LEAD INDUSTRIES ASSOCIATION

420 LEXINGTON AVENUE
NEW YORK 17, N. Y.

RED LEAD DIVISION

CONFIDENTIAL - FOR COMMITTEE USE ONLY

SUBJECT TO REVISION

RED LEAD TECHNICAL COMMITTEE

New York, N. Y. September 28-29, 1944

On Thursday, September 28, the members of the Technical Committee proceeded to Sayville, L.I. to inspect the panels on exposure. The following were present:

COMMITTEE	REPRESENTING
A.C. Goetz	Eagle-Picher Lead Co.
O.J. Shobe	Glidden Co.
George Dieblman	National Lead Co.

L. L. Carrick, Director of Red Lead Research

INSPECTION OF TEST PANELS

1. TOTAL IMMERSION EXPOSURES

These panels were placed on total immersion exposure at the National Lead Co. Marine Test Basin, Sayville, L.I. on September 28, 1943. They have been on exposure for almost exactly 12 months.

A. Four Hour Dry Between Coats - U.S.M.C. Anti-Fouling Top Coat

These panels were coated with two coats of the primer and one coat of U.S.M.C. anti-fouling paint and were allowed to dry four hours between coats. They were rated in the following order, No. 1 being the best:

No. 1 - Panel No. 4349C; this panel was covered with pigmentation J and vehicle 13 (old number).

No. 2 - Panel No. 4343C; this panel was covered with pigmentation J and vehicle 20 (old number).

No. 3 - Panel No. 4341C; this panel was covered with pigmentation A and vehicle 8 (old number).

B. Four Hour Dry Between Coats - National Lead Co. No.2346 Anti-Fouling Top Coat.

These panels were allowed to dry four hours between primer coats and four hours before the application of N-2346 anti-fouling top coats. Panel No. 1 was the best.

No. 1 - Panel No. 4845C was rated first. The primer consisted of pigmentation J and vehicle 20 (old number). This was considered the best panel of all the total immersion tests.

No. 2 - Panel No. 4851C was rated second. It was covered with pigmentation J and vehicle 13 (old number).

No. 3 - Panel No. 4878C was rated third. It is the Navy 52-P-18. This panel should be compared with panel No. 4873C which has the U.S.M.C. anti-fouling top coat. Panel No. 4878C is normal for 52-P-18 exposures.

C. Twenty-Four Hour Dry Between Coats - U.S.M.C. Anti-Fouling Top Coats.

These panels were covered with two coats of the primer followed by one coat of U.S.M.C. anti-fouling primer. Time to dry between coats was 24 hours. Panel No. 1 was the best.

No. 1 - Panel No. 4850C was considered the best panel of this series. It was covered with pigmentation J and vehicle 13 (old number).

No. 2 - Panel No. 4844C was considered the second best for this class. It was covered with pigmentation J and vehicle 20 (old number).

D. Twenty-Four Hour Dry Between Coats - National Lead Co. M-2345 Anti-Fouling Top Coats.

These panels were covered with two coats of primer followed by one coat of National Lead Co. M-2345 anti-fouling top coat. These panels were allowed to dry twenty-four hours between coats. Panel No. 1 was the best.

No. 1-Panel No. 4852C was rated first. It was covered with pigmentation J and vehicle 13 (old number).

No. 2-Panel No. 4846C was rated second. It was covered with pigmentation J and vehicle 20 (old number).

VEHICLES INVOLVED ARE --

Vehicle 13 is 60% by wt. LV287 (six-gallon length); 40% by wt. medium linseed oil alkyd, 54% phthalic anhydride (GE2454).

Vehicle 20 is 40% by wt. linseed oil alkyd, (52% phthalic anhydride) (GE2454); 60% by wt. LV268 varnish (KE2432) 10-gallon length.

Vehicle 8 is a 60-gallon varnish containing Durez 480 resin.

THE PIGMENTATIONS INVOLVED ARE --

	A	J	K
Red Lead(97% grade)	45%	80%	80%
Zinc Oxide	10%	10%	10%
Zinc Chromate	-	10%	-
Iron Oxide	30%	7%	-
Magnesium Silicate	10%	10%	10%
Diatomaceous Silica	5%	5%	5%
Monobasic Lead Chromate	-	-	20%

Red Lead Technical Committee — September 28-29, 1944
Meeting Minutes

GENERAL SUMMARY

First and second place ratings were awarded to pigmentation J.

Vehicle 18 (old number) received first place rating as follows:

Panel No. 4849C - a four hour drying time between paint coats was employed. The top coat is UMC anti-fouling paint.

Panel No. 4850C - a twenty-four hour drying time between paint coats was employed. The top coat is U.S.M.C. anti-fouling paint.

Panel No. 4852C - a twenty-four hour drying time between paint coats was employed. The top coat is National Lead Company's anti-fouling paint M-2345.

Vehicle 20 was given a first-choice rating on the showing of Panel No. 4845C. This panel dried four hours between coats and had a top coat of National Lead Company's anti-fouling paint M-2345.

Thus, Vehicle 18 received three first ratings to one for Vehicle 20. Vehicle 20 was given three second-choice ratings; Vehicle 18 one second choice rating.

It should be noted that these paints were designed for a four hour dry between coats and that the inspection data shows that these paints dry or give better exposure when applied as a four hour system rather than applied as a twenty four hour system between coats. (For details of the inspection data for Total-Immersion Exposure see Exhibit A attached.)

II. TIDE-RANGE EXPOSURES

Panels were allowed to dry twenty four hours between coats. An examination of the enclosed inspection sheet will indicate the first, second and third-choice ratings. (Attached as Exhibit B).

Here, again, it should be observed that pigmentation J received the first, second and third place rating although pigmentation L showed up quite well and could also be considered as a third place rating pigmentation.

Vehicle No. 20 received first place rating. Vehicle 21 second place rating. Vehicle 22 and 8 received third place ratings. It should be noted that Vehicle 20 is a lower oil resin than Vehicle 18 which showed up so well as an undercoating primer vehicle.

III. ATMOSPHERIC EXPOSURES

No attempt was made to evaluate the atmospheric exposure data, but the inspection data is included for your files. (Attached as Exhibit C.)

The inspection lasted until 5:00 P.M. when the members returned to New York to reconvene at 1:00 P.M., Friday, September 29, at the Association's New York Offices.

The Technical Committee reconvened on Friday, September 29, at 1:15 P.M. at the Association's New York Office. The following were present:

PRESENT	REPRESENTING
A.C. Coats	Eagle-Picher Lead Co.
O.P. Shobe	Glidden Co.
George Diehlman	National Lead Co.
A.J. Eickhoff	National Lead Co.

L. L. Carrick, Director of Red Lead Research

REPLY TO MR. THUESEN'S ARTICLE IN THE "OFFICIAL DIGEST" OF THE FEDERATION OF PAINT & VARNISH PRODUCTION CLUBS, NO. 239

Exhibit B of last Red Lead Meeting Minutes, August 25-26, 1944, which constitutes a reply to Mr. Thuesen's article in the "Official Digest" of the Federation of Paint & Varnish Production Clubs, No. 239, was approved by the Committee and is being forwarded to the editor of the "Official Digest."

PROTECTIVE COATINGS FOR GALVANIZED IRON

The Committee reviewed the data submitted by Don Critchfield, Agricultural Service Director of the Lead Industries Association in regard to painting of galvanized surfaces. It was decided to make a further study of the general practices of painting on galvanized iron before initiating any additional research programs.

Galvanized iron which has weathered over six months or has been rusting and has been properly cleaned does not require any special formulation of red lead for its protection. Regular quick-drying red lead is satisfactory and should give excellent service.

PURE RED LEAD RESEARCH PROGRAM

The red lead research program as outlined in Exhibit E of the August 25-26 Meeting Minutes of the Red Lead Technical Committee has been deferred for future consideration. It was thought by the members of the committee that the points of investigation suggested in this program could best be done as an academic research project and would not constitute a source of immediate facts for promoting the red lead research program.

CONSIDERATION OF THE INSPECTION DATA OBTAINED AT BAYVILLE, L.I., SEPTEMBER 28, 1944

It was decided because of the splendid showing of vehicle 18 and vehicle 20 that these should constitute the basis of further study with the view of reducing their cost and the possibility of improving their exposure characteristics. In accordance with this idea a set of formulations given in Exhibit D were approved. These primers are to be made up as soon as possible and they are to be placed on exposure at the North Florida Test Station, Daytona Beach, Florida so we may have an early report as to their characteristics.

NEXT MEETING DATE

It was decided not to have the October meeting as the Chairman will be away on a Western trip interviewing shipbuilders on the Pacific Coast. The date of the Nov. meeting will be announced about the middle of Nov. after consulting the Committee members.

The meeting adjourned at 6:30 P. M.

L. L. Carrick

L. L. Carrick, Director
Red Lead Research

[illegible]

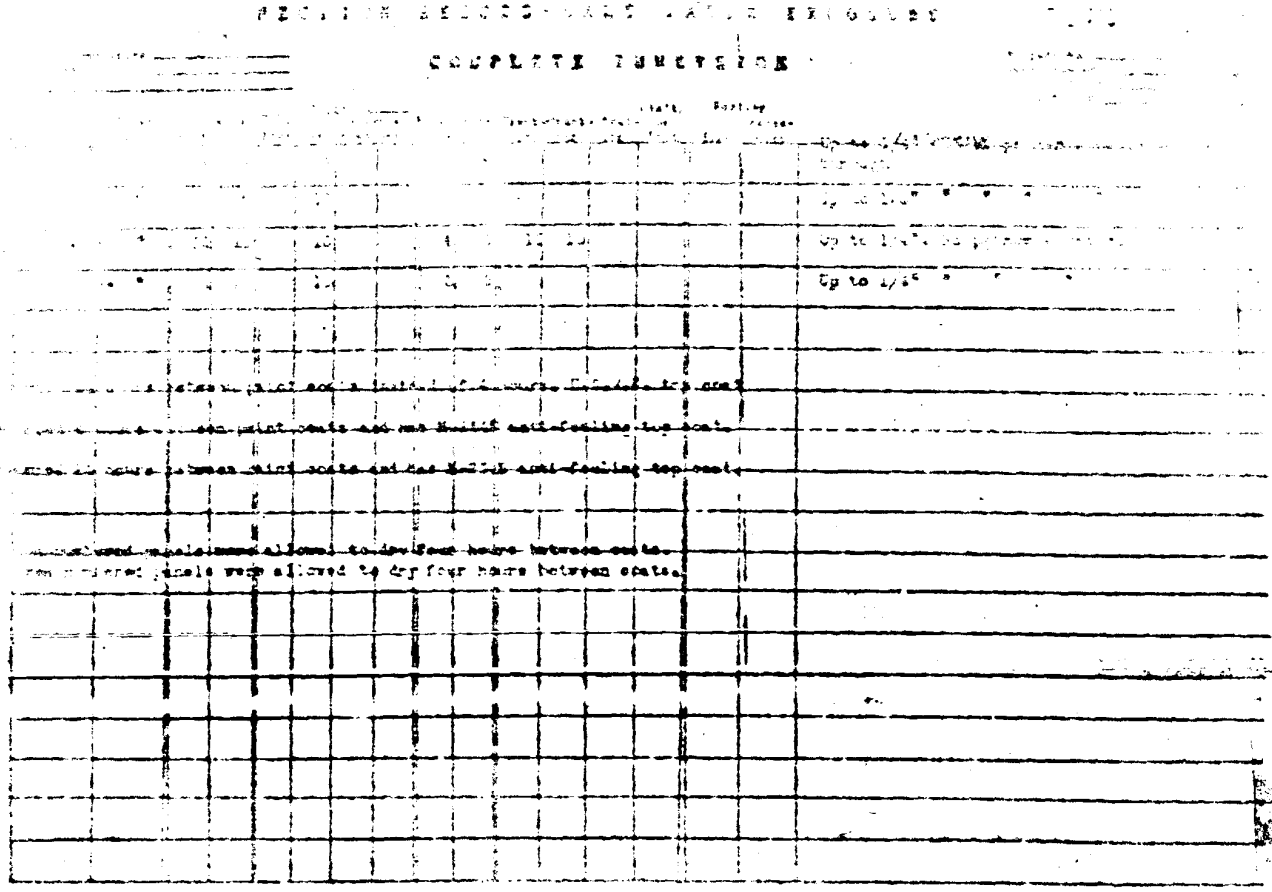
COMPLETE IMMERSION

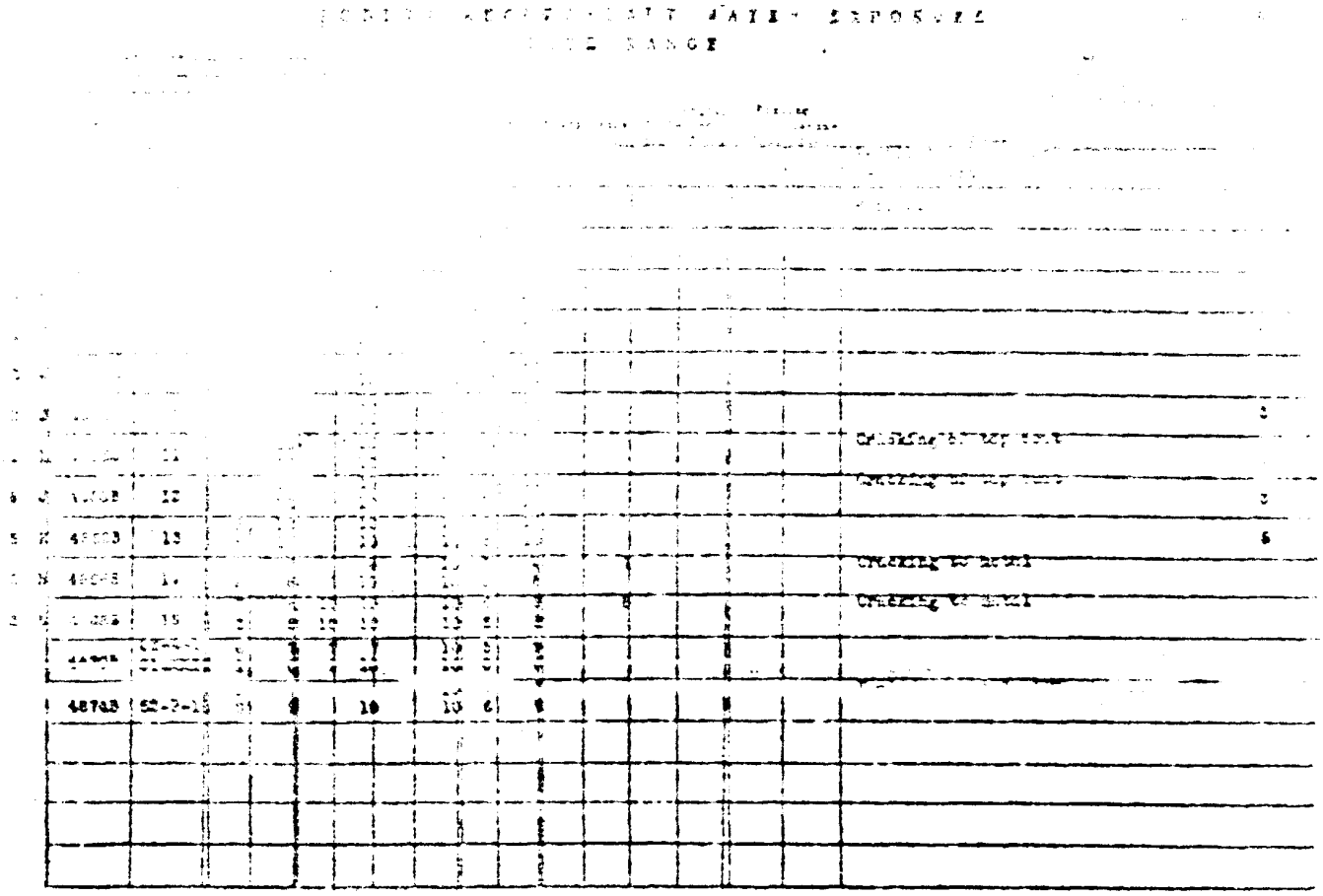
											Remarks
			9							[illegible]	[illegible]
	7	[illegible]	9	10	10	10	10	4	4		Up to 1/4" [illegible]
	2	3	7						6	6 to metal	[illegible] 1/4"
	4	[illegible]	9	10	10	10	10		4		Up to 1/4" (one blister 1" diam [illegible])
[illegible]	4	5	8		9				7		Up to 1/2" (mostly 1/4" diameter)
[illegible]	4	9	10	10	10	10	10	9	10		Lost of four-hour dry.
[illegible]	4	7	10		10				10		Loss of adhesion near top of panel, 4" ~~area back and front.~~
4[illegible]	5	4	8		9				4		Up to 1/4" diameter
45A[illegible]	8										Failure
43490	6	6	9		10				7		Up to 1/4" diam.[illegible] checking of anti-fouling
									8		Up to 1/4"
45910	6	5	10		10				9/		Up to 1/16" (no checking of anti-fouling)
[illegible]	5	7	10		10				10		
4[illegible]		5	3		8				2		Large blisters up to 4% area
4[illegible]	7	[illegible]	8		7				6		

[illegible]

COUPL[illegible] [illegible]

										Remarks
										Up to 1/4" [illegible]
			4	4						Failure
		2	9	9						Up to 3/4" " " "
	12	4		3						[illegible]
[illegible]	12	7	9	8	7					Up to 1" (" " " "
[illegible]	12	6	8	8	6		7 to metal			Longitudinal cracks to metal.
[illegible]	13	5	9	10						Up to 1/2" (" " " "
[illegible]	12	4	9	4		6				Up to 1/2"
[illegible]	12	7	8	8		[illegible]	7			[illegible] adhesion due to longitudinal cracks.
[illegible]	13	5	5	5		5	4			Failure
[illegible]	14									Complete Failure.
[illegible]	14	4	6	5		4	4			Failure
[illegible]	15	1	5	9		6				Blisters
[illegible]										Fail[illegible]
[illegible]		5	2	5		6				Practical [illegible] & complete failure.
[illegible]						8				Failure
[illegible]		5	6	6		4				[illegible] cracking to metals.
[illegible]		2	2	4		4				Failure





INSPECTION RECORD - ATMOSPHERIC EXPOSURE

EXHIBIT 6

Date

Water Temperature ______
Salinity ______
pH ______

Project No. ______
Date Exposed ______
Last Insp. ______
Elapsed Time ______

V. P. No.	Panel No.	Paint No.	Corrosion Size	Corrosion Con.	Peeling to Metal Size	Peeling to Metal Con.	Intercoat Size	Intercoat Con.	Blistering Size	Blistering Con.	Checking	Cracking	Scaling	Chalk. or Eros.	Fouling Slime	Fouling Barnacles	Comments
9 A	4487A	PM3-3		8 8													A = AD - Duplicate panel of A
9 B	4488A	PM3-3		9 9/													
8 A	4459A	PM3-3		9/ 10													
8 B	4490A	PM3-3		8 7													
10 A	4491A	PM3-3		8 8													
10 B	4492A	PM3-3		6 7													
1 A	4493A	S-2-8-A		4 5													
1 B	4494A	S-2-8-B		2 2													Little corrosion on second coat 9
2 A	4495A	S-2-8-		9 10													
2 B	4496A	S-2-8-		5 6													
3 A	4497A	S-2-8-		3 4													
3 B	4498A	S-2-8-		5 4													
1 B-2	4499	S-2-8-		4 4													
1 B-A	4500A	S-2-8-		3 4													
1 C	4501A	S-2-8-		3 3													A few spots on second coat
13 B	4502A	S-2-8-		4 6													A few spots on second coat
	4503A	V.789 Glidden		6 6													
	4504A	52-P-19 C-H Cd 53-P-19		6 6													A few spots on second of AD

LIA08206

INSPECTION RECORD—ATMOSPHERIC EXPOSURE

EXHIBIT C
-2-

Date

Water Temperature ______
Salinity ______
pH ______

Project No. ______
Date Exposed ______
Date Inspected ______
Elapsed Time ______

V. F. No.		Panel No.	Paint No.	Corroding Line	Corroding Gen.	Peeling to Metal Edge	Peeling to Metal Gen.	Peeling to Undercoat Edge	Peeling to Undercoat Gen.	Blistering Edge	Blistering Gen.	Checking	Cracking	Scaling	Chalk. or Erod.	Peeling Clear	Perma-sion	Comments
4	N	4505A	M-1977		9 9✓													
4	A	4506A	M-1978		9 9													
4	A	4507A	M-1979		9 9													
4	N	4508A	M-1980		9 9✓													
12	N	4509A	M-1981		9✓ 9✓													
6	Sp.	4510A	M-1982		10 10													
7	N	4511A	M-1990		9 9													
7	A	4512A	M-1991		9 9													
6	A	4513A	M-1994		10 9													
6	N	4514A	M-1995		8 8													
		4515A	JEAC XXII		8 8													

Only the one coat primer system was inspected.
The two coat primer systems and the primer systems with top coats were in perfect condition, hence they were not inspected.

INSPECTION RECORD - ATMOSPHERIC EXPOSURE

EXHIBIT C

Date

Water Temperature ______
Salinity ______
pH ______

Project No. [illegible]
Date Exposed [illegible]
Date Inspected [illegible]
Elapsed Time 12 [illegible]

	Panel No.	Paint No.	Corroding Face	Corroding Gen.	Peeling in Weld Face	Peeling in Weld Gen.	Peeling in Overcoat Face	Peeling in Overcoat Gen.	Blistering Face	Blistering Gen.	Checking	Cracking	Scaling	Chalk. or Erod.	Peeling Minor	Peeling Major	Comments
	4870	52-A-1 Cl. XXII		8													
	4871	52-B-18		9													
1 B	4838			7													
12 B	4848			9													
8 A	4842			9✓													
20 C	4644			9✓													
21 J	4648			10													
13 J	4650			10													
22 J	4654			10													
21 L	4656			10													
8 J	4650			9✓													
8 M	4642			9✓													
13 N	4266			9													
22 N	4648			9✓													

Red Lead Technical Committee — 5 — EXHIBIT B
Meeting Minutes

PRIMERS FORMULATED AT THE SEPT. 29, MEETING OF THE TECHNICAL COMMITTEE

RESEARCH PROJECT NO. 8

MODIFICATIONS OF V-19 (VEHICLE 13 OLD NUMBER)

L.I.A. Paints Nos. 186 to 188, inclusive constitute a variation of V-19 (old number 13) which has shown up as well at Bayville on underwater and tide-range exposures. The Glidden Co. has agreed to prepare these primer paints.

The vehicles are to be cooked so the varnish is 60% solids.

The thinning is to be done with a 50:50 mixture of Solvesso Nos. 3 and 4.

The primers are to be made up with a PV of 30. Should the paint with the PV of 30 have an excessive gloss then the PV should be increased to 35.

The viscosity should be between 70-75 KU. The KU to be run after the paint has stood twenty-four hours.

The size of the sample is to be 1 pint.

These samples should be shipped to Mr. George Dieblum of the National Lead Co. who will make arrangements for painting and packing of them for shipment to the North Florida Test Station at Daytona Beach, Florida.

Pigmentation 75, which is to be used with all these primer paints, is:

Red Lead (97% grade)	60%
Zinc Chromate	10%
Iron Oxide	4%
Magnesium Silicate	18%
Diatomaceous Silica	6%
Micalith-6	10%

The directions for formulation of V-19 (old Vehicle 13) may be found on page 9, section B of the Data Book. Only the variation in the vehicle formulations are noted below.

L.I.A. NO.	PIGMENTATION NO.*	VEHICLE NO.*	COMPOSITION OF VEHICLE
186	P-75	V-19f (13f)	60% by wt. alkyd (GE2484(EV-3181)34% phthalic anhydride); 40% by wt. LV-287, except a 12 gal. oil length.
186	P-75	V-19g (13g)	60% by wt. alkyd (GE2484(EV-3181)34% phthalic anhydride); 40% by wt. LV-287 except 18 gal. oil length.
187	P-75	V-19h (13h)	60% by wt. alkyd (GE2484), 34% phthalic anhydride, 40% by wt. LV-287 except 24 gal. oil length.

* Old pigmentation and old vehicle numbers are in parenthesis.

N2852.04

158	P-75	V-19i (13i)	80% by wt. alkyd (GE2454); 80% LV-257.
159	P-75	V-19j (13j)	80% alkyd (GE2454); 40% LV-257.
160	P-75	V-19k (13k)	80% alkyd (GE2454); 80% LV-257, as modified under V-19f (13f).
161	P-75	V-19L (13L)	80% alkyd (GE2454); 40% LV-257 as modified under V-19f (13f).
162	P-75	V-19m (13m)	40% alkyd (GE2454); 60% LV-257 except BR254 is used instead of BR9432. 6 gal. length.
163	P-75	V-19n (13n)	40% alkyd (GE2454); 60% LV-257 except BR254 is used instead of BR9432 and the oil length is raised 18 gal. length.

MODIFICATIONS OF VEHICLE V-19 (OLD VEHICLE 13) GROUND IN P-16 (OLD FIG. J.)

Since Pigmentation 75 has been extended to the point where it may not have sufficient anti-corrosive qualities and so that time may be saved it was thought advisable by Messrs. Coats, Kiekhoff and Carrick that the vehicles included in L.I.A. Paints Nos. 165-183, inclusive, should be ground with Pigmentation J as outlined below. The formulation of Pigmentation J is given on page 8, section A of the Data Book. Messrs. Diehlman and Shobe were not available for consultation. If they object to this part of the program, it may be omitted.

It is requested that Mr. Shobe make these paints. Details of formulation are the same as L.I.A. Paints No. 155 to 163 inclusive.

L.I.A. NO.	PIGMENTATION NO.	VEHICLE NO.	COMPOSITION OF VEHICLES
164	P-16(J)	V-19f (13f)	Same vehicle as used in L.I.A. Paint No. 156.
165	P-16(J)	V-19g (13g)	Same vehicle as used in L.I.A. Paint No. 156.
166	P-16(J)	V-19h (13h)	Same vehicle as used in L.I.A. Paint No. 157.
167	P-16(J)	V-19i (13i)	Same vehicle as used in L.I.A. Paint No. 158.
168	P-16(J)	V-19j (13j)	" " " 159.
169	"	V-19k (13k)	" " " 160.
170	"	V-19L (13L)	" " " 161.
171	"	V-19m (13m)	" " " 162.
172	"	V-19n (13n)	" " " 163.

MODIFICATION OF V-26 (OLD VEHICLE 20)

The members of the Committee felt that Vehicle No. 20 had made such a good showing at Bayville that it was worthy of more study. The paints outlined below, L.I.A. Paints Nos. 173-178 inclusive, constitute variations in V-26 (old No. 20).

L.I.A. Paints 173, 174, 175 are to be ground in Pigmentation P-75 given above.

L.I.A. Paints 176, 177 and 178 are to be ground with Pigmentation P-16(J).

It is suggested these paints to be prepared by the Eagle-Picher Lead Co.

The viscosity should be 70-75 KU, taken after the paint has stood twenty-four hours.

The PV of these paints should be 30, but, should the paints with a PV of 30 have excessive gloss, the PV may be increased to 35.

A one pint sample of each paint should be prepared and sent to Mr. Diehlman who will prepare these for shipment to the North Florida Test Station, Daytona Beach, Florida.

The varnishes should be cooked to 60% solids. Thinning should be done with a 50:50 mixture of Solvesso Nos. 2 and 3.

The directions for formulation of V-26 (old vehicle 20) may be found on pages 11 & 12, section B of the Data Book. Only the variations in the vehicle formulation are noted below.

The formulation of Pigmentation J is given on page 2, section A of the Data Book.

L.I.A. PAINT NO.	PIGMENTATION NO.	VEHICLE NO.	COMPOSITION OF VEHICLE
173	P-75	V-26d	40% by wt. medium linseed oil alkyd (GE2454) 35% phthalic anhydride; 60% by wt. LV-268 same except it is to be an 18 gal. length.
174	P-75	V-26e	40% by wt. medium linseed oil alkyd (GE2454), 35% phthalic anhydride; 60% modified LV-268 used in V-26d.
175	P-75	V-26f	40% by wt. medium linseed oil alkyd (GE2454) 35% phthalic anhydride; 60% modified LV-268 used in V-26d.
176	P-16(J)		Same vehicle as used in L.I.A. 173.
177	P-16(J)		" " " 174.
178	P-16(J)		" " " 175.

Red Lead Technical Committee — EXHIBIT 9
Meeting Minutes

The following standards should be included in this series of tests:

52-R-18, October 15, 1942
52-R-18, December 1, 1945
53-MC-29, September 21, 1945
57-MC-23, August, 1943
L.I.A. Joint No. 6 - R-16(J), V-19 (old no. 13).
L.I.A. Joint No. 6 - R-16(J), V-26 (old no. 20).