



Address 100 Barr Harbor Drive
PO Box C700
W. Conshohocken, PA
19428-2959 | USA

Phone 610.832.9500
Fax 610.832.9666
Web www.astm.org

Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

Chairman: KENNETH O. HENDERSON, Cannon Instrument Co., 2139 High Tech Road, State College, PA 16803, (814) 353-8000, Fax: (814) 353-8007, e-mail: kenohenderson@worldnet.att.net
First Vice-Chairman: BEN R. BONAZZA, 3457 WOODVALLEY DRIVE, LAPEER, MI 48446 (810) 664-6769 e-mail: bbonazza@charter.net
Second Vice-Chairman: JANET L. LANE, ExxonMobil Research & Engrg., 600 Billingsport Rd, Paulsboro, NJ 08066-0480 (856) 224-3302, Fax: (856) 224-3616, e-mail: janet.l.lane@exxonmobil.com
First Secretary: RALPH A. CHERRILLO, Shell Global Solutions (US) Inc., Westhollow Tech Ctr., 3333 Highway 6 South, Houston, TX 77082 (281) 544-8789, Fax: (281) 544-8150, e-mail: ralph.cherrillo@shell.com
Second Secretary: MICHAEL A. COLLIER, Petroleum Analyzer Co. LP, PO Box 206, Wilmington, IL 60481, (815) 458-0216, Fax: (815) 458-0217, e-mail: Michael.collier@paclp.com
Staff Manager: DAVID R. BRADLEY, (610) 832-9681, Fax: (610) 832-9668, e-mail: dbradley@astm.org

April 29th, 2010

Reply to:
Galen Greene
The Lubrizol Corporation
29400 Lakeland Blvd.
Wickliffe, OH 44092
(440) 347-2394
(440) 347-2878 (FAX)
ggre@lubrizol.com

ASTM D02.B0.03 L-37 Surveillance Panel
Members and Guests:

Attached for your review and comment are the unconfirmed minutes of the:

- **April 20th, 2010 L-37 Surveillance Panel Meeting**

Please direct any corrections or comments to my attention.

Sincerely,

Galen Greene, Chairman
L-37 Surveillance Panel

Report of Meeting
L-37 Surveillance Panel Teleconference

April 20th, 2010

Attendees:

Dana -	Miller , Guzikowski, Pappademos, Ramsey
SwRI -	Koehler
Lubrizol -	Greene , Graziano, Hamilton
Afton -	Koglin
Intertek-Parc -	Smith
TMC -	Lind , Parke
Chevron -	Haire
Arvin Meritor	McGlone
AAM	Dharte

Voting Members in **BOLD**

The meeting was called to order at 10:30 am EST.

1.0 Summary of Meeting Discussions

1.1 Review of Gear Set Analysis

Mr. Guzikowski presented a report (attachment 1) which explored differences in shot peening and lapping between the V1L417 successful batch and the V1L500 severe batch. He commented that the V1L417 looked like Dana standard shot peening (which is 150% coverage) and light to normal lapping. The V1L500 pinion appeared to be over peened and very lightly lapped. Joe commented that he saw no reason to not recommend standard Dana processing for future hardware.

Mr. Guzikowski then commented that the differences in shot peening should have no effect on the pitting/spalling performance of the hardware. As far as the differences in lapping, Mr. Miller commented that the V1L500 pinion appeared to not be lapped as full at the heel (noting that this is just a sample size of one) and that the tooth damage we have seen has been occurring at the mid section of the tooth.

1.2 Discussion of how to Proceed with the Manufacture of a New Pilot Batch of Lubrited Hardware

There was then a discussion regarding how to proceed with the next pilot build. The panel discussed options such as making the new pilot batch match the V1L417 pinion, which would mean less shot peening and more lapping. There was a comment that both V1L417 and V1L500 had the same shot peening and lapping targets. This may mean we are within manufacturing variability. After further discussion, no final decision was made on how to proceed.

Mr. Pappademos commented that if we could procure some material that falls within the new Dana specification on DI (ideal diameter), our chances of success would be much higher. He continued and said that the higher the DI of the material, the better the performance of the part. The new specification on DI is 2.4 to 2.7. The V1L500 (2008) was 2.1, the V1L417 (2005) was 2.35, the V1L351 (2004) was 2.55 and 8822 material. The recently procured batch known as V1L528 (2009) is 2.21 DI. The panel reviewed that this was discussed around the time of the procurement of the 2009 V1L528 hardware. At that time, the labs and Dana agreed that a lot of steel meeting the old specification of 2.1 to 2.6 would be acceptable.

There was some discussion around this topic but the meeting had already run well over its scheduled time, therefore it was decided to postpone further discussion for the next meeting.

1.3 Other Agenda Items

Discussion of an industry survey on lubrifying and a final decision of how to proceed with shot peening, lapping, and lubrifying was also on the agenda, but time had run out and discussion on these topics was postponed to the next meeting.

2.0 Adjournment

Meeting adjourned at 12:45 pm EST

Respectfully submitted,

Galen Greene
L-37 Surveillance Panel Chairman



**MATERIALS ENGINEERING LAB REPORT
DANA HOLDING CORPORATION
3939 TECHNOLOGY DRIVE.
MAUMEE, OH 43537**

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE CONSENT OF THE MATERIALS ENGINEERING DEPARTMENT..

LAB NO.	: 2010-0351	PART NO.	: 060-GP-105
PART NAME	: PINION - HYPOID DRIVE FIN	PRINT REV.	: F
REP. TITLE	: GEAR, PINION	MODEL	: 60
MARKINGS	: CH DANA D5 060GP105 41 7 V1L500 JH DANA D5 060GP105 41 7 V1L417 336HG	HEAT CODE	: V1L417 & V1L500
MATERIAL	: STEEL, SAE 8625 PER ES-PM-FW0001	MFG. DATE	: UNKNOWN
VENDOR	: DANA - FORT WAYNE PLANT	SAMP. REQ	: N/A
CUSTOMER	: ASTM (SWRI, LUBRIZOL, AFTON)	VIN	: N/A
TAR NO.	: NONE	MAR NO.	: MAR-4723
JOB NO.	: N/A	REC'D DATE	: 04/09/10
TEST ENG.	: N/A	REP. DATE	: 04/13/10
REQ. BY	: JOE GUZIKOWSKI	NO. OF PAGES	: 3
REP. BY	: JOE GUZIKOWSKI		

ADD. COMMENTS :

COPIES : GREG FETT, KENNY MILLER

REQUEST : EXAMINE PINIONS TO DETERMINE IF THERE IS AN APPARENT DIFFERENCE IN SHOT PEENING

REASON : THE ASTM TEST LABORATORIES HAVE NOT BEEN ABLE TO USE THE LUBERITED V1L500 GEARSETS THAT HAVE BEEN PRODUCED FOR THEIR TEST MATRIX. THIS BATCH WAS TO BE A COPY OF THE V1L417 GEARSETS MANUFACTURED IN 2005, WHICH PERFORMED VERY WELL. THE ASTM LABORATORIES VISUALLY OBSERVED A DIFFERENCE IN THE APPEARANCE OF THE PINIONS. THE COTC MATERIALS LAB WAS ASKED TO DOCUMENT ANY DIFFERENCES OBSERVED.

RESULTS :

VISUAL INSPECTION

ONE PINION FROM THE 2005 V1L417 HEAT OF MATERIAL AND ONE PINION FROM THE 2009 V1L500 HEAT OF MATERIAL WERE EXAMINED.

THE V1L417 PINION HEAD EXHIBITS OVERLAPPING DIMPLING ON THE TOOTH FLANK AND ROOT THAT IS CONSISTENT WITH A NORMAL SHOT PEENED PINION HAVING GOOD COVERAGE. THE TOOTH FLANKS HAVE THE EXPECTED APPEARANCE OF LIGHT TO NORMAL LAPPED SURFACES STILL EVIDENT AT BOTH THE HEEL AND TOE ENDS.

THE V1L500 PINION HEAD EXHIBITS CONSIDERABLE DIMPLING ON THE TOOTH FLANKS AND ROOT THAT IS CONSISTENT WITH PARTS THAT HAVE BEEN SHOT PEENED FOR AN EXTENDED LENGTH OF TIME. THE TOOTH FLANKS HAVE THE APPEARANCE OF BEING ONLY SLIGHTLY LAPPED WITH THE LAPPING EXTENDING ONLY FROM THE MID-TOOTH TOWARDS THE TOE.

CONCLUSION :

THE V1L417 PINION THAT WAS SUBMITTED FOR EXAMINATION EXHIBITED DIMPLING THAT IS CONSISTENT WITH A STANDARD DANA SHOT PEENED PART. THE TOOTH FLANKS HAVE THE EXPECTED APPEARANCE OF LIGHT TO NORMAL LAPPED SURFACES.

THE V1L500 PINION THAT WAS SUBMITTED FOR EXAMINATION APPEARS TO HAVE BEEN SHOT PEENED FOR AN EXTENDED PERIOD OF TIME, AS EVIDENCED BY THE MORE SEVERE DIMPLING. IT ALSO APPEARS TO HAVE RECEIVED MUCH LESS LAPPING THAN DID THE V1L417 PINION.

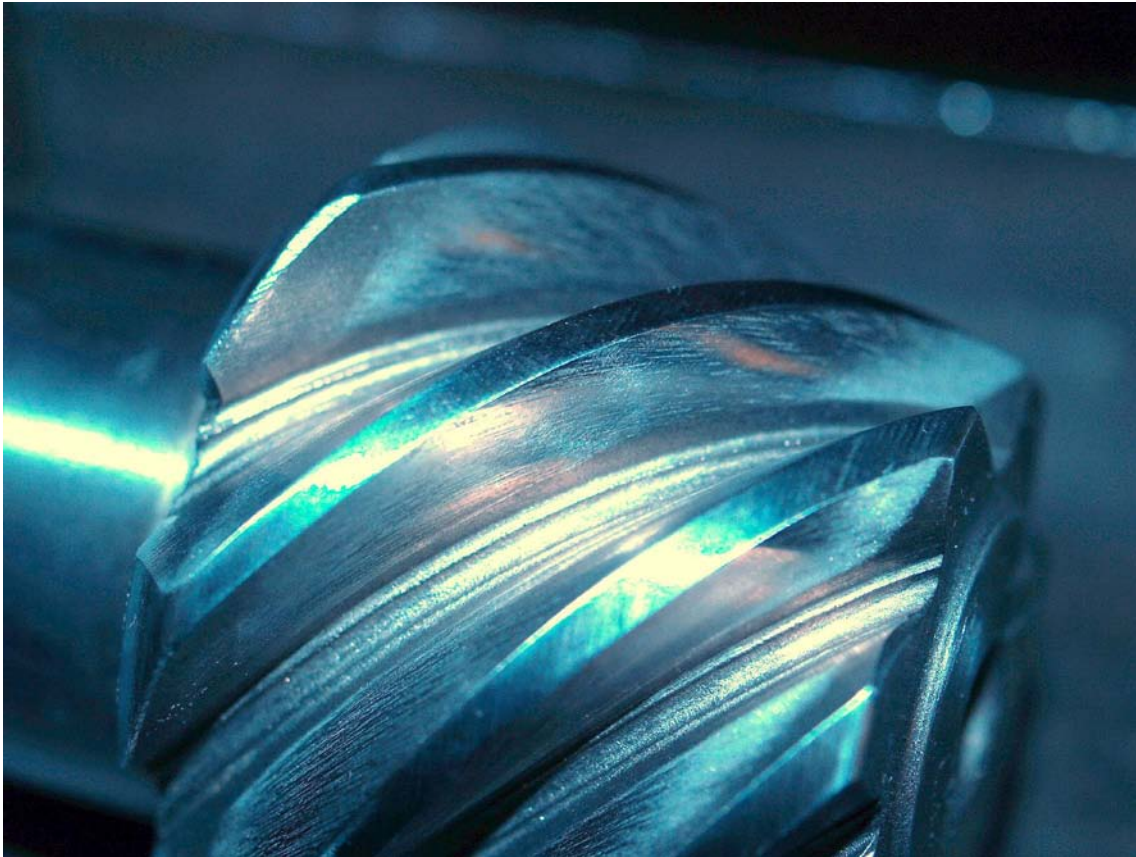


FIGURE 1 OVERALL MACRO OF V1L417 PINION HEAD



FIGURE 2 OVERALL MACRO OF V1L500 PINION HEAD

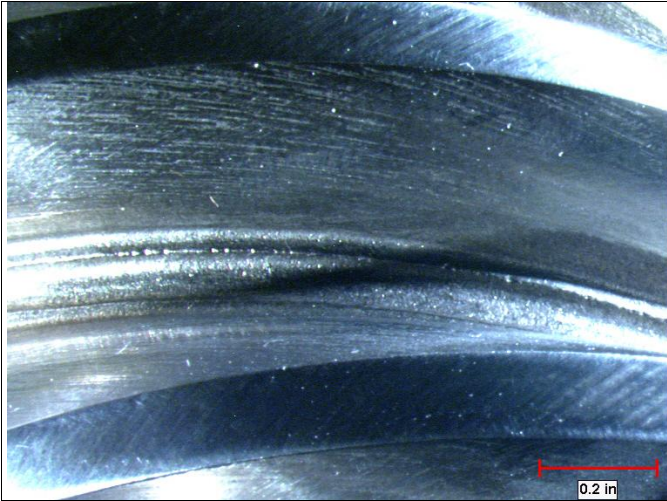


FIGURE 3 V1L417 MID-TOOTH FLANK AND ROOT

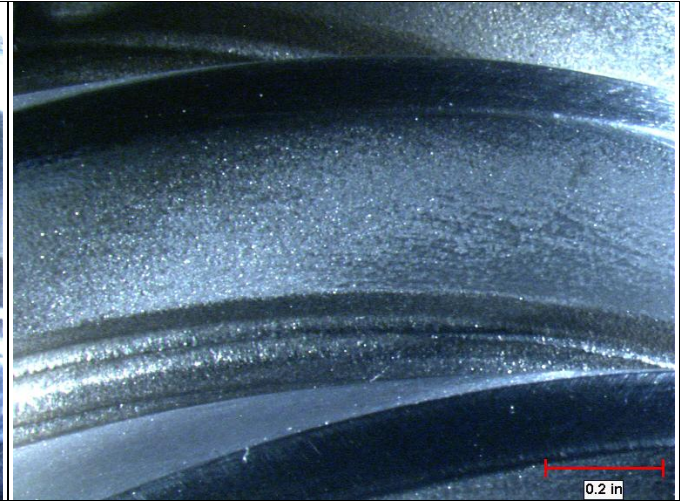


FIGURE 4 V1L500 MID-TOOTH FLANK AND ROOT

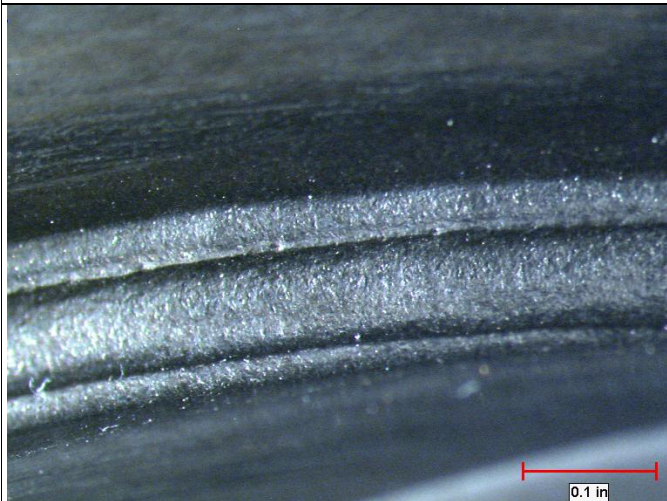


FIGURE 5 V1L417 MID-TOOTH ROOT

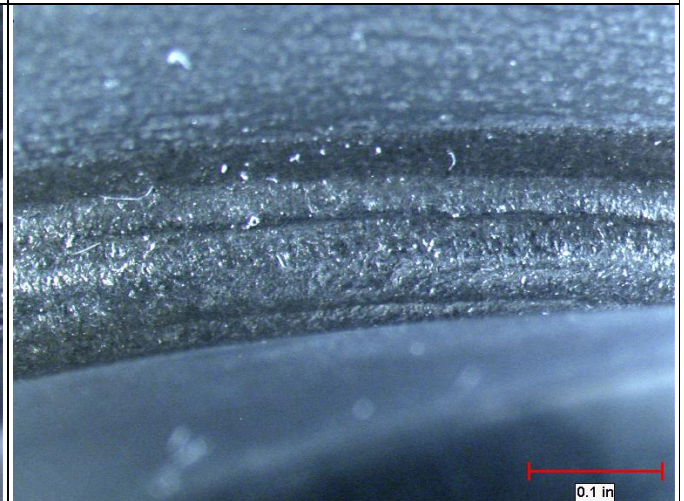


FIGURE 6 V1L500 MID-TOOTH ROOT

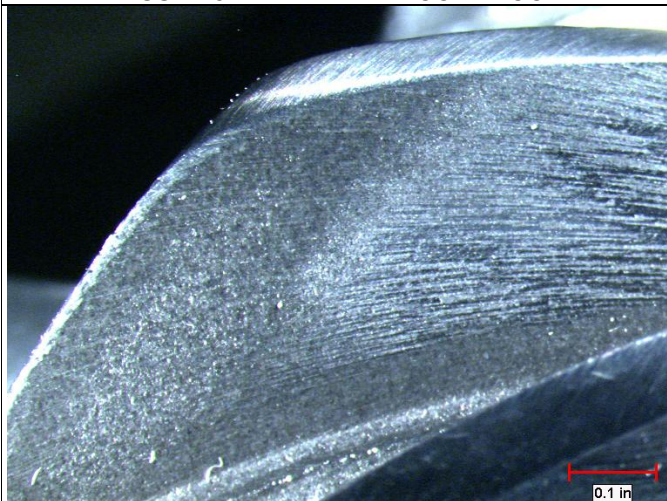


FIGURE 7 V1L417 HEEL TOOTH FLANK

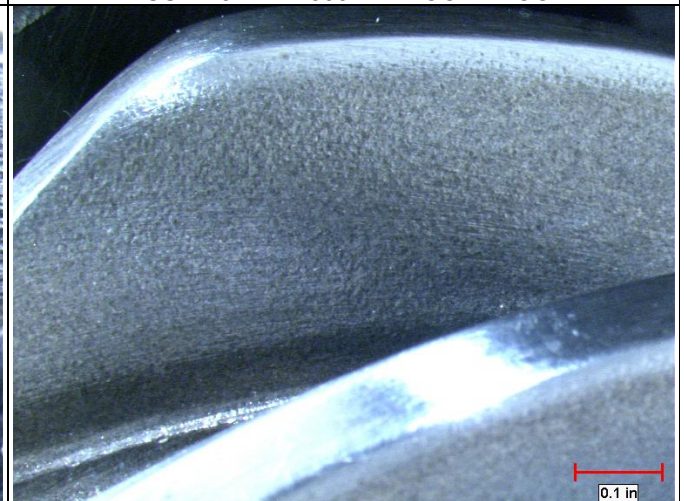


FIGURE 8 V1L500 HEEL TOOTH FLANK