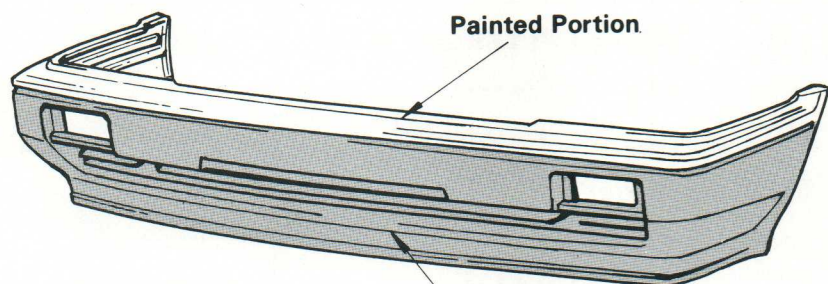


**TOYOTA**

# **SERVICE NEWS**

BULLETIN NO. 15

SPRING 1985



Non-painted Portion

**REPAINTING  
RESIN  
BUMPERS**

## **THE DIGITAL DASH**

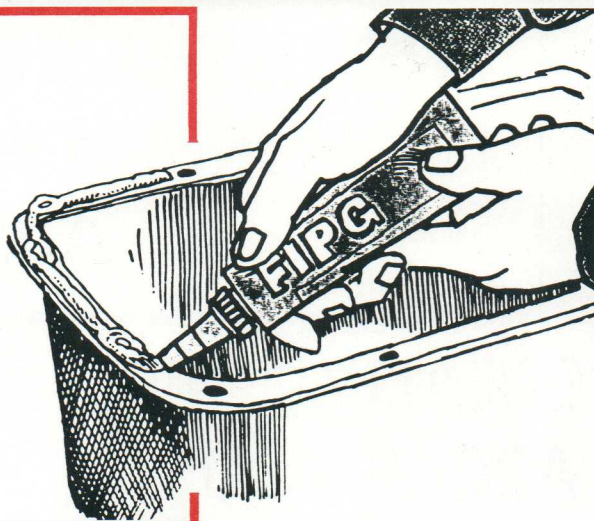
HOW IT WORKS

AND

HOW TO FIX IT



**SEAL OF  
APPROVAL  
FOR FIPG**






# APRIL

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

**DON'T MISS THE  
REGISTRATION DEADLINE  
FOR MAY ASE TESTS!  
APRIL 5**

**WE REALLY**   
**ABOUT YOU**



**PLEASE  
BUCKLE UP**

# TOYOTA SERVICE NEWS

Bulletin No. 15

Spring 1985

The *Toyota Service News* is published by Toyota Motor Sales, U.S.A., Inc., as a service to the independent automotive service industry. There are no expressed or implied warranty implications. All procedures, specifications and part numbers were in effect at the time of printing. Toyota Motor Sales, U.S.A., Inc., reserves the right to change procedures and/or specifications at any time, without prior notice and without incurring obligation. For complete specifications and procedural information, please refer to the appropriate repair manuals. As for part number changes, consult your local Toyota Dealer.

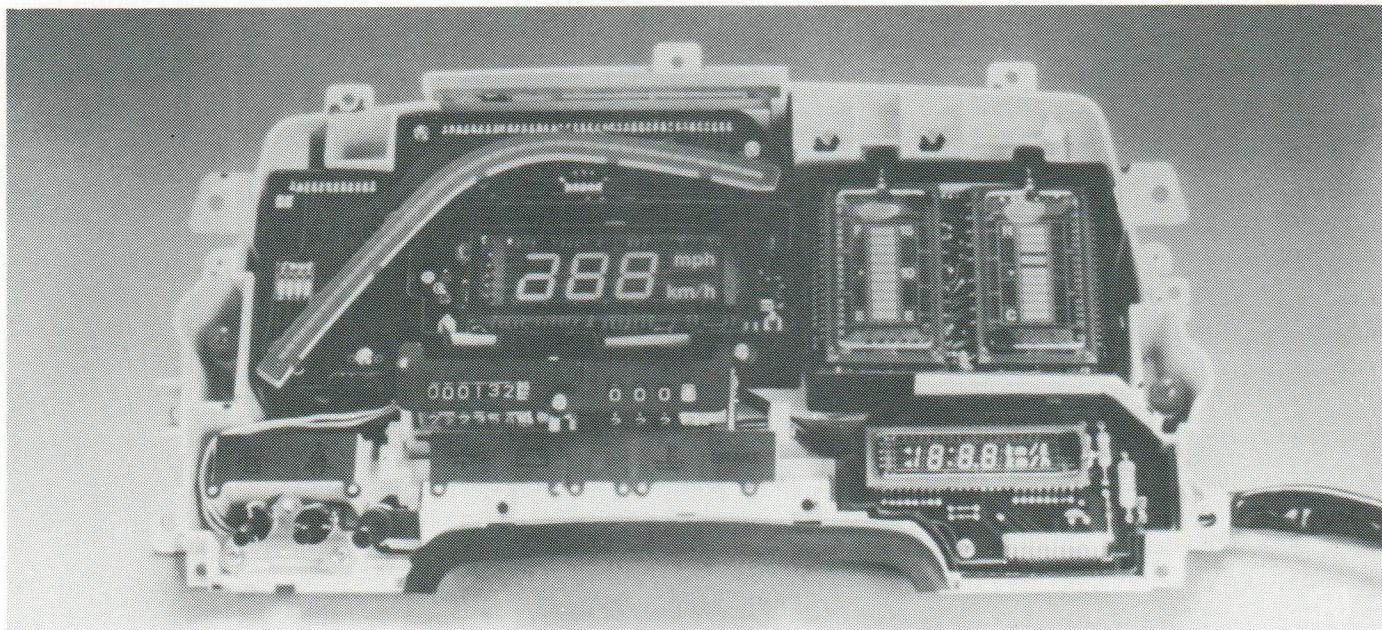
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**TOYOTA**  
**GENUINE PARTS**  
**WHOLESALE**

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## THE DIGITAL DASH — HOW IT WORKS . . .



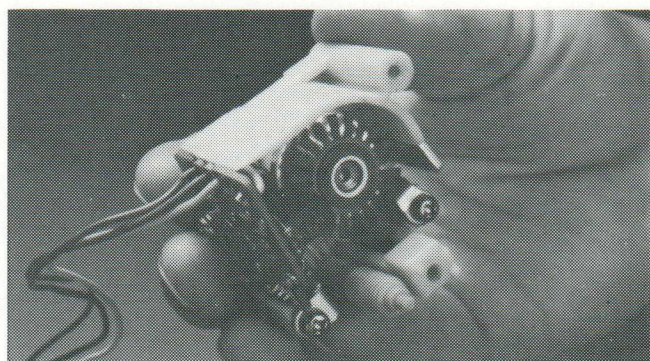
For many years, the auto industry has predicted that "in the next few years, we're going to see more new technology and change than we've seen in the past twenty five." Until recently, the attitude has been one of "wait and see." Then, Toyota brought out the digital dash, and that long promised technology was suddenly here.

It's important to remember that this digital dash operates on basic principles common to any gauge system. Each gauge gets a signal from its sender, and modifies this signal to display a value to the driver. Analog gauges use electric coils and magnets to modify the signal into the right display. Digital gauges simply use computer circuits to do the same thing. The only hangup is that the digital system *thinks* about the signal before it displays it.

The digital dash operates as a system. It's made up of four major components; the speedometer,

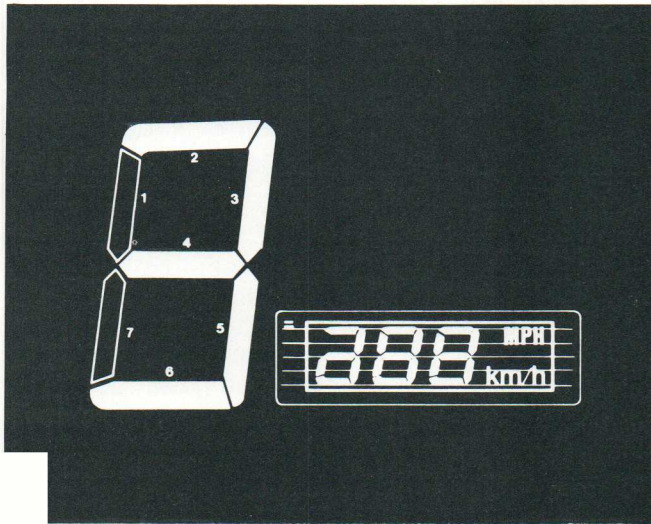
tachometer, a combined fuel/temperature gauge and the counter assembly. The speedometer head is the brain of the system. It contains the main computer processing unit (CPU) for all the displays, and its job is to receive the signals, rework them a bit, and then send these new signals to the various displays. It basically runs this "over-the-road light show" by talking in computer language to the other gauges.

On the Supra, the main signals to the speedometer come from the speedometer cable and counter, the igniter, and from the water temperature and fuel senders. Of course there is also battery voltage, a headlamp ON signal and some other less critical signals which are common to every car, but those four main signals are the ones that make the digital system work.





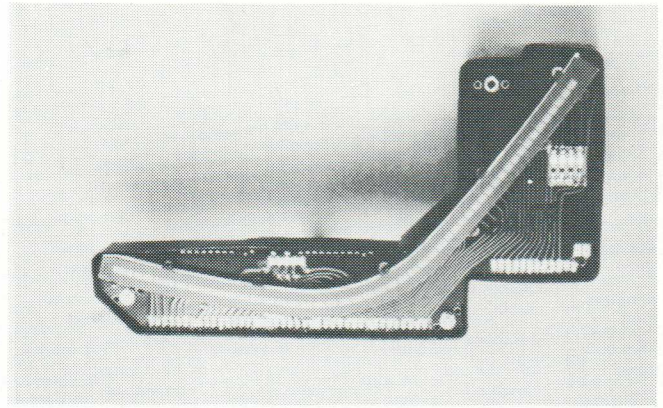
On a regular car, the speedometer cable turns a magnetic cup which causes the speedo needle to deflect and indicate speed. With the digital dash, the cable turns a device called the counter, which is inside the cluster behind the speedometer display. The counter converts the rotation of the cable into an electrical signal. The cable rotates a small slotted metal wheel past a light activated switch (photo-coupler) causing it to open and close. This action results in an ON-OFF-ON-OFF signal being sent to the speedometer. It reads the signal, thinks about it, and then displays the speed. And it doesn't seem to care whether the car is moving forwards or backwards, which is why the speedo will display your speed in reverse. As the vehicle moves faster down the road, the cable rotates the counter faster, and it sends a faster ON-OFF signal to the speedometer. The speedo thinks about it for a second and then displays the new speed.



If you look closely at the speedometer display you'll see that each numeral is made up of seven light bars. There's a total of only twenty bars for the three numerals because the "hundreds" digit is missing one. You should also see some very fine wires running across the display just above the numerals.

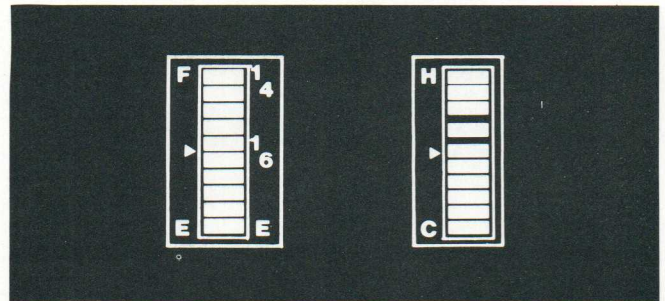
All the bars have power applied all the time when running, and can be individually grounded to form numbers. If the car is going 3 mph, the computer grounds #2, #3, #4, #5, and #6 light bars and we see a three. It's a little tricky to control all this when you're doing a zero to hyper-speed acceleration run which is why the system is computer controlled.

The display element forms the numbers, but there's more work needed to make the lights glow brightly. Those fine wires running across the numbers are called "heaters," and supposedly they shower photons (electrical particles) through the light bars to a ground to make them glow. With the combination of a grounded light bar and the photon shower, we achieve a digital display known as "electro-fluorescent display."



The tachometer is a bit different from the speedometer, and is really pretty simple. Like in any electric tach, an ignition signal comes to the tach from the coil/igniter. On Toyota's system though, this signal first goes into the speedometer, is converted to a computer language, and then is sent over to the tach. The tach reads this modified signal and decides what RPM to display. The tach display is made up of many small LED's (light emitting diodes) that glow when we pass current through them. The tachometer computer selects which LED's to power according to the incoming RPM signal. At very high RPM, the LED's glow bright red to indicate over-Rev. But don't try free-revving an engine to see the red as this can cause expensive engine damage.

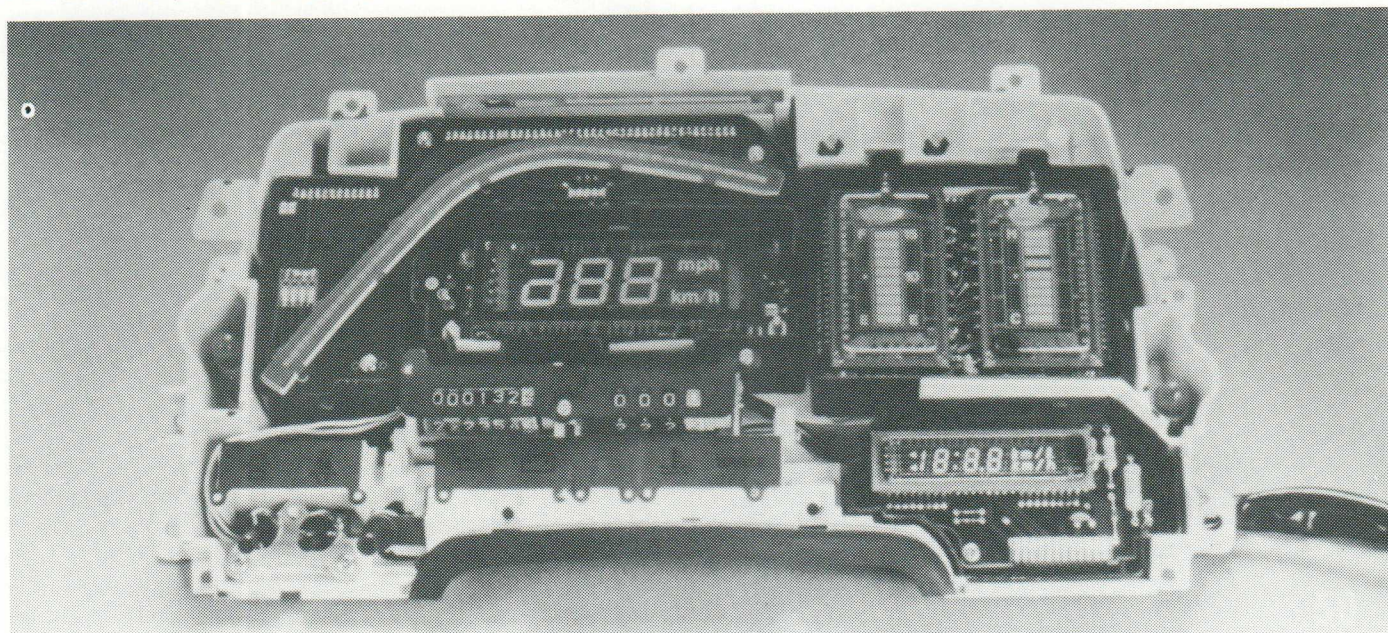
The fuel and temperature gauges operate just like the speedometer. A variable signal comes from the senders, gets converted to the right language by the speedometer CPU, and then is sent to the displays. The display circuitry decides which elements to light up to give the proper display. These gauges are both electro-fluorescent displays like the speedo, but use single light bars to display level, instead of the seven piece kind used to display numerals.



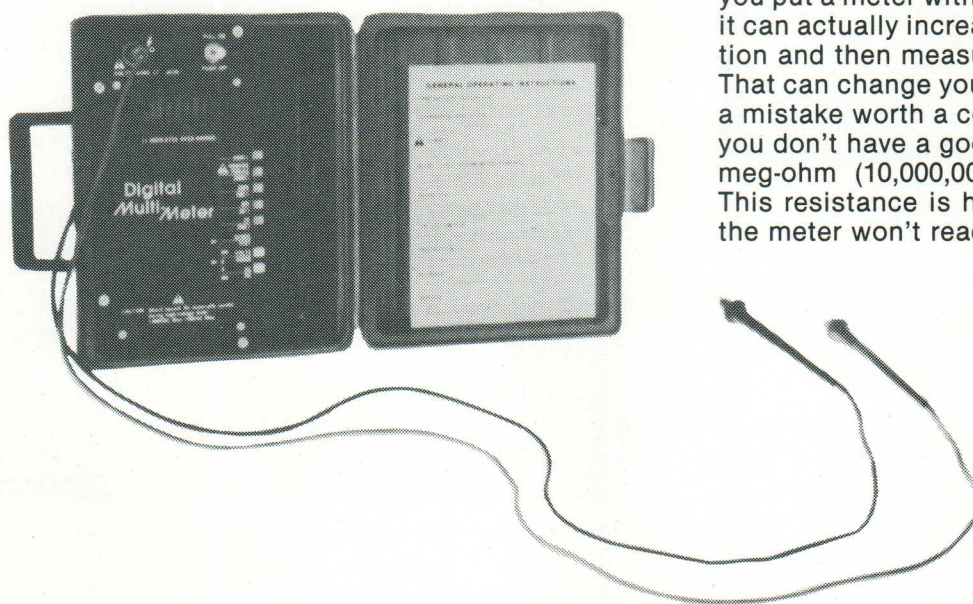
The speedometer and fuel gauges have dual scales that offer the driver additional information. The speedo scale change switch adds another internal circuit to the system which results in the higher reading, and switches the ground from the "MPH" to the "km/h" light bar. The fuel scale change switch adds a new circuit to the fuel gauge, causing it to expand the last quarter tank to full scale display. Toyota has added a new fuel sender that's super accurate to make sure this system will work correctly. The expanded scale only works for a few seconds to avoid someone thinking they have a full tank when they're actually getting low on fuel.



## THE DIGITAL DASH — AND HOW TO FIX IT



Well that's how it works. Now, let's look at how to work on it. A few things to keep in mind are:



A few words about multi-meter required for testing digital dash systems. Those digital display computer circuits work on awfully low power levels. If you put a meter with low resistance into the circuit, it can actually increase the circuit power consumption and then measure itself as part of the circuit. That can change your readings. And that can mean a mistake worth a couple of hundred dollars. So, if you don't have a good meter, get one. Make it a 10 meg-ohm (10,000,000 ohm/volt) impedance unit. This resistance is high enough to make sure that the meter won't read itself as part of the circuit.

- 1) Never connect or disconnect any components with power applied. This can damage the computers.
- 2) Treat the displays gently. They're expensive.
- 3) Test problems carefully. These parts are too expensive to randomly install. Also, if something in the car made the first display fail and you just replace the display, what's to say that the car won't damage the replacement part too.

The small Supra Repair Manual (#36147) does a good job of guiding you through the tests, so we won't try to rewrite it. Let us encourage you, instead, to sit down with a copy and read pages BE-33 through BE-62 carefully. Get familiar with the tests.

To order Supra Repair Manual (#36147) see your Local Toyota Star Dealer.





The first problem that comes to mind is one seen several times. Some technicians work too hard trying to get the digital cluster out. They've got darn near the whole inside of the car scattered around the hood, the roof and the floor. There's no need for major disassembly.

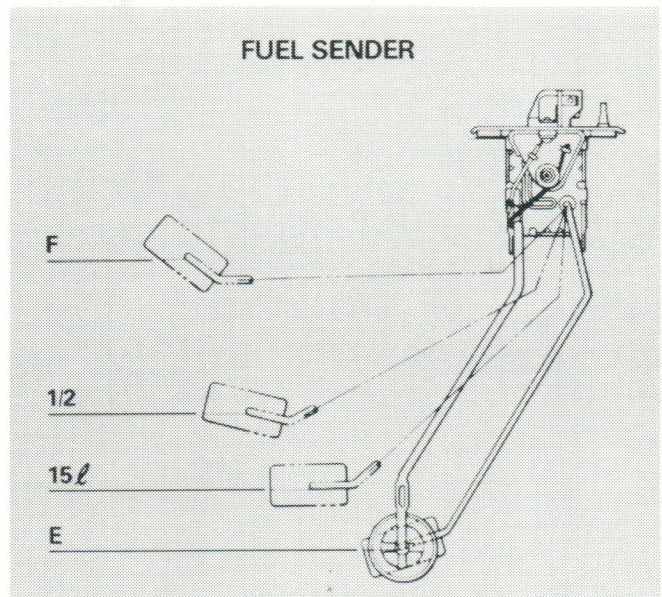
- Be sure you need to take it out. Test the senders first if possible.
- Copy down the customer's pre-selected radio stations so you can reset them along with the clock after service. Then, remove the negative battery cable.
- Reach under the dash and pull the speedo cable.
- Pry out the Trip Computer keypad and the rheostat faceplate.
- Remove the two screws from each of those openings.
- Remove two screws from the meter hood (located above the speedometer display).
- Roll the meter hood back, disconnect the cruise control switch wiring and rotate the hood away to the right.
- Remove the four screws that hold the cluster in.
- Tilt the steering wheel down and carefully work the cluster out of the dash.

Once you've got the meter out, hook up the SST, then the battery cable, and begin your testing.

As you test each component, keep in mind the way it works. You'll need to confirm operation of the sender (signal), the speedometer (CPU), the display itself, and verify battery power and so on. If you can, check the signal and wiring connectors first. These have been the problem more often than failed display units. Here are a few tips:

**Speedometer problem** — check the cable. If it's broken you'll see "O" all the time. If it's kinked, the display can fluctuate up and down on a steady cruise. If the displays won't dim at night or stay dim during the day, check the rheostat.

**Fuel gauge** — if the readings are funny, check the wiring at the fuel tank sender unit and check the curve of the sender resistor. (See BE-61)



**Water temperature gauge** — check the top tank temperature against the chart on page BE-61 in the manual. Also, keep in mind that an open circuit to the sender will indicate minimum temperature, and a short to ground in the sender wire will indicate maximum temperature.

Segment No.	Water Temperature
10	120°C or more
9	115—120°C
8	110—115°C
7	105—110°C
6	85—105°C
5	70—85°C
4	65—70°C
3	60—65°C
2	50—60°C
1	50°C or less

That's about all we can tell you about these parts. Probably the best tool or tip you can have is your familiarity with the system and the tests, and good, solid diagnostic practices.

Well, you can't lubricate or torque the digital dash, but with a little practice it'll be easy to fix. We suggest you get familiar with it right away. Toyota's got lots more stuff like this coming in the near future, and you'll have to be ready for it. Believe us, "in the next few years, we're going to see more new technology and change than we've seen in the last twenty five."



# TERCEL/ STARLET



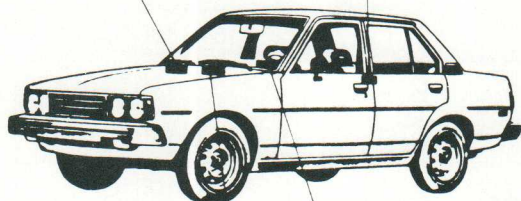
## PARTS APPLICATION GUIDE

Toyota parts are specified by model number, engine type and/or production date. Here's where to find this information on your vehicle:

The correct model number, engine type and/or production date may be necessary in order to accurately identify the desired part number. These are located in various places on each Toyota.

Body Number  
(on the dash panel  
adjacent to Name Plate)

Certification Regulation Plate  
(on the center body pillar)

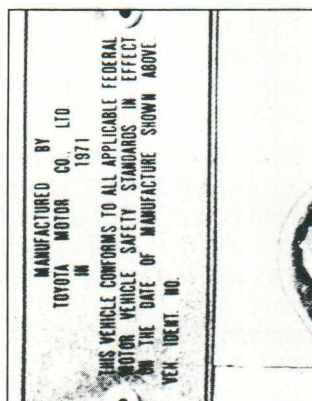
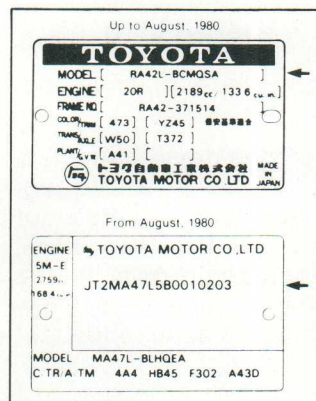


Name Plate  
(on the dash panel  
in the engine room)

Vehicle Identification Number Plate  
(on the instrument panel)

Model number and engine type are printed on the metal plate located on the firewall.

Production date is printed on the metal plate attached to the doorjamb.



## TOYOTA

# TERCEL PARTS APPLICATIONS

### GAS CAPS

PROD. DATE	MODEL	LOCKING	NON-LOCKING
8/79-7/82	AL 1#	Lock on Door	77310-12100
8/82-	AL 2#	Lock on Door	77310-16010

### SPARK PLUGS

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-8/80	AL 1#	1AC	90919-01089
8/80-	AL 1#, 2#	3AC	90919-01091

### SPARK PLUG WIRE SETS

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-7/82	AL 1#	1AC, 3A#	90919-21271
8/82-	AL 2#	3A#	90919-22133

### DISTRIBUTOR ROTORS

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-8/80	AL10	1AC	19102-15021
8/80-7/82	AL12	3AC	19102-38210
8/82-	AL2#	3A#	19102-63010

### DISTRIBUTOR CAPS

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-7/82	AL 1#	1AC, 3AC	19101-15021
8/82-	AL2#	3A#	19101-15090

### AIR FILTER

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79	AL 1#, 2#	1AC, 3A#	17801-15010

### FUEL FILTER

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-	AL 1#, 2#	1AC, 3A#	2300-34100

### PCV VALVES

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-8/80	AL 10	1AC	12204-28010
8/80-	AL 12, 2#	3A#	12204-15022

### OIL FILTER

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79	AL 1#, 2#	1AC, 3A #	15601-13011



**OIL FILLER CAPS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-3/83	AL 1#, 2#	1AC, 3A#	12180-13010
3/83-	AL 2#	3A#	12180-70010

**FRONT BRAKE PADS**

PROD. DATE	MODEL	PART NUMBER
8/79-8/80	AL10	04491-10040
8/80-7/82	AL12	04491-16022
8/82-	AL2#	04491-16050

**REAR BRAKE SHOES**

PROD. DATE	MODEL	PART NUMBER
8/79-7/82	AL1#	04495-16010
8/82-	AL21, SED	04495-16020
8/83-	AL21, WG	04495-12080
8/82-	AL25	04495-16030

**RADIATOR CAPS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-7/82	AL1#	1AC, 3A#	16401-36011
8/82-	AL2#	3A#	16401-63010

**UPPER HOSES — RADIATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-8/80	AL10	1AC	16571-15040
8/80-7/82	AL12	3A#	16571-15060
8/82-	AL2#	3A#	16571-15081

**LOWER HOSES — RADIATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-8/80	AL10	1AC	16572-15030
8/80-7/82	AL12	3AC	16572-15060
8/82-	AL2#	3A#	16572-15120
8/82-1/83	AL2#	3A#	16572-15111*
1/83-	AL2#	3A#	16572-15112*

\* With Power Steering

**BYPASS HOSES — RADIATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-	AL1#, 2#	1AC, 3A#	16268-15010

**THERMOSTATS & GASKETS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-	AL1#, 2#	1AC, 3A#	90916-03046
			16325-70021

**BELTS, FAN & ALTERNATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-7/82	AL1#	1AC, 3#	99331-60985
8/82-	AL2#	3AC	90916-02126
8/82-	AL2#	3AC	99363-01050
			(with A/C)

**IGNITION COILS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-8/80	AL 10	1AC	90919-02106
8/80-7/82	AL 12	3AC	90919-02117
8/82-	AL 2#	3A#	90919-02135

**VOLTAGE REGULATORS**

ENGINE	MODEL	APPLICATION	REMFG. PART NUMBER
1A-C	AL1#	Std	27700-38060-84
1A-C	AL1#	Opt	27700-38100-84
3A, 3A-C	AL2#	Std	27700-13060-84
3A-C	AL2#	Std	27700-13090-84
3A, 3A-C	AL2#	Opt	27700-43010-84

**CLUTCH COVERS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/78-5/82	AL10, 12	1AC, 3AC	31210-12063-84

**CLUTCH DISC**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/79-7/82	AL10, 12	1AC, 3AC	31250-16012-84

**CLUTCH BEARINGS**

PROD. DATE	MODEL	CLUTCH/RELEASE BEARING	INPUT/SHAFT BEARING
8/79-10/80	AL10, 12	90363-40022	97123-06001
10/80-	AL1#, 2#	90363-40022	90363-12003

**TOYOTA****STARLET PARTS APPLICATIONS****GAS CAPS**

PROD. DATE	MODEL	LOCKING	NON-LOCKING
8/80-8/82	KP61	Lock on Door	77310-12100
8/82-	KP61	Lock on Door	77310-16010

**SPARK PLUGS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/81	KP61	4KC	90919-01091
8/81-8/82		4KC	90919-01113
8/80-8/82		4KC	90919-01064
		(Calif. Spec)	
8/80-8/82		4KC Optional	90919-01065
		(Calif. Spec)	
8/82-	4F	4KE (1)	90919-01115
8/82-	5F	4KE (2)	90919-01123

(1) Four Speed Manual (2) Five Speed Manual

**SPARK PLUG WIRE SETS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	90919-21267
8/82-	KP61	4KE	90919-21309



**DISTRIBUTOR ROTOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-	KP61	4#	19102-26150

**DISTRIBUTOR CAP**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-	KP61	4K#	19101-25070

**AIR FILTERS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	17801-13010
8/82-	KP61	4KE	17801-24010

**FUEL FILTERS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	23300-25020
8/82-	KP61	4KE	23300-19045

**PCV VALVES**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	12204-13050
8/82-	KP61	4KE	12204-13060

**OIL FILTER**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-	KP61	4K#	15601-33020

**OIL FILLER CAPS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-3/83	KP61	4K#	12180-13010
3/83-	KP61	4K#	12180-70010

**FRONT BRAKE PADS**

PROD. DATE	MODEL	PART NUMBER
8/80-	KP61	04491-10040

**REAR BRAKE SHOES**

PROD. DATE	MODEL	PART NUMBER
8/80-	KP61	04495-10041

**RADIATOR CAPS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	16401-36011
8/82-	KP61	4KE	16401-63010

**UPPER HOSES — RADIATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	90916-01169
8/82-	KP61	4KE	16572-13090

**LOWER HOSES — RADIATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	16571-13090
8/82-	KP61	4KE	16571-13130

**BYPASS HOSES — RADIATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	16261-13010
8/82-	KP61	4KE	16261-13050

**THERMOSTATS & GASKETS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-11/82	KP61	4K#	90916-03036
			16341-13011
11/82-	KP61	4KE	90916-03055
			16341-13011

**BELTS, FANS & ALTERNATOR**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/81	KP61	4KC	99331-10870
8/81-8/82		4KC	99331-10885
8/82-		4KE	99331-10870

**IGNITION COILS**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-	KP61	4KC, 4KE	90919-02083 (2)
8/82-	KP61	4KE	90919-02144 (1)

(1) Four Speed Manual (2) Five Speed Manual

**VOLTAGE REGULATORS**

MODEL	ENGINE	APPLICATION	REMFG. PART NUMBER
KP61	4KC	Std	27700-13060-84
KP61	4KC	Std	27700-13090-84
KP61	4KC, 4KE	Opt	27700-13070-84

**CLUTCH COVER**

PROD. DATE	MODEL	ENGINE	PART NUMBER
8/80-8/82	KP61	4KC	31210-12052-84

**CLUTCH DISC**

PROD. DATE	MODEL	ENGINE	PART NUMBER
1/78-	KP61	4KC	31250-12021-84

**CLUTCH BEARINGS**

PROD. DATE	MODEL	CLUTCH/RELEASE BEARING	INPUT/SHAFT BEARING
8/80-10/80	KP61	90363-33003	97123-06001
10/80-4/82	KP61	90363-33003	90363-12003
4/82-	KP61	90963-33004	90363-12003



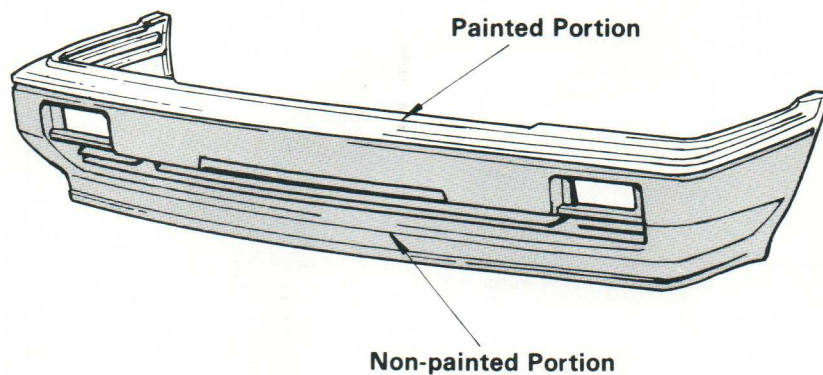
# REPAINTING OF POLYPROPYLENE AND URETHANE BUMPERS

## 1. Repainting of polypropylene (PP) bumpers.

- Polypropylene (PP) bumpers on Toyota vehicles come in two types: one with a tinted base material and another which is partially painted.
- The paint used for PP bumpers is a special paint that requires a flexing agent and an adhesive primer.
- The adhesive primer and a finish coat with flexing agent must be used to prevent peeling of the paint.
- Minor damages (scratches) may be repaired using an epoxy resin adhesive agent.
- On late model Toyota's to determine if the bumper is a polypropylene bumper or a urethane bumper you must remove the bumper skin and check for the plastic identification code.

**PP — Polypropylene**

**PUR — Urethane**



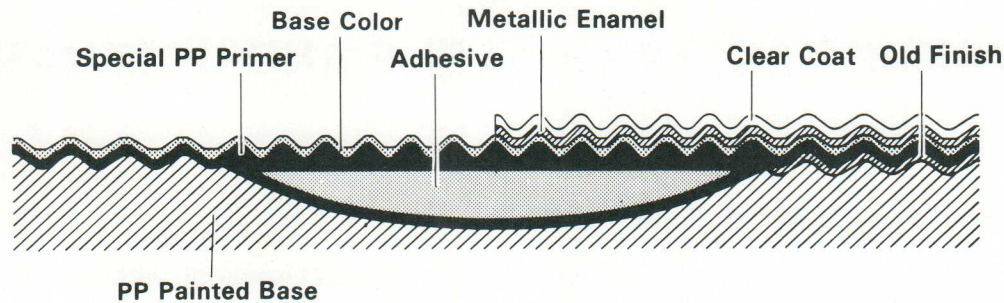
**PARTIALLY PAINTED BUMPER**

### TYPE OF PAINT USED

- **Epoxy Resin Adhesive Agent**  
This is used as a filler for lightly damaged portions (such as a scratch) of a PP bumper.
- **Special Primer (2-component Acryl Synthetic Resin Paint)**  
This special primer is required for good adherence between the bumper, the epoxy resin adhesive and top coat.
- **Top Coat Paint**  
For the top coat, the 2-component type acrylic resin paints should be used because they have good flexing qualities, but special softening agents must also be added to maximize flexing of paint on bumpers.



## REPAINTING PROCEDURES



### REPAINTING OF DAMAGED PP BUMPER

#### Feather Edging

Feather edge the damaged area by sanding with a #240-320 grit sand paper. Wet sanding will cause the sand paper to gum up so dry sand only.

#### Application of PP Primer and Drying

- Degrease and clean the entire bumper before application of PP primer over the bumper.
- Adjust the viscosity of the PP primer.

#### Important:

1. Do not apply in one thick coat, but in several thin coats.
  2. Do not prepare the base by sanding as it will become uneven.
  3. Insufficient degreasing will result in peeling and beading so be sure to thoroughly degrease.
  4. Always use the special PP bumper primer to insure good adhesion.
  5. Always apply the primer over the entire bumper as any portion not having primer will cause poor adhesion.
  6. Mixed paint should be used within 12 hours.
- Always allow about a 10 minute setting time after application of the PP primer. Next pre-heat at 30 - 40 degrees C (86-104 degrees F) for 10 - 20 minutes before force-drying at 70 - 80 degrees C (158-176 degrees F) for 40 - 50 minutes.

#### NOTE:

1. PP bumpers are made of thermoplastic resin, and force-drying over 100 degrees C (212 degrees F) could result in deformation.
2. The PP primer is very soft so be careful not to scratch it.
3. Do not allow more time than necessary between applications of the forced-dried PP primer and the top coat. If allowed to set for more than two days, adherence between the two coats will be adversely affected.

#### Application of Epoxy Resin and Drying

- Thoroughly mix the epoxy resin and apply over the entire damaged area. Be careful not to trap air bubbles during application of the epoxy resin.
- After the application, allow a setting time of about 5 minutes. Force dry at 50 - 60 degrees C (122 - 140 degrees F) for 20 - 30 minutes.

#### Restoration of Damaged Area

Wet sand the damaged area using a #400 grit sand paper.



### **Application of PP Primer**

- Using silicone solvent or comparable material, degrease and clean the surface to be painted.
- Apply a thin coat of PP primer and allow at least a 5 minute flash time. Decrease the air pressure of the gun to form a narrow pattern. Paint a test piece to determine the conditions required (air pressure, gun distance, etc.) to obtain the desired finish.
- After applying, allow about a 10-minute setting time, next pre-heat at 30 - 40 degrees C (86-104 degrees F) for 10 - 20 minutes before force-drying at 70 - 80 degrees C (158 - 176 degrees F) for 40 - 50 minutes.

**NOTE: PP bumpers are made of thermoplastic resin, force-drying above 100 degrees C (212 degrees F) may cause deformation.**

### **Base Painting and Drying**

- Using a silicone solvent or comparable material degrease, and clean the entire bumper. Spray a thin coat of paint on the bumper surface.

**NOTE: After matching the color, apply the paint over the entire bumper in several thin coats and allow a setting time of at least 5 minutes, then apply a dry coat.**

1. Insufficient degreasing may result in peeling and beading.
2. Insufficient use of a flexing agent will cause a lack of flexibility. Too much flexing agent will reduce the waterproofing effectiveness. Therefore, it is important to add the correct amount of flexing agent according to manufacturers recommendations and stir thoroughly.
3. Apply the paint about 10 minutes after mixing.

### **Important**

**Do not attempt to spot repair, repaint entire bumper to assure a quality finish.**

- Always allow a setting time of about 10 minutes after the application of the base color. Pre-heat at 30 - 40 degrees C (86-104 degrees F) for 10 - 20 minutes before force-drying at 50 - 60 degrees C (122 - 140 degrees F) for 40 - 50 minutes.

**NOTE: Because PP bumpers are made of thermoplastic resin, force-drying above 100 degrees C (212 degrees F) may cause deformation.**

### **Application of Finish Coat and Drying**

- Prepare the area to be painted by lightly polishing with a #600 - 900 grit sand paper.
- Mask off the areas not to be painted and, using silicone solvent or comparable material degrease and clean the area to be painted.
- Apply the metallic enamel paint.
- Apply a thin clear coat of the metallic enamel paint. Next, in the same manner as when applying the base color, apply a dry coat.
- After the application of the clear coat, allow a setting time of about 10 minutes. Next pre-heat at 30 - 40 degrees C (86-104 degrees F) for 10 - 20 minutes before force-drying at 50 - 60 degrees C (122 - 140 degrees F) for 50 - 60 minutes.

### **NOTE:**

1. Because the PP bumpers are made of thermoplastic resin, force-drying above 100 degrees C (212 degrees F) may cause deformation.
2. The paint film is still soft and easily damaged after force-drying. Allow the vehicle to stand at room temperature for 2 - 3 hours before assembly.



## 2. REPAINTING OF URETHANE BUMPERS

Urethane bumpers include the colored type which have been painted and the tinted black bumpers. Although both are made of urethane, the black type has been made with an additive which helps prevent deterioration due to sunlight and rain. If painted, a black bumper would change color due to this additive. Light colors such as white would cause a noticeable change. Therefore, black bumpers must not be painted.

Described below are the procedures for repainting a colored urethane bumper (for damage which does not extend to the base material). Paint for urethane bumpers must be pliable so it is necessary to add a flexing agent.

### PAINT USED

Use a 2-component acrylic urethane paint with a flexing agent added.

### PAINTING PROCEDURE

#### Feather Edging

Feather edge the damaged area with a #240 grit (dry sanding) or a #320 grit (wet sanding) sand paper.

**NOTE: Lightly sand the area as scratches in the base material will result in pin holes in the future.**

#### Degreasing and Cleaning

Mask off the areas to be repainted, degrease with silicone solvent and clean.

**NOTE: Insufficient degreasing will result in peeling and beading.**

#### Application of Primer-Surfacer and Drying

1. Apply a coat of pre-adjusted viscosity primer-surfacer over the entire surface. Repair any small scratches by applying the primer-surfacer with a paint brush.

#### NOTE:

1. Insufficient flexing agent will result in a lack of flexibility, while excessive flexing agent will reduce the water-proofing effect. Be sure to add the flexing agent in the proper amounts and stir thoroughly.
  2. After mixing the primer-surfacer and additive, allow it to stand for about 10 minutes before applying.
2. After applying, allow the primer-surfacer to set for about 10 minutes. Pre-heat at 30 - 40 degrees C (86 - 104 degrees F) for 10 - 20 minutes before force-drying at 50 - 60 degrees C (122 - 140 degrees F) for 50 - 60 minutes.

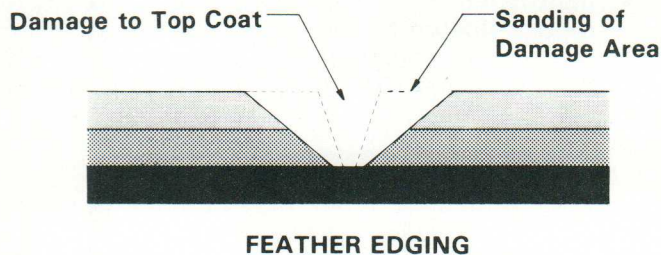
**NOTE: To prevent deformation, apply the heat evenly throughout the area.**

It is extremely difficult to match the paint for spot repainting so the entire bumper should be repainted. Wet sand the entire surface with #400 grit paper.

#### Degreasing, Cleaning and Drying

Using silicone solvent or comparable material degrease and clean the top coat surface.

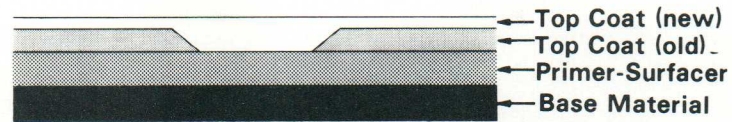
**NOTE: Insufficient degreasing will cause peeling and beading later on.**





## Application of Top Coat and Drying

- 1 . Apply the top coat over the entire bumper.



APPLICATION OF TOP COAT

- 2 . For a metallic color, allow a flash time of about 5 minutes after application then apply a clear coat.
- 3 . After complete application, allow a setting time of about 10 minutes. Pre-heat at 30 - 40 degrees C (86 - 104 degrees F) for 10 - 20 minutes before force-drying at 50 - 60 degrees C (122 - 140 degrees F) for 50 - 60 minutes.

### NOTE:

1. To prevent deformation, apply the heat evenly throughout the area.
2. You may place the vehicle outside after the paint has dried. Water drops which remain after rain or washing may leave rain streaks so always remove them with a soft cloth. The vehicle should not be washed or waxed for 2 or 3 days as the paint will still scratch easily.



## SEAL OF APPROVAL FOR FIPG

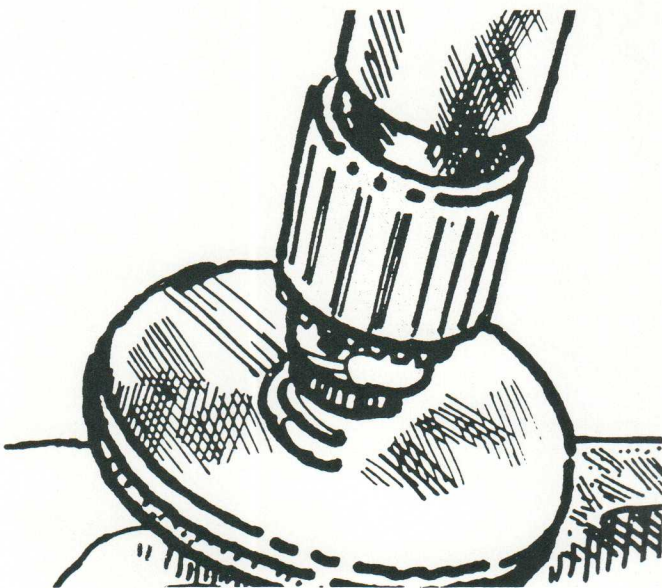
Ever since Toyota began using FIPG (Form-In-Place-Gaskets) on the 1982 Tercel 3A-C engine, these miracle sealants have been oozing their way deep into the product line.

Today, they're found on the 3A-C and 4A-C oil pans, 2SE oil pan and cam shaft housing and Corolla C-51 transmission case halves. And you can bet there'll be more in the near future.

It's time to get to know FIPG procedures, because proper use will avoid oil leaks and stop comebacks. Here's three key steps on how to use it:

**Step 1** — Remove the old material completely. Start with a scraper to help peel off the FIPG residue. Be careful not to gouge the surface, especially on aluminum parts. When the surface is pretty well scraped clean, you can use one of the commercially available cleaning pads to remove the last traces of sealer.

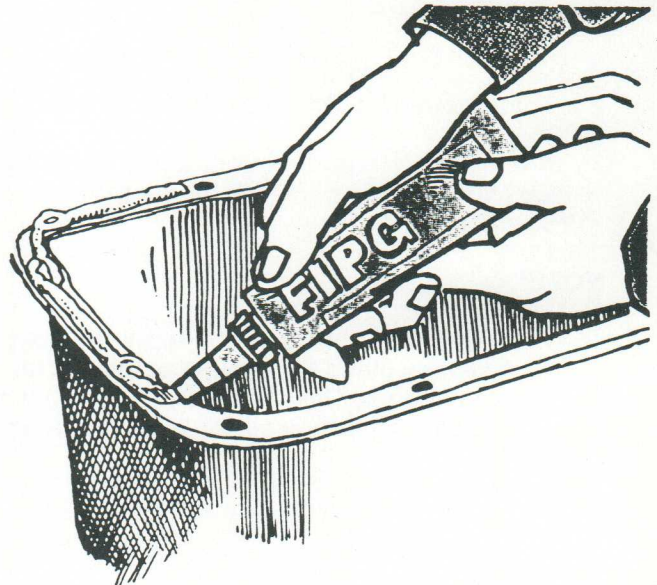
3M has a "surface conditioning disc" kit that worked very well in our test. Check your local auto supply store for similar products. The key is to get a consistent bare metal surface to work with.



A clean surface will help insure a positive bond and leak free repair.

**Step 2** — Next, wash the mating surfaces thoroughly, using a *non-residue* cleaner. Don't use parts tank solvent or mineral spirits because they leave a film when they dry, which can reduce sealing effectiveness. The goal is to apply the FIPG onto a totally clean, oil free surface.

We've found brake cleaner and carb/choke cleaner sprays to be very good (chlorinated type), but don't let them get on cosmetic surfaces (polished aluminum, paint, etc.).



The prepared surface is now ready for the FIPG. Apply evenly and circle all bolt holes.

**Step 3** — Use the right sealer for the job. Toyota uses two kinds — P/N 00295-00102 silicone for engine parts and P/N 00295-01281 for transmissions.

If you use the wrong kind, it may break down over time, causing a leak. Also, using the wrong type in the engine can cause deterioration of the O<sub>2</sub> sensor. Either way, you'll probably *get to meet that customer again*.

When you're sure you've got the right material, apply a bead of FIPG to one of the clean surfaces. The bead size should be about 5mm for oil pans, 2mm for the cam housing and 1.5mm for the Corolla transmission. Assemble the parts within 15 minutes and torque to spec.

After another 30 minutes, you can start the car and check for leaks. Then shut it off and let it stand for an hour or so to make sure you've got a good seal.

That's it. Follow these simple guidelines and you can't go wrong with FIPG. In the next few years, you can expect to see fewer gaskets and more FIPG, so take the time to learn the proper procedures now. It'll save you a lot of headaches by helping you do the repair right — the first time.



# 1985 TOYOTA FACTORY PREPARED SERVICE MANUALS

## FEATURING REPAIR INFORMATION FOR THE FOLLOWING SYSTEMS:

- Engine
- Chassis/Body
- Emission Control
- Automatic Transmission
- Collision Repair
- A/C System and Compressor
- Service Specifications
- Maintenance Procedures
- Electrical Wiring Diagrams

These are the same manuals used at Toyota Dealerships throughout the U.S. Some procedures may indicate the use of Special Service Tools (SST's) which are available through your local Toyota Dealer.

## 1985 APPLICABILITY LIST

YEAR	MODEL	OWNER'S	ENGINE	CHASSIS	BODY	EMISSION CONTROL	AUTO TRANS.	A/C SYSTEM	A/C COMPRES	SERVICE SPEC.	MAINT. PROCED.	ELECT. WIRING DIAG.	ELECT. WIRING REPAIR	SEAT BELT SYSTEM	COLLISION REPAIR
	<b>COROLLA</b> Diesel: CE82E.L	12429U						36240A (4A-LC,1C-LC)				36702A	—		36434-E
	FWD: AE82,83,84 RWD: AE86,88	12431U						36241A (4A-C,4A-GEC)				36703A	—		
	<b>CELICA</b> RA63,64,65	14433U						36242A (22R-E)				36704A	—		36182
	<b>CELICA CONV.</b> RA63,64,65	37746-S						36221-S (22R-E)				36704A			36182
	<b>TERCEL</b> STD: AL3#G,AL3#H	16419U						36239A (3A,3A-C)				36701A	—		36431-E
	4x4: AL3#V,AL3#W	16420U													36432-E
	<b>CRESSIDA</b> MX72,73	22413U						36245A <sup>†</sup> (5M-GE)				36707A <sup>†</sup>	—		N/A
	<b>SUPRA</b> MA67	14432U						36243A (5M-GE)				35705A	—		36182
	<b>CAMRY</b> STD: SV12,16 Diesel: CV12	32412U						36244A (2S-ELC,1C-TLC)				36706A	—		36433-E
	<b>VAN</b> YR22,26,27	28406U						36248A (3Y-E)				36708A	—		—
	<b>PICKUP</b> STD Diesel: LN50,55, 56,58,59	35426U						36247A (2L,2L-T)				—	—		—
	4x4 Diesel: LN68	35427U													
	STD: RN50,55,56	35426U													
	4x4: RN60,65,66 4Runner: RN61,62,65	35427U						36246A (22R,22R-E)				—	—		—
	<b>LAND CRUISER</b> FJ60	60416U	36104 (2F)	36044		36043	—	00015	00401	—	36783-A	36679A	—	—	—

<sup>†</sup> SEDAN ONLY—85½ supplement will be published for WAGON.

N/A—Publication number not available at time of printing.

See your local Toyota Star Dealer for order details.



# NOW IT'S YOUR TURN!

TO TELL US WHAT ARTICLES YOU WOULD LIKE TO SEE IN TOYOTA SERVICE NEWS

## GENERAL REPAIR

- ☐ — Engine Repair (☐ — Gas ☐ — Diesel)
- ☐ — Transmission/Transaxle Repair
- ☐ — Brake Repair
- ☐ — Suspension and Steering
- ☐ — Electrical Systems
- ☐ — Heating and Air Conditioning Repair
- ☐ — (Other) \_\_\_\_\_

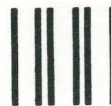
## COLLISION REPAIR

- ☐ — Refinishing Information
- ☐ — Corrosion Protection Restoration
- ☐ — High Strength Steel Locations
- ☐ — Underbody Dimensions
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- ☐ — Electrical Diagrams
- ☐ — (Other) \_\_\_\_\_

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TYPE	
A — Brake Shops	E — Body Shops
B — Garages (General Repair Shops)	F — Radiator Repair Shops
C — Gasoline Service Stations	G — Parts Stores
D — Muffler Shops	H — Transmission Repair Shops

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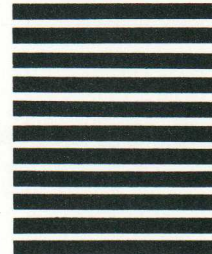
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FIPG—transmission	00295-01281
FIPG—oil pan	00295-00102
Semi-drying liquid gasket	00295-1LG04

*Try these Toyota chemical  
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36-tube case (retail blister package)	00295-1CM00
24-tube case (shop package)	00295-1CM24
Weather strip cement-Y	00295-1WY00

Don't miss the article on formed-in-place gaskets in this issue of Toyota Service News.

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