BASIC INSPECTION ADJUSTMENT

TRANSAXLE FLUID LEVEL INSPECTION

1. Drive the vehicle until the fluid reaches normal operating temperature [70~80°C].
2. Place the vehicle on a level surface.
3. Move the selector lever through all gear position. This will fill the torque converter and the hydraulic system with fluid and move the selector lever to the "N" (Neutral) position.
4. Before removing the oil level gauge, wipe all contaminants from around the oil level gauge. Then take out the oil level gauge and check the condition of the fluid.

NOTE

If the fluid smells as if it is burning, it means that the fluid has been contaminated by fine particles from the bushes and friction materials, a transmission overhaul may be necessary.

5. Check that the fluid level is in the "HOT" mark on the oil level gauge. If fluid level is low, add automatic transaxle fluid until the level reaches the "HOT" mark.

Auto transaxle fluid :
DIAMOND ATF SP-III, SK ATF SP-III

NOTE

Low fluid level can cause a variety of abnormal conditions because it allows the pump to take in air along with fluid. Air trapped in the hydraulic system forms bubbles, which are compressable. Therefore, pressures will be erratic, causing delayed shifting, slipping clutches and brakes, etc. Improper filling can also raise fluid level too high. When the transaxle has too much fluid, gears churn up foam and cause the same conditions which occur with low fluid level, resulting in accelerated deterioration of automatic transaxle fluid. In either case, air bubbles can cause overheating, and fluid oxidation, which can interfere with normal valve, clutch, and brake operation. Foaming can also result in fluid escaping from the transaxle vent where it may be mistaken for a leak.

6. Insert the oil level gauge securely.

NOTE

When new, automatic transmission fluid should be red, The red dve is added so the assembly plant can identify it as transmission fluid and distinguish it from engine oil or antifreeze. The red dve, which is not an indicator of fluid quality, is not permanent. As the vehicle is driven the transmission fluid will begin to look darker. The color may eventually appear light brown.

AUTOMATIC TRANSMISSION FLUID REPLACEMENT

If you have a fluid changer, use this changer to replace the fluid. If you do not have a fluid replace the fluid by the following procedure.

1. Disconnect the hose, which connects the transmission and the oil cooler (inside the radiator).

2. Start the engine and let the fluid drain out.

Running conditions : "N" range with engine idling.

CAUTION

The engine should be stopped within one minute after it is started. If the fluid has all drained out before then, the engine should be stopped at that point.

3. Remove the drain plug from the bottom of the transmission case to drain the fluid.
4. Install the drain plug via the gasket, and tighten it the specified torque.

Tightening torque : 32 Nm

---

5. Pour the new fluid in through the oil filler tube.

CAUTION

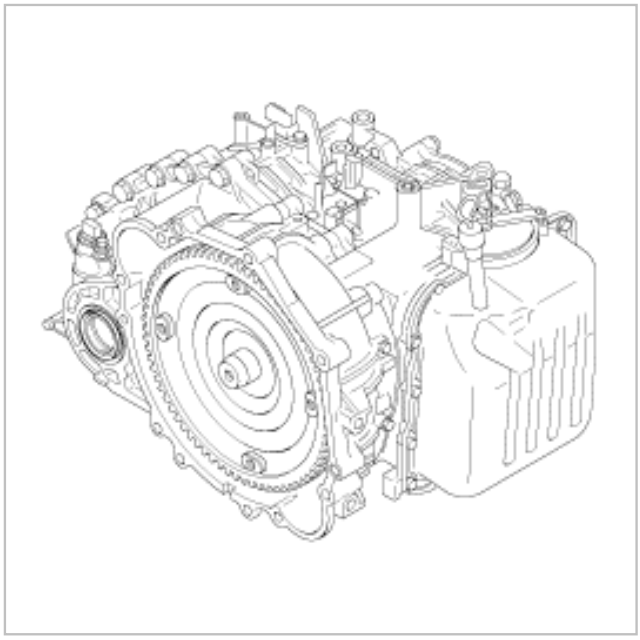
Stop pouring if the full volume of fluid cannot be poured in.

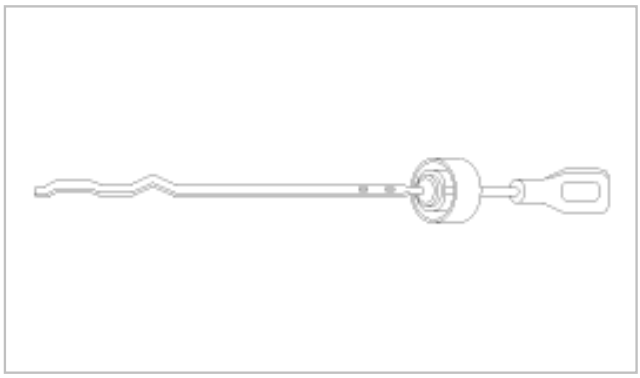
6. Repeat the procedure in step (2).

NOTE

Check the old fluid for contamination. If it has been contaminated, repeat the steps (5) and (6).

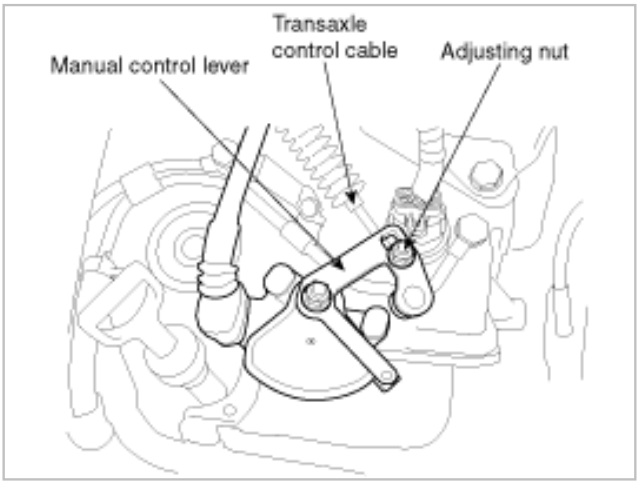
7. Pour the new fluid in through the oil filler tube.
8. Reconnect the hose, which was disconnected in step (1) above, and firmly replace the oil level gauge. (In case of this "replace", this means after wiping off any dirt around the oil level gauge, insert it into the filler tube.)
9. Start the engine and run it at idle for 1~2 minutes.
10. Move the select lever through all positions, and then move it to the "N" or "P"position.
11. Drive the vehicle until the fluid temperature rises to the normal temperature (70~80C), and then check the fluid level again. The fluid level must be at the HOT mark.
12. Firmly insert the oil level gauge into the oil filler tube.





TRANSAXLE RANGE SWITCH AND CONTROL CABLE ADJUSTMENT

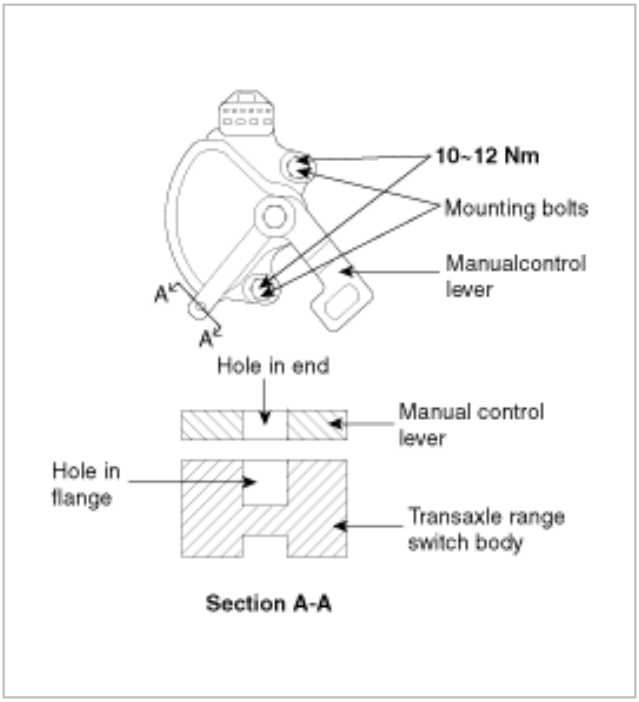
1. Set the selector lever to the "N" position.
2. Loosen the control cable to manual control lever coupling nut to free the cable and lever.
3. Set the manual control lever to the neutral position.



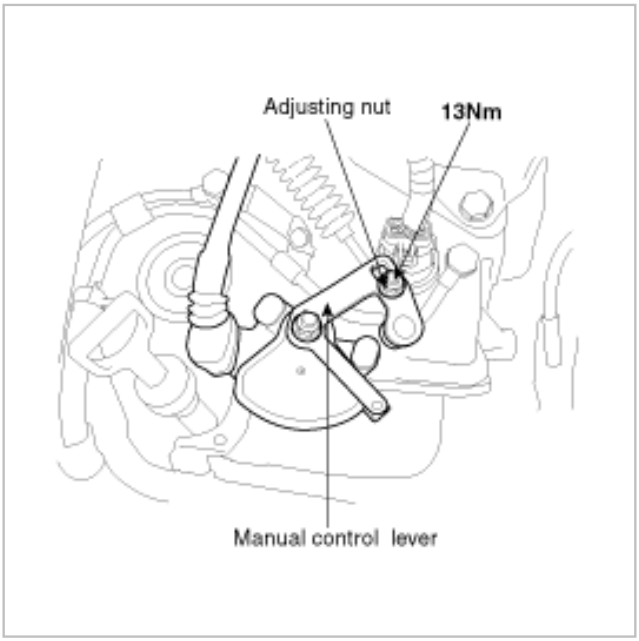
4. Loosen the transaxle range switch body mounting bolts and then turn the transaxle range switch body so the hole in the end of the manual control lever and the hole (cross section A-A in the figure) in the flange of the transaxle range switch body flange are aligned.

5. Tighten the transaxle range switch body mounting bolts to the specified torque. Make sure at this time that the position of the switch body did not move.

Tightening torque : 10~12 Nm



6. Gently pull the transmission control cable in the direction of the arrow, and then tighten the adjusting nut.
7. Check that the selector lever is in the "N" position.
8. Check that each range on the transmission side operates and functions correctly for each position of the selector lever.

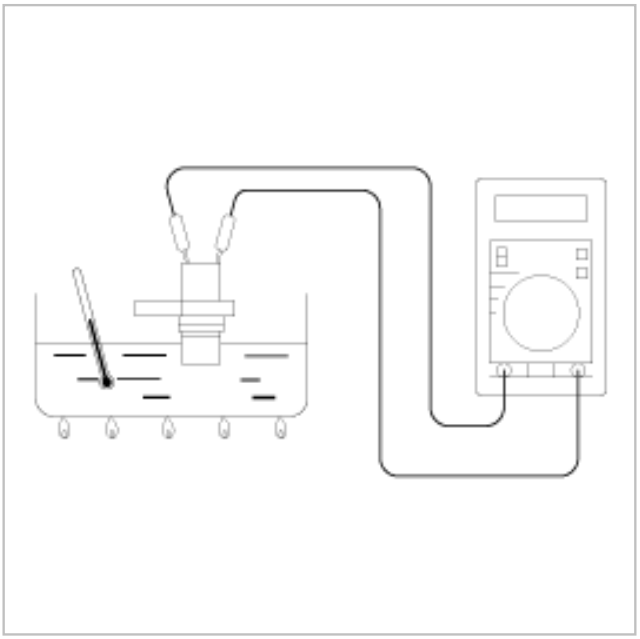


A/T CONTROL COMPONENT CHECK

1. Remove the oil temperature sensor.

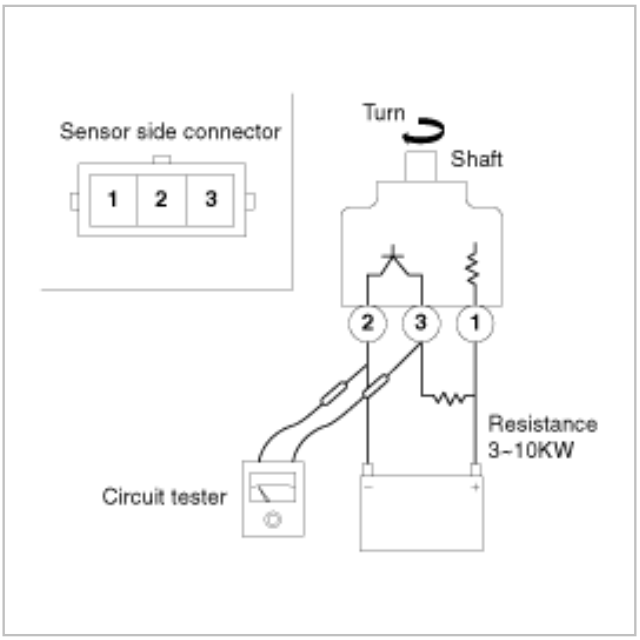
2. Measure the resistance between terminals No.1 and No.2 of the oil temperature sensor connector.
   STANDARD VALUE :

Oil temperature (°C)	Resistance (KΩ)
0	16.7 ~ 20.5
100	0.57 ~ 0.69



VEHICLE SPEED SENSOR CHECK

1. Remove the vehicle speed sensor and connect a 3~10 KΩresistance as shown in the illustration.
2. Turn the shaft of the vehicle speed sensor and check that there is voltage between terminals 1~2 (1 turn = 4 pulses).

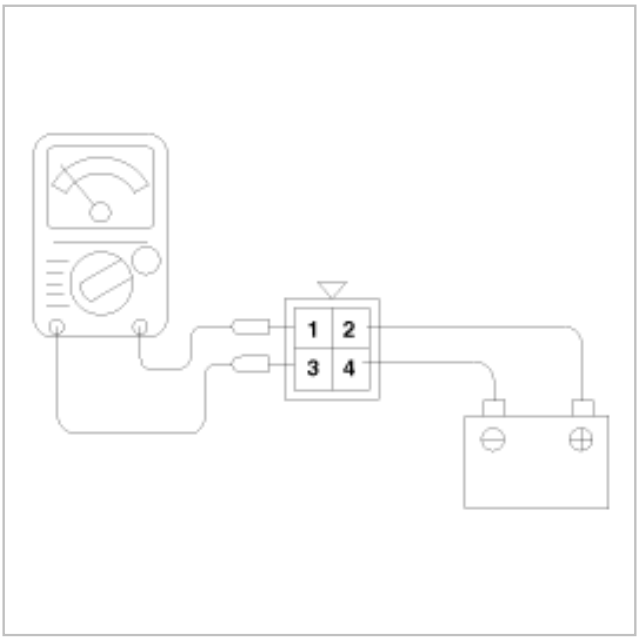


A/T CONTROL RELAY CHECK

1. Remove the A/T control relay.

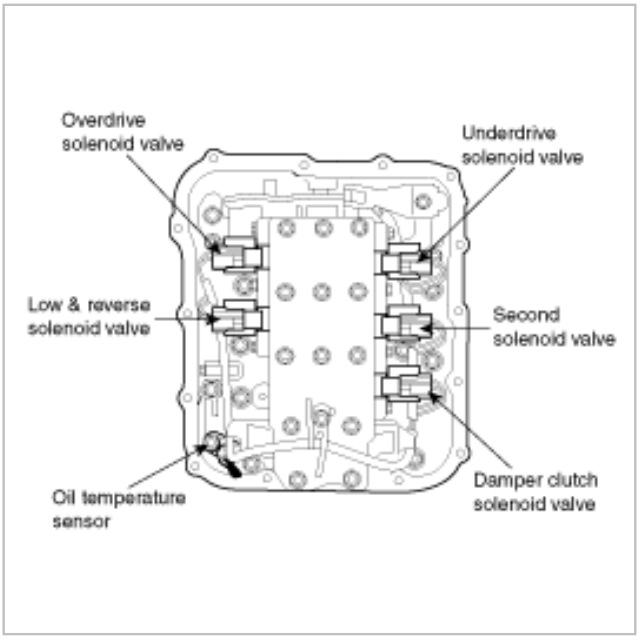
2. Use jumper wires to connect A/T control relay terminal 2 to the battery (+) terminal and terminal 4 to the battery (-) terminal.
3. Check the continuity between terminal (1) and terminal (3) of the A/T control relay when the jumper wires are connected to and disconnected from the battery.
4. If there is a problem, replace the A/T control relay.

Jumper wire	Continuity between terminal No.1
Connected	Continuity
Disconnected	No continuity



SOLENOID VALVE CHECK

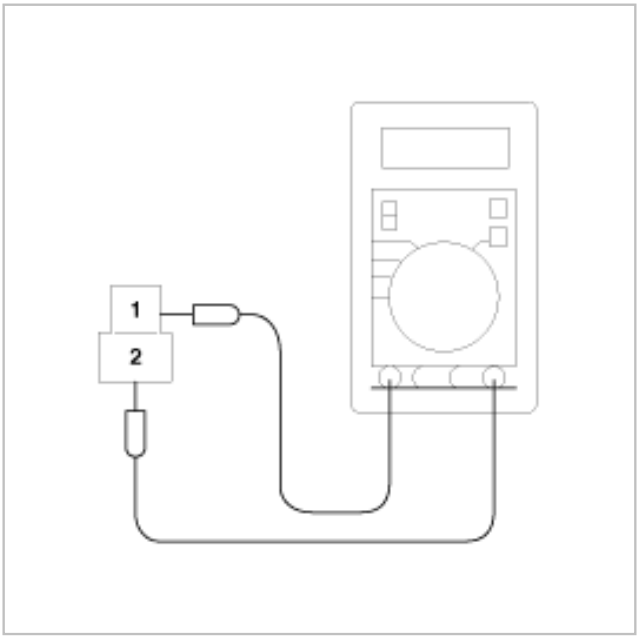
1. Remove the valve body cover.
2. Disconnect the connectors of each solenoid valve.



3. Measure the resistance between terminals 1 and 2 of each solenoid valve.

Standard value :

Name	Resistance
Damper clutch solenoid valve	2.7 ~ 3.4Ω (at 20°C)
Low and reverse solenoid valve	
Second solenoid valve	
Underdrive solenoid valve	
Overdrive solenoid valve	

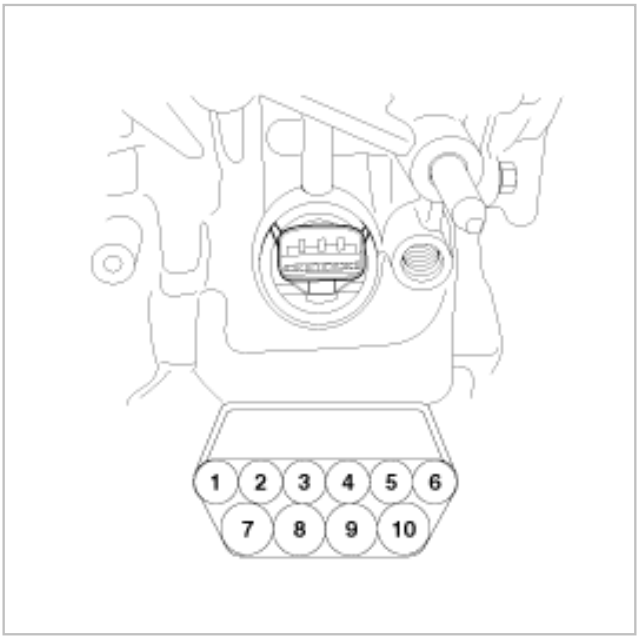


4. If the resistance is outside the standard value, replace the solenoid valve.

NOTE

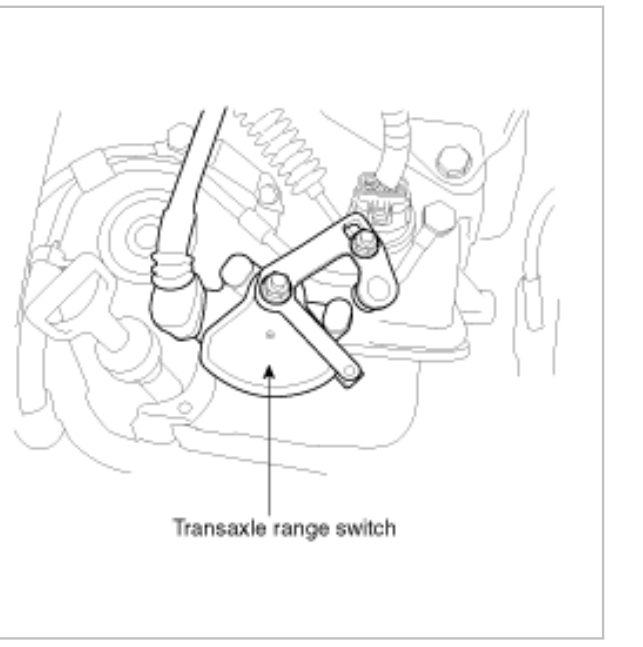
Resistance of the solenoid valve connector.

Terminal No.	Name	Resistance
7 & 10	Damper clutch solenoid valve	2.7 ~ 3.4Ω (at 20°C)
10 & 6	Low and reverse solenoid valve	
9 &4	Second solenoid valve	
9 & 3	Underdrive solenoid valve	
9 & 5	Overdrive solenoid valve	



TRANSAXLE RANGE SWITCH CONTINUITY CHECK

Range	Terminal No									
	1	2	3	4	5	6	7	8	9	10
P			○	—	—	—	—	○	○	○
R							○	○		
N				○	—	—	—	○	○	○
D	○	—	—	—	—	—	—	○		
3					○	—	—	○		
2		○	—	—	—	—	—	○		
L						○	—	○		



IN/OUTPUT SHAFT SPEED SENSOR CHECK

	Check item	Standard value
Air gap	Input shaft speed sensor	1.3 mm
	Output shaft speed sensor	0.85 mm
Coil insulation resistance	Input shaft speed sensor	Over 1MΩ
	Output shaft speed sensor	Over 1MΩ
Output voltage	HIGH side	4.8 ~ 5.2V
	LOW side	Below 0.8V

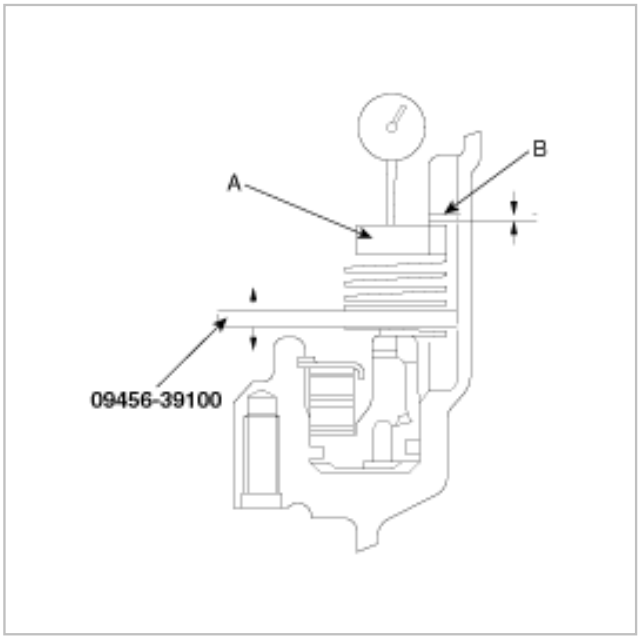
SERVICE ADJUSTMENT PROCEDURES

BRAKE REACTIONPLATE END PLAY ADJUSTMENT

Replace the pressure plate of the low-reverse brake with the special tool, and then install the brake disc, brake plate and snap ring as shown in the figure.

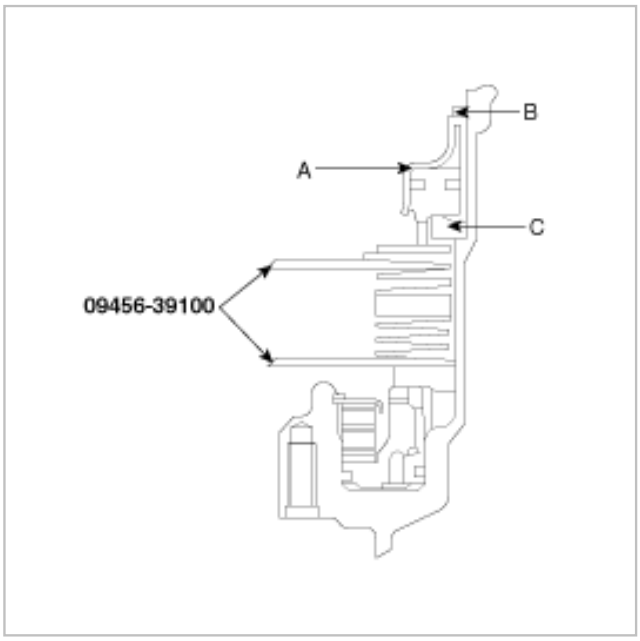
Install the reaction plate(A) and the used snap ring(B). Move the special tool to measure the end play, and then replace the snap ring to adjust the end play to standard value.

Standard value : 0~0.16mm



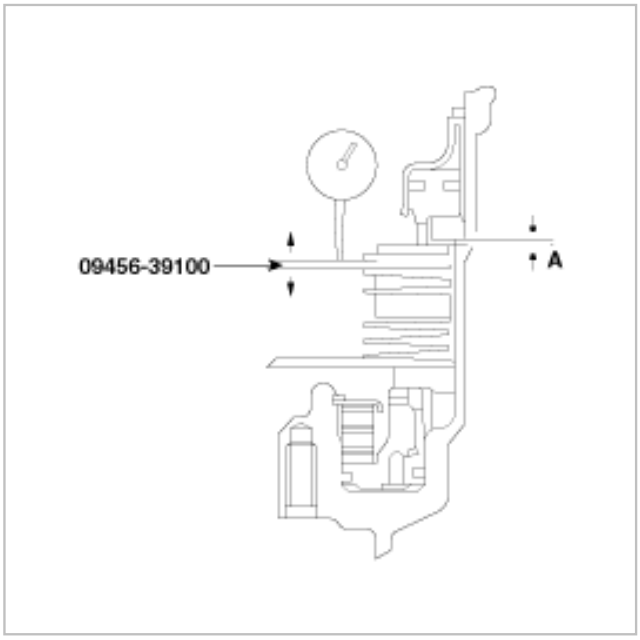
SECOND BRAKE END PLAY ADJUSTMENT

Replace the pressure plate of the second brake with the special tool, and then install the brake disc and brake plate as shown in the figure. Install the return spring(C), second brake piston(A) and snap ring(B).



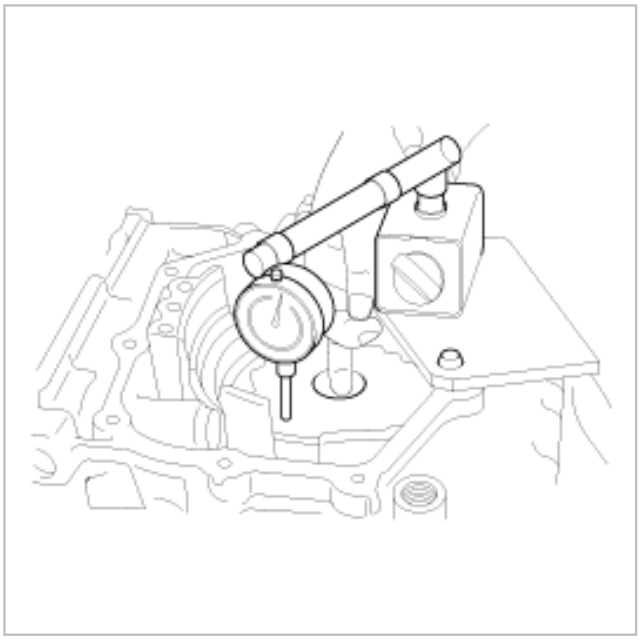
Standard value : 0.79~1.25mm

Reference Select a pressure plate whose thickness is within the following value. [A (moving amount) + thickness of the special tool - 1.25] to [A (moving amount) + thickness of the special tool - 0.79].



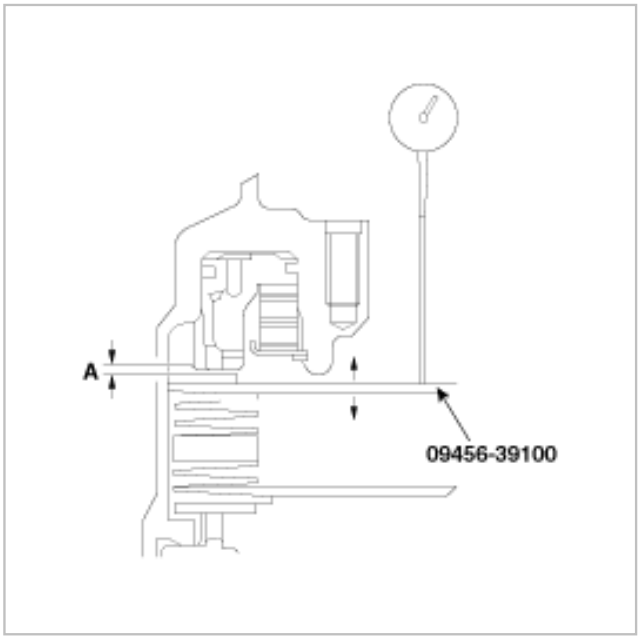
LOW-REVERSE BRAKE END PLAY ADJUSTMENT

Reverse the transmission and install the dial gauge. Move the special tool up and down to measure the end play.



Standard value : 1.35~1.81mm

Reference Select a pressure plate whose thickness is within the following value. [A (moving amount) + thickness of the special tool - 1.81] to [A (moving amount) + thickness of the special tool - 1.35].



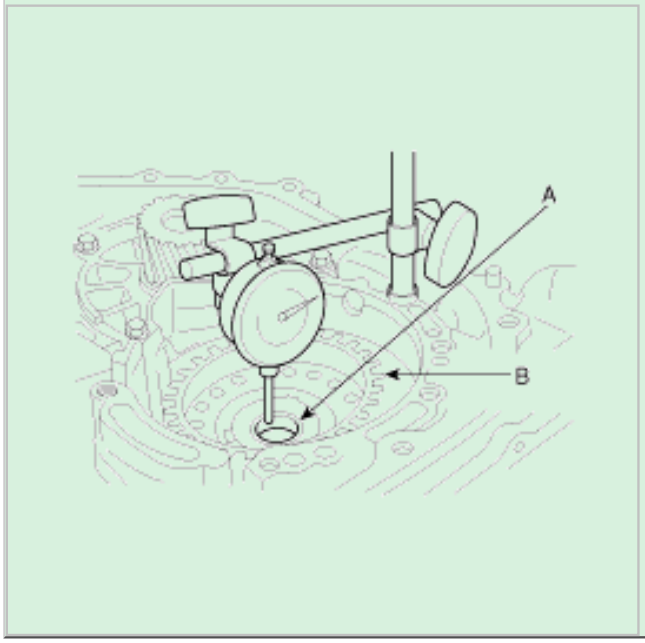
UNDERDRIVE SUN GEAR END PLAY ADJUSTMENT

Install the used thrust race #8, and then the rear cover. Measure end play of the underdrive sun gear. Replace thrust race #8 to adjust the play to the standard value.

Standard value : 0.25~1.45mm

NOTE

Installing the underdrive clutch hub(B) makes it easy to measure the end play of the underdrive sun gear(A).



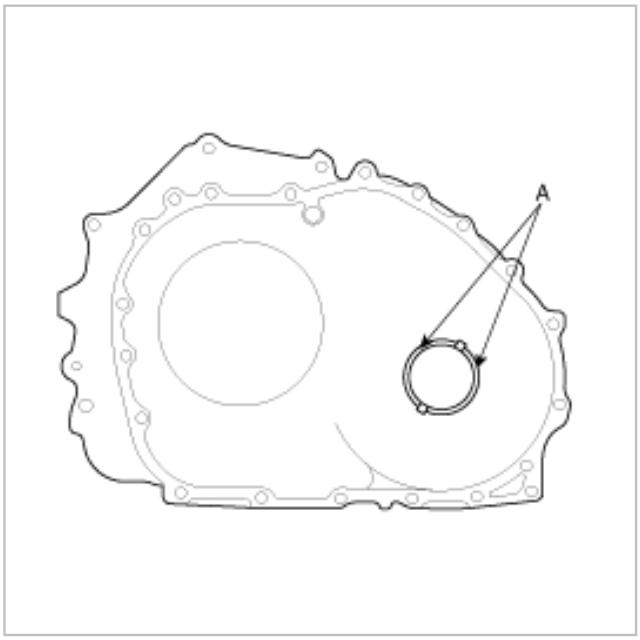
DIFFERENTIAL CASE PRELOAD ADJUSTMENT

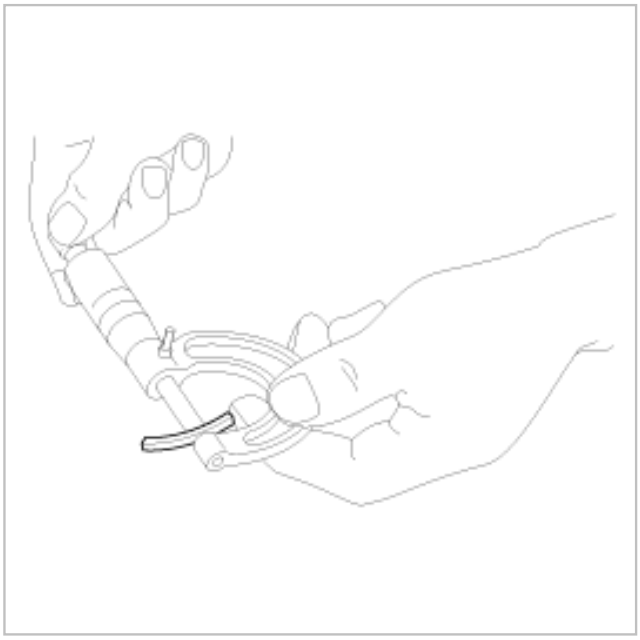
Place a solder (approx. 10 mm in length, 3 mm in diameter) on the torque converter housing as shown in the figure.

Install the torque converter housing to the transmission case without applying sealant. Tighten its mounting bolts to the specified torque. Loosen the bolts, and remove the solder(A). Use a micrometer to measure the thickness

(T) of the pressed solder(A).
Select a-spare which thickness is within the following value.

Standard value : (T+0.045 mm) to (T+0.105 mm)





BASIC INSPECTION ADJUSTMENT

TRANSAXLE FLUID LEVEL INSPECTION

1. Drive the vehicle until the fluid reaches normal operating temperature [70~80°C].
2. Place the vehicle on a level surface.
3. Move the selector lever through all gear position. This will fill the torque converter and the hydraulic system with fluid and move the selector lever to the "N" (Neutral) position.

4. Before removing the oil level gauge, wipe all contaminants from around the oil level gauge. Then take out the oil level gauge and check the condition of the fluid.

> NOTE
>
> If the fluid smells as if it is burning, it means that the fluid has been contaminated by fine particles from the bushes and friction materials, a transmission overhaul may be necessary.

5. Check that the fluid level is in the "HOT" mark on the oil level gauge. If fluid level is low, add automatic transaxle fluid until the level reaches the "HOT" mark.

Auto transaxle fluid :
DIAMOND ATF SP-III, SK ATF SP-III

> NOTE
>
> Low fluid level can cause a variety of abnormal conditions because it allows the pump to take in air along with fluid. Air trapped in the hydraulic system forms bubbles, which are compressable. Therefore, pressures will be erratic, causing delayed shifting, slipping clutches and brakes, etc. Improper filling can also raise fluid level too high. When the transaxle has too much fluid, gears churn up foam and cause the same conditions which occur with low fluid level, resulting in accelerated deterioration of automatic transaxle fluid. In either case, air bubbles can cause overheating, and fluid oxidation, which can interfere with normal valve, clutch, and brake operation. Foaming can also result in fluid escaping from the transaxle vent where it may be mistaken for a leak.

6. Insert the oil level gauge securely.

> NOTE
>
> When new, automatic transmission fluid should be red, The red dve is added so the assembly plant can identify it as transmission fluid and distinguish it from engine oil or antifreeze. The red dve, which is not an indicator of fluid quality, is not permanent. As the vehicle is driven the transmission fluid will begin to look darker. The color may eventually appear light brown.

AUTOMATIC TRANSMISSION FLUID REPLACEMENT

If you have a fluid changer, use this changer to replace the fluid. If you do not have a fluid replace the fluid by the following procedure.

1. Disconnect the hose, which connects the transmission and the oil cooler (inside the radiator).
2. Start the engine and let the fluid drain out.

Running conditions : "N" range with engine idling.

> CAUTION
>
> The engine should be stopped within one minute after it is started. If the fluid has all drained out before then, the engine should be stopped at that point.

3. Remove the drain plug from the bottom of the transmission case to drain the fluid.

4. Install the drain plug via the gasket, and tighten it the specified torque.

   Tightening torque : 32 Nm

5. Pour the new fluid in through the oil filler tube.

   CAUTION

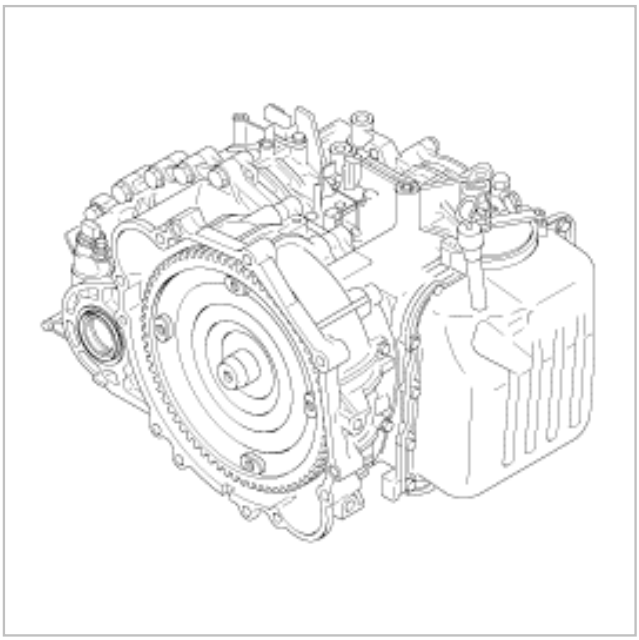
   Stop pouring if the full volume of fluid cannot be poured in.

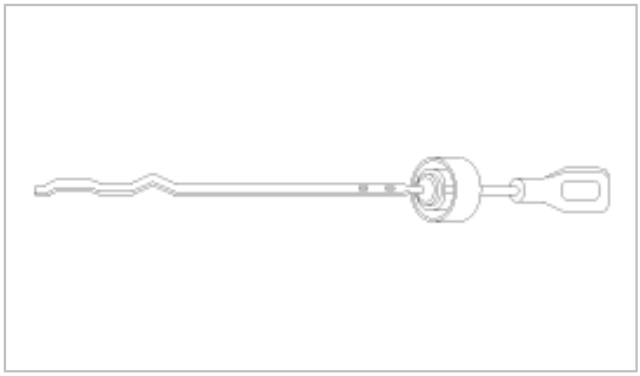
6. Repeat the procedure in step (2).

   NOTE

   Check the old fluid for contamination. If it has been contaminated, repeat the steps (5) and (6).

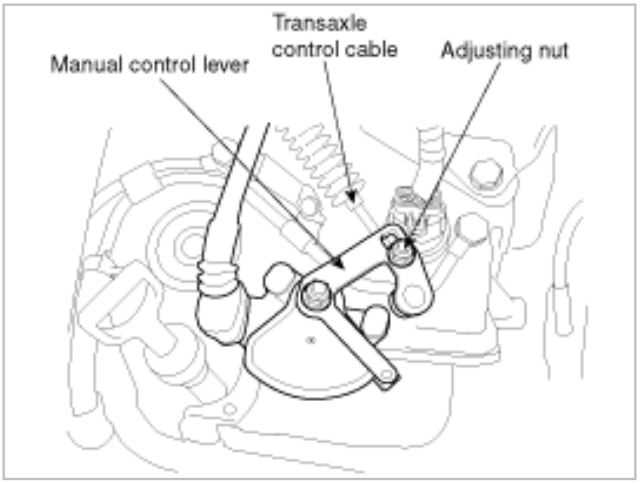
7. Pour the new fluid in through the oil filler tube.
8. Reconnect the hose, which was disconnected in step (1) above, and firmly replace the oil level gauge. (In case of this "replace", this means after wiping off any dirt around the oil level gauge, insert it into the filler tube.)
9. Start the engine and run it at idle for 1~2 minutes.
10. Move the select lever through all positions, and then move it to the "N" or "P"position.
11. Drive the vehicle until the fluid temperature rises to the normal temperature (70~80C), and then check the fluid level again. The fluid level must be at the HOT mark.
12. Firmly insert the oil level gauge into the oil filler tube.





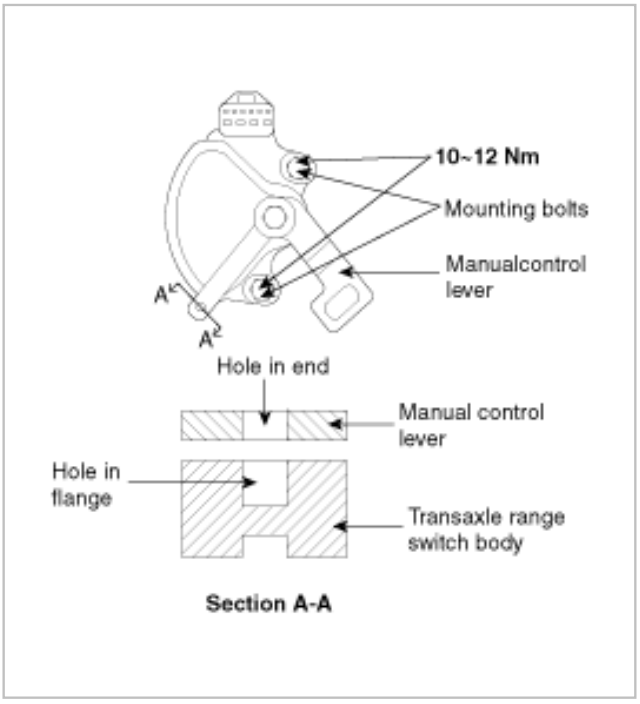
TRANSAXLE RANGE SWITCH AND CONTROL CABLE ADJUSTMENT

1. Set the selector lever to the "N" position.
2. Loosen the control cable to manual control lever coupling nut to free the cable and lever.
3. Set the manual control lever to the neutral position.

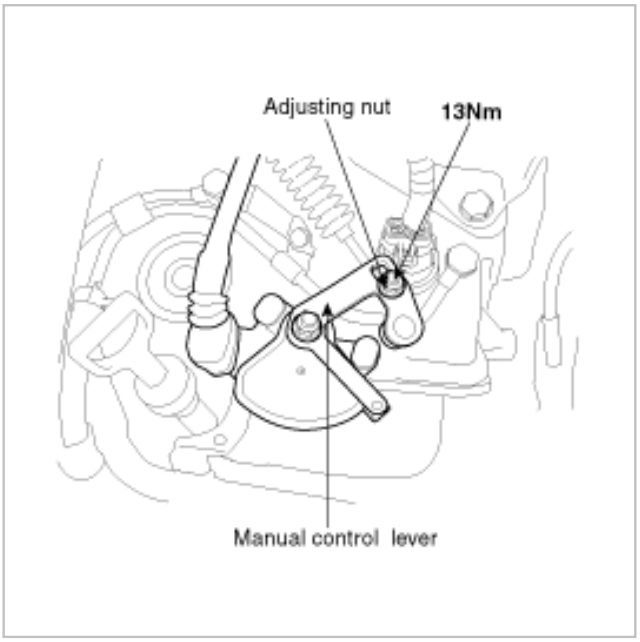


4. Loosen the transaxle range switch body mounting bolts and then turn the transaxle range switch body so the hole in the end of the manual control lever and the hole (cross section A-A in the figure) in the flange of the transaxle range switch body flange are aligned.
5. Tighten the transaxle range switch body mounting bolts to the specified torque. Make sure at this time that the position of the switch body did not move.

Tightening torque : 10~12 Nm



6. Gently pull the transmission control cable in the direction of the arrow, and then tighten the adjusting nut.
7. Check that the selector lever is in the "N" position.
8. Check that each range on the transmission side operates and functions correctly for each position of the selector lever.

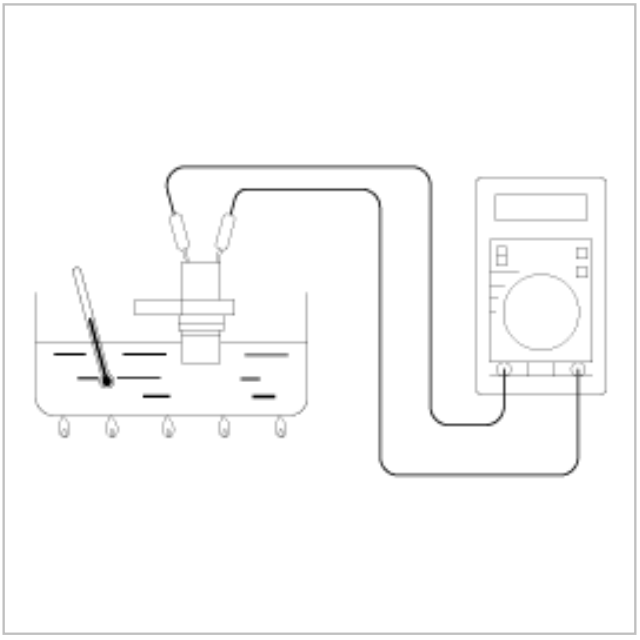


A/T CONTROL COMPONENT CHECK

1. Remove the oil temperature sensor.

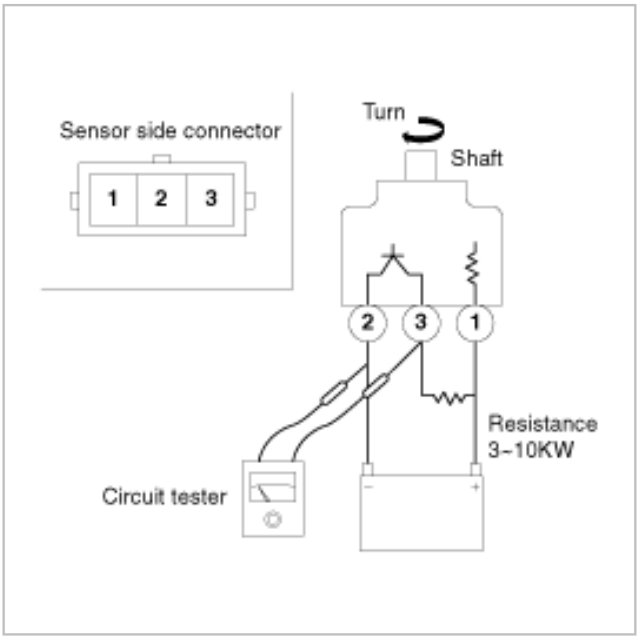
2. Measure the resistance between terminals No.1 and No.2 of the oil temperature sensor connector.
   STANDARD VALUE :

Oil temperature (°C)	Resistance (KΩ)
0	16.7 ~ 20.5
100	0.57 ~ 0.69



VEHICLE SPEED SENSOR CHECK

1. Remove the vehicle speed sensor and connect a 3~10 KΩresistance as shown in the illustration.
2. Turn the shaft of the vehicle speed sensor and check that there is voltage between terminals 1~2 (1 turn = 4 pulses).

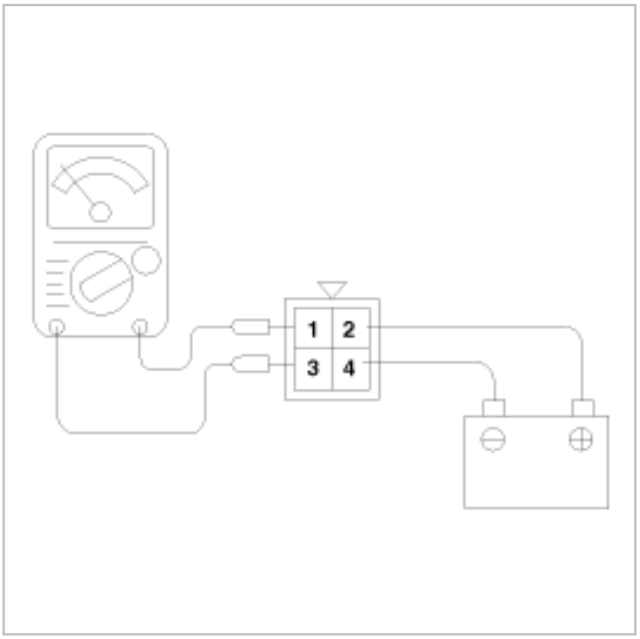


A/T CONTROL RELAY CHECK

1. Remove the A/T control relay.

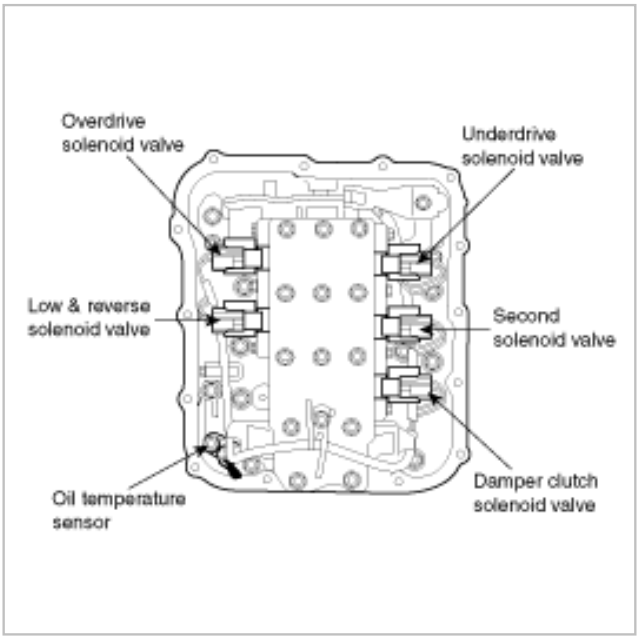
2. Use jumper wires to connect A/T control relay terminal 2 to the battery (+) terminal and terminal 4 to the battery (-) terminal.
3. Check the continuity between terminal (1) and terminal (3) of the A/T control relay when the jumper wires are connected to and disconnected from the battery.
4. If there is a problem, replace the A/T control relay.

Jumper wire	Continuity between terminal No.1
Connected	Continuity
Disconnected	No continuity



SOLENOID VALVE CHECK

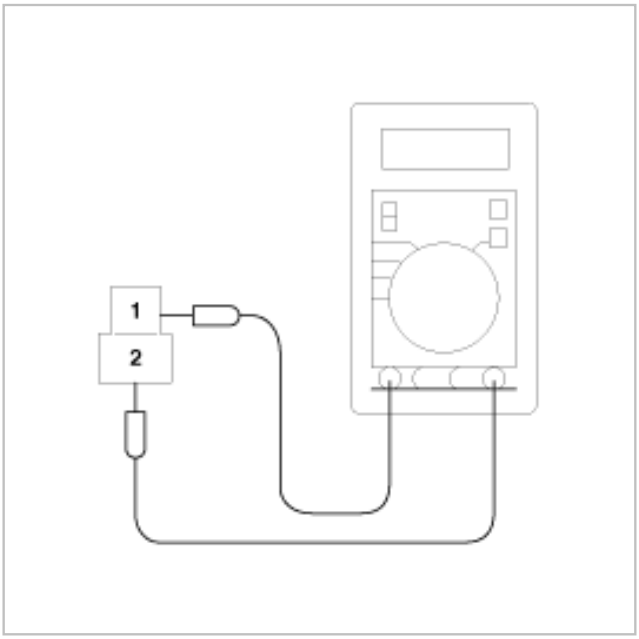
1. Remove the valve body cover.
2. Disconnect the connectors of each solenoid valve.



3. Measure the resistance between terminals 1 and 2 of each solenoid valve.

Standard value :

Name	Resistance
Damper clutch solenoid valve	2.7 ~ 3.4Ω (at 20°C)
Low and reverse solenoid valve	
Second solenoid valve	
Underdrive solenoid valve	
Overdrive solenoid valve	

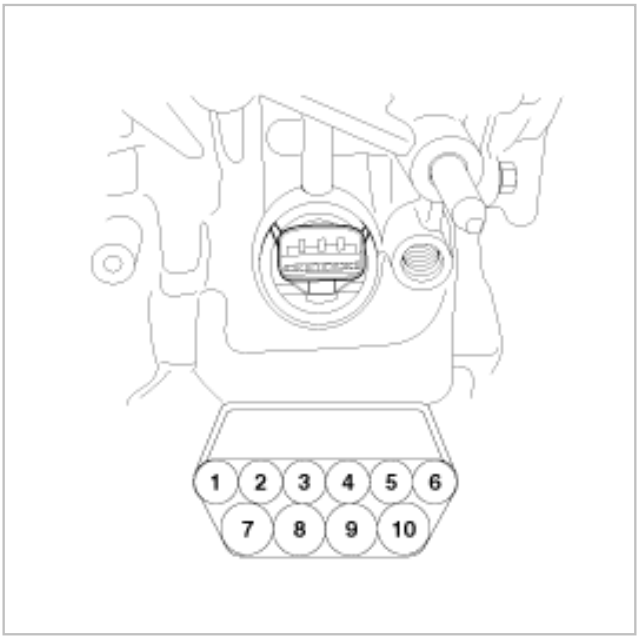


4. If the resistance is outside the standard value, replace the solenoid valve.

NOTE

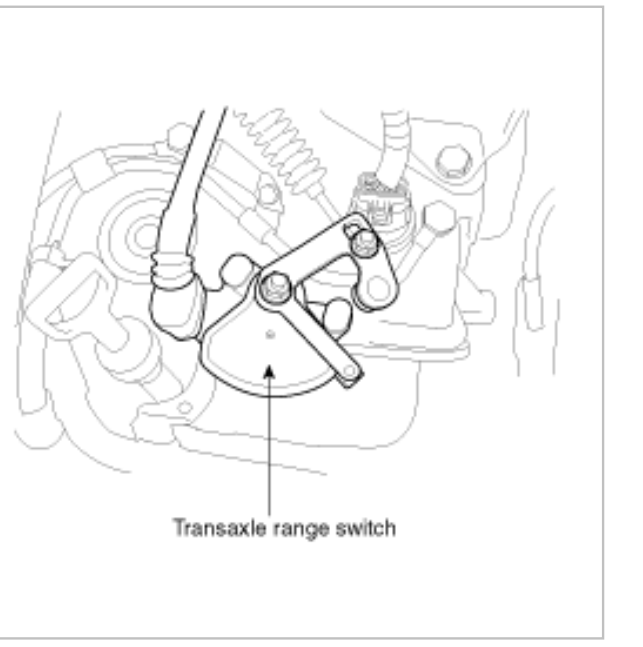
Resistance of the solenoid valve connector.

Terminal No.	Name	Resistance
7 & 10	Damper clutch solenoid valve	2.7 ~ 3.4Ω (at 20°C)
10 & 6	Low and reverse solenoid valve	
9 &4	Second solenoid valve	
9 & 3	Underdrive solenoid valve	
9 & 5	Overdrive solenoid valve	



TRANSAXLE RANGE SWITCH CONTINUITY CHECK

Range	Terminal No									
	1	2	3	4	5	6	7	8	9	10
P			○	—	—	—	—	○	○	○
R							○	○		
N				○	—	—	—	○	○	○
D	○	—	—	—	—	—	—	○		
3					○	—	—	○		
2		○	—	—	—	—	—	○		
L						○	—	○		



IN/OUTPUT SHAFT SPEED SENSOR CHECK

	Check item	Standard value
Air gap	Input shaft speed sensor	1.3 mm
	Output shaft speed sensor	0.85 mm
Coil insulation resistance	Input shaft speed sensor	Over 1MΩ
	Output shaft speed sensor	Over 1MΩ
Output voltage	HIGH side	4.8 ~ 5.2V
	LOW side	Below 0.8V