Green Fleet Summary

November 2021

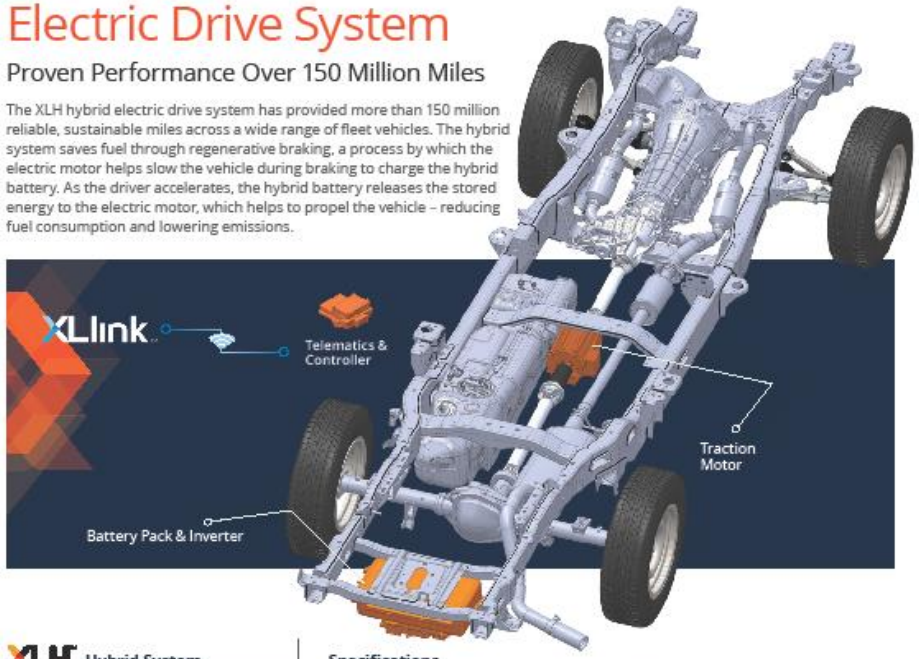
XLhybrid™

Ford F-250

XLH™ Hybrid Electric Drive System

Proven Performance Over 150 Million Miles

The XLH hybrid electric drive system has provided more than 150 million reliable, sustainable miles across a wide range of fleet vehicles. The hybrid system saves fuel through regenerative braking, a process by which the electric motor helps slow the vehicle during braking to charge the hybrid battery. As the driver accelerates, the hybrid battery releases the stored energy to the electric motor, which helps to propel the vehicle – reducing fuel consumption and lowering emissions.



XLH Hybrid System	Specifications
MPG Improvement*	Up to 25%
System Voltage	259V
Battery	Lithium Ion
System Weight	350 lbs
Electronic Speed Governor	Up to 75 MPH
System Torque (Peak)	220 lb-ft (Added at Driveline)
Component Warranty	3-Year / 75,000 Miles

*Actual MPG may vary based on driver behavior, drive cycle and other factors.

XLlink

Intelligent Decisions

Our proprietary, cloud-based, vehicle connectivity platform provides actionable intelligence, including speed, idling, vehicle drive cycle and CO2 emissions reduction.

XL Fleet is a leading provider of a full suite of commercial and municipal fleet electrification solutions.

XLhybrid | XLplug-in | XLelectric | XLgrid | XLlink

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Hybrid Units					
Unit number	**Description**	**Owning Dept**	**LTD Mileage (Km)**	**LTD Fuel (L)**	**Avg Fuel Economy (L/100Km)**
B3-20005	2020 Ford F250 Crew Cab, Long Box, 4x4	facilities	9353	2563	27.40
B3-20006	2020 Ford F250 Crew Cab, Long Box, 4x4	drinking water	11612	3529	30.39
B3-20008	2020 Ford F250 Crew Cab, Long Box, 4x4	drinking water	8837	2245	25.40
B3-20011	2020 Ford F250 Crew Cab, Long Box, 4x4	roads	22122	4903	22.16
B3-20007	2020 Ford F250 Extended Cab, Long Box 4x4	drinking water	9147	2522	27.57
total			**61071**	**15762**	**25.81**
Non Hybrid Units					
Unit number	**Description**	**Owning Dept**	**LTD Mileage (Km)**	**LTD Fuel (L)**	**Avg Fuel Economy (L/100Km)**
B3-20446	2020 Ford F250 Crew Cab, Long Box, 4x4	facilities	12176	2653	21.79
B3-20447	2020 Ford F250 Crew Cab, Long Box, 4x4	facilities	19774	4423	22.37
B3-20080	2020 Ford F250 Crew Cab, Long Box, 4x4	roads	21170	5508	26.02
B3-20082	2020 Ford F250 Crew Cab, Long Box, 4x4	roads	27817	6235	22.41
B3-20009	2020 Ford F250 Regular Cab, Long Box, 4x4	roads	49001	10101	20.61
B3-20010	2020 Ford F250 Regular Cab, Long Box, 4x4	roads	67719	17667	26.09
total			**197657**	**46587**	**23.57**

FORD F250 XL HYBRID SUMMARY

Ford Transit T250 XL Hybrid Summary

Hybrid Units					
Unit Number	Description	Owing Dept	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
C3-18011	2018 FORD TRANSIT 250	OWNING - CITY CLERK	25192	4009	15.91378215
C3-18012	2018 FORD TRANSIT 250	OWNING - DRINKING WATER	42277	9005	21.29999763
C3-18013	2018 FORD TRANSIT 250	OWNING - FACILITIES	11267	2191	19.44617023
C3-18014	2018 FORD TRANSIT 250	OWNING - DRINKING WATER	47600	12857	27.0105042
C3-18015	2018 FORD TRANSIT 250	OWNING - FACILITIES	15460	3100	20.05174644
C3-18016	2018 FORD TRANSIT 250	OWNING - UTILITIES - CSOS	36788	9760	26.53039034
C3-18017	2018 FORD TRANSIT 250	OWNING - UTILITIES - CSOS	30604	7222	23.59822245
C3-19038	2019 T250		13462	2568	19.0759174
Totals			**222650**	**50712**	**22.77655513**
Non Hybrid Units					
C3-16037	2017 FORD TRANSIT 250	OWNING - WASTE WATER	150815	34035	22.56738388
C3-16219	2017 FORD TRANSIT 250	OWNING - DRINKING WATER	35263	8576	24.3201089
C3-21203	2021 FORD TRANSIT 250	OWNING - Water Meters	3755	651	17.33688415
C3-21204	2021 FORD TRANSIT 250	OWNING - Water Meters	4237	823	19.42412084
C3-21205	2021 FORD TRANSIT 250	OWNING - Water Meters	4526	768	16.96862572
Totals			**198596**	**44853**	**22.58504703**

Altec J.E.M.S. System

- **What is JEMS?**
- JEMS is an integrated plug-in system that uses stored electrical energy from a lithium-ion battery to power the hydraulics (such as the PTO aerial device), jobsite tools, cab comfort (AC and heat), and offers exportable power. The energy storage system is recharged through the following convenient options: plug-in charging Level I and II (SAE J1772) jobsite and mobile charging.

Units with JEMS System								
57-18181 (2017 Freightliner M2-106)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	147.97	$14,811.95	$17,928.89	$9,057.93	$41,798.77	64175	28797.88	44.87
57-18182 ((2017 Freightliner M2-106)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	114.49	$11,677.24	$23,478.47	$3,723.10	$38,878.81	56553	27724.61	49.02
57-18183 (2017 Freightliner M2-106)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	138.29	$13,416.69	$26,972.43	$3,992.79	$44,381.91	61223	28768.85	46.99
57-16000 (2016 Freightliner M2-106)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	120.99	$11,839.93	$30,850.03	$7,105.55	$49,795.51	66044	39692.96	60.10
57-16001 (2016 Freightliner M2-106)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	146.15	$14,473.15	$49,750.81	$6,303.39	$70,527.35	69339	42923.59	61.90
57-15217 (2015 International 4300)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	332.09	$32,327.01	$67,492.54	$22,063.04	$121,882.59	100990	62288.14	61.68
57-17218 (2015 International 4300)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	179.77	$17,101.79	$55,940.63	$11,495.35	$84,537.77	78469	46247.82	58.94
total sum					$451,802.71	496,793.00	276443.85	55.65
			Cost/KM		$0.91			
total average					$64,543.24			54.79

Units without JEMS System								
57-18184 (2017 Freightliner M2-106)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	200.86	$20,215.70	$8,754.83	$9,780.28	$38,750.81	78650	24633.56	31.32
57-16154 (2016 Freightliner M2-106)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	261.54	$25,627.23	$20,012.98	$14,879.50	$60,519.71	129531	63443.83	48.98
57-18191 (2019 International 4300)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	92.29	$9,321.29	$13,178.86	$1,740.85	$24,241.00	29720	19010.45	63.97
57-15448 (2015 International 4300)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	381.01	$36,590.26	$34,369.40	$15,626.93	$86,586.59	123234	52220.09	42.37
57-D236 (2012 International 4300)								
Period	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	381.39	$35,900.09	$73,549.06	$20,745.43	$130,194.58	112961	61945.35	54.84
57-15448 (2015 International 4300)								
	LaborHours	LaborValue	CommValue	PartsValue	Total Maintenance Costs	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	381.01	$36,590.26	$34,369.40	$15,626.93	$86,586.59	123234	52220.09	42.37
57-3458 (2010 International 4300)								
	LaborHours	LaborValue	CommValue	PartsValue	ReplacementTotal	LTD Mileage (KMs)	LTD Fuel (L)	Avg Fuel Economy
	502.51	$45,854.74	$77,208.38	$33,788.45	$156,851.57	152433	75398.3	49.46
total sum					$583,730.85	749,763.00	348871.67	46.53
			Cost/KM		$0.78			
Total Average					**$83,390.12**			**47.62**

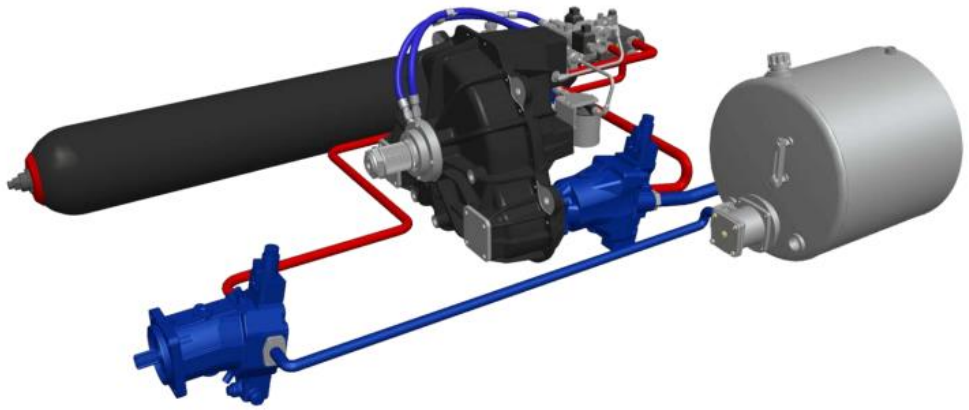
Effenco

- System overview The HEAD Hybrid System is a parallel hydraulic hybrid system based on a unique architecture specifically developed for refuse trucks. During braking, hydraulic pumps are used to slow down the vehicle instead of service brakes, recovering kinetic energy that would be otherwise lost in heat. The recovered energy is stored in a hydraulic accumulator in the form of a pressurized fluid. The HEADTM Hybrid System uses this stored energy to assist the engine when it is the least efficient: at idle while driving auxiliary equipment. As a result, engine idle is reduced or eliminated while the operator is operating the waste handling equipment such as a compactor or an automated arm.

effenco

HEAD™ Hybrid System
Operator Manual

REVISION 0



Effenco System
Single Stream Garbage Trucks Fuel Efficiency

January 2014 Results

Single Stream

	UNIT_NO	Fuel QTY (L)	Usage (KM)	KM/L
1	12-C848	29,185	39,781	1.36
2	12-C845	26,045	34,053	1.31
3	12-C843	28,905	37,447	1.30
4	12-C839	27,699	35,350	1.28
5	12-C844	27,415	34,901	1.27
6	12-C836	23,644	29,942	1.27
7	12-C837	26,879	33,955	1.26
8	12-C841	31,923	40,106	1.26
9	12-C846	33,244	41,671	1.25
10	12-C840	30,880	37,939	1.23
11	12-C847	29,510	35,324	1.20
12	12-C842	32,362	38,665	1.19
13	12-C838	31,195	37,262	1.19
14	12-C835	28,843	34,352	1.19

December 2013 Results

Single Stream

	UNIT_NO	Fuel QTY (L)	Usage (KM)	KM/L
1	12-C845	22,034	29,435	1.34
2	12-C843	27,448	35,840	1.31
3	12-C837	22,772	29,501	1.30
4	12-C839	27,424	35,350	1.29
5	12-C836	21,049	27,031	1.28
6	12-C844	24,033	30,779	1.28
7	12-C848	27,558	35,083	1.27
8	12-C841	27,777	35,157	1.27
9	12-C846	29,693	37,284	1.26
10	12-C838	27,498	34,353	1.25
11	12-C840	27,119	33,485	1.23
12	12-C847	25,331	31,112	1.23
13	12-C835	26,467	31,871	1.20
14	12-C842	28,644	34,047	1.19

November Results

Single Stream

	UNIT_NO	Fuel QTY (L	Usage (KM)	KM/L
1	12-C845	19,245	25,930	1.35
2	12-C843	25,168	33,085	1.31
3	12-C836	18,289	23,873	1.31
4	12-C837	21,408	27,891	1.30
5	12-C839	24,149	30,833	1.28
6	12-C841	24,268	30,947	1.28
7	12-C844	21,060	26,729	1.27
8	12-C846	26,460	33,238	1.26
9	12-C838	24,168	30,319	1.25
10	12-C840	23,995	29,866	1.24
11	12-C835	23,216	28,896	1.24
12	12-C847	22,352	27,689	1.24
13	12-C848	25,356	31,407	1.24
14	12-C842	25,363	30,405	1.20

October Results

Single Stream

	UNIT_NO	Fuel QTY (L	Usage (KM)	KM/L
1	12-C845	15,860	23,921	1.51
2	12-C836	14,807	19,873	1.34
3	12-C843	21,869	28,852	1.32
4	12-C837	18,658	24,427	1.31
5	12-C841	21,063	27,109	1.29
6	12-C839	21,003	26,717	1.27
7	12-C844	19,987	25,412	1.27
8	12-C840	20,898	26,475	1.27
9	12-C846	23,062	29,116	1.26
10	12-C847	19,088	23,860	1.25
11	12-C838	21,432	26,415	1.23
12	12-C835	19,952	24,228	1.21
13	12-C848	21,968	26,461	1.20
14	12-C842	21,789	26,198	1.20

September Results

Single Stream

	UNIT_NO	Fuel QTY (L	Usage (KM)	KM/L
1	12-C845	13,125	18,047	1.38
2	12-C836	12,780	17,428	1.36
3	12-C843	17,760	24,200	1.36
4	12-C837	16,024	21,150	1.32
5	12-C841	17,517	22,574	1.29
6	12-C840	17,052	21,733	1.27
7	12-C846	19,441	24,719	1.27
8	12-C839	17,268	21,883	1.27
9	12-C844	16,860	21,243	1.26
10	12-C835	16,502	20,682	1.25
11	12-C847	15,577	19,362	1.24
12	12-C838	18,169	22,520	1.24
13	12-C842	18,052	21,865	1.21
14	12-C848	18,898	22,685	1.20

Effenco System
Dual Stream Garbage Trucks Fuel Efficiency

Dual Stream (August/January Data Only)

	UNIT_NO	Fuel QTY (L)	Usage (KM)	KM/L
1	12-C867	23,731	28,547	1.20
2	12-C860	29,808	34,361	1.15
3	12-C868	27,560	30,783	1.12
4	12-C866	29,905	33,303	1.11
5	12-C864	28,130	30,464	1.08
6	12-C869	30,950	33,442	1.08
7	12-C862	28,832	30,373	1.05
8	12-C861	28,875	29,728	1.03
9	12-C865	28,139	28,780	1.02
10	12-C863	28,175	28,489	1.01
11	12-C849	24,320	24,549	1.01
12	12-C870	28,585	28,676	1.00
13	12-C853	22,989	22,639	0.98
14	12-C858	25,533	25,093	0.98
15	12-C859	24,591	24,027	0.98
16	12-C851	24,961	24,185	0.97
17	12-C850	21,219	20,265	0.96
18	12-C857	25,375	23,912	0.94
19	12-C852	24,499	22,975	0.94
20	12-C856	26,674	24,859	0.93
21	12-C854	25,128	23,110	0.92
22	12-C855	21,828	19,925	0.91

Dual Stream (August/December Data Only)

	UNIT_NO	Fuel QTY (L)	Usage (KM)	KM/L
1	12-C867	9,965	12,837	1.29
2	12-C860	15,288	17,743	1.16
3	12-C866	14,205	15,841	1.12
4	12-C868	13,390	14,847	1.11
5	12-C864	13,673	14,964	1.09
6	12-C869	15,290	16,275	1.06
7	12-C849	12,557	13,123	1.05
8	12-C865	13,541	13,998	1.03
9	12-C861	13,469	13,785	1.02
10	12-C862	13,747	13,983	1.02
11	12-C870	13,604	13,756	1.01
12	12-C863	13,550	13,598	1.00
13	12-C858	12,218	11,840	0.97
14	12-C853	11,278	10,909	0.97
15	12-C851	13,213	12,530	0.95
16	12-C859	12,175	11,347	0.93
17	12-C857	11,630	10,797	0.93
18	12-C854	11,699	10,846	0.93
19	12-C856	12,677	11,733	0.93
20	12-C855	11,742	10,616	0.90
21	12-C850	10,415	9,350	0.90
22	12-C852	11,957	10,587	0.89

Dual Stream (August/November Data Only)

	UNIT_NO	Fuel QTY (L	Usage (KM)	KM/L
1	12-C860	12,412	14,628	1.18
2	12-C867	9,562	11,207	1.17
3	12-C866	11,338	12,946	1.14
4	12-C868	10,536	11,975	1.14
5	12-C869	12,096	13,478	1.11
6	12-C864	10,994	12,227	1.11
7	12-C865	10,737	11,432	1.06
8	12-C849	10,647	11,214	1.05
9	12-C861	11,014	11,319	1.03
10	12-C870	11,348	11,589	1.02
11	12-C862	11,278	11,491	1.02
12	12-C863	10,997	11,168	1.02
13	12-C853	8,785	8,849	1.01
14	12-C858	10,137	9,807	0.97
15	12-C851	10,753	10,380	0.97
16	12-C854	9,468	9,128	0.96
17	12-C857	9,463	9,004	0.95
18	12-C859	9,836	9,300	0.95
19	12-C850	8,252	7,783	0.94
20	12-C856	10,443	9,743	0.93
21	12-C852	9,385	8,672	0.92
22	12-C855	10,562	9,626	0.91

Dual Stream (August/October Data Only)

	UNIT_NO	Fuel QTY (L	Usage (KM)	KM/L
1	12-C867	6,939	8,186	1.18
2	12-C860	9,143	10,732	1.17
3	12-C866	8,362	9,518	1.14
4	12-C868	7,947	8,953	1.13
5	12-C869	8,981	10,066	1.12
6	12-C864	8,175	9,144	1.12
7	12-C865	8,088	8,599	1.06
8	12-C849	7,889	8,302	1.05
9	12-C853	6,546	6,818	1.04
10	12-C861	8,123	8,425	1.04
11	12-C870	8,851	9,060	1.02
12	12-C863	8,290	8,446	1.02
13	12-C862	8,643	8,767	1.01
14	12-C857	6,986	6,918	0.99
15	12-C858	7,612	7,500	0.99
16	12-C851	8,199	8,028	0.98
17	12-C850	5,471	5,289	0.97
18	12-C855	7,874	7,515	0.95
19	12-C854	7,496	7,107	0.95
20	12-C859	7,321	6,927	0.95
21	12-C852	6,961	6,422	0.92
22	12-C856	7,987	7,331	0.92

Dual Stream (August/September Data Only)

	UNIT_NO	Fuel QTY (L	Usage (KM)	KM/L
1	12-C867	3,900	4,686	1.20
2	12-C860	5,551	6,450	1.16
3	12-C866	5,151	5,827	1.13
4	12-C869	5,878	6,631	1.13
5	12-C868	5,489	6,188	1.13
6	12-C864	5,417	6,026	1.11
7	12-C849	4,872	5,327	1.09
8	12-C865	5,211	5,605	1.08
9	12-C861	5,018	5,390	1.07
10	12-C870	5,696	6,104	1.07
11	12-C853	4,400	4,676	1.06
12	12-C857	4,432	4,558	1.03
13	12-C863	5,446	5,560	1.02
14	12-C858	4,948	5,032	1.02
15	12-C862	5,702	5,660	0.99
16	12-C851	5,345	5,268	0.99
17	12-C854	4,724	4,596	0.97
18	12-C850	4,340	4,132	0.95
19	12-C855	5,131	4,828	0.94
20	12-C859	4,807	4,377	0.91
21	12-C852	4,446	4,039	0.91
22	12-C856	5,291	4,754	0.90

OEM Solutions

Hybrid and Electric Vehicles

In 2020 41 hybrid and 4 electric units were added to the Bylaw fleet, which is now 85% green (71 Hybrid units and 4 Electric SUV's). Fuel consumption has dropped as the total kilometers driven has increased.

		2018	2019	2020
Number of green units		14	30	75
Total Km Driven		1,750,078.00	1,890,775.00	1,906,458.00
Total Fuel Consumed		255,430.47	241,809.81	207,991.00
Total average fuel economy		14.59537632	12.78892571	10.90981286

Summary

XL Hybrids (2016 – Current)

- Fleet will not see enough fuel savings recuperated to offset purchase price (between $20,000 - $25,000)
- Minimal mechanical issues, feedback from the clients has been generally positive
- OEM hybrid and full electric models coming to market in the near future that have similar purchase price

Altec JEMS System (2015 – 2018)

- Ongoing maintenance issues and increased downtimes. Batteries have frozen in the winter.
- No measurable fuel savings, will not recover costs to offset purchase price (approximately $30,000)
- Vendor has released a new system with internal battery heater, works to -10°C, may not be suitable for Canadian winters
- Electric bucket trucks entering the market in the near future

Effenco (2013 – 2014)

- No measurable reduction in fuel economy, will not recover costs to offset purchase price (approximately $50,000)
- Increased downtime due to mechanical failures
- Another municipality had similar results monitoring the fuel economy of their solid waste contractor with and without the system installed

DynaCert

- Not enough data to support a trial in fleet application