

Results of the Investigation Regarding Domestic Certification for Engines

Toyota Industries Corporation, on March 17, 2023, made public announcement of violation of domestic laws and regulations in domestic certification relating to emissions performance of current model forklift and construction machinery engines, and stopped shipping the subject engines and carried out a recall and took other measures concerning forklifts within Japan. At the Company's request, a Special Investigation Committee made up of outside experts conducted an independent investigation, and on this day, the Company made report to Japan's Ministry of Land, Infrastructure, Transport and Tourism and other competent ministries, of the content of such investigation and of the initiatives the Company is promoting to prevent recurrence.

Through the investigation, it became clear that there were violations of domestic laws and regulations with regards to industrial engines, including old types of engines for forklift and construction machinery, and it was newly discovered that there were violations of domestic laws and regulations with regards to certain engines for automobiles, too. In light of the importance of the certification system—which, amidst the Company's corporate business activities, is a fundamental system that must be complied with—the Company's management takes this extremely seriously and reflects deeply upon this.

The Company understands that this matter has caused a great deal of trouble for our customers, our sales agents, vendors, competent ministries, and many other related persons, and the Company again apologizes for that. The Company will reemphasize the fundamentals of compliance with laws and regulations and undertake company-wide initiatives to prevent recurrence to ensure that this sort of conduct does not happen again.

I. Discovered Matters

1. Industrial Engines

1) Overview

Besides the three current models of engines for forklifts and the one current model of engines for construction machinery shipping of which was suspended in Japan because violations of domestic laws and regulations were confirmed in March 2023, it was discovered in this investigation that there were domestic violations involving six models of engines for forklifts (of which, five were old types) and one engine for construction machinery (old type).

In addition, regarding one current model of engine for construction machinery shipping of which was suspended in Japan, it was learned that domestic emission regulation values had been exceeded.

VIOLATION OF ENGINES FOR INDUSTRIAL VEHICLES

Use	Engine Model			Year Certified	Reported on March 17		Results of this Investigation		No. of Domestic Sales		
					Violation s	Regulations Values Exceeded	Violation s	Whether Regulation Values Exceeded or not (Note 1*)	FY2022 Sales	Total Sales	
Forklift	Current type	Diesel	1KD	2014	●	●	●	Same as Reported on March 17	2,000 units	11,000 units	163,000 units
			1ZS						8,000 units	61,000 units	
		Gasoline	4Y	2009		Confirmed no excess		Confirmed no excess	6,000 units	89,000 units	
			1FS	2014		—		●	Confirmed no excess	200 units	
	Old type	Diesel	Former 1DZ	2007	—	●	To be confirmed	—	26,000 units	67,000 units	
			3Z						20,000 units		
			15Z	2010					4,000 units		
		Gasoline	Former 4Y	2007					16,000 units		
			1FZ						1,000 units		
Construction Machinery	Current type	Diesel	1KD	2020	●	—	●	●	2,000 units	2,000 units	2,000 units
	Old type	Diesel	Former 1KD	2016	—		●	To be confirmed	—	1,000 units	1,000 units

*Note 1: Type designations of the IKD and IZS Engines were revoked in April 2023.

*Note 2: In deterioration durability testing implemented again in-house, it was confirmed that the 4Y and 1FS Engines for forklifts had emission values that were within the domestic regulation values, and the current model 1KD Engine for construction machinery had NOx (nitrous oxide) values that exceeded the domestic regulation values.

2) Details of Violations of Domestic Laws and Regulations

It was discovered as part of the Special Investigation Committee's work, regarding forklift engines and engines for construction machinery, that in the deterioration durability testing for domestic certification, there was such conduct as data different from measured values being used and parts being replaced during testing, and in the Mass Production Sampling Inspections carried out at the plant, there was such conduct as implementing tests using a sampling frequency different from the sampling frequency specified in internal rules and using control unit software different from the mass production engine control unit software.

[Domestic] Violations Involving Industrial Vehicle Engines

Use	Engine Model			Year Certified	When obtaining certification				During Mass Production Sampling Inspections
					Used values different from measured values	Replaced parts during testing	Used control unit software different from mass production engine software	Selected values from among multiple measured values	Used frequency different from rules and control unit software different from mass production engine software
Forklift	Current type	Diesel	1KD	2014	●		●		●
			1ZS*		●		●		●
		Gasoline	4Y	2009	●	●	●	●	●
			1FS	2014	●	●	●	●	●
	Old type	Diesel	Former 1DZ	2007	●				
			3Z*		●				
			15Z*	2010	●				
		Gasoline	Former 4Y	2007	●	●	●	●	
			1FZ			●	●	●	
Construction Machinery	Current type	Diesel	1KD	2020			●	●	●
	Old type	Diesel	Former 1KD	2016	●	●	●	●	●

*Note 3: 1KD deterioration durability testing data was used for 1ZS.

*Note 4: The former 1DZ deterioration durability testing data was used for 3Z and 15Z.

2. Engines for Automobiles

For three models of engines for automobiles of which the development was partially entrusted by Toyota Motors to the Company (table below), Toyota Motors and Hino Motors have proceeded with application procedures for vehicle type designation. During the application procedures, the Company was in charge of the output tests and submitted necessary data; however, it was discovered that upon conducting the tests, there was such conduct as adjusting the fuel injection amount to make the data better-looking with respect to output values and torque curve. Meanwhile, it was confirmed in sampling inspections that the output shipping standard values for output performance were satisfied.

Use	Engine Model			Year Certified	Vehicles in which Relevant Engines are Installed	Results of this Investigation		No. of Domestic Sales
						Irregularities	Output Performance	FY22 Sales
Automobile	Current type	Diesel	1GD	2017-2021	Hiace, Granace, Land Cruiser Prado, Dyna/Dutro	●	Satisfaction of shipping standard values confirmed	84,000 units
			2GD	2020	Hilux			
			F33A	2021	Land Cruiser			

3. Causes of Violations

The company understands, based on the Special Investigation Committee's findings, the following to be the primary causes that led to the discovered violations.

1) Engines for industrial vehicles

(1) Lack of risk management awareness on the part of management relating to compliance with laws and regulations

In relation to the industrial vehicles business that the Company has been operating after its functional integration with Toyota Motors in 2001, management and the organization failed to be properly aware of

the change in circumstances represented by the tightening of domestic emissions regulations for engines for industrial vehicles, and the allocation of managerial resources and communication befitting the challenges faced by the respective work sites were insufficient, leading to an environment where the obtaining of certification and management of mass production were not properly carried out, and it was not possible to correct this situation.

(2) Lack of sufficient independent mindset

The Company did not learn the type of behavior that would enable it to respond under its own responsibility and power to the tightening of social circumstances such as regulations and thus was not able to respond to the new challenges arising from the introduction of strict emissions regulations.

(3) Trivializing engines for industrial vehicles

The difficulty of development of engines for industrial vehicles, which had a smaller scale of business compared to engines for automobiles, was under-evaluated, and the Company did not implement the necessary review of the development system and schedule, or the education and training necessary for addressing the tightening of emissions regulations.

(4) Lack of management's efforts to address the adverse effects of the business divisions system

No constructive discussions took place between the industrial vehicles business divisions and the Engine Division regarding how to develop better engines, and with regards to risks and business problems that a business division on its own would be unable to fully address, there was insufficient participation and initiatives on the part of the management for considering these matters in a cross-sectorial manner and seeking the attainment of total optimization.

2) Engines for automobiles

(1) Lack of sufficient communication with Toyota Motors, the entrustor of the output tests

In a situation where the role of diesel engine development was expanding, work of output tests was being carried out without sufficient communication and sufficient alignment of testing process and required procedures.

3) Common to both engines for industrial vehicles and engines for automobiles

(1) Lack of compliance awareness

In a situation where the role and business of diesel engine development was expanding, the top priorities and values, namely, "compliance," and "(i) safety, (ii) quality, (iii) amount, and (iv) cost," failed to be kept, and the basic awareness of respecting data accuracy was weak.

(2) Inadequacies regarding organizations and systems necessary to advance development and production in compliance with laws and regulations

There was no department dedicated to regulation certification and there were insufficient efforts to understand the domestic laws and regulations and ensure that the rules set forth in domestic laws and regulations were included in the provisions of internal rules. There also was no check function on development that operated from the perspective of compliance with laws and regulations and the quality assurance functions and system were insufficient, and for this reason, there was also no check function on development schedule or targets operating from the perspective of quality assurance.

II. Responses in Light of the Investigation Results

1. Company's attitude

The Company management reflects with deep seriousness on its responsibility for the fact that the violations continued over many years without a proper understanding of the certification system being thoroughly ensured, and that the Company was unable to detect and correct the said violations.

The Company takes the discovered facts very seriously; and the Company will return to the fundamentals and its starting point as a manufacturer, and, as the top priority of the management, make efforts to thoroughly raise awareness of compliance with laws and regulations and to rebuild a system and an organization.

2. Addressing the subject engines

In addition to the engines that have been under a suspension of domestic shipping since March 2023, domestic shipping has been stopped as of today for forklift engines and engines for automobiles which in this investigation were newly found to involve violations of domestic laws and regulations, as well as for forklifts in which said engines were installed. The Company will have discussions with the recipient customers and competent ministries and take necessary measures with respect to the 1KD Engine for construction machinery which was discovered to exceed the regulation values.

3. Towards prevention of recurrence

The Company is aware of the need for a fundamental rebuilding of the engine business for industrial vehicles and will carry out a comprehensive inspection of the certification and mass production processes and proceed with company-wide measures to prevent recurrence. In addition, as regards engines for automobiles, the Company will revisit its division of duties with Toyota Motors and rebuild its communications with Toyota Motors as it moves forward with initiatives to prevent recurrence.

Since the announcement of its violations of domestic laws and regulations in March 2023, the Company, working in parallel with the Special Investigation Committee investigation, has moved forward with initiatives to prevent recurrence in the three fields of “mechanisms”, “organization and systems”, and “corporate culture”, such as independence of the certification function, the creation of a dedicated regulation certification department and the strengthening of compliance awareness, having received from the Special Investigation Committee recommendations concerning recurrence prevention focusing on “fostering a compliance culture”, “establishing mechanisms contributing to prevention and early detection of improper conduct”, and “reforming awareness and behavior of the management”, the Company will incorporate these recommendations into its initiatives so that its measures to prevent recurrence are that much more secure and robust.

The Principal Initiatives Being Advanced

1) Devise mechanisms that enable manufacturing (*monozukuri*) to be carried out properly to prevent improper conduct

(1) Standardized and clearly defined development, certification, quality control processes

- Standardization of test procedures for certification by incorporating laws and regulations, and tightening of systems for recording and storing of test data
- Review the processes for compliance with laws and regulations, certification application and acquisition, and post-market introduction, as well as the standard certification schedule.
- Revamp internal rules, provide rules and standards for important processes, and revamp the related managerial tools.

(2) Strengthen the check and monitor functions in the development and certification processes

- Make clear the examination items and determination criteria for each stage of the Design Review (development and design review).
- Implementation of transition to deterioration durability testing and certification application, as well as control unit software management, will no longer be carried out by the engineering departments, but will be implemented by the Certification & Administration Dept.

2) Construction of organizations and systems for proper response to risks and optimal distribution of managerial resources

(1) Construction of a system enabling early detection of and response to risks

- Establish a dedicated organization for overseeing and managing the promotion of compliance across the entire Company and overseeing and managing the risks arising in corporate activities.
- Implementation of a comprehensive company-wide inspection of regulatory and quality risks.

(2) Achieving a sound check and oversight function

- Establish the position of Global Chief Compliance Officer, Chief Quality Officer and Chief Legal Officer overseeing the entire Company regarding the functions of compliance, laws and regulations, and quality.
- Establish in both the industrial vehicle and engine divisions a “Regulation Certification & Administration Department” having a certification function independent from engineering departments.
- In order to strengthen the check function exercised by headquarters on business divisions, reorganize the Quality Control Dept. into “Quality Management Dept.” and carry out a review of the audit process in collaboration with outside agencies in order to improve its effectiveness.

(3) Construction of company-wide collaborative systems that span all business divisions and departments

- Organizational change from having, within the engine engineering department, separate organizations based on use, for engines for industrial vehicles and automobile engines, to having separate organizations based on functions, such as design, control, compliance, etc.
- Introduce an internal recruitment system and promote job rotation in order to improve personnel fluidity and prevent persons in charge from becoming entrenched at their positions.

3) Fostering a corporate culture where if there are mistakes, they are noticed, work pauses, and everyone works together on a solution

(1) Strengthening compliance awareness

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III. Responsibility and dispositions

As announced on March 17, 2023, in response to the matter at hand, the related officers have already declined compensation; going forward, in light of the investigation results, the Officer Personnel Committee, among others, will give further consideration to this matter, including proper systems, and if decisions of additional dispositions are made, the Company will give notice at such time.

IV. Impact on business results

The Company is currently studying the impact that the content of this announcement will have on the Company’s consolidated results. If a matter requiring disclosure arises, the Company will promptly make disclosure.

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Reference Materials

I. Overview of the Investigation Report by the Special Investigation Committee (Chairman, Hiroshi Inoue, Attorney and Certified Fraud Examiner)

The Special Investigation Committee divided the violations it identified in its investigation into the categories of “intentional improper conduct to obtain certification”, “other intentional misconduct”, “improper conduct caused by lack of understanding of laws and regulations”, and “improper conduct regarding mass production sampling inspections”; and reported on their causes, the root causes of the conduct overall, and advice on recurrence prevention.

1. Details and causes of violations found by the Special Investigation Committee

1) Intentional improper conduct to obtain certification

This refers to rewriting test results in order to obtain certification and otherwise knowingly violating domestic laws and regulations and intentionally disguising facts, and similar conduct.

(1) Specific examples

- Because the NOx values after deterioration durability operation exceeded domestic regulation values, the data was rewritten so that it appeared that the regulation values were satisfied. (Former 1DZ Engine)
- Because PM values rose during deterioration durability operation, the fuel injection device was improved, and thereafter, the emission component values assuming that the improved device was installed were estimated, and those figures were used as the test results. (1KD Engine)

(2) Causes

① Lack of compliance awareness

The Committee points out that there is insufficient, or lack of, compliance awareness on the part of related persons.

② Unreasonable development schedules

Development policies and mass production launch dates were set without sufficient consideration, and schedules were set that prioritized the mass production launch date and did not fully consider the time required for deterioration durability testing; in these and other ways, the development schedule was not something that could be called reasonable.

③ Dysfunction amongst managerial personnel

While managerial personnel were aware of the development schedule problems, they did not negotiate with other departments or report to superiors and seek resolutions or otherwise try to resolve the problems. They did not show a stance of engaging with the on-site problems and jointly considering and executing with on-site staff measures to resolve these problems, and an environment was not in place where the problems that work sites faced would be properly escalated.

④ Inadequacies in organization and systems necessary to promote development and production while complying with laws and regulations

Because the development reference timetables and deterioration durability testing implementation timing were not stipulated matters and there was no dedicated regulation certification department, there was no check function operating on the development function from the perspective of compliance with domestic laws and regulations. Further, because the functions and systems of the Quality Assurance Department were insufficient, at the development stage, there was no check function operating on the schedule and targets from the perspective of quality assurance for mass production products.

4) Other intentional improper conduct

This refers to conduct such as rewriting data for the purpose of concealing variations in values, even though there were not any pressing circumstances such as where domestic certification wouldn't be obtained without engaging in improper conduct.

(1) Specific examples

- Emission values were measured multiple times, and only some of the measurement results were used. (4Y Engine/1FS Engine/ 1KD Engine for Construction Machinery)
- In in-house output tests concerning engine output, fuel injection amounts were changed to ensure that output values exceeded development target values and that the torque curve would not be distorted by swings in output values. (diesel engines for automobiles)

(2) Causes

① Lack of compliance awareness and trivialization of data integrity (data accuracy)

There were problems in the attitude that engineers had regarding compliance with accuracy of data, as is required of them.

② Lack of managerial and supervisory awareness

On the grounds that they had no knowledge or experience regarding engine calibration work or deterioration durability testing, managers fully delegated work to engineers in charge, were not aware of the problems, and lacked awareness of their responsibility to supervise the engineers in charge to ensure that their conduct was appropriate.

3) Improper conduct caused by lack of understanding of laws and regulations

This refers to conduct undertaken without awareness of violation of domestic laws and regulations, arising because of ignorance of the detailed domestic regulatory rules for deterioration durability testing.

(1) Specific examples

- During deterioration durability testing, parts were replaced and damaged parts were repaired without report to the domestic authorities, and the replaced parts were not preserved. (4Y Engine/1FS Engine)

(2) Causes

Because there was no department dedicated to regulation certification, the engineering department engineer in charge of engine calibration work studied and considered the regulations himself as the work progressed, and there were gaps in the proper understanding of the information on laws and regulations. The rules as stipulated by laws and regulations had not been put into the form of written internal rules.

4) Improper conduct regarding mass production sampling inspections

This refers to improper conduct in the mass production sampling inspections carried out by the Quality Assurance Department following launch of mass production.

(1) Specific examples

- During mass production sampling inspections, software other than ECU software for mass production was used to measure emissions.
- The inspection frequency specified in internal rules was not adhered to, and control limit values, control standard values, etc. were not stipulated in accordance with internal rules.

(2) Causes

The awareness of the need to comply with the stipulated quality assurance process had grown thin, there was a lack of compliance awareness, and there were deficiencies in rules concerning inspection implementation and review, and retention and management of related documents, among other things.

2. Root Causes

1) Corporate culture and organizational climate

(1) Contractor's mentality

The Company had developed a "contractor's mentality", where the Company had little power to discover or resolve problems on its own. Regarding engines for industrial vehicles that the Company had developed on its own, it was necessary to understand the content of laws and regulations and the challenges they presented, and derive solutions; however, by the impact of this "contractor's mentality", where the Company had not

learned the mode of behavior where it would take responsibility and address the matter itself, the Company was not able to address the new challenges arising from the introduction of stringent emissions regulations.

(2) Trivializing engines for industrial vehicles

The management and the executives of the Engine Division trivialized engines for industrial vehicles, a business which, compared to engines for automobiles, was small in scale. They thought there was little difficulty involved in the development of these engines.

(3) Low risk sensitivity among executives at the Engine Division

Because of this “contractor’s mentality” and the “trivializing of engines for industrial vehicles”, when emissions regulations for engines for industrial vehicles were introduced, the details of those regulations and the risks they involved were not accurately understood, and no review was made of the organizational system for ensuring compliance with regulations and appropriate obtaining of certification.

2) Adverse effect of the business divisions system and lack of management’s efforts to address such effect

(1) Imbalanced power dynamic between TMHC (industrial vehicles business divisions) and department responsible for engines for industrial vehicles

In the business divisions system used by Toyota Industries, TMHC and the department responsible for engines for industrial vehicles did not have a relationship where they could negotiate as equals, and they did not have constructive discussions with the point of the two divisions developing better engines.

(2) The initiatives by management to correct relationships and achieve total optimization were insufficient

It is the responsibility of management to consider in a company-wide manner risks and business problems that business departments are unable to fully handle on their own, and thus seek total optimization; these efforts were insufficient. The debate regarding improvement of the relationship between TMHC and the Engine Division and giving incentive toward development of better engines for industrial vehicles was not something that should have been led by the business divisions, but was something that management needed to carry out, as a managerial goal of Toyota Industries overall.

3. Advice on Recurrence Prevention Measures

1) Fostering a compliance culture

(1) Enabling individuals to make the right decisions

- Management and executives themselves should always show an attitude of prioritizing compliance over everything else and in specific situations should act as a model in their response.
- Compliance education and training should be enhanced and strengthened so that all officers and employees observe the principles of judgment and behavior for fulfilling their own roles and responsibilities, no matter the situation, and properly understand the changes in the various risks the Company faces and changes in the perceptions of society.

(2) Adherence to engineering ethics

- Education and training to confirm, maintain, and strengthen the fundamental engineering ethics, including data integrity; emphasis by management on the importance of pride as an engineer.

(3) Enabling the organization to make the right decisions

- In order to ensure that the report lines function, management and business division executives should create an atmosphere where the problems work sites face can be easily reported, accept reports with sincerity, take the initiative themselves and show a willingness to tackle problems, and foster a culture where problems are escalated.
- By welcoming internal whistleblower reports and by responding to internal reports by showing that management will do whatever it can to resolve the problems, enable the whistleblower system to function the way it is supposed to, where persons making internal reports feel psychologically secure and problems are directly escalated.

2) Putting mechanisms in place to help prevent and quickly discover improper conduct

(1) Putting rules in place

- Rules that include development reference timetables including deterioration durability testing commencement timing and the requirements of laws and regulations should be put in place.

(2) Separation of those in charge of development and of certification

(3) Ensuring checks in the development process

- Ensuring that the dedicated regulation certification department is sufficiently robust and exercises checks on, provides information to, and performs an external affairs function for, engineering departments.
- Strengthening of the mechanisms for ensuring substantial participation by the Quality Assurance Department in the review regarding transition to the development process; strengthening of the Quality Assurance Department systems and personnel development.

(4) Enhancing oversight functions

- Securing of personnel and enhancement of a system for ensuring the effectiveness of business division internal audits; implementing personnel development from a long-term perspective.
- Strengthening of the head office quality management function for supervising and supporting the quality assurance activities of the business divisions; collaborating with audit departments.

(5) Promoting systemization for automatic data recording and data alteration prevention

3) Reform of the awareness and behavior of management

(1) Initiatives towards reform of corporate culture and organizational climate

- Escape from the “contractor’s mentality” by having individual employees understand the meaning of the work they do and are aware of the responsibility that comes with the work and by the management showing the way with its own behavior
- Reform of overall Company awareness through an accurate understanding of the circumstances behind the tightening of regulations concerning the industrial vehicles businesses and of the challenges in responding to the same.

(2) Improving the risk sensitivity of the Engine Division executives and management

- Advance the reform of employee awareness by having management heighten its own risk sensitivity to “quality improprieties” and exhibit a strong resolve.
- Reform of the risk management system surrounding businesses; involvement by management in a leading role.

(3) Managerial determinations that are not bound by the confines of the business divisions

- A framework for minimizing the demerits of the business divisions system, where discussions take place for total optimization transcending the boundaries of business divisions, and company-wide managerial determinations are made for the purpose of enhancing corporate value.

[Investigation Report \(Published Version\)](#)

[Investigation Report \(Summary Version\)](#)