CITROËN TECHNICAL TRAINING

ZF 4HP20 AUTOMATIC TRANSMISSION

CITROËN UK LTD
221 BATH ROAD
SLOUGH SL1 4BA

DEALER PERSONNEL
DEVELOPMENT AND
TRAINING

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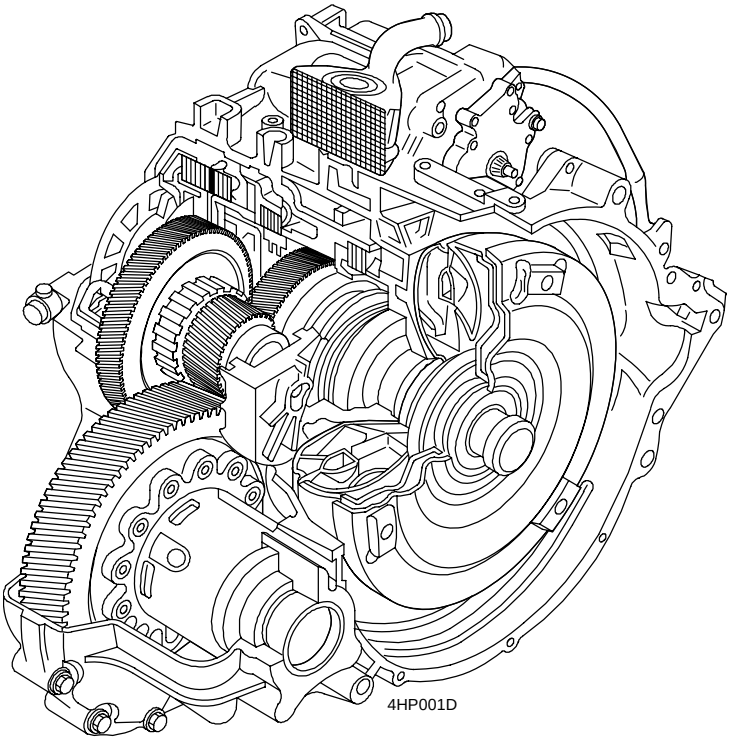
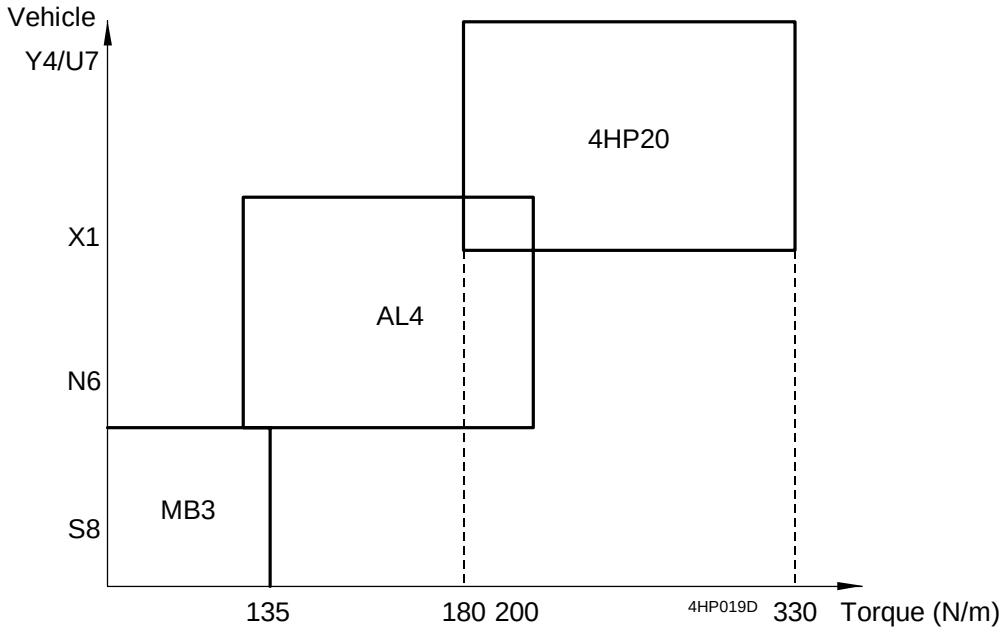
PRESENTATION - GENERAL

I - INTRODUCTION



- Totally electronically managed transverse automatic transmission.
- Four forward gears and one reverse gear.
- Auto-adaptive ECU used for managing the converter, gear changes and specific programs.
- The maximum torque capacity is 330 mN.
- Sealed transmission with reduced maintenance.
- This transmission is aimed at the powerful engines fitted to the top of the range CITROËN vehicles: mono volume, H and M2 segments.

Note: This document only deals with the ES9 J4 L3 engine.



II - PRESENTATION

Transmission architecture

- Hydraulic torque converter with lock-up device.
- Primary shaft.
- Two "Simpson 2" type epicyclic gear trains.
- Multidisc clutches / brakes (no belt brakes).
- Step down torque in central position.
- Differential with sealed outputs.

Control

This is provided by:

- the hydraulic unit,
- the ECU,
- the control cable.

Points of note

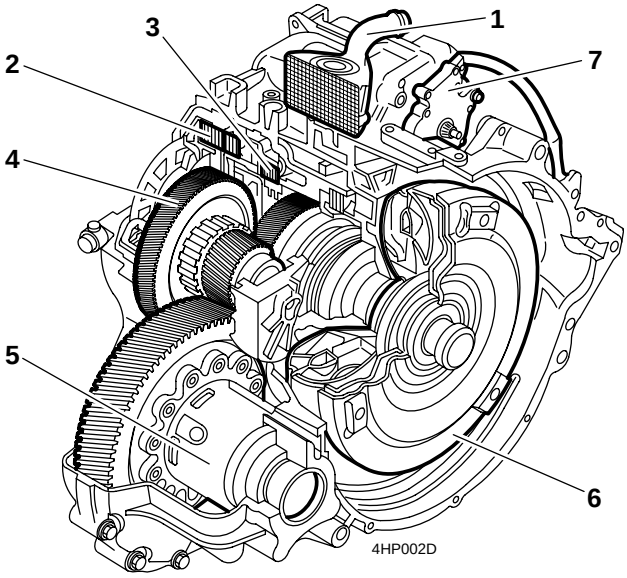
- Lock-up of 2nd, 3rd and 4th gears with controlled slip.
- Electronic management of all regulation and gear changing functions.
- Multiple programs: auto-adaptive (DSP) - Sport-Snow.
- Gears and programs displayed on dashboard.
- Possibility of manually selecting one of the first three gears: 1 - 2 - 3.
- Cannot change up a gear when in no load position (foot off accelerator).
- ECU with auto-adaptive "Flash EPROM".
- Downgraded mode operation in the event of a fault.
- Closed loop operation.
- Autodiagnostic and downgraded mode.
- SHIFT LOCK* and KEY LOCK** functions

* Shift lock: impossible to leave position P without having pressed brake beforehand.

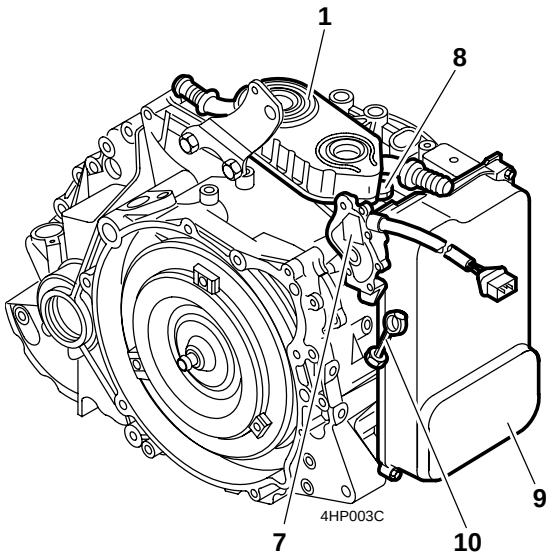
** KEY LOCK: impossible to remove key from ignition if the selector lever is not in P. On CITROËN vehicles, the KEY LOCK device has not been chosen and may be replaced by a buzzer (same as the lights on reminder buzzer).

This will appear on the restyled CITROËN XANTIA.

III - DESCRIPTION



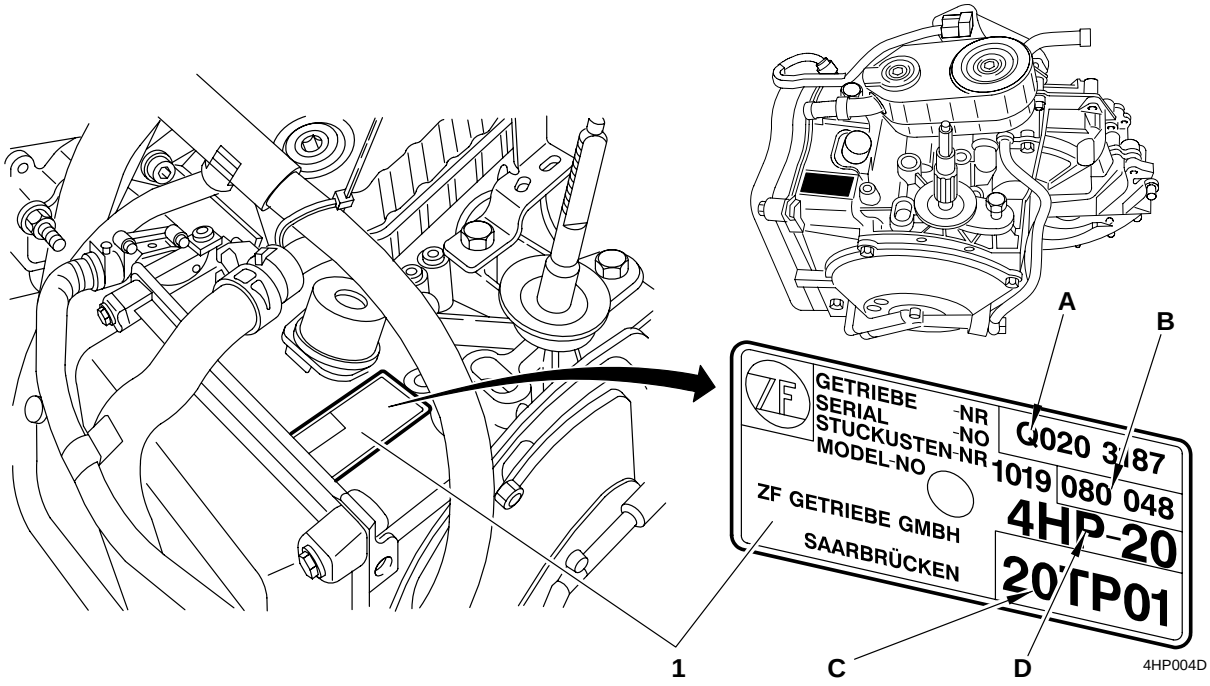
1 - Heat exchanger
2 - Clutch
3 - Brake
4 - Step-down torque
5 - Differential
6 - Torque converter
7 - Multifunction switch



8 - Breather
9 - Hydraulic unit cover
10 - Oil dipstick

IV - IDENTIFICATION OF THE COMPONENTS OF THE AUTOMATIC TRANSMISSION

A - AUTOMATIC TRANSMISSION



1 - Identification plate

The transmission is identified by means of a plate riveted to the housing:

A - Serial number.

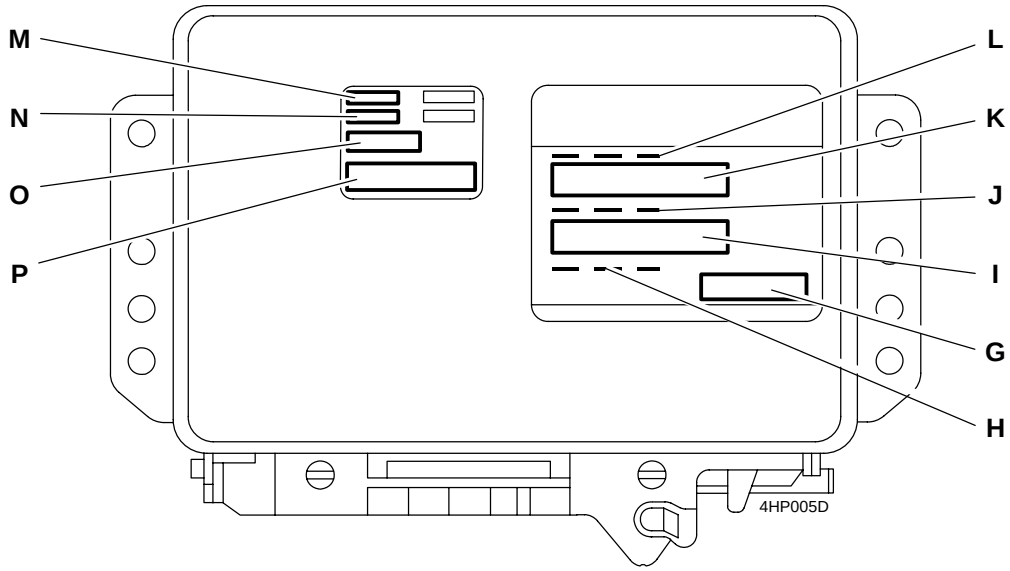
B - Parts list number (last 3 figures taken into account).

C - Component reference.

D - Automatic transmission type.

ZF PARTS LIST NUMBER (B)	COMPONENT REFERENCE (C)	HYDRAULIC UNIT NUMBER (D)
1019000010	20HZ07	1019198306

B - ECU



G - Reference.

H - Customer number.

I - Customer number bar code.

J - ZF parts list number.

K - ZF number bar code (software identification).

L - Order number.

M - Hardware version.

N - Program data version (software version).

O - Date of manufacture.

P - Serial number.

Identification (with an ELIT type diagnostic device)

- The ECU identification is found in the Identification menu.

V - SPECIFICATIONS - MAINTENANCE

A - INTERVALS - CAPACITIES

	XANTIA
Engine	ES9J4L3
Transmission capacity	7.7 - 8.3 litres
Draining capacity	between 2.7 and 3 litres
Exclusive oil	ESSO LT 71141
Draining interval	lubricated for life
Top-up interval	60 000 km
Transmission lubrication	pressurised
Final drive lubrication	oil splash
Weight	88 kg with oil and electronics
Torque capacity	330 mN at 3500 rpm

B - GEARS

	XANTIA	XM
Engine	ES9J4L3	ES9J4L3
Tyres - circumference	205/60R15MXV3 A	205/65R15 index V
1st	2.718 - 11.35 km/h*	2.718 - 11.65 km/h*
2nd	1.481 - 21 km/h*	1.481 - 21.4 km/h*
3rd	1 - 31 km/h*	1 - 31.66 km/h*
4th	0.720 - 43 km/h*	0.720 - 44 km/h*
Reverse	2.568 - 12 km/h*	2.568 - 12.33 km/h*
Step-down torque	61x66	59x68
Cylindrical torque	20x69	20x69
Tachometric torque	20x16	20x16

* Speeds in km/h are given at 1000 rpm.

Internal gear change safety thresholds:

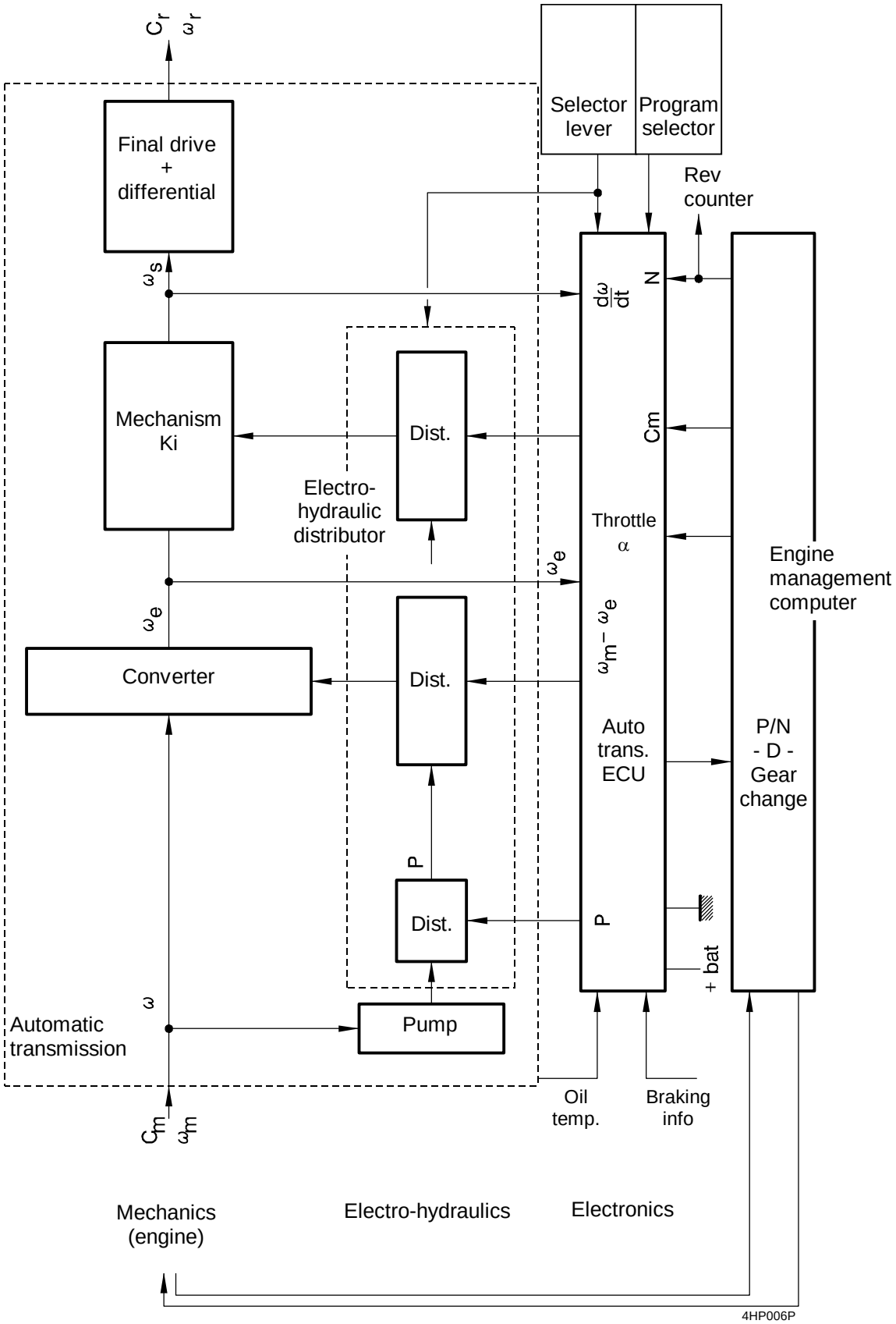
LEVER POSITION	SAFETY THRESHOLD
D $\rightarrow$ R	10 km/h
D $\rightarrow$ 3	165 km/h
3 $\rightarrow$ 2	110 km/h
2 $\rightarrow$ 1	60 km/h

VI - TIGHTENING TORQUES

TRANSMISSION COMPONENT	DESCRIPTION	N° BOLTS	HEX HEAD	BOLT DIMENSIONS	TIGHTENING TORQUE(S)
Auto trans housing	Exchanger output connector tube mounting to auto. trans	1	Hex head - 13 mm spanner	M8	23 Nm
Side cover	Cover mountings	5	Hex head - 13 mm spanner	M8 L = 28	23 Nm
Side cover	Banjo connect. Transmission input	1	Hex head - 19 mm spanner	M14 x 1.5	25 Nm
Converter housing	External mountings on auto trans + strap bracket (2 bolts)	18	Hex head - 13 mm spanner	M8 L = 40	23 Nm
Converter housing	auto trans mountings behind converter	5	Hex head - 13 mm spanner	M8 L = 50	23 Nm
Converter housing	Drain plug	1	6 point socket bolt, 8 spanner	M16 x 1.5	45 Nm
Exchanger	Mounting(s) on auto trans (socket bolts)	2	6 point socket bolt, 6 spanner	M12 x 1.5	35 Nm
Position switch	Switch mountings on support plate	2	Hex head - 10 mm spanner	M6 L = 16	10 Nm
Selector control	Selector mounting on shaft	1	Hex nut (13)	M8	21 Nm
Selector control	Sleeve stop lug mounting on converter housing	2	Hex head - 13 mm spanner	M8	15 Nm
Hydraulic unit cover	Bridge mountings on auto trans housing	4	-	M6 L = 37	6 Nm
Hydraulic unit cover	Angle mountings on auto trans housing	2	Hex head - 10 mm spanner	M6 L = 20	6 Nm
Hydraulic unit	Mounting(s) on auto trans housing	7	TORX	M6 L = 55	8 Nm
Engine speed sensor	Mounting on hydraulic unit (output speed)	1	TORX	M6 L = 20	10 Nm
Engine speed sensor	Mounting(s) on auto trans housing (input speed)	1	TORX	M6 L = 35	8 Nm
Speedo sensor	Mounting(s) on auto trans housing	1	Hex head - 11 mm spanner	M7 X1 L = 16	8 Nm

ASSEMBLY	N° BOLTS	BOLT HEAD	BOLT DIMENSIONS	TIGHTENING TORQUE(S)
Drive plate converter	3	Hex head - 16 mm spanner	M8 x 1.25 L = 14	65 Nm (± 20%)
Engine block converter housing	4	Hex head - 17 mm spanner	M10 x 1.5 L = 75	65 Nm (± 20%)
Engine block converter housing	2	6 point socket bolt - 8 spanner (thread on AT side)	M10 x 1.5 L = 80	65 Nm (± 20%)
Crankshaft/carrier - ring	8	Hex head - 17 mm spanner	M9 x 1 L = 18	90 Nm (± 10%)
Closure plate	3	Hex head - 10 mm spanner	M6 x 1 L = 16	17.6 Nm (± 10%)
Auto trans. suspension	1	Stud(s)	M14 x 1.5 L = 29	50 Nm (± 10%)
Auto trans. suspension	1	Hex head - 13 mm spanner	M12 x 1.5 L = 35	60 Nm

VII - LAYOUT OF THE 4HP20 AUTOMATIC TRANSMISSION



ZF 4HP20 AUTOMATIC TRANSMISSION

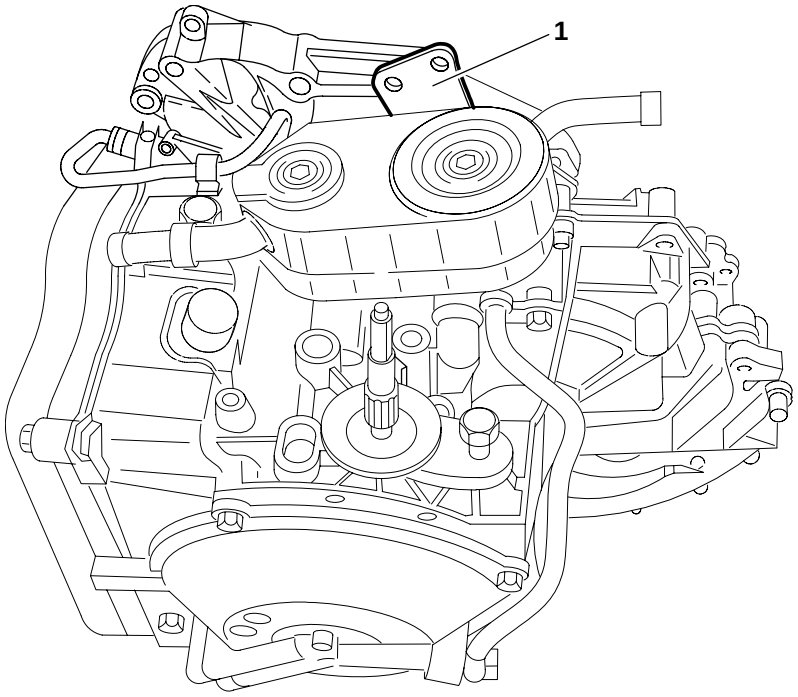
VIII - MISCELLANEOUS NOTES

A - TOWING

The transmission is lubricated when the engine is running since the engine drives the transmission oil pump; therefore, when towing, the drive wheels must be raised off the ground. The vehicle can however be towed with the drive wheels on the ground under exceptional circumstances as long as the following conditions are complied with:

- travel a distance of no more than 100 km,
- drive at less than 70 km/h,
- put lever in position N,
- the vehicle must be horizontal or else be inclined by a maximum of 5° if the rear wheels have to be raised.

B - LIFTING



4HP020D

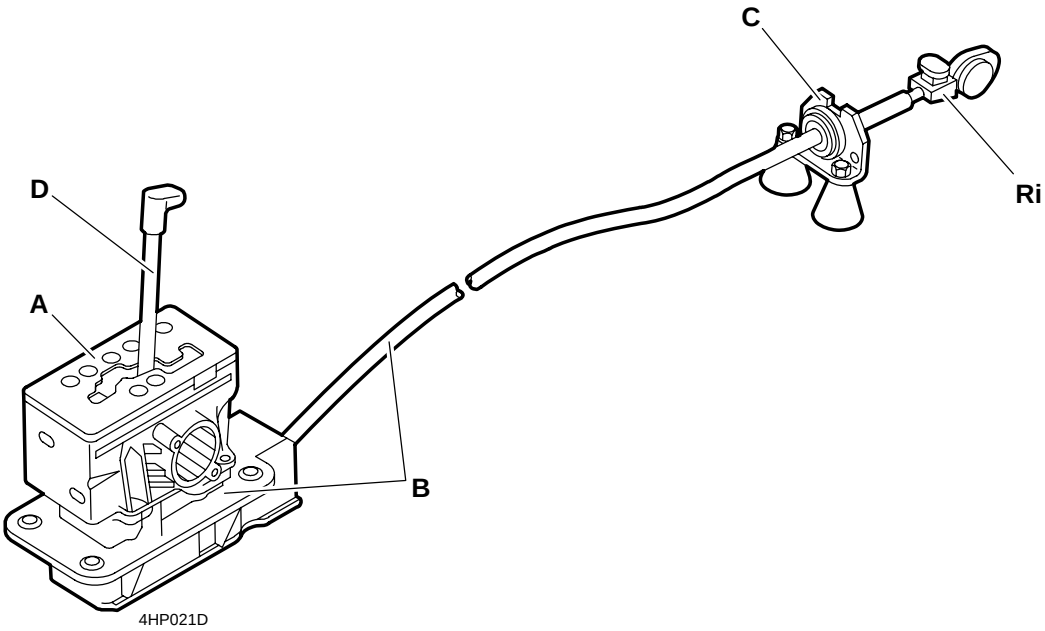
The 4HP20 transmission is fitted with a sling bracket (1) for easy lifting.

Never place the transmission on the floor unprotected.

SELECTOR CONTROL

XANTIA

I - SELECTOR LEVER



A - Upper part

B - Lower part

C - Sleeve stop

D - Control lever

Ri - Initial adjustment

The selector lever, located on the central console, has 7 positions using an offset grid.

The lever has a mechanical safety device which locks by means of a radial action on the lever.

Different positions:

- P - park: the transmission is mechanically locked, the starter motor may be operated.
- R - reverse: corresponds to reverse gear with illumination of reversing lights.
- N - neutral: corresponds to the neutral position; the starter motor may be operated.
- D - drive: the 4 gears are changed automatically; 1-2, 2-3, 3-4, 4-3, 3-2, 2-1
- 3-3rd hold: the first 3 gears can be used
- 2-2nd hold: the first 2 gears can be used
- 1-1st hold: only first gear can be used

Except in "snow" program

The 3rd, 2nd and 1st hold positions are totally controlled by the ECU.

Mechanical safety

The lever has to be moved radially in the following cases:

- from position P to position R,
- from position R to position P,
- from position N to position R,
- from position D to position N,
- from position 3 to position 2,
- from position 2 to position 1.