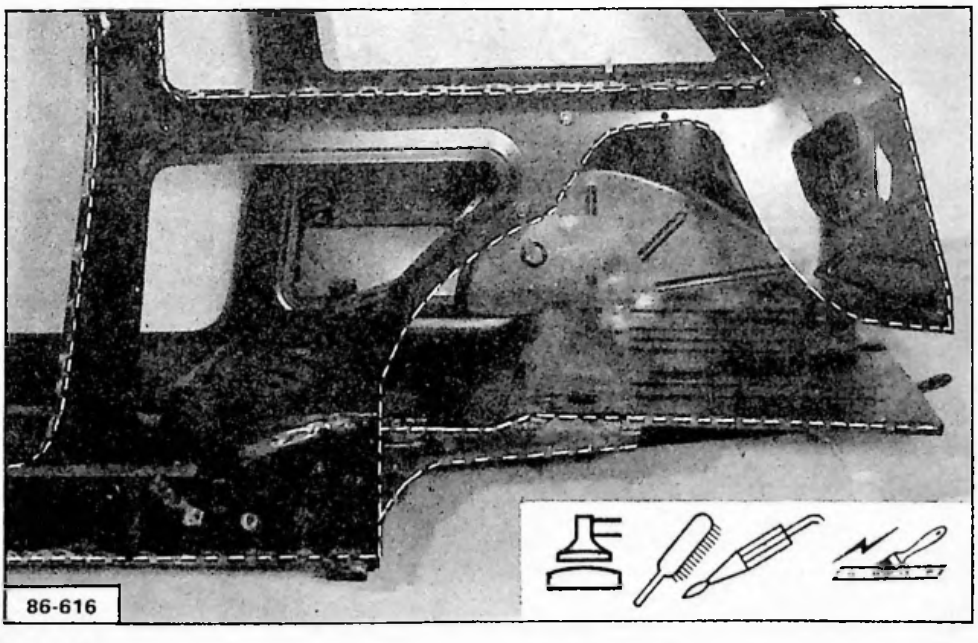

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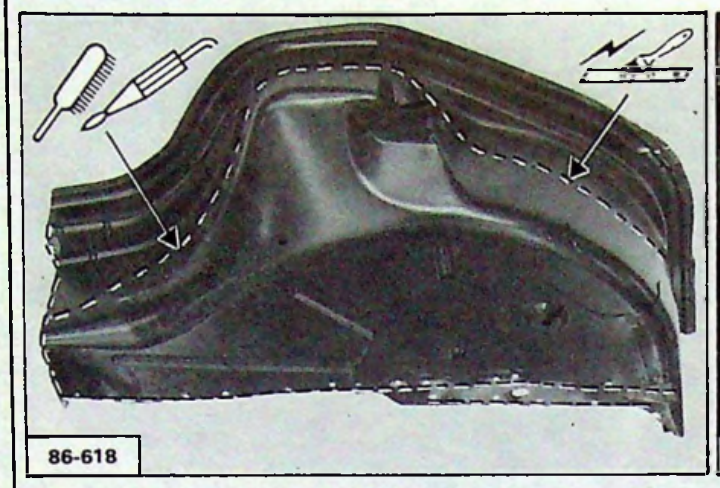
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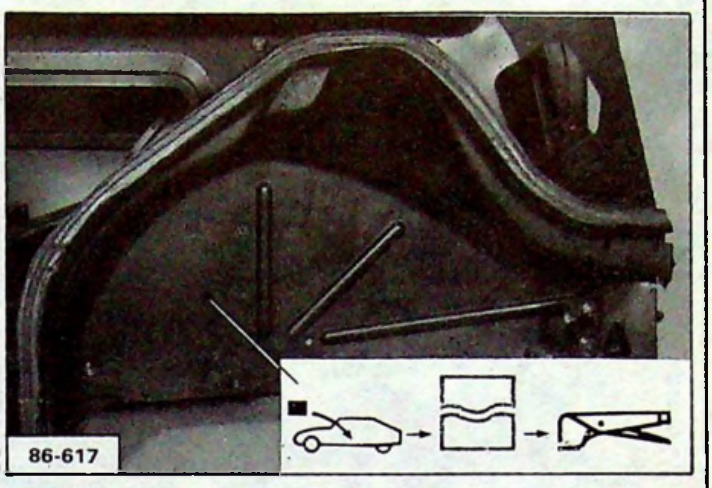
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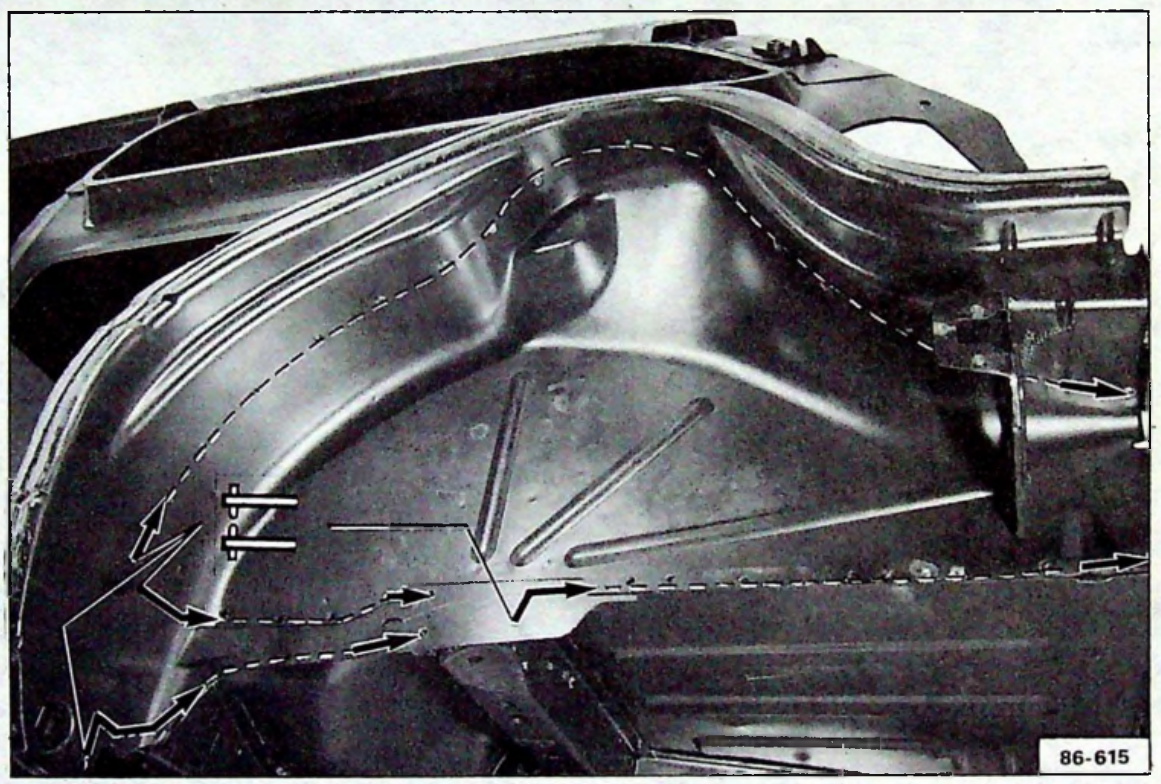
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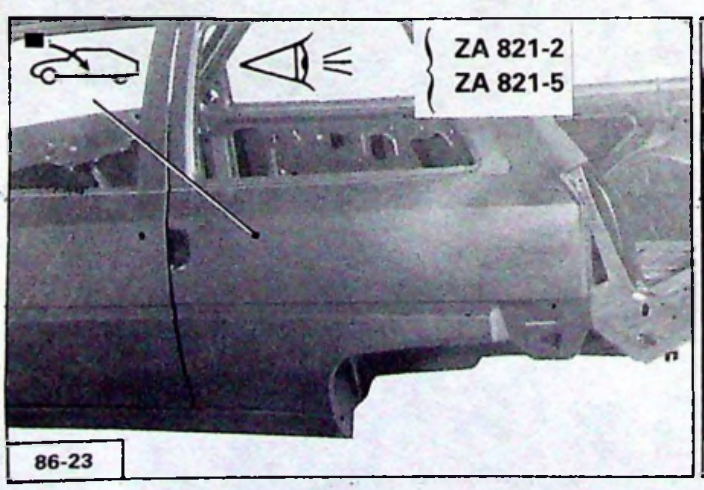
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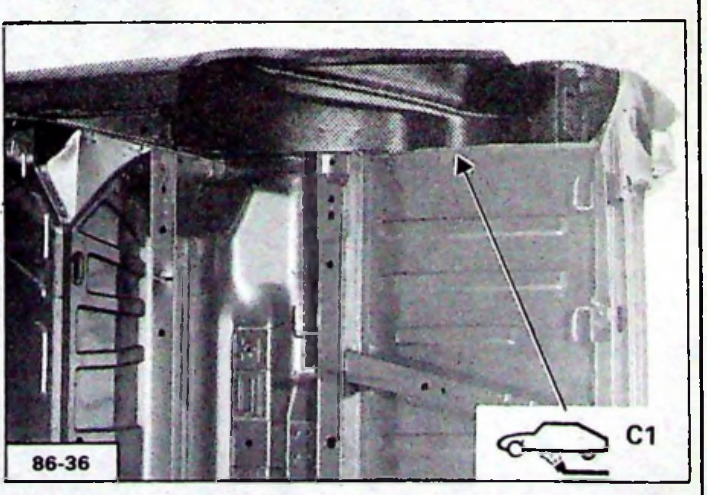
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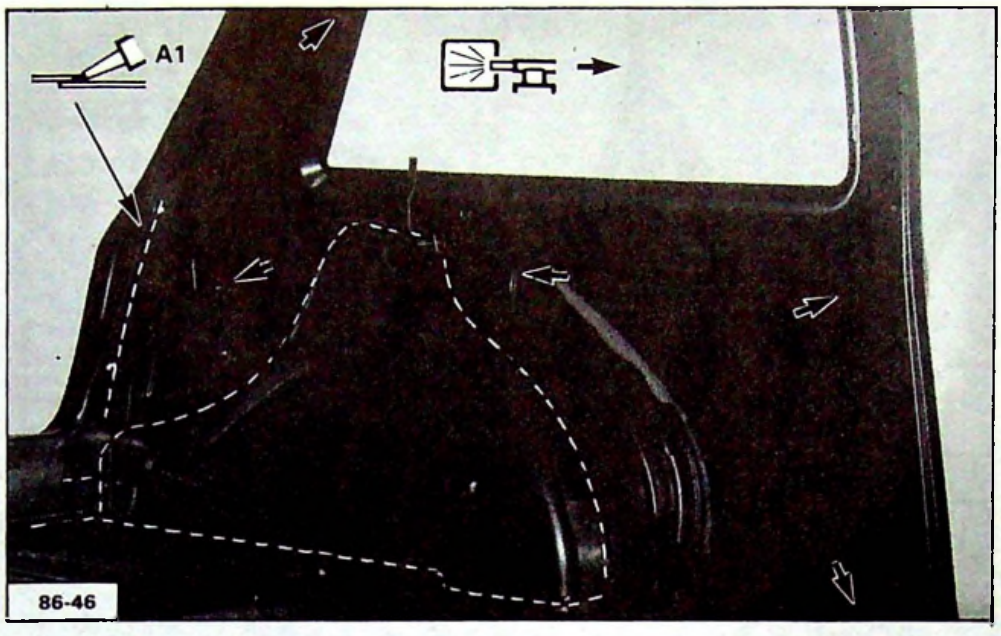
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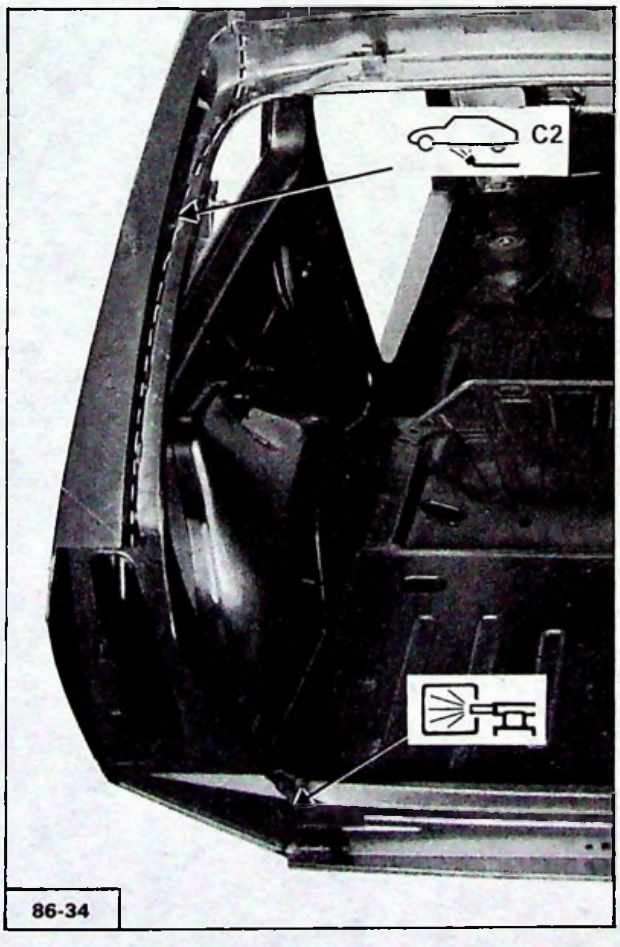
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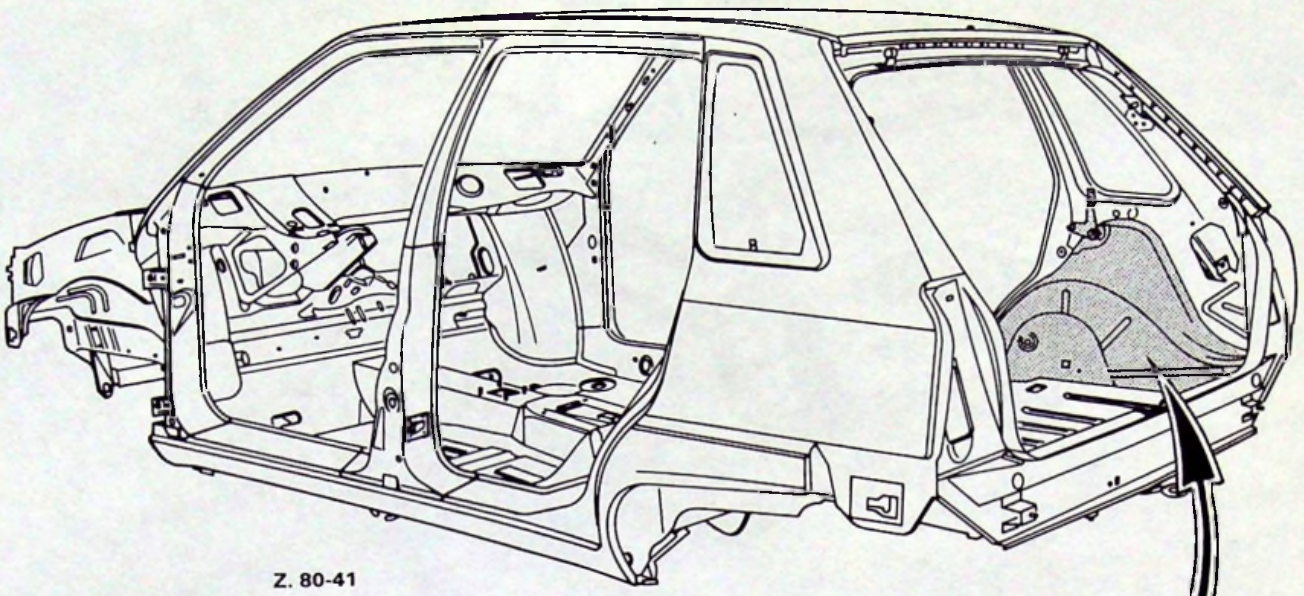

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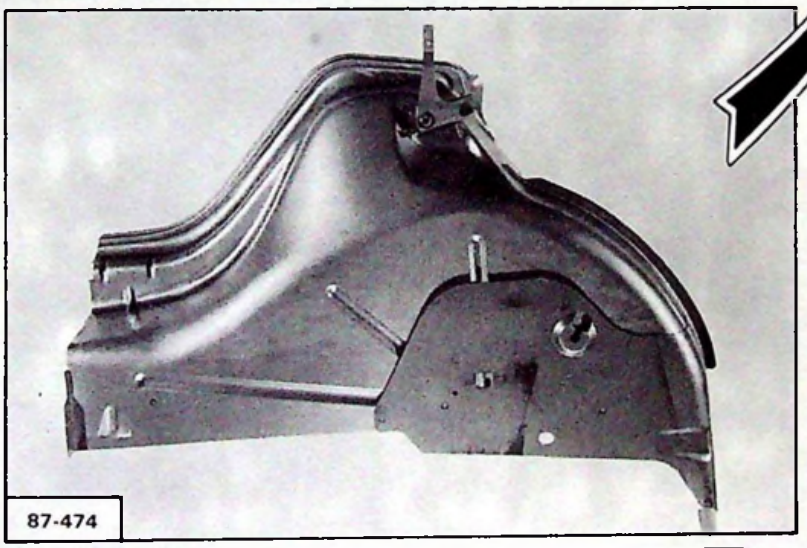

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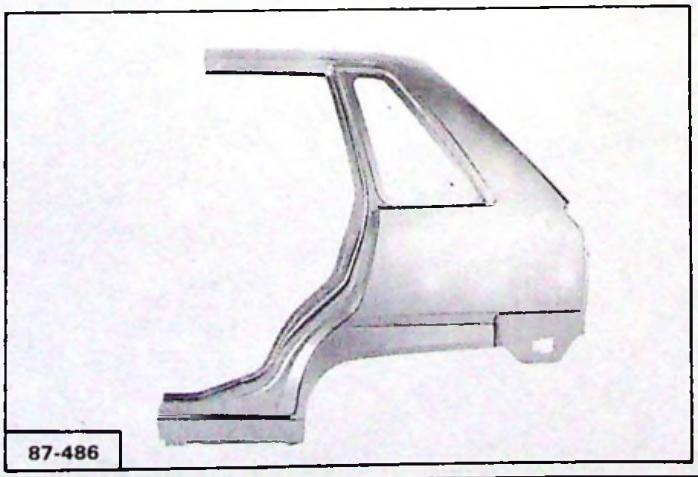

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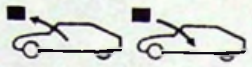

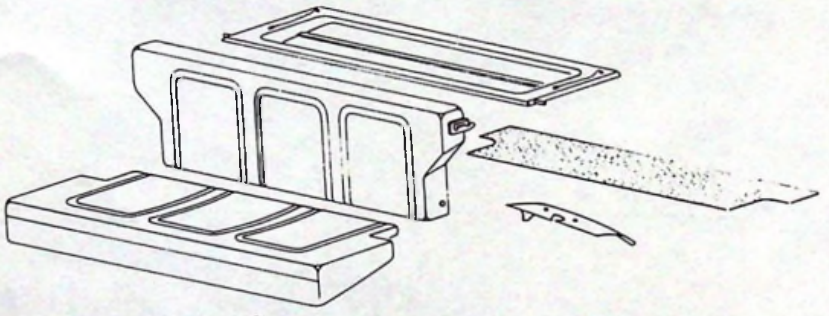

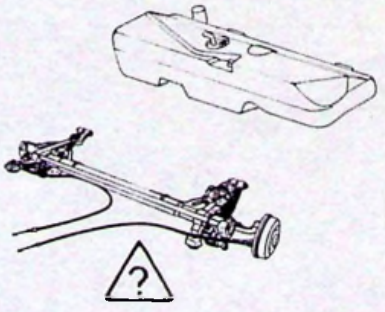

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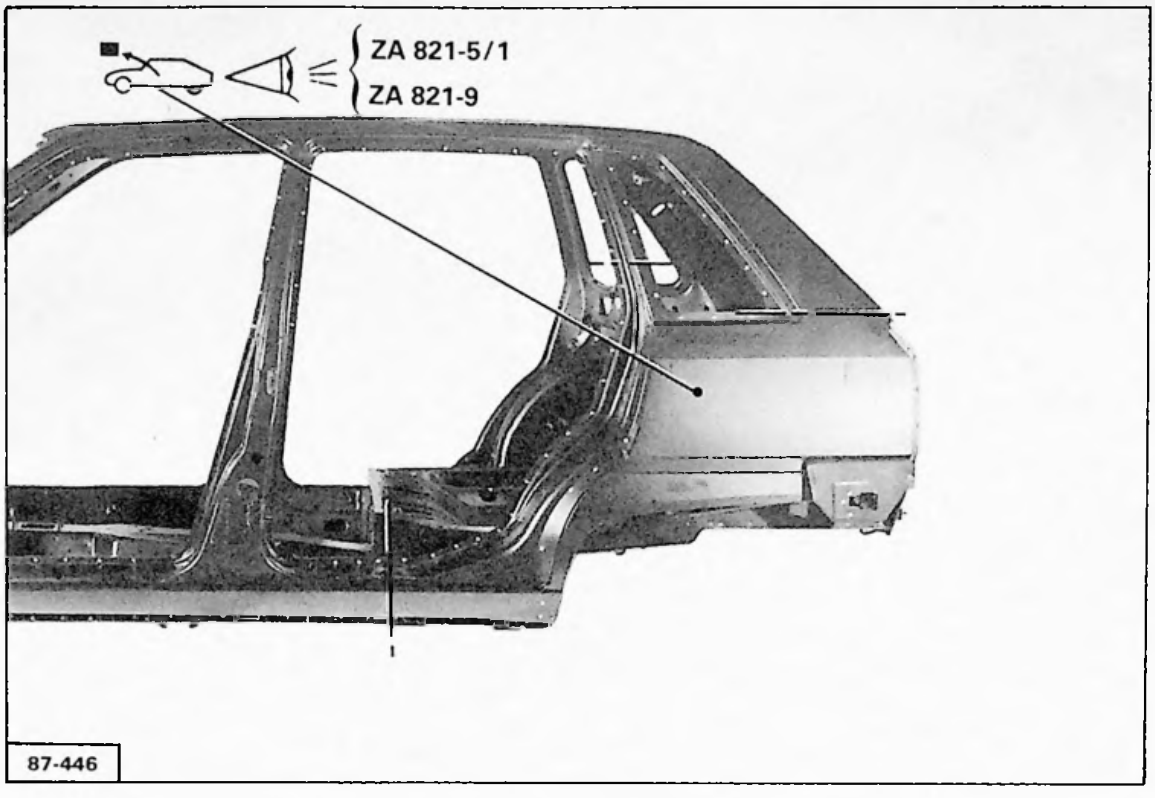
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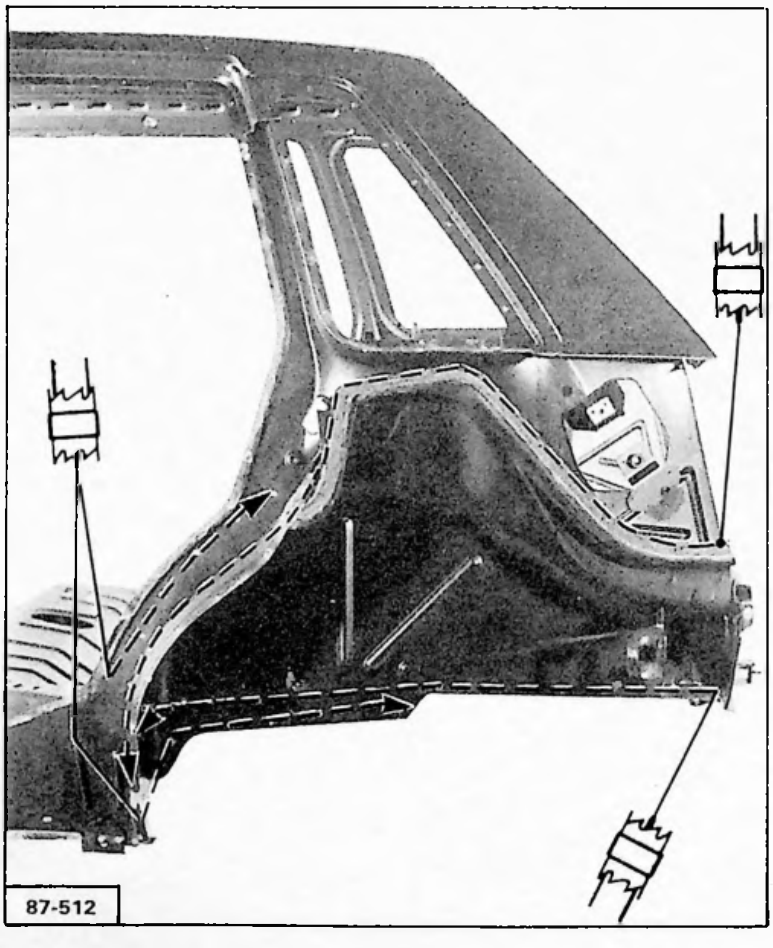
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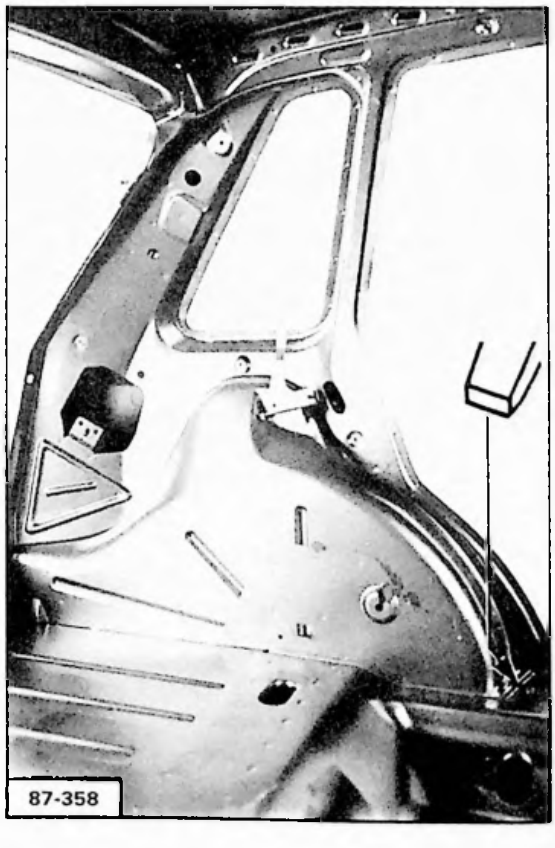
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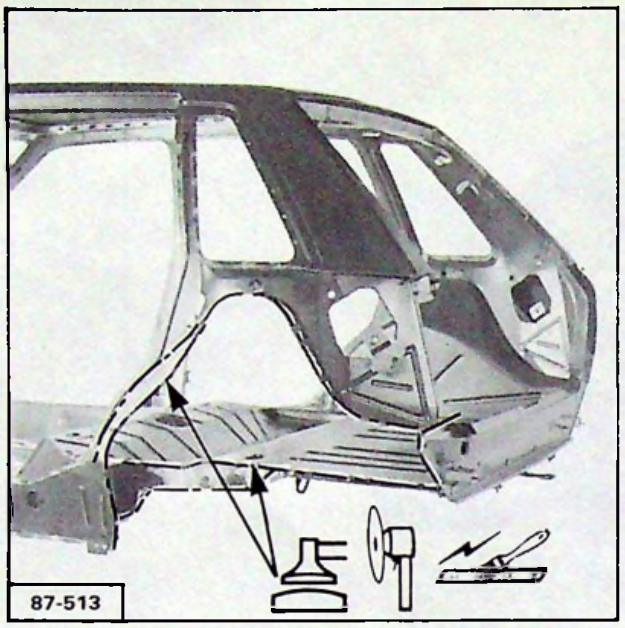
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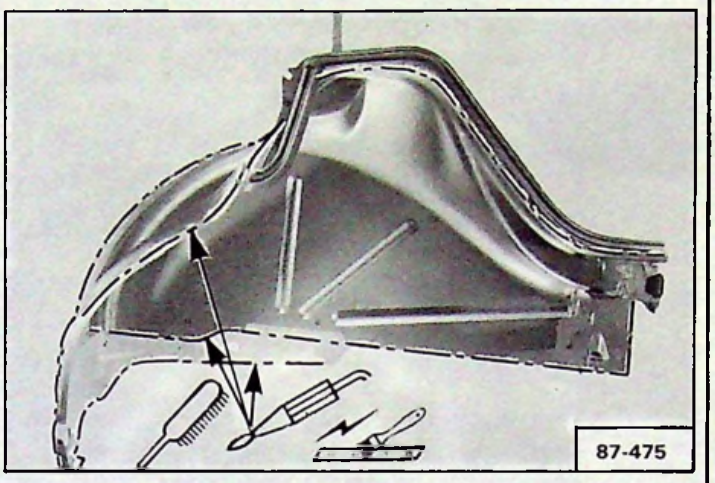
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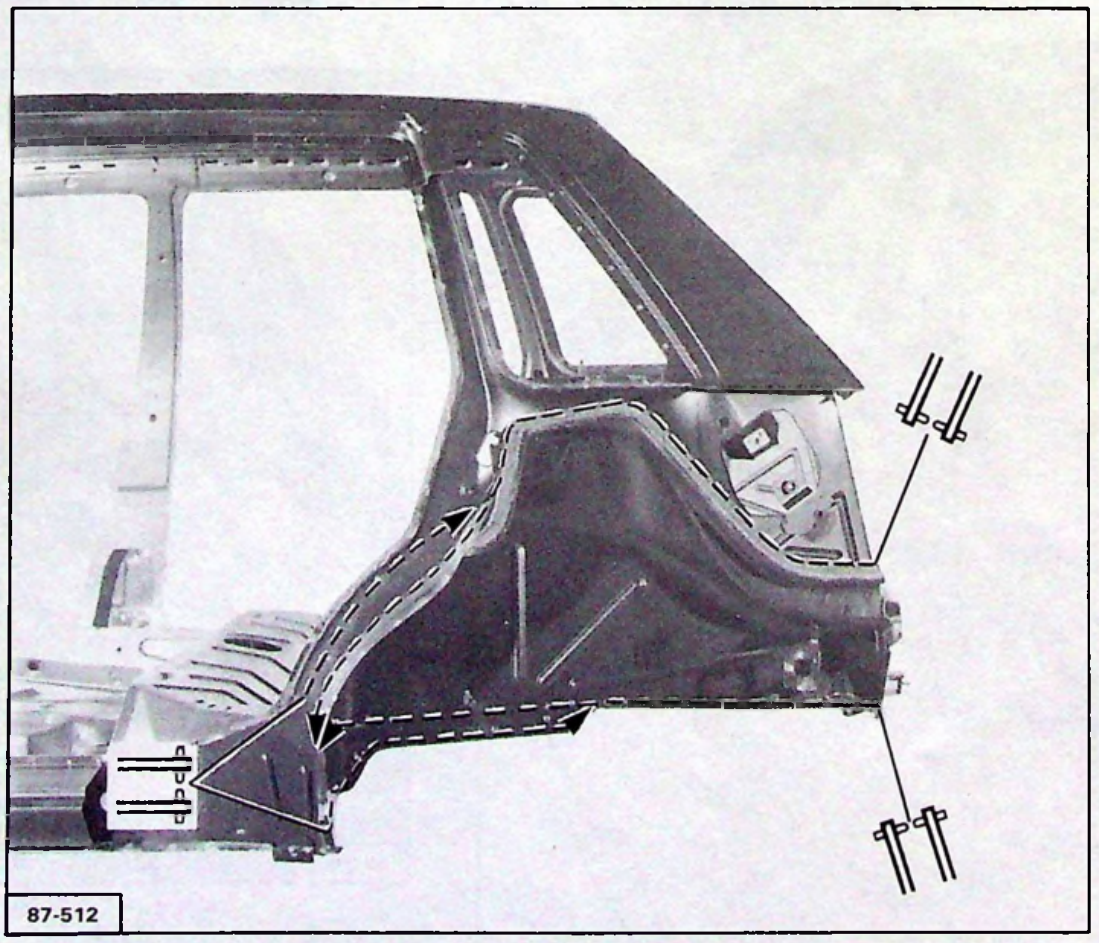
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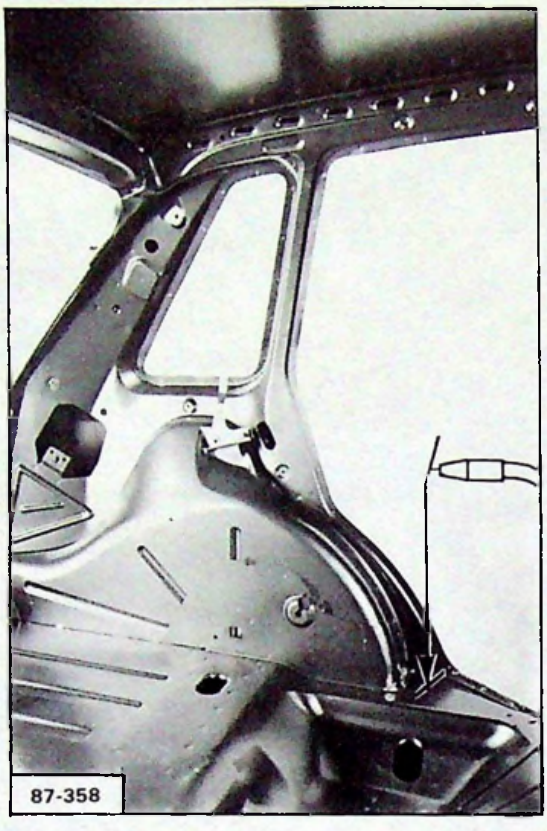
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ZA 821-5/1
ZA 821-9
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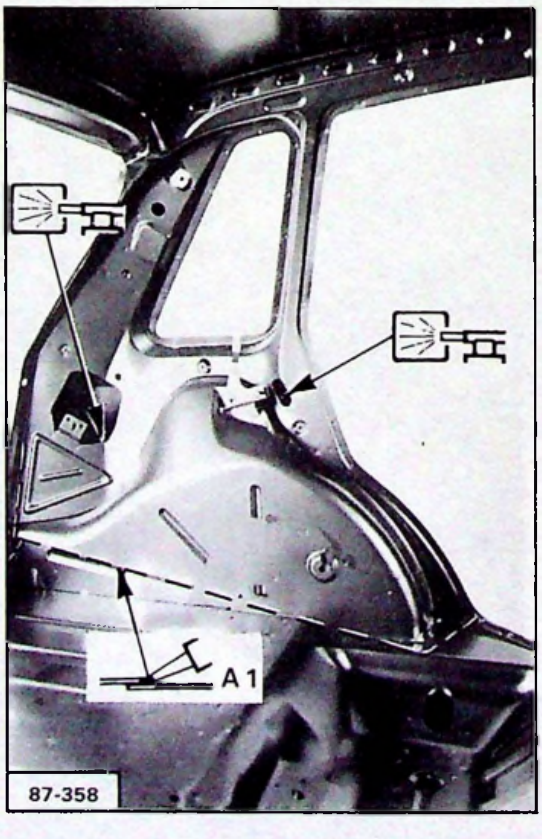
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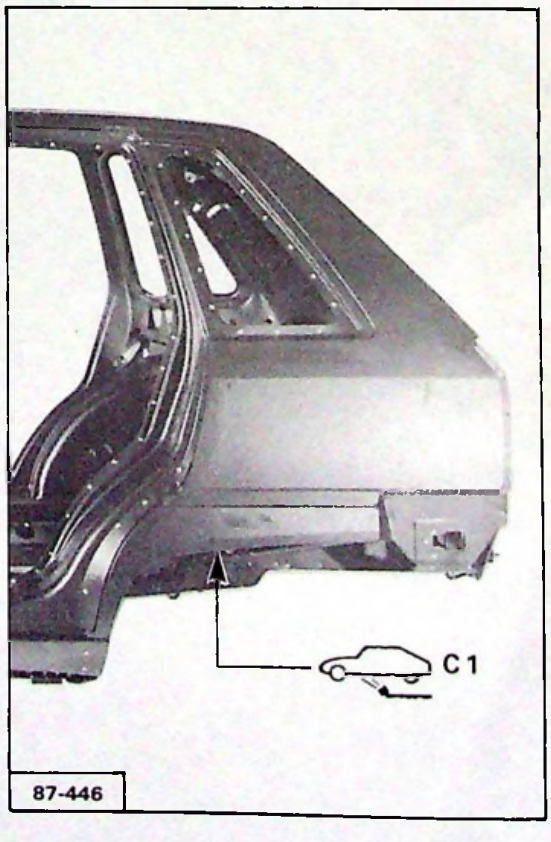
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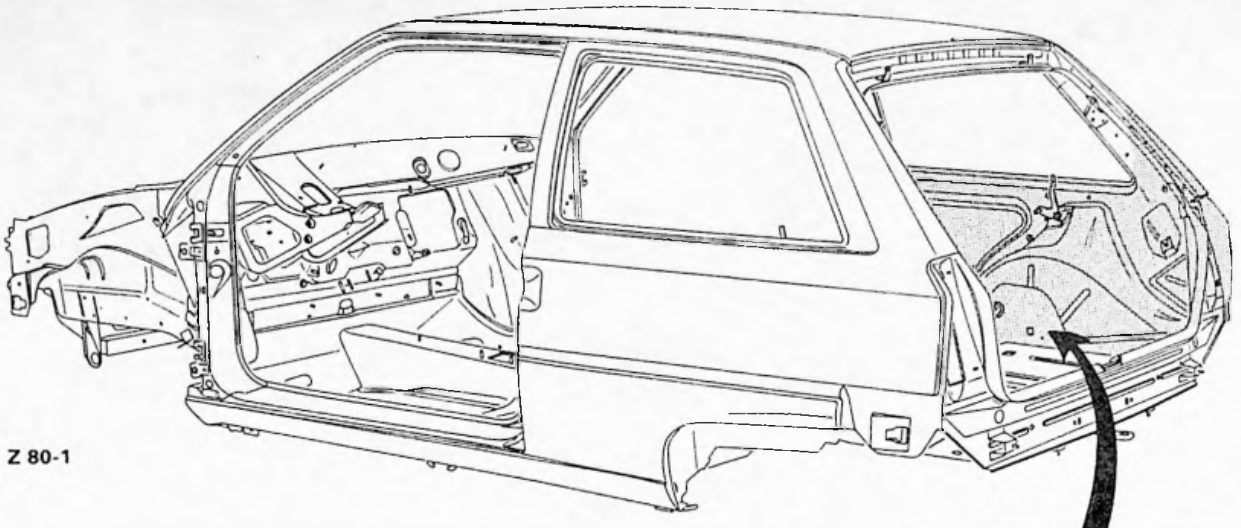
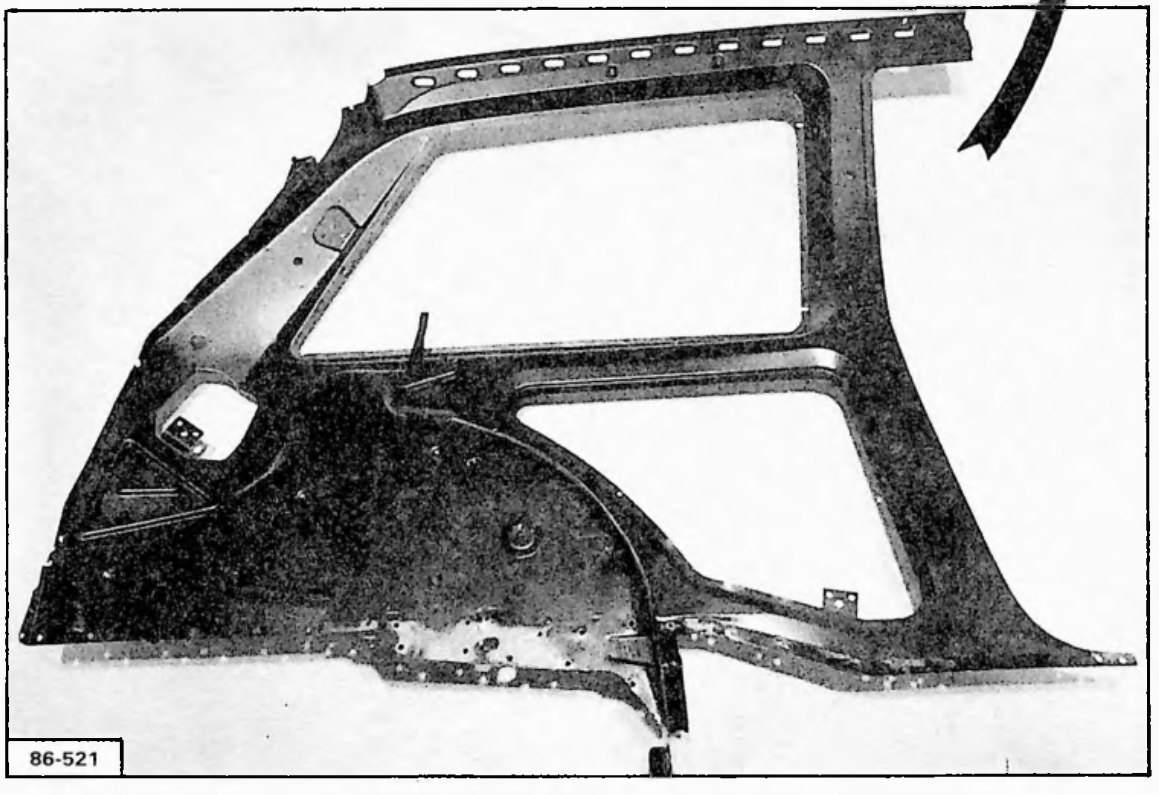


Z 80-1



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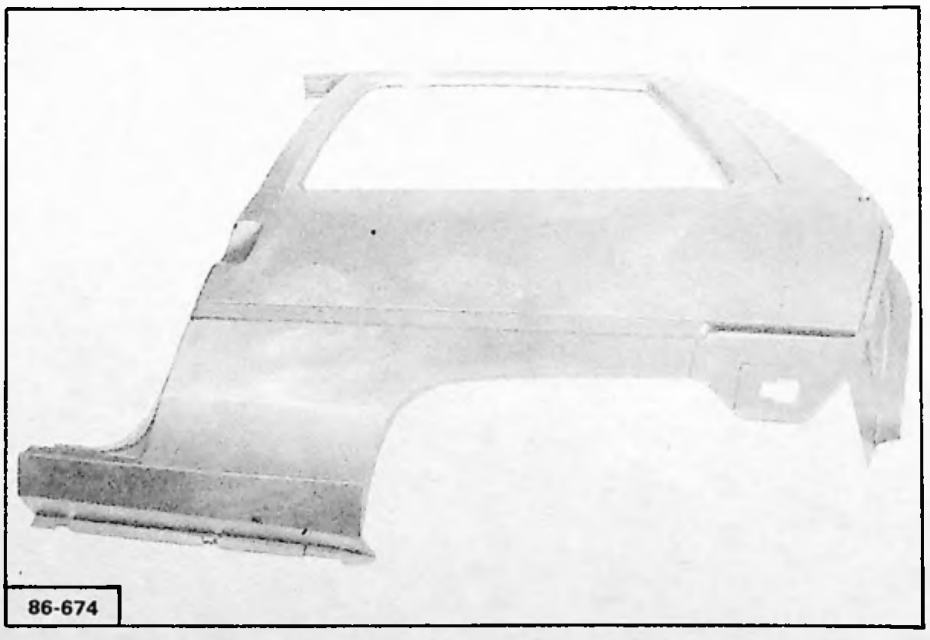

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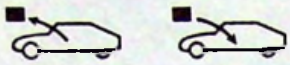

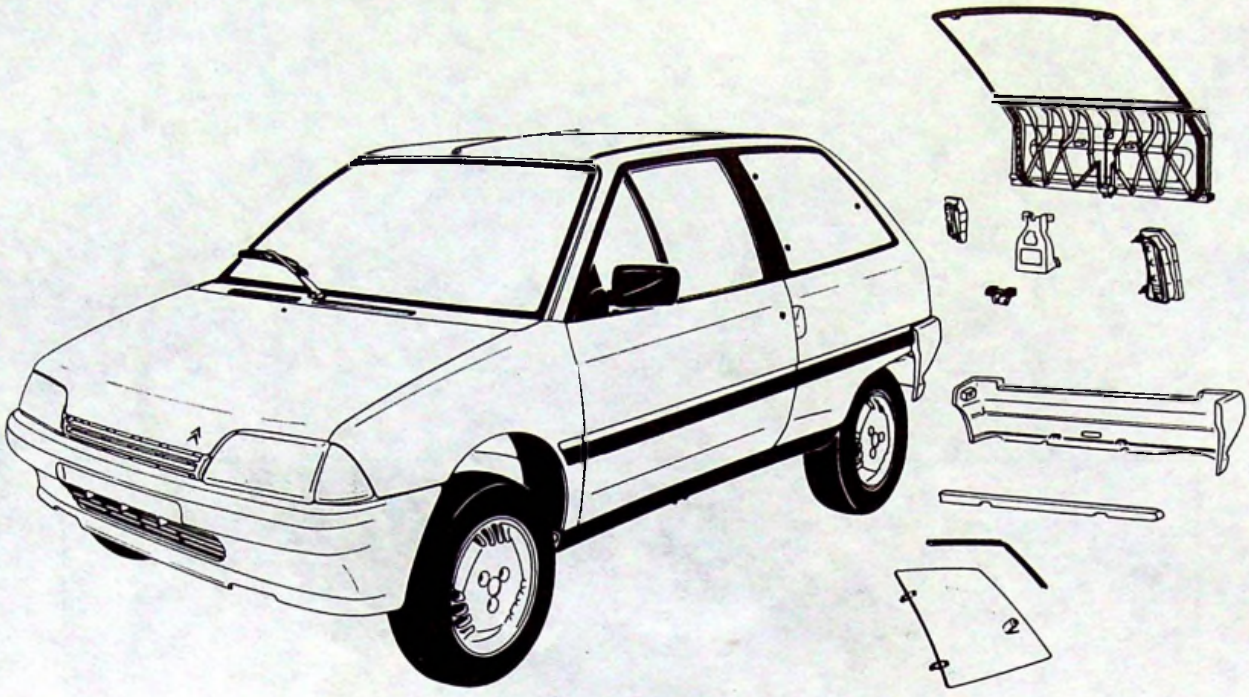

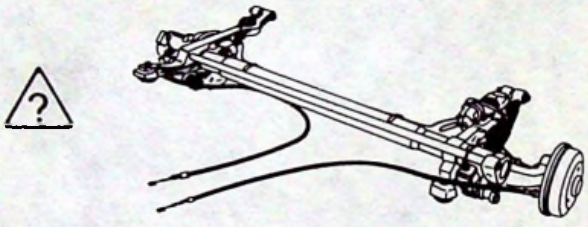

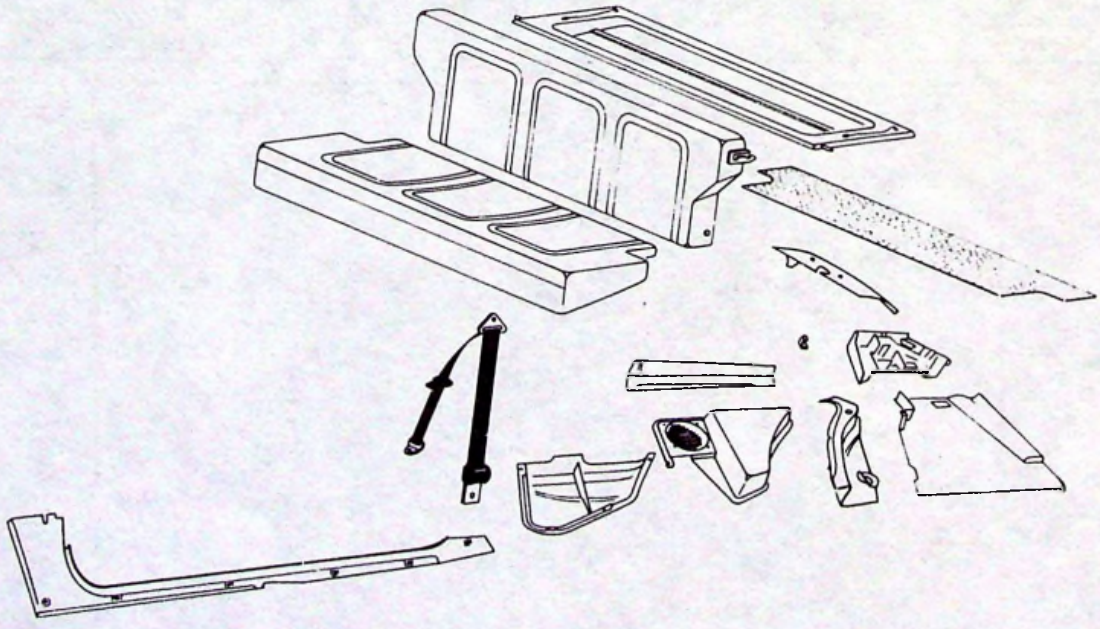

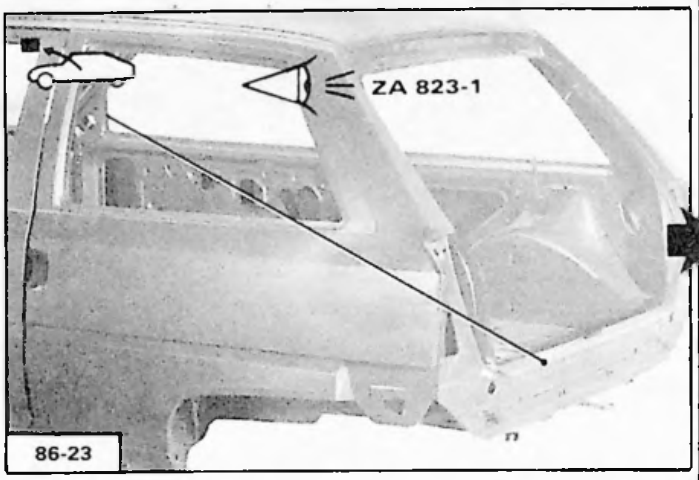
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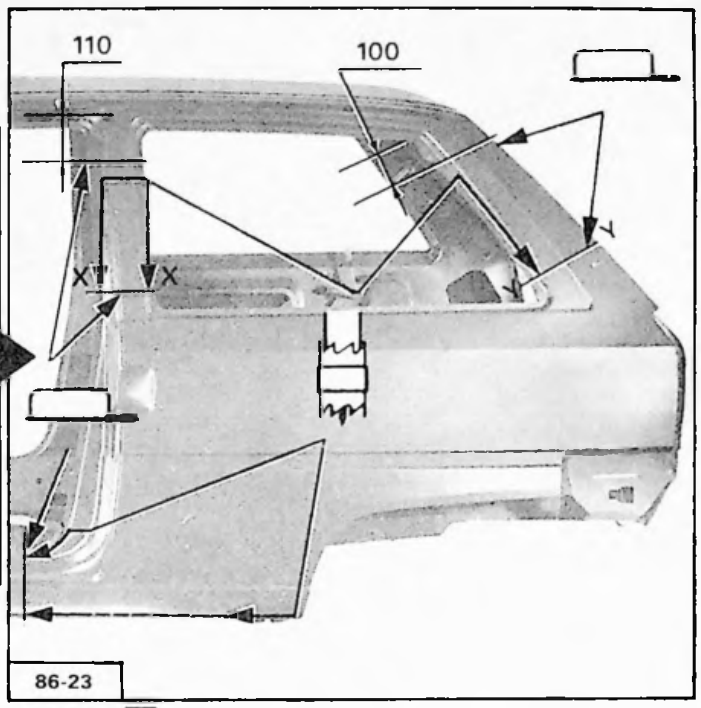
86-23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Y
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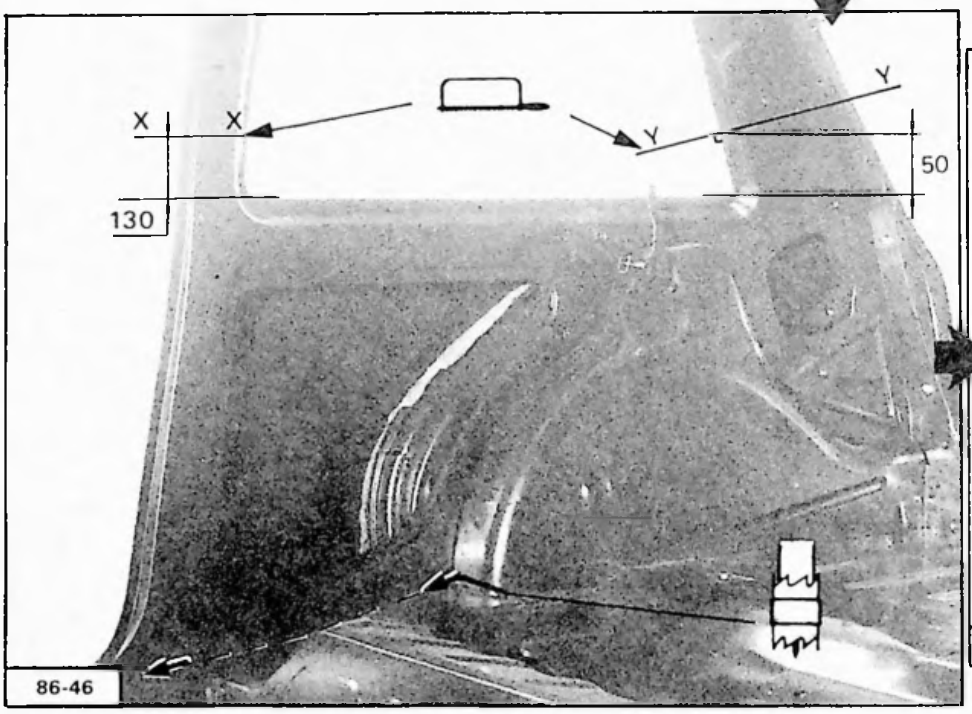
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X
Y
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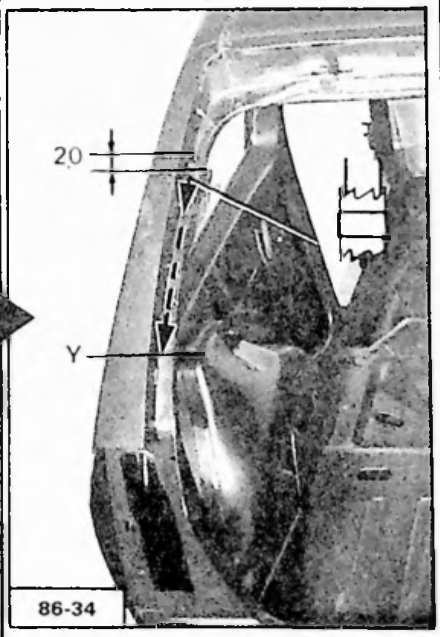
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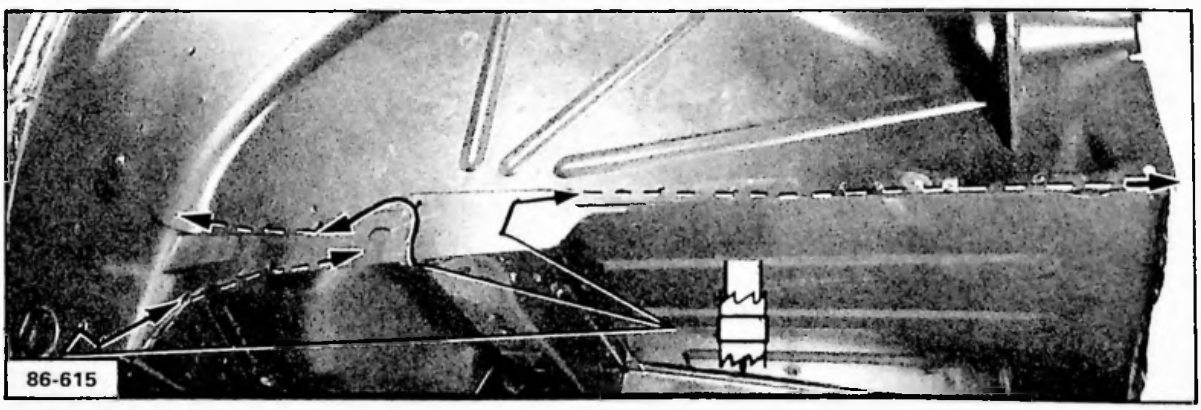
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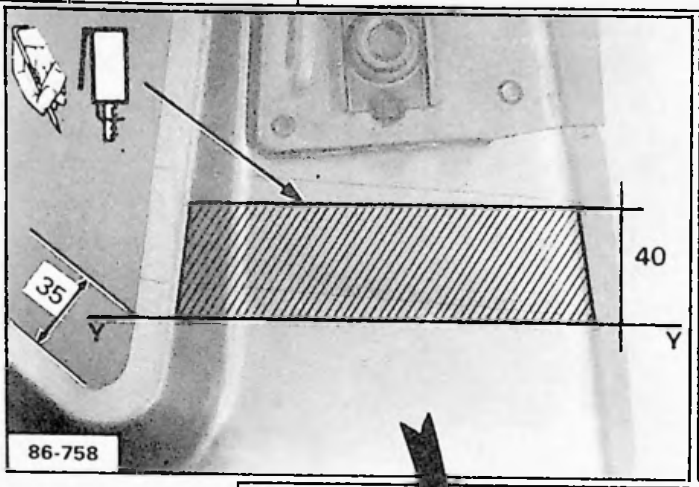
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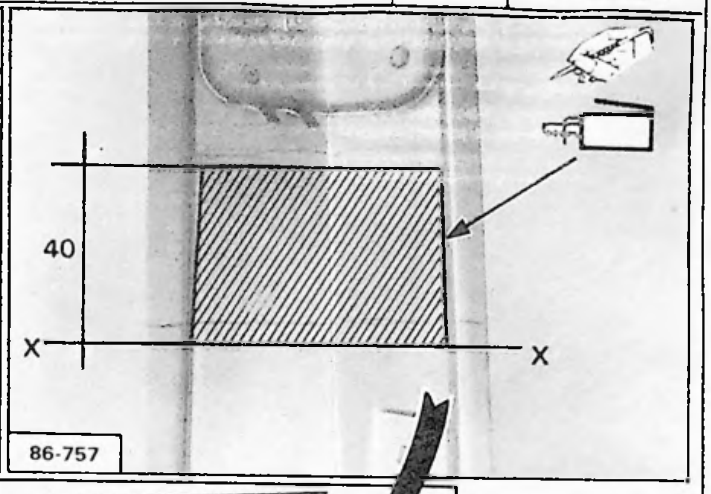
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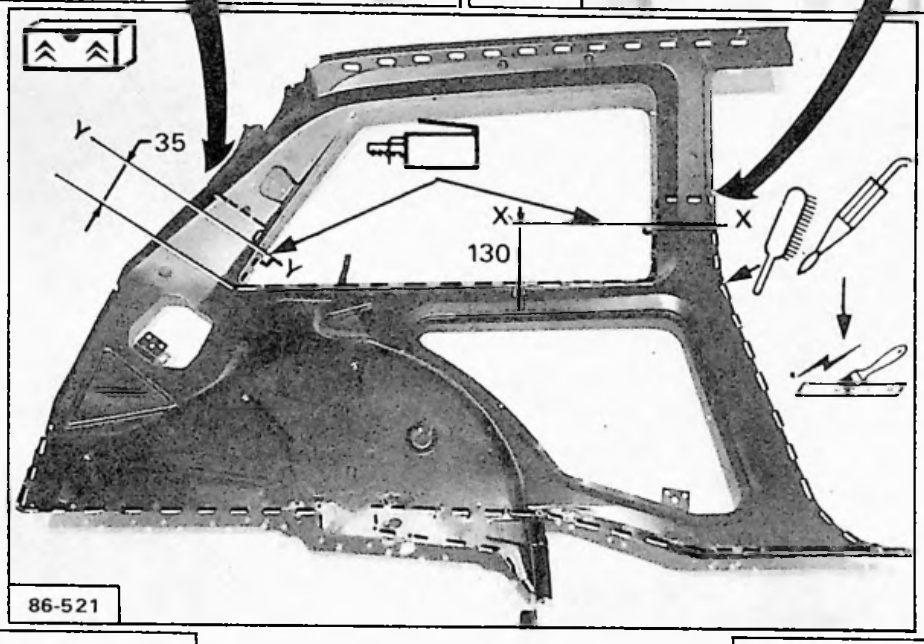
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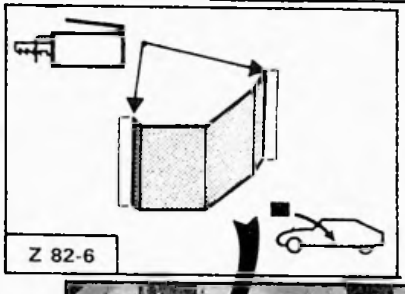
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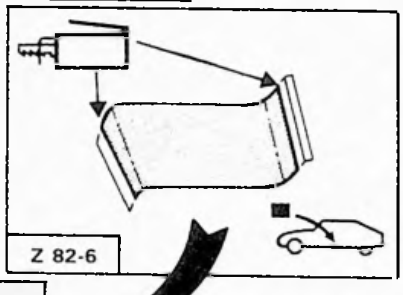
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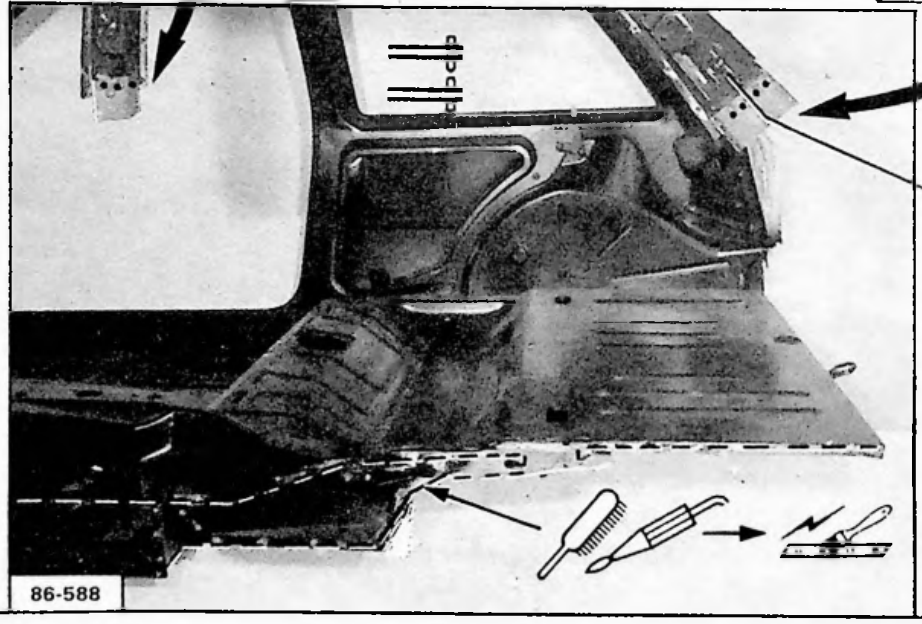
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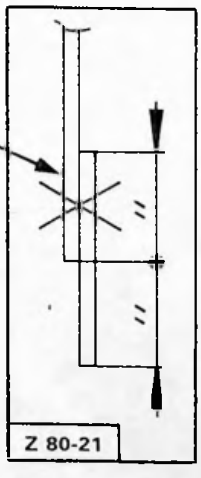
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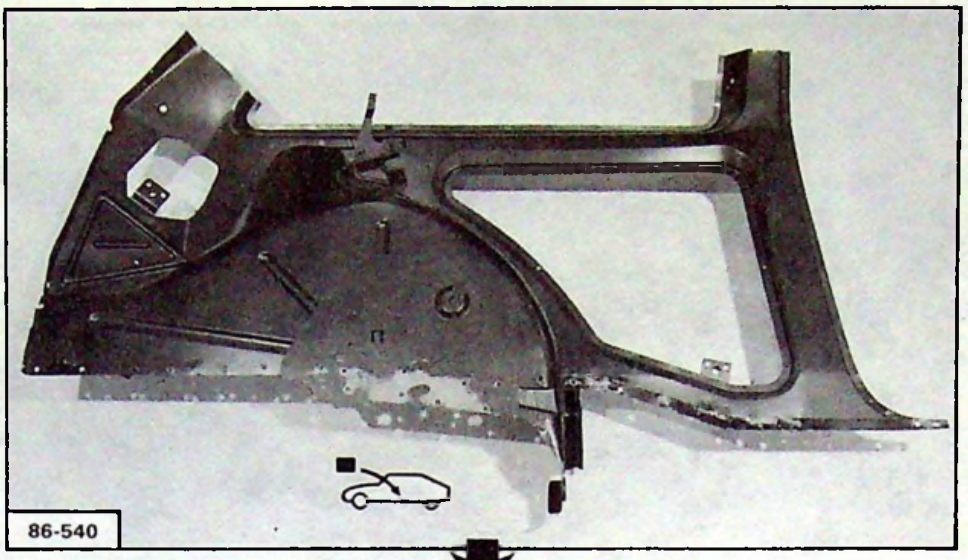
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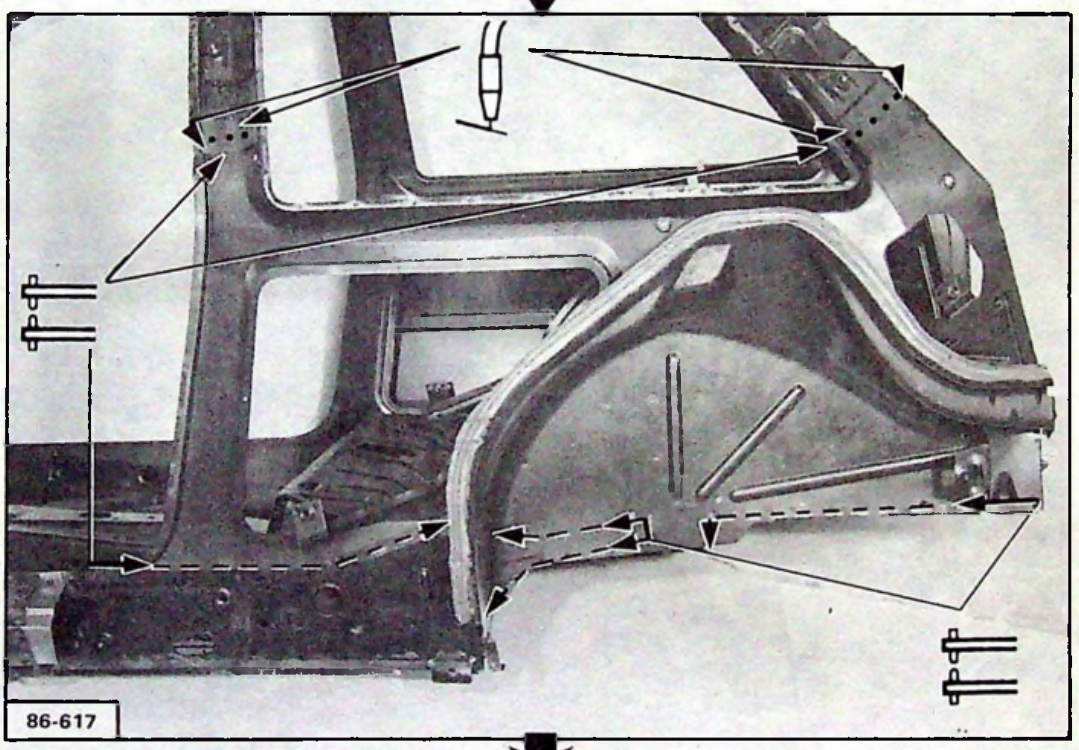
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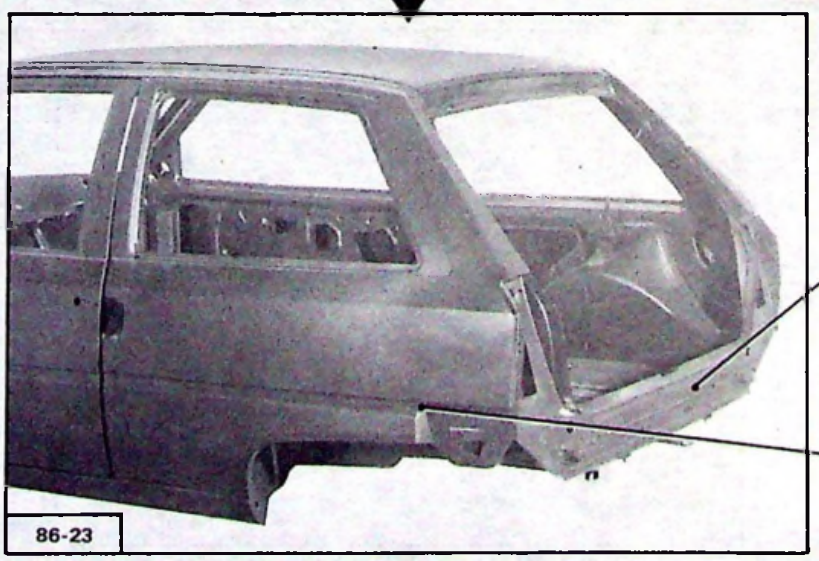
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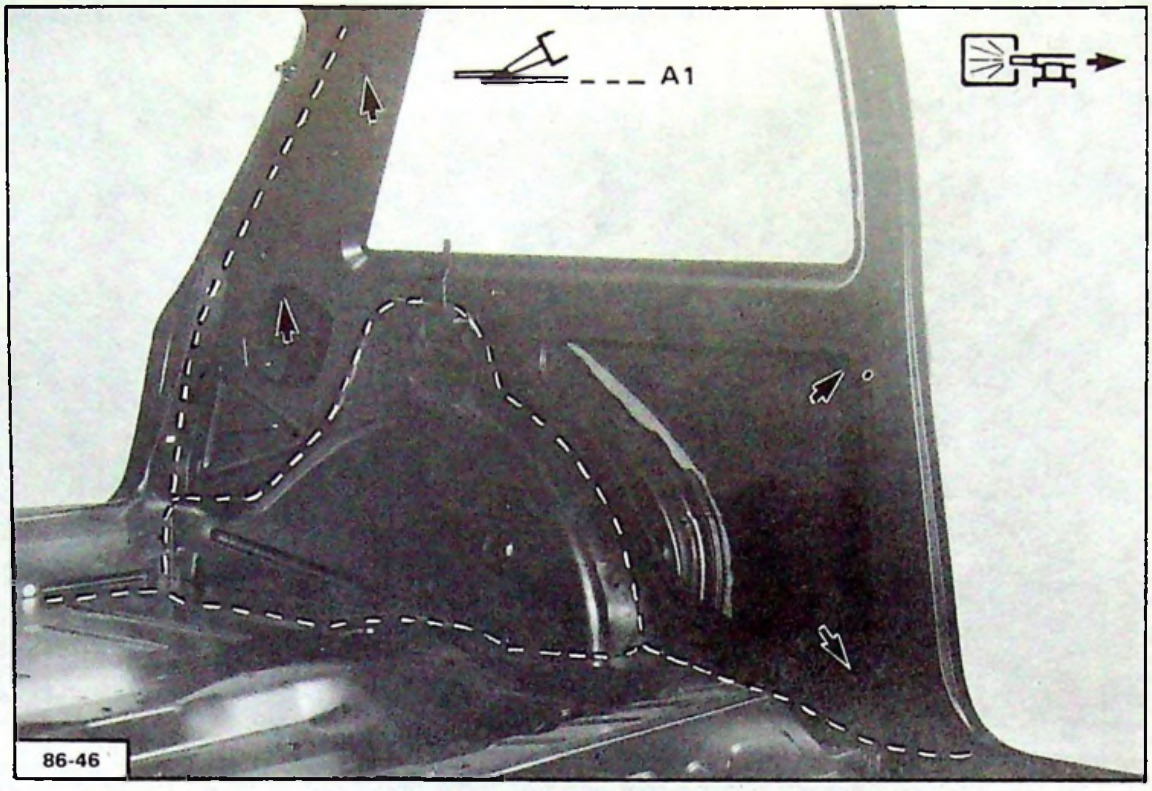
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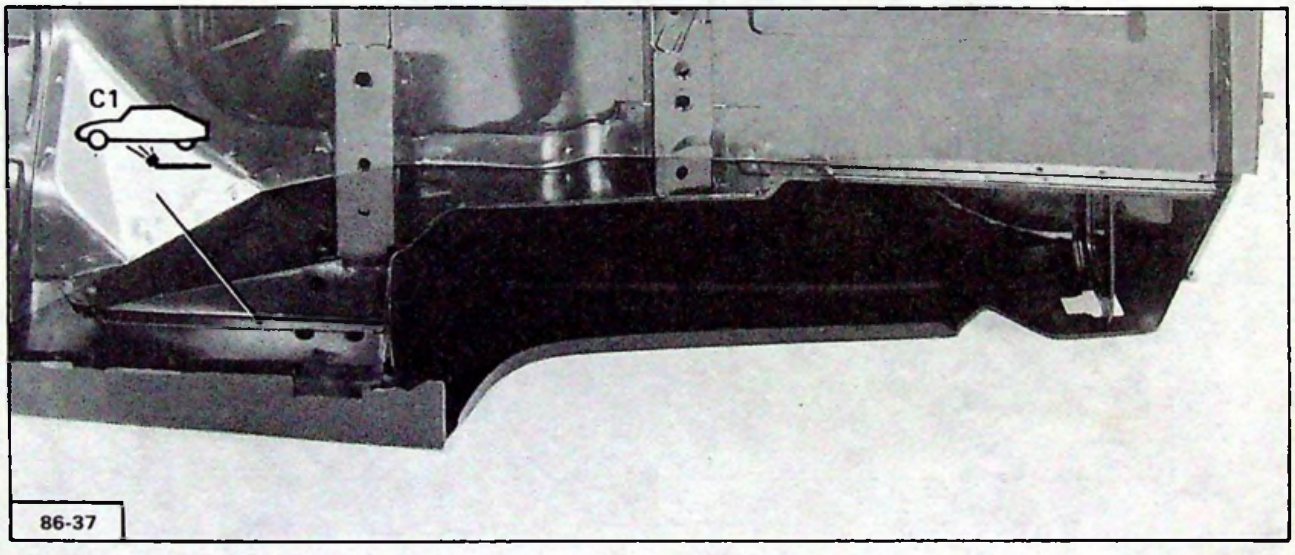
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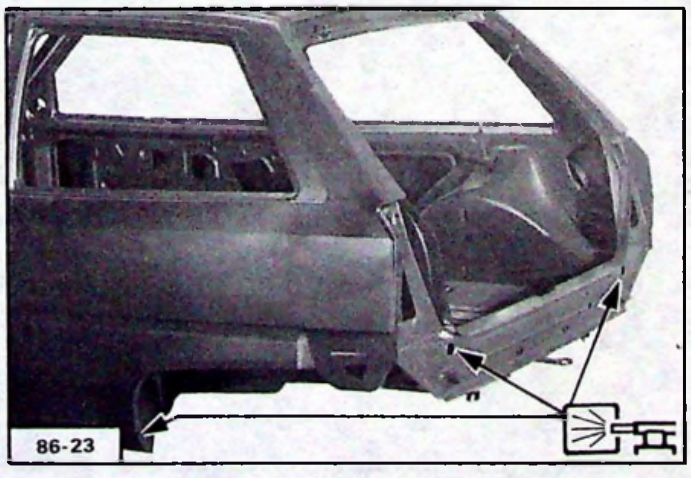
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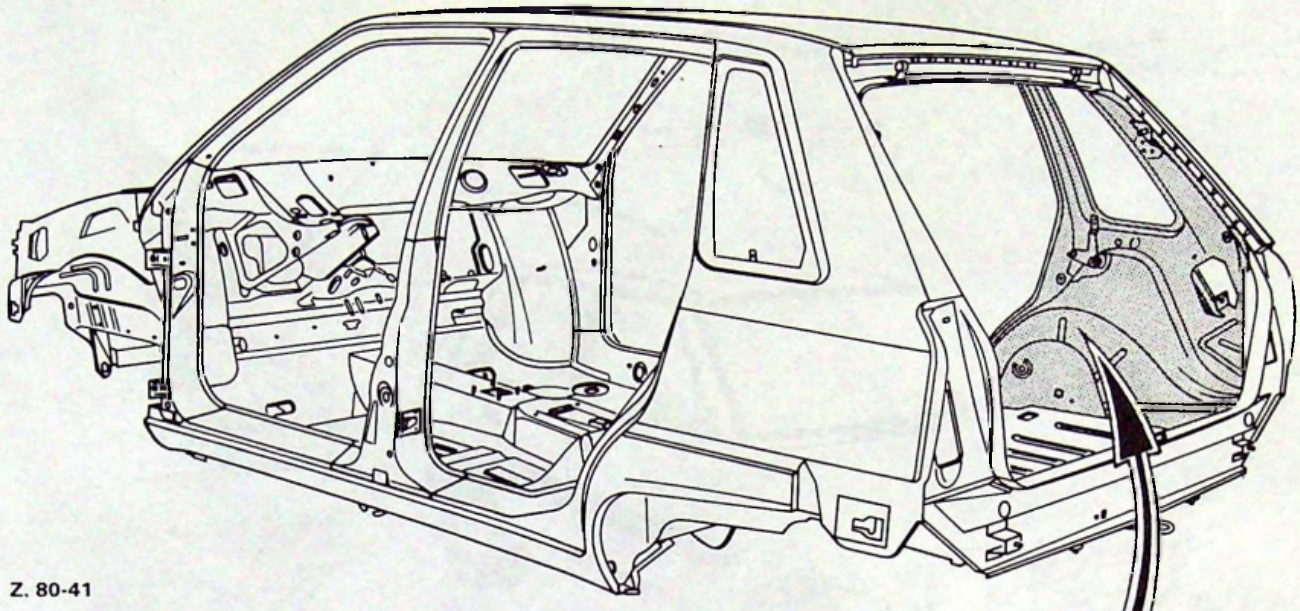

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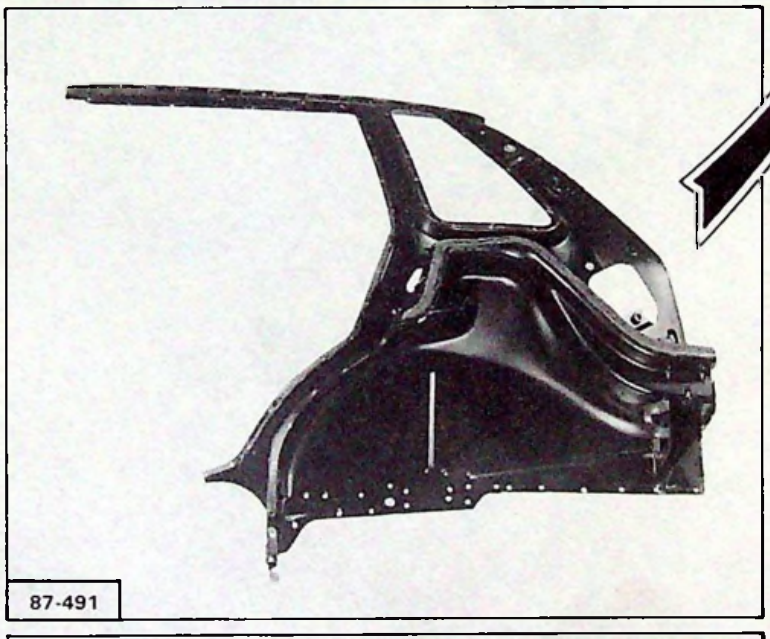

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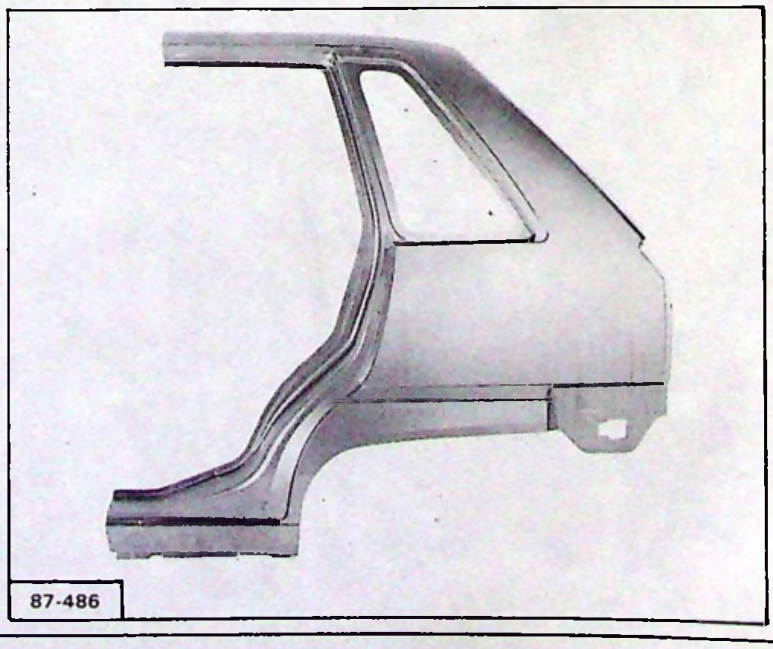

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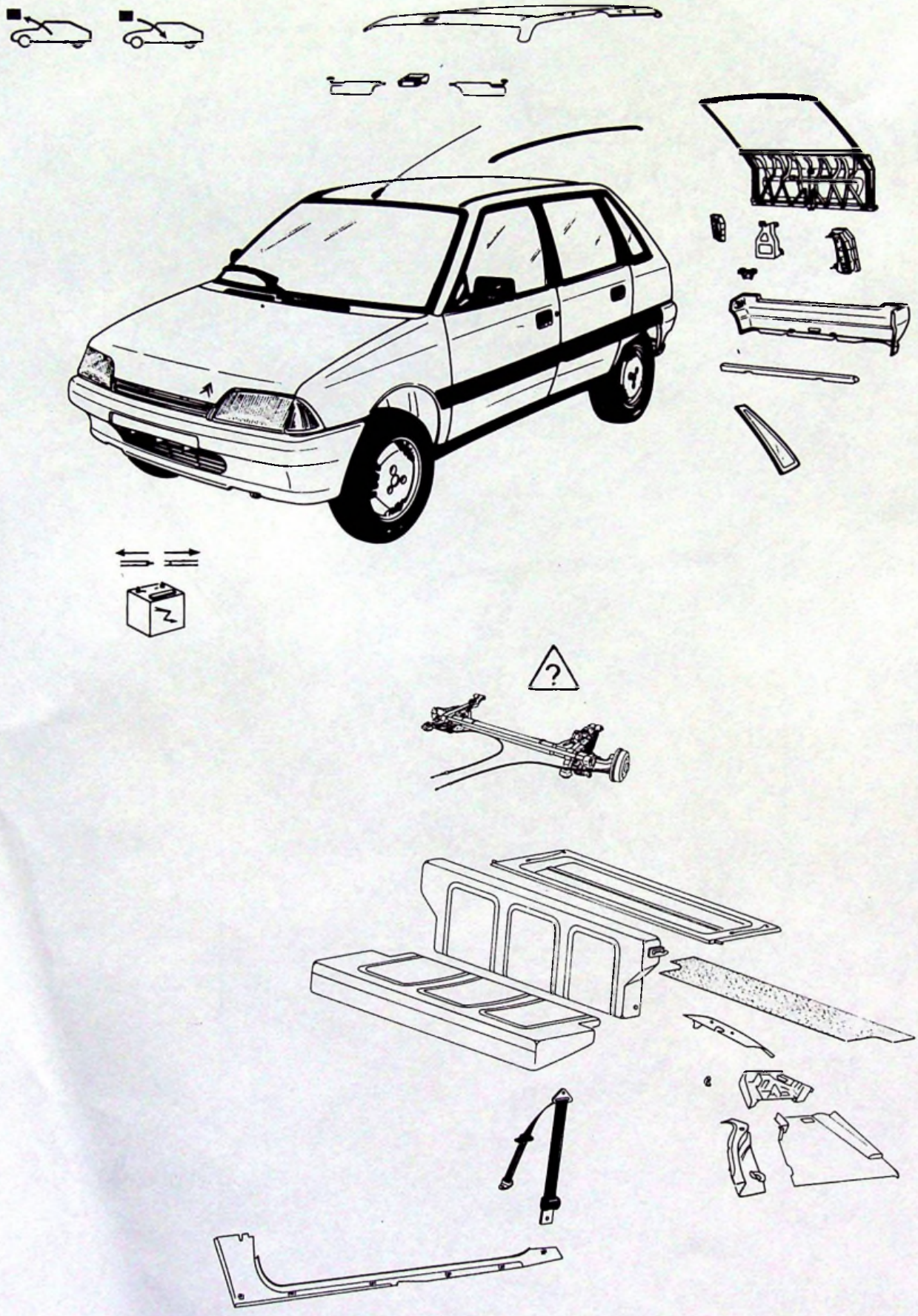

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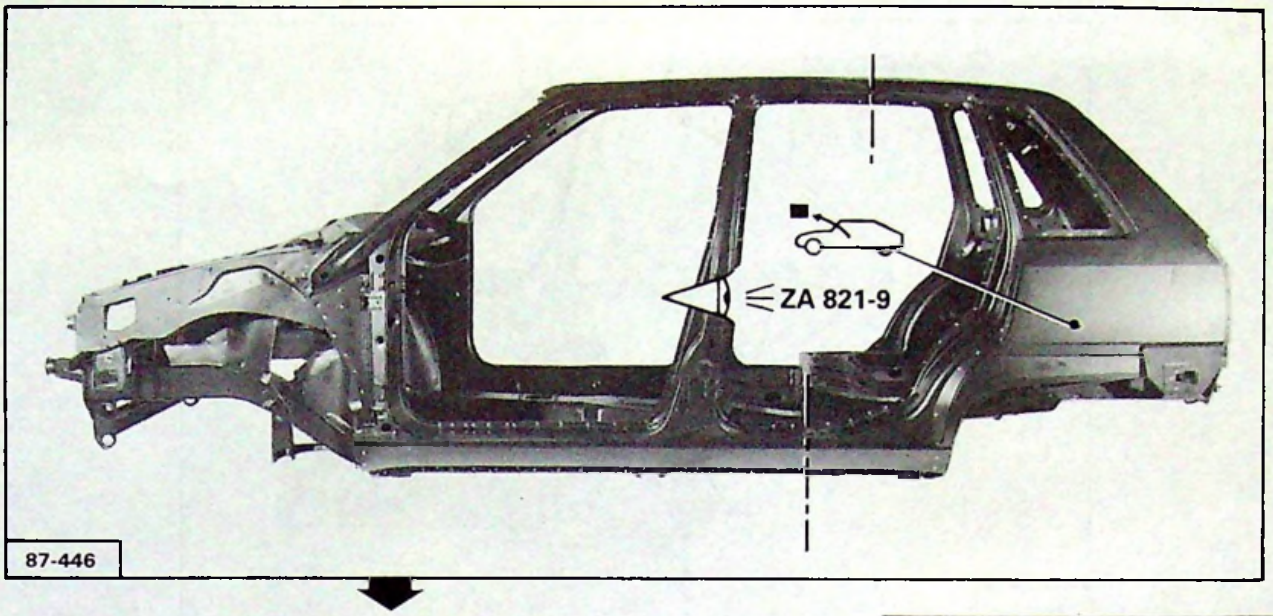
Z. 80-19
Z. 80-45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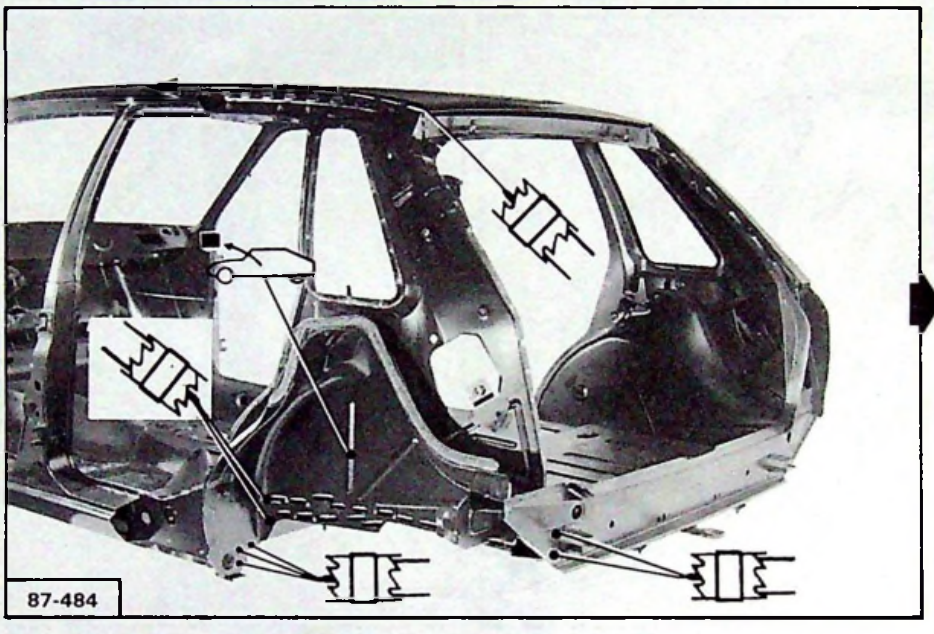
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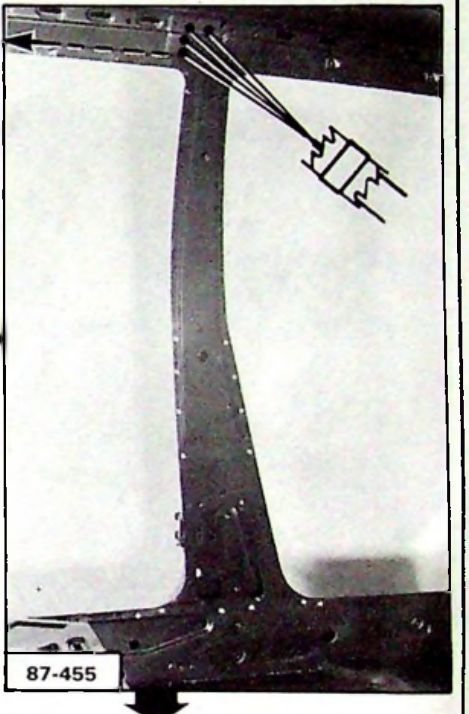
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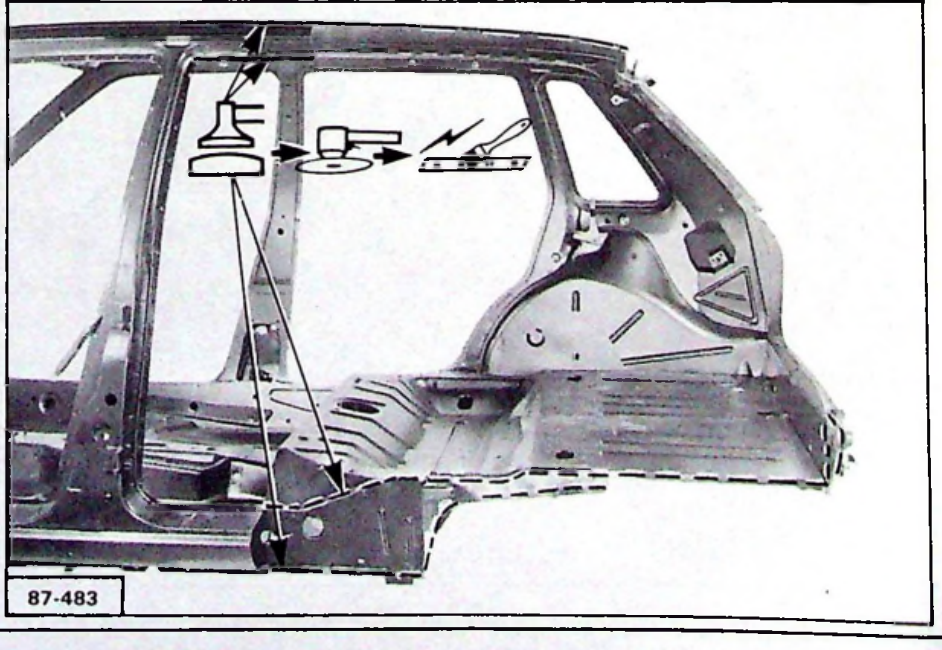
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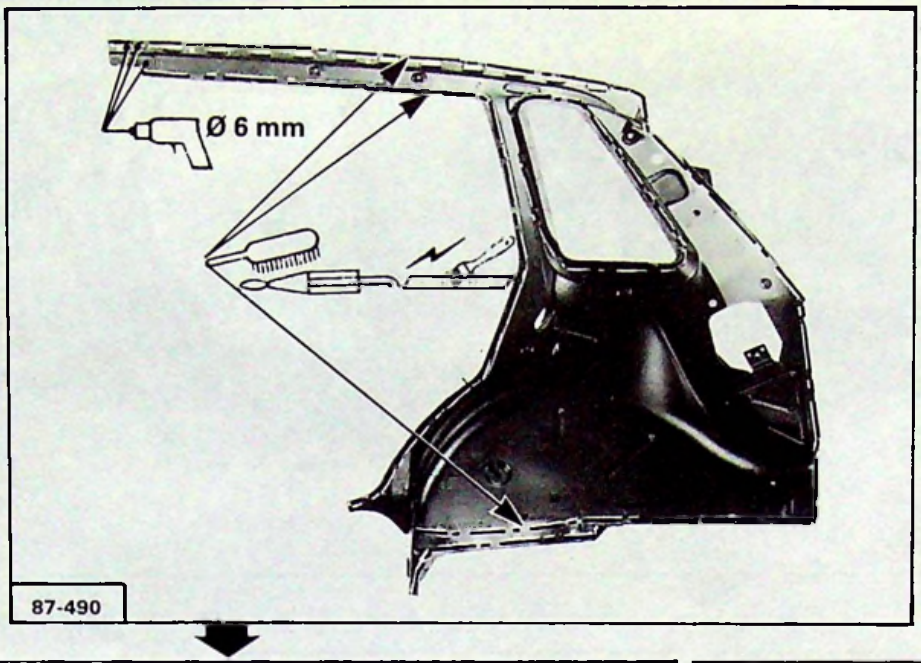
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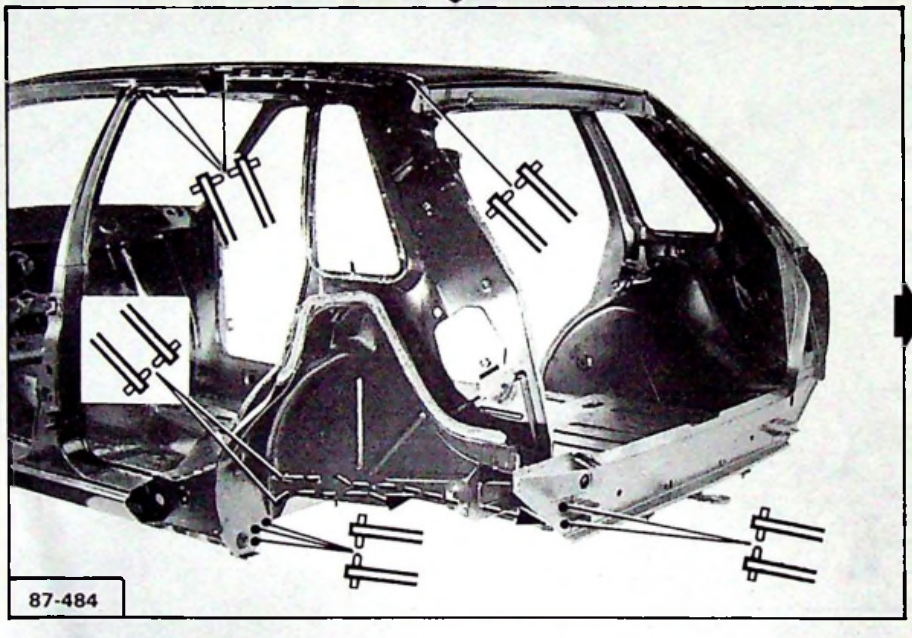
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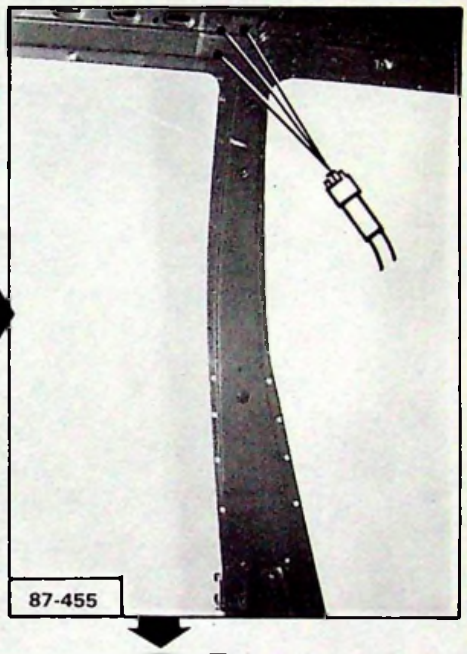
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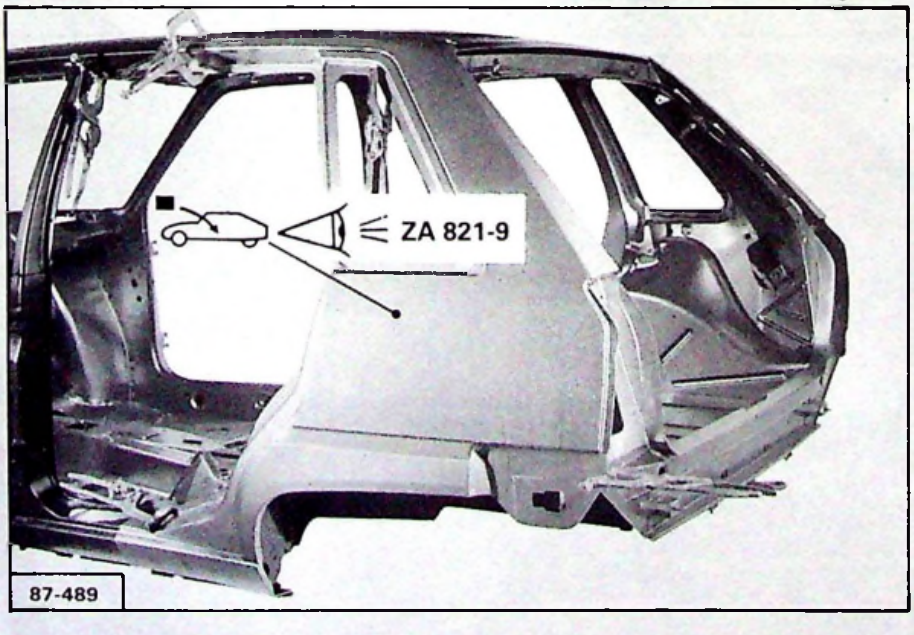
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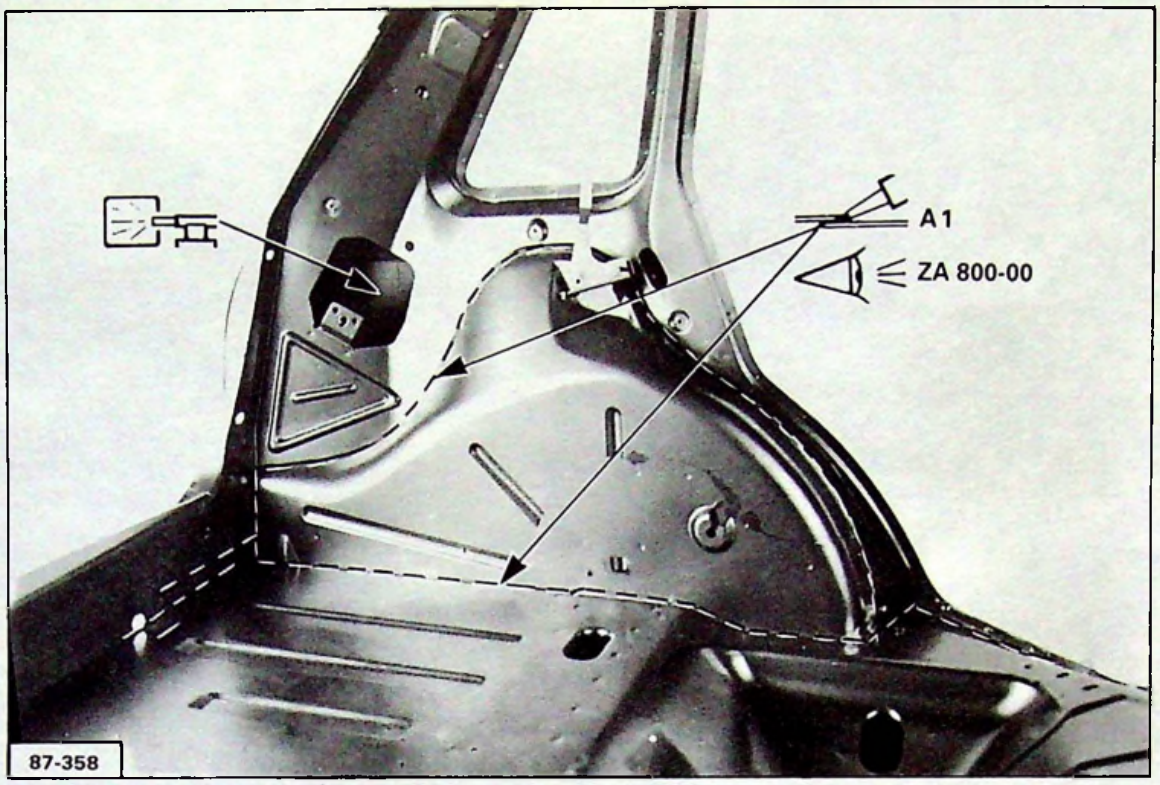
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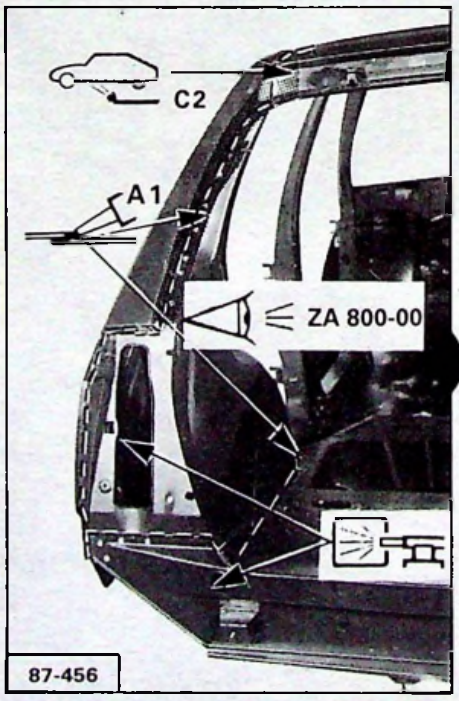
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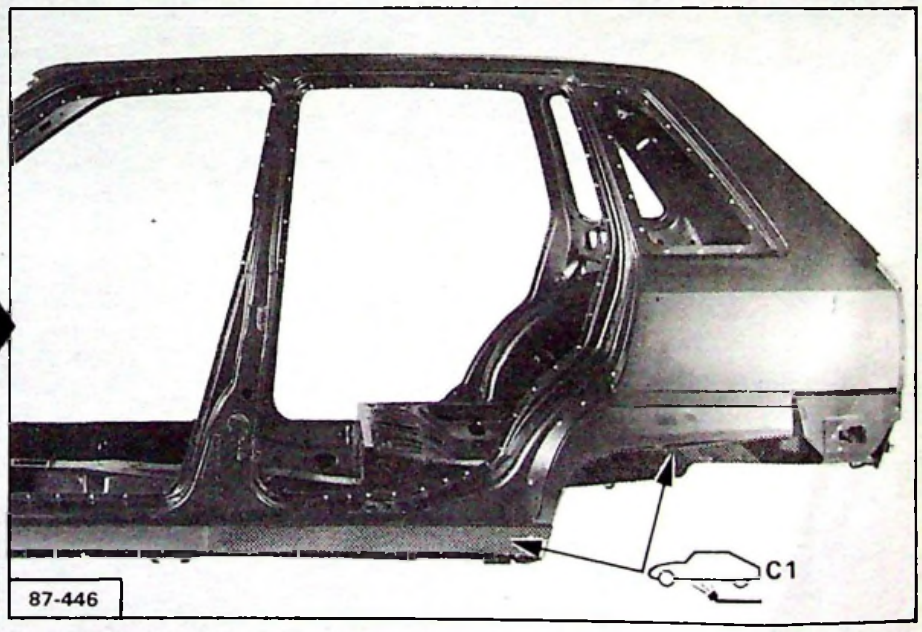
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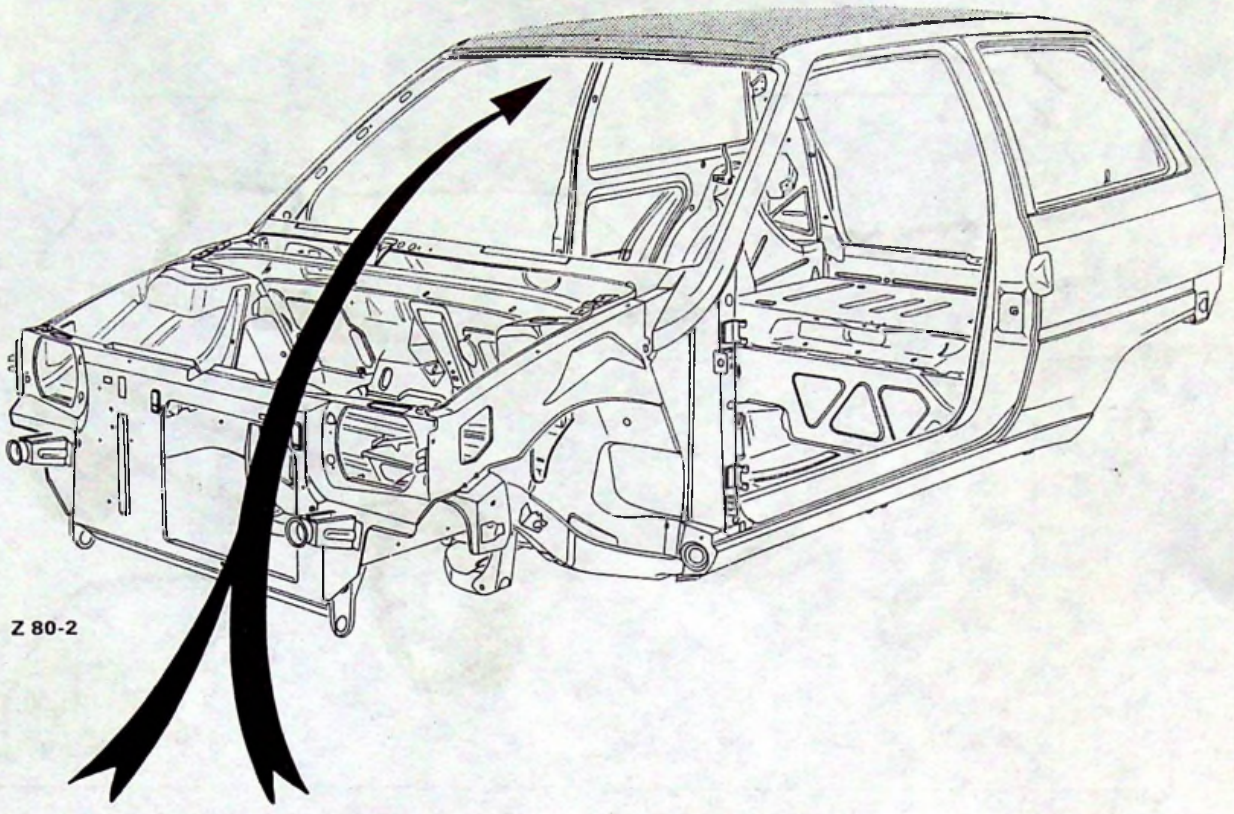

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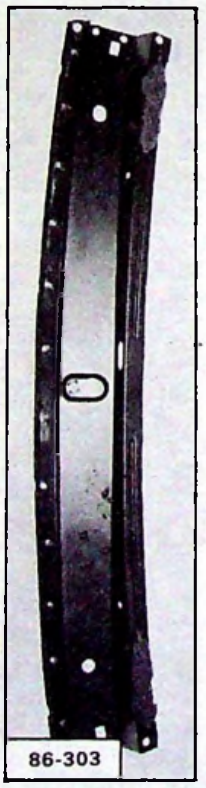

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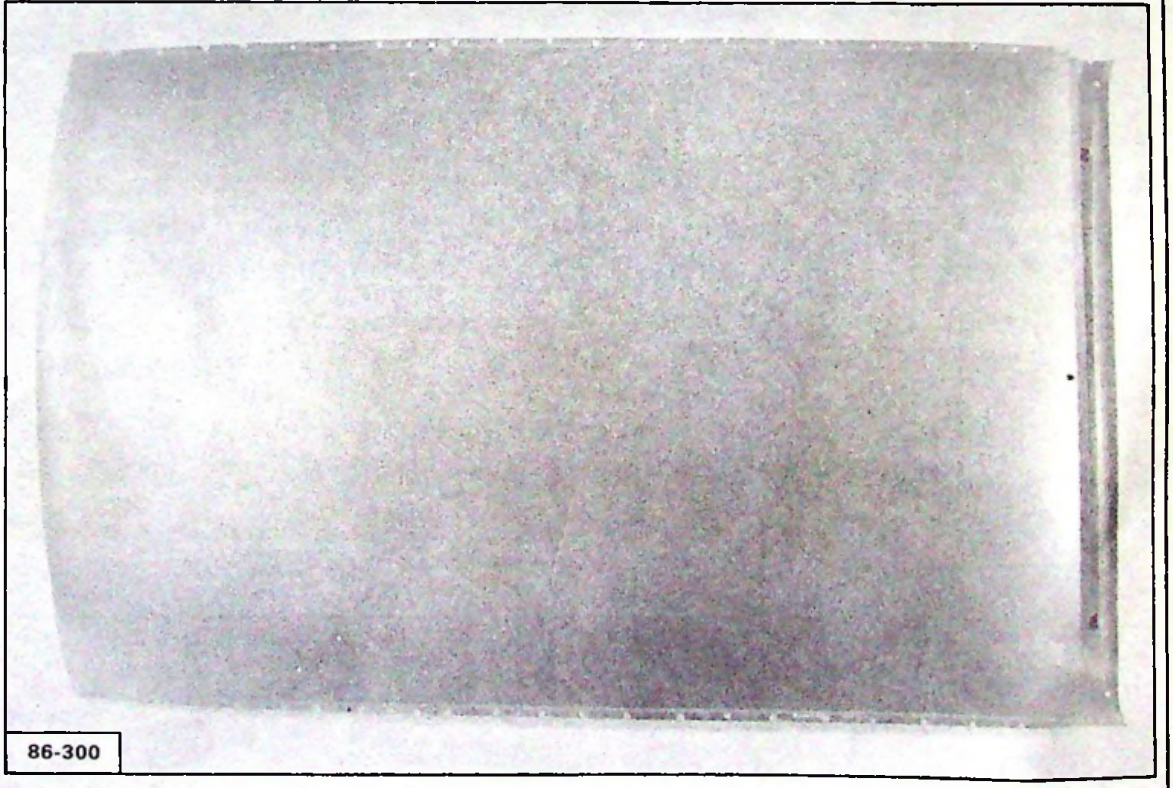

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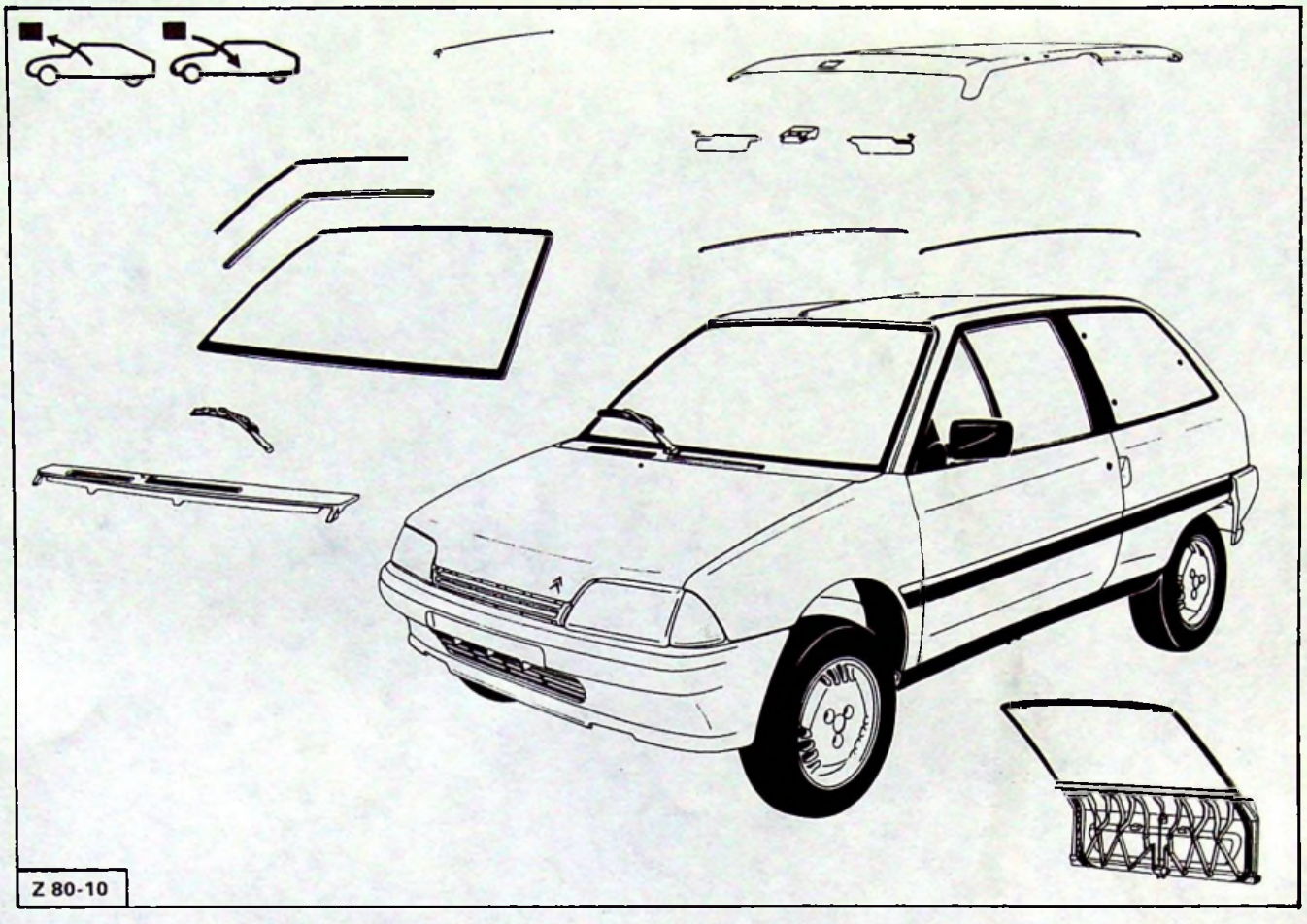
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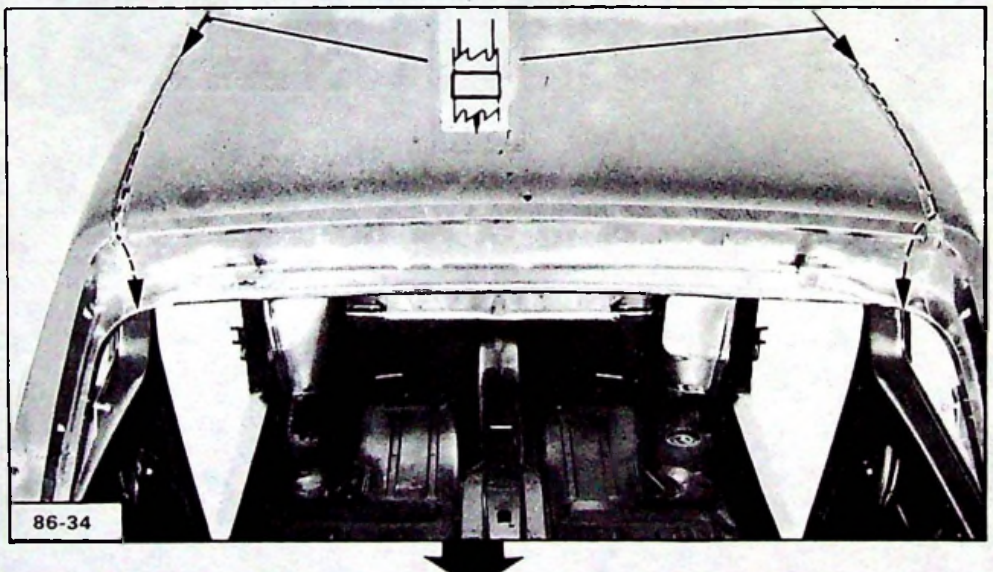
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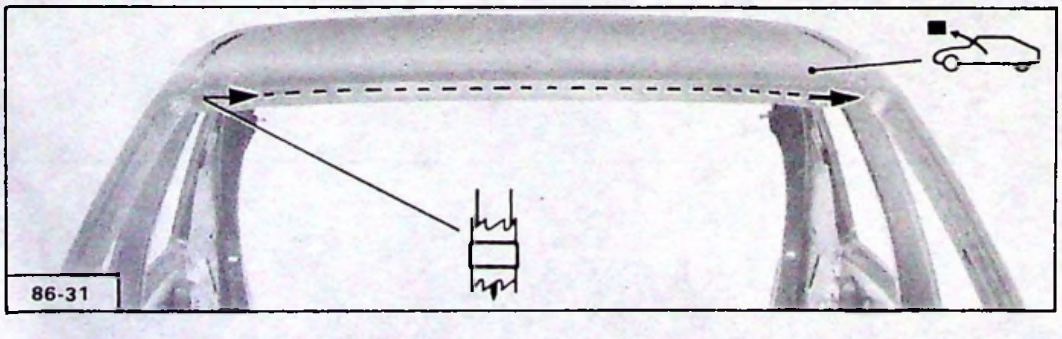
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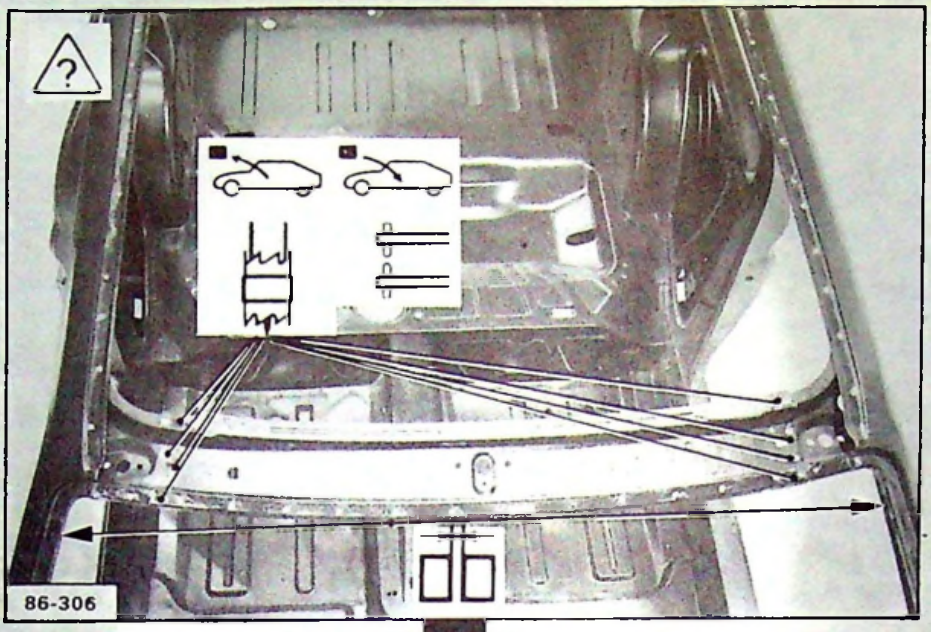
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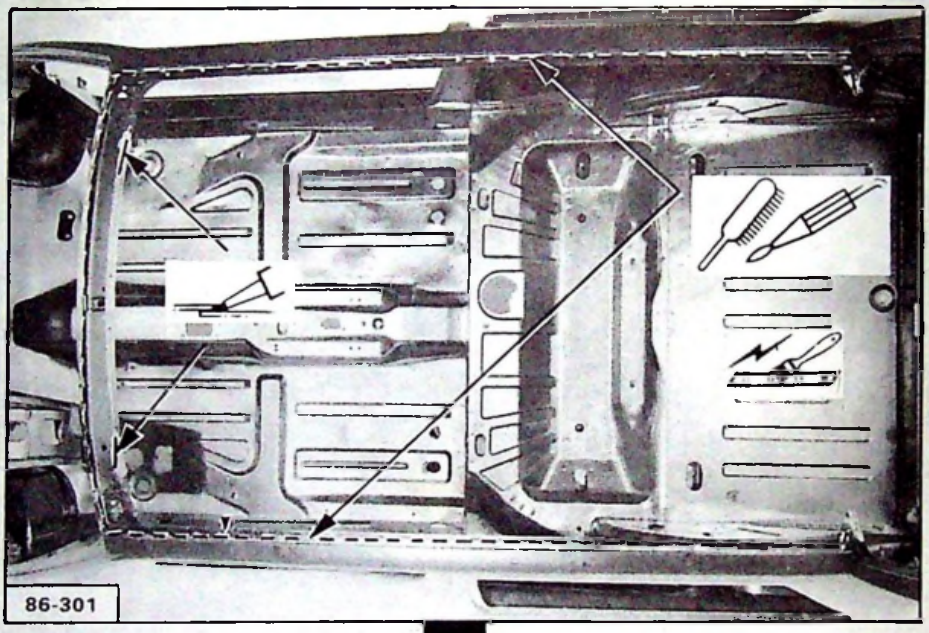
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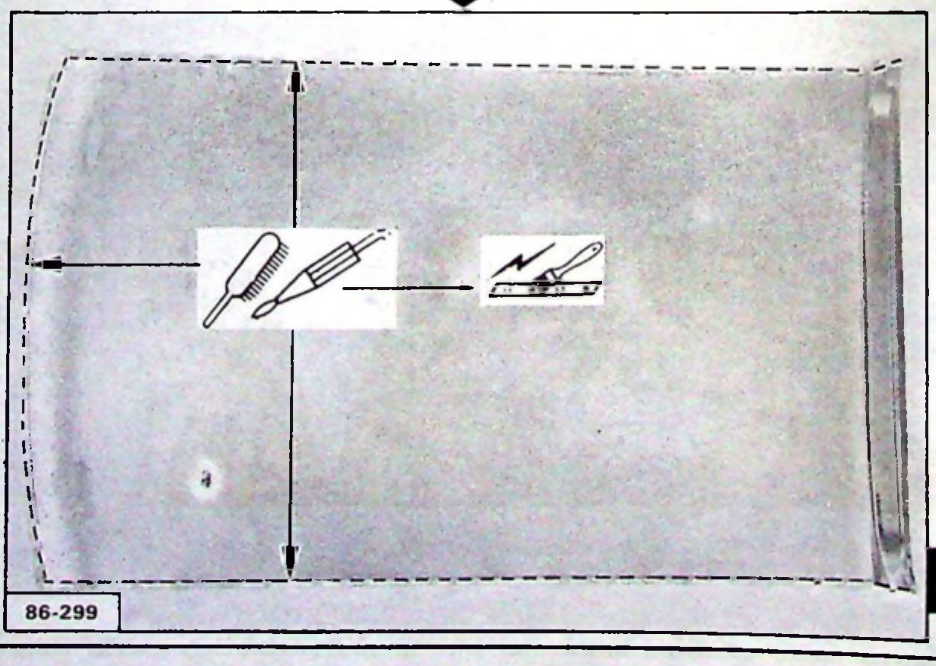
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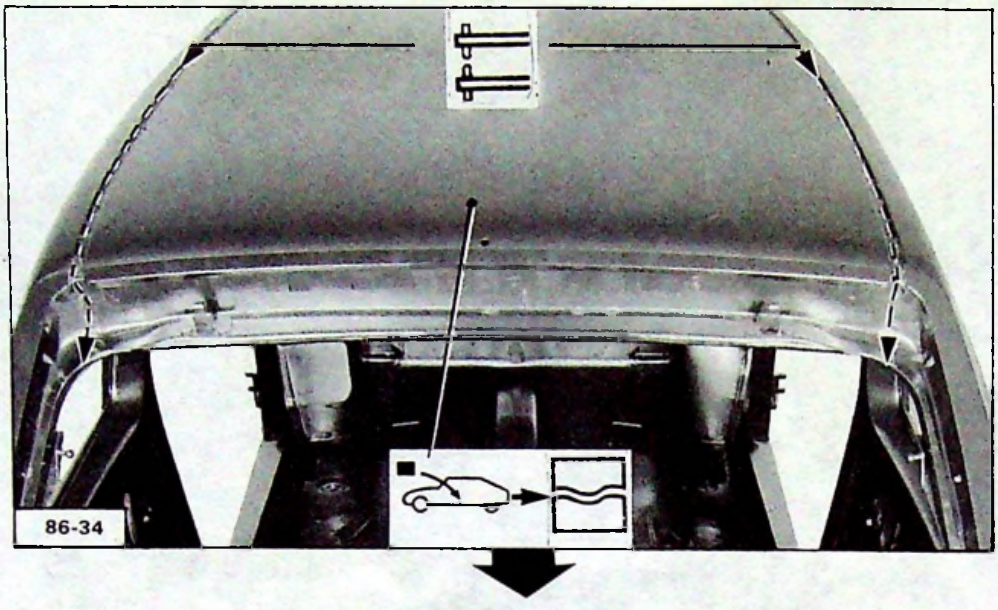
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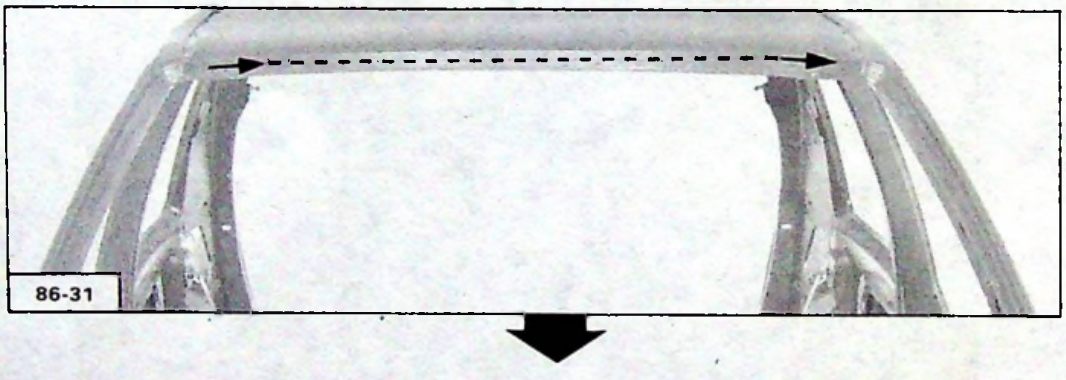
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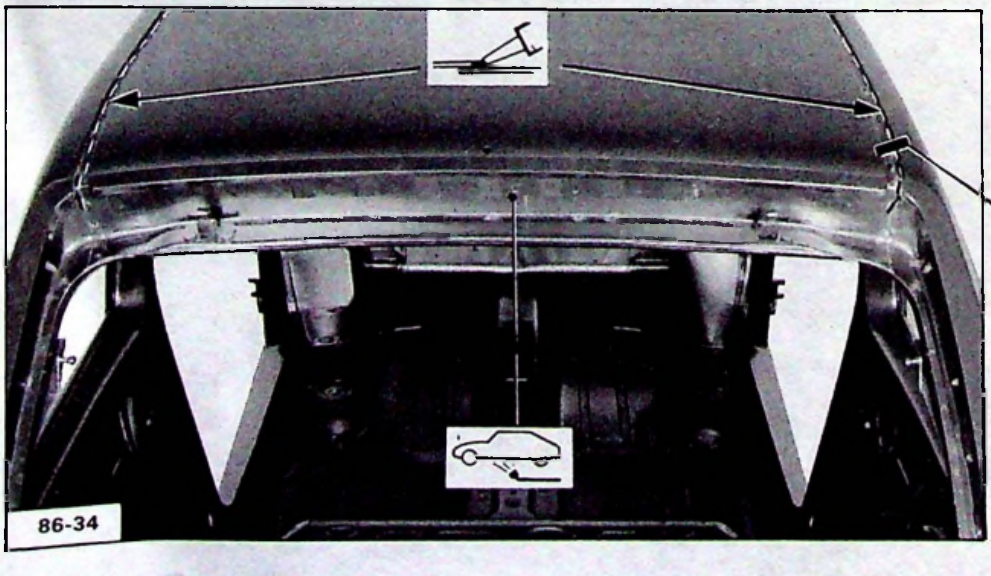
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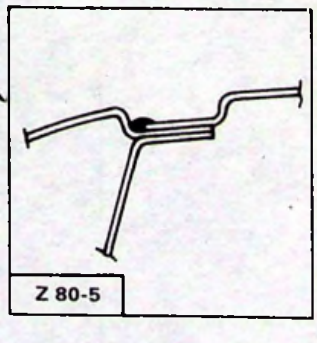
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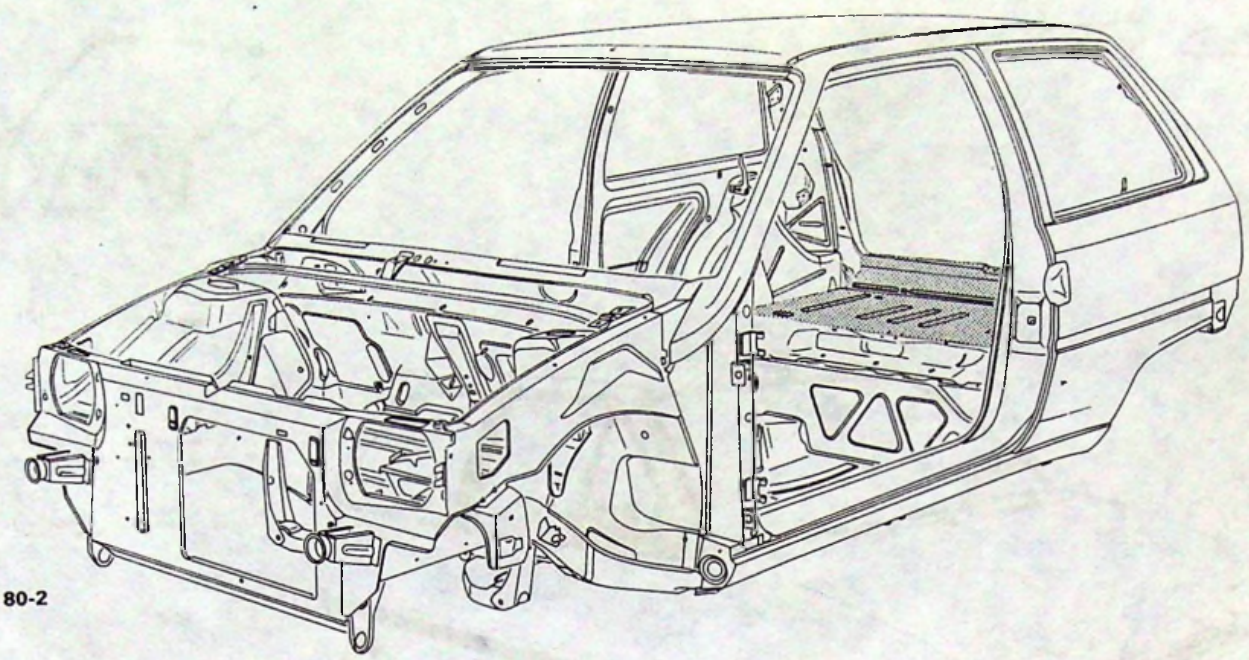

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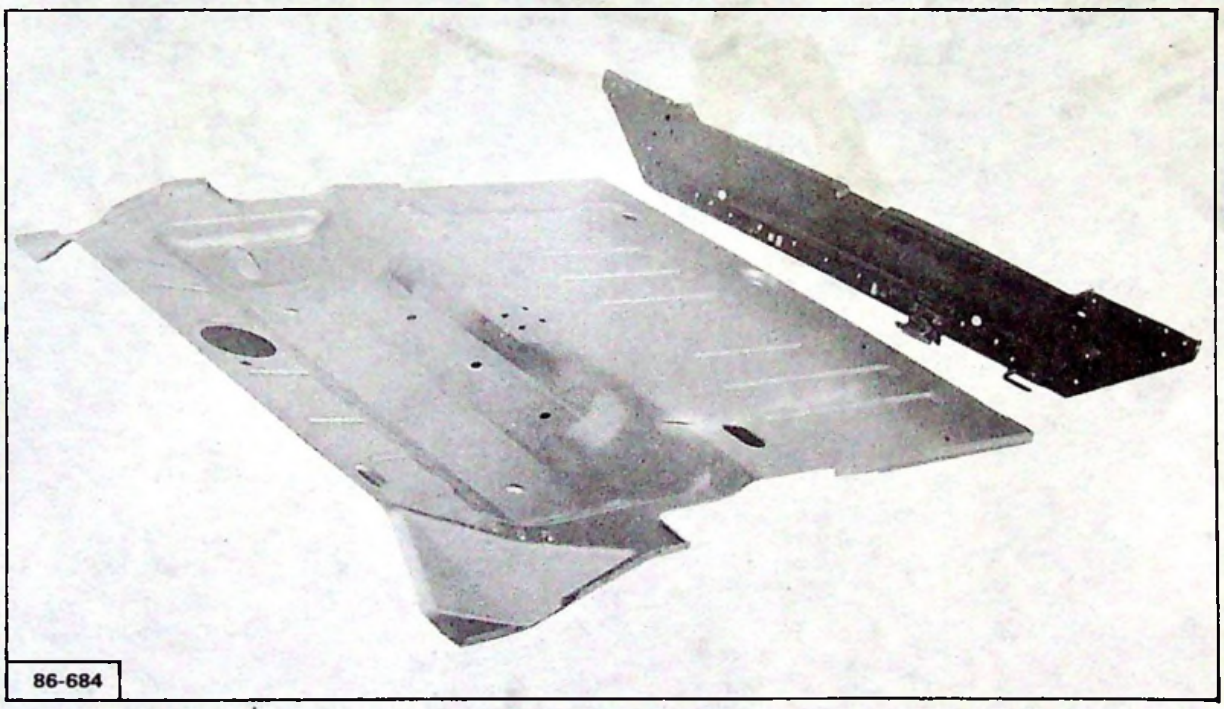

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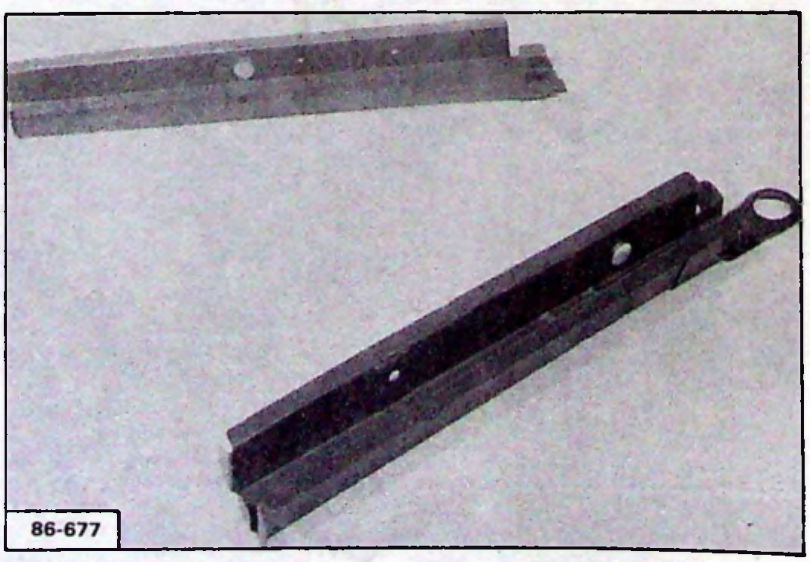

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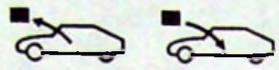

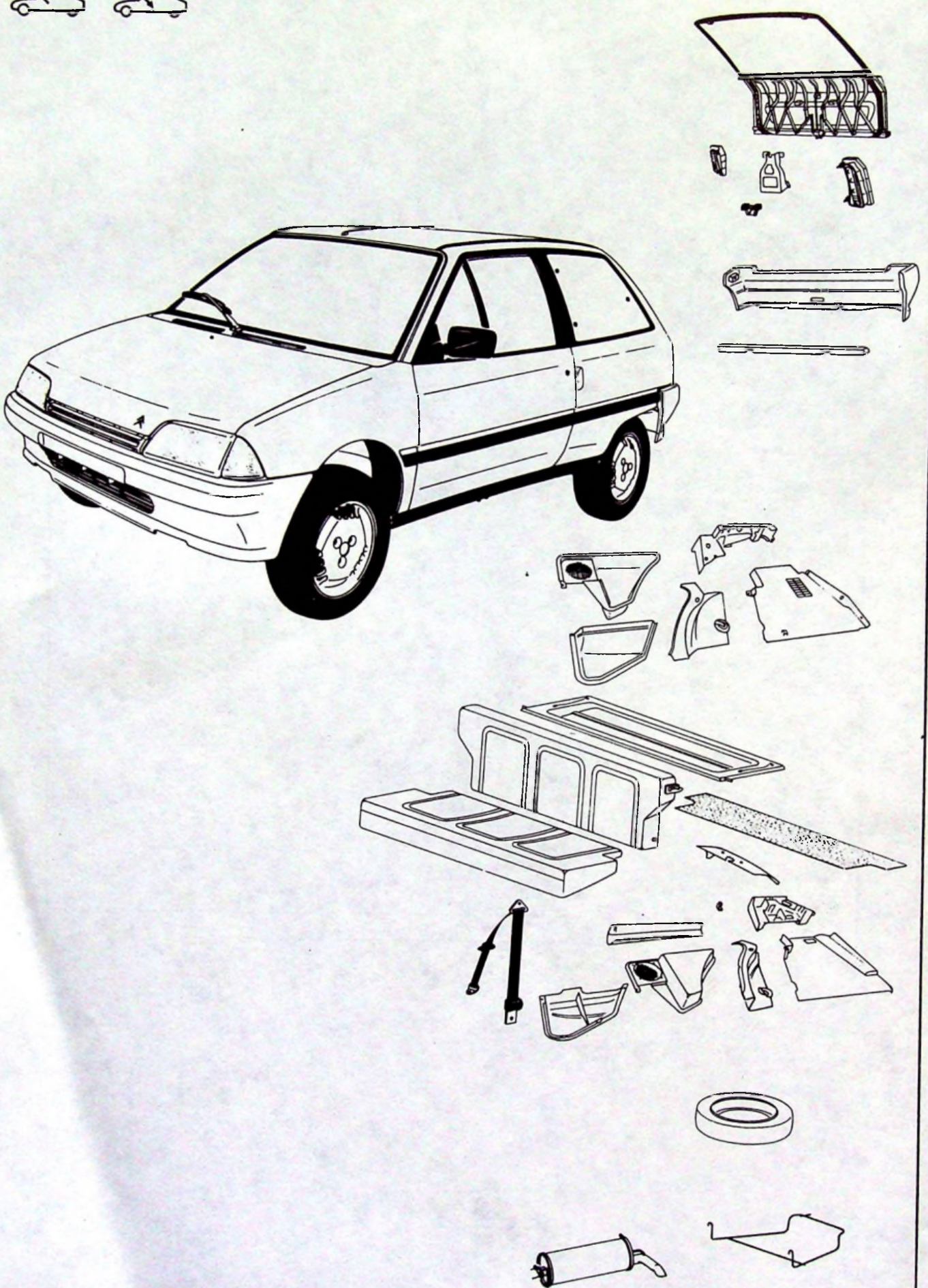

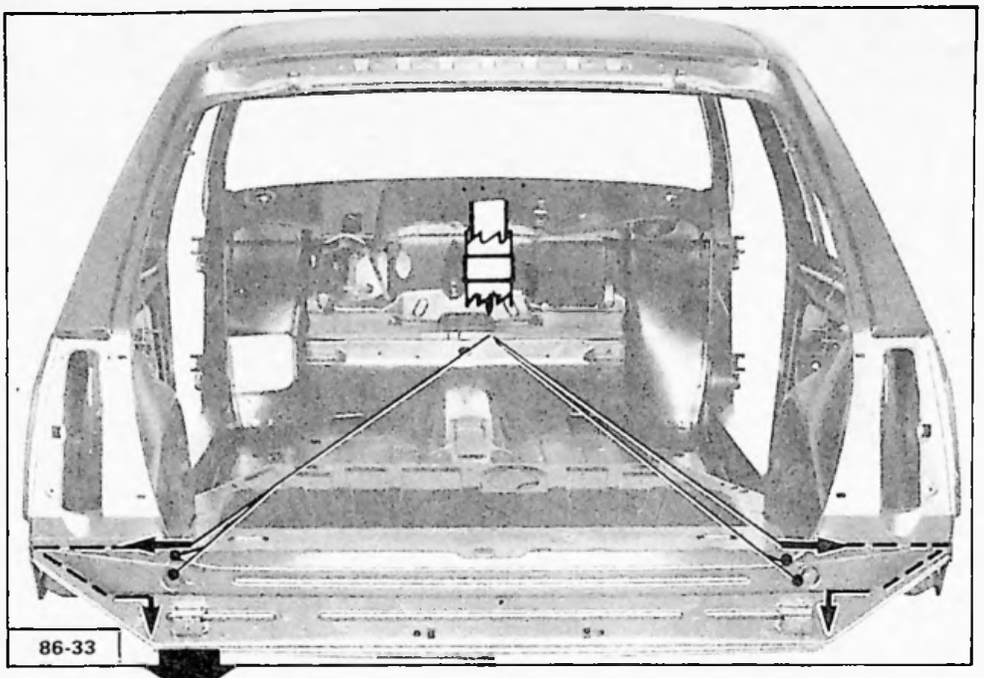
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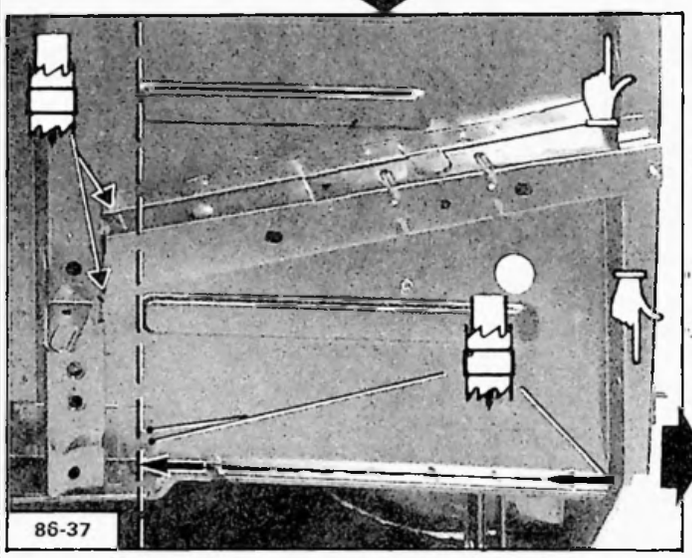
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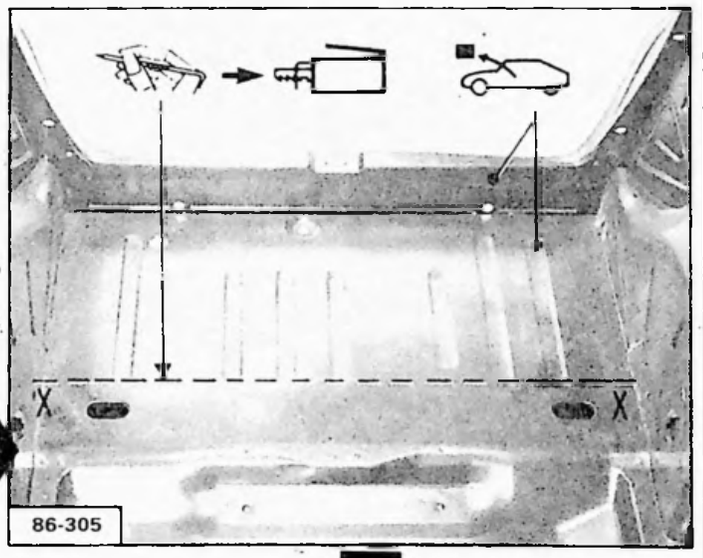
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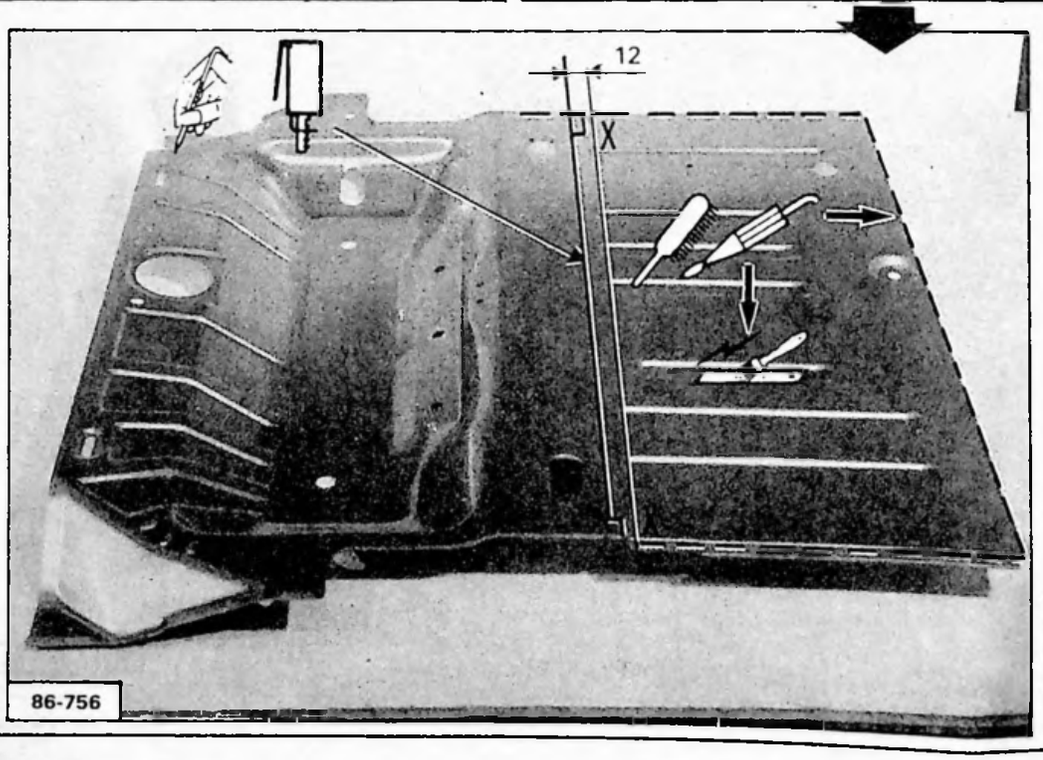
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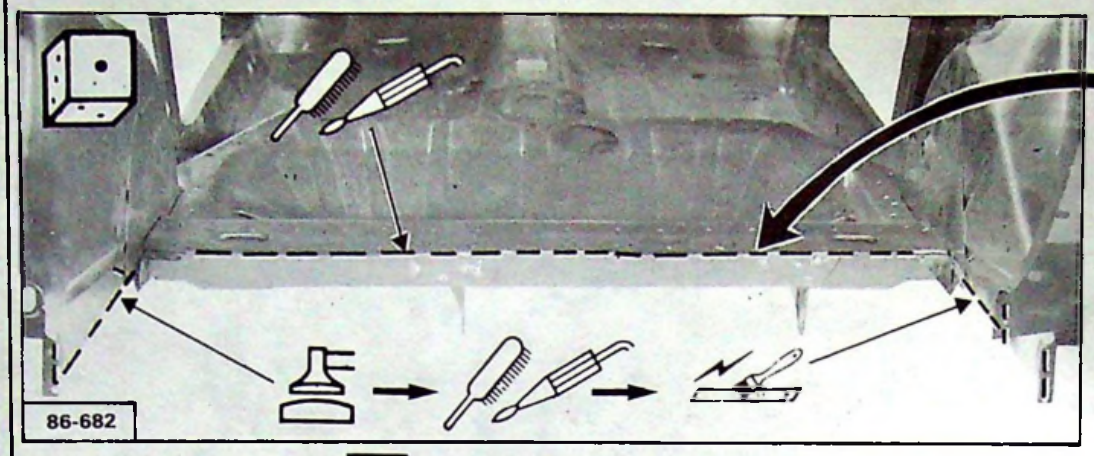
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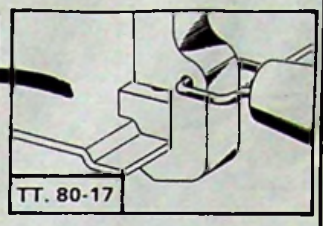
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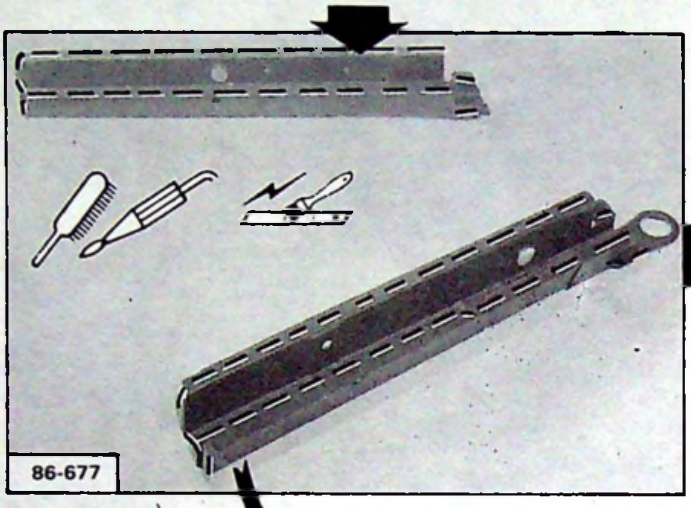
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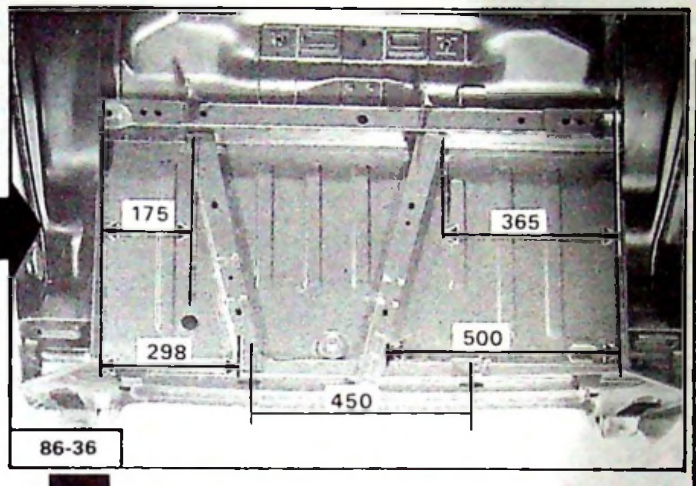
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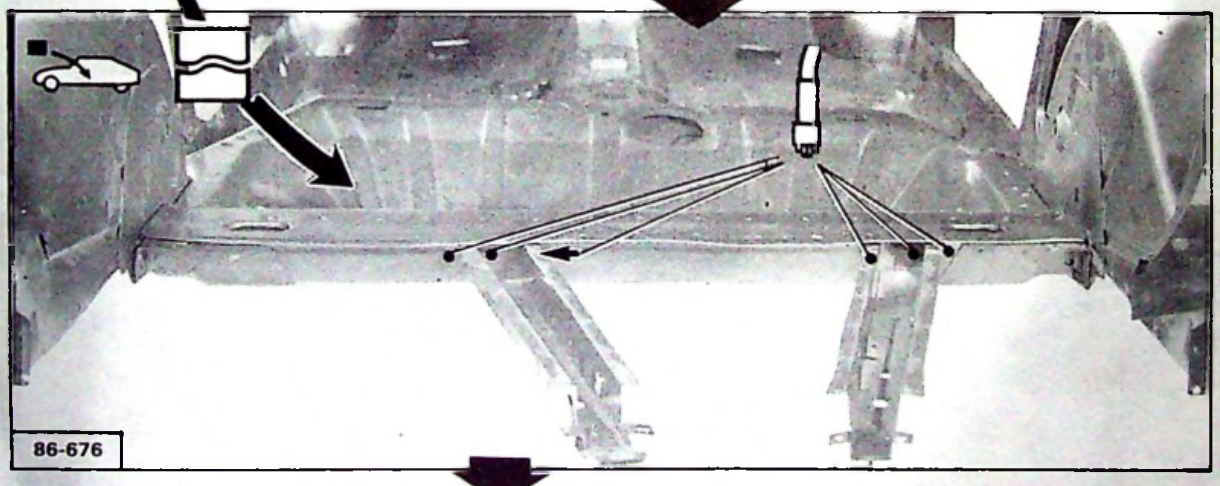
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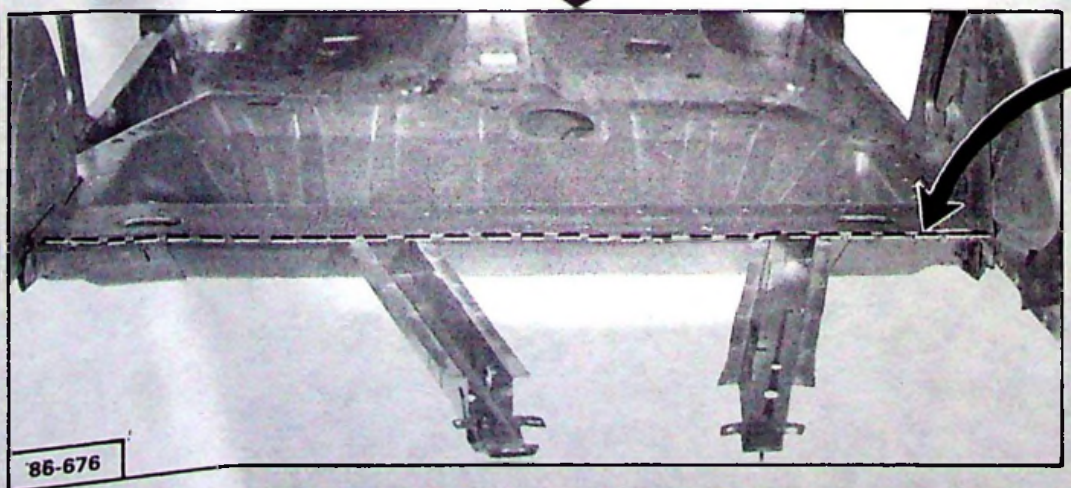
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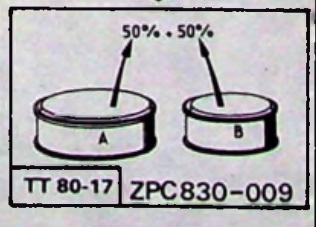
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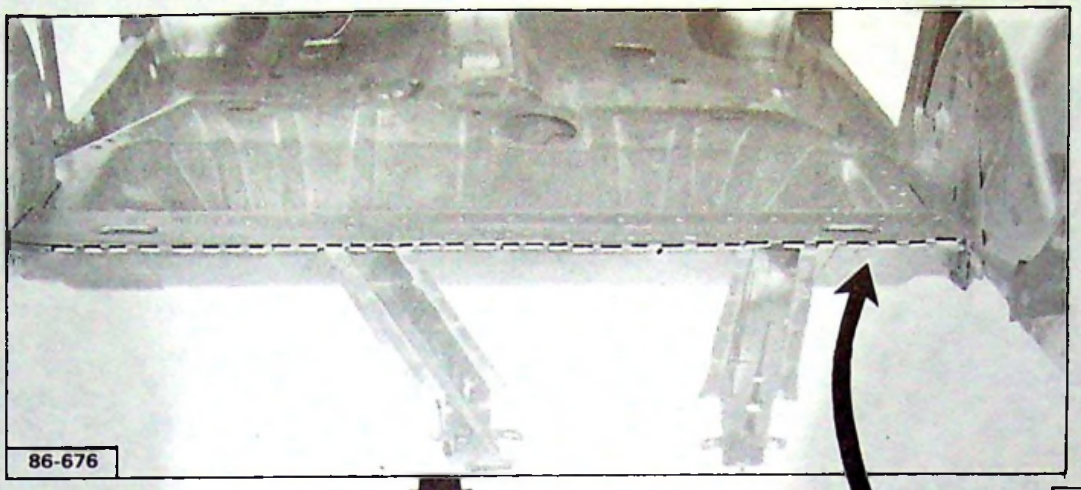

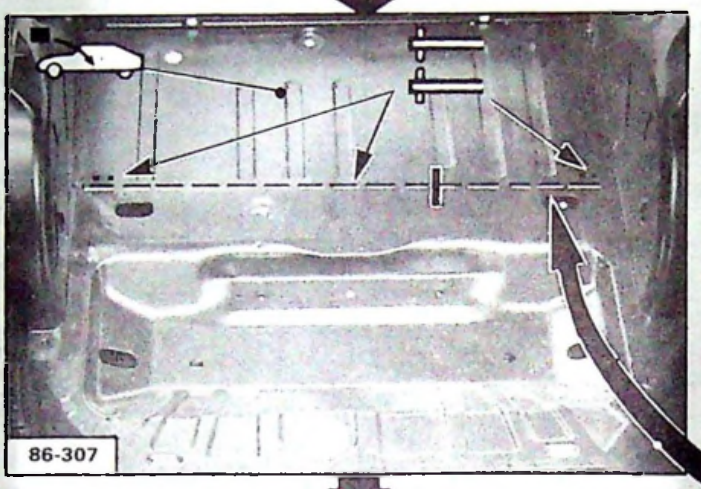

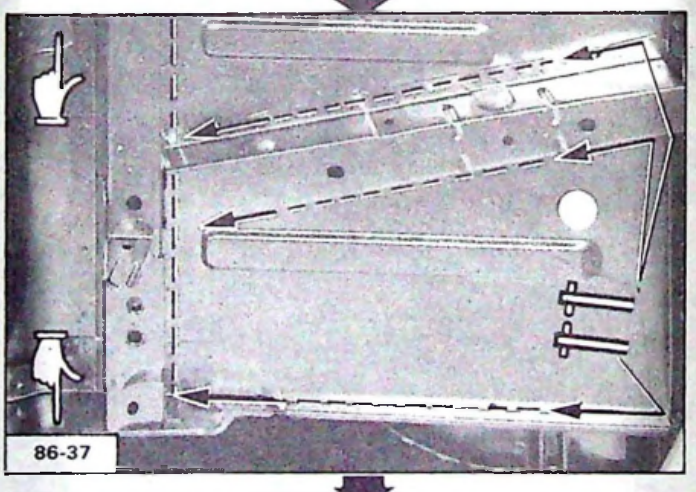

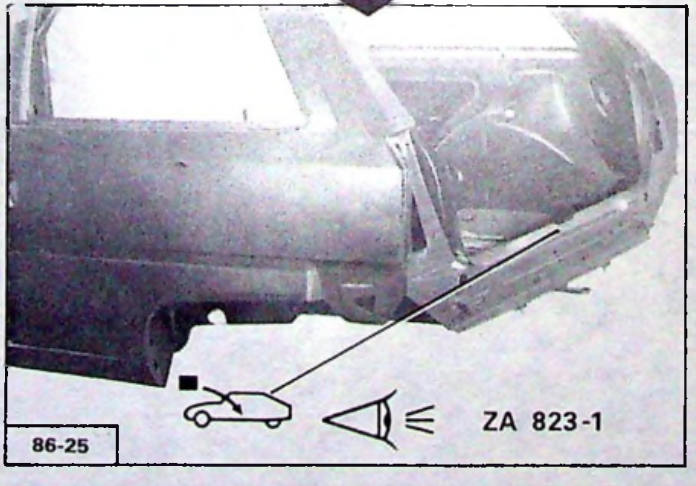

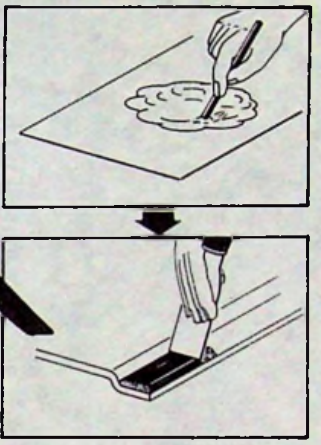

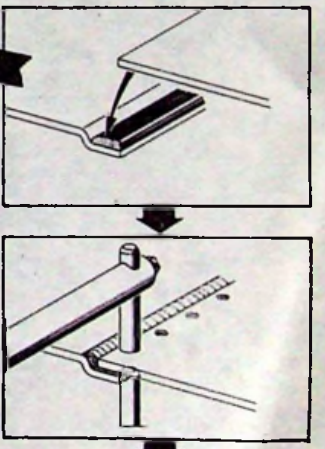

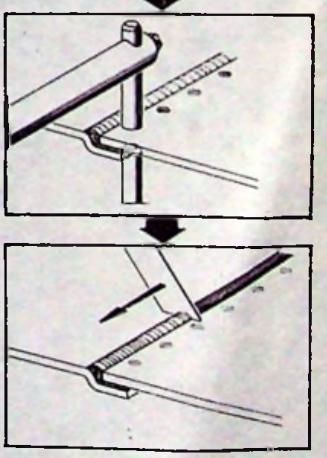

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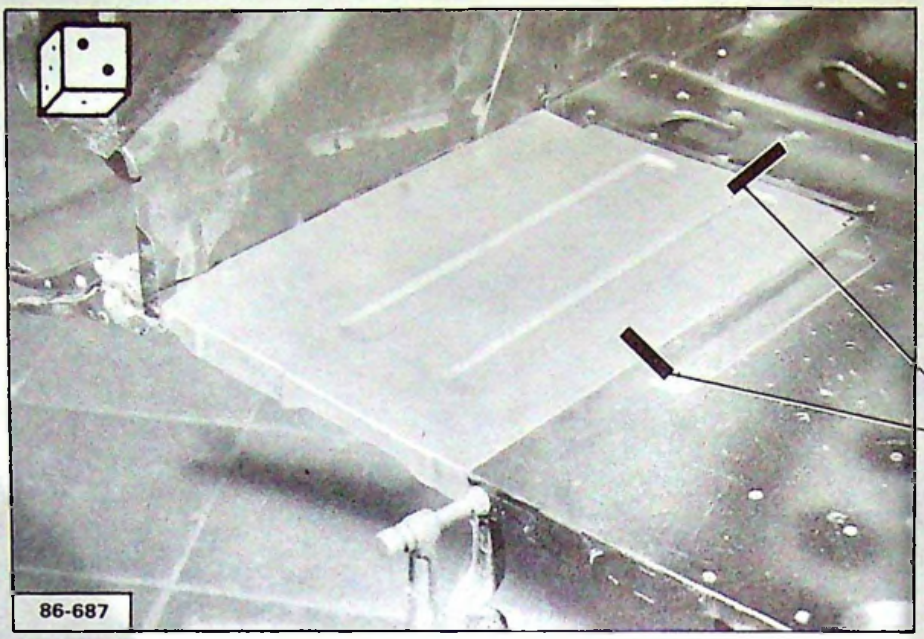
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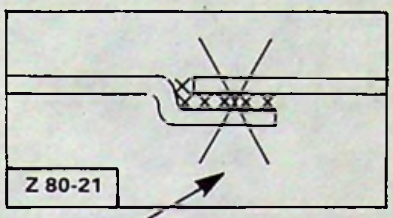
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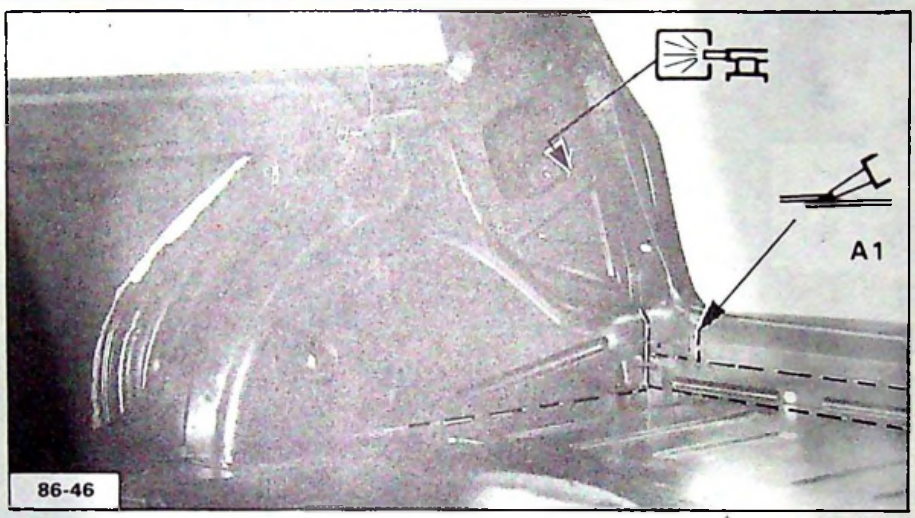
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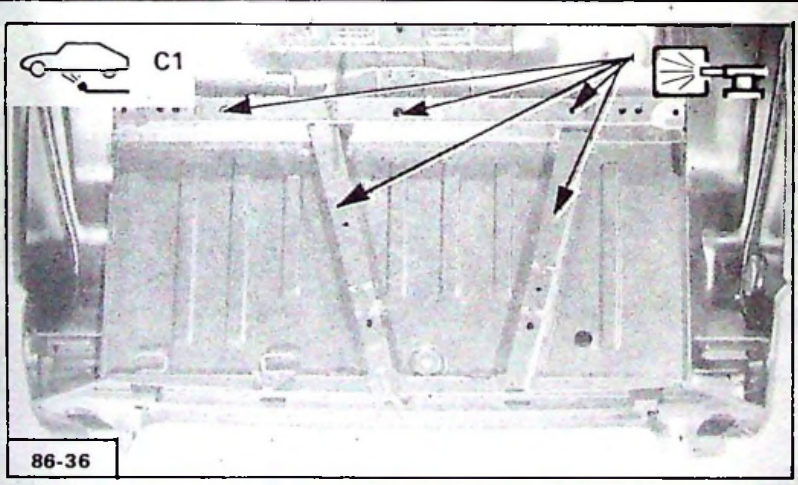
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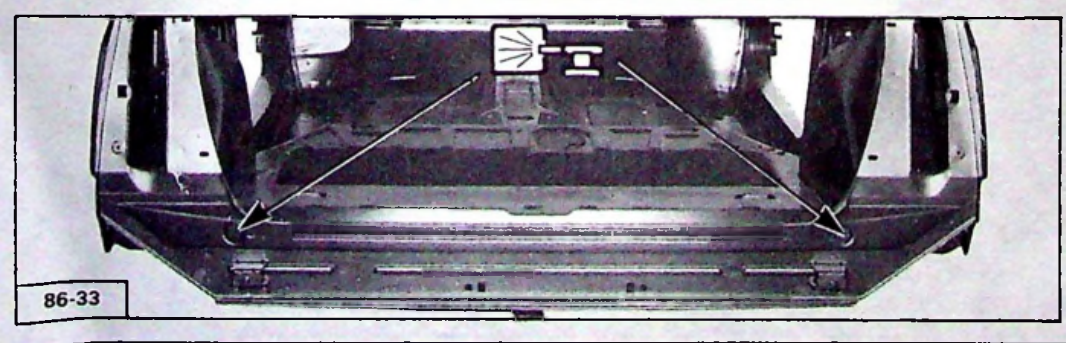
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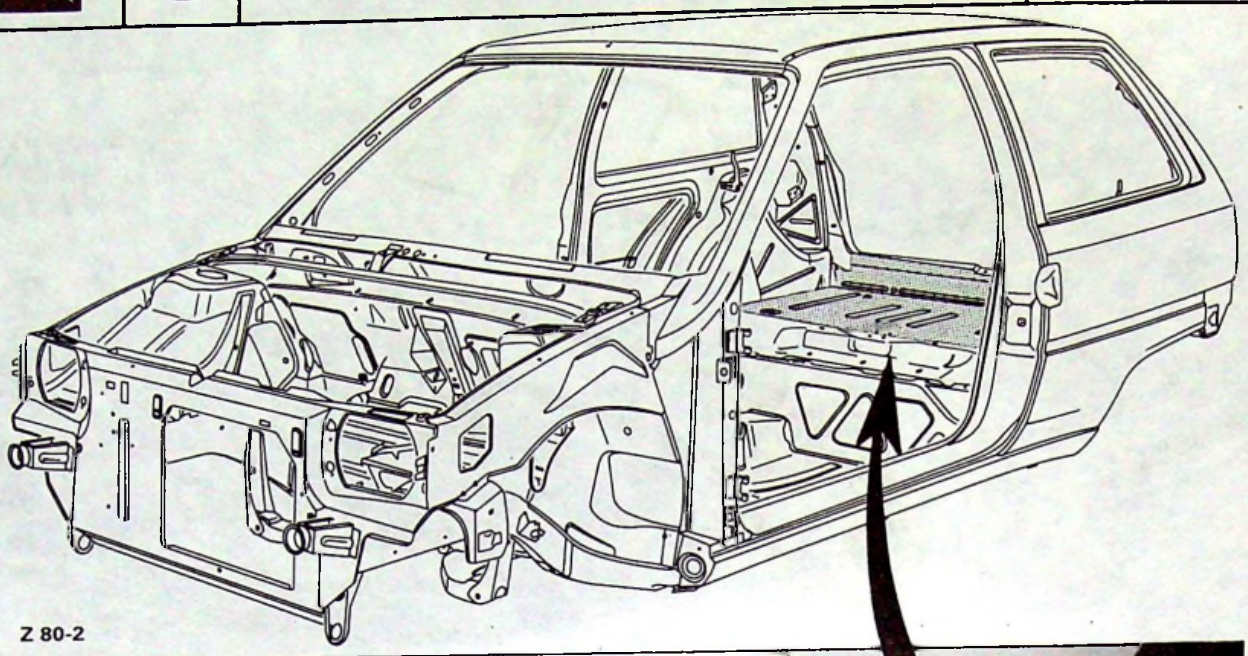

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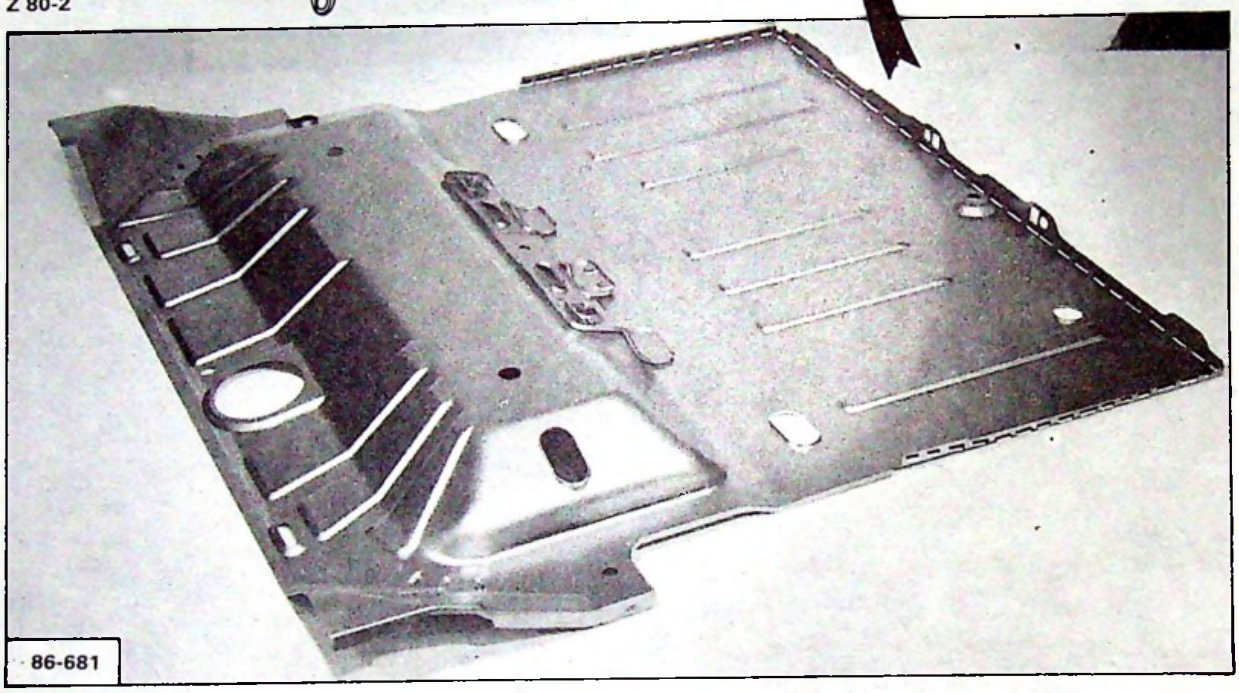

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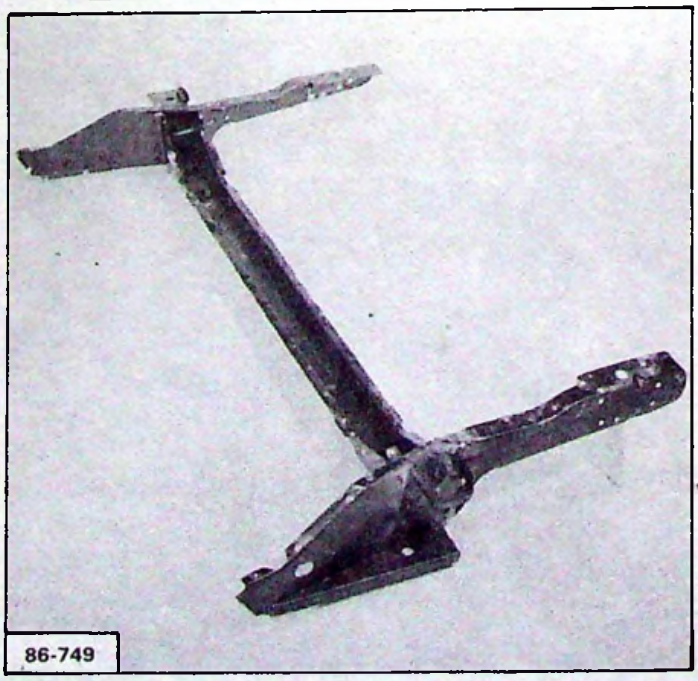

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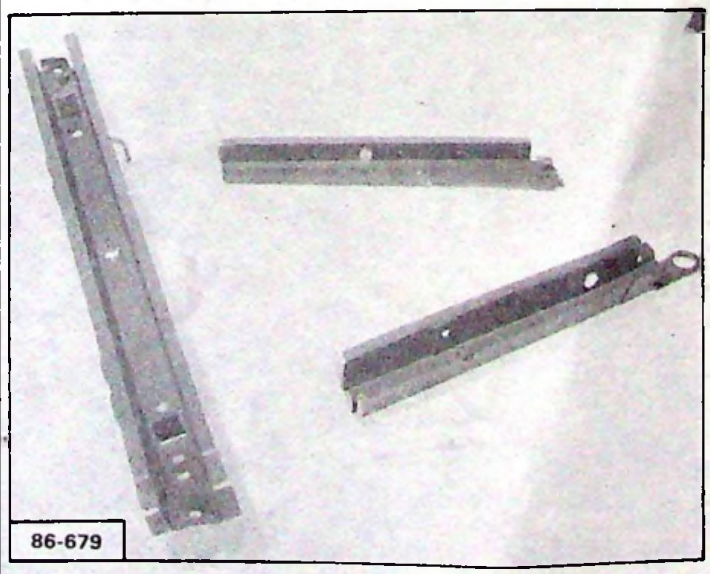

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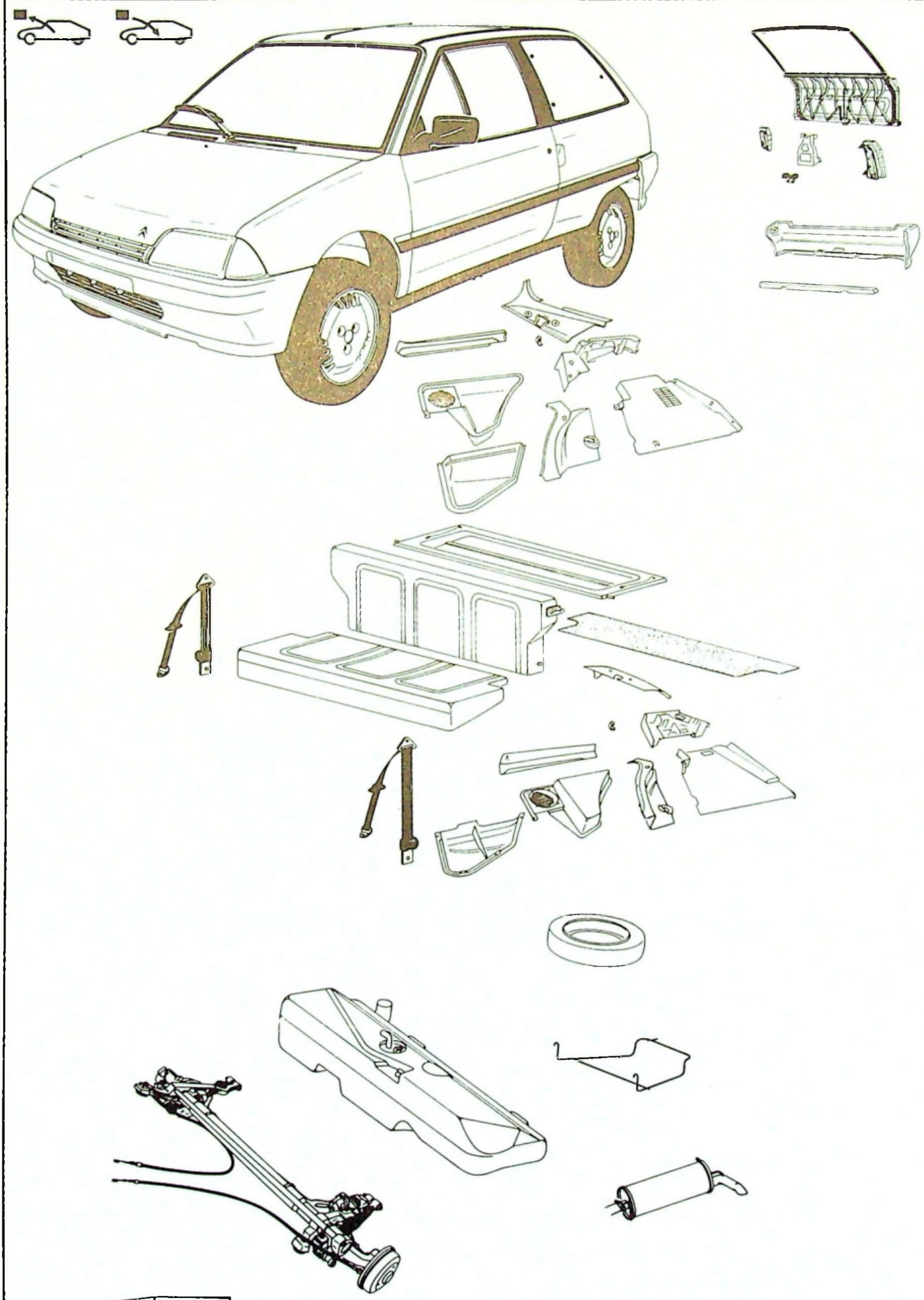

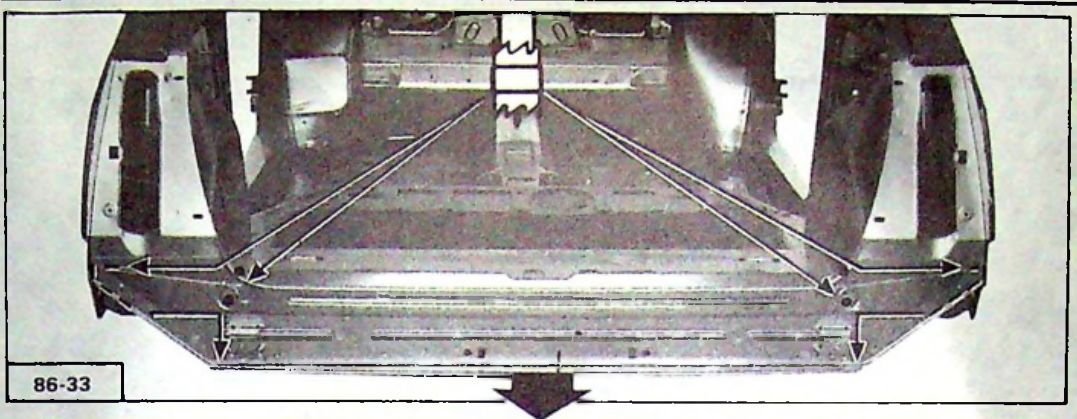

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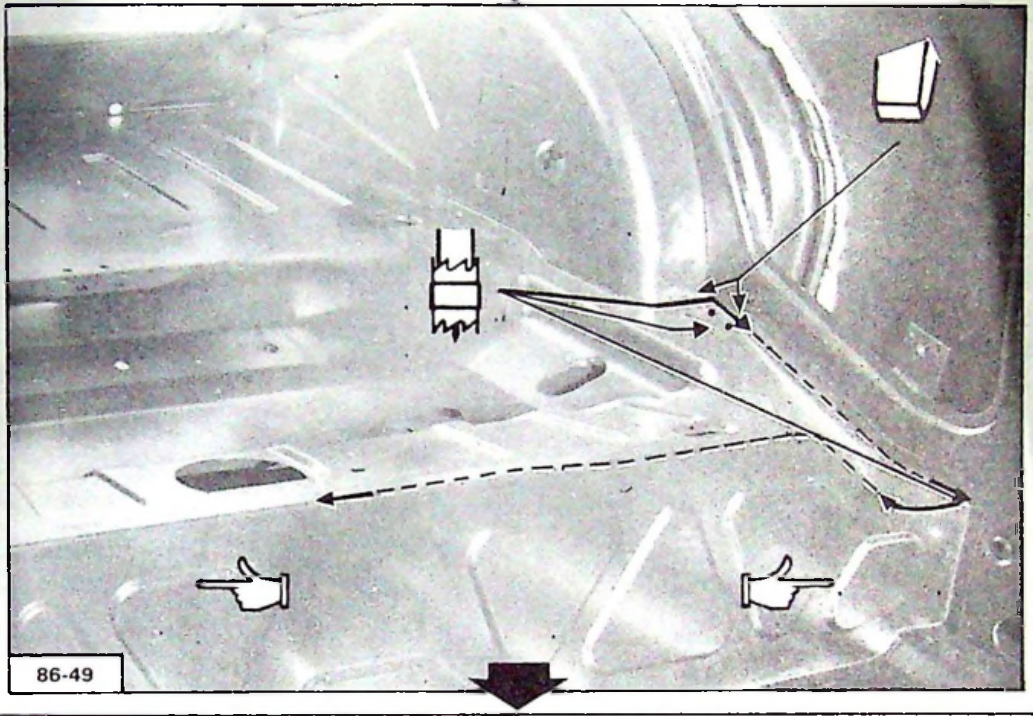

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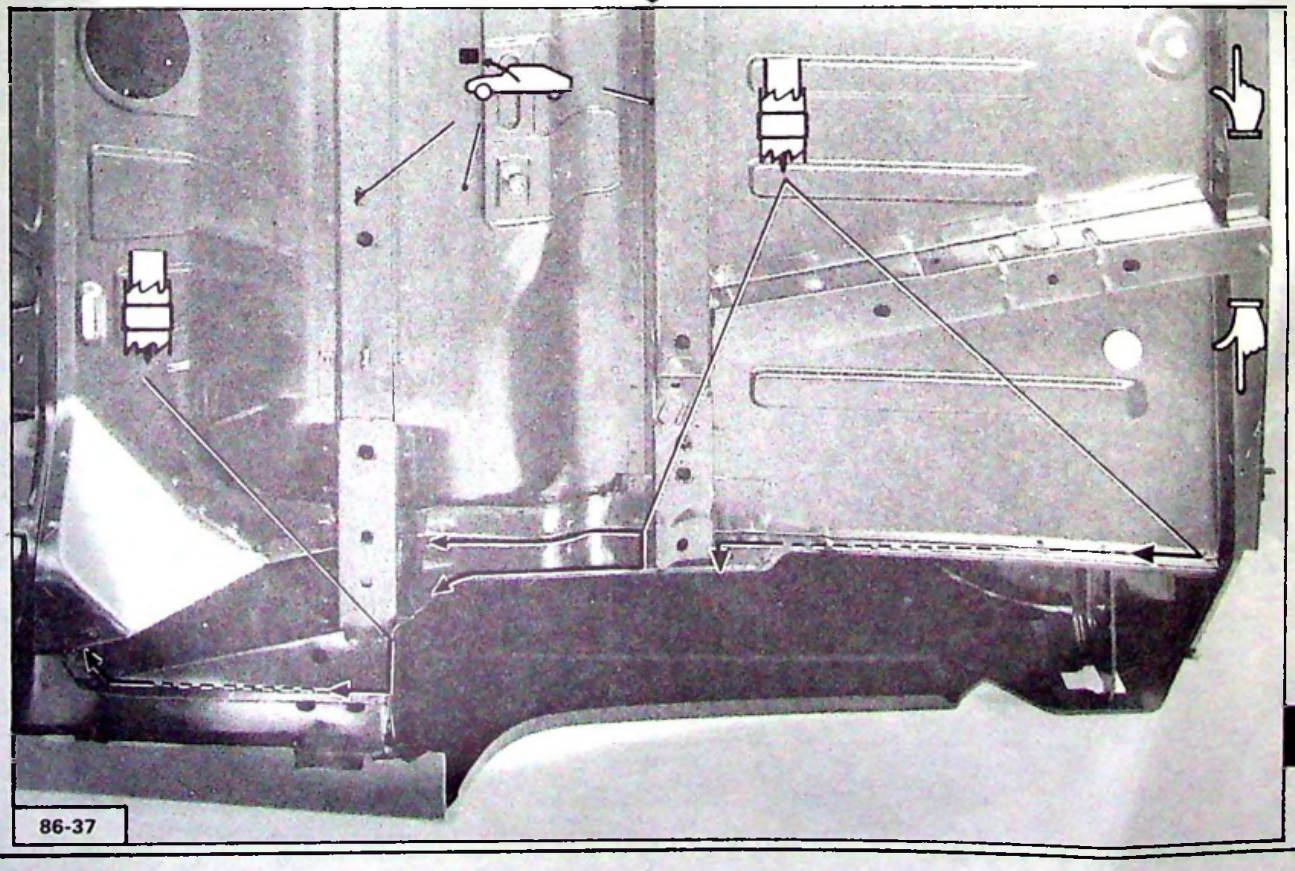

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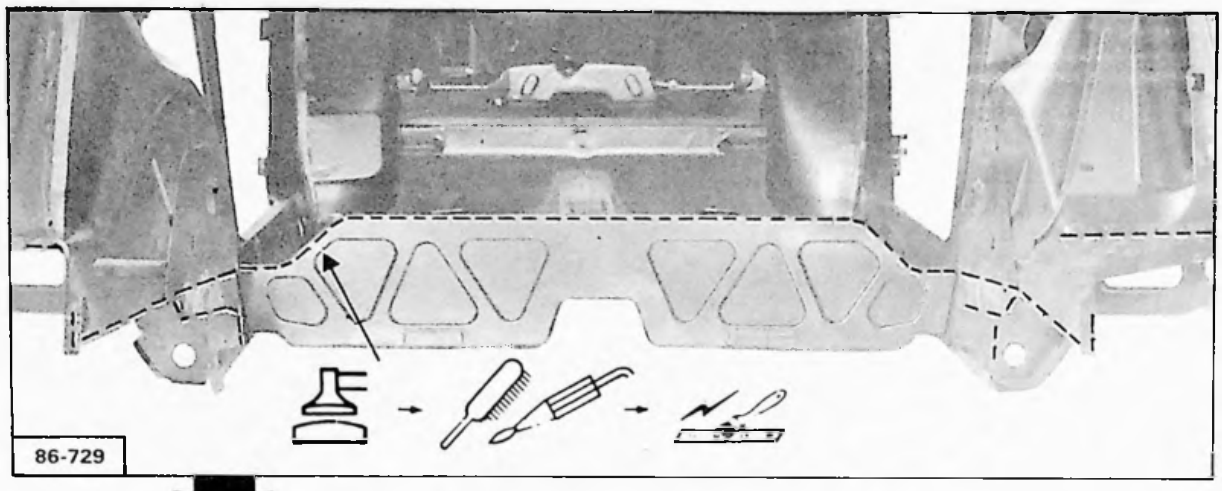
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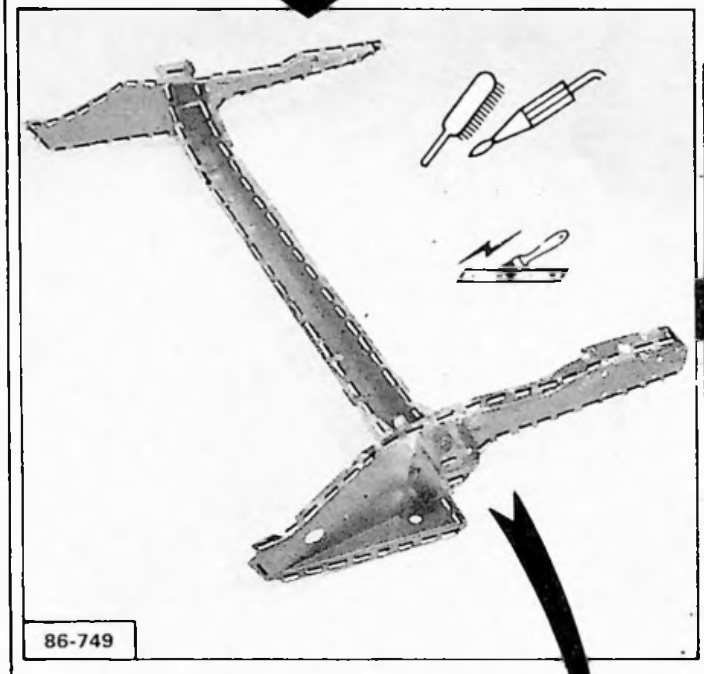
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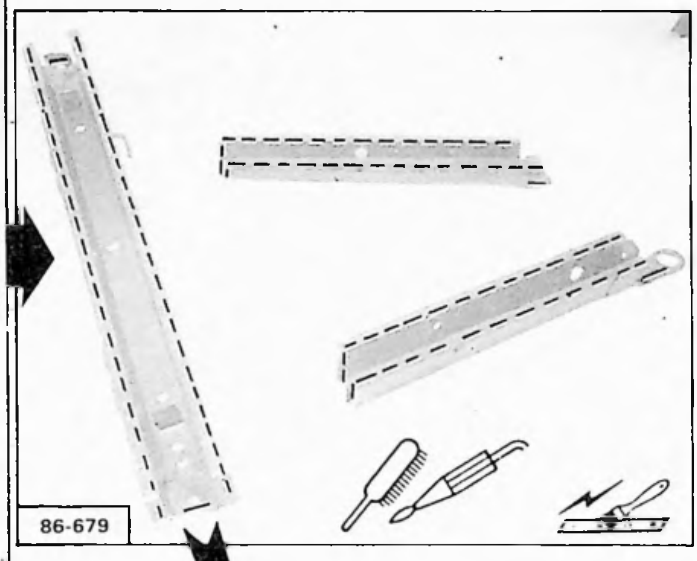
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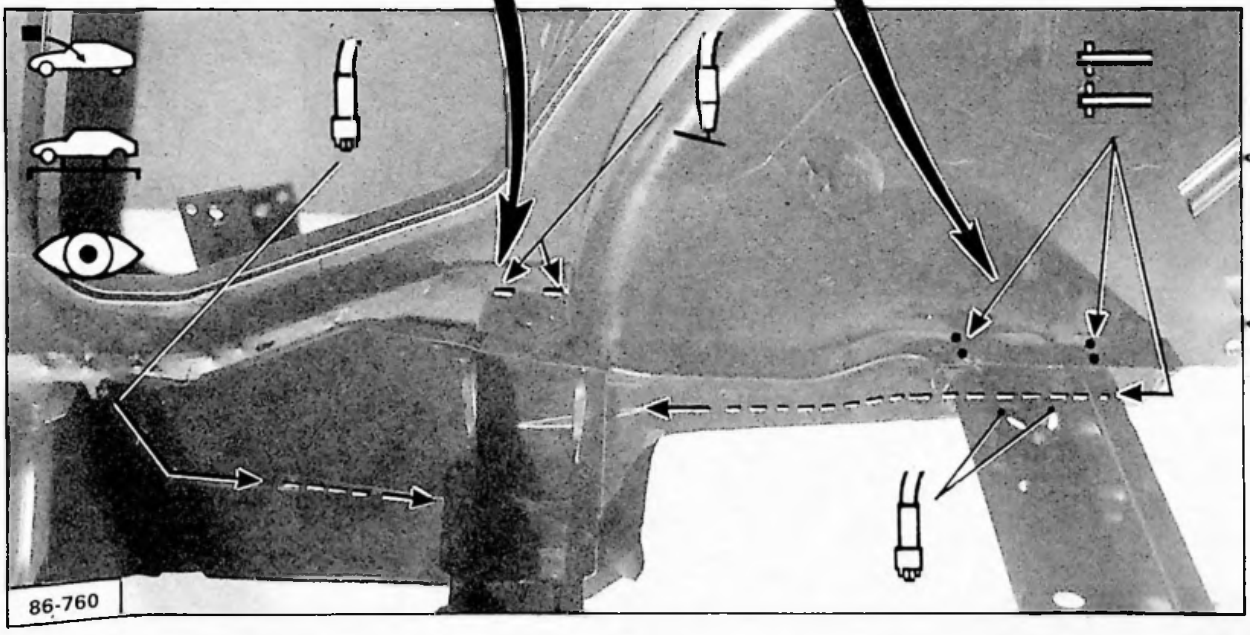
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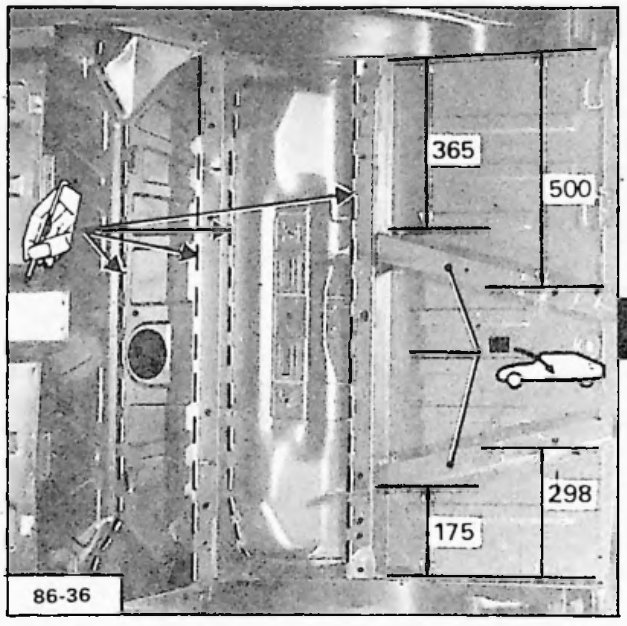
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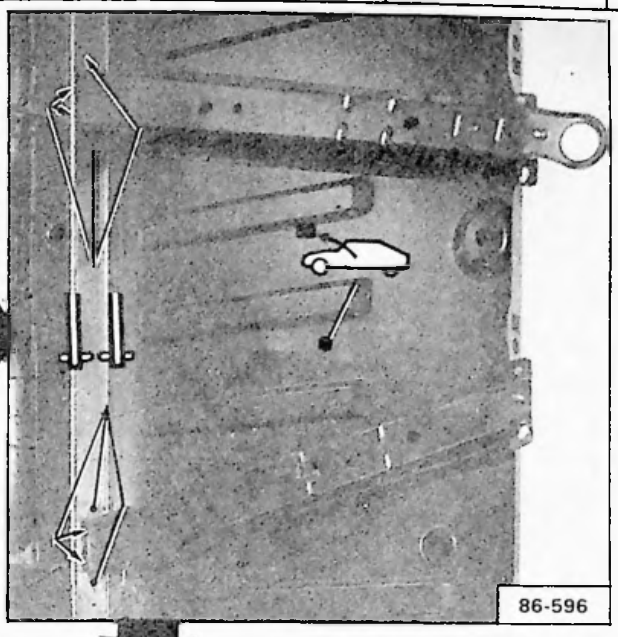
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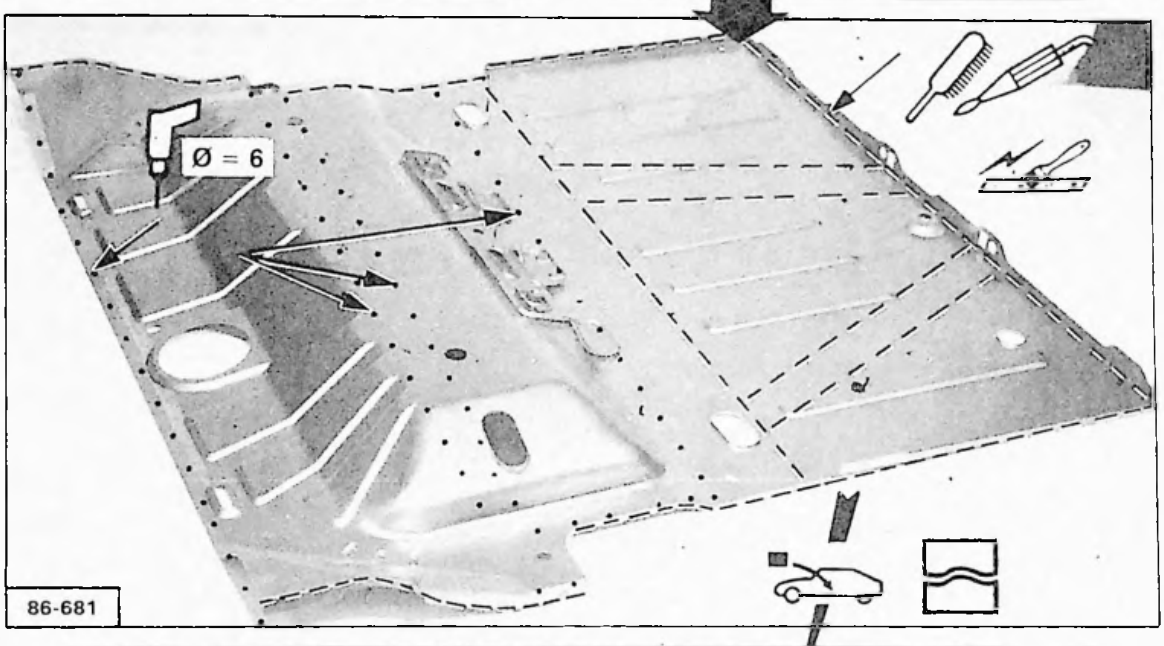
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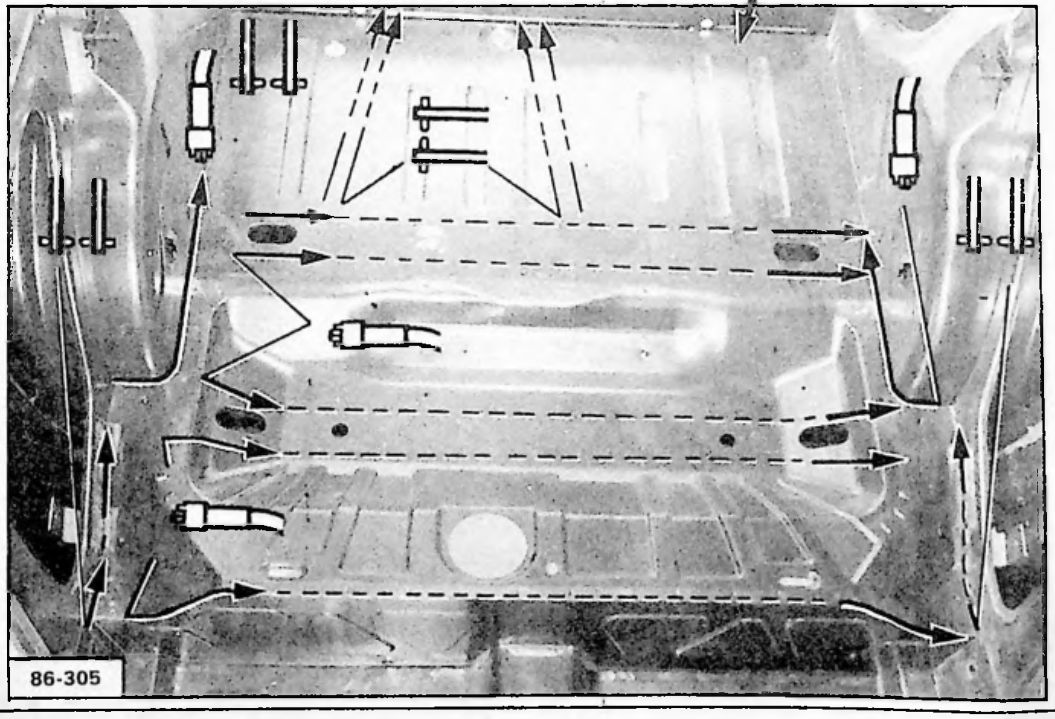
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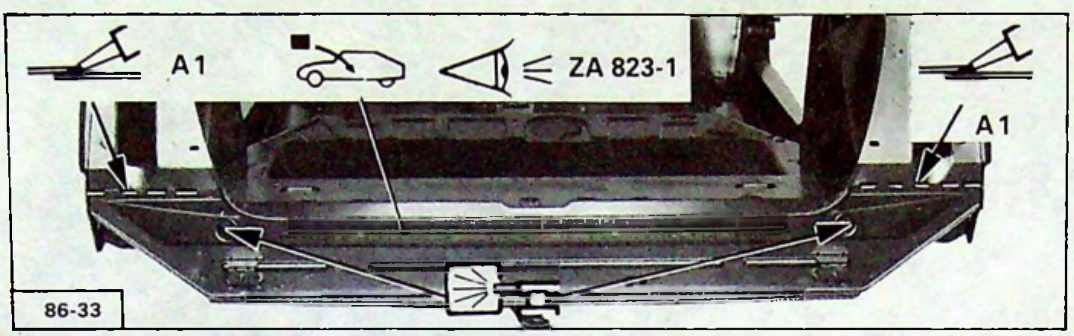
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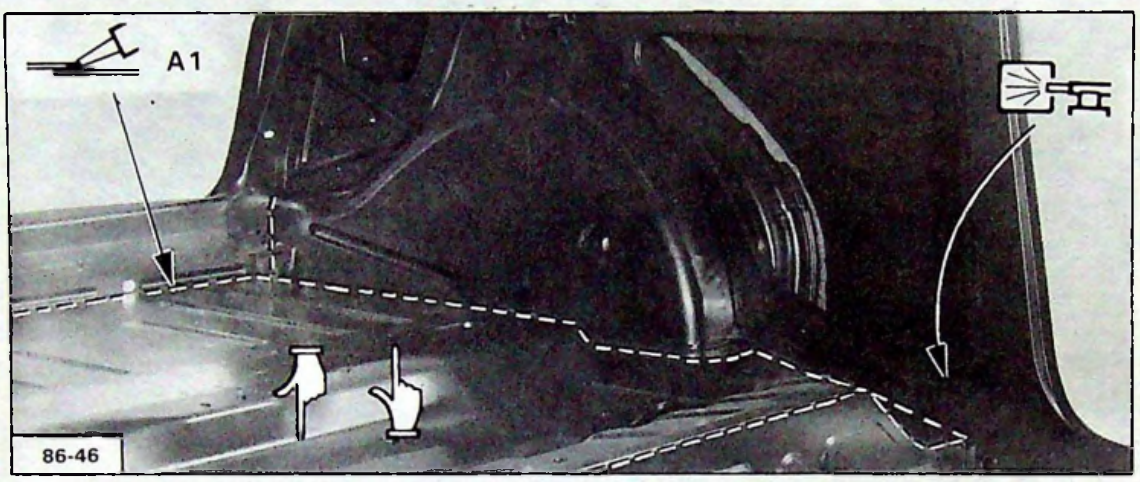
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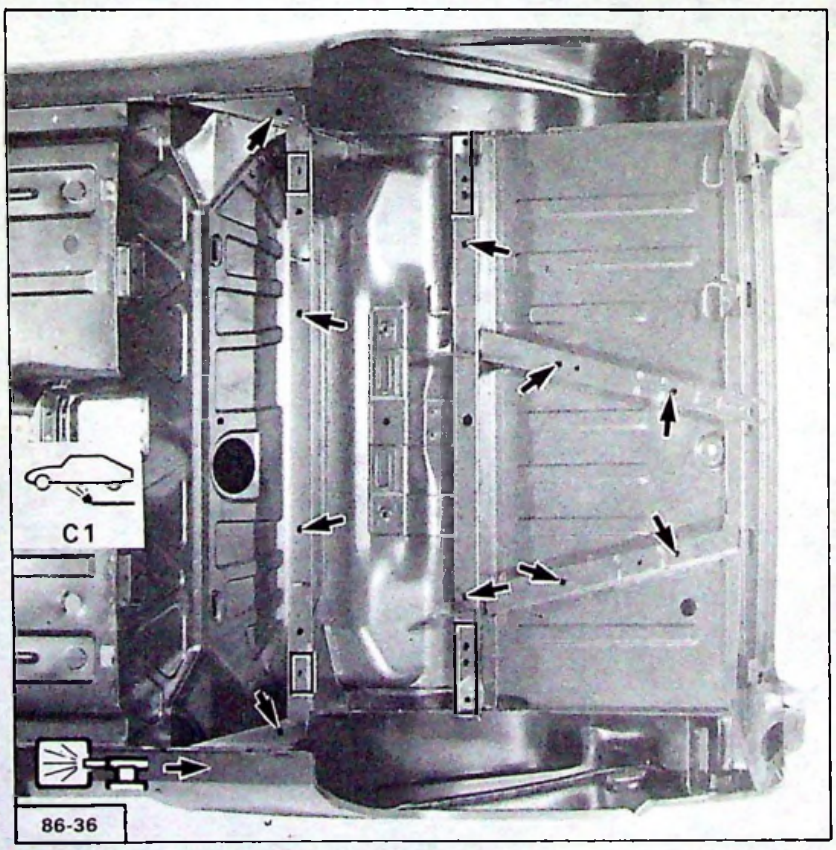
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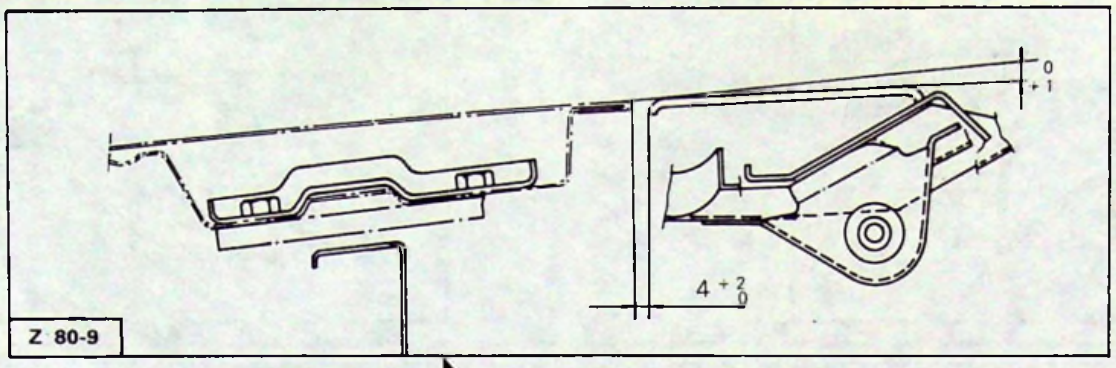
NUMÉRO DE L'OPÉRATION	VERSION 3 P.	VERSION 5 P.	DÉSIGNATION
ZA 840-0	X		Jeux des éléments amovibles
ZA 840-0/1		X	Jeux des éléments amovibles
ZA 840-1	X	X	Éléments en matériaux composites
ZA 840-2	X	X	Réparation des éléments en matériaux composites renforcés de fibre de verre
			PORTES LATÉRALES
ZA 841-1	X		Réglage d'une porte latérale
ZA 841-1/1		X	Réglage d'une porte avant
ZA 841-2	X		Dépose et pose d'une porte
ZA 841-2/1		X	Dépose et pose d'une porte avant
ZA 841-3	X		Déshabillage et habillage d'une porte latérale
ZA 841-3/1		X	Déshabillage et habillage d'une porte avant
ZA 841-1	X		Remplacement d'une serrure
ZA 841-1/1		X	Remplacement d'une serrure de porte avant
ZA 841-5	X		Remplacement d'une glace de porte latérale
ZA 841-5/1		X	Remplacement d'une glace de porte avant
ZA 841-6	X	X	Remplacement d'un panneau extérieur
ZA 841-7			Soudage des charnières de portes latérales sur montant de porte
ZA 842-1		X	Réglage d'une porte arrière
ZA 842-2		X	Dépose et pose d'une porte arrière
ZA 842-3		X	Déshabillage et habillage d'une porte arrière
ZA 842-4		X	Remplacement d'une serrure de porte arrière
ZA 842-5		X	Remplacement d'une glace de porte arrière
ZA 843-1	X		Pose des portes latérales sur une coque neuve
			VOLET ARRIÈRE
ZA 844-1	X	X	Remplacement d'un volet arrière
ZA 844-2	X	X	Remplacement d'une glace de volet arrière
			HABILLAGE AVANT
ZA 851-1	X	X	Remplacement d'une aile avant
ZA 851-2	X	X	Remplacement d'un pare chocs avant
ZA 851-3	X	X	Remplacement d'un capot
			HABILLAGE ARRIÈRE
ZA 853-1	X	X	Remplacement d'un pare chocs arrière
ZA 853-2	X		Remplacement d'une glace de custode
ZA 853-2/1		X	Remplacement d'une glace de custode
			PLANCHE DE BORD
ZA 856-1	X	X	Dépose et pose d'une planche de bord

LISTE DES OPÉRATIONS FIGURANT AU CHAPITRE : ÉLÉMENTS AMOVIBLES ET HABILLAGE

NUMÉRO DE L'OPÉRATION	VERSION 2 P.	VERSION 4 P.	DÉSIGNATION
			PARE-BRISE
ZA 961-1	X	X	Remplacement d'une glace de pare-brise
			PAVILLON
ZA 988-1	X	X	Remplacement d'une garniture de pavillon
			OUTIL MR
MR 630-84/21	X	X	Crochet d'ouverture de capot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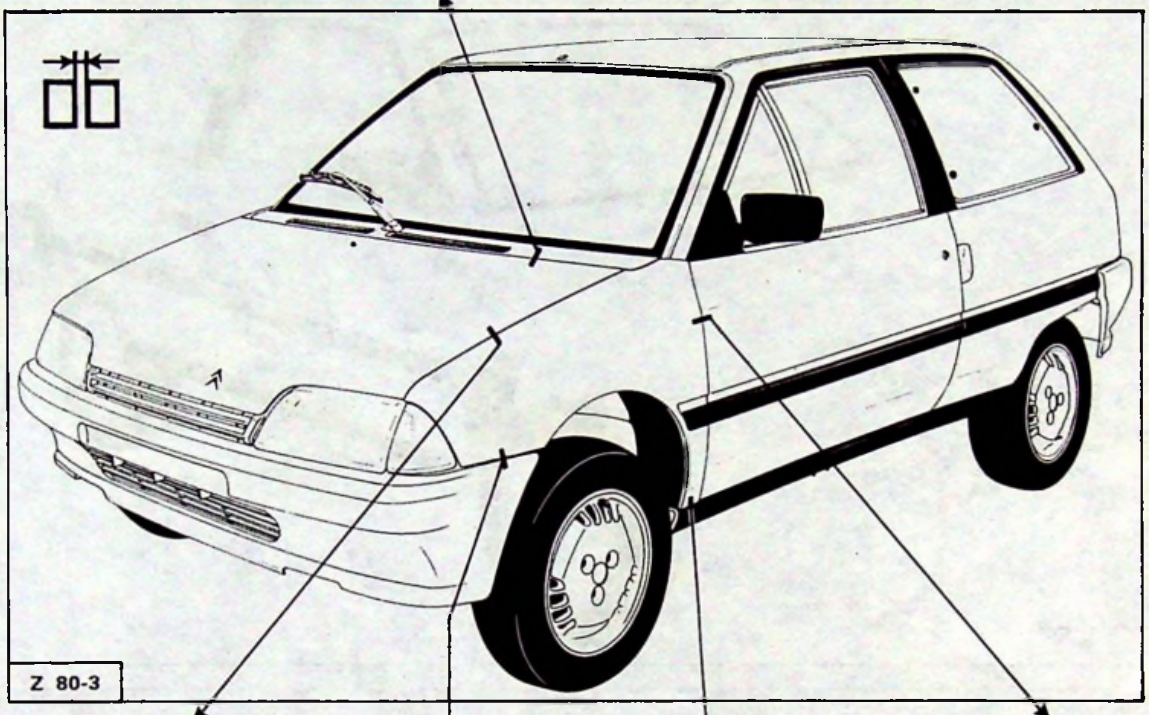
4 +2 0
Z 80-9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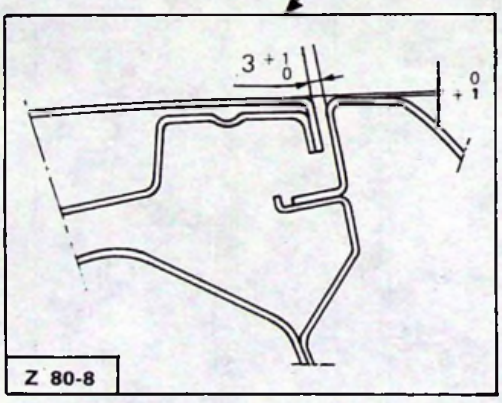
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0
+1
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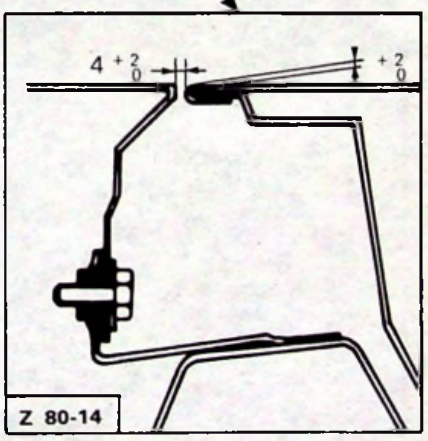
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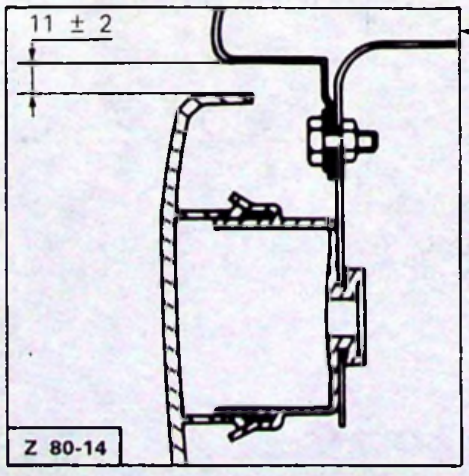
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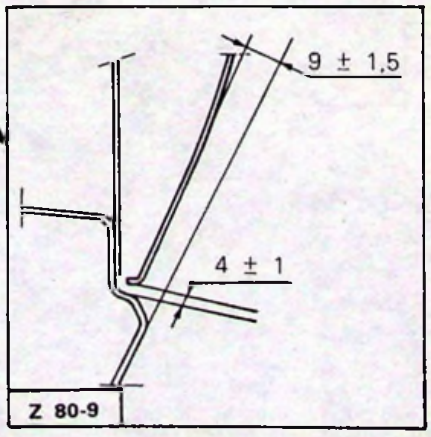
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4 ± 1
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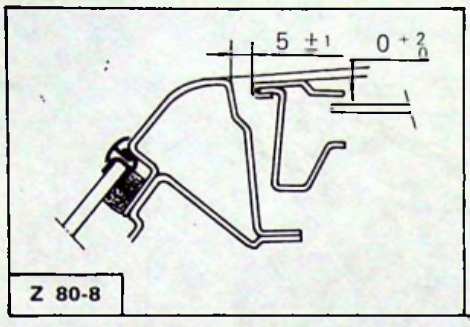

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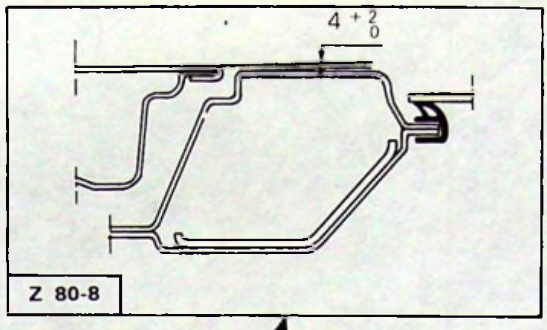

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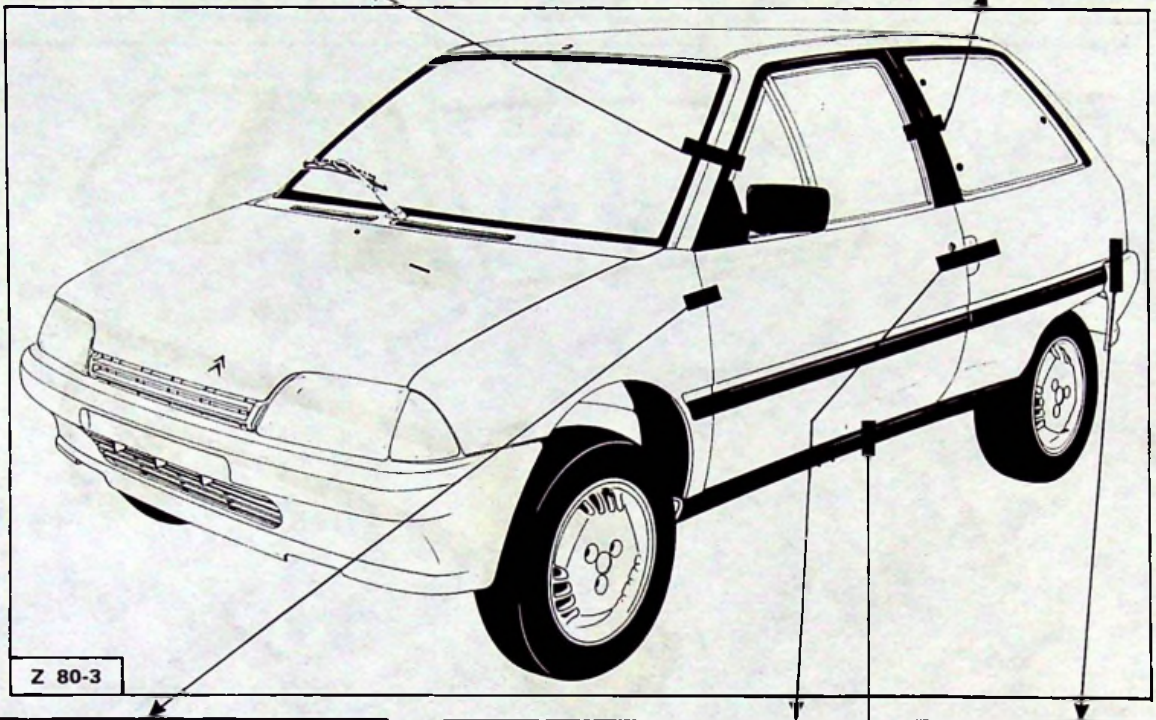
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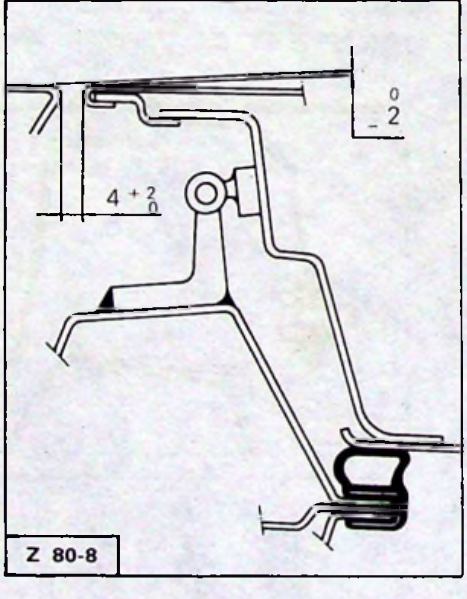

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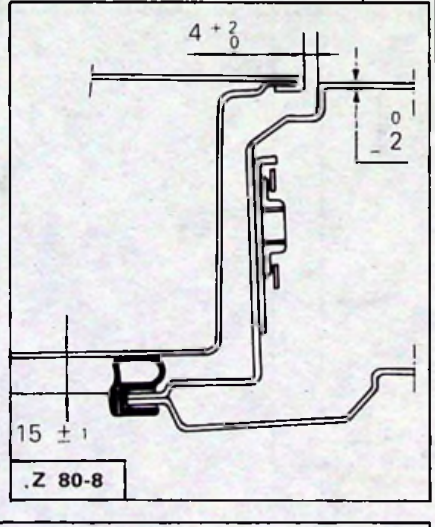

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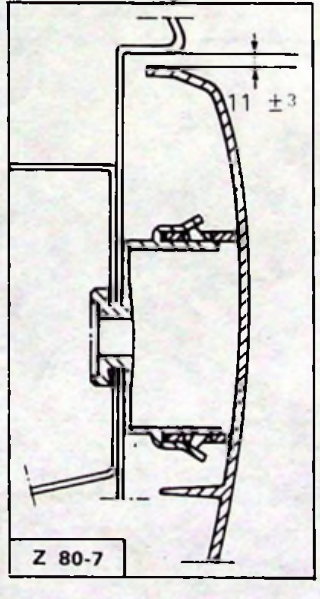

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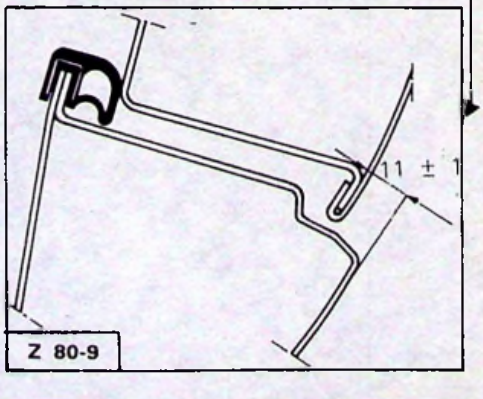

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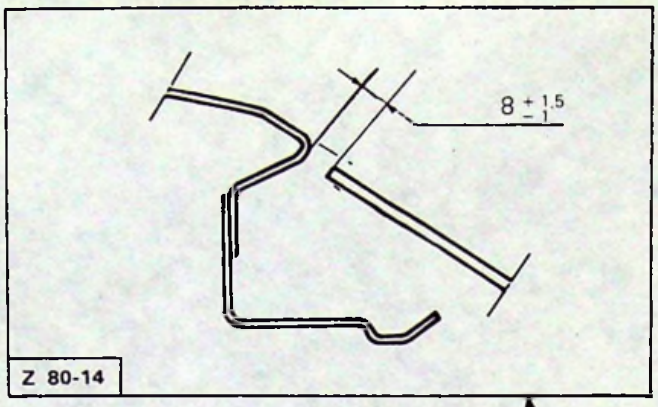

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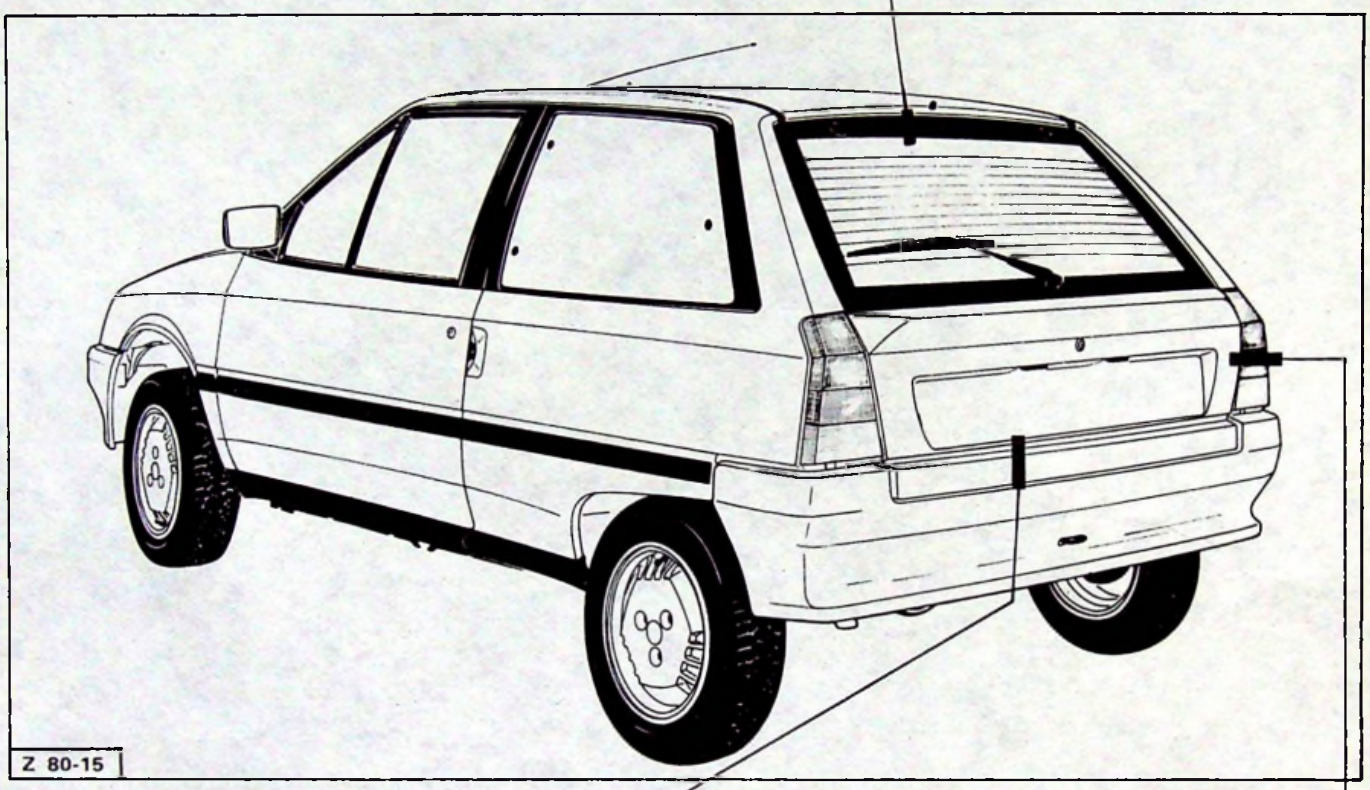

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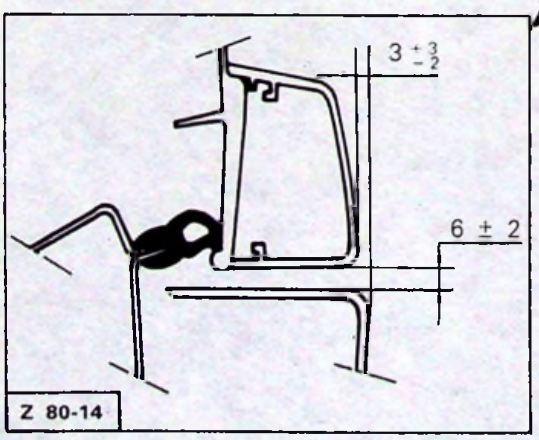

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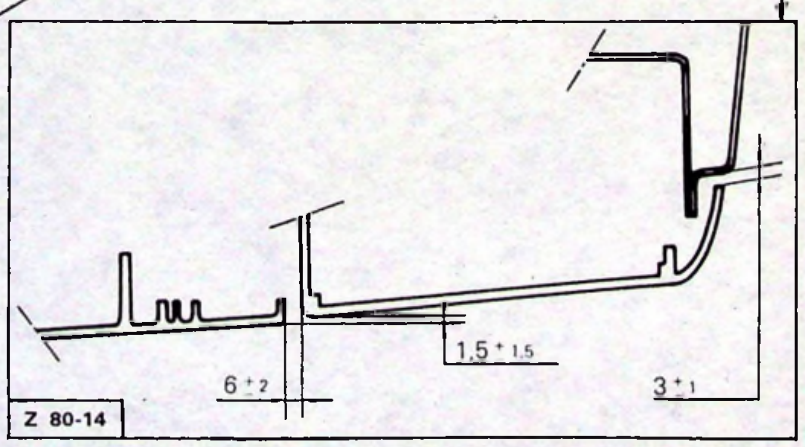

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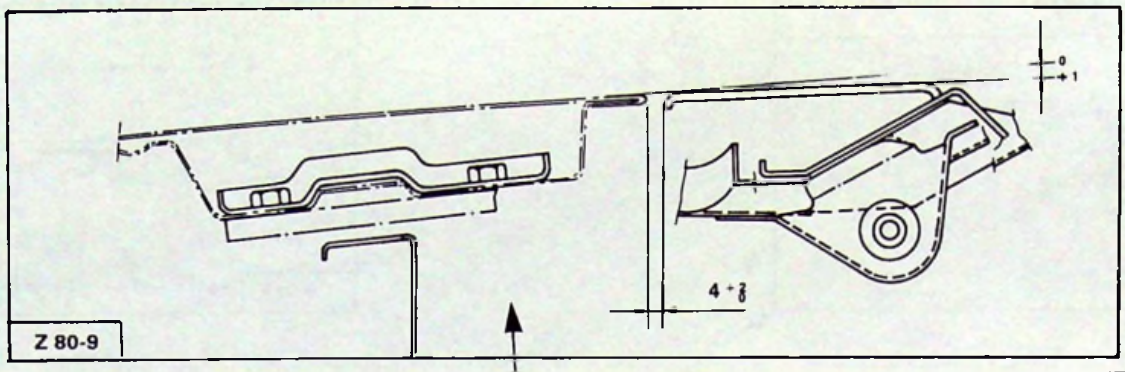
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+1
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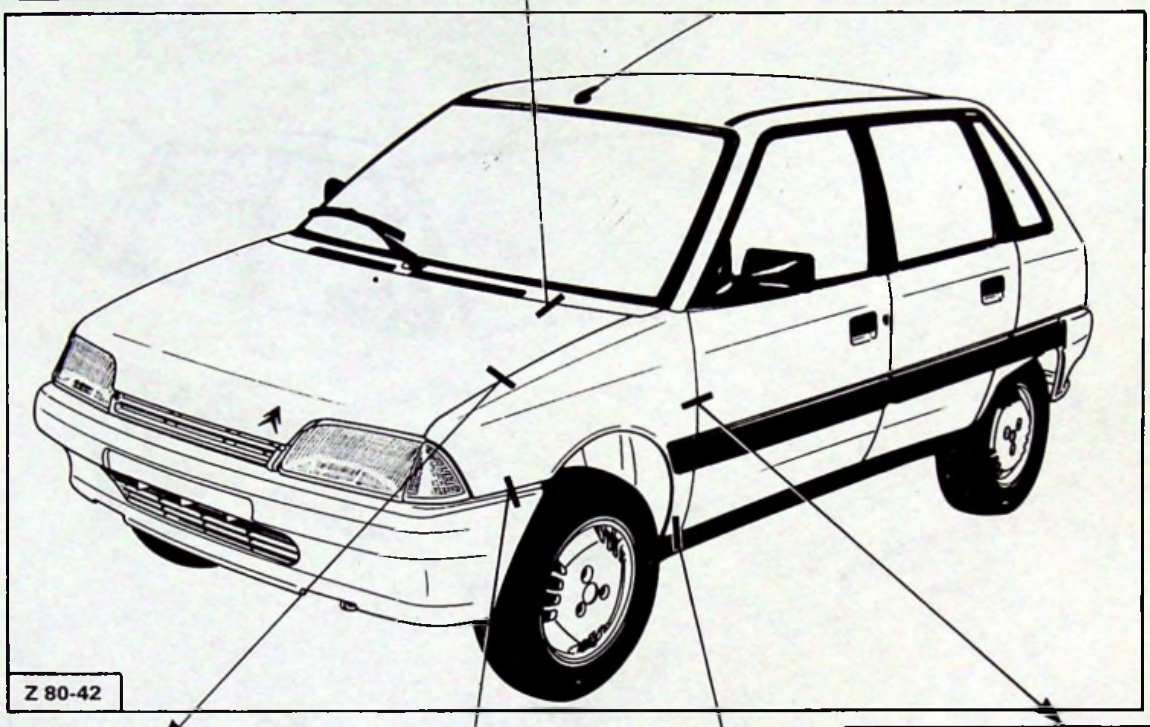
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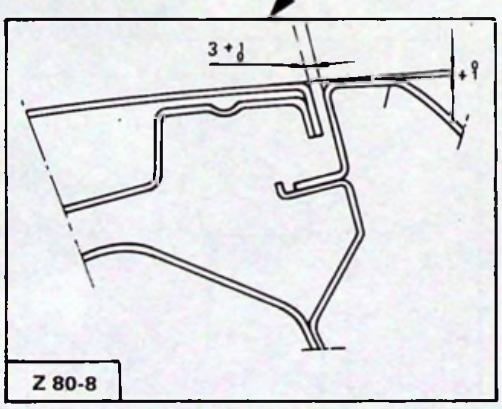
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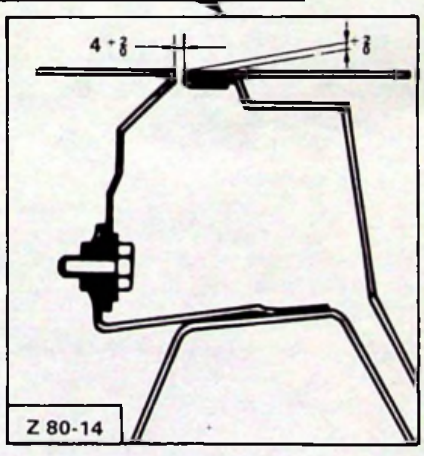
+1
Z 80-8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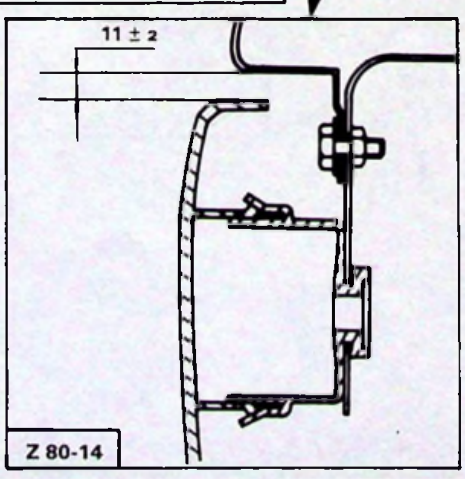
+2
Z 80-14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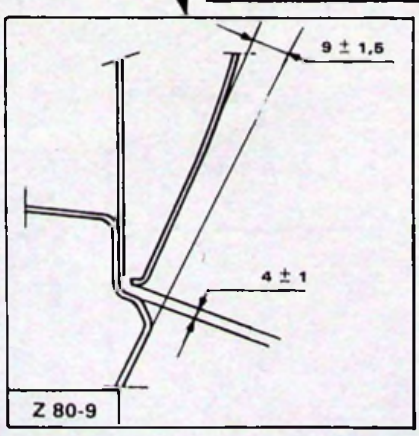
Z 80-14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4 ± 1
Z 80-9

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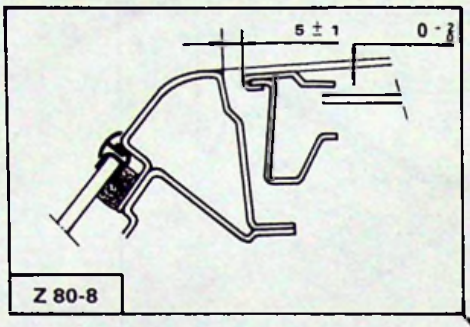

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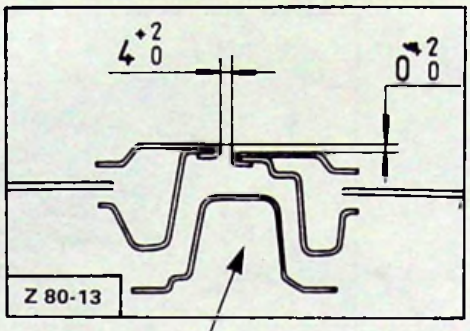

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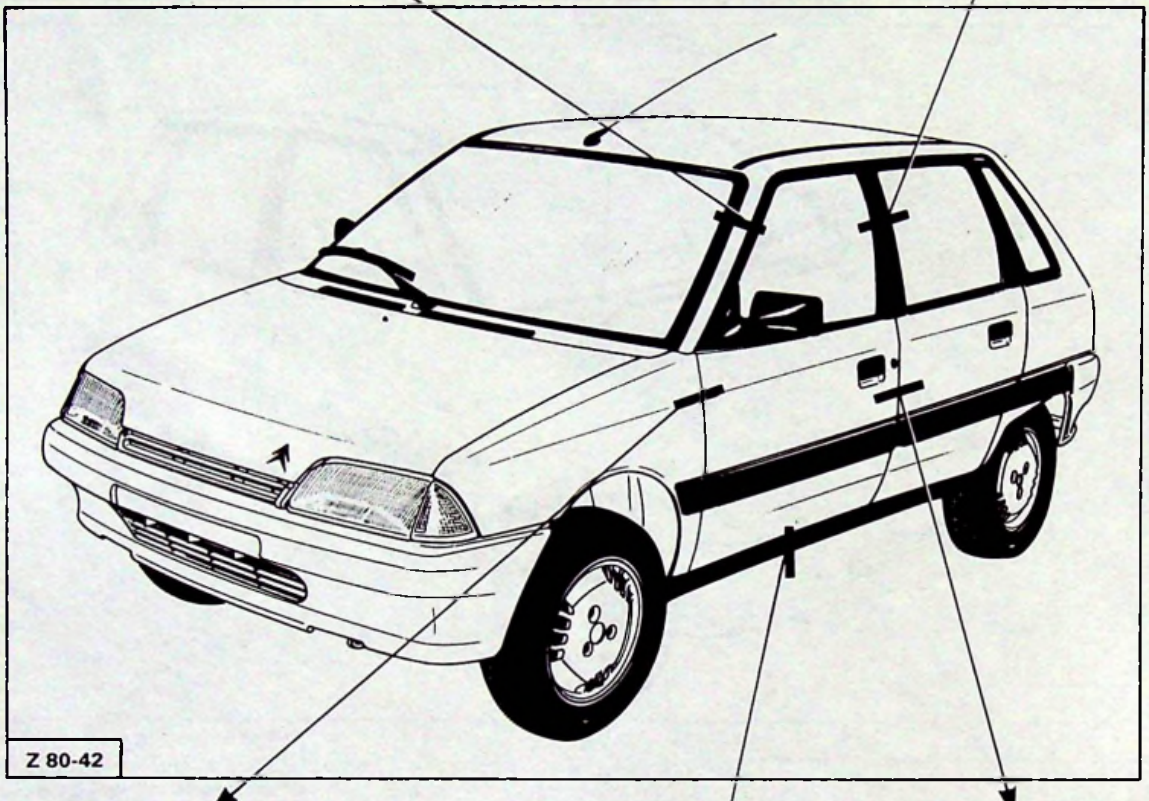
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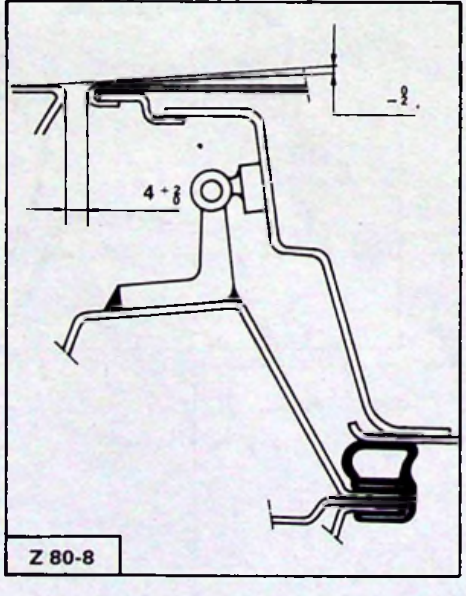

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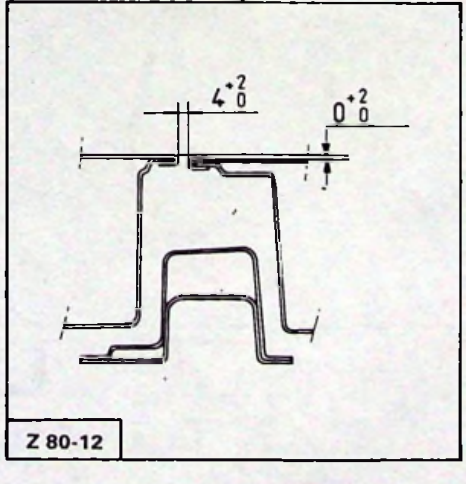

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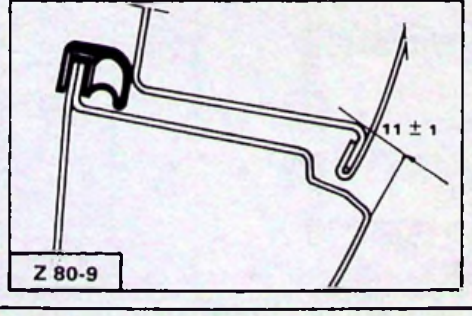

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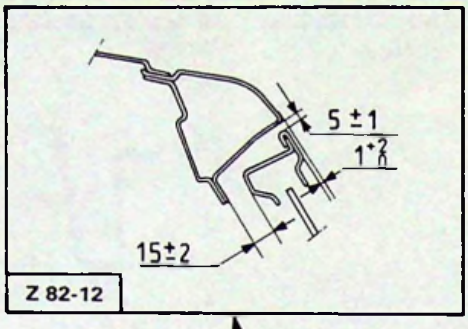

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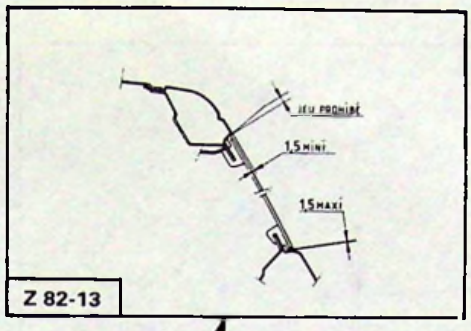

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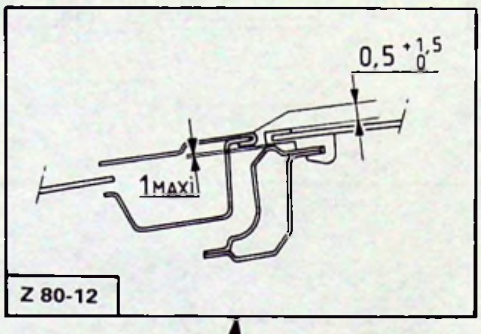

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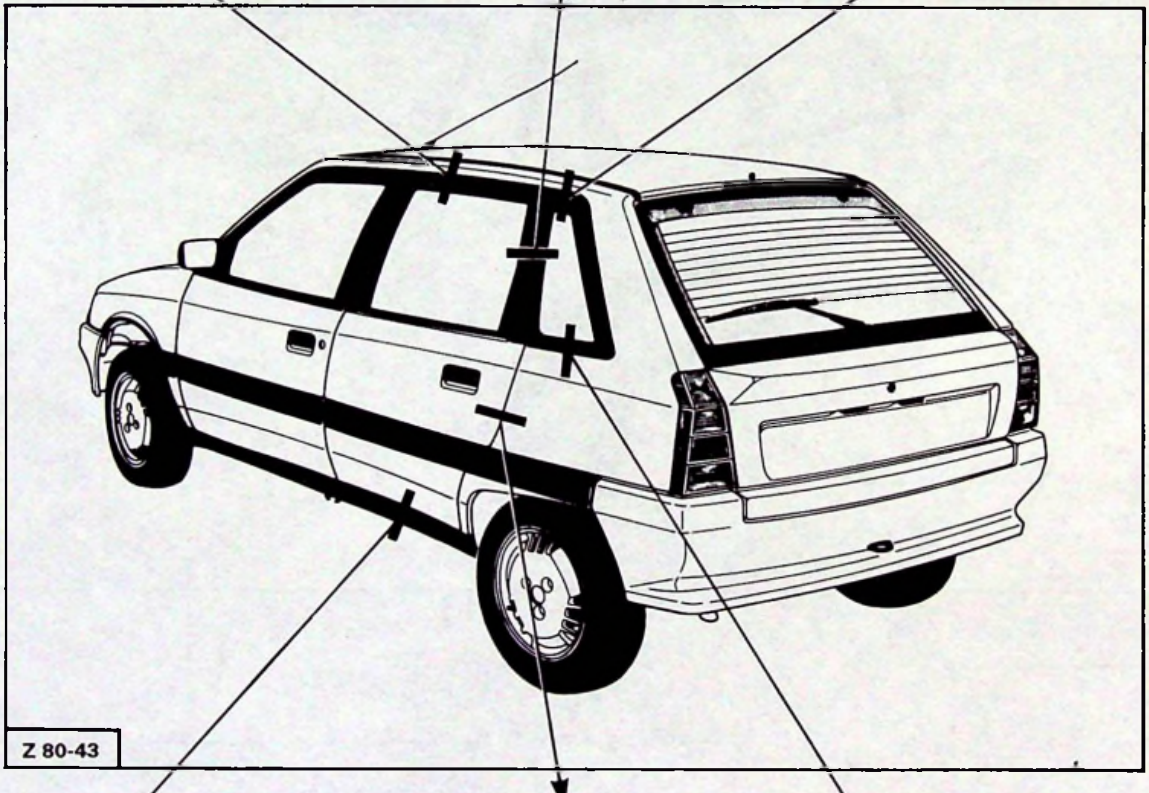

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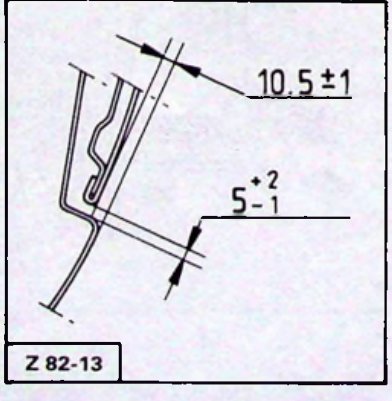

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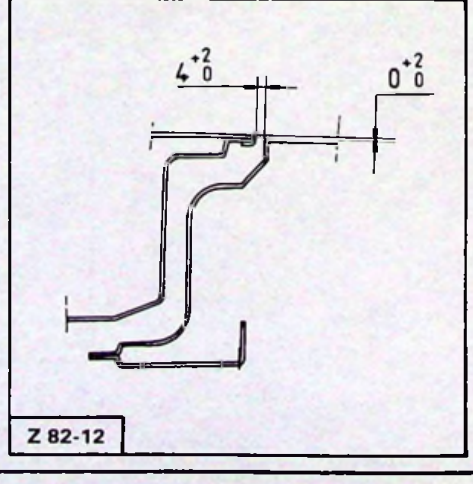

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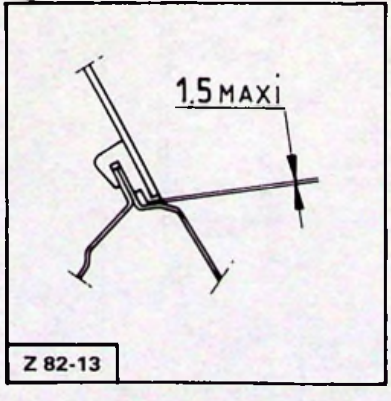

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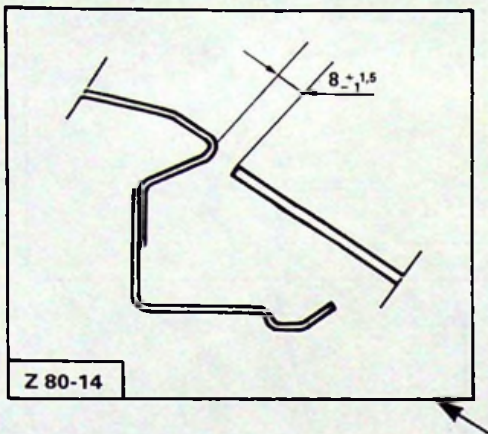
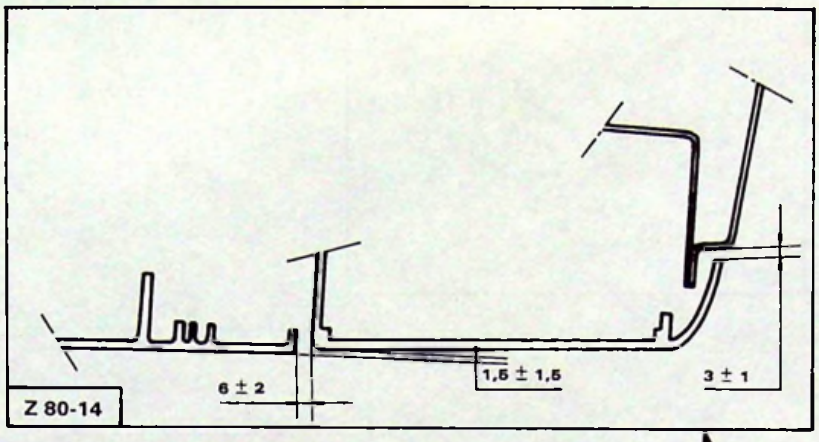
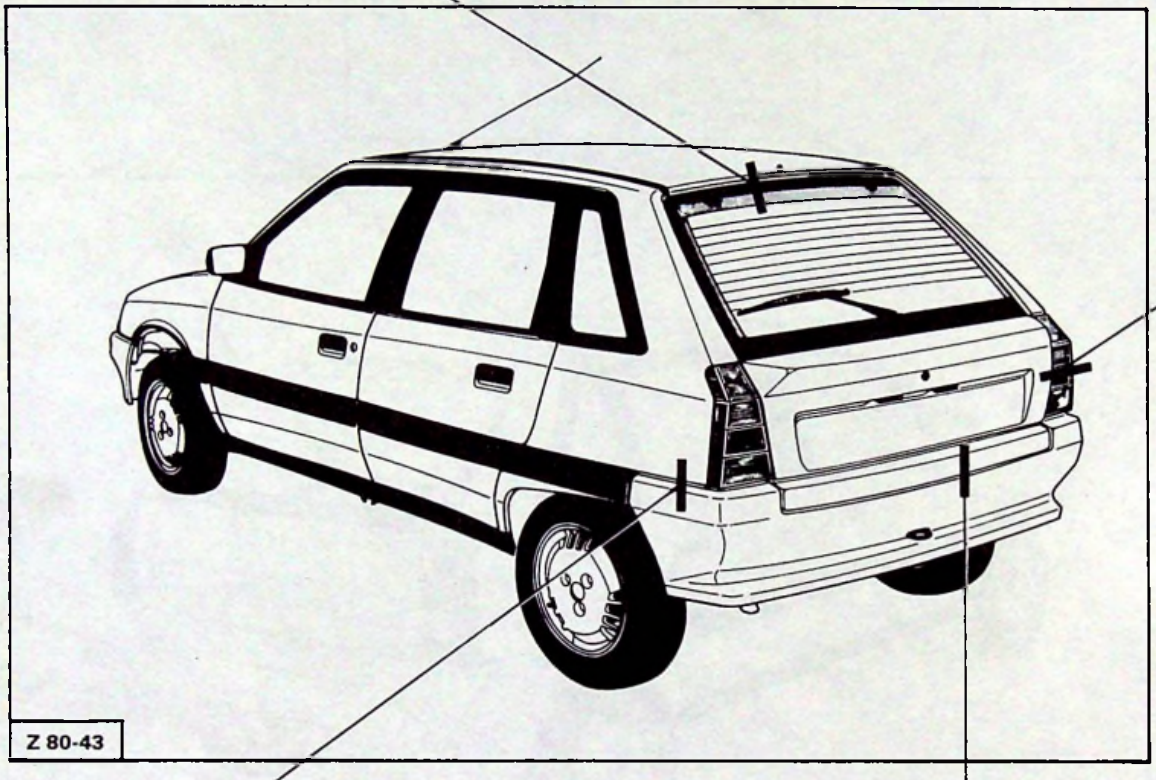

8 +1,5 -1
Z 80-14


6 ± 2
1,5 ± 1,5
3 ± 1
Z 80-14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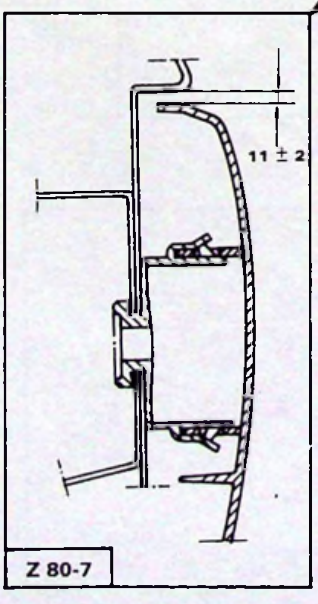
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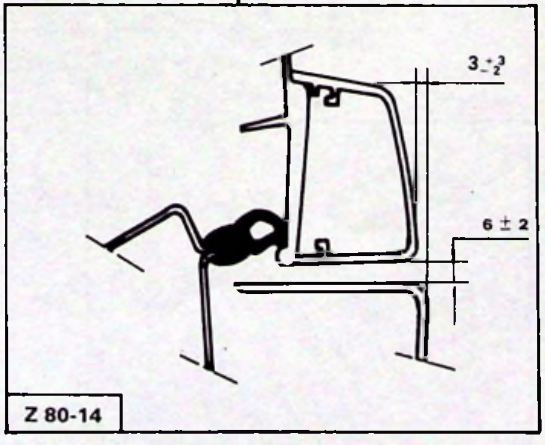
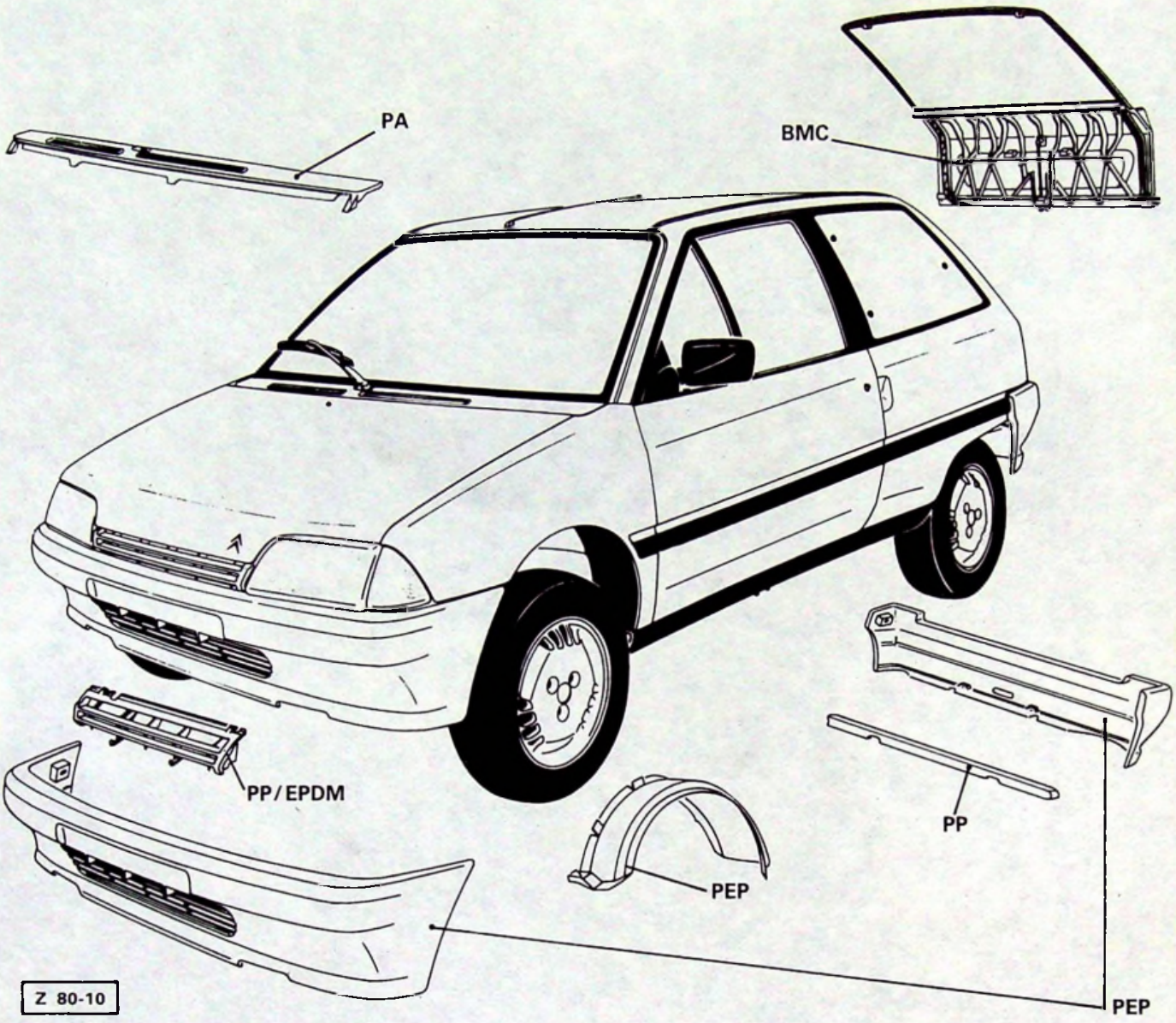
Z 80-7


3 +3 -2
6 ± 2
Z 80-14



SYMBOLE MATIÈRE	NATURE DU MATÉRIAU	ÉLÉMENTS
BMC	Bulk Molding Compound résine polyester + film de verre)	Volet arrière
PEP	Polypropylène Type "STAMILAN"	Pare-chocs avant et arrière Pare-boue...
PP/EPDM	Polypropylène Type "EPDM"	Calandre
PA	Polyamide	Grille d'auvent
PP	Polypropylène Type "ELTEX"	Absorbeur de pare-chocs arrière

RÉPARATION DES MATÉRIAUX COMPOSITES RENFORCÉS DE FIBRE DE VERRE
(Volet arrière)

I. GÉNÉRALITÉS

II. PRODUITS DE RÉPARATION

III. MATÉRIEL

IV RÉPARATION D'UNE FISSURE OU D'UNE CASSURE

V RÉPARATION D'UNE NERVURE

I. GÉNÉRALITÉS

1. Définition

Les matériaux de base du volet sont des résines polyester renforcées de fibre de verre dont l'appellation est BMC (Bulk Molding Compound) qui signifie «composite moulable en vrac.

2. Composition du BMC :

- Résine polyester avec catalyseur en solution dans du styrène.
- Fibre de verre en vrac :longueur des fibres égale à 25 mm maximum).
- Charges (elles ont pour fonction de renforcer la résine polyester et diminuer le coût).
- Additifs (agents épaississants et de démoulage).

3. Procédé de fabrication : Injection

La pâte, chauffée à 60° C et mélangée dans un appareil du genre pétrin, est injectée à grande vitesse dans le moule par une "vis-piston".

La température du moule est de 150° C et la pression de la matière dans le moule est de 80 à 150 kg/cm³.

4. Principe général de réparation

Il est possible de procéder à certaines réparations (trous, cassures, félures, rayures) à l'aide de produits adaptés pour ce type de matériaux.

Les produits les plus adaptés pour ces réparations sont les résines polyester chargées de fibre de verre dont la composition est très proche des matériaux de base utilisés en fabrication, c'est-à-dire : résine polyester, fibre de verre, charges minérales auxquelles on adjoint un catalyseur pour obtenir une polymérisation rapide à basse température.

ADHÉRENCE DES PRODUITS DE RÉPARATION.

Dans ce type de réparation, l'adhérence du produit rapporté sur le matériau de base est extrêmement importante en particulier dans le cas où il s'agit de restructurer des zones où les efforts sont importants.

Pour obtenir une adhérence correcte, il est indispensable d'effectuer une préparation minutieuse des surfaces, c'est-à-dire :

- abrasion avec un disque à gros grains (40 à 60).
- dépoussiérage avec un chiffon très propre ou du papier genre essuie-tout.

ATTENTION : Ne jamais effectuer de dégraissage des surfaces abrasées avec des solvants gras (diluant peinture, white-spirit) ou qui laissent des pellicules de poussière en surface (alcool dénaturé) car les effets sont négatifs pour l'adhérence.

En cas de nécessité, utiliser de l'acétone ou le solvant contenu dans la trousse de réparation. Dans le cas où la pièce à réparer a subi des projections de corps gras, il est préférable de nettoyer ces projections avant abrasion et chanfreinage ; pour ce nettoyage préliminaire, le choix du solvant importe peu.

PRÉPARATION DES SURFACES POUR PEINTURE

Dans tous les cas, compte-tenu des porosités qui subsistent dans la matière après surfaçage, il est indispensable de recouvrir la zone réparée d'une ou deux couches fines de mastic polyester de finition. La première couche doit être appliquée à la spatule métallique de façon à bien obturer toutes les porosités.

Après surfaçage, appliquer deux couches d'un apprêt à fort pouvoir garnissant et ayant une bonne adhérence sur ce type de matériaux.

Surveiller les porosités pouvant apparaître, et éventuellement charger davantage ces zones pour éliminer ce défaut.

PEINTURE :

Voir Note Équipement N° 84-06.

II. PRODUITS DE RÉPARATION

La réparation des matériaux composites nécessite plusieurs produits et, pour répondre aux caractéristiques d'adhérence, résistance et rigidité indispensables, nous retenons ceux qui permettent d'obtenir les meilleurs résultats.

Mastic polyester chargé de fibre de verre "V.11" : Réf. DPR : **ZCP 830-004**

Caractéristiques :

Très bonne adhérence sur la plupart des matériaux composites à base de résines polyester et sur la tôle. Résistance et rigidité comparables aux matérieux de base utilisés pour la fabrication.

Conditionnements :

Boîtes de 1 kg ; 1,6 kg + tube de catalyseur.

Trousse de réparation : Réf. DPR : **ZCP 830-006**

Composition :

- 1 bidon de résine polyester KR,
- 1 tube de catalyseur pour résine (à ajouter à raison de 3 % dans la résine)
- 2 m² de mat de verre, à 225 gr/m² (pour restructuration de surfaces),
- 1 m² de mat de verre à 25 gr/m² (pour réparation des nervures de capot),
- 1 pinceau pour application de la résine,
- 2 bols pour préparation de la résine,
- 1 spatule,
- 1 litre d'acétone (pour nettoyage des instruments),
- 1 flacon (250 cc) de cire de démoulage

Utilisation :

Dans le cas de réparation nécessitant une résistance importante (ex. : zones périphériques, de fixation glace et serrure), il est indispensable de rigidifier la zone réparée à l'aide de mat de verre et de résine liquide KR).

Recommandation :

Avant application de la résine liquide KR, il faut impérativement mettre une couche de mastic polyester chargé de fibre de verre (V.11) afin d'obtenir l'adhérence nécessaire.
La résine liquide peut être appliquée 10 minutes après le mastic polyester, sans ponçage préalable, mais en raison des inégalités de surface, il est préférable de faire un léger surfaçage avec un disque à gros grains.
Après séchage de la résine (30 minutes à 20° C), appliquer si nécessaire une couche de mastic "V.11".
Laisser sécher et surfacer.

Mastic polyester de finition :

Après toutes réparations à l'aide des produits ci-dessus, il est indispensable d'appliquer un mastic polyester de finition en raison des porosités pouvant subsister dans la matière.
Tous les mastics polyester de bonne qualité conviennent pour cette opération.

REMARQUES :

Les mastics polyester chargés de fibre de verre s'appliquent à la spatule métallique sur des surfaces décapées, abrasées avec disques ou papier à gros grains et soigneusement dépoussiérées.
La quantité de catalyseur à mélanger intimement aux produits polyester cités ci-dessus, est de 3 % et éventuellement jusqu'à 5 % par basses températures.
Ne pas dépasser la dose prescrite de catalyseur, car il aurait un effet néfaste sur la qualité de la matière rapportée.

Il est possible de se procurer du mat de verre au détail au Département des Pièces de Rechange :

- Mat de verre à 225 gr/m² (2 m²) – Réf. DPR : **ZCP 830-007**
- Mat de verre à 25 gr/m² (2m²) – Réf. DPR : **ZCP 830-008**

III. MATÉRIEL

Pour toutes les opérations de découpage, disquage ou ponçage, il faut dans tous les cas opérer avec un matériel muni d'un système spécial d'aspiration en raison du volume de poussière dégagée et de la présence de fibre de verre.
Il est également recommandé de porter un masque du type de ceux utilisés en peinture.

TYPES DE POSTES DE TRAVAIL RECOMMANDÉS.

Équipement FESTO : Fig. I et II.

Ensemble comprenant :

1 – Aspirateur WAP – Turbo M 1 S (puissance 750 W).
2 – Ponceuse vibrante LRM-GA (patin 93 x 175 : 1/3 feuille standard) (surfaçage et ponçage de finition).
3 – Ponceuse à disque et excentrique LET-A (disque Ø 150) (surfaçage chanfreinage).
4 – Ponceuse avec fraise cylindrique LGS 0615 AT (fraise diamantée Ø = 10) (ponçage des arêtes, angles, nervures...).
5 – Tronçonneuse à renvoi d'angle LWS 0610 AS (disque diamanté Ø = 100) (tronçonnage, chanfreinage,...).

NOTA : Les Sociétés «FESTO» et «3 M FRANCE» fournissent des abrasifs (disques et feuilles) préperforés, adaptés pour ce matériel.

Équipement «MIR» : Fig. III et IV

6 – Aspirateur (puissance 750 W).
7 – Disqueuse à «barber» LEN 8 Z AP (disque Ø 170) (chanfreinage, préparation des surfaces et ébauche du surfaçage).
8 – Ponceuse à disque et excentrique AS 306 P 150 (disque Ø 150) (auto-adhésif) (surfaçage, préparation des surfaces).
9 – Ponceuse vibrante + gabarit de perçage des abrasifs AS 190 BXC (patin 170 × 95) (ponçage et surfaçage de finition).
10 – Tronçonneuse ENF 4/TAZ (disque diamanté Ø 100) (découpage des zones détériorées).

NOTA : Ces matériels (disqueuses et ponceuses) utilisent des abrasifs courants du commerce (sans perforation spéciale).

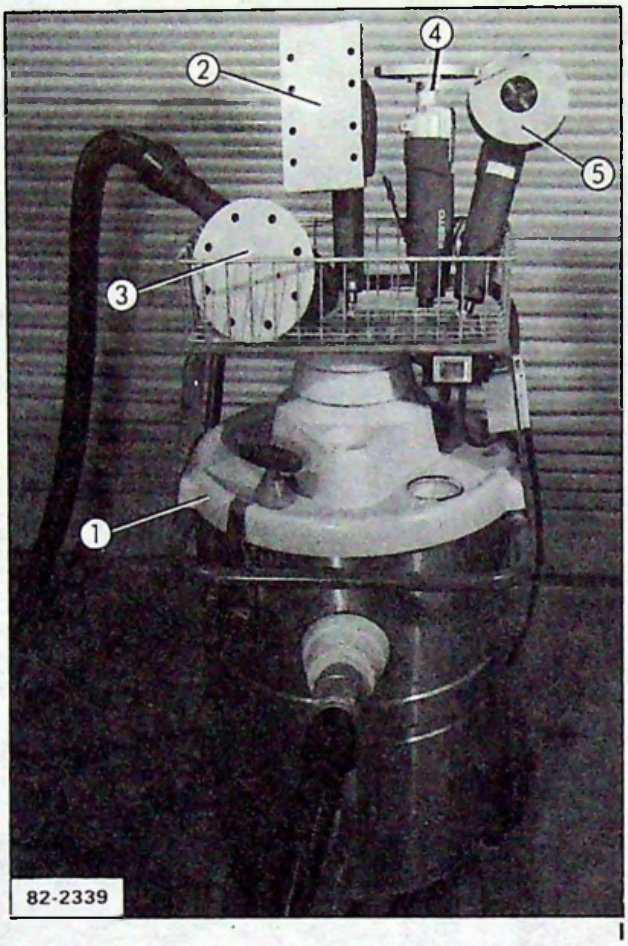
ADRESSE DES FOURNISSEURS.

FESTO SARL : rue Édouard Jaunez – 57202 SARREGUEMINES CEDEX – Tél. 87.95.01.43.

MIR International : 106, rue Danton – 92300 LEVALLOIS PERRET – Tél. 47.58.13.93.

REMARQUE :

Ces matériels sont utilisables pour le surfaçage et le ponçage des mastics ou apprêts polyester sur surfaces métalliques.



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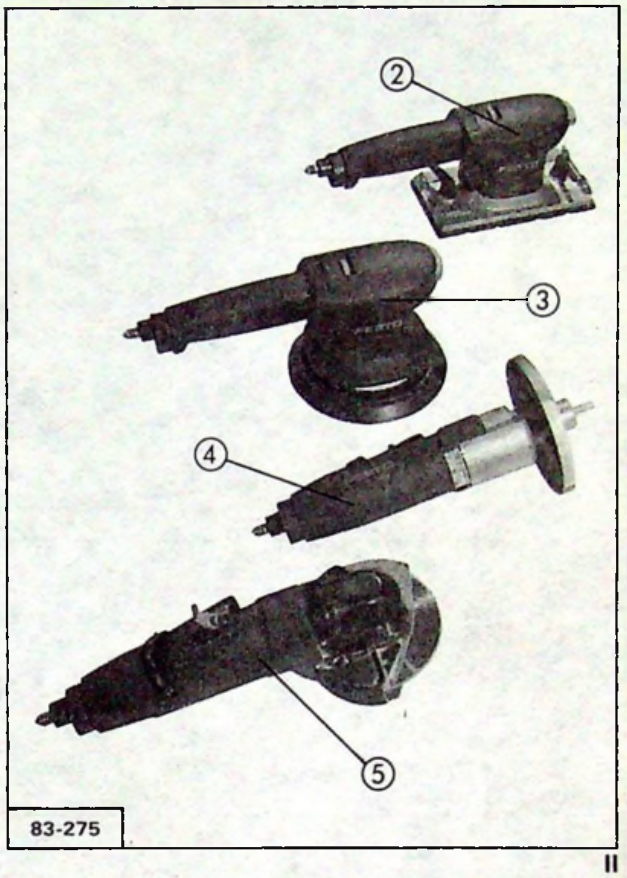

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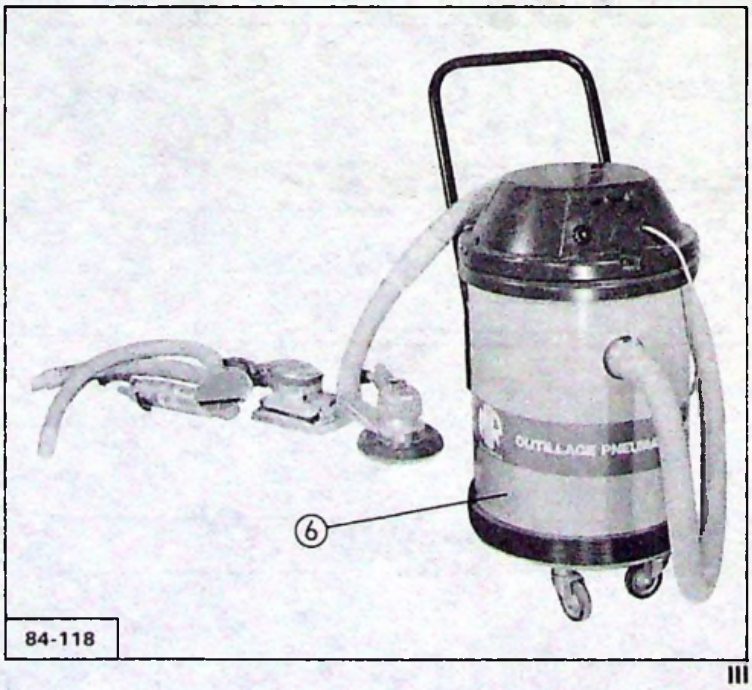

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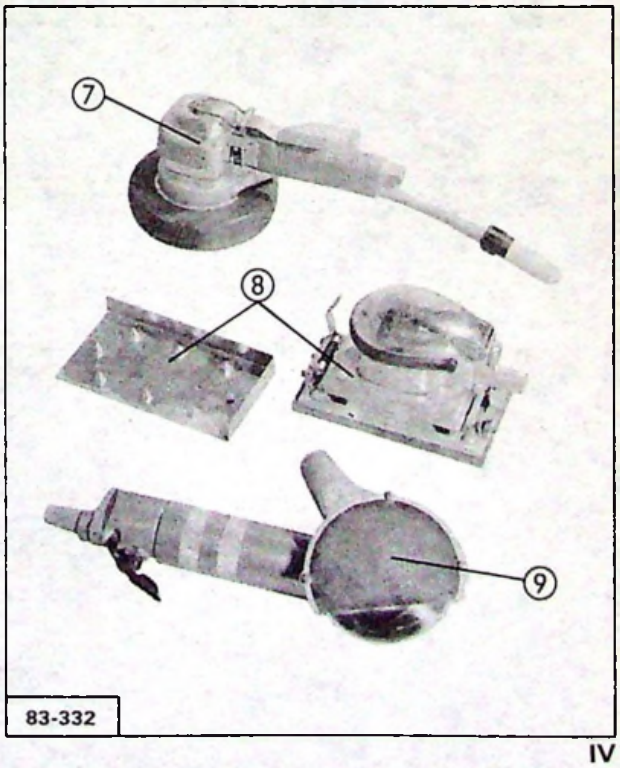

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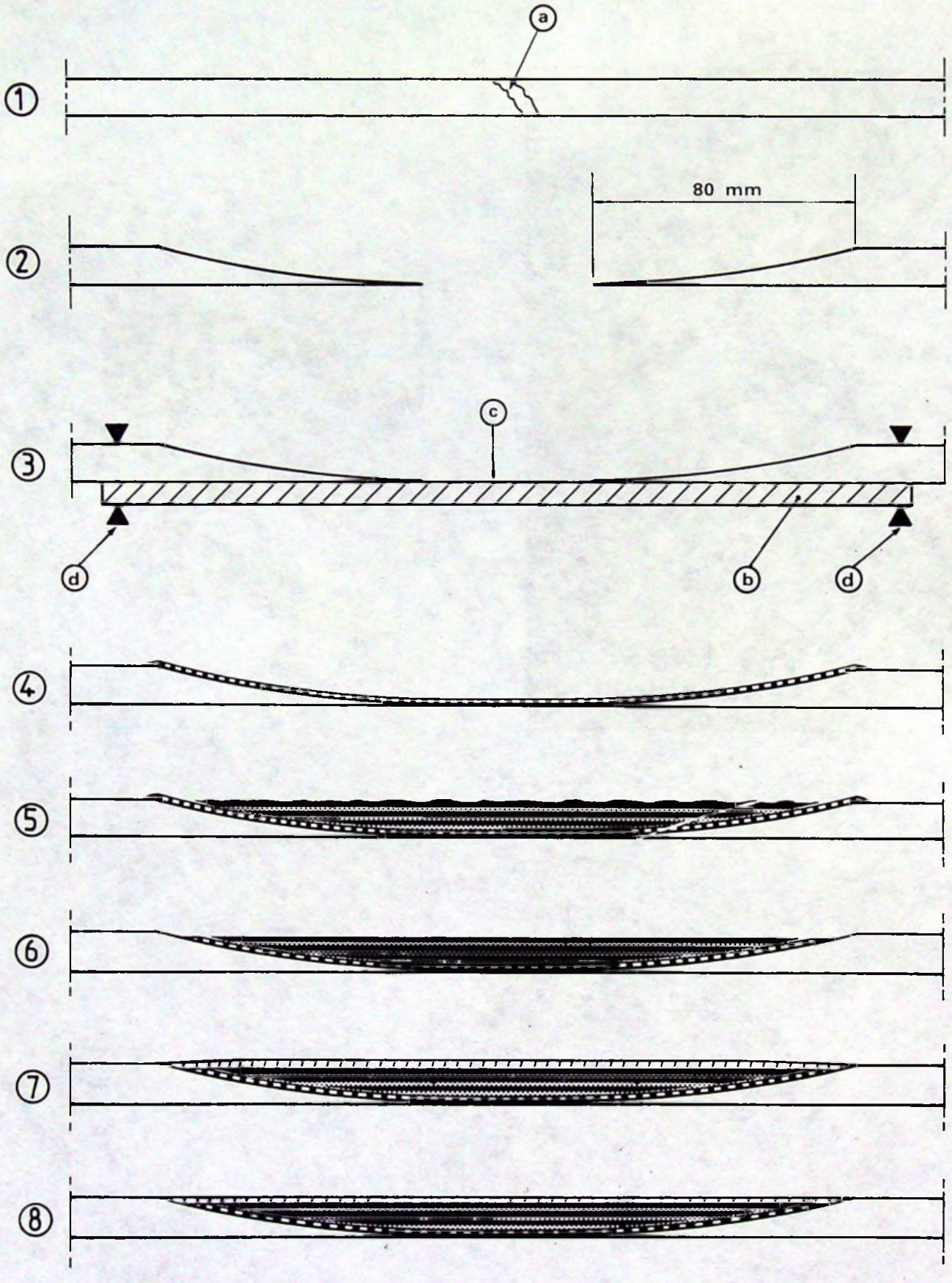

a
1
80 mm
2
c
3
d
b
d
4
5
6
7
8

IV. RÉPARATION D'UNE FISSURE OU D'UNE CASSURE

Dans le cas d'une cassure ou même d'une fissure qui ā priori paraît être de moindre importance, il faut procéder à une réparation offrant les caractéristiques de résistance les meilleures possibles, en particulier lorsqu'elle est située dans une zone soumise à des efforts importants.

ATTENTION : Dans certains cas, lorsqu'une réparation présente des difficultés importantes de réalisation et risque de mettre en jeu la sécurité de l'utilisateur, il faut remplacer l'élément (ex. : arrachement des bossages de fixation de la serrure).

MODE OPÉRATOIRE

① : Cassure (**a**) dans son état initial (**ATTENTION : En apparence la fissure peut paraître bénigne bien que très profonde, donc le tissu de fibre est rompu, il convient de réaliser l'opération offrant la meilleure résistance possible**).

② : A l'aide d'une disqueuse aspirante, effectuer un chanfrein très large (80 mm mini de part et d'autre de la fissure) et très profond.
Utiliser un disque à gros grains (40 ou 60).
Dépoussiérer à l'aide d'un chiffon sec et propre.

③ : Préparer un support (**b**) (en tôle, en plastique ou carton) afin de soutenir la matière dans la zone cassée.
Enduire la face en contact (**c**) de cire de démoulage.
Fixer ce support à l'aide de pinces (**d**).

④ : Appliquer à la spatule une fine couche de mastic polyester chargé de fibre de verre "V 11" (couche d'adhérence).
Laisser sécher (10 mn environ) et effectuer un léger surfaçage avec un papier à gros grains.
Dépoussiérer.

⑤ : Couper **le nombre de surfaces de mat de verre nécessaires au remplissage du chanfrein.**
Préparer la quantité de résine liquide (résine polyester KR + 3 à 5 % de catalyseur).
A l'aide d'un pinceau, humecter une à une les différentes couches de mat de verre (agir avec le pinceau par tamponnage en évitant au maximum les bulles d'air).

⑥ : Laisser sécher (20 à 30 mn à 20° C).
Surfacer (avec abrasif gros grain) et dépoussiérer.

En cas d'insuffisance légère de résine, appliquer une couche de mastic polyester "V 11".
Surfacer.

⑦ : Appliquer une couche de mastic polyester de finition pour supprimer toutes les porosités dans la matière rapportée.

⑧ : Effectuer le surfaçage final.

REMARQUE

Dans certains cas où la réparation est avant tout un problème d'aspect (trous ou cassures légères en plein panneau par exemple) il n'est pas nécessaire de renforcer la zone réparée avec du mat de verre et de la résine liquide, le mastic renforcé de fibre de verre (V. 11) étant suffisant, ce qui permet un gain de temps important.

V. RÉPARATION D'UNE NERVURE INTÉRIEURE CASSÉE OU FISSUREE

PRODUITS NÉCESSAIRES :

- Mastic polyester chargé de fibre de verre "V. 11".
- Mat de verre à 25 gr/m² (contenu dans la trousse réparation).

MODE OPÉRATOIRE

Dégraisser la zone à réparer à l'aide d'un chiffon imbibé d'un solvant non gras (solvant de la trousse de réparation ou super-clean).
A l'aide d'une lame, décaper et abraser la zone à réparer, chanfreiner les zones fissurées. **Fig. I.**
Dépoussiérer soigneusement à l'aide d'un chiffon propre et sec.

Confectionner un support **A** pour maintenir la colle pendant application et séchage, **Fig. II.**
Recouvrir le support d'un produit anti-adhérent (corps gras ou feuille de polyéthylène).

Plaquer le support contre la nervure.

Découper une surface de mat de verre correspondant à la zone **B** à réparer, **Fig. III.**

Appliquer à la spatule une fine couche.
Disposer et plaquer la feuille de mat de verre sur cette couche de colle.
Appliquer une nouvelle couche de colle en imprégnant bien le mat de verre.

Laisser sécher, déposer le support **A** et procéder à la même opération sur l'autre face de la nervure, **Fig. IV.**

REMARQUE : Pour éviter toute opération de surfaçage délicat, il est recommandé d'appliquer des couches fines et régulières.
Après séchage, peindre la zone réparée à la couleur de la pièce.

REMPLACEMENT ET POSE D'UN INSERT MÉTALLIQUE (Fig. V.).

Il ne faut jamais réutiliser un insert ayant déjà été monté, car dans ce cas le filetage est toujours plus ou moins détérioré, ce qui entraîne une mauvaise tenue de l'insert, d'où risque d'arrachement.

POSE D'UN INSERT NEUF :

Par l'intermédiaire d'un montage (vis + écrou bloqués, visser l'insert neuf à l'emplacement prévu.

Serrer au couple de **1,4 m.daN** à l'aide d'une clé dynamométrique.

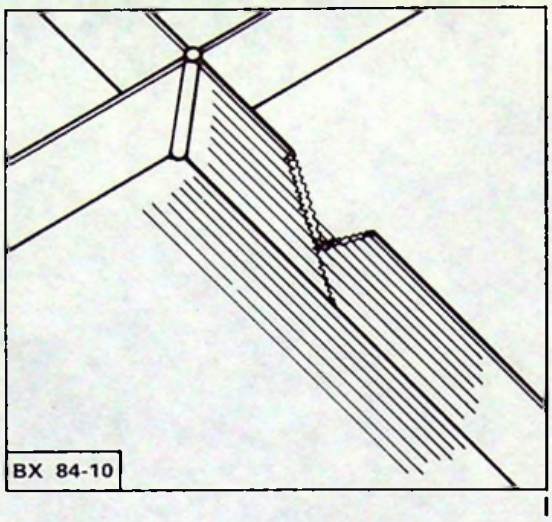
CAS D'UN INSERT «FOIRÉ».

Dans le cas d'un insert «foiré» dans son bossage ou d'un bossage légèrement éclaté, il faut :
- **Nettoyer parfaitement l'intérieur du bossage** (il ne doit subsister ni corps gras, ni poussière, ni particules arrachées).
- Dégraisser l'insert neuf.
- Enduire l'intérieur du bossage et la face d'appui de la collerette d'un produit de blocage.
- Avant séchage, serrer jusqu'au contact de la collerette de l'insert sur le sommet du bossage sans appliquer le couple de serrage.
- Laisser sécher avant dépose des écrous et vis servant à la mise en place.

Produits de collage utilisables :

- Colle Epoxy "POXYMATIC RAPIDE", (Réf : **ZC 9 865 105 U**) – Séchage : 0,50 h à 20° C.
- Colle TEROKAL 6022 (Réf : **ZC 9 867 448 U**) – Séchage : 0,50 h à 60° C.
- Colle Epoxy 3 179/3 180 (Réf. : **ZCP 803 009**) – Séchage : 1 h à 60° C.

NOTA : Pour éviter que le produit de blocage pénètre à l'intérieur des inserts femelles, visser à fond de filetage la vis servant à la mise en place.



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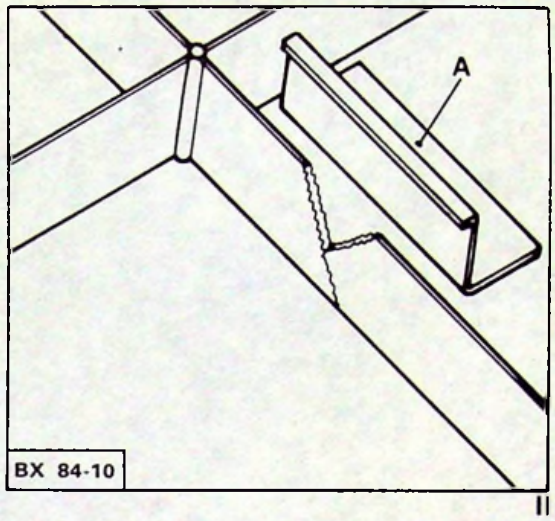

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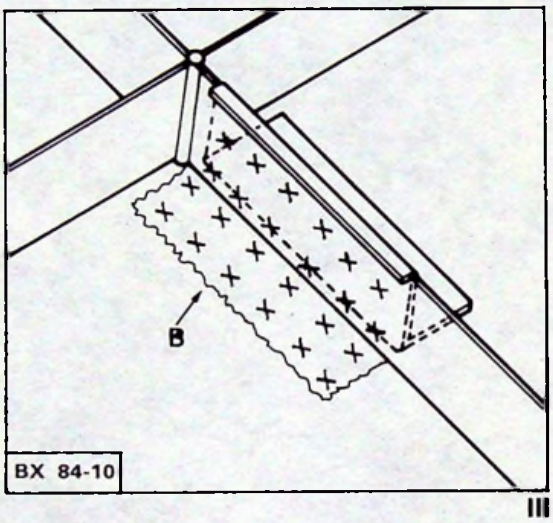

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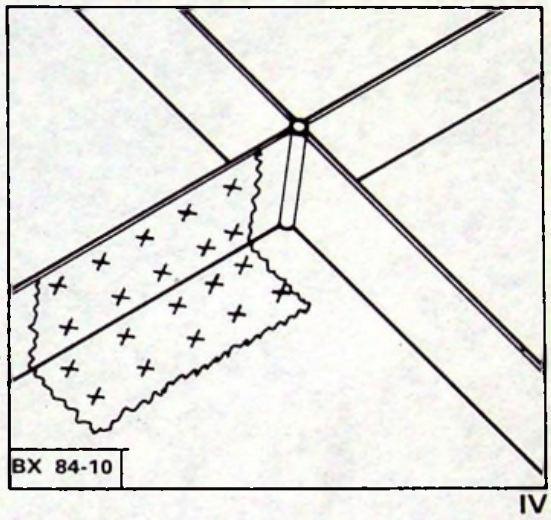

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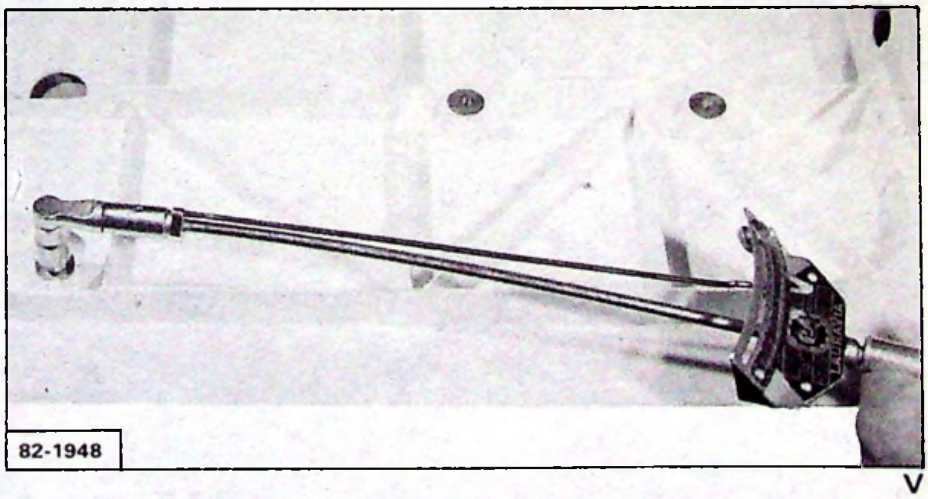

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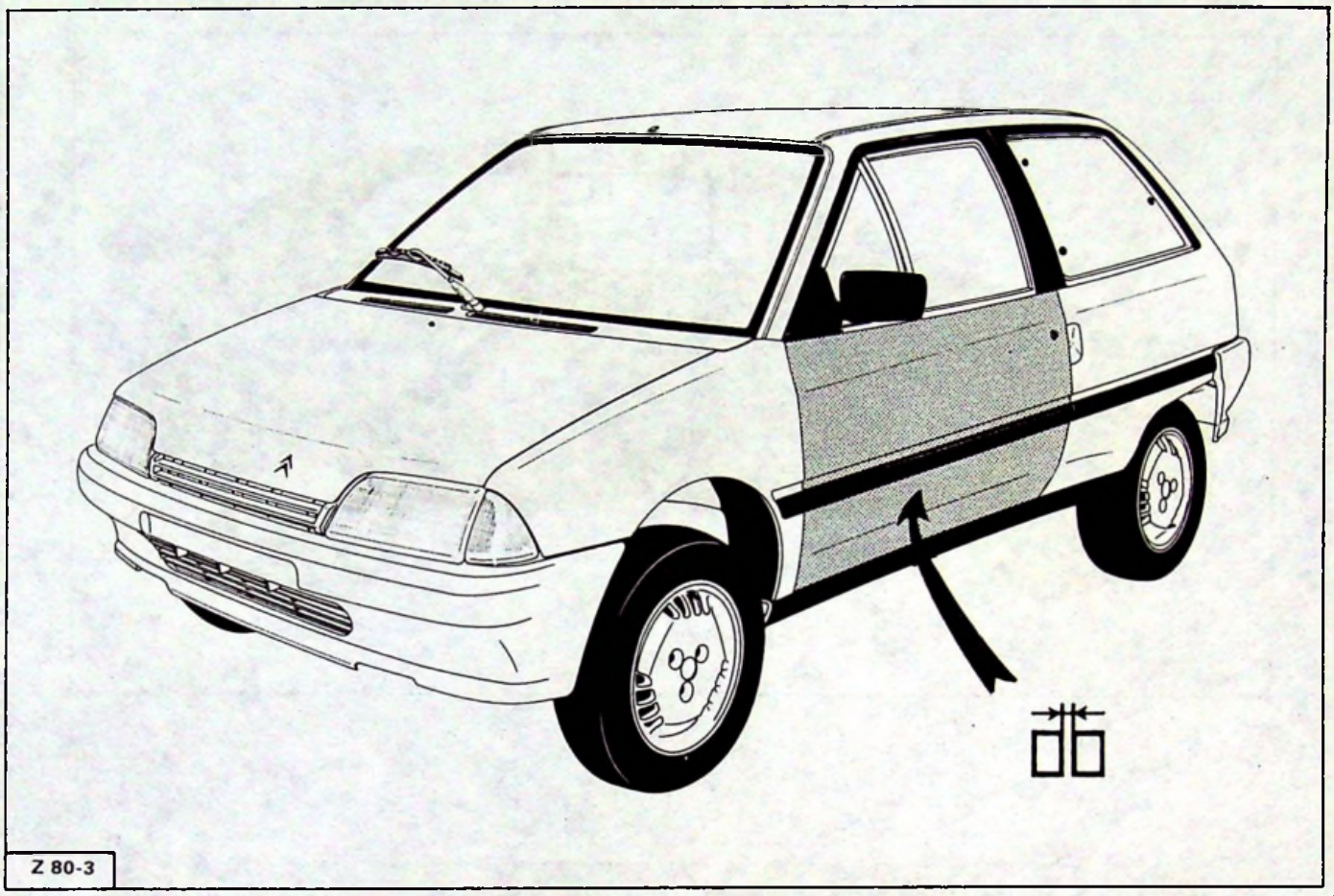

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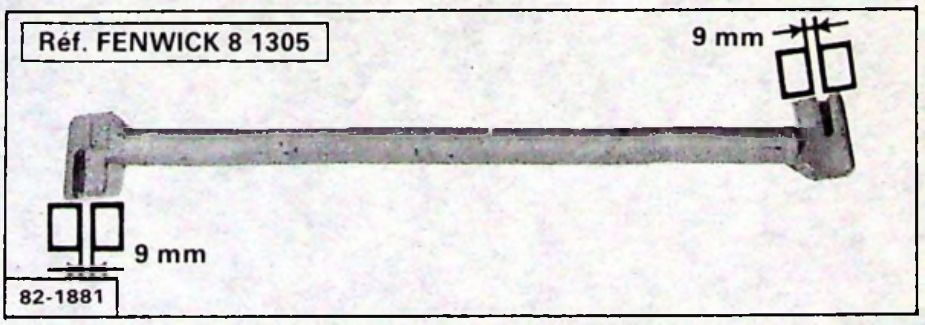

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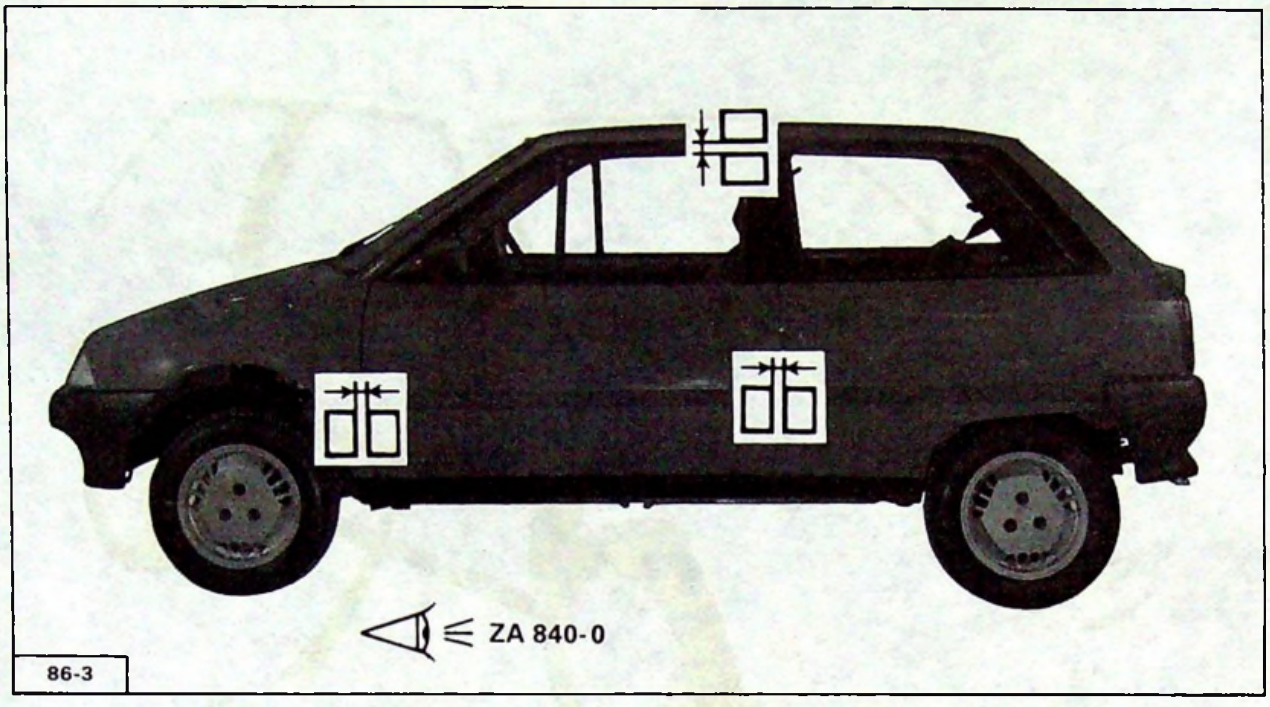
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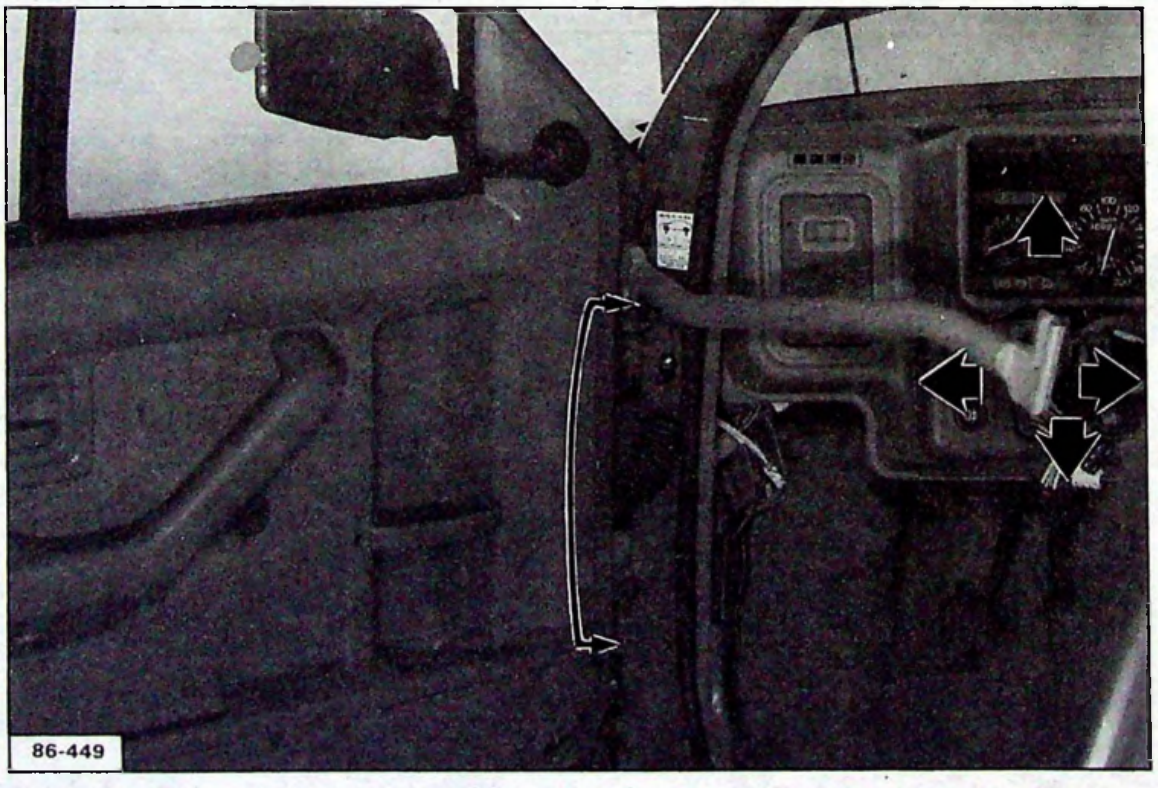
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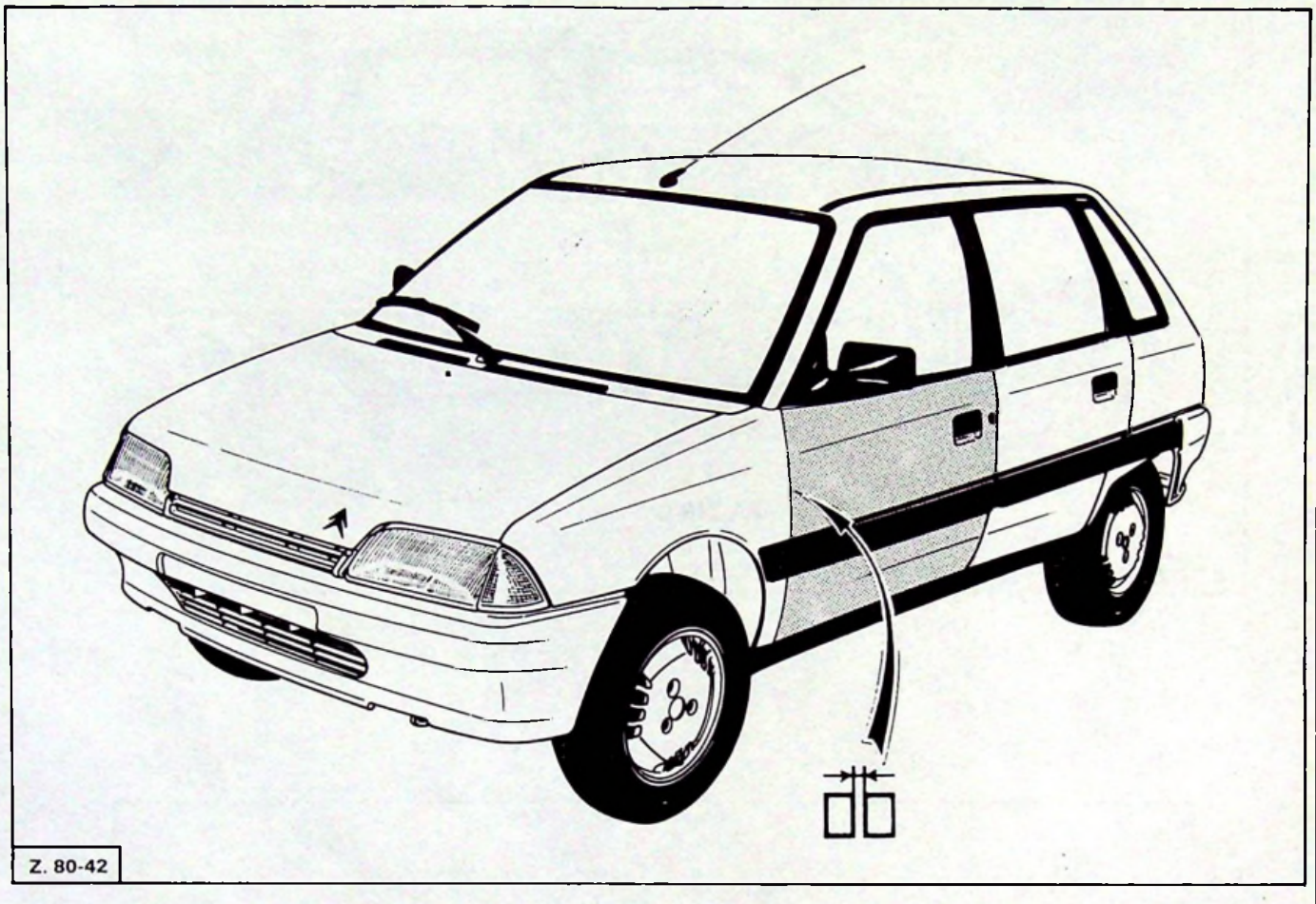

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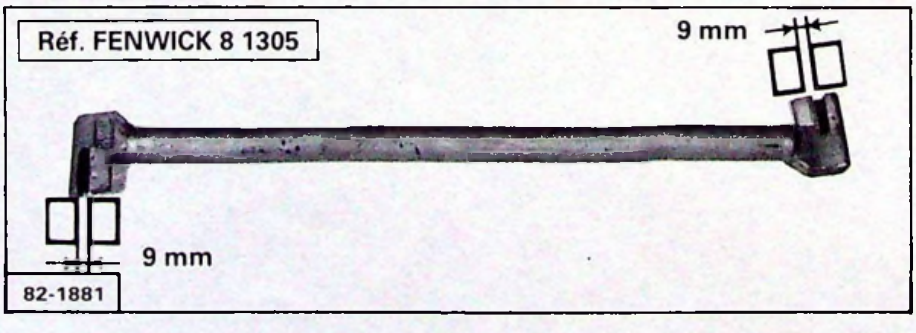

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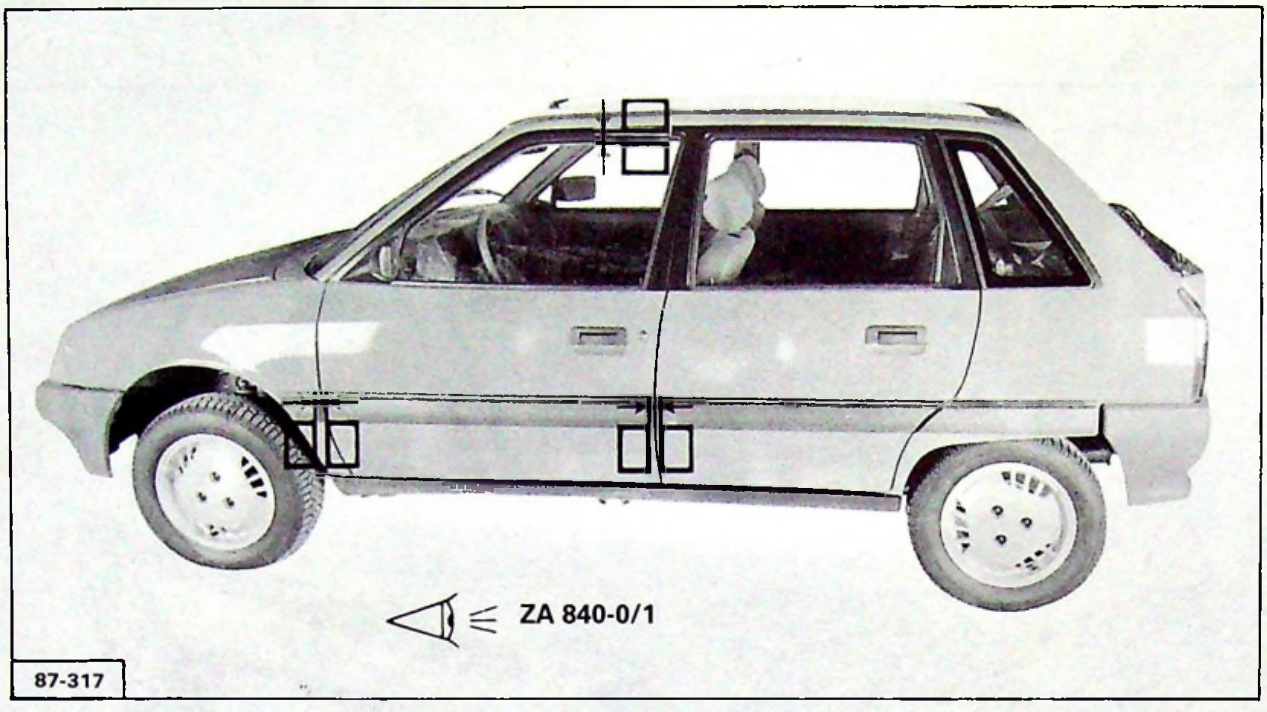
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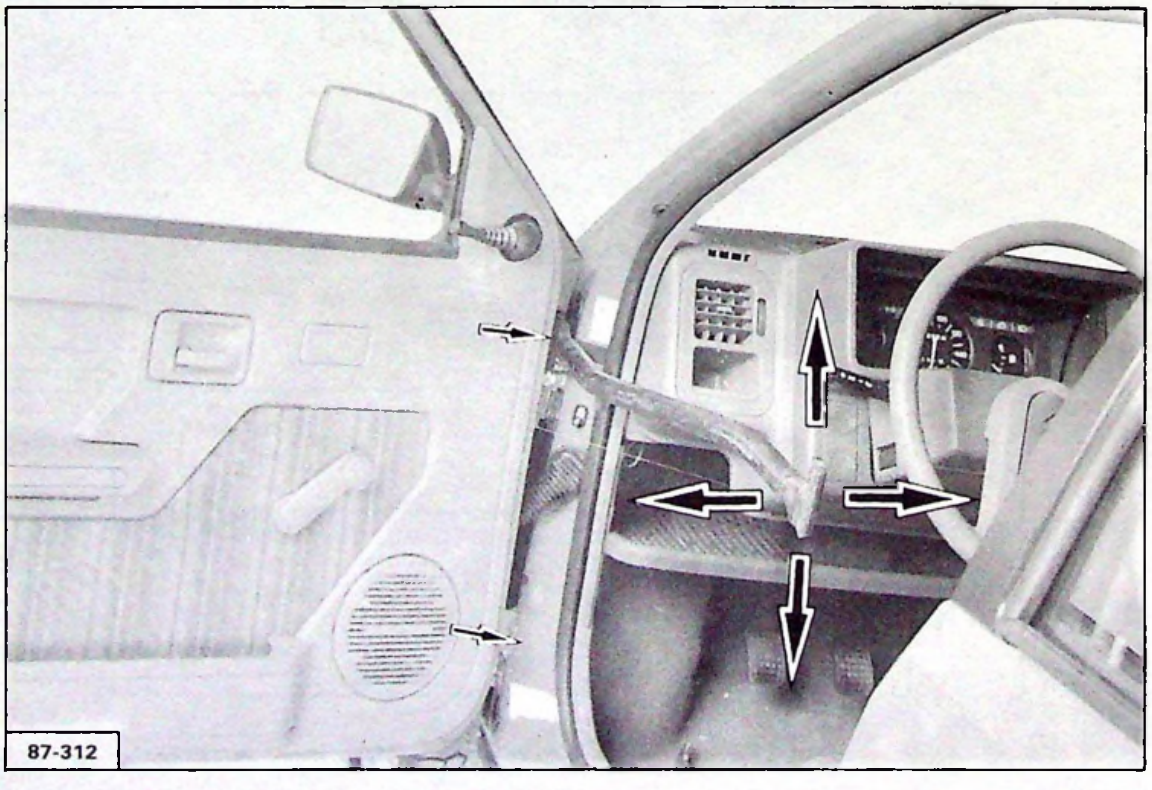
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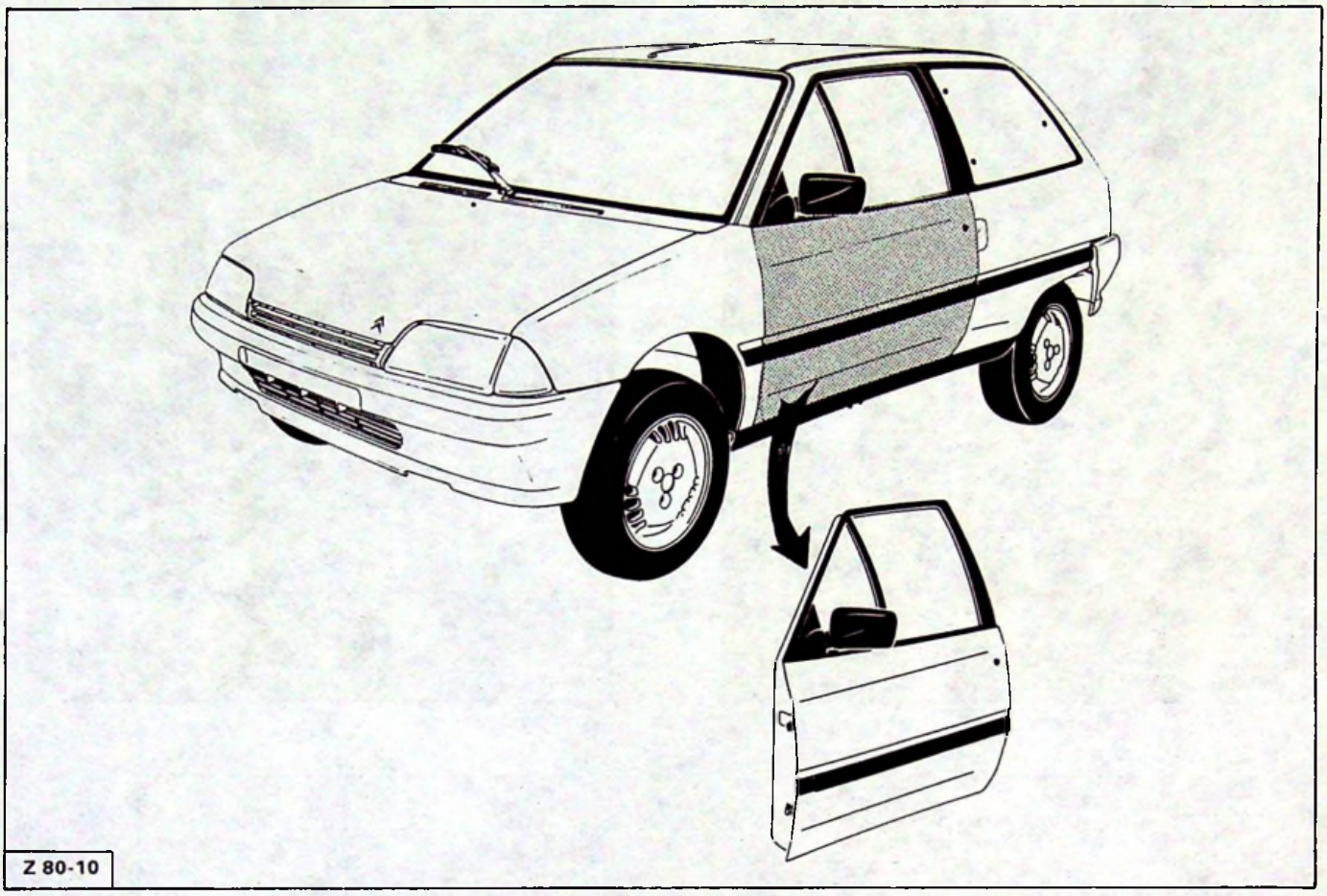

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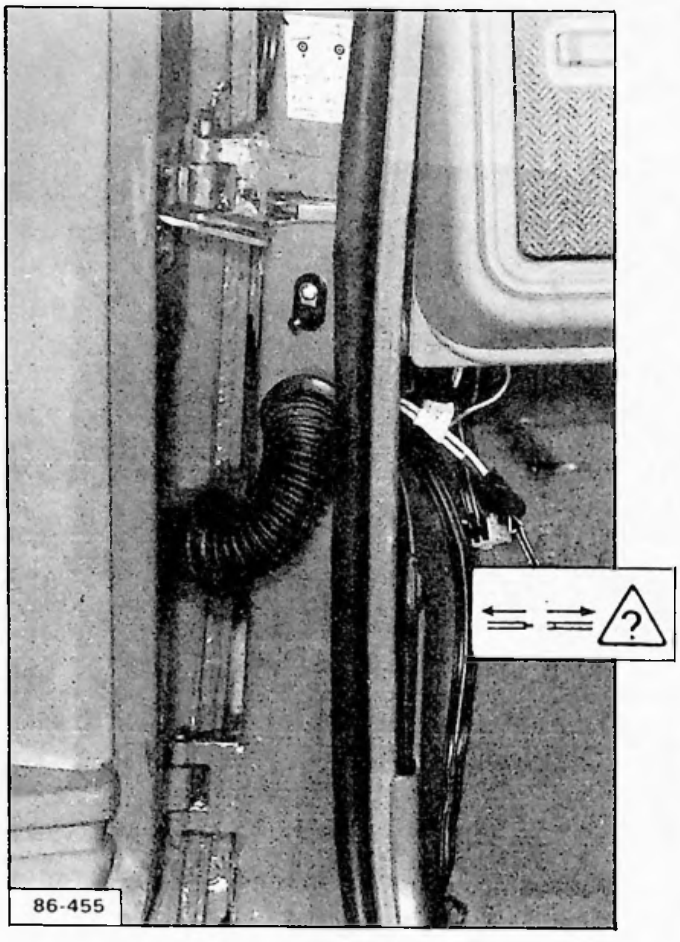
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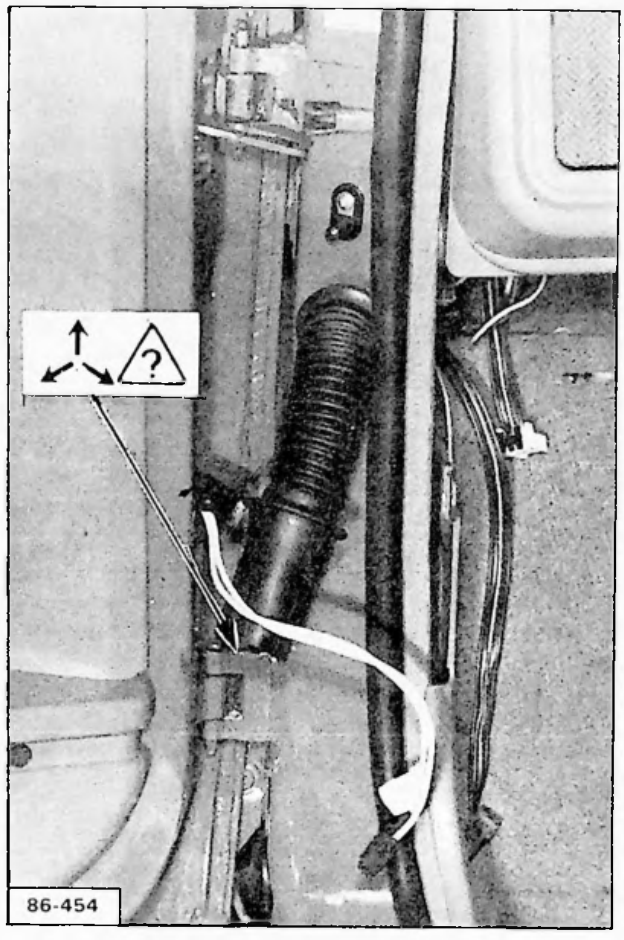
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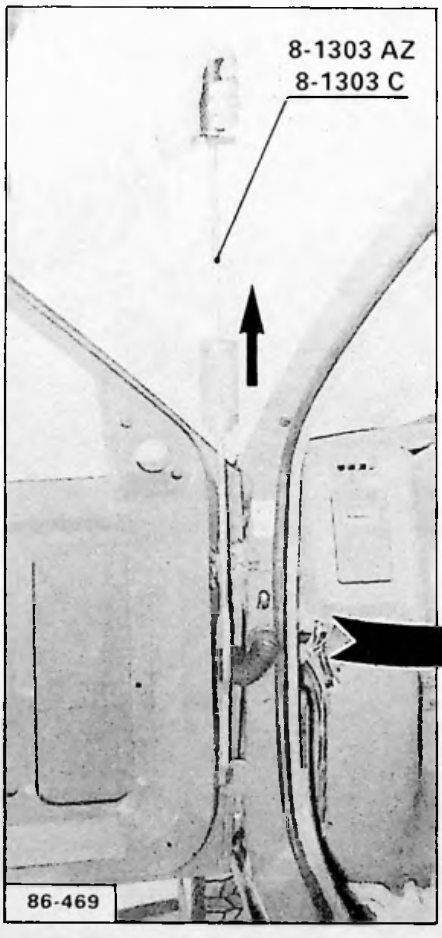
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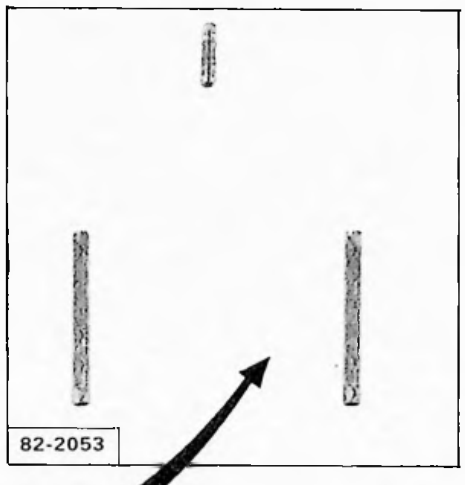
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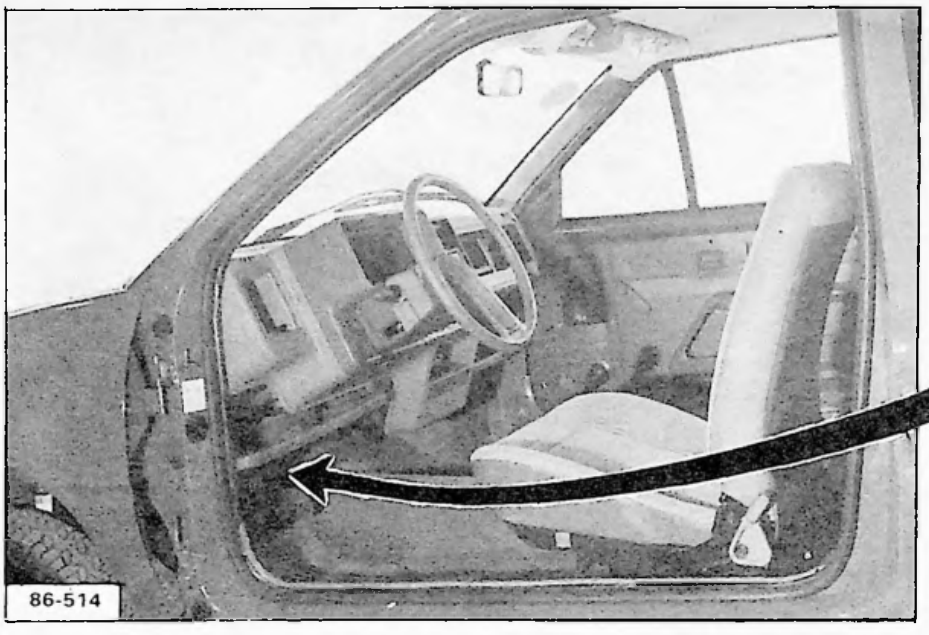
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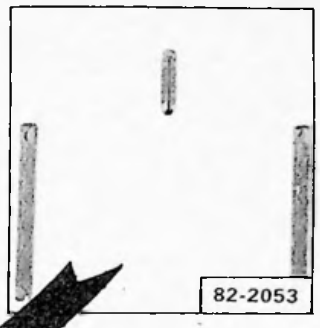
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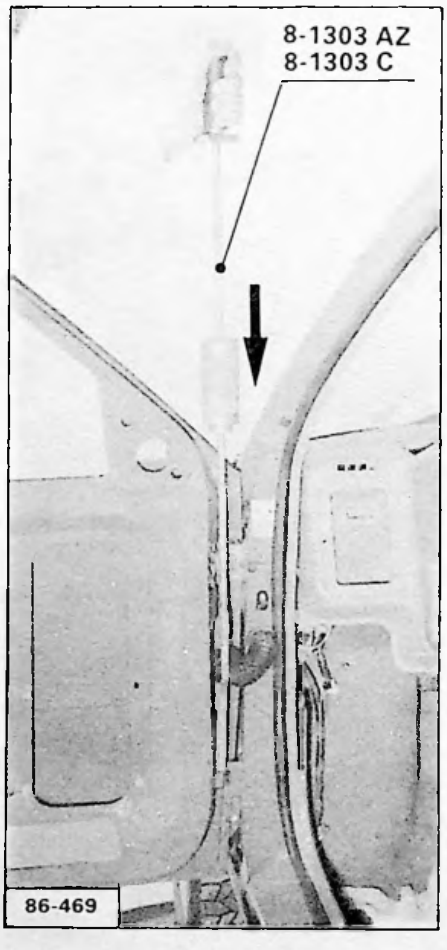
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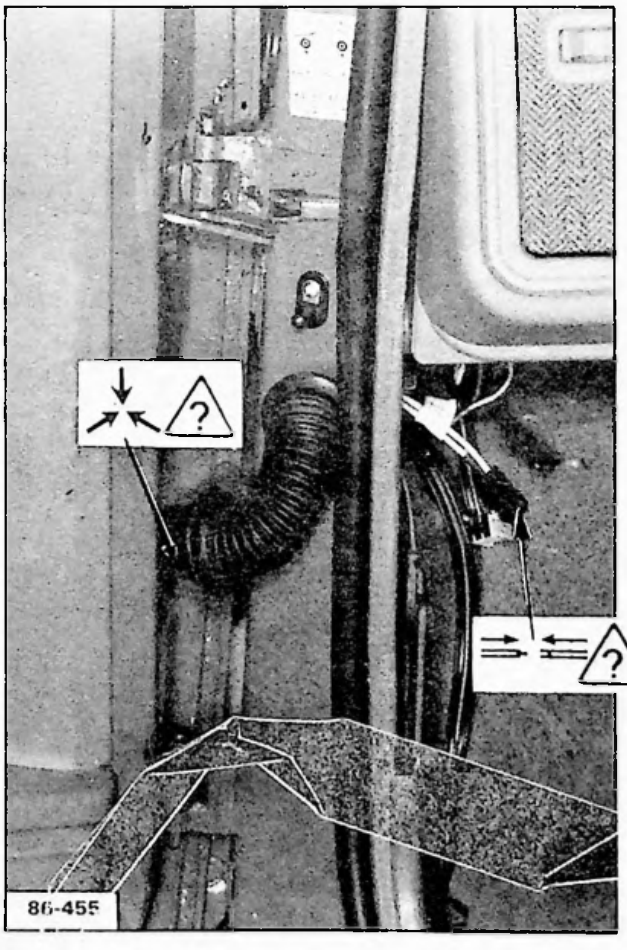
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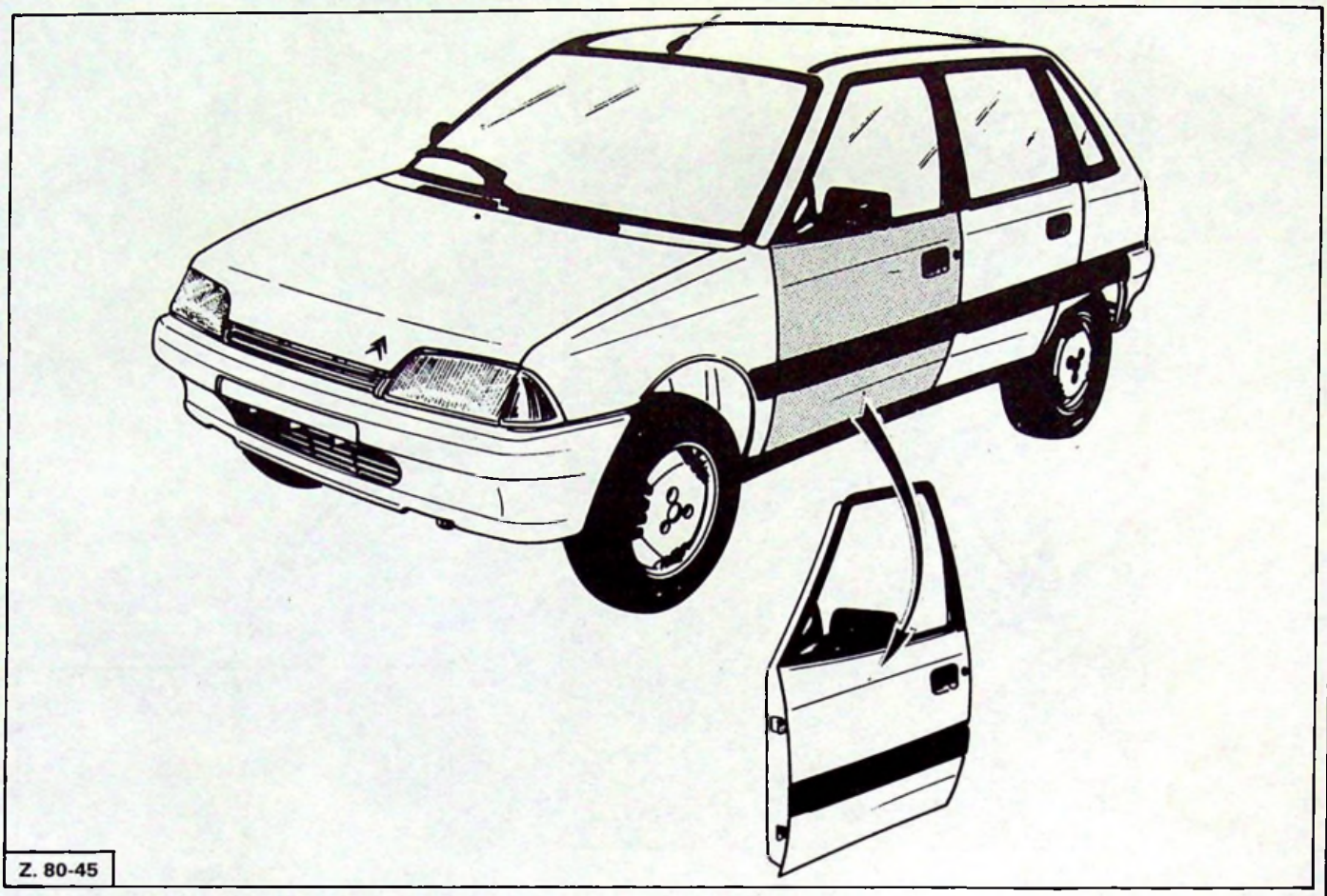

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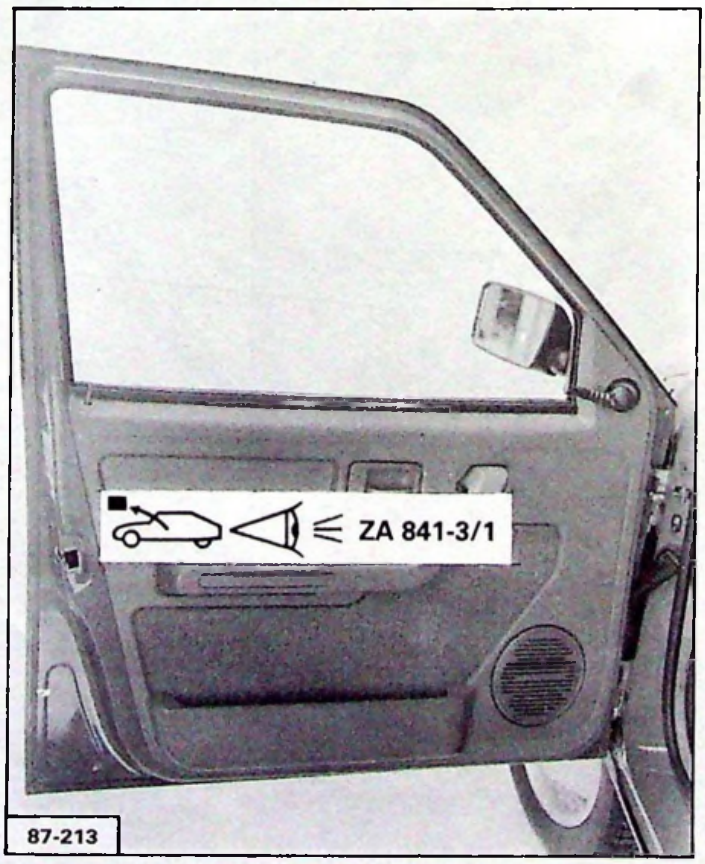

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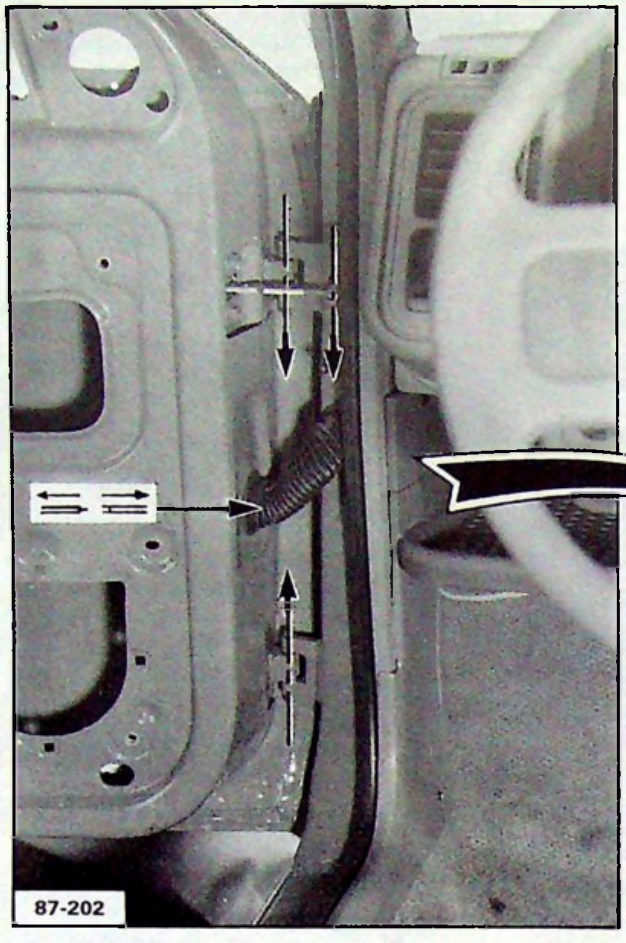
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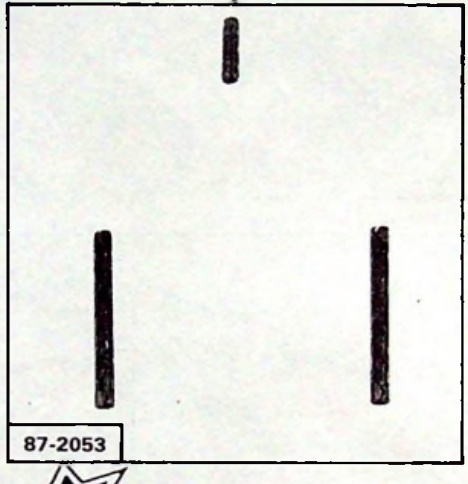
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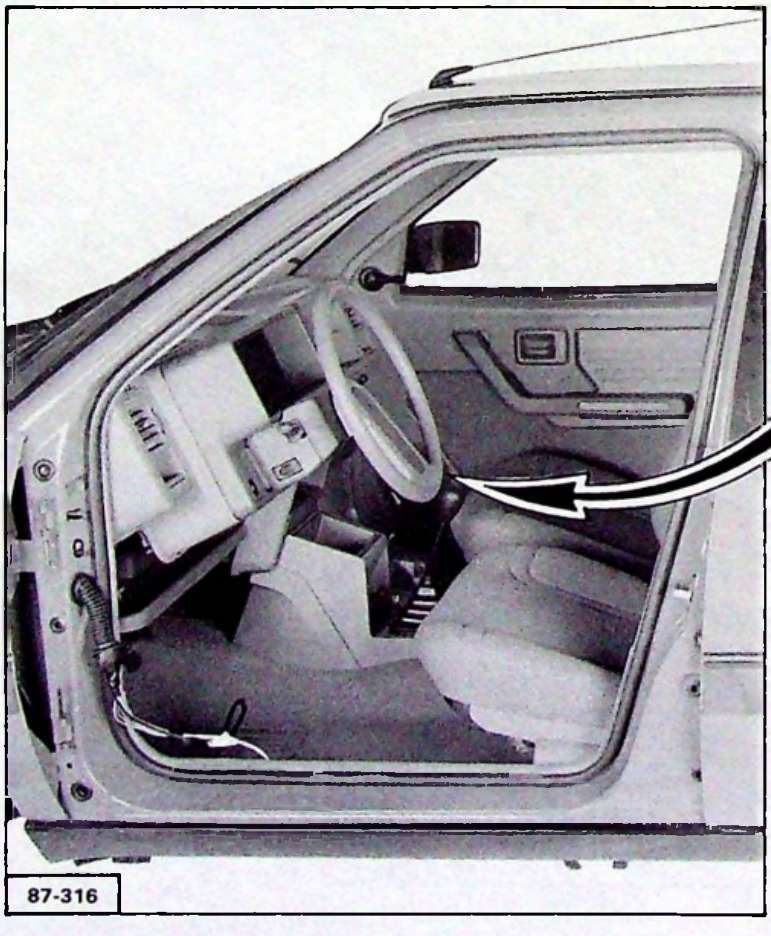
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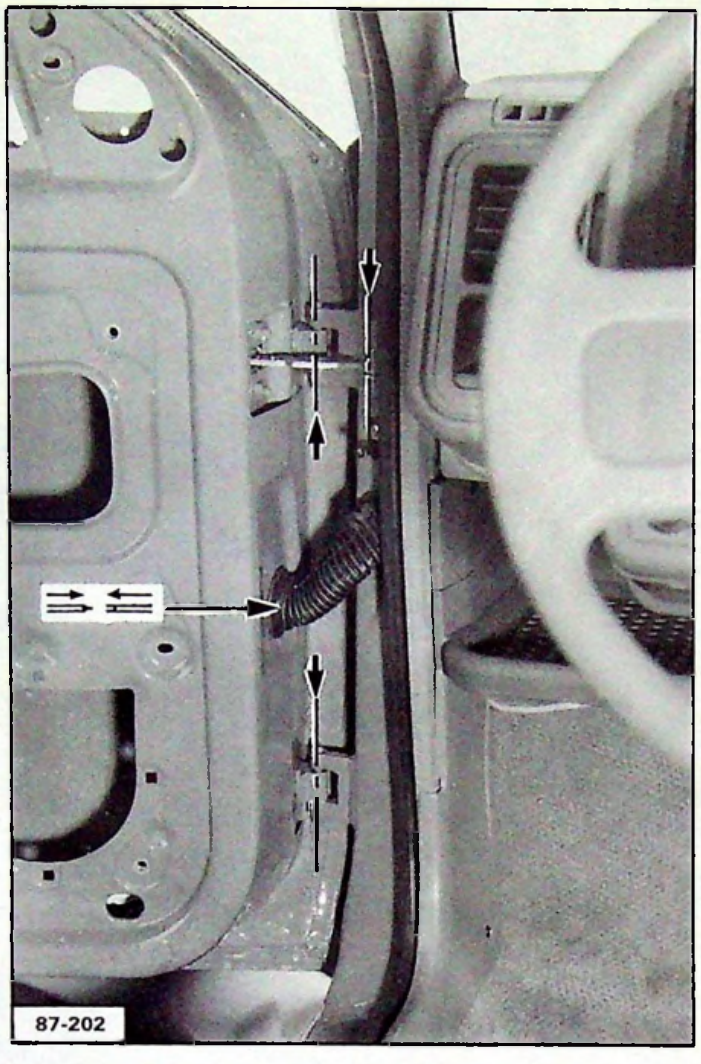
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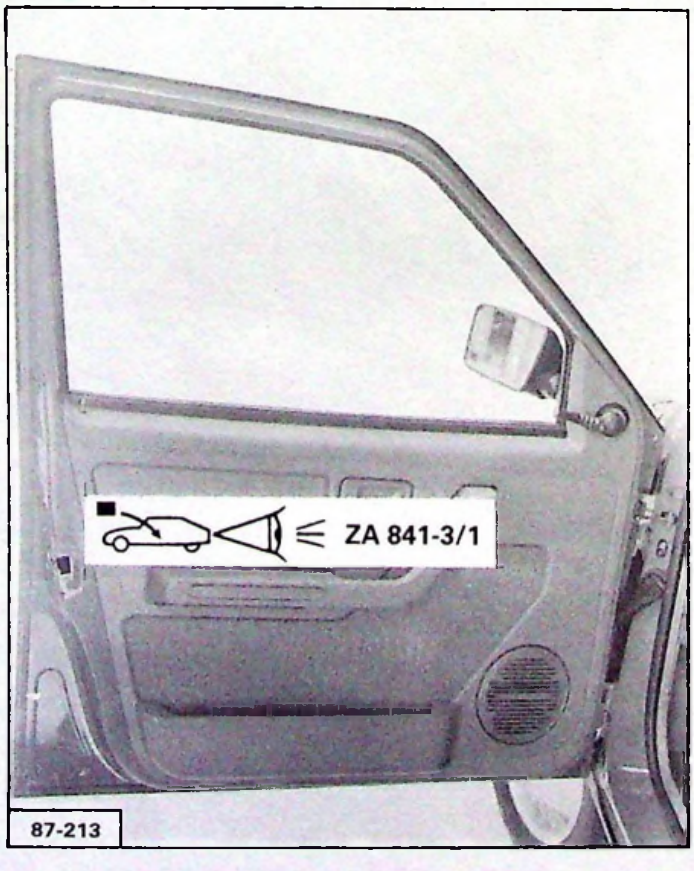
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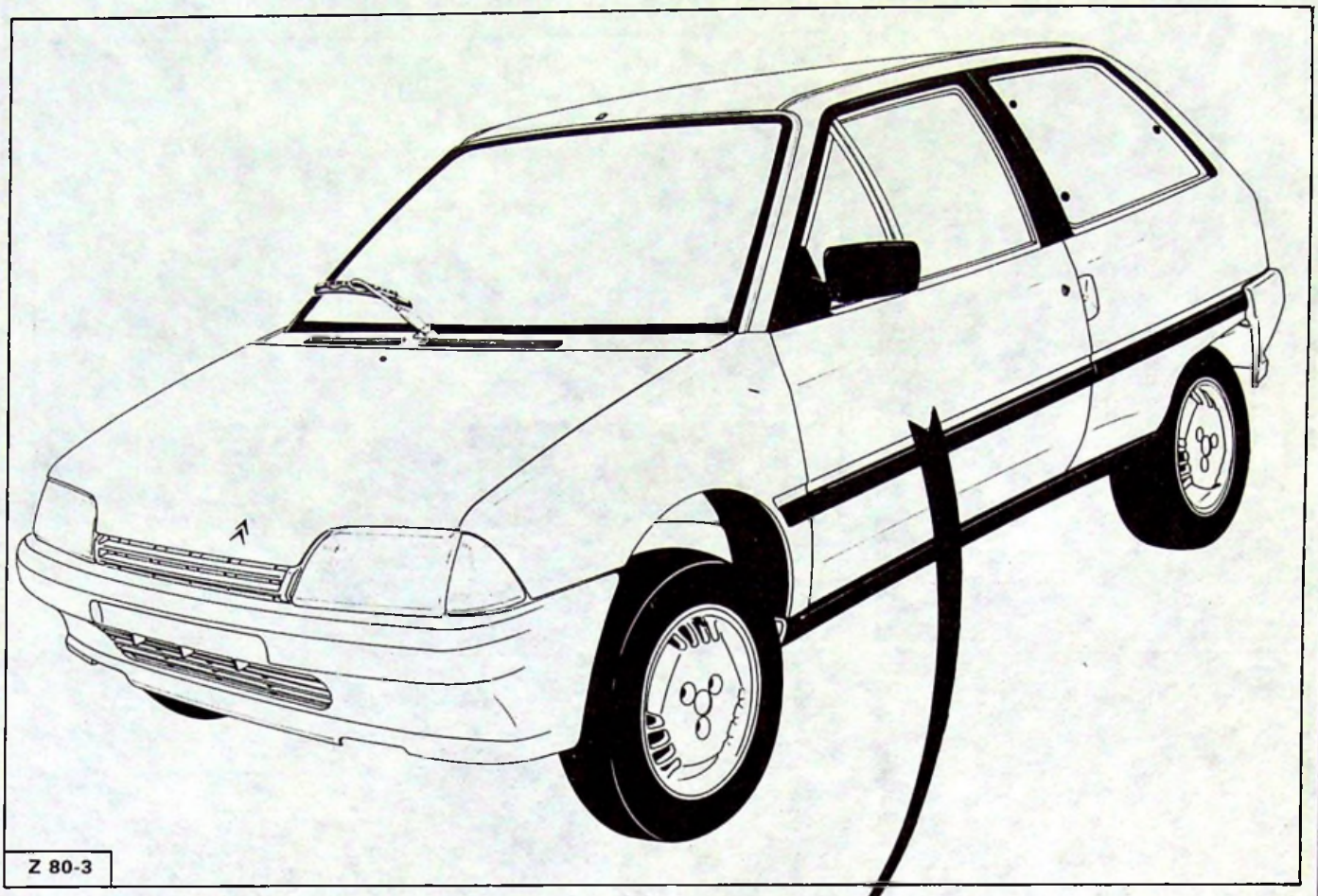

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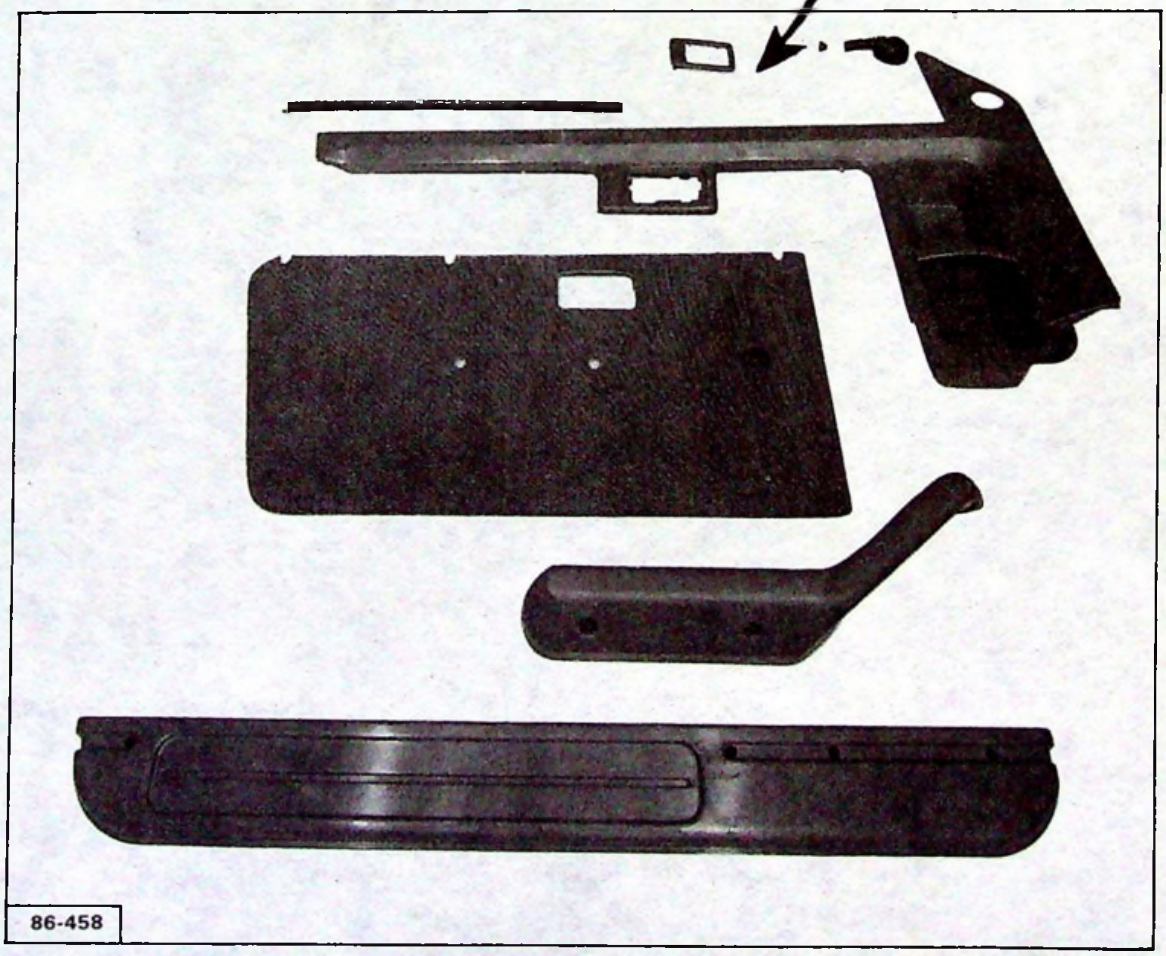

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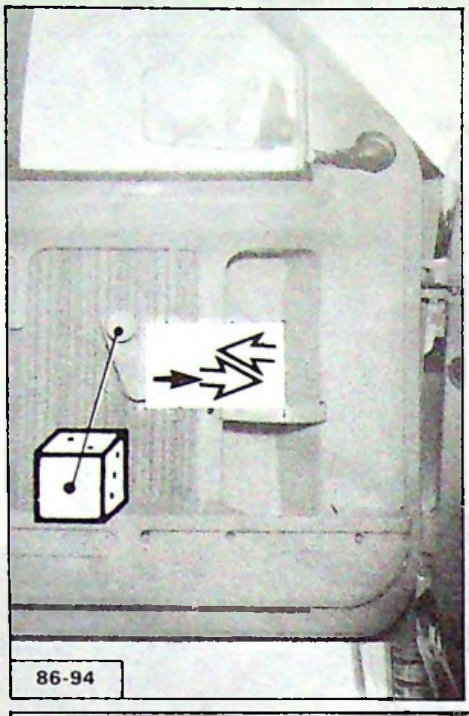
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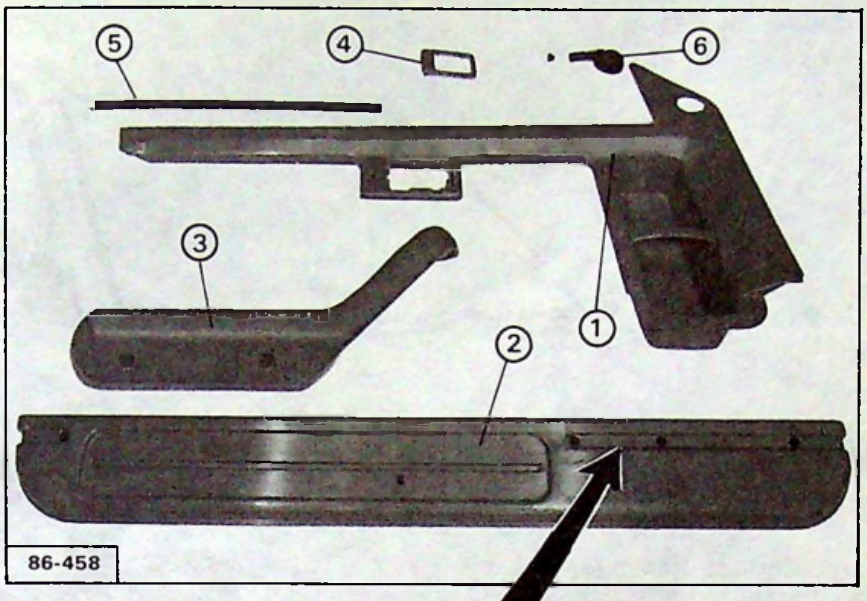
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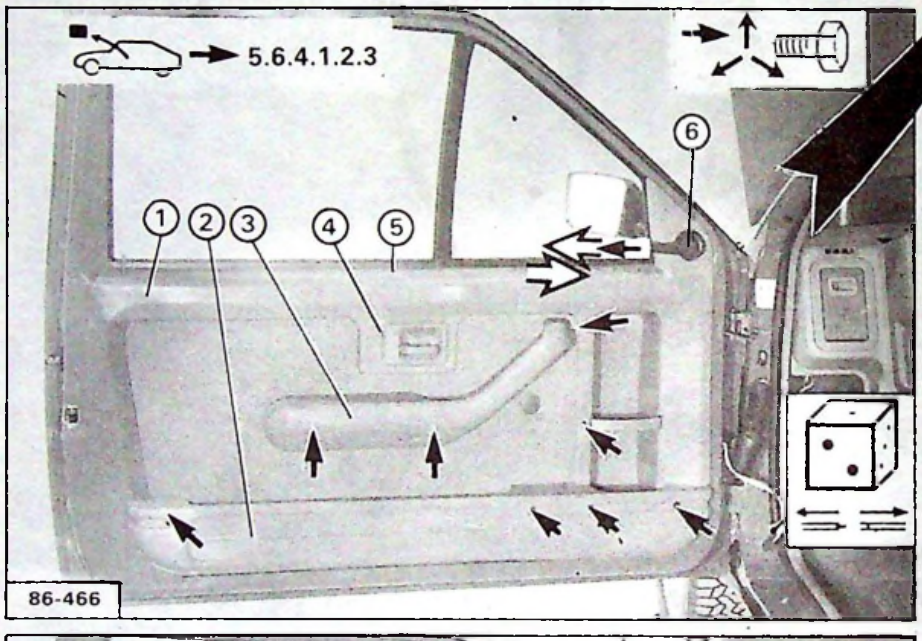
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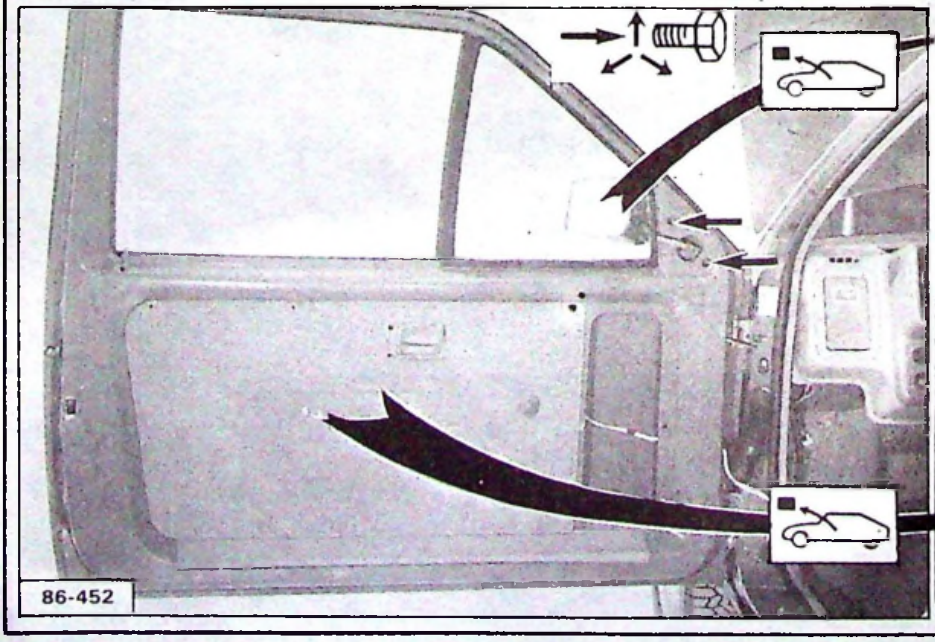
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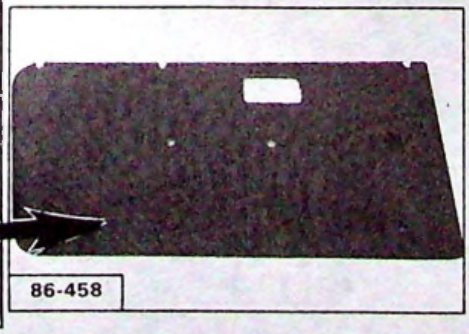
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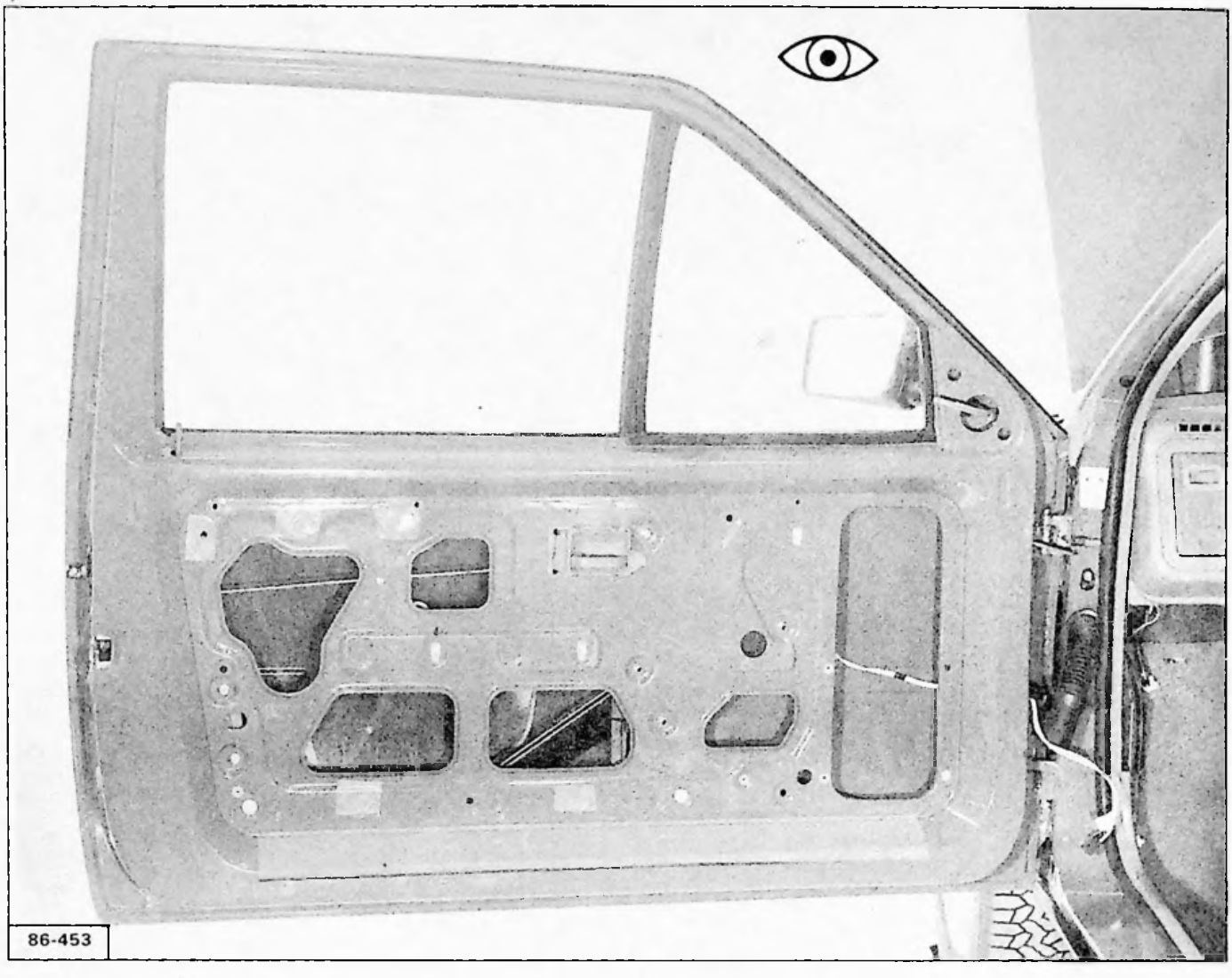

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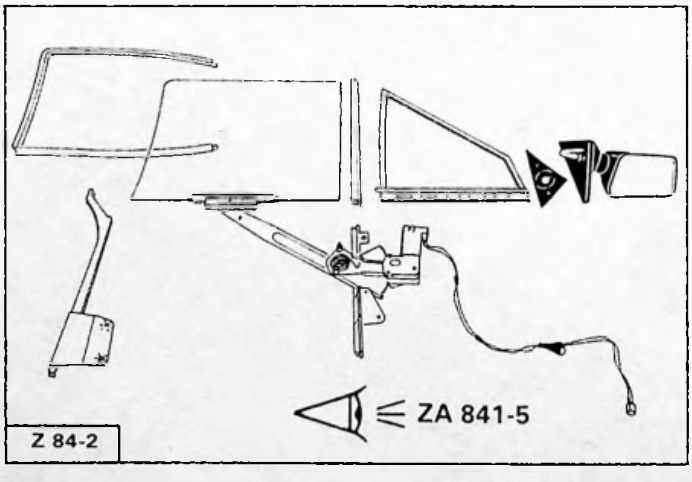

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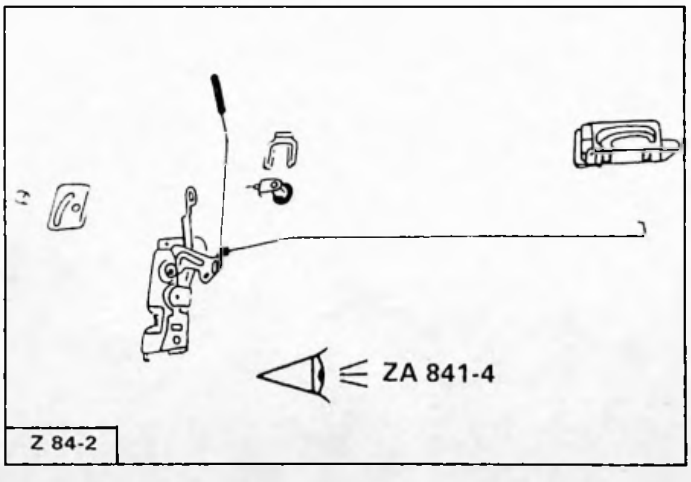

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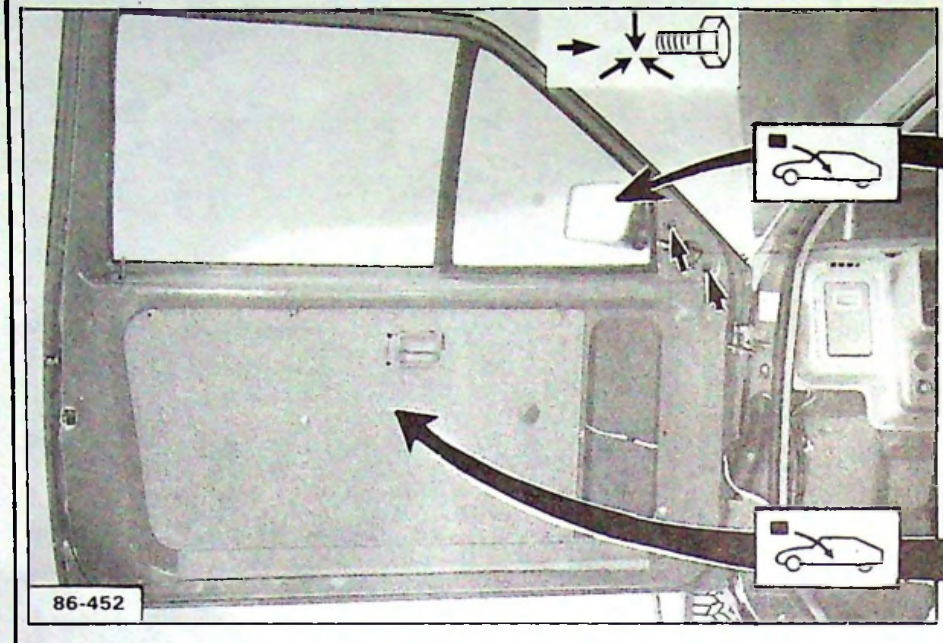
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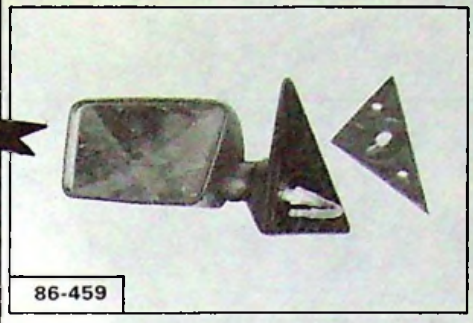
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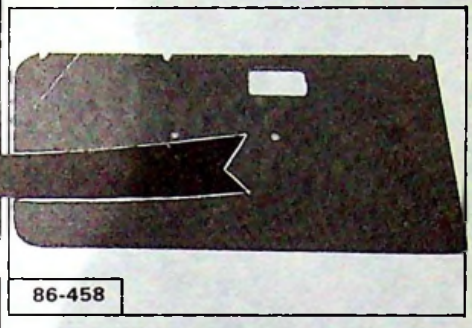
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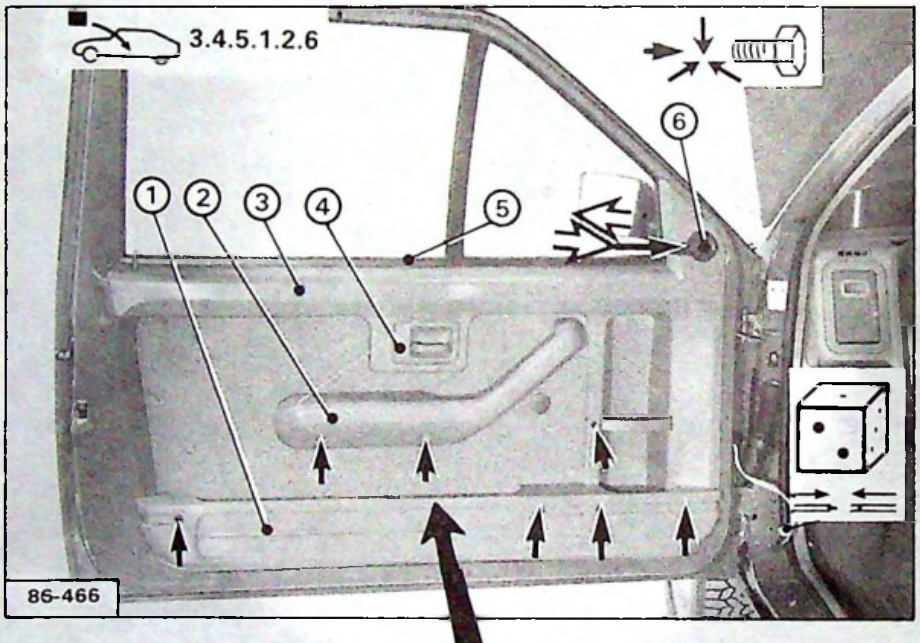

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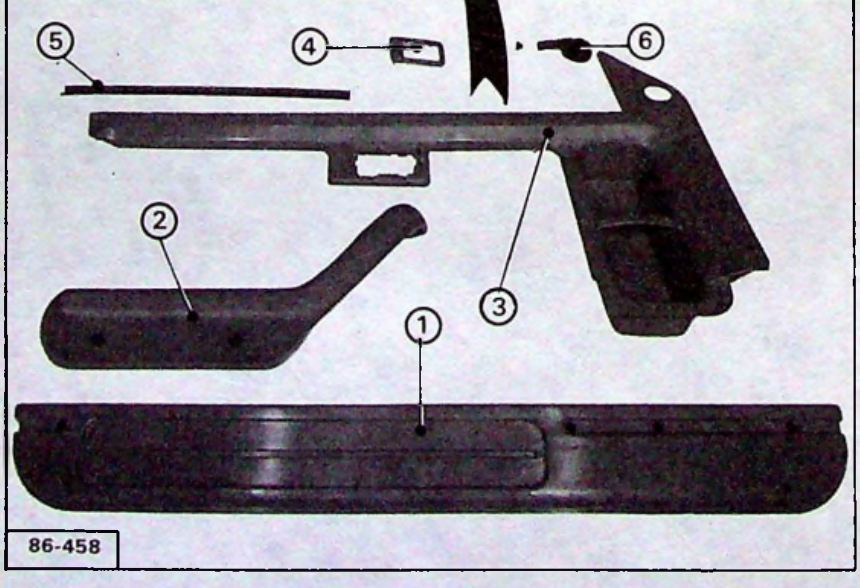

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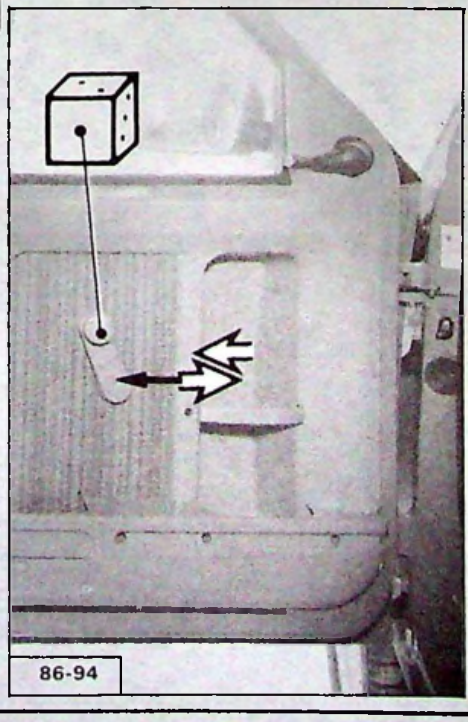
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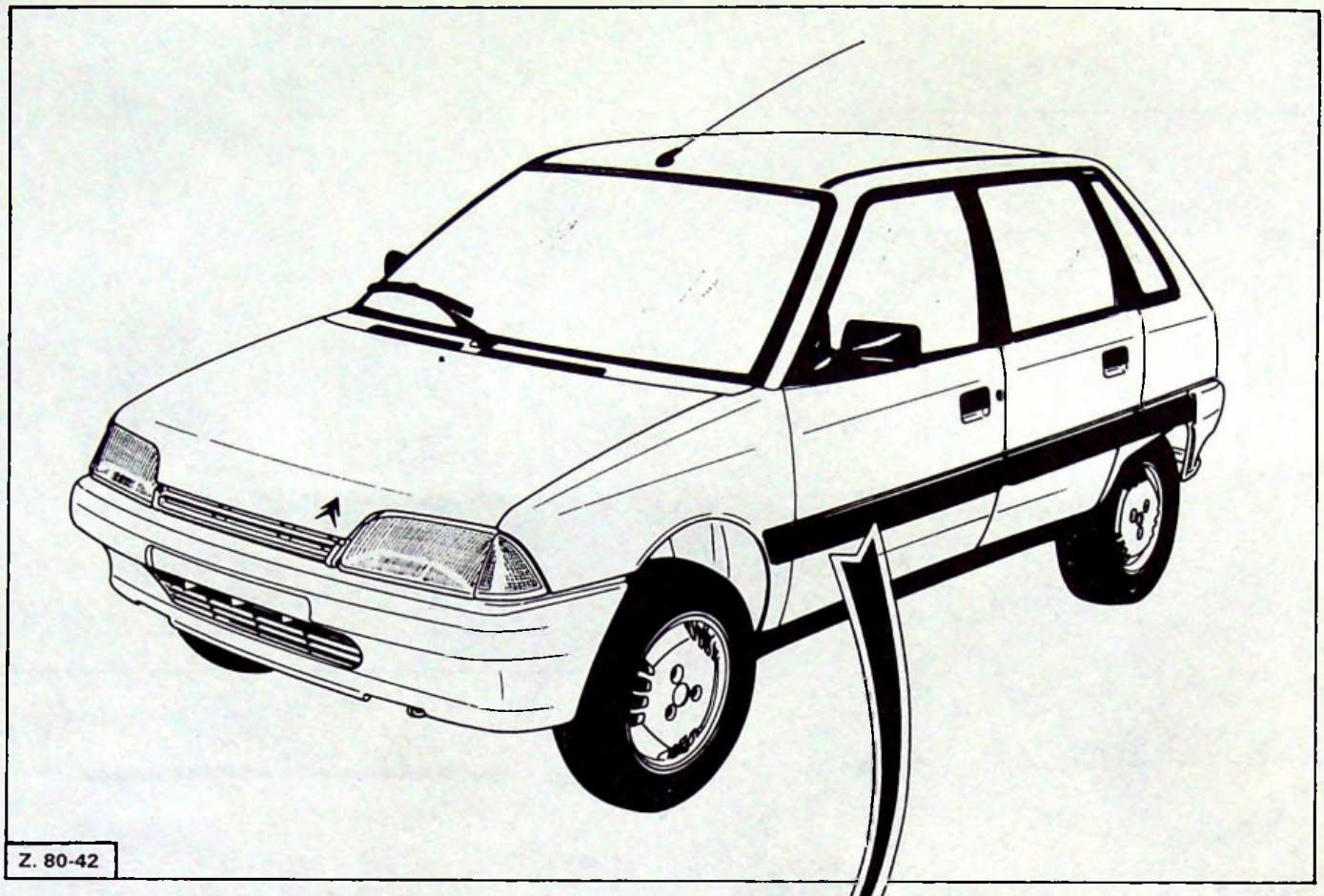

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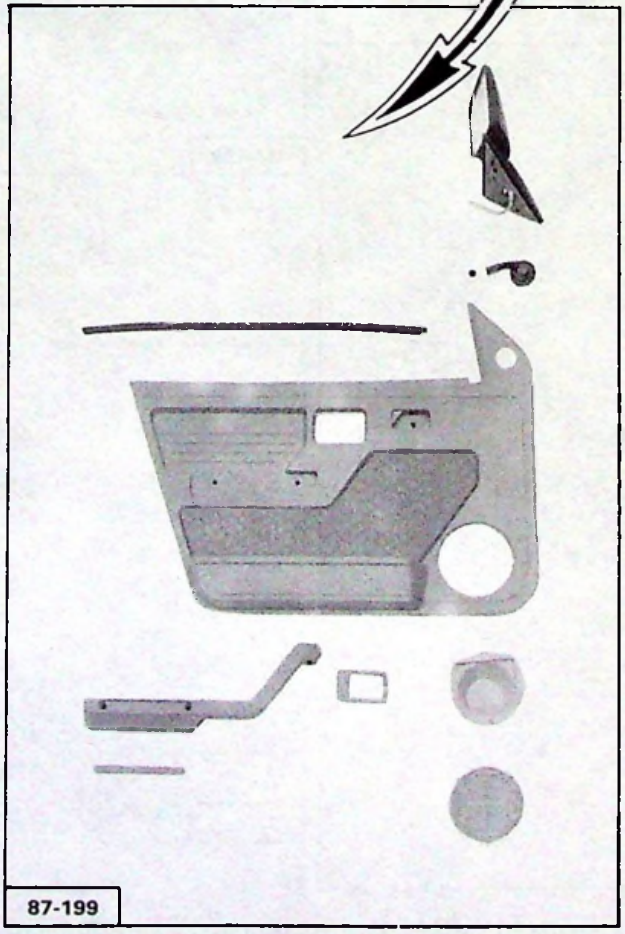

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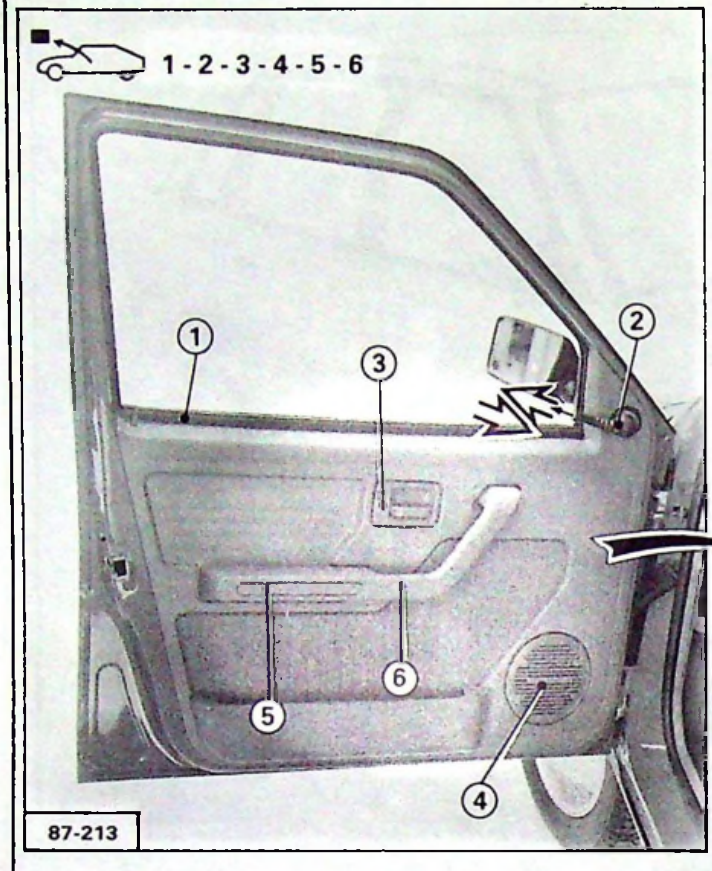
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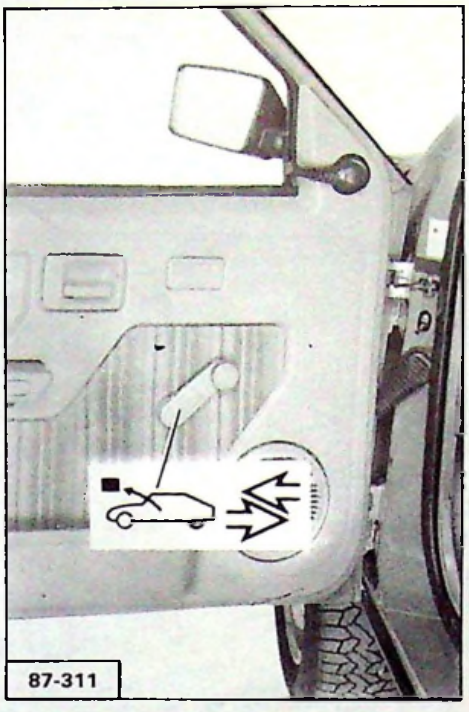
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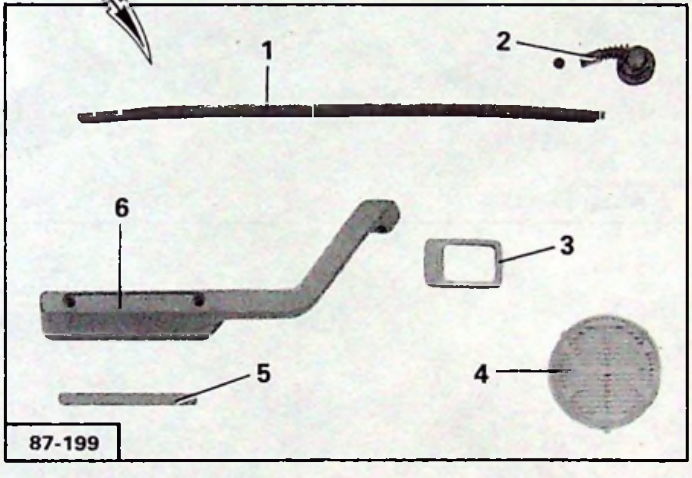
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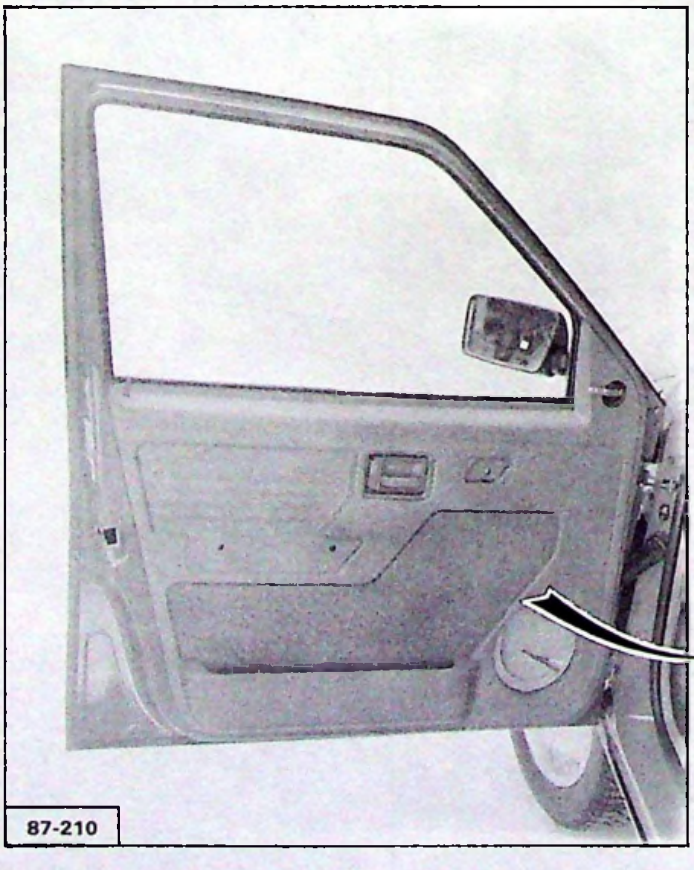
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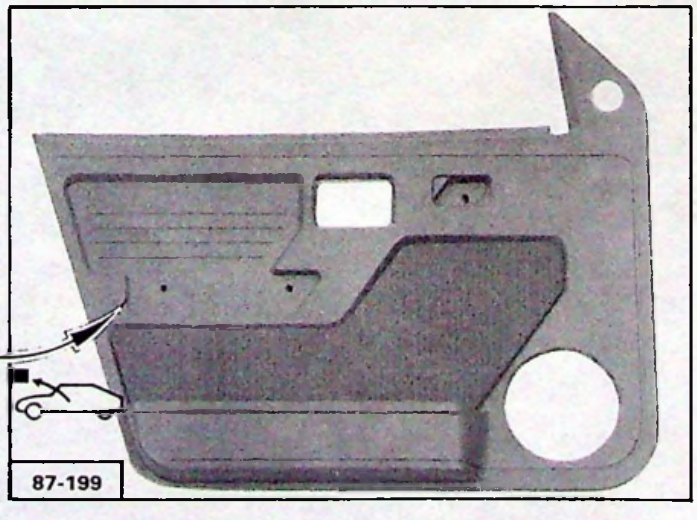
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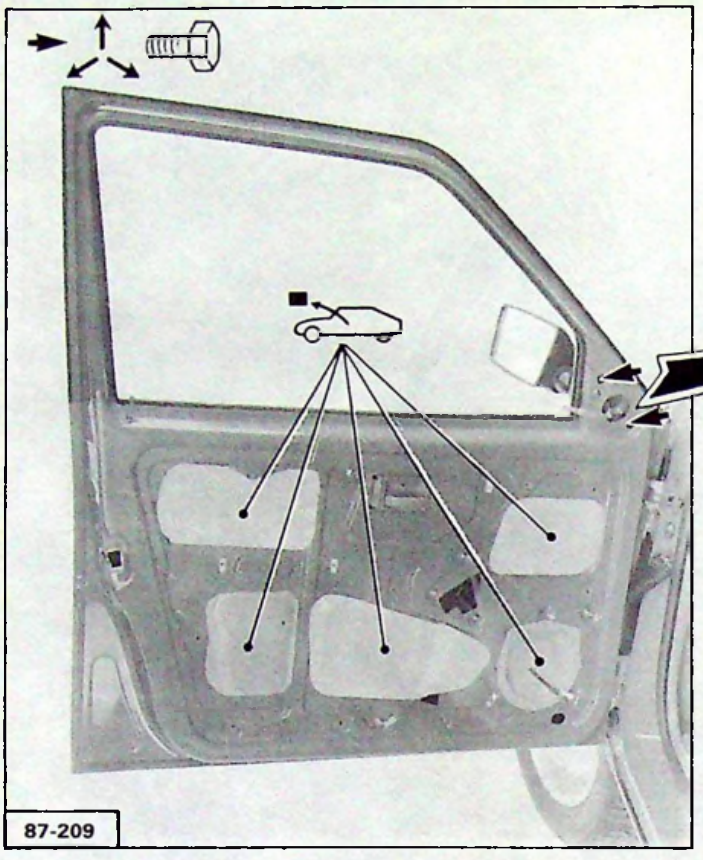
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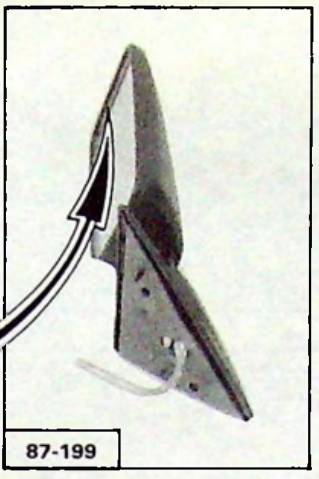
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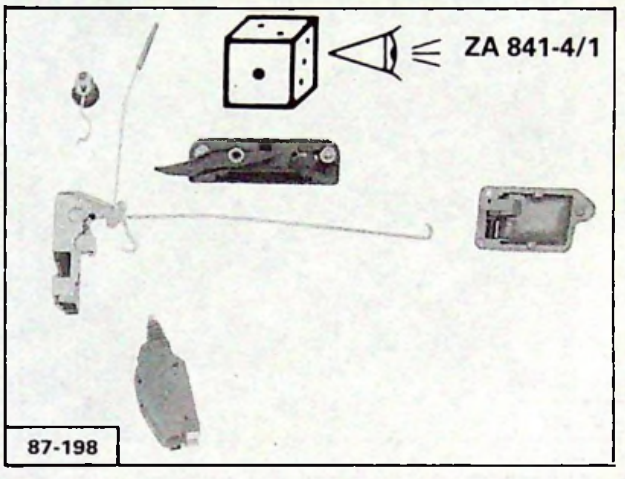
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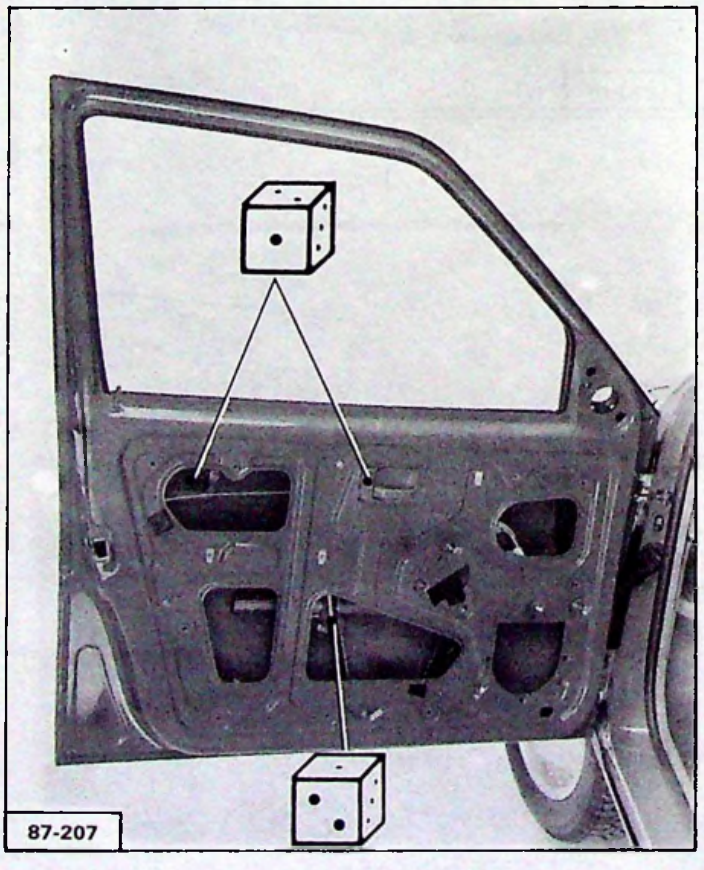
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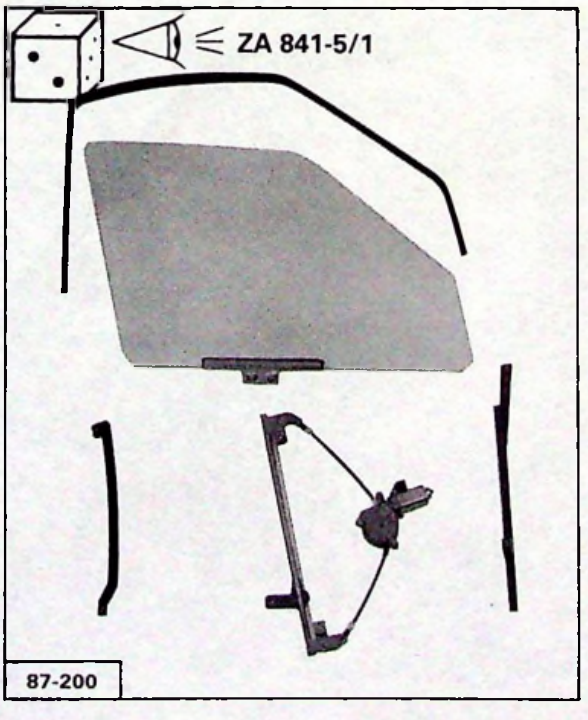
ZA 841-5/1
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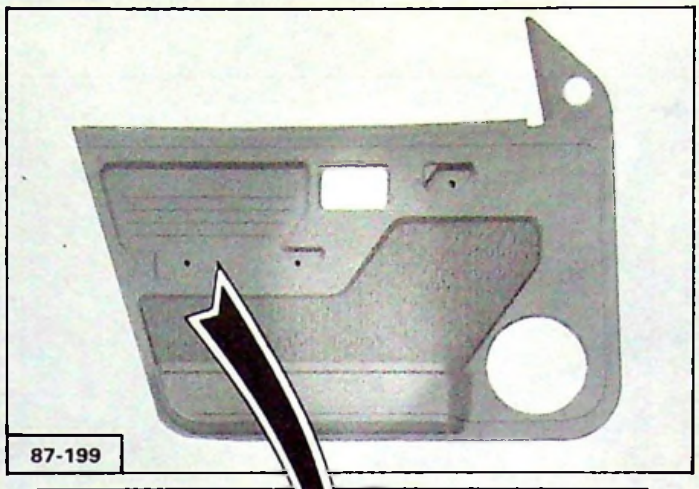
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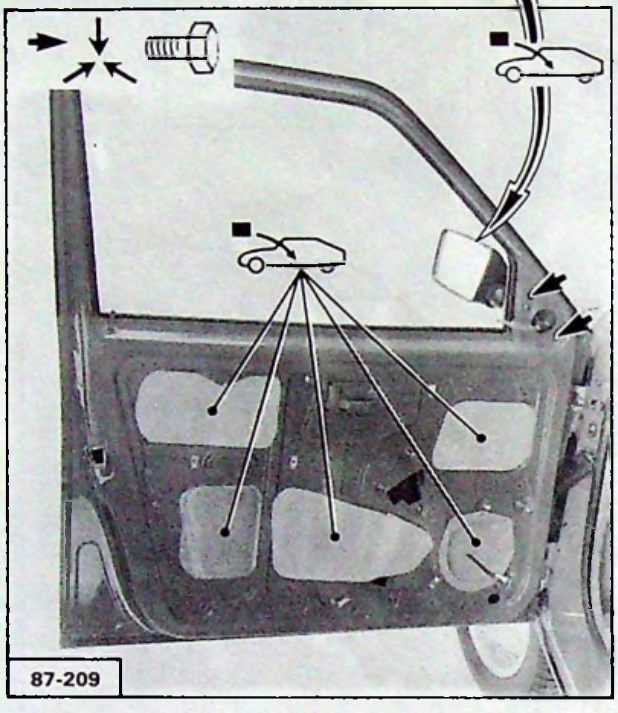
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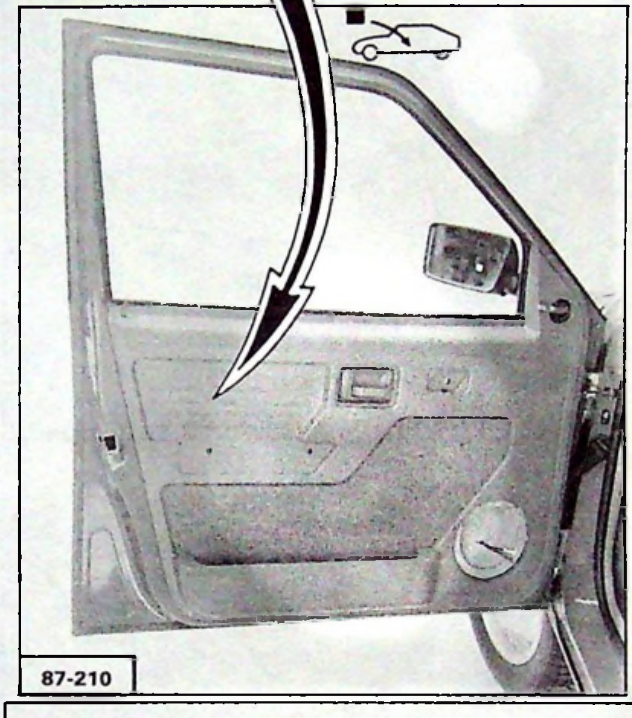
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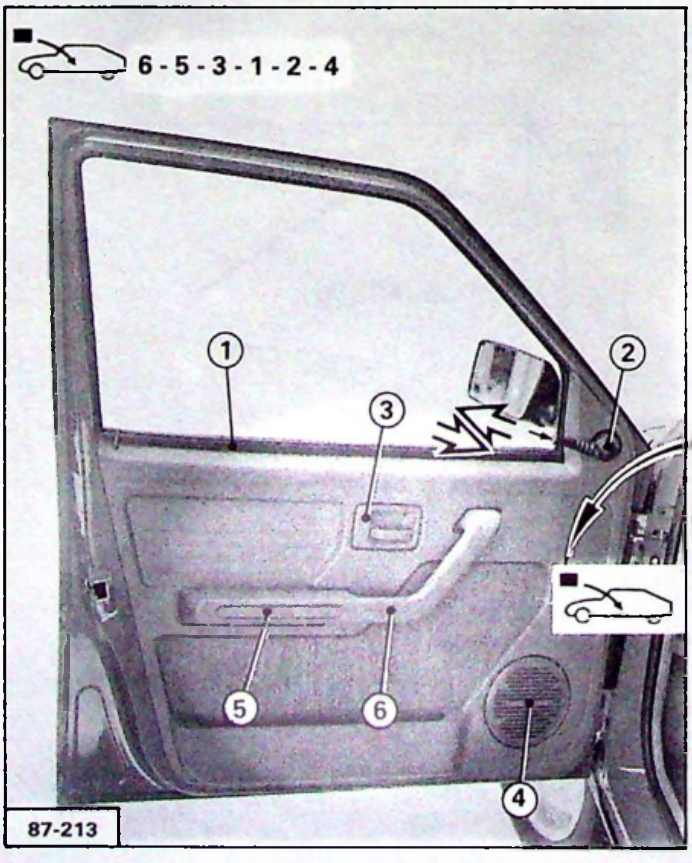
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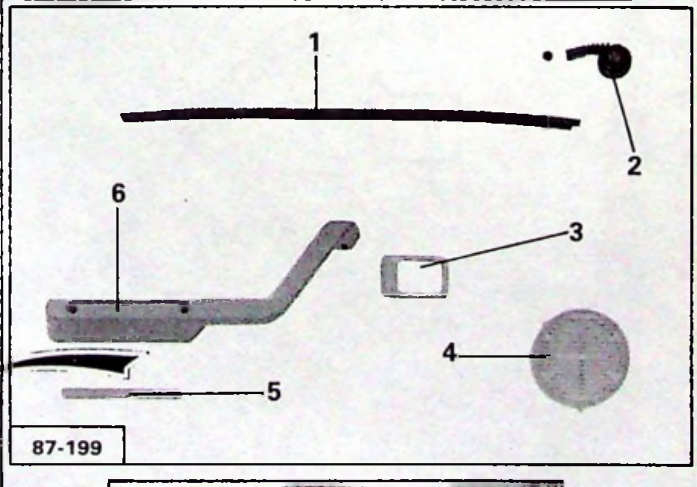
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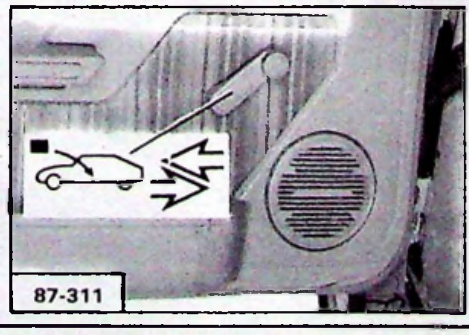
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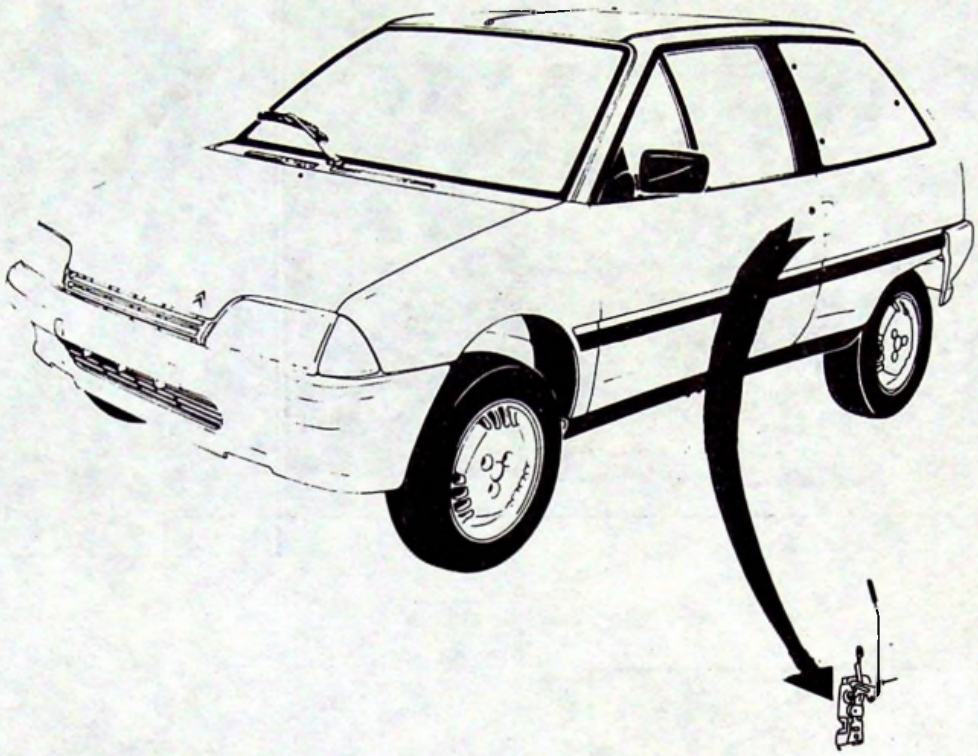
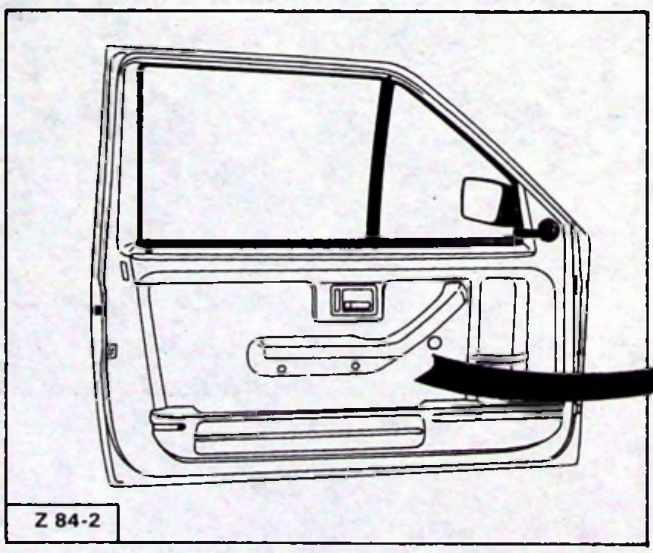


Z 80-10 | Z 84-2



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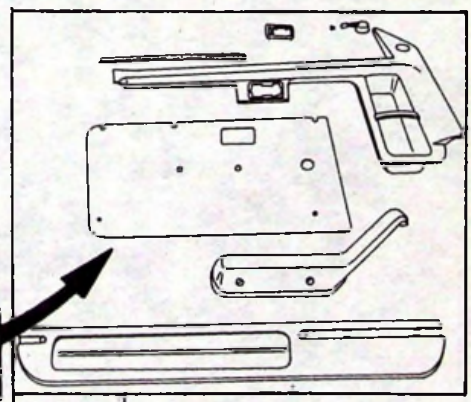
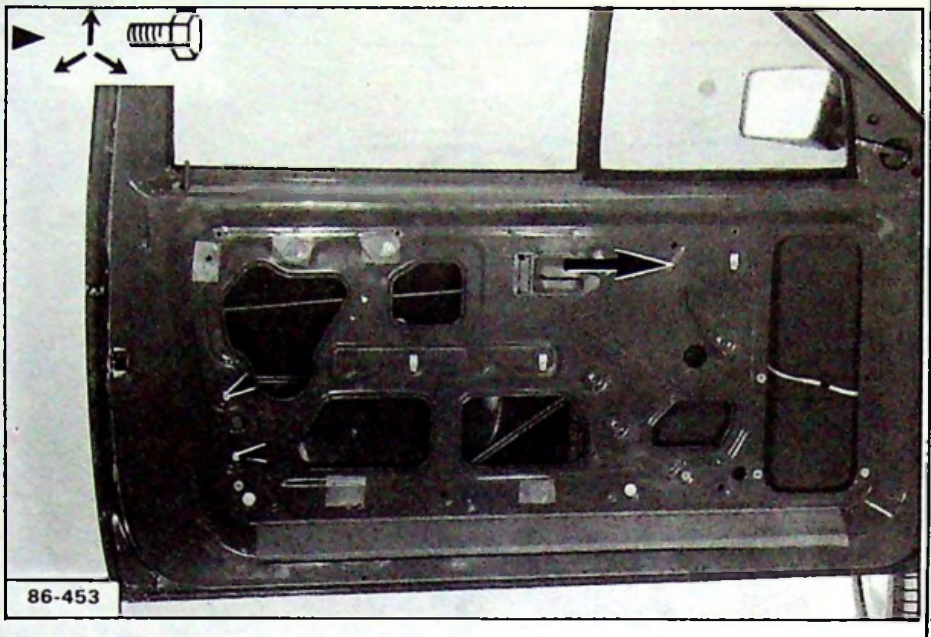


Z 84-2

ZA 841-3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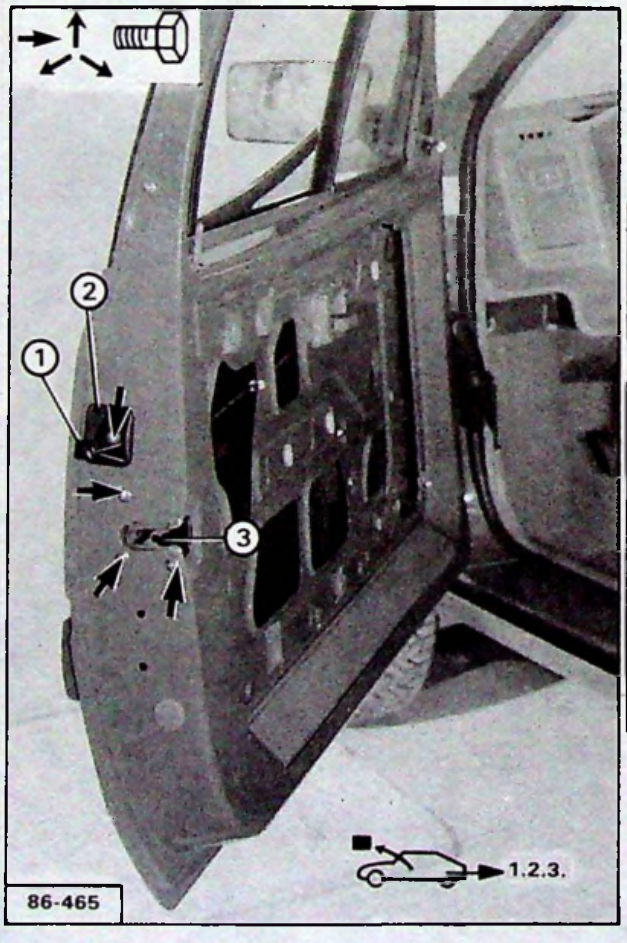
86-461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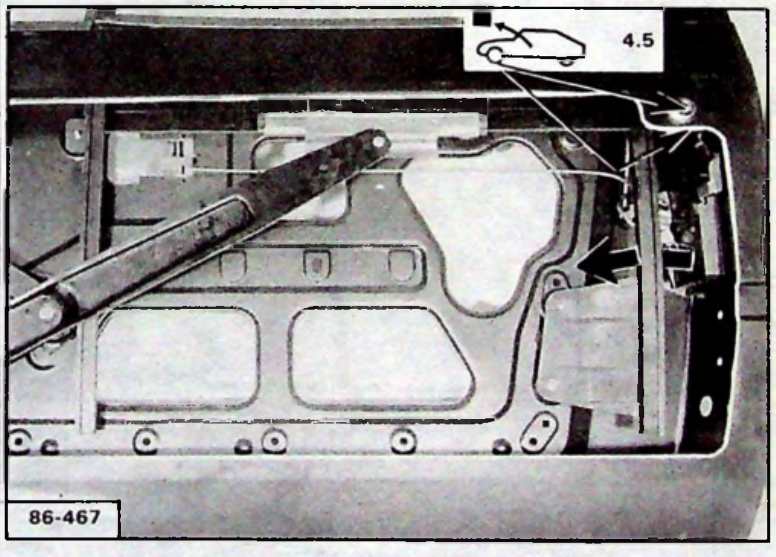
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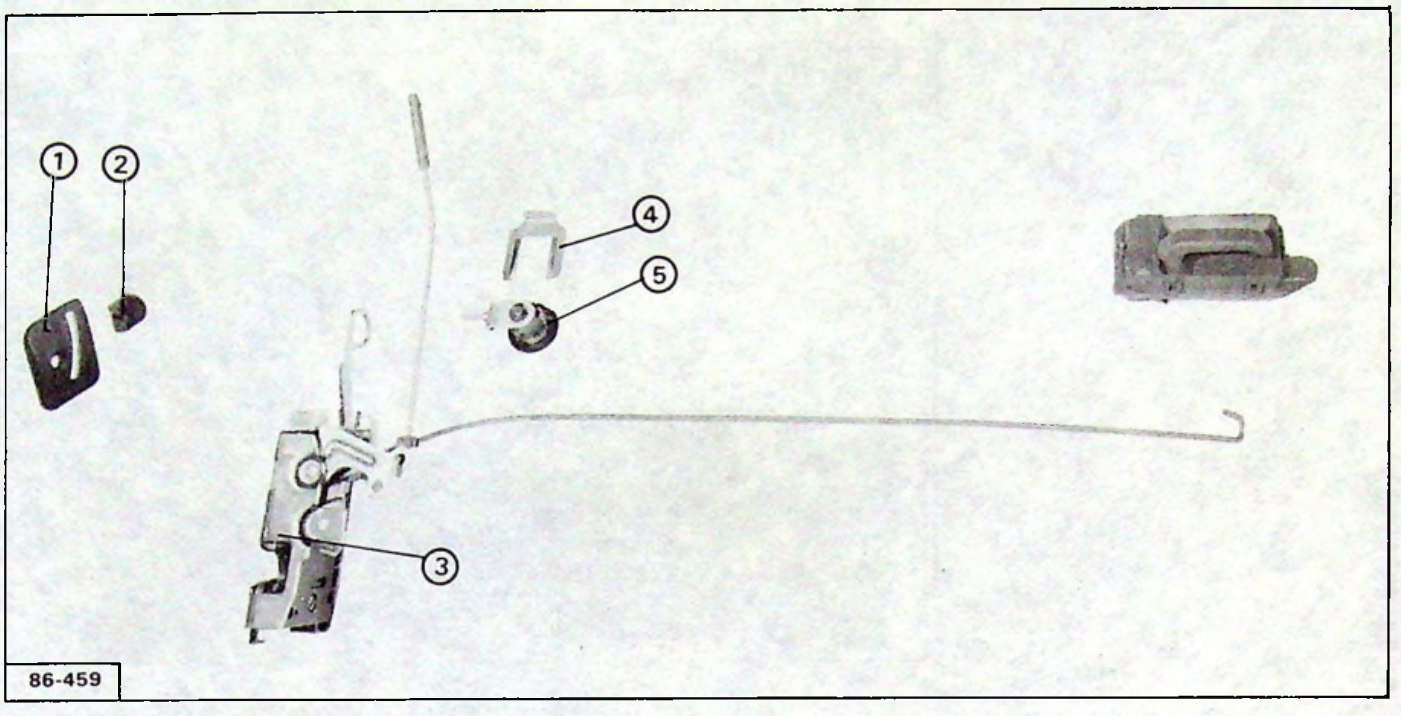

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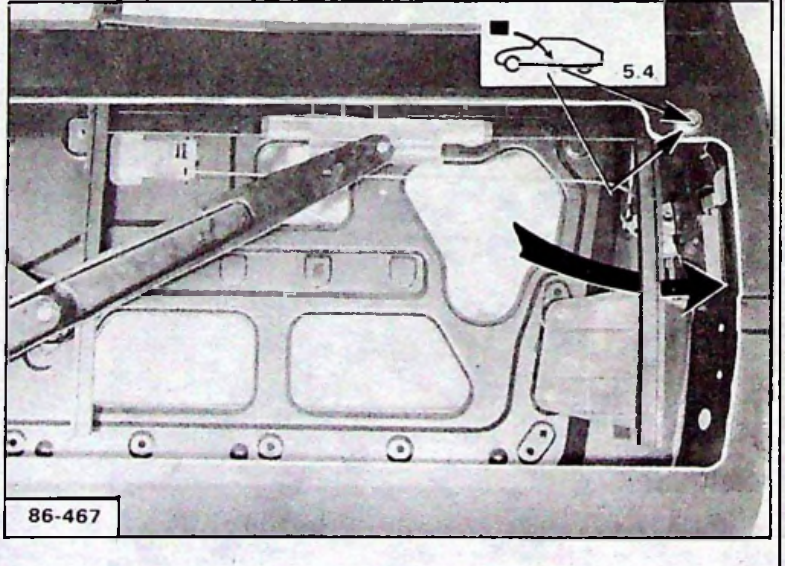

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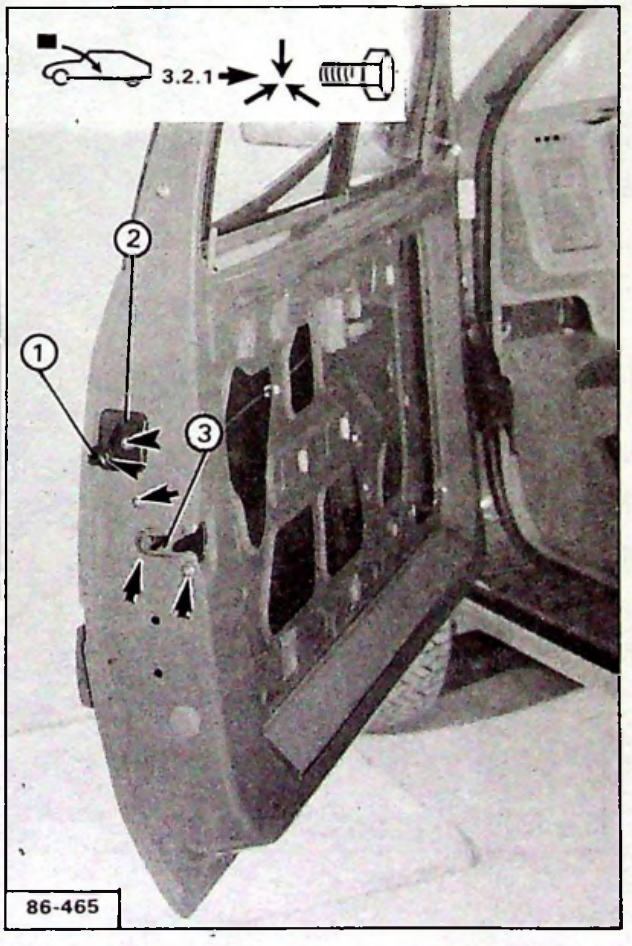

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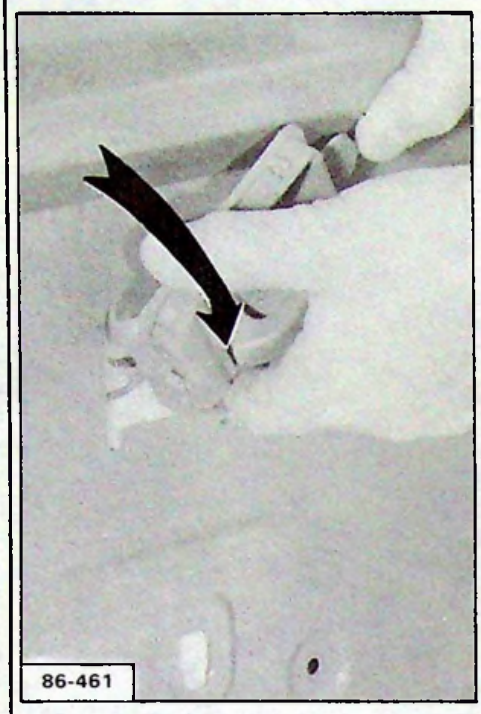
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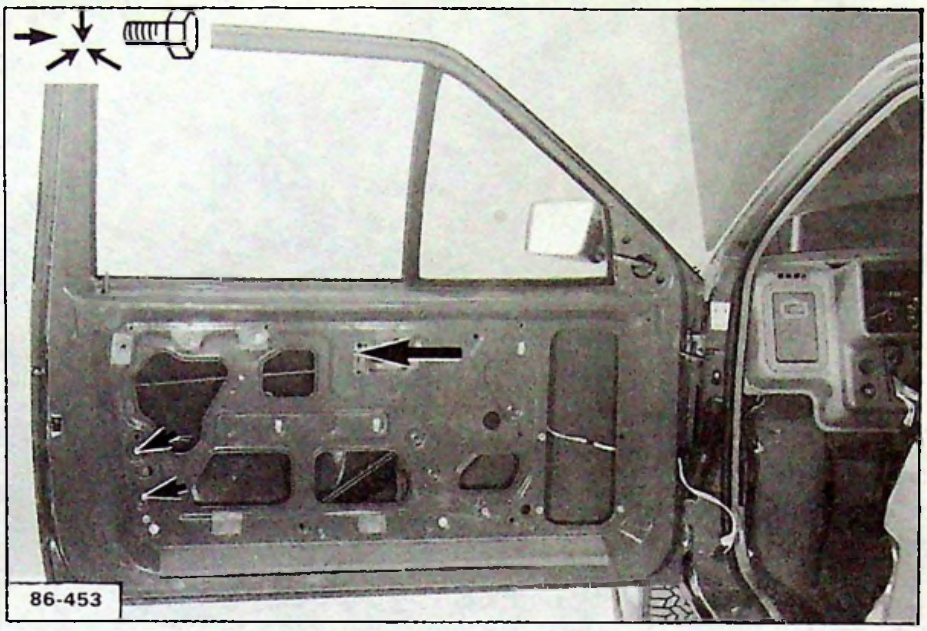
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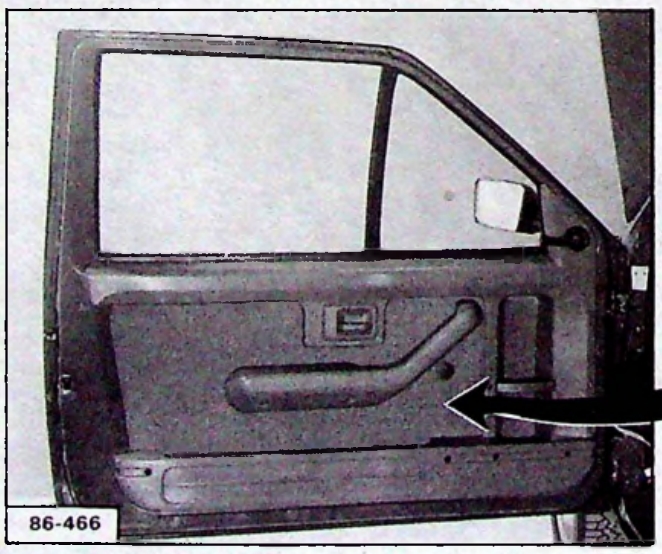
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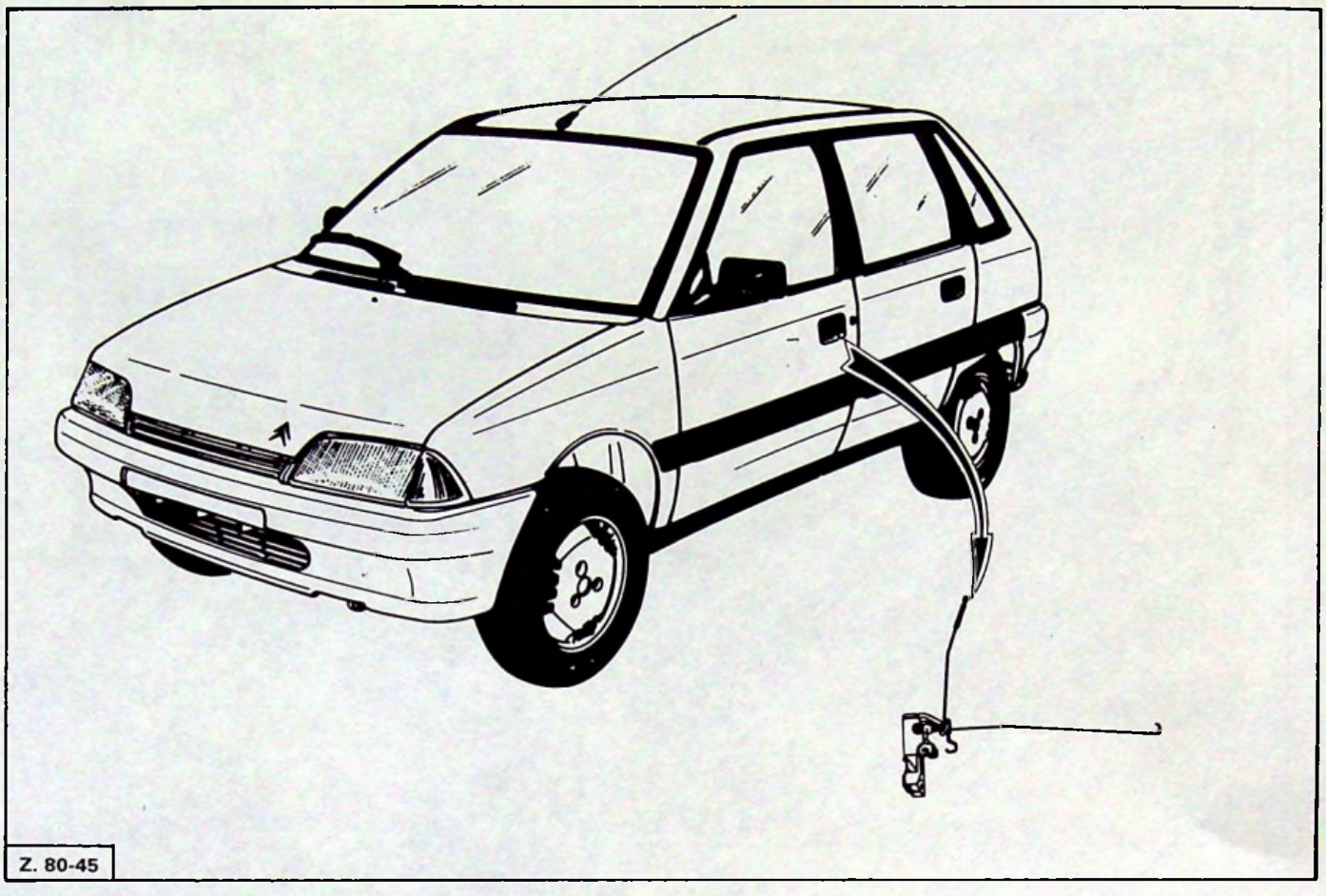
86-458

ZA 841-3



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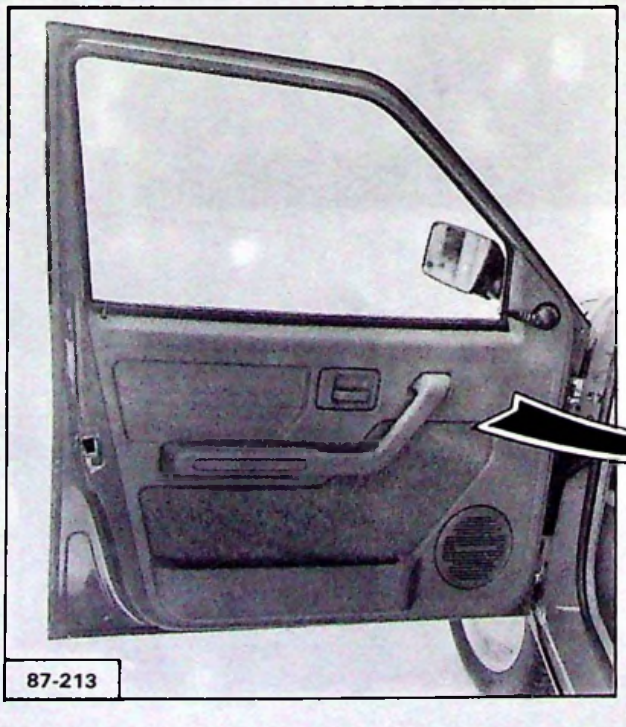

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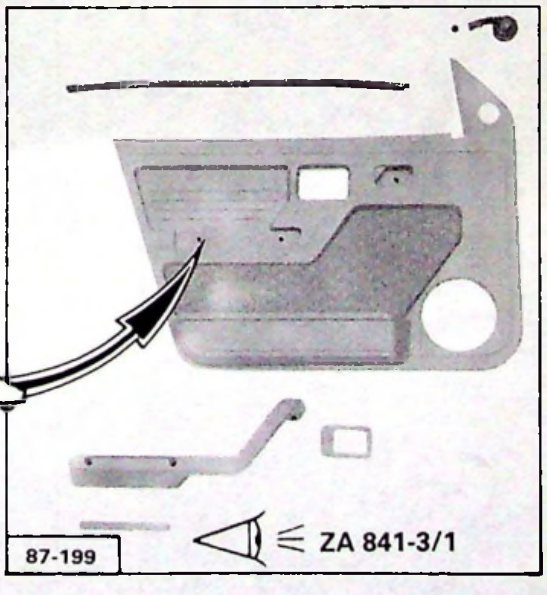

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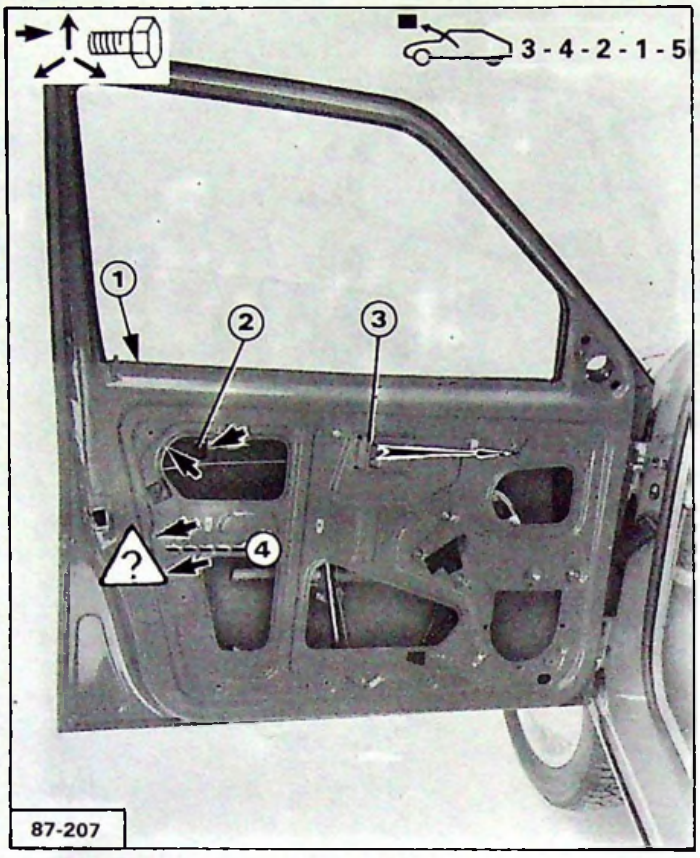
ZA 841-3/1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87-207

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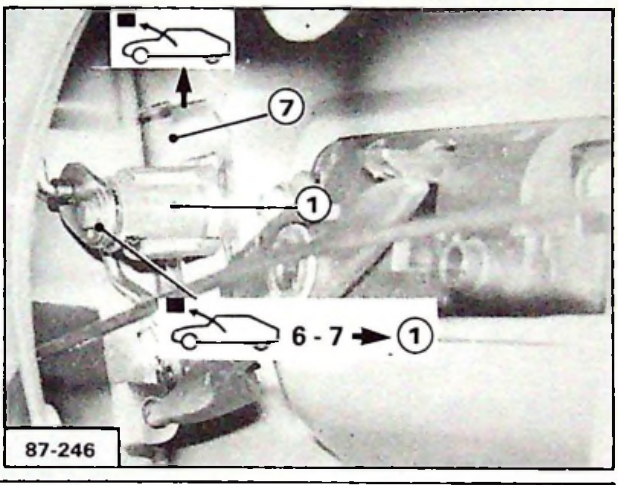
86-461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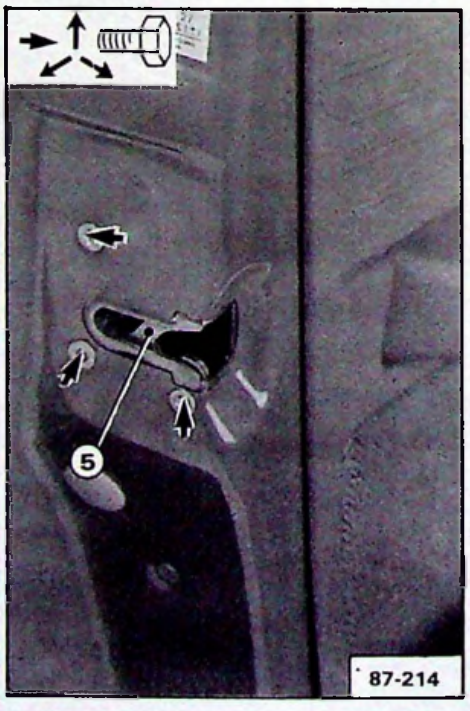
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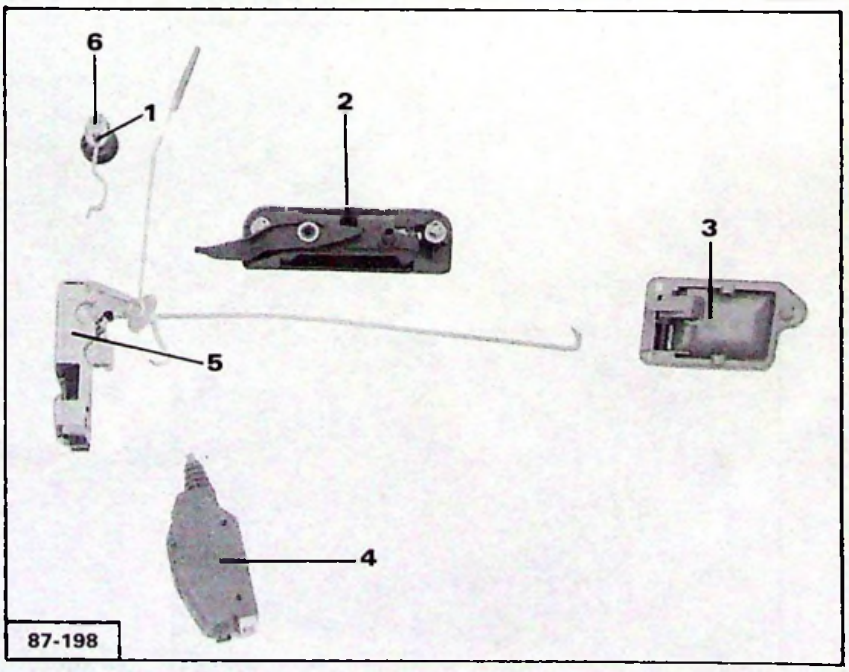
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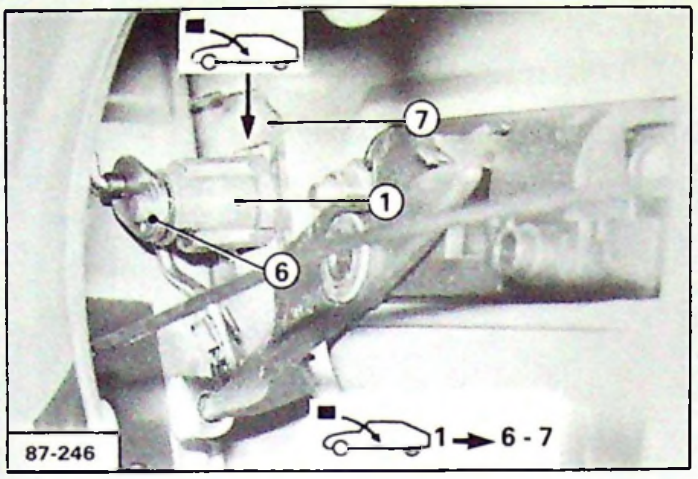
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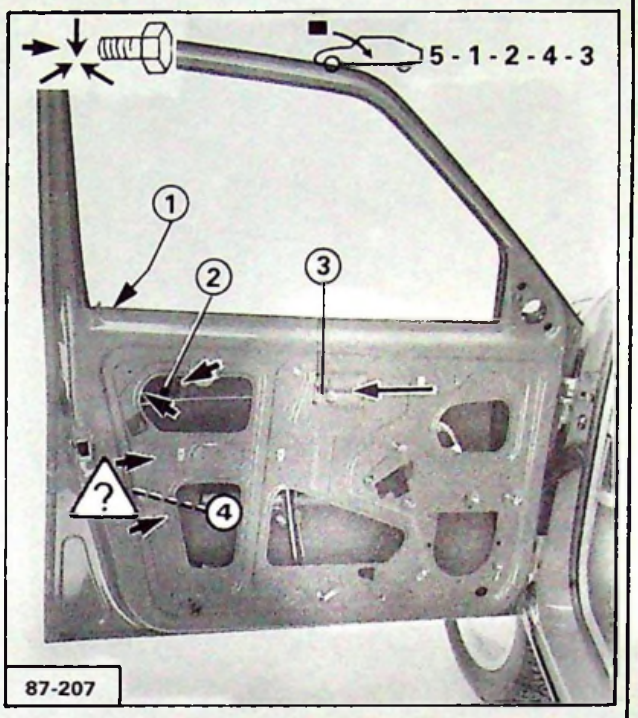
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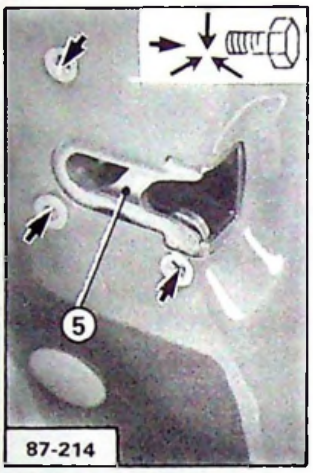
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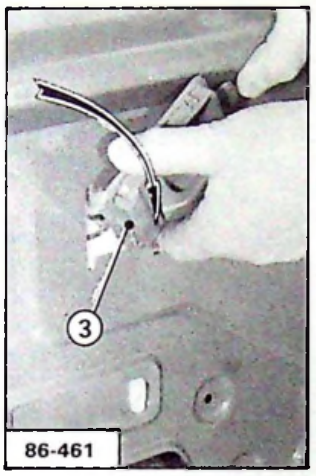
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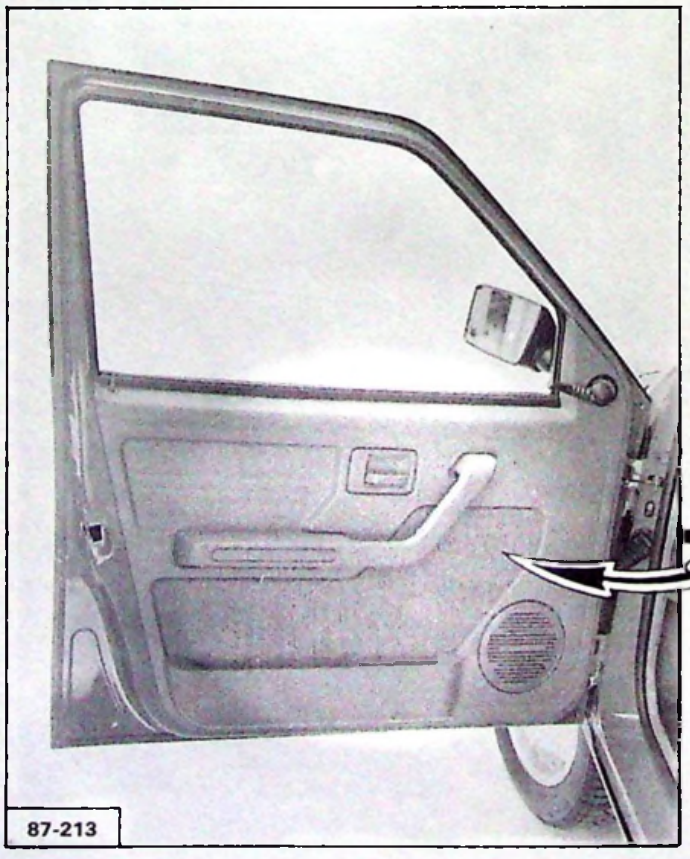
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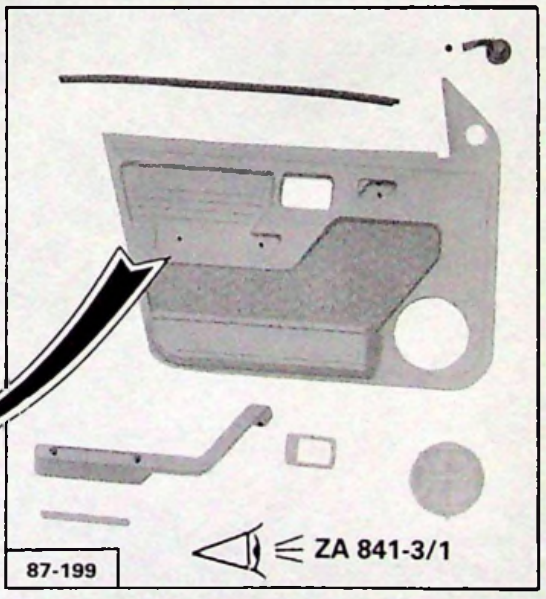
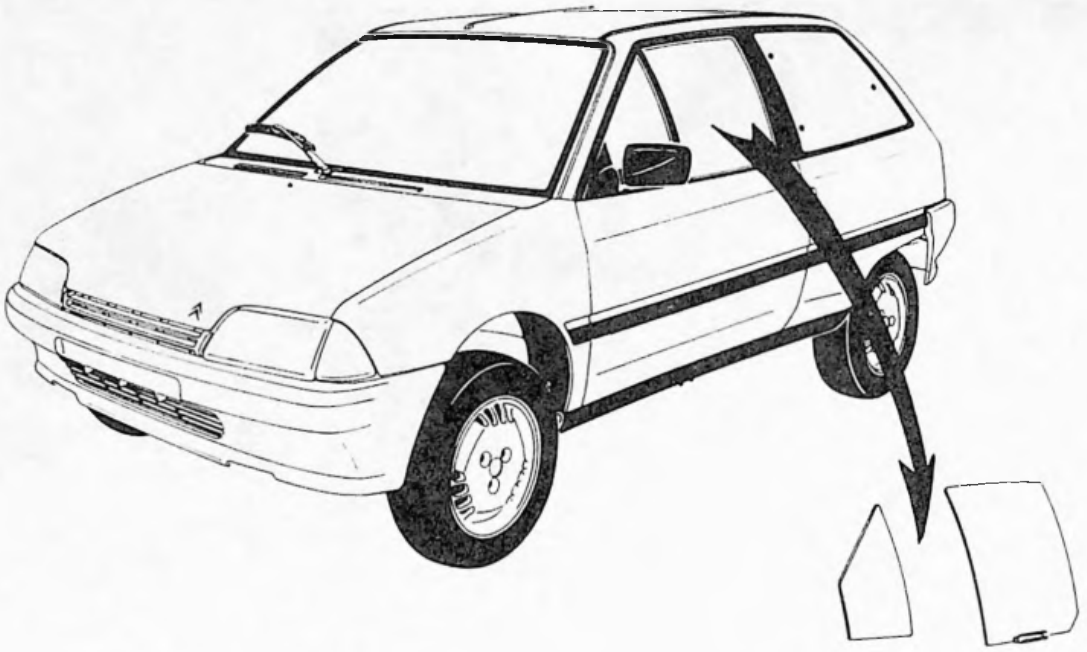

ZA 841-3/1
87-199



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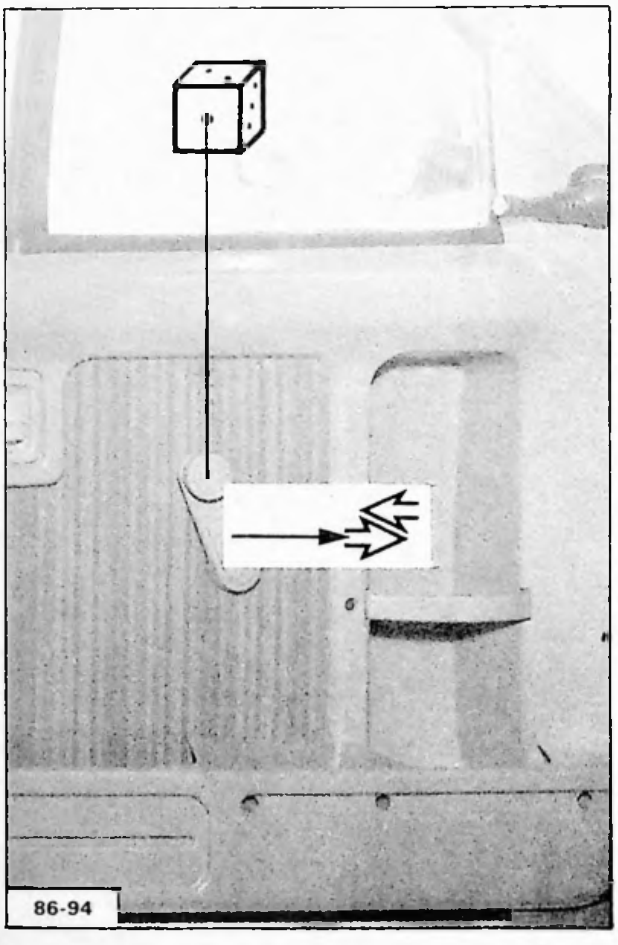

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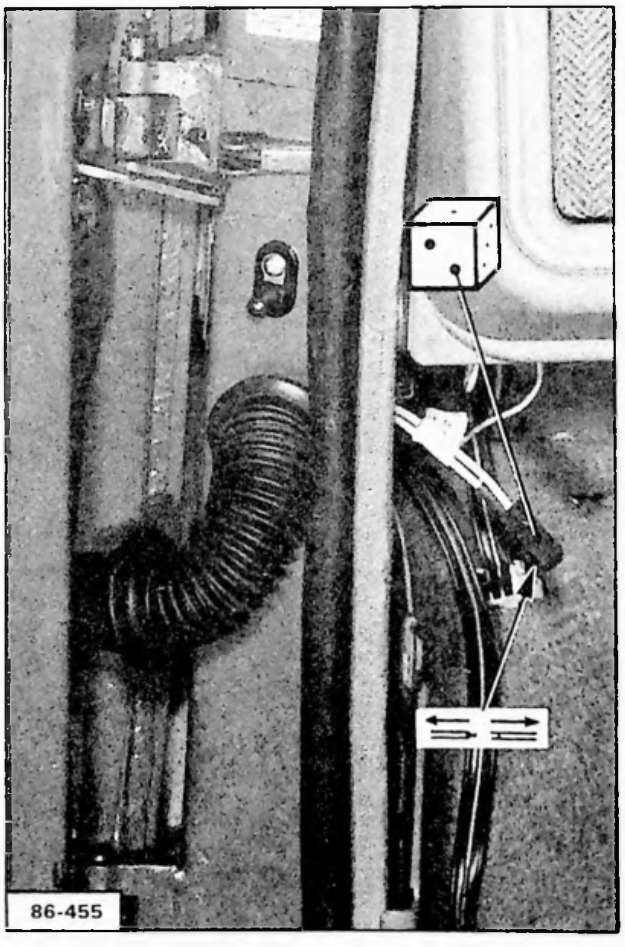

86-455

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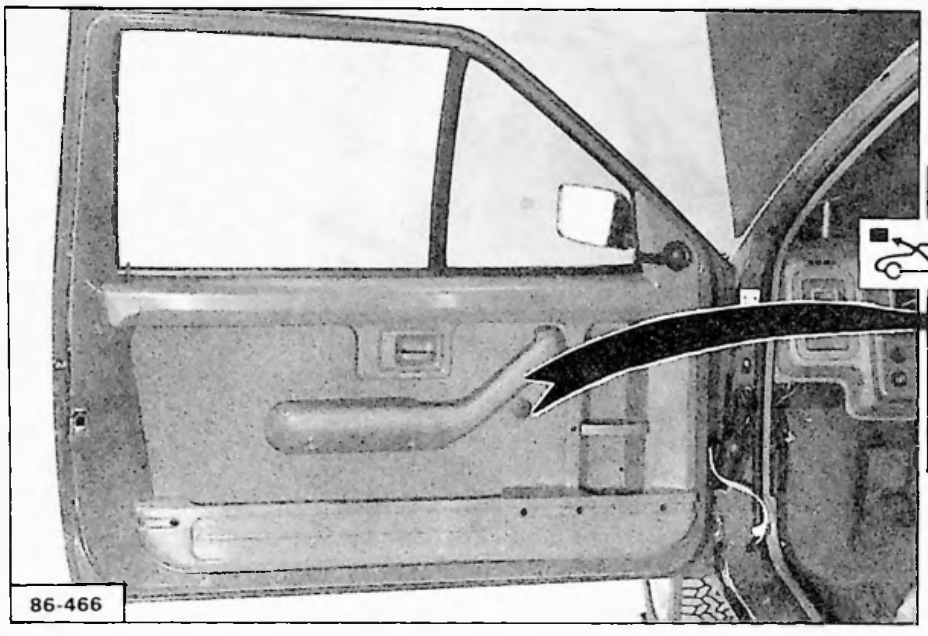
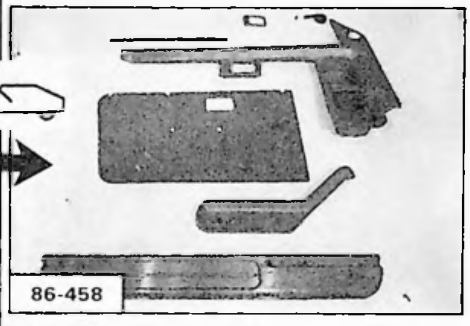
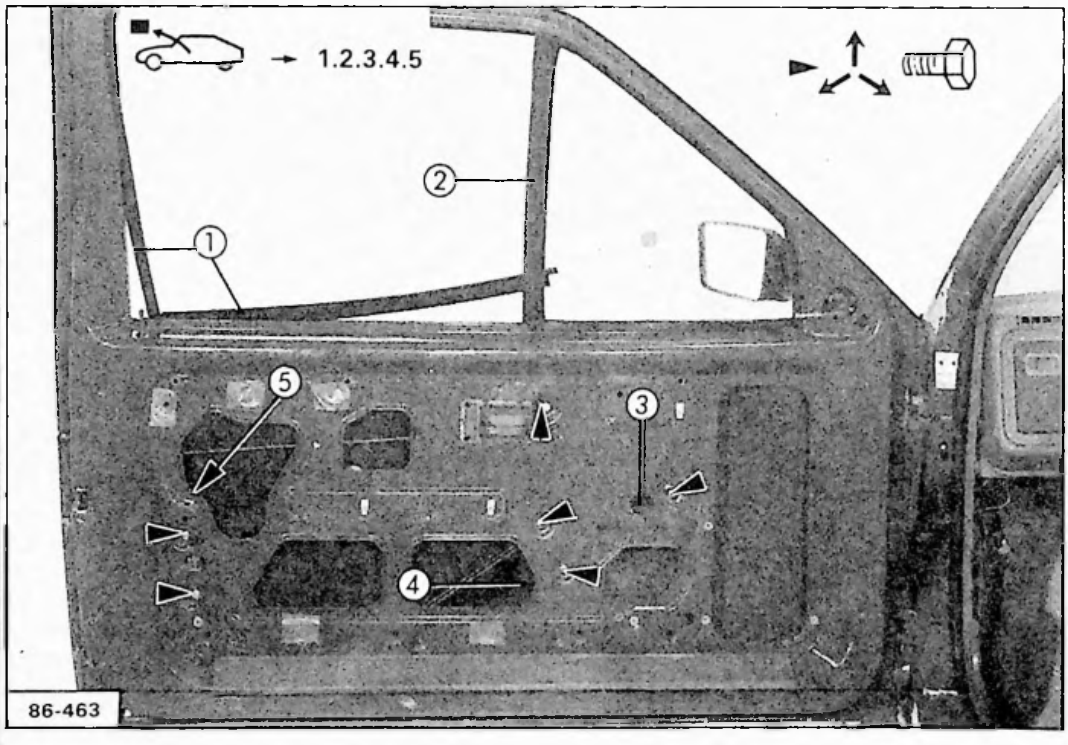
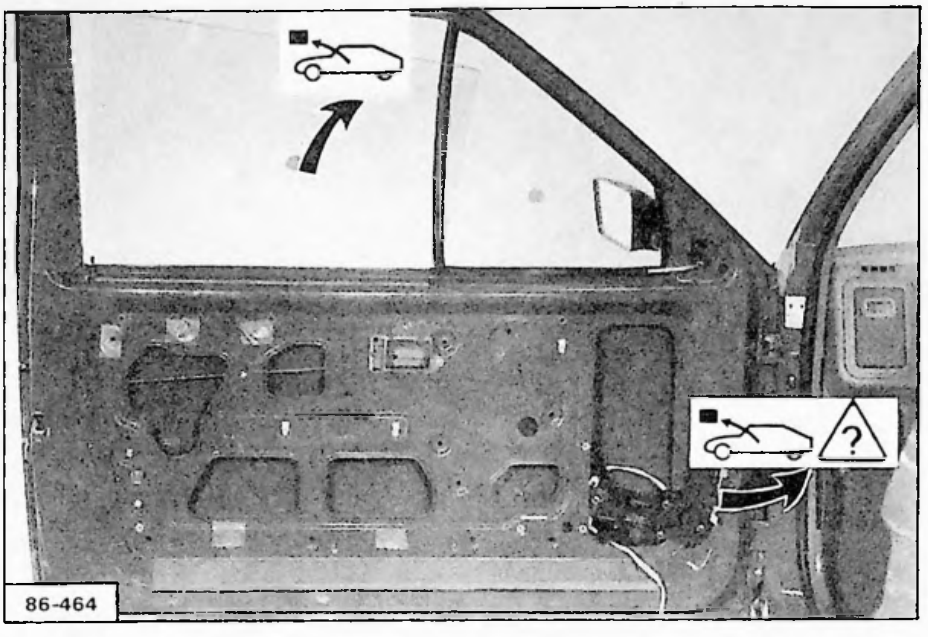




ZA 841-3

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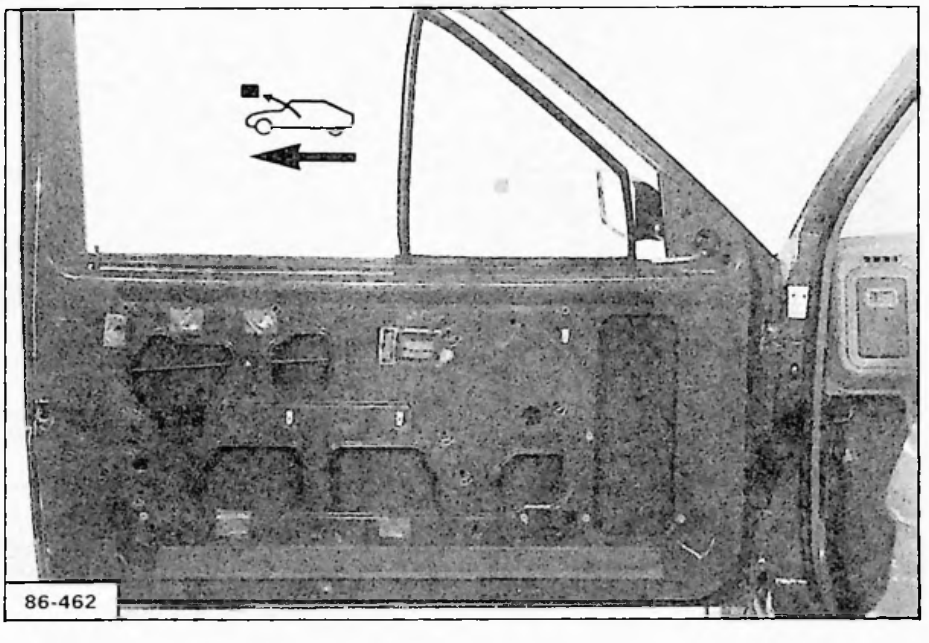
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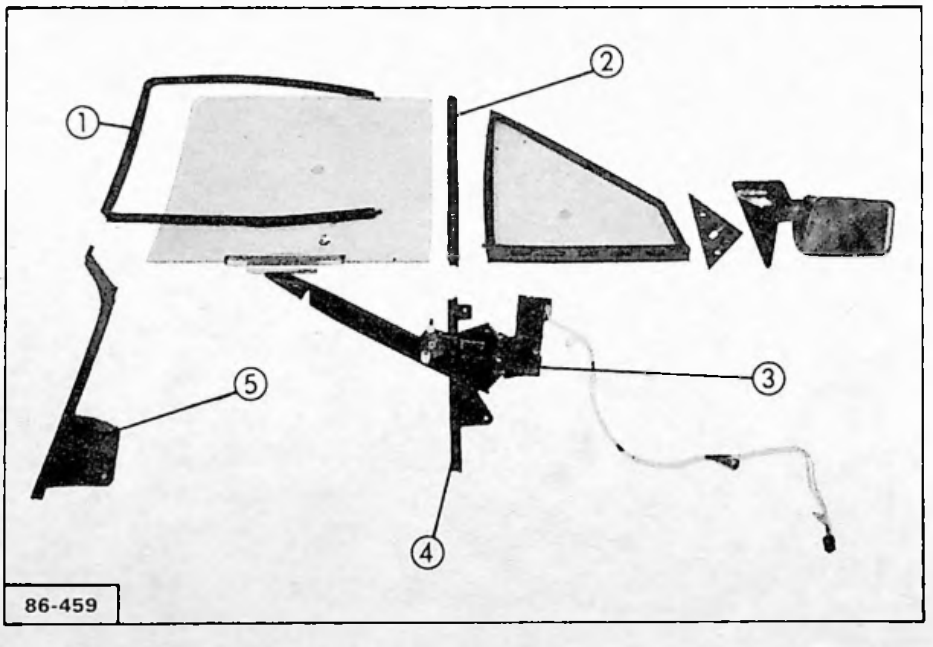
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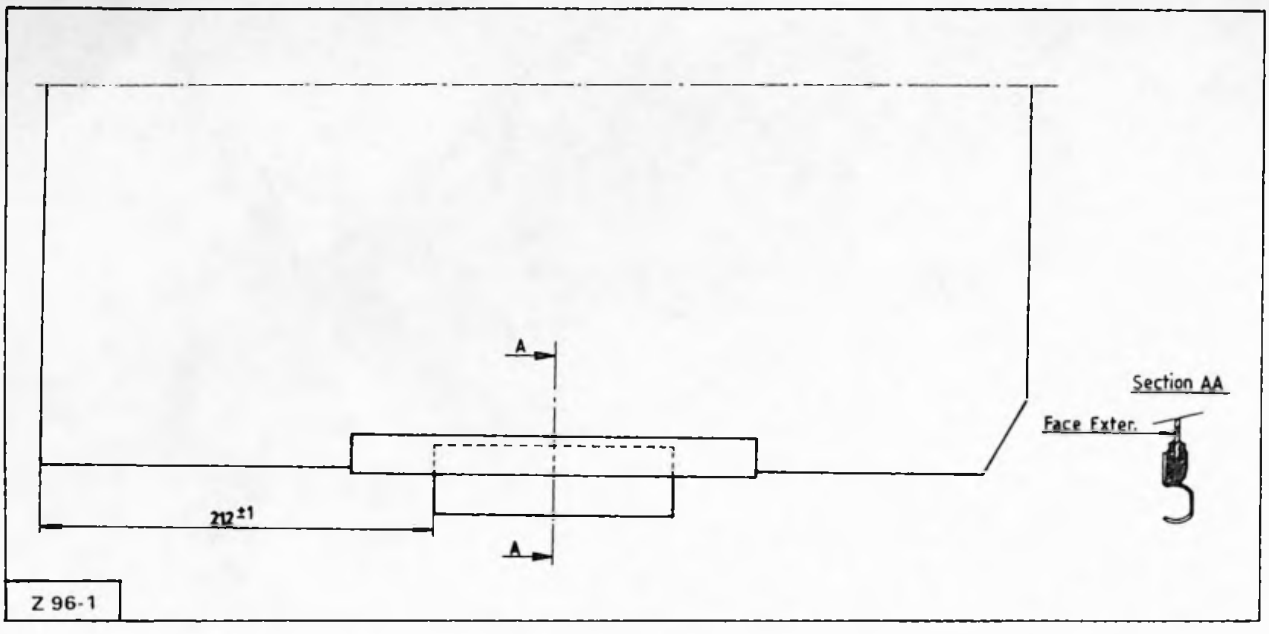
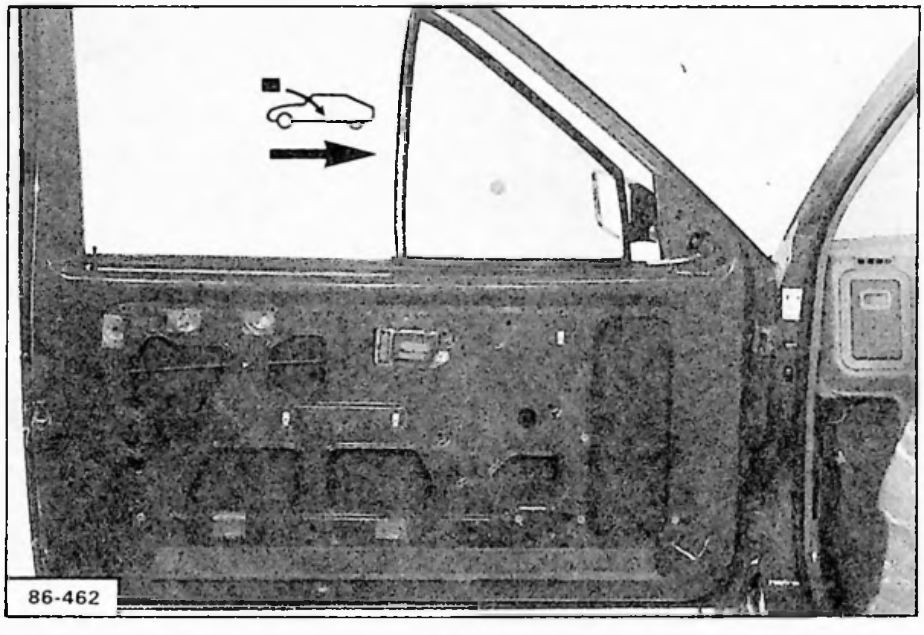


Z 96-1



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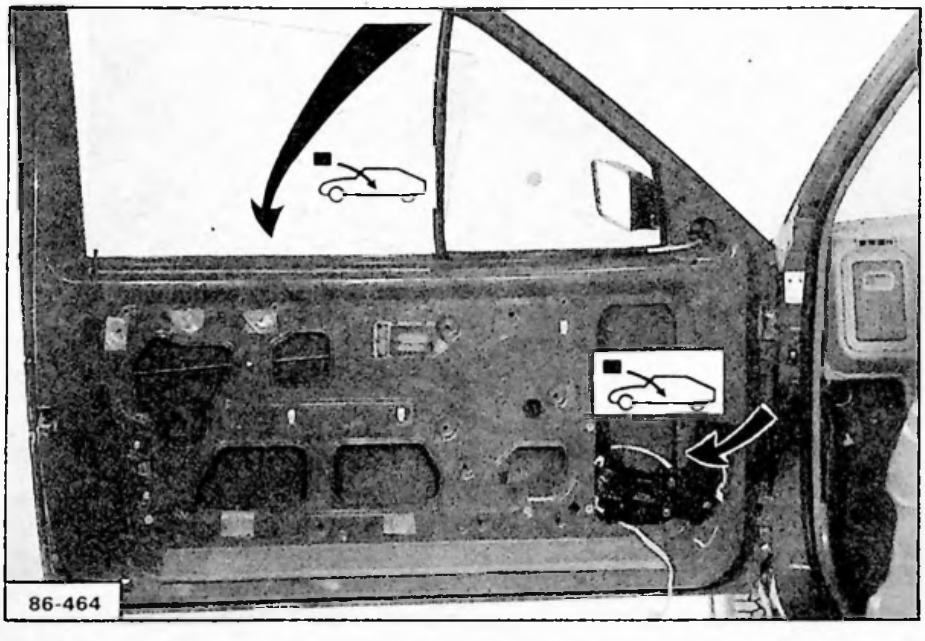

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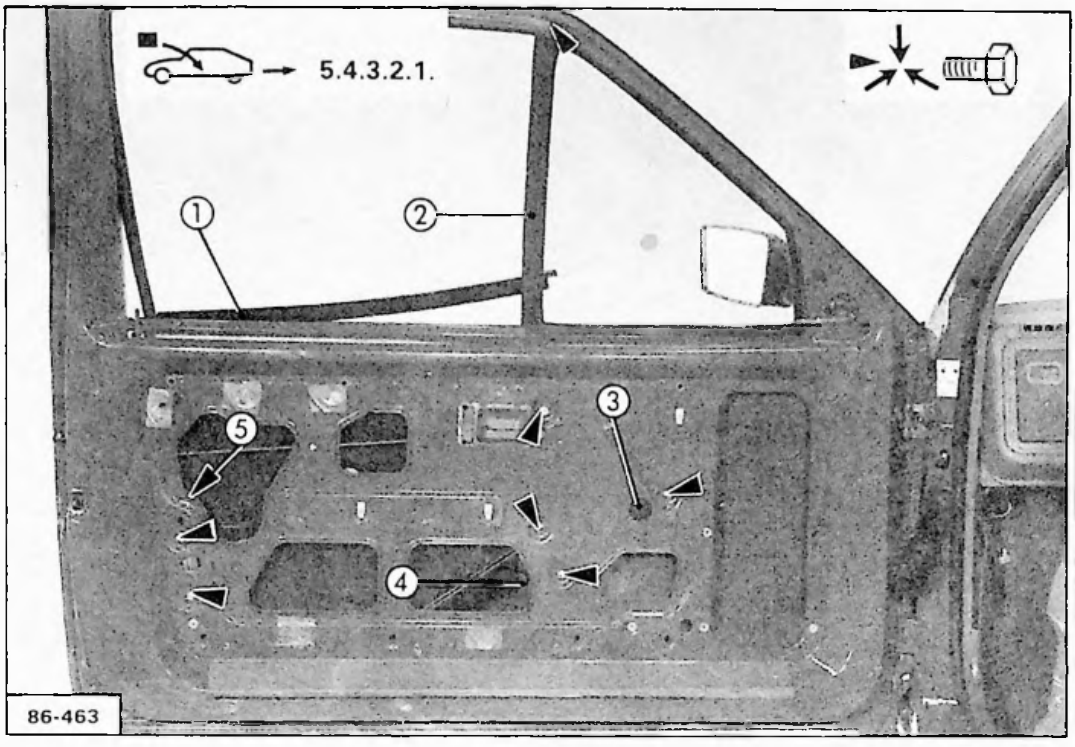

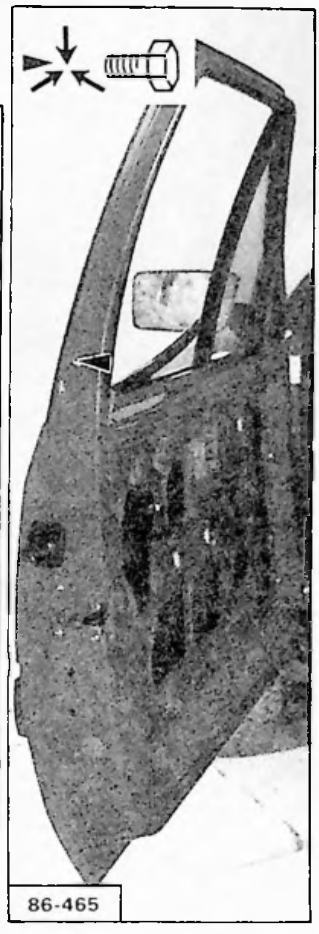

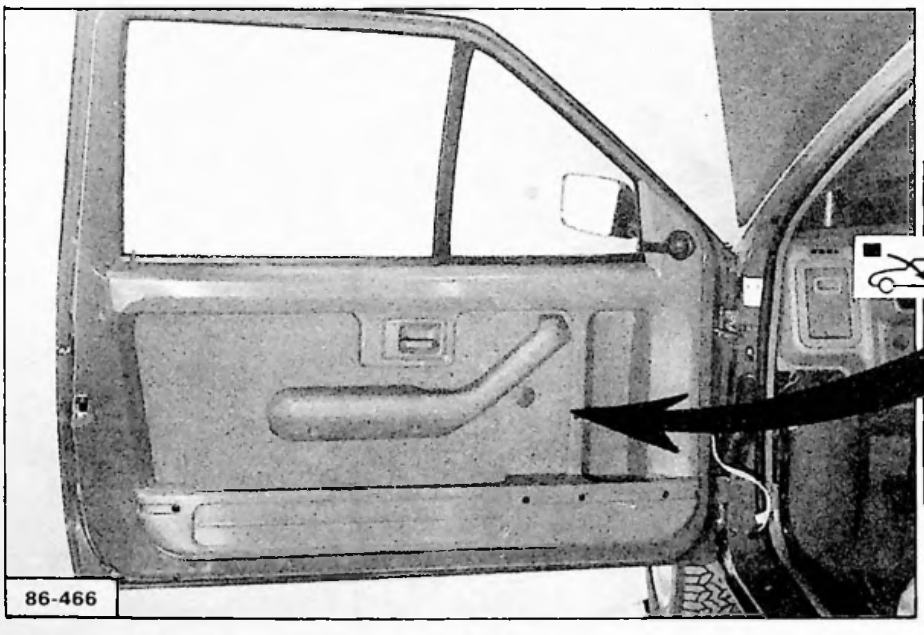

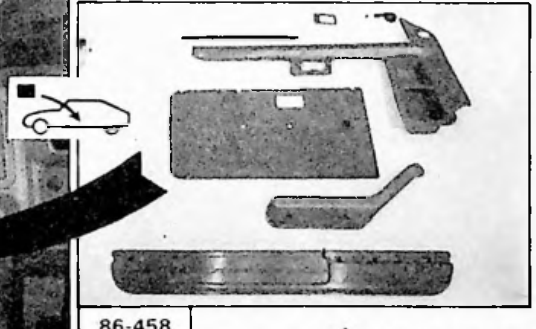

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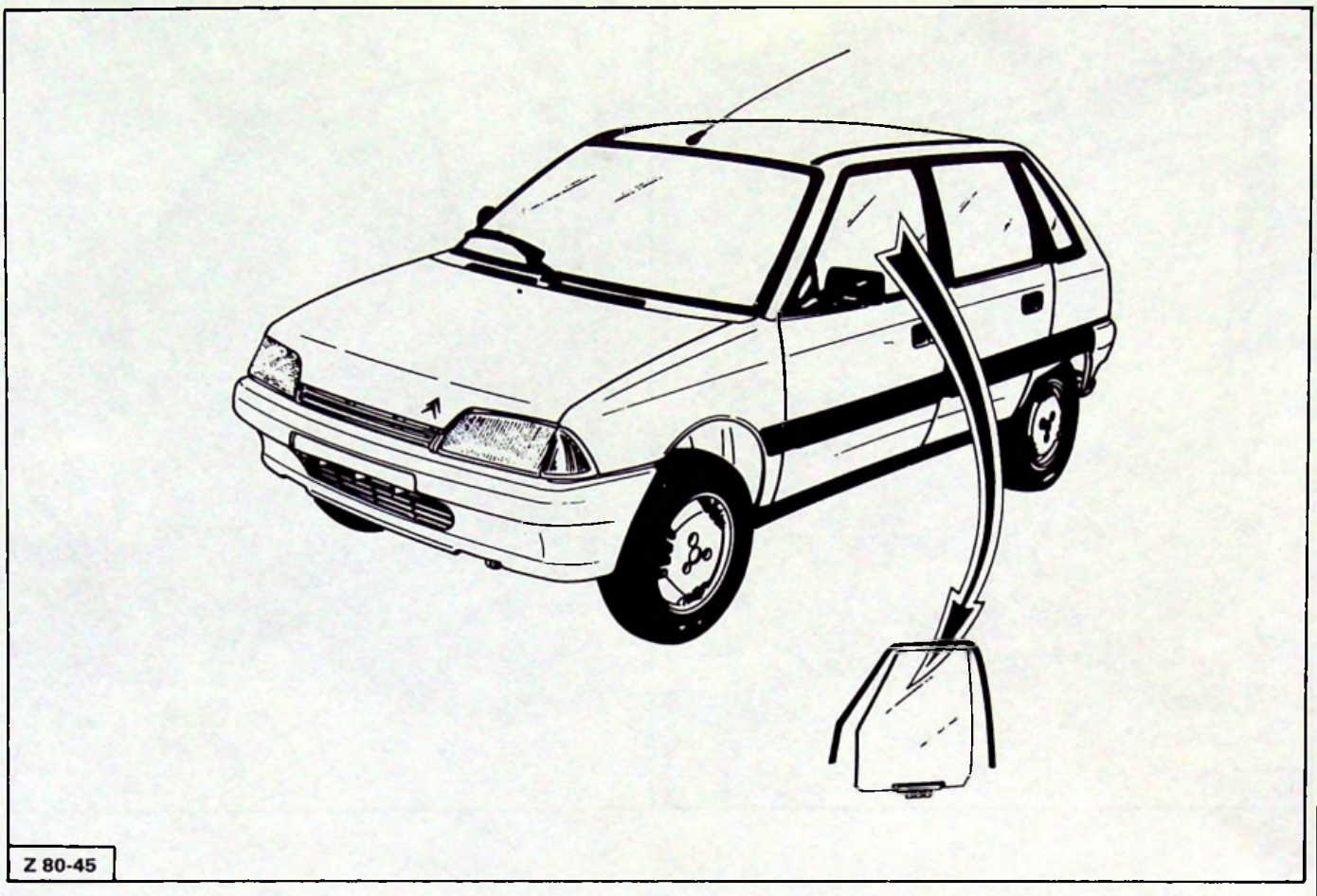

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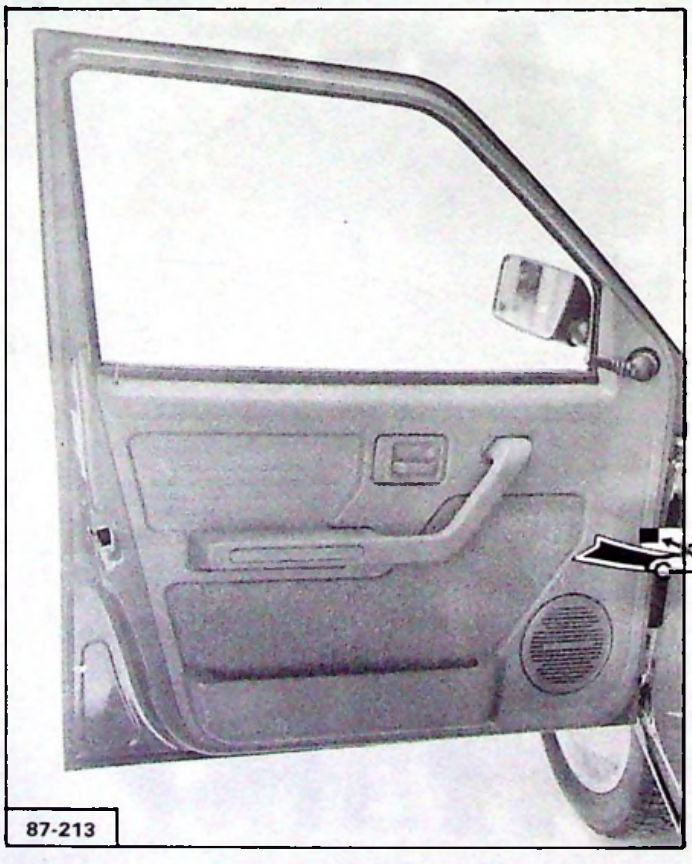

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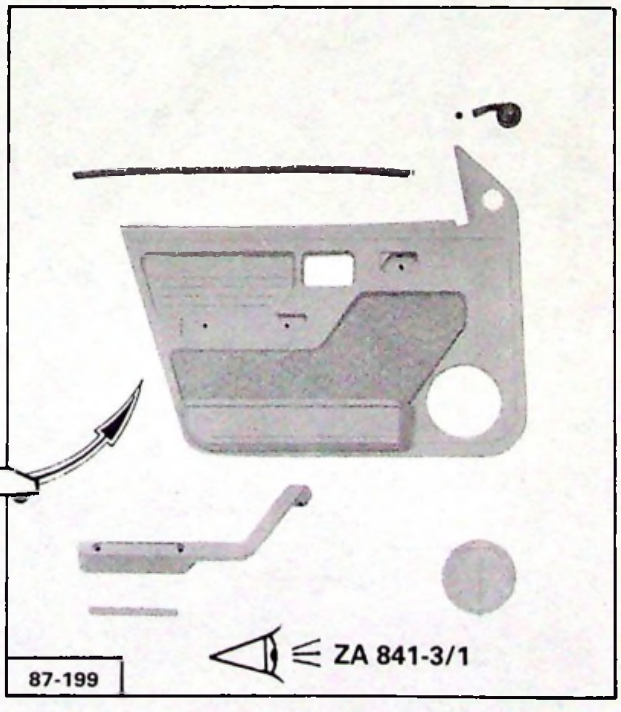

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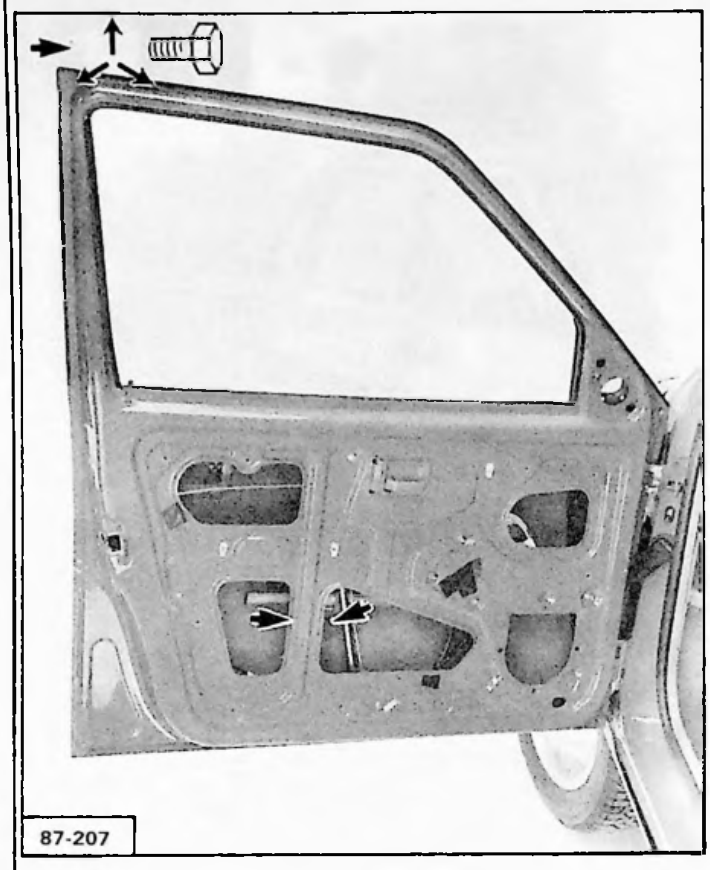

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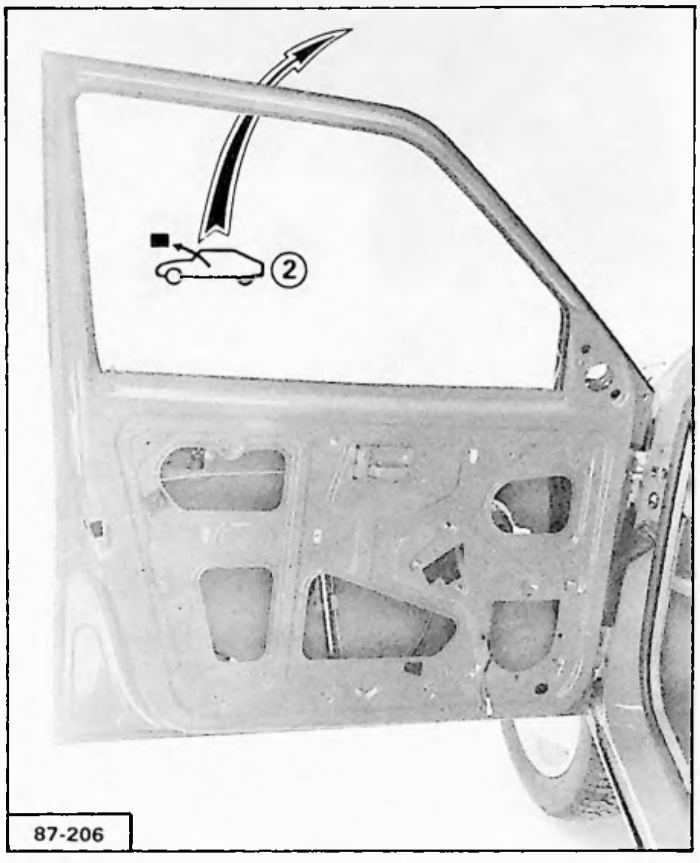

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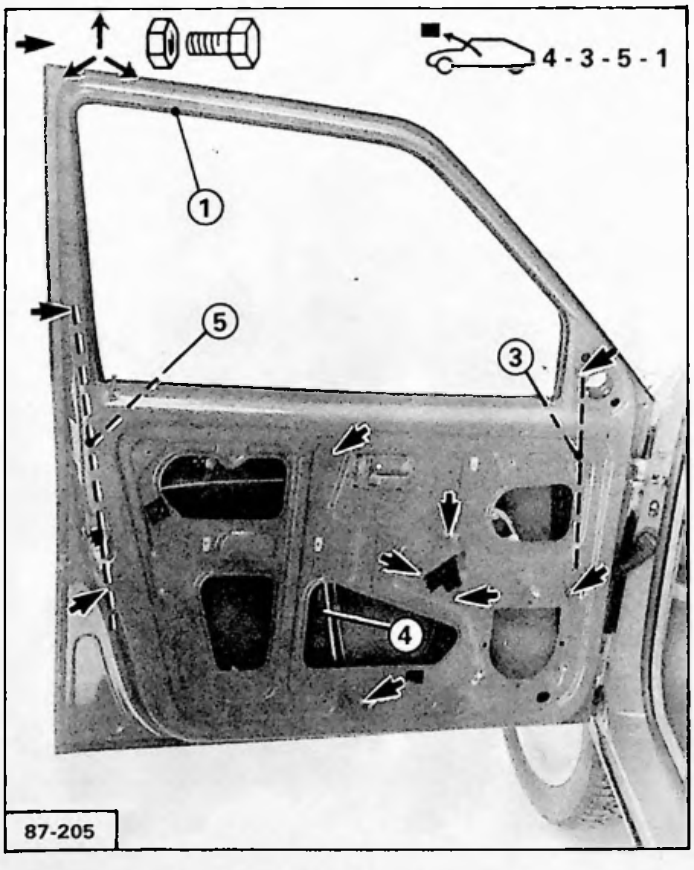

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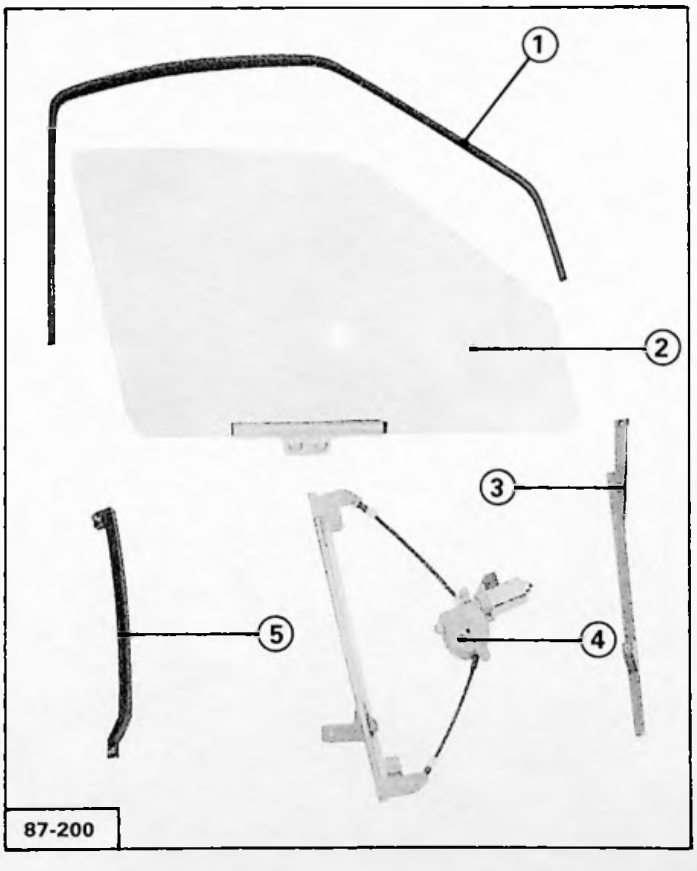

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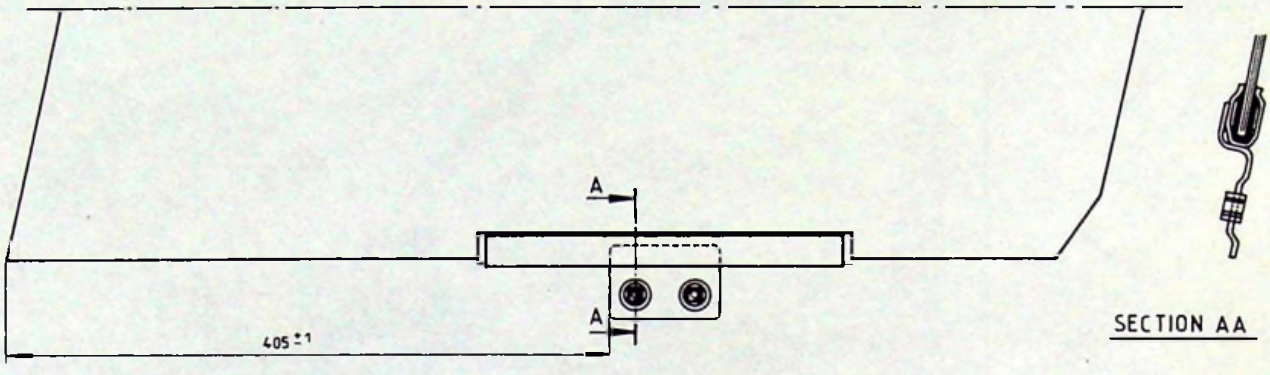

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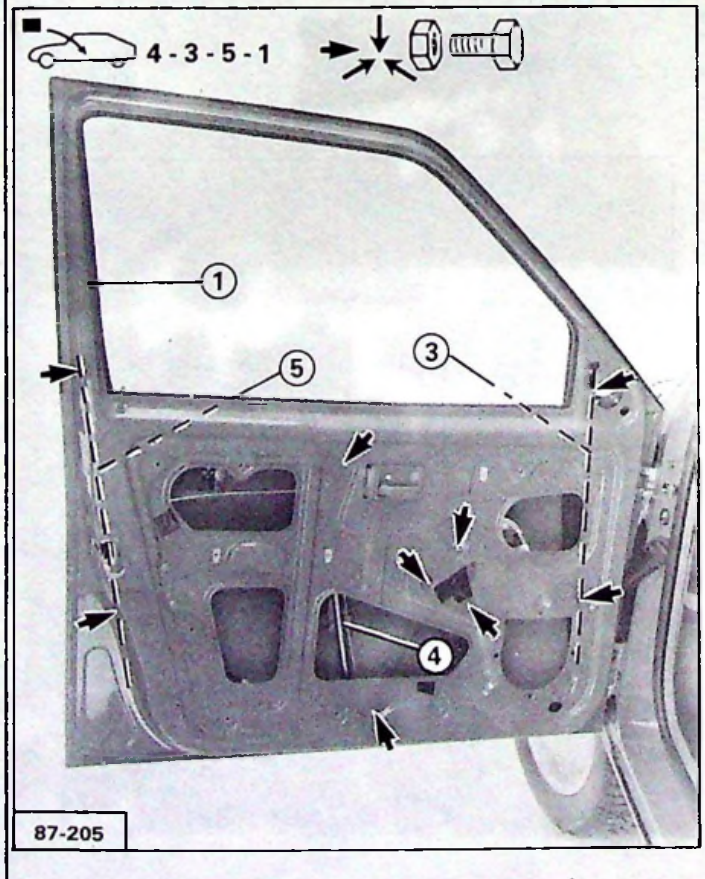

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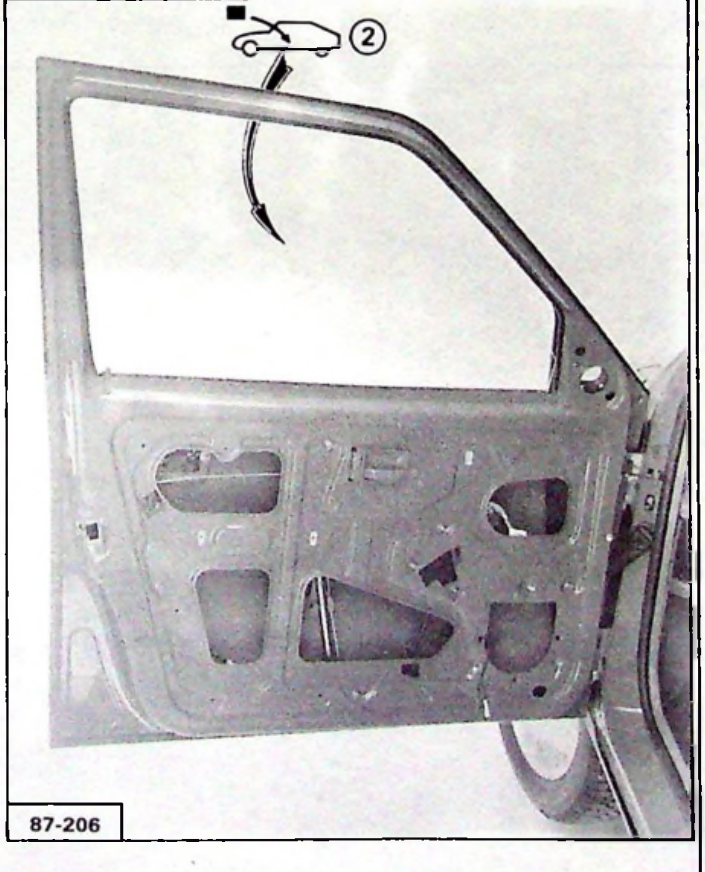

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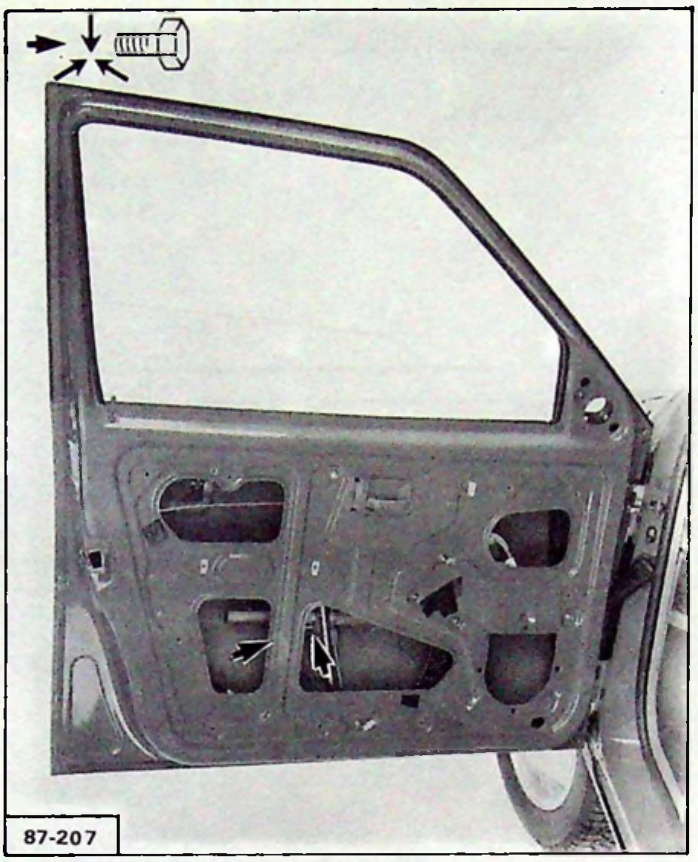
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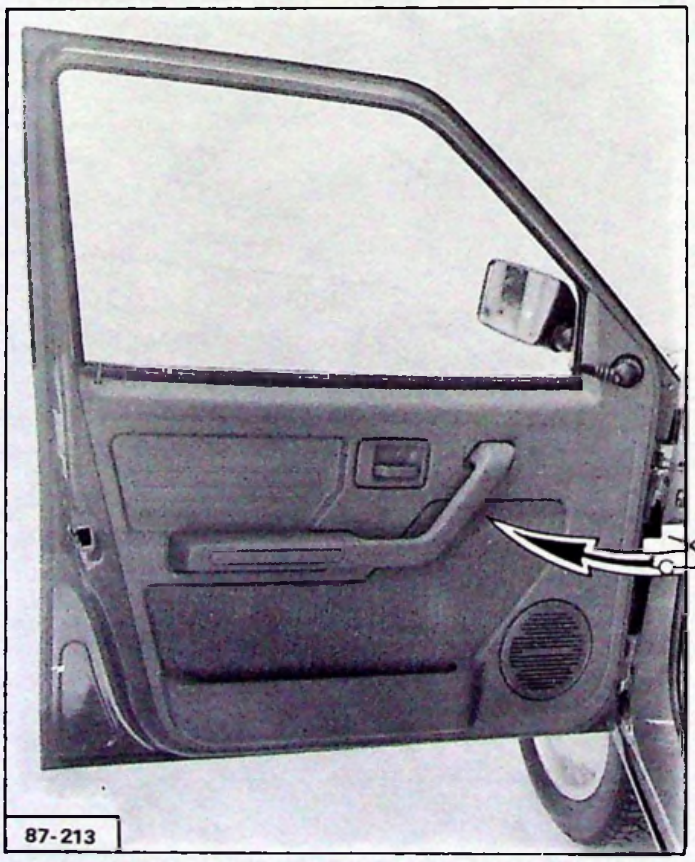
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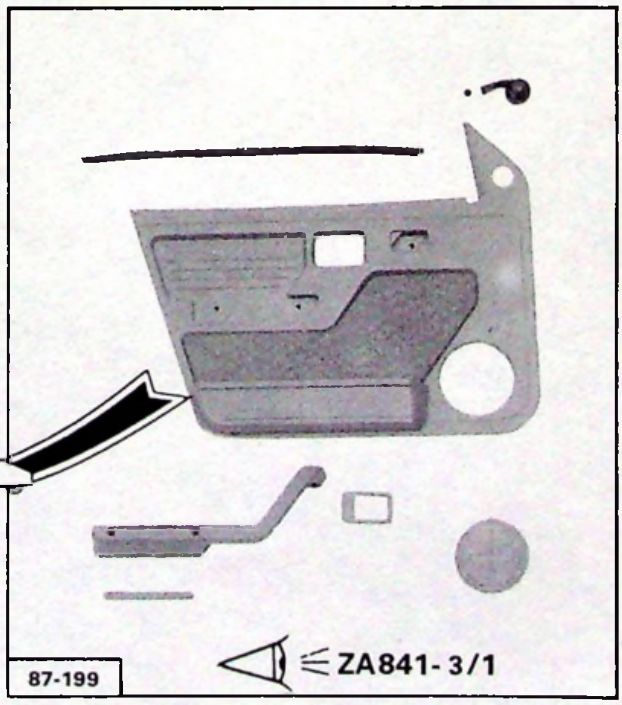
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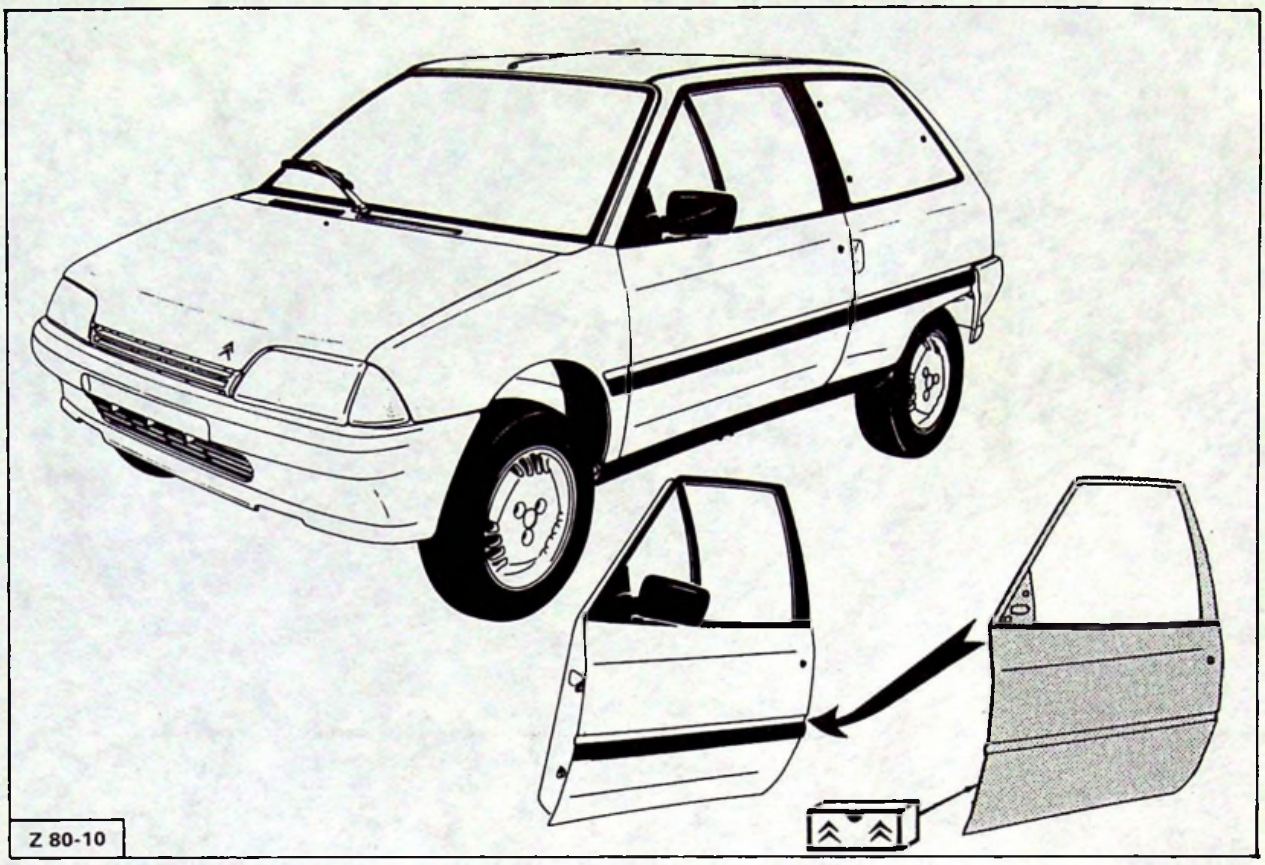
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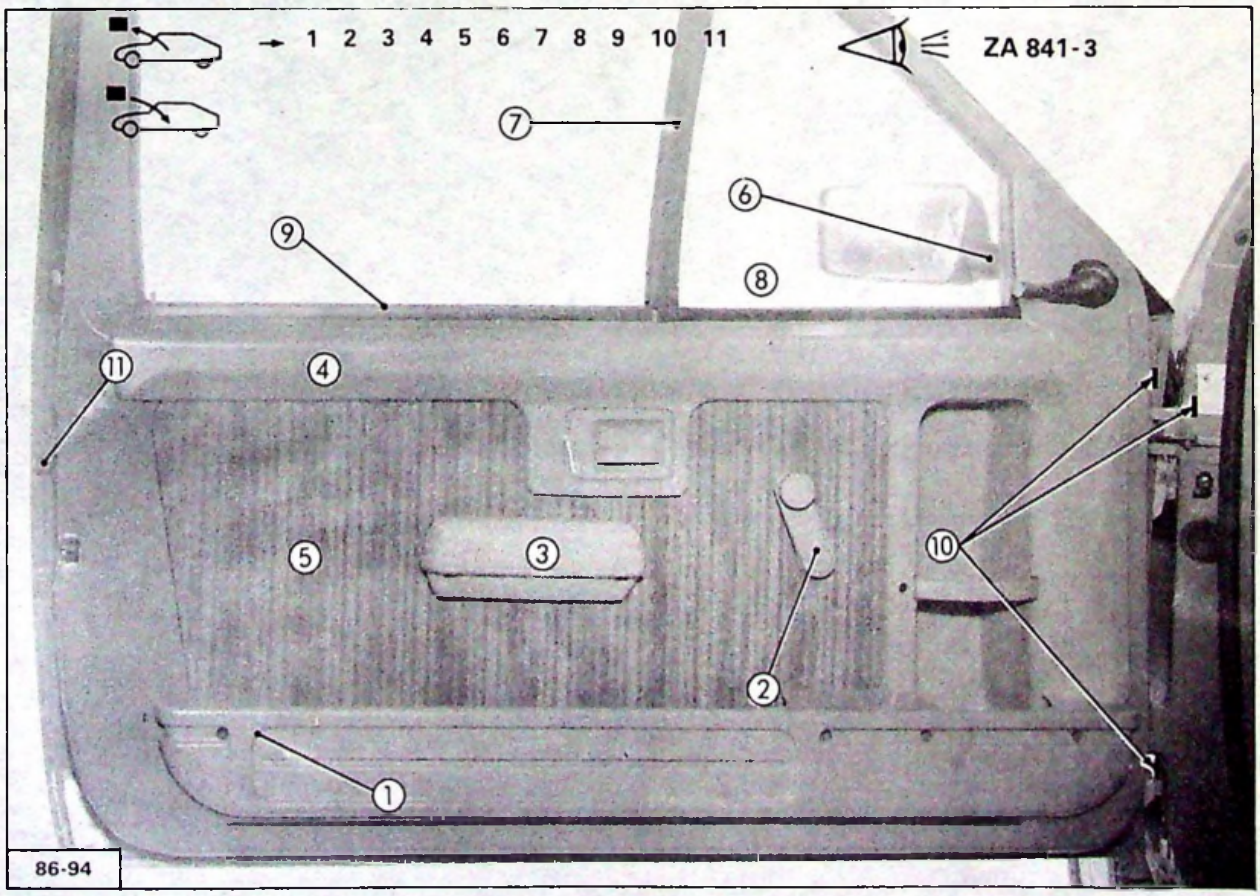
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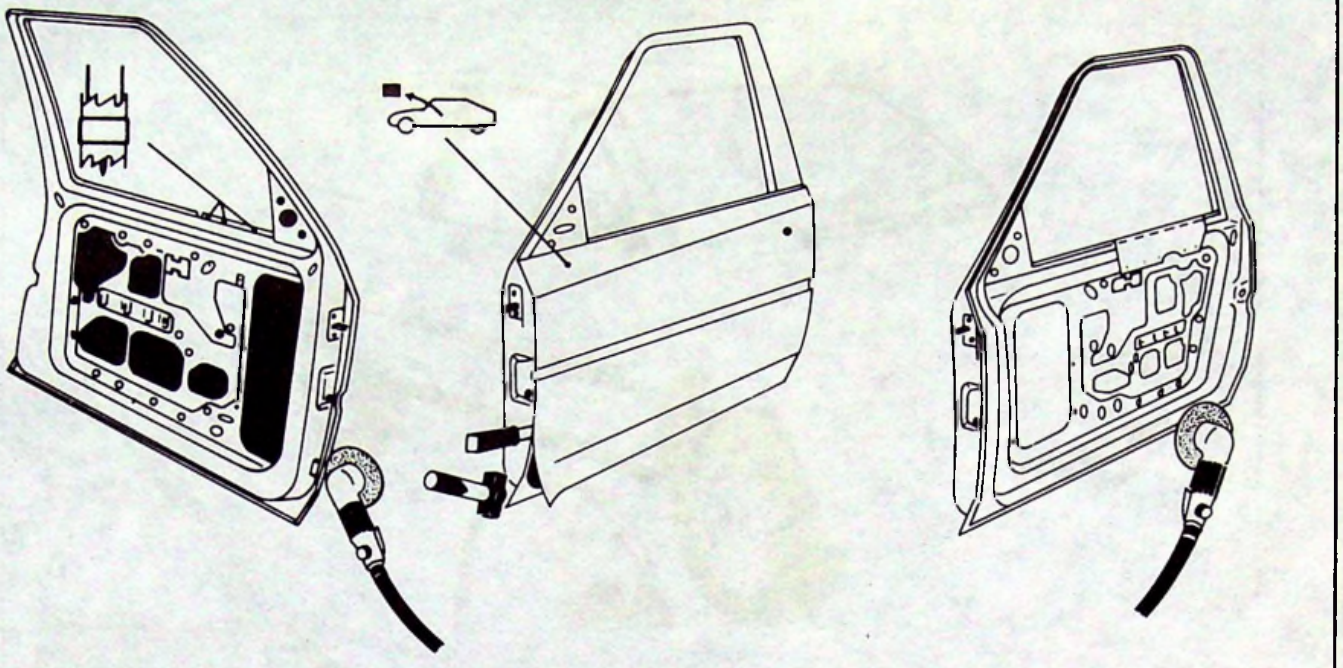

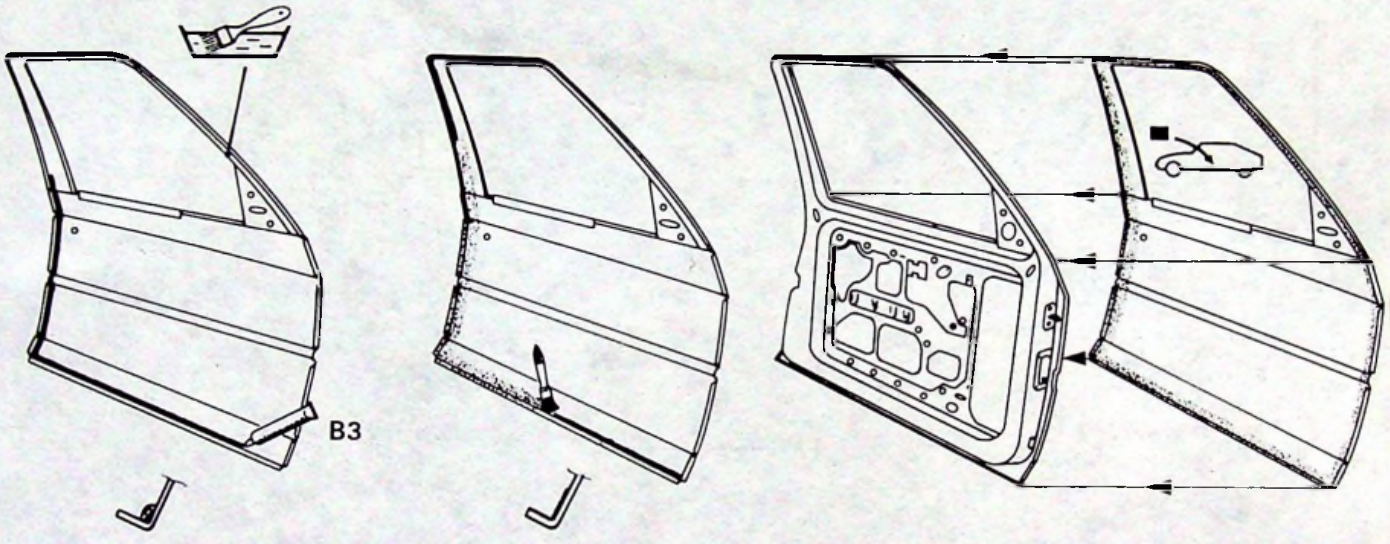
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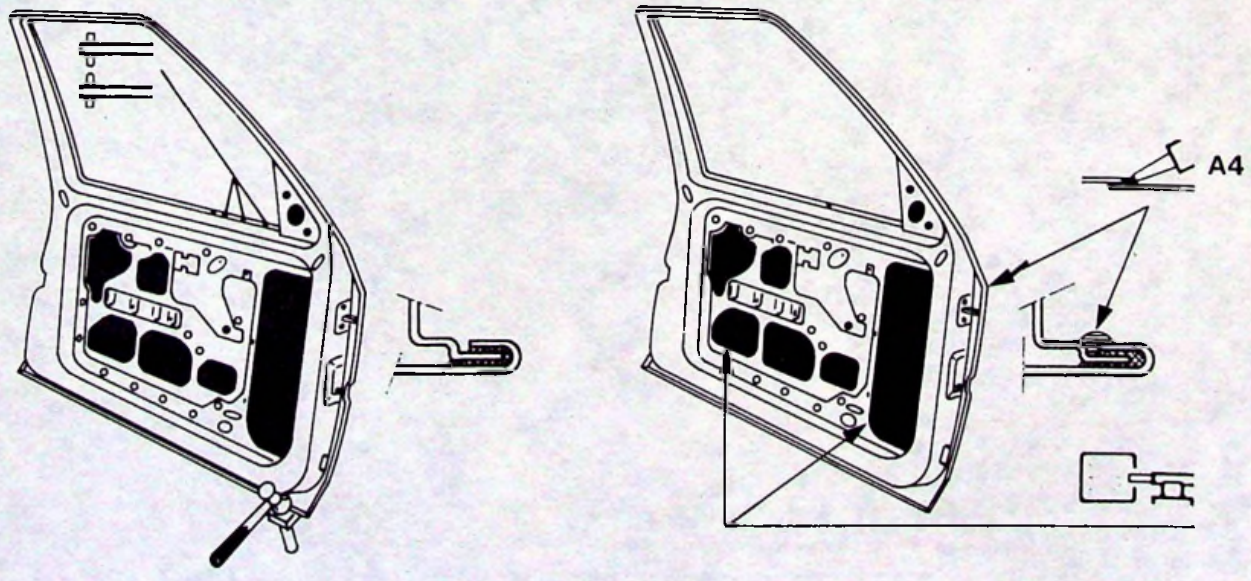
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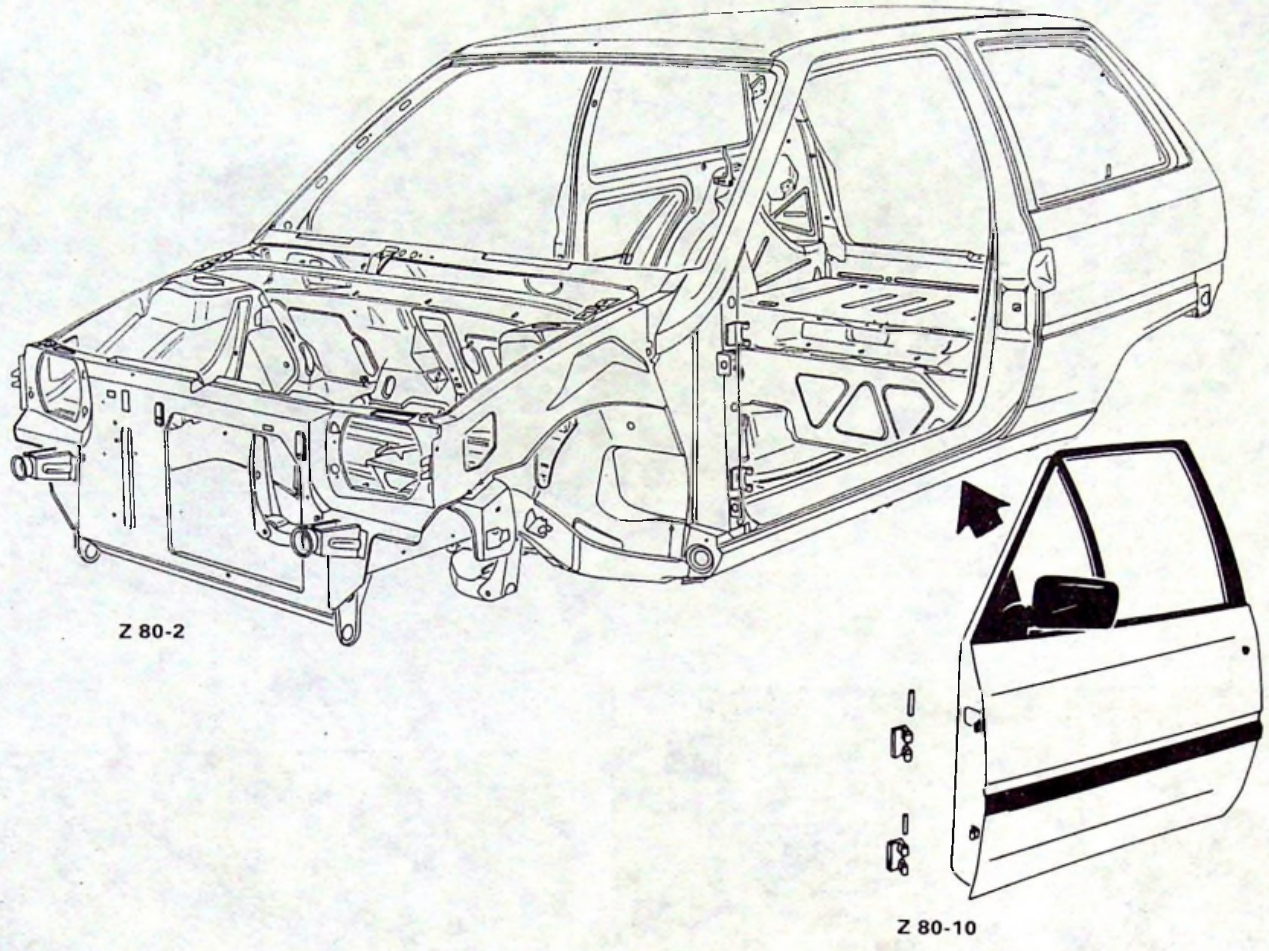

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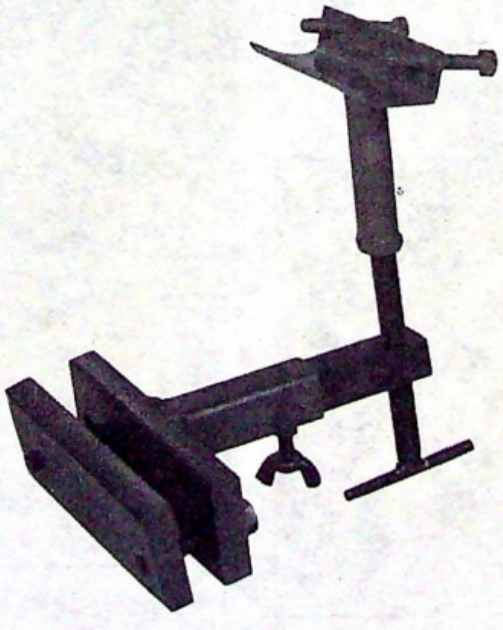
Z 80-10

7501-T



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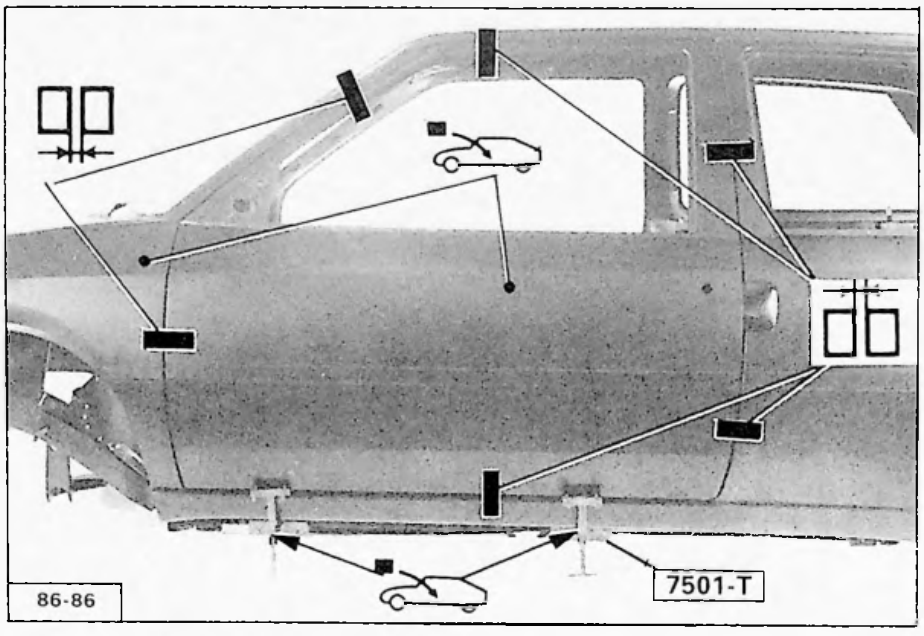
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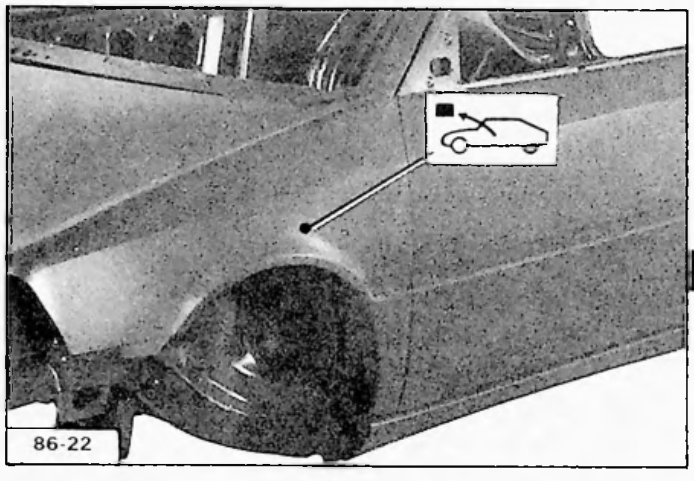
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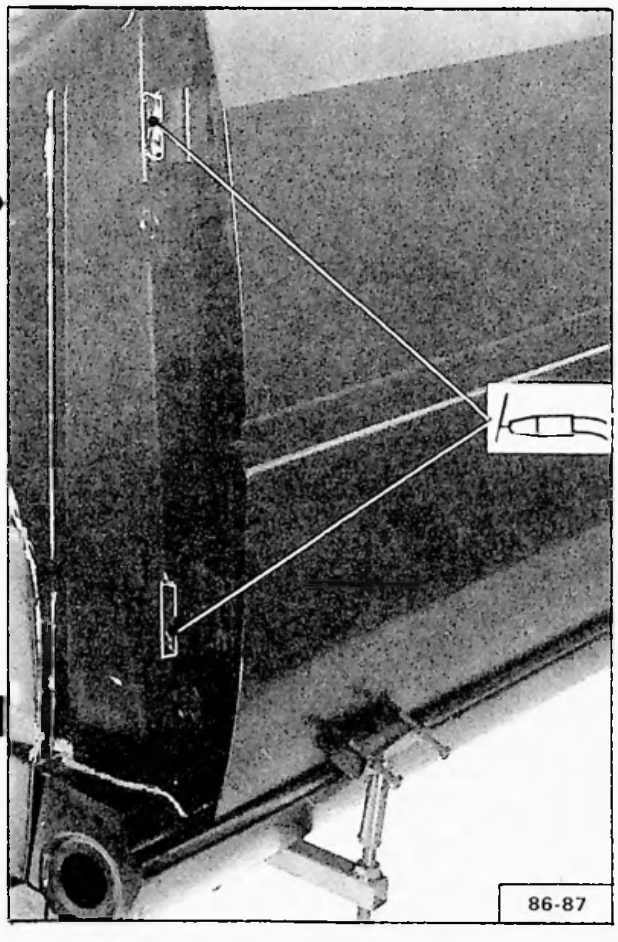
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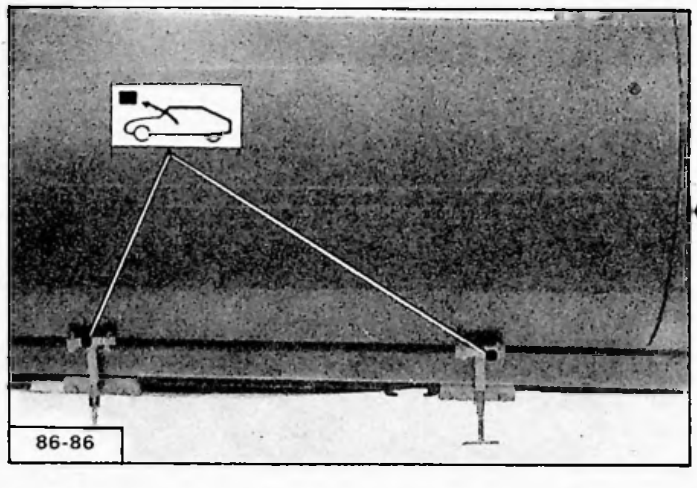
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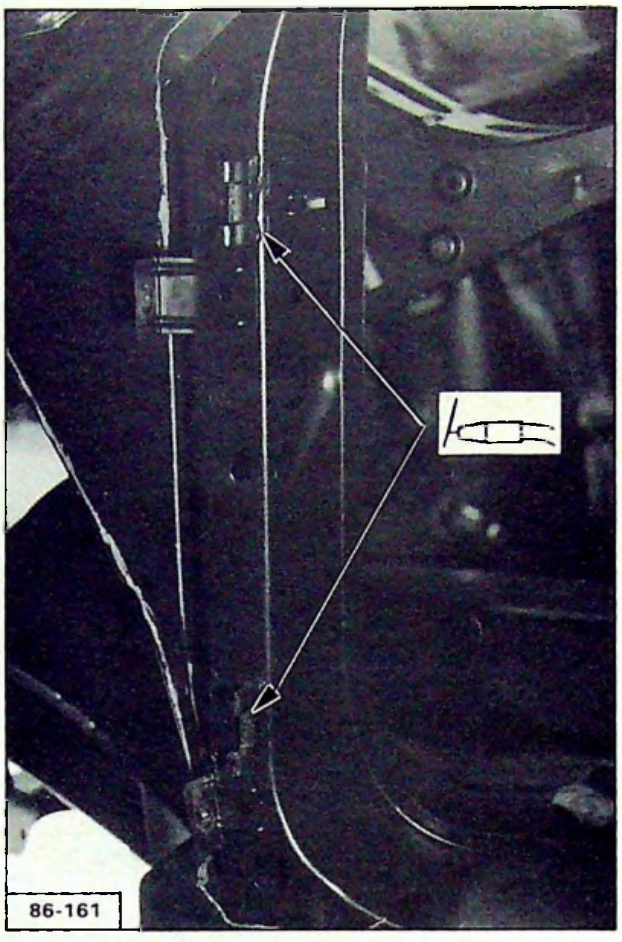
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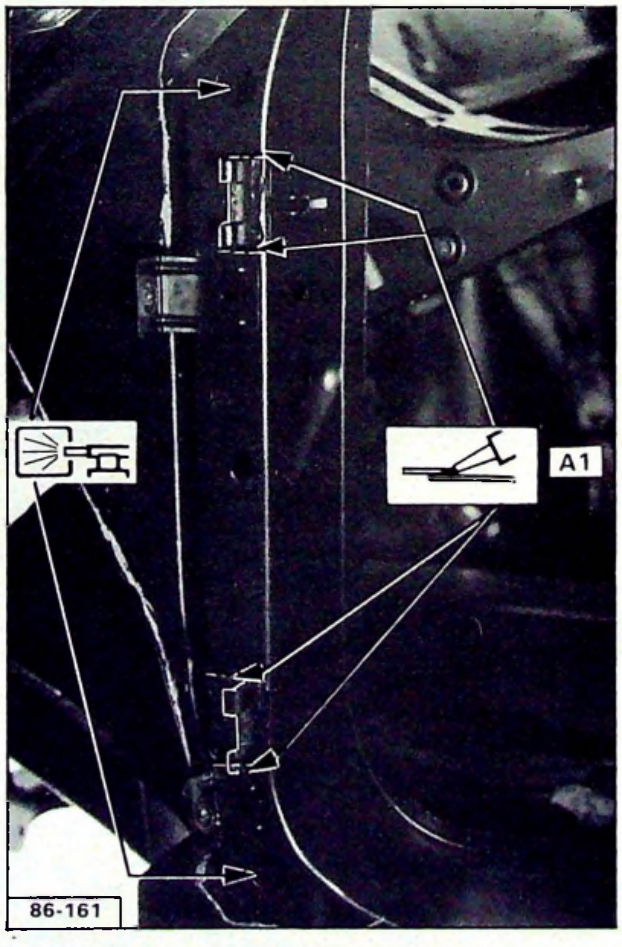
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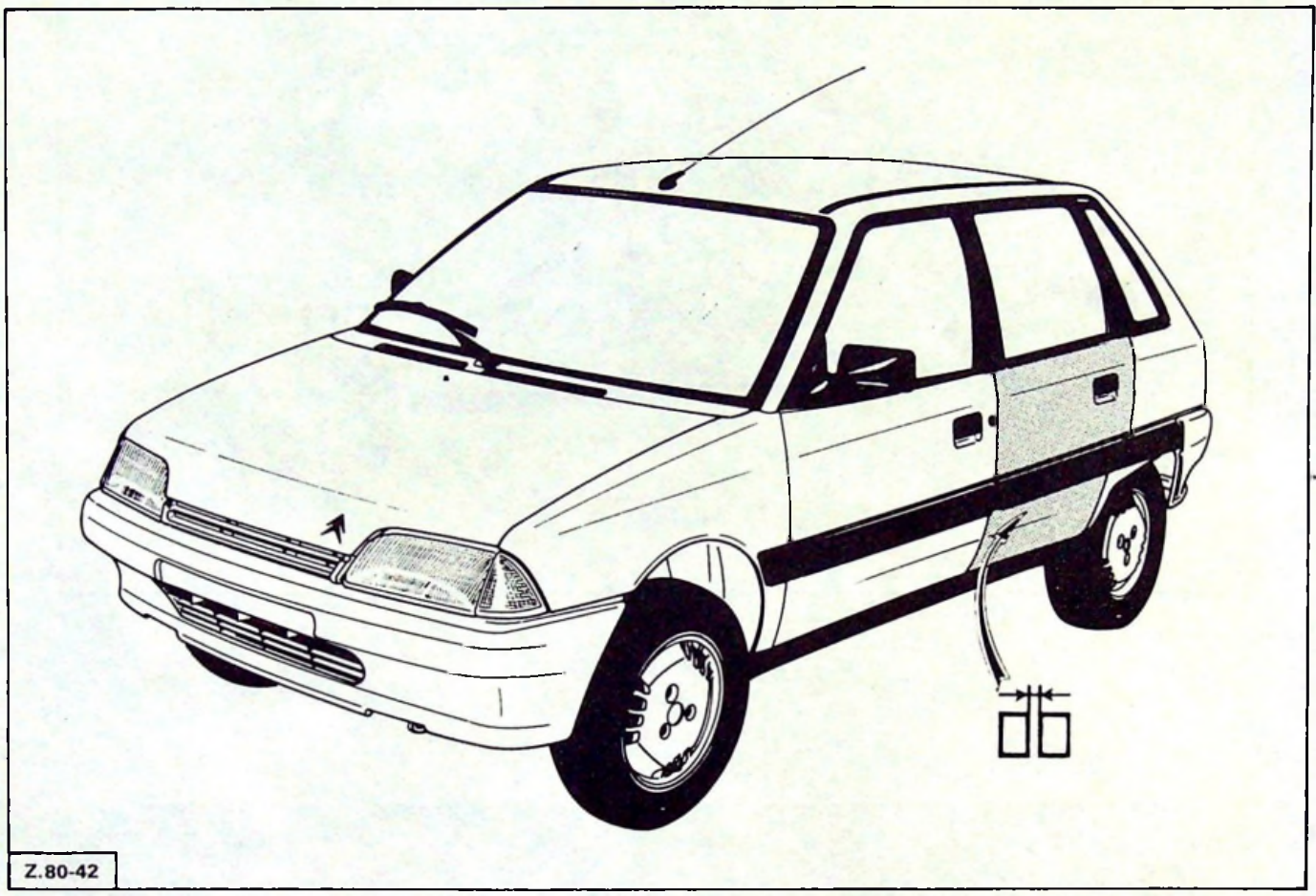

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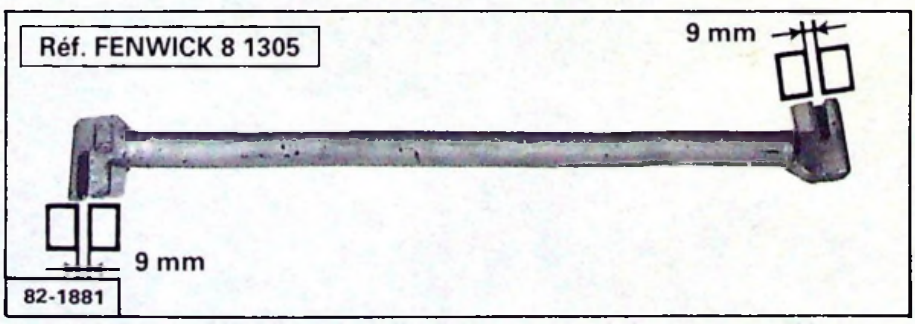

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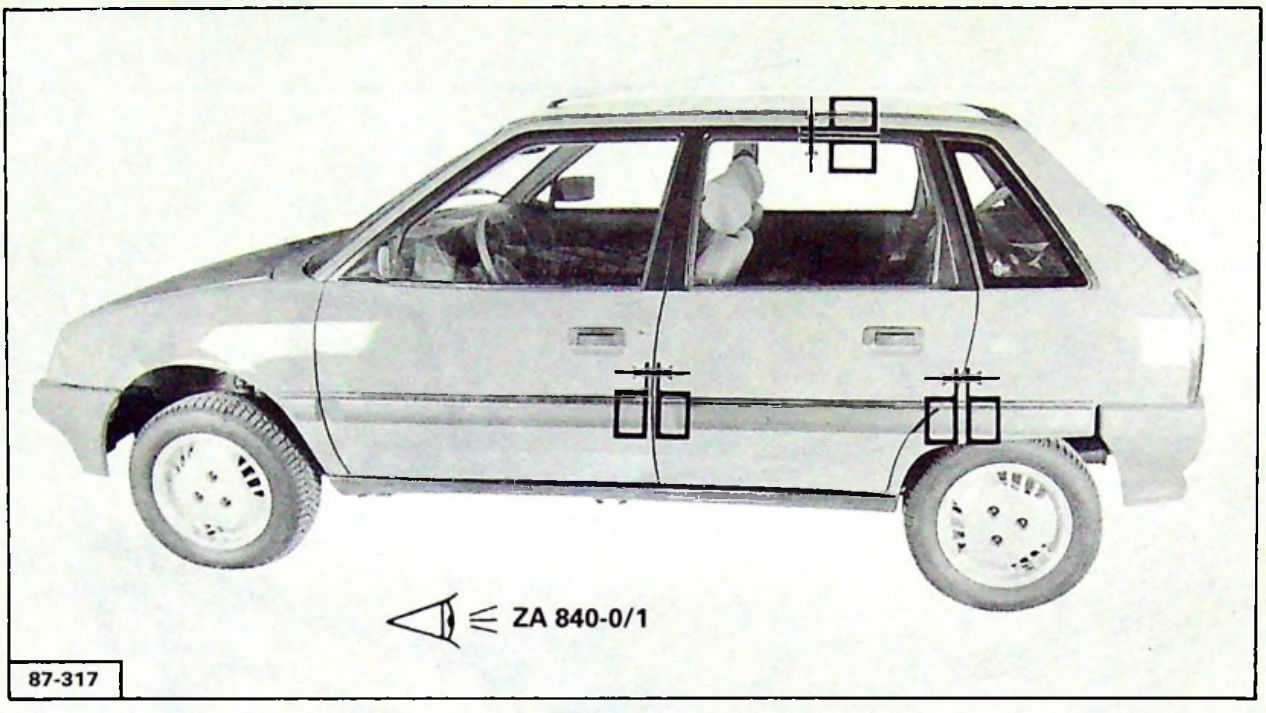
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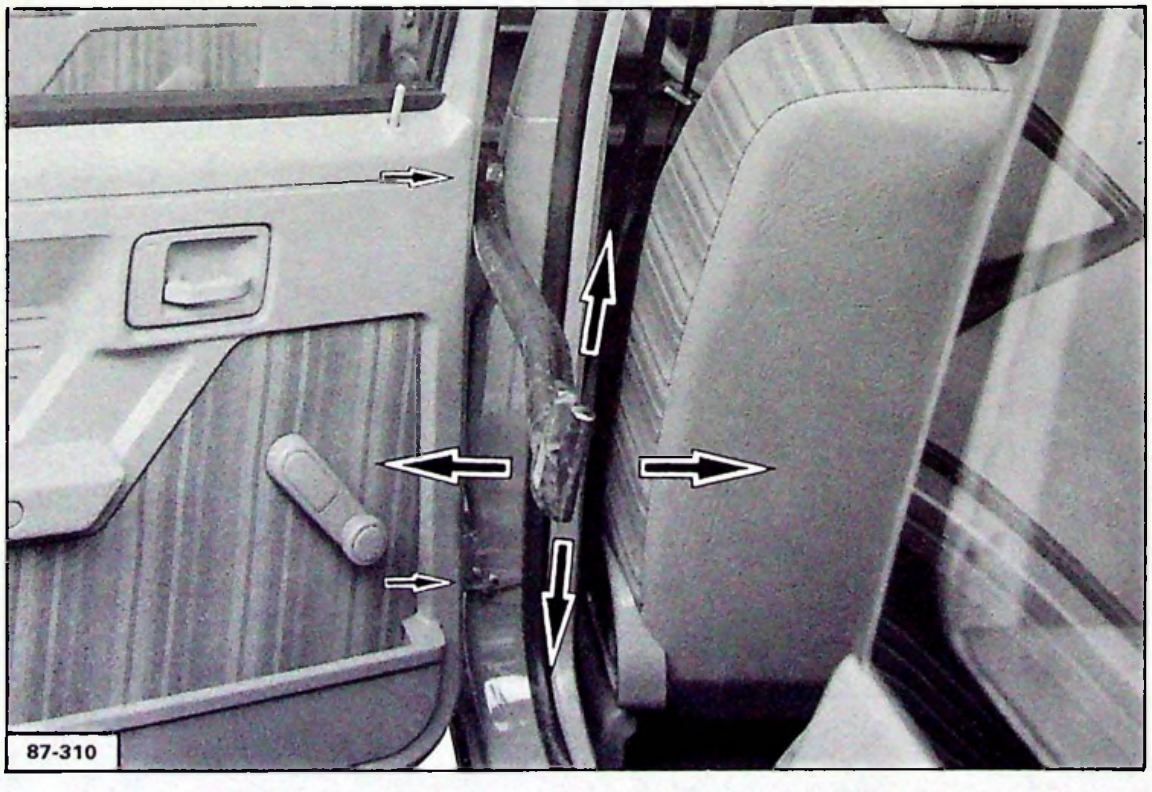
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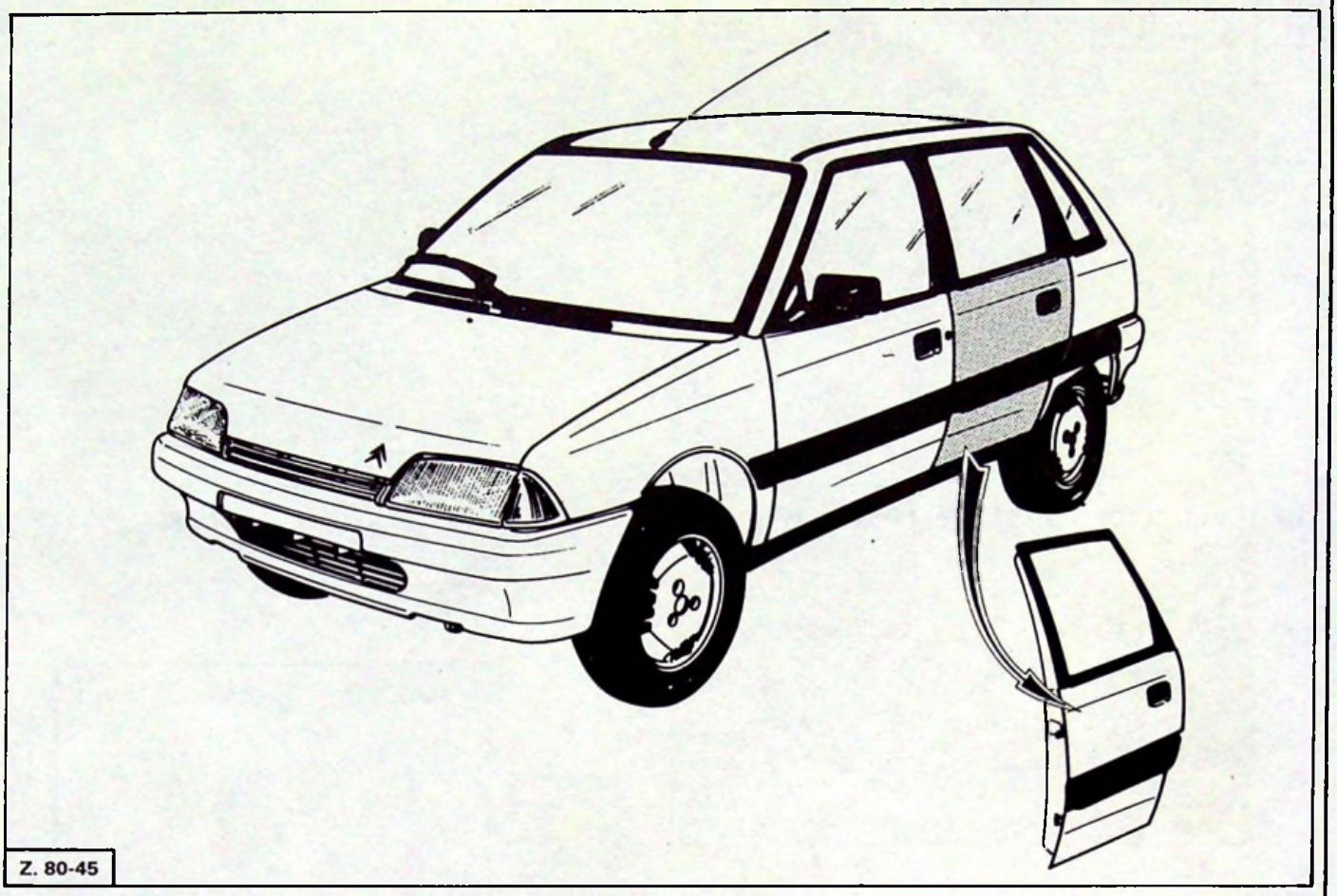

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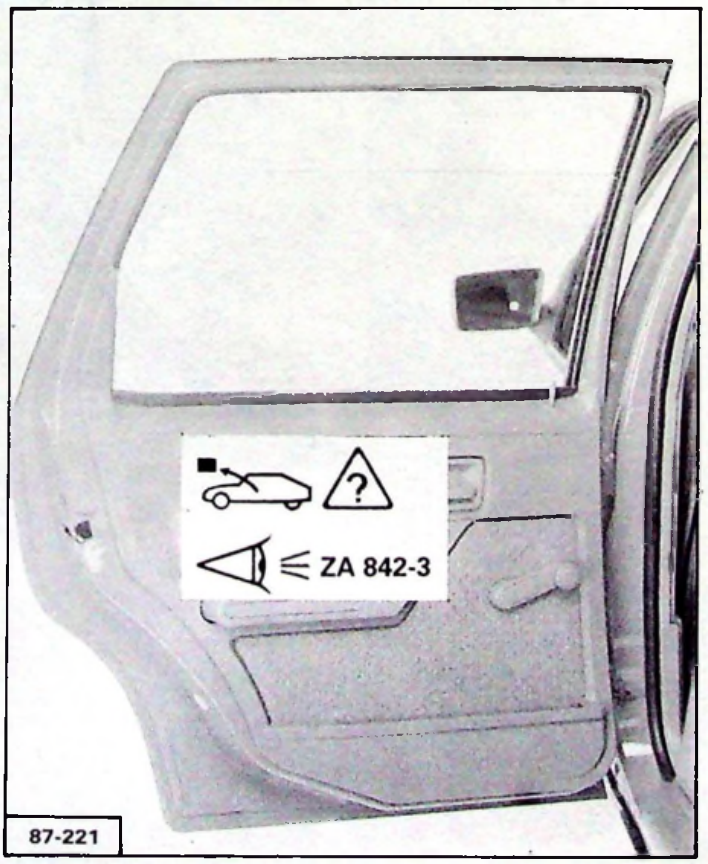

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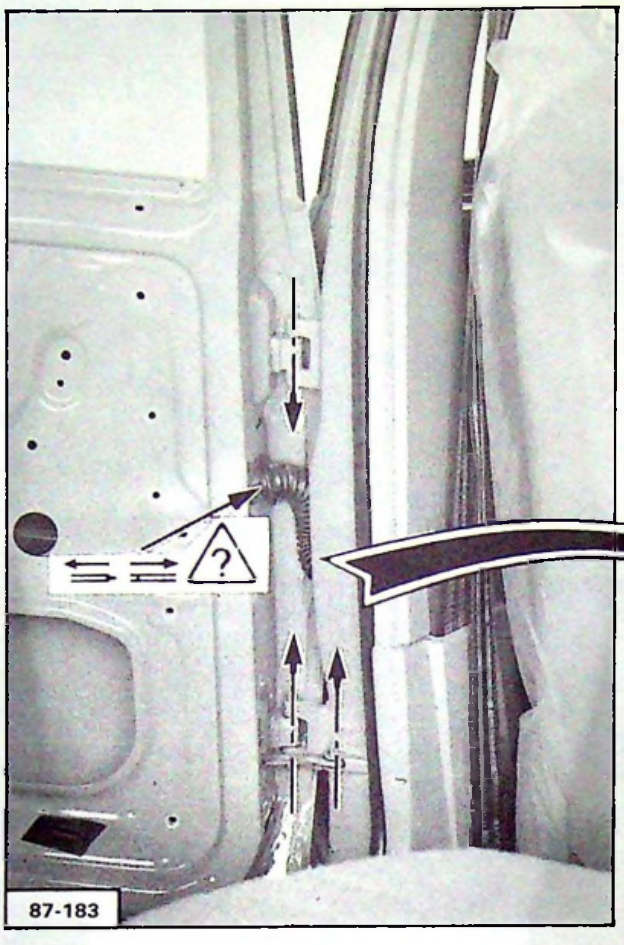
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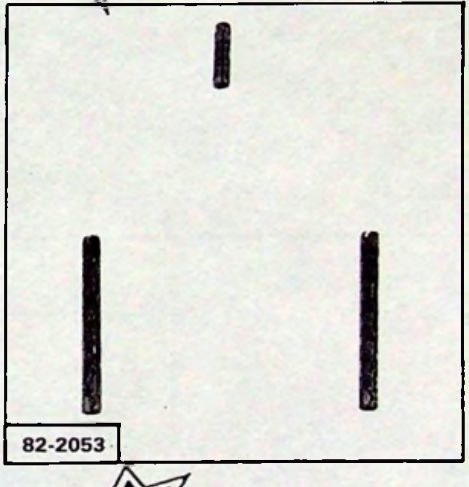
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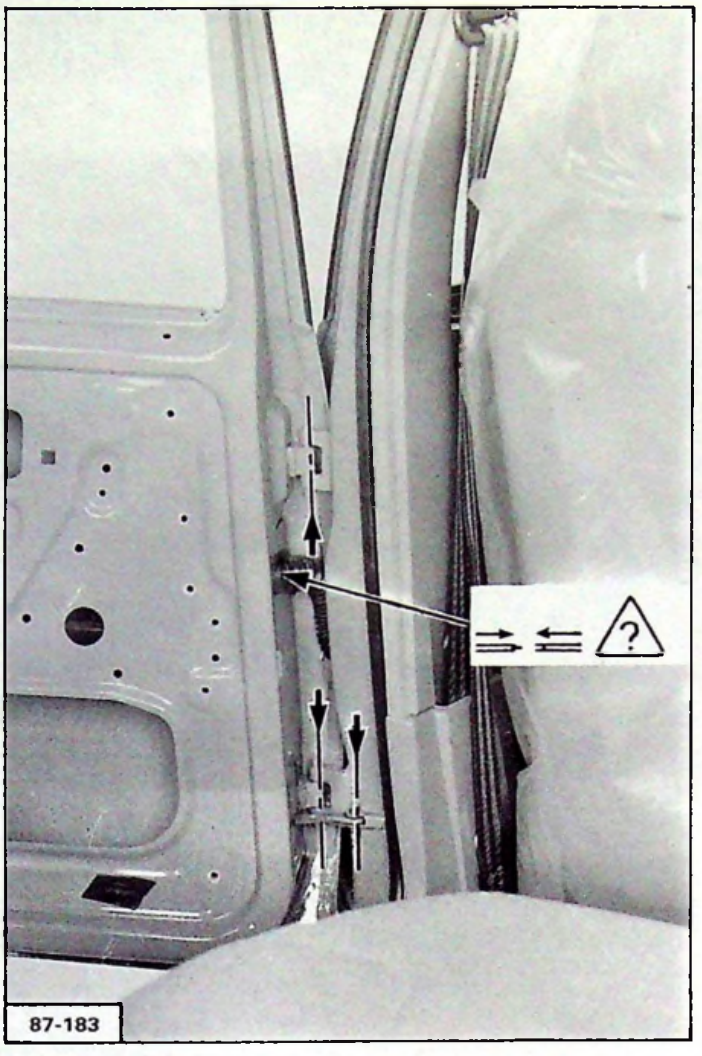
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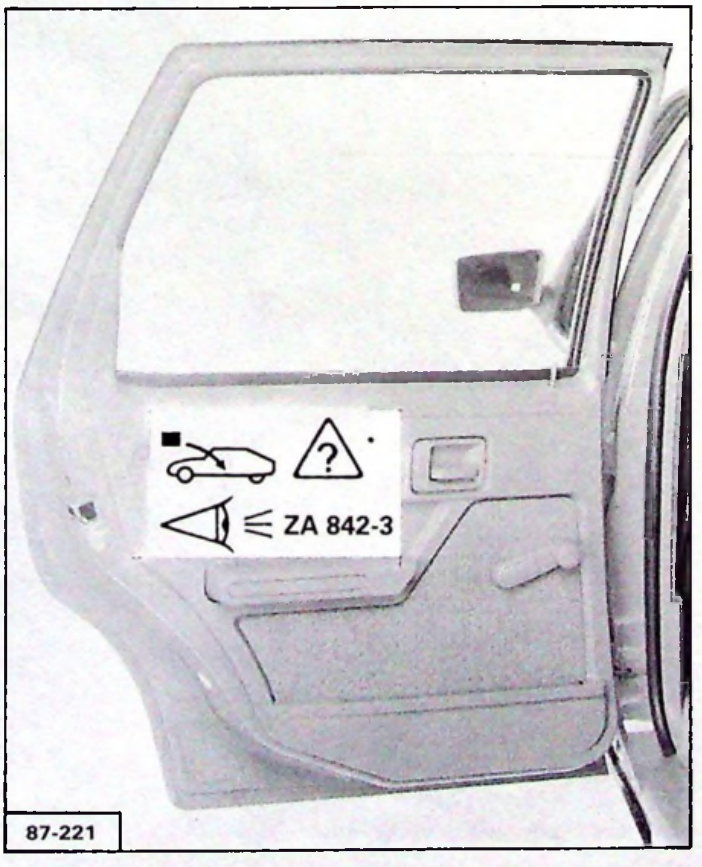
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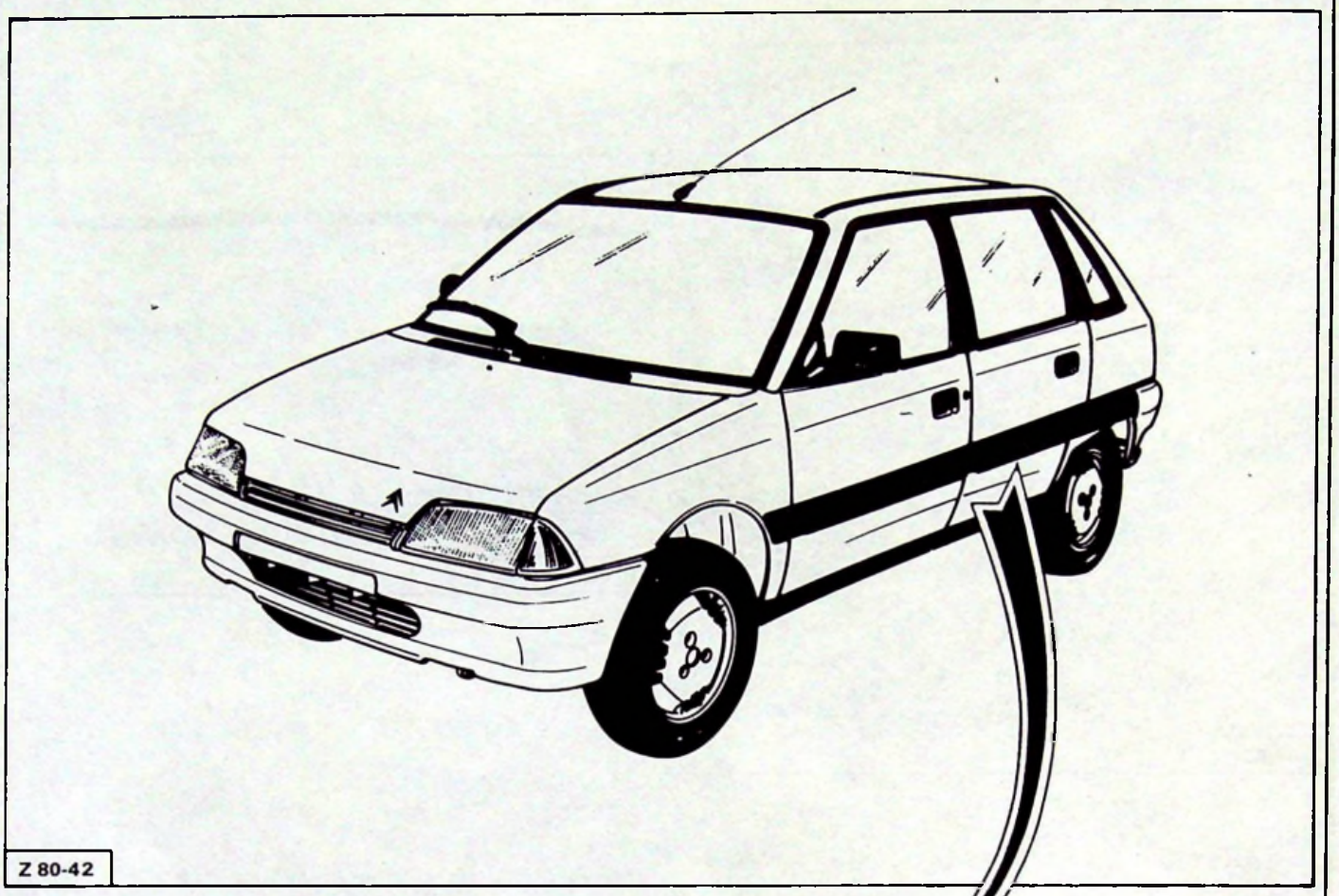

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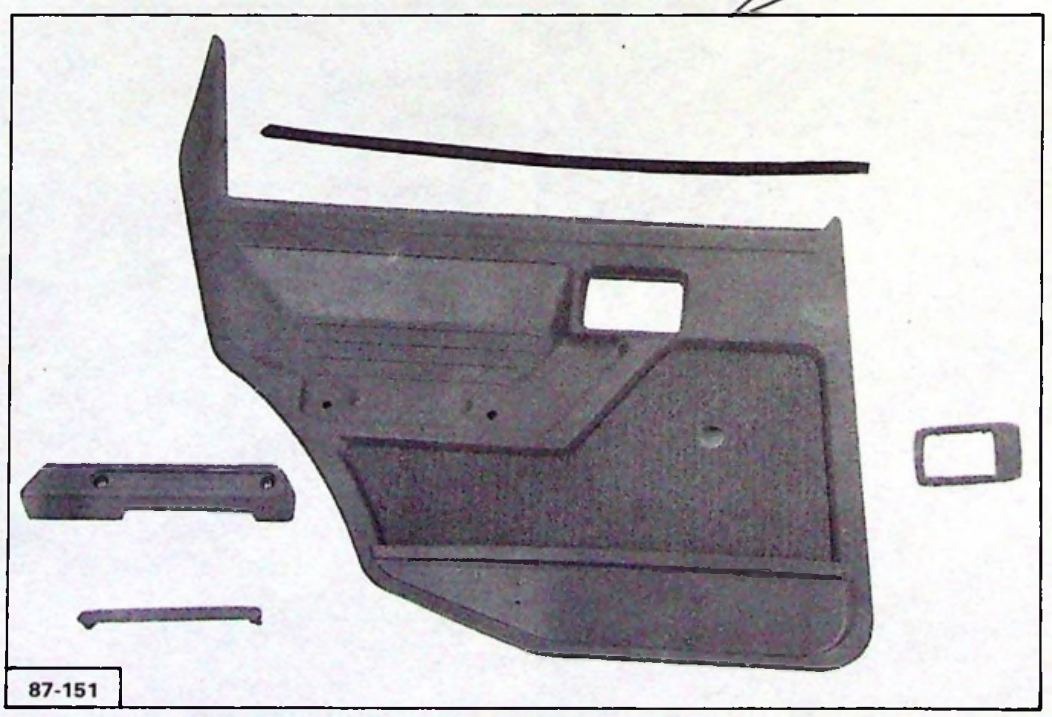

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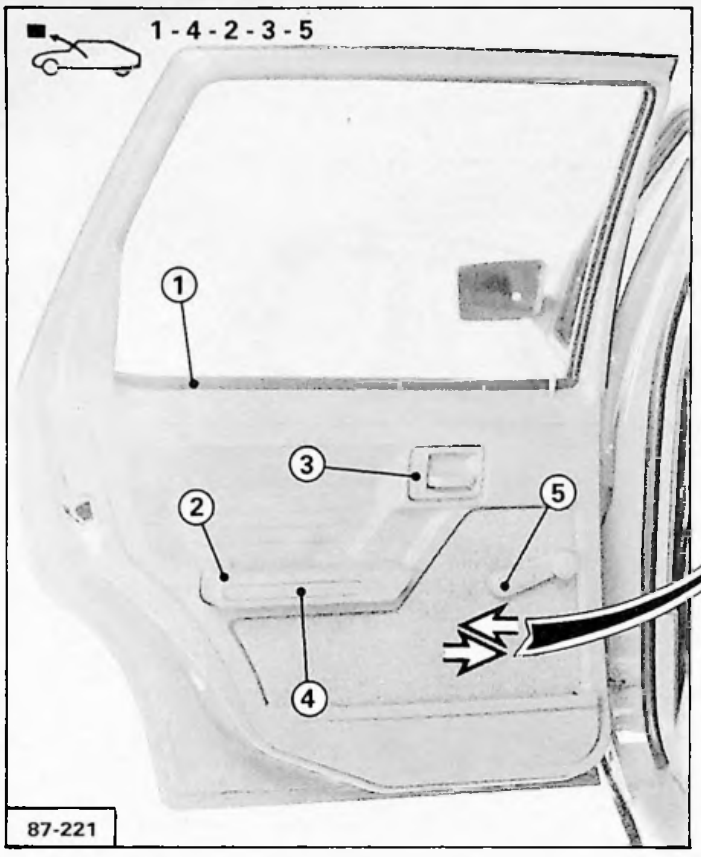
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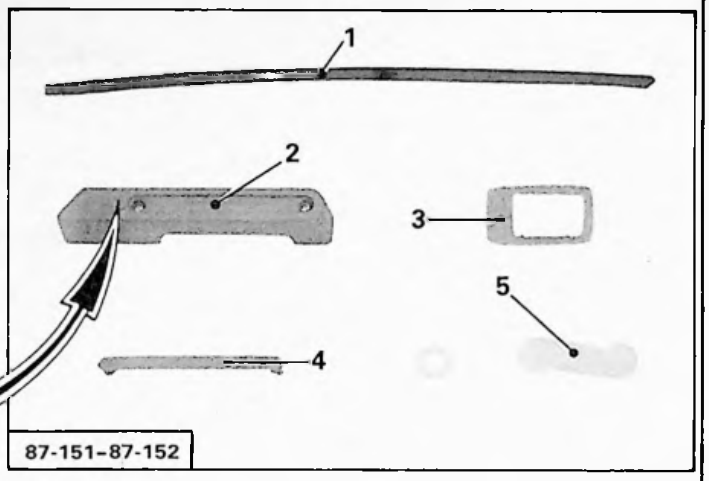
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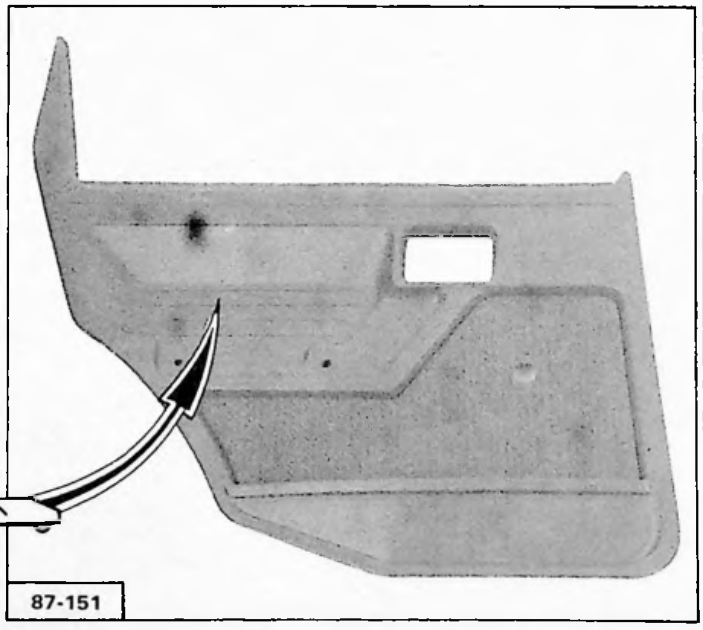
87-197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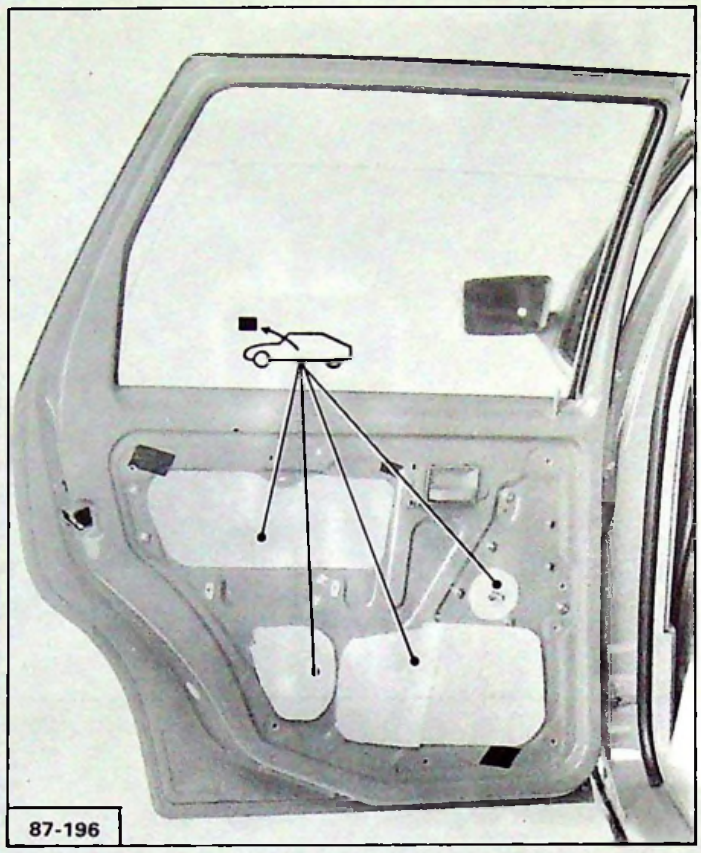

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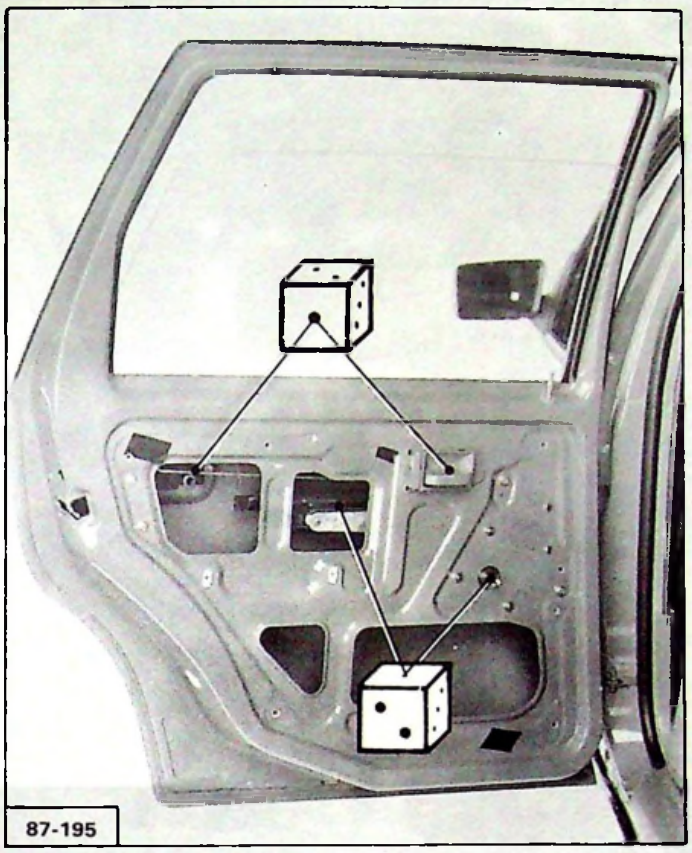

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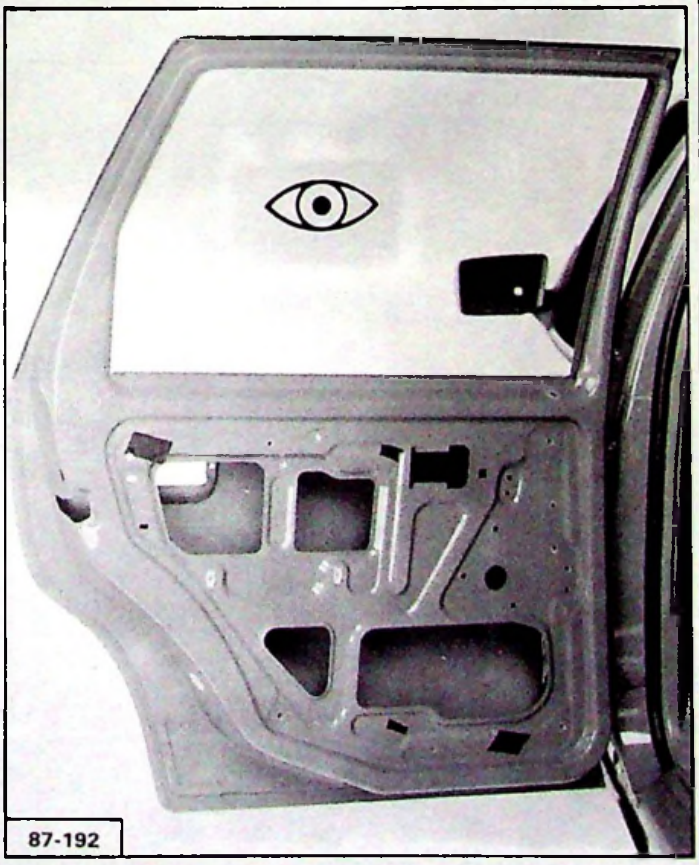

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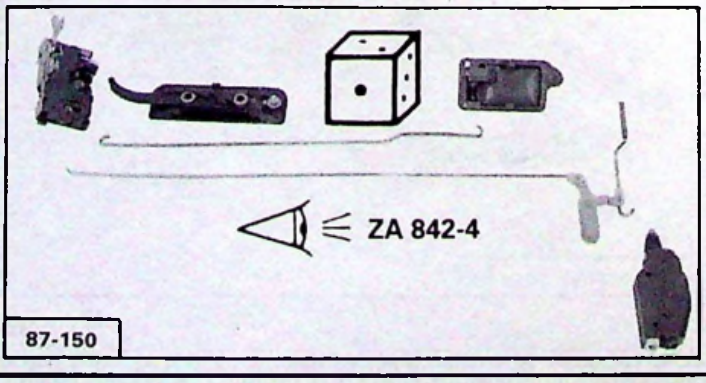

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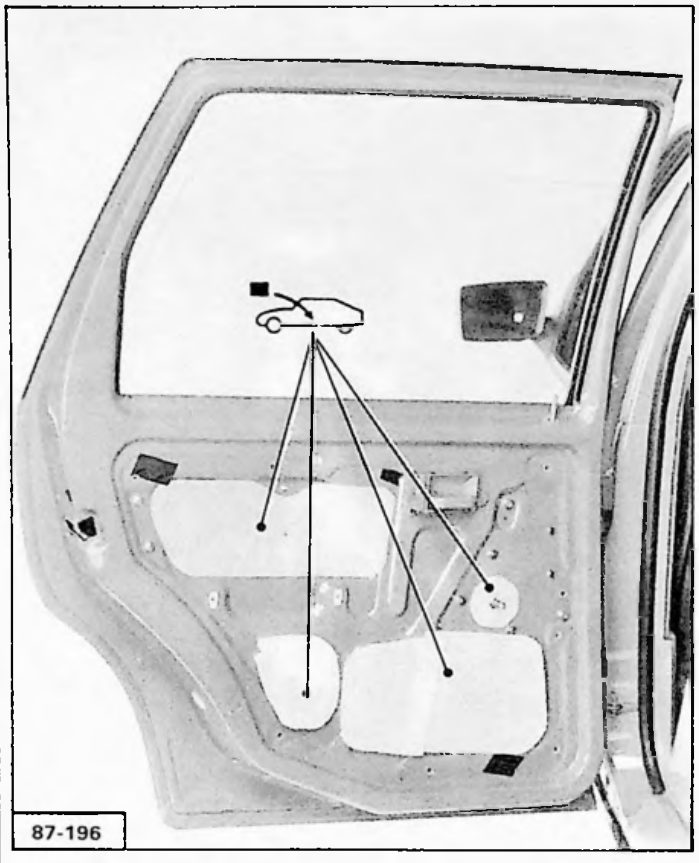
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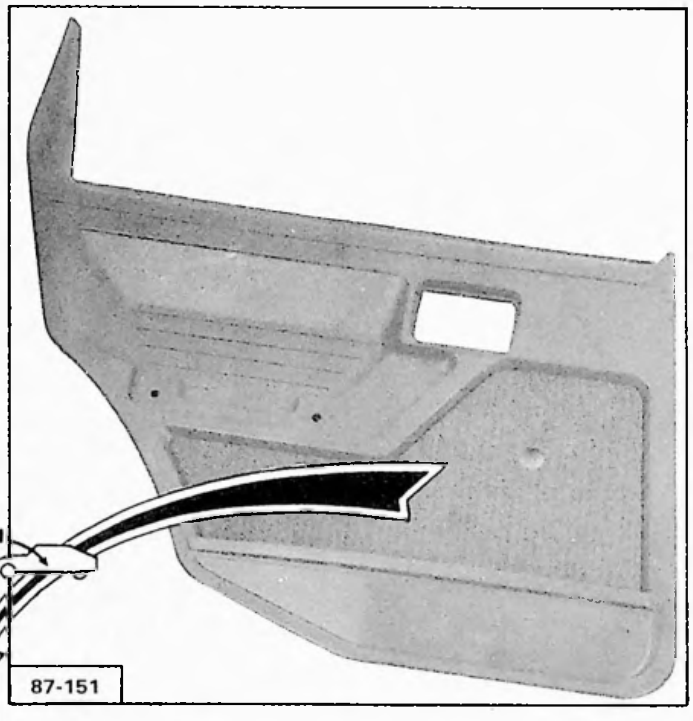
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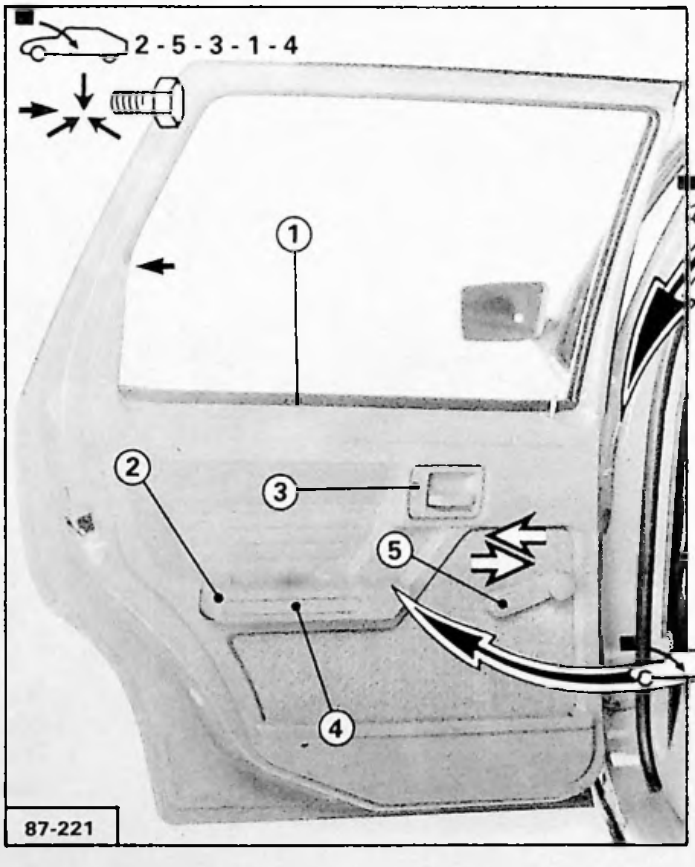
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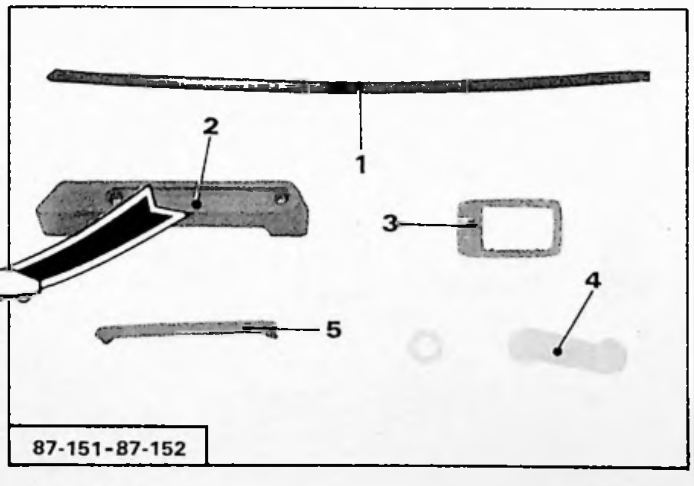
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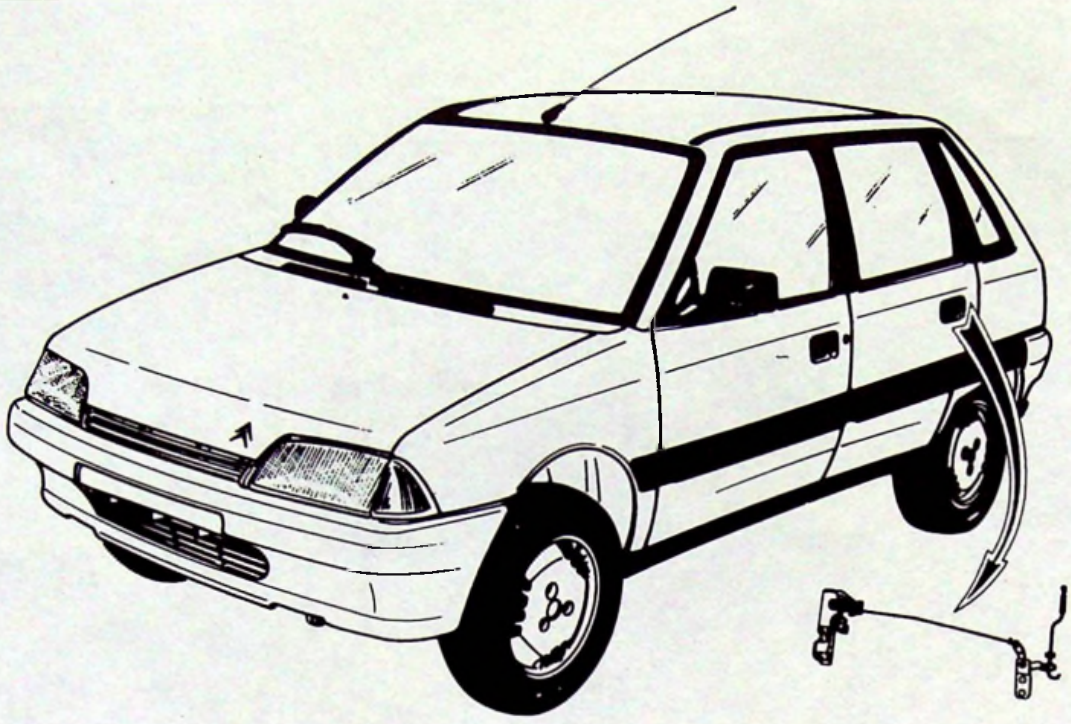

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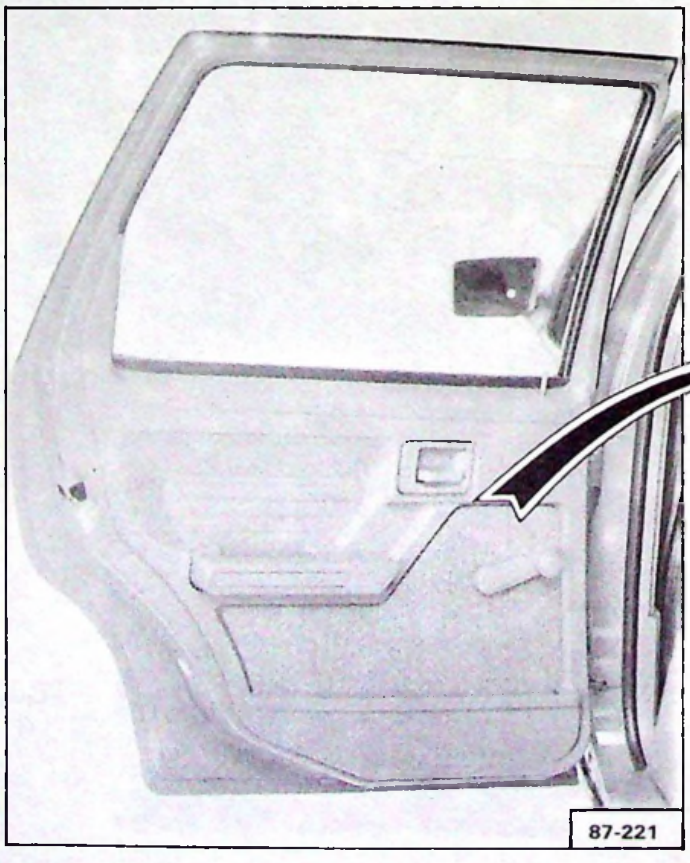

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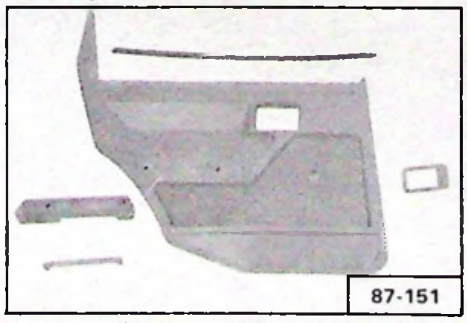

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ZA 842-3

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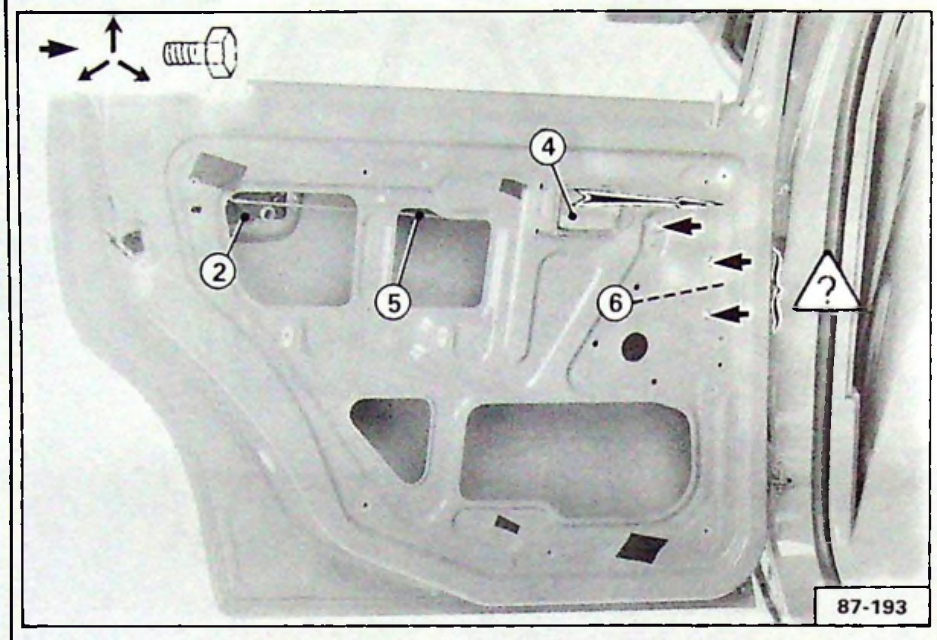
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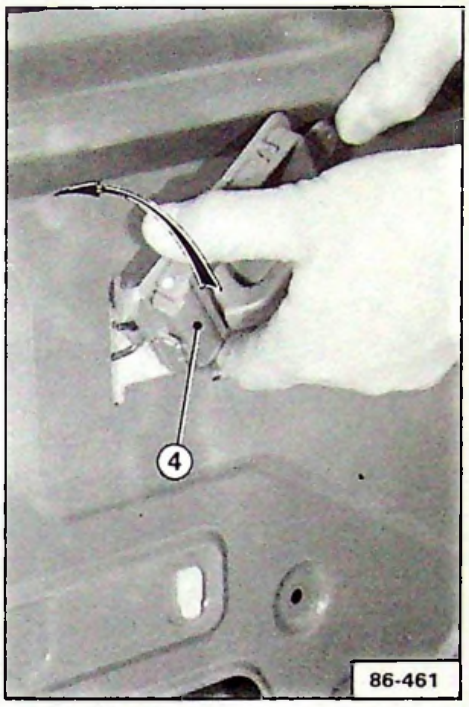
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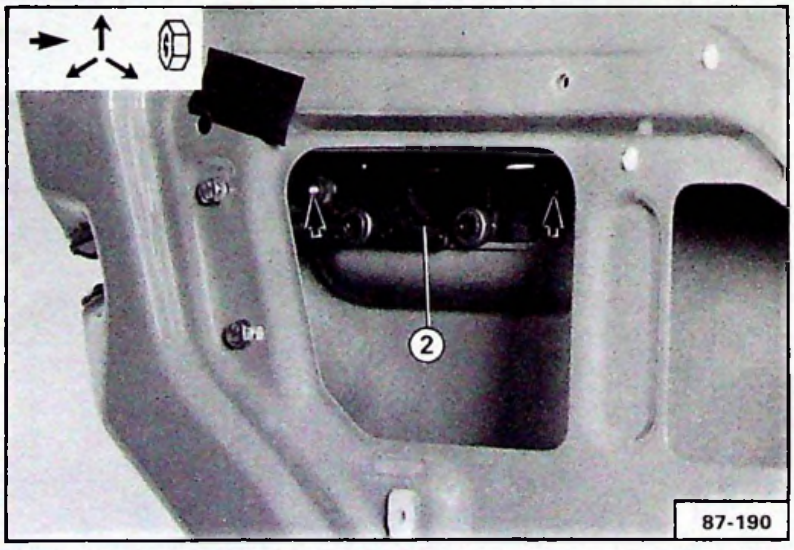
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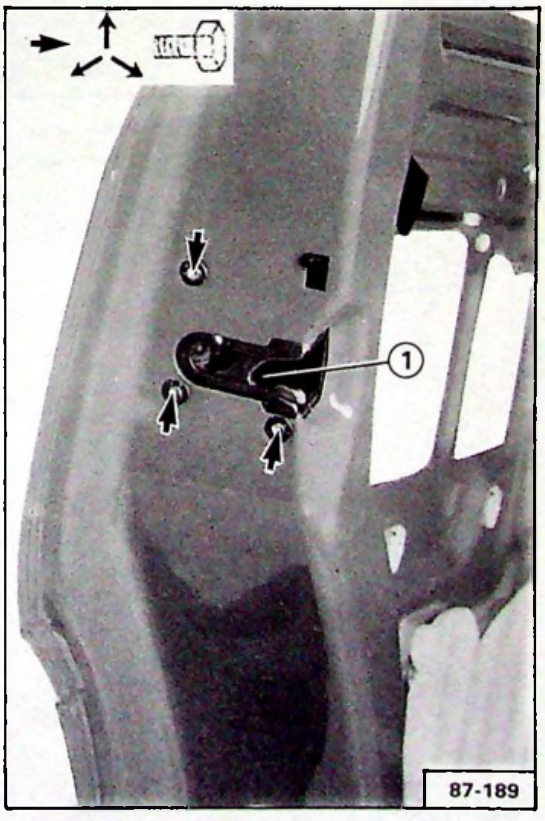
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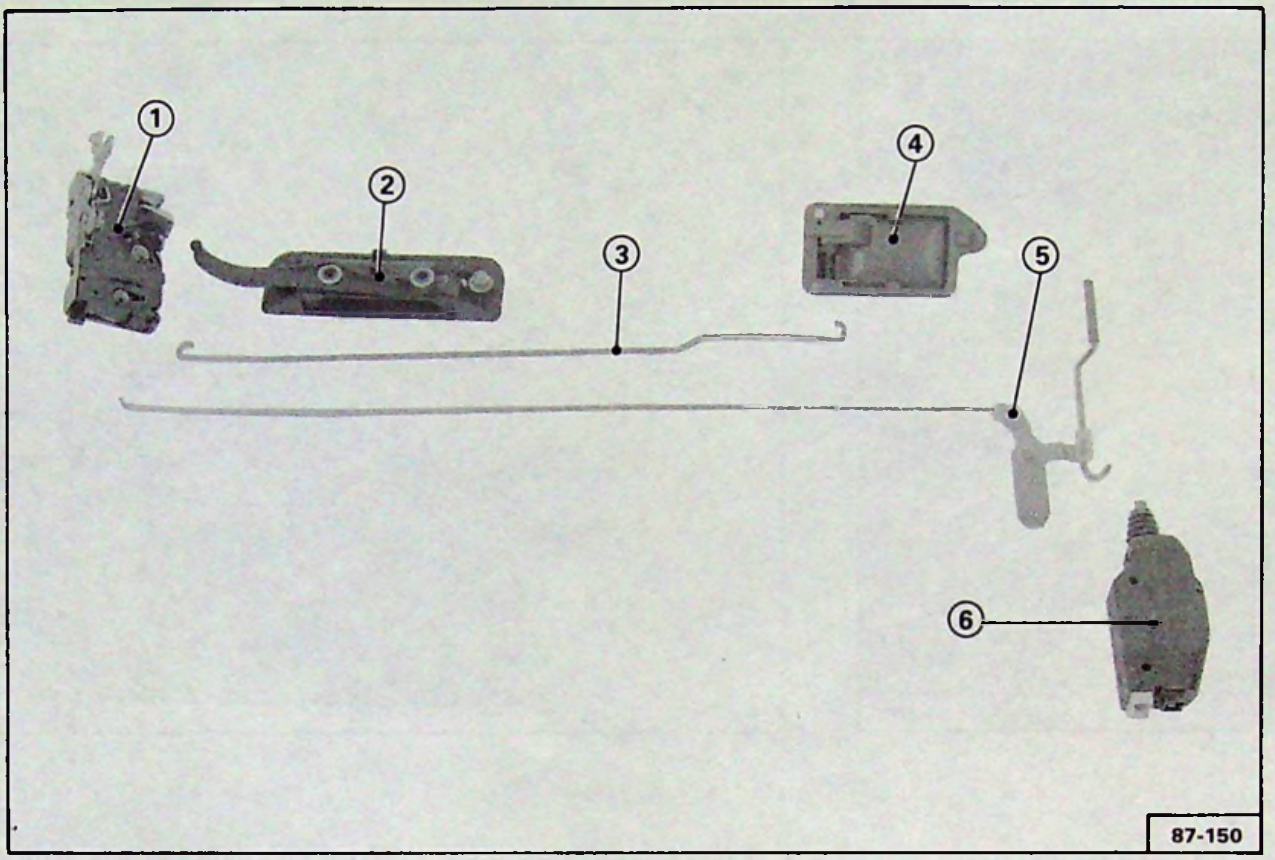
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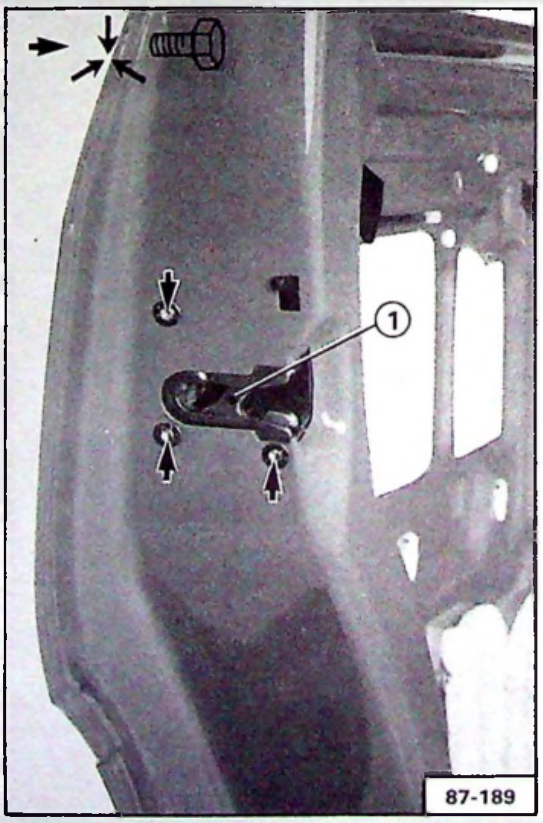
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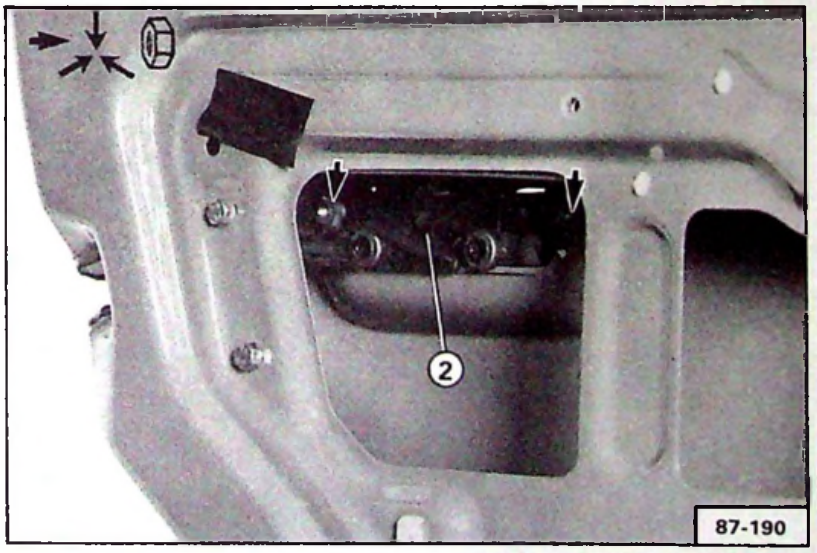
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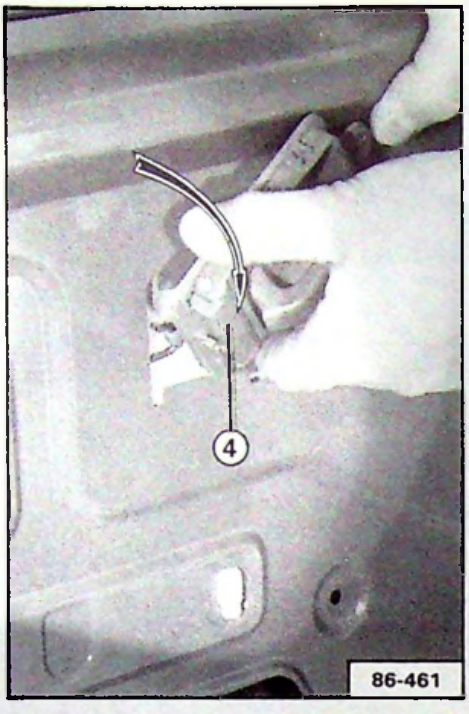
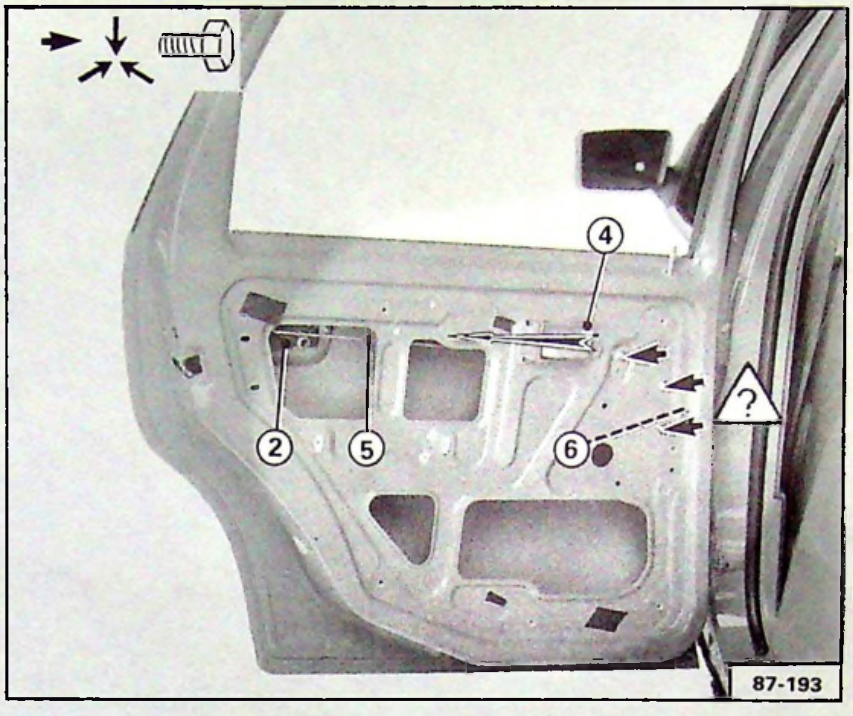
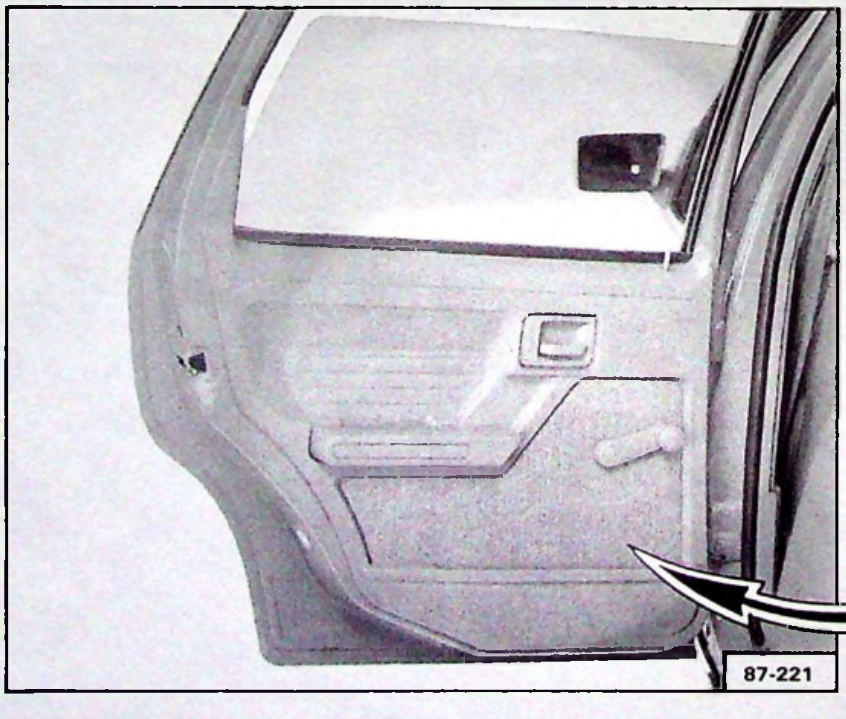
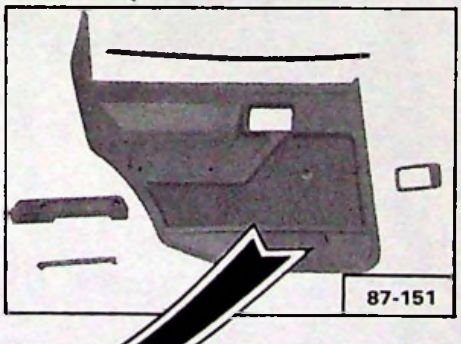
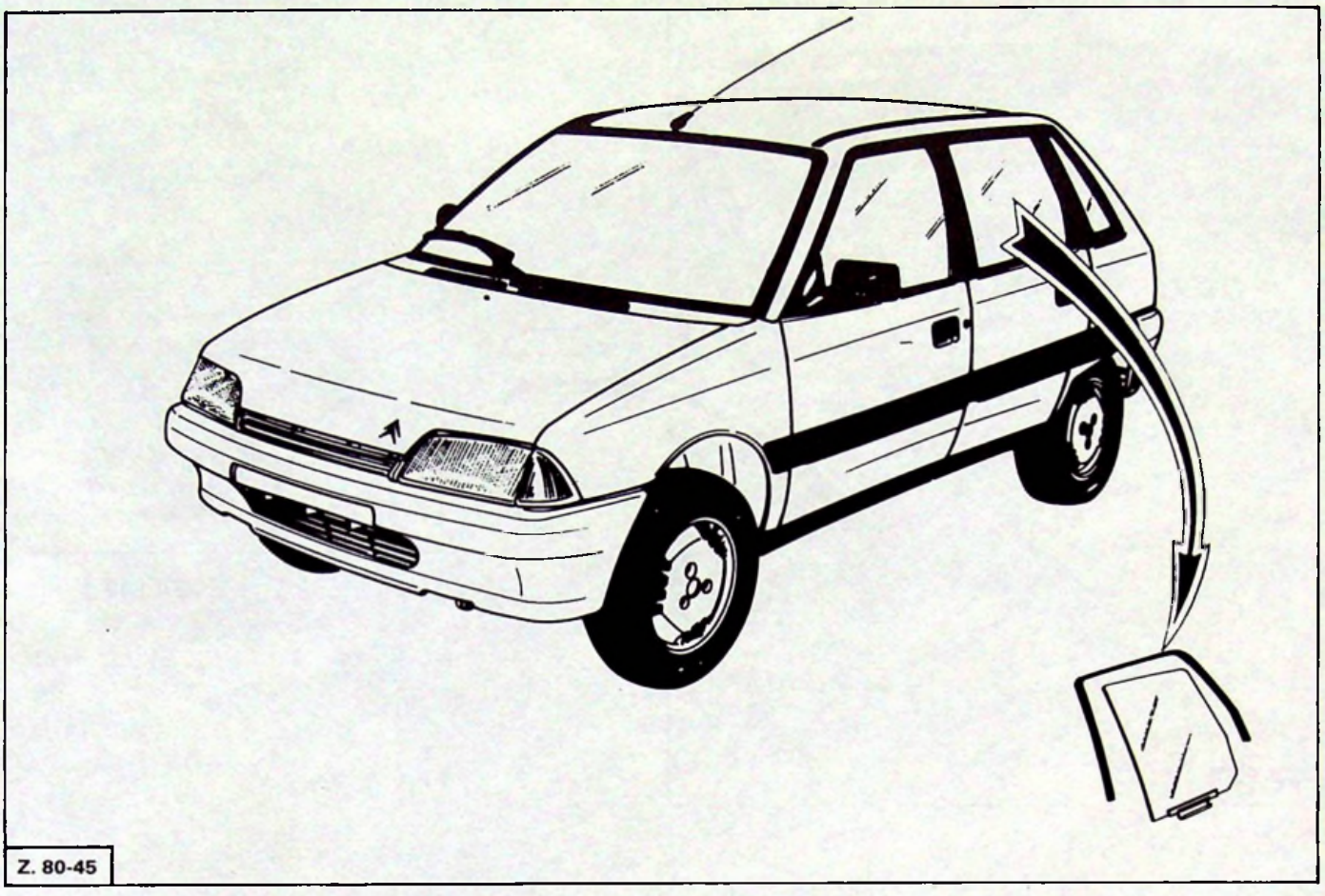






ZA 842-3





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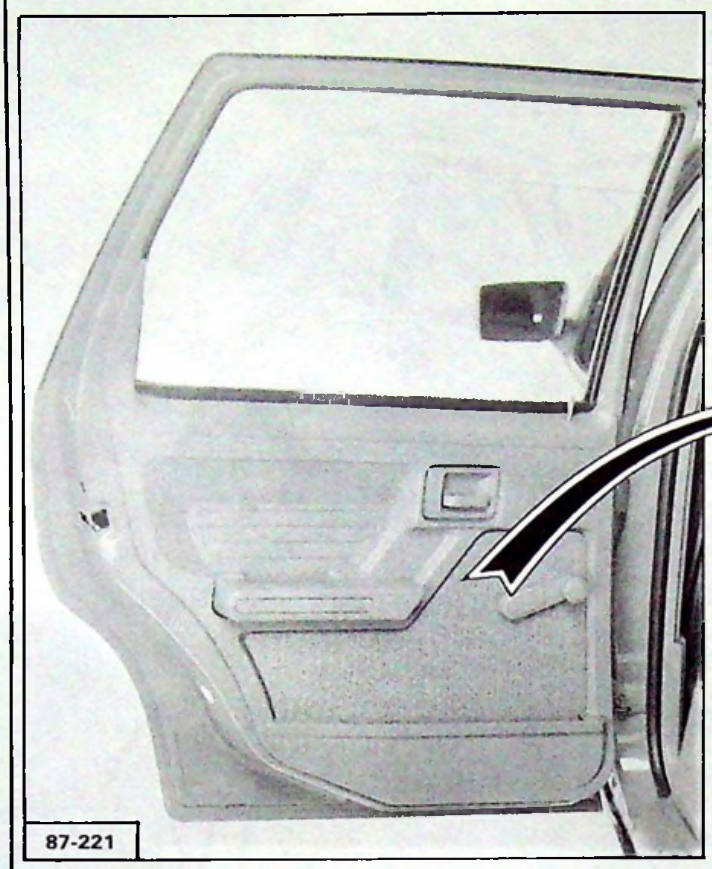

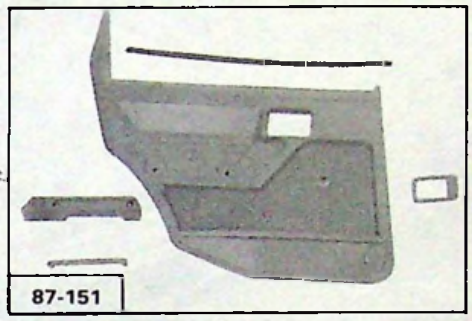

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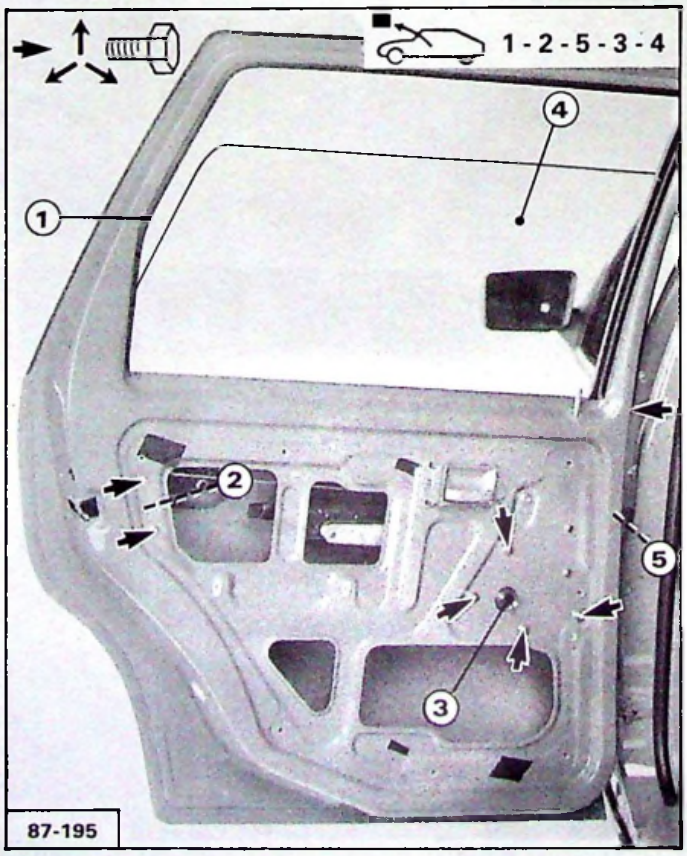

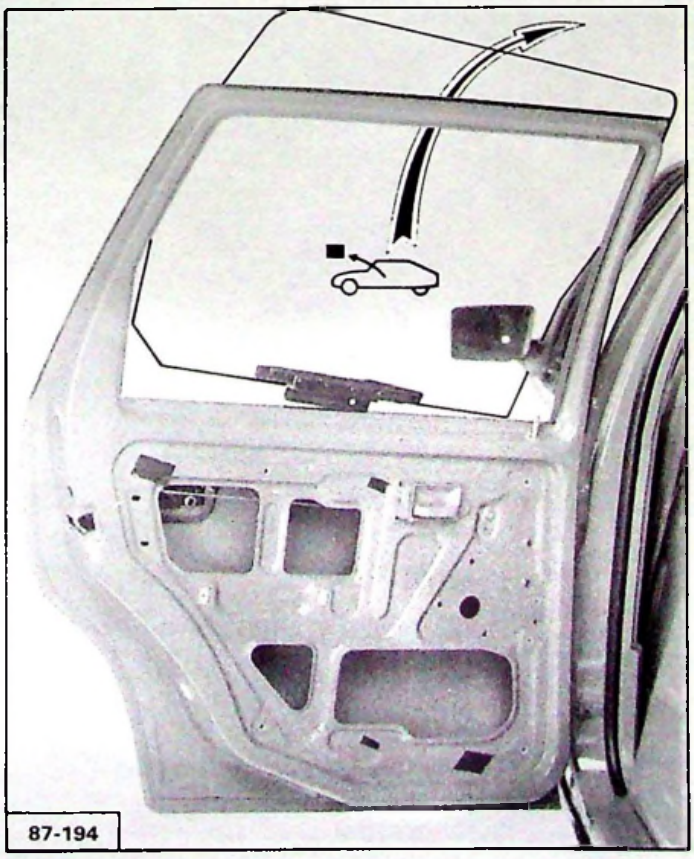

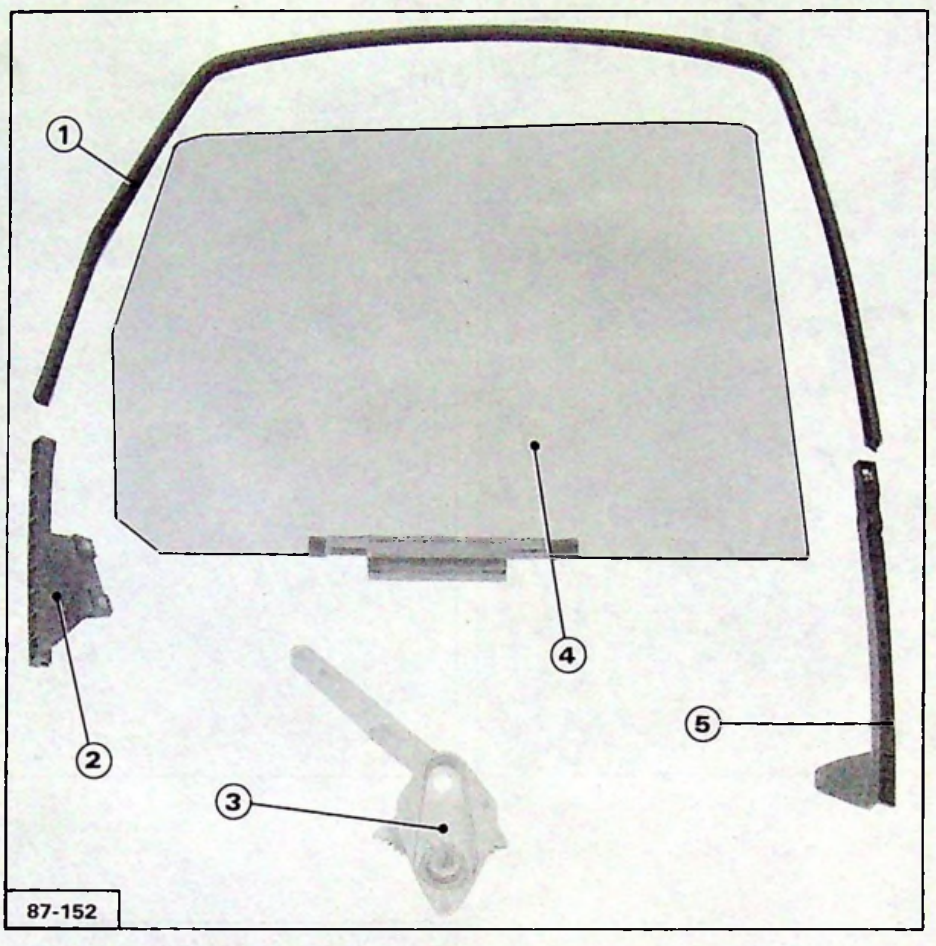
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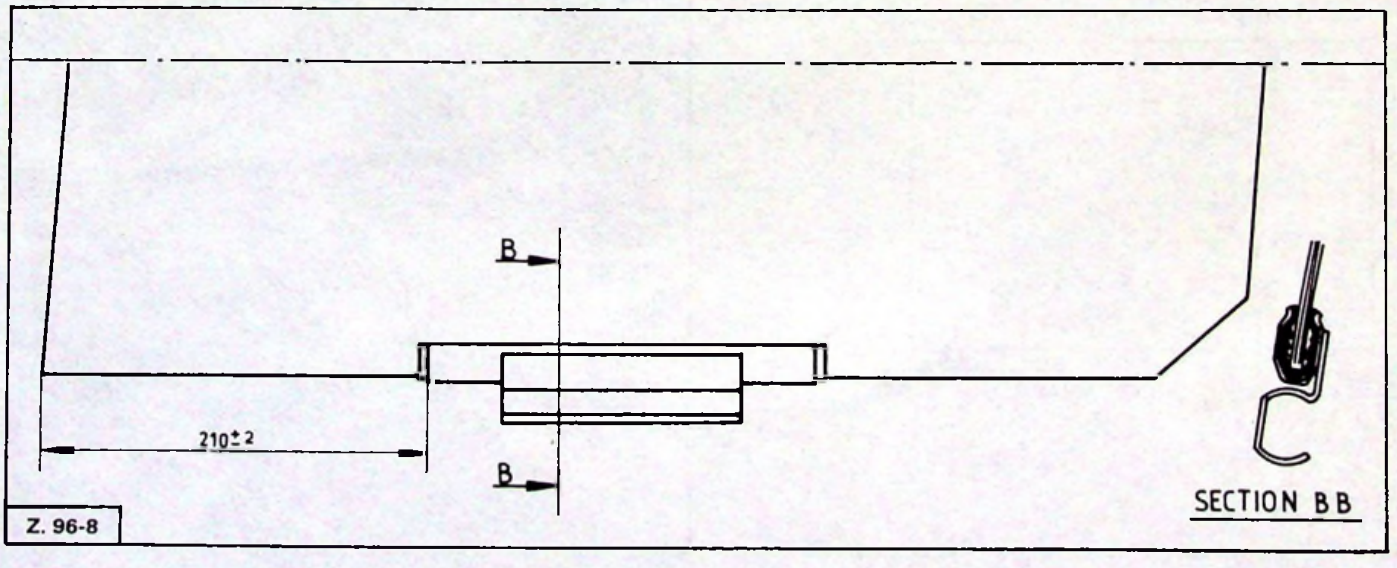
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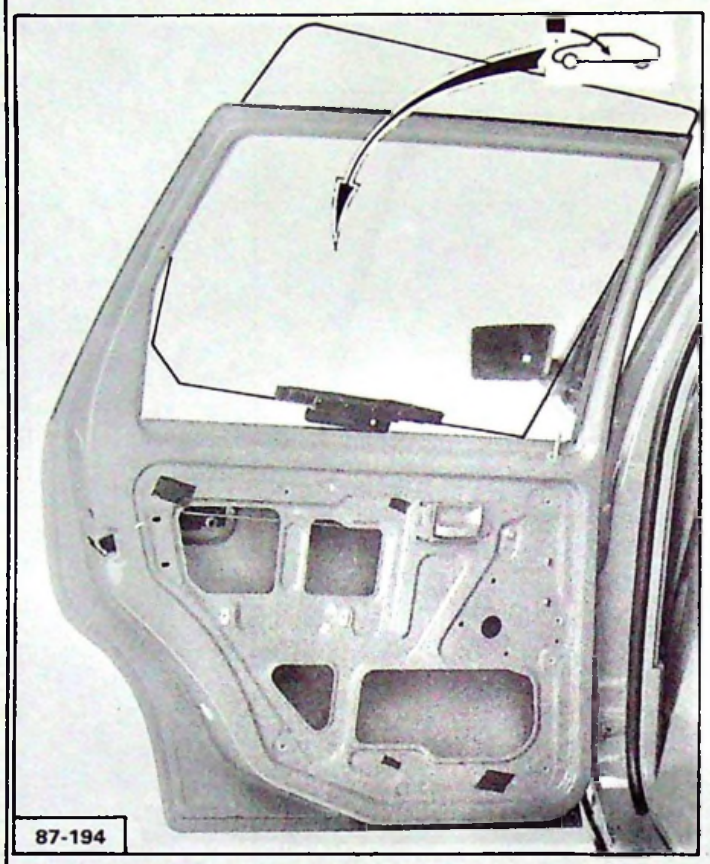
Z. 96-8
SECTION B B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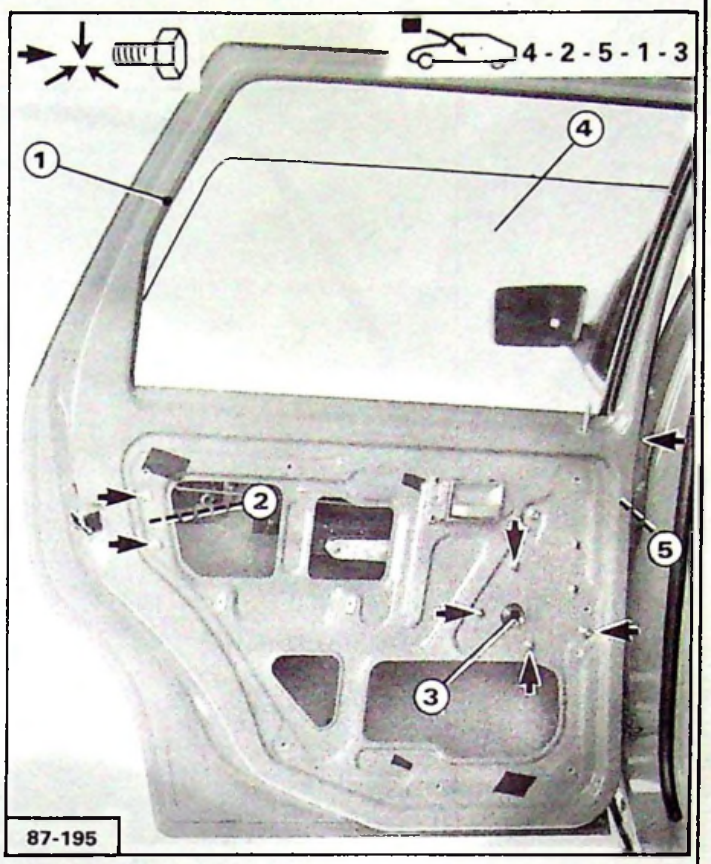
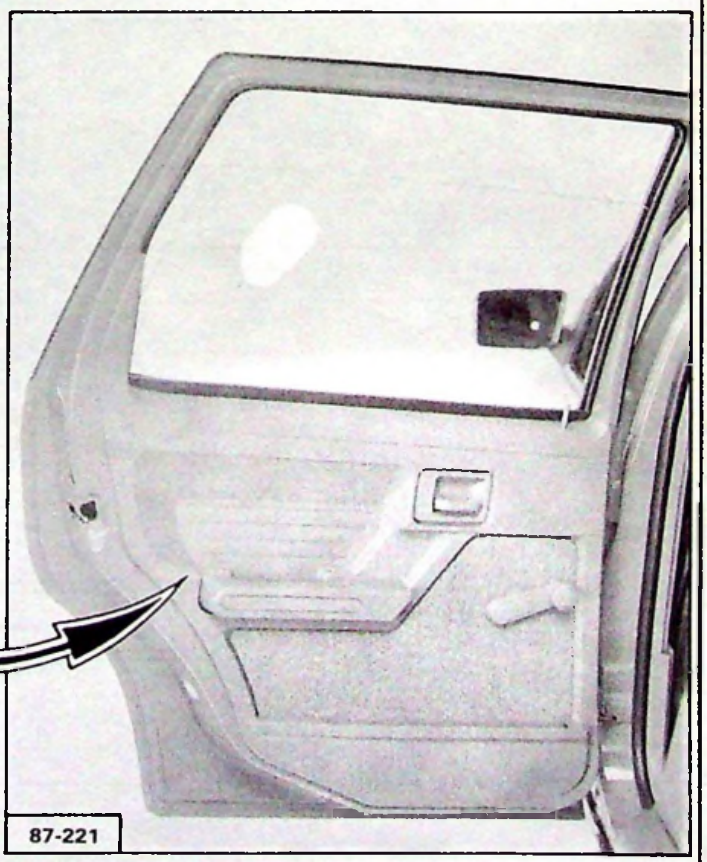


87-195

87-151

ZA 842-3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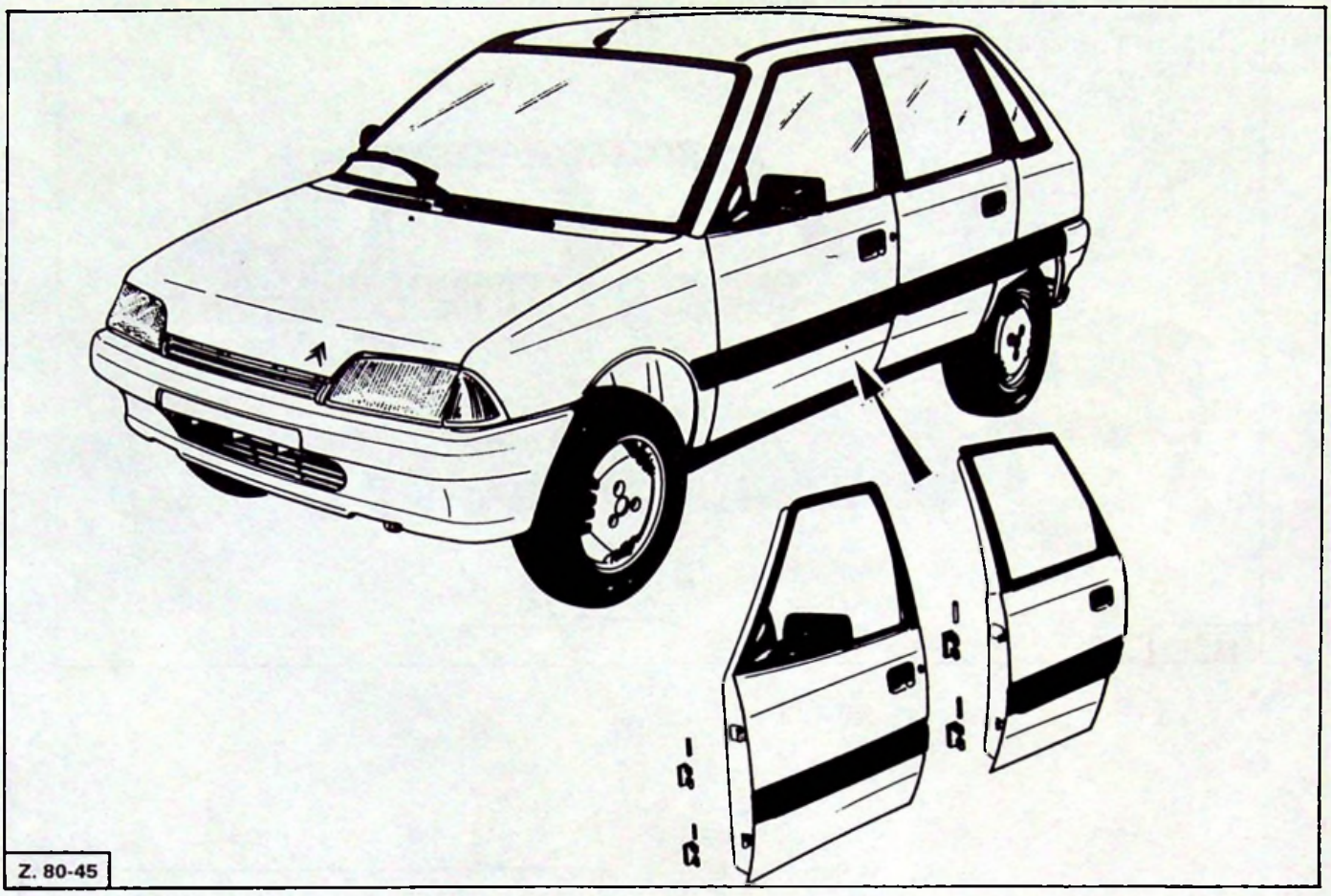

Z. 80-45

7501-T

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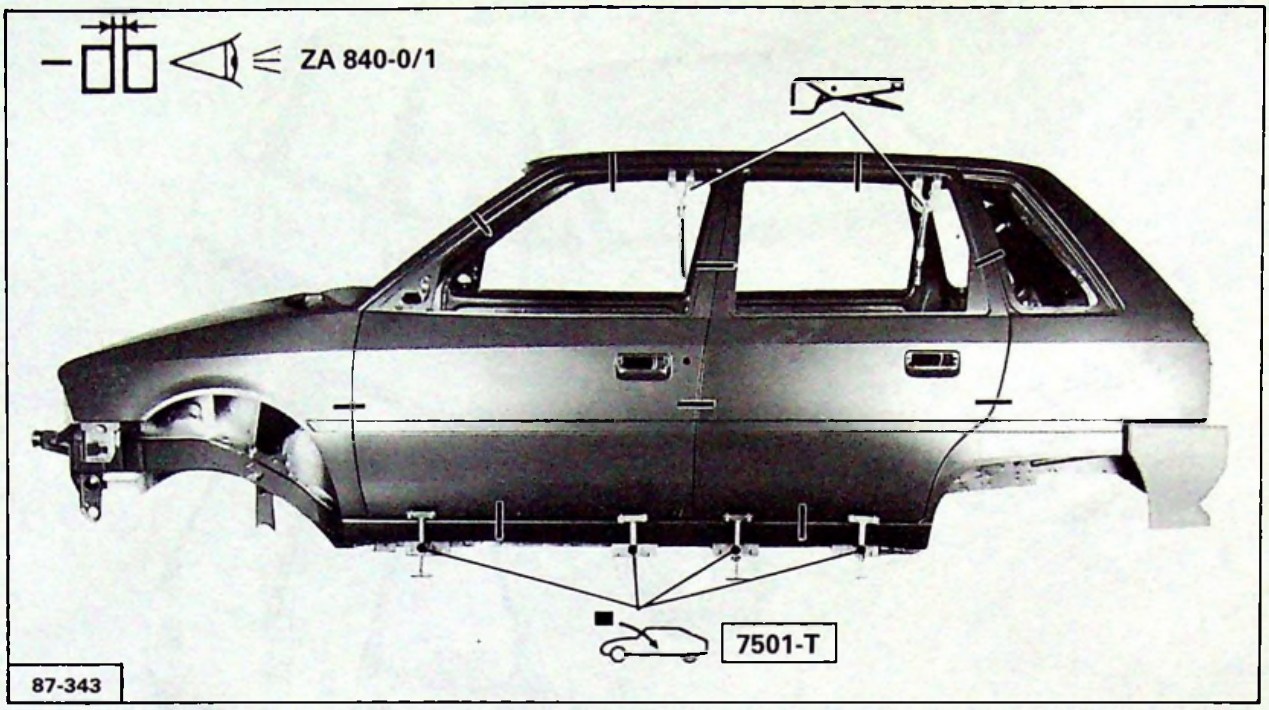
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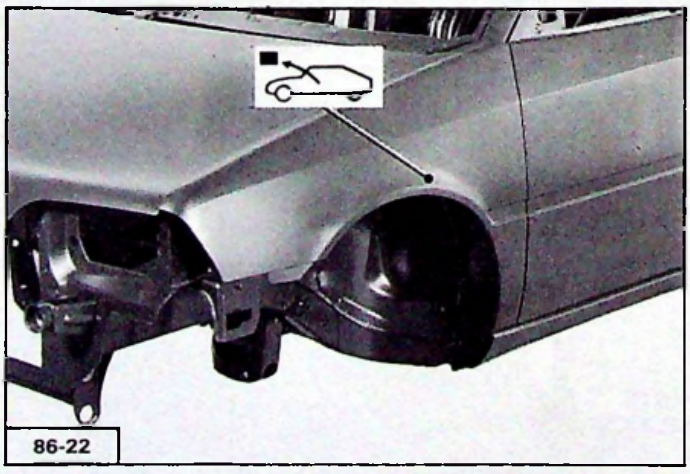
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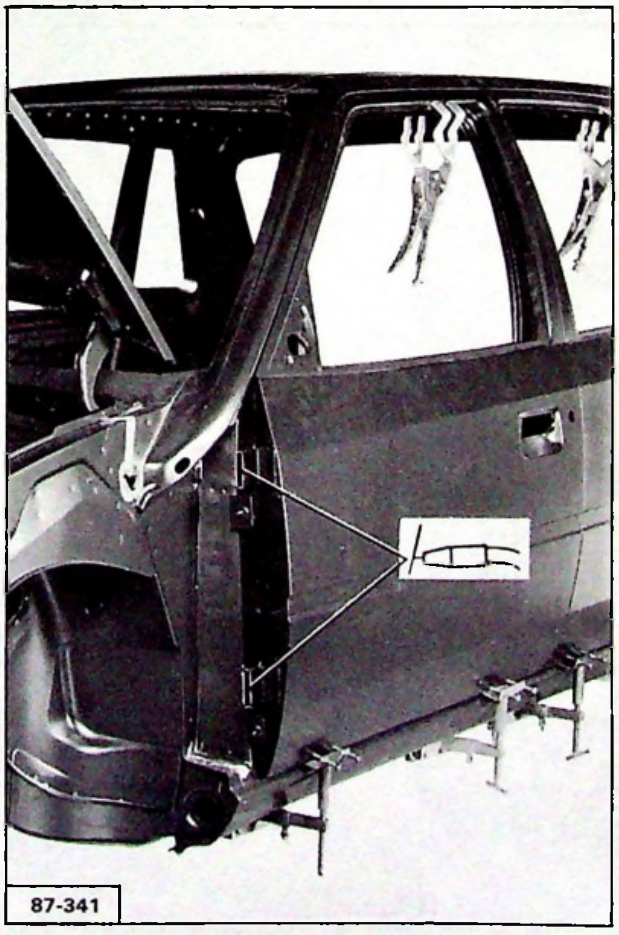
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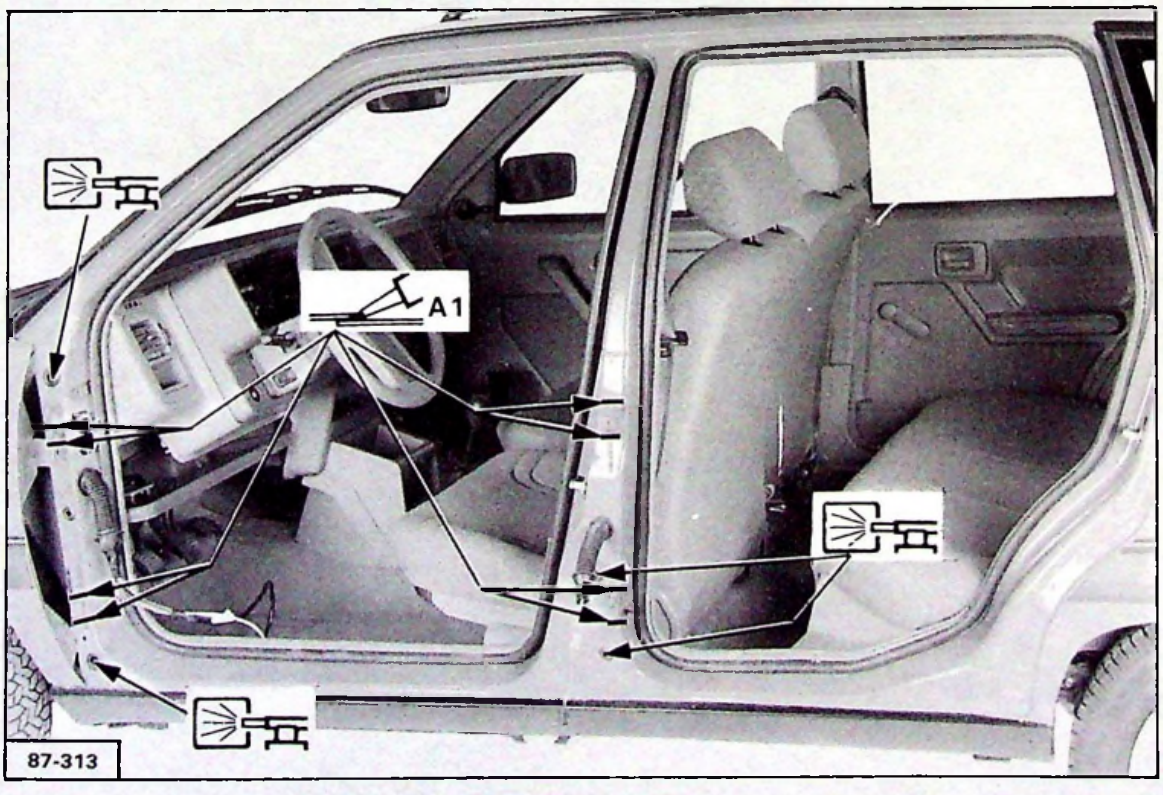
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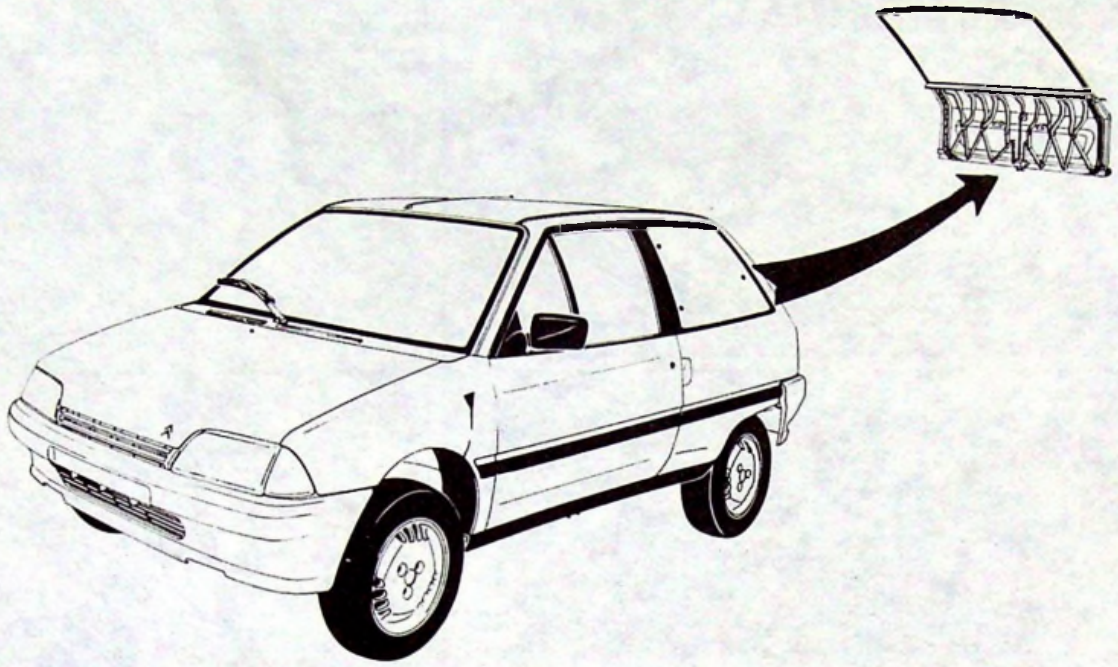

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MR 630-84/23a

83-265

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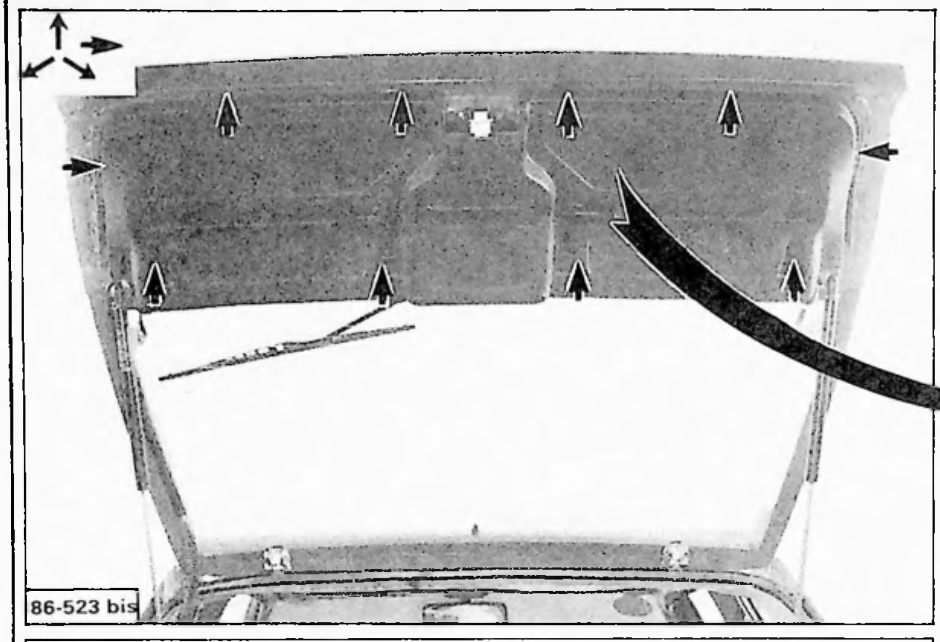
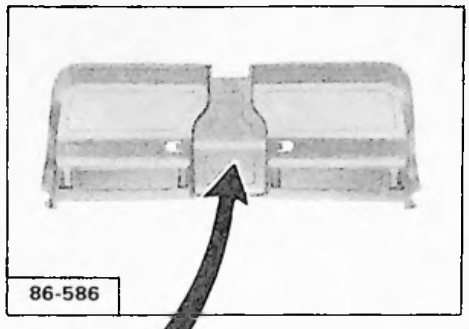

86-523 bis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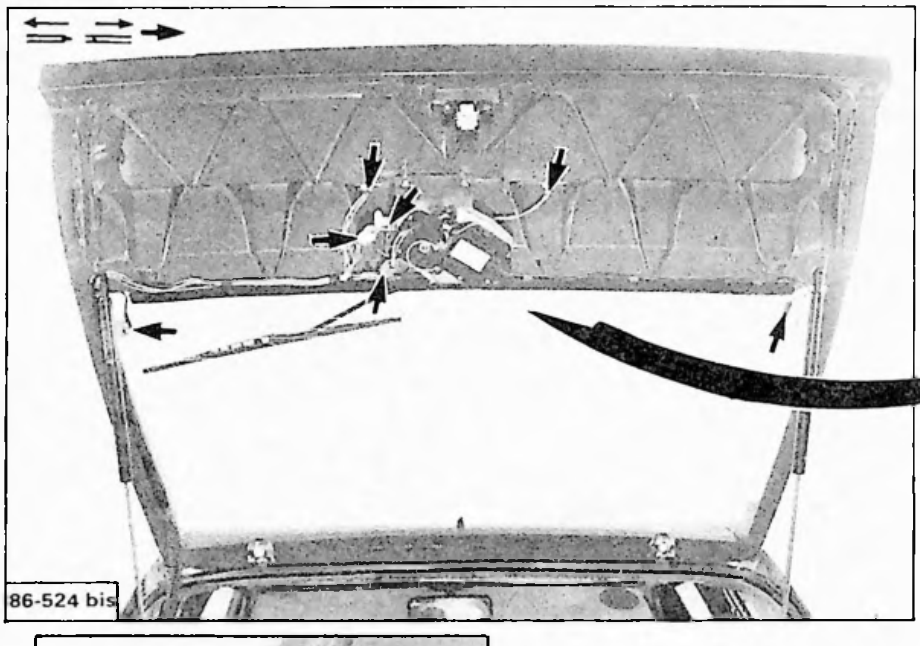
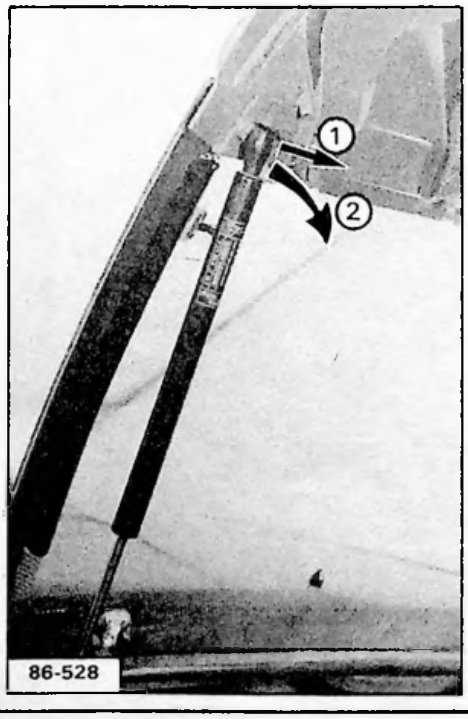

86-524 bis

86-586



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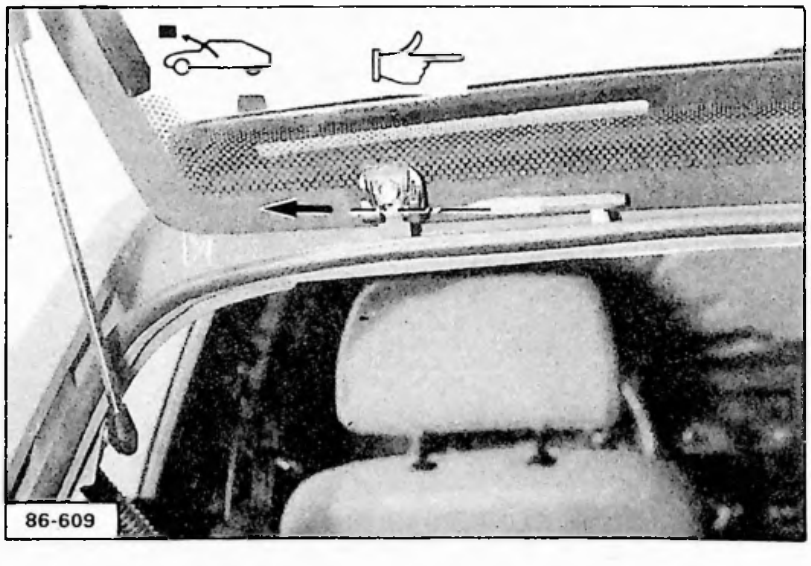
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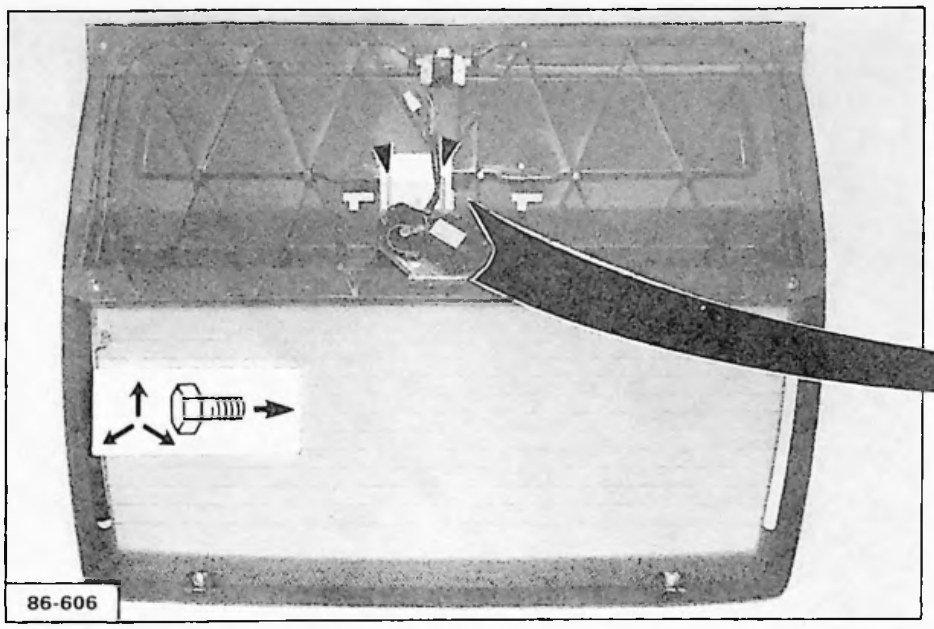
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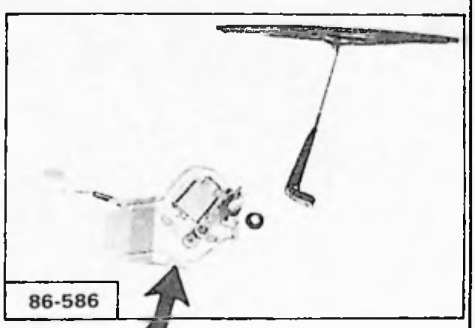
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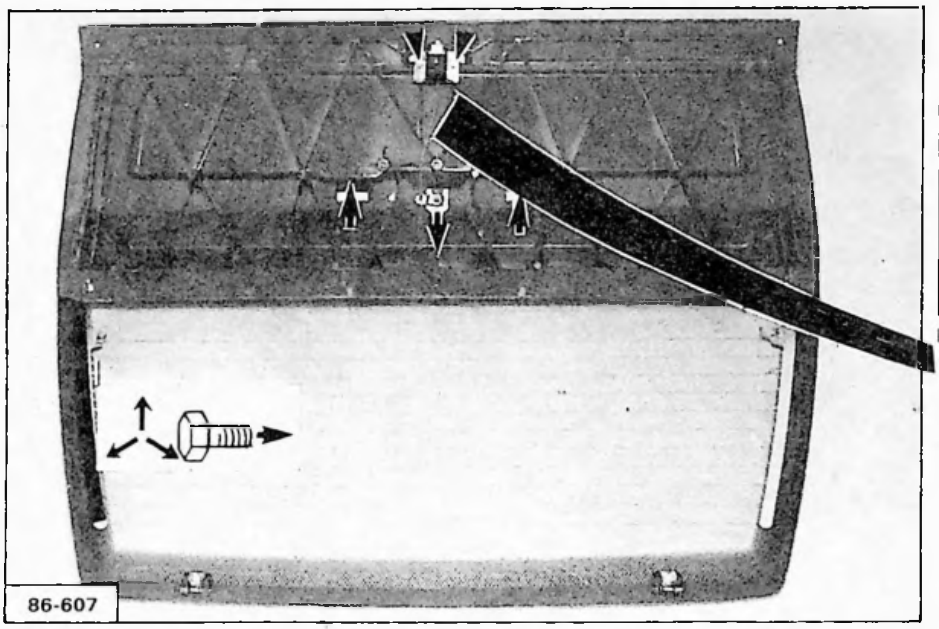
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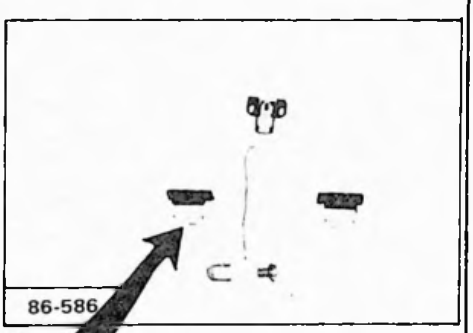
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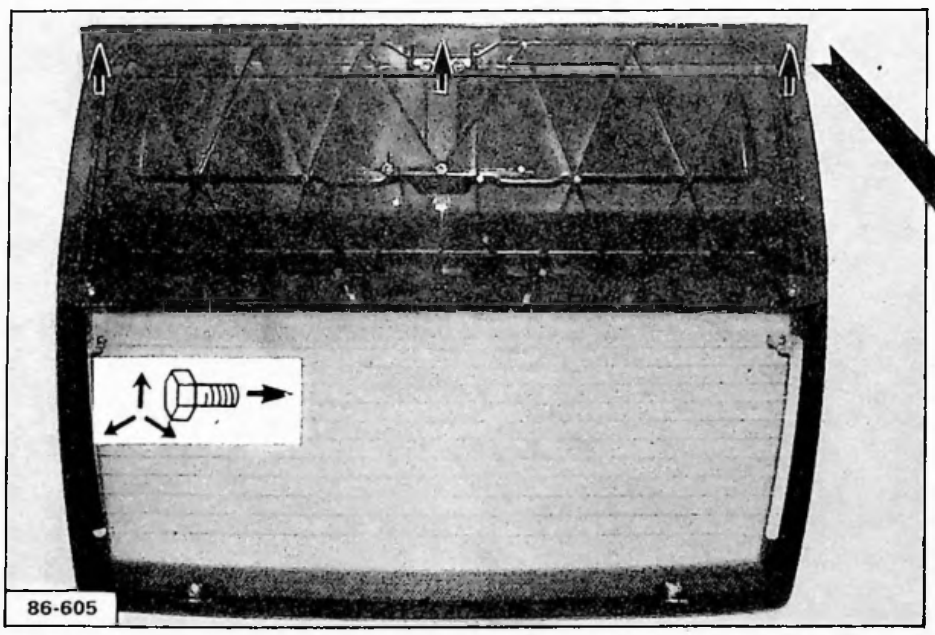
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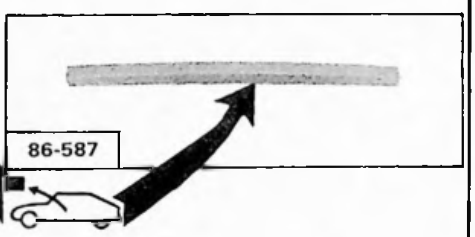
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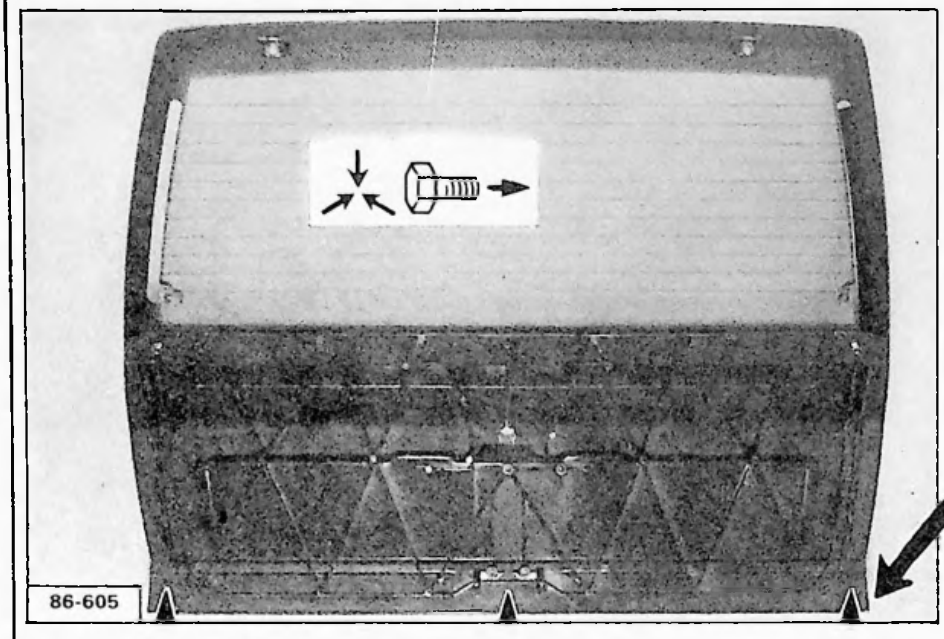
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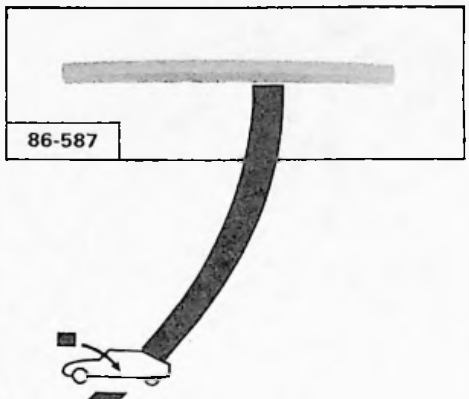
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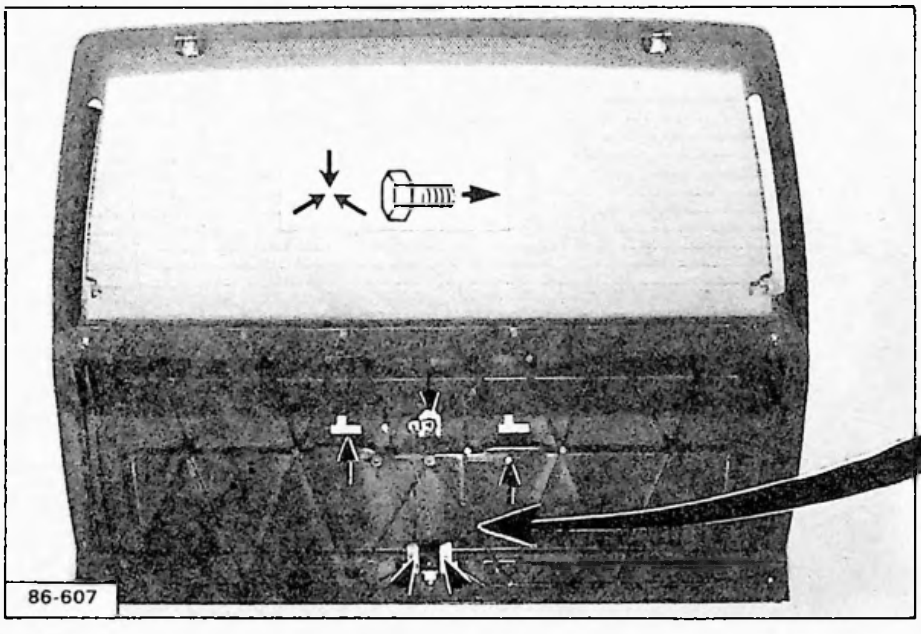
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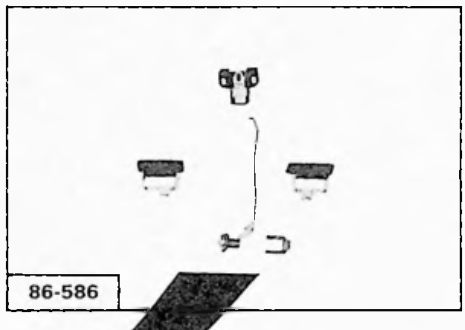
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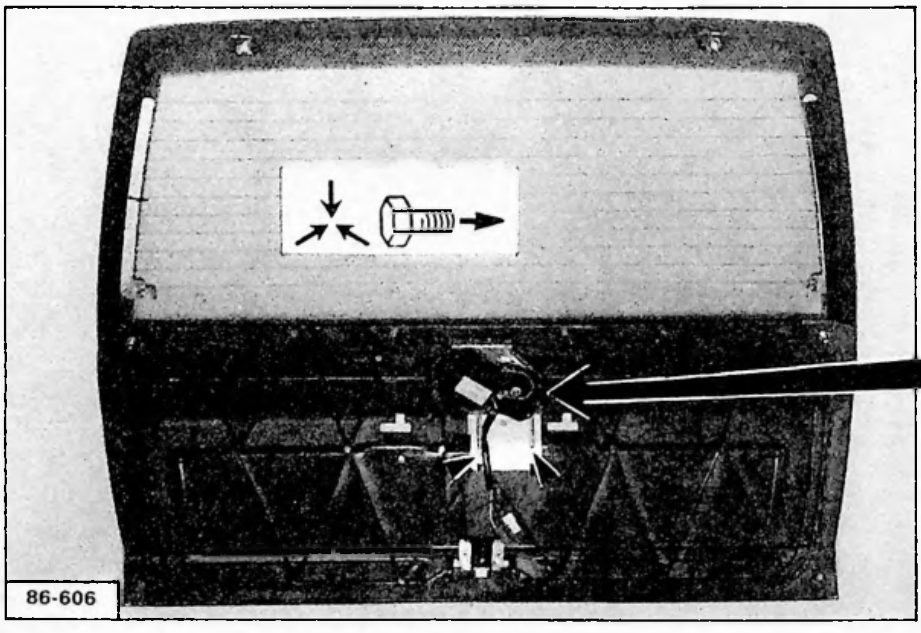
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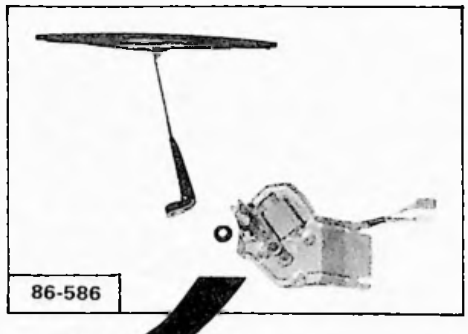
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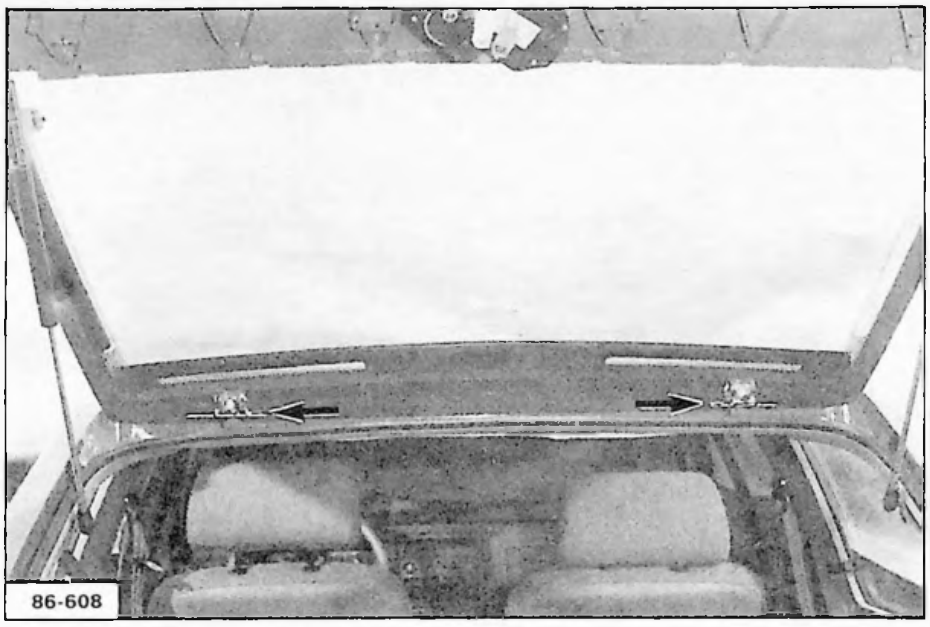

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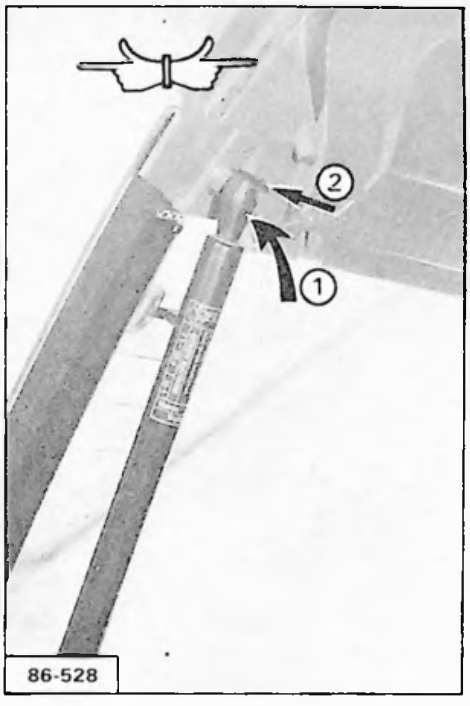

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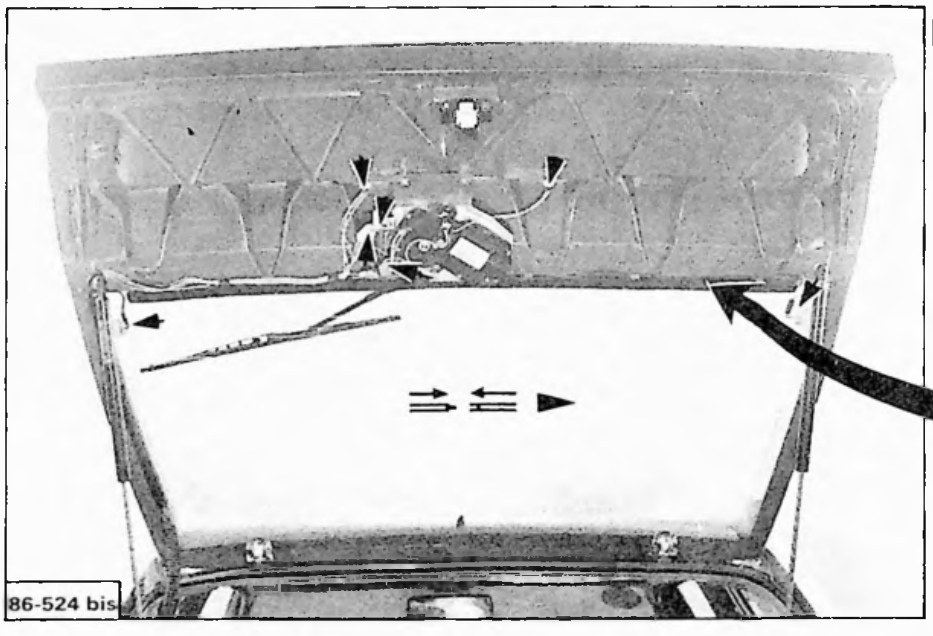
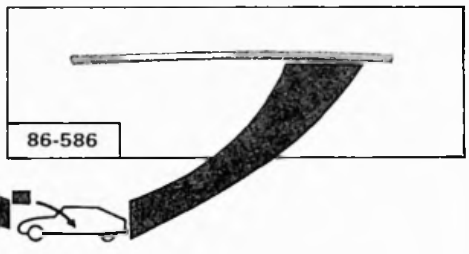


86-524 bis



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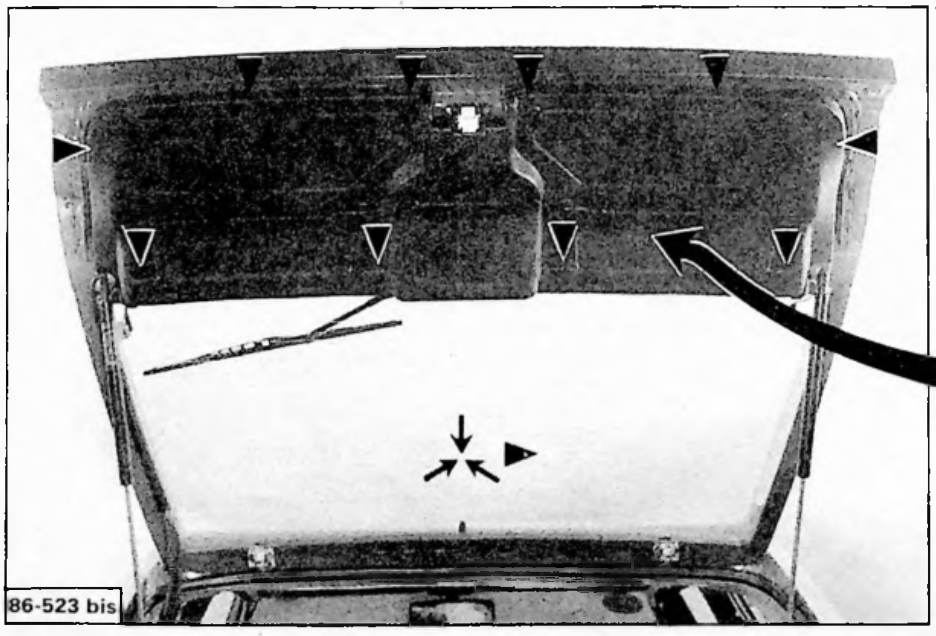

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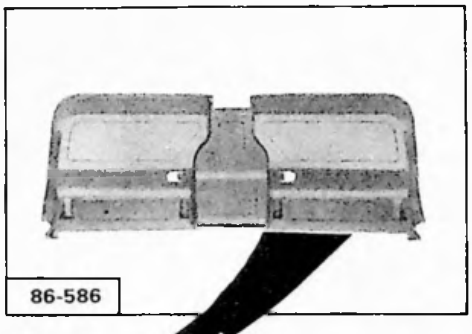

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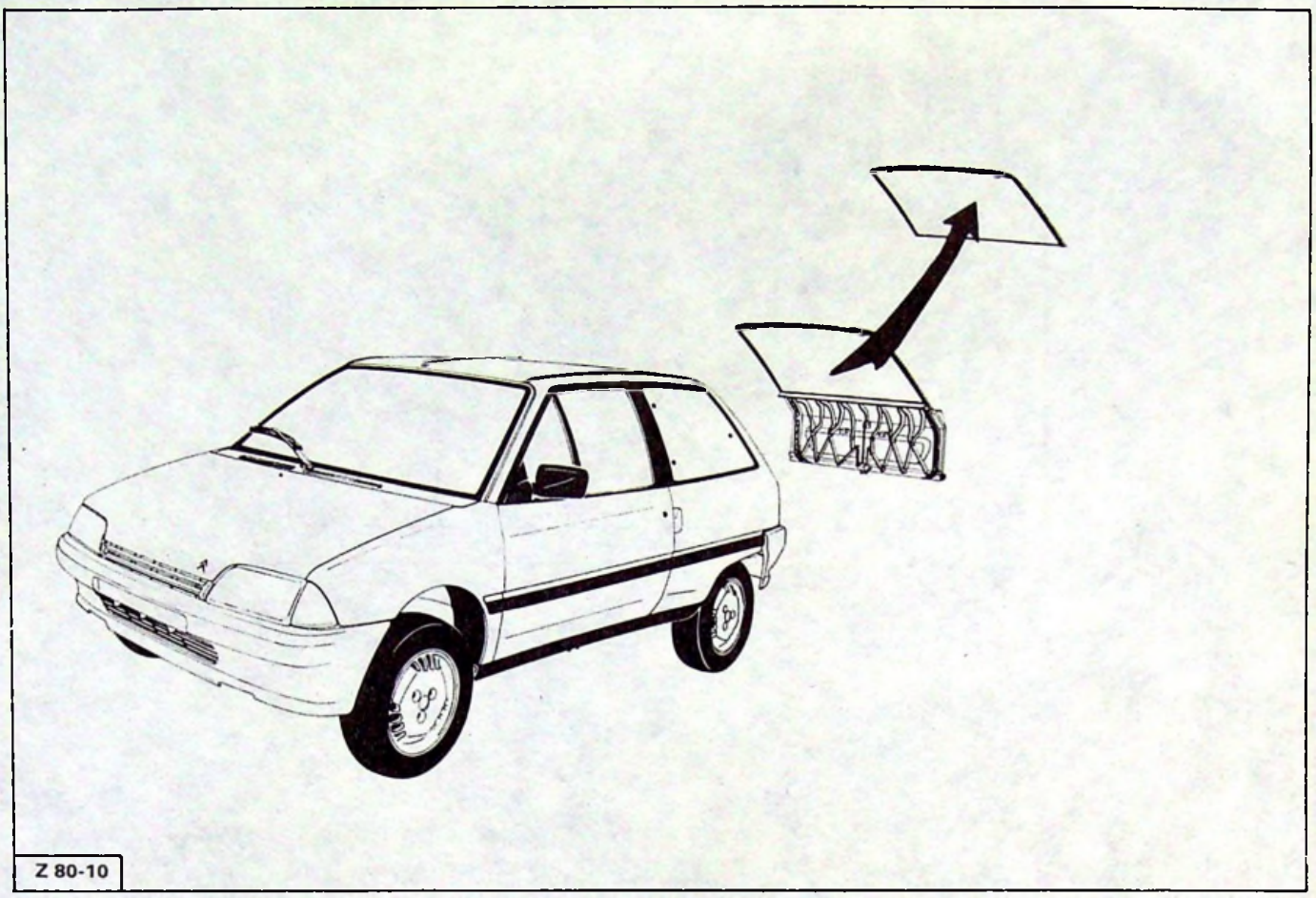
86-4



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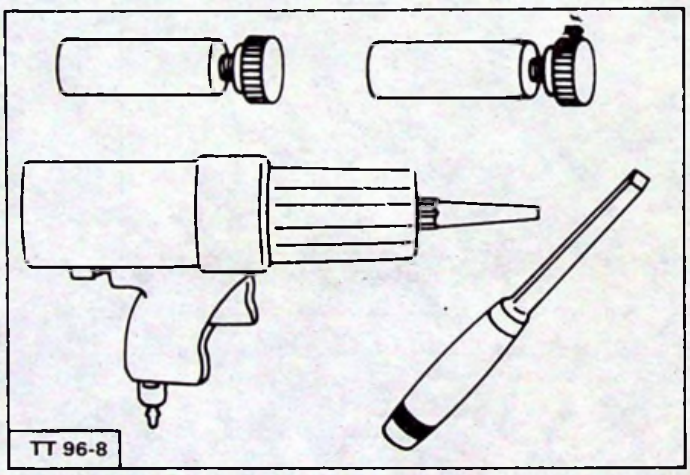
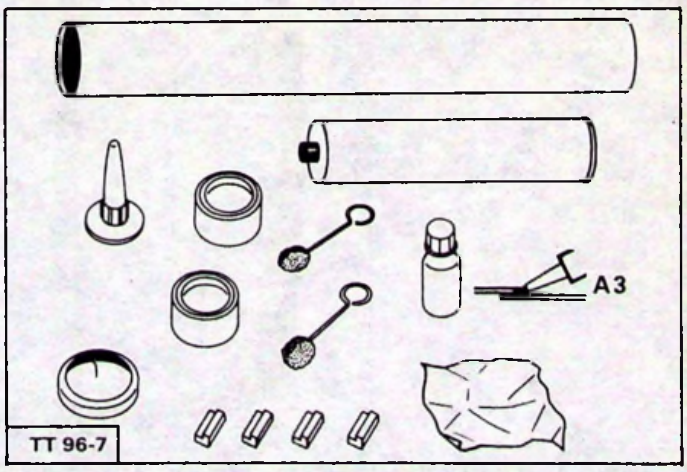


TT 96-8



TT 96-7

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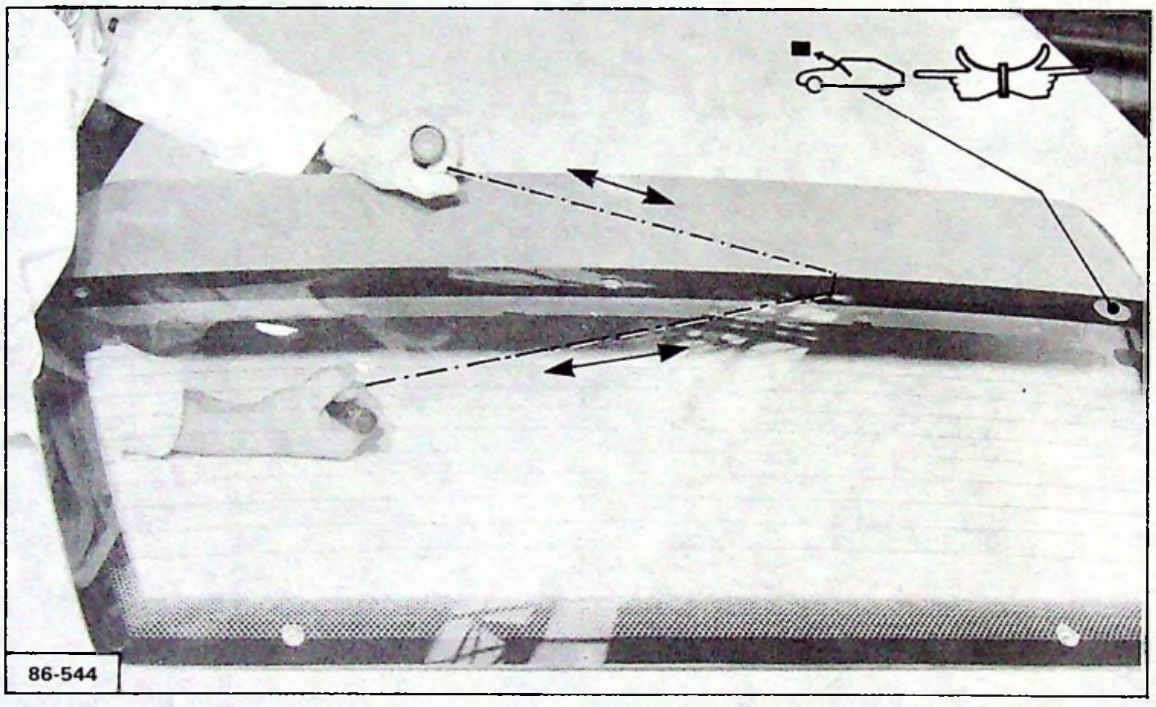
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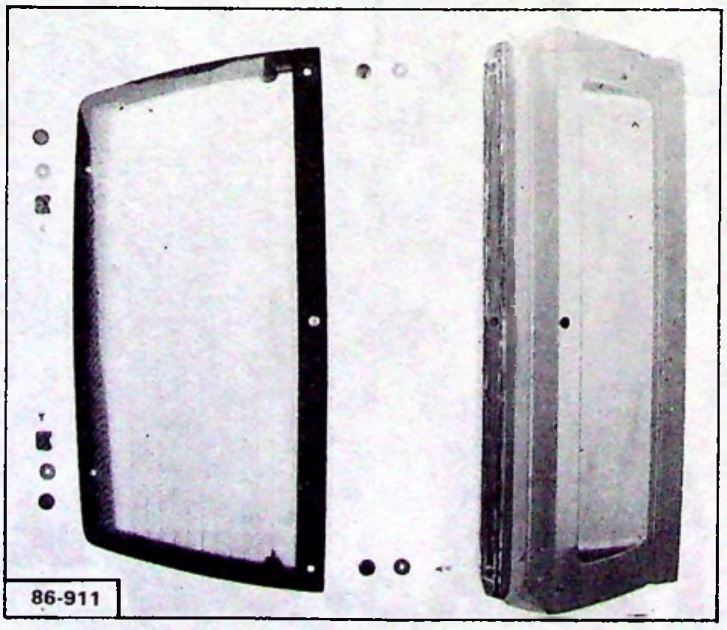
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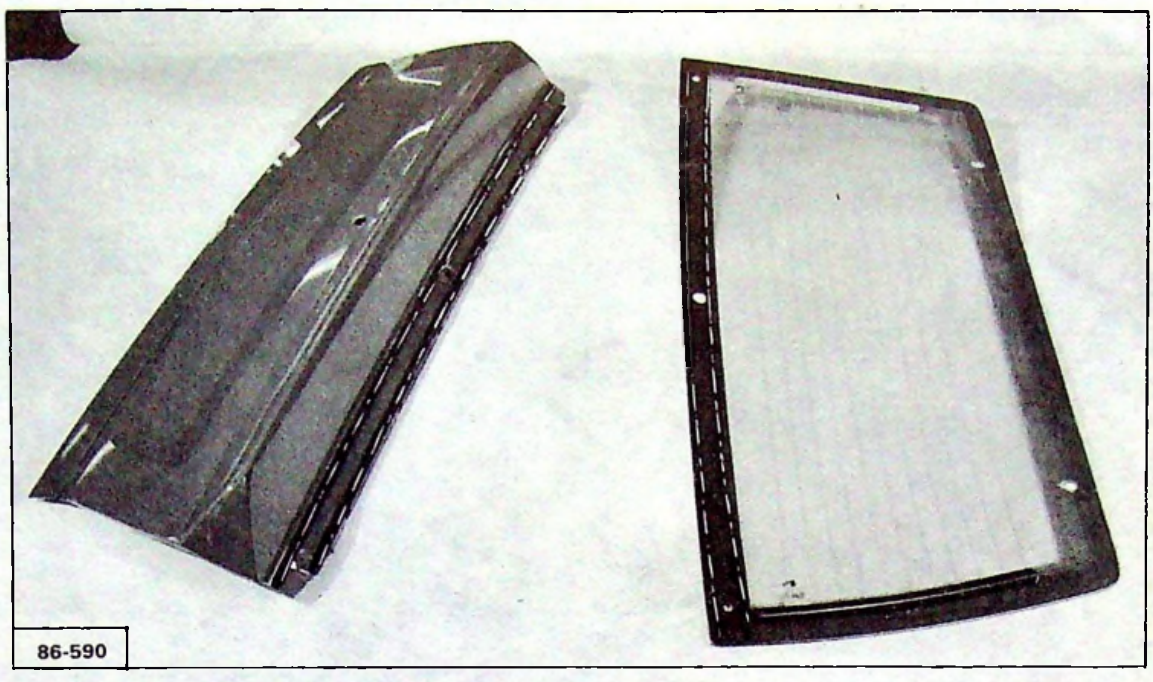

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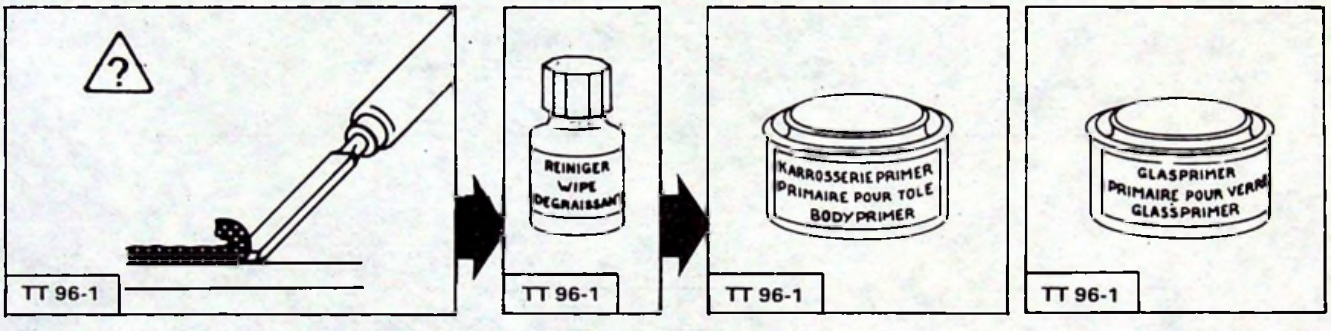

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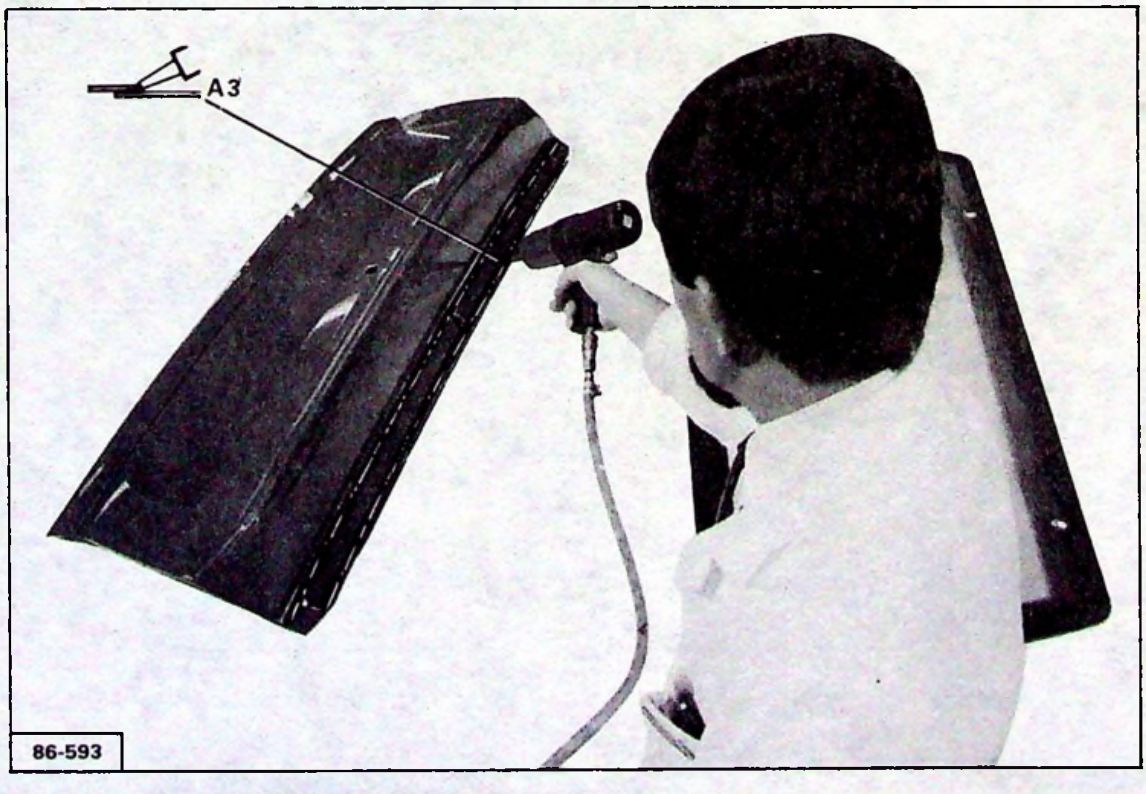

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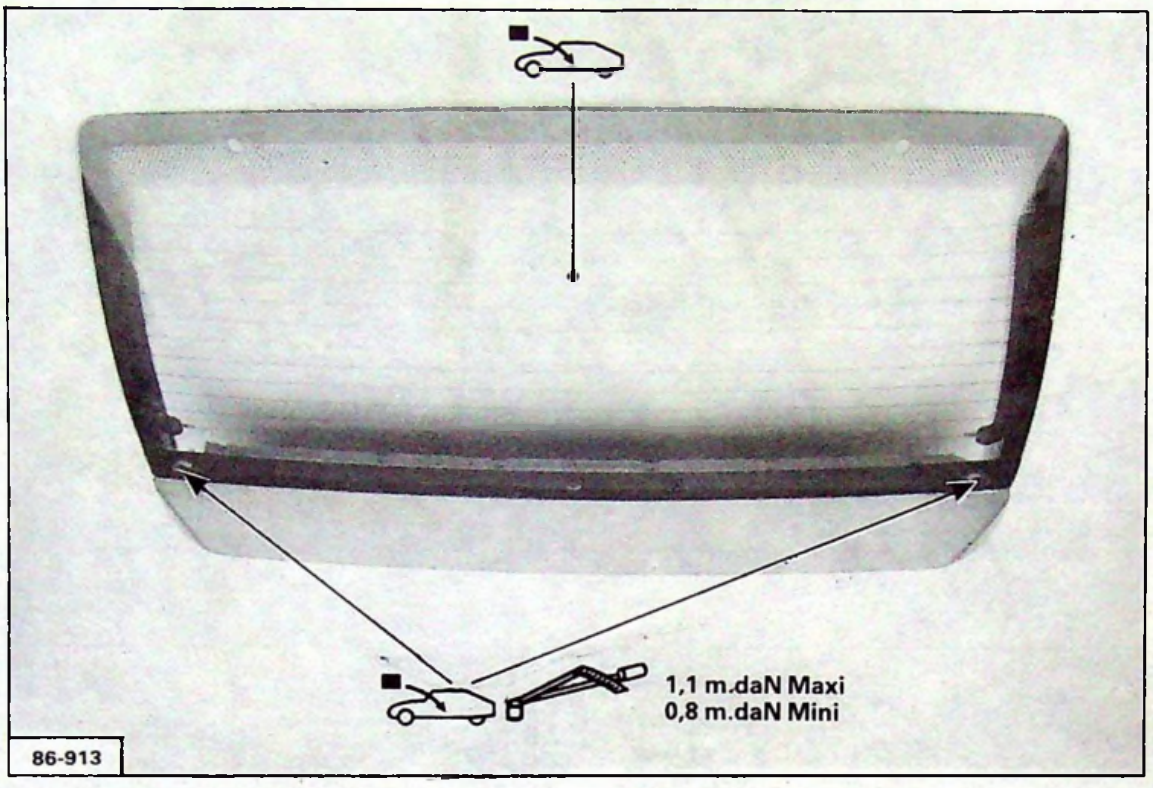
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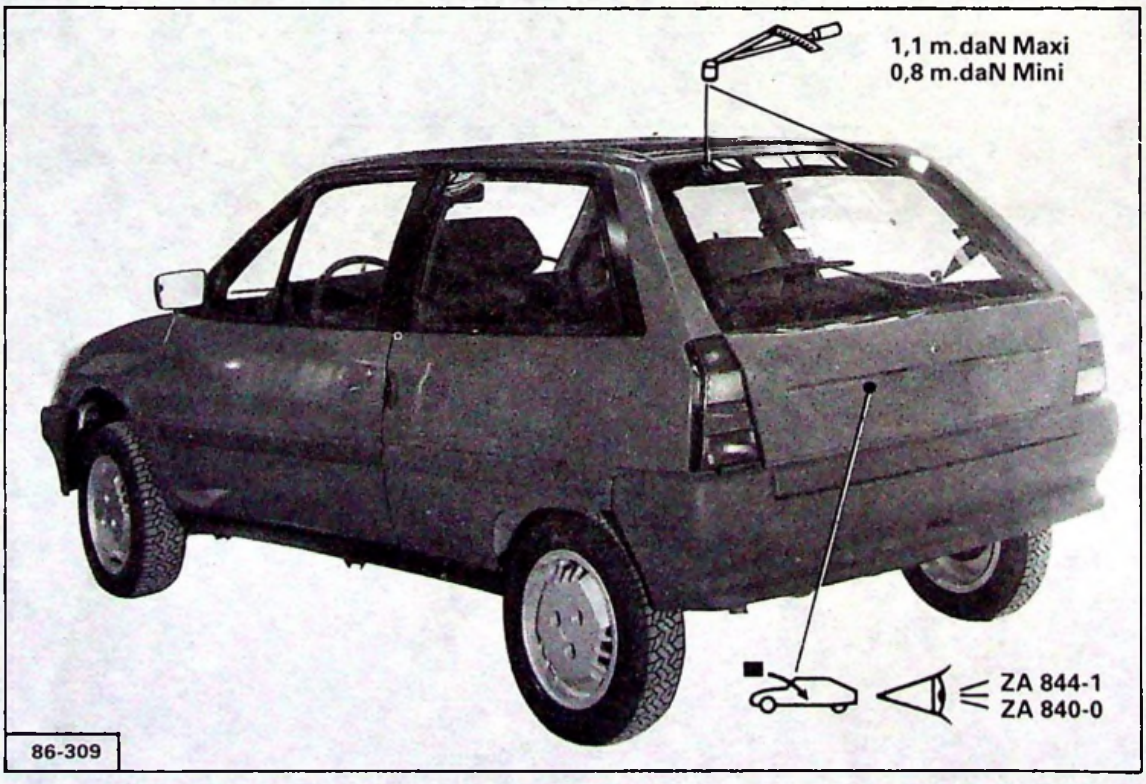
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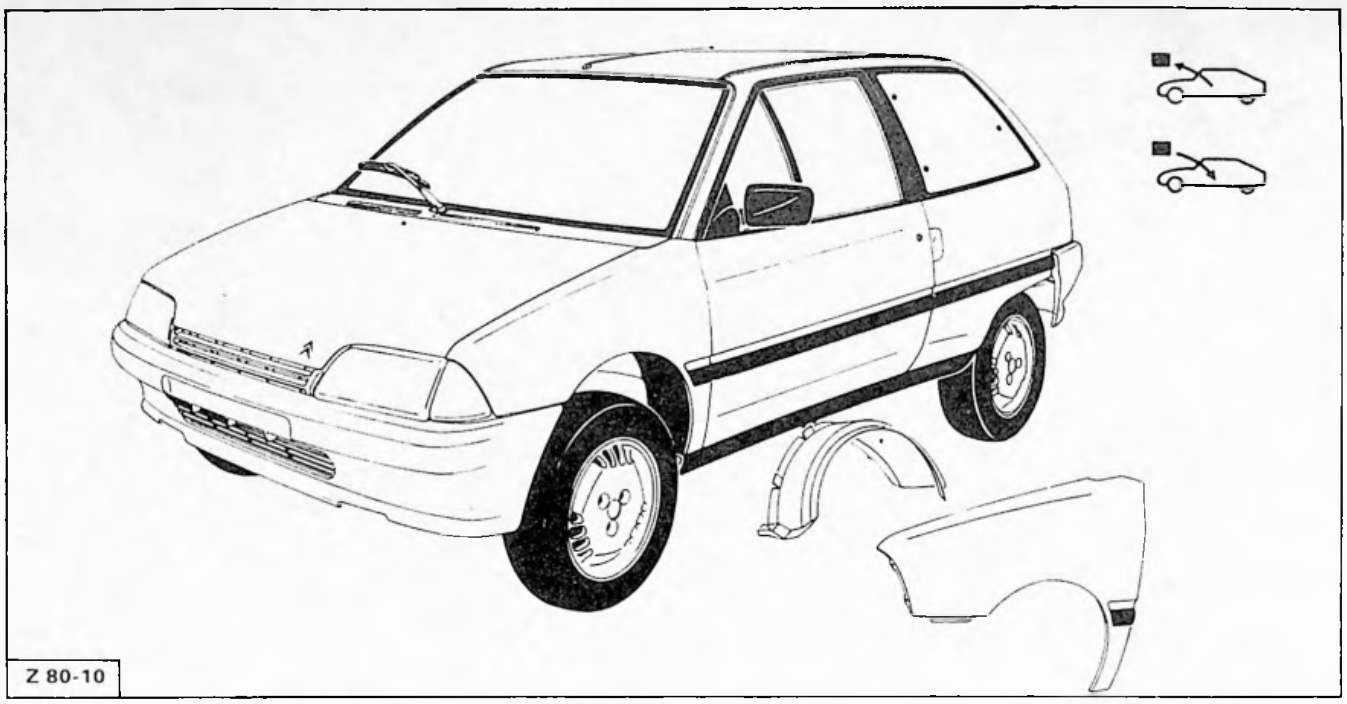

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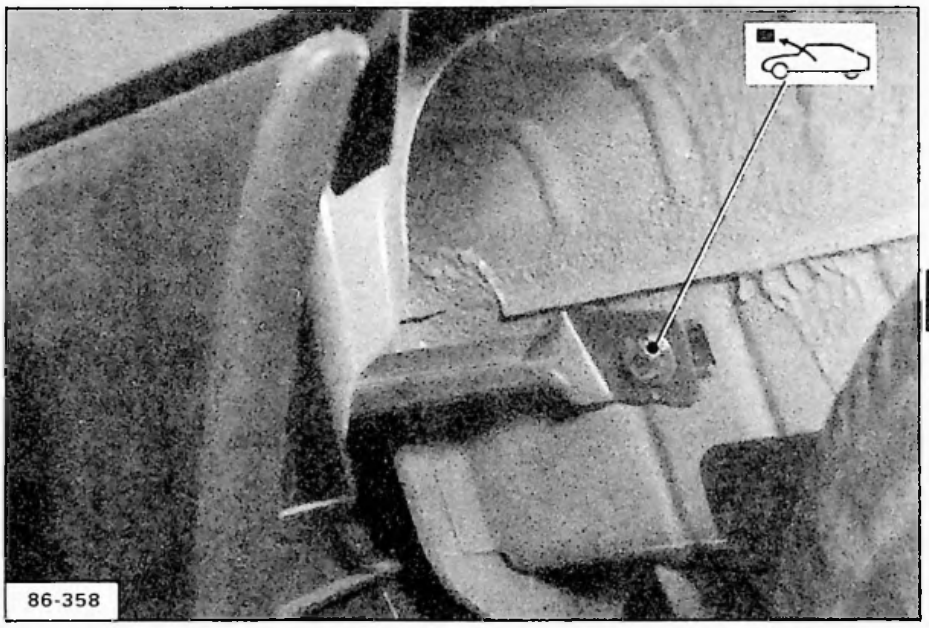

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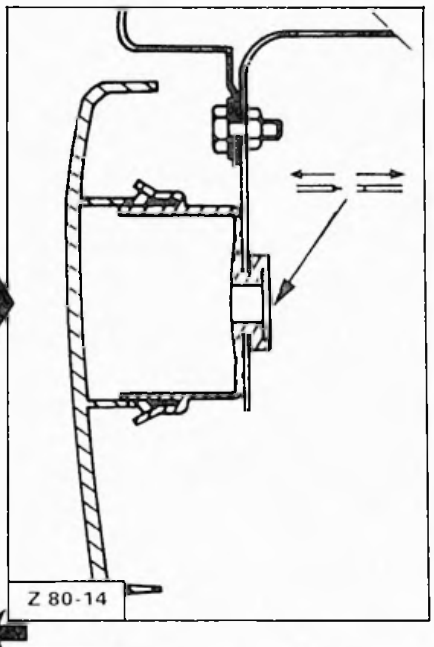

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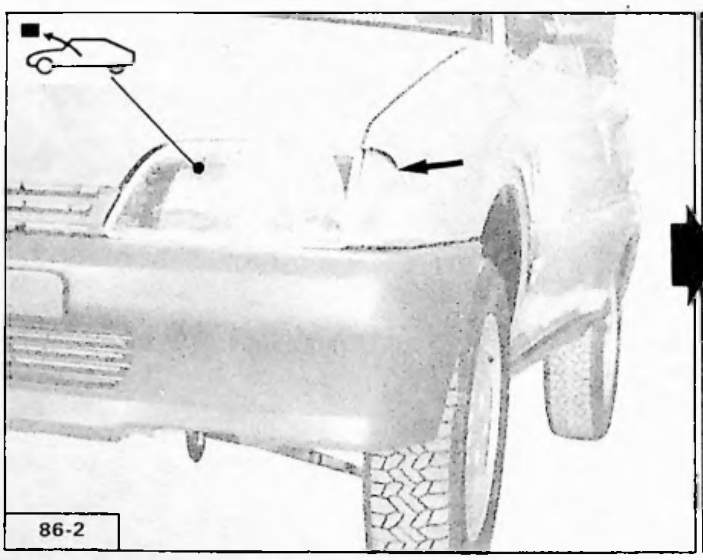

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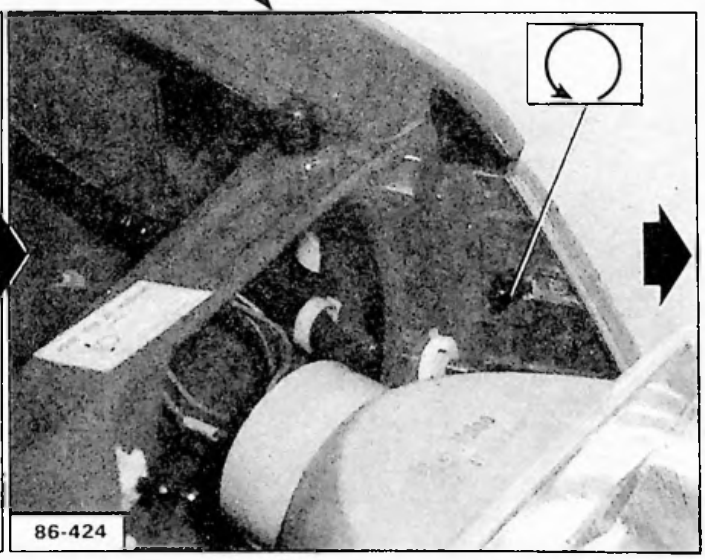

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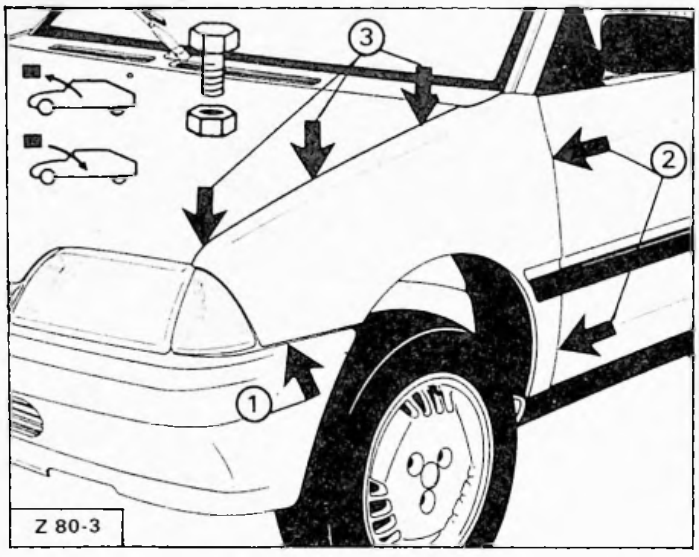

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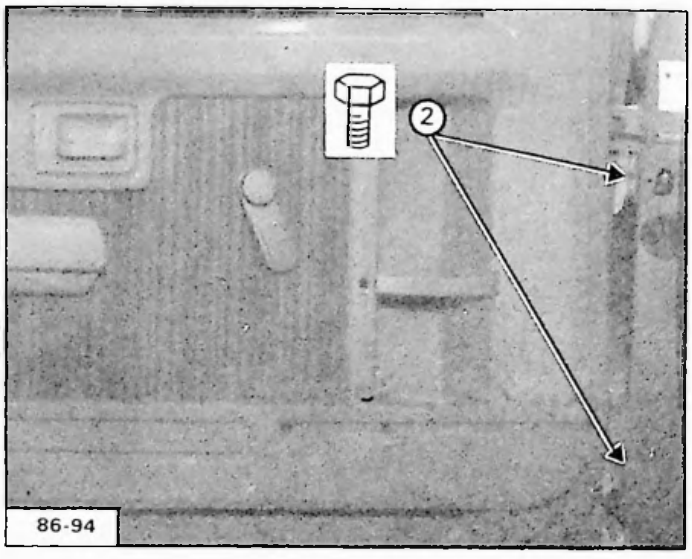

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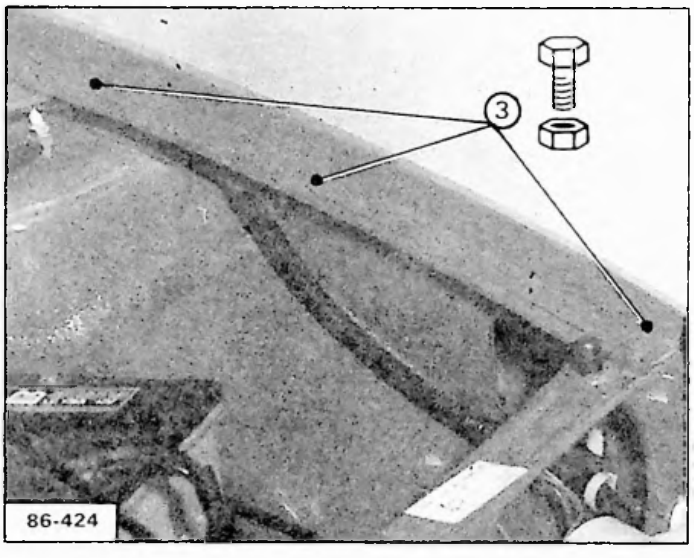

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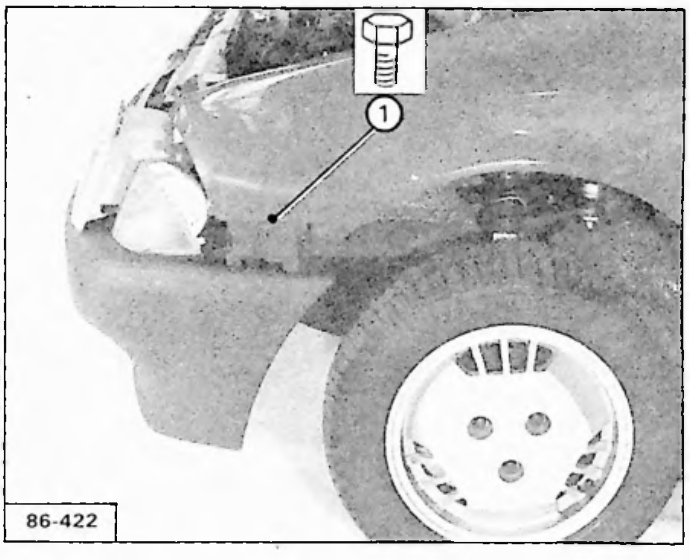

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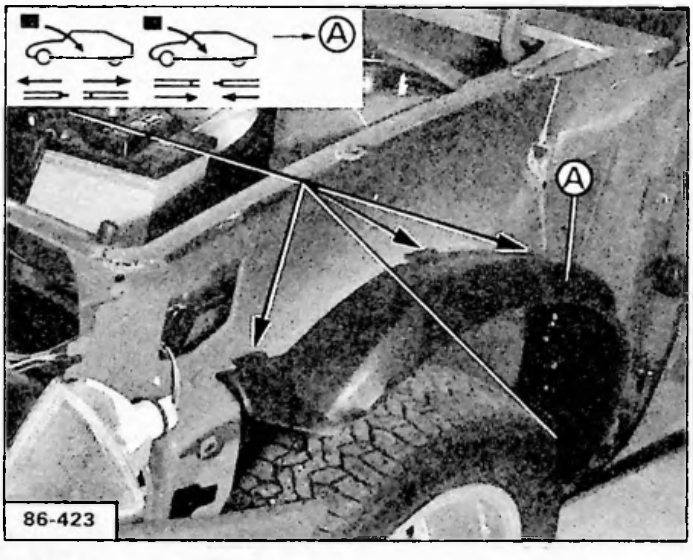

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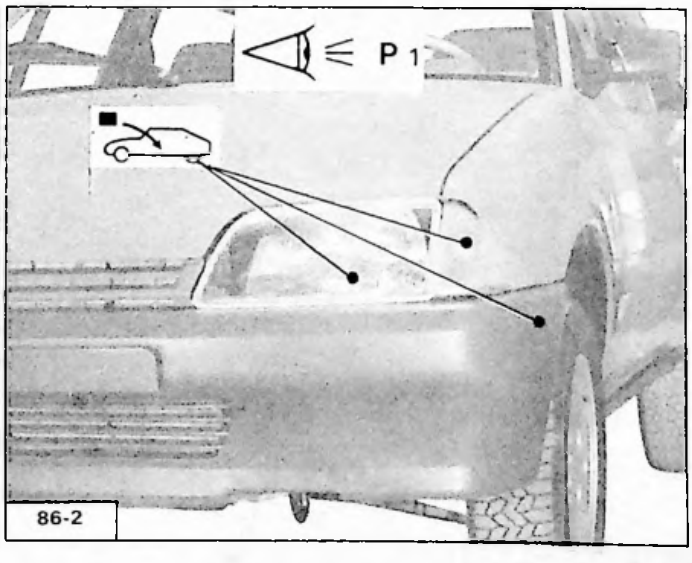

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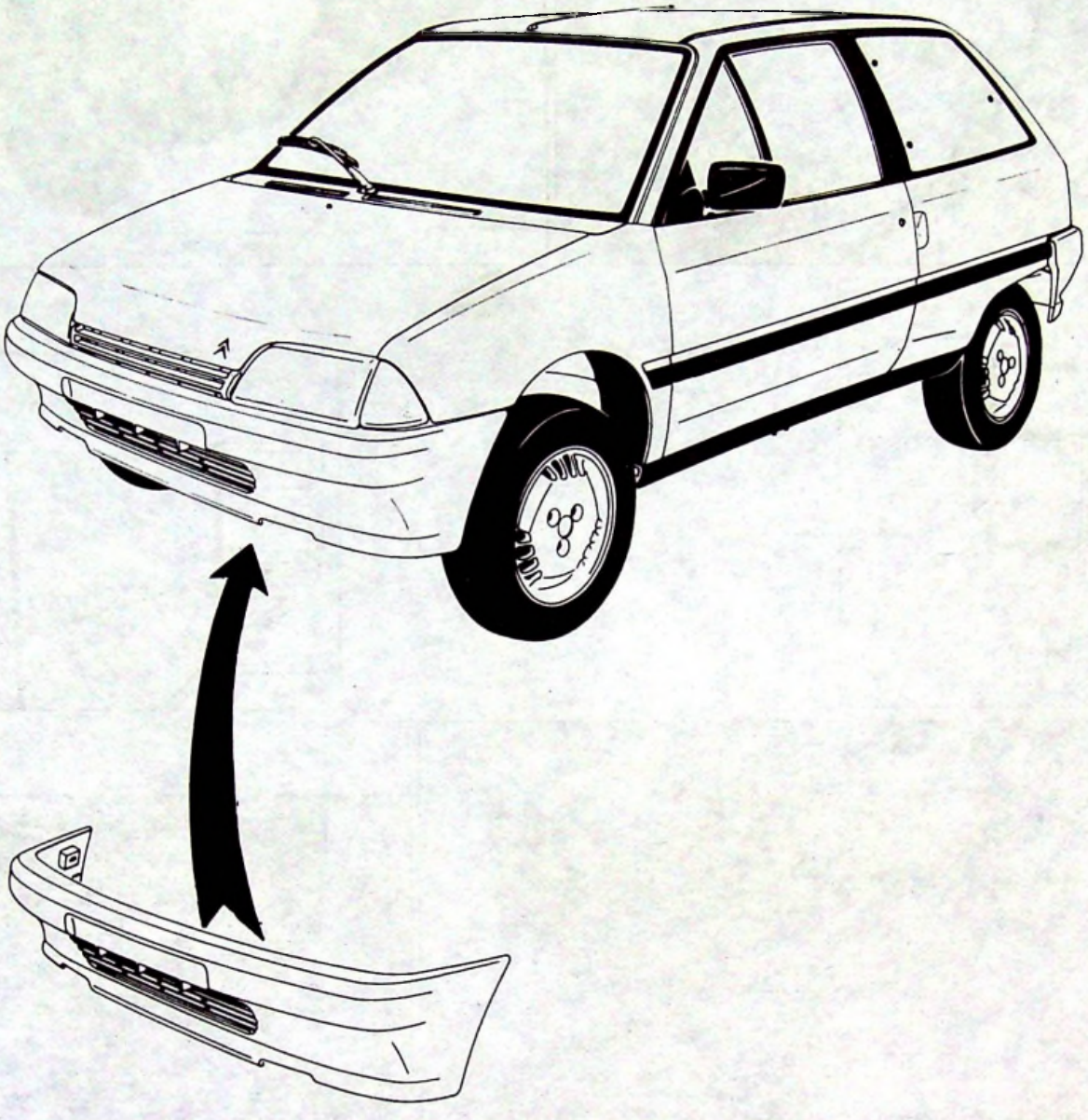

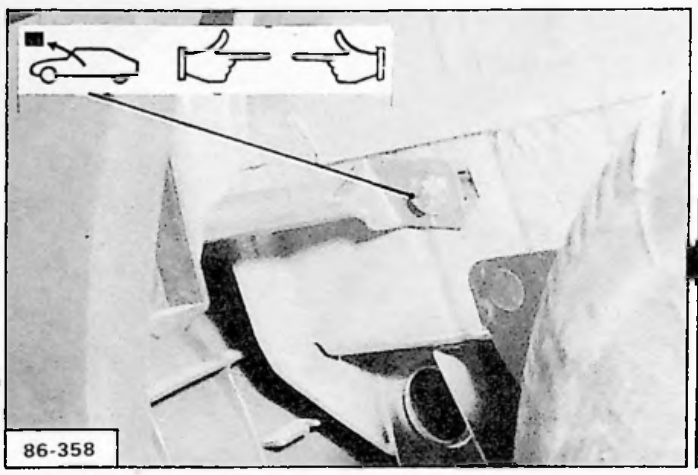
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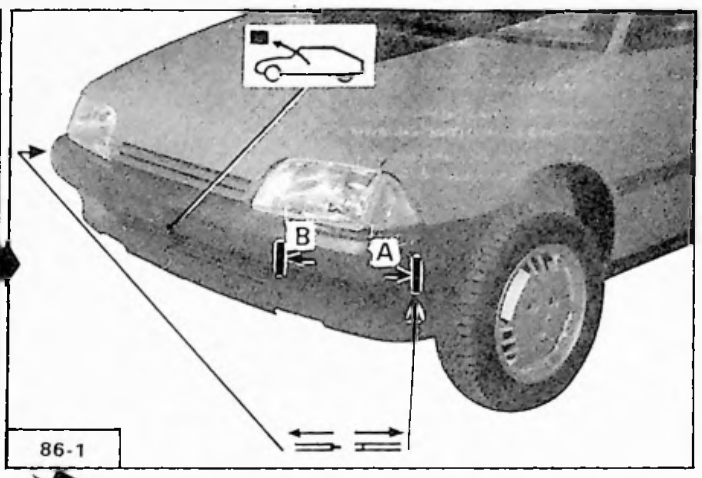
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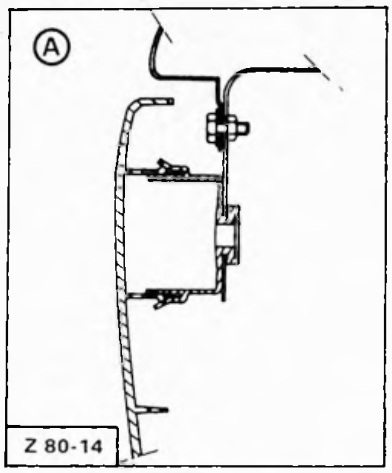
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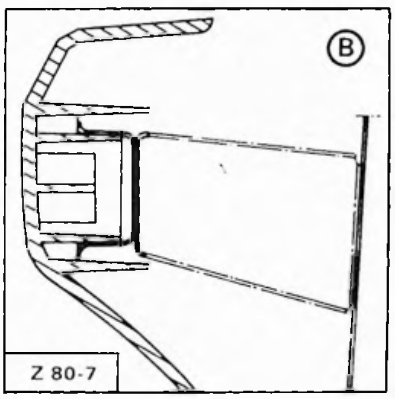
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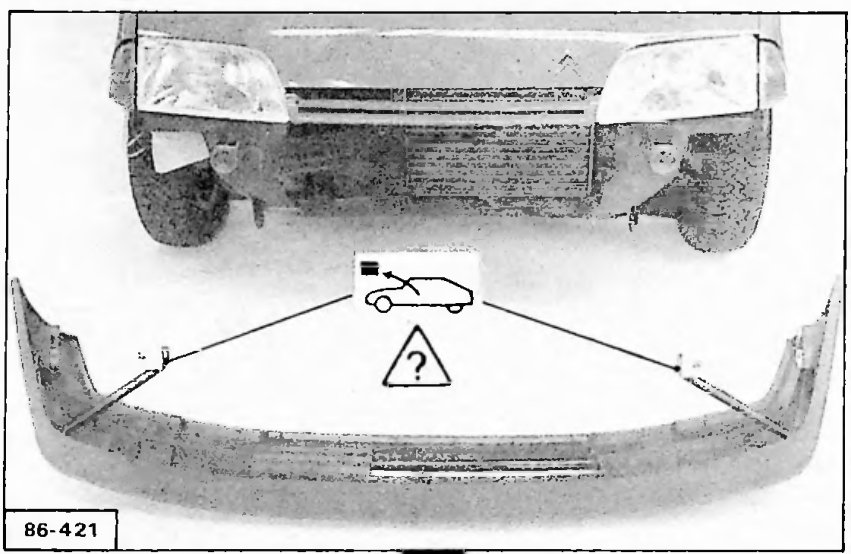
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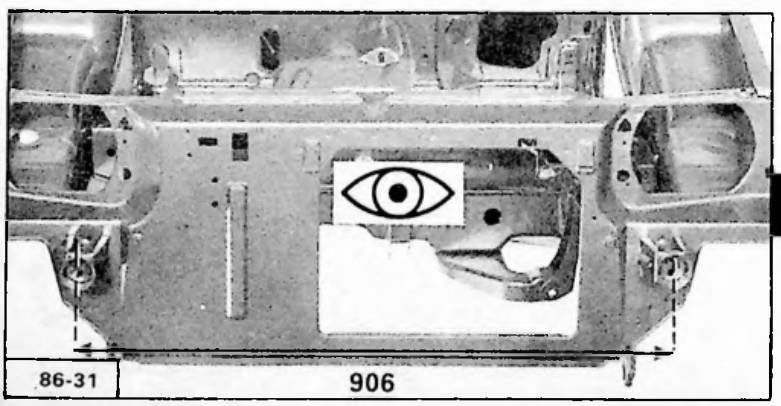
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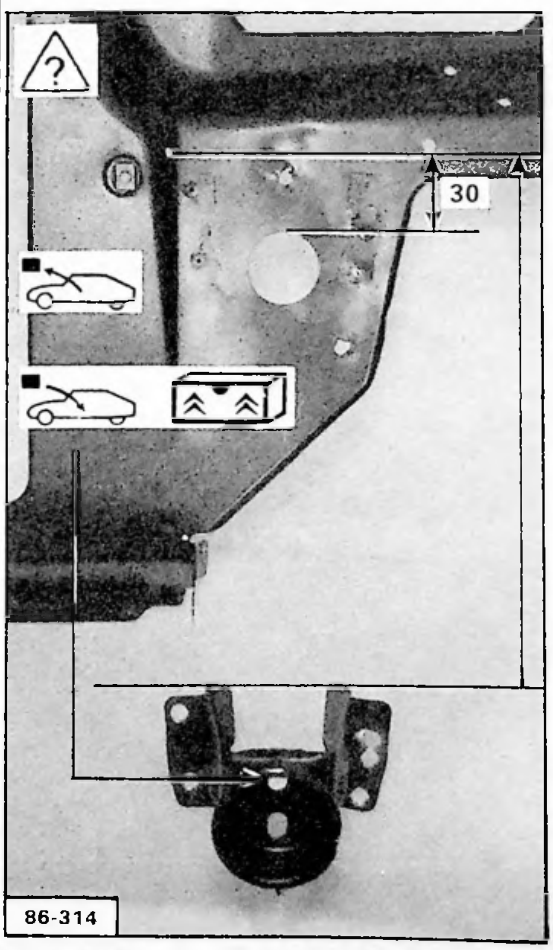
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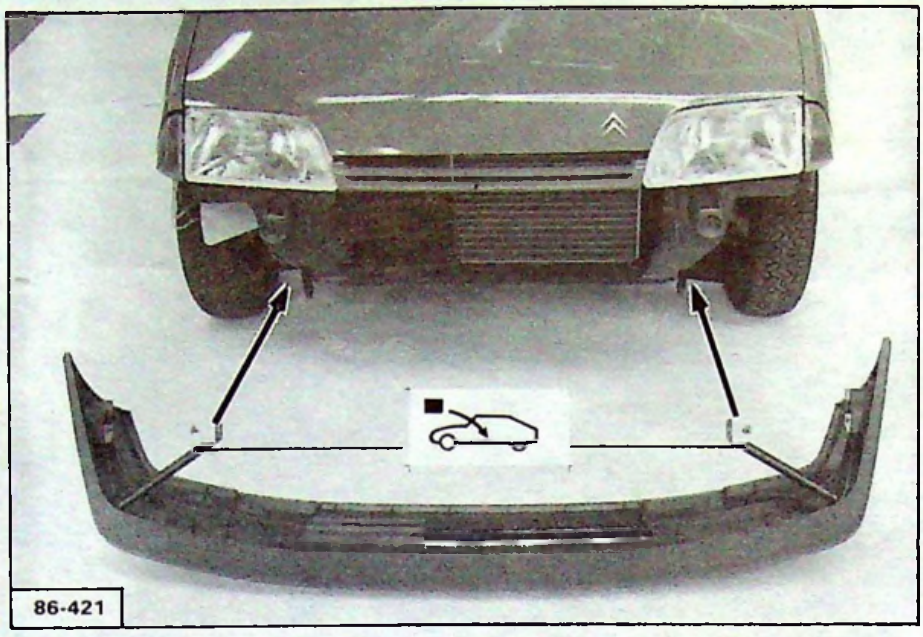
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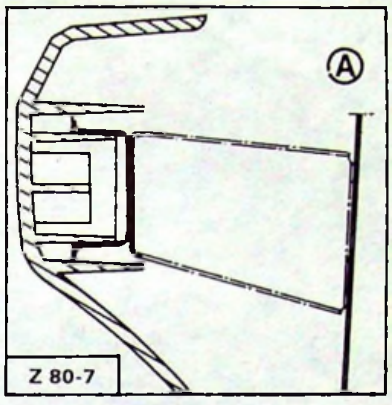

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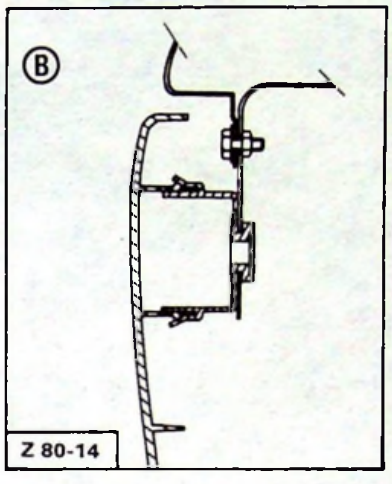

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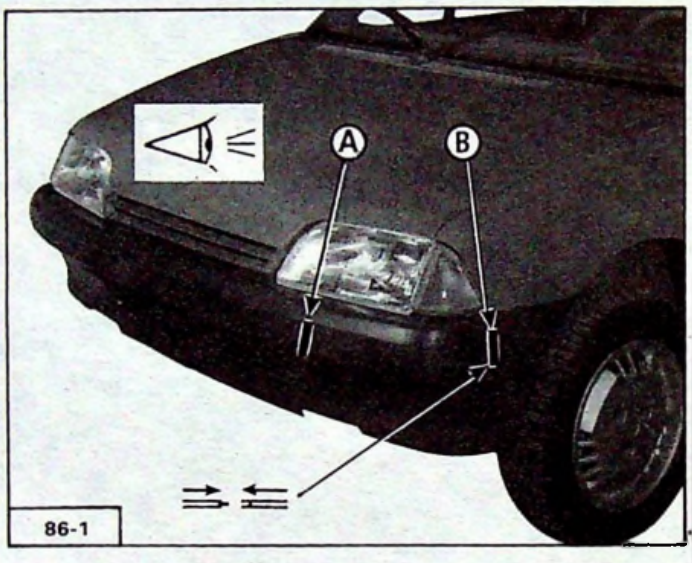

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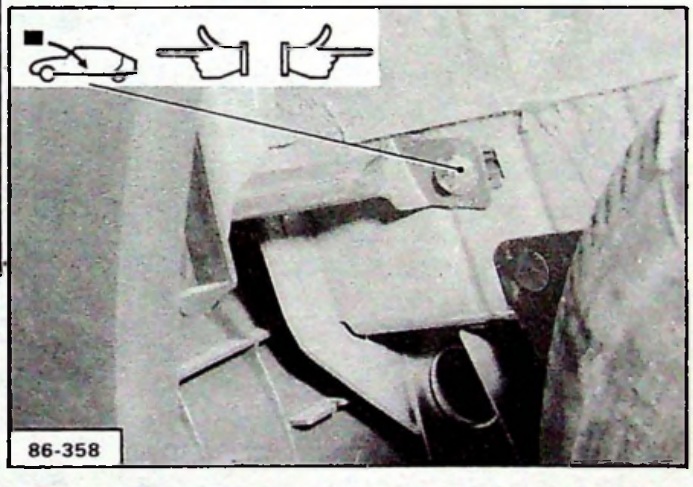
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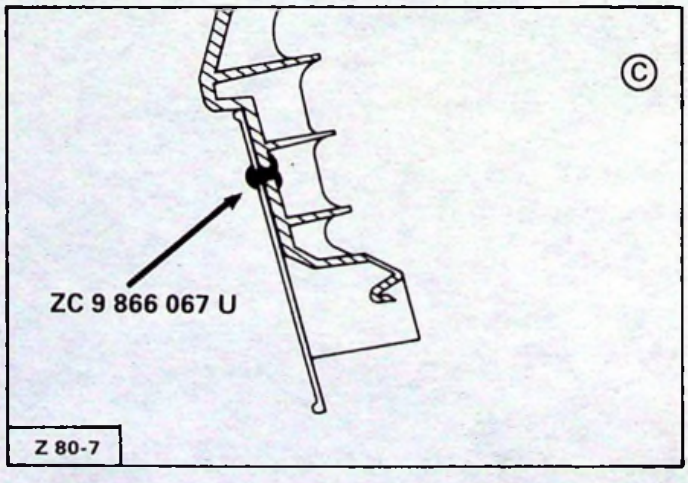

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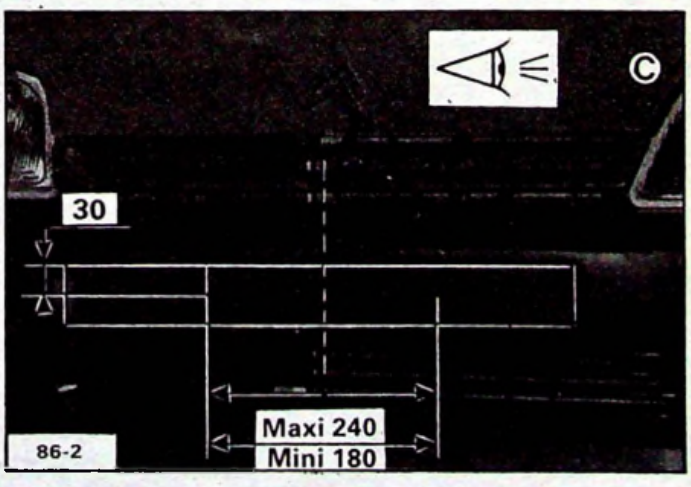

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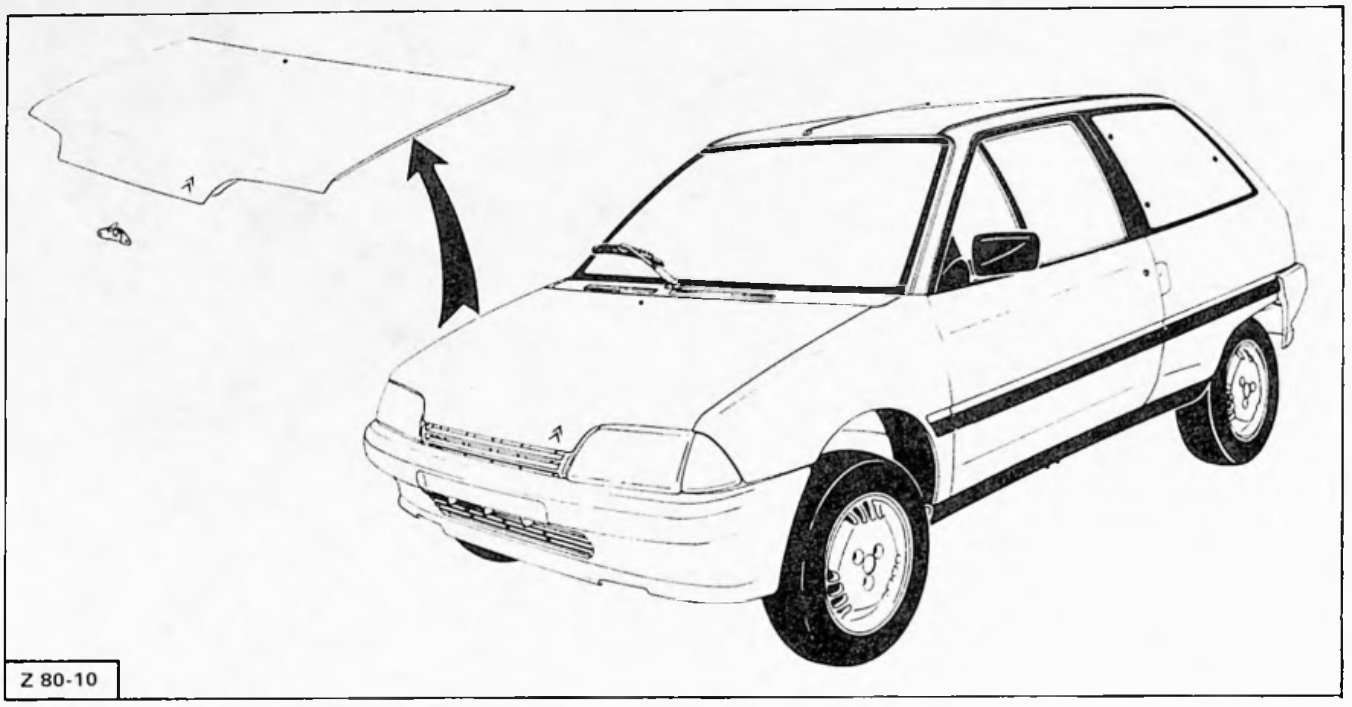

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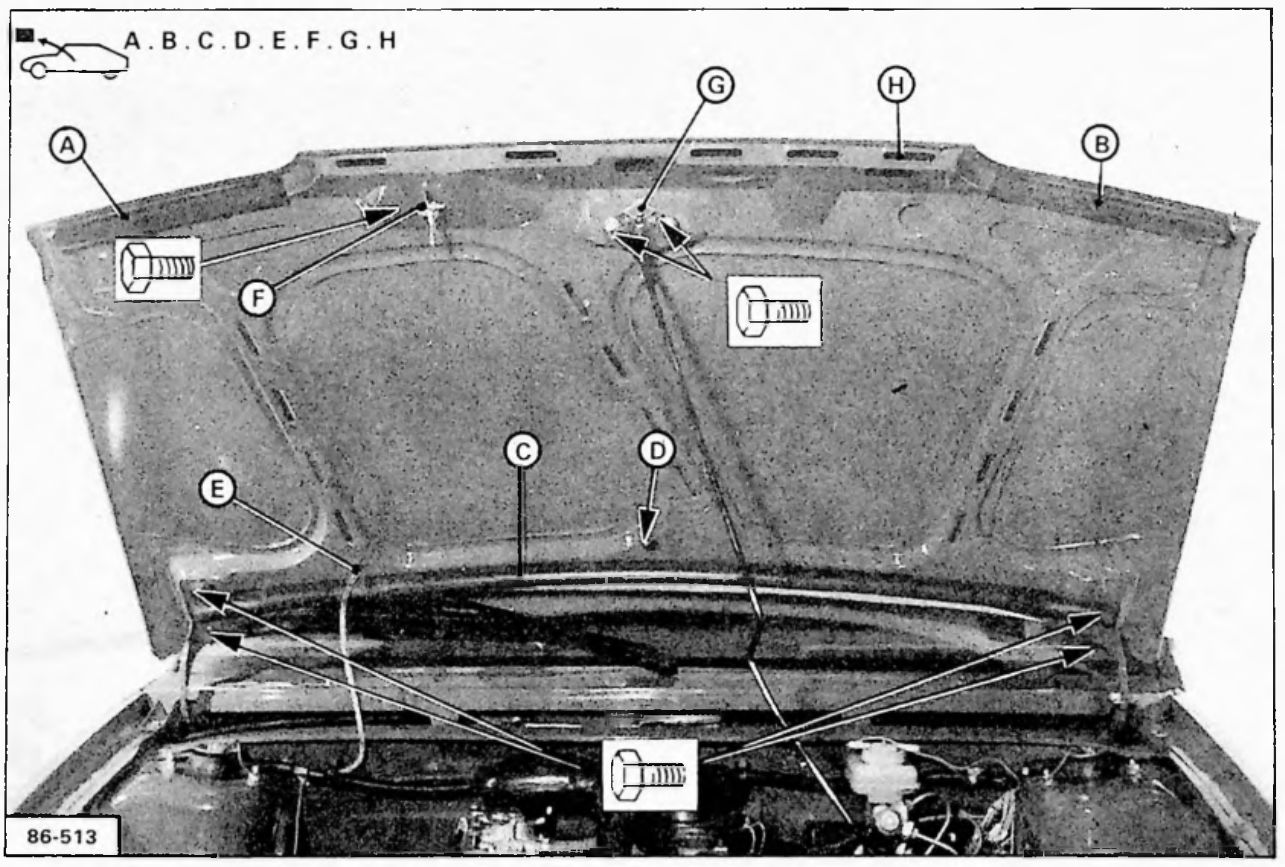

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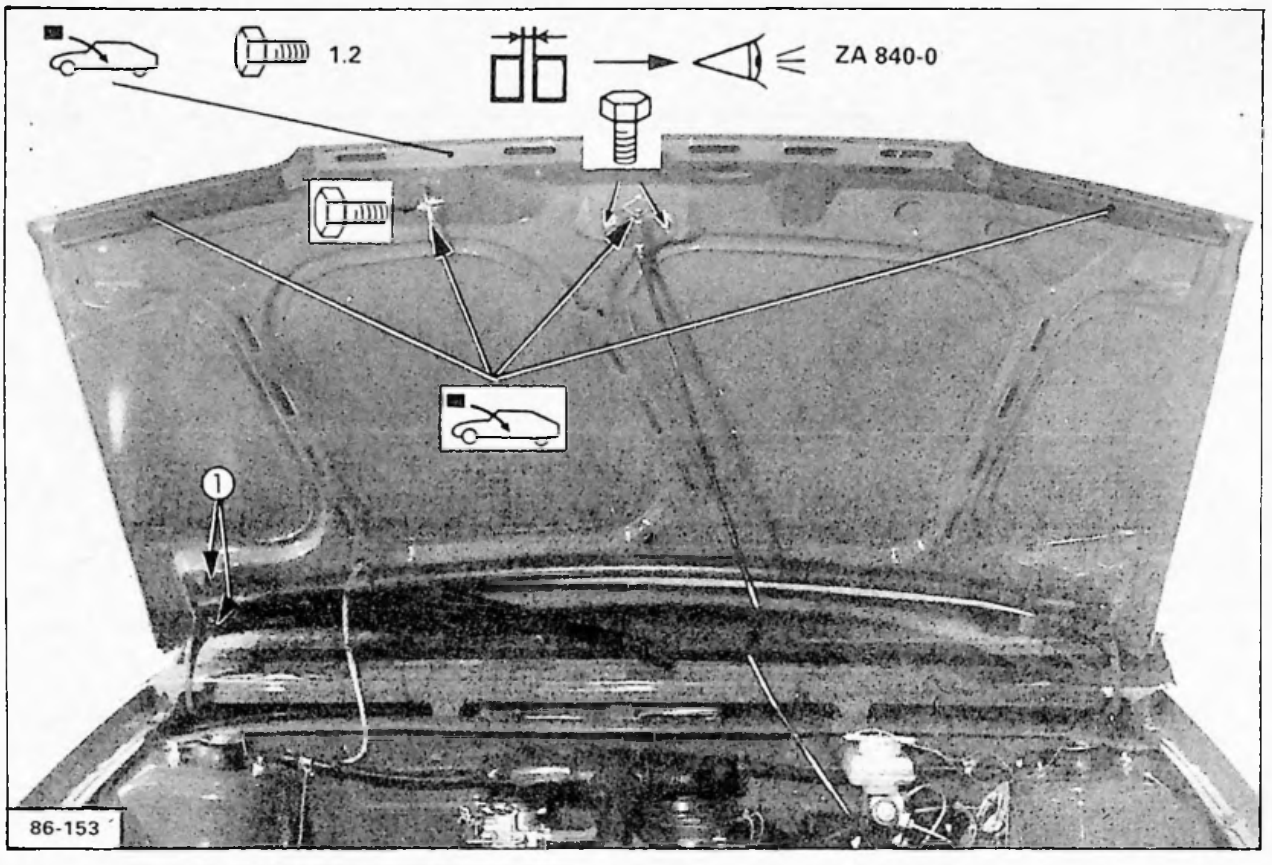
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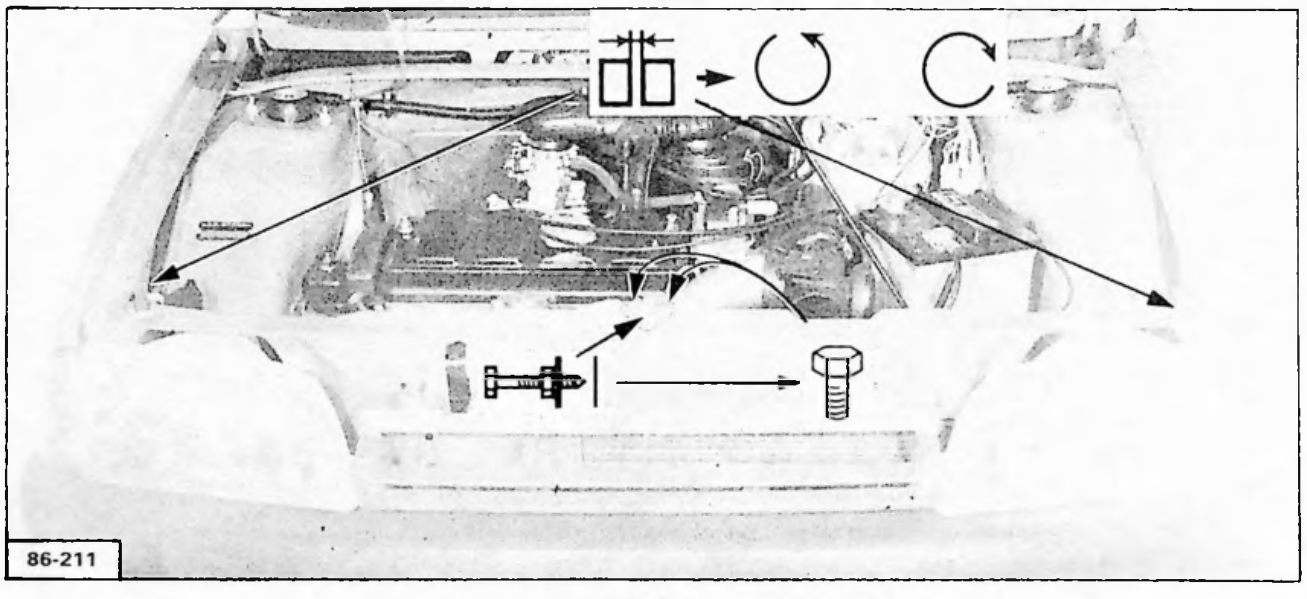
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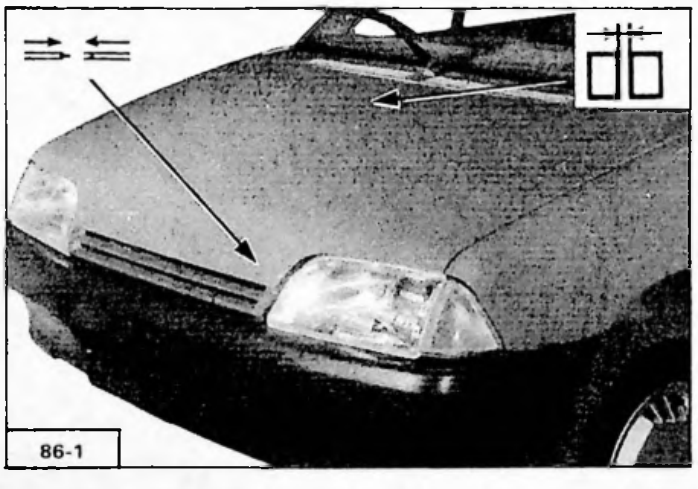
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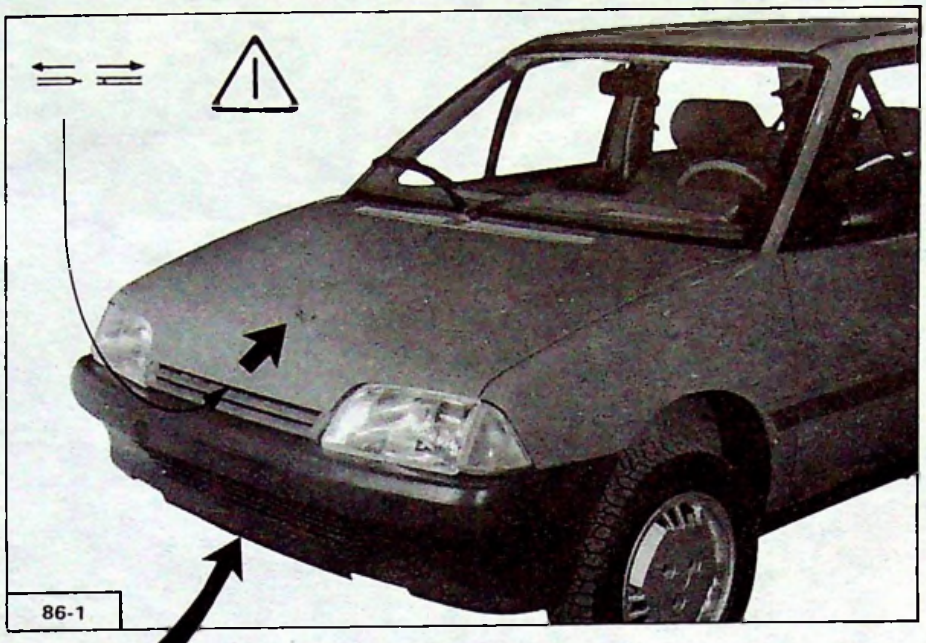

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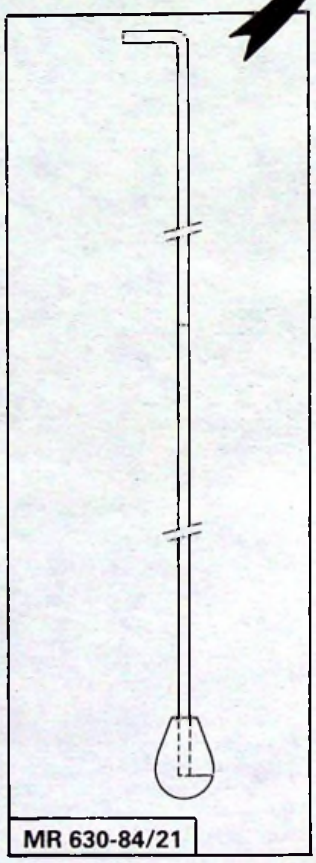

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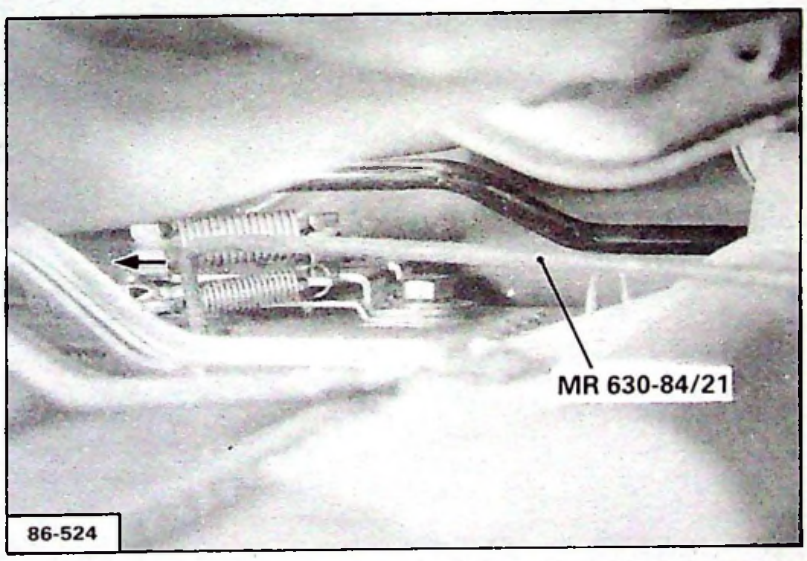

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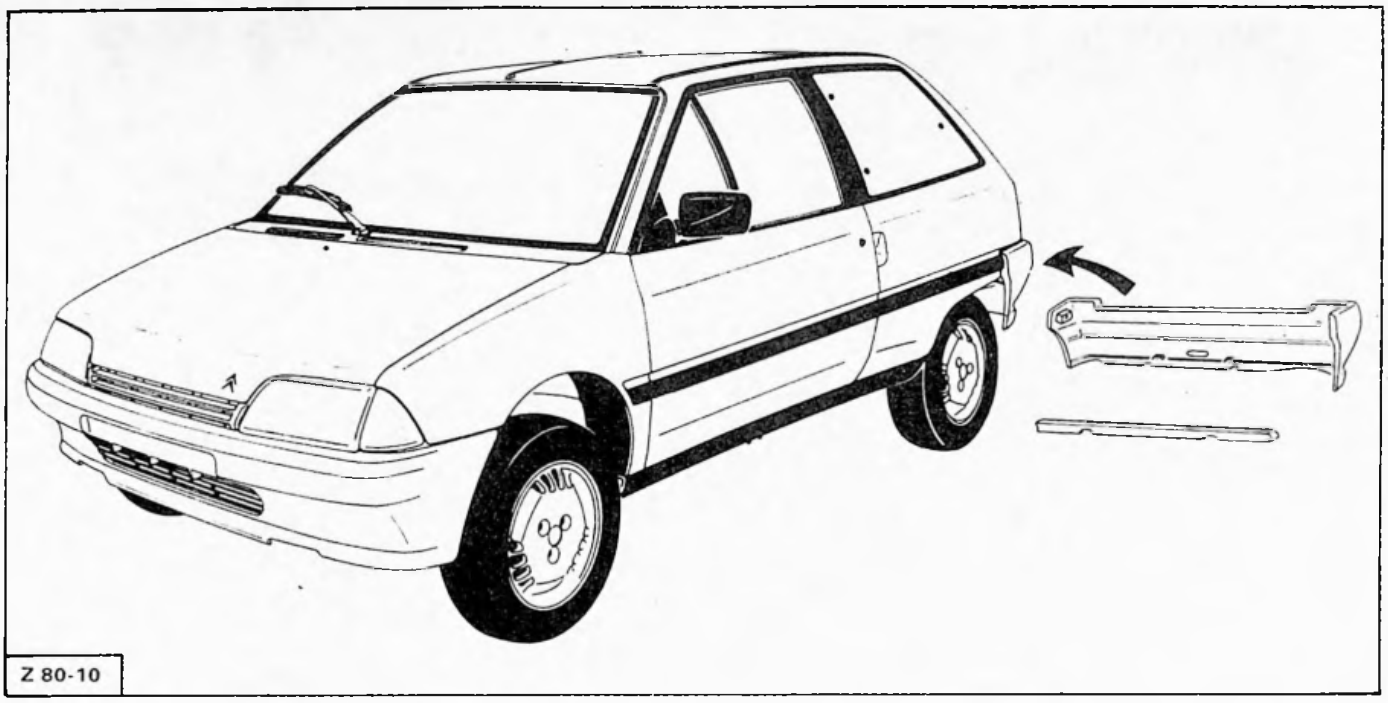

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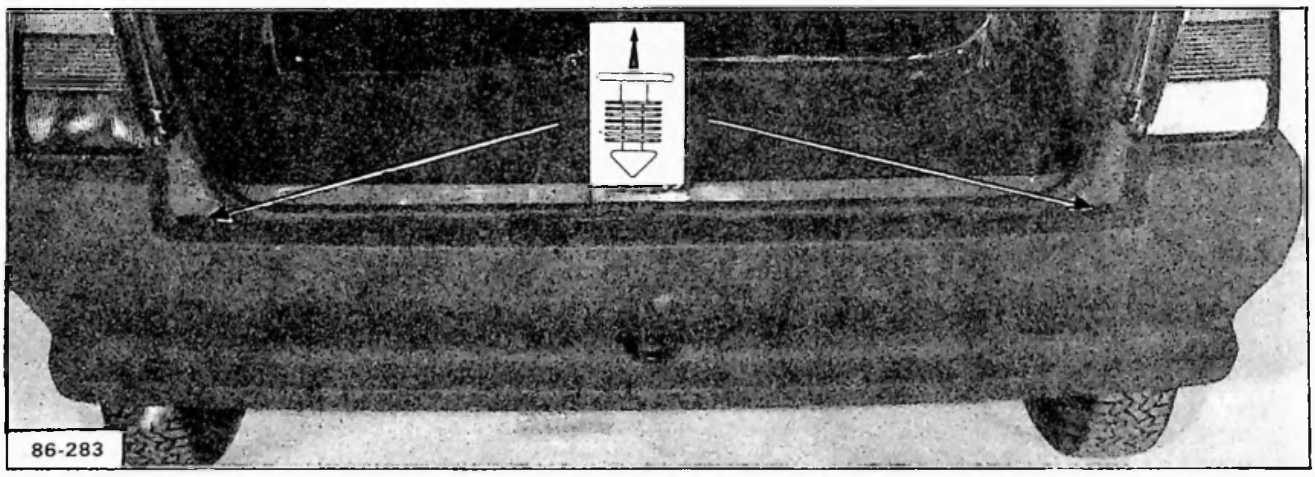

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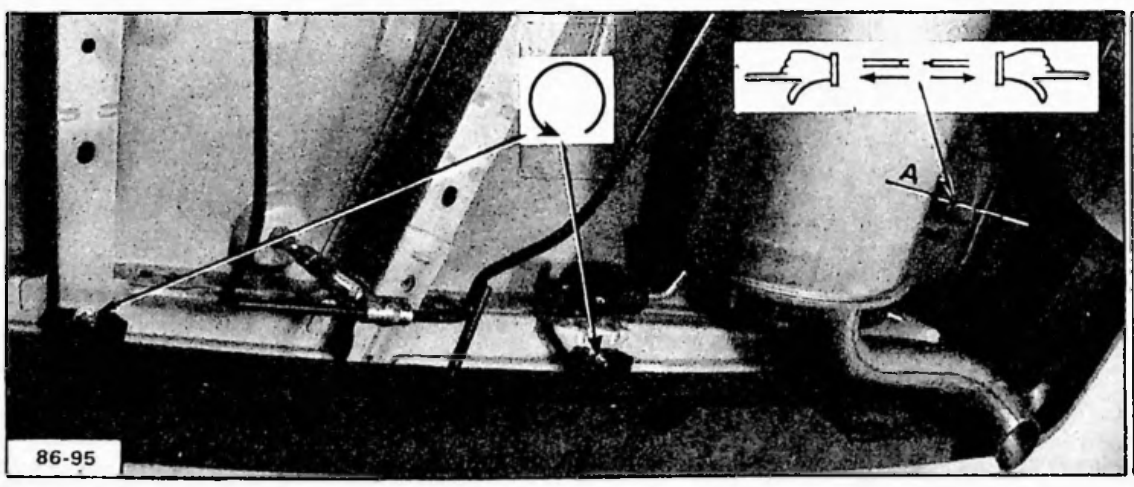

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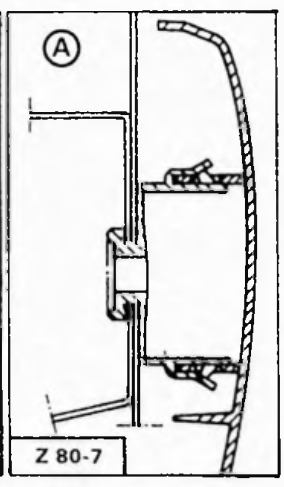

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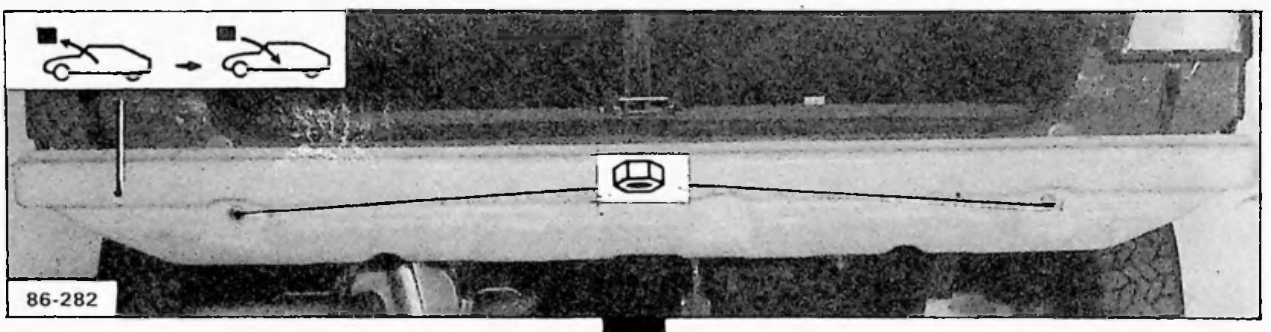
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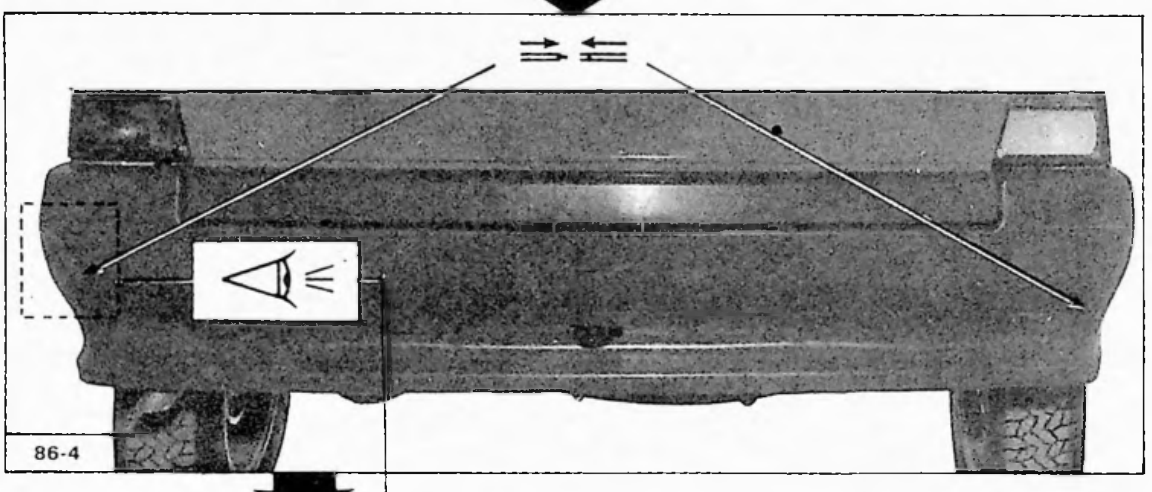
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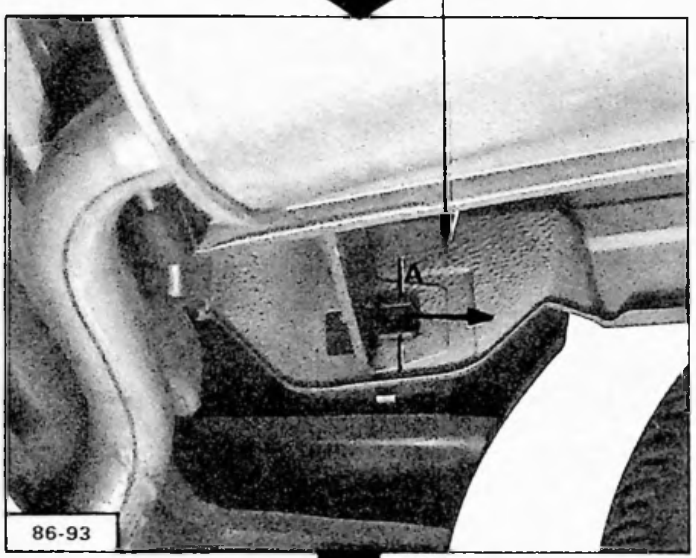
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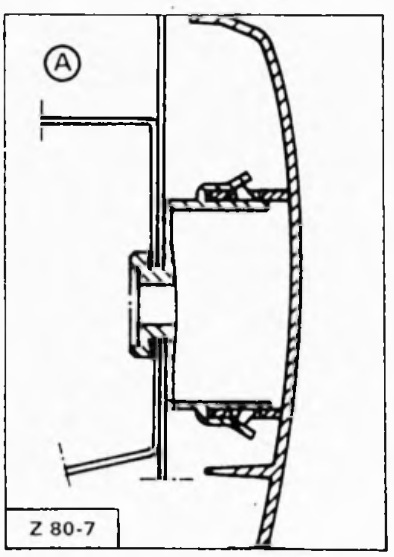
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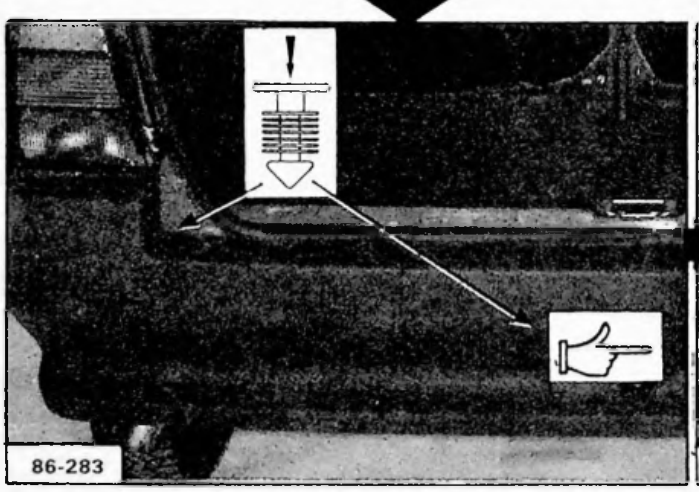
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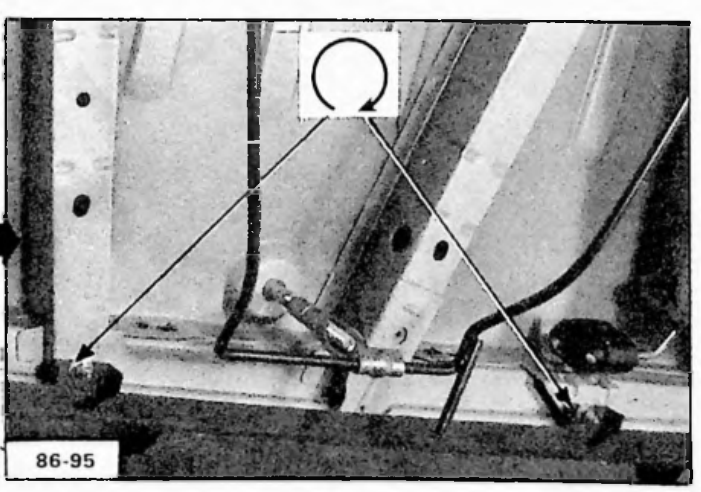
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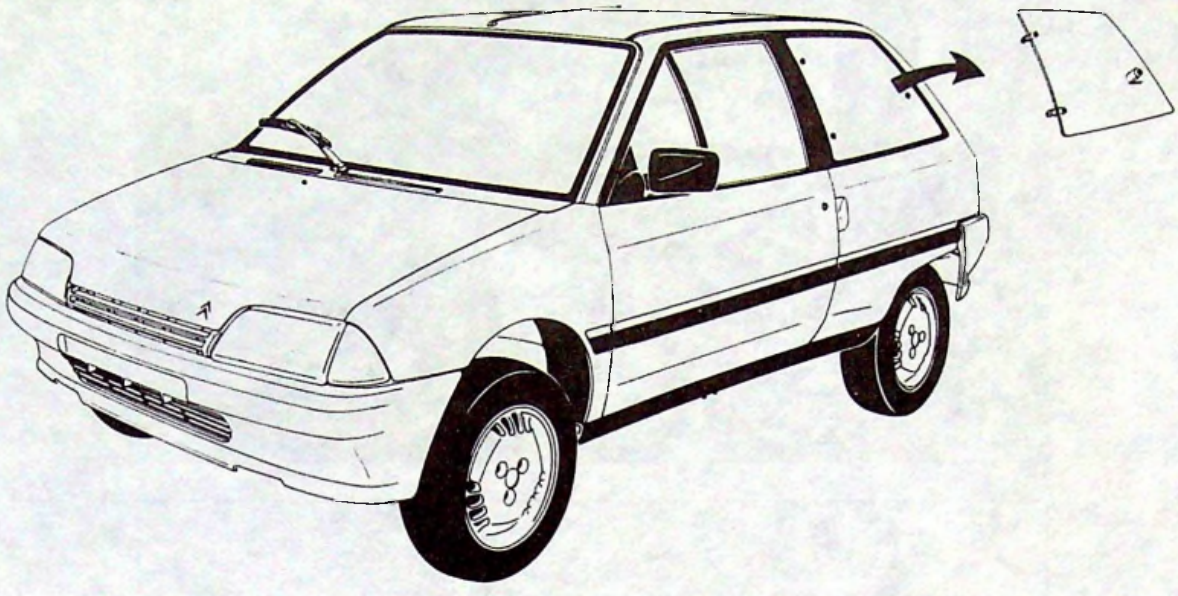

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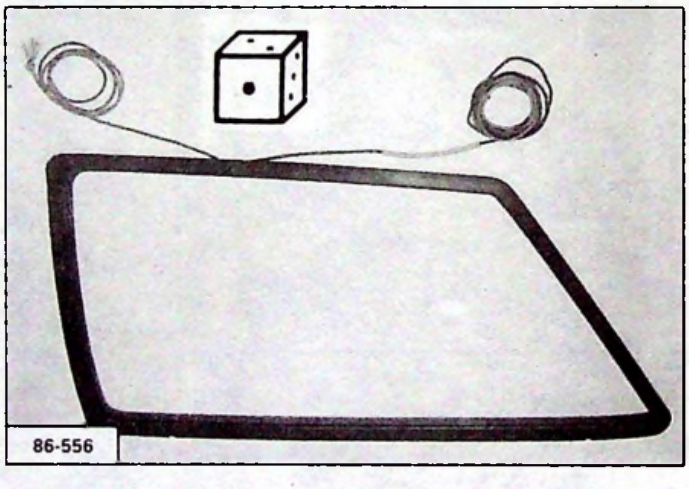

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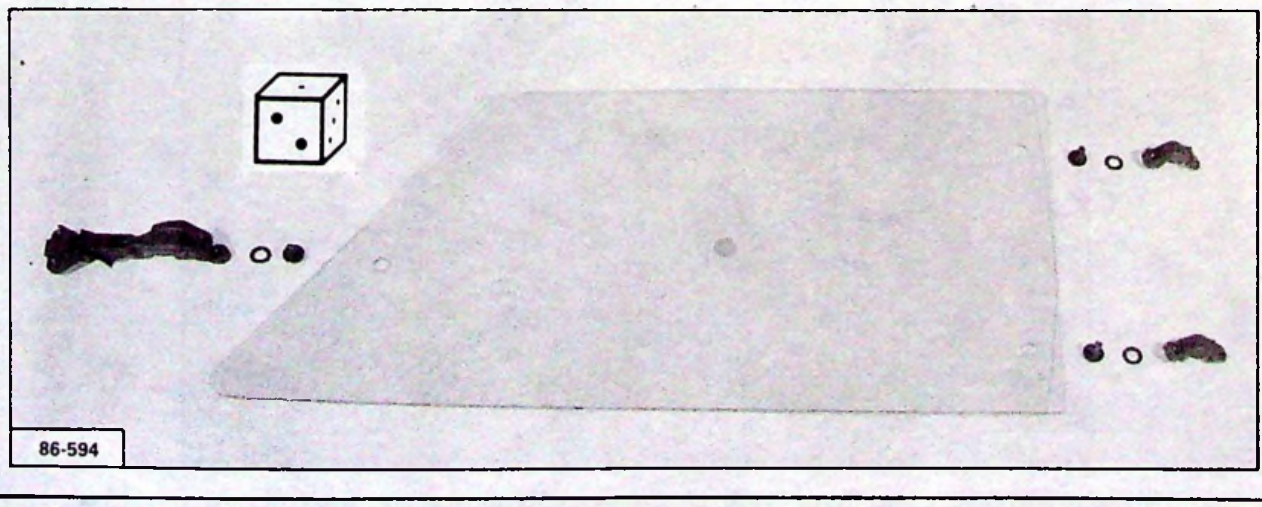

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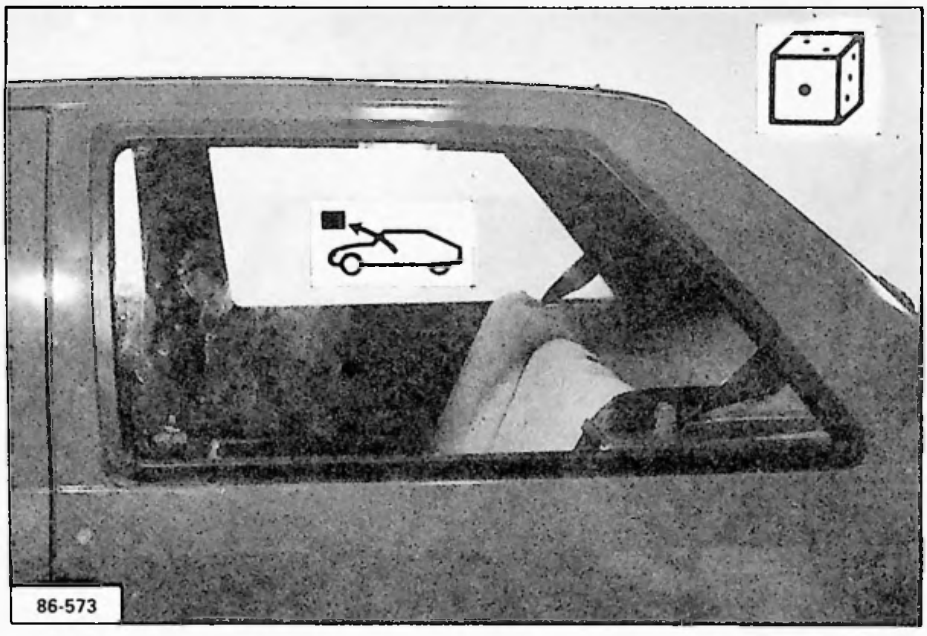
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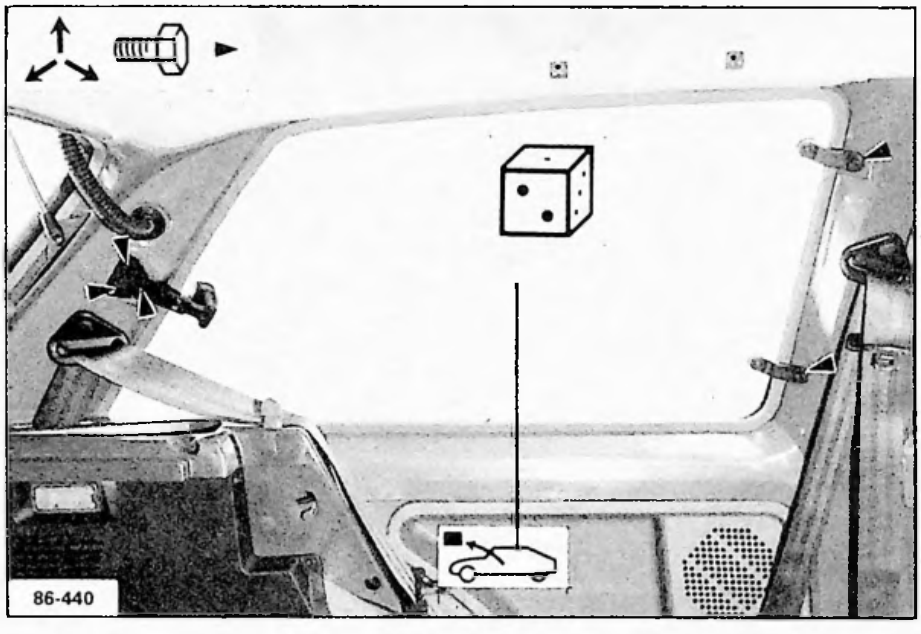
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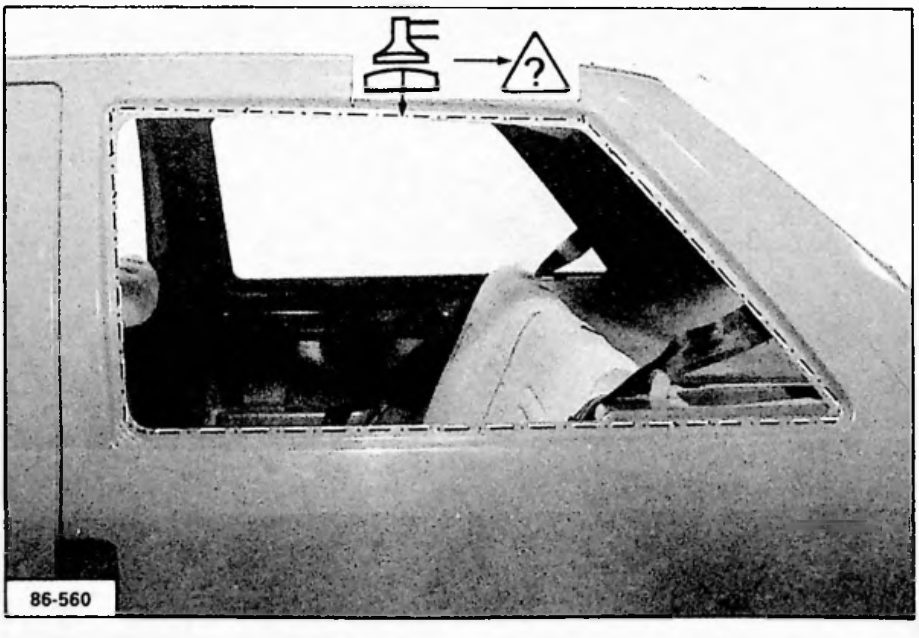
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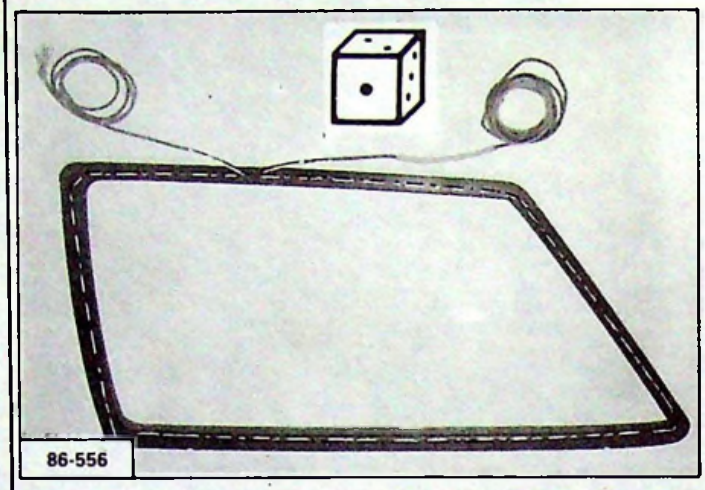
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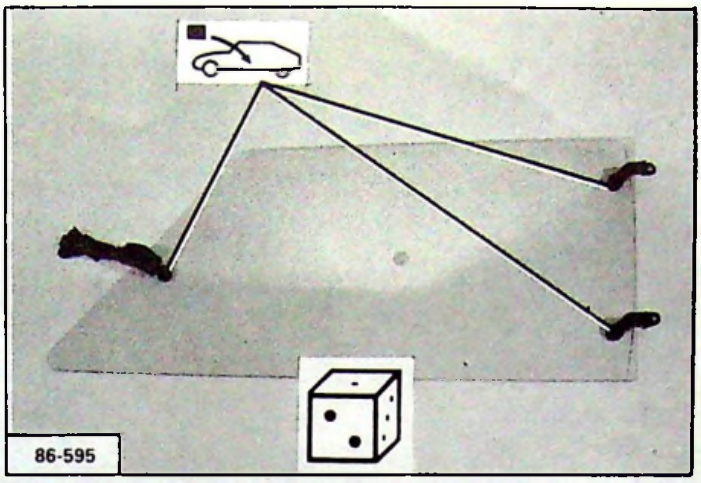
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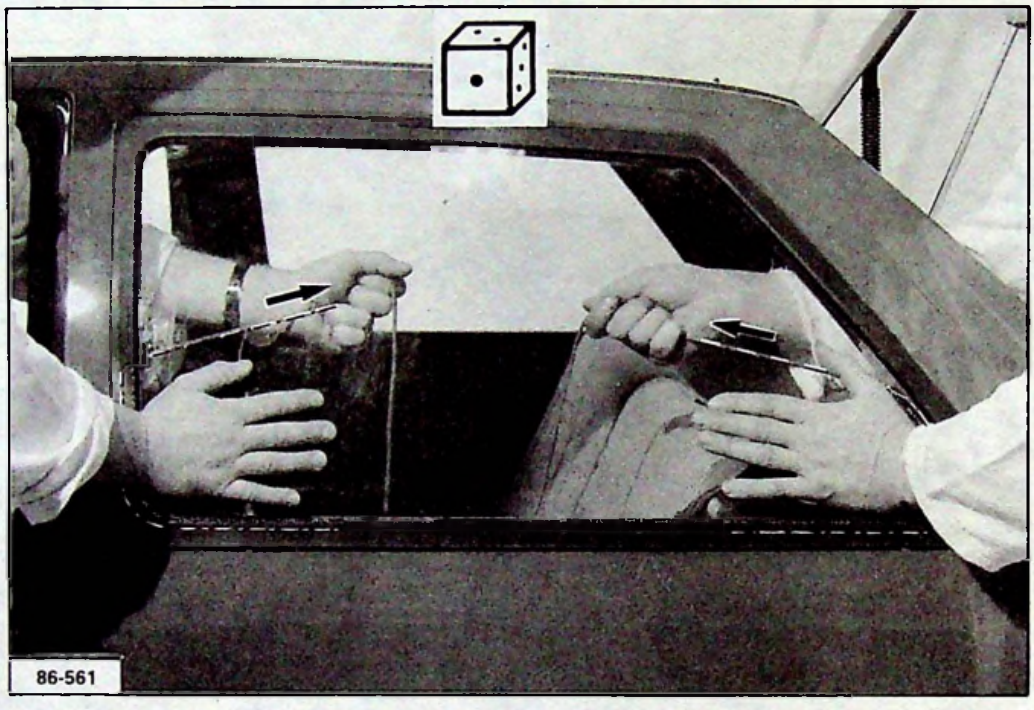
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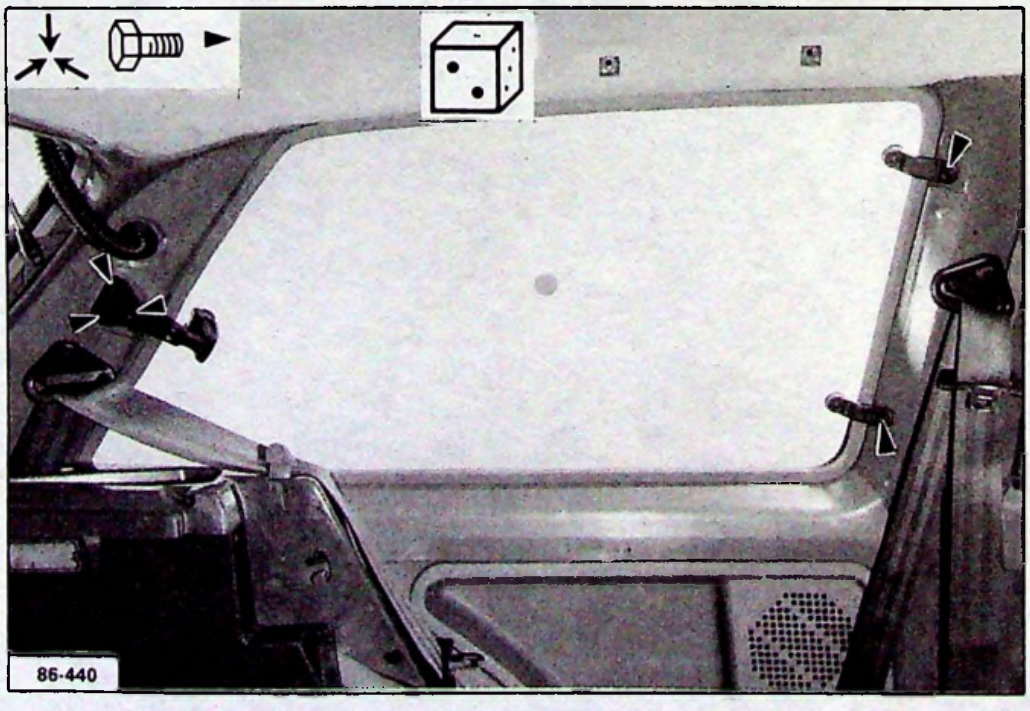
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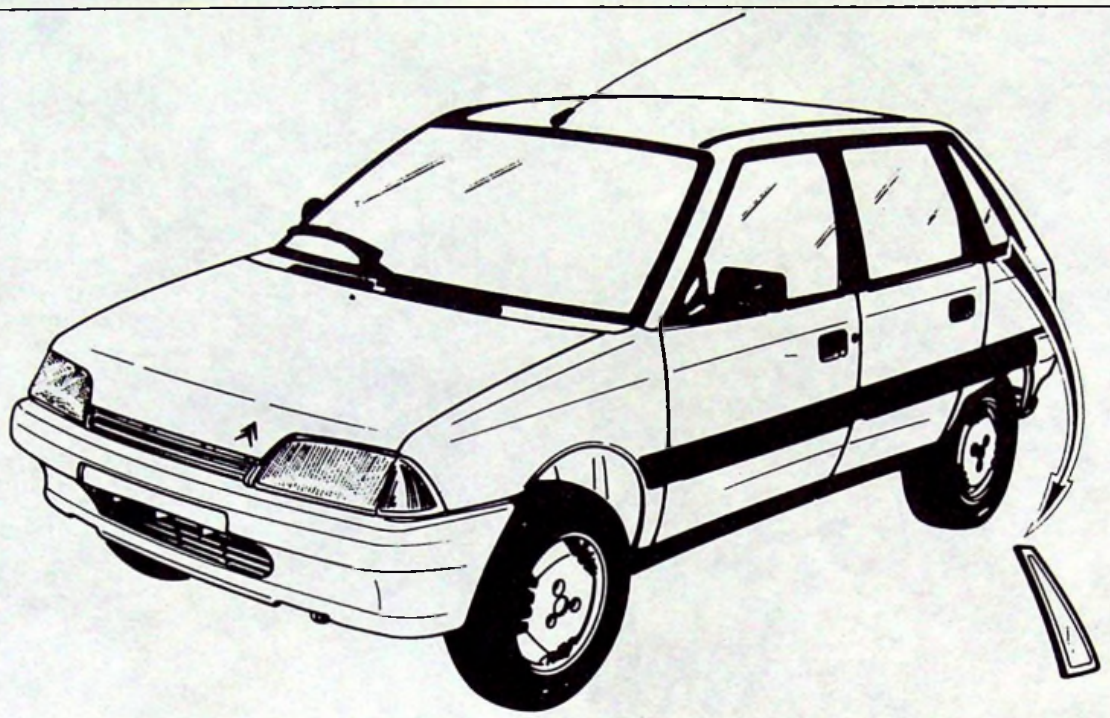

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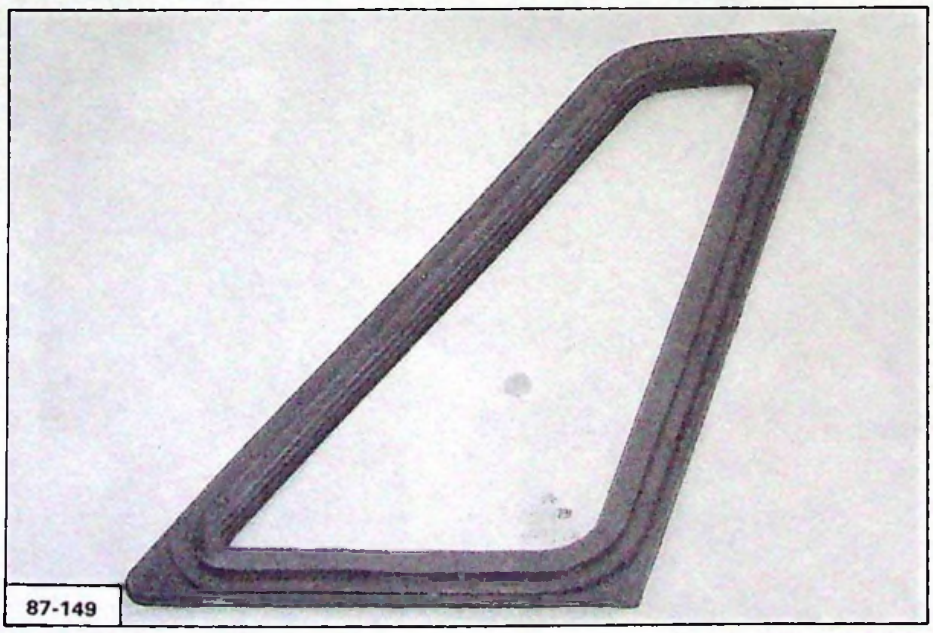

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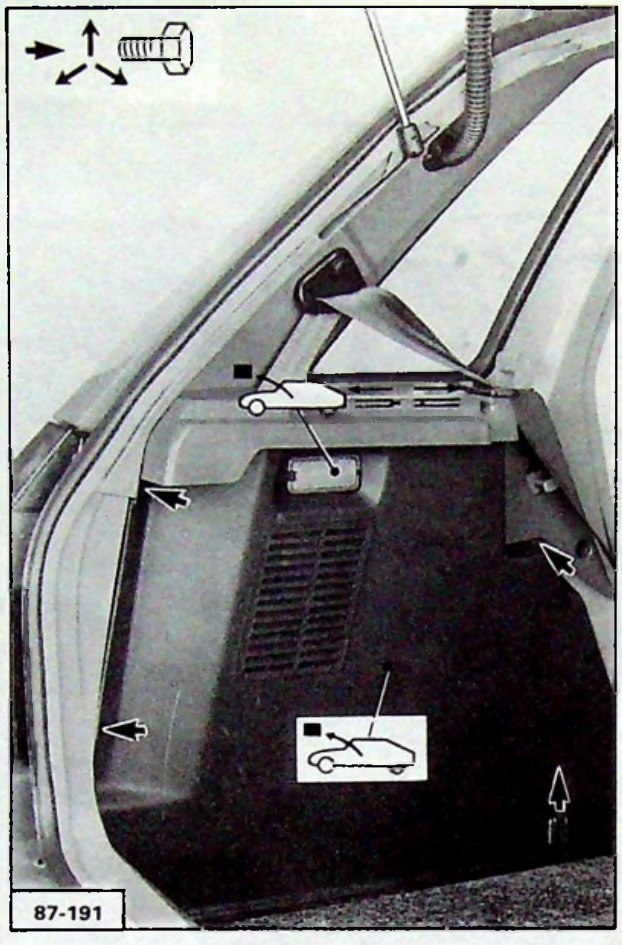
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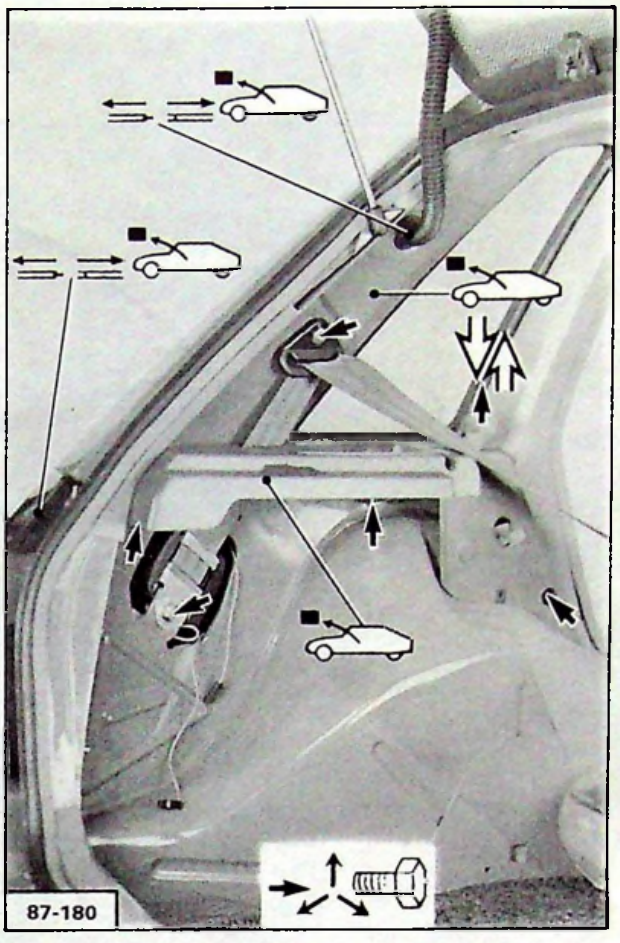
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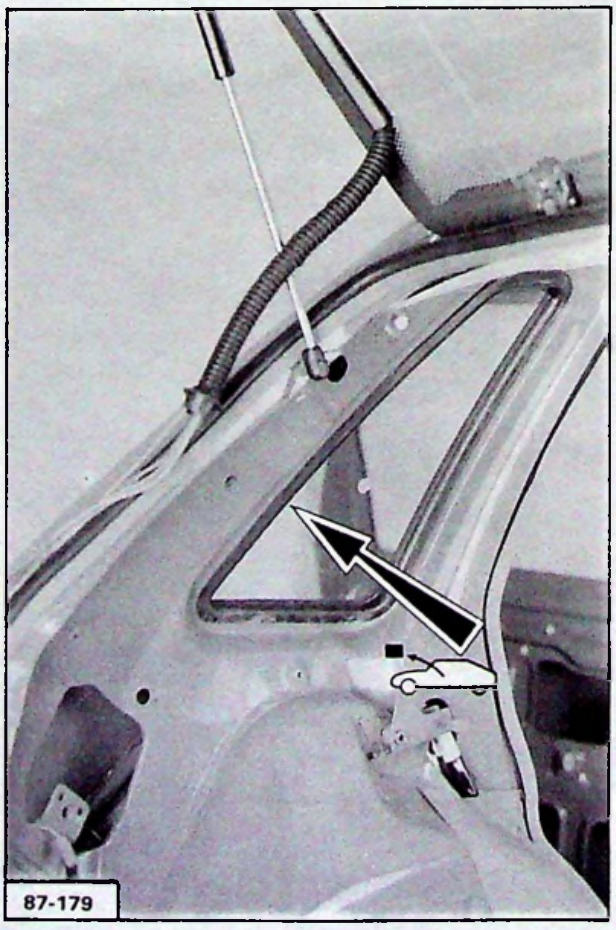
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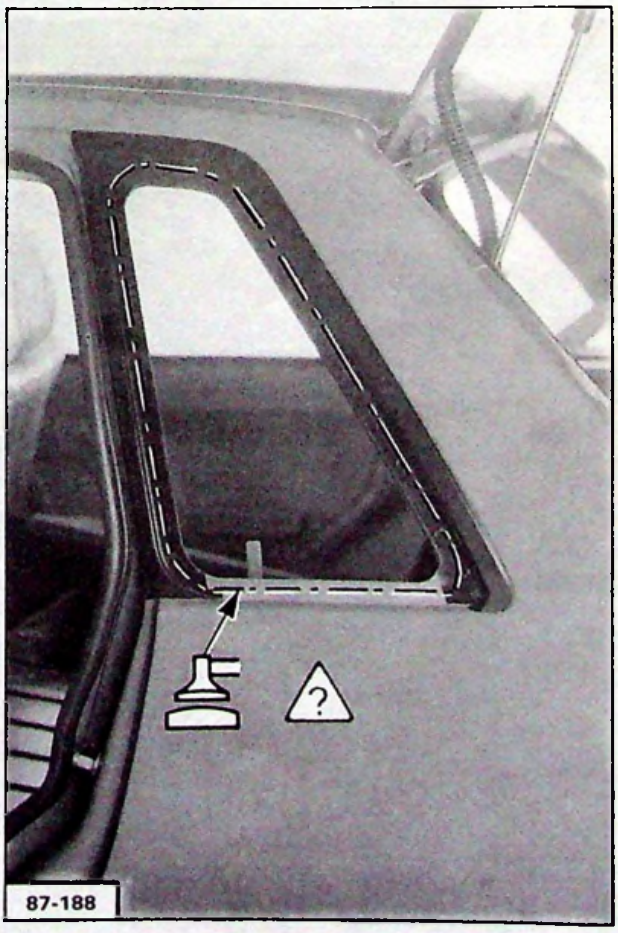
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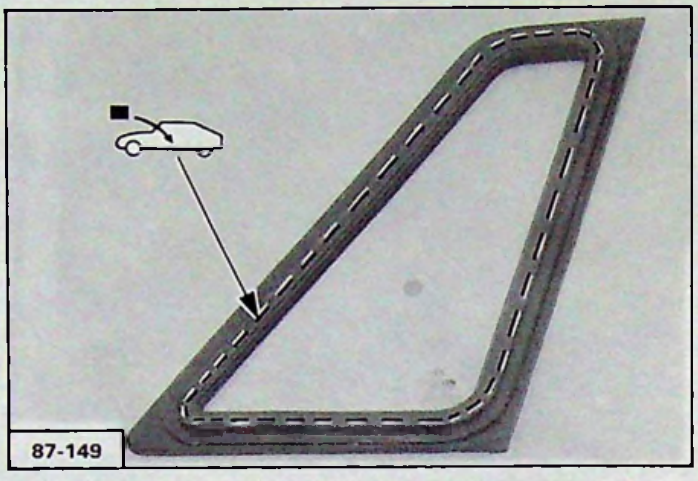
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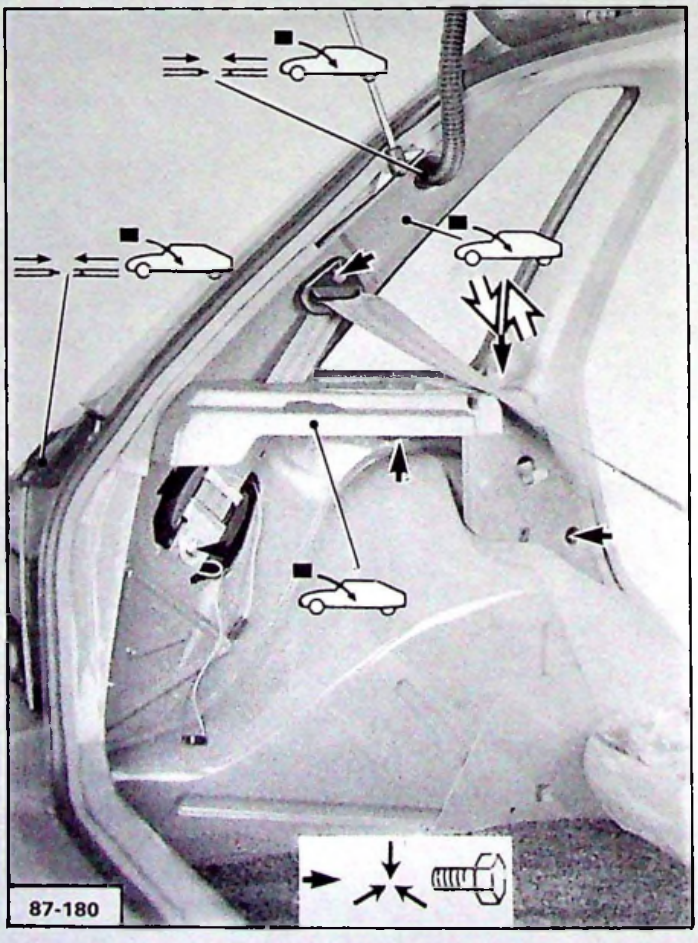
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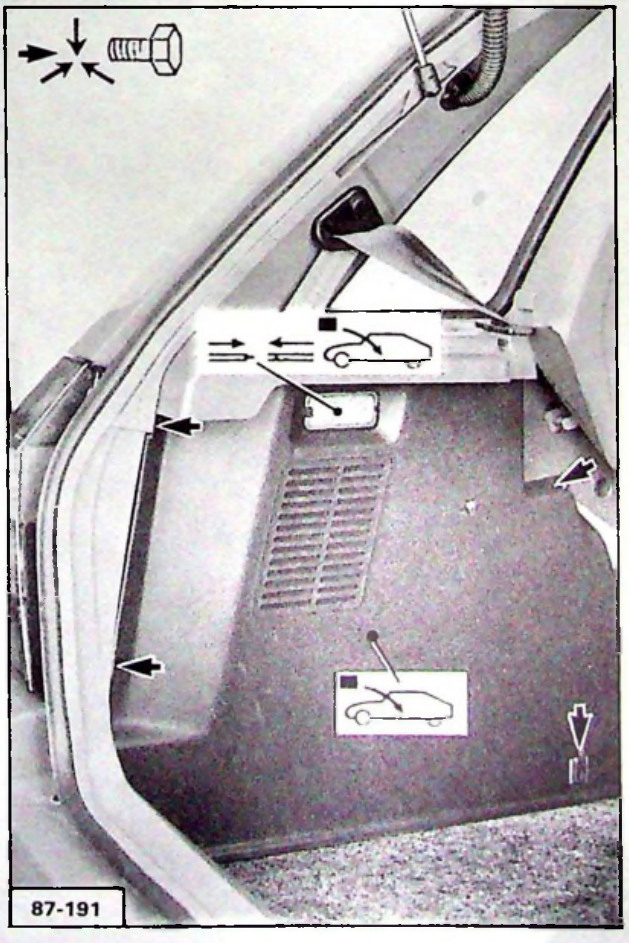
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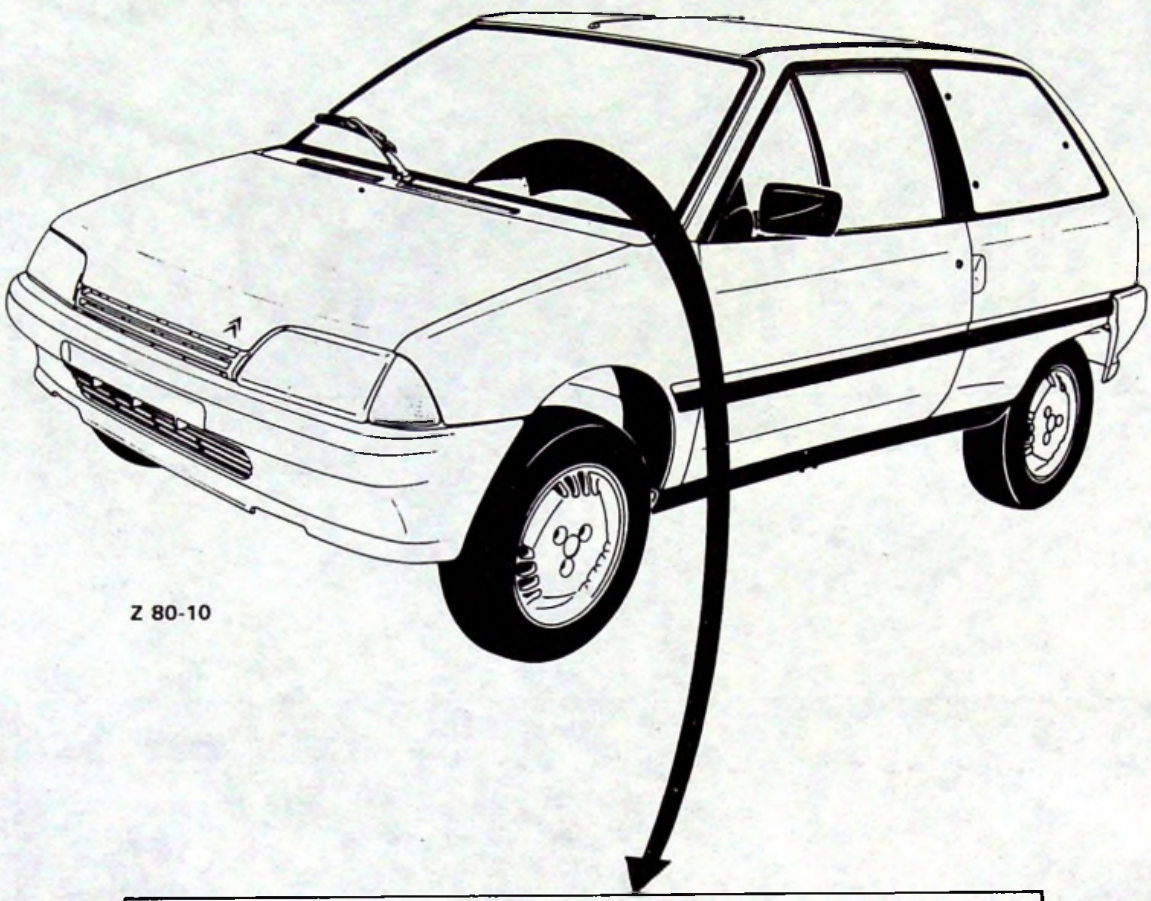

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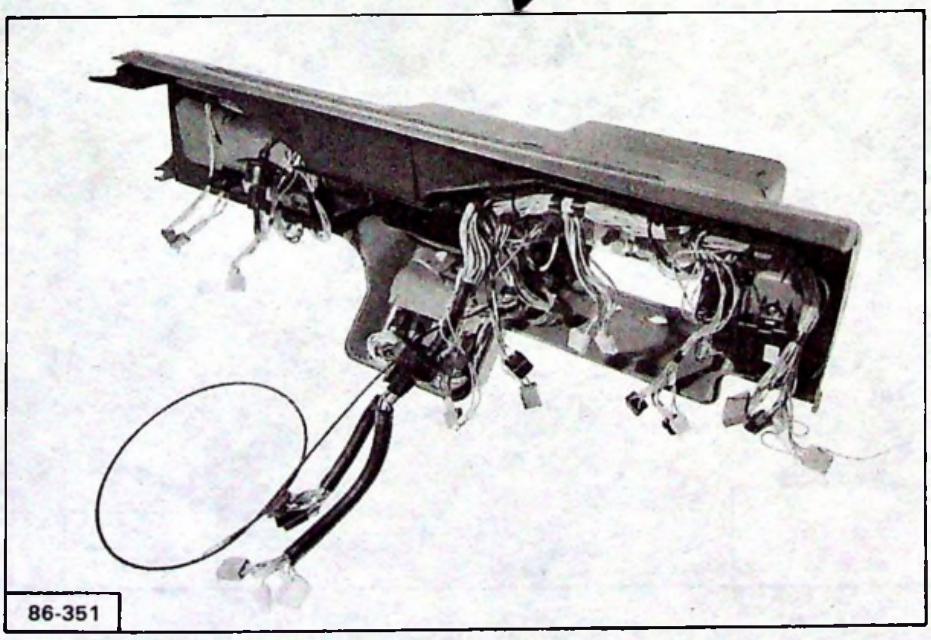

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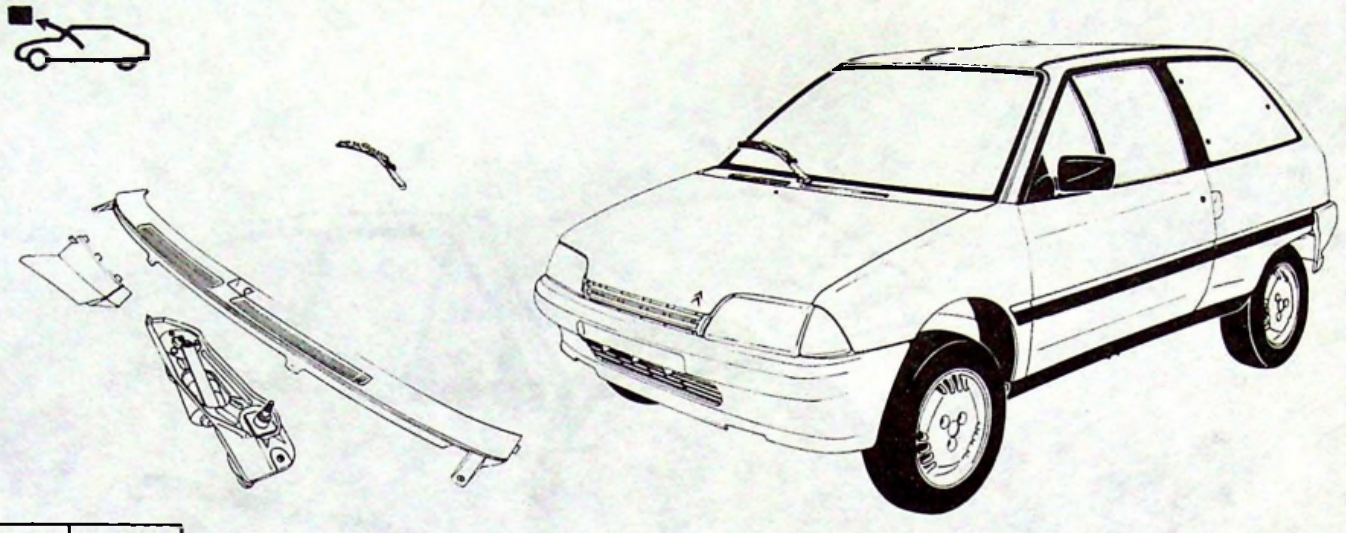
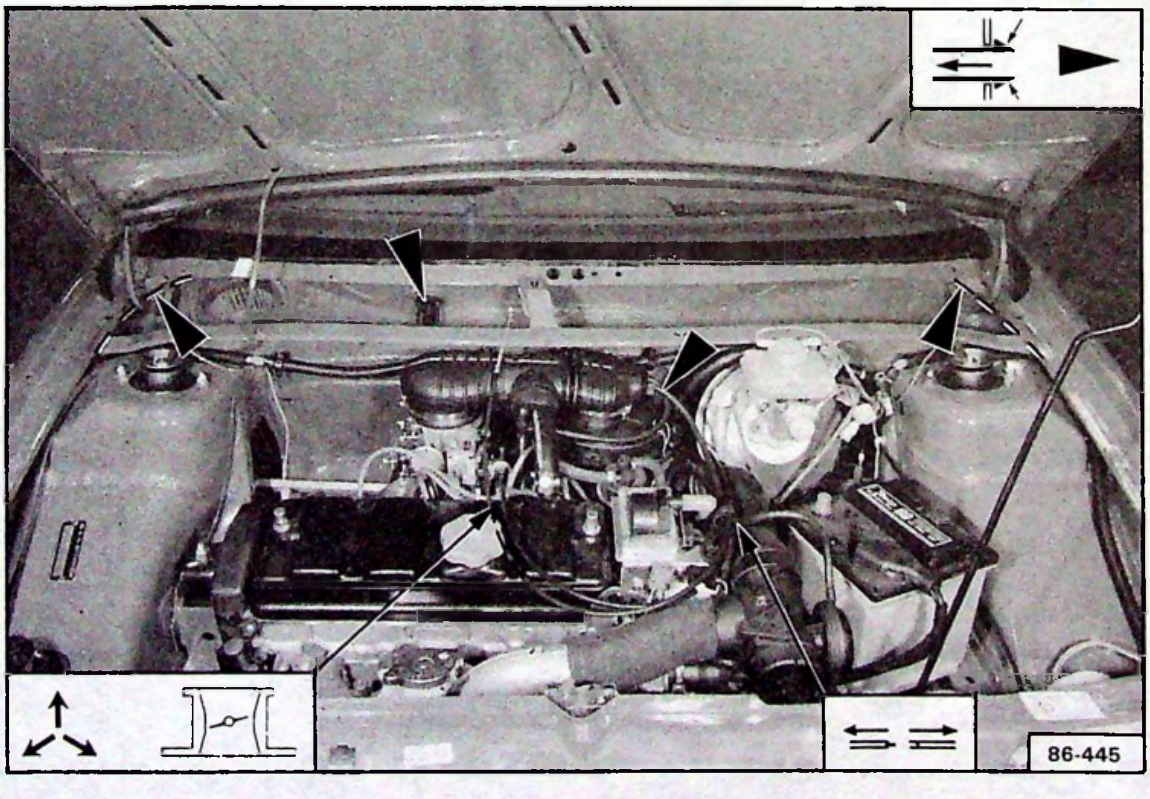
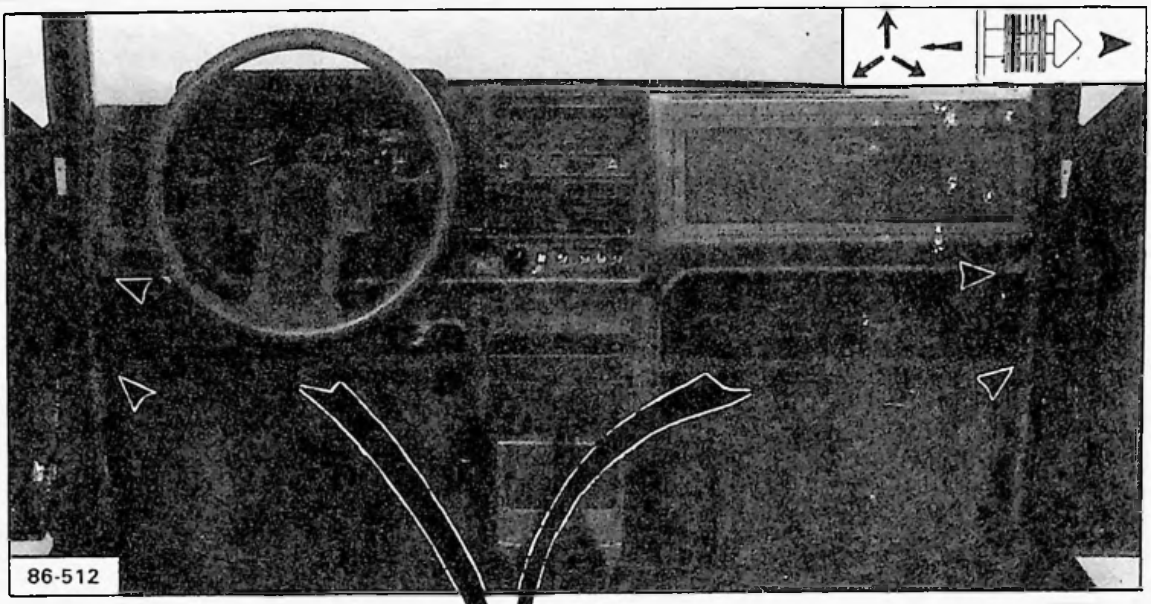


Z 80-10 | Z 80-17

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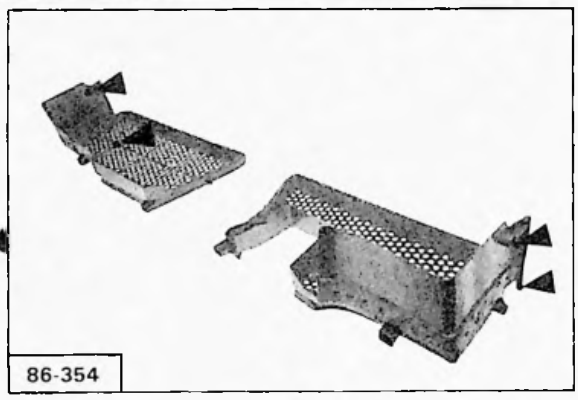
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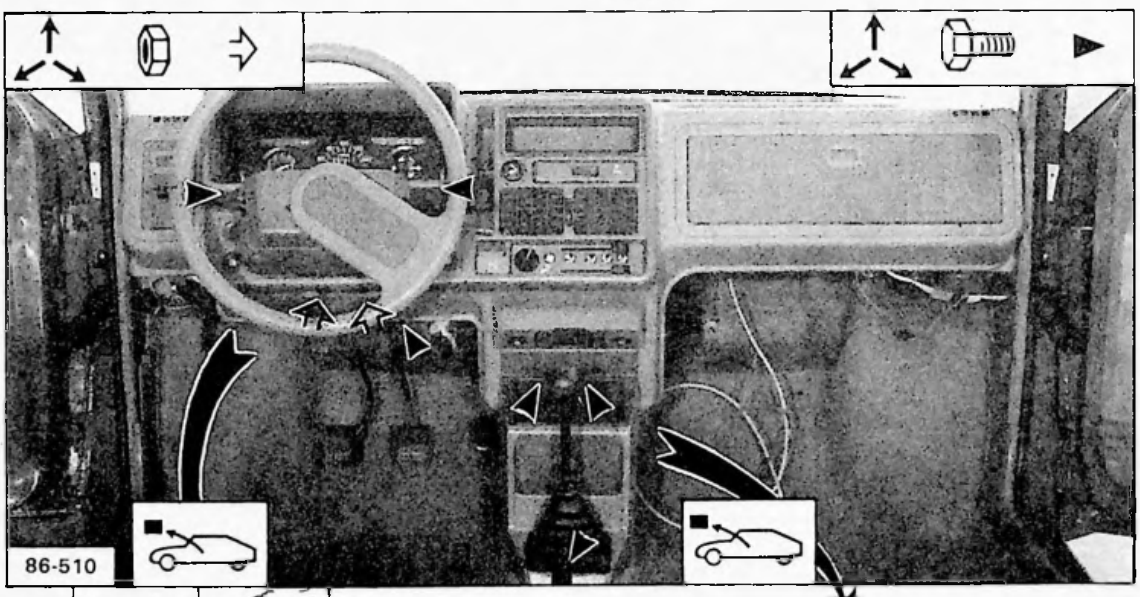
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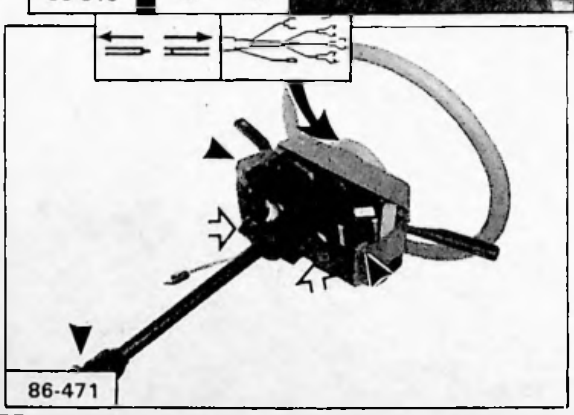
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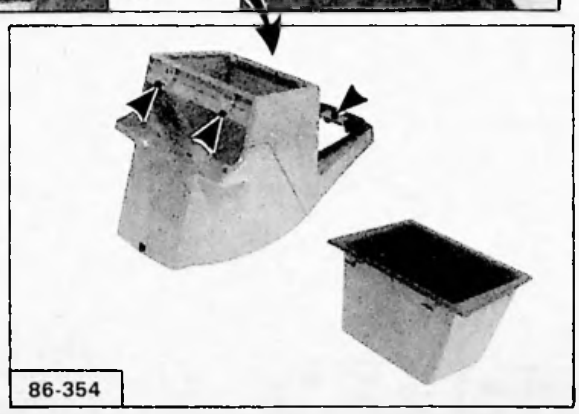
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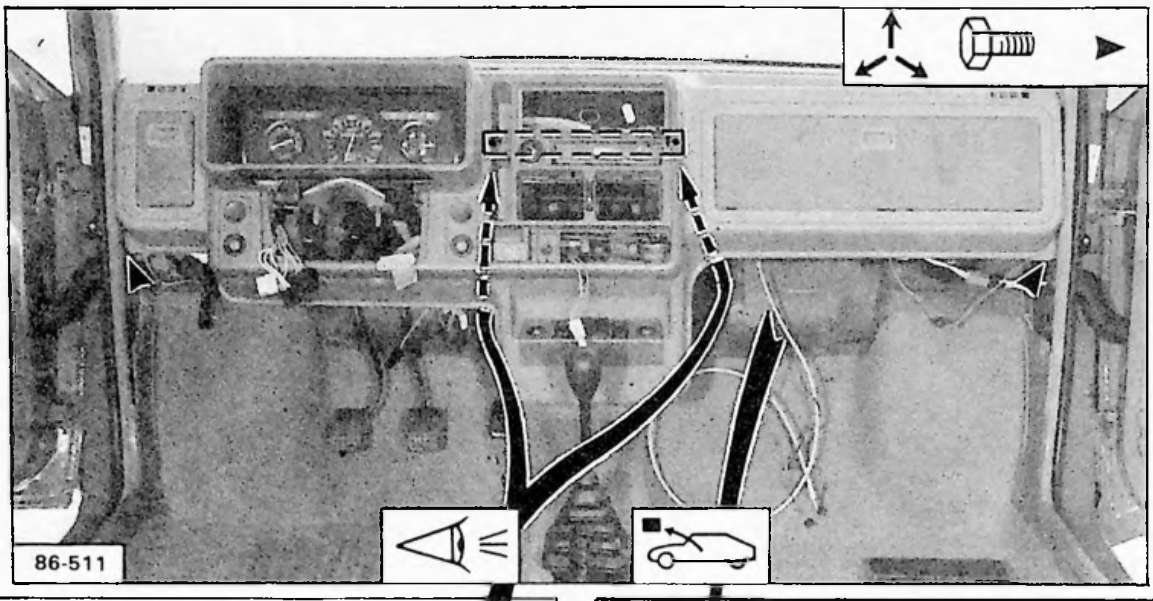
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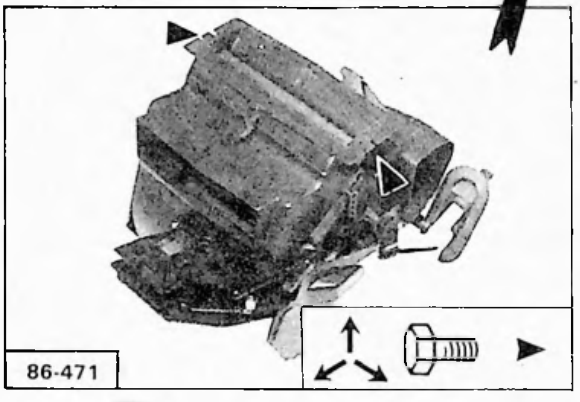
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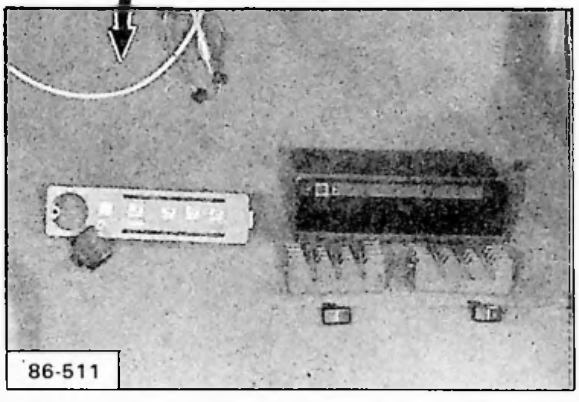
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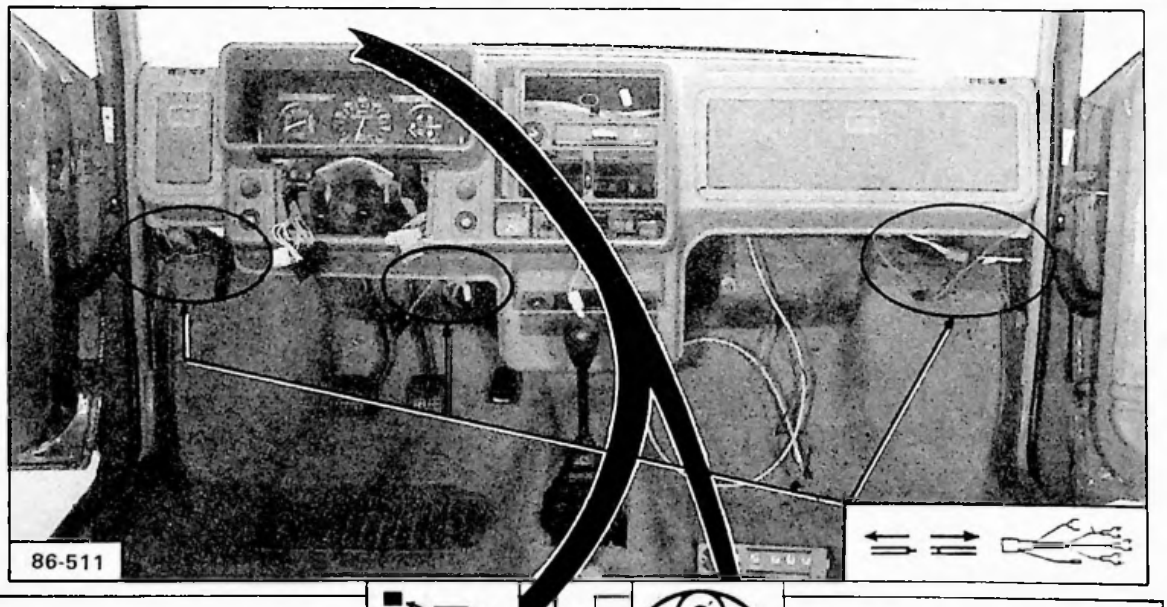
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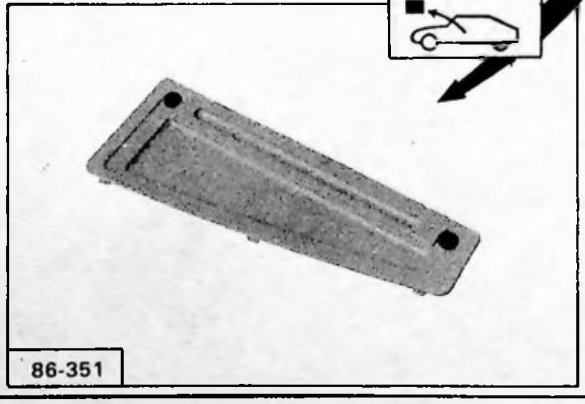
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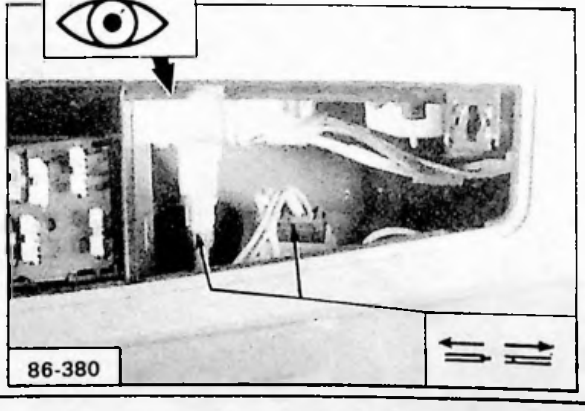
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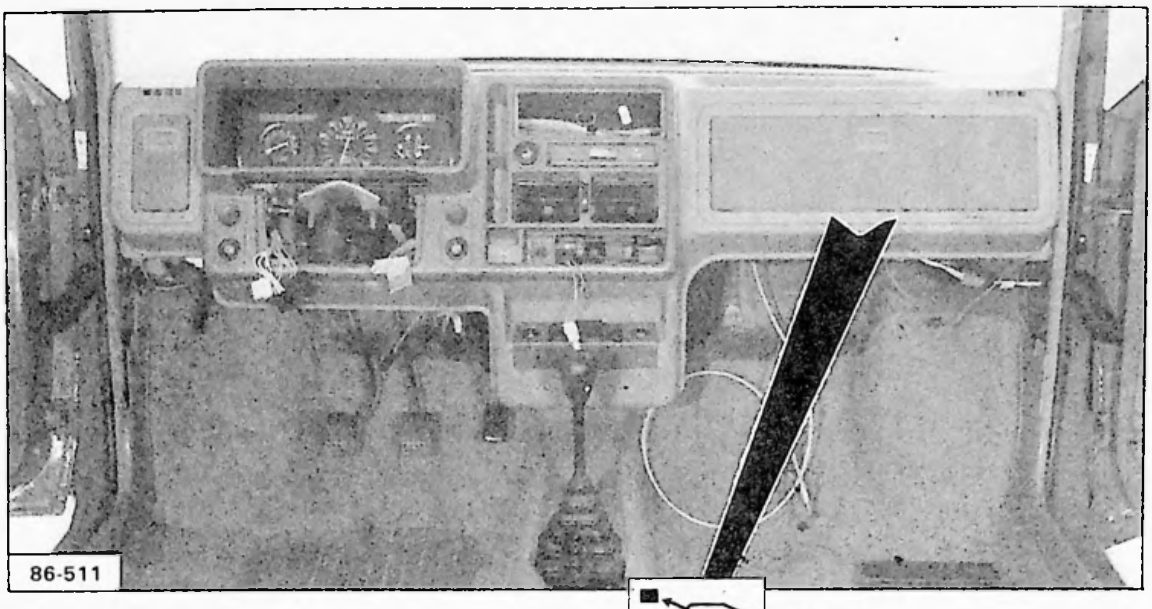
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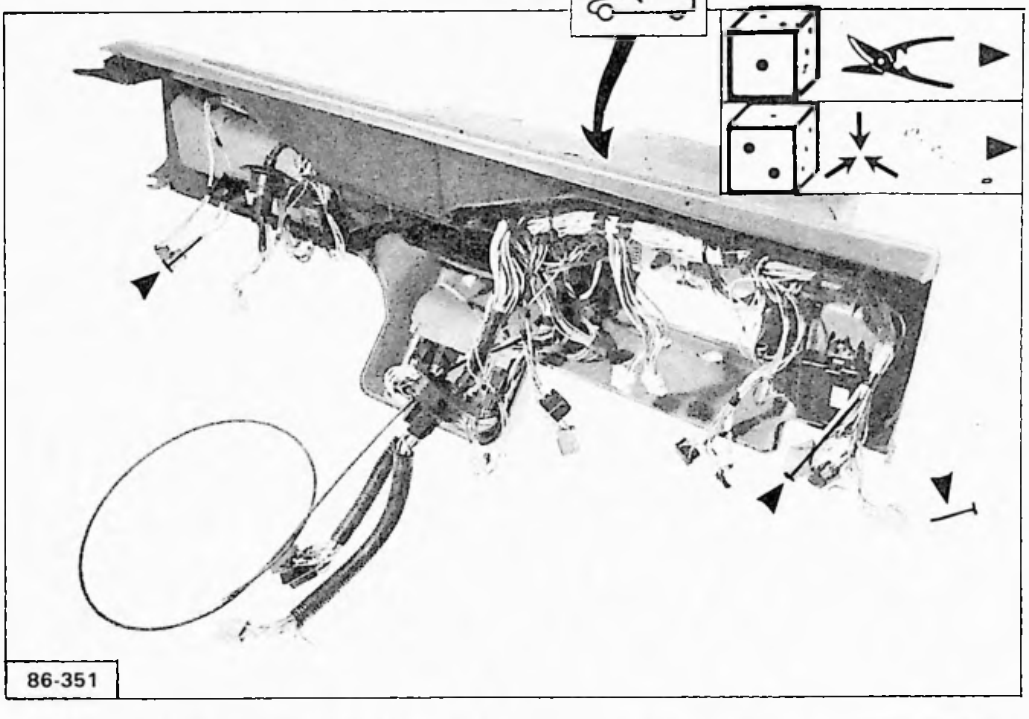
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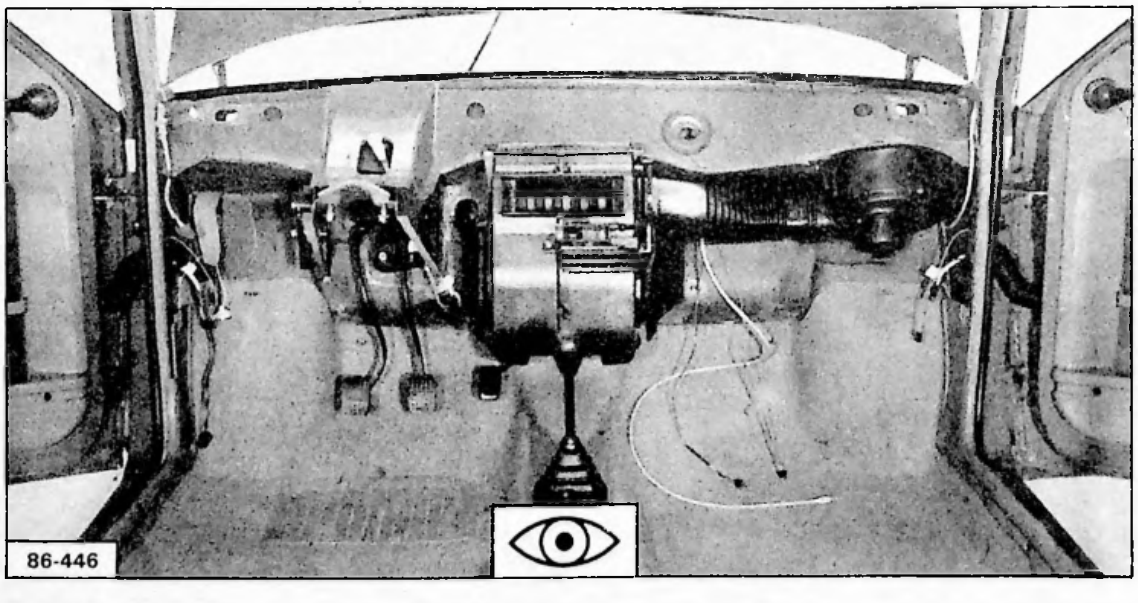
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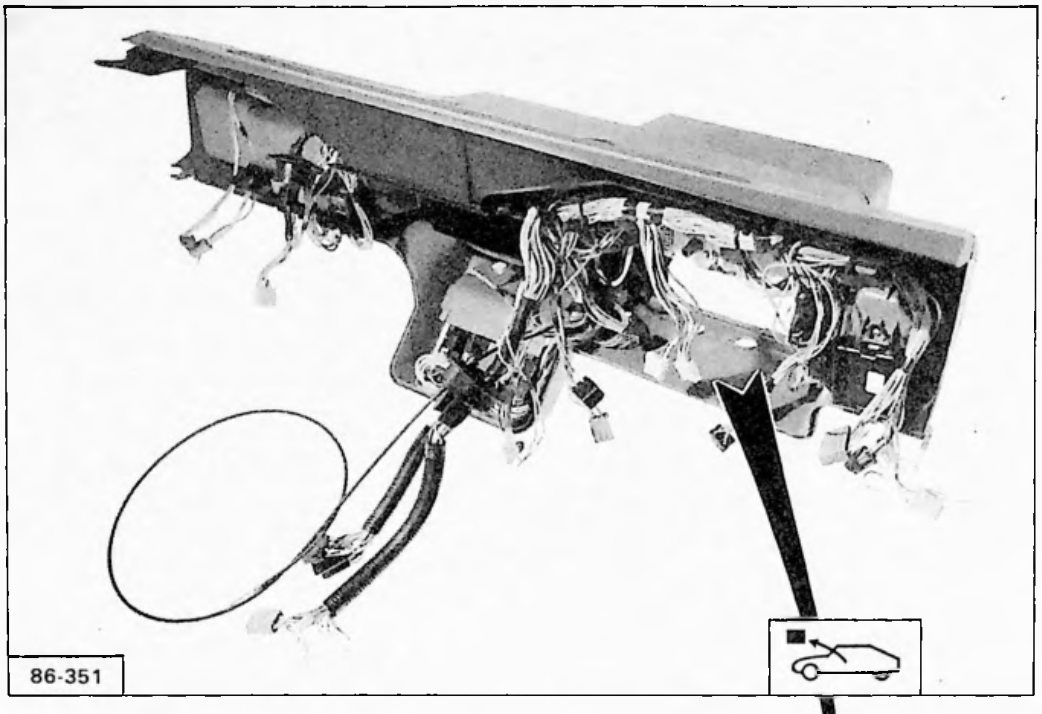
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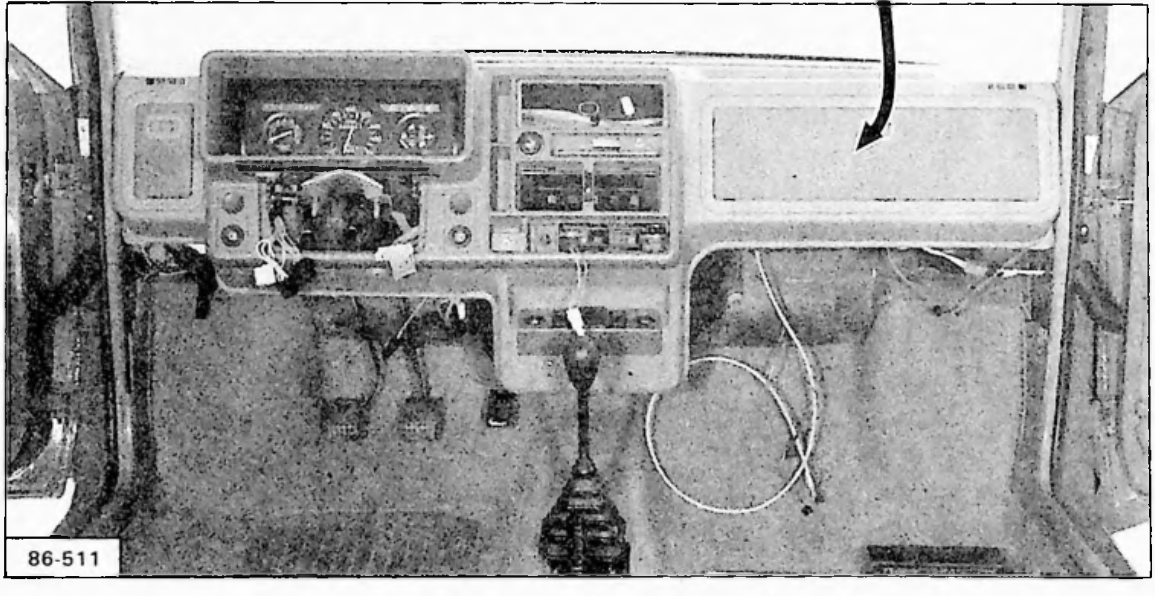
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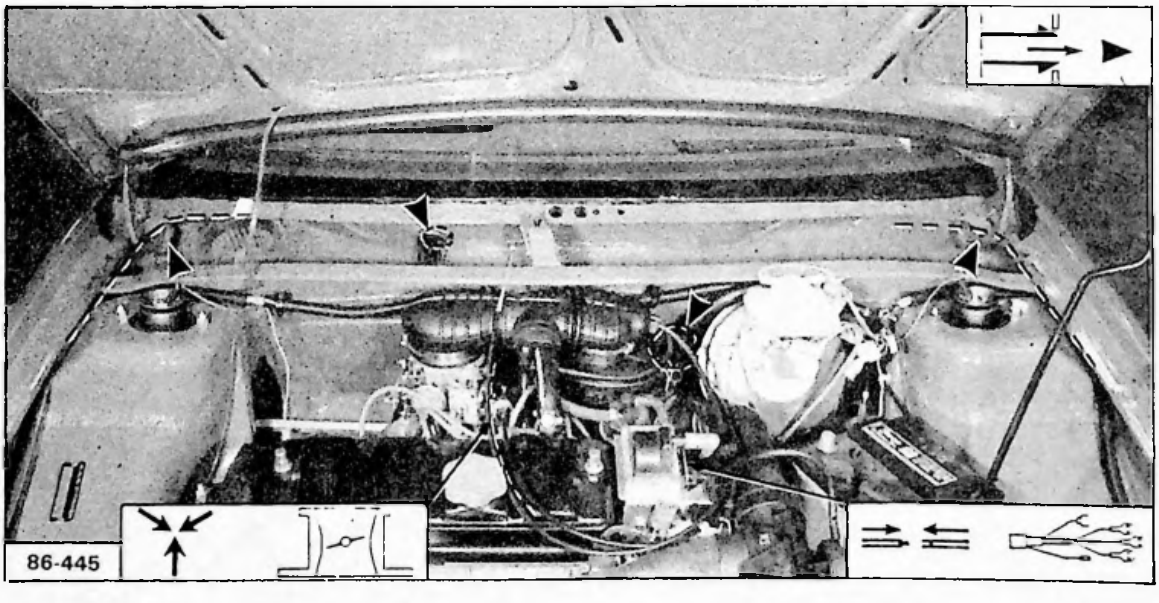
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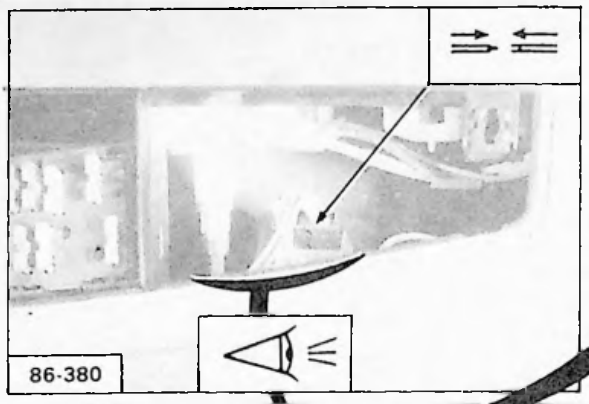
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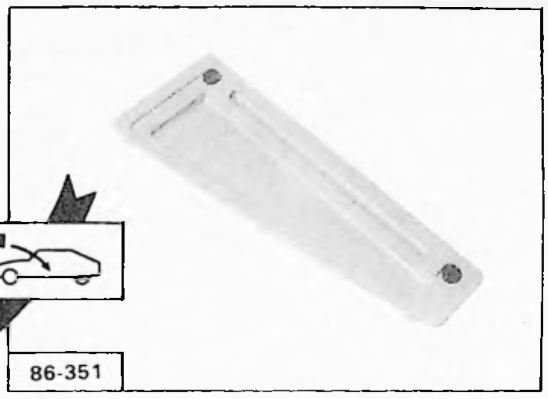
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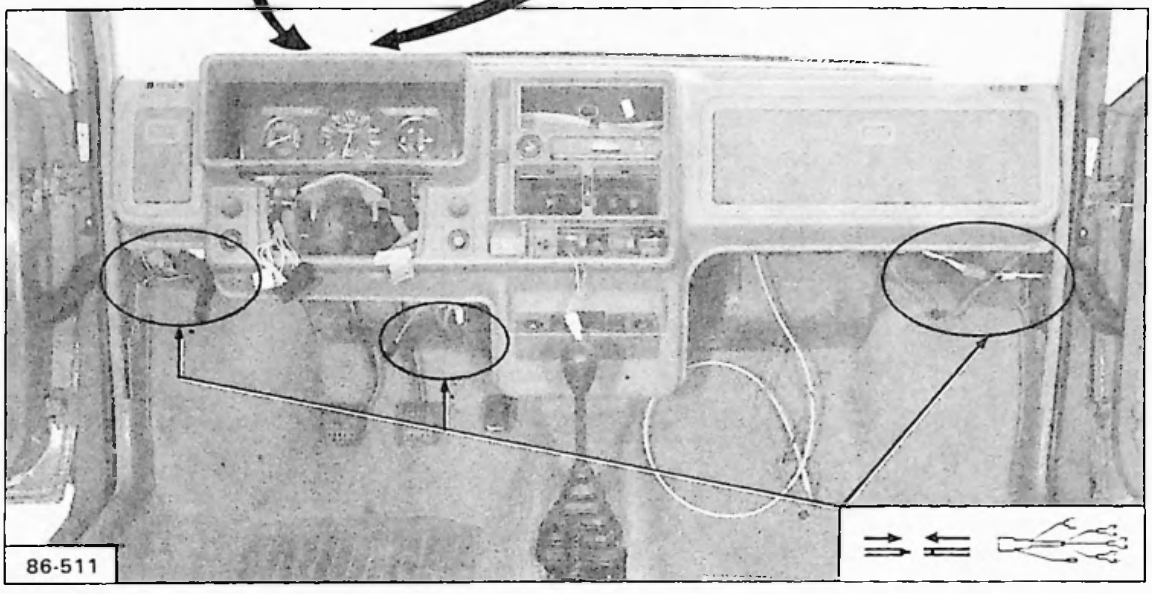
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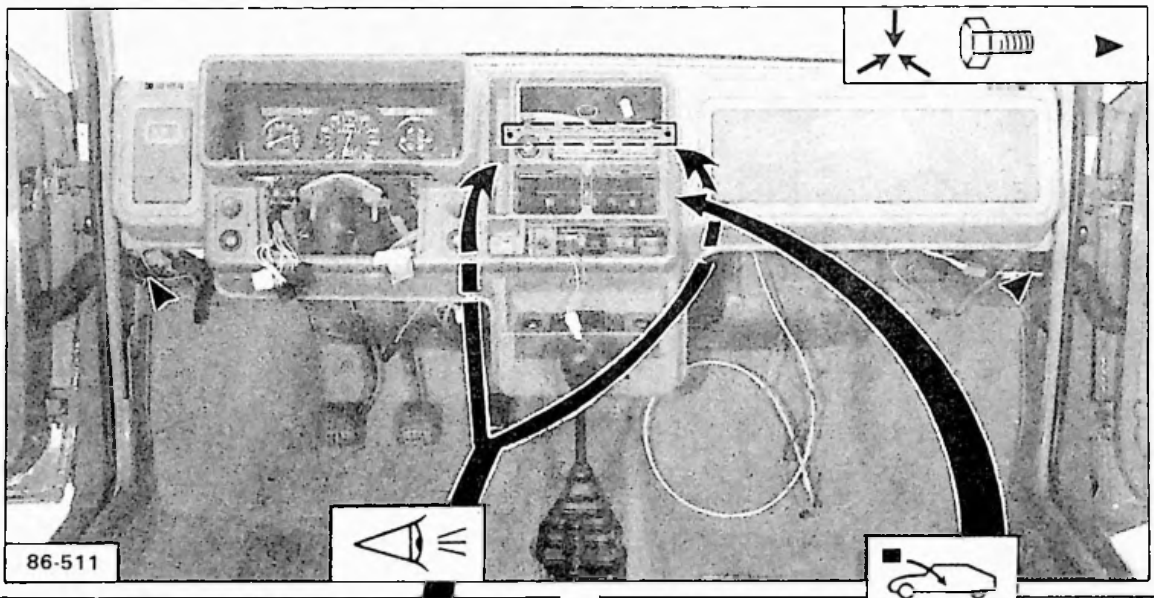
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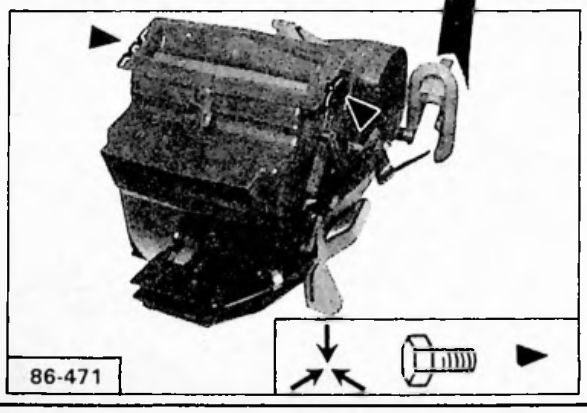
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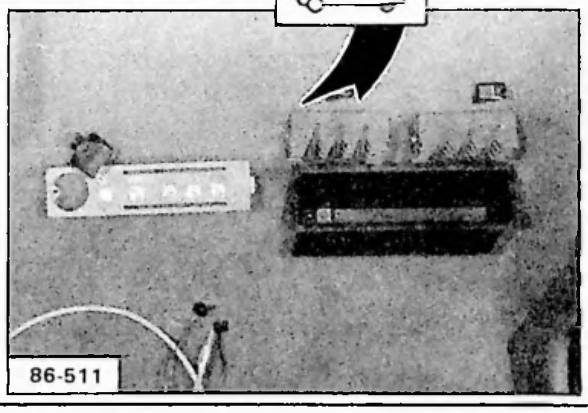
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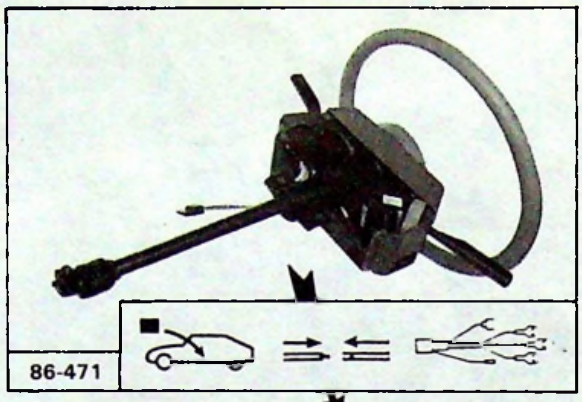
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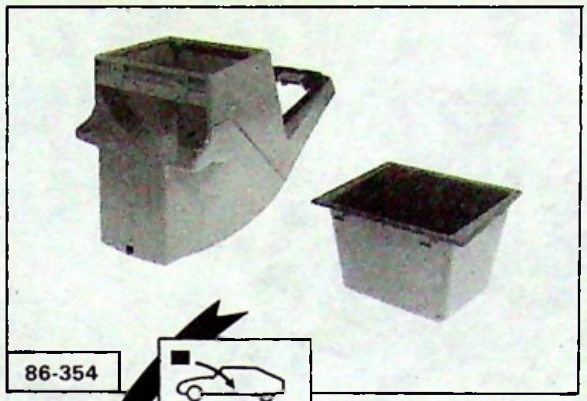
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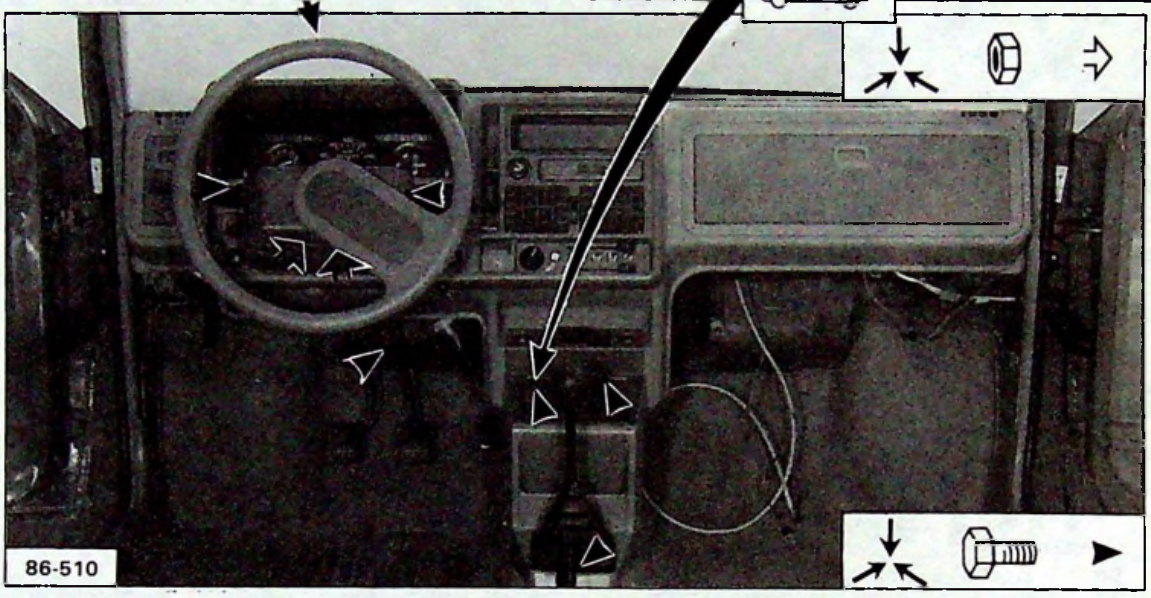
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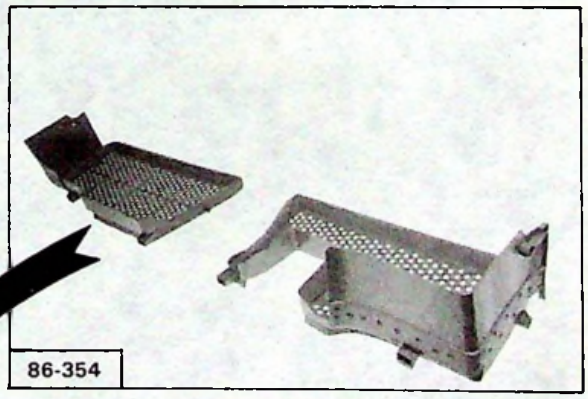
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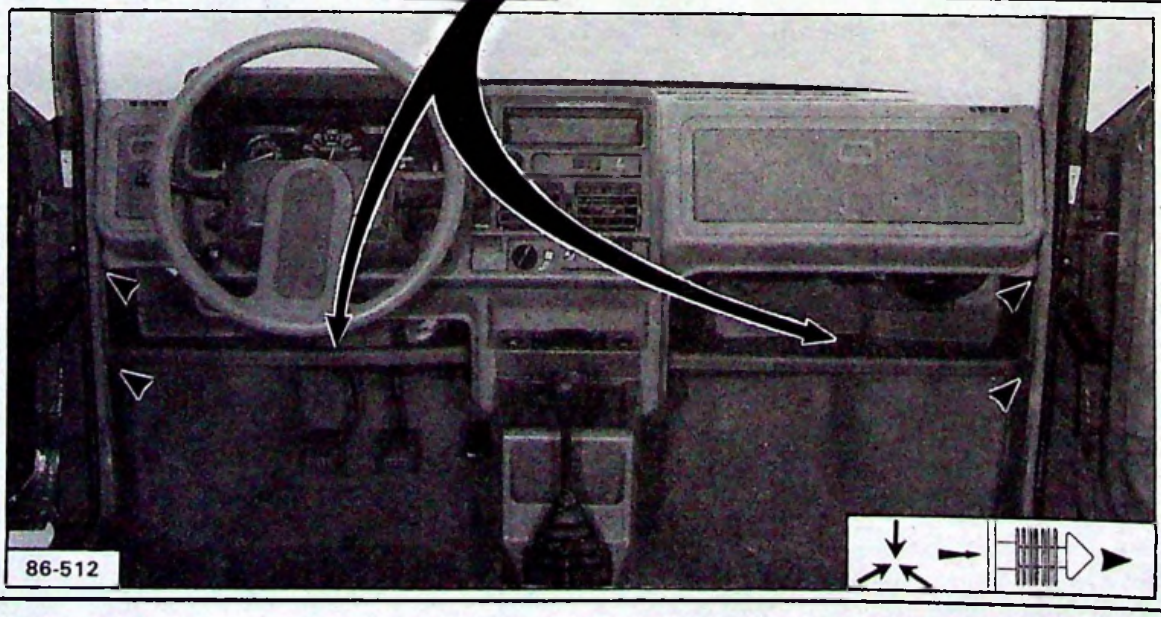
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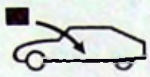
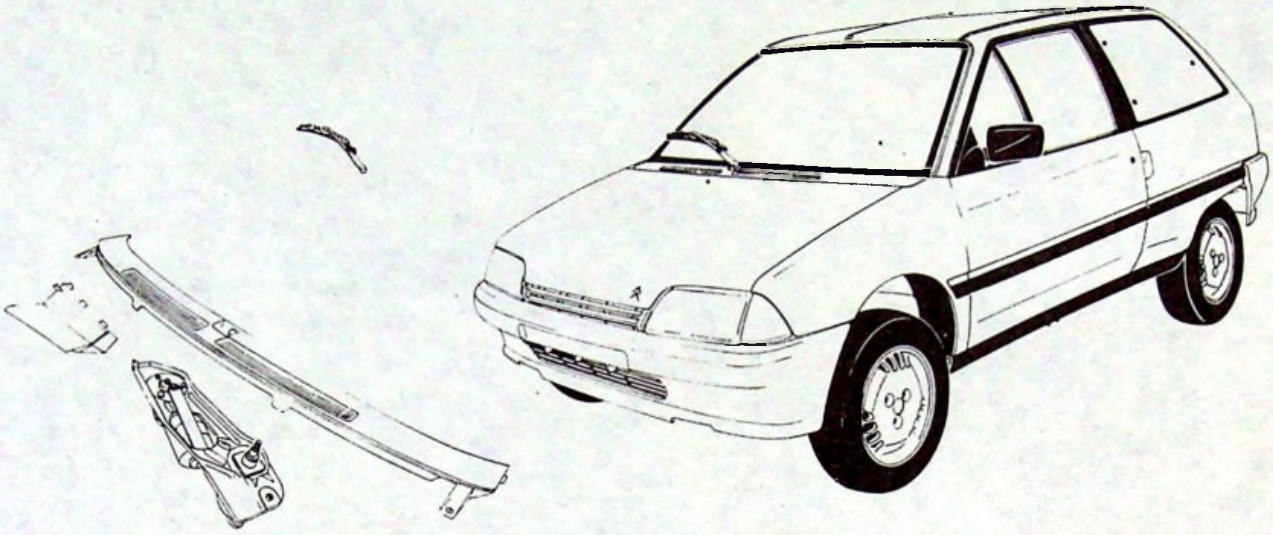
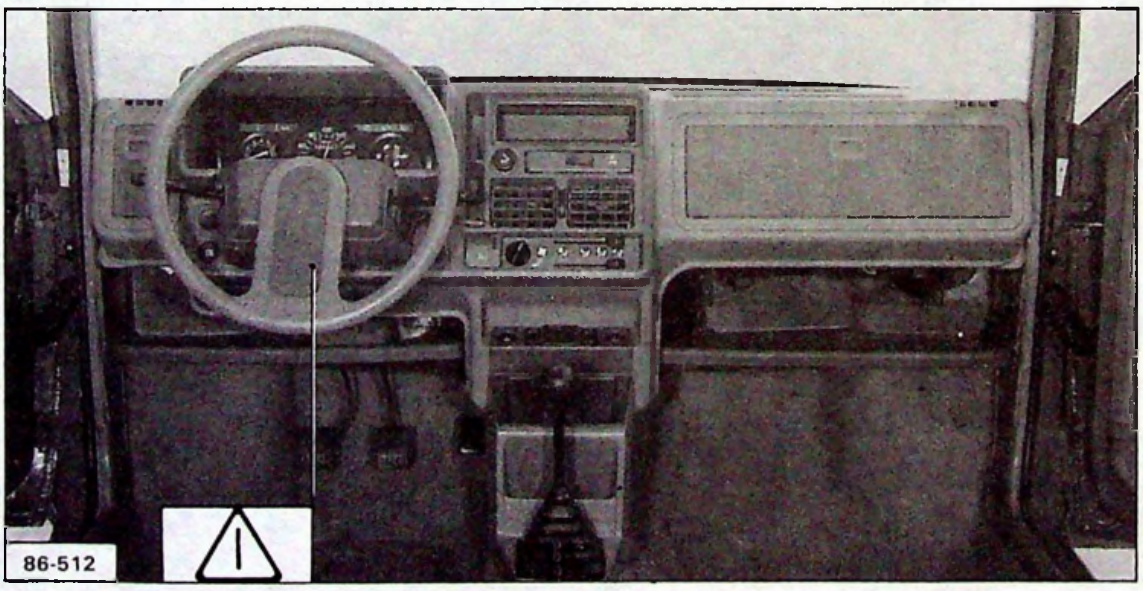
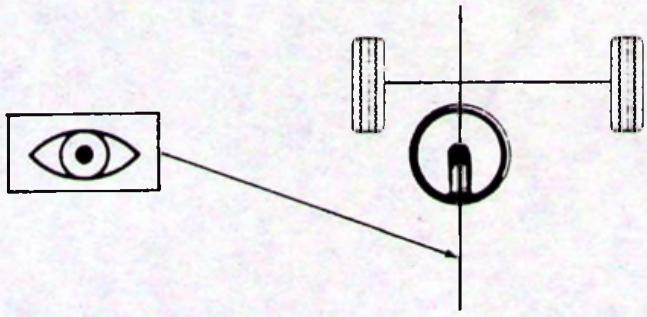
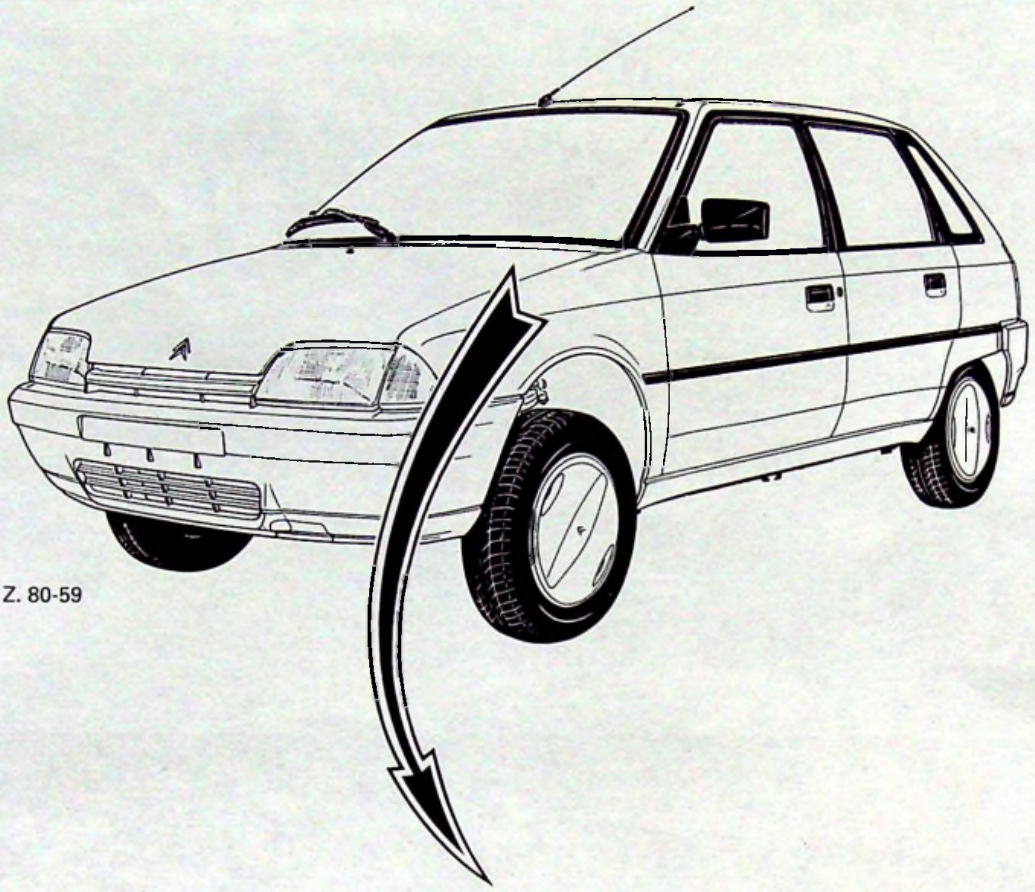




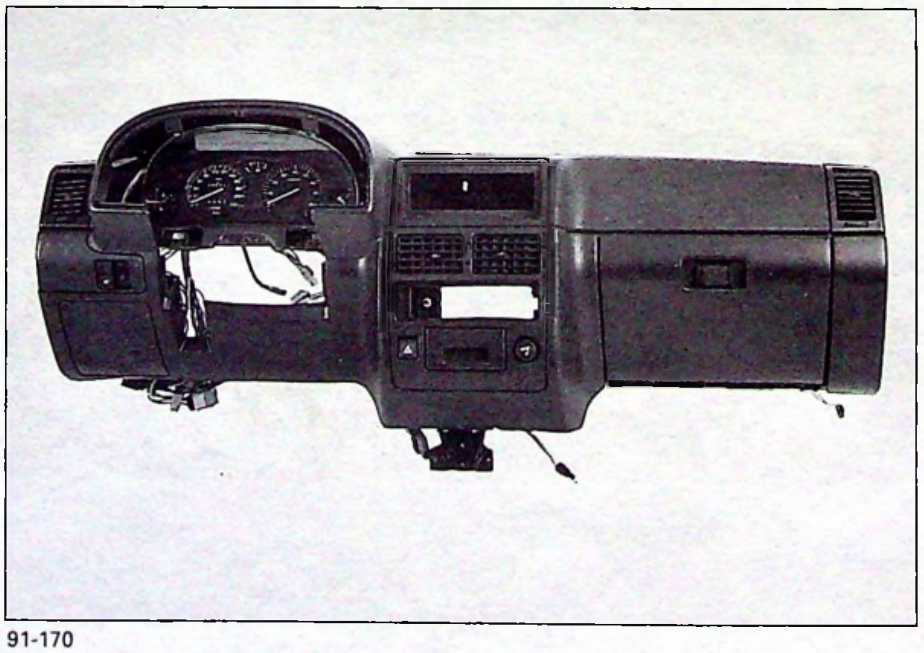
Z 80-10 | Z 80-17







Z. 80-59



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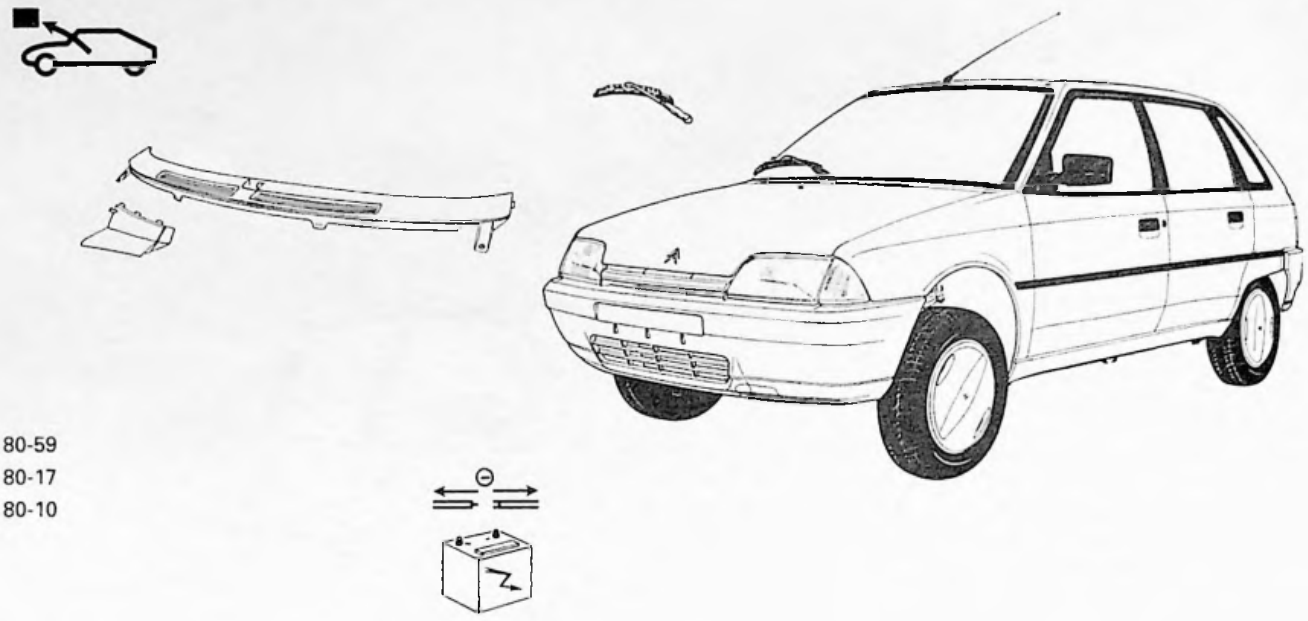
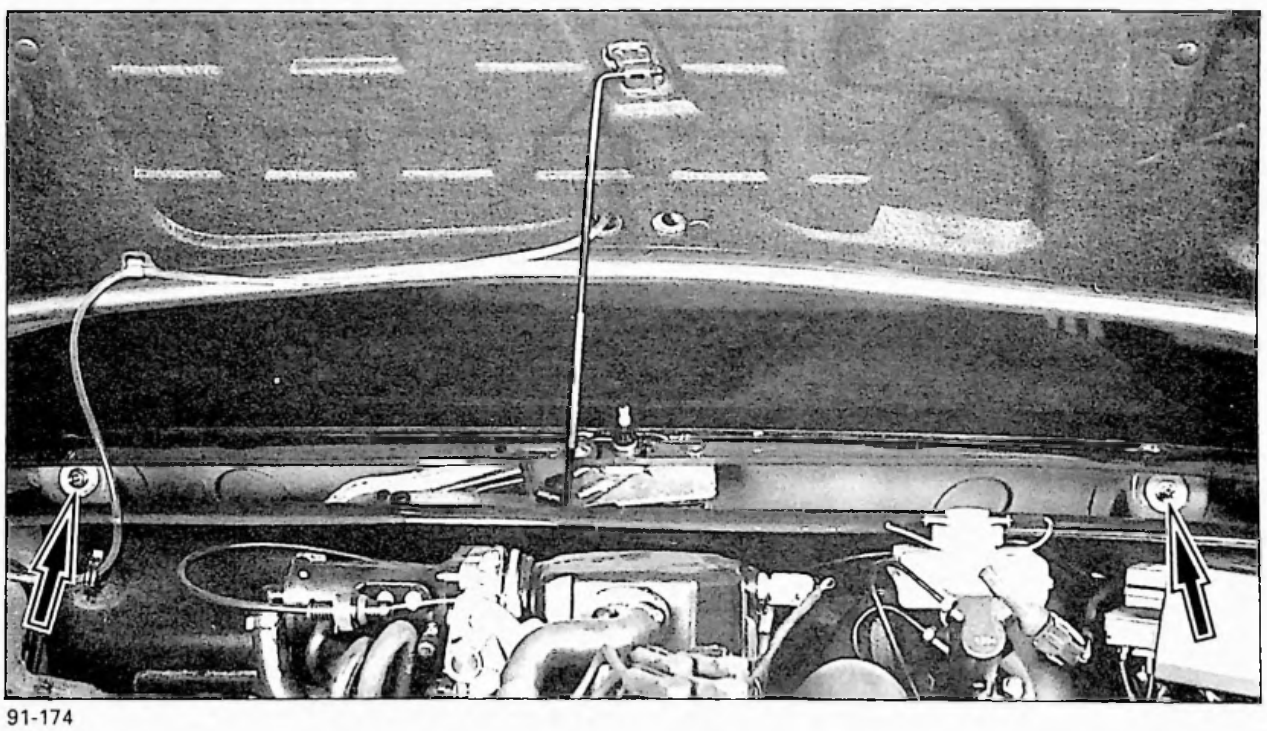


Z. 80-59
Z. 80-17
Z. 80-10



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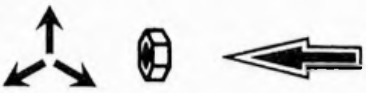

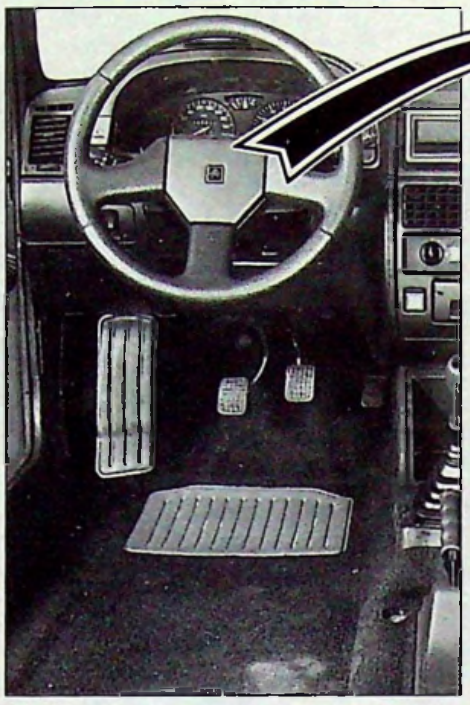

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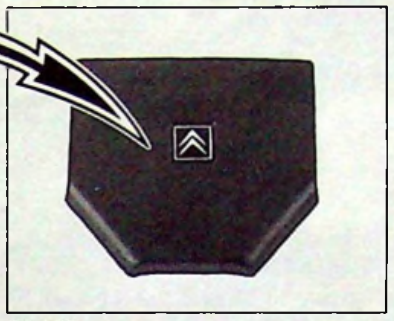

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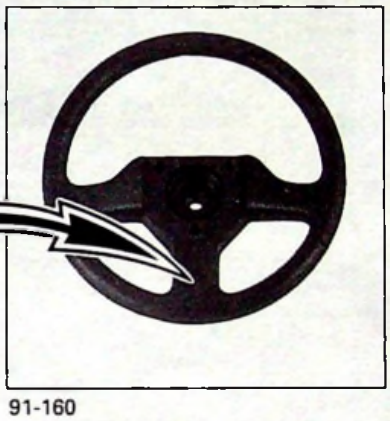

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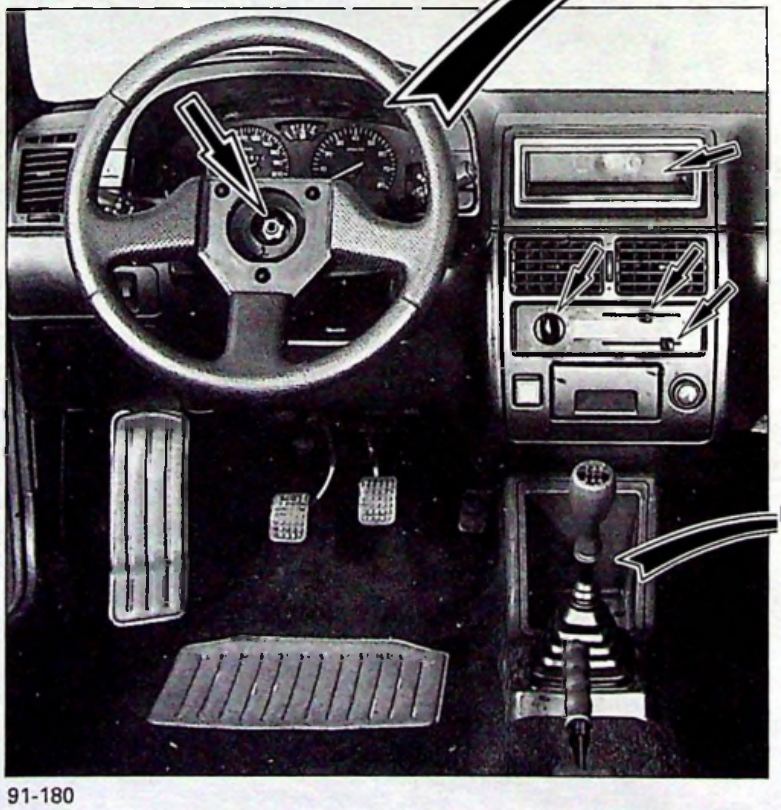

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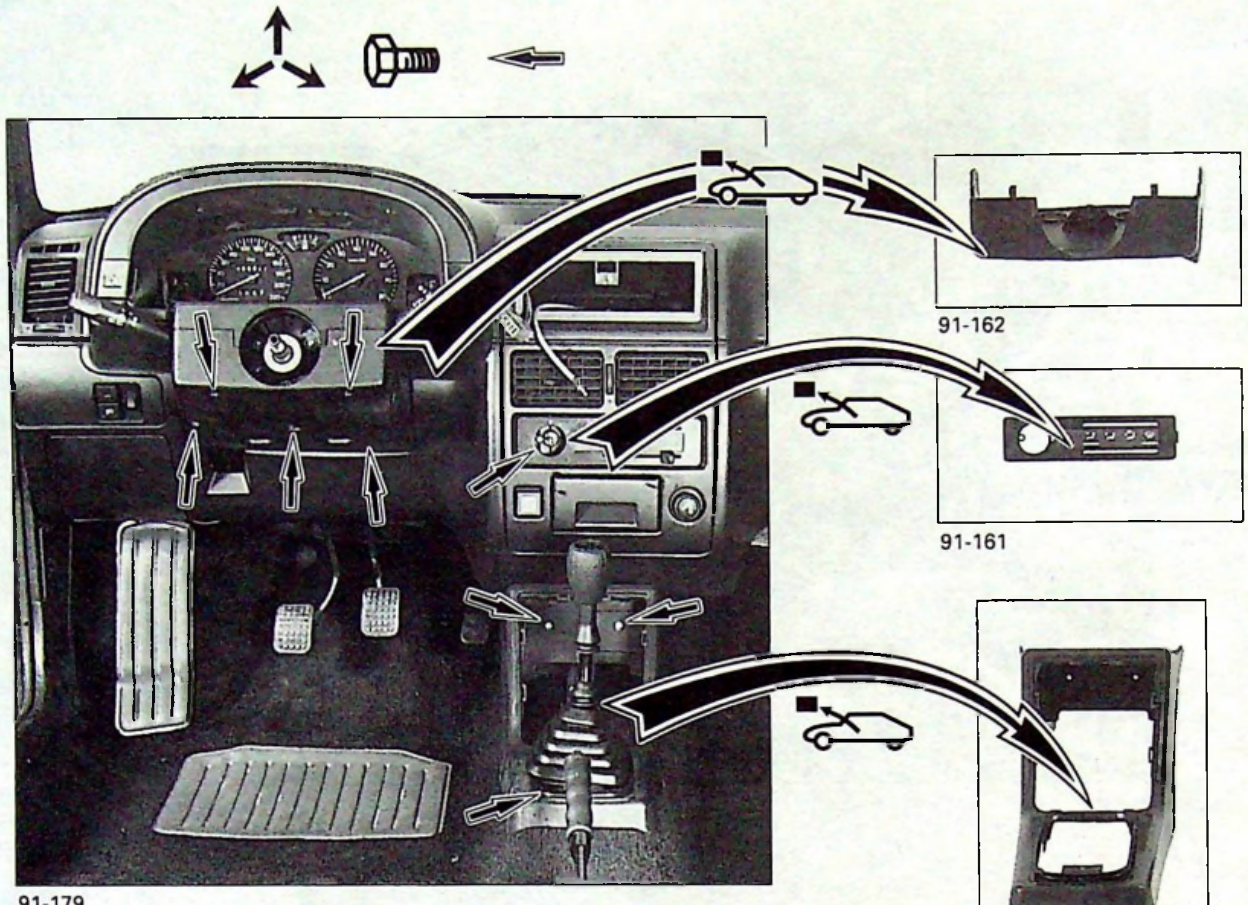
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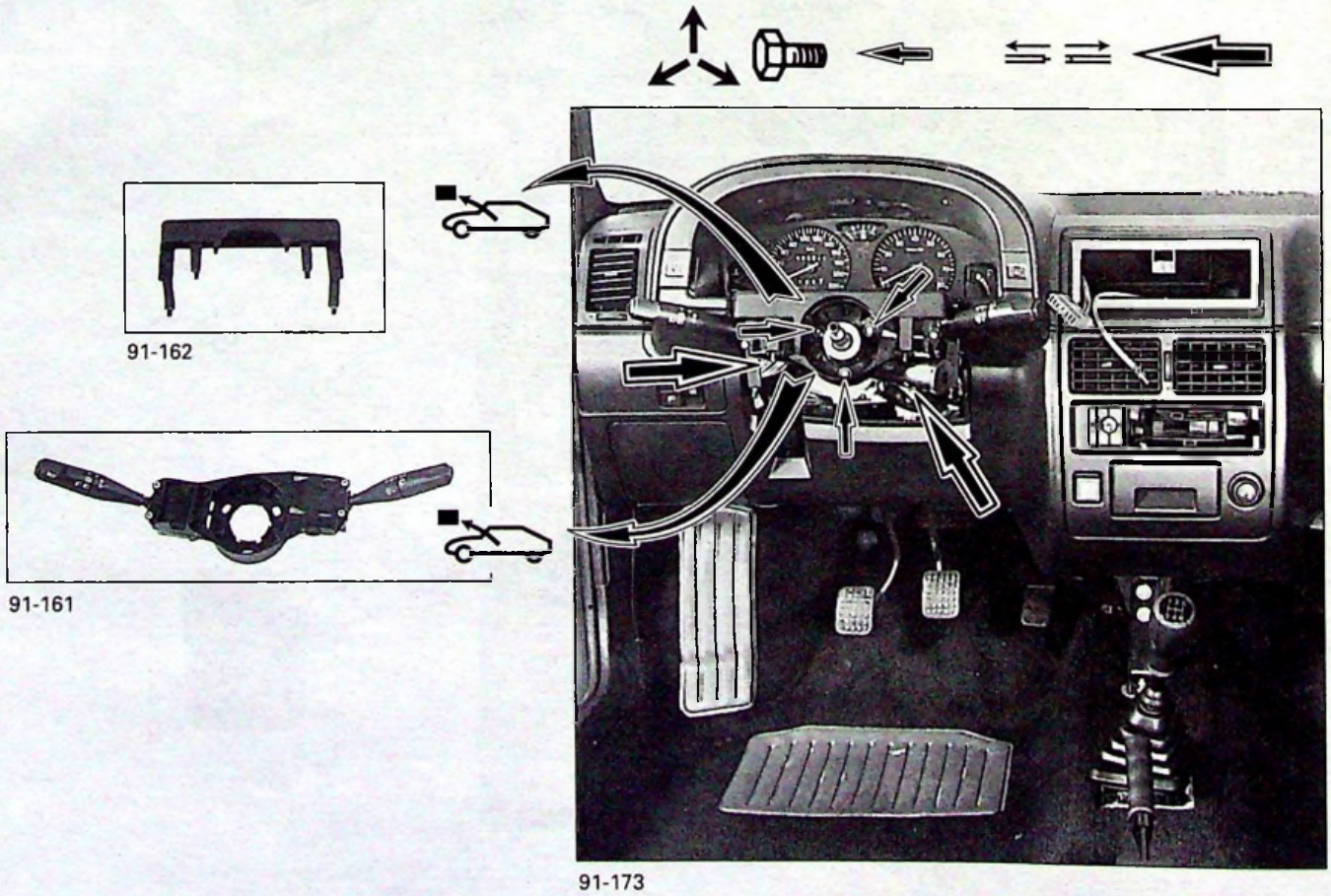
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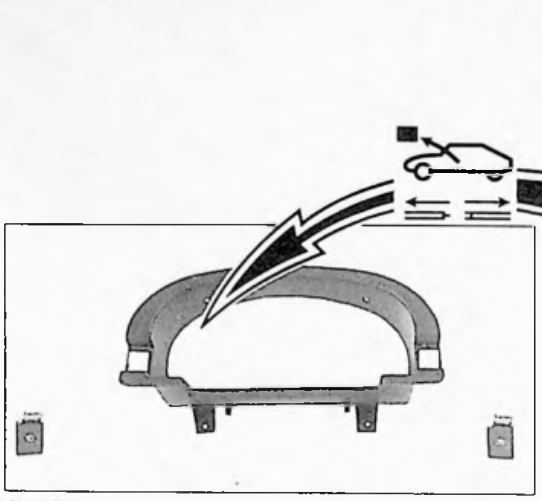

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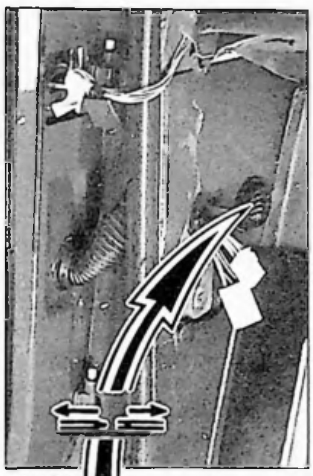

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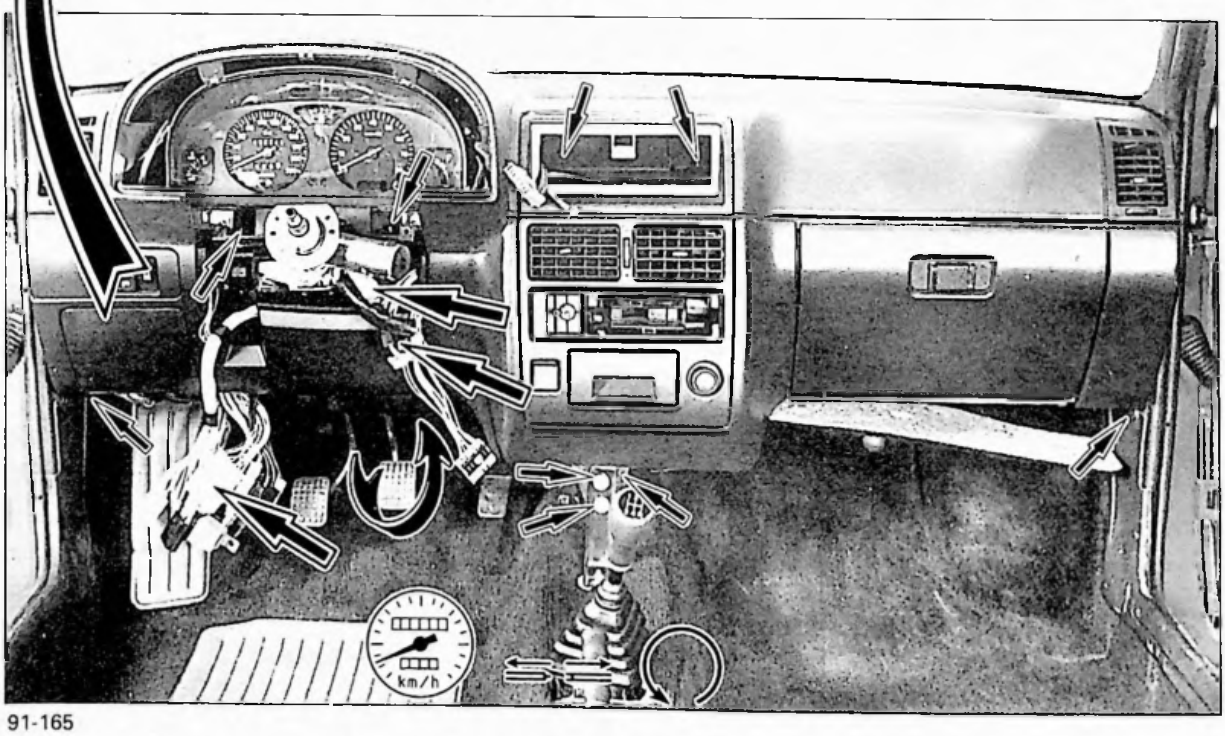

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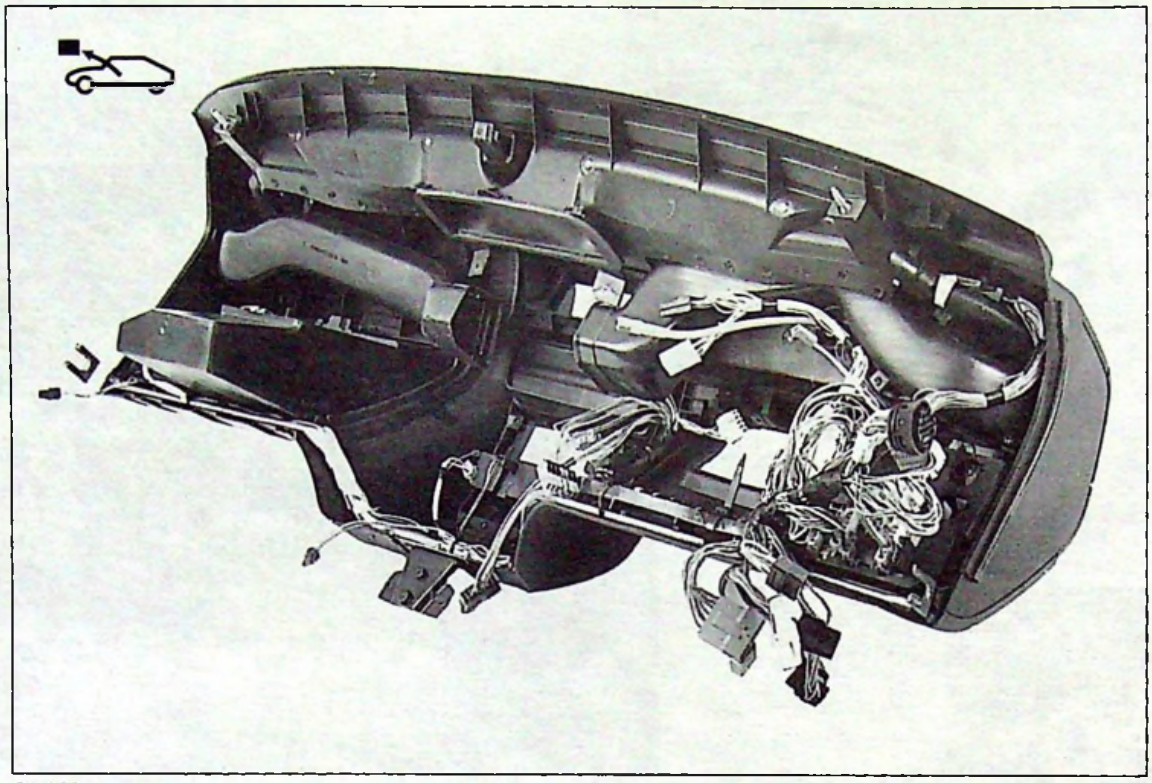

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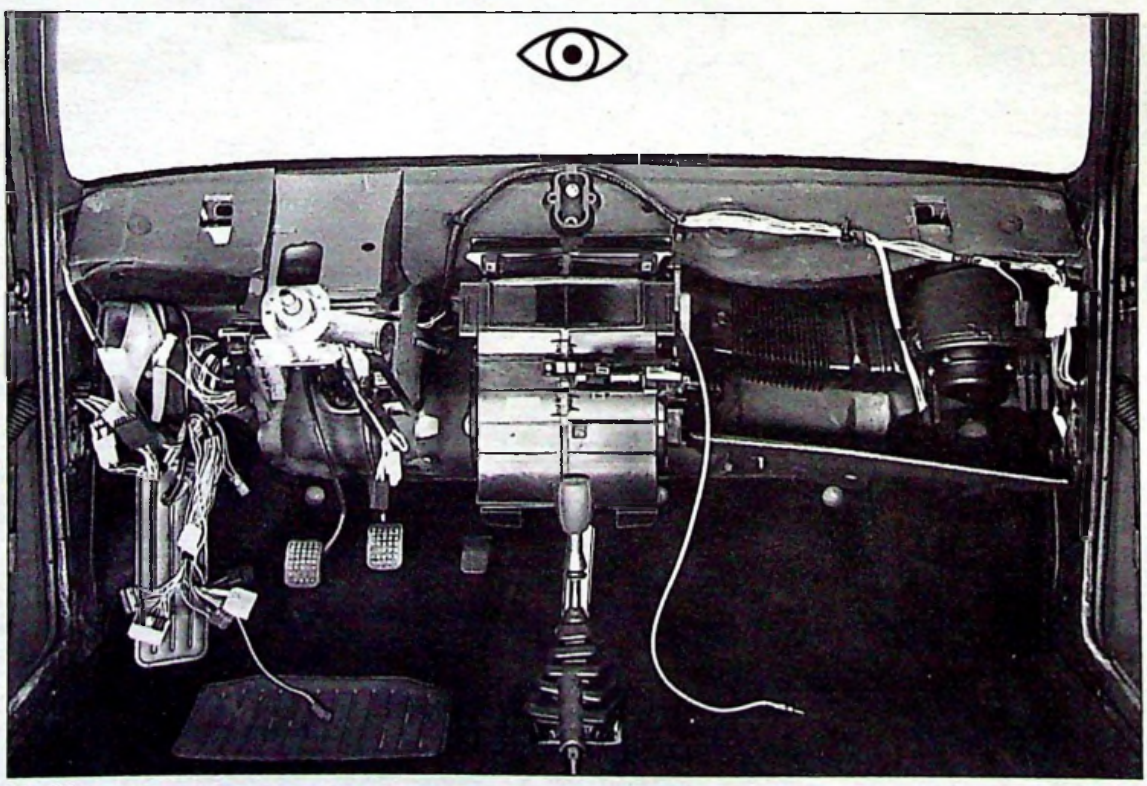

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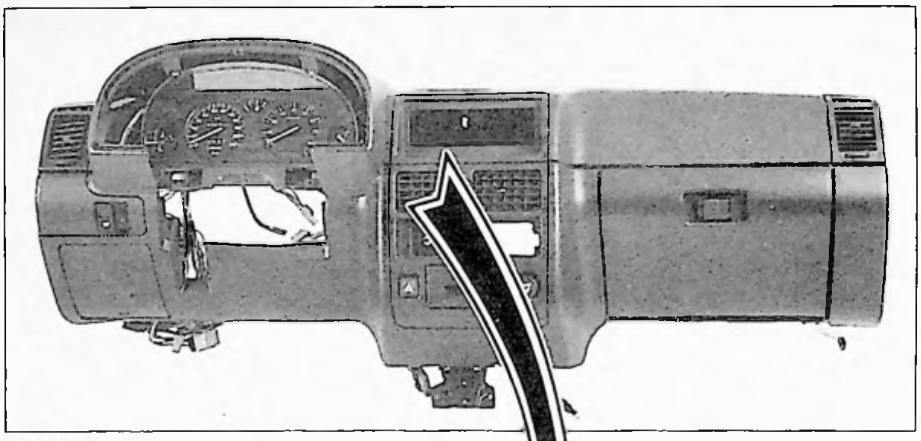

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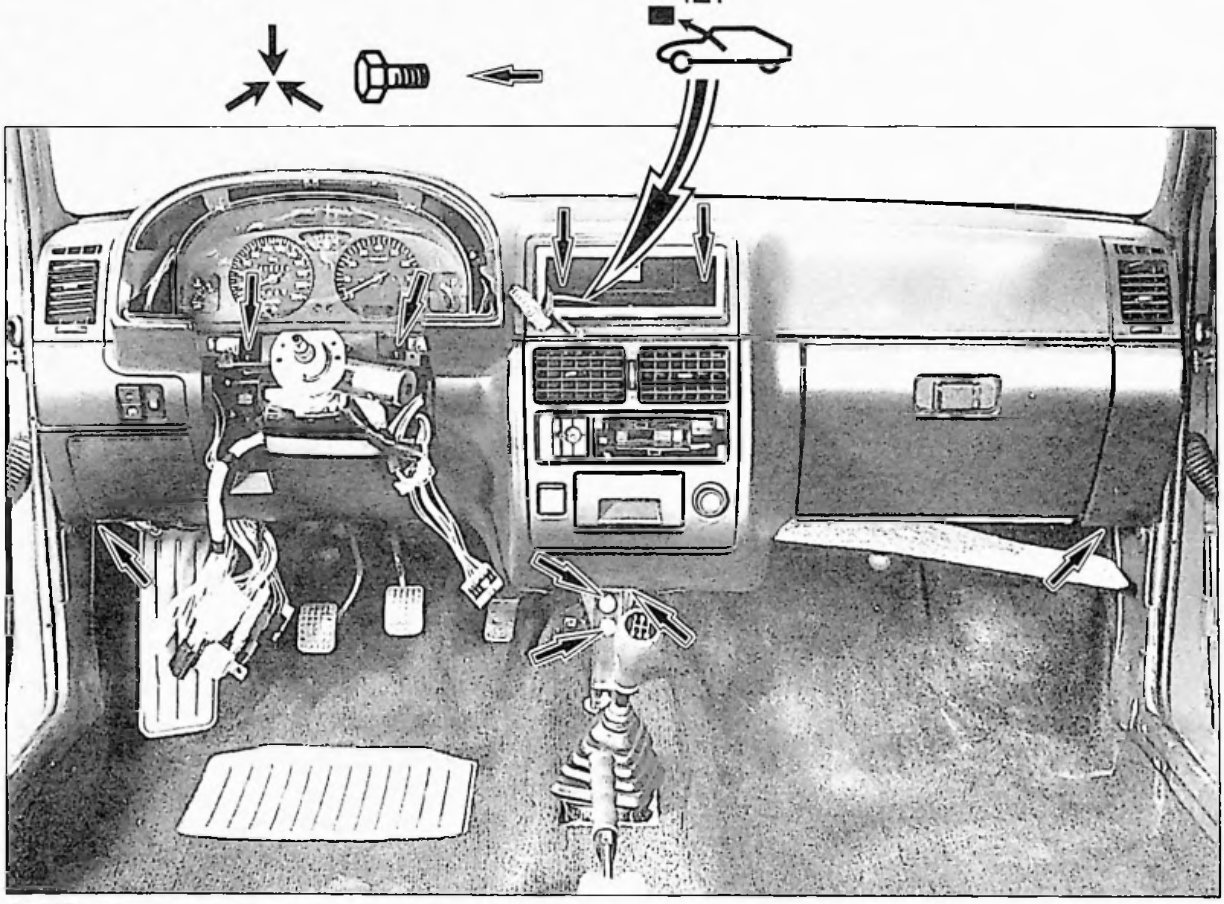

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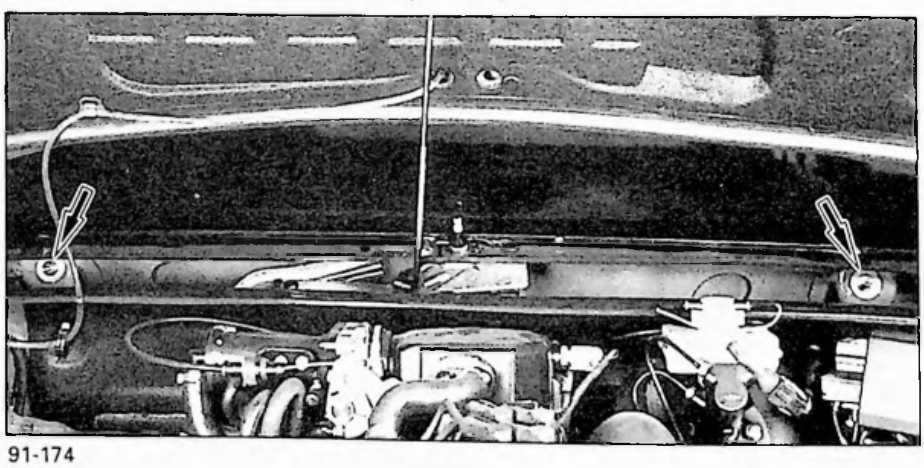

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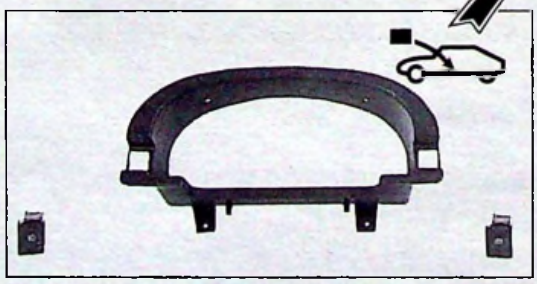

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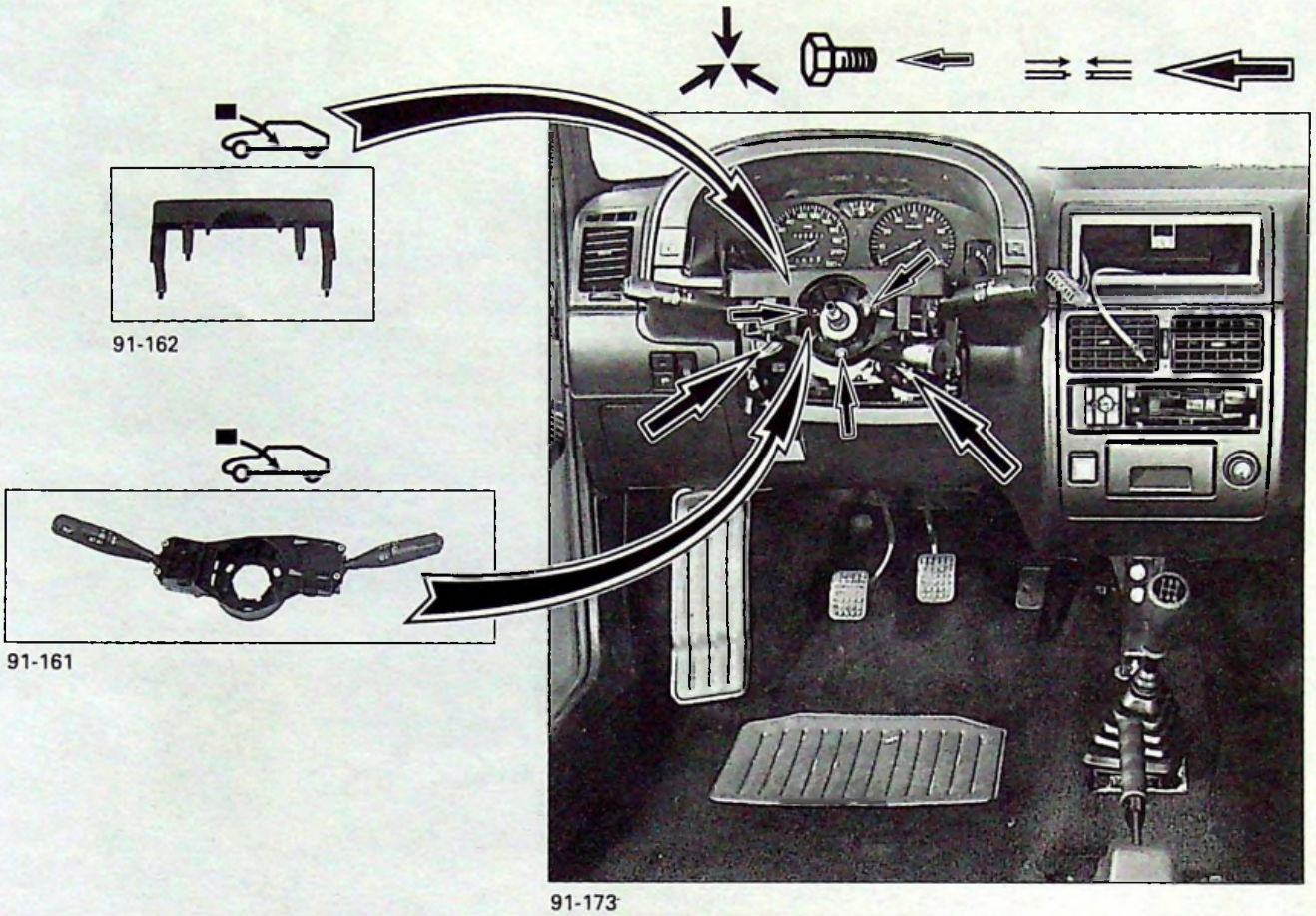
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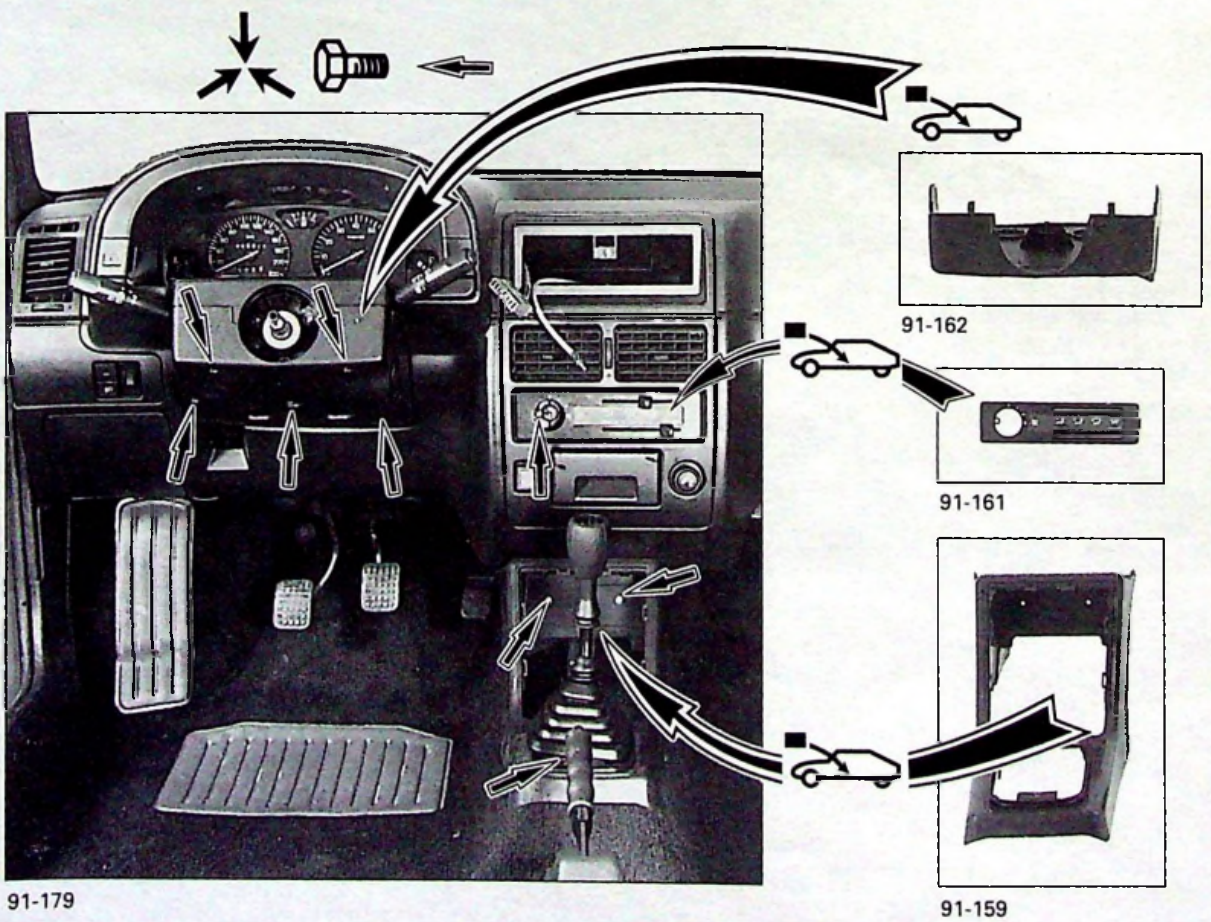
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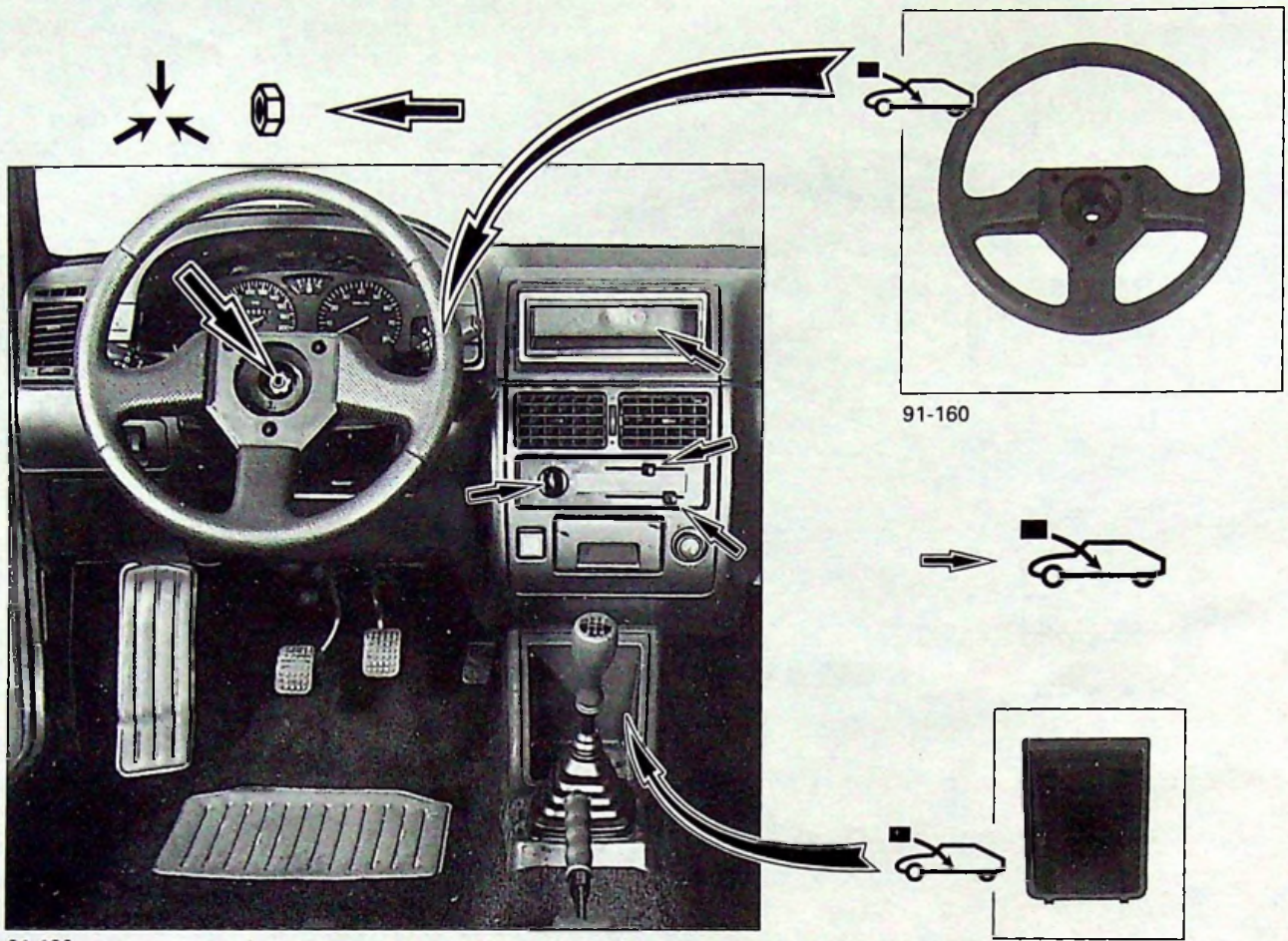
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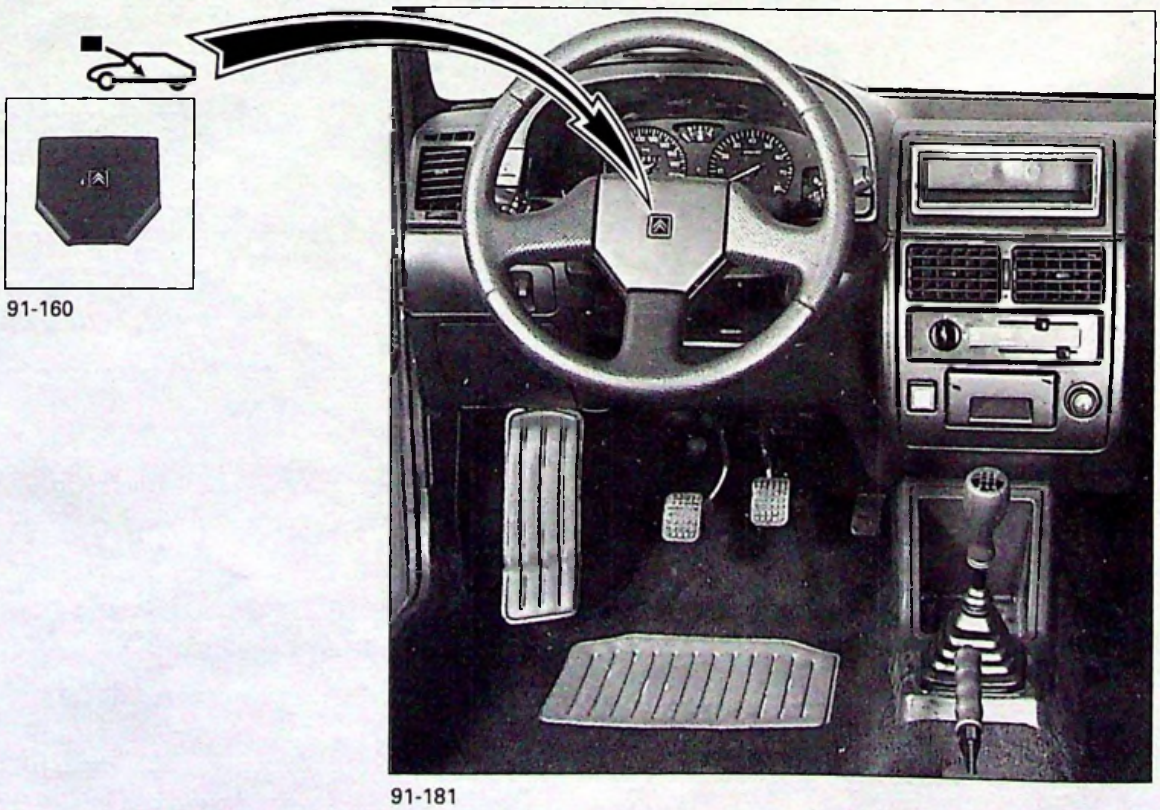
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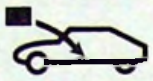

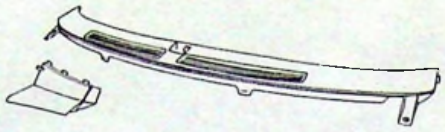

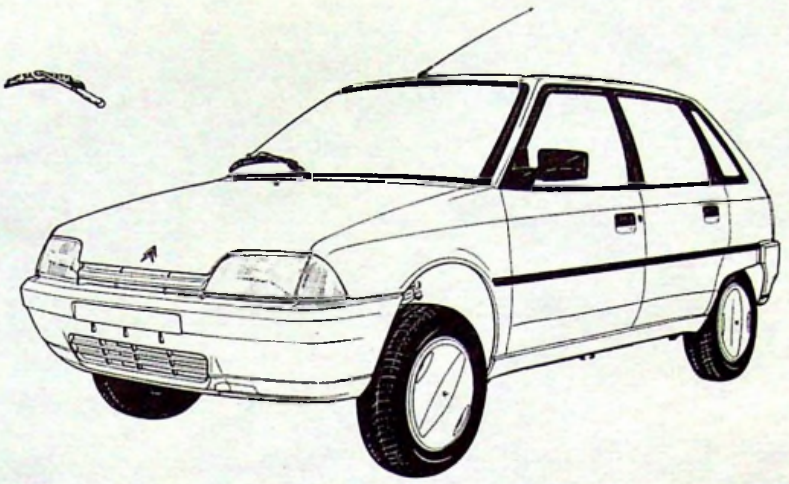

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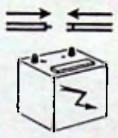

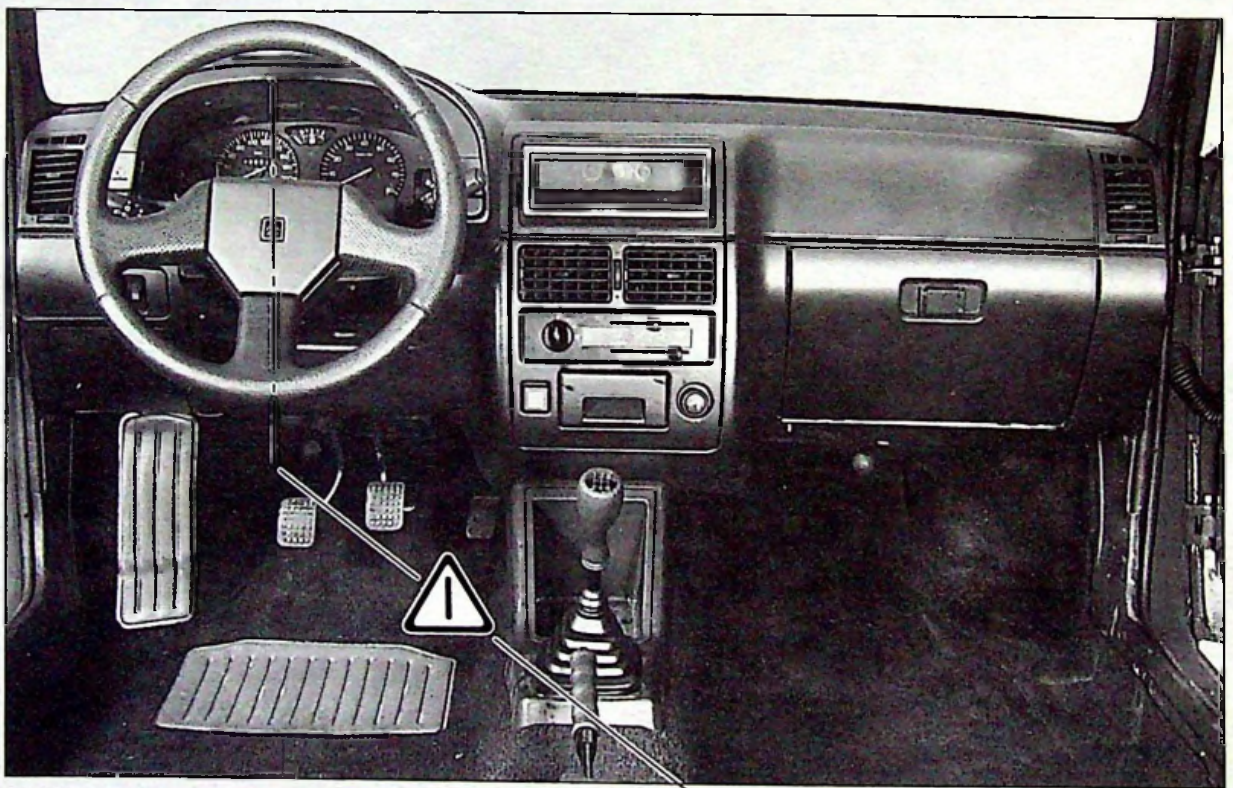

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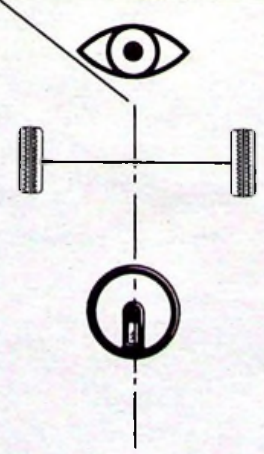

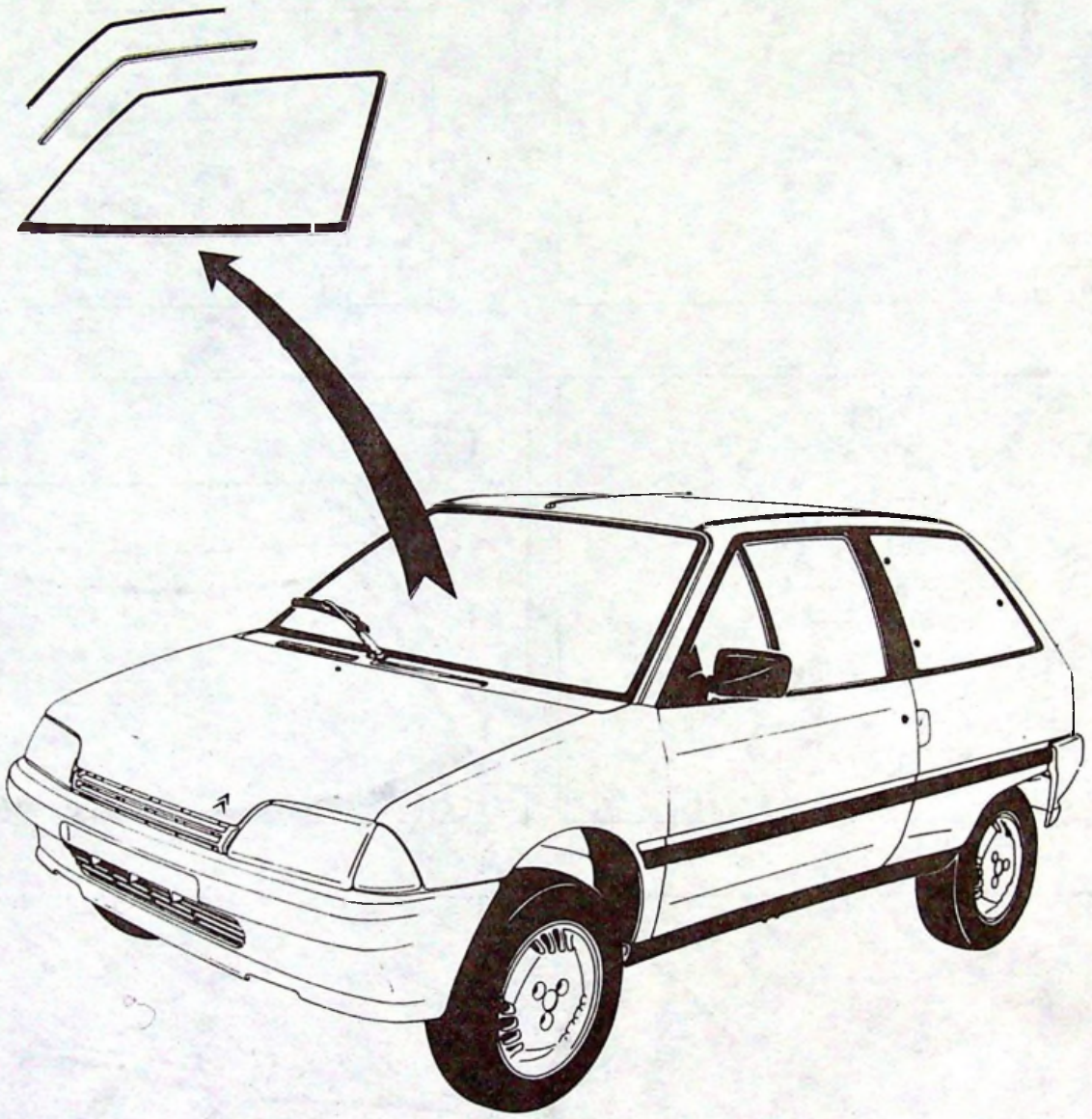

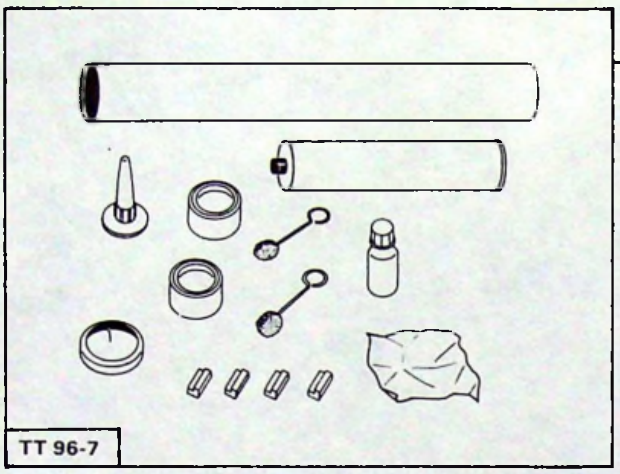
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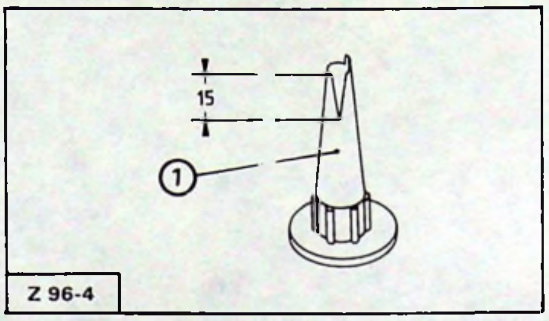

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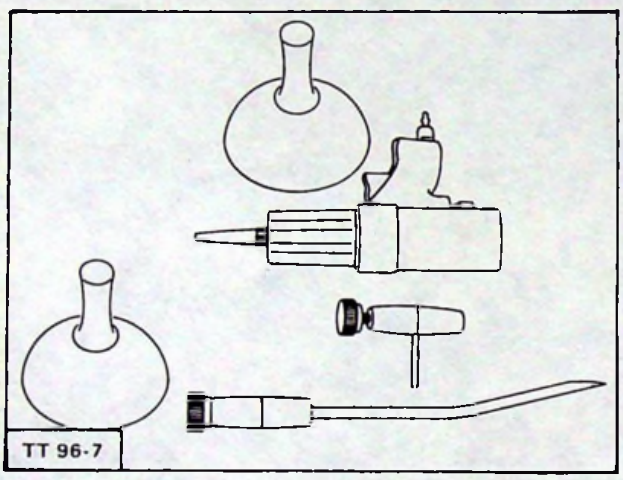
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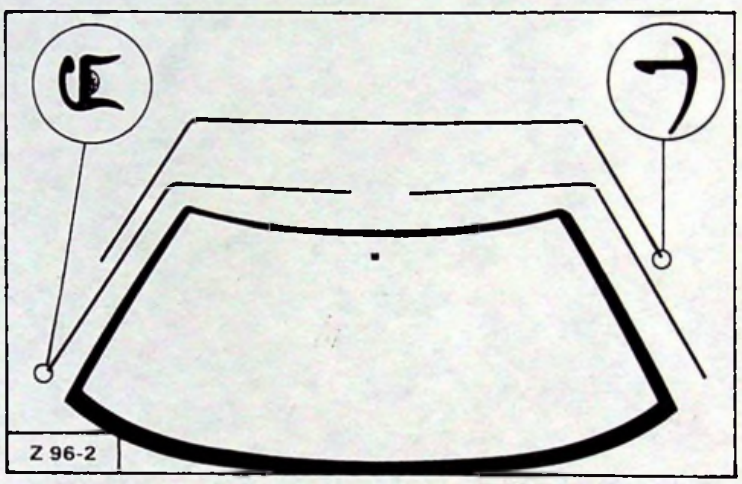
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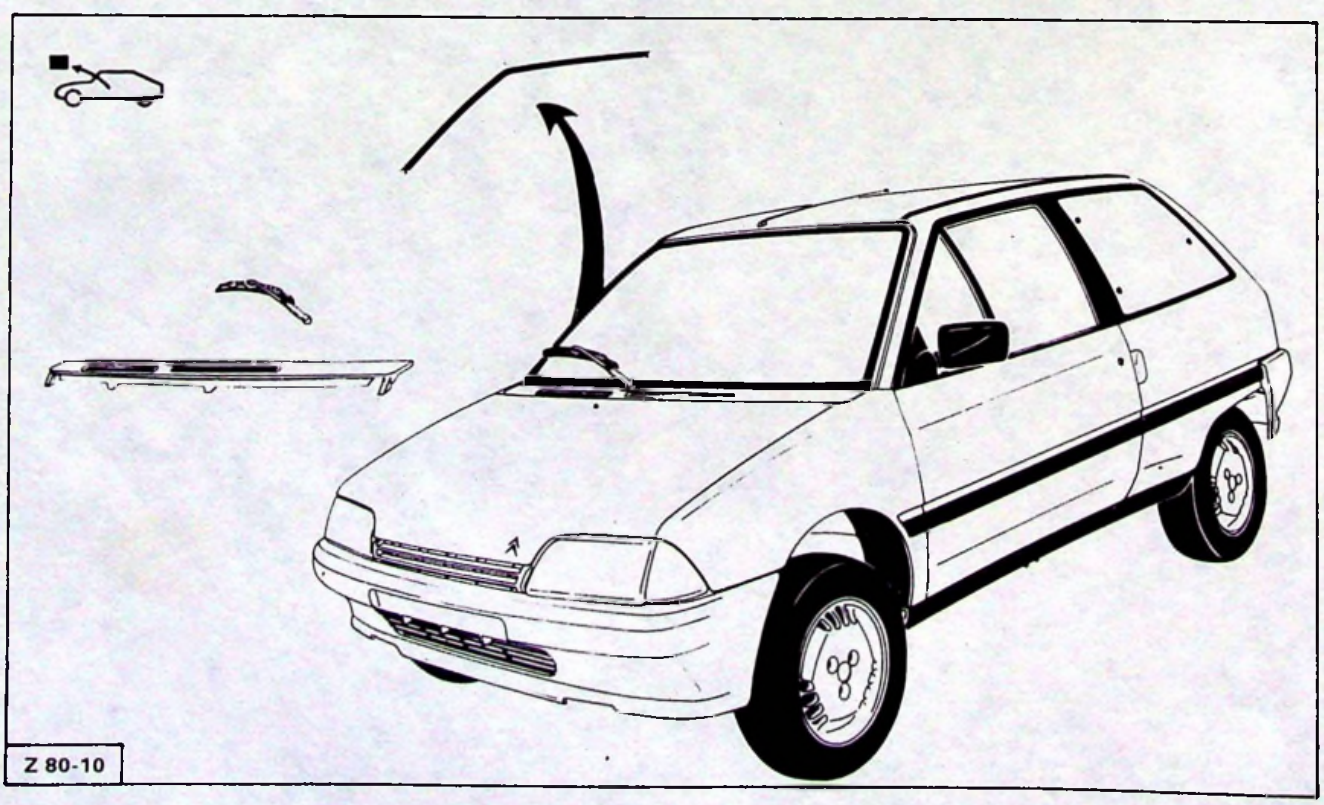
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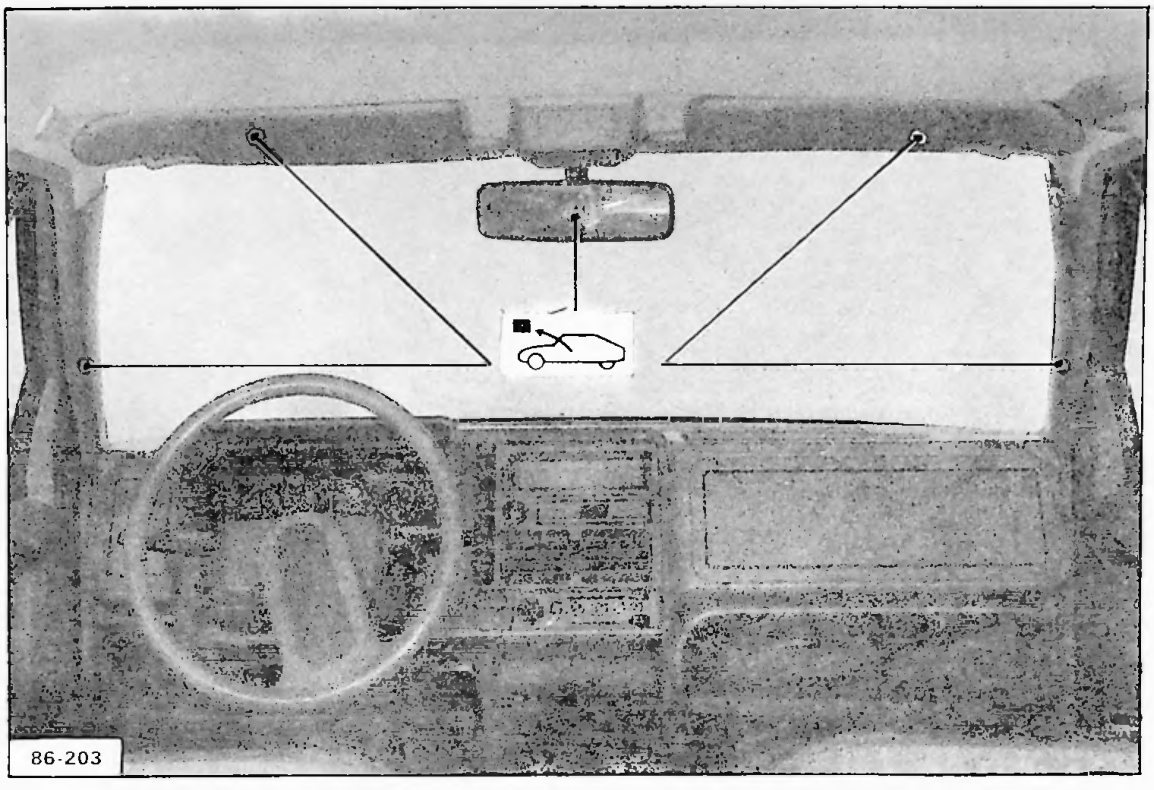
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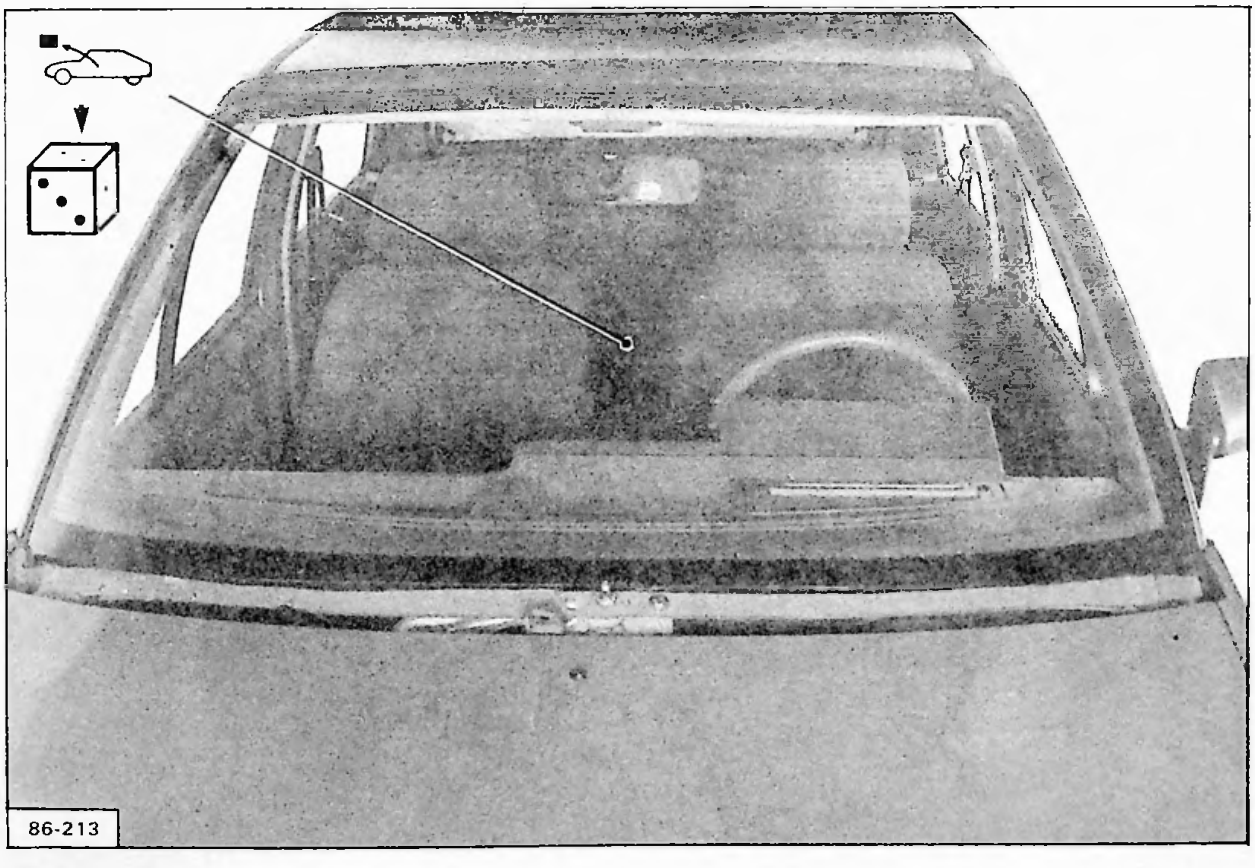
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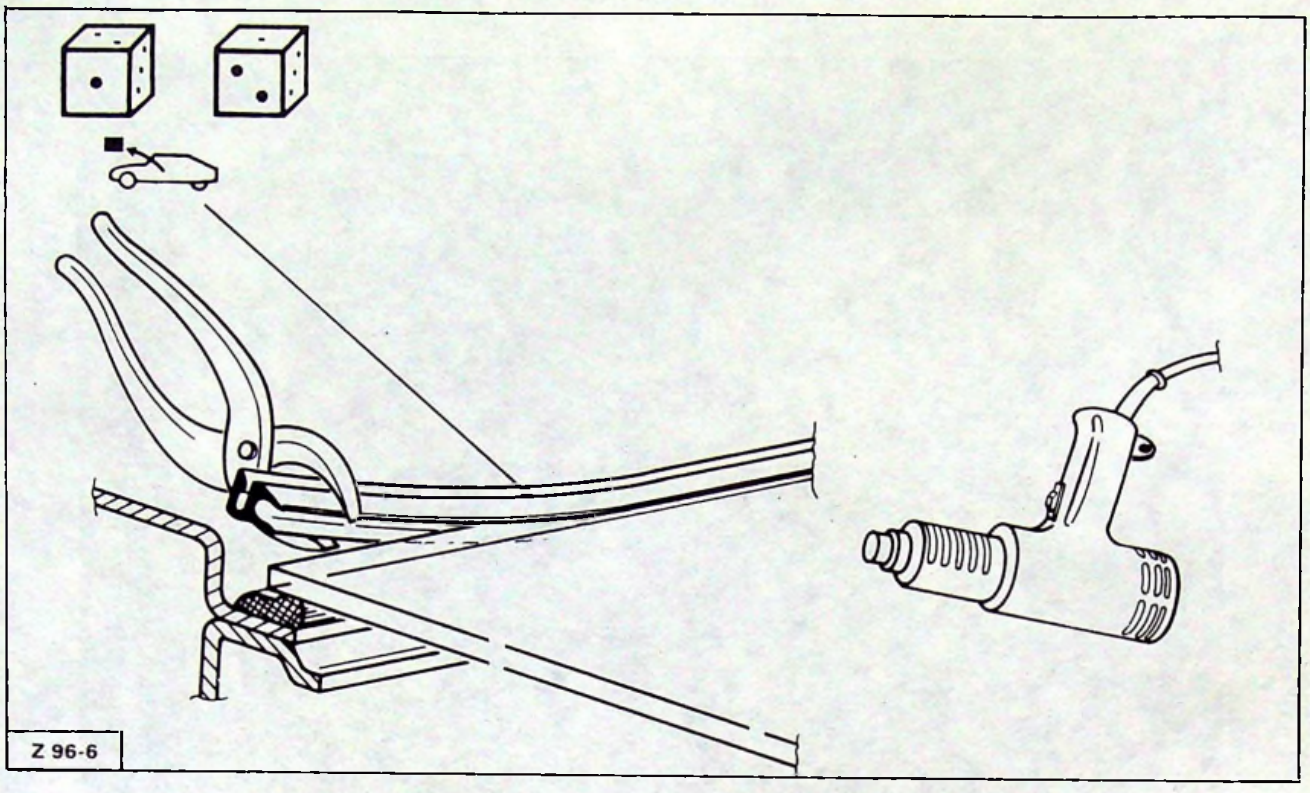

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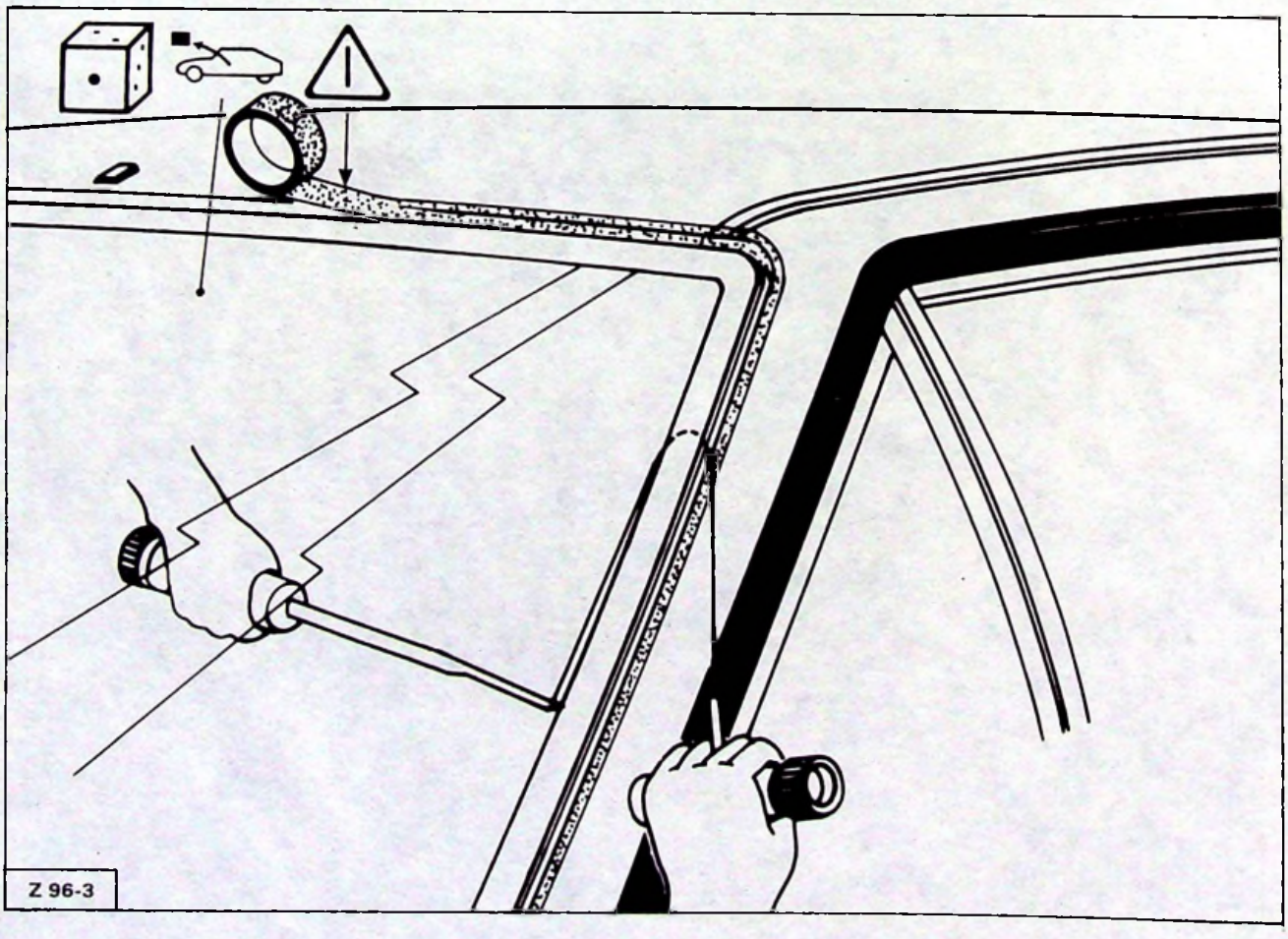

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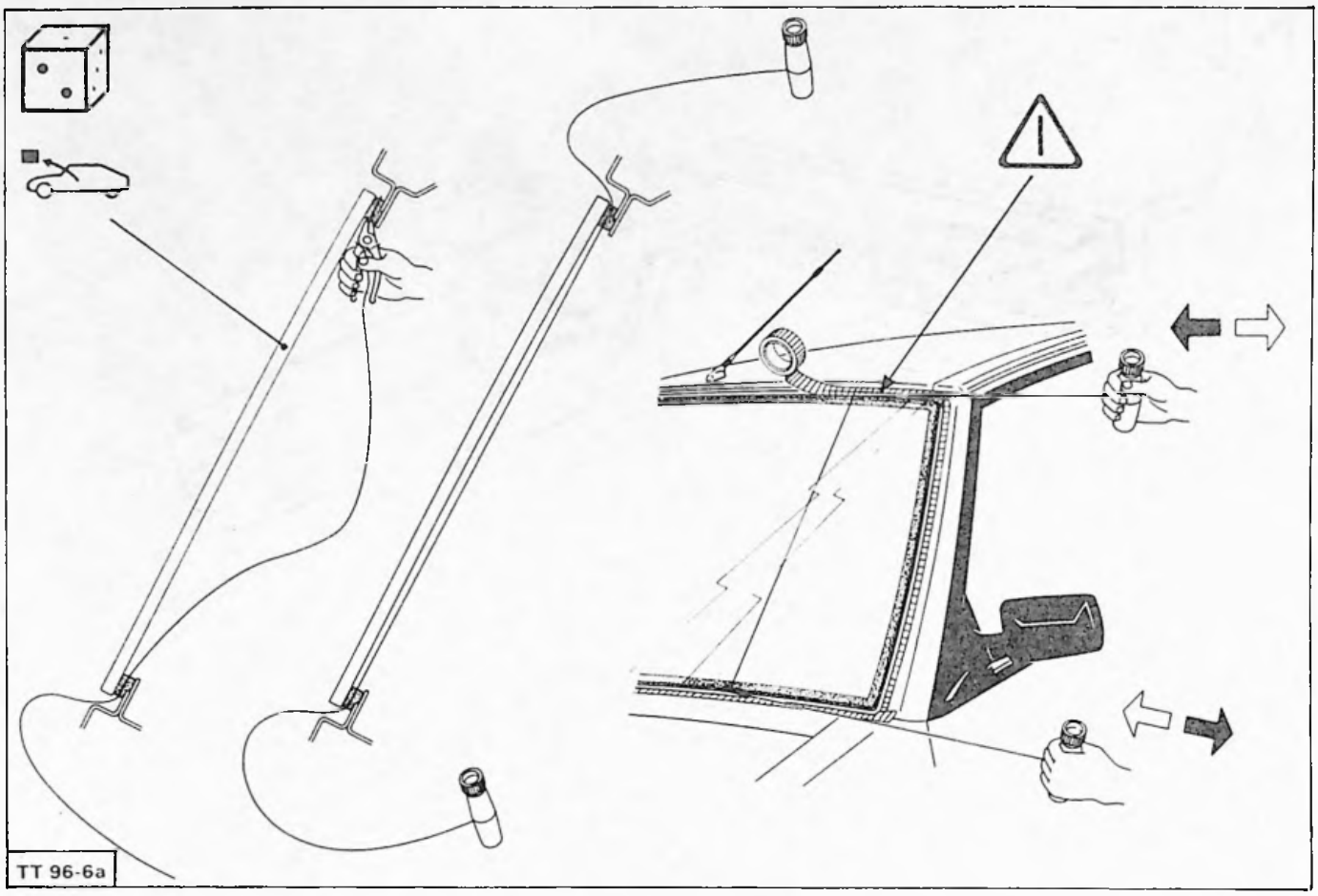
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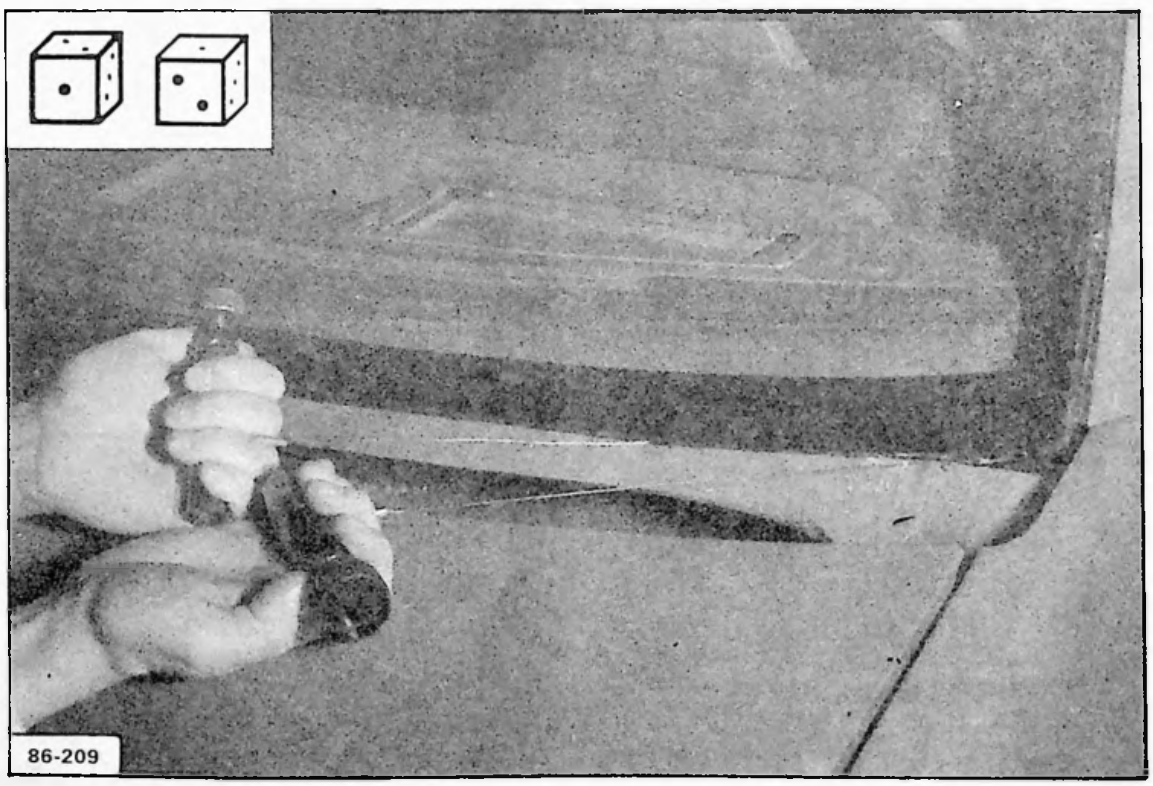
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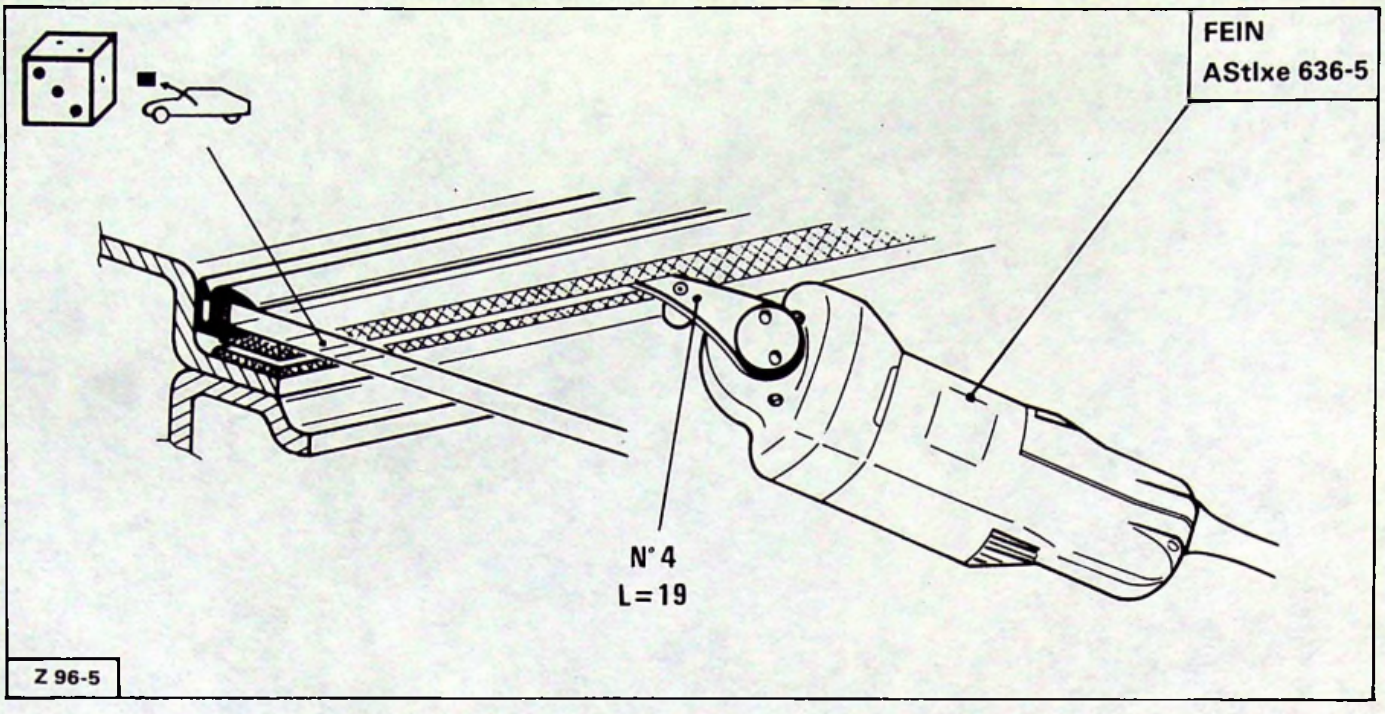

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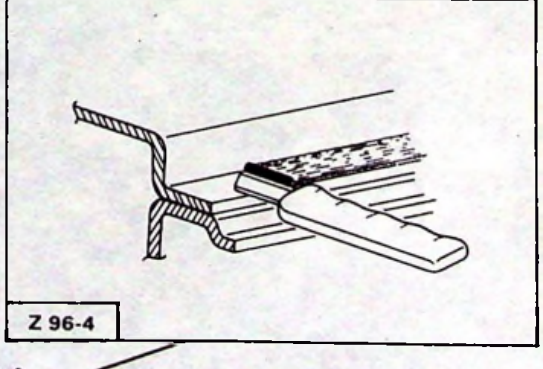
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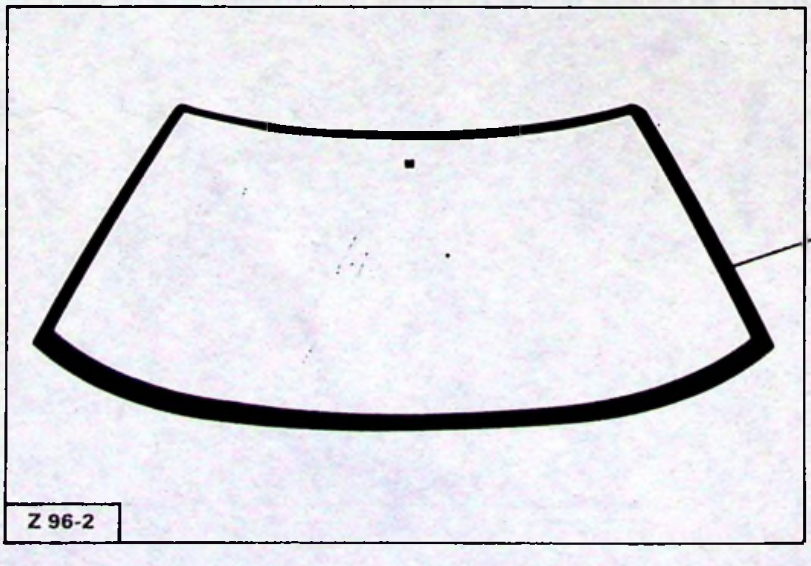
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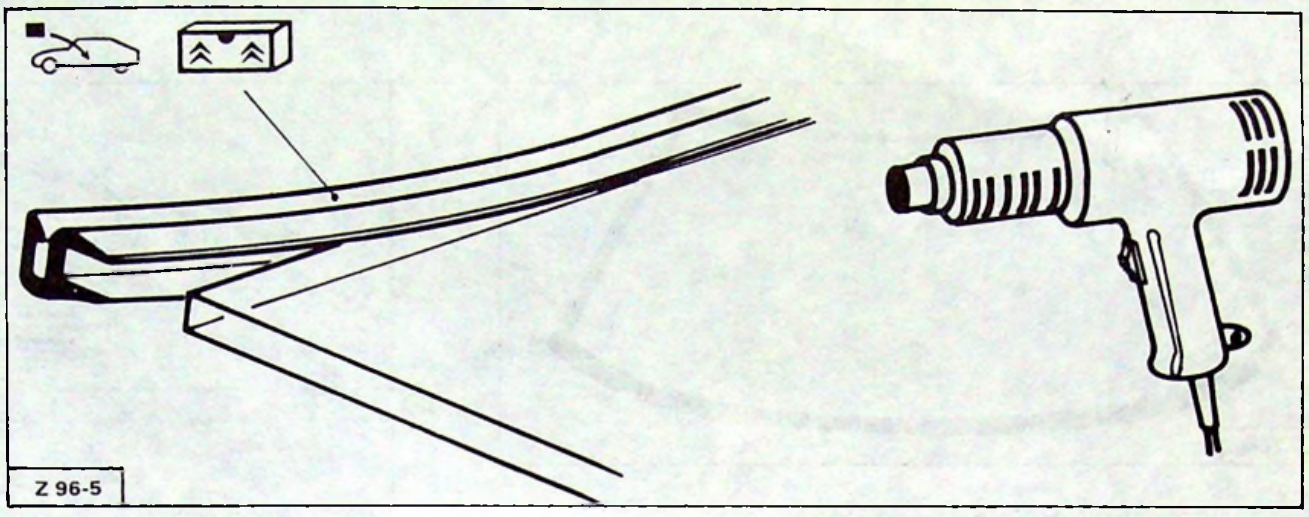

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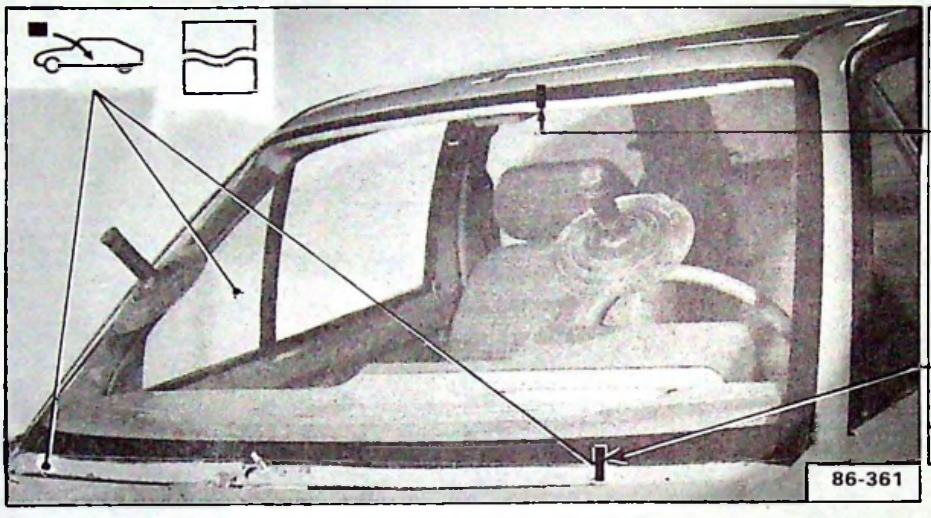

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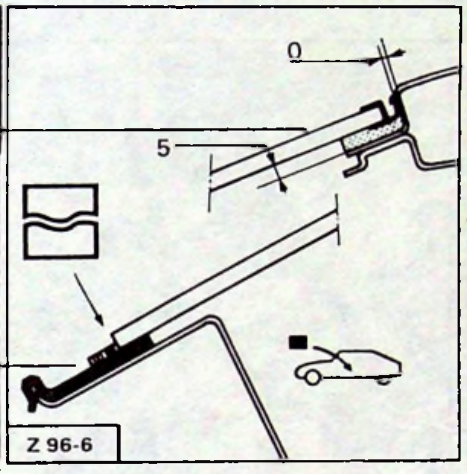

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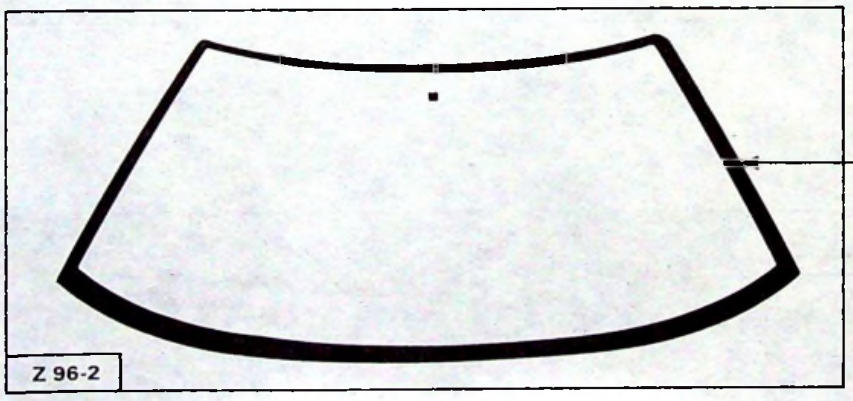

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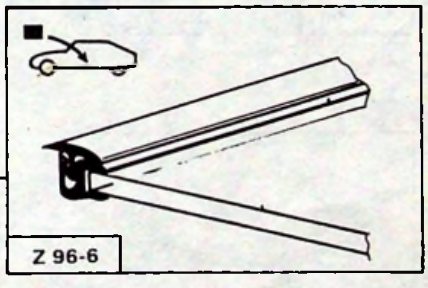

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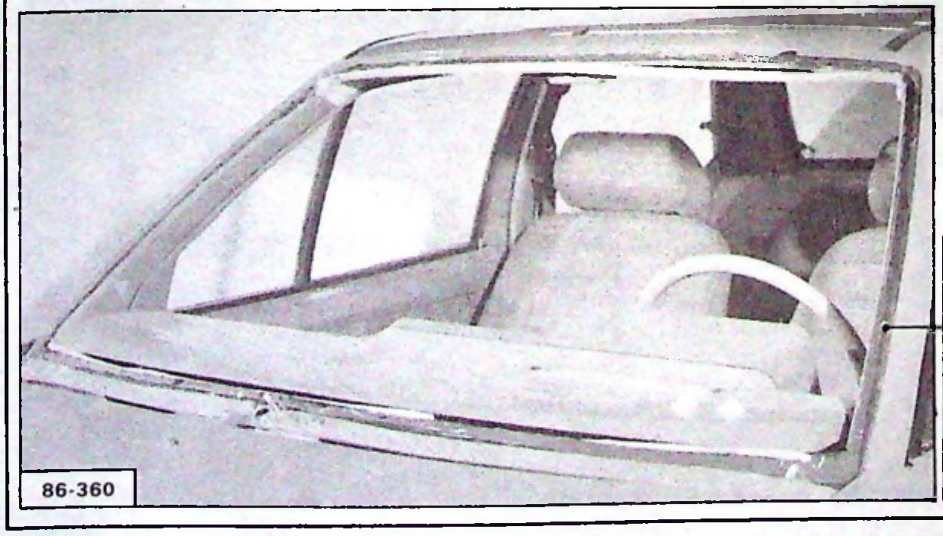

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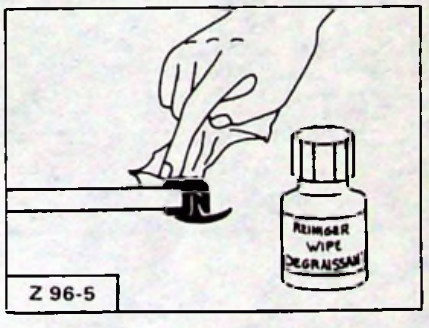

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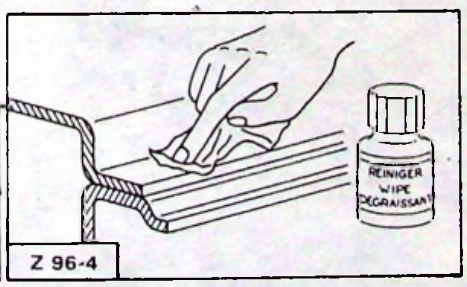

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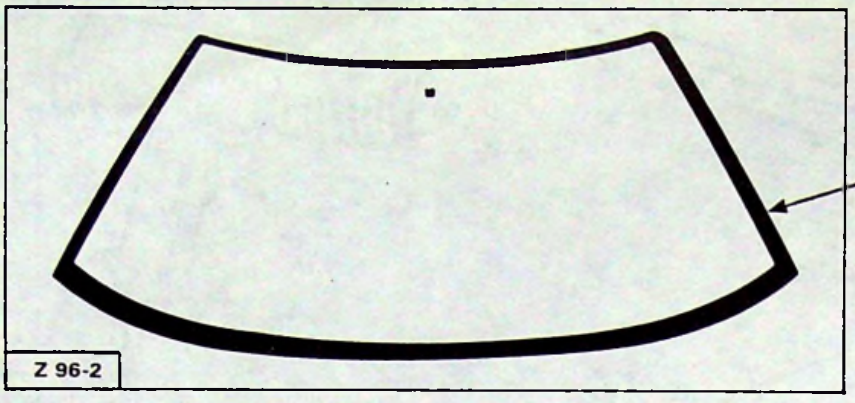
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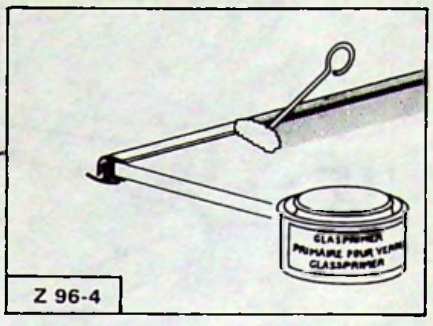

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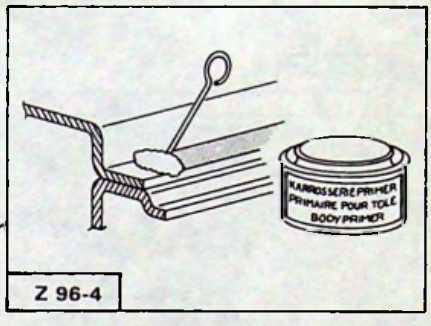

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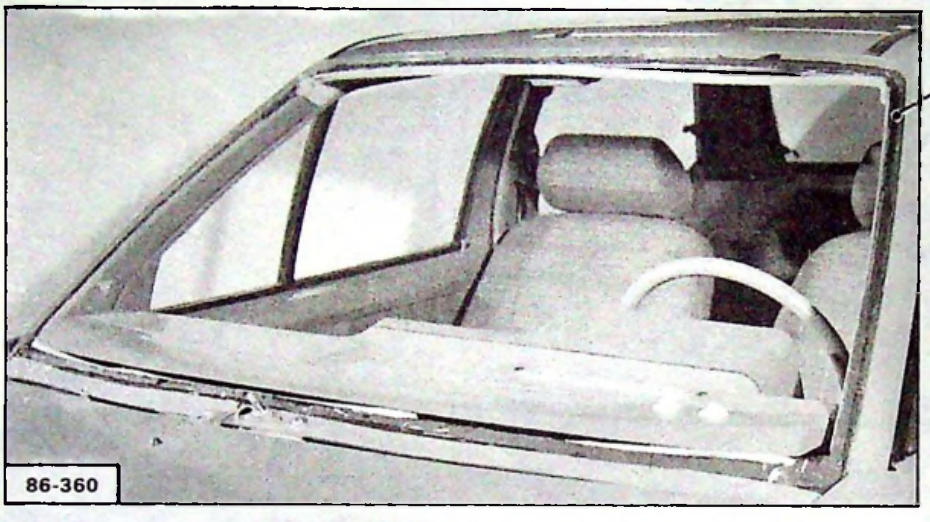
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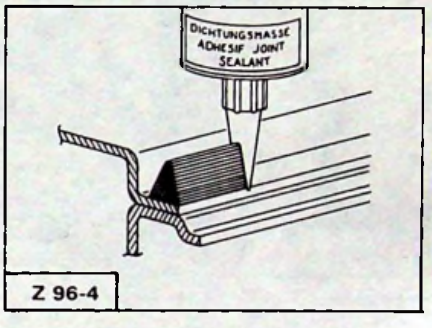

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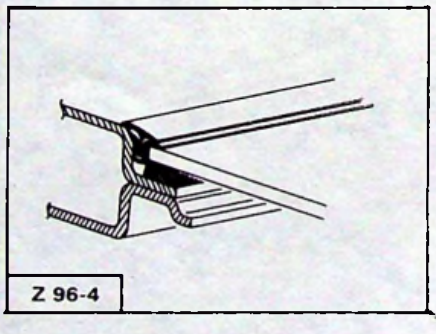
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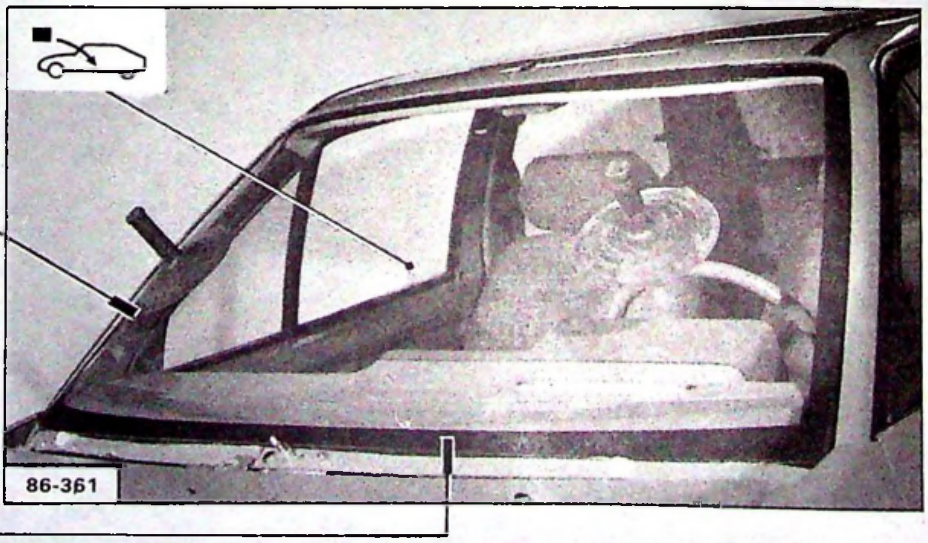
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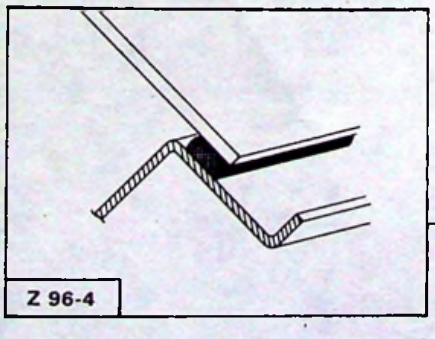
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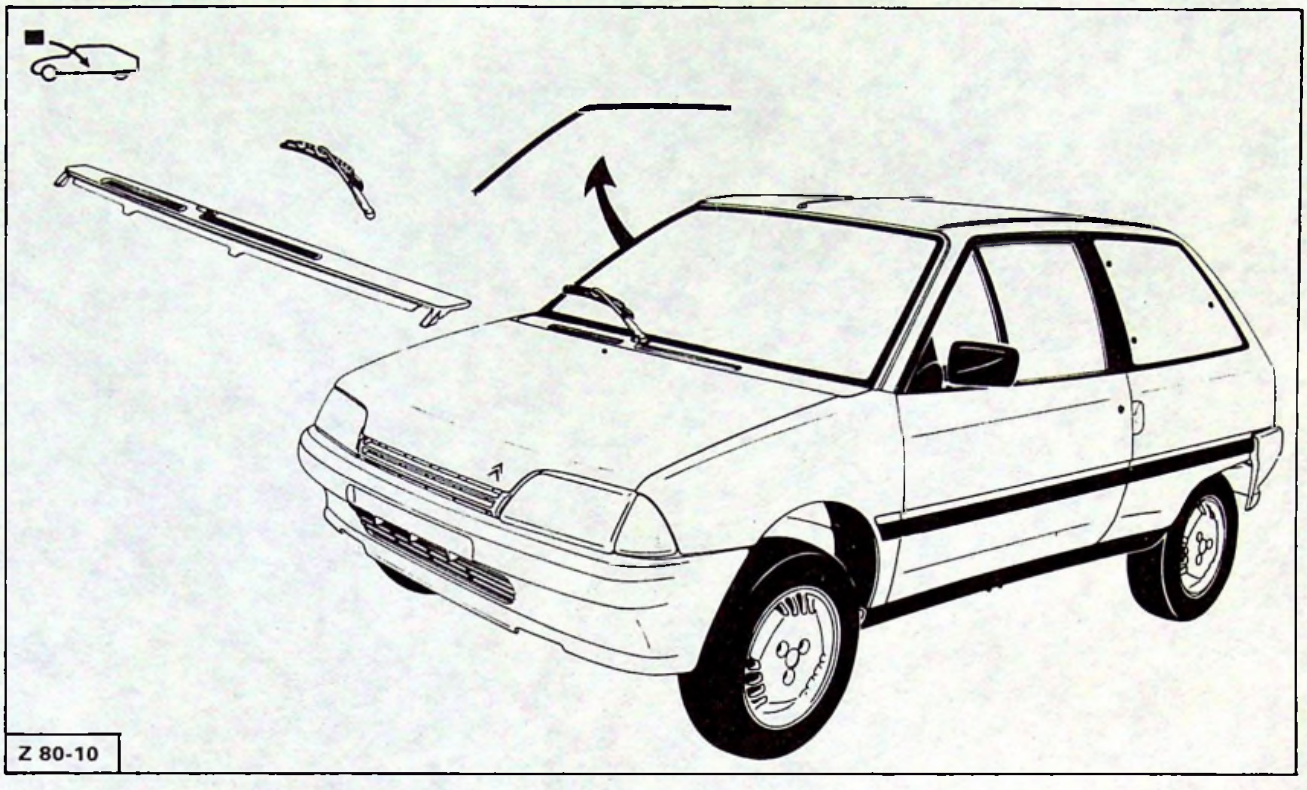

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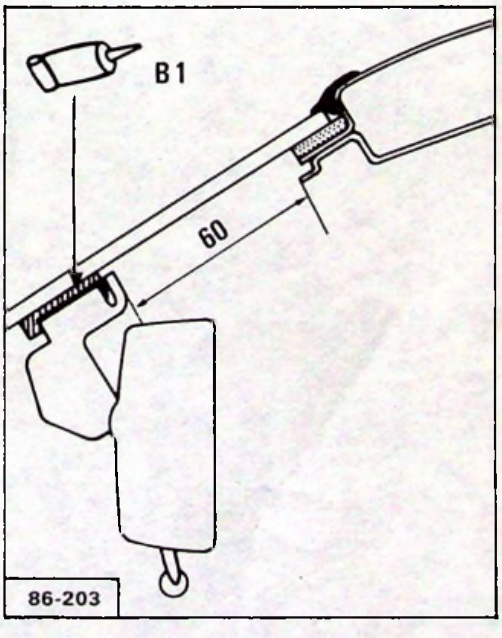

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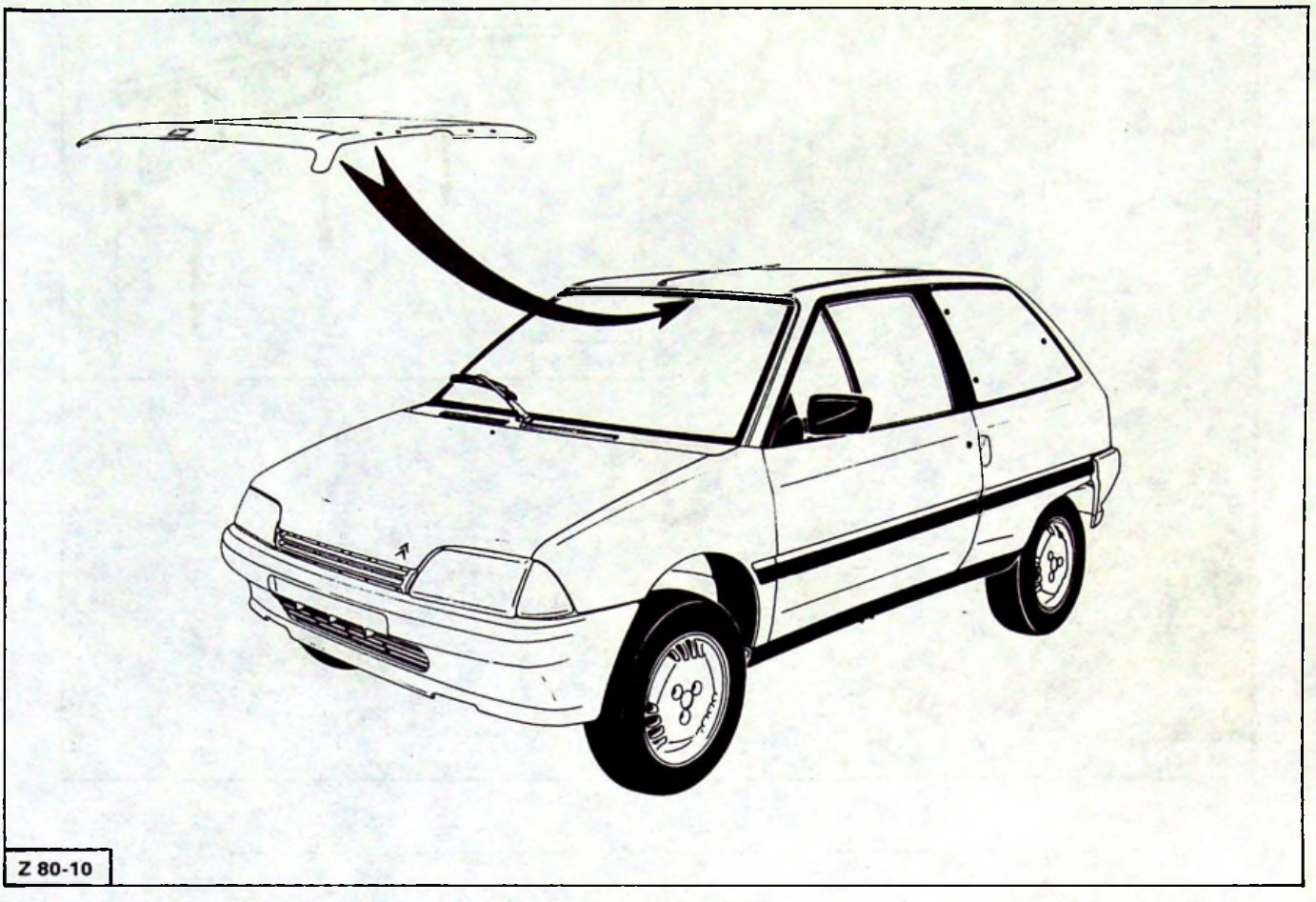

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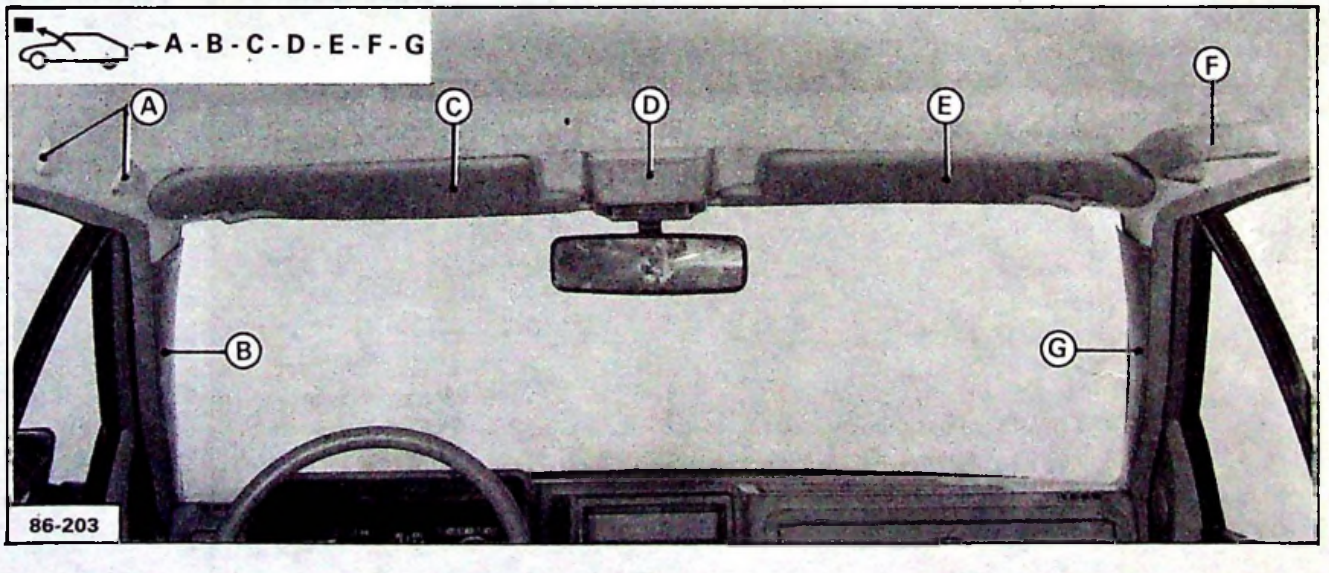

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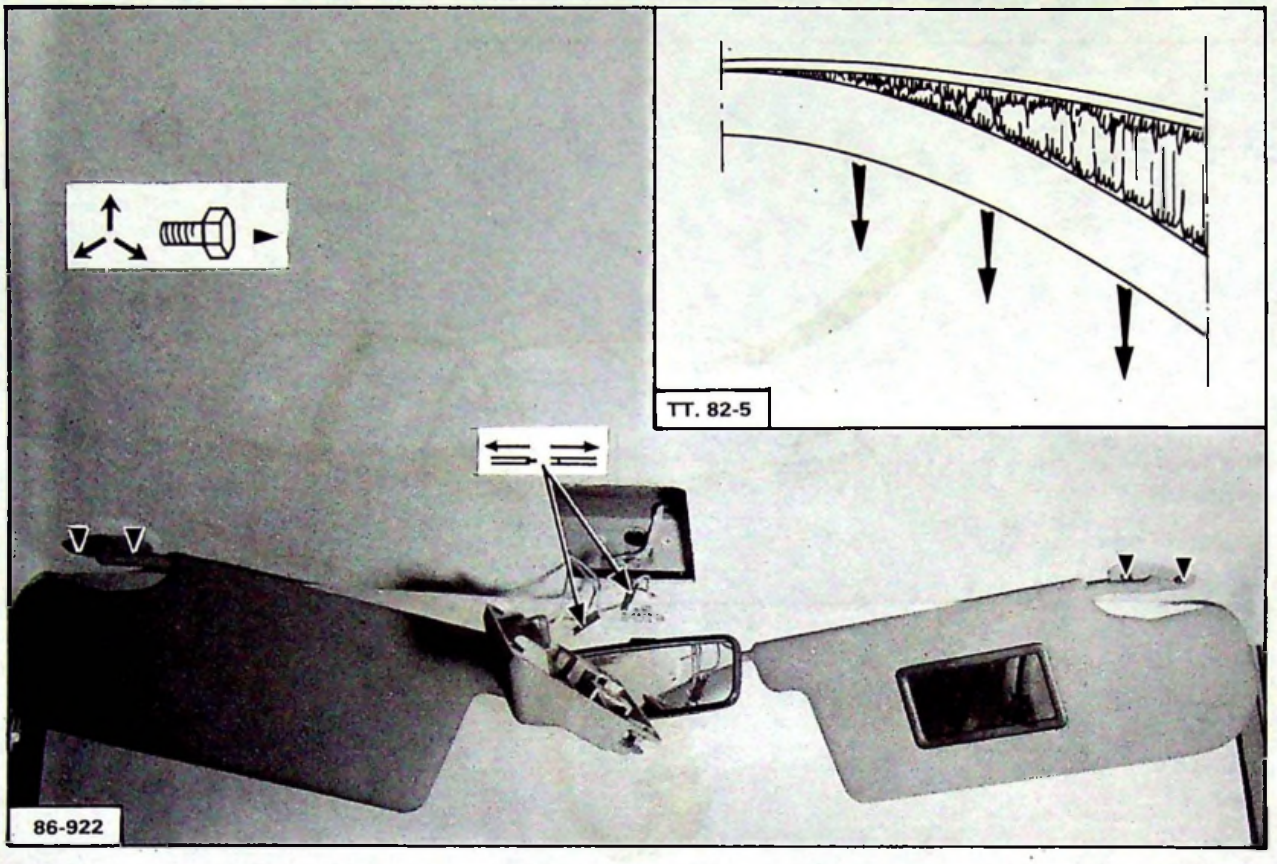
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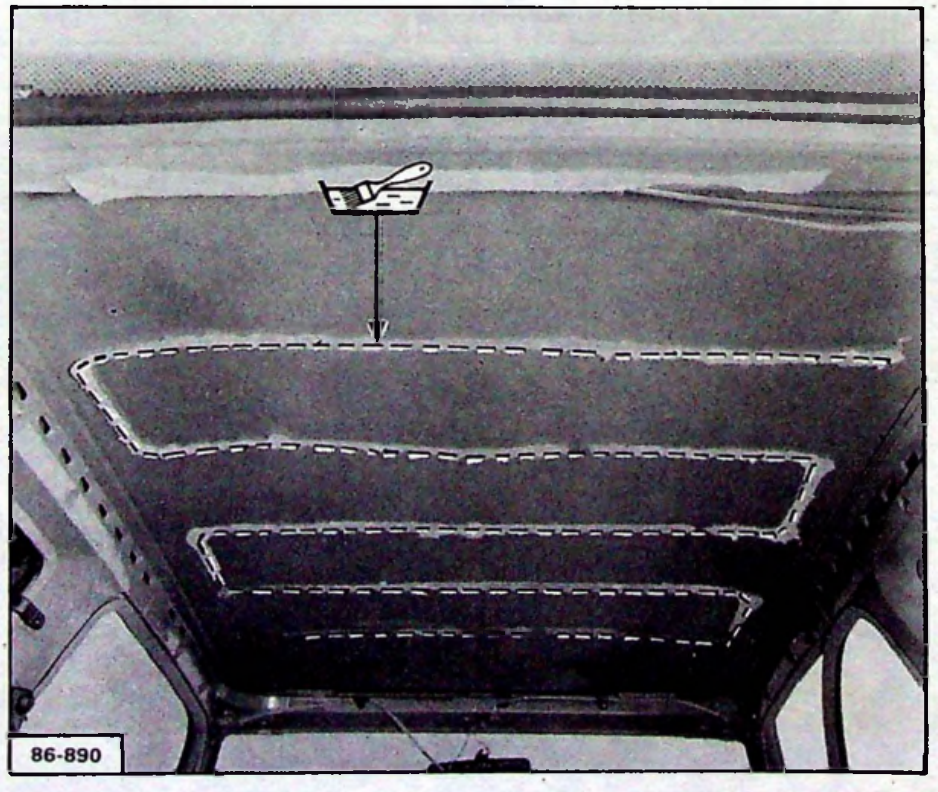
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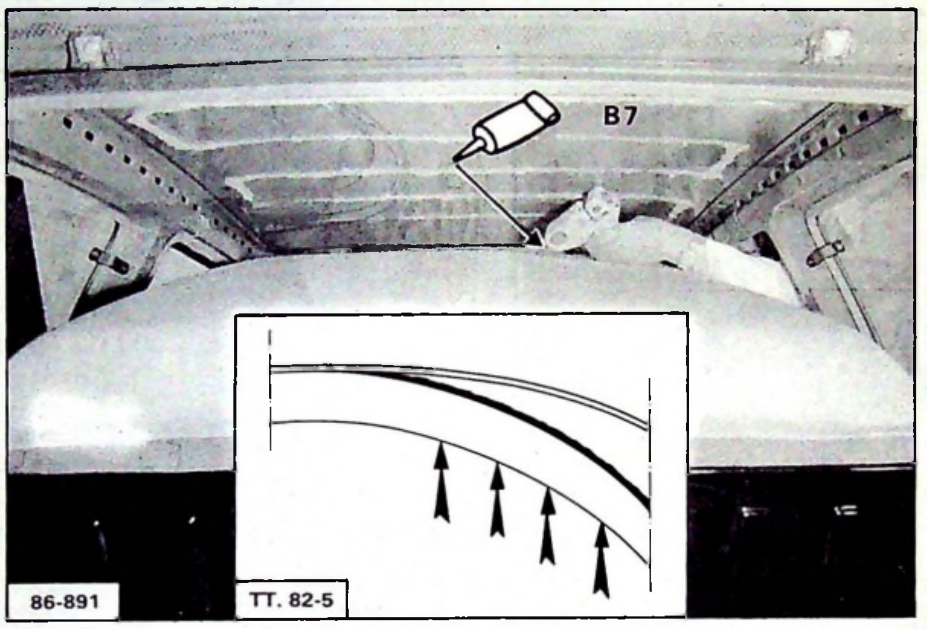
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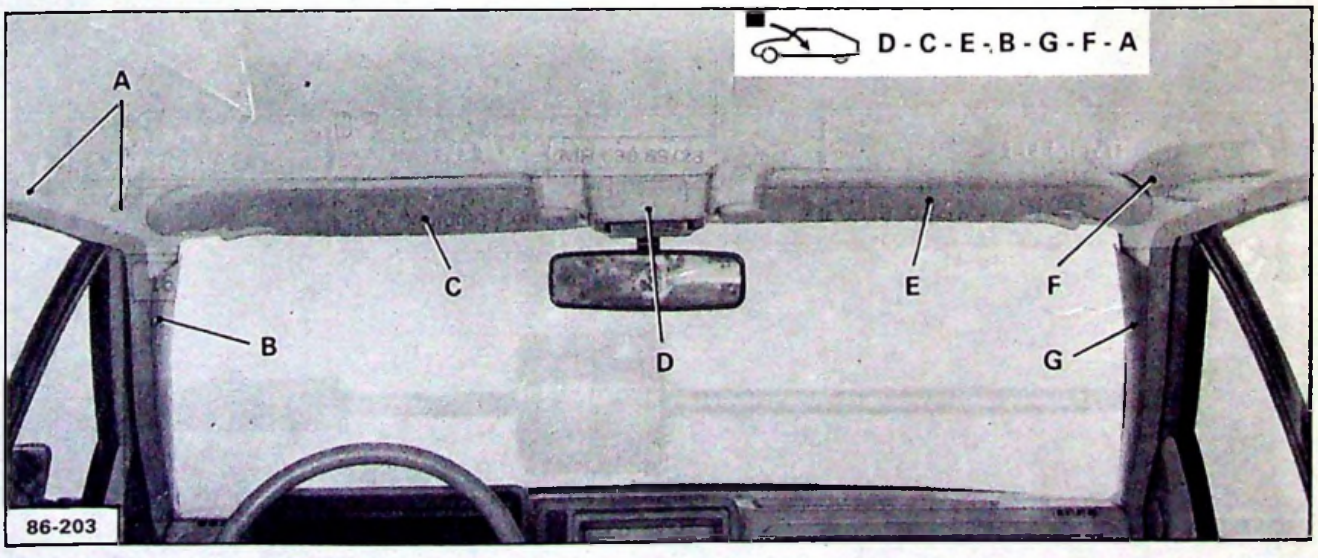
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G
86-203

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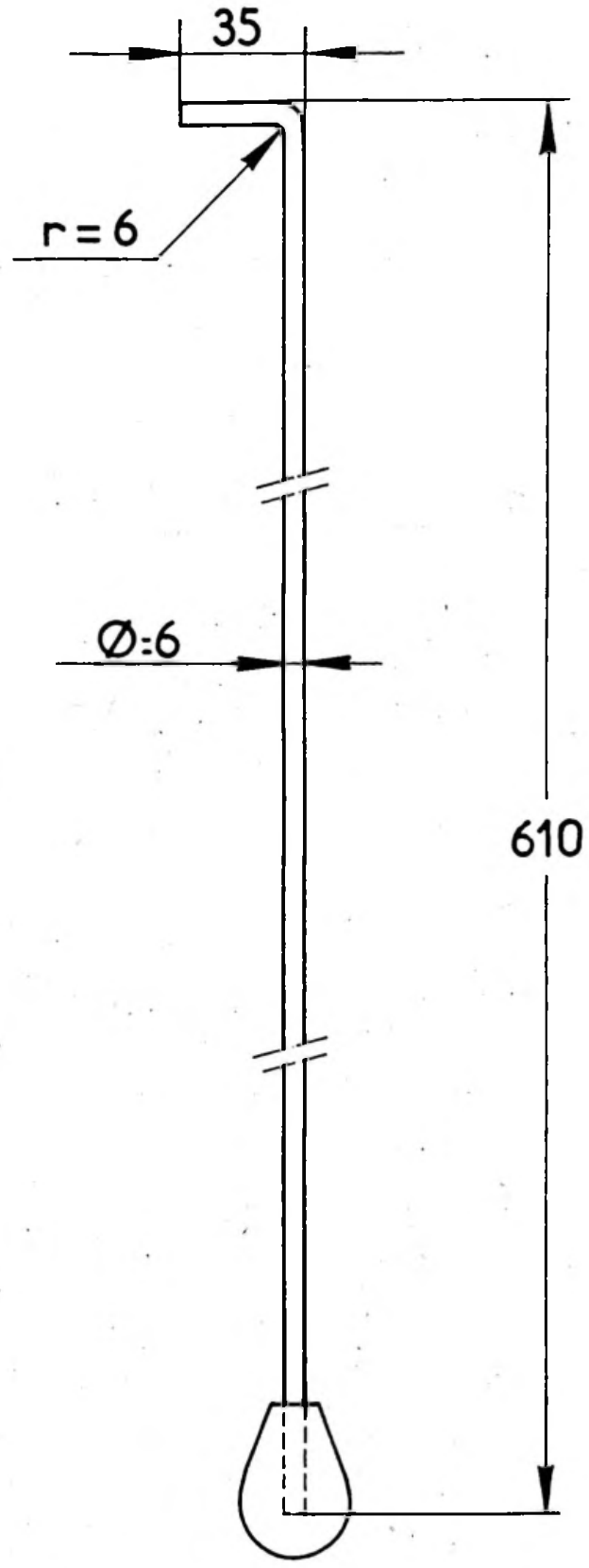

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