



# Glory new 580 training courseware

A6F30 Automatic transmission



# 目 录

C O N T E N T S

01

A6F30 automatic  
transmission

02

Transmission  
shift mechanism

# 目 录

C O N T E N T S

01

A6F30 automatic  
transmission

02

Transmission  
shift mechanism

## Course objectives

- Be able to understand the composition and transmission process of the A6F30 automatic transmission system
- Able to understand A6F30 automatic transmission sensor, actuator detection data
- Be able to master the use and adjustment of A6F30 automatic transmission

# 目 录

C O N T E N T S

01

**A6F30  
Automatic  
transmission  
introduce**

02

Transmission  
structure and  
power  
transmission  
route

03

Hydraulic system  
structure and  
working process

04

Electronic control  
system and  
detection

05

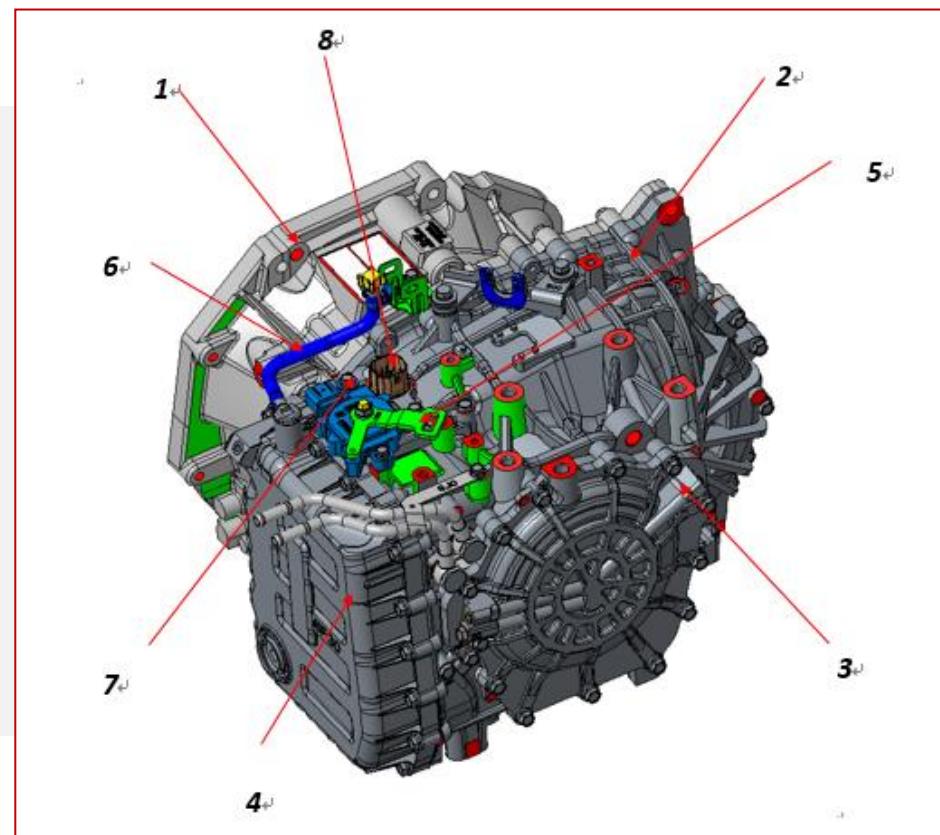
Transmission use  
and maintenance  
Adjustment

# ► One、Automatic transmission introduce

## 1. System Overview

High power automatic transmission differential (A6F30) for DFSK's 1.5L turbo gasoline direct injection engine. The transmission differential has been improved in durability, fuel consumption and efficiency.

1. clutch housing
2. automatic transmission case
3. rear cover
4. valve body cover
5. Manual control lever
6. air respirator hose
7. gear switch
8. Main harness connector



# ► One、Automatic transmission introduce



## 2.6F30Automatic transmission——Main parameters

Item	6F30				
Torque Converter Type	3-element, 1-stage, 2-stage type				
Transmission Differential Type	6 forward gears, 1 reverse gear				
Engine type	HD15M1A				
Vehicle	SUV				
gear ratio	1 <sup>st</sup> gear	4.639	-		
	2 <sup>nd</sup> gear	2.826	-		
	3 <sup>rd</sup> gear	1.841	-		
	4 <sup>th</sup> gear	1.386	-		
	5 <sup>th</sup> gear	1.000	-		
	6 <sup>th</sup> gear	0.772	-		
	Reverse gear	3.385	-		
Final drive ratio	3.195	-			
shift mode	variable				
shift range	4 ranges (P-R-N-D) + manual mode				
Shift range value	VFS; 6, switch SOL.: 1				
Planetary gear	3 sets (front, middle and rear planetary pose)				
clutch	2				
brake	3				
A.T.F. (automatic transmission differential oil)	SK ATF SP-IV M				

# ► One、Automatic transmission introduce



## 3.6F30 automatic transmission introduce——Main features

Item	Content
General	<ol style="list-style-type: none"><li>1. Excellent starting performance and speed-up performance (excellent responsiveness)</li><li>2. Realize overtaking performance and improve air-fuel ratio</li></ol>
Lightweight	<ol style="list-style-type: none"><li>1. Adopt aluminum oil pump (lightweight)</li><li>2. Stamping process (increase wear resistance)</li></ol>
Valve body	<ol style="list-style-type: none"><li>1. 7 solenoid valves for independent control of gears at all levels</li><li>2. The control form of the lock-up clutch is reversed. Duty ratio 100% / oil pressure 0%</li></ol>
Main filter	The filter element has a long service life and generally does not need to be replaced (inside the gearbox)
6F36 control	<p>Driver Habit Control comes with Variable Shift Modes</p> <p>Uphill and downhill road to achieve driver habit control</p>

# 目 录

C O N T E N T S

01

A6F30  
Automatic  
transmission  
introduce

02

**Transmission  
structure and  
power  
transmission  
route**

03

Hydraulic system  
structure and  
working process

04

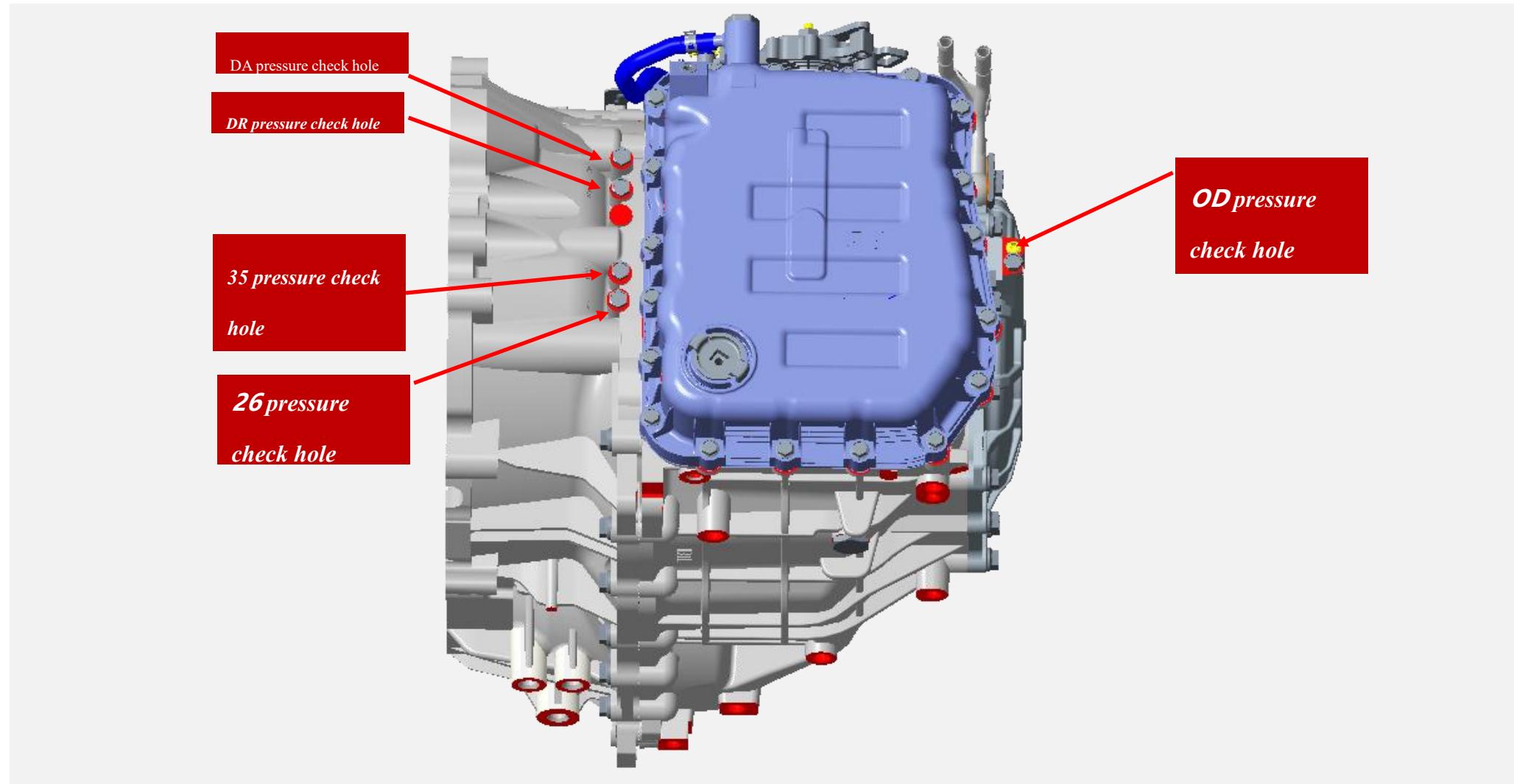
Electronic control  
system and  
detection

05

Transmission use  
and maintenance  
Adjustment

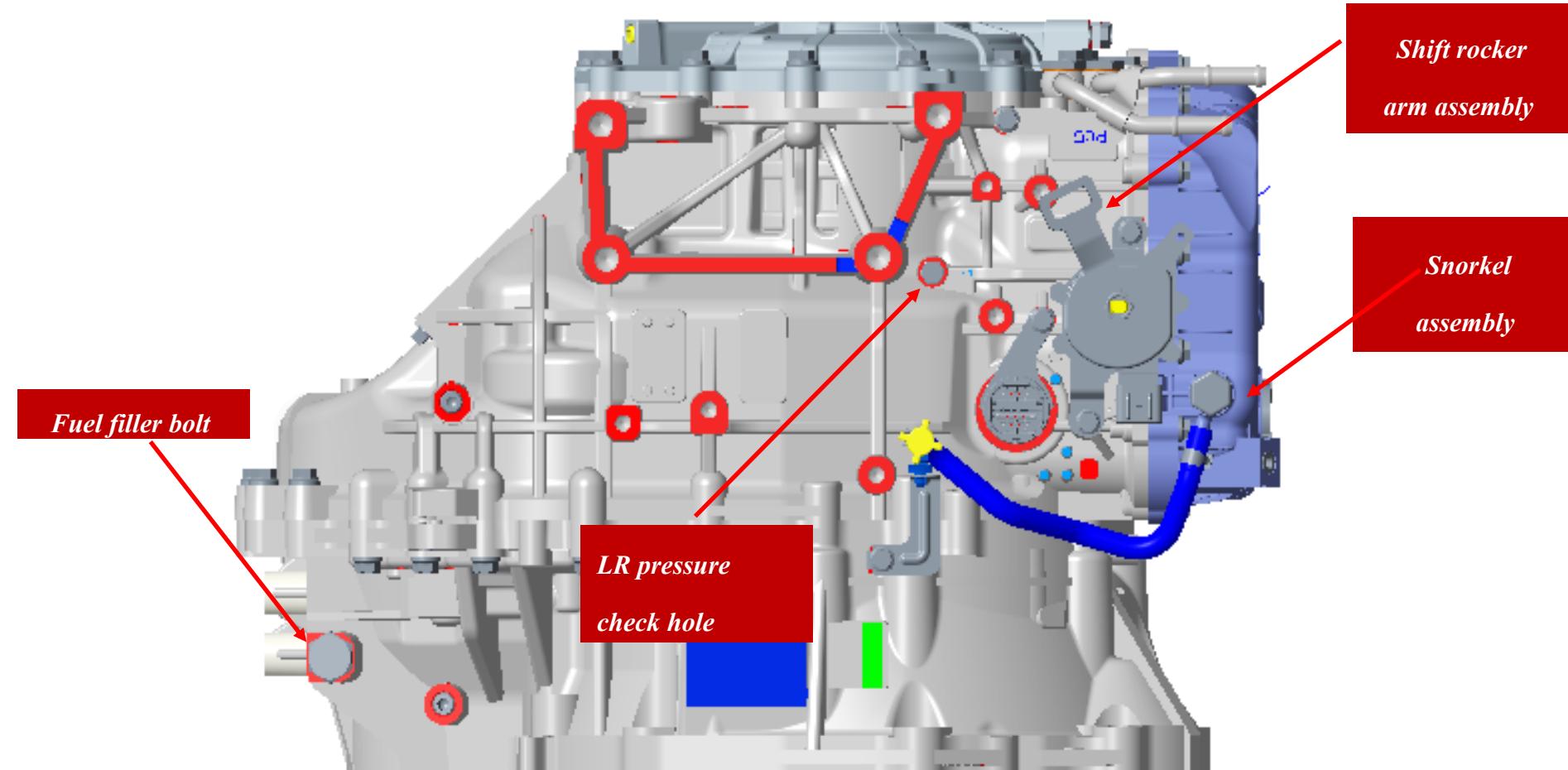
## ► TWO、Transmission structure and power transmission route

### 1. Appearance structure - side



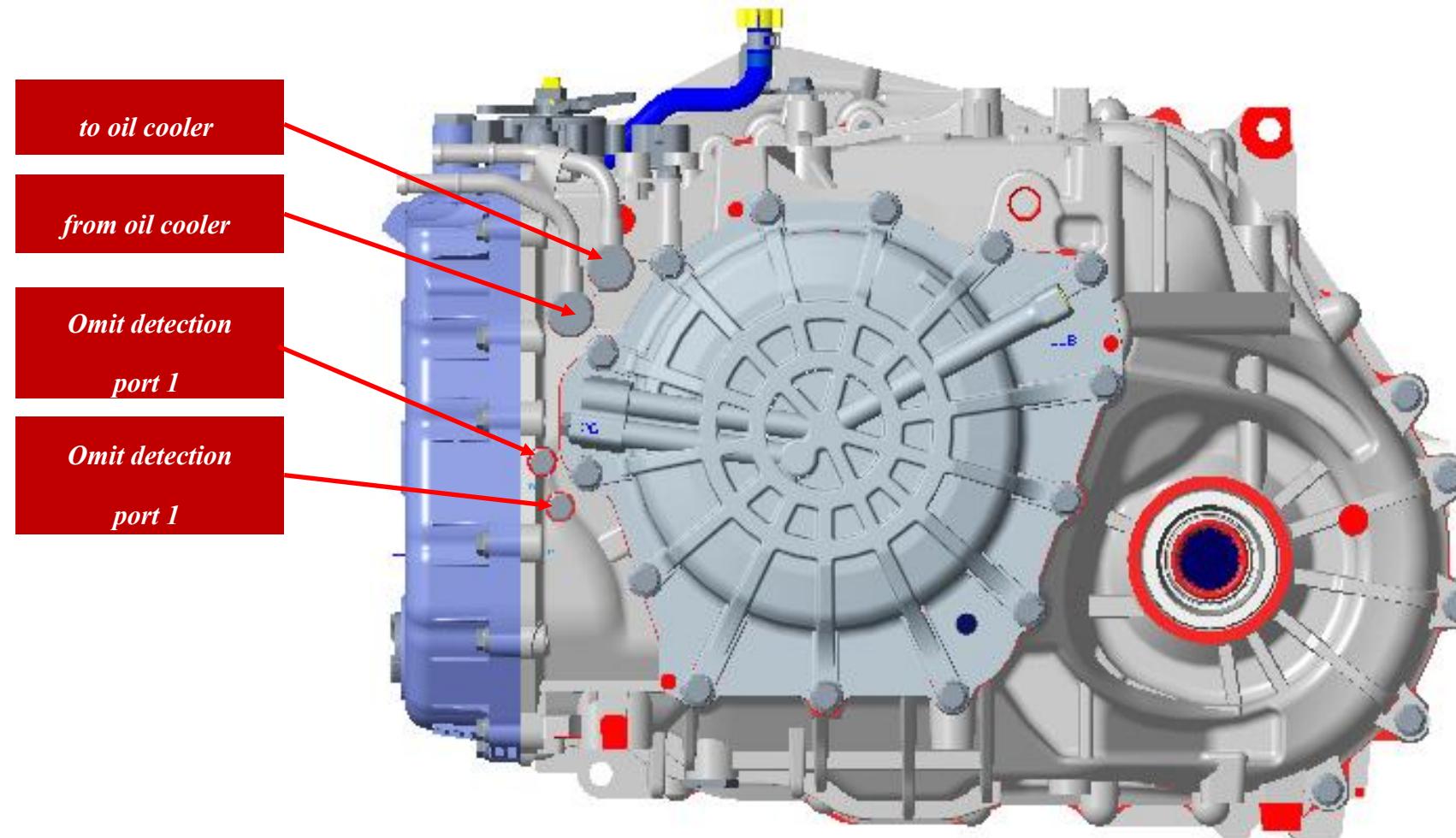
## ► TWO、Transmission structure and power transmission route

### 2. Appearance Structure - Upper



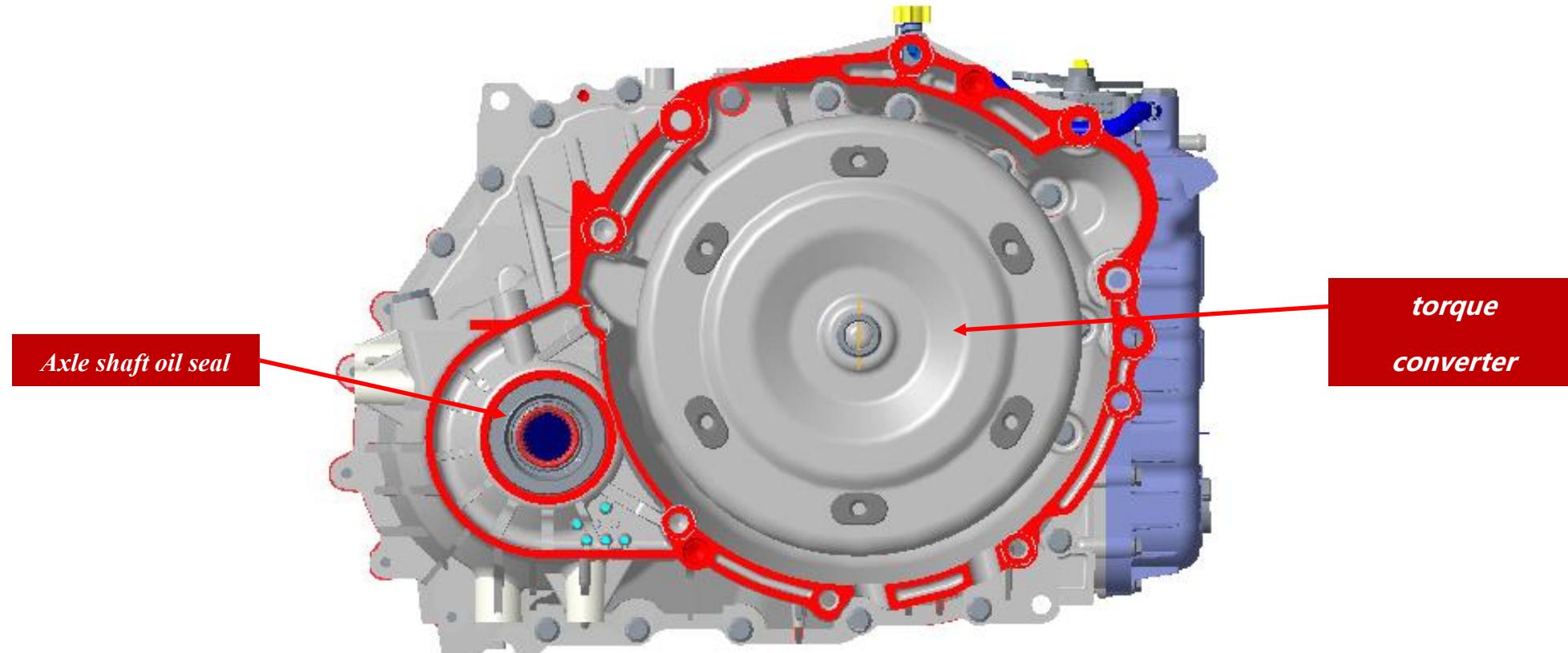
## ► TWO、Transmission structure and power transmission route

### 3. Appearance Structure - Rear



## ► TWO、Transmission structure and power transmission route

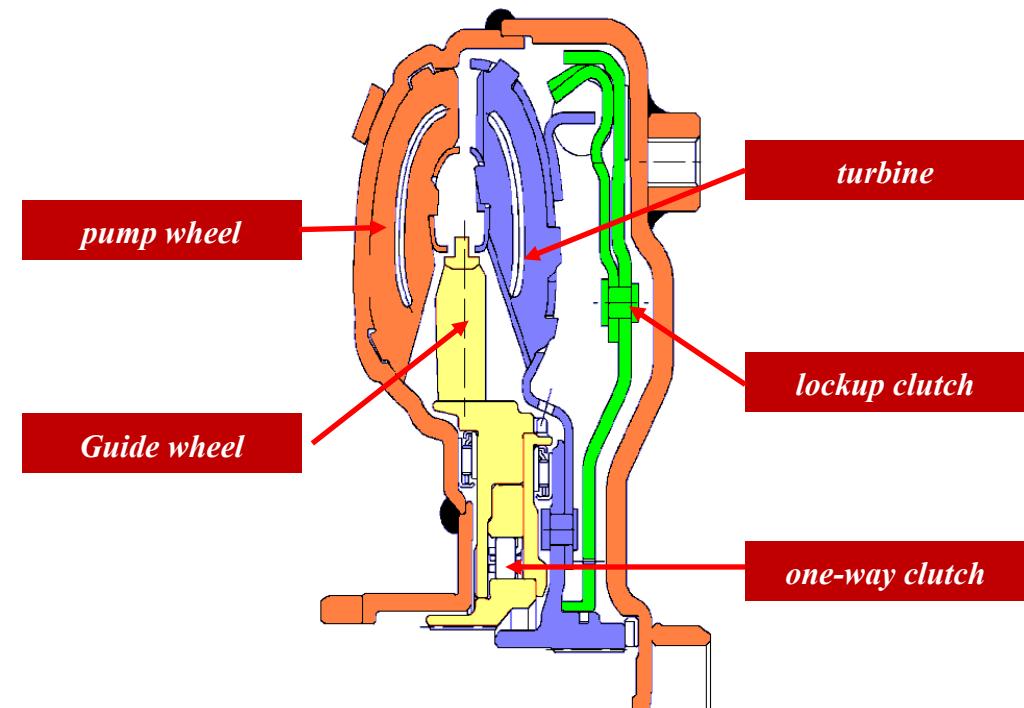
### 4.Appearance Structure - Front



## ► TWO、Transmission structure and power transmission route

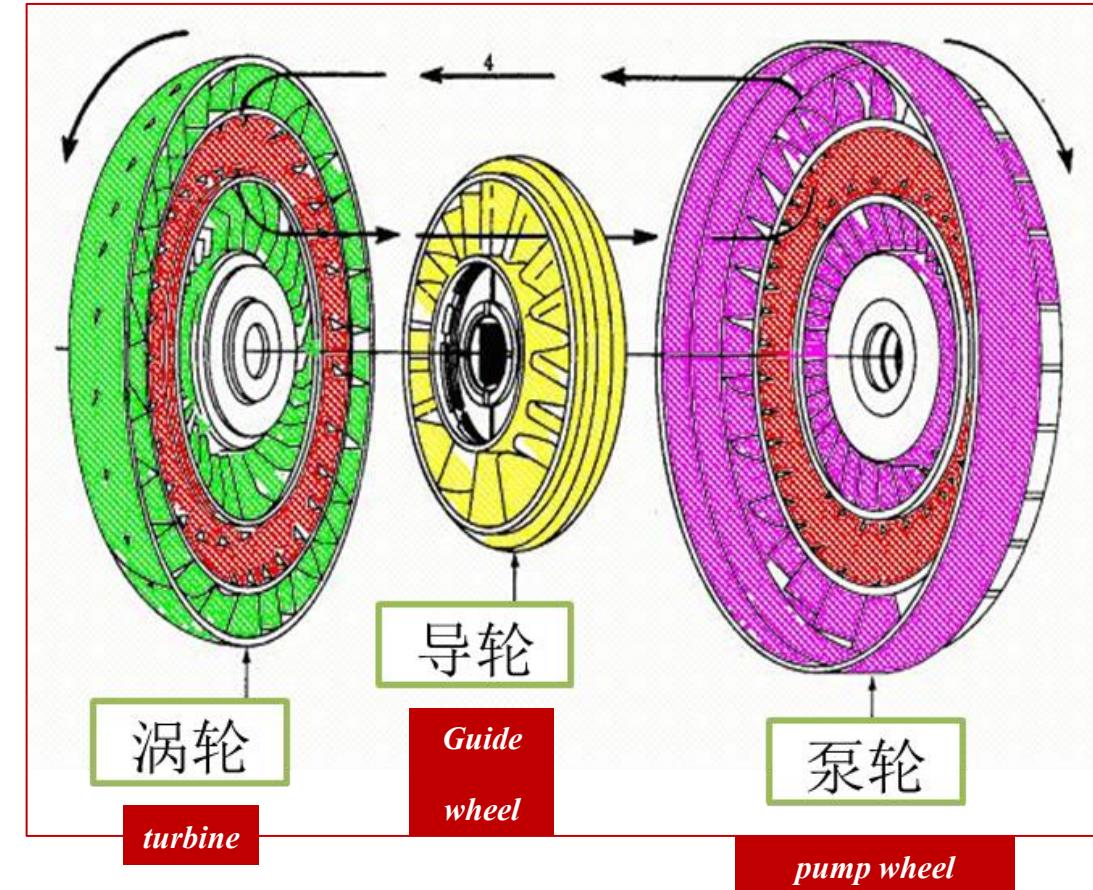
### 5.Internal Transmission Components - Torque Converter

The torque converter converts the mechanical energy from the engine into hydraulic energy, and the turbine connected to the input shaft of the transmission differential converts the hydraulic energy into mechanical energy again.



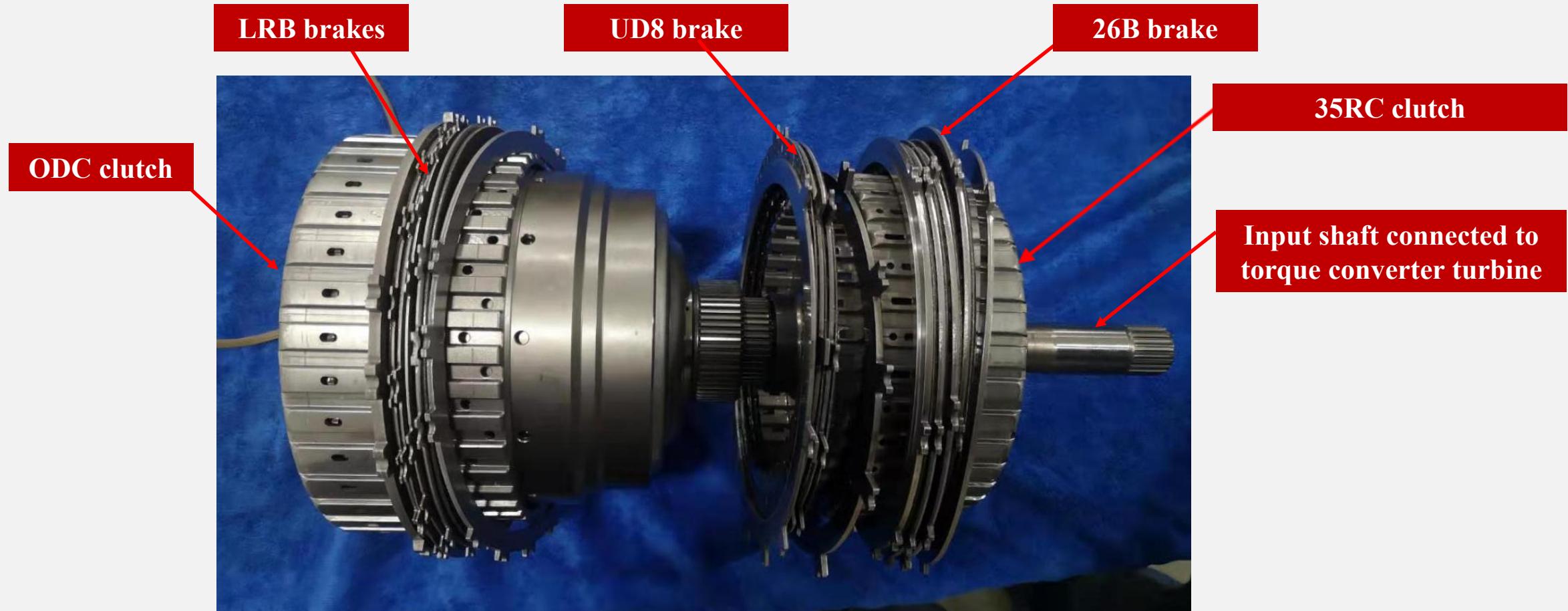
## ► TWO、Transmission structure and power transmission route

### 6. Internal Transmission Parts - Working Principle of Torque Converter



## ► TWO、Transmission structure and power transmission route

### 7. Internal transmission components - brakes/clutches



## ► TWO、Transmission structure and power transmission route



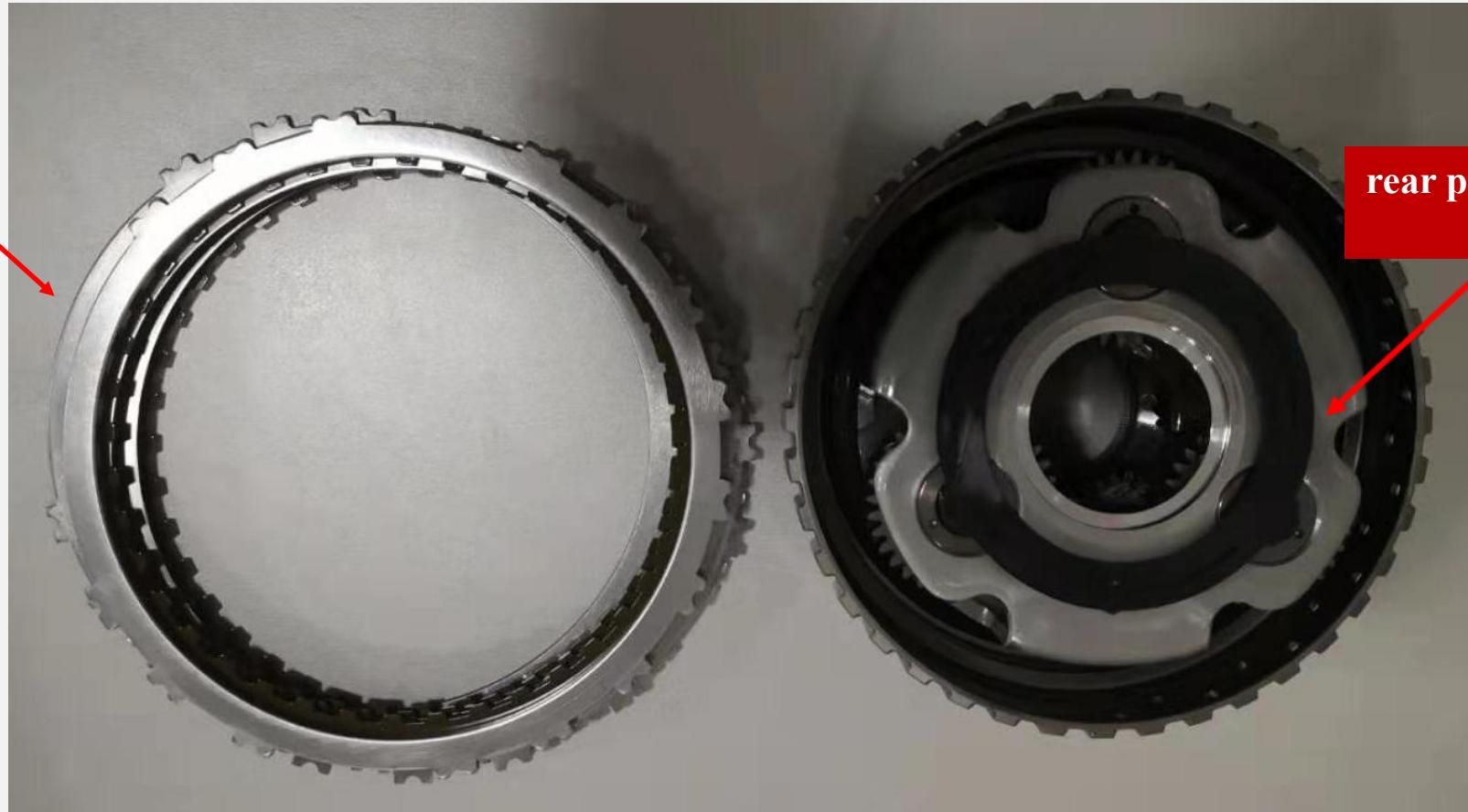
### 8. Internal transmission components - planetary gear mechanism



## ► TWO、Transmission structure and power transmission route



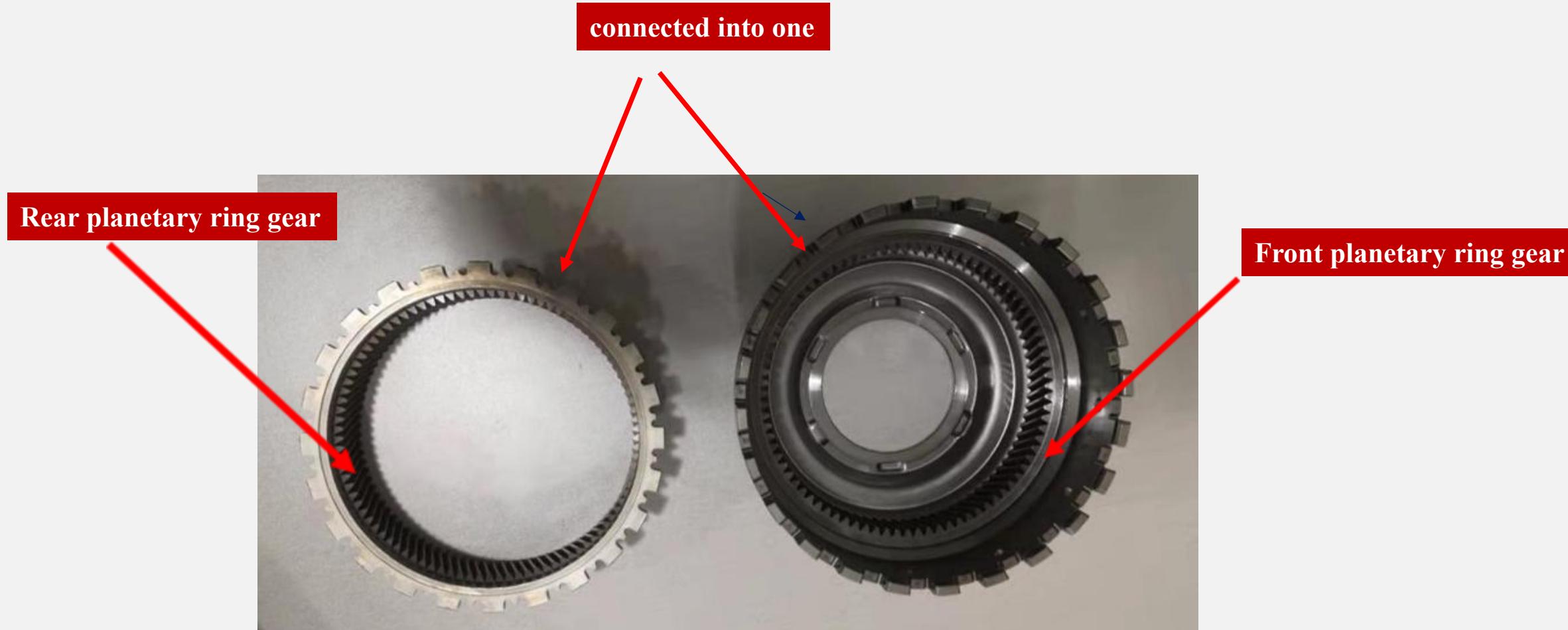
### 8. Internal transmission components - planetary gear mechanism



## ► TWO、Transmission structure and power transmission route

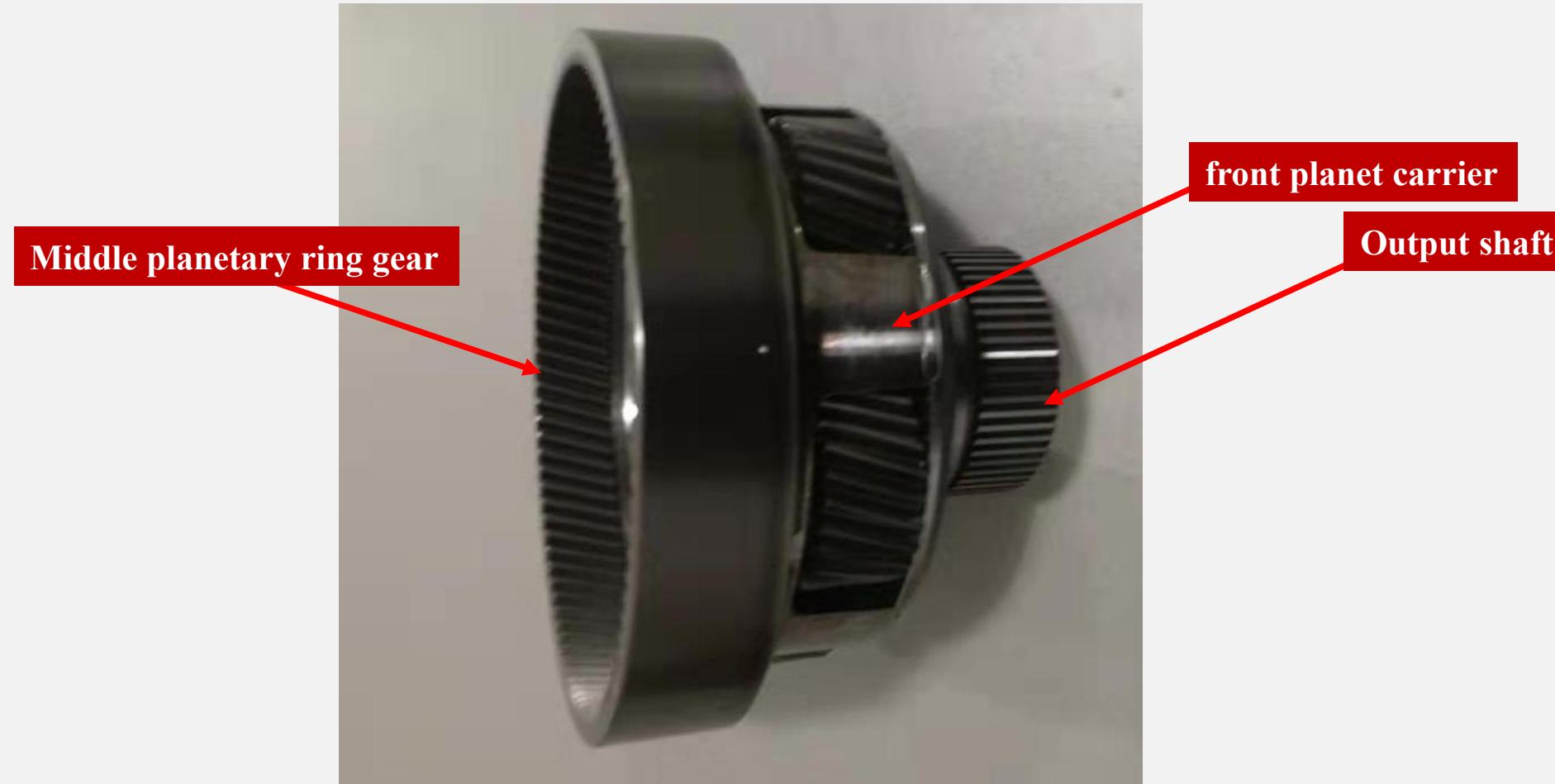


### 9. Internal transmission parts - ring gear



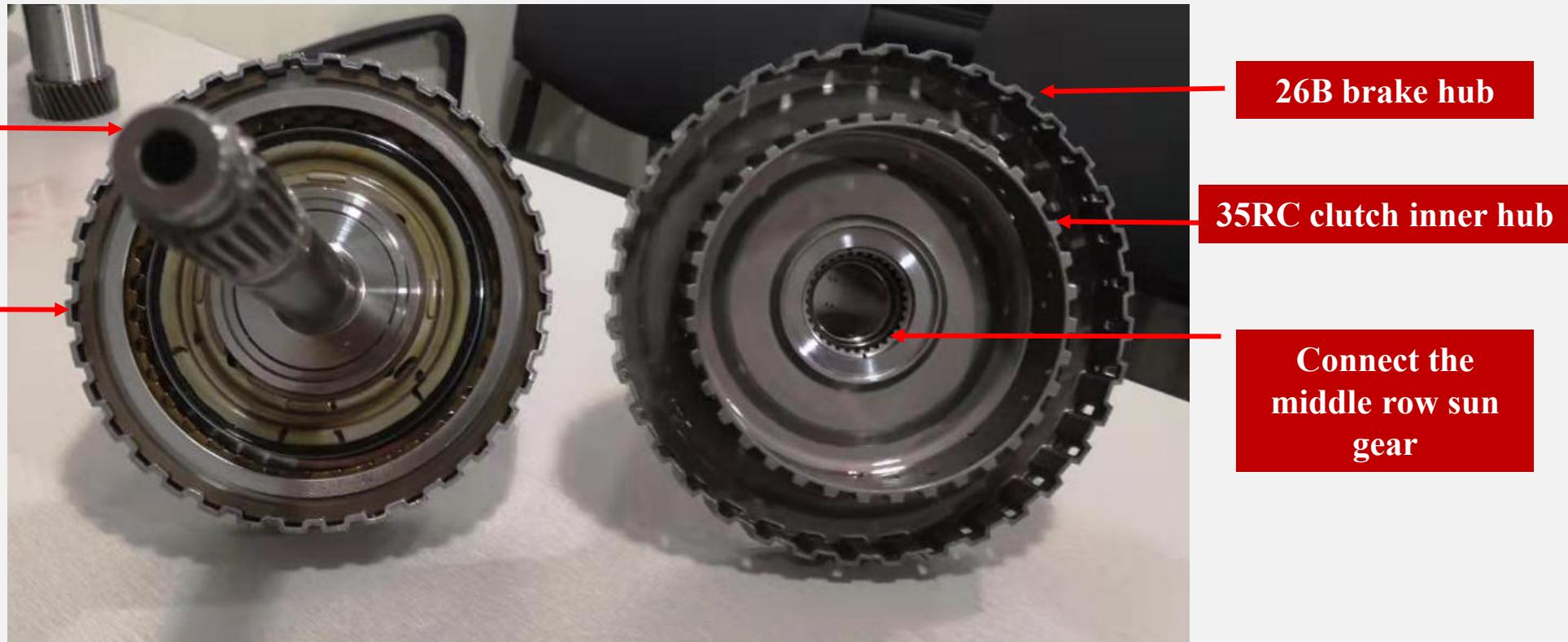
## ► TWO、Transmission structure and power transmission route

### 10. Internal transmission parts - output part



## ► TWO、Transmission structure and power transmission route

### 11. Internal transmission parts - input part



## ► TWO、Transmission structure and power transmission route

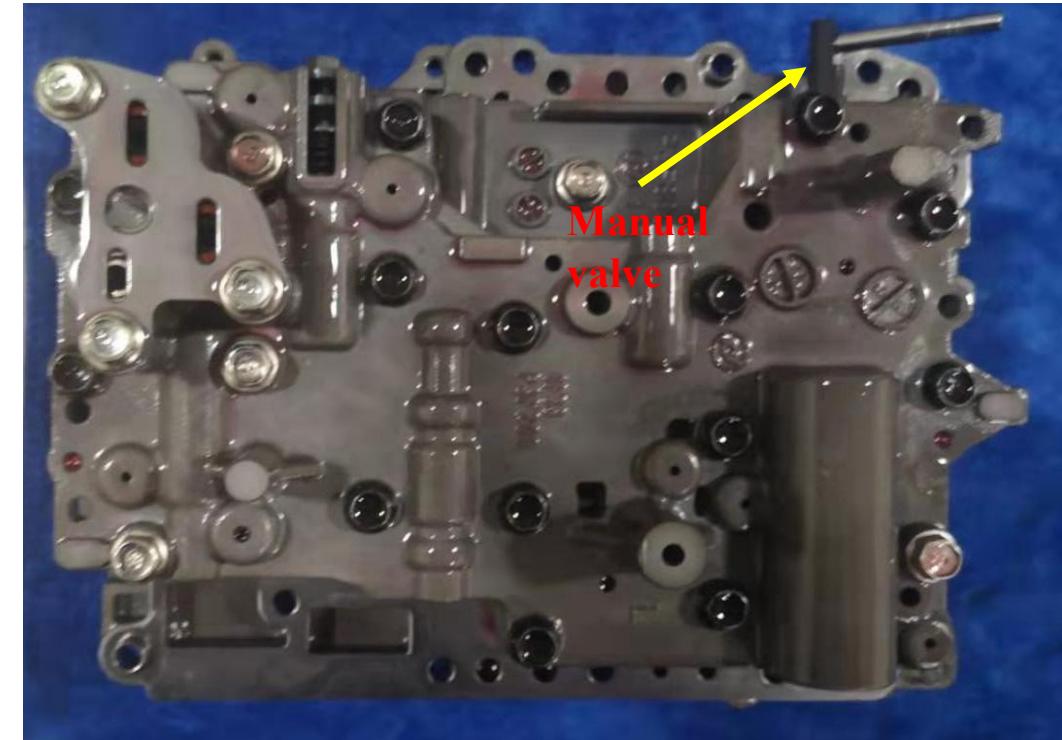
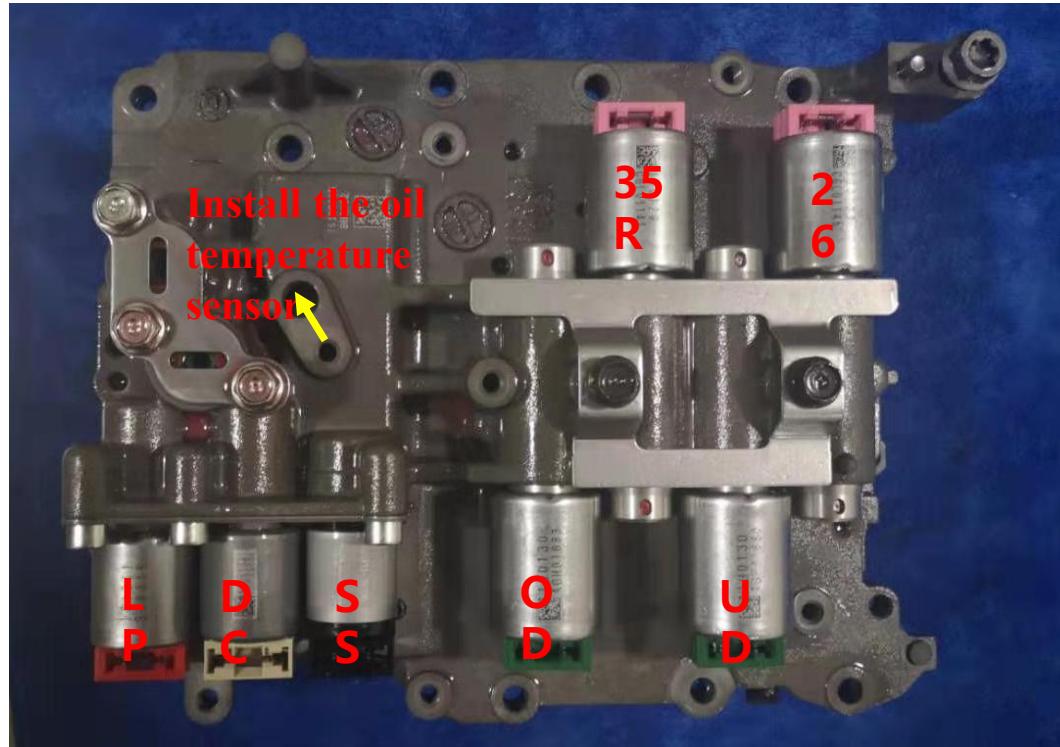


### 12. Internal transmission components - front sun gear



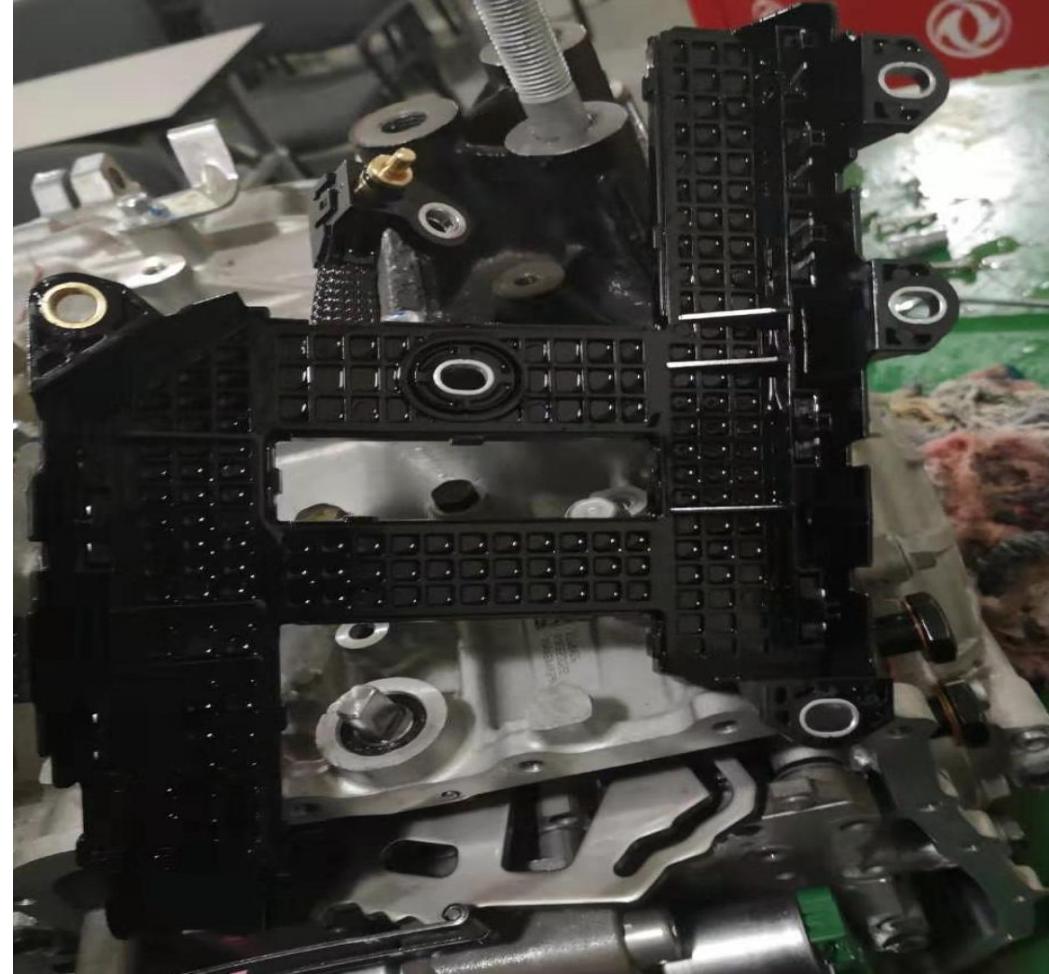
## ► TWO、Transmission structure and power transmission route

### 13. Internal transmission parts - valve body



## ► TWO、Transmission structure and power transmission route

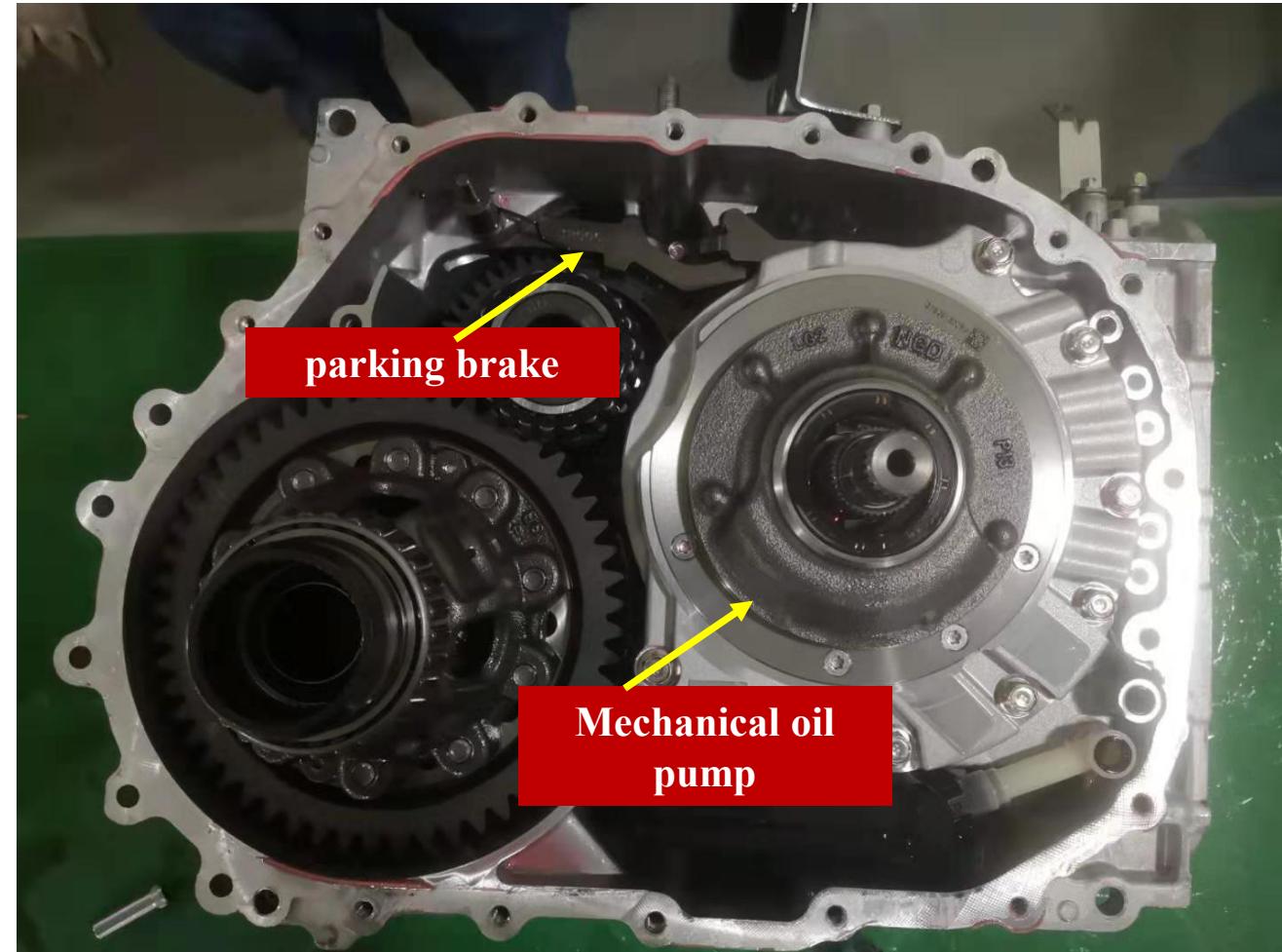
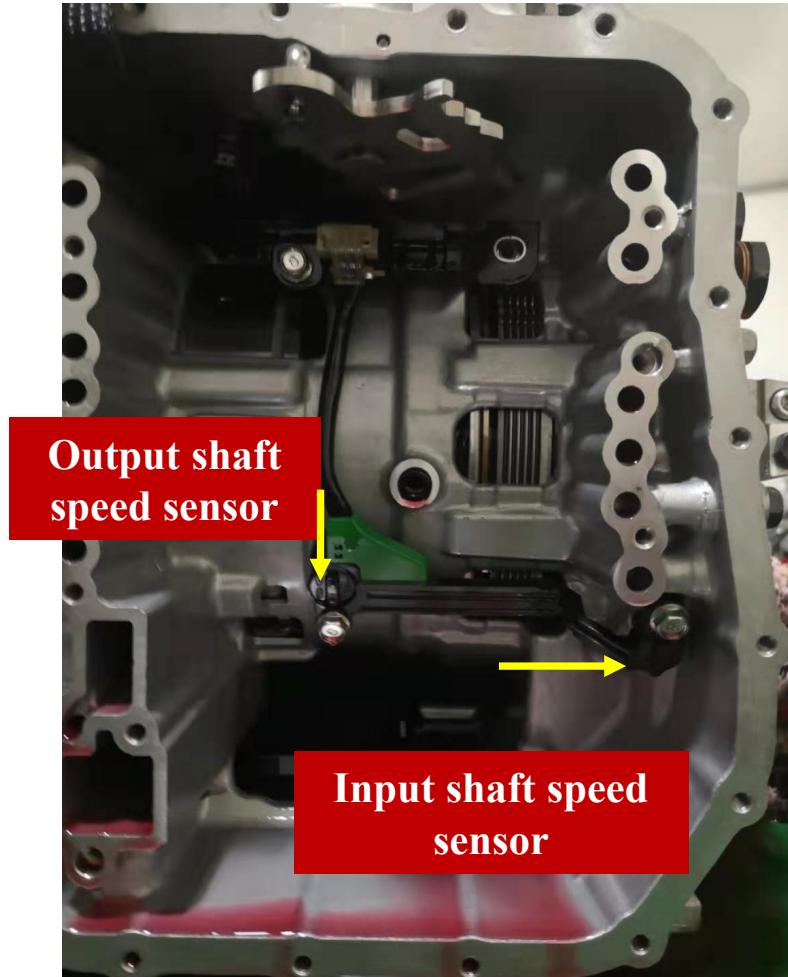
### 14. Internal transmission parts - valve body wiring harness



## ► TWO、Transmission structure and power transmission route



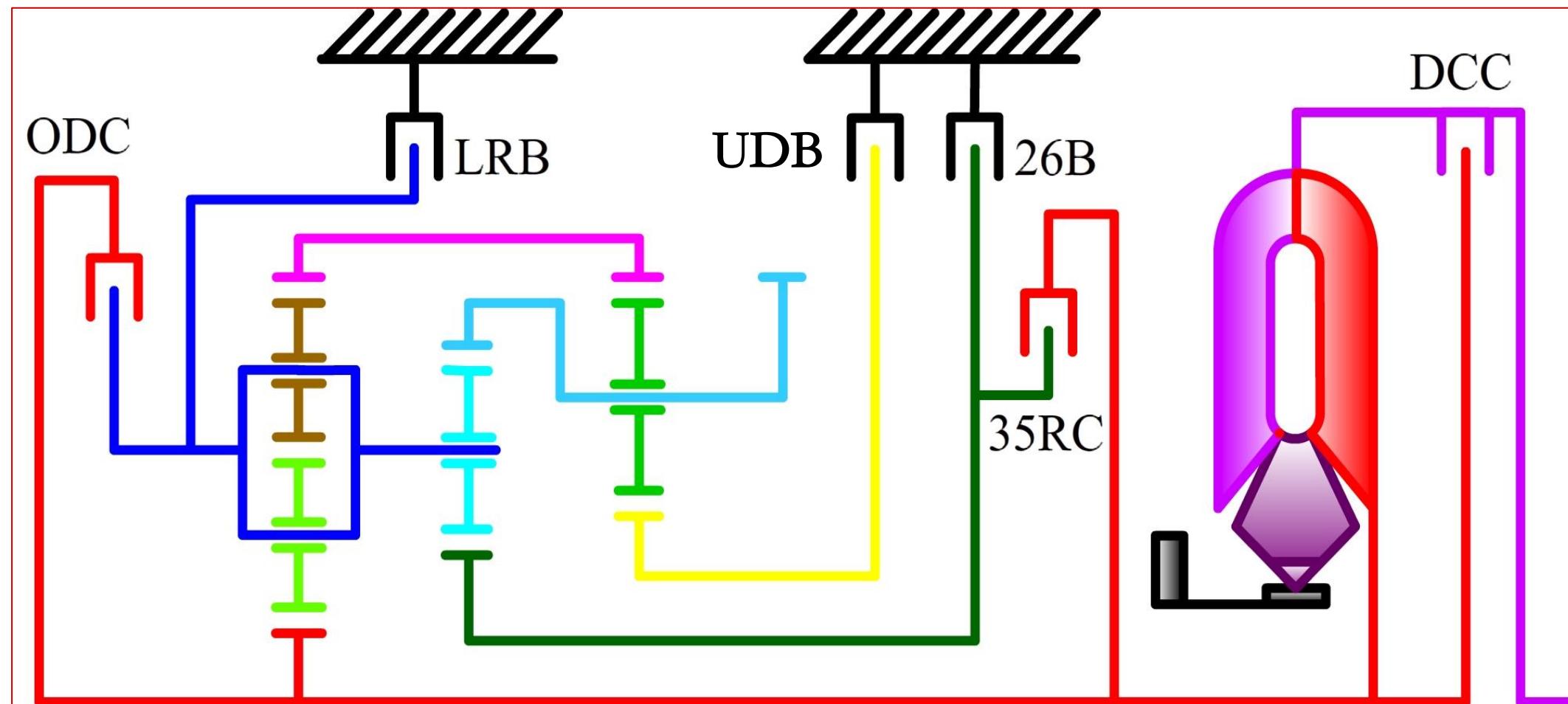
### 14. Internal transmission components - sensor, differential and oil pump



## ► TWO、Transmission structure and power transmission route



## 15. Power Transmission Route



## ► TWO、Transmission structure and power transmission route



### 16. Power transmission route - diagram of working elements of each gear

	ODC	35RC	26B	LRB	UDB
D1				○	●
D2			●		●
D3		●			●
D4	●				●
D5	●	●			
D6	●		●		
N, P				●	
R		●		●	

●: Work execution element

○: Works but doesn't execute

# 目 录

## C O N T E N T S

01

A6F30 automatic transmission introduction

02

Transmission structure and power transmission route

03

**Hydraulic system structure and working process**

04

Electronic control system and detection

05

Transmission maintenance and adjustment

## ➤ Three、 Hydraulic system structure and working process



### 1. 6F30 automatic transmission - features of hydraulic system

project	Content
Structure	<ul style="list-style-type: none"><li>-Oil pump, pressure regulating valve, oil pressure control solenoid valve</li><li>-Hydraulic control valve, safety valve, switch valve, etc.</li></ul>
Independent control	<ul style="list-style-type: none"><li>- Each clutch is equipped with an independent control valve</li><li>- Good shifting feeling and responsiveness</li></ul>
safe mode	<ul style="list-style-type: none"><li>- 4th gear and reverse driving in safe mode</li></ul>
pressure accumulator	<ul style="list-style-type: none"><li>- Accumulators are installed in each clutch to absorb shocks</li></ul>
Reduce pump load	<ul style="list-style-type: none"><li>-Add oil circuit before pressure regulating valve and manual control valve This reduces wear on the oil pump when parked or in neutral</li></ul>

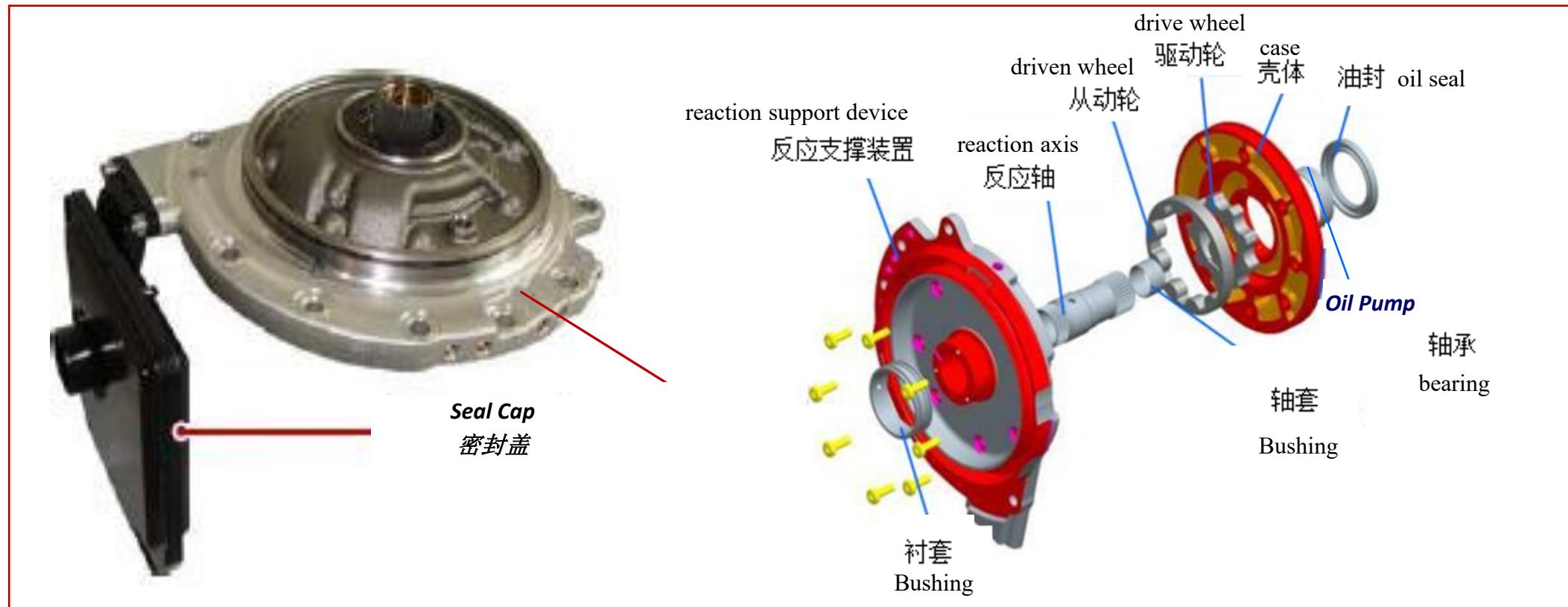
## ► Three、 Hydraulic system structure and working process

### 2、 6F30 automatic transmission - oil pump structure

The oil pump in HPT6 A/T (6F30) is a rotor type, which can improve the discharge efficiency and is integrated with the filter.

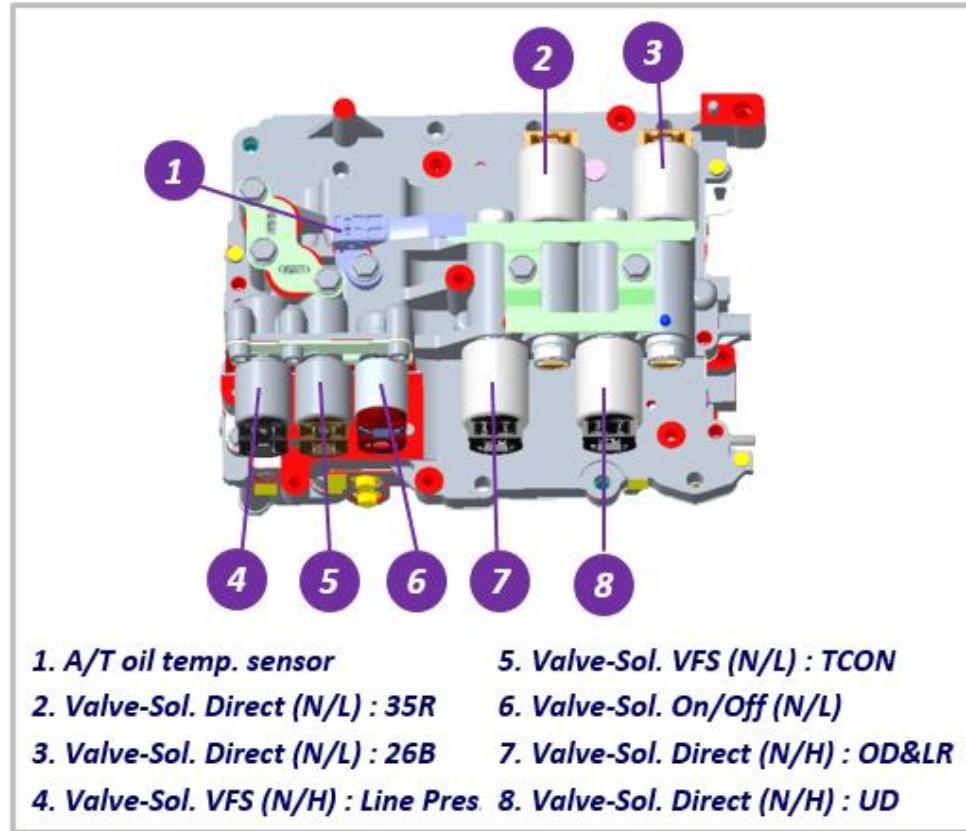
Oil pressure from the oil pump is used for clutch and brake operation.

Transmission oil lubricates the differential transmission components and circulates through the torque converter and oil cooler.



## ► Three、 Hydraulic system structure and working process

### 3、 6F30 automatic transmission - valve body structure



<b>1. A/T oil temp. sensor</b>	automatic transmission oil temperature sensor
<b>2. Valve-Sol. Direct (N/L) : 35R</b>	Valve - Solenoid VFS (N/L); 35R
<b>3. Valve-Sol. Direct (N/L) : 26B</b>	Valve - Solenoid VFS (N/L); 26B
<b>4. Valve-Sol. VFS (N/H) ; Line pres.</b>	Valve - Solenoid VFS (N/H); Line pres.
<b>5. Valve-Sol. VFS (N/L) ; TCON</b>	Valve - Solenoid VFS (N/L); TCON
<b>6. Valve-Sol. ON/OFF (N/L)</b>	Valve - Solenoid VFS (N/L); On/Off
<b>7. Valve-Sol. Direct (N/H) ; OD&amp;LR</b>	Valve - Solenoid VFS (N/H); OD&LR.
<b>8. Valve-Sol. Direct (N/H) ; UD.</b>	Valve - Solenoid VFS (N/H); UD

## ► Three、 Hydraulic system structure and working process



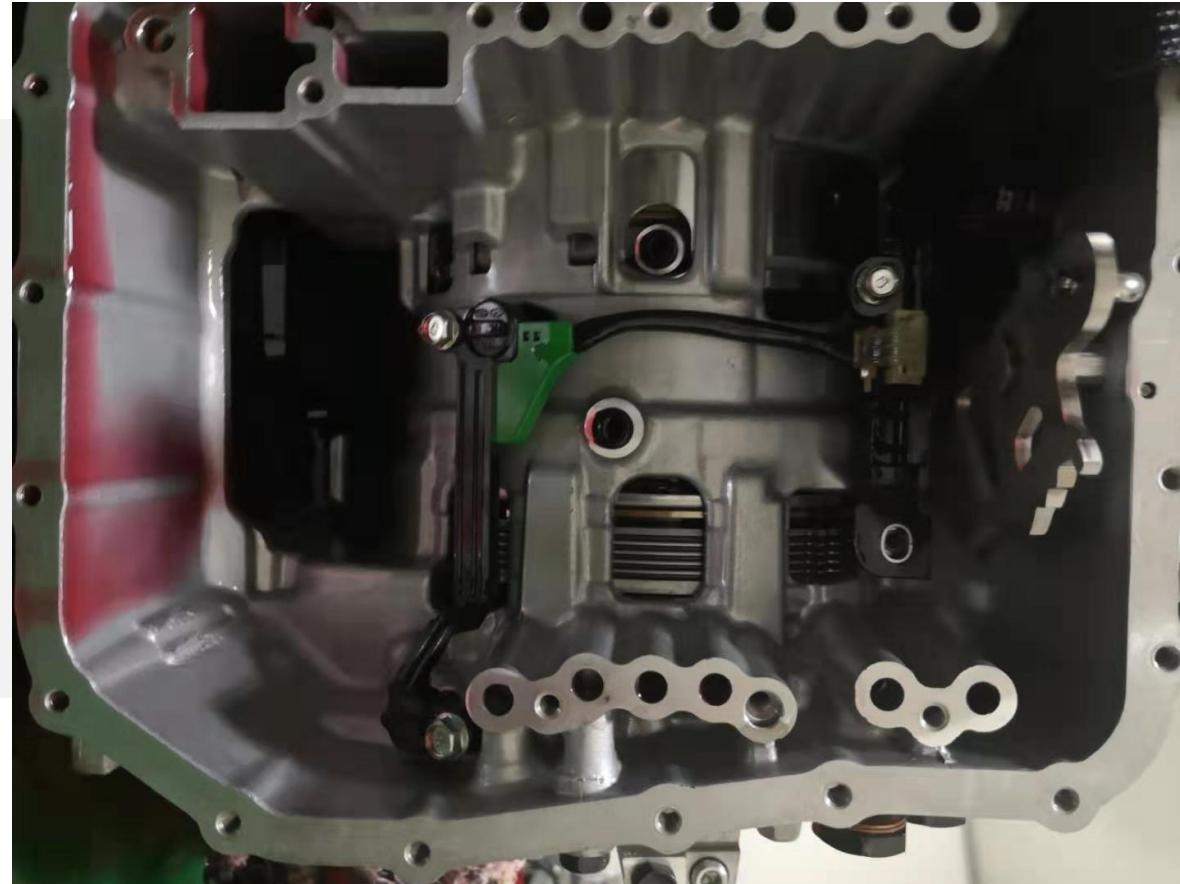
### 6F30 Automatic Transmission - Valve Body Specification

illustrate	specification	Features
valve body assembly	quantity control type	3 Main line pressure variable control Torque Converter Release Control
	The electromagnetic valve	VFS: 2, Solenoid switch: 1, Direct: 4
Terminal structure		Modular
Location		automatic transmission sidewall(Inside the plastic oil pan)

## ► Three、 Hydraulic system structure and working process

### 5. 6F30 automatic transmission - case ATF oil passage

The oil passage is used to transport the hydraulic oil of the transmission, and the oil passage is divided into the clutch, brake, torque converter and lubricating oil circuit.



## ► Three、 Hydraulic system structure and working process

### 6. 6F30 automatic transmission - start and stop oil pump

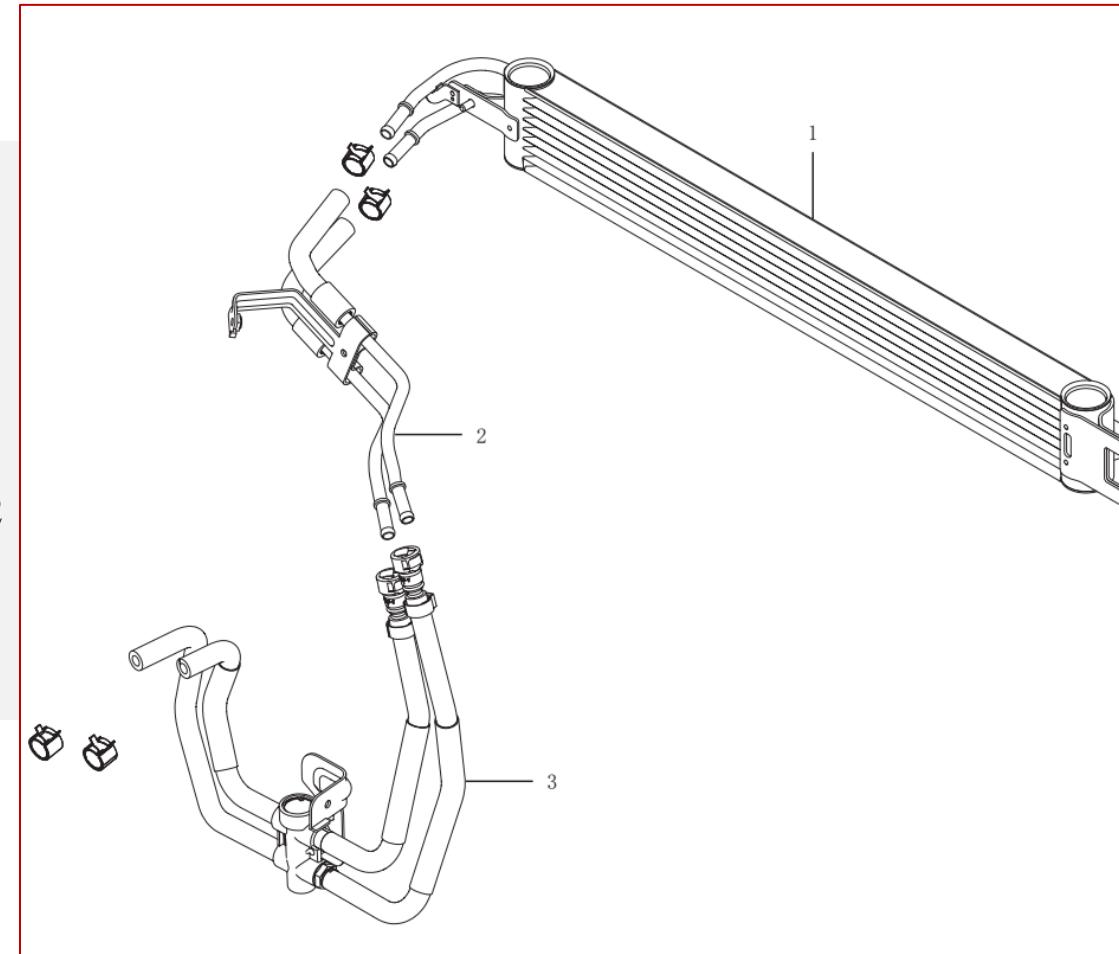
When the vehicle starts after parking, the system can be filled with oil as soon as possible, extending the service life of the clutches and brakes in the transmission.



## ► Three、 Hydraulic system structure and working process

### 7. 6F30 automatic transmission - oil cooler

1. Transmission oil cooler assembly
2. Oil cooler inlet and outlet oil pipe assembly 1
3. Oil cooler inlet and outlet oil pipe assembly 2



# 目 录

C O N T E N T S

01

A6F30 automatic  
transmission  
introduction

02

Transmission  
structure and  
power  
transmission  
route

03

Hydraulic system  
structure and  
working process

04

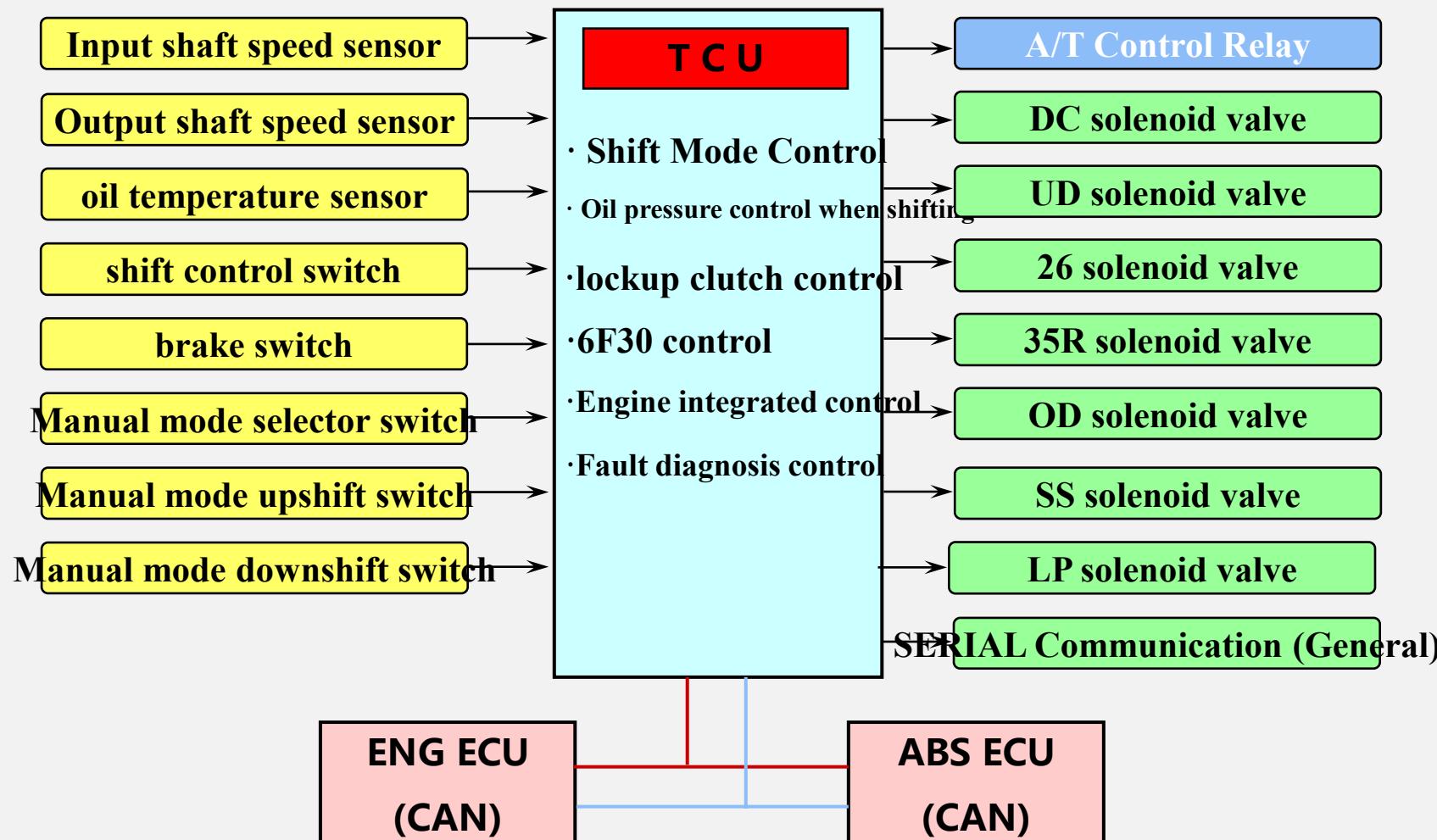
**Electronic  
control system  
and detection**

05

Transmission  
maintenance and  
adjustment

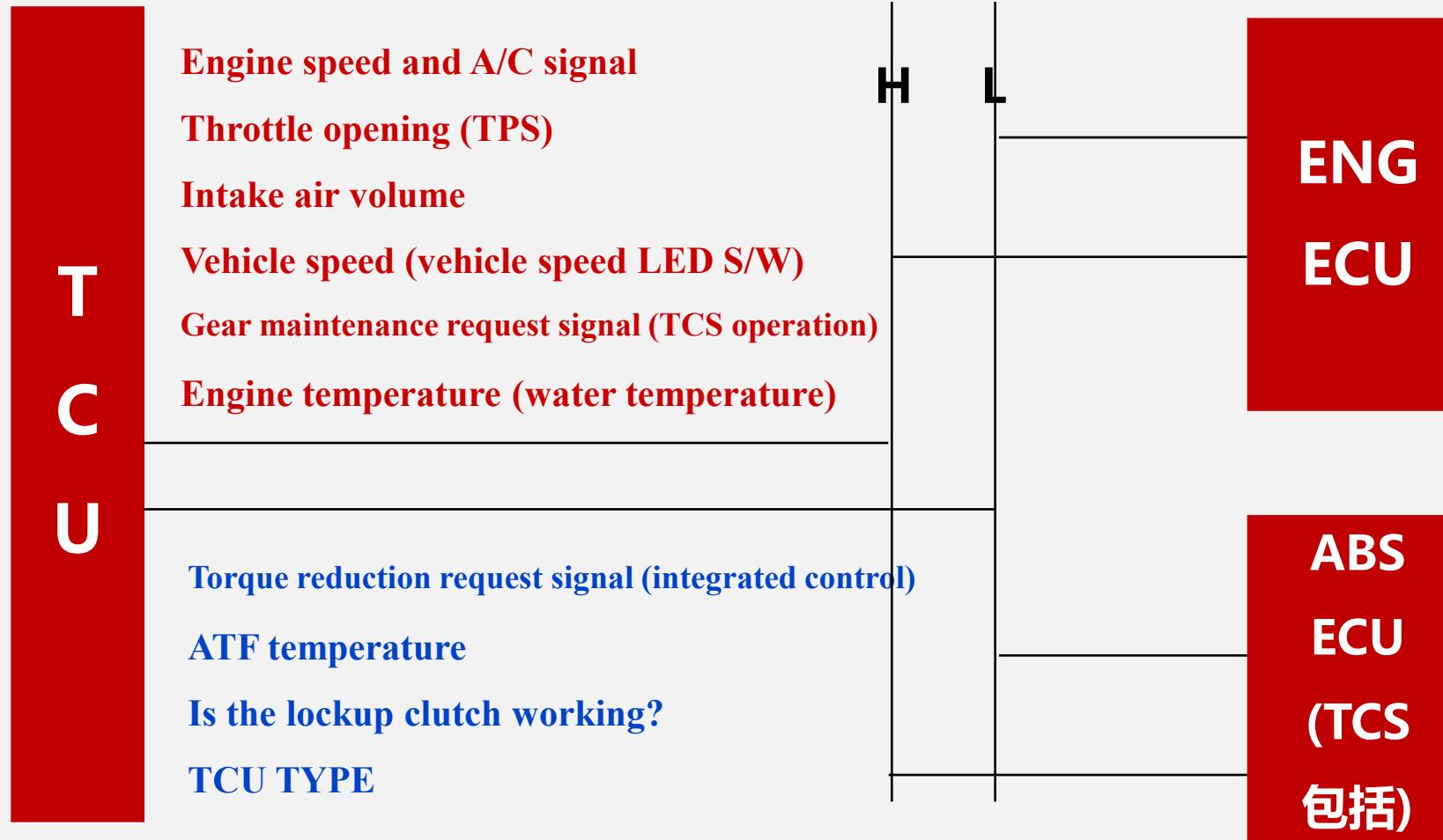
## ► FOUR. the electronic control system and detection

### 1. 6F30 automatic transmission - transmission control input and output signals



## ► FOUR. the electronic control system and detection

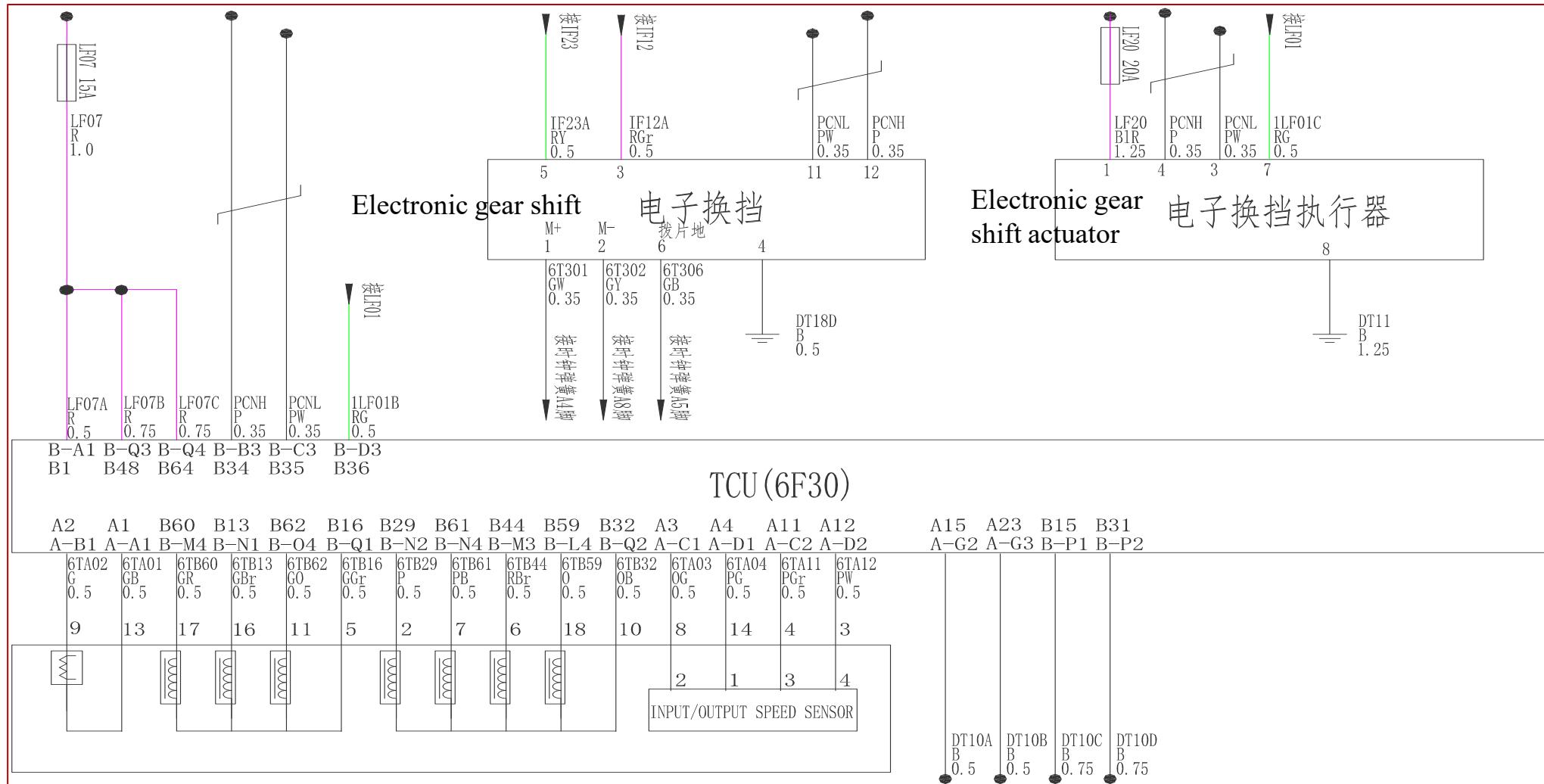
### 2、6F30 automatic transmission - transmission control input and output signal



## ► FOUR. the electronic control system and detection



### 3. 6F30 automatic transmission - transmission circuit diagram



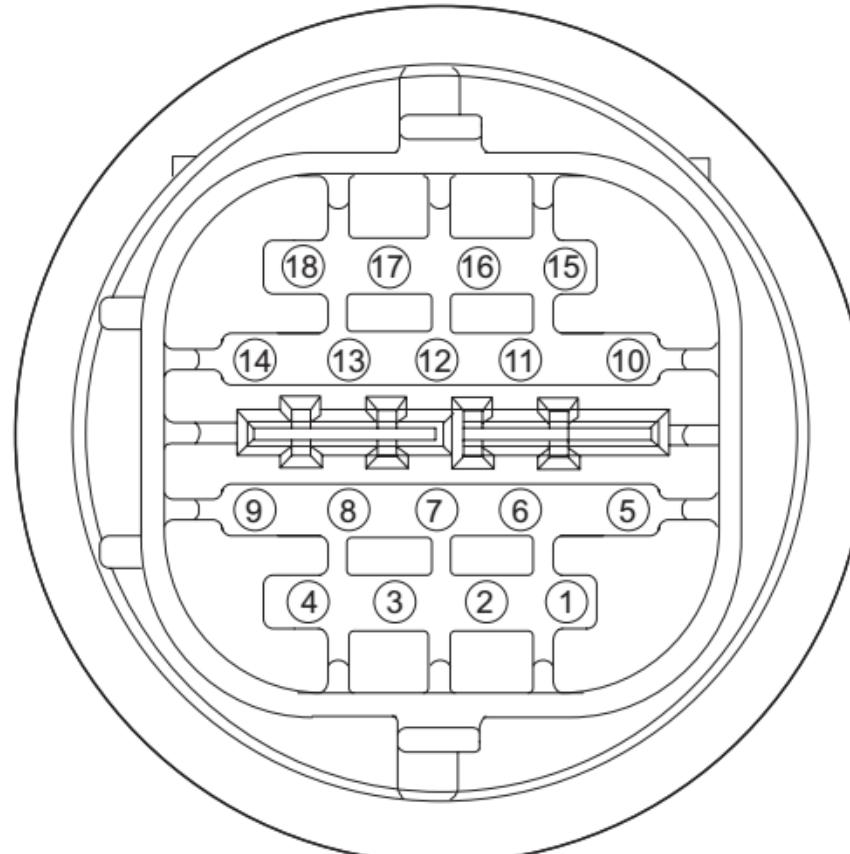
## ► FOUR. the electronic control system and detection

### 4. 6F30 automatic transmission-transmission TCU appearance and terminals



## ► FOUR. the electronic control system and detection

### 5. 6F30 automatic transmission - transmission box plug-in and terminal



pin number	description		TCU connector
F1	N.C	—	—
F2	VFS-T/CON	Torque Converter Variable Pressure Solenoid Valve	B29
F3	VCC(OUTPUT SPEED)	Output speed sensor power supply	A12
F4	SIGNAL(OUTPUT SPEED)	Output speed sensor signal	A11
F5	SOL POWER2	Solenoid valve power supply 2	B16
F6	VFS-35R	35R gear variable pressure solenoid valve	B44
F7	VFS-OD	Overrunning clutch variable pressure solenoid valve	B61
F8	SIGNAL(INPUT SPEED)	Input speed sensor signal	A3
F9	OTS(-)	ATF oil temperature sensor (-)	A2
F10	SOL POWER1	Solenoid valve power supply 1	B32
F11	VFS-26	2 six gear variable pressure solenoid valve	B62
F12	NC	-	-
F13	OTS(+)	ATF oil temperature sensor (+)	A1
F14	VCC(INPUT SPEED)	Input speed sensor power supply	A4
F15	N.C	—	—
F16	VFS-UD	Low speed clutch variable pressure solenoid valve	B13
F17	VFS-LP	LP variable pressure solenoid valve	B60
F18	SS-A	Shift solenoid valve A	B59

## ► FOUR. the electronic control system and detection



### 6. 6F30 automatic transmission - various control modes of transmission

Item	Content
exhaust emission control Variable speed mode	<p>-When the water temperature is below 35°C, in order to increase the engine speed, the low gear range below the standard mode is maintained for 120 seconds</p>
Extremely low temperature shifting mode	<p>①When the oil temperature is <math>\leq -29^{\circ}\text{C}</math>, the 2nd gear is fixed (to prevent the clutch from burning) ②<math>-29^{\circ}\text{C} \leq \text{oil temperature} \leq -7^{\circ}\text{C}</math>, Skip shift, prohibit shifting during driving</p>
Variable oil temperature shift mode	<p>-When climbing a hill in 3rd or 4th gear, change the 2→3/3→2 shift mode to prevent the oil temperature from rising due to torque converter slippage</p> <p>①When the 4th gear or 5th gear is used ②When the D gear is used ③The oil temperature is above 125°C ④When the output shaft speed is within 600 to 2,010rpm</p>

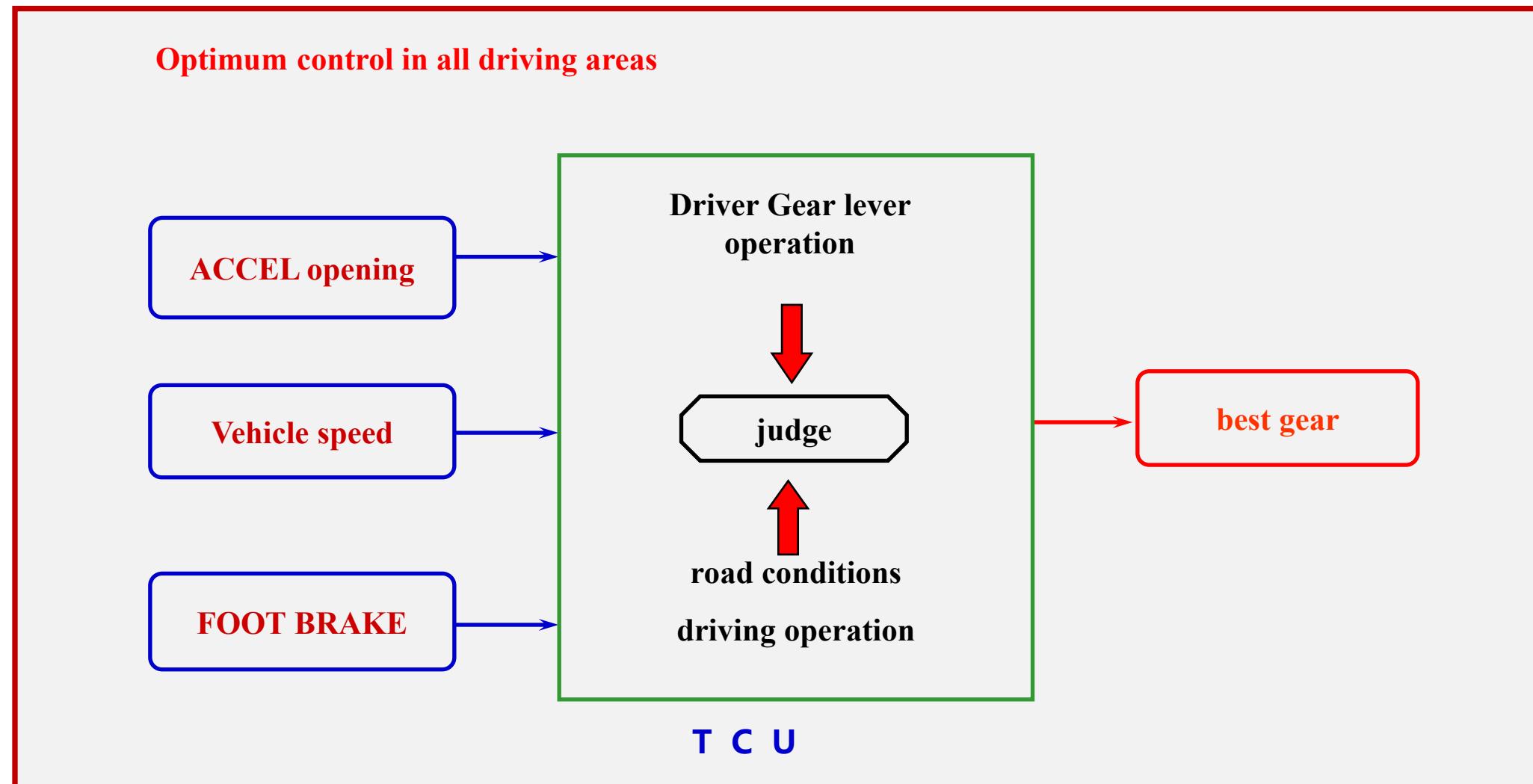
## ► FOUR. the electronic control system and detection

### 7. 6F30 automatic transmission - various control modes of transmission

entry conditions	Gear shift in 4th gear
	D-position
	Oil temperature above 125°C
	$600\text{RPM} \leq \text{output shaft speed} \leq 2010\text{RPM}$
Release condition	The 3rd gear state is maintained for more than 3 seconds
	Oil temperature below 110°C
	Output Shaft Speed $\geq 2100$ RPM
	Output shaft speed $\leq 240\text{RPM}$
	Select other position of D-

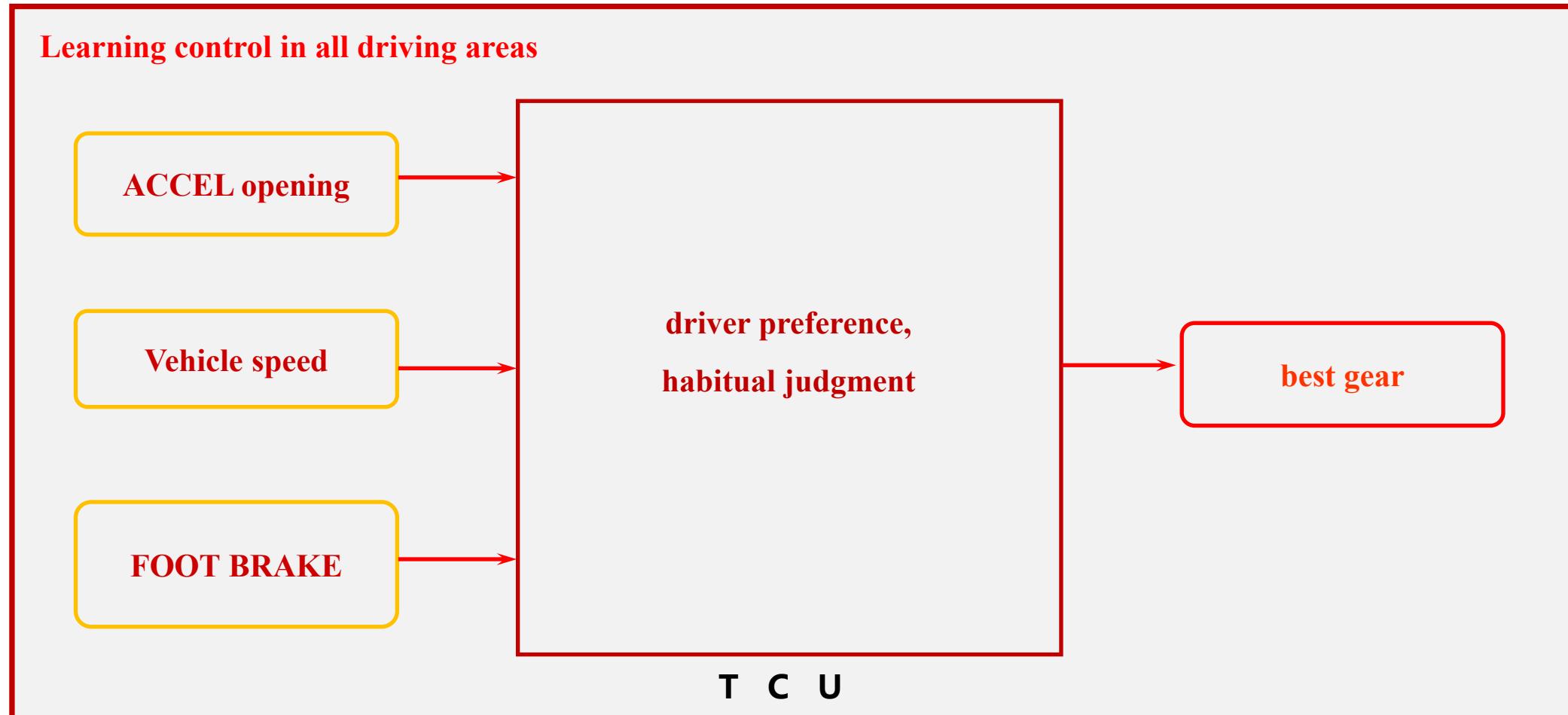
## ► FOUR. the electronic control system and detection

### 8. 6F30 automatic transmission - various control modes of transmission



## ► FOUR. the electronic control system and detection

### 9. 6F30 automatic transmission - various control modes of transmission



## ► FOUR. the electronic control system and detection

### 10. 6F30 automatic transmission - handling measures when the transmission control CAN communication is poor

Signal

TPS

engine load

Engine speed

vehicle speed sensor

Water temperature sensor

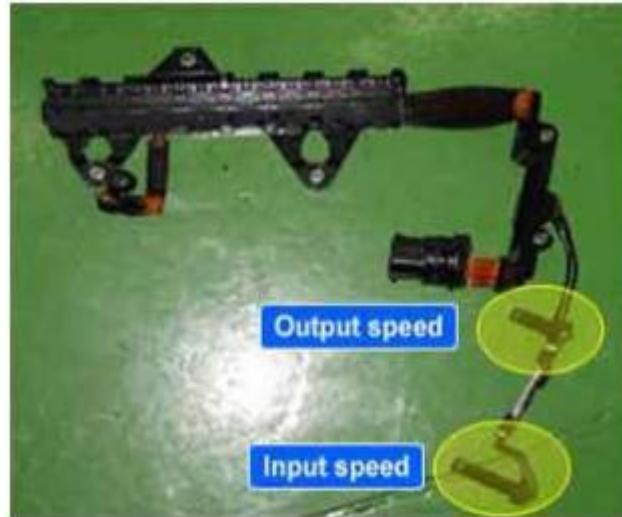
A/C working signal

DATA communication

信号	measurement	H/SCAN DATA
TPS	Throttle opening is 50% by default	0%
发动机负荷	Engine load defaults to 70% of maximum load	0%
发动机转速	Default is 3000rpm	3000rpm
车速传感器	The default is no input signal, stop the fault judgment of the input and output shaft speed sensors	0km/h
水温传感器	The default engine temperature is 80 degrees	—
A/C工作信号	Default is A/C OFF	Off
DATA通信	Stop various communications - stop HIVEC mode	—

## ► FOUR. the electronic control system and detection

### 11. 6F30 automatic transmission - fault diagnosis of speed sensor



item	Content	Fault code
input speed sensor	open circuit or short circuit	P0715
Output shaft speed sensor	open circuit or short circuit	P0720

#### Fault judgment conditions

- In forward gear, when the vehicle speed is 40Km or more, it lasts for more than 1 second signal detected from sensor
- When the vehicle speed signal of the output shaft speed sensor detected for more than 1 second is less than 50% (Except when the engine speed is below 2600RPM in 1st or 2nd gear)

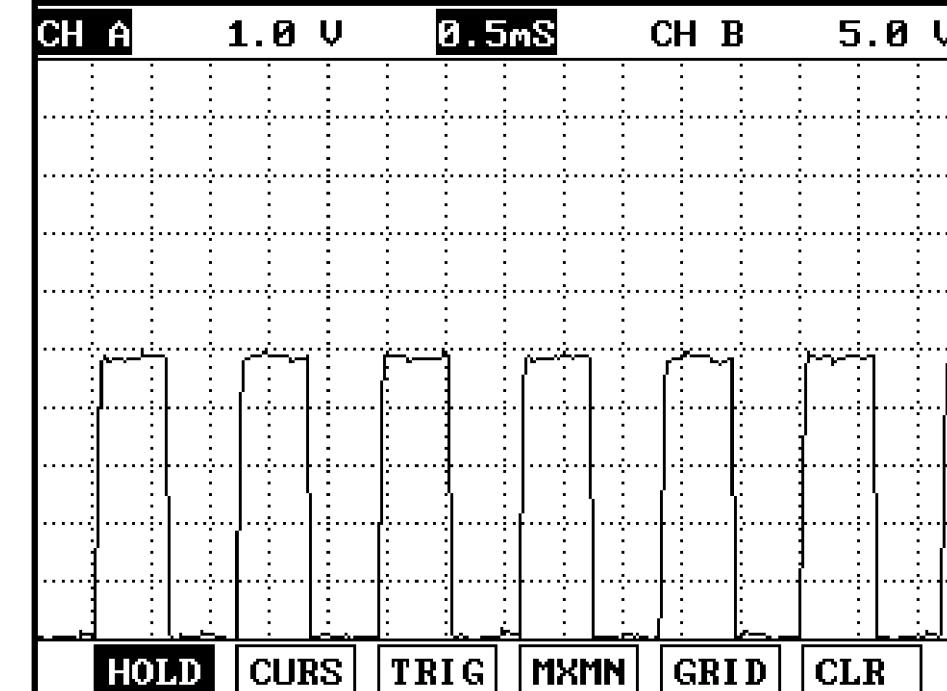
#### Troubleshooting

- The self-diagnosis result is output when it is judged as a failure for the first time. From the fourth time the fault is judged, until the key is off, the shift mode remains in 2nd or 3rd gear.

## ► FOUR. the electronic control system and detection

### 12. 6F30 automatic transmission - fault diagnosis of speed sensor

standard value			output waveform		
installation clearance (mm)	Input shaft speed sensor	1.3			
	Output shaft speed sensor	0.85			
Insulation resistance	Input shaft speed sensor	1MΩ以上			
	Output shaft speed sensor	1MΩ以上			
The output voltage	HIGH side	4.8V			
	LOW side	0.8V			



## ► FOUR. the electronic control system and detection

### 13. 6F30 automatic transmission - fault diagnosis of throttle position sensor TPS

Item	Content	Fault code
throttle position sensor	disconnection or short circuit	P1704.P1703

Troubleshooting Condition	-450rpm≤NE≤1000rpm for more than 4 seconds When the sum of detected TPS1 and TPS2 voltages is not 5.0V — short circuit -In the state of NE≥2000rpm, the detection lasts for more than 4 seconds When the TPS voltage is below 0.2V — disconnection
Troubleshooting	-Stop learning and 6F36 control until IG Key Off -The default TPS opening is 50%.

## ► FOUR. the electronic control system and detection

### 14. 6F30 automatic transmission - fault diagnosis of gear switch

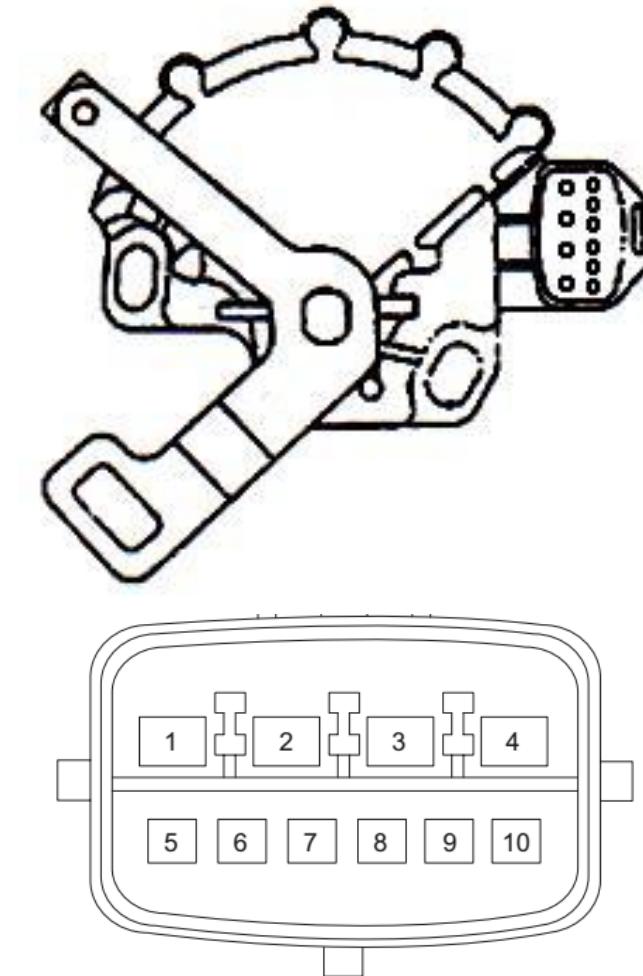
Item	Content	Fault code
gear switch	disconnection or short circuit	P0707/P0708

Troubleshooting Condition	<p>①No input signal for 30 seconds</p> <p>②More than 2 signals are continuously input for more than 30 seconds</p>
Troubleshooting	<p>①Defaults to the previous signal when interrupting a signal</p> <p>②<b>Defaults to the previous signal when receiving double signals</b></p> <p>③When the R signal is received while driving in D gear (NO≤220rpm), the LR pressure is released --Prevent damage to gearbox caused by wrong operation</p> <p>④When IG On has no power or receives dual signals Close all solenoid valves</p> <p>⑤When the UP/DOWN signal is received at the P.R.N position for more than 3 seconds Stop Manual Mode Only - No DTCs</p>

## ► FOUR. the electronic control system and detection

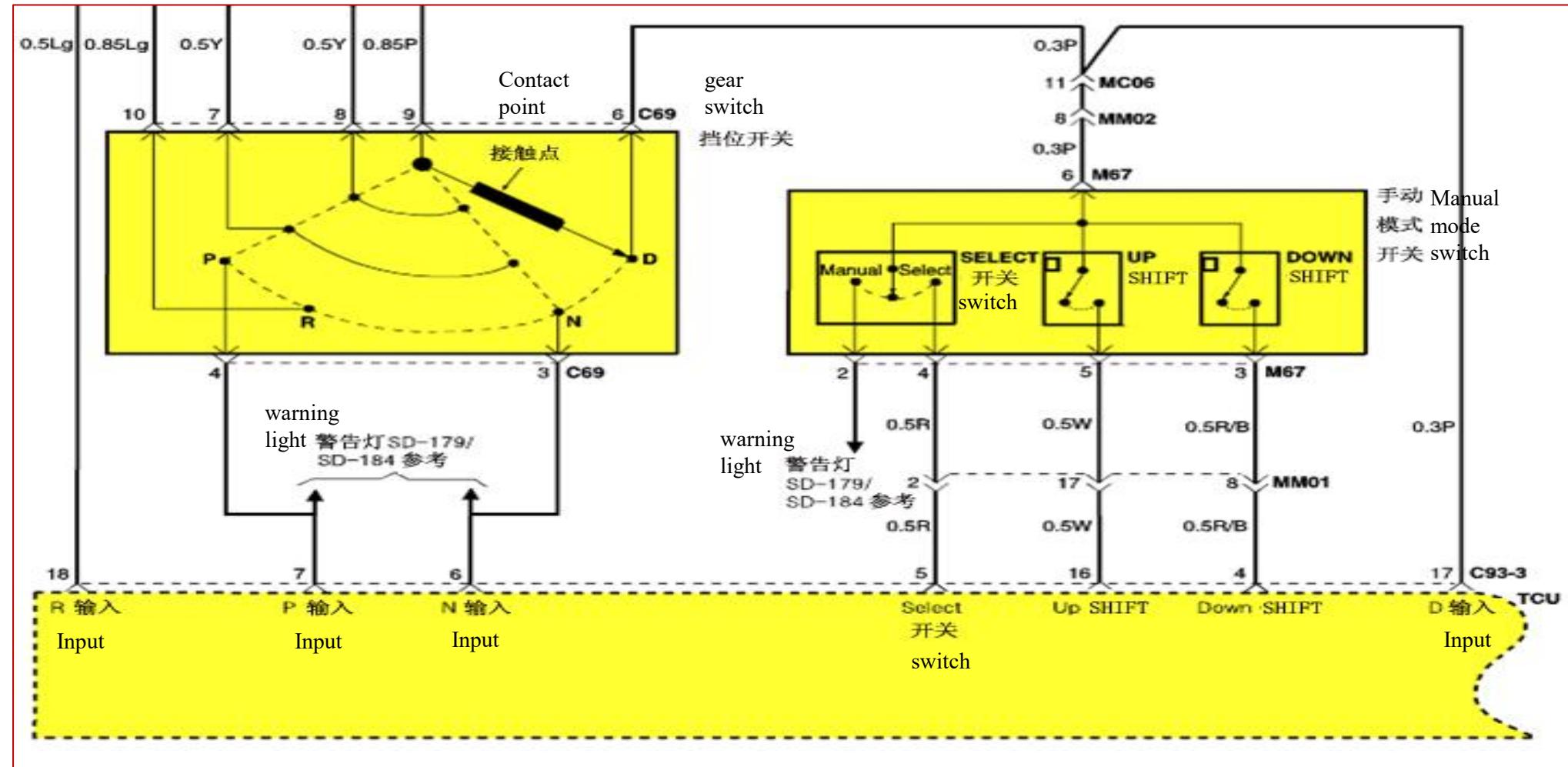
### 15. 6F30 automatic transmission - fault diagnosis of gear switch

项目	1	2	3	4	5	6	7	8	9	10
P			○				○	○	○	
R							○	○		
N				○			○	○	○	
D	○							○		
3					○			○		
2		○						○		
L						○		○		



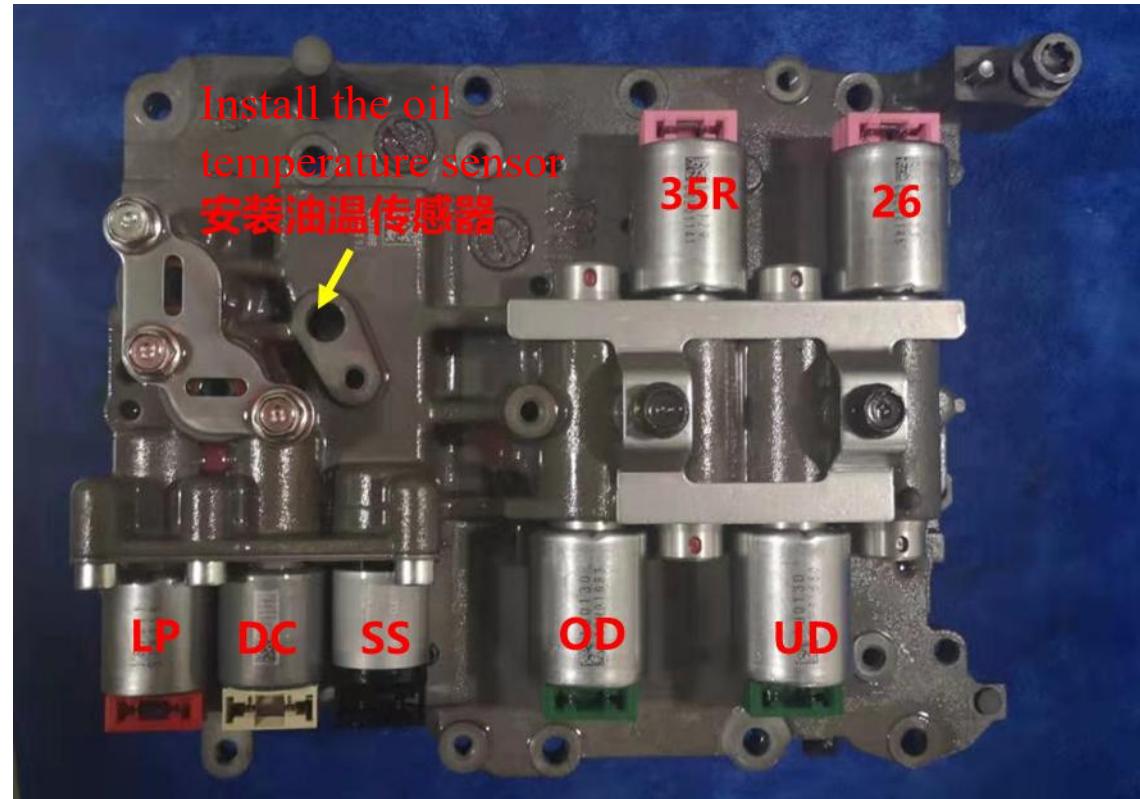
## ► FOUR. the electronic control system and detection

### 16. 6F30 automatic transmission - fault diagnosis of gear switch

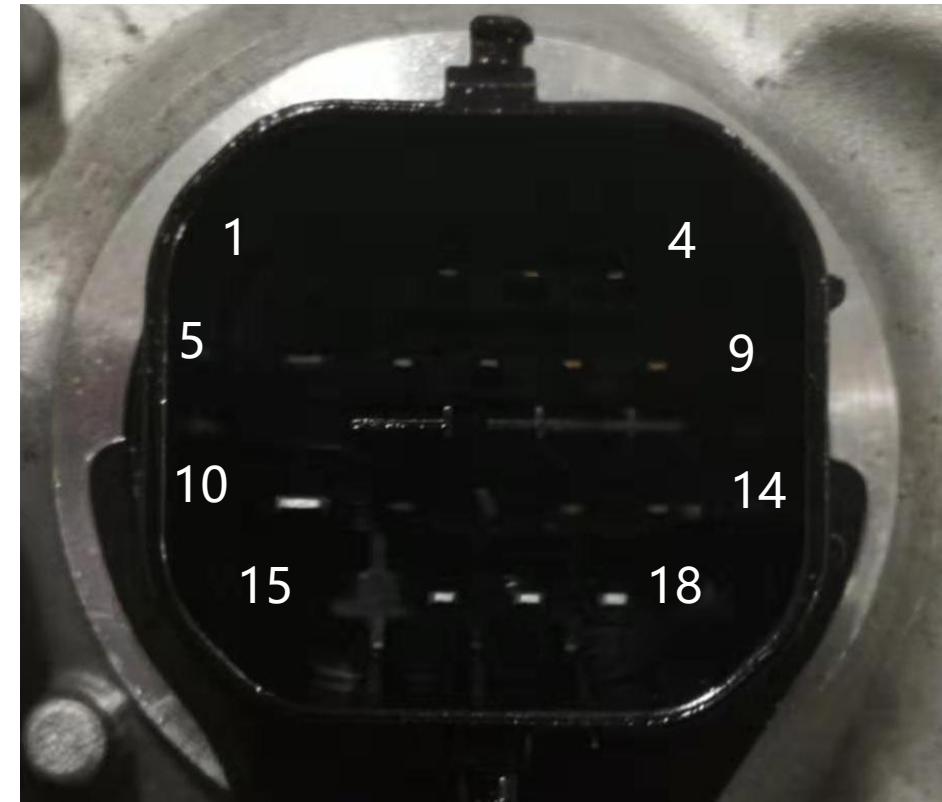


## ► FOUR. the electronic control system and detection

### 17. 6F30 automatic transmission - fault diagnosis of solenoid valve



26B:5 and 11 resistance  $5.6\Omega$    UD:5 and 16 resistance  $5.6\Omega$   
LP:5 and 17 resistance  $5.1\Omega$



DC:10 and 2 resistance  $5.3\Omega$    OD:10 and 7  
resistance  $5.6\Omega$   
35R:10 and 6 resistance  $5.6\Omega$    SS:10 and 8  
resistance  $10.5\Omega$

## ► FOUR. the electronic control system and detection

### 18. 6F30 automatic transmission - fault diagnosis of solenoid valve

#### SS solenoid valve

The shift solenoid valve controls the direction of the oil circuit, and the TCU controls the solenoid valve to switch the working gear to achieve gear switching.

20°C resistance  $10\sim11\Omega$ ; fail-safe mode locks 4 gears

#### OD solenoid valve

The TCU controls the OD solenoid valve to optimize the OD clutch shock by varying the current.

25°C resistance  $5.1\pm0.3\Omega$ ; failsafe mode lock 4 gears

#### UD solenoid valve

The TCU controls the UD solenoid valve to optimize the impact of the UD brake by varying the amperage.

25°C resistance  $5.1\pm0.3\Omega$ ; failsafe mode lock 4 gears

## ► FOUR. the electronic control system and detection

### 19. 6F30 automatic transmission - fault diagnosis of solenoid valve

#### 26 Solenoid valve

The TCU controls the 26 solenoid valve to optimize the 26 brake shock by varying the amperage.

25°C resistance  $5.1 \pm 0.3\Omega$ ; failsafe mode lock 4 gears

#### 35R Solenoid Valve

The TCU controls the 35R to optimize the 35R clutch shock by varying the amperage.

25°C resistance  $5.1 \pm 0.3\Omega$ ; failsafe mode lock 4 gears

#### DC solenoid valve

The TCU controls the DC clutch by supplying oil pressure.

25°C resistance  $5.1 \pm 0.3\Omega$ ; failsafe mode lock 4 gears

## ► 4. Electronic control system and detection

### 20. 6F30 automatic transmission - fault diagnosis of solenoid valve

#### LP solenoid valve

The TCU controls the LP solenoid valve to optimize the shift shock by varying the amperage.  
25°C resistance  $5.1 \pm 0.3\Omega$ ; failsafe mode lock 4 gears

#### Speed ratio out of synchronization

The value of the input speed sensor must correspond to the value of the output speed sensor.  
For example, the output speed is 1000rpm, the gear is in first gear, and the speed ratio is 4.212,  
then the input speed must be 4212rpm.

#### CAN

Vehicles need to collect a large amount of data from various modules to carry out reasonable control, so as to meet the requirements of reducing emissions and improving safety performance.  
TCU can use CAN network to receive and send data from engine ECU module or ABS control module or BCM.

## ►4. Electronic control system and detection

### 21. 6F30 automatic transmission - fault diagnosis of solenoid valve

#### DC clutch

The TCU controls the DC clutch by supplying oil pressure. The DC clutch can reduce the oil resistance caused by the oil transmission in the torque converter, so as to achieve the purpose of improving fuel economy.

#### Parameters

- Oil supply pressure: 5.5.kgf/ cm<sup>2</sup>
- Internal resistance: 5.1.±.0.3.Ω
- Pressure loss: 0.3.kgf/ cm<sup>2</sup>

#### Input speed sensor

The input/output sensor is integrated and mounted on the transmission, the sensor type is a hall sensor, and it is powered by the TCU.

## ►4. Electronic control system and detection

### 22. 6F30 automatic transmission - fault diagnosis of oil temperature sensor

#### Function

According to the ATF temperature, the oil temperature variable control signal is detected in the working / non-working area.

Different oil temperature and corresponding oil pressure information in shifting state.



Oil temperature sensor	TEMP.(°C)	Resistance value ( kΩ )	TEMP.(°C)	Resistance value ( kΩ )
	-40°C	about 48.1	80°C	about 0.32
	-20°C	about 15.6	100°C	about 0.18
	0°C	about 5.88	120°C	about 0.10
	20°C	about 2.51	140°C	about 0.06
	40°C	about 1.11	—	—
	60°C	about 0.61	—	—

# Table of contents

## CONTENTS

01

A6F30  
automatic  
transmission  
introduction

02

Transmission  
structure and  
power  
transmission  
route

03

Hydraulic  
system  
structure and  
working  
process

04

Electronic  
control system  
and detection

05

**Transmission  
use  
maintenance  
and adjustment**

## ➤ 5. Transmission use maintenance and adjustment



### 1. 6F30 automatic transmission - automatic hydraulic transmission control cable assembly

#### Disassemble

1. Disconnect the negative electrode of the battery.
2. Remove the snap connection between the shift panel and the shift trim panel of the center console.
3. Remove the trim panel of the center console and the lower left trim panel of the instrument panel.
4. Remove the battery and the air filter assembly.
5. Remove the gear shift cable assembly.
  - (a) Remove the lock nut connecting the shift cable joint with the transmission shift rocker arm, and disassemble the connection between the shift cable and the transmission.
  - (b) Remove the clamping connection between the brake pipe tie and the cable bracket, and remove the fixing bolts between the cable bracket and the transmission.
  - (c) Use a flat-blade screwdriver to disconnect the shift cable from the shift rocker pin of the transmission operating mechanism and the "U" -shaped groove.
  - (d) Remove the connecting bolts between the cable bracket and the body, remove the two nuts connecting the cable cover and the vehicle body, and remove the cable.

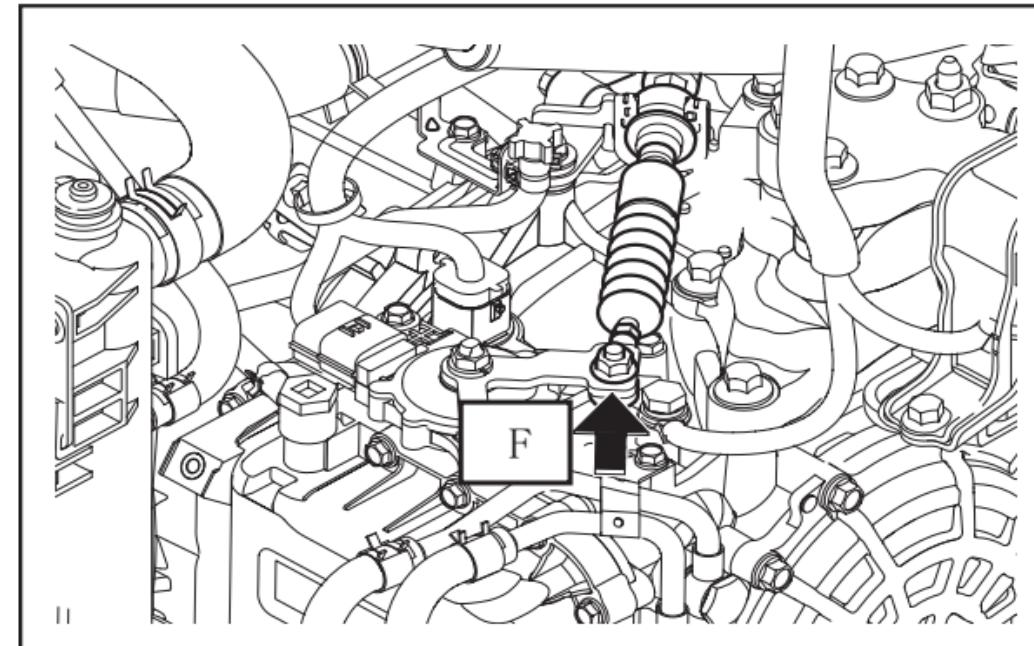
## Install

The installation sequence is the reverse of the removal sequence.

Note : Move the shift lever and transmission side shift rocker arm to the "Neutral ( N )" position.

## Adjustment

1. Move the shift lever and the shift rocker arm on the transmission side to the ".P. gear" position.
2. By adjusting the nut, push the shift cable in the F direction to eliminate the free travel, and then check whether the shift lever moves freely.
3. Tighten the adjusting nut.
4. After adjustment, check and make sure that the work of each gear of this part on the transmission side corresponds to each position of the shift lever.

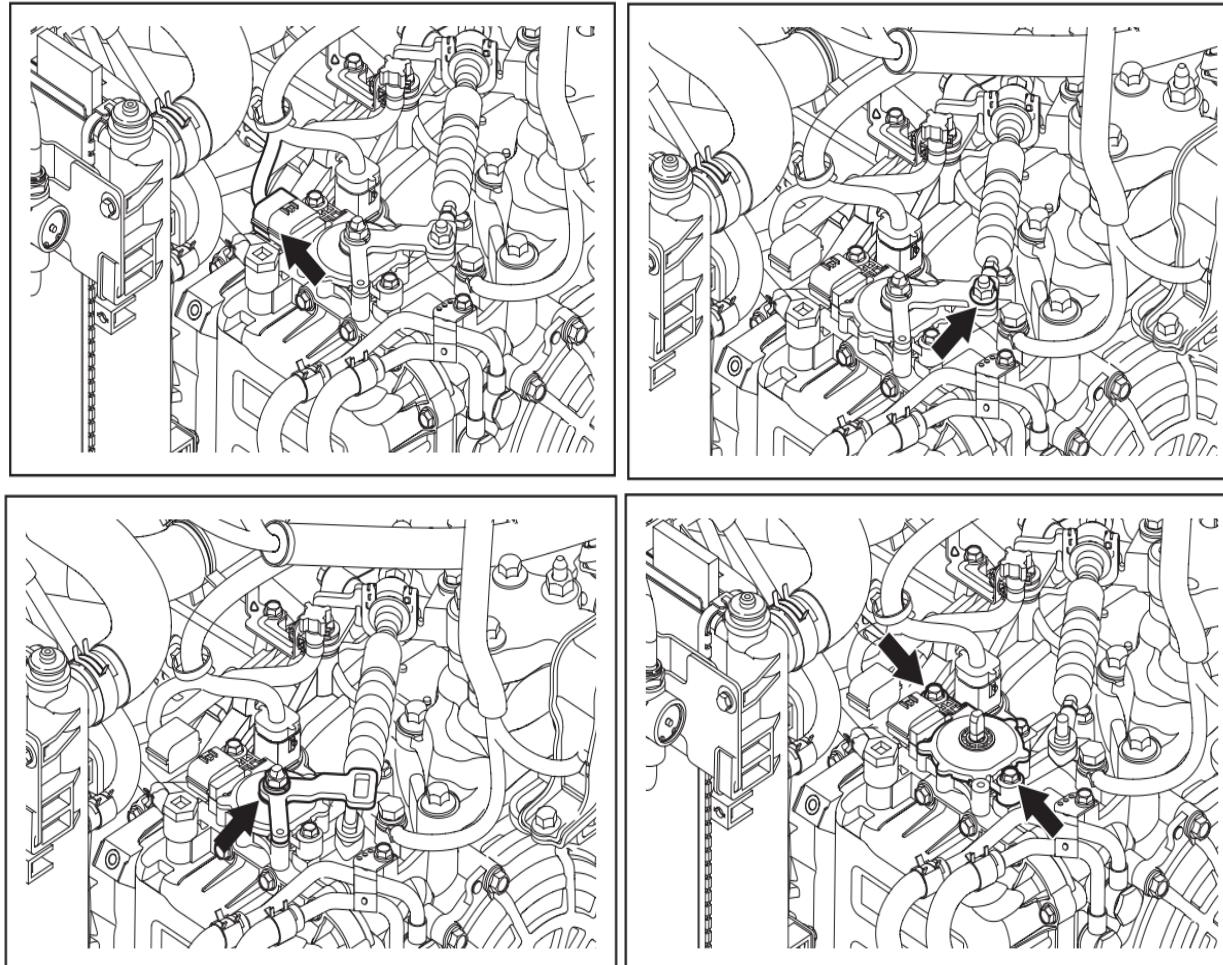


## ►5. Transmission use maintenance and adjustment

### 2. 6F30 automatic transmission - gear switch

#### Removal

- 1.. Remove battery.
- 2.. Remove battery tray.
- 3.. Remove air filter assembly.
- 4.. Pull up parking brake.
- 5.. Position shift lever in .P . Position.
- 6.. Disconnect Bit switch connection harness.
- 7.. Unscrew the shift cable fixing nut.
- 8.. Remove the nut, remove the shift rocker arm and washer.
- 9.. Unscrew .2. bolts, remove the gear switch assembly.
- 10.. Refer to the transmission shift control cable "adjustment" procedure to check continuity.



#### Installation

Installation is performed in the reverse order of removal.

## ➤5. Transmission use maintenance and adjustment

### 3. 6F30 automatic transmission - transmission oil inspection

1. Fill in the ATF filling port.2. 700mL of ATF with model .SP-IV.M.
2. Start the engine (do not depress the brake and accelerator at the same time), and ensure that the transmission oil temperature is between 50°C and 60°C.
3. When the vehicle is idling, move the shift lever from gear P to gear D, then from gear D to gear P, and repeat it again (keep each gear for more than. 2S), which will make the torque converter and hydraulic system full of liquid.
4. Lift the car up and remove the oil level plug from the oil pan (the car must be level).
5. If the transmission fluid from the oil level plug becomes slow, the oil level is normal . Then end the testing procedure and tighten the oil level plug. Checking methods for oil level (over or under):
  - Excessive condition: When the amount of oil released in two minutes exceeds 900 ml (the oil temperature is within the range of 50 °C ~ 60 °C ).
  - Insufficient situation: do not drain oil.
  - The gasket of the oil level plug needs to be replaced with a new one, and the used gasket cannot be used.
6. Put the car down and lock the fuel filler bolt tightening torque of the fuel filler bolt: ( 42 ~ 48 ) N·m
7. If the ATF is to be completely replaced, add 5L of ATF after the transmission oil is completely drained from the oil drain hole. Then repeat the above operation steps (1 ~ 7).

**Note:**

- The oil drain plug gasket needs to be replaced with a new one . The tightening torque of the oil drain plug is: ( 35 ~ 44 ) N·m



## ➤5. Transmission use maintenance and adjustment

### Transmission oil change

#### NOTE:

6F30 automatic transmission fluid does not need to be changed. However, if it is used in harsh environments, it should be replaced after driving to 100000 kilometers, and the ATF will be replaced every 96000 kilometers thereafter.

Severe usage is defined as:

Driving on roads with poor road conditions (rough, gravel, snow , unpaved, etc.);

Driving on mountain roads, uphill / downhill;

Repetitive driving for short distances ;

More than 50% of the time driving in an environment where the temperature is higher than 30 ° C and the traffic is congested ;

Police , rental, commercial or trailer towing, etc.

1. Remove the oil drain plug at the bottom of the gearbox and drain all the liquid.

2. Install the oil drain plug through a new gasket, and then tighten the plug with the specified tightening torque. The oil drain plug tightening torque is: ( 35 ~ 44 ) N·m.

3. Add 5L of ATF oil through the filler pipe.

Note:

The gearbox has high requirements on the cleanliness of the container and funnel that are filled with oil. Any impurities, oil stains, water stains, etc. in the container and funnel are not allowed.

4. Check the oil level

## ► 5. Transmission use maintenance and adjustment

### 4. 6F30 automatic transmission -transmission TCU self-learning program

Note:

When the gear shift fails or the relevant parts of the transmission are replaced, the transmission TCU self-learning procedure must be executed.

The transmission TCU self-learning procedure must be executed in the following cases:

- Replace the transmission assembly
- Replace the transmission TCU
- Transmission TCU upgrade

#### 1. Condition of Execute the transmission TCU self-learning program ATF.

ATF. Temperature: 60 °C ~ 95 °C (recommended)

#### 2. Transmission TCU self-learning program

Static learning

Apply the brake and repeat the following shift mode for four times or more (from gear N to gear R & from gear N to gear D).

## ►5. Transmission use maintenance and adjustment

### 5. 6F30 automatic transmission - driving learning

Remarks:

Choose wide barrier-free roads for driving learning.

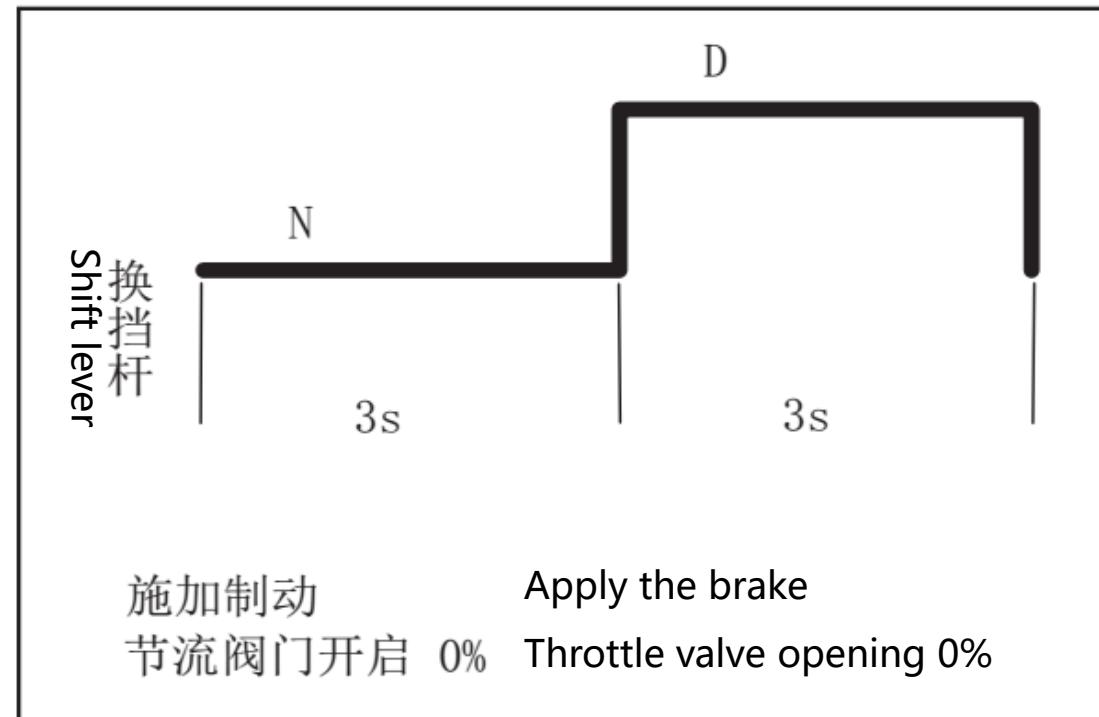
(a) The driving vehicle changes all gears in the D gear range, from stop to first gear to second gear to third gear to fourth gear to fifth gear to sixth gear with the fixed throttle valve open.

(b) Downshift from sixth gear to fifth gear to fourth gear to third gear to first gear.

(c) Repeat the above driving pattern 4 or more times.

Note:

Throttle valve open when upshifting : 15% ~ 25%



## ➤ 5. Transmission use maintenance and adjustment

### 6. 6F30 automatic transmission - transmission fault code list

Serial number	Error code	Description	Chinese
1	P0607	TCU ROM Check-sum error	TCU memory checksum error
2	P0712	ATF Oil Temperature Sensor Short to Ground	OTS negative short circuit
3	P0713	ATF Oil Temperature Sensor Short to Battery or Open	OTS positive short circuit or open circuit
4	P0974	SS-A Solenoid Circuit Short to Battery	SS-A solenoid valve positive short circuit
5	P0973	SS-A Solenoid Circuit Short to Ground	SS-A Solenoid Valve Negative Short Circuit
6	P0750	SS-A Solenoid Circuit Open	SS-A solenoid valve open circuit
7	P0977	SS-B Solenoid Circuit Short to Battery	SS-B solenoid valve positive short circuit
8	P0976	SS-B Solenoid Circuit Short to Ground	SS-B solenoid valve negative pole short circuit
9	P0755	SS-B Solenoid Circuit Open	SS-B solenoid valve open circuit
10	P0983	OD VFS Circuit Short to Battery	OD solenoid valve positive short circuit
11	P0982	OD VFS Circuit Short to Ground	OD solenoid valve negative short circuit
12	P097D	OD VFS Circuit Open	OD solenoid valve open circuit

## ➤ 5. Transmission use maintenance and adjustment



### 6F30 automatic transmission - transmission fault code list

Serial number	Error code	Description	Chinese
13	P0986	UD VFS Circuit Short to Battery	UD solenoid valve positive short circuit
14	P0985	UD VFS Circuit Short to Ground	UD solenoid valve negative short circuit
15	P097E	UD VFS Circuit Open	UD solenoid valve open circuit
16	P0999	26 VFS Circuit Short to Battery	26 Solenoid valve positive short circuit
17	P0998	26 VFS Circuit Short to Ground	26 Solenoid valve negative short circuit
18	P097F	26 VFS Circuit Open	26 Solenoid valve open circuit
19	P0980	35R VFS Circuit Short to Battery	35R solenoid valve positive short circuit
20	P0979	35R VFS Circuit Short to Ground	35R solenoid valve negative short circuit
21	P097C	35R VFS Circuit Open	35R solenoid valve open circuit
22	P2763	Damper Clutch VFS Circuit Short to Battery	DC solenoid valve positive short circuit
23	P2764	Damper Clutch VFS Circuit Short to Ground	DC solenoid valve negative short circuit
24	P2761	Damper Clutch VFS Circuit Open	DC solenoid valve open circuit

## ➤ 5. Transmission use maintenance and adjustment

### 6F30 automatic transmission - transmission fault code list

Serial number	Error code	Description	Chinese
25	P0963	Line Pressure Control VFS Circuit Short to Battery	LP solenoid valve positive short circuit
26	P0962	Line Pressure Control VFS Circuit Short to Ground	LP solenoid valve negative short circuit
27	P0960	Line Pressure Control VFS Circuit Open	LP solenoid valve open circuit
28	P0731	1st Speed Asynchronous	1st ratio out of sync
29	P0732	2nd Speed Asynchronous	2nd ratio out of sync
30	P0733	3rd Speed Asynchronous	3rd ratio out of sync
31	P0734	4th Speed Asynchronous	4th ratio out of sync
32	P0735	5th Speed Asynchronous	5th ratio out of sync
33	P0729	6th Speed Asynchronous	6th ratio out of sync
34	U0100	No ID from ECU	Data
35	U0001	CAN Bus Off	CAN network line error
36	U0122	No ID from ABS/ESP	Data

## ➤ 5. Transmission use maintenance and adjustment



### 6F30 automatic transmission - transmission fault code list

Serial number	Error code	Description	Chinese
37	U0140	No ID from BCM	Cannot receive data from
38	P0741	Damper Clutch Abnormal	DC anomaly
39	P0885	TCU Power Signal error	TCU voltage signal error
40	P0706	Inhibit Switch Invalid Code	Inhibit switch failure
41	P0705	Inhibit Switch Unused Code	Inhibit switch not connected
42	P07C0	Input Speed Sensor Circuit Short to Battery	Input speed sensor positive short circuit
43	P0715	Input Speed Sensor Circuit Open	Input speed sensor open circuit
44	P07BF	Input Speed Sensor Circuit Short to Ground	Input speed sensor negative short circuit
45	P077D	Output Speed Sensor Circuit Short to Battery	Output speed sensor positive short circuit
46	P0720	Output Speed Sensor Circuit Open	Output speed sensor open circuit
47	P077C	Output Speed Sensor Circuit Short to Ground	Output speed sensor negative short circuit

# Table of contents

C O N T E N T S



01

A6F30 automatic  
transmission



02

Transmission  
shift  
mechanism

## Course targets

- Be able to understand the working process of the transmission electronic shifting mechanism.
- Be able to understand the working process of the electronic shift actuator.
- Be able to analyze electronic gearshift fault codes.

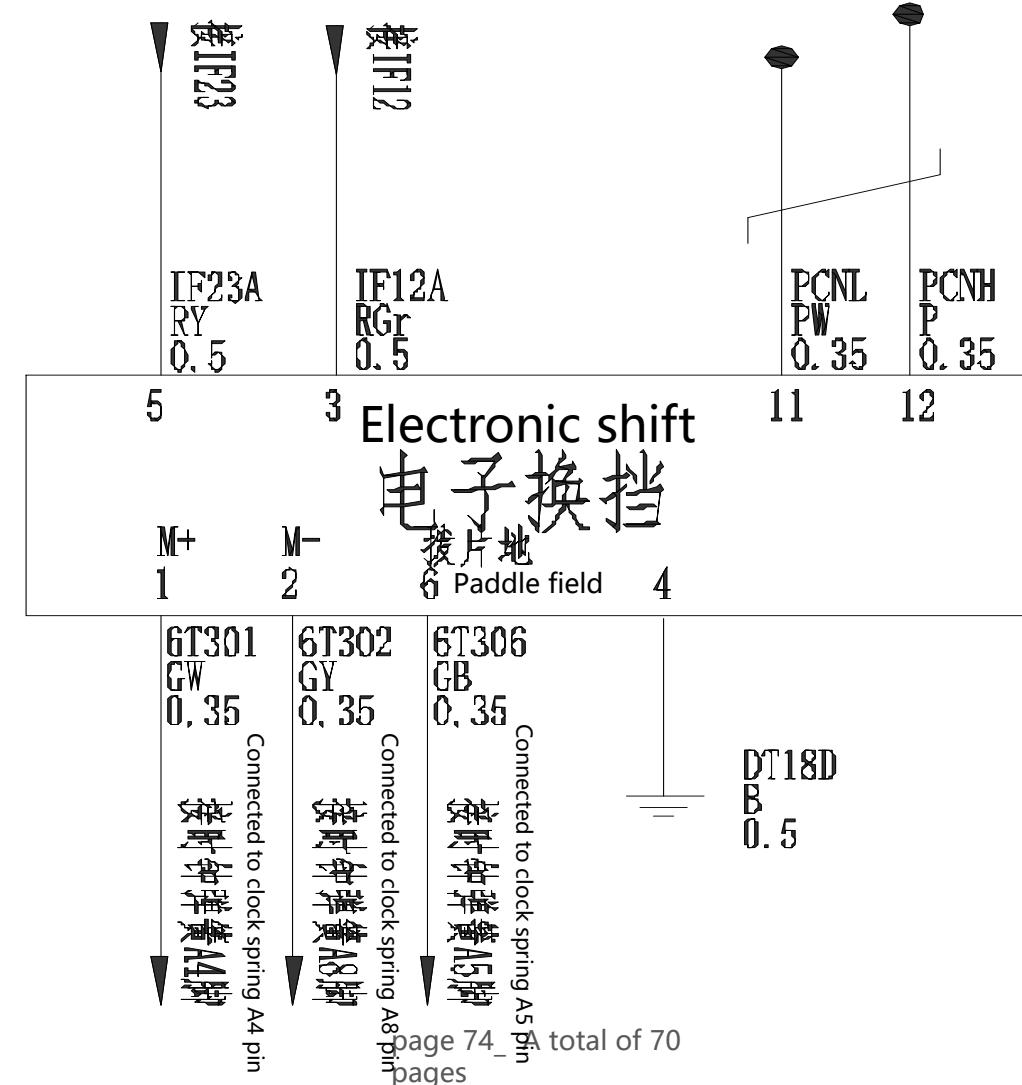
## 1. OVERVIEW OF ELECTRONIC SHIFTING

The function of the electronic shift mechanism is to manually control the shift intention, and form a Hall voltage signal through the movement of the shift lever, which is then sent to the electronic shift actuator control module, TCU module and BDC module through CAN after processing.



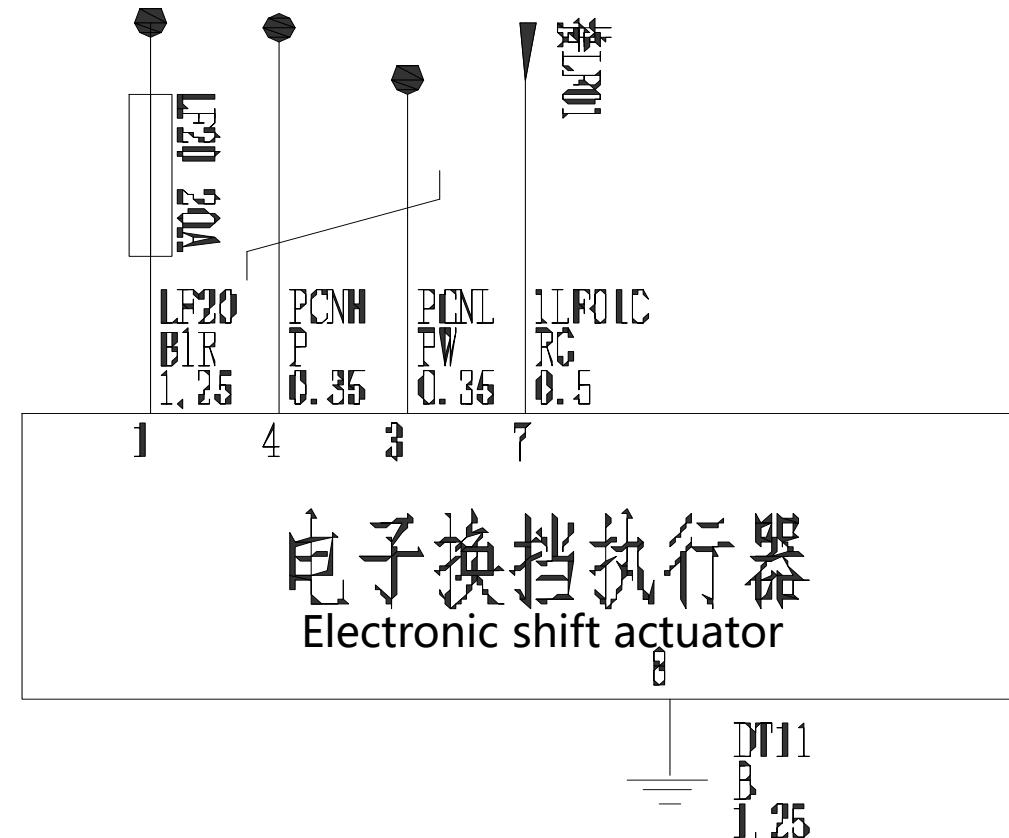
# Transmission shift mechanism

## 2. Electronic shift circuit



# Transmission shift mechanism

## 3. Electronic shift actuator circuit



# ➤ Transmission shift mechanism

## 4. Electronic shift fault code

Error code	Fault code meaning	Error code	Fault code meaning
B111716	Battery voltage is too low	P1C0102	P key fault key card
B111717	Battery voltage is too high	P1C0202	Unlock key fault key card
U007388	PT_CAN bus disconnect detected	P1C0311	Shift paddle +(up) circuit is shorted to ground
U010087	Lost communication with EMS	P1C0312	Shift paddle +(up) circuit is shorted to power
U010187	Lost communication with TCU	P1C0313	Shift paddle + (up) circuit open
U014087	Lost communication with BCM	P1C0411	Shift paddle-(down) circuit is shorted to ground
U018687	Lost communication with RRM	P1C0412	Shift paddles - (down) circuit shorted to power
U015587	Lost communication with IC	P1C0413	Shift paddles - (down) circuit open
U012287	Lost communication with ESP		

# ➤ Transmission shift mechanism

## 5. Electronic shift actuator fault code

Error code	Fault code meaning	Error code	Fault code meaning
U010387	Lost communication with GSM	P1A8015	ABM message error
U010087	Lost communication with EMS	P1A8012	BCM message error
U014687	Lost communication with gateway	P1A8000	Electronic shift actuator hardware failure
U010187	Lost communication with TCU	P1A8001	Position sensor failure
U007388	Power CAN bus off	P1A8002	Mechanical defect
U012287	Lost communication with ESP	P1A8003	Institution temperature is too high
U015187	Lost communication with ABM	P1A8005	Motor overcurrent
U014087	Lost communication with BCM	P1A8007	Voltage is too low
P1A8010	GSM message error	P1A8008	Voltage is too high
P1A8011	EMS message error	P1A8009	CAN communication voltage is too low
P1A8013	TCU message error	P1A8006	CAN communication voltage is too high
P1A8014	ESP packet error		



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