# EXHIBIT 30

# U.S. Patent No. 7,928,348

Claims 24, 25, 26, and 27. Toyota / Aisin Pump Toyota P/N G9040-33030 Aisin P/N WQT-002

# 24. A fluid conveying mechanism comprising:

The Toyota / Aisin Water Pump (the "Aisin Pump") has a Toyota part number G9040-33030 and Aisin part number WQT-002:



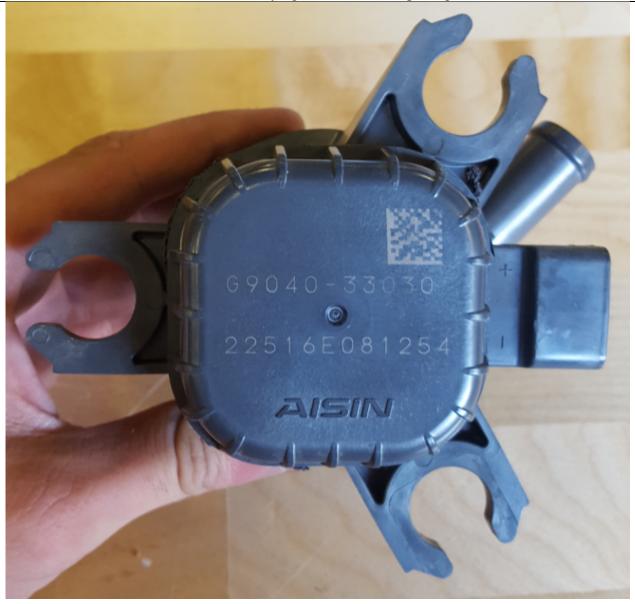
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O.E. Part #	Manufacturer	AISIN Part #	
10100 10010	T	W/DT oos	
16120-49046	Toyota	WPT-065	
16120-49055	Toyota	WPT-065	
16120-49065	Toyota	WPT-084	
16120-49080	Toyota	WPT-084	
161A0-29015	Toyota	WPT-190	
161A0-39015	Toyota	WPT-190	
161A0-39025	Toyota	WPT-191	
G9040-33030	Toyota	WQT-002	

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

The Aisin Pump is marked with the Aisin logo:

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

• Toyota Avalon Hybrid Limited 2.5L L4 – Electric/Gas

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See, http://www.toyota.com/avalon/

- Toyota Camry Hybrid LE 2.5L L4 Electric /Gas
- Toyota Camry Hybrid SE 2.5L L4 Electric/Gas
- Toyota Camry Hybrid XLE 2.5L L4 Electric/Gas



See, http://www.toyota.com/camry/

- Toyota RAV4 LE 2.5L L4 Gas
- Toyota RAV4 Limited 2.5L L4 Gas
- Toyota RAV4 XLE 2.5L L4 Gas
- Toyota RAV4 SE 2.5L L4 Gas
- Toyota RAV4 Hybrid XLE 2.5L L4 Electric/Gas
- Toyota RAV4 Hybrid Limited 2.5L L4 Electric/Gas

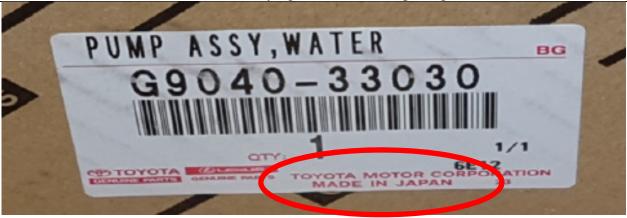


See, http://www.toyota.com/rav4/

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

The Aisin Pump is made in Japan:

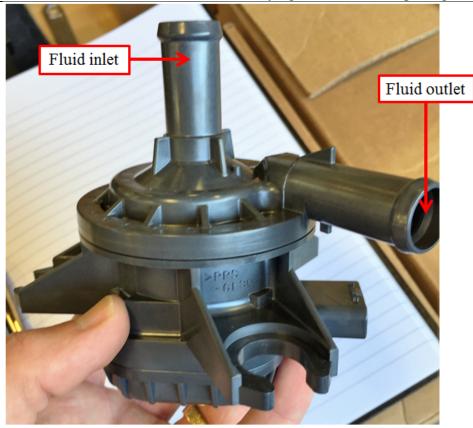
Case 1:17-cv-00300-UNA Dosument 1/307, Filed 403/20/17<sub>24</sub>Page 7 of 43 PageID #: 910



20160808\_151508.jpg

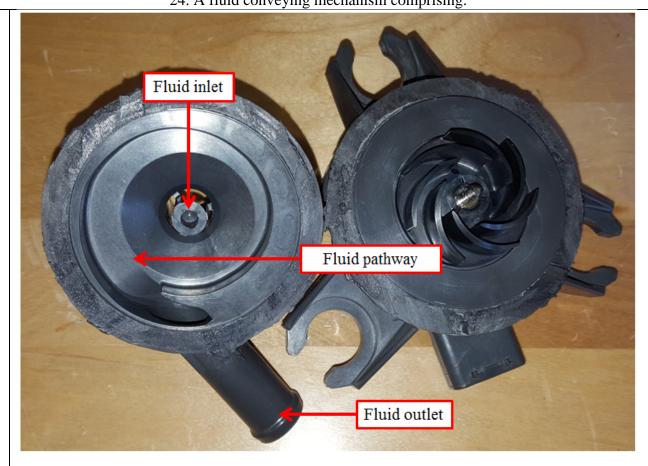
As shown in greater detail below, the Aisin Pump comprises a fluid conveying mechanism. For example, as shown in the images below, the Aisin Pump contains a fluid pathway to conduct fluid, in which fluid enters the motor via the fluid inlet, travels along the fluid pathway, and then exits the motor via the fluid outlet.

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IMG\_9990 (2).JPG

Case 1:17-cv-00300-UNA Dosument N307, Filed 483 (20/17<sub>24</sub> Page 9 of 43 PageID #: 912 "24. A fluid conveying mechanism comprising:"



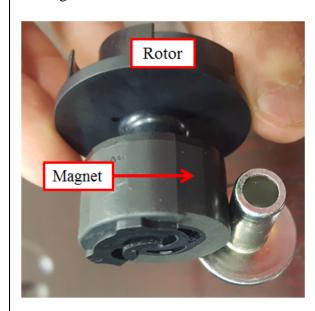
20160809\_101706.jpg

"a) an electromagnetic field-functioning device having a magnetically inducible core"

a) an electromagnetic fieldfunctioning device having a magnetically inducible core The Aisin Pump comprises an electromagnetic field-functioning device having a magnetically inducible core.

For example, the Aisin Pump contains a stator assembly comprising poles with wire windings wrapped around said poles. The poles, combined with an electric input, create a rotating magnetic field containing moving polarities within the core. At least one (permanent) magnet is contained within a rotor, which sits in the middle of the stator assembly (i.e., the core). The rotor screws into a molded space in the monolithic body of the motor of the Aisin Pump, such space being located in the middle of the stator assembly, or within the core. This location situates the magnet within the core of the stator assembly, in the center of the poles with copper wire windings wrapped around them. An electric input provides a charge to these windings (conductors), which then allows the polarity of the poles to change. The magnet then rotates with the changing polarities of the poles.

Pictured below is the rotor. The magnetic properties of the magnet within are displayed by the attraction of a metal object to the magnet:

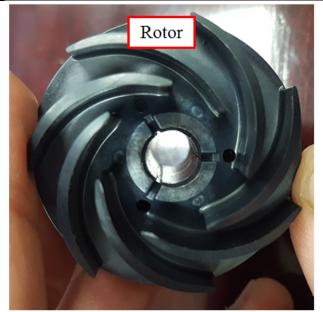


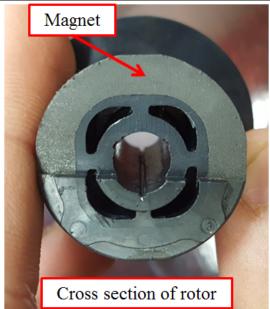
20160817\_115132.jpg

A cross section of the rotor shows the magnet within:

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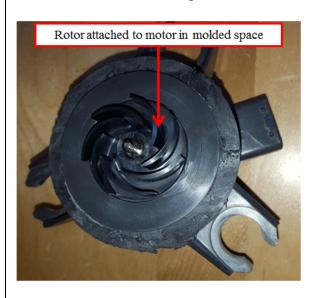
"a) an electromagnetic field-functioning device having a magnetically inducible core"





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Pictured below is the monolithic body of the motor of the Pump displaying (1) the rotor within a molded space and (2) removed from the molded space;

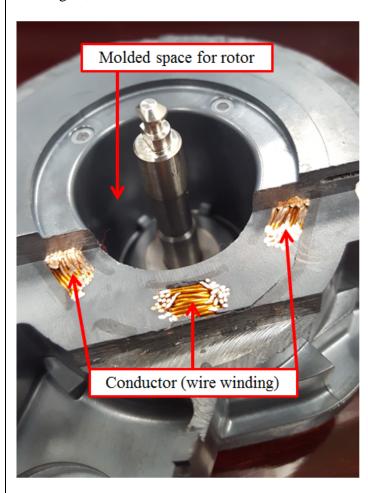




## Case 1:17-cv-00300-UNA Document 1x30 7 5 led 03/20/17 2 Page 12 of 43 PageID #: 915

"a) an electromagnetic field-functioning device having a magnetically inducible core" 20160809\_101659.jpg & 20160809\_101718.jpg

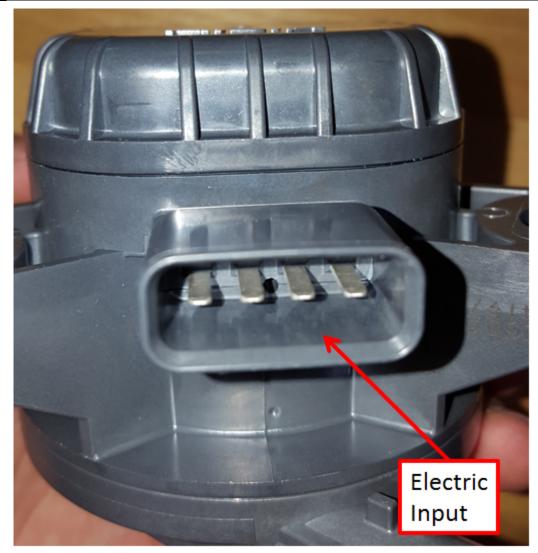
Pictured below are conductors (wire windings) situated around the molded space in which the rotor, containing the at least one magnet, sits:



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Pictured below is the electric input to the Aisin Pump:

"a) an electromagnetic field-functioning device having a magnetically inducible core"



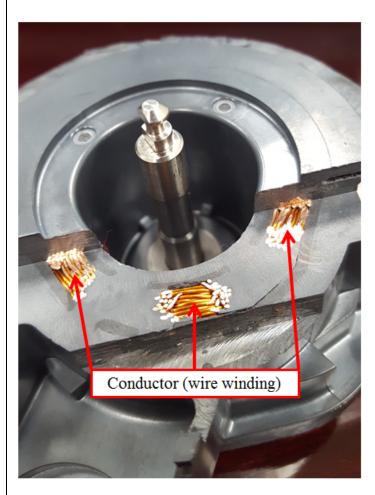
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"and at least one electrical conductor that creates a magnetic field in the core when electrical current is conducted through the conductor;"

and at least one electrical conductor that creates a magnetic field in the core when electrical current is conducted through the conductor; The Aisin Pump comprises at least one electrical conductor that creates a magnetic field in the core when electrical current is conducted through the conductor.

For example, as explained above, the Aisin Pump comprises a stator assembly with copper wires wrapped around the poles of the stator assembly. These wires are conductors.

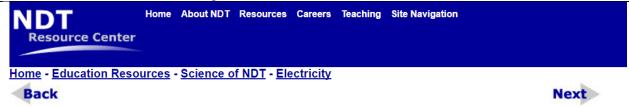


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These conductors create a magnetic field in the core when electrical current is conducted through the conductor.

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"and at least one electrical conductor that creates a magnetic field in the core when electrical current is conducted through the conductor;"



#### **ELECTROSTATIC FIELD**

#### After reading this section you will be able to do the following:

- Compare the definitions of a magnetic field (from the previous page) and an electrostatic field.
- Describe what field intensity is and how it is determined.
- Explain the "right-hand rule."

#### **Electrostatic Field**

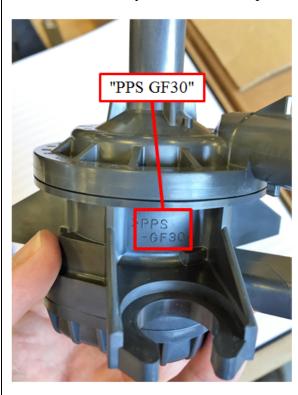
Remember that electrons have a negative electrostatic field surrounding them. When energy from a power source such as a battery is applied to a circuit, making the electrons flow through a conductor, a new type of field is developed around the wire. This is called an electromagnetic field. You can learn more about why this field develops in the materials about magnetism.

As we can see in the diagram below, the magnetic field that surrounds a current-carrying conductor is made up of concentric lines of force. The strength of these circular lines of force gets progressively smaller the further away from the conductor we get. Also, if a stronger current is made to flow through the conductor, the magnetic lines of force become stronger. As a matter of fact, we can say that the strength of the magnetic field is directly proportional to the current that flows through the conductor.

https://www.nde-ed.org/EducationResources/HighSchool/Electricity/electrostaticfield.htm

b) a monolithic body of injection molded thermoplastic material The Aisin Pump comprises a monolithic body of injection molded thermoplastic material.

The monolithic body of the Aisin Pump includes a "PPS – GF 30" label:



IMG\_9989.JPG

"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 database.

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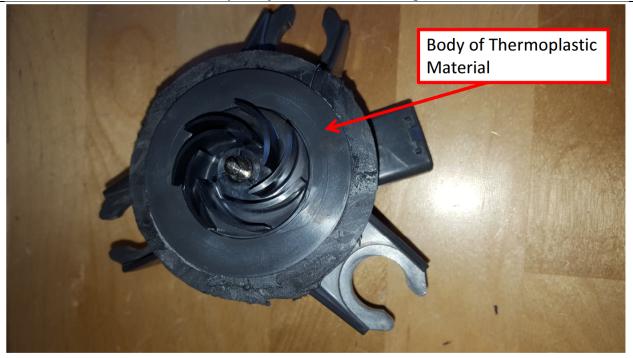
"b) a monolithic body of injection molded thermoplastic material"



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.

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20160808\_101659.jpg

PPS-GF30 is commonly used in injection molding processes to manufacture parts:







Home > Plastics > Generics > Polyphenylene Sulfide (PPS)

# Polyphenylene Sulfide (PPS) Plastic

Polyphenylene Sulfide (PPS) - Manufacturers - Materials - Classification

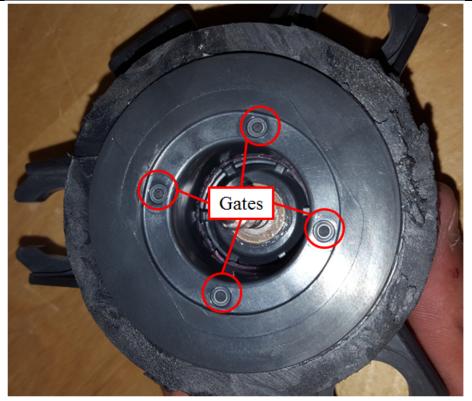


Polyphenylene Sulfide (PPS) - A crystalline polymer having a symmetrical, rigid backbone chain consisting of recurring p-substituted benzene rings and sulfur atoms. A variety of grades suitable for slurry coating, fluidized-bed coating, electrostatic spraying, as well as injection and compression molding are offered. Polyphenylene sulfides exhibit outstanding chemical resistance, thermal stability, dimensionally stability, and fire resistance. PPS's extreme inertness toward organic solvents, and inorganic salts and bases make for outstanding performance as a corrosion-resistant coating suitable for contact with foods.

https://plastics.ulprospector.com/generics/41/polyphenylene-sulfide-pps (downloaded Dec. 15, 2016).

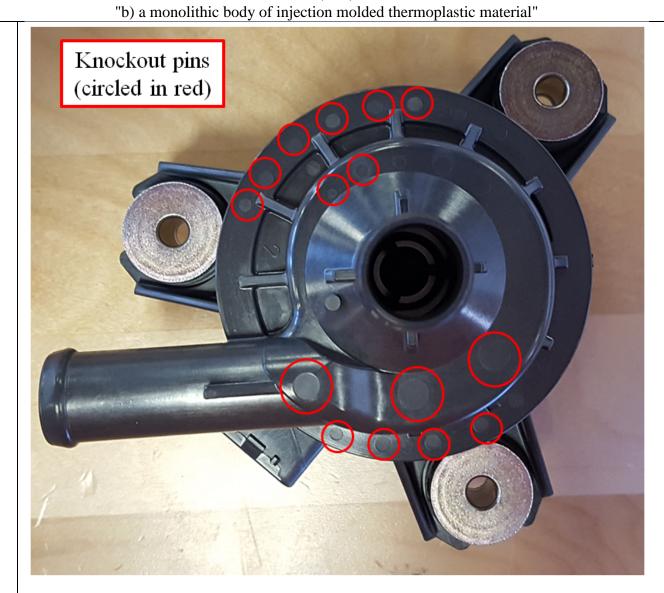
The monolithically formed body of the motor of the Aisin Pump contains markings that indicate it as manufactured using injection molding. For example, as shown in the images below, the monolithically formed body of the Aisin Pump shows signs of gates and knockout pins, such markings being associated only with injection molded manufacturing.

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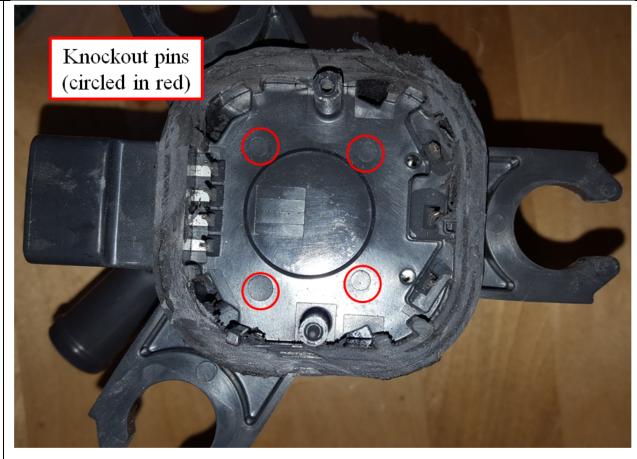
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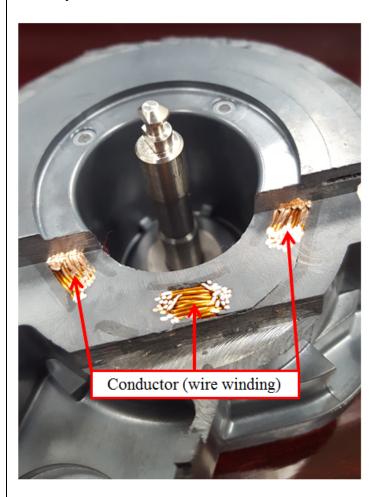
20160809\_100245.jpg

"substantially encapsulating the at least one conductor;"

substantially encapsulating the at least one conductor;

The thermoplastic, injection molded, monolithic body of the Aisin Pump substantially encapsulates the at least one conductor.

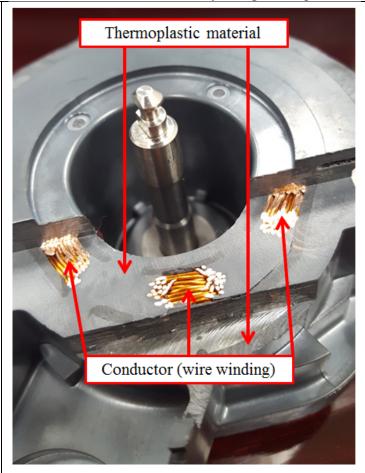
As explained above, the Aisin Pump comprises a stator assembly with copper wires wrapped around the poles of the stator assembly. These wires are conductors.



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The conductors are substantially encapsulated within the body of PPS - GF 30. For example, the photo below shows the conductors substantially encapsulated within the body of PPS - GF 30.

"substantially encapsulating the at least one conductor;"



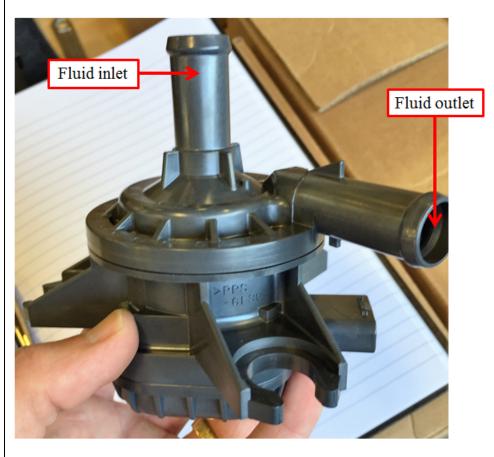
20160817\_111906.jpg

"and c) a fluid pathway at least partially embedded in and integral with the monolithic body,"

and c) a fluid pathway at least partially embedded in and integral with the monolithic body, The Aisin Pump comprises a fluid pathway at least partially embedded in and integral with the monolithic body.

The Aisin Pump comprises a fluid pathway contained within the monolithic body, with fluid inlets and outlets. As shown in the images below, the fluid pathway is molded within the thermoplastic material of the monolithic body, and is contained inside the body itself.

The photo below shows the fluid inlet and fluid outlet into the fluid pathway of the Aisin Pump.

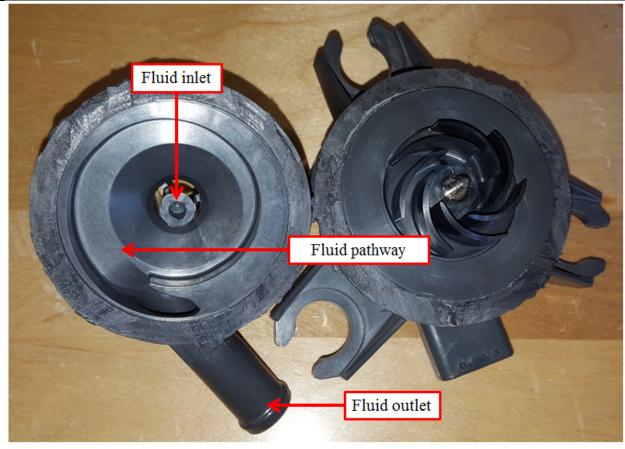


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A cross-section of the Aisin Pump shows the fluid pathway molded and located within the monolithic body of the Aisin Pump.

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"and c) a fluid pathway at least partially embedded in and integral with the monolithic body,"



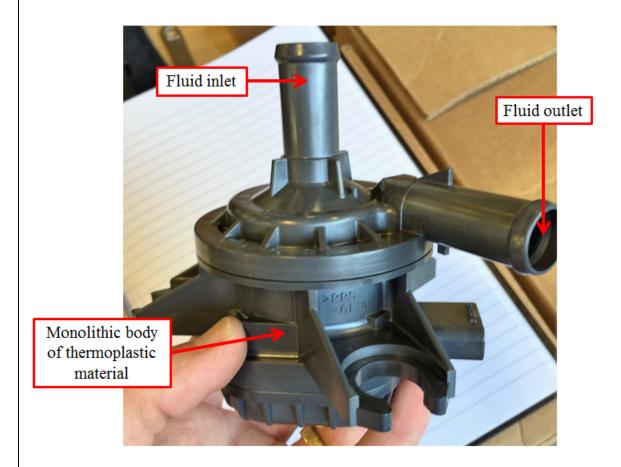
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"with at least one of a fluid inlet into the pathway and a fluid outlet from the pathway being formed in the body of injection molded thermoplastic,"

with at least one of a fluid inlet into the pathway and a fluid outlet from the pathway being formed in the body of injection molded thermoplastic, The fluid pathway of the Aisin Pump contains at least one of a fluid inlet into the pathway and a fluid outlet from the pathway being formed in the body of injection molded thermoplastic.

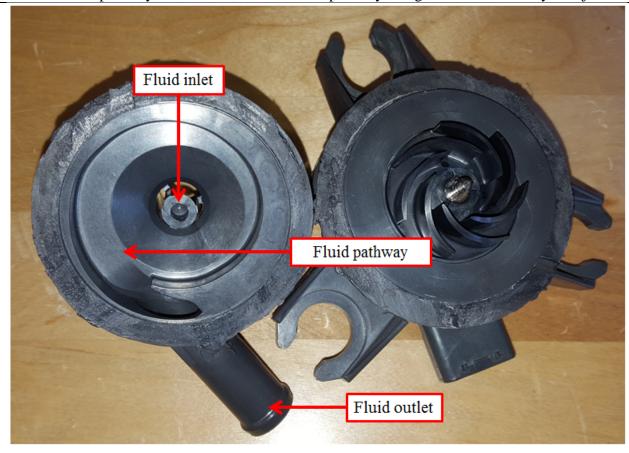
As shown in the below images, the Aisin Pump comprises a fluid inlet and a fluid outlet, shaped from the thermoplastic material and attached to the monolithic body. The fluid inlet and the fluid outlet allow fluid (e.g., air) to enter and exit the fluid pathway, respectively.



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"with at least one of a fluid inlet into the pathway and a fluid outlet from the pathway being formed in the body of injection molded thermoplastic,"



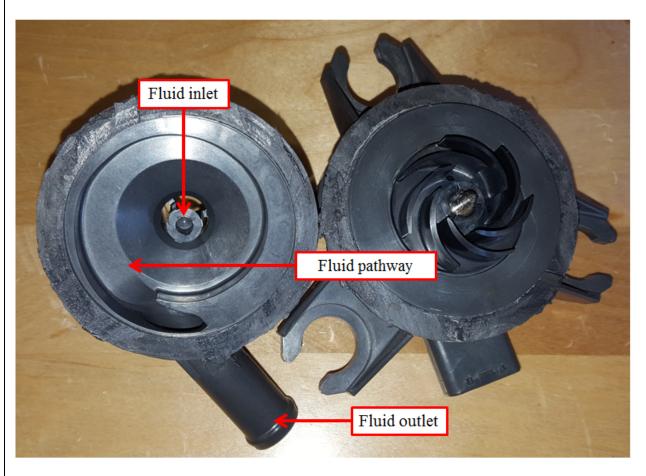
20160809\_101706.jpg

"and the pathway through the body being confined within the body."

and the pathway through the body being confined within the body.

The fluid pathway through the body of the Aisin Pump is confined within the body.

As shown in the image below, the fluid pathway is located within the monolithic body of the Aisin Pump. The photo below shows the body broken into two pieces in order to display the inside of the body. Both sections of the body are displayed with the inside portion facing upwards. The fluid pathway is confined within the body.



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"wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body."

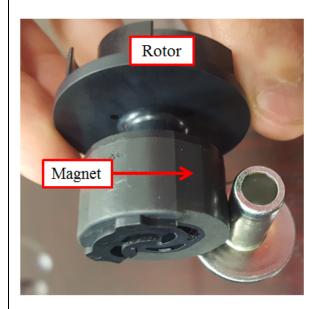
25. The fluid conveying mechanism of claim 24 wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body.

The Aisin Pump comprises the fluid conveying mechanism of claim 24 wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body.

The Aisin Pump comprises the fluid conveying mechanism of claim 24. See the chart of claim 24, supra.

The rotor of the motor of the Aisin Pump spins during motor operation due to a magnet located within the rotor. The rotor sits in the middle of the stator assembly of the motor (e.g., the core), screwed into a molded space in the monolithic body of the Aisin Pump, such space being located in the middle of the stator assembly. This location situates the magnet within the core of the stator assembly, in the center of poles with copper wire windings wrapped around them. An electrical input to the motor provides a charge to these windings (conductors), which then allows the polarity of the poles they are wrapped around to change. The rotor then rotates with the changing polarity of the poles due to the attraction of the magnet located within the rotor. The rotation of the rotor spins a fan attached to the top of the rotor.

Pictured below is the magnet, the magnetic properties of which are displayed by the attraction of a metal object to the magnet:

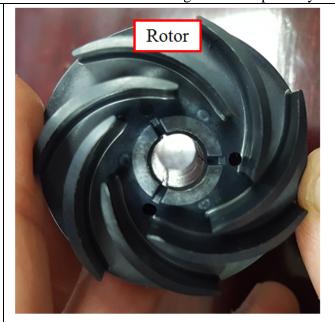


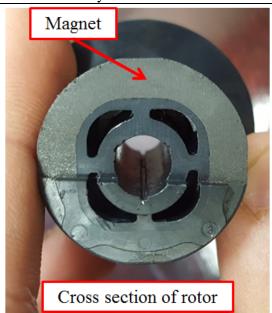
20160817\_115132.jpg

A cross section of the rotor shows the magnet within:

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"wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body."



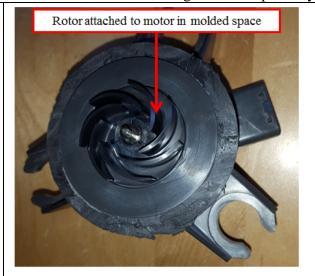


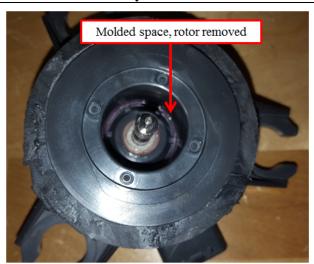
20160817\_111712.jpg & 20160817\_111855.jpg

Pictured below is the monolithic body of the Aisin Pump displaying (1) the rotor within a molded space and (2) removed from the molded space:

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"wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body."



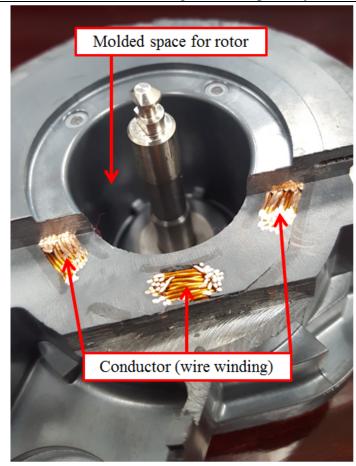


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Pictured below are conductors (wire windings) situated around the molded space in which the rotor, containing the at least one magnet, sits:

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"wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body."

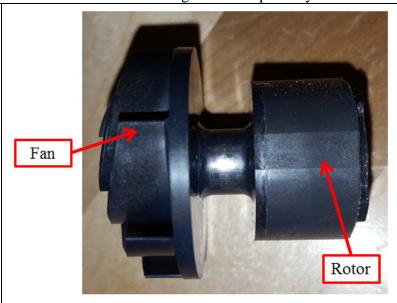


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Pictured below is the fan attached to the rotor:

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"wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body."



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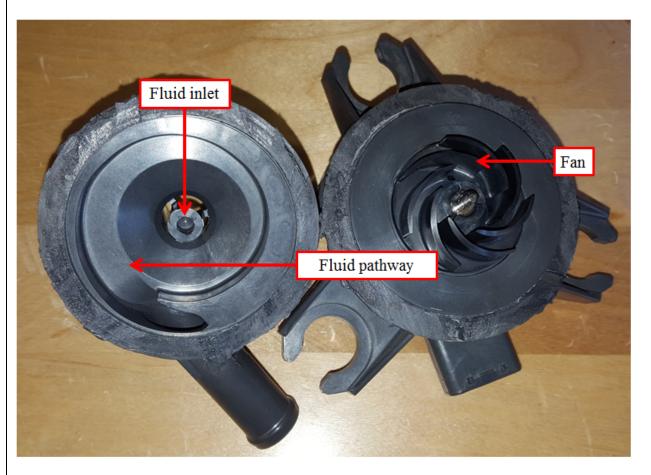


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"wherein the device is operable to power fluid conveyance through the mechanism and at least a portion of the fluid conveyed by the mechanism passes through the fluid pathway in the monolithic body."

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The fan attached to the rotor moves fluid through the fluid pathway during motor operation. At least a portion of the fluid (e.g., air, water) conveyed by the mechanism passes through the fluid pathway in the monolithic body. This is so because the fan that spins during motor operation is opposite the fluid pathway in the monolithic body, thereby forcing fluid to follow the fluid pathway during motor operation. The image below shows inside the monolithic body of thermoplastic material; during motor operation the two pieces are attached, with the fan fitting into the circular indentation of the fluid pathway.



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"wherein the mechanism is selected from the group consisting of valves, pumps and blowers."

26. The fluid conveying
mechanism of claim 24
wherein the mechanism is
selected from the group
consisting of valves, pumps
and blowers.

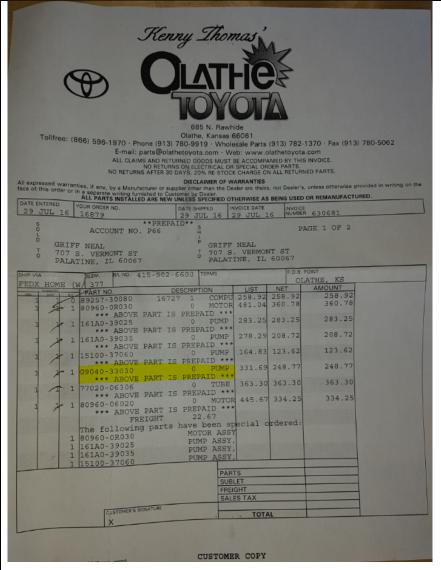
The Aisin Pump comprises the fluid conveying mechanism of claim 24 wherein the mechanism is selected from the group consisting of valves, pumps and blowers.

The Aisin Pump comprises the fluid conveying mechanism of claim 24. See chart of claim 24, supra.

The Aisin Pump is selected from the group consisting of valves, pumps and blowers. Specifically, the Aisin Pump is a pump.

For example, the Aisin Pump is referred to as a water pump on the purchase receipts and packaging of the product, as seem in the images below.

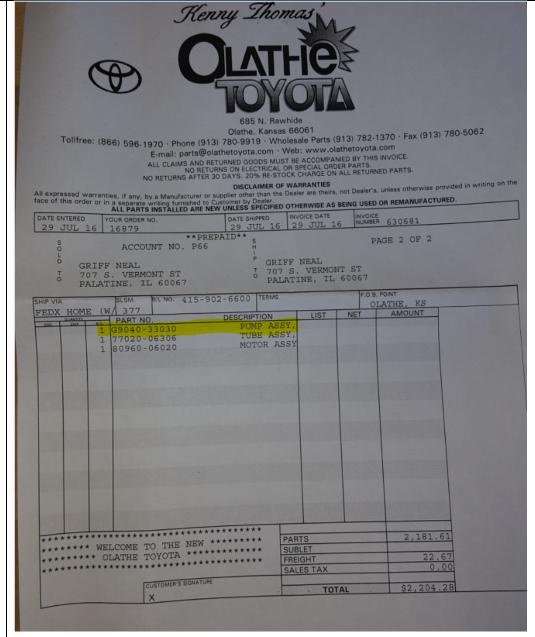
"wherein the mechanism is selected from the group consisting of valves, pumps and blowers."



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"wherein the mechanism is selected from the group consisting of valves, pumps and blowers."



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"wherein the mechanism is selected from the group consisting of valves, pumps and blowers."



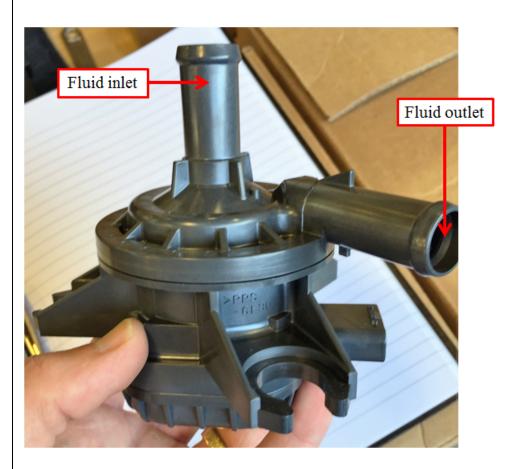
20160808\_151500.jpg

27. The fluid conveying mechanism of claim 24 wherein said at least one of a fluid inlet and a fluid outlet is in the form of a plumbing fitting.

The Aisin Pump comprises the fluid conveying mechanism of claim 24 wherein said at least one of a fluid inlet and a fluid outlet is in the form of a plumbing fitting.

The Aisin Pump comprises the fluid conveying mechanism of claim 24. See chart of claim 24, supra.

At least one of a fluid inlet and a fluid outlet of the Aisin Pump is in the form of a plumbing fitting. Specifically, the fluid inlet is in the form of a plumbing fitting. As shown in the images below, the fluid inlet connects the Aisin Pump to tubing within the engine.

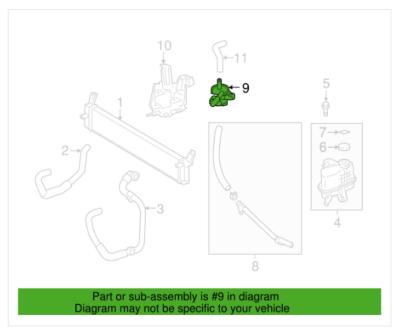


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A diagram which shows the placement of this part in relation to other parts shows a piece of tubing or piping being

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connected to the fluid inlet of this Aisin Pump. The Aisin Pump is highlighted in green.



**CLICK TO ENLARGE** 

http://www.oempartworld.com/oe-toyota/g904033030

Pictured below is an enlarged version of this diagram:

## **WATER PUMP - TOYOTA (G9040-33030)**

List Price:

\$331.69

You Save:

\$89.56 (27% off)

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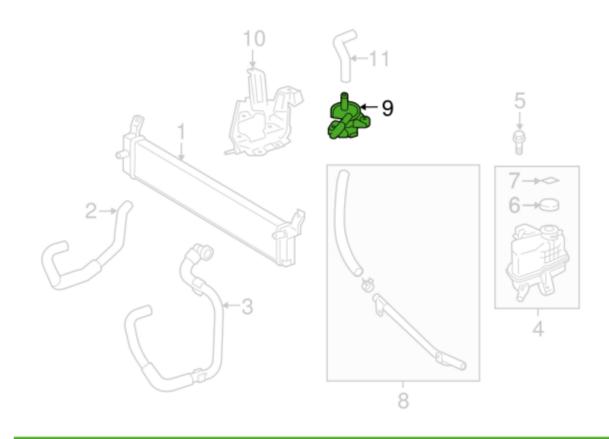
#### **GENUINE TOYOTA & SCION PARTS**





Manufacturer: Toyota

Part Number: G9040-33030
Part: Water Pump

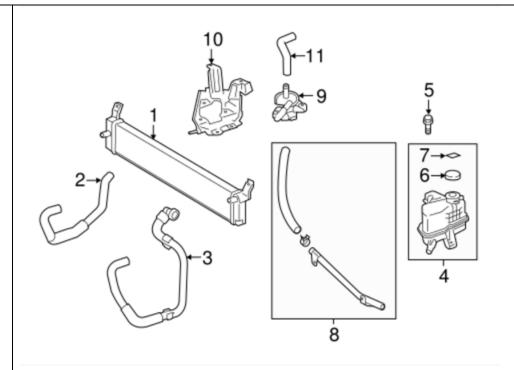


Part or sub-assembly is #9 in diagram Diagram may not be specific to your vehicle

http://www.oempartworld.com/oe-toyota/g904033030

A "clean" version of this diagram, without the Aisin Pump highlighted in green, is displayed below. These diagrams clearly show a pipe or tubing, labeled as 11, placed above the fluid inlet of the Aisin Pump:

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 $\underline{http://www.oempartworld.com/oe-toyota/g904033030}$