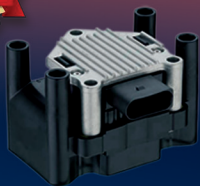


# 2020 BREMI Germany Cam/Crankshaft Sensor Catalog

Kurbel- & Nockenwellensensoren | Crankshaft & Camshaft Sensors

- OEM-quality sensors that meet IATF 16949 OE-standards and are produced precisely to the individual specifications of car manufacturers.

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**OEM-Supplier for Generations!**

AUDI, BENTLEY, BMW, MERCEDES & VOLKSWAGEN



### Why choose Bremi Germany Camshaft & Crankshaft Sensors?

Bremi Fahrzeug-Elektrik produces every component of their Sensor Program (Air Mass, Wheel Speed & Cam/Crankshaft) in their own factories.

The final completion and testing of each sensor is completed 100% in Germany. Their acquisition of “Streicher Plast” in Germany has allowed them to become a leader in Injection molded parts for electronics and microelectronics, utilizing the same material, fit and function as OE.

All Bremi Cam/Crankshaft Sensors contain Hall-Effect Sensor IC’s from OE manufacturers. Each Sensor is subjected to an electrical test which compares the sensor data to the OE profile to ensure that it is within optimal range and meets IATF 16949 OE-standards.

Additionally, Bremi performs this electrical test both before and after a full thermal shock test to ensure performance under all environmental conditions.

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CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## ACURA

### CL

V6	3.2 LTR.		2003	60131
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### ILX

L4	2.4 LTR.	K24Z7 Eng.	13-15	60450
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### MDX

V6	3.5 LTR.		03-06	60131
V6	3.7 LTR.		07-10	60131

### RDX

L4	2.3 LTR.		07-12	60133
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### RL

V6	3.5 LTR.		05-08	60131
V6	3.7 LTR.		09-10	60131

### RSX

L4	2.0 LTR.		02-06	60133
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### TL

V6	3.2 LTR.		04-08	60131
V6	3.5 LTR.		07-08	60131

### TSX

L4	2.4 LTR.		09-14	60450
L4	2.4 LTR.	Exhaust side	04-08	60133
L4	2.4 LTR.	Intake side	04-08	60147

## AUDI

### A3

L4	1.8 LTR.		15-16	60449
L4	2.0 LTR.	CZRA Eng.	2017	60449
L4	2.0 LTR.	BPY Eng.	2008	60141
L4	2.0 LTR.	CBFA Eng.	08-13	60440
L4	2.0 LTR.	CCTA Eng.	08-13	60440
L4	2.0 LTR.		06-07	60012

### A3 Quattro

L4	2.0 LTR.	CNTC Eng.	15-17	60449
L4	2.0 LTR.	CCTA Eng.	09-13	60440
V6	3.2 LTR.		06-09	60011

### A3 Sportback e-tron

L4	1.4 LTR.		16-17	60449
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## A4

L4	1.8 LTR.		97-06	60095
L4	2.0 LTR.		2017	60449
L4	2.0 LTR.	CAEB Eng.	2009	60440
L4	2.0 LTR.		10-16	60440
L4	2.0 LTR.		07-08	60141
L4	2.0 LTR.		05-06	60141
V6	2.8 LTR.		98-01	60095
V6	2.8 LTR.	AHA Eng.	1997	60095
V6	3.0 LTR.		02-05	60012
V6	3.2 LTR.		06-07	60026

## A4 Quattro

L4	1.8 LTR.		97-05	60095
L4	2.0 LTR.		2017	60449
L4	2.0 LTR.		09-16	60440
L4	2.0 LTR.	BWT Eng.	07-08	60141
L4	2.0 LTR.	BPG Eng.	05-06	60141
V6	2.8 LTR.		98-01	60095
V6	3.0 LTR.		02-06	60012
V6	3.2 LTR.	CALA Eng.	2009	60440
V6	3.2 LTR.		05-09	60026

## A5

L4	2.0 LTR.		10-14	60440
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## A5 Quattro

L4	2.0 LTR.		10-17	60440
V6	3.2 LTR.	CALA Eng.	08-10	60440

## A6

L4	2.0 LTR.		16-17	60449
L4	2.0 LTR.		12-15	60440
V6	2.8 LTR.	AHA Eng.	98-99	60095
V6	2.8 LTR.	ATQ Eng.	00-01	60095
V6	3.0 LTR.		02-04	60012
V6	3.2 LTR.		2006	60026
V6	3.2 LTR.		07-11	60440

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>A6 Quattro</b>				
L4	2.0 LTR.		16-17	60449
L4	2.0 LTR.		13-15	60440
V6	2.7 LTR.		00-04	60095
V6	2.8 LTR.	AHA Eng.	98-99	60095
V6	2.8 LTR.	ATQ Eng.	00-01	60095
V6	3.0 LTR.		09-15	60440
V6	3.0 LTR.		02-04	60012
V6	3.0 LTR. Supercharged		16-17	60449
V6	3.0 LTR. Turbo Diesel		2016	60440
V6	3.2 LTR.		07-08	60440
V8	4.2 LTR.	ART Eng.	2000	60095
V8	4.2 LTR.	BVJ Eng.	07-11	60440
V8	4.2 LTR.		05-06	60026
V8	4.2 LTR.	AWN Eng.	01-04	60095
<b>A7 Quattro</b>				
V6	3.0 LTR.		12-17	60440
<b>A8</b>				
V8	3.7 LTR.		97-99	60095
<b>A8 Quattro</b>				
V6	3.0 LTR.		13-15	60440
V6	3.0 LTR. Supercharged		16-17	60449
V6	3.0 LTR. Turbo Diesel		2016	60440
W12	3.6 LTR.		12-15	60011
V8	4.0 LTR.		13-17	60449
V8	4.2 LTR.		97-06	60095
V8	4.2 LTR.		07-12	60440
W12	6.0 LTR.		05-09	60106
<b>Allroad</b>				
L4	2.0 LTR.		13-16	60440
<b>Allroad Quattro</b>				
V6	2.7 LTR.		01-05	60095
V8	4.2 LTR.	Left side	03-05	60026
V8	4.2 LTR.	Right side	03-05	60012
<b>Q3</b>				
L4	2.0 LTR.	CCTA Eng.	15-16	60440
<b>Q3 Quattro</b>				
L4	2.0 LTR.	CCTA Eng.	15-16	60440
<b>Q5</b>				
L4	2.0 LTR.	CPMA Eng.	2013	60440
L4	2.0 LTR.	CPMB Eng.	14-17	60440
L4	2.0 LTR.		11-16	60440
V6	3.0 LTR.	CPNB Eng.	14-17	60440
V6	3.0 LTR.	CTUC Eng.	13-17	60440
V6	3.2 LTR.	CALB Eng.	09-12	60440

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Q7</b>				
V6	3.0 LTR.		2017	60449
V6	3.0 LTR.	CJWE Eng.	2012	60440
V6	3.0 LTR.	CJWC Eng.	2011	60440
V6	3.0 LTR.	CNRB Eng.	13-15	60440
V6	3.0 LTR.	CTWA Eng.	13-15	60440
V6	3.0 LTR.	CTWB Eng.	13-15	60440
V6	3.0 LTR.	CJWB Eng.	11-12	60440
V6	3.0 LTR.	CATA Eng.	09-12	60440
V6	3.6 LTR.		07-10	60011
V8	4.2 LTR.	BAR Eng.	07-10	60440
<b>R8</b>				
V8	4.2 LTR.		11-15	60440
V8	4.2 LTR.	BYH Eng.	08-10	60440
V10	5.2 LTR.		2017	60449
V10	5.2 LTR.	BUJ Eng.	2010	60440
V10	5.2 LTR.		11-15	60440
<b>RS4</b>				
V8	4.2 LTR.	BNS Eng.	07-08	60440
<b>RS5</b>				
V8	4.2 LTR.		13-15	60440
<b>RS6</b>				
V8	4.2 LTR.		2003	60095
<b>RS7</b>				
V8	4.0 LTR.		14-17	60449
<b>S3</b>				
L4	2.0 LTR.		15-17	60449
<b>S4</b>				
V6	2.7 LTR.		00-02	60095
V6	3.0 LTR.	CGXC Eng.	2013	60440
V6	3.0 LTR.	CTUB Eng.	14-16	60440
V6	3.0 LTR.	CCBA Eng.	10-12	60440
V8	4.2 LTR.	Left side	04-09	60026
V8	4.2 LTR.	Right side	04-09	60012
<b>S5</b>				
V6	3.0 LTR.		10-17	60440
V8	4.2 LTR.		2012	60440
V8	4.2 LTR.	CAUA Eng.	08-11	60440
<b>S6</b>				
V8	4.0 LTR.		13-17	60449
V8	4.2 LTR.		02-03	60095
V10	5.2 LTR.	BXA Eng.	07-11	60440
<b>S7</b>				
V8	4.0 LTR.		13-17	60449

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## S8

V8	4.0 LTR.		13-17	60449
V8	4.2 LTR.		01-03	60095
V10	5.2 LTR.	BSM Eng.	07-09	60440

## SQ5

V6	3.0 LTR.		14-17	60440
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## TT

L4	1.8 LTR.		00-06	60095
L4	2.0 LTR.	CCTA Eng.	2009	60440
L4	2.0 LTR.	BPY Eng.	08-09	60141

## TT Quattro

L4	1.8 LTR.		00-06	60095
L4	2.0 LTR.		16-17	60449
L4	2.0 LTR.	CETA Eng.	11-15	60440
L4	2.0 LTR.	CDMA Eng.	09-15	60012
L4	2.0 LTR.	CCTA Eng.	09-10	60440
L5	2.5 LTR.	CEPB Eng.	12-13	60440
V6	3.2 LTR.		08-09	60011
V6	3.2 LTR.		04-06	60106

## BMW

### 1 Series M

L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2011	60015
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### 128i

L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-13	60015
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### 135i

L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-13	60015
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### 228i

L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
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### 228i xDrive

L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	15-16	60015
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### 318i

L4	1.9 LTR.		96-98	60149
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### 318is

L4	1.9 LTR.		96-97	60149
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### 318ti

L4	1.9 LTR.		96-99	60149
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### 320i

L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	13-18	60015
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### 320i xDrive

L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	13-18	60015
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### 323Ci

L6	2.5 LTR.		2000	60043
L6	2.5 LTR.		2000	60139

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>323i</b>				
L6	2.5 LTR.	Exhaust side	99-00	60043
L6	2.5 LTR.	Intake side	99-00	60139
L6	2.5 LTR.	Convertible	98-99	60138
<b>323is</b>				
L6	2.5 LTR.		98-99	60138
<b>325Ci</b>				
L6	2.5 LTR.	Exhaust side	01-06	60043
L6	2.5 LTR.	Intake side	01-06	60139
<b>325i</b>				
L6	2.5 LTR.		93-95	60156
L6	2.5 LTR.	Exhaust side	01-05	60043
L6	2.5 LTR.	Intake side	01-05	60139
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60015
<b>325is</b>				
L6	2.5 LTR.		93-95	60156
<b>325xi</b>				
L6	2.5 LTR.	Exhaust side	01-05	60043
L6	2.5 LTR.	Intake side	01-05	60139
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60015
<b>328Ci</b>				
L6	2.8 LTR.	Exhaust side	2000	60043
L6	2.8 LTR.	Intake side	2000	60139
<b>328i</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	12-16	60015
L6	2.8 LTR.	Exhaust Side	99-00	60043
L6	2.8 LTR.	Intake side	99-00	60139
L6	2.8 LTR.	Convertible	96-99	60138
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-13	60015
<b>328i GT xDrive</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
<b>328i xDrive</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	13-16	60015
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-13	60015
<b>328is</b>				
L6	2.8 LTR.		96-99	60138
<b>328xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-08	60015
<b>330Ci</b>				
L6	3.0 LTR.	Exhaust side	01-06	60043
L6	3.0 LTR.	Intake side	01-06	60139
<b>330i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60015
L6	3.0 LTR.	Exhaust side	01-05	60043
L6	3.0 LTR.	Intake side	01-05	60139



CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>330xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60015
L6	3.0 LTR.	Exhaust side	01-05	60043
L6	3.0 LTR.	Intake side	01-05	60139
<b>335i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-15	60015
<b>335i GT xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
<b>335i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-15	60015
<b>335is</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	11-13	60015
<b>335xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-08	60015
<b>428i</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
<b>428i Gran Coupe</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	15-16	60015
<b>428i xDrive</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
<b>428i xDrive Gran Coupe</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	15-16	60015
<b>435 xDrive Gran Coupe</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	15-16	60015
<b>435i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
<b>435i Gran Coupe</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	15-16	60015
<b>435i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
<b>525i</b>				
L6	2.5 LTR.		93-95	60156
L6	2.5 LTR.	Exhaust side	01-05	60043
L6	2.5 LTR.	Intake side	01-05	60139
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60015
<b>525xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60015
<b>528i</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	12-16	60015
L6	2.8 LTR.	Exhaust side	99-00	60043
L6	2.8 LTR.	Intake side	99-00	60139
L6	2.8 LTR.		97-98	60138
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-11	60015

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>528i xDrive</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	12-16	60015
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-10	60015
<b>528xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2008	60015
<b>530i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60015
L6	3.0 LTR.	Exhaust side	01-05	60043
L6	3.0 LTR.	Intake side	01-05	60139
<b>530xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60015
<b>535 xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-15	60015
<b>535i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-16	60015
<b>535i GT</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	10-17	60015
<b>535i GT xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	11-16	60015
<b>535xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2008	60015
<b>540i</b>				
V8	4.4 LTR.		99-03	60101
<b>545i</b>				
V8	4.4 LTR.		04-05	60043
<b>550i</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	11-16	60015
V8	4.8 LTR.	Use 12 14 1 748 398 O-ring	06-10	60015
<b>550i GT</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	10-15	60015
<b>550i GT xDrive</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	10-17	60015
<b>550i xDrive</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	11-16	60015
<b>640i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	12-17	60015
<b>640i Gran Coupe</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	13-17	60015
<b>640i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	14-17	60015
<b>640i xDrive Gran Coupe</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	14-17	60015

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>645Ci</b>				
V8	4.4 LTR.		04-05	60043
<b>650 i xDrive</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	12-17	60015
<b>650i</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	12-17	60015
V8	4.8 LTR.	Use 12 14 1 748 398 O-ring	06-10	60015
<b>650i Gran Coupe</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	13-17	60015
<b>650i xDrive Gran Coupe</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	13-17	60015
<b>740i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	11-15	60015
V8	4.4 LTR.		99-01	60101
<b>740iL</b>				
V8	4.4 LTR.		99-01	60101
<b>740Li</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	11-15	60015
<b>740Li xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	13-15	60015
<b>745i</b>				
V8	4.4 LTR.		02-05	60043
<b>745Li</b>				
V8	4.4 LTR.		02-05	60043
<b>750i</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	09-17	60015
V8	4.8 LTR.	Use 12 14 1 748 398 O-ring	06-08	60015
<b>750i xDrive</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	10-17	60015
<b>750iL</b>				
V12	5.4 LTR.		98-01	60154
<b>750Li</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	09-15	60015
V8	4.8 LTR.	Use 12 14 1 748 398 O-ring	06-08	60015
<b>750Li xDrive</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	10-15	60015
<b>760Li</b>				
V12	6.0 LTR.	Use 12 14 1 748 398 O-ring	10-15	60015
<b>ActiveHybrid 3</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	13-15	60015
<b>ActiveHybrid 5</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	12-16	60015

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>ActiveHybrid 7</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	13-15	60015
<b>Alpina B6 xDrive Gran Coupe</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	15-17	60015
<b>Alpina B7</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	11-15	60015
V8	4.4 LTR.		07-08	60043
<b>Alpina B7 xDrive</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	11-15	60015
<b>Alpina B7L</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	11-15	60015
<b>Alpina B7L xDrive</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	11-15	60015
<b>M2</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	16-18	60015
<b>M235i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	14-16	60015
<b>M235i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	15-16	60015
<b>M3</b>				
L6	3.0 LTR.		1995	60156
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	15-18	60015
L6	3.2 LTR.		96-99	60138
L6	3.2 LTR.	Exhaust side	01-06	60005
V8	4.0 LTR.		08-13	60093
<b>M4</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	15-18	60015
<b>M5</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	13-16	60015
V8	5.0 LTR.	Exhaust side	00-03	60005
<b>M6</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	12-17	60015
<b>M6 Gran Coupe</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	14-17	60015
<b>X1</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	13-15	60015
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	13-15	60015
<b>X3</b>				
L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	13-17	60015
L6	2.5 LTR.	Exhaust side	04-05	60043
L6	2.5 LTR.	Intake side	04-05	60139
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-17	60015
L6	3.0 LTR.	Exhaust side	04-06	60043
L6	3.0 LTR.	Intake side	04-06	60139

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### X4

L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	15-17	60015
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	15-17	60015

### X5

L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-17	60015
L6	3.0 LTR.	Exhaust side	01-06	60043
L6	3.0 LTR.	Intake side	01-06	60139
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	10-17	60015
V8	4.4 LTR.		04-06	60043
V8	4.4 LTR.		00-03	60101
V8	4.6 LTR.		02-03	60101
V8	4.8 LTR.	Use 12 14 1 748 398 O-ring	07-10	60015
V8	4.8 LTR.		04-06	60043

### X6

L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-17	60015
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	08-17	60015

### Z3

L4	1.9 LTR.		96-98	60149
L6	2.5 LTR.	Exhaust side	99-02	60043
L6	2.5 LTR.	Intake side	99-02	60139
L6	2.8 LTR.	Exhaust side	99-00	60043
L6	2.8 LTR.	Intake side	99-00	60139
L6	2.8 LTR.		97-98	60138
L6	3.0 LTR.	Exhaust side	01-02	60043
L6	3.0 LTR.	Intake Side	01-02	60139
L6	3.2 LTR.		98-00	60138
L6	3.2 LTR.	Exhaust side	01-02	60005

### Z4

L4	2.0 LTR.	Use 12 14 1 748 398 O-ring	12-16	60015
L6	2.5 LTR.	Exhaust side	03-05	60043
L6	2.5 LTR.	Intake side	03-05	60139
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-16	60015
L6	3.0 LTR.	Exhaust side	03-05	60043
L6	3.0 LTR.	Intake side	03-05	60139
L6	3.2 LTR.	Exhaust side	06-08	60005

### Z8

V8	4.8 LTR.		2003	60101
V8	5.0 LTR.	Exhaust side	00-03	60005

## CHEVROLET

### Prizm

L4	1.8 LTR.		98-01	60067
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## CHRYSLER

### 300

V8	5.7 LTR.		05-07	60072
V8	6.1 LTR.		05-07	60072

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## Aspen

V8	4.7 LTR.		2007	60072
V8	5.7 LTR.		2007	60072

## DODGE

### Charger

V8	5.7 LTR.		06-08	60072
V8	6.1 LTR.		06-08	60072

### Dakota

V8	4.7 LTR.		00-07	60072
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### Durango

V8	4.7 LTR.		00-07	60072
V8	5.7 LTR.		04-07	60072

### Magnum

V8	5.7 LTR.		05-07	60072
V8	6.1 LTR.		06-07	60072

### Nitro

V6	3.7 LTR.		2007	60072
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### Ram 1500

V6	3.7 LTR.		02-08	60072
V8	4.7 LTR.		02-06	60072
V8	5.7 LTR.		06-07	60072

### Ram 2500

V8	5.7 LTR.		03-07	60072
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### Ram 3500

V8	5.7 LTR.		03-07	60072
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### Sprinter 2500

L5	2.7 LTR.		2006	60041
V6	3.0 LTR.		08-09	60041

### Sprinter 3500

L5	2.7 LTR.		2006	60041
V6	3.0 LTR.		08-09	60041

## HONDA

### Accord

L4	2.4 LTR.		08-12	60450
L4	2.4 LTR.	Exhaust side	03-07	60133
L4	2.4 LTR.	Intake side	03-07	60147
V6	3.0 LTR.		03-07	60131

### Civic

L4	1.3 LTR.		03-11	60133
L4	1.7 LTR.		01-05	60132
L4	2.0 LTR.	Intake side	06-11	60147
L4	2.0 LTR.	Exhaust side	02-11	60133
L4	2.4 LTR.		12-15	60450

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Crosstour</b>				
L4	2.4 LTR.		12-15	60450
<b>CR-V</b>				
L4	2.4 LTR.		10-14	60450
L4	2.4 LTR.	Intake side	07-09	60147
L4	2.4 LTR.	Exhaust side	02-09	60133
<b>Element</b>				
L4	2.4 LTR.	Exhaust side	03-11	60133
L4	2.4 LTR.	Intake side	03-11	60147
<b>Fit</b>				
L4	1.5 LTR.		07-08	60133
<b>Odyssey</b>				
V6	3.5 LTR.		05-10	60131
<b>Pilot</b>				
V6	3.5 LTR.		05-08	60131
<b>Ridgeline</b>				
V6	3.5 LTR.		06-08	60131

## HYUNDAI

<b>Azera</b>				
V6	3.3 LTR.		07-14	60073
V6	3.8 LTR.		06-11	60073
<b>Elantra</b>				
L4	1.8 LTR.		11-15	60129
L4	2.0 LTR.		14-15	60129
L4	2.0 LTR.		04-12	60129
<b>Elantra Coupe</b>				
L4	1.8 LTR.		2013	60129
L4	2.0 LTR.		2014	60129
<b>Elantra GT</b>				
L4	1.8 LTR.		2013	60129
L4	2.0 LTR.		2014	60129
<b>Entourage</b>				
V6	3.8 LTR.		07-08	60073
<b>Genesis</b>				
V6	3.8 LTR.		09-14	60073
<b>Genesis Coupe</b>				
L4	2.0 LTR.		10-14	60030
V6	3.8 LTR.	J Eng., Left side	13-15	60073
V6	3.8 LTR.		10-12	60073
<b>Santa Fe</b>				
L4	2.4 LTR.		10-12	60030
V6	2.7 LTR.		01-06	60124
V6	3.3 LTR.		07-09	60073
V6	3.5 LTR.		10-12	60073

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### **Santa Fe Sport**

L4	2.0 LTR.		13-14	60030
L4	2.4 LTR.		13-14	60030

### **Sonata**

L4	2.0 LTR.		11-14	60030
L4	2.4 LTR.		2005	60124
L4	2.4 LTR.		06-15	60030
V6	2.5 LTR.		99-01	60124
V6	2.7 LTR.		02-05	60124
V6	3.3 LTR.		06-10	60073

### **Tiburon**

L4	2.0 LTR.		04-08	60129
V6	2.7 LTR.		03-08	60124

### **Tucson**

L4	2.0 LTR.		11-15	60030
L4	2.0 LTR.		05-09	60129
L4	2.4 LTR.		10-15	60030
V6	2.7 LTR.		05-09	60124

### **Veracruz**

V6	3.8 LTR.		07-12	60073
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## INFINITI

### **EX35**

V6	3.5 LTR.		08-12	60076
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### **EX37**

V6	3.7 LTR.		2013	60512
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### **FX35**

V6	3.5 LTR.		09-12	60076
V6	3.5 LTR.	Left side	03-08	60040
V6	3.5 LTR.	Right side	03-08	60102

### **FX37**

V6	3.7 LTR.		2013	60512
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### **FX45**

V8	4.5 LTR.		03-08	60040
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### **G25**

V6	2.5 LTR.	VQ25HR Eng.	11-12	60076
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### **G35**

V6	3.5 LTR.	VQ35HR Eng.	07-08	60076
V6	3.5 LTR.	VQ35DE Eng., Left side	03-07	60040
V6	3.5 LTR.	VQ35DE Eng., Right side	03-07	60102

### **G37**

V6	3.7 LTR.		08-13	60512
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### **I35**

V6	3.5 LTR.	Left side	02-04	60040
V6	3.5 LTR.	Right side	02-04	60102



CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>JX35</b>				
V6	3.5 LTR.		2013	60076
<b>M35</b>				
V6	3.5 LTR.		09-10	60076
V6	3.5 LTR.	Left side	06-08	60040
V6	3.5 LTR.	Right side	06-08	60102
<b>M35h</b>				
V6	3.5 LTR.	VQ35HR Eng.	12-13	60076
<b>M37</b>				
V6	3.7 LTR.		11-13	60512
<b>M45</b>				
V8	4.5 LTR.		06-10	60040
V8	4.5 LTR.	VK45DE Eng.	06-10	60040
V8	4.5 LTR.		03-04	60040
<b>Q45</b>				
V8	4.5 LTR.		02-06	60040
<b>Q50</b>				
L4	2.0 LTR.		2018	60451
L4	2.0 LTR. Turbo		16-17	60451
V6	3.5 LTR.		14-15	60076
V6	3.7 LTR.		2014	60512
<b>Q60</b>				
L4	2.0 LTR.		17-18	60451
V6	3.7 LTR.		14-15	60512
<b>Q70</b>				
V6	3.5 LTR.		14-15	60076
V6	3.7 LTR.		2014	60512
<b>QX30</b>				
L4	2.0 LTR.		17-18	60451
<b>QX4</b>				
V6	3.5 LTR.		01-03	60135
<b>QX50</b>				
V6	3.7 LTR.		14-17	60512
<b>QX56</b>				
V8	5.6 LTR.		04-10	60040
<b>QX60</b>				
V6	3.5 LTR.		14-15	60076
<b>QX70</b>				
V6	3.7 LTR.		2014	60512

## JAGUAR

<b>F-Type</b>				
V6	3.0 LTR.		14-17	60034
V8	5.0 LTR.		14-16	60034

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>S-Type</b>				
V6	3.0 LTR.		03-08	60058
<b>XF</b>				
V6	3.0 LTR.		13-17	60034
V8	5.0 LTR.		10-15	60034
<b>XFR</b>				
V8	5.0 LTR.		10-15	60034
<b>XFR-S</b>				
V8	5.0 LTR.		13-15	60034
<b>XJ</b>				
V6	3.0 LTR.		13-17	60034
V8	5.0 LTR.		10-15	60034
<b>XJR</b>				
V8	5.0 LTR.		14-17	60034
<b>XK</b>				
V8	5.0 LTR.		10-15	60034
<b>XKR</b>				
V8	5.0 LTR.		10-15	60034
<b>XKR-S</b>				
V8	5.0 LTR.		12-15	60034
<b>X-Type</b>				
V6	2.5 LTR.		02-05	60058
V6	3.0 LTR.		02-08	60058

## JEEP

<b>Commander</b>				
V6	3.7 LTR.		06-07	60072
V8	4.7 LTR.		06-07	60072
V8	5.7 LTR.		06-07	60072
<b>Grand Cherokee</b>				
V6	3.0 LTR.		07-09	60041
V8	4.7 LTR.		99-07	60072
<b>Liberty</b>				
V6	3.7 LTR.		02-07	60072

## KIA

<b>Amanti</b>				
V6	3.8 LTR.		07-09	60073
<b>Borrego</b>				
V6	3.8 LTR.		2009	60073
<b>Cadenza</b>				
V6	3.3 LTR.	Left side	14-15	60073

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### **Forte**

L4	1.8 LTR.		14-15	60129
L4	2.0 LTR.		14-15	60129
L4	2.0 LTR.		10-13	60030
L4	2.4 LTR.		10-13	60030

### **Forte Koup**

L4	2.0 LTR.		14-15	60129
L4	2.0 LTR.		10-13	60030
L4	2.4 LTR.		10-13	60030

### **Optima**

L4	2.0 LTR.		11-15	60030
L4	2.4 LTR.		06-15	60030
V6	2.5 LTR.		2001	60124
V6	2.7 LTR.		02-05	60124

### **Rondo**

L4	2.4 LTR.		07-12	60030
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### **Sedona**

V6	3.5 LTR.		11-14	60073
V6	3.8 LTR.		06-10	60073

### **Sorento**

L4	2.4 LTR.		11-15	60030
V6	3.3 LTR.		08-09	60073
V6	3.5 LTR.		11-13	60073
V6	3.5 LTR.		03-06	60074
V6	3.8 LTR.		07-09	60073

### **Soul**

L4	2.0 LTR.		10-15	60129
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### **Spectra**

L4	1.8 LTR.		2004	60129
L4	2.0 LTR.		04-09	60129

### **Spectra5**

L4	2.0 LTR.		05-09	60129
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### **Sportage**

L4	2.0 LTR.		95-02	60112
L4	2.0 LTR.		11-15	60030
L4	2.0 LTR.		06-10	60129
L4	2.4 LTR.		11-15	60030

## LAND ROVER

### **LR2**

L6	3.2 LTR.		08-12	60034
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### **LR3**

V8	4.4 LTR.		05-09	60150
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### LR4

V6	3.0 LTR.		14-16	60034
V8	5.0 LTR.		10-13	60034

### Range Rover

V6	3.0 LTR.		14-18	60034
V8	4.2 LTR.	Right side	06-09	60150
V8	4.4 LTR.	Right side	06-09	60150
V8	4.4 LTR.		03-05	60101
V8	5.0 LTR.		10-18	60034

### Range Rover Sport

V6	3.0 LTR.		14-18	60034
V8	4.2 LTR.	Right side	06-09	60150
V8	4.4 LTR.	Right side	06-09	60150
V8	5.0 LTR.		10-18	60034

## LEXUS

### CT200h

L4	1.8 LTR.		11-16	60033
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### ES300

V6	3.0 LTR.	Right side	99-03	60067
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### ES300h

L4	2.5 LTR.		13-16	60033
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### ES330

V6	3.3 LTR.	3MZ-FE Eng.	04-06	60067
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### ES350

V6	3.5 LTR.	2GRFE Eng.	07-16	60033
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### GS F

V8	5.0 LTR.		2016	60033
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### GS300

V6	3.0 LTR.	3GR-FSE Eng.	2006	60033
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### GS350

V6	3.5 LTR.	2GR-FSE Eng.	07-15	60033
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### GS400

V7	4.0 LTR.	1UZ-FE Eng.	98-00	60032
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### GS430

V8	4.3 LTR.	3UZ-FE Eng.	01-07	60032
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### GS450h

V6	3.5 LTR.	2GR-FXE Eng.	13-16	60033
V6	3.5 LTR.	2GR-FSE Eng.	07-11	60033

### GS460

V8	4.6 LTR.	1UR-FSE Eng.	08-11	60033
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### GX460

V8	4.6 LTR.	1UR-FE Eng.	10-16	60033
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>GX470</b>				
V8	4.7 LTR.		05-09	60032
<b>HS250h</b>				
L4	2.4 LTR.	2AZ-FXE Eng.	10-12	60067
<b>IS F</b>				
V8	5.0 LTR.	2UR-GSE Eng.	08-14	60033
<b>IS250</b>				
V6	2.5 LTR.	4GR-FSE Eng.	06-15	60033
<b>IS300</b>				
V6	3.5 LTR.		2016	60033
<b>IS350</b>				
V6	3.5 LTR.	2GR-FSE Eng.	06-16	60033
<b>LS400</b>				
V8	4.0 LTR.	1UZ-FE Eng.	98-00	60032
<b>LS430</b>				
V8	4.3 LTR.	3UZ-FE Eng.	01-06	60032
<b>LS460</b>				
V8	4.6 LTR.	1UR-FSE Eng.	07-16	60033
<b>LS600h</b>				
V8	5.0 LTR.		08-16	60033
<b>LX470</b>				
V8	4.7 LTR.		05-07	60032
<b>LX570</b>				
V8	5.7 LTR.		08-16	60033
<b>NX300h</b>				
L4	2.5 LTR.		15-16	60033
<b>RC F</b>				
V8	5.0 LTR.		15-16	60033
<b>RC300</b>				
V6	3.5 LTR.		2016	60033
<b>RC350</b>				
V6	3.5 LTR.		15-16	60033
<b>RX300</b>				
V6	3.0 LTR.	1MZ-FE Eng.	99-03	60067
<b>RX330</b>				
V6	3.3 LTR.	3MZ-FE Eng.	04-06	60067
<b>RX350</b>				
V6	3.5 LTR.		15-16	60033
V6	3.5 LTR.	2GRFE Eng.	07-14	60033
<b>RX400h</b>				
V6	3.3 LTR.	3MZ-FE Eng.	06-08	60067

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### **RX450h**

V6	3.5 LTR.		2016	60033
V6	3.5 LTR.	2GR-FXE Eng.	10-15	60033

### **SC400**

V8	4.0 LTR.	1UZ-FE Eng.	98-00	60032
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### **SC430**

V8	4.3 LTR.	3UZ-FE Eng.	02-10	60032
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## LINCOLN

### **LS**

V6	3.0 LTR.		02-05	60058
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## MAZDA

### **3**

L4	2.3 LTR.		07-13	60003
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### **6**

L4	2.3 LTR.		06-07	60003
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### **CX-7**

L4	2.3 LTR.		07-12	60003
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## MERCEDES-BENZ

### **AMG GT**

V8	4.0 LTR.		17-18	60451
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### **AMG GT C**

V8	4.0 LTR.		2018	60451
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### **AMG GT R**

V8	4.0 LTR.		2018	60451
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### **AMG GT S**

V8	4.0 LTR.		16-18	60451
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### **B250**

L4	2.0 LTR.		13-19	60451
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### **C230**

L4	1.8 LTR.		03-05	60168
L4	2.3 LTR.		97-00	60050

### **C240**

V6	2.6 LTR.		01-05	60168
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### **C250**

L4	1.8 LTR.		12-15	60437
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### **C280**

V6	2.8 LTR.		98-99	60168
L6	2.8 LTR.		1997	60050

### **C300**

L4	2.0 LTR.		15-18	60451
V6	3.0 LTR.		11-12	60437

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>C32 AMG</b>				
V6	3.2 LTR.		02-04	60168
<b>C320</b>				
V6	3.2 LTR.		01-05	60168
<b>C350e</b>				
L4	2.0 LTR.		16-18	60451
<b>C36 AMG</b>				
L6	3.6 LTR.		1997	60050
<b>C43 AMG</b>				
V8	4.3 LTR.		98-00	60168
<b>C63 AMG</b>				
V8	4.0 LTR.		16-18	60451
<b>C63 AMG S</b>				
V8	4.0 LTR.		15-18	60451
<b>CL500</b>				
V8	5.0 LTR.		98-05	60168
V8	5.0 LTR.		2006	60168
<b>CL55 AMG</b>				
V8	5.5 LTR.		01-06	60168
<b>CL600</b>				
V12	5.5 LTR.		2014	60437
V12	6.0 LTR.		98-99	60168
<b>CL65 AMG</b>				
V12	6.0 LTR.		08-14	60437
<b>CLA250</b>				
L4	2.0 LTR.		14-18	60451
L4	2.0 LTR.	FLEX	14-18	60451
<b>CLA45 AMG</b>				
L4	2.0 LTR.		14-18	60451
<b>CLK320</b>				
V6	3.2 LTR.		98-05	60168
<b>CLK430</b>				
V8	4.3 LTR.		99-03	60168
<b>CLK500</b>				
V8	5.0 LTR.		03-06	60168
<b>CLS500</b>				
V8	5.0 LTR.		2006	60168
<b>CLS55 AMG</b>				
V8	5.5 LTR.		2006	60168
<b>CLS550</b>				
V8	5.5 LTR.		2011	60437
<b>E300</b>				
L4	2.0 LTR.		17-19	60451

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>E320</b>				
V6	3.0 LTR.		07-09	60041
V6	3.2 LTR.		98-05	60168
L6	3.2 LTR.		96-97	60050
L6	3.2 LTR.		05-06	60041
<b>E350</b>				
V6	3.0 LTR.		11-13	60041
V6	3.5 LTR.		2011	60437
<b>E420</b>				
V8	4.2 LTR.		1997	60168
<b>E430</b>				
V8	4.3 LTR.		98-02	60168
<b>E500</b>				
V8	5.0 LTR.		03-06	60168
<b>E55 AMG</b>				
V8	5.5 LTR.		99-06	60168
<b>E550</b>				
V8	5.5 LTR.		2011	60437
<b>E63 AMG S</b>				
V8	4.0 LTR.		2018	60451
<b>G500</b>				
V8	5.0 LTR.		02-08	60168
<b>G55 AMG</b>				
V8	5.5 LTR.		03-11	60168
<b>G550</b>				
V8	4.0 LTR.		16-18	60451
V8	5.5 LTR.		11-15	60437
<b>G550 4X4</b>				
V8	4.0 LTR.		17-18	60451
<b>GL320</b>				
V6	3.0 LTR.		07-09	60041
<b>GL350</b>				
V6	3.0 LTR.		10-16	60041
<b>GL450</b>				
V8	4.6 LTR.		11-12	60437
<b>GL550</b>				
V8	5.5 LTR.		11-12	60437
<b>GLA250</b>				
L4	2.0 LTR.		15-18	60451
L4	2.0 LTR.	FLEX	15-18	60451
L4	2.0 LTR. Turbo		2016	60451
<b>GLA45 AMG</b>				
L4	2.0 LTR.		15-18	60451



CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>GLC300</b>				
L4	2.0 LTR.		16-17	60451
<b>GLC350e</b>				
L4	2.0 LTR.		2019	60451
<b>GLC63</b>				
V8	4.0 LTR.		2018	60451
<b>GLC63 S</b>				
V8	4.0 LTR.		2018	60451
<b>GLK350</b>				
V6	3.5 LTR.		11-12	60437
<b>Maybach S560</b>				
V8	4.0 LTR.		2018	60451
<b>Metris</b>				
L4	2.0 LTR.		16-18	60451
<b>ML320</b>				
V6	3.0 LTR.		07-09	60041
V6	3.2 LTR.		98-03	60168
<b>ML350</b>				
V6	3.0 LTR.		10-14	60041
V6	3.5 LTR.		11-12	60437
V6	3.7 LTR.		03-05	60168
<b>ML430</b>				
V8	4.3 LTR.		99-01	60168
<b>ML450</b>				
V6	3.5 LTR.		2011	60437
<b>ML500</b>				
V8	5.0 LTR.		02-07	60168
<b>ML55 AMG</b>				
V8	5.5 LTR.		00-03	60168
<b>ML550</b>				
V8	5.5 LTR.		2011	60437
<b>R320</b>				
V6	3.0 LTR.		07-09	60041
<b>R350</b>				
V6	3.0 LTR.		10-12	60041
V6	3.5 LTR.		2011	60437
<b>R500</b>				
V8	5.0 LTR.		06-07	60168
<b>S320</b>				
L6	3.2 LTR.		97-99	60050
<b>S350</b>				
V6	3.0 LTR.		12-13	60041

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>S400</b>				
V6	3.5 LTR.		11-13	60437
<b>S420</b>				
V8	4.2 LTR.		96-99	60168
<b>S430</b>				
V8	4.3 LTR.		00-06	60168
<b>S500</b>				
V8	5.0 LTR.		96-06	60168
<b>S55 AMG</b>				
V8	5.5 LTR.		01-06	60168
<b>S550</b>				
V8	5.5 LTR.		2011	60437
<b>S560</b>				
V8	4.0 LTR.		2018	60451
<b>S600</b>				
V12	6.0 LTR.		96-99	60168
V12	6.0 LTR.		2015	60437
<b>S63 AMG</b>				
V8	4.0 LTR.		2018	60451
<b>S65 AMG</b>				
V12	6.0 LTR.		07-13	60437
<b>SL320</b>				
L6	3.2 LTR.		1997	60050
<b>SL500</b>				
V8	5.0 LTR.		96-06	60168
<b>SL55 AMG</b>				
V8	5.5 LTR.		03-08	60168
<b>SL550</b>				
V8	5.5 LTR.		11-12	60437
<b>SL600</b>				
V12	6.0 LTR.		96-02	60168
<b>SL65 AMG</b>				
V12	6.0 LTR.		05-14	60437
<b>SLC300</b>				
L4	2.0 LTR.		17-18	60451
<b>SLK230</b>				
L4	2.3 LTR.		98-00	60050
<b>SLK250</b>				
L4	1.8 LTR.		12-14	60437
<b>SLK300</b>				
L4	2.0 LTR.		2016	60451
V6	3.0 LTR.		2011	60437

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>SLK32 AMG</b>				
V6	3.2 LTR.		02-04	60168
<b>SLK320</b>				
V6	3.2 LTR.		01-04	60168
<b>SLK350</b>				
V6	3.5 LTR.		2011	60437
<b>Sprinter 2500</b>				
V6	3.0 LTR.		10-17	60041
<b>Sprinter 3500</b>				
V6	3.0 LTR.		10-17	60041

## MINI

<b>Cooper</b>				
L4	1.6 LTR.		07-15	60059
L4	1.6 LTR.	W10B16A Eng.	02-08	60144
L4	1.6 LTR.	W11B16A Eng.	02-08	60144
<b>Cooper Countryman</b>				
L4	1.6 LTR.		11-16	60059
<b>Cooper Paceman</b>				
L4	1.6 LTR.		13-16	60059

## MITSUBISHI

<b>Eclipse</b>				
L4	2.4 LTR.		06-11	60029
V6	3.8 LTR.		06-11	60029
<b>Endeavor</b>				
V6	3.8 LTR.		04-11	60029
<b>Galant</b>				
L4	2.4 LTR.		04-11	60029
V6	3.8 LTR.		04-09	60029
<b>Lancer</b>				
L4	2.4 LTR.		04-06	60029
<b>Outlander</b>				
L4	2.4 LTR.		04-06	60029
<b>Raider</b>				
V6	3.7 LTR.		06-08	60072
V8	4.7 LTR.		06-07	60072

## NISSAN

<b>350Z</b>				
V6	3.5 LTR.		07-09	60076
V6	3.5 LTR.	Left side	03-06	60040
V6	3.5 LTR.	Right side	03-06	60102

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>370Z</b>				
V6	3.7 LTR.		09-18	60512
<b>Altima</b>				
L4	2.5 LTR.		07-15	60076
L4	2.5 LTR.		02-06	60165
V6	3.5 LTR.		07-15	60076
V6	3.5 LTR.	Left side	02-06	60040
V6	3.5 LTR.	Right side	02-06	60102
<b>Armada</b>				
V8	5.6 LTR.		05-15	60040
<b>Cube</b>				
L4	1.8 LTR.		09-14	60089
<b>Frontier</b>				
L4	2.5 LTR.		05-17	60165
V6	4.0 LTR.	Left side	05-17	60040
V6	4.0 LTR.	Right side	05-15	60102
<b>GT-R</b>				
V6	3.8 LTR.		09-15	60076
<b>Maxima</b>				
V6	3.5 LTR.		09-14	60076
V6	3.5 LTR.	Left side	02-08	60040
V6	3.5 LTR.	Right side	02-08	60102
<b>Murano</b>				
V6	3.5 LTR.		09-15	60076
V6	3.5 LTR.	Left side	03-07	60040
V6	3.5 LTR.	Right side	03-07	60102
<b>NV1500</b>				
V6	4.0 LTR.	VQ40DE Eng., Left side	12-17	60040
V6	4.0 LTR.	VQ40DE Eng., Right side	12-15	60102
<b>NV200</b>				
L4	2.0 LTR.		13-15	60089
<b>NV2500</b>				
V6	4.0 LTR.	VQ40DE Eng., Left side	12-17	60040
V6	4.0 LTR.	VQ40DE Eng., Right side	12-15	60102
V8	5.6 LTR.	VK56DE Eng.	12-17	60040
<b>NV3500</b>				
V6	4.0 LTR.	VQ40DE Eng., Left side	13-17	60040
V6	4.0 LTR.	VQ40DE Eng., Right side	12-15	60102
V8	5.6 LTR.	VK56DE Eng.	12-17	60040

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Pathfinder</b>				
V6	3.5 LTR.		13-15	60076
V6	3.5 LTR.		03-04	60135
V6	3.5 LTR.	Rear	01-02	60135
V6	4.0 LTR.	Left side	12-15	60040
V6	4.0 LTR.	Right side	05-12	60102
V8	5.6 LTR.		08-12	60040

<b>Pathfinder Armada</b>				
V8	5.6 LTR.		2004	60040

<b>Quest</b>				
V6	3.5 LTR.	VQ35DE Eng.	11-15	60076
V6	3.5 LTR.	Left side	04-09	60040
V6	3.5 LTR.	Right side	04-09	60102

<b>Rogue</b>				
L4	2.5 LTR.	QR25DE Eng.	08-17	60076

<b>Rogue Select</b>				
L4	2.5 LTR.		14-15	60076

<b>Sentra</b>				
L4	1.8 LTR.		13-17	60089
L4	1.8 LTR.		00-06	60040
L4	2.0 LTR.		07-12	60089
L4	2.5 LTR.		07-12	60076
L4	2.5 LTR.		02-06	60165

<b>Titan</b>				
V8	5.6 LTR.		04-15	60040

<b>Versa</b>				
L4	1.8 LTR.		07-12	60089

<b>Xterra</b>				
V6	4.0 LTR.	Left side	05-15	60040
V6	4.0 LTR.	Right side	05-15	60102

## PONTIAC

<b>Vibe</b>				
L4	1.8 LTR.		03-08	60067
L4	2.4 LTR.		2009	60067

## PORSCHE

<b>911</b>				
H6	3.4 LTR.		99-01	60168
H6	3.4 LTR.		12-16	60437
H6	3.6 LTR.		2002	60168
H6	3.6 LTR.		05-12	60437
H6	3.8 LTR.		05-17	60437
H6	4.0 LTR.		2011	60437

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>911 40th Anniversary Edition</b>				
L6	3.6 LTR.		2004	60037
<b>911 Carrera</b>				
L6	3.6 LTR.		03-04	60037
<b>911 Carrera 4</b>				
L6	3.6 LTR.		03-04	60037
<b>911 Carrera 4S</b>				
L6	3.6 LTR.		03-04	60037
<b>911 GT2</b>				
L6	3.6 LTR. Turbo		03-05	60037
<b>911 GT3</b>				
L6	3.6 LTR.		04-05	60037
<b>911 Turbo</b>				
L6	3.6 LTR.		03-05	60037
<b>911 Turbo S</b>				
L6	3.6 LTR.		2005	60037
<b>Boxster</b>				
H6	2.5 LTR.		97-99	60168
L6	2.7 LTR.		2004	60037
H6	2.7 LTR.		13-15	60437
H6	2.7 LTR.		05-08	60437
H6	2.7 LTR.		00-02	60168
H6	2.9 LTR.		09-12	60437
H6	3.2 LTR.		03-06	60437
H6	3.2 LTR.		00-02	60168
H6	3.4 LTR.		07-16	60437
H6	3.8 LTR.		2016	60437
<b>Boxster Roadster</b>				
L6	2.7 LTR.		2003	60037
<b>Boxster Roadster S</b>				
L6	3.2 LTR.		2003	60037
<b>Boxster S</b>				
L6	3.2 LTR.		2004	60037
<b>Cayenne</b>				
V6	3.0 LTR. Supercharged	ELECTRIC/GAS	11-17	60440
V6	3.0 LTR. Turbo Diesel		11-16	60440
V6	3.2 LTR.		04-06	60106
V8	4.5 LTR.		03-06	60168
V8	4.8 LTR.	M48.51 Eng.	09-10	60437
V8	4.8 LTR.	M48.01 Eng.	08-09	60437

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## **Cayman**

H6	2.7 LTR.		14-16	60437
H6	2.7 LTR.		07-08	60437
H6	2.9 LTR.		09-12	60437
H6	3.4 LTR.		06-16	60437
H6	3.8 LTR.		2016	60437

## **Panamera**

V6	3.0 LTR. Supercharged	ELECTRIC/GAS	12-16	60440
V6	3.0 LTR. Turbo Diesel		12-16	60440

## SCION

### **iM**

L4	1.8 LTR.		2016	60033
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### **iQ**

L4	1.3 LTR.		12-15	60033
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### **tC**

L4	2.4 LTR.		05-10	60067
L4	2.5 LTR.		11-16	60033

### **xB**

L4	2.4 LTR.		08-15	60067
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### **xD**

L4	1.8 LTR.		08-14	60033
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## SUBARU

### **BRZ**

H4	2.0 LTR.		13-15	60146
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### **Forester**

H4	2.0 LTR.		14-15	60146
H4	2.5 LTR.		11-15	60146

### **Impreza**

H4	2.0 LTR.		12-15	60146
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### **Legacy**

H4	2.5 LTR.		13-15	60146
H6	3.6 LTR.		10-15	60046

### **Outback**

H4	2.5 LTR.		13-15	60146
H6	3.6 LTR.		10-15	60046

### **Tribeca**

H6	3.6 LTR.		08-14	60046
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### **WRX**

H4	2.0 LTR.		2015	60146
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### **XV Crosstrek**

H4	2.0 LTR.		13-15	60146
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## TOYOTA

### 4Runner

L4	2.7 LTR.	3RZ-FE Eng.	97-00	60067
L4	2.7 LTR.	2TR-FE Eng.	2010	60032
V6	4.0 LTR.	1GR-FE Eng.	05-17	60033
V6	4.0 LTR.	1GR-FE Eng.	03-04	60067
V8	4.7 LTR.		05-09	60032

### Avalon

L4	2.5 LTR.	2AR-FXE Eng.	13-17	60033
V6	3.0 LTR.	1MZ-FE Eng.	00-04	60067
V6	3.5 LTR.	2GRFE Eng.	05-17	60033

### Camry

L4	2.2 LTR.	5S-FE Eng.	97-01	60119
L4	2.2 LTR.	5S-FNE Eng.	00-01	60119
L4	2.4 LTR.		02-11	60067
L4	2.5 LTR.	2AR-FXE Eng.	13-17	60033
L4	2.5 LTR.	2AR-FE Eng.	10-17	60033
V6	3.0 LTR.	1MZ-FE Eng.	03-06	60067
V6	3.3 LTR.	3MZ-FE Eng.	04-06	60067
V6	3.5 LTR.	2GRFE Eng.	07-17	60033

### Celica

L4	1.8 LTR.	1ZZ-FE Eng.	00-05	60067
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### Corolla

L4	1.8 LTR.	1ZZ-FE Eng.	98-08	60067
L4	1.8 LTR.	2ZR-FAE Eng.	14-17	60033
L4	1.8 LTR.		09-17	60033
L4	2.4 LTR.	2AZ-FE Eng.	09-10	60067

### FJ Cruiser

V6	4.0 LTR.	1GR-FE Eng.	07-14	60033
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### Highlander

L4	2.4 LTR.	2AZ-FE Eng.	01-07	60067
L4	2.7 LTR.	1AR-FE Eng.	09-17	60033
V6	3.0 LTR.	1MZ-FE Eng.	01-03	60067
V6	3.3 LTR.	3MZ-FE Eng.	04-10	60067
V6	3.5 LTR.	2GR-FXE Eng.	11-16	60033
V6	3.5 LTR.	2GRFE Eng.	08-16	60033

### Land Cruiser

V8	4.7 LTR.		06-07	60032
V8	5.7 LTR.		08-17	60033

### Matrix

L4	1.8 LTR.		10-13	60033
L4	1.8 LTR.	1ZZ-FE Eng.	03-08	60067
L4	2.4 LTR.	2AZ-FE Eng.	09-13	60067

### MR2 Spyder

L4	1.8 LTR.	1ZZ-FE Eng.	00-05	60067
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Prius</b>				
L4	1.8 LTR.		10-17	60033
<b>Prius Plug-In</b>				
L4	1.8 LTR.		13-15	60033
<b>Prius V</b>				
L4	1.8 LTR.		12-17	60033
<b>RAV4</b>				
L4	2.0 LTR.	3S-FE Eng.	98-00	60119
L4	2.0 LTR.	1AZ-FE Eng.	01-03	60067
L4	2.4 LTR.	2AZ-FE Eng.	04-08	60067
L4	2.5 LTR.	2AR-FXE Eng.	16-17	60033
L4	2.5 LTR.	2AR-FE Eng.	09-17	60033
V6	3.5 LTR.	2GRFE Eng.	06-12	60033
<b>Sequoia</b>				
V8	4.6 LTR.		10-12	60033
V8	4.7 LTR.		05-09	60032
V8	5.7 LTR.		08-17	60033
<b>Sienna</b>				
L4	2.7 LTR.	1AR-FE Eng.	11-12	60033
V6	3.0 LTR.	1MZ-FE Eng.	01-03	60067
V6	3.3 LTR.	3MZ-FE Eng.	04-06	60067
V6	3.5 LTR.	2GRFE Eng.	07-16	60033
<b>Solara</b>				
L4	2.2 LTR.	5S-FE Eng.	99-01	60119
L4	2.4 LTR.	2AZ-FE Eng.	02-08	60067
V6	3.3 LTR.	3MZ-FE Eng.	04-08	60067
<b>Tacoma</b>				
L4	2.4 LTR.	2RZ-FE Eng.	97-04	60067
L4	2.7 LTR.	3RZ-FE Eng.	97-04	60067
L4	2.7 LTR.	2TR-FE Eng.	05-15	60032
V6	3.5 LTR.	2GR-FKS	16-17	60033
V6	4.0 LTR.	1GR-FE Eng.	05-15	60033
<b>Tundra</b>				
V6	4.0 LTR.		10-14	60033
V6	4.0 LTR.	1GR-FE Eng.	05-09	60033
V8	4.6 LTR.	1UR-FE Eng.	10-17	60033
V8	4.7 LTR.		05-09	60032
V8	5.7 LTR.		07-17	60033
<b>Venza</b>				
L4	2.7 LTR.	1AR-FE Eng.	09-15	60033
V6	3.5 LTR.	2GRFE Eng.	09-15	60033

## VOLKSWAGEN

### Beetle

L4	1.8 LTR.		99-05	60095
L4	1.8 LTR.		2014	60449
L4	1.9 LTR.	ATD Eng.	2004	60010
L4	1.9 LTR.	BEW Eng.	2004	60010
L4	1.9 LTR.		05-07	60010
L4	2.0 LTR.		98-05	60021
L4	2.0 LTR.	CPPA Eng.	2014	60449
L4	2.0 LTR.	CPLA Eng.	13-14	60449
L4	2.0 LTR.	CBFA Eng.	12-13	60440
L4	2.0 LTR.	CCTA Eng.	12-13	60440
L5	2.5 LTR.		10-14	60141
L5	2.5 LTR.	BPR Eng.	06-09	60141
L5	2.5 LTR.	BPS Eng.	06-09	60141

### CC

L4	2.0 LTR.		12-17	60440
L4	2.0 LTR.	CBFA Eng.	10-11	60440
L4	2.0 LTR.	CCTA Eng.	09-11	60440
V6	3.6 LTR.		09-15	60011

### Eos

L4	2.0 LTR.	BPY Eng.	2009	60012
L4	2.0 LTR.	CBFA Eng.	2009	60440
L4	2.0 LTR.	CCTA Eng.	2009	60440
L4	2.0 LTR.		07-08	60012
L4	2.0 LTR. Turbo		10-16	60440
V6	3.2 LTR.	BUB Eng.	07-08	60011

### EuroVan

V6	2.8 LTR.	AES Eng.	1999	60106
V6	2.8 LTR.	AXK Eng.	01-03	60106

### Golf

L4	1.8 LTR.		15-17	60449
L4	1.8 LTR.		00-06	60095
L4	1.9 LTR.	BEW Eng.	2004	60010
L4	1.9 LTR.		05-06	60010
L4	2.0 LTR.		99-06	60021
L5	2.5 LTR.	CBTA Eng.	10-14	60141
L5	2.5 LTR.	CBUA Eng.	10-14	60141
V6	2.8 LTR.		98-05	60106
V6	3.2 LTR.		2004	60106

### Golf Alltrack

L4	1.8 LTR.		2017	60449
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### Golf R

L4	2.0 LTR.		15-18	60449
L4	2.0 LTR.		12-13	60012

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## **Golf SportWagen**

L4	1.8 LTR.		15-17	60449
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## **GTI**

L4	2.0 LTR.	CBFA Eng.	08-14	60440
L4	2.0 LTR.	CCTA Eng.	08-14	60440
L4	2.0 LTR.	BPY Eng.	06-08	60012

## **Jetta**

L4	1.4 LTR.	CZTA Eng.	16-18	60449
L4	1.4 LTR.	CNLA Eng.	13-16	60449
L4	1.8 LTR.		2014	60449
L4	1.8 LTR.		00-05	60095
L4	1.9 LTR.		04-05	60010
L4	2.0 LTR.		99-05	60021
L4	2.0 LTR.	CPLA Eng.	13-14	60449
L4	2.0 LTR.	CPPA Eng.	13-14	60449
L4	2.0 LTR.	CBFA Eng.	12-13	60440
L4	2.0 LTR.	CCTA Eng.	12-13	60440
L4	2.0 LTR.	CBPA Eng.	11-15	60021
L4	2.0 LTR.	Front	06-08	60012
L5	2.5 LTR.		05-14	60141
V6	2.8 LTR.	AFP Eng.	99-02	60106
V6	2.8 LTR.	BDF Eng.	02-04	60106

## **Passat**

L4	1.8 LTR.		98-05	60095
L4	1.8 LTR.		14-17	60449
L4	2.0 LTR.		2008	60141
L4	2.0 LTR.	CCTA Eng.	2008	60440
L4	2.0 LTR.		09-10	60440
L4	2.0 LTR.		06-07	60012
L5	2.5 LTR.	CBTA Eng.	12-14	60141
L5	2.5 LTR.	CBUA Eng.	12-14	60141
V6	2.8 LTR.		98-05	60095
V6	3.6 LTR.	CDVB Eng.	12-15	60011
V6	3.6 LTR.		06-08	60011
W8	4.0 LTR.		02-04	60106

## **Phaeton**

V8	4.2 LTR.		04-06	60095
W12	6.0 LTR.	BRP Eng.	2006	60106
W12	6.0 LTR.	BAP Eng.	2005	60106
W12	6.0 LTR.		2004	60106

## **R32**

V6	3.2 LTR.		2008	60011
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## **Rabbit**

L5	2.5 LTR.		06-09	60141
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## **Tiguan**

L4	2.0 LTR.		13-17	60440
L4	2.0 LTR.	CCTA Eng.	09-12	60440

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## Touareg

V6	3.0 LTR.	CNRB Eng.	13-16	60440
V6	3.0 LTR.	CGFA Eng.	11-15	60440
V6	3.0 LTR.	CATA Eng.	09-12	60440
V6	3.2 LTR.	BAA Ang.	2004	60106
V6	3.2 LTR.	BMX Eng.	05-06	60106
V6	3.6 LTR.	CGRA Eng.	11-17	60011
V6	3.6 LTR.	BHK Eng.	07-10	60011
V8	4.2 LTR.	BAR Eng.	07-09	60440
V8	4.2 LTR.		04-07	60095

## VOLVO

### S60

L4	2.0 LTR.		2015	60034
L6	3.0 LTR.		11-15	60034

### S80

L4	2.0 LTR.		2015	60034
L6	3.0 LTR.		08-15	60034
L6	3.2 LTR.		07-14	60034

### V60

L4	2.0 LTR.		2015	60034
L6	3.0 LTR.		2015	60034

### V70

L6	3.2 LTR.		08-10	60034
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### XC60

L4	2.0 LTR.		15-16	60034
L6	3.0 LTR.		10-15	60034
L6	3.2 LTR.		10-15	60034

### XC70

L4	2.0 LTR.		15-16	60034
L6	3.0 LTR.		08-15	60034
L6	3.2 LTR.		08-15	60034

### XC90

L6	3.2 LTR.		07-14	60034
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## ACURA

### ILX

L4	2.0 LTR.		13-15	60516
L4	2.4 LTR.		13-15	60259

### MDX

V6	3.5 LTR.		03-06	60332
V6	3.7 LTR.	J37A1 Eng.	10-13	60259
V6	3.7 LTR.		07-09	60332

### RDX

L4	2.3 LTR.		07-12	60218
V6	3.5 LTR.		2013	60218
V6	3.5 LTR.		14-17	60259

### RL

V6	3.5 LTR.		05-08	60332
V6	3.7 LTR.	J37A2 Eng.	11-12	60259
V6	3.7 LTR.		09-10	60332

### RLX

V6	3.5 LTR.	J35Y4 Eng.	14-17	60259
V6	3.5 LTR.		14-16	60259

### RSX

L4	2.0 LTR.		02-06	60361
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### TL

V6	3.2 LTR.		04-08	60332
V6	3.5 LTR.	J35Z6 Eng.	09-14	60259
V6	3.5 LTR.		07-08	60332
V6	3.7 LTR.	J37A4 Eng.	09-14	60259

### TLX

L4	2.4 LTR.		15-18	60516
V6	3.5 LTR.	SOHC	15-18	60516
V6	3.5 LTR.		15-16	60516

### TSX

L4	2.4 LTR.	K24Z3 Eng.	09-14	60259
L4	2.4 LTR.		04-08	60218
V6	3.5 LTR.	J35Z6 Eng.	10-14	60259

### ZDX

V6	3.7 LTR.	J37A5 Eng.	10-13	60259
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## AUDI

### A3

L4	1.8 LTR.		15-16	60472
L4	2.0 LTR.		2017	60472
L4	2.0 LTR.	CBFA Eng.	08-13	60457
L4	2.0 LTR.	CCTA Eng.	08-13	60457
L4	2.0 LTR.	BPY Eng.	06-08	60197

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### A3 Quattro

L4	2.0 LTR.		15-17	60472
L4	2.0 LTR.		09-13	60457
V6	3.2 LTR.		06-09	60438

### A4

L4	1.8 LTR.		01-06	60191
L4	2.0 LTR.	Cabriolet Model Only	2009	60197
L4	2.0 LTR.	Only for Models up to Production Date 04/17/2017	13-17	60472
L4	2.0 LTR.	CAEB Eng.	09-12	60457
L4	2.0 LTR.		05-08	60197
V6	2.8 LTR.		98-99	60187
V6	2.8 LTR.		00-01	60187
V6	3.0 LTR.	BGN Eng.	2005	60187
V6	3.0 LTR.	AVK Eng.	02-05	60187

### A4 Quattro

L4	1.8 LTR.		01-05	60191
L4	2.0 LTR.	Cabriolet Model Only	2009	60197
L4	2.0 LTR.	Only for Models up to Production Date 04/17/2017	13-17	60472
L4	2.0 LTR.	CAEB Eng.	09-12	60457
L4	2.0 LTR.		05-08	60197
V6	2.8 LTR.		98-99	60187
V6	2.8 LTR.		00-01	60187
V6	3.0 LTR.		02-06	60187
V6	3.2 LTR.	CALA Eng.	2009	60504

### A5

L4	2.0 LTR.		13-14	60472
L4	2.0 LTR.		10-12	60457
V6	3.2 LTR.		08-10	60504

### A5 Quattro

L4	2.0 LTR.		13-16	60472
L4	2.0 LTR.		10-12	60457
V6	3.2 LTR.	CALA Eng.	08-10	60504

### A6

L4	2.0 LTR.		12-17	60472
V6	2.8 LTR.		98-04	60187
V6	3.2 LTR.	CALA Eng.	2010	60504

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>A6 Quattro</b>				
L4	2.0 LTR.		13-17	60472
V6	2.7 LTR.	w/ Manual Trans.	00-04	60187
V6	2.7 LTR.	w/ Automatic Trans.	00-01	60191
V6	2.8 LTR.		98-01	60187
V6	3.0 LTR.		2012	60500
V6	3.0 LTR.		02-04	60187
V6	3.0 LTR. Supercharged		2016	60500
V6	3.0 LTR. Supercharged		12-13	60500
V6	3.0 LTR. Turbo Diesel		2016	60500
V6	3.0 LTR. Turbo Diesel		12-13	60500
V8	4.2 LTR.		00-06	60323
<b>A7 Quattro</b>				
L4	2.0 LTR. Turbo		2017	60500
V6	3.0 LTR.		2012	60500
V6	3.0 LTR. Supercharged		12-17	60500
V6	3.0 LTR. Turbo Diesel		14-16	60500
<b>A8 Quattro</b>				
V6	3.0 LTR. Supercharged		13-17	60500
V6	3.0 LTR. Turbo Diesel		14-16	60500
V8	4.0 LTR. Turbo		14-16	60500
V8	4.2 LTR.		11-12	60504
V8	4.2 LTR.		00-03	60323
W12	6.3 LTR.		13-14	60500
<b>Allroad</b>				
L4	2.0 LTR.		13-16	60472
<b>Allroad Quattro</b>				
V6	2.7 LTR.		01-05	60187
V8	4.2 LTR.		03-05	60323
<b>Q5</b>				
L4	2.0 LTR.		13-17	60472
L4	2.0 LTR.	CAEB Eng.	11-12	60457
V6	3.0 LTR. Diesel		10-12	60504
V6	3.2 LTR.		09-12	60504
<b>Q51</b>				
V6	3.0 LTR. Supercharged		13-17	60500
V6	3.0 LTR. Turbo Diesel		13-17	60500
<b>Q7</b>				
L4	2.0 LTR.		2017	60472
V6	3.0 LTR. Supercharged		11-14	60504
V6	3.0 LTR. Turbo Diesel		13-14	60500
V6	3.6 LTR.		07-10	60190
V8	4.2 LTR.		07-10	60331
<b>RS5</b>				
V8	4.2 LTR.		13-15	60504

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## RS6

V8	4.2 LTR.		03-04	60331
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## RS7

V8	4.0 LTR.		14-17	60500
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## S3

L4	2.0 LTR.		15-17	60472
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## S4

V6	2.7 LTR.		00-02	60187
V6	3.0 LTR.		13-16	60500
V6	3.0 LTR. Supercharged		2013	60500
V6	3.0 LTR. Supercharged		10-12	60504
V8	4.2 LTR.		04-09	60323

## S5

V6	3.0 LTR.		13-16	60500
V6	3.0 LTR. Supercharged		2013	60500
V6	3.0 LTR. Supercharged		10-12	60504
V8	4.2 LTR.		08-12	60504

## S6

V8	4.0 LTR.		13-17	60500
V8	4.2 LTR.		02-03	60323

## S7

V8	4.0 LTR.		13-17	60500
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## S8

V8	4.0 LTR.		13-17	60500
V8	4.2 LTR.		01-03	60323

## SQ5

V6	3.0 LTR.		14-17	60500
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## TT

L4	1.8 LTR.	AWP Eng.	01-06	60197
L4	1.8 LTR.	ATC Eng.	00-01	60187
L4	2.0 LTR.	CCTA Eng.	2009	60457
L4	2.0 LTR.	BPY Eng.	08-09	60197

## TT Quattro

L4	1.8 LTR.	AMU Eng.	2002	60197
L4	1.8 LTR.	AWP Eng.	2002	60197
L4	1.8 LTR.		2001	60197
L4	1.8 LTR.		2000	60187
L4	2.0 LTR.	CETA Eng.	11-17	60472
L4	2.0 LTR.	CDMA Eng.	09-14	60197
L4	2.0 LTR.	CCTA Eng.	09-10	60457
L5	2.5 LTR.		12-13	60319
V6	3.2 LTR.		04-09	60438

## BMW

### 1 Series M

L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2011	60308
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>128i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-13	60308
<b>135i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-10	60308
<b>323Ci</b>				
L6	2.5 LTR.		2000	60257
<b>323i</b>				
L6	2.5 LTR.		98-00	60257
<b>323is</b>				
L6	2.5 LTR.		98-99	60257
<b>325Ci</b>				
L6	2.5 LTR.		01-06	60257
<b>325i</b>				
L6	2.5 LTR.		92-95	60387
L6	2.5 LTR.		01-05	60257
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60308
<b>325is</b>				
L6	2.5 LTR.		92-95	60387
<b>325xi</b>				
L6	2.5 LTR.		01-05	60257
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60308
<b>328Ci</b>				
L6	2.8 LTR.		2000	60257
<b>328i</b>				
L6	2.8 LTR.		96-00	60257
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-13	60308
<b>328i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-13	60308
<b>328is</b>				
L6	2.8 LTR.		96-99	60257
<b>328xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-08	60308
<b>330Ci</b>				
L6	3.0 LTR.		01-06	60257
<b>330i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60308
L6	3.0 LTR.		01-05	60257
<b>330xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2006	60308
L6	3.0 LTR.		01-05	60257
<b>335i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-10	60308
<b>335i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-10	60308

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>335is</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	11-13	60308
<b>335xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-08	60308
<b>525i</b>				
L6	2.5 LTR.		91-95	60387
L6	2.5 LTR.		01-05	60257
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60308
<b>525xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60308
<b>528i</b>				
L6	2.8 LTR.		97-00	60257
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-11	60308
<b>528i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-10	60308
<b>528xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2008	60308
<b>530i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60308
L6	3.0 LTR.		01-05	60257
<b>530xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-07	60308
<b>535i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-10	60308
<b>535i xDrive</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	09-10	60308
<b>535xi</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	2008	60308
<b>540i</b>				
V8	4.4 LTR.		97-03	60201
<b>545i</b>				
V8	4.4 LTR.		04-05	60281
<b>550</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	11-13	60308
<b>550i</b>				
V8	4.4 LTR.		11-14	60307
V8	4.8 LTR.		2006	60281
V8	4.8 LTR.		07-10	60307
<b>550i GT</b>				
V8	4.4 LTR.		10-14	60307
<b>550i GT xDrive</b>				
V8	4.4 LTR.		10-14	60307
<b>550i xDrive</b>				
V8	4.4 LTR.		11-14	60307

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>645Ci</b>				
V8	4.4 LTR.		04-05	60281
<b>650</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	2012	60308
<b>650i</b>				
V8	4.4 LTR.		12-13	60307
V8	4.8 LTR.		2006	60281
V8	4.8 LTR.		07-10	60307
<b>650i xDrive</b>				
V8	4.4 LTR.		12-13	60307
<b>740i</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	11-12	60308
V8	4.4 LTR.		97-01	60201
<b>740iL</b>				
V8	4.4 LTR.		96-01	60201
<b>740Li</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	11-12	60308
<b>745i</b>				
V8	4.8 LTR.		02-05	60281
<b>745Li</b>				
V8	4.4 LTR.		02-05	60281
<b>750i</b>				
V8	4.4 LTR.		09-12	60307
V8	4.8 LTR.		2006	60281
V8	4.8 LTR.		07-08	60307
<b>750i xDrive</b>				
V8	4.4 LTR.		10-13	60307
<b>750iL</b>				
V12	5.4 LTR.		95-01	60201
<b>750Li</b>				
V8	4.4 LTR.		09-13	60307
V8	4.8 LTR.		2006	60281
V8	4.8 LTR.		07-08	60307
<b>750Li xDrive</b>				
V8	4.4 LTR.		10-13	60307
<b>760Li</b>				
V12	6.0 LTR.		10-15	60307
<b>840Ci</b>				
V8	4.4 LTR.		96-97	60201
<b>850Ci</b>				
V12	5.4 LTR.		95-97	60201
<b>Alpina B7</b>				
V8	4.4 LTR.		07-13	60307

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Alpina B7 xDrive</b>				
V8	4.4 LTR.		11-13	60307
<b>Alpina B7L</b>				
V8	4.4 LTR.		11-13	60307
<b>Alpina B7L xDrive</b>				
V8	4.4 LTR.		11-13	60307
<b>M3</b>				
L6	3.0 LTR.		1995	60387
L6	3.2 LTR.		96-99	60257
V8	4.0 LTR.	Use 12 14 1 748 398 O-ring, Manual Trans.	08-13	60308
V8	4.0 LTR.	w/ Auto Dual Clutch Trans.	08-13	60201
<b>M5</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	13-16	60308
V10	5.0 LTR.	Use 12 14 1 748 398 O-ring, Manual Trans.	06-10	60308
V10	5.0 LTR.	w/ Auto Dual Clutch Trans.	06-10	60201
V8	5.0 LTR.		00-03	60201
<b>M6</b>				
V8	4.4 LTR.	Use 12 14 1 748 398 O-ring	12-16	60308
V10	5.0 LTR.		06-10	60201
V8	5.0 LTR.	Use 12 14 1 748 398 O-ring	06-10	60308
<b>X3</b>				
V6	2.5 LTR.		04-06	60257
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-12	60308
V6	3.0 LTR.		04-06	60257
<b>X5</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	07-10	60308
L6	3.0 LTR.		01-06	60257
V8	4.4 LTR.		10-13	60307
V8	4.4 LTR.		04-06	60281
V8	4.8 LTR.		07-10	60307
V8	4.8 LTR.		04-06	60281
<b>X6</b>				
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	08-10	60308
V8	4.4 LTR.		08-14	60307
<b>Z3</b>				
L6	2.5 LTR.		99-02	60257
L6	2.8 LTR.		97-00	60257
L6	3.0 LTR.		01-02	60257
L6	3.2 LTR.		98-00	60257
<b>Z4</b>				
V6	2.5 LTR.		03-05	60257
L6	3.0 LTR.	Use 12 14 1 748 398 O-ring	06-16	60308
V6	3.0 LTR.		03-05	60257
<b>Z8</b>				
V8	5.0 LTR.		00-03	60201

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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## CHEVROLET

### *Cobalt*

L4	2.0 LTR.		05-07	60249
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## CHRYSLER

### *Cirrus*

L4	2.0 LTR.		2000	60342
L4	2.4 LTR.		97-00	60342

### *Crossfire*

V6	3.2 LTR.		04-08	60270
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### *Neon*

L4	2.0 LTR.		00-02	60342
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### *PT Crusier*

L4	2.4 LTR.		01-02	60342
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### *Sebring*

L4	2.0 LTR.		97-99	60342
L4	2.4 LTR.		01-02	60342

### *Voyager*

L4	2.4 LTR.		00-02	60342
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## DODGE

### *Avenger*

L4	2.0 LTR.		98-99	60342
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### *Caravan*

L4	2.4 LTR.		98-01	60342
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### *Dakota*

V6	3.7 LTR.		04-10	60272
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### *Durango*

V6	3.7 LTR.		04-09	60272
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### *Neon*

L4	2.0 LTR.		98-02	60342
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### *Nitro*

V6	3.7 LTR.		09-10	60272
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### *Ram 1500*

V6	3.7 LTR.		04-10	60272
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### *Ram 2500*

L6	5.9 LTR.		2007	60272
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### *Ram 3500*

L6	5.9 LTR.		2007	60272
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### **Sprinter 2500**

V6	2.7 LTR.		03-06	60270
V6	3.0 LTR.		2007	60270
V6	3.0 LTR.		08-09	60231
V6	3.5 LTR.		2008	60231
V6	3.5 LTR.		2007	60270

### **Sprinter 3500**

L5	2.7 LTR.		03-06	60270
V6	3.0 LTR.		2007	60270
V6	3.0 LTR.		08-09	60231
V6	3.5 LTR.		2008	60231
V6	3.5 LTR.		2007	60270

### **Stratus**

L4	2.0 LTR.		97-00	60342
L4	2.4 LTR.		97-02	60342

## EAGLE

### **Talon**

L4	2.0 LTR.		97-98	60342
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## FREIGHTLINER

### **Sprinter 2500**

V6	3.0 LTR.		09-10	60231
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### **Sprinter 3500**

V6	3.0 LTR.		09-10	60231
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## HONDA

### **Accord**

L4	2.0 LTR.	ELECTRIC/GAS	14-15	60516
L4	2.4 LTR.		13-17	60516
L4	2.4 LTR.	Trim: EX	13-16	60516
L4	2.4 LTR.	K24Z2 Eng.	08-12	60259
L4	2.4 LTR.	K24Z3 Eng.	08-12	60259
L4	2.4 LTR.		03-07	60218
V6	3.0 LTR.		03-07	60332
V6	3.5 LTR.		08-17	60259

### **Accord Crosstour**

V6	3.5 LTR.	J35Z2 Eng.	10-11	60259
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### **Civic**

L4	1.3 LTR.		03-11	60361
L4	1.7 LTR.		01-05	60360
L4	1.8 LTR.		12-15	60516
L4	1.8 LTR.	CNG	12-15	60516
L4	1.8 LTR.		06-11	60218
L4	2.0 LTR.		02-11	60361
L4	2.4 LTR.		12-15	60259
L4	2.4 LTR.		02-09	60361

### **Crosstour**

L4	2.4 LTR.	K24Y2 Eng.	12-15	60259
V6	3.5 LTR.		12-15	60259

### **CR-V**

L4	2.4 LTR.		15-18	60516
L4	2.4 LTR.		10-14	60259

### **Element**

L4	2.4 LTR.		03-11	60218
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### **Fit**

L4	1.5 LTR.		07-08	60218
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### **HR-V**

L4	1.8 LTR.		16-18	60516
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### **Odyssey**

V6	3.5 LTR.	J35Z8 Eng.	11-17	60259
V6	3.5 LTR.	J35A7 Eng.	08-10	60259
V6	3.5 LTR.	J35A6 Eng.	05-10	60332
V6	3.5 LTR.	J35A7 Eng.	05-07	60332

### **Pilot**

V6	3.5 LTR.	J35Z4 Eng.	09-15	60259
V6	3.5 LTR.		05-08	60332

### **Ridgeline**

V6	3.5 LTR.	J35Z5 Eng.	09-14	60259
V6	3.5 LTR.		06-08	60332

## HYUNDAI

### **Accent**

L4	1.5 LTR.		00-02	60223
L4	1.6 LTR.		12-17	60214
L4	1.6 LTR.		01-11	60223

### **Elantra**

L4	1.8 LTR.		11-16	60214
L4	2.0 LTR.		14-17	60214

### **Elantra Coupe**

L4	1.8 LTR.		2013	60214
L4	2.0 LTR.		2014	60214

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Elantra GT</b>				
L4	1.8 LTR.		2013	60214
L4	2.0 LTR.		14-17	60214
<b>Rio</b>				
L4	1.6 LTR.		06-11	60223
<b>Rio5</b>				
L4	1.6 LTR.		06-11	60223
<b>Santa Fe</b>				
L4	2.4 LTR.		10-12	60224
V6	2.7 LTR.		01-06	60209
<b>Santa Fe Sport</b>				
L4	2.0 LTR.		13-14	60224
L4	2.4 LTR.		13-14	60224
<b>Sonata</b>				
L4	2.0 LTR.		11-14	60224
L4	2.4 LTR.		06-15	60224
V6	2.5 LTR.		99-01	60209
V6	2.7 LTR.		02-05	60209
<b>Tiburon</b>				
V6	2.7 LTR.		03-08	60209
<b>Tucson</b>				
L4	2.0 LTR.		11-13	60224
L4	2.4 LTR.		10-15	60224
V6	2.7 LTR.		05-09	60209
<b>Tuscon</b>				
L4	2.0 LTR.		14-17	60214
<b>Veloster</b>				
L4	1.6 LTR.		12-17	60214

## INFINITI

<b>EX35</b>				
V6	3.5 LTR.		08-12	60276
<b>EX37</b>				
V6	3.7 LTR.		2013	60276
<b>FX35</b>				
V6	3.5 LTR.		09-12	60276
V6	3.5 LTR.		03-08	60325
<b>FX37</b>				
V6	3.7 LTR.		2013	60276
<b>FX45</b>				
V8	4.5 LTR.		03-08	60040
<b>G35</b>				
V6	3.5 LTR.	VQ35HR Eng.	07-08	60276
V6	3.5 LTR.	VQ35DE Eng.	03-07	60325



CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>G37</b>				
V6	3.7 LTR.		08-13	60276
<b>I30</b>				
V6	3.0 LTR.		96-01	60363
<b>I35</b>				
V6	3.5 LTR.		02-04	60325
<b>JX35</b>				
V6	3.5 LTR.		2013	60276
<b>M35</b>				
V6	3.5 LTR.		09-10	60276
V6	3.5 LTR.		06-08	60325
<b>M35h</b>				
V6	3.5 LTR.		12-13	60276
<b>M37</b>				
V6	3.7 LTR.		11-13	60276
<b>M45</b>				
V8	4.5 LTR.		06-10	60040
V8	4.5 LTR.	VK45DE Eng.	06-10	60040
V8	4.5 LTR.		03-04	60040
<b>Q45</b>				
V8	4.5 LTR.		02-06	60040
<b>Q50</b>				
V6	3.5 LTR.		2014	60276
V6	3.7 LTR.		2014	60276
<b>Q60</b>				
V6	3.7 LTR.		2014	60276
<b>Q70</b>				
V6	3.5 LTR.		2014	60276
V6	3.7 LTR.		2014	60276
<b>QX4</b>				
V6	3.5 LTR.		01-03	60363
<b>QX50</b>				
V6	3.7 LTR.		2014	60276
<b>QX56</b>				
V8	5.6 LTR.		04-10	60040
<b>QX60</b>				
V6	3.5 LTR.		2014	60276
<b>QX70</b>				
V6	3.7 LTR.		2014	60276

## JEEP

<b>Commander</b>				
V6	3.7 LTR.		06-10	60272

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### Grand Cherokee

V6	3.0 LTR.		07-09	60231
V6	3.7 LTR.		05-10	60272

### Liberty

V6	3.7 LTR.		04-10	60272
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## KIA

### Forte

L4	1.8 LTR.		2014	60214
L4	2.0 LTR.		2014	60214
L4	2.0 LTR.		10-13	60224
L4	2.4 LTR.		10-13	60224

### Forte Koup

L4	2.0 LTR.		2014	60214
L4	2.0 LTR.		10-13	60224
L4	2.4 LTR.		10-13	60224

### Forte5

L4	2.0 LTR.		14-17	60214
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### Optima

L4	2.0 LTR.		11-14	60224
L4	2.4 LTR.		06-14	60224
V6	2.5 LTR.		2001	60209
V6	2.7 LTR.		02-06	60209

### Rio

L4	1.6 LTR.		12-14	60214
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### Rondo

L4	2.4 LTR.		07-12	60224
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### Sorento

L4	2.4 LTR.		11-14	60224
V6	3.5 LTR.		03-06	60275

### Soul

L4	1.6 LTR.		10-14	60214
L4	2.0 LTR.		12-14	60214

### Sportage

L4	2.0 LTR.		2005	60209
L4	2.0 LTR.		11-14	60224
L4	2.4 LTR.		11-14	60224
V6	2.7 LTR.		05-10	60209

## LAND ROVER

### Discovery

V8	4.0 LTR.		98-02	60510
V8	4.6 LTR.		03-04	60510

### LR2

L6	3.2 LTR.		08-12	60232
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Range Rover</b>				
V8	4.0 LTR.		99-00	60510
V8	4.6 LTR.		99-02	60510
<b>LEXUS</b>				
<b>CT200h</b>				
L4	1.8 LTR.		11-17	60462
<b>ES300</b>				
V6	3.0 LTR.	1MZ-FE Eng.	94-03	60045
<b>ES300h</b>				
L4	2.5 LTR.		13-17	60462
<b>ES330</b>				
V6	3.3 LTR.	3MZ-FE Eng.	04-06	60045
<b>ES350</b>				
V6	3.5 LTR.	2GRFE Eng.	07-17	60264
<b>GS300</b>				
V6	3.0 LTR.	3GR-FSE Eng.	2006	60264
<b>GS350</b>				
V6	3.5 LTR.	2GR-FSE Eng.	07-15	60264
<b>GS400</b>				
V8	4.0 LTR.	1UZ-FE Eng.	98-00	60226
<b>GS430</b>				
V8	4.3 LTR.	3UZ-FE Eng.	01-07	60226
<b>GS450h</b>				
V6	3.5 LTR.	2GR-FXE Eng.	13-17	60264
V6	3.5 LTR.	2GR-FSE Eng.	07-11	60264
<b>GX470</b>				
V8	4.7 LTR.		03-09	60226
<b>HS250h</b>				
L4	2.4 LTR.	2AZ-FXE Eng.	10-12	60242
<b>IS250</b>				
V6	2.5 LTR.	4GR-FSE Eng.	06-15	60264
<b>IS350</b>				
V6	2.5 LTR.	2GR-FSE Eng.	06-17	60264
<b>LS400</b>				
V8	4.0 LTR.		98-00	60226
<b>LS430</b>				
V8	4.3 LTR.	3UZ-FE Eng.	01-06	60226
<b>LX470</b>				
V8	4.7 LTR.		98-07	60226
<b>NX300h</b>				
L4	2.5 LTR.		15-17	60462

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>RC300</b>				
V6	3.5 LTR.	2GR-FSE Eng.	06-17	60264
<b>RC350</b>				
V6	3.5 LTR.	2GR-FSE Eng.	15-17	60264
<b>RX300</b>				
V6	3.0 LTR.	1MZ-FE Eng.	99-03	60045
<b>RX330</b>				
V6	3.3 LTR.	3MZ-FE Eng.	04-06	60045
<b>RX350</b>				
V6	3.5 LTR.	2GRFE Eng.	07-15	60264
<b>RX400h</b>				
V6	3.3 LTR.	3MZ-FE Eng.	06-08	60045
<b>RX450h</b>				
V6	3.5 LTR.	2GR-FXE Eng.	10-15	60264
<b>SC400</b>				
V8	4.0 LTR.	1UZ-FE Eng.	98-00	60226
<b>SC430</b>				
V8	4.3 LTR.	3UZ-FE Eng.	02-10	60226

## MAZDA

<b>3</b>				
L4	2.0 LTR.		06-13	60172
L4	2.3 LTR.		06-13	60172
L4	2.5 LTR.		10-13	60172
<b>5</b>				
L4	2.3 LTR.		08-10	60172
L4	2.5 LTR.		12-15	60172
<b>6</b>				
L4	2.3 LTR.		06-08	60172
L4	2.5 LTR.		09-13	60172
<b>CX-7</b>				
L4	2.3 LTR.		07-12	60172
L4	2.5 LTR.		10-12	60172
<b>MX-5 Miata</b>				
L4	2.0 LTR.		06-15	60172

## MERCEDES-BENZ

<b>C230</b>				
L4	1.8 LTR.		03-05	60270
L4	2.3 LTR.		99-02	60270
V6	2.5 LTR.		06-09	60231
<b>C240</b>				
V6	2.6 LTR.		01-05	60270

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>C250</b>				
L4	1.8 LTR.		12-15	60231
L4	1.8 LTR. Turbo		12-15	60333
V6	2.5 LTR.		2012	60333
<b>C280</b>				
V6	2.8 LTR.	w/1 Locking Tab	98-99	60270
V6	2.8 LTR.	w/2 Locking Tabs	98-00	60376
L6	2.8 LTR.		94-97	60376
V6	3.0 LTR.		06-07	60231
<b>C300</b>				
L4	2.0 LTR.		2015	60333
V6	3.0 LTR.		08-12	60231
V6	3.5 LTR.		13-14	60333
<b>C32 AMG</b>				
V6	3.2 LTR.		02-04	60270
<b>C320</b>				
V6	3.2 LTR.		01-05	60270
<b>C350</b>				
V6	3.5 LTR.		12-15	60333
V6	3.5 LTR.		06-11	60231
<b>C36 AMG</b>				
L6	3.6 LTR.		95-97	60376
<b>C43 AMG</b>				
V8	4.3 LTR.	From Eng.# 60 002421, w/1 Locking Tab	98-00	60270
V8	4.3 LTR.	To Eng.# 60 002420, w/2 Locking Tabs	98-00	60376
<b>C55 AMG</b>				
V8	5.5 LTR.		05-06	60270
<b>C63 AMG</b>				
V8	6.3 LTR.		08-15	60231
<b>CL500</b>				
V8	5.0 LTR.		98-06	60270
<b>CL55 AMG</b>				
V8	5.5 LTR.		01-06	60270
<b>CL550</b>				
V8	4.7 LTR.		11-14	60333
V8	5.5 LTR.		07-10	60231
<b>CL600</b>				
V12	5.5 LTR.		03-14	60270
V12	5.8 LTR.		01-02	60270
<b>CL63 AMG</b>				
V8	5.5 LTR.		11-14	60333
V8	6.3 LTR.		08-10	60231
<b>CL65 AMG</b>				
V12	6.0 LTR.		05-14	60270

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>CLK 320</b>				
V6	3.2 LTR.		98-00	60376
<b>CLK320</b>				
V6	3.2 LTR.		98-05	60270
<b>CLK350</b>				
V6	3.5 LTR.		06-09	60231
<b>CLK430</b>				
V8	4.3 LTR.		99-03	60270
<b>CLK500</b>				
V8	5.0 LTR.	113.968 Eng.	2006	60270
V8	5.0 LTR.		03-05	60270
<b>CLK55 AMG</b>				
V8	5.5 LTR.		01-06	60270
<b>CLK550</b>				
V8	5.5 LTR.		07-09	60231
<b>CLK63 AMG</b>				
V8	6.3 LTR.		07-08	60231
<b>CLS500</b>				
V8	5.0 LTR.		2006	60270
<b>CLS55 AMG</b>				
V8	5.5 LTR.		2006	60270
<b>CLS550</b>				
V8	4.7 LTR.		12-17	60333
V8	5.5 LTR.		07-11	60231
<b>CLS63 AMG</b>				
V8	5.5 LTR.		12-14	60333
V8	6.3 LTR.		07-11	60231
<b>CLS63 AMG S</b>				
V8	5.5 LTR.		14-17	60333
<b>E250</b>				
L4	2.1 LTR. Diesel		14-17	60333
<b>E320</b>				
V6	3.2 LTR.	From Eng.# 30 370999 & 31 000001, w/1 Locking Tab	98-05	60270
V6	3.2 LTR.	To Eng.# 30 370998 & 31 000000, w/2 Locking Tabs	98-03	60376
L6	3.2 LTR.		1997	60376
L6	3.2 LTR.		05-06	60270
<b>E350</b>				
V6	3.0 LTR.		11-13	60231
V6	3.0 LTR. Diesel		11-13	60333
V6	3.5 LTR.		12-16	60333
V6	3.5 LTR.		06-11	60231
<b>E400</b>				
V6	3.0 LTR. Turbo		15-16	60333
V6	3.5 LTR.	ELECTRIC/GAS	13-15	60333

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>E430</b>				
V8	4.3 LTR.	From Eng.# 30 039710, w/1 Locking Tab	98-02	60270
V8	4.3 LTR.	To Eng.# 30 039709, w/2 Locking Tabs	98-02	60376
<b>E500</b>				
V8	5.0 LTR.		03-06	60270
<b>E55 AMG</b>				
V8	5.5 LTR.	From Eng.# 60 002693, w/1 Locking Tab	99-06	60270
V8	5.5 LTR.	To Eng.# 60 002692, w/2 Locking Tabs	99-02	60376
<b>E550</b>				
V8	4.7 LTR.		12-17	60333
V8	5.5 LTR.		07-11	60231
<b>E63 AMG</b>				
V8	5.5 LTR.		12-15	60333
V8	6.3 LTR.		07-11	60231
<b>E63 AMG S</b>				
V8	5.5 LTR.		14-16	60333
<b>G500</b>				
V8	5.0 LTR.		02-08	60270
<b>G55 AMG</b>				
V8	5.5 LTR.		03-11	60270
<b>G550</b>				
V8	5.5 LTR.		09-15	60231
<b>G63 AMG</b>				
V8	5.5 LTR.		13-17	60333
<b>GL350</b>				
V6	3.0 LTR. Turbo Diesel		11-16	60333
<b>GL450</b>				
V6	3.0 LTR.		15-16	60333
V8	4.6 LTR.		07-12	60231
V8	4.7 LTR.		13-14	60333
<b>GL550</b>				
V8	4.7 LTR.		13-16	60333
V8	5.5 LTR.		08-12	60231
<b>GL63 AMG</b>				
V8	5.5 LTR.		13-16	60333
<b>GLK250</b>				
L4	2.1 LTR. Diesel		13-15	60333
<b>GLK350</b>				
V6	3.5 LTR.		13-15	60333
V6	3.5 LTR.		10-12	60231
<b>ML320</b>				
V6	3.2 LTR.	From Eng.# 30 358407, w/1 Locking Tab	98-03	60270
V6	3.2 LTR.	To Eng.# 30 358406, w/2 Locking Tabs	98-03	60376

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>ML350</b>				
V6	3.0 LTR. Turbo Diesel		11-14	60333
V6	3.5 LTR.		12-15	60333
V6	3.5 LTR.		06-11	60231
V6	3.7 LTR.		03-05	60270
<b>ML430</b>				
V8	4.3 LTR.		99-01	60270
<b>ML450</b>				
V6	3.5 LTR.		10-11	60231
<b>ML500</b>				
V8	5.0 LTR.		02-07	60270
<b>ML55 AMG</b>				
V8	5.5 LTR.		00-03	60270
<b>ML550</b>				
V8	4.7 LTR.		12-14	60333
V8	5.5 LTR.		08-11	60231
<b>ML63 AMG</b>				
V8	5.5 LTR.		12-15	60333
V8	6.3 LTR.		07-11	60231
<b>R320</b>				
V6	3.0 LTR.		07-09	60231
<b>R350</b>				
V6	3.0 LTR. Turbo Diesel		11-12	60333
V6	3.5 LTR.		2012	60333
V6	3.5 LTR.		06-11	60231
<b>R500</b>				
V8	5.0 LTR.		06-07	60270
<b>R63 AMG</b>				
V8	6.3 LTR.		2007	60231
<b>S350</b>				
V6	3.0 LTR. Diesel		2012	60333
V6	3.7 LTR.		2006	60270
<b>S400</b>				
V6	3.5 LTR.		11-13	60231
<b>S430</b>				
V8	4.3 LTR.		00-06	60270
<b>S500</b>				
V8	5.0 LTR.		00-06	60270
<b>S55 AMG</b>				
V8	5.5 LTR.		01-06	60270
<b>S550</b>				
V8	4.7 LTR.		12-17	60333
V8	5.5 LTR.		07-11	60231



CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>S600</b>				
V12	5.5 LTR.		03-13	60270
V12	5.8 LTR.		01-02	60270
<b>S63 AMG</b>				
V8	5.5 LTR.		11-17	60333
V8	6.3 LTR.		08-10	60231
<b>S65 AMG</b>				
V12	6.0 LTR.		06-13	60270
<b>SL500</b>				
V8	5.0 LTR.		99-06	60270
<b>SL55 AMG</b>				
V8	5.5 LTR.		03-08	60270
<b>SL550</b>				
V8	4.7 LTR.		13-17	60333
V8	5.5 LTR.		07-12	60231
<b>SL600</b>				
V12	5.5 LTR.		04-09	60270
<b>SL63 AMG</b>				
V8	5.5 LTR.		13-17	60333
V8	6.3 LTR.		09-12	60231
<b>SL65</b>				
V12	6.0 LTR.		13-17	60333
V12	6.0 LTR.		05-11	60270
<b>SLK230</b>				
L4	2.3 LTR.		99-04	60270
<b>SLK250</b>				
L4	1.8 LTR.		12-15	60333
<b>SLK280</b>				
V6	3.0 LTR.		06-08	60231
<b>SLK300</b>				
V6	3.0 LTR.		09-11	60231
<b>SLK32 AMG</b>				
V6	3.2 LTR.		02-04	60270
<b>SLK320</b>				
V6	3.2 LTR.		01-04	60270
<b>SLK350</b>				
V6	3.5 LTR.		12-16	60333
V6	3.5 LTR.		05-11	60231
<b>SLK55 AMG</b>				
V8	5.5 LTR.		12-16	60333
V8	5.5 LTR.		05-10	60270
<b>SLR McLaren</b>				
V8	5.5 LTR.		05-09	60270

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### **SLS AMG**

V8	6.3 LTR.		11-15	60231
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### **Sprinter 2500**

L4	2.1 LTR. Diesel		14-17	60333
V6	3.0 LTR.		10-18	60231

### **Sprinter 3500**

L4	2.1 LTR. Diesel		14-17	60333
V6	3.0 LTR.		10-18	60231

## MINI

### **Cooper**

L4	1.6 LTR.		07-15	60383
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### **Cooper Countryman**

L4	1.6 LTR.		11-16	60383
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### **Cooper Paceman**

L4	1.6 LTR.		13-16	60383
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## MITSUBISHI

### **Eclipse**

V6	3.8 LTR.		06-12	60372
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### **Endeavor**

V6	3.8 LTR.		05-11	60372
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### **Galant**

V6	3.8 LTR.		04-09	60372
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### **Mirage**

L4	1.8 LTR.		97-00	60284
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### **Raider**

V6	3.7 LTR.		06-09	60272
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## NISSAN

### **350Z**

V6	3.5 LTR.		07-09	60276
V6	3.5 LTR.		03-06	60325

### **370Z**

V6	3.7 LTR.		09-14	60276
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### **Altima**

L4	2.5 LTR.		07-18	60461
L4	2.5 LTR.		02-06	60165
V6	3.5 LTR.		07-14	60276
V6	3.5 LTR.	w/ Manual Trans.	04-05	60325
V6	3.5 LTR.		02-03	60325

### **Armada**

V8	5.6 LTR.		05-15	60040
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CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Cube</b>				
L4	1.8 LTR.		09-14	60216
<b>Frontier</b>				
L4	2.5 LTR.		05-17	60165
V6	4.0 LTR.		05-17	60326
<b>GT-R</b>				
V6	3.8 LTR.		09-14	60276
<b>Maxima</b>				
V6	3.0 LTR.	VQ30DE Eng.	95-00	60363
V6	3.5 LTR.	SE w/ Manual Trans. & SL w/ Automatic Trans.	2004	60325
V6	3.5 LTR.		09-14	60276
V6	3.5 LTR.	SE w/ Manual Trans.	05-06	60325
V6	3.5 LTR.		02-03	60325
<b>Murano</b>				
V6	3.5 LTR.		09-14	60276
V6	3.5 LTR.		03-07	60325
<b>NV1500</b>				
V6	4.0 LTR.		12-17	60326
<b>NV200</b>				
L4	2.0 LTR.		13-17	60216
<b>NV2500</b>				
V6	4.0 LTR.		12-17	60326
V8	5.6 LTR.		12-17	60040
<b>NV3500</b>				
V6	4.0 LTR.		12-17	60326
V8	5.6 LTR.		12-17	60040
<b>Pathfinder</b>				
V6	3.5 LTR.	VQ35DE Eng.	13-16	60276
V6	3.5 LTR.		03-04	60325
V6	3.5 LTR.		01-02	60363
V6	4.0 LTR.		05-12	60326
V8	5.6 LTR.		08-12	60040
<b>Pathfinder Armada</b>				
V8	5.6 LTR.		2004	60040
<b>Quest</b>				
V6	3.5 LTR.	S & SL w/ Automatic Trans.	2004	60325
V6	3.5 LTR.		11-17	60276
V6	3.5 LTR.	Base; S w/ Automatic Trans.	05-06	60325
<b>Rogue</b>				
L4	2.5 LTR.		08-17	60461
<b>Rogue Select</b>				
L4	2.5 LTR.		14-15	60461

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Sentra</b>				
L4	1.8 LTR.		00-06	60040
L4	2.0 LTR.		07-12	60216
L4	2.5 LTR.		07-12	60461
L4	2.5 LTR.		02-06	60165

<b>Titan</b>				
V8	5.6 LTR.		04-15	60040

<b>Versa</b>				
L4	1.6 LTR.		09-17	60216
L4	1.8 LTR.		07-12	60216

<b>Versa Note</b>				
L4	1.6 LTR.		14-17	60216

<b>Xterra</b>				
V6	4.0 LTR.		05-15	60326

## PLYMOUTH

<b>Breeze</b>				
L4	2.4 LTR.		97-00	60342

<b>Grand Voyager</b>				
L4	2.4 LTR.		1997	60342

<b>Neon</b>				
L4	2.0 LTR.		98-01	60342

<b>Voyager</b>				
L4	2.4 LTR.		97-00	60342

## PONTIAC

<b>Vibe</b>				
L4	2.4 LTR.		09-10	60242

## PORSCHE

<b>Cayenne</b>				
V6	3.0 LTR. Supercharged	ELECTRIC/GAS	11-12	60500
V6	3.2 LTR.		04-06	60190
V6	3.6 LTR.		08-10	60190

<b>Panamera</b>				
V6	3.0 LTR. Supercharged	ELECTRIC/GAS	2012	60500
V6	3.0 LTR. Turbo Diesel		2012	60500

## SAAB

<b>900</b>				
L4	2.0 LTR.		96-98	60230
L4	2.3 LTR.		96-98	60230

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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**9-3**

L4	2.0 LTR.	Arc, Linear & Vector	2003	60249
L4	2.0 LTR.	SE	2003	60230
L4	2.0 LTR.		04-11	60249
L4	2.0 LTR.		00-02	60230
L4	2.3 LTR.		99-02	60230

**9-3X**

L4	2.0 LTR.		10-11	60249
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**9-5**

L4	2.3 LTR.		99-09	60230
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## SATURN

**Ion**

L4	2.0 LTR.		04-07	60249
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## SCION

**iM**

L4	1.8 LTR.	2ZR-FAE Eng.	2016	60462
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**tC**

L4	2.4 LTR.	2AZ-FE Eng.	2010	60242
L4	2.4 LTR.		05-09	60242
L4	2.5 LTR.		11-16	60462

**xB**

L4	2.4 LTR.		14-15	60242
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**xD**

L4	1.8 LTR.	2ZR-FE Eng.	08-14	60462
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## TOYOTA

**4Runner**

V6	4.0 LTR.	1GR-FE Eng.	03-17	60264
V8	4.7 LTR.		03-09	60226

**Avalon**

L4	2.5 LTR.	2AR-FXE Eng.	13-17	60462
V6	3.0 LTR.	1MZ-FE Eng.	95-04	60045
V6	3.5 LTR.	2GRFE Eng.	05-17	60264

**Camry**

L4	2.4 LTR.	2AZ-FXE Eng.	07-11	60242
L4	2.4 LTR.	2AZ-FE Eng.	02-09	60242
L4	2.5 LTR.	2AR-FXE Eng.	12-17	60462
L4	2.5 LTR.	2AR-FE Eng.	10-17	60462
V6	3.0 LTR.	1MZ-FE Eng.	96-06	60045
V6	3.0 LTR.		94-95	60045
V6	3.3 LTR.	3MZ-FE Eng.	04-06	60045
V6	3.5 LTR.	2GRFE Eng.	07-17	60264

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>C-HR</b>				
L4	2.0 LTR.	3ZR-FAE Eng.	2018	60462
<b>Corolla</b>				
L4	1.8 LTR.	2ZR-FAE Eng.	14-17	60462
L4	1.8 LTR.	2ZR-FE Eng.	09-17	60462
L4	2.4 LTR.	2AZ-FE Eng.	09-10	60242
<b>Corolla iM</b>				
L4	1.8 LTR.	2ZR-FAE Eng.	17-18	60462
<b>FJ Crusier</b>				
V6	4.0 LTR.	1GR-FE Eng.	07-14	60264
<b>Highlander</b>				
L4	2.4 LTR.	2AZ-FE Eng.	01-07	60242
L4	2.7 LTR.	1AR-FE Eng.	09-17	60462
V6	3.3 LTR.	3MZ-FE Eng.	04-10	60045
V6	3.5 LTR.	2GR-FXE Eng.	11-16	60264
V6	3.5 LTR.	2GRFE Eng.	08-16	60264
<b>Land Cruiser</b>				
V8	4.7 LTR.		98-07	60226
<b>Matrix</b>				
L4	1.8 LTR.	2ZR-FE Eng.	09-13	60462
L4	2.0 LTR.	1AZ-FE Eng.	01-03	60242
L4	2.4 LTR.	2AZ-FE Eng.	09-13	60242
<b>Prius</b>				
L4	1.8 LTR.	2ZR-FXE Eng.	10-17	60462
<b>Prius Plug-In</b>				
L4	1.8 LTR.		12-15	60462
<b>Prius Prime</b>				
L4	1.8 LTR.		2017	60462
<b>Prius V</b>				
L4	1.8 LTR.	2ZR-FXE Eng.	12-17	60462
<b>RAV4</b>				
L4	2.4 LTR.	2AZ-FE Eng.	04-08	60242
L4	2.5 LTR.	2AR-FXE Eng.	16-17	60462
L4	2.5 LTR.	2AR-FE Eng.	09-17	60462
V6	3.5 LTR.	2GRFE Eng.	06-12	60264
<b>Sequoia</b>				
V8	4.7 LTR.		01-09	60226
<b>Sienna</b>				
L4	2.7 LTR.	1AR-FE Eng.	11-12	60462
V6	3.0 LTR.	1MZ-FE Eng.	98-03	60045
V6	3.3 LTR.	3MZ-FE Eng.	04-06	60045
V6	3.5 LTR.	2GRFE Eng.	07-16	60264

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>Solara</b>				
L4	2.4 LTR.	2AZ-FE Eng.	02-08	60242
V6	3.0 LTR.	1MZ-FE Eng.	99-03	60045
V6	3.3 LTR.	3MZ-FE Eng.	04-08	60045
<b>Tacoma</b>				
V6	4.0 LTR.	1GR-FE Eng.	05-15	60264
<b>Tundra</b>				
V6	4.0 LTR.	1GR-FE Eng.	05-14	60264
V8	4.7 LTR.		00-09	60226
<b>Venza</b>				
L4	2.7 LTR.	1AR-FE Eng.	09-15	60462
V6	3.5 LTR.	2GRFE Eng.	09-15	60264

## VOLKSWAGEN

<b>Atlas</b>				
V6	3.6 LTR.		2018	60472
<b>Beetle</b>				
L4	1.8 LTR.	APH Eng.	99-01	60187
L4	1.8 LTR.		2005	60197
L4	1.8 LTR.	AWV Eng.	2001	60187
L4	1.8 LTR.	AWP Eng.	02-04	60197
L4	1.8 LTR.	AWV Eng.	02-04	60197
L4	2.0 LTR.	AEG Eng.	98-01	60187
L4	2.0 LTR.	CBFA Eng.	12-13	60457
L4	2.0 LTR.		04-05	60197
L4	2.0 LTR.	AVH Eng.	01-03	60197
L4	2.0 LTR.	AZG Eng.	01-02	60197
L5	2.5 LTR.	CBTA Eng.	12-14	60319
L5	2.5 LTR.	CBUA Eng.	12-14	60319
L5	2.5 LTR.	BPR Eng.	06-10	60319
L5	2.5 LTR.	BPS Eng.	06-10	60319
<b>Cabrio</b>				
L4	2.0 LTR.		95-99	60390
<b>CC</b>				
L4	2.0 LTR.		09-17	60457
V6	3.6 LTR.		09-11	60438
<b>Eos</b>				
L4	2.0 LTR.	CBFA Eng.	09-16	60457
L4	2.0 LTR.	CCTA Eng.	09-16	60457
L4	2.0 LTR.	BPY Eng.	07-09	60197
V6	3.2 LTR.		07-08	60438
<b>EuroVan</b>				
V6	2.8 LTR.	AES Eng.	99-00	60330
V6	2.8 LTR.		1997	60330
V6	2.8 LTR.	AXK Eng.	01-03	60190

CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### *Golf*

L4	1.8 LTR.	CNSA Eng.	2015	60472
L4	1.8 LTR.		02-06	60197
L4	1.8 LTR.		00-01	60187
L4	2.0 LTR.	AEG Eng.	99-01	60187
L4	2.0 LTR.	ABA Eng.	95-99	60390
L4	2.0 LTR.		93-94	60390
L4	2.0 LTR.	AVH Eng.	2001	60197
L4	2.0 LTR.	AZG Eng.	2001	60197
L4	2.0 LTR.		12-13	60197
L4	2.0 LTR.		02-06	60197
L5	2.5 LTR.	CBTA Eng.	10-14	60319
L5	2.5 LTR.	CBUA Eng.	10-14	60319
V6	2.8 LTR.	AFP Eng.	99-02	60190
V6	2.8 LTR.	AAA Eng.	96-98	60330
V6	2.8 LTR.	BDF Eng.	02-05	60438
V6	3.2 LTR.		2004	60190

### *Golf R*

L4	2.0 LTR.		15-18	60472
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### *GTI*

L4	2.0 LTR.	CBFA Eng.	08-14	60457
L4	2.0 LTR.	CCTA Eng.	08-14	60457
L4	2.0 LTR.	BPY Eng.	06-08	60197

### *Jetta*

L4	1.8 LTR.		02-05	60197
L4	1.8 LTR.		00-01	60187
L4	2.0 LTR.		99-00	60187
L4	2.0 LTR.	ABA Eng.	95-99	60390
L4	2.0 LTR.		93-94	60390
L4	2.0 LTR.	AEG Eng., Sedan	2001	60187
L4	2.0 LTR.	CBPA Eng.	11-15	60197
L4	2.0 LTR.	CBFA Eng.	08-13	60457
L4	2.0 LTR.	CCTA Eng.	08-13	60457
L4	2.0 LTR.		06-08	60197
L4	2.0 LTR.		01-05	60197
V6	2.5 LTR.	AAA Eng.	96-99	60330
L5	2.5 LTR.	CBTA Eng.	08-14	60319
L5	2.5 LTR.	CBUA Eng.	08-14	60319
L5	2.5 LTR.	BGP Eng.	05-07	60319
L5	2.5 LTR.	BGQ Eng.	05-07	60319
V6	2.8 LTR.	AFP Eng.	99-02	60190
V6	2.8 LTR.	BDF Eng.	02-04	60438



CYL	APPLICATION	NOTES	YEAR	KARLYN #
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### **Passat**

L4	1.8 LTR.	AWM Eng.	01-05	60191
L4	1.8 LTR.	AUG Eng.	00-01	60191
L4	2.0 LTR.		95-96	60390
L4	2.0 LTR.	CBFA Eng.	2010	60457
L4	2.0 LTR.	CCTA Eng.	08-10	60457
L4	2.0 LTR.	BPY Eng.	06-08	60197
L5	2.5 LTR.		12-14	60319
V6	2.8 LTR.		98-05	60187
V6	2.8 LTR.		96-97	60330
V6	3.6 LTR.		06-08	60438

### **R32**

V6	3.2 LTR.		2008	60438
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### **Rabbit**

L5	2.5 LTR.		06-09	60319
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### **Tiguan**

L4	2.0 LTR.		09-17	60457
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### **Touareg**

V6	3.0 LTR. Supercharged	ELECTRIC/GAS	11-14	60500
V6	3.0 LTR. Turbo Diesel		11-14	60500
V6	3.2 LTR.		04-06	60190
V6	3.6 LTR.		07-10	60190
V8	4.2 LTR.	BAR Eng.	2007	60331
V8	4.2 LTR.		08-09	60331
V8	4.2 LTR.		04-06	60331

## VOLVO

### **240**

L4	2.3 LTR.		90-93	60411
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### **244**

L4	2.3 LTR.		1989	60411
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### **245**

L4	2.3 LTR.		1989	60411
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### **740**

L4	2.3 LTR.		88-92	60411
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### **760**

L4	2.3 LTR.		88-90	60411
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### **940**

L4	2.3 LTR.		91-95	60411
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### **C30**

L5	2.4 LTR.		08-10	60220
L5	2.5 LTR.		08-13	60220

CYL	APPLICATION	NOTES	YEAR	KARLYN #
<b>C70</b>				
L5	2.3 LTR.		02-04	60220
L5	2.4 LTR.		02-04	60220
L5	2.5 LTR.		06-13	60220
<b>S40</b>				
L5	2.4 LTR.		04-10	60220
L5	2.5 LTR.		04-11	60220
<b>S60</b>				
L5	2.3 LTR.		02-04	60220
L5	2.4 LTR.		02-09	60220
L5	2.5 LTR.		03-12	60220
L6	3.0 LTR.		11-15	60232
<b>S80</b>				
L5	2.5 LTR.		04-06	60220
L6	2.9 LTR.		02-05	60220
L6	3.0 LTR.		08-15	60232
L6	3.2 LTR.		07-14	60232
V8	4.4 LTR.		07-10	60220
<b>V50</b>				
L5	2.4 LTR.		05-10	60220
L5	2.5 LTR.		05-11	60220
<b>V60</b>				
L6	3.0 LTR.		2015	60232
<b>V70</b>				
L5	2.3 LTR.		02-04	60220
L5	2.4 LTR.		02-07	60220
L5	2.5 LTR.		03-07	60220
L6	3.2 LTR.		08-10	60232
<b>XC60</b>				
L6	3.0 LTR.		11-15	60232
L6	3.0 LTR. Turbo		2010	60232
L6	3.2 LTR.		11-15	60232
<b>XC70</b>				
L5	2.5 LTR.		03-07	60220
L6	3.0 LTR.		11-15	60232
L6	3.0 LTR. Turbo		09-10	60232
L6	3.2 LTR.		08-15	60232
<b>XC90</b>				
L5	2.5 LTR.		03-06	60220
L6	2.9 LTR.		03-05	60220
L6	3.2 LTR.		07-13	60232
V8	4.4 LTR.		05-11	60220

**# 60003**  
CAMSHAFT  
(MAZDA OE #L3K9-18-230A)



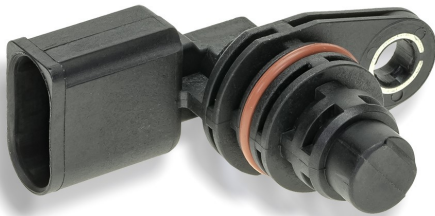
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**# 60011**  
CAMSHAFT  
(AUDI/VW OE #030-907-601-E)



**# 60012**  
CAMSHAFT  
(AUDI/VW OE #06C-905-163-B)



**# 60015**  
CAMSHAFT  
(BMW OE #13-62-7-525-014,  
S119445001Z)



**# 60021**  
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(VW OE #06A-905-161-B/C)



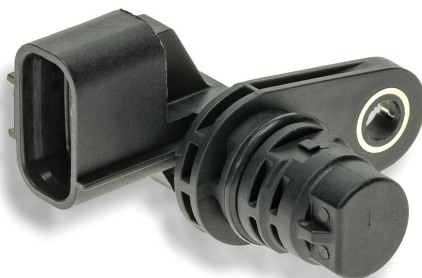
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**# 60029**  
CAMSHAFT  
(MITSUBISHI OE #MR578768)



**# 60030**  
CAMSHAFT  
(HYUNDAI/KIA OE #39350-25010)



**# 60032**  
CAMSHAFT  
(LEXUS/TOYOTA OE #90919-05036,  
90919-A5002)



**# 60033**  
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(LEXUS/SCION/TOYOTA  
OE #90919-05060)



**# 60034**

**CAMSHAFT**

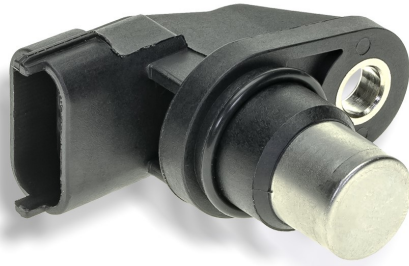
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OE #31272689, AJ811224, LR014372)



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**CAMSHAFT**

(PORSCHE OE #996-606-106-03)



**# 60040**

**CAMSHAFT/CRANKSHAFT**

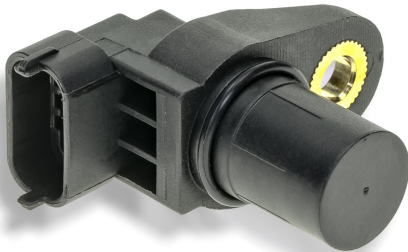
(INFINITI/NISSAN  
OE #23731-AL61A/4M50B/5M005)



**# 60041**

**CAMSHAFT**

(DODGE/JEEP/MB OE #005-153-13-28,  
5080346AA, 5175762AA)



**# 60043**

**CAMSHAFT**

(BMW OE #12-14-7-518-628,  
12-14-1-438-082)



**# 60045**

**CRANKSHAFT**

(LEXUS/TOYOTA OE #90919-05012,  
90080-19009)



**# 60046**

**CAMSHAFT**

(SUBARU OE #22056-AA230)



**# 60050**

**CAMSHAFT**

(MB OE #004-153-00-28)



**# 60058**

**CAMSHAFT**

(JAGUAR/LINCOLN OE #XR853846,  
1X4E-6B288-CA/CB/CC,  
1X4Z-6B288-CA/CB, C2S6438)



**# 60059**

**CAMSHAFT**

(MINI OE #13-62-7-588-095)



**# 60067**

**CAMSHAFT**

(CHEVY/LEXUS/PONTIAC/SCION/  
TOYOTA OE #90080-19014,  
90919-05026)



**# 60072**

**CAMSHAFT**

(CHRYSLER/DODGE/JEEP/MITSUBISHI  
OE #56028133AE/AB/AC/AD, 56028133)



<p><b># 60073</b> CAMSHAFT (HYUNDAI/KIA OE #39318-3C100)</p> 	<p><b># 60074</b> CAMSHAFT (KIA OE #39318-39800)</p> 	<p><b># 60076</b> CAMSHAFT (INFINITI/NISSAN OE #23731-JA11A/B)</p> 
<p><b># 60089</b> CAMSHAFT (NISSAN OE #23731-3LM1A)</p> 	<p><b># 60093</b> CAMSHAFT (BMW OE #13-62-7-837-904)</p> 	<p><b># 60095</b> CAMSHAFT (AUDI/VW OE #058-905-161-B/C)</p> 
<p><b># 60101</b> CAMSHAFT (BMW/LAND ROVER OE #12-14-7-539-166, 12-14-1-438-083, 8510301)</p> 	<p><b># 60102</b> CAMSHAFT (INFINITI/NISSAN OE #23731- 5M016/10/15, 23731-6J905/06)</p> 	<p><b># 60106</b> CAMSHAFT (AUDI/PORSCHE/VW OE #06A-905-161A, 955-606-106-00)</p> 
<p><b># 60112</b> CAMSHAFT (KIA OE #0K013-18131/18131A/1813X)</p> 	<p><b># 60119</b> CAMSHAFT (TOYOTA OE #19300-74010, 19300-03010)</p> 	<p><b># 60124</b> CAMSHAFT (HYUNDAI/KIA OE #39350-37110/100)</p> 

**# 60129**

**CAMSHAFT**

(HYUNDAI/KIA OE #39350-23910,  
39350-23700)



**# 60131**

**CAMSHAFT**

(ACURA/HONDA OE #37840-PGE-A11)



**# 60132**

**CAMSHAFT**

(HONDA OE #37840-PLC-006,  
37840-RJH-006)



**# 60133**

**CAMSHAFT**

(ACURA/HONDA OE #37510-PNA-003,  
37510-PNB-003)



**# 60135**

**CAMSHAFT**

(INFINITI/NISSAN  
OE #23731-2Y524/22/23/2A)



**# 60138**

**CAMSHAFT**

(BMW OE #12-14-1-703-221,  
5WK96011Z)



**# 60139**

**CAMSHAFT**

(BMW OE #12-14-7-539-165,  
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**# 60141**

**CAMSHAFT**

(AUDI/VW OE #07K-907-601-A)



**# 60144**

**CAMSHAFT**

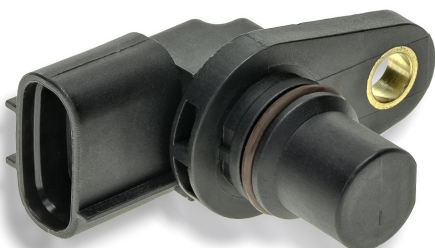
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**# 60146**

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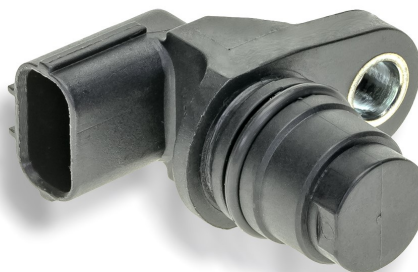
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**# 60147**

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(BMW OE #12-14-1-743-072)



**# 60150**  
CAMSHAFT  
(LAND ROVER OE #4427657)



**# 60154**  
CAMSHAFT  
(BMW OE #12-14-1-433-263)



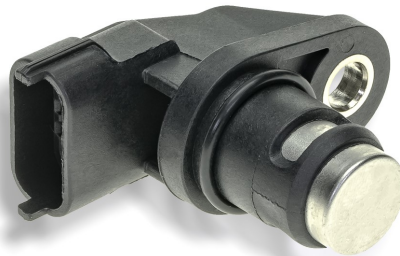
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**# 60165**  
CAMSHAFT/CRANKSHAFT  
(NISSAN OE #23731-6N21A/6N20D/6N206)



**# 60168**  
CAMSHAFT  
(MB/PORSCHE OE #004-153-69-28, 004-153-07-28, 996-606-106-02)



**# 60172**  
CRANKSHAFT  
(MAZDA OE #L3K9-18-221A, L3G2-18-221)



**# 60187**  
CRANKSHAFT  
(AUDI/VW OE #06A-906-433-C)



**# 60190**  
CRANKSHAFT  
(AUDI/PORSCHE/VW OE #022-957-147-A, 021-906-433-E, 021-957-147, 955-606-433-00, 955-606-147-00)



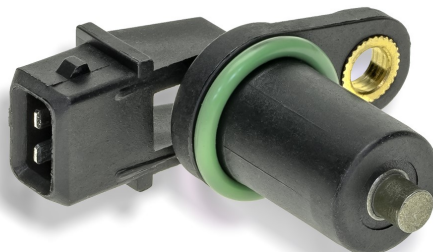
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**# 60197**  
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**# 60201**  
CRANKSHAFT  
(BMW OE #13-62-7-839-138)



**# 60209**  
CRANKSHAFT  
(HYUNDAI/KIA OE #39180-37200/150)



<p><b># 60214</b> CRANKSHAFT (HYUNDAI/KIA OE #39180-2B000)</p> 	<p><b># 60216</b> CRANKSHAFT (NISSAN OE #23731-ED01A/1KT0A/1VA0A/EN20A)</p> 	<p><b># 60218</b> CRANKSHAFT (ACURA/HONDA OE #37500-RAA-A01)</p> 
<p><b># 60220</b> CRANKSHAFT (VOLVO OE #31331765)</p> 	<p><b># 60223</b> CRANKSHAFT (HYUNDAI/KIA OE #39180-22600, 39180-26900)</p> 	<p><b># 60224</b> CRANKSHAFT (HYUNDAI/KIA OE #39180-25200/300)</p> 
<p><b># 60226</b> CRANKSHAFT (LEXUS/TOYOTA OE #90919-05035, 90919-A5001)</p> 	<p><b># 60230</b> CRANKSHAFT (SAAB OE #55557326, 30561772, 9177221)</p> 	<p><b># 60231</b> CRANKSHAFT (DODGE/FREIGHTLINER/JEEP/MB OE #642-905-00-00, 642-153-07-28, 5175763AA/AB, 68039478AA/AC)</p> 
<p><b># 60232</b> CRANKSHAFT (LAND ROVER/VOLVO OE #31331753, LR030200)</p> 	<p><b># 60242</b> CRANKSHAFT (LEXUS/PONTIAC/SCION/TOYOTA OE #90919-05047, 90080-19024)</p> 	<p><b># 60249</b> CRANKSHAFT (CHEVY/SAAB/SATURN OE #12789959)</p> 



**# 60257**  
CRANKSHAFT  
(BMW OE #12-14-1-709-616,  
S107230001Z)



**# 60259**  
CRANKSHAFT  
(ACURA/HONDA OE #37500-R40-A01)



**# 60264**  
CRANKSHAFT  
(LEXUS/TOYOTA OE #90919-A5003)



**# 60270**  
CRANKSHAFT  
(CHRYSLER/DODGE/MB OE #003-153-  
28-28/27-28, 5080352AA/350AA)



**# 60272**  
CRANKSHAFT  
(DODGE/JEEP/MITSUBISHI  
OE #56044180AB, 56041479AD/AC)



**# 60275**  
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(KIA OE #39310-39800)



**# 60276**  
CRANKSHAFT  
(INFINITI/NISSAN  
OE #23731-JA10C/10B)



**# 60281**  
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(BMW OE #13-62-7-639-278)



**# 60284**  
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(MITSUBISHI OE #MD327122,  
MR560276)



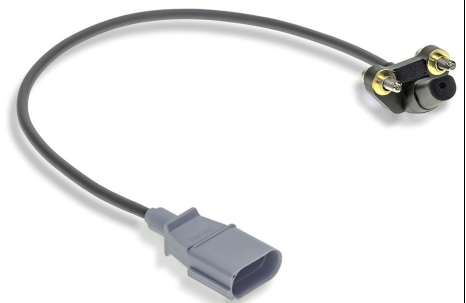
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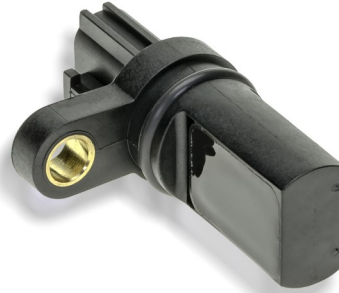
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**# 60323**  
CRANKSHAFT  
(AUDI OE #077-905-381-F)



**# 60325**  
CRANKSHAFT  
(INFINITI/NISSAN  
OE #23731-AL60C/8J105/8J106)



**# 60326**  
CRANKSHAFT  
(NISSAN OE #23731-EA20C)



**# 60330**  
CRANKSHAFT  
(VW OE #021-906-433-C/A/D)



**# 60331**  
CRANKSHAFT  
(AUDI/VW OE #077-905-381-G/N)



**# 60332**  
CRANKSHAFT  
(ACURA/HONDA OE #37500-RCA-A01)



**# 60333**  
CRANKSHAFT  
(MB OE #276-153-01-28,  
276-905-07-00-28)



**# 60342**  
CRANKSHAFT  
(CHRYSLER/DODGE/EAGLE/  
MITSUBISHI/PLYMOUTH  
OE #5269703, M05235377)



**# 60360**  
CRANKSHAFT  
(HONDA OE #37500-PLC-005/015)



**# 60361**  
CRANKSHAFT  
(ACURA/HONDA OE #37500-PNA-003,  
37500-PNB-003)



**# 60363**  
CRANKSHAFT  
(INFINITI/NISSAN OE #23731-31U11/10)



**# 60372**  
CRANKSHAFT  
(MITSUBISHI OE #MR985145)



**# 60376**

**CRANKSHAFT**

(MB OE #003-153-96-28/95-28)



**# 60383**

**CRANKSHAFT**

(MINI OE #13-62-7-561-753)



**# 60387**

**CRANKSHAFT**

(BMW OE #12-14-1-726-065/066)



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(VW OE #021-907-319-B/A)



**# 60411**

**CRANKSHAFT**

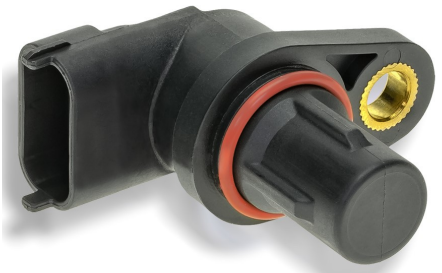
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997-606-106-03)



**# 60438**

**CRANKSHAFT**

(AUDI/VW OE #022-957-147)



**# 60440**

**CAMSHAFT**

(AUDI/VW/PORSCHE  
OE #07L-905-163C)



**# 60449**

**CAMSHAFT**

(AUDI/VW OE #04C-907-601)



**# 60450**

**CAMSHAFT**

(ACURA/HONDA OE #37510-R40-A01)



**# 60451**

**CAMSHAFT**

(INFINITI/MB OE #270-905-04-00)



**# 60457**

**CRANKSHAFT**

(AUDI/VW OE #06H-906-433)



**# 60461**  
CRANKSHAFT  
(NISSAN OE #23731-JA00C)



**# 60462**  
CRANKSHAFT  
(LEXUS/TOYOTA OE #90919-A5004)



**# 60472**  
CRANKSHAFT  
(AUDI/VW OE #06H-906-433D)



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CRANKSHAFT  
(AUDI/VW OE #059-906-433J)



**# 60504**  
CRANKSHAFT  
(AUDI/VW OE #059-906-433C)



**# 60510**  
CRANKSHAFT  
(LAND ROVER OE #ERR7354)



**# 60512**  
CAMSHAFT  
(INFINITI/NISSAN OE #23731-EY00B)



**# 60516**  
CRANKSHAFT  
(ACURA/HONDA OE #37500-R60-U01)



## CROSS REFERENCE

BECK	KARLYN
180-0261	60363
180-0279	60226
180-0288	60032
180-0299	60284
180-0308	60242
180-0329	60045
180-0333	60223
180-0348	60124
180-0355	60129
180-0357	60074
180-0359	60275
180-0365	60270
180-0368	60223
180-0369	60224
180-0376	60112
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180-0384	60168
180-0385	60390
180-0392	60361
180-0393	60360
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180-0395	60147
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180-0397	60040
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180-0409	60209
180-0411	60387
180-0414	60187
180-0417	60438
180-0418	60330
180-0419	60190
180-0424	60095
180-0425	60257
180-0429	60156
180-0430	60106
180-0439	60376

BECK	KARLYN
180-0448	60411
180-0452	60372
180-0453	60131
180-0458	60201
180-0459	60139
180-0460	60342
180-0470	60043
180-0471	60138
180-0472	60230
180-0473	60165
180-0481	60264
180-0482	60218
180-0483	60067
180-0487	60331
180-0490	60040
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180-0492	60220
180-0493	60191
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180-0501	60325
180-0509	60135
180-0510	60076
180-0512	60046
180-0515	60003
180-0517	60172
180-0518	60172
180-0523	60272
180-0526	60450
180-0531	60132
180-0535	60119
180-0537	60216
180-0543	60326
180-0552	60224
180-0553	60030
180-0557	60281
180-0558	60457

FOR REFERENCE PURPOSES ONLY!  
REFER TO OUR MODEL LISTINGS FOR THE CORRECT APPLICATION

## CROSS REFERENCE

<b>BECK</b>	<b>KARLYN</b>
180-0566	<b>60249</b>
180-0574	<b>60149</b>
180-0578	<b>60141</b>
180-0579	<b>60050</b>
180-0584	<b>60073</b>
180-0592	<b>60089</b>
180-0598	<b>60010</b>
180-0600	<b>60041</b>
180-0650	<b>60154</b>
180-0654	<b>60308</b>
180-0655	<b>60005</b>
180-0660	<b>60150</b>
180-0678	<b>60144</b>
180-0681	<b>60323</b>
180-0683	<b>60012</b>
180-0684	<b>60026</b>
180-0702	<b>60259</b>
180-0707	<b>60015</b>
180-0710	<b>60101</b>
180-0711	<b>60072</b>
180-0713	<b>60462</b>
180-0716	<b>60461</b>
180-0720	<b>60231</b>
180-0726	<b>60319</b>
180-0729	<b>60276</b>
180-0731	<b>60216</b>
180-0735	<b>60214</b>
180-0739	<b>60307</b>
180-0741	<b>60512</b>
180-0744	<b>60021</b>
180-0746	<b>60437</b>
180-0747	<b>60440</b>
180-0751	<b>60216</b>
180-0759	<b>60093</b>
180-0763	<b>60449</b>
180-0767	<b>60146</b>

<b>BOSCH</b>	<b>KARLYN</b>
0-232-101-024	<b>60095</b>
0-232-103-003	<b>60156</b>
0-232-103-019	<b>60106</b>
0-232-103-022	<b>60168</b>
0-232-103-037	<b>60168</b>
0-232-103-040	<b>60037</b>
0-232-103-064	<b>60059</b>
0-232-103-092	<b>60437</b>
0-232-103-114	<b>60437</b>
0-232-103-125	<b>60451</b>
0-261-210-107	<b>60330</b>
0-261-210-141	<b>60376</b>
0-261-210-147	<b>60187</b>
0-261-210-170	<b>60270</b>
0-261-210-177	<b>60191</b>
0-261-210-190	<b>60323</b>
0-261-210-199	<b>60197</b>
0-261-210-229	<b>60249</b>
0-261-210-269	<b>60230</b>
0-261-210-298	<b>60331</b>
0-261-210-383	<b>60472</b>
0-986-280-431	<b>60026</b>

<b>OEM</b>	<b>KARLYN</b>
003-153-27-28	<b>60270</b>
003-153-28-28	<b>60270</b>
003-153-95-28	<b>60376</b>
003-153-96-28	<b>60376</b>
004-153-00-28	<b>60050</b>
004-153-07-28	<b>60168</b>
004-153-69-28	<b>60168</b>
005-153-13-28	<b>60041</b>
021-906-433-A	<b>60330</b>
021-906-433-C	<b>60330</b>
021-906-433-D	<b>60330</b>
021-906-433-E	<b>60190</b>

FOR REFERENCE PURPOSES ONLY!  
REFER TO OUR MODEL LISTINGS FOR THE CORRECT APPLICATION

## CROSS REFERENCE

OEM	KARLYN
021-907-319-A	60390
021-907-319-B	60390
021-957-147	60190
022-957-147	60438
022-957-147-A	60190
030-907-601-E	60011
045-957-147-B	60010
04C-907-601	60449
058-905-161-B	60095
058-905-161-C	60095
059-906-433C	60504
059-906-433E	60500
059-906-433J	60500
06A-905-161A	60106
06A-905-161-B	60021
06A-905-161-C	60021
06A-906-433-C	60187
06A-906-433-G	60197
06A-906-433-L	60197
06C-905-163-B	60012
06E-905-163	60026
06H-906-433	60457
06H-906-433D	60472
071-957-147	60191
077-905-381-F	60323
077-905-381-G	60331
077-905-381-N	60331
078-906-433A	60191
07K-906-433-B	60319
07K-907-601-A	60141
07L-905-163C	60440
OK013-18131	60112
OK013-18131A	60112
OK013-1813X	60112
12-14-1-433-263	60154
12-14-1-438-081	60139

OEM	KARLYN
12-14-1-438-082	60043
12-14-1-438-083	60101
12-14-1-485-845	60144
12-14-1-703-221	60138
12-14-1-709-616	60257
12-14-1-726-065	60387
12-14-1-726-066	60387
12-14-1-740-383	60156
12-14-1-740-959	60156
12-14-1-743-072	60149
12-14-7-518-628	60043
12-14-7-539-165	60139
12-14-7-539-166	60101
12789959	60249
13-62-7-525-014	60015
13-62-7-525-015	60308
13-62-7-548-995	60307
13-62-7-561-753	60383
13-62-7-588-095	60059
13-62-7-639-278	60281
13-62-7-796-054	60005
13-62-7-837-904	60093
13-62-7-839-138	60201
19300-03010	60119
19300-74010	60119
1X4E-6B288-CA	60058
1X4E-6B288-CB	60058
1X4E-6B288-CC	60058
1X4Z-6B288-CA	60058
1X4Z-6B288-CB	60058
22056-AA230	60046
22056-AA270	60146
23731-1KTOA	60216
23731-1VA0A	60216
23731-2Y522	60135
23731-2Y523	60135

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## CROSS REFERENCE

OEM	KARLYN
23731-2Y524	60135
23731-2Y52A	60135
23731-31U10	60363
23731-31U11	60363
23731-3LM1A	60089
23731-4M50B	60040
23731-5M005	60040
23731-5M006	60040
23731-5M010	60102
23731-5M015	60102
23731-5M016	60102
23731-6J905	60102
23731-6J906	60102
23731-6N206	60165
23731-6N20D	60165
23731-6N21A	60165
23731-8J105	60325
23731-8J106	60325
23731-93CON	60451
23731-AL60C	60325
23731-AL61A	60040
23731-EA20C	60326
23731-ED01A	60216
23731-EN20A	60216
23731-EN22A	60076
23731-EY00B	60512
23731-JA00C	60461
23731-JA10B	60276
23731-JA10C	60276
23731-JA11A	60076
23731-JA11B	60076
270-905-04-00	60451
271949	60411
272-905-0043	60437
276-153-01-28	60333
276-905-07-00	60333

OEM	KARLYN
276-905-07-00-28	60333
30561772	60230
31272689	60034
31331753	60232
31331765	60220
3547847	60411
37500-PLC-005	60360
37500-PLC-015	60360
37500-PNA-003	60361
37500-PNB-003	60361
37500-R40-A01	60259
37500-R60-U01	60516
37500-RAA-A01	60218
37500-RCA-A01	60332
37510-PNA-003	60133
37510-PNB-003	60133
37510-R40-A01	60450
37510-RAA-A01	60147
37840-PGE-A11	60131
37840-PLC-006	60132
37840-RJH-006	60132
39180-22600	60223
39180-25200	60224
39180-25300	60224
39180-26900	60223
39180-2B000	60214
39180-37150	60209
39180-37200	60209
39310-39800	60275
39318-39800	60074
39318-3C100	60073
39350-23700	60129
39350-23910	60129
39350-25010	60030
39350-37100	60124
39350-37110	60124

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## CROSS REFERENCE

OEM	KARLYN
4427657	60150
5080346AA	60041
5080350AA	60270
5080352AA	60270
5175762AA	60041
5175763AA	60231
5175763AB	60231
5269703	60342
55557326	60230
56028133	60072
56028133-AB	60072
56028133-AC	60072
56028133-AD	60072
56028133-AE	60072
56041479AC	60272
56041479AD	60272
56041584-AF	60072
56044180AB	60272
56044180AC	60272
5WK96011Z	60138
642-153-07-28	60231
642-905-00-00	60231
68039478AA	60231
68039478AC	60231
8510301	60101
90080-19009	60045
90080-19014	60067
90080-19024	60242
90919-05012	60045
90919-05026	60067
90919-05035	60226
90919-05036	60032
90919-05047	60242
90919-05057	60264
90919-05060	60033
90919-A5001	60226

OEM	KARLYN
90919-A5002	60032
90919-A5003	60264
90919-A5004	60462
9177221	60230
955-606-106-00	60106
955-606-147-00	60190
955-606-433-00	60190
958-606-106-01	60440
996-606-106-02	60168
996-606-106-03	60037
997-606-106-03	60437
AJ811224	60034
C2S6438	60058
ERR7354	60510
L3G2-18-221	60172
L3K9-18-221A	60172
L3K9-18-230A	60003
LR014372	60034
LR030200	60232
M05235377	60342
M05269703	60342
MD327122	60284
MR560276	60284
MR578768	60029
MR985145	60372
S107230001Z	60257
S119044012Z	60308
S119445001Z	60015
XR853846	60058

STANDARD	KARLYN
PC79	60045
PC80	60330
PC89	60363
PC166	60342

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## CROSS REFERENCE

STANDARD	KARLYN
PC167	60119
PC172	60284
PC177	60411
PC192	60330
PC211	60257
PC214	60226
PC216	60067
PC231	60387
PC244	60072
PC266	60032
PC302	60201
PC309	60101
PC310	60139
PC330	60124
PC345	60095
PC365	60390
PC371	60209
PC376	60361
PC379	60050
PC384	60156
PC395	60149
PC406	60242
PC422	60112
PC428	60230
PC456	60376
PC458	60135
PC460	60102
PC461	60040
PC462	60040
PC464	60165
PC467	60058
PC477	60360
PC478	60218
PC479	60332
PC482	60043
PC487	60272

STANDARD	KARLYN
PC497	60270
PC499	60325
PC502	60187
PC509	60191
PC520	60323
PC524	60190
PC525	60197
PC531	60223
PC532	60275
PC548	60249
PC557	60372
PC559	60033
PC564	60264
PC580	60510
PC585	60220
PC586	60190
PC595	60190
PC605	60131
PC610	60133
PC618	60132
PC619	60147
PC625	60041
PC626	60106
PC628	60021
PC632	60074
PC641	60168
PC650	60138
PC661	60129
PC669	60154
PC670	60012
PC672	60141
PC676	60037
PC680	60029
PC687	60331
PC700	60011
PC702	60150

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## TESTING OF BREMI WHEEL SPEED SENSORS

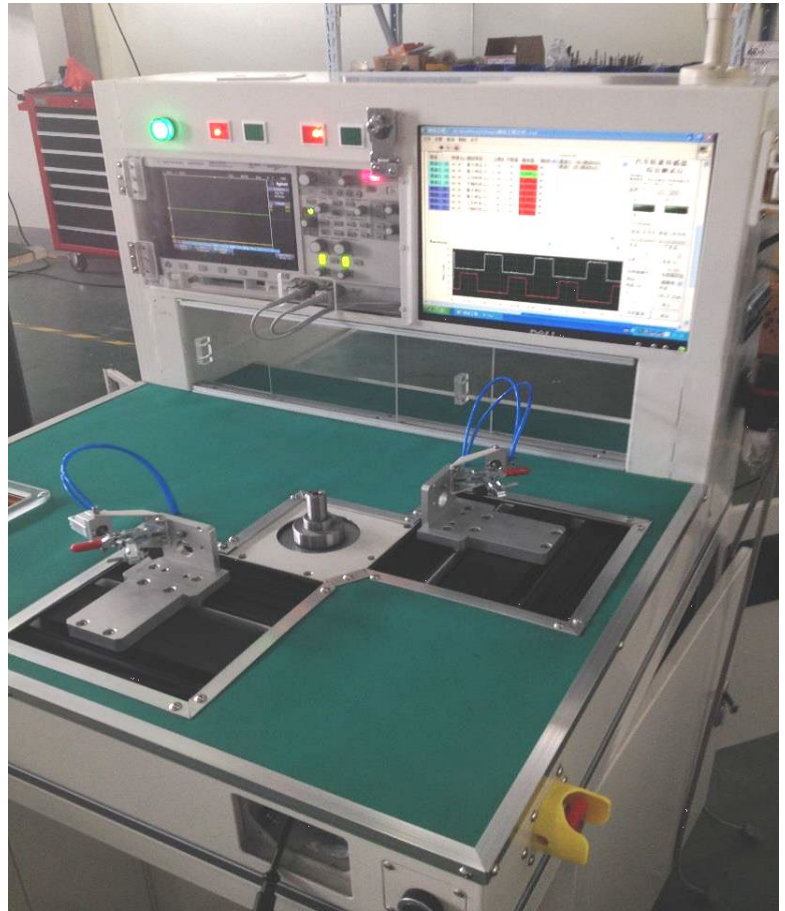
### Electrical test

Sensors are subjected to an **electrical test** both *before* and *after* the thermal shock test.

The illustration on the right shows the apparatus used to test the wheel speed sensors.

The following values are recorded and compared to the OE profile to ensure that it is within the optimal range.

- Capacity utilization in %
- Load resistance in  $\Omega$
- Frequency in Hz
- VPP ("Volts Peak to Peak")



### Thermal shock

Within the context of product qualification, all newly produced wheel speed sensors are subjected to defined **thermal shock cycles**.

Extreme temperatures act on the parts in a special chamber:

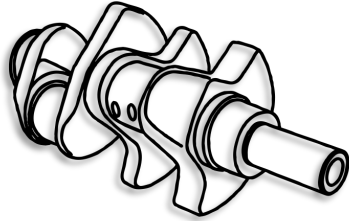
- $-40^{\circ}\text{C}$  for a period of 45 min
- $+130^{\circ}\text{C}$  for a period of 30 min

The change in temperature takes about 10 seconds.

A complete test covers a total of 60 cycles.

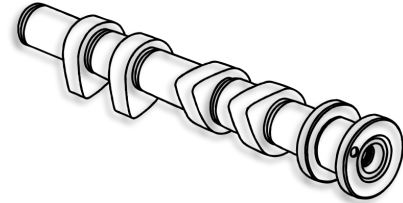


## SPEED SENSORS IN ENGINE MANAGEMENT



### Crankshaft sensor

- Measures engine speed
- Identifies the crankshaft position
- Ignition timing signal



### Camshaft sensor

- Identifies the camshaft position (valve position)
- Ignition timing signal (single spark at ignition coil)
- Start of injection signal (sequential injection)

## REASONS FOR FAILURE

### Reasons for failure

- Open circuits
- Internal short circuits
- External damage
- Severe contamination
- Mechanical damage to sensor rotor

### Effects of failure

The following system characteristics can be recognized when speed sensors fail:

- The engine indicator lamp (exhaust warning lamp) lights up
- A fault code is stored
- Engine management goes into limp-home mode (no output)
- Engine start may not be possible
- Failure of other systems

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