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COMMITTEE D02 ON PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

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Originally Issued: November XX , 2023

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Unapproved Minutes of the November 14, 2023
Sequence IV Surveillance Panel Conference Call.

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The meeting was called to order by Chairman Buscher at 1:00 PM Central Time.

A copy of the agenda is included as attachment 1.

A list of attendees is included as attachment 2.

Minutes from the 5/4/23 meeting were approved by voice vote.

The panel discussed hardware for the Sequence IVB test. The panel also reviewed the CPD report. All the hardware updates are included as attachment 3. The current camshaft batches are for intake, Batch G and exhaust Batch E. There was also a brief discussion about refurbishing some of the IVB engines. Kits are available from the CPD. It was felt that a build workshop, similar to what was done could accomplish the task of familiarizing the labs with the techniques. No plans were made to accomplish a workshop, but it will be discussed sometime in the future. A brief update was also provided by the fuel supplier.

The panel heard from Ben Maddock regarding issues with the RAC coolant pump. A motion to allow replacement of the pump motor with any motor matching the speed and horsepower of the TEI supplied pump motor was approved by voice vote. Data sheet from a replacement motor is included as attachment 4. An information letter will be issued to allow alternate motor(s). George Szappanos identified a discrepancy in the Method D8350 regarding sulfur measurements. Section 7 of the method specifies Test Method D5453 for fuel sulfur measurements, however, the supplier C of A shows D2622 being used to determine sulfur in the fuel (See attachment 5). The panel approved a motion to address this item via information letter. The panel discussed variability in IVB blowby measurements. It was noted that the Sierra flow meter may not be the most repeatable flow meter for these measurements and the long line lengths of tubing in the system may also contribute to this variability. Labs agreed to study potential improvements in these measurements for the next meeting. George Szappanos also indicated his lab has difficulty in starting the engine when it has been down for extended periods. Several labs indicated they run the pumps until the engine coolant temp is up to about 50°C. After some discussion, George agreed to investigate a method to bypass the engine coolant resistor, and report back with a proposed change to allow this in the method. Chairman Buscher indicated that he is planning on scheduling a metrology workshop sometime in the 1st quarter of 2024.

The panel discussed the status of reference oil 1006-2 for IVA calibration. The reference oil has been in the system over 20 years and, based on analysis conducted by the supplier, it was determined that this oil may be at the end of its useful life. It has been replaced in the Sequence VIII because of suspected severity issues. Only one lab has hardware to run this test and there are approximately 70 tests worth of cams to continue the test. Testing levels have been 5 – 10 tests a year for the past few years, based on ACC registrations (See attachment 6). The panel discussed other potential oils, 1009-1 and 300-1, but decided that the best path right now was to allow the lab to attempt to reference on 1006-2.

Attachment 8 includes the motion and action items recorded during this meeting.

The next meeting is expected to be held in May of 2024 along with other Surveillance Panels.

Sequence IV Surveillance Panel

Microsoft Teams Meeting

November 14, 2023

1:00 p.m. - 3:00 p.m. Central Time

A G E N D A

1. Chairman comments.
2. Attendance.
3. Membership changes.
4. Approval of minutes for May 4, 2023.
5. CPD inventory status report.
6. Sequence IVB alternative coolant pump.
7. Sequence IVB provision for alternative coolant pump mounting height.
8. Sequence IVB test procedure revision to Section 7.2.2.1; replacing ASTM D5453 with ASTM D2622.
9. Sequence IVB discussion on blowby measurement variability.
10. Sequence IVB discussion on difficulty with cold start.
11. Sequence IVB discussion on a possibly metrology workshop In early 2025.
12. Sequence IVA reference oil situation.
13. Old business.
14. New business.
15. Next meeting.
16. Adjourn.

**MEMBERSHIP
SEQUENCE IV SURVEILLANCE PANEL**

November 14, 2023

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
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Okuda, Sachiko	Nissan Motor Co., Ltd. Phone No.: Cell No.: Email: sa-okuda@mail.nissan.co.jp	
Proctor, Robert	Honda R&D Americas, Inc. Phone No.: 937-309-9321 Cell No.: Email: rproctor@oh.hra.com	




**MEMBERSHIP
SEQUENCE IV SURVEILLANCE PANEL**

November 14, 2023

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**NON-MEMBER MAILING LIST
SEQUENCE IV SURVEILLANCE PANEL**

November 14, 2023

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Affinito, Ricardo	Company: Phone No.: Cell No.: Email:	
Bowden, Matt	Company: Phone No.: Cell No.: Email:	
Campbell, Bob	Company: Phone No.: Cell No.: Email:	
Castanien, Chris	Company: Phone No.: Cell No.: Email:	
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Clark, Sid	Company: Phone No.: Cell No.: Email:	
Clark, Jeff	Company: Phone No.: Cell No.: Email:	
Coker, Carlton	Company: Phone No.: Cell No.: Email:	
Collins, Chet	Company: Phone No.: Cell No.: Email:	
Dvorak, Todd	Company: Phone No.: Cell No.: Email:	
Flores, Jesus	Company: Phone No.: Cell No.: Email:	
Hirano, Satoshi	Company: Phone No.: Cell No.: Email:	
Kinzel, Mike	Company: Phone No.: Cell No.: Email:	
Kostan, Travis	Company: Phone No.: Cell No.: Email:	

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November 14, 2023

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Lang, Patrick	Company: Phone No.: Cell No.: Email:	
Laufer, Caroline	Company: Phone No.: Cell No.: Email:	
Lekavich, Jason	Company: Phone No.: Cell No.: Email:	
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Matthews, Tim	Company: Phone No.: Cell No.: Email:	
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Schmid, Lesley	Company: Phone No.: Cell No.: Email:	

**NON-MEMBER MAILING LIST
SEQUENCE IV SURVEILLANCE PANEL**

November 14, 2023

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Stone, Amanda	Company: Phone No.: Cell No.: Email:	✓
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Beck, Dylan	Company: TMC Phone No.: Cell No.: Email:	✓
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	Company: Phone No.: Cell No.: Email:	
	Company: Phone No.: Cell No.: Email:	
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November 14, 2023

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Seq. IVB Inventory Status Report As of October 31, 2023

For presentation to:

**Seq. IV Surveillance Panel (November 14, 2023)
&
PCEOCP (December 05, 2023)**

1. Seq. IVB Engine Inventory Life Estimates (Based on Industry Wide Consumption Rates)

Remaining Engine Inventory Life (Based on 6 Year Industry Wide Consumption Rate)	
OHTIVB-16000-2 Engine Assembly	9.21 Years
Including Engine Component Build-Out	13.35 Years

*Includes highest yearly consumption rate (2018-2019)

Remaining Engine Inventory Life (Based on 2 Year Average Industry Wide Consumption Rate)	
Current OHTIVB-16000-2 Engine Assembly	11.42 Years
Including Engine Component Build-Out	16.68 Years

Remaining Engine Inventory Life (Based on 1 Year Industry Wide Consumption Rate)	
OHTIVB-16000-2 Engine Assembly	9.43 Years
Including Engine Component Build-Out	13.78 Years

Comments:

- From 2022 to October 31, 2023, Industry Engine Consumption Rates have increased 13%.
- At the time of this estimate, the supplier anticipates engine consumption rates to remain the same.
- The supplier has also acquired enough ancillary engine kit materials (OHTIVB-103-1) to match our engine inventory.

2. Seq. IVB Intake and Exhaust Camshaft Inventory Life Estimates(Based on Industry Wide Consumption Rates)

Remaining Camshaft Inventory Life (Based on 6 Year Average Industry Wide Consumption Rate)	
Seq. IVB Intake Camshaft	14.65 Years
Seq. IVB Exhaust Camshaft	16.49 Years

*Includes highest yearly consumption rate (2018-2019)

Remaining Camshaft Inventory Life (Based on 2 Year Average Industry Wide Consumption Rate)	
Seq. IVB Intake Camshaft	21.86 Years
Seq. IVB Exhaust Camshaft	25.47 Years

Remaining Camshaft Inventory Life (Based on 1 Year Industry Wide Consumption Rate)	
Seq. IVB Intake Camshaft	17.77 Years
Seq. IVB Exhaust Camshaft	19.28 Years

Comments:

- From 2021 to March 31, 2023, Industry Camshaft Consumption Rates have increased 24.83%.
- At the time of this estimate, the supplier anticipates camshaft consumption rates to remain the same.
- The supplier has also acquired enough camshaft test kit (OHTIVB-102-1) materials to match our camshaft inventory.

3. Seq. IVB Test Lifters Inventory Life Estimates (Based on Industry Wide Consumption Rates)

Remaining Lifter Inventory Life (Based on Average Industry Wide Consumption Rate)	
Minimum Inventory Life of any Given Lifter Size (5 Year Consumption Rate)	>21 Years
Minimum Inventory Life of any Given Lifter Size (2 Year Consumption Rate)	>24 Years
Minimum Inventory Life of any Given Lifter Size (1 Year Consumption Rate)	>20 Years

- There are 25 individual lifter grades (sizes). The remaining lifter inventory life estimate indicates the earliest depletion of any given lifter grade.
- At the time of this estimate, the supplier anticipates lifter consumption rates to remain the same.

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Customer information packet

JXL051522

1.5HP, 3450RPM, 1PH, 60HZ, 56J, 3530L, XPFC, F1

ELECTRIC MOTOR WHOLESAL.COM

Class - CLI GP D; CLII GP F,G

Division - Division I

Specifications

Enclosure	XPFC
Frame	56J
Frame Material	Steel
Frequency	60.00 Hz
Motor Letter Type	Cap Start, Induction Run
Output @ Frequency	1.500 HP @ 60 HZ
Phase	1
Synchronous Speed @ Frequency	3600 RPM @ 60 HZ
Voltage @ Frequency	230.0 V @ 60 HZ 115.0 V @ 60 HZ 208.0 V @ 60 HZ
XP Class and Group	CLI GP D; CLII GP F,G
XP Division	Division I
Agency Approvals	CSA UL
Ambient Temperature	40 °C
Auxillary Box	No Auxillary Box
Auxillary Box Lead Termination	None
Base Indicator	No Mounting
Bearing Grease Type	Polyrex EM (-20F +300F)
Blower	None
Current @ Voltage	16.000 A @ 115.0 V 8.000 A @ 230.0 V 8.500 A @ 208.0 V
Design Code	L
Drip Cover	No Drip Cover
Duty Rating	CONT
Efficiency @ 100% Load	70.0 %
Electrically Isolated Bearing	Not Electrically Isolated
Feedback Device	NO FEEDBACK
Heater Indicator	No Heater
High Voltage Full Load Amps	8.0 a

Part detail

Revision	B
Type	AC
Mech. spec.	
Base	
Status	PRD/A
Elec. spec.	35WG0093
Layout	35LYE790
Eff. date	06-28-2022
CD Diagram	CD0001
Poles	02/02
Leads	4#16 A PH,2#18 B PH
Proprietary	False
Created date	04-14-2021

Insulation Class	F
Inverter Code	Not Inverter
IP Rating	NONE
KVA Code	J
Lifting Lugs	No Lifting Lugs
Locked Bearing Indicator	Locked Bearing
Motor Lead Termination	Flying Leads
Motor Standards	NEMA
Motor Type	3530L
Mounting Arrangement	F1
Number of Poles	2
Overall Length	16.56 IN
Power Factor	82
Product Family	General Purpose
Pulley Face Code	C-Face
Rodent Screen	None
Service Factor	1.15
Shaft Diameter	0.625 IN
Shaft Ground Indicator	No Shaft Grounding
Shaft Rotation	Reversible
Speed	3450 rpm
Speed Code	Single Speed
Starting Method	Direct on line
Thermal Device - Bearing	None
Thermal Device - Winding	Normally Closed Thermostat
Vibration Sensor Indicator	No Vibration Sensor
Winding Thermal 1	None
Winding Thermal 2	None
XP Temp Code	T3C

Nameplate

NP1426XPSL				
NO.		CC		
SER.				
SPEC.	35-0000-1108			
CAT.NO.	JXL051522			
HP	1.5	T. CODE	T3C	
VOLTS	115/208-230			
AMPS	16/8.5-8			
RPM	3450			
HZ	60	PH	1	CL F
SER.F.	1.15	DES	L	CODE J
RATING	40C AMB-CONT			
FRAME	56J	NEMA-NOM-EFF	70	
USABLE AT 208V		PF	82	
BLANK	NEMA MG-1 PART 5, IP54			

Parts list

Part number	Description	Quantity
SA393093	SA 35-0000-1108	1.000 ea
RA383711	RA 35-0000-1108	1.000 ea
LB1119N	WARNING LABEL	1.000 ea
LC0081	CONNECTION LABEL X	1.000 ea
PK3082	STYROFOAM CRADLE	1.000 ea
PK3088	MICROFOAM, 8"X"8 PERF. SHEETS	1.000 ea
NP1426XPSL	SS XP UL CSA CC CL-I GP-D CL-II GP-F&G	1.000 ea
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	2.000 ea
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	4.000 ea
MN416A01	TAG-INSTAL-MAINT no wire (2200bx) 4/22	1.000 ea
NP0018F	ALUM UL XP CONDUIT BOX NAMEPLATE	1.000 ea
35FH4005A04	IEC FH NO GRSR W/1.09 SHAFT HOLE, W/	1.000 ea
51XW1032A06	10-32 X .38, TAPTITE II, HEX WSHR SLTD S	3.000 ea
34FN3002A01SP	EXTERNAL FAN, PLASTIC, .637/.639 HUB W/	1.000 ea
51XB0818A12	8-18X3/4 HXWSSLD SERTYB	1.000 ea
MJ1000A02	GREASE, POLYREX EM EXXON	0.050 lb
HA3104A10	THRUBOLT, 5/16-18 X 10.25	4.000 ea
SP5051A64	MODEL 35 TORQ STATIONARY SWITCH FOR XP	1.000 ea
XY3118A12	5/16-18 HEX NUT DIRECTIONAL SERRATION	4.000 ea
WD4100A10	465 NIAGARA PLUG (SO ELEC),FOR 1.093 DIA	1.000 ea
35EP3700A01SP	FR ENDPLATE, XPFC	1.000 ea
HW5100A03	WAVY WASHER (W1543-017)	1.000 ea
HA6003A52	CLAMP, CAPACITOR, WHITE ZINC PLATED	2.000 ea
35EP3702A01SP	PU EP-205 BRG-35X-56C-143-5TC	1.000 ea
51XN1032A18	10-32 X 1 1/8 HX WS SL SR (ESKAY)	2.000 ea
HA3013A01	1/2-20X5/8 SPL.HX BOLT	2.000 ea
HW3021C06	3/32 DI X .625 PIN (F/S)	2.000 ea
35CB3001A01SP	EXPL CONDUIT BOX, MACH, 1/2" PIPE TAP LE	1.000 ea
11XW1032G06	10-32 X .38, TAPTITE II, HEX WSHR SLTD U	1.000 ea
HW3001B01	BRASS CUP WASHER, FOR #10 SCREW	1.000 ea
35CB3500A01SP	CONDUIT BOX LID, MACH	1.000 ea

51XN2520A16	SCREW, HEX WS SLT, ZN, 1/4-20 X 1.00	4.000 ea
WD1000A15	3-520132-2 AMP FLAG (4M/RL NON-CANC/NON-	4.000 ea
51XW0832A07	8-32 X .44, TAPTITE II, HEX WSHR SLTD SE	2.000 ea
EC1324A02	ELEC CAP, 324-389 MFD, 125V, 1.48D X 3.	2.000 ea
MG1500Y02	WILKOPON PRIMER YELLOW	0.022 ga
MG1025G29	WILKOFAS, 789.229, DARK CHARCOAL GRAY	0.022 ga
36PA1001	PKG GRP, PRINT PK1017A06	1.000 ea

AC Induction Motor Performance Data

Record # 88062

Typical performance - not guaranteed values

Winding: 35WG0199-R001		Type: 3528L	Enclosure: XPFC	
Nameplate Data			115 V, 60 Hz: Low Voltage Connection	
Rated Output (HP)	1.5	Full Load Torque	2.26 LB-FT	
Volts	115/208-230	Start Configuration	Unknown	
Full Load Amps	16/8.5-8	Breakdown Torque	5.73 LB-FT	
R.P.M.	3450	Pull-up Torque	3.83 LB-FT	
Hz	60 Phase	1	Locked-rotor Torque	5.02 LB-FT
NEMA Design Code	L KVA Code	J	Starting Current	71.1 A
Service Factor (S.F.)	1.15	No-load Current	7 A	
NEMA Nom. Eff.	70 Power Factor	82	Line-line Res. @ 25°C	0.269 Ω A Ph 1.13 Ω B Ph
Rating - Duty	40C AMB-CONT	Temp. Rise @ Rated Load	61°C	
S.F. Amps	18/9.9-9	Temp. Rise @ S.F. Load	71°C	
		Locked-rotor Power Factor	87.2	
		Rotor inertia	0.083 lb-ft ²	

Load Characteristics 115 V, 60 Hz, 1.5 HP

% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	51	69	79	84	87	88	86
Efficiency	60.3	73	77.4	78.8	78.6	77.2	78.7
Speed	3570	3546	3519	3490	3456	3417	3470
Line amperes	7.95	9.69	12	14.7	17.9	21.5	16.6

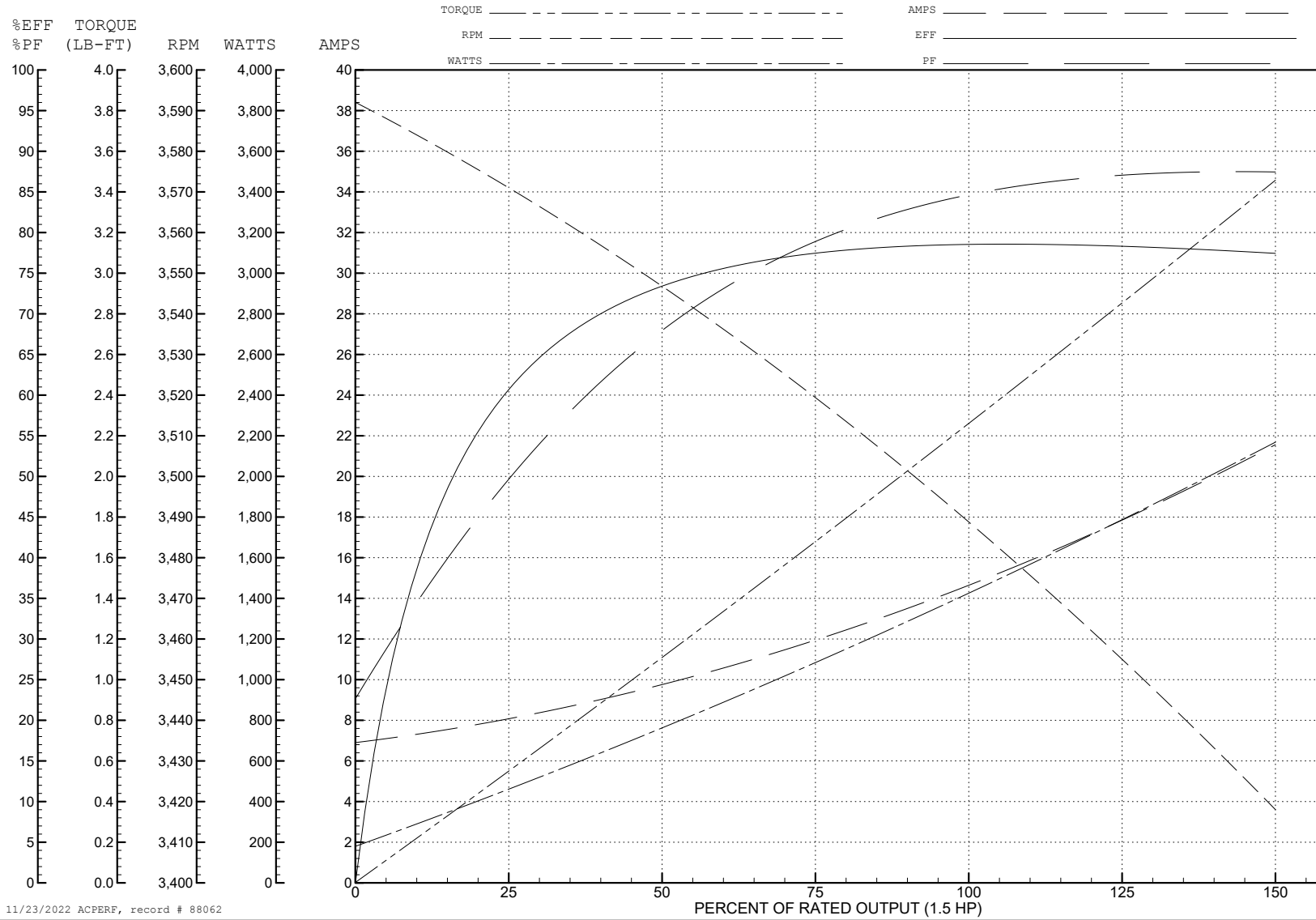
ABB Motors and Mechanical Inc.

WINDING # 35WG0199

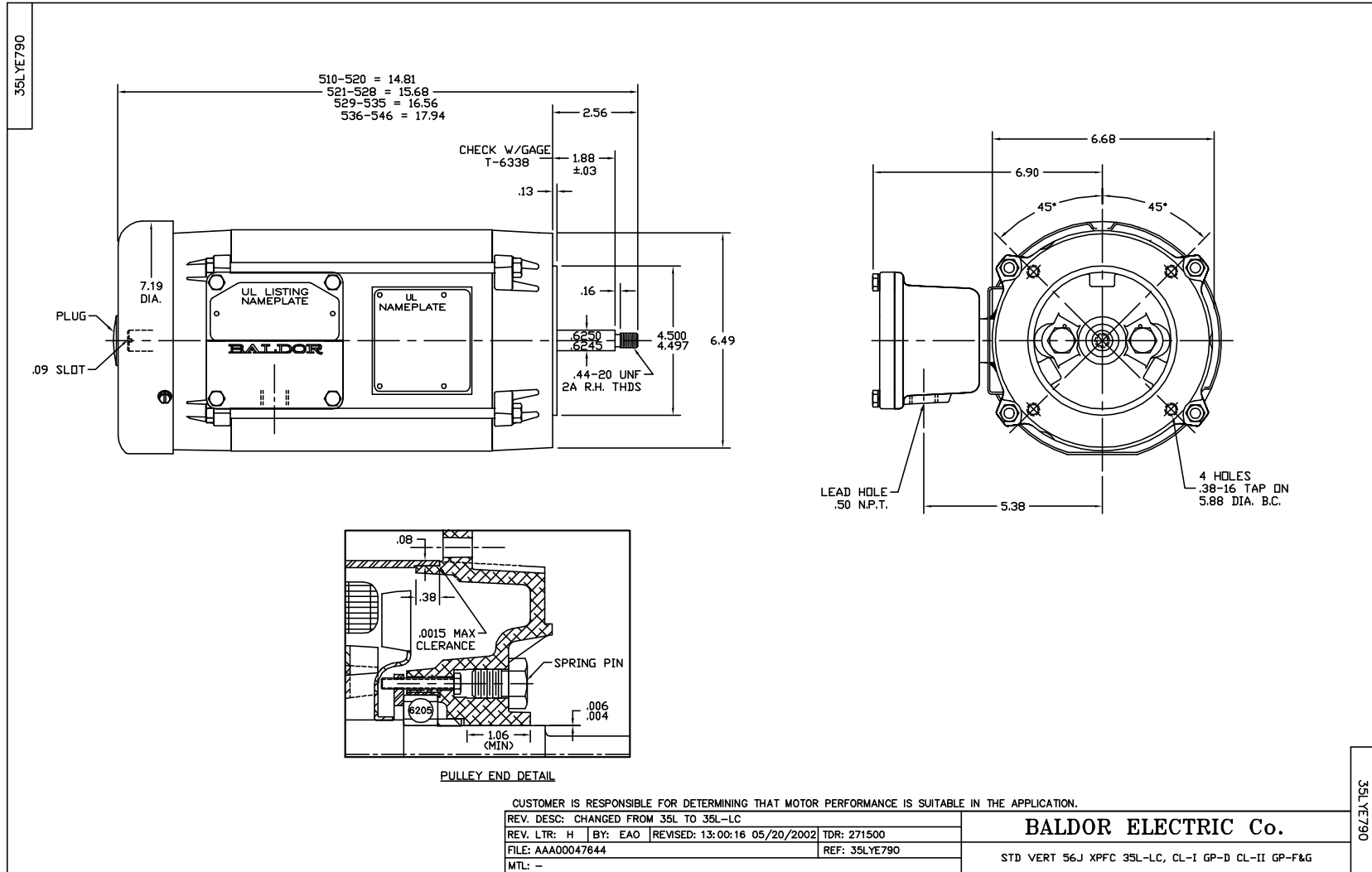
Typical performance - not guaranteed values.

1.5 HP 1 PH 60 HZ 3450 RPM 115 V 3528L

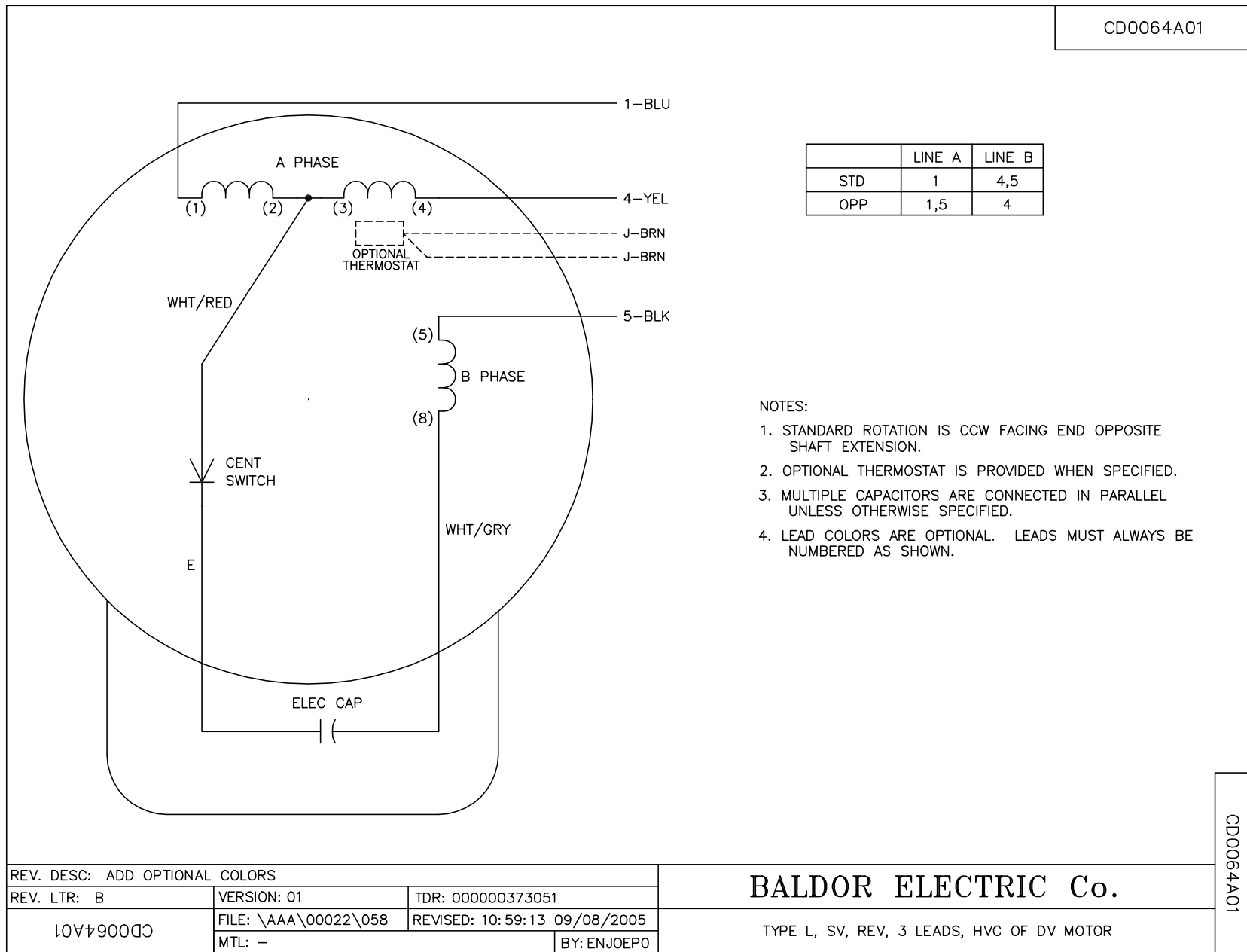
TORQUES (LB-FT): PO=5.73 PU=3.83 LR=5.02 LRA=71.1



11/23/2022 ACPERF, record # 88062



CD0064A01



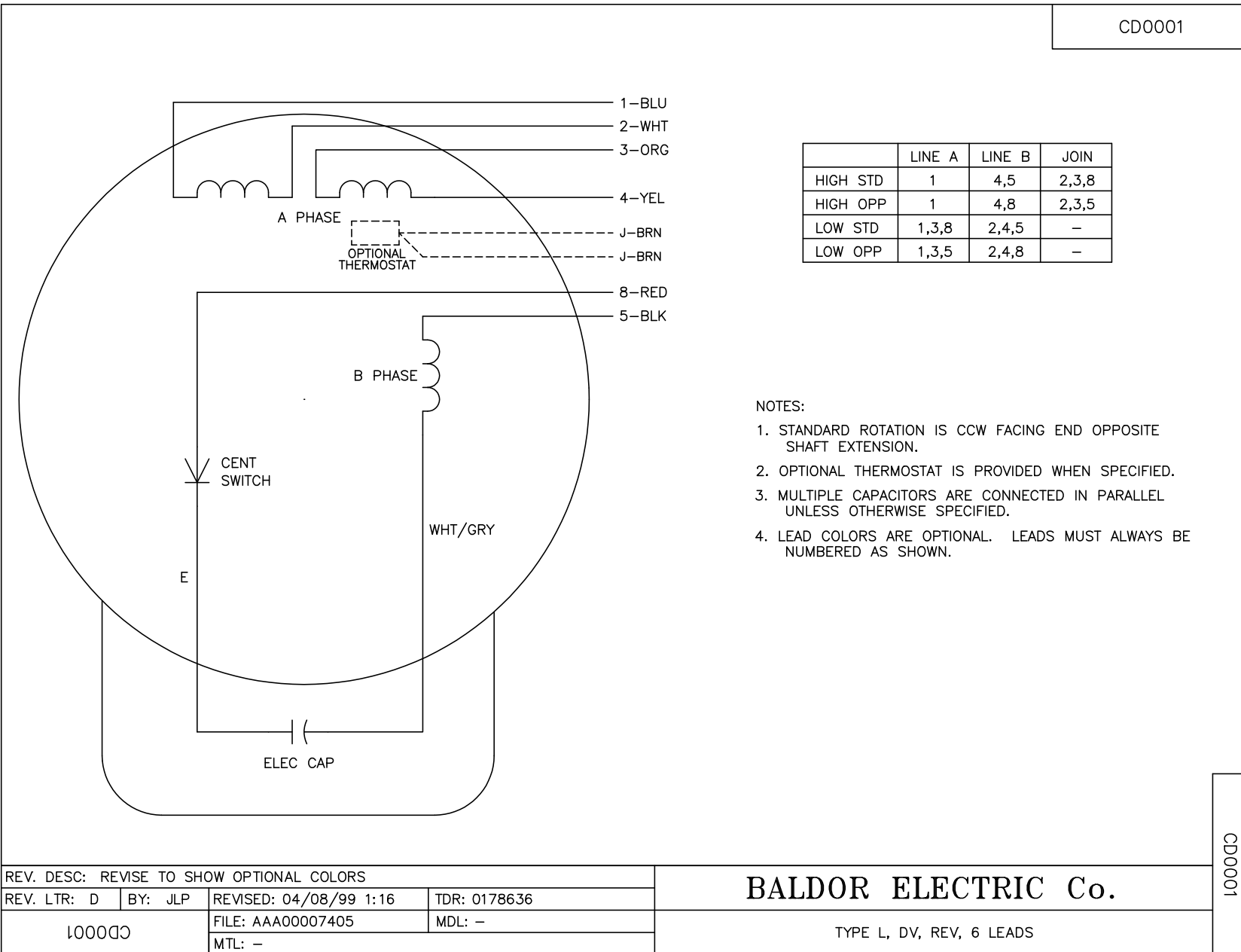
REV. DESC: ADD OPTIONAL COLORS		
REV. LTR: B	VERSION: 01	TDR: 000000373051
CD0064A01	FILE: \AAA\00022\058	REVISED: 10:59:13 09/08/2005
	MTL: -	BY: ENJOEPO

BALDOR ELECTRIC Co.

TYPE L, SV, REV, 3 LEADS, HVC OF DV MOTOR

CD0064A01

CD0001



	LINE A	LINE B	JOIN
HIGH STD	1	4,5	2,3,8
HIGH OPP	1	4,8	2,3,5
LOW STD	1,3,8	2,4,5	-
LOW OPP	1,3,5	2,4,8	-

NOTES:

1. STANDARD ROTATION IS CCW FACING END OPPOSITE SHAFT EXTENSION.
2. OPTIONAL THERMOSTAT IS PROVIDED WHEN SPECIFIED.
3. MULTIPLE CAPACITORS ARE CONNECTED IN PARALLEL UNLESS OTHERWISE SPECIFIED.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

CD0001

REV. DESC: REVISE TO SHOW OPTIONAL COLORS			
REV. LTR: D	BY: JLP	REVISED: 04/08/99 1:16	TDR: 0178636
100000		FILE: AAA00007405	MDL: -
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BALDOR ELECTRIC Co.

TYPE L, DV, REV, 6 LEADS

Seq IVB fuel analysis requirement

11/14/2023

Sulfur concentration

- Section 7.2.2 requires check of the KA24E test fuel
 - after shipment and semi-annually
- One of the measurements is Sulfur concentration. The procedure states to use ASTM D5453.

7.2.1 Fuel Approval Requirements—The fuel is blended to a sulfur content of 130 ppm \pm 10 ppm and the fuel supplier's requirements. Base the fuel batch acceptance upon the physical and chemical specifications given in **Annex A10**. Engine validation tests are not necessary for fuel batch acceptance.

7.2.2 Fuel Analysis—Monitor the test fuel using good laboratory practices. Analyze each fuel shipment to determine the value of each parameter for fuel sulfur as described in Test Method **D5453**, existent gum as described in Test Method **D381**, RVP as described in Test Method **D5191**, and API Gravity as described in Test Method **D4052**. Compare the results to the original values supplied by the fuel supplier. The analytical results shall be within the tolerances shown in parentheses beside each parameter. This provides a method to determine if the fuel batch is contaminated or has aged prematurely. If any analytical result falls outside the tolerances, the laboratory shall contact the fuel supplier for problem resolution.

7.2.2.1 Fuel Deterioration—Analyze the fuel semiannually to ensure the fuel has not deteriorated excessively or been contaminated in storage.

7.2.2.2 Analyze the fuels using Test Methods **D5453**, **D4052**, **D381**, and **D5191**.

Supplier specification

- The fuel supplier (Haltermann) CofA has a specification for Sulfur using ASTM D2622
- Limit is 0.0120 to 0.0140 wt% using that method
- **Recommend change Seq IVB procedure to match supplier's method.**

Date: 10/2/23



20/TD000015

haltermannsolutions™

Telephone: (800) 969-2542

Certificate of Analysis

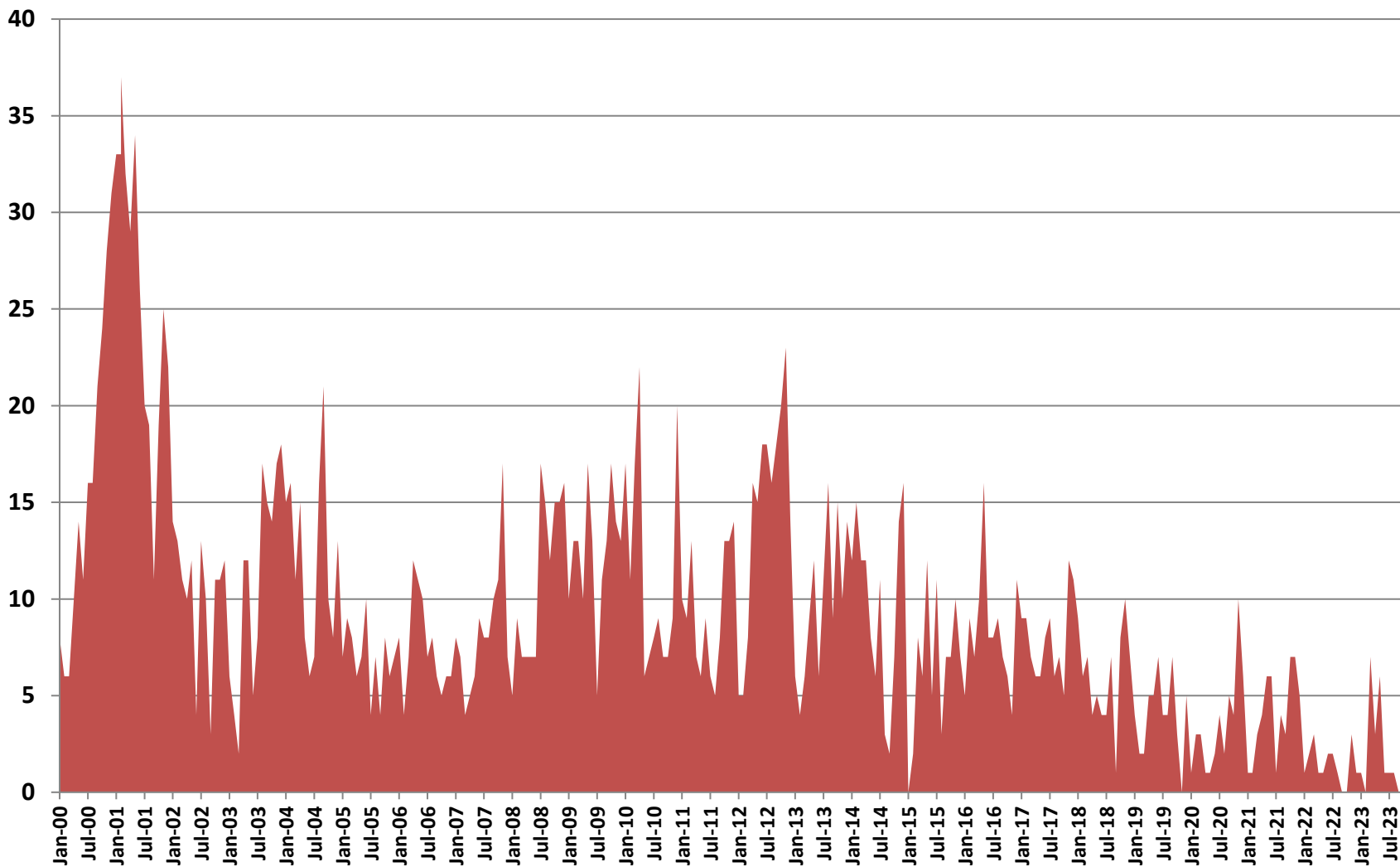
FAX: (281) 457-1469

PRODUCT: KA24E TEST FUELBatch No.: TD-000015PRODUCT CODE: HF0008Date: 9/6/2023

TEST	METHOD	UNITS	SPECIFICATIONS			RESULTS
			MIN	TARGET	MAX	
Distillation, % Evap - IBP	ASTM D86 ¹	°F	75		95	86
5%		°F				110
10%		°F	120		135	124
20%		°F				146
30%		°F				171
40%		°F				202
50%		°F	200		230	222
60%		°F				232
70%		°F				241
80%		°F				257
90%		°F	300		325	316
95%		°F				341
Distillation - EP		°F	385		415	397
Recovery		vol %		Report		97.2
Residue		vol %		Report		1.1
Loss		vol %		Report		1.8
Gravity @ 60 °F	ASTM D4052 ¹	°API	58.7		61.2	59.3
Density @ 15 °C	ASTM D4052 ¹	kg/l	0.734		0.744	0.741
Reid Vapor Pressure	ASTM D5191 ¹	psi	8.8		9.2	8.9
Carbon	ASTM D5291 ²	wt fraction	0.8580		0.8667	0.8645
Carbon	ASTM D3343 ¹	wt fraction		Report		0.8661
Sulfur	ASTM D2622 ²	wt %	0.0120		0.0140	0.0122
Lead	ASTM D3237 ²	g/gal			0.05	None Detected
Oxygen	ASTM D4815 ¹	wt %			0.2	None Detected
Composition, aromatics	ASTM D5769 ¹	vol %			35.0	30.5

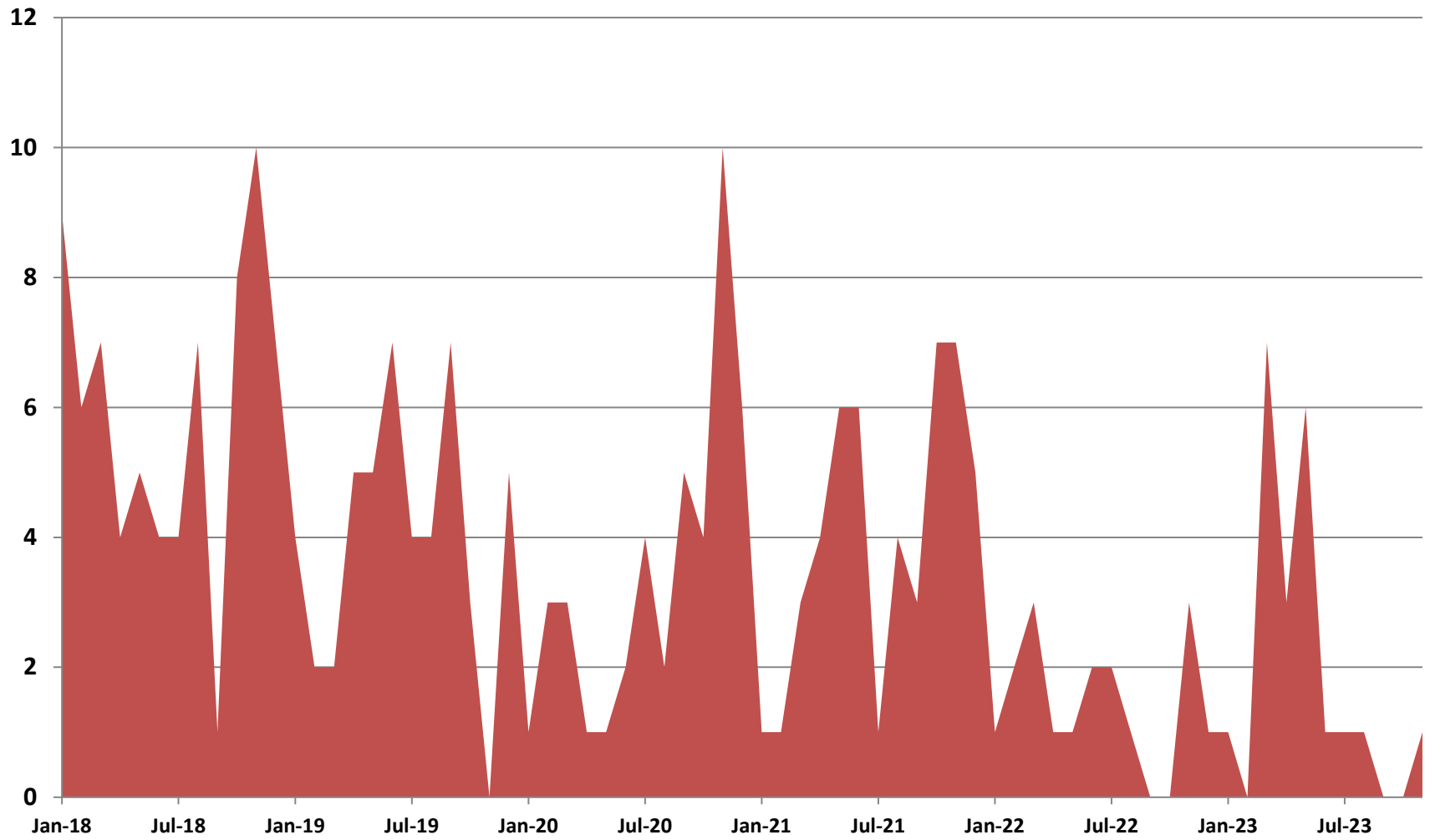
IVA Candidate Activity Levels

■ IVA



IVA Candidate Activity Levels

■ IVA



Sequence IV Surveillance Panel
November 14, 2023
1:00 p.m. - 3:00 p.m. Central Time
Microsoft Teams Meeting

Motions and Action Items

As Recorded at the Meeting by Bill Buscher

1. Motion – The Sequence IV Surveillance Panel approves revision to the Sequence IVB test procedure (D8350) to allow any electric pump motor that meets the designated Golden Stand electric pump motor specifications (details to be included in the information letter), as a replacement electric pump motor to accommodate Class 1, Div 2 by OSHA requirements.
Ben Maddock / Rich Grundza / Passed Unanimously 14 – 0 – 0
2. Motion – The Sequence IV Surveillance Panel approves revision to the Sequence IVB test procedure (D8350) section 7.2.2.1 to replace ASTM D5453 with ASTM D2622 as the required test for sulfur content analysis of the test fuel.
George Szappanos / Bill Buscher / Passed Unanimously 14 – 0 – 0
3. Action Item – Confirm that the fuel specification for Haltermann HF-0008 also includes ASTM D2622 as the required test for sulfur content analysis of the test fuel.
4. Action Item – Lubrizol to develop a system to bypass the ECT resistor at engine start to richen the AFR and eliminate cold start issues.
5. Action Item – SP chair to coordinate a metrology workshop in early 2024. An invite will be distributed in January 2024.