RENAULT

Technical Note 5164A

TTY

Noise fault finding

All types

General Methods

77 11 398 922 December 2006 EDITION ANGLAISE

General information

Contents

1. SCOPE OF THIS DOCUMENT

This document covers the following topics:

- Noise from the drive train,
- Noise when changing gear,
- Air inlet noises,
- Noise from the turbocharger,
- Noise from the exhaust
- Interference noise (suspension, steering, etc.)
- Noise from the dashboard,
- Noise from the upholstery,
- Noise from the sunroof,
- Noise from the window winders,
- Noise from the speakers.

This document presents the fault finding procedure applicable to all vehicles with the following specifications:

- Vehicles with 2 drive wheels for the drive train,
- Manual gearboxes (for drive train noises)
- Original sliding/tilting sunroof.

2. PRE-REQUISITES FOR FAULT FINDING

Documentation type

- Fault finding procedure (this document):
- Repair Manual for the vehicle concerned

Type of diagnostic tools

- CLIP to lock the airbags (if necessary)
- Noise diagnostic tool (see **01E GENERAL VEHICLE INFORMATION, Noise diagnostic tool - Use**)

3. FAULT FINDING PROCEDURE

1st time
complete the fault finding log
with the customer (with or without a test)

↓

2nd time
Use the Customer Complaint classification chart to identify the cause of the noise and
the corresponding ALP based on the conditions under which the noise appears

↓

3rd time
Apply the corresponding **F**ault **F**inding **C**hart (ALP).
Identify the origin of the fault

Rules for dealing with a noise-related customer complaint when the vehicle is received or in the workshop:

Rule no. 1: When the customer complaint is registered.

When the appointment is made by telephone, ask if the customer would be able to reproduce the noise in the workshop (enable the cotech to hear the noise with the customer present so that the fault finding procedure is more efficient).

If the customer cannot, preferably offer a date when they are not busy in order to deal with the noise.

Rule no. 2: Take information in a methodical manner.

The fault finding log must be completed to accurately describe the customer complaint in addition to the Order of repair.

4. FAULT FINDING LOG

IMPORTANT!

WARNING
All problems involving a complex system call for thorough diagnostics with the appropriate tools. The FAULT FINDING LOG, which should be completed during the fault finding procedure, ensures a record is kept of the procedure carried out. It is an essential item when discussing the fault with the manufacturer.

It is therefore mandatory to fill out a fault finding log for each fault finding procedure.

You will always be asked for this log:

- when requesting technical assistance from the Techline,
- for approval requests before replacing parts for which approval is compulsory
- which must be attached to monitored parts for which reimbursement is requested. It is therefore used to decide whether a reimbursement will be made under warranty and leads to improved analysis of the removed parts.

A blank log is available on the following pages

FAULT FINDING LOG

Administrative identification

Date	2 0
Log completed by	
VIN	
Engine	
Diagnostic tool	CLIP
Update version	

Customer complaint

	520	Abnormal noise, vibrations

Other — Your comments:

Conditions under which the customer complaint occurs

		In forwards gear (whilst driving)			Whilst reversing			When starting (increased engine speed in 1st)
		Whilst parking			When stationary (engine running)			When stationary (engine not running)
		Switching the engine on/off						

– Engine

	Engine fitted with a turbocharger		Petrol		Diesel

– Vehicle speed

	between 0 and 30 mph (0-50 km/h)		between 30 and 54 mph (50-90 km/h)		between 54 and 78 mph (90-130 km/h)
	constant		variable		

FAULT FINDING LOG

– Engine speed

	at idle speed (neutral)		at low engine speed Diesel and Petrol < 1500 rpm		at medium engine speed 1500 < Diesel < 3000 rpm 1500 < Petrol < 4000 rpm
	at high speed Diesel > 3000 rpm Petrol > 4000 rpm		stabilised		variable
	under speed		over speed		increasing engine speed (no load)
	lessens when engine speed increases				

– Engine temperature

	When cold		When warm		Quieter when hot
	Worse when hot				

– Driving conditions

	In neutral		When decelerating		Heavy acceleration
	On a hill		Pedal released suddenly after it is fully depressed		

– Vehicle speed

	Stabilised: vehicle speed or engine speed constant.		Accelerating

– Driver's action on the accelerator (acceleration or deceleration)

	no pressure		foot resting on or lightly depressing the accelerator pedal		Accelerator pedal moderately depressed and held (neither slightly nor fully depressed)
	pedal held fully depressed		pedal fully depressed suddenly (on-off)		Accelerator pedal gradually released
	Accelerator pedal suddenly released		disappears when pedal released without braking		

FAULT FINDING LOG

– Driver's action on the gear lever (gearbox)

	when changing gear (one or more)		gets worse when changing gear quickly		only appears when engaging the gear.
	Always appears when engaging AND disengaging gear.		worse when downshifting		

– Driver's action on the clutch

	the customer complaint disappears when declutching and reappears when engaging the clutch		the customer complaint disappears when changing gear, disengaged.		the customer complaint lessens when changing gear, disengaged. (test type handling in a motor show)

– Driver's action on the steering wheel

	Little movement (pressure change, cornering)		Significant movement (roundabout, manoeuvres)

– Driver's action on a vehicle fitting

	Upholstery (adjustments)		Sunroof (opening/closing)		Sunblind (opening/closing the sunblind)
	Dashboard (glovebox, air conditioning controls, etc.)		Speaker (switching on)		whilst opening/closing the window
	whilst opening or closing the window fully		when closing the door (window half-open)		

FAULT FINDING LOG

– Weather conditions

	cold weather (frost)		hot weather (sun)		humid conditions
	dry conditions				

– Main beam

	smooth		cobbled		grooved
	in poor condition: unmade, road seams, drain cover, pot hole, etc.		When driving over a speed bump		Mounting/dismounting the pavement
	Corner (to the left or right)		parallel parking		

5. SAFETY INSTRUCTIONS

Safety rules must be observed during any work on a component to prevent any damage or injury:

The road tests referred to in this document should be carried out in accordance with Road Traffic Regulations (speed limits must be obeyed).

During the tests performed with the engine running, observe the safety advice. Pay particular attention to the accessories, moving parts or parts which heat up (fan assembly activation, increase in temperature of the air pipe at the turbocharger outlet, etc.)

WARNING
When carrying out road tests, obey Road Traffic Regulations, especially speed limits.

Within the framework of a fault finding test, two people are required to carry out the research and specific identification of the source of the noise.

6.1. DEFINITIONS OF CAUSES:

This document deals with the following causes of noise:

Drive train:

TEST PROTOCOL FOR CLASSIFICATION OF THE CUSTOMER COMPLAINT

A. If the customer complaint appears when driving
- Perform **gradual** accelerations and decelerations [1] [2] on each gear to determine which gear(s) display the customer complaint (on an even straight line with a good surface, warm engine and after having checked that the oil and coolant levels are correct). Note the vehicle speed, gear ratio and engine speed.
- **Disengage / re-engage**: if the customer complaint disappears when disengaging and reappears when re-engaging the gear and the engine speed is stabilised, there is a whining noise and/or growling.
- **Change pressure**: if the noise level is more pronounced or decreases when pressure is applied (when overtaking, cornering, on a roundabout, moving steering wheel to the left/right), this is not a drive train fault (check the wheel bearings).

B. If the customer complaint appears particularly during a parking manoeuvre (steering greater than one steering wheel revolution, in 1st or 2nd gear)
If a noise appears when accelerating and disappears when decelerating, there is a murmuring noise from the differential.

C. If the customer complaint appears when stationary
In neutral and disengaged, increase the engine speed **very** gradually [2].
If the noise identified when driving is still present at the same engine speed, it is not a drive chain fault.

[1]: The speed range under which the customer complaint appears may be restricted. It is necessary to slowly increase and decrease the engine speed for each gear.
[2]: Increased engine speed: as long as the noise can be heard.
- up to approximately 4500 rpm (petrol engine),
- up to approximately 3000 rpm (diesel engine).

Never go into the red zone.

Whining noise (drive train)
Definition: high-pitched noise caused by teeth engaging when driving.
Note: this customer complaint can be noticed from 0 miles. It is more noticeable on long journeys on a constant road type (motorway). Not to be confused with aerodynamic noise.

Test to identify the whining noise from the engaging teeth: during a road test, hold the gear lever to dampen the gearbox control driveshaft chain. If the noise is quieter or disappears, check the gear lever first and, if the gear lever is correct, consult ALP 13 - Whining noise from the drive train.

Murmuring (differential - relay bearings)
Definition: modulated noise which is similar to the cooing of a pigeon.
Note: this customer complaint can occur at any point in the vehicle's lifetime.

Test to identify the murmuring noise from a driveshaft: during a road test, if there is significant noise when driving in a straight line and when cornering, study the right-hand driveshaft relay bearing. If there is only significant noise when cornering, there is a fault in the gearbox, mainly with the differential.

Growling noise (drive train)
Definition: continuous noise which is similar to the noise when shaking a bag of nuts.
Note: appears particularly when hot and can be easily heard when the windows are open when passing alongside a wall. It is quite noticeable at low speed.

Test to identify the growling noise: during a road test, perform gentle accelerations in 1st and 2nd gear. If the noise dies down or disappears whilst holding the gear lever, study the control instead.

Noise from neutral (drive train)
Definition: sewing machine noise.
Note: disappears when accelerating and declutching.

Exhaust

Crackling from the pipe or ball joint.
Definition:
– For the pipe: noise like a bag of marbles shaken energetically. Very high frequency (very high-pitched).
– The ball joint may grate when fitted to the spring.
Note: can be heard easily from the outside or when the window is open (car park exit, when passing alongside a wall). The noise becomes more pronounced very quickly if no repair work is carried out on the vehicle. It can be reproduced when stationary by shaking the exhaust pipe.

Warning
The crackling may spread and get worse along the exhaust system, despite the cause being very localised at the beginning of the system (connecting hose or ball joint bracket). It may appear that the entire pipe is concerned but this is not the case.

Noise from underbody contact.
Definition: dull or bright metallic noise (fist banging on a table).
Note: it can be reproduced when stationary by shaking the exhaust pipe.

Exhaust leak noise.
Definition: none.
Note: it depends on the engine speed and can be heard according to the extent and location of the leak.

Turbocharger

Meowing noise from the turbocharger.
Definition: single frequency continuous noise, **sub-synchronous to the speed of the turbocharger**.
Note: the meowing noise from the turbocharger is quieter when hot.

Whistling noise from the turbocharger.
Definition: high-pitched whistling which follows the turbocharger rotation speed, **either synchronous to the turbocharger speed, or super-synchronous to this speed (vane number x turbocharger speed)**.
Notes:
– the whistling noise from the turbocharger is worse when hot.
– Any of the fittings installed, poor bonding of the windscreen or cable routing through the bulkhead may be the cause of the detected noise.

Blowing noise from the turbocharger.
Definition: noise similar to the noise made by a ventilation fan (passenger compartment ventilation, engine cooling system)
Note: the blowing noise from the turbocharger is even louder when the turbocharger air flow is higher.

Sighing noise from the turbocharger (Diesel terminology).
Definition: noise similar to a volume of pressurised air being released **suddenly**.
Note: the sighing noise from the turbocharger is even greater when the turbocharging pressure is greater as the pedal is released.

Releasing noise from the turbocharger: (petrol terminology).
Definition: noise similar to a volume of pressurised air being released **very suddenly** (activation of the turbocharger recirculation valve).
Note: the releasing noise from the turbocharger is even greater when the turbocharging pressure is greater as the pedal is released.

Air intake

Air inlet whistling.
Definition: high-pitched noise similar to whistling.

Test protocol.
Carry out at test in the workshop with the vehicle stationary and the bonnet open:
Warm engine: increased engine speed (neutral) to average speed (4000 rpm for a petrol engine; 3000 rpm for a diesel engine).

Warning.
The air inlet whistling noise must be distinguished from the turbocharger whistling noise. It is directly related to the engine speed and not to the speed of the turbocharger.

Air inlet humming.
Definition: dull noise which is similar to the noise of a bumblebee in flight.
Note: noise sensitive to engine load (petrol).
Noise not sensitive to engine load (diesel).

Noise when changing gear

Noise when engaging and disengaging gear.
Definition: more or less marked dull clicking (short thud).
Note:
– engine stopped, when static, if the same gears are engaged one after another (e.g. neutral- first), the first gear change is always the noisiest. On the other hand, if the gear is changed from neutral - 1st - 2nd then neutral - 1st, there will be as much noise during the first gear change in the first series as in the second.
– depending on the clutch "performance" (ability to separate the engine from the gearbox quickly) the noises when engaging/disengaging may be more pronounced.

Creaking:
Definition: onomatopoeia of a dry noise heard whilst engaging a gear (partially or completely). A malfunctioning gearbox can potentially be accompanied by successive shocks in the gear knob which may prevent gear engagement. Sporadic noise which is similar to a rattle.
Note: for basic range vehicles, it may be normal to notice creaking noises in reverse gear.

Banging during power take-up:
Definition: banging whilst changing gear or during torque inversion (successive acceleration or deceleration).
Note: mainly in the lower gears (1st, 2nd, 3rd).

Interference noise

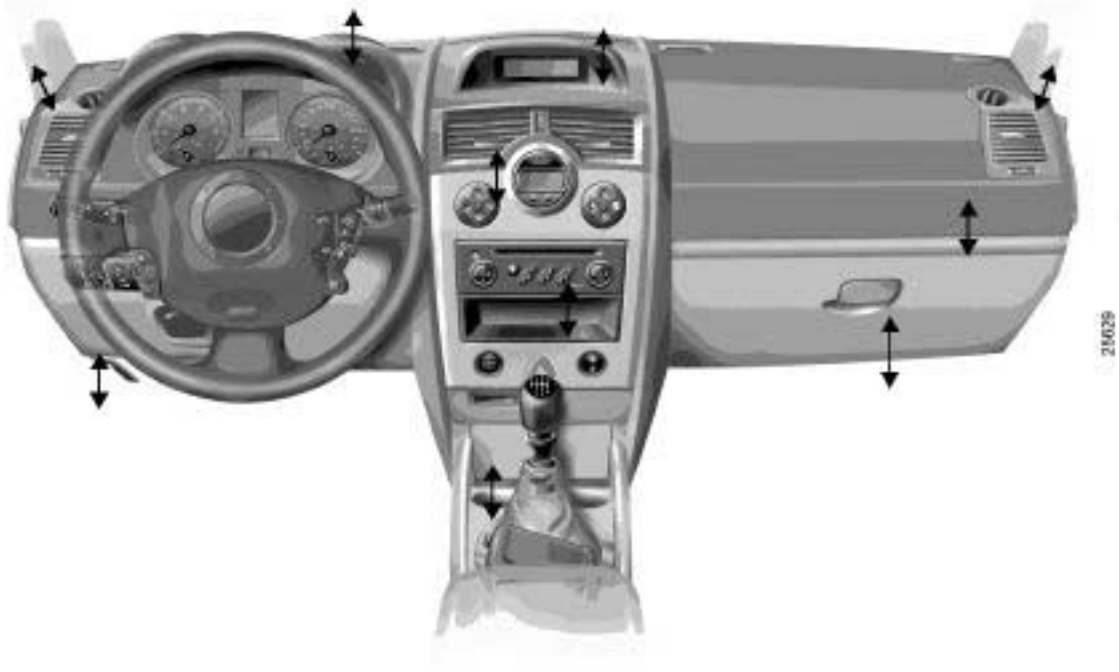
Definition: noise which is difficult to locate, due to a fault in the chassis, steering, engine and transmission assembly suspensions, underbody area, rotating components or front end panel.

Dashboard

There are three types of dashboard noise:

- **rubbing noises**: two components or sections rub against each other which produces a creaking or grating noise.
- **banging noises**: two components or sections knock together which produces a crackling or rattling noise.
- **vibration**: too much play between two components or sections

These noises are mainly related to contact between two components (cover or front panel and dashboard casing) or related to a component which moves with another component.



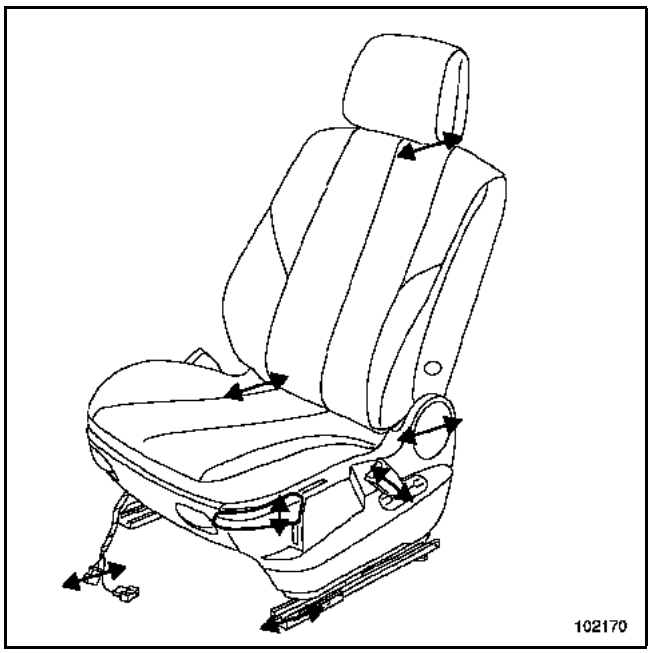
↔: Area likely to produce a noise

Noise from the upholstery

There are three types of seat noise:

- **rubbing noises:** two components or sections rub against each other which produces a squeaking or grating noise (e.g. adjustment lever)
- **banging noises**: two components or sections knock together which produces a crackling noise (e.g. cover) or a rattling noise (e.g. wiring)
- **vibration**: too much play between two components or sections

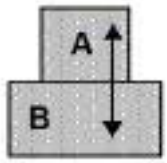
These noises are mainly related to contact between two components (e.g. cover and dashboard casing) or related to a component which moves against another component (e.g. runners)



↔: Area likely to produce a noise

Crackling from the speaker

Definition:



Crackling: quick alternating impact between two components.

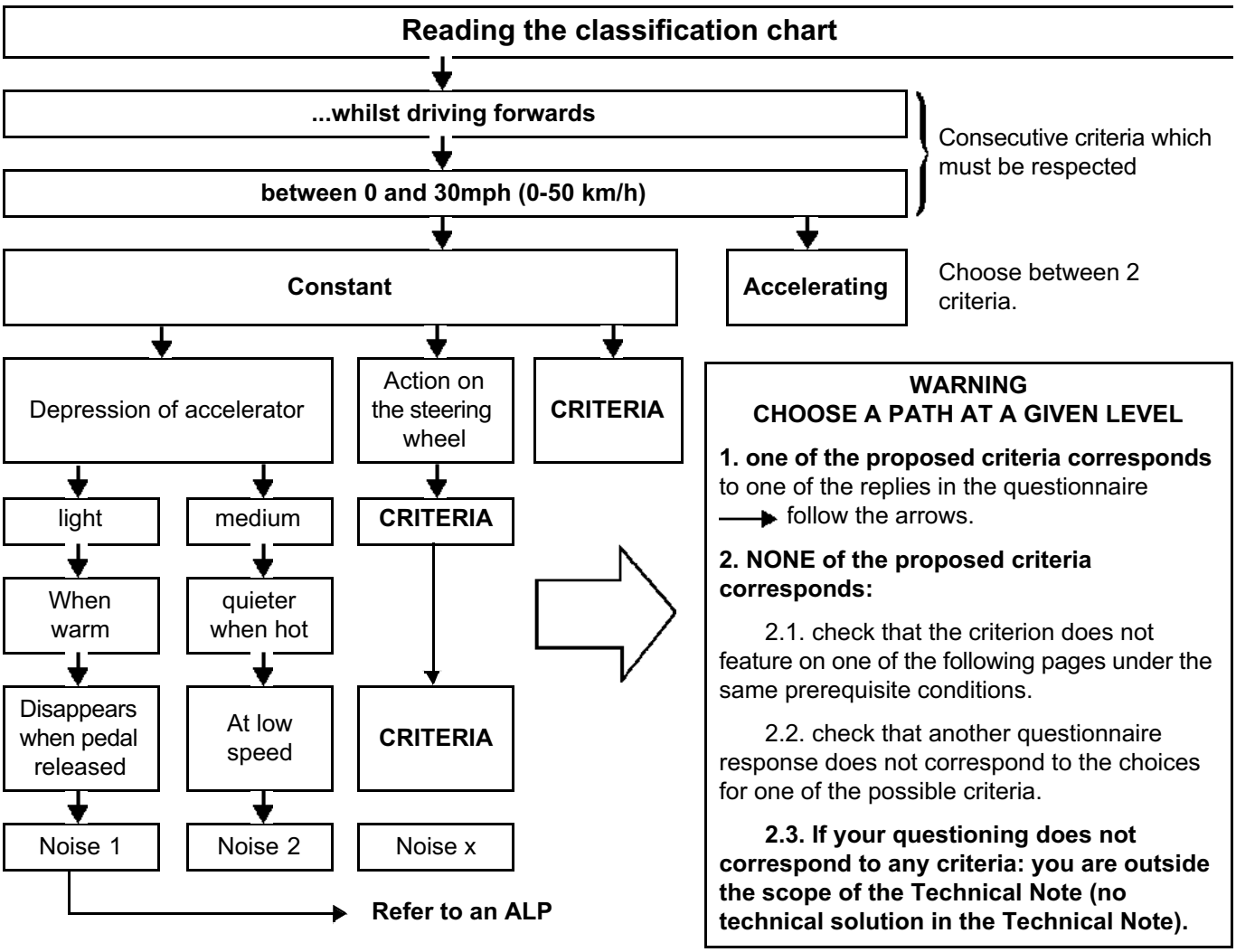
Sunroof:

Sunroof chattering: jerky movement of mobile panel when opening/closing (vertical movement of the panel while moving longitudinally)

6.2. CAUSE OF NOISE CLASSIFICATION CHART

WARNING
The Customer Complaint Classification Chart is used to identify the cause of a noise which has been detected by the customer. A Classification Chart is selected using a questionnaire which lists the different conditions under which the noise appears.

Only the **most common conditions** under which the noise occurs are listed in the classification chart. It is important to correctly identify with the customer **the main condition** under which the noise appears.



CONDITIONS UNDER WHICH THE NOISE APPEARS

The noise is detected:		
	whilst driving forwards between 0 and 30 mph (0-50 km/h) and the noise depends on the road surface	conditions under which the noise appears no. 1
	whilst driving forwards between 0 and 30 mph (0-50 km/h) and the noise does not depend on the road surface	conditions under which the noise appears no. 2
	whilst driving forwards between 30 and 54 mph (50 and 90 km/h)	conditions under which the noise appears no. 3
	whilst driving forwards between 54 and 78 mph (90 and 130 km/h)	conditions under which the noise appears no. 4
	whilst driving forwards in a particular engine speed range	conditions under which the noise appears no. 5
	whilst driving forwards when the accelerator is depressed in a particular manner	conditions under which the noise appears no. 6
	whilst driving forwards when the gear lever is manipulated in a particular manner	conditions under which the noise appears no. 7
	whilst driving forwards	conditions under which the noise appears no. 8
	Whilst reversing	conditions under which the noise appears no. 9
	starting	conditions under which the noise appears no. 10
	whilst parking	conditions under which the noise appears no. 11
	when stationary, engine running	conditions under which the noise appears no. 12
	when stationary, engine may or may not be running	conditions under which the noise appears no. 13
	vehicle stationary, engine not running or switching ignition on/off	conditions under which the noise appears no. 14

Conditions under which the noise appears no. 1

The noise is detected...

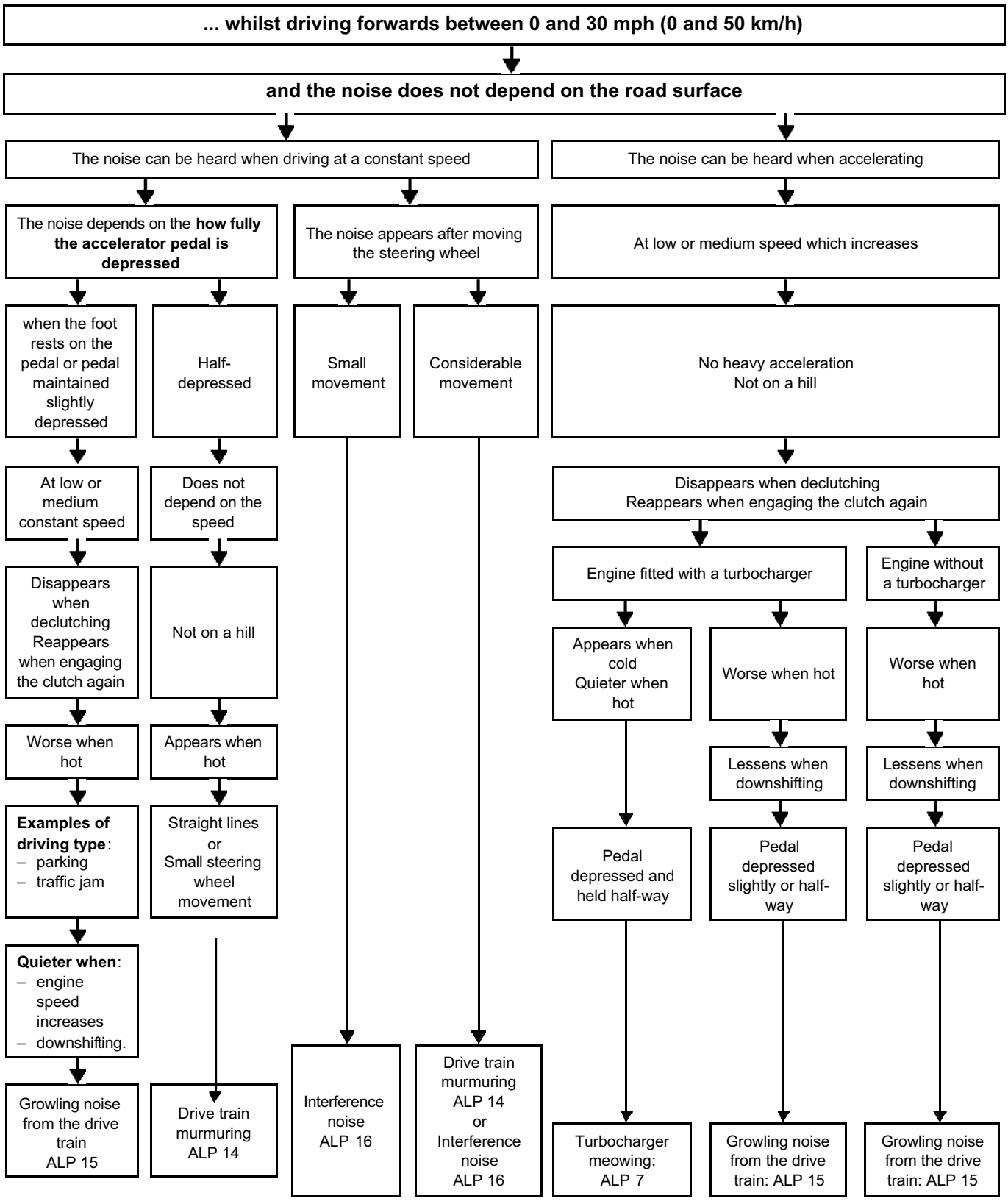
... whilst driving forwards between 0 and 30 mph (0 and 50 km/h)

and the noise depends on the road surface

- Smooth surface + Hot and dry weather → Sunroof creaking: ALP 24
- Cobbled surface → **It may be related to:** 1. Interference noise: ALP 16 2. Dashboard noise: ALP 18 3. Upholstery noise: ALP 19 4. Sunroof rattling: ALP 26 5. Underbody contact noise (exhaust): ALP 4
- Grooved surface → Interference noise: ALP 16
- Poor condition: unmade road, road seams, drain cover, pot hole, etc.
  - Weather has no effect → **It may be related to:** 1. Interference noise: ALP 16 2. Dashboard noise: ALP 18 3. Upholstery noise: ALP 19 4. Sunroof rattling: ALP 26 5. Underbody contact noise (exhaust): ALP 4
  - in hot and dry weather → Sunroof creaking: ALP 24
- On a speed bump → **It may be related to:**
  - Interference noise: ALP 16
  - Sunroof rattling: ALP 26

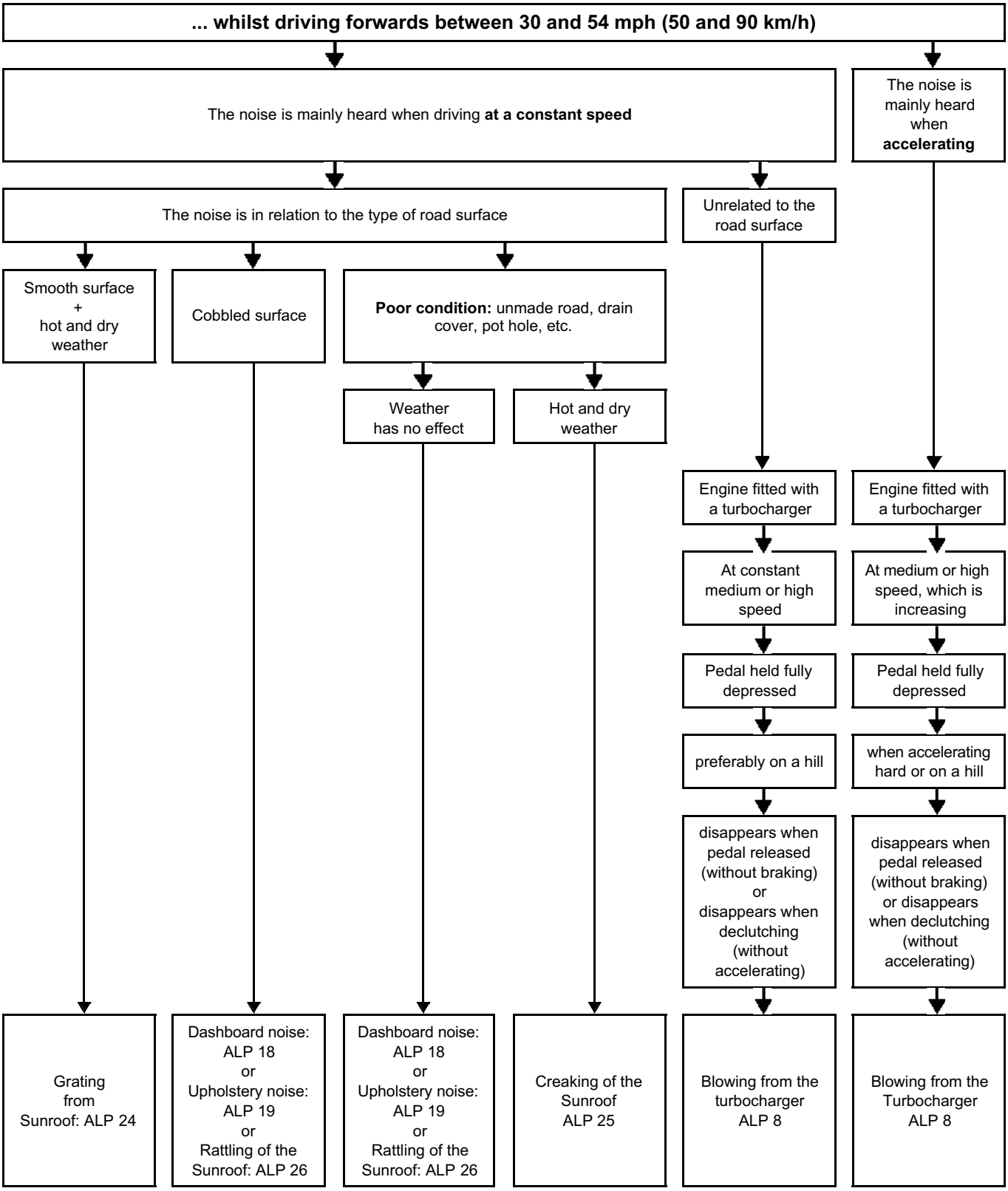
Conditions under which the noise appears no. 2

The noise is detected...



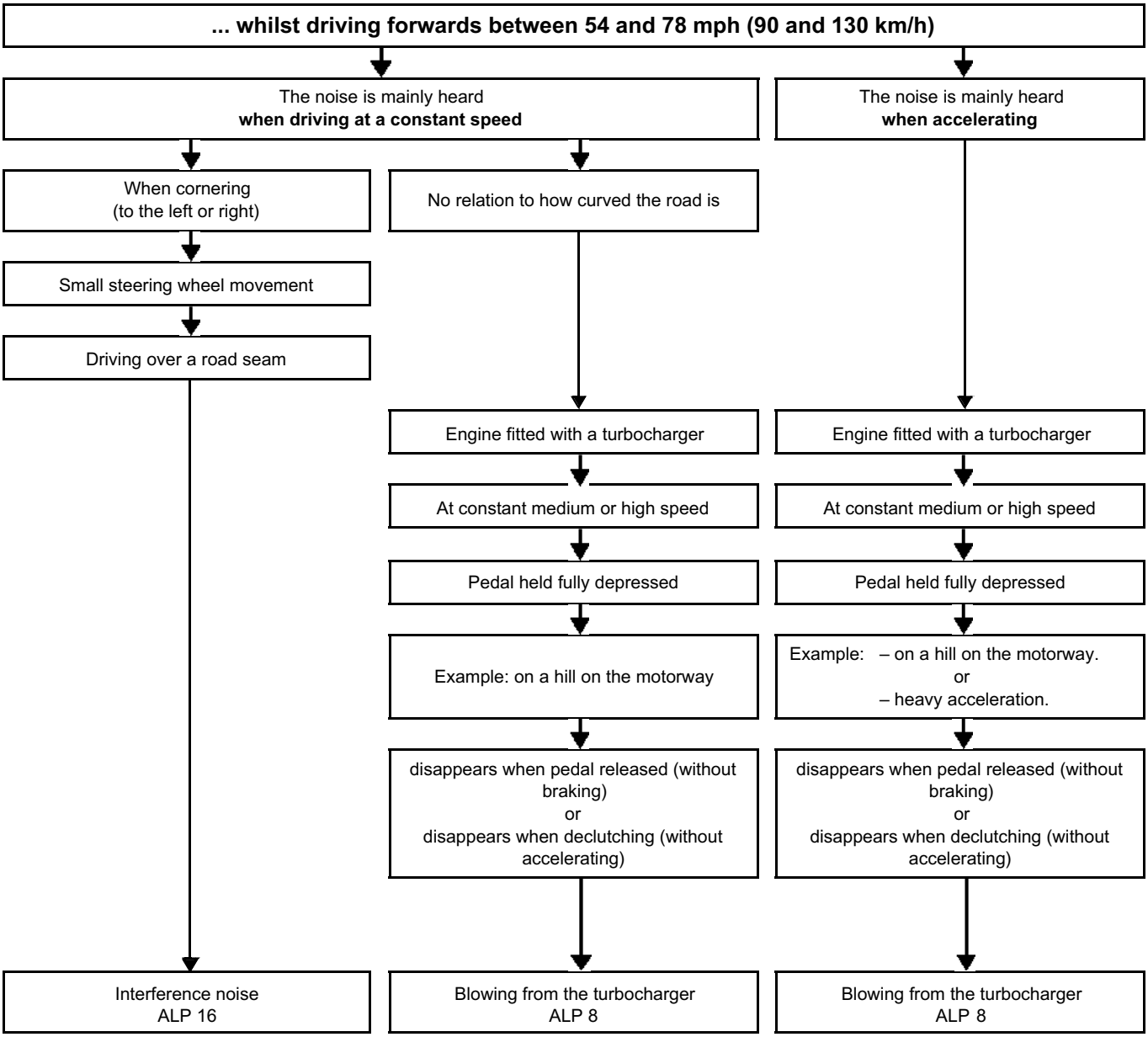
Conditions under which the noise appears no. 3

The noise is detected...



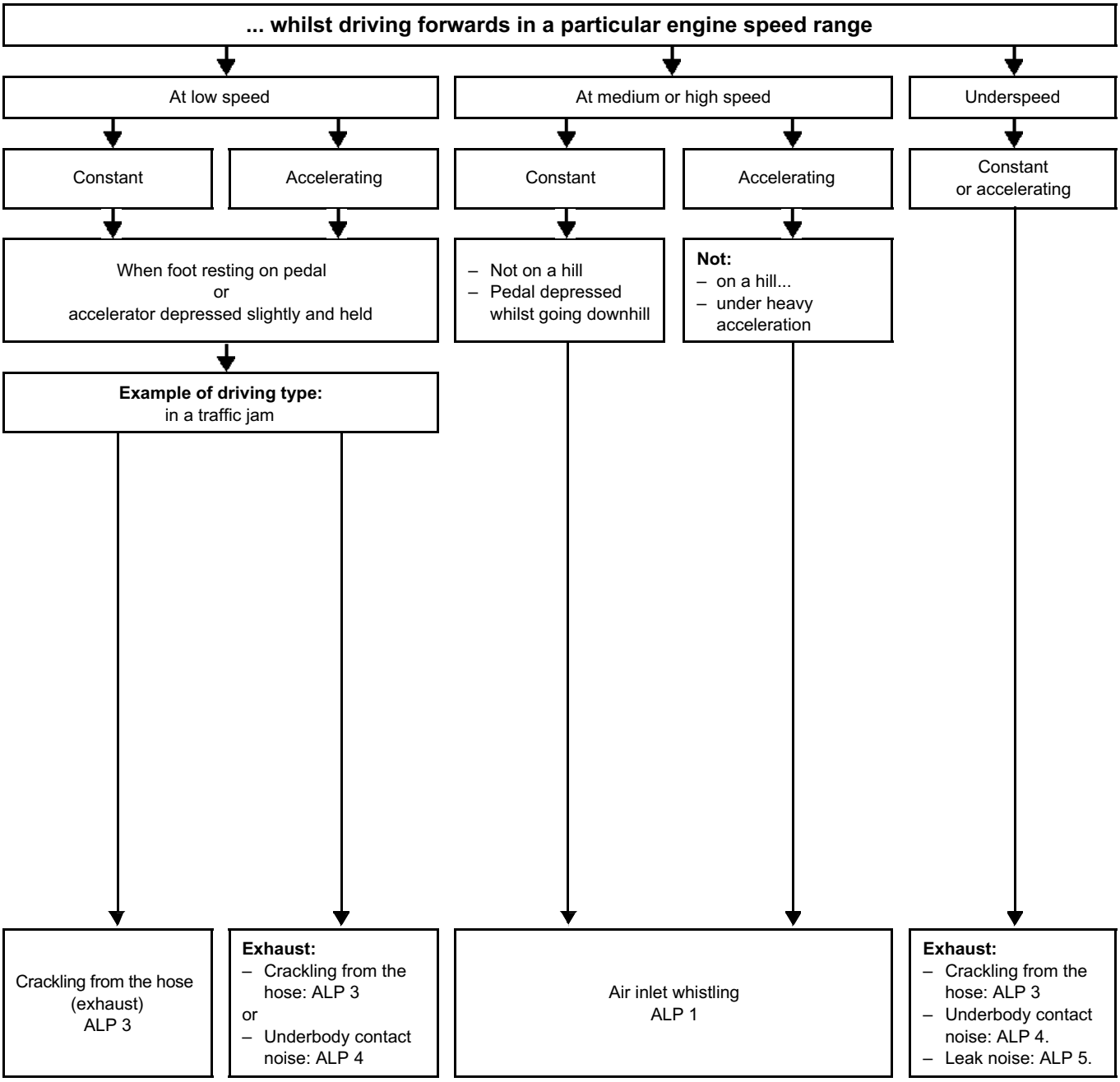
Conditions under which the noise appears no. 4

The noise is detected...



Conditions under which the noise appears no. 5

The noise is detected...



Conditions under which the noise appears no. 6

The noise is detected...

... whilst driving forwards when the accelerator is depressed in a particular manner

Noise present:
from foot resting on pedal...
to pedal held depressed half-way (not lightly nor fully).

With or without turbocharger

constant or accelerating

Appears at any vehicle speed

– Not on a hill.
– No heavy acceleration.

Disappears **instantly** when declutching
Reappears when engaging the clutch again

Does not appear when speed increased unladen (workshop)

Whining noise from the drive train
ALP 13

Noise absent:
– when foot resting on pedal,
– when pedal maintained slightly depressed.

Noise present:
– when pedal maintained depressed half-way (neither slightly nor fully).

Engine fitted with a turbocharger

Accelerating

Appears at any engine speed

Worse when hot

Fades then disappears when declutching
Reappears when engaging the clutch again

The noise fades when pedal is released then disappears (without braking)

Whistling noise from the turbocharger
ALP 6

Pedal fully depressed suddenly
(on-off)

Banging during power take-up
ALP 12

Appears
when pedal released gradually

With or without turbocharger

Deceleration controlled by the engine

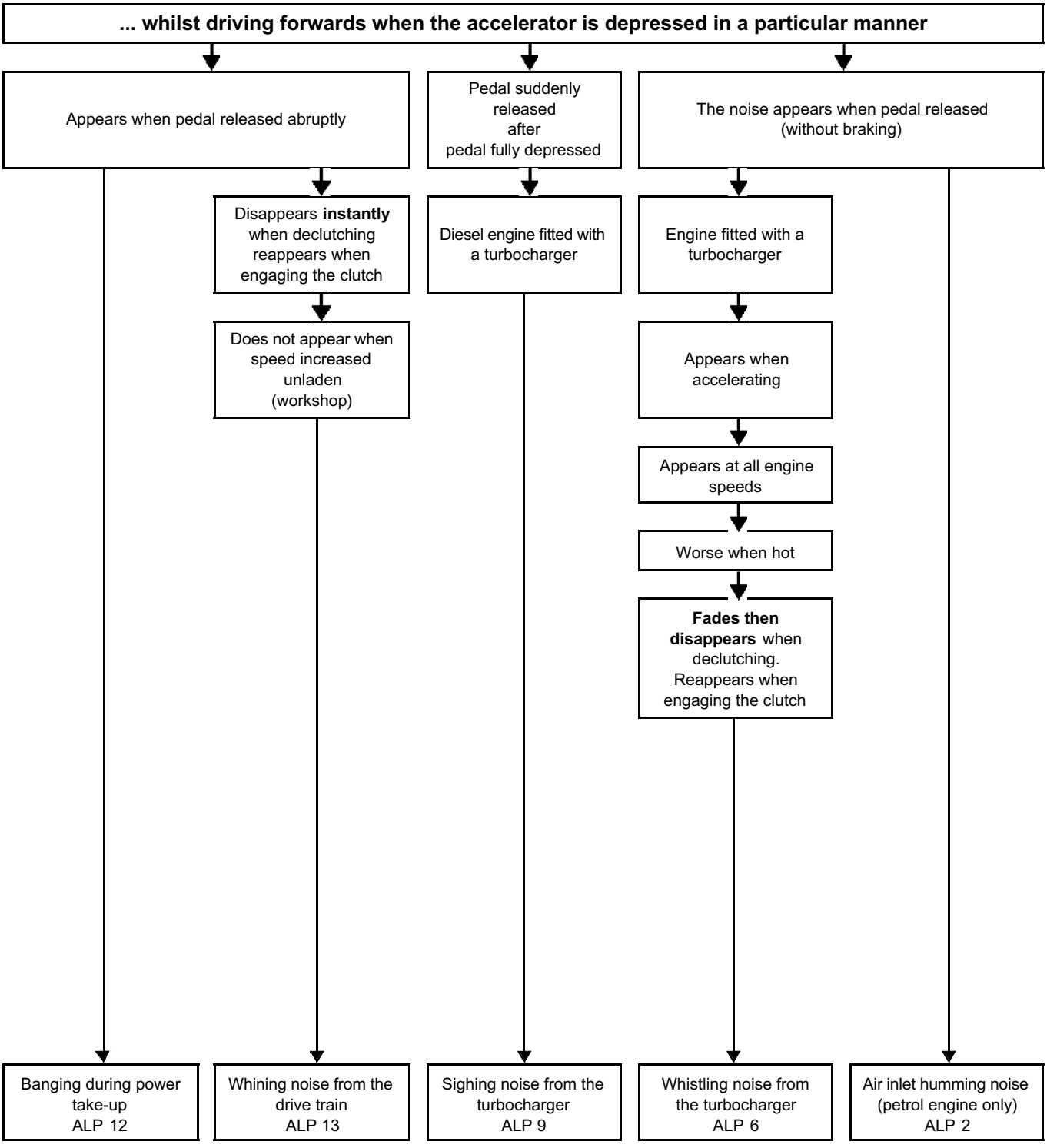
Disappears **instantly** when declutching
Reappears when engaging the clutch again

Does not appear when speed increased unladen (workshop)

Whining noise from the drive train
ALP 13

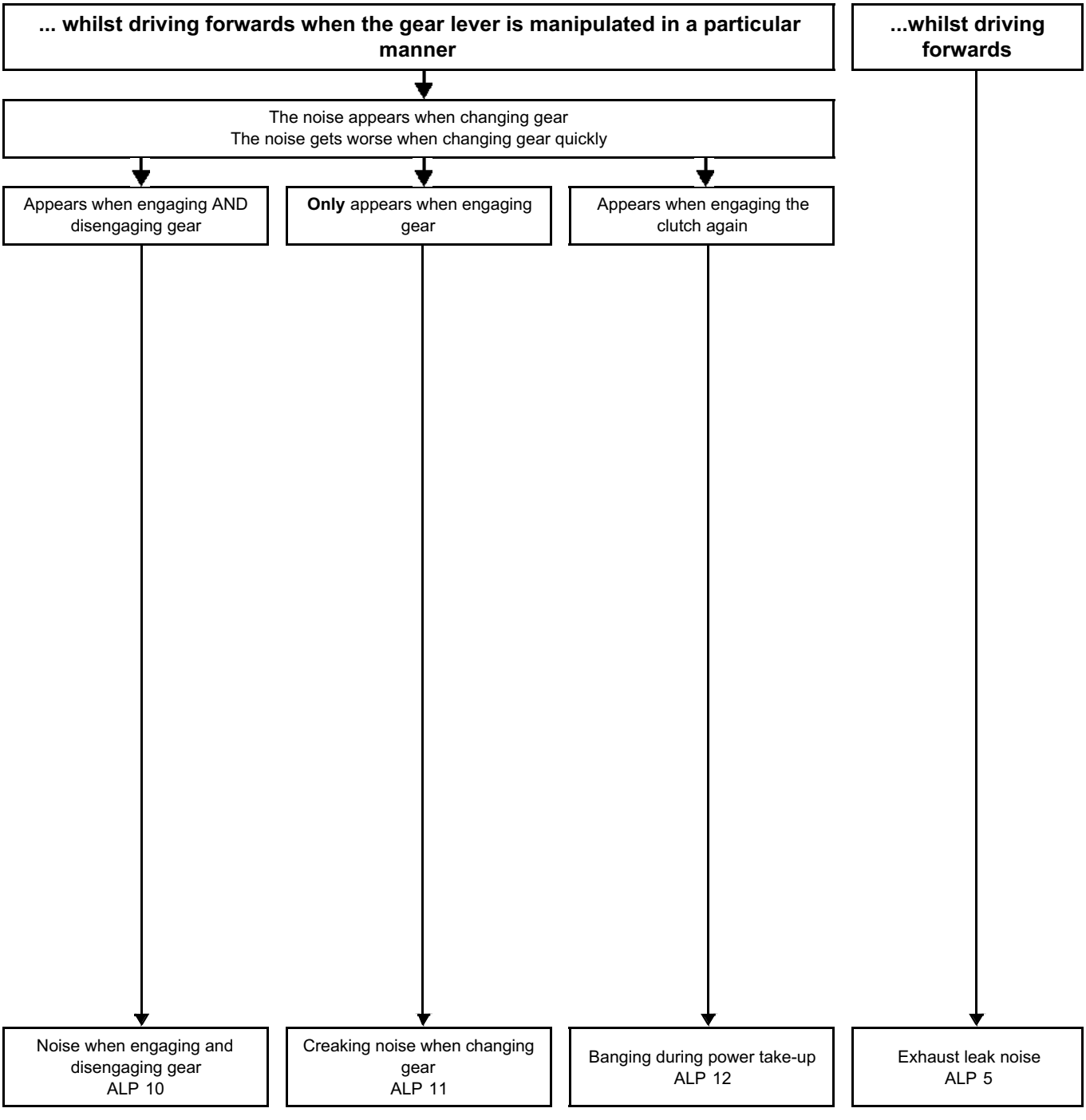
Conditions under which the noise appears no. 6 (continued)

The noise is detected...



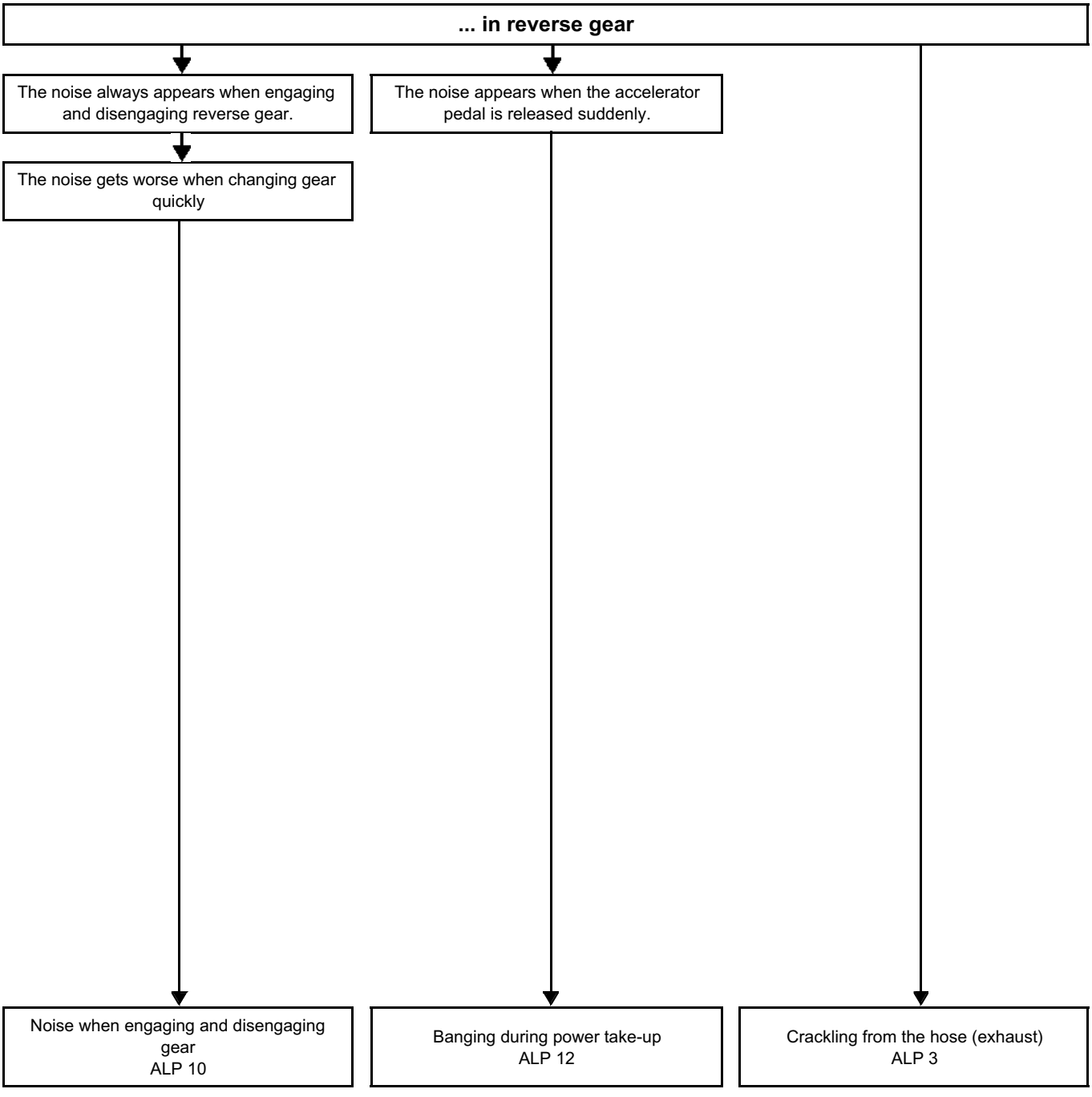
Conditions under which the noise appears nos. 7 and 8

The noise is detected...



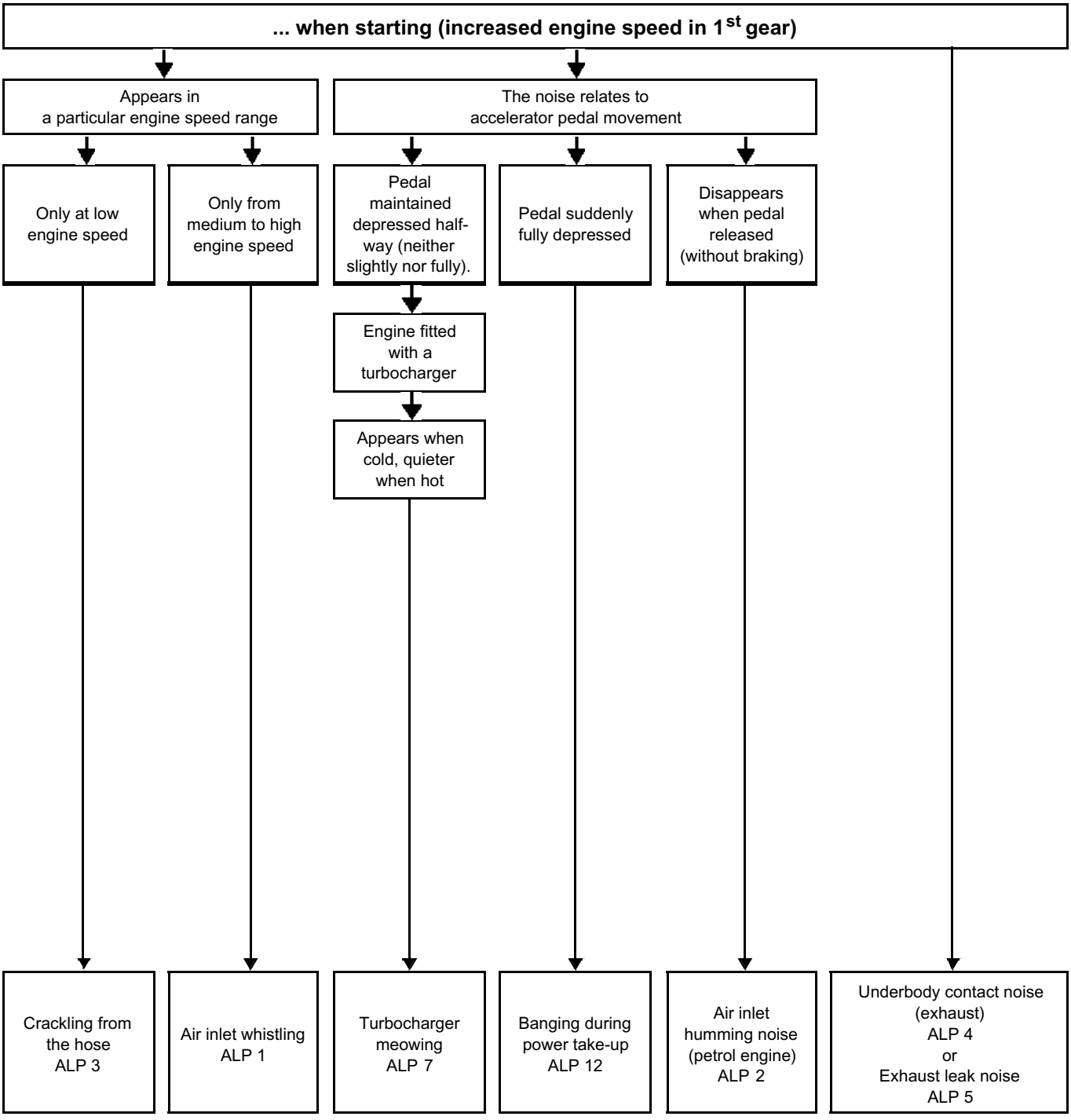
Conditions under which the noise appears no. 9

The noise is detected...



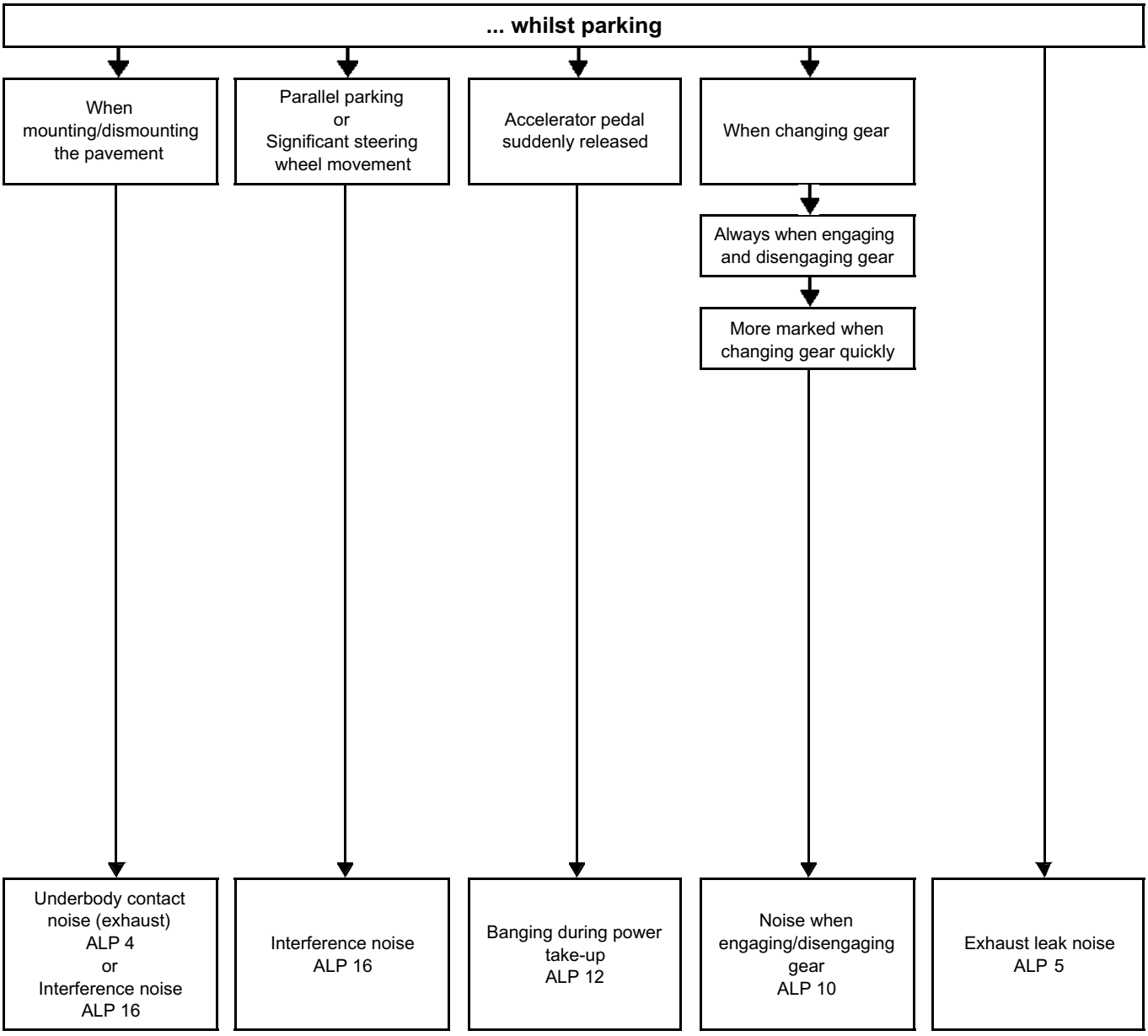
Conditions under which the noise appears no. 10

The noise is detected...



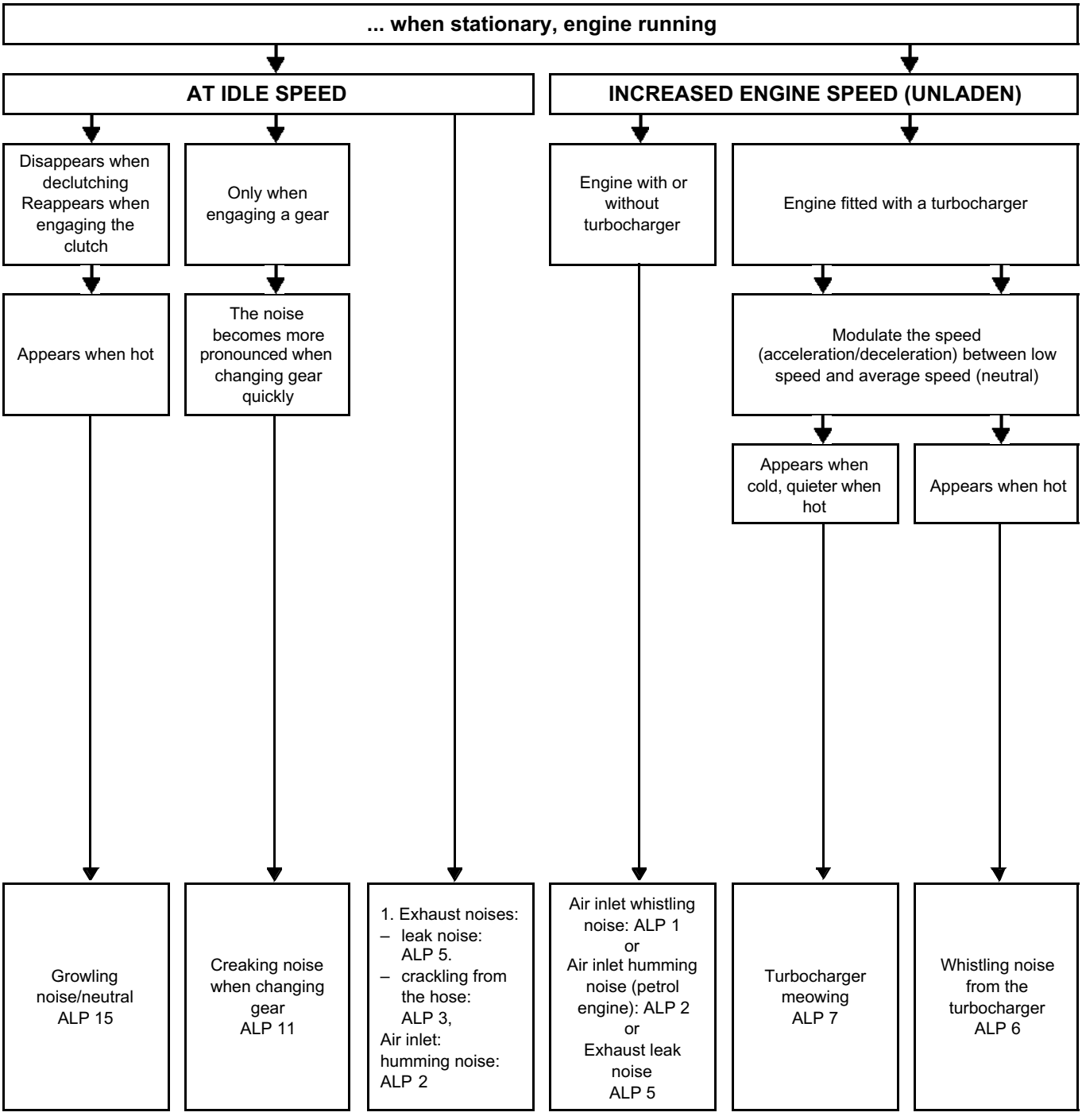
Conditions under which the noise appears no. 11

The noise is detected...



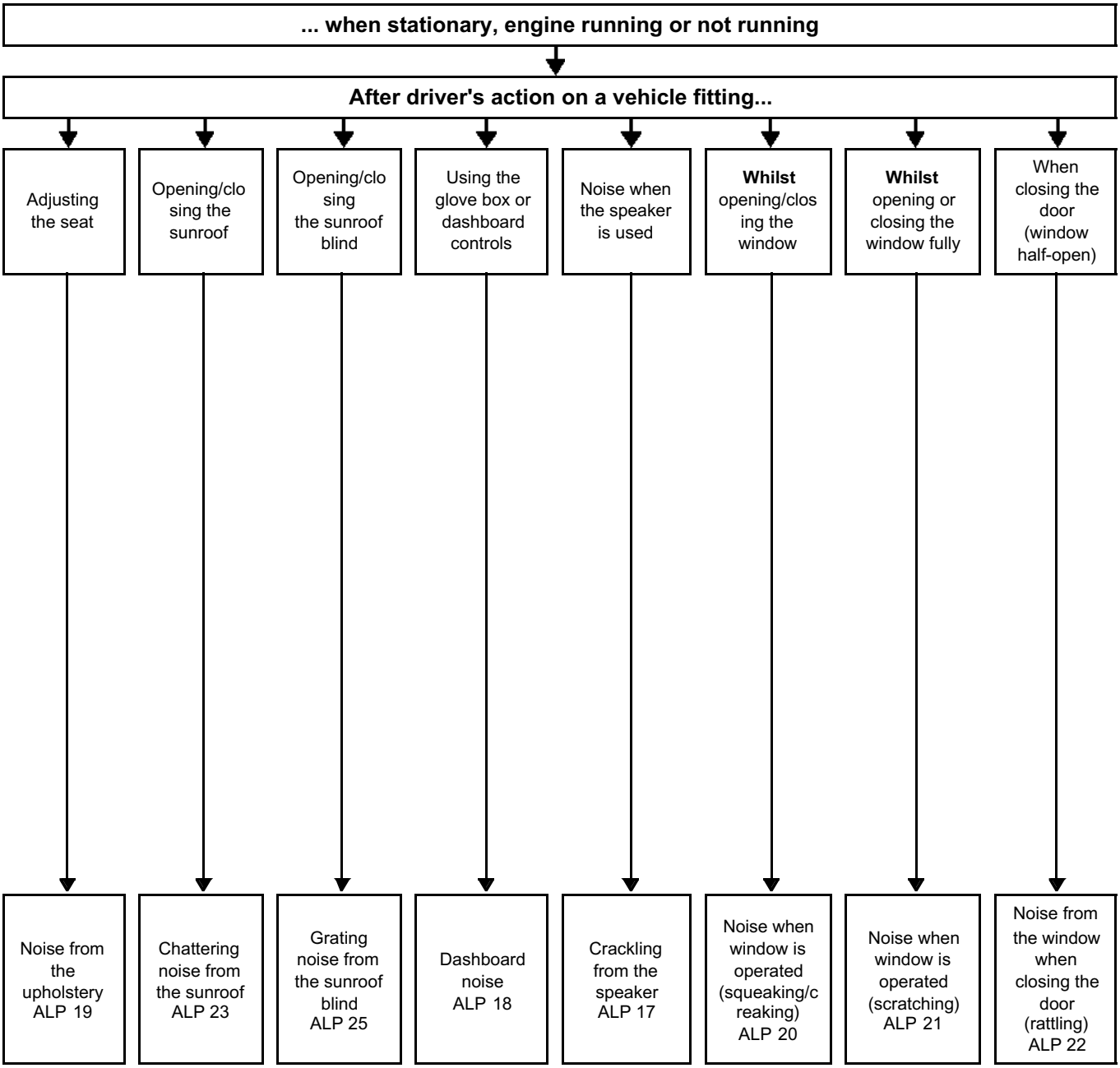
Conditions under which the noise appears no. 12

The noise is detected...



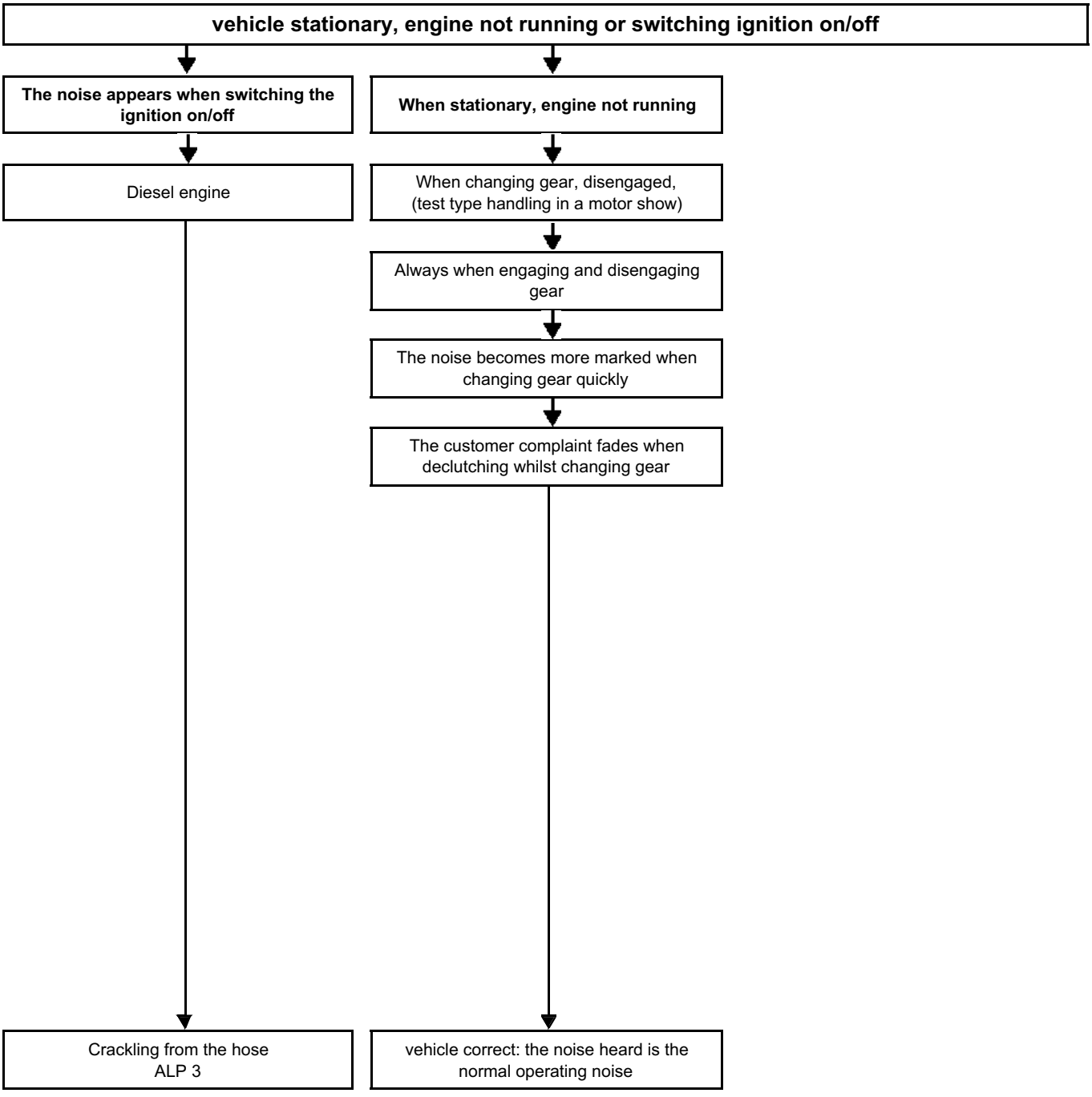
Conditions under which the noise appears no. 13

The noise is detected...



Conditions under which the noise appears no. 14

The noise is detected...



ALP 1	Air inlet whistling noises

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step: determine the area concerned (if accessible).
With the engine running, reproduce the whistling noise and detect the cause by placing a hand (part by part) or using the noise diagnostic tool (see **Noise diagnostic tool - Use**) on components which may be causing the noise and examining the entire circuit.
Two possible scenarios can arise:
– scenario no. 1 - The area is identified: only apply the ALP to the suspect area.
– scenario no. 2 - The area is not identified: follow the ALP, applying it to the entire air circuit.

↓

Check with the engine not running.

Condition of the air circuit assembly
The noise may be caused by:
- a damaged seal,
- a poorly fitted pipe,
- a damaged component.

– Check that all of the pipes are correctly clipped and/or fitted to each other, from one end of the circuit to the other.
– Check that the air filter unit, air resonators, air pipes and turbocharging air cooler are secured correctly.
– Check that the clips are tight enough.

not correct →

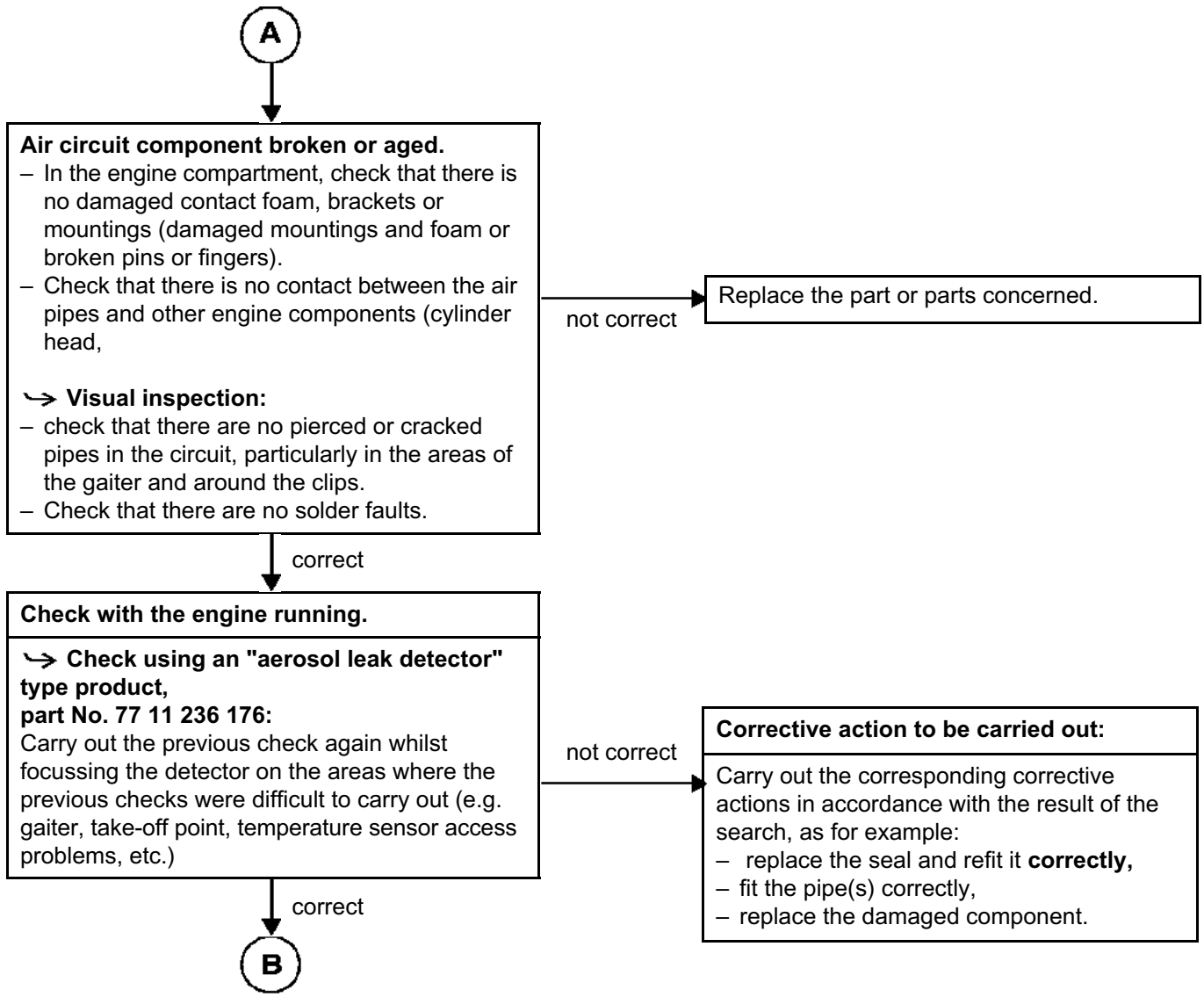
Corrective action to be carried out:

In all cases, repair the air circuit, by fitting the pipes correctly and checking that the clips are correctly torque tightened using a release torque wrench preset to the recommended tightening torque.

correct ↓

(A)

ALP 1 CONTINUED 1	Air inlet whistling noises



ALP 1 CONTINUED 2	Air inlet whistling noises

Checking the internal air circuit passages, with the air pipes removed
Check the internal air circuit passages, and in particular: ↪ **Air filter:** – air filter seal on the unit or its slide, – air filter not damaged, – air filter conformity (compare manufacturer's recommendations with the filter part number) ↪ **Other internal passage or part:** – resonator not blocked, – air pipe not blocked.

not correct →

Corrective action to be carried out:
Replace the part or parts concerned.

ALP 2	Air inlet humming noises

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step: determine the area concerned (if accessible).
With the engine running, recreate the humming noise and locate the source by placing a hand (part by part) on the components which may be the cause and examining the entire circuit.
Two possible scenarios can arise:
– scenario no. 1 - The area is identified: only apply the ALP to the suspect area.
– scenario no. 2 - The area is not identified: follow the ALP, applying it to the entire air circuit.

Check with the engine not running.

Condition of the air circuit assembly
The noise may be caused by:
– a damaged seal,
– a poorly fitted pipe,
– a damaged component.
– Check that all of the pipes are correctly clipped and/or fitted to each other, from one end of the circuit to the other.
– Check that the air filter unit, air resonators, air pipes and turbocharging air cooler are secured correctly.
– Check that the clips are tight enough.

not correct →

Corrective action to be carried out:

In all cases, repair the air circuit, by fitting the pipes correctly and checking that the clips are correctly torque tightened using a release torque wrench preset to the recommended tightening torque.

Air circuit component broken or aged.
– Check that there is not too much clearance in the air circuit created by the old component.
– In the engine compartment, check that there is no damaged contact foam, brackets or mountings (damaged mountings and foam or broken pins or fingers).

↪ **Visual inspection:**
– check that there are no pierced or cracked pipes in the circuit, particularly in the areas of the gaiter and around the clips.
– Check that there are no solder faults.

not correct → Replace the part or parts concerned.

correct ↓

(A)

ALP 2 CONTINUED	Air inlet humming noises

Checking the internal air circuit passages, with the air pipes removed
Check the internal air circuit passages, and in particular: ↪ **Air filter:** – air filter seal on the unit or its slide, – air filter not damaged, – air filter conformity (compare manufacturer's recommendations with the filter part number) ↪ **Other internal passage or part:** – resonator not blocked, – air pipe not blocked.

not correct →

Corrective action to be carried out:
Replace the part or parts concerned.

ALP 3	Crackling noises from the connecting hose or ball joint bracket (depending on version) (exhaust)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Preliminary step:
visually determine if the exhaust system has a ball joint bracket or a connecting hose (see vehicle MR, **19B EXHAUST**).

↓

Check the tightening torques

With the vehicle raised on a lift, check that the torque wrench, which is preset to the recommended tightening torque, is released at the recommended tightening torque of the bracket (flat or ball joint) at the start of the exhaust system (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

→ **Corrective action to be carried out:**

Tighten to the recommended torque (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

↓

Check the exhaust system manually ON A VEHICLE LIFT (engine stopped)

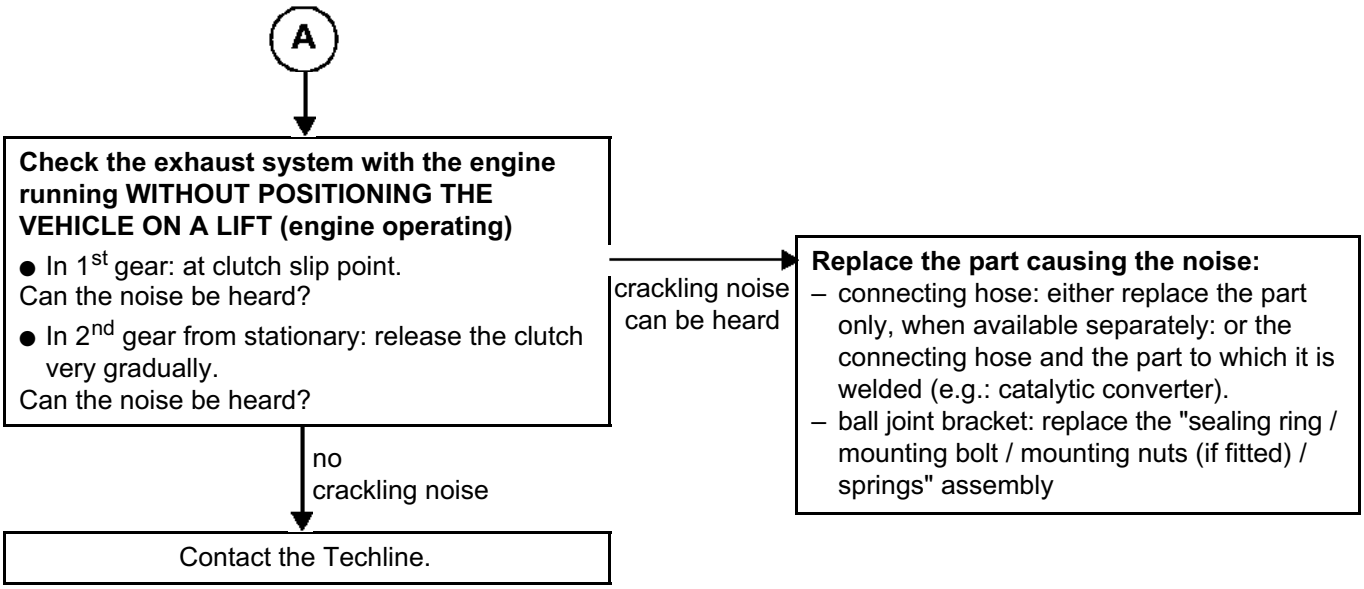
With the exhaust system cold, lightly knock the exhaust system by hand in several places (especially on the front axle subframe), without reaching its stops.
Note:
If the exhaust system is suspended from the subframe, remove the suspension mounting(s) in order to knock the pipe.

→ crackling noise can be heard

Replace the part causing the noise:
- **connecting hose:** either replace the part only, when sold separately; or the connecting hose and the part to which it is welded (e.g. catalytic converter).
- **ball joint bracket:** replace the "sealing ring / mounting bolt / mounting nuts (if fitted) / springs" assembly

↓ no crackling noise

ALP 3 CONTINUED	Crackling noises from the connecting hose or ball joint bracket (depending on version) (exhaust)



ALP 4	Underbody contact noise (exhaust)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the tightening torques

With the vehicle raised on a lift, check that the torque wrench, which is preset to the recommended tightening torque, is released at the recommended tightening torque of the bracket (flat or ball joint) at the start of the exhaust system (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

→ **Corrective action to be carried out:**

Tighten to the recommended torque (see MR for vehicle, **19B EXHAUST, Catalytic converter: Removal - Refitting**).

↓

Visually and manually check the exhaust system

Knock the exhaust system with force in several places (cold pipe) to accurately identify the areas of the exhaust system in contact with:
– heat shields,
– suspension bolt(s) or rubber mounting bush(es),
– exhaust pipe anchorage point(s) on the body,
– suspension bracket,
– exhaust sleeve.

→ contact noises noticeable

Corrective action to be carried out:

Perform one or more of the following operations:
- Replace or manually correct the heat shield
- Check the heat shield mountings.
- Replace the suspension bolt(s).
- Replace the component on which the anchorage points or brackets may be broken or damaged.
- Reposition the exhaust pipe, by moving the sleeve or the exhaust pipe clamp (see MR for vehicle, **19B EXHAUST, Exhaust: Precautions for repair)**

↓ no contact noise

Consult ALP 16: Interference noise

These noises may be similar to exhaust system contact noises.

ALP 5	Exhaust leak noise

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

DO NOT BLOCK the exhaust pipe output.
Remove the engine undertray.

Safety
Rules which MUST be respected when the engine is operating:
– heat-protective gloves must be worn when handling the hot exhaust
– connect an exhaust gas extractor

↓

Check the exhaust system, which must only be carried out with the vehicle ON A LIFT, and the engine running

At idle speed (visual, aural and tactile inspection):
Wearing a heat-resistant glove, use one hand to lightly touch the exhaust system from the exhaust manifold to the exhaust tailpipe end.

More specifically, check:
– the seal on the exhaust manifold,
– the condition of the welds on the entire exhaust system,
– the exterior appearance of the exhaust system (impact, corrosion, cracks, welds, holes),
– the condition of the removable connections on the exhaust system (sleeves, clips and brackets)
– the presence of condensed water under the vehicle.

In certain cases and whenever possible in order to determine the leak, check the area in question using an "aerosol leak detector" type product, part no.77 11 236 176.

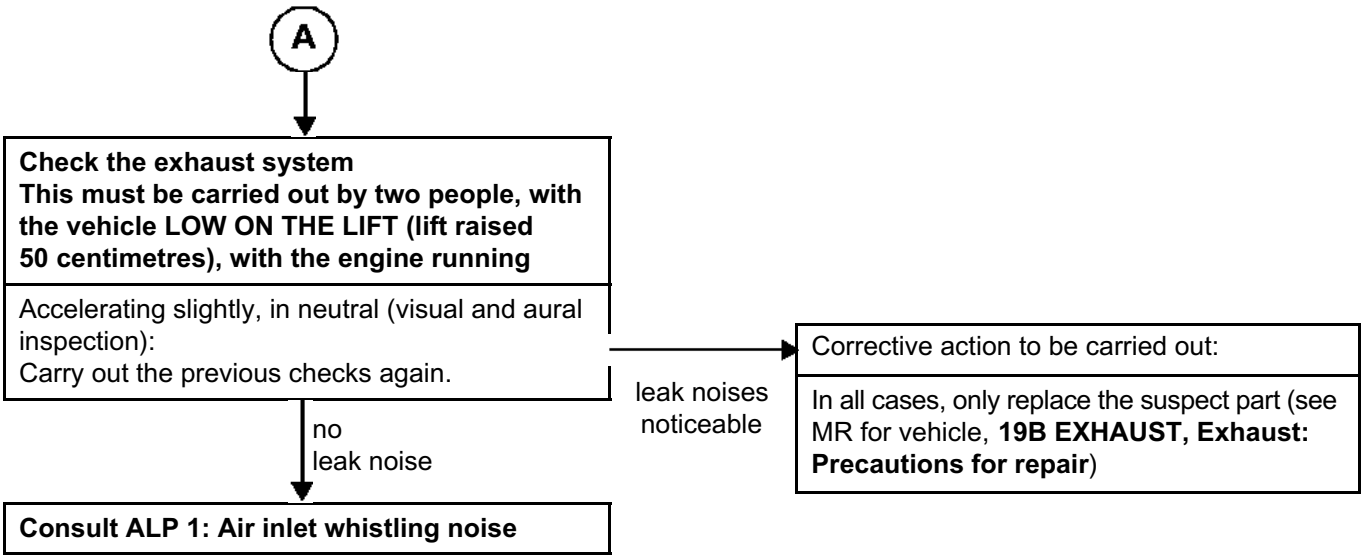
leak noises noticeable →

Corrective action to be carried out:

In all cases, only replace the suspect part (see MR for vehicle, **19B EXHAUST, Exhaust: Precautions for repair**)

↓ no leak noise

ALP 5 CONTINUED	Exhaust leak noise



ALP 6	Whistling noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Checking the engine oil level

Check the oil level.

→ not correct → Adjust the level (not excessively) using the manual dipstick (do not exceed the maximum level)

Checking the engine oil grade

1. By checking the Maintenance Booklet.

→ if the oil service interval has passed or is close → Change the oil.
Drive so that the engine cooling fan is triggered. (to homogenise the viscosity of the engine oil).
If the noise disappears: end of turbocharger fault finding.

2. By checking if the noise appears when the engine starts from cold.
If this is the case, the oil is the cause (excessive thickening)

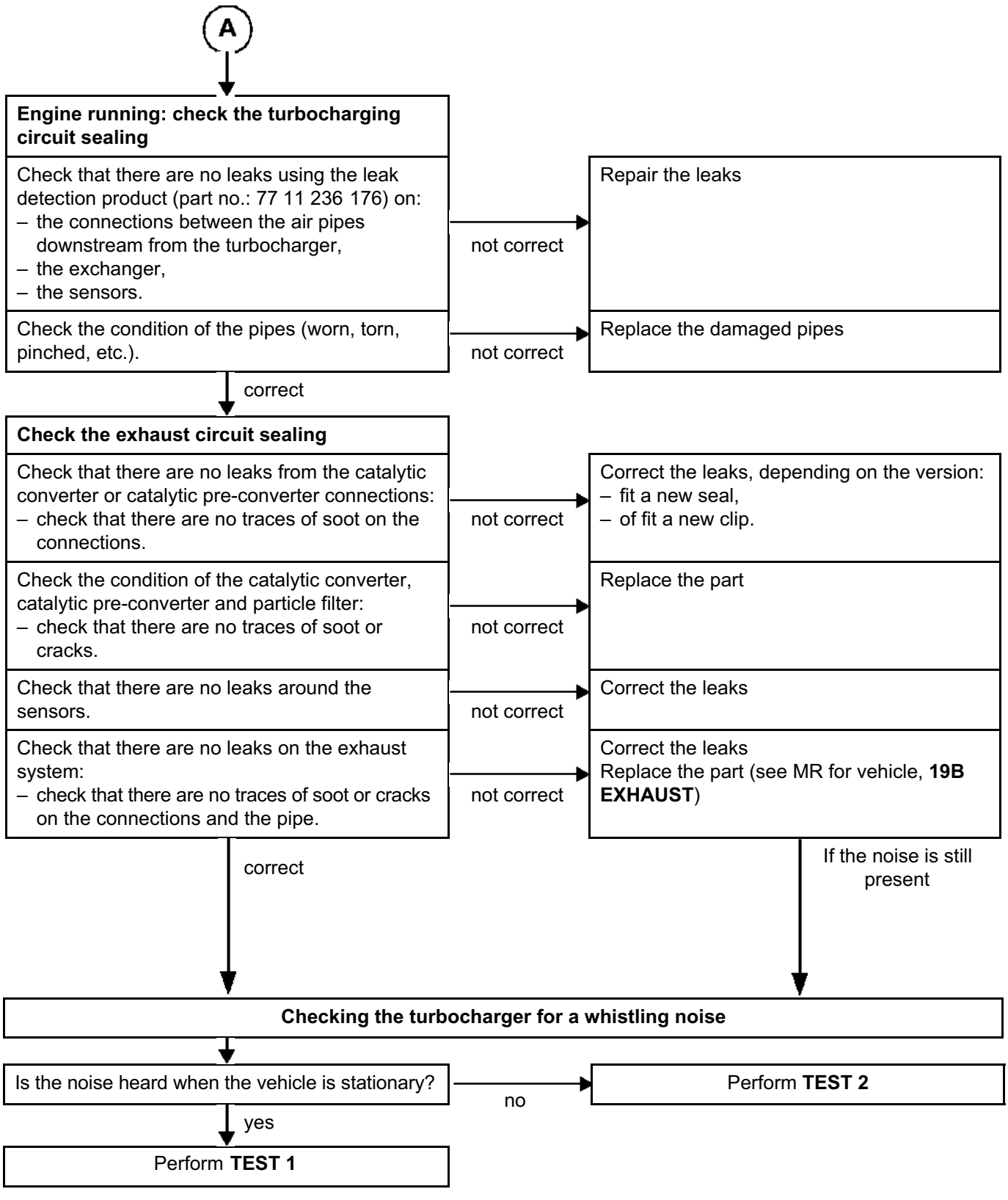
→ if noise when cold → Change the oil.
Drive so that the engine cooling fan is triggered. (to homogenise the viscosity of the engine oil).
If the noise disappears: end of turbocharger fault finding.

Oil service interval correct and no noise when cold → (A)

If the noise is still present → **Is the noise more pronounced?**

- no → Continue the ALP → (A)
- yes → Replace the turbocharger (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

ALP 6 CONTINUED 1	Whistling noise from the turbocharger



ALP 6 CONTINUED 2	Whistling noise from the turbocharger

TEST 1

Configurations: vehicle stationary, **disengaged**, engine running and warm
Before the test, clearly identify the speed conditions under which the noise appears
A) For a vacuum-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Only for a turbocharger on G9T 710* engine: create a vacuum to control the regulator using a pressure-vacuum pump at a vacuum value of 0.6 bar (opening the pressure regulation valve).
B) For a pressure-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Create pressure to control the regulator using a pressure-vacuum pump at a maximum pressure value of 1.4 bar (opening the turbocharger by-pass valve).
These operations aim to lower the speed of the turbocharger which changes the conditions under which the noise appears.
** On the G9T 710 engine, the turbocharger controls are inverted.*

If the noise changes → **Replace the turbocharger** (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

If the noise does not change → The turbocharger is not the cause of the noise (end of turbocharger whistling fault finding)

TEST 2

Configurations: vehicle driving when warm
Before the test, clearly identify the speed conditions under which the noise appears
A) For a vacuum-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Only for a turbocharger on G9T 710* engine: create a vacuum to control the regulator using a pressure-vacuum pump at a vacuum value of 0.6 bar (opening the pressure regulation valve).
B) For a pressure-controlled turbocharger:
– Disconnect the pneumatic control on the turbocharger regulator.
– Clamp the pipe (e.g. using a set of hose clamps).
– Create pressure to control the regulator using a pressure-vacuum pump at a maximum pressure value of 1.4 bar (opening the turbocharger by-pass valve).
These operations aim to lower the speed of the turbocharger which changes the conditions under which the noise appears.
** On the G9T 710 engine, the turbocharger controls are inverted.*

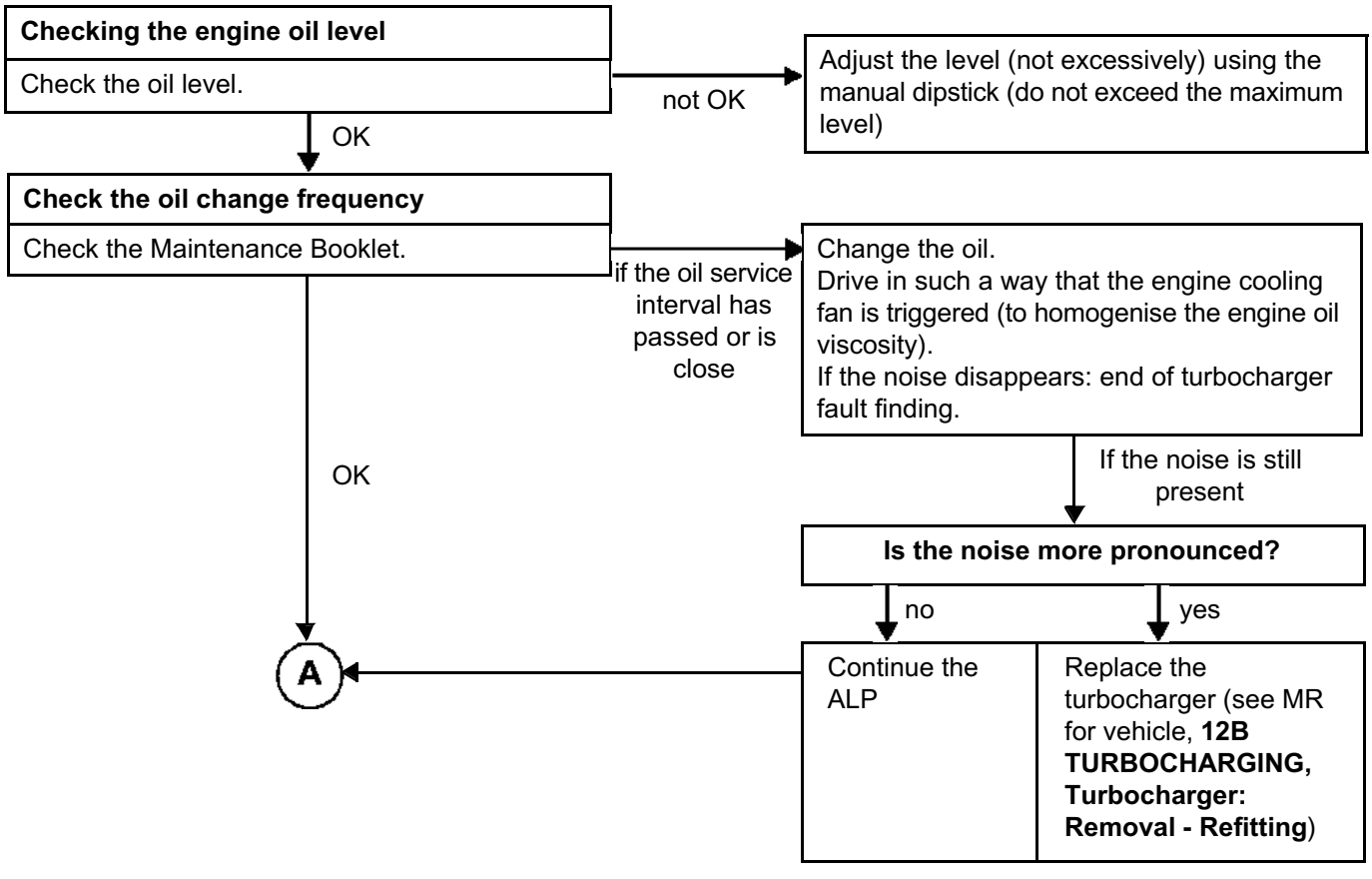
If the noise changes → **Replace the turbocharger** (see MR for vehicle, **12B TURBOCHARGING, Turbocharger: Removal - Refitting**)

If the noise does not change → The turbocharger is not the cause of the fault (end of turbocharger whistling noise fault finding) **Consult the ALP: Whining noise in the drive train**

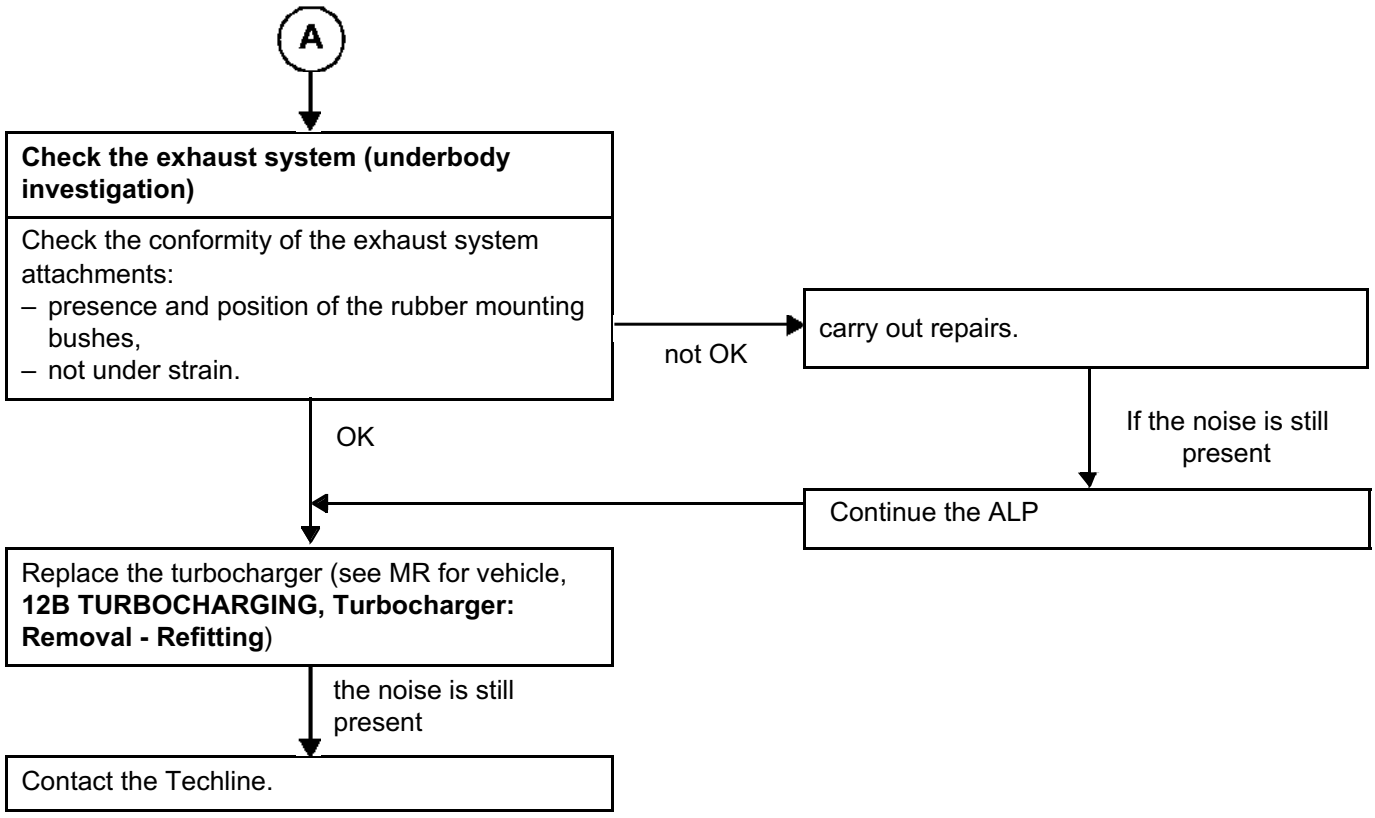
ALP 7	Meowing noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

IMPORTANT:
Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.



ALP 7 CONTINUED	Meowing noise from the turbocharger



ALP 8	Blowing noise from the turbocharger

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

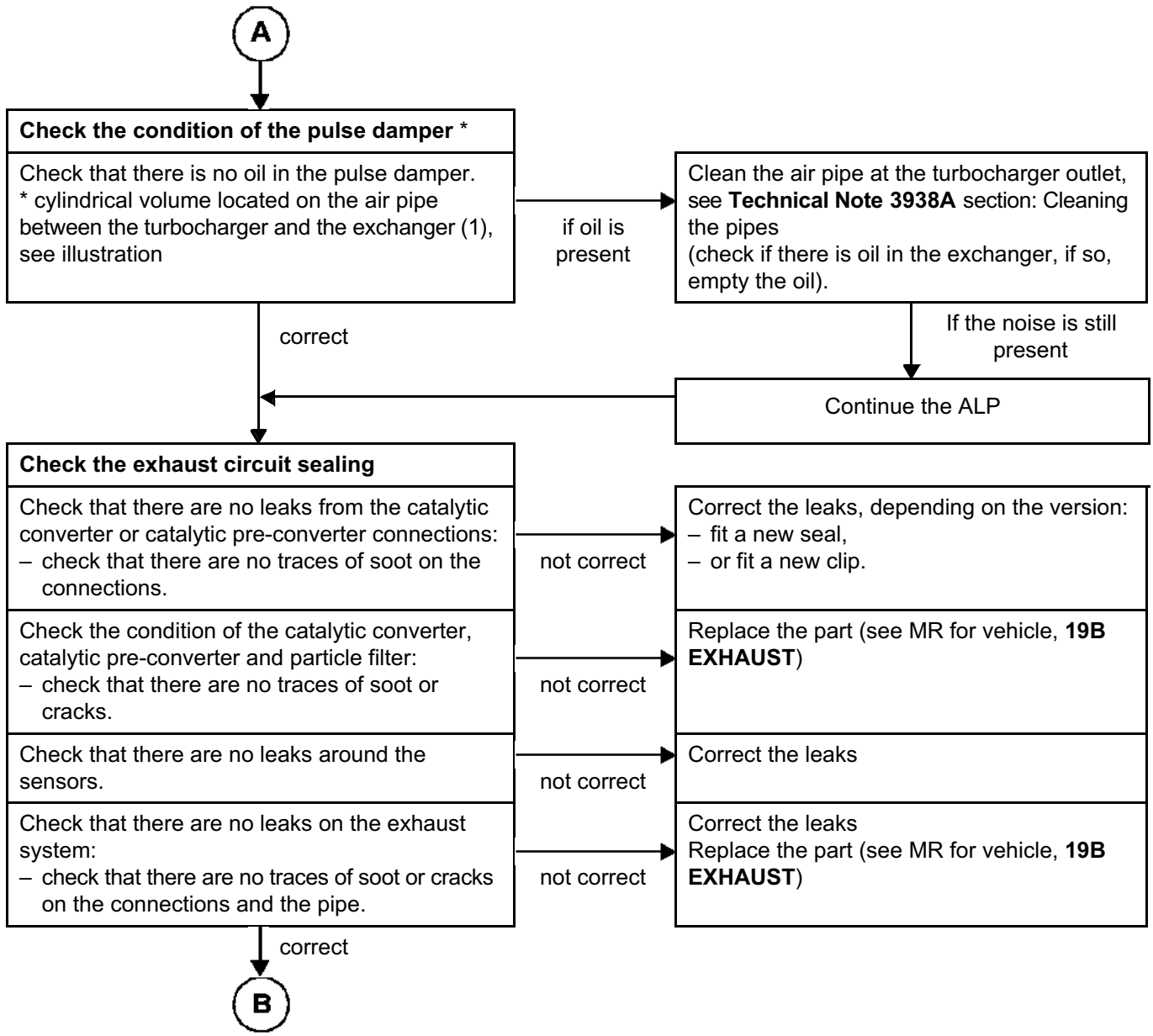
IMPORTANT:
Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.

Check the turbocharging circuit sealing		
Check that there are no leaks on the connections between the air pipes downstream from the turbocharger and on the exchanger: – use the leak detection product (part no.: 77 11 236 176)	not correct →	Repair the leaks
Check that there are no leaks around the sensors: – use the leak detection product (part no.: 77 11 236 176)	not correct →	Repair the leaks
Check the condition of the pipes (worn, torn, pinched, etc.).	not correct →	Replace the part (see MR for vehicle, **19B EXHAUST**)
Check that the ducts are correctly fitted and check that the clips are correctly positioned on the cylindrical part of the end pieces.	not correct →	Repair

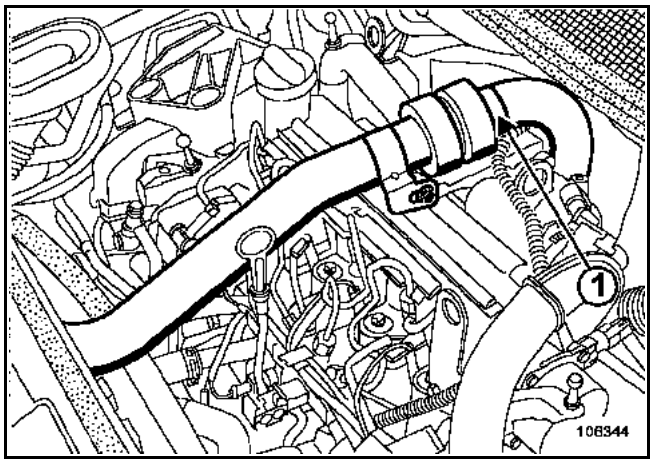
correct ↓

A

ALP 8 CONTINUED 1	Blowing noise from the turbocharger



ALP 8 CONTINUED 2	Blowing noise from the turbocharger



B

Check the operation of the EGR solenoid valve

See Fault Finding MR for the vehicle, **13B DIESEL INJECTION, Fault finding - Conformity check**

not OK → Carry out repairs

If the noise is still present → Continue the ALP

OK → The vehicle is correct

ALP 9	Sighing noise from the turbocharger (diesel engine)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

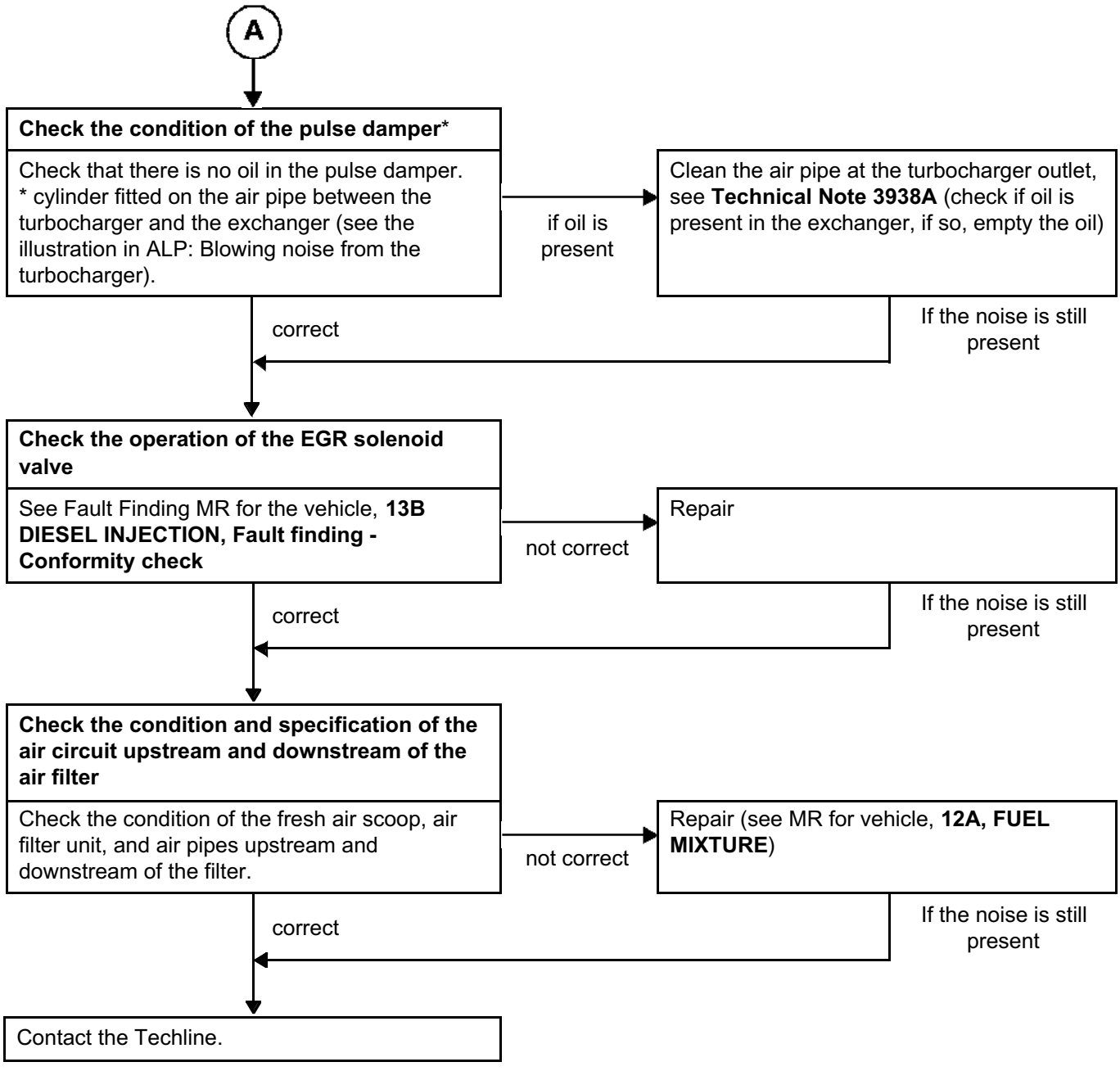
IMPORTANT: Consult the vehicle's history in the ICM database and check that the exhaust system has not been replaced (even partially) and that no work has been undertaken on the high pressure air circuit.
If this is the case, check that the operation was carried out correctly.

Check the turbocharging circuit sealing **IMPORTANT***:* *Under no circumstances must the sealing test be performed by plugging the exhaust system (risk of damaging the shaft line seals)*		
Check the condition of the air pipes (worn, torn, pinched, etc.).	not correct	Replace the defective part
Check that the ducts are correctly fitted and check that the clips are correctly positioned on the cylindrical part of the end pieces.	not correct	Repair the ducts
Check that there are no leaks on the connections between the air pipes downstream from the turbocharger and on the intercooler; use leak detection product (part no.: 77 11 236 176)	not correct	Repair the leaks
Check that there are no leaks around the sensors: – use the leak detection product (part no.: 77 11 236 176)	not correct	Repair the leaks

correct

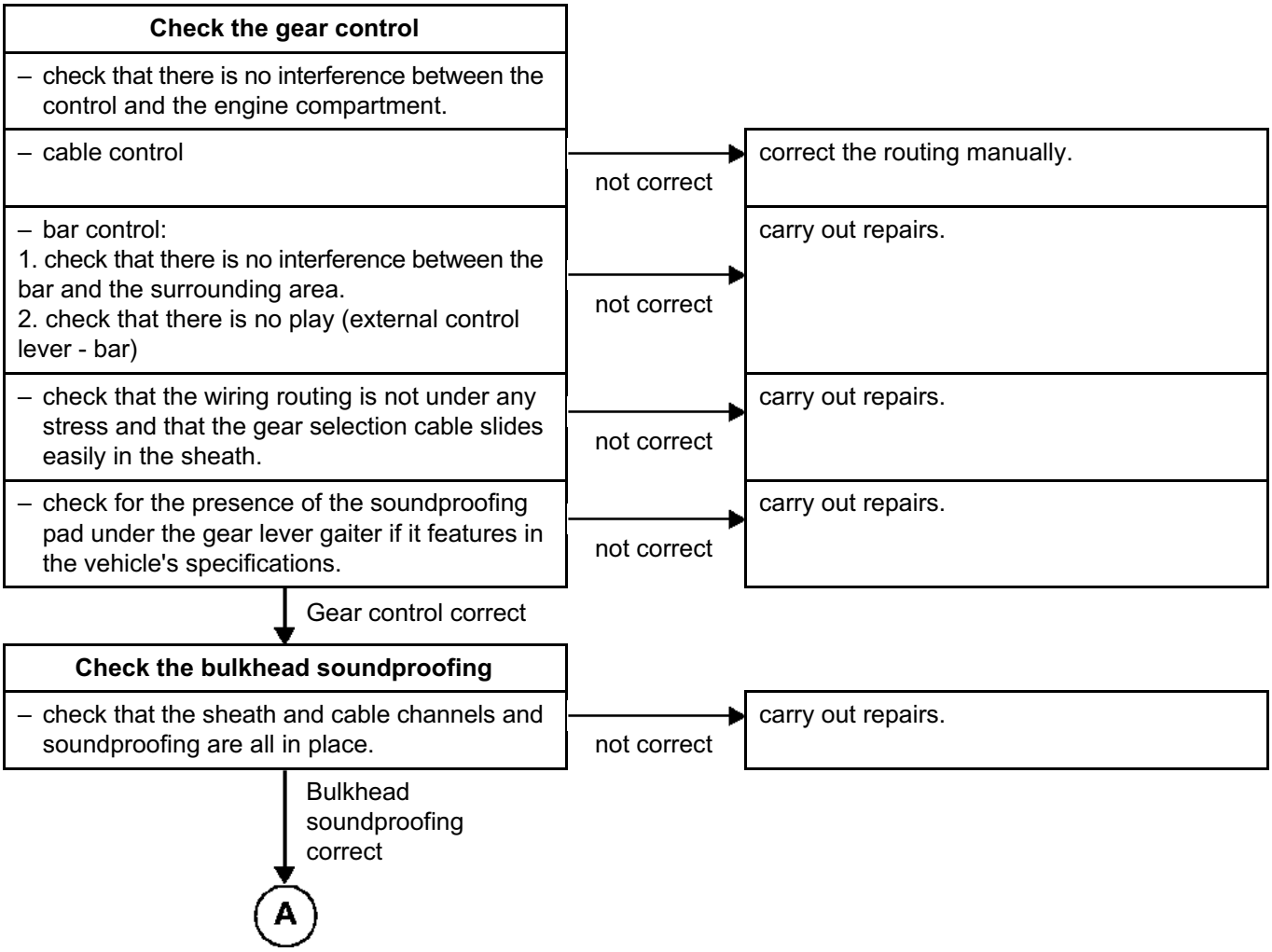
A

ALP 9 CONTINUED	Sighing noise from the turbocharger (diesel engine)

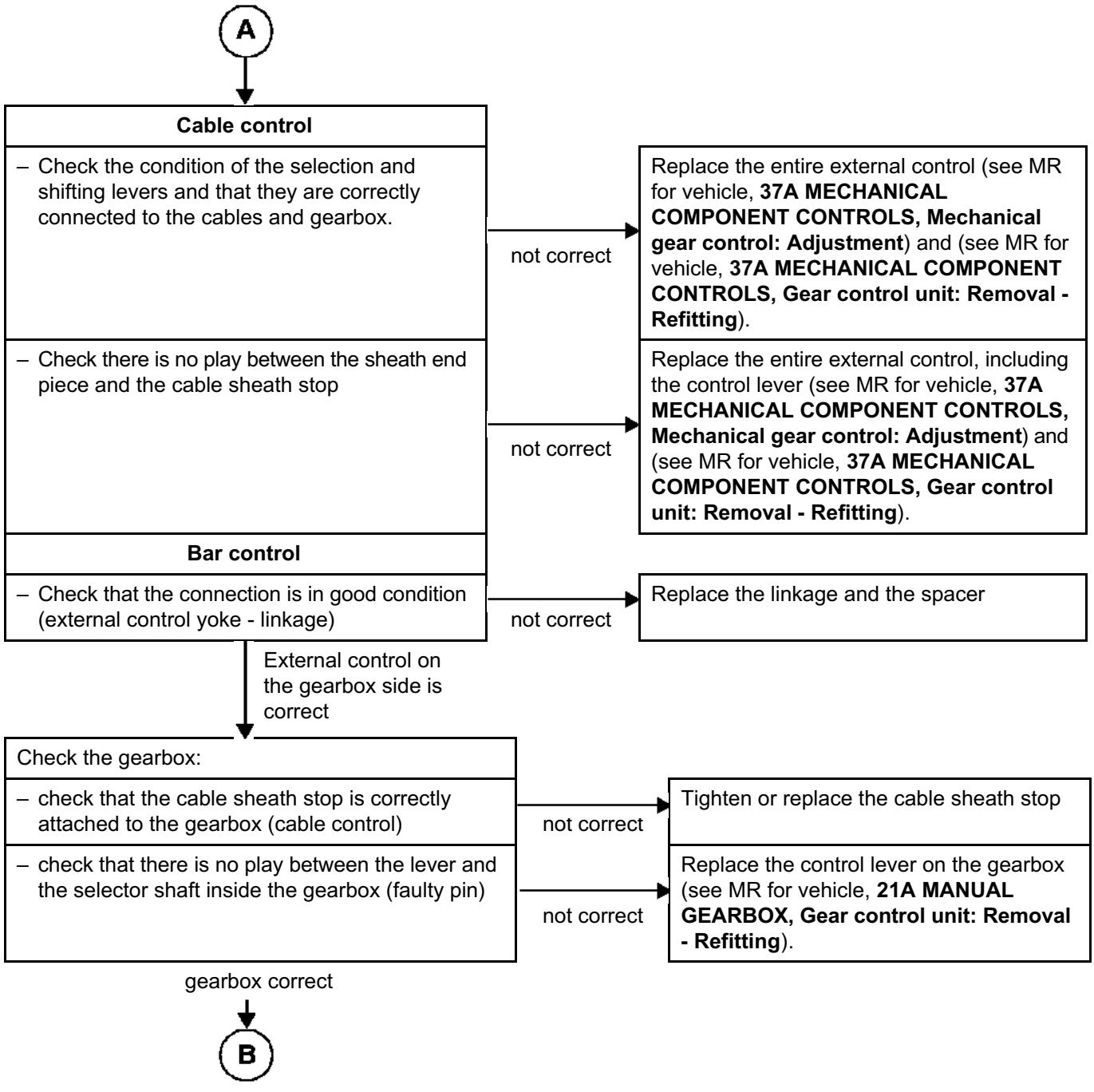


ALP 10	Noise when engaging/disengaging gear

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.



ALP 10 CONTINUED 1	Noise when engaging/disengaging gear

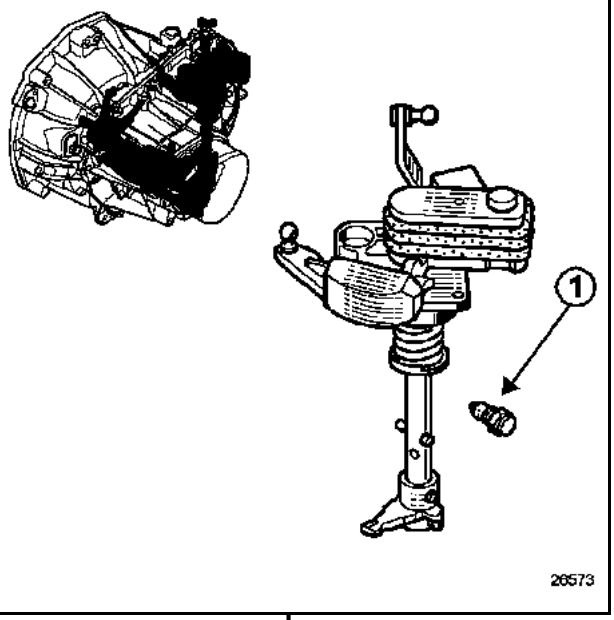


ALP 10 CONTINUED 2	Noise when engaging/disengaging gear

B

Only for JH JR gearboxes

Replace the locating ball unit (1)



gearbox correct

If the noise is still present, contact the Techline

*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 11	Creaking noise when changing gear

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check that no vehicle mat is preventing the clutch from operating when changing gear.
Check that the gear control setting is correct (see MR for vehicle, **21A MANUAL GEARBOX, Manual gear control: Adjustment**).
WARNING
If creaking can be heard:
– **On EVERY gear ratio:** the customer may have complained previously about hard spots when selecting gear (cable clutches). Therefore it is ONLY the clutch which is concerned (see Technical Note 3451A)
– **When changing from Neutral / 1st or Neutral / Reverse:** start by checking the clutch and follow the ALP if the clutch is correct.
– **Other gears:** start DIRECTLY by checking the gearbox WITHOUT checking the clutch

Check the clutch		
– Check that the clutch release point is correct.		
– For mechanical clutch controls: Check the fork travel (see **Technical Note 3451A**)	not correct →	Adjust the travel if manual adjustment (e.g. Logan). (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Adjustment**).
– For hydraulic clutch controls: Only check the release point (it must be possible to change gear with the pedal depressed 3/4 of its total travel)	not correct →	Bleed the hydraulic circuit (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch circuit: Bleeding**).

Clutch release point correct

ALP 11 CONTINUED 1	Creaking noise when changing gear

Check the gearbox before removing it		Corrective action to be carried out:
– check that there are no leaks on the driveshaft side and/or joint face and/or gear control module (JB, JC gearbox).	not correct	Repair either: – By replacing the driveshaft seals if the leaks originate from the driveshafts (see MR for vehicle, **21A MANUAL GEARBOX, Differential output seal: Removal - Refitting**) – By repairing the gearbox joint face sealing (see Technical Note for the gearbox*) – By replacing: the gearbox seal and selector shaft if the module is leaking (see Technical Note for JB-JC)
– check the gearbox oil level.	not correct	Adjust the oil level (using oil specified by the manufacturer).
– check the appearance of the oil Oil which is dark in colour is not a fault. Oil which smells burnt is caused by a hot gearbox (insufficient oil level or hard use). The presence of bronze-coloured rings is not a fault. The presence of particles of an aluminium colour is an indication that the gearbox is seriously damaged internally.	not correct	– Perform an oil change (using oil specified by the manufacturer). – If aluminium colour particles are present, replace the gearbox (see MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**)

ALP 11 CONTINUED 2	Creaking noise when changing gear

B

Remove the gearbox		Corrective action to be carried out:
– Check the clutch wear.	not correct →	Replace the whole clutch system. *Important: the synchronisation must be checked as this might have been damaged following clutch damage.*
Open the gearbox		**Corrective action to be carried out:**
– Check the condition of the synchronisation, synchronisation springs, idle gear and synchroniser ring and the selector rod for the gear(s) concerned. (See MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Check**)	not correct →	Replace all of the components of the damaged gear(s) (pinion, hub, selector rod, synchroniser ring and synchronisation spring) (see Technical Note for the gearbox*)

*

Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 12	Banging during power take-up or torque inversion

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

VERY IMPORTANT - Preliminary checks:	
– **Engine and transmission assembly suspension points:** Check the tightness and positioning of all of the engine and transmission assembly suspension points (engine tie-bar, engine and/or gearbox hydro-elastic rubber pads) using the centring tool mentioned in the MR concerned (if it exists).	– apply the tightening torques (see MR for vehicle, **19D ENGINE MOUNTING, Suspended engine mounting: Tightening torque**) – recentre (loosen and retighten all of the rubber pads)
– **Axle components:** Check, by comparison, the conformity of the axle components and that they are correctly tightened, in particular: the lower wishbone, anti-roll system, suspension and associated rubber mounting bushes.	– apply the recommended tightening torques (see MR for vehicle, **30A GENERAL INFORMATION, Front axle: Tightening torque**).
– **Subframe/steering rack:** Check the tightness and condition of the subframe and steering rack rubber pads.	– apply the recommended tightening torques (see MR for vehicle, **31A FRONT AXLE COMPONENTS, Front axle subframe: Removal - Refitting**). – only replace the rubber pads if they are extremely worn
– **Stub-axle (Hub-carriers):** Check the tightness of the stub-axles.	– apply the recommended tightening torques (see MR for vehicle, **31A FRONT AXLE COMPONENTS, Front driveshaft hub-carrier: Removal - Refitting) (Important: risk of driveshaft damage**).
– **Wheels:** check the tightness of the wheels.	– apply the tightening torques (see MR for vehicle, **35A WHEELS AND TYRES, Wheel: Removal - Refitting**)

correct

ALP 12 CONTINUED	Banging during power take-up or torque inversion

(A)

Check the driveshafts:

– Check the condition of the gaiters and the presence of grease on the gaiter exterior.

→ – replace the gaiters if they are damaged and/or replace the driveshaft if the gaiters are not sold separately or if there is play on the driveshaft connections (see MR for vehicle, **29A DRIVESHAFTS, Driveshaft: Removal - Refitting**)

– **Removing/refitting the right-hand driveshaft:** Check the wear of the coupling sleeve grooves on the relay bearing driveshaft (right-hand driveshaft - sunwheel) by removing/refitting the component (see MR for vehicle, **29A DRIVESHAFTS, Front right-hand driveshaft: Removal - Refitting**).

→ – It is essential to follow Infotech No. 4645.

Driveshafts correct

Check the clutch:

– check the progressiveness of the clutch by checking the clutch clearance, if it exists (see MR for the vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Adjustment**) or the automatic pedal adjustment system.

→ 1. Adjust the clearance (if it exists).
2. Replace the automatic adjustment system (see MR for vehicle, **37A MECHANICAL COMPONENT CONTROLS, Clutch control: Removal - Refitting**)
3. If the clutch clearance or the mechanical adjustment system is correct and the clutch progressiveness is still not correct, replace the clutch kit (see MR for the vehicle, **20A CLUTCH, Pressure plate - Disc: Removal - Refitting**)

– Depending on the clutch version, remove the gearbox to:
1) Check that there are no traces of oil.
OR
2) Check that the dual-mass flywheel springs are not damaged.

→ – Depending on the version, if it is in poor condition:
1) If there are traces of oil, look for the source of the leaks and repair.
OR
2) Replace the dual-mass flywheel (see MR for vehicle, **20A CLUTCH, Flywheel: Removal - Refitting**)

Clutch correct

– Contact the Techline:
Gearbox concerned - request for approval.

ALP 13	Siren (drive train)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the oil level and grade in the gearbox (see MR for vehicle concerned, **21A MANUAL GEARBOX, Manual gearbox oil: Oil change**):

– if the oil level is low → Top up the level of oil in the gearbox

– check the appearance of the oil
Oil which is dark in colour is not a fault.
Oil which smells burnt is caused by a hot gearbox (insufficient oil level or hard use).
The presence of bronze-coloured rings is not a fault.
The presence of particles of an aluminium colour is an indication that the gearbox is seriously damaged internally

not correct → – Perform an oil change (using oil specified by the manufacturer).
– If aluminium colour particles are present, replace the gearbox (see MR for vehicle, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**)

oil level and grade correct ↓

Check that all components under the cover are in good condition:

– if there is unwanted gearbox / cable or sheath contact → Correct the unwanted contact

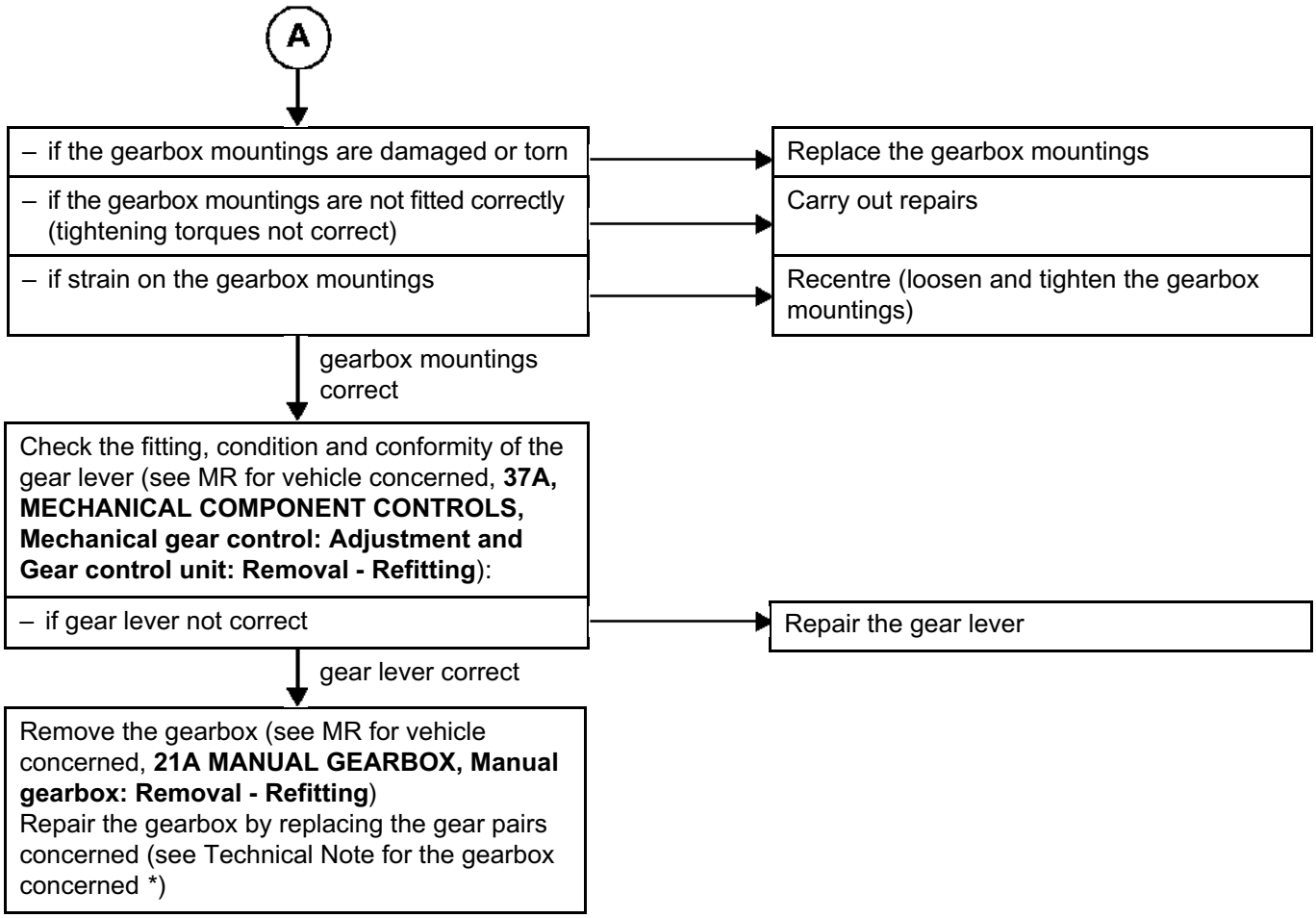
– if the grommets and other bulkhead through-routes are incorrectly fitted → Carry out repairs

under-cover components correct ↓

Check the condition, fitting and conformity of the gearbox mountings (see MR for vehicle concerned, **21A MANUAL GEARBOX, Manual gearbox: Removal - Refitting**):

↓

ALP 13 CONTINUED	Siren (drive train)



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Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

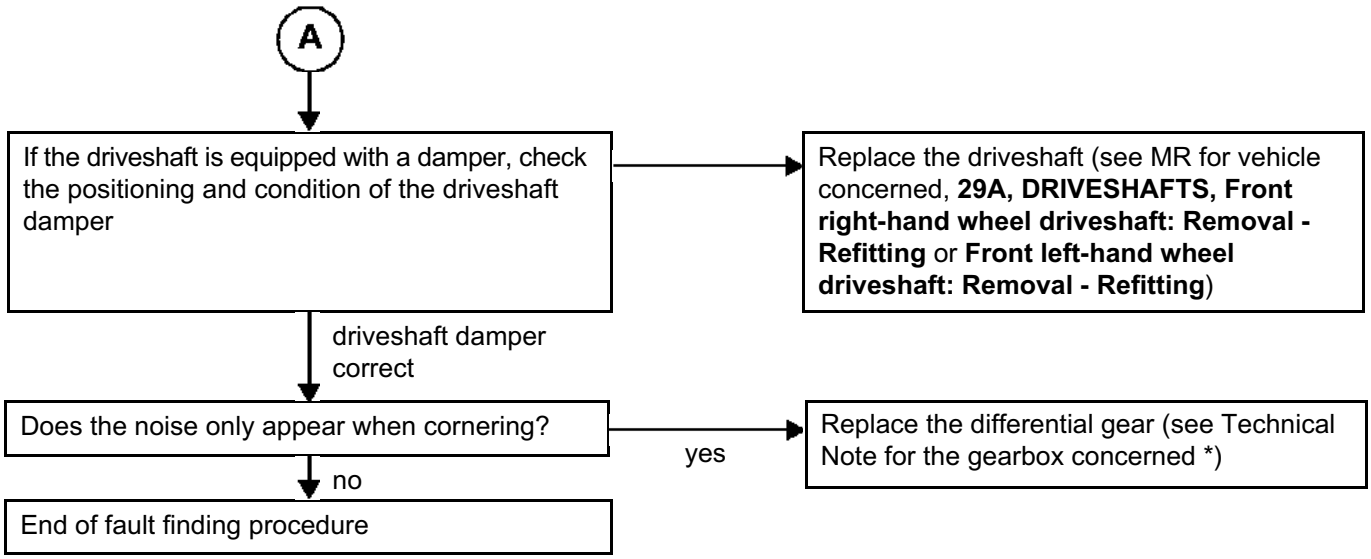
ALP 14	Drive train murmuring

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the fitting of the driveshaft relay bearing (see MR for vehicle concerned, **29A, DRIVESHAFTS, Front right-hand wheel driveshaft: Removal - Refitting**)	
– if the bearing plate tightness is not correct	Replace and tighten to torque the plate O-ring
– if bearing category not correct (flange colour)	Replace the bearing
– if fitting not correct (O-ring present without self-aligning bearing)	Realign the assembly
– if the relay bearing is incorrectly tightened on the engine	Retighten to torque
– For PK6 gearboxes, if the direction of fitting of the bearing tightness plate is not correct	Colour on the outer side (see MR for the vehicle concerned, **29A, DRIVESHAFTS, Driveshaft: Precautions for repair**)

driveshaft relay bearing correct

ALP 14 CONTINUED	Drive train murmuring



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Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
ZF5 S 270 and ZF6 S 350	Technical Note 6016A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A

ALP 15	Growling / noise in neutral (drive train)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Check the engine idle speed

idle speed not correct → Perform fault finding on an incorrect idle speed (see Fault Finding Manual for the vehicle concerned, **13B, DIESEL INJECTION, Fault finding - Conformity check** or **17B, PETROL INJECTION, Fault finding - Conformity check**)

idle speed correct

Check that all components under the cover are in good condition:

- if there is unwanted gearbox / cable or sheath contact → Correct the unwanted contact
- if the grommets and other bulkhead through-routes are incorrectly fitted → Carry out repairs
- if there is interference between the engine and transmission assembly and body components (engine mountings, gearbox mountings, suspended engine mountings, acoustic filters, etc.) → Eliminate the interference by replacing the faulty components

under-cover components correct

If the clutch plate has a shock absorber component, replace the clutch plate (see MR for vehicle concerned, **20A, CLUTCH, Pressure plate - clutch plate: Removal - Refitting**)

ALP 16	Interference noise

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Identification of the noise identified by the customer

↓

Is the origin of the noise known (dealt with by Infotech) or easily identifiable?

yes → Proceed directly to the repair operation

↓ no

Connect the noise diagnostic tool - Part no. **77 11 421 103** - (see **Noise diagnostic tool - Use**) to:
– the steering column,
– the universal joint
Does the noise come from this area?

yes → See ALP 16.1. "Steering column area"

↓ no

Connect the tool to the engine and transmission assembly suspensions
Does the noise come from this area?

yes → See ALP 16.2. "Engine area"

↓ no

Connect the tool to:
– the front shock absorber bump stop
– the front suspension spring
– the front shock absorber
Does the noise come from this area?

yes → See ALP 16.3. "Suspension area"

↓ no

Connect the tool to:
– the steering box
– the track rod end
– the front lower wishbone
– the anti-roll bar tie rod
– the subframe
Does the noise come from this area?

yes → See ALP 16.4. "Subframe area"

↓ no

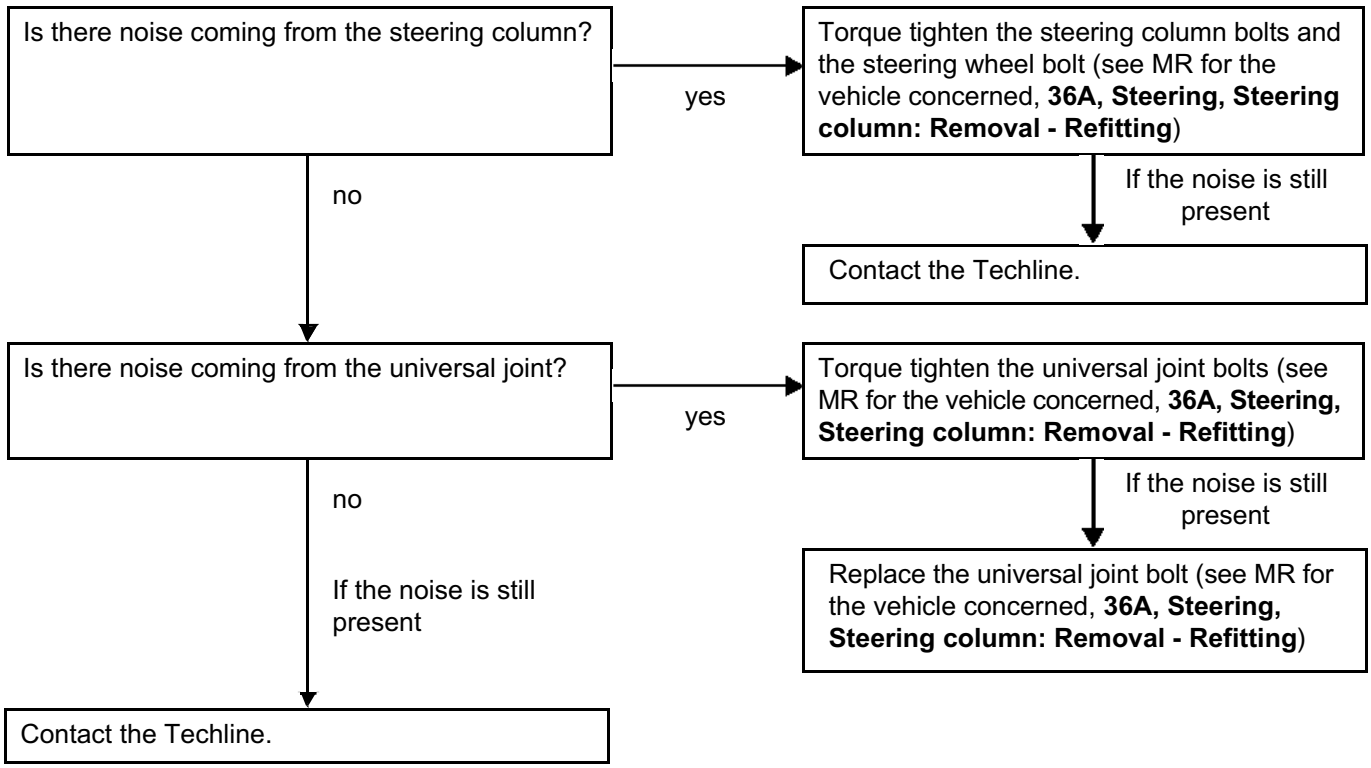
Is the noise still present?

yes → Contact the Techline.

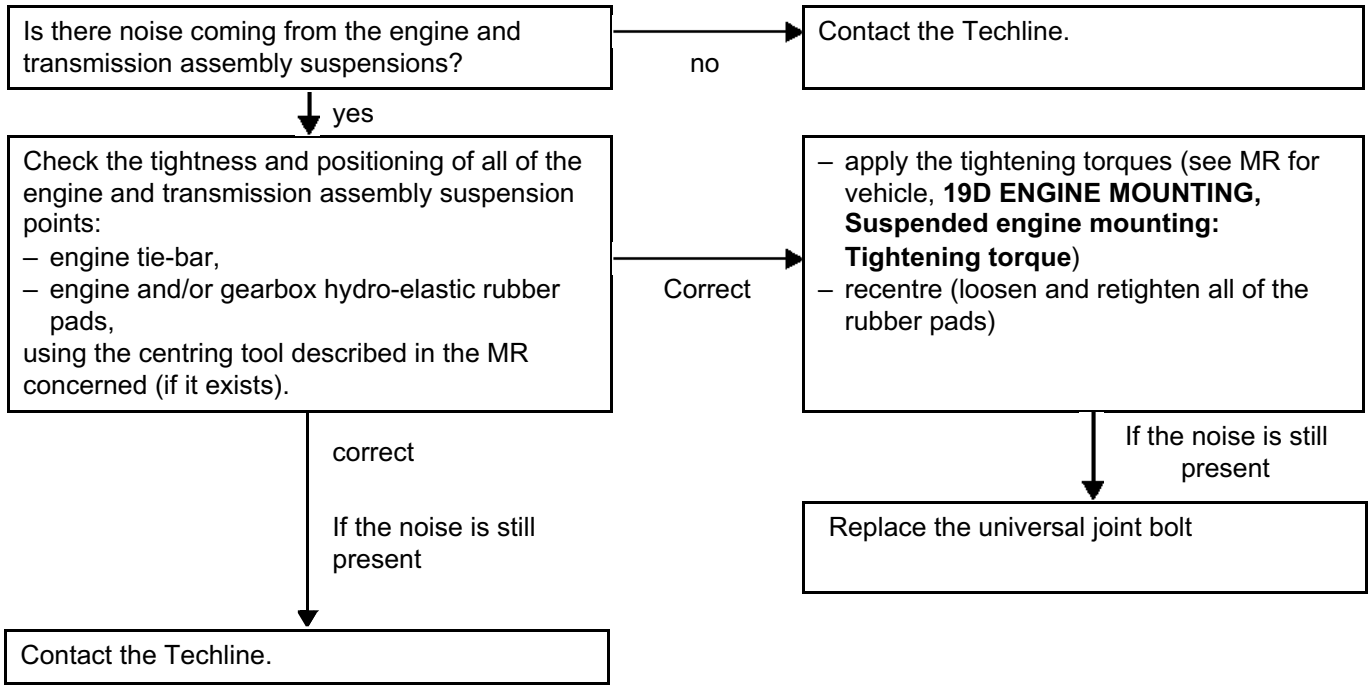
↓ no

End of fault finding procedure

ALP 16.1	**Interference noise** Noise in the "steering column area"



ALP 16.2	**Interference noise** Noise in the "engine area"



ALP 16.3	**Interference noise** Noise in the "suspension area"

Is there noise coming from the front shock absorber bump stop?

yes → Torque tighten front shock absorber bump stop bolts

If the noise is still present → Replace the filter assembly (see MR for the vehicle concerned, **31A, Front axle component, Filter assembly: Removal - Refitting**)

no

Is there noise coming from the front suspension spring?

yes → Lubricate the shock absorber cups

If the noise is still present → Contact the Techline

no

Is there noise coming from the front shock absorber?

yes → Torque tighten the front shock absorber bolts (see MR for the vehicle concerned, **31A, Front axle components, Front shock absorber and spring: Removal - Refitting**)

If the noise is still present → Replace the shock absorber (see MR for the vehicle concerned, **31A, Front axle components, Front shock absorber and spring: Removal - Refitting**)

no

If the noise is still present

Contact the Techline.

ALP 16.4	**Interference noise** Noise in the "subframe area"

Is there noise coming from the steering box?
yes → Replace the steering box (see MR for the vehicle concerned, **36A, Steering, Steering box: Removal - Refitting**)
no

Is there noise coming from the track rod end?
yes → Replace the track rod end (see MR for the vehicle concerned, **36A, Steering, Track rod: Removal - Refitting**)
no

Is there noise coming from the front suspension wishbone?
yes → Check the suspension lower ball joint (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm ball joint: Check**)
If the noise is still present → Torque tighten the front suspension wishbone bolts (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm: Removal - Refitting)**
If the noise is still present → Replace the front suspension wishbone (see MR for the vehicle concerned, **31A, Front axle components, Front driveshaft lower arm: Removal - Refitting**)
no

Is there noise coming from a front anti-roll bar tie rod?
yes → Torque tighten the anti-roll bar tie rod bolts (see MR for the vehicle concerned, **31A, Front axle components, Front anti-roll bar: Removal - Refitting**)
If the noise is still present → Replace the anti-roll bar tie rod (see MR for the vehicle concerned, **31A, Front axle components, Front anti-roll bar: Removal - Refitting**)
no

Is there noise coming from the subframe?
yes → Torque tighten all of the components fixed to the subframe (see MR for the vehicle concerned, **31A, Front axle components, front axle subframe: Removal - Refitting**)
no

If the noise is still present

Contact the Techline.

ALP 17	Crackling from the speakers

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

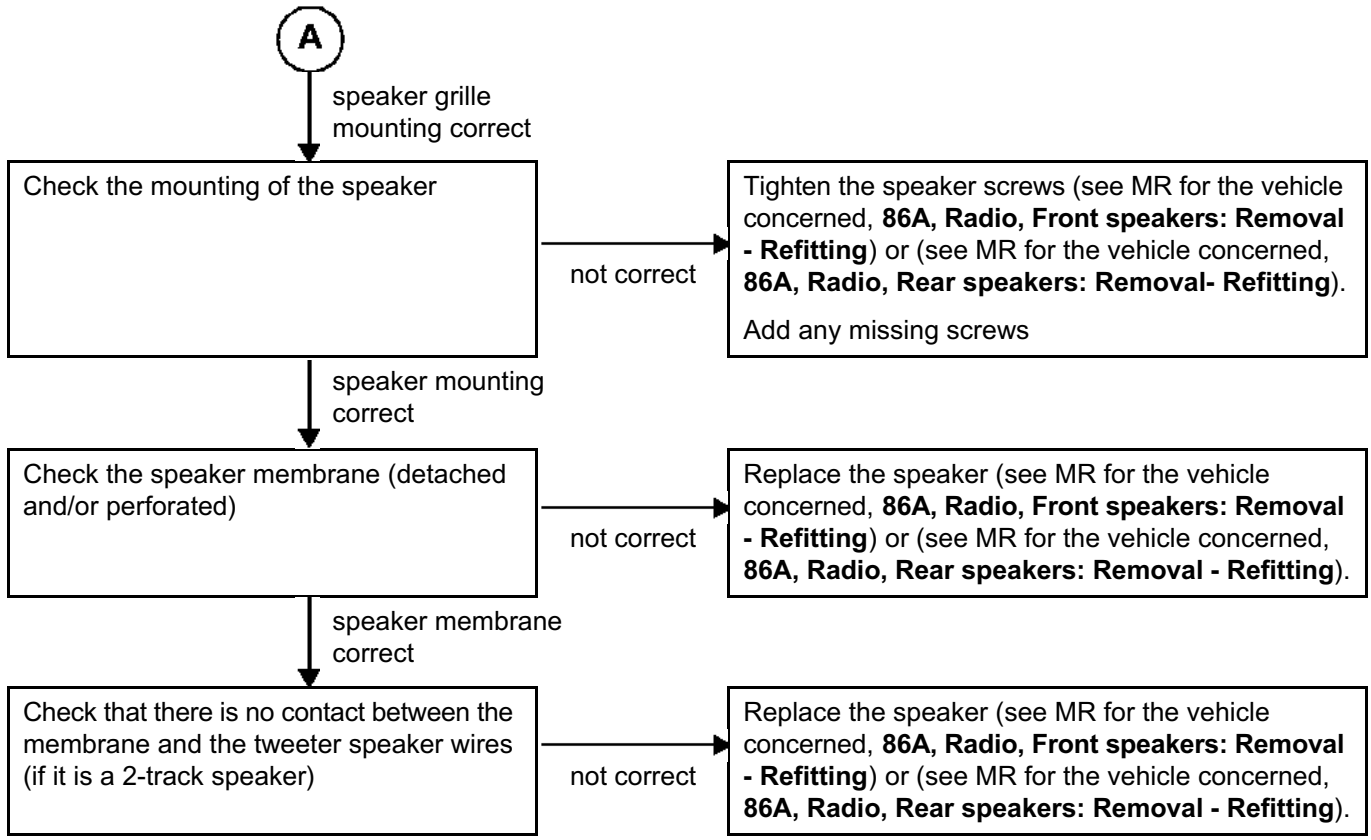
Ensure that there are no foreign bodies present in the passenger compartment.
Check that no parts are broken.
Switch on the sound system and adjust it as follows:
– volume slightly raised
– bass level set at MEDIUM
– treble level set at MEDIUM
Insert a CD or audio cassette which has strong bass tones.

Check the mounting of the speaker grille:		
if the grille is clipped onto the speaker	not correct	Clip the grille onto the speaker Replace the speaker grille if the clip is broken*
if the grille is screwed onto the speaker	not correct	Tighten the speaker grille screws* Add any missing screws*
if the grille is clipped onto the trim	not correct	Clip the grille onto the trim Replace the grille if the clip is broken*
if the grille is bonded onto the trim	not correct	Bond the grille onto the trim*

*: See MR for the vehicle concerned, **72A, Side opening element trim, Front side door trim: Removal - Refitting**) or (see MR for the vehicle concerned, **72A, Side opening element trim, Rear side door trim: Removal - Refitting**)

A

ALP 17 CONTINUED	Crackling from the speakers



ALP 18	Noise from the dashboard

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Start by checking the following points:

● **When stationary, engine not running.**

– Empty all of the storage compartments in the dashboard and doors.
– Ensure that there are no foreign bodies present in the passenger compartment.
– Check that no parts are broken
– Test all of the storage compartment covers and flaps and air vent grilles (catches, hinges, play, etc.)
– Check all of the dashboard trims, visors and clipped front panels (tactile inspection that the parts are secure).
– Visually check for the presence of the bolts

? It is essential to replace all of the faulty components (fasteners, clips, air vent grilles).

● **When stationary, engine running.**

– Accelerate slightly to detect any vibration of the trims and front panels clipped onto the dashboard.
– Test the heating distribution at different speeds to detect any foreign bodies in the heating ducts (air vent vanes, dead leaves, etc.).

? It is essential to replace any faulty component (fasteners, clips, air vent grilles, etc.).

● **Operational or road test in accordance with the customer complaint.**
(Different speeds, cobbled surface, with or without ventilation or heating system, etc.).

⇓

When all of these checks have been carried out and the fault is still present, proceed to the following step

ALP 18 CONTINUED 1	Noise from the dashboard

Check that no parts are broken.
It is essential to consult the Repair Manual for the vehicle concerned in order to observe the safety advice and recommended tightening torques.
After each operation, carry out a vehicle test to check that the vehicle has been repaired.

Check the operation of the storage flaps and covers.
Visually and manually inspect the joint play.

not correct → Replace any faulty parts (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)

correct ↓

Check the centre and side air vent grilles.
Visually inspect if any components are missing and the clearance between the air vent vanes.

not correct → Replace the faulty parts (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)

correct ↓

Check that the covers, front panels, trim pieces and A-pillar trims are clipped on correctly.
Visually and manually inspect if any components are missing (bolts, clips, etc.) and check the clearance between the components.

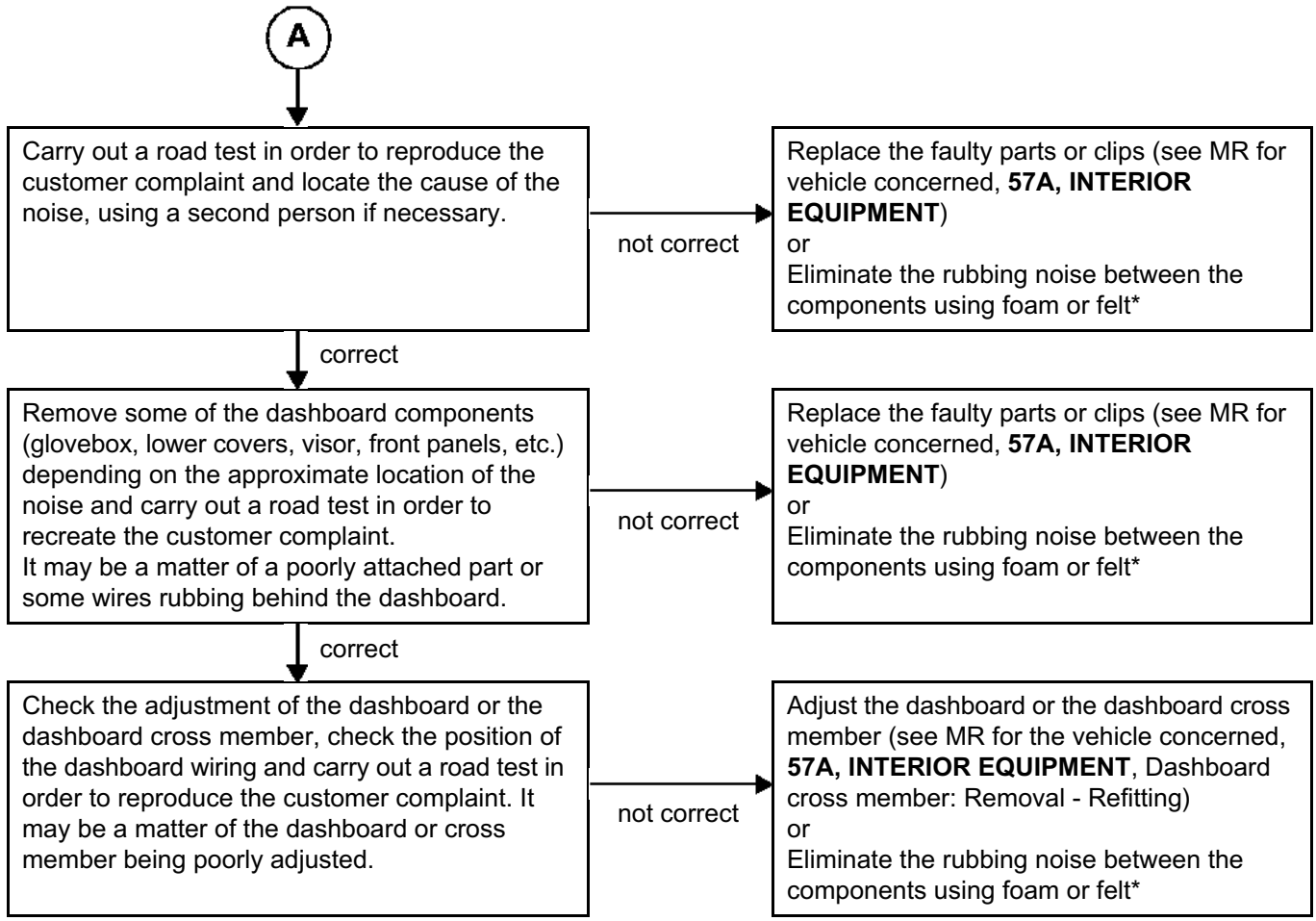
not correct → Replace the faulty parts or clips (see MR for vehicle concerned, **57A, INTERIOR EQUIPMENT**)
or
Eliminate the rubbing noise between the components using foam or felt*

correct ↓

(A)

- *adhesive foam: **77 05 042 163**
- *adhesive foam: **77 05 042 122**
- *adhesive felt: **82 00 281 967**

ALP 18 CONTINUED 2	Noise from the dashboard

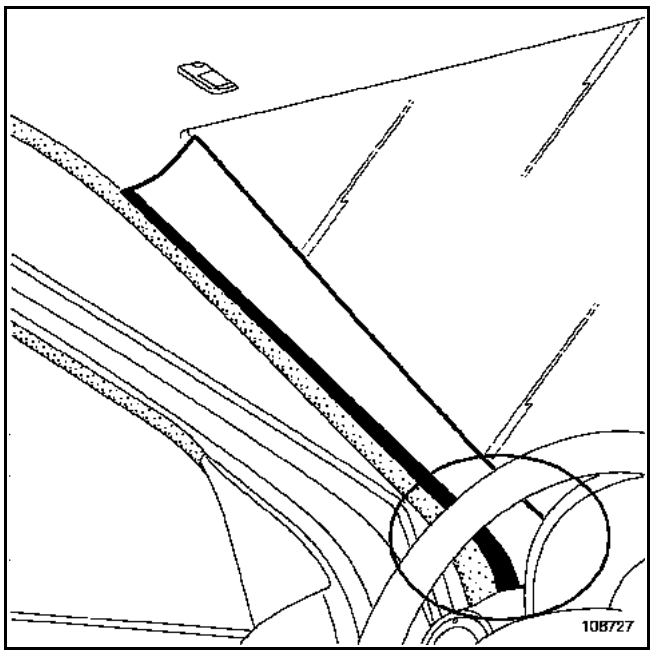


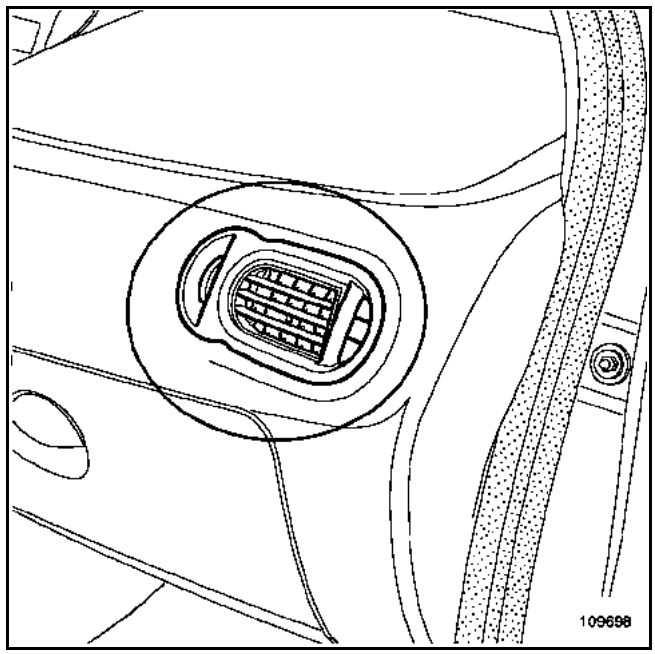
- *adhesive foam: **77 05 042 163**
- *adhesive foam: **77 05 042 122**
- *adhesive felt: **82 00 281 967**

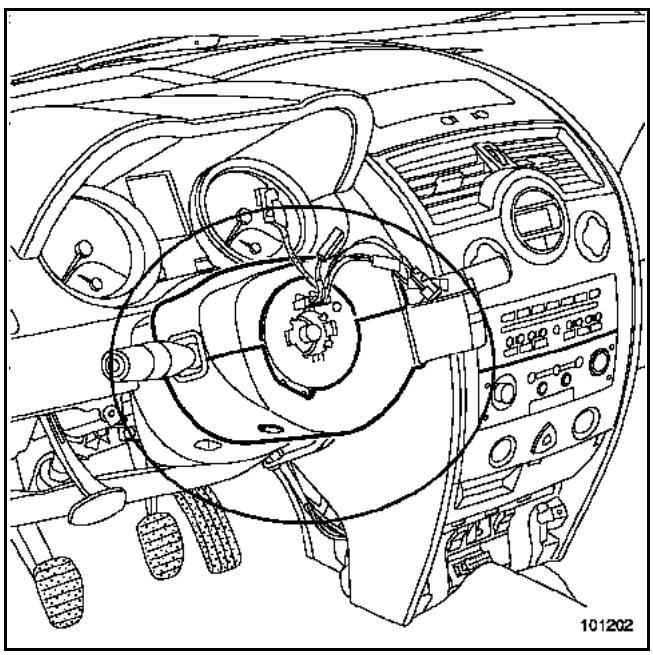
ALP 18 CONTINUED 3	Noise from the dashboard

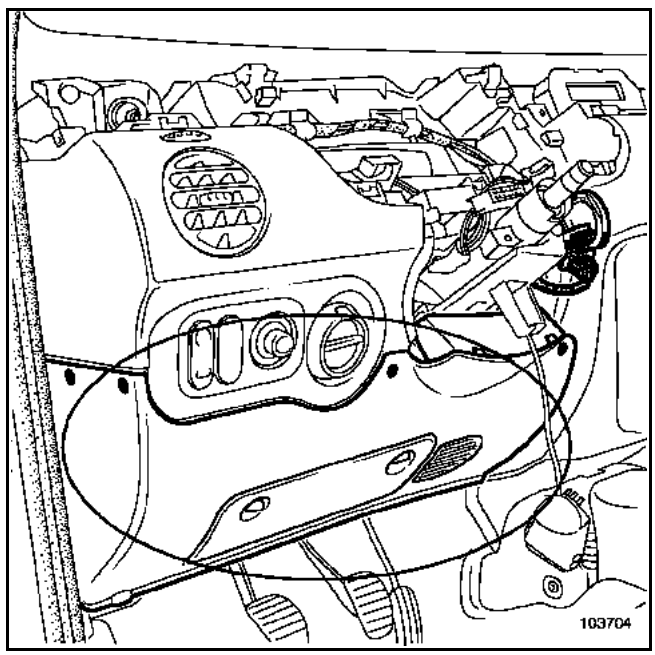
IMPORTANT:
It is essential to consult the MR for the vehicles concerned in order to observe the safety advice related to airbag locking.

Any parts connected to the dashboard body, (clipped, fitted and screwed parts) could potentially create noise (see parts below).

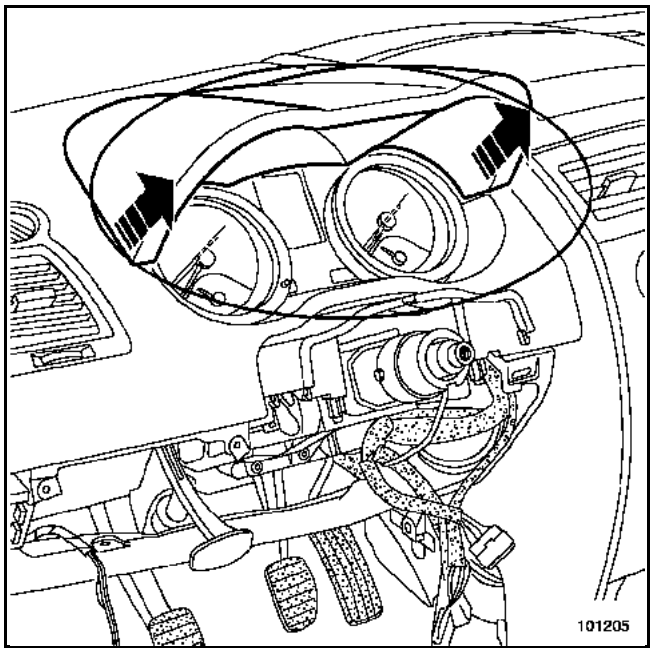


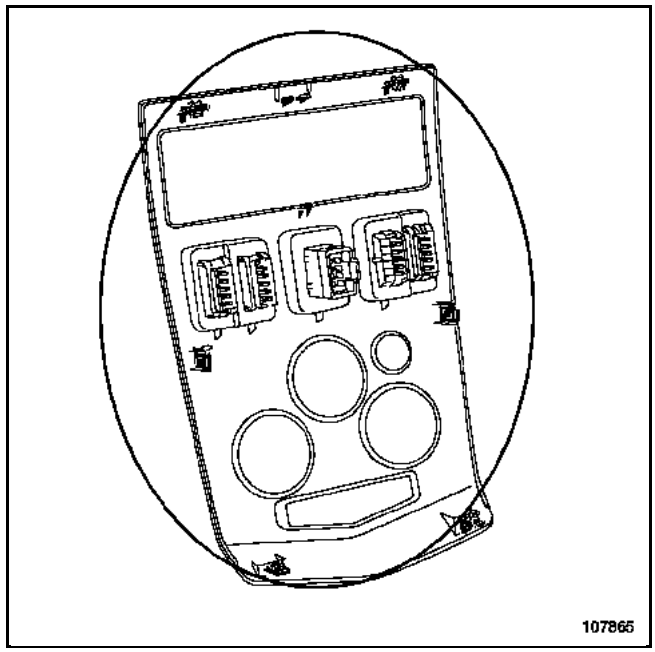


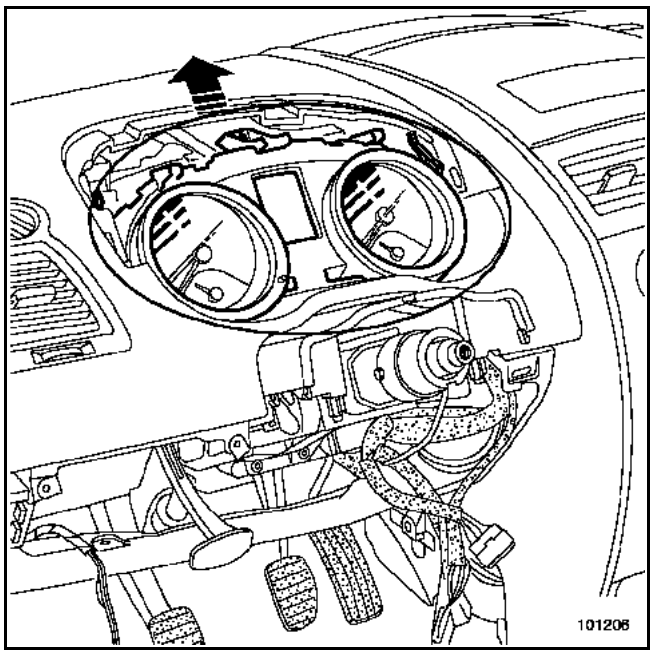


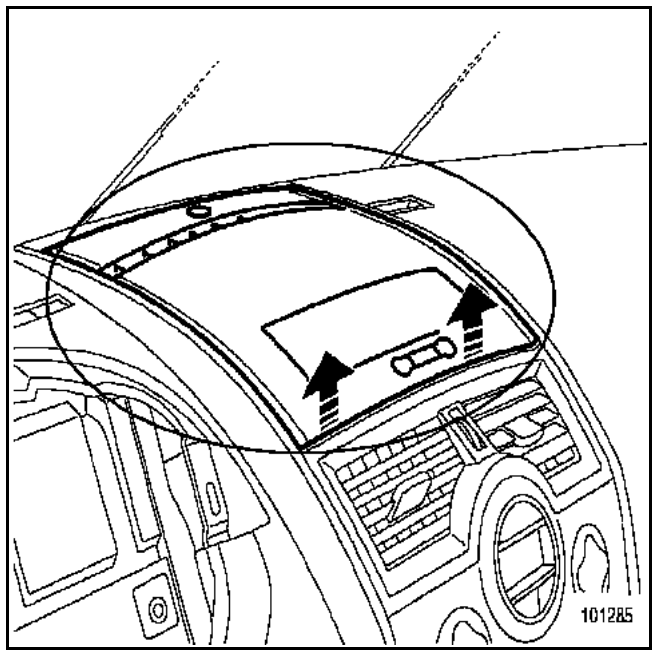


ALP 18 CONTINUED 4	Noise from the dashboard

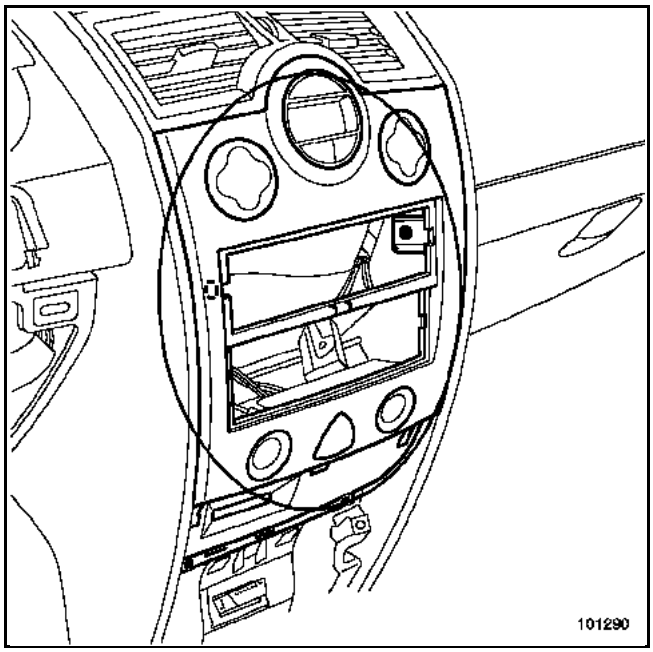


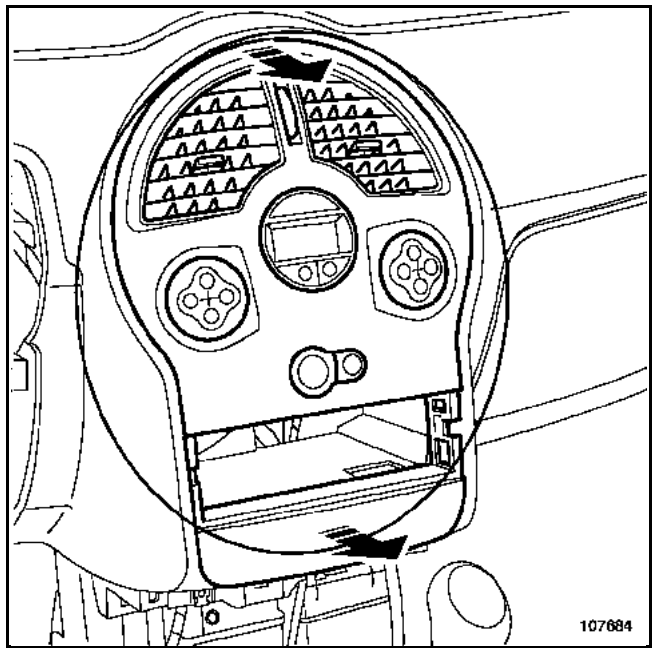


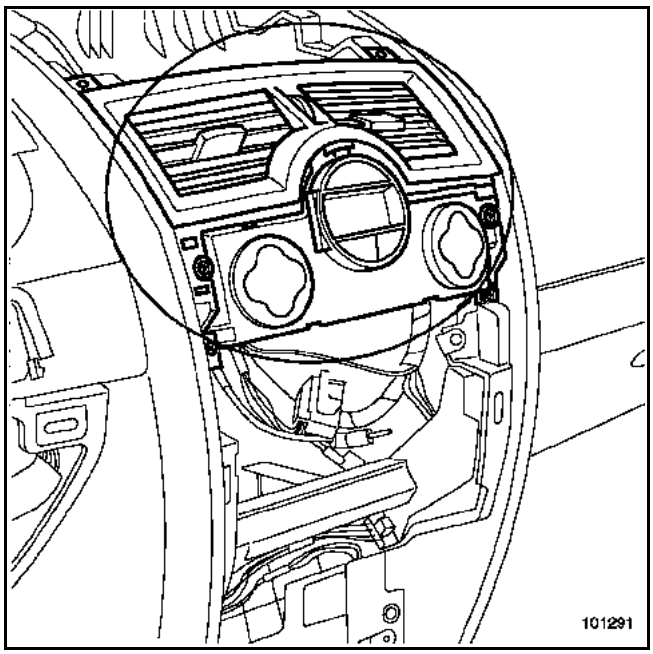


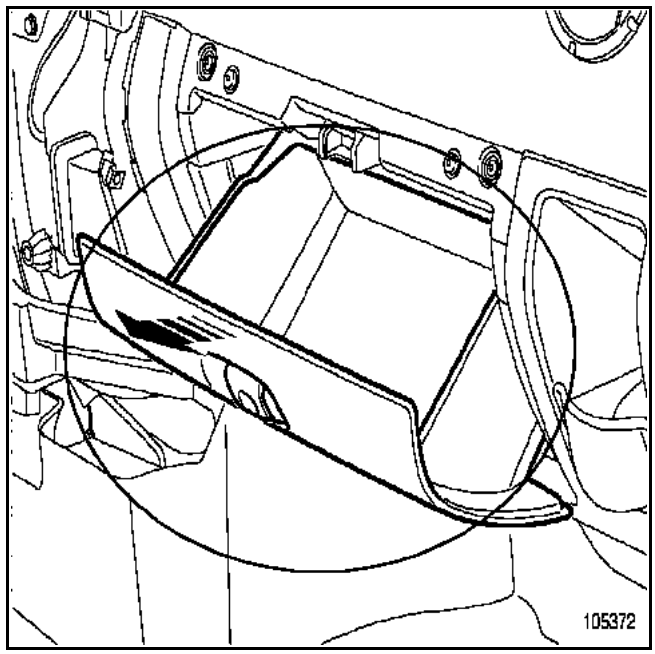


ALP 18 CONTINUED 5	Noise from the dashboard



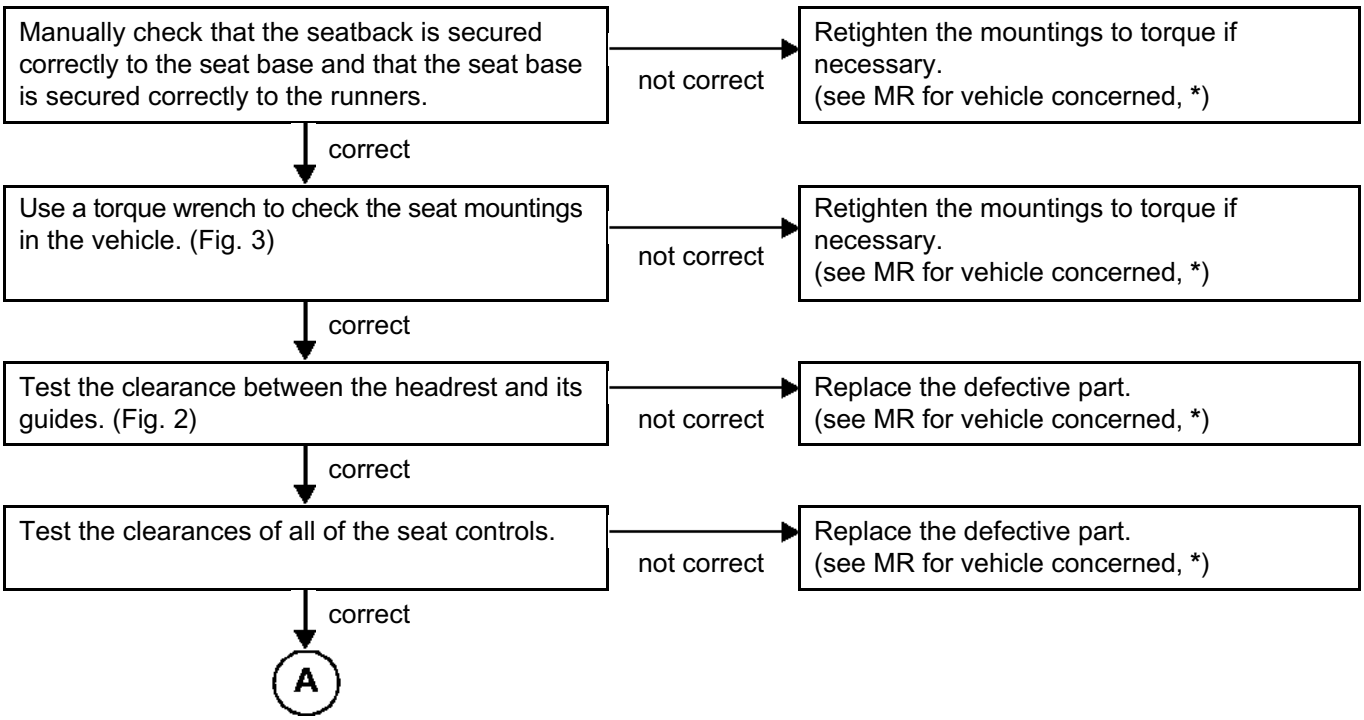






ALP 19	Noise from the upholstery

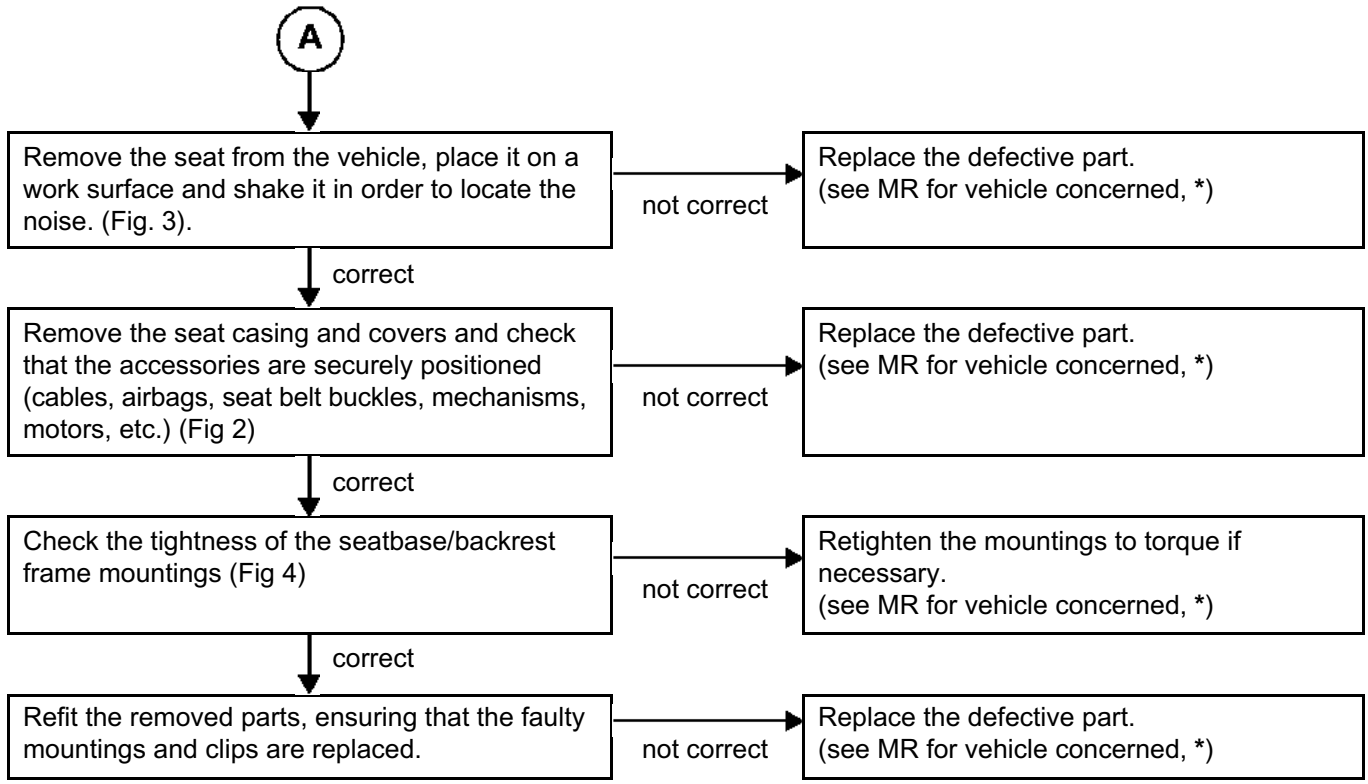
NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.



*

75A, FRONT SEAT FRAMES AND RUNNERS
76A, REAR SEAT FRAMES AND RUNNERS
77A, FRONT SEAT TRIMS
78A, REAR SEAT TRIMS

ALP 19 CONTINUED 1	Noise from the upholstery



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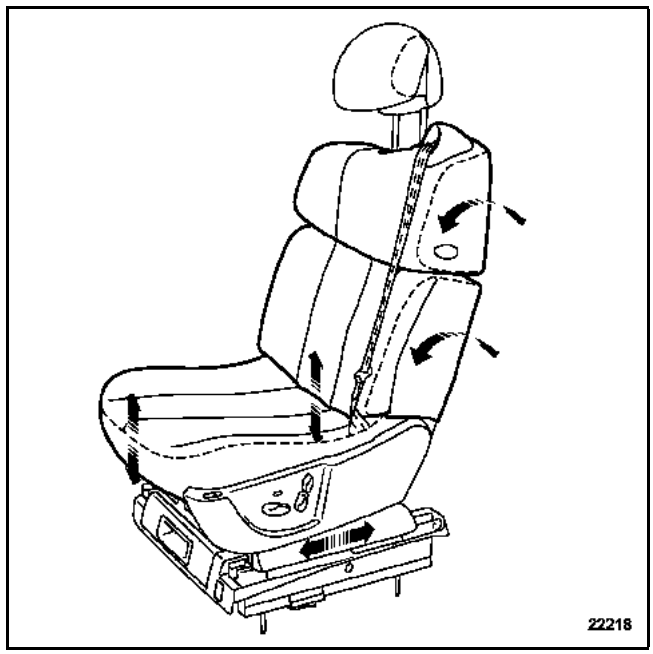
75A, FRONT SEAT FRAMES AND RUNNERS
76A, REAR SEAT FRAMES AND RUNNERS
77A, FRONT SEAT TRIMS
78A, REAR SEAT TRIMS

ALP 19 CONTINUED 2	Noise from the upholstery

Notes: before reading the ALP.

Fig. 1

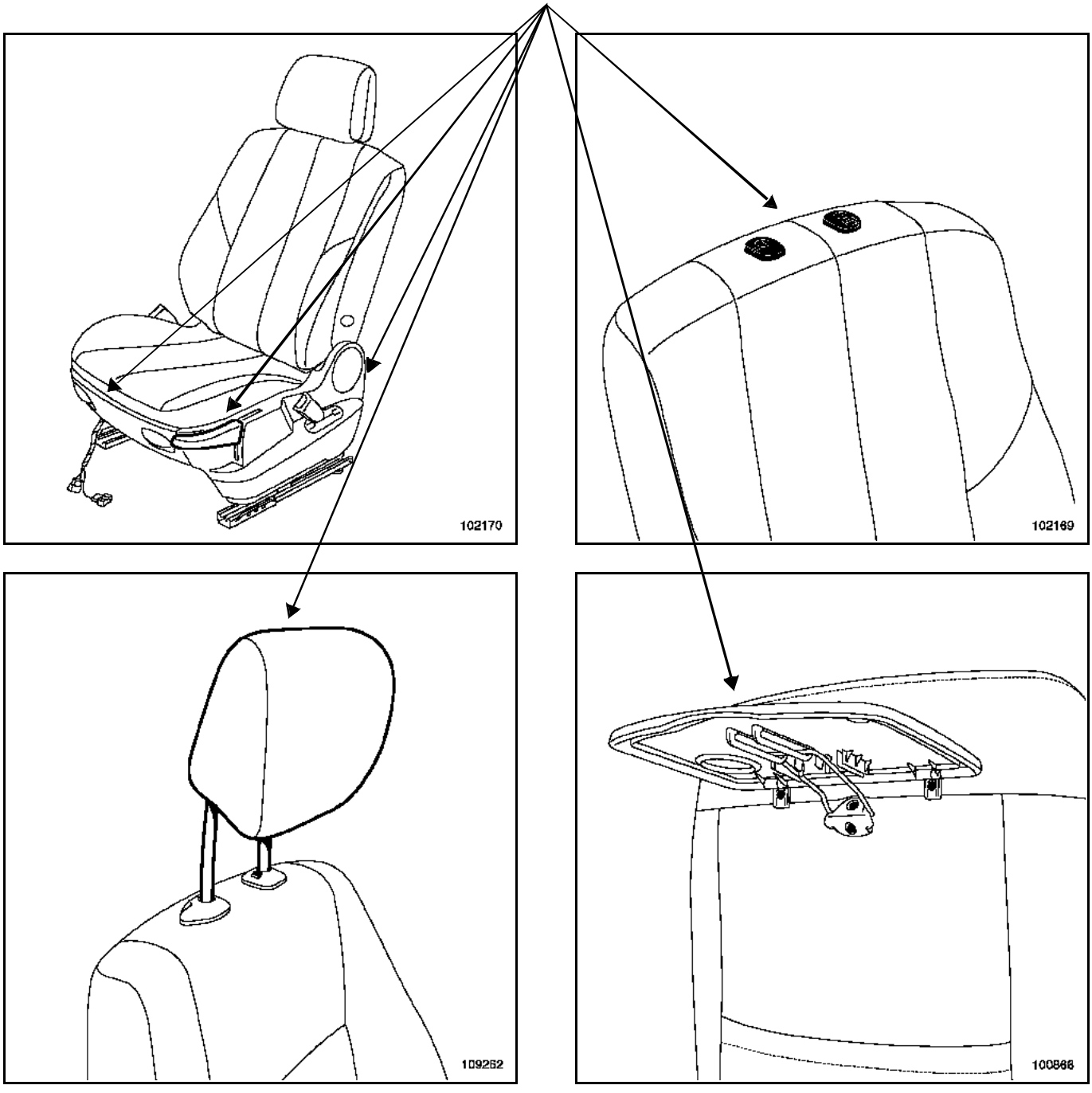
Carry out an operational test on the seat



ALP 19 CONTINUED 3	Noise from the upholstery

Fig. 2

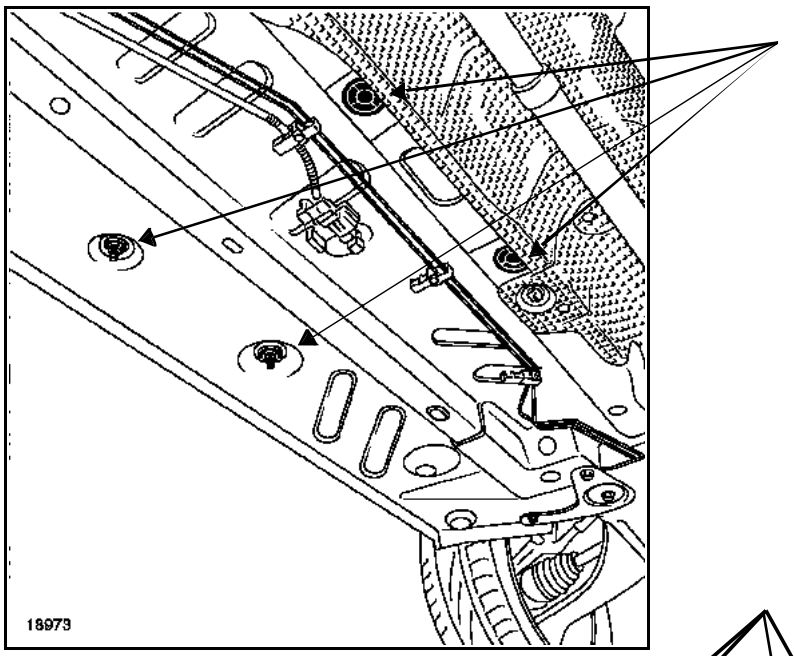
Check the resistance and mountings of the casings, control levers, headrest and guides, rear parcel shelf, etc.



ALP 19 CONTINUED 4	Noise from the upholstery

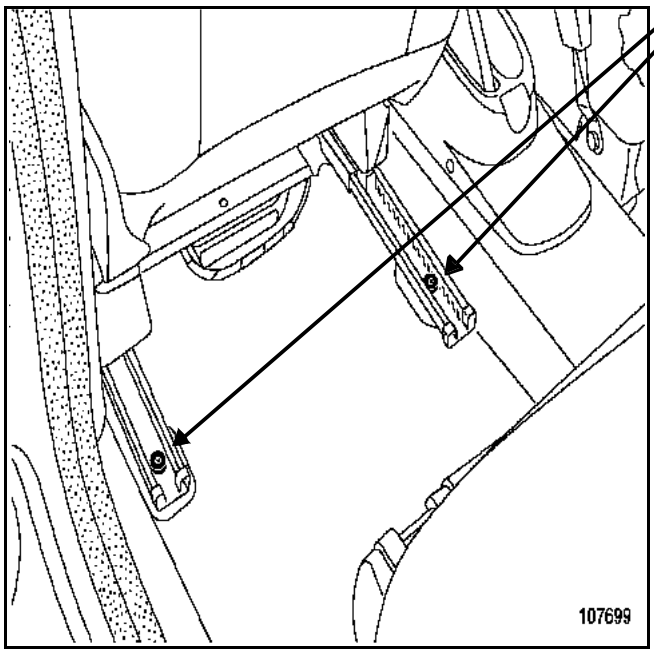
Fig. 3

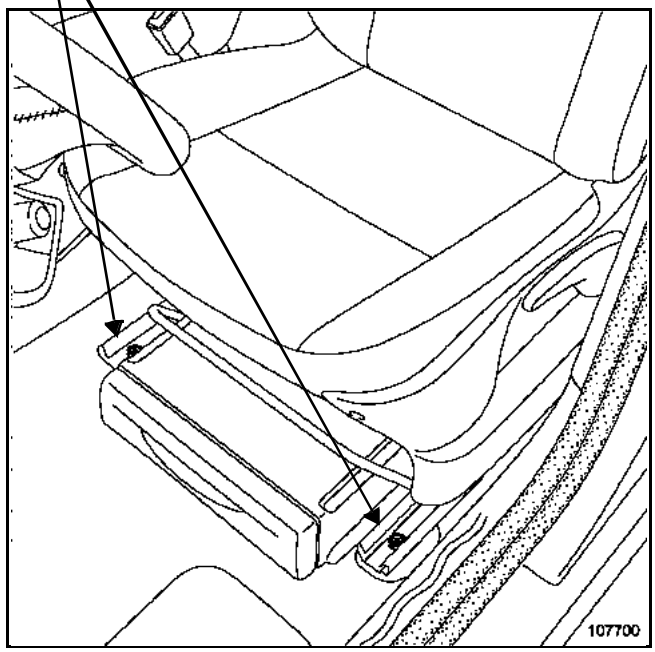
A seat can either be removed from underneath the vehicle or from the vehicle interior:



Mountings underneath the vehicle

Mountings inside the vehicle



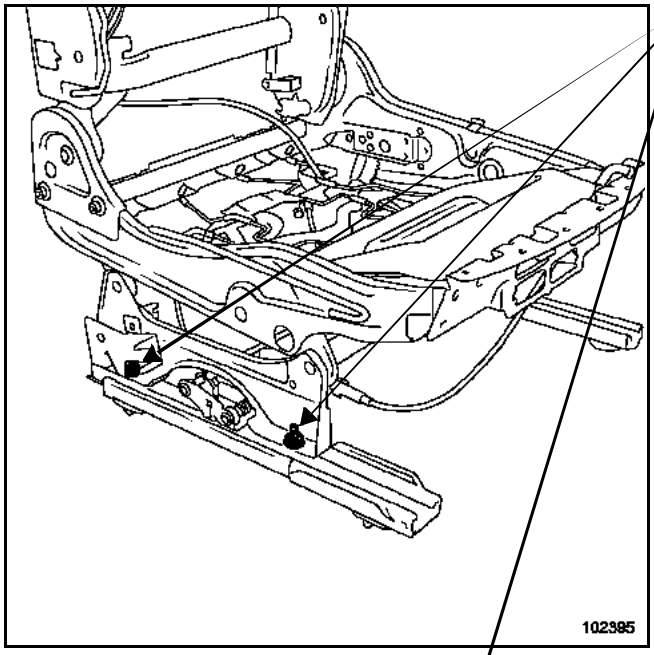


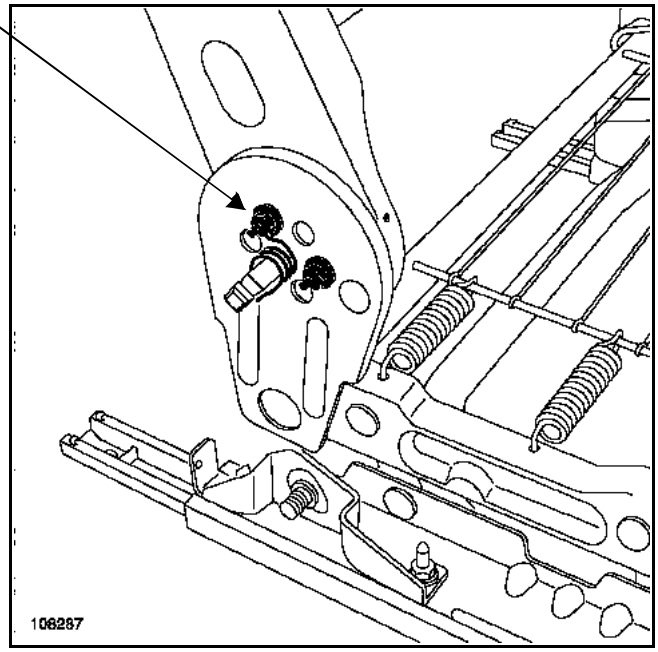
ALP 19 CONTINUED 5	Noise from the upholstery

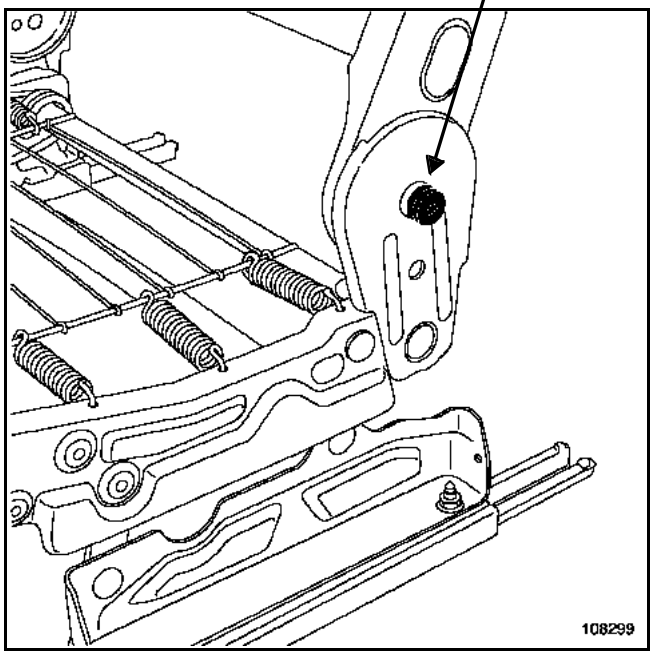
Fig. 4

The frame mountings to be checked include:

Seat base/backrest frame mountings and runners/seat base mountings







Consult the MR in order to respect the recommended tightening torques.

ALP 20	Noise when window is operated (squeaking/creaking)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

Check that the runners* and the window winder drum are lubricated correctly

not correct → Clean the window winder (using a lint-free cloth soaked in heptane, Part no. 77 11 170 064), and lubricate the runners* and the window winder drum (mechanism lubricant: Part no. 77 11 419 865), removing the window winder mechanism if necessary (see MR for the vehicle, **51A, SIDE OPENING ELEMENT MECHANISMS, Front or rear manual or electric window mechanism: Removal - Refitting**)

correct

Check the cleanliness and wear of the exterior weatherstrip* and/or the glass run channel*.

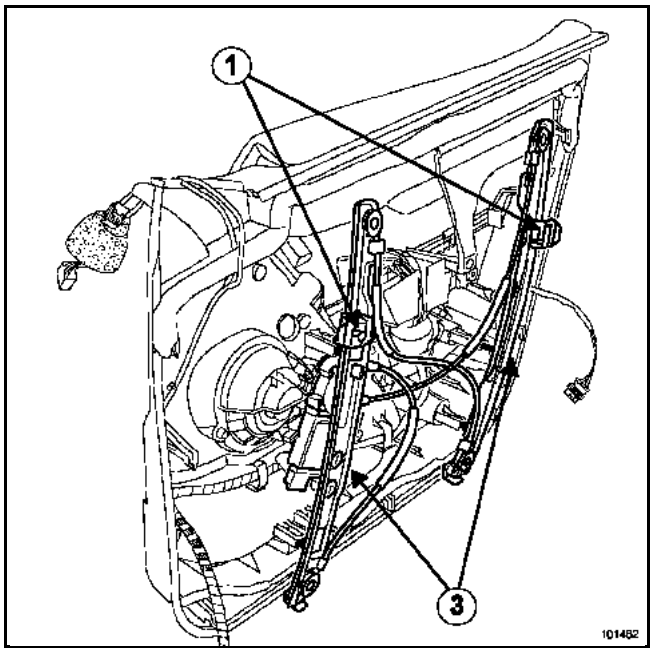
not correct → Remove the exterior weatherstrip* and/or the glass run channel* (see MR for vehicle, **66A WINDOW SEALING, Front or rear door exterior weather strip: Removal - Refitting** and **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

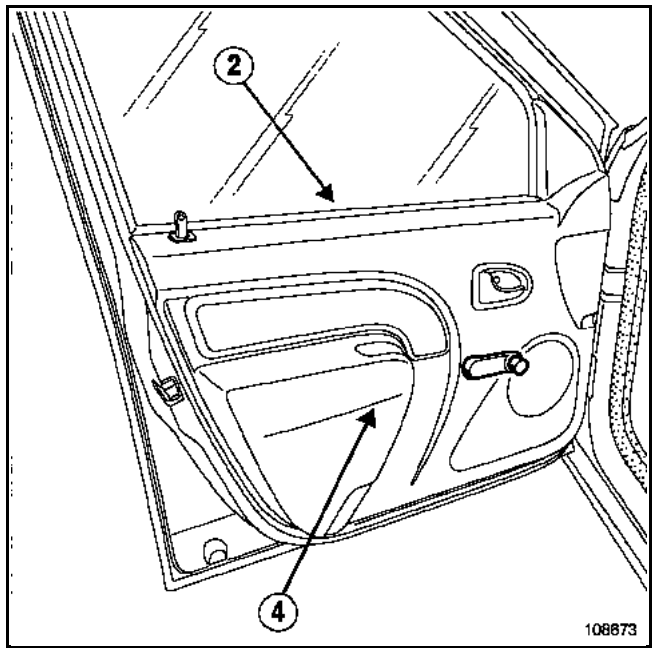
1) Clean the exterior weatherstrip* and/or the glass run channel* using a flexible brush and soapy water (under no circumstances must abrasive soap be used).

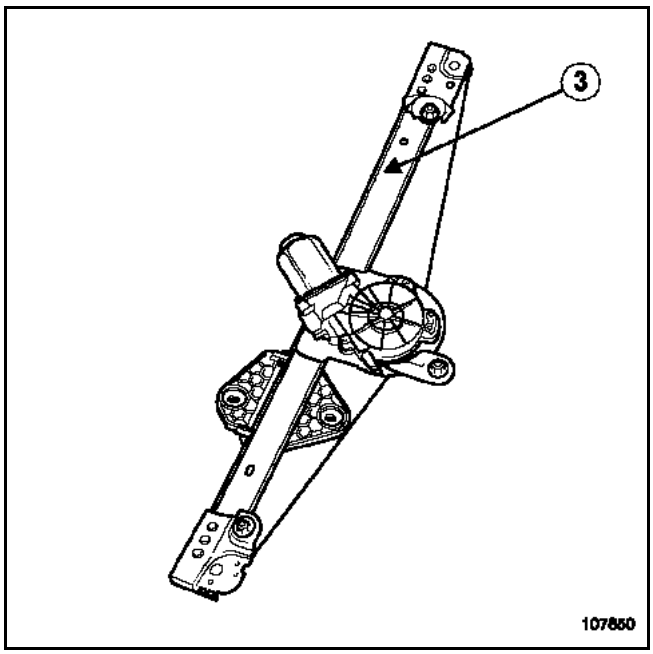
2) If the first operation is not successful, replace the weatherstrip* and/or the window channel*.

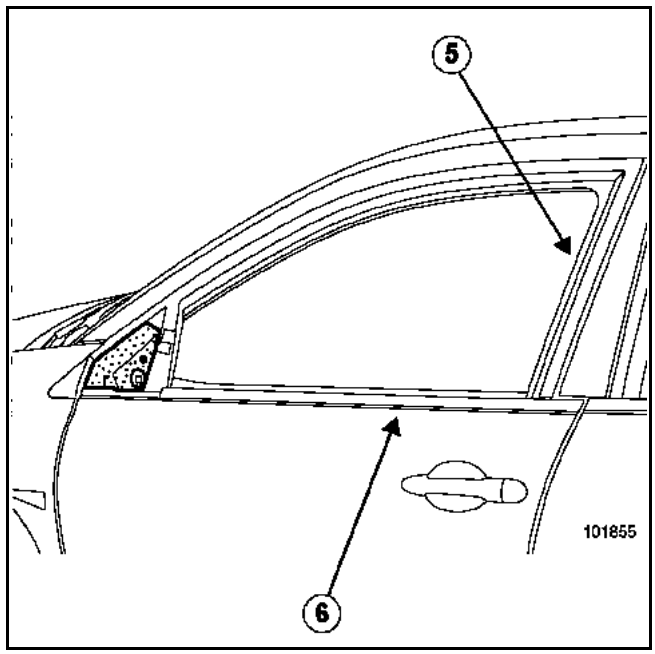
*: see the illustrations on the following page

ALP 20 CONTINUED	Noise when window is operated (squeaking/creaking)









1 Window winder sliders
2 Interior weatherstrip
3 Window winder mechanism runners
4 Interior door trim
5 Glass run channel
6 Exterior weatherstrip

ALP 21	Noise when window is operated (scratching)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check that the internal section of the slide* is not damaged.

→ not correct

1) Use the CAR 1363 special tool to realign the damaged section.

2) If the first operation is not successful, replace the glass run channel*. (see MR for the vehicle, **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

*: see illustrations in ALP: Noise when window is operated (squeaking / creaking)

ALP 22	Noise from the window when closing the door (rattling)

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies present
– no parts are loose, damaged or broken.

After the operation, check that the operation was successful by performing an operational test or road test.

Check that the interior * and/or exterior weatherstrip* are correctly positioned.

not correct → 1) Reposition the interior* and/or exterior* weatherstrips.
2) If the first operation is not successful, replace the weatherstrip* on the front or rear door. (see MR for vehicle, **66A WINDOW SEALING, Front or rear side door exterior weatherstrip: Removal - Refitting** or **Front or rear side door trim: Removal - Refitting**).

correct ↓

Check that the internal section of the slide* is not damaged.

not correct → 1) Use the CAR 1363 special tool to realign the damaged section.
2) If the first operation is not successful, replace the glass run channel*. (see MR for the vehicle, **66A WINDOW SEALING, Front or rear door glass run channel: Removal - Refitting**)

correct ↓

Check the play of the window winder slider* in relation to the window (check that no noise can be detected)

not correct → Fit a square piece of foam between the window and the window winder slider*
Part no.: 77 05 042 122

*: see illustrations in ALP: Noise when window is operated (squeaking / creaking)

ALP 23	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the operation of the mobile panel* by initialising the sunroof motor, with the vehicle's engine running (see fault finding MR for vehicle, **87D ELECTRIC WINDOW - SUNROOF, Electric sunroof: Initialisation**)

↓ correct

Check the cleanliness of the side runners*

not correct → Clean the internal and external side runners* and, depending on the vehicle, only lubricate the internal side runners* or the external side runners* without removing the sunroof mobile panel (see MR for the vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check the condition of the mobile panel linkages*

not correct → Remove the mobile panel* and replace the runners and/or the mobile panel linkages. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check that the mobile panel* slides correctly (no jerky movement)

not correct → Replace the sunroof* motor. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS**, or **87D ELECTRIC WINDOWS - SUNROOF, Sunroof opening motor: Removal - Refitting**)

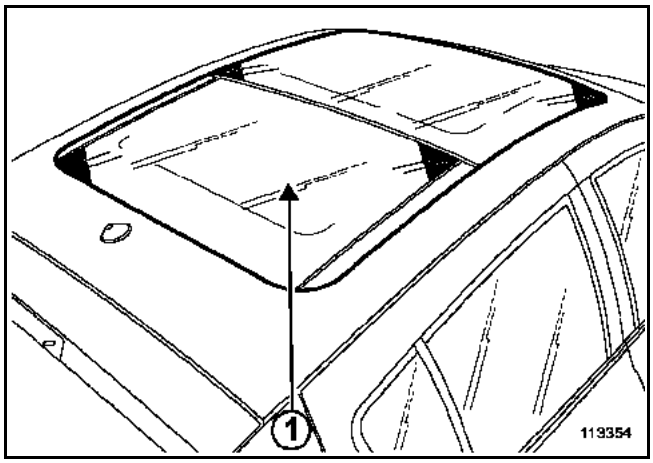
↓ correct

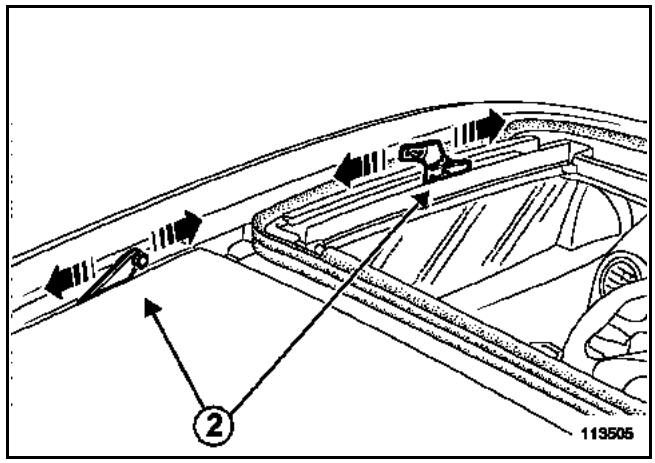
Check the conformity of the sunroof* (damaged runners, operating mechanism, etc.)

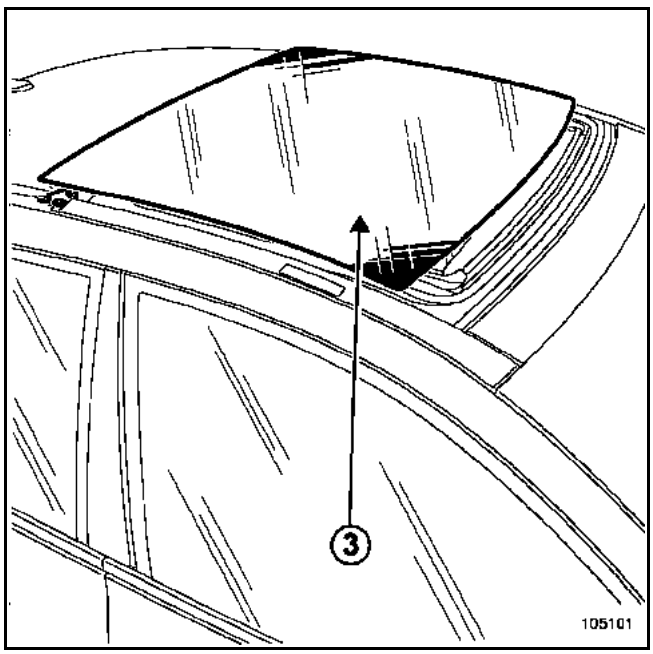
not correct → Replace the sunroof*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof operating mechanism: Removal - Refitting**).

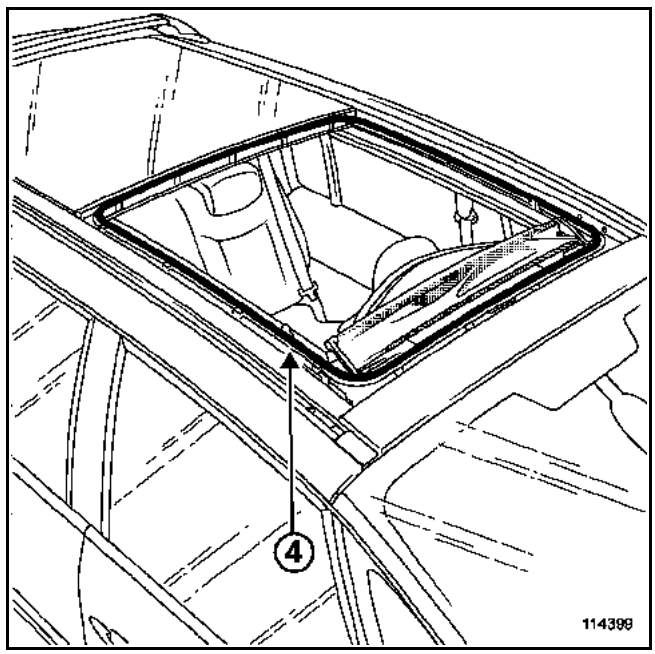
*: see the illustrations on the following page

ALP 23 CONTINUED 1	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel



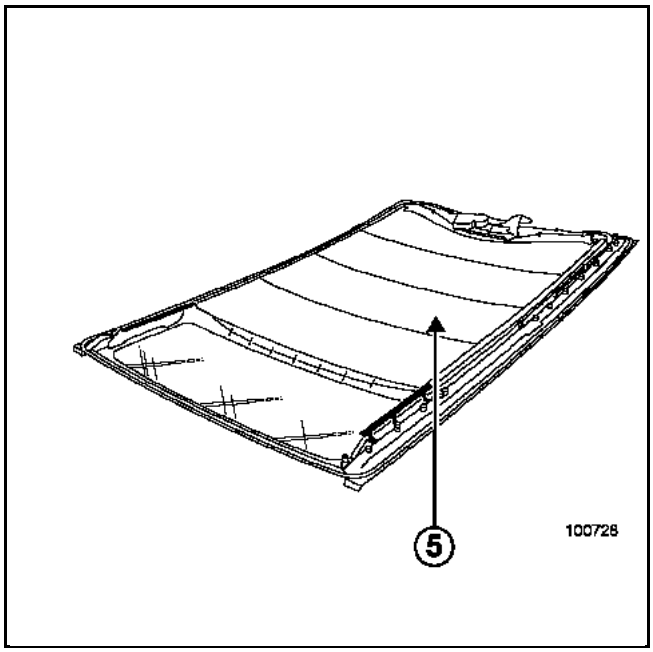


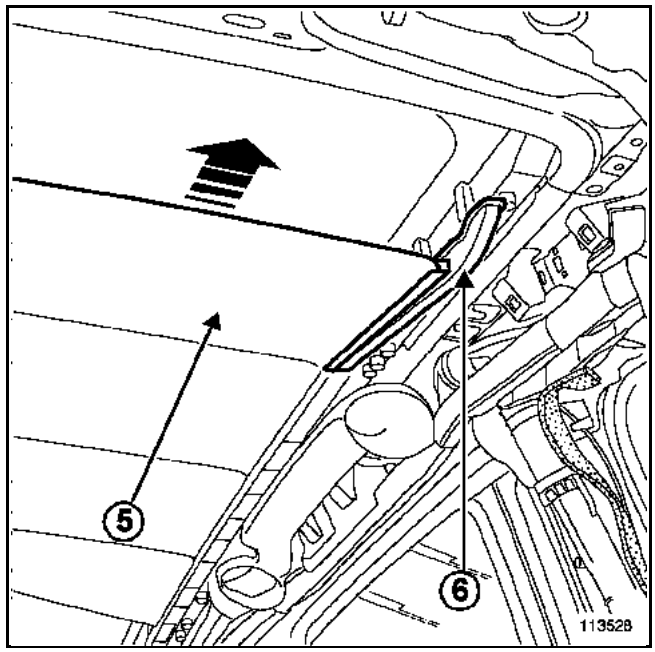


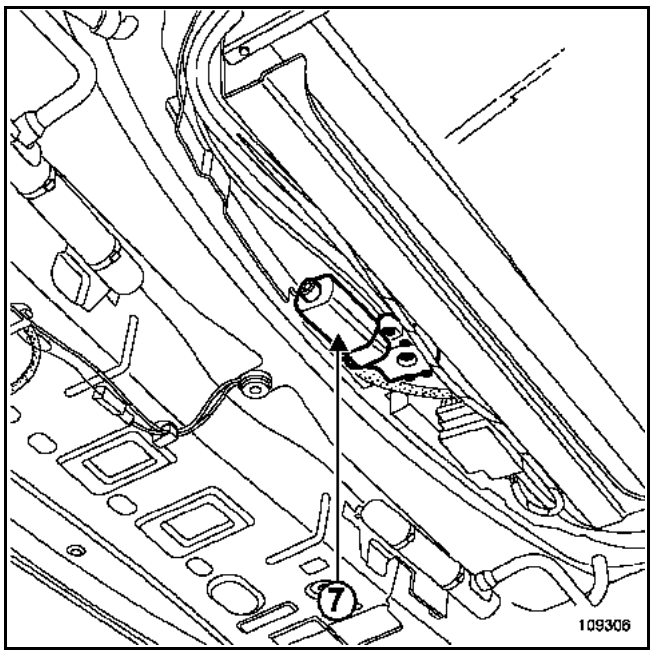


1 Sunroof operating mechanism (sunroof assembly)
2 Linkages and side runners (position of sliding linkages)
3 Sunroof mobile panel
4 Seal

ALP 23 CONTINUED 2	Sunroof chattering: jerky movement when opening/closing sunroof mobile panel







5 Sunroof blind (e.g. Espace IV)
6 Sunblind storage unit
7 Sunroof motor

ALP 24	Sunroof creaking

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the cleanliness:
– of the seal on the front section of the sunroof*
– of the seal between the mobile panel* and the sunroof operating mechanism*.

→ not correct → In all cases: Clean the seals* using a sponge and soapy water (under no circumstances must abrasive soap be used).

↓ correct

Check the condition:
– of the seal on the front section of the sunroof*.
– of the seal between the mobile panel* and the sunroof operating mechanism*.

→ not correct → If the seal is worn and/or broken, replace:
– the seal* on the front section of the sunroof, and/or
– the seal* between the mobile panel* and the sunroof operating mechanism*.
(see MR for vehicle, **65A OPENING ELEMENT SEALING, Sunroof seal: Removal - Refitting**).

*: see the illustrations in ALP: Sunroof chattering

ALP 25	Grating noise from the sunblind

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Remove the headlining (see MR for vehicle, **71A BODY INTERNAL TRIM, Headlining: Removal - Refitting**)

↓ correct

Check the cleanliness of the side runners* and the sunblind storage units*.

→ not correct: Clean then lubricate the side runners* and the sunblind storage units* (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof blind: Removal - Refitting**).

↓ correct

Check the condition of the sunblind side runners*.

→ not correct: Clean and lubricate the sunblind side runners* (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof blind: Removal - Refitting**).

*: see the illustrations in ALP: Sunroof chattering

CHART 26	Sunroof rattling

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.

Consult the ICM database and check the conformity of the vehicle.
Check the tyre pressures.
Visually inspect the vehicle:
– exterior cleanliness,
– no foreign bodies in the sunroof side runners,
– no parts are broken.

After the operation, check that the operation was successful by performing an operational test or road test.

↓

Check the tightness of the **detachable** side runners* at the front of the sunroof*. (e.g. Modus)

→ not correct: Torque tighten the detachable side runners* (see MR for vehicle concerned, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check the cleanliness of the side runners*

→ not correct: Clean the internal and external side runners* and, depending on the vehicle, only lubricate the internal side runners* or the external side runners* without removing the sunroof mobile panel (see MR for the vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

↓ correct

Check the linkage* - linkage mounting contact.

→ not correct: Insulate the contact between the linkage* and the linkage mounting by bonding a piece of felt (part no.: 82 00 281 967) to the front and/or rear linkages.

↓ correct

(A)

*: see the illustrations in ALP: Sunroof chattering

CHART 26 CONTINUED	Sunroof rattling

Check the condition of the mobile panel linkages*.

not correct → Remove the mobile panel* and replace the runners and/or the linkages* of the mobile panel*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof mobile panel: Removal - Refitting**)

correct ↓

Check the conformity of the sunroof* (damaged runners, operating mechanism, etc.)

not correct → Replace the sunroof*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof operating mechanism: Removal - Refitting**).

correct ↓

Check the geometry of the sunroof* in relation to the bodywork.
(Front, rear and side play)

not correct → Correct the geometry of the sunroof operating mechanism*. (see MR for vehicle, **52A NON-SIDE OPENING ELEMENT MECHANISMS, Sunroof operating mechanism: Removal - Refitting**).
Bolted sunroof operating mechanism*:
Use the centring kit corresponding to the vehicle and tighten the sunroof operating mechanism, observing the tightening order specified in the procedure in sub-section **52A NON-SIDE OPENING ELEMENT MECHANISMS**.
Bonded sunroof operating mechanism*:
Use the centring kit which corresponds to the vehicle.
Remove and reattach the sunroof operating mechanism following the procedure in the sub-section **52A NON-SIDE OPENING ELEMENT MECHANISMS**.

*: see the illustrations in ALP: Sunroof chattering

Introduction:

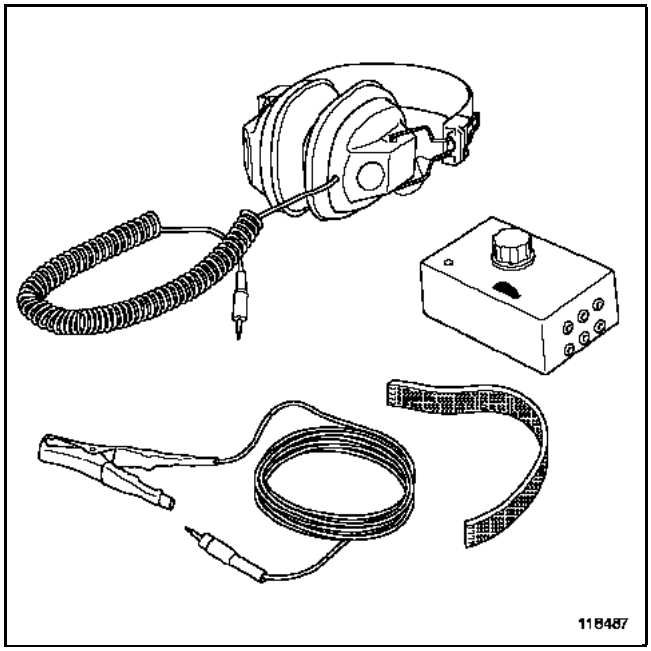
Before using the diagnostic tool (**Part no. 77 11 421 103**), it is essential to identify that the noise heard by the customer comes from the vehicle (and not from various objects in the vehicle or from the surrounding environment, etc.).

Note: Whenever possible, empty the contents of the vehicle's various storage compartments.

The **ChassisEar** is an electronic, versatile diagnostic tool designed to enable the user, during a road test, to amplify the sounds produced by different areas of the vehicle:

- Suspension
- Rotating components
- Front panel
- Engine
- Engine sub-frame
- Steering column
- Under body
- Rear face

Diagram of the tool:



The tool case is composed of the following:

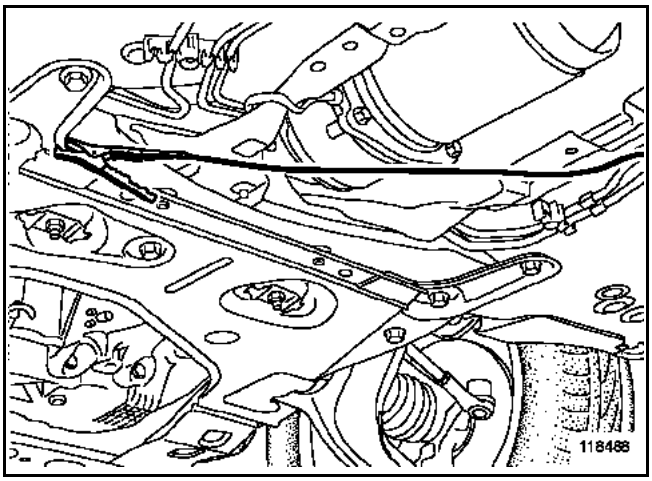
- Control unit (1)
- Clamp - Cable assembly (2)
- Headset (3)
- Velcro strip (4)

1) Fitting the tool:

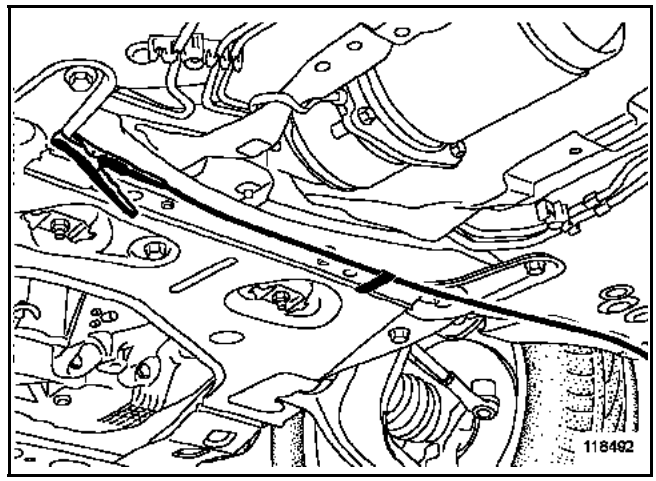
1.1) Precautions to observe when fitting the tool:

1.1.1) Assembly (wire – clamp):

– Ensure that the clamps are not:
  ● In contact with or near to sources of heat (exhaust, etc.)

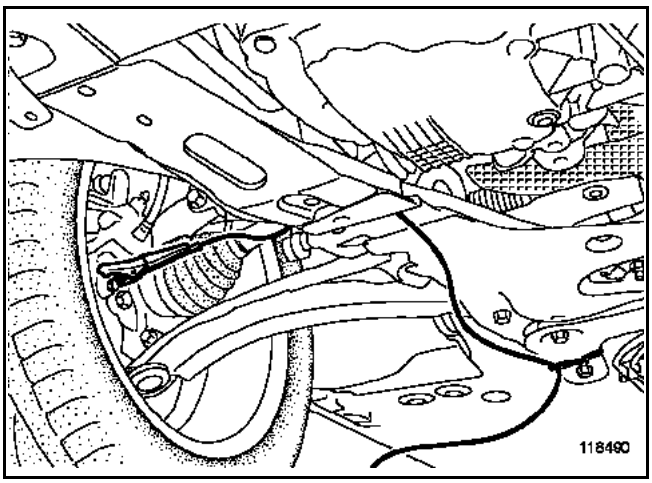


Incorrect fitting

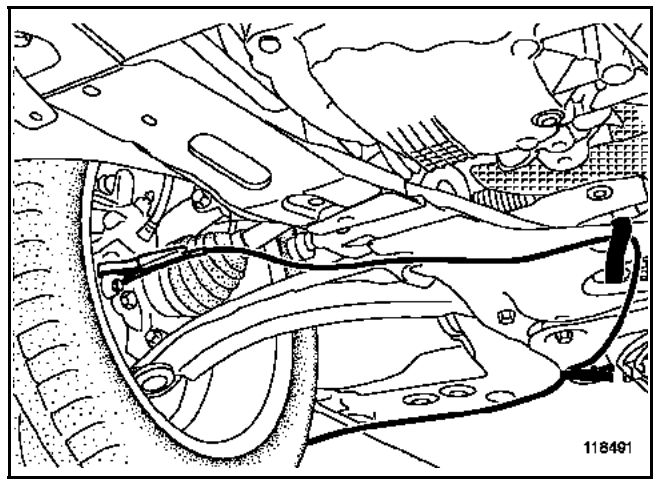


Correct fitting

  ● In contact with highly corrosive liquids (brake fluid, etc.).
– Ensure that the clamps are not:
  ● In contact with rotating components.



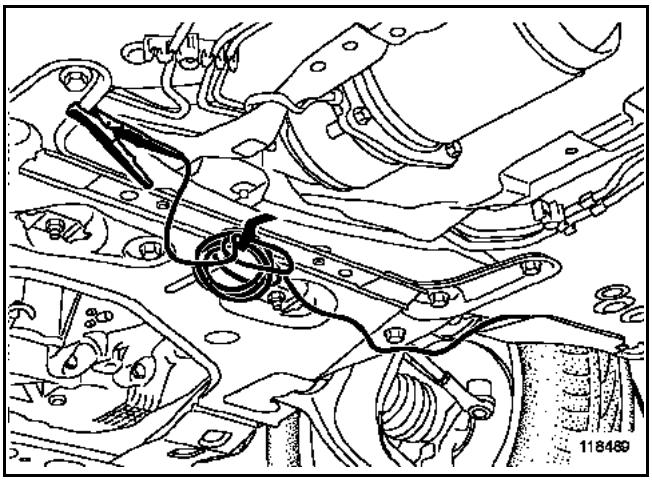
Incorrect fitting



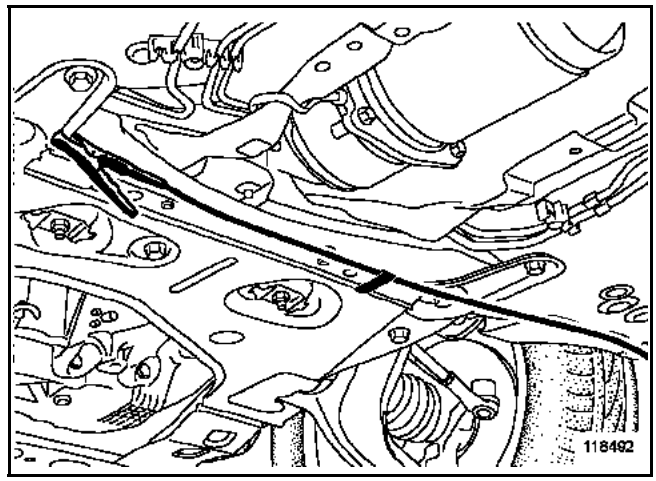
Correct fitting

  ● Make provision for parts to move whilst driving (wheels turned to full lock, movement) to prevent the clamp from becoming unclipped and the wire being severed.

- Do not twist the wires.



Incorrect fitting



Correct fitting

- Only attach the wires using the velcro strips supplied in the tool case.

1.1.1) Connection (Clamps-Control unit):

The control unit has 6 inputs which correspond to clamps of the following colours:

- **1: Red**
- **2: Green**
- **3: White**
- **4: Pink**
- **5: Blue**
- **6: Orange**

1.1.2) Fitting the tool:

– Place the vehicle on a lift.
– Fit the clamps to the components which may be causing the noise.
● Attach the wires using velcro strips.
● A coloured ring on the wire aids their identification.

– Remember the area or the component studied, according to the position of the clamps.
– Connect the clamps to the control unit.
– Connect the headset.

2) Stages of the test:

WARNING
When driving, **2 people are required**. Someone other than the driver must wear the headpiece.

Do not move the clamps during the driving test.
If the position of the clamps has to be adjusted, the vehicle must be in the workshop.

Perform the vehicle test according to the information collected and shown on the **Fault finding log**, when the customer complaint was registered (conditions under which noise appears).

Confirm the components in question during the test phase by a performing a check in the workshop:
– Special tooling.
– Visual or tactile inspection.