TOYOTA
SERVICE NEWS

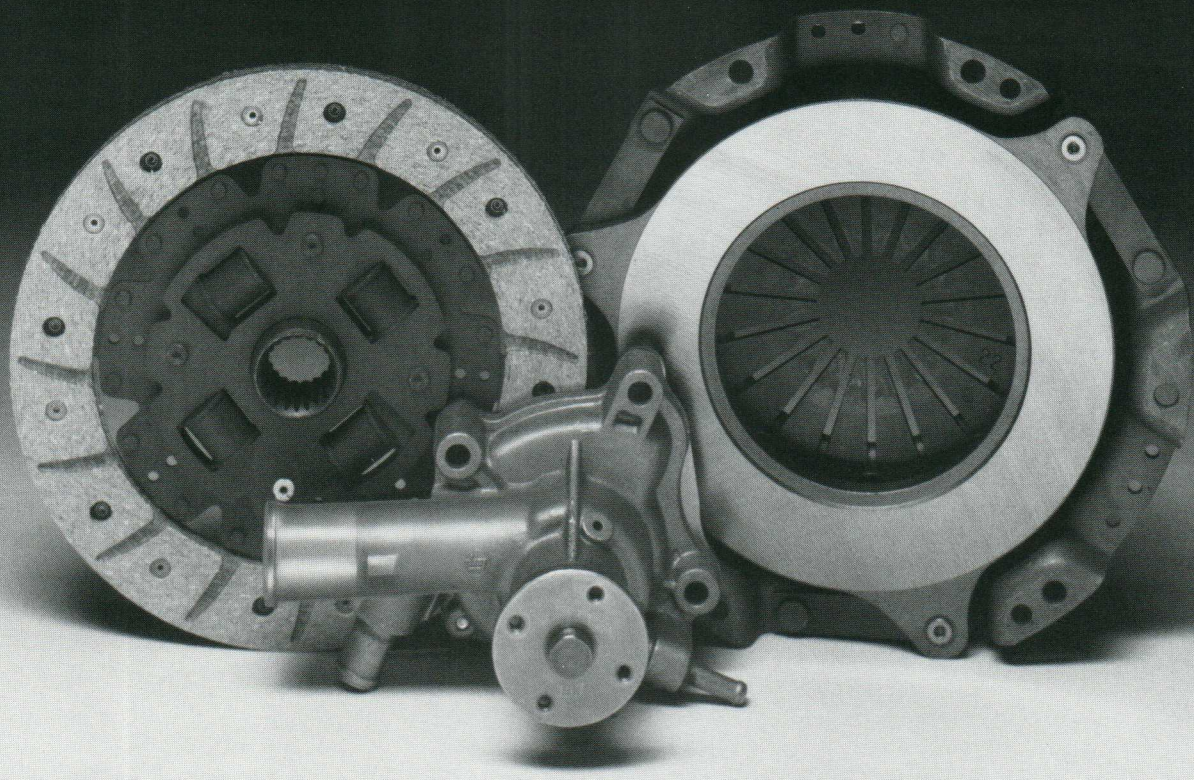
Winter 1986 The Independent's Guide to Professional Toyota Service and Repair Bulletin 22

TOYOTA ENGINES

REPAIRS, MODIFICATIONS AND MAINTENANCE OF TOYOTA ENGINES

IN THIS ISSUE:

ONLY THE PRICE IS LOWER.



Toyota remanufactured clutches and water pumps have the look, performance, and warranty of OE parts. Then how can they be better? Price! These reman parts are priced substantially lower than new parts.

But, the quality is the same as new. We start with high quality cores, and replace any component which will affect performance. The clutch disc facings and cover diaphragm springs are replaced 100% with OE components. The water pump bearings are replaced with OE components. . . 100%. And only OE gaskets and seals are used. These Toyota Reman clutches and water pumps go through 15 to 27 inspections for quality control. They're built for reliability, priced for value, and warranted to perform like new.

So, give your customer a break. Avoid the problems connected with "rebuilt" and universal parts. . . install Toyota remanufactured parts.

TOYOTA

GENUINE PARTS

REMANUFACTURED

TOYOTA SERVICE NEWS

Winter 1986 Bulletin 22

PAGE DESCRIPTION ARTICLE NO.

THIS ISSUE

SERVICE TIPS

BODY LANGUAGE

On the Cover

Contained in this issue of *Toyota Service News* are specific repair and maintenance procedures for various Toyota engines, including detailed information on changes in engine components and part numbers.

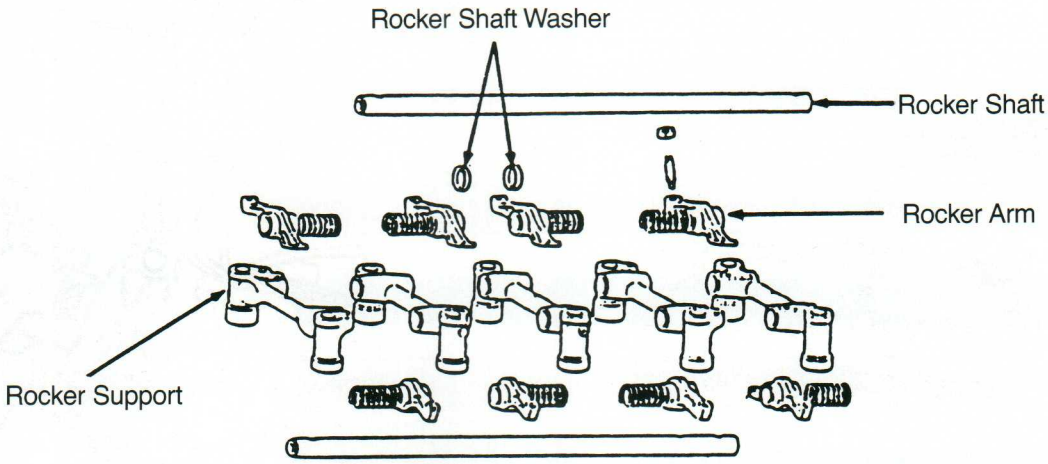
The *Toyota Service News* is published by Toyota Motor Sales, U.S.A., Inc., as a service to the independent automotive service industry. **Articles and technical data contained in this periodical are based in part or whole on prior Toyota communications to its dealers.** For complete specifications and procedural information, please refer to the appropriate repair manuals. As for part number changes, consult your local Toyota dealer. Address all correspondence and inquiries to Editor, Toyota Service News, P.O. Box 2991, Torrance, CA 90509, Telephone (213) 618-4000.

GET MORE FROM LIFE – BUCKLE UP!

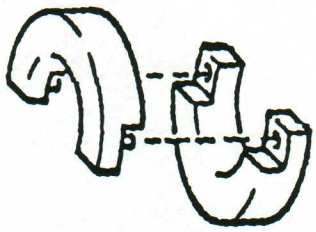
Article No. 197

ROCKER SHAFT WASHER ON 22R AND 22R-E ENGINE (1984-1985 TRUCK AND CELICA)

To improve durability, the material of the rocker shaft washers has been changed from resin powder metal to sintered powder metal on engines after and including number 22R-1181659.



For repair of engines prior to this number, a new two-piece rocker shaft washer has been made available as a supply part. This new two-piece rocker shaft washer can be installed without removing the rocker shaft bolts/cylinder head, and is designed for field fix only. The two-piece washer is not used in production.



Two-piece Rocker Shaft Washer

Note: On vehicles equipped with the resin-type washers, it is *not* necessary to replace rocker arms that show signs of wear. The new two-piece washers are larger in diameter and will contact the rocker arm outer surface not worn by the original resin-type washer.

FIELD FIX

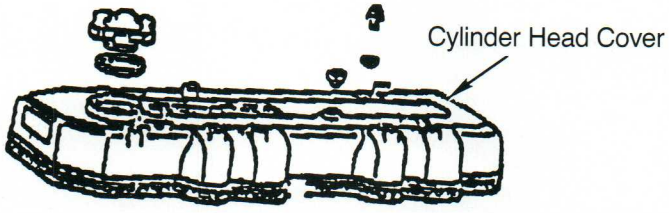
Part Number Information

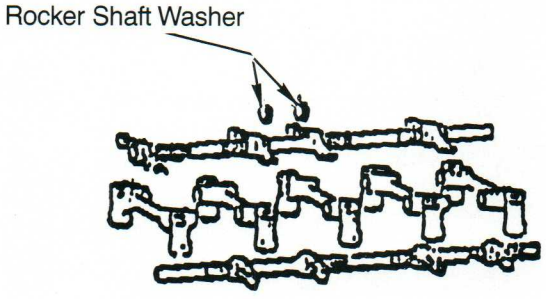
Previous Part No.	New Part No.	Part Name
—	90561-16005	Rocker Shaft Washer
11213-35010	Same	Gasket, Cylinder Head Cover

ROCKER SHAFT WASHER ON 22R AND 22R-E ENGINE (Continued)

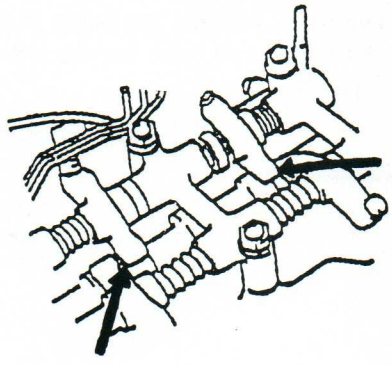
Rocker Shaft Washer Replacement Procedure

1. Remove the cylinder head cover.



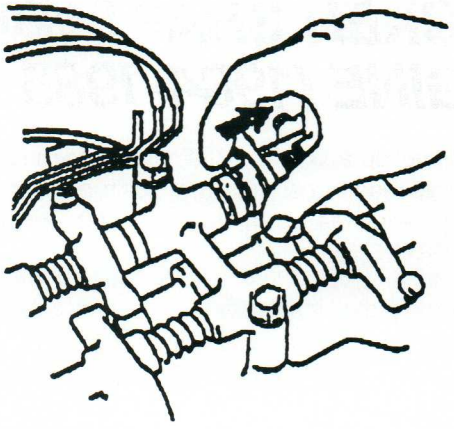


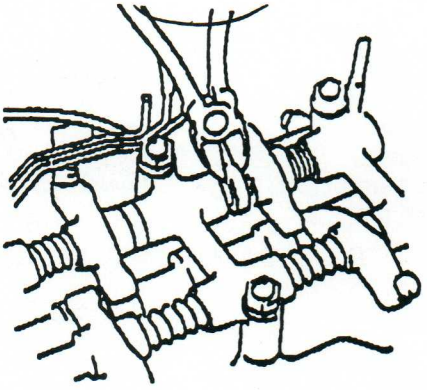
2. Rotate the crankshaft until clearance exists between No. 2 and No. 3 intake rocker arms and the cam lobes.



3. Remove the rocker shaft washer by sliding the rocker arm and cutting the washer with a diagonal cutter. Remove and discard the old washers.

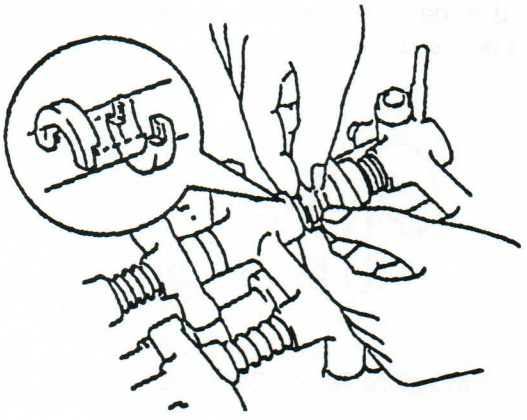
Note: Resin washers are very brittle and may shatter. You should wear safety goggles as a precaution.





4. Install the two-piece type rocker shaft washer.

Note: Make sure the washer is securely installed.



5. Adjust valve clearance.

A) Warm engine to operating temperature.

B) Check and adjust intake No. 2 and 3 valve clearances – 0.008 in. (0.20 mm).

6. Using a new head cover gasket, install the cylinder head cover.

Article No. 198

OIL CONSUMPTION REDUCTION (1985-1986 TRUCK)

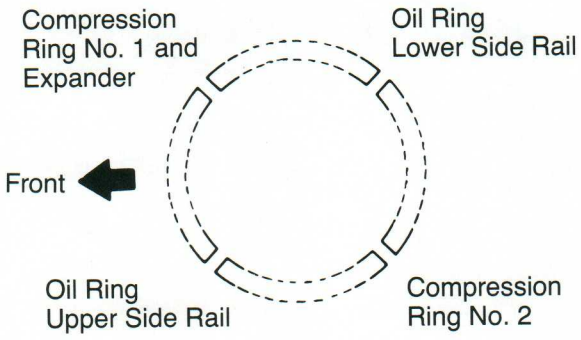
To reduce the possibility of oil consumption on 22R and 22R-E engines, the following modifications have been made:

1. The piston oil control ring side rail material was changed from chrome-plated steel to case-hardened stainless steel.

Production Effective
From Engine No. 22R-1602747 (September 1985 to present)

2. The end gap clearance of No. 2 compression ring was increased:

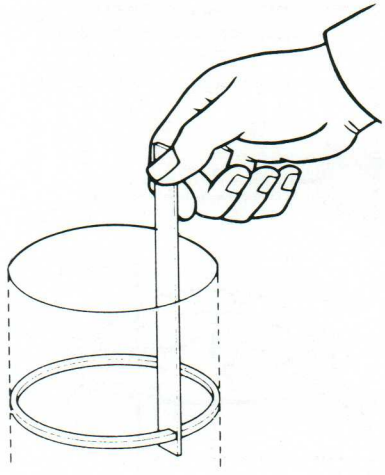
Old	New
0.010-0.014 in. (0.25-0.35 mm)	0.024-0.028 in. (0.6-0.7 mm)



Production Effective
From Engine No. 22R-1932459 (July 1986 to present)

3. The end gap clearance of the oil control ring side rail was decreased:

Old	New
0.008-0.028 in. (0.2-0.7 mm)	0.008-0.018 in. (0.20-0.45 mm)



Production Effective
From Engine No. 22R-1932459 (July 1986 to present)

The new part numbers shown below incorporate all of the above modifications.

PART NUMBER INFORMATION

	Previous Part No.	New Part No.	Part Name
Standard	13011-35051	13011-35052	Ring Set, Piston
O/S 0.50	13013-35051	13013-35052	Ring Set, Piston

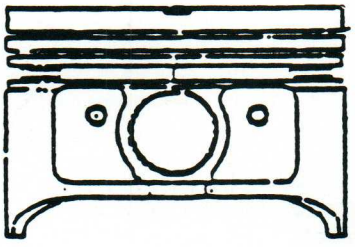
Be sure to use the new part numbers when piston ring replacement is necessary.

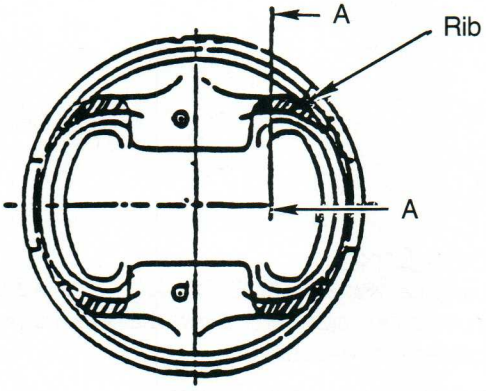
Article No. 199

22R/22R-E COLD ENGINE PISTON KNOCKING NOISE (1985 TRUCK)

To reduce temporary engine knocking noise during cold engine operation, a reinforcement rib has been added to the piston inner skirt as shown below.

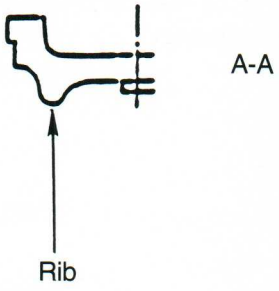
Side View





Piston – Top View

Cut-away View



PRODUCTION EFFECTIVE

From Engine No.	Production Date
22R-1677334 (22R and 22R-E)	December 1985 to present

PART NUMBER INFORMATION

Previous Part No.	New Part No.	Part Name
*13101-35030	13101-35031	Piston Sub-Assembly, W/Pin STD
*13103-35040	13103-35041	Piston Sub-Assembly, W/Pin O/S 0.50
*13105-35040	13105-35041	Piston Sub-Assembly, W/Pin O/S 1.00

*The new type pistons can be used on previous engines, but all pistons *must* be replaced as a set.

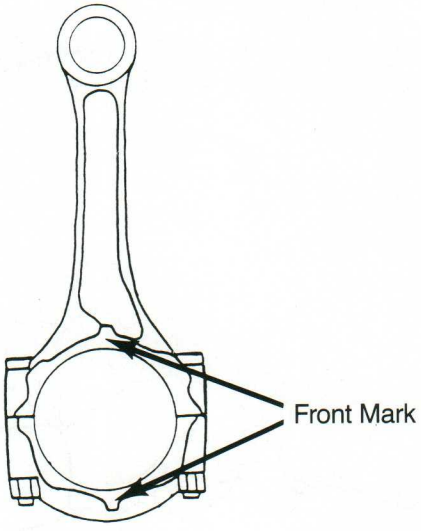
Article No. 200

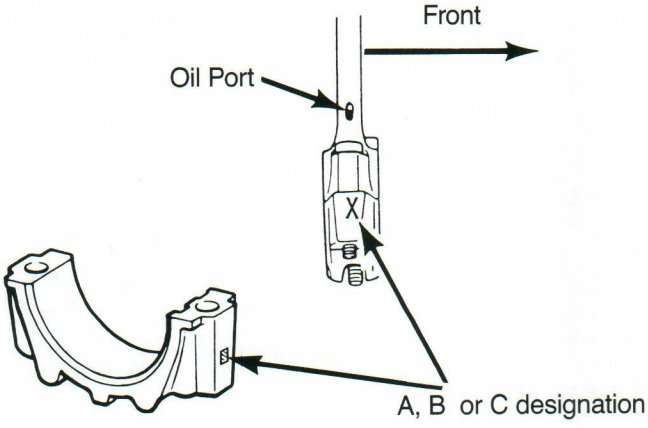
22R AND 22R-E ENGINE BEARING SELECTION (1985 TRUCK AND CELICA)

Selection of individual connecting rod bearings and main bearing is accomplished as follows:

1. Connecting Rod Bearing Selection

When replacing a connecting rod bearing, replace with one having the same letter marked on the bearing cap. There are three sizes of standard bearings, marked A, B and C. Check oil clearance with plastigage as outlined in the appropriate Toyota Repair Manual to insure proper oil clearance.





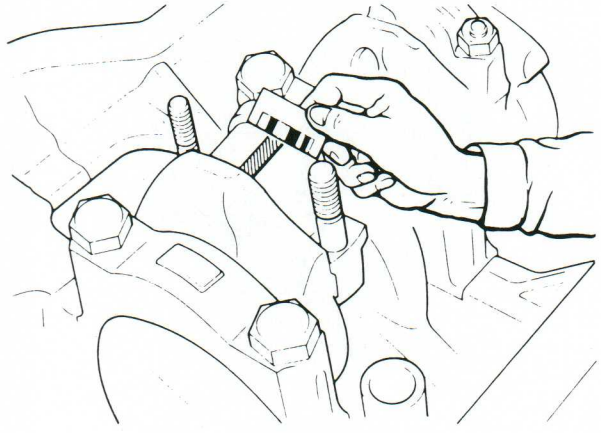
For both the Celica and Truck, lay a strip of plastigage across the crankshaft pin, and then measure the plastigage at its widest point. If the clearance is greater than the maximum, replace the bearings and/or grind the crank pins. Make sure to clean out the pieces of plastigage from the bearings and journals.

Celica 22R

Maximum clearance:	0.08 mm (0.0031 in.)
Standard clearance:	0.025-0.055 mm (0.0010-0.0022 in.)

22R and 22R-E Truck

Maximum clearance:	0.10 mm (0.0039 in.)
Standard clearance:	0.025-0.055 mm (0.0010-0.0022 in.)



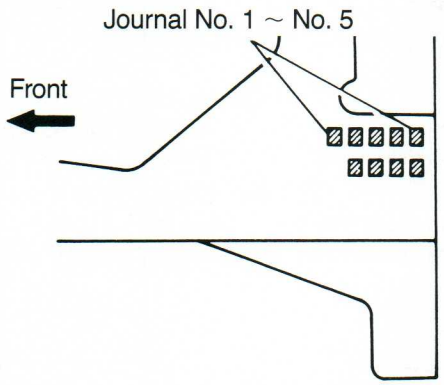
22R AND 22R-E ENGINE BEARING SELECTION (Continued)

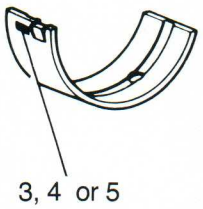
2. Main Bearing Selection

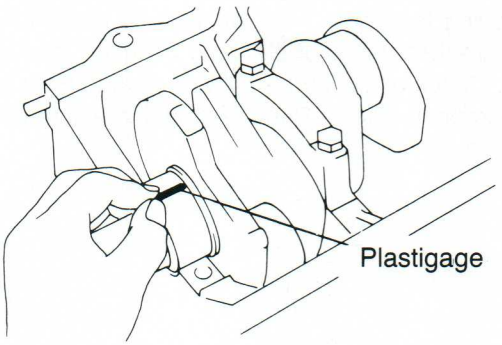
When replacing a main bearing, replace with one having the same number as marked on the cylinder block. There are three sizes of standard main bearings, marked 3, 4 and 5. Be sure to check oil clearances with plastigage as outlined in the appropriate Toyota Repair Manual to insure proper clearance.

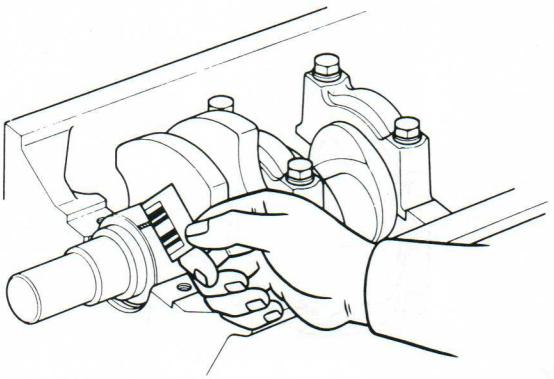
For both the Celica and Truck, remove the main bearing caps and after laying a strip of plastigage across the main journals, measure the plastigage at its widest point. If the clearance is greater than the maximum, replace the bearings and/or grind the main journals.

Maximum clearance: 0.08 mm (0.0031 in.)
Standard clearance: 0.025-0.055 mm (0.0010-0.0022 in.)









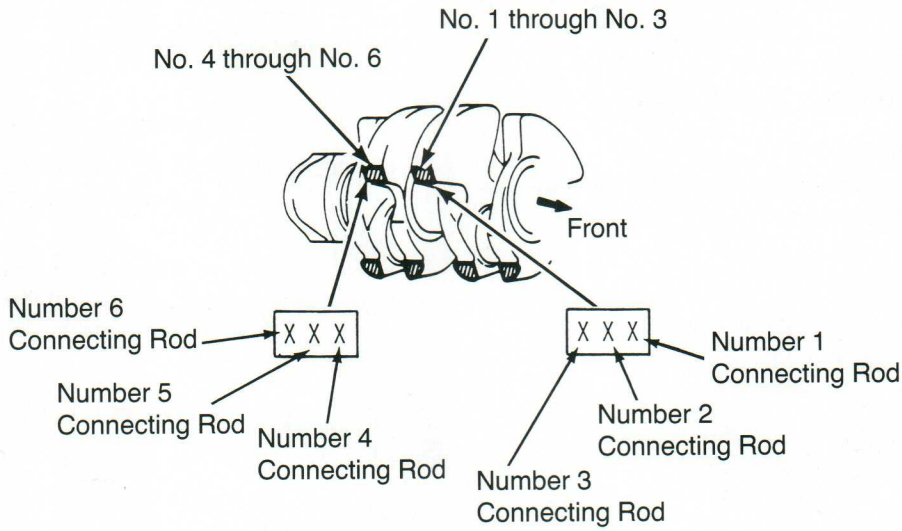
Article No. 201

5M-GE ENGINE BEARING SELECTION (1984-1986 SUPRA AND CRESSIDA)

Selection of individual connecting rod bearings and main bearings for late model 5M-GE engines (approximately 6/84 production) is accomplished as follows:

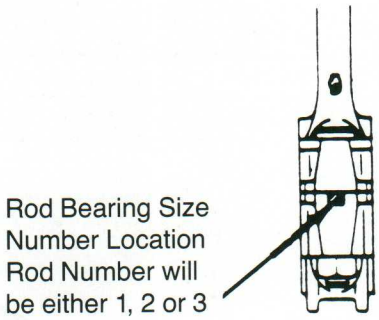
1. Connecting Rod Bearing Selection

A) Locate the rod bearing size numbers on the crankshaft counterweights as illustrated below:



(Crankshaft Number will be either 0, 1 or 2 – "X" equals crankshaft number)

B) Identify the individual rod sizing number on each connecting rod cap.



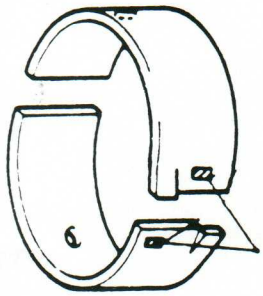
Note: Be sure to use the number in the location illustrated above. There are other numbers on the rod that do not apply to bearing size.

C) The correct connecting rod bearing number is obtained by adding the crankshaft number and the rod shaft number together.

Crankshaft Size Number	+	Rod Cap Size Number	=	Rod Bearing Number to be used

Example:

1	+	2	=	3
Number on crank	+	Number on rod	=	Bearing Number to be used



Rod Bearing Size Number Location Number will be 1, 2, 3, 4 or 5

5M-GE ENGINE BEARING SELECTION (Continued)

D) After selecting the proper connecting rod bearing, check the oil clearance with plastigage as outlined in the appropriate Toyota Repair Manual.

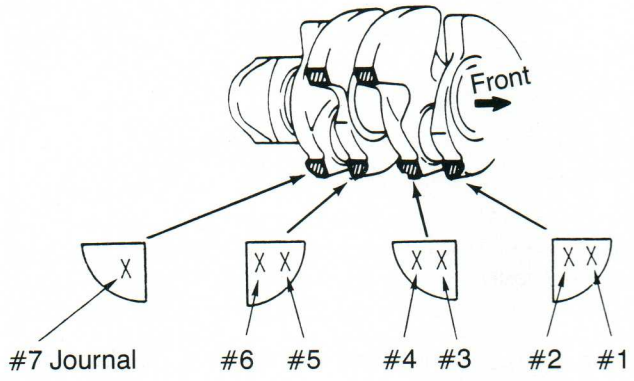
For both the Cressida and Supra, measure the plastigage at its widest point. If the clearance is greater than the maximum, replace the bearings and if necessary, grind the crank pins.

Maximum clearance: 0.08 mm (0.0031 in.)
Standard clearance: 0.21-0.053 mm (0.0008-0.0021 in.)
Undersize bearing: U/S 0.05, 0.25, 0.50

If oil clearance is not within specification, a different size bearing must be selected and oil clearances rechecked. If correct clearance cannot be obtained with any of the five bearings, the crankshaft must be replaced or ground.

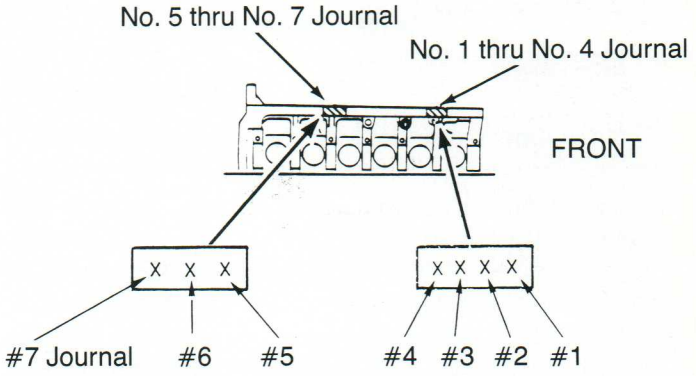
2. Main Bearing Selection

A) Locate the size numbers on the crankshaft counterweights as illustrated below:



Crankshaft Number will be either 0, 1 or 2 –
"X" equals crankshaft number

B) Locate the size numbers on the oil pan mating surface of the block as illustrated below:



Number on Cylinder Block will be either 1, 2 or 3 –
"X" equals cylinder block number

C) The correct main bearing number is obtained by adding the crankshaft number to the number on the block.

Crankshaft size number	+	Block size number	=	Main bearing number to be used

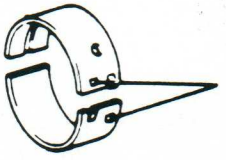
Example:

0	+	2	=	2
Number on crankshaft	+	Number on block	=	Main bearing number to be used

Possible Combinations

Cylinder Block No.	1	2	1	3	2	1	3	2	3
Crankshaft No.	0	0	1	0	1	2	1	2	2
Bearing No.	1	2	2	3	3	3	4	4	5

Main Bearing Size Number Location



1, 2, 3, 4 or 5

5M-GE ENGINE BEARING SELECTION (Continued)

D) After selecting the proper size bearing, check the oil clearance with plastigage.

Clearance Specs.	
Standard clearance:	0.034 – 0.058 mm (0.0013 – 0.0023 in.)
Maximum clearance:	0.08 mm (0.0031 in.)

If clearance is not within specifications, another size bearing must be selected and oil clearance rechecked. If the proper clearance cannot be obtained, the crankshaft must be replaced or ground.

Note: With all crankshafts and engine blocks supplied through the dealer parts department, use this method of bearing size selection.

CURRENT PART NUMBERS (NEW STYLE BEARINGS)

ROD BEARINGS

Part No.	Size
13041-42010-01	1
13041-42010-02	2
13041-42010-03	3
13041-42010-04	4
13041-42010-05	5
13204-42010	0.25 Undersize (Bearing Set)
13205-42010	0.50 Undersize (Bearing Set)

#1 MAIN BEARING

Part No.	Size
11071-43010-01	1
11071-43010-02	2
11071-43010-03	3
11071-43010-04	4
11071-43010-05	5

#2 – #7 MAIN BEARINGS

Part No.	Size
11701-43010-01	1
11701-43010-02	2
11701-43010-03	3
11701-43010-04	4
11701-43010-05	5
11704-43010	0.25 Undersize (Bearing Set: 1-7)
11705-43010	0.50 Undersize (Bearing Set: 1-7)

Note: The larger the size number, the more undersized the bearing. For example, a #5 bearing fits a smaller crankshaft journal than a #3 bearing.

CURRENT PART NUMBERS (OLD STYLE BEARINGS)

ROD BEARING SETS

Part No.	Size
13202-45011	STD
13203-45011	0.05 Undersize
13204-45011	0.25 Undersize
13205-45011	0.50 Undersize

MAIN BEARING

Part No.	Size
11702-45011	STD
11703-45011	0.05 Undersize
11704-45011	0.25 Undersize
11705-45011	0.50 Undersize

Note: When replacing main and/or rod bearing inserts in an engine built prior to the new sizing program (approximately 6/84), the above bearings must be used. The indexing tab location was reversed on the rods and number one main bearing when the new bearing style was introduced.

CONNECTING ROD

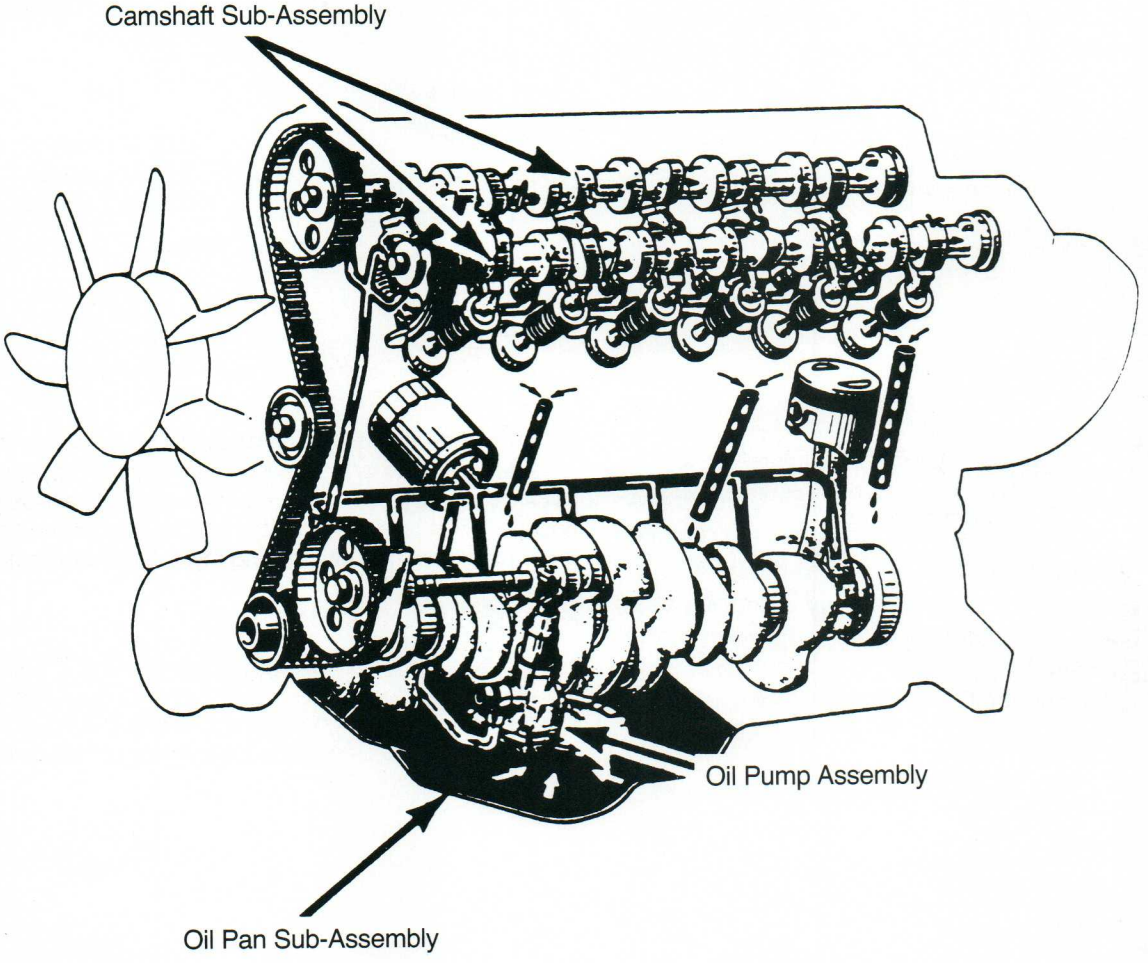
All connecting rods supplied through the Toyota dealer parts department come with a bearing. Use the bearing supplied with the connecting rod. Be sure to check the oil clearance with plastigage to insure proper clearance.

Article No. 202

5M-GE ENGINE CAMSHAFT LUBRICATION (1984-1985 SUPRA AND CRESSIDA)

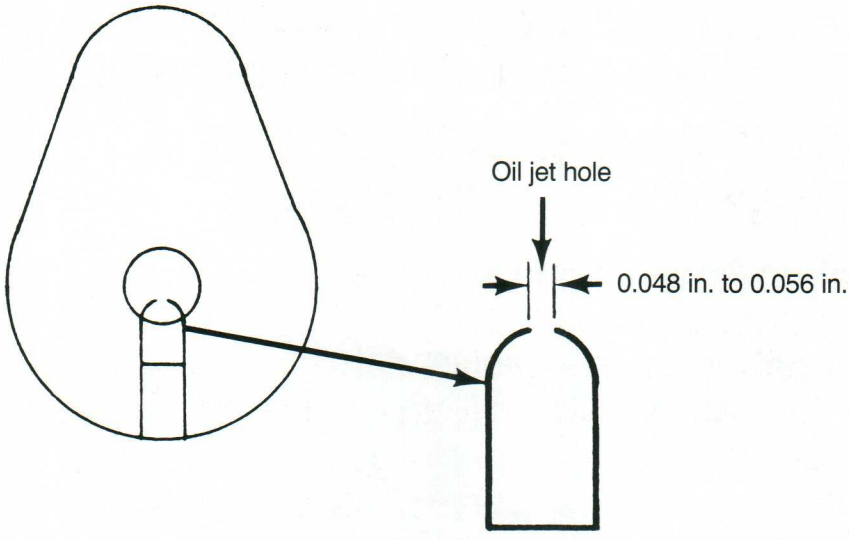
To improve lubrication of the camshaft, the following modifications have been made:

1. The capacity of the oil pump has been increased. Consequently, the shape of the oil pan has also been modified to provide adequate clearance for the oil pump.



5M-GE ENGINE CAMSHAFT LUBRICATION (1984-1985 SUPRA AND CRESSIDA)

2. The diameter of the camshaft oil jet has been increased from 0.048 in. (1.2 mm) to 0.056 in. (1.4 mm).



PRODUCTION EFFECTIVE:

The new oil pump and oil pan entered production beginning with Engine No. 5M-3581713 (August 1984).

The new camshafts were first used in production beginning with Engine No. 5M-3675931 (May 1985).

Note: Always refer to the appropriate Toyota Repair Manual for proper repair procedures. It is very important that all components are properly cleaned prior to final assembly to insure that no foreign material will restrict any essential oil passage.

PART NUMBER INFORMATION:

Previous Part No.	New Part No.	Part Name
13501-43010	13501-43030	Camshaft Sub-Assembly, No. 1
13502-43010	13502-43030	Camshaft Sub-Assembly, No. 2
15100-43010	15100-43020	Pump Assembly, Oil
12101-43020	12101-43040	Pan Sub Assembly, Oil
83530-14020	83530-14050	Switch Assembly, Oil Pressure (for engine)

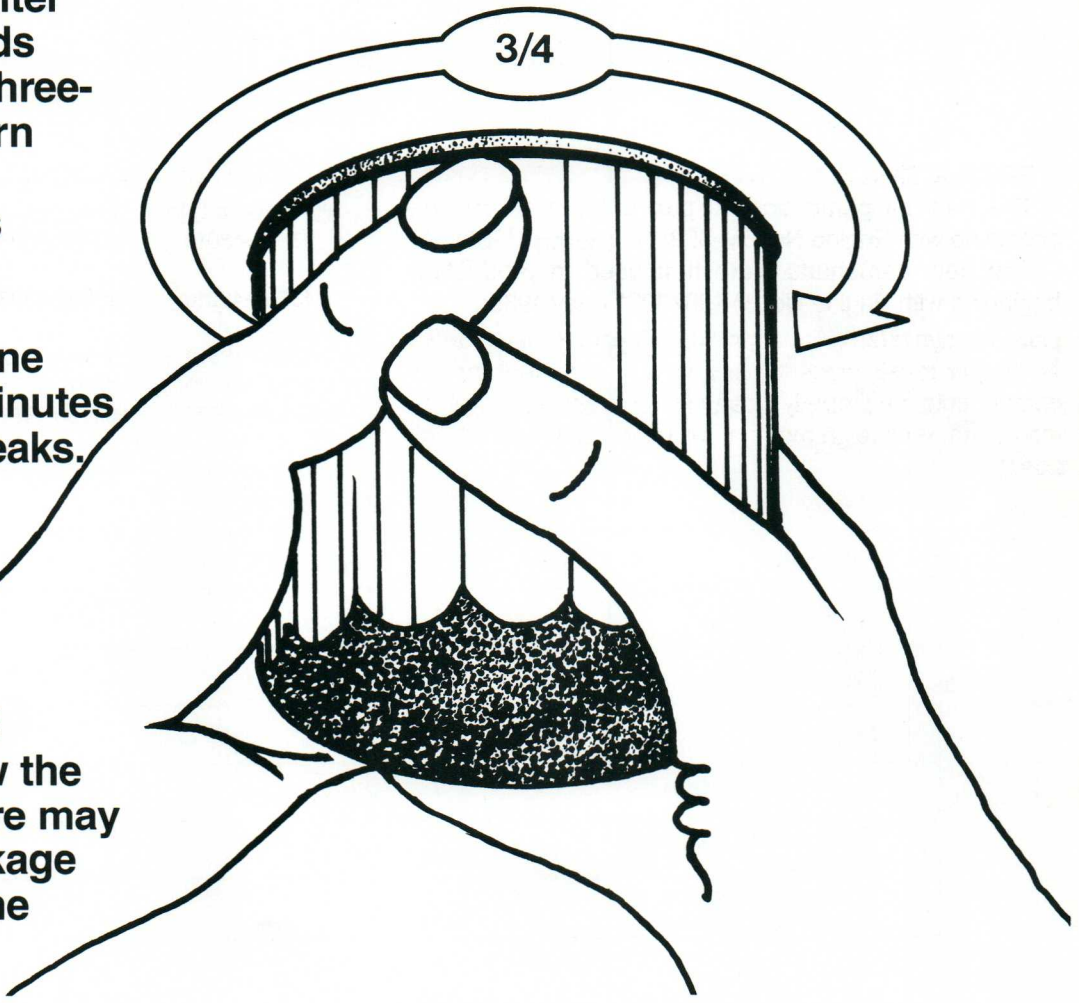
Article No. 203

FILTER FACTS

To insure proper sealing of a Genuine Toyota oil filter, use both hands to tighten the filter approximately three-quarters of a turn after the gasket contacts the mating surface.

PROCEDURES FOR INSTALLING A GENUINE TOYOTA OIL FILTER:

1. Clean the block-to-filter mating surface of any foreign material such as road tar, dirt, paint, undercoating or old gasket debris.
2. Lubricate the filter gasket with clean engine oil.
3. Tighten the filter using both hands approximately three-quarters of a turn after the filter gasket contacts with the mating surface.
4. Run the engine at least three minutes and check for leaks.



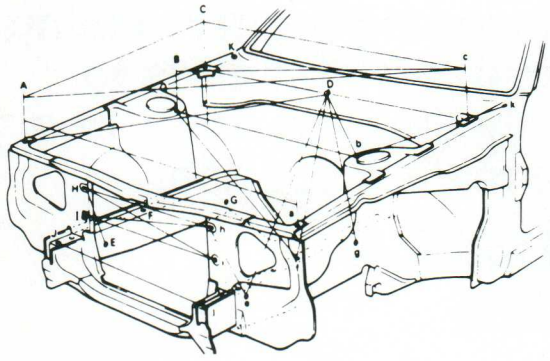
CAUTION:

Failure to follow the above procedure may result in oil leakage or damage to the engine.

Article No. 204

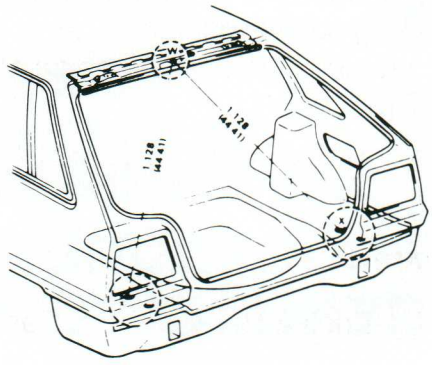
REPAIR MANUALS FOR COLLISION DAMAGE

(To order these manuals, contact your nearest Toyota dealer)



FEATURING:

- Factory recommended repair procedures
- Weld locations & types
- Body dimensions
- Body sealing points
- Plastics type & locations



MODEL	MODEL YEAR	PUBLICATION NO.
Starlet	1981, 82, 83, 84	36158
Tercel	1980, 81, 82	98367
Tercel	1983, 84, 85, 86	36431E
Tercel 4 x 4	1984, 85, 86	36432E
Corolla	1980, 81, 82, 83	36001
Corolla (RWD & FWD)	1984, 85, 86	36434E
Corolla FX16	1987	BRM006E
Celica & Supra	1982, 83, 84, 85	36182
Supra	1986	BRM005E
Celica	1986	BRM001E
Camry	1983, 84, 85, 86	36433E
Cressida	1981, 82, 83, 84	36118
Cressida Sedan	1985, 86	36441E
Cressida Wagon	1985, 86	36442E
MR2	1985, 86	36440A
Van	1984, 85, 86	BRM003E
Fundamental Painting Procedure	All	36438E
Fundamental Body Repair Procedures	All	BRM0024

NOW IT'S YOUR TURN!

Toyota Service News conducts this reader survey so we can serve your needs better. Your responses to these questions will be used to improve the content of Toyota Service News. After filling out this questionnaire, just tear along the perforation and fold in thirds, with the business reply and your return address on the outside. Then staple or tape and mail – the postage is prepaid. Thank you.

1. WHAT ARTICLES WOULD YOU LIKE TO SEE IN TOYOTA SERVICE NEWS?

GENERAL REPAIR

ARTICLE	MODEL	YEAR
☐ Engine Repair ☐ Gas ☐ Diesel		
☐ Transmission/Transaxle Repair		
☐ Brake Repair		
☐ Suspension and Steering		
☐ Electrical Systems		
☐ Heating and Air Conditioning Repair		
☐ (Other)		

COLLISION REPAIR

ARTICLE	MODEL	YEAR
☐ Refinishing Information		
☐ Corrosion Protection Restoration		
☐ High Strength Steel Locations		
☐ Underbody Dimensions		
☐ Welding Procedures		
☐ Electrical Diagrams		
☐ (Other)		

2. WHAT TYPE OF BUSINESS DO YOU HAVE?

☐ Brake Shop	☐ Garage (General Repair Shop)	☐ Gasoline Service Station
☐ Muffler Shop	☐ Body Shop	☐ Radiator Repair Shop
☐ Parts Store	☐ Transmission Repair Shop	☐ Other

3. WHAT DO YOU FIND USEFUL ABOUT THE ILLUSTRATIONS IN TOYOTA SERVICE NEWS?

- ☐ Speed up repairs/service
- ☐ Make text easier to understand
- ☐ Other (please specify) _____

4. WHAT OTHER RECOMMENDATIONS OR COMMENTS WOULD YOU LIKE TO MAKE CONCERNING TOYOTA SERVICE NEWS?

_____

_____

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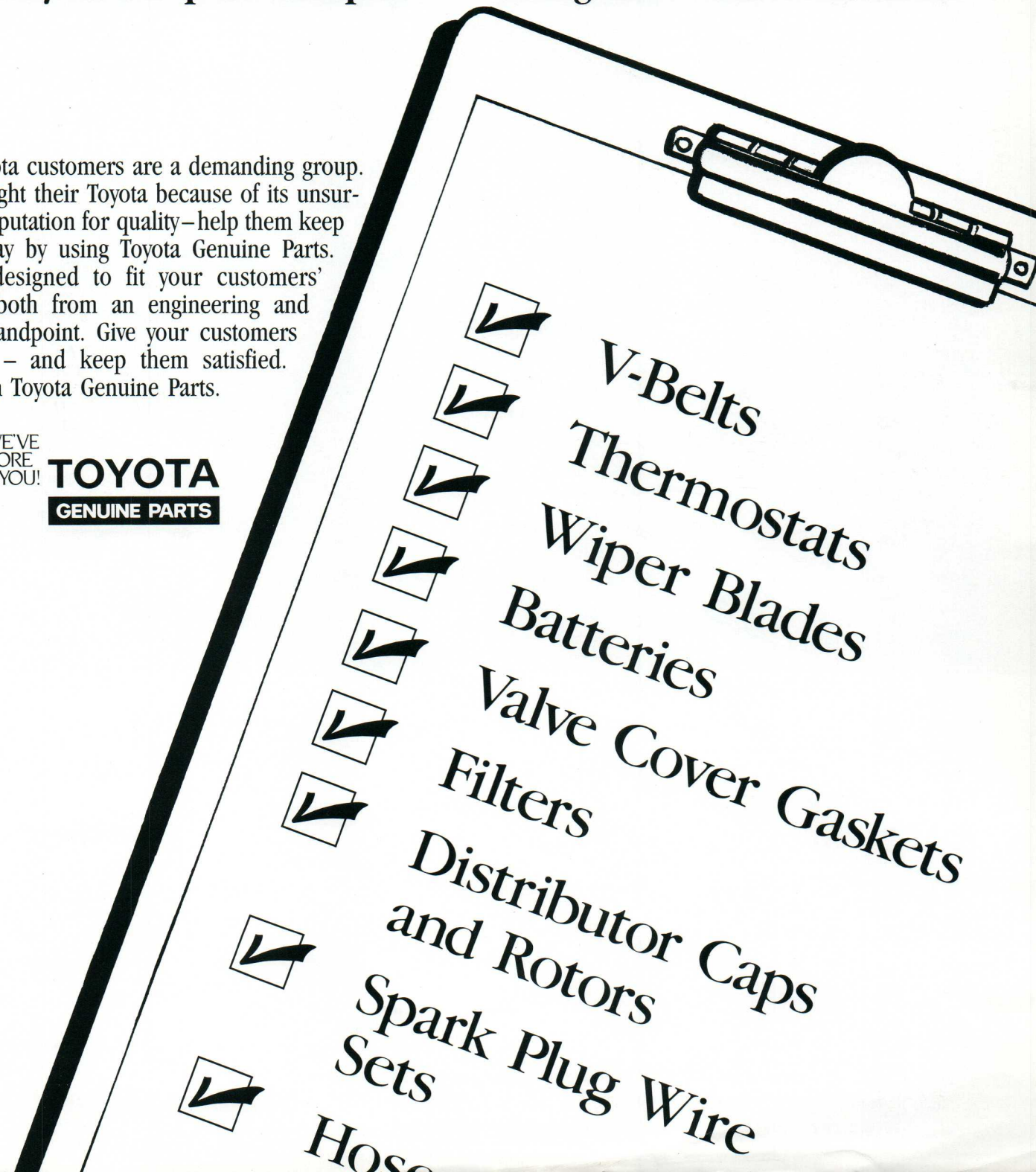
While customers are in your shop, make sure you've checked items that may need replacement prior to sending them back on the road.

Your Toyota customers are a demanding group. They bought their Toyota because of its unsurpassed reputation for quality–help them keep it that way by using Toyota Genuine Parts. They're designed to fit your customers' vehicles both from an engineering and quality standpoint. Give your customers the best – and keep them satisfied. Give them Toyota Genuine Parts.

WE'VE GOT MORE FOR YOU! **TOYOTA GENUINE PARTS**



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An independent test determined Toyota replacement oil filters to have the best overall performance when compared to nine other standard replacement filters.

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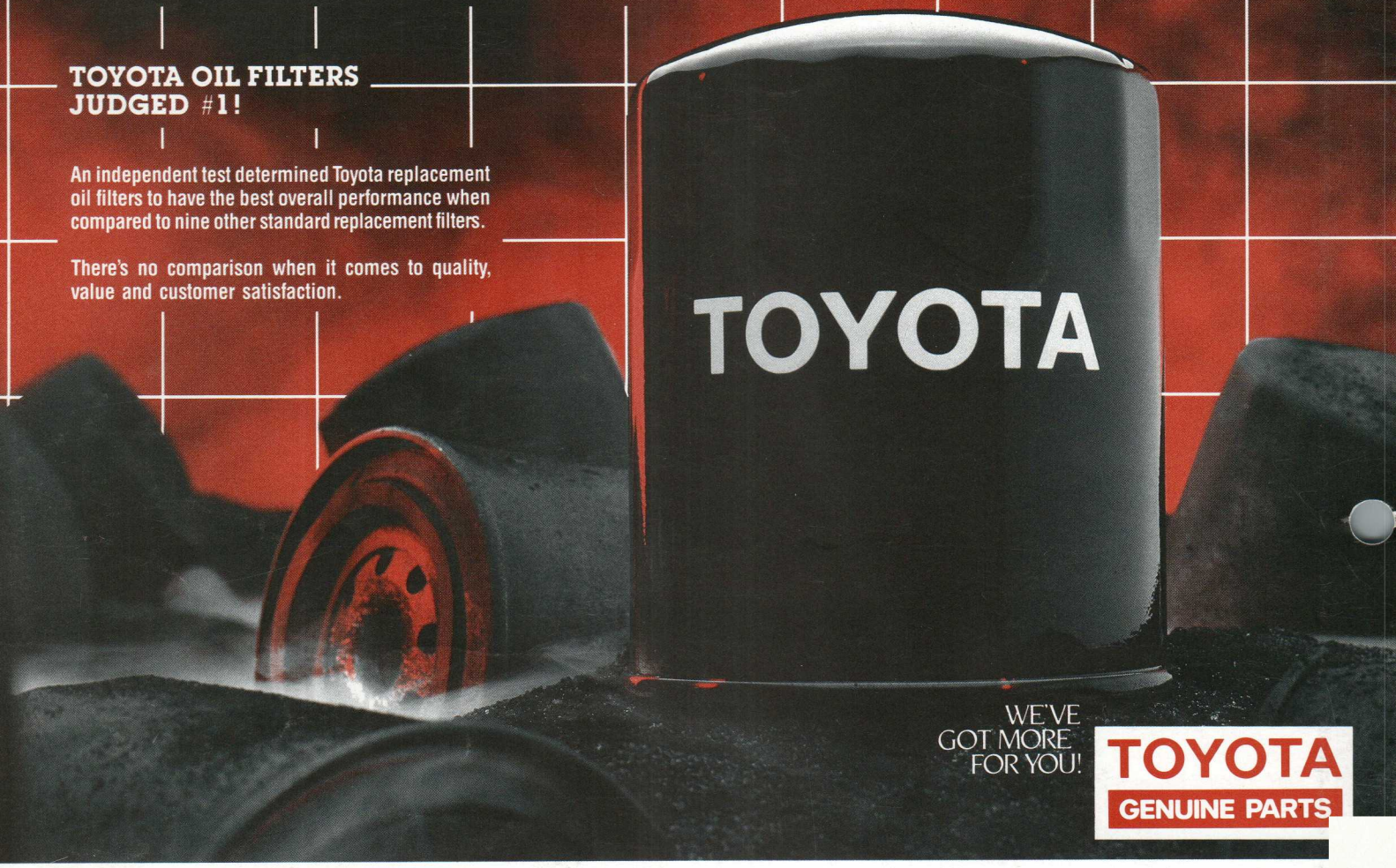

WE'VE GOT MORE FOR YOU!

TOYOTA GENUINE PARTS