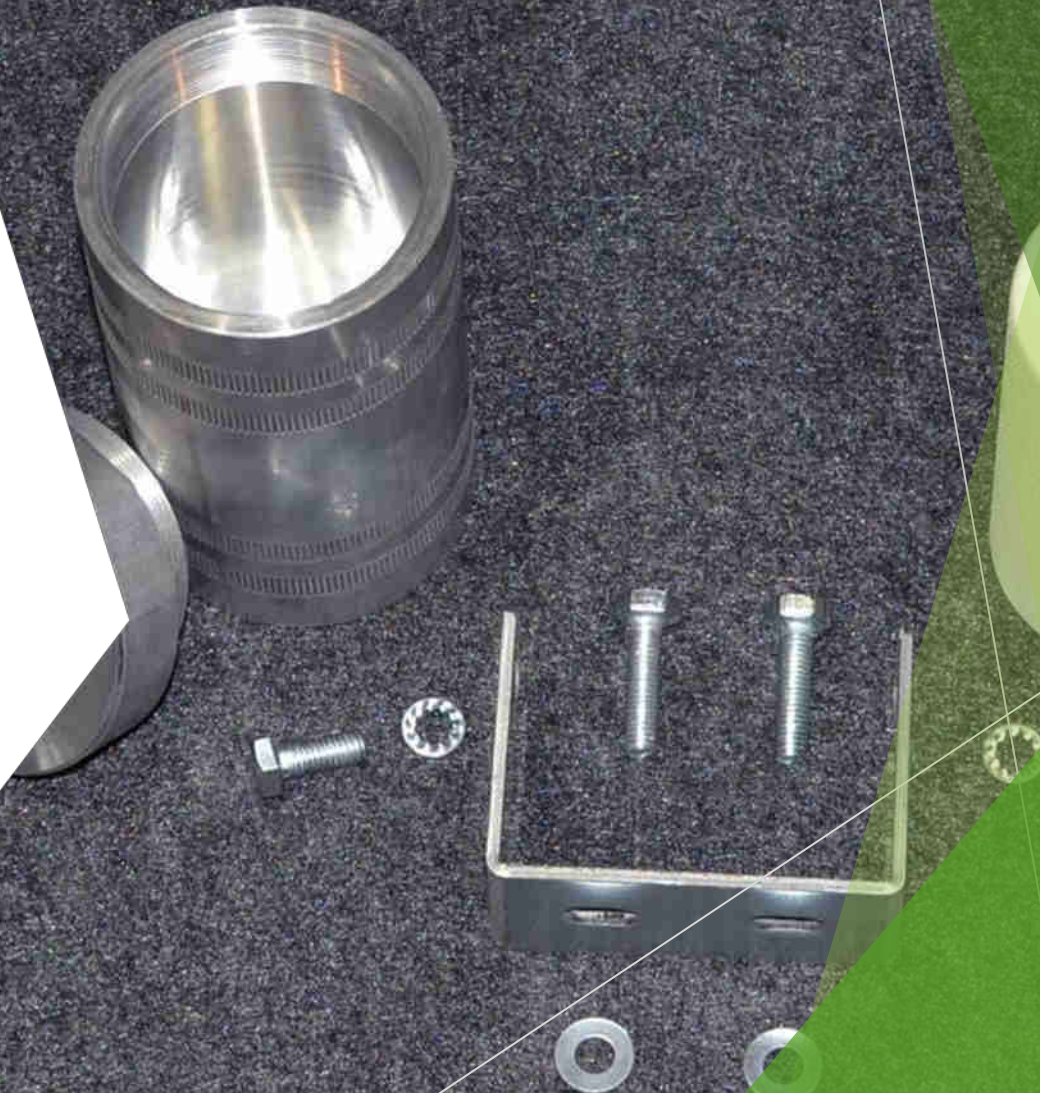


KLEENOIL

Kleenoil Kleenfuel
Bypass Filtration System

DBT Environmental Services
Distributor of
Kleenoil Filtration System

- Established in 2016
- Pearland Texas
- MWBE Certification
- Kleenoilusa.com
- Kleenoilkleenfuel.com
(Website is currently under construction)



Environmental, Social, Governance Climate Sustainability Action Plan

- ▶ Minimize environmental impacts on health of customers, neighbors and employees
- ▶ Foster Sustainability & Resiliency by waste reduction, recycling, re-use, and re-purposing of fuel and oil
- ▶ Monitor Environmental objectives and implement best management practices without reducing services
- ▶ Establish relationships with industry, local, state, and national organizations focused on zero emissions fleet transition



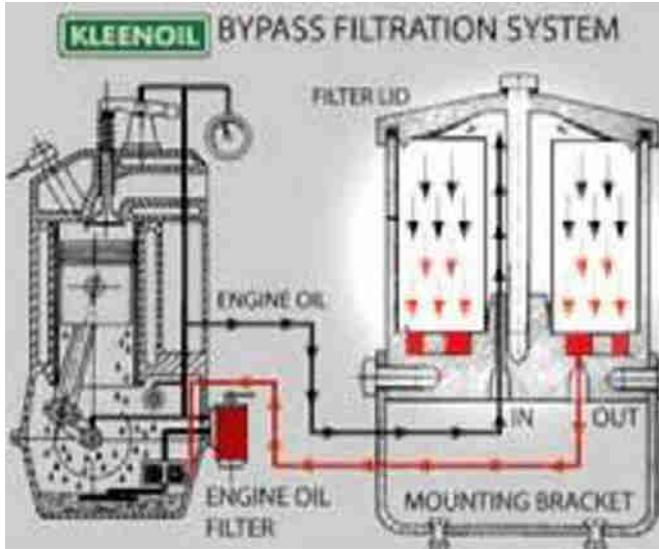
Kleenoil Kleenfuel Filtration Legacy Fleet Adoption

- ▶ Establish Memorandum of Understanding (MOU) with DBT Environmental Services for Carbon Reduction demonstration applying Kleenoil Kleenfuel Bypass Filtration Systems
- ▶ Pursue Grant funding to support the adoption to a Carbon Reduction alternative for Diesel Legacy fleet.
- ▶ Check after 3 months of operation, assess preliminary performance
 - ▶ Operation, yard trucks, gantry cranes, top handlers, large fork lifts
 - ▶ Workforce
 - ▶ Customer Service
- ▶ Implement lessons learned and best practices
- ▶ Reduce cost, Reduce Emission, Extend Equipment Life, Train Workforce

Kleenoil Kleenfuel Bypass Filter Systems

- ▶ The Kleenoil Bypass Filter System is a bypass oil filtration system that passes only a small portion of the total **oil or diesel** flow through a very dense filter cartridge at about 2 to 3 quarts per minute.
 - ▶ At this speed, it is possible to:
 - ▶ Remove particles down to 1 micron, 3 absolute
 - ▶ Remove 99.95% of all water from the oil
 - ▶ Eliminate water and particulate matter
 - ▶ Greatly decrease engine and component wear
 - ▶ Extend oil life up to 5 times and hydraulic oil up to 10 times
 - ▶ Reduce downtime





Kleenoil Kleenfuel Bypass Filter Systems Con.

- ▶ Kleenoil USA Inc. was founded and incorporated in Shreveport, Louisiana on April 24, 2003. It's primary product warehouse and distribution center is based in Tulsa, Oklahoma.
- ▶ The Kleenoil Bypass Filter System is effective for internal combustion engines, hydraulic applications and automatic transmissions in the construction, trucking, oil field, transit, hydraulics, marine, OEM, mining, military, city-municipality-public works, agriculture, automotive, and power generating industries.



Cummings Engine Warranty



To whom it may concern:

Summary: Cummins Engine Warranty

Solution: Thanks for your message. You have contacted Cummins, Inc. at our Customer Assistance Center located in Columbus, Indiana. This is our worldwide headquarters and has been our home since Clessie Cummins founded the company February 3, 1919.

Regarding your questions on the Kleenoil and Power Up products, the products themselves will not void the warranty however any progressive damage issue linked either directly or indirectly to aftermarket products or additives will not be covered by warranty.

We thank you for your interest in Cummins products. We occasionally misunderstand a question. If our answer to your communication looks like we have misunderstood your question, please reply with further inquiry.

To locate the nearest Cummins-authorized Dealer or Distributor Service Provider call our toll free customer assistance line 1-800-DIESELS (343-7357) or for computer assistance in locating a Service Provider, use Cummins Service Locator, which can be found on Cummins website:

<http://wsl.cummins.com/ServiceLocator/isp/controller.jsp?action=showworldmap>

Please let us know if you have other questions and if away from your computer or have a time-critical request that needs more urgent attention, feel free to call us toll-free (from North America) on 1-800-DIESELS (343-7357). Cummins Email (via webpage):

<http://www.cummins.com/cmi/content.jsp?siteId=1&langId=1033&menuId=6&overviewId=33&menuIndex=7>

Customer Assistance Center
Cummins, Inc.
Columbus, Indiana, USA

Cummins PM Service Bulletin

- ▶ Service Bulletin Number Date 3810340-06 11-MAY-2007
- ▶ All Service Bulletin Cummins® Engine Oil and Oil Analysis Recommendations
- ▶ Section 6:
 - ▶ OIL CONTAMINATION:
 - ▶ The engine oil must be changed just before it can no longer adequately perform its intended functions within an engine. Technically, oil does not wear out, but it does become contaminated. Additives deplete to the point that the oil and additive combination can no longer satisfactorily protect the engine. Progressive contamination of the oil between drain intervals is normal and can vary as a function of engine operation and load factor. Oil Contaminants In normal diesel engine operation a wide variety of contaminants are introduced to the lubricating oil.



Cummins PM Service Bulletin

- ▶ Section 7:
 - ▶ OIL FILTRATION Oil Filter Design, Use and Function



▶ Maximum engine life is dependent on the correct use and maintenance of full flow, bypass, or combination lubricating oil filters that protect vital engine components from the abrasive contaminant, which are held in suspension in the lubricating oil. Cummins

requires the use of full flow filters on all of its engine

. In

addition, except for the B Series model, all turbocharged

ins®

engines **must** use bypass filtration, bypass filtration is

ly

recommended for use on all naturally aspirated engines.

ll flow

filter will remove contaminant particles of 30 microns and

that

are suspended in the engine oil. Particles of this size can

cause

immediate bearing damage. The bypass filter (or filter

section if using

a combination filter) receives approximately ten percent

City of Houston 2017 Oil Analysis



WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
138
Component
Diesel Engine *Solid Waste Truck*
Fluid
DIESEL ENGINE OIL SAE 15W40 (--- LTR)

***A projected savings of \$300 per sample History for this analysis.

RECOMMENDATION

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.



Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number				KLM2342840	KLM2342841	KLM2327503
Sample Date				24 Nov 2017	11 Oct 2017	12 Sep 2017
Machine Age	hrs			30877	30324	26310
Oil Age	hrs			0	0	0
Filter Age	hrs			0	0	0
Oil Changed				Not Changd	Not Changd	N/A
Filter Changed				Not Changd	Not Changd	N/A
Sample Status				NORMAL	NORMAL	NORMAL

***Dates read right to left

WEAR

All component wear rates are normal.

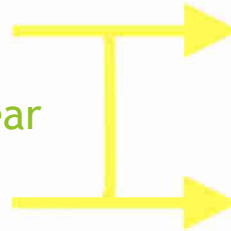
Iron	ppm	ASTM D5185m	>100	3	4	3
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	<1	1	2
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Tin	ppm	ASTM D5185m	>15	0	0	3
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

City of Houston 2017 Oil Analysis Con.

CONTAMINATION

The system cleanliness is acceptable for your target SAE AS4059 (replaces NAS 1638) cleanliness code. The system and fluid cleanliness is acceptable.

- Reducing Emission
- Decreasing Engine Wear
- Reducing Cost



Silicon	ppm	ASTM D5185m	>25	2	5	6
Potassium	ppm	ASTM D5185m	>20	1	4	0
Fuel		ASTM D3524	>5	<1.0	<1.0	<1.0
Glycol		ASTM D2982		NEG	NEG	NEG
Soot %	%	*ASTM D7686	>3	0.1	0.2	0.1
Nitration	Abs/cm	*ASTM D7624		7.	7.	7.
Sulfation	Abs/.1mm	*ASTM D7415		18.	19.	18.
Particles >4µm		ASTM D7647		397	628	1179
Particles >6µm		ASTM D7647	>5000	216	342	642
Particles >14µm		ASTM D7647	>640	36	58	109
Particles >21µm		ASTM D7647	>160	12	19	36
Particles >38µm		ASTM D7647	>40	1	3	5
Particles >71µm		ASTM D7647	>10	0	0	0
Oil Cleanliness		ISO 4406 (c)	>19/16	15/12	16/13	17/14
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

- Sustainable



Sodium	ppm	ASTM D5185m		4	3	3
Boron	ppm	ASTM D5185m	250	114	142	159
Barium	ppm	ASTM D5185m	10	0	0	0
Molybdenum	ppm	ASTM D5185m	100	28	36	36
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m	450	125	160	179
Calcium	ppm	ASTM D5185m	3000	1838	1696	1924
Phosphorus	ppm	ASTM D5185m	1150	728	854	931
Zinc	ppm	ASTM D5185m	1350	918	988	1045
Sulfur	ppm	ASTM D5185m	4250	2848	2723	3105
Oxidation	Abs/.1mm	*ASTM D7414		13.	13.	13.
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	7.21	8.74	8.61
Visc @ 100°C	cSt	ASTM D445	14.4	13.33	13.02	13.43

Fort Bend ISD 2022 Oil Analysis



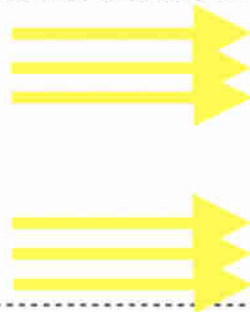
WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
INTERNATIONAL 1126
 Component
Diesel Engine *School Bus*
 Fluid
NOT GIVEN (--- LTR)

***A projected savings of \$200 per sample History for this analysis

RECOMMENDATION

Resample at the next service interval to monitor.



Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number				KL0008123	KL0008124	KL0008125
Sample Date				27 Mar 2022	10 Feb 2022	25 Jan 2022
Machine Age	mls			56713	55021	54558
Oil Age	mls			0	0	0
Filter Age	mls			0	0	0
Oil Changed				Not Changed	Not Changed	Not Changed
Filter Changed				Not Changed	Not Changed	Not Changed
Sample Status				NORMAL	NORMAL	ABNORMAL

***Dates read right to left

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	10	5	36
Chromium	ppm	ASTM D5185m	>20	<1	<1	1
Nickel	ppm	ASTM D5185m	>4	0	0	<1
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	2	11
Lead	ppm	ASTM D5185m	>40	1	1	1
Copper	ppm	ASTM D5185m	>330	<1	1	2
Tin	ppm	ASTM D5185m	>15	0	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

Fort Bend ISD 2022 Oil Analysis

CONTAMINATION

There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable.



- Reducing Emission
- Decreasing Engine Wear
- Reducing Cost

Silicon	ppm	ASTM D5185m	>25	5	5	7
Potassium	ppm	ASTM D5185m	>20	<1	3	11
Fuel		WC Method	>2.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7686	>3	0.5	0.2	1.2
Nitration	Abs/cm	*ASTM D7624	>20	6.3	4.6	10.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	20.1	19.2	22.9
Particles >4µm		ASTM D7647		2358	1453	36182
Particles >6µm		ASTM D7647	>5000	1284	791	▲ 19710
Particles >14µm		ASTM D7647	>640	219	135	▲ 3354
Particles >21µm		ASTM D7647	>160	74	45	▲ 1130
Particles >38µm		ASTM D7647	>40	11	7	▲ 174
Particles >71µm		ASTM D7647	>10	1	1	▲ 18
Oil Cleanliness		ISO 4406 (c)	>19/16	17/15	17/14	▲ 21/19
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

- Sustainable

Sodium	ppm	ASTM D5185m		<1	0	<1
Boron	ppm	ASTM D5185m		354	418	241
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		90	87	101
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m		429	416	487
Calcium	ppm	ASTM D5185m		1483	1482	1556
Phosphorus	ppm	ASTM D5185m		1031	1030	951
Zinc	ppm	ASTM D5185m		1124	1112	1047
Sulfur	ppm	ASTM D5185m		2787	2803	2570
Oxidation	Abs/.1mm	*ASTM D7414	>25	14.8	13.8	17.3
Base Number (BN)	mg KOH/g	ASTM D2896		7.04	7.59	6.58
Visc @ 100°C	cSt	ASTM D445		13.6	14.0	13.7

City of Houston RFP 2017



CITY OF HOUSTON INVITATION TO BID

Issued: January 27, 2017

BID OPENING

Sealed bids (labelled with the company name, address and bid number), in duplicate will be received by the City Secretary of the City of Houston, in the City Hall Annex, Public Level, 900 Bagby Street, Houston, Texas 77002, until 10:30 a.m., Thursday, February 16, 2017 and all bids will be opened and publicly read in the City Council Chamber, City Hall Annex, Public Level, 900 Bagby Street at 11:00 AM on that date for the purchase of:

**HYDRAULIC EXTERNAL BY PASS FILTER SYSTEM MAINTENANCE AND REPAIR SERVICES
FOR THE FLEET MANAGEMENT DEPARTMENT
BID INVITATION NO.: S07-L25930
NIGP CODE: 060-64**

BUYER

Questions regarding this solicitation document should be addressed to Casey Crossnoe at 832.393.8724, or e-mail to casey.crossnoe@houstontx.gov.

ELECTRONIC BIDDING

In order to submit a bid for the items associated with this procurement, vendor must fill in the pricing information on the "PLACE BID" page.

PRE-BID CONFERENCE

A Pre-Bid Conference will be held for all Prospective Bidders at 901 Bagby Street, Houston, Texas 77002 City Hall, Tunnel Level (Basement) SPD Conference Room 2, at **9:00 a.m. on Thursday, February 9, 2017.**

All Prospective Bidders are urged to be present. It is the Bidder's responsibility to ensure that they have secured and thoroughly reviewed the solicitation documents prior to the Pre-Bid Conference. Any revisions to be incorporated into this solicitation document arising from discussions before, during and subsequent to the Pre-Bid Conference will be confirmed in writing by Letter(s) of Clarification prior to the bid due date. Verbal responses will not otherwise alter the specifications, and terms and conditions as stated herein.

Bidding forms, specifications, and all necessary information should be downloaded from the Internet at <https://purchasing.houstontx.gov/>. By registering and downloading this solicitation document, all updates to this solicitation document will be automatically forwarded via e-mail to all registered Bidders. This information may also be obtained from the Supplier Assistance Desk, Strategic Procurement Division, 901 Bagby (Concourse Level), Houston, Texas 77002.

The place of the bid opening may be transferred in accordance with Paragraph (b), (5) of Section 15-3 of The Code of Ordinances, Houston, Texas. The bid opening meeting may be rescheduled in accordance with Paragraph (b), (6) of said Section 15-3.

The City reserves the right to reject any or all bids or to accept any bid or combination of bids deemed advantageous to it.

City Employees are prohibited from bidding on this solicitation in accordance with the Code of Ordinances, Section 15-1.

*CONTENTS:

SECTION A: OFFER
SECTION B: SCOPE OF WORK/SPECIFICATIONS
SECTION C: GENERAL TERMS & CONDITIONS

*NOTE 1: Actual page numbers for each Section may change when the solicitation document is downloaded from the Internet or because of Letters of Clarification. Therefore, Bidders must read the bid document in its entirety and comply with all the requirements set forth therein.

*NOTE 2: To be considered for award, please submit the electronic bid form and the forms listed in Section A, including the Official Signature Page, which must be signed by a company official authorized to bind the company.

KLEENOIL

City of Houston RFP 2021



CITY OF HOUSTON

Sylvester Turner

Mayor

Jerry Adams
Chief Procurement Officer
P.O. Box 1562
Houston, Texas 77251-1562

T. 832.383.8126
<https://purchasing.houstontx.gov>

KLEENOIL

Date: December 3, 2021

Subject: Letter of Clarification No. 1
Hydraulic External Bypass Filter System Maintenance and
Repair Service for Fleet Management Department

Reference: Invitation to Bid (ITB) No.: S10-L30003

To All Prospective Bidders:

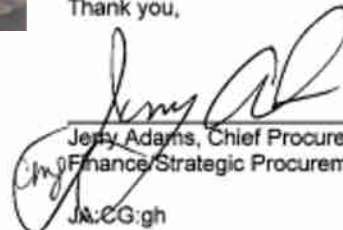
This Letter of Clarification is issued for the following reason:

1. The Bid opening due date has been extended from **Thursday, December 30, 2021** to **Thursday, January 6, 2022 at 10:30 a.m. CST**. The City will not be receiving bids during the holiday week of December 27, 2021.

When issued, Letter(s) of Clarification shall automatically become a part of the ITB documents and shall supersede any previous specification(s) and/or provision(s) in conflict with the Letter(s) of Clarification. It is the responsibility of the Bidder to ensure that they have obtained any such previous Letter(s) associated with this solicitation. By submitting a response to this ITB, Bidders shall be deemed to have received all Letter(s) of Clarification and to have incorporated them into this Bid.

Should you have any questions, please contact Greg Hubbard at (832) 393-8748, or by e-mail at Greg.Hubbard@houstontx.gov.

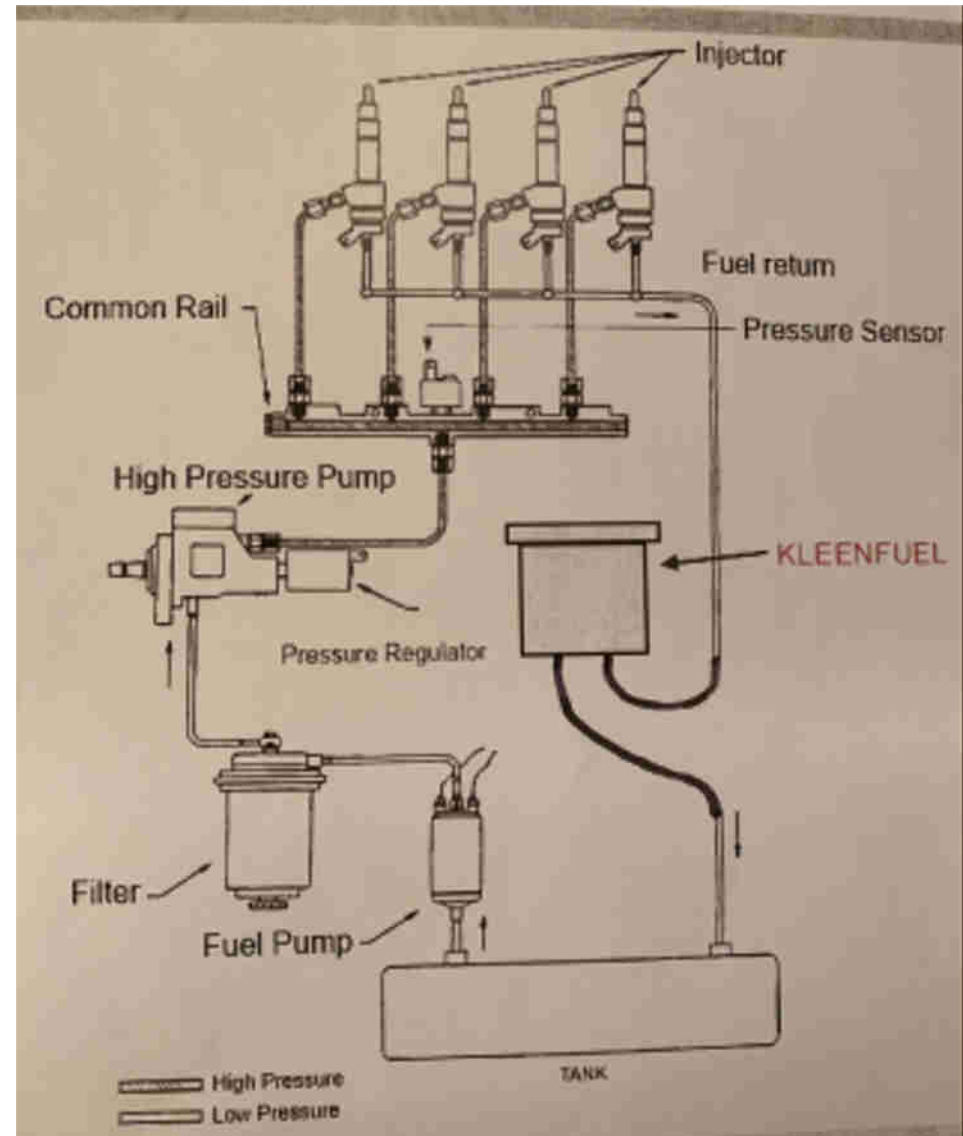
Thank you,


Jerry Adams, Chief Procurement Officer
Finance/Strategic Procurement Division
JA:EG:gh



The Fuel System

- ▶ All commercial vehicles now operate on common rail engines.
- ▶ Common rail offers 90% return fuel to tank
- ▶ Kleenfuel install on the return line of the common rail to tank
- ▶ 90% fuel passes an oxidizing heat source, depositing soot agglomerate along respective surfaces.





Reduces Particulate Matter (Soot)

Time (Hr)	ISO 4406 Cleanliness Codes (6µm/14µm)	6 µm Counts	14 µm Counts
0.0	23 / 18	41,517	1,710
0.5	22 / 17	21,338	873
1.0	21 / 16	9,975	393
1.5	19 / 15	4,627	178
2.0	18 / 14	2,203	91
2.5	17 / 13	1,143	61
3.0	16 / 12	623	33
3.5	16 / 12	363	25
4.0	15 / 12	238	21
4.5	15 / 11	183	18
5.0	14 / 11	154	16
5.5	14 / 11	140	12
6.0	14 / 11	135	14

Reduces GHG



Reduces Carbon Footprint

+ Summary of Kleenfuel Filtration Unit Test

	Fuel Consumption	HC (ppm)	CO (%)	CO ₂ (%)	NO (%)	O ₂ (%)
Without KleenFuel Unit	17.70	13	0.08	10.70	836.80	22.51
With KleenFuel Unit	16.20	1	0.03	3.16	102.80	19.80
Difference	1.54	12	0.05	7.54	734.00	2.71
Savings in Percentage*	8.70%	95%	66.67%	70.47%	87.72%	12.05%

*These results are from the generator having only 15% load during testing. It is to be expected that savings in percentage would result to even much higher numbers when the generator is efficiently loaded at 70%.

Abbreviations:
 HC = Hydrocarbon NO = Nitrogen Oxide CO₂ = Carbon Dioxide
 CO = Carbon Monoxide O₂ = Oxygen

Ports and Kleenoil Kleenfuel Collaboration Benefits

- ▶ Reduced Emissions
- ▶ Reduced Cost
- ▶ Extend Equipment Life
- ▶ Train Workforce
- ▶ Environmental Justice
- ▶ Sustainable & Resilience

Informative Videos and References

- ▶ <https://youtu.be/H9IVcZ8cqTg>
- ▶ Notable references
 - ▶ Frito Lay
 - ▶ 1400 Trucks- Kleenoil 2009
 - ▶ Changes filters 30k - change oil 120k
 - ▶ *Johnathan Boils* Former 'Director of Fleet Services'
 - ▶ Contact Information:
 - ▶ Cell: (214)-636-9772
 - ▶ City of Houston
 - ▶ 600 Trucks-Kleenoil 2016
 - ▶ Changes oil Annually - Oil & Hydraulics
 - ▶ *Denney Taylor* Current 'Assistant Director of Fleet Services'
 - ▶ Contact Information:
 - ▶ Cell: (832)-259-1262

References Cont.

▶ Notable References

▶ Fort Bend Independent School District (FBISD)

▶ 1 School Bus Demo

- ▶ Extended Current Oil Life an Additional 6,000 miles and Counting.

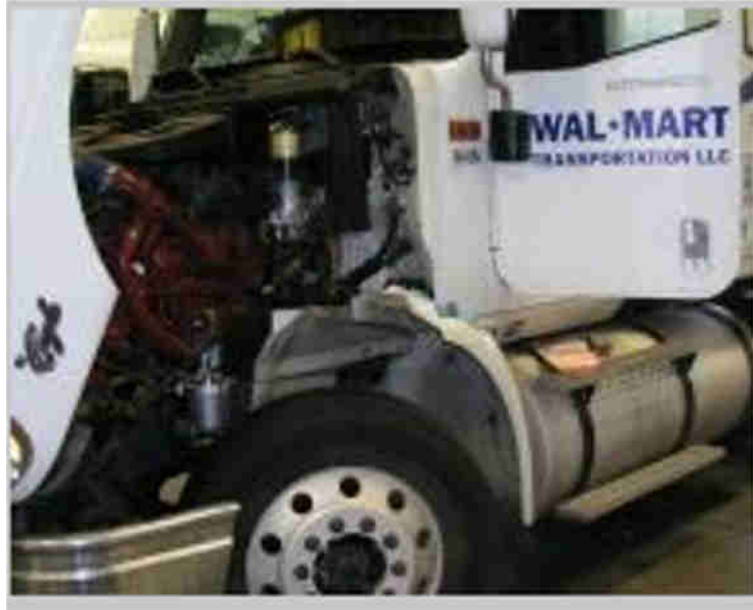
- ▶ Increased MPG from 5.73 to 7.33

- ▶ Charles Svoboda- Supervisor of Fleet Services

- ▶ Contact Information:

- ▶ Cell: (281)- 634- 1936

- ▶ Email: Chuck.Svoboda@fotbendis



KLEENOIL



Kleenoil and Kleenfuel



Oil Changed at 120,000 miles



Frito Lay

Oil Changed
Once Year

**Reduces
GHG**



Removal of Moisture by 99%



DBT Environmental Services
dbtenvir@gmail.com
713-875-4949
Kleenoilusa.com

