

Reparaturanleitung
Repair Manual
Manuel de Réparation
Manual de Reparaciones
Manuale di Riparazione



8 HP 45

Car Automatic-Transmission





subject to alterations

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ZF Friedrichshafen AG, ZF Services, Saarbrücken, Department MAPS14

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Initial information

These instructions contain the procedure for repairing the complete gearbox.

The repair instructions are only adequately comprehensible if the personnel have also had ZF-Services training. Failure to comply with this may result in incorrect work being carried out.

All the dismantling and assembly work is listed in chronological order.

The photographs have been kept in general form for the various applications and are not binding in every case.

Important changes for specific applications which must be taken into account for repair work will be published in *Technical Circulars* and at training courses.

For repairs the instructions of and specification from SDM and/or ServiceLine must be considered. See also our service recommendation relating to lubricants for automatic gearboxes.

Please note the following:

- Seals such as O-rings, shaft sealing rings, gaskets and filters must always be replaced.
- A thin coating of Vaseline or a film of gearbox oil must be applied to all O-rings, rectangular rings and other sealing rings during the assembly process. Metal seals must be fitted dry and with no grease.
- All bearings must be fitted after applying a thin coating of oil to them.
- Coating and steel multi-plates must be either replaced or reused depending on their condition.
- After couplings / brakes have suffered damage, the converter, oil pipes and the oil cooler must be cleaned thoroughly using a suitable cleaning product.
- Aluminium screws must always be replaced.

The following conditions must be met before starting any repair work:

- The special tools required for the work must be available, otherwise it is possible that the assembly work will be carried out incorrectly.
The complete set of special tools is listed in section 1.7.
- A suitable gearbox test bed must be available.
The required test values are set out in the *Technical Circulars*.

Note:

The mechatronic is treated in the instructions as a complete unit and should not be dismantled by personnel who do not have the special skills required to do so and instead should be replaced in full.

Separate instructions are planned for the mechatronic.

Important:

The gearbox is filled with oil which will last for its full service life.

The oil only has to be replaced after the vehicle has covered between 80,000 km and 120,000 km, depending on the drive conditions, or after 8 years. (see ref. TE-ML 11)

The gearbox may only be supplied with the quantity and type of oil set out in the relevant parts list document (see SDM).

Technical After-Sales

Technical Documentation

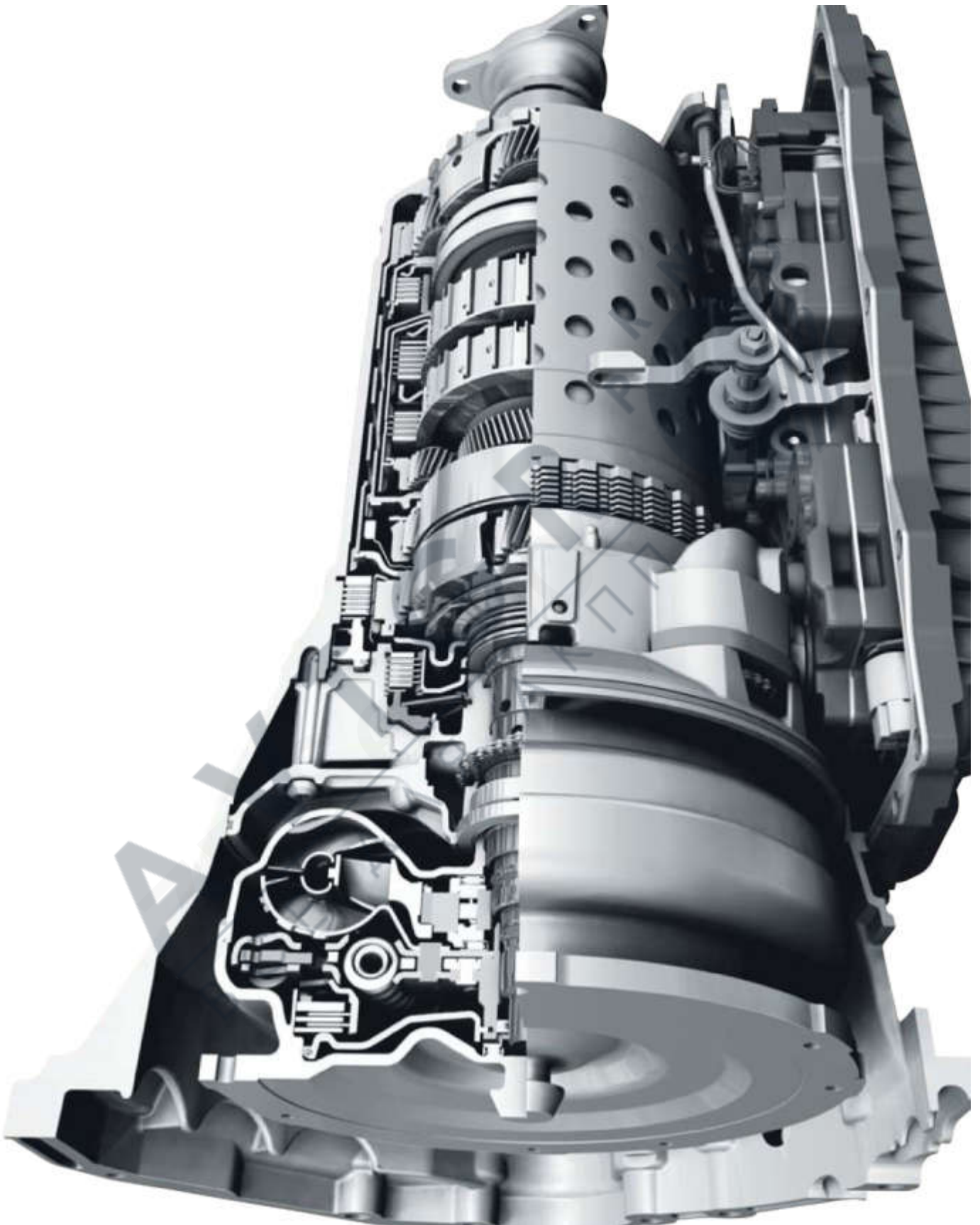
After-Sales Workshop

Herth

Reus

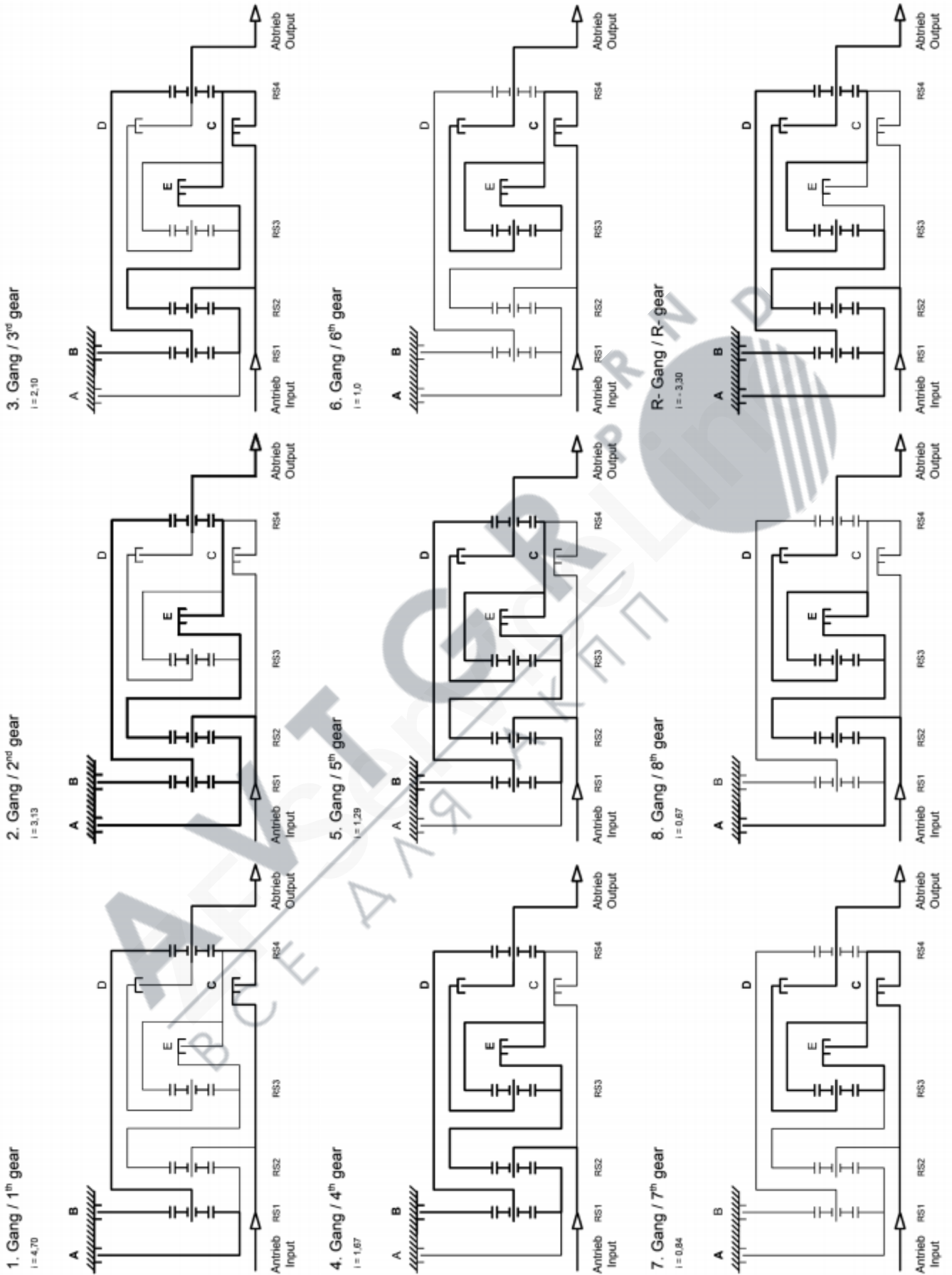
Stubauer

- 1. General
- 1.1 Illustration of transmission





1.2 Power flow diagram

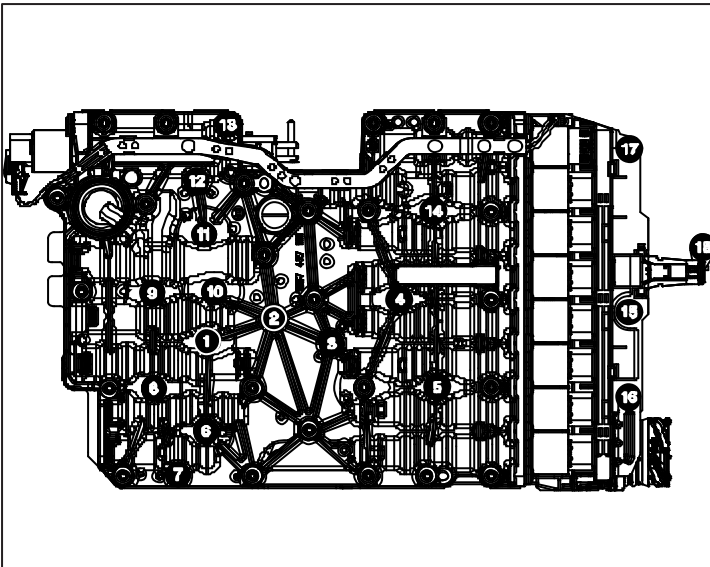




1.3 Specifications

1.3.1 Screw specifications

1.3.1.1 Mechatronic CU type E



Tighten screws of the type E mechatronic CU in the order of the numbering (see diagram):

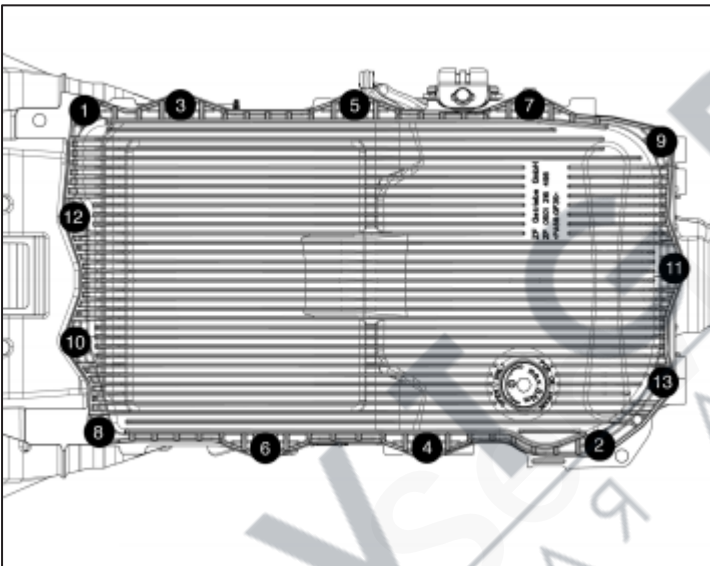
1 ⇔ 2 ⇔ 3 ⇔ ... ⇔ 18

Note:

Specification 1087 700 079

(Tightening torque: see Chapter 1.5)

1.3.1.2 Oil sump



Tighten screws of oil sump in the order of the numbering (see diagram):

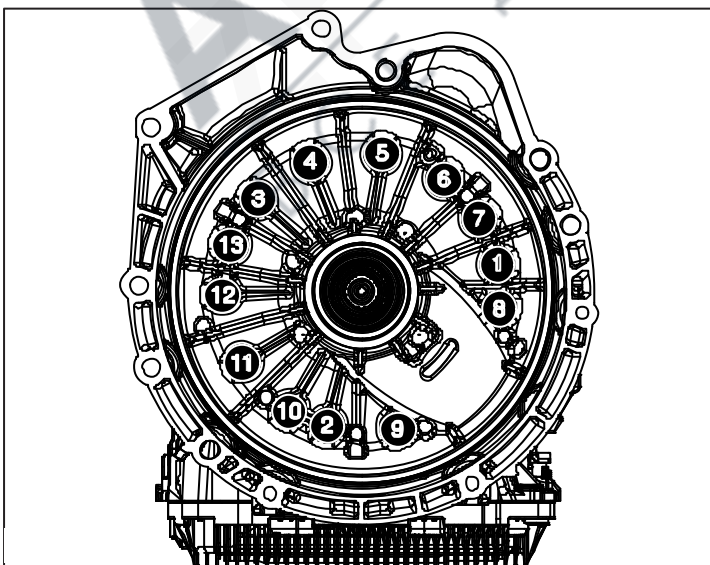
1 ⇔ 2 ⇔ 3 ⇔ ... ⇔ 13

Note:

Specification 1087 700 136

(Tightening torque: see Chapter 1.5)

1.3.1.3 Oil supply



Tighten the screws on the oil supply in the sequence indicated by the numbers:

1 ⇔ 2 ⇔ 3 ⇔ ... ⇔ 13

Note:

Specification 1087 700 163

(Tightening torque: see Chapter 1.5)

1.3.1.4 Intermediate plate

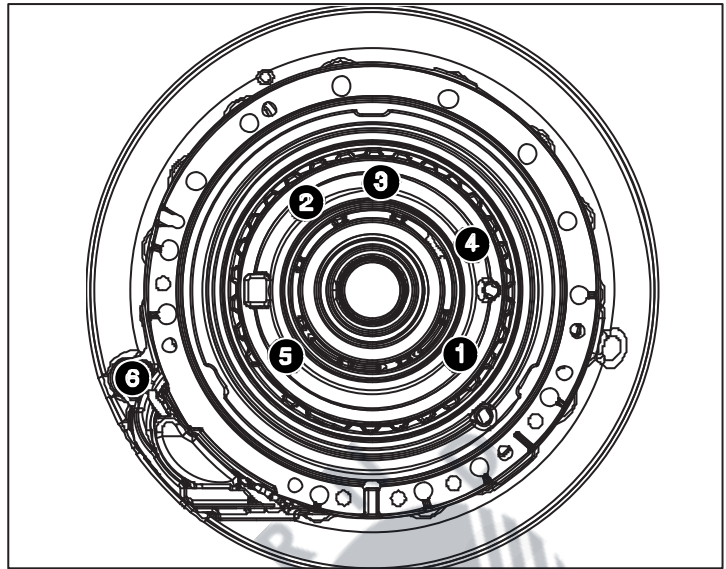
Tighten the screws on the oil supply in the sequence indicated by the numbers:

1 ⇔ 2 ⇔ 3 ⇔ ... ⇔ 6

Note:

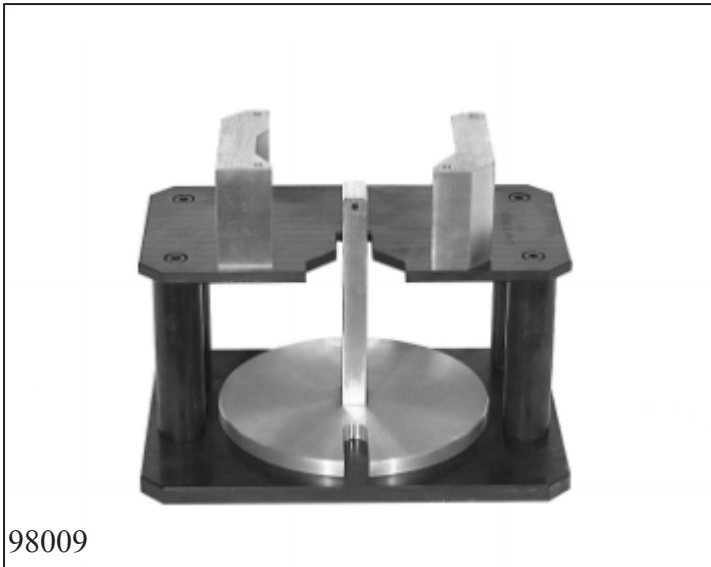
Specification 1090 700 133

(Tightening torque: see Chapter 1.5)



1.4 Adjusting procedure
1.4.0 Measuring clutch packs (procedure)

Place the 2 spacers 5p01 000 329 on the marked points of measuring fixture 5p01 000 330.



98009

Use the knurled screw to turn adjusting fixture 5p01 001 458 to the upper limit position. Attach strain gauge 5p01 000 329 in the adjusting fixture.

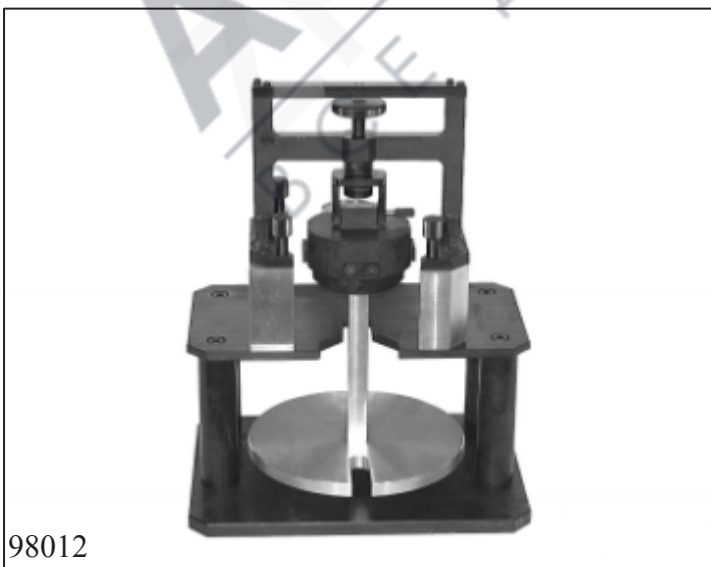


98011

Tighten the 4 knurled screws 5p01 000 329 to secure the adjusting fixture firmly with the height measuring fixtures by way of the spacers.

Connect measuring plate 5p01 040 330 to the strain gauge with the locating pin.

Clamp the disk cluster to be measured into the fixture, using the knurled screw (the corrugated steel disk, if present, must be at the bottom).

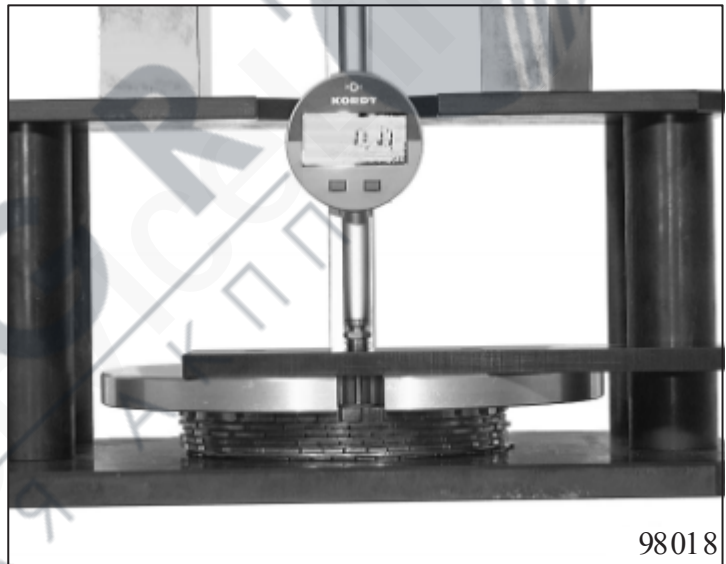


98012

Check the value shown on the strain gauge.



Next, place measuring bar 5p01 000 330 on the measuring plate, place the measuring foot of the dial gauge in the groove of the measuring plate on the upper disk of the disk cluster, and set the dial gauge to "0".



Measure down to the baseplate with the measuring bar.

Take the reading $\Rightarrow M_X$

Note:

The index **X** in M_X stands for the clutch brake cluster that has been inserted. (A, B, C, D, E).

1.4.1 Clearance adjustment clutch D (snap ring)

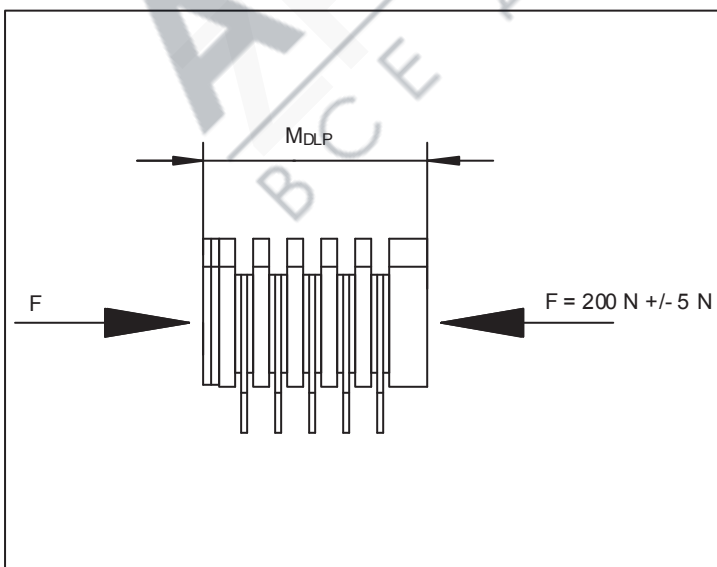
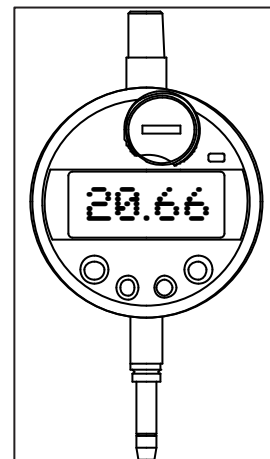
(Adjustment instructions 1090 700 028)

Multidisk package consists of:
a wave spring, then in alternation:
outer clutch disk > lined clutch disk and
finally an end disk.

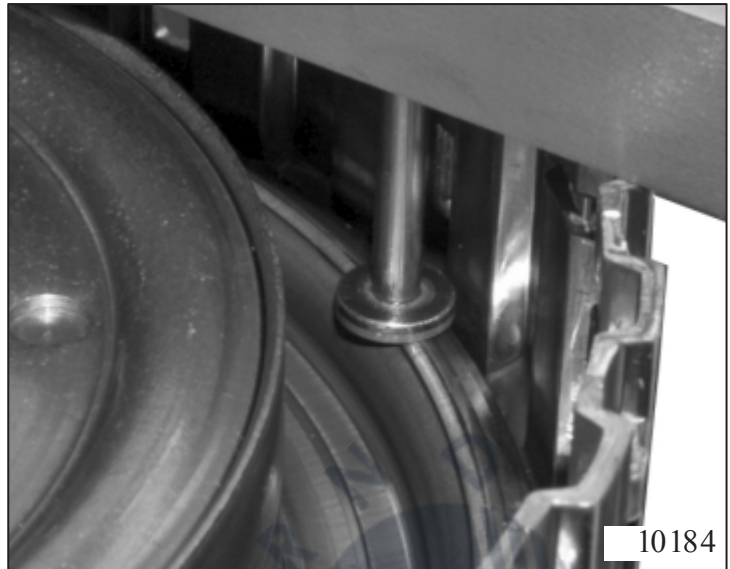


Insert multidisk package in measuring instrument, preload force = 200 N.
Fit metering bar with dial gauge on the pressure plate of the measuring instrument, fit measuring sensor on the base plate, and set dial gauge to "zero".
Measuring of clutch disk set

Read off measured value
 $\Rightarrow M_{DLP} = 20.66 \text{ mm}$



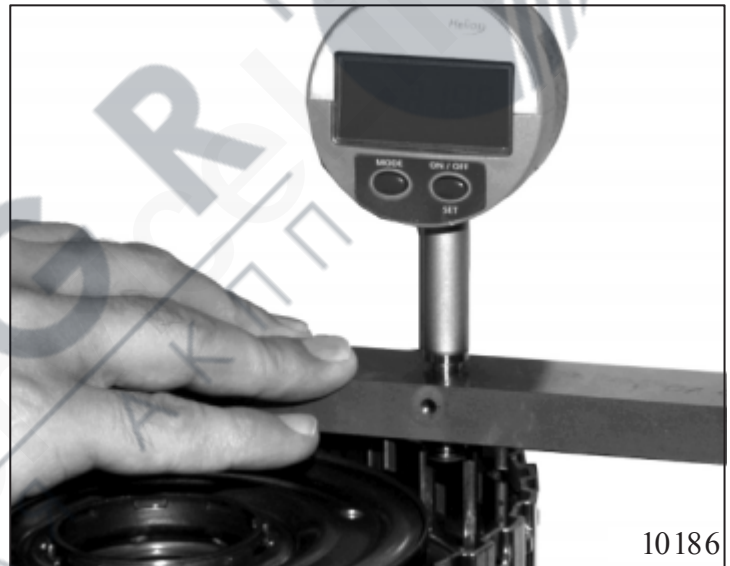
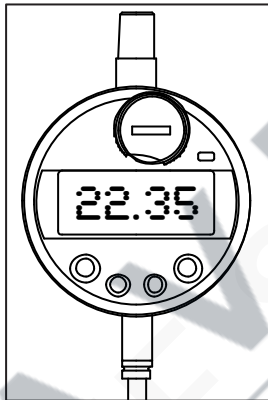
Fit metering bar with dial gauge on cylinder D, fit measuring sensor on piston D, set dial gauge on “zero” and determine measurement to upper edge of snap ring notch.



Repeat measurement at 3 points of its length.

$M_1 = 22.35 \text{ mm}$; $M_2 = 22.34 \text{ mm}$;
 $M_3 = 22.35 \text{ mm}$

Average value $\Leftrightarrow M_{DSR} = 22.35 \text{ mm}$



Gauge measuring sensor $M_{MT} = 1.85 \text{ mm}$

$$M_{DZYL} = M_{DSR} + M_{MT}$$

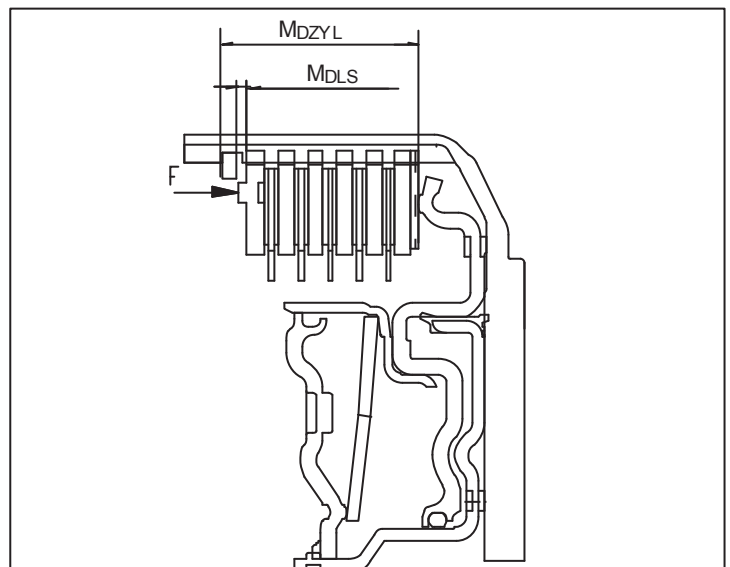
$$M_{DZYL} = 22.35 \text{ mm} + 1.85 \text{ mm}$$

$$M_{DZYL} = 24.20 \text{ mm}$$

$$M_D = M_{DZYL} - M_{DLP}$$

$$M_D = 24.20 \text{ mm} - 20.66 \text{ mm}$$

$$M_D = 3.54 \text{ mm}$$



$$\text{Clearance } M_{\text{DLS act}} = M_{\text{D}} - M_{\text{DSP}}$$

$$\text{Snap ring thickness } M_{\text{DSP}} = 1.80 \text{ mm}$$

$$\text{Clearance } M_{\text{DLS act}} = 3.54 \text{ mm} - 1.80 \text{ mm}$$

$$M_{\text{DLS act}} = 1.74 \text{ mm}$$

According to setting specification 1090
700 028 (mounting 4 lined clutch disks)

$$M_{\text{DLS dest}} = 1.14 \text{ to } 1.43 \text{ mm}$$

⇔ Snap ring thickness M_{DSP} with
1.80 mm = insufficient.

New snap ring thickness 2.20 mm

$$M_{\text{DLS act}} = 3.54 \text{ mm} - 2.20 \text{ mm}$$

$$M_{\text{DLS act}} = 1.34 \text{ mm}$$

⇔ snap ring thickness M_{DSP} at 2.20 mm
= O.K.

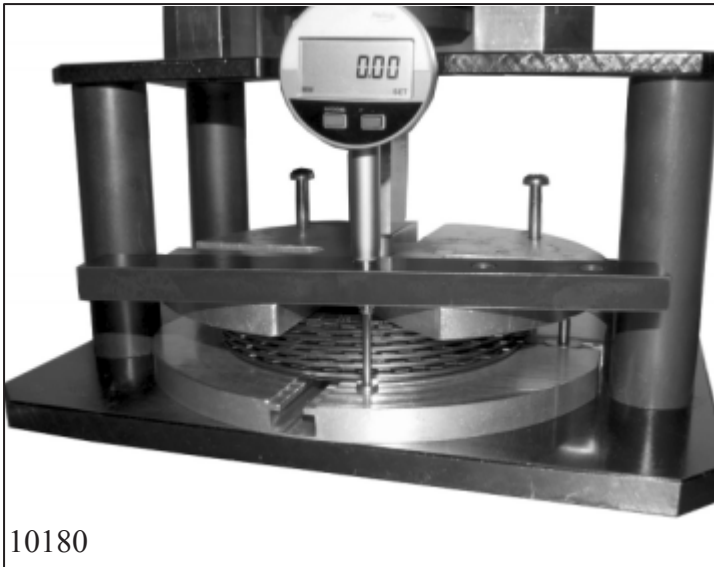


1.4.2 Clearance adjustment clutch C (End disk)

(Setting specification 1090 700 027)

Multidisk package consists of:
A wave spring, then in alternation:
outer clutch disk > lined clutch disk and
finally an end disk.

$$\Leftrightarrow M_{CEL}: 3.3 \text{ mm}$$



10180

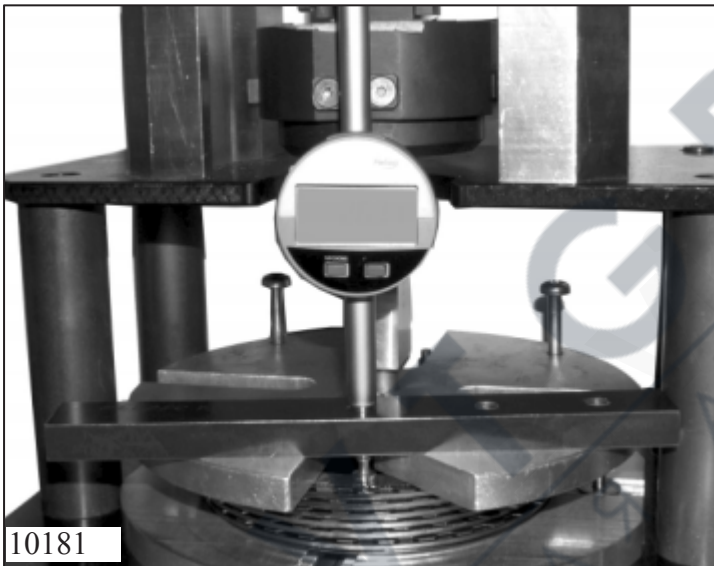
Insert multidisk (without end disk) package in measuring instrument, preload force = 200 N.

Fit metering bar with dial gauge on the pressure plate of the measuring instrument, place measuring sensor on the base plate, and set dial gauge to "zero".

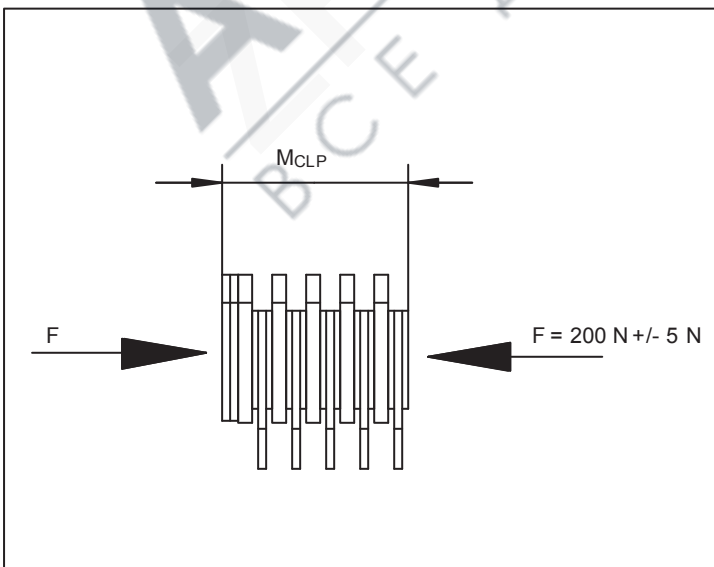
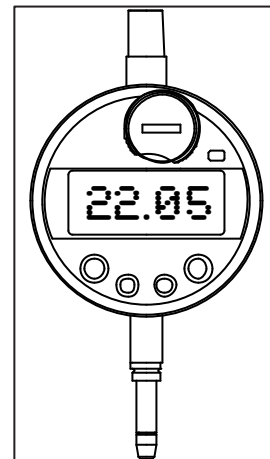
Measuring of multidisk package

Read off measured value

$$\Leftrightarrow M_{CLP} = 22.05 \text{ mm}$$

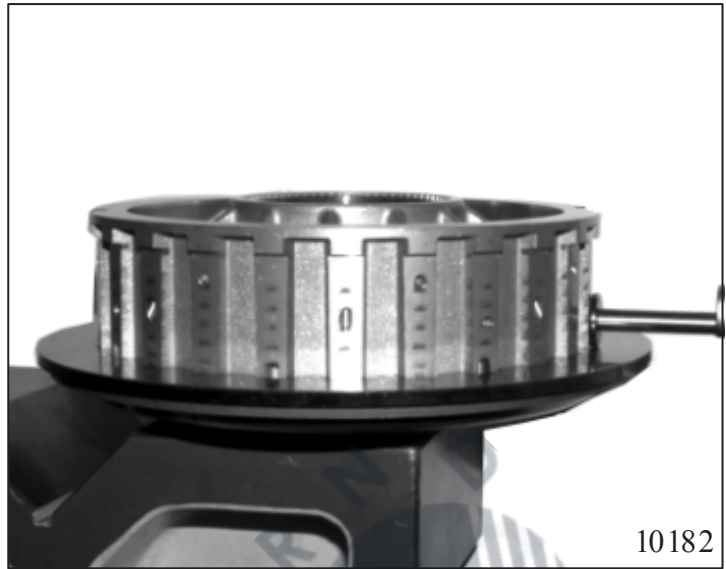


10181

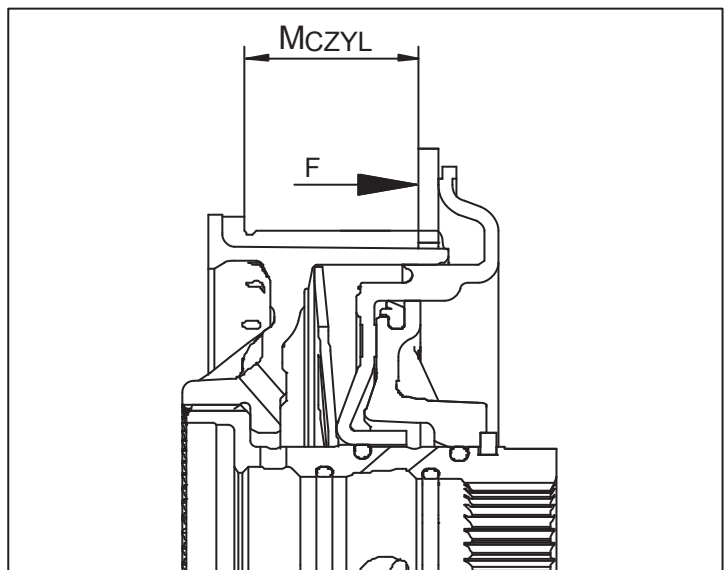
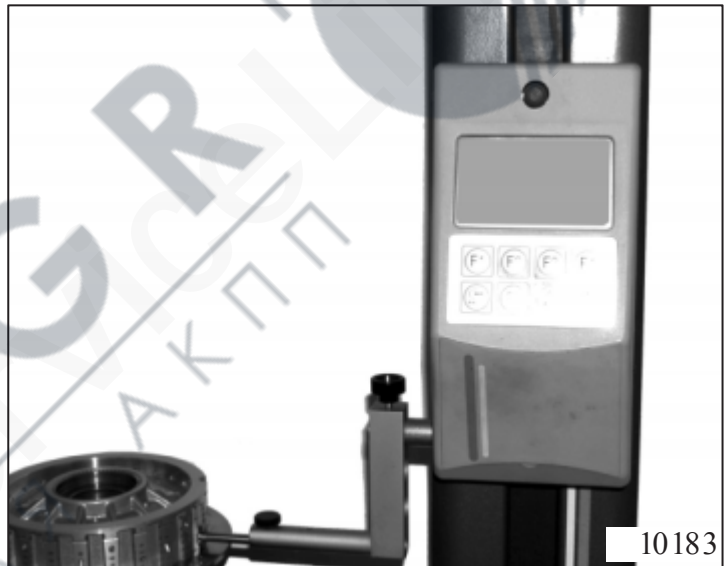
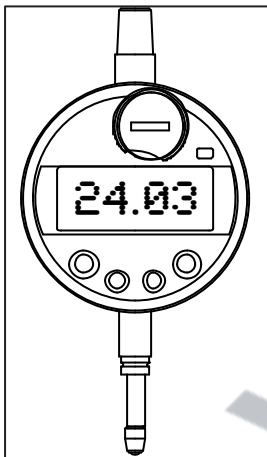


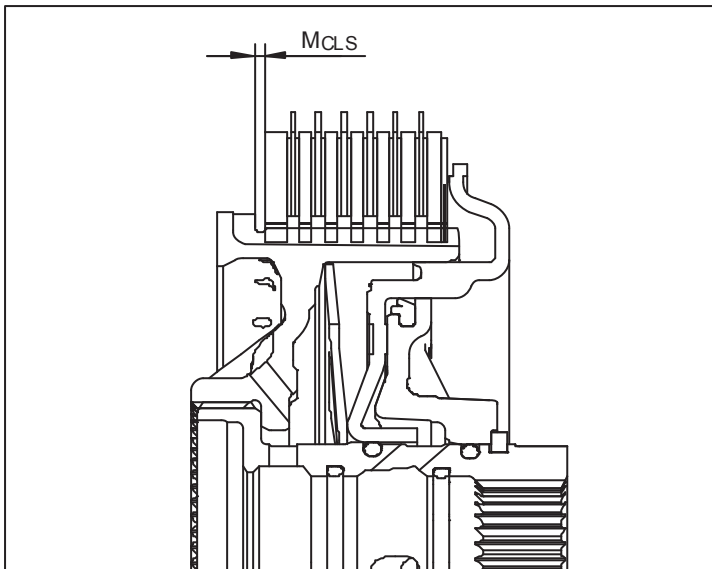
Assemble cylinder C and end disk and secure with old round wire ring.

Determine the measurement from the upper edge of the end disk to the support for the disk toothing with height measuring device.



Read off measured value ⇔
 $M_{CZYL} = 24.03 \text{ mm}$





$$\text{Clearance } M_{CLS \text{ act}} = M_{CZYL} - M_{CLP}$$

$$M_{CLS \text{ act}} = 24.03 \text{ mm} - 22.05 \text{ mm}$$

$$M_{CLS \text{ act}} = 1.98 \text{ mm}$$

According to setting specification 1090 700 027 (mounting 5 lined clutch disks)

$$M_{CLS \text{ dest}} = 1.35 \text{ to } 1.74 \text{ mm}$$

⇒ end disk M_{CEL} at 3.3 mm = insufficient.

New end disk with thickness 3.6 mm

Read off measured value

$$\Rightarrow M_{CLP} = 22.35 \text{ mm}$$

$$M_{CLS \text{ act}} = 24.03 \text{ mm} - 22.35 \text{ mm}$$

$$M_{CLS \text{ act}} = 1.68 \text{ mm}$$

⇒ end disk M_{CEL} at 3.6 mm = O.K.

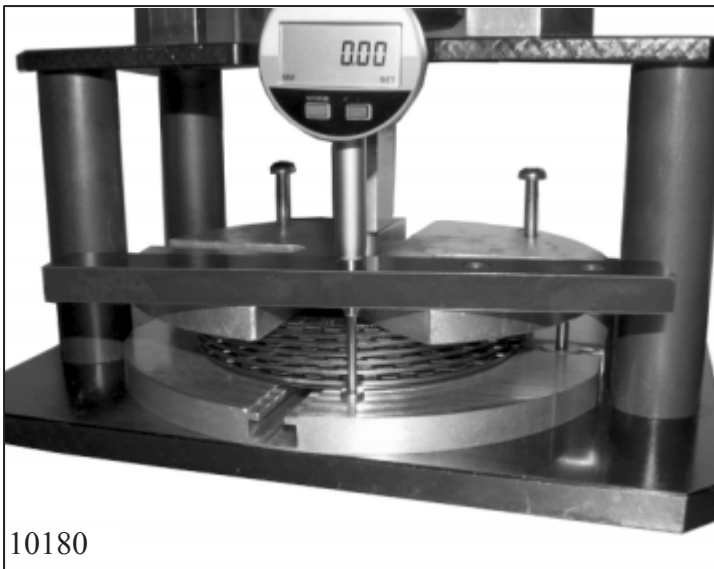


1.4.3 Clearance adjustment clutch E (end disk)

(Setting specification 1090 700 029)

Multidisk package consists of:
A wave spring, then in alternation:
outer clutch disk > lined clutch disk and
finally an end disk (3.6 mm).

⇨ M_{EEL} : 3.6 mm



10180

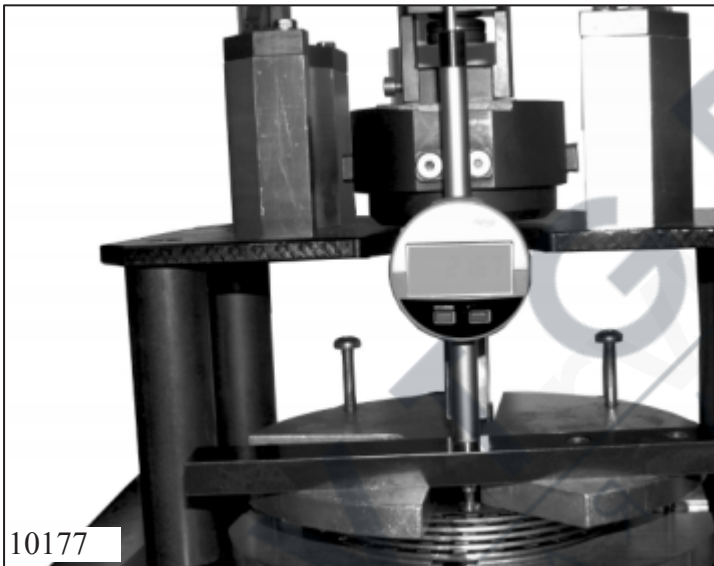
Insert multidisk package (without end disk) into measuring instrument, preload force = 200 N.

Fit metering bar with dial gauge on the pressure plate of the measuring instrument, fit measuring sensor on the base plate, and set dial gauge to "zero".

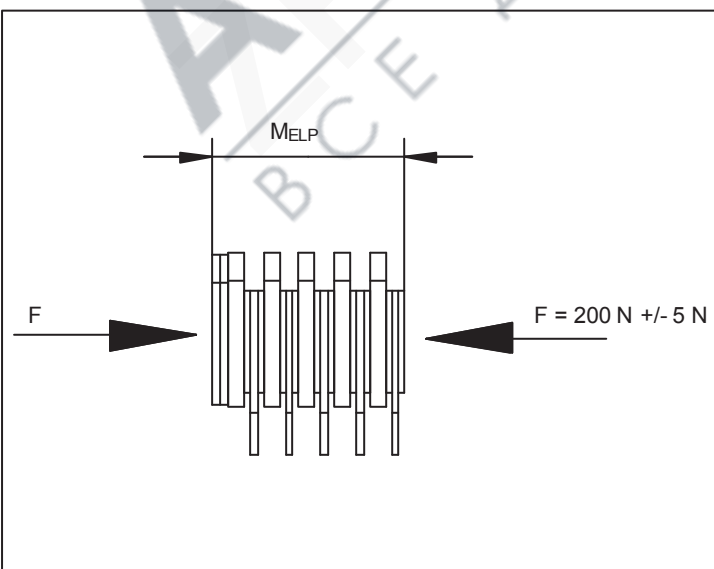
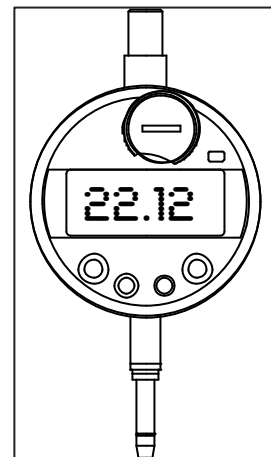
Measuring of multidisk package

Read off measured value

⇨ M_{ELP} = 22.12 mm

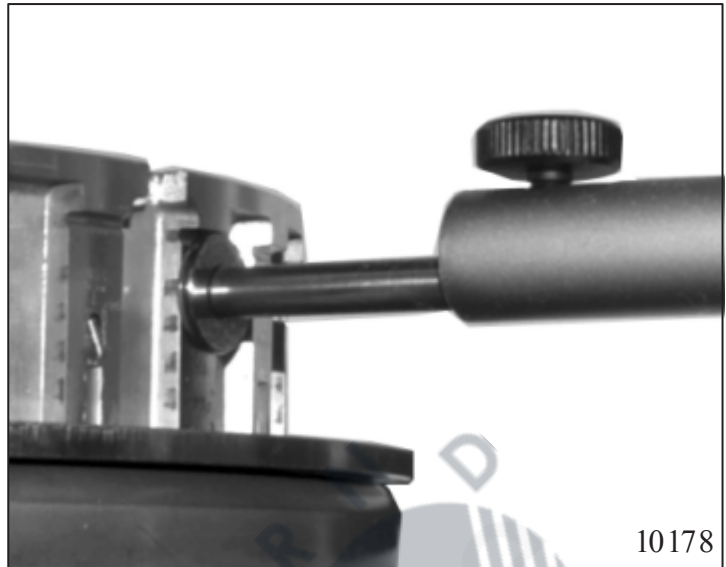


10177



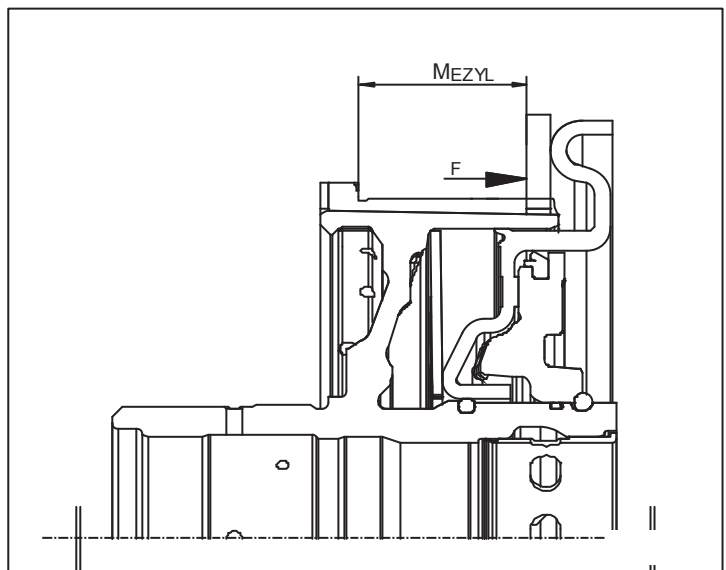
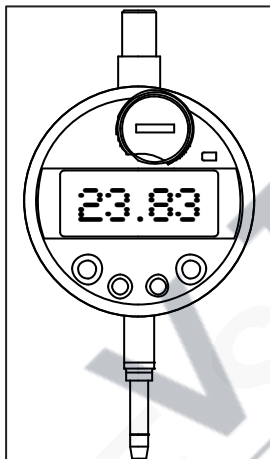
Assemble cylinder E with end disk and secure with old locking ring.

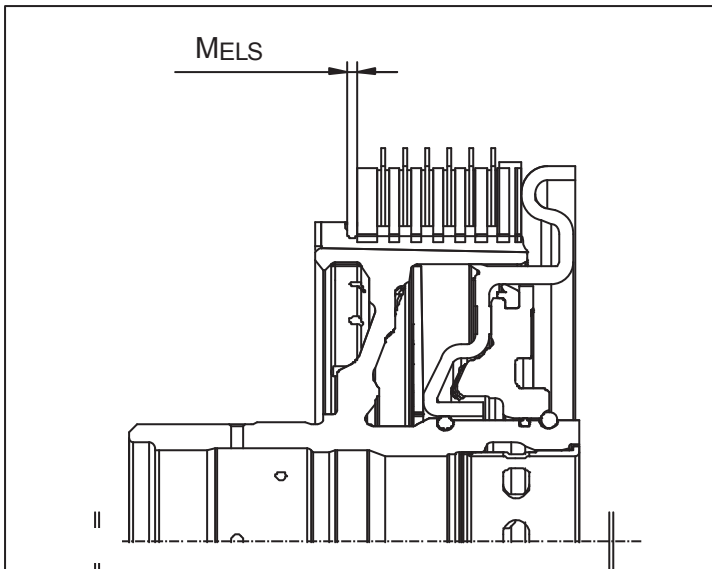
Determine the measurement from the upper edge of the end disk to the support for the disk toothing with the height measuring device.



Read off measured value

$$\Rightarrow M_{EZYL} = 23.83 \text{ mm}$$





$$\text{Clearance } M_{\text{ELS act}} = M_{\text{EZY}} - M_{\text{ELP}}$$

$$M_{\text{ELS act}} = 23.83 \text{ mm} - 22.12 \text{ mm}$$

$$M_{\text{ELS act}} = 1.71 \text{ mm}$$

According to setting specification 1090 700 029 (mounting 5 lined clutch disks)

$$M_{\text{ELS dest}} = 1.35 \text{ to } 1.74 \text{ mm}$$

⇒ end disk M_{EEL} at 3.6 mm = O.K.



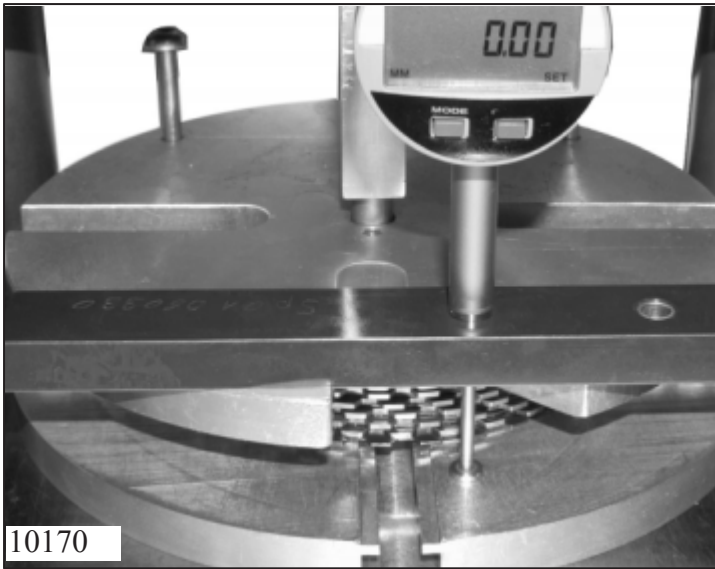


1.4.4 Clearance adjustment brake A (snap ring)

(Setting specification 1090 700 030)

Multidisk package consists of:

A wave spring, then in alternation: outer clutch disk > lined clutch disk and finally an end disk.



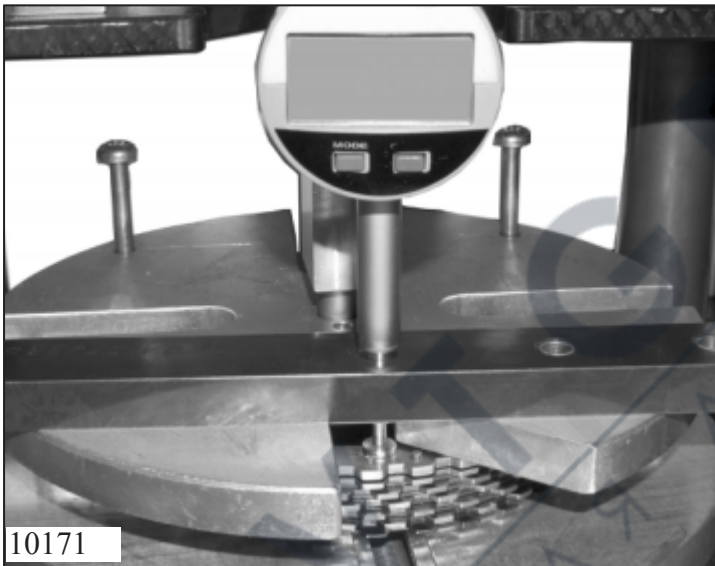
10170

Insert multidisk package in measuring instrument, preload force = 200 N.

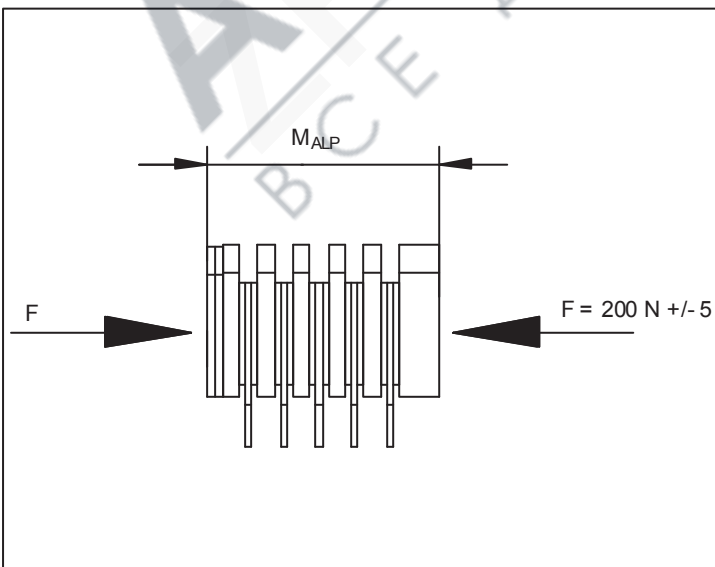
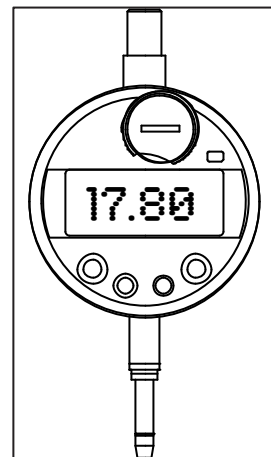
Fit metering bar with dial gauge on the pressure plate of the measuring instrument, fit the measuring sensor on the base plate, and set dial gauge to "zero". Measurement of multidisk package

Read off measured value

$$\Rightarrow M_{ALP} = 17.80 \text{ mm}$$



10171

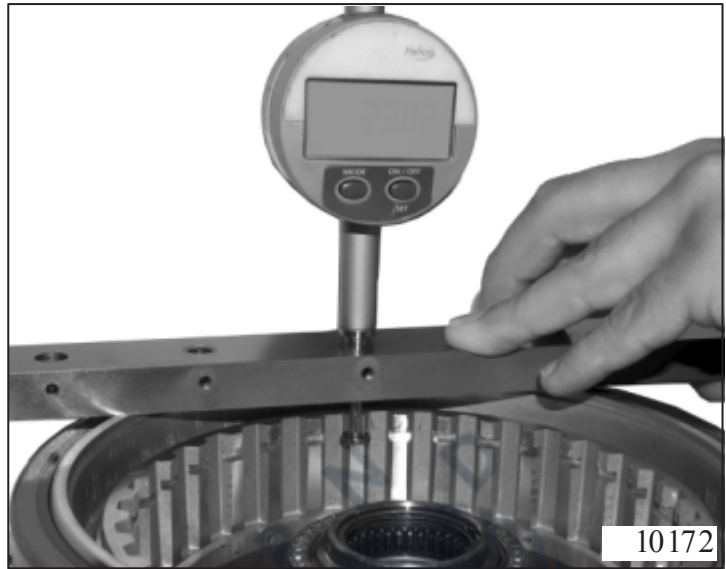
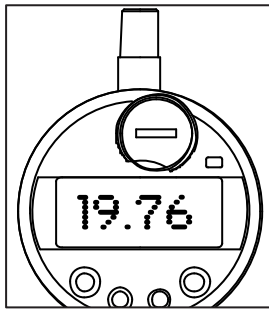


Fit metering bar with dial gauge on piston B, fit measuring sensor on piston A, set dial gauge at “zero” and determine the measurement to the upper edge of the snap ring notch.

Repeat measurement at 3 points of its length.

$M_1 = 19,76 \text{ mm}$; $M_2 = 19,76 \text{ mm}$;
 $M_3 = 19,77 \text{ mm}$

Average value $\Rightarrow M_{ASR} = 19.76 \text{ mm}$



Thickness measuring sensor $M_{MT} = 1.85 \text{ mm}$

$$M_{AZYL} = M_{ASR} + M_{MT}$$

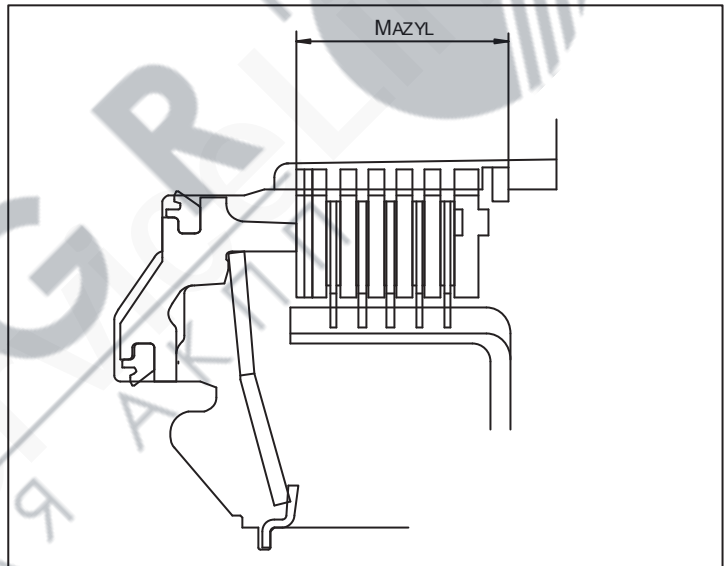
$$M_{AZYL} = 19.76 \text{ mm} + 1.85 \text{ mm}$$

$$M_{AZYL} = 21.61 \text{ mm}$$

$$M_A = M_{AZYL} - M_{ALP}$$

$$M_A = 21.61 \text{ mm} - 17.80 \text{ mm}$$

$$M_A = 3.81 \text{ mm}$$



$$\text{Clearance } M_{ALS \text{ act}} = M_A - M_{ASP}$$

$$\text{Thickness snap ring } M_{ASP} = 2.6 \text{ mm}$$

$$M_{ALS \text{ act}} = 3.81 \text{ mm} - 2.6 \text{ mm}$$

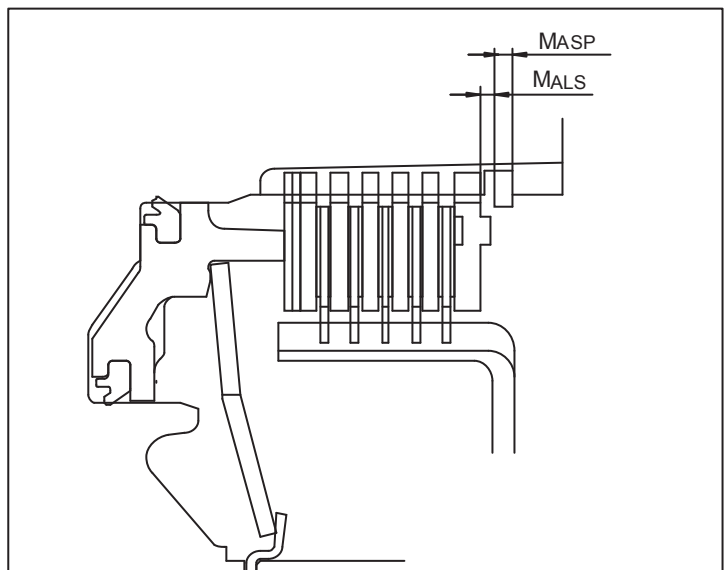
$$M_{ALS \text{ act}} = 1.21 \text{ mm}$$

According to setting specification 1090 700 030 (mounting 4 lined clutch disks)

$$M_{ALS \text{ dest}} = 1.13 \text{ to } 1.42 \text{ mm}$$

\Rightarrow snap ring thickness

M_{ASP} at 2.6 mm = O.K.



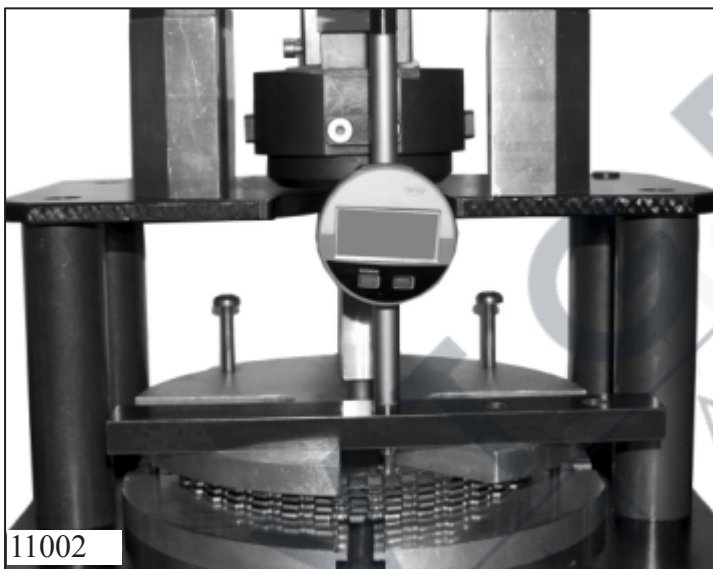
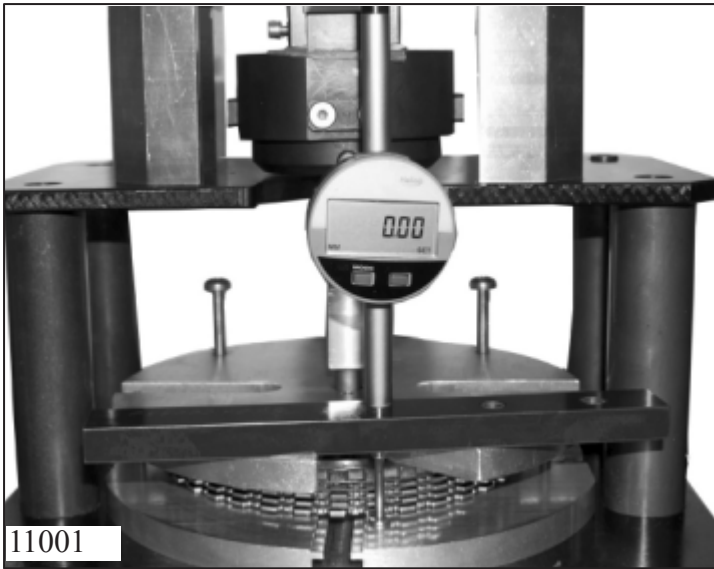
1.4.5 Clearance adjustment brake B (end disk)

(Setting specification 1090 700 039)

Multidisk package consists of:

A wave spring, then in alternation: outer clutch disk > lined clutch disk and finally an end disk (5.4 mm).

$$\Leftrightarrow M_{BEL}: 5.4 \text{ mm}$$



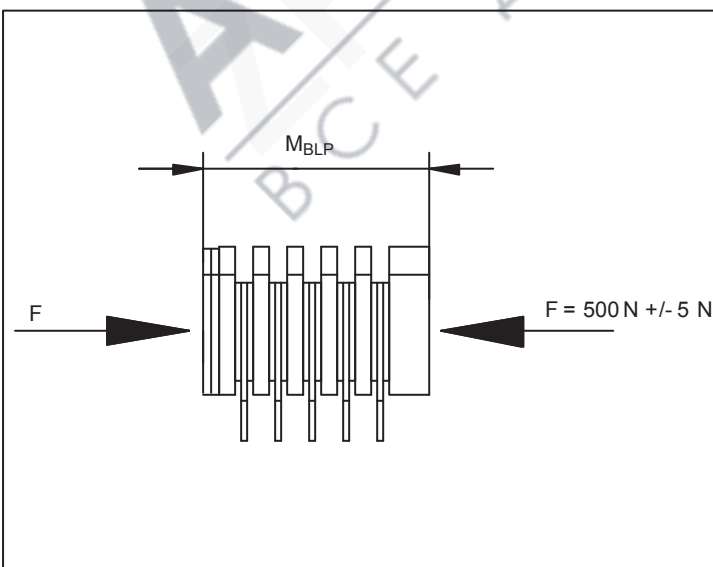
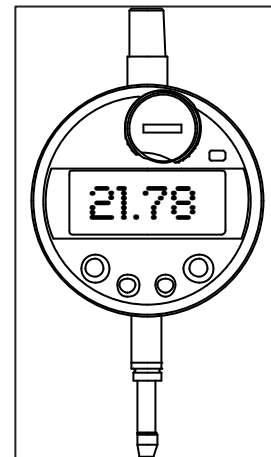
Insert multidisk package in measuring instrument, preload force = 500 N.

Fit metering bar with dial gauge on pressure plate of the measuring instrument, fit measuring sensor on the base plate, and set dial gauge to "zero".

Measuring of multidisk package

Read off measured value

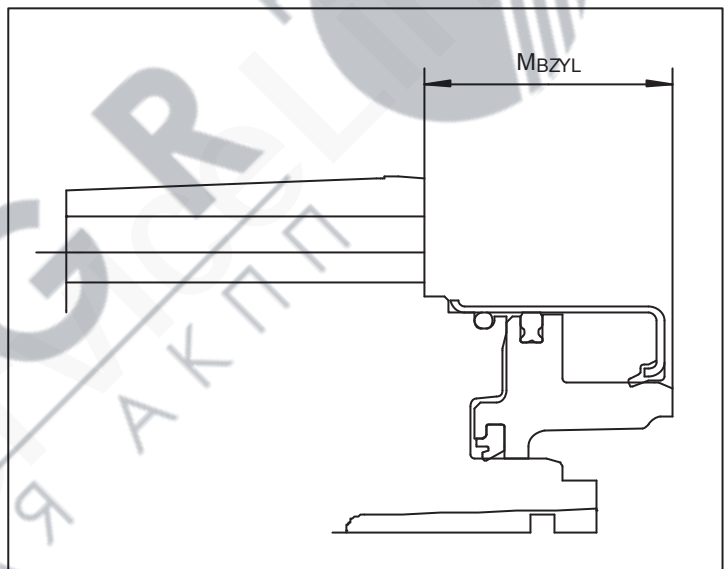
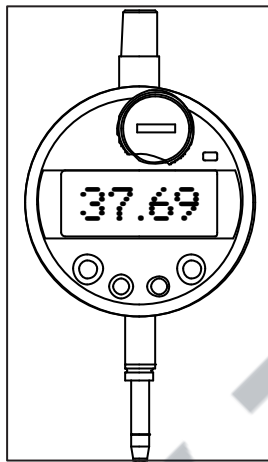
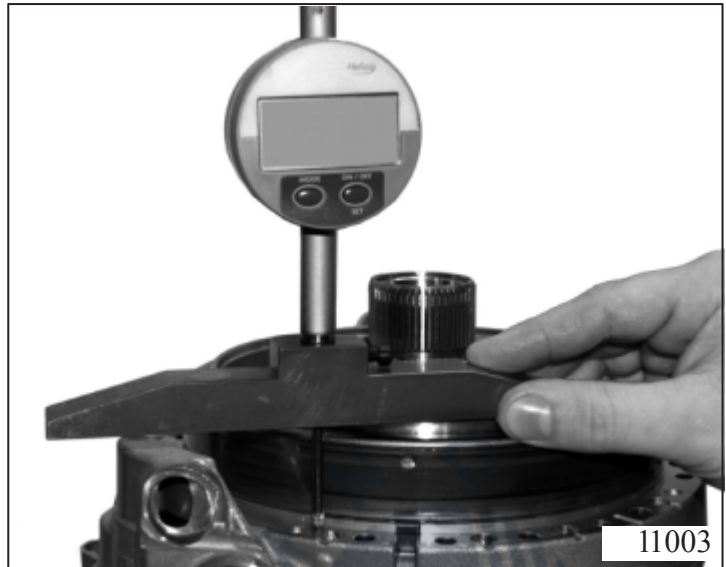
$$\Leftrightarrow M_{BLP} = 21.78 \text{ mm}$$



Place metering bar with dial gauge on flat surface and set dial at “zero”. Fit metering bar with dial gauge on piston B and determine the depth to flat surface of intermediate plate.

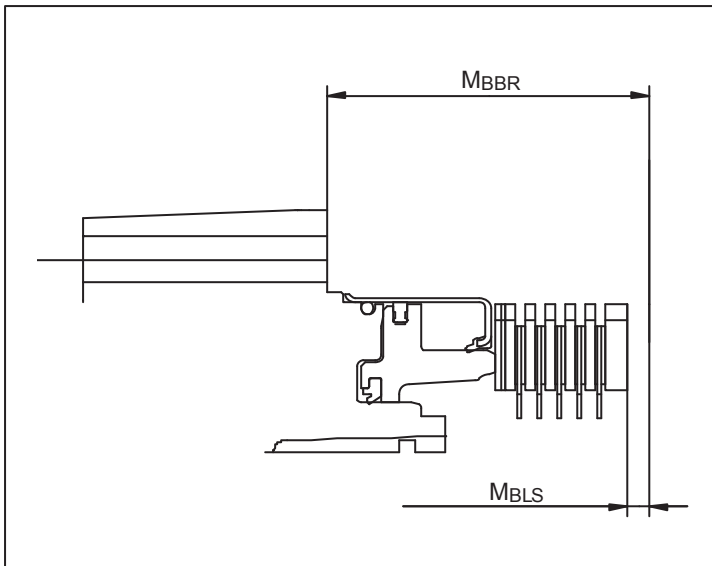
Read off measured value
 $\Rightarrow M_{BZYL} = 37.69 \text{ mm}$

Note:
Piston "B" must be free of oil and rest stably.



Fixed dimension from setting specification, installation space for transmission housing $61.0 + 0.1 \text{ mm}$.

Average value = $\Rightarrow M_{BBR} = 61.05 \text{ mm}$



$$\text{Clearance } M_{\text{BLS act}} = M_{\text{BBR}} - M_{\text{BZYL}} - M_{\text{BLP}}$$

$$M_{\text{BLS act}} = 61.05 \text{ mm} - 37.69 \text{ mm} - 21.78 \text{ mm}$$

$$M_{\text{BLS act}} = 1.58 \text{ mm}$$

According to setting specification
1090 700 039
(4 Lined - and outer clutch disks)

$$M_{\text{BLS dest}} = 1.26 - 1.67 \text{ mm}$$

End disk M_{BEL} at 5.4 mm \Rightarrow O.K.

AVTIGRIP
ВСЕ ДЛЯ АКПП



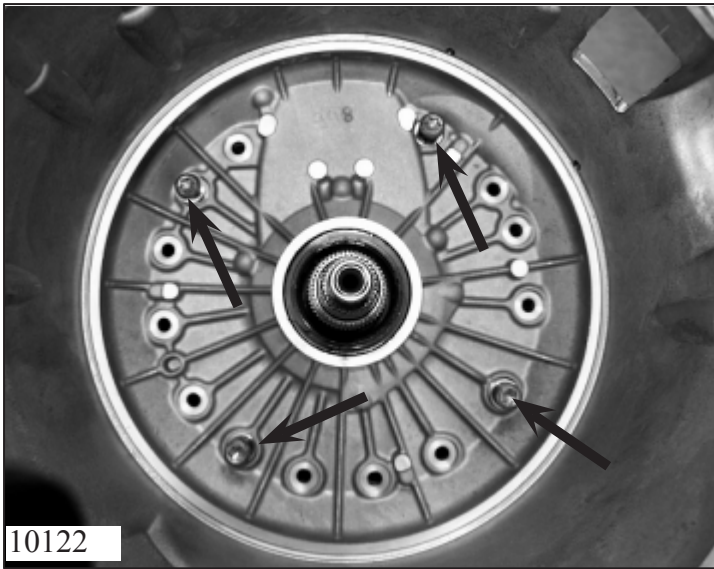
1.4.6 Transmission clearance

(Setting regulation ASZ 0001)

Tighten the oil supply with 4 screws crosswise with a torque of 5.0 Nm.

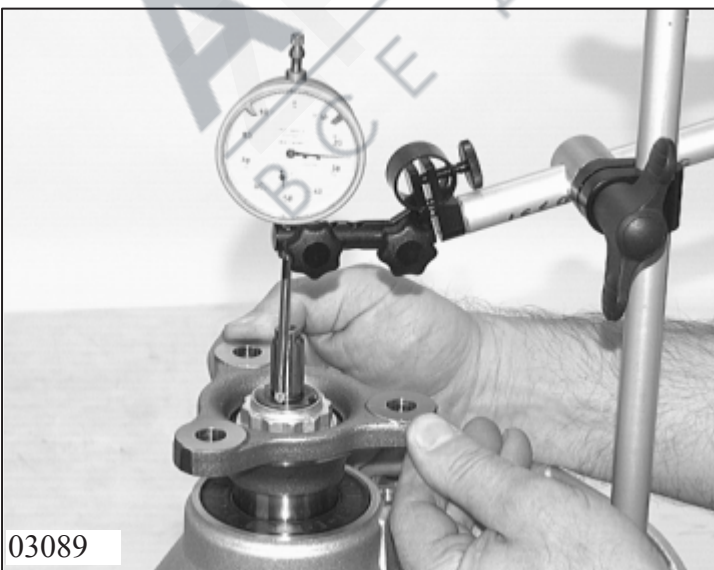
Turn the transmission so that the torque converter side is at the bottom.

Insert output flange and secure form-fit with new collar nut.



Screw measuring support 5p01 000 347 into appropriate bore in transmission casing and place dial gauge on output shaft. Press against flange and set dial gauge to "0".

Pull on output shaft with flange and read off value GS.



Transmission clearance

$GS_{dest} = 0.11 - 0.32 \text{ mm}$

$GS_{act} = 0.26 \text{ mm} = \text{O.K.}$

Unscrew collar nut and take out output flange.

Turn the transmission so that the converter side is at the top.

Unscrew 4 screws in the oil supply.

Note:

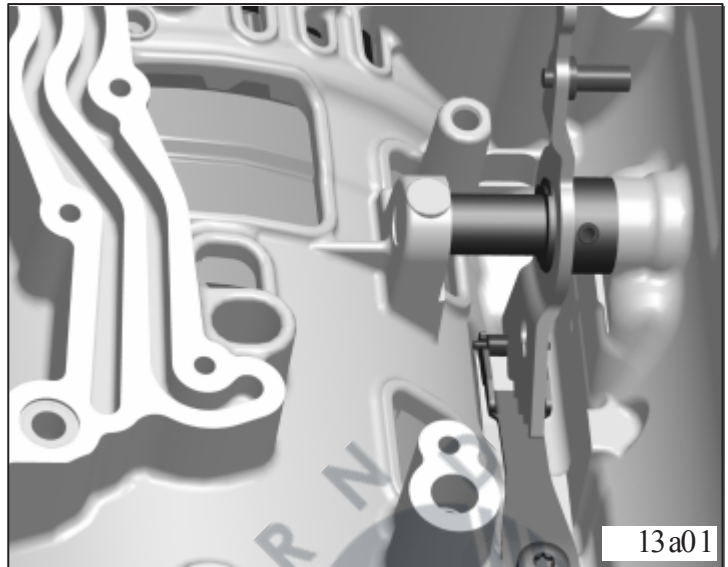
The oil supply must be removed to replace the shim.

Then repeat the measuring process.

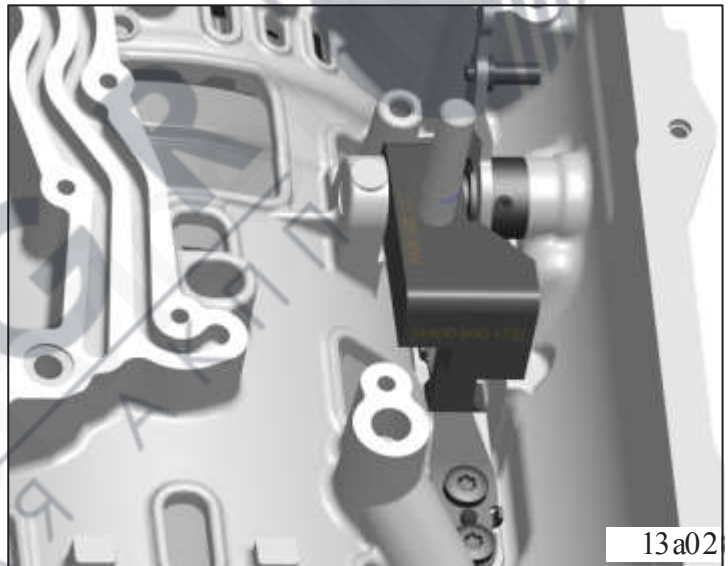
(M-type only)

1.4.7 Switch setting (detent spring)

Set locking disk with appropriate tool or manually to N position (neutral).

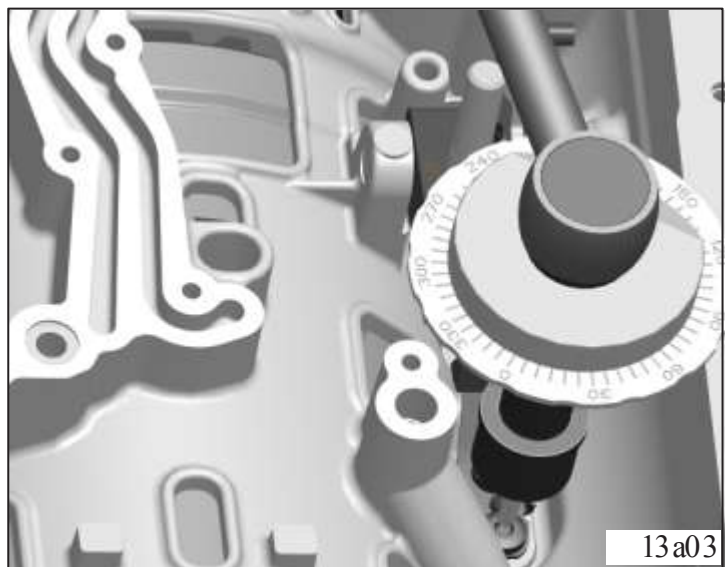


Align detent spring with centering device AA00 600 175 and tighten detent spring in this position.
Tighten output side screw first.



(Tightening torque: see Chapter 1.5)

Tighten farther by the specified angle with special tool 5w04 000 583.
Remove centering device.
Shift the selector shaft through all positions and remove it again.



(Tightening torque: see Chapter 1.5)

1.5 Tightening torques

No.	Designation	SDM- Item-No.	Wrench size No.	Page	Tightening torque [Nm]
1	Cylindrical screw (Intermediate plate / Centering plate)	10.110	TORX - TX 40	3.2/10	4,0 ± 0,5 Nm + (+90° ± 5°)
2	Screw plug (Gearbox housing)	01.100	Internal hexagon SW = 5 mm	3.4/1	12 Nm (±1,2Nm)
3	Cylindrical screw (Detent spring M-Typ)	06.090	TORX - TX 27 H	3.4/2	4 Nm ± 3% + (+ 27° ± 2%)
4	Screw plug (Parking lock bolt)	24.020	Internal hexagon SW = 8 mm	3.4/3	35 Nm (±3,5 Nm)
5	Cylindrical screw (Guiding plate)	24.120	TORX - TX 27	3.4/4	10 Nm (±1,0 Nm)
6	Cylindrical screw (Emergency release E-Typ)	06.170	TORX - TX 27	3.4/4	8,0 Nm (±0,8 Nm)
7	Cylindrical screw (Oil supply / Gearbox housing)	10.230	TORX - TX 50	1.3/1 3.5/3	10 ± 1,0 Nm + (+90° ± 5°)
8	Cylindrical screw (screw connection sealing device)		TORX - TX 40	3.5/3	8,0 Nm (±1,0 Nm)
9	Cylindrical screw (Mechatronic CU) (Oil volume accu)	28.450 28.570	TORX - TX 40	1.3/1 3.6/2 3.6/3	8 Nm (±0,8 Nm)
10	Cylindrical screw (Oil pan)	03.030	TORX - TX 40	1.3/1 3.6/3	10 Nm (±1,0 Nm)
11	Screw plug M18x1,0 (Oil pan)	03.010/030	Internal hexagon SW = 10 mm		8 Nm (-1,0 Nm)
12	Cylindrical screw (Lever)	06.210	TORX - TX 25	3.7/1	6,5 Nm (±0,65 Nm)
13	Collar nut (Output flange)	14.160	socket wrench 5X46 002 456	3.7/2	60 Nm (±6,0 Nm)
14	Hexagon screw M10x55 (Coverter bracket) M10x16	97.020 97.030	SW = 17 mm	3.8/2	15 Nm (±1,5 Nm)
15	Screw plug M18x1,5 (Oil fill plug)	01.120	Internal hexagon SW = 8 mm	3.8/2	35 Nm (±3,5 Nm)



1.6 Transmission test

The following points must be checked:

Correct oil level

Proper oil level; observe the vehicle manufacturer's specifications, as well as the list of lubricants TE-ML 11 (ServiceLine) and SDM.

Oil level too low

This can result in:

- Engine over-revving or no power flow in curves or when starting from a stop
- Valve chatter due to air pockets in the oil
- General malfunctions

Among other things, burned clutches can be the result.

Oil level too high

Danger of loss due to splashing, formation of foam, strong increases in temperature at high road speeds. Loss of oil via breather; among other things, burned clutches and shifting problems can result.

Proper engine settings

Correct idle speed; follow specifications from vehicle manufacturer.

Power flow, forward and reverse


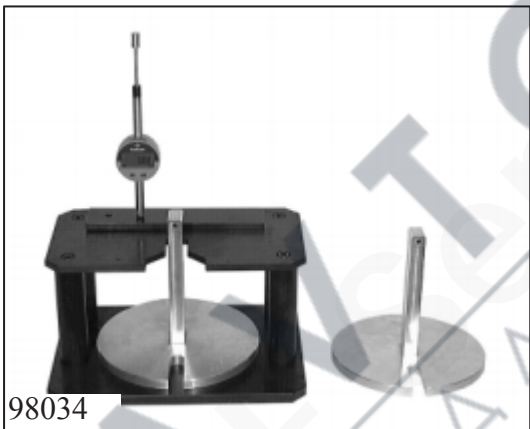

Correct adjustment of selector linkage or control cable; observe the vehicle manufacturer's specifications.

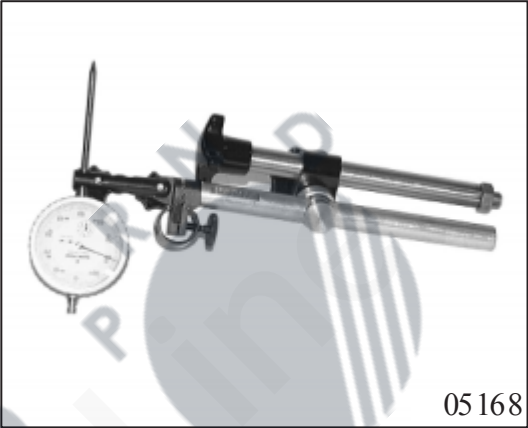
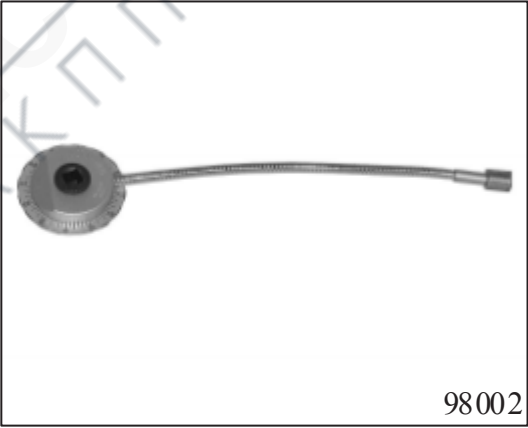

Cooler-bypass or cooler connection on the test bench



Do not overheat transmission, maximum 120° C.






1.7 Special tools

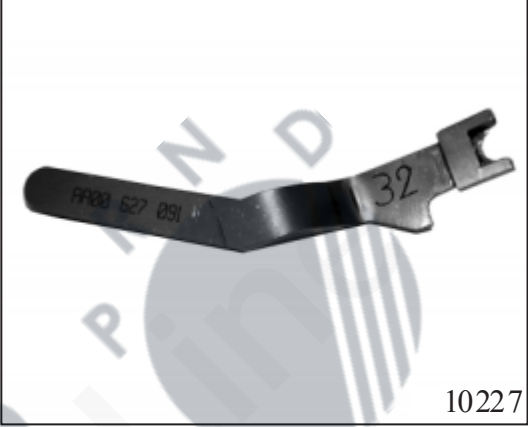
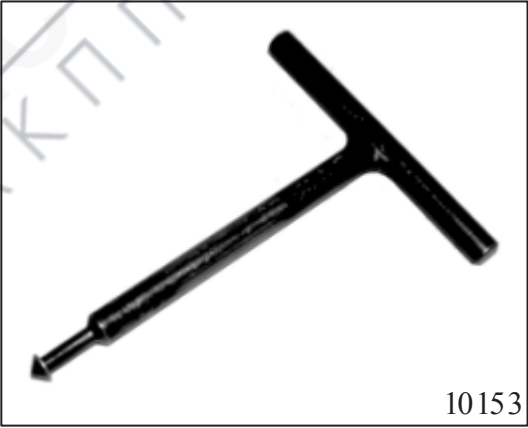
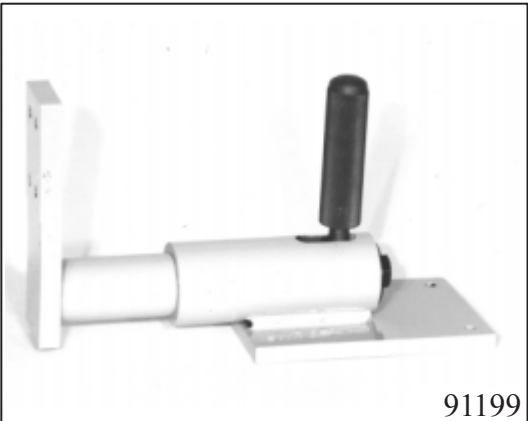
OBJECT	Order-No. / Application Measuring tools	Remarks
<p style="text-align: center;">E 1</p>  <p>98008</p>	<p>5p01 000 329 Force gauge</p>	<p>identical</p> <p>4 HP 20 ---- 8 HP xx</p>
<p style="text-align: center;">E 2</p>  <p>98034</p>	<p>5p01 000 330 Clutch play measuring device</p> <p>(Measuring plate: - short neck > 20 mm - long neck < 20 mm clutch disk thickness)</p>	<p>identical</p> <p>4 HP 20 ---- 8 HP xx</p>
<p style="text-align: center;">E 3</p>  <p>97301</p>	<p>5p01 001 458 Pretension adjusting device</p>	<p>identical</p> <p>4 HP 18 Q ---- 8 HP xx</p>

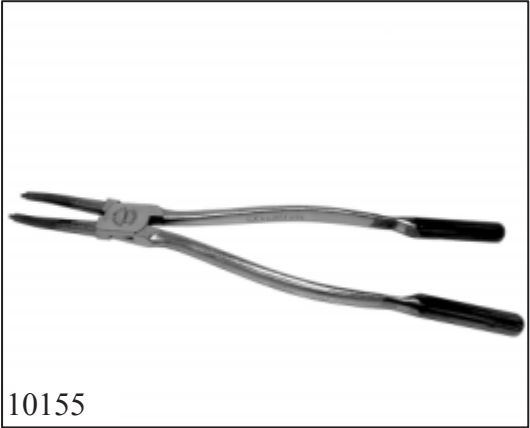
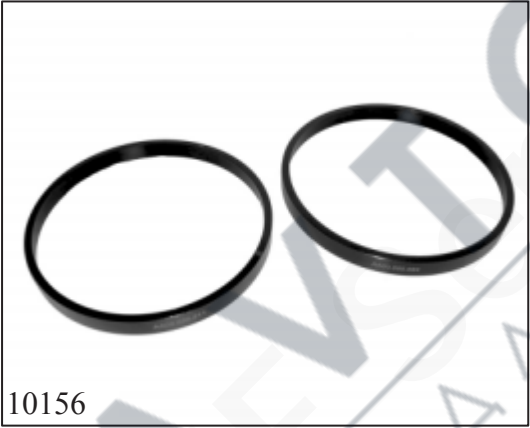

Remarks	Order-No. / Application Measuring tools	OBJECT
identical 4 HP 14 --- 8 HP xx	5P01 000 347 Measuring support Transmission clearance setting	E 4  05168
identical 6 HP 19/A/X ---- 8 HP xx	<i>(M-type only)</i> 5w04 000 583 Torsional measuring device, detent spring assembly	E 5  98002
identical 8 HP xx	<i>(M-type only)</i> AA00 600 175 Centering device, detent spring	E 6  02026




OBJECT	Order-No. / Application Measuring tools	Remarks
<p data-bbox="411 409 456 443">E 7</p>  <p data-bbox="188 862 268 891">10225</p>	<p data-bbox="767 427 1190 533">AA00 628 624 Spacer piece (BMW new emergency release)</p>	<p data-bbox="1262 427 1374 456">identical</p> <p data-bbox="1270 501 1374 530">8 HP xx</p>
<p data-bbox="411 972 456 1005">E 8</p>  <p data-bbox="188 1424 268 1453">13002</p>	<p data-bbox="767 987 1091 1093">AA00 373 240 Sealing device (Coupling-leakage tests)</p>	<p data-bbox="1262 987 1374 1016">identical</p> <p data-bbox="1270 1061 1374 1090">8 HP xx</p>


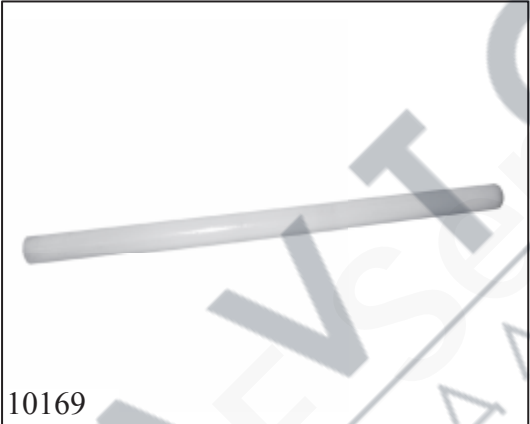
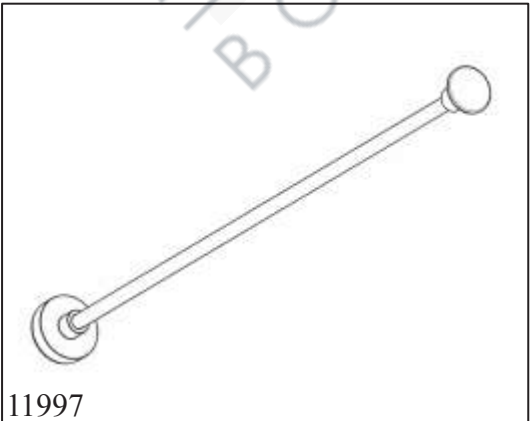


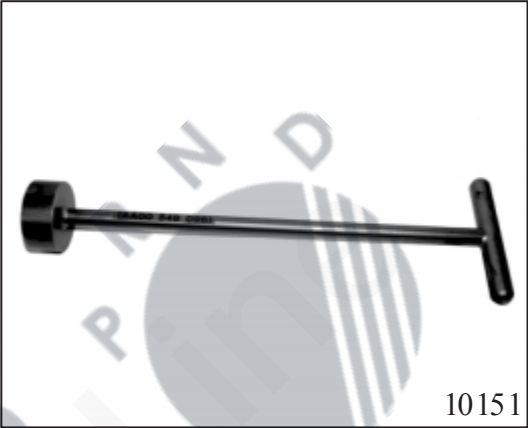
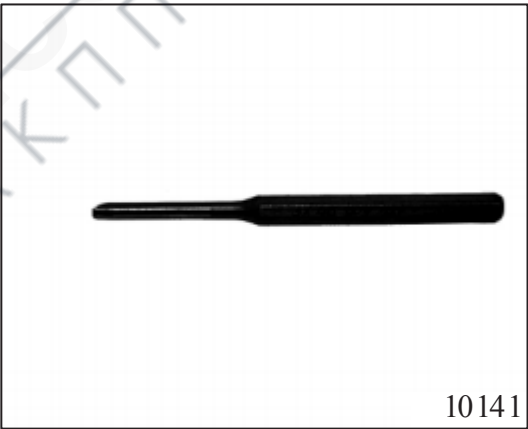

OBJECT	Order-No. / Application Disassembly tools	Remarks
<p style="text-align: center;">D 1</p>  <p>10150</p>	<p>5t66 000 286 Transmission retaining bracket</p>	<p>identical</p> <p>8 HP 45 X 8 HP 70 (X) 8 HP 90</p>
<p style="text-align: center;">D 2</p>  <p>10139</p>	<p>5x46 004 264 Supporting fixture Tower</p>	<p>identical</p> <p>8 HP xx</p>
<p style="text-align: center;">D 3</p>  <p>10147</p>	<p>AA00 577 956 Fixing bracket Selector shaft</p>	<p>identical</p> <p>8 HP xx</p>

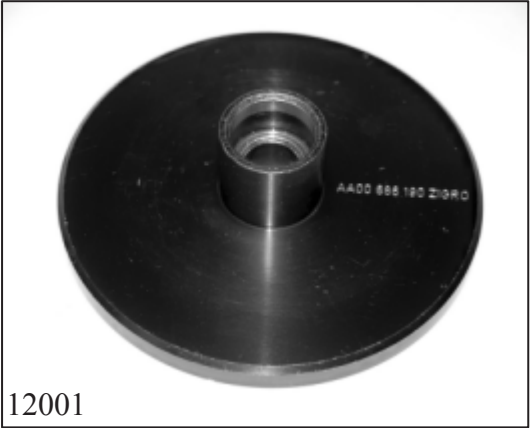
Remarks	Order-No. / Application Disassembly tools	OBJECT
identical 8 HP xx	AA00 627 091 Fixing bracket Selector shaft	D 4  10227
identical 4 HP 20 ---- 8 HP xx	5x46 001 210 Disassembly tool Sealing sleeve	D 5  10153
identical 4 HP 20 ---- 8 HP xx	5x46 000 763 Workbench holder	D 6  91199

OBJECT	Order-No. / Application Disassembly tools	Remarks
<p style="text-align: center;">D 7</p>  <p>10155</p>	<p>5x46 001 376 Pliers Snap ring</p>	<p>identical 4 HP 20 ---- 8 HP xx</p>
<p style="text-align: center;">D 8</p>  <p>10156</p>	<p>AA00 558 209 AA00 558 210 Supporting rings Pot 1 and pot 2</p>	<p>identical 8 HP 45 X</p>
<p style="text-align: center;">D 9</p>  <p>10164</p>	<p>AA00 549 802 Lifter Oil supply</p>	<p>identical 8 HP xx</p>

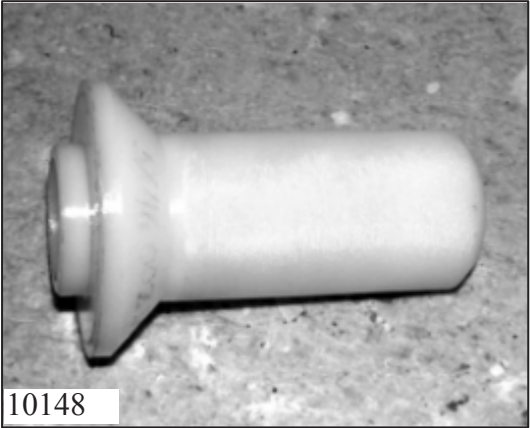
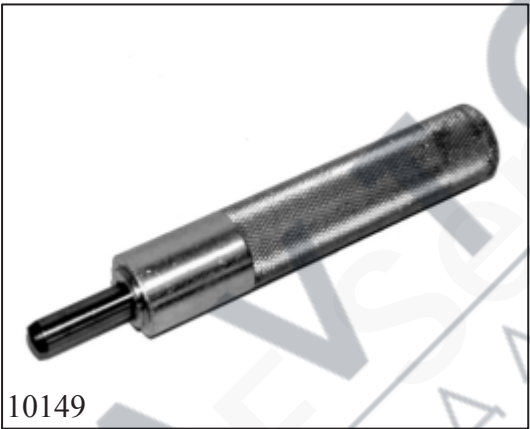

Remarks	Order-No. / Application Disassembly tools	OBJECT
identical 8 HP xx	5x46 003 957 Lifter Tower 5w46 000 003 Adapter	D 10  10165
identical 8 HP 45 X	AA00 349 472 Downhold device	D 11  10166
identical 6 HP 19/A/X ---- 8 HP xx	5x46 001 502 Downhold device	D 12  10168


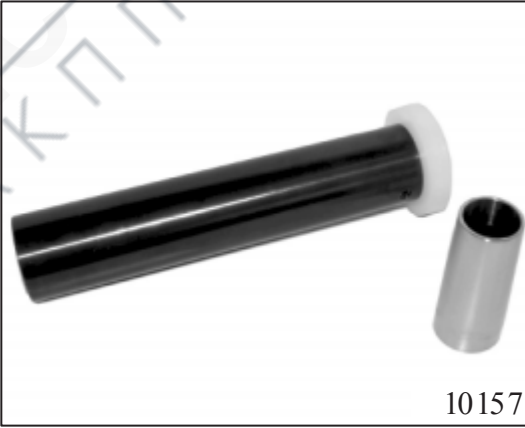
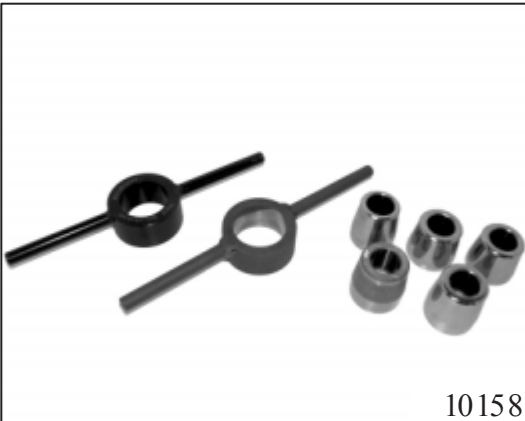
OBJECT	Order-No. / Application Disassembly tools	Remarks
<p style="text-align: center;">D 13</p>  <p>10167</p>	<p>5x46 909 248 Downhold device</p>	<p>identical 5 HP 18/19 ---- 8 HP xx</p>
<p style="text-align: center;">D 14</p>  <p>10169</p>	<p>5x46 004 605 Drive-out tool Ball bearing output</p>	<p>identical 6 HP 19/A/X ---- 8 HP xx</p>
<p style="text-align: center;">D 15</p>  <p>11997</p>	<p>AA00 666 390 Drive-out tool Needle-, sealing-sleeve output</p>	<p>identical 8 HP xx</p>

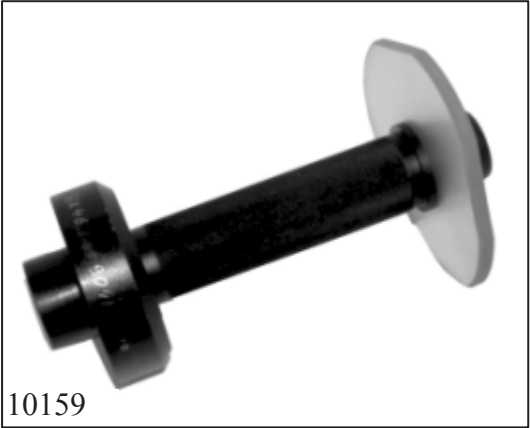
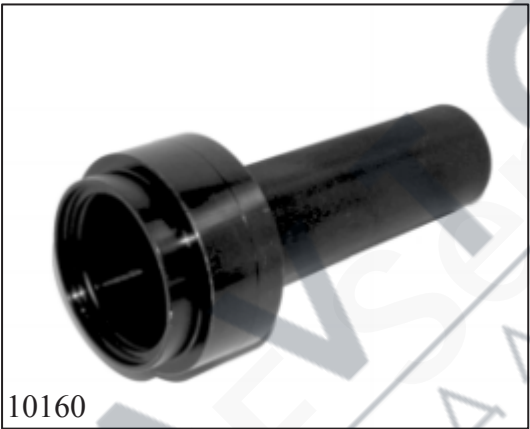
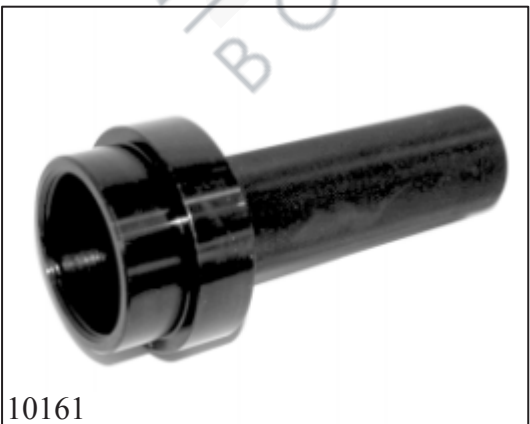
Remarks	Order-No. / Application Disassembly tools	OBJECT
identical 6 HP 19/A/X ---- 8 HP xx	AA00 548 098 Extracting tool Guide sleeve	D 16  10151
identical 6 HP 19/A/X ---- 8 HP xx	5x46 004 158 Peening-out tool Collar nut	D 18  10141
identical 6 HP 19/A/X ---- 8 HP xx	5x46 002 456 Nut wrench Collar nut	D 19  10142

OBJECT	Order-No. / Application	Remarks
<p data-bbox="411 409 480 443">D 20</p>  <p data-bbox="188 862 268 896">12001</p>	<p data-bbox="767 427 999 539">AA00 686 190 Mounting fixture Input shaft</p>	<p data-bbox="1262 427 1377 499">identical 8 HP xx</p>

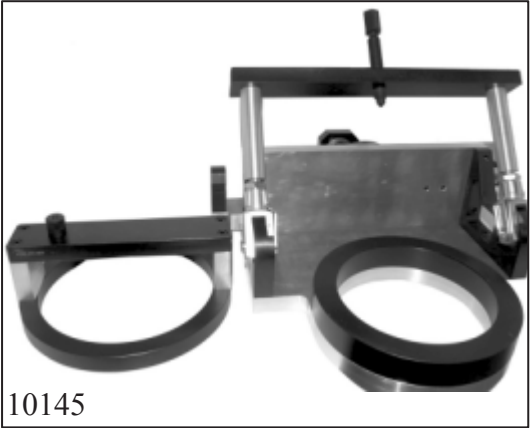




OBJECT	Order-No. / Application Asseby tools	Remarks
<p>M 1</p>  <p>10148</p>	<p>5x46 002 567 Supporting sleeve and Press-in tool Shaft seal output</p>	<p>identical 8 HP 70 X</p>
<p>M 2</p>  <p>10149</p>	<p>5x46 002 561 Press-in tool Shaft seal selector shaft</p>	<p>identical 6 HP 19/A/X ---- 8 HP xx</p>
<p>M 3</p>  <p>10152</p>	<p>AA00 524 960 Drive-in tool Clamping sleeve</p>	<p>identical 8 HP xx</p>

Remarks	Order-No. / Application Assembly tools	OBJECT
<p>identical 8 HP xx</p>	<p>AA00 615 414 Drive-in tool Fixing pin oil supply</p>	<p>M 4</p>  <p>10154</p>
<p>identical 8 HP 45 X</p>	<p>5x46 004 066 Insert sleeve and Press-in tool Gear set 2</p>	<p>M 5</p>  <p>10157</p>
<p>identical 8 HP xx</p>	<p>AA00 637 175 Assembly tool Round-, and snap ring Clutch E und C</p>	<p>M 6</p>  <p>10158</p>

OBJECT	Order-No. / Application Assembly tools	Remarks
<p style="text-align: center;">M 7</p>  <p>10159</p>	<p>5x56 003 904 Press-in tool Ball bearing output</p>	<p>identical 8 HP 70 8 HP 90</p>
<p style="text-align: center;">M 8</p>  <p>10160</p>	<p>5x54 909 281 Press-in tool Sealing sleeve output</p>	<p>identical 8 HP xx</p>
<p style="text-align: center;">M 9</p>  <p>10161</p>	<p>5x54 909 282 Press-in tool Needle sleeve output</p>	<p>identical 8 HP xx</p>

Remarks	Order-No. / Application Assembly tools	OBJECT
<p>identical</p> <p>8 HP xx</p>	<p>5x46 003 913 Press-in tool Pump</p>	<p>M 10</p>  <p>10162</p>
<p>identical</p> <p>8 HP xx</p>	<p>AA00 613 946 Press-in tool Shaft seal oil supply</p>	<p>M 11</p>  <p>10163</p>
<p>identical</p> <p>8 HP xx</p>	<p>AA00 548 808 Assembly-pliers Snap ring pot 1</p>	<p>M 12</p>  <p>13127</p>

OBJECT	Order-No. / Application Assembly tools	Remarks
<p style="text-align: center;">M 13</p>  <p>10145</p>	<p>AA00 602 553 Assembly fixture oil supply</p>	<p>identical 8 HP xx</p>
<p style="text-align: center;">M 14</p>  <p>10143</p>	<p>5x46 002 849 5x46 012 798 Insert sleeve and Press-in tool Output flange</p>	<p>identical 6 HP 19/A/X ---- 8 HP xx</p>
<p style="text-align: center;">M 15</p>  <p>10140</p>	<p>5x46 004 174 Peening tool Collar nut</p>	<p>identical 6 HP 19/A/X ---- 8 HP xx</p>





2. Disassembly

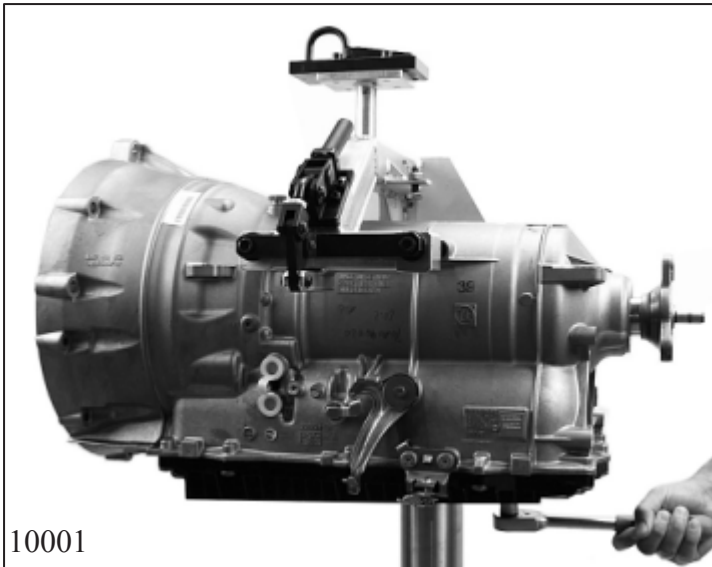
2.1 Disassembling the transmission by assemblies

2.1.1 Preparations

Read the data/error memory using the diagnostic tester.

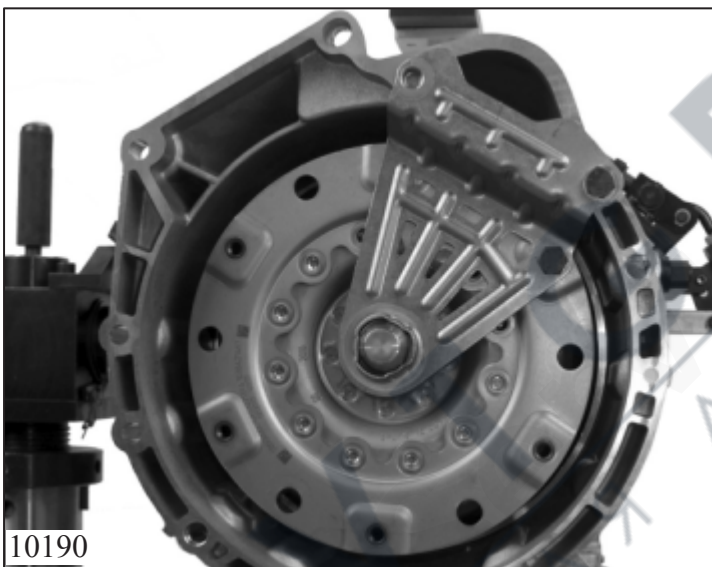
Clamp the transmission on the assembly truck or workbench mounting using the retaining bracket 5T66 000 286 with the oil sump side at the bottom.

Drain the transmission oil by removing the screw plug from the oil sump.



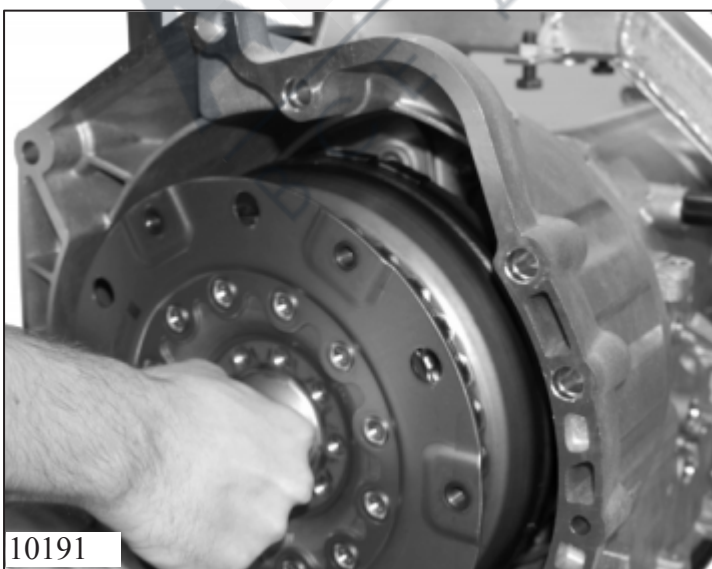
2.1.2 Removing the torque converter

Unscrew the screw M10 and the screw M10 with nut from the torque converter holding bracket and remove the torque converter holding bracket.



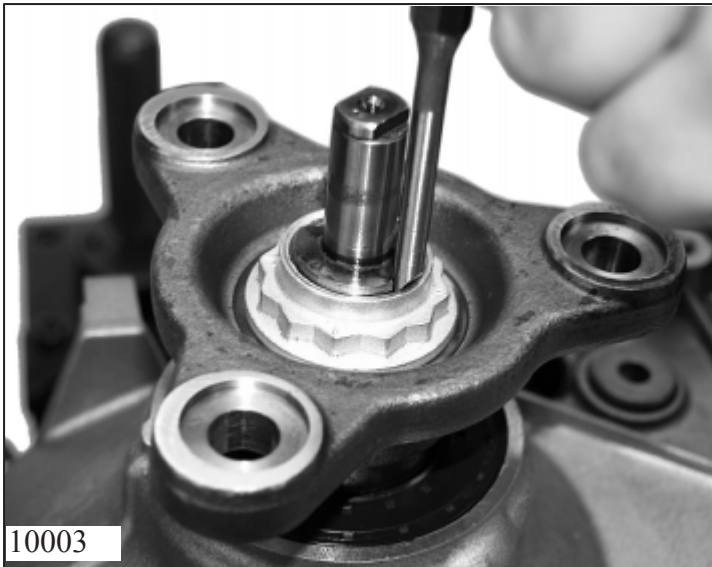
Pull out the torque converter by hand or using lifting gear 5x46 001 539 (insert meshing) and place it on one side.

Remove the O-ring from the input shaft.





2.2 Dismantling output flange



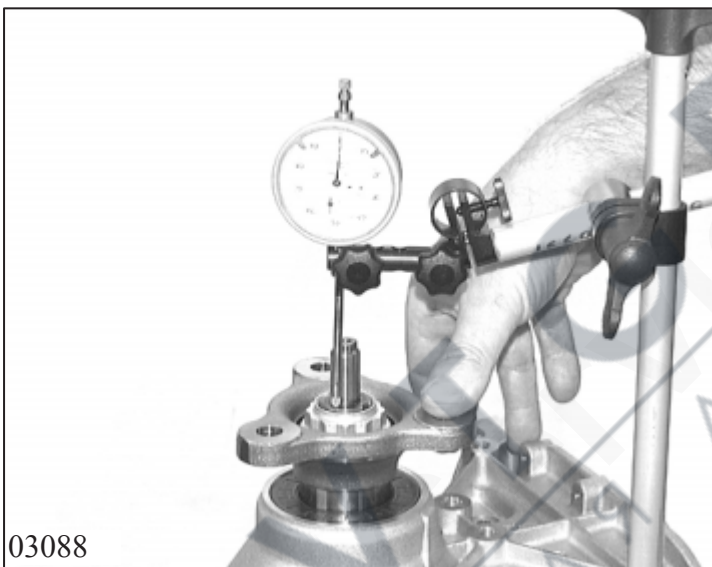
Turn the transmission so that the torque converter side is at the bottom.

Release the caulk on the collar nut on the output flange using tool 5x46 004 158.

Unscrew the collar nut using tool 5x46 002 456.

Recommendation:

Measure transmission clearance and compare it with the measured value of the transmission clearance during assembly.



Screw in new collar nut form fittingly.

Measurement transmission clearance, see **Chapter 1.4.6**

Detach the measuring support,

remove shaft sealing ring in the output flange, using a suitable tool.

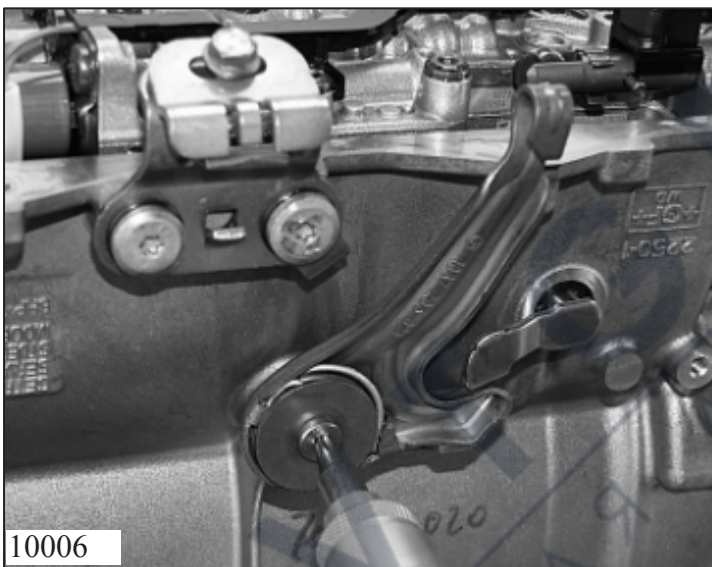


2.3 Removing the oil sump, the mechatronic CU unit and the parking lock

2.3.1 Dismantle oil pan and emergency release

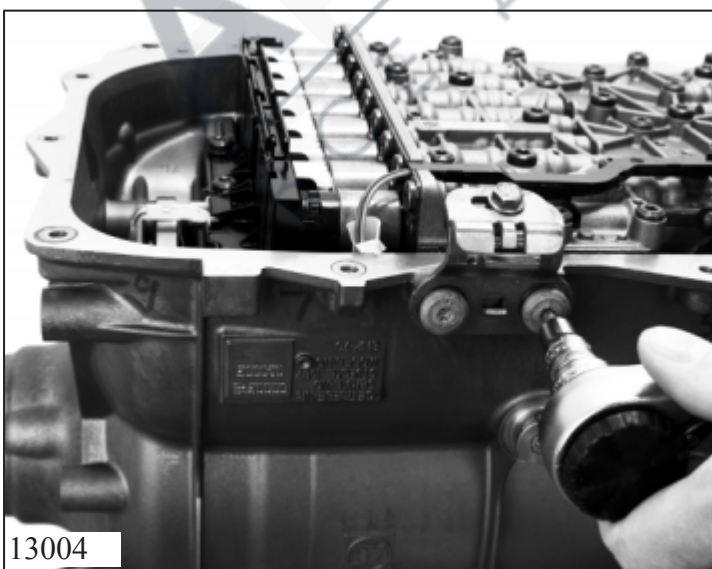
Turn the transmission so that the oil sump is at the top.

Remove 13 screws from the oil sump and remove oil pan.



Unscrew screw for emergency release lever and remove lever.

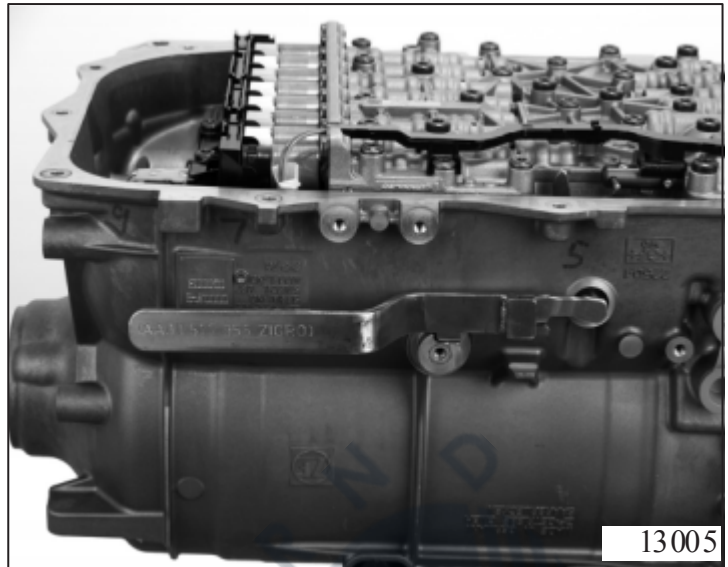
Note:
Lever and screw are eliminated on BMW transmissions with the new emergency release.



Unscrew 2 screws from the holder (emergency release puller) and remove the holder.

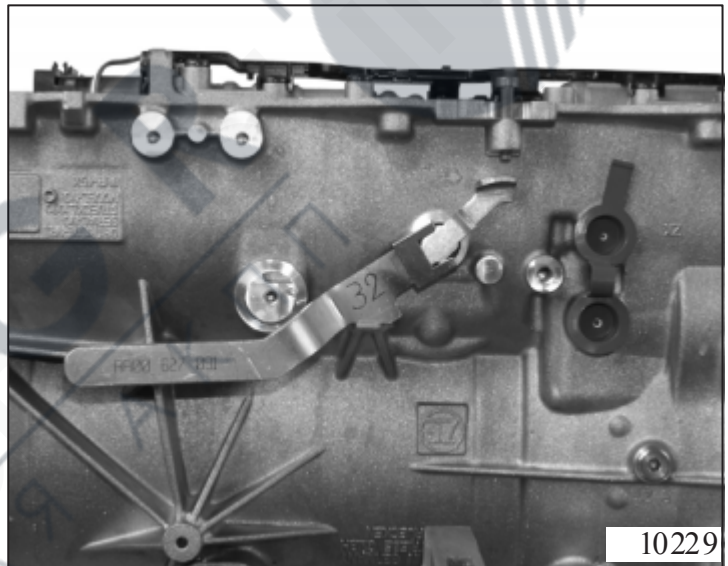
Note:
Angle bracket and screws are eliminated in BMW transmissions with new emergency release.

Push retaining tool AA00 577 956 over the selector lever pin and fit onto the contact surface of the transmission case.



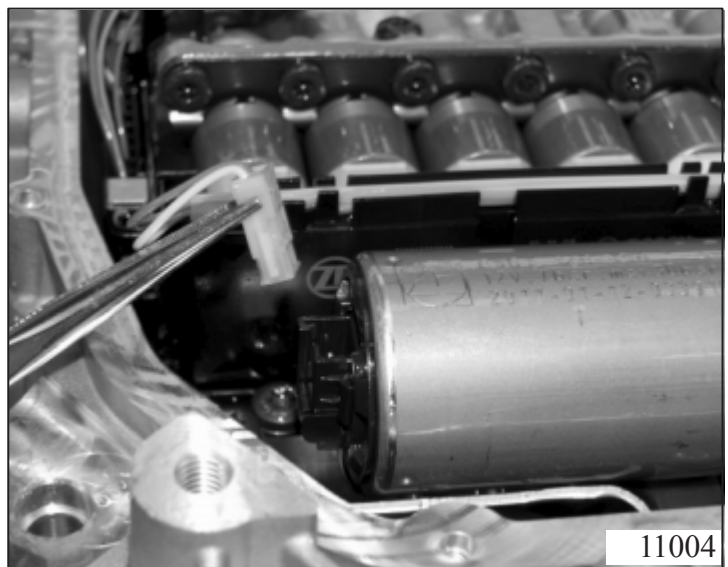
Only BMW with the new emergency release:

Push holding tool AA00 627 091 over the pin of the selector shaft and fit on the contact surface of the transmission housing.



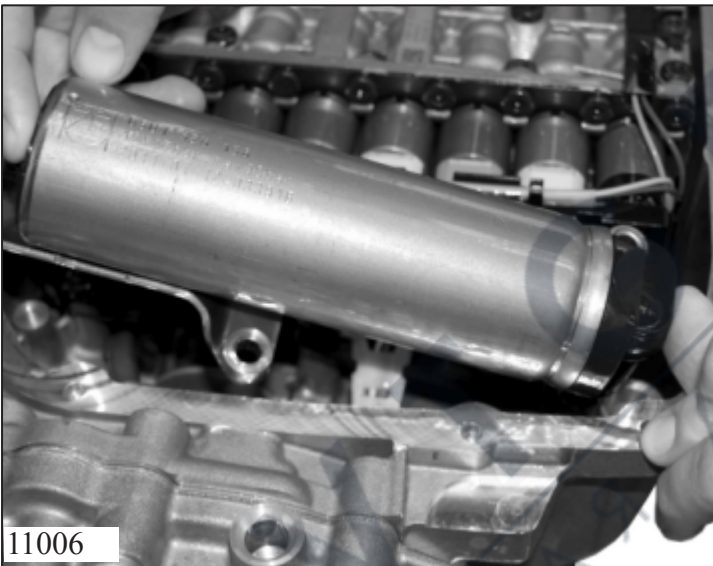
Only gearbox with oil volume accu:

Stripping the cable connector from oil volume accu. Using a long nose pliers.





Unscrew 3 torx screws from oil volume accu.



Remove careful the oil volume accu.



Strip out O-ring from oil volume accu.

Caution!

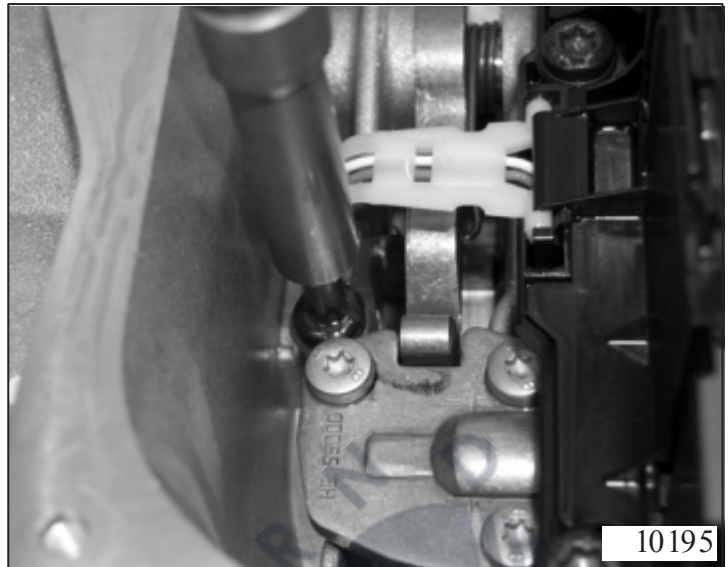
Do not apply a tool for pulling off the O-ring! The pressure socket of the oil volume accu must not be damaged!

2.3.2 Dismantling mechatronic CU unit

Remove 4 short screws (thick screw heads) from the mechatronic CU unit and the rotational speed sensor on the input side.

Note:

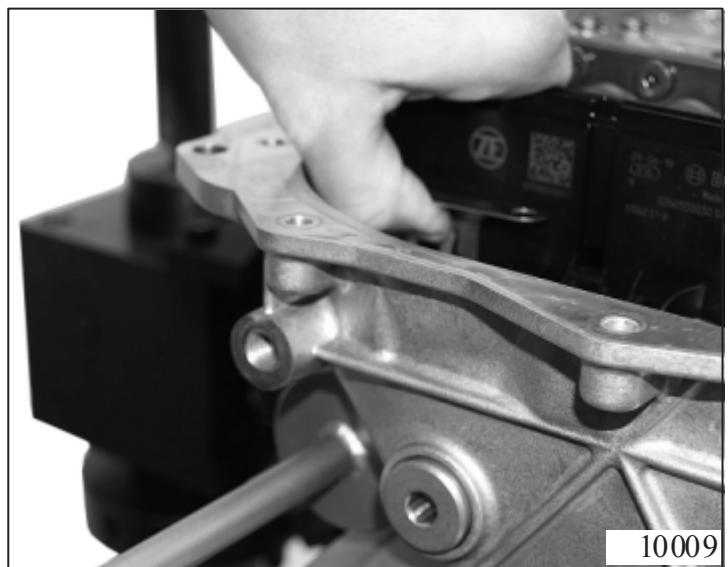
Gearbox with oil volume accu = 3 screws.

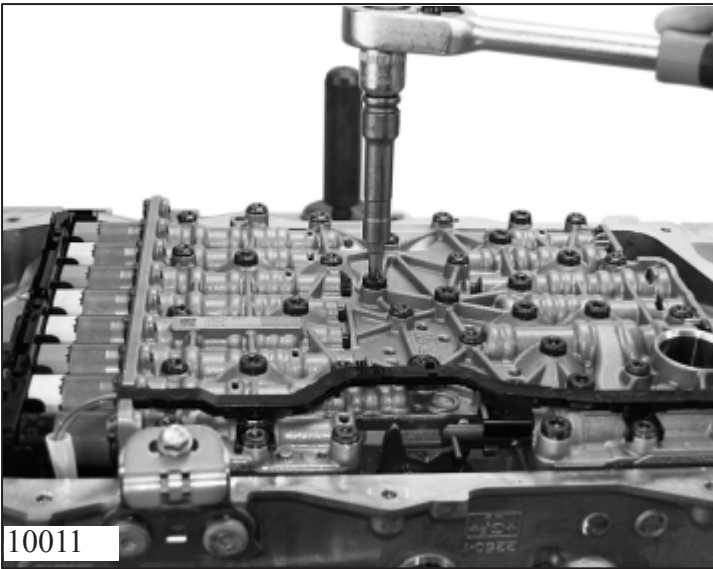


Remove rotational speed sensor and place in module's open area.



Release the lock for the guide sleeve and pull out the guide sleeve using tool AA00 548 098.

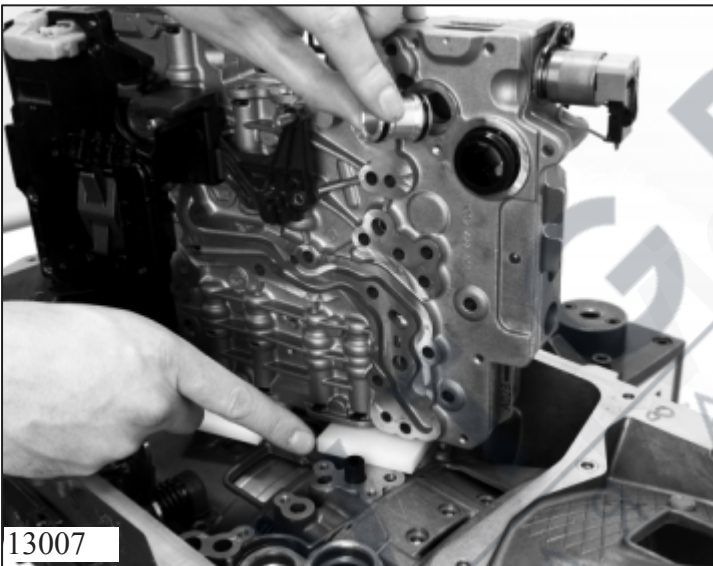




Remove 14 long screws (thick screw heads) from the mechatronic CU unit.

Carefully loosen and take off mechatronic CU unit.

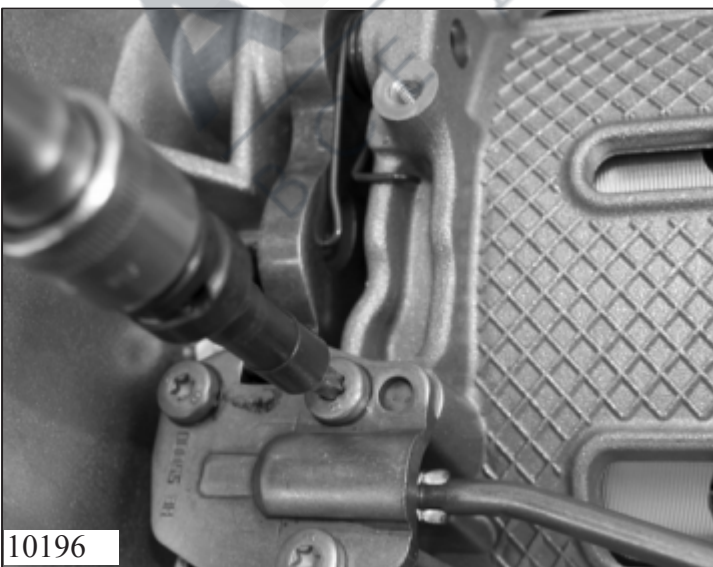
Note:
Clamping effect due to pressure pipe



Pull the pressure pipe out of the mechatronic CU unit.

Pull out the sealing sleeve using tool 5x46 001 210.

2.3.3 Detach parking lock



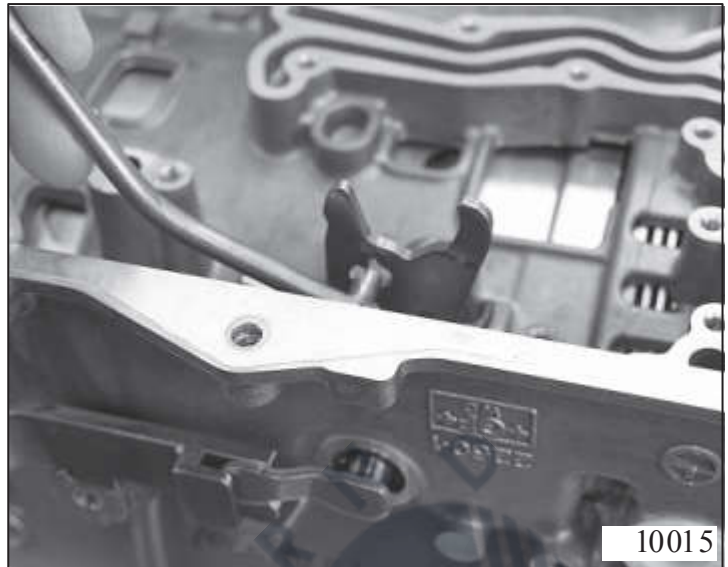
Unscrew 3 screws from the guiding plate and remove the guiding plate.

Unscrew the parking lock bolt screw plug.

Drive out the parking lock bolt using a suitable tool.

Remove the pawl with the spring.

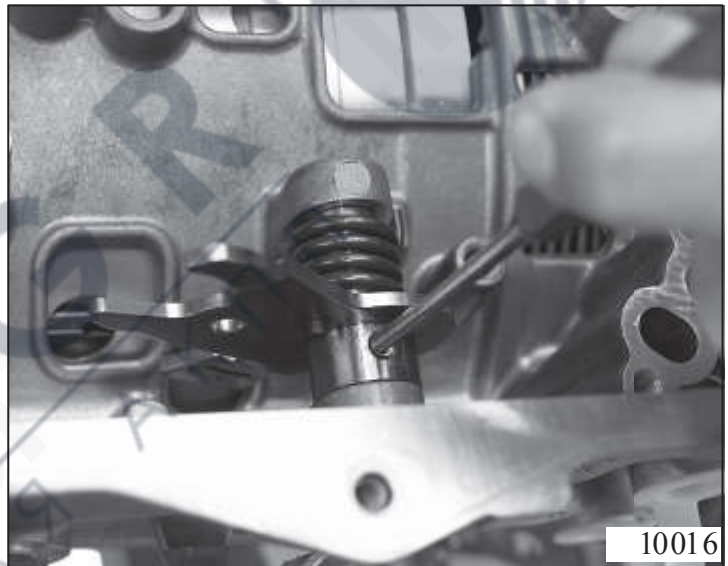
Remove connecting rod from parking disk.



Separate connecting rod AA00 577 956 (AA00 627 091) from selector shaft.

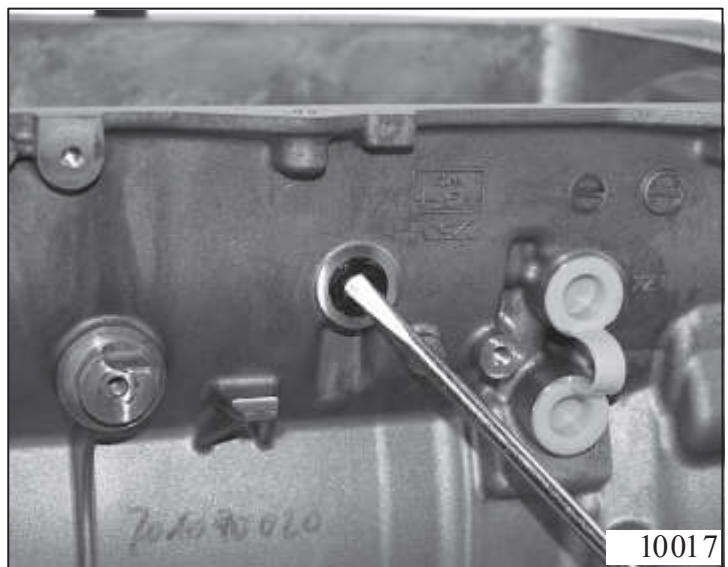
Knock out the selector shaft's locking pin with appropriate tool.

Withdraw selector shaft and remove parking disk with leg spring.



Remove the selector shaft sealing ring using a suitable tool.

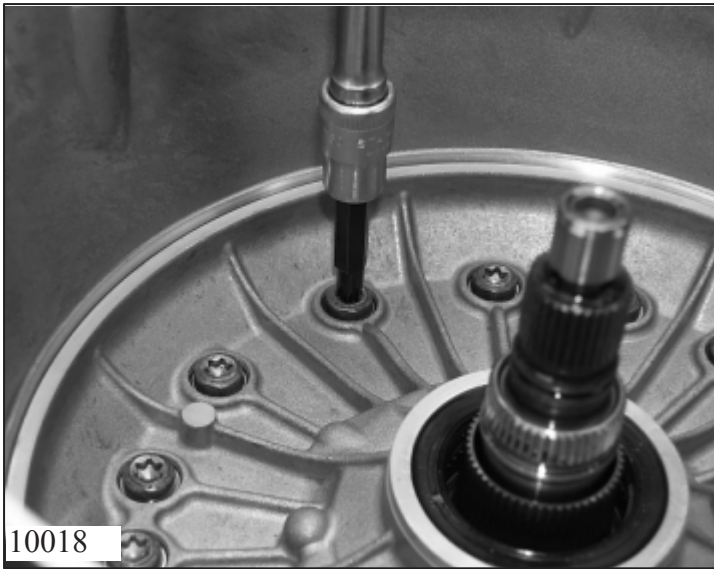
Unscrew the oil filling and lock-up clutch screw plugs from the transmission housing.



2.4 Removing the oil supply

Turn transmission converter side upwards.

Unscrew 13 screws in the oil supply.



Position the lifting gear/extractor AA00 549 802 and lock with slider.

With flat wrench (14 mm), turn the threaded spindle in clockwise direction until the oil supply unit is loosened.

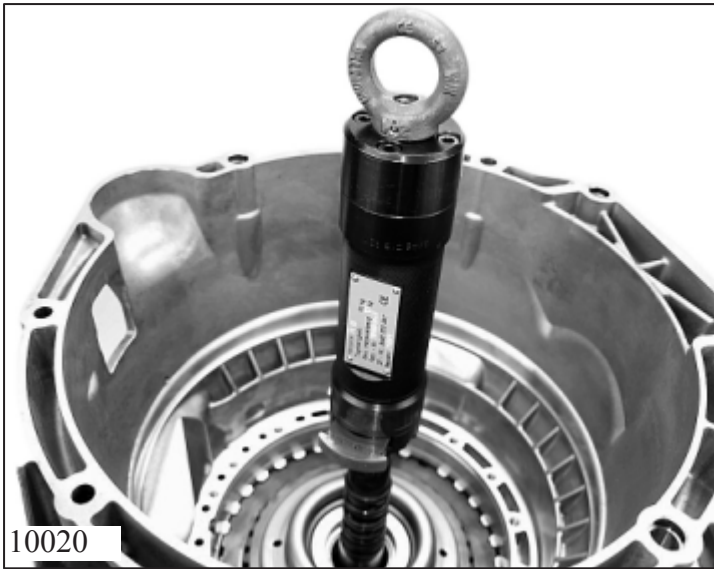
Lift out the oil supply unit, detach chain hoist.





2.5. Dismantle tower / disassemble interior parts

Place 5x46 003 957 tower lifter on the input shaft and secure with damber.
Extract tower with crane or lifting aid.



Place tower in 5x46 004 264 device.

Extract power lifter.

Extract multidisk carrier B incl. internal ring gear (a component) with brake B.



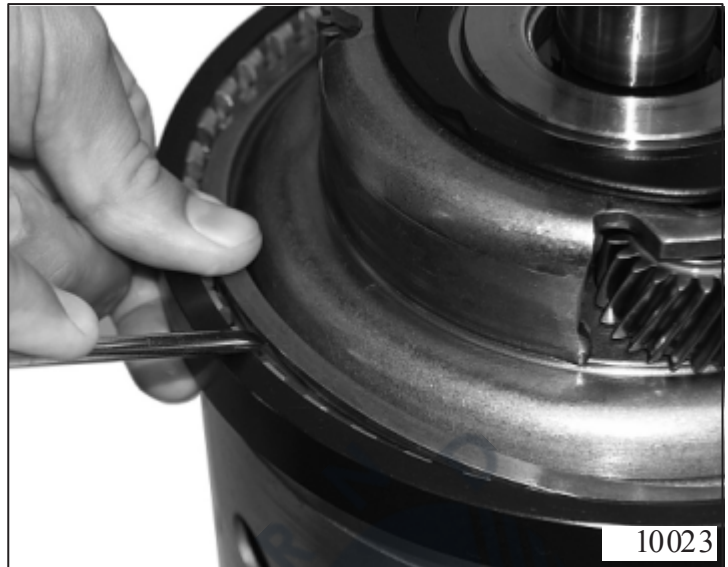
Adjusting shim axial clearance from internal ring gear.

Extract axial needle bearing with fixing plate from planet carrier.



Place ring AA00 558 209 (protection from leveraging tool) on pot 1.

Leverage off snap ring with screwdriver opposite the snap ring opening and remove.



Extract gear set 1.

Extract sun gear 1 and 2.



Extract input shaft with gear set 2 and magnet ring.

Pull off 7 rectangular rings from input shaft.

Remove axial needle bearing and torque angle gauge from ring gear 2.

Insert input shaft on input end into cradle.

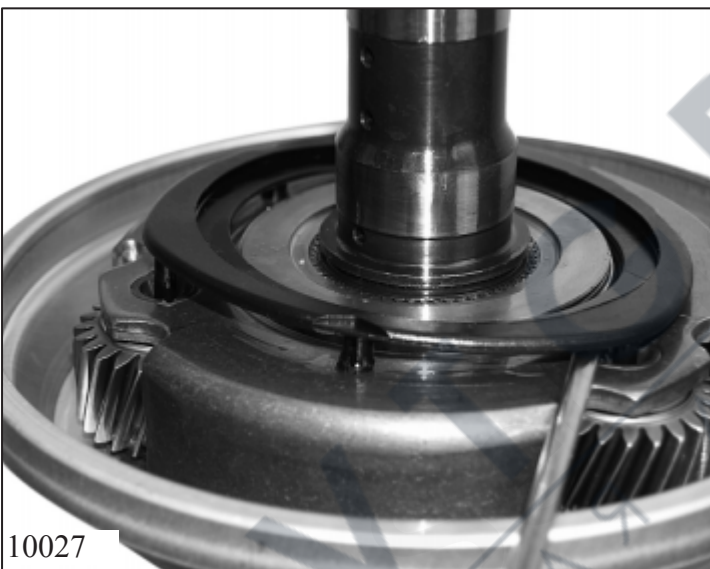




Leverage out thrust washer from planet carrier 2.

Loosen snap ring with appropriate tool (pliers and screwdriver).

Extract gear set with magnetic ring upward.



Leverage out oil tray from planet carrier 2 with screwdriver.

Leverage out oil tray from planet carrier 1 with screwdriver.

Note:
Apply the screwdriver at several points, otherwise the locking pins will break apart.

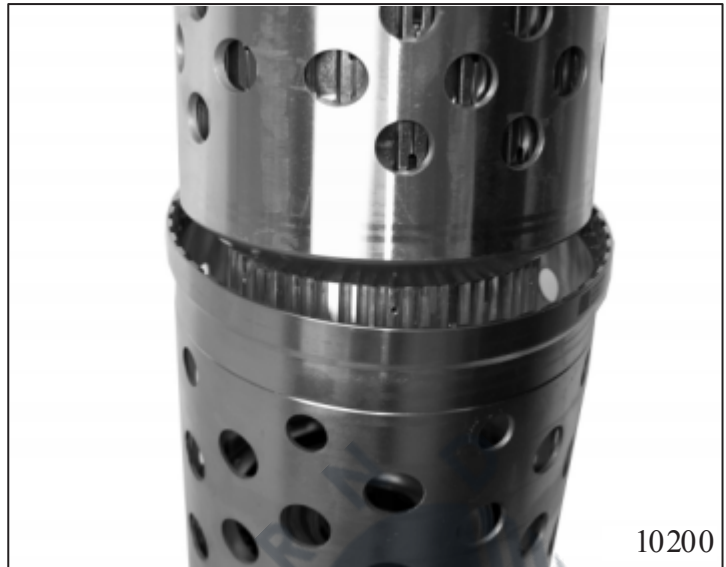


Remove internal ring gear 2 with sun gear 3 from pot 2.

Snap out angle disk from sun gear 3.

Loosen snap ring, deposit internal ring gear and sun gear.

Pull pot 2 upwards from pot 1.



Extract clutch D from pot 1.

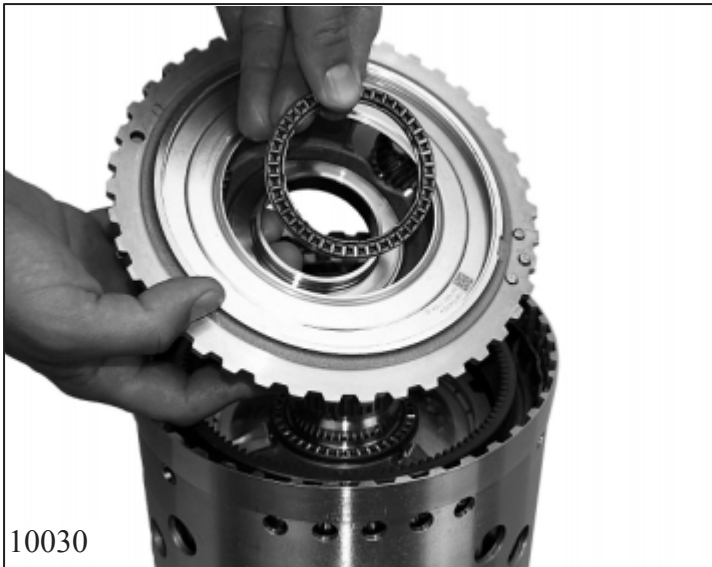
Place pot 2 in 5x46 004 264 device.



Set ring AA00 558 210 (protection from leveraging tool) on pot 2.

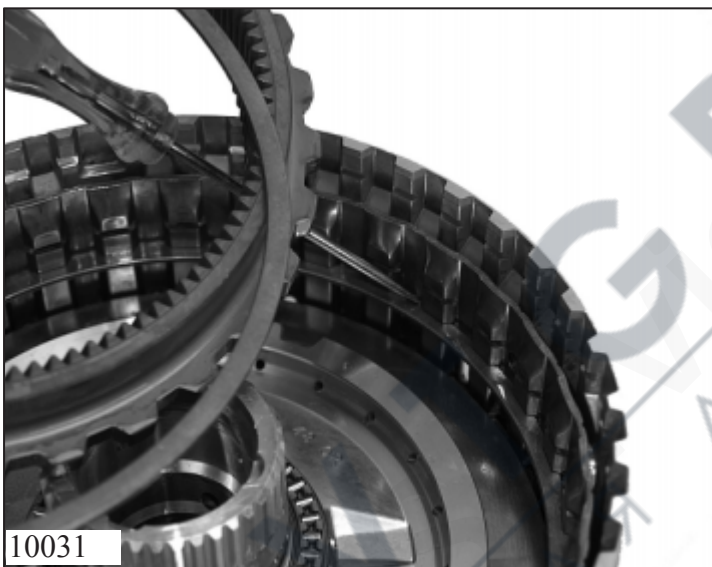
Leverage out and remove snap ring with screwdriver opposite the snap ring opening.





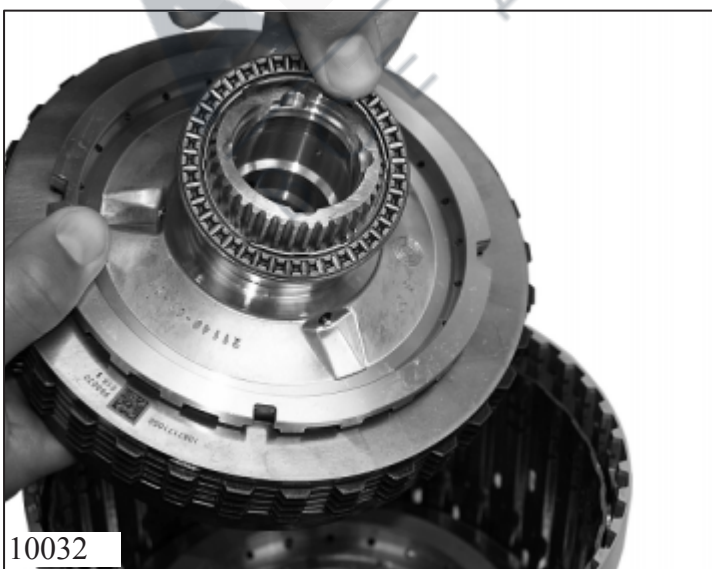
Extract gear set 3.

Extract axial needle bearing from gear set.



Detach snap ring 1 and extract ring gear 3.

Detach snap ring 2 (support for internal ring gear).



Extract clutch E.

Extract axial needle bearing on the upper side of clutch E.

Extract clutch C.

Extract a combination bearing at both the upper and the lower side of clutch C.

Note:
The larger of the two combination bearings lies on the upper side of clutch C.

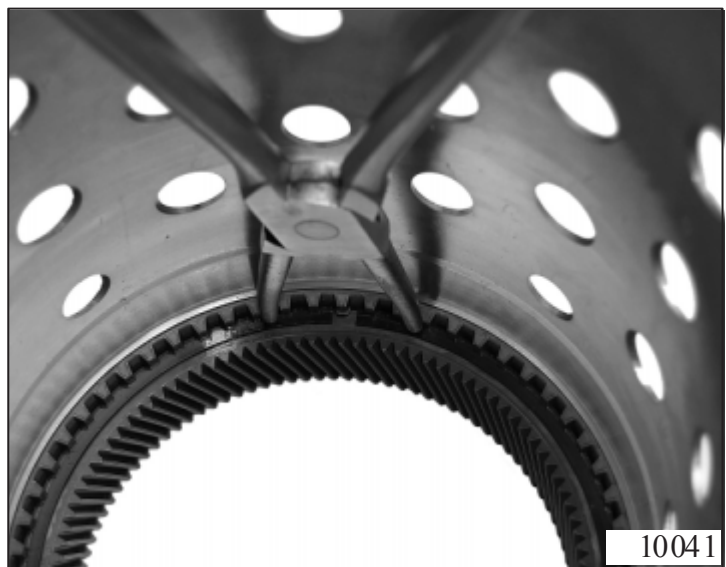


Extract the sun shaft with sun gear 4.

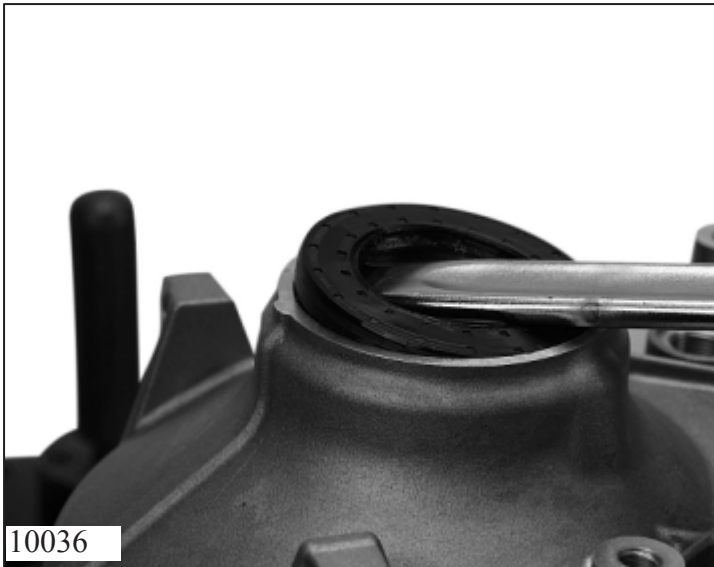


Loosen snap ring with snap ring gripper 5x46 001 376.

Take the internal ring gear off gear set 4 from retainer.



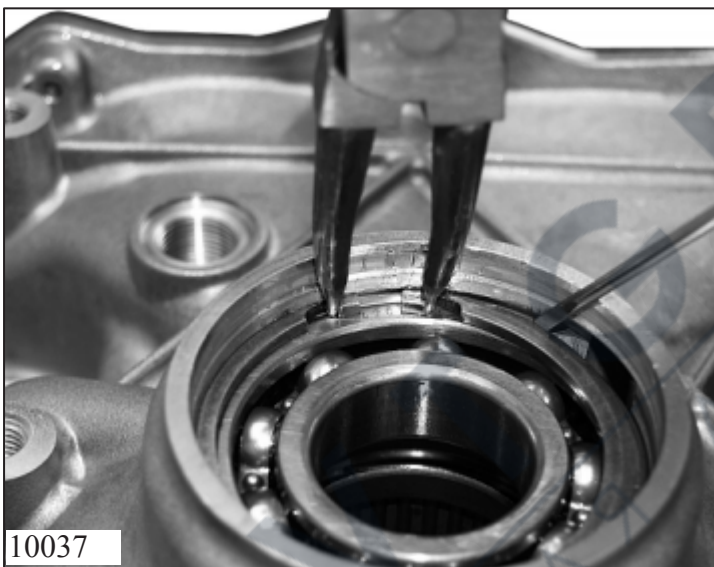
2.6 Dismantle output (bearing)



Turn transmission converter side downward.

Lever out the shaft sealing ring-output, using suitable tools.

Remove spacer disk.



Remove the snap ring from the ball bearing.

Turn transmission with converter side upward.

Knock out roller bearing with plastic arbor 5 x46 004 605.

Turn transmission with converter side downward.

Remove the snap ring from the sleeve using suitable tools.



Turn transmission converter side upwards.

Drive out bushing with tool AA00 666 390.

Turn transmission converter side downward.

Remove the snap ring from the needle bearing using suitable tools.

Turn transmission converter side upwards.

Press out the needle bearing using tool AA00 666 390.

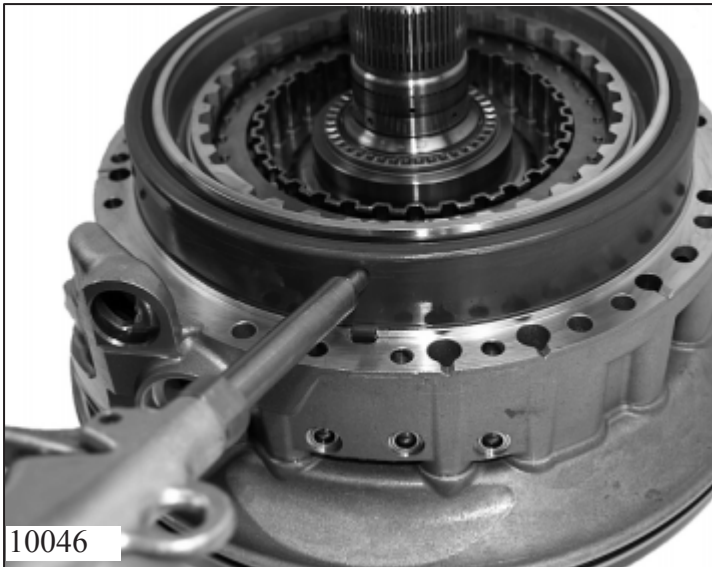


2.7 Removing the oil supply and clutches

2.7.1 Oil supply

Loosen cylinder B from intermediate plate with compressed air and remove.

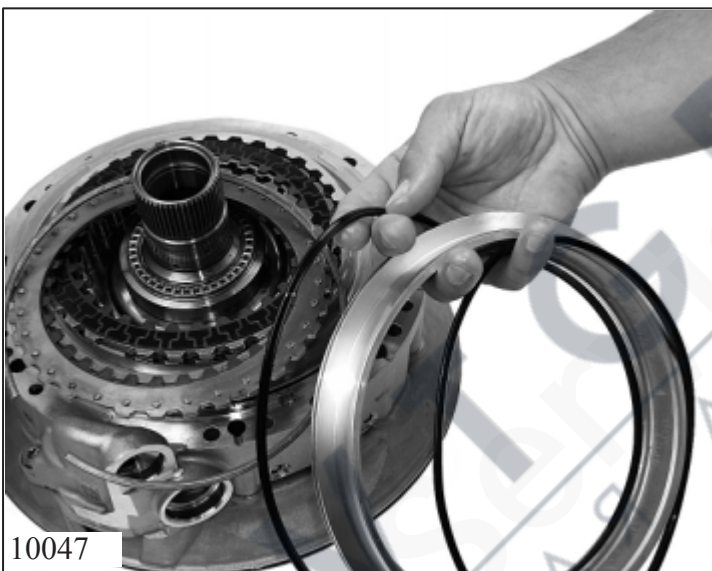
Remove piston B.



Take the section and lipped seal ring off the piston.

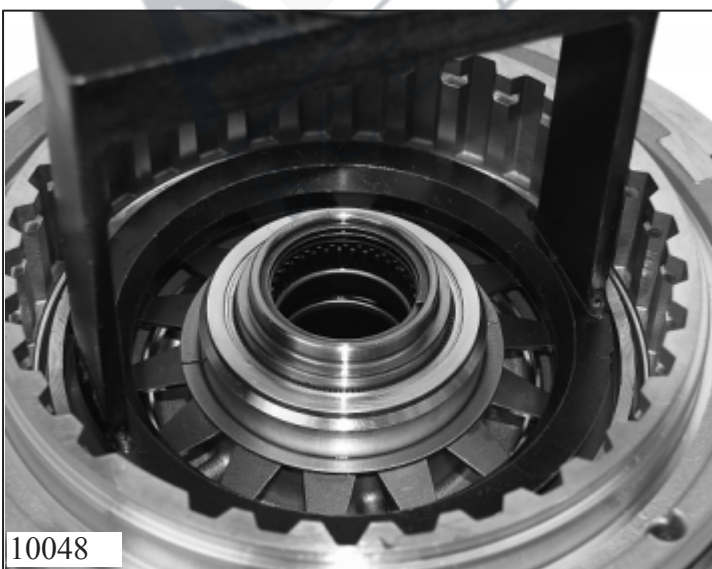
Take out the axial needle bearing from disk carrier.

Lever the snap ring off brake A and remove the clutch plate carrier A, sun gear 1 and multidisc package.

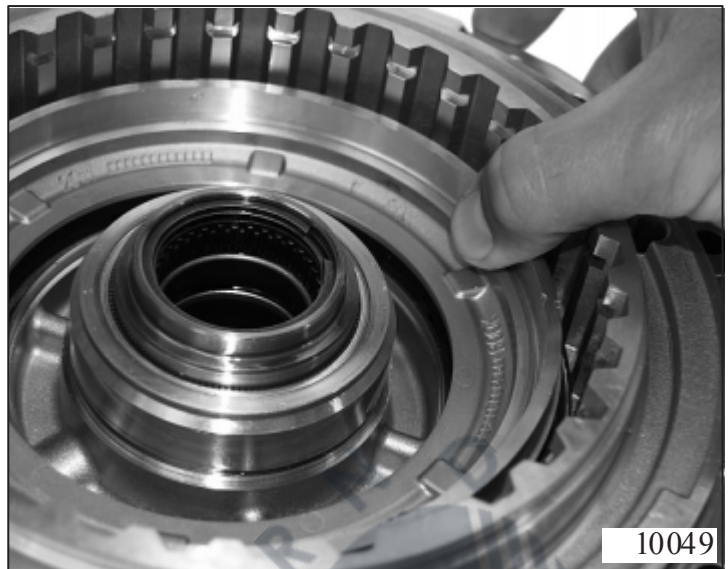


Remove the wave spring and outer clutch disc.

Press down the piston A using pressure pad 5x46 001 502 under the mandrel press, remove the retainer rings and disc spring.



Remove the piston A using a rotating and pulling movement, remove 2 lipped seal rings.



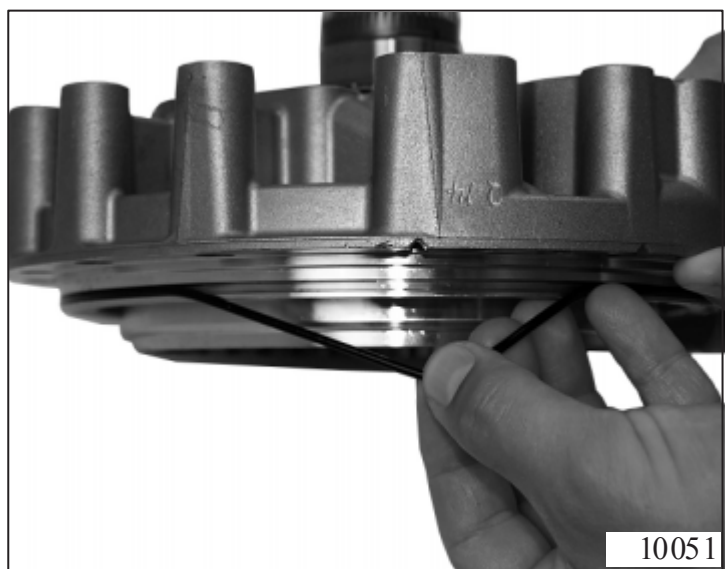
Unscrew 5 screws in cylinder A and one outside the cylinder.

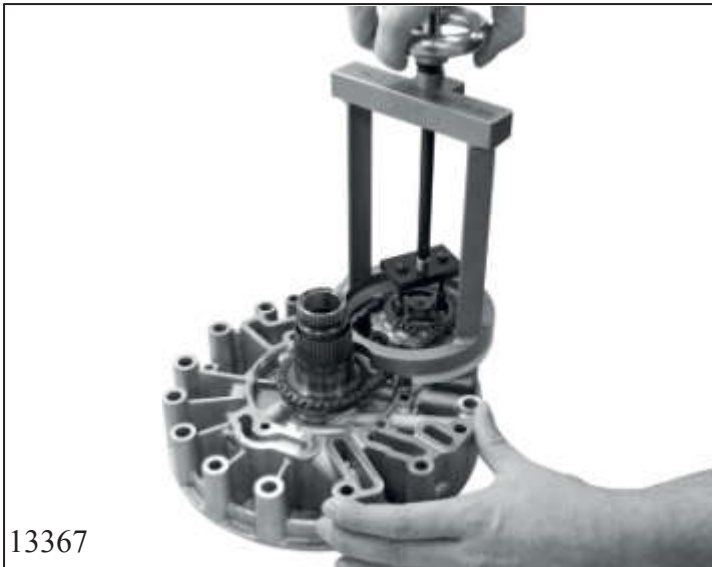
Raise the intermediate plate.

Remove the O-ring from the centring plate and lever out the shaft sealing ring using suitable tools.



Remove the O-ring from the intermediate plate.





13367

Carefully lever out and remove the pump with chain drive with tool AA00 566 429.

Remove 2 O-rings and a sealing element from the pump underside.

Note:
The complete unit must be replaced if the axial needle bearing in the stator shaft is damaged or there are any signs of damage on the stator shaft or intermediate plate.

2.7.2 Removing clutch E



10044

Press down on to the baffle plate using pressure pad 5x46 909 248 and remove the round wire ring.

Remove the piston with the baffle plate.

Take the baffle plate out of the piston and remove the lipped seal ring from the baffle plate.



10045

Remove the disc spring and multidisc package.

Remove the clutch plate and remove 2 O-rings.

2.7.3 Removing clutch C

Press down on to the baffle plate using pressure pad 5x46 909 248 and remove the snap ring.

Remove the piston with the baffle plate. Take the baffle plate out of the piston and remove the lipped seal ring from the baffle plate.



Remove the disc spring and multidisc package.

Remove the clutch plate and pull the hub out of the multidisc holder.

Remove 4 O-rings (2 inside and 2 outside) off the hub.



2.7.4 Removing clutch D

Remove the snap ring.

Remove the multidisc package.





Position tool AA00 349 472 with both pins in baffle plate.



Insert clutch D with tool in the mandrel press (Abb. 13a08).

Turn the tool under a slight pressure of the mandrel press clockwise until the clips disengage. (Abb. 13a07)

Remove baffle plate and spring disc.
Strip the O-ring from baffle plate.



Remove piston D by hand.

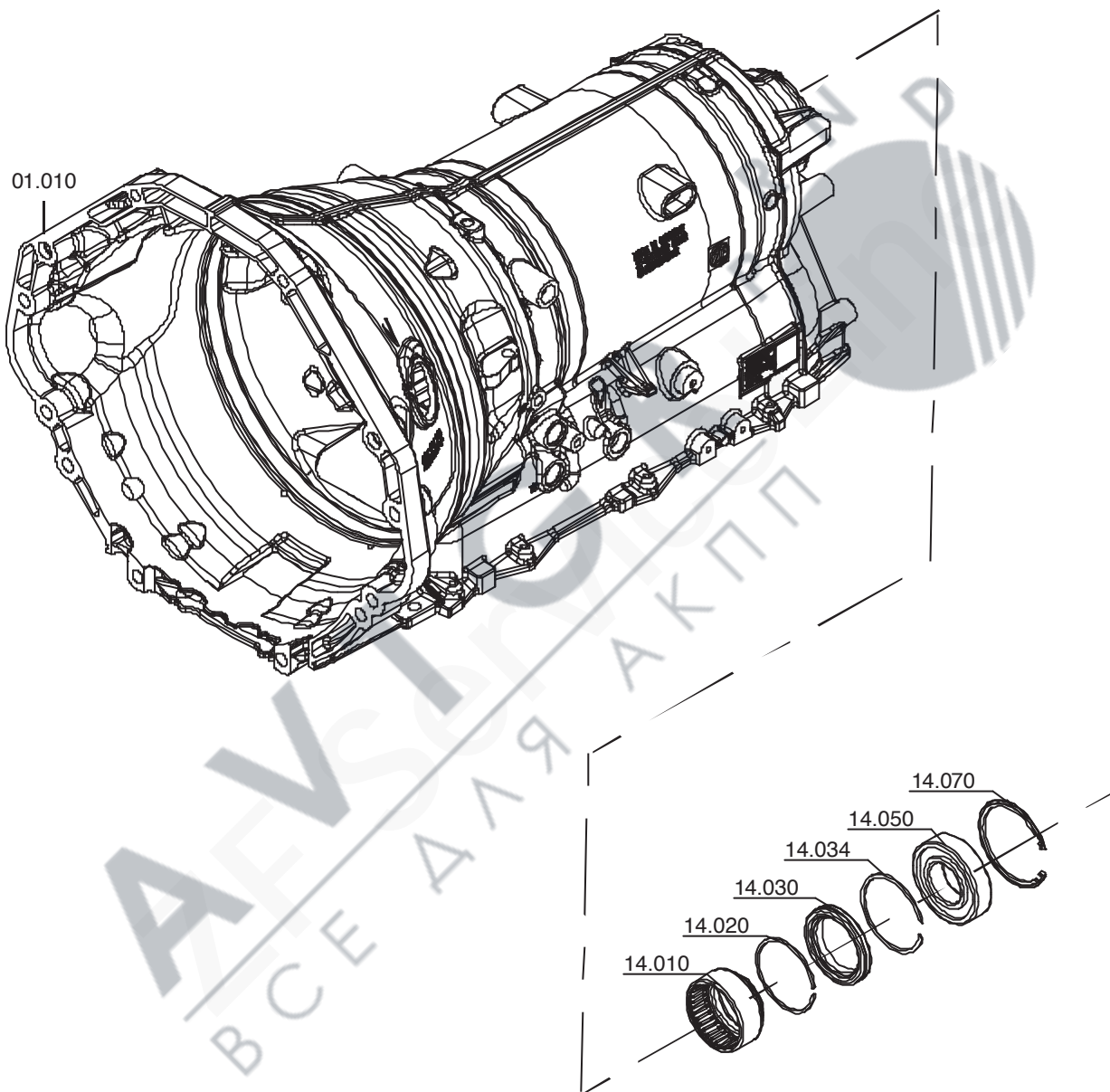
Strip the O-ring off from piston D.

Dismantle 2 rectangular rings from output shaft.



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3. Assembly
3.1 Assembly on transmission housing



Place the transmission housing with the assembly bracket 5T66 000 286 in the assembly trolley or workbench holder and turn it so that the converter bell side is at the bottom.

Position the needle bush 14.010 onto tool 5x54 909 282 and mount into the output side of the transmission housing.

Secure the needle bush with a new snap ring 14.020.



Position a new sealing sleeve 14.030 onto tool 5x54 909 281 and mount into the transmission housing.

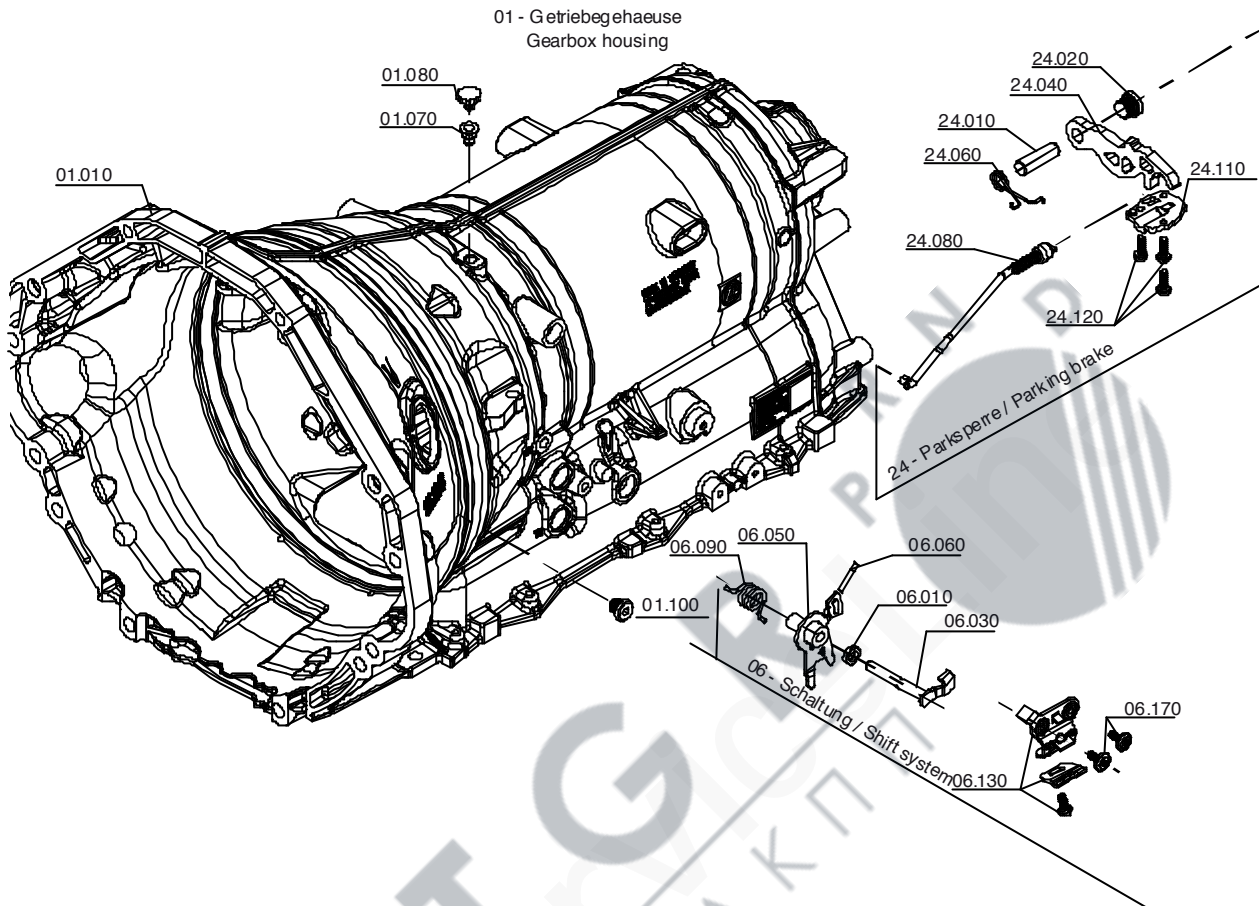
Secure sealing sleeve with new snap ring 14.034.



Drive the ball bearing 14.050 into the transmission housing using tool 5x46 003 904 and secure it with a new snap ring 14.070.



3.2 Transmission housing, parking lock and emergency release



3.2.1 Parking lock



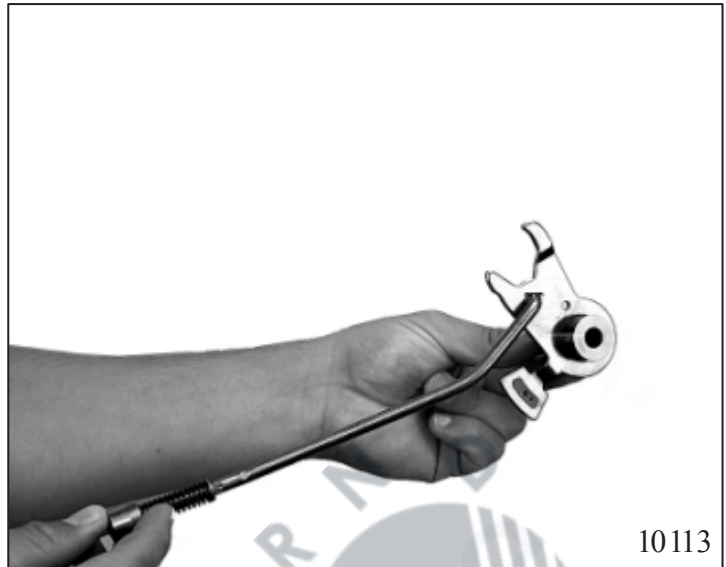
Turn the transmission housing so that the oil pan side is at the top.
Insert the WDR selector shaft 06.010 into the transmission housing using tool 5x46 002 561.

Screw plug screw WK 01.100 into transmission case.

(Tightening torque: see Chapter 1.5)

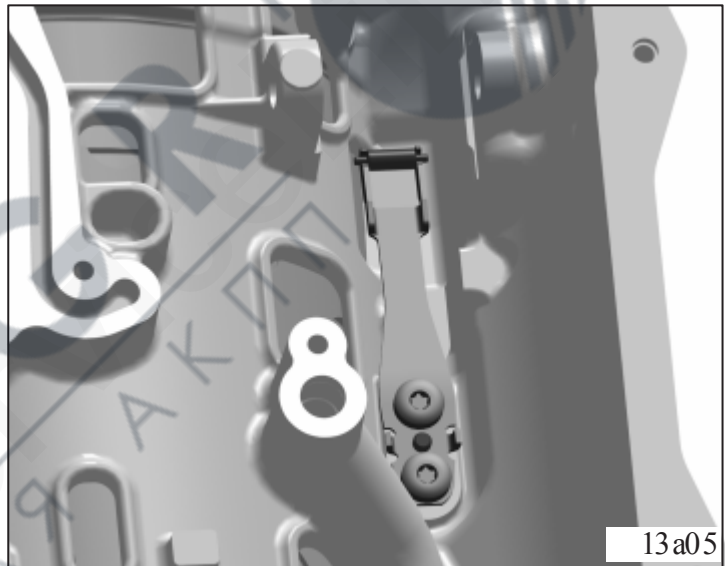
Only with new housing:
Drive breather tube 01.070 flush with plastic hammer. Insert breather cover 01.080 into breather tube.

Install the connecting rod 24.080 into park or notched disk 06.050 in the position shown and twist.



(Only with M-type and new housing)

Secure locking spring loosely using 2 torx screws so that the locking spring can still be turned easily.



(Tightening torque: see Chapter 1.5)

Caution!

Adjustment work Chapter 1.4.7

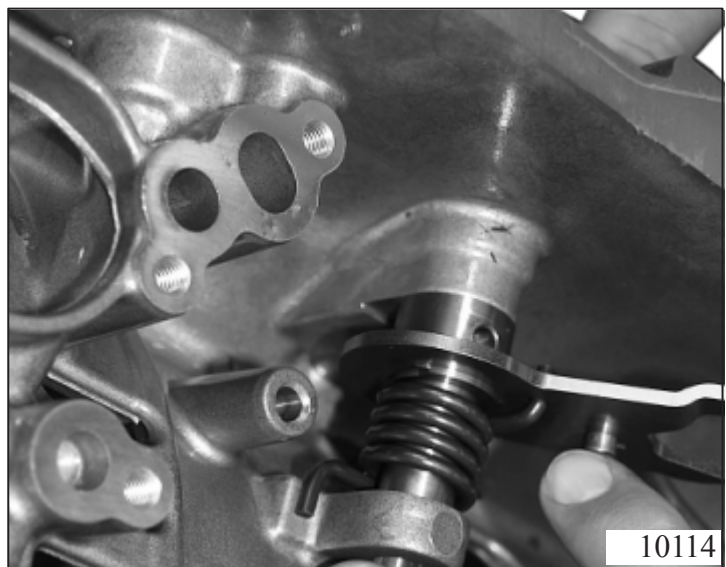
Insert the parking or notched disk with connecting rod into the transmission case and insert the selector shaft 06.030 through notched disk.

Note:

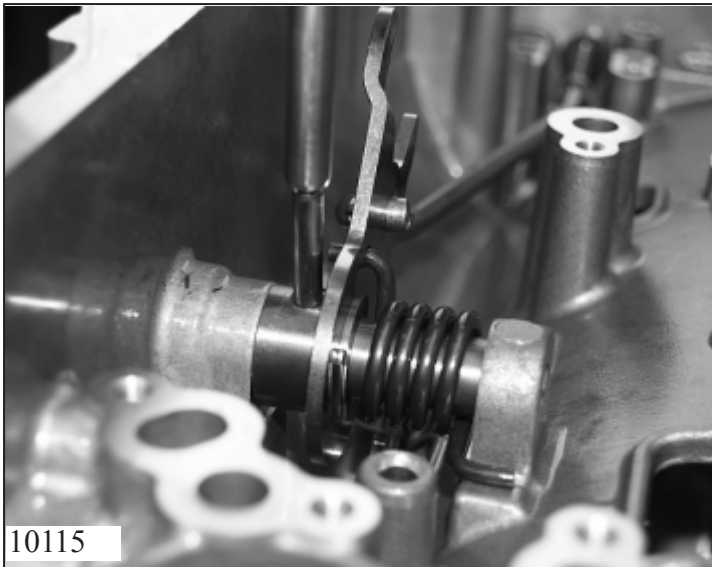
For E-type also push spring 06.090 over the selector shaft first.

*Mounting direction from selector shaft:
Lever indicate to output.*

*Mounting direction from selector shaft
(new emergency release):
Lever indicate to input.*



(E type only)

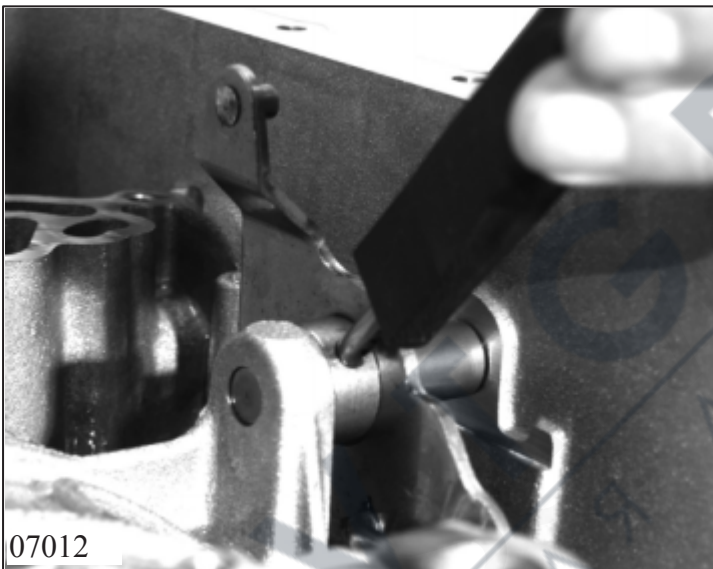


Fit new slotted spring pin 06.060 with fitting bolt AA00 524 960 in the position shown.

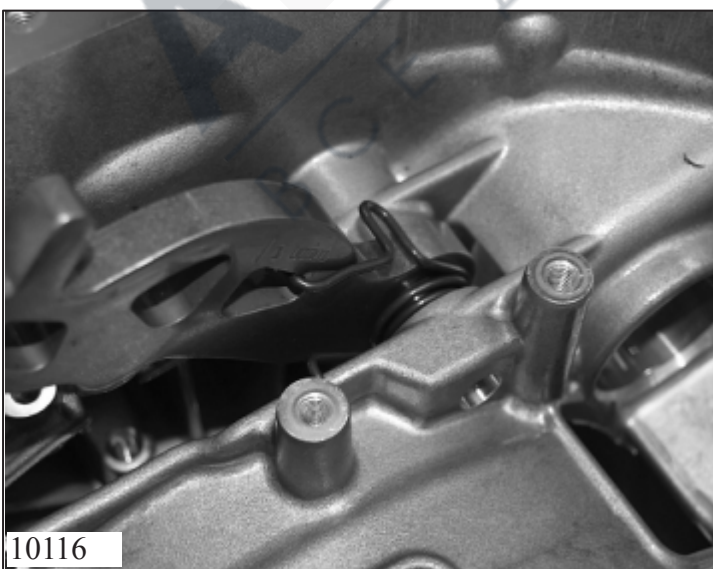
Push retainer tool AA00 577 956 (AA00 627 091) over selector shaft and lock it against the transmission case.

Note:
The spring must be slightly tightened to engage the parking lock without current.

(M-type only)



Fit new slotted spring pin 06.060 with fitting bolt AA00 524 960 in the position shown.



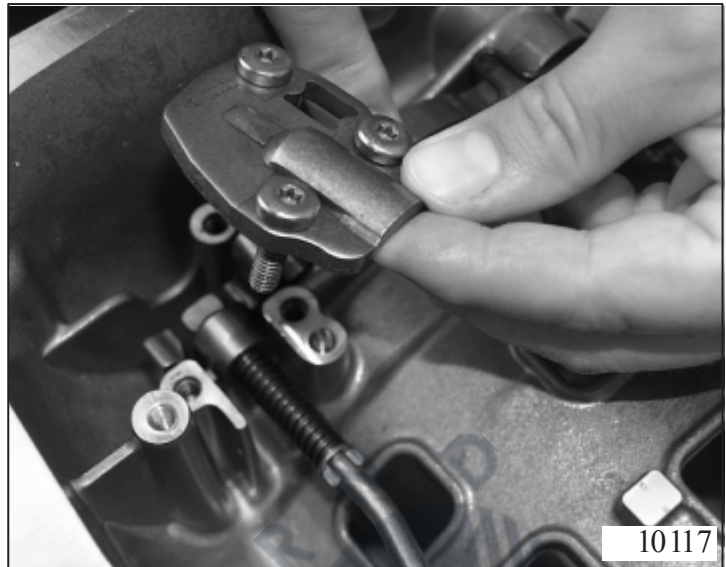
Insert the pawl 24.040 with leg spring 24.060 in the transmission housing and secure it by pressing the bolt 24.010.

Then seal the borehole using the screw plug with sealing ring 24.020.

(Tightening torque: see Chapter 1.5)

Push down the pawl, fit connecting rod and secure the guiding plate 24.110 with 3 new torx screws 24.120.

(Tightening torque: see Chapter 1.5)



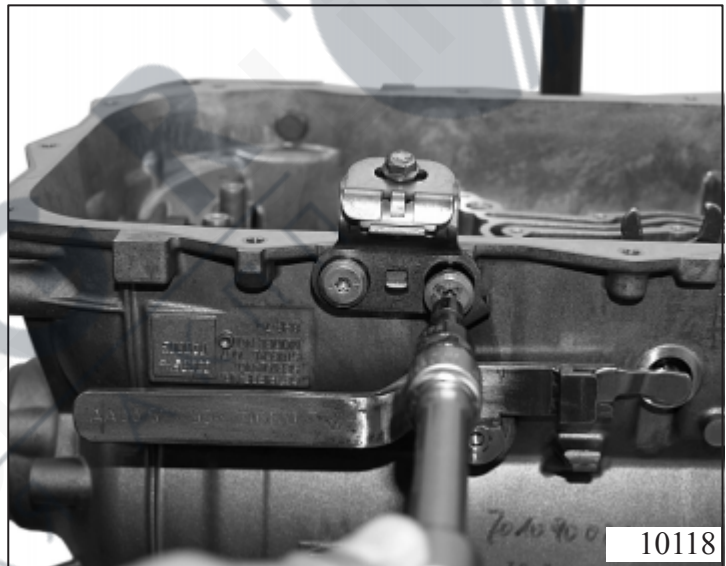
(E-type only)

3.2.2 Emergency release

Secure the emergency release angle bracket 06.130 in the position shown using 2 new screws 06.170.

(Tightening torque: see Chapter 1.5)

Note:
Angle bracket and screws are eliminated in BMW transmissions with new emergency release.

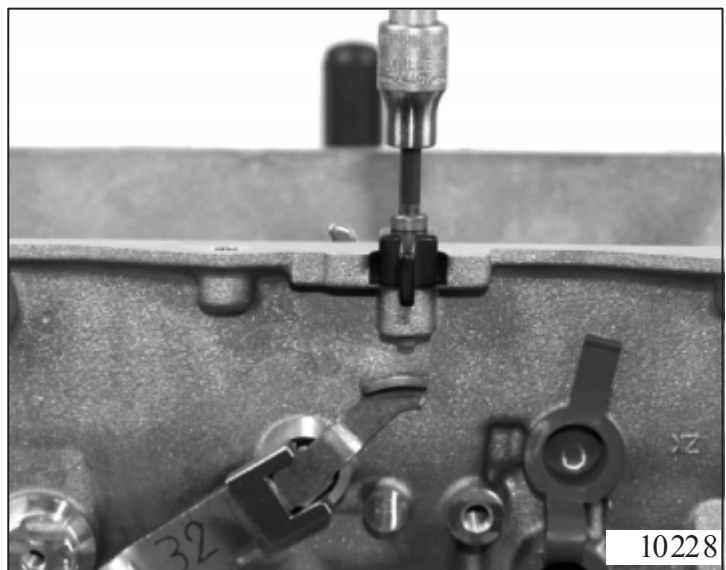


(Only BMW with the new emergency release)

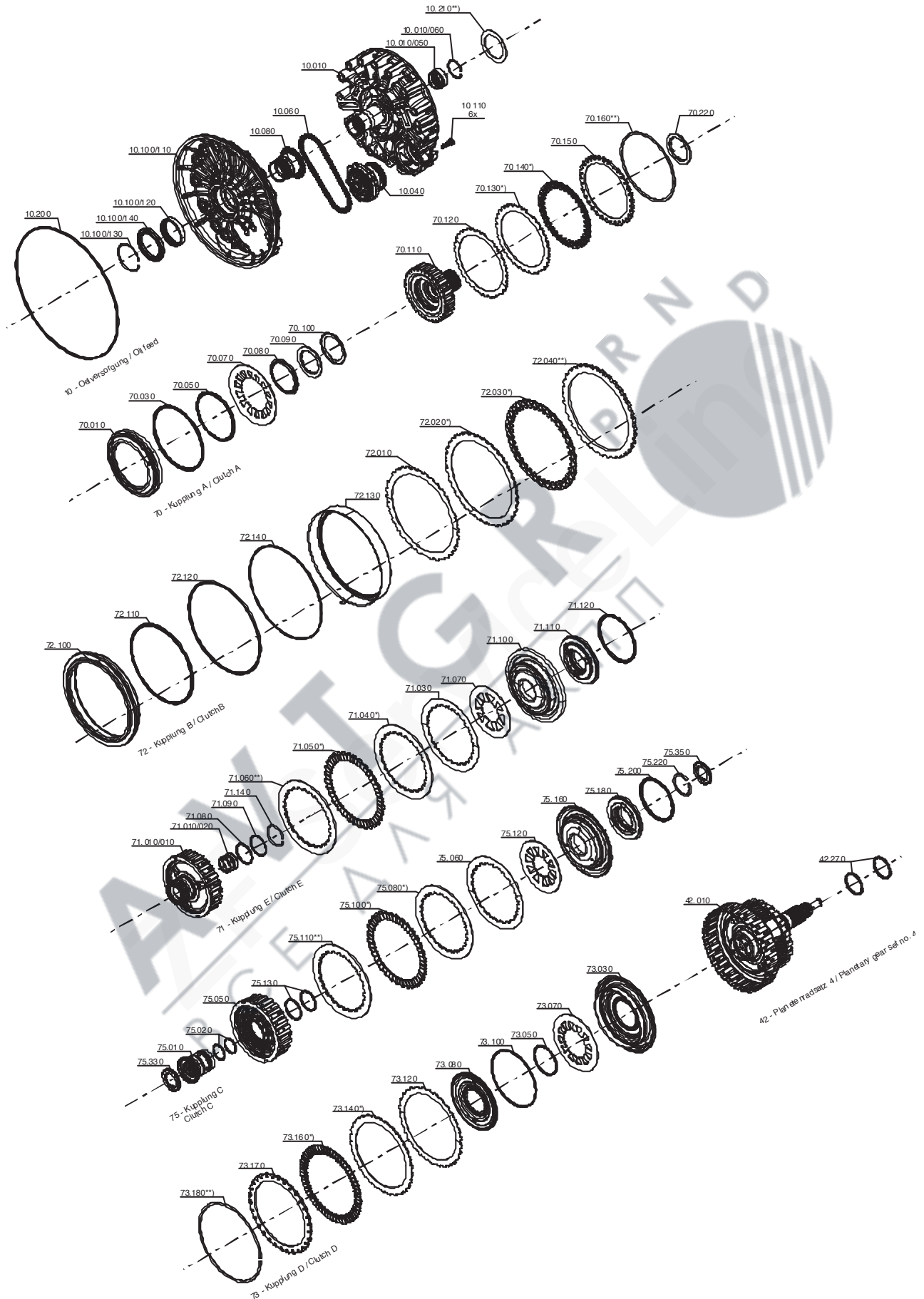
Check screw-in depth of the screw with distance piece AA00 628 624.

In case of deviation, unscrew screw. Screw in new screw 06.210 into transmission housing, position distance piece AA00 628 624 and screw in form-fittingly until stoppage at the tool.

Pull out distance piece.



3.3 Assembling the clutches and oil supply



3.3.1 Clutch D

Fit 2 new rectangular rings 42.270 on the output shaft 42.010.

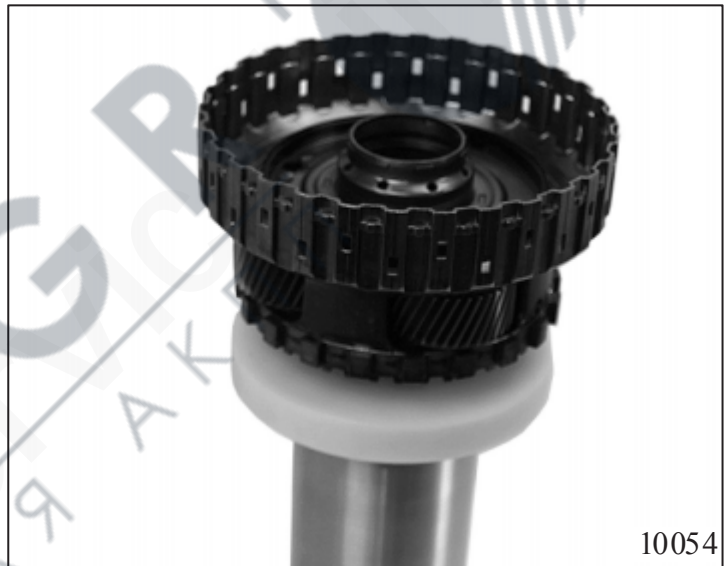
Note:

The sealing element in the output shaft (cylinder D) is riveted and cannot be replaced.

The complete component (output shaft with gear set and cylinder D) must be replaced in the event that any signs of damage are found.

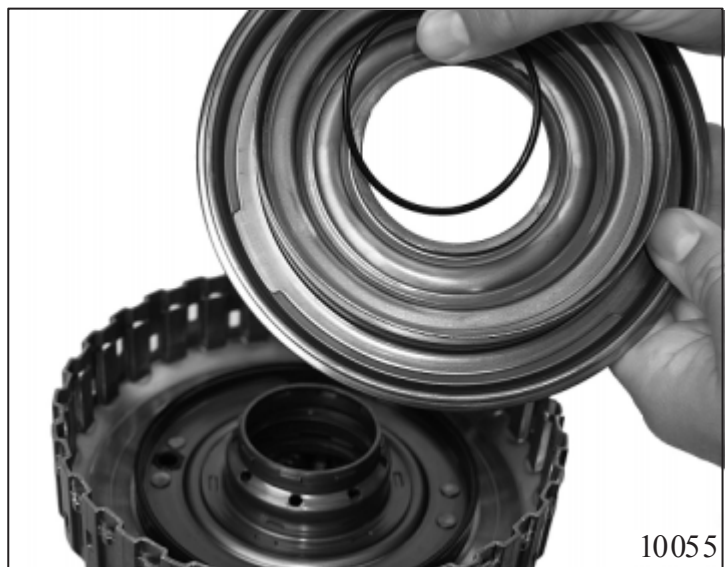


Insert the output shaft in the mounting device.



Fit new O-ring 73.050 on piston D 73.030.

Press piston D into cylinder D and insert the disc spring.73.070.

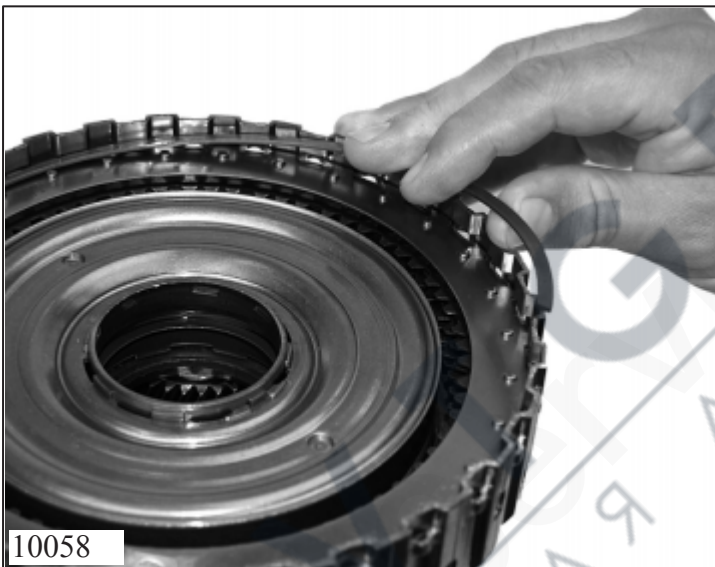




Fit new O-ring 73.100 onto baffle plate 73.080.

Position the baffle plate with the recesses over the matching spigot.

Press the baffle plate under the mandrel press using tool AA00 349 472 and turn it anti-clockwise until the small spigot are between the secure straps.



Insert the multidisc package, starting with the wave carrier 73.120, the outer clutch disc 73.140 and the lined clutch disc 73.160 alternately and the end disc 73.170.

Secure the end disc with a snap ring 73.180.

Caution!

Adjustment work "clutch D",
Chapter 1.4.1

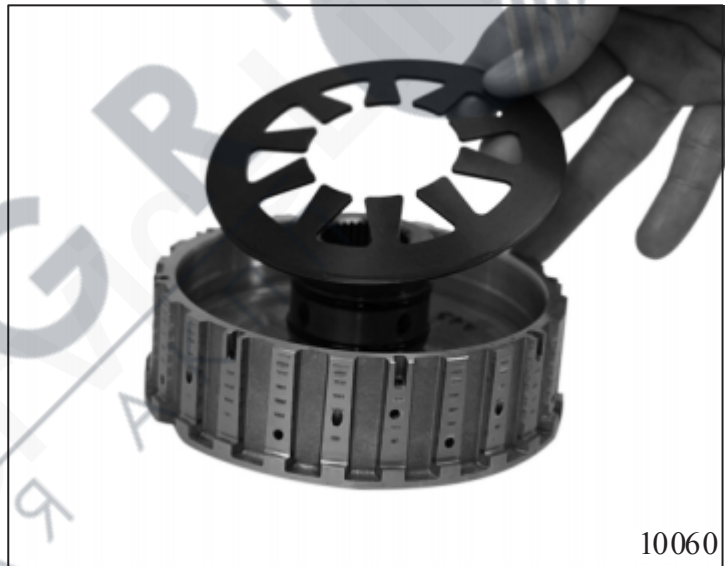
3.3.2 Clutch C

Fit 4 new O-rings (2 on the inside 75.020 and 2 on the outside 75.130) on the hub 75.010.



Fit the hub into cylinder C 75.050.

Fit disc spring 75.120 into the cylinder.



Fit the multidisc package starting with the end disc 75.110 and then a lined clutch disc 75.100 and an inner clutch disc 75.080 alternately.

Fit the wave carrier 75.060.



Caution!

Adjustment work "clutch C",
Chapter 1.4.2



Press piston C 75.160 on to cylinder C.

Note:
The sealing element on piston C is vulcanized and cannot be replaced separately.



Press support plate 75.180 with a new lippered seal ring 75.200 into piston C.

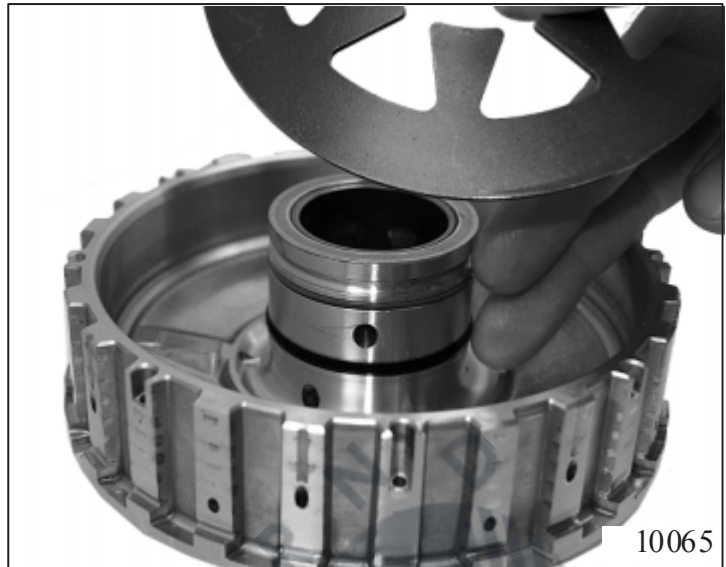


Press down the support disk with the pressure pad 5x46 909 248 under the mandrel press and secure it with a new snap ring 75.220.
Fit assembly sleeve AA00 637 176 over the hub of cylinder C and insert snap ring with tool AA00 637 175 for this purpose.

3.3.3 Clutch E

Fit 2 new O-rings 71.080 and 71.090 to cylinder E 71.010.

Fit disc spring 71.070 into cylinder E.



Insert disk package, beginning with end disk 71.060, and then alternately lined clutch disk 71050 and internal disk 71.040.

Insert corrugated spring 71.030.



Caution!

Adjustment work "clutch E",
Chapter 1.4.3

Press piston E 71.100 on to the cylinder.



Note:

The sealing element on piston E is vulcanized and cannot be replaced separately.



10068

Press support plate 71.110 with a new lipped seal ring 71.120 into piston E.



10069

Press down the baffle plate with the pressure pad 5x46 909 248 under the mandrel press and secure it with a new round wire ring 71.140.

Fit assembly sleeve AA00 637 173 over the hub of cyl. E for this purpose and install the round wire ring with tool AA00 609 919.

3.3.4 Oil supply

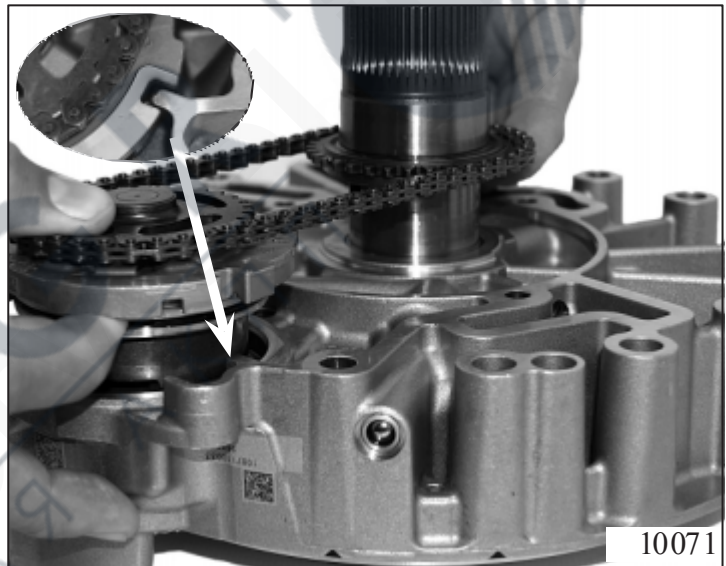
Fit or install 2 new O-rings and a new sealing element to the pump 10.040.

Note:

Pump: Test function / capacity (pressure) / leak



Fit the pump with chain 10.060 and drive sprocket 10.080 on the intermediate plate 10.010.

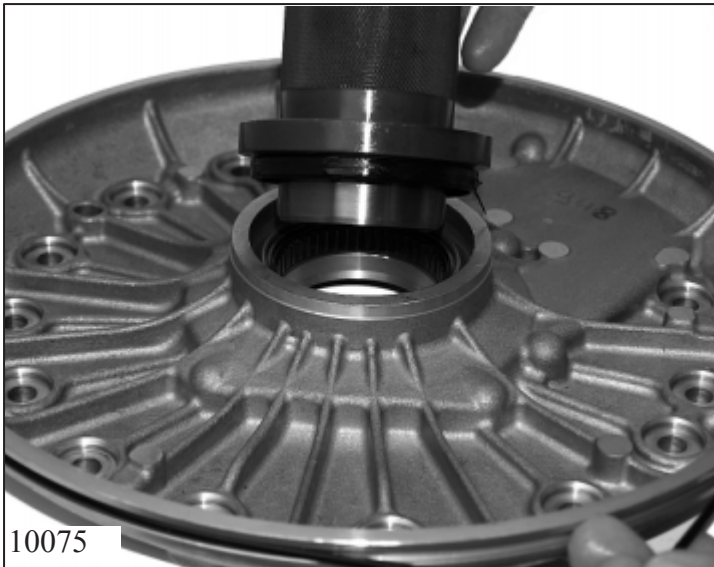


Push the pump securely on the intermediate plate using tool 5x46 003 913.

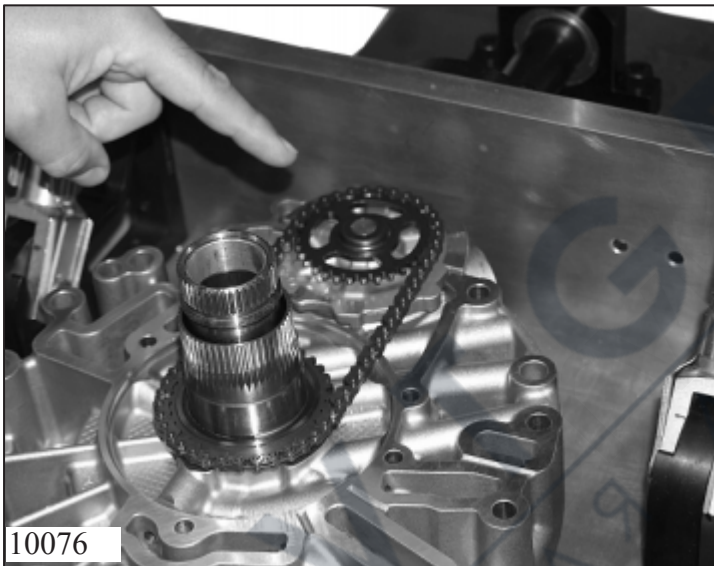


Note:

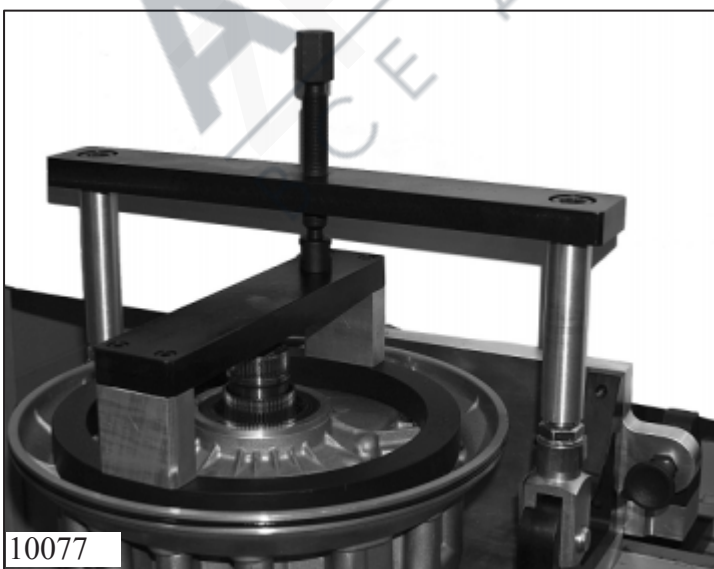
The size of the gap between pump and intermediate plate is about 2 mm.



Fit a new O-ring 10.200 on the centering plate, press the shaft sealing ring 10.100/140 into the centering plate using tool AA00 613 946.



Install intermediate plate into fixture AA00 602 553 in the position shown.



Mount centering plate and orientate according to the 13 circumferential connecting borings.

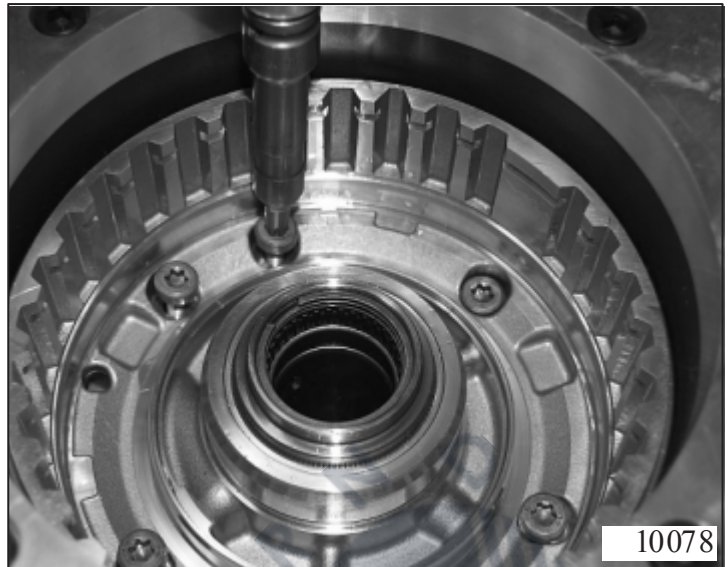
Mount hold-down device onto centering plate.

Press the centering plate with the hold-down device by rotation of the threaded spindle with a tightening torque of 11,0 Nm.

Loosen the locking of the fixture.
Turn unit 180° and screw in with 5 new
10.110 screws.

(Tightening torque: see Chapter 1.5)

Note:
See bolting sequence described in
Chapter 1.3.1.

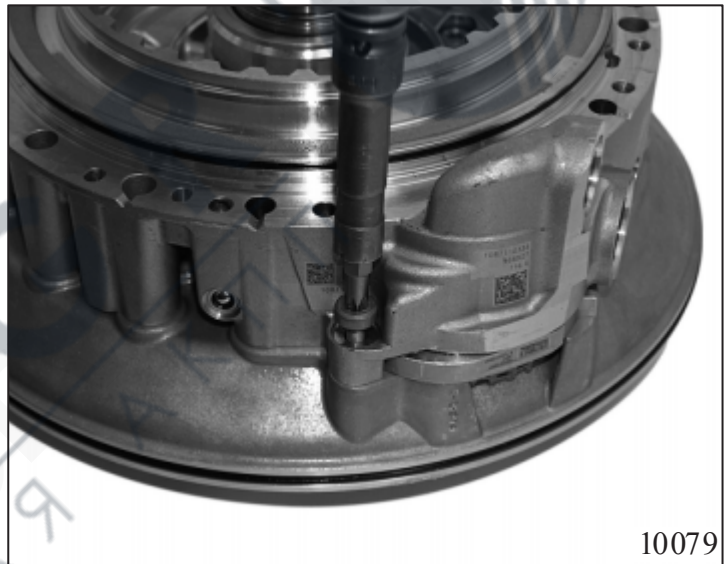


Turn unit 180°.
Loosen tension by turning the threaded
spindle and remove hold-down device.

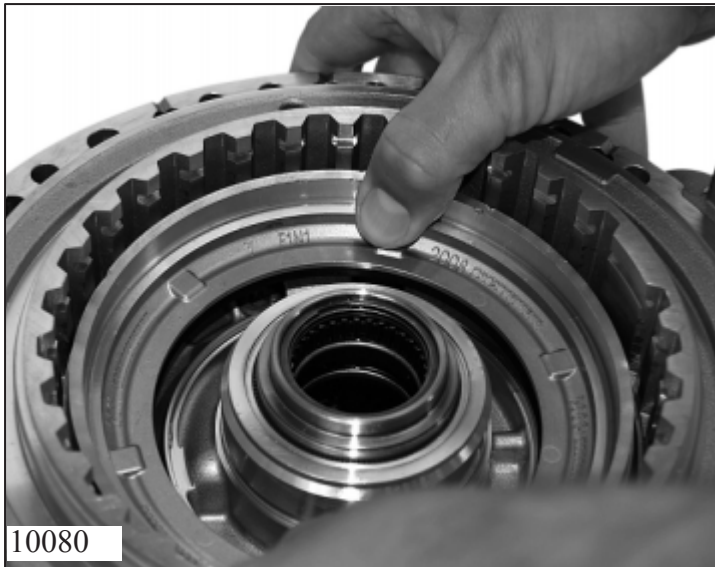
Remove oil supply unit.

Screw a new 10.110 screw into the inter-
mediate plate.

(Tightening torque: see Chapter 1.5)

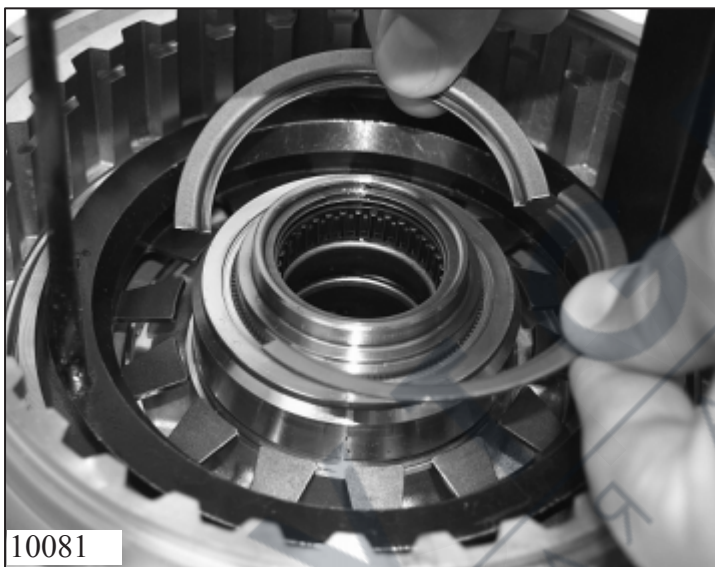


3.3.5 Brake A



Fit 2 new lipped seal rings 70.030 and 70.050 to piston A 70.010.

Press piston A into the oil supply (cylinder A).



Insert disc spring 70.070 into the oil supply (cylinder A), press it down under the mandrel press using pressure pad 5x46 001 502 and secure it with a split ring 70.080.



Fit an angle disc 70.100 and needle bearing 70.090 in the oil supply (cylinder A).

Clip axial needle bearing 70.220 onto disk carrier 70.110.

Insert disk carrier into oil supply (cylinder A).



Insert disk package beginning with corrugated spring 70.120, then alternately exterior disk 70.130 and lined disks 70.140.

Finally, insert end disk 70.150 and secure with snap ring 70.160.



Caution!

Adjustment work "brake A",
Chapter 1.4.4

3.3.6 Brake B



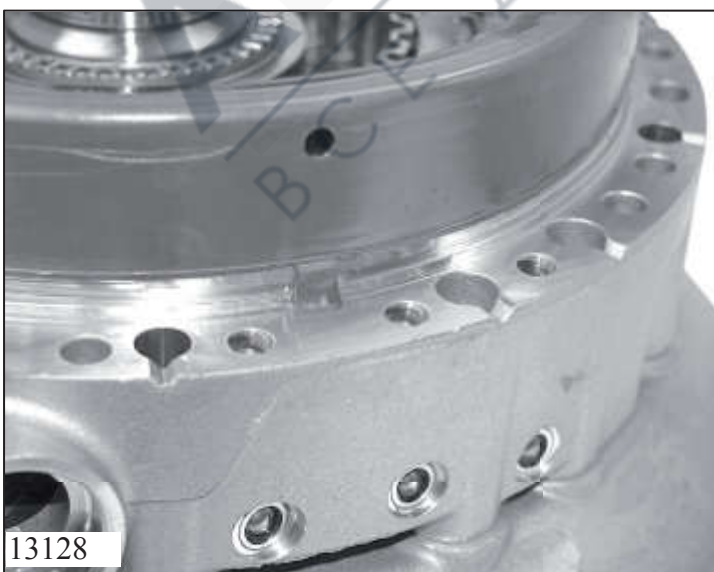
Mount new O-ring 72.140 onto intermediate plate.

Insert piston B 72.100 with new lip seal 72.110 and new profile gasket 72.120 into intermediate plate.



Insert cylinder B 72.130 over piston B into intermediate plate.

Note:
Position cylinder's centering nose in intermediate plate slot.

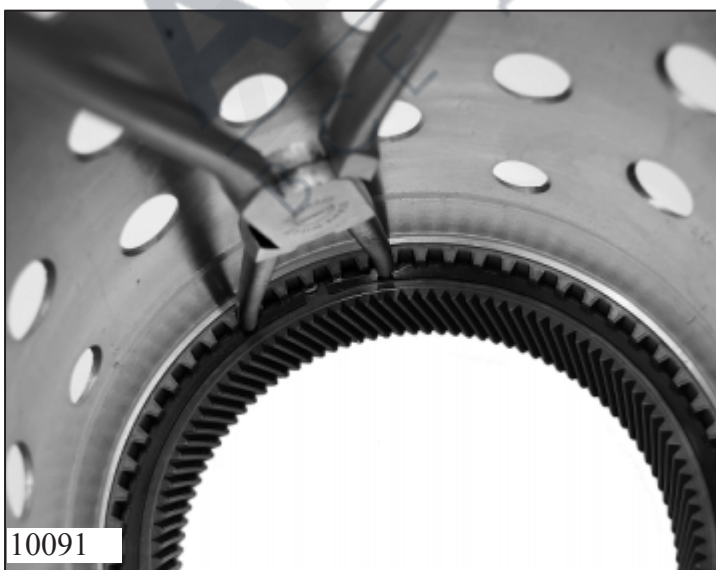
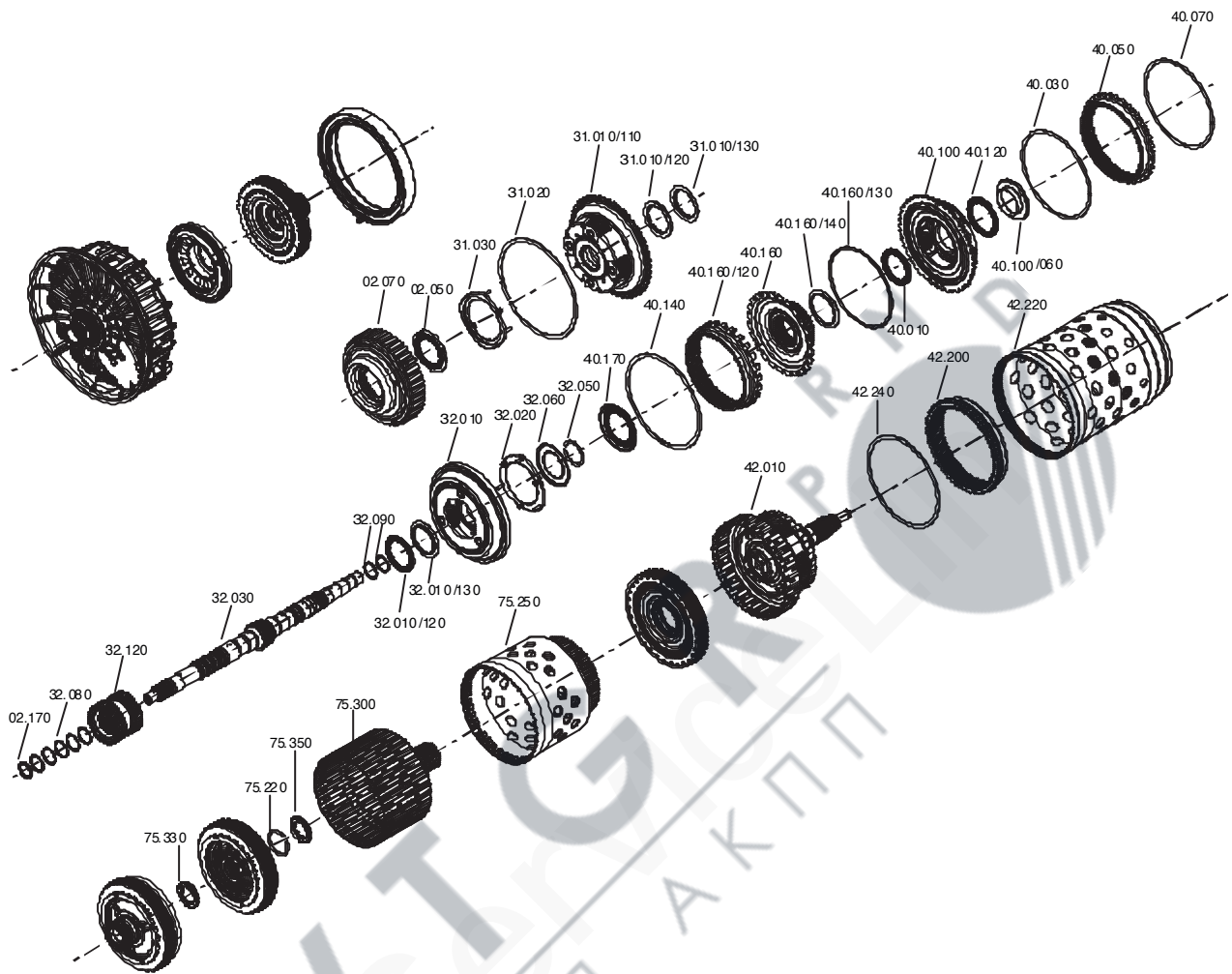


Firmly push cylinder B in.

Note:
Piston B must protrude over cylinder B.



3.4 Assembling tower



Fit the internal ring gear (gear set 4) 42.200, with the phase downwards in pot 1, 42.220.

Secure the internal ring gear with a new snap ring 42.240.

Insert pot 2 73.250 into receiving device 5x46 004 264.

Insert sun shaft 75.300 into pot 2.

Insert combination bearing 75.350 (small diameter) into sun shaft.



Insert clutch C into sun shaft.

Insert combination bearing 75.330 (large diameter) onto hub of interior multidisk carrier C.

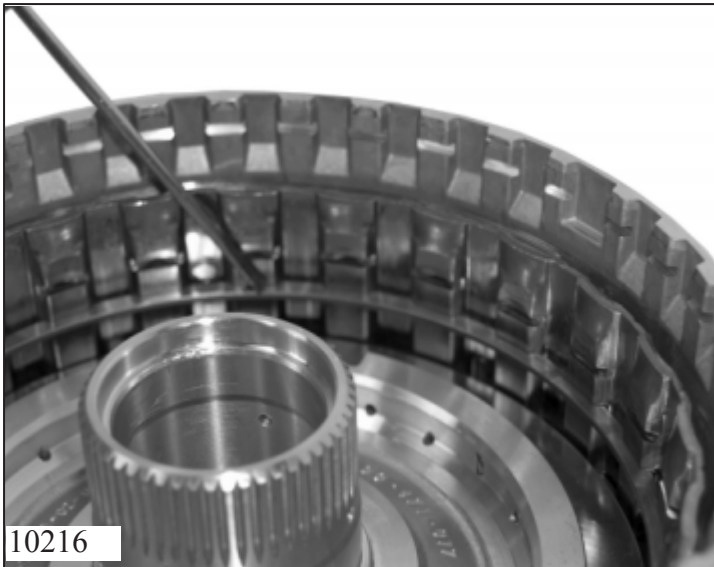


Note:
Align lined disks of clutch C before insertion.

Insert clutch E into sun shaft.

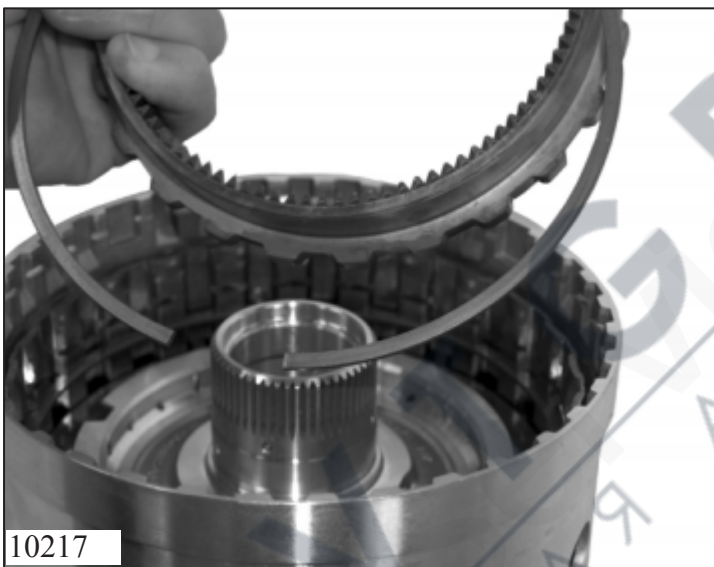


Note:
Align lined disks of clutch E before insertion.



Insert new snap ring 40.070 into sun shaft.

Note:
A clearance of about 12 mm remains from the upper edge of snap ring to end disk of clutch E.



Insert internal ring gear 40.050 into the sun shaft in the position shown and secure with snap ring 40.030.

Fit needle bearing 40.120 with angle washer 40.100/060 onto clutch E.



Insert planet carrier 3, 40.100, into the internal ring gear.

Secure pot 2 with new snap ring 40.160/130.

Take finished unit out of receiving device.

Note:
Position snap ring as shown in image and drive in with tool AA00 548 808.

Insert pot 1 into receiving device 5x46 004 264.

Insert output shaft 42.010 in pot 1.



Insert finished pot 2 into pot 1 while rotating.

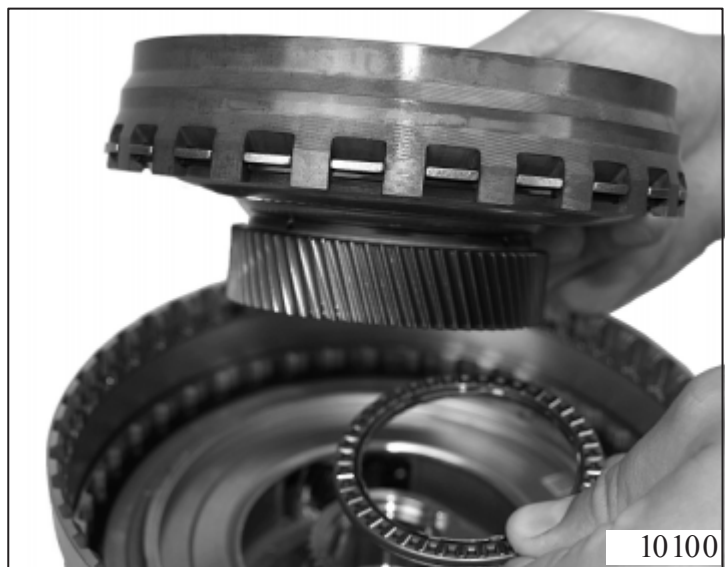


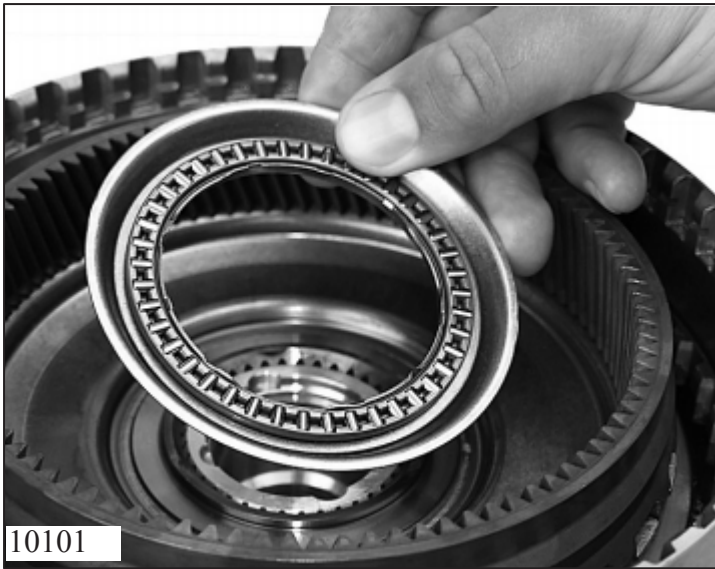
Fit needle bearing 40.010 with angle washer onto hub of planet carrier.

Assemble internal ring gear 2, 40.160/120, and sun gear 3, 40.160, and secure with new snap ring 40.140.

Clip angle washer 40.160/140 into sun gear 3.

Insert unit into gear set 3.





Fit needle bearing 40.170 with beveled angle washer onto sun gear.



Raise 5 new rectangular rings 32.080 and 2 new rectangular rings 32.090 onto input shaft 32.030.

Insert input shaft into receiving device AA00 686 190.

Fit planet carrier 2, 32.010, onto input shaft.



Secure planet carrier with new snap ring 32.050.

Use installer 5x46 004 066 for this.

Clip oil slinger 32.020 onto planet carrier.

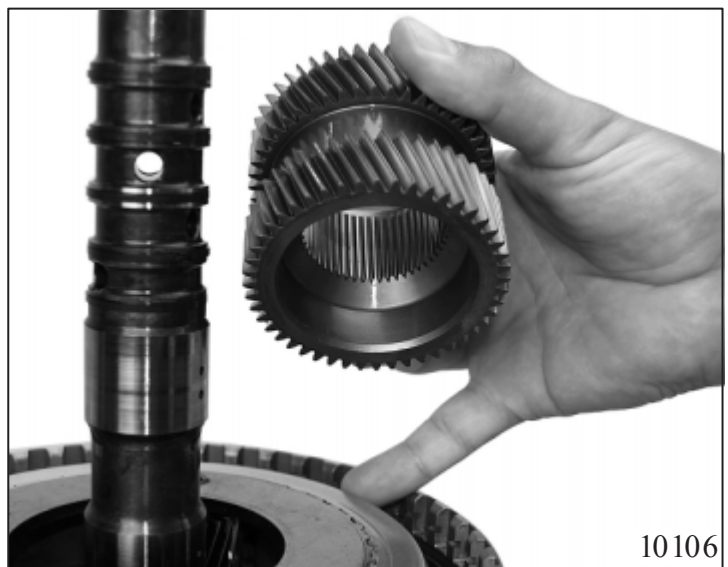
Clip angle washer 32.060 onto planet carrier.



Insert input shaft into tower.



Insert sun gear (1-2) 32.120, with deep inside thread downward, into planet gear 2.



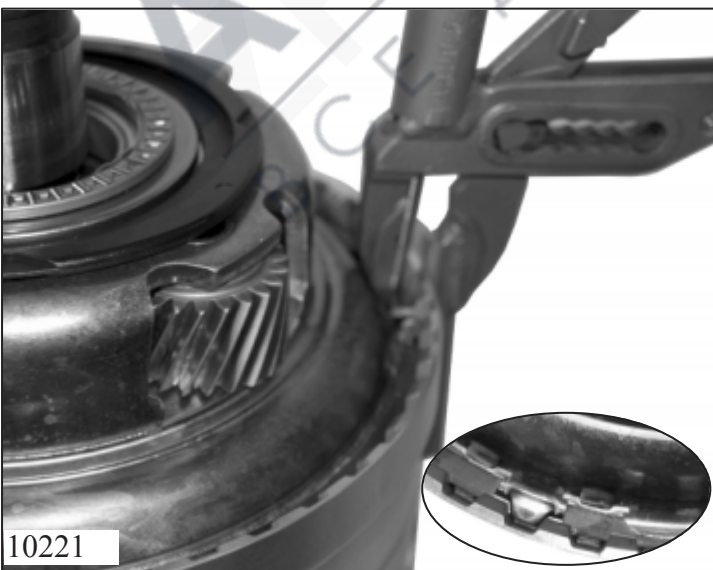


Fit planet carrier over sun gear (1-2).

Clip oil slinger 31.030 onto planet carrier.



Fit needle bearing 02.050 with angle washer, the side with the 3 curved noses downward, onto the planet carrier.



Pull pot 1 upward and secure with new snap ring 31.020.

Use tool AA 00 548 808 for this.

Note:
Position snap ring as shown in image.

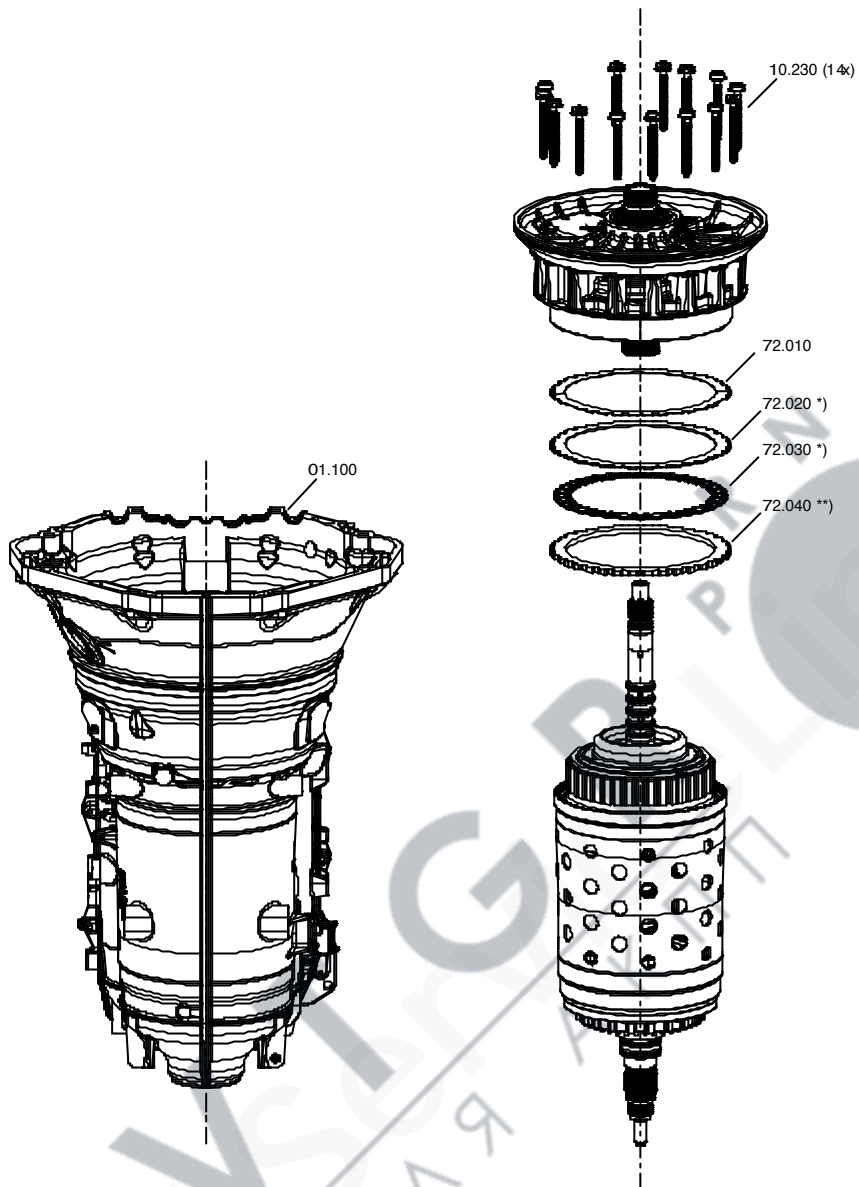
Fit internal ring gear 02.070 with caulked angle washer onto the planet carrier.

Insert old shim for transmission clearance 10.210.



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3.5 Installing tower and oil supply



3.5.1 Tower

Turn the transmission so that the converter side is at the top.

For new transmission housing only:
Drive locating pin 01.030 with tool AA00 615 414 for oil supply into the transmission housing.

Place the tower lifter 5x46 003 957 on the input shaft and lock it with a securing pin.

Fit the tower into the transmission housing using lifting equipment.



Insert brake B beginning with end disk 72.040, then alternately lined disk 72.030 and outer clutch disk 72.020, and finally spring clutch disk 72.010.



Caution!

Adjustment work "brake B,"
Chapter 1.4.5

3.5.2 Oil supply

Fit the oil supply in the transmission housing using lifting tool AA00 549 802 and press together.

Note:

Apply Vaseline to the transmission housing sealing surface.

Caution!

Transmission clearance setting work,
Chapter 1.4.6

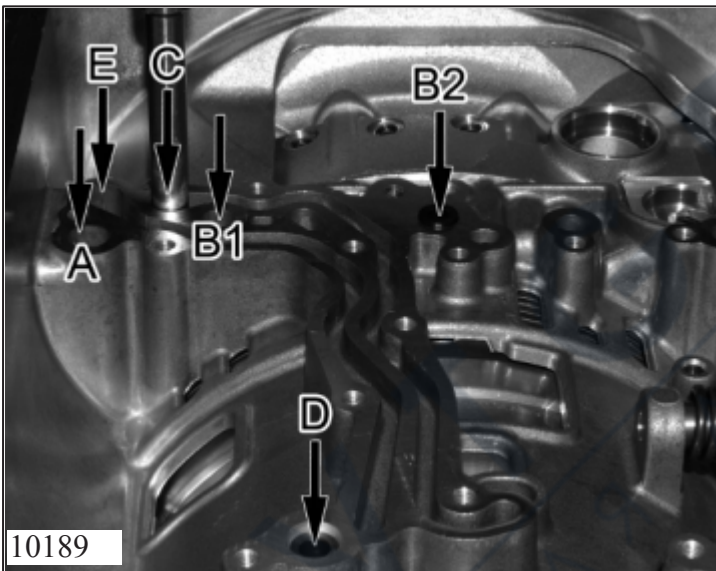




Secure the oil supply with 13 new screws 10.230.

(Tightening torque: see Chapter 1.5)

Note:
See bolting sequence described in Chapter 1.3.1.



Turn the transmission so that the oil pan side is at the top.

Insert eventually new sealing sleeve 01.020 in gearbox housing (dependent on nozzle of air gun).

Leak test the clutches with compressed air (see figure).

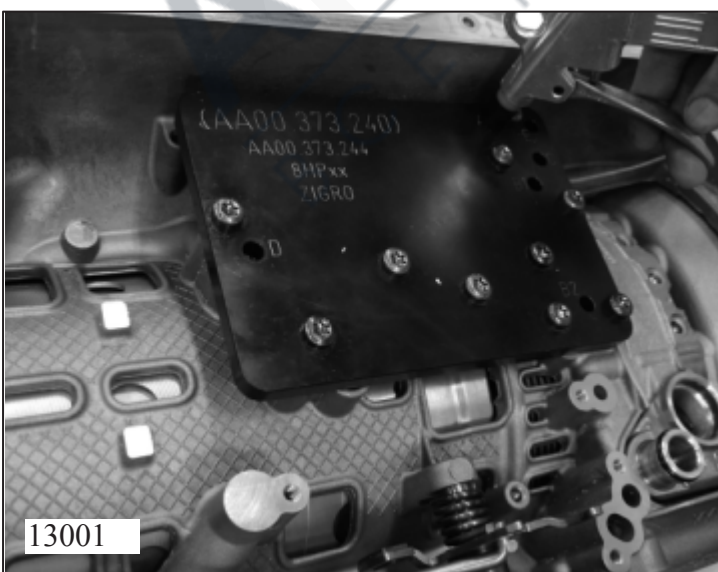
alternative:

Bolt form-fittingly sealing device AA00 373 240 with 10 screws in indicated position.

Leak test the clutches with compressed air (see figure).

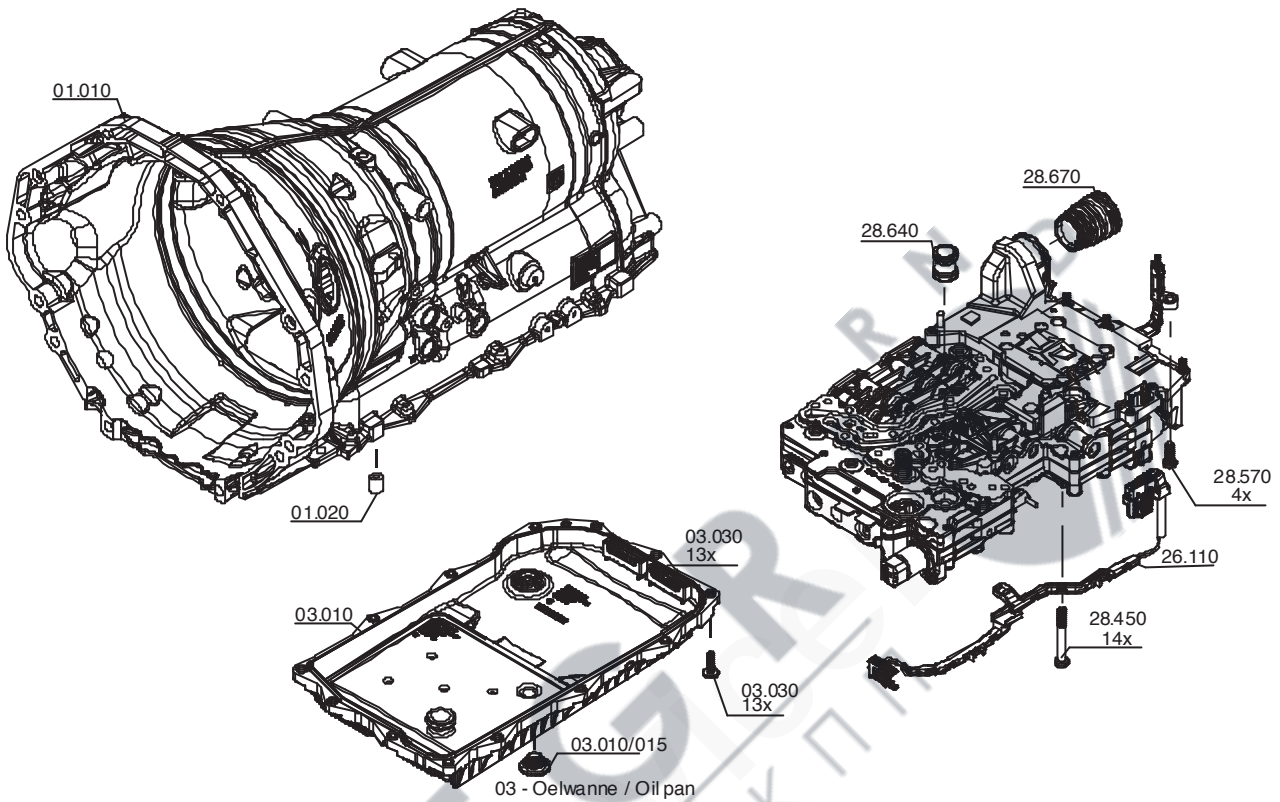
Dismount sealing device.

(Tightening torque: see Chapter 1.5)

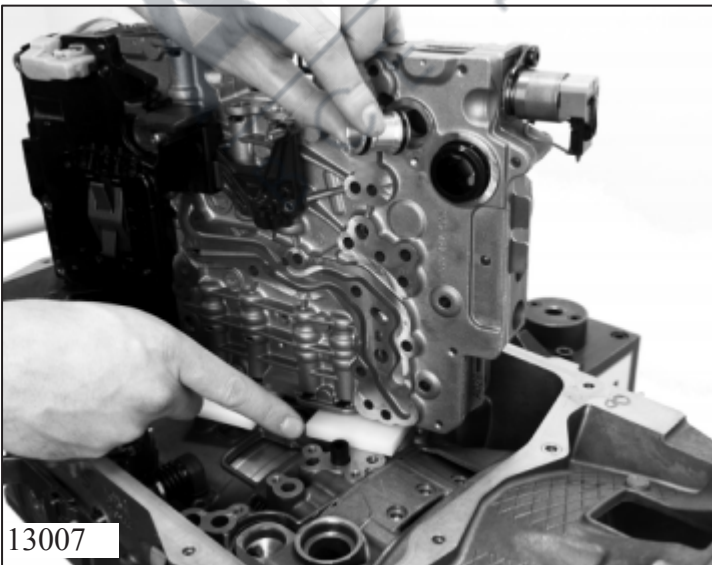




3.6 Installing the mechatronic CU and oil sump



3.6.1 Mechatronic CU



Turn the transmission so that the control unit side is at the top.

Fit a new sealing sleeve 01.020 in the transmission housing.

Fit a new pressure pipe 28.640 in the mechatronic CU unit.

Position the mechatronic CU unit, attaching and orientating the parking disk in the mechatronic CU, and secure it with 14 screws 28.450.

(Tightening torque: see Chapter 1.5)

Note:

Press the mechatronic CU unit against the transmission housing in a form-locking way.

See bolting sequence described in Chapter 1.3.1.

(only M-Type)

Position the mechatronic CU unit, attaching and orientating the selector valve and the position sensor in locking disk in the mechatronic CU, and secure it with 14 screws 28.450.

(Tightening torque: see Chapter 1.5)

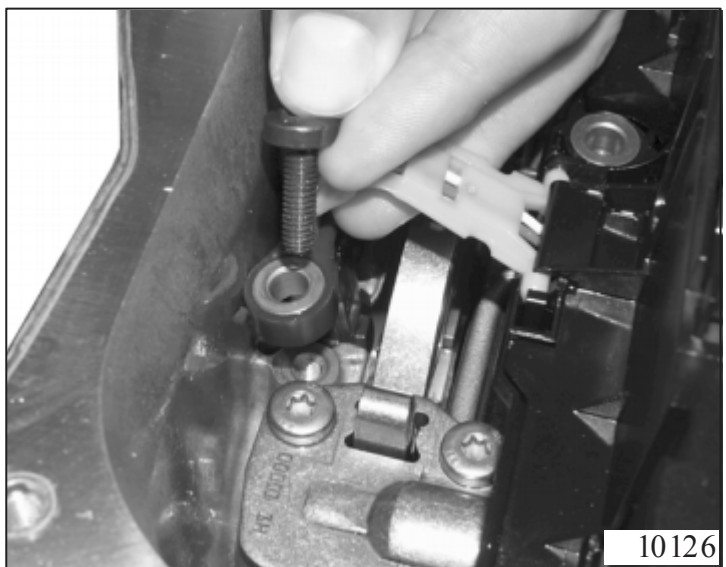
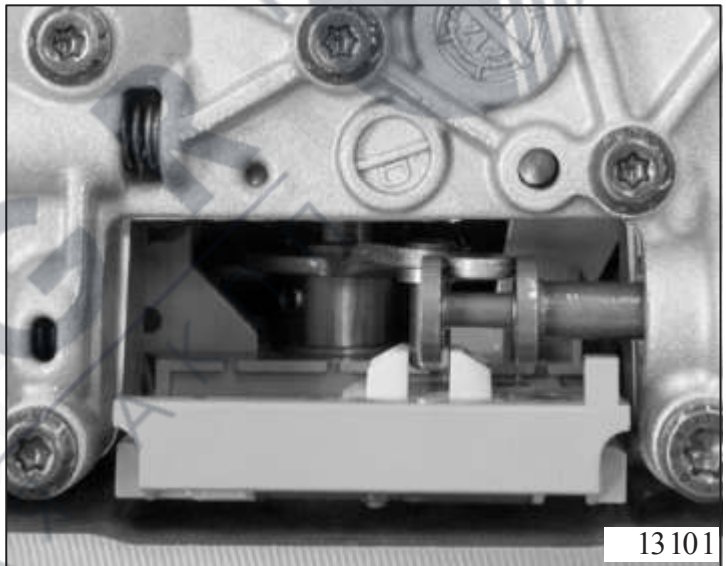
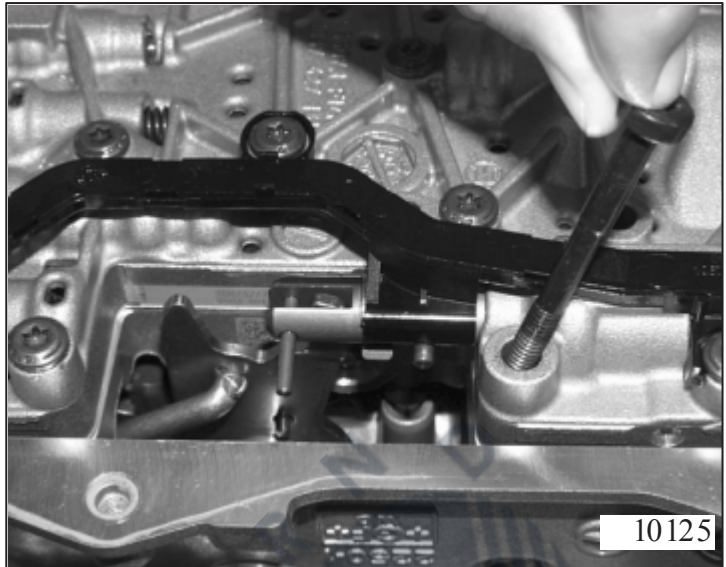
Note:

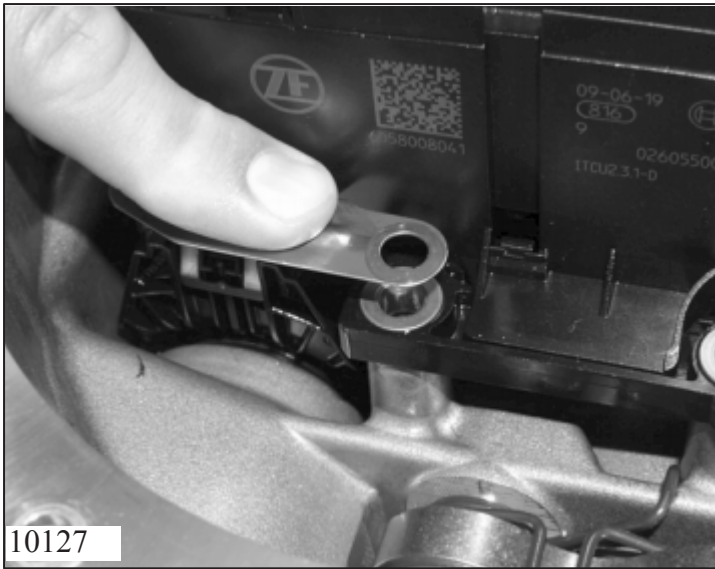
Press the mechatronic CU unit against the transmission housing in a form-locking way.

See bolting sequence described in Chapter 1.3.3.

Fit the speed sensor into the transmission housing flute and secure it with a screw 28.570.

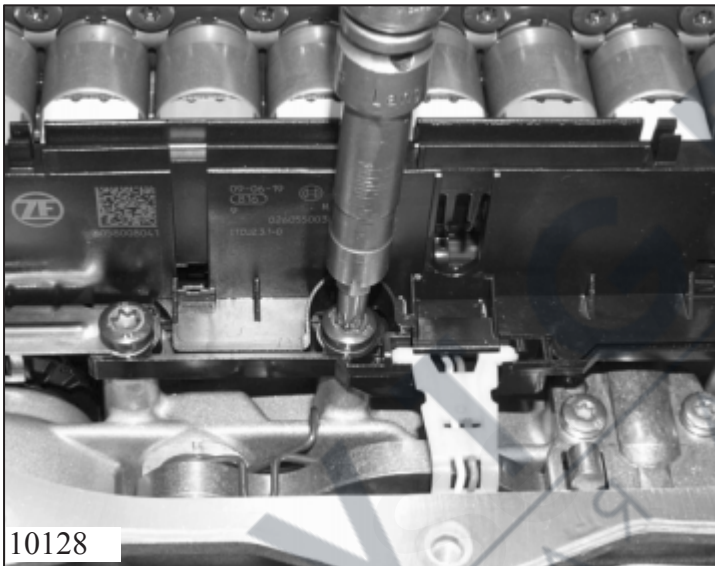
(Tightening torque: see Chapter 1.5)





10127

Fit a new guide sleeve 28.670 using tool AA00 548 098 and secure it with the lug.



10128

Screw in 3 screws 28.570 for the mecha-
tronic CU unit.

(Tightening torque: see Chapter 1.5)

Note:

*Gearbox with oil volume accu = 2
screws.*

Only gearbox with oil volume accu:



11005

Fit a new O-ring in pressure socket from
oil volume accu.

Insert oil volume accu in gearbox
housing.

Screw in 1 screw 28.450 and 2 screws
28.570 for the oil volume accu.

Connect the Cable connector from oil
volume accu.

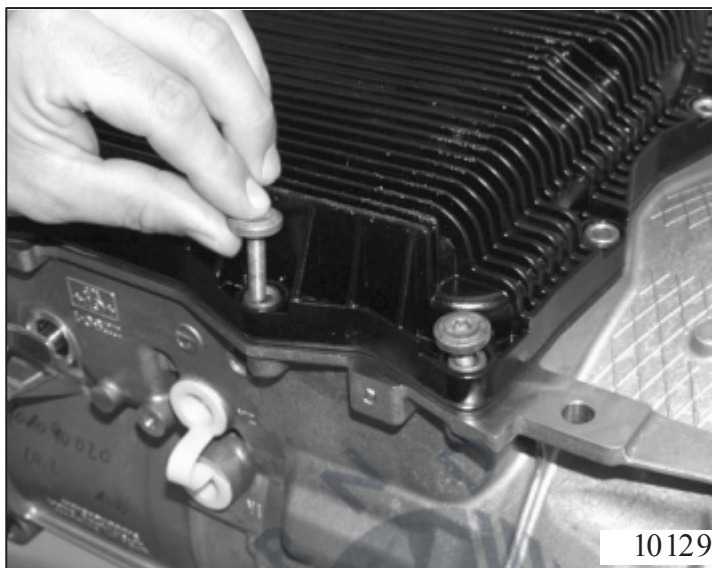
(Tightening torque: see Chapter 1.5)

3.6.2 Oil sump

Fit the new oil pan 03.010 and secure it with 13 new screws 03.030.

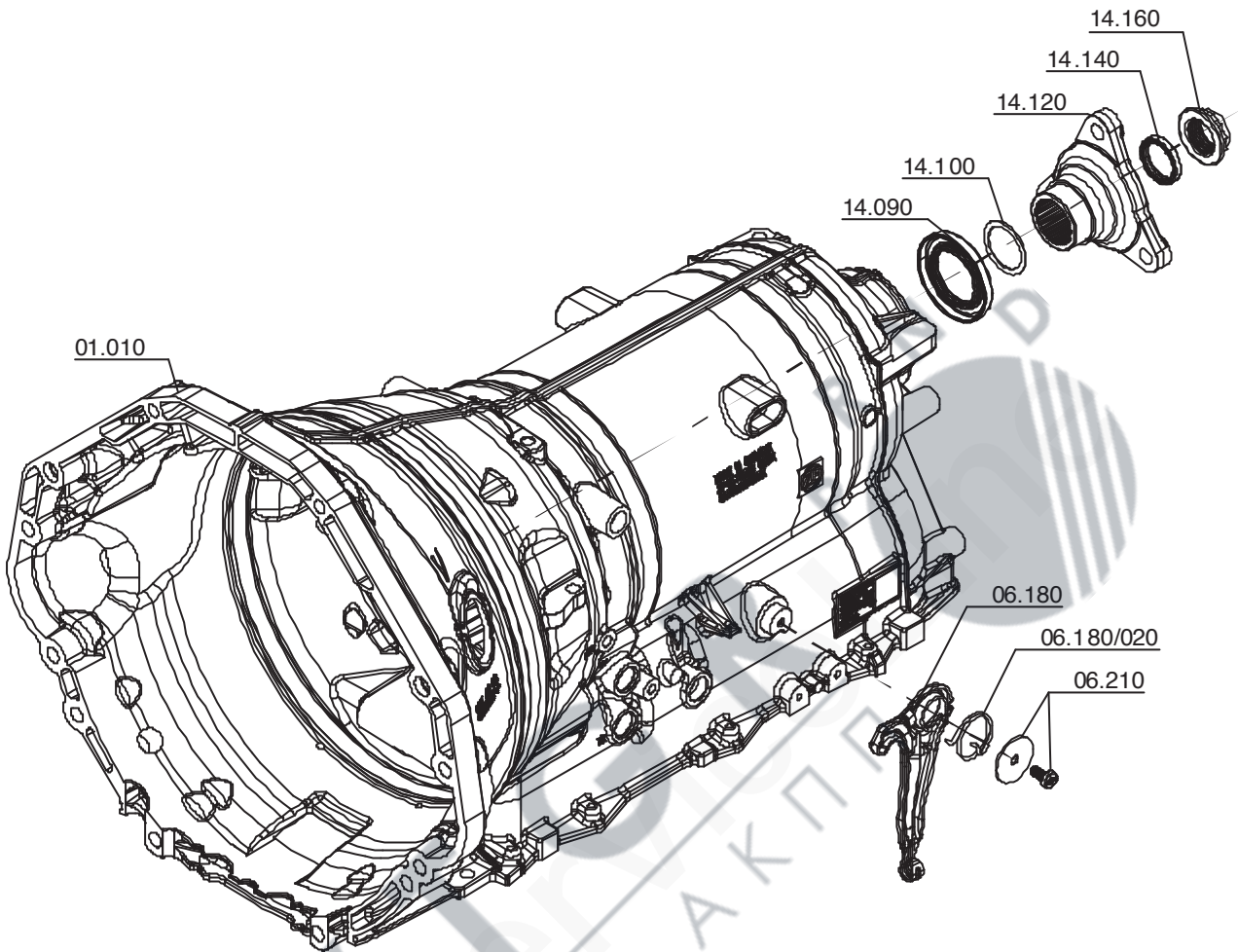
(Tightening torque: see Chapter 1.5)

Note:
See bolting sequence described in Chapter 1.3.1.



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3.7 Installing output and lever for emergency release



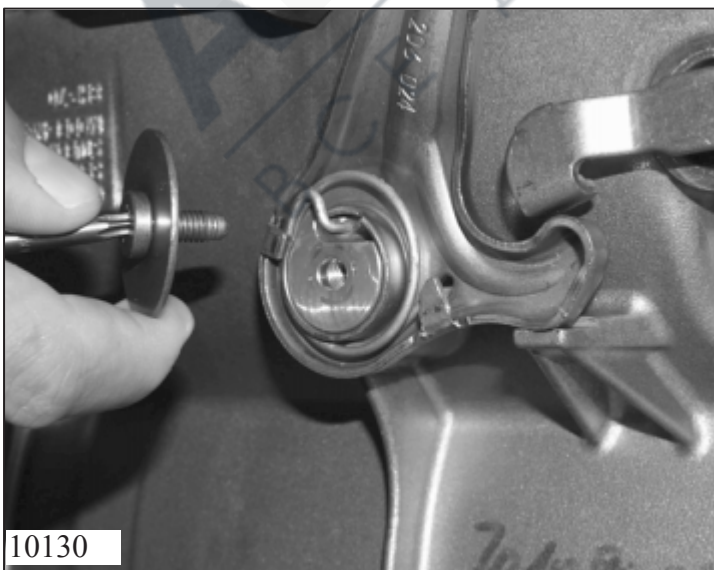
3.7.1 Mount lever for emergency release

Detach retaining tool from selector shaft.

Position lever 06.180, install leg spring 06.180/020, and attach with screw and disk 06.210.

(Tightening torque: see Chapter 1.5)

Note:
Lever and screw are eliminated on BMW transmissions with the new emergency release.



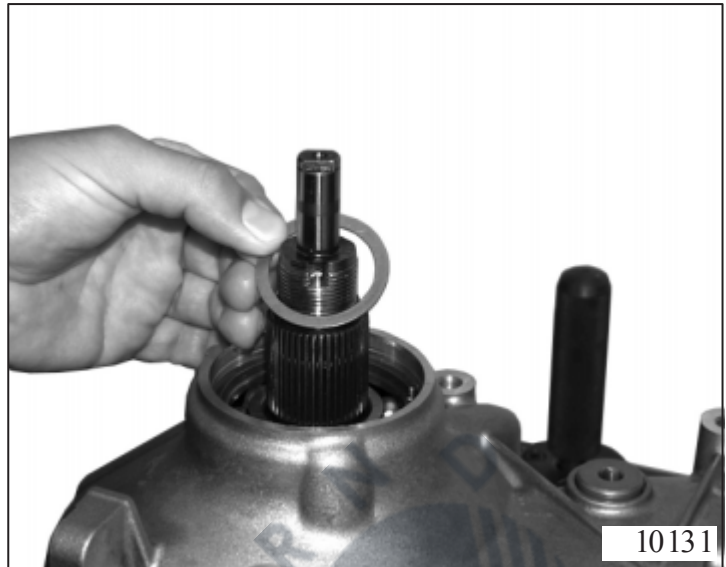
10130

3.7.2 Installing the output flange

Turn the transmission so that the converter side is at the bottom.

Insert spacer disk 14.100.

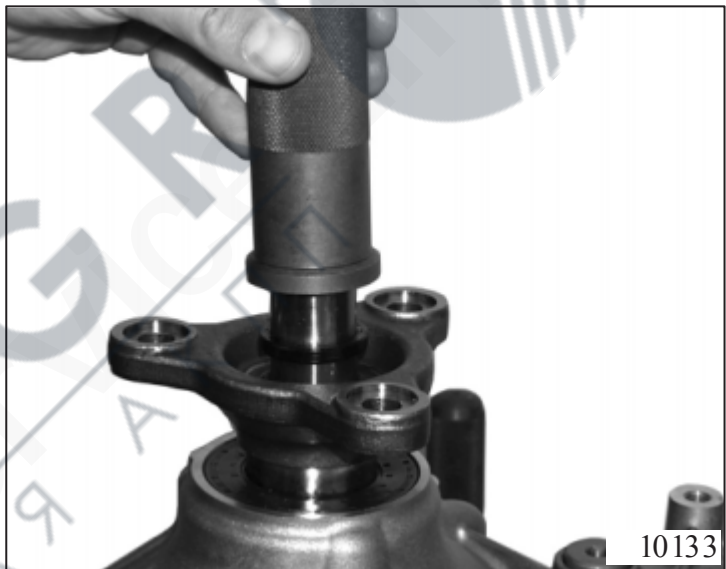
Drive the shaft sealing ring 14.090 into the output flange using tool 5x46 002 567.



Place the output flange 14.120 on the output shaft.

Snap the insertion tool 5x46 012 798 over the output shaft.

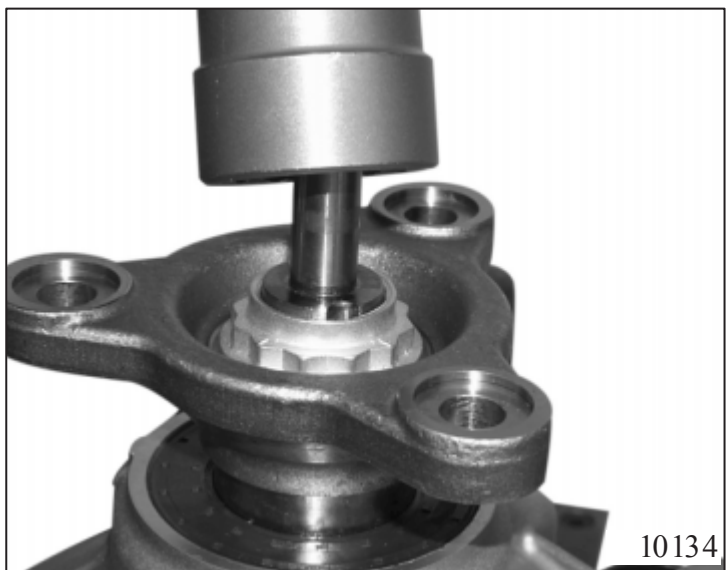
Drive the shaft sealing ring 14.140 into the output flange using tool 5x46 022 849.



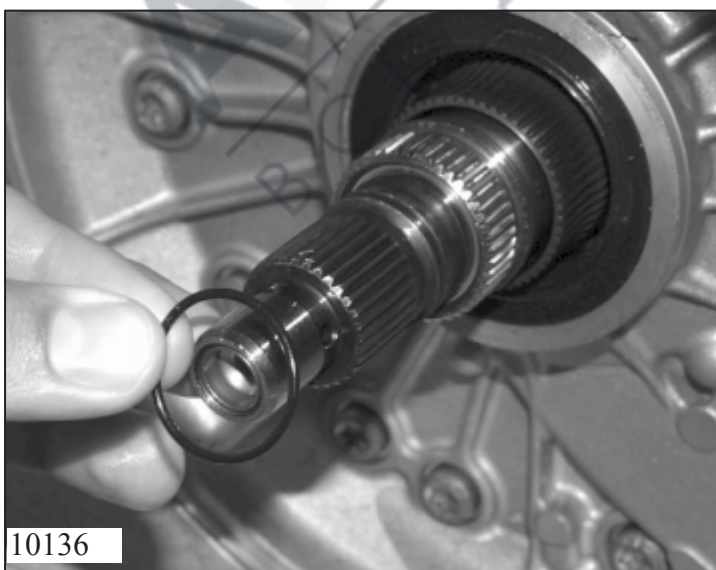
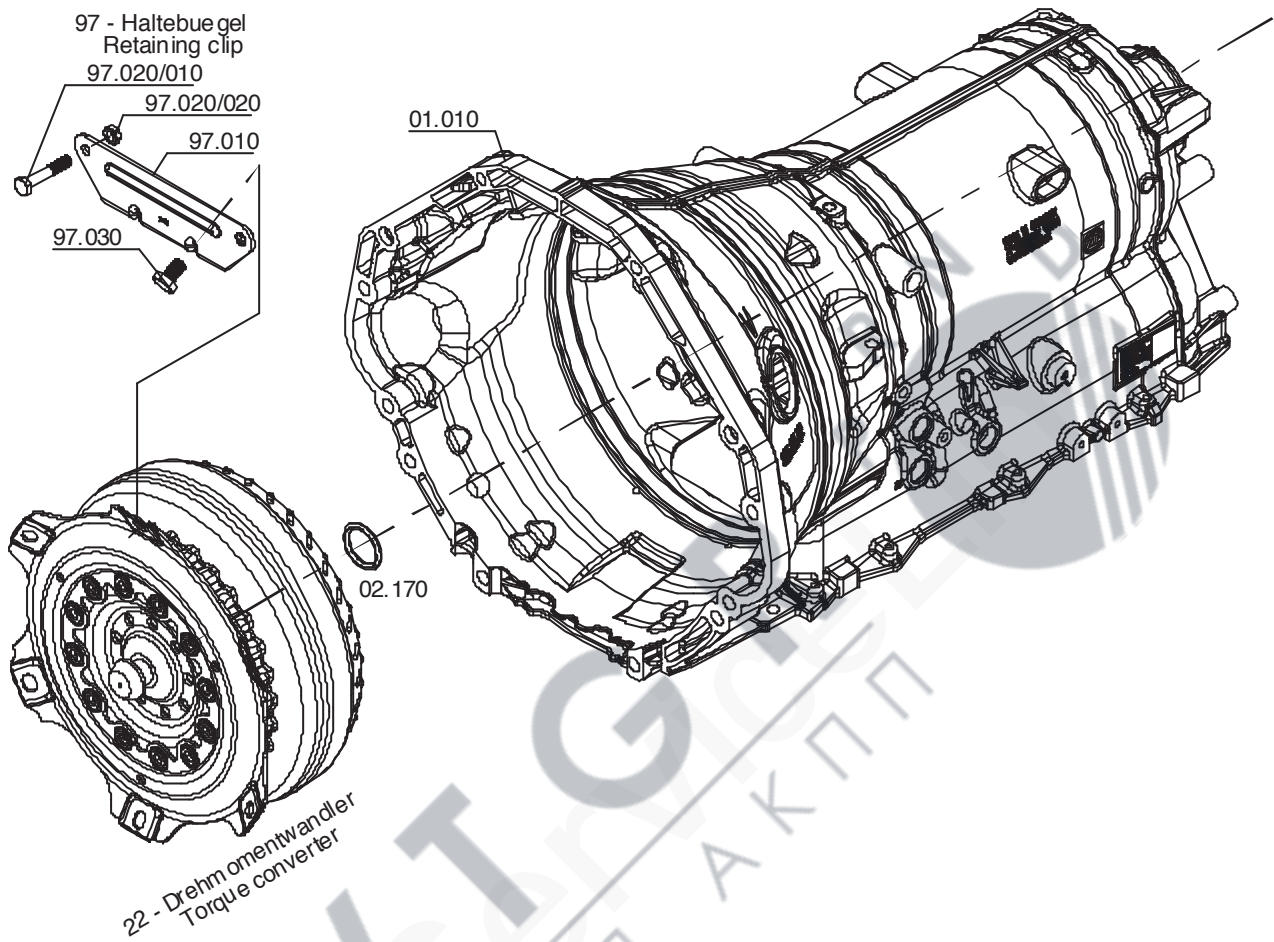
Remove the insertion tool.

Tighten the collar nut 14.160 using tool 5x46 002 456 and caulk it into the groove in the output shaft using peening tool 5x46 004 174.

(Tightening torque: see Chapter 1.5)



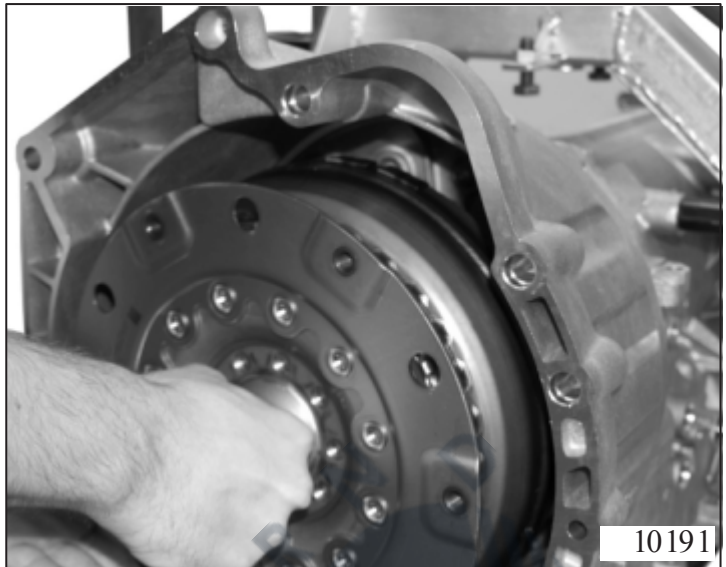
3.8 Installing the torque converter



Position transmission horizontally.

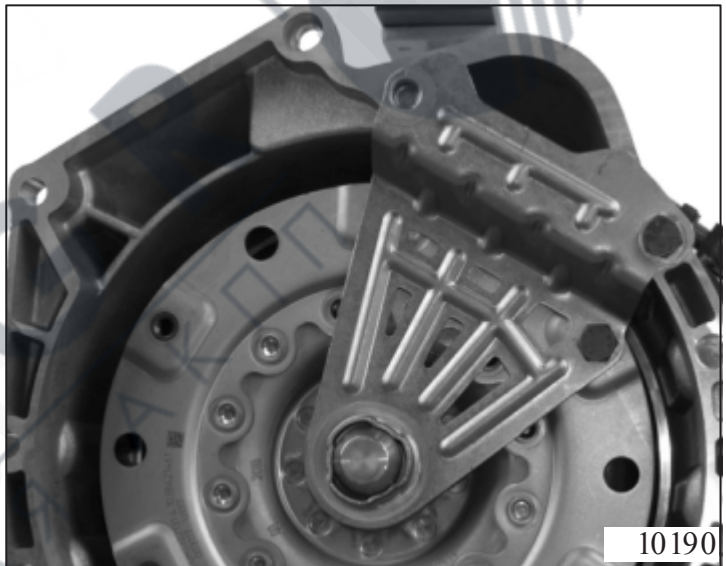
Fit the O-ring 02.170 on to the input shaft.

Fit the torque converter .320 by hand or using the lifting tool 5x46 001 539.



Secure the converter holder bracket 97.010 using screw 97.030 and a screw with a hexagonal nut 97.020 to the converter and transmission housing.

(Tightening torque: see Chapter 1.5)



Fill gearbox with gearbox oil.

Screw in new oil fill plug.

(Tightening torque: see Chapter 1.5)

Note:

Regard list of lubricants and oil filling specification.

Revisions			
Rev A	Base of document		2011/07/15
Rev B	Tool AA00 686 190 in RA registered Pos.nr. of the sealing elements of cell pump eliminated	S. 3.3/5 and S. 1.7/9 S. 3.2/8	2012/02/28
Rev C	Adjusting procedure revised, new graphics Screwing instruction Intermediate plate, Tool E6 modified New structure of workflow Chapter 1.4.7 revised, diverse graphics replaced Proofreading with changes	S.1.4/1 – 1.4/24 S. 1.3/2 S. 1.7/2 div. Chap. 1.4.7 and div. Compl. document	2012/11/15 2013/01/09 2013/02/05 2013/04/29 2013/07/01
Rev D	Press-in tool shaft seal output modified Tool AA00 566 429 in RA registered	S. 1.7/13 S. 2.7/3	2013/12/02
Rev E	Graphic transmission ratio inserted Change of oil flow diagrams	S. 1.2/2 S. 1.8/1 – 1.8/5	2014/04/25
Rev. F	Contents table 2.1.2 Typesetting, typografic corrections and layout	div.	2015/09/22





ZF Friedrichshafen AG

ZF Services

Mutter Str. 160

66117 Saarbrücken

Deutschland/Germany

Telefon: +49 681 920 0

www.zf.com

Order-No. 1090 751 102

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