TECHNICAL INSTRUCTIONS

FOR

Safety Recall 21TA09

NHTSA Recall No. 21V-890

SUDDEN LOSS OF POWER BRAKING ASSIST MAY OCCUR

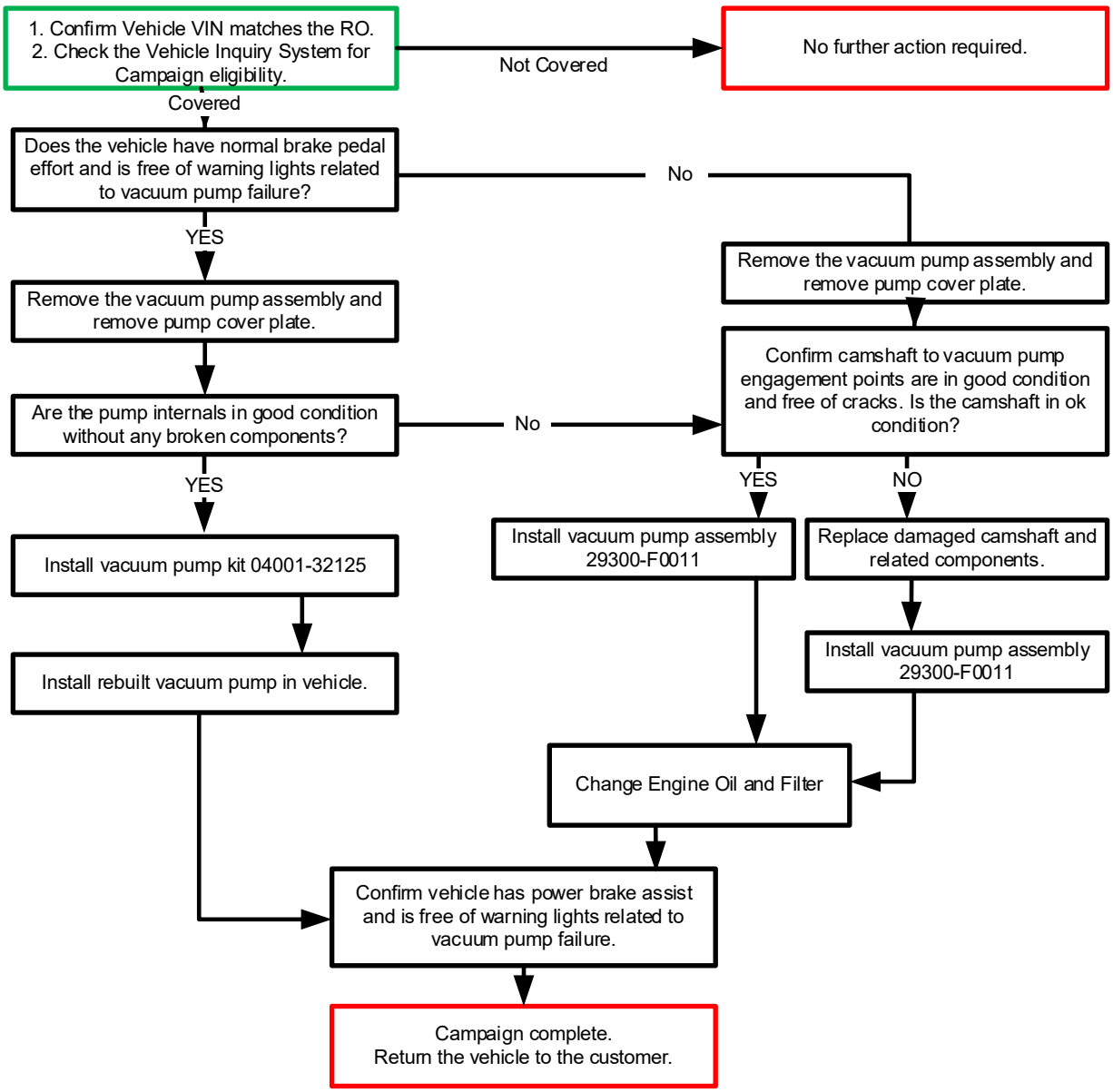
CERTAIN 2018-2019 MODEL YEAR CAMRY VEHICLES

The repair quality of covered vehicles is extremely important to Toyota. All dealership technicians performing this repair are required to successfully complete the most current version of the E-Learning course "Safety Recall and Service Campaign Essentials". To ensure that all vehicles have the repair performed correctly; technicians performing this recall repair are required to currently have completed all of the following courses:

T151 – Engine Service and Repair

It is the dealership's responsibility to select technicians with the above certification level or greater to perform this recall repair. Carefully review your resources, the technician skill level, and ability before assigning technicians to this repair. It is important to consider technician days off and vacation schedules to ensure there are properly trained technicians available to perform this repair at all times.

I. OPERATION FLOW CHART



II. IDENTIFICATION OF AFFECTED VEHICLES

1. CHECK VEHICLE FOR CAMPAIGN ELIGIBILITY

a. Compare the vehicle's VIN to the VIN listed on the Repair Order to ensure they match.

b. Check the TIS Vehicle Inquiry System to confirm the VIN is involved in this Campaign, and that it has not already been completed.

Note: TMNA warranty will not reimburse dealers for repairs completed on vehicles that are not affected or were previously completed, even by another dealer.

III. BACKGROUND

The subject vehicles have a system that provides power brake assist when the driver depresses the brake pedal. Specific components in a part of this system can prematurely wear and could lead to a sudden loss of power braking assist. Non-power assisted braking will remain functional. However, a sudden loss of power braking assist while driving could increase the risk of a crash.

IV. PREPARATION

1. PARTS

Part Number	Part Description	Quantity
04001-32125	Vacuum Pump – Repair Kit	1*
29300-F0011	Vacuum Pump Assembly	1*

***Note: Parts needed will be dependent on inspection results. If the vehicle requires a new vacuum pump assembly, the vehicle does not also need a vacuum pump repair kit. Only one part number will be accepted on the warranty claim.**

Note: Vehicles with camshaft damage will require additional parts, reference Section XIII – Camshaft Coupling Connection Damage for additional instructions.

A. TOOLS & EQUIPMENT

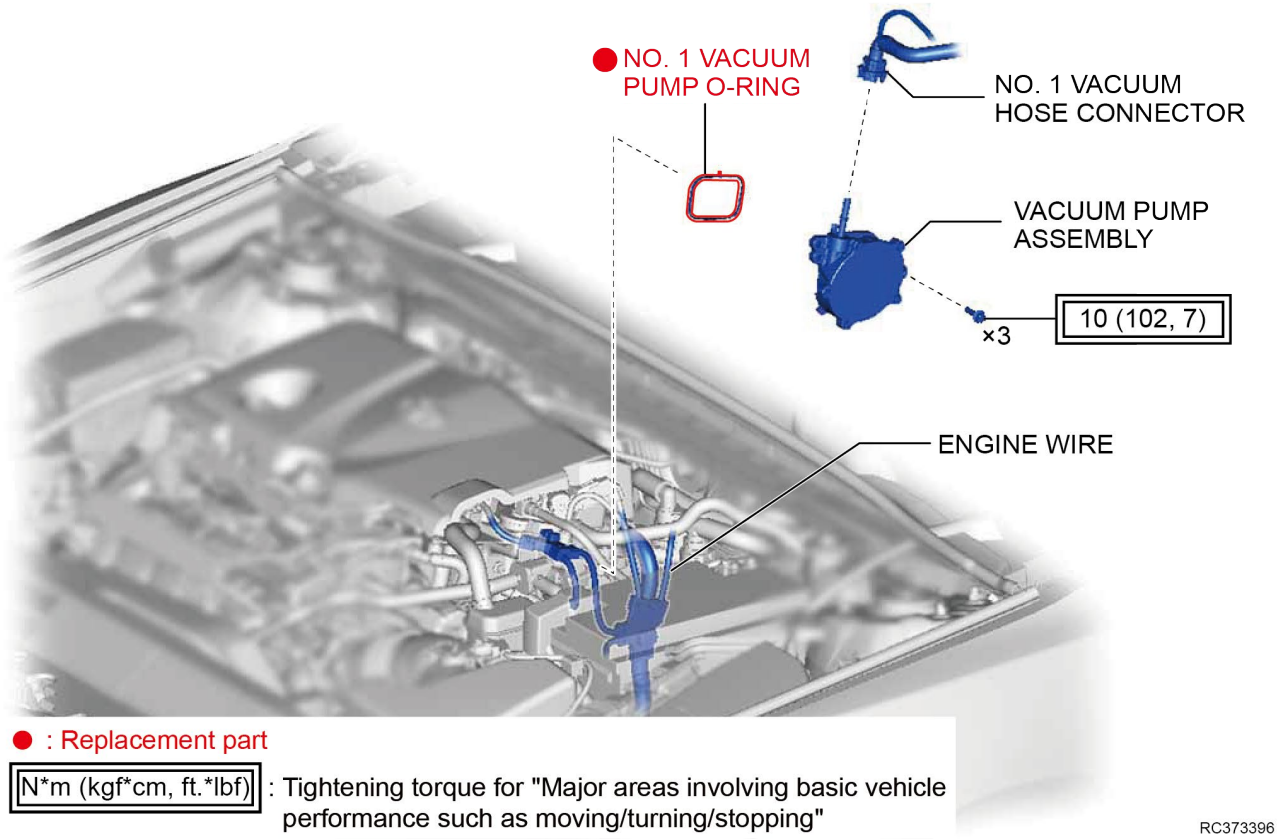
- Standard Hand Tools
- Socket Wrench 8mm
- Torque Wrench
- TORX" Socket Wrench T-type" T30

B. MATERIALS

- Engine Oil (small amount)
- Shop Cloth
- Brake Cleaner
- Vacuum Gauge
- Wooden Block
- Protective Tape

Note: Vehicles with camshaft damage will require additional tools and materials. Consult the repair manual for a full list of tools required for vehicles with camshaft damage.

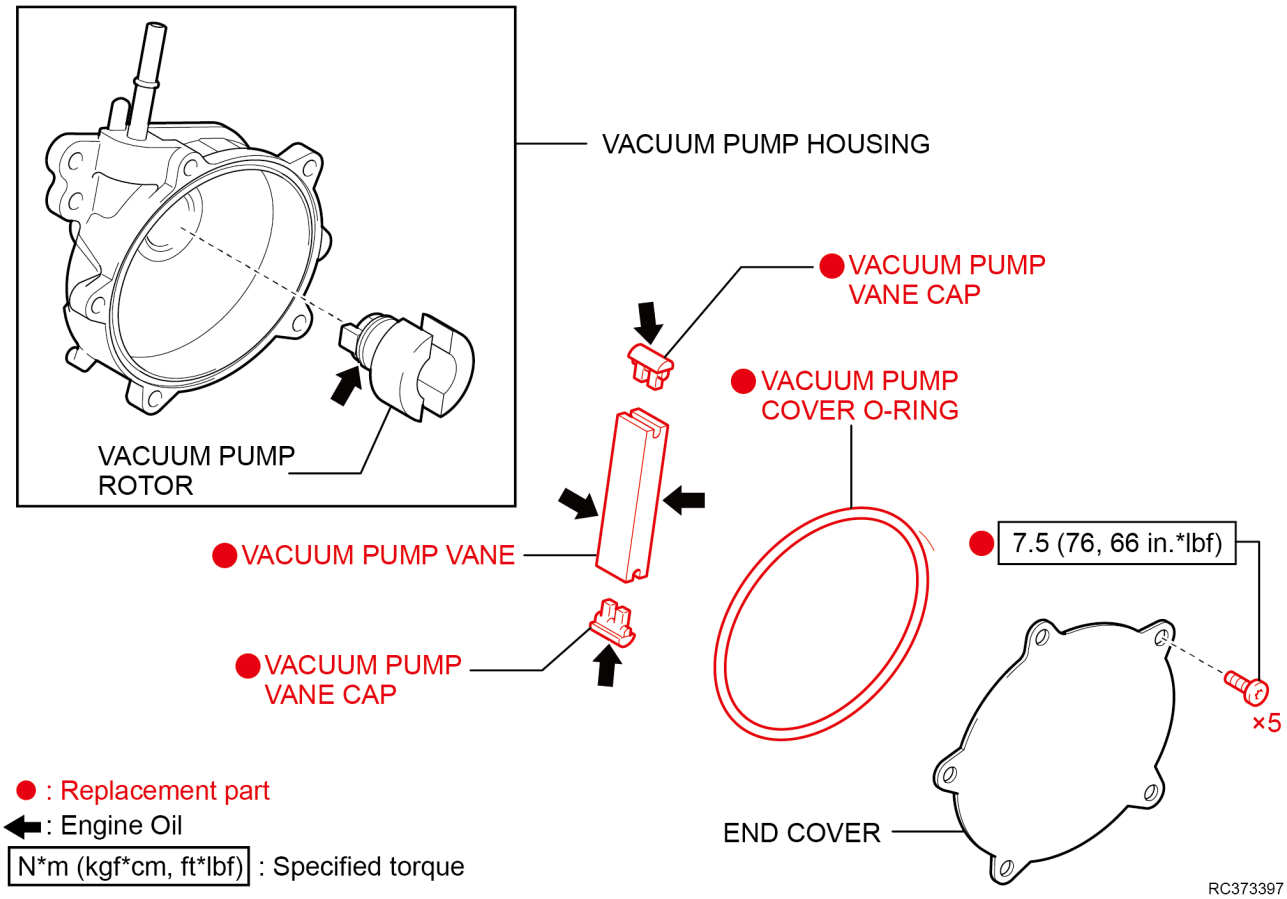
V. COMPONENTS



● : Replacement part

N*m (kgf*cm, ft.*lbf) : Tightening torque for "Major areas involving basic vehicle performance such as moving/turning/stopping"

RC373396



● : Replacement part

← : Engine Oil

N*m (kgf*cm, ft*lbf) : Specified torque

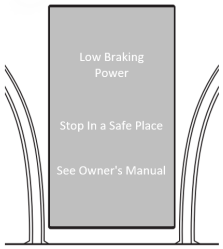
RC373397

VI. INSPECTING BRAKE PEDAL OPERATION / WARNING MESSAGES

1. CHECK VEHICLE BRAKE PEDAL OPERATION

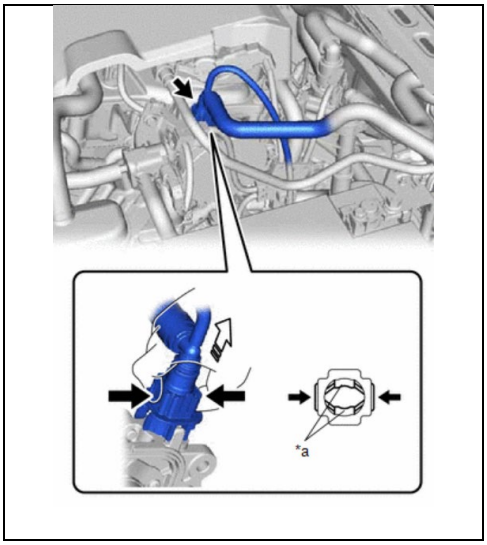
a. With the engine running, does the vehicle require normal brake pedal application effort?
HINT: A vehicle with a failed vacuum pump will require significantly more effort to depress the brake pedal.

b. Is the multi-information display screen free of the following warning lights?

		
Master Warning Light (Yellow)	Brake System Warning Light (Red)	Low Braking Power Message

Results: Note your findings of Brake Pedal Operation inspection and continue to Section VII – Remove Vacuum Pump Assembly. Your findings will be required in following sections.

VII. REMOVE VACUUM PUMP ASSEMBLY

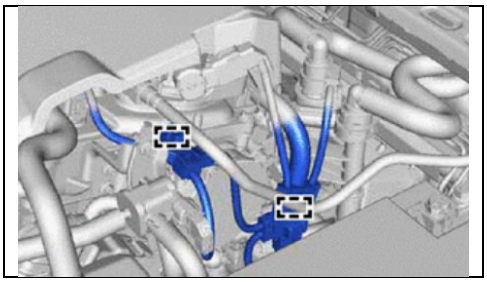


1. Vacuum Pump Assembly Removal - Process

a. Disconnect No. 1 vacuum hose connector.

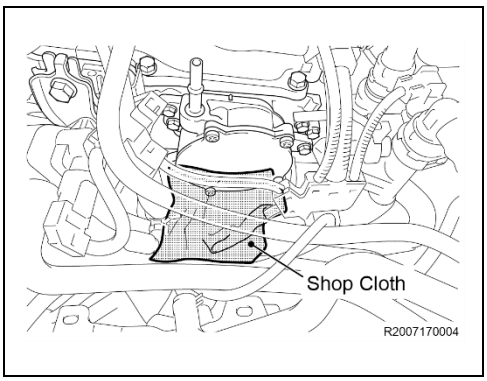
b. Pinch the retainer of the No. 1 vacuum hose connector, and then pull the hose connector off the vacuum pump assembly.

Note: Be sure to disconnect the vacuum hose connector by hand to avoid damaging the connector.

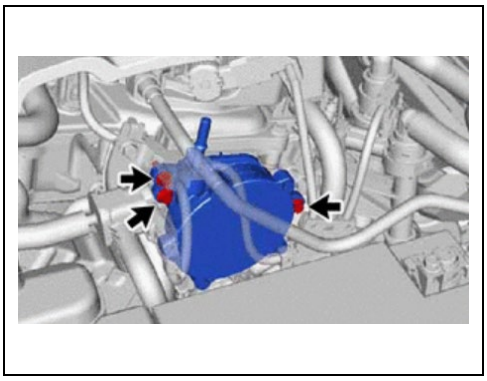


c. Disengage the 2 clamps to separate the engine wire harness from holder.

Hint: disengaging the 2 clamps will allow additional room to remove the pump assembly mounting bolts.

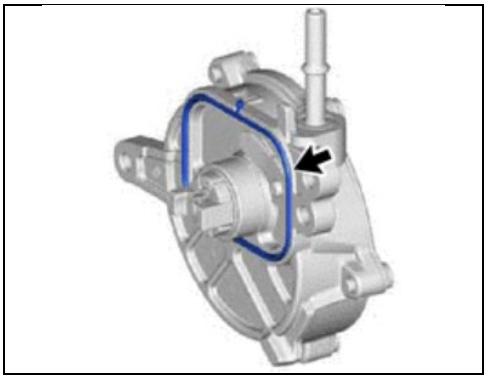


d. Place a shop cloth to catch oil that may discharge from the engine when remove the vacuum pump assembly.



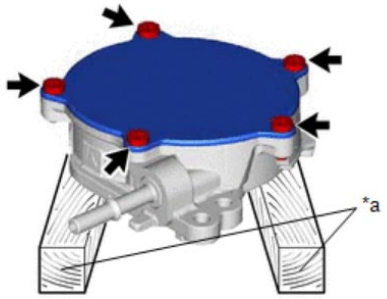
e. Using an 8 mm socket wrench, remove the 3 bolts and vacuum pump assembly.

Hint: Use extra care when removing the 3 bolts, if the bolt is dropped during removal it may be difficult to locate.



f. Remove the No. 1 vacuum pump O-ring from the vacuum pump assembly.

VIII. VACUUM PUMP ASSEMBLY - INSPECTION



*a – Wooden Support Block

1. INSPECT VACUUM PUMP ASSEMBLY - PROCESS

a. To prevent the coupling of the vacuum pump assembly from contacting the workbench, support the vacuum pump assembly with wooden blocks or an equivalent object.

b. Using a T30 "TORX" socket wrench, remove the 5 screws and end cover plate.

NOTE:

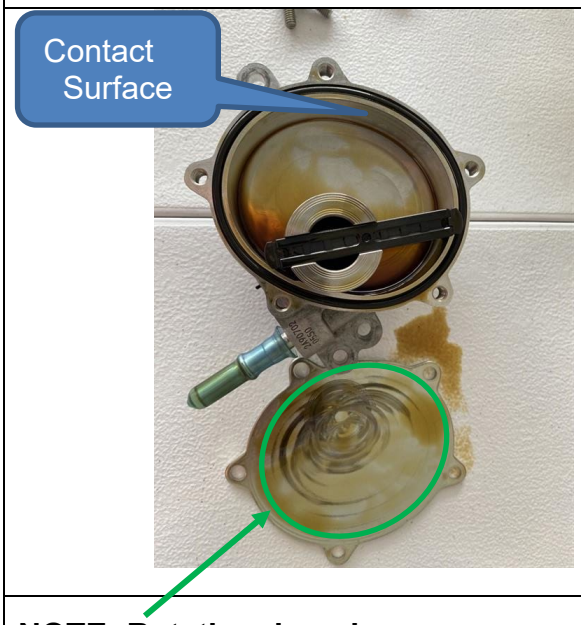
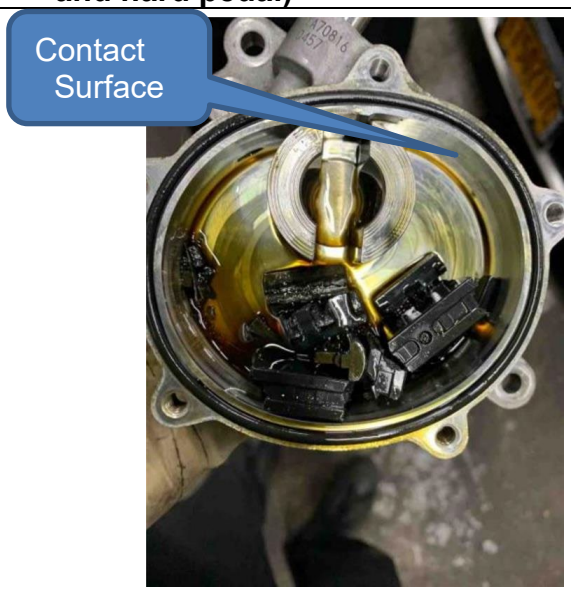
- Hold the pump so that the pump installation surface and fitting parts will not be damaged.
- Do not hold the pump housing with a tool such as a vise, it will deform.
- Securely fit the T30 "TORX" socket wrench to the screws to prevent stripping of fastener.
- Do not drop the end cover or damage it, it will be reused depending on inspection results.
- As there will be a small amount of oil remaining in the vacuum pump housing, be careful not to spill the oil when removing the end cover.
- Do not rotate the coupling as oil remaining in the vacuum pump housing may be discharged.

Continue to page 8 #2 - VACUUM PUMP ASSEMBLY – INTERANL COMPONENT INSPECTION

2. VACUUM PUMP ASSEMBLY – INTERANL COMPONENT INSPECTION

VACUUM PUMP ASSEMBLY – INTERNAL COMPONENT INSPECTION

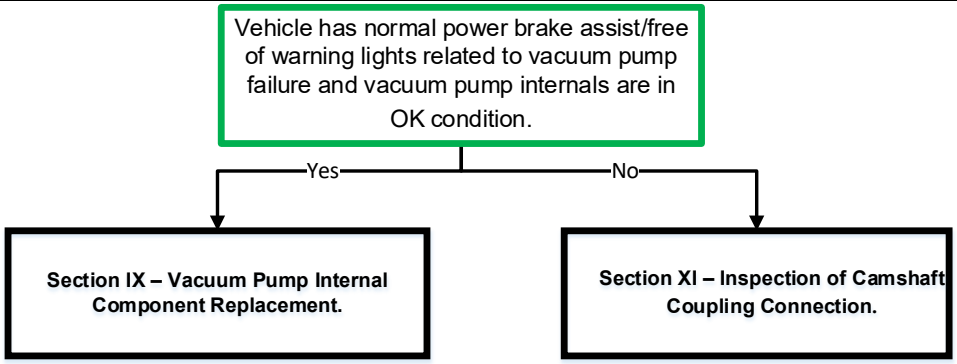
- **Check that there is no foreign material in the engine oil in vacuum pump housing – If foreign material is present replace pump assembly.**
- **Check that there are not cracks or fractures to vacuum pump vanes and vane caps – If there is damage to vacuum pump vanes or vane caps, replace the pump assembly.**
- **Visually inspect the contact surface of the vacuum pump housing (area where vane caps ride on in pump housing) – If there is damage or heavy scoring to vacuum pump housing contact surface, replace vacuum pump assembly.**

Example of OK Vacuum Pump Internals	Example of failed Vacuum Pump Internals (This condition would cause warning light and hard pedal)
	

NOTE: Rotational marks on vacuum pump cover plate are normal, pump assembly does NOT need to be replaced due to these wear marks.

REVIEW SECTION BELOW (3. POST INSPECTION FLOW CHART) TO DETERMINE NEXT STEPS

3. POST INSPECTION FLOW CHART



IX. VACUUM PUMP INTERNAL COMPONENT REPLACEMENT.

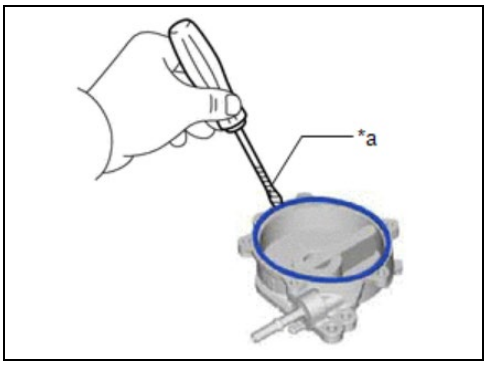
This repair is only for vehicles that have normal power brake assist/free of warning lights related to vacuum pump failure and vacuum pump internals are in OK condition.

1. Preparation – Confirm you have the following parts from repair kit 04001-32125.

Part Number	Part Description	Quantity
04001-32125	KIT, VACUUM PUMP*	1

The kit above includes the following parts.
Note: VP VANE may be part number 29331-25010 or 29331-37010, only one is required.

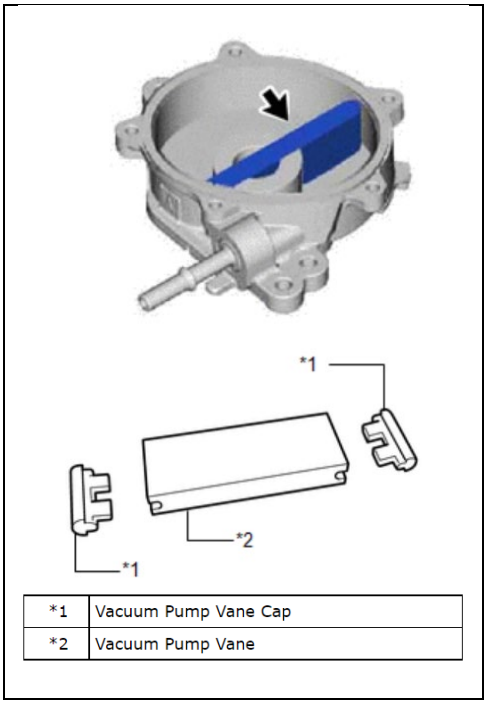
Part Number	Part Name	Quantity
29329-25011	VP VANE CAP	2
29343-25010	VP O-RING NO.1	1
29363-25010	SCREW	5
29346-25010	VP COVER O-RING	1
29331-25010 or 29331-37010	VP VANE	1



2. Vacuum Pump Internal Component Replacement - Process

a. Using a screwdriver with it's tip wrapped in protective tape, remove the vacuum pump cover O-ring.

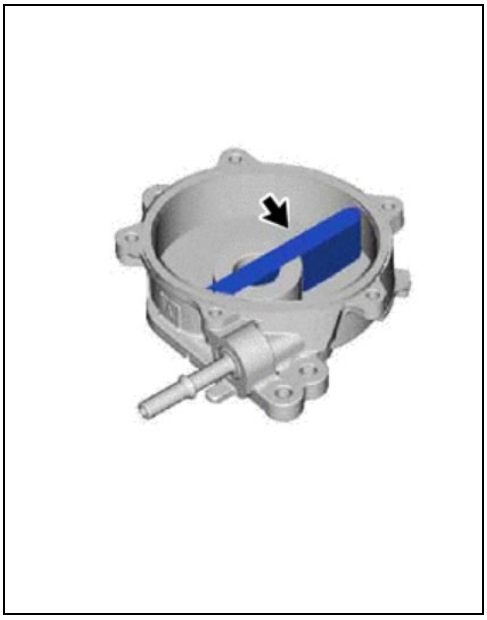
Hint: Be sure to avoid damaging the O-ring groove.



*1	Vacuum Pump Vane Cap
*2	Vacuum Pump Vane

b. Remove the vacuum pump vane together with the 2 vacuum pump vane caps.

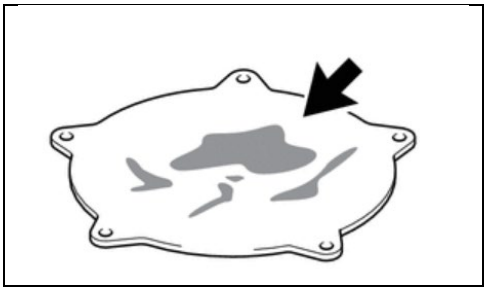
c. Discard removed vacuum pump vane and vane caps to prevent mix-up with new parts.



d. Apply fresh engine oil to the new vacuum pump vane and the 2 new vacuum pump vane caps and install the vacuum pump vane caps onto the new vacuum pump vane.
NOTE: Apply fresh engine oil all over vane and vape caps.
e. Install the vacuum pump vane with the vacuum pump vane caps into the vacuum pump housing.

Note: Parts Used are the following.

Part Number	Part Description	Quantity Used
29329-25011	VP VANE CAP	2
29331-25010 or 29331-37010	VP VANE	1



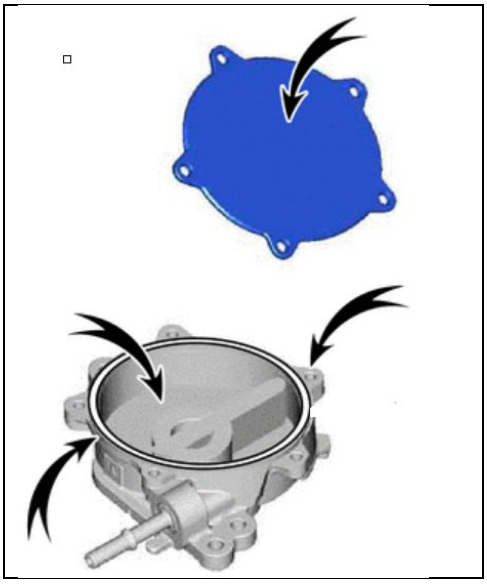
f. Clean the inside surface of the vacuum pump cover plate using a lint free shop towel.

g. Replace vacuum pump cover O-ring with PN: 29346-25010

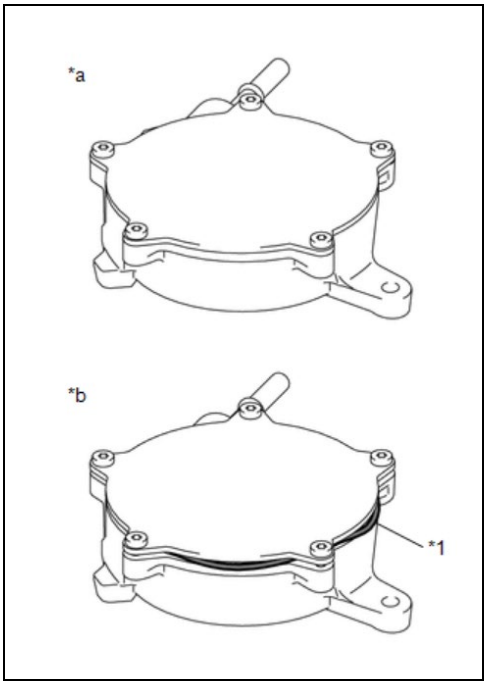
Note: Parts Used are the following.

Part Number	Part Description	Quantity Used
29346-25010	VP Cover O-ring	1

Confirm the O-ring is installed correctly in the pump body O-ring groove.



h. Install vacuum pump cover plate onto vacuum pump housing.
NOTE: Ensure openings in cover plate align with screw holes in pump housing.

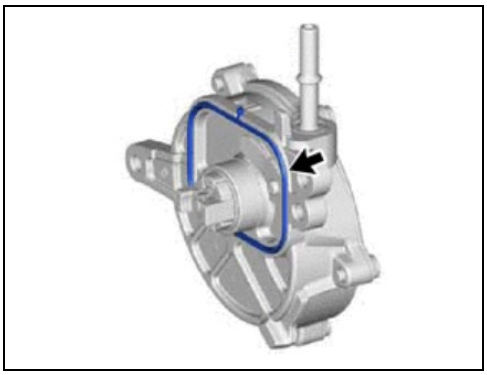


i. Using a T30 “TORX” socket wrench, install the 5 new end cover screws. Torque the 5 screws to 7.5 N·m {76 kgf·cm, 66 in·lbf}

Note: Parts Used are the following.

Part Number	Part Description	Quantity Used
29363-25010	VP Cover Screws	5

Figure *a shows the correct installation of the cover plate and gasket.
Figure *b shows the incorrect instalation of the cover plate where the O-ring gasket, identified as *1, is incorrectly seated in the groove.
Ensure pump cover plate is installed properly



j. Install the new No. 1 vacuum pump O-ring onto the vacuum pump assembly.

Note: Parts Used are the following.

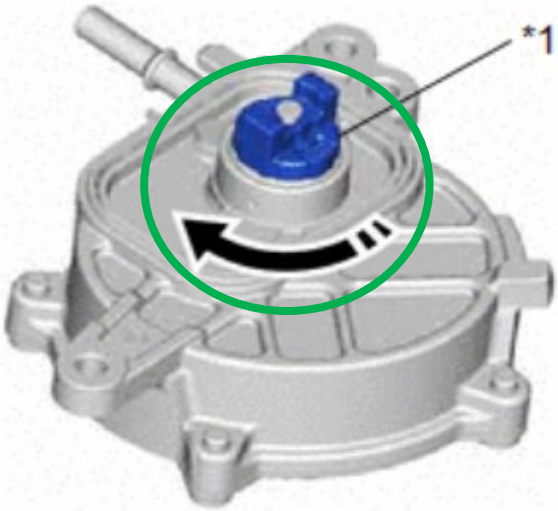
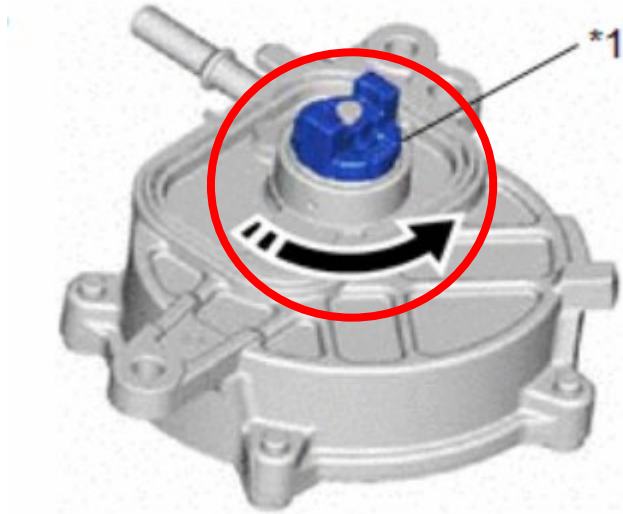
Part Number	Part Description	Quantity Used
29363-25010	VP O-ring No. 1	1

3. Inspect Rebuilt Vacuum Pump Assembly – Before Installation

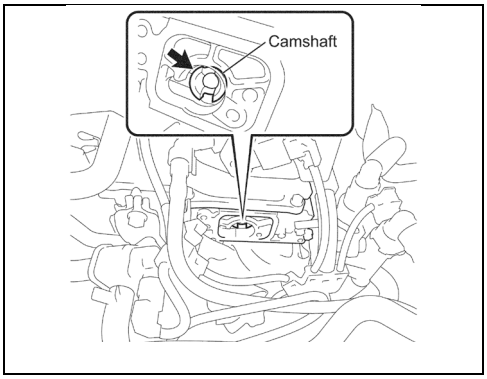
a. While looking at the vacuum pump from the camshaft couple side, rotate the coupling clockwise. Standard operation of the vacuum pump may have fluctuation in effort required to turn the coupling. If the vacuum pump locks up and can no longer be turned, this indicates a concern with the pump rebuild.

STOP

The coupling, identified as *1, should only be rotated in the clockwise direction. Rotation of the coupling in the wrong direction may result in damage to the pump.

CORRECT ROTATION	INCORRECT ROTATION
	

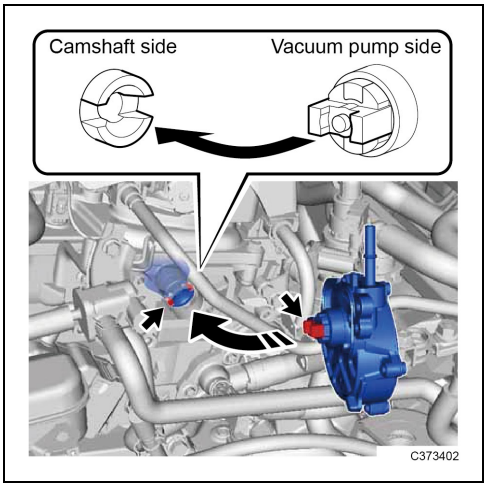
X. REBUILT VACUUM PUMP INSTALATION



1. Rebuilt Vacuum Pump Assembly Installation - Process

a. Before Installing the rebuilt vacuum pump, confirm that the camshaft to vacuum pump coupling connection is present on the camshaft.

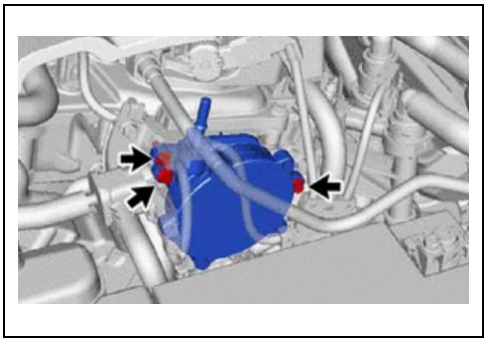
Note: Confirm that there are no fractures or missing components from the camshaft end.



b. Install the rebuilt vacuum pump assembly so that the coupling teeth of the vacuum pump assembly and coupling groove on the camshaft are engaged.

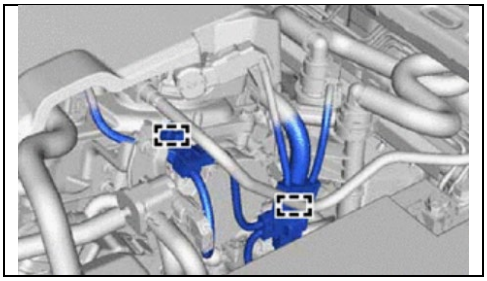
STOP

- **Ensure that the vacuum pump assembly is installed fully to the cylinder head.**
- **Be careful not to pinch the No. 1 vacuum pump O-ring.**

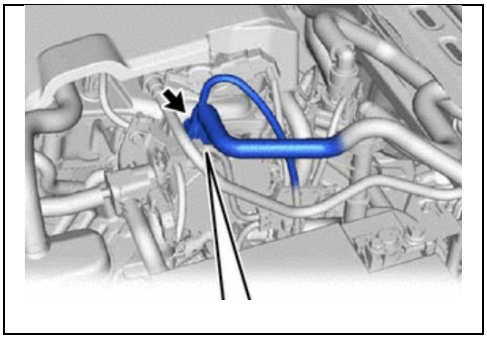


c. Using an 8 mm socket wrench, install the 3 bolts securing the vacuum pump to the cylinder head. Torque the 3 bolts to 10 N·m {102 kgf·cm, 7 ft·lbf}.

Note: Use extra care when installing the 3 bolts, if a bolt is dropped during installation it may be difficult to locate.



d. Engage the 2 clamps on the engine wire harness to reattach the harness clips to the brackets.



e. Reinstall the No.1 vacuum hose connector onto the vacuum pump port fitting. Put connector onto the port fitting until a “click” sound is heard.

- **Verify repair quality below before returning the vehicle to the customer.**

◄ VERIFY REPAIR QUALITY ►

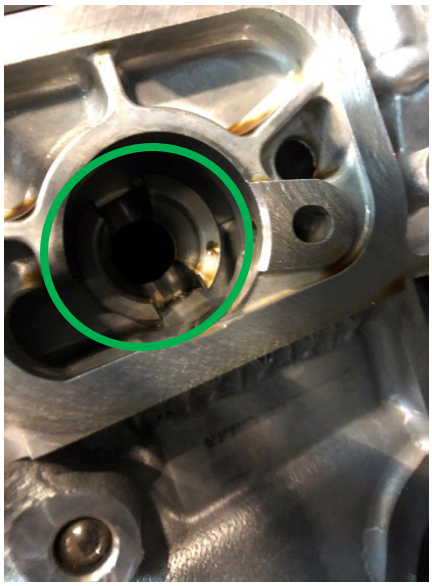
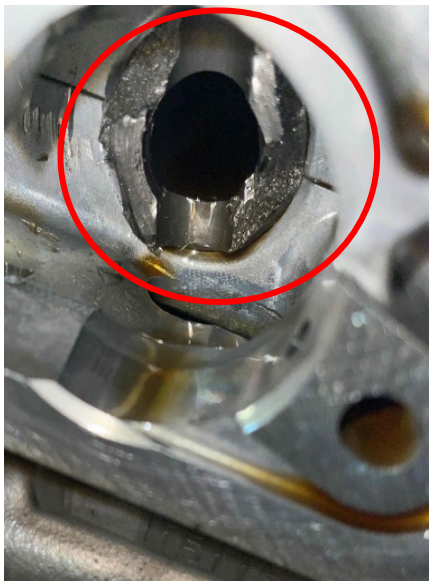
- **With the engine not running, clean any oil that may have leaked onto the transmission case during vacuum pump removal.**
- **With the engine running confirm that there are no oil leaks present from the vacuum pump assembly.**
- **With the engine running confirm that brake pedal application effort is normal, and that the multi-information display is free of warning lights related to the brake system.**
- **With the engine not running, check the engine oil level. Replace any oil lost during vacuum pump removal.**

XI. INSPECTION OF CAMSHAFT COUPLING CONNECTION

- This inspection process is for vehicles that did NOT have normal brake pedal application effort and or had warning lights related to vacuum pump failure and or had failed internal components in the vacuum pump assembly.
- This inspection is based on the Vacuum Pump Assembly being previously removed in section VIII and inspected in section IX.

With the vacuum pump removed, use a mirror and a flashlight or a camera with flash to inspect the camshaft to vacuum pump coupling connection.

- Confirm that the coupling connection point is free of fractures and or cracks.

Example of an OK camshaft coupling connection	Example of a failed camshaft coupling connection
	

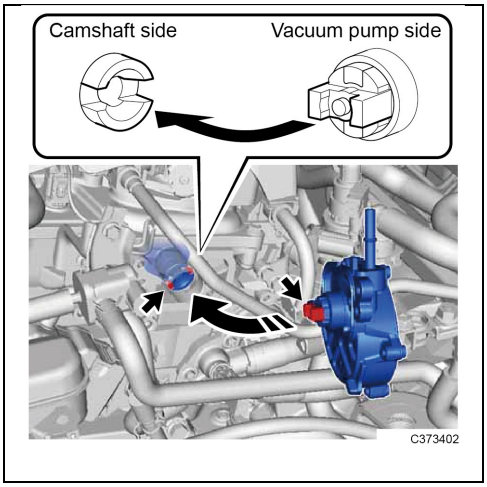
RESULTS:

a. If the camshaft coupling connection is in OK condition, proceed to **section XII – New Vacuum Pump Assembly Installation.**

b. If the camshaft coupling connection is failed, proceed to **section XIII – Camshaft Coupling Connection Damage Present**

XII. NEW VACUUM PUMP ASSEMBLY INSTALLATIION

- Section XIII. The installation of a new vacuum pump assembly is for vehicles that had failed internal components in the vacuum pump assembly.
- Vehicles with a failed camshaft coupling connection will also receive a new vacuum pump assembly. Use Section XII **after** camshaft damage is repaired.



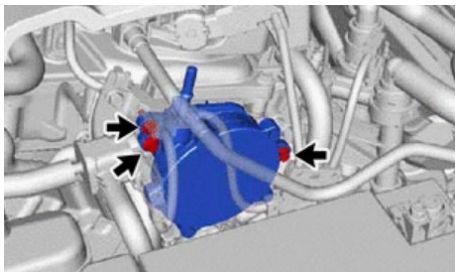
1. New Vacuum Pump Assembly Installation - Process

a. Install the new vacuum pump assembly so that the coupling teeth of the vacuum pump assembly and coupling groove on the camshaft are engaged.

Note: Parts Used are the following.

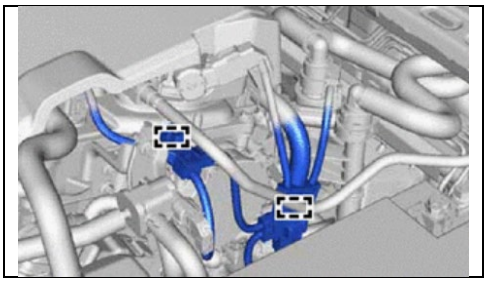
Part Number	Part Description	Quantity Used
29300-F0011	VP Assembly	1

- **Ensure that the vacuum pump assembly is installed fully to the cylinder head.**
- **Be careful not to pinch the No. 1 vacuum pump O-ring.**

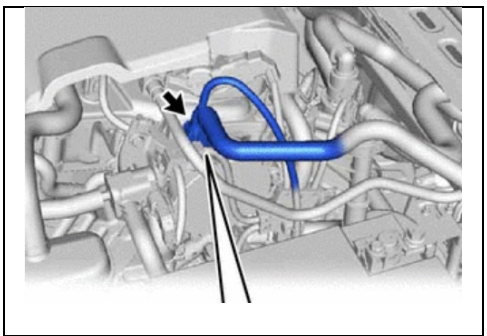


b. Using an 8 mm socket wrench, install the 3 bolts securing the vacuum pump to the cylinder head. Torque the 3 bolts to 10 N·m {102 kgf·cm, 7 ft·lbf}.

Note: Use extra care when installing the 3 bolts, if a bolt is dropped during installation it may be difficult to locate.



c. Engage the 2 clamps on the engine wire harness to reattach the harness clips to the brackets.



d. Reinstall the No.1 vacuum hose connector onto the vacuum pump port fitting. Put connector onto the port fitting until a “click” sound is heard.

2. Engine Oil and Engine Oil Filter – Change Process

- Vehicles with internal vacuum pump component damage and or camshaft damage will receive an oil and oil filter change as part of the repair process.

a. Follow the Repair Manual Process to replace the engine oil and engine oil filter.

A25A-FKS OIL AND OIL FILTER: REPLACEMENT; 2018 - 2019 MY Camry (RM1000000015OUY)

Note: Parts Used are the following.

Part Number	Part Description	Quantity Used
90915-YZZN1	Engine Oil Filter	1
00279BLK1601 or equivalent	0W-16 Engine Oil	4.8 US Qts
90430-12031	Engine Oil Drain Plug Gasket	1

- **Ensure that the engine oil filter has been replaced.**

◄ VERIFY REPAIR QUALITY ►

- **With the engine not running, clean any oil that may have leaked onto the transmission case during vacuum pump removal.**
- **With the engine running confirm that there are no oil leaks present from the vacuum pump assembly.**
- **With the engine running confirm that brake pedal application effort is normal, and that the multi-information display is free of warning lights related to the brake system.**
- **With the engine not running, check the engine oil level. Confirm oil level is correct after oil change.**

XIII. CAMSHAFT COUPLING CONNECTION DAMAGE PRESENT

- **The technician is required to create a TAS case related to camshaft damage with photos.**
- **Code the TAS case like the following:**

Symptom Coding (Customer Complaint)

*Service Category:	Brake
*Section:	Brake System
*Sub-Component:	Brake Pedal
*Symptom Code:	Condition-Not-Listed
*Pre-call Worksheet:	Not applicable

- **Include a good call back number**
- **Include this statement in the Condition Log: "Safety Recall 21TA09 – Camshaft Damage – Request for Additional Part Replacement"**
- **List damaged components with part number requiring replacement, Example:**
  - **Damaged Exhaust Camshaft, Damaged Camshaft Timing Gear.**
- **Attach a picture of the vehicle VIN plate.**
- **Attach clear pictures illustrating the damaged components referenced above.**
- **Submit the TAS case.**
- **Call TAS informing them of the TAS case created.**
- **TAS will put the case in open status and forward the case to the FTS for review.**

Submit the completed case in TAS; allow 1 day for FTS to review the case. After 1 day, check the TAS case for status. If the repair is approved, the case will be marked closed. Additionally, the FTS will provide the necessary labor op-code as well as the maximum allowable time for the repairs requested.

NOTE: It is critical that dealers document all damaged components in the TAS case and attach pictures of the damaged components. TMNA warranty will review all warranty claims utilizing this special labor op-code to ensure the allowable time noted in the TAS case by the FTS matches the warranty claim filed by the dealer. (Include TAS case # on claim).

1. **Camshaft coupling connection damage - Repair**

   Vehicles with camshaft damage will require the following parts:

   - New exhaust camshaft
   - New exhaust camshaft timing gear.

   If additional components are damaged due to camshaft components entering the cylinder head assembly, the damaged components can also be replaced with FTS TAS case approval.

   a. Follow the Repair Manual Process to remove the exhaust camshaft and exhaust camshaft timing gear.

   A25A-FKS (ENGINE MECHANICAL): CAMSHAFT: REMOVAL; 2018 MY Camry (RM1000000015OWS)

- **Carefully inspect the cylinder head internals for pieces of the broken camshaft coupling connection. Remove all broken camshaft pieces found prior to reinstallation of new components.**
- **An oil change will be completed after vacuum pump installation to change engine oil and engine oil filter.**

- Order the correct replacement components using the Electronic Parts Catalog.

   b. Follow the Repair Manual Process to install the new exhaust camshaft and exhaust camshaft timing gear.

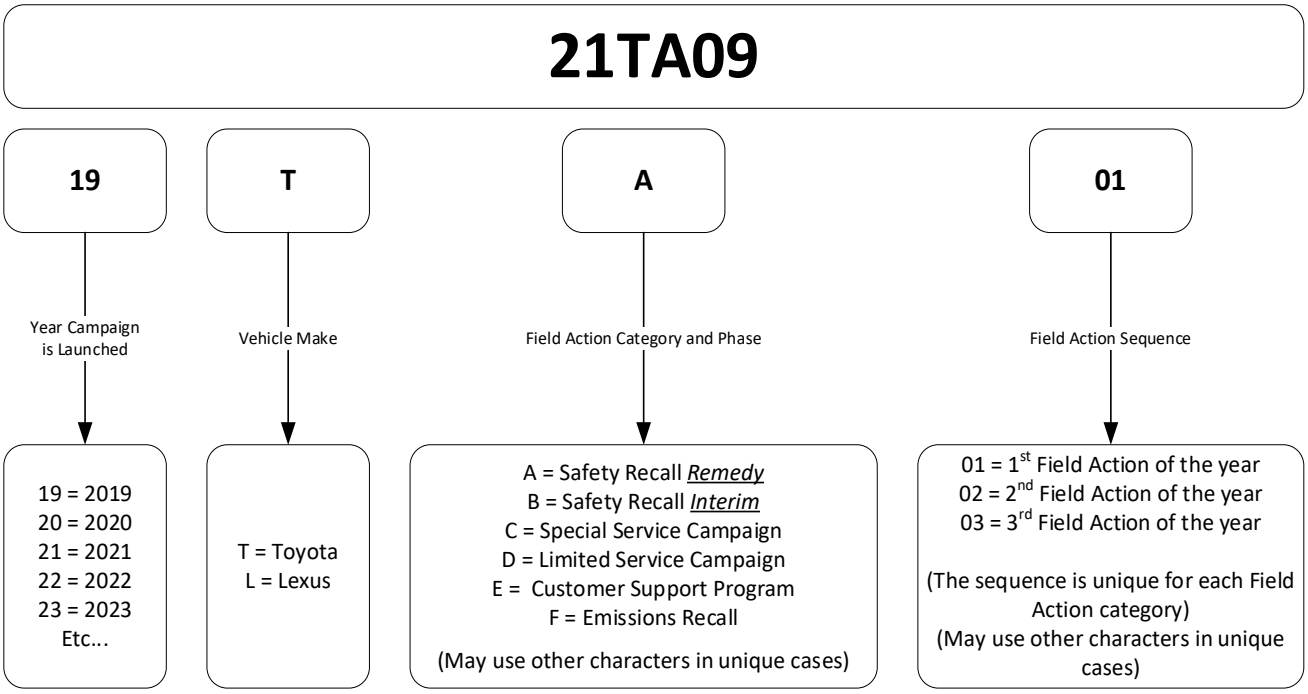
   A25A-FKS (ENGINE MECHANICAL): CAMSHAFT: INSTALLATION; 2018 - 2022 MY Camry (RM1000000012VD8)

- **Confirm that all components were installed correctly per the repair manual.**
- **Confirm that all components were torqued to specifications listed in repair manual.**

- **NEXT STEPS:** Following camshaft and camshaft gear replacement, the technician should go to **section XII - NEW VACUUM PUMP ASSEMBLY INSTALLATIION** to complete vehicle repair.

XIV. APPENDIX

A. CAMPAIGN DESIGNATION/PHASE DECODER



Examples:
19TA01 = Launched in 2019, Toyota, Safety Recall Remedy Phase, 1st Safety Recall Launched in 2019
20TC02 = Launched in 2020, Special Service Campaign, 2nd Special Service Campaign Launched in 2020
21TE05 = Launched in 2021, Customer Support Program, 5th Customer Support Program Launched in 2021

C. RECALL PARTS DISPOSAL

As required by Federal Regulations, please make sure all recalled parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused, ***unless requested for parts recovery return.***