RENAULT

Technical Note 3451A

Twingo - Twingo II - Renault 5 - Express - Kangoo - Kangoo II - Clio I - Clio II - Clio III - Renault 19 - Modus - Logan - Sandero - Mégane I - Mégane II - Mégane III - Scénic I - Scénic II - Koleos - Laguna I - Laguna II - Laguna III - Safrane - Vel Satis - Avantime - Espace III - Espace IV - Trafic II - Master II - Master Propulsion - Spider

Clutch: Fault finding aid

The aim of this note is to help the repairer to carry out fault finding on the clutch and the parts that are attached to it.

V3 **Edition Anglaise**

Contents

20A CLUTCHES

1- Document applicability

This document presents the fault finding procedure applicable to all vehicles with the following specifications:
– Vehicles with 2 or 4 drive wheels
– Manual gearboxes

2- Prerequisites for fault finding

Documentation type:

– Fault finding procedure (this document):
– Repair Manual for the vehicle concerned
– Repair manual for the gearbox concerned:

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Gearbox	Technical Note No.
PA6 - PK5 - PK6	Technical Note 6003A
TL4	Technical Note 6019A
JBX - JCX	Technical Note 6036A
PF6 - PK4	Technical Note 6021A
JA3, JH1, JH3, JR5	Technical Note 6029A
ND0	Technical Note 6034A
ND4	Technical Note 6039A
ZF6	Technical Note 6016A

3- Fault finding procedure

– Identify the function difference type using the proposed definitions.
– Use the ALPs (fault finding charts) to identify the cause of the fault.

4- 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).

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

It may be necessary to do the road test with the customer to take note of his usual driving style. The faults detected by a customer may only be due to the fact that he is not used to using the normal functions of the clutch.

5- Definition of the causes

Clutch pedal remains depressed after usage:

Definition: The customer complaint is that the clutch pedal remains depressed after usage.

Appearance context:

- The pedal remains depressed without driving the vehicle, engine running or when stationary:
  – either while doing several successive manoeuvres,
  – or leaving the foot on the pedal with a moderate force over an extended + /- period.
- The pedal remains depressed only after an extended + /- period of using the vehicle, in particular in dense traffic (traffic jam).
- The pedal remains depressed immediately after each manoeuvre. There is no or very little pedal force and lifting it up manually does not stop it happening again.
- When there is an extended stop in the disengaged position, with the first gear engaged (waiting at traffic lights for example), the vehicle tends to move forwards after a certain period of time. If the pedal is released, it does not go up again.

Notice: If the pedal is brought up manually its operation is recovered.

Clutch slipping:

Definition: Sensation of engine speed increasing, gear engaged, but vehicle not accelerating.

Appearance context: When cold and/or warm, with engine torque measurement, on flat or steep surfaces.

Notice: This customer complaint is generally accompanied by a strong brake pad type odour.

Clutch chatter:

Definition: Vibration (physical) felt when engaging the clutch again, when a gear is engaged.

Appearance context: When cold and/or warm, during the first few meters driven by the vehicle. A high level of air humidity or high air temperature may contribute to the appearance of the symptom.

Notice: Sensation without mechanical incidence. Cannot cause an immobilising breakdown.

Banging noise when the clutch pedal is depressed:

Definition: Banging felt in the clutch pedal.

Appearance context: When the clutch pedal is activated, all situations.

Grating/squeaking when the clutch pedal is pressed:

Definition: Sharp noise when declutching.

Appearance context: With the engine running or when stationary, all situations.

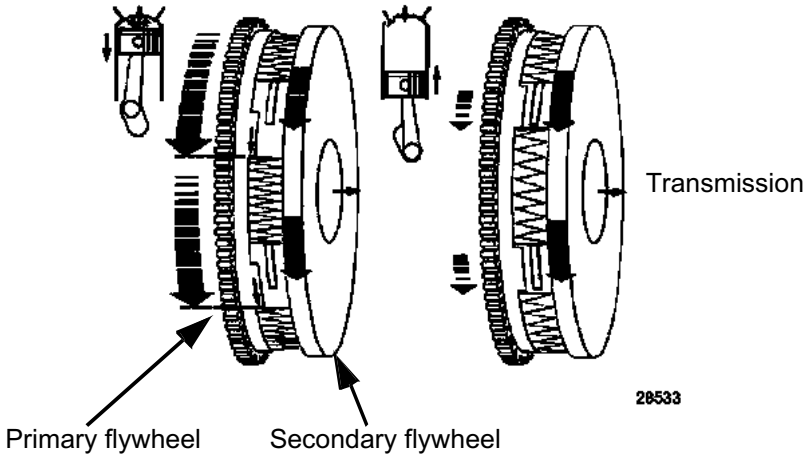
Clutch pedal vibration when stationary:

Definition: Physical vibration felt by the driver, when he/she puts his foot on the clutch pedal, with the engine running and vehicle stationary or when driving.

Appearance context: All situations.

The Dual Mass Flywheel (DVA) allows the engine torque shift to be absorbed.

Dual mass flywheel operation diagram:



It is normal to find rotation "play" in the dual mass flywheel (relative movement between the primary flywheel and the secondary flywheel) or tilting "play" in the secondary flywheel around its axis of rotation. This "play" is called dual mass flywheel "operating play".

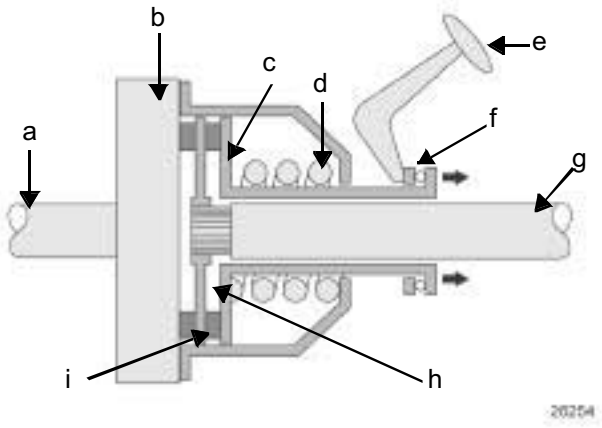
A Dual mass flywheel can be seen in two statuses:
For a new Dual mass flywheel, no play is present because of a primary flywheel/secondary flywheel retaining clip for locking rotation and enabling access for the correct electric screw drivers for factory fitting of the dual mass flywheel on the crankshaft. This clip is broken the first time the engine starts.
For a dual mass flywheel which has worked: presence of a free rotation angle. This angle is measured by fixing the primary flywheel and turning the secondary flywheel. The free rotation angle of the dual mass flywheel must not exceed 25˚ or 60 mm in linear movement measured on the edge.

The clutch is a system that may be used to link a mechanical energy to its final action.
It consists of an assembly of parts located between the engine and the driveshaft components.
The functions that it ensures are:

- In clutch pedal position: transmitting the supplied power.
- In disengaged position: stopping this transmission.
- Between both: gradually re-establishing power transmission.

● According to the control type

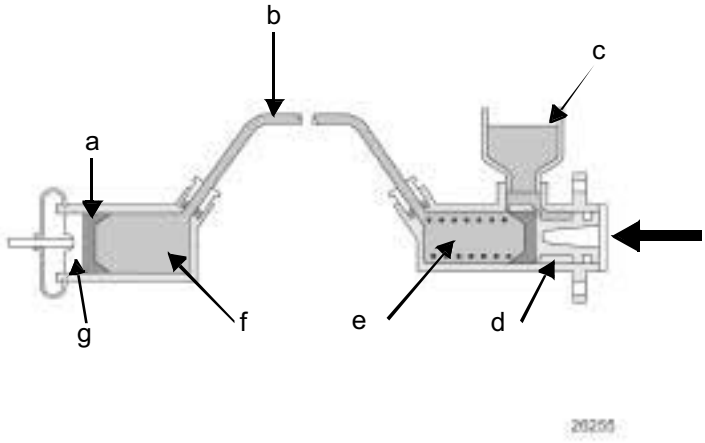
- mechanical control;
- hydraulic control;
- electronically controlled electric control (BVR).



a: crankshaft
b: flywheel
c: pressure plate
d: spring
e: clutch pedal
f: clutch thrust bearing
g: gearbox input shaft
h: clutch plate
i: clutch plate pad

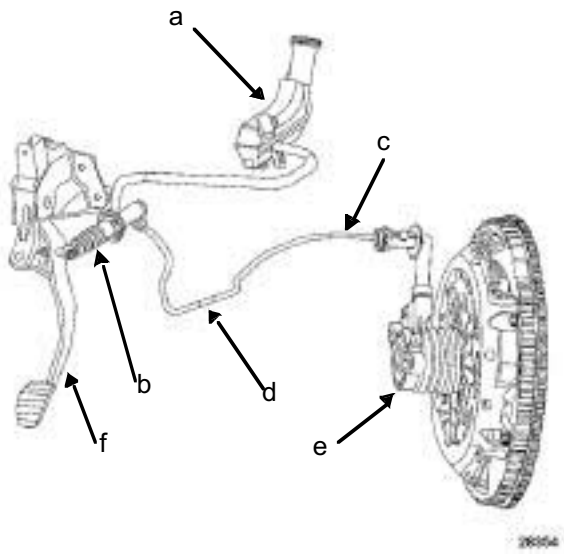
The system is composed of a flywheel (attached to the engine) (the centre bolts are bolted in the crankshaft).
The clutch plate is attached to the gearbox.
The part on the outer side is called the friction or the pad. The mechanism ensures the disc adherence to the flywheel in the engaged position, so that they turn at exactly the same speed, one driving the other.
During declutching, the mechanism springs are "crushed" by the clutch thrust bearing.
When the clutch control (hydraulic or cable) is activated, the discs separate, and movement is transmitted less and less, rendering the engine independent from the gearbox. This allows, for example, to remain motionless without stalling the engine, or changing gears.
The inverse manoeuvre consists of gradually releasing the clutch control, to re-establish the engine/gearbox connection. This manoeuvre is called "letting the clutch slide".

Diagram of clutch hydraulic system:



a: Seal
b: Piping
c: Hydraulic liquid tank
d: Piston
e: Clutch master cylinder
f: Clutch thrust bearing
g: Piston

Global diagram of the hydraulic clutch system:



a: Hydraulic liquid tank
b: Clutch master cylinder
c: Hydraulic liquid duct
d: Hydraulic circuit filter
e: Clutch thrust bearing
f: Pedals

Clutch pedal remains depressed after usage	ALP 1
Clutch slipping	ALP 2
Clutch chatter	ALP 3
Rattling noise when the clutch pedal depressed - Rattling when the engine is started	ALP 4
Grating/squeaking when the clutch pedal is depressed	ALP 5
Vibration from the clutch pedal	ALP 6
Oil leak at the clutch	ALP 7
Checking the clutch release point	TEST 8
Checking the clutch fork travel	TEST 9

ALP 1	Clutch pedal remains depressed after usage

NOTES	– Check that the customer has not topped up the brake fluid. – Check the condition of the brake pads before topping up the brake fluid.

Check the area around the pedals on the passenger compartment side.

Does the floor carpet or anything else obstruct clutch pedal movement?

YES

Free the pedals and check that the customer complaint does not happen again.

NO

Check the return spring and the pedals pushrod.

Has a fault been detected?

YES

Repair the fault and check that the customer complaint is no longer occurring.

NO

Check the brake fluid level.

Is the level below the minimum?

NO

YES

Check the sealing of the pipes and filter of the hydraulic clutch circuit (connections and pipes), of the clutch master cylinder (engine and passenger compartment side) and the clutch thrust bearing (checking for oil on the engine/gearbox connection)

Have leaks been detected?

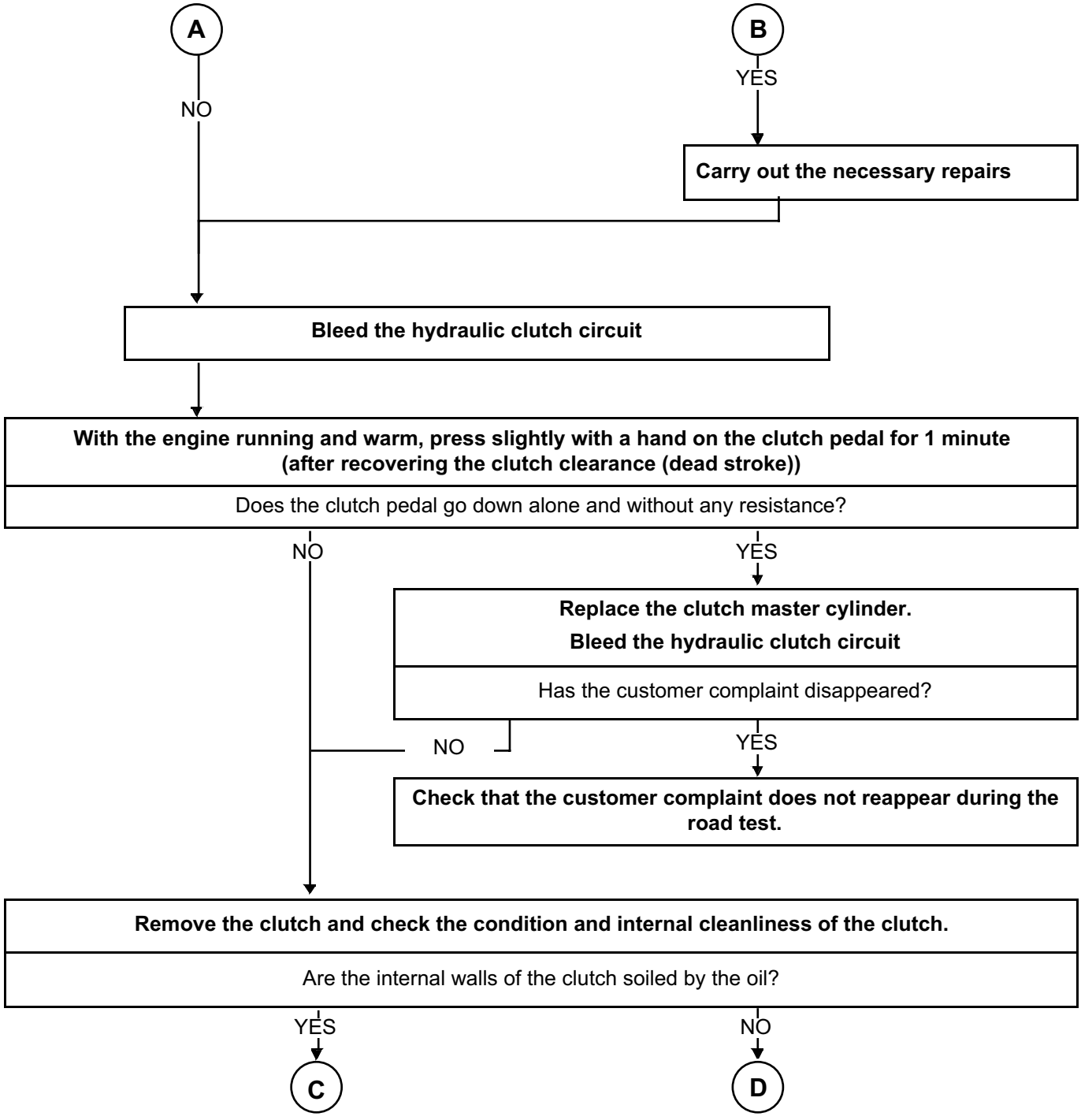
NO

YES

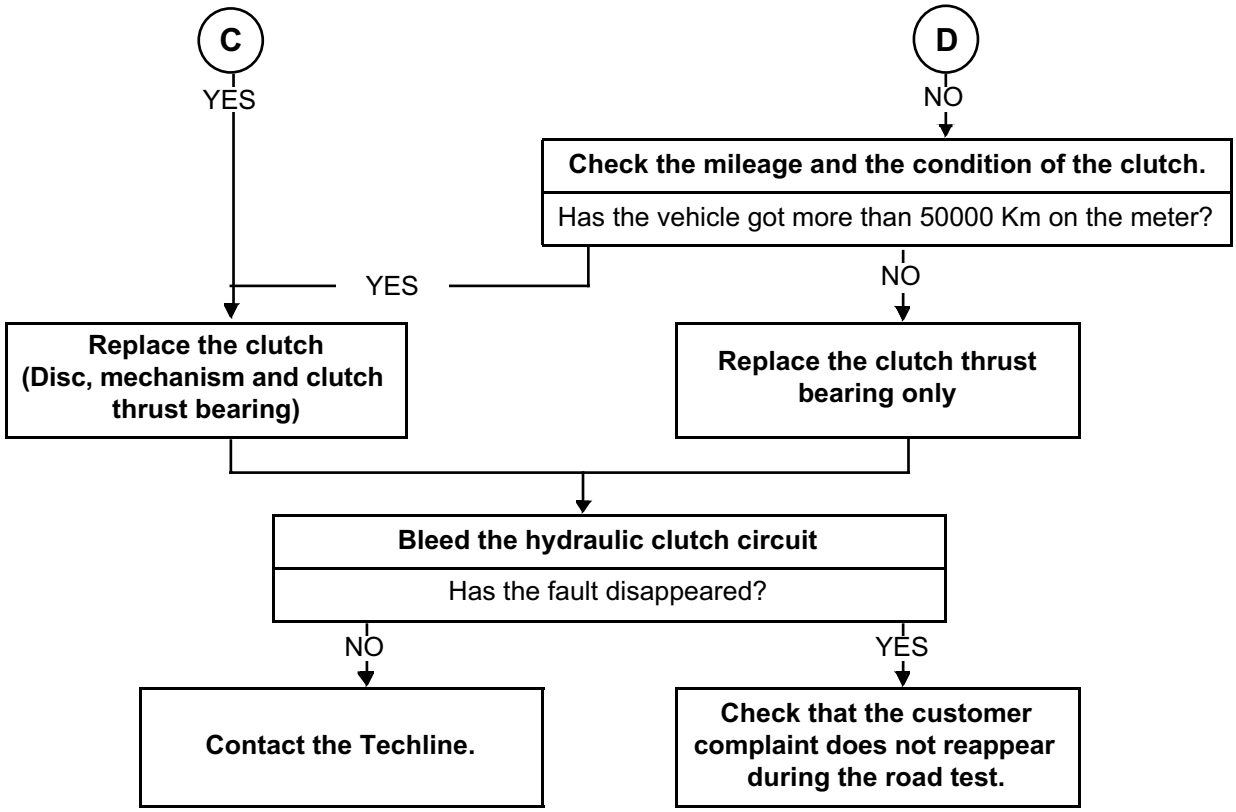
A

B

ALP 1 CONTINUED 1	Clutch pedal remains depressed after usage

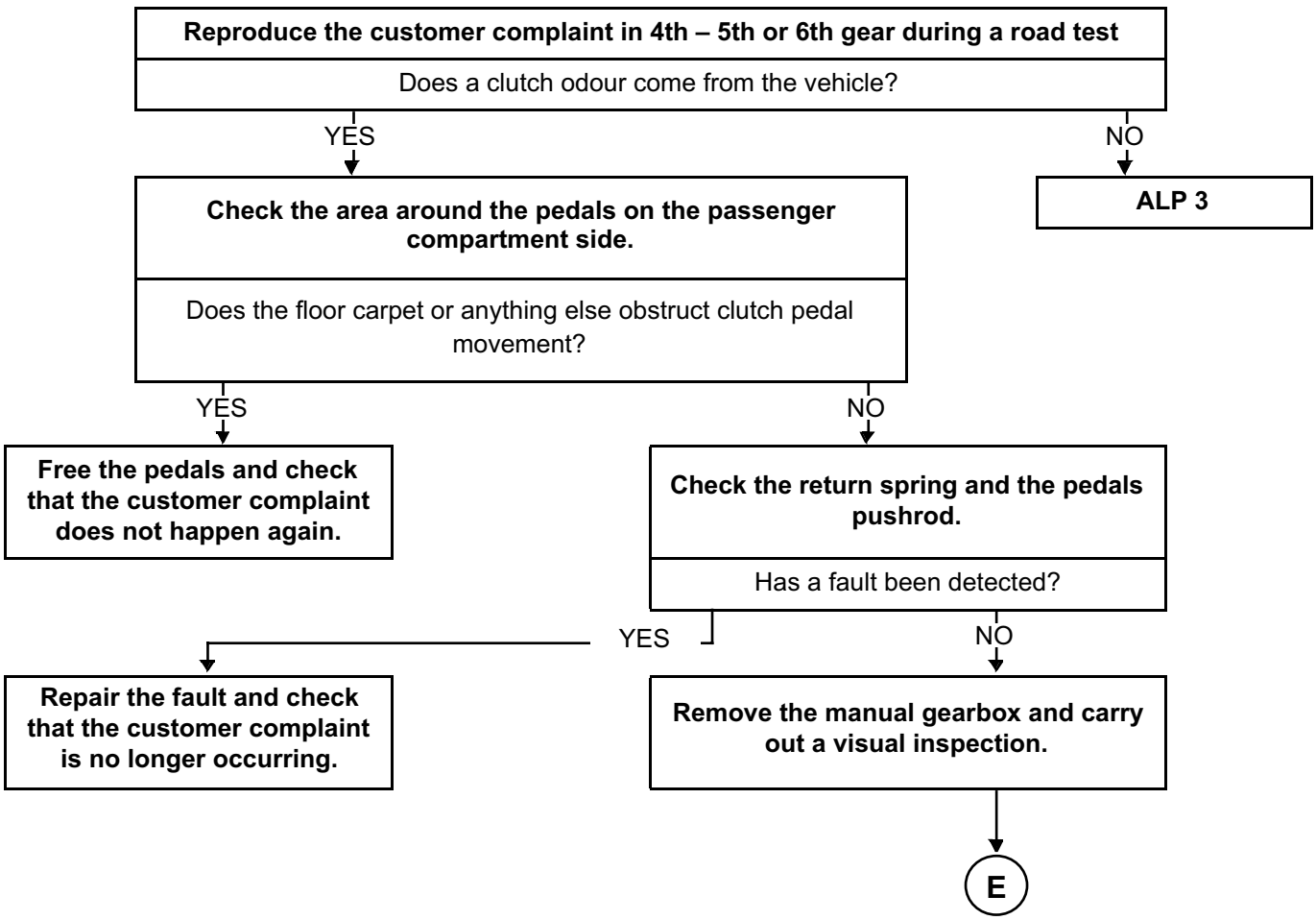


ALP 1 CONTINUED 2	Clutch pedal remains depressed after usage

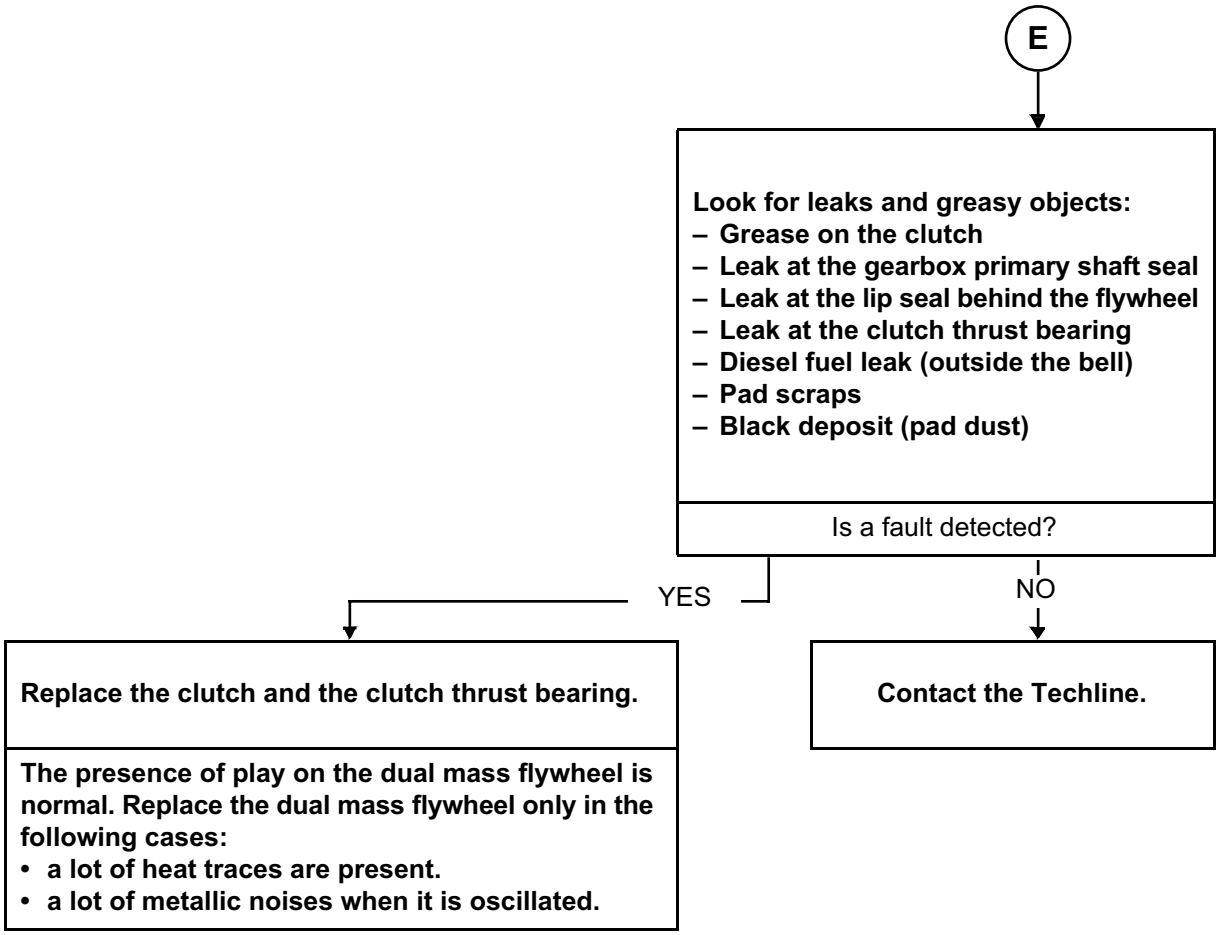


ALP 2	Clutch slipping

NOTES	– Question the customer about when the customer complaint occurs and his/her driving style.



ALP 2 CONTINUED	Clutch slipping



ALP 3	Clutch chatter

NOTES	– Question the customer about when the customer complaint occurs and his/her driving style.

Reproduce the customer complaint during a road test

- Are vibrations felt, at idle speed, in the seat or the steering wheel at the end of travel when releasing the clutch pedal?

YES

The fault is not caused by the clutch.

Check the engine and transmission assembly suspensions , the air conditioning compressor, the injection or the front axle.

NO

Is clutch chatter felt when re-engaging in 1st gear or in reverse (between 1200 and 1500 rpm)?

YES

Is the fault intermittent (especially when cold)?

YES

Run the clutch in on a horizontal (flat) road.

Set the engine speed to between 1500 and 1800 rpm.

Engage 1st gear and release the pedal gradually for 1 to 1.5 seconds until the vehicle starts.

Repeat this operation 20 times with a 30 second pause between each engine start.

NO

F

NO

The fault is not caused by the clutch. Check the engine and transmission assembly suspensions, the air conditioning compressor or the injection.

ALP 3 CONTINUED 1	Clutch chatter

F

Remove the manual gearbox and carry out a visual inspection.

Look for leaks and greasy objects:
- **Grease on the clutch**
- **Leak at the gearbox primary shaft seal**
- **Leak at the lip seal behind the flywheel**
- **Leak at the clutch thrust bearing**
- **Diesel fuel leak (outside the bell)**
- **Pad scraps**
- **Black deposit (pad dust)**

Is a fault detected?

YES

Replace the part that causes the leak or greasy object.

Replace the clutch and the clutch thrust bearing.

The presence of play on the dual mass flywheel is normal. Replace the dual mass flywheel only in the following cases:
- **a lot of heat traces are present.**
- **a lot of metallic noises when it is oscillated.**

NO

G

ALP 3 CONTINUED 2	Clutch chatter

G

NO

Analysis of the free angle in the dual mass flywheel while trying to impose secondary flywheel rotation (see: Dual mass flywheel – Operation)

- Can you hear a loud grating/clanking noise?
- Does the secondary flywheel rotate more than 25˚ (60 mm measured on the edge) in relation to the primary flywheel?
- Is the secondary flywheel locked in relation to the primary flywheel (no rotation at all)?

YES

Replace:
– The whole clutch system
– The clutch thrust bearing
– The flywheel or the dual mass flywheel

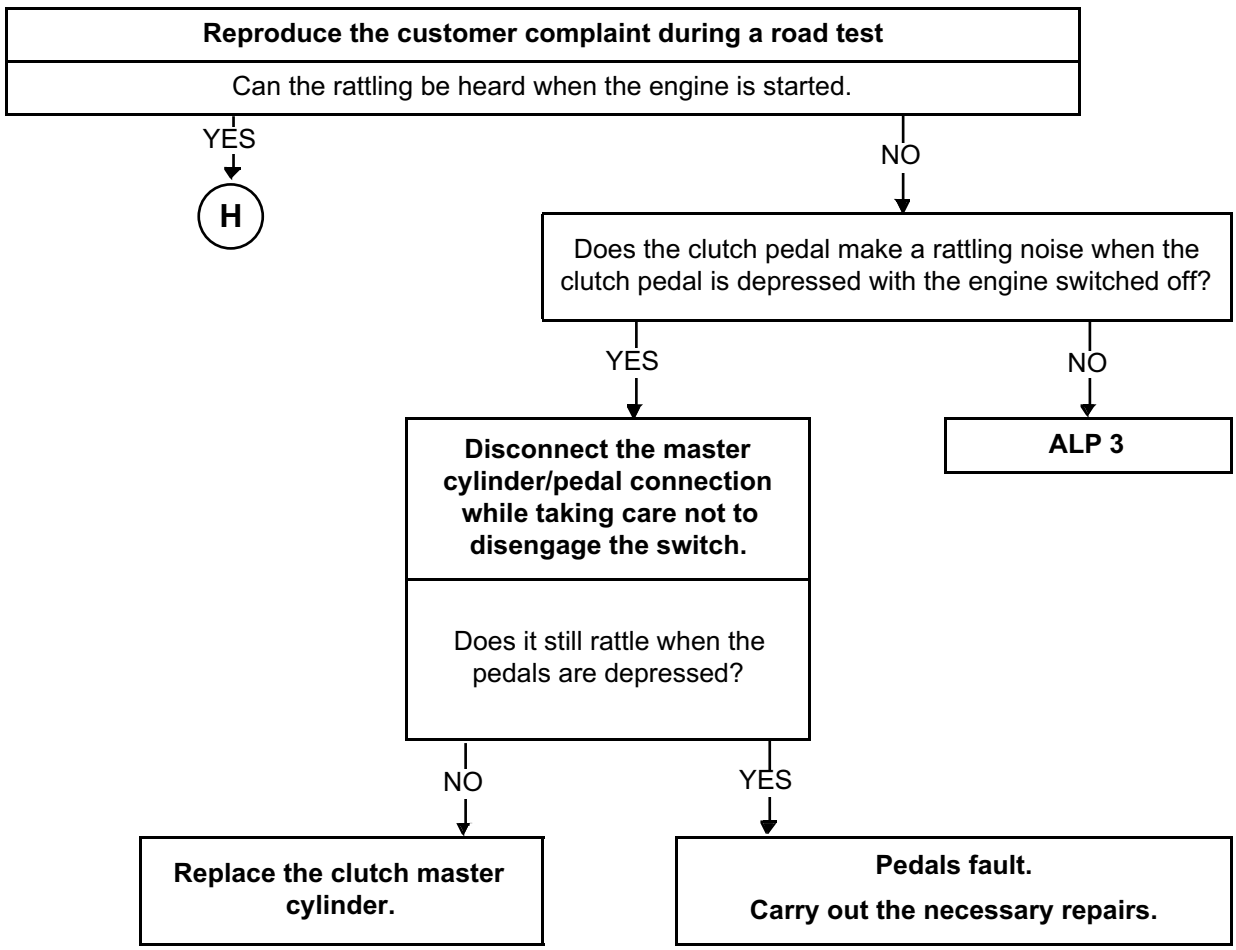
NO

The fault does not arise from the clutch.

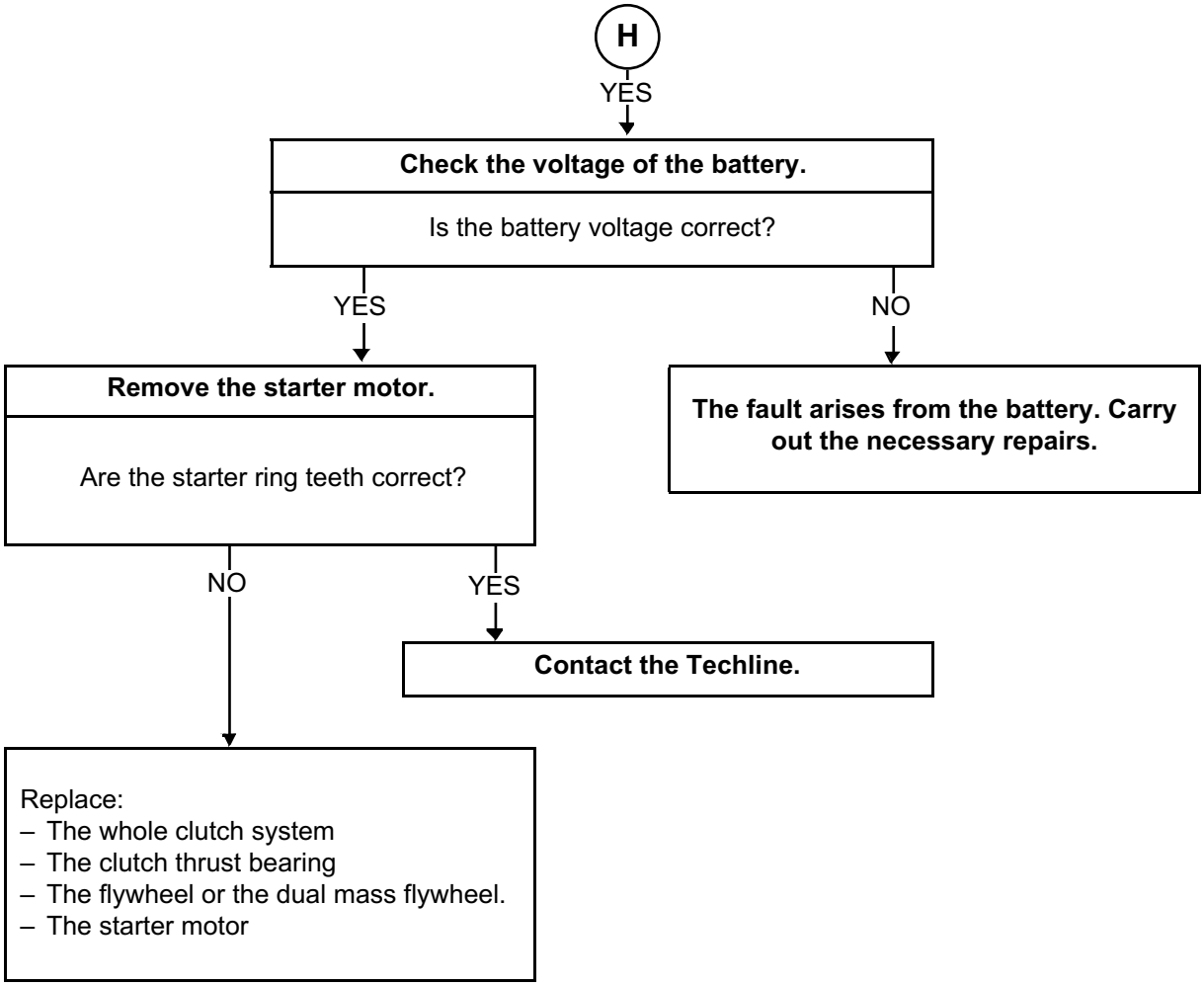
Contact the Techline.

ALP 4	Rattling noise when the clutch pedal is depressed - Rattling when the engine is started

NOTES	– Question the customer about when the customer complaint occurs and his/her driving style.



ALP 4 CONTINUED	Rattling noise when the clutch pedal is depressed - Rattling when the engine is started



ALP 5	Grating/squeaking when the clutch pedal is depressed

NOTES	– Question the customer about when the customer complaint occurs and his/her driving style.

Activate the clutch pedal several times with the engine switched off

Has the fault been reproduced?

YES

Check the area around the pedals on the passenger compartment side.

Does the floor carpet or anything else obstruct clutch pedal movement?

YES

Free the pedals and check that the customer complaint does not happen again.

NO

(I)

NO

Disconnect the master cylinder/pedal connection while taking care not to disengage the switch.

Only check the pedals.

Does the noise come from the shaft or the assistance (return spring)?

YES

Repair the fault and check that the customer complaint is no longer occurring.

NO

Reconnect the pedals.

Depending on the vehicle, check whether the noise comes from the clutch master cylinder, clutch cable or clutch cable routing.

Has a fault been detected?

YES

- **If the fault comes from the clutch master cylinder, replace the clutch master cylinder.**
- **If the fault arises from the clutch cable, replace the clutch control cable.**
- **If the fault arises from the routing of the clutch cable, clean the routing of the clutch control cable.**

NO

(I)

ALP 5 CONTINUED 1	Grating/squeaking when the clutch pedal is depressed

I

Activate the clutch pedal several times with the engine running

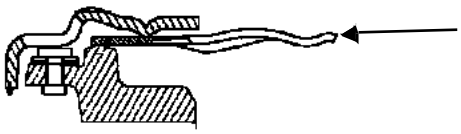
Has the fault been reproduced?

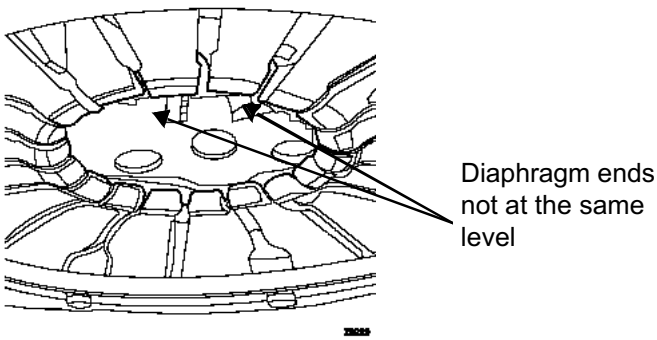
YES

NO → **ALP 3**

Remove the gearbox

Are the clutch diaphragm ends worn or not at the same level?

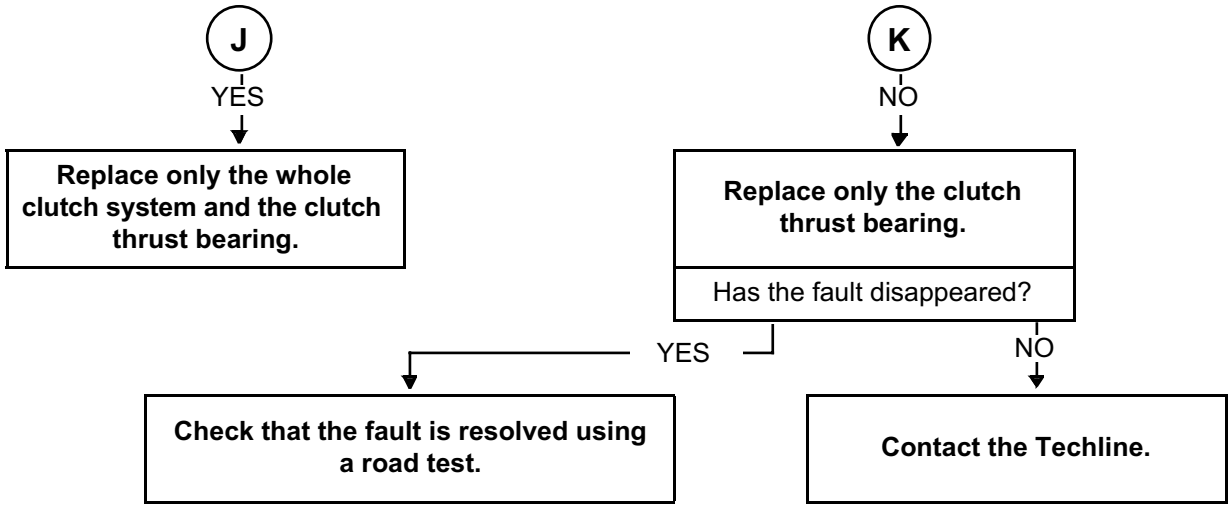




YES → J

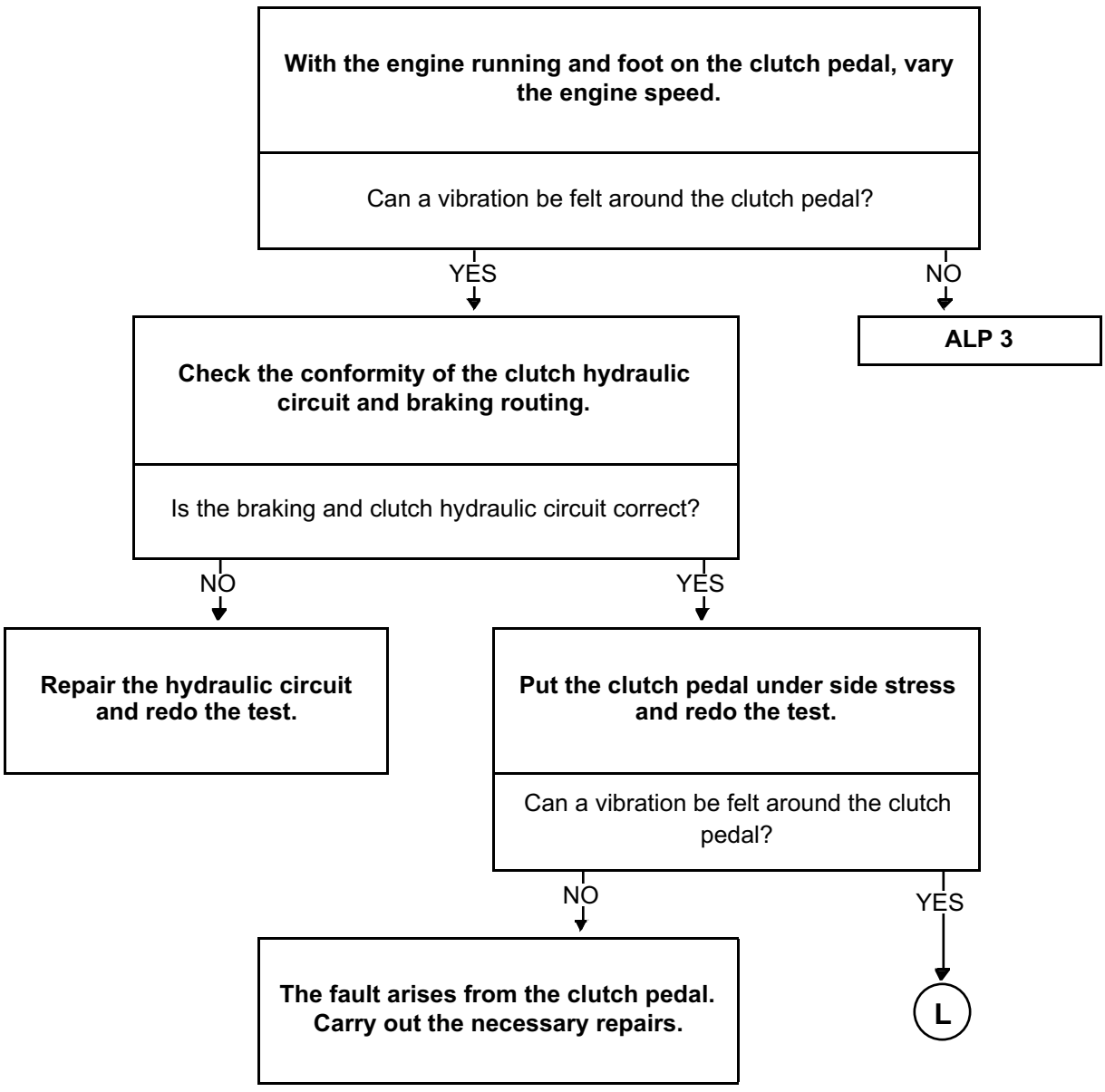
NO → K

ALP 5 CONTINUED 2	Grating/squeaking when the clutch pedal is depressed



ALP 6	Vibration from the clutch pedal

NOTES	– Question the customer about when the customer complaint occurs and his/her driving style.

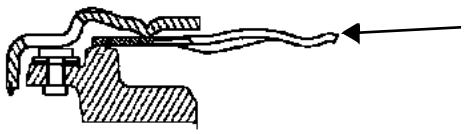


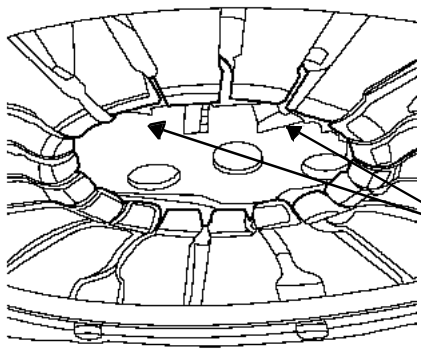
ALP 6 CONTINUED	Vibration from the clutch pedal

L

Remove the gearbox

Are the clutch diaphragm ends worn or not at the same level?





YES

Replace only the whole clutch system and the clutch thrust bearing.

NO

Replace only the clutch thrust bearing.

Has the fault disappeared?

YES

Check that the fault is resolved using a road test.

NO

Contact the Techline.

ALP 7	Oil leak at the clutch

NOTES	Check that the leak does come from the gearbox before carrying out the tests below.

Remove the engine undertray and detect the source of the oil leak.

Does the leak come from the pipes or from the hydraulic circuit filter?

YES → **Carry out the necessary repairs.**

NO → Does the leak come from the joint between the engine and the gearbox?

YES → **Remove the manual gearbox and carry out a visual inspection.**

Look for leaks and greasy objects:
- **Grease on the clutch**
- **Leak at the gearbox primary shaft seal**
- **Leak at the lip seal behind the flywheel**
- **Leak at the clutch thrust bearing**

Is a fault detected?

YES → (M)

NO → **The leak does not come from the clutch or the manual gearbox.**

Carry out a visual inspection to detect the exact source of the leak.

NO → Does the leak come from the mechanism housing?

YES → **Replace the gearbox.**

NO → **The leak does not come from the clutch or the manual gearbox.**

Carry out a visual inspection to detect the exact source of the leak.

ALP 7 CONTINUED	**Oil leak at the clutch**

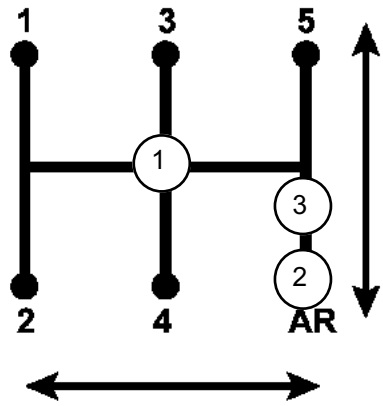
M

YES

Replace the clutch and the clutch thrust bearing
The presence of play on the dual mass flywheel is normal. Replace the dual mass flywheel only in the following cases: **• a lot of heat traces are present.** **• a lot of metallic noises when it is oscillated.**

TEST 8	CHECKING THE CLUTCH RELEASE POINT

NOTES	– The following tests are carried out at idle speed, with a warm engine. – The handbrake must be applied throughout the duration of the tests.



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● Vehicles without reverse gear brake:

Code vehicle	Gearbox type	Gearbox suffix
X06 (TWINGO I)	JB1	All types
X44 (TWINGO II)	JB1	520, 521, 523
	JB3	996
X40 (EXPRESS)	JB0	All types
	JB1	All types
	JB2	All types
X53 (RENAULT 19)	JB0	All types
	JB1	All types
	JB3	All types
X57 (CLIO I)	JB0	All types
	JB1	All types
	JB3	All types

X64 (MEGANE I)	JB1	902, 913, 914, 915, 916, 917, 947, 949, 950, 960, 961, 962
	JB3	109, 924, 933, 945, 947, 948, 949, 950, 952, 953, 954, 956, 957, 961, 964, 981, 982, 984, 989
X76 (KANGOO I)	JB1	512, 969, 970, 973, 974, 985, 992, 993, 994, 995
	JB3	959, 960, 968, 970, 977, 987
X65 (CLIO II)	JB1	510, 513, 514, 905, 906, 926, 928, 958, 964, 965, 966, 967, 968, 977, 978, 981, 991, 992, 997, 999
	JB3	958, 975, 979, 984
X85 (CLIO III)	JH3	128, 165, 176
X90 (LOGAN / SANDERO)	JH1	053
	JH3	052, 054, 055, 056, 058, 059, 060, 061, 062, 064, 068
X77 (MODUS)	JH3	128
X84 (MEGANE II / SCENIC)	JH3	105, 106, 137

Method for checking the clutch release point:

– Disengage the clutch (1),
– Wait for **3 seconds** (1),
– Select reverse gear (2).

If a creak or a jerk is felt when selecting reverse gear, see ALP1.

● Vehicles with reverse gear synchronisation or brake:

Code vehicle	Gearbox type	Gearbox suffix
X44 (TWINGO II)	JB3	993, 994
	JH3	166, 169
	JR5	176, 193
X53 (RENAULT 19)	JC5	002
X57 (CLIO I)	JC5	014

X65 (CLIO II)	JH3	All types
	JR5	All types
	JC5	All types
	JB3	905, 969, 971, 976, 980, 986, 991, 992
X85 (CLIO III)	JH3	131, 132, 141, 155, 172, 173, 174, 175, 177, 179, 184, 185, 186, 187, 189, 190
X94 (SPIDER)	JC5	049
X76 (KANGOO I)	JB3	974
	JC5	All types
	JC7	All types
	JR5	All types
X61 (KANGOO II)	JH3	All types
	JR5	All types
	JR5	All types
X90 (LOGAN / SANDERO)	JH3	053, 057, 065, 067, 160
	JR5	All types
X77 (MODUS)	JH3	131, 132, 172, 184, 189
	JR5	All types
X64 (MEGANE I)	JB3	926, 946, 951, 967, 972, 973, 983, 985, 988
	JC5	All types
	JC7	All types
X84 (MEGANE II / SCENIC)	JH3	142, 143, 144, 157
	JR5	All types
	JR5	All types
X66 (AVANTIME / ESPACE III)	JC5	All types
X56 (LAGUNA I)	JB3	All types
	JC5	All types
X74 (LAGUNA II)	JH3	All types
	JR5	All types

Method for checking the clutch release point:

– Put the gear lever in neutral (1)
– Disengage the clutch (1)
– Engage reverse gear (2)
– Bring back the lever halfway without coming back to neutral (the objective is to position the sliding gear wheel teeth close to the claws, disarming the brake or synchroniser without engaging the gear), (3)
– Re engage the clutch, (3)
– It should be possible to hear the claw teeth grinding **slightly** (if required, move the lever), (3)
– Disengage the clutch (pedal at the bottom) (3)
– Wait for **3 seconds**, (3)
– Engage reverse gear (2).

If a creak or a jerk is felt when selecting reverse gear, see ALP1.

TEST 9	CHECKING THE CLUTCH FORK TRAVEL

FORK TRAVEL CORRESPONDENCE TABLE (CONTINUED)

Code vehicle	Gearbox type	Gearbox suffix	Fork travel (mm)
X06 (TWINGO I)	JB1	025, 057, 940, 941, 187, 190, 222, 511, 515, 516, 517, 518, 522, 938, 939, 956, 975, 986, 987, 988, 989, 996	17 MIN - 20 MAX
	JH1	002, 003, 012, 013, 014, 015, 017, 018,	17 MIN - 20 MAX
X44 (TWINGO II)	JB1	520, 521, 523,	27 MIN - 30 MAX
	JH1	020, 021	17 MIN - 20 MAX
X40 (EXPRESS)	JB1	025, 032, 048, 070, 074, 100, 109, 126, 155, 157,	17 MIN - 20 MAX
X42 (RENAULT 9)	JB1	025	17 MIN - 20 MAX
X53 (RENAULT 19)	JB1	025, 033, 070,	17 MIN - 20 MAX
	JB3	061, 095, 158, 166,	17 MIN - 20 MAX
	JC5	002	17 MIN - 20 MAX
X56 (LAGUNA I)	JB3	909	27 MIN - 30 MAX
	JC5	004, 005, 016, 017, 022, 024, 028, 029, 036, 047, 048, 054, 095, 099, 111,	27 MIN - 30 MAX
	PK1	062, 069, 071	12 MIN - 13 MAX
X57 (CLIO I)	JB1	074, 082, 087, 104, 131, 154,	17 MIN - 20 MAX
	JB3	091	17 MIN - 20 MAX
	JC5	014	17 MIN - 20 MAX
X65 (CLIO II)	JB1	510, 513, 514, 519, 905, 906, 909, 925, 926, 928, 957, 958, 959, 963, 965, 966, 967, 968, 969, 977, 978, 980, 981, 982, 991, 992, 997, 999	27 MIN - 30 MAX
	JB3	905, 958, 969, 971, 986, 975, 976, 979, 980, 984,	27 MIN - 30 MAX
	JC5	089, 128, 129, 130, 140, 144,	27 MIN - 30 MAX
	JH1	004, 016,	17 MIN - 20 MAX

X64 (MEGANE I)	JB1	902	17 MIN - 20 MAX
		095, 918, 923, 944, 945, 947, 949, 950, 960, 961, 962, 966,	27 MIN - 30 MAX
	JB3	109, 123	17 MIN - 20 MAX
		106, 170, 180, 199, 904, 918, 923, 924, 933, 940, 943, 945, 948, 949, 950, 952, 953, 954, 957, 961, 964, 965, 966, 967, 972, 973, 981, 982, 983, 984, 985, 988, 989,	27 MIN - 30 MAX
	JC5	060, 062, 066, 072, 084, 086, 100, 103, 105, 106, 107, 110, 115, 124, 131, 132, 137, 138,	27 MIN - 30 MAX
X76 (KANGOO I)	JB1	116, 118, 148, 171, 512, 906, 952, 969, 970, 971, 972, 973, 974, 977, 979, 980, 984, 985, 992, 993, 994, 995,	27 MIN - 30 MAX
	JB3	168, 169, 198, 913, 959, 960, 968, 970, 974, 976, 977, 978, 987,	27 MIN - 30 MAX
	JC5	087, 090, 093, 123, 125, 126, 141, 142, 143, 145, 147	27 MIN - 30 MAX
X94 (SPIDER)	JC5	049	27 MIN - 30 MAX
X66 (AVANTIME / ESPACE III)	JC5	119, 120,	27 MIN - 30 MAX
	PK1	050, 064, 068, 075	12 MIN - 13 MAX
X90 (LOGAN / SANDERO)	JH3	052, 053, 054, 055, 056, 057, 058, 059, 060, 061, 062, 064, 065, 066, 067, 068, 069	27 MIN - 30 MAX
X54 (SAFRANE)	PK1	003, 004, 006, 027, 043, 062, 066, 069, 071,	12 MIN - 13 MAX
	VM1	001, 002, 003, 004, 005, 006	17 MIN - 19 MAX
	PK9	001, 002	10 MIN - 11 MAX
	PK7	000, 002	10 MIN - 11 MAX
X70 (MASTER II)	PF1	All types	12 MIN - 13 MAX