Ventura County Transportation Commission

Fleet Maintenance Audit

Eleven (11) MCI 4505 Buses & Five (5) Volvo 9700 Buses Conducted March 23 - 24, 2019



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VENTURA COUNTY TRANSPORTATION COMMISSION FLEET MAINTENANCE AUDIT Sixteen (16) Buses Conducted March 23 - 24, 2019

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VENTURA COUNTY TRANSPORTATION COMMISSION FLEET MAINTENANCE AUDIT Sixteen (16) Buses Conducted March 23 – 24, 2019

EXECUTIVE SUMMARY

TRC Engineering Services (TRC) was contracted by Ventura County Transportation Commission (VCTC) to conduct inspections and appraisal evaluations on the sixteen (16) buses currently leased to VCTC by RATP/Roadrunner. The results from these inspections and appraisal evaluations will help guide VCTC regarding potential acquisition of these 16 buses.

The following report presents the findings of the maintenance audit portion of this evaluation of eleven (11) 2015 MCI 4505 buses and five (5) 2013/14 Volvo 9700 buses owned by RATP/Roadrunner. The maintenance audit was conducted on March 23 – 24, 2019. The report compares the findings of this current audit to the findings of the previous two audits conducted by TRC on buses owned by VCTC. All 16 buses received a physical inspection. TRC also drew engine oil and transmission fluid samples from all 16 buses and coolant samples from 14 buses.

The results of this audit showed:

- The total number of maintenance defects found during this audit was 102, or 6.38 average defects per bus, up considerably when compared to the average of 4.60 defects per bus found during the January 2019 audit and the average of 5.00 defects per bus found during the initial audit conducted in September 2018.
- Thirty-two (32) Class "A" defects were found during this audit, or an average of 2.00 Class "A" defects per bus, compared to an average of 1.40 Class "A" defects per bus during the January 2019 audit and 2.88 Class "A" defects per bus during the initial audit conducted in September 2018. Class "A" defects were found on twelve (12) of the 16 buses inspected. A Class "A" defect is a safety-related defect that requires immediate repair and keeps the vehicle from returning to revenue service until the defect is corrected. TRC will review the PMI paperwork on the buses that had Class "A" defects were completed in a timely manner and the buses were returned to service.
- The review of on-time adherence to preventive maintenance inspections (PMIs) scheduled for 5,000-mile intervals found that the PMI work was performed on time and within mileage requirements.
- Positive observations from this audit include the following:
 - RATP/Roadrunner management and staff were cooperative and prepared in providing a constant supply of buses for TRC to inspect, thus, ensuring that the audit inspections were efficiently carrier out.
 - \circ $\;$ The shop work areas were clean and well organized.

Additional audit findings are presented in various tables located throughout this report. The tables are based on data contained in Excel spreadsheets included on a separate drive as Appendix A to this report. A summary of recommendations is provided at the end of this report.

<u>Audit Report</u>

BUSES INSPECTED

Sixteen (16) buses received a physical inspection and PMI records review. Engine oil and transmission fluid samples were taken from all 16 buses and coolant samples were taken from 14 buses. Table 1 identifies these buses.

Table 1 Buses Inspected			
PHYSICAL INSPECTION	MODEL YEAR	VEHICLE MAKE	FLUIDS ANALYSIS
315	2015	MCI	Х
316	2015	MCI	Х
317	2015	MCI	Х
318	2015	MCI	Х
319	2015	MCI	Х
320	2015	MCI	Х
321	2015	MCI	Х
322	2015	MCI	Х
323	2015	MCI	Х
324	2015	MCI	Х
325	2015	MCI	Х
326	2014	Volvo	Coolant sample not taken
981	2014	Volvo	Coolant sample not taken
983	2013	Volvo	X
986	2013	Volvo	X
988	2013	Volvo	X

EVALUATION CRITERIA & METHODOLOGY

TRC assigned a team of two bus inspectors to perform the maintenance audit, physically inspect the buses, and draw fluid samples. The inspection team members were Lee Loper and Greg Dowell. Mr. Loper also served as Project Manager and organized the overall inspection process, performed the records and fluids analysis audit, and prepared the final report. The material which follows describes the evaluation criteria and methodology used by TRC to conduct the fleet inspection and the records and fluids analysis audits.

Fleet Inspection

Specific defects documented during the bus inspections were classified under 18 functional categories:

- 1) Accessibility Features
- 2) Air System/Brake System

- 3) Climate Control
- 4) Destination Signs
- 5) Differential
- 6) Driver's Controls
- 7) Electrical System
- 8) Engine Compartment
- 9) Exhaust
- 10) Exterior Body Condition
- 11) Interior Condition
- 12) Lights
- 13) Passenger Controls
- 14) Safety Equipment
- 15) Structure/Chassis/Fuel Tank
- 16) Suspension/Steering
- 17) Tires
- 18) Transmission

An "A/B" designation system was used to distinguish defects requiring immediate repair from those that could be repaired at a later time.

- **Class A** Indicates a safety-related defect that requires immediate repair and keeps the vehicle from returning to revenue service until the defect is corrected.
- **Class B** Indicates a non-safety critical defect that requires attention during the next scheduled preventive maintenance service interval.

Class "A" safety defects were discussed and agreed upon between VCTC and the TRC inspectors during the initial inspection in September 2018. A list of the Class "A" defects regarded as being safety related for this audit is attached as Appendix B. During the inspection, TRC provided RATP/Roadrunner and VCTC staff with copies of the defect lists for use in scheduling repairs. TRC inspectors also verified operation of certain controls to ensure that defects were legitimate ones and not the result of the inspectors being unfamiliar with specific bus equipment.

Records and Fluids Analysis Audit

The audit team conducted a fluids analysis and reviewed the PMI records for all 16 buses. The fluids analysis audit included taking engine oil, transmission fluid, and coolant samples from the buses inspected. (TRC was unable to take coolant samples from Volvo units 326 and 981 due to a short shipment of sample bottles.)

The records examination set out to determine if:

- Preventive maintenance (PM) had been performed correctly and at prescribed intervals;
- Repairs had been performed properly and made promptly.

PM Intervals

To determine if preventive maintenance inspections (PMIs) were performed correctly and on time, TRC examined the PMI records of the sixteen (16) buses. Mileage between the last four scheduled PMIs was calculated to determine if the inspections were performed on time (within 300 miles of the scheduled 5,000-mile interval) or if they were late.

<u>Repairs</u>

To determine if repairs were performed properly and made promptly, two audit procedures were used:

- 1) PMI sheets going back to the previous four PMIs were selected and examined for each of the sixteen (16) buses to determine if and when defects defined during the PMI process were repaired.
- 2) Defects from the previous four PMIs were then compared to determine if any defects were repeated from one PMI to the next.

From this comparison, TRC can determine if the defects were repaired or if they were simply noted on subsequent inspections.

Fluids Analysis Management

TRC uses a fluids analysis program to verify any problems which may have occurred before the initial inspection. TRC examined the engine and transmission oil change records for each of the sixteen (16) buses going back four PMIs (64 records). TRC also reviewed the mileage between oil changes to verify that the buses were being serviced at the newly changed interval of 10,000 miles. The previous oil change interval was set at 15,000-miles.

TRC also drew engine oil, transmission fluid, and coolant samples from each of the 16 buses inspected, with the exception of drawing coolant samples from two Volvo units. TRC will review those results (46 samples) when received. In reviewing the results, TRC looks for evidence of inappropriate levels of deterioration.

FINDINGS

Overall Fleet Condition

The total number of defects found during this audit was 102, or an average of 6.38 defects per bus. As can be seen in the chart which follows, this inspection showed an increase in the average number of defects per bus when compared to the initial audit conducted in September 2018 and the January 2019 audit.



Defects were found in the Accessibility Features, Air System/Brake System, Driver's Controls, Electrical Systems, Engine Compartment, Exterior Body Condition, Interior Condition, Lights, Safety Equipment, and Suspension/Steering categories. The Exterior Body Condition category showed the most defects during this current audit with a total of twenty-seven (27) defects, followed by the Interior Condition category with a total of twenty-five (25) defects. A breakdown of defects by category can be found in Table 2 and the chart below.

Table 2			
Summary of Defects By Category	9/15/18	1/20/19	3/23/19
Accessibility Features	9	0	5
Air System/Brake System	4	2	3
Climate Control	0	0	0
Destination Signs	0	0	0
Differential	0	0	0
Driver's Controls	3	0	12
Electrical System	0	0	1
Engine Compartment	6	4	10
Exhaust	0	0	0
Exterior Body Condition	16	9	27
Interior Condition	5	2	25
Lights	7	2	12
Passenger Controls	0	0	0
Safety Equipment	32	1	6
Structure/Chassis/Fuel Tank	0	0	0
Suspension/Steering	0	2	1
Tires	2	1	0
Transmission	1	0	0
Total Defects:	85	23	102
Avg. Defects Per Bus:	5.00	4.60	6.38



Specific Defect Summaries

All of the defects identified during the inspections were entered in a database which was used to generate a Master Defect Sheet. Data contained in that spreadsheet were then used to produce a series of detailed Excel reports.

The following Excel spreadsheets produced by TRC for the VCTC are included as a CD attachment to this report:

- **Defect Summary:** includes a summary of defect totals and a summary of the 18 defect categories
- All Defects (Master Defect Sheet): identifies all defects for all buses inspected
- **Defects by Category:** identifies specific defects under each of the 18 categories
- "A" Defects: identifies all Class "A" defects
- "A" Defects by Category: identifies specific "A" defects under each of the 18 categories
- "B" Defects: identifies all Class "B" defects
- "B" Defects by Category: identifies specific "B" defects under each of the 18 categories
- Buses Inspected: lists all buses inspected and those selected for a fluids analysis audit

As mentioned earlier, each defect was given a severity code:

- **Class A** Indicates a safety-related defect that requires immediate removal from service and keeps the vehicle from returning to revenue service until the defect is corrected.
- **Class B** Indicates a non-safety critical defect that requires attention during the next scheduled preventive maintenance service interval.

Defect Analysis

Defects identified by TRC were analyzed to determine the severity or detrimental impact they pose in terms of safety, comfort and convenience, as well as structural integrity.

<u>Safety</u>

Thirty-two (32) Class "A" defects, or an average of 2.00 Class "A" defects per bus, were found during this current audit compared to an average of 1.40 Class "A" defects per bus during the January 2019 audit and 2.88 Class "A" defects per bus during the initial audit conducted in September 2018. These 32 Class "A" defects found during this inspection are listed in Table 3 which follows.

			Table 3
Bus #	Year	Make	Class "A" Defects
315	2015	MCI	Electrical box, front, bare wires showing
315	2015	MCI	Headlight, S/S front, high beam inop
315	2015	MCI	ATC light, dash, light is on
315	2015	MCI	Wheelchair curb light, C/S sidewall, inop
319	2015	MCI	Air leak, tag axle, camber lock on tag axle leaking
320	2015	MCI	ABS & ATC lights, dash, lights are on
322	2015	MCI	Fire suppression system, interior front, inop
323	2015	MCI	Windshield, driver's side, rock chips in line of sight
324	2015	MCI	ABS light, dash, light is on
324	2015	MCI	ATC light, dash, light is on
324	2015	MCI	Back-up light, C/S rear, inop
325	2015	MCI	Air leak, tag axle, Camber lock on tag axle leaking
326	2014	Volvo	Marker lights, upper, inop
326	2014	Volvo	Brake light, S/S lower rear brake light, inop
326	2014	Volvo	Marker light, C/S front, inop
326	2014	Volvo	Back-up lights, exterior, inop
326	2014	Volvo	Back-up alarm, exterior, inop
326	2014	Volvo	Wheelchair lift , inop
981	2014	Volvo	Fire suppression system, dash, has trouble light on
981	2014	Volvo	Kneeling, C/S exterior, inop
981	2014	Volvo	Marker light, upper front center marker light, inop
981	2014	Volvo	Marker light, C/S center lower, inop
983	2013	Volvo	Emergency park brake release knob, dash, missing
983	2013	Volvo	Check engine light, dash, light is on
983	2013	Volvo	Brake light, C/S rear lower brake light, inop
983	2013	Volvo	Wheelchair lift , inop
			Oil leak, engine compartment, crank case filter housing gasket
983	2013	Volvo	leaking
983	2013	Volvo	Fire suppression system, dash, inop

Table 3			
Bus #	Year	Make	Class "A" Defects
986	2013	Volvo	Fire suppression system, dash, inop
988	2013	Volvo	Mil light, dash, light is on
988	2013	Volvo	Back-up alarm, rear, inop
988	2013	Volvo	Marker light, C/S front, inop

A Class "A" defect is a safety-related defect that requires immediate repair and keeps the bus from returning to revenue service until the defect is corrected. Class "A" defects were found on twelve (12) of the 16 buses inspected. The 32 Class "A" defects had to be repaired before these twelve buses could be allowed to return to revenue service. As can be seen in the chart below, this current inspection showed an increase in the average number of Class "A" defects per bus when compared to the January 2019 audit but showed a decrease when compared to the initial audit conducted in September 2018.



Comfort and Convenience

During this audit, TRC found the interiors and exteriors of buses to be kept clean and well maintained.

Structural Integrity

TRC did not observe any structural defects during this audit.

PMI Paperwork Review Findings

TRC performed a PMI paperwork review during this inspection. The review found that PMI work was done on time and within mileage requirements.

PMI Schedule Adherence

TRC examined the records of the sixteen (16) buses to determine if the PMIs were being done at the scheduled 5,000-mile intervals. PMI intervals were considered "on time" if performed on or before 5,300 miles ("late window" of 300 miles). The review found that the buses had PMI work performed within mileage requirements. The PMI records were well organized and easy to locate.

Fluids Analysis Management

TRC examined the engine and transmission oil change records for each of the sixteen (16) buses going back four PMIs. TRC also reviewed the mileage between oil changes to verify that the buses were being serviced at the recently changed 10,000-mile oil change intervals and that the records were properly filed for easy reference. TRC found that all buses were serviced on time.

TRC also drew engine oil, transmission fluid, and coolant samples from the 16 buses inspected with the exception of drawing coolant samples from two Volvo units (units 326 & 981). Results can be found in Table 4 below.

	Table 4
	Fluids Analysis Results
Engine Oil:	Results
315	Normal
316	Normal
317	Normal
318	Normal
319	Normal
320	Normal
321	Normal
322	Normal
323	Normal
324	Normal
325	Normal
326	Normal
	Caution: All wear levels appear within acceptable limits for first sample.
	PQ index number (ferrous material) exceeds tolerance limit. Silicon level
	(dirt/sealant material) satisfactory. Water content acceptable. Fuel
	dilution satisfactory. Viscosity within specified operating range. Action:
	Advise inspect magnetic plug for wear debris and evaluate. Change oil
	and filter(s) if not already done. Resample at next recommended
981	interval to monitor and establish wear trend.
983	Normal
986	Severe: Elevated Nickel indicates possible valve train wear. Elevated Iron level indicates possible crankshaft, camshaft, gear train, cylinder wear, or corrosion. Silicon level (dirt/sealant material) abnormal. Minor fuel dilution occurring. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Check fuel injection system. Check for lower than typical oil pressure. Change oil and filter(s) if not already done. Resample after corrective action to further monitor.
988	Normal
Transmission Fluid:	
315	Normal
316	Normal
317	Normal
318	Normal
319	Normal
320	Normal
321	Normal

Table 4		
	Fluids Analysis Results	
322	Normal	
323	Normal	
324	Normal	
325	Normal	
326	Normal	
981	Normal	
983	Normal	
986	Abnormal: Cooler core leaching/clutch pack/thrust washer wear indicated. Dirt level (alumina + silica) high. Other contaminant levels acceptable. Viscosity within specified operating range. Action: Check all dirt access points. Advise inspect filter/strainer for abnormal wear metal (if applicable). Advise schedule for oil change. Resample at a reduced service interval to monitor and establish wear trend.	
988	Abnormal: Bearing/bushing/thrust washer wear indicated. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at a reduced service interval to monitor and establish wear trend. Please provide all compartment make and model details.	
Coolant:		
315	Abnormal: Glycol level is high. pH is low. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.	
316	Re-Inhibit.	
317	Abnormal: Glycol level is high. pH is low. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.	
318	Normal	
319	Abnormal: Glycol level is high. pH level is normal. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.	
320	Normal	
321	Caution: pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.	
322	Normal	
323	Caution: pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.	
324	Normal	
325	Abnormal: pH is low. Glycol level is high. Suggest drain, flush and refill cooling system.	
326	Coolant sample not taken due to shortage of sample kits	
981	Coolant sample not taken due to shortage of sample kits	
983	Normal	
986	Normal	
988	Normal	

SUMMARY OF RECOMMENDATIONS

- TRC recommends that RATP/Roadrunner consolidate all Volvo bus files to the current facility.
- TRC recommends that RATP/Roadrunner review its paint and body repair guidelines to conform to industry standards (i.e. minimal body filler, OEM parts, and proper procedure to clean and gloss top coat paint). Substandard repair methods will compromise the integrity and value of the fleet buses.
- TRC recommends that RATP/Roadrunner instruct the maintenance workers and cleaning crew of the proper procedure to remove graffiti from glass and interiors.

APPENDIX A: Electronic copy of EXCEL spreadsheet reports

APPENDIX B:

Master Class "A" Defects

- Fire extinguisher
- Headlights
- Wipers
- Washers
- Cracked windshield in driver's view
- Seat belts, driver
- Turn signals
- Horn
- Emergency flashers
- Brake lights
- Air pressure/Air leaks
- Brake lining thickness @ _____
- Tire tread depth @ _____
- Fuel leak
- Exposed wires
- Proximity to exhaust oil, harness, etc.
- Oil/Grease on Brakes
- Wheelchair lift/ramp & securement
- Sharp edges interior
- Tripping hazard interior
- Critical steering/suspension play, wear
- Sensitive edges doors not working at all
- Tire pressure below 80 psi
- Wheel lug nuts
- Exhaust leak into bus
- Back up alarm
- Excessive slack adjuster throw past ______
- Excessive oil in air system
- Missing battery label for shutoff
- Missing emergency exit signs
- Emergency window won't open

APPENDIX C: Fluid Analysis Results

(ALS)	

UIN 071E773

	Diesel Engine
Unit No.	315
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartmen	t:
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Fuel dilution satisfactory. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED	23	-Mar-19	
DATE RECEIVED	04	-Apr-19	
DATE REPORTED	05	-Apr-19	
LAB NO. SIF NO. TIME ON UNIT	4102 35 Hrs	22166147 424202	
OIL BRAND OIL TYPE OIL GRADE	Petro Du SAE	o Canada uron HP E 15W40	
OIL ADDED FILTER OIL CHANGED WO NUMBER	Hrs		
Metals (ppm)			
Iron (Fe)		4	
Chromium (Cr)		<1	
Lead (Pb)		<1	
Copper (Cu)		<1	
Tin (Sn)		<1	
Aluminium (Al)		2	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		6	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)		207	
Calcium (Ca)		397 1505	
Barium (Ba)		-1	
Danum (Da) Dhochboruc (D)		< I 1021	
$r_{\rm rosphorus}(r)$		1021	
Zinc (Zn) Molybdenum (Mo)		1210 00	
Boron (B)		110	
Contaminanta		743	
Water (%)		<0.05	
Coolant		No	
Physical Tests			
Viscosity (cSt 100C)		14.0	
Fuel (%)		<1	
PQ Index		<10	
Soot (%) Infrared		0.3	
		0.0	

ANALYST: Sam Smith Cleveland





Viscosity (cSt 100C)

-- Soot (%) Infrared

Right Solutions • Right Partner

U.S. Laboratories

Valley View, Ohio - 410

UIN 071E773

Atlanta, Georgia - 420



Chromium (Cr)

Iron (Fe)

(ALS)	

UIN 071E799

0	Diesel Engine
Unit No.	316
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		23-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
		11000100100	
LAB NO.		41022166186	
TIME ON LINIT	Hrs	55424194	
TIME ON OIL	Hrs		
OIL BRAND		Chevron	
OIL TYPE		Delo 400 LE	
OIL GRADE		SAE 15W40	
	HIS		
WO NUMBER			
Metala (nom)			
Iron (Fe)		8	
Chromium (Cr)		<1	
Lead (Pb)		<1	
Copper (Cu)		<1	
Tin (Sn)		<1	
Aluminium (Al)		3	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		7	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)			
Magnesium (Mg)		429	
Calcium (Ca)		1657	
Barium (Ba)		<1	
Phosphorus (P)		1112	
Zinc (Zn)		1326	
Molybdenum (Mo)		100	
Boron (B)		477	
Contaminants		-0 0E	
vvaler (%)		<0.05	
		INU	
Viscosity (cSt 1000))	14.0	
)	14.0 _1	
		<10	
FQ IIIUEX		<10	
		0.3	

ANALYST: Susan.Stapleton



	U.S. Laboratories
Chromium (Cr) Iron (Fe)	Viscosity (cSt 100C) Soot (%) Infrared Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH 44125 800.394.3669 800.726.5400
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	O.3 Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earll Drive 0.2 00 800.332.8055 800.445.7930
	Open Portland, Oregon - 401 0.1 4943 NW Front Avenue Portland, OR 97210 800.770.4128
23/03/2019	23/03/2019 Canadian Laboratories
— Copper (Cu) — Lead (Pb) … Tin (Sn)	Burlington, Ontario - 450 Edmonton, Alberta - 402 Water (%) 5036 South Service Rd. Burlington, ON L7L5Y73 10717-176 Street Edmonton, AB T5S 1K1 905 332 9559 888.489.0057
1 0.8 0.6 0.4 0.2 0.04 0.04 0.04 0.02	Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437
0 23/03/2019	23/03/2019 International Locations Australia
Aluminium (AI) – Silicon (Si) – Sodium (Na)	Filter patch test is not performed Contact laboratory
6	for more information New Zealand Southeast Asia Europe Wellington Kuala Lumpur, Singapore Prague
	TEST METHODS:Acid Number:ASTM D974/D664 (*M)Base Number:ASTM D4739 (*M)Base Number (Perchloric):ASTM D2896 (*M)Fuel Dilution by GC:ASTM D7593Fuel Dilution Visc/SetaflashIn House
Since services are based on samples and information supplied by others, and since corrective	Fuel Soot ATR/IR: ASTM D7686 (*M) ctions, if any, are necessarily taken by others, these Soot by FTIR: ASTM D7844
services are rendered without any warranty or liability of any kind beyond the actual amount pa recommendations are based on interpretations of the generated test results and historical data tested at other ALS laboratories within the Tribology divisional network.	d to ALS Tribology for the services. Reported Certain test results appearing in this report may have been Ox, NOx, SOx, FTIR: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624
Transit Resource Center	PQ Index: ASTM D8120 (*M)
Attn: Robin Thompson	Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity AOTH D 455 (*M) / ST022 (*M)
5840 Red Bug Lake Rd Ste 165	Viscosity: ASTM D445 (*M) / D7279 (*M)
Winter Springs FL 32708	Water Crackle: In House
IUSA	
	*M - Modified Method

UIN 071E799





UIN 071D7AD

D	iesel Engine
Unit No.	317
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	
Compartment:	
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	0.0 Ltrs

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		24-Mar-19	23-Mar-19
DATE RECEIVED		04-Apr-19	04-Apr-19
DATE REPORTED		05-Apr-19	05-Apr-19
		41022166141	41022166147
SIF NO.		35424206	35424202
TIME ON UNIT		00.21200	
TIME ON OIL			
OIL BRAND		Chevron	Chevron
OIL TYPE		Delo 400 LE	Delo 400 LE
	l tro	SAE 15W40	SAE 15W40
	LUS	Not Applicable	
OIL CHANGED		NOL APPRICADIO	
WO NUMBER			
Motals (nnm)			
Iron (Fe)		5	4
Chromium (Cr)		<1	
Lead (Ph)		~1	~1
		~1	~1
		<1	<1
		<1	<1
Aluminium (Al)		Z1	2
		<1	<1
Sliver (Ag)		<1	<1
Titanium (Ti)		<1	<1
Vanadium (V)		<1	<1
Contaminants (ppm)		_	-
Silicon (Si)		7	6
Sodium (Na)		2	2
Potassium (K)		<1	<1
Additives (ppm)			
Magnesium (Mg)		374	397
Calcium (Ca)		1466	1505
Barium (Ba)		<1	<1
Phosphorus (P)		977	1021
Zinc (Zn)		1165	1210
Molybdenum (Mo)		90	90
Boron (B)		400	449
Contaminants			-
Water (%)		<0.05	<0.05
Coolant		No	No
Physical Tests		-	-
Viscosity (cSt 100C)	13.9	14.0
Fuel (%)	,	<1	<1
PQ Index		<10	<10
Soot (%) Infrared		0.4	0.3
2000 (70) 111000			

ANALYST: Susan.Stapleton





UIN 071D7AD

Chromium (Cr) Iron (Fe)		U.S. Laboratories Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669 Sunshine Road Sass City, Kansas - 430 935 Sunshine Road Sass City, KS 66115 800.332.8055 Phoenix, Arizona - 440 935 Sunshine Road Sass City, KS 66115 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian Laboratories
Copper (Cu) Lead (Pb) Tin (Sn)		Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB TSS 1K1 905 332 9559 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia
Aluminium (AI) Silicon (Si) Sodium (Na)	Filter Image Filter patch test is not performed Contact laboratory for more information	Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Europe Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution Visc/Setaflash In House Europe ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results and tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	since corrective actions, if any, are necessarily taken by others, these ctual amount paid to ALS Tribology for the services. Reported d historical data. Certain test results appearing in this report may have been	ASTM D7686 (TM) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House

(ALS)	

UIN 071E788

D	iesel Engine
Unit No.	318
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All engine wear rates normal. Silicon appears to be from source other than dirt, and not creating abrasive wear within system. Water content acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		23-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO		41022166187	
SIF NO.		35424196	
TIME ON UNIT	Hrs	00.21100	
TIME ON OIL	Hrs		
OIL BRAND		Chevron	
OIL TYPE		Delo 400 LE	
OIL GRADE		SAE 15W40	
	Hre		
	1115		
WO NUMBER			
Metals (nnm)			
Iron (Fe)		6	
Chromium (Cr)		<1	
Lead (Pb)		<1	
Copper (Cu)		<1	
Tin (Sn)		<1	
Aluminium (AI)		3	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		20	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)			
Magnesium (Mg)		405	
Calcium (Ca)		1548	
Barium (Ba)		<1	
Phosphorus (P)		1028	
Zinc (Zn)		1242	
Molybdenum (Mo)		94	
Boron (B)		402	
Contaminants		0.05	
vvater (%)		<0.05	
Coolant		NO	
Physical Tests	`	1.1.1	
)	14.1	
		<1	
		<10	
Soot (%) Intrafed		0.4	

ANALYST: Susan.Stapleton



Chromium (Cr) Iron (Fe)	Viscosity (cSt 100C) Soot (%) Infrared 0.5 0.4 0.2 0.2 0.1 0.2 0.1 0.3 0.2 0.1 0.3 0.2 0.3 0.2 0.3 0.2 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.3 0.3 0.3 0.2 0.3 0.3 0.3 0.3 0.3 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0	Atlanta, Georgia - 420Valley View, Ohio - 4103121 Presidential Drive Atlanta, GA 303406180 Halle Dr. Suite D Valley View, OH 44125 800.726.5400Son.394.3669Valley View, OH 44125 800.726.5400Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 800.332.8055Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128Allert Action 400
Copper (Cu) Lead (Pb) Tin (Sn)		Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 S88.489.0057 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437
23/03/2019 — Aluminium (Al) – Silicon (Si) – Sodium (Na)	23/03/2019 Filter Image Filter patch test is not	Australia Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil
25 20 15 10 5 0 23/03/2019	performed Contact laboratory for more information	New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Europe Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Soot ATR/IR: ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results ar tested at other ALS laboratories within the Tribology divisional network.	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported ad historical data. Certain test results appearing in this report may have been	Soot by FTIR:ASTM D7844Glycol:In HouseMetals by ICP AES:ASTM D5185 (*M)Ox, NOx, SOx, FTIR:ASTM D7418/D7414/D7415D7624
Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	0002 v1.9	PQ Index:ASTM D8120 (*M)Particle Count:ASTM D7647 (*M) / ISO 4406Viscosity:ASTM D445 (*M) / D7279 (*M)Water KF:D6304C / E203 (*M)Water Crackle:In House*M - Modified Method

Right Solutions • Right Partner

U.S. Laboratories

UIN 071E788





D	iesel Engine
Unit No.	319
Unit:	
Make	
Model	
Serial No.	
Site	
Compartment:	
Name	Diesel Engine
Make	MCI
Model	102
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All engine wear rates normal. Silicon appears to be from source other than dirt, and not creating abrasive wear within system. Water content acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		24-Mar-19	17-Apr-11	
DATE RECEIVED		04-Apr-19	30-Apr-11	
DATE REPORTED		05-Apr-19	03-May-11	
		41022466442	41020225040	
LAB NO. SIE NO		41022166142 35424204	41020235010	
TIME ON LINIT	Hrs	JJ424204	10423092	
TIME ON OIL	Hrs			
OIL BRAND		Petro Canada	Petro Canada	
OIL TYPE		Duron HP	Duron-E	
OIL GRADE		SAE 15W40	SAE 15W40	
OIL ADDED				
FILTER	Hrs	Not Applicable		
			Not Changed	
Metals (ppm)		_	_	
Iron (Fe)		2	7	
Chromium (Cr)		<1	1	
Lead (Pb)		<1	1	
Copper (Cu)		<1	1	
Tin (Sn)		<1	<1	
Aluminium (Al)		2	1	
Nickel (Ni)		<1	<1	
Silver (Ag)		<1	<1	
Titanium (Ti)		<1	<1	
Vanadium (V)		<1	<1	
Contaminants (ppm)				
Silicon (Si)		24	<1	
Sodium (Na)		1	4	
Potassium (K)		- <1	8	
Additives (nnm)			~	
Magnesium (Mg)		406	26	
Calcium (Ca)		1575	2455	
Barium (Ba)		-1	~1	
Danum (Da) Dhoonhorua (D)		<1	1046	
r = 10 sphorus (P) $Z = 10$ ($T_{\rm m}$)		6001	1040	
ZINC (ZN) Malukalanuna (Mai)		1290	1103	
iviolypaenum (IVIO)		93	3	
Boron (B)		512	6	
Contaminants		0.05	0.05	
vvater (%)		<0.05	<0.05	
Coolant		No	No	
Physical Tests				
Viscosity (cSt 100C))	14.9	12.4	
Fuel (%)		<1	<1	
PQ Index		<10		
Soot (%) Infrared		0.2	1.3	
			(<>)	

ANALYST: Susan.Stapleton





UIN 02811BA

Chromium (Cr) Iron (Fe)	- Viscosity (cSt 100C) Soot (%) Infrared 1.4 1.2 1.4 1.2 1.4 1.2 1.8 0.6 0.4 0.2 0 1.7/04/2011 24/03/2019	U.S. Laboratories Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669 935 Sunshine Road Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 800.322.8055 Phoenix, Az 85017 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian Laboratories Burlington Ontario - 450 Edmonton Alberta - 402
Copper (Cu) Lead (Pb) ···· Tin (Sn)		Statistics of Lamonton, Aberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 888.489.0057 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia
Aluminium (AI) Silicon (Si) Sodium (Na)	Filter Image Filter patch test is not performed Contact laboratory for more information	Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D4739 (*M) Fuel Dilution Visc/Setaflash In House Fuel Sont ATR/IP: ASTM D7593 (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results and tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	since corrective actions, if any, are necessarily taken by others, these inctual amount paid to ALS Tribology for the services. Reported ad historical data. Certain test results appearing in this report may have beer	Fuel Sour ATR/IR. ASTM D7866 (M) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: PQ Index: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method



UIN 035BD5C

	Diesel Engine
Unit No.	320
Unit:	
Make	MCI
Model	
Serial No.	
Site	
Compartmer	nt:
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		23-Mar-19	06-Oct-16	09-Oct-13	11-Aug-13	
DATE RECEIVED		04-Apr-19	28-Oct-16	25-Oct-13	29-Aug-13	
DATE REPORTED		05-Apr-19	01-Nov-16	28-Oct-13	30-Aug-13	
			01110110	20 000 10	007/kg 10	
LAB NO.		41022166188	41021546914	41020822851	41020780774	
SIF NO.		35424192	31188024	14311342	13985694	
TIME ON UNIT	Hrs					
TIME ON OIL	Hrs	Oharman	Datas Canada	Oltra	Datas Osas da	
		Cnevron	Petro Canada	Linidoptified	Petro Canada	
		SAF 15W40	SAE 15W40	SAF 15W40	SAF 15W40	
		CAL TOWNS				
FILTER	Hrs					
OIL CHANGED				Not Changed	Not Changed	
WO NUMBER						
Metals (ppm)						
Iron (Fe)		5	20	12	19	
Chromium (Cr)		<1	<1	<1	<1	
Lead (Pb)		<1	3	2	<1	
Copper (Cu)		<1	24	3	<1	
Tin (Sn)		<1	2	<1	<1	
Aluminium (Al)		3	- 3	6	3	
Nickel (Ni)		-1	<1	-1	-1	
Silver (Ag)		<1	~1	<1	~1	
Titanium (Ti)		<1	<1	<1	<1	
Vanadium (V)		-1	<1	<1	<1	
			<u> </u>	<1 <1		
Silicon (Si)		7	Б	Λ	-1	
Silicon (Si) Sodium (No)		1	J 11	4	<1	
Botocoium (K)		-1	-1	-5	<1	
		<1	<۱	<0	<0	
Additives (ppm)		401	70	20	106	
Coloium (Co)		401	2276	20	2477	
		1929	2310	23/4	2411	
Barium (Ba)		<1	<1	<1	<1	
Phosphorus (P)		1023	997	1045	1193	
∠inc (∠n)		1230	1181	1144	1317	
Molybdenum (Mo)		93	9	10	5	
Boron (B)		408	43	11	14	
Contaminants		0.05	0.05	0.05	0.05	
vvater (%)		<0.05	<0.05	<0.05	<0.05	
Coolant		No	No	No	No	
Physical Tests		10.0	10.1	10.0		
Viscosity (cSt 100C))	13.8	13.4	12.6	14.4	
Fuel (%)		<1	<1	1	<1	
PQ Index		<10	<10	<10	<10	
Soot (%) Infrared		0.3	0.2	0.6	1.7	

ANALYST: Susan.Stapleton





UIN 035BD5C

Chromium (Cr) Iron (Fe) 25 20 15 10 5 0 0 0 0 0 0 0 0 0 0 0 0 0	- Viscosity (cSt 100C) Soot (%) Infrared $ \begin{array}{c} $	U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH44125 800.394.3669 B00.726.5400 Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earl Drive Kansas City, KS 66115 Phoenix, AZ 85017 800.332.8055 B00.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, Oregon - 401 4943 NW Front Avenue Portland, Oregon - 401 800.770.4128 Canadian Laboratories Burlington, Ontario - 450 Edmonton, Alberta - 402
Copper (Cu) Lead (Pb) Tin (Sn)	Water (%) 0.06 0.04 0.02 0 0 0 0 0 0 0 0 0 0 0 0 0	5036 South Service Rd. Burlington, ON L7L5Y73 905 332 9559 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia
Aluminium (AI) Sodium (Na) Silicon (Si)	Filter mage Filter patch test is not performed Contact laboratory for more information	Brisbane, Perth, sydney, Musweilbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Southeast Asia Europe Wellington Kuala Lumpur, Singapore Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution Visc/Setaflash In House Fuel Dilution Visc/Setaflash In House
Since services are based on samples and information supplied by others, and s services are rendered without any warranty or liability of any kind beyond the ac recommendations are based on interpretations of the generated test results and tested at other ALS laboratories within the Tribology divisional network.	ince corrective actions, if any, are necessarily taken by others, these stual amount paid to ALS Tribology for the services. Reported I historical data. Certain test results appearing in this report may have been	J Fuel Soot ATR/IR: ASTM D7686 (*M) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: ASTM D8120 (*M) Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House



UIN 01A309B

D	iesel Engine
Unit No.	321
Unit:	MCI
Make Model	
Serial No.	
Site	
Compartment:	
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	
Customer:	

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		23-Mar-19	11-Oct-12	15-Oct-09	22-Feb-09	10-Nov-08	
DATE RECEIVED		04-Apr-19	31-Oct-12	19-Oct-09	27-Feb-09	17-Nov-08	
DATE REPORTED		05-Apr-19	01-Nov-12	20-Oct-09	02-Mar-09	18-Nov-08	
<u>.</u>							
LAB NO.		41022166189	41020582542	41009177545	41009032418	41008220682	
SIF NO.		35424190	12606438	92274060007	92129350013	82068700005	
TIME ON UNIT	Hrs						
	nis.	Chovron	Citao	Unidentified	Unidentified	Unidentified	
		Delo 400 I F	Unidentified	Unidentified	Unidentified	Unidentified	
OIL GRADE		SAE 15W40					
OIL ADDED							
FILTER	Hrs						
OIL CHANGED			Not Changed	Not Provided	Not Provided	Not Provided	
WO NUMBER							
Metals (ppm)							
Iron (Fe)		3	17	28	9	18	
Chromium (Cr)		<1	<1	2	1	1	
Lead (Pb)		<1	3	2	1	<1	
Copper (Cu)		<1	5	11	2	2	
Tin (Sn)		<1	<1	<1	<1	<1	
Aluminium (Al)		2	4	3	3	1	
Nickel (Ni)		<1	<1	<1	<1	<1	
Silver (Ag)		<1	<1	<1	<1	<1	
Titanium (Ti)		<1	<1	<1	<1	<1	
Vanadium (V)		<1	<1	<1	<1	<1	
Contaminants (ppm)							
Silicon (Si)		6	4	9	1	3	
Sodium (Na)		2	11	9	4	10	
Potassium (K)		<1	<5	<5	<5	<5	
Additives (ppm)							
Magnesium (Mg)		396	51	275	112	113	
Calcium (Ca)		1536	2267	2471	2487	2516	
Barium (Ba)		<1	<1	<1	<1	<1	
Phosphorus (P)		1060	964	1131	1076	1122	
Zinc (Zn)		1256	1085	1268	1239	1160	
Molybdenum (Mo)		92	8	18	5	5	
Boron (B)		481	<5	13	<5	<5	
Contaminants							
Water (%)		< 0.05	< 0.05	< 0.05	< 0.05	<0.05	
Coolant		No	No	No	No	No	
Physical Tests							
Viscosity (cSt 1000	C)	14.5	12.8	14.9	11.7	12.8	
Fuel (%)	- /	<1	1	<1	<1	<1	
PO Index		<10	<10	~ ~ ~			
Soot (%) Infrared		0.2	06	0.6	03	1 4	
		0.2	0.0	0.0	0.5		

ANALYST: Susan.Stapleton





UIN 01A309B

			U.S. Laboratories
	Chromium (Cr) Iron (Fe)	Soot (%) Infrared Viscosity (cSt 100C)	Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH 44125 800.394.3669 800.726 5400
PPM Fe	25 20 15 10 5 0 22/02/2009 11/10/2012 22/02/2009 11/10/2012	B C C C C C C C C C C C C C	% % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % % %
	10/11/2008 15/10/2009 23/03/2019	10/11/2008 15/10/2009 23/03/2019	Canadian Laboratories
	Copper (Cu) - Lead (Pb) ···· Tin (Sn)	— Water (%)	Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y73 Edmonton, AB TSS 1K1 905 332 9559 888.489.0057
Mqq		ber 0.04	Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437
	22/02/2009 11/10/2012	22/02/2009 11/10/2012	International Locations
	10/11/2008 15/10/2009 23/03/2019	10/11/2008 15/10/2009 23/03/201	Australia
	Aluminium (AI) Sodium (Na) Silicon (Si)	Filter Image Filter patch test is not performed Contact labor for more information	atory Wellington Kuala Lumpur, Singapore Prague
Mdd	6 4 0 22/02/2009 11/10/2012 10/11/2008 15/10/2009 23/03/2019		TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Soot ATR/R: ASTM D7686 (*M)
Since servic recom testea	services are based on samples and information supplied by others, and es are rendered without any warranty or liability of any kind beyond the mendations are based on interpretations of the generated test results a I at other ALS laboratories within the Tribology divisional network.	Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624	
	Transit Resource Center		PQ Index: ASTM D8120 (*M)
	Attn: Robin Thompson		Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosition ACTA D 445 (*M) / SECTO 4406
	5840 Red Bug Lake Rd Ste 165		Viscosity: ASTM D445 (*M) / D7279 (*M)
	Winter Springs FL 32708		Water Crackle: In House

Page 2 of 2

*M - Modified Method



UIN 01A3172

	Diesel Engine	
Unit No.	322	
Unit:		
Make	MCI	
Model		
Serial No.		
Site		
Compartmen	t:	
Name	Diesel Engine	
Make	Detroit Diesel	
Model	Series 60	
Serial No.		
Capacity:		
•		

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		23-Mar-19	04-Oct-17	05-Dec-15	10-Aug-14	06-Oct-10	15-Sep-08
DATE RECEIVED		04-Apr-19	18-Oct-17	21-Dec-15	17-Sen-14	14-Oct-10	24-Sep-08
DATE REPORTED		05-Anr-19	24-Oct-17	22-Dec-15	19-Sen-14	19-Oct-10	24-Sep-08
		00 Apr-18		22 060-10			27 000-00
LAB NO.		41022166190	41021789852	41021341094	41021039122	41020118204	41008181264
SIF NO.		34557419	32939577	20161837	15408478	102520650027	82016710022
TIME ON UNIT	Hrs						
		Chevron	Gulf	Petro Canada	Petro Canada	Citao	Citao
OIL TYPE		Delo 400 LE	Unidentified	Duron-E	Duron-E	Unidentified	Unidentified
OIL GRADE		SAE 15W40	SAE 15W40	SAE 15W40	SAE 15W40	SAE 15W40	SAE 15W40
OIL ADDED							
FILTER	Hrs						
					Not Changed	Not Changed	Not Provided
Metals (ppm)		0	00	10	10	F	26
Chromium (Cr)		<u>_</u>	23	10	19	-1	30
		<1	2	<1	<1	< 1	2
		<	2	<1	<1	1	0
Copper (Cu)		<1	4	2	2	1	18
Tin (Sn)		<1	2	2	<1	<1	<1
Aluminium (Al)		2	3	3	2	2	8
		<1	1	<1	<1	<1	<1
Silver (Ag)		<1	<1	<1	3	<1	<1
Litanium (Ti)		<1	4	9	5	<1	<1
Vanadium (V)		<1	<1	<1	<1	1	<1
Contaminants (ppm)		7	4.4	4	2	4	4.4
Silicon (Si)		1	21	4	2	1	11
Socium (Na)		<1	31	4	Z 15	24	15
Additives (name)		<1	Ζ	<1	<0	<0	<0
Magnesium (Mg)		306	700	126	80	30	851
Calcium (Ca)		1537	1523	2594	1994	1901	1677
Barium (Ba)		-1	-1	~1	-1	-1	-1
Phoenhorus (P)		1069	1005	1066	906	1107	1181
$Z_{inc}(Z_n)$		1284	1310	1238	1036	1015	1383
Molybdenum (Mo)		02	55	1250	1050	015	1505
Boron (B)		92 405	23	21	13	-5	40
Contaminants		+00	20	21	10	<0	~0
Water (%)		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Coolant		No	No	No	No	No	No
Physical Tests							
Viscosity (cSt 100C	;)	15.2	13.2	13.6	14.0	13.0	13.0
Fuel (%)	-	<1	<1	<1	<1	<1	<1
PQ Index		<10	<10	<10	<10		
Soot (%) Infrared		0.2	0.1	1.2	1.6	0.3	0.6
. /							

ANALYST: Susan.Stapleton





UIN 01A3172

		U.S. Laboratories
Chromium (Cr) Iron (Fe)	Soot (%) Infrared Viscosity (cSt 100C)	Atlanta, Georgia - 420Valley View, Ohio - 4103121 Presidential Drive Atlanta, GA 303406180 Halle Dr. Suite D Valley View, OH 44125 800.394.3669800.726.5400
30 20 20 1.5 1.5 1.5	1.5 % 0 10 1.5 %	Kansas City, Kansas - 430Phoenix, Arizona - 440935 Sunshine Road3319 West Earll DriveKansas City, KS 66115Phoenix, AZ 85017800.332.8055800.445.7930
	5 0 0 0 0 0 06/10/2010 05/12/2015 23/03/2019 0 0	Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128
15/09/2008 10/08/2014 04/10/2017	15/09/2008 10/08/2014 04/10/2017	Canadian Laboratories
Copper (Cu) - Lead (Pb) ···· Tin (Sn)	Water (%) 0.06	Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 888.489.0057
15 Ma 10 5	ber 0.04	Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437
06/10/2010 05/12/2015 23/03/2019	06/10/2010 05/12/2015 23/03/2019	International Locations
15/09/2008 10/08/2014 04/10/2017	15/09/2008 10/08/2014 04/10/2017	Australia
	Filter	Brisbane, Perth, Sydney, Muswellbrook
Aluminium (Al) Sodium (Na) Silicon (Si)	Image Filter patch test is not	South America Santiago de Chile, Belo Horizonte, Brazil
35 30 25	performed Contact laboratory for more information	New ZealandSoutheast AsiaEuropeWellingtonKuala Lumpur, SingaporePrague
		TEST METHODS:
10-		Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M)
		Base Number (Perchloric): ASTM D2896 (*M)
06/10/2010 05/12/2015 23/03/2019		Fuel Dilution by GC: ASTM D7593
15/09/2008 10/08/2014 04/10/2017		Fuel Dilution Visc/Setatlash In House Fuel Soot ATR/IR: ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and	since corrective actions, if any, are necessarily taken by others, these	Soot by FTIR: ASTM D7844
services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results a	ctual amount paid to ALS Tribology for the services. Reported d historical data. Certain test results appearing in this report may have beer	Glycol: In House
tested at other ALS laboratories within the Tribology divisional network.		Ox, NOx, SOx, FTIR: ASTM D5185 (1M)
	D7624	
Transit Resource Center		PQ Index: ASTM D8120 (*M)
Attn: Robin Thompson		Particle Count: ASTM D7647 (*M) / ISO 4406
5840 Red Bug Lake Rd Ste 165		Viscosity: ASTM D445 ("M) / D7279 ("M)
Winter Springs FL 32708		Water Crackle: In House
USA		*M - Modified Method

(ALS)

UIN 071E77F

	Diesel Engine
Unit No.	323
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartmen	t:
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED DATE RECEIVED		23-Mar-19 04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO. SIF NO. TIME ON UNIT TIME ON OIL OIL BRAND OIL TYPE OIL GRADE OIL ADDED FILTER OIL CHANGED WO NUMBER	Hrs Hrs Hrs	41022166191 35424200 Chevron Delo 400 LE SAE 15W40	
Metals (ppm)		2	
Iron (Fe)		2	
		<1	
		<1	
Tin (Sn)		<1	
$\Delta uminium (\Delta)$		2	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		6	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)			
Magnesium (Mg)		393	
Calcium (Ca)		1520	
Barium (Ba)		<1	
Phosphorus (P)		1050	
Zinc (Zn)		1246	
Molybdenum (Mo)		92	
Boron (B)		483	
Water (%)		~0.05	
Coolant		<0.05 No	
Physical Tests		110	
Viscosity (cSt 100C)		14.8	
Fuel (%)		<1	
PQ Index		<10	
Soot (%) Infrared		0.2	

ANALYST: Susan.Stapleton





U.S. Laboratories

UIN 071E77F



(ALS)

UIN 071E79D

D	esel Engine
Unit No.	324
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Fuel dilution satisfactory. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED DATE RECEIVED		24-Mar-19 04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO. SIF NO. TIME ON UNIT TIME ON OIL OIL BRAND OIL TYPE OIL GRADE OIL ADDED FILTER OIL CHANGED WO NUMBER	Hrs Hrs Hrs	41022166192 35424208 Chevron Delo 400 LE SAE 15W40	
Metals (ppm)			
Iron (Fe)		3	
Chromium (Cr)		<1	
Lead (Pb)		<1	
Copper (Cu)		<1	
Tin (Sn)		<1	
Aluminium (Al)		2	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		6	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)		100	
Magnesium (Mg)		403	
Calcium (Ca)		1537	
Barium (Ba)		<1	
Phosphorus (P)		1052	
Zinc (Zn)		1251	
		93	
Boron (B)		459	
		-0.0E	
Valer (%)		<0.05 No	
		INU	
Viscosity (cSt 100C)	\	13.0	
Fuel (%)	/	-1	
		<10	
FW INUEX		<10	
Soot (%) initiated		0.3	



ANALYST: Sam Smith Cleveland





UIN 071E79D



U.S. Laboratories Vallev View, Ohio - 410
(ALS)	

UIN 071E783

D	iesel Engine
Unit No.	325
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		23-Mar-19	
		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166193	
SIF NO.		35424198	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs		
		Chevron	
		Delo 400 LE	
		5AL 150040	
FILTER	Hrs		
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		3	
Chromium (Cr)		<1	
Lead (Pb)		<1	
Copper (Cu)		<1	
Tin (Sn)		<1	
Aluminium (Al)		2	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)		-	
Silicon (Si)		6	
Sodium (Na)		1	
Potassium (K)		<1	
Additives (ppm)		400	
Magnesium (Mg)		400	
Barium (Ba)		1000	
Phosphorus (P)		1059	
Zinc (Zn)		1262	
Molyhdenum (Mo)		92	
Boron (B)		468	
Contaminants		100	
Water (%)		<0.05	
Coolant		No	
Physical Tests			
Viscosity (cSt 100C))	14.3	
Fuel (%)		<1	
PQ Index		<10	
Soot (%) Infrared		0.2	

ANALYST: Susan.Stapleton





Viscosity (cSt 100C)

-- Soot (%) Infrared

Right Solutions • Right Partner

U.S. Laboratories

Vallev View, Ohio - 410

6180 Halle Dr. Suite D

UIN 071E783

Atlanta, Georgia - 420

3121 Presidential Drive



Chromium (Cr)

Iron (Fe)

Page 2 of 2



UIN 01A2FB1

D	iesel Engine
Unit No.	326
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	Lynx
Compartment:	
Name	Diesel Engine
Make	Detroit Diesel
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		24-Mar-19	02-Apr-17	29-Jun-08	
DATE RECEIVED		04-Apr-19	26-Apr-17	09-Jul-08	
DATE REPORTED		05-Apr-19	28-Apr-17	10-Jul-08	
		41022166145	41021664877	41008128112	
SIF NO.		35424205	32005359	81968330022	
TIME ON UNIT	Hrs				
TIME ON OIL	Hrs				
OIL BRAND		Petro Canada	Petro Canada	Mobil	
OIL TYPE		Duron HP	Duron-E	Unidentified	
		SAE 157740	SAE 150040	Unknown	
FILTER	Hrs	Not Applicable			
OIL CHANGED				Not Provided	
WO NUMBER					
Metals (ppm)					
Iron (Fe)		43	14	125	
Chromium (Cr)		3	<1	4	
Lead (Pb)		10	<1	3	
Copper (Cu)		14	1	6	
Tin (Sn)		2	<1	5	
Aluminium (Al)		3	1	2	
Nickel (Ni)		4	<1	<1	
Silver (Ag)		<1	<1	1	
Titanium (Ti)		<1	<1	<1	
Vanadium (V)		<1	<1	<1	
Contaminants (ppm)					
Silicon (Si)		8	3	12	
Sodium (Na)		4	2	<1	
Potassium (K)		<1	<1	<5	
Additives (ppm)					
Magnesium (Mg)		828	575	218	
Calcium (Ca)		1122	1159	2121	
Barium (Ba)		<1	<1	<1	
Phosphorus (P)		889	774	1088	
Zinc (Zn)		1118	991	1218	
Molybdenum (Mo)		67	43	10	
Boron (B)		10	16	10	
Contaminants					
Water (%)		<0.05	<0.05	<0.05	
Coolant		No	No	No	
Physical Tests					
Viscosity (cSt 100C)		13.5	12.9	16.5	
Fuel (%)		<1	1	<1	
PQ Index		<10	<10		
Soot (%) Infrared		0.8	1.6	2.8	
		\sim	\sim		

ANALYST: Susan.Stapleton





UIN 01A2FB1

	Chromium (Cr) Iron (Fe)	Viscosity (cSt 100C) Soot (%) Infrared			U.S. Laboratories Atlanta, Georgia - 420 3121 Presidential Drive 6180 Halle Dr. Suite D	
PM Fe	140 120 100 80 60 5 4 3 2 90 60 60 5 4 3 2 90 60	20		2 1.5 1 %	Atlanta, GA 30340 800.394.3669 Kansas City, Kansas - 43 935 Sunshine Road Kansas City, KS 66115 800.332.8055	Valley View, OH 44125 800.726.5400 30 Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930
<u>а</u>			02/04/2017	0.5	Portland 4943 N Portla 800	, Oregon - 401 <i>W</i> Front Avenue nd, OR 97210).770.4128
	96425 24/03/2019	96425	24/03/201	9	Canadian	Laboratories
	Copper (Cu) Lead (Pb) ···· Tin (Sn)	0.06	Water (%)		5036 South Service Rd. Burlington, ON L7L5Y73 905 332 9559	10717-176 Street Edmonton, AB T5S 1K1 888.489.0057
5	12- 10- 8-	be 0.04			Sales & Hous	Marketing ton, Texas
Idd		≷ ≈ 0.02-			10450 Stand Houst 877	5mr Koad, Suite 210 on, TX 77099 7.835.8437
	96425 02/04/2017 24/03/2019	0	25 02/04/2017 2	24/03/2010	Internatio	nal Locations
	00420 02/04/2011 24/06/2010	90- 511	23 02/04/2017 2	-4/03/2019	A Brisbane, Perth	ustralia , Sydney, Muswellbrook
		Filter				
	Aluminium (Al) Sodium (Na) Silicon (Si)	Image			Sout	th America
	Aluminium (AI) Sodium (Na) Silicon (Si)	Image	Filter patch t	test is not	Sou t Santiago de Chi	th America ile, Belo Horizonte, Brazil
	Aluminium (AI) Sodium (Na) Silicon (Si)	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation	Sout Santiago de Chi New Zealand Sout Wellington Kuala Li	th America lie, Belo Horizonte, Brazil theast Asia Europe umpur, Singapore Prague
ž	Aluminium (Al) Sodium (Na) Silicon (Si)	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation	Sour Santiago de Chi New Zealand Wellington Kuala Li TEST	th America ile, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS:
Mdd	Aluminium (Al) Sodium (Na) Silicon (Si)	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation	Sour Santiago de Chi New Zealand Wellington Kuala Li Kuala Li TEST Acid Number:	th America ile, Belo Horizonte, Brazil theast Asia Europe mpur, Singapore Prague METHODS: ASTM D974/D664 (*M)
Mdd	Aluminium (AI) Sodium (Na) Silicon (Si)	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation	Sour Santiago de Chi New Zealand Wellington Kuala Li Kuala Li TEST Acid Number: Base Number: Base Number (Perchloric):	th America ile, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M)
Mqq	Aluminium (Al) Sodium (Na) Silicon (Si)	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation	Sour Santiago de Chi New Zealand Wellington Kuala L TEST Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution Visc/Setaflash	th America ile, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House
Since	Aluminium (AI) Sodium (Na) Silicon (Si)	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation	Sour Santiago de Chi New Zealand Wellington Kuala Li Kuala Li TEST Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution by GC: Fuel Dilution Visc/Setaflash Fuel Soot ATR/IR: Soot by FTIR:	th America ile, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7844
Mad Since service	Aluminium (AI) Sodium (Na) Silicon (Si)	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation others, these ported	Sour Santiago de Chi Mew Zealand Wellington Kuala Li TEST Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution Visc/Setaflash Fuel Soot ATR/IR: Soot by FTIR: Glycol:	th America ile, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7844 In House
Since service recom tested	Aluminium (AI) Sodium (Na) Silicon (Si)	Image I since corrective actions, if any actual amount paid to ALS Trib nd historical data. Certain test r	Filter patch t performed C for more info	test is not Contact laboratory ormation others, these ported port may have been	Sour Santiago de Chi Mew Zealand Wellington TEST Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution by GC: Fuel Dilution Visc/Setaflash Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOX, SOX, FTIR:	th America iie, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7686 (*M) ASTM D7844 In House ASTM D5185 (*M) ASTM D7418/D7414/D7415
Since service recom tested	Aluminium (AI) Sodium (Na) Silicon (Si)	Image Image I since corrective actions, if any actual amount paid to ALS Trib nd historical data. Certain test r	Filter patch t performed C for more info	test is not Contact laboratory ormation others, these ported port may have been	Sour Santiago de Chi Mew Zealand Wellington Kuala Li Excelosional Acid Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution Visc/Setaflash Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR:	th America lie, Belo Horizonte, Brazil theast Asia Europe Prague METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7844 In House ASTM D5185 (*M) ASTM D5185 (*M) ASTM D7418/D7414/D7415 D7624
Since service recom tested	Aluminium (AI) Sodium (Na) Silicon (Si) Aluminium (AI) Sodium (Na) Silicon (Si) Aluminium (AI) Sodium (Na) Silicon (Si) 	Image I since corrective actions, if any actual amount paid to ALS Trib nd historical data. Certain test r	Filter patch t performed C for more info	test is not Contact laboratory prmation others, these ported port may have been	Sour Santiago de Chi Mew Zealand Wellington TEST Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution Visc/Setaflash Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR: PQ Index:	th America ile, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7686 (*M) ASTM D7844 In House ASTM D5185 (*M) ASTM D7418/D7414/D7415 D7624 ASTM D8120 (*M)
Since service recom tested	Aluminium (AI) Sodium (Na) Silicon (Si) Aluminium (AI) Sodium (Na) Silicon (Si) Aluminium (AI) Sodium (Na) Silicon (Si) 	Image	Filter patch t performed C for more info	test is not Contact laboratory ormation others, these ported port may have been	Sour Santiago de Chi Mew Zealand Wellington Sur Kuala Li Sase Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR: PQ Index: Particle Count: Viscosity:	th America ile, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7686 (*M) ASTM D7844 In House ASTM D5185 (*M) ASTM D7418/D7414/D7415 D7624 ASTM D8120 (*M) ASTM D7647 (*M) / ISO 4406 ASTM D445 (*M) / D7279 (*M)
Since service recom tested	Aluminium (AI) Sodium (Na) Silicon (Si) Aluminium (AI) Sodium (Na) Silicon (Si) Aluminium (AI) Sodium (Na) Silicon (Si) 	Image I since corrective actions, if any actual amount paid to ALS Trib nd historical data. Certain test r	Filter patch t performed C for more info	test is not Contact laboratory ormation	Souri Santiago de Chi Mew Zealand Wellington Kuala Li TEST Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution Visc/Setaflash Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR: PQ Index: Particle Count: Viscosity: Water KF:	America lie, Belo Horizonte, Brazil theast Asia umpur, Singapore Europe Prague METHODS: ASTM D974/D664 (*M) ASTM D974/D664 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7686 (*M) ASTM D7686 (*M) ASTM D7686 (*M) ASTM D7686 (*M) ASTM D7644 In House ASTM D7844 ASTM D5185 (*M) ASTM D7418/D7414/D7415 D7624 ASTM D8120 (*M) ASTM D7647 (*M) / ISO 4406 ASTM D445 (*M) / J7279 (*M) D6304C / E203 (*M) ASTM D445 (*M)
Since service recom tested	Aluminium (Al) Sodium (Na) Silicon (Si) Aluminium (Al) Sodium (Na) Silicon (Si) Aluminium (Al)	Image	Filter patch t performed C for more info	test is not Contact laboratory prmation	Sour Santiago de Chi Mew Zealand Wellington TEST Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution Visc/Setaflash Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR: PQ Index: Particle Count: Viscosity: Water KF: Water Crackle:	th America iie, Belo Horizonte, Brazil theast Asia umpur, Singapore METHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House ASTM D7686 (*M) ASTM D7687 (*M) /ISO 4406 ASTM D445 (*M) / D7279 (*M) D6304C / E203 (*M) In House



UIN 071D7BB

D	iesel Engine
Unit No.	981
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	
Compartment:	
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	0.0 Ltrs

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. PQ Index number (ferrous material) exceeds tolerance limit. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Fuel dilution satisfactory. Viscosity within specified operating range. Action: Advise inspect magnetic plug for wear debris and evaluate. Change oil and filter(s) if not already done. Resample at next recommended interval to monitor and establish wear trend.

DATE 0445: 55		04.14. 12	
DATE SAMPLED		24-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO		41022166144	
SIF NO.		35424207	
TIME ON UNIT			
TIME ON OIL			
OIL BRAND		Chevron	
		Delo 400 LE	
	l trs	SAE 15W40	
FILTER	LUS	Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		59	
Chromium (Cr)		13	
Lead (Pb)		<1	
Copper (Cu)		<1	
Tin (Sn)		5	
Aluminium (Al)		4	
Nickel (Ni)		q	
Silver (Ag)		-1	
Titanium (Ti)		<1 _1	
Vanadium (V)		<1	
		<1	
Silicon (Si)		٥	
Sodium (No)		3	
Dotoccium (K)		ی 1	
		<1	
Additives (ppm)		286	
Coloium (Co)		300	
Calcium (Ca)		1000	
Barium (Ba)		<1 1007	
Phosphorus (P)		1027	
∠inc (∠n)		1226	
Molybdenum (Mo)		91	
Boron (B)		366	
Contaminants		0.05	
vvater (%)		<0.05	
		NO	
Physical Tests	`	10.4	
VISCOSITY (CST 1000))	13.4	
FUEL(%)			
PQ Index		34	
Soot (%) Infrared		0.4	

ANALYST: harold.scarborough



Chromium (Cr) Iron (Fe) $ \begin{array}{c} 60 \\ 40 \\ 40 \\ $		Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH44125 800.394.3669 800.726.5400 Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earll Drive Kansas City, KS 66115 Phoenix, AZ 85017 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128
Copper (Cu) Lead (Pb) Tin (Sn)		Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 Sales & Marketing Houston, Texas 10450 Stancilf Road, Suite 210 Houston, TX 77099 877.835.8437
0	0 24/03/2019	International Locations Australia Brisbane, Perth, Sydney, Muswellbrook
Aluminium (Al) Silicon (Si) Sodium (Na)	Image Filter patch test is not performed Contact laboratory for more information	South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Europe Prague ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Dilution Visc/Setaflash ACTM D3789 (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results ar tested at other ALS laboratories within the Tribology divisional network.	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported and historical data. Certain test results appearing in this report may have been	Soot by FTIR: ASTM D7000 (M) Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 D7624
Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	0002 v1.9	PQ Index: ASTM D8120 (*M) Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method

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UIN 071D7BB

U.S. Laboratories



(ALS)

UIN 071E7A1

	Diesel Engine
Unit No.	983
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	VCTC
Compartmen	t:
Name	Diesel Engine
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Fuel dilution satisfactory. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED DATE RECEIVED		24-Mar-19 04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO. SIF NO. TIME ON UNIT TIME ON OIL OIL BRAND OIL TYPE OIL GRADE OIL ADDED FILTER OIL CHANGED WO NUMBER	Hrs Hrs Hrs	41022166185 35424201 Petro Canada Duron HP SAE 15W40	
Metals (ppm)			
Iron (Fe)		27	
Chromium (Cr)		<1	
Lead (Pb)		2	
Copper (Cu)		1	
Tin (Sn)		<1	
Aluminium (Al)		6	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	_
Contaminants (ppm)		7	
Silicon (SI)		1	
Botopoium (K)		6	
		4	-
Magnesium (Mg)		370	
Calcium (Ca)		1550	
Barium (Ba)		<1	
Phosphorus (P)		1041	
Zinc (Zn)		1216	
Molvbdenum (Mo)		89	
Boron (B)		428	
Contaminants		-	-
Water (%)		<0.05	
Coolant		No	
Physical Tests			
Viscosity (cSt 100C)	14.0	
Fuel (%)		<1	
PQ Index		<10	
Soot (%) Infrared		0.4	

ANALYST: Sam Smith Cleveland



Chromium (Cr) Iron (Fe) 30 25 20 4 20 5 0 24/03/2019	Viscosity (cSt 100C) Soot (%) Infrared 0.5 0.4 0.3 0.2 0.1 0.1 0.2 0.1 0.5 0.4 0.2 0.1 0.5 0.4 0.2 0.1 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.2 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.2 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	U.S. Laboratories Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 30.394.3669 Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 800.332.8055 Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian Laboratories
- Copper (Cu) - Lead (Pb) ···· Tin (Sn)		Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y73 10717-176 Street Edmonton, AB TSS 1K1 888.489.0057 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia
- Aluminium (Al) Silicon (Si) Sodium (Na) $= 4$ $= 4$ $= 0$ $= 24/03/2019$	Filter Image Filter patch test is not performed Contact laboratory for more information	Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Kuala Lumpur, Singapore FEST METHODS: Acid Number: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Data ATD (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the recommendations are based on interpretations of the generated test results a tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	I since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported nd historical data. Certain test results appearing in this report may have been	Fuel Soot ATR/IR: ASTM D7686 (*M) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method

Right Solutions • Right Partner

UIN 071E7A1





UIN 071D7C4

DATE SAMPLED

24-Mar-19

D	iesel Engine
Unit No.	986
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	
Compartment:	
Name	Diesel Engine
Маке	
Model	
Serial No.	
Capacity:	0.0 Ltrs

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

Elevated Nickel indicates possible valve train wear. Elevated Iron level indicates possible crankshaft, camshaft, gear train, cylinder wear, or corrosion. Silicon level (dirt/sealant material) abnormal. Minor fuel dilution occurring. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Check fuel injection system. Check for lower than typical oil pressure. Change oil and filter(s) if not already done. Resample after corrective action to further monitor.

DATE RECEIVED 04-Apr-19 DATE REPORTED 09-Apr-19 LAB NO. 41022166146 SIF NO. 35424203 TIME ON UNIT TIME ON OIL OIL BRAND Chevron OIL TYPE Delo 400 LE **OIL GRADE** SAE 15W40 OIL ADDED Ltrs FILTER Not Applicable OIL CHANGED WO NUMBER Metals (ppm) 66 Iron (Fe) 2 Chromium (Cr) 6 Lead (Pb) Copper (Cu) 141 Tin (Sn) 5 12 Aluminium (AI) 21 Nickel (Ni) <1 Silver (Ag) Titanium (Ti) <1 Vanadium (V) <1 Contaminants (ppm) Silicon (Si) 39 Sodium (Na) 13 Potassium (K) 41 Additives (ppm) 496 Magnesium (Mg) 1556 Calcium (Ca) Barium (Ba) <1 Phosphorus (P) 737 Zinc (Zn) 976 49 Molybdenum (Mo) 48 Boron (B) Contaminants < 0.05 Water (%) Coolant No Physical Tests Viscosity (cSt 100C) 12.6 Fuel (%) 3 PQ Index <10 Soot (%) Infrared 0.6

ANALYST: Eric.Dunlap



			U.S. Laboratories	
Chromium (Cr) Iron (Fe)	2		Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH44125 800.394.3669 800.726.5400	
60 월 40	1.5 1 PPM o		Kansas City, Kansas - 430Phoenix, Arizona - 440935 Sunshine Road Kansas City, KS 66115 800.332.80553319 West Earll Drive Phoenix, AZ 85017 800.445.7930	
	0.5 [°] 0		Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128	
24/03/2019		24/03/2019	Canadian Laboratories	
Copper (Cu) - Lead (Pb) ···· Tin (Sn)		Water (%)	Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y7 Edmonton, AB TSS 1K1 905 332 9559 888.489.0057	
		0.04 - ≶ Sate % 0.02 -	Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437	
24/03/2019		0 24/03/2019	International Locations	
Aluminium (Al)		Filter Image	Brisbane, Perth, Sydney, Muswellbrook South America	
40	,	Filter patch test is not	Santiago de Chile, Belo Horizonte, Brazil	
30		performed Contact laboratory for more information	New Zealand Southeast Asia Europe Wellington Kuala Lumpur, Singapore Prague	
₹ 20-			TEST METHODS:	
10			Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M)	
			Base Number (Perchloric): ASTM D2896 (*M)	
24/03/2019			Fuel Dilution by GC: ASTM D7593	
24/00/2010			Fuel Soot ATR/IR: ASTM D7686 (*M)	
Since services are based on samples and information supplied by services are rendered without any warranty or liability of any kind l recommendations are based on interpretations of the generated te tested at other ALS laboratories within the Tribology divisional net	others, and beyond the est results a work.	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported nd historical data. Certain test results appearing in this report may have been	Soot by FTIR:ASTM D7844Glycol:In HouseMetals by ICP AES:ASTM D5185 (*M)Ox, NOx, SOx, FTIR:ASTM D7418/D7414/D7415D7624	
Transit Resource Center			PQ Index: ASTM D8120 (*M)	
Attn: Robin Thompson			Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M)	
5840 Red Bug Lake Rd Ste 165	i		Water KF: D6304C / E203 (*M)	
Winter Springs FL 32708			Water Crackle: In House	
IUSA				
			*M - Modified Method	

UIN 071D7C4





UIN 071D7B6

D	iesel Engine
Unit No.	988
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	
Compartment: Name Make Model Serial No.	Diesel Engine
Capacity:	0.0 Ltrs

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Fuel dilution satisfactory. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED	24-Mar-19	
DATE RECEIVED	04-Apr-19	
DATE REPORTED	05-Apr-19	
	41022166142	
SIE NO	35424209	
TIME ON UNIT	00424200	
TIME ON OIL		
OIL BRAND	Chevron	
OIL TYPE	Delo 400 LE	
OIL GRADE	SAE 15W40	
	Ltrs	
	Not Applicable	
WO NUMBER		
Metals (nnm)		
Iron (Fe)	30	
Chromium (Cr)	6	
Lead (Pb)	<1	
Copper (Cu)	<1	
Tin (Sn)	2	
Aluminium (Al)	2	
Nickel (Ni)	4	
Silver (Ag)	<1	
Titanium (Ti)	<1	
Vanadium (V)	<1	
Contaminants (ppm)		
Silicon (Si)	7	
Sodium (Na)	2	
Potassium (K)	<1	
Additives (ppm)		
Magnesium (Mg)	393	
Calcium (Ca)	1626	
Barium (Ba)	<1	
Phosphorus (P)	1098	
Zinc (Zn)	1305	
Molybdenum (Mo)	92	
Boron (B)	471	
Contaminants		
Water (%)	<0.05	
Coolant	No	
Physical Tests	44.0	
VISCOSITY (CST 100C)	14.6	
Fuel (%)	<1	
PQ Index	17	
Soot (%) Infrared	0.3	



ANALYST: Sam Smith Cleveland





Viscosity (cSt 100C)

-- Soot (%) Infrared

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UIN 071D7B6

Atlanta, Georgia - 420

U.S. Laboratories

Vallev View, Ohio - 410



Iron (Fe)



UIN 01A307A

Т	ransmission
Unit No.	315
Unit:	
Make	Gillig
Model	
Serial No.	
Site	
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	
Customer:	

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		23-Mar-19	11-Aug-13	07-Oct-10	15-Sep-08	
DATE RECEIVED		04-Apr-19	29-Aug-13	14-Oct-10	24-Sep-08	
DATE REPORTED		05-Apr-19	30-Aug-13	19-Oct-10	25-Sep-08	
		41000166106	41020790766	41020119204	41000101207	
LAB NO. SIE NO		41022166136 35424185	41020780766	41020118201	41008181307	
TIME ON LINIT	Hrs	33424103	13903000	102320030021	02010710023	
TIME ON OIL	Hrs					
OIL BRAND		BP	Petro Canada	Castrol	Castrol	
OIL TYPE		Autran Syn 295	ATF PC HD Syn	TranSynd	TranSynd	
OIL GRADE		-	-	-	-	
	Ll ro					
	HIS		Not Changed	Not Changed	Not Provided	
WO NUMBER			Not Onlanged	Not onlanged	Nothiovided	
Motals (nnm)						
Iron (Fe)		62	62	8	37	
Chromium (Cr)		<1	<1	<1	<1	
Lead (Pb)		9	10	9	184	
		57	10	1/	72	
Tin (Sn)		1	1	/ + ~1	2	
Aluminium (Al)		23	15	1	6	
Nickol (Ni)		23	-1	-1	-1	
		<1	<1	< I 4	4	
Silver (Ag)		<1	<1	-1	-1	
Venedium (V)		<1	<1	<1	<1	
		<1	<1	<1	<1	
Silicon (Si)		2	1	-1	2	
Silicon (Si) Sodium (No)		3	4	<1	2	
Botopoium (K)		2 -1	9	<1	5	
		<1	<0	<0	<0	
Magnesium (Mg)		15	-1	~1	1	
Calcium (Ca)		04	62	7	24	
Calcium (Ca)		94	03	1	24	
Dallulli (Da)		<1	<1	1	<1	
Phosphorus (P)		2/5	311	219	253	
ZINC (ZN)		53	12	<1	8 .1	
iviolypaenum (Mo)		4	<1	<1	<1	
Boron (B)		120	162	130	108	
Water (%)		<0.05	<0.05	<0.05	<0.05	
Physical Tasts		<0.03	NU.UU	<0.00	NO.00	
Viscosity (cSt 1000	\	74	6.6	73		
Solide (%)	,	0.2	0.0	0.1		
		0.2	0.1	0.1		
PO Index		23	~10			
		20				

ANALYST: roldan.beldad





UIN 01A307A

Chromium (Cr) Iron (Fe) 80 40 40 20 0 0 07/10/2010 23/03/2019 15/09/2008 11/08/2013	- Viscosity (cSt 100C)	U.S. Laboratories Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669 Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 Kansas City, KS 66115 800.332.8055 Phoenix, Az 85017 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian Laboratories Burlington Ontario - 450 Edmonton Alberta - 402
Copper (Cu) Lead (Pb) Tin (Sn) 200 150 100 50 07/10/2010 23/03/2019 15/09/2008 11/08/2013		Solad South Service Rd. Burlington, ON L7L5Y73 905 332 9559 10717-176 Street Edmonton, AB T5S 1K1 888.489.0057 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia
Aluminium (AI) Sodium (Na) Silicon (Si)	Filter Image Filter patch test is not performed Contact laboratory for more information	Brisbarle, Perin, Sydney, Musweinbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Europe Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Sont ATR/IP: ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and s services are rendered without any warranty or liability of any kind beyond the ac recommendations are based on interpretations of the generated test results and tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	, ince corrective actions, if any, are necessarily taken by others, these ctual amount paid to ALS Tribology for the services. Reported d historical data. Certain test results appearing in this report may have been	Fuel Sout ATR/R. ASTM D7666 (M) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House

(ALS)	

UIN 071E798

T	ransmission
Unit No.	316
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED		23-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166177	
SIF NO.		35424193	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs	55	
		BP Autron Syn 205	
OIL GRADE		-	
OIL ADDED			
FILTER	Hrs	Not Applicable	
WONUMBER			
Metals (ppm)		~~	
Iron (⊢e)		29	
Chromium (Cr)		<1	
Lead (Pb)		5	
Copper (Cu)		13	
lin (Sn)		<1	
Aluminium (Al)		14	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)		2	
Silicon (SI)		3	
Sodium (Na)		1	
Potassium (K)		<1	
Magnesium (Mg)		5	
Calcium (Ca)		5 13	
Barium (Ba)		40	
Dallulli (Da) Dhosphorus (D)		< I 254	
r = 10 sphores(r) Zinc (Zn)		204 1 <i>1</i>	
Allo (ZII) Molybdenum (Mo)		1 4 ~1	
Boron (R)		11/	
Contaminante		114	
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C)	7.3	
Solids (%)		0.2	
Additional			
PQ Index		<10	

ANALYST: harold.scarborough





UIN 071E798

	Chromium (Cr) Iron (Fe)	8 T	Viscosity (cSt 100C)	U.S. Lab Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669	oratories Valley View, Ohio - 410 6180 Halle Dr. Suite D Valley View, OH 44125 800.726.5400
PM Fe	25 1 20 0.8 PP 15 0.6 M	6		Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 800.332.8055	Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930
		ສູ້ 2 0		Portland, (4943 NW Portland 800.7	Jregon - 401 Front Avenue , OR 97210 70.4128
	23/03/2019		23/03/2019	Canadian L	aboratories.
	Copper (Cu) - Lead (Pb) Tin (Sn)			Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 888.489.0057	
		ate 0.04 - X % 0.02 -		Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437	
	0	0 -	00/00/0010	Internation	al Locations
	23/03/2019	23/03/2019		Australia Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil	
		Filter Image Filter patch test is not			
	Aluminium (AI) – – Silicon (Si) – – Sodium (Na)				
	16		performed Contact laboratory	New Zeeland Southoast Asia Europe	
	14		for more information	Wellington Kuala Lum	ipur, Singapore Prague
Σ	10-			TEST M	ETHODS:
법	6			Acid Number:	ASTM D974/D664 (*M)
	4-			Base Number:	ASTM D4739 (*M)
				Ease Number (Perchioric):	ASTM D2896 (^M) ASTM D7593
	23/03/2019			Fuel Dilution Visc/Setaflash	In House
				Fuel Soot ATR/IR:	ASTM D7686 (*M)
Since	services are based on samples and information supplied by others, and as are rendered without any warranty or liability of any kind beyond the a	l since corrective actions, if any, actual amount paid to ALS Tribu	are necessarily taken by others, these ploav for the services. Reported	Soot by FTIR:	ASTM D7844
recom	mendations are based on interpretations of the generated test results a	nd historical data. Certain test r	esults appearing in this report may have been	Metals by ICP AES:	ASTM D5185 (*M)
tested	at other ALS laboratories within the Tribology divisional network.			Ox, NOx, SOx, FTIR:	ASTM D7418/D7414/D7415 D7624
	Transit Resource Center			PQ Index:	ASTM D8120 (*M)
	Attn: Robin Thompson			Particle Count:	ASTM D7647 (*M) / ISO 4406
	5840 Red Bug Lake Rd Ste 165			Viscosity:	ASTM D445 (*M) / D7279 (*M)
	Winter Springs FL 32708			Water KF:	D6304C / E203 (*M)
				Water Crackle:	In House
	IUSA				

UIN 071D757

Т	ransmission
Unit No.	317
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	Ltrs

Customer:

TRANSIT RESOURCE CENTER

5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample next service interval to monitor and establish wear trend.

[
DATE SAMPLED		24-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166135	
SIF NO.		35424181	
		BP	
		Autran Syn 295	
OIL GRADE		-	
OIL ADDED	Ltrs		
FILTER		Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		64	
Chromium (Cr)		<1	
Lead (Pb)		5	
Copper (Cu)		15	
Tin (Sn)		1	
Aluminium (Al)		15	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (nnm)			
Silicon (Si)		3	
Sodium (Na)		1	
Potassium (K)		<1	
Additives (nnm)			
Magnesium (Mg)		15	
Calcium (Ca)		79	
Barium (Ra)		-1	
Phosphorus (P)		273	
$Z_{inc}(Z_n)$		42	
Molyhdenum (Mo)		4	
Boron (B)		121	
Contaminante		121	
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C)	7.5	
Solids (%)		0.3	
Additional			
PQ Index		14	



ANALYST: Jon.Sowers





UIN 071D757

Chromium (Cr) Iron (Fe)		U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH 44125 800.394.3669 800.726.5400 Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earll Drive Phoenix, AZ 85017 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128
24/03/2019 — Copper (Cu) — Lead (Pb) … Tin (Sn) 20 15 10 5	24/03/2019 — Water (%) 0.06 brown water (%) 0.04 0.04 0.02	Canadian Laboratories Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 Sales & Marketing Houston, Texas 10450 Staneliff Road, Suite 210 Houston, TX 77099 877.835.8437
24/03/2019	24/03/2019	International Locations Australia
	Filter Image Filter patch test is not performed Contact laboratory for more information	South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Southeast Asia Europe Wellington Kuala Lumpur, Singapore Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Sont ATR/IP: ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results ar tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported nd historical data. Certain test results appearing in this report may have been	Puer Soot ATR/IR: ASTM D7686 (*M) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: PQ Index: ASTM D8120 (*M) Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method

(ALS)	

UIN 071E787

T	ransmission
Unit No.	318
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED		23-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166178	
SIF NO.		35424191	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs	DD	
		BP Autran Syn 295	
OIL GRADE		-	
OIL ADDED			
FILTER	Hrs	Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		38	
Chromium (Cr)		<1	
Lead (Pb)		4	
Copper (Cu)		15	
Tin (Sn)		<1	
Aluminium (Al)		10	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		2	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)		6	
Magnesium (Mg)		0 51	
		1 C	
Danuni (Ba) Dhoophorug (D)		<1	
Thosphorus (P)		200	
ZINC (ZN) Molybdonum (Ma)		20	
Roron (P)		∠ ۱۱۱	
		111	
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C))	7.3	
Solids (%)		0.2	
Additional			
PQ Index		<10	

ANALYST: harold.scarborough





UIN 071E787

	Chromium (Cr) Iron (Fe)	Wiscosity (cSt 100C)	U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH44125 800.394.3669 800.726.5400	
PPM Fe	30 1 20 0.8 10 0.4 0 0.2 0 0	6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earll Drive Kansas City, KS 66115 Phoenix, AZ 85017 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128	
	23/03/2019	23/03/2019	Canadian Laboratories	
	Copper (Cu) Lead (Pb) ···· Tin (Sn)	— Water (%)	Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 888.489.0057	
Mdd	15 10 5	und = 0.04 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.02 - 0.	Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437	
	0	0	International Locations	
23/03/2019		25/05/2019	Australia Brishane Perth Sydney Muswellbrook	
	Aluminium (Al) – Silicon (Si) – Sodium (Na)	Filter Image Filter patch test is not performed Contact laboratory for more information	South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Southeast Asia Europe Wellington Kuala Lumpur, Singapore Prague	
Mdd	8 6 4 2 0 23/03/2019		TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Soct ATP/IP: ASTM D7686 (*M)	
Since services are based on samples and information supplied by others, and since corrective actions, if any, are necessarily taken by others, these services are rendered without any warranty or liability of any kind beyond the actual amount paid to ALS Tribology for the services. Reported recommendations are based on interpretations of the generated test results and historical data. Certain test results appearing in this report may have been tested at other ALS laboratories within the Tribology divisional network.			Soot by FTIR:ASTM D7844Glycol:In HouseMetals by ICP AES:ASTM D5185 (*M)Ox, NOx, SOx, FTIR:ASTM D7418/D7414/D7415D7624	
	Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA		PQ Index: ASTM D8120 (*M) Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method	



UIN 02811B9

Т	ransmission
Unit No.	319
Unit:	
Make	
Model	
Serial No.	
•	
Site	
Compartment:	
Nome	Transmission
Name	Transmission
Make	MCI
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		24-Mar-19	17-Apr-11
DATE RECEIVED		04-Apr-19	30-Apr-11
DATE REPORTED		05-Apr-19	03-May-11
LAB NO.		41022166133	41020235009
SIF NU. TIME ON LINIT	Hre	35424183	10425894
TIME ON OIL	Hrs		
OIL BRAND		BP	Petro Canada
OIL TYPE		Autran Syn 295	Unidentified
OIL GRADE		-	Unknown
	Uro	Not Applicable	
	rirs	Not Applicable	Not Changed
WO NUMBER			NUL CHANGEU
Metals (ppm)		407	10
		107	13
		<1	< 1
		б 20	5
Copper (Cu)		20	10
Tin (Sn)		1 04	5
Aluminium (Al)		21	8
		<1	<1
Silver (Ag)		<1	<1
litanium (II)		<1	<1
vanadium (V)		<1	<1
Contaminants (ppm)		0	4
Silicon (Si)		8	1
Sodium (Na)		2	9
Potassium (K)		<1	35
Additives (ppm)		~	~
iviagnesium (Mg)		2	2
Calcium (Ca)		68	41
Barium (Ba)		<1	<1
Phosphorus (P)		258	207
∠inc (∠n)		22	17
Molybdenum (Mo)		1	1
Boron (B)		108	58
Contaminants		0.05	0.05
vvater (%)		<0.05	<0.05
Physical Tests		7.4	7.0
VISCOSITY (CSt 100C	•)	1.4	7.0
Solias (%)		0.2	0.1
Additional		-10	
		<10	~

ANALYST: roldan.beldad





UIN 02811B9

Chromium (Cr) Iron (Fe) 120 100 100 100 100 100 100 100		U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive Atlanta, GA 30340 800.394.3669 8610 Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road Kansas City, K5 66115 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian L aboratorios
Copper (Cu) Lead (Pb) ···· Tin (Sn)		Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y73 Edmonton, AB TSS 1K1 905 332 9559 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia
Aluminium (Al) Silicon (Si) Sodium (Na)	Filter Image Filter patch test is not performed Contact laboratory for more information	South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Europe Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Sont ATR/IR: ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results ar tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported ad historical data. Certain test results appearing in this report may have been	Note Coort ATMIN: ASTM D7060 (1M) Soot by FTIR: ASTM D70844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method *M - Modified Method

(ALS)	

UIN 071E78F

T	ransmission
Unit No.	320
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment: Name Make Model Serial No.	Transmission
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED		23-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166179	
SIF NO.		35424195	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs	DD	
		BP Autran Syn 295	
OIL GRADE		-	
OIL ADDED			
FILTER	Hrs	Not Applicable	
Metals (ppm)		96	
Iron (Fe)		86	
		<1	
Lead (PD)		C	
Copper (Cu)		11	
Tin (Sn)		<1	
Aluminium (Al)		16	
NICKEI (NI)		<1	
Silver (Ag)		<1	
Vanadium (11)		<1	
		<۱	
Silicon (Si)		5	
Sodium (Na)		1	
Potassium (K)		<1	
Additives (nnm)			
Magnesium (Mg)		2	
Calcium (Ca)		35	
Barium (Ba)		<1	
Phosphorus (P)		250	
Zinc (Zn)		7	
Molybdenum (Mo)		<1	
Boron (B)		113	
Contaminants			
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C)	7.4	
Solids (%)		0.2	
Additional		~ ~ ~	
PQ Index		21	

ANALYST: harold.scarborough





UIN 071E78F

Chromium (Cr) Iron (Fe)		U.S. Laboratories Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669 Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 935 Sunshine Road Maga Sunshine Roa	
$- Copper (Cu) - Lead (Pb) \cdots Tin (Sn)$		Canadian Laboratories Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 888.489.0057 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437	
23/03/2019	0 23/03/2019	International Locations Australia	
Aluminium (AI) Silicon (Si) Sodium (Na)	Filter Image Filter patch test is not performed Contact laboratory for more information	Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: Fuel Dilution by GC: Fuel Sout ATP/IP: ASTM D7686 (*M)	
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results ar tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported and historical data. Certain test results appearing in this report may have been	Free SourATR/IR. ASTM D7666 (M) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: PQ Index: ASTM D7647 (*M) Viscosity: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method	

(ALS)	

UIN 071E794

Т	ransmission
Unit No.	321
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE CAMPLED		00.14 10	
		23-Mar-19	
		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166180	
SIF NO.		35424197	
TIME ON UNIT	Hrs		
	Hrs	חח	
		Autran Svn 295	
OIL GRADE		-	
OIL ADDED			
FILTER	Hrs	Not Applicable	
WO NUMBER			
Metals (ppm)			
Iron (Fe)		60	
Chromium (Cr)		<1	
Lead (Pb)		6	
Copper (Cu)		14	
Tin (Sn)		<1	
Aluminium (Al)		11	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)		0	
Silicon (SI)		2	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)		4	
Calcium (Ca)		4	
Barium (Ba)		44 ~1	
Danum (Da) Dhosphorus (D)		255	
$Z_{inc}(Z_n)$		200	
Molybdenum (Mo)		1	
Boron (B)		112	
Contaminants		112	
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C)	7.4	
Solids (%)		0.2	
Additional			
PQ Index		<10	



ANALYST: harold.scarborough





UIN 071E794

Chromium (Cr) Iron (Fe)		Viscosity (cSt 100C)		U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH 44125 800.394.3669 800.726.5400		
PPM Fe	60 40 20	1 0.8 PPZ 0.6 Z 0.4 C 0.2 0	6 6 0 6 0 0 0 0 0 0 0 0 0 0 0 0 0		Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 800.332.8055 Portland, 4943 NW Portlanc 800.7	Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930 Dregon - 401 Front Avenue , OR 97210 70.4128
	23/03/2019	9		23/03/2019	Canadian L	.aboratories
	Copper (Cu) Lead (Pb) Tin (Sn)				Burlington, Ontario - 450 5036 South Service Rd. Burlington, ON L7L5Y73 905 332 9559	Edmonton, Alberta - 402 10717-176 Street Edmonton, AB T5S 1K1 888.489.0057
Mdd			ate A ≫ % 0.02 -		Sales & Housto 10450 Standif Houstor 877.8	Marketing on, Texas f Road, Suite 210 , TX 77099 35.8437
			0		International Locations	
23/03/2019		20/00/2013		Australia Brisbane Perth Sydney Muswellbrook		
Aluminium (Al) – Silicon (Si) – Sodium (Na)		Filter Image Filter patch test is not performed Contact laboratory for more information		South Santiago de Chile New Zealand South Wellington Kuala Lun	America Belo Horizonte, Brazil east Asia Europe ppur, Singapore Praque	
23/03/2019				TEST N Acid Number: Base Number: Base Number (Perchloric): Fuel Dilution by GC: Fuel Dilution Visc/Setaflash	ETHODS: ASTM D974/D664 (*M) ASTM D4739 (*M) ASTM D2896 (*M) ASTM D7593 In House	
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results ar tested at other ALS laboratories within the Tribology divisional network.		I since corrective actions, if any, actual amount paid to ALS Tribo nd historical data. Certain test r	are necessarily taken by others, these ology for the services. Reported esults appearing in this report may have been	Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR:	ASTM D7686 (*M) ASTM D7844 In House ASTM D5185 (*M) ASTM D7418/D7414/D7415 D7624	
Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA					PQ Index: Particle Count: Viscosity: Water KF: Water Crackle:	ASTM D8120 (*M) ASTM D7647 (*M) / ISO 4406 ASTM D445 (*M) / D7279 (*M) D6304C / E203 (*M) In House fied Method

(ALS)	

UIN 071E78B

Т	ransmission
Unit No.	322
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

		22 Mar 10	
		23-War-19	
		04-Apr-19	
DATE REPORTED		05-Api-19	
LAB NO.		41022166181	
SIF NO.		35424199	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs		
		BP Autrop Sup 205	
		Autran Syn 295	
FILTER	Hrs	Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		78	
Chromium (Cr)		<1	
Lead (Pb)		7	
Copper (Cu)		15	
Tin (Sn)		1	
Aluminium (Al)		19	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		3	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)			
Magnesium (Mg)		2	
Calcium (Ca)		48	
Barium (Ba)		<1	
Phosphorus (P)		252	
Zinc (Zn)		12	
Molybdenum (Mo)		1	
Boron (B)		108	
Contaminants			
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C)	7.4	
Solids (%)		0.2	
Additional			
PQ Index		<10	



ANALYST: harold.scarborough





UIN 071E78B

	Chromium (Cr) Iron (Fe)	8	Viscosity (cSt 100C)	U.S. Lab Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669	Oratories Valley View, Ohio - 410 6180 Halle Dr. Suite D Valley View, OH 44125 800.726.5400
PPM Fe	60 1 40 0.6 M	00 4 -		Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 800.332.8055	Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930
				4943 NW F Portland, C Portland, 800.7	7regon - 401 Front Avenue OR 97210 70.4128
	23/03/2019		23/03/2019	Canadian L	aboratories
	Copper (Cu) - Lead (Pb) Tin (Sn)	0.06 -	Water (%)	Burlington, Ontario - 450 5036 South Service Rd. Burlington, ON L7L5Y73 905 332 9559	Edmonton, Alberta - 402 10717-176 Street Edmonton, AB T5S 1K1 888.489.0057
Mdd	20 15 10 5	aj 0.04 - ≥ % 0.02 -		Sales & M Housto 10450 Stancliff Houston, 877.83	Marketing n, Texas Road, Suite 210 TX 77099 35.8437
	0	0		Internationa	al Locations
23/03/2019		23/03/2019		Australia	
Aluminium (AI) — Silicon (Si) — Sodium (Na)		Filter Image Filter patch test is not performed Contact laboratory for more information		Brisbane, Perth, S South Santiago de Chile, New Zealand South Wellington Kuala Lum	America Belo Horizonte, Brazil east Asia Europe pur, Singapore Prague
Σ	10			TEST M	ETHODS:
L L				Acid Number:	ASTM D974/D664 (*M)
	5 -			Base Number:	ASTM D4739 (*M)
	0			Base Number (Perchloric):	ASTM D2896 (*M)
	23/03/2019			Fuel Dilution Visc/Setaflash	In House
Since s service recomn tested a	ervices are based on samples and information supplied by others, and s are rendered without any warranty or liability of any kind beyond the nendations are based on interpretations of the generated test results a at other ALS laboratories within the Tribology divisional network.	since corrective actions, if any, actual amount paid to ALS Tribo. nd historical data. Certain test re	are necessarily taken by others, these logy for the services. Reported soults appearing in this report may have been	Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR:	ASTM D7886 (*M) ASTM D7844 In House ASTM D5185 (*M) ASTM D7418/D7414/D7415 D7624
	Transit Resource Center Attn: Robin Thompson			PQ Index: Particle Count: Viscosity:	ASTM D8120 (*M) ASTM D7647 (*M) / ISO 4406 ASTM D445 (*M) / D7279 (*M)
	Winter Springs FL 32708			Water KF: Water Crackle: *M - Modif	D6304C / E203 (*M) In House ied Method



UIN 01A31C3

T	ransmission
Unit No.	323
Unit:	
Make	MCI
Model	
Serial No.	
Site	
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	
Customer:	

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next service interval to further monitor.

DATE SAMPLED		23-Mar-19	10-Oct-18	10-Apr-16	12-Apr-15	19-Sep-10	22-Feb-09
DATE RECEIVED		04-Apr-19	29-Oct-18	21-Apr-16	21-Apr-15	30-Sep-10	27-Feb-09
DATE REPORTED		04-Apr-19	01-Nov-18	25-Apr-16	24-Apr-15	01-Oct-10	02-Mar-09
LAB NO. SIE NO		41022166134	41022054506 34601875	41021418452	41021175580	41020107940 102468600027	41009032409 92129350016
TIME ON UNIT	Hrs	55424107	34001073	30131402	10100000	102400030027	32123330010
TIME ON OIL	Hrs						
OIL BRAND		Castrol	Castrol	Unidentified	Petro Canada	Petro Canada	Castrol
OIL TYPE		TranSynd	TranSynd	Unidentified	ATF PC HD Syn	ATF PC HD Syn	TranSynd
		-	-	Unknown	-	-	-
FILTER	Hrs	Not Applicable					
OIL CHANGED					Not Changed	Not Changed	Not Provided
WO NUMBER							
Metals (ppm)				_			
Iron (Fe)		74	266	120	50	63	26
Chromium (Cr)		<1	<1	<1	<1	<1	<1
Lead (Pb)		4	69	4	4	10	10
Copper (Cu)		12	88	21	20	75	19
Tin (Sn)		1	6	2	2	5	3
Aluminium (Al)		14	61	21	15	25	12
Nickel (Ni)		<1	<1	<1	<1	<1	<1
Silver (Ag)		<1	<1	<1	<1	<1	<1
Titanium (Ti)		<1	<1	<1	<1	<1	<1
Vanadium (V)		<1	<1	<1	<1	<1	<1
Contaminants (ppm)				10			
Silicon (Si)		3	25	13	8	25	1
Sodium (Na)		2		J 4	5	8	1
Potassium (K)		<1	2	6	<5	13	<5
Additives (ppm)		2	2	1	-1	16	1
Coloium (Co)		3	3 27	109	< I 100	10	52
Calcium (Ca)		43	-1	100	100	-1	52
Danum (Da)		240	<1	< I 245	<1	<1	< 227
Zing (Zn)		240	200	240	241	313	237
ZITIC (ZTI) Malubdanum (Ma)		12	12	10	0	10	10
Roron (R)		< I 100	<1	۲ م ۲	×۱ 74	112	92
Contaminante		109	79	00	74	115	02
Water (%)		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Physical Tests							
Viscosity (cSt 100C))	7.3	7.7	5.8	6.0	6.8	
Solids (%)		0.2	0.1	0.1	0.1	0.2	
Additional							
PQ Index		<10	15	19	<10		-

ANALYST: Sam Smith Cleveland





UIN 01A31C3

) (is a set to (s Ot 1000)		l	J.S. Labor	ratories	
	300 1.2	81	Viscosity (CSt TOUC)		Atlanta, Georg 3121 Presidential Atlanta, GA 30 800.394.366	1 a - 420 I Drive /340 39	6180 Halle Dr. Valley View, O 800.726.5	NIO - 410 Suite D H 44125 400
PM Fe	250 200 150 10.6 M	- 6 0 00 0 4			Kansas City, Kar 935 Sunshine F Kansas City, KS 800.332.805	1sas - 430 Road 66115 55	Phoenix, Arizo 3319 West Ea Phoenix, AZ 800.445.7	na - 440 Il Drive 85017 930
	100 50 0 19/09/2010 10/04/2016 23/03/2019		04/2015 10/10/201	8	F	ortland, Ore 4943 NW Fro Portland, O 800.770	egon - 401 nt Avenue R 97210 4128	
	22/02/2009 12/04/2015 10/10/2018	19/09/2010	10/04/2016	23/03/2019	Car	hadian La	boratories	
	Copper (Cu) - Lead (Pb) Tin (Sn)	0.06	— Water (%)		Burlington, Onta 5036 South Servi Burlington, ON L7 905 332 955	ario - 450 ice Rd. rL5Y73 59	Edmonton, Alb 10717-176 S Edmonton, AB T 888.489.00	≱rta - 402 reet 5S 1K1 57
Mdd		be 0.04 ≷ % 0.02			S	Ales & Ma Houston, 0450 Stancliff Re Houston, T 877.835.	Texas Texas Dad, Suite 210 K 77099 8437	
	0 - 19/09/2010 10/04/2016 23/03/2019	19/0	09/2010 10/04/2016	23/03/2019	Inte	rnational	Locations	
	22/02/2009 12/04/2015 10/10/2018	22/02/2009	12/04/2015 10/10)/2018	inte	Austr	alia	
		Filter			Brisb	bane, Perth, Sydr	ney, Muswellbrook	
	Aluminium (Al) Sodium (Na) Silicon (Si)	Image	Filter noteb to	at is used	Sant	South A	merica	
	80 T		performed Co	ntact laboratory				
	60		for more infor	mation	New Zealand Wellington	Southea Kuala Lumpu	I St ASIa r, Singapore	Europe Prague
Σd	40					TEST ME	THODS:	
L 0	20				Acid Number:	A	STM D974/D664 (*M)
					Base Number:	A A	STM D4739 (*M)	
	19/09/2010 10/04/2016 23/03/2019				Fuel Dilution by G	Chione): A	STM D2896 (M)	
	22/02/2009 12/04/2015 10/10/2018				Fuel Dilution Visc/S	Setaflash Ir	n House	
Since	a services are based on samples and information supplied by others and	since corrective actions if any	are necessarily taken by ot	hars these	Fuel Soot ATR/IR:	A	STM D7686 (*M)	
servi	ces are rendered without any warranty or liability of any kind beyond the	actual amount paid to ALS Trib	plogy for the services. Repo	rted	Glycol:	- A	n House	
recor	mmendations are based on interpretations of the generated test results a d at other ALS laboratories within the Tribology divisional network	nd historical data. Certain test r	esults appearing in this repo	ort may have been	Metals by ICP AES	3: A	STM D5185 (*M)	
10010					Ox, NOx, SOx, FTI	IR: A	STM D7418/D741 07624	4/D7415
	Transit Descurse Contar		1		PQ Index:	A	STM D8120 (*M)	
	Attn: Robin Thompson				Particle Count:	А	STM D7647 (*M) / IS) 4406
	5840 Red Bug Lake Rd Ste 165				Viscosity:	А	STM D445 (*M) / I)7279 (*M)
	Winter Springs FL 32708				Water KF:	D	6304C / E203 (*M)
	USA				Water Crackle:	the Medifier	n House	

(ALS)	

UIN 071E79C

Т	ransmission
Unit No.	324
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED		24-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166182	
SIF NO.		35424188	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs		
		BP Autron Svn 205	
OIL GRADE		-	
OIL ADDED			
FILTER	Hrs	Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		65	
Chromium (Cr)		<1	
Lead (Pb)		7	
Copper (Cu)		23	
Tin (Sn)		<1	
Aluminium (Al)		18	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		3	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)		00	
Magnesium (Mg)		20	
Calcium (Ca)		101	
Barium (Ba)		<1	
Phosphorus (P)		291	
ZINC (ZN)		59	
Molybaenum (Mo)		5	
Boron (B)		128	
		<0.05	
		<0.05	
Viscosity (cSt 1000)	`	7.6	
Solids (%)	,	0.2	
Additional		0.2	
PQ Index		<10	



ANALYST: harold.scarborough





UIN 071E79C

	Chromium (Cr) Iron (Fe)	Viscosity (cSt 100C)	U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH 44125 800.394.3669 800.726.5400
PPM Fe	60 40 20 20 1 0.8 0.6 20 0.6 0.2	Bin G 00 04 05 04 05 06 07 08 09 09 09 09 09 09 09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 </td <td>Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earl Drive Kansas City, KS 66115 Phoenix, AZ 85017 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue</td>	Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earl Drive Kansas City, KS 66115 Phoenix, AZ 85017 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue
	0 0	0	Portland, OR 97210 800.770.4128
	24/03/2019	24/03/2019	Canadian Laboratories Burlington, Ontario - 450 Edmonton, Alberta - 402
	Copper (Cu) - Lead (Pb) ···· Tin (Sn)	Water (%)	5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 888.489.0057
Mdd	25 20 15 10 5	u.04 ≥ ≈ 0.02	Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437
	0	0	International Locations
	2-100/2010	Filter	Australia Brisbane, Perth, Sydney, Muswellbrook
	Aluminium (Al) – Silicon (Si) – Sodium (Na)	Image Filter patch test is not performed Contact labor for more information	ratory Wellington Wellington Kuala Lumpur, Singapore Prague
Σ	10		TEST METHODS:
Id	5		Acid Number:ASTM D974/D664 (*M)Base Number:ASTM D4739 (*M)Base Number (Perchloric):ASTM D2896 (*M)For JDitution 1000ASTM D2896 (*M)
	24/03/2019		Fuel Dilution by GC: A STM D7593 Fuel Dilution Visc/Setaflash In House
Since servic recom tested	services are based on samples and information supplied by others, and es are rendered without any warranty or liability of any kind beyond the a mendations are based on interpretations of the generated test results ar at other ALS laboratories within the Tribology divisional network.	since corrective actions, if any, are necessarily taken by others, these ctual amount paid to ALS Tribology for the services. Reported d historical data. Certain test results appearing in this report may have	Puel Soci ATR/IR. ASTM D7686 ("M) Soot by FTIR: ASTM D7884 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624
	Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708		PQ Index:ASTM D8120 (*M)Particle Count:ASTM D7647 (*M) / ISO 4406Viscosity:ASTM D445 (*M) / D7279 (*M)Water KF:D6304C / E203 (*M)Water Crackle:In House

UIN 071E782

Т	ransmission
Unit No.	325
Unit:	
Make	MCI
Model	D4505
Serial No.	
Site	VCTC
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

DATE SAMPLED		23-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166183	
SIF NO.		35424189	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs		
		BP Autrop Sym 205	
		Autran Syn 295	
OIL ADDED			
FILTER	Hrs	Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		38	
Chromium (Cr)		<1	
Lead (Pb)		4	
Copper (Cu)		15	
Tin (Sn)		<1	
Aluminium (Al)		14	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		3	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)			
Magnesium (Mg)		5	
Calcium (Ca)		44	
Barium (Ba)		<1	
Phosphorus (P)		261	
Zinc (Zn)		12	
Molybdenum (Mo)		<1	
Boron (B)		114	
Contaminants			
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C))	7.3	
Solids (%)		0.2	
Additional			
PQ Index		<10	



ANALYST: harold.scarborough





UIN 071E782

	Chromium (Cr) Iron (Fe)	Viscosity (cSt 100C)	U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH44125 800.394.3669 800.726.5400
PPM Fe	30 20 10 0 20 10 0 20 10 0 20 10 0 20 10 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 - 00 00 00 00 00 00 00 00 00 00 00 00 0	Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earll Drive Kansas City, KS 66115 Phoenix, AZ 85017 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128
	23/03/2019	23/03/2019	Canadian Laboratories
	Copper (Cu) Lead (Pb) Tin (Sn)	—— Water (%) 0.06	Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. 10717-176 Street Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 888.489.0057
MAA		0.04 Segret % 0.02	Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437
	23/03/2010	0	International Locations
	23/03/2018	25/03/2019	Australia Brisbago Porth Sudagy Muswellbrack
	Aluminium (AI) Silicon (Si) Sodium (Na)	Filter Image Filter patch test is not performed Contact laboratory for more information	South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Southeast Asia Europe Wellington Kuala Lumpur, Singapore Prague
Σ	10-		TEST METHODS:
L L	6- 4- 2-		Acid Number:ASTM D974/D664 (*M)Base Number:ASTM D4739 (*M)Base Number (Perchloric):ASTM D2896 (*M)
	23/03/2019		Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Sont ATR/IR: ASTM D7686 (*M)
Since service recom tested	services are based on samples and information supplied by others, and es are rendered without any warranty or liability of any kind beyond the amendations are based on interpretations of the generated test results a I at other ALS laboratories within the Tribology divisional network.	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported nd historical data. Certain test results appearing in this report may have been	Soot by FTIR:ASTM D7844Glycol:In HouseMetals by ICP AES:ASTM D5185 (*M)Ox, NOx, SOx, FTIR:ASTM D7418/D7414/D7415D7624
	Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA		PQ Index: ASTM D8120 (*M) Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House *M - Modified Method



UIN 01A2FAE

7	Fransmission
Unit No.	326
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	Lynx
Compartment	
Name	Transmission
Make	Allison
Model	
Serial No.	
Capacity:	

Customer: TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

All wear rates normal. Abrasive and other contaminant levels are acceptable. Viscosity within specified operating range. Action: Resample next recommended service interval to further monitor.

DATE SAMPLED		24-Mar-19	02-Apr-17	29-Jun-08	
DATE RECEIVED		04-Apr-19	26-Apr-17	09-Jul-08	
DATE REPORTED		05-Apr-19	28-Apr-17	10-Jul-08	
		11022166120	11021664967	41008129101	
SIE NO.		34370598	32005361	41008128101	
TIME ON UNIT	Hrs	34370330	52005501	01900350031	
TIME ON OIL	Hrs				
OIL BRAND		BP	Petro Canada	Unidentified	
OIL TYPE		Autran Syn 295	Unidentified	Unidentified	
OIL GRADE		-	Unknown	Unknown	
	Hrs	Not Applicable		Not Drovided	
				Not Provided	
Metals (ppm)		77	<u>c</u> e	77	
Iron (Fe)		11	65	21	
		2	<1	<1	
Lead (Pb)		<1	9	21	
Copper (Cu)		34	40	112	
Tin (Sn)		<1	2	11	
Aluminium (Al)		4	14	11	
Nickel (Ni)		2	<1	<1	
Silver (Ag)		<1	<1	<1	
Titanium (Ti)		<1	<1	<1	
Vanadium (V)		<1	<1	<1	
Contaminants (ppm)					
Silicon (Si)		96	6	4	
Sodium (Na)		2	22	4	
Potassium (K)		<1	<1	<5	
Additives (ppm)					
Magnesium (Mg)		3	<1	21	
Calcium (Ca)		786	66	126	
Barium (Ba)		<1	<1	<1	
Phosphorus (P)		658	185	379	
Zinc (Zn)		15	9	95	
Molvbdenum (Mo)		2	<1	6	
Boron (B)		<5	49	81	
Contaminants		-	-	-	
Water (%)		<0.05	<0.05	<0.05	
Physical Tests					
Viscosity (cSt 100C)	8.7	5.9		
Solids (%)		0.2	0.2		
Additional					
PQ Index		<10	86		
		()	()	()	

ANALYST: roldan.beldad





UIN 01A2FAE

Chromium (Cr) - Iron (Fe)		Viscosity (cSt 100C)		U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive Atlanta, GA 30340 Valley View, OHi 44125 800.393.8669 Kansas City, Kansas - 430 935 Sunshine Road %ansas City, Kansas - 430 935 Sunshine Road %ansas City, KS 66115 800.332.8055 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian Laboratories Burlington, On tario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y73 905 332 9559 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Kuala Lumpur, Singapore Wellington Kuala Lumpur, Singapore Prague TEST METHODS: Acid Number: Acid Number: ASTM D974/D664 (*M) Base Number(Perchloric): ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number: ASTM D4739 (*M) Base Number: ASTM D27896 (*M) Fuel Dilution by GC: ASTM D27896 (*M)	
- Copper (Cu) - Lead (Pb) ···· Tin (Sn)					
Aluminium (Al) Sodium (Na) Silicon (Si)		Filter Image Filter patch test is not performed Contact laboratory for more information			
Since services are based on samples and information supplied by others, and since corrective actions, if any, are necessarily taken by others, these services are rendered without any warranty or liability of any kind beyond the actual amount paid to ALS Tribology for the services. Reported recommendations are based on interpretations of the generated test results and historical data. Certain test results appearing in this report may have been tested at other ALS laboratories within the Tribology divisional network. ASTM D748/CMU UP AES: ASTM D748/CPA14/D741 D7624 D762					


UIN 071D783

т	ransmission
Unit No.	981
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	
Compartment: Name Make Model Serial No.	Transmission
Capacity:	Ltrs

Customer:

TRANSIT RESOURCE CENTER

5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

		24-Mar-19	
DATE RECEIVED		04-Apr-19	
DATE REPORTED		05-Apr-19	
LAB NO.		41022166137	
SIF NO.		35424180	
TIME ON UNIT			
TIME ON OIL			
		BP Autom Our 005	
		Autran Syn 295	
	l trs	-	
FILTER	200	Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		105	
Chromium (Cr)		1	
Lead (Pb)		<1	
Copper (Cu)		39	
Tin (Sn)		<1	
Aluminium (Al)		5	
Nickel (Ni)		1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		95	
Sodium (Na)		2	
Potassium (K)		<1	
Additives (ppm)			
Magnesium (Ma)		2	
Calcium (Ca)		754	
Barium (Ba)		<1	
Phosphorus (P)		650	
Zinc (Zn)		17	
Molybdenum (Mo)		1	
Boron (B)		<5	
Contaminants		~~	
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C	:)	8.5	
Solids (%)		0.2	
Additional			
PQ Index		<10	



ANALYST: roldan.beldad



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UIN 071D783

Chromium (Cr) Iron (Fe) 120 100 100 100 100 100 100 100	Viscosity (cSt 100C)	U.S. Laboratories Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669 Kansas City, Kansas - 430 935 Sunshine Road Kansas City, K5 66115 800.332.8055 Phoenix, A2 85017 800.332.8055 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian Laboratories
Copper (Cu) Lead (Pb) Tin (Sn) 40 30 20 10 0 24/03/2019	Water (%)	Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y73 Edmonton, AB T5S 1K1 905 332 9559 S88.489.0057 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437 International Locations Australia
$ \begin{array}{ c c c c c } \hline & & & & \\ \hline & & & & \\ \hline & & & & \\ & & & &$	Filter Image Filter patch test is not performed Contact laboratory for more information	Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Wellington Southeast Asia Kuala Lumpur, Singapore Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7686 (*M) Fuel Sout ATP/IP: ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and s services are rendered without any warranty or liability of any kind beyond the ar recommendations are based on interpretations of the generated test results and tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	since corrective actions, if any, are necessarily taken by others, these ctual amount paid to ALS Tribology for the services. Reported d historical data. Certain test results appearing in this report may have been	Puer Sour ATRVIR. ASTM D7686 (*M) Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House

(ALS)	

UIN 071E7A0

T	ransmission
Unit No.	983
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	VCTC
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at next recommended interval to monitor and establish wear trend.

		24 Mar 10	
		24-IVIAI-19	
		04-Api-19 05 Apr 19	
DATE REPORTED		03-Api-19	
LAB NO.		41022166184	
SIF NO.		35424186	
TIME ON UNIT	Hrs		
TIME ON OIL	Hrs		
		BP	
		Autran Syn 295	
		-	
FILTER	Hrs	Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		31	
Chromium (Cr)		<1	
Lead (Pb)		<1	
Copper (Cu)		8	
Tin (Sn)		<1	
Aluminium (Al)		2	
Nickel (Ni)		<1	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		36	
Sodium (Na)		3	
Potassium (K)		2	
Additives (ppm)			
Magnesium (Mg)		<1	
Calcium (Ca)		98	
Barium (Ba)		<1	
Phosphorus (P)		297	
Zinc (Zn)		8	
Molybdenum (Mo)		3	
Boron (B)		99	
Contaminants			
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C))	11.3	
Solids (%)		0.1	
Additional			
PQ Index		<10	



ANALYST: harold.scarborough



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UIN 071E7A0

35 30 25 25 20 X 20 X 15 10 5 0	Chromium (Cr) Iron (Fe)	12 50 10 00 0 0 0 0 0 0 0 0 0 0 0	Viscosity (cSt 100C)	U.S. La Atlanta, Georgia - 420 3121 Presidential Drive Atlanta, GA 30340 800.394.3669 Kansas City, Kansas - 43 935 Sunshine Road Kansas City, KS 66115 800.332.8055 Portland 4943 NV Portland 800	boratories Valley View, Ohio - 410 6180 Halle Dr. Suite D Valley View, OH 44125 800.726.5400 30 Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930 , Oregon - 401 W Front Avenue td, OR 97210 J.770.4128
	24/03/2019		24/03/2019	Canadian	Laboratories
(Copper (Cu) —— Lead (Pb) •••• Tin (Sn)	0.06 J	Water (%)	Burlington, Ontario - 450 5036 South Service Rd. Burlington, ON L7L5Y73 905 332 9559	D Edmonton, Alberta - 402 10717-176 Street Edmonton, AB T5S 1K1 888.489.0057
6 4		bg 0.04 - S % 0.02 -		Sales & Hous 10450 Stanc Houst 877	Marketing ton, Texas liff Road, Suite 210 on, TX 77099 .835.8437
0		0		International Locations	
24/03/2013		24/00/2013		Australia Brisbane, Perth, Sydney, Muswellbrook	
40 30	ninium (Al) —— Silicon (Si) —— Sodium (Na)	Filter Image	Filter patch test is not performed Contact laboratory for more information	Sout Santiago de Chi New Zealand Sout Wellington Kuala Lu	th America le, Belo Horizonte, Brazil theast Asia Europe Impur, Singapore Praque
≥ 20				TEST	METHODS:
				Acid Number:	ASTM D974/D664 (*M)
10 -				Base Number:	ASTM D4739 (*M)
0	24/03/2019			Fuel Dilution by GC: Fuel Dilution Visc/Setaflash	ASTM D2593 In House ASTM D7686 (*M)
Since services are based on samples and information supplied by others, and since corrective actions, if ar services are rendered without any warranty or liability of any kind beyond the actual amount paid to ALS Tri recommendations are based on interpretations of the generated test results and historical data. Certain test tested at other ALS laboratories within the Tribology divisional network.			, are necessarily taken by others, these ology for the services. Reported results appearing in this report may have been	Soot by FTIR: Glycol: Metals by ICP AES: Ox, NOx, SOx, FTIR:	ASTM D7844 In House ASTM D5185 (*M) ASTM D7418/D7414/D7415 D7624
	Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA			PQ Index: Particle Count: Viscosity: Water KF: Water Crackle:	ASTM D8120 (*M) ASTM D7647 (*M) / ISO 4406 ASTM D445 (*M) / D7279 (*M) D6304C / E203 (*M) In House



UIN 071D7A9

Т	ransmission
Unit No.	986
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	Ltrs

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

Cooler core leaching/clutch pack/thrust washer wear indicated. Dirt level (alumina + silica) high. Other contaminant levels acceptable. Viscosity within specified operating range. Action: Check all dirt access points. Advise inspect filter/strainer for abnormal wear metal (if applicable). Advise schedule for oil change. Resample at a reduced service interval to monitor and establish wear trend.

DATE SAMPLED		24-Mar-19	
DATE RECEIVED		04-Apr-19	
		05-Apr-19	
		00770110	
LAB NO.		41022166140	
SIF NO.		35424184	
		PD	
		Autran Syn 295	
OIL GRADE		-	
OIL ADDED	Ltrs		
FILTER		Not Applicable	
OIL CHANGED			
WO NUMBER			
Metals (ppm)			
Iron (Fe)		149	
Chromium (Cr)		4	
Lead (Pb)		<1	
Copper (Cu)		181	
Tin (Sn)		1	
Aluminium (Al)		35	
Nickel (Ni)		3	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)			
Silicon (Si)		117	
Sodium (Na)		5	
Potassium (K)		<1	
Additives (ppm)			
Magnesium (Mg)		5	
Calcium (Ca)		1754	
Barium (Ba)		1	
Phosphorus (P)		2281	
Zinc (Zn)		426	
Molybdenum (Mo)		3	
Boron (B)		13	
		-0.05	
vvater (%)		<0.05	
Viscosity (oSt 4000)	\ \	0.2	
)	9.3	
SOIIOS (%)		0.3	
		10	
		12	



ANALYST: roldan.beldad



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UIN 071D7A9

Chromium (Cr) Iron (Fe)	Viscosity (cSt 100C)		U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio 3121 Presidential Drive 6180 Halle Dr. Suit Atlanta, GA 30340 Valley View, OH44	
140 140 120 3 100 2 100 2 2 40 100 2			800.394.3669 Kansas City, Kansas - 430 935 Sunshine Road Kansas City, KS 66115 800.332.8055	800.726.5400 Phoenix, Arizona - 440 3319 West Earll Drive Phoenix, AZ 85017 800.445.7930
			4943 NW I Portland 800.7	Front Avenue , OR 97210 70.4128
24/03/2019		24/03/2019	Canadian L	aboratories.
Copper (Cu) Lead (Pb) ···· Tin (Sn)	0.06	— Water (%)	Burlington, Ontario - 450 5036 South Service Rd. Burlington, ON L7L5Y73 905 332 9559	Edmonton, Alberta - 402 10717-176 Street Edmonton, AB T5S 1K1 888.489.0057
150 ≥ 100	taj 0.04		Sales & I Housto	Marketing on, Texas
50 -	° 0.02 -		Houston 877.8	, TX 77099 35.8437
0	0		International Locations Australia	
24/03/2019	24/03/2019			
	Filter		Brisbane, Perth, S	ydney, Muswellbrook
Aluminium (AI) – – Silicon (Si) – – Sodium (Na)	Image	Filter patch test is not		America Belo Horizonte, Brazil
120 J		performed Contact laboratory	New Zeelend Couth	
		for more information	Wellington Kuala Lum	ipur, Singapore Prague
			TEST M	ETHODS:
			Acid Number:	ASTM D974/D664 (*M)
20			Base Number:	ASTM D4739 (*M)
0			Fuel Dilution by GC:	ASTM D2896 (M) ASTM D7593
24/03/2019			Fuel Dilution Visc/Setaflash	In House
Since services are based on samples and information supplied by others, an services are rendered without any warranty or liability of any kind beyond the recommendations are based on interpretations of the generated test results.	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported nd historical data. Certain test results appearing in this report may have been		Fuel Soot ATR/IR: Soot by FTIR: Glycol: Metals by ICP AES:	ASTM D7686 (*M) ASTM D7844 In House ASTM D5185 (*M)
tested at other ALS laboratories within the Tribology divisional network.			Ox, NOx, SOx, FTIR:	ASTM D7418/D7414/D7415 D7624
Transit Resource Center			PQ Index:	ASTM D8120 (*M)
Attn: Robin Thompson			Particle Count:	ASTM D7647 (*M) / ISO 4406
5840 Red Bug Lake Rd Ste 165			Water KE:	D6304C / E203 (*M)
Winter Springs FL 32708			Water Crackle:	In House
			+14 14-15	

(ALS)	

UIN 071D792

Т	ransmission
Unit No.	988
Unit:	
Make	Volvo
Model	9700
Serial No.	
Site	
Compartment:	
Name	Transmission
Make	
Model	
Serial No.	
Capacity:	Ltrs

Customer:

TRANSIT RESOURCE CENTER 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708

USA

DIAGNOSIS

Bearing/bushing/thrust washer wear indicated. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at a reduced service interval to monitor and establish wear trend. Please provide all compartment make, and model details.

DATE CAMPLED		04.14- 10	
		24-Mar-19	
		04-Apr-19	
DATE REPORTED		08-Apr-19	
LAB NO.		41022166138	
SIF NO.		35424182	
TIME ON UNIT			
		חס	
		DP Autran Syn 295	
OIL GRADE		-	
OIL ADDED	Ltrs		
FILTER		Not Applicable	
OIL CHANGED			
WONUMBER			
Metals (ppm)			
Iron (Fe)		140	
Chromium (Cr)		3	
Lead (Pb)		<1	
Copper (Cu)		654	
Tin (Sn)		1	
Aluminium (Al)		17	
Nickel (Ni)		2	
Silver (Ag)		<1	
Titanium (Ti)		<1	
Vanadium (V)		<1	
Contaminants (ppm)		00	
Silicon (Si)		80	
Sodium (Na)		5	
Potassium (K)		<1	
Additives (ppm)		F	
Coloium (Co)		3 1760	
Calcium (Ca)		1762	
Dallulli (Da) Dhochharus (D)		2	
$Z_{inc}(Z_n)$		638	
Molybdenum (Mo)		3	
Boron (B)		10	
Contaminants		10	
Water (%)		<0.05	
Physical Tests			
Viscosity (cSt 100C)	9.3	
Solids (%)		0.3	
Additional			
PQ Index		<10	

ANALYST: Eric.Dunlap



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Page 2 of 2

UIN 071D792

Chromium (Cr) Iron (Fe)	Viscosity (cSt 100C)	U.S. Laboratories Atlanta, Georgia - 420 Valley View, Ohio - 410 3121 Presidential Drive 6180 Halle Dr. Suite D Atlanta, GA 30340 Valley View, OH 44125 800.394.3669 800.726.5400 Kansas City, Kansas - 430 Phoenix, Arizona - 440 935 Sunshine Road 3319 West Earl Drive Phoenix, AZ 85017 800.332.8055 800.445.7930 Portland, Oregon - 401 4943 NW Front Avenue Portland, OR 97210 800.770.4128 Canadian Laboratories
Copper (Cu) Lead (Pb) Tin (Sn)		Burlington, Ontario - 450 Edmonton, Alberta - 402 5036 South Service Rd. Burlington, ON L7L5Y7 905 332 9559 Sales & Marketing Houston, Texas 10450 Stancliff Road, Suite 210 Houston, TX 77099 877.835.8437
Aluminium (Al) Silicon (Si) Sodium (Na) $\begin{bmatrix} & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & $	Filter Image Filter patch test is not performed Contact laboratory for more information	Australia Hustralia Brisbane, Perth, Sydney, Muswellbrook South America Santiago de Chile, Belo Horizonte, Brazil New Zealand Southeast Asia Europe Wellington Kuala Lumpur, Singapore Prague TEST METHODS: Acid Number: ASTM D974/D664 (*M) Base Number: ASTM D4739 (*M) Base Number (Perchloric): ASTM D2896 (*M) Fuel Dilution by GC: ASTM D7593 Fuel Dilution Visc/Setaflash In House Fuel Dilution P/IP: ASTM D7896 (*M)
Since services are based on samples and information supplied by others, and services are rendered without any warranty or liability of any kind beyond the a recommendations are based on interpretations of the generated test results and tested at other ALS laboratories within the Tribology divisional network. Transit Resource Center Attn: Robin Thompson 5840 Red Bug Lake Rd Ste 165 Winter Springs FL 32708 USA	since corrective actions, if any, are necessarily taken by others, these actual amount paid to ALS Tribology for the services. Reported and historical data. Certain test results appearing in this report may have been	Soot by FTIR: ASTM D7844 Glycol: In House Metals by ICP AES: ASTM D5185 (*M) Ox, NOx, SOx, FTIR: ASTM D7418/D7414/D7415 D7624 PQ Index: Particle Count: ASTM D7647 (*M) / ISO 4406 Viscosity: ASTM D445 (*M) / D7279 (*M) Water KF: D6304C / E203 (*M) Water Crackle: In House



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E774 Cooling System 315 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	23-Mar-19 05-Apr-19 09-Apr-19 41022167465 35424223 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solia Freeze Point (D3321 Refractometer) Glycol Content (D33 Boil Point (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	ds (D1125) ppm °F 21) % °F C D5827) ppm	Clear None Trace Black Orange 2060 -65 <u>62</u> 235 96 7.4	



Glycol level is high. pH is low. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E79A Cooling Syster 316 MCI D4505	n	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UN	TS	23-Mar-19 05-Apr-19 09-Apr-19 41022167476 35424222 Unidentified Coolant	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solii Freeze Point (D332: Refractometer) Glycol Content (D33 Boil Point (D3321) Nitrites (Titrimetric/M pH (D1287/Meter)	ds (D1125) pp 1 °F 121) % C D5827) pp	m = - m	Clear None None Orange 2100 -60 60 234 62 7.3	

DIAGNOSIS:



pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E77C Cooling System 317 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	24-Mar-19 05-Apr-19 09-Apr-19 41022167467 35424217 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321 Refractometer) Glycol Content (D33 Boil Point (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	is (D1125) ppm °F 21) % °F 2 D5827) ppm	Clear None None Orange 2260 -65 <u>62</u> 235 68 7.3	



Glycol level is high. pH is low. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E789 Cooling System 318 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	08-Mar-19 05-Apr-19 09-Apr-19 41022167472 35424220 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	s (D1125) ppm °F :1) % °F D5827) ppm	Clear None None Orange 1676 -30 48 224 448 8.4 Interventional constraints	

DIAGNOSIS:



pH level is normal. Glycol level is normal. Resample at the next scheduled interval.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E778 Cooling System 319 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	24-Mar-19 05-Apr-19 09-Apr-19 41022167466 35424215 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Soli Freeze Point (D332 Refractometer) Glycol Content (D33 Boil Point (D3321) Nitrites (Titrimetric/M pH (D1287/Meter)	ds (D1125) ppm 1 °F 321) % °F C D5827) ppm	Clear None None Orange 2020 -77 <u>67</u> 239 10 7.3	



Glycol level is high. pH level is normal. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E791 Cooling System 320 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	23-Mar-19 05-Apr-19 09-Apr-19 41022167474 35424224 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	's (D1125) ppm °F 21) % °F 5 D5827) ppm	Clear None None Orange 1859 -48 55 229 274 7.6	

DIAGNOSIS:



pH level is normal. Glycol level is normal. Resample at the next scheduled interval.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E796 Cooling System 321 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	23-Mar-19 05-Apr-19 09-Apr-19 41022167475 35424211 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Soli Freeze Point (D332 Refractometer) Glycol Content (D33 Boil Point (D3321) Nitrites (Titrimetric/M pH (D1287/Meter)	ds (D1125) ppm 1 °F 121) % F C D5827) ppm	Clear None None Orange 2270 -38 51 226 106 7.4	

DIAGNOSIS:



pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E78D Cooling System 322 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	23-Mar-19 05-Apr-19 09-Apr-19 41022167473 35424213 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	s (D1125) ppm °F 1) % °F D5827) ppm	Clear None None Orange 1701 -33 49 225 441 8.2 ()))	

DIAGNOSIS:



pH level is normal. Glycol level is normal. Resample at the next scheduled interval.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E780 Cooling System 323 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	23-Mar-19 05-Apr-19 09-Apr-19 41022167470 35424225 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321) Refractometer) Glycol Content (D33 Boil Point (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	ds (D1125) ppm °F 21) % °F 2 D5827) ppm	Clear None None Orange 2070 -48 55 229 159 7.4 7.4	

DIAGNOSIS:



pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E79E Cooling System 324 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	24-Mar-19 05-Apr-19 09-Apr-19 41022167477 35424219 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	s (D1125) ppm °F 21) % °F D5827) ppm	Clear None None Orange 1721 -28 47 224 355 8.2	

DIAGNOSIS:



pH level is normal. Glycol level is normal. Resample at the next scheduled interval.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E784 Cooling System 325 MCI D4505	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	23-Mar-19 05-Apr-19 09-Apr-19 41022167471 35424221 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3327 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/I0 pH (D1287/Meter)	ds (D1125) ppm I °F 21) % F C D5827) ppm	Clear None None Orange 2050 -75 <u>66</u> 237 40 7.2	

DIAGNOSIS:



pH is low. Glycol level is high. Suggest drain, flush and refill cooling system.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E7A2 Cooling System 983 Volvo 9700	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	24-Mar-19 05-Apr-19 09-Apr-19 41022167478 35424210 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	ls (D1125) ppm °F 21) % °F : D5827) ppm	Clear None None Orange 1881 -38 51 226 94 7.5	

DIAGNOSIS:



pH level is normal. Glycol level is normal. Resample at the next scheduled interval.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E7AA Cooling System 986 Volvo 9700	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	24-Mar-19 05-Apr-19 09-Apr-19 41022167469 35424212 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solid Freeze Point (D3321 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	ls (D1125) ppm °F 21) % °F ≿ D5827) ppm	Clear None None Orange 1983 -48 55 229 238 8.0	

DIAGNOSIS:



pH level is normal. Glycol level is normal. Resample at the next scheduled interval.



Coolant Sample Analysis

UIN: Compartment: Unit No.: Unit Make: Unit Model: Serial No.:	071E7A6 Cooling System 988 Volvo 9700	Site: Description: Compartment Make: Compartment Model: CompartmentSerial No.:	VCTC Delo 50/50 ELC Coolant
DATE SAMPLED DATE RECEIVED DATE REPORTED LAB NO. SIF NO. COMPARTMENT SAMPLE COOLANT BRAND COOLANT TYPE COOLANT CHANGED WO NUMBER TEST/METHOD	Hrs Hrs UNITS	24-Mar-19 05-Apr-19 09-Apr-19 41022167468 35424214 Unidentified Coolant RESULTS	
Visual Appearance Clarity Petroleum Layer Sediment Color Physical / Chemical Total Dissolved Solic Freeze Point (D3321 Refractometer) Glycol Content (D3321) Nitrites (Titrimetric/IC pH (D1287/Meter)	ls (D1125) ppm °F 21) % °F : D5827) ppm	Clear None None Orange 2230 -35 50 225 135 8.2	

DIAGNOSIS:



pH level is normal. Glycol level is normal. Resample at the next scheduled interval.

Ventura County Transportation Commission

Appraisal Review

Eleven (11) MCI 4505 Buses & Five (5) Volvo 9700 Buses Conducted March 23 - 24, 2019



TRC Engineering Services, LLC 5840 Red Bug Lake Road Suite 165 Winter Springs, FL 32708 Phone: (407) 977-4500 Fax: (407) 977-7333 tranrc@earthlink.net

VCTC EQUIPMENT VALUATION SUMMARY

INSPECTION PROCESS

Onsite inspections were conducted on eleven (11) 2015 MCI D4505 buses currently in daily service and five (5) Volvo 9700 2013 & 2014 buses not currently in daily service, with the exception of Bus 981.

FLEET OBSERVATION

- The MCI fleet is in daily service, clean, with good overall appearance, and minimal body damage. Interiors are in good used bus condition acceptable as four-year-old buses in daily use. Drivers' areas are in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with A and B defects noted in our inspection detail.
- The Volvo fleet is not currently in daily service for VCTC, with the exception of Bus 981. The Volvo 9700 bus is a budget-orientated bus assembled in Mexico, alternative to Big 4 US fleet buses at a higher cost. These buses have not aged as well as the MCI fleet. General exterior appearance shows several areas of body damage. Not all W/C lifts operate and operation seems more cumbersome than the MCI standard fleet. Interiors are acceptable with normal wear for the age and mileage of the inspected buses. Driver's area shows more wear and loose dash parts for buses this age. Mechanical issues include glitchy electrical systems that cause some functions to not operate until two or more tries. Class A and B defects are noted on our complete inspection results spreadsheet.
- Inspections were conducted over a two-day period at the RATP maintenance facility located at 240 S. Glenn Drive, Camarillo, CA. Fleet maintenance director Jeff Brown facilitated our needs in every area. Each bus was photographed, and the exterior body and interior condition was inspected. Mechanical function and electronic fault history was also reviewed and a general overall condition assessment for age and mileage was conducted.
- Market value research was conducted using 2018 Bus Blue Book values minus 2019 adjustments by Blue Book editor. Recent fleet sales of like make and models

were not found for the 2015 MCI D4505 buses. MCI and ABC gave consistent values for the MCI D4505 buses.

 Fleet sales for the Volvo 9700 buses were few. Pricing is affected by a large fleet of a California-based operator going into bankruptcy. Large numbers of used Volvo buses were found for sale, depressing market pricing. MCI and ABC gave pricing and average sale ready cost for final buy price. Volvo had advertised pricing for Volvo units only. Several "by owner" pricings were noted but were higher than the advertised Volvo pricing. Independent dealers suggested the lowest Volvo 9700 sales pricing. Not using the highest and lowest pricing gave us the suggested price for the Volvo 9700 buses.

APPRAISAL METHODOLGY

After the physical inspection and records review was conducted on each of the transit vehicles, TRC's representative used all the information gathered to start the process of appraising each vehicle. Appraisal value was established using all tools available including:

- Book value
- Depreciation value
- Any recent fleet sales history
- Condition of body and interior
- Operation condition
- Collision damage
- Overall mileage
- PMI/service history

ASSUMPTIONS FOR PURCHASE PRICING

- All defects found during inspection to be repaired to industry standards using OEM parts or equivalent.
- All glass to be free of scratches and defects. Some wear and light scratches are acceptable.
- Bodies to be clean and free of body damage & loose parts, lights to be operative, and lenses to be free of fog.
- Interior to be thoroughly cleaned.
- Interior 110-volt system to be in operating condition.
- Driver's area to be clean and dash area to be checked for loose fasteners.
- All major mechanical systems to be serviced and in good operating condition.
- Tire tread depth to be 10/32 mm and tire pressure monitoring system to be operational.

• Engine and transmission warranties to be verified and transferred to VCTC. Some additional cost may be incurred for this transfer by the manufacturer.

SUMMARY

The 2015 MCI fleet (units 315 – 325) is in good used bus condition in VCTC livery. Each unit has some defects that should be corrected to industry standards using OEM parts and paint repair techniques before change of ownership takes place. These repairs should also be verified before change of ownership. All recommendations for abnormal fluid sample results should be followed for correction/repairs.

The value of each MCI bus in sale condition is \$310,000.00 which is a total of \$3,410,000.00 for all eleven (11) buses combined.

The 2013 & 2014 Volvo fleet is not currently in daily service, with the exception of Bus 981. These units were in the RATP charter fleet. The maintenance on these buses is not up to VCTC standards. Several buses had Abnormal, Caution and Severe engine oil and transmission sample results which should be corrected by a Volvo dealer before transfer of ownership. All defects should also be corrected to VCTC fleet standards using industry best practices and OEM parts. The value gap between the Volvo and MCI buses is substantial, due to the oversupply of used Volvo 9700 buses on the market. More than ninety (90) Volvo 9700 buses were available for sale during market research.

The values of the Volvo 9700 buses are as follows:

- Unit 326 value with all defects corrected: \$195,000
- Unit 981 value with all defects corrected: \$235,000
- Unit 983 value with all defects corrected: \$200,000
- Unit 986 value with all defects corrected: \$190,000
- Unit 988 value with all defects corrected: \$195,000

FLEET VALUATION

VCTC 2015 MCI



Coach 315

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 321,975 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Defects Found During Audit

Exterior Body Condition	Door, C/S front, body damage	В
Exterior Body Condition	Windows, C/S exterior, 3 windows have scrapes	В
Exterior Body Condition	Corner panel, C/S rear top corner panel, body damage	В
Electrical Systems	Electrical box, front, bare wires showing	A
Exterior Body Condition	Windshield, C/S, broken @ bottom	В
Lights	Headlight, S/S front, high beam inop	A
Driver's Controls	Mil light, dash, light is on	В

Driver's Controls	ATC light, dash, light is on	Α
Interior Condition	Luggage bay door lock knob, dash, missing	В
Interior Condition	Windows, C/S & S/S interior, 3 windows scratched	B
Accessibility Features	Wheelchair curb light, C/S sidewall, inop	A
Engine Compartment	Oil leak, engine compartment, oil pan gasket seeping	B
Accessibility Features	Kneeling valve, exterior front, no fast recovery on kneeling	B

Abnormal Coolant Sample Analysis Results

315 – Abnormal: Glycol level is high. pH is low. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.

VCTC 2015 MCI



Coach 316

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 256,349 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Defects Found During Audit

Exterior Body Condition	Body panel, C/S front, body damage	В
Interior Condition	Windows, C/S & S/S windows, 3 windows scratched	В

Abnormal Coolant Sample Analysis Results

316 - Caution: pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.

VCTC 2015 MCI



Coach 317

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 299,714 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Defects Found During Audit

Bumper, front, C/S lower corner damaged	В
Wheel flare, C/S rear, damaged	В
Luggage bay door lock knob, dash, missing	В
Window, C/S, 1 window scratched	В
	Bumper, front, C/S lower corner damaged Wheel flare, C/S rear, damaged Luggage bay door lock knob, dash, missing Window, C/S, 1 window scratched

Abnormal Coolant Analysis Results

317 – Abnormal: Glycol level is high. pH is low. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.

VCTC 2015 MCI



Coach 318

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 350,856 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Defects Found During Audit

Lights	Light, rear exterior top light, missing screws	В
Interior Condition	Windows, C/S & S/S, 3 windows scratched	В
Interior Condition	Luggage bay door lock knob, dash, missing	В

VCTC 2015 MCI



Coach 319

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 333,592 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Defects Found During Audit

Exterior Body Condition	Condenser door, S/S sidewall, dented	В
Driver's Controls	Check transmission light, dash, light is on	В
Engine Compartment	Shutoff valve (dirty gray water) leaking	В
Interior Condition	Windows, C/S & S/S, 6 windows scratched	В
Interior Condition	Air diffusers, S/S, broken	В

Suspension/Steering	Air leak, tag axle, lock on tag axle leaking	А
Suspension/Steering	Radius rod bushings, front axle, bad	В

Abnormal Coolant Analysis Results

319 – Abnormal: Glycol level is high. pH level is normal. Pressure check radiator cap, if it fails replace cap and recheck pressure. Check that proper coolant volume is being maintained. Recommend adjust coolant to a 50/50 mix. Recommend take corrective action and resample to monitor.

VCTC 2015 MCI



Coach 320

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 311,920 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Defects Found During Audit

В
В
В
A
В
В


Coach 321

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 299,609 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Defects Found During Audit

Engine CompartmentOil leak, engine compartment, air compressor rear gasket leakingBInterior ConditionWindows, C/S & S/S, 2 windows have graffiti scratchesB

Abnormal Coolant Analysis Results

321 – Caution: pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.



Coach 322

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 344,382 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Safety Equipment	Fire suppression system, interior front, inop	A
Interior Condition	Windows, C/S & S/S, 6 windows have scratches	В
Interior Condition	Luggage bay door lock knob, dash, missing	В



Coach 323

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 348,983 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Exterior Body Condition	Corner panel, C/S rear, top corner has body damage	В
Exterior Body Condition	Sidewall, S/S under condenser access door, body damage	В
Exterior Body Condition	Wheelchair door window, C/S, broken	В
Interior Condition	Windows, C/S & S/S, 4 windows scratched	В
Engine Compartment	Coolant leak, antifreeze leak @ webasto	В
Interior Condition	Luggage bay door lock knob, dash, missing	В
Exterior Body Condition	Door arm cover, front door, torn	В
Exterior Body Condition	Windshield, driver's side, rock chips in line of sight	Α

Abnormal Coolant Analysis Results

323 – Caution: pH is low. Glycol level is normal. Recommend drain 50% and Re-Inhibit.



Coach 324

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 299,958 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Driver's Controls	ABS light, dash, light is on	Α
Driver's Controls	ATC light, dash, light is on	Α
Driver's Controls	Mil light, dash, light is on	Α
Exterior Body Condition	Body panel, S/S rear above engine access door, body damage	В
Interior Condition	Luggage bay door lock knob, dash, missing	В
Interior Condition	Window, C/S, 1 window scratched	В
Lights	Back-up light, C/S rear, inop	A



Coach 325

This Coach is in daily service, clean, with good overall appearance, and minimal body damage. Interior is in good used bus condition acceptable as a four-year-old bus in daily use. Driver's area is in acceptable condition with some clutter of current and new noncommissioned electronics. Wheels and tires are fleet owned in DOT acceptable tread depths. Mechanical condition is acceptable with Class A and B defects to be repaired by vender as noted in our inspection detail. Five-year engine and transmission warranties were purchased at time of original sale. VCTC should ask for verification and transfer documents as condition of sale.

Mileage at Time of Inspection: 283,481 Blue Book Value in Sale Ready Condition: \$345,569 Aggregate Industry Value in Sale Ready Condition: \$322,000 Volume Sales Discount: \$10,000 to \$14,000 Suggested April 4, 2019 Value **\$310,000.00** with all defects repaired to industry standards and verified.

Interior Condition	Windows, C/S, 2 windows scratched	В
Exterior Body Condition	Body panel, S/S rear access door, body damage	В
Exterior Body Condition	Door, C/S front, body damage	В
Air System/Brake System	Air leak, tag axle, lock on tag axle leaking	Α
Exterior Body Condition	Door lock, front door, missing	В

Abnormal Coolant Analysis Results

325 – Abnormal: pH is low. Glycol level is high. Suggest drain, flush and refill cooling system.

VCTC 2014 Volvo 9700



Coach 326

This Volvo bus is not currently in fleet service for VCTC. General exterior appearance noted new paint to VCTC livery base color with no livery decals. W/C lift does not operate. Interiors are acceptable with normal wear for the age and mileage of inspected buses. Driver's area shows more wear and loose dash parts for buses this age. Mechanical issues include glitchy electrical systems that cause some functions to not operate until two or more tries. Class A and B defects are noted on our complete inspection results spreadsheet. Wheels and tires are fleet owned in DOT acceptable tread depths. This is a low mileage bus.

Mileage at Time of Inspection: 180,306 Blue Book Value in Sale Ready Condition: \$316,540 Aggregate Industry Value in Sale Ready Condition: \$242,000 Volume Sales Discount: \$6,000 to \$8,000 Suggested April 15, 2019 Value **\$235,000.00** with all defects repaired to industry standards and verified.

Lights	Marker lights, upper, inop	A
Lights	Brake light, S/S lower rear brake light, inop	A
Lights	Marker light, C/S front, inop	A
Lights	Back-up lights, exterior, inop	A
Safety Equipment	Back-up alarm, exterior, inop	A
Accessibility Features	Wheelchair lift, inop	A

VCTC 2014 Volvo 9700



Coach 981

This Volvo bus is in daily service for VCTC. General exterior appearance noted new paint to VCTC livery base color with livery decals. W/C lift operates but operation seems more cumbersome than the fleet standard MCI. Interior is acceptable with normal wear for the age and mileage of inspected bus. Driver's area shows more wear and loose dash parts for a bus this age. Mechanical issues include glitchy electrical systems that cause some functions to not operate until two or more tries. Class A and B defects are noted on our complete inspection results spreadsheet. Wheels and tires are fleet owned in DOT acceptable tread depths.

Mileage at Time of Inspection: 421,366 Blue Book Value in Sale Ready Condition: \$316,540 Aggregate Industry Value in Sale Ready Condition: \$202,000 Volume Sales Discount: \$6,000 to \$8,000 Suggested April 15, 2019 Value **\$195,000.00** with all defects repaired to industry standards and verified.

Fire suppression system, dash, has trouble light on	Α
Mil light, dash, light is on	В
Kneeling, C/S exterior, inop	Α
Window, C/S front above entry door, outside glass broken	В
Marker light, upper front center marker light, inop	Α
Fog light, S/S front, inop	В
Marker light, C/S center lower, inop	Α
	Fire suppression system, dash, has trouble light on Mil light, dash, light is on Kneeling, C/S exterior, inop Window, C/S front above entry door, outside glass broken Marker light, upper front center marker light, inop Fog light, S/S front, inop Marker light, C/S center lower, inop

Exterior Body Condition	Sidewall, C/S rear, body damage
Interior Condition	Window, C/S & S/S, 6 windows scratched

Abnormal Oil Sample Analysis Results

981 – Caution: All wear levels appear within acceptable limits for first sample. PQ Index number (ferrous material) exceeds tolerance limit. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Fuel dilution satisfactory. Viscosity within specified operating range. Action: Advise inspect magnetic plug for wear debris and evaluate. Change oil and filter(s) if not already done. Resample at next recommended interval to monitor and establish wear trend.

B B

VCTC 2013 Volvo 9700



Coach 983

This Volvo bus is not currently in fleet service for VCTC. General exterior appearance noted new paint to VCTC livery base color with no livery decals. Not all W/C lifts operate and operation seems more cumbersome than the fleet standard MCI. Interiors are acceptable with normal wear for the age and mileage of inspected buses. Driver's area shows more wear and loose dash parts for buses this age. Mechanical issues include glitchy electrical systems that cause some functions to not operate until two or more tries. Class A and B defects are noted on our complete inspection results spreadsheet. Wheels and tires are fleet owned in DOT acceptable tread depths.

Mileage at Time of Inspection: 375,756 Blue Book Value in Sale Ready Condition: \$312,534 Aggregate Industry Value in Sale Ready Condition: \$207,000 Volume Sales Discount: \$6,000 to \$8,000 Suggested April 15, 2019 Value **\$200,000.00** with all defects repaired to industry standards and verified.

Driver's Controls	Emergency park brake release knob, dash, missing	A
Interior Condition	Windows, C/S & S/S, 5 windows scratched	В
Driver's Controls	Check engine light, dash, light is on	A
Lights	Brake light, C/S rear lower brake light, inop	Α
Accessibility Features	Wheelchair lift, inop	A
Engine Compartment	leaking	А

Engine Compartment	Coolant leak, engine compartment, companion flange leaking	В
Engine Compartment	Coolant leak, engine compartment, heater shutoff valves leaking	В
Engine Compartment	Oil leak, engine compartment, oil filter pressure sensor seeping	В
Engine Compartment	Electrical box, engine compartment, missing latches	В
Safety Equipment	Fire suppression system, dash, inop	А

VCTC 2013 Volvo 9700



Coach 986

This Volvo bus is not currently in fleet service for VCTC. General exterior appearance noted body damage on both sides of the bus. W/C lift operates but operation seems more cumbersome than the fleet standard MCI. Interior is acceptable with normal wear for the age and mileage of inspected bus. Driver's area shows more wear and loose dash parts for a bus this age. Mechanical issues include glitchy electrical systems that cause some functions to not operate until two or more tries. Class A and B defects are noted on our complete inspection results spreadsheets. Wheels and tires are fleet owned in DOT acceptable tread depths.

Mileage at Time of Inspection: 370,559 Blue Book Value in Sale Ready Condition: \$312,534 Aggregate Industry Value in Sale Ready Condition: \$197,000 Volume Sales Discount: \$6,000 to \$8,000 Suggested April 15, 2019 Value **\$190,000.00** with all defects repaired to industry standards and verified. Painted to VCTC livery.

Exterior Body Condition	Sidewall, C/S, body damage	В
Driver's Controls	Check engine light, dash, light is on	В
Safety Equipment	Fire suppression system, dash, inop	Α
Interior Condition	Wheelchair door hinge cover, interior, lower hinge cover missing	В
Interior Condition	Windows, C/S & S/S, 3 windows scratched	В
Engine Compartment	Oil leak, S/S engine compartment, oil leak above starter	В

Abnormal Oil Sample Analysis Results

986 – Severe: Elevated Nickel indicates possible valve train wear. Elevated Iron level indicates possible crankshaft, camshaft, gear train, cylinder wear, or corrosion. Silicon level (dirt/sealant material) abnormal. Minor fuel dilution occurring. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Check fuel injection system. Check for lower than typical oil pressure. Change oil and filter(s) if not already done. Resample after corrective action to further monitor.

Abnormal Transmission Sample Analysis Results

986 – Abnormal: Cooler core leaching/clutch pack/thrust washer wear indicated. Dirt level (alumina + silica) high. Other contaminant levels acceptable. Viscosity within specified operating range. Action: Check all dirt access points. Advise inspect filter/strainer for abnormal wear metal (if applicable). Advise schedule for oil change. Resample at a reduced service interval to monitor and establish wear trend.

VCTC 2013 Volvo 9700



Coach 988

This Volvo bus is not currently in fleet service for VCTC. General exterior appearance noted body damage both sides. W/C lift operates but operation seems more cumbersome than the fleet standard MCI. Interior is acceptable with normal wear for the age and mileage of inspected bus. Driver's area shows more wear and loose dash parts for a bus this age. Mechanical issues include glitchy electrical systems that cause some functions to not operate until two or more tries. Class A and B defects are noted on our complete inspection results spreadsheet. Wheels and tires are fleet owned in DOT acceptable tread depths.

Mileage at Time of Inspection: 354,911 Blue Book Value in Sale Ready Condition: \$312,534 Aggregate Industry Value in Sale Ready Condition: \$202,000 Volume Sales Discount: \$6,000 to \$8,000 Suggested April 15, 2019 Value **\$195,000.00** with all defects repaired to industry standards and verified. Painted to VCTC livery.

Exterior Body Condition	Windshield, S/S top of driver's windshield, broken	В
Driver's Controls	Mil light, dash, light is on	А
Safety Equipment	Back-up alarm, rear, inop	А
Lights	Marker light, C/S front, inop	А
Interior Condition	Windows, C/S & S/S, 3 windows scratched	В
Exterior Body Condition	Window, C/S, restroom outer window broken	В
Exterior Body Condition	Sidewall, C/S, has damaged spots	В

Exterior Body Condition	Sidewall, S/S, has damaged spots	В
Exterior Body Condition	Engine door, S/S, body damage	В

Abnormal Transmission Sample Analysis Results

988 – Abnormal: Bearing/bushing/thrust washer wear indicated. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Viscosity within specified operating range. Action: Resample at a reduced service interval to monitor and establish wear trend. Please provide all compartment make, and model details.