PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
HOSEINALI BORHAN	01/09/2018
AKASH S. DESAI	02/14/2018
EDMUND P. HODZEN	12/12/2017
PINAK JAYANT TULPULE	01/09/2018
BIBIN N. PATEL	03/07/2018

RECEIVING PARTY DATA

Name:	CUMMINS, INC.
Street Address:	500 JACKSON STREET
City:	COLUMBUS
State/Country:	INDIANA
Postal Code:	47201

PROPERTY NUMBERS Total: 1

Property Type	Number	
Application Number:	15833775	

CORRESPONDENCE DATA

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Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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ATTORNEY DOCKET NUMBER:	106389-4761
NAME OF SUBMITTER:	LAURA BUHS
SIGNATURE:	/laura buhs/
DATE SIGNED:	03/12/2018

Total Attachments: 7

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PATENT REEL: 045173 FRAME: 0325

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PATENT REEL: 045173 FRAME: 0326

ASSIGNMENT - WORLDWIDE

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, each undersigned inventor (hereinafter referred to singly and collectively as "ASSIGNOR") has sold, assigned, and transferred, and by these presents hereby sells, assigns, and transfers, unto

Cummins, Inc. 500 Jackson Street Columbus, Indiana 47201

(hereinafter referred to as "ASSIGNEE") its successors and assigns, the full and exclusive right, title and interest for the United States, its territories and possessions, and all foreign countries in and to this invention relating to

SYSTEM AND METHOD FOR PREDICTIVE ENGINE AND AFTERTREATMENT SYSTEM CONTROL

check one [] e] executed concurrently	herewith,	
	[] executed on	
	13	(1 Serial No. 15/833.775	Filed 12/6/2015

as set forth in this United States Patent Application

as well as in and to (a) all improvements and modifications of the above-identified invention or inventions, (b) the above-identified application and all other applications for Letters Patent of the United States and countries foreign thereto for above-identified invention or inventions and all improvements and modifications thereof, (c) all Letters Patent which may issue from said applications in the United States and countries foreign thereto, (d) all divisions, continuations, reissues, and extensions of said applications and Letters Patent, and (e) the right to claim for any of said applications the full benefits and priority rights under the Patent Cooperation Treaty, the Paris Convention and any other international agreement; such right, title, and interest to be held and enjoyed by ASSIGNEE, its successors and assigns, to the full end of the term or terms for which any and all such Letters Patent may be granted as fully and entirely as would have been held and enjoyed by ASSIGNOR had this Assignment not been made.

ASSIGNOR HEREBY AUTHORIZES ASSIGNEE to file patent applications in any or all countries on the above-identified invention or inventions in the name of the undersigned or in the name of ASSIGNEE or otherwise as ASSIGNEE may deem advisable under the International Convention or otherwise.

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ASSIGNOR HEREBY AUTHORIZES AND REQUESTS the Commissioner of Patents and Trademarks to issue said Letters Patent to ASSIGNEE as assignee of the entire interest, for the sole use and benefit of ASSIGNEE, its successors and assigns.

ASSIGNOR HEREBY AGREES (a) to communicate to ASSIGNEE, its successors and assigns, or their representative or agents, all facts and information known or available to ASSIGNOR respecting said invention or inventions, improvements, and modifications including evidence for interference, reexamination, reissue, opposition, revocation, extension, or infringement purposes or other legal, judicial, or administrative proceedings, whenever requested by ASSIGNEE; (b) to testify in person or by affidavit as required by ASSIGNEE, its successors and assigns, in any such proceeding in the United States or a country foreign thereto; (c) to execute and deliver, upon request by ASSIGNEE, all lawful papers including, but not limited to, original, divisional, continuation, and reissue applications, renewals, assignments, powers of attorney, oaths, affidavits, and declarations, depositions; and (d) to provide all reasonable assistance to ASSIGNEE, its successors and assigns, in obtaining and enforcing proper title in and protection for said invention or inventions, improvements, and modifications under the intellectual property laws of the United States and countries foreign thereto.

ASSIGNOR HEREBY REPRESENTS AND WARRANTS that ASSIGNOR has the full and unencumbered right to sell, assign, and transfer the interests sold, assigned, and transferred herein, and that ASSIGNOR has not executed and will not execute any document or instrument in conflict herewith.

ASSIGNOR HEREBY GRANTS to the law firm of Foley & Lardner LLP the power and authority to insert in this Assignment any further identification which may be necessary or desirable to comply with the rules of the U.S. Patent and Trademark Office for recordation of this Assignment.

ASSIGNOR UNDERSTANDS AND AGREES that the attorneys and agents of the law firm of Foley & Lardner LLP do not personally represent ASSIGNOR OR ASSIGNOR's legal interests, but instead represent the interests of ASSIGNEE; since said attorneys and agents cannot provide legal advice to ASSIGNOR with respect to this Assignment, ASSIGNOR acknowledges its right to seek its own independent legal counsel.

Executed this 9 day of January, 2018

HOSEINALI BORHAN

State of $\frac{T_NDIP_O/A}{County of 6ARTHOLOGIEW}$

On JAN 9, 2018 , before me, TOBY REELE JOHNSON NOTTHEN PUBLIC,

Date Here insert Name and Title of the Officer (Notary Public)

personally appeared <u>HOSEINALI BORHAN</u> Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/their executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature THAT ROOM

TOBY REECE JOHNSON Notary Public - Seal State of Indiana Bartholomew County

Place No Land My Commission Expires Sep 10, 2022

Signature of Notary Public

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and the second	
State of INTRACE County of President County County Of Pr	
On <u>2-14-2018</u> , before me,	The same and the same
Date Date	Here insert Name and Title of the Officer (Notary Public)
personally appeared AKASH S. DESAI	

Executed this 14 day of February 2018

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/their executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of

Name(s) of Signer(s)

I certify under PENALTY OF PERJURY that the foregoing paragraph is true and correct.

WITNESS my liand and official seal.

Signature __

Signature of Notary Public

which the person(s) acted, executed the instrument.

SEAL VOLKE

TRACY LEA JONES
Notary Public, State of Indiana
Bartholomew County
Commission # 708997
My Commission Expires
January 04, 2026

Place Notary Seal Above

Executed this 12 day of Decembra 120/7

Duff House

State of INDIANA (County of BARTHOLOMEN)

On 12-DEC-2017

, before

TEMPY J. NEFF

Here insert Name and Title of the Officer (Notary Public)

personally appeared <u>EDMUND P. HODZEN</u>
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/their executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

Signature of Notary Public

TERRY T NEFF Notary Public- Seal State of Indiana My Commission Expires Apr 18, 2020

Place Notary Seal Above

Executed this 1th day of January, 2018.
Without the same of the same o
PINAK JAYANT TULPULE
State of TNO(ANA) County of BARTHOLDELEN)
On <u>JAN, 9, 2018</u> , before me, <u>TOBY REGGE TOHNSON NOTARY</u> ABLIC Date Here insert Name and Title of the Officer (Notary Public)
personally appeared <u>PINAK JAYANT TULPULE</u> Name(s) of Signer(s)
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/their executed the same in his/her/their authorized capacity(ics), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.
I certify under PENALTY OF PERJURY that the foregoing paragraph is true and correct.
WITNESS my hand and official scal. Signature Signature of Notary Public
TOBY REECE JOHNSON Notary Public - Seal State of Indiana Bartholomew County Place Notarty Schningston Expires Sep 10, 2022

Executed this 27 day of MARCH , 20 18.

State of Indiava County of Fauthory

On Houch, 2018 before me. Tracy (ea Jones Notory Public)

Here insert Jame and Tale of the Officer (Notary Public)

personally appeared BIBIN N. PATTEL Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/their executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY that the foregoing paragraph is true and correct.

WITNESS hy han I and official seal.

Signature

Signature of Notary Public

January 04, 2026 My Commission Expues Commission # 708997 Saitholomew County Notary Public, State of Indians TRACY LEA JONES

Place Notary Seal Above

RECORDED: 03/12/2018

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