

EXHIBIT 21

U.S. Patent No. 7,154,200

Claims 1, 2, 4, 6, and 7

Toyota / Aisin Water Pump

Toyota P/N G9040-52010

Aisin P/N WQT-001.

"1. A motor comprising:"

1. A motor comprising:

The Toyota / Aisin Water Pump (the "Aisin Pump") has a Toyota part number G9040-52010 and Aisin part number WQT-001:



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O.E. Part #	Manufacturer	AINIS Part #
16120-49046	Toyota	WPT-065
16120-49055	Toyota	WPT-065
16120-49065	Toyota	WPT-084
16120-49080	Toyota	WPT-084
161A0-29015	Toyota	WPT-190
161A0-39015	Toyota	WPT-190
161A0-39025	Toyota	WPT-191
G9040-33030	Toyota	WQT-002
G9040-33040	Toyota	WQT-002
G9040-52010	Toyota	WQT-001

Aisin Cooling Catalog 2016.pdf at 145 (hereinafter "Aisin Cooling Catalog"), available at <http://aisinaftermarket.com/FlipBook/CoolingCatalog/mobile/index.html> (downloaded Dec. 6, 2016)

The Aisin Pump is marked with the Aisin logo:

"1. A motor comprising:"



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The Aisin Pump is a water pump and is believed to be installed in the following 2016 Toyota models:

"1. A motor comprising:"

- Toyota Highlander Hybrid Limited 3.5L V6 - Electric/Gas
- Toyota Highlander LE 2.7L L4 - Gas
- Toyota Highlander XLE 3.5L V6 - Gas
- Toyota Highlander LE Plus 3.5L V6 - Gas
- Toyota Highlander Limited 3.5L V6 - Gas
- Toyota Highlander LE 3.5L V6 – Gas



See, http://usnews.rankingsandreviews.com/cars-trucks/Toyota_Highlander/2016/

- Toyota Prius C Four 1.5L L4 - Electric/Gas
- Toyota Prius C One 1.5L L4 - Electric/Gas
- Toyota Prius C Three 1.5L L4 - Electric/Gas

"1. A motor comprising:"

- Toyota Prius C Two 1.5L L4 - Electric/Gas
- Toyota Prius C Persona Series 1.5L L4 - Electric/Gas
- Toyota Prius V Five 1.8L L4 - Electric/Gas
- Toyota Prius V Four 1.8L L4 – Electric/Gas
- Toyota Prius V Three 1.8L L4 – Electric/Gas
- Toyota Prius V Two 1.8L L4 – Electric/Gas



<http://o.aolcdn.com/dims-global/dims3/GLOB/resize/708x398/quality/60/http://o.aolcdn.com/commerce/autodata/images/USC60TOC161D022000.jpg>

<http://parts.olathetoyota.com/oe-toyota/g904033030> (accessed December 12, 2016).

"1. A motor comprising:"

The Aisin Pump is made in Japan:



52010label.jpg

The Aisin Pump is an electric pump assembly, as indicated on the packaging label directly above and as listed below on the purchase receipt.

"1. A motor comprising:"



685 N. Rawhide
 Olathe, Kansas 66061
 Tollfree: (866) 596-1970 · Phone (913) 780-5919 · Wholesale Parts (913) 782-1370 · Fax (913) 780-5062
 E-mail: parts@olathetoyota.com · Web: www.olathetoyota.com
 ALL CLAIMS AND RETURNED GOODS MUST BE ACCOMPANIED BY THIS INVOICE.
 NO RETURNS ON ELECTRICAL OR SPECIAL ORDER PARTS.
 NO RETURNS AFTER 30 DAYS. 20% RE-STOCK CHARGE ON ALL RETURNED PARTS.

DISCLAIMER OF WARRANTIES
 All expressed warranties, if any, by a Manufacturer or supplier other than the Dealer are theirs, not Dealer's, unless otherwise provided in writing on the face of this order or in a separate writing furnished to Customer by Dealer.
ALL PARTS INSTALLED ARE NEW UNLESS SPECIFIED OTHERWISE AS BEING USED OR REMANUFACTURED.

DATE ENTERED 02 DEC 16	YOUR ORDER NO. 28023	DATE SHIPPED 02 DEC 16	INVOICE DATE 02 DEC 16	INVOICE NUMBER 645567
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ACCOUNT NO. P65
 GRIFF NEAL
 727 S. VERMONT ST
 PALATINE, IL 60067

PAGE 1 OF 1

QTY	UNIT	PART NO.	DESCRIPTION	LIST	NET	AMOUNT
1		80960-0E070	0 MOTOR	456.26	456.26	456.26
		*** ABOVE PART IS PREPAID ***				
1		80960-52090	0 MOTOR	389.06	291.79	291.75
		*** ABOVE PART IS PREPAID ***				
1		161A0-29C15	15203 1 PUMP	433.03	433.03	433.03
1		G9040-47040	C PUMP	171.77	171.77	171.77
		*** ABOVE PART IS PREPAID ***				
1		G9040-52010	11503 3 PUMP	171.77	171.77	171.77
		*** ABOVE PART IS PREPAID ***				
		FREIGHT 21.65				
		The following parts have been special ordered:				
1		80960-0E070	MOTOR ASSY			
1		80960-52090	MOTOR ASSY			
1		G9040-47040	PUMP ASSY			
1		G9040-52010	PUMP ASSY			
***** WELCOME TO THE NEW ***** ***** OLATHE TOYOTA *****						
CUSTOMER'S SIGNATURE X						
PARTS						1,524.62
SURFET						
FREIGHT						21.65
SALES TAX						0.00
TOTAL						\$1,546.27

*Spoke w/
 William
 returned
 for
 456.26
 credit.*

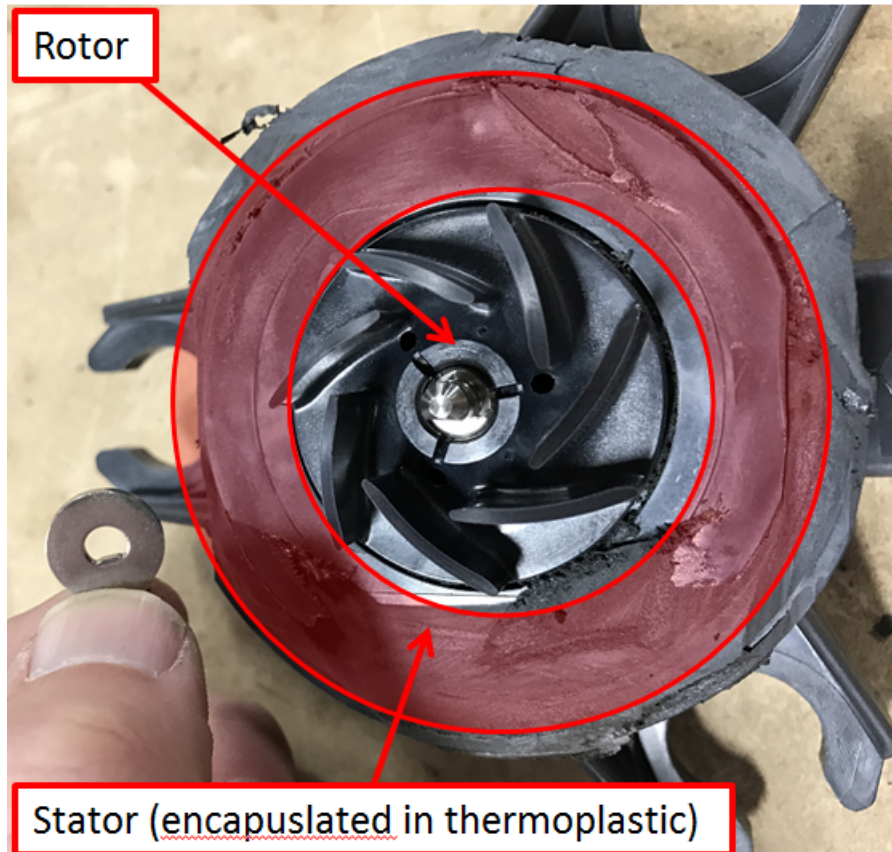
685 N. Rawhide

CCF_000055.pdf

As shown in greater detail below, the Aisin Pump is an electric motor having a stator and a rotor, where the stator is designed

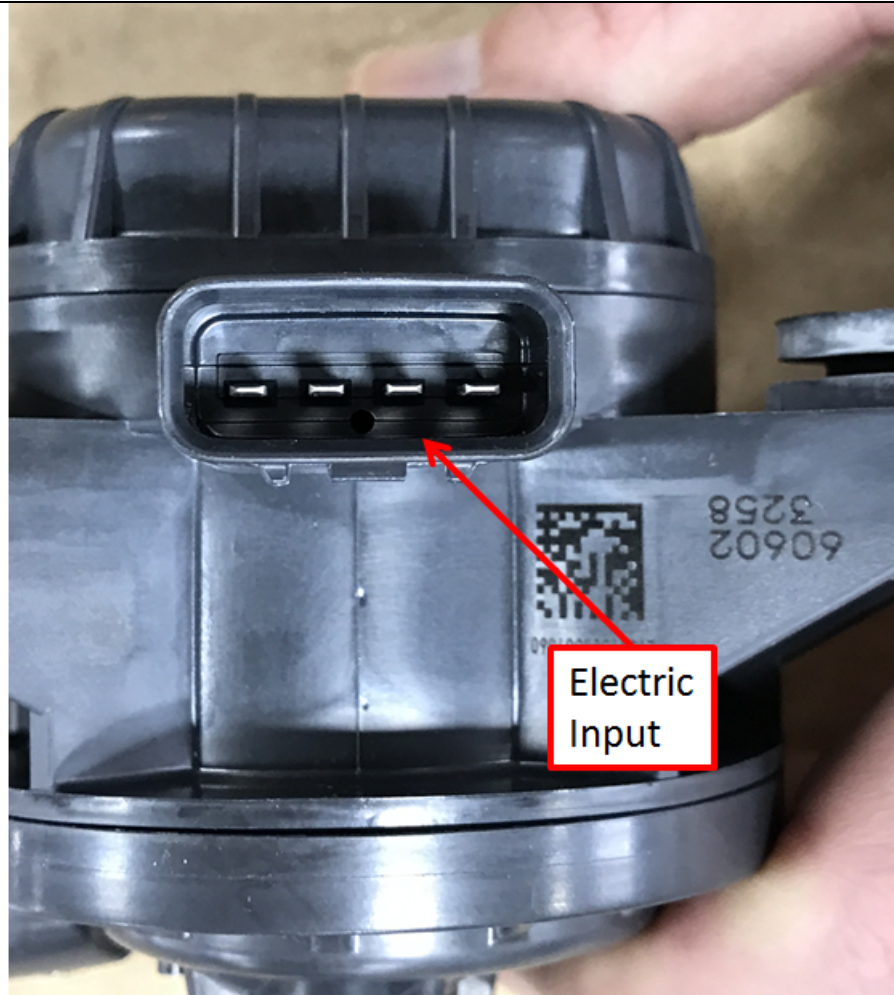
"1. A motor comprising:"

to cause the rotor to rotate during operation.



IMG_1956.JPG

"1. A motor comprising:"



IMG_1905.JPG

"a) a stator substantially encapsulated within a body of thermoplastic material; and"

a) a stator substantially encapsulated within a body of thermoplastic material; and

The Aisin Pump comprises a stator substantially encapsulated within a body of thermoplastic material.

The Aisin Pump includes a "PPS – GF 30" label:



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"PPS – GF 30" refers to polyphenylene sulfide with 30% glass fiber filler ("PPS-GF30"). *See, e.g.*, U.S. Patent Publication 2009/0173903 (application No. 12/295,565), at ¶ 0114 ("The abbreviations of the resin names in the tables above are as follows. PPS-GF30: Polyphenylene sulfide resin containing 30 wt % of glass fibers").

PPS-GF30 is a thermoplastic – the excerpt pictured below is a summary of its properties (including the categories of which it is a member, which includes "thermoplastic") from the MatWeb material property data.

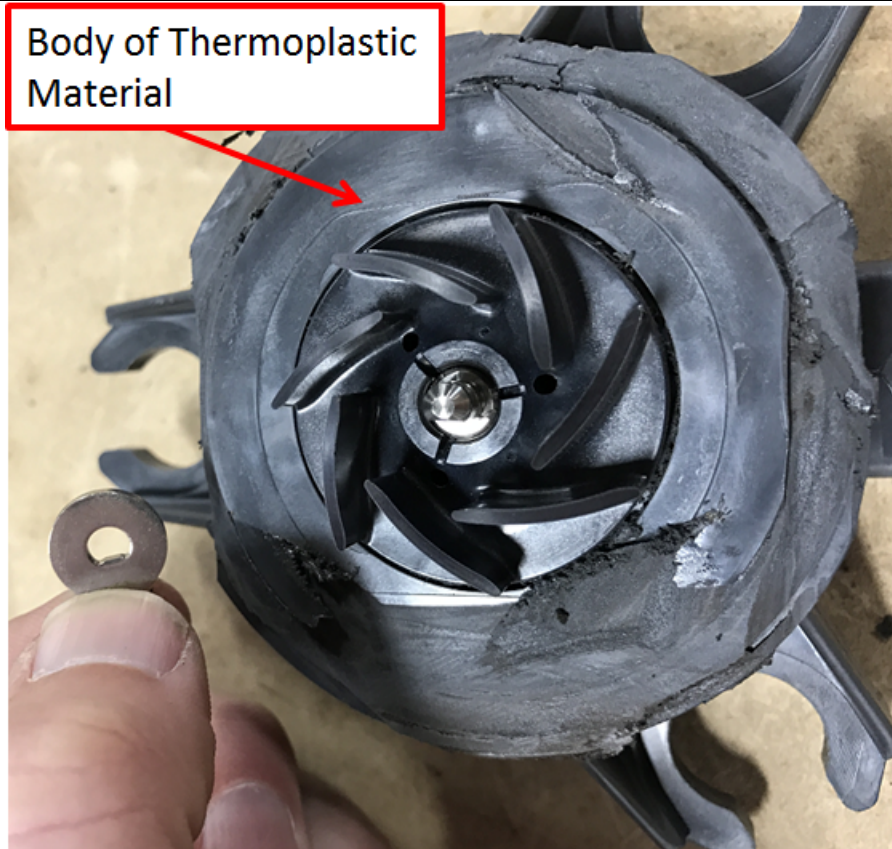
"a) a stator substantially encapsulated within a body of thermoplastic material; and"

The screenshot shows the MatWeb website interface. At the top left is the MatWeb logo with the tagline 'MATERIAL PROPERTY DATA'. To the right, there is a navigation menu with links for 'HOME', 'SEARCH', 'TOOLS', 'SUPPLIERS', 'FOLDERS', 'ABOUT US', 'FAQ', and 'LOG IN'. A search bar contains the text 'PPS' and a 'SEARCH' button. Below the navigation is a search filter bar with options: 'Advanced', 'Category', 'Property', 'Metals', 'Trade Name', 'Manufacturer', and 'Recently Viewed Materials'. The main content area features a blue header for 'Overview of materials for Polyphenylene Sulfide (PPS) with 30% Glass Fiber Filler'. Below this, the 'Categories' are listed as 'Polymer', 'Thermoplastic', 'Polyphenylene Sulfide (PPS)', and 'Polyphenylene Sulfide (PPS) with 30% Glass Fiber Filler'. The 'Material Notes' section states: 'This property data is a summary of similar materials in the MatWeb database for the category "Polyphenylene Sulfide (PPS) with 30% Glass Fiber Filler". Specific grades with glass content between 25% and 34% are included. Each property range of values reported is minimum and maximum values of appropriate MatWeb entries. The comments report the average value, and number of data points used to calculate the average. The values are not necessarily typical of any specific grade, especially less common values and those that can be most affected by additives or processing methods.'

<http://www.matweb.com/search/DataSheet.aspx?MatGUID=c43bc743bdc0413ead2b87aca2e38a30&ckck=1> (downloaded Dec. 9, 2016).

The "PPS – GF 30" label on the Aisin Pump denotes that the plastic body of the Aisin Pump is made of this type of thermoplastic material.

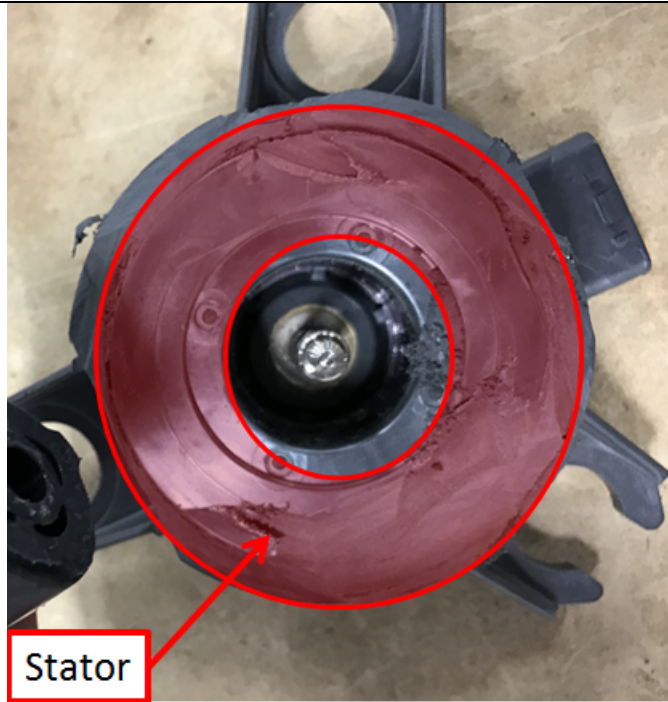
"a) a stator substantially encapsulated within a body of thermoplastic material; and"



IMG_1956.JPG

The Aisin Pump also includes a stator. The general location of the stator is shown shaded in red in the photo below.

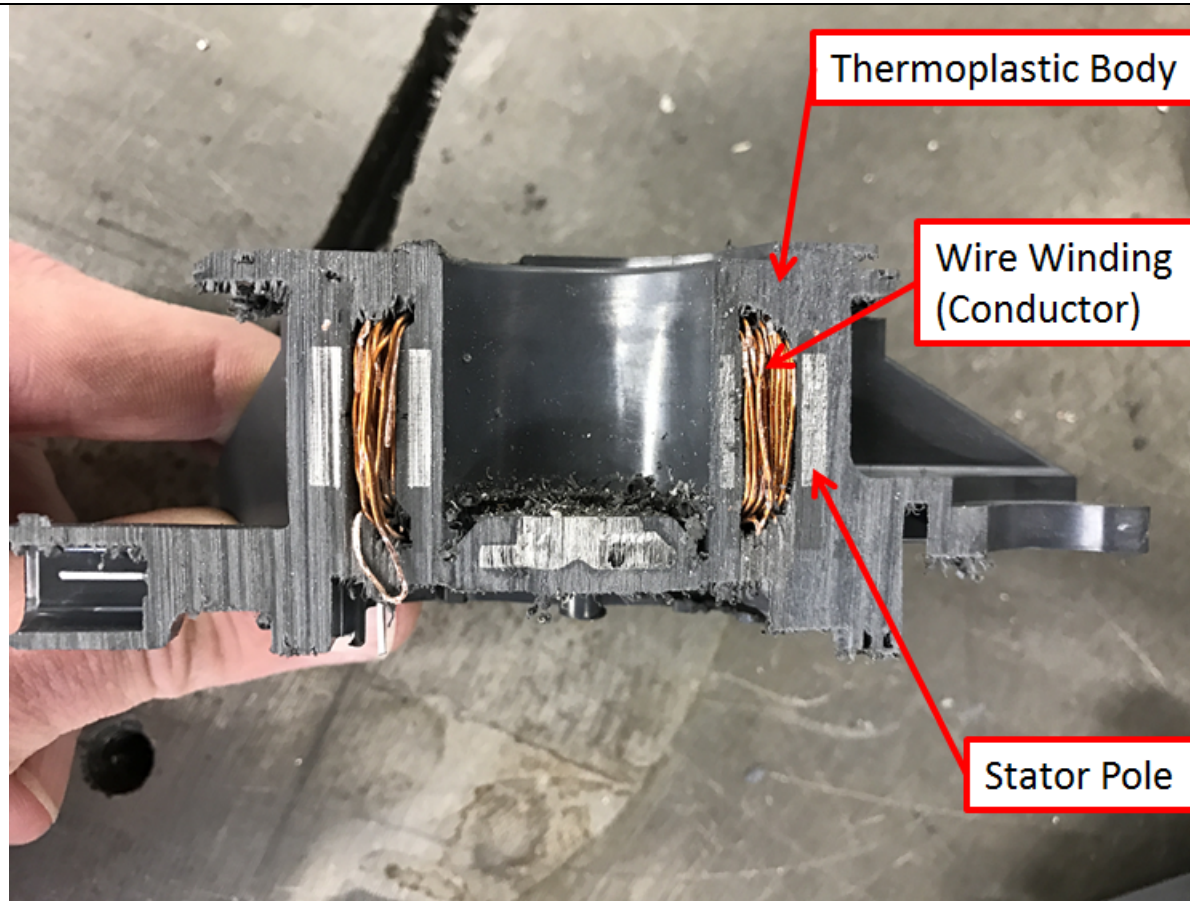
"a) a stator substantially encapsulated within a body of thermoplastic material; and"



IMG_1960.JPG

The stator is substantially encapsulated within the body of PPS – GF 30. For example, the photo below shows stator conductors (*i.e.*, wire windings) and stator poles substantially encapsulated within the body of PPS – GF 30.

"a) a stator substantially encapsulated within a body of thermoplastic material; and"



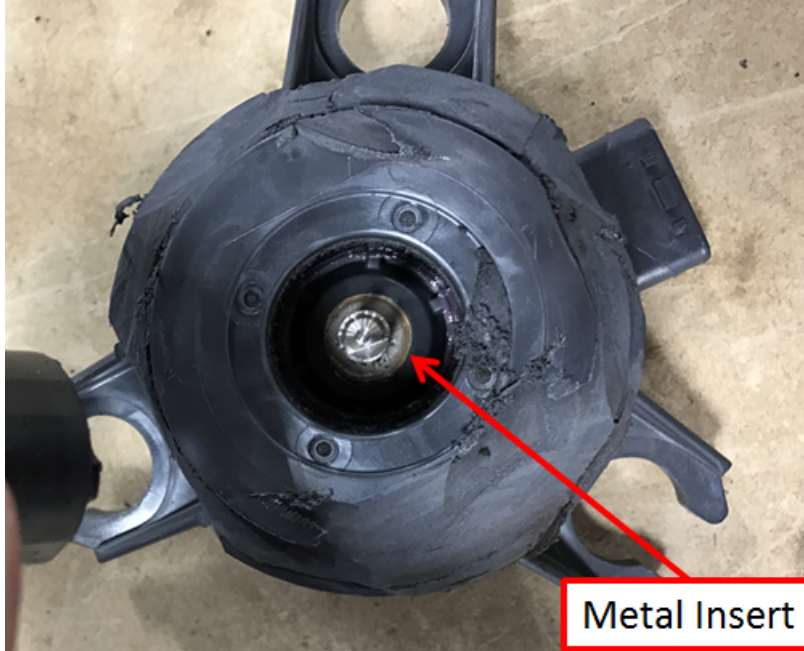
IMG_2010.JPG

"b) one or more solid parts used in the motor either within or near the body;"

b) one or more solid parts used in the motor either within or near the body;

The Aisin Pump comprises one or more solid parts either within or near the body.

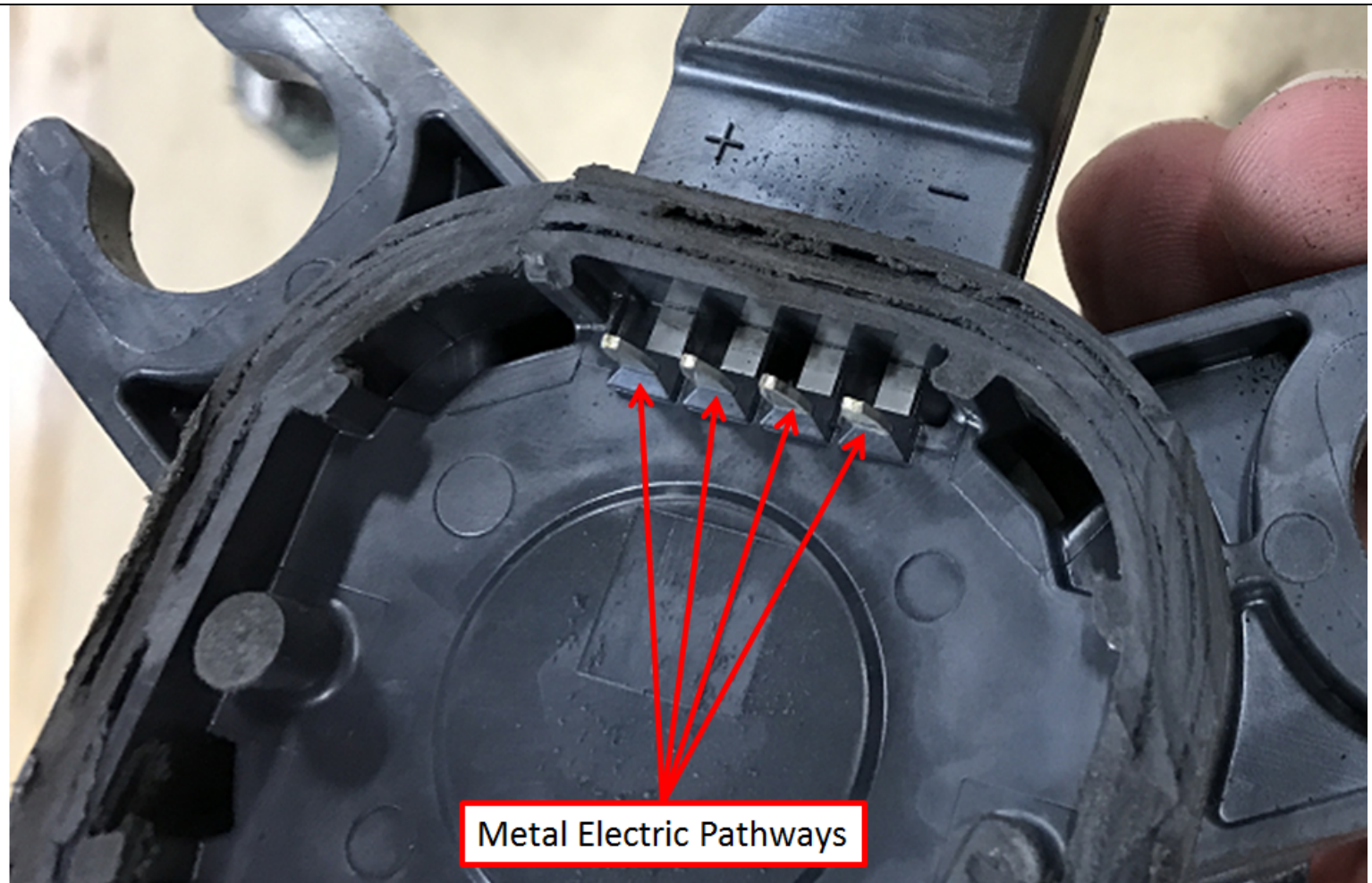
The Aisin Pump includes a number of solid parts within or near the body of PPS – GF 30. For example, the Aisin Pump includes a metal insert within the body PPS – GF 30:



IMG_1958.JPG

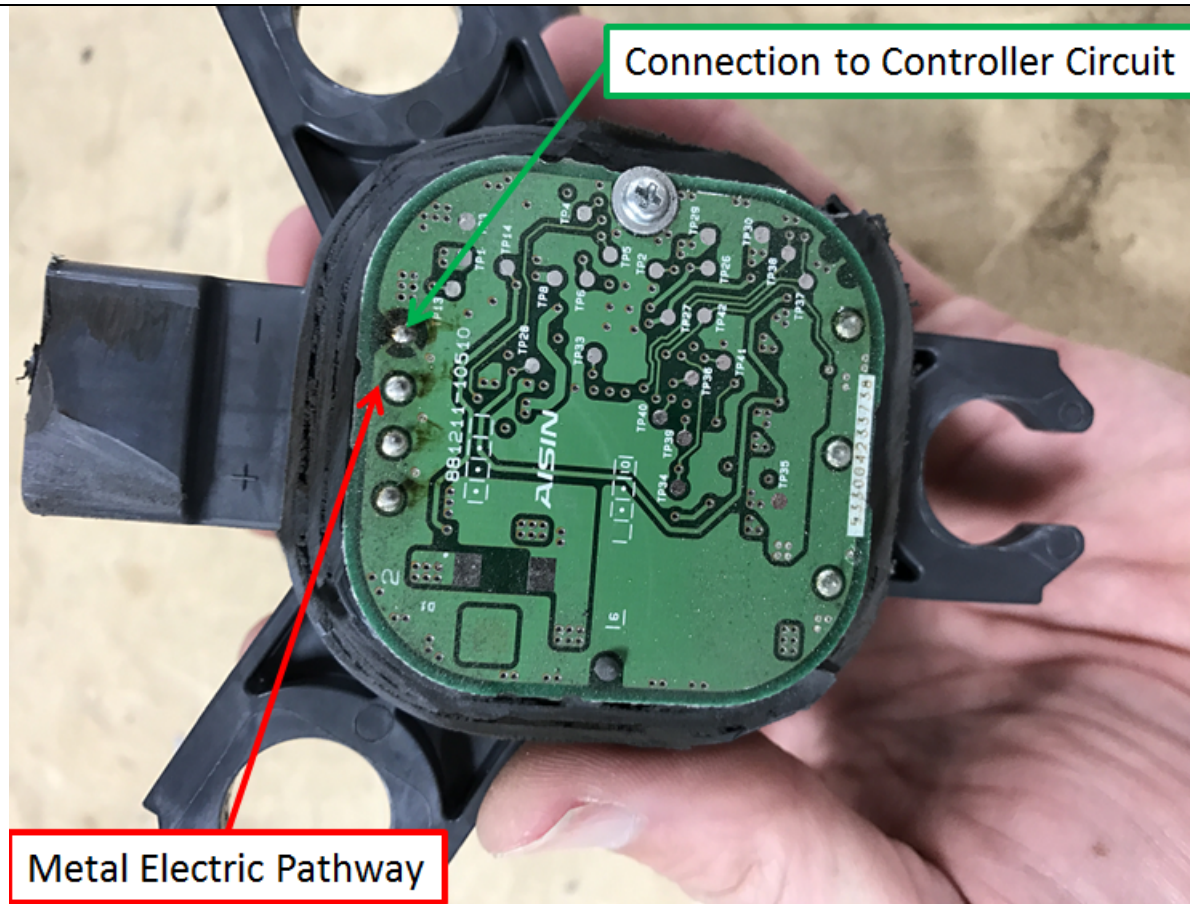
By way of further example, the Aisin Pump includes metal terminals each having a portion within the body of PPS – GF 30, as shown in the photos below:

"b) one or more solid parts used in the motor either within or near the body;"



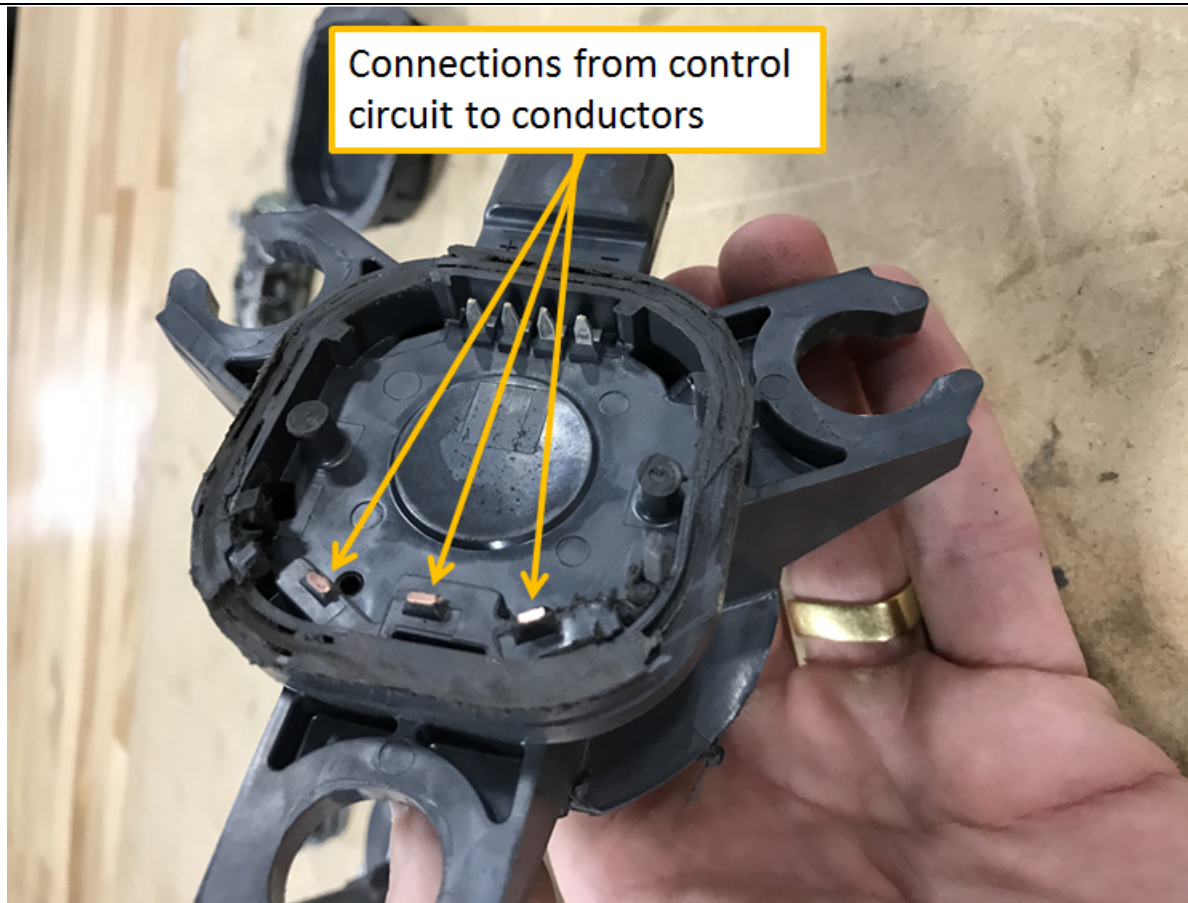
IMG_1951.JPG

"b) one or more solid parts used in the motor either within or near the body;"



IMG_1926.JPG

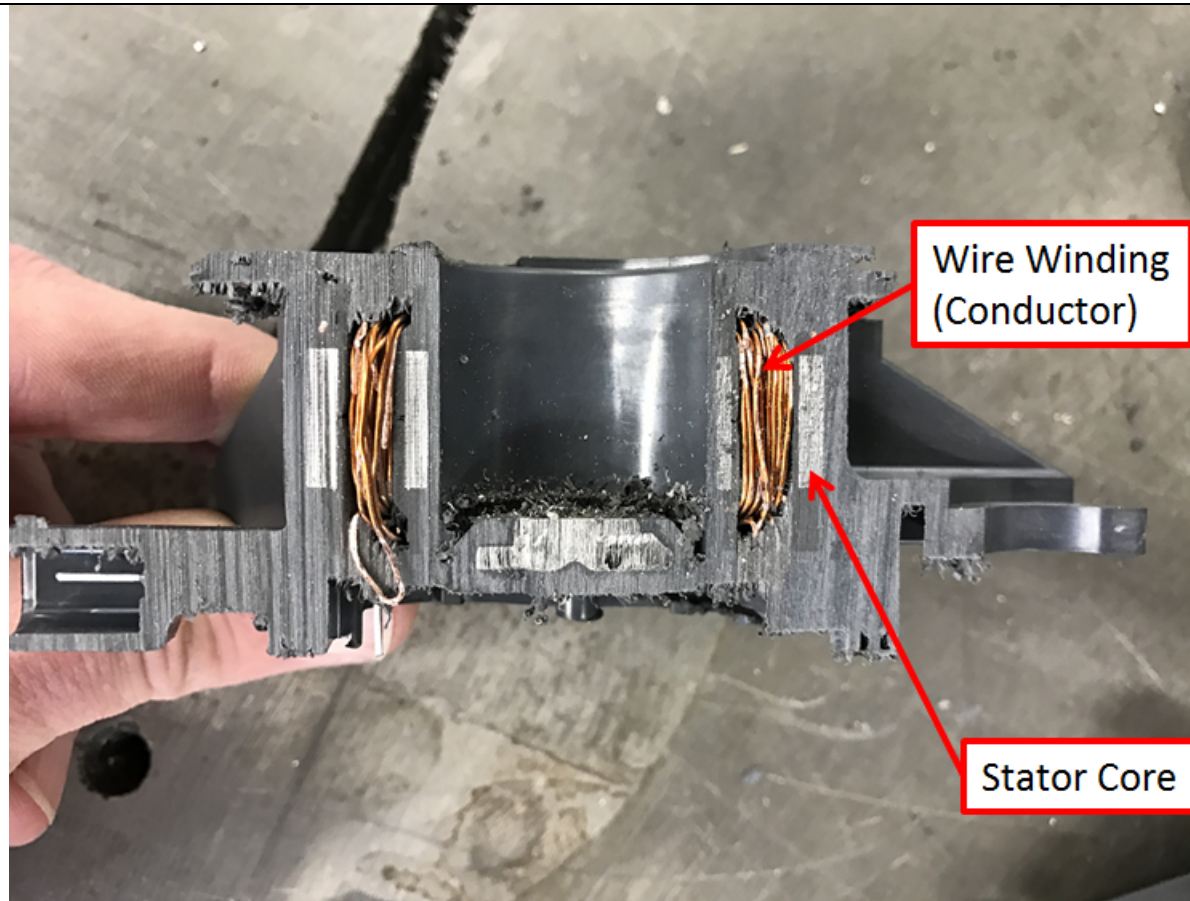
"b) one or more solid parts used in the motor either within or near the body;"



IMG_1952.JPG

The Aisin Pump further includes a metal stator core and wire windings as components of the stator substantially encapsulated within the body of PPS – GF 30:

"b) one or more solid parts used in the motor either within or near the body;"



IMG_2010.JPG

"c) the thermoplastic material having a coefficient of linear thermal expansion such that the thermoplastic material contracts and expands at approximately the same rate as the one or more solid parts."

c) the thermoplastic material having a coefficient of linear thermal expansion such that the thermoplastic material contracts and expands at approximately the same rate as the one or more solid parts.

The Aisin Pump comprises a thermoplastic material having a coefficient of linear thermal expansion such that the thermoplastic material contracts and expands at approximately the same rate as the one or more solid parts.

As explained above, the Aisin Pump includes a body that contains a label "PPS – GF 30," which refers to a thermoplastic material called polyphenylene sulfide with 30% glass fiber filler. The "PPS – GF 30" label on the Aisin Pump denotes that the body of the Aisin Pump is made of this type of thermoplastic material.

The coefficient of linear thermal expansion ("CLTE" or "CTE") is a measurement that describes how the size of an object changes in one dimension (e.g., length) per unit rise in temperature:

Most solid materials expand upon heating and contract when cooled. The change in length with temperature for a solid material can be expressed as:

$$(l_f - l_0)/l_0 = \alpha_1 (T_f - T_0) \quad \Delta l/l_0 = \alpha_1 \Delta T$$

$$\alpha_1 = 1/l(dl/dT)$$

where l_0 and l_f represent, respectively, the original and final lengths with the temperature change from T_0 to T_f . The parameter α_1 CTE and has units of reciprocal temperature (K^{-1}) such as $\mu\text{m}/\text{m} \cdot \text{K}$ or $10^{-6}/\text{K}$. Conversion factors are:

To convert	To	Multiply by
$10^{-6}/\text{K}$	$10^{-6}/^{\circ}\text{F}$	0.55556
$10^{-6}/^{\circ}\text{F}$	$10^{-6}/\text{K}$	1.8
ppm/ $^{\circ}\text{C}$	$10^{-6}/\text{K}$	1
$10^{-6}/^{\circ}\text{C}$	$10^{-6}/\text{K}$	1
$(\mu\text{m}/\text{m})/^{\circ}\text{F}$	$10^{-6}/\text{K}$	1.8
$(\mu\text{m}/\text{m})/^{\circ}\text{C}$	$10^{-6}/\text{K}$	1
$10^{-6}/\text{R}$	$10^{-6}/\text{K}$	1.8


The coefficient of thermal expansion is also often defined as the fractional increase in length per unit rise in temperature. The exact definition

<http://www.owlnet.rice.edu/~msci301/ThermalExpansion.pdf> (downloaded Dec. 6, 2016).

"c) the thermoplastic material having a coefficient of linear thermal expansion such that the thermoplastic material contracts and expands at approximately the same rate as the one or more solid parts."

PPS – GF30 has a CLTE similar to one or more of the solid (e.g., metal) parts either within or near the body of PPS – GF 30 of the Aisin Pump and, accordingly, contracts and expands at approximately the same rate as those one or more solid parts.

More specifically, PPS – GF 30 is known to possess CLTE values in the range of 0.50×10^{-5} in/in °F to 2.06×10^{-5} in/in °F when heated to temperatures between 212 °F and 392 °F, with an average value of 1.39×10^{-5} in/in °F:

Thermal Properties	Metric	English	Comments
CTE, linear	9.00 - 37.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	5.00 - 20.6 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	Average value: 25.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ Grade Count:8
	10.0 - 52.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ @Temperature 100 - 200 °C	5.56 - 28.9 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$ @Temperature 212 - 392 °F	Average value: 31.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ Grade Count:2

http://www.matweb.com/search/datasheet_print.aspx?matguid=c43bc743bdc0413ead2b87aca2e38a30 (downloaded Dec. 9, 2016)

One or more of the solid parts, such as the metal insert, metal inserts within the mounting flanges, metal electric pathways and metal stator core, are believed to be some type of steel. Steels are known to possess CLTE values within the CLTE range of values of PPS – GF 30, namely from 0.63×10^{-5} in/in °F to 0.68×10^{-5} in/in °F:

Steels		
Material	Coefficient of Thermal Expansion	
	$10^{-6} (\text{°C})^{-1}$	$10^{-6} (\text{°F})^{-1}$
Plain Carbon and Low Alloy Steels		
Steel Alloy A36	11.7	6.5
Steel Alloy 1020	11.7	6.5
Steel Alloy 1040	11.3	6.3
Steel Alloy 4140	12.3	6.8
Steel Alloy 4340	12.3	6.8

<http://www.amesweb.info/Materials/Linear-Thermal-Expansion-Coefficient-Metals.aspx> (downloaded Dec. 9, 2016).

"c) the thermoplastic material having a coefficient of linear thermal expansion such that the thermoplastic material contracts and expands at approximately the same rate as the one or more solid parts."

The wire windings are believed to be some type of copper. Copper alloys are known to possess CLTE values within the CLTE range of values of PPS – GF 30, namely from 0.90×10^{-5} in/in °F to 1.14×10^{-5} in/in °F:

Copper-Base Alloys		
Material	Coefficient of Thermal Expansion	
	$10^{-6} (\text{°C})^{-1}$	$10^{-6} (\text{°F})^{-1}$
Copper Alloy C11000 (electrolytic tough pitch)	17.0	9.4
Copper Alloy C17200 (beryllium - copper)	16.7	9.3
Copper Alloy C22000 (Commercial bronze, 90%)	18.4	10.2
Copper Alloy C23000 (Red brass, 85 %)	18.7	10.4
Copper Alloy C26000 (cartridge brass)	19.9	11.1
Copper Alloy C27000 (Yellow Brass)	20.3	11.3
Copper Alloy C36000 (free - cutting brass)	20.5	11.4
Copper Alloy C51000 (Phosphor bronze, 5% A)	17.8	9.9
Copper Alloy C62300 (Aluminum bronze, 9%)	16.2	9.0
Copper Alloy C71500 (copper - nickel, 30%)	16.2	9.0
Copper Alloy C93200 (bearing bronze)	18.0	10.0

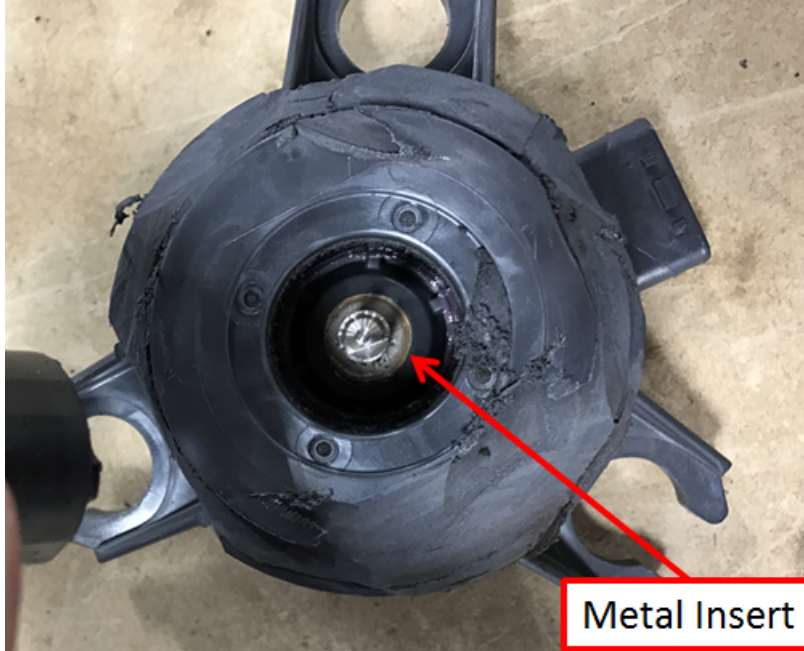
<http://www.amesweb.info/Materials/Linear-Thermal-Expansion-Coefficient-Metals.aspx> (downloaded Dec. 9, 2016).

"2. The motor of claim 1 wherein the one or more solid parts comprise a metal."

2. The motor of claim 1 wherein the one or more solid parts comprise a metal.

One or more solid parts in the Aisin Pump comprise a metal.

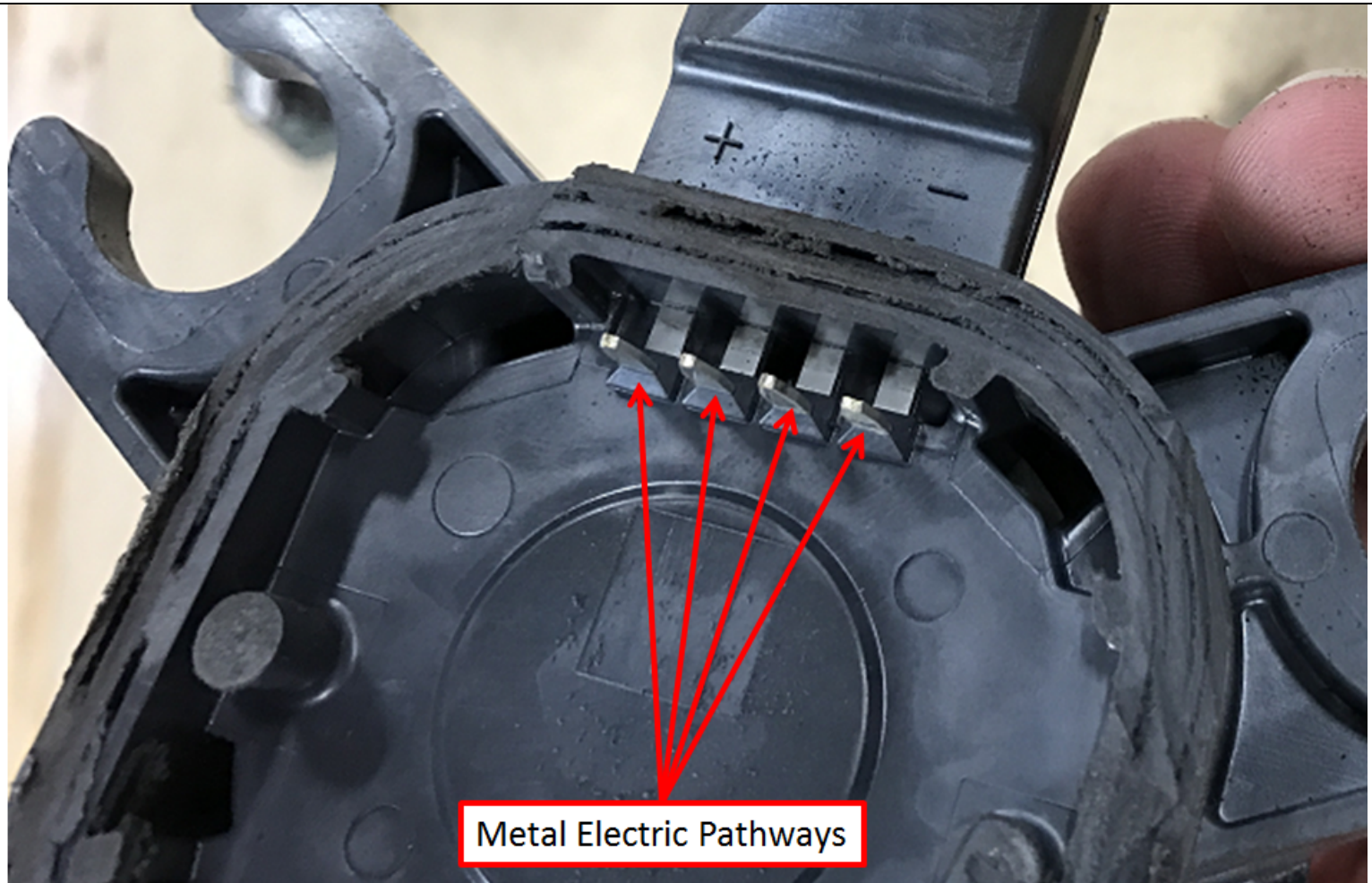
As explained above, the Aisin Pump includes one or more solid parts. The solid parts are believed to be made from metal. For example, as shown in the photo below, the Aisin Pump includes a metal insert.



IMG_1958.JPG

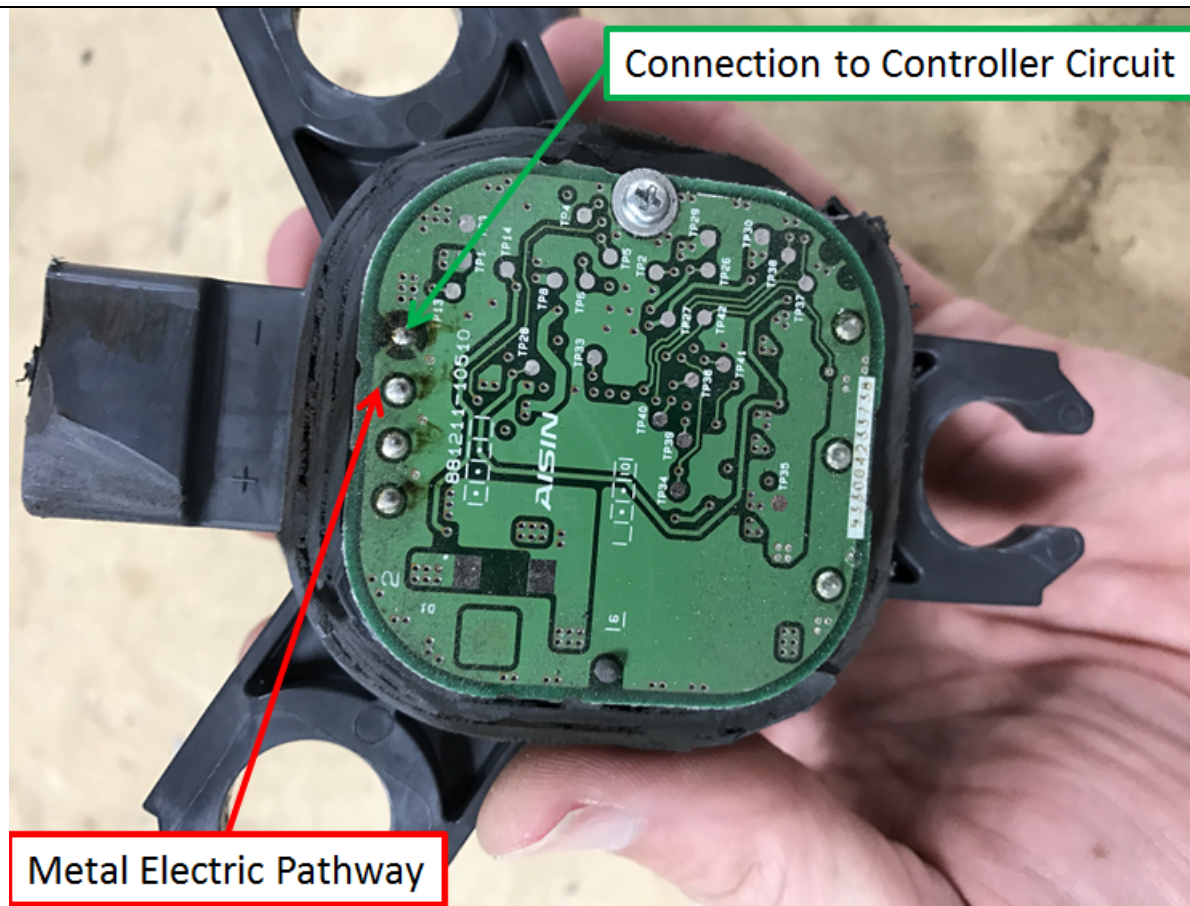
By way of further example, the Aisin Pump includes metal terminals each having a portion within the body of PPS – GF 30, as shown in the photos below:

"2. The motor of claim 1 wherein the one or more solid parts comprise a metal."



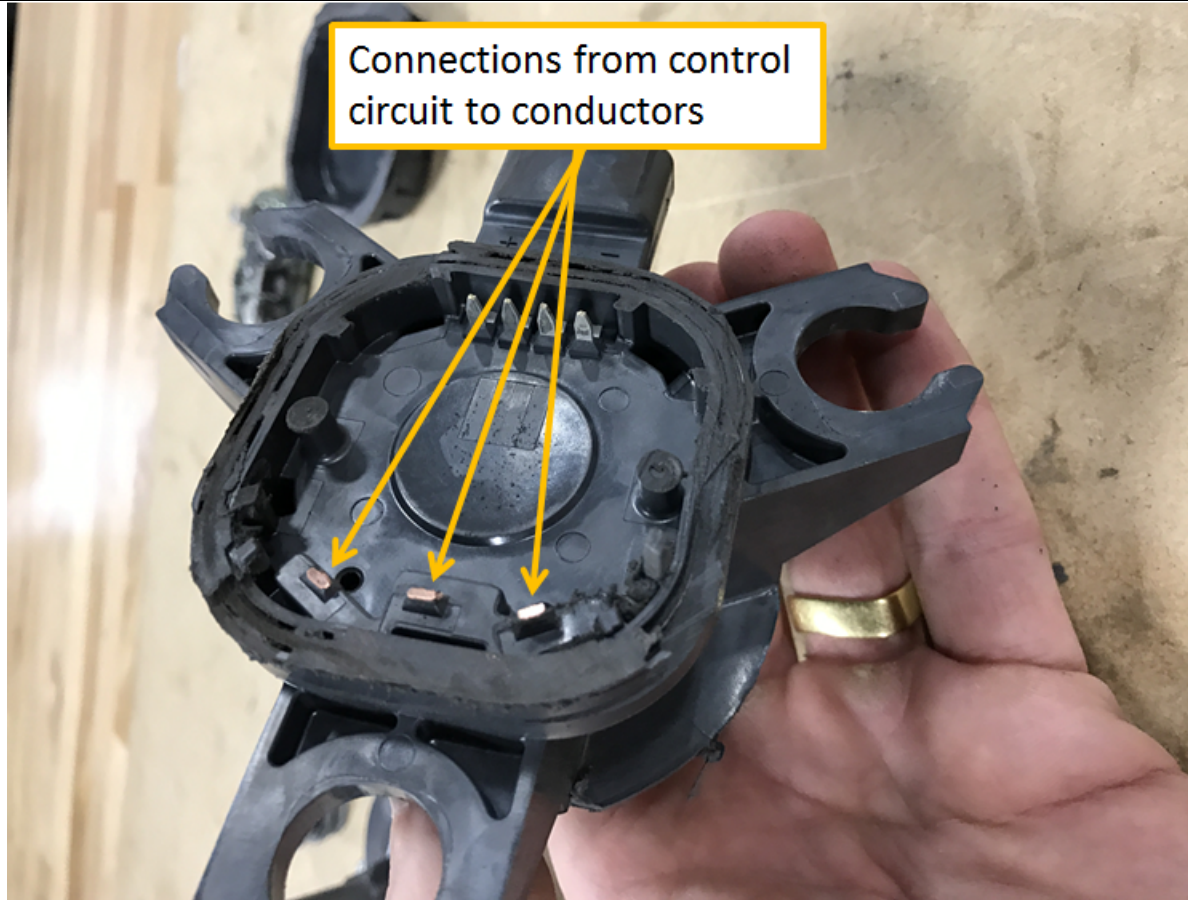
IMG_1951.JPG

"2. The motor of claim 1 wherein the one or more solid parts comprise a metal."



IMG_1926.JPG

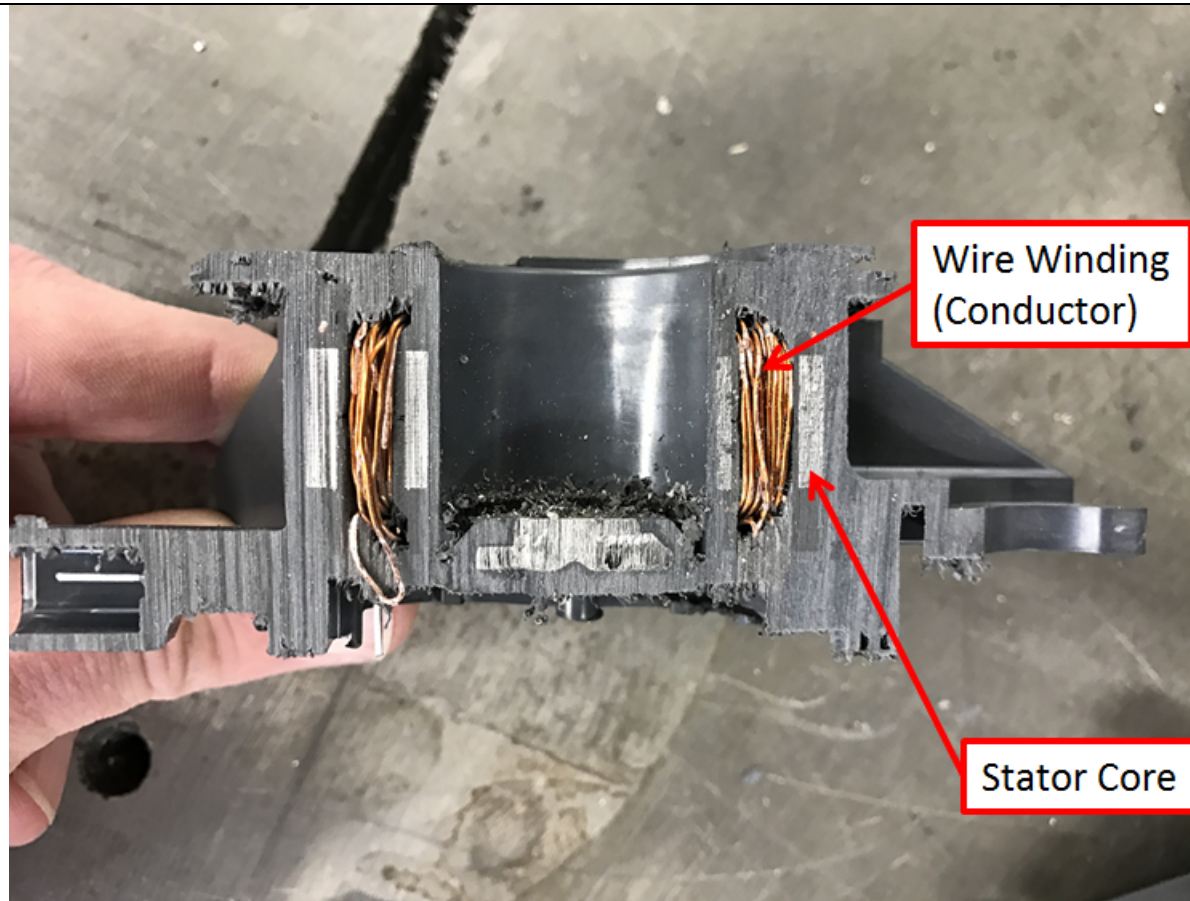
"2. The motor of claim 1 wherein the one or more solid parts comprise a metal."



IMG_1952.JPG

The Aisin Pump further includes a metal stator core and wire windings as components of the stator substantially encapsulated within the body of PPS – GF 30:

"2. The motor of claim 1 wherein the one or more solid parts comprise a metal."



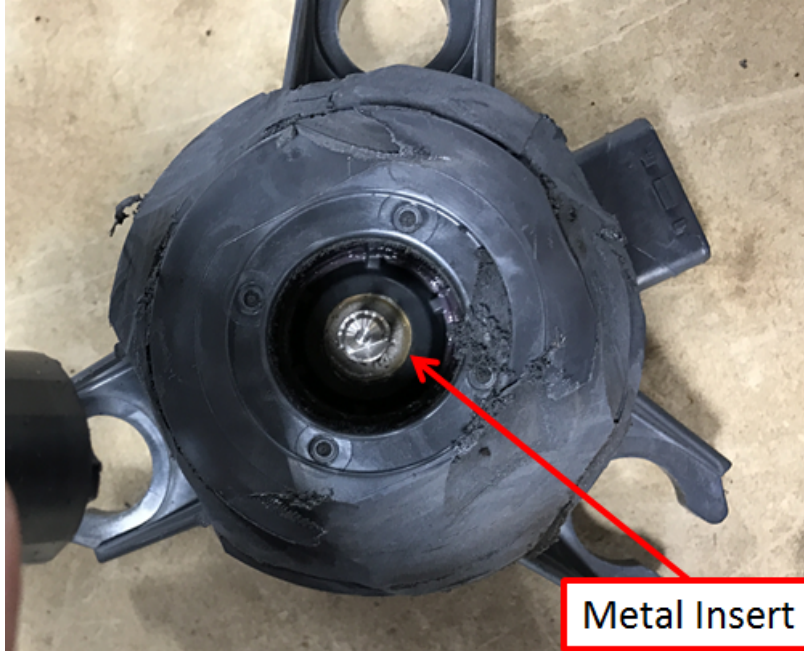
IMG_2010.JPG

"4. The motor of claim 1 wherein the one or more solid parts comprise a metal insert molded within the body."

4. The motor of claim 1 wherein the one or more solid parts comprise a metal insert molded within the body.

One or more solid parts in the Aisin Pump comprise a metal insert molded within the body.

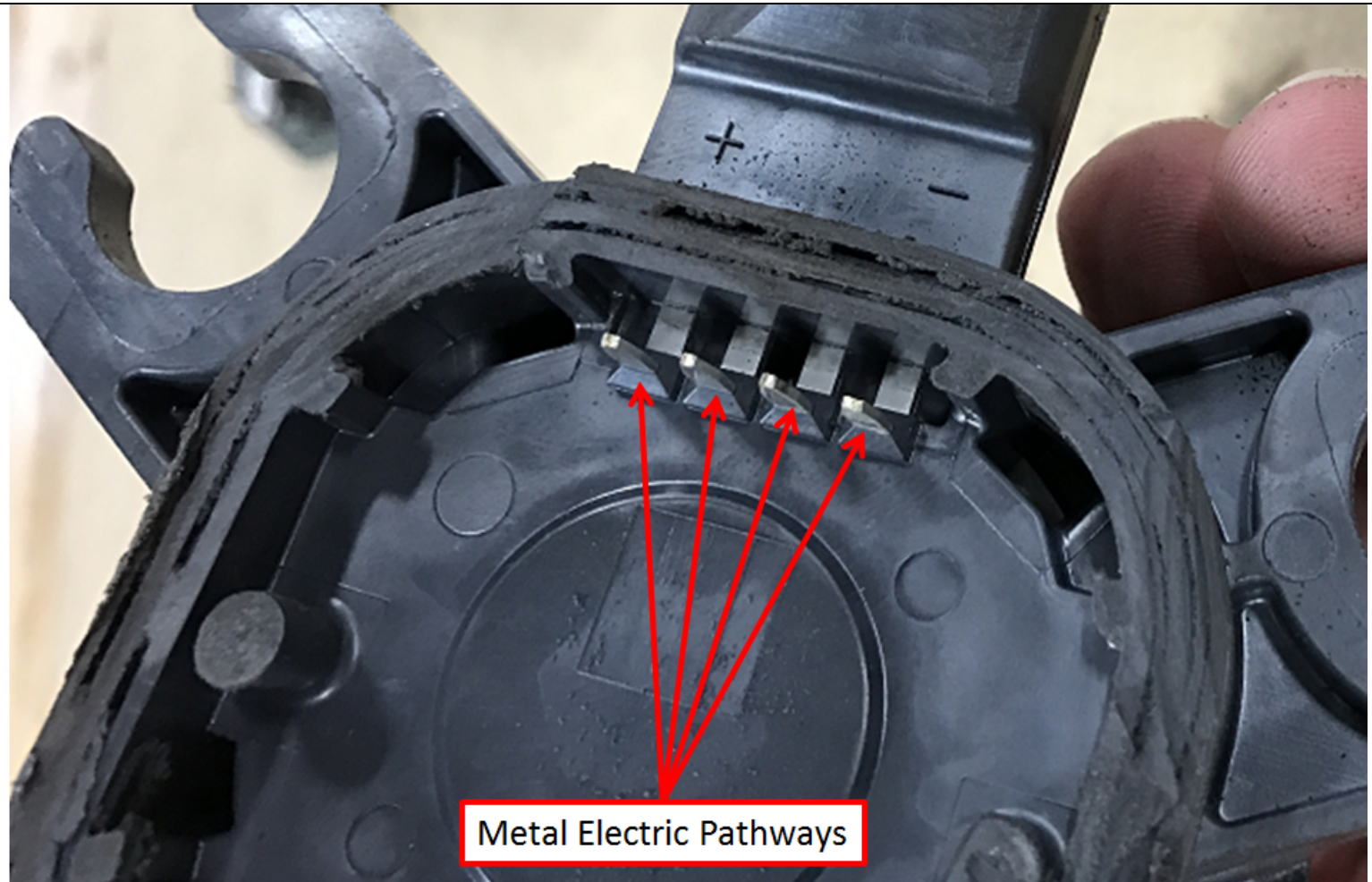
As explained above, the Aisin Pump includes a number of solid parts within or near the body of PPS – GF 30. For example, the Aisin Pump includes a metal insert within the body of PPS – GF 30:



IMG_1958.JPG

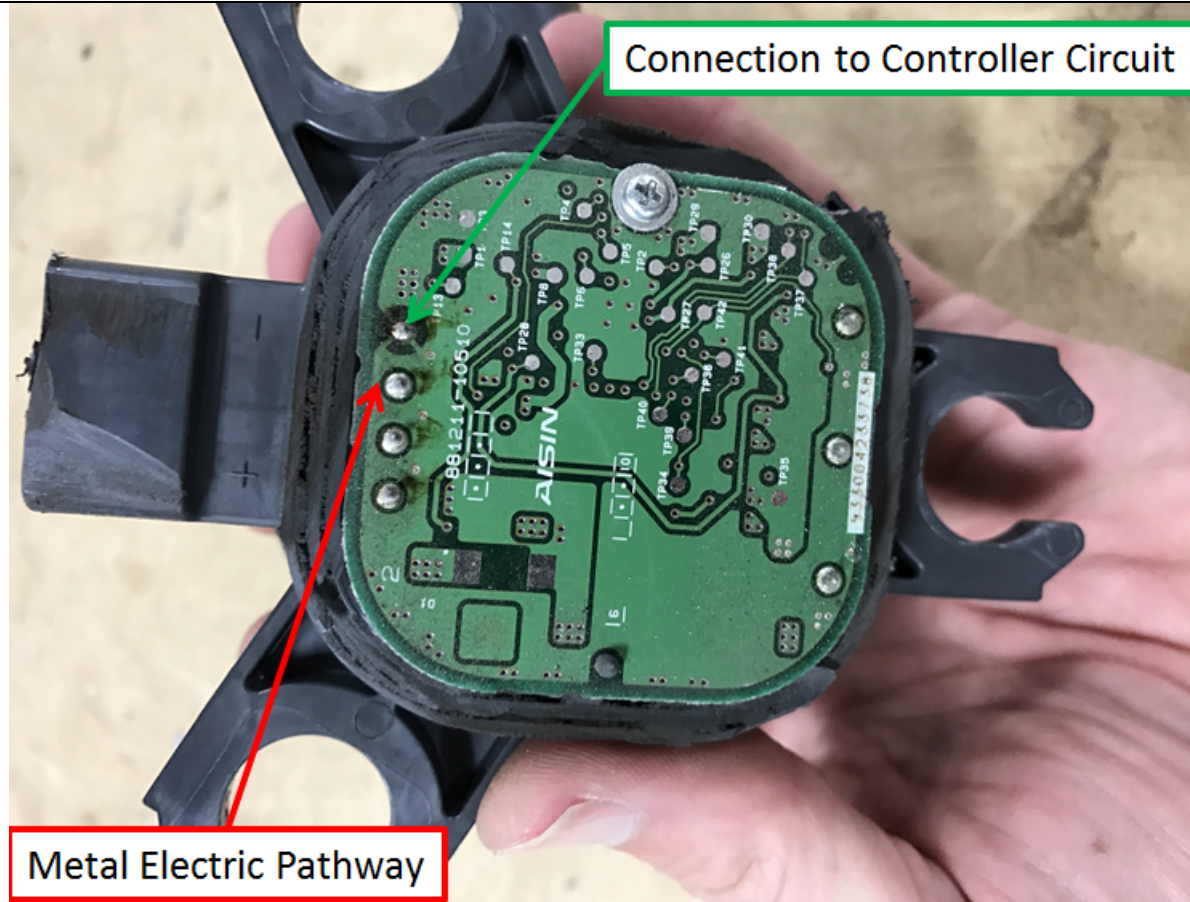
The Aisin Pump also includes metal terminals each having a portion within the body of PPS – GF 30, as shown in the photos below:

"4. The motor of claim 1 wherein the one or more solid parts comprise a metal insert molded within the body."



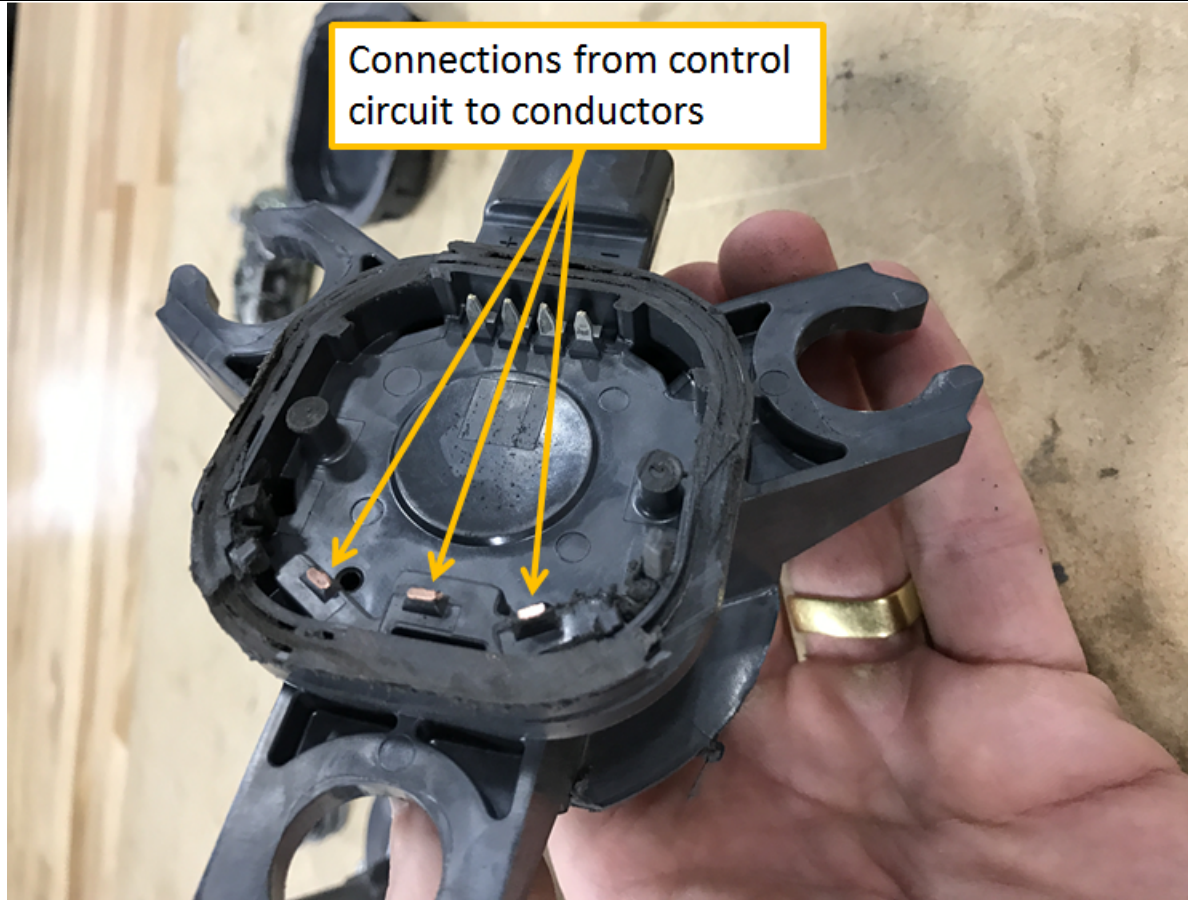
IMG_1951.JPG

"4. The motor of claim 1 wherein the one or more solid parts comprise a metal insert molded within the body."



IMG_1926.JPG

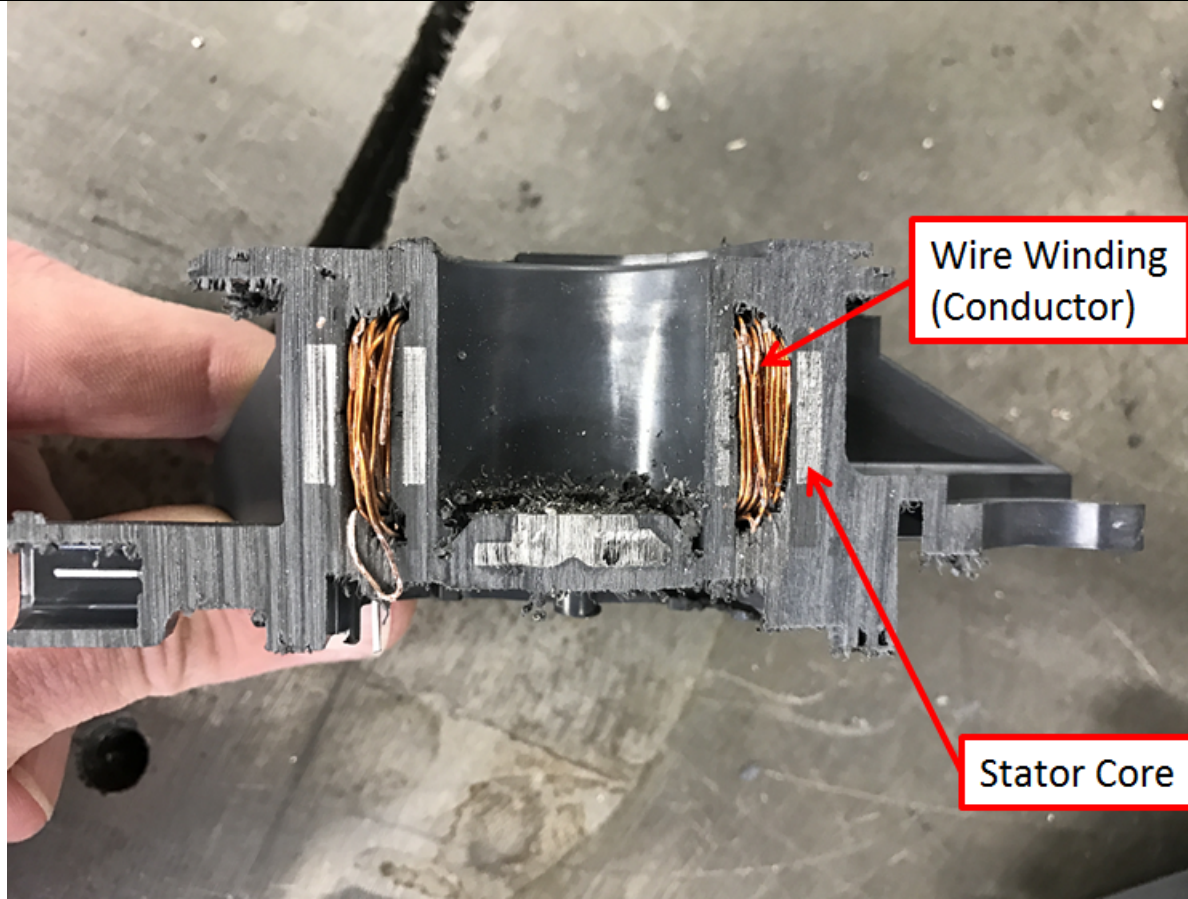
"4. The motor of claim 1 wherein the one or more solid parts comprise a metal insert molded within the body."



IMG_1952.JPG

The Aisin Pump further includes a metal stator core and wire windings as components of the stator substantially encapsulated within the body of PPS – GF 30:

"4. The motor of claim 1 wherein the one or more solid parts comprise a metal insert molded within the body."



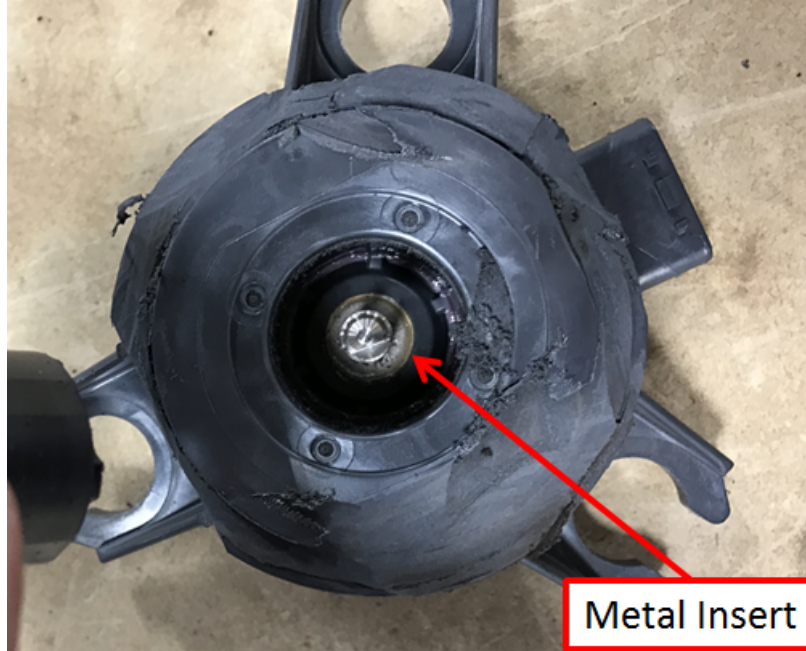
IMG_2010.JPG

"6. The motor of claim 1 wherein there are a plurality of solid parts that will be either within or near the body, and"

6. The motor of claim 1 wherein there are a plurality of solid parts that will be either within or near the body, and

A plurality of the one or more solid parts of the Aisin Pump is either within or near the body.

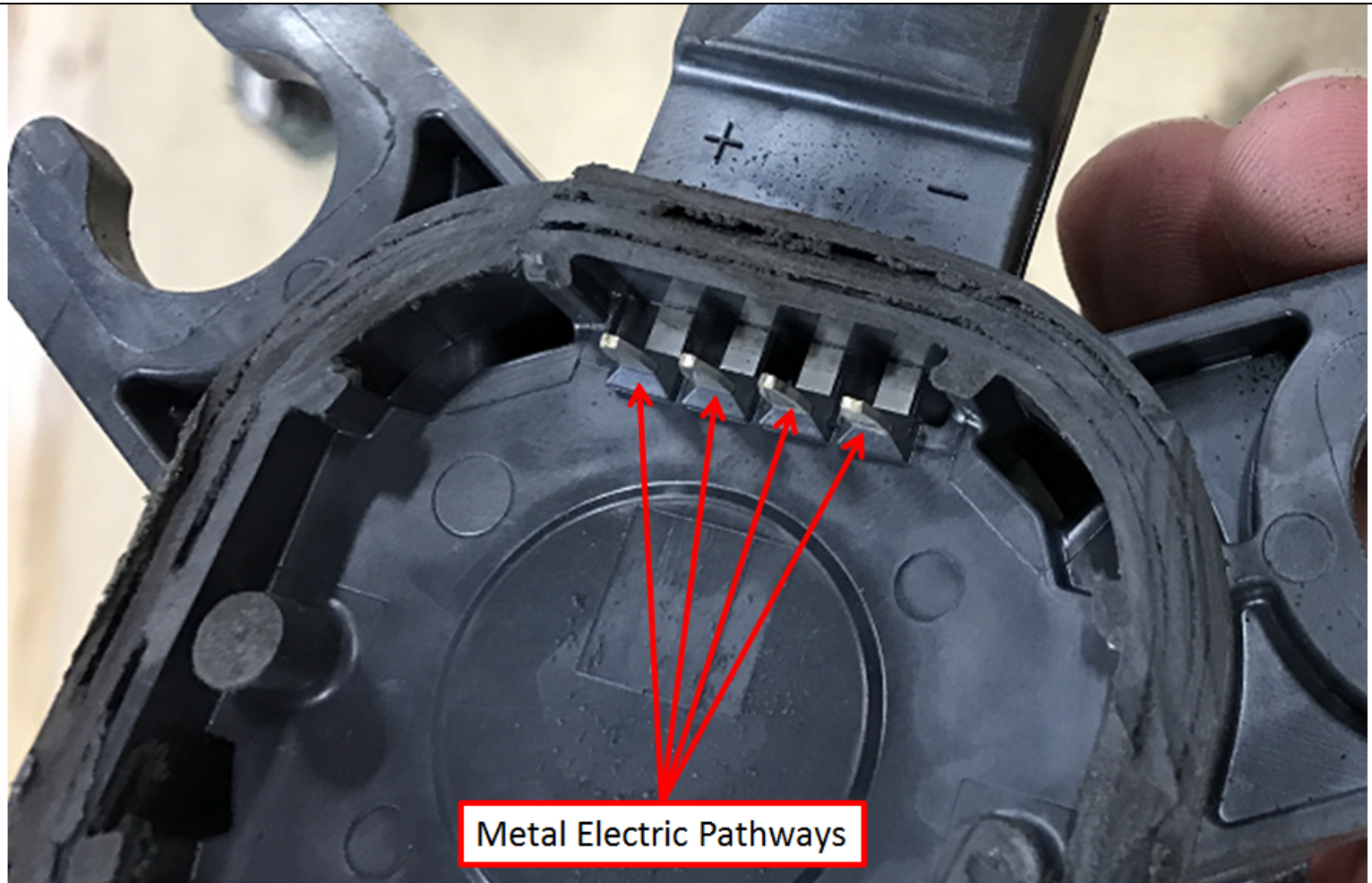
The Aisin Pump includes a plurality of solid parts within or near the body of PPS – GF 30. For example, the Aisin Pump includes a metal insert within the body of PPS – GF 30:



IMG_1958.JPG

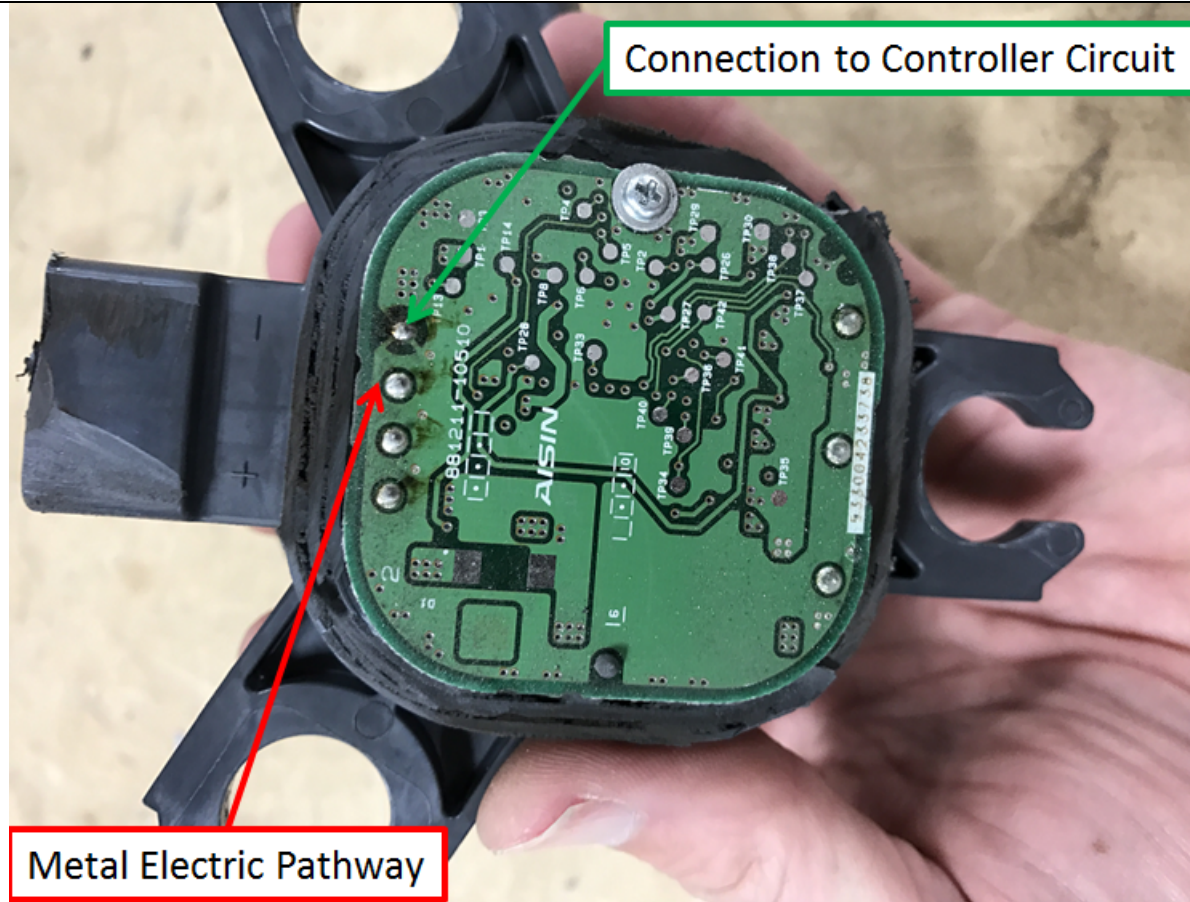
By way of further example, the Aisin Pump includes metal terminals each having a portion within the body of PPS – GF 30, as shown in the photos below:

"6. The motor of claim 1 wherein there are a plurality of solid parts that will be either within or near the body, and"



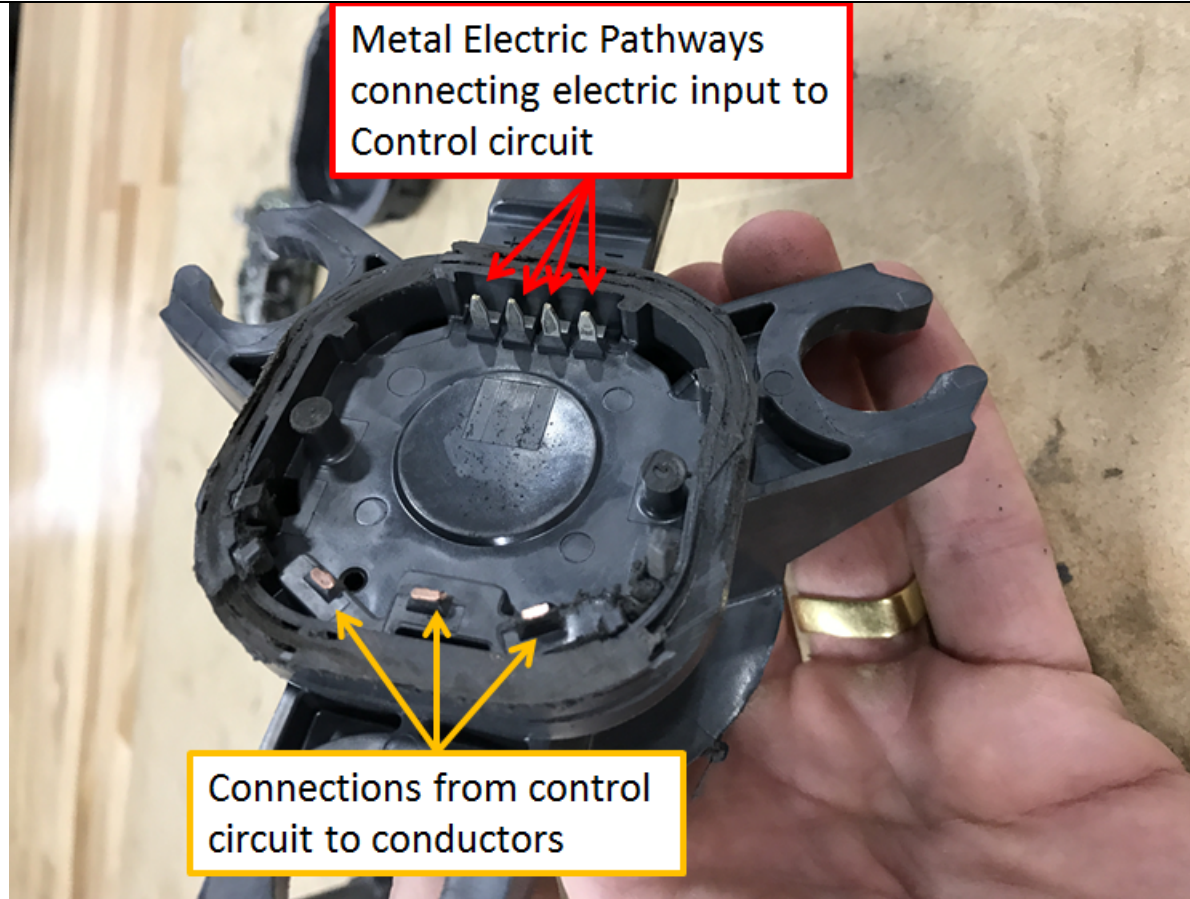
IMG_1951.JPG

"6. The motor of claim 1 wherein there are a plurality of solid parts that will be either within or near the body, and"



IMG_1926.JPG

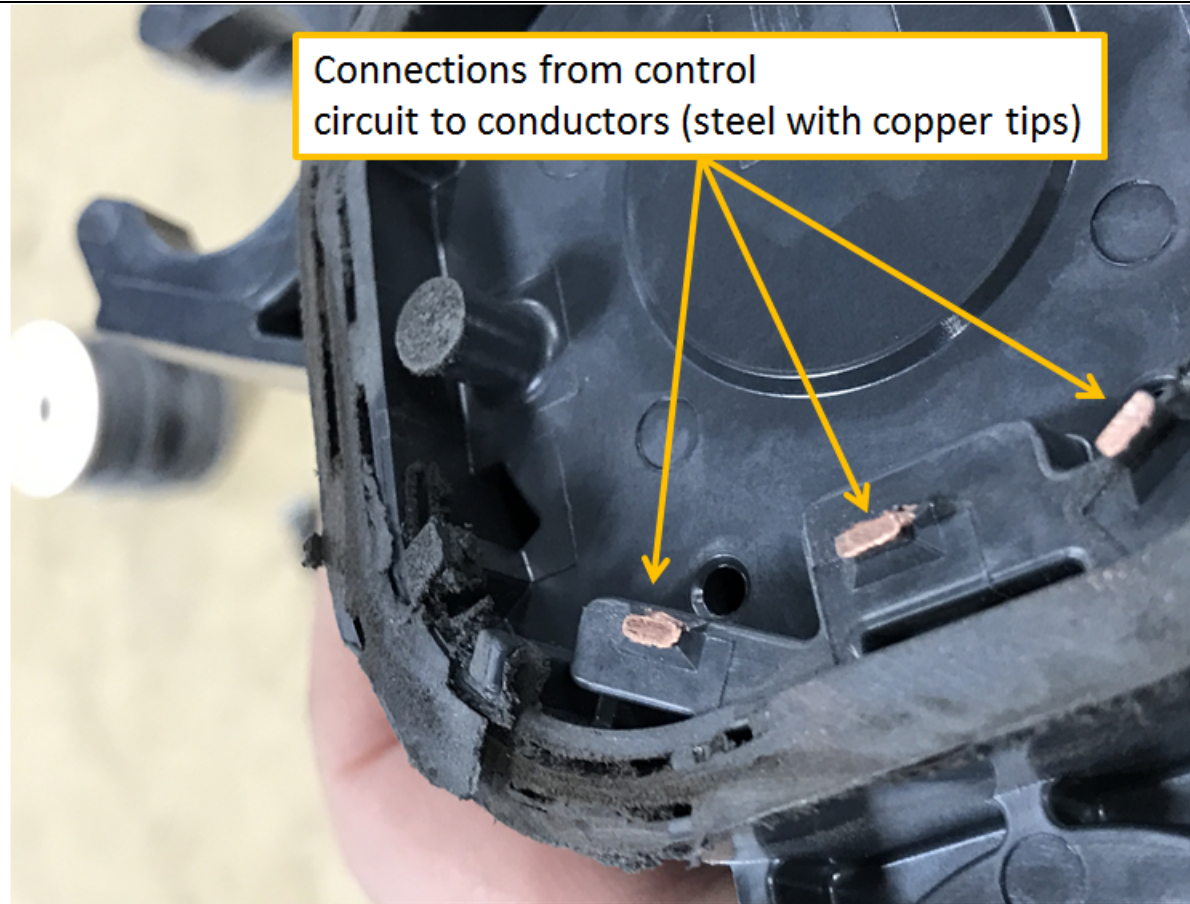
"6. The motor of claim 1 wherein there are a plurality of solid parts that will be either within or near the body, and"



IMG_1952.JPG

The electric pathways appear to include some type of copper, as shown below:

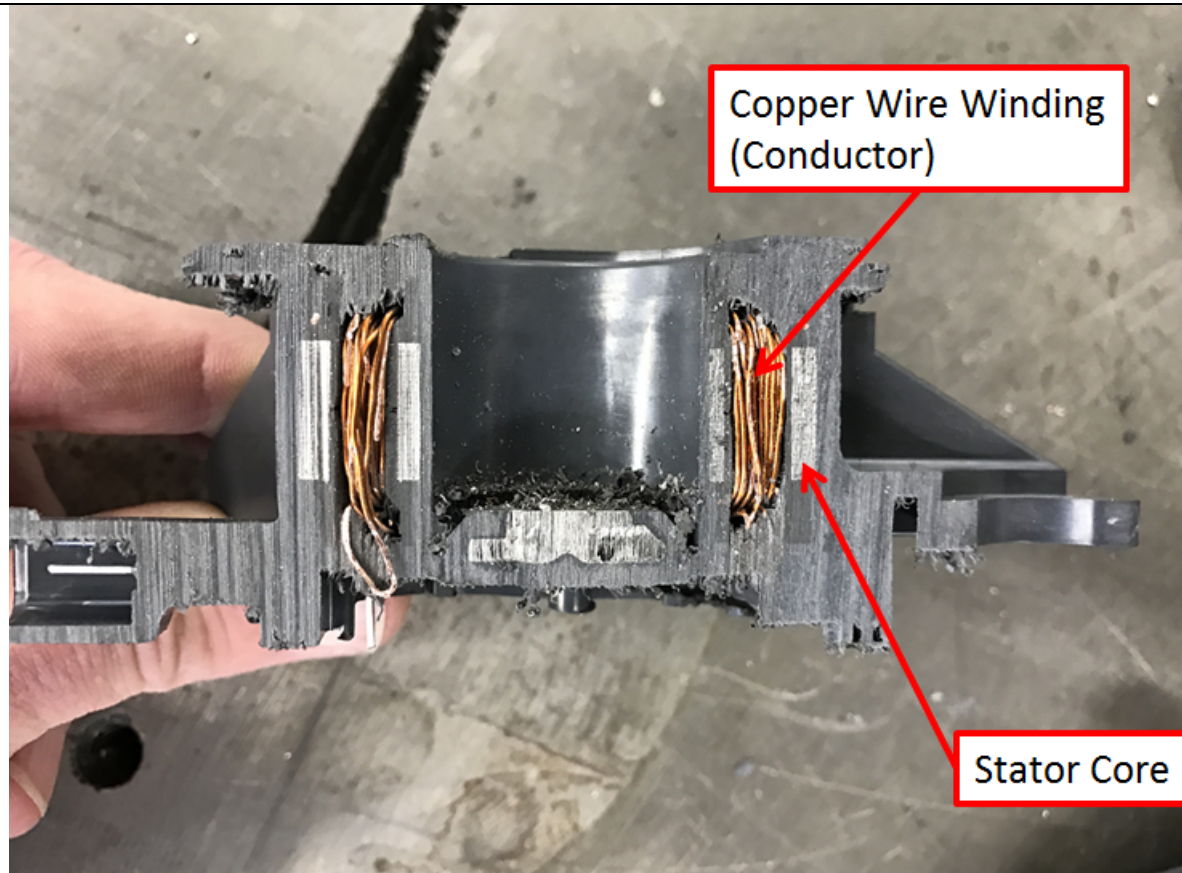
"6. The motor of claim 1 wherein there are a plurality of solid parts that will be either within or near the body, and"



IMG_1941.JPG

The Aisin Pump further includes a metal stator core and wire windings that as components of the stator substantially encapsulated within the body of PPS – GF 30:

"6. The motor of claim 1 wherein there are a plurality of solid parts that will be either within or near the body, and"



IMG_2010.JPG

"the solid parts have different coefficients of linear thermal expansion, and"

the solid parts have different coefficients of linear thermal expansion, and

The solid parts in the Aisin Pump have different coefficients of linear thermal expansion.

As explained above, the Aisin Pump includes a number of solid metal parts. Two or more of the solid parts are known to possess CLTE values that are different.

As stated above, one or more of the solid parts, such as the metal insert, metal inserts within the mounting flanges, metal electric pathways and metal stator core, are believed to be some type of steel. Steels for example are known to possess CLTE values from 0.63×10^{-5} in/in °F to 0.68×10^{-5} in/in °F:

Steels		
Material	Coefficient of Thermal Expansion	
	$10^{-6} (\text{°C})^{-1}$	$10^{-6} (\text{°F})^{-1}$
Plain Carbon and Low Alloy Steels		
Steel Alloy A36	11.7	6.5
Steel Alloy 1020	11.7	6.5
Steel Alloy 1040	11.3	6.3
Steel Alloy 4140	12.3	6.8
Steel Alloy 4340	12.3	6.8

<http://www.amesweb.info/Materials/Linear-Thermal-Expansion-Coefficient-Metals.aspx> (downloaded Dec. 9, 2016).

As stated above, the wire windings are believed to be some type of copper. Copper alloys are known to possess CLTE values from 0.90×10^{-5} in/in °F to 1.14×10^{-5} in/in °F, different from those of steels:

"the solid parts have different coefficients of linear thermal expansion, and"

Copper-Base Alloys		
Material	Coefficient of Thermal Expansion	
	$10^{-6} (^{\circ}\text{C})^{-1}$	$10^{-6} (^{\circ}\text{F})^{-1}$
Copper Alloy C11000 (electrolytic tough pitch)	17.0	9.4
Copper Alloy C17200 (beryllium - copper)	16.7	9.3
Copper Alloy C22000 (Commercial bronze, 90%)	18.4	10.2
Copper Alloy C23000 (Red brass, 85 %)	18.7	10.4
Copper Alloy C26000 (cartridge brass)	19.9	11.1
Copper Alloy C27000 (Yellow Brass)	20.3	11.3
Copper Alloy C36000 (free - cutting brass)	20.5	11.4
Copper Alloy C51000 (Phosphor bronze, 5% A)	17.8	9.9
Copper Alloy C62300 (Aluminum bronze, 9%)	16.2	9.0
Copper Alloy C71500 (copper - nickel, 30%)	16.2	9.0
Copper Alloy C93200 (bearing bronze)	18.0	10.0

<http://www.amesweb.info/Materials/Linear-Thermal-Expansion-Coefficient-Metals.aspx> (downloaded Dec. 9, 2016).

"the thermoplastic material is designed to have a coefficient of linear thermal expansion intermediate the maximum and minimum coefficients of linear thermal expansion of the different solids."

the thermoplastic material is designed to have a coefficient of linear thermal expansion intermediate the maximum and minimum coefficients of linear thermal expansion of the different solids.

The thermoplastic material in the Aisin Pump is designed to have a coefficient of linear thermal expansion intermediate the maximum and minimum coefficients of linear thermal expansion of the different solids.


As explained above, the Aisin Pump includes a body of PPS – GF 30:



IMG_2043.JPG

PPS – GF 30 is known to possess CLTE values in the range of 0.50×10^{-5} in/in °F to 2.06×10^{-5} in/in °F when heated to temperatures between 212 °F and 392 °F, with an average value of 1.39×10^{-5} in/in °F:

"the thermoplastic material is designed to have a coefficient of linear thermal expansion intermediate the maximum and minimum coefficients of linear thermal expansion of the different solids."

Thermal Properties	Metric	English	Comments
CTE, linear	9.00 - 37.0 $\mu\text{m}/\text{m}\text{-}^\circ\text{C}$	5.00 - 20.6 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$	Average value: 25.0 $\mu\text{m}/\text{m}\text{-}^\circ\text{C}$ Grade Count:8
	10.0 - 52.0 $\mu\text{m}/\text{m}\text{-}^\circ\text{C}$ @Temperature 100 - 200 $^\circ\text{C}$	5.56 - 28.9 $\mu\text{in}/\text{in}\text{-}^\circ\text{F}$ @Temperature 212 - 392 $^\circ\text{F}$	Average value: 31.0 $\mu\text{m}/\text{m}\text{-}^\circ\text{C}$ Grade Count:2

http://www.matweb.com/search/datasheet_print.aspx?matguid=c43bc743bdc0413ead2b87aca2e38a30 (downloaded Dec. 9, 2016)

Also, as indicated above, steels are known to possess a minimum CLTE value of 0.63×10^{-5} in/in $^\circ\text{F}$ and a maximum CLTE value of 0.68×10^{-5} in/in $^\circ\text{F}$. Because the range of known CLTE values of PPS – GF 30 spans these minimum and maximum CLTE values of steel, it can be said that the body of PPS – GF 30 of the Aisin Pump is known to possess a coefficient of linear thermal expansion intermediate the maximum and minimum coefficients of linear thermal expansion of one or more solid steel parts.

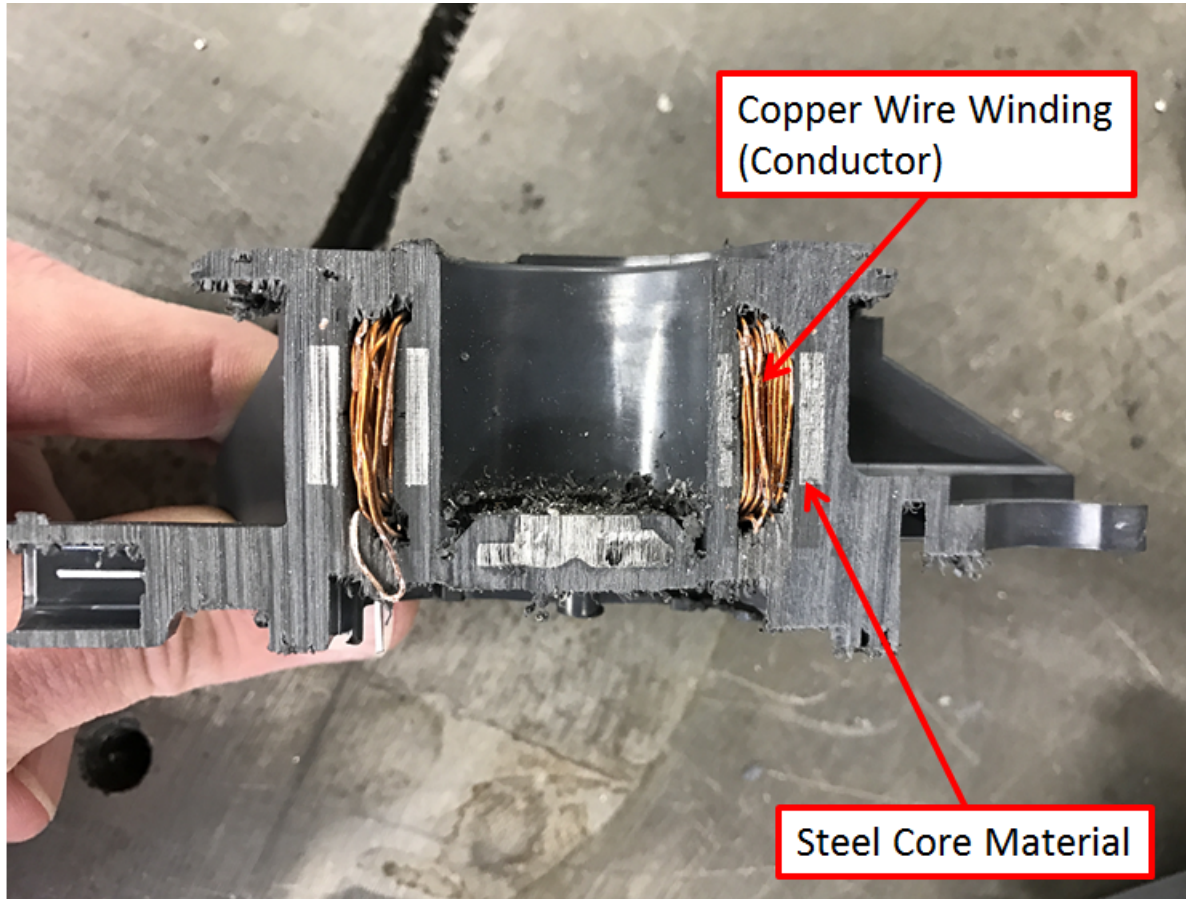
Also, as indicated above, steels are known to possess a minimum CLTE value of 0.63×10^{-5} in/in $^\circ\text{F}$ and a maximum CLTE value of 0.68×10^{-5} in/in $^\circ\text{F}$ and copper alloys are known to possess a minimum CLTE value of 0.90×10^{-5} in/in $^\circ\text{F}$ and a maximum CLTE value of 1.14×10^{-5} in/in $^\circ\text{F}$. Accordingly, the range of CLTEs intermediate the maximum and minimum CLTEs of the copper and steel solid components of the Aisin Pump extends from at least 0.69×10^{-5} in/in $^\circ\text{F}$ to 0.89×10^{-5} in/in $^\circ\text{F}$. Moreover, because the range of known CLTE values of PPS – GF 30 extends through this intermediate range of CLTE values, it can be said that the body of PPS – GF 30 of the Actuator is known to possess a coefficient of linear thermal expansion intermediate the maximum and minimum coefficients of linear thermal expansion of the steel and copper solid parts.

"7. The motor of claim 6 wherein the different solids comprise steel and copper."

7. The motor of claim 6 wherein the different solids comprise steel and copper.

Two or more of the different solid parts in the Aisin Pump comprise steel and copper.

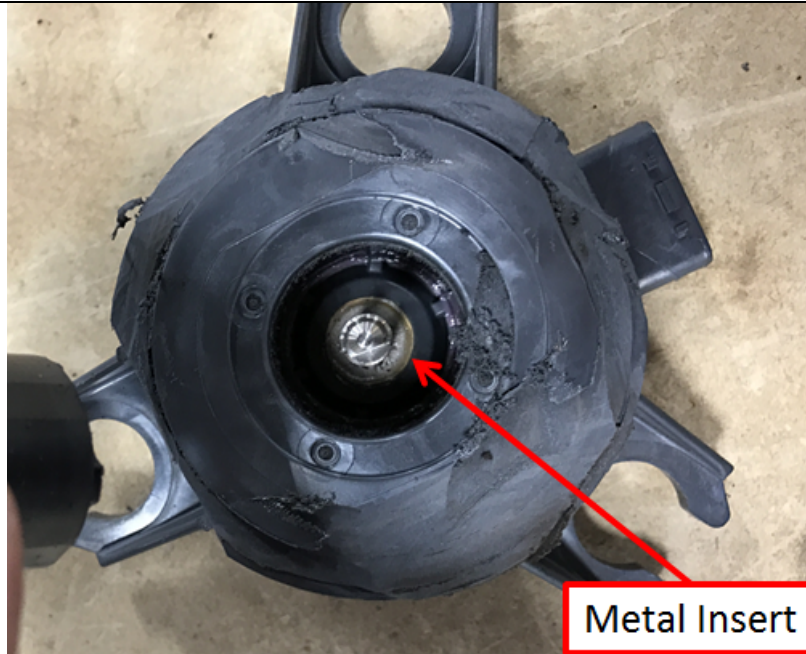
Upon information and belief, two or more solid parts of the Aisin Pump are made from steel and copper. For example, the Aisin Pump includes a metal stator core that is believed to be some type of steel and wire windings that are believed to be some type of copper:



IMG_2010.JPG

The Aisin Pump also includes a metal insert that is also believed to be some type of steel:

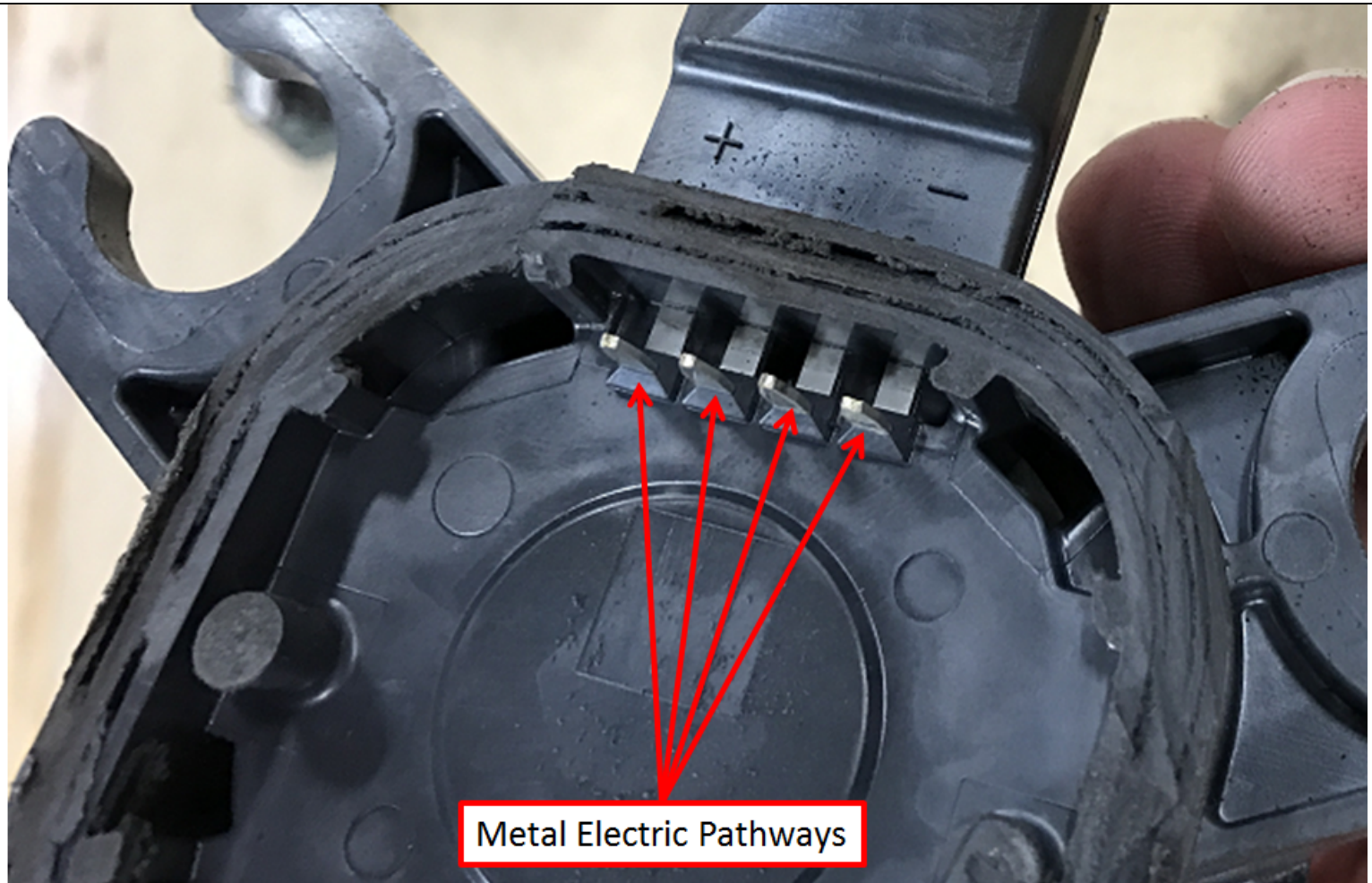
"7. The motor of claim 6 wherein the different solids comprise steel and copper."



IMG_1958.JPG

The Aisin Pump further includes metal terminals contained partially within the body of PPS – GF 30 and having portions that are believed to be some type of steel:

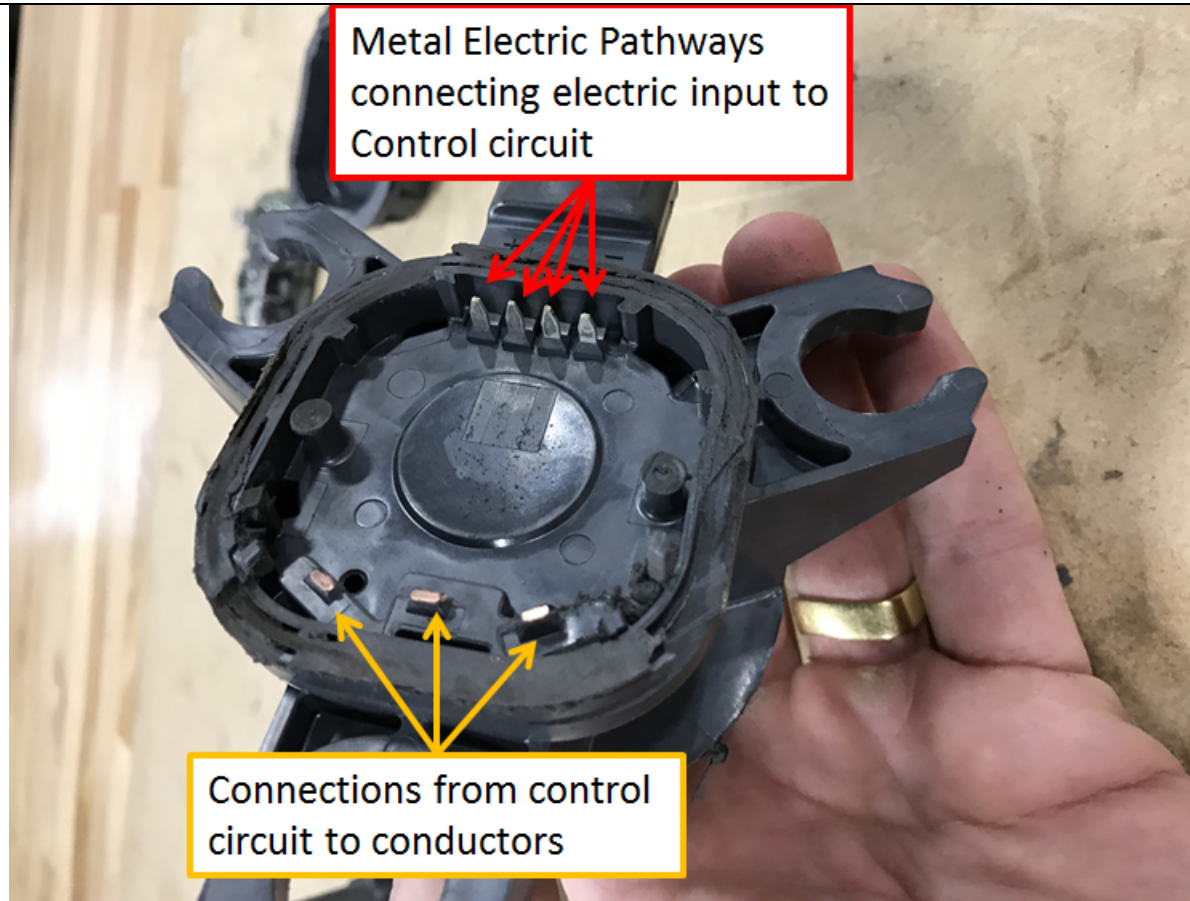
"7. The motor of claim 6 wherein the different solids comprise steel and copper."



Metal Electric Pathways

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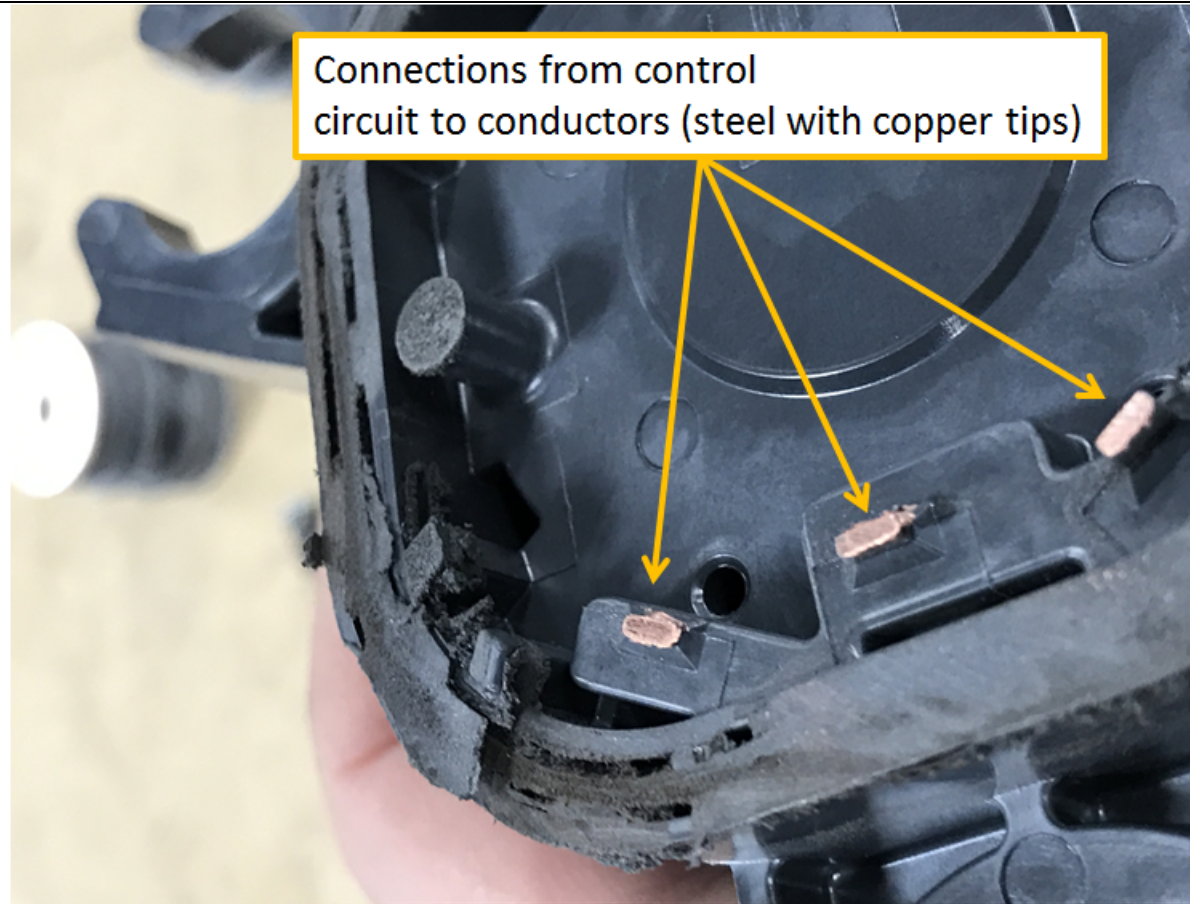
"7. The motor of claim 6 wherein the different solids comprise steel and copper."



IMG_1952.JPG

The metal electric pathway also appear to have portions of some type of copper, as shown below:

"7. The motor of claim 6 wherein the different solids comprise steel and copper."



IMG_1941.JPG