



UD TRUCKS

T466/1₍₅₀₃₂₈₃₎

ESCOT Gearbox, Fault tracing procedure
Quy trình truy tìm lỗi hộp số Escot

UDIS Competence Development

Fault Tracing Process/ Quy trình truy lỗi

Chapter 1



Work routine, fault tracing



KH liên hệ xưởng DV và mô tả vấn đề đang gặp



Trước khi xe đến, Xưởng cần thực hiện kiểm tra trước các thông tin như:

- Chiến dịch
- TSB (Technical Service Bulletin)
- DTC
- CBR



Đại diện dịch vụ khách hàng đặt thêm câu hỏi cho vấn đề



KTV thực hiện chẩn đoán bằng Tech Tool.



Giao xe

Basic Data Gathering Thu thập dữ liệu cơ bản

Chapter 2



Basic Data Gathering and driver interview

Detail/Background:

Chassis Number: JPCT-021188

Model: Quester

Mileage: 77720 km

Road condition: Test Vehicle.

Gearbox: ATO2612F

Symptoms and conditions:

- Driver identify that during past few days there is a fault in gear shifting
- Lái xe nhận định có lỗi chuyển số trong vài ngày qua
- Gear shifting happen in manual mode and specially in downshifting/ Chuyển số gặp vấn đề ở chế độ thủ công và đặc biệt khi giảm số



Fault Verification Xác minh lỗi

Chapter 3

V PARAMETER READOUT?

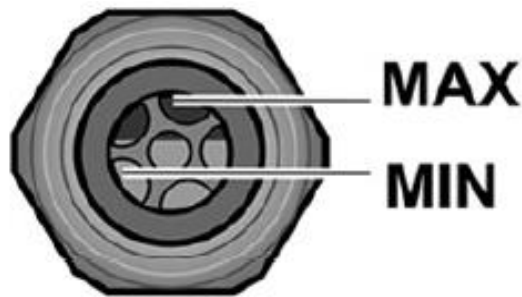
VERIFY FAULT EXISTS

TEST DRIVE?



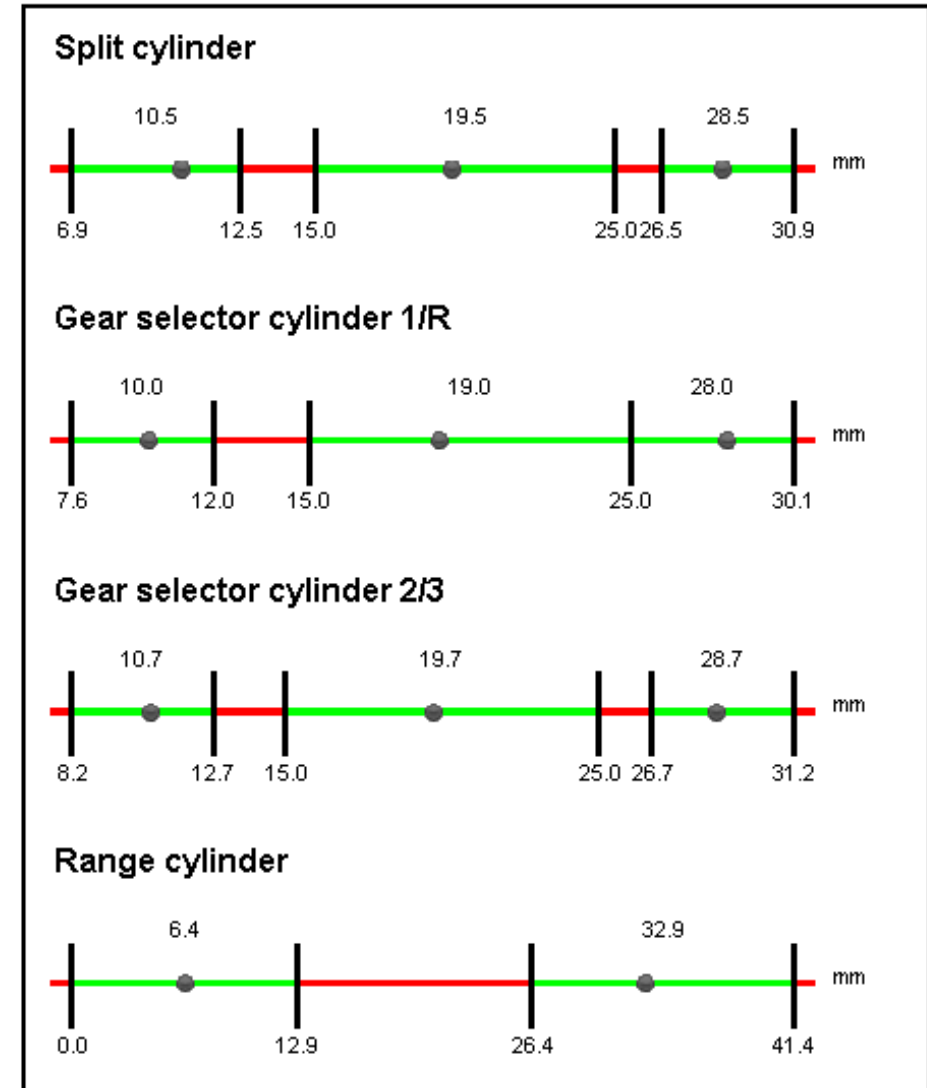
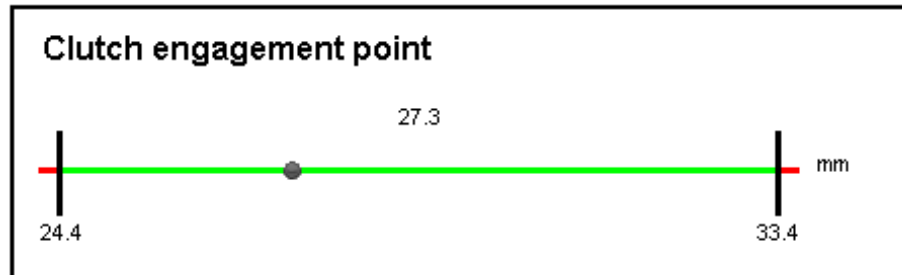
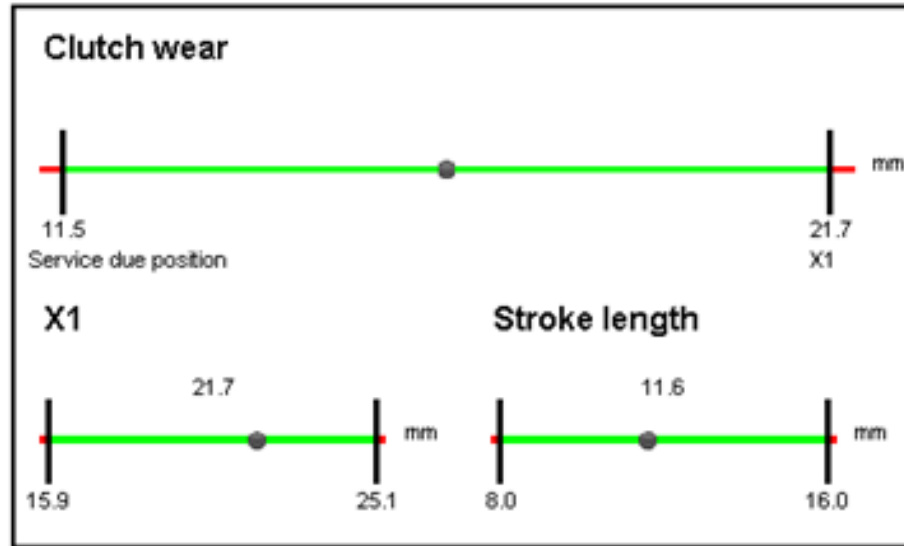
What our technician found?/ KTV tìm thấy gì?

- No oil leakage from the gearbox/ Không có rò rỉ nhớt từ hộp số
- No air leakage from the pneumatic system of the gearbox/ Không có rò rỉ khí nén từ hệ thống khí nén của hộp số
- The last service and maintenance was happen in 69500 km/ Số km cho lần bảo dưỡng gần nhất là 69500 km
- No DTCs / Không có DTC



- Test drive shows that the gear shifting problem happens in manual mode as the driver said before/ Lái thử cho thấy rằng xảy ra vấn đề chuyển số ở chế độ thủ công như lái xe đã nói trước đó

What our technician found?/ KTV tìm thấy gì



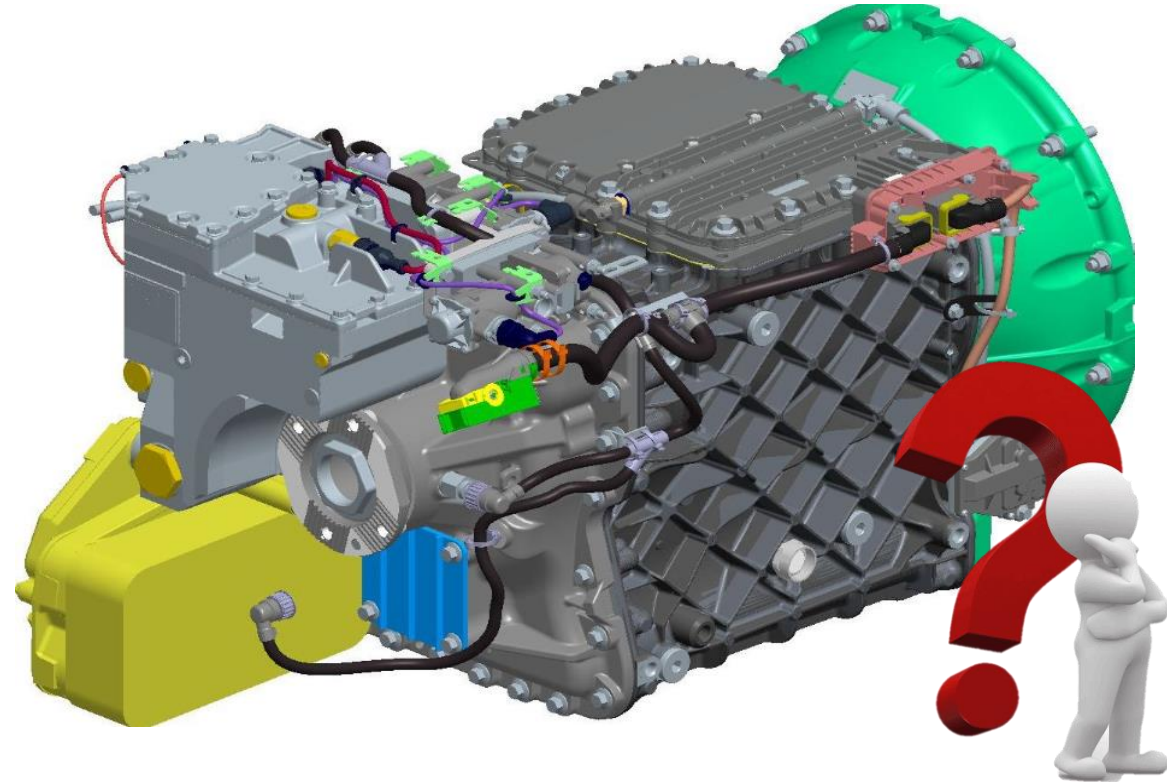
Fault analysis Phân tích lỗi

Chapter 4



What are the probabilities? Xác suất có thể xảy ra?

- GLU
- Hệ thống ly hợp (CVU – CCA)
- Hệ thống khí nén
- Cảm biến tốc độ
- Cảm biến vị trí
- Càng cua chuyển số
- Hệ thống phanh trục truyền chung (Countershaft brake system)

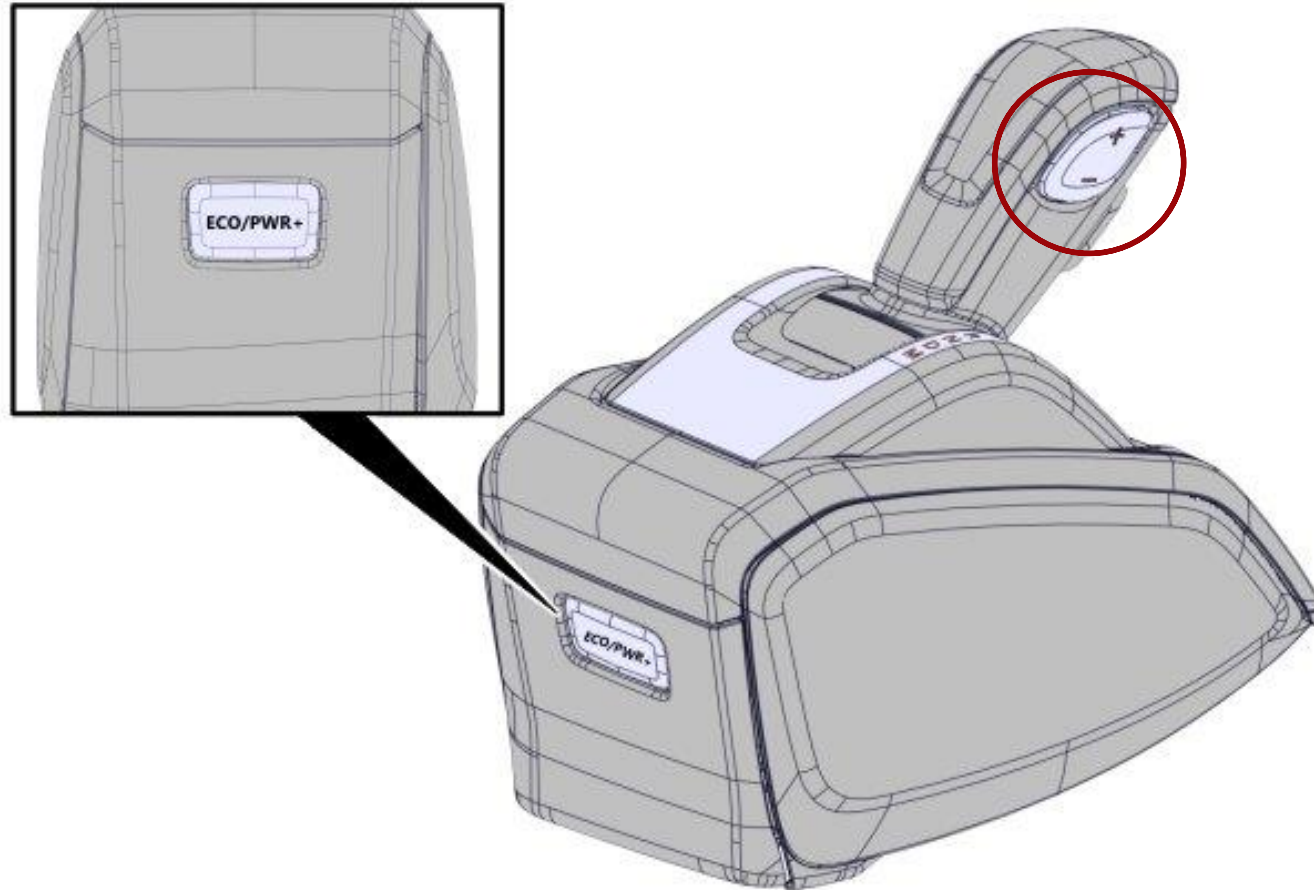


Tests and Evaluations Kiểm tra và đánh giá

Chapter 5



Kiểm tra GLU



40112-3 Gear selector (chọn số)

Tech Tool

Tech ToolLinksHelp

Parham Fatehirad

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

Test

Select an operation and click Start

+

Sort by function

🔍

1 - Service and maintenance

2 - Engine, Engine mounting and equipment

3 - Electrical system and instruments

4 - Gearbox

40010-3 Clutch cylinder

40015-3 Range cylinder

40016-3 Split cylinder

40020-3 Gears

40023-3 Gearbox speed sensors

40083-3 PWM valves clutch

40087-3 Pressure sensor

40091-3 Gear activation, control housing (for removal/replacement)

40112-3 Gear selector

41126-3 Clutch wear check

41180-3 Clutch drag

41182-3 PWM valves clutch activation

43121-3 Gear selector cylinder 1/Reverse

43122-3 Gear selector cylinder 2/3

43126-3 Solenoid valve, gearbox brake (input shaft brake/ countershaft brake)

Start >Cancel

40112-3 Gear selector

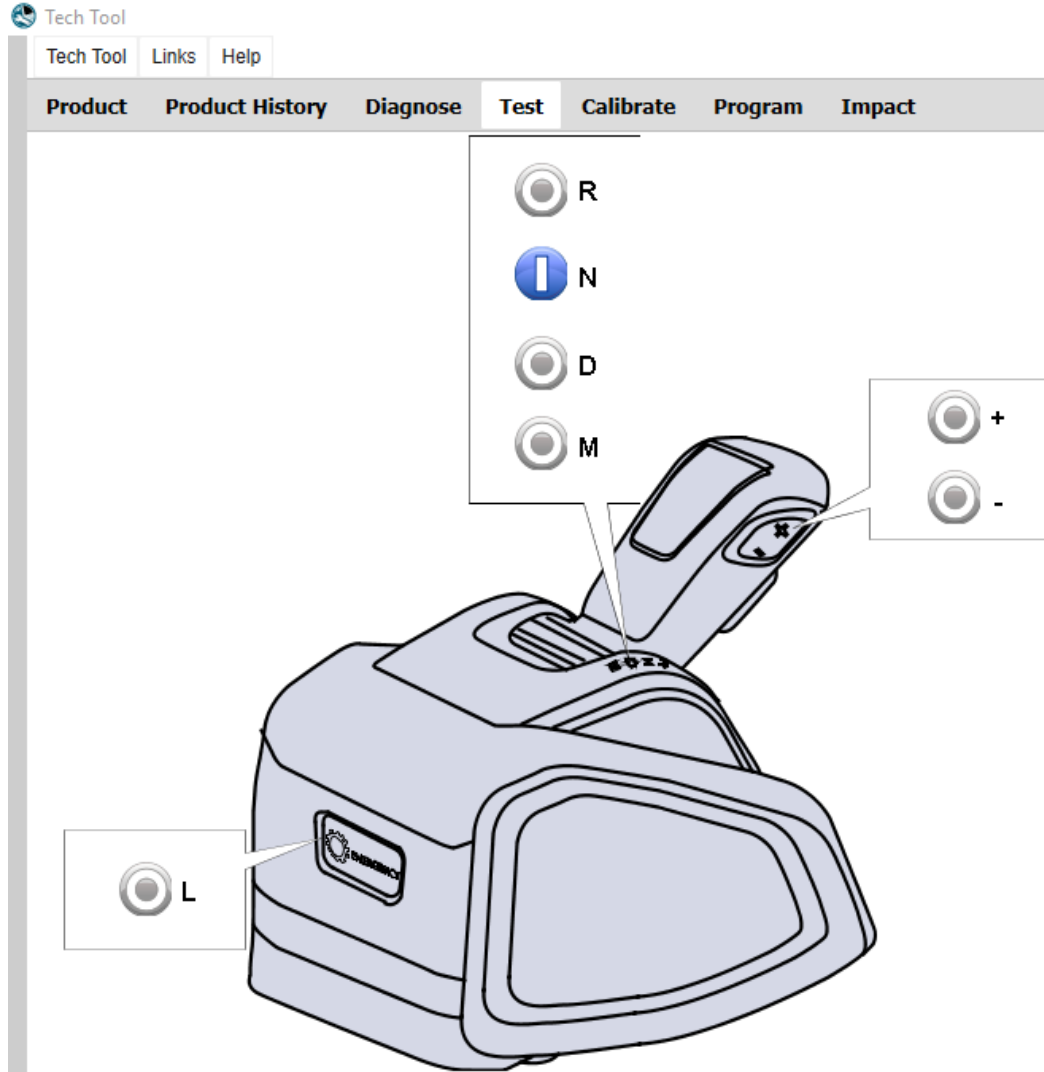
☐ Run the operation in simulation mode

Purpose

Check that the gear selector status is read correctly by the control unit

Chassis ID: JNCU 46856VIN: JNCMBP0G0LU046856Work Order: Tuas QoProductOnline

40112-3 Gear selector (chọn số)



40112-3 Gear selector

Information >> Execution

Symbol	Description
+	Up shift
-	Down shift
R, N, D, M	Gear selector position
L	Limp home button

Action

Check that the button/lever position corresponds to the status shown in the illustration

Test result

Select one of the following alternatives

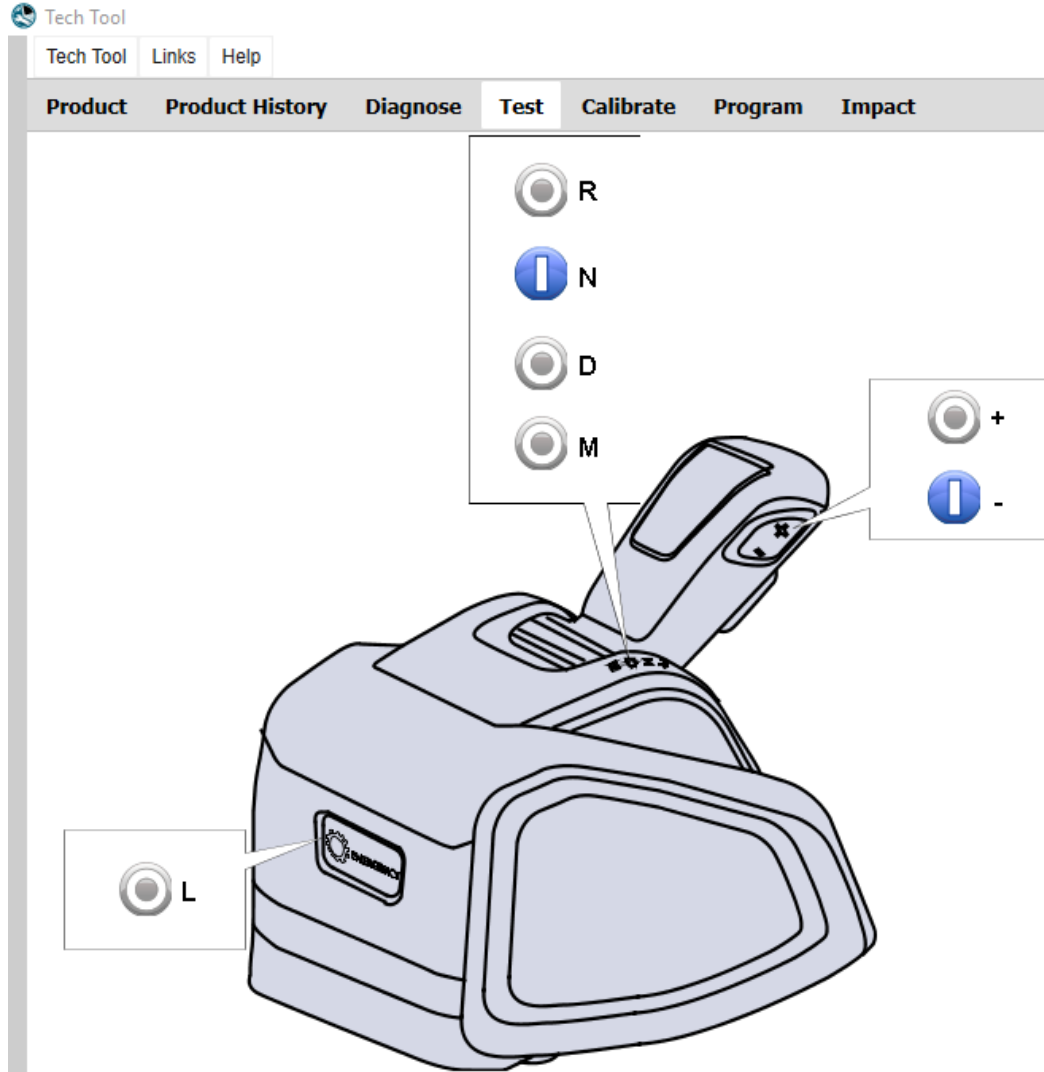
- ☐ OK
- ☐ Not OK

Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

✔ Product ✔ Online

40112-3 Gear selector (chọn số)



40112-3 Gear selector

Information >> Execution

Symbol	Description
+	Up shift
-	Down shift
R, N, D, M	Gear selector position
L	Limp home button

Action

Check that the button/lever position corresponds to the status shown in the illustration

Test result

Select one of the following alternatives

- ☐ OK
- ☐ Not OK

Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

✔ Product ✔ Online

 Tech Tool

—  

Parham Fatehirad

40112-3 Gear selector

Information >> Execution

Symbol	Description
+	Up shift
-	Down shift
R, N, D, M	Gear selector position
L	Limp home button

Action

Check that the button/lever position corresponds to the status shown in the illustration

Test result

Select one of the following alternatives

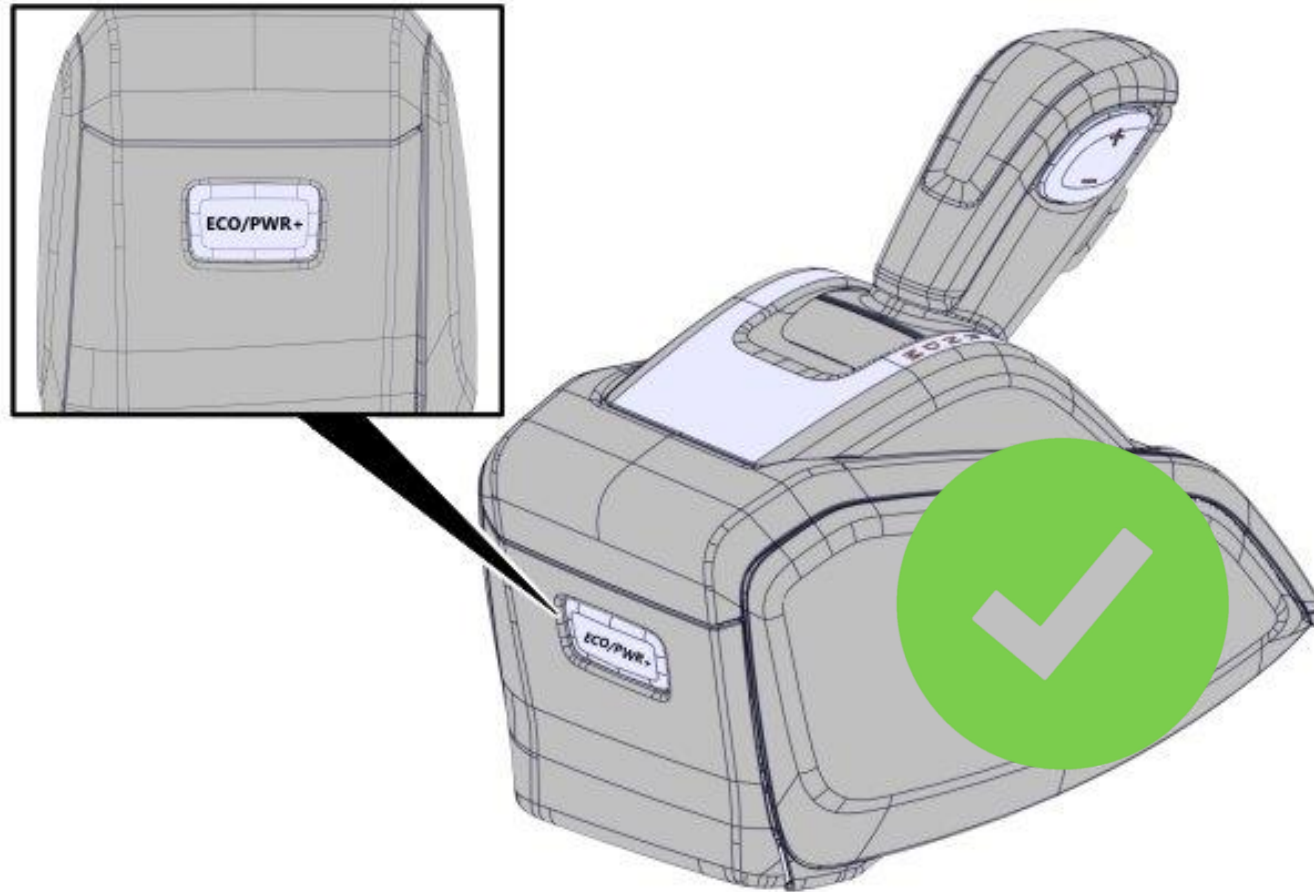
- ☐ OK
- ☐ Not OK

Continue >

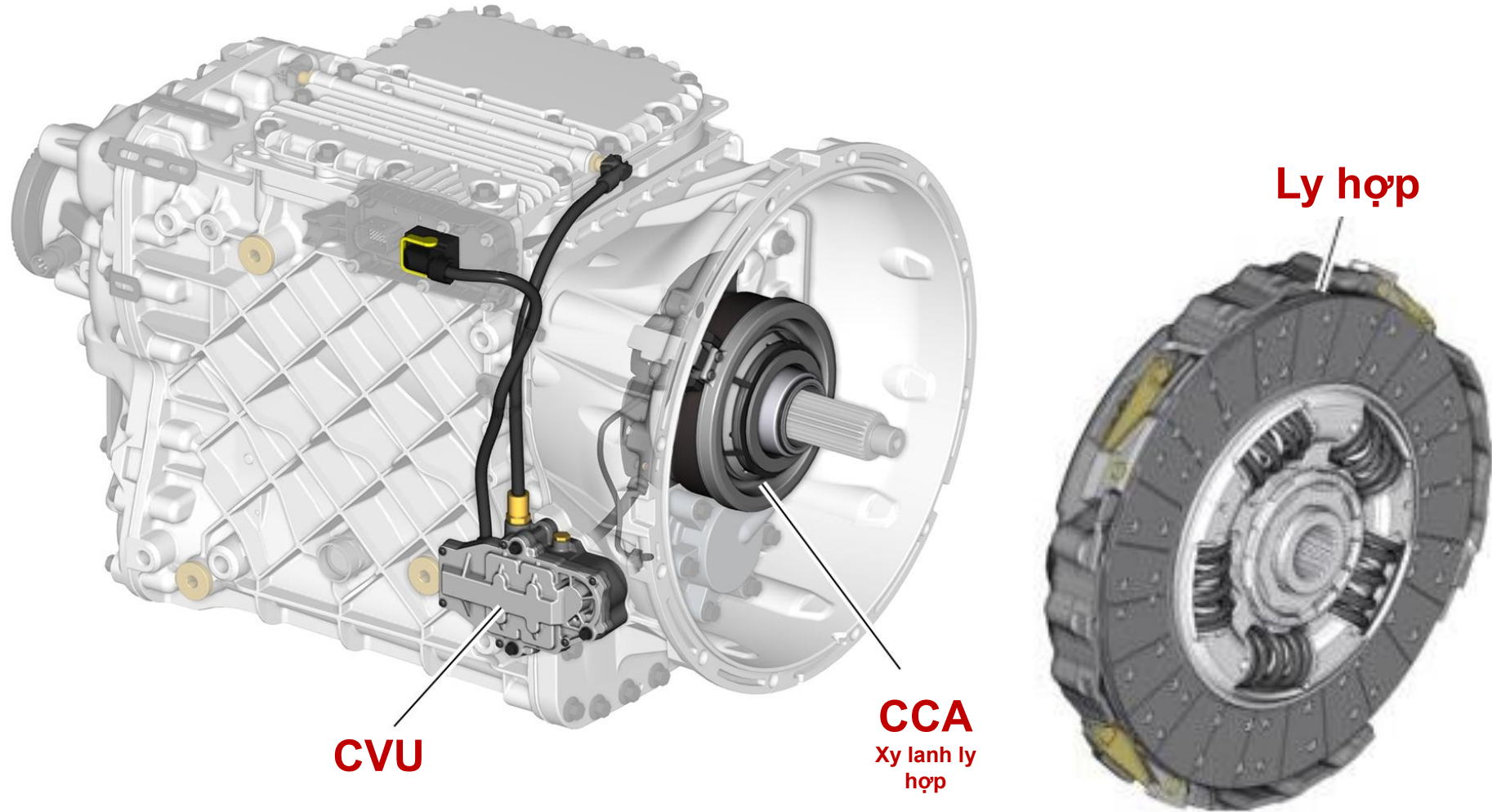
Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

✔ Product ✔ Online

What our technician found?/ KTV tìm thấy gì?



Kiểm tra hệ thống ly hợp



41126-3 Clutch wear check/ Kiểm tra mòn ly hợp

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

41126-3 Clutch wear check

Information >> Conditions >> Execution >> Result

Purpose

Check the X1 value and the clutch wear

Description

The Transmission Electronic Control Unit (TECU) moves the clutch cylinder to the engaged and the disengaged position, the current engaged position is compared with the calibrated engaged position

Note! X1 is the calibrated engagement point for a newly installed clutch plate
X2 is the current engagement point for the clutch plate

1	On = 0 rpm	On 0 rpm	
2	(P)	(P)	
3	N	N	
4	> 650 kPa	834 kPa	

Continue >Cancel

Clutch cylinder

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

ProductOnline

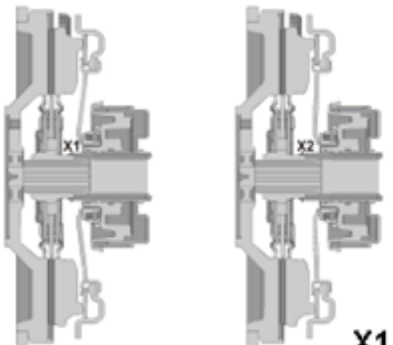
What our technician found?/ KTV tìm thấy gì?

Tech Tool

Tech Tool Links Help

Product Product History Diagnose Test Calibrate Program Impact

1



X1 = 21.7 mm

X2 = 19.5 mm

X1-X2 = 2.2 mm

2

Service due position 11.5 mm

Current engaged position 19.5



11.5 25.1 mm

41126-3 Clutch wear check

Information >> Conditions >> Execution >> Result

Information

1

- X1 is the calibrated engagement point for a newly installed clutch plate
- X2 is the current engagement point for the clutch plate
- The difference between X2 and X1 is a measure of the clutch wear

2

- The ball represents the X2 value
- If the X2 value is less than the service due position, the clutch is worn out

Note! The X2 value might vary slightly on each test execution due to different conditions, such as oil temperature. On a relatively new clutch, this might cause an indication of a small negative wear ($X2 > X1$). This is normal and not a fault.

Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

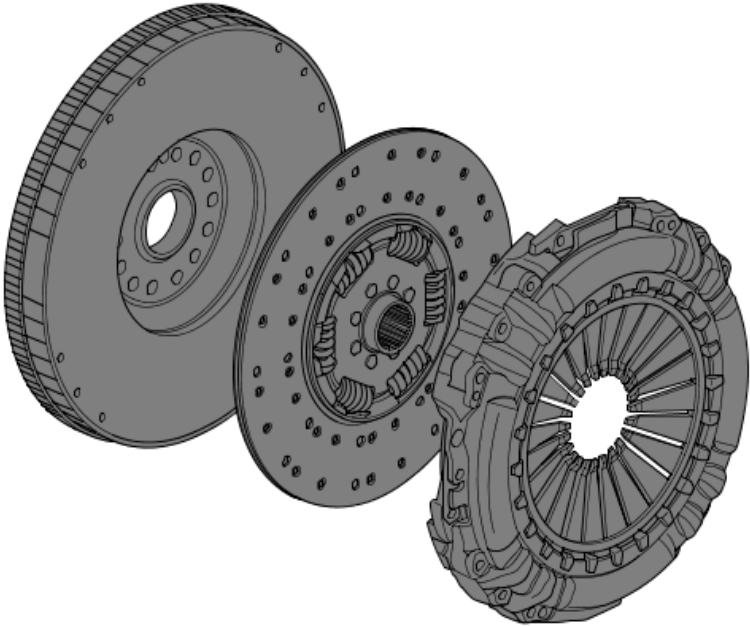
Product Online

41180-3 Clutch drag/ Trượt ly hợp

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact



41180-3 Clutch drag

Information >> Conditions >> Execution >> Result

Purpose

Check the clutch drag

Description

The test performs the following steps:

- 1 The clutch is engaged
- 2 The clutch is disengaged
- 3 The control module waits for the input shaft to stop
- 4 The clutch is slowly engaged until the input shaft starts to rotate
- 5 The clutch position when the input shaft starts to accelerate is stored
- 6 The clutch is engaged

1	 On	 rpm > 400 rpm	 On	546 rpm	
2	 (P)	 (P)	 (P)		
3	 (4)	N	N		
4		> 650 kPa		829 kPa	

Continue >Cancel

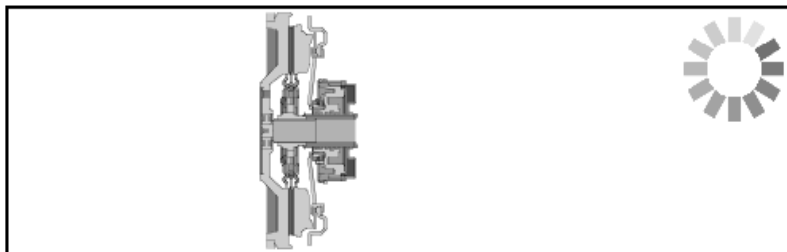
Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

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Information >> Conditions >> **Execution** >> Result

Test in progress



Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

✔ Product ✔ Online

What our technician found?/ KTV tìm thấy gì?

Tech Tool

Tech Tool Links Help

Product Product History Diagnose Test Calibrate Program Impact

41180-3 Clutch drag

Information >> Conditions >> Execution >> Result

Result

The test result is approved

Transmission Oil Temperature 65 °C

Detailed information

Clutch engagement point

2.0 6.0 8.0 mm

Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product Online

But it takes longer than usual
Nhưng phải mất nhiều thời gian hơn bình thường



40083-3 PWM Valve clutch/ Van PWM ly hợp

Tech Tool

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ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

Test

Select an operation and click Start

+

Sort by function

4 - Gearbox

40010-3 Clutch cylinder

40015-3 Range cylinder

40016-3 Split cylinder

40020-3 Gears

40023-3 Gearbox speed sensors

40083-3 PWM valves clutch

40087-3 Pressure sensor

40091-3 Gear activation, control housing (for removal/replacement)

40112-3 Gear selector

41126-3 Clutch wear check

41180-3 Clutch drag

41182-3 PWM valves clutch activation

43121-3 Gear selector cylinder 1/Reverse

43122-3 Gear selector cylinder 2/3

43126-3 Solenoid valve, gearbox brake (input shaft brake/ countershaft brake)

43128-4 Solenoid valve, gearbox brake (input shaft brake/countershaft brake)(Gearbox removed)

43194-3 Input signals for gear selection

5 - Brakes

40083-3 PWM valves clutch

☐ Run the operation in simulation mode

Purpose

Check for air leakage in the clutch cylinder system and check the performance and function of the clutch

Components to be tested are:

Clutch system

Description

- The leakage test will disengage the clutch, turn off all valves to the clutch, then wait a specified time to see if the clutch position has changed
- The clutch performance test will engage and disengage the clutch and present the measured times to check for proper operation of the clutch system

1

rpm

= 0 rpm

0 rpm

✓

2

km/h

= 0 km/h

0 km/h

✓

3

> 650 kPa

831 kPa

✓

Start >

Cancel

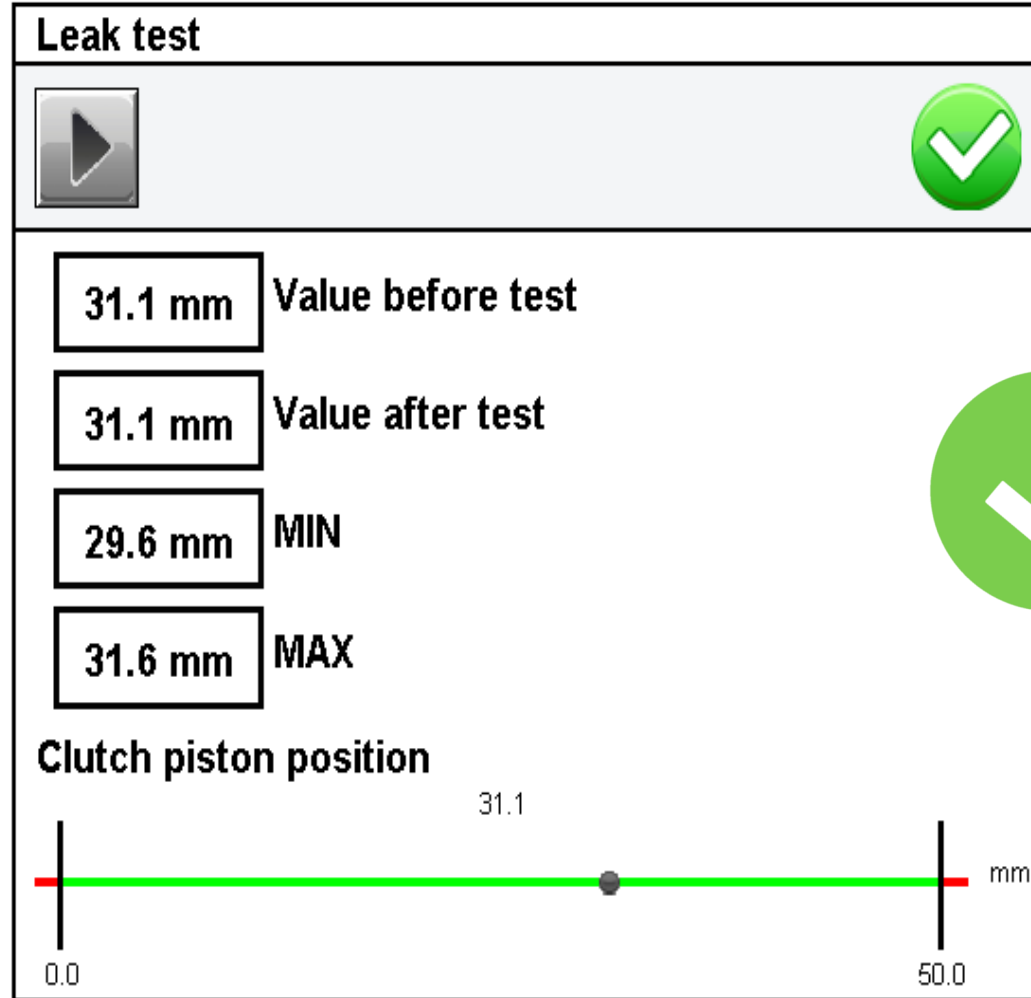
Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

ProductOnline

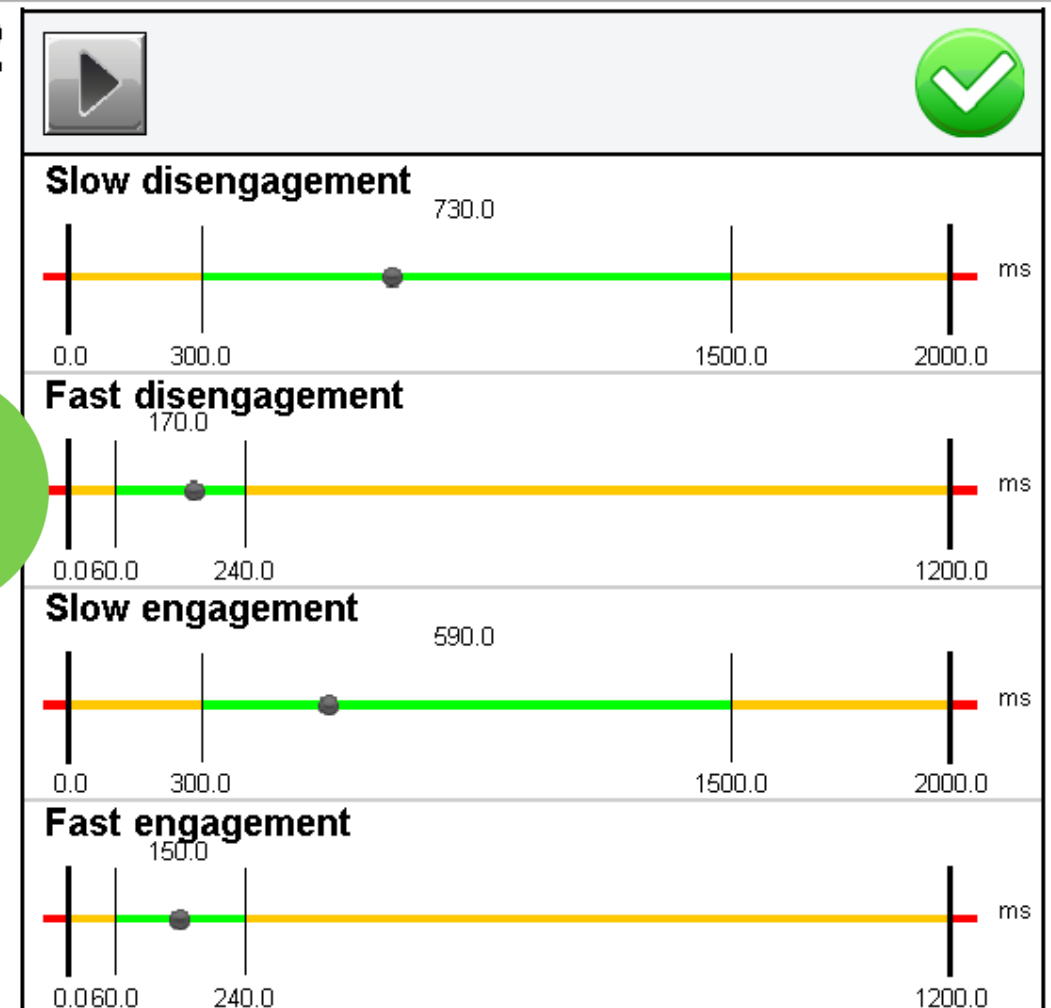
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What our technician found?/ KTV tìm thấy gì?

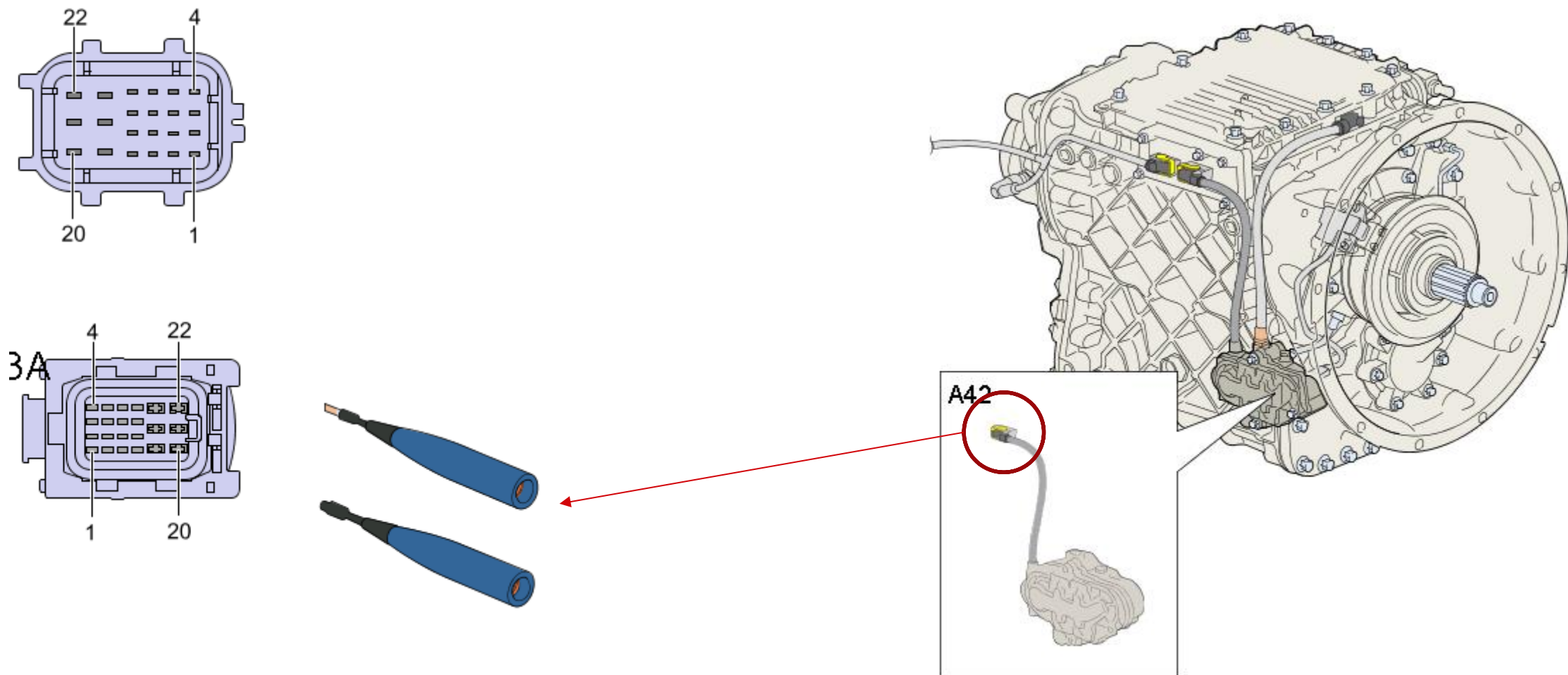
1



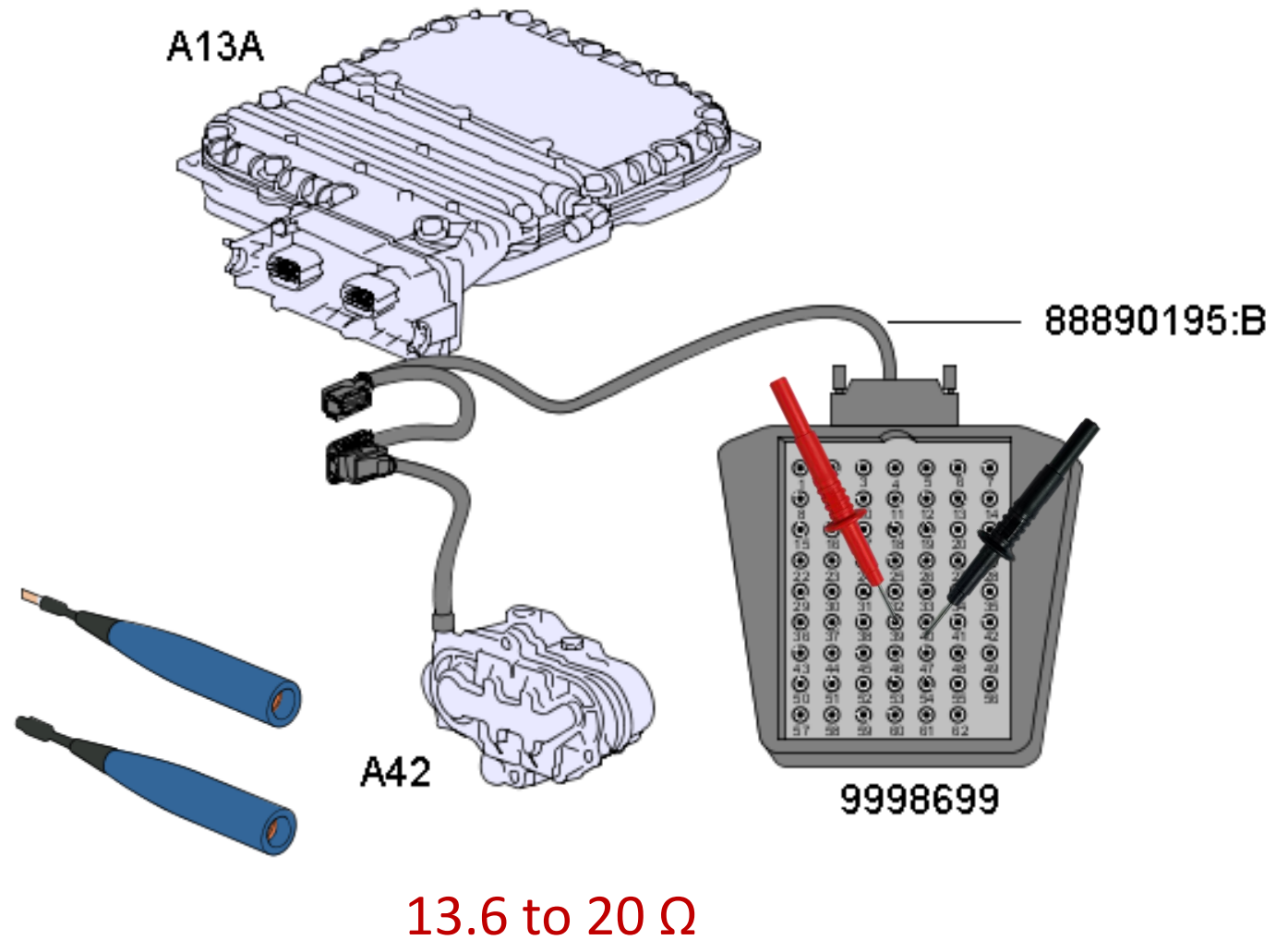
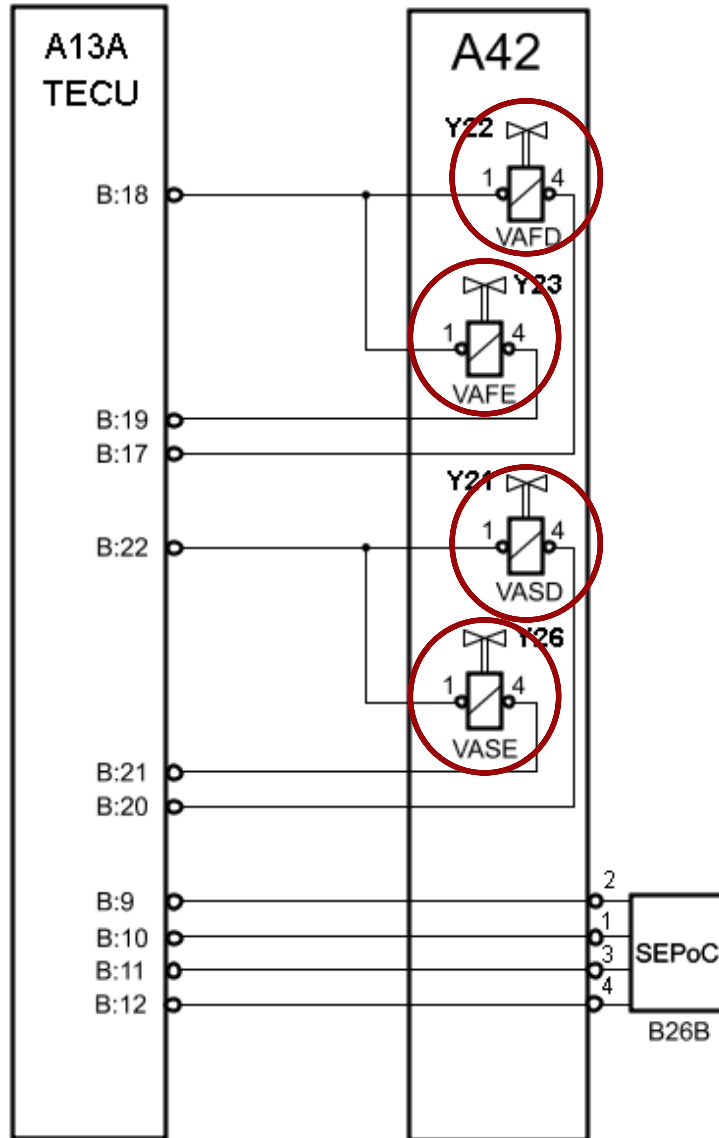
2



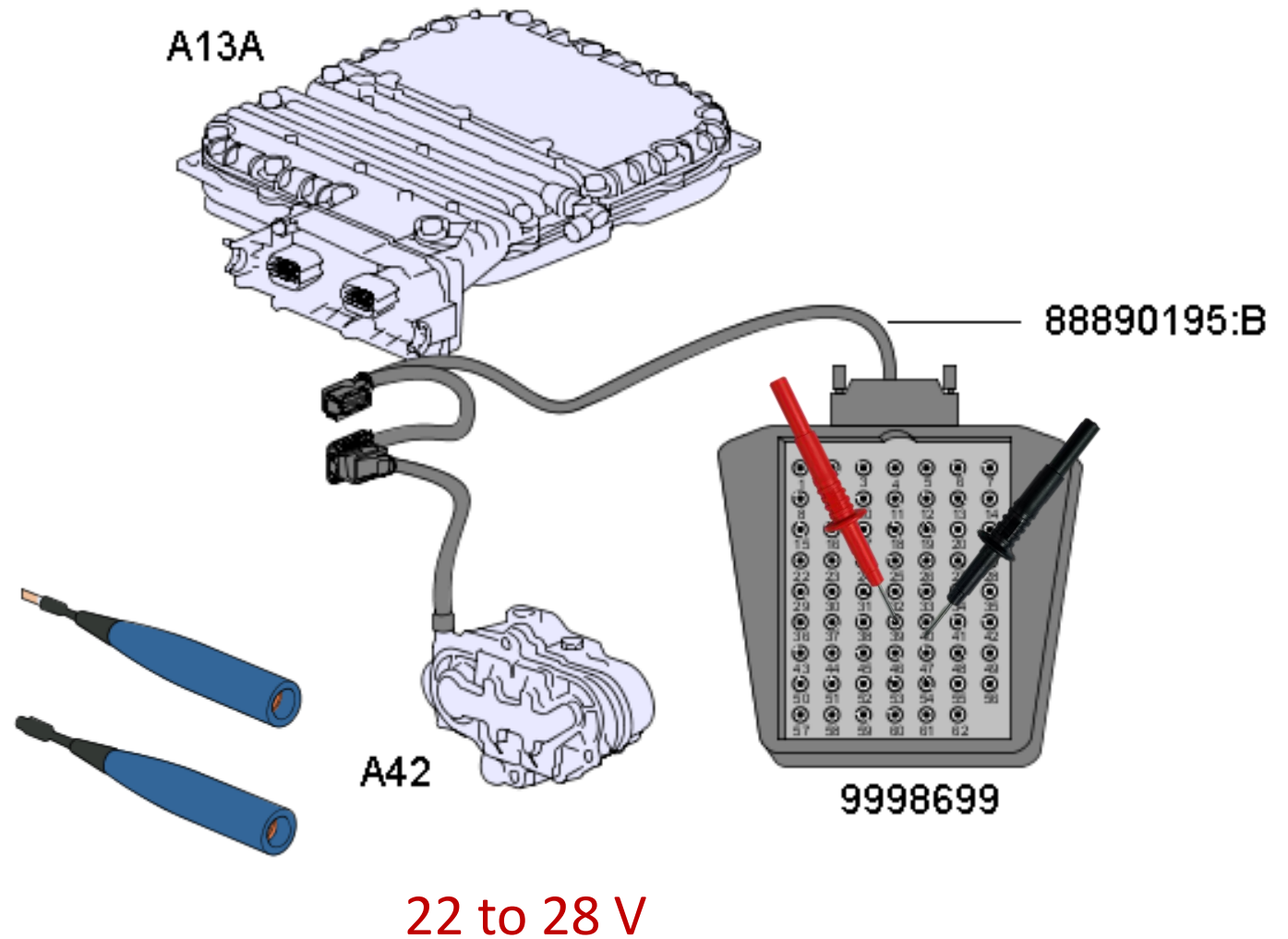
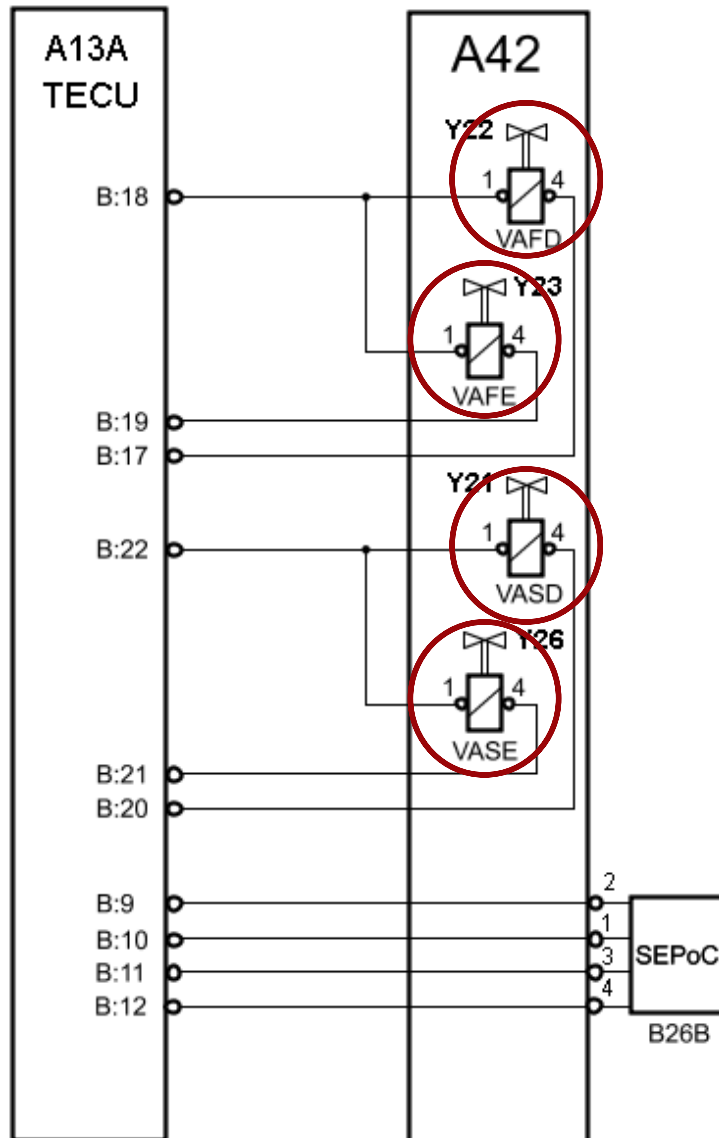
CVU checks - Basic Checks/ Kiểm tra cơ bản CVU



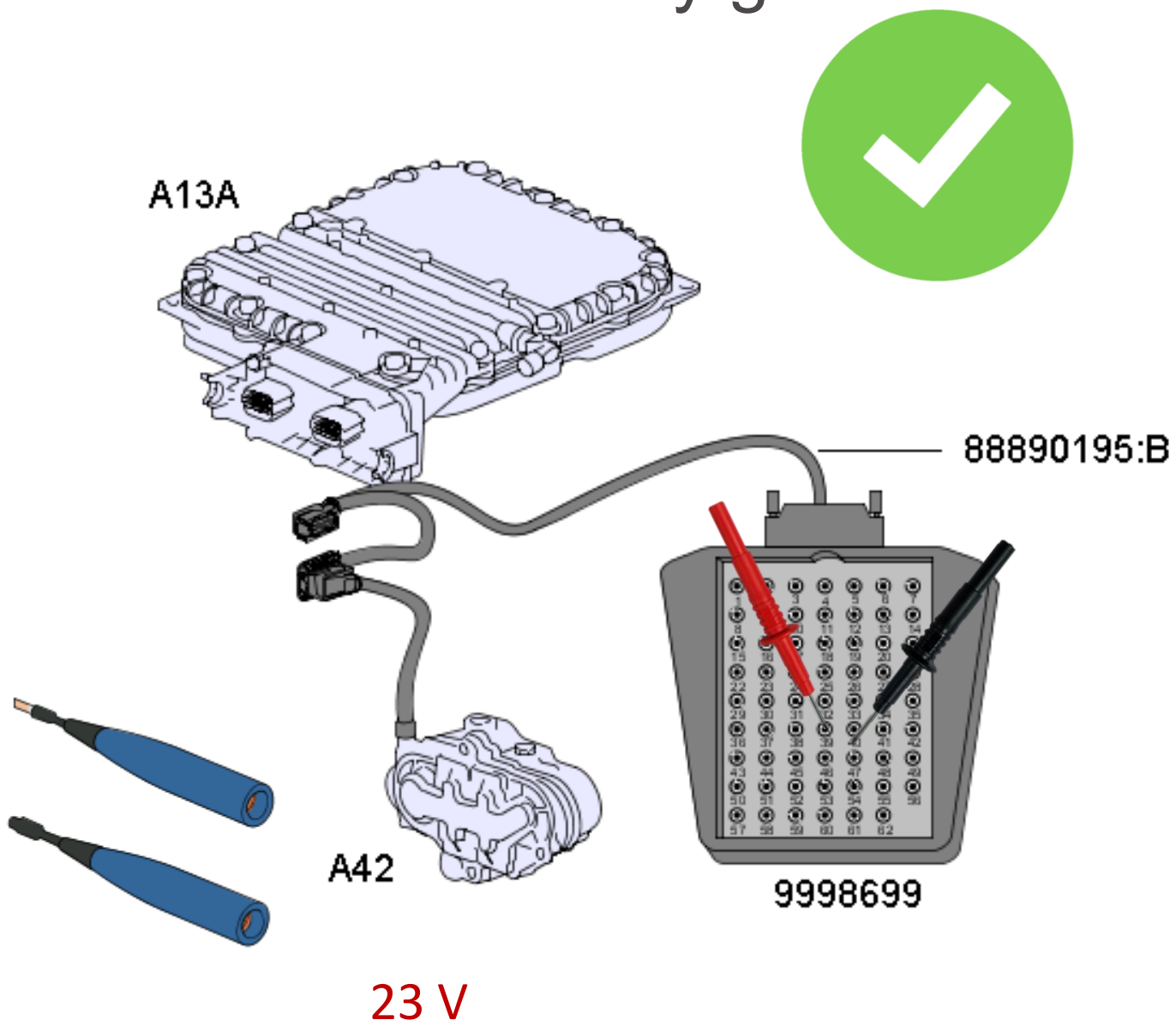
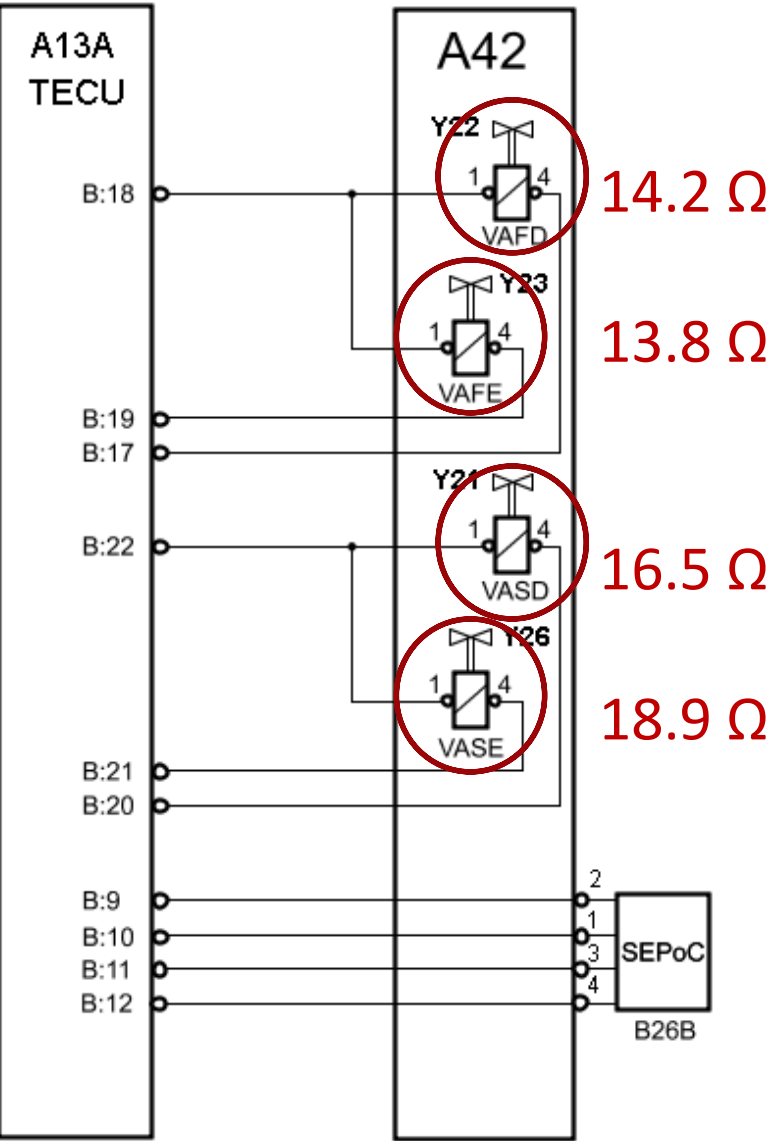
CVU resistance checks/ Kiểm tra điện trở CVU



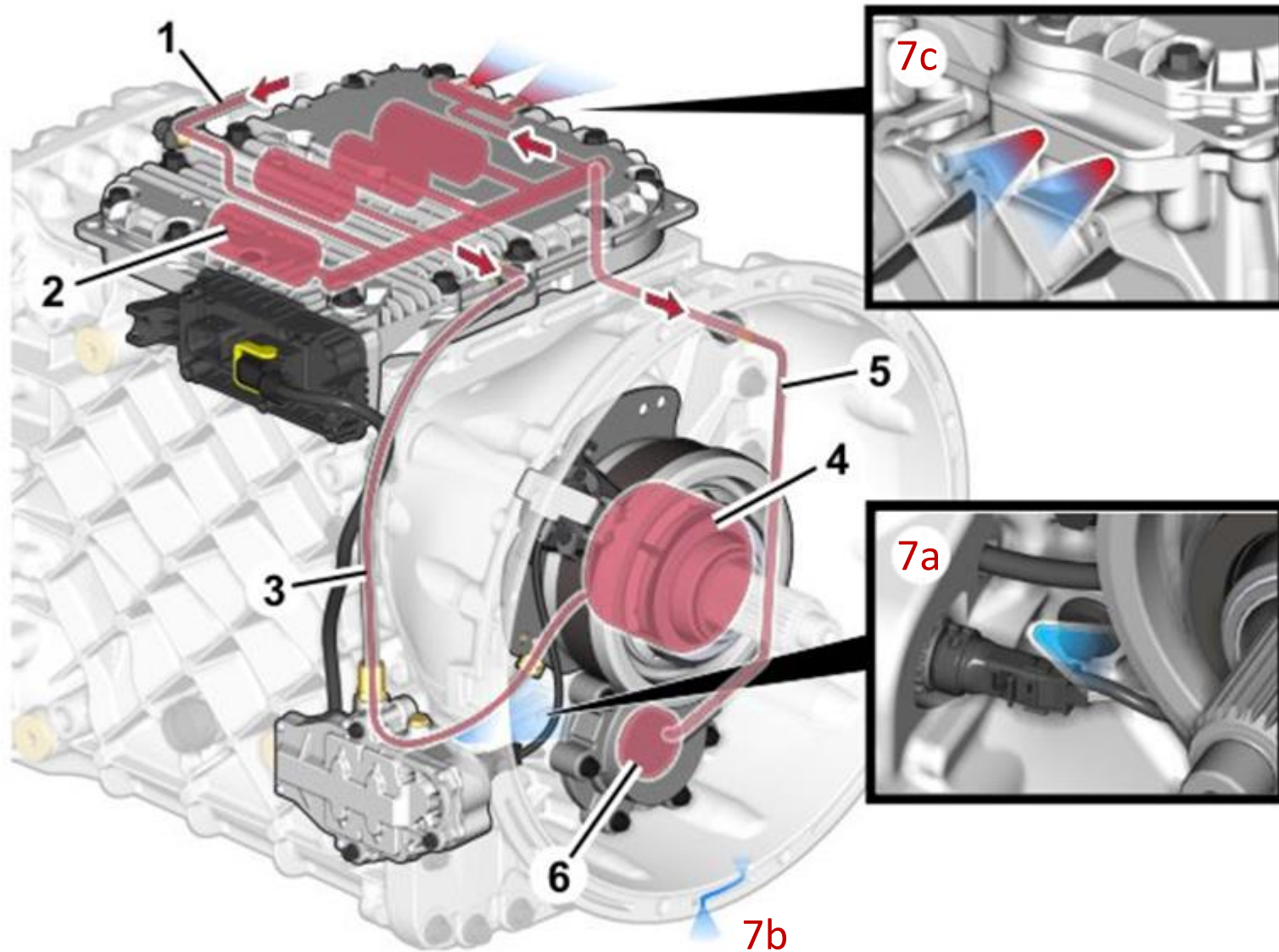
CVU voltage checks/ Kiểm tra điện áp CVU



What our technicians found?/ KTV tìm thấy gì?



Pneumatic system checks/ Kiểm tra hệ thống khí nén



40087-3 Pressure sensor/ Cảm biến áp suất

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

Test

Select an operation and click Start

+

Sort by function

4 - Gearbox

40010-3 Clutch cylinder

40015-3 Range cylinder

40016-3 Split cylinder

40020-3 Gears

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40083-3 PWM valves clutch

40087-3 Pressure sensor

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43121-3 Gear selector cylinder 1/Reverse

43122-3 Gear selector cylinder 2/3

43126-3 Solenoid valve, gearbox brake (input shaft brake/ countershaft brake)

43128-4 Solenoid valve, gearbox brake (input shaft brake/countershaft brake)(Gearbox removed)

43194-3 Input signals for gear selection

5 - Brakes

6 - Wheel suspension and steering

40087-3 Pressure sensor

☐ Run the operation in simulation mode

Purpose

Check the function of the Air pressure sensor

Components to be tested are:

Air pressure sensor

Description

This test will use the measurement from an external pressure gauge and compare it to the air pressure sensor readout from the vehicle

Start >

Cancel

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product

Online

40087-3 Pressure sensor/ Cảm biến áp suất

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

The illustration may not correspond exactly to the selected vehicle.

The essential information in the illustrations is, however, always correct.

40087-3 Pressure sensor

Information >> Execution

DANGER

Before beginning any work on any part of the air system, be certain that the air pressure has been released. After air has been released from the air system the transmission may still contain high pressure, before removing any air components on the gearbox, slowly loosen them to allow air pressure to be released. Failure to do so may cause components to violently separate causing serious eye and or personal injury.

Action

- Completely drain the compressed air from the pneumatic system
- Connect measurement tools according to illustration
- Apply compressed air to supply the gearbox with a minimum of 700 kPa (100 psi) to a maximum of 1000 kPa (145 psi)

X6: Air pressure sensor

The component is located inside of the Gearbox control unit (TECU)

Continue >Cancel

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product Online

What our technician found?/ KTV tìm thấy gì?

Tech Tool

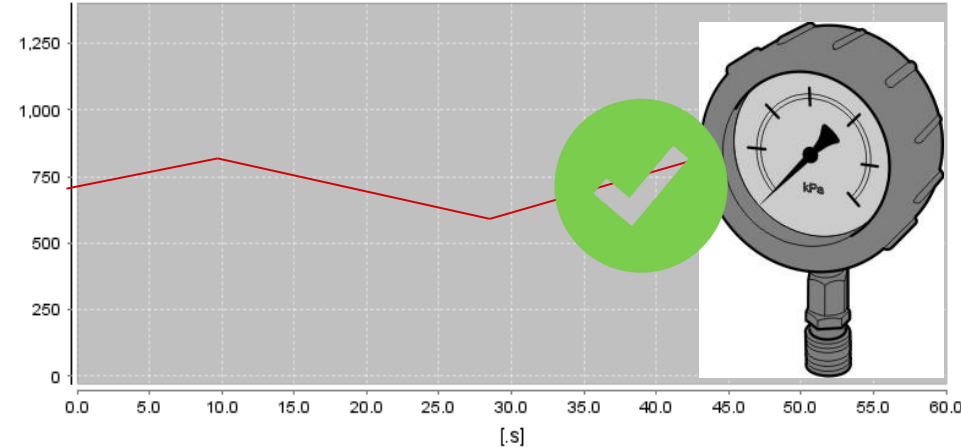
Tech Tool Links Help

Product Product History Diagnose Test Calibrate Program Impact

831 kPa

Air pressure sensor

Graph



☒ Air pressure sensor [kPa]

Information Execution

Action

Start the test

Evaluation

Check that the sensor value displayed in the test is approximately the same as the measured value using the pressure gauge

Additional information

- If a problem occurs, take notes of the time on the X-axis of the graph. The notes can be used as a reference when evaluating the recorded values in replay mode.
- After the test is performed, run the test again in replay mode to properly evaluate all signals and values
- When in replay mode, clicking on a graph places the marker at a certain time value, which is reflected also in the readouts. Slide the marker in the graph forwards or backwards to compare the graph to the digital readout at that point in time. Use the scroll bar at the bottom of the screen to move the readout of the recorded values forwards or backwards in time.

Closing actions

- Completely drain the compressed air from the pneumatic system
- Remove the tool when the procedure is finished

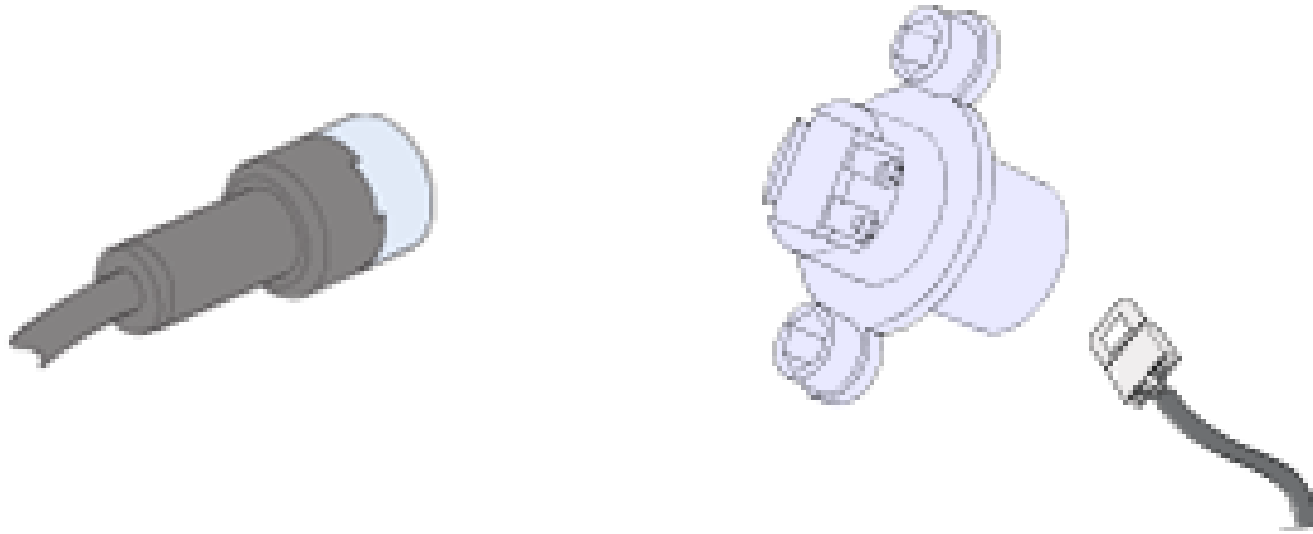
Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product

Online

Gearbox Sensors/ Cảm biến hộp số



40023-3 Gearbox speed sensors/ Cảm biến tốc độ hộp số

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ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

Engine speed - Sensor

Countershaft speed - Sensor

Main shaft speed - Sensor

40023-3 Gearbox speed sensors

Information >> Conditions >> Execution

Purpose

Check the speed sensors

Components to be tested are:

- Engine speed - Sensor
- Countershaft speed - Sensor
- Main shaft speed - Sensor

Description

Perform the test during a test drive

Continue >

Cancel

Chassis ID: JNCU 46856VIN: JNCMBP0G0LU046856Work Order: Tuas Qo

ProductOnline

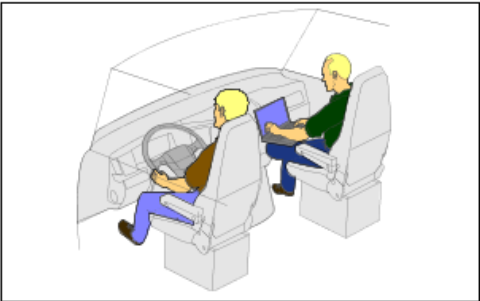
40023-3 Gearbox speed sensors/ Cảm biến tốc độ hộp số

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

1



40023-3 Gearbox speed sensors

Information >> Conditions >> Execution

Manual conditions

1

Two people must be in vehicle when test driving. One person to drive while the other activates the test on the driver's command. If this rule is not followed it can lead to personal injury or death.

☒

Confirmed

Continue >

Cancel

Chassis ID: JNCU 46856VIN: JNCMBP0G0LU046856Work Order: Tuas Qo

Product

Online

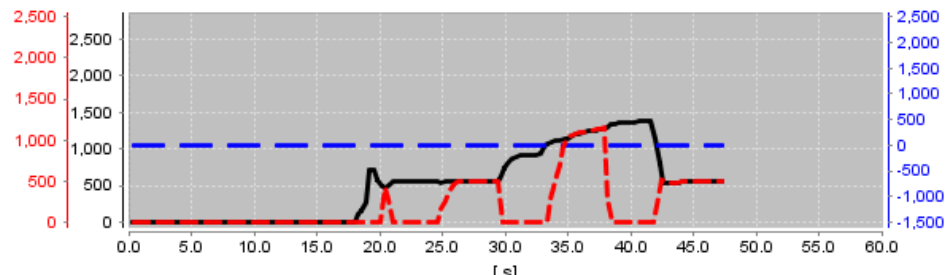
What our technicians found?/ KTV tìm thấy gì?

Tech Tool

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Product Product History Diagnose Test Calibrate Program Impact

▲ Sensor values



☒ Engine Speed [rpm]

☒ Main shaft speed [rpm]

☒ Countershaft speed [rpm]

▲ Sensor values

550 rpm Engine Speed

0 rpm Main shaft speed

492 rpm Countershaft Speed

40023-3 Gearbox speed sensors

Information >> Conditions >> Execution

Action

- Drive with 5th or 11th gear selected
- Drive at a constant speed with low or no load on the driveline
- Check the speed sensors RPM values in the graph

Evaluation

- The engine's speed- and main shaft sensors RPM are almost identical
- The countershaft sensor RPM should not differ more than ± 250 RPM when compared to the engine's speed- or main shaft sensor RPM, however the wave form should be identical

Test result

Select one of the following alternatives

☐ OK

☐ Not OK



No test drive happen due to the gear shifting problem

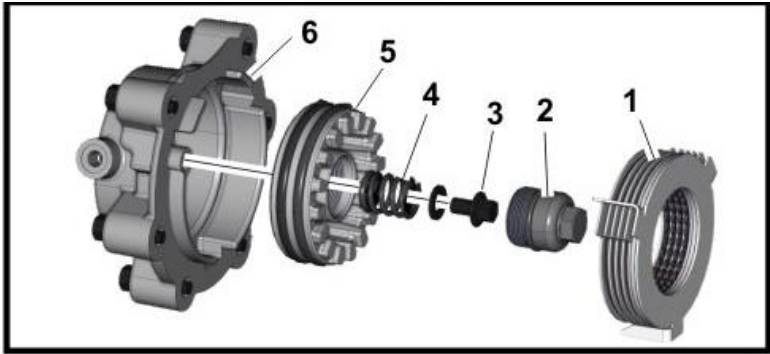
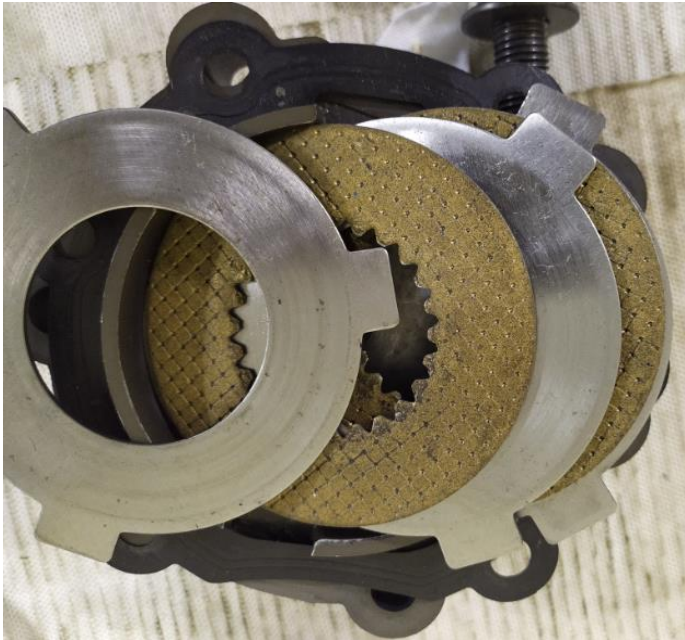
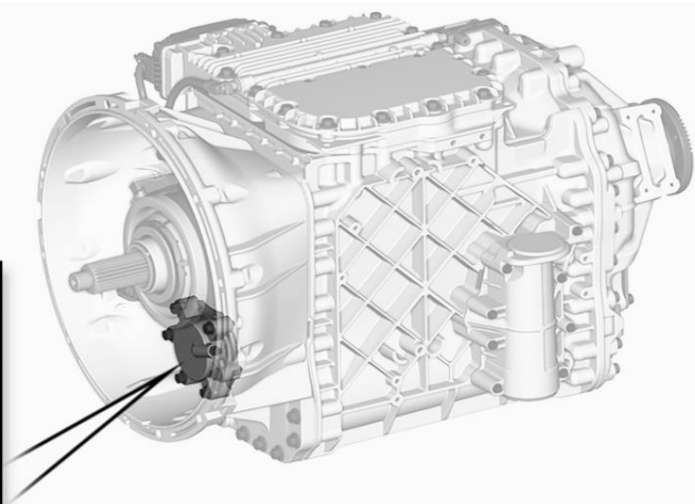
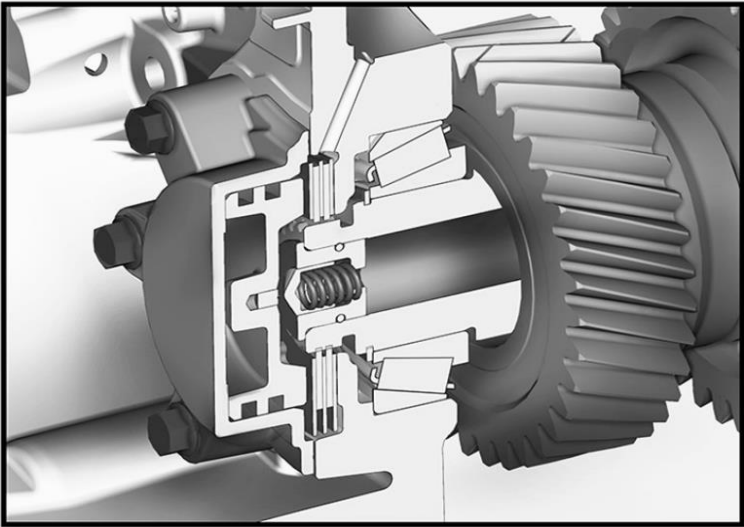
Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product Online

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Countershaft brake/ lá phanh trục trung gian



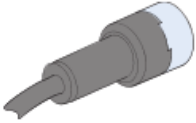
43126-3 Solenoid valve, gearbox brake/ van điện từ, phanh hộp số

Tech Tool

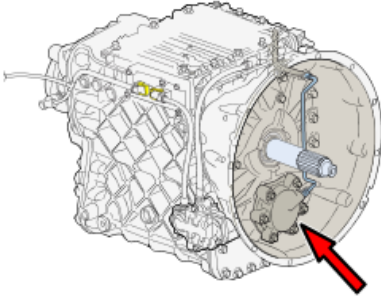
Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

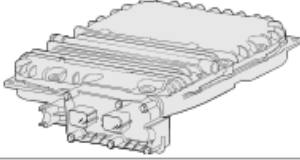
Speed sensor, counter shaft



Gearbox brake (Countershaft brake / Input shaft brake)



Solenoid valve



43126-3 Solenoid valve, gearbox brake (input shaft brake/ countershaft brake)

Information >> Conditions >> Execution

Purpose

Check braking effect of gearbox brake (countershaft brake / input shaft brake)

Components to be tested are:

- Speed sensor, counter shaft
- Gearbox brake (Countershaft brake / Input shaft brake)
- Solenoid valve

Description

During the test the Transmission Control Module (TCM) will activate the transmission solenoid valve for the gearbox brake (countershaft brake / input shaft brake) actuator and record the braking effect time

1				
2		> 400 rpm	540 rpm	
3		> 650 kPa	809 kPa	
4		N	N	

Continue >

Cancel

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

 Product

 Online

What our technician found?/ KTV tìm thấy gì?

Tech Tool

Tech Tool Links Help

Product Product History Diagnose Test Calibrate Program Impact

817 kPa Air pressure

Solenoid valve

Retardation time with braking

Retardation time without braking

Brake activated short time

43126-3 Solenoid valve, gearbox brake (input shaft brake/ countershaft brake)

Information >> Conditions >> Execution

Action

- Start the test
- Repeat twice

Evaluation

Check that values are within limits and that the status icon turns green

Note! For Retardation time without braking to be successful, the action should take less than 19 (19000 ms) seconds

Test result

Select one of the following alternatives

☐ OK

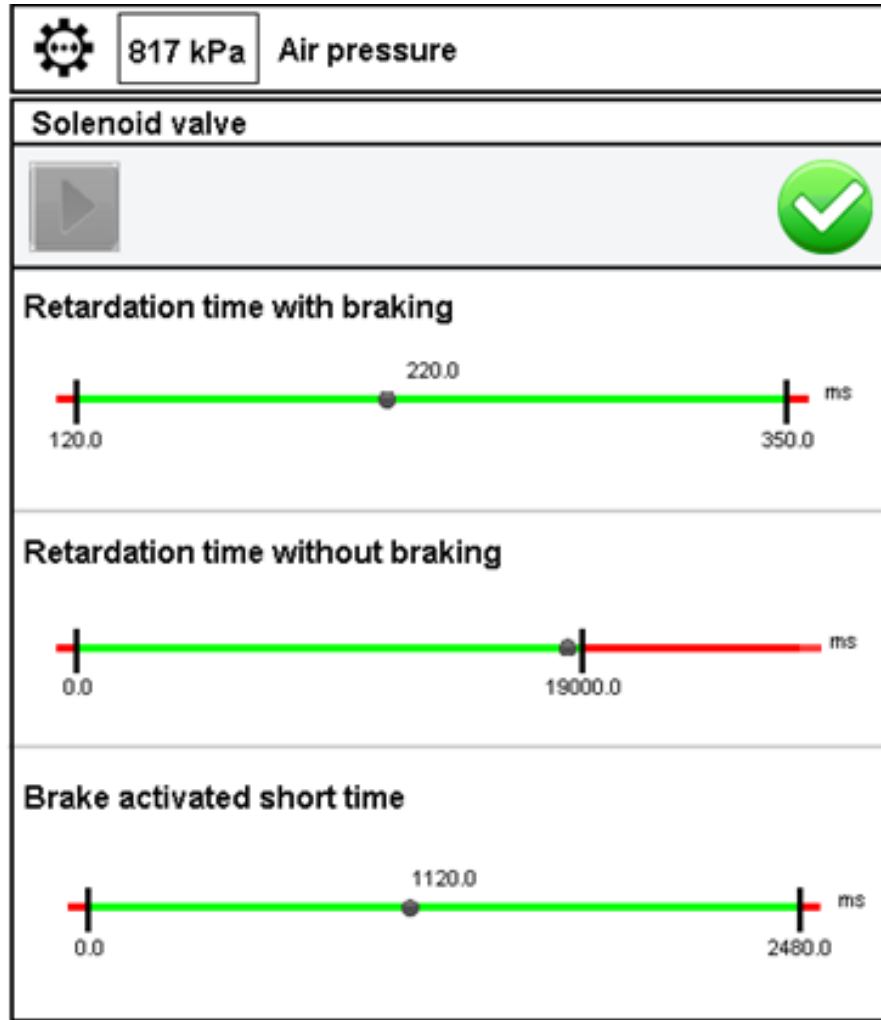
☐ Not OK

Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product Online

Probable courses of the fault/ Các nguyên nhân của lỗi:

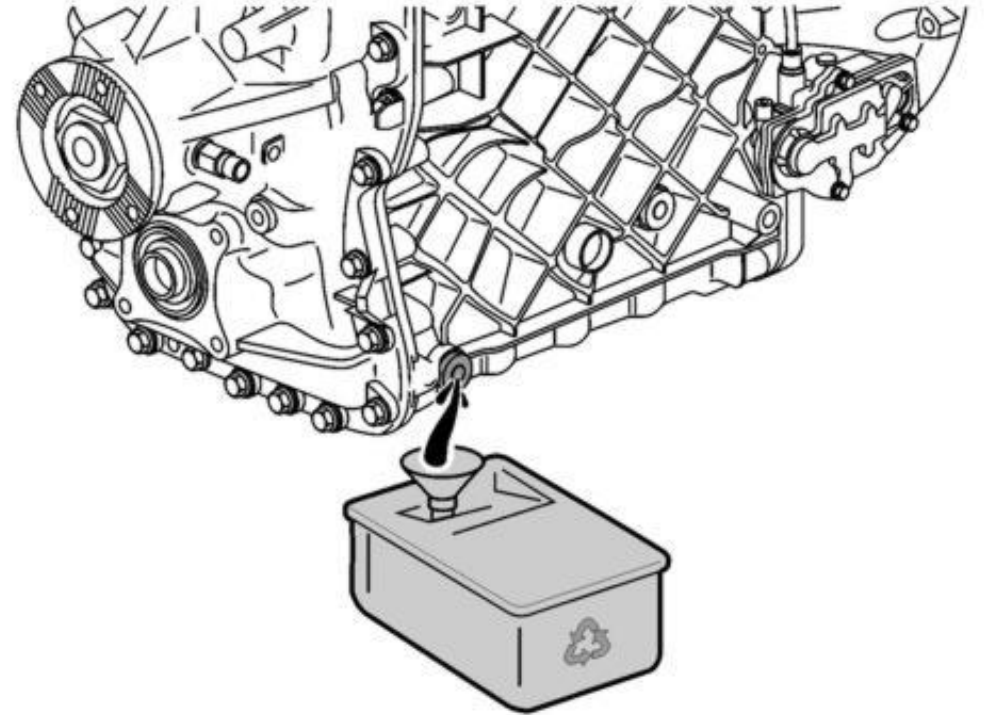
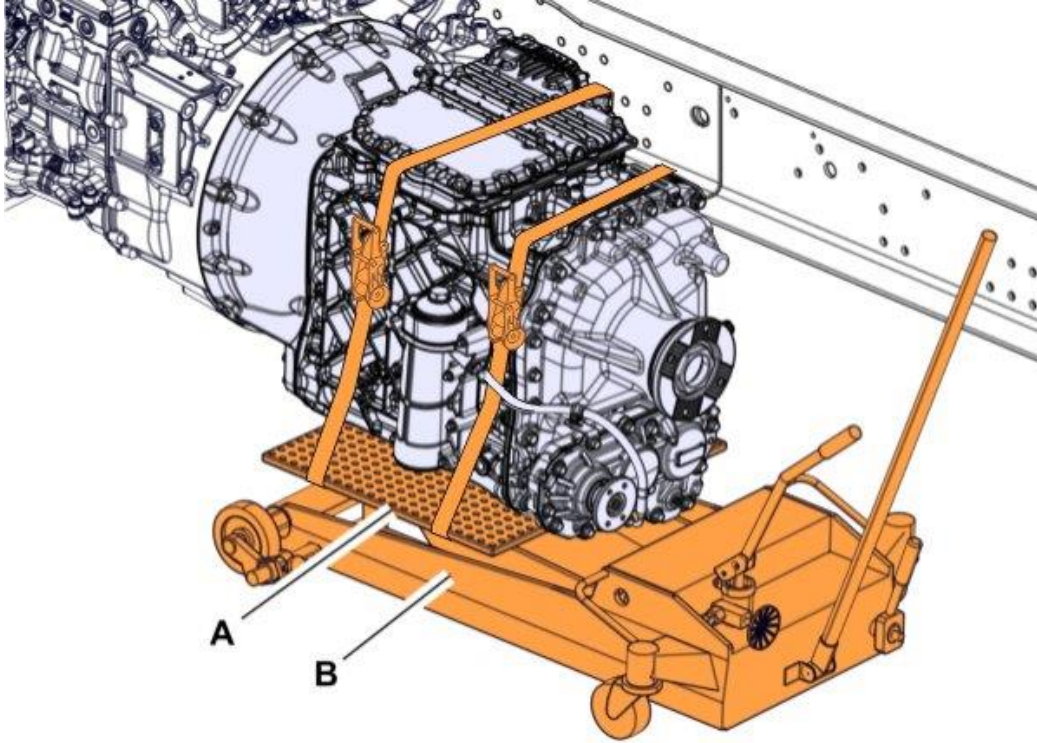


- Leakage/ rò rỉ
 - Worn discs/ mòn đĩa
 - Fault in the countershaft brake system
- Lỗi trong hệ thống trục truyền chung



Remove the gearbox and drain the oil

Tháo hộp số và xả nhớt

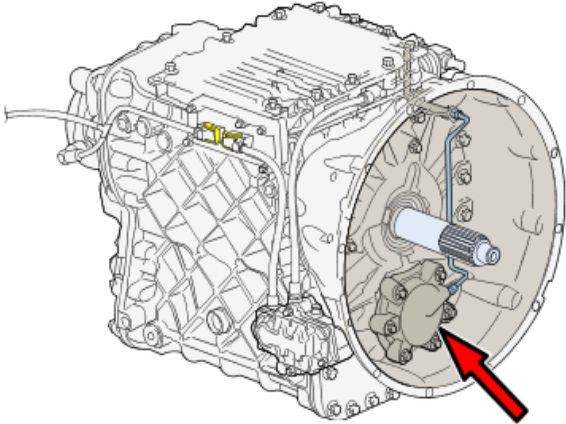


43128-3 Solenoid valve, removed gearbox/ van điện từ, hộp số đã tháo

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact



43128-4 Solenoid valve, gearbox brake (input shaft brake/countershaft brake)(Gearbox removed)

Information >> Conditions >> Execution

Purpose

Check for air leaks on the gearbox brake (countershaft brake / input shaft brake) while operating the solenoid valve

Components to be tested are:

Gearbox brake (countershaft brake / input shaft brake) control air system

Description

During the test the Transmission Control Module (TCM) will activate the transmission solenoid valve for the gearbox brake (countershaft brake / input shaft brake) actuator

Continue >Cancel

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

ProductOnline

43128-3 Solenoid valve, removed gearbox/ van điện từ, hộp số đã tháo

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

43128-4 Solenoid valve, gearbox brake (input shaft brake/countershaft brake)(Gearbox removed)

Simulation

Information >> Conditions >> Execution

If performing a gearbox removed operation and Tech Tool is connected to the product's main diagnostic connector, you must first click Finish Work under the Product tab, then start a new session once you are connected to the gearbox using the special tools displayed in the illustration

Action

- Connect special tools according to illustration
- Apply compressed air to supply the gearbox with a minimum of 700kPa (100 psi) to a maximum of 1000kPa (145 psi)

< Back

Continue >

Cancel

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

ProductOnline

UD TRUCKS

43128-3 Solenoid valve, removed gearbox/ van điện từ, hộp số đã tháo

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

1

> 20 V

21 V

2

> 650 kPa

683 kPa

3

43128-4 Solenoid valve, gearbox brake (input shaft brake/countershaft brake)(Gearbox removed)

Simulation

Information >> Conditions >> Execution

Automatically checked conditions

1 Gearbox Supply voltage above 20 V

2 Air pressure above 650 kPa

Manual conditions

3 Transmission Control Unit (TECU) disconnected from vehicle communication connector

Confirmed

Continue >

Cancel

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product

Online

 UD TRUCKS

What our technician found?/ KTV tìm thấy gì?

Tech Tool

Tech Tool Links Help

Product Product History Diagnose **Test** Calibrate Program Impact

650 kPa Air pressure

Solenoid valve

43128-4 Solenoid valve, gearbox brake (input shaft brake/countershaft brake)(Gearbox removed)

Simulation

Information >> Conditions >> Execution

Action

If performing a gearbox removed operation and Tech Tool is connected to the product's main diagnostic connector, you must first click Finish Work under the Product tab, then start a new session once you are connected to the gearbox using the special tools displayed in the illustration

- Start the test
- Perform leak check by listening or using soapy water

Test result

Select one of the following alternatives

☐ OK

☐ Not OK

Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

Product Online

Clutch plate visual checks and measurement

Kiểm tra và đo trực quan đĩa ly hợp

Độ dày đĩa: **11mm**
Mòn tối đa: **3 mm**
1.5 mm mòn bên hông



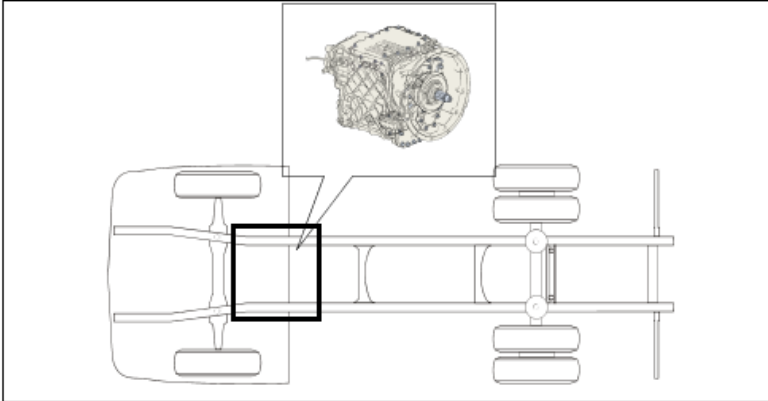
40091-3 Gear activation/ kích hoạt số

Tech Tool

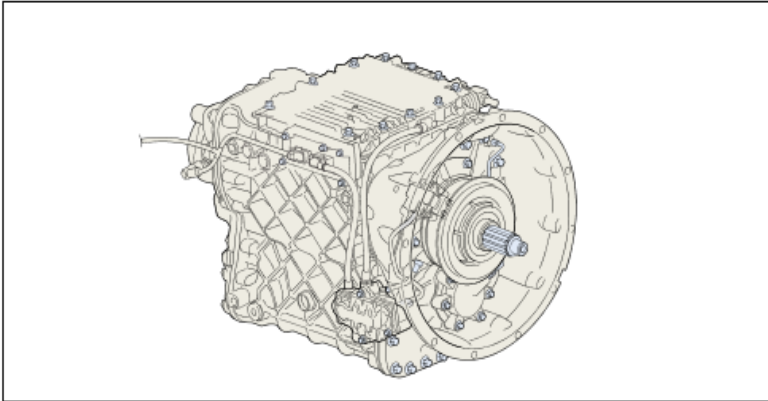
Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

A



B



40091-3 Gear activation, control housing (for removal/replacement)

Information >> Conditions >> Execution

Purpose

To arrange the gears in a certain position to allow for the proper removal/replacement of the Gearbox control unit (TECU) on the gearbox

Selections

Select the illustration corresponding to the method or test to be performed

A

Gearbox installed

1  = 0 rpm0 rpm 

B

Gearbox removed

2  = 0 km/h0 km/h 

3  > 650 kPa834 kPa 

4 

Continue >

Cancel

Chassis ID: JNCU 46856VIN: JNCMBP0G0LU046856Work Order: Tuas Qo

 Product

 Online

40091-3 Gear activation/ kích hoạt số

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

Activation of gears

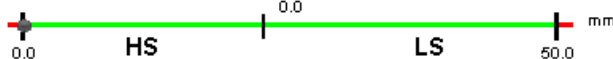


 833 kPa Air pressure

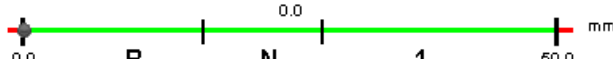


Cylinder position

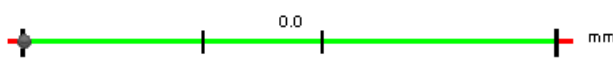
Split

 0.0 mm
HSLS

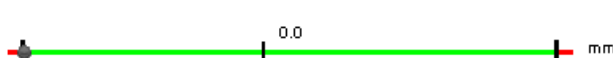
R-N-1

 0.0 mm
RN1

2-N-3

 0.0 mm
2N3

Range

 0.0 mm
LRHR

40091-3 Gear activation, control housing (for removal/replacement)

Information >> Conditions >> Execution

Action

Start the test

 **Note!** In order to perform this test properly, air pressure must always be in the normal operating range

 **WARNING**

While performing this test, the actuator moves with considerable force. The actuator can crush fingers or pinch hands if not kept away. To avoid injury, keep body parts clear of the actuator.

Evaluation

The position for each graph should correspond to the expected value in the table

Expected value:

Cylinder	Split	R-N-1	2-N-3	Range
Cylinder Position	LS	R	N	HR

Closing actions

When the test is complete, removal/replacement of the Gearbox control unit (TECU) can be performed

Continue >

Chassis ID: JNCU 46856 VIN: JNCMBP0G0LU046856 Work Order: Tuas Qo

 UD TRUCKS

 Product  Online

40091-3 Gear activation/ kích hoạt số

Tech Tool

Tech ToolLinksHelp

ProductProduct HistoryDiagnoseTestCalibrateProgramImpact

Activation of gears

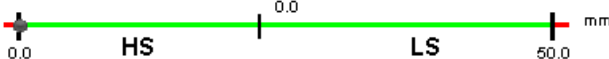


 **833 kPa** Air pressure

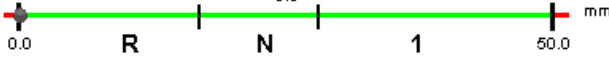


Cylinder position

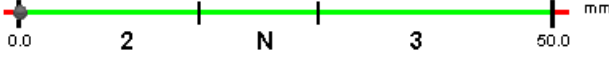
Split



R-N-1



2-N-3



Range

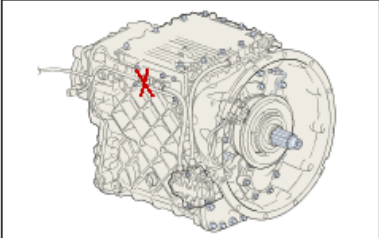


Cylinder PositionLSRNRHR

Closing actions

When the test is complete, removal/replacement of the Gearbox control unit (TECU) can be performed

 **Note!** Disconnect the Transmission Control Unit (TECU) connector before turning off the key or exiting the test, otherwise the gearbox will be shifted back to neutral position



Test result

Select one of the following alternatives

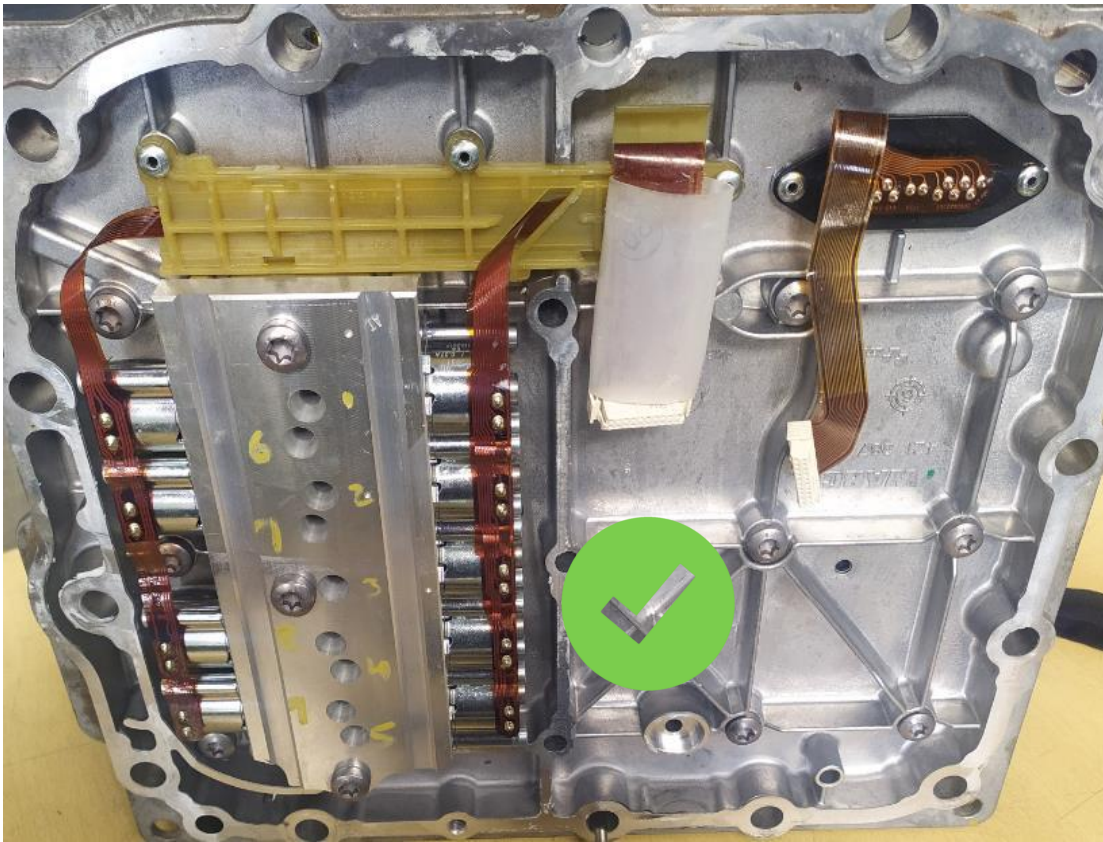
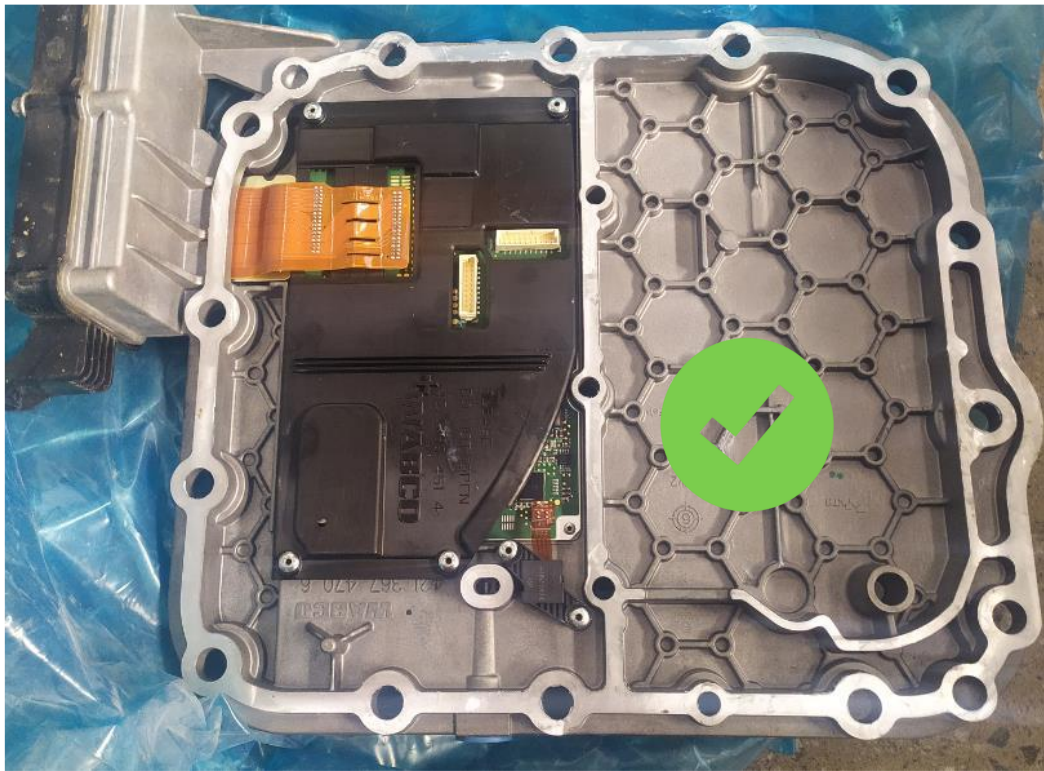
☐ OK☐ Not OK

Continue >

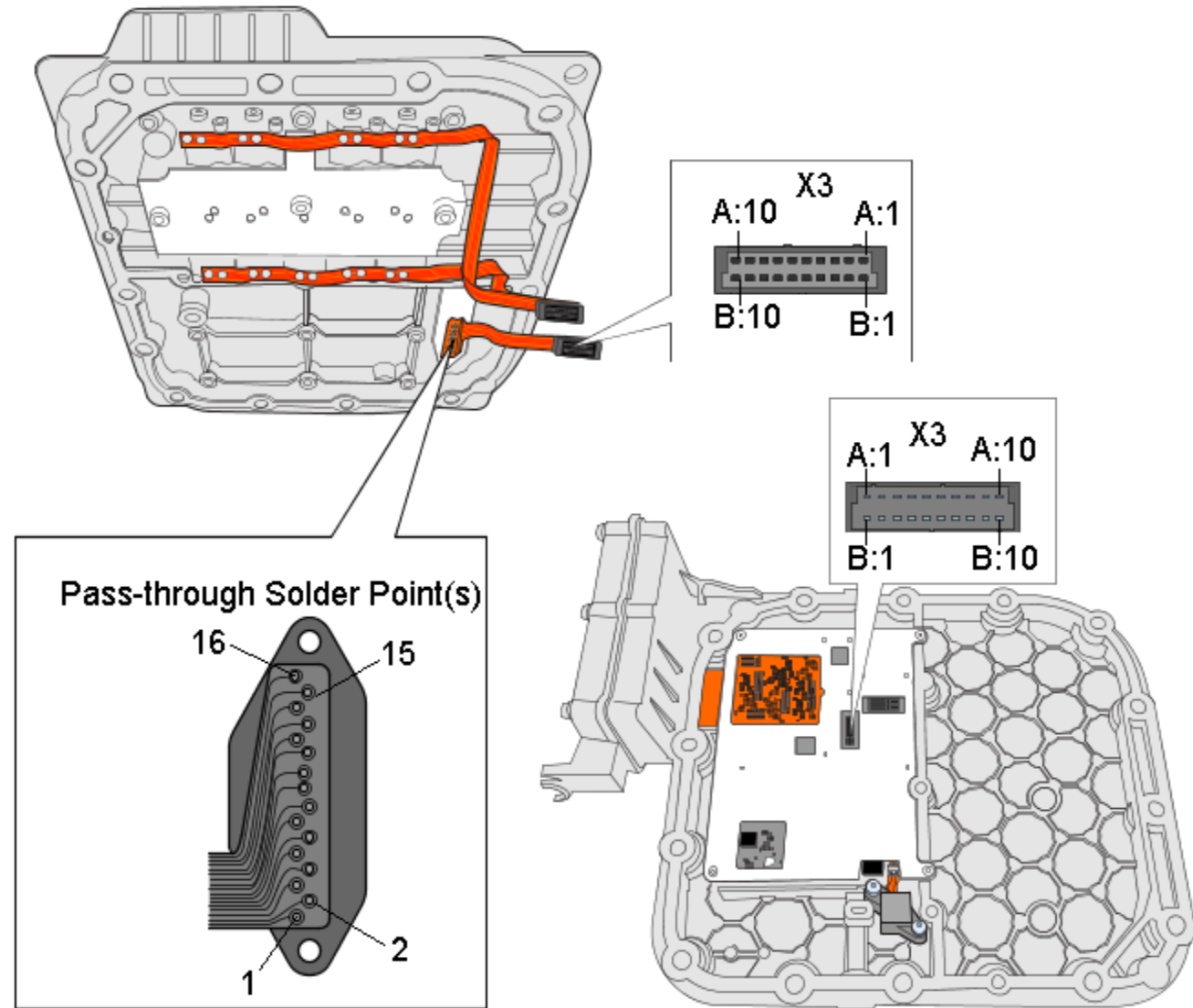
Chassis ID: JNCU 46856VIN: JNCMBP0G0LU046856Work Order: Tuas Qo

ProductOnline

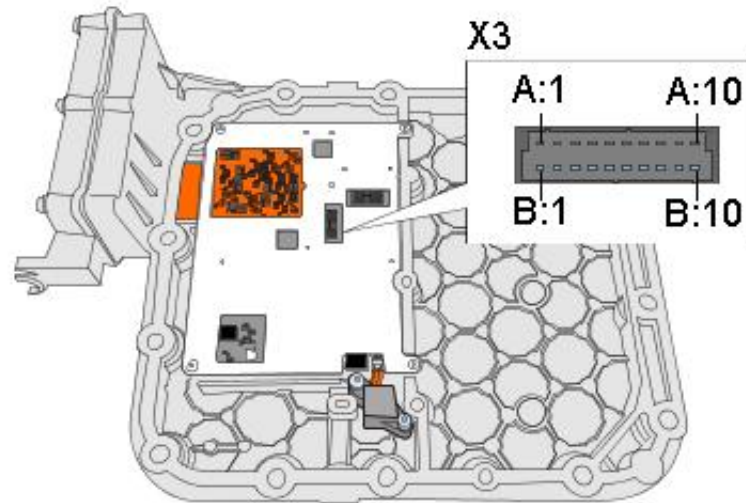
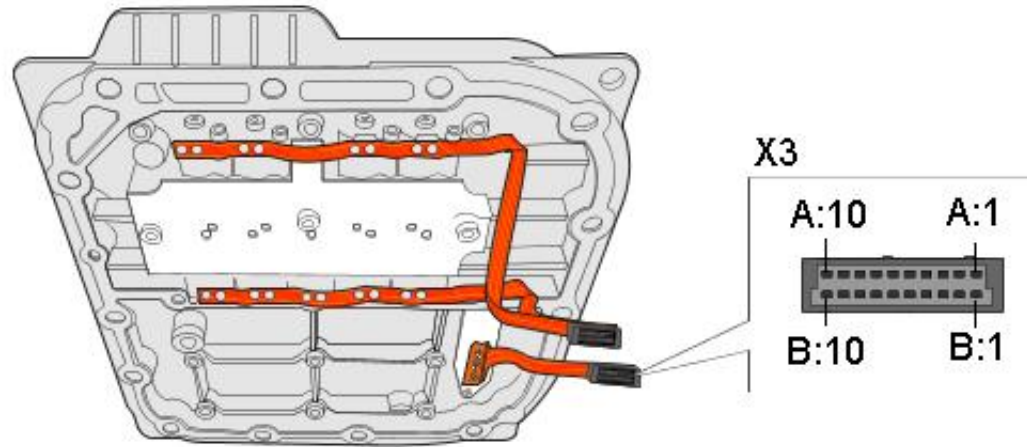
GCU visual checks/ Kiểm tra trực quan GCU



Main shaft Sensor – Checks/ Kiểm tra cảm biến trục chính



Visual checks/ Kiểm tra trực quan

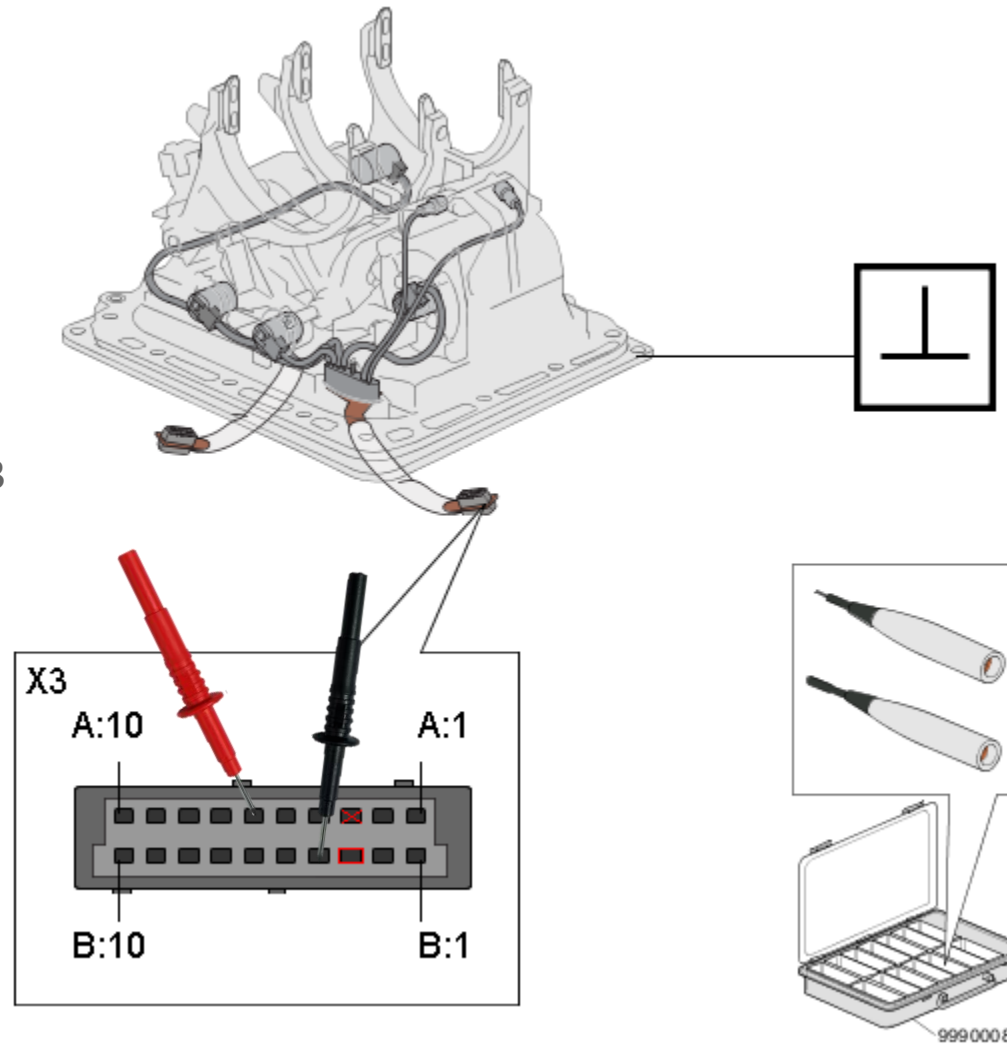


Short circuit checks/ Kiểm tra ngắn mạch

Chân A13B.X3:b3

All other pins except **a3** at connector X3
Ground point
Tất cả các chân khác trừ **a3** tại kết nối
X3 điểm nối mass

Open circuit/ Hở mạch

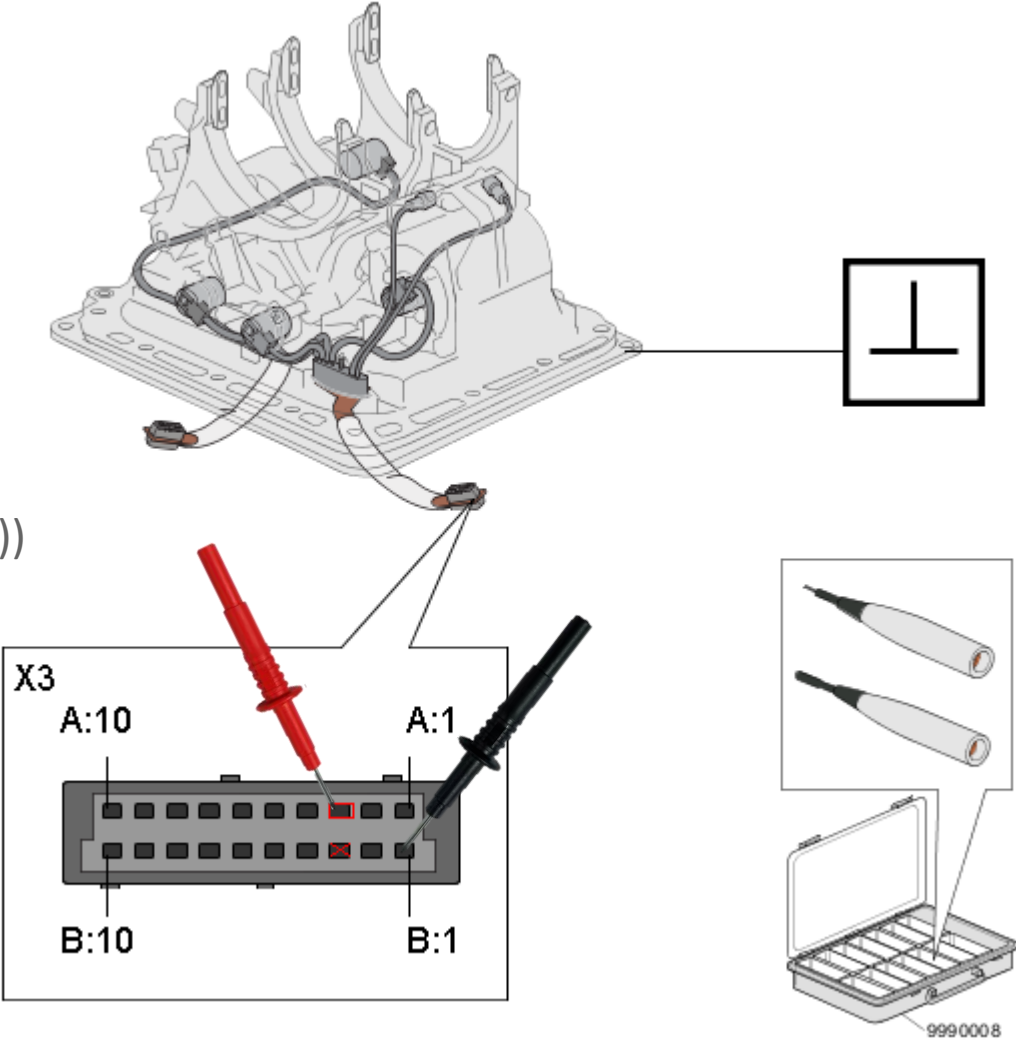


Short circuit checks/ Kiểm tra ngắn mạch

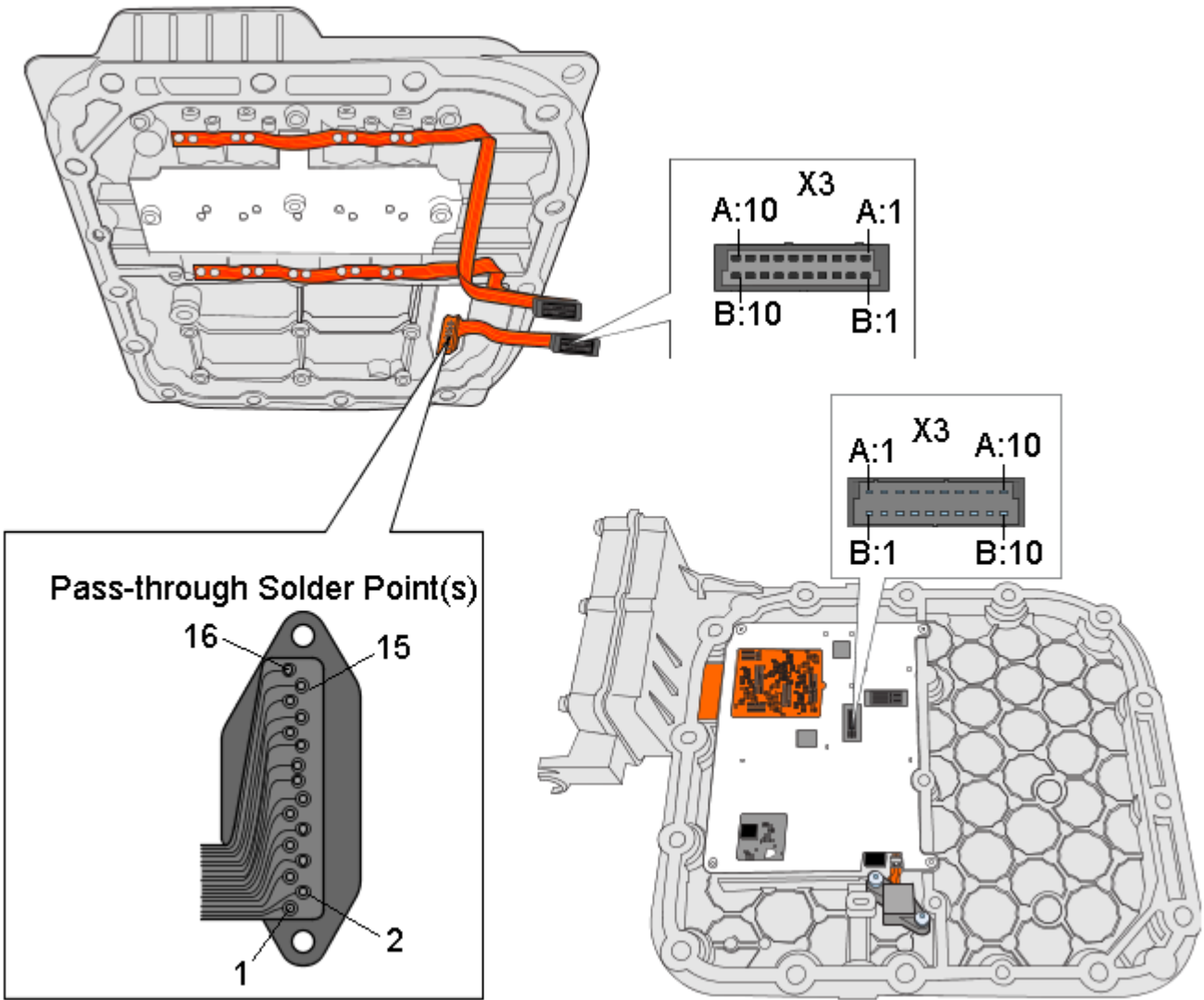
Pin X3:a3

All other pins except **b3** at connector X3
Ground point (Gearbox control unit (TECU))
Tất cả các chân khác trừ **a3** tại kết nối
X3 điểm nối mass (TECU)

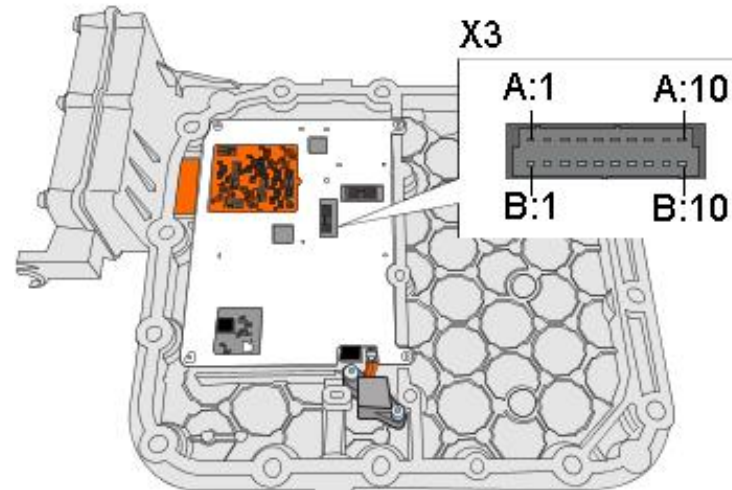
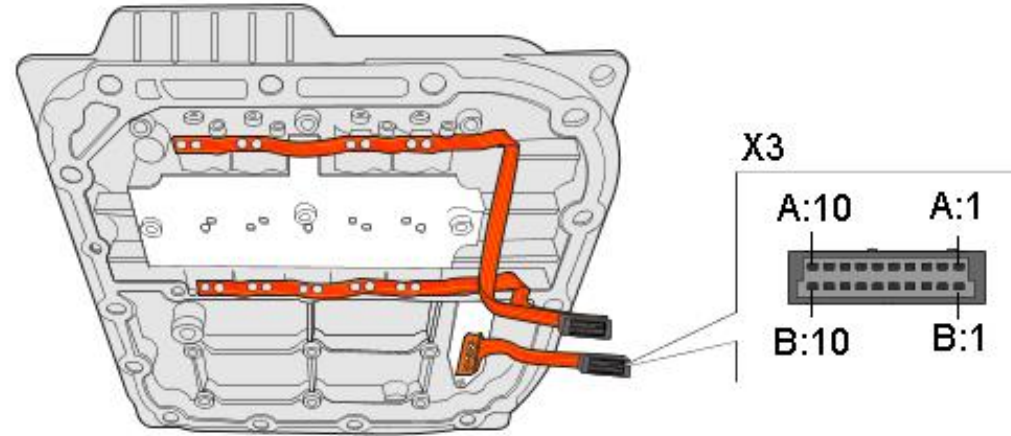
Open circuit/ hở mạch



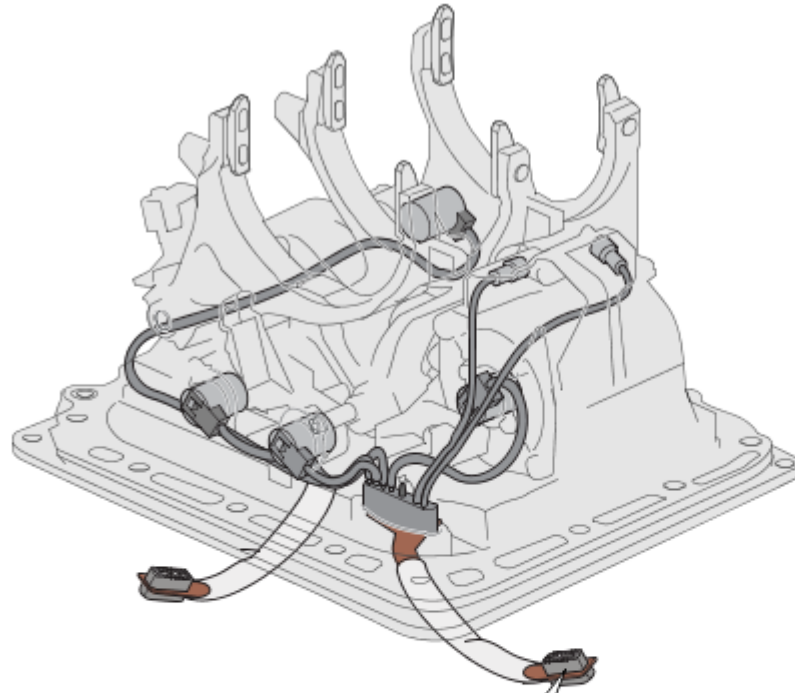
Counter shaft sensor checks/ Kiểm tra cảm biến trục trung gian



Visual checks/ Kiểm tra trực quan

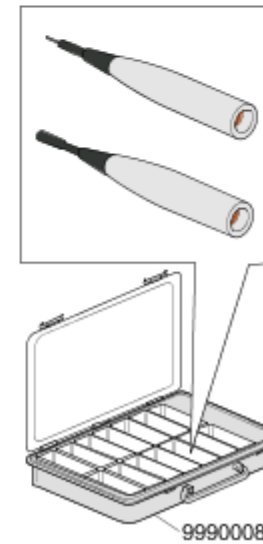
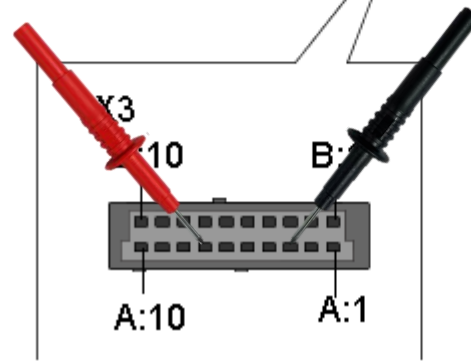


Resistant checks/ Kiểm tra điện trở

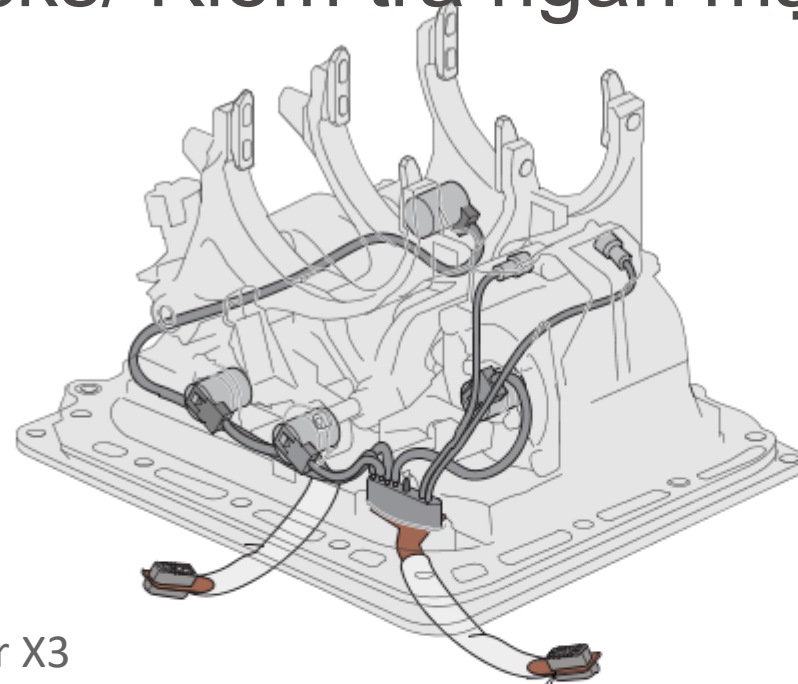


Chân X3:b2
Chân X3:a2

1.03 to 1.3 K Ω



Short circuit checks/ Kiểm tra ngắn mạch



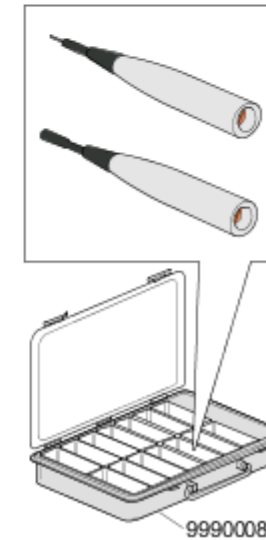
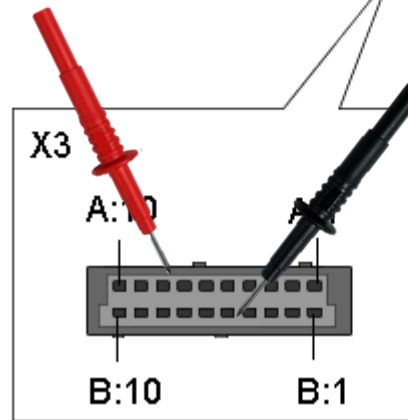
Chân X3:b2

All other pins except **a2** at connector X3

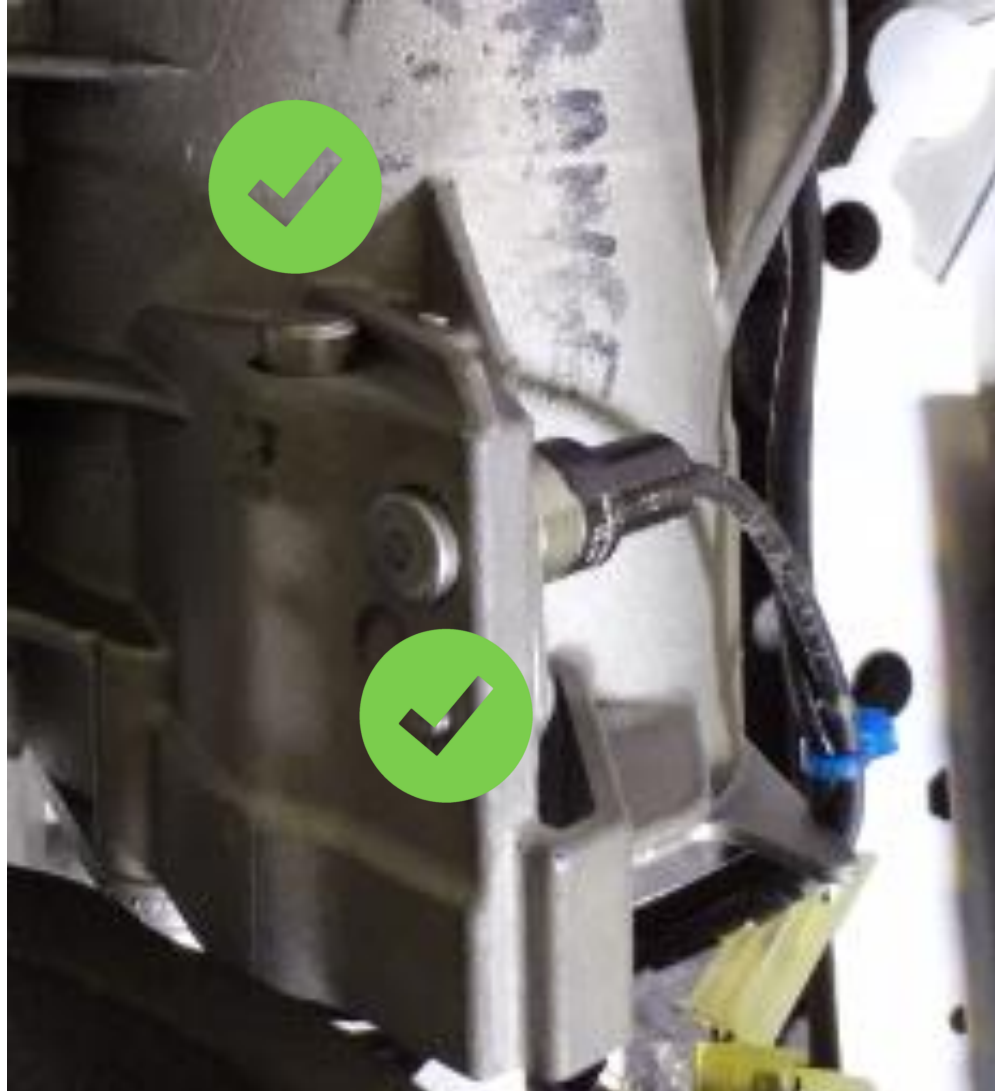
Tất cả các chân khác trừ **a2** tại kết nối

X3

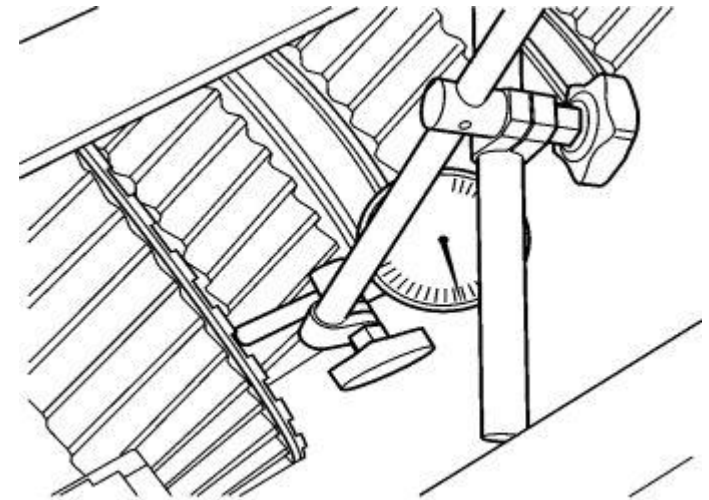
Open Circuit/ hở mạch



Speed sensor visual checks/ Kiểm tra trực quan cảm biến tốc độ



Sensor wheel checks/ Kiểm tra bánh răng cảm biến



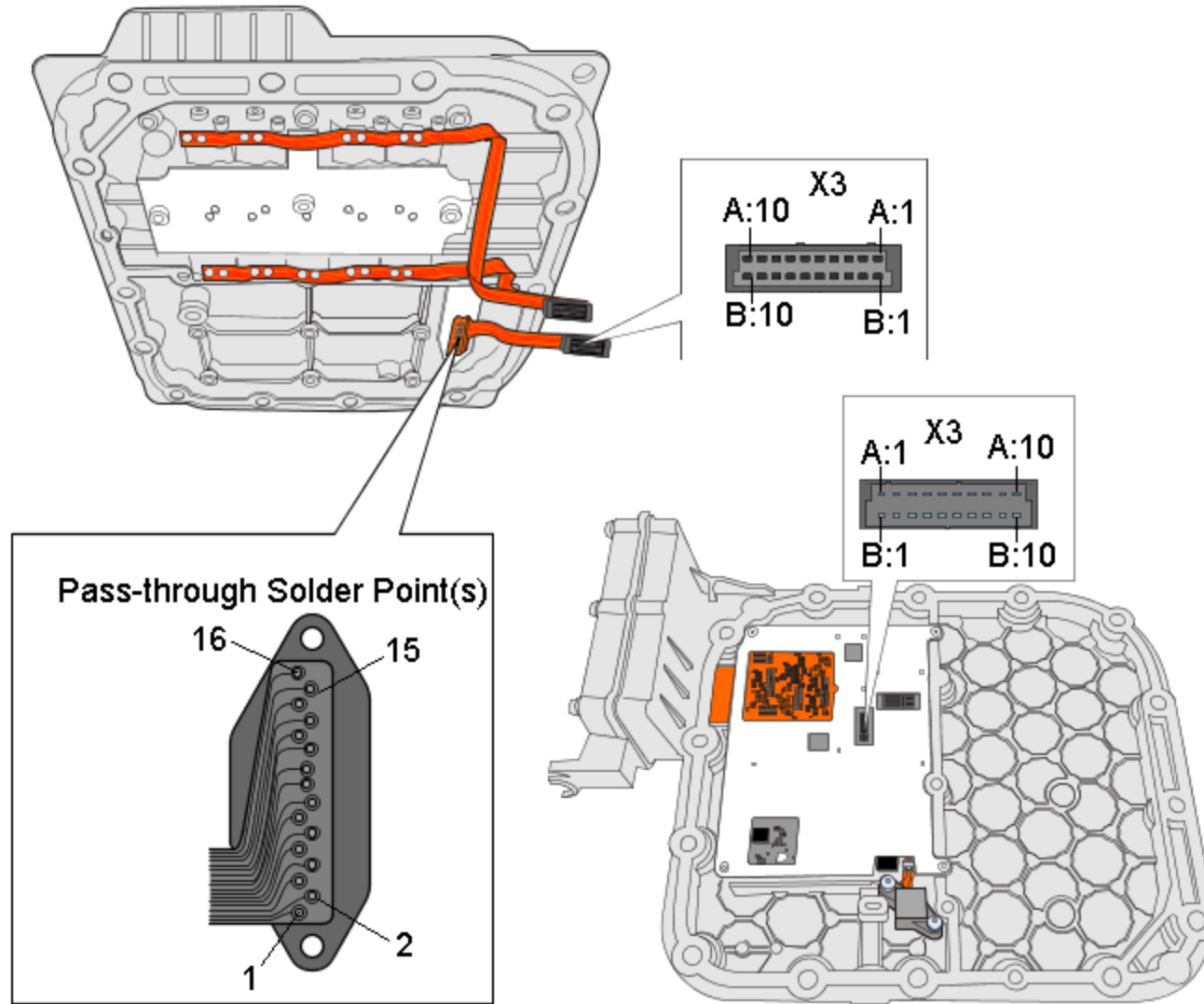
The measuring tip of the dial gauge must be **2 mm** below the teeth. The maximum permitted runout is **0.4 mm**.

Đầu đo của đồng hồ so phải nằm dưới răng **2mm**. Độ đảo tối đa cho phép là **0,4mm**

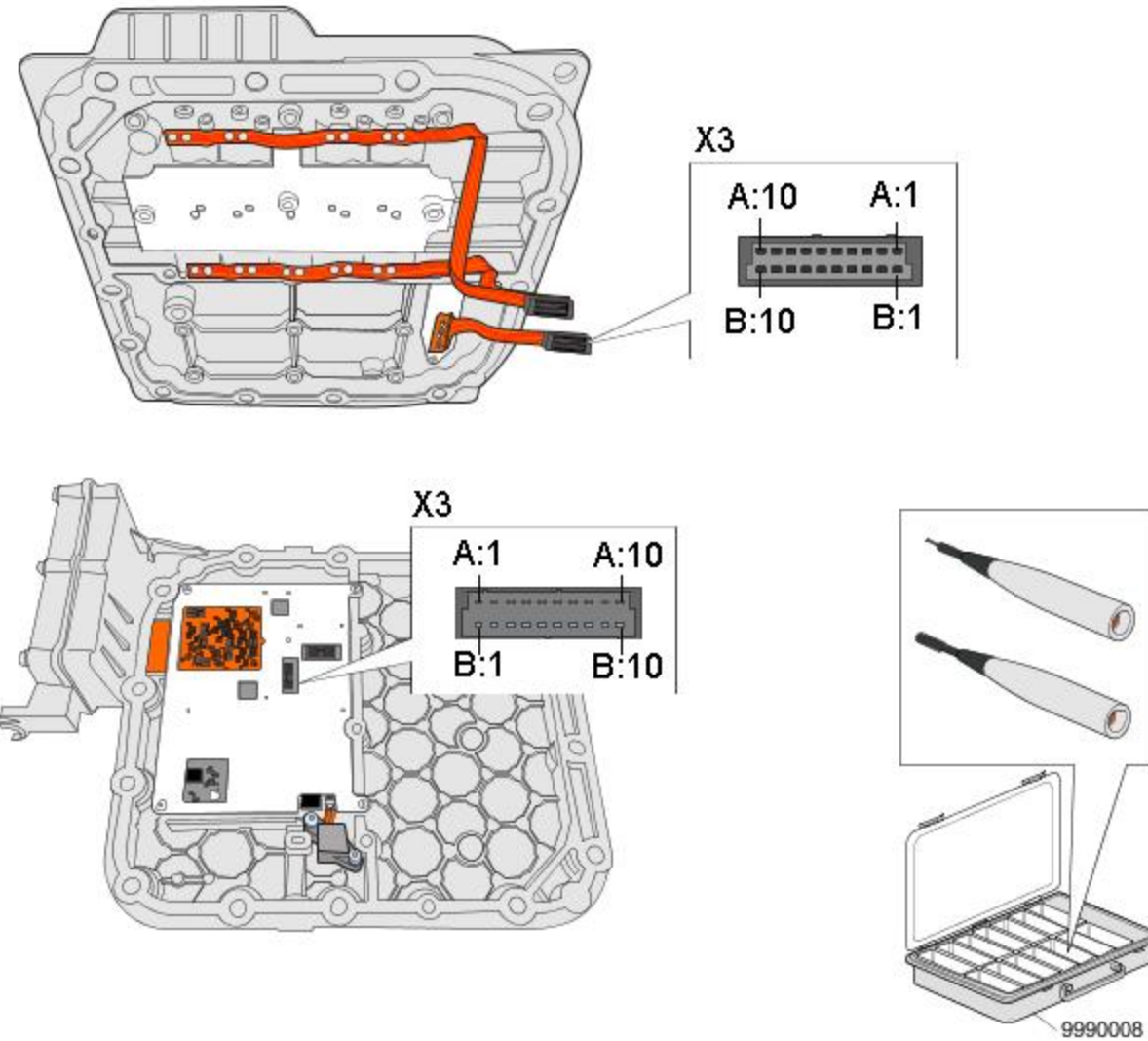
Position sensors/ Cảm biến vị trí



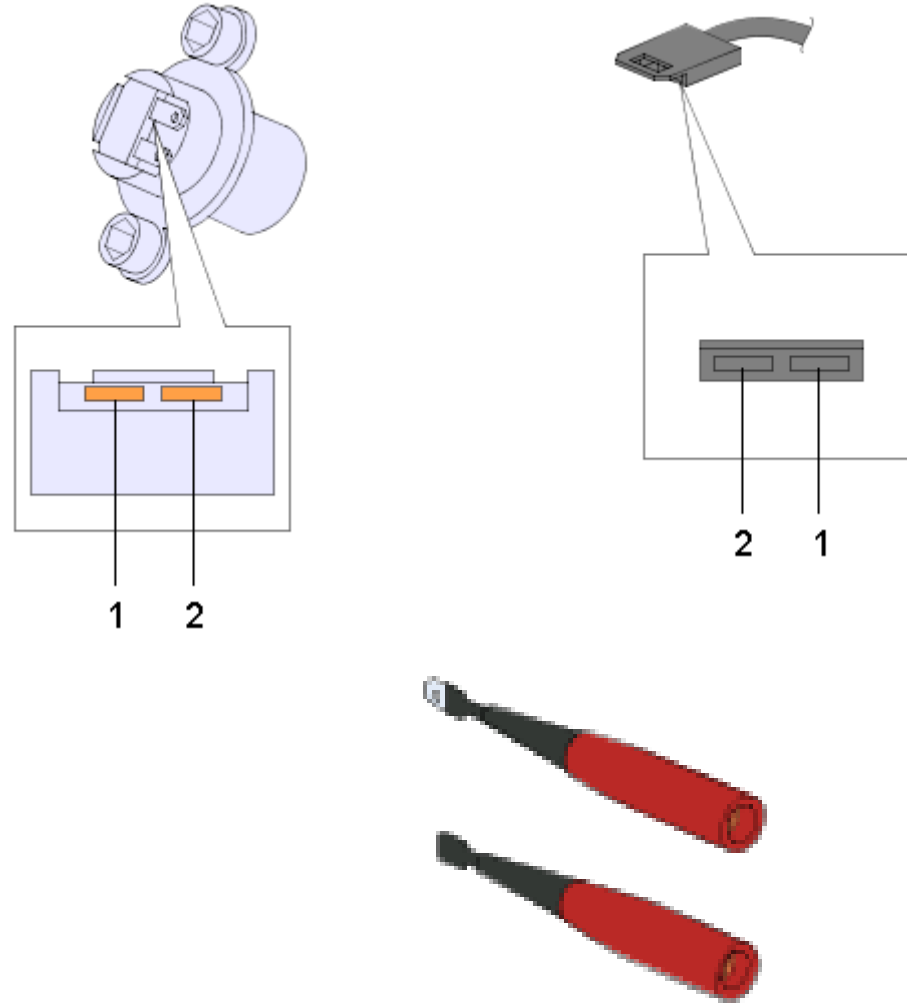
Visual checks/ Kiểm tra trực quan



Visual checks/ Kiểm tra trực quan

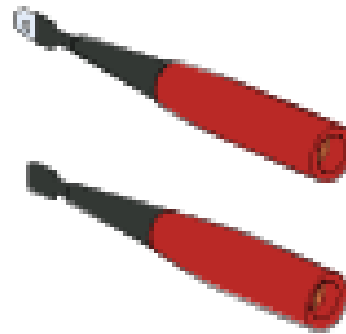
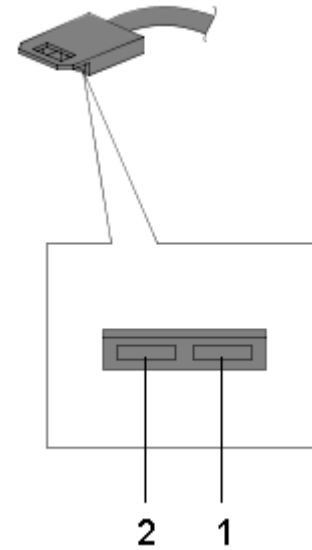
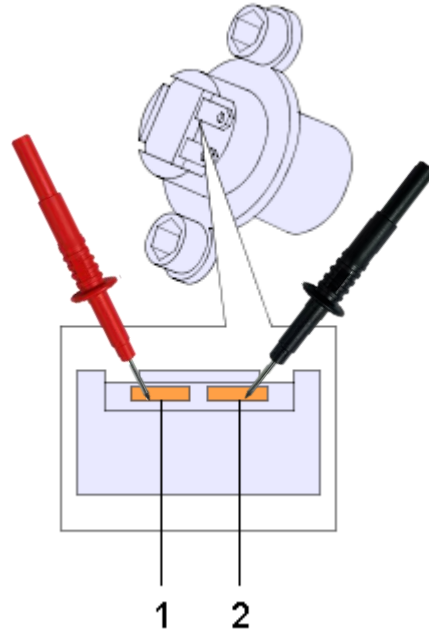


Visual checks/ Kiểm tra trực quan

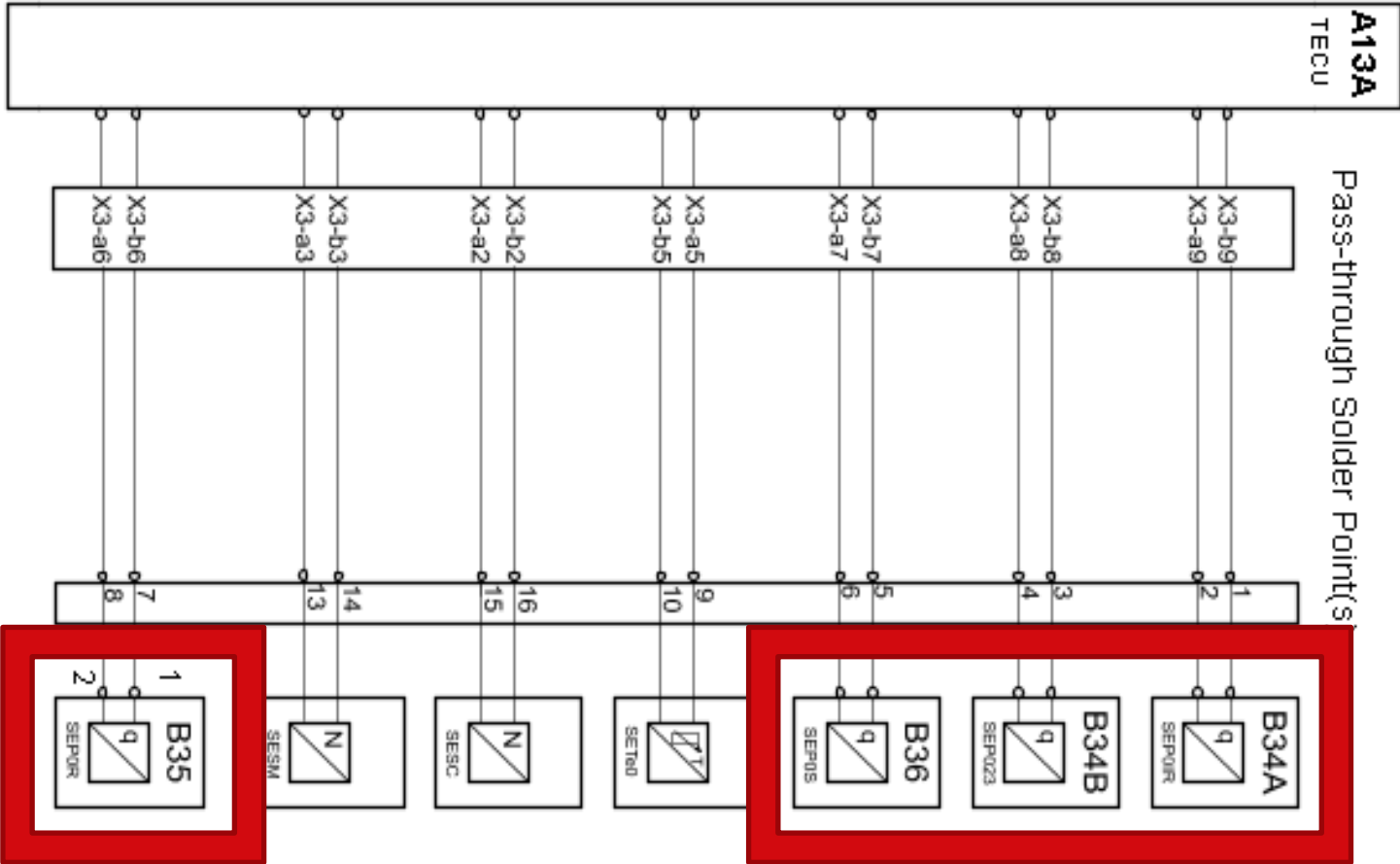
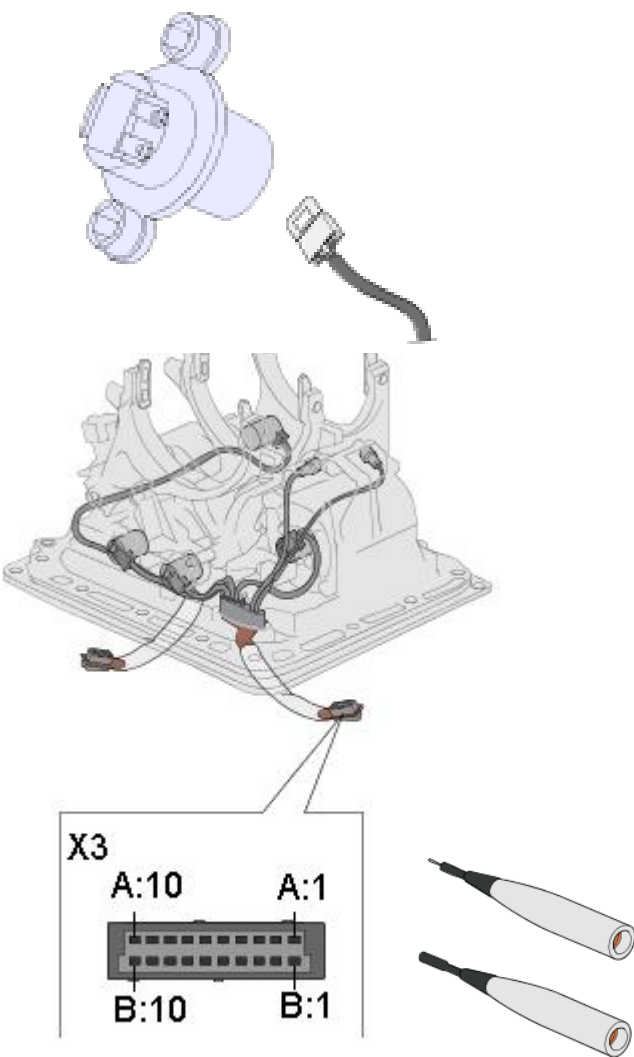


Resistant checks/ Kiểm tra điện trở

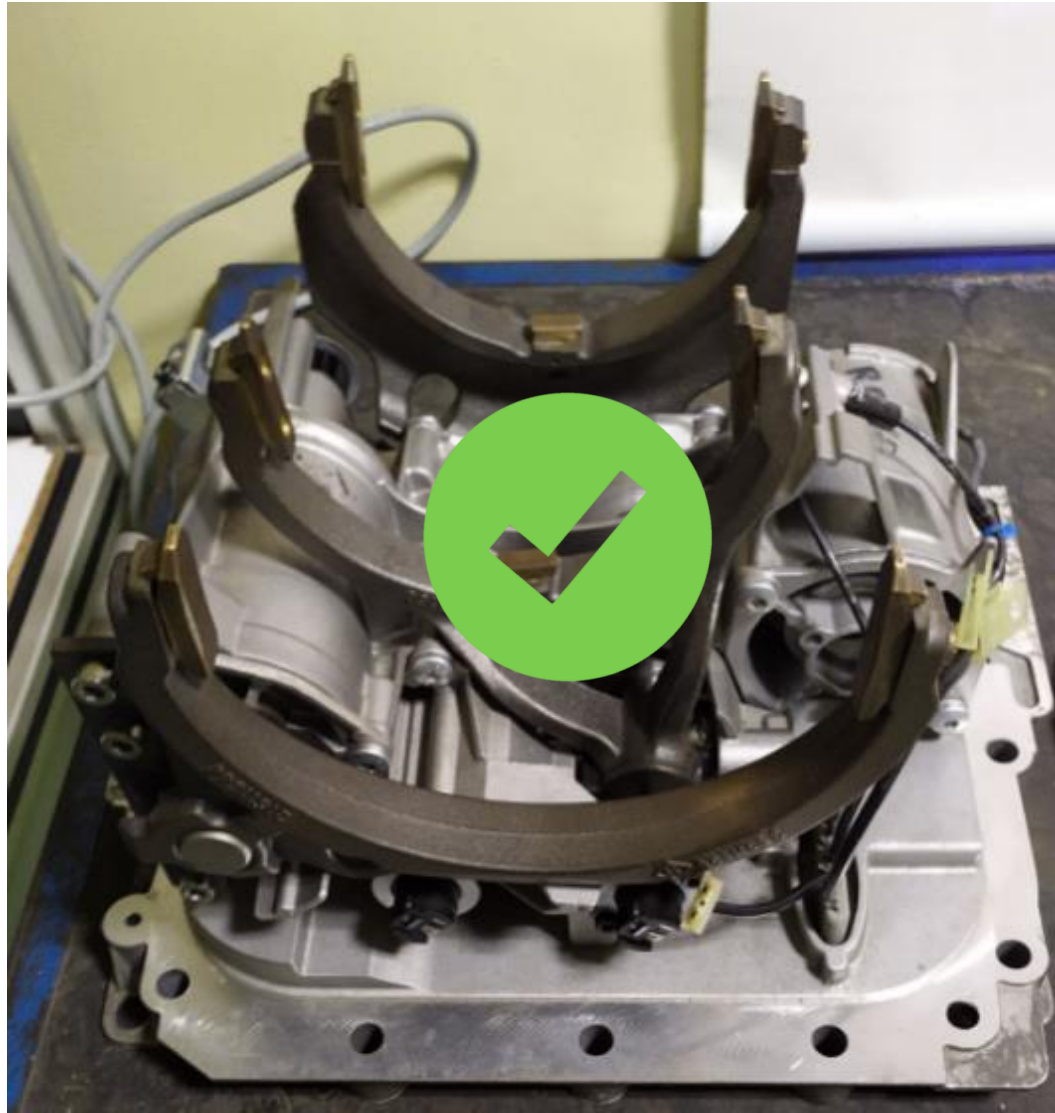
61 to 77 Ω



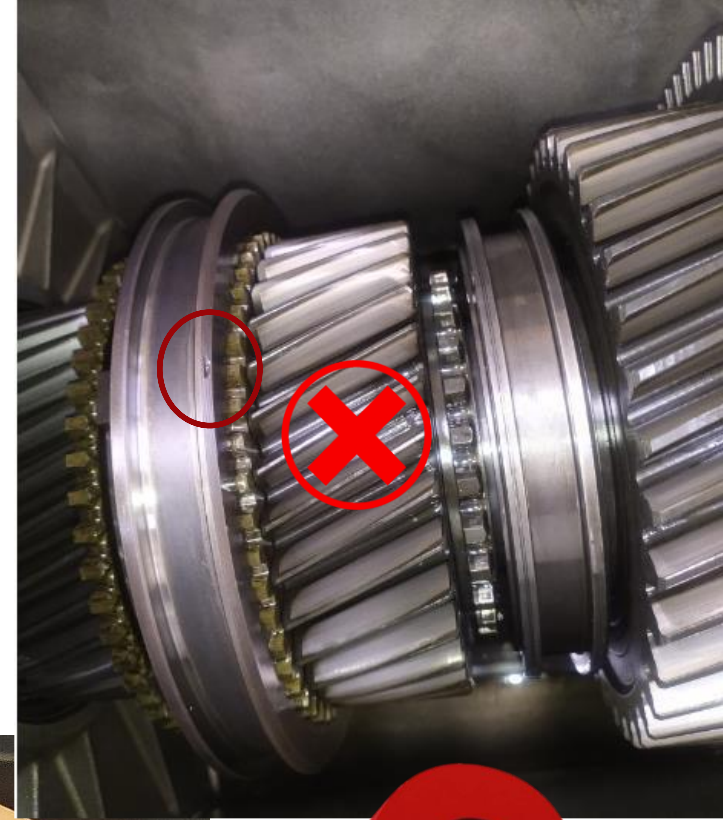
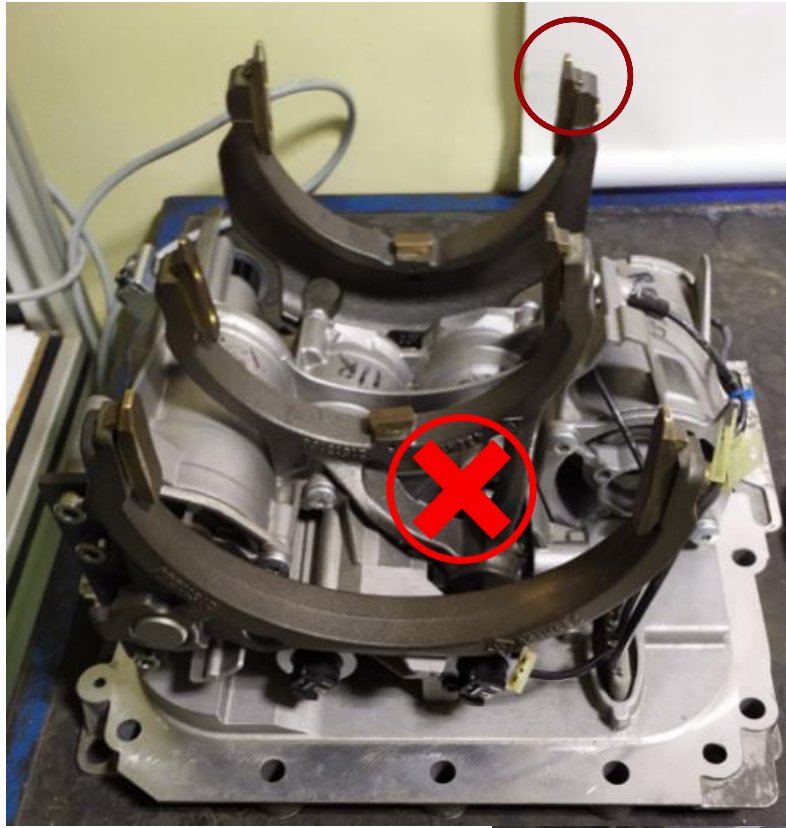
Short circuit checks/ Kiểm tra ngắn mạch



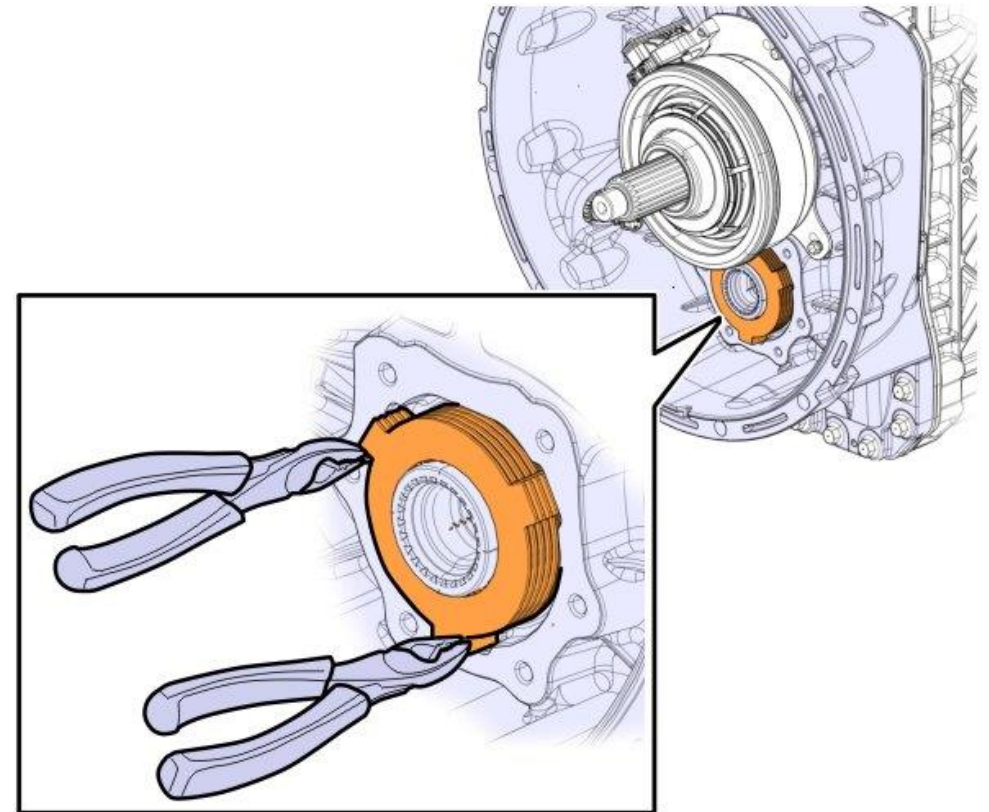
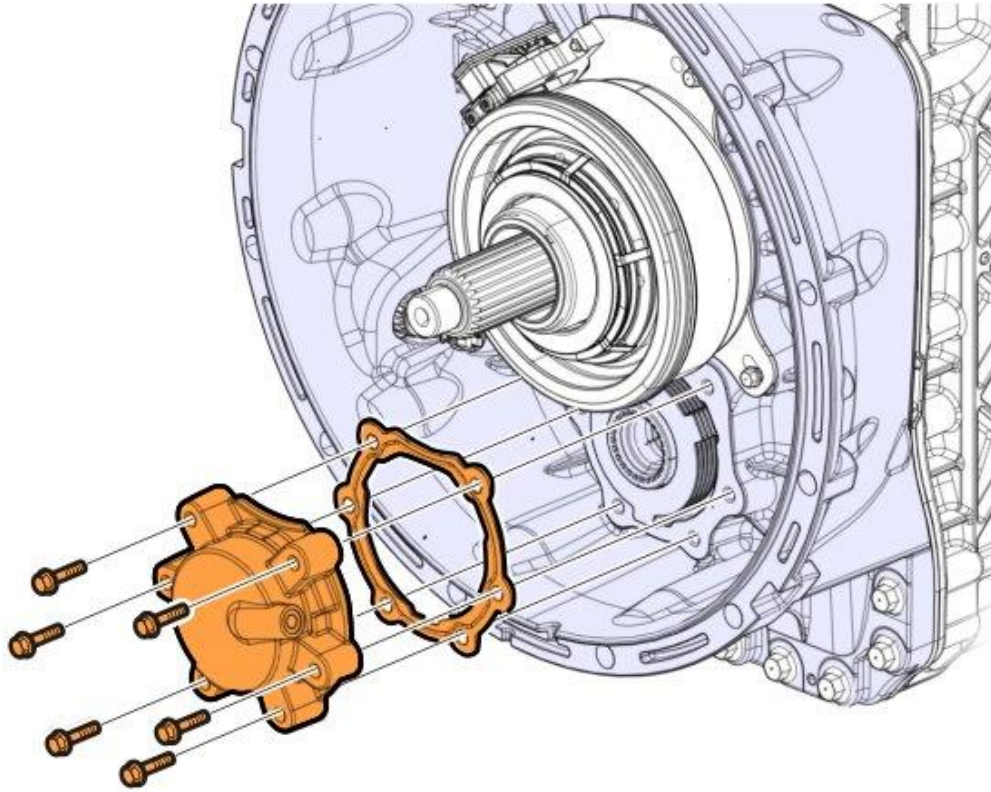
Position sensors/ Cảm biến vị trí



Gear forks and sleeves checks/ Kiểm tra càng cua & ống trượt



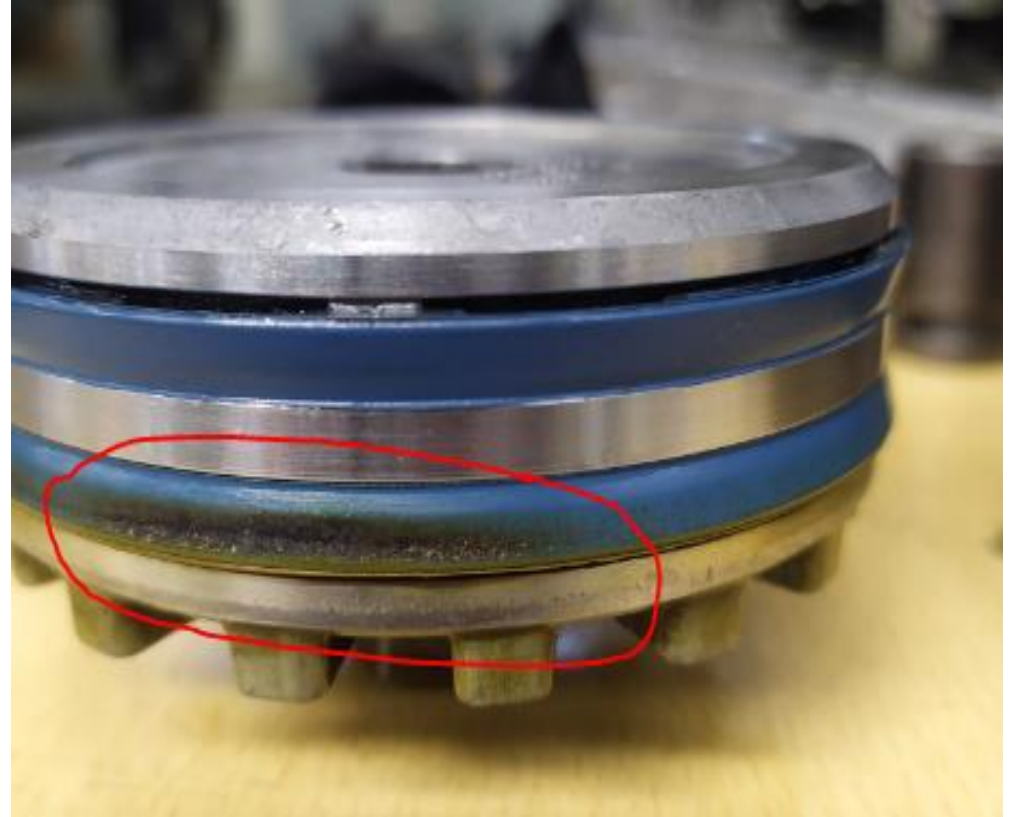
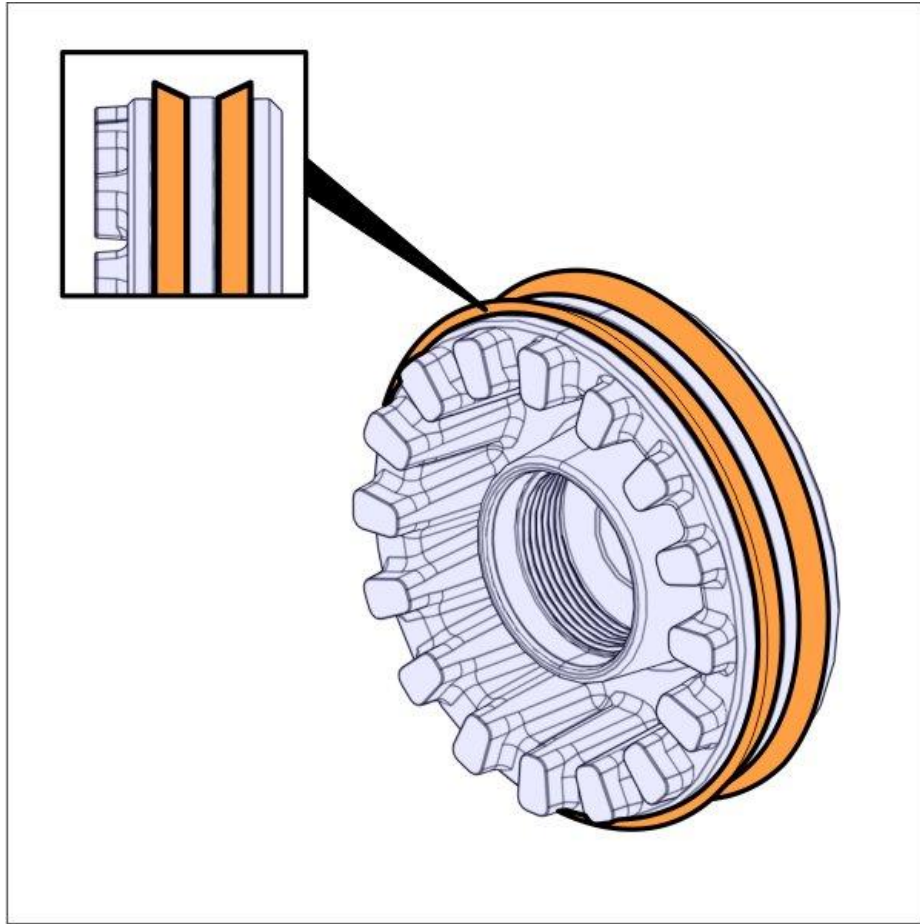
Countershaft brake disassembly/ Cụm phanh trục trung gian



Counter shaft brake disassembly/ Cụm phanh trực trung gian



What our technicians found?/ KTV tìm thấy gì?



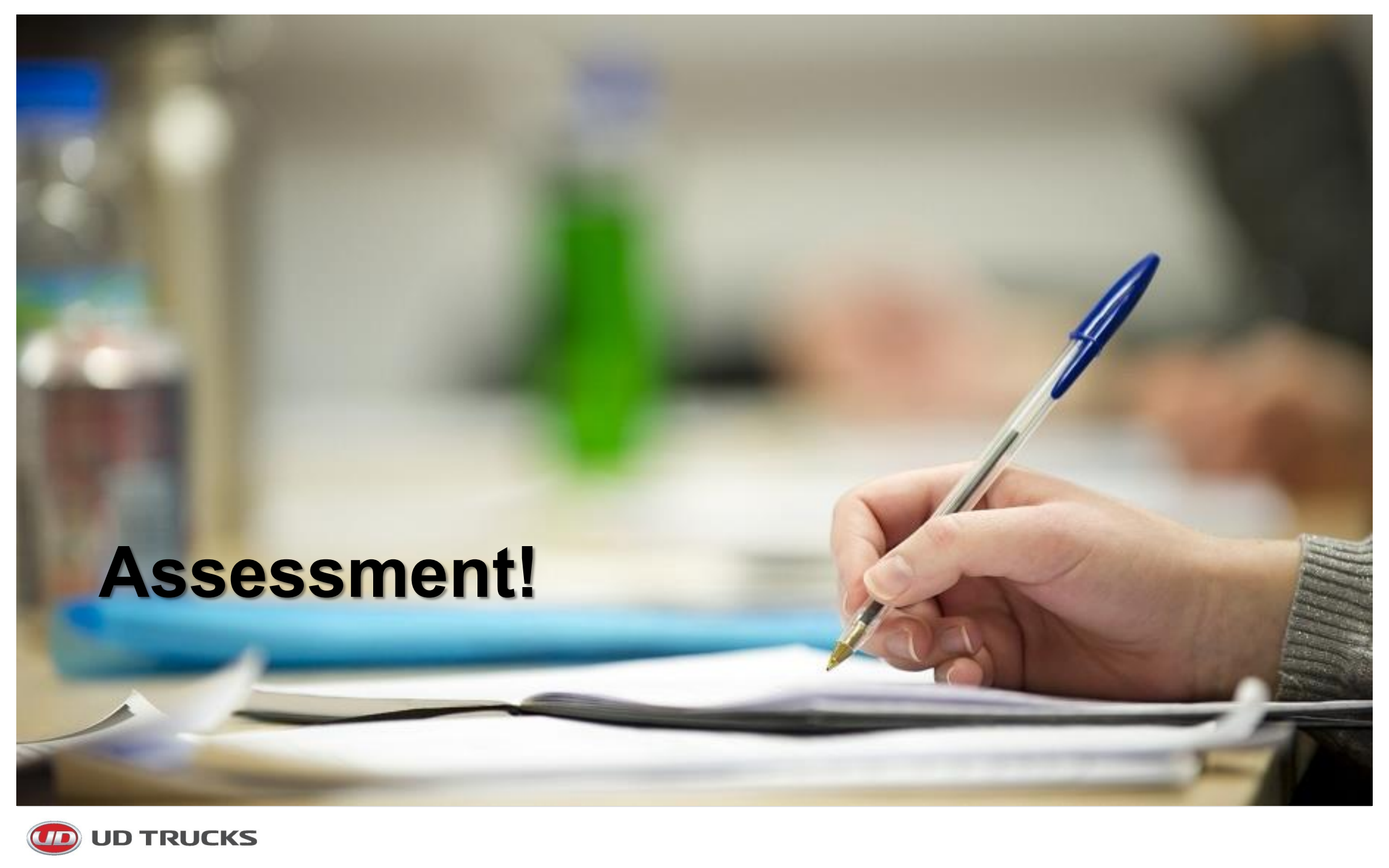
What our technicians found?/ KTV tìm thấy gì?



Summary

Tổng kết



A close-up photograph of a person's hand holding a blue pen, poised to write on a document. The background is a blurred office environment with shelves and other people working. The word "Assessment!" is overlaid in large, bold, black text on the left side of the image.

Assessment!