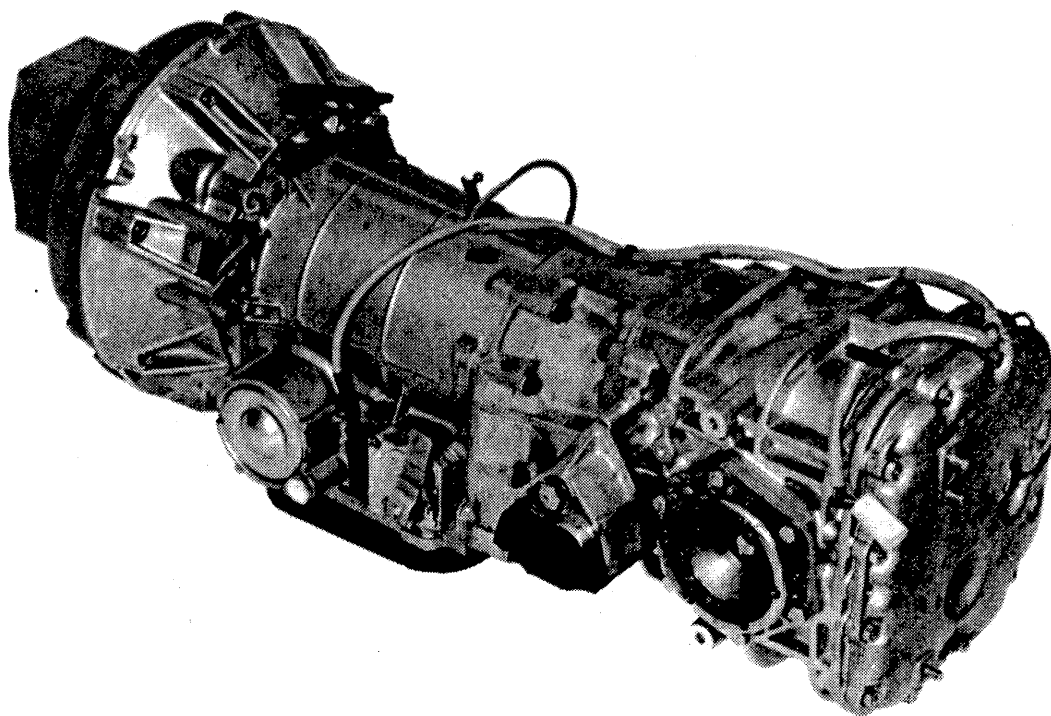


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This brochure will provide you with information on possible defects with automat transmission A 22 and should be used to troubleshoot and diagnose the car. There are also brief service and repair instructions.

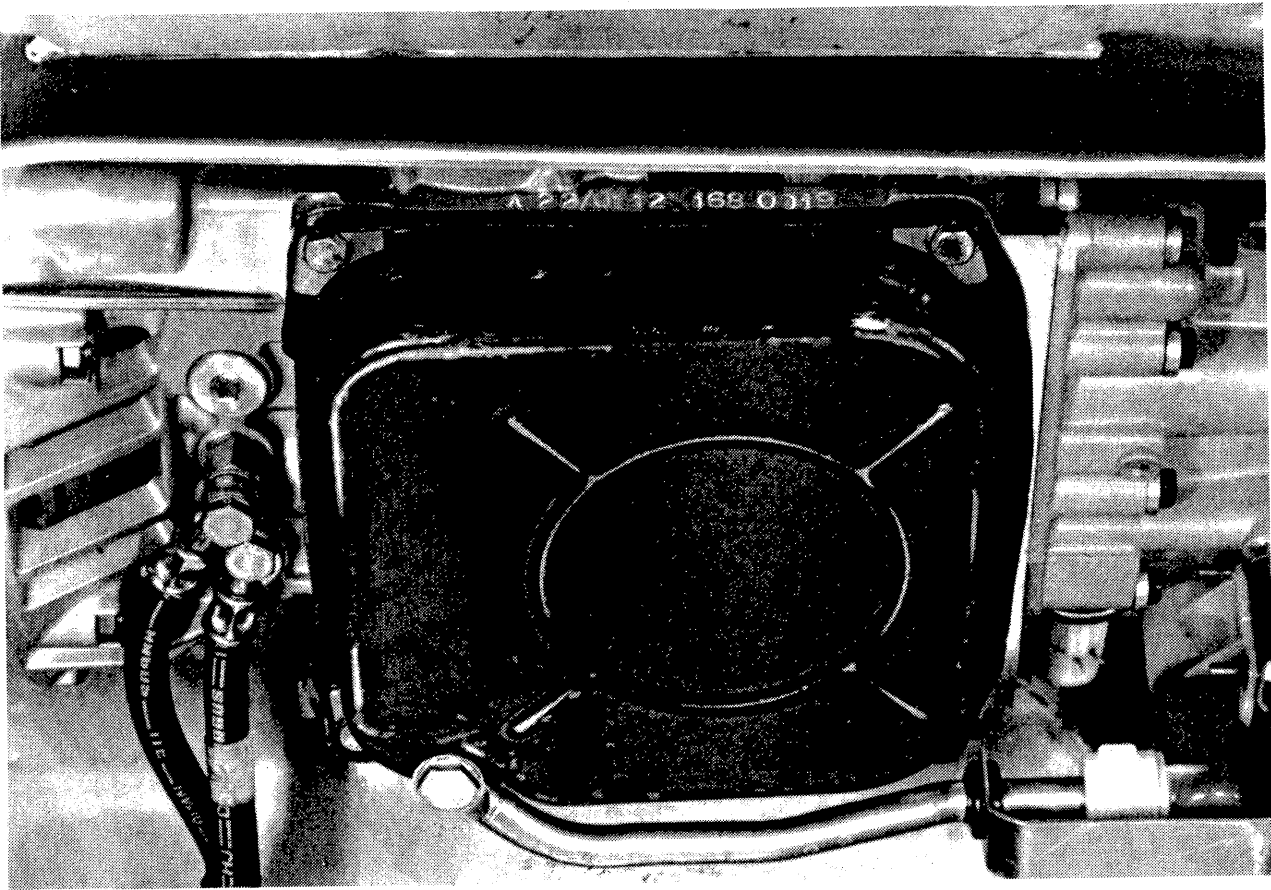
More information on the **operation of the automatic transmission** can be found in the "Automatic Transmission A 22" brochure, Order No. 4568.21.

Detailed instructions on automatic transmission adjustments, service and repairs are published in Repair Manual 928, Volume II.

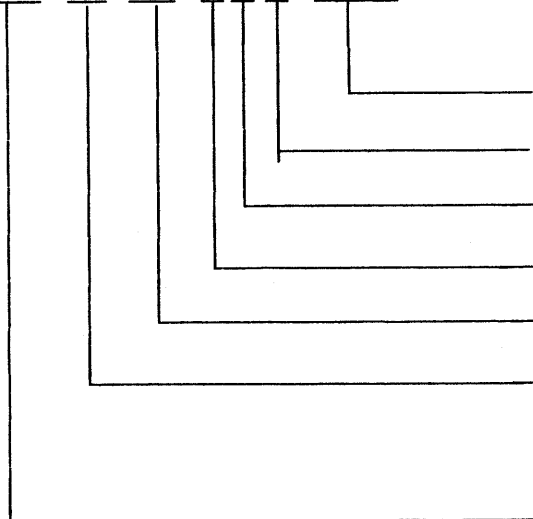
Informative hydraulic diagrams of all pistons, valves, control valves, etc. will be published later.

The **transmission code** is stamped on the **left** side of the center transmission case, above the ATF pan.

The number stamped on the **right** side is only for production supervision.



A 22 / 01 / 12 / 1 6 8 / 0019



Serial number

Model year (1978)

Transmission version

Engine version

12 = limited slip (40 %) differential

Country code

01 = Rest of World and USA Model 1980

02 = USA Model 1978 and 1979

Transmission type

A 22 = Automatic transmission

G 28 = 5-speed manual transmission

## Specifications

	Model 1980	Model 1978 and 19
Transmission code	A 22/01	A 22/02
No. of gears	3 forward 1 reverse	3 forward 1 reverse
Ratios: 1st range	2.306	2.306
2nd range	1.460	1.460
3rd range	1.000	1.000
Reverse gear	-1.836	-1.836
Final drive	Bevel drive without hypoid displacement/ Oerlikon Spiroflex System	
Final drive ratio $i_A$	2.750 (12 : 33)	
Torque converter		
Converter ratio	2.00 : 1	2.00 : 1
Stall speed (rpm)	2470 ± 200	2350 ± 200
Engine type	M 28.14 (170 kW)	M 28.04 (169 kW)
Performance Figures:		
Top speed (mph)	140	140
Acceleration 0 . . . 60 mph	8.5 seconds	8.5 seconds
Acceleration 1/4 mile	16.0 seconds	16.0 seconds
Acceleration for 1000 meters*	29.0 seconds	29.0 seconds
Hill climbing ability,		
1st range (%)*	approx. 29 briefly 58	approx. 42 briefly 68
2nd range (%)*	approx. 21 briefly 35	approx. 23 briefly 37
3rd range (%)*	approx. 11 briefly 21	approx. 12 briefly 24
* DIN curbweight + 1/2 payload kg (lbs.)	1720 (3792)	1720 (3792)
Weight of automatic transmission and torque converter without ATF kg (lbs.)	100 (220)	100 (220)

## Test Values

### A) Upshift Points A 22/02

Accelerator Pedal Position	Shift	Road Speed
Full throttle	1st to 2nd	60 . . . 65 mph
Full throttle	2nd to 3rd	93 . . . 98 mph

#### Remarks:

Pressing the accelerator pedal further to the kickdown point will not change the upshift points when shifting up!

### B) Downshift Points A 22/02

Accelerator Pedal Position	Shift	Road Speed
Full throttle	3rd to 2nd	53 . . . 35 mph
Full throttle	2nd to 1st	32 . . . 28 mph
Kickdown	3rd to 2nd	83 . . . 76 mph
Kickdown	2nd to 1st	48 . . . 36 mph

When checking the shift points, remember that a speedometer reading could be off by 7 % even though within permissible tolerances!

### C) Stall Speed **2350 ± 200 rpm** A 22/02

(selector lever in D or R, full throttle)

The stall speed will drop at high altitude!  
Drop per 1000 meters (3,300 ft.) altitude: approx. 125 rpm.

## Capacities

### Final Drive

SAE 90 hypoid gear lube  
GL 5 (MIL-L 2105 B)

approx. 1.9 ltr.

### Automatic Transmission

ATF Dexron \*

Total volume including torque converter

approx. 5.4 ltr. \*

ATF change including torque converter

approx. 5 ltr. \*

- \* Add about 4 ltr. ATF in a stopped engine, start engine in "P", run at idle speed, observe ATF level in filler tank and add missing amount immediately (see pages 38-25 and 38-26 of Repair Manual).

**Observe mark on filler tank, don't overfill!**

### Service Instructions

ATF level check

at 1000 miles,  
then 15,000 mile intervals

ATF change, including torque converter,  
ATF filter replaced

30,000 mile intervals

Final drive hypoid oil level check

at 1000 miles,  
then 15,000 mile intervals

Final drive hypoid oil change

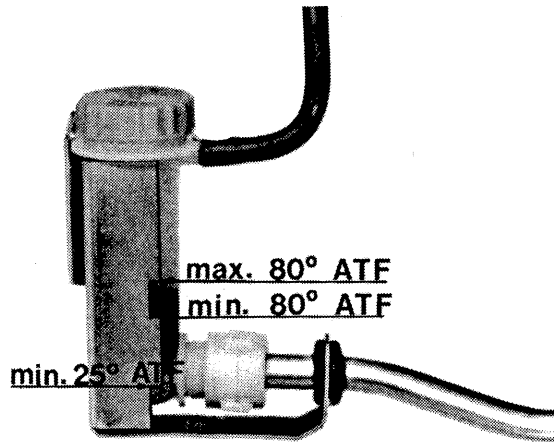
30,000 mile intervals

- \* Quality informations page 7 and 8.

The ATF must be changed and the ATF filter replaced at 30,000 mile intervals. The ATF of cars operated in difficult conditions (e. g. trailer hauling, hard sporty events) should be changed more often, without replacement of the ATF filter.

Change ATF in accordance with instructions on pages 38-25 and 38-26 of Repair Manual 928, Volume II.

The ATF level can be checked on either a **cold** transmission (ATF temperature approx. 25 °C) or on a transmission at **operating temperature** (ATF temperature approx. 80 °C).



The difference in amount of oil between the **min. mark at approx. 80 °C** and the **max. mark at approx. 80 °C** is only about 200 ml (0.2 ltr.).

If too much ATF is added, it is **absolutely essential** to drain the excessive amount.

When the ATF level is too high, rotating parts will emerge in the ATF and produce foam.

Air bubbles in the hydraulic lines will cause unwanted shifts, which could damage the transmission.

It could be advantageous to check the ATF level of a cold transmission prior to a test drive or when changing the ATF.

Since only the minimum level will be shown, the ATF level must always be rechecked after transmission has reached its operating temperature.

It is difficult for ATF and final drive SAE 90 gear lube to mix.

Should ATF or gear lube leave an open hole on the side of the transmission case near the ATF filler tank, the seal between the final drive and automatic transmission is defective. Remove and repair the transmission without delay.

## Automatic Transmission Fluid

The automatic transmission fluid (ATF) is used to **lubricate** and **cool** components of the automatic transmission. ATF is also used to **transmit power** in the torque converter, as **hydraulic fluid** and to build up **defined friction** on the wet clutches and brake bands. If the wrong ATF grade is used, the shifts could be too hard or too long.

Long shifts will cause overheating and excessive wear on friction parts in the automatic transmission.

ATF was sold for many years with the specification "**ATF Dexron B**". The additives which have considerably influence on the properties of this fluid, contain fats and oils, which are from the sperm whale (similar to the well known cod-liver oil!).

Now the killing of sperm whales has been strictly forbidden by the USA. The restriction covers the sales of products, which contain parts of this animal. Consequently also ATF Dexron B in cans, transmissions or cars.

"ATF Dexron B" is still available in Europe. However the manufacture of the additive, Lubrizol 3216 (with sperm whale oil), which almost all lubricant manufacturers had used for ATF Dexron B, has been stopped.

A **new ATF quality** with the additive **Lubrizol 3216 C**

is available worldwide and is also suitable for the automatic transmissions A 22 (Porsche 928) and RL (Porsche 924). The additive, Lubrizol 3216 C, in this ATF is synthetic. It also does not contain any poisonous ingredients.

The following fluids are **not** suitable for our automatic transmissions!

**ATF Dexron II**

**ATF Dexron II C**

**ATF Dexron II D**

**ATF Type A, Suffix A**



**The following brand name fluids have been tested and approved for use in the automatic transmission.**

<b>Product Name</b>	<b>Make</b>
Automatic Transfluid 7171	Esso (EXXON)
BP Autran DX	BP
Caltex Texamatic Fluid 7492 Dexron B 10 333	Caltex Petroleum Corp. New York/USA
Castrol TQT	Castrol Ltd. GB
Mobil Automatic Transmission Fluid C	Mobil Oil
Quaker State Autom. Transm.- Fluid Dexron B – 11220	Quaker State Oil, Oil City/Pa. USA
Shell ATF S 8684	SHELL
Sunamatic 128	Sun Oil Co.
Texaco Transmission Fluid VD	Texaco Inc. New York/USA

As much information as possible on the trouble and damage history will be necessary to diagnose a defective automatic transmission.

The following points must definitely be checked and, if necessary, corrected **prior to test driving**, in order to prevent additional damage during the test drive or an incorrect diagnosis.

1. External damage, leaks from the transmission (ATF loss) or the final drive (hypoid oil loss), detached cables or wires.
2. Check fluid level at inspection tank of automatic transmission (also check appearance and odor of ATF!).
3. Check engine tuning (ignition timing, idle speed, wide open throttle with full throttle or kickdown position of accelerator pedal).
4. Adjustment of control pressure cable (see page 17).
5. Adjustment of selector lever cable (see page 16).
6. Operation of electric kickdown valve (see page 18).

Test drive the car on a route which will allow a complete test of the transmission.

Try to get an accurate description of the problem from the customer or, better yet, let the customer drive the car and show you the problem.

Always check:

- **all upshifts**
- **all downshifts** (also kickdown)
- **all selector lever positions** (P–R–N–D–2–1)
- **operation while backing up**, also on hill when possible
- **stall speed**

Naturally an accurate diagnosis of problems will require knowledge of the automatic transmission's design and operation. Consequently you should thoroughly read and study the brochure "Automatic Transmission A 22, Description of Operation".

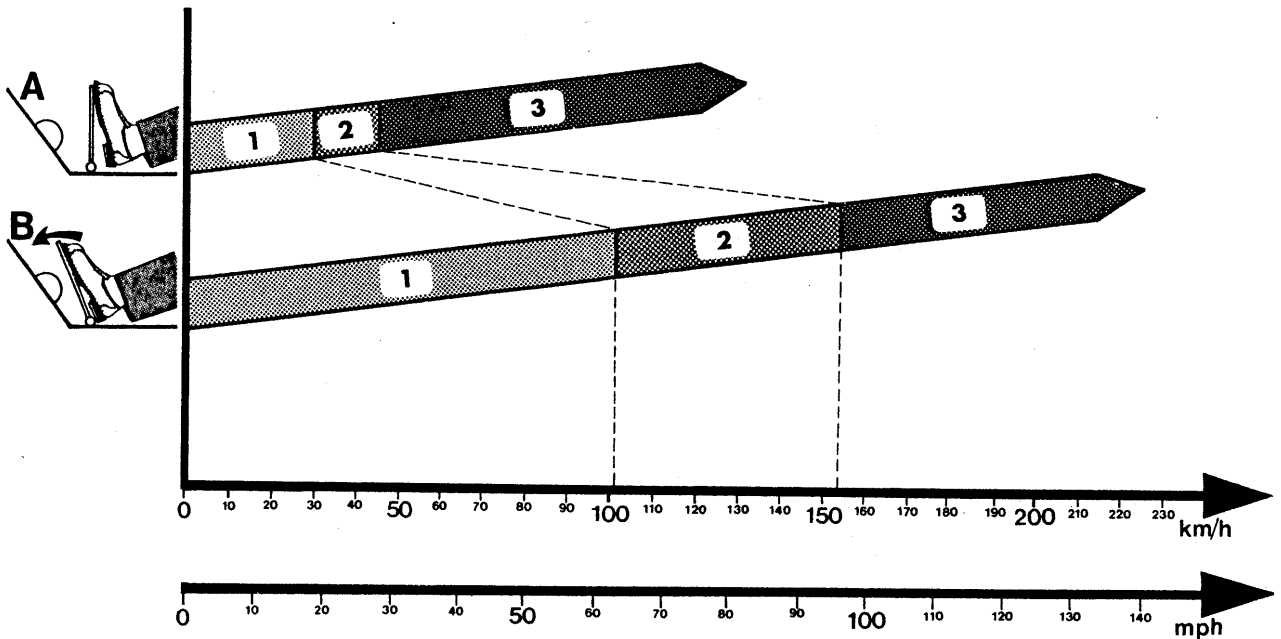
If the problems cannot be definitely pinpointed during the test drive, systematically check:

- **the shift points,**
- **the stall speed and**
- **the pressures.**

How this is done, will be explained on the following pages.

When checking shift points on a road test or on a chassis dynamometer, remember that permissible tolerances allow the speedometer an incorrect reading of up to 7 %

### Lets First Check the Upshifts



A = Rolling vehicle without force on accelerator pedal  
B = Full throttle position

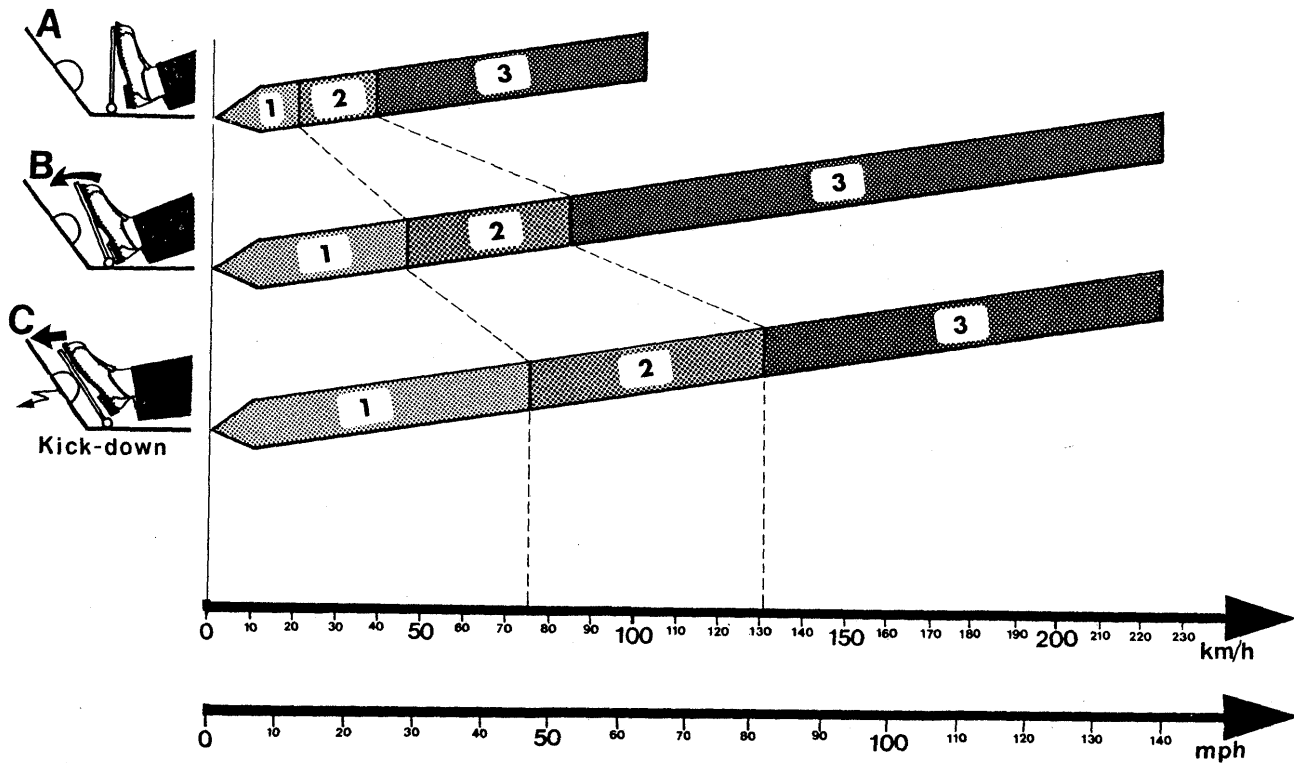
### Full Throttle Upshift Points (B):

From 1st to 2nd gear between 60 and 65 mph  
From 2nd to 3rd gear between 93 and 98 mph

Shift points will be scattered infinitely between the lower partial load range and full throttle position.

**If the accelerator pedal is pressed down past the full throttle pressure point (kick-down), the shift points will not change as compared with the full throttle upshift points.**

## Checking Downshift Points



A = Rolling vehicle without force on accelerator pedal

B = Full throttle position

C = Accelerator pedal pressed beyond full throttle position (kickdown)

### Full Throttle Downshift Points (B):

From 3rd to 2nd gear between 53 and 35 mph

From 2nd to 1st gear between 32 and 28 mph

**Test:** Car rolling speed about 34 mph accelerator pedal at full throttle (not kick-down), transmission **must** downshift from 3rd to 2nd gear.

### Kickdown Downshift Points (C):

From 3rd to 2nd gear between 83 and 76 mph

From 2nd to 1st gear between 48 and 36 mph

**Test:** Car rolling speed about 75 mph, accelerator pedal at kickdown, transmission **must** downshift from 3rd to 2nd gear.

This test will indicate whether the torque converter is operating correctly, as well as the shift elements brake band 1, brake band 2 and one-way clutch with the selector lever in D, 2 or 1, and also brake band B 3 and one-way clutch with selector lever in R.

### **Testing Conditions:**

- Engine tuning (valve timing, ignition, CO level, Throttle) checked and correct.
- ATF level checked and correct.
- Engine/transmission at operating temperature.
- Parking brake **fully** applied.
- Brake pedal pressed down with left foot. Now start engine, move selector lever to D (no difference in position 2 or 1, since 1st gear of automatic transmission is always engaged when car is stopped!).
- Full throttle for maximum 5 seconds.
- Read engine speed from tachometer.

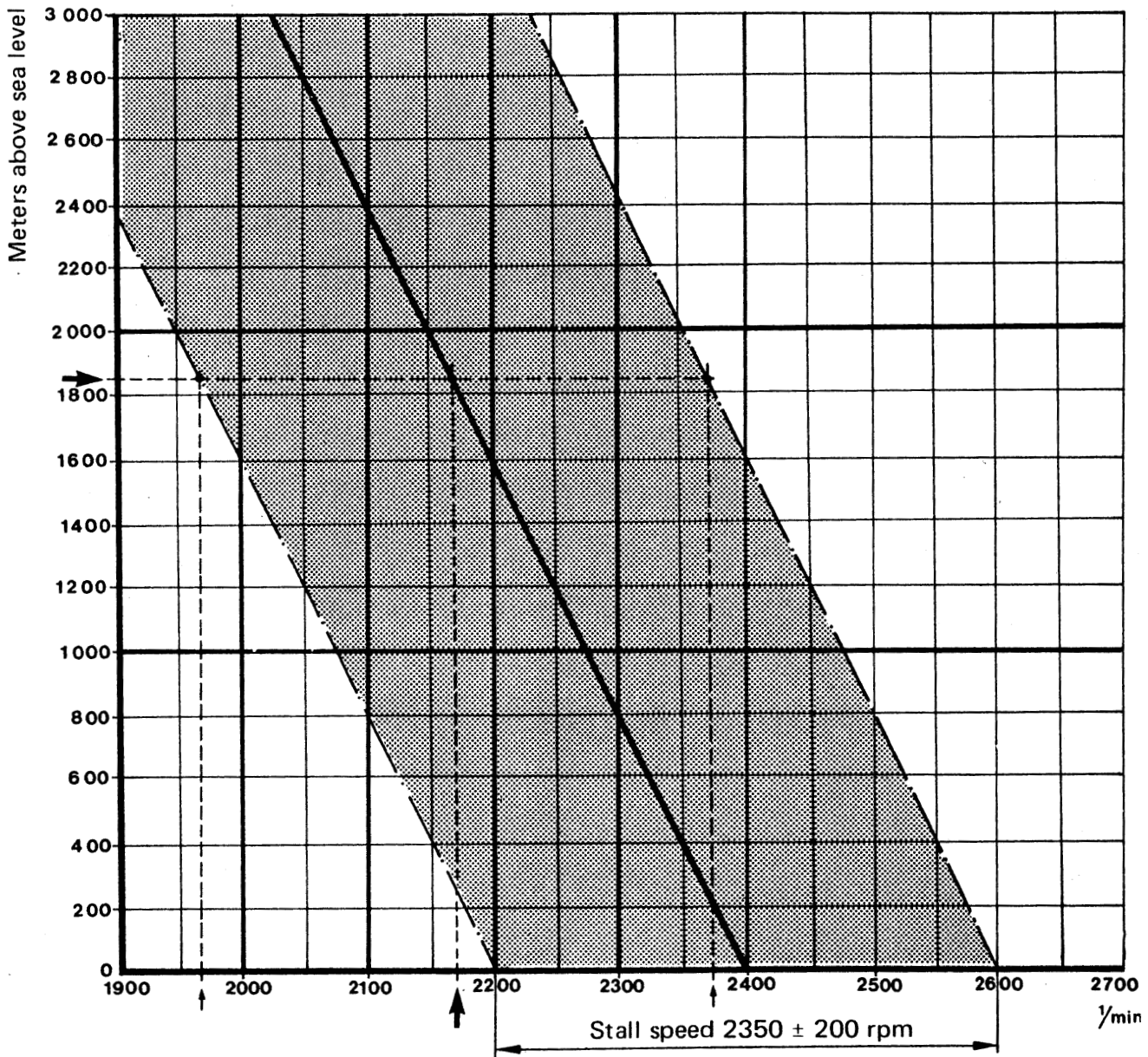
### **Caution!**

**Never test stall speed longer than 5 seconds due to the great heat developed in the torque converter!**

**Never move off with stall speed!**

Stall speed should be **2350 ± 200 rpm**.

The stall speed will drop in relation to the altitude above sea level. The drop is caused by the lower engine output at higher altitudes and will be about 125 rpm per 1000 meters (3,300 ft.) above sea level.



Explanation of Diagram:

A Porsche 928 tested at 1850 meters above sea level (e. g. in the Porsche Workshop at St. Moritz, Switzerland) can only reach a stall speed of  $2170 \pm 200$  rpm (broken line in diagram) due to reduced engine output in the mountains.

### Torque Converter

Requirements:  
 ATE level correct  
 Operating temperature  
 Modulation pressure correct  
 Control pressure correct

Complaint

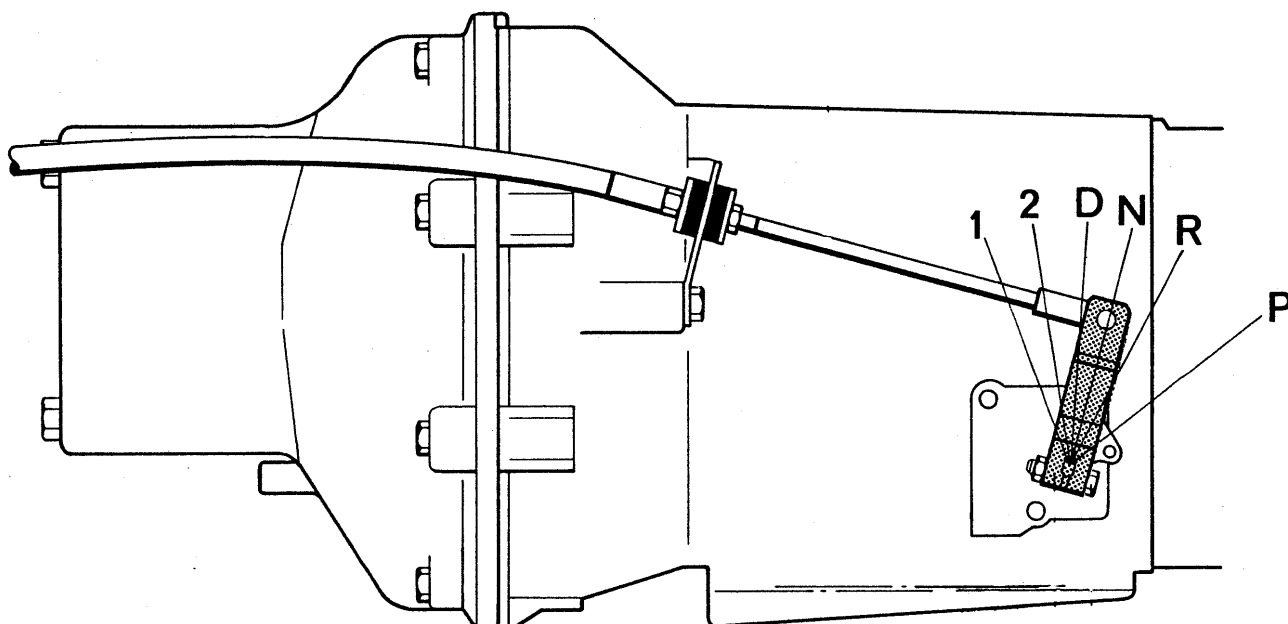
Complaint	Possible Damage							
	One-way clutch defective Replace torque converter	Check check valve in turbine	Check piston ring on turbine shaft; replace piston ring if necessary.	Good engine, no damage on torque converter! Everthing okay, if top speed is reached.	Thrust washer in torque converter worn. Replace torque converter. Flush lines.	Engine output insufficient. Check engine, especially whether throttle is at full throttle.	Check modulation and control pressure. Correct modulation pressure, if necessary (3.1 ... 3.15 bar vacuum)	Friction elements B 1 or B 2 or one-way clutch in transmission
Selector lever in "P" Engine only reaches 2500 ... 4000 rpm	▲							
Selector lever in "D" Stall speed higher than 3000 rpm		▲	▲					
Selector lever in "D" Stall speed is 2600 ... 2800 rpm				●	▲			
Selector lever in "D" Stall speed is 2000 ... 2200 rpm						●		
Selector lever in "D" Stall speed is 1500 ... 1900 rpm	▲							
Selector lever in "D" Stall speeds continues to rise							●	▲
Driving up to about 80 km/h (50 mph) okay, faster as "with brakes on"	▲							
Moving off only possible 10 to 20 seconds after starting engine		▲	▲					

- Adjustments and inspections on installed transmission
- Repairs, which can be done on an installed transmission
- ▲ Repairs, which must be done on a removed transmission



## Selector Lever Cable

The selector lever cable connects the selector lever in the passenger compartment with the range selector lever on the transmission.

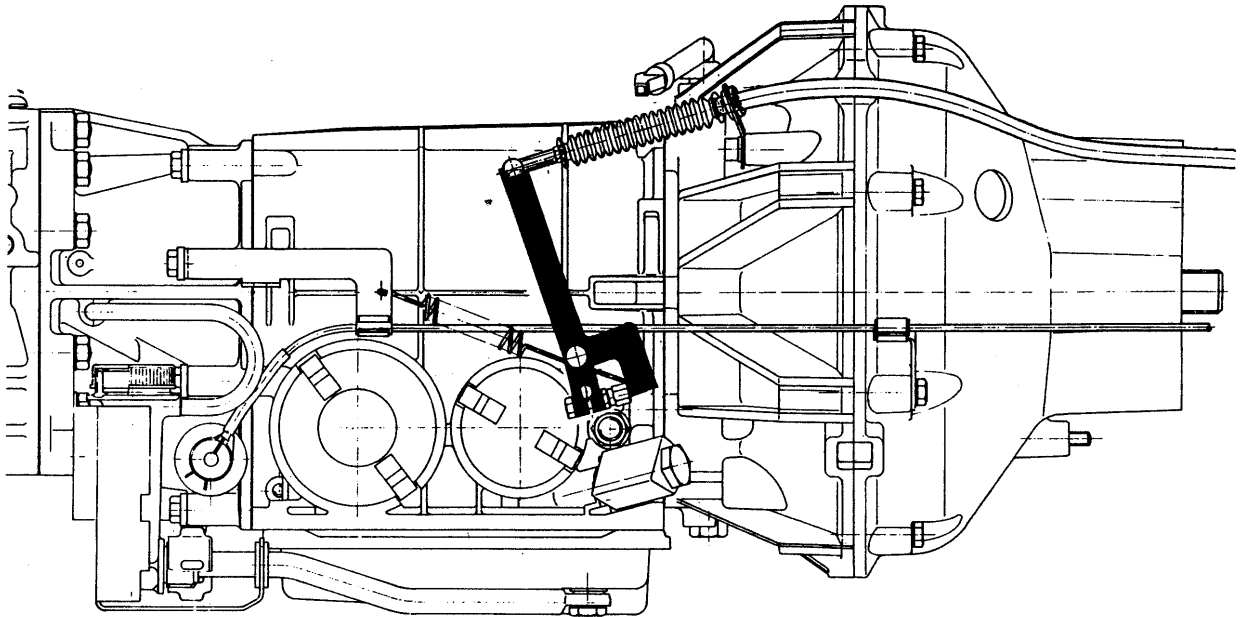


**Adjustment:** (see pages 37–11 and 37–12 of Repair Manual 928, Volume II)

1. Position selector lever at „N“.
2. Detach cable of range selector lever on transmission at ball socket.
3. Position range selection lever on transmission at „N“.
4. Adjust ball socket on cable so that the cable can be reattached without tension.
5. Test all positions of selector lever.

## Control Pressure Cable

The control pressure cable connects the throttle valve of the engine with the control pressure lever on the side of the transmission. The pertinent throttle valve position (or accelerator pedal position) is transmitted to the lever on the transmission and consequently to the automatic transmission controls.



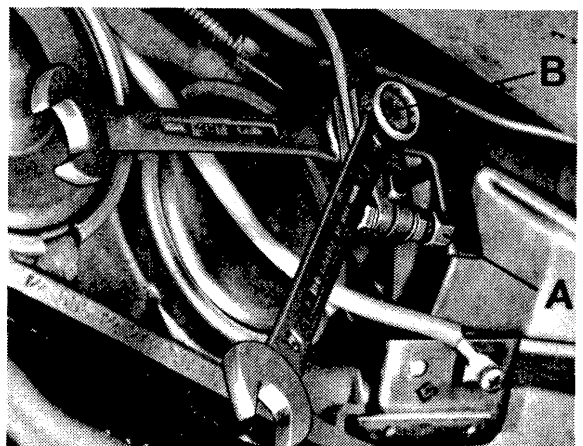
**Adjustment** (see page 37 – 14 of Repair Manual 928, Volume II)

1. Adjust engine idle speed.
2. Adjust accelerator cable (between accelerator pedal and throttle valve lever) to remove play.
3. Attach cable on control pressure lever of transmission without play and, if necessary, turn adjusting screw on control pressure lever to remove tension or play.
4. The ball sockets of the cable must be screwed on the threads by about 6 mm.

When the cable is correctly adjusted, there will be a travel of about 33 mm on the transmission ball joint of the control pressure lever, if the accelerator pedal is pressed from neutral to full throttle position (not kick-down).

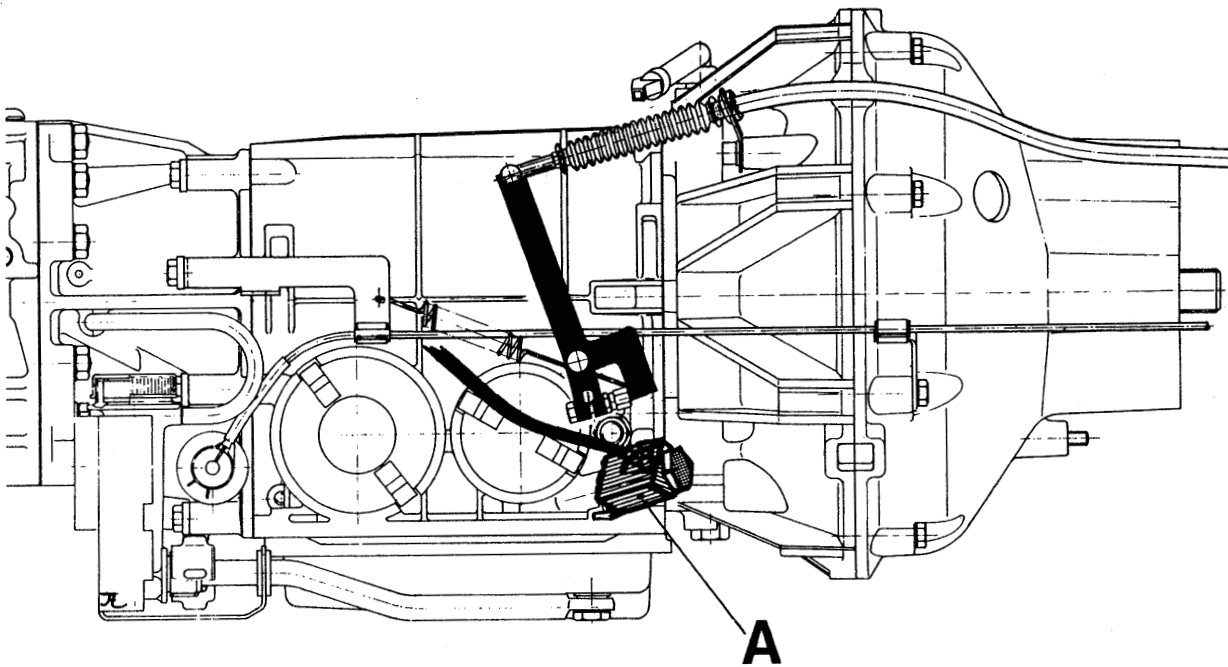
**Note:** If adjustments had required loosening the M 8 connecting screw between the lever and clamp, this screw must never be tightened against the stop in the automatic transmission (danger of damaging the connecting lever in the transmission).

- A – Adjusting screw
- B – Connecting screw



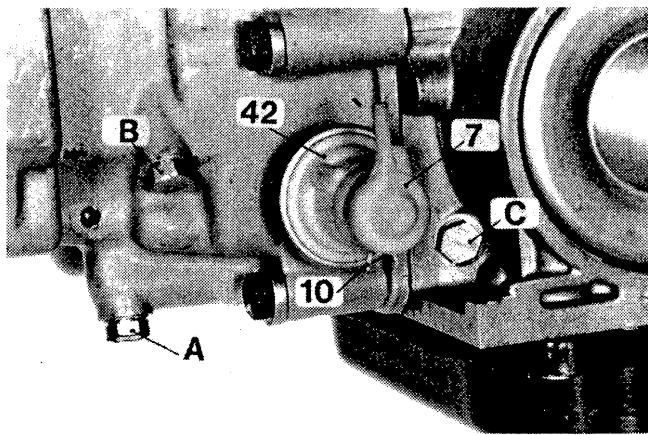
The accelerator pedal can be pressed down past its full throttle point against additional resistance. This position of the accelerator pedal is known as **kickdown**. An electric switch behind the accelerator pedal will operate a solenoid on the transmission (A), which will influence the hydraulic action in the valve body. Consequently in this manner there is direct influence on the downshifts of the automatic transmission.

- **Automatic downshift** by one or two gears, for example for fast passing or on steep gradients (selector lever in D or with less effect in 2).
- **Automatic upshift**, if the full acceleration is interrupted with kickdown in low speed ranges (selector lever in D or with less effect in 2).



### Testing:

- Turn on ignition.
- Press accelerator pedal to full throttle pressure point.
- Press accelerator pedal past the full throttle point to kickdown. A definite click of solenoid (A) must be heard.



Three different pressures can be checked:

- Modulation pressure  
test connection C
- Main pressure  
test connection A
- Governor pressure  
test connection B

(Refer to pages 38-6 to 38-9 of Repair Manual 928, Volume II.)

**Modulation Pressure:** Modulating pressure can be checked and adjusted.

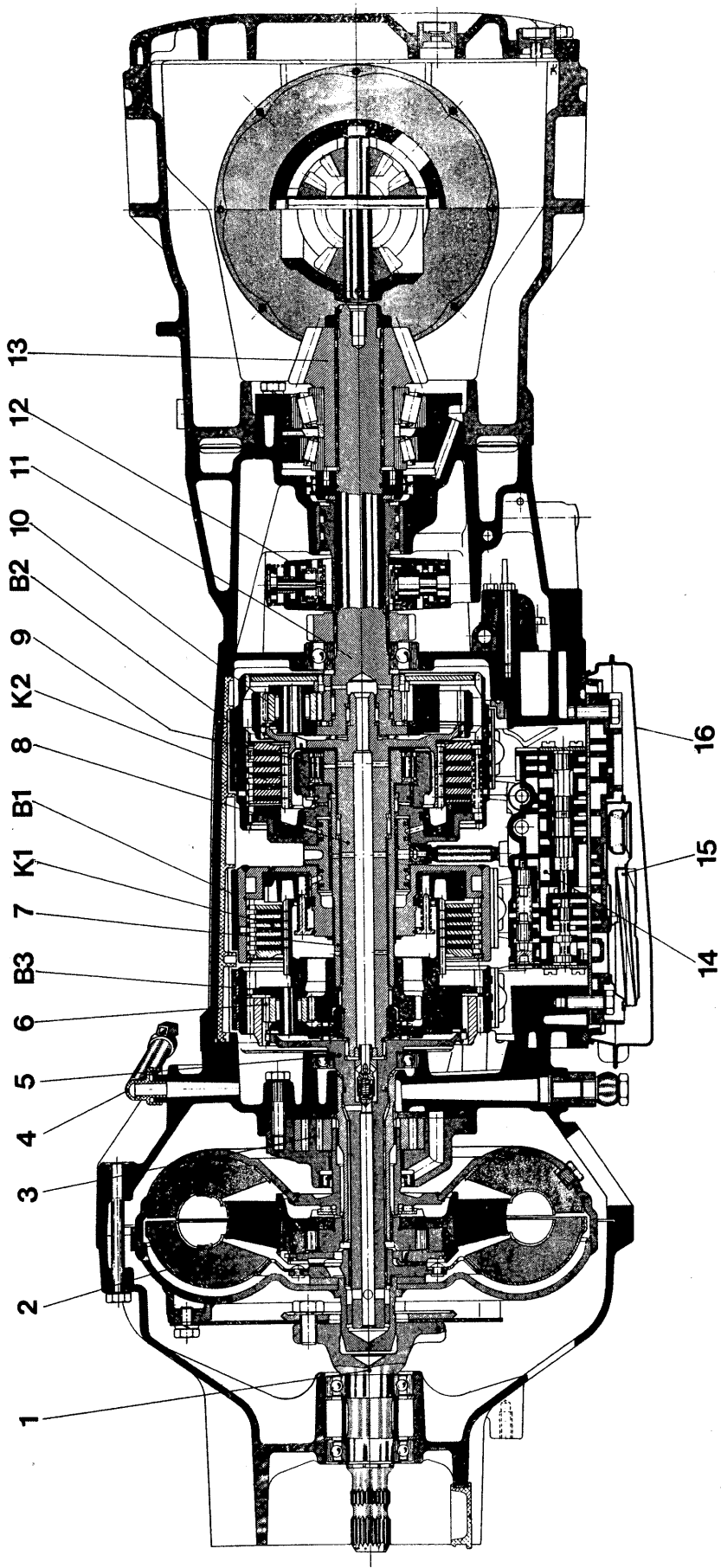
Selector Lever Position	Accelerator Pedal Position	Test Conditions	Pressure (bar)
D	Full throttle (not kickdown)	More than 50 mph	3.1 . . . 3.15
D	Full throttle (not kickdown)	Car held by brakes Vacuum line off	4.6 . . . 4.9

**Main Pressure:** Main pressure can be checked, but not adjusted.

Selector Lever Position	Accelerator Pedal Position	Test Conditions	Pressure (bar)
D	Full throttle	Car held by brakes Vacuum line off	10.9 . . . 10.5 . . . 11.6      11.2
R	Full throttle	Car held by brakes Vacuum line off	19.2 . . . 18.5 . . . 20.3      19.6
D	Full throttle (not kickdown)	About 62 mph Vacuum line on	5.5 . . . 5.2 . . . 5.9      5.6

**Governor Pressure:** Governor pressure can be checked, but not adjusted.

Selector Lever Position	Accelerator Pedal Position	Test Conditions	Pressure (bar)
D	Partial load	12 mph Vacuum line off	0.5 . . . 0.6
D	Partial load	46 mph Vacuum line off	2.1 . . . 2.2
D	Partial load	81 mph Vacuum line off	3.1 . . . 3.3



- 1 **Drive flange** transmits engine torque to automatic transmission.
- 2 **Hydrodynamic torque converter** doubles the engine torque value for moving off.
- 3 **Pump** delivers ATF to automatic transmission and converter for lubrication and operation.
- 4 **Transmission vent** equalizes pressure as temperatures fluctuate.
- 5 **Turbine shaft** is in power flow between torque converter and automatic transmission.
- 6 **Front planetary gear** set transmits and converts speed of turbine shaft and changes direction of rotation for reverse.
- 7 **Hollow shaft** connects sun gear of front planet gear set (6) with one-way clutch (9).
- 8 **Intermediate shaft** connects planet gear carrier of front planet gear set (6) with ring gear of rear planet gear set (10).
- 9 **One-way clutch** locks in 1st gear and reverse.
- 10 **Rear planet gear set** transmits and converts speed of front planet gear set (6) again.
- 11 **Output shaft** transmits power flow (forward or reverse) from automatic transmission to final drive.
- 12 **Centrifugal governor** provides hydraulic pressure according to changes in road speed.
- 13 **Drive pinion** is mounted on output shaft (11) and is in mesh with ring gear.
- 14 **Valve body** controls the automatic transmission.
- 15 **ATF filter** stops dirt from entering bores/passages of valve body.
- 16 **Sump** contains ATF Dexron.
- B1 **Brake band 1**
- B2 **Brake band 2**
- B3 **Brake band 3**
- K1 **Clutch pack 1**
- K2 **Clutch pack 2**

Certain components will operate for each gear. In the case of failure, i. e. delayed or excessively hard shifts, the following table shows which components are being used.

In our case we are dealing with 2 clutch packs, 3 brake bands and 1 one-way clutch.

Gear	K1	K2	B1	B2	B3	One-way Clutch
1			★	★		★
2	★			★		
3	★	★				
R					★	★

Operating components of automatic transmission A 22:

K1	Clutch pack	1
K2	Clutch pack	2
B1	Brake band	1
B2	Brake band	2
B3	Brake band	3

The **clutches** have to **connect** or **disconnect** rotating parts.

**Brakes stop** or **release** parts.

Example: Car accelerates correctly in 1st and 2nd gear.  
A shift element slips when shifting to 3rd gear.

Solution: When shifting from 2nd to 3rd gear, clutch  
K2 engages.  
K2 is slipping.

The defects found during the test drive and other tests can now be used to more closely pinpoint the defects and damage in the automatic transmission.

The following damage symbols are used for problems concerning ATF and gear lube in the final drive.

- Adjustments and inspections on an installed transmission.
- Repairs, which can be done on an installed transmission.
- ▲ Repairs, which must be done on an installed transmission.

Complaint	Possible Damage Cause													
	Check ATF level, correct if necessary	Check final drive oil level, correct if necessary	Water in ATF! Replace all clutches and brake bands	Flush ATF cooler, hoses and pipes	Replace torque converter	Flush torque converter	Converter drains, defective check valve in turbine shaft	Final drive oil level too high = seal betw. box and shaft defective	Vacuum unit diaphragm	Check vent cap for dirt	Check radial seal and O-ring of ATF pump	Reseal drain plug of converter, use Hylomar sealant	Seal betw. box and final drive missing or defective	Repair transmission. Better: install exchange transmission.
ATF escaping from front vent	●	●								▲				
ATF in sump milky white			▲	●		▲								
ATF black and smells bad. Metal burrs in fluid				●	▲									▲
ATF level rises too much after stopping engine. Higher than expansion tank							▲							
ATF loss, but no visible leak							▲	■	▲	▲				
ATF loss very slow								■						
Sudden smoke from exhaust								■						
ATF loss visible betw. converter and ATF pump										▲	■			
Gear lube escaping from final drive case at hole near expansion tank												▲		



During the compilation of possible automatic transmission defects and measures for their repair, it became quite clear that a defect and its cure could not be covered with 4 or 5 words and published in a table as in the past. Consequently we have decided on a reference card system, which provides more details.

A **complaint card** shows all possible problems.

**Details of the problem** are described in the center of the card.

**Cause of damage** is given as a code below.

Complaint:	Code
Details:	
Possible damage cause, see reference	

The codes on the complaint card show on which **"damage cause"** card the repair notes can be found.

The possible **damage causes** are described on a second card.

The **Manual column** shows the page of repair manual where instructions can be found.

The **"Code"** column provides back-reference to the complaints.

Possible damage cause:	Reference
Manual:	
Repair Instructions:	
Code:	

This reference system is easy to explain and learn.

The **problems** are divided into:

- A No drive, drive problems
- D Incorrect hydraulic pressure
- F Shifting problems
- G Noises
- R Shift components slipping
- S Other problems

Trouble elimination instructions on the "damage cause" cards are again divided into the following sections.

**PR Testing and adjusting operations**, which can easily be performed on the car. Comparable with ● of our former division system.

**IN Repair operations** on the transmission or other components, which can be performed on units installed in car. Comparable with ■ of our former division system.

**RE Repair operations**, which can only be performed on a removed transmission. Comparable with ▲ of our former division system.

When repairing a transmission it is best to always start with the instructions for testing and adjusting operations (**PR**), and in fact progressively (e. g. first PR 1, then PR 2, then PR 7 and finally PR 12). This is followed by the **IN** instructions for repairs on car and concluded with major transmission repairs (**RE**).

#### **One Example:**

While test driving the car you find that the shift from 2nd to 3rd gear is too slow, a shift part is slipping.

First step: Refer to troubles at "**R**" (shift parts slipping). At **R5** we will find the following complaint: "Transmission slips only in 3rd gear".

The details read:

"Moving off in 1st gear and driving in 2nd gear is okay, but transmission slipping in 3rd gear.

Possible damage causes listed on the card:

- PR 1 ATF level too low
- PR 2 Check ATF level
- PR 4 Wrong operating pressure
- IN 6 Defect in valve body housing
- IN 7 Sealing bushings of insert tubes damaged
- RE 7 Seals on clutches defective
- RE 8 Clutch plates K 1 and (or) K 2 worn or burnt

Note: Transmission only has to be removed for the last two points!

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Print: Beck & Co., 7000 Stuttgart 40

Illustrations, descriptions and diagrams serve exclusively the presentation of the text.  
We cannot accept any liability for completeness or conformity of the contents of this  
publication with the pertinent legislative regulations.  
Subject to changes without prior notice.

## **Complaints**

The "complaint" cards are divided into:

- A No drive, drive problems
- B Incorrect hydraulic pressures
- F Shifting problems
- G Noises
- R Shift components slipping
- S Other problems

---

## **Damage Causes**

The "damage cause" cards are arranged according to:

- PR Inspections and adjustments
- IN Repairs on installed transmissions
- RE Repairs only possible on removed transmissions

**Possible Damage Cause:**

ATF level too low

Reference

PR 1

Manual: Pages 38-2, 38-26

**Repair Instructions:**

Because the ATF level is too low, the ATF pump cannot draw in fluid; consequently the entire control system fails. Correct ATF level to specified value.

**Code:**

A 1, A 2, A 4, D 1, F 2, F 10, G 6, R 1, R 2, R 3, R 4, R 5, R 6

Reference

PR 2

**Possible Damage Cause:**

Check ATF level and odor

Manual: page 38-2

**Repair Instructions:**

If ATF has a strong odor and is no longer clear and light red, but brown or black, the entire automatic including valve body and converter must be replaced. Flush ATF cooler and its lines thoroughly.

**Complaint:**

No drive in all gears

**Code****A 1****Details:**

In spite of engine in perfect running condition it is not possible to move off with the car in forward or reverse, with the selector lever in any position.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 7, PR 12, IN 1, RE 1

**Possible Damage Cause:**

Incorrect modulator pressure

**Reference****PR 3**

Manual: pages 38-6 to 38-9

**Repair Instructions:**

The modulator pressure can be checked and adjusted.  
Specified value: 3.1 to 3.15 bar at 55 mph, 3rd gear and full throttle (not kickdown!).

**Code**

**A 2**

**Complaint:**

Slipping. Shift components only engage at high engine speed

**Details:**

Too much time is required before the car moves, transmission engages with a jerk. Great pressure loss inside of transmission.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 3, PR 4, PR 5, IN 14, RE 1, RE 10, RE 11

**Reference**

**PR 4**

**Possible Damage Cause:**

Incorrect main pressure

Manual: page 38-8

**Repair Instructions:**

Main pressure can only be checked. It depends on modulating pressure. If modulator pressure is okay and main pressure not, check main pressure valve no. 21 in valve body.

Specified main pressures:

10.9 . . . 11.6 bar, car stopped, range D, vacuum line off  
19.2 . . . 20.3 bar, car stopped, range R, vacuum line off  
5.5 . . . 5.9 bar, 62 mph, range D, vacuum line on

**Complaint:**

Slipping for several seconds after starting engine

**Code****A 3****Details:**

After starting engine many seconds elapse before the car will move. Once moving there is no further complaint.

**Possible Damage Causes, see Reference:**

RE 10, RE 11

**Possible Damage Cause:**

Incorrect governor pressure

**Reference****PR 5**

Manual: page 38-8

**Repair Instructions:**

The governor pressure depends on the road speed and main pressure and cannot be adjusted. If governor pressure is wrong, but main pressure correct, clean the centrifugal governor.

Specified governor pressures:

0.5 . . . 0.6 bar at 12 mph, vacuum line off

2.1 . . . 2.2 bar at 46 mph, vacuum line off

3.1 . . . 3.3 bar at 81 mph, vacuum line off



**Code**

**A 4**

**Complaint:**

Slipping with selector lever in "R", or too much time required before car moves back

**Details:**

No reverse. Backing up only possible after waiting a long time, then moving selector lever to "R".

**Possible Damage Causes, see Reference:**

PR 1, PR 2, IN 12, IN 13, IN 22, RE 3, RE 5

**Reference**

**PR 6**

**Possible Damage Cause:**

Control pressure lever or cable misadjustment or cable not connected

Manual: pages 37-13, 37-14

**Repair Instructions:**

Check adjustment. Adjust exactly on control pressure lever. Ball joint on lever must travel about 33 mm from neutral to full throttle. Also check control pressure cable ball joint on throttle lever of engine, lubricate ball joint if necessary.

**Complaint:**

Engine cannot be started in "P" or "N"

**Code****A 5****Details:**

The engine cannot be started, although the electrical system is receiving power.

**Possible Damage Causes, see Reference:**

PR 12, IN 3

**Possible Damage Cause:**

Break in power train between engine and transmission

**Reference****PR 7**

Manual: pages 39-45 to 39-53

**Repair Instructions:**

Mechanical connection between engine and transmission could be interrupted at:

- flywheel/drive plate flange
- drive shaft
- rear flange
- drive plate/torque converter

**Code**

**D 1**

**Complaint:**

No main pressure in "P" or "N"

**Details:**

The main pressure is very low or "0" in "P" or "N" selector lever position.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 3, IN 1, IN 6, IN 7, IN 13, IN 19, RE 1

**Reference**

**PR 8**

**Possible Damage Cause:**

Engine output insufficient

Manual: see section on engine adjustments

**Repair Instructions:**

Misadjustments causing insufficient engine output.

Output requirements:

- basic engine tuning okay
- throttle valve wide open
- check camshaft timing

**Complaint:**

No modulating pressure

**Code****D 2****Details:**

No modulating pressure can be measured.

**Possible Damage Causes, see Reference:**

PR 4, IN 6, IN 14, IN 19, RE 2

**Possible Damage Cause:**

Electrical defect

**Reference****PR 9**

Manual:

**Repair Instructions:**

Begin troubleshooting on kickdown switch at accelerator pedal; kickdown coil on transmission must receive power at kickdown and solenoid click must be heard.

**Code**  
D 3

**Complaint:**  
Modulating pressure too high

**Details:**

The measured modulating pressure is too high and cannot be adjusted.

**Possible Damage Causes, see Reference:**

PR 11

**Reference**  
PR 10

**Possible Damage Cause:**

Vacuum line from engine to modulator valve plugged or bent

Manual: pages 38-6 to 38-9

**Repair Instructions:**

Check vacuum line between engine intake manifold and modulator valve on transmission for blockage.

**Complaint:**

Governor pressure too high

**Code****D 4****Details:**

The governor pressure is too high at operating temperature, correct ATF level and vacuum line between modulator valve and engine in good condition.

**Possible Damage Causes, see Reference:**

IN 6, RE 13

**Possible Damage Cause:**

Vacuum line from engine to modulator valve torn or disconnected

**Reference****PR 11**

Manual: pages 38-6 to 38-9

**Repair Instructions:**

First inspect cap of modulator valve on side of transmission; then follow line to engine.

**Code**  
D 5

**Complaint:**  
Governor pressure too low

**Details:**

The governor pressure is too low at operating temperature, correct ATF level and vacuum line between modulator valve and engine in good condition.

**Possible Damage Causes, see Reference:**

RE 13, RE 15

**Reference**  
PR 12

**Possible Damage Cause:**  
Selector lever system misadjusted

Manual: pages 37-9 to 37-11, 37-15

**Repair Instructions:**

Check and readjust selector lever system. Move selector lever inside car to "N", detach cable to transmission lever, move transmission lever to "N" and readjust cable.

**Complaint:**

No upshifts

**Code****F 1****Details:**

The transmission starts off in 1st gear, but does not shift up into 2nd gear.

**Possible Damage Causes, see Reference:**

PR 5, IN 6, IN 7, RE 13

**Possible Damage Cause:**

ATF filter plugged

**Reference****IN 1**

Manual: pages 38-21, 38-22

**Repair Instructions:**

Filter could be plugged by dirt and metal shavings from torque converter, ATF cooler and parts of automatic transmission. If in doubt, replace filter.

Replace filter at 30 000 miles intervals, or 15 000 miles intervals when operating conditions are extreme.



**Code**

**F 2**

**Complaint:**

Delayed upshift

**Details:**

Upshifts do occur, but it takes too long before they are completed.

**Possible Damage Causes, see Reference:**

PR 1, IN 7, RE 7, RE 8, RE 12

**Reference**

**IN 2**

**Possible Damage Cause:**

Modulator valve defective

Manual: page 38-7

**Repair Instructions:**

The modulator valve has a diaphragm, which could be pious or torn. When installing a new unit make sure that pin length between diaphragm and modulating pressure valve no. 43a is correct. Pin is glued in modulator valve with metal cement.

**Complaint:**

Transmission shifts up too early

**Code****F 3****Details:**

When accelerating upshift points are at too low speed.

Upshift 1st – 2nd at full throttle: 60 . . . 65 mph

Upshift 2nd – 3rd at full throttle: 93 . . . 98 mph

**Possible Damage Causes, see Reference:**

PR 3, PR 4, PR 5, PR 6, PR 10, PR 11, RE 13

**Possible Damage Cause:**

Starting lock and backup light switch defective or misadjusted

**Reference****IN 3**

Manual: page 37-12

**Repair Instructions:**

First check operation of electric switch:

Measure switch resistance in various selector positions.

	50 and 50	81 and 81a
P and N	0	infinite
R	infinite	0
D, 2 and 1	infinite	infinite

Use locating tool for adjustments (selector lever at N).

**Code**

**F 4**

**Complaint:**

Transmission shifts up too late

**Details:**

When accelerating upshift points are at too high a speed; engine may over-rev.

Upshift points at full throttle:

1st – 2nd 60 . . . 65 mph

2nd – 3rd 93 . . . 98 mph

**Possible Damage Causes, see Reference:**

PR 3, PR 5, PR 6, PR 10, PR 11, IN 2, RE 13

**Reference**

**IN 4**

**Possible Damage Cause:**

Quick filling valve no. 51 dirty or seized

Manual:

**Repair Instructions:**

Quick filling valve no. 51 is located next to brake band piston B 3 (22 mm bolt). It is easy to remove and check.

**Complaint:**

Downshifts take place at too low a speed

**Code****F 5****Details:**

Automatic downshifts at too low a speed.

Correct downshift points:

Full throttle 3rd – 2nd 53 . . . 35 mph

Full throttle 2nd – 1st 32 . . . 28 mph

Kickdown 3rd – 2nd 83 . . . 76 mph

Kickdown 2nd – 1st 48 . . . 36 mph

**Possible Damage Causes, see Reference:**

IN 5

**Possible Damage Cause:**

Kickdown solenoid or its seal defective

**Reference****IN 5**

Manual:

**Repair Instructions:**

Remove solenoid and check operation after removal (ground removed valve).

Check O-ring on valve neck thoroughly.

**Code**

**F 6**

**Complaint:**

Upshifts take place only at full throttle or in upper partial load range

**Details:**

Transmission shifts up to next higher gear only in full throttle position, or upshifts take place only after throttle valve is almost open.

**Possible Damage Causes, see Reference:**

PR 6, IN 6, IN 15

**Reference**

**IN 6**

**Possible Damage Cause:**

Defect in valve body

Manual: pages 38-21 to 38-23

**Repair Instructions:**

Remove with selector lever positioned between P and R.  
Check seals on tubes between valve body and transmission.

**Complaint:**

Vehicle without 1st gear

**Code**

**F 7**

**Details:**

The car moves off in 2nd gear or will not shift back into 1st gear.

**Possible Damage Causes, see Reference:**

IN 15, RE 13

**Possible Damage Cause:**

Valve body seals damaged

**Reference**

**IN 7**

Manual: page 38-22

**Repair Instructions:**

Always replace valve body seals whenever valve body is removed.  
Caution! The H-shaped connector for the tubes, made of plastic, could be installed wrong. Snap engages in the support flange.

**Code**

**F 8**

**Complaint:**

No 3rd gear

**Details:**

Transmission will not shift into 3rd gear when accelerating.

**Possible Damage Causes, see Reference:**

IN 5, IN 16, RE 7, RE 13

**Reference**

**IN 8**

**Possible Damage Cause:**

Brake bands worn

Manual:

**Repair Instructions:**

After removal of valve body, brake bands can be checked for wear without removing:

Travel B 1: 3.0 . . . 4.0 mm ) Correct with thrust pins of differ-  
B 2: 3.0 . . . 4.0 mm ) length  
B 3: at least 3.0 mm / correct with adjusting screw

**Complaint:**

No kickdown downshifts

**Code****F 9****Details:**

No kickdown downshifts with accelerator pedal floored.

Downshift Points with Kickdown:

3rd – 2nd 83 . . . 76 mph

2nd – 1st 48 . . . 36 mph

**Possible Damage Causes, see Reference:**

PR 6, PR 9, IN 5, IN 6, IN 17

**Possible Damage Cause:**

Brake band piston B 1 defective

**Reference****IN 9**

Manual:

**Repair Instructions:**

The brake band piston can be removed in car. Inspect seals carefully.



**Code**  
**F 10**

**Complaint:**

Unwanted downshifts from 3rd to 2nd gear

**Details:**

While driving car normally transmission downshifts on its own from 3rd into 2nd gear.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 9, IN 5, IN 6

**Reference**  
**IN 10**

**Possible Damage Cause:**

Brake band piston B 2 defective

Manual:

**Repair Instructions:**

The brake band piston can be removed in car. Inspect piston ring and seals for wear.

**Caution:** Remove and install piston for brake band B 2 only with Special Tool 9305, since otherwise piston ring will be damaged!

**Complaint:**

Kickdown downshifts 3rd – 2nd too hard

**Code****F 11****Details:**

Downshift jolt very uncomfortable and hard.

**Possible Damage Causes, see Reference:**

IN 20, IN 21

**Possible Damage Cause:**

Brake band piston B 3 defective

**Reference****IN 11**

Manual:

**Repair Instructions:**

The brake band piston can be removed in car.  
Inspect seals carefully.

**Code**

**F 12**

**Complaint:**

Parking lock cannot be engaged on stopped car

**Details:**

It is not possible to engage the parking lock.

**Possible Damage Causes, see Reference:**

RE 5, RE 17

**Reference**

**IN 12**

**Possible Damage Cause:**

Seal of piston B 3 defective

Manual:

**Repair Instructions:**

Piston B 3 can be removed in car.  
Check seals for wear and damage.

**Complaint:**

Transmission shifts up with lever at "1"

**Code****F 13****Details:**

The transmission sometimes shifts up even though the selector lever is in "1".

**Possible Damage Causes, see Reference:**

IN 6

**Possible Damage Cause:**

Gasket on valve body is defective

**Reference****IN 13**

Manual: oages 38-21 to 38-23

**Repair Instructions:**

Remove valve body in car.

Inspect and replace protruding, graphite-colored gasket between housing surfaces. Proceed exactly according to instructions in Repair Manual.

**Code**  
**G 1**

**Complaint:**  
Noise in 1st gear and reverse

**Details:**

Howling noise in 1st gear and reverse.  
No noise in 2nd and 3rd gears.

**Possible Damage Causes, see Reference:**

RE 18

**Reference**  
**IN 14**

**Possible Damage Cause:**

Modulating pressure relief valve seized (valve body)

Manual: pages 38-21 to 38-23

**Repair Instructions:**

The modulating pressure relief valve no. 34 in valve body can be removed and partially disassembled valve body inspected and cleaned. Proceed exactly according to instructions in Repair Manual!

**Complaint:**

Noise in 1st and 2nd gears

**Code****G 2****Details:**

Howling noise in 1st and 2nd gears.  
No noise in 3rd gear.

**Possible Damage Causes, see Reference:**

RE 19

**Possible Damage Cause:**

Valve in valve body seized or damaged

**Reference**

Manual: pages 38-21 to 38-23

**Repair Instructions:**

Valves no. 1 through 6 in valve body can be easily removed from a removed valve body and cleaned. Proceed exactly according to instructions in Repair Manual!

**Code**

**G 3**

**Complaint:**

Noise while accelerating

**Details:**

Howling noise while accelerating.  
No noise when speed held constant.

**Possible Damage Causes, see Reference:**

Defective torque converter, see "Troubleshooting Torque Converter"

**Reference**

**Possible Damage Cause:**

Command valve 2 – 3 stuck

Manual: pages 38-21 to 38-23

**Repair Instructions:**

The 2nd – 3rd gear command valve no. 14 can easily be inspected and cleaned in valve body.

**Complaint:**

Singing noise depending on engine speed

**Code****G 4****Details:**

Singing noise depending on engine speed, which could also occur in "P" or "N" selector lever position.

**Possible Damage Causes, see Reference:**

RE 1

**Possible Damage Cause:**

Kickdown control valve seized

**Reference****IN 17**

Manual: pages 38-21 to 38-23

**Repair Instructions:**

The kickdown control valve no. 32 in valve body can be inspected and cleaned after removing valve body.



**Code**

**G 5**

**Complaint:**

Knocking noise when stopping engine

**Details:**

There is a knocking metal sound when stopping the engine.

**Possible Damage Causes, see Reference:**

IN 23

**Reference**

**IN 18**

**Possible Damage Cause:**

Brake apply piston seized

Manual: pages 38-21 to 38-23

**Repair Instructions:**

Brake apply piston no. 15 in valve body can be inspected and cleaned after removing valve body.

**Complaint:**

Transmission slips while driving forward

**Code****G 6****Details:**

Undefinable rattling noise from automatic transmission

**Possible Damage Causes, see Reference:**

PR 1, IN 1, IN 24

**Possible Damage Cause:**

Main pressure control valve seized

**Reference****IN 19**

Manual: pages 38-21 to 38-23

**Repair Instructions:**

The main pressure control valve no. 21 in valve body can be inspected and cleaned after removing valve body.

**Code**

**R 1**

**Complaint:**

Rattling noise with engine running and car moving or stopped

**Details:**

The car will move off, but slips when accelerating hard.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 4, IN 6, IN 8, IN 10

**Reference**

**IN 20**

**Possible Damage Cause:**

0.2 mm dia. restrictor in cylinder B 2 servo missing

Manual:

**Repair Instructions:**

The servo for brake band piston B 2 has a 0.2 mm dia. restrictor in the transmission case.

This restrictor could fall out.

Check after removing piston B 2.

**Complaint:**

Transmission okay, but slips when accelerating hard

**Code****R 2****Details:**

Everything is okay while driving slowly, but transmission will slip when accelerating at full throttle.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 3, PR 4, PR 10, IN 6, IN 8, IN 10, IN 13

**Possible Damage Cause:**

Piston B 2 sticks

**Reference****IN 21**

Manual:

**Repair Instructions:**

The piston of brake band B 2 could stick. Remove and install with guide sleeve. Also check bore in case for traces of wear.

**Code**  
**R 3**

**Complaint:**

Transmission slips in 1st gear

**Details:**

The transmission only slips in 1st gear.  
The transmission is okay in all other gears.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, IN 8, IN 9, RE 6

**Reference**  
**IN 22**

**Possible Damage Cause:**

One-way valve no. 38 dirty

Manual: pages 38-21 to 38-23

**Repair Instructions:**

The one-way valve no. 38 can be inspected and cleaned after removing valve body.

Always replace graphite-colored gasket between valve body parts.

**Complaint:**

Transmission slips in 2nd and 3rd gears

**Code****R 4****Details:**

Moving off in 1st gear is okay.  
Transmission slipping in 2nd and 3rd gears.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 4, IN 7, RE 6, RE 7, RE 8, RE 9

**Possible Damage Cause:**

Drive plate between drive shaft and torque converter not bolted tight

**Reference****IN 23**

Manual: pages 32-1 to 32-3

**Repair Instructions:**

In the converter housing the torque converter is driven by a drive plate.  
The 6 connecting bolts must be tight.

**Code**

**R 5**

**Complaint:**

Transmission slips only in 3rd gear

**Details:**

Moving off in 1st gear and driving in 2nd gear is okay, but transmission slipping in 3rd gear.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 4, IN 6, IN 7, RE 7, RE 8

**Reference**

**IN 24**

**Possible Damage Cause:**

ATF pump taking in air

Manual: page 38-21

**Repair Instructions:**

ATF pump could take in air because of:

1. insufficient ATF level
2. plugged ATF filter
3. missing or defective seal on filter neck

**Complaint:**

Transmission slips during partial throttle downshifts

**Code****R 6****Details:**

Operation of transmission is okay while driving normally, but transmission will slip briefly when making partial throttle downshifts.

**Possible Damage Causes, see Reference:**

PR 1, PR 2, PR 4, IN 6, IN 7, RE 7, RE 8

**Possible Damage Cause:**

ATF pump worn excessively

**Reference****RE 1**

Manual:

**Repair Instructions:**

The ATF pump is mounted on the rear converter housing wall.  
Always replace both gear wheels together.



**Code**

**S 1**

**Complaint:**

Poor acceleration

**Details:**

The car accelerates poorly in all driving situations.

**Possible Damage Causes, see Reference:**

Defective torque converter, refer to "Troubleshooting Torque Converter".

**Reference**

**RE 2**

**Possible Damage Cause:**

Modulating pressure regulating valve seized

Manual:

**Repair Instructions:**

The modulating pressure regulating valve no. 43'a is located in rear of transmission case in valve body for modulating pressure.

Clean and inspect valve.

**Complaint:**

No engine braking when downshifting with selector lever

**Code****S 2****Details:**

When downshifting while driving to improve the engine braking effect, there is no downshift and therefore also no better braking effect.

**Possible Damage Causes, see Reference:**

PR 6, IN 6, IN 18

**Possible Damage Cause:**

Brake band B 3 worn or slipping

**Reference****RE 3**

Manual:

**Repair Instructions:**

First check with removed valve body, whether B 3 can be adjusted (new shear-off screw!), if not, replace.

**Code**

**S 3**

**Complaint:**

Hard jolt when a gear is engaged

**Details:**

There is a hard engagement jolt when moving the selector lever to a drive position while engine is running.

**Possible Damage Causes, see Reference:**

PR 3, PR 4, PR 8, RE 2, RE 5, RE 14, RE 15

**Reference**

**RE 4**

**Possible Damage Cause:**

Torque converter

Manual: pages 32-1 to 32-3

**Repair Instructions:**

Refer to "Troubleshooting Torque Converter" for detailed information.

**Complaint:**

Very hard engagement jolt in reverse gear

**Code****S 4****Details:**

There is a very hard engagement jolt when the selector lever is moved to "R" while engine is running.

**Possible Damage Causes, see Reference:**

IN 4

**Possible Damage Cause:**

One-way clutch of rear planet gear set defective

**Reference****RE 5**

Manual:

**Repair Instructions:**

Replace one-way clutch of rear planet gear set.

**Code**  
**S 5**

**Complaint:**  
Harsh shifting while driving

**Details:**

Upshifts and downshifts take place with hard engagement jolts.

**Possible Damage Causes, see Reference:**

PR 3, PR 4, PR 6, PR 10, PR 11, IN 2, IN 19, RE 14

**Reference**  
**RE 6**

**Possible Damage Cause:**

Reaction valve at brake band supports defective

Manual:

**Repair Instructions:**

Reaction valves RV 1 and RV 2 must be cleaned or replaced.

**Complaint:**

Selector lever cannot be moved to "R" or "P" while engine is running

**Code****S 6****Details:**

After starting the engine the selector lever cannot be moved into P or R. However, if the engine is stopped, the lever can be moved into all ranges.

**Possible Damage Causes, see Reference:**

IN 5, IN 11, RE 13, RE 16

**Possible Damage Cause:**

Seals on clutches defective

**Reference****RE 7**

Manual:

**Repair Instructions:**

Inspect seals of K 1 and K 2 thoroughly and replace even if wear is only slight.

**Code**  
**S 7**

**Complaint:**

No engine braking with selector lever in "1"

**Details:**

Engine braking with selector lever in "D" or "2", but the car continues to roll on when downshifting to "1".

**Possible Damage Causes, see Reference:**

IN 8, IN 9

**Reference**  
**RE 8**

**Possible Damage Cause:**

Clutch pack K 1 and/or K 2 worn or burnt

Manual:

**Repair Instructions:**

Premature wear: Driver often drives car downhill in "N" with engine running.

Burnt linings: Replace converter, flush lines and ATF cooler thoroughly.

**Complaint:**

Engine exhaust white, but no engine oil loss

**Code****S 8****Details:**

White/bluish smoke leaving exhaust, which indicates oil being burnt.

**Possible Damage Causes, see Reference:**

IN 2

**Possible Damage Cause:**

Support flange between K 1 and K 2 cracked

**Reference****RE 9**

Manual:

**Repair Instructions:**

The support flange could have cracks behind the bronze thrust washers.  
Pressure loss there!  
Inspect carefully and replace, if necessary.



**Code**

**G 7**

**Complaint:**

Scraping noise from torque converter area

**Details:**

A scraping or knocking noise from torque converter in almost all driving situations, but especially while accelerating.

**Possible Damage Causes, see Reference:**

RE 20

**Reference**

**RE 10**

**Possible Damage Cause:**

Check valve in turbine shaft defective

Manual:

**Repair Instructions:**

Check valve became defective because of dirt or broken spring.

If cleaning does not help, replace turbine shaft.

Turbine shaft is easy to detach from front planet gear set;

transmission need not be disassembled.

**Complaint:**

**Code**  
**S 9**

**Details:**

Oil or ATF is running out of a bore on right side of the transmission case (near ATF filler tank).

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

Piston ring on turbine shaft damaged

**Reference**  
**RE 11**

Manual:

**Repair Instructions:**

Piston ring on turbine shaft can be replaced easily.  
After removal of front converter housing and converter, detach and remove rear converter housing. Piston ring is then visible and can be replaced.

**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**  
**RE 12**

**Possible Damage Cause:**

Ball valve in K 1 or K 2 dirty

Manual:

**Repair Instructions:**

These ball valves are located in vertical surface of clutch cylinder bottoms.

**Complaint:**

**Code:**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

Centrifugal governor sticks

**Reference**

**RE 13**

Manual:

**Repair Instructions:**

If defect is in governor, it is easy to disassemble and clean. Make sure that governor is assembled correctly! Prior to removing transmission for repairing, try to loosen governor by applying several knocks with a heavy rubber hammer on the rear transmission case.

**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**

**RE 14**

**Possible Damage Cause:**

Engagement accumulator no. 46

Manual:

**Repair Instructions:**

The engagement accumulator no. 46 is located in rear transmission case.

It could stick because of dirt or metal particles.

**Complaint:**

**Code**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

Rear transmission case porous

**Reference**

**RE 15**

Manual:

**Repair Instructions:**

The rear transmission case must be replaced.

**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**

**RE 16**

**Possible Damage Cause:**

Blocking piston in rear transmission case sticks

Manual:

**Repair Instructions:**

The small piston is partially covered by a lockplate. This must be unscrewed, so that the piston can be cleaned and serviced.

**Complaint:**

**Code**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

Parking lock mechanism sticks

**Reference**

**RE 17**

Manual:

**Repair Instructions:**

Check and service mechanism.



**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**

**RE 18**

**Possible Damage Cause:**

Front planet gear set defective

Manual:

**Repair Instructions:**

The transmission has to be disassembled.  
Replace the entire front planet gear set.

**Complaint:**

**Code**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

Rear planet gear set defective

**Reference**

**RE 19**

Manual:

**Repair Instructions:**

The transmission has to be disassembled.  
Replace the entire rear planet gear set.

**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference  
RE 20**

**Possible Damage Cause:**

Guide bearing for torque converter defective

Manual: page 32-2

**Repair Instructions:**

Two sealed ball bearings are located in the front torque converter housing to guide the drive shaft and support the converter. They could be damaged.

**Complaint:**

**Code**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

Seals defective

**Reference**

**RE 21**

Manual: pages 39-22 to 39-24

**Repair Instructions:**

A double shaft seal is located between the final drive and automatic.  
If the seal is defective, ATF or oil will run out of a relief bore.  
Detach automatic box from final drive and replace seals.

**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**

**Possible Damage Cause:**

**Repair Instructions:**

**Complaint:**

**Code**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

**Reference**

**Repair Instructions:**

**Complaint:**

**Code**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

**Reference**

**Repair Instructions:**

**Complaint:**

**Code**

**Details:**

**Possible Damage Causes, see Reference:**

**Possible Damage Cause:**

**Reference**

**Repair Instructions:**



**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**

**Possible Damage Cause:**

**Repair Instructions:**

**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**

**Possible Damage Cause:**

**Repair Instructions:**

**Code**

**Complaint:**

**Details:**

**Possible Damage Causes, see Reference:**

**Reference**

**Possible Damage Cause:**

**Repair Instructions:**