

NORMAL WEAR NORMAL CONTAMINATION FLUID CONDITION NORMAL

MISCELLANEOUS

HM Lopes 317 Component Diesel Engine

{not provided} (--- GAL)

Sample Authene Age Client Info POA109882 POA10988 POA109883 POA1088								
Geample at the next service interval to monitor. (Customer Sample Comment: Hm lopes 317) ID Nm 2021 (The Sample Sample Dil Age Filter Age Filter Age (The Sample Status Client Info (The Sample Sample Sample Status ID Sample Sample (The Sample Status ID Sample Sample (The Sample Status ID Sample Sample (The Sample Status NA (NA (NA (NA (NA (NA (NA (NA (RECOMMENDATION	Test	UOM	Method	Limit/Abn	Current	,	History2
Comment: Hm lopes 317) Sample Date Clefit Info ID #7 404 IS N07 203 IS N07 203 <this 203<="" n07="" th=""> IS N07 203</this>	Resample at the next service interval to monitor. (Customer Sample Comment: Hm lopes 317)							
Machine Age NS Client Info 1157						•		
Filter Age Oil Changed Client Info 0 0			hrs					
Oil Changed Fitter Changed Client Info NA		-	hrs					
Filter Changed Sample Status Client Info NORMAL N/A N/A N/A N/A N/A VEAR Iron ppm ASTId Distis >100 73 47 All component wear rates are normal. Chromium ppm ASTId Distis >20 4 4 Nickel ppm ASTIM Distis >20 4 4 Nickel ppm ASTIM Distis >20 4 4 Silver ppm ASTIM Distis >20 4 14 Aluminum ppm ASTIM Distis >30 3 5 Vanadium ppm ASTIM Distis >40 35 3 1 Vanadium ppm ASTIM Distis >20 4 1 Vanadium ppm ASTIM Distis >25 6 7 Vanadium ppm ASTIM Distis >25 1 1 <th>0</th> <td>hrs</td> <td></td> <td></td> <th></th> <td></td> <td></td>		0	hrs					
Sample Status NORMAL								
VEAR Iron ppm ASTM D5185n >100 73 477 All component wear rates are normal. Phromium ppm ASTM D5185n - 1 0 Nickel ppm ASTM D5185n - - 0 Silver ppm ASTM D5185n - 0 0 Aluminum ppm ASTM D5185n -30 0 0 Aluminum ppm ASTM D5185n -30 0 0 Copper ppm ASTM D5185n -40 35 3 1 Vanadium ppm ASTM D5185n -40 35 3 1 Vanadium ppm ASTM D5185n -40 35 3 1 Vanadium ppm ASTM D5185n -20 1 0 Vanadium ppm ASTM D5185n -20 1		-		Client Info				
All component wear rates are normal. Chromium Nickel pm ASTM 0586m >20 4 4 Nickel ppm ASTM 0586m 0		Sample Status				NORMAL	NORMAL	
Nickel ppm ASTM 05185m >4 <1 0 Titanium ppm ASTM 05185m >3 0 0 Aluminum ppm ASTM 05185m >20 4 14 Aluminum ppm ASTM 05185m >20 4 14 Lead ppm ASTM 05185m >30 3 5 Copper ppm ASTM 05185m >30 3 5 Vanadium ppm ASTM 05185m >15 3 1 Vanadium ppm ASTM 05185m >20 2 5 Value NONE NONE NONE NONE NONE Stito scalar *Visual NONE NONE NONE CONTAMINATION Stito scalar *Visual NONE NONE Contrastition of any contamination in the oil. Stito <	WEAR	Iron	ppm	ASTM D5185m	>100	73	47	
Nickel ppm ASIM Disten -4 -1 0		Chromium	ppm	ASTM D5185m	>20	4	4	
Silver ppm ASTM D5155m -30 0 0 Aluminum ppm ASTM D5155m -20 4 1.4 Lead ppm ASTM D5155m -20 3 3 5 Copper ppm ASTM D5155m -30 3 1 Vanadium ppm ASTM D5155m -51 3 1 Vanadium ppm ASTM D5155m -51 3 1 Vanadium ppm ASTM D5155m -52 6 7 Velow Metal scalar Visual NONE NONE NONE Velow Metal scalar Visual NONE NONE NONE CONTAMINATION Silicon ppm ASTM D5155m -20 6 7 Contrastront ppdassum ppdassum ASTM D5155m -20 6 Th	All component wear rates are normal.	Nickel	ppm	ASTM D5185m	>4	<1	0	
Aluminum ppm ASTM D5185m >20 4 14 Lead ppm ASTM D5185m >40 35 3 Copper ASTM D5185m >40 35 3 1 Tin ppm ASTM D5185m >15 3 1 White Metal scalar Yisual NONE NONE NONE NONE Variadium ppm ASTM D5185m >2 6 7 Variadium ppm ASTM D5185m >2 6 7 Visual NONE NONE NONE NONE NONE NONE NONE CONTAMINATION Silicon ppm ASTM D5185m >2 6 7 Pale WC Method > 2 NONE Sili fitiiiiiiii		Titanium	ppm	ASTM D5185m		<1	2	
Lead ppm ASTM D5185n >40 35 3 Copper ppm ASTM D5185n >330 3 5 Vanadium ppm ASTM D5185n >15 3 1 Vanadium ppm ASTM D5185n >15 3 1 White Metal scalar 'Visual NONE NONE NONE NONE CONTAMINATION Silicon ppm ASTM D5185n >25 6 7 Potassium ppm ASTM D5185n >25 6 7 Silicon ppm ASTM D784 >3 0.5 0.4 Vater WC Method >0.2 NEG NEG NC Soti % % 'ASTM D784 >3 0.5 0.4 Sulfation Asciar 'Visual NONE NONE NONE Sulfation <t< td=""><th>Silver</th><td>ppm</td><td>ASTM D5185m</td><td>>3</td><th>0</th><td>0</td><td></td></t<>		Silver	ppm	ASTM D5185m	>3	0	0	
Lead ppm ASTM D5185m >400 35 3.3 Cooper ppm ASTM D5185m >3.30 3 5 Tin ppm ASTM D5185m >15 3 1 Vanadium ppm ASTM D5185m >15 3 1 Vanadium ppm ASTM D5185m >15 3 1 Vanadium ppm ASTM D5185m >16 RONE NONE NONE NONE NONE CONTAMINATION Scalar 'Visual NONE NONE NONE NONE There is no indication of any contamination in the oil. Silicon ppm ASTM D784 >3 0.5 -1.0 <1.0		Aluminum				4	14	
Copper ppm ASTM D5185m >330 3 5 Tin ppm ASTM D5185m -15 3 1 Vanadium ppm ASTM D5185m -15 3 1 White Metal scalar *Visual NONE NONE NONE NONE CONTAMINATION Silicon ppm ASTM D5185m -22 57 Potassium ppm ASTM D5185m -22 57 Fuel WC Method >5 <1.0		Lead		ASTM D5185m	>40	35	3	
Tin ppm ASTM D5185m >15 3 1 Vanadium ppm ASTM D5185m		Copper		ASTM D5185m	>330	3	5	
Vanadium ppm ASTM D5185m <1 0 White Metal scalar 'Visual NONE NONE NONE NONE Vellow Metal scalar 'Visual NONE NONE NONE NONE CONTAMINATION Silicon ppm ASTM D5185m >25 6 7 Potassium ppm MSTM D5185m >25 6 7 Fuel WC Method >5 <1.0		Tin		ASTM D5185m	>15	3	1	
White Metal scalar 'Visual NONE		Vanadium		ASTM D5185m		<1	0	
Silicon ppm ASTM D5185n >25 6 7 There is no indication of any contamination in the oil. Silicon ppm ASTM D5185n >20 2 57 Fuel WC Method >5 <1.0		White Metal	scalar	*Visual	NONE	NONE	NONE	
Potassium ppm ASTM D5185m >20 2 57 Fuel WC Method 55 <1.0		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
Potassium ppm ASTM D5185m >20 2 57 Fuel WC Method 55 <1.0	CONTAMINATION	Silicon	ppm	ASTM D5185m	>25	6	7	
Water Workendor > > NEG	There is no indication of any contamination in the oil.	Potassium		ASTM D5185m	>20	2	57	
Glycol WC Method NEG 0.0 Soot % % 'ASTM D7844 >3 0.5 0.4 Nitration Abs/cm 'ASTM D7824 >20 13.1 12.4 Sulfation Abs/cm 'ASTM D745 >30 25.9 26.5 Sulfation Abs/cm 'Visual NONE NONE NONE Debris scalar 'Visual NONE NONE NONE Sand/Dit scalar 'Visual NOR NORL NORML Appearance scalar 'Visual NORM NORML NORML Odor scalar 'Visual NORM NORML NORML Odor scalar 'Visual NORM NORML NORML The BN result indicates that there is suitable alkalinity remaining in the oil is suitable for further service. Sodium pm ASTM D5185m 0 -1		Fuel		WC Method	>5	<1.0	<1.0	
Soot % % *ASTM D7844 >3 0.5 0.4		Water		WC Method	>0.2	NEG	NEG	
Soot % % YaSTM D7844 >3 0.5 0.4 Nitration Abs/cm *ASTM D7844 >20 13.1 12.4 Sulfation Abs/tm *ASTM D7845 >30 25.9 26.5 Silt scalar *Visual NONE NONE NONE Silt scalar *Visual NONE NONE NONE Sand/Dirt scalar *Visual NORE NONE NORE Appearance scalar *Visual NORE NORML NORML Odor scalar *Visual NORE NORML Odor scalar *Visual NORML NORML The BN result indicates that there is suitable alkalinity remaining in the oil is suitable for further service. Sodium pm ASTM D5185m 6 7		Glycol		WC Method		NEG	0.0	
Nitration Abs/cm *ASTM D7624 >20 13.1 12.4 Sulfation Abs/tm *ASTM D7415 >30 25.9 26.5 Silt scalar *Visual NONE NONE NONE Silt scalar *Visual NONE NONE NONE NONE Sand/Dirt scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORM NORM NORM NORM Odor scalar *Visual NORM NORM NORM NORM Emulsified Water scalar *Visual NORM NORM NORM FLUID CONDITION Sodium ppm ASTM D5185m 3 1 Boron ppm ASTM D5185m 6 7 6			%	*ASTM D7844	>3	0.5	0.4	
Siltscalar*VisualNONENONENONEDebrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONEAppearancescalar*VisualNORNORMLNORMLNORMLOdorscalar*VisualNORMNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*VisualNORNORNORMLNORMLBoronppmASTM D5185m67BariumppmASTM D5185m67MolybdenumppmASTM D5185m661ManganeseppmASTM D5185m661MagnesiumppmASTM D5185m110341187PhosphorusppmASTM D5185m116810033ZincppmASTM D5185m614751248SulfurppmASTM D5185m635693089		Nitration	Abs/cm				12.4	
Debrisscalar*VisualNONENONENONESand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGNEGNEGSodiumppmASTM D5185m67		Sulfation	Abs/.1mm	*ASTM D7415	>30	25.9	26.5	
Sand/Dirtscalar*VisualNONENONENONENONENONENONENONENONENONENONENONENORE<		Silt	scalar	*Visual	NONE	NONE	NONE	
Appearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185mS67BoronppmASTM D5185mI67BariumppmASTM D5185mI617633MolybdenumppmASTM D5185mI617633MarganeseppmASTM D5185mI617633MarganeseppmASTM D5185mI10949355CalciumppmASTM D5185mI10381187PhosphorusppmASTM D5185mI11681003ZincppmASTM D5185mI14751248SulfurppmASTM D5185mI35693089		Debris	scalar	*Visual	NONE	NONE	NONE	
Appearancescalar*VisualNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLEmulsified Waterscalar*Visual>0.2NEGNEGSodiumppmASTM D5185mS67BoronppmASTM D5185mI67BariumppmASTM D5185mI617633MolybdenumppmASTM D5185mI617633MarganeseppmASTM D5185mI617633MarganeseppmASTM D5185mI10949355CalciumppmASTM D5185mI10381187PhosphorusppmASTM D5185mI11681003ZincppmASTM D5185mI14751248SulfurppmASTM D5185mI35693089		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
Emulsified Waterscalar*Visual>0.2NEGNEGNEGNEGSodiumppmASTM D5185m31BoronppmASTM D5185m67BariumppmASTM D5185m0<1		Appearance	scalar		NORML	NORML	NORML	
Sodium ppm ASTM D5185m 3 1 Boron ppm ASTM D5185m 6 7 Barium ppm ASTM D5185m 0 <1		Odor	scalar	*Visual	NORML	NORML	NORML	
Boron ppm ASTM D5185m 6 7 Barium ppm ASTM D5185m 0 <1		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
Boron ppm ASTM D5185m 6 7 Barium ppm ASTM D5185m 0 <1		Sodium	ppm	ASTM D5185m		3	1	
Bar result indicates that there is suitable alkalinity remaining in the pil. The condition of the oil is suitable for further service. Barium ppm ASTM D5185m 0 <1 Molybdenum ppm ASTM D5185m 67 63 Maganese ppm ASTM D5185m <1094	The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.					•		
Molybdenum ppm ASTM D5185m 67 63 Manganese ppm ASTM D5185m <1								
Manganese ppm ASTM D5185m <1 <1 Magnesium ppm ASTM D5185m 1094 935 Calcium ppm ASTM D5185m 1308 1187 Phosphorus ppm ASTM D5185m 1168 1003 Zinc ppm ASTM D5185m 1475 1248 Sulfur ppm ASTM D5185m 3369 3089								
Magnesium ppm ASTM D5185m 1094 935 Calcium ppm ASTM D5185m 1308 1187 Phosphorus ppm ASTM D5185m 1168 1003 Zinc ppm ASTM D5185m 1475 1248 Sulfur ppm ASTM D5185m 33569 3089								
Calcium ppm ASTM D5185m 1308 1187 Phosphorus ppm ASTM D5185m 1168 1003 Zinc ppm ASTM D5185m 1475 1248 Sulfur ppm ASTM D5185m 3569 3089		•						
Phosphorus ppm ASTM D5185m 1168 1003 Zinc ppm ASTM D5185m 1475 1248 Sulfur ppm ASTM D5185m 3369 3089		U U						
Zinc ppm ASTM D5185m 1475 1248 Sulfur ppm ASTM D5185m 3569 3089								
Sulfur ppm ASTM D5185m 3369 3089								
					>25			

Base Number (BN) mg KOH/g ASTM D2896

ASTM D445

Visc @ 100°C cSt

6.27

13.0

7.27

13.5



