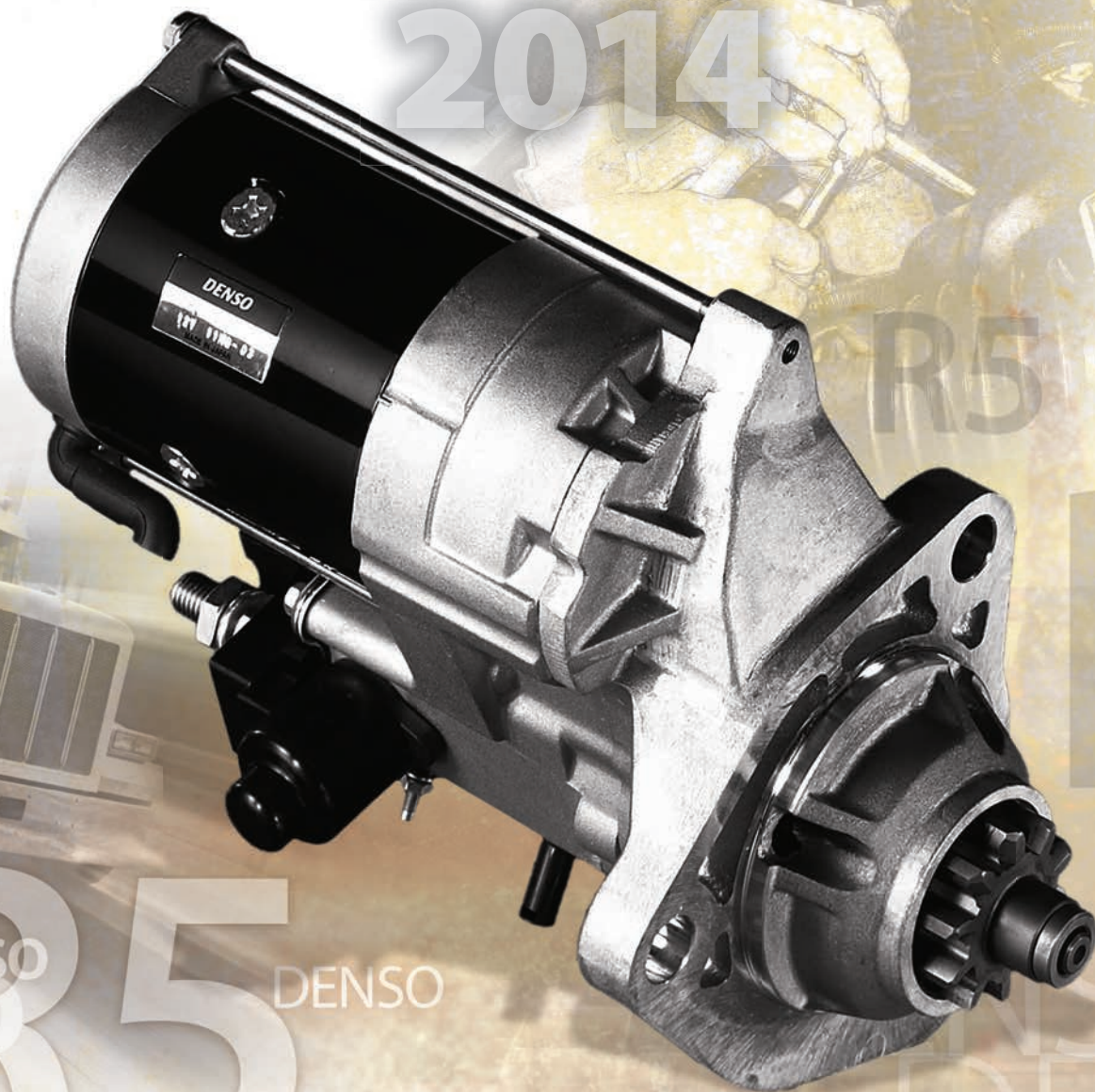


R5.0 STARTER APPLICATION GUIDE

FOR CLASS-8 TRUCK, ON-ROAD & OFF-ROAD APPLICATIONS



DENSO
HEAVY DUTY



WHY DENSO?

OE Heritage

DENSO is one of the world's largest automotive component suppliers with over \$38 billion in annual sales. We supply every major auto manufacturer in the world, providing them with the quality and innovation they need to remain on the leading edge of automotive technology. In addition to our automotive customers, we also supply components to virtually all heavy-duty manufacturers worldwide. For decades, we have helped all of our customers to become giants in their industries.

Unsurpassed Quality

At DENSO, we know that one of the major keys to success for our company and our customers is an unwavering commitment to quality. We strive for, and achieve, zero defects for parts manufactured in the millions in DENSO facilities that are QS9000, ISO9000, and ISO14000 certified. This dedication to quality is clearly recognized by the industry as DENSO has received such prestigious awards as the Deming Award for Quality, the J.D. Power and Associates Chairman's Award and numerous supplier awards for quality from companies like Toyota, Lexus, General Motors and DaimlerChrysler.

Bringing It All To The Aftermarket

In the 1980s, DENSO became the first to mass-produce the platinum spark plug and offer it in the aftermarket. A decade later we introduced the world's most advanced spark plug, Iridium Power®, which revolutionized the concept of the aftermarket performance plug. By the late 1990s, the world watched with great interest as DENSO unveiled a line of OE-standard premium replacement components under the First Time Fit® brand. Today, the First Time Fit line of products includes A/C compressors, cabin air filters, condensers, receiver driers, expansion valves, starters, alternators, oxygen sensors, fuel pumps, oil and air filters, ignition wire sets and wiper blades.

Better By Design

As you can see, we've spent decades perfecting our craft — a claim few automotive component manufacturers can make. Clearly the DENSO commitment to quality, innovation, and advanced technology is the reason our automotive and heavy-duty components truly are Better by Design.

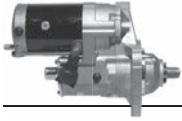


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The illustrations contained in this application guide are for reference only. Please refer to installation instructions for proper mounting procedures.

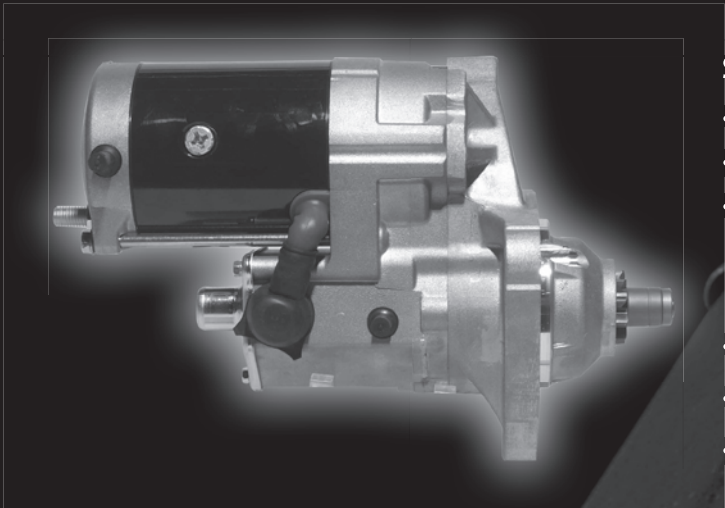


WARRANTY

3 Years / 350,000 Miles

(On-Road Applications)

1 Year/Unlimited Miles (Off-Road)



SPECIFICATIONS

- 12V 5.0 kW
- Weight: approximately 23.8 lbs.
- Pinion: DP6/8 10 tooth, DP8 10 tooth, and M3 10 tooth (Interchangeable with competitors 11 and 12 tooth) DP8/10 11 tooth, DP8 11 tooth
- Rotation: Clockwise
- Mount: SAE #3
- OCP By-Pass Kit Available
Part Number 053680-8010

FEATURES / BENEFITS

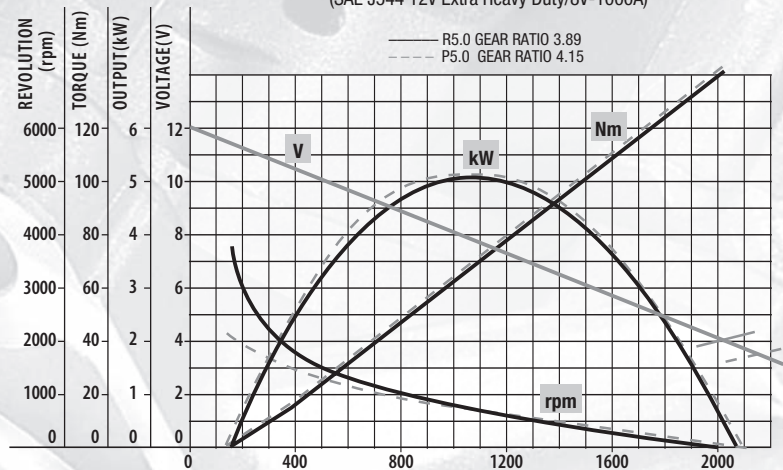
- Smallest class-8 starter in the market
- High durability for the most demanding applications
- High torque for maximum starting power (improved cold start-ability); highest in the industry.
- Smooth engagement for improved durability of pinion and ring gear
- Torque limiter feature to prevent ring gear/drive train breakage.
- **Warranty: 3 years / 350,000 miles (On-Road Applications) 1 year/unlimited miles (Off-Road Applications)**

ENGINE RECOMMENDATION CHART

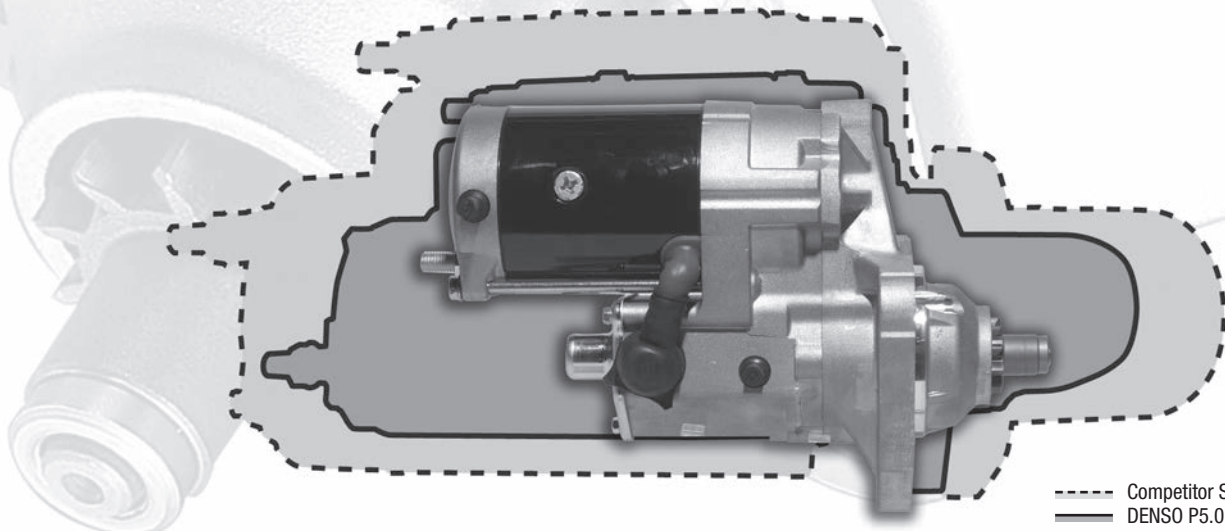
TYPE		ENGINE DISPLACEMENT
Offset Reduction Gear Type	R5.0	10 12 14 16 18 [L]

R5.0 OUTPUT PERFORMANCE

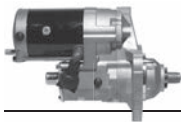
Comparison with P5.0
(SAE J544 12V Extra Heavy Duty/8V-1000A)



SIZE COMPARISON



--- Competitor Starter
— DENSO P5.0 Starter



R5.0 Starter Application

By OE

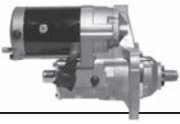


OE Name	Make/Model	Year	Engine	Voltage	kW	DENSO Part Number	Type
Case New Holland	MX240 Tractor	2008-	Cummins 8.3L	12	5.0	428000-5850	R
Freightliner	All	1999	CAT C12	12	5.0	428000-4420	R
Freightliner	All	2004-2006	CAT C13	12	5.0	428000-4420	R
Freightliner	All	2000-2006	CAT C15	12	5.0	428000-4420	R
Freightliner	All	1998-2002	Cummins ISM	12	5.0	428000-4420	R
Freightliner	All	1994-1998	Cummins M11	12	5.0	428000-4430	R
Freightliner	All	1994-2006	Detroit Series 60	12	5.0	428000-4430*	R
Freightliner	All	2004-2006	Detroit Series 60	12	5.0	428000-5730	R
Freightliner	All	1999-2006	Cummins ISX	12	5.0	428000-4440	R
Freightliner	All	1999-2006	Cummins ISX	12	5.0	428000-5190	R
Freightliner	All	1994-2002	Cummins N14	12	5.0	428000-4440	R
Freightliner	All	2001-2006	MBE4000	12	5.0	428000-4450	R
Freightliner	All	2007-	Cummins ISX	12	5.0	428000-5170	R
Freightliner	All	2007-	Detroit Diesel 13	12	5.0	428000-8690	R
International	All	2003-2006	CAT C11	12	5.0	428000-4420	R
International	All	1998	CAT C12	12	5.0	428000-4420	R
International	All	2004-2006	CAT C13	12	5.0	428000-4420	R
International	All	2000-2006	CAT C15	12	5.0	428000-4420	R
International	All	1998-2006	Cummins ISM	12	5.0	428000-4420	R
International	All	1994-2006	Detroit Series 60	12	5.0	428000-4430	R
International	All	1994-2006	Detroit Series 60	12	5.0	428000-5730	R
International	All	1994-1998	Cummins M11	12	5.0	428000-4430	R
International	All	1994-2002	Cummins N14	12	5.0	428000-4440	R
International	All	1999-2006	Cummins ISX	12	5.0	428000-4440	R
International	All	1999-2006	Cummins ISX	12	5.0	428000-5190	R
International	All	2007-	Cummins ISX	12	5.0	428000-5170	R
International	All	2007-	MaxxForce 11	12	5.0	428000-8370	R
International	All	2007-	MaxxForce 13	12	5.0	428000-8370	R
John Deere	WTS Combines	2006-	PowerTech	12	5.0	428000-3320	R
John Deere	T660 & T670 Combines	2006-	PowerTech	12	5.0	428000-3320	R
John Deere	C670 Combine	2006-	PowerTech	12	5.0	428000-3320	R
John Deere	6090	2006-	PowerTech 9.0L	12	5.0	428000-3320	R
John Deere	8030 Series Tractors	2006-	PowerTech 9.0L	12	5.0	428000-4080	R
John Deere	9230 Tractors	2006-	PowerTech 9.0L	12	5.0	428000-4080	R
John Deere	Agriculture Machinery R5.0	2006-	6135	12	5.0	428000-5530	R
John Deere	Combine	2006-	6135	12	5.0	428000-5750	R
J.I. Case	TV145 Tractor	2008-	EEA 6.7L 6cyl	12	5.0	428000-6340	R
Kenworth	All	2003-2006	CAT C11	12	5.0	428000-4420	R
Kenworth	All	2004-2006	CAT C13	12	5.0	428000-4420	R
Kenworth	All	2000-2006	CAT C15	12	5.0	428000-4420	R
Kenworth	All	1998-2006	Cummins ISM	12	5.0	428000-4420	R
Kenworth	All	1994-1998	Cummins M11	12	5.0	428000-4430	R
Kenworth	All	1994-2003	Detroit Series 60	12	5.0	428000-4430	R
Kenworth	All	1994-2003	Detroit Series 60	12	5.0	428000-5730	R
Kenworth	All	1994-2002	Cummins N14	12	5.0	428000-4440	R
Kenworth	All	2011	Cummins ISX	12	5.0	428000-5170	R
Kenworth	All	1999-2010	Cummins ISX	12	5.0	428000-5190	R
Mack	All	1997-2006	Mack E-Tech	12	5.0	428000-4430	R
Mack	All	1994-1996	Mack E-7	12	5.0	428000-4430	R
Peterbilt	All	1999	CAT C12	12	5.0	428000-4420	R
Peterbilt	All	2004-2006	CAT C13	12	5.0	428000-4420	R
Peterbilt	All	2000-2006	CAT C15	12	5.0	428000-4420	R
Peterbilt	All	1998-2006	Cummins ISM	12	5.0	428000-4420	R
Peterbilt	All	1994-1998	Cummins M11	12	5.0	428000-4430	R
Peterbilt	All	1994-2002	Cummins N14	12	5.0	428000-4440	R
Peterbilt	All	2011	Cummins ISX	12	5.0	428000-5170	R
Peterbilt	All	1999-2010	Cummins ISX	12	5.0	428000-5190	R
Peterbilt	All	1994-2003	Detroit Series 60	12	5.0	428000-4430	R
Peterbilt	All	1994-2003	Detroit Series 60	12	5.0	428000-5730	R
Sterling	All	2004-2006	CAT C13	12	5.0	428000-4420	R
Sterling	All	2000-2006	CAT C15	12	5.0	428000-4420	R
Sterling	All	1998-2002	Cummins ISM	12	5.0	428000-4420	R
Sterling	All	1994-1998	Cummins M11	12	5.0	428000-4430	R
Sterling	All	1994-2006	Detroit Series 60	12	5.0	428000-4430*	R
Sterling	All	1994-2006	Detroit Series 60	12	5.0	428000-5730	R
Sterling	All	1994-2002	Cummins N14	12	5.0	428000-4440	R
Sterling	All	2001-2006	MBE4000	12	5.0	428000-4450	R
Volvo	All	1998-2006	Cummins ISM	12	5.0	428000-4420	R
Volvo	All	1994-2006	Detroit Series 60	12	5.0	428000-4430	R
Volvo	All	1994-2006	Detroit Series 60	12	5.0	428000-5730	R
Volvo	All	1994-2002	Cummins N14	12	5.0	428000-4440	R
Volvo	All	1994-2006	VE	12	5.0	428000-5430	R
Western Star	All	1997	CAT C12	12	5.0	428000-4420	R
Western Star	All	2007	CAT C15	12	5.0	428000-4420	R
Western Star	All	2007	Detroit Series 60	12	5.0	428000-4430	R
Western Star	All	2007	Detroit Series 60	12	5.0	428000-5730	R
Western Star	All	2001-	MBE4000	12	5.0	428000-4450	R
Western Star	All	2007-	Cummins ISX	12	5.0	428000-5170	R
Western Star	All	2007-	Detroit Diesel 13	12	5.0	428000-8690	R

* 1994-2006 Freightliner with DDS 60 when the fuel filter is outside the frame rail (single fuel filter)

WARRANTY

3 Years / 350,000 Miles (On-Road Applications)



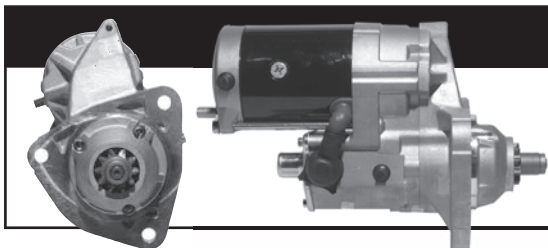
R5.0 Starter Application By Part Number



On-Road Applications	
428000-4420	
Freightliner w/CAT C12	1999
Freightliner w/CAT C13	2004-2006
Freightliner w/CAT C15	2000-2006
Freightliner w/Cummins ISM	1998-2002
Sterling w/CAT C13	2004-2006
Sterling w/CAT C15	2000-2006
Sterling w/Cummins ISM	1998-2002
International w/CAT C11	2003-2006
International w/CAT C12	1998
International w/CAT C13	2004-2006
International w/CAT C15	2000-2006
International w/Cummins ISM	1998-2006
Kenworth w/CAT C11	2003-2006
Kenworth w/CAT C13	2004-2006
Kenworth w/CAT C15	2000-2006
Kenworth w/Cummins ISM	1998-2006
Peterbilt w/CAT C12	1999
Peterbilt w/CAT C13	2004-2006
Peterbilt w/CAT C15	2000-2006
Peterbilt w/Cummins ISM	1998-2006
Volvo w/Cummins ISM	1998-2002
Western Star w/Cat C12	1997
Western Star w/Cat C15	2007
428000-4430	
Freightliner w/Cummins M11	1994-1998
Freightliner w/Detroit Series 60	1994-2006*
International w/Cummins M11	1994-1998
International w/Detroit Series 60	1994-2006
Mack w/E-Tech	1997-2006
Mack w/E-7	1994-1996
Sterling w/Cummins M11	1994-1998
Sterling w/Detroit Series 60	1994-2006
Kenworth w/Cummins M11	1994-1998
Kenworth w/Detroit Series 60	1994-2003
Peterbilt w/Cummins M11	1994-1998
Volvo w/Detroit Series 60	1994-2006
Western Star w/Detroit Series 60	2007
Volvo w/Detroit Series 60	1994-2006
Western Star w/Detroit Series 60	2007
428000-4440	
Freightliner w/Cummins ISX	1999-2006
Freightliner w/Cummins N14	1994-2002
Sterling w/Cummins N14	1994-2002
International w/Cummins ISX	1999-2006
International w/Cummins N14	1994-2002
Kenworth w/Cummins N14	1994-2002
Peterbilt w/Cummins N14	1994-2002
Volvo w/Cummins N14	1994-2002

On-Road Applications (Cont.)	
428000-4450	
Freightliner w/MBE4000	2001-2006
Sterling w/MBE4000	2001-2006
Western Star w/MBE4000	2001-
428000-5170	
Freightliner w/Cummins ISX	2010-
International w/Cummins ISX	2007-
Kenworth w/Cummins ISX	2011-
Peterbilt w/Cummins ISX	2011-
428000-5190	
Kenworth w/Cummins ISX	1999-2010
Peterbilt w/Cummins ISX	1999-2010
Freightliner w/Cummins ISX	1999-2010
International w/Cummins ISX	1999-2010
428000-5430	
Volvo VE 12	1994-2006
428000-5730	
Freightliner w/Detroit Series 60	1994-2006
International w/Detroit Series 60	1994-2006
Sterling w/Detroit Series 60	1994-2006
Kenworth w/Detroit Series 60	1994-2003
Peterbilt w/Detroit Series 60	1994-2003
Volvo w/Detroit Series 60	1994-2006
Western Star w/Detroit Series 60	2007
428000-8370	
International w/MaxxForce 11	2007-
International w/MaxxForce 13	2007-
428000-8690	
Freightliner w/Detroit Diesel 13	2007-
Off-Road Applications	
428000-3320	
John Deere w/PowerTech Engines, C670, T660, T670 & WTS Combines & 6090	2006-
428000-4080	
John Deere w/PowerTech Engines, 8030 Series & 9230 Tractors	2006-
428000-5530	
John Deere Ag. Machinery, 6135	2006-
428000-5750	
John Deere Combine, 6135	2006-
428000-5850	
Case New Holland MX240 Tractor w/ Cummins 8.3L engine	2008-
428000-6340	
J.I. Case TV145 Tractor w/ EEA 6.7L, 6cyl	

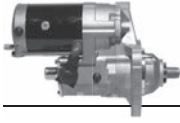
* 1994-2006 Freightliner with DDS 60 when the fuel filter is outside the frame rail (single fuel filter)



WARRANTY

3 Years / 350,000 Miles

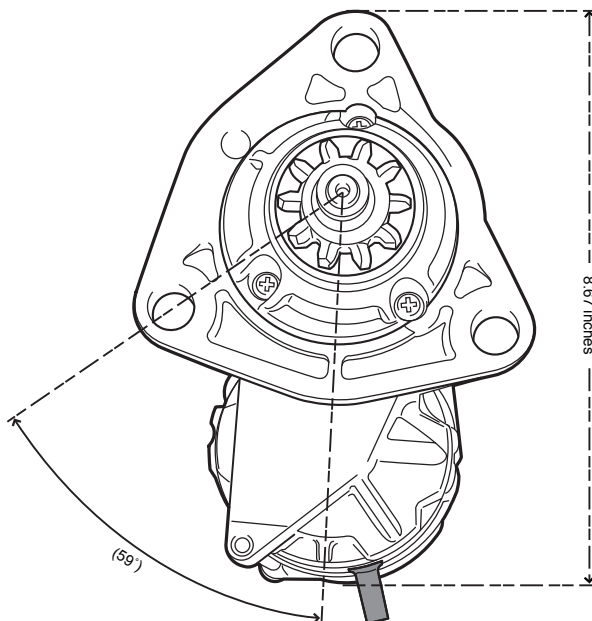
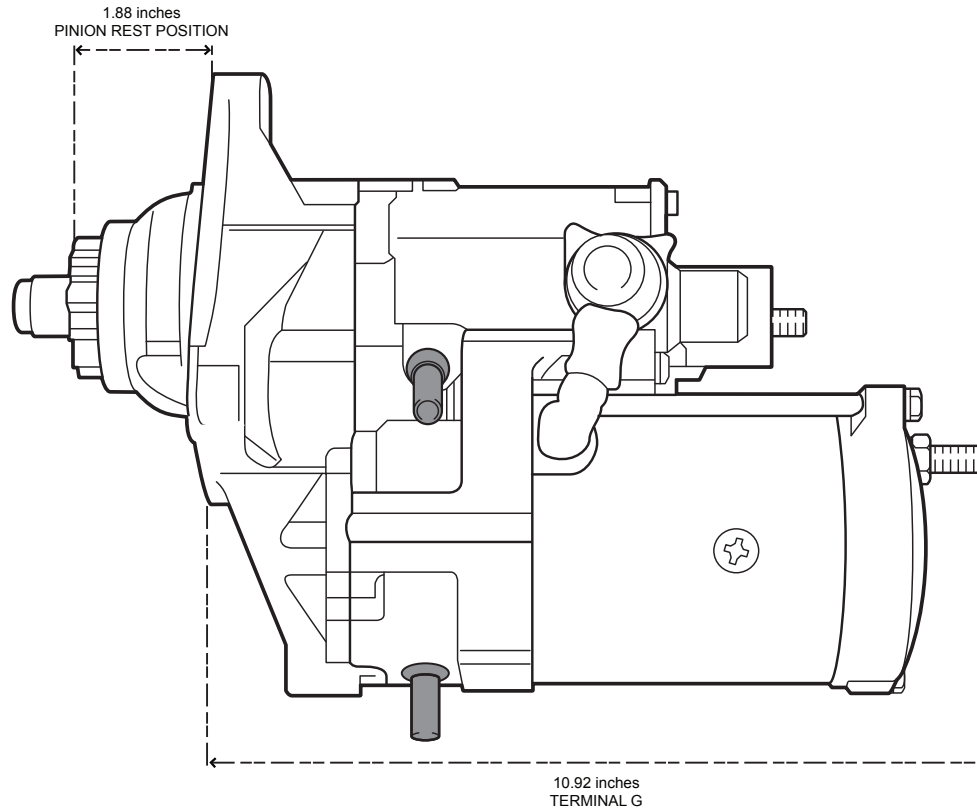
1 Year (On-Road Applications) / 1 Year (Off-Road)



On-Road SPECIFICATIONS



428000-4420



Application: 428000-4420

Freightliner w/CAT C12, C13 & C15

Freightliner w/Cummins ISM

International w/CAT C11, C12, C13 & C15

International w/Cummins ISM

Kenworth w/CAT C11, C13 & C15

Peterbilt w/CAT C12, C13 & C15

Peterbilt w/Cummins ISM

Sterling w/CAT C13 & C15

Sterling w/Cummins ISM

Volvo w/Cummins ISM

Western Star w/Cat C12 & C15

428000-4420

PINION SPECIFICATIONS

DIAMETRAL PITCH 6/8

NUMBER OF TEETH 10

R5.0 STARTER SPECIFICATIONS

SYSTEM VOLTAGE 12V

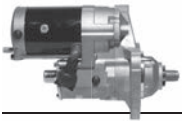
RATED OUTPUT 5.0kW (SAE J544B 12V
EXTRA HEAVY DUTY)

DIRECTION OF ROTATION CLOCKWISE VIEWED FROM
PINION END

WEIGHT APPROX. 23 lbs (10.7 kg)

WARRANTY 3 Years / 350,000 Miles (On-Road Applications)

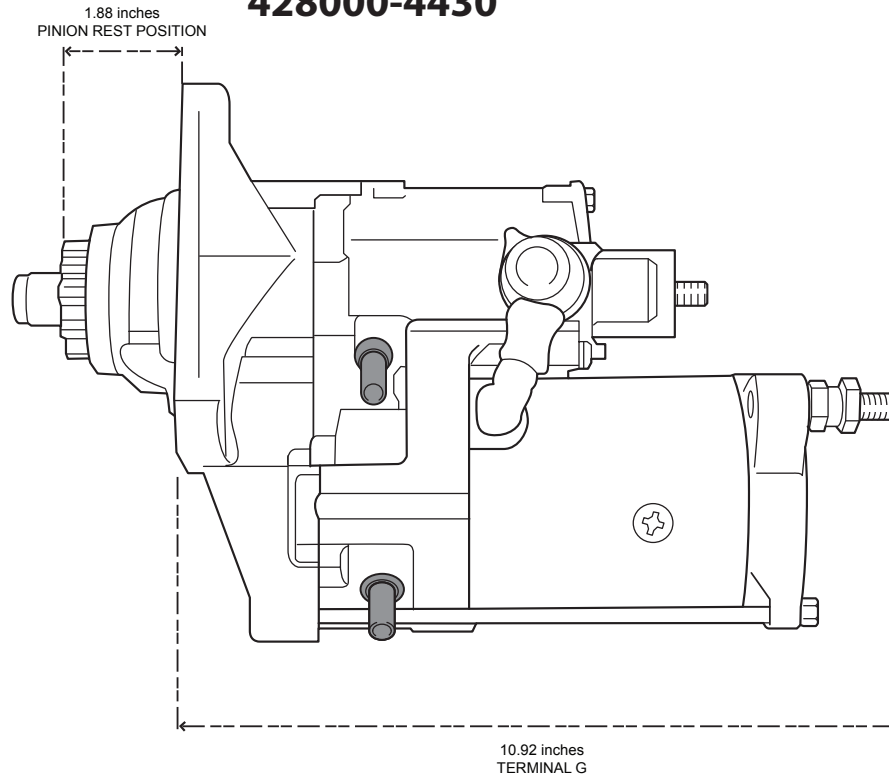
Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



On-Road SPECIFICATIONS



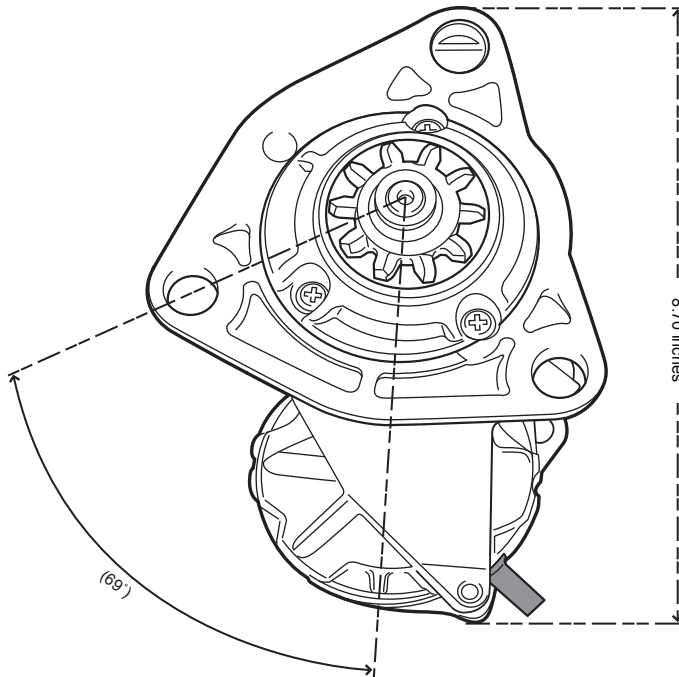
428000-4430



Application: 428000-4430

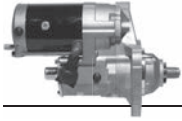
Freightliner w/Cummins M11
 Freightliner w/Detroit Series 60
 International w/Cummins M11
 International w/Detroit Series 60
 Kenworth w/Cummins M11
 Kenworth w/Detroit Series 60
 Mack w/E-Tech

Mack w/E-7
 Peterbilt w/Cummins M11
 Sterling w/Cummins M11
 Sterling w/Detroit Series 60
 Volvo w/Detroit Series 60
 Western Star w/Detroit Series 60



428000-4430	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	6/8
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
RATED OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 23 lbs. (10.7 kg)

WARRANTY 3 Years / 350,000 Miles (On-Road Applications)

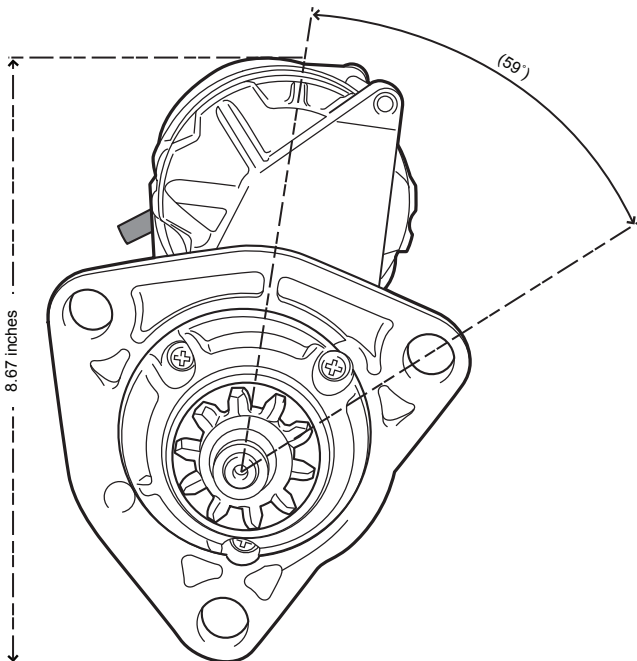
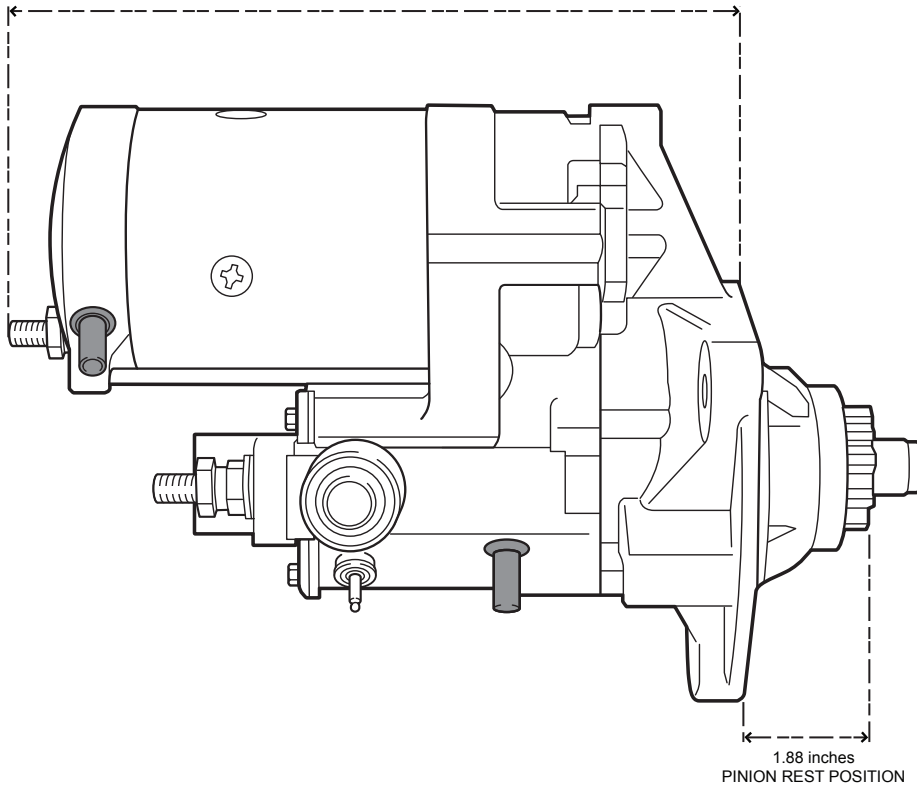


On-Road SPECIFICATIONS



428000-4440

10.92 inches
TERMINAL G



Application: 428000-4440

Freightliner w/Cummins ISX
Freightliner w/Cummins N14
International w/Cummins ISX
International w/Cummins N14

Kenworth w/Cummins N14
Peterbilt w/Cummins N14
Sterling w/Cummins N14
Volvo w/Cummins N14

428000-4440

PINION SPECIFICATIONS

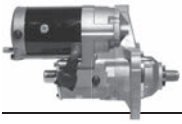
DIAMETRAL PITCH	6/8
NUMBER OF TEETH	10

R5.0 STARTER SPECIFICATIONS

SYSTEM VOLTAGE	12V
RATED OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 23 lbs. (10.7 kg)

WARRANTY 3 Years / 350,000 Miles (On-Road Applications)

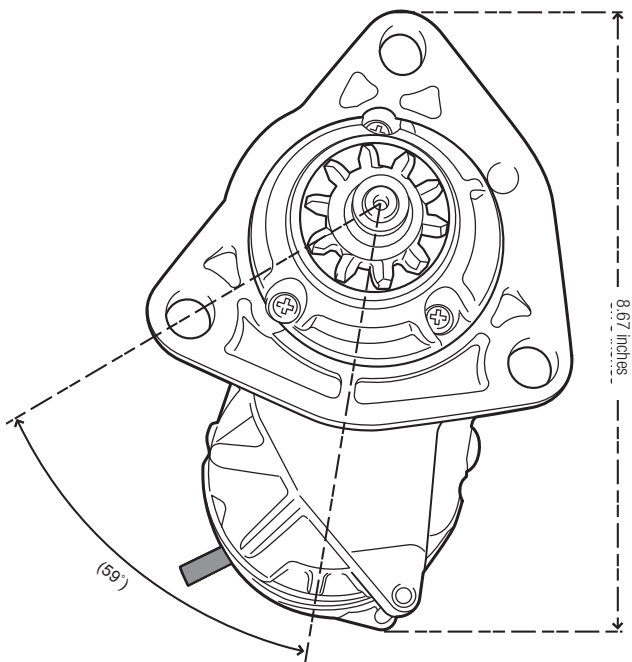
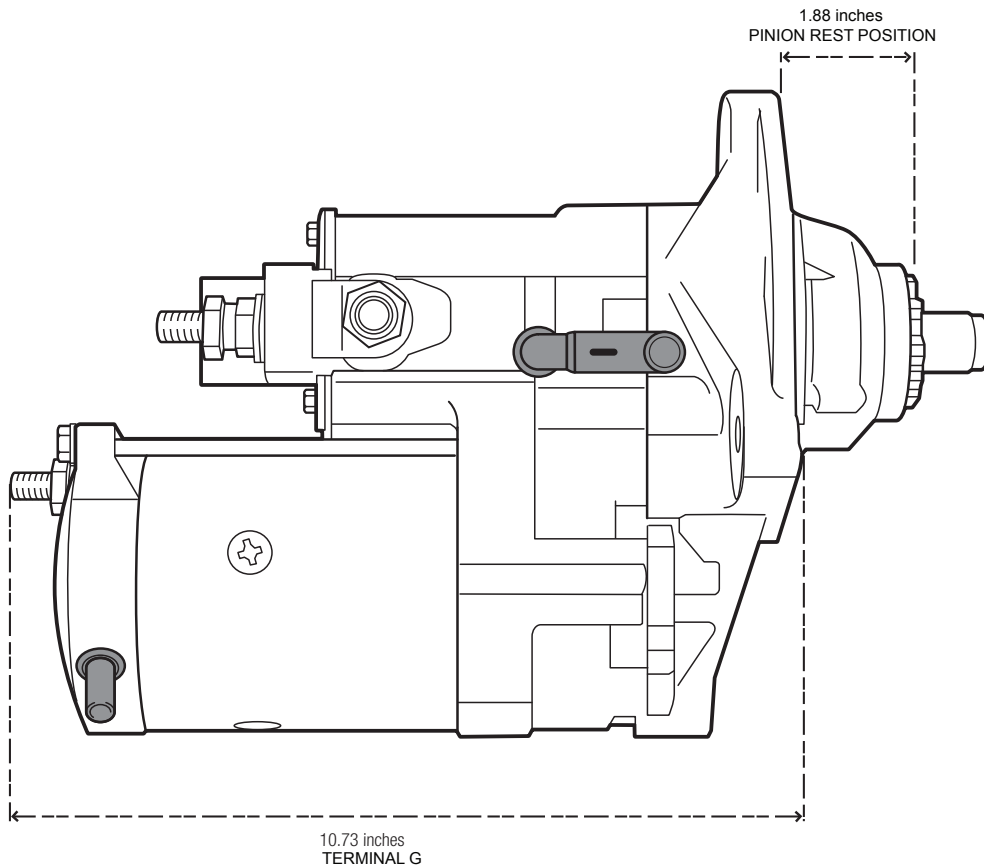
Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



On-Road SPECIFICATIONS



428000-4450



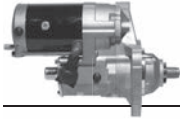
Application: 428000-4450

Freightliner w/Mercedes 4000

Sterling w/Mercedes 4000

428000-4450	
PINION SPECIFICATIONS	
MODULE	3
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
RATED OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 23 lbs. (10.5 kg)

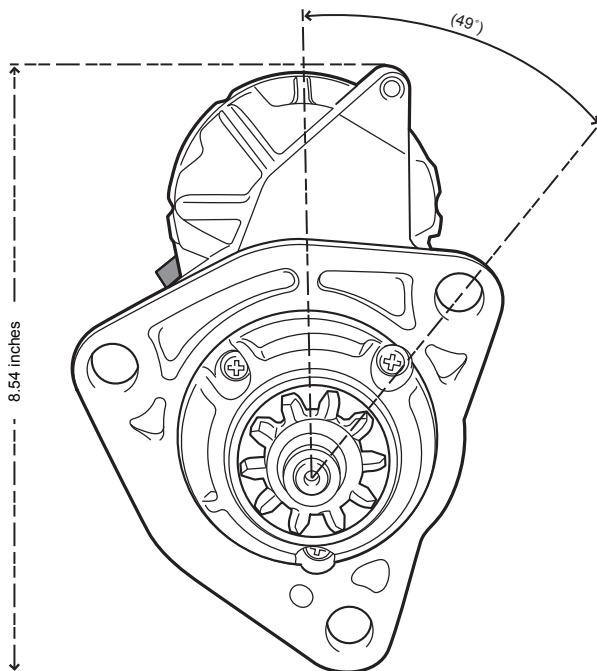
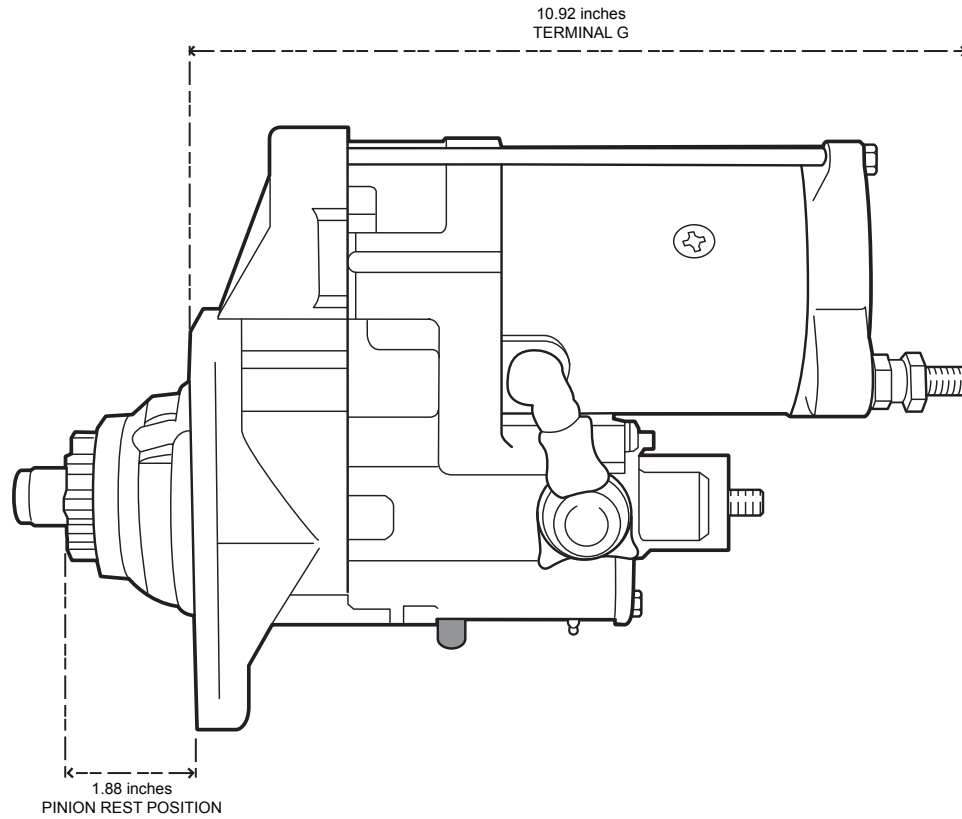
WARRANTY 3 Years / 350,000 Miles (On-Road Applications)



On-Road SPECIFICATIONS



428000-5190



Application: 428000-5190

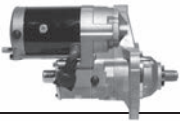
Freightliner w/Cummins ISX
International w/Cummins ISX

Kenworth w/Cummins ISX
Peterbilt w/Cummins ISX

428000-5190	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	6/8
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
RATED OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 24 lbs. (11 kg)

WARRANTY 3 Years / 350,000 Miles (On-Road Applications)

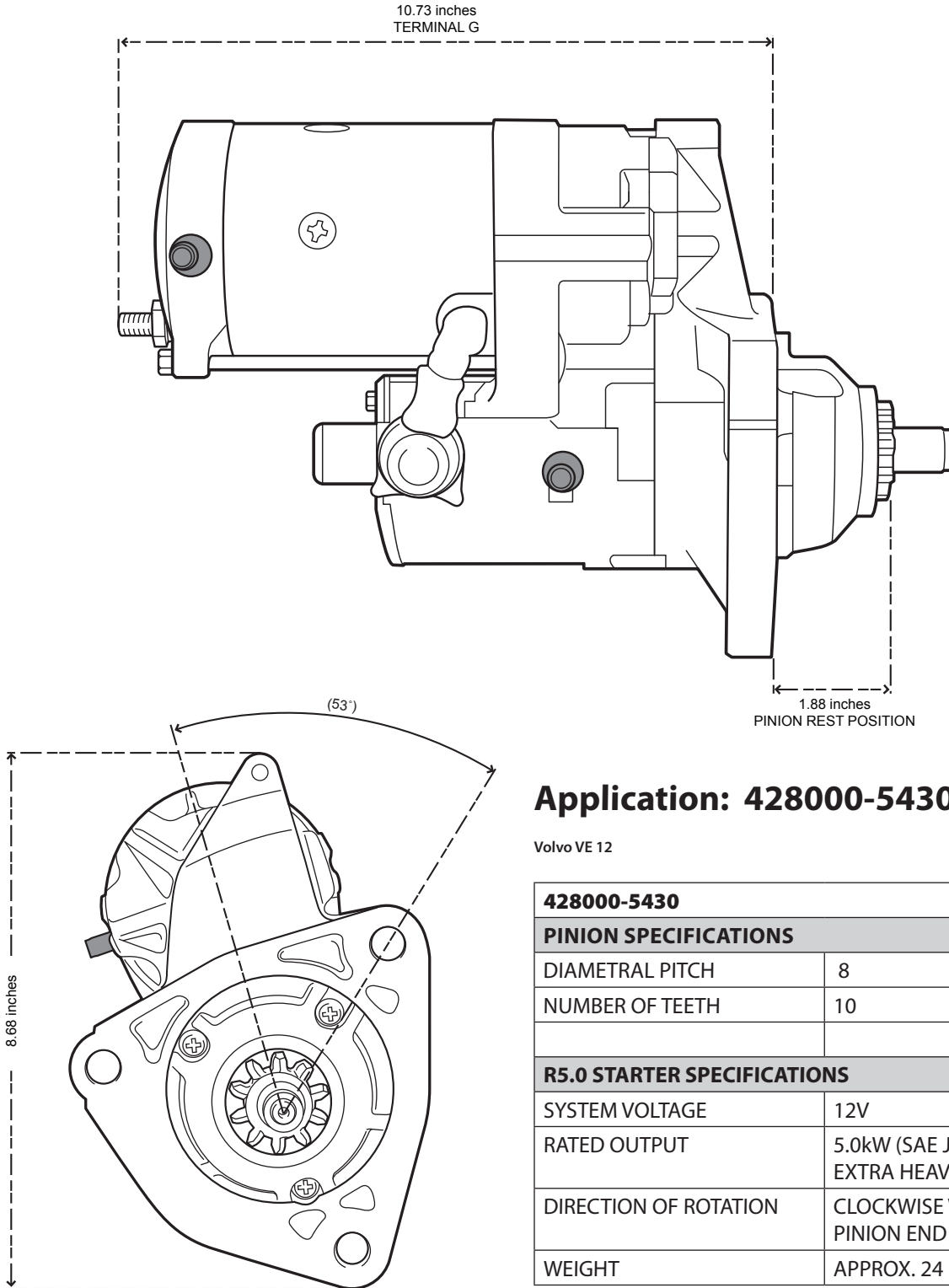
Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



On-Road SPECIFICATIONS



428000-5430

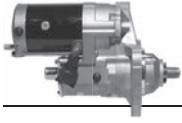


Application: 428000-5430

Volvo VE 12

428000-5430	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	8
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
RATED OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 24 lbs. (11 kg)

WARRANTY 3 Years / 350,000 Miles (On-Road Applications)

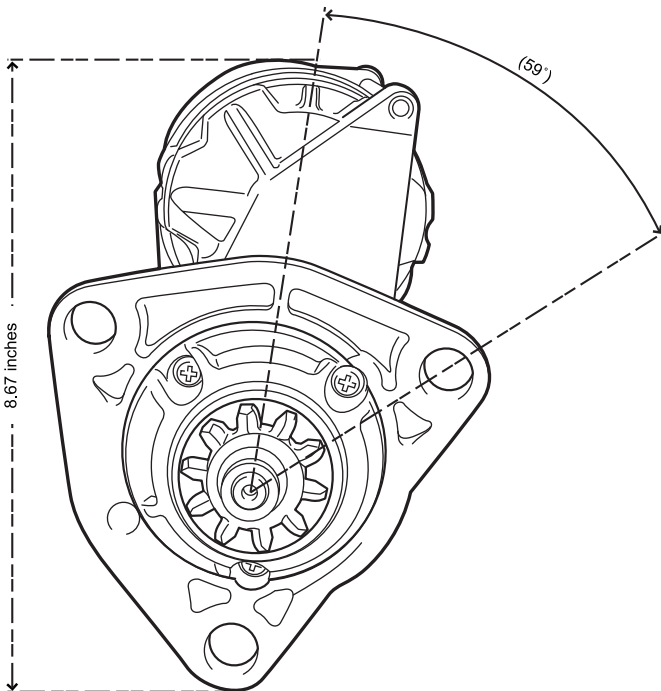
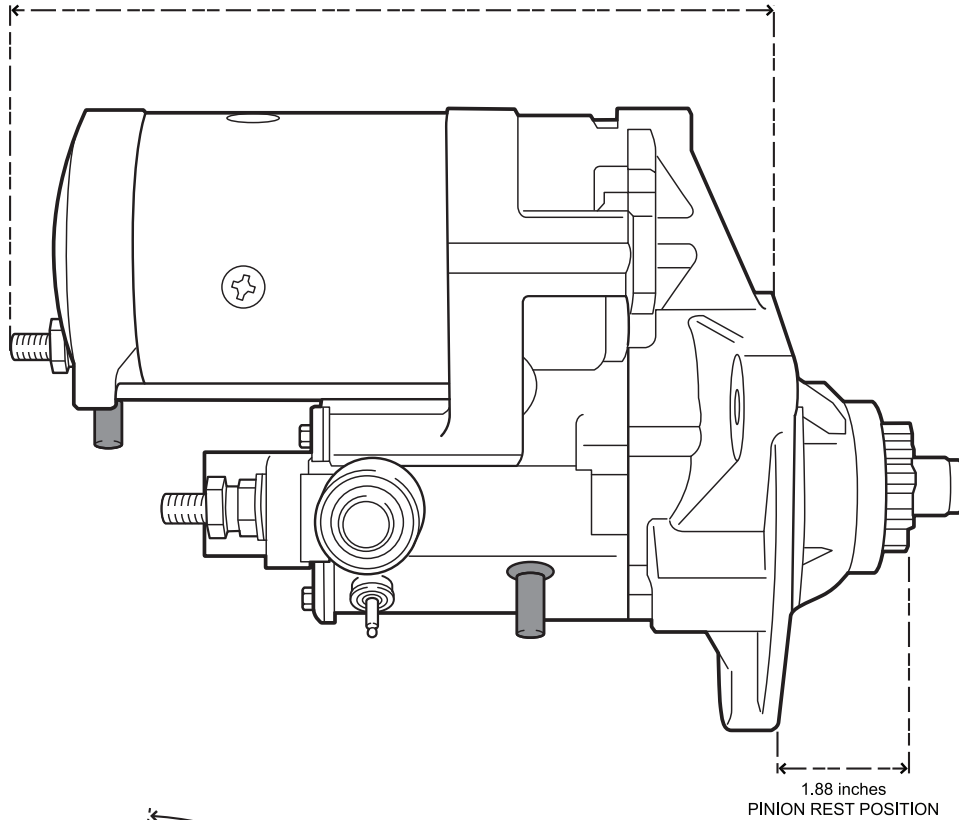


On-Road SPECIFICATIONS



428000-5730

10.92 inches
TERMINAL G



Application: 428000-5730

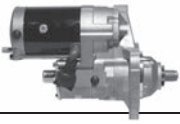
Freightliner w/Detroit Series 60
International w/Detroit Series 60
Kenworth w/Detroit Series 60
Peterbilt w/Detroit Series 60

Sterling w/Detroit Series 60
Volvo w/Detroit Series 60
Western Star w/Detroit Series 60

428000-5730	
PINION SPECIFICATIONS	
DIAMETRICAL PITCH	6/8
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 23 lbs. (10.7 kg)

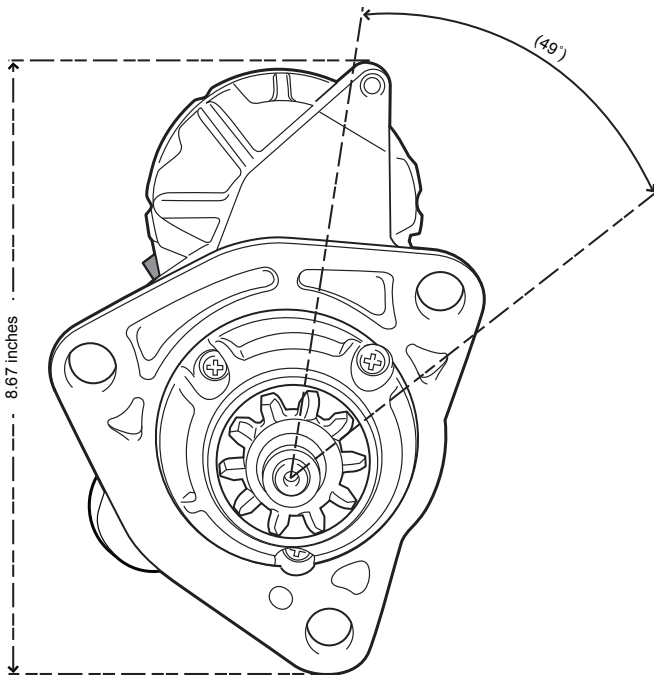
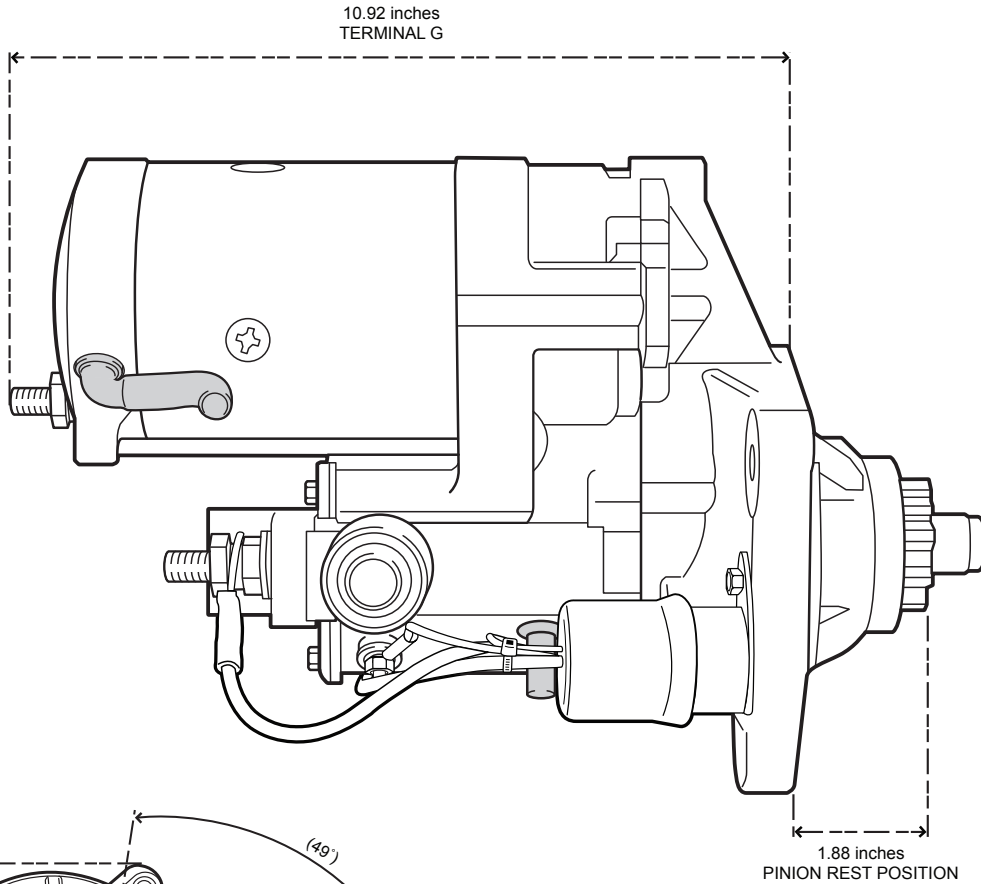
WARRANTY 3 Years / 350,000 Miles (On-Road Applications)

Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



On-Road Specifications

428000-5170



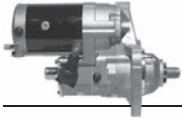
Application: 428000-5170

2010 - Freightliner w/Cummins ISX
2007 - International w/Cummins ISX

2011 - Kenworth w/Cummins ISX
2011 - Peterbilt w/Cummins ISX

428000-5170	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	6
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 25 lbs. (11.3 kg)
OPERATION VOLTAGE (AT 20°C)	8V MAX

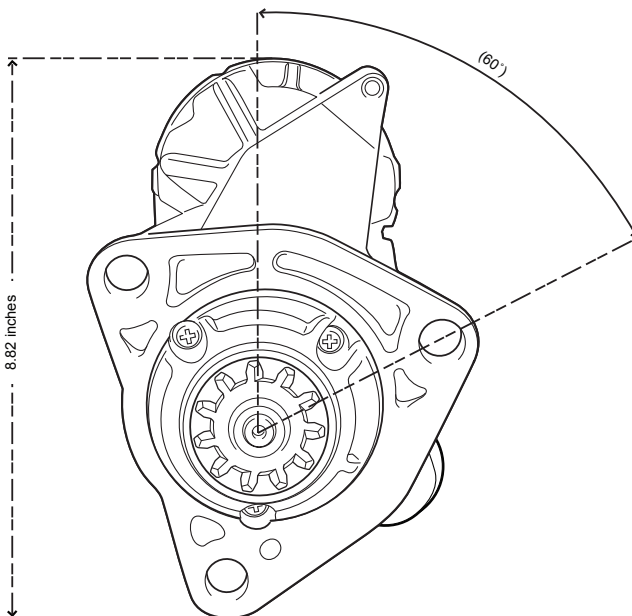
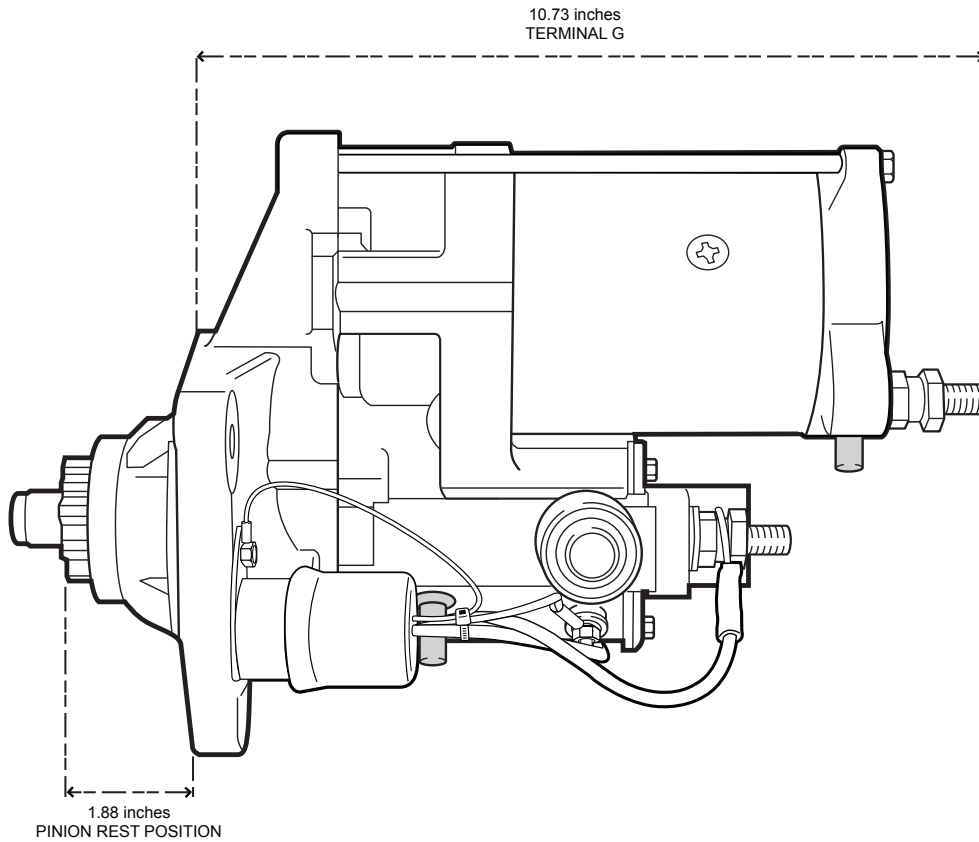
WARRANTY 3 Years / 350,000 Miles (On-Road Applications)



On-Road Specifications



428000-8370



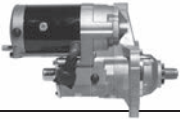
Application: 428000-8370

International w/MaxxForce 11 & 13

428000-8370	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	8
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 25 lbs. (11.3 kg)
OPERATION VOLTAGE (AT 20°C)	8V MAX

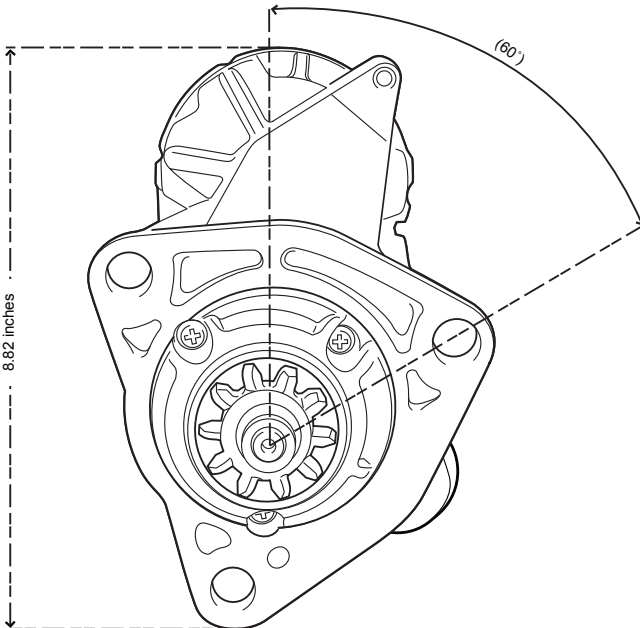
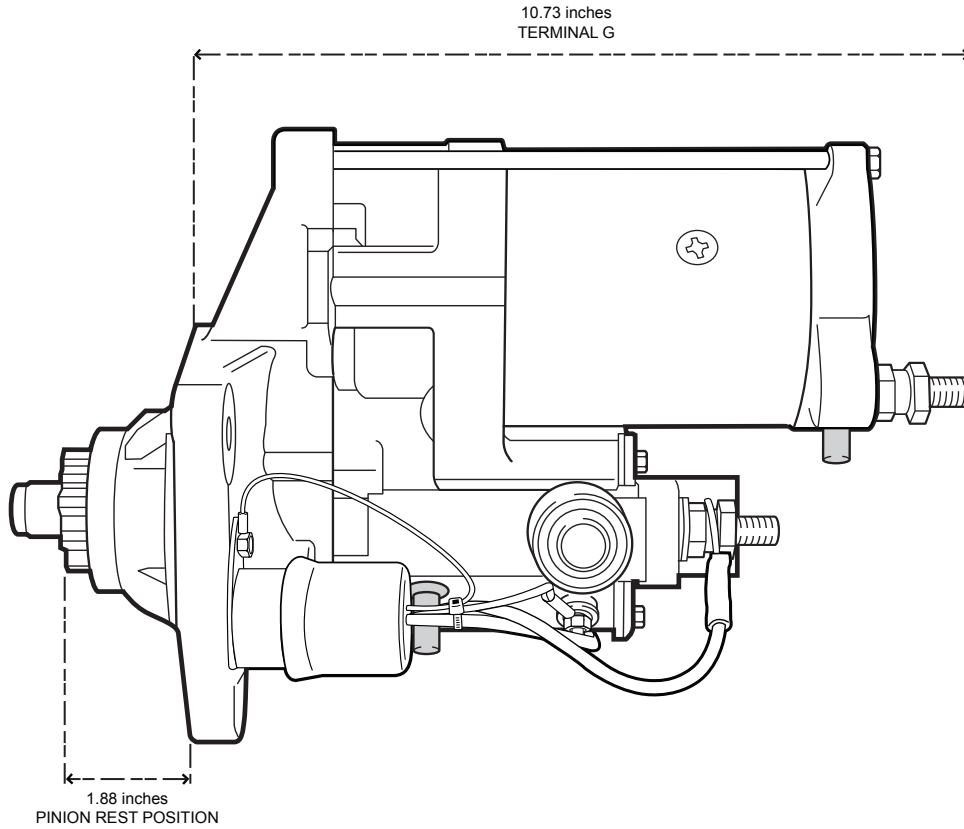
WARRANTY 3 Years / 350,000 Miles (On-Road Applications)

Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



On-Road Specifications

428000-8690

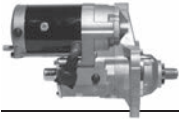


Application: 428000-8690

Freightliner w/DD13

428000-8690	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	3
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 24 lbs. (11 kg)
OPERATION VOLTAGE (AT 20°C)	8V MAX

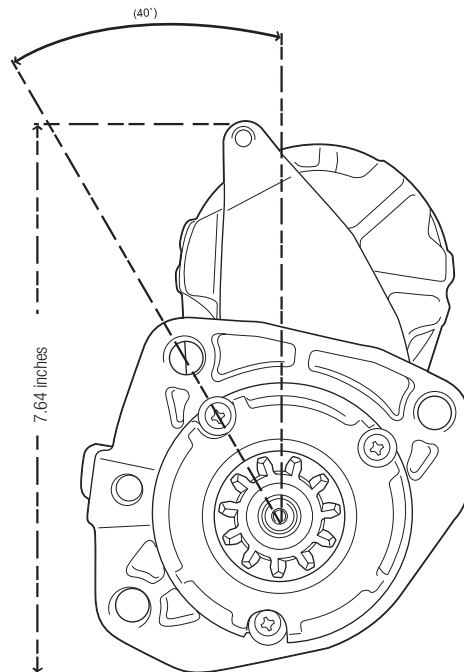
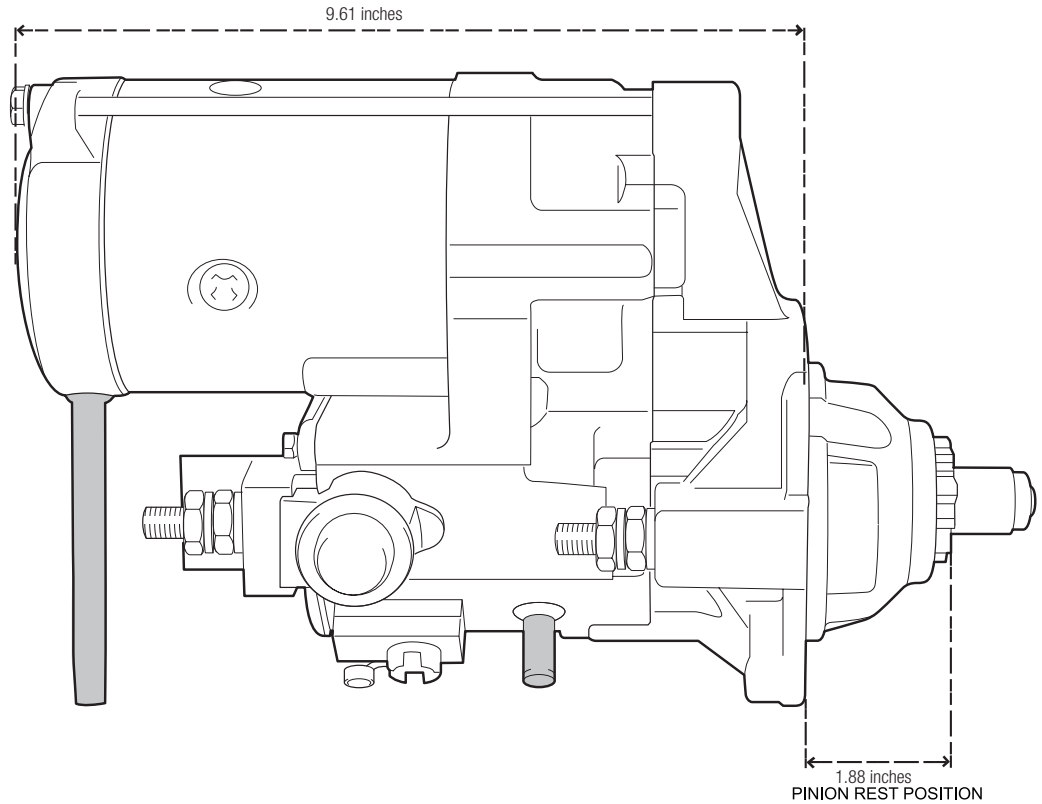
WARRANTY 3 Years / 350,000 Miles (On-Road Applications)



Off-Road SPECIFICATIONS



428000-3320



Application: 428000-3320

John Deere w/PowerTech Engines, C670
T660, T670 & WTS Combines & 6090

428000-3320

PINION SPECIFICATIONS

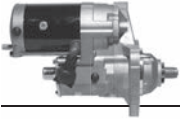
DIAMETRAL PITCH	8/10
NUMBER OF TEETH	11

R5.0 STARTER SPECIFICATIONS

SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 23 lbs. (10.7 kg)

WARRANTY 1Year/Unlimited Miles (Off-Road Applications)

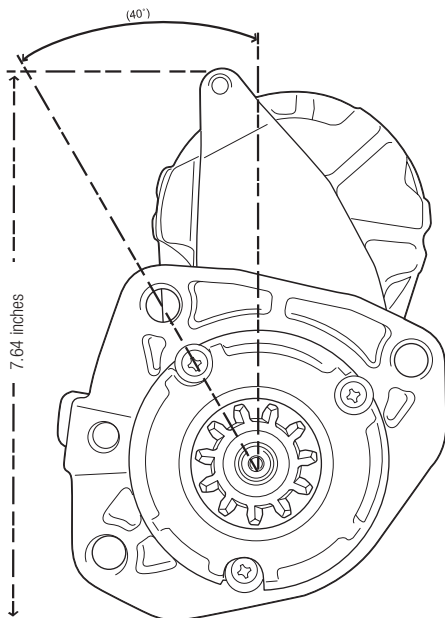
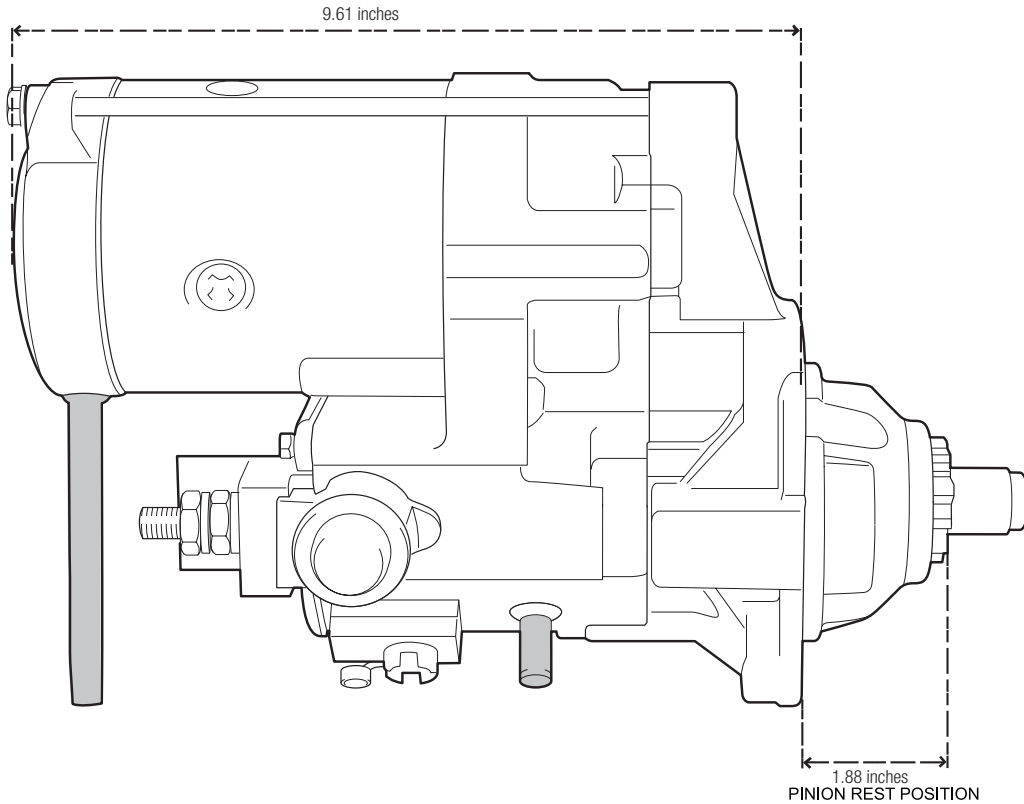
Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



Off-Road SPECIFICATIONS



428000-4080

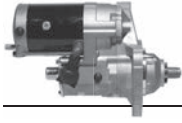


Application: 428000-4080

John Deere w/ 9230 Tractors

428000-4080	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	8/10
NUMBER OF TEETH	11
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 23 lbs. (10.7 kg)

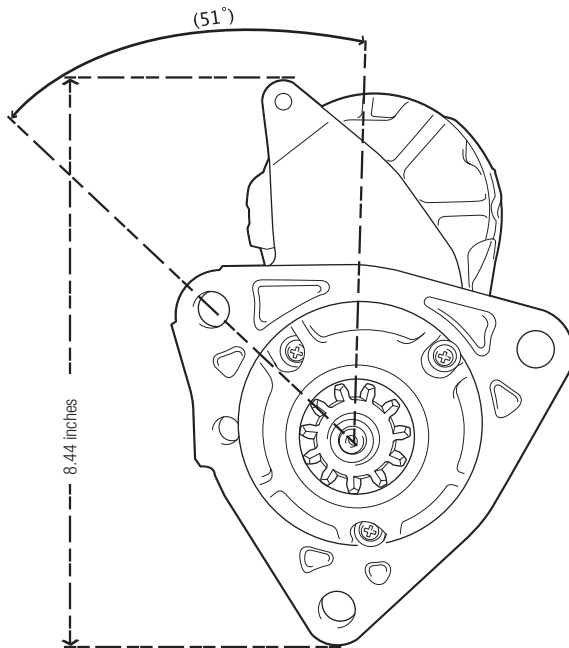
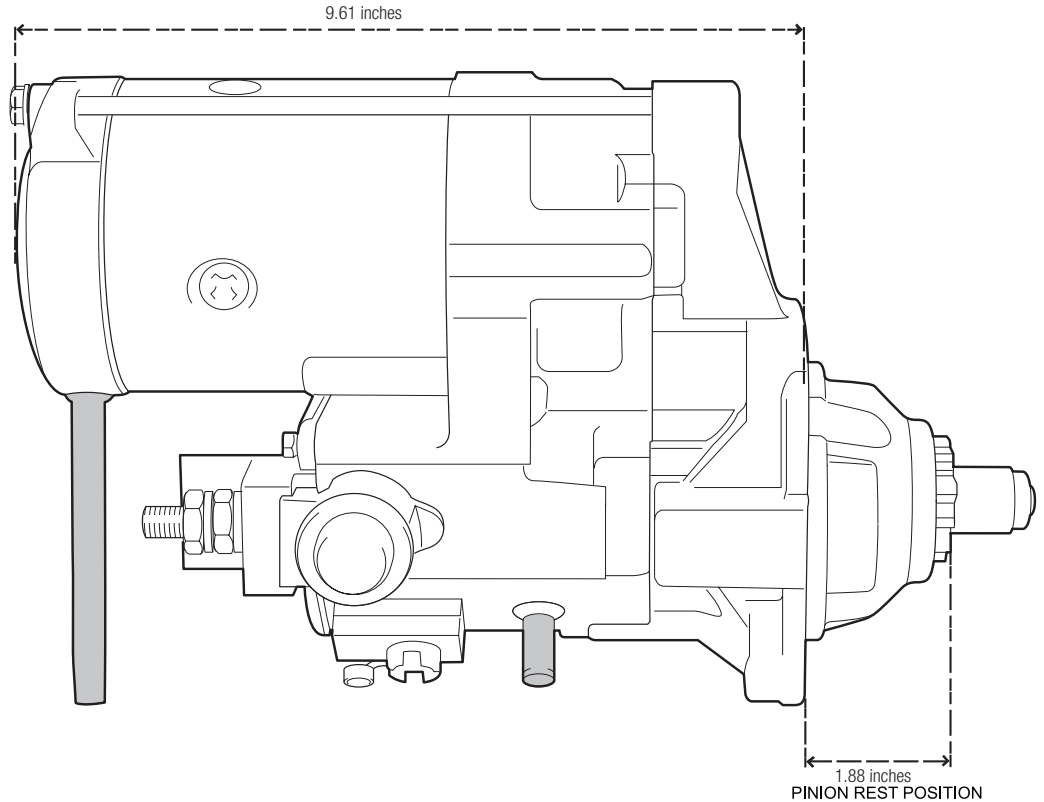
WARRANTY 1 Year/Unlimited Miles (Off-Road Applications)



Off-Road SPECIFICATIONS



428000-5530



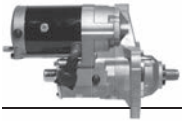
Application: 428000-5530

John Deere Agricultural Machinery, 6135

428000-5530	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	8
NUMBER OF TEETH	11
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 24 lbs. (11 kg)

WARRANTY 1Year/Unlimited Miles (Off-Road Applications)

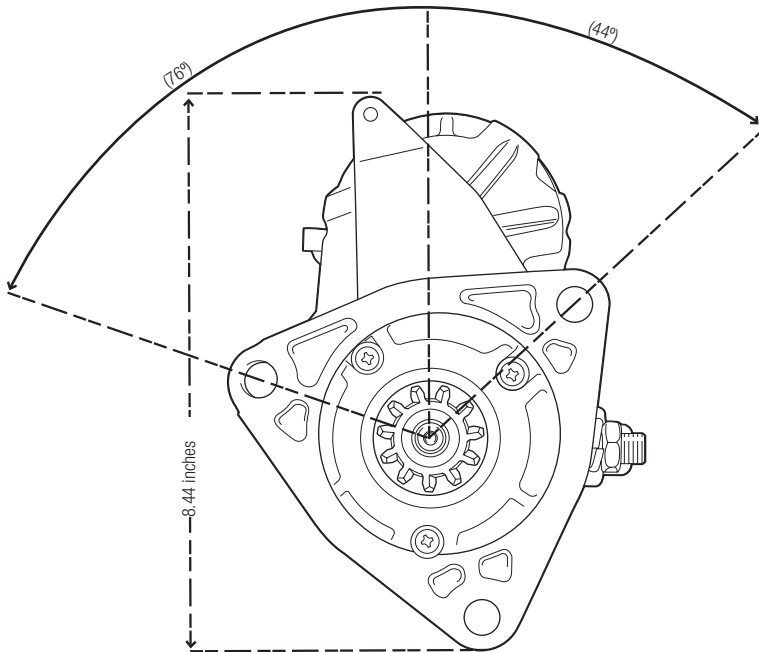
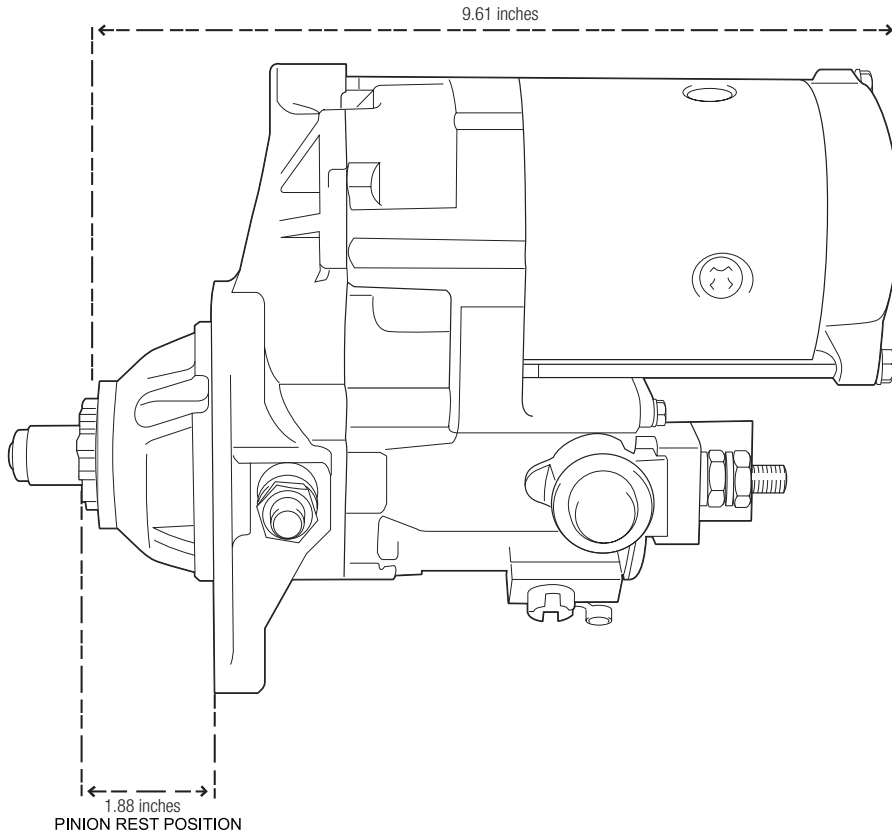
Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



Off-Road SPECIFICATIONS



428000-5750

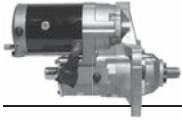


Application: 428000-5750

John Deere Combine, 6135

428000-5750	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	8/10
NUMBER OF TEETH	11
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 24 lbs. (11 kg)

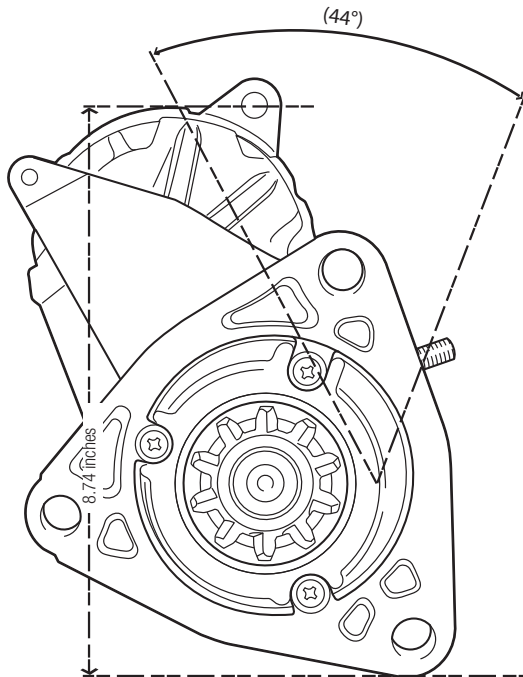
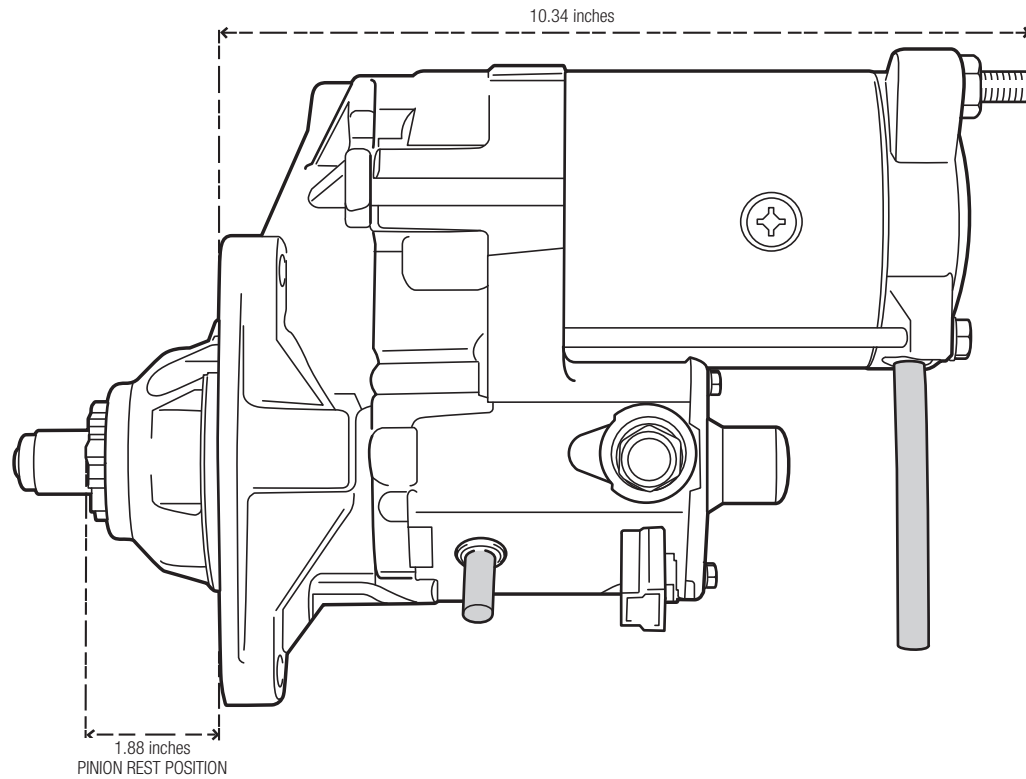
WARRANTY 1 Year/Unlimited Miles (Off-Road Applications)



Off-Road SPECIFICATIONS



428000-5850



Application: 428000-5850

Case New Holland MX240 Tractor w/ Cummins 8.3L engine

42800-5850

PINION SPECIFICATIONS

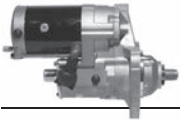
DIAMETRAL PITCH	8
NUMBER OF TEETH	10

R5.0 STARTER SPECIFICATIONS

SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 24lbs (11kg)
OPERATION VOLTAGE (AT 20°C)	8V MAX

WARRANTY 1Year/Unlimited Miles (Off-Road Applications)

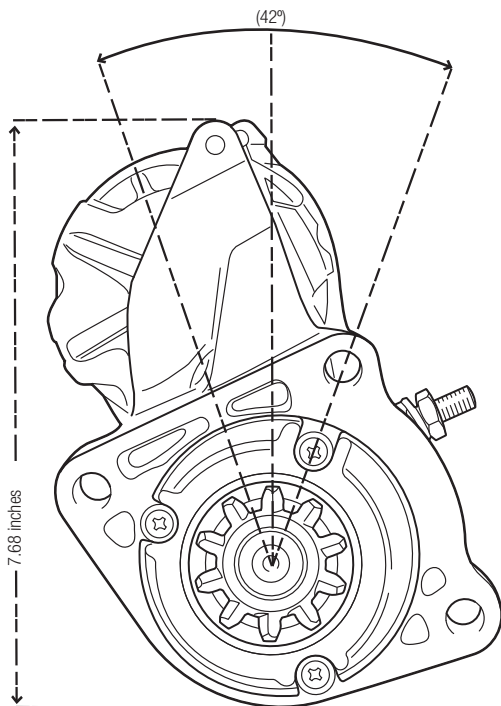
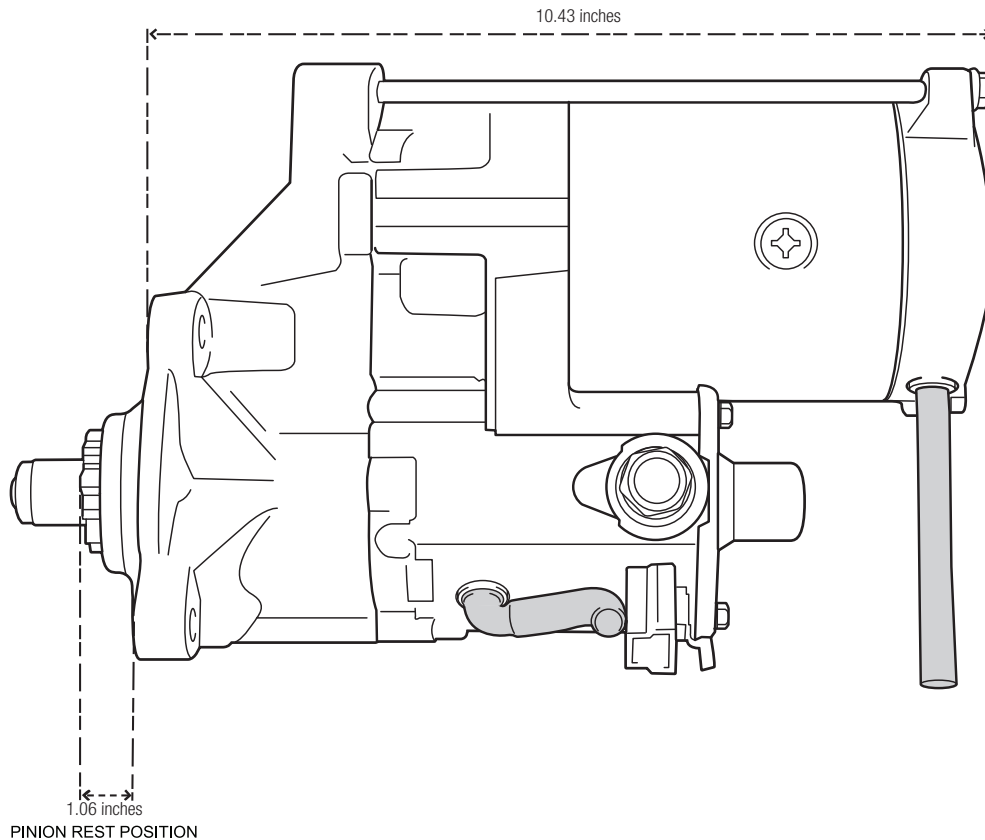
Starter must be installed with the drain tube positioned downward.
The physical appearance of this DENSO starter may differ from the original starter.



Off-Road SPECIFICATIONS



428000-6340

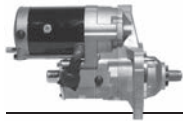


Application: 428000-6340

J.I. Case TV145 Tractor w/ EEA 6.7L, 6cyl

428000-6340	
PINION SPECIFICATIONS	
DIAMETRAL PITCH	8
NUMBER OF TEETH	10
R5.0 STARTER SPECIFICATIONS	
SYSTEM VOLTAGE	12V
NOMINAL OUTPUT	5.0kW (SAE J544B 12V EXTRA HEAVY DUTY)
DIRECTION OF ROTATION	CLOCKWISE VIEWED FROM PINION END
WEIGHT	APPROX. 24lbs (11kg)
OPERATION VOLTAGE (AT 20°C)	8V MAX

WARRANTY 1 Year/Unlimited Miles (Off-Road Applications)

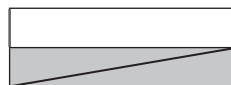


R5.0 Starter Truck /Engine Model Application Chart



R5 Approved Applications

Engine/Truck Model	Freightliner	Sterling	International (Thru MY2006)	Peterbilt	Kenworth	Mack	Volvo	Western Star
CAT C11			428000-4420		428000-4420			
CAT C12			428000-4420 ^(C)	428000-4420 ^(D)				428000-4420 ^(E)
CAT C13	428000-4420	428000-4420	428000-4420	428000-4420	428000-4420			
CAT C15	428000-4420	428000-4420	428000-4420	428000-4420	428000-4420			428000-4420 ^(B)
Cummins ISM	428000-4420	428000-4420	428000-4420	428000-4420	428000-4420		428000-4420	
Cummins ISX	428000-4440 428000-5190		428000-4440 428000-5190	428000-5190	428000-5190			
Cummins ISX w/ IMS Relay	428000-5170 (MY2010-)		428000-5170 (MY2007-)	428000-5170	428000-5170			
Cummins M11	428000-4430	428000-4430	428000-4430	428000-4430	428000-4430			
Cummins N14	428000-4440	428000-4440	428000-4440	428000-4440	428000-4440		428000-4440	
DD S60	428000-4430 ^(A) 428000-5730	428000-4430 ^(A) 428000-5730	428000-4430 ^(A) 428000-5730	428000-4430 ^(A) 428000-5730	428000-4430 ^(A) 428000-5730		428000-4430 ^(A) 428000-5730	428000-4430 ^(A&B) 428000-5730 ^(B)
DTNA DD13 w/ IMS Relay	428000-8690 ^(F)							428000-8690 ^(F)
Mack E-Tech, E-7						428000-4430		
MaxxForce 11 w/ IMS Relay			428000-8370 ^(G)					
MaxxForce 13 w/ IMS Relay			428000-8370 ^(G)					
MBE 4000	428000-4450	428000-4450						428000-4450
Volvo VE12							428000-5430	



Under Development

Not Applicable

^(A) 1994-2006 when the fuel filter is outside the frame rail (single fuel filter)

^(B) 2007 Model Year Only

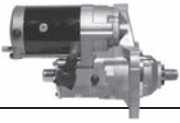
^(C) 1998 Model Year Only

^(D) 1999 Model Year Only

^(E) 1997 Model Year Only

^(F) 2007 Model Year Forward

^(G) 2007 Model Year Forward



IMAGES, SCHEMATICS & UPDATED APPLICATION INFORMATION ON THE WEB

Additional images, schematics and updated application information is available on our website.

Log on to www.DensoHeavyDuty.com and click the "Product Search" link.

You can look up applications by DENSO part number, product category or competitor cross-reference number.

The screenshot shows the DENSO Heavy Duty website interface. At the top, there is a navigation bar with links for HOME, WHY DENSO, PART LOOKUP, DISTRIBUTOR SEARCH, DOWNLOADS, MOTORSPORTS, FAQ, and SITE MAP. On the right, there are search options for ONTAE US, FIND M/PAR, and DISTRIBUTOR/SEARCH, along with DENSO logos for F1RSE F1TRNO F1K and IRIIDIUM POWER, with corresponding website URLs.

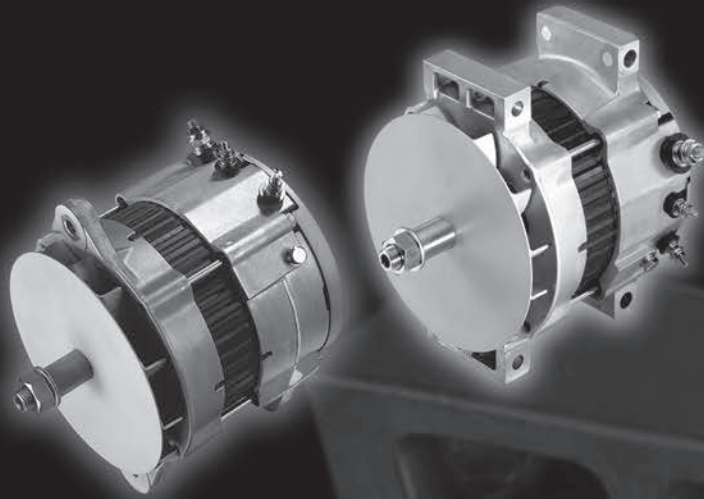
The main content area features a large image of various engine components with the text: "A leading global supplier of advanced technology, systems and components, DENSO serves all the world's major automakers." Below this is a "DENSO Products" section with five categories: AGRICULTURAL CONSTRUCTION, INDUSTRIAL, COMMERCIAL VEHICLE FLEET, OUTDOOR POWER EQUIP., and RV, each with a representative image.

On the left side, there is a vertical navigation menu with the following categories and sub-items:

- Construction/Agricultural**
 - Alternator
 - Alternator
 - Diesel Fuel Injection
 - Starter
- Industrial**
 - Alternator
 - Diesel Fuel Injection
 - Spark Plug
 - Starter
- Commercial Vehicle Fleet**
 - Heavy Duty Fleet
 - Medium Duty Fleet
 - Light Duty Fleet
- Outdoor Power Equipment**
 - Alternator
 - Spark Plug
 - Starter
- RV**
 - HWC
 - Windshield Washer/Wiper
- Resources**
 - Product Search
 - Tech Support
 - Sales Brochures
 - Installation Instructions

Below the product categories, there is a section titled "A WINNING TRADITION" with the text: "The DENSO name means high quality and superior technology in the automotive industry. DENSO takes this technological expertise to the racetrack in the form of sponsorships and component provisions." This is followed by a "News & Events" section listing several news items with dates and headlines, such as "DENSO Announces Year-end Financial Results - (05/09/2007)" and "DENSO Awarded Pronto OE Supplier of the Year - (11/16/2006)".

At the bottom of the page, there is a footer with navigation links: HOME, WHY DENSO, NEWS AND EVENTS, ONTAE US, DISTRIBUTOR/SEARCH, FIND M/PAR, DENSO GLOBAL, and SITE MAP. Below the footer is the copyright notice: "Copyright © 2009 DENSO Sales California | Legal Information | Privacy Policy".



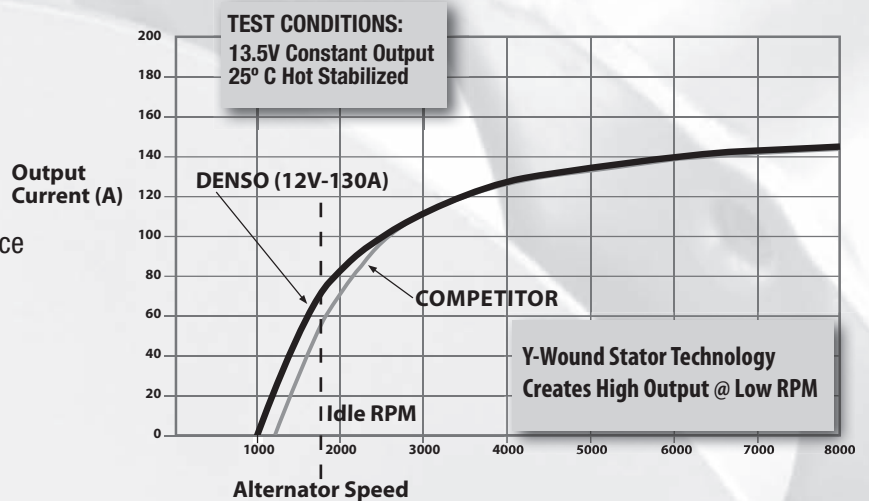
SPECIFICATIONS

- Rated Voltage and Rated Output: 12V - 130A
- Allowable Max RPM: 10,000 rpm
- Allowable Belt Load: 980N max
- Polarity: Negative - Case Grounded
- Rotation: Clockwise (viewed from pulley end)
- Approximate Weight: 22.9 lbs

FEATURES AND BENEFITS

- Tested to endure heat producing engines of today and tomorrow
- Long-life brushless design
- Heavy-duty front and rear bearings
- Corrosion resistant rectifier and rotor
- Heat resistant windings
- Non-soldered connections for easier service
- Compact and lightweight design
- One wire connection
- Load dump protection
- SAE J180 mount / Pad Mount
- **Warranty: 3 years / 350,000 miles** (On-Road Applications)

12V 130 AMP PERFORMANCE CURVE



PART NUMBERS & APPLICATIONS

	Part Number	Mount	Amperage	B-Terminal	R-Terminal	I-Terminal	Application
12V	101211-8120	J180	130	5/16-18 UNC	3mm Pin	--	CAT C7, C9, C10, C11, C12, C13, C15, 3176, 3406; Cummins ISB, ISM, ISX, L-10, M11, N14; Detroit Series 60
	101211-8060	J180	130	5/16-18 UNC	10-24 UNC	10-24 UNC	CAT C7, C9, C10, C11, C12, C13, C15 3406, 3176; Cummins ISB, ISM, ISX, L10, M11, M14, N14; Detroit Series 60; Volvo VE D300, VE-250, VE D12B-345
	101211-8380	Pad Mount	130	5/16-18 UNC	10-24 UNC	10-24 UNC	CAT C7, C9, C11, C13, C15; Cummins ISB, ISM, ISX; Detroit Series 60; Mack E7/E-Tech; Mercedes MBE4000
	101211-8390	Pad Mount	130	5/16-18 UNC	3mm Pin	--	CAT C7, C9, C11, C13, C15; Cummins ISB, ISM, ISX; Detroit Series 60; Mercedes MBE4000
24V	101211-8130	J180	50	5/16-18 UNC	3mm pin	--	Allis Chalmers, CAT, Clark Equipment, Cummins, Euclid, Fiat-Allis, IHC, Terex, Waukesha, Detroit Diesel, Volvo, White
	101211-8140	J180	65	5/16-18 UNC	3mm pin	--	Clark Equipment, Consolidated Diesel, Cummins, Detroit Diesel, IHC, J.I. Case, Navistar



With the increasing demands placed on trucks and the challenges of keeping fleets moving, the need for stronger and more durable components is constant. That's why Gary Page counts on DENSO Heavy Duty starters and alternators. Because of its long-lasting brushless design, the DENSO alternator leads the industry in customer satisfaction. And DENSO's new R5.0 starter is smaller, lighter and — with torque up to 60nM and 5kW output — more powerful than competitive units it replaces. Just two more reasons fleet managers everywhere look to DENSO for the solutions to today's challenges.

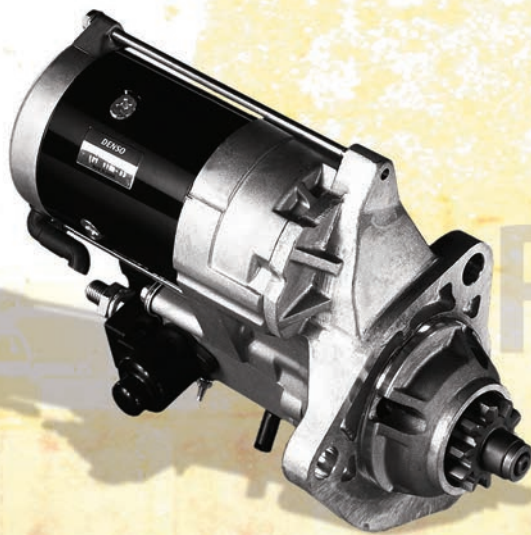
DENSO Heavy Duty starters and alternators. Better quality. Better durability. Better by design. Just ask Gary.

For more information or your distributor, visit www.densoheavyduty.com



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DENSO
HEAVY DUTY



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HDSA-R5AG-0114
D1787.331

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