

Removal

⚠ WARNING

When working on the high voltage system, make sure that you are familiar and comply with the "Safety Precautions, Cautions and Warnings". If you do not comply with them, a serious accident such as electric shock or leakage may occur.

When working on the high voltage system, make sure that you cut off the high voltage first according to the "High Voltage Cut-off Procedure". If you do not comply with them, a serious accident such as electric shock or leakage may occur.

NOTICE

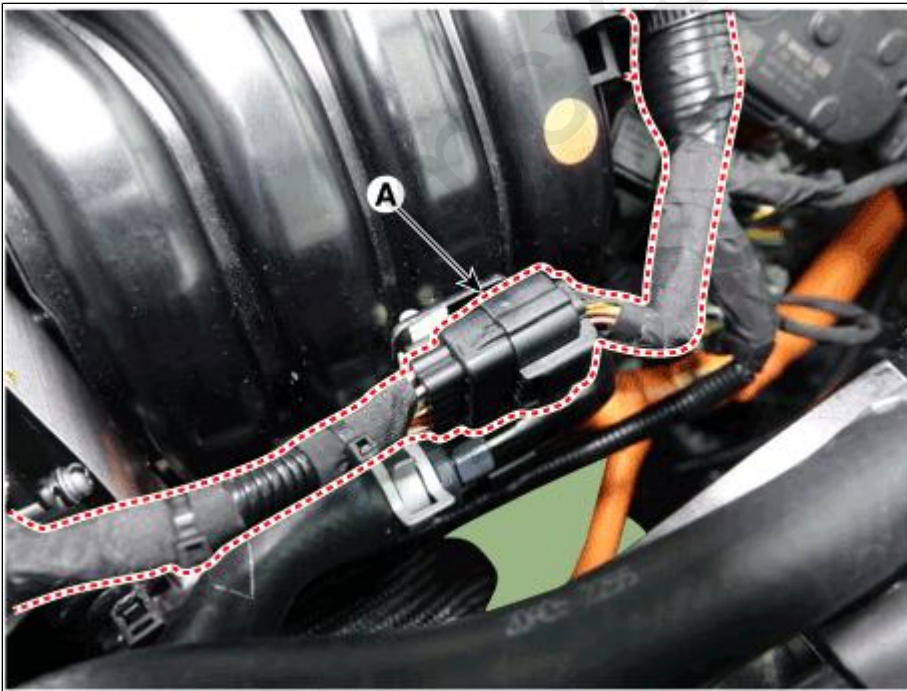
Use a fender cover to prevent damage of the vehicle painting.

Make sure that connectors and wiring are not damaged when separating them.

i Information

Mark the wiring connectors and hoses to prevent wrong connection.

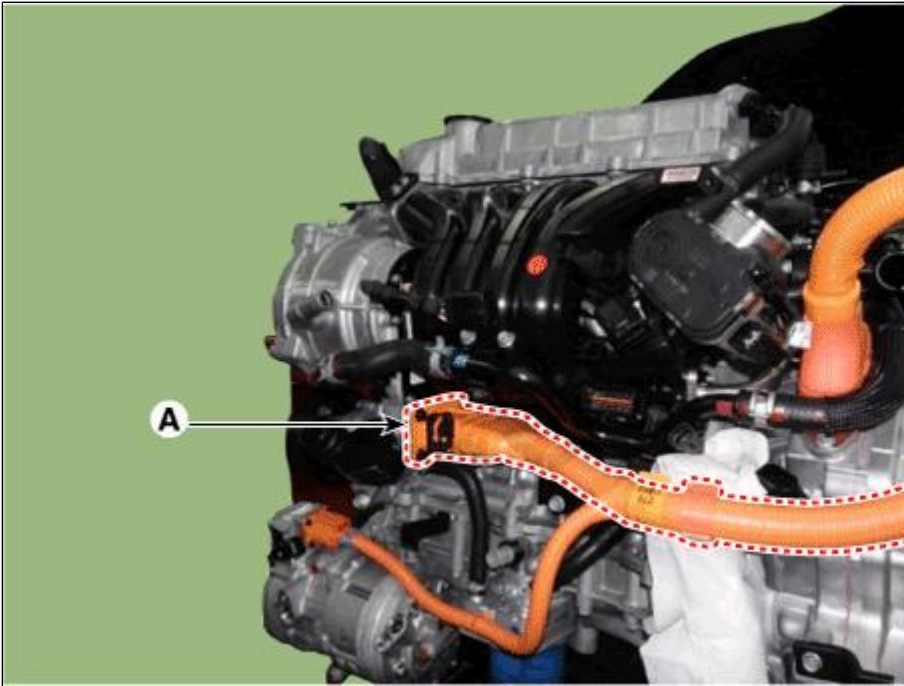
1. Cut off the high voltage.
(Refer to Generals - "High Voltage Cut-off Procedure")
2. Open the drain plug to discharge inverter coolant. Leave the reservoir cap open for smooth discharge.
(Refer to Hybrid Motor Cooling System - "Coolant")
3. Remove the drive belt.
(Refer to Engine Mechanical System - "Drive Belt")
4. Remove the mechanical drive belt tensioner.
(Refer to Engine Mechanical System - "Drive Belt Tensioner")
5. Remove the timing chain cover idler.
(Refer to Engine Mechanical System - "Idler")
6. Disconnect the HSG sensor connector (A).



7. Remove the cooler hose (A) from the HSG.



8. Remove the intake manifold.
(Refer to Engine Mechanical System - "Intake Manifold")
9. Disconnect the HSG high-voltage cable connector (A).



10. Loosen the HSG support bracket mountine bolts (A).

Tightening torque :

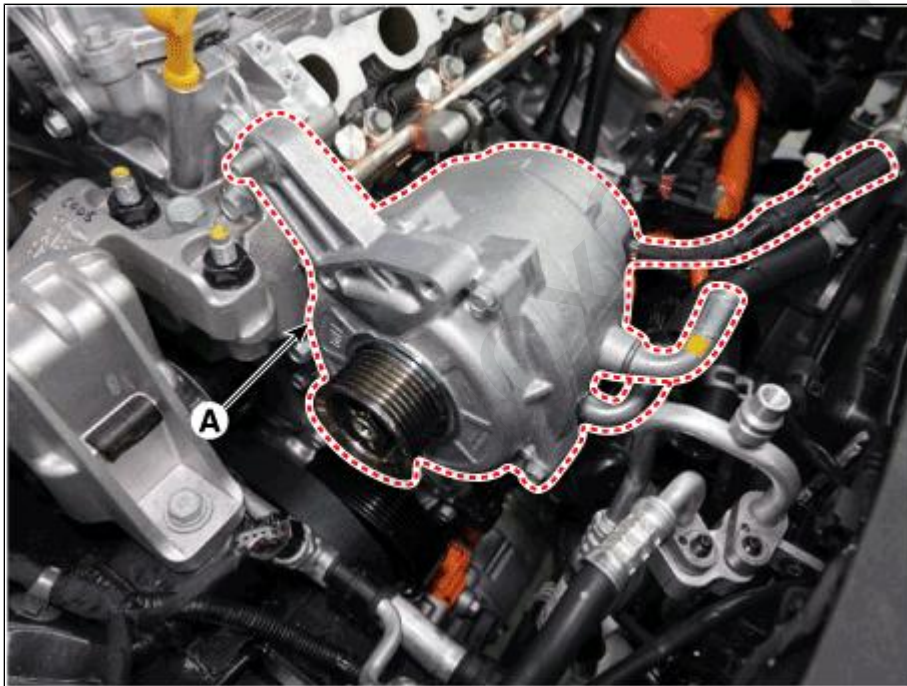
44.1 - 53.9 N.m (4.5 - 5.5 kgf.m, 32.5 - 39.8 lb-ft)



11. Remove the HSG (A).

Tightening torque :

44.1 - 49.0 N.m (4.5 - 5.0 kgf.m, 32.5 - 36.1 lb-ft)



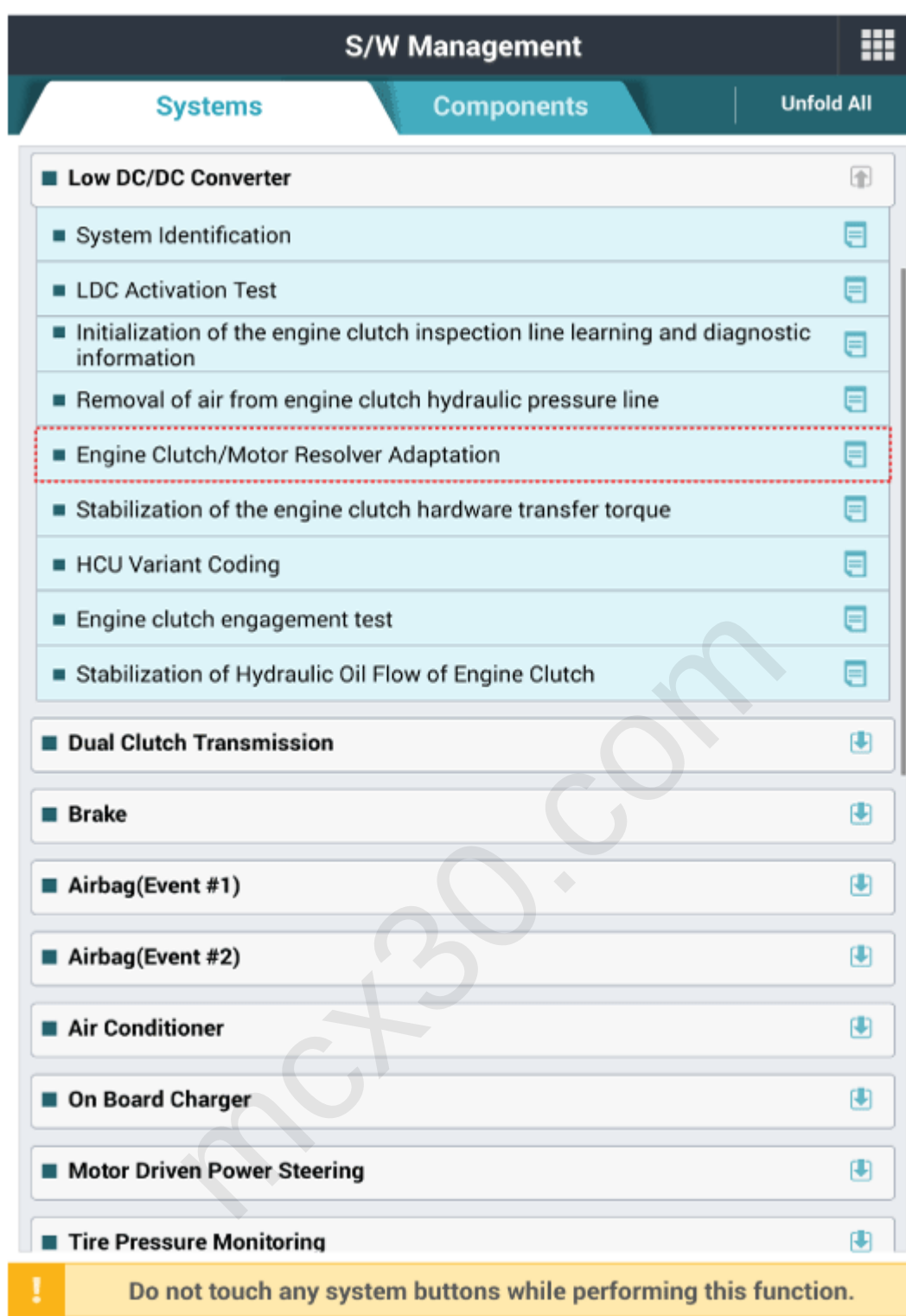
Installation

NOTICE

Be careful not to cause any damage on the hose when tightening the clamp.

Mount the clamp tightening part in the designated direction so that interference does not occur with the adjacent parts.

1. To install, reverse the removal procedure.
2. Perform resolver sensor compensation.
Perform compensation according to the diagnostic tool motor / HSG resolver compensation procedure shown below.



3. Fill the coolant in the hybrid cooling system and use the diagnostic tool to perform air bleeding.
(Refer to Hybrid Motor Cooling System - "Coolant")

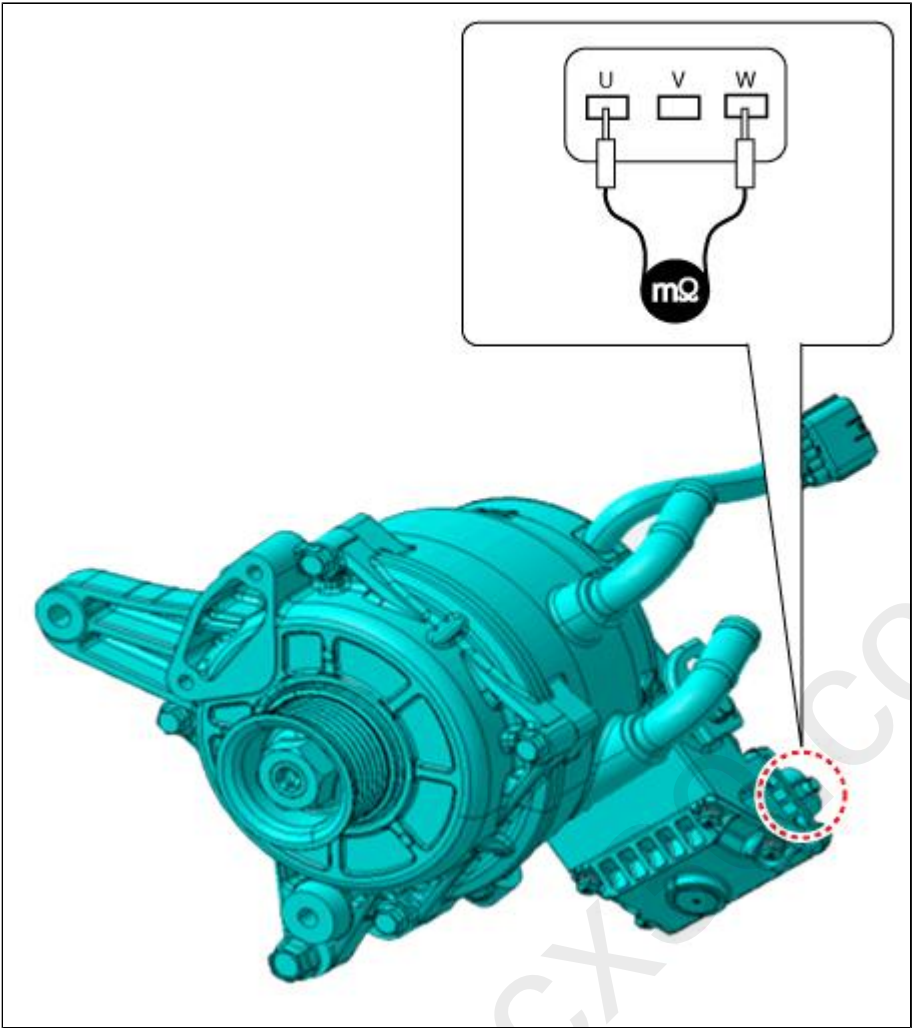
4. Check for the leakage in the hose connections while the engine is running.

Inspection

1. Use the mΩ tester to check the line resistance.

Category	Inspection Based on	Inspection Area	Inspection method	Remarks
Resistance (Line)	U - V	195 mΩ± 5%	Measuring equipment: Milliohm meter Measuring point: U - V - W	Change depending on temperature:
	V - W			

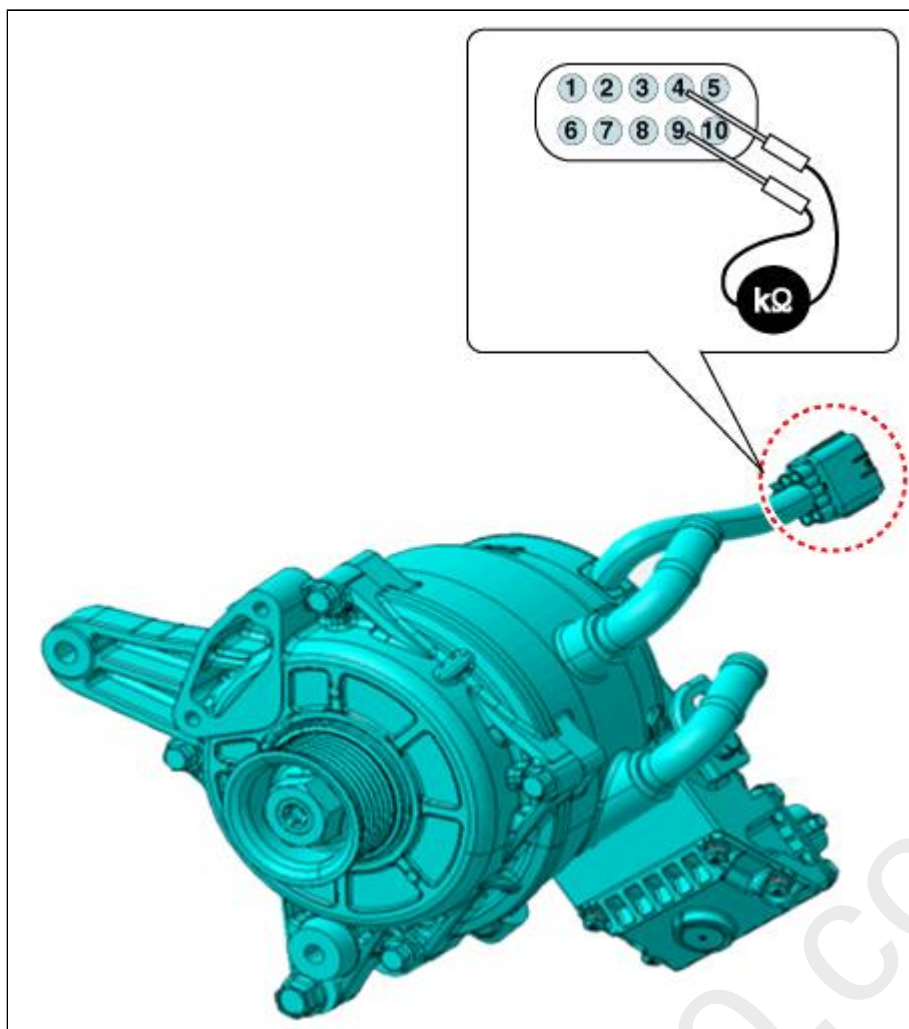
- Line)			Line resistance per part Applied current : 10 A	+ 0.4%/°C
	W - U			



2. Check the temperature sensor resistance.

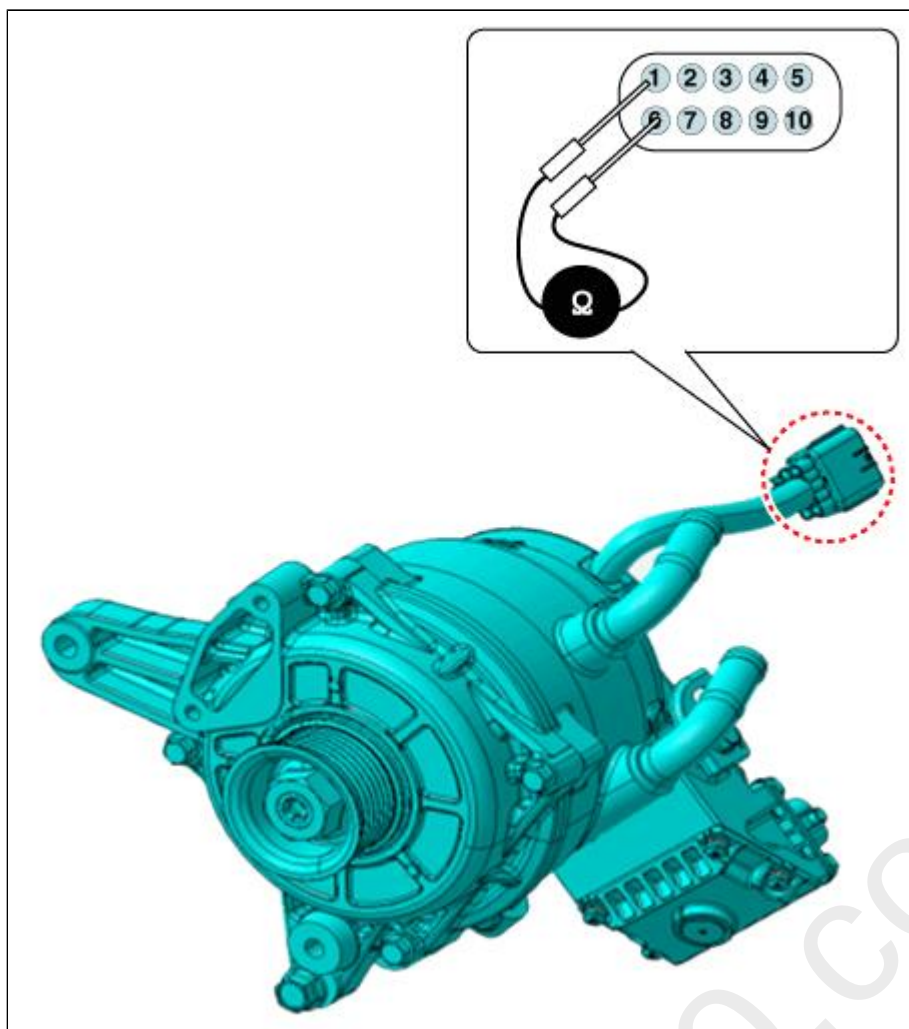
Category	Inspection Based on	Inspection Area	Inspection method	Remarks
Resistance (Temperature sensor)	Pin 4 - 9	10.92 - 13.44 kΩ	Measuring equipment: Multimeter	Based on ambient temperature (20°C)

Temperature (°C) (°F)	Standard
-40 (-40)	115.6 - 142.8kΩ
0 (32)	30.99 - 36.27kΩ
20 (68)	18.14 - 20.78kΩ
40 (104)	11.31 - 12.71 kΩ
100 (212)	3.63 - 3.90 kΩ
200 (392)	0.97 - 1.09 kΩ



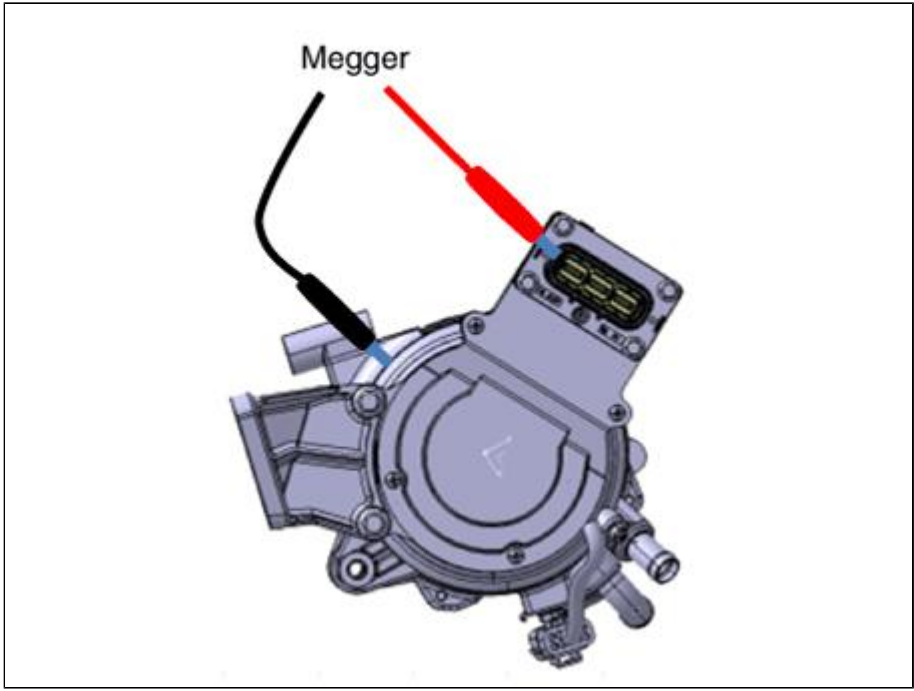
3. Check the resolver sensor resistance.

Category	Inspection area	Inspection criteria	Remarks
Resistance (Resolver sensor)	Pin 1 - 6	$15.8 \pm 2\Omega$	Based on ambient temperature (23°C)
	Pin 2 - 7	$28.2 \pm 2\Omega$	
	Pin 3 - 8	$28.2 \pm 2\Omega$	



4. Perform the insulation test.

Category	Inspection Based on	Inspection Area	Inspection method	Remarks
Insulation (Housing, cover)	W - U - V	10 MΩ↑	Measuring equipment: Voltage tester Measuring method : After 3-phase short-circuit Measurement between the phase and housing	DC 540 Vdc, 1 min
		5 mA↓		AC 1600 Vac, 1 min
	Position (resolver) sensor	10 MΩ↑		DC 500 Vdc, 1 min
	Temperature sensor	10 MΩ↑		



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