



SURFACE VEHICLE RECOMMENDED PRACTICE

J2406™

FEB2018

Issued 2002-03
Stabilized 2018-02

Superseding J2406 MAR2002

Recommended Practices for CNG Powered Medium and Heavy-Duty Trucks

RATIONALE

This technical report is being Stabilized because it covers technology, products, or processes for which technical expertise no longer resides in the owning committee.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE Truck and Bus Powertrain Steering Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2018 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
<http://www.sae.org>

SAE WEB ADDRESS:

Full document details: SAE J2406_201802

SAE values your input. To provide feedback on this Technical Report, please visit http://standards.sae.org/J2406_201802

Documents
Document Sharing Hub

Foreword—This SAE Recommended Practice is intended as a guide for standard practice and is subject to change in order to keep pace with experience and technical advances. Its purpose is to promote safety and efficiency by making available to sellers and buyers of commercial compressed natural gas (CNG) powered medium and heavy-duty trucks (TRUCKS) a recommended practice for construction, operation, and maintenance of such TRUCKS. (TRUCKS defined as vehicles with a gross vehicle weight (gvw) of greater than 6350 kg (14 001 USA pounds.)) The intent of this document is to cover TRUCKS only and specifically excludes passenger vehicles such as: buses, recreational vehicles, motor homes or vehicles which may incorporate a TRUCK chassis in their construction.

This document was developed by the SAE J2406 Committee, which was organized in 1998 to guide the trucking and NGV industries in their efforts associated with the use of CNG as an alternate fuel for use in medium and heavy-duty trucks. Prior to the first meeting, preparatory work for this recommended practice was built upon the strong foundation established by the Truck Engine - Chassis Manufacturer's LNG Technical Subcommittee of the ATA Foundation's Alternative Fuels Task Force in developing SAE J2343 – Recommended Practices for LNG Powered Heavy Duty Trucks.

The first steps of the SAE J2406 Subcommittee's work included (1) Review of the Modes and Effects Analysis (FMEA) - SAE J2343, (2) detailed review of existing codes, standards, recommended practices, and regulations pertinent to trucks and CNG in force or in preparation. It is the intent of the SAE J2406 Recommended Practices to reference and follow the path of the SAE J2343 Recommended Practices whenever and as closely as possible. The content and format for SAE J2406 will utilize the content, FMEA and practices from the SAE J2343 document as it applies to compressed natural gas applications for TRUCKS.

Although a separate FMEA was not conducted for this document, the committee did make use of the applicable sections from the original SAE J2343 FMEA documentation. The SAE J2343 committee's original work began with a FMEA for LNG onboard fuel systems, facilitated by Failure Analysis Associates. This study identified Failure Scenarios and Failure Mechanisms, which could potentially lead to the identified Failure Scenarios. The committee also recognizes that there are FMEA's that have been performed for automobiles and small trucks that remain within the domain of the owners and were not available to the committee for review.

It is the intent of this document to insure the safety and utilization of components for CNG onboard fuel system applications whenever possible, i.e., to avoid the potential failure mechanisms that could be identified, where possible, and to devise and recommend means of construction, operation, and maintenance which would warn of an impending fault or failure, and/or mitigate the outcome should a failure occur. In all cases the CNG onboard fuel system should be consistent and in conformance with applicable federal, state and local requirements.

This publication necessarily deals to some extent in generalities, because it is not possible to anticipate and address every individual set of conditions that might be found in constructing, operating, and maintaining CNG powered TRUCKS. It is intended to be a practical guide illustrating rather than dictating the application of these Recommended Practices. The correct application of these practices in any field situation must rely on sound judgment and experience. Whether or not to institute this voluntary document is up to each individual company, and members of the Subcommittee have not reached any agreement to use it or to require its use.

This document does not address the choice of compressed natural gas (CNG) tank(s) or the method of mounting, as this is application specific. In all cases, the choice and mounting of the CNG tanks shall be in accordance with the chassis manufacturer's recommendations. (In conjunction with a CNG tank supplier's recommendations for the specific application).

TABLE OF CONTENTS

1.	Scope	3
1.1	Purpose	3
2.	References	4
2.1	Applicable Publications	4
2.1.1	SAE Publications	4
2.1.2	ANSI/IAS Publications	4
2.1.3	Federal Motor Vehicle Safety Standards	4
2.1.4	California Code of Regulations	4
2.1.5	Compressed Gas Association Publications	4
2.1.6	NFPA Publications	4
2.1.7	Department of California Highway Patrol - Title 13 Regulations	5
2.2	Related Publications	5
2.2.1	Federal Motor Carrier Safety Administration Publications	5
2.2.2	Texas Railroad Commission Publications	5
2.2.3	Canadian Standards Association Publications	5
2.2.4	Canadian Gas Association Publications	5
2.2.5	GTI Publications	5
2.2.6	ASME Publications	5
2.2.7	Department of Industrial Relations Publications	5
2.2.8	CCPS Publications	5
3.	Fuel System Components and Definitions	5
3.1	Maximum Allowable Working Pressure	5
3.2	Pressure Regulator	5
3.3	Service Pressure	5
3.4	Pressure Relief Valves	5
3.5	Fuel Quantity Indicator	6
3.6	Pressure Indicator	6
3.7	Shutoff Valves	6
3.8	Excess Flow Device.....	6
3.9	Fuel Tank Supports	6
3.10	Automatic Shutoff Valves	6

4.	Fuel System General Design - Construction Considerations.....	6
4.1	General	6
4.1.1	Fuel System Cleanliness	6
4.1.2	Gas Detection	6
4.1.3	Electrical Requirements.....	6
4.1.4	Gas Filtration	6
4.1.5	Defueling Requirements	7
5.	Operation	7
5.1	General	7
5.2	Fuel System Overview	7
5.2.1	Fuel Tank System	7
5.2.2	Pressure Relief Valves	7
5.2.3	Automatic and Manual Shutoff Valves	7
5.2.4	Vent System	7
5.3	Operational Safety	7
5.3.1	Leak Detection	7
5.3.2	Methane Leak Detection Device(s).....	7
5.4	Fueling Safety	7
5.4.1	Grounding For Electrostatic Discharge	7
5.4.2	Defueling.....	7
5.5	Fuel Quality.....	8
5.5.1	Fuel Specifications	8
5.5.2	Fuel Contamination.....	8
6.	Maintenance - General	8
6.1	Final Stage Manufacture.....	8
6.1.1	Safety Hazards	8
6.1.2	Protective Equipment.....	8
6.1.3	Fuel System Leaks	8
6.2	Facility and Vehicle Safety During Maintenance	8
6.2.1	Fuel System Bleed Down	8
6.2.2	Leak Testing	8
6.2.3	Protection from Ignition Sources.....	8
6.3	Fuel System Maintenance Overview	8
6.4	System Components	9
6.5	Document Related Resource Information.....	9
7.	Generic SAE J2406 CNG Fuel System Schematic for TRUCKS.....	9

1. Scope—This SAE Recommended Practice provides guidance for the construction, operation, and maintenance of CNG powered medium and heavy-duty trucks. The intent of this document is to cover TRUCKS (6350 kg (14 001 gvw pounds) and above) and specifically excludes passenger vehicles such as: buses, recreational vehicles, motor homes and/or passenger vehicles which may incorporate a truck chassis in their construction.

1.1 Purpose—The purpose of this document is to establish a uniform practice for construction, operation, and maintenance of CNG powered TRUCKS and is subject to change to keep pace with experience and technical advances.