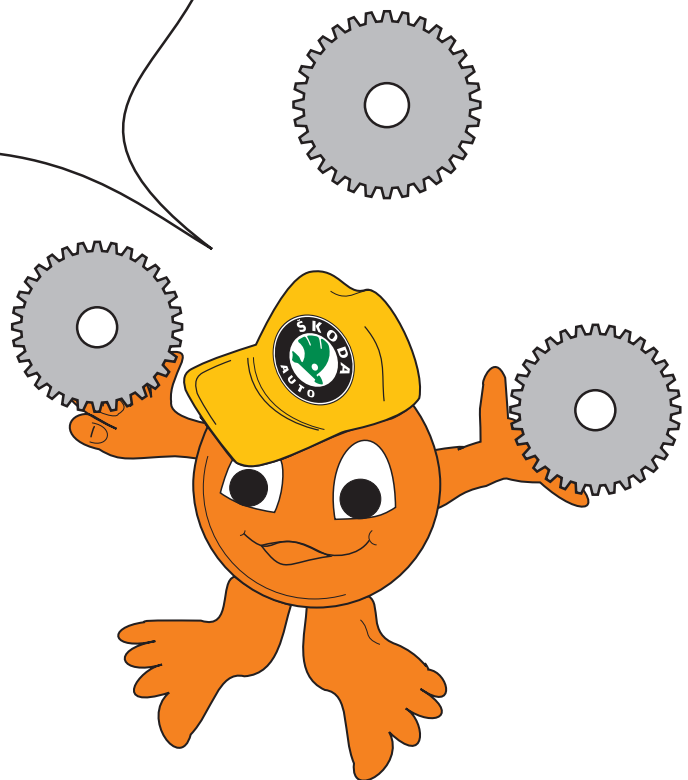


... gears provide traction!



SP18-37

SKODA uses modern all-synchromesh gearboxes in the OCTAVIA for converting engine torque and speed.

■	General	4
	5-Speed Manual Gearbox 02K	4
	5-Speed Manual Gearbox 02J	5
■	Manual Gearbox 02K	6
	Diagram of Gearbox	6
	Gearbox Housing	8
	Manual Gearbox	10
	Shift Mechanism in Gearbox	13
	External Shift Mechanism	14
	Clutch Mechanism	15
■	Manual Gearbox 02J	16
	Diagram of Gearbox	16
	Gearbox Housing	18
	Manual Gearbox	20
	Shift Mechanism in Gearbox	22
	External Shift Mechanism	24
	Clutch Mechanism	26
■	Lock Synchronesh	27
■	Differential	29
■	Drive Shafts	30

You can find notes on inspection and maintenance, setting and repair instructions in the Workshop Manual.



General

The SKODA OCTAVIA features the manual gearboxes 02K and 02J for the transverse-mounted engines.

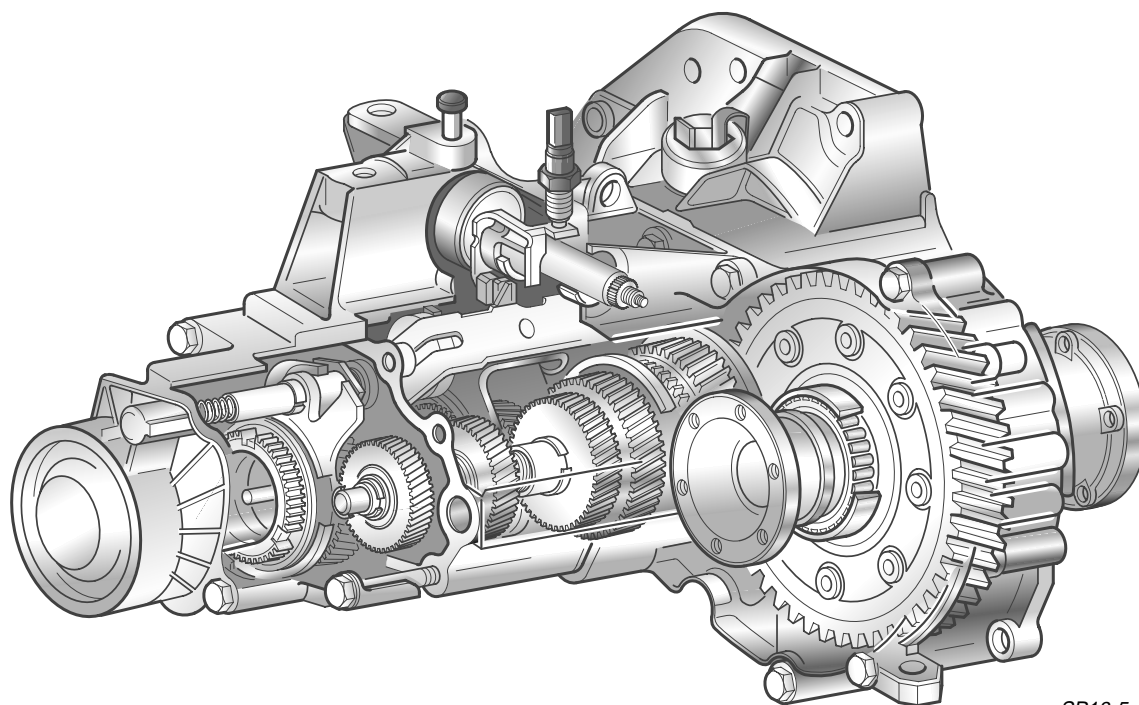
Both manual gearboxes are based on proven Group components and have been matched to the specific engine characteristics and the pendulum mounting in the OCTAVIA.

5-speed manual gearbox 02K

Manual gearbox and final drive form a single unit.

The code letters indicate the assignment of the gearbox to the corresponding engine. The code letters are affixed together with the construction data of the gearbox on the gearbox housing.

Engine	1.6 l/55 kW	1.6 l/74 kW	1.9 l/50 kW
Engine code letters	AEE	AEH	AGP
Gearbox code letters	CZE	DLP	CZB



SP18-5

The manually-operated 5-speed manual gearboxes 02K and 02J have been specifically developed for engines with a displacement of 1.6 litres up to 2 litres.

The clutch unit, the manual gearbox and the differential together with the final drive are combined to form a compact gearbox block.

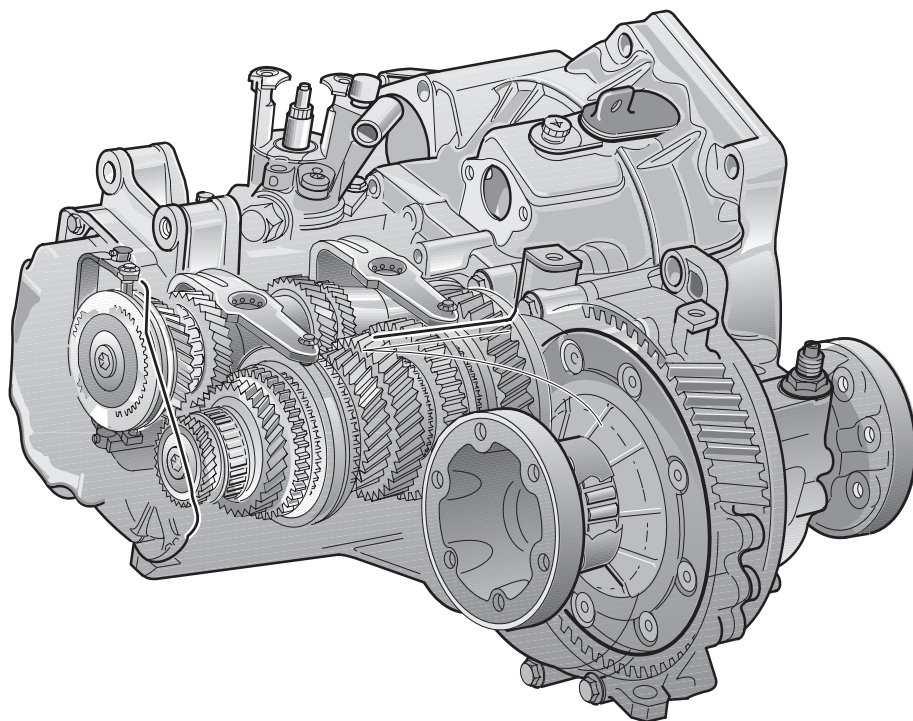
The gearbox has a high efficiency. Gearshifts are achieved with short, convenient and precise travel.

5-speed manual gearbox 02J

Manual gearbox and final drive form a single unit.

The manual gearbox is assigned to the following engines:

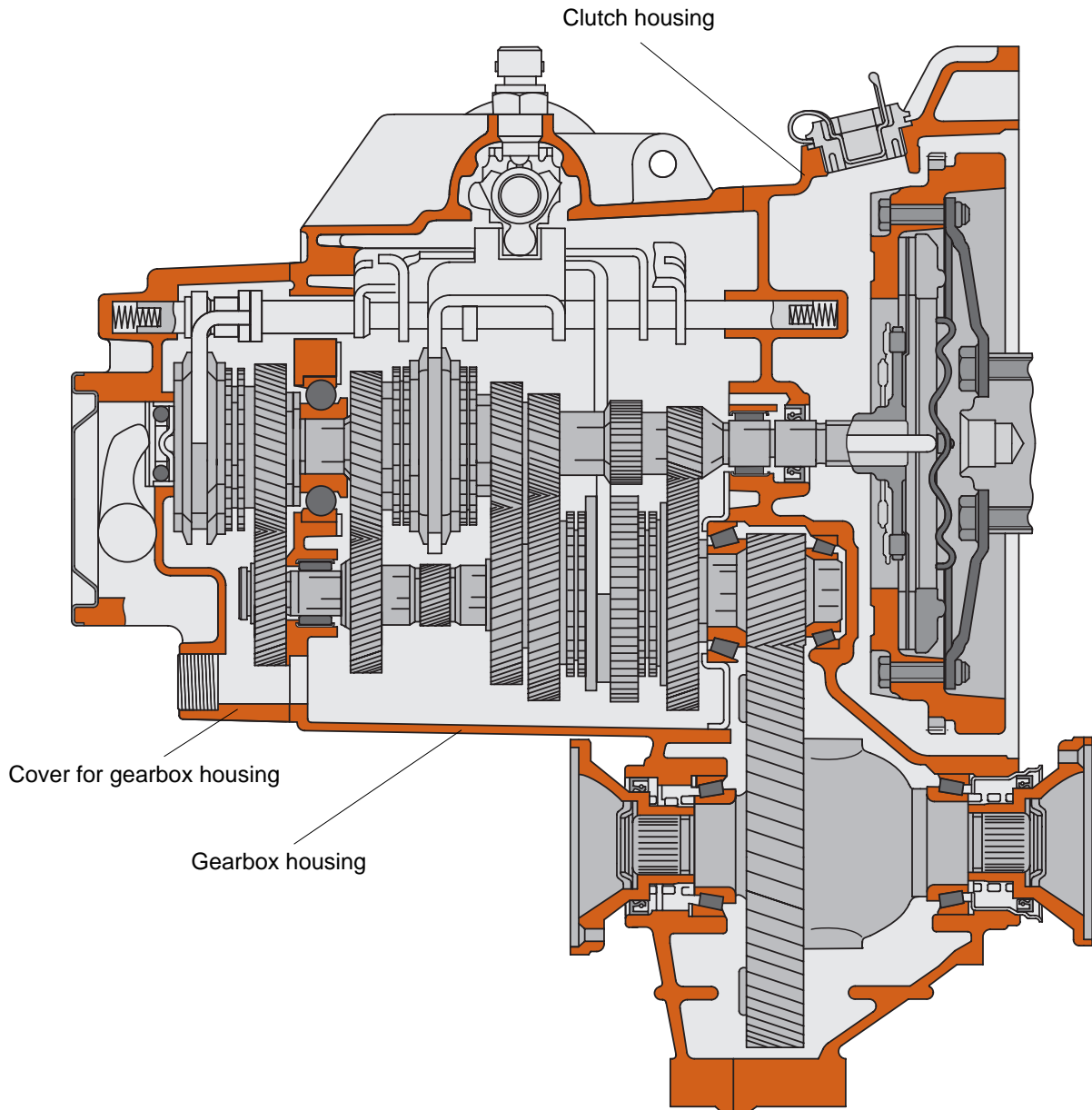
Engine	1.8 I/92 kW	1.9 I/66 kW
Engine code letters	AGN	AGR
Gearbox code letters	CZM	DQY



SP18-29

Manual Gearbox 02K

Diagram of Gearbox



SP18-21

- Two-section housing (clutch housing, gearbox housing) with compact cover for gearbox housing
- All shafts arranged parallel
- Helical gearing is used generally for the splines of the selector gears and gearwheels of the forward speeds
- The shift forks are guided on a rod (single-rod shift)
- The speedometer is driven by the output shaft
- The selector gears (sliding gears) are mounted on needle bearings

Manually operated 5-speed gearbox	Gear reduction $i = \frac{\text{Teeth of driven gear } z_2}{\text{Teeth of driving gear } z_1}$								
Gearbox code letters	CZE			DLP			CZB		
	z_2	z_1	i	z_2	z_1	i	z_2	z_1	i
Final drive	67	15	4.467	68	16	4.250	68	16	4.250
1st speed	38	11	3.455	38	11	3.455	38	11	3.455
2nd speed	35	18	1.944	35	18	1.944	35	18	1.944
3rd speed	36	28	1.286	37	27	1.370	36	28	1.286
4th speed	31	33	0.939	32	31	1.032	30	33	0.909
5th speed	38	51	0.745	34	40	0.850	37	52	0.712
Reverse	20 38	12 20	3.167	20 38	12 20	3.167	20 38	12 20	3.167
Speedometer	15	7	2.143	15	7	2.143	15	7	2.143
Capacity	1.9 l								
Specification	G 50 SAE 75-W 90 (synthetic oil)								



Note:

In line with the service intervals for the SKODA OCTAVIA, the level of the gear oil should be inspected every 30,000 km and topped up, if necessary.

Manual gearbox 02K has two shafts and five pairs of gears with helical gearing.

When the forward gears are shifted, a compulsory synchronesh is activated which ensures quiet and convenient gear changes.

The advantage of the helical gearing is that the teeth are able to cope with higher stresses (more than one tooth is constantly meshed) and the quieter operation of the gearbox. Reverse gear is equipped with spur gearing with a compression spring. This compression spring ensures that reverse gear can be easily engaged.

The shift forks are guided on a floating rod.

The rod is located between gearbox housing and clutch housing.

The gear steps have been selected so as to ensure optimum transmission of engine power.

Fifth gear is designed to ensure low fuel consumption when driving at a continuous speed.

Manual Gearbox 02K

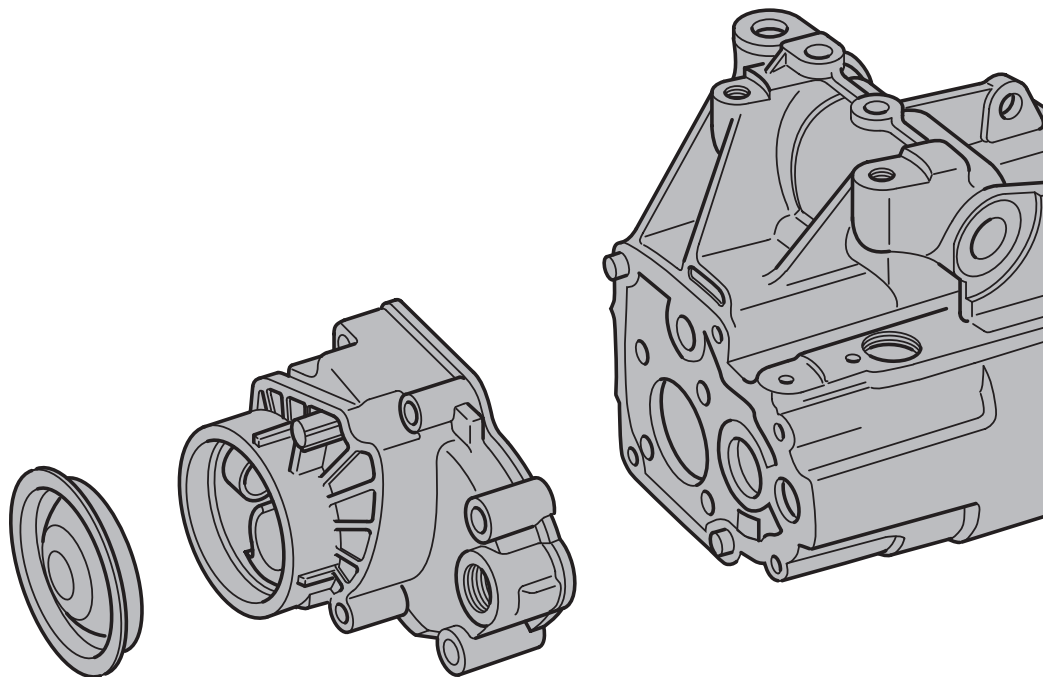
Gearbox Housing

The axle bearing for the clutch mechanism is located directly in the cover for the gearbox housing. It can be replaced with the gearbox installed.

A mechanical stop is cast onto the cover for the gearbox housing in order to limit the travel of the clutch release lever, when the clutch slave cylinder is removed.

The mounting points for the pendulum support are located on the gearbox housing.

A coated end cover seals the assembly opening at the gearbox. It should always be replaced after carrying out work on the gearbox.



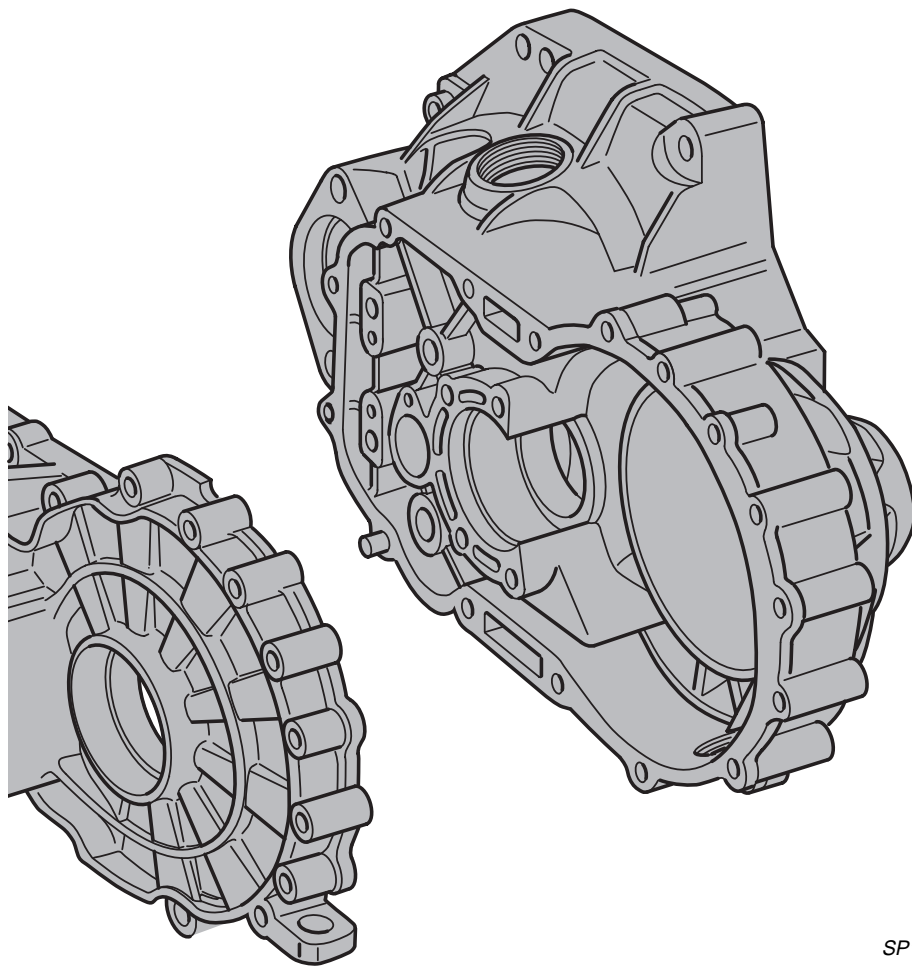
End cover

Cover for gearbox housing



Note:

A comprehensive range of special tools is available for all the work involving removing and inserting bearings, bushes, seals etc. Please refer to the Workshop Manual.



SP18-3

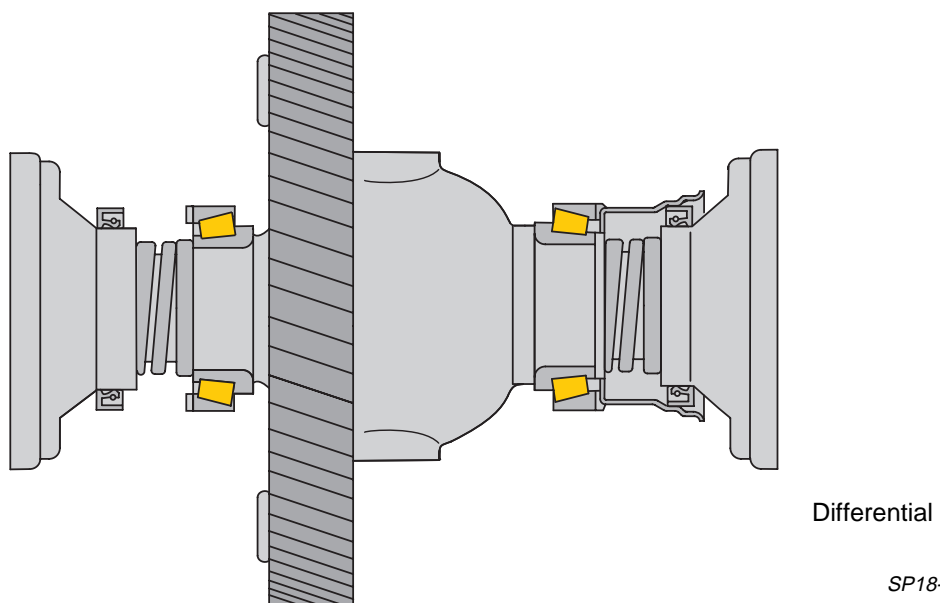
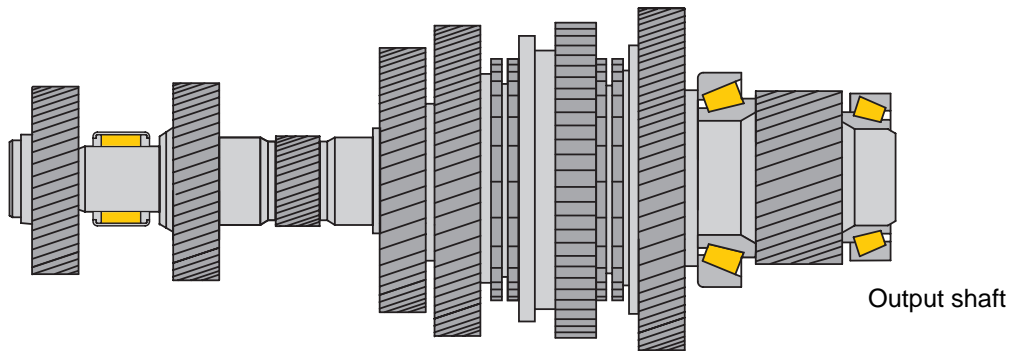
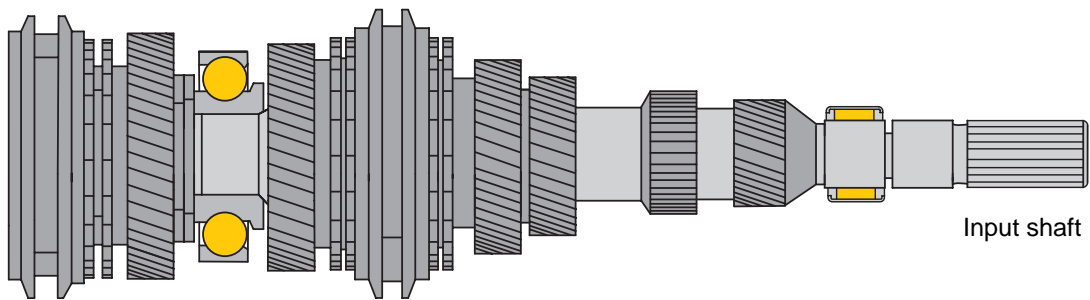
Gearbox housing

Clutch housing

Manual Gearbox 02K

Manual Gearbox

The input shaft runs in a grooved ball bearing in the gearbox housing.
This grooved ball bearing is secured by means of a retaining plate in the gearbox housing.
The input shaft in the clutch housing runs in a needle bearing.
The selector gears for 3rd, 4th and 5th speed are arranged on the input shaft.
The output shaft runs in two taper roller bearings and one needle bearing.
The selector gears of 1st and 2nd speed are arranged on the output shaft.
The differential is mounted at both sides in taper roller bearings.

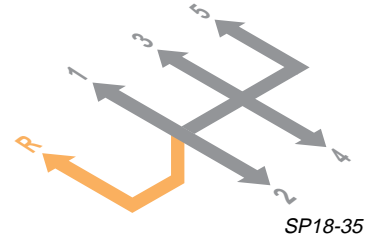


SP18-18

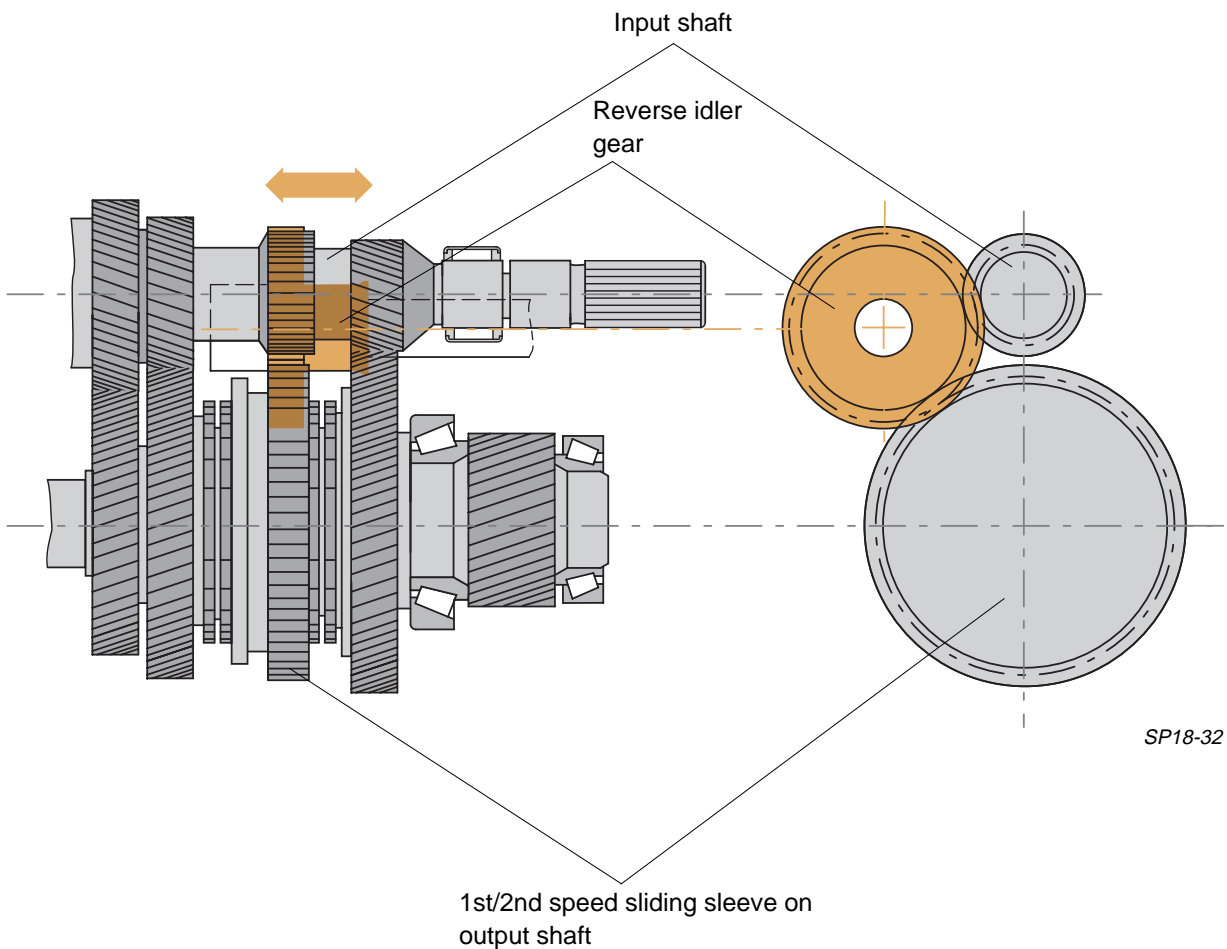
Engaging reverse gear

The gearwheels of the reverse gear feature spur gearing. The higher noise level as a result of this is considered acceptable. No synchronmesh is provided as reverse gear is only engaged when the car is stationary.

The sliding sleeve of 1st and 2nd gear is at the same time the reverse gear on the output shaft. The change in the direction of rotation is achieved by directly engaging the reverse idler gear between input and output shafts.



SP18-35



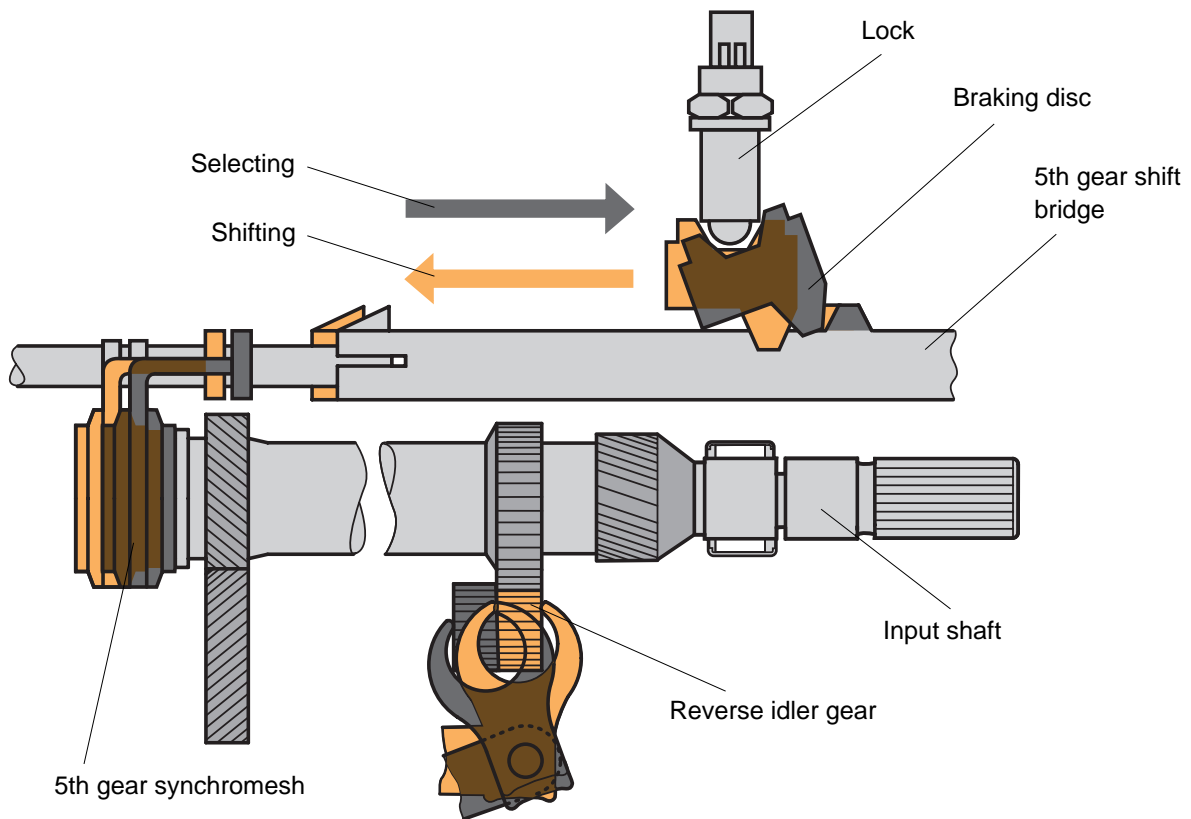
SP18-32

Manual Gearbox 02K

Braking the selector gears when engaging reverse gear

The cause of "grating noises" when engaging the non-synchromesh reverse gear is frequently the long runout time of the input shaft until it stops.

For this reason, the input shaft - and thus also the gear to be engaged - is braked when selecting reverse gear.

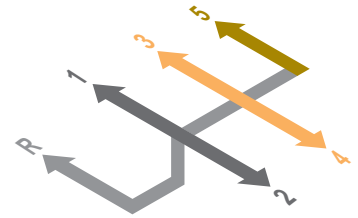
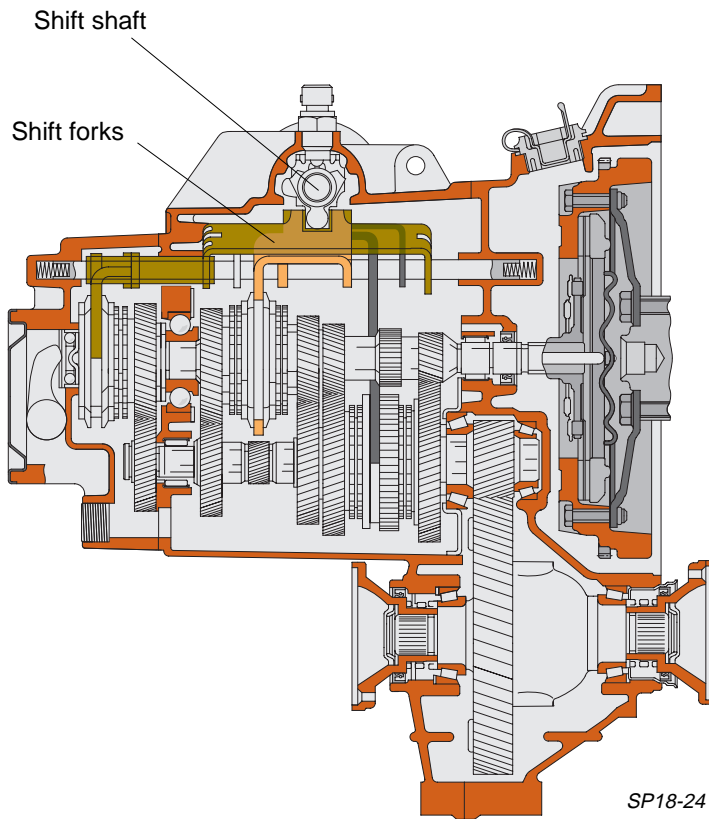


SP18-31

When reverse gear is selected, the shift shaft carries out a movement in which a spring-tensioned braking disc is pressed against the lock of the shift shaft.

The spring-tensioned braking disc tilts and slightly displaces the 5th gear shift bridge. As a result of this, 5th gear is synchronized and the input shaft is braked. This is cancelled again when reverse gear is engaged. The braking disc moves back into the initial position. Reverse gear is engaged silently.

Shift Mechanism in the Gearbox



SP18-34

The shift shaft runs in the gearbox housing in a ball sleeve.

The reversing light switch is integrated in a retaining bolt.

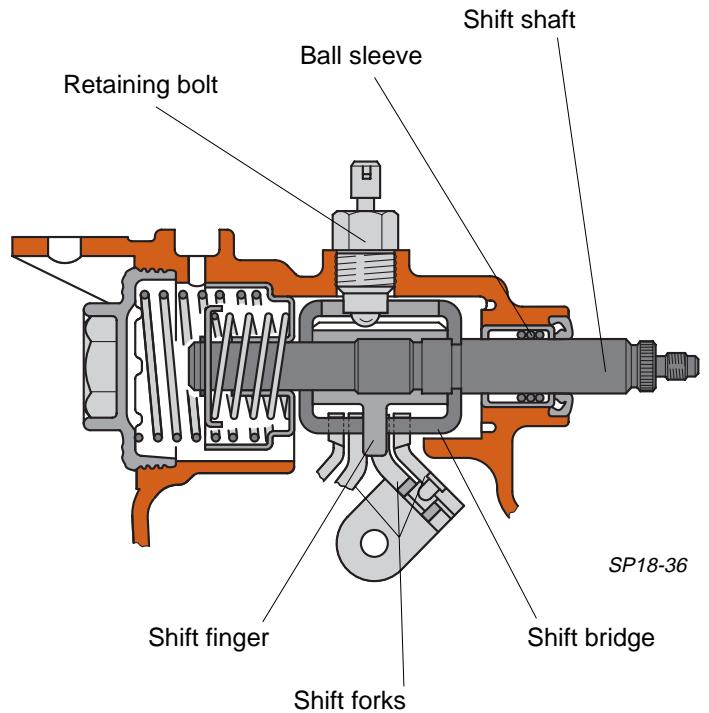
This bolt holds the bridge of the shift lock and at the same time locks the shift shaft.

A spring always pushes the shift shaft and the shift lever into the gate of 3rd/4th gear.

To select the gear, the shift shaft, together with the shift bridge and the shift finger, move in an axial direction.

When the gear is engaged, the shift shaft rotates together with the shift bridge and the shift finger.

When reverse gear is engaged, the switch for the reversing lights is operated.



Manual Gearbox 02K

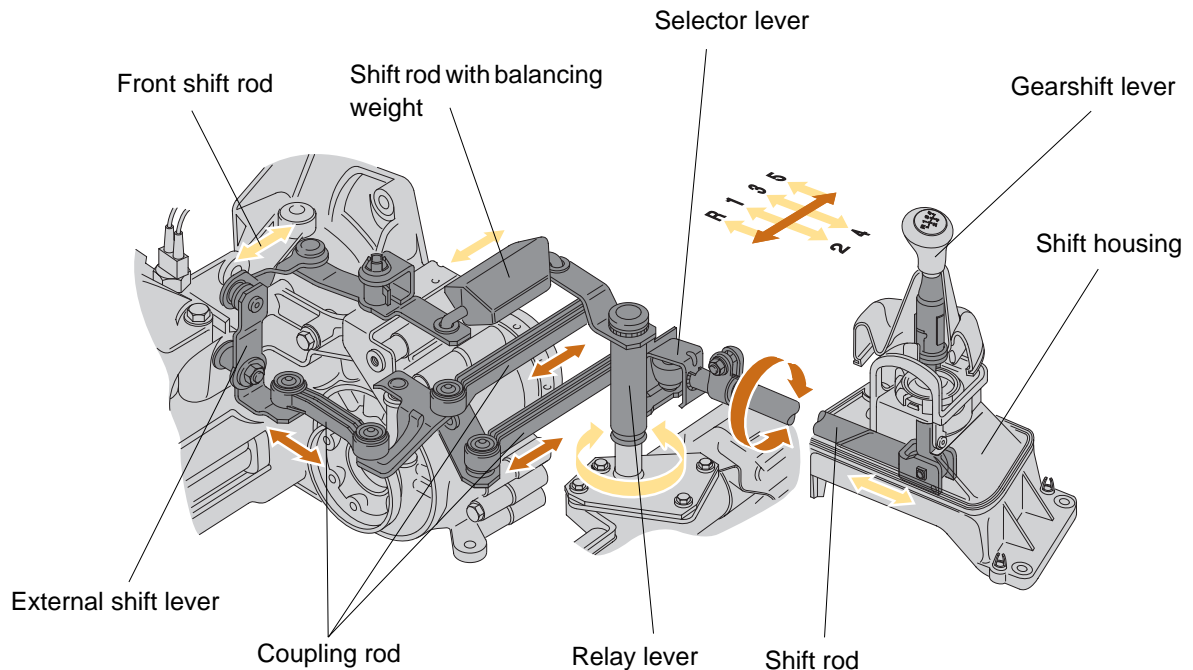
External Shift Mechanism

The gearshift lever is located in a shift housing which is attached to the floor tunnel in the interior of the car.

The shift movements (selecting and engaging) are transmitted to the gearbox by a shift rod.

Coupling rods are used to ensure that the relative movements between gearbox and body are not transmitted to the gearshift lever.

The shift movements (selecting and engaging) of the gearshift lever are relayed to the internal gearshift mechanism by shift rod, selector lever, coupling rods and external shift lever.



SP18-1



Note:

It is essential that the shift mechanism is precision-set in order to ensure smooth gearshifts.

A gauge at the shift housing is used for this purpose.

Further information is contained in the OCTAVIA Workshop Manual - 5-Speed Manual Gearbox 02K.

Clutch Mechanism

The clutch is operated hydraulically. The slave cylinder presses on the clutch lever which is attached to the end of the gearbox.

The clutch pushrod moves longitudinally through the input shaft.

The release movement is transmitted to the clutch by the clutch lever, the release bearing and the clutch pushrod.

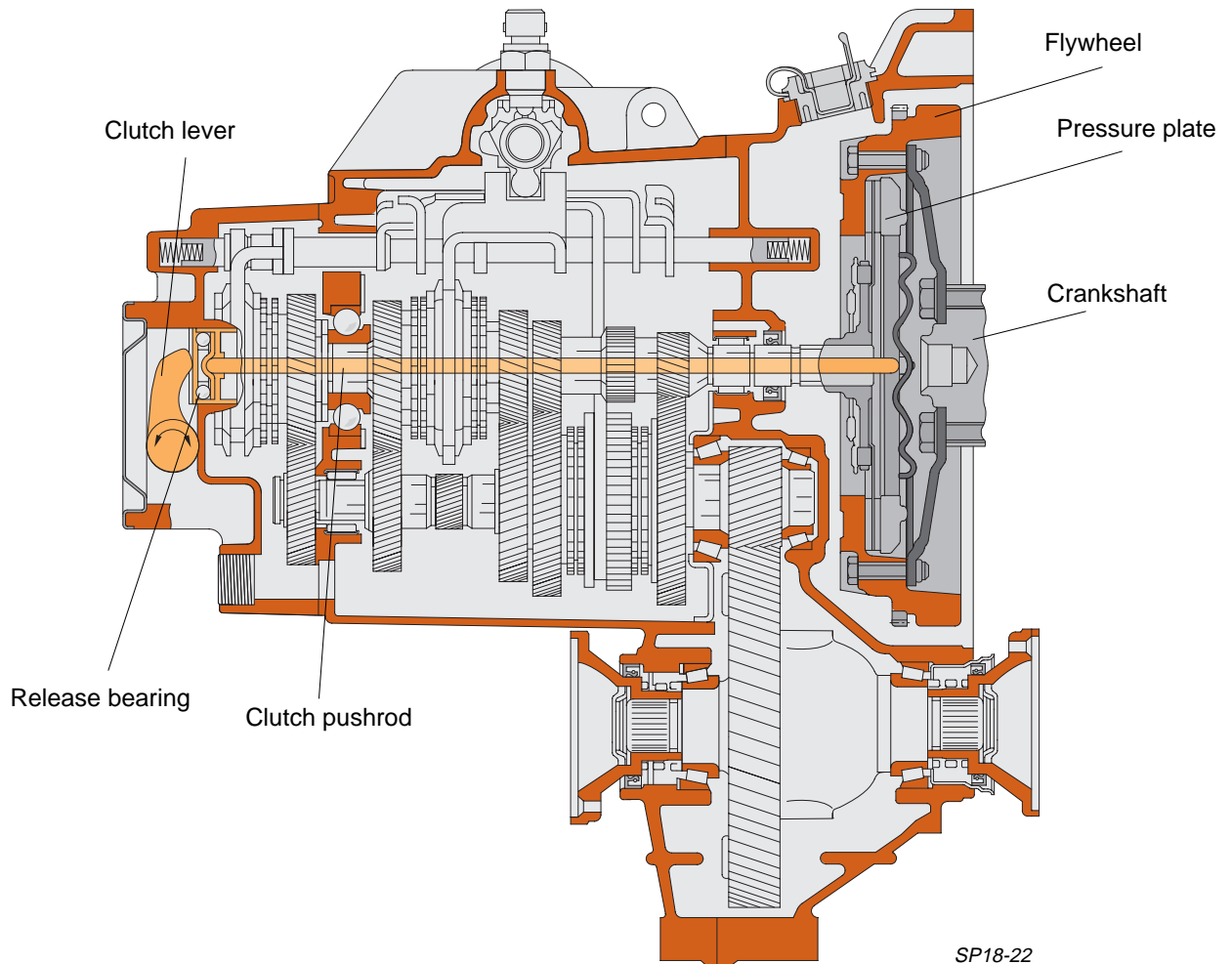


Note:

The clutch is mounted on the other way round.

The pressure plate is bolted to the crankshaft.

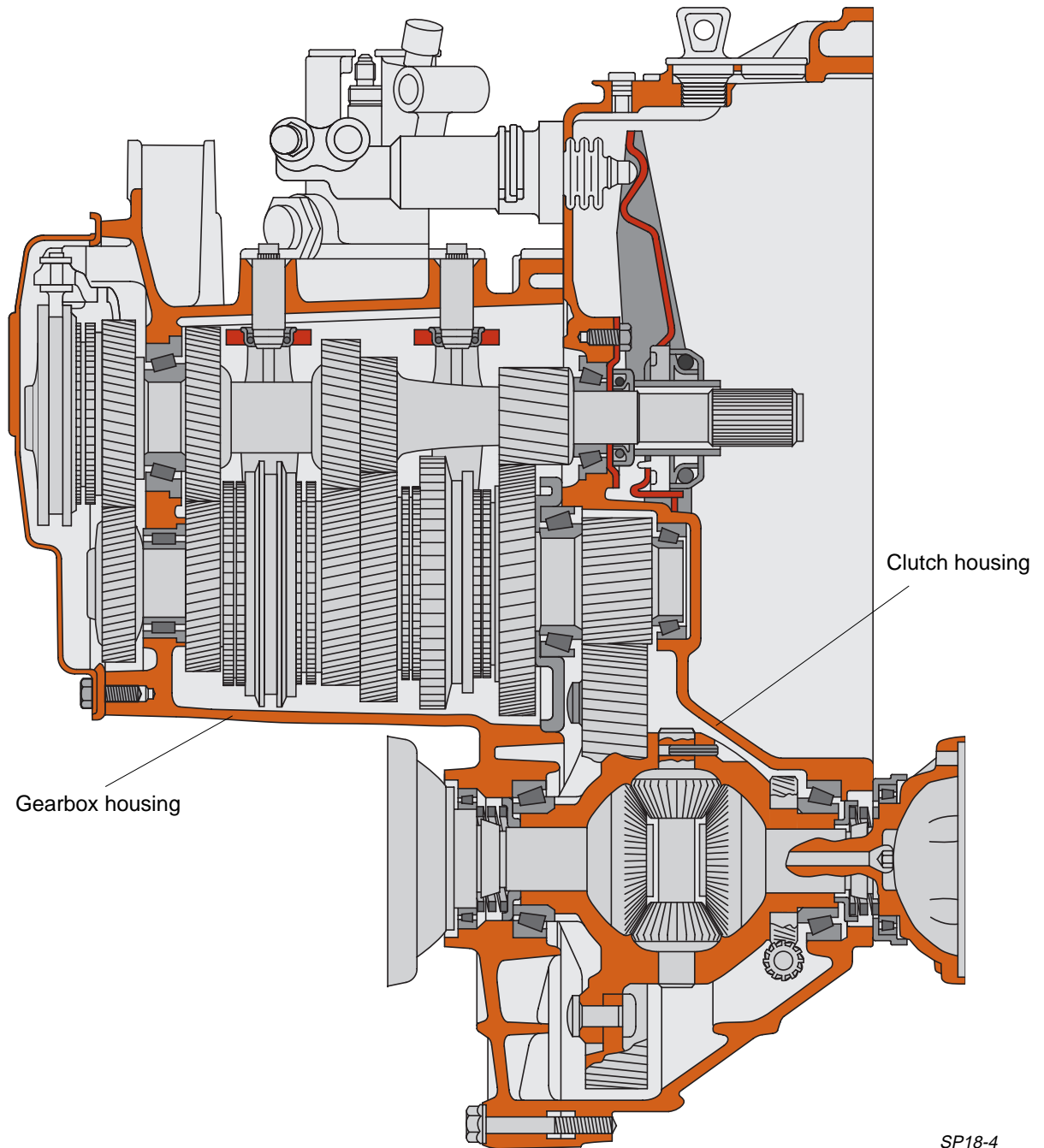
The flywheel points toward the gearbox.



SP18-22

Manual Gearbox 02J

Diagram of Gearbox



SP18-4

- Two-section housing with cover (clutch housing, gearbox housing)
- All shafts arranged in parallel
- Helical gearing is used for the splines of the selector gears and gearwheels of all forward speeds
- The selector gears (loose gears) run in needle bearings
- The selector gears of 1st to 4th speed are mounted on the output shafts
- The selector gear for 5th speed is mounted on the input shaft

Manually operated 5-speed gearbox	Gear reduction $i = \frac{\text{Teeth of driven gear } z_2}{\text{Teeth of driving gear } z_1}$					
Gearbox code letters	CZM			DQY		
	z_2	z_1	i	z_2	z_1	i
Final drive	72	17	4.235	61	18	3.389
1st speed	33	10	3.300	34	09	3.778
2nd speed	35	18	1.944	36	17	2.118
3rd speed	34	26	1.308	34	25	1.360
4th speed	35	34	1.029	34	35	0.971
5th speed	36	43	0.837	34	40	0.850
Reverse	17 36	10 20	3.060	18 36	09 20	3.600
Speedometer	13	22	0.591	13	22	0.591
Capacity	2 l					
Specification	G 50 SAE 75-W 90 (synthetic oil)					



Note:

In line with the service intervals for the SKODA OCTAVIA, the level of the gear oil should be inspected every 30,000 km and topped up, if necessary.

Manual gearbox 02J is fitted to the SKODA OCTAVIA and is capable of transmitting torques of more than 180 Nm.

The shift mechanism of the individual gears is transmitted through cables.

The clutch is operated hydraulically.

The gears are engaged by means of shift rockers.

Manual Gearbox 02J

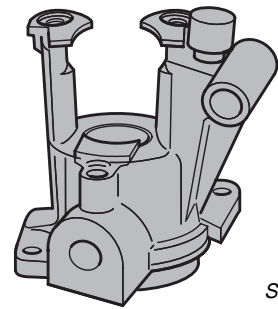
Gearbox Housing

The housing of the 02J gearbox consists of two parts and a cover. It is split transversely.

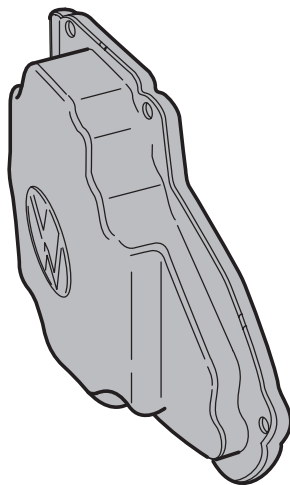
The gearbox housing also contains the attachment points for the pendulum bearing support.

The separate shift cover which houses the shift shaft for the internal shift mechanism, is mounted on the gearbox housing.

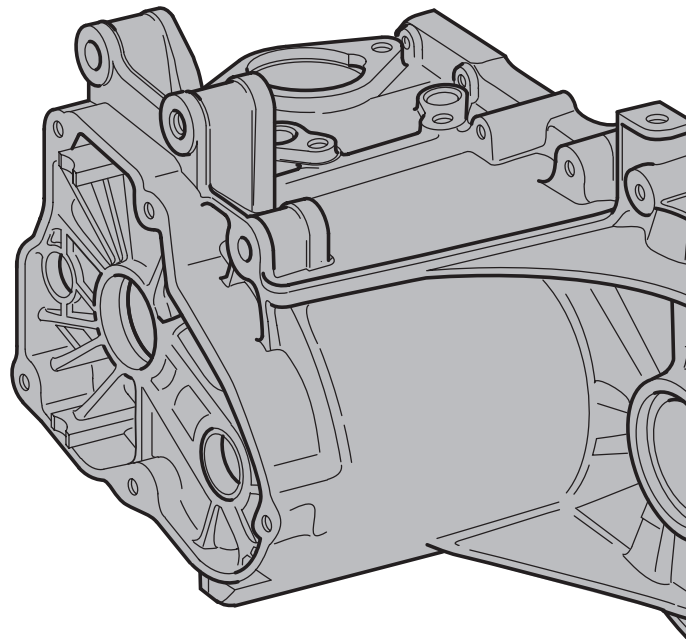
Shift cover



SP18-38



Cover for gearbox housing

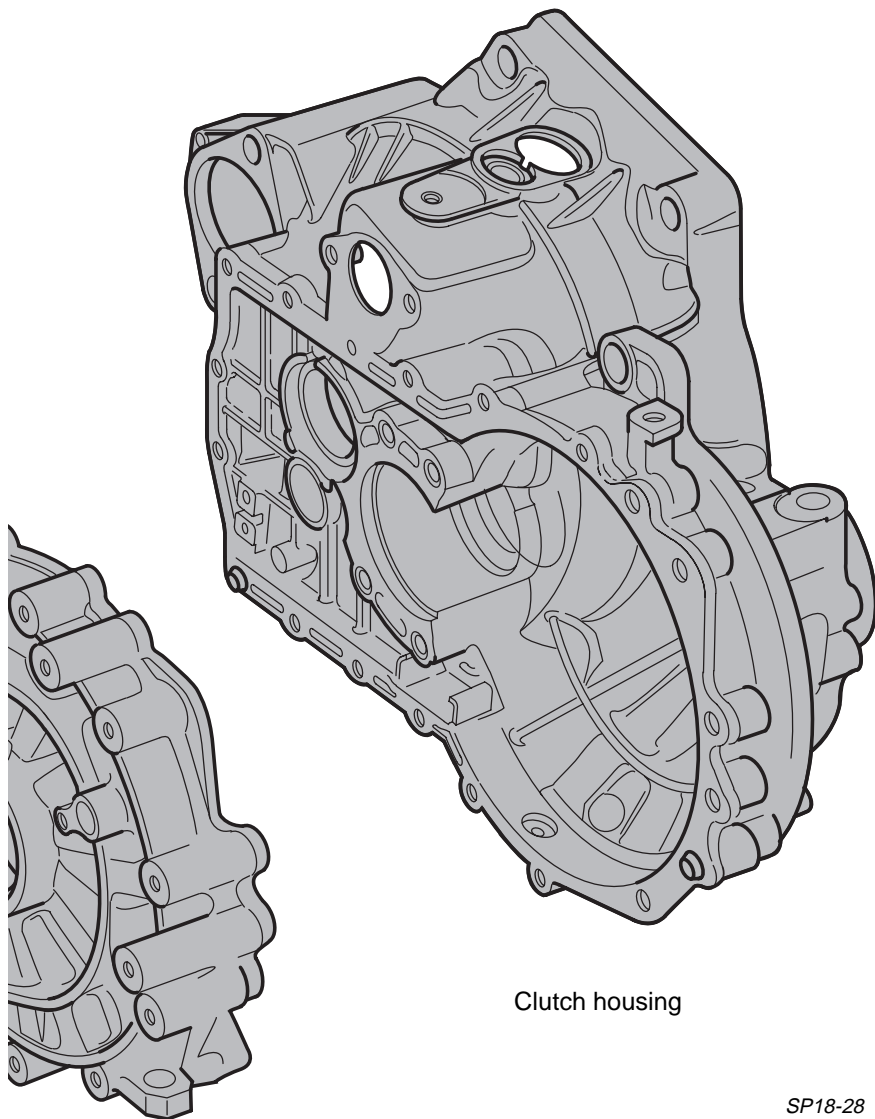


Gearbox housing



Note:

A comprehensive range of special tools is available for all the work involving removing and inserting bearings, bushes, seals etc. Please refer to the Workshop Manual.



Clutch housing

SP18-28

Manual Gearbox 02J

Manual Gearbox

The manual gearbox consists of three parallel shafts - input shaft, output shaft and reverse idler shaft.

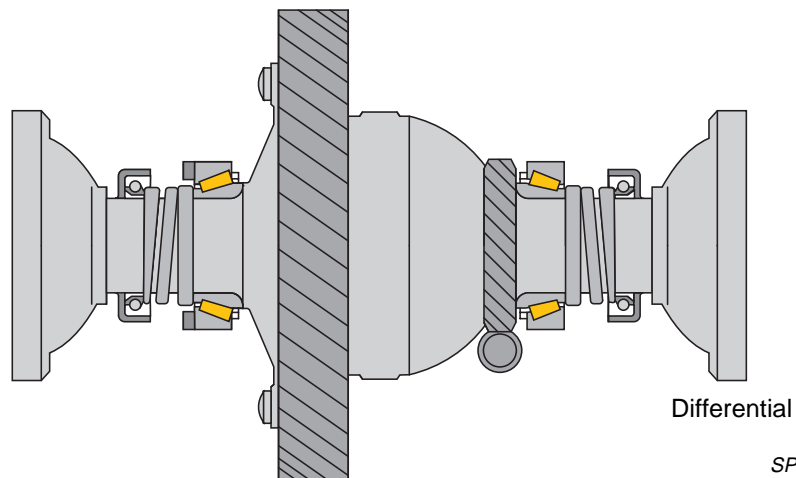
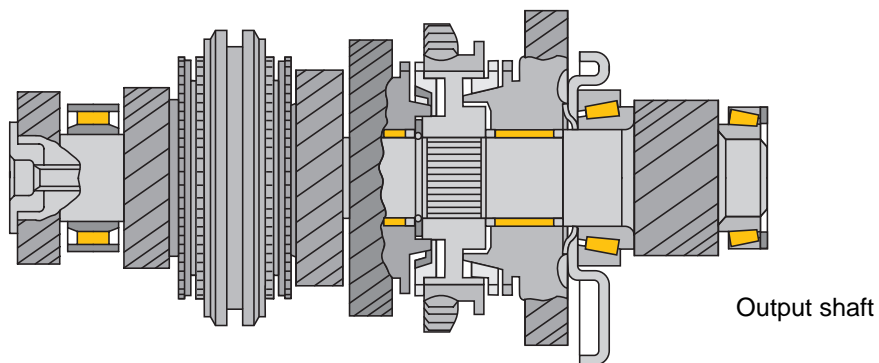
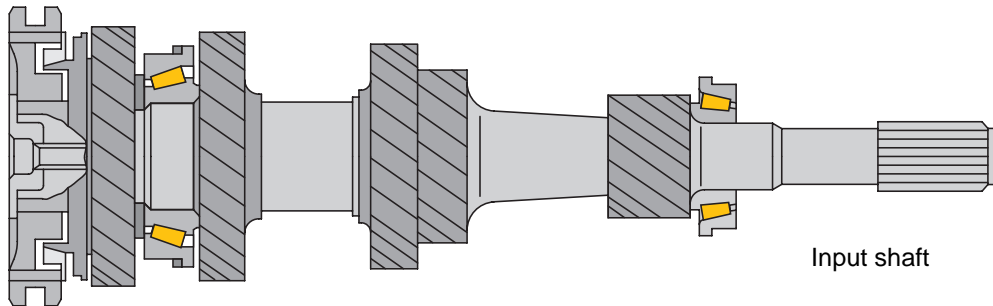
Input shaft and output shaft as well as the differential run in taper roller bearings.

2nd gear is a double-synchronmesh design (see page 28).

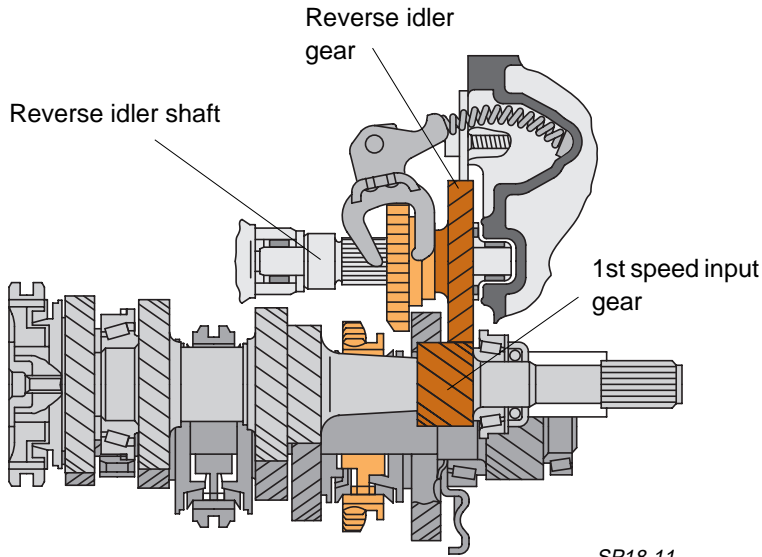
The helically toothed gearwheels and selector gears are constantly meshed and are engaged by synchronizing couplings.

The selector gear of 5th speed is located on the input shaft.

The selector gears of 1st to 4th speed are located on the output shaft.



SP18-13



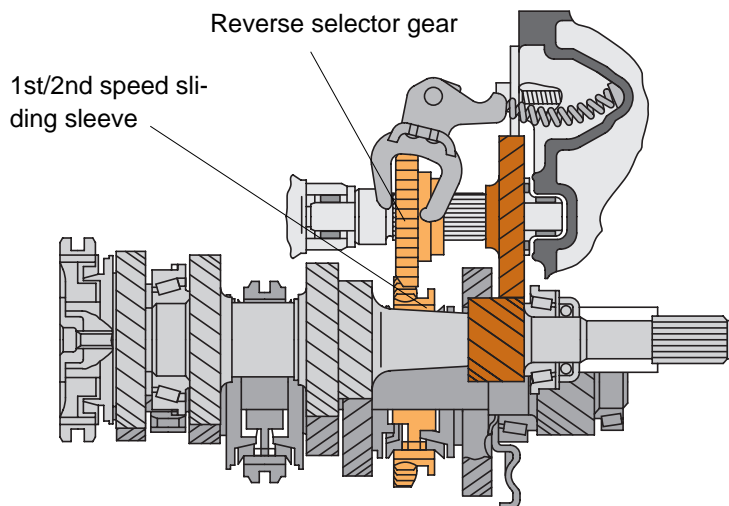
SP18-11

Reverse gear not engaged

The reverse idler shaft is located between gearbox housing and clutch housing. It runs in needle bearings in order to absorb the flywheel load transmitted by the shift fork.

A helically-toothed gear which is constantly meshed with the input gear of 1st speed, is located on this shaft.

Reverse gear and 5th gear are engaged by means of an independent linkage.



SP18-12

Reverse gear engaged

Reverse gear is engaged by moving the reverse selector gear into the 1st and 2nd speed sliding sleeve. This features spur gearing on the outside.

The reverse selector gear likewise features spur gearing and is not synchronized. The movement is supported by an over-centre spring.

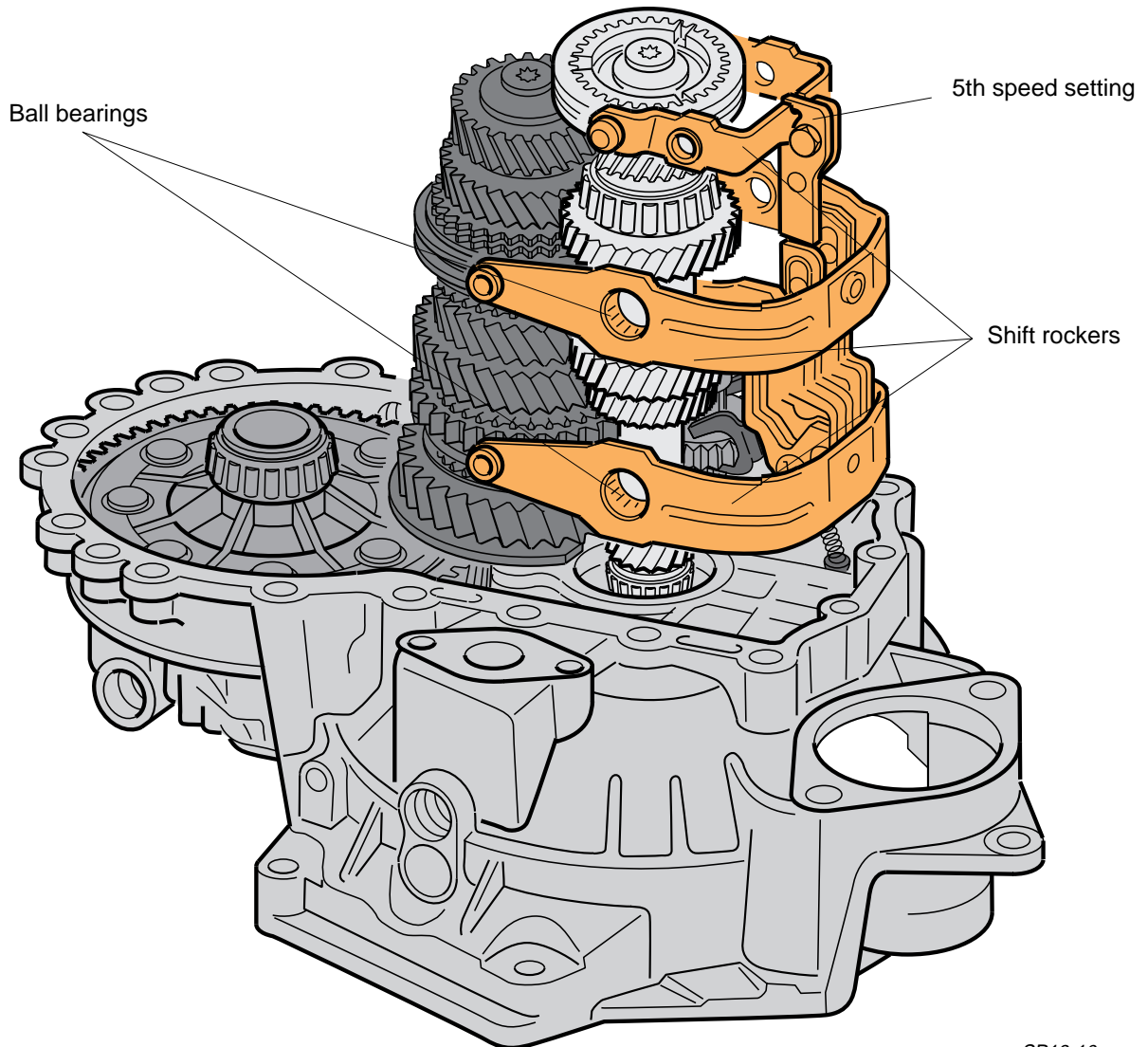
The shift movement is initiated by the separate shift fork for reverse gear.

Manual Gearbox 02J

Shift Mechanism in Gearbox

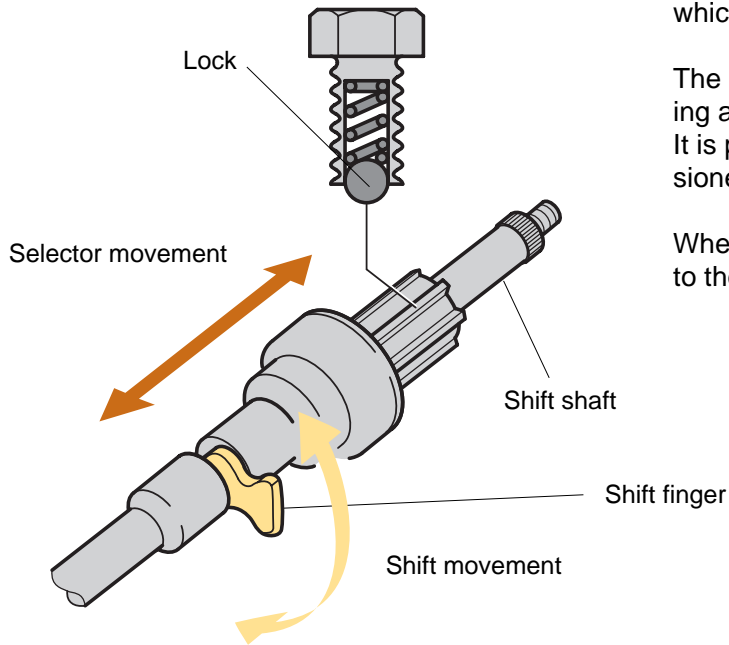
Rocker shift mechanism

Engaging of 1st to 5th gears is designed as a rocker shift mechanism. The shift rockers for 1st to 4th gears are mounted in ball bearings which contribute to the smooth operation of the shift mechanism. The shift rocker for 5th gear is adjustable and has to be set separately.



SP18-10

Internal shift mechanism

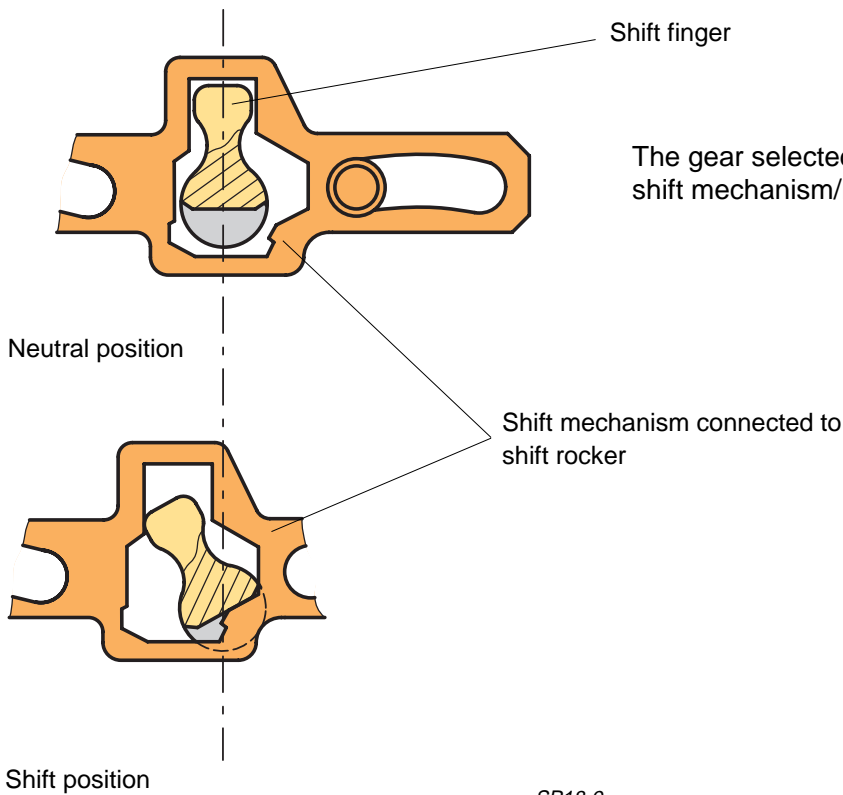


The shift shaft is located in the shift mechanism which is linked to the shift rockers.

The shift shaft is moved in an axial direction during a selector movement. It is prevented from rotating by the spring-tensioned locking ball.

When a gear is engaged, the shift shaft is rotated to the connected shift finger.

SP18-8



The gear selected is engaged by means of the shift mechanism/rocker.

SP18-9

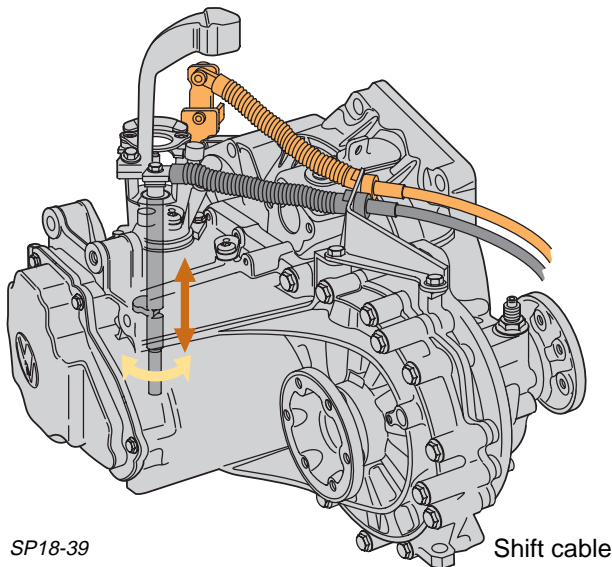
Manual Gearbox 02J

External Shift Mechanism

The shift movement (selecting and engaging) is transmitted by two cables.

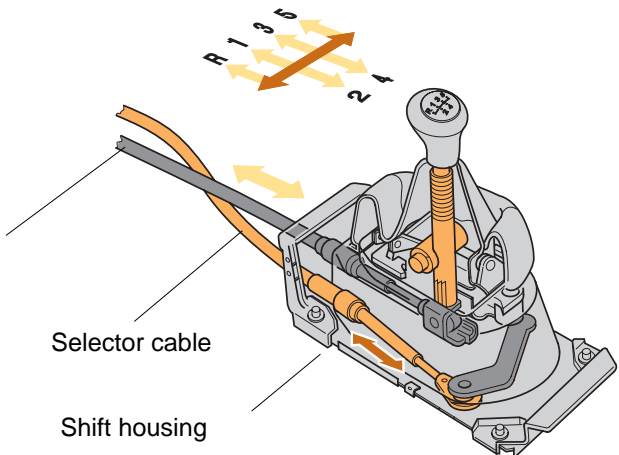
This offers the following benefits:

- Influences on gearshift operations are minimized
- Improved protection against the transmission of structure-borne sound
- A system requiring practically no maintenance
- Internal shift mechanism is located above the oil fill level which reduces the forces acting on the external shift mechanism



SP18-39

Shift cable



SP18-2

Once the gearshift lever is moved in the Neutral position to select a gear, the pivot point is located in the selector housing.

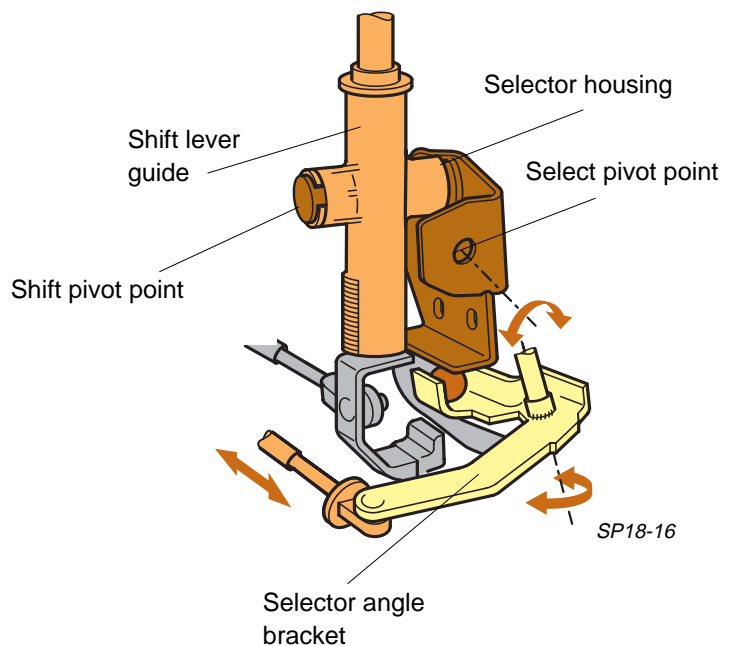
The shift lever guide is linked in this case to the selector housing.

The selector housing is mounted in the shift housing.

A ball head positioned at the base end of the selector housing carries out a contrary movement.

The ball head is surrounded by the selector angle bracket.

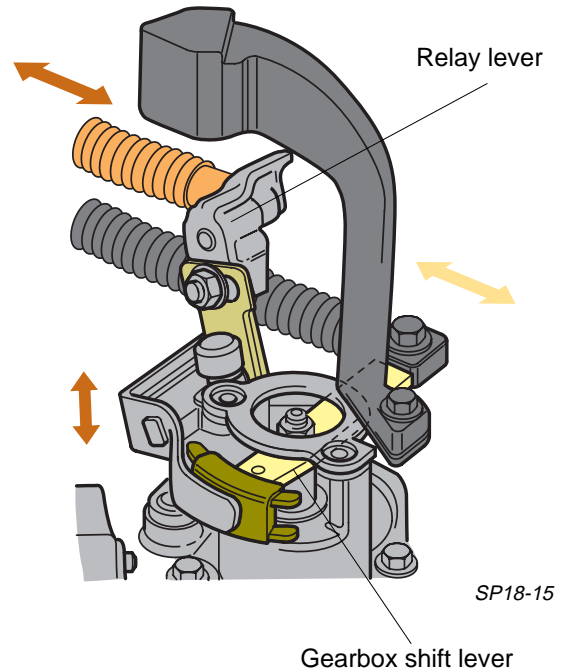
This converts the movement of the gearshift lever when selecting a gear into a pull/push movement.



SP18-16

Selector angle bracket

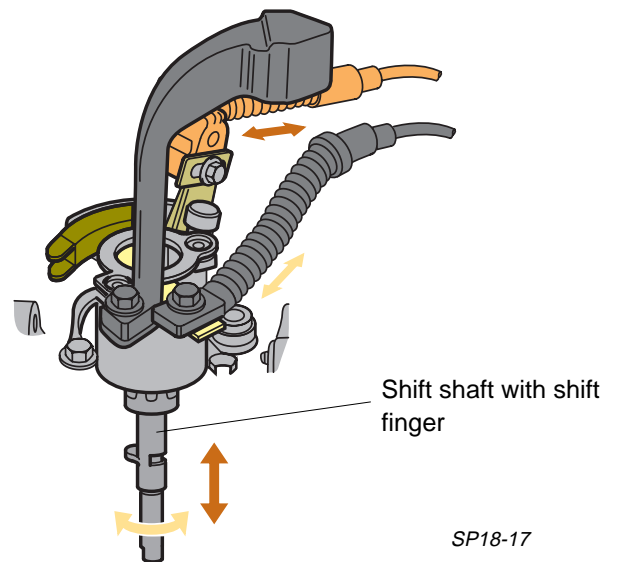
The selector cable transmits the movement to a relay lever on the shift cover. The relay lever is linked to the shift shaft and lifts the shift shaft up or presses it down, respectively.



If the shift lever is moved (shifted) in the direction of the gear, the pivot point is located in the shift lever guide.

The shift cable engages in the base of the shift lever. The shift cable transmits the forward/backward movement to the gearbox shift lever. The gearbox shift lever rotates the shift shaft in the direction of the corresponding gear.

The shift finger which is connected to the shift shaft, engages the gear.

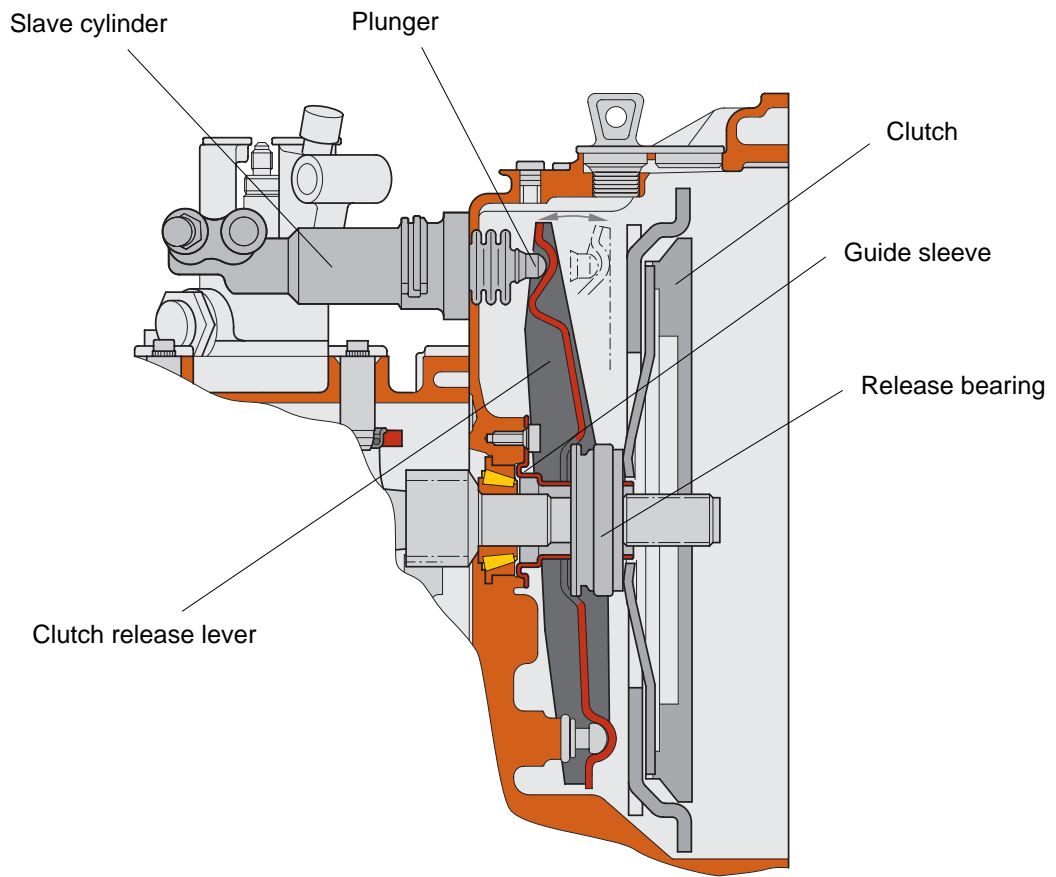


Manual Gearbox 02J

Clutch Mechanism

The clutch is operated hydraulically.
The slave cylinder is located at the gearbox housing.
It presses on the clutch release lever through a plunger.

The release bearing is located on a guide sleeve.
The clutch is operated through the release bearing.
After carrying out removal and installation work on the clutch mechanism, the clutch system should be bled with a brake filling and bleeding appliance.

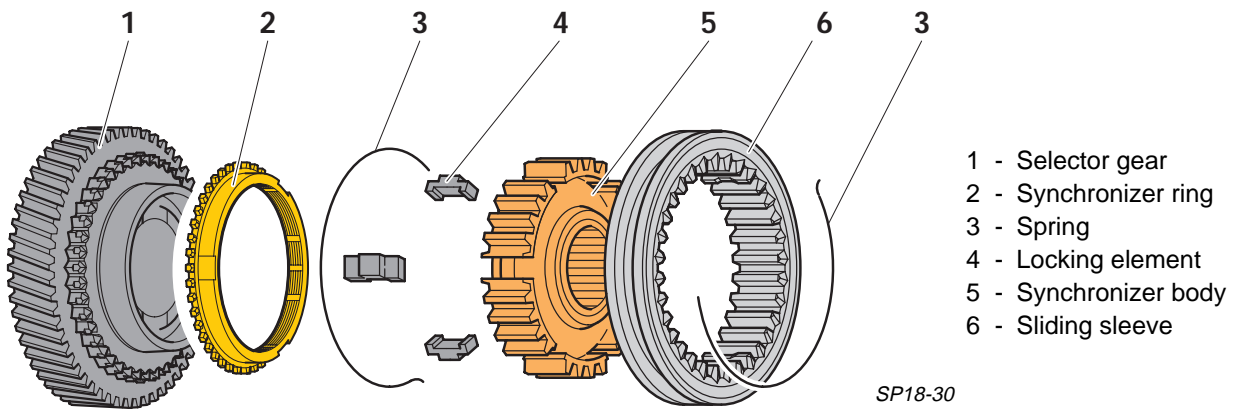


Note:
Before removing the gearbox, secure the clutch release lever to prevent it slipping out.
Press the clutch release lever toward the housing for this step and secure with an assembly bolt.

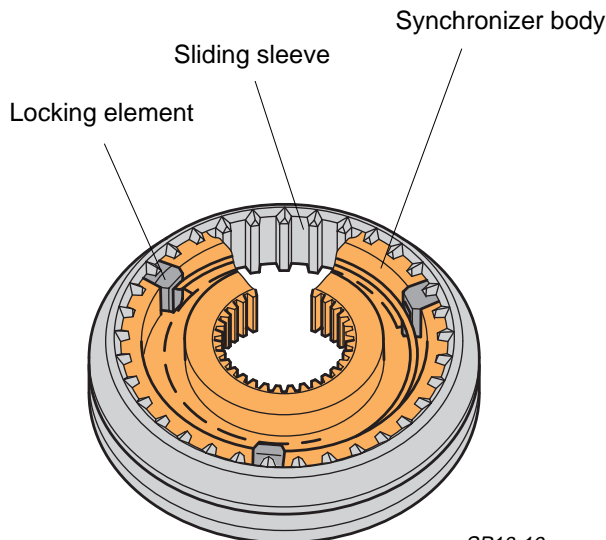
Lock Synchronmesh

The gears of both manual gearboxes feature helical gearing and are constantly meshed. Each selector gear in addition features a cone and a shift gearing through which the gear is shifted by means of sliding sleeves. The sliding sleeve is connected through the synchronizer body to the gearbox shaft.

The selector gears are pivot-mounted and constantly meshed with the fixed gearwheels. The force flow is produced through the sliding sleeves which can move axially. The synchronizing of the selector gears which is required for shifting a gear, is produced by synchronizer rings.



Design of the lock synchronmesh in detail

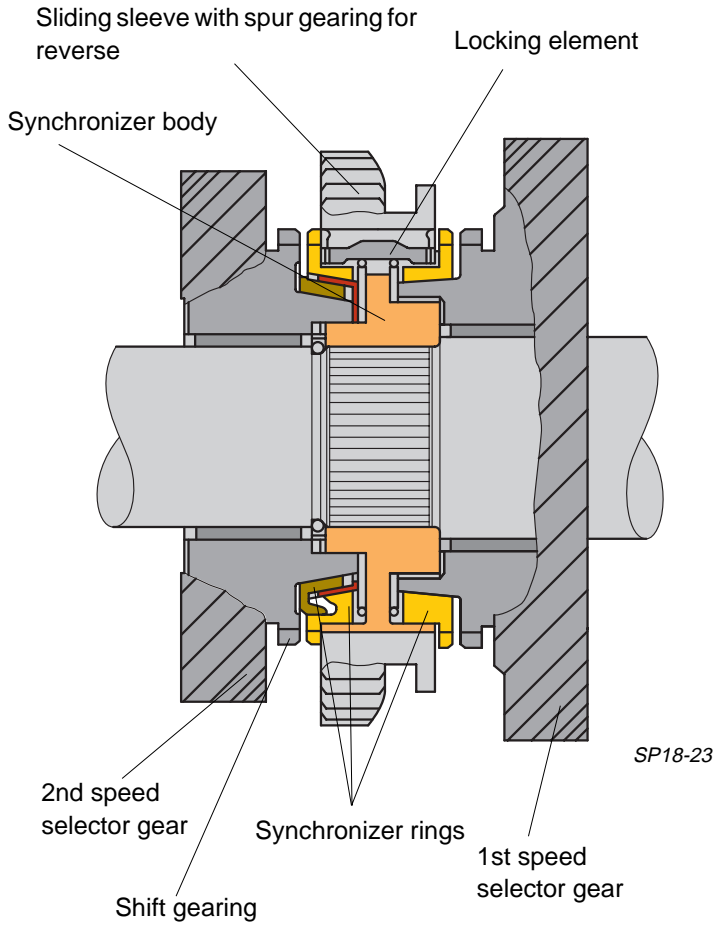


Lock synchronmesh installed

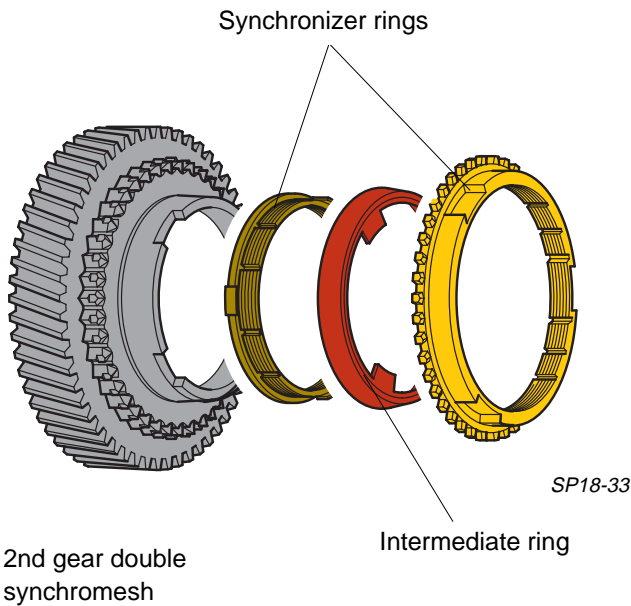
The synchronizer body is firmly attached on the shaft. The synchronizer body contains recesses for mounting the locking elements which are pushed out by two springs. In the Neutral position the sliding sleeve is held in the middle position by the spring pressure.

The synchronizer ring likewise features a friction cone, but is limited in its torsion angle by mechanical stops.

Lock Synchronmesh



When the shift force is transmitted through the shift mechanism, the sliding sleeve is moved out of its middle position. This movement is continued at the synchronizer ring. The friction cone of the synchronizer ring is pushed against the cone of the selector gear. This is braked when shifting into a higher gear - and accelerated when shifting into a lower gear. The further movement of the sliding sleeve is blocked until the speeds between synchronizer body and selector gear are approximately matched. Once synchronmesh has been established between the selector gear and the shaft, the sliding sleeve is able to mesh with the splines of the selector gear and the power transmission is established.



As the power output of engines increases, the synchronmesh mechanism has to absorb greater forces. That is why a double synchronmesh mechanism has been used. Doubling the conical friction surfaces boosts the power-handling capacity by 50 % and halves the gearshift force.

A double synchronmesh is used on gearbox 02J for synchronizing 2nd gear.

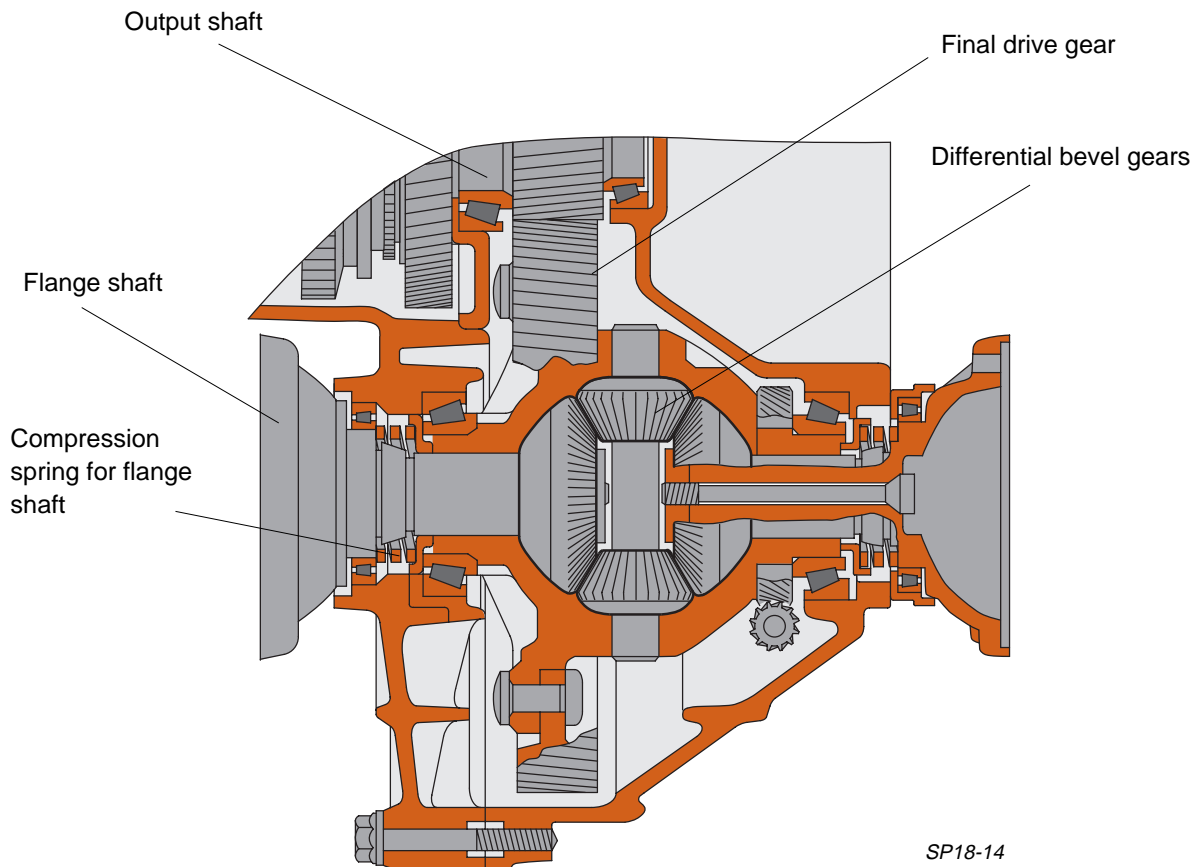
Differential

Manual gearbox and differential together with final drive of both gearboxes form a single unit.

The differential is linked to the flange shafts through differential bevel gears. These flange shafts are resiliently mounted by compression springs and tapered rings. The tapered rings transmit the spring force to the housing of the differential and pre-tension the flange shafts in the axial direction.

This measure offers the following advantages:

- Reduces the housing noise level
- Provides higher active vehicle safety
- Permits more rapid cornering



Differential of manual gearbox 02J

The differential of manual gearbox 02K is similar in design

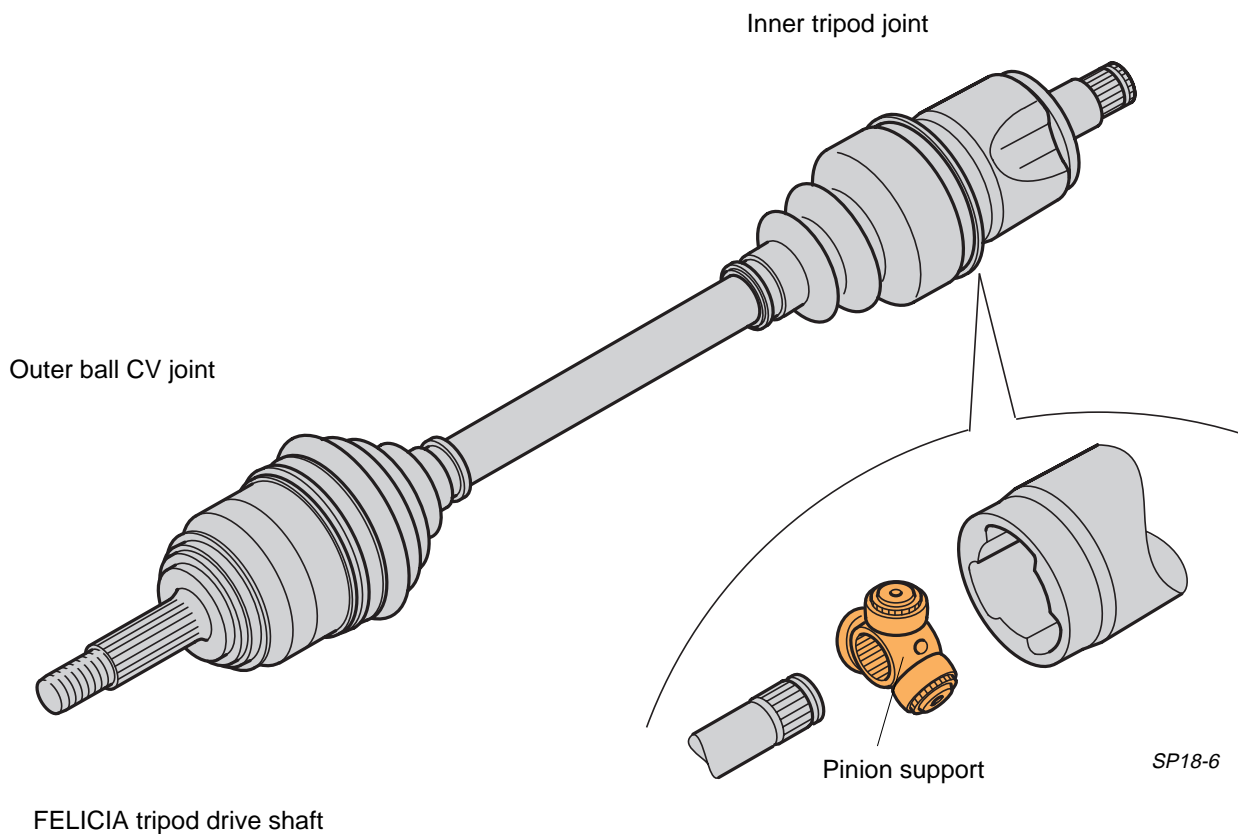
Drive Shafts

The two manual gearboxes are used in the OCTAVIA with drive shafts featuring inner and outer constant-velocity joints.

These are bolted at the inner joint to the flange shafts of the differential.

What is the difference in this case to the FELICIA?

The drive shafts used in the FELICIA feature an outer ball constant-velocity joint and an inner tripod joint. Both drive shafts are solid shafts.



Note:

OCTAVIA models with automatic transmission, however, feature a tripod drive shaft. The tripod inner joint in this case is likewise bolted to the flange shafts of the differential.

The drive shafts used on the SKODA OCTAVIA feature an inner and outer ball constant-velocity joint.

The left drive shaft is a solid shaft while the right drive shaft is designed as a hollow shaft.

Ball hub and joint housing of the inner joint are matched.

They must be marked before removing.

The assignment of the tracks must not be mixed up.

