

VOLVO CAR MI

[volvocar-m1](#) 1 hour ago

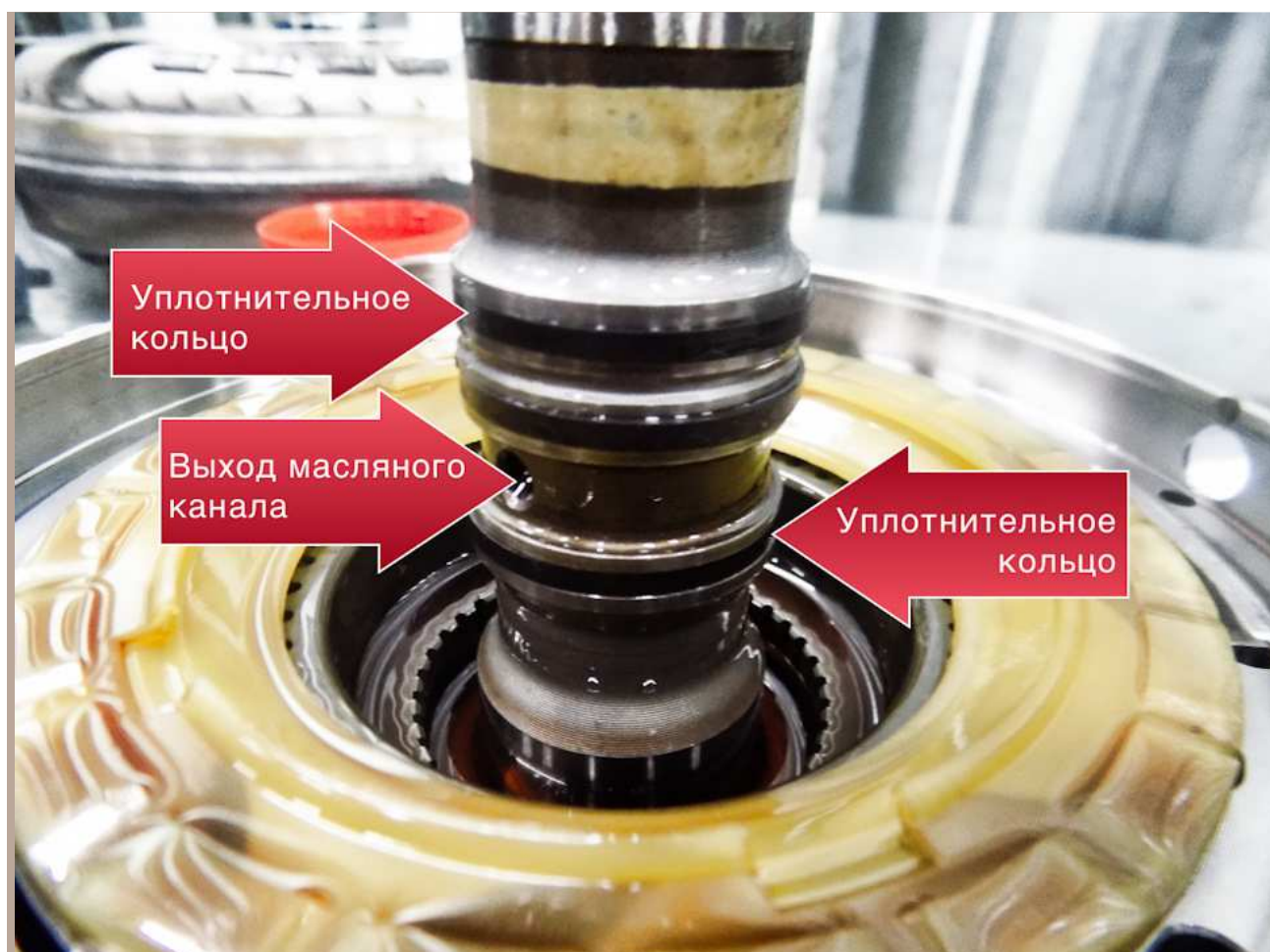
Official dealer of Volvo, Discount for work on first visit - 50% Moscow, Russia

One of the most common and discussed problems with Volvo cars built on the P3 platform is, perhaps, the behavior of the automatic transmission TF-80SC / SD. The most common complaints are jerks when shifting gears, strokes when the D mode of the selector of the automatic transmission is activated, a jerk at the beginning of the movement after the activation of the "auto-neutral". All these malfunctions, mainly, are manifested at high temperatures. They began to appear after the release of the second generation of this transmission, starting from 20 weeks of 2010. The manufacturer has developed a technical solution to eliminate such problems - this is the updating of the TCM module software and the adaptation of the transmission. But, unfortunately, as practice has shown, this decision is not always enough ...

The initial cause of the described symptoms of malfunction are internal oil leakage in the automatic transmission. This is a sort of uncontrolled reduction in the working pressure of the oil in the control lines. That is why the symptoms appear at high temperatures - the higher the oil temperature, the lower its viscosity, the greater the uncontrolled leakage. Adaptation of automatic transmissions means compensation for leaks at the software level. That is, the algorithm for the operation of the automatic transmission control software introduces additional correction factors that allow for the loss of oil pressure.

Oil leakage, according to information from VCR engineers, occurs through the joint of the shaft seal rings of the C1 clutch pack. The shaft itself is hollow, it is the main oil channel.

Here it is - the shaft of planetary gear and a package of clutches C1:



planetary shaft and clutch pack C1

If you remove the O-rings, they look like this:



O-rings

Rings, by the way, plastic, with Teflon coating. Obviously, if there is wear, or if the size tolerance is exceeded, a leakage of oil will occur through the joint of the rings.

Engineers Aisin have developed a technical solution to the leakage problem - a ring with a new lock. They are introduced into production at the plant from 39 weeks of 2015.



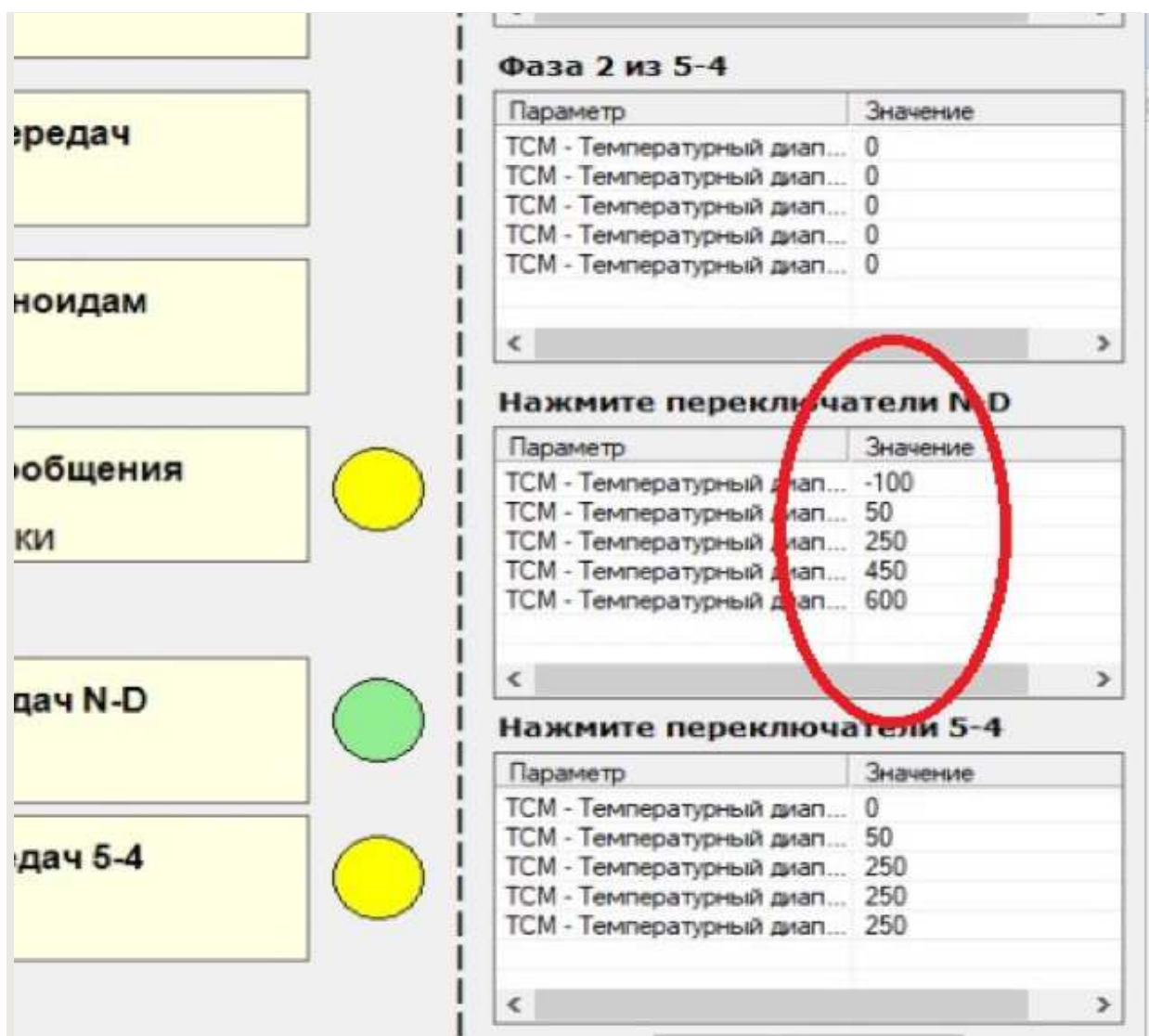
To the left is a ring of the old model, to the right - a new one, with a labyrinth seal.

We went to the supplier of rings with a labyrinth seal, and decided to develop a repair technology for automatic transmission - the replacement of O-rings.

So: the patient is Volvo XC60 2013. The mileage is 63 thousand km. The problem: hard mode D selector automatic transmission after traffic in traffic jams and in hot weather and a blow at the beginning of traffic after the shutdown of "auto-neutral".

The first stage of treatment: in accordance with the technical journal, we carried out the updating of the TCM module software and the adaptation of the transmission. As a result, the hard mode D was practically not shown, but the impact after the "auto-neutral" shutdown did not go anywhere.

Here are the results of adaptation:



Here you can see: the spread of the coefficients is quite large. This, indirectly, indicates a significant leakage, increasing with increasing temperature.

Further, a small digression:

We have a wonderful partner - the laboratory for the study of the characteristics and condition of the oils "Diamas". These guys are real fans of their business, and we decided to ask them to check out the new original gear oil Volvo 31256775, designed for the TF-80SC / SD. Here are the conclusions given to us by experts: the oil has a very high viscosity index of 174. This indicates that the viscosity of the oil varies relatively little with temperature. The viscosity was measured at a temperature of 40 degrees and was 25.1 cSt (centistoke), at a temperature of 100 degrees, a viscosity of 5.6 cSt. For oils such as ATF this is a unique high performance - in the good sense of the word. The original oil continues to protect the automatic transmission even at extremely high temperatures. So if the leak in the automatic transmission is not yet critical, then to minimize its symptoms it is necessary to use only the original oil.

Also, the results of a laboratory study of the viscosity of the oil at different temperatures have proved to us that the spread of the adaptation values directly characterizes the amount of uncontrolled leakage and is the basis for recommending the repair under consideration here.

Below is a complete report on the study of the oil. Absolute viscosity and viscosity index values at the bottom of the table are marked with a marker.

ОТЧЕТ О ПРОВЕДЕНИИ ИСПЫТАНИЯ МАСЛА

№ R00588/00140 13.09.2017



ДИАМАС
ЛАБОРАТОРИЯ

119571, Москва,
ул. Академика
Анохина, д. 64сА
+7 499 553-08-70
mail@oillab.ru
www.oillab.ru

Данные о заказчике

Договор б/н
Название VOLVO CAR M1
Подразделение -

ФИО
Тел +7(499)790-790-0
Моб
E-mail info@volvocarm1.ru

Точка пробоотбора и объект анализа

Производитель оборудования -
Модель оборудования -
Емкость маслобака Нет данных

Точка отбора пробы -
Тип оборудования -

ID пробы	ID заказчика	Дата отбора	Пробег общий	Наработка масла	Производитель масла	Марка	Класс вязкости масла	Дата анализа	Доля	Фильтрация
03-00-0042-000947	-	13.09.2017	-	0	Volvo	Transmission Oil 31256774	ATF	13.09.2017	нет	-

Интерпретация отчета

Общая оценка отчета



Состояние масла 1
Состояние техники 1
Фильтрация 1



ID пробы 000947

Индикаторы износа:

Железо (Fe), ppm (D6595)	<2
Хром (Cr), ppm (D6595)	<2
Алюминий (Al), ppm (D6595)	<2
Медь (Cu), ppm (D6595)	<2
Свинец (Pb), ppm (D6595)	<2
Олово (Sn), ppm (D6595)	<2
Ванадий (V), ppm (D6595)	3

Индикаторы износа или присадки:

Титан (Ti), ppm (D6595)	<2
Молибден (Mo), ppm (D6595)	<2
Никель (Ni), ppm (D6595)	<2
Марганец (Mn), ppm (D6595)	<2
Бор (B), ppm (D6595)	53

Присадки:

Магний (Mg), ppm (D6595)	3
Кальций (Ca), ppm (D6595)	170
Барий (Ba), ppm (D6595)	<2
Фосфор (P), ppm (D6595)	210
Цинк (Zn), ppm (D6595)	121

Элементы загрязнения:

Кремний (Si), ppm (D6595)	<2
Натрий (Na), ppm (D6595)	<2
Калий (K), ppm (D6595)	<2
Вода (FTIR), % (ASTM E2412)	0.2

Состояние масла:

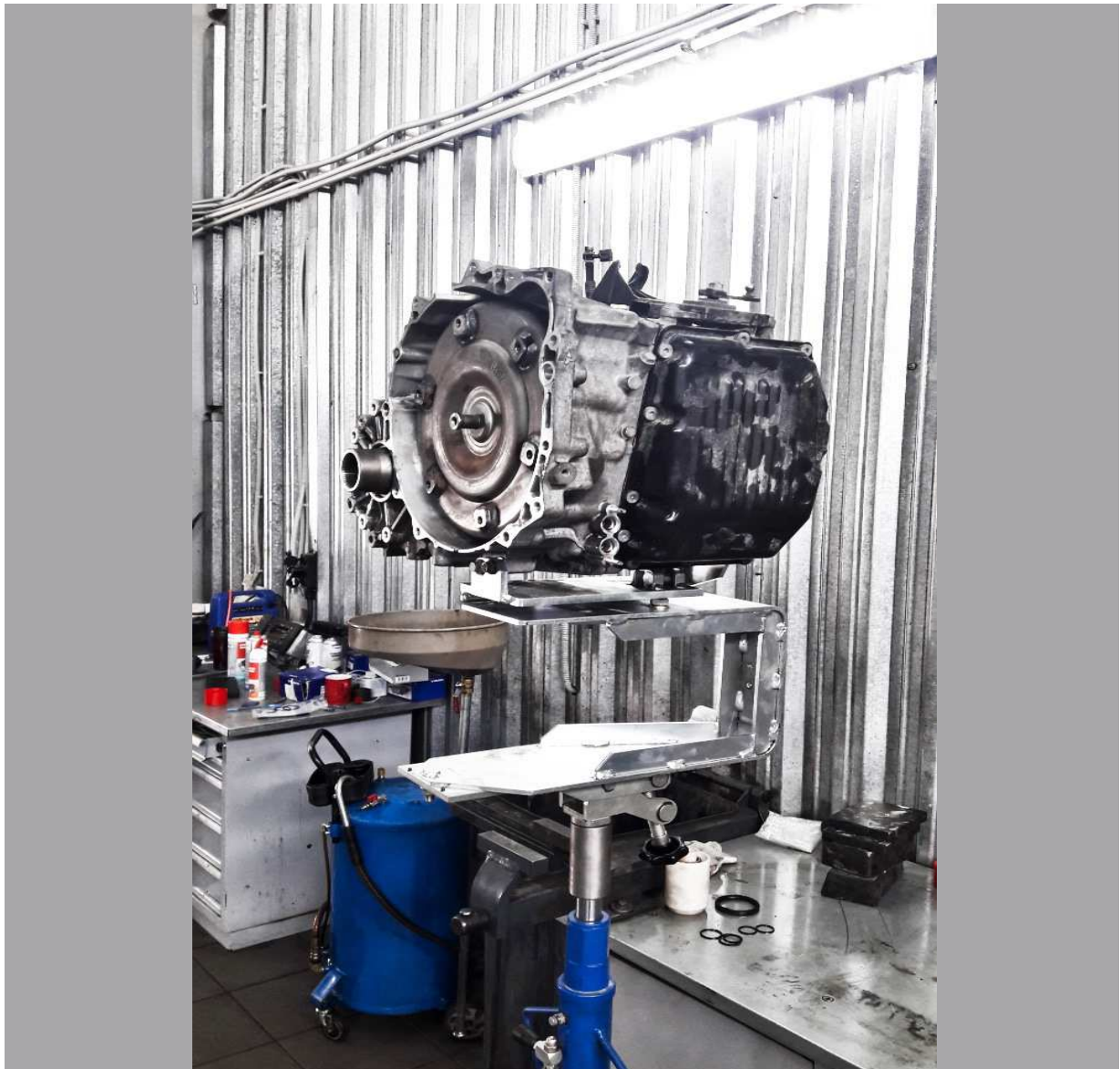
Вязкость 40°C, мм ² /с (ASTM D 445)	25.1
Вязкость 100°C, мм ² /с (ASTM D 445)	5.6
Индекс вязкости	174
Степень окисления, Абс/см (ASTM E2412)	7.4
Чистота промышленная ISO 4406	22/21/17

We offer the next stage of treatment - surgical intervention. Here, we already have to act at our own risk, since the plant does not give us the technology of disassembly / assembly of automatic transmissions.

For a start, we practiced on the decommissioned automatic transmission ...

Dismantled, we got to the rings, it turned out to be assembled without problems. It is decided - we try on a living organism))

To repair the automatic gearbox we remove from the car:

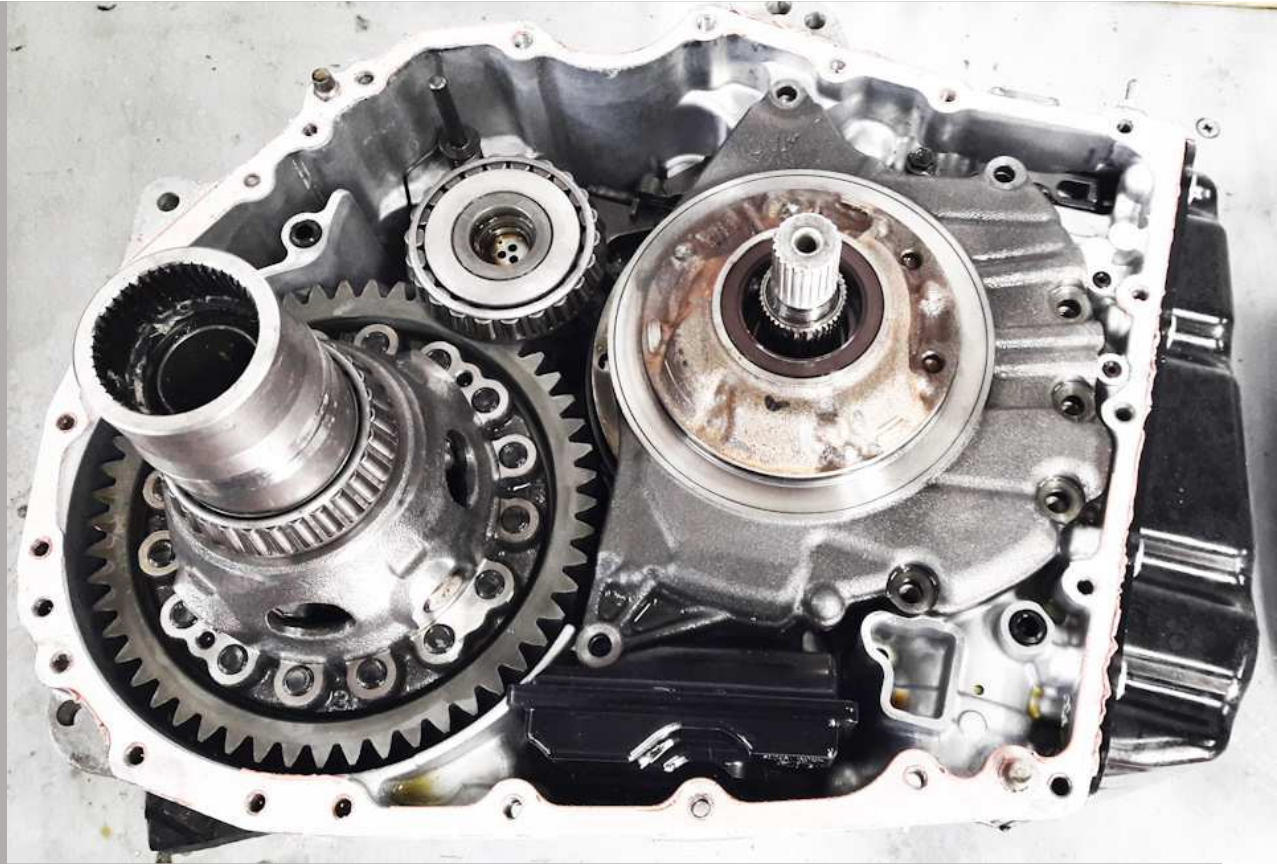


Carefully wash the body (with surgical intervention - hygiene above all)

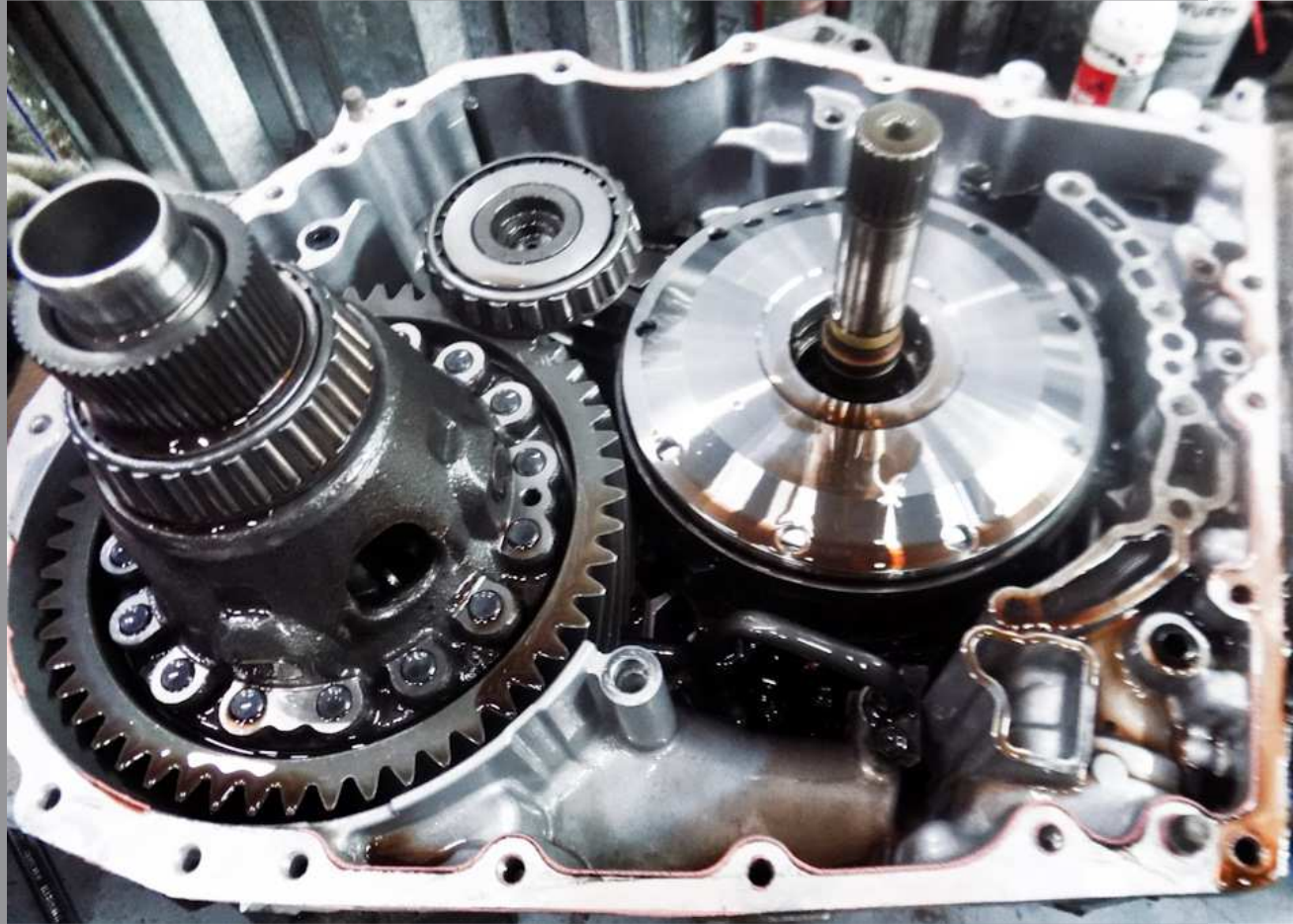
Here it is, with the converter removed:



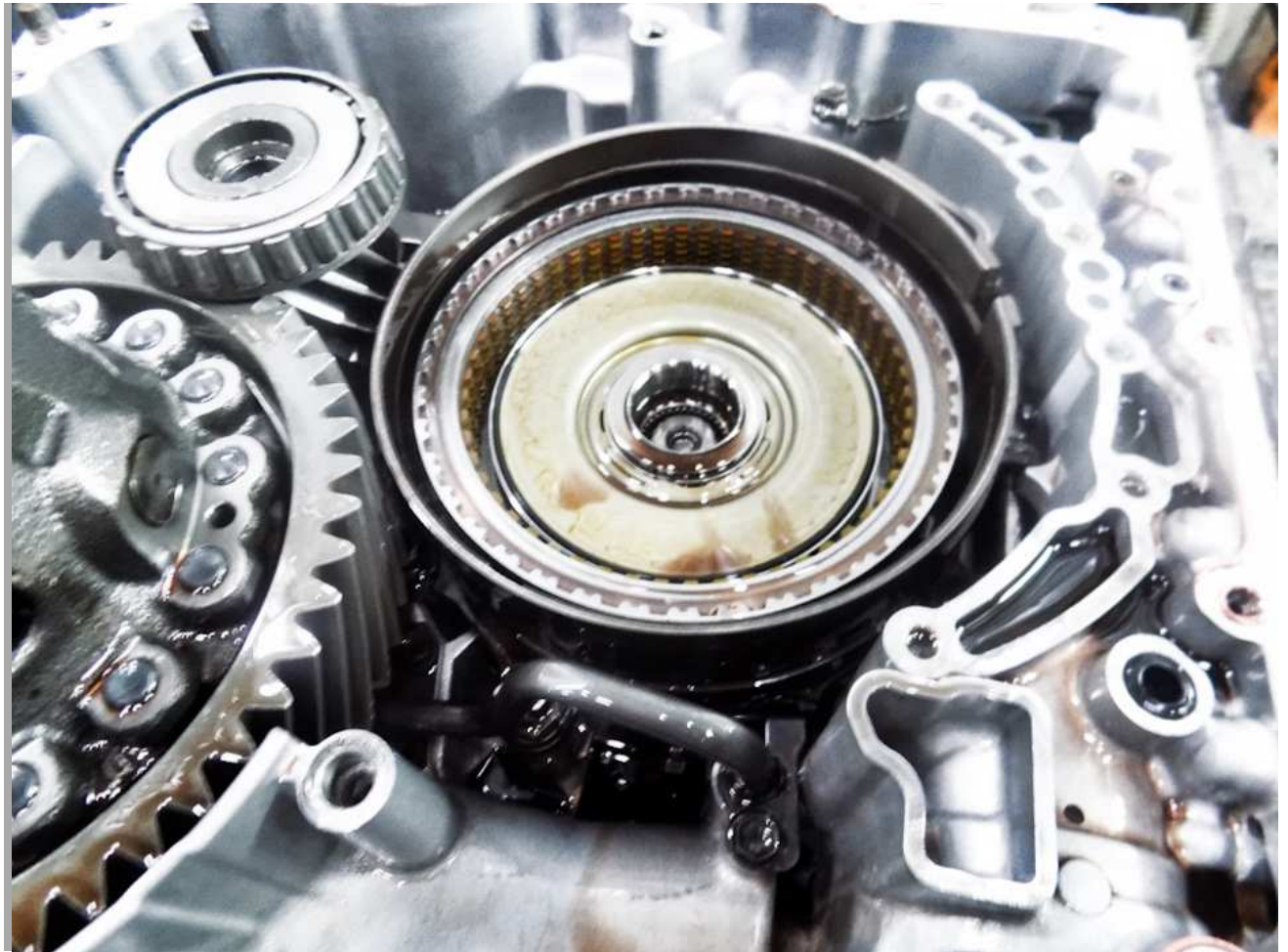
Then we divide the body of the automatic transmission and gain access to internal organs:



Then we remove the oil pump:



Now we have access to the planetary gear and clutch package C1 ...
Let's begin its analysis:



We extract the planetary gear. Everything, a shaft with all five seals is available!

We change three rings from above:



And two at the bottom:



We also replaced the oil filter of the automatic transmission (it is installed on the oil pump)



And cleaned the magnets of the wear products:



And this is a photo of the magnets BEFORE cleaning. A lot of wear products accumulate on the entire casing.



Next - the assembly. The most difficult thing is to properly build a package of friction clutches. After, we replaced the converter oil seal and the stuffing box at the junction with the transfer case. Filled a new oil.

Next test drive and re-adaptation of automatic transmission. Even before the adaptation, we immediately felt that the spurt after the "auto-neutral" shutdown had gone. Enabling D mode is very smooth.

And here is the culmination - the value of adaptation coefficients after repair:

5

коробка передач

94 °C

ласно соленоидам

1

кстового сообщения

енных передач N-D

42

енных передач 5-4

4

00:00:00

Спрятать

Фаза 2 из 5-4

Параметр	Значение
TSM - Температурный диап...	0
TSM - Температурный диап...	0
TSM - Температурный диап...	6
TSM - Температурный диап...	10
TSM - Температурный диап...	2

Нажмите переключатели N-D

Параметр	Значение
TSM - Температурный диап...	-150
TSM - Температурный диап...	-150
TSM - Температурный диап...	-100
TSM - Температурный диап...	-150
TSM - Температурный диап...	-150

Нажмите переключатели 5-4

Параметр	Значение
TSM - Температурный диап...	-360
TSM - Температурный диап...	-360
TSM - Температурный диап...	-360
TSM - Температурный диап...	-340
TSM - Температурный диап...	-330

Скрыть дополнительную информацию.

The difference in different temperature ranges is absent. This suggests that the leak does not change with temperature, but that all the coefficients are negative, which indicates that there is actually no leakage. The behavior of automatic transmission is ideal.

Let's summarize: we performed two adaptations of automatic transmission (before and after repair), replaced 5 sealing rings with rings with labyrinth seal, made a complete replacement of oil, replaced two oil seals. By the time it took 1.5 days.

The repair we described was free of charge, as we worked out the technology. Now we are confident in the result, ready to perform similar repairs, and provide a minimum of one year warranty for the work performed.