REPAIR MANUAL

6 HP-26

ZF GETRIEBE GMBH SAARBRÜCKEN

Version 02/11/01
CD

subject to alterations

Printed in Germany

Contents

Advance Information

These instructions contain the procedure for repair work on the complete transmission.

The repair instructions will only be understood sufficiently in combination with ZFS training. Neglecting this could lead to installation errors.

All disassembly and assembly work is listed in chronological order.

Photos and illustrations for the various applications are general in character and not binding for every individual case.

Important changes and those relevant to specific applications that have to be considered during repair work are announced in *Technical Circular Letters* and training courses.

During the repair work ELCAT regulations and specifications must be observed.

Please note the following:

- Seals, e.g. O-rings, shaft sealing rings, gaskets and filters must always be renewed.
- During assembly, all O-rings, cylindrical rings and other sealing rings must be greased with Vaseline before mounting.
- All bearings must be slightly oiled when installed.
- Exchange all lining and steel disks in transmissions with higher distance readings (> 80,000 kilometers / 50,000 miles).
- After clutch / brake damage, converters, oil pipes and oil coolers must be cleaned out thoroughly and sufficiently with an appropriate cleaning agent.
- After damage to brake F, if the distance reading is high (> 80,000 km / 50,000 miles), piston F must be renewed.

The following requirements should be satisfied before starting the repair work:

- Availability of the necessary special tools otherwise assembly faults are possible.
  Chapter 1.8 lists the complete set of special tools.
- Availability of a suitable transmission test rig.
  For the necessary test values, please refer to the *Technical Circular Letters*.

Note:

In the instructions the shift control unit is considered as a complete unit. It must not be dismantled without special experience, but should be exchanged as a complete unit.

Warning:

The transmission is filled for life with oil.

An oil change is not necessary before 160 000 km or 10 years.

Make sure that the transmission is delivered with the oil quantity and oil type specified in the relevant part list document (see ELCAT).
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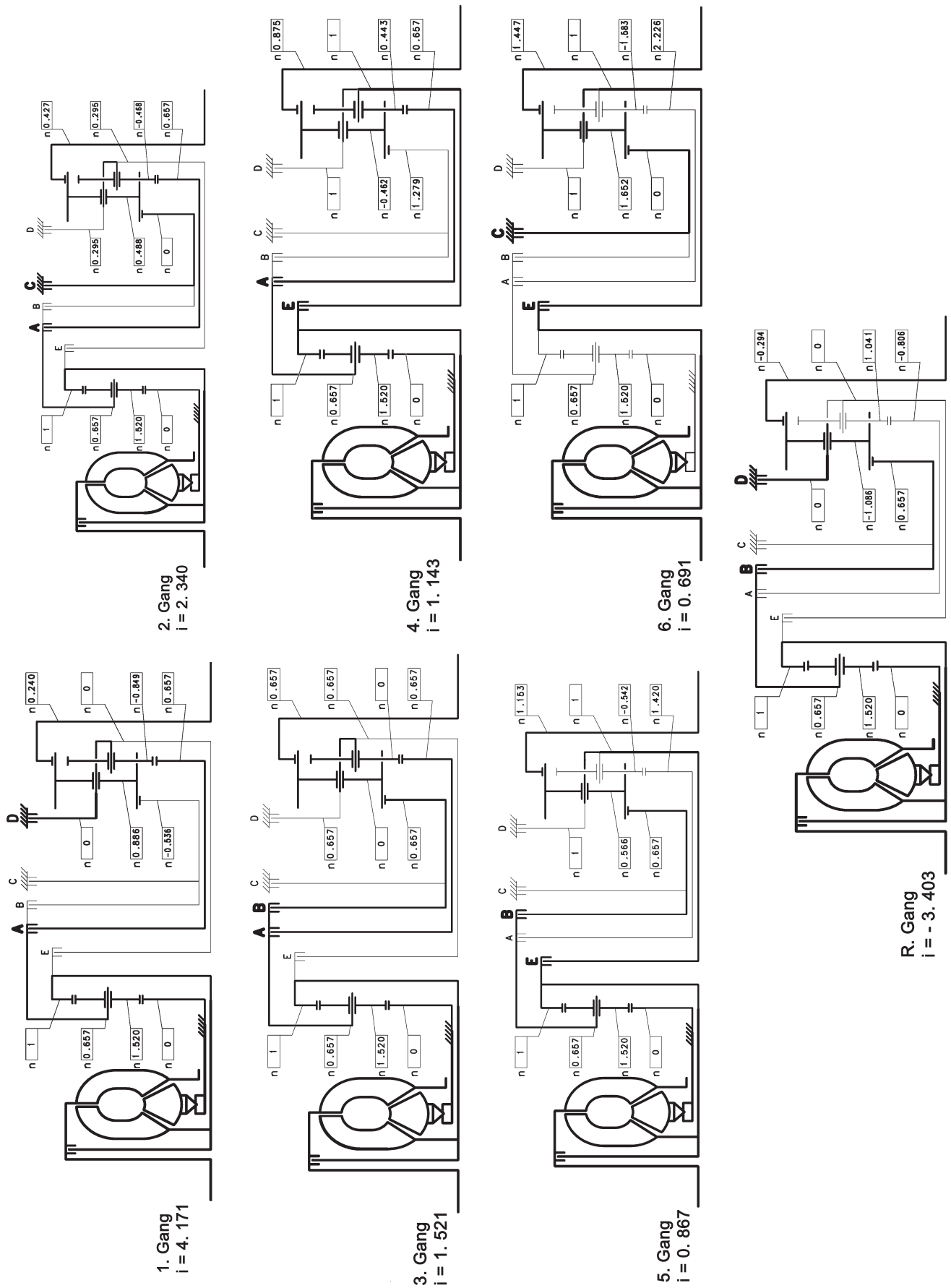
Techn. KD	Techn. Documentation	KD Training
Bach	***Reus***	***Schultz***

1. General
1.1 Illustration of transmission

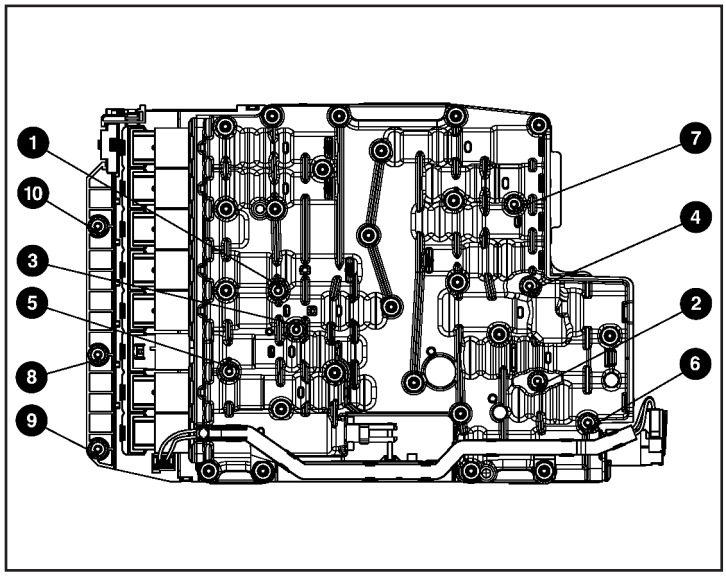
1.2 Power flow diagram



1.3 Specifications

1.3.1 Screw specifications

1.3.1.1 Mechatronic type E



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

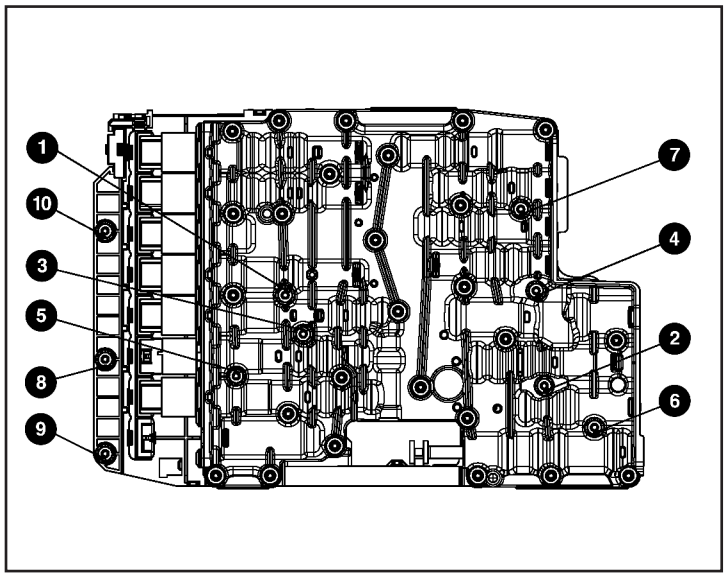
1 ⇨ 2 ⇨ 3 ⇨ ... ⇨ 10

Important!

Specification 1068 700 152

(Tightening torque: see Chapter 1.5)

1.3.1.2 Mechatronic type M



Tighten screws of thetype M mechatronic in the order of the numbering (see diagram)

1 ⇨ 2 ⇨ 3 ⇨ ... ⇨ 10

Important!

Specification 1068 700 152

(Tightening torque: see Chapter 1.5)

1.4 Adjusting procedure
1.4.0 Measuring clutch packs (procedure)

98009

Place the two intermediate pieces 5p01 050 329/5p01 060 329 on the marked position on measuring fixture 5p01 000 330.

98011

Using the knurled screw, turn adjusting device 5p01 001 458 to the upper limit.

Attach force measuring unit 5p01 000 329 to adjusting device.

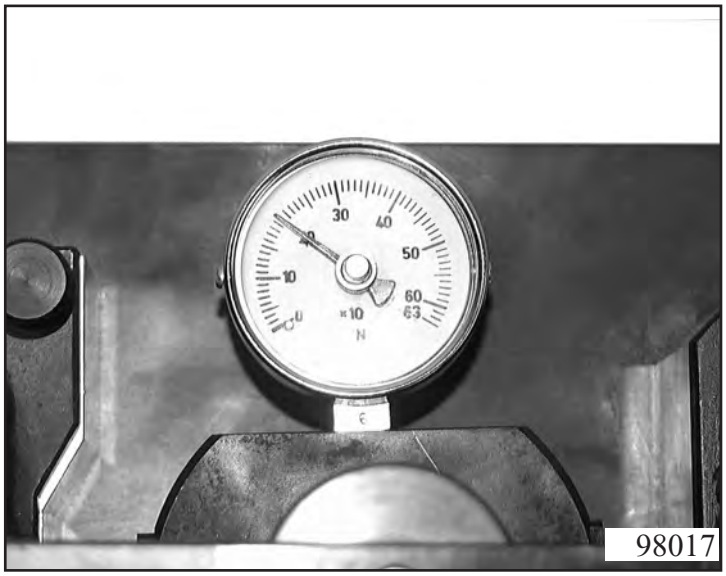
98012

Fasten it with 4 knurled screws to the measuring fixture using the intermediate pieces.

Using a fixing pin, connect measuring plate 5p01 040 330 with the force measuring unit.

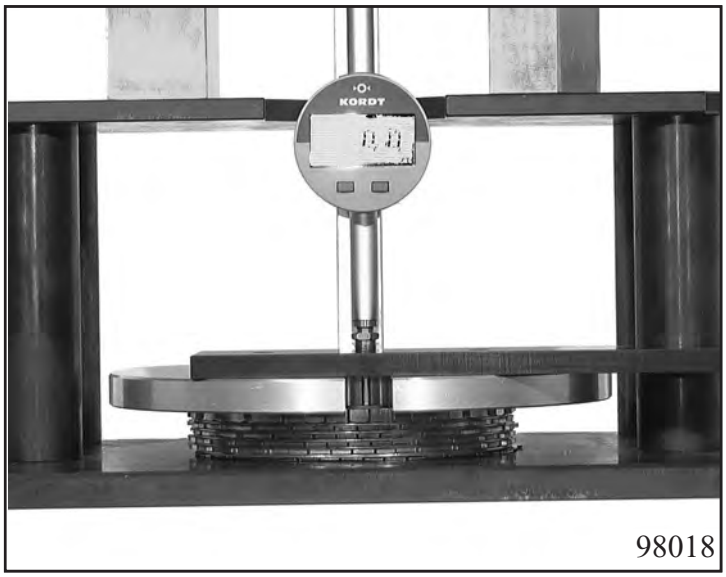
Using the knurled screw, clamp the clutch pack to be measured (with steel disc on the top and corrugated disc if there is one on the bottom) in the device at 200N.

Check the value on the force measuring unit's display.



98017

Then place measuring bar 5p01 060 330 on the measuring plate, put the dial gauge's measuring base in the measuring plate's groove on the top disc of the set, and set the dial gauge to 0.



98018

Now use the measuring bar to measure down to the base plate.

Read the measurement value ⇨ $\mathbf{M_X}$

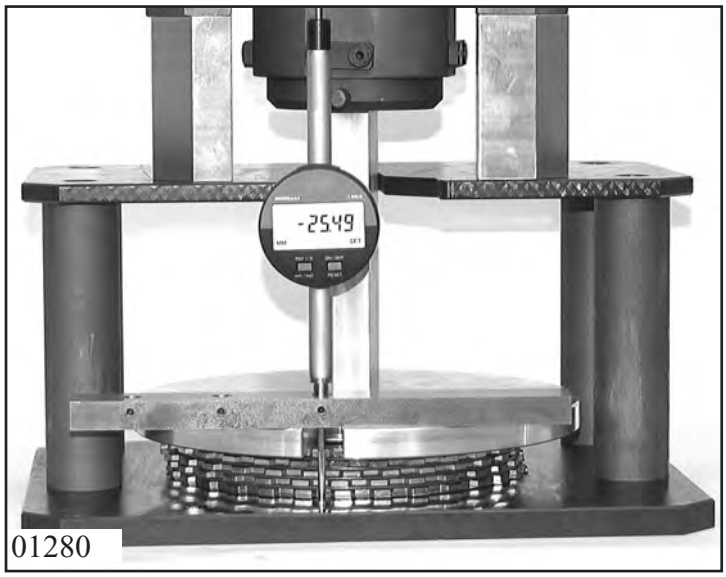
Note!
In each case, the **X** index in $\mathbf{M_X}$ stands for the brake/ clutch clutch packs that are put in (A, B, C, D, E).


01278

1.4.1 Clearance setting, brake C (snap ring)

Determine space requirement $\mathbf{E_C}$ for brake C with measuring bar 5p01 000 330.
To do this, place measuring bar 5p01 000 330 on cylinder edge of brake C.
Place measuring base on the topmost point on the disk supporting area at the piston and set dial gauge to “0”.
Pull measuring sensor upwards, insert into snap ring groove and press against the top edge of the groove.

Read measured value off at dial gauge ➪ $\mathbf{W_C}$



01280

Determine thickness $\mathbf{M_C}$ of brake C clutch pack according to **Chapter 1.4.0 Measuring clutch pack**.

➪ $\mathbf{M_C}$

Space requirement $\mathbf{E_C}$ is determined from measured value $\mathbf{W_C}$ plus base thickness **F**. ➪ $\mathbf{E_C}$

Test value $\mathbf{P_C}$ is determined from space requirements $\mathbf{E_C}$ minus $\mathbf{M_C}$.

Value $\mathbf{P_C}$ should be between 4.37 and 5.77 mm.
Testing specification 1068 700 099.
Version ***B***

Select snap ring $\mathbf{S_C}$ with test value $\mathbf{P_C}$.

Calculation:
$\mathbf{E_C = W_C + F}$
$\mathbf{P_C = E_C - M_C}$

Clearance $\mathbf{L_C}$ with 5 lining disks should be between 1.38 Ð 1.83 mm.

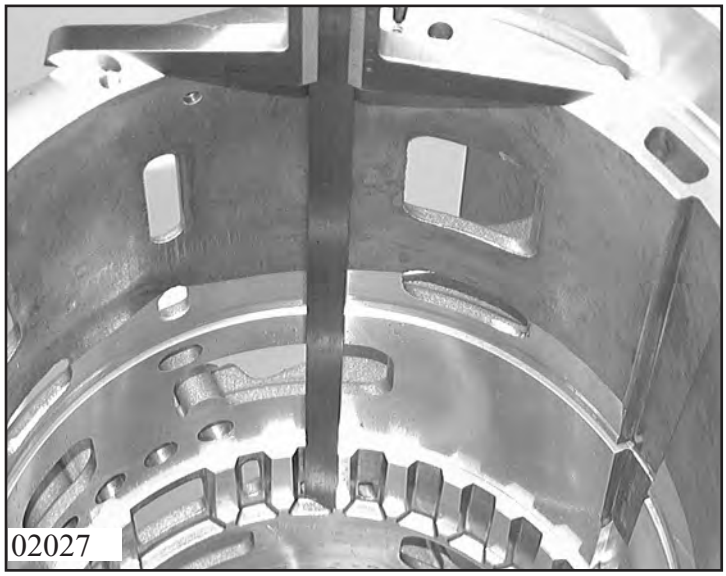
Example (for 1.4.1):

F = 1.48 mm (base thickness)
W_C = 29.05 mm
M_C = 25.49 mm

E_C = 29.05 + 1.48
= 30.53 mm
P_C = 30.53 Đ 25.49
= 5.04 mm

S_C = 3.36 mm

L_C = 5.04 Đ 3.36
⇨ L_C = 1.68 mm



1.4.2 Clearance setting, brake D (snap ring)

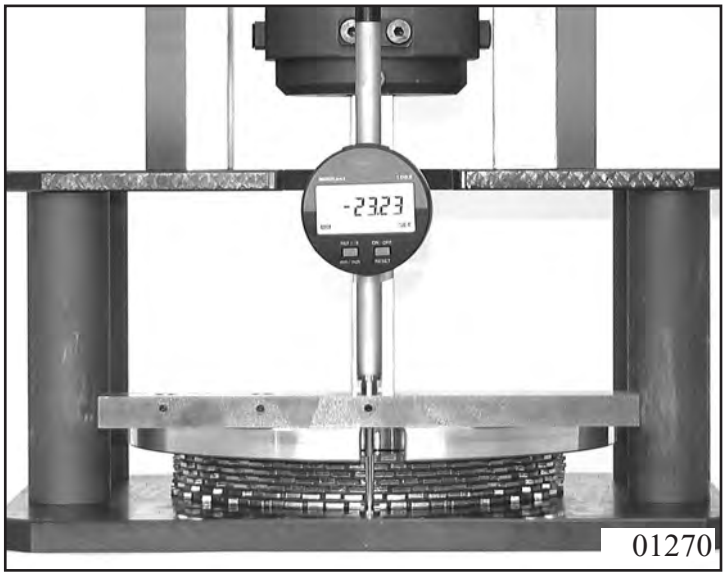
Determine space requirement $\mathbf{E_D}$ of brake D with depth gauge.
To do this, place depth gauge on oil supply sealing face.
Place measuring base on lowest point of the disk support area in the housing and read off dimension ⇨ $\mathbf{W_{DA}}$.

Place measuring base on cylinder support area CD in the housing and read off dimension ⇨ $\mathbf{W_{DB}}$.

Measure down from piston to cylinder support area CD and read off dimension ⇨ $\mathbf{M_{DB}}$.

Determine thickness $\mathbf{M_{DA}}$ of brake D clutch pack D Đ excluding final disk Đ according to **Chapter 1.4.0 Measuring clutch pack**.

$\mathbf{M_{DA}}$



Space requirement $\mathbf{E_D}$ and clutch pack thickness/ test value $\mathbf{P_D}$ result from:

➪ $\mathbf{E_D = W_{DA} - W_{DB}}$
➪ $\mathbf{P_D = M_{DA} + M_{DB}}$

Value $\mathbf{P_D}$ should be between 26.85 Đ 28.65 mm.
Testing specification 1068 700 114
Version ***B***

Select snap ring $\mathbf{S_D}$ with test value $\mathbf{P_D}$.

Clearance $\mathbf{L_D}$ with 6 lining disks should be between 2.11 and 2.75 mm.

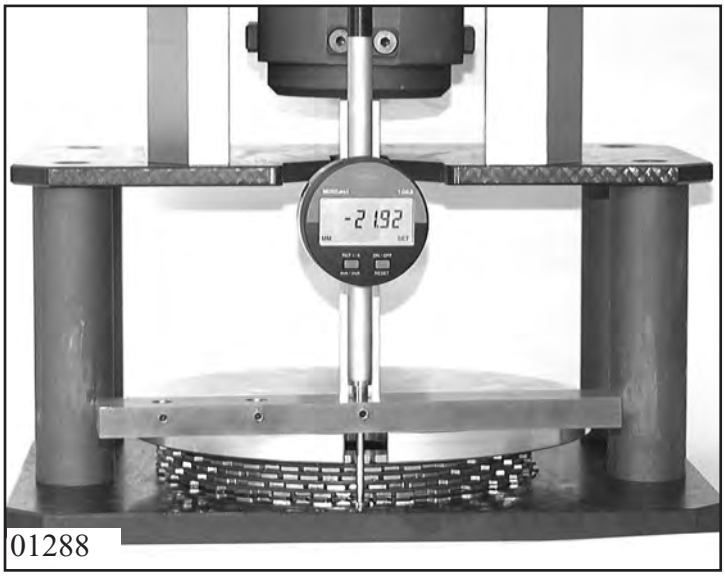
Example (for 1.4.2):

$\mathbf{W_{DA}}$ **= 247.9 mm**
$\mathbf{W_{DB}}$ **= 214.5 mm**
$\mathbf{M_{DA}}$ **= 23.23 mm**
$\mathbf{M_{DB}}$ **= 4.3 mm**

$\mathbf{E_D}$ **= 247.9 Đ 214.7**
= 33.2 mm
$\mathbf{P_D}$ **= 23.23 + 4.3**
= 27.53 mm

$\mathbf{S_D}$ **= 3.3 mm**

$\mathbf{L_D}$ **= 33.2 Đ 27.53 - 3.3**
➪ $\mathbf{L_D}$ **= 2.37 mm**



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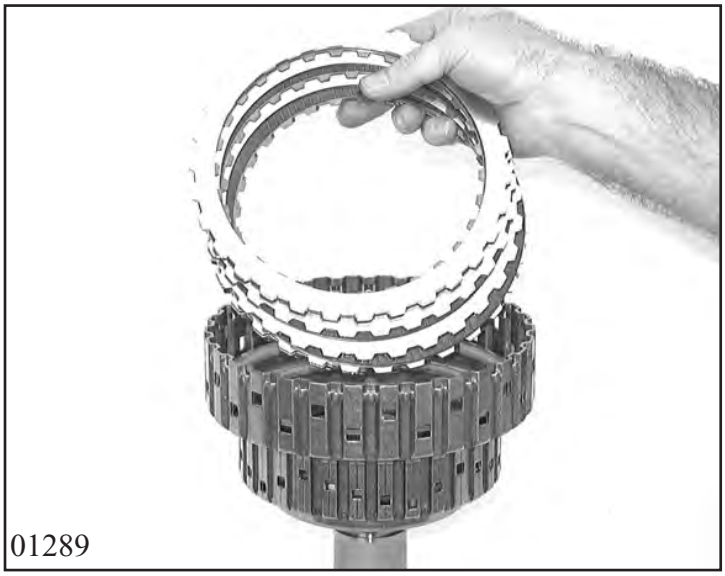
1.4.3 Clearance setting, clutch B (snap ring)

Determine space requirement $\mathbf{E_B}$ for clutch B with measuring bar 5p01 000 330.
For this purpose, place measuring bar 5p01 000 330 on cylinder edge of clutch B. Place measuring base on highest point of disk support area at the piston and set dial gauge to “0”.
Pull measuring sensor upwards, insert into snap ring groove and press against the upper edge of the groove.

Read off measured value from dial gauge ⇨ $\mathbf{W_B}$


01289

Determine thickness $\mathbf{M_B}$ of clutch B clutch pack according to **Chapter 1.4.0 Measuring clutch pack**.

⇨ $\mathbf{M_B}$

Space requirement $\mathbf{E_C}$ results from measured value $\mathbf{W_B}$ plus base thickness **F**. ⇨ $\mathbf{E_B}$

Test value $\mathbf{P_B}$ is therefore space requirement $\mathbf{E_B}$ minus $\mathbf{M_B}$.

Value $\mathbf{P_B}$ should be between 4.4 and 6.2 mm.
Testing specification 1068 700 098
Version ***B***

Select snap ring $\mathbf{S_B}$ with test value $\mathbf{P_B}$.

Calculation:
$\mathbf{E_B = W_B + F}$
$\mathbf{P_B = E_B - M_B}$

Clearance $\mathbf{L_B}$ with 4 lining disks should be between 1.41 and 1.86 mm.

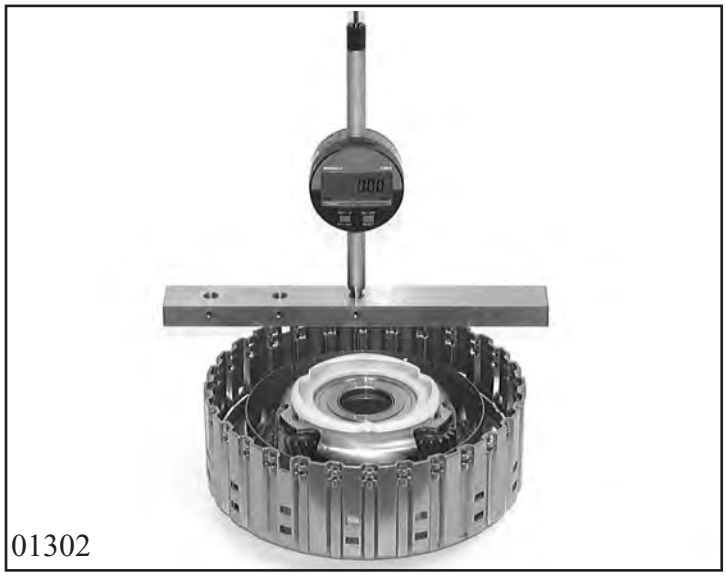
Example (for 1.4.3):

F = 1.48 mm (base thickness)
W_B = 25.8 mm
M_B = - 21.92 mm

E_B = 25.8 + 1.48
= 27.28 mm
P_B = 27.28 Đ 21.92
= 5.36 mm

S_B = 3.8 mm

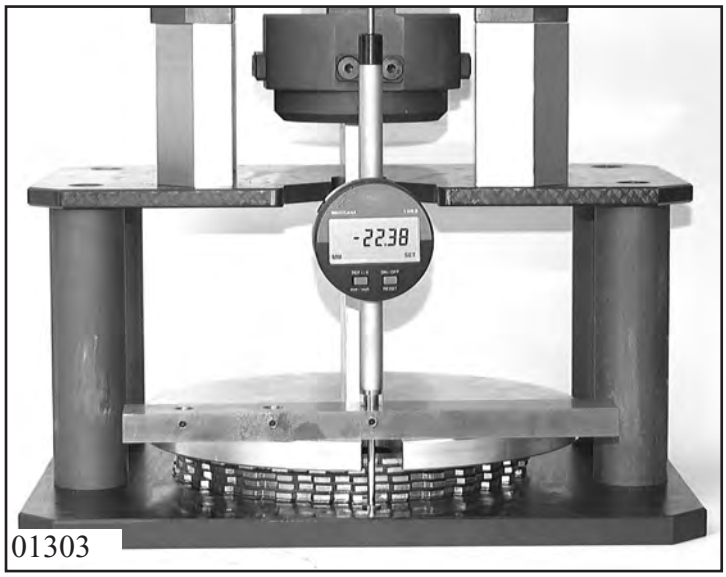
L_B = 5.36 mm Đ 3.8 mm
⇨ L_B = 1.56 mm


01302

1.4.4 Clearance setting, clutch A (snap ring)

Determine space requirement $\mathbf{E_A}$ of clutch A with measuring bar 5p01 000 330.
For this purpose, place measuring bar 5p01 000 330 on cylinder edge of clutch A. Place measuring base on highest point of disk support area at the piston and set dial gauge to “0”.
Pull measuring sensor upwards, insert into snap ring groove and press against the upper edge of the groove.

Read off measured value from dial gauge ⇨ $\mathbf{W_A}$


01303

Determine thickness $\mathbf{M_A}$ of clutch A clutch pack according to **Chapter 1.4.0 Measuring clutch pack**.

⇨ $\mathbf{M_A}$

Space requirement $\mathbf{E_A}$ results from measured value $\mathbf{W_A}$ plus base thickness **F**. ⇨ $\mathbf{E_A}$

Test value $\mathbf{P_A}$ is therefore space requirement $\mathbf{E_A}$ minus $\mathbf{M_A}$.

Value $\mathbf{P_A}$ should be between 4.58 and 6.18 mm.
Testing specifications 1068 700 084
Version ***B***

Select snap ring $\mathbf{S_A}$ with test value $\mathbf{P_A}$.

Calculation:
$\mathbf{E_A = W_A + F}$
$\mathbf{P_A = E_A - M_A}$

Clearance $\mathbf{L_A}$ with 4 lining disks should be between 1.59 and 2.04 mm.

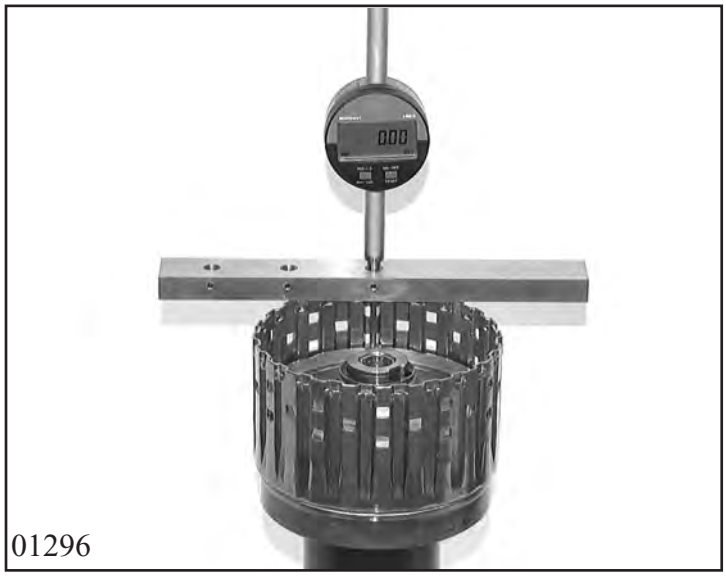
Example (for 1.4.4):

F = 1.48 mm (base thickness)
W_A = 26.15 mm
M_A = - 22.38 mm

E_A = 26.15 + 1.48
= 27.63 mm
P_A = 27.63 Đ 22.38
= 5.25 mm

S_A = 3.4 mm

L_A = 5.25 Đ 3.4
⇨ L_A = 1.85 mm

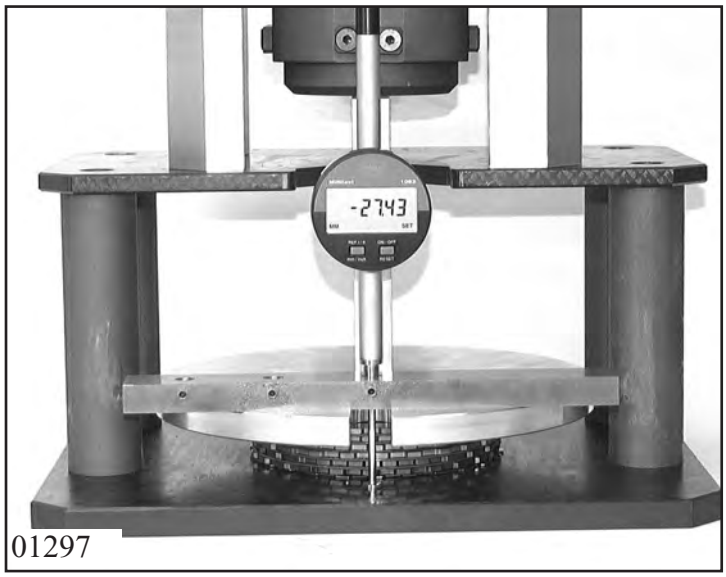


01296

1.4.5 Clearance setting, clutch E (snap ring)

Determine space requirement $\mathbf{E_E}$ of clutch with measuring bar 5p01 000 330. For this purpose, place measuring bar 5p01 000 330 on cylinder edge of clutch E. Place measuring base on the highest point of the disk support area at the piston and set dial gauge to “0”.
Pull measuring sensor upwards, insert into snap ring groove and press against the upper edge of the groove.

Read off measured value at dial gauge ➪ $\mathbf{W_E}$



01297

Determine thickness $\mathbf{M_E}$ of clutch E clutch pack according to **Chapter 1.4.0 Measuring clutch pack**.

➪ $\mathbf{M_E}$

Space requirement $\mathbf{E_E}$ resultsfrom measured value $\mathbf{W_E}$ plus base thickness **F**. ➪ $\mathbf{E_E}$

Test value $\mathbf{P_E}$ is therefore space requirement $\mathbf{E_E}$ minus $\mathbf{M_E}$.

Value $\mathbf{P_E}$ should be between 3.83 and 5.83 mm.
Testing specification 1068 700 048
Version ***B***.

Select snap ring $\mathbf{S_E}$ with test value $\mathbf{P_E}$.

Calculation:
$\mathbf{E_E = W_E + F}$
$\mathbf{P_E = E_E - M_E}$

Clearance $\mathbf{L_E}$ with 5 lining disks should be between 1.84 and 2.37 mm.

Example (for 1.4.5):

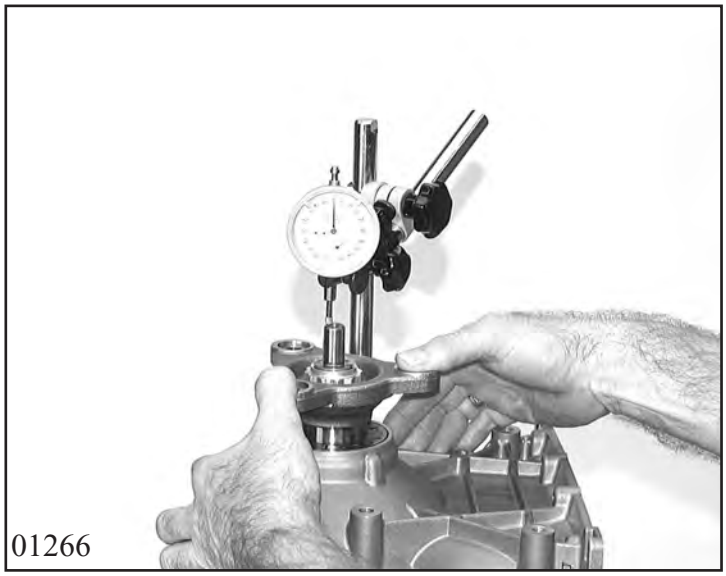
F = 1.48 mm (base thickness)
W_E = 30.27 mm
M_E = 27.43 mm

E_E = 30.27 + 1.48
= 31.75 mm
P_E = 31.75 Đ 27.43
= 4.32 mm

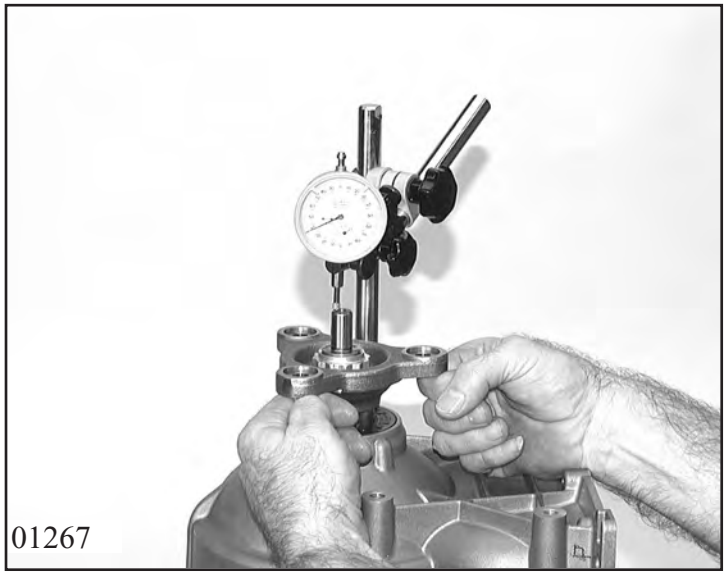
S_E = 2.4 mm

L_E = 4.32 Đ 2.4
⇨ L_E = 1.92 mm

1.4.6 Clearance - output (disk)


01266

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


01267

Pull on flange and read off value **A**.
Select a thinner or thicker disk if value A is outside tolerance C.

Example: (for 1.4.6)

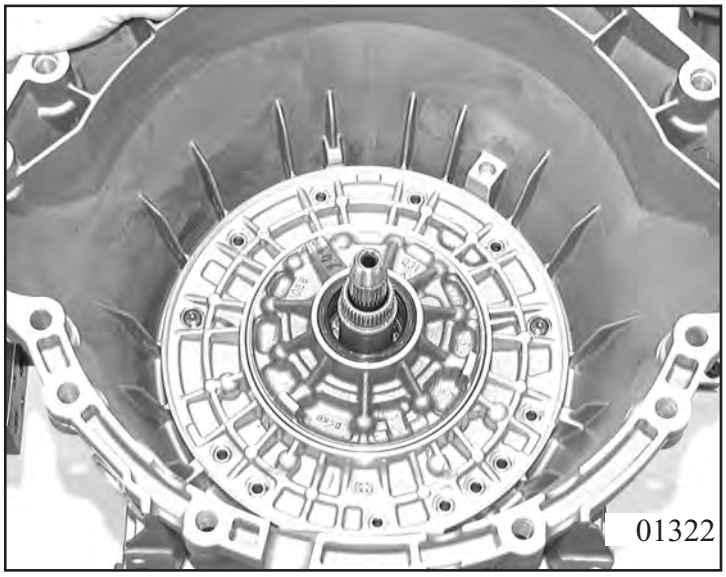
A = 0.15 mm
C = 0.15 to 0.35 mm

disk o.k.

1.4.7 Clearance - input (disk)

Secure oil supply in casing with 2 opposite fillister head screws 10.080.

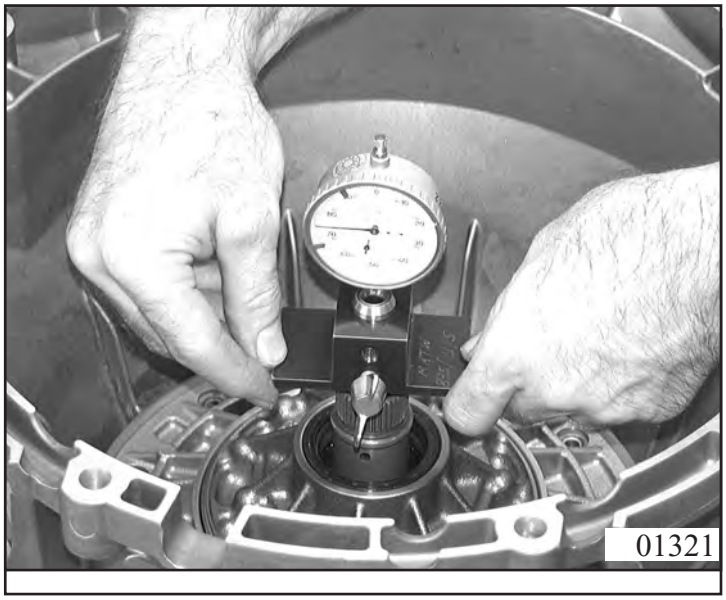
(for tightening torque see Chapter 1.5)



Requirements:
Shim 10.090 (thickness = 2.6 mm, thinnest according to WTB) is in position

Push measuring device 5p01 002 379 over input shaft splines and clamp with locking screw approx. 2 mm above stator shaft.

Set dial gauge to 0.

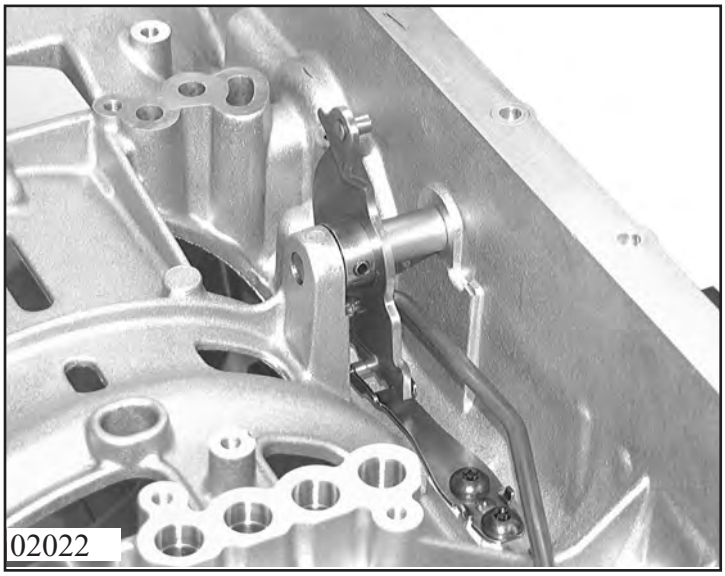


Determine axial clearance by pressing and pulling the handle (repeat measuring process several times).

Target axial clearance = 0.2 - 0.4 mm at a force of 200 N (dry according to **test specification1068 700 051)**

If there is any deviation, insert a thicker or thinner disk 02.260 as appropriate. Check axial clearance again after this.

(M type only)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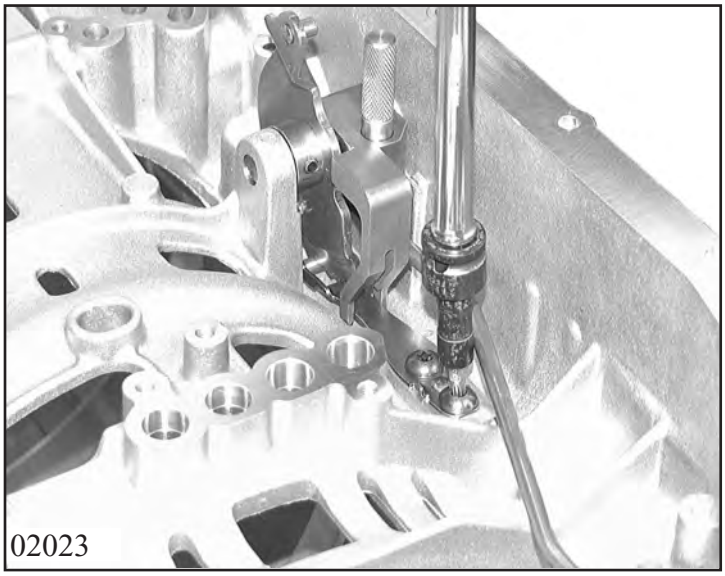
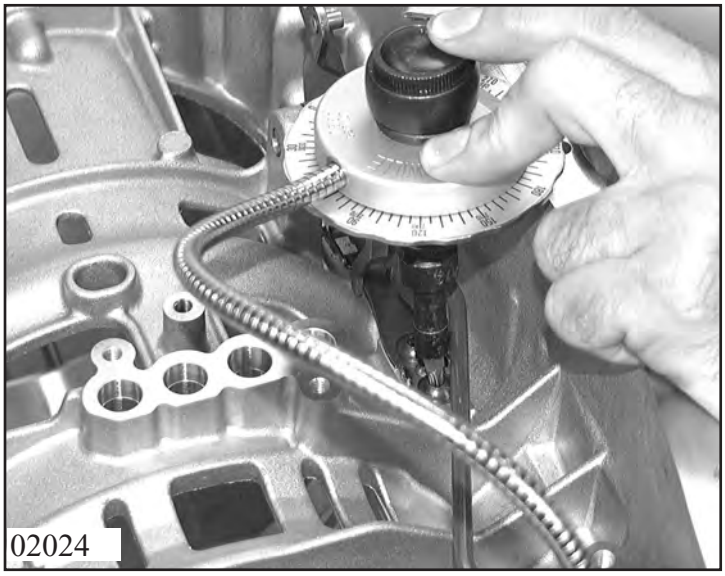
1.4.8 Switch setting (detent spring)

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


02023

Align detent spring with centering device 5x46 002 292 and tighten detent spring in this position.
Tighten output side screw first.

(for tightening torque see Chapter 1.5)


02024

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.

(for tightening torque see Chapter 1.5)

1.5 Tightening torques

No.	Designation	Part List-Item-No.	Wrench size No.	Page	Tightening torque [Nm]
1	Screw plug (transmission housing)	01.100	Hexagonal socket Size = 5 mm	3.1/2	12 Nm (±1.2 Nm)
2	Machine screw (detent spring M type)	06.090	TORX - TX 27 H	1.4/15 3.1/3	10 Nm + 30¡ (±0.3 Nm ±10¡)
3	Machine screw (guide plate)	24.120	TORX - TX 27	3.1/4	10 Nm (±1.0 Nm)
4	Screw plug M12x1.5 (torsion spring)	24.020	Hexagonal socket Size = 6 mm	3.1/4	23 Nm (±2.3 Nm)
5	Hex bolt (lever)	06.190	Hex Size = 13 mm	3.1/5	9.5 Nm (±1.0 Nm)
6	Machine screw (emergency release, E type)	06.210	TORX - TX 27	3.1/5	10 Nm (±1.0 Nm)
7	Castellated nut (output without Helium-WDR) (output with Helium-WDR)	14.160	Socket wrench 5X46 002 456 5X46 002 456	3.2/3	80 Nm (±8.0 Nm) 60 Nm (±6.0 Nm)
8	Machine screw (stator shaft/intermediate plate)	10.040/150	TORX - TX 27	3.6/3	15 Nm (±1.5 Nm)
9	Machine screw (intermediate plate/centering plate)	10.040/180	TORX - TX 27	3.6/3	10 Nm (±1.0 Nm)
10	Machine screw (stator shaft/centering plate)	10.050	TORX - TX 27	3.6/3	15 Nm (±1.5 Nm)
11	Countersunk screw (intermediate plate/pump)	10.080	TORX - TX 27	1.4/14 3.6/4	10 Nm (±1.0 Nm)
12	Countersunk screw (intermediate plate/pump)	10.084	TORX - TX 27	1.4/14 3.6/4	10 Nm (±1.0 Nm)
13	Machine screw (Mechatronic)	27.450 27.500	TORX - TX 30	1.3/1 3.7/3	8 Nm (±0,8 Nm)
14	Machine screw (oil pan)	03.020	TORX - TX 27	3.7/4	8 Nm (±0,8 Nm)
15	Screw plug M18x1.5 (transmission casing)	01.140	Hexagonal socket Size = 8 mm	3.7/4	35 Nm (±3,5 Nm)

No.	Designation	Part List-Item-No.	Wrench size No.	Page	Tightening torque [Nm]
16	Screw plug M16x1.5 (oil pan)	03.010/030	Hexagonal socket Size = 8 mm	3.7/5	9 Nm (-1.0 Nm)
17	Hex bolt M8x45 (converter retaining bracket)	97.020	Size = 13 mm	3.7/5	15 Nm (±1.5 Nm)
18	Hex bolt M10x16 (converter retaining bracket)	97.030	Size = 17 mm	3.7/5	15 Nm (±1.5 Nm)

1.6 Transmission test (test bench)

The following points must be checked:

Correct oil level

Proper oil level; observe the vehicle manufacturer's specifications and Part List.

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.

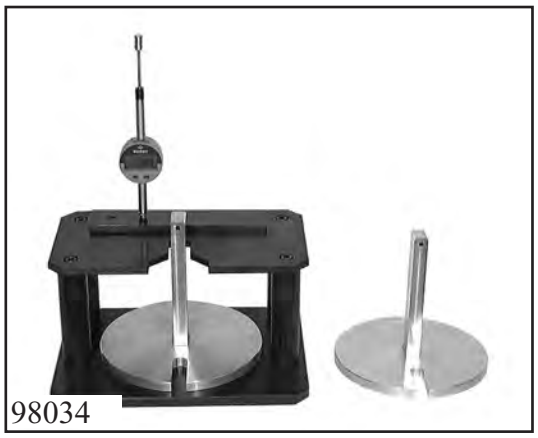
Proper engine settings

Correct idle speed; follow specifications from vehicle manufacturer.

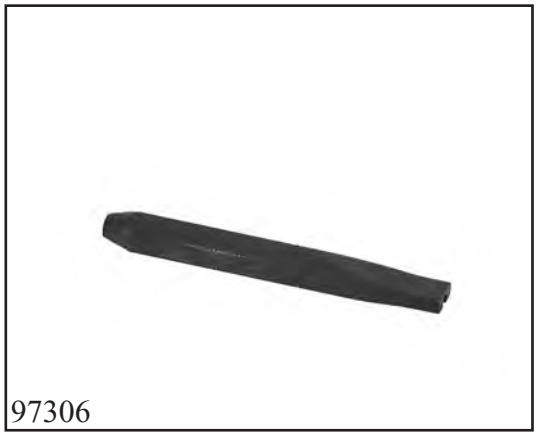
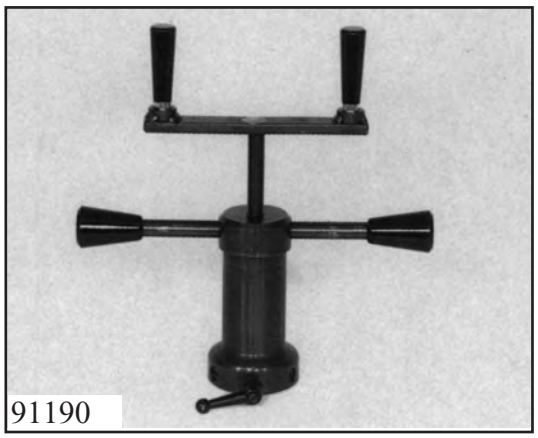
Power flow, forward and reverse

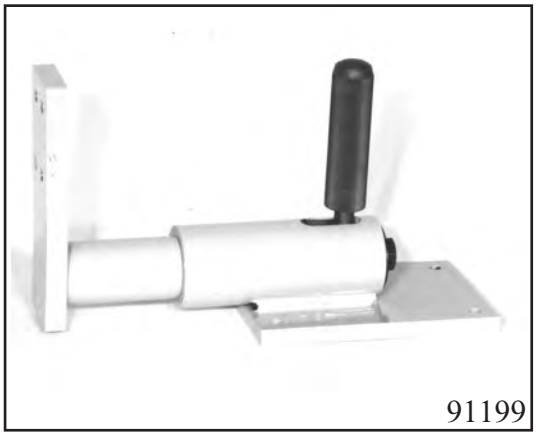
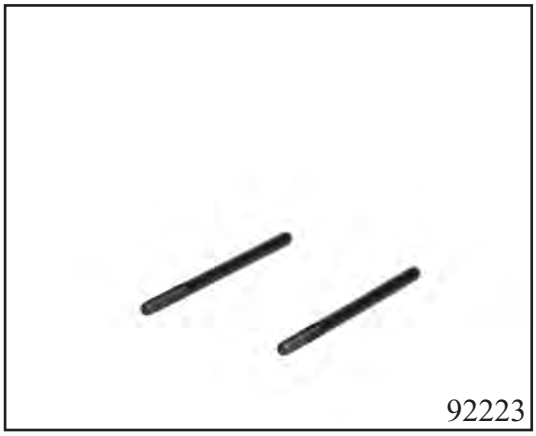
Correct adjustment of selector linkage or control cable; observe the vehicle manufacturer's specifications.

1.7 Special tools

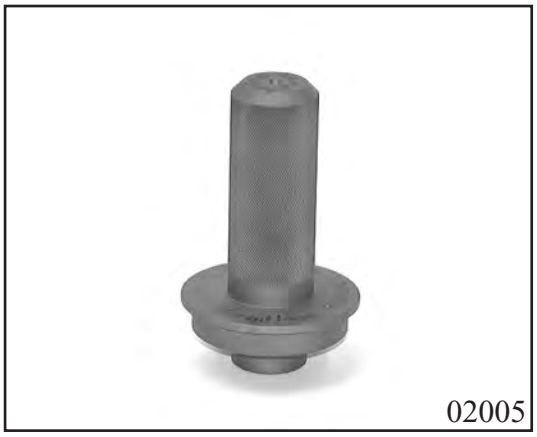
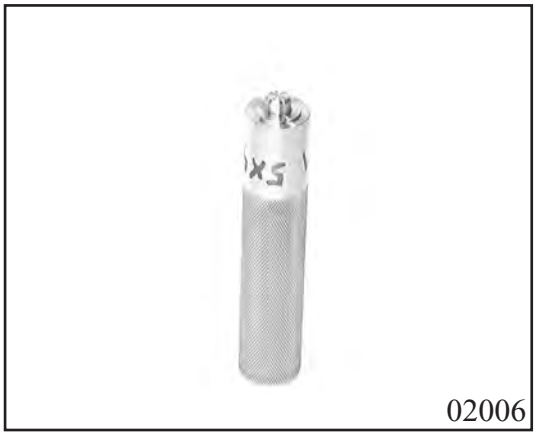
OBJECT	Order-No. / Application	Remarks
1  98008	5p01 000 329 Force gauge	identical 4 HP 20 5 HP 19 5 HP 19 FL/A 5 HP 24 5 HP 24 A
2  98034	5p01 000 330 Clutch play measuring device (Measuring plate: - short neck > 20 mm - long neck < 20 mm clutch disk thickness)	identical 4 HP 20 5 HP 19 5 HP 19 FL/A 5 HP 24 5 HP 24 A
3 	5p01 001 458 Pre-tension adjusting device	identical 4 HP 18 Q 4 HP 20 5 HP 19 5 HP 19 FL/A 5 HP 24 5 HP 24 A

Remarks	Order-No. / Application	OBJECT
	5p01 002 379 Input shaft axial play measuring device	4 
	5t66 000 094 Transmission retaining bracket	5  02001
identical 5 HP 18	5x46 000 221 Assembly bracket, brake D	6  02014

OBJECT	Order-No. / Application	Remarks
7  97306	5x46 000 291 Locking sleeve driving-in mandrel	identical 4 HP 18 Q 5 HP 24 5 HP 24 A
8  98135	5x46 000 306 Pump torque checking sleeve	identical 4 HP 18 Q 5 HP 19
9  91190	5x46 000 563 Disassembly/assembly fixture for complete oil supply unit	identical 5 HP 18 5 HP 24 A 5 HP 30

Remarks	Order-No. / Application	OBJECT
identical 4 HP 20 5 HP 18 5 HP 30	5x46 000 763 Work-bench holder	10  91199
identical 5 HP 24 5 HP 24 A 5 HP 30	5x46 000 917 Mount	11  92214
identical 5 HP 19 5 HP 19 FL/A 5 HP 24 5 HP 24 A	5x46 001 007 2 locating pins	12  92223

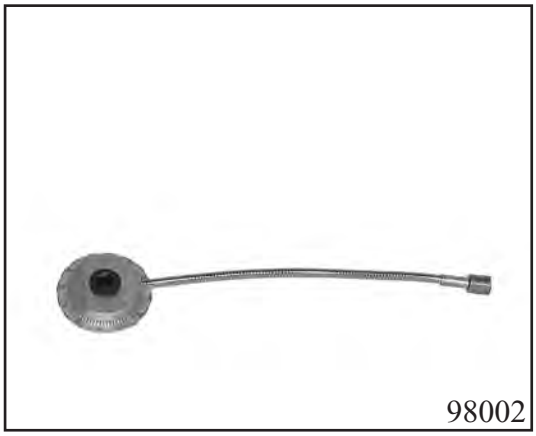
OBJECT	Order-No. / Application	Remarks
13  97307	5x46 001 135 Bleed valve driving-in pin	identical 5 HP 24
14  02002	5x46 002 456 Nut wrench	
15  02003	5x46 002 558 Driving-in mandrel for needle roller bearing and pump shaft sealing ring	

Remarks	Order-No. / Application	OBJECT
	5x46 002 559 Driving-in mandrel for shaft sealing ring + needle roller bearing	16  02004
	5x46 002 560 Driving-in mandrel for output side ball bearing	17  02005
	5x46 002 561 Driving-in mandrel for shaft sealing ring WDR	18  02006

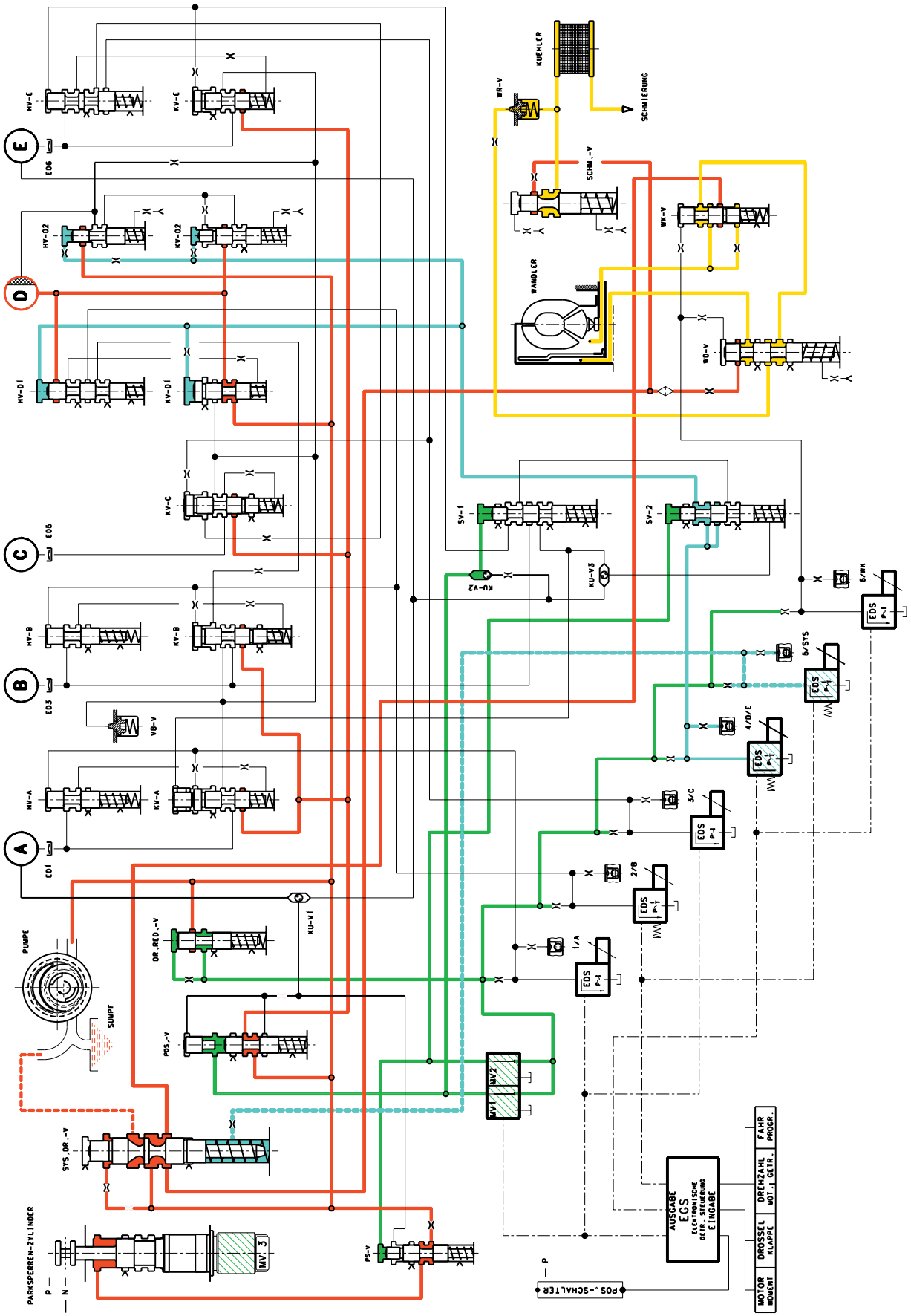
OBJECT	Order-No. / Application	Remarks
19  02007	5x46 002 563 Turret lifting device	
20  02008	5x46 002 566 Assembly bracket for clutch A, B, D, E	
21  02009	5x46 002 567 Driving-in mandrel for output-side shaft sealing ring	

Remarks	Order-No. / Application	OBJECT
identical 5 HP 24 5 HP 24 A	5x46 001 501 Assembly bracket for brake C	22  97312
	5x46 002 569 Pull-out handle	23  02011
	5x46 002 571 Assembly aid, clutch E snap ring	24  02012

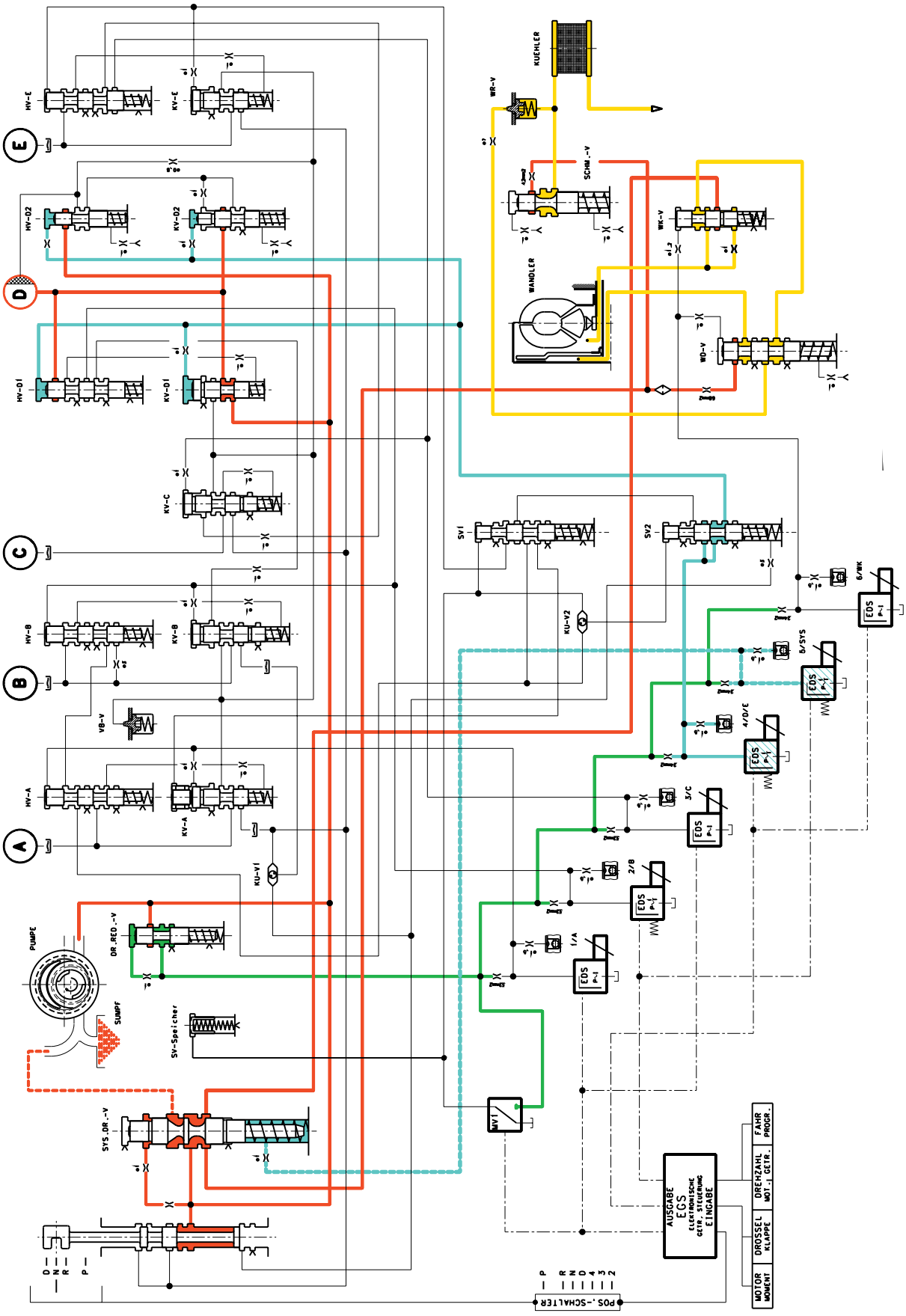
OBJECT	Order-No. / Application	Remarks
25  76046	5x56 000 090 2 converter pull-out handles	
26  97315	5x46 001 930 Driving tool for snap ringin the groove of the housing	
27, 28, 29  02036	5x46 002 849 Mandrel helium-shaft sealing ring 5x46 012 696 Press-in aid helium-shaft sealing ring BMW 5x46 012 798 Press-in aid helium-shaft sealing ring Jaguar	

Remarks	Order-No. / Application	OBJECT
	(M type only) 5w04 000 583 Torsional measuring device, detent spring assembly	30  98002
	5x46 002 292 Centering device, detent spring	31  02026

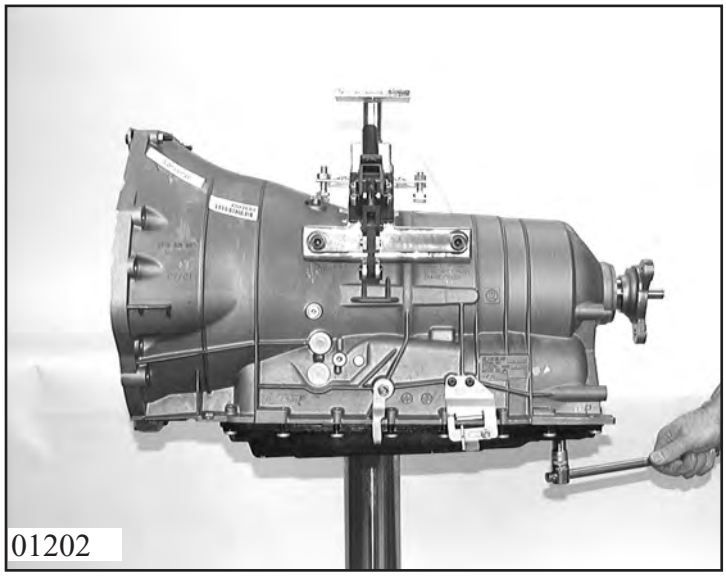
1.8 Oilflow chart (Position N)
(E - type)



(M - type)

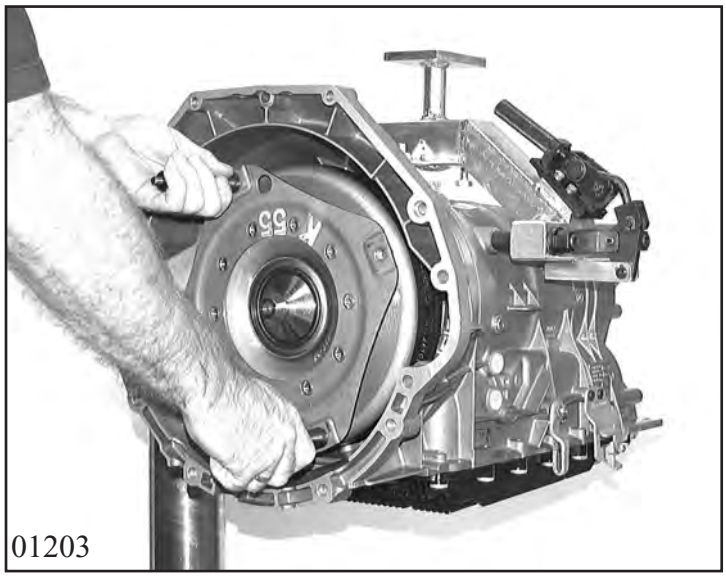

KUEHLER
WR-V
SCHM.-V
WK-V
WANDLER
WD-V
HV-E
KV-E
HV-D2
KV-D2
HV-D1
KV-D1
KV-C
HV-B
KV-B
VB-V
HV-A
KV-A
SV1
SV2
KU-V2
KU-V1
PUMPE
DR.RED.-V
SUMPF
SV-Speicher
SYS.DR.-V
MV1
EDS
AUSGABE EGS
ELEKTRONISCHE GETRIEBE STEUERUNG EINGABE
FAHR PROGR.
DREHZAHL MOT. / GETR.
DROSSEL KLAPPE
MOTOR MOMENT
POS.-SCHALTER
P R N D 4 3 2
D N R P

2. Disassembly
2.1 Transmission disassembly according to component groups


01202

Clamp transmission into support bracket 5t66 000 094 and fasten to assembly trolley, if necessary in workbench holding device 5x46 000 763.
Screw out oil drain plug /oil filler cap and drain oil.
.

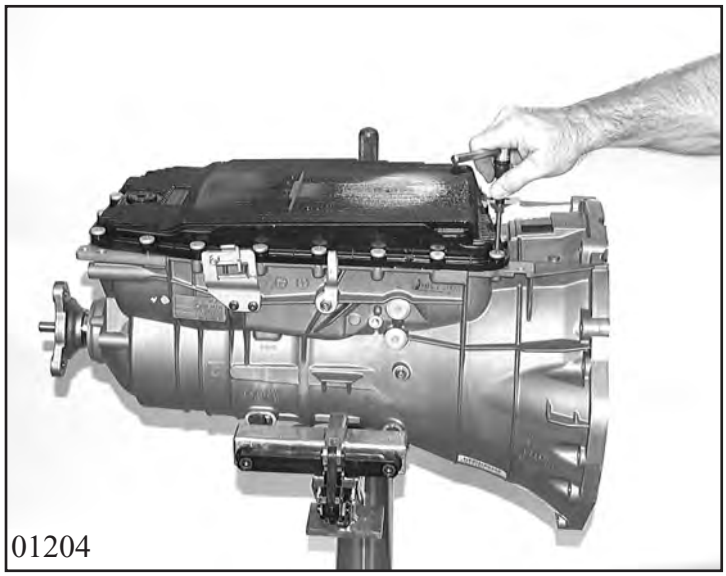
Wrench sizes
Oil drain plug = 10 mm Hexagonal socket
Oil filler plug = 8 mm Hexagonal socket


01203

Remove converter bracket and take out converter
using the two converter pull-out handles 5x56 000 090.

(Wrench size = 13 mm)
(Wrench size = 17 mm)

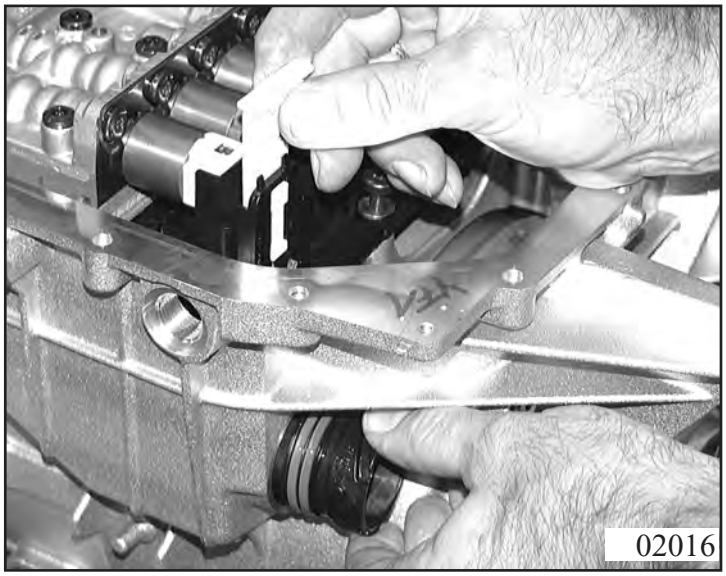
Warning!
Oil may be spilled.
Do not damage converter bearings and shaft sealing ring of the pump.


01204

Turn transmission by 180°.
Unscrew 21 machine screws holding the oil pan, remove it and pull off the O-ring seal and gasket.

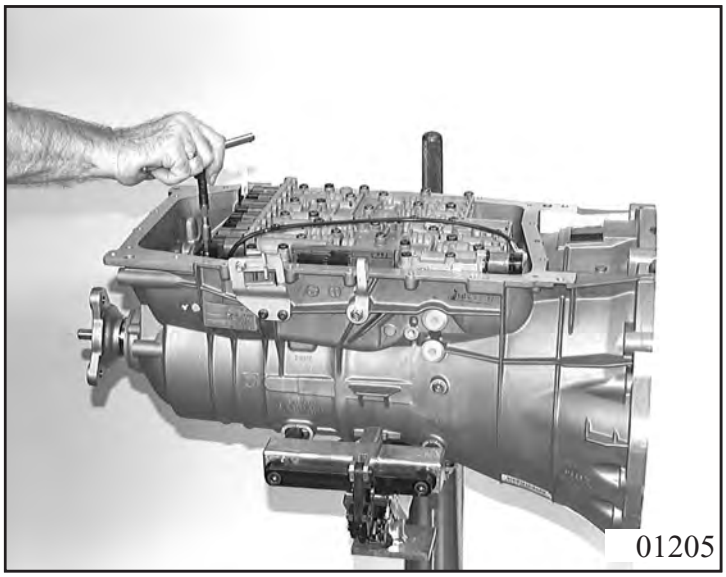
(Wrench size = Torx - TX 27)

Pull protective transport cap off socket for wiring harness and release retaining clamp.
Pull socket out of casing by hand.



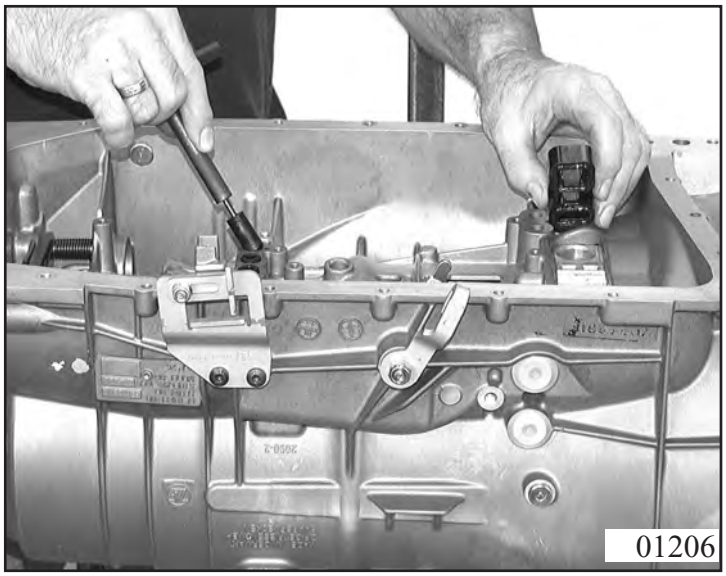
Unscrew screws with **large head** (M6) and lift off complete Mechatronics.

(Wrench size = Torx - TX 40)



Pull 4 sealing sleeves out of transmission casing with handle 5x46 002 569.

Remove sealing sleeve from transmission casing.



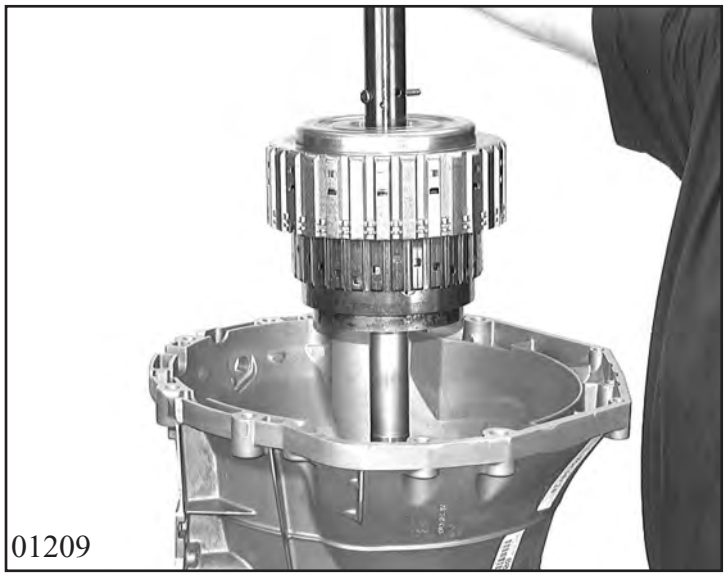

01207

Turn transmission by 90°. Completely remove oil supply unit. To do this, loosen 14 Torx screws and remove with Usit rings.

(Wrench size = Torx - TX 27)

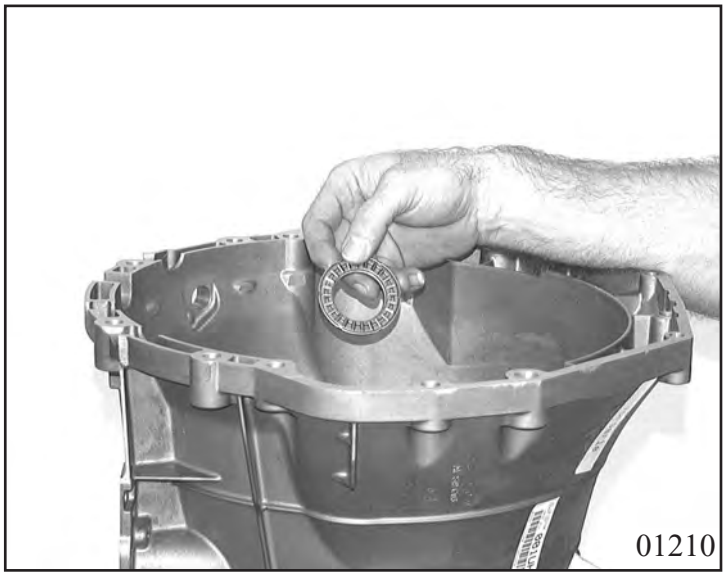

01208

Press out the oil supply unit with jack 5x46 000 563 and lift off.


01209

Take out the shim washer.
Remove turret (input with clutches A and E).
To do this, lock lifting device 5x46 002 563 in the input shaft with 5 mm mandrel. Take out the complete unit by hand.
Insert turret into fixture 5x46 000 917 and remove the fixture.

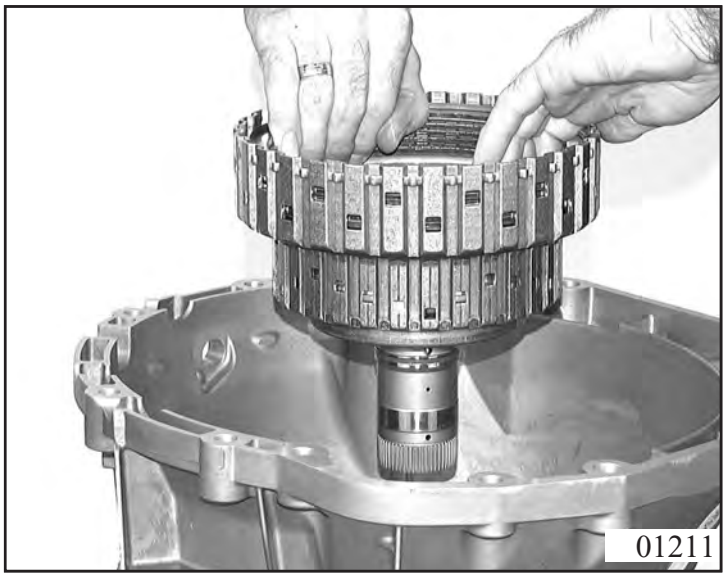
Remove axial needle roller bearing cage from hub of cylinder B.



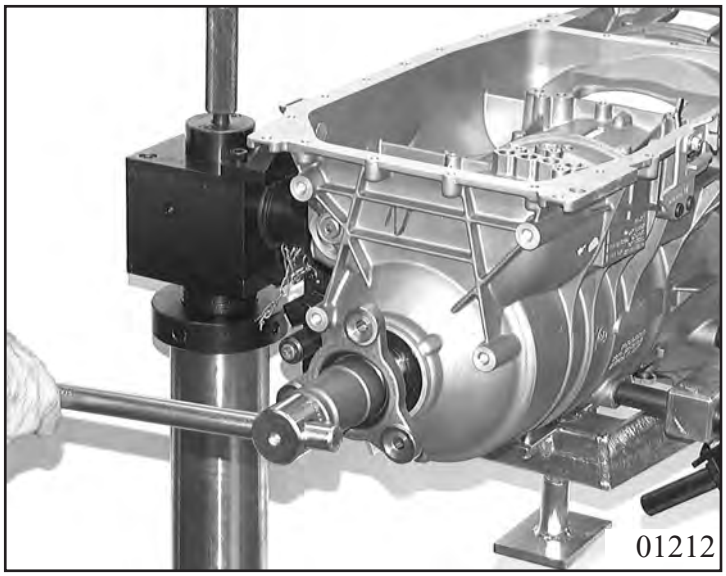
Warning!
The second angled thrust washer is located in the hub of internal disk carrier B and could be loosened during cleaning.

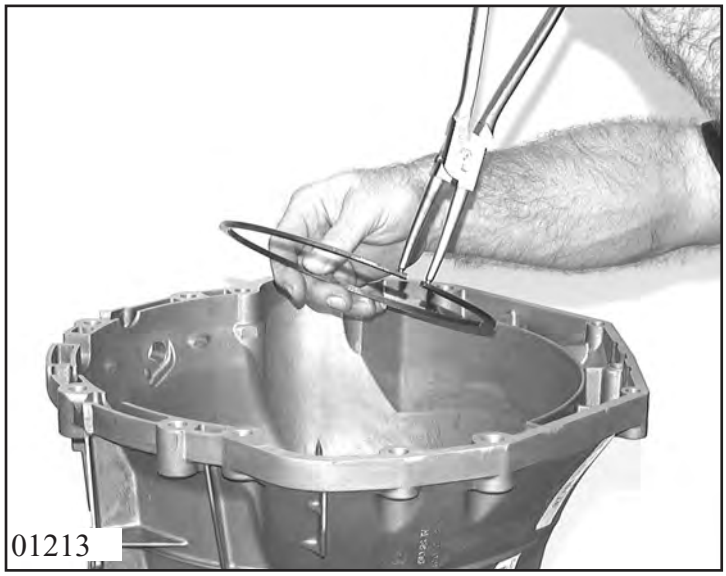
Risk of loss!

Remove clutch B manually.



Turn transmission by 90° and loosen the 12-sided nut with wrench 5x46 002 456.
Pull off the output flange.
If present remove the reversing disk.

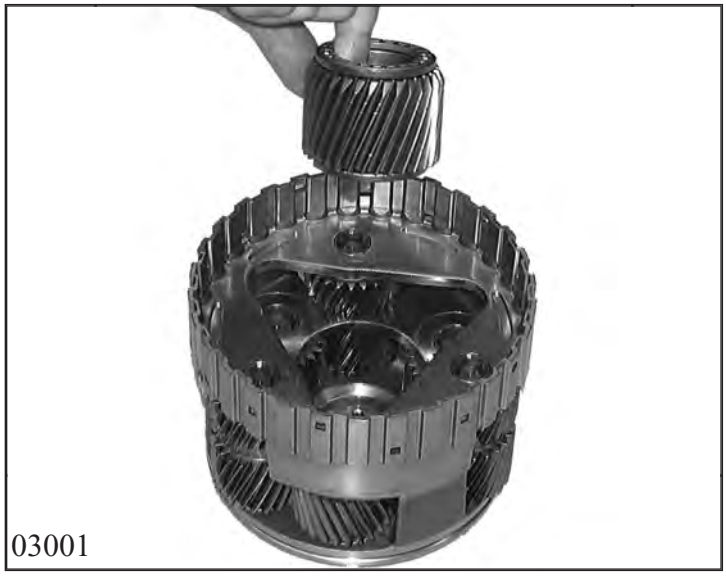



01213

Turn transmission by 90° and lever snap ring out of casing with a screwdriver or take it out with snap ring pliers.
Lift off clutch C.

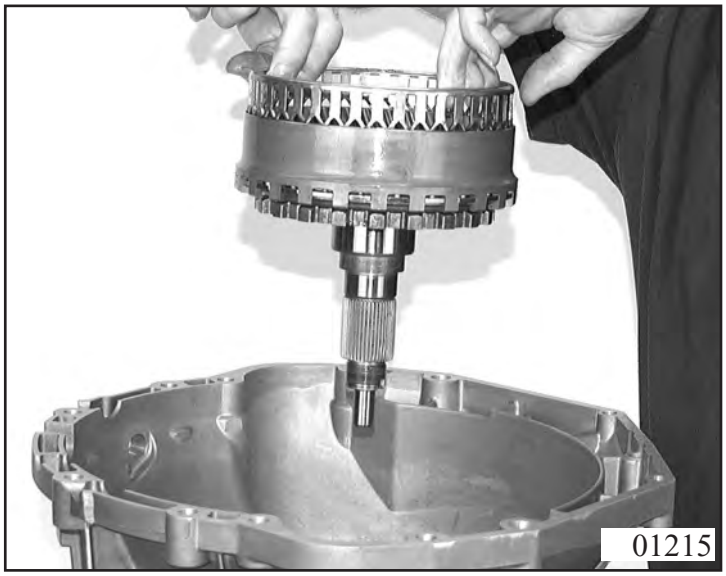

01214

Take out the angle plate and sun gear.
Remove planet carrier with complete clutch pack D.
Remove final disk from transmission casing.
Remove complete clutch pack D from planet carrier.


03001

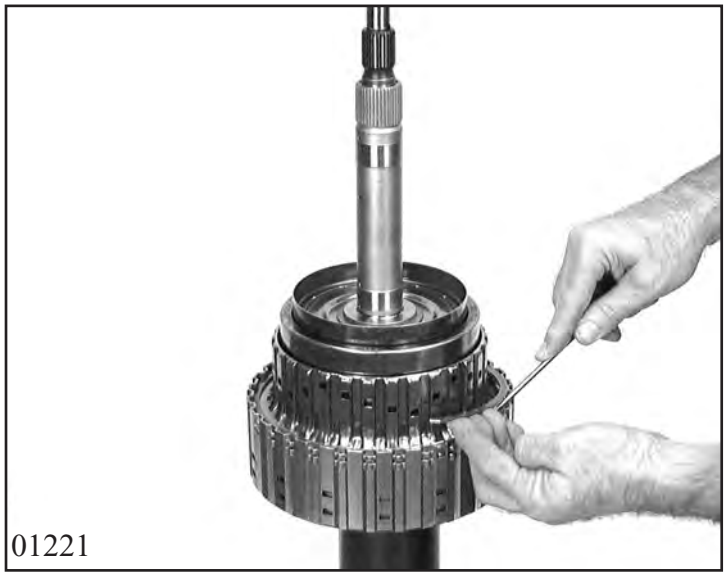
Remove thrust plates and sun gears 2 + 3 from planet carrier.
Lift clip bearings from planet carrier and sun gear 3.

Lift thrust washer off planet carrier hub.
Take out ring gear with output shaft.
Remove output axial clearance adjusting disk.

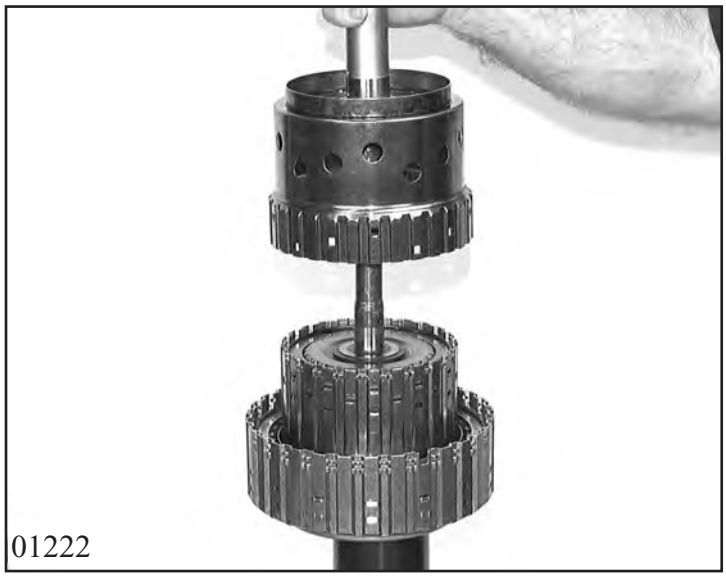


Dismantling

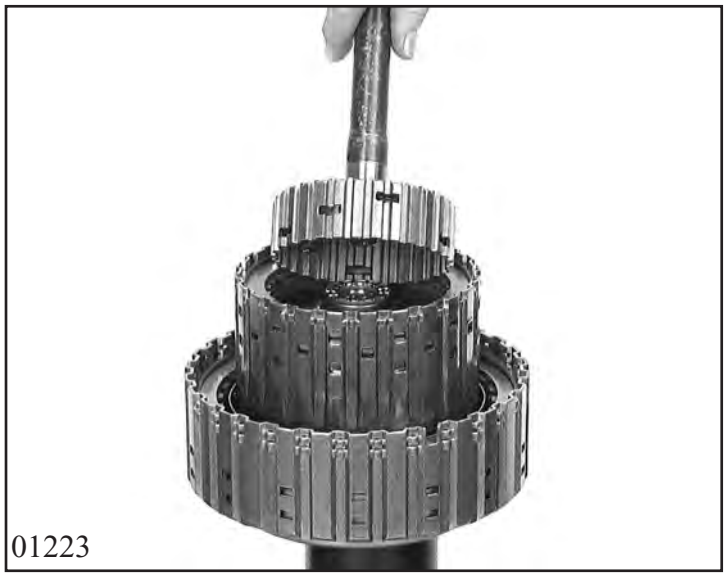
2.2 Turret (with clutches A and E)


01221

Put turret with input shaft in mount 5x46 000 917.
Unclip the angled disk.
Take out the snap ring and remove internal disk carrier B.


01222

Take out disk carrier A and lever axial needle roller bearing out of intermediate shaft with a long scriber.


01223

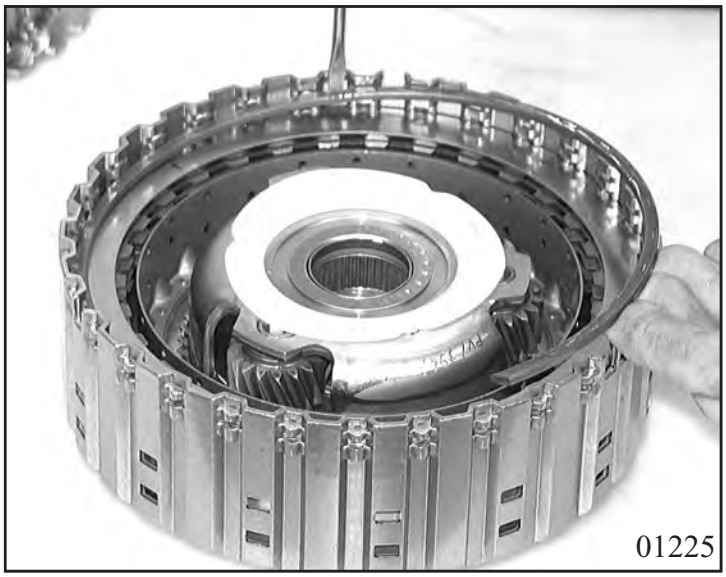
Lift off intermediate shaft with internal disk carrier E. Lever out axial needle roller bearing.

Then turn cluster by 180° and insert it into the fixture again.

Pull clutch A off clutch E / input shaft.

Note:
Drive shaft is splined to clutch E.

Rebound clutch A snap ring and withdraw complete clutch pack.



Lever snap ring out of planet carrier and take planet carrier out of cylinder A. Withdraw snap ring and sun gear from planet carrier and lever out axial needle roller bearing cage.