

Diagnostic protocol for manual gearbox

Date
License plate no.
Car make and model Year
Engine size and fuel Mileage km
Type of vehicle Occupational Private (car)
Does the car regularly carry heavy trailers or heavy load? No Yes

General

Has any gearbox related parts been recently exchanged? No Yes (If yes, please check correct option/s below.)
 Clutch Slave cylinder Flywheel
 Release bearing Other
Does the clutch operate normally/feel normal? Normal Not normal (If *not normal*, please describe below.)
Describe clutch symptoms as thoroughly as possible

Symptoms

The symptoms are Sporadic Constant
Symptoms arise when the gearbox('s oil) is Cold Warm Regardless of cold or warm
Did an error occur at a specific situation? What happened? When?

Shifting gears

Lacking drive on any gear? No Yes
Problems with shifting gears? No Yes
Any noise when shifting gears? No Yes, on following gear/s
Do the gears feel/appear sluggish? No Yes, on following gear/s
Has the gear shift mechanism been adjusted? No Yes
Describe any gear symptoms as thoroughly as possible

Oil

Has the gearbox's oil been replaced? No Yes, when
Is the oil level correct? No Yes Not checked
Does the oil look normal? No Yes Not checked
Metal particles/coarse metal chips in the oil? No Yes Not checked
Other comments about the oil

Vibrations

Does vibration occur? No Yes
If yes, describe the circumstances as thoroughly as possible

Noise

Any noise coming from the gearbox? No Yes (If yes, please check correct options below.)
 Single gears Constant Linked to speed
If yes, when does the noise appear? At acceleration When engine braking
Does the noise disappear when clutch is pressed down? No Yes
Describe noise as thoroughly as possible

Car mechanic's comments about gearbox symptoms and the customer style of driving

Customer's comments about gearbox symptoms and style of driving

Procedure

If the manual gearbox appears to be involved in the symptoms that the car is showing, a number of tests should be performed to show if the manual gearbox is defective and if, regardless of the origin of the problem, it needs to be replaced.

In-depth troubleshooting through exclusion of possible sources of error (parts/oil) is an accessible way until actions begin to be too costly for the customer. After in-depth troubleshooting it is very likely that the whole error will be resolved by replacing the gearbox. If the problems persists after the gearbox has been replaced, you need to contact the gearbox supplier for technical support.

After-inspection and documentation

After a gearbox replacement, a check is performed according to instructions. Work is completed by archiving all documentation about the reason for the gearbox replacement (fault description/troubleshooting). Copies of these documents are sent to the supplier of the gearbox and to the customer. Post-check and documentation are very helpful if the reason for the change of the gearbox turns out to be a malfunction in a car, which needs further investigation.

About "high mileage cars"

The manual gearbox in a so-called "high mileage car", where the service has been

neglected, is worn. If the manual gearbox is not working properly, it is usually a change of gearbox that is needed. What is considered to be a "high mileage car" varies, but in this context a mileage of 250 000 km is considered a guideline.

Instructions for test driving a car with error symptoms in the manual gearbox

Test drive is a key part of the troubleshooting. With a memorandum list, it will be easier to take full advantage of test drive - it's not always you get more than one chance to perform a test drive. The test drive should take place both when the manual gearbox is cold and when it is warm. Several symptoms are only noticeable when the gearbox is cold, while others only appear when it is warm.

Use the questionnaire on the other side to highlight problems experienced during the test drive.

Follow below instructions.

- Please note the customer's description of the problem/s experienced. Be sure to test drive according to the customer's instructions, for the best chance to repeat the

experienced problem/s. The rest of the test drive should be used to locate other potential problems.

- Start the car.
- Press down the clutch and then release it. Any sound/noise noticeable?
- If yes, does the sound/noise change when you press down the clutch?
- Is there any vibrations in the clutch pedal?
- Whilst the car is standing still: change to first gear, then consequently change to second gear, third gear and so on. Also try putting in the reverse gear. Any difficulties changing gears in general, or putting in a particular gear?
- If all gears seem fine when standing still: put in first gear and drive with light acceleration. Try shifting up to higher gears as well as shifting back to lower gears. Are there any difficulties changing to

higher or lower gears?

- Listen for sound/noise when the car is accelerating, engine braking and turning (both left and right).
- Do vibrations occur while driving?

The manual gearbox should be warm by now. Repeat the test drive. Once again, note problems experienced in the questionnaire on the other side.

Avoid test driving of a car that has:

- **strong dissonance**
- **heavy slip**
- **too little oil**

This could significantly reduce the condition of the gearbox!