

TO CHIEF S, file RME
xc: BROWN, HITE, THOMPSON
you might want
TO ME OJM FIELD

GENERAL DYNAMICS
Land Systems Division
P.O. Box 1901, Warren, Michigan 48090

GCW:il/85-30
12 February 1985

Inter-Office Memo

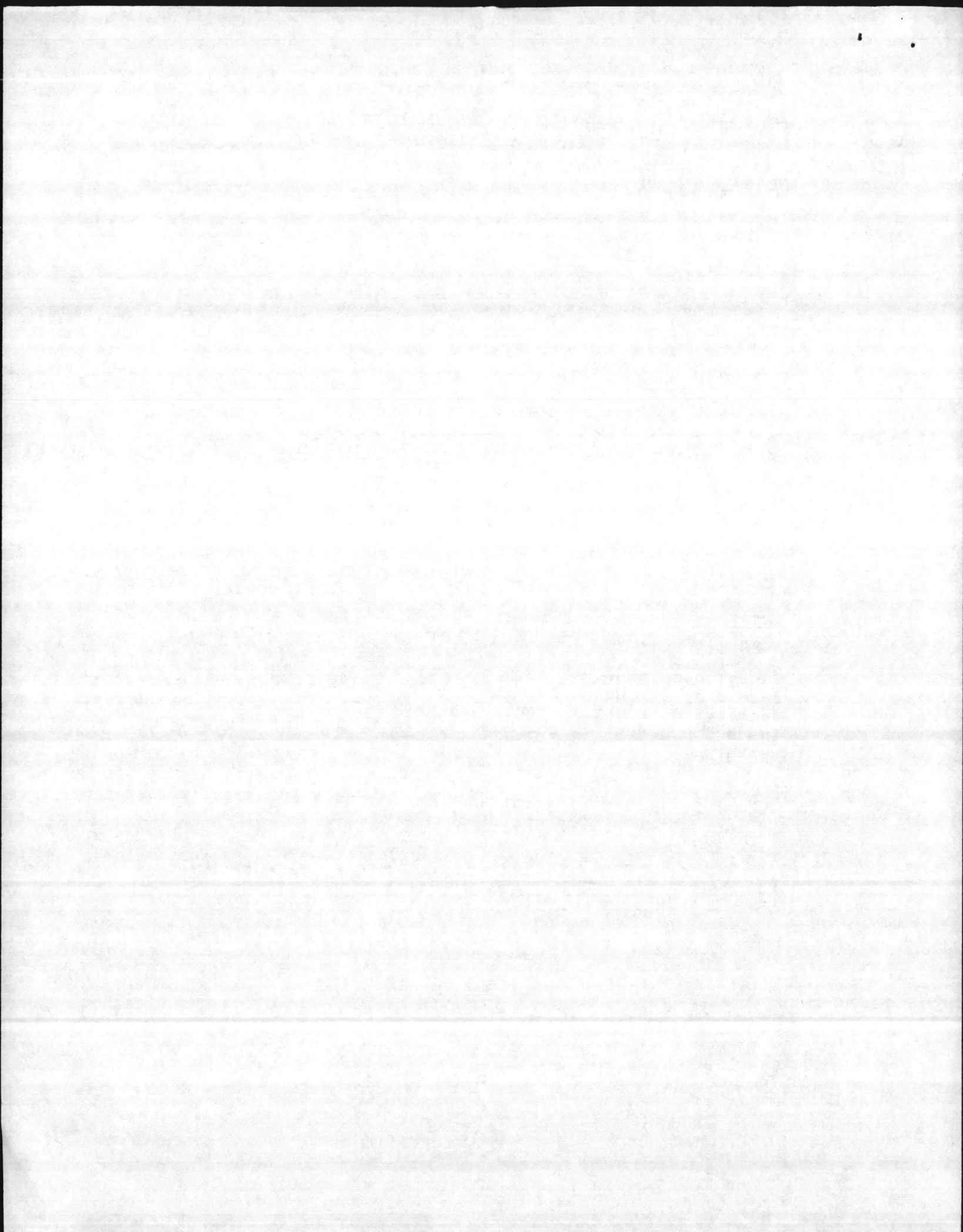
J. Rowland

To: R. M. Brayer
From: G. C. Weber
xc: J. C. Barnhardt, B. K. Radlick, D. G. Thorson,
K. A. Ziglar
Subject: In-Tank Fuel Pump Failures
Ref./Enc.: 1) I.O.M. from K. A. Ziglar (KAZ:il/85-15) to
J. C. Barnhardt dated 8 February 1985
2) I.O.M. from D. A. DeMello (85-63) to
G. C. Weber dated 5 Feb. 1985 on the same
subject

1. Reference 1 states Engineering's position relating to your comments to Reference 2 memo.
2. The problem does not have a fast correction but the failure rate can be reduced for an interim by electrically disconnecting the right in-tank fuel pump. This pump will be used in an emergency "to get home" or until the left fuel pump is repaired.
3. First available Airborne pumps for production will be July 1985 (120 per month), and with encouraged direction, to 300 per month by October of this year.
4. The basic Airborne electric motor design has been in the German Leopard tank for 10 years, with minimum failures noted, according to Airborne.

G. C. Weber
G. C. Weber

*Jan -
is this pump
qualified
17
cc J.S. McCuen*



GENERAL DYNAMICS

Land Systems Division

P.O. Box 1901, Warren, Michigan 48090

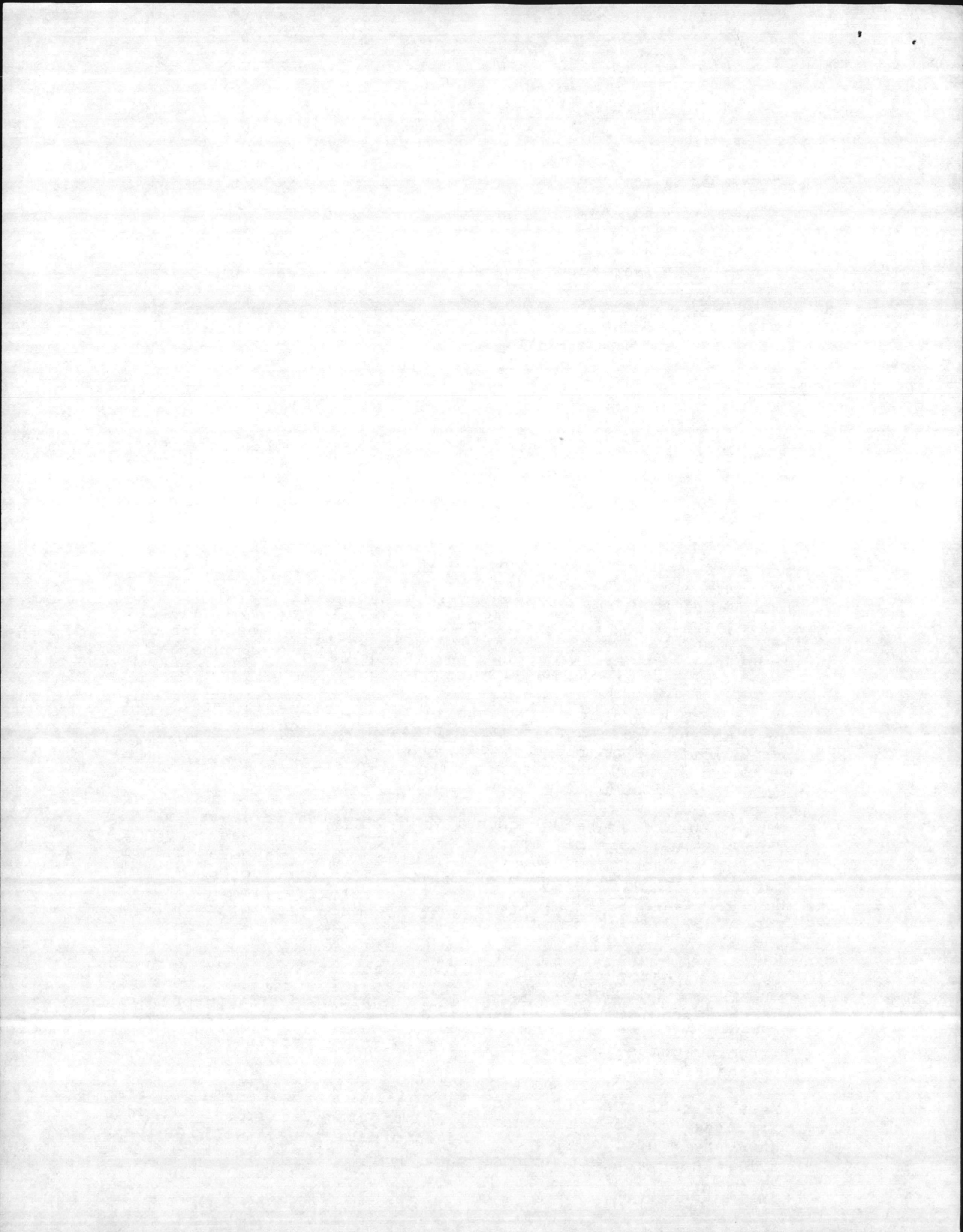
Inter Office Memo

KAZ:il/85-15
8 February 1985

To: J. C. Barnhardt
cc: G. C. Weber
From: K. A. Ziglar
Subject: In-Tank Fuel Pump Failures

1. We have recently received a number of communications from various field locations indicating a continued high frequency of failures of the in-tank fuel pump. All of these failures seem to be with the TRW unit and are occurring at 200-300 hours of operation.
2. The pump is spec'd for 1,000 hours of durability but has never consistently demonstrated this capability. The 200-300 hour limit was demonstrated during IPT and has been repeated during special tests recently concluded by TRW. We had originally understood that the pump had achieved 1,000 hours of endurance but when visiting TRW, learned that the pump had been repaired at 400 hours into the test.
3. It is apparent that the TRW unit will continue to fail at an unacceptable rate both to specification and to the customer. We do not have confidence that our efforts to work with TRW to improve the durability will be successful in achieving a satisfactory pump life.
4. At the last procurement council, which we believe was for 7th year and possibly spares, the Airborne pump was chosen as the new source of supply. This unit has passed a qualification test, including durability, and appears to be better. However, our overall experience is still very limited and we cannot be totally confident about how much this will improve the pump failure rate.
5. It is requested that you lend your backing to approving an M1 STS work directive which would provide additional testing of the Airborne pump. Also, provide direction on future directions with the customer to give priority to placing Airborne pumps in the supply system to replace the TRW units as they fail.
6. We will continue to collect failure data and information from Airborne to support technical and program decisions. If you have any specific ideas on the information that would be helpful, please contact George Weber.

K. A. Ziglar
K. A. Ziglar



GENERAL DYNAMICS

Land Systems Division

P.O. Box 527, Warren, Michigan 48090

Inter-Office Memo

DAD/85-63
5 February 1985

To:

G. Weber

cc:

W. F. Barnes, R. Brayer, D. E. Brown, F. Bryan,
B. DeFillipi, B. E. Ewing, L. Felder, R. Fey,
D. Foglesong, N. W. Hammes, R. G. Hill, C. Payne,
N. Sparks, V. Versage

Subject:

In-Tank Fuel Pump Failures

Enclosure:

- 1) IOM, CC/85-58, 5 February 1985
- 2) Computer Printout

1. Attached as enclosure 1 is an IOM from Mr. S. Stein, our Reliability Field Service Representative (FSR) at Vilseck, FRG, concerning the In-Tank Fuel Pump failure problem.
2. In this IOM, Mr. Stein gives some general data and requests information concerning what is being done to resolve the In-Tank Fuel Pump problem.
3. Enclosure 2 is a copy of the computer printout covering data reported concerning In-Tank Fuel Pumps on European Weekly Progress Reports for 1984 from Europe. It covers 103 known failures in Europe. It must be stated that we no longer have FSR's in many units. Therefore, other failures that may have occurred have gone unreported.
4. Request you investigate the In-Tank Fuel Pump problem and provide International Field Operations a response concerning the problem that can be telecopied to Europe no later than 15 March 1985.

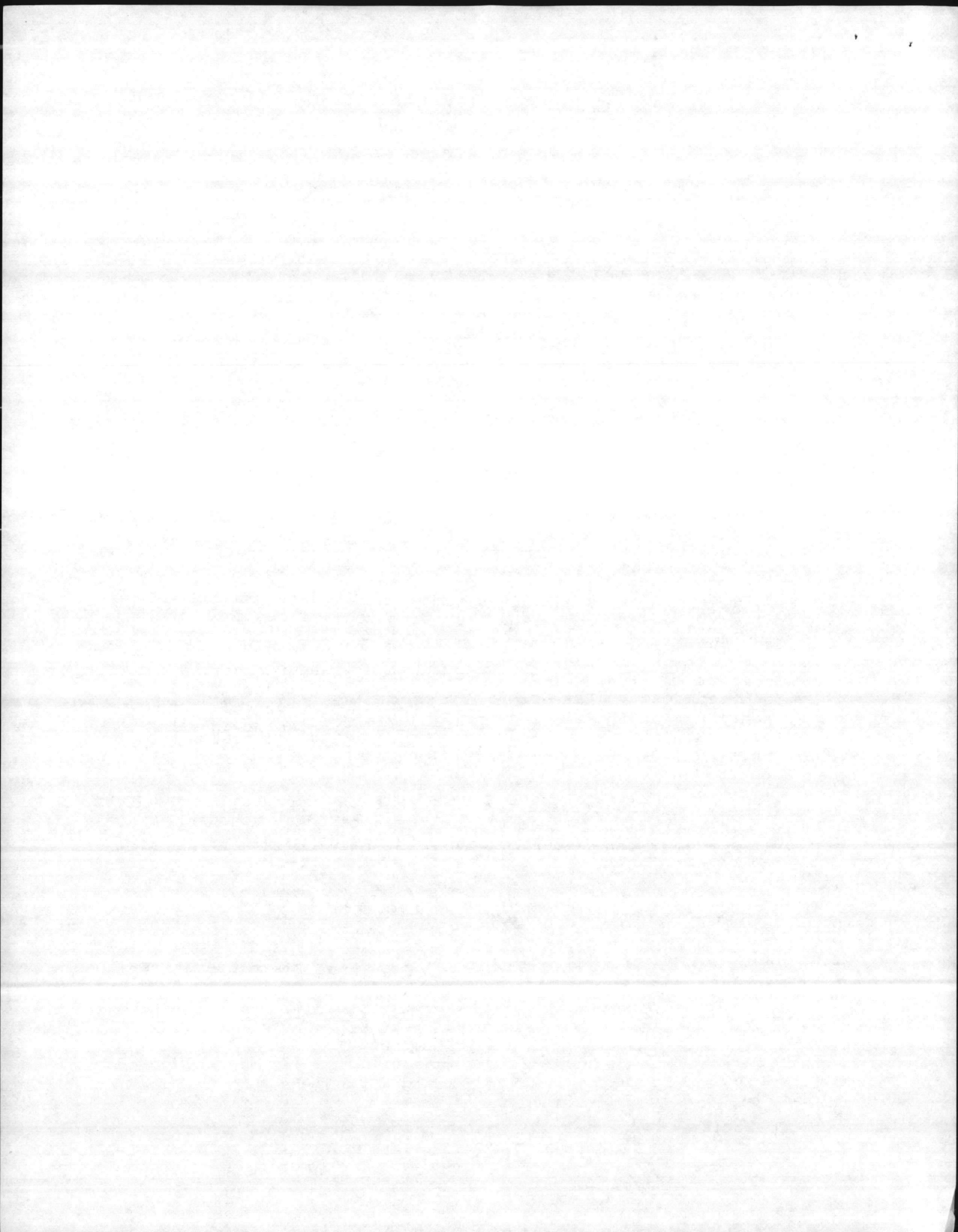
*Geo -
Give an answer
describing the problem
& recommended action
in 1 week*

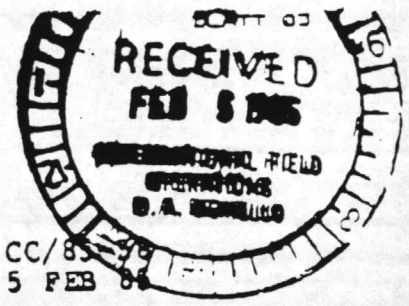
for N C Bozick
D. A. DeMello
Chief
International Field Operations

[Signature]
J. J. McCuen
Manager
Field Operations

N. C. Bozick/mks

F/u 2/15





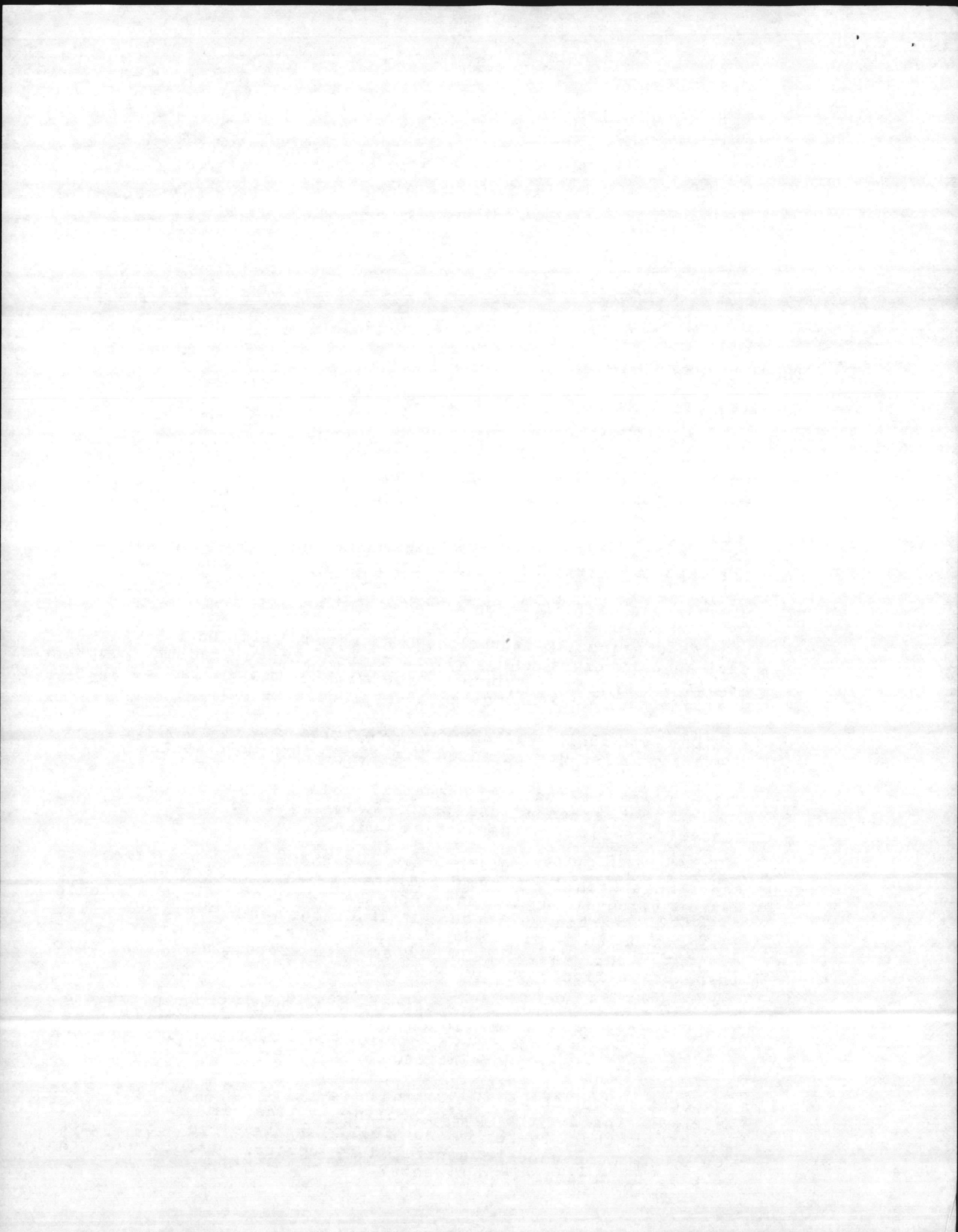
GENERAL DYNAMICS
Land Systems Division
P.O. Box 527, Warren, Michigan 48090

CC/85
5 FEB 85

TO: C. CROOMS
XC: D. DEMELLO, COL. DONOVAN, C. PAYNE
FROM: S. STEIN
SUBJECT: IN-TANK FUEL PUMP FAILURES

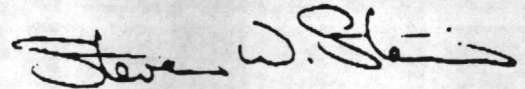
I COPY TO : I
I R.G. HILL I
I D.E. BROWN I
I J.J. McCUEN I

1. GDLS-PSR's assigned to the three (3) squadrons of the 11th Armored Cavalry Regiment have reported numerous failures of in-tank fuel pumps (P/N 12285597). Initial reports of fuel pump failures are being received 10 to 12 months after vehicle fielding. The greatest number of fuel pump failures are reported after 12 to 15 months of vehicle operation.
2. Discussions with GDLS-PSR's indicate that:
 - o Maintenance personnel on occasion wait until vehicle semi-annual or annual services to change faulty pumps. Repair delays are common if the right pump fails; because, the powerpack must be pulled to replace this pump.
 - o Due to fuel availability, vehicles may be required to operate on DF-2 for extended periods during cold weather.
3. These points raise the question, will vehicle operation on one pump or extended use of DF-2 during cold weather reduce the service life of the in-tank pumps.
 - o Use of DF-2 during cold weather does not seem to contribute greatly to pump failure; as, 1/11th ACR fuel pumps were failing in August and September whereas 2/11th ACR pump failures started to occur in December and January. The 3/11th ACR fuel pumps do not have a high failure rate at present; but, several vehicles are reporting fuel pump inoperative lights on.
 - o Extended vehicle operation with only one operational in-tank fuel pump seems to reduce the pump service life; as, numerous reports have been received of vehicles having both in-tank fuel pumps inoperative.
4. Inspection of failed pumps has revealed a dry soot like material inside the pump housing. The dry pump "soot" indicated that there is no fuel leakage into the pumps. Could the pump soot be generated by unusual wear between the pump motor armature and brushes?



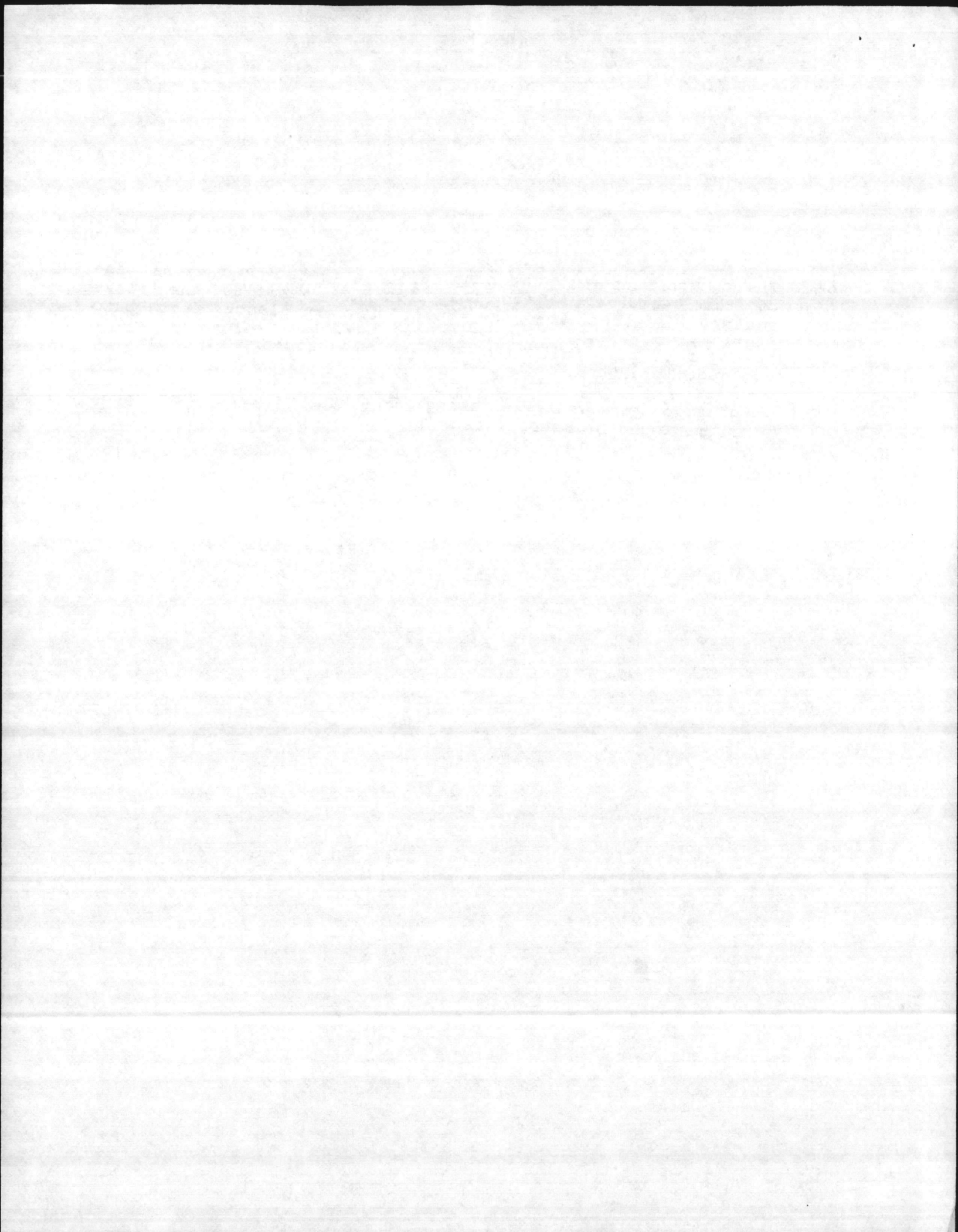
CC/85-58
5 FEB 85
PAGE 2

5. The common factor in the pump failures is the operational age of the vehicles. With the 11th ACR vehicles the first squadron fielded was the first to experience fuel pump problems, presently, the second fielded 11th ACR squadron is having fuel pump failures and the third squadron is starting to report problems.
6. Information on what is being done to resolve fuel pump problems would be appreciated.



Steven. W. Stein
Reliability Field Engr.
Vilseck, Germany

SS/mn



**THE FOLLOWING
DOCUMENT IMAGE(S)
WERE POOR QUALITY IN THE
ORIGINAL PAPER FORMAT**

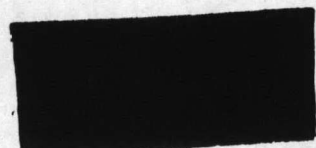
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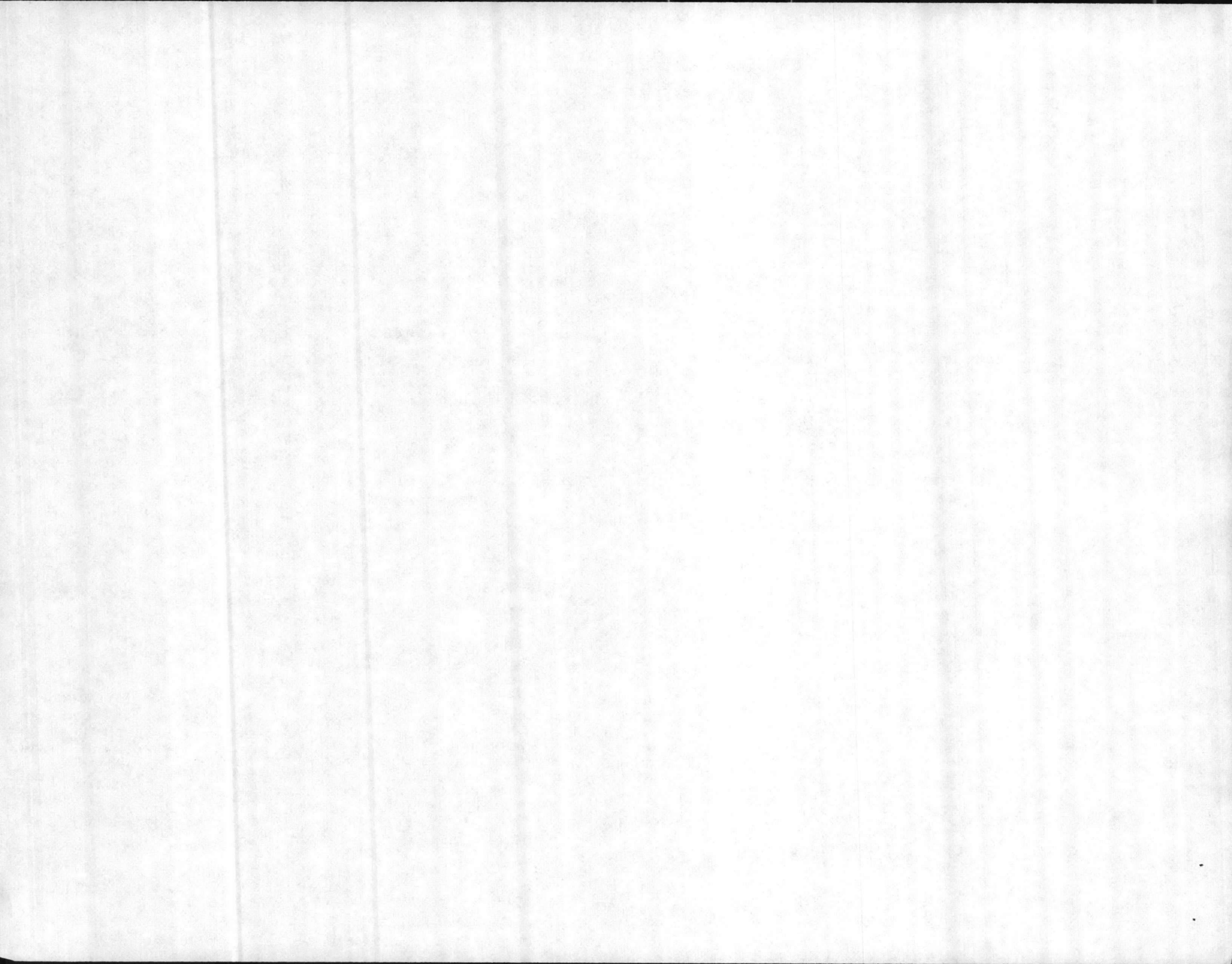
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New Bern, NC
1-888-622-4425
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PAGE 1

FIELD DEFLECTIONS REPORT

BLACK BOX CODE CONTROL NUMBER MOD NUMBER ECF NUMBER LOCATION	NOMENCLATURE PART OR ASN NUMBER OLD SERIAL NUMBER NEW SERIAL NUMBER ID NUMBER	AREA	VEH TYPE VEH NUMB VEH F.M VEH HRS TEST/PROD	PROBLEM DESCRIPTION REMARKS AUTHOR/UNIT
A7A1 001098	FUEL PUMP 12285597 465 3725 05/31/84	I	M1 L 0184 F	REPLACED LEFT REAR FUEL PUMP. 3/6/84
A7A1 001475	FUEL PUMP 12285597 1243 3666 01/04/84	I	M1 L 0200 P	REPLACED LEFT REAR 1/3 ID
A7A1 000826	FUEL PUMP 12285597 573 4653 03/29/84	I	M1 L 0203 F	REPLACED LEFT REAR. 1/3 ID
A7A1 000827	FUEL PUMP 12285597 573 3653 03/29/84	I	M1 L 0203 F	REPLACED RIGHT REAR PUMP. 1/3 ID
A7A1 001441	FUEL PUMP 12285597 573 3653 03/29/84	I	M1 L 0203 F	1/3 ID
A7A1 0054	FUEL PUMP 12285597		M1 L 0208	

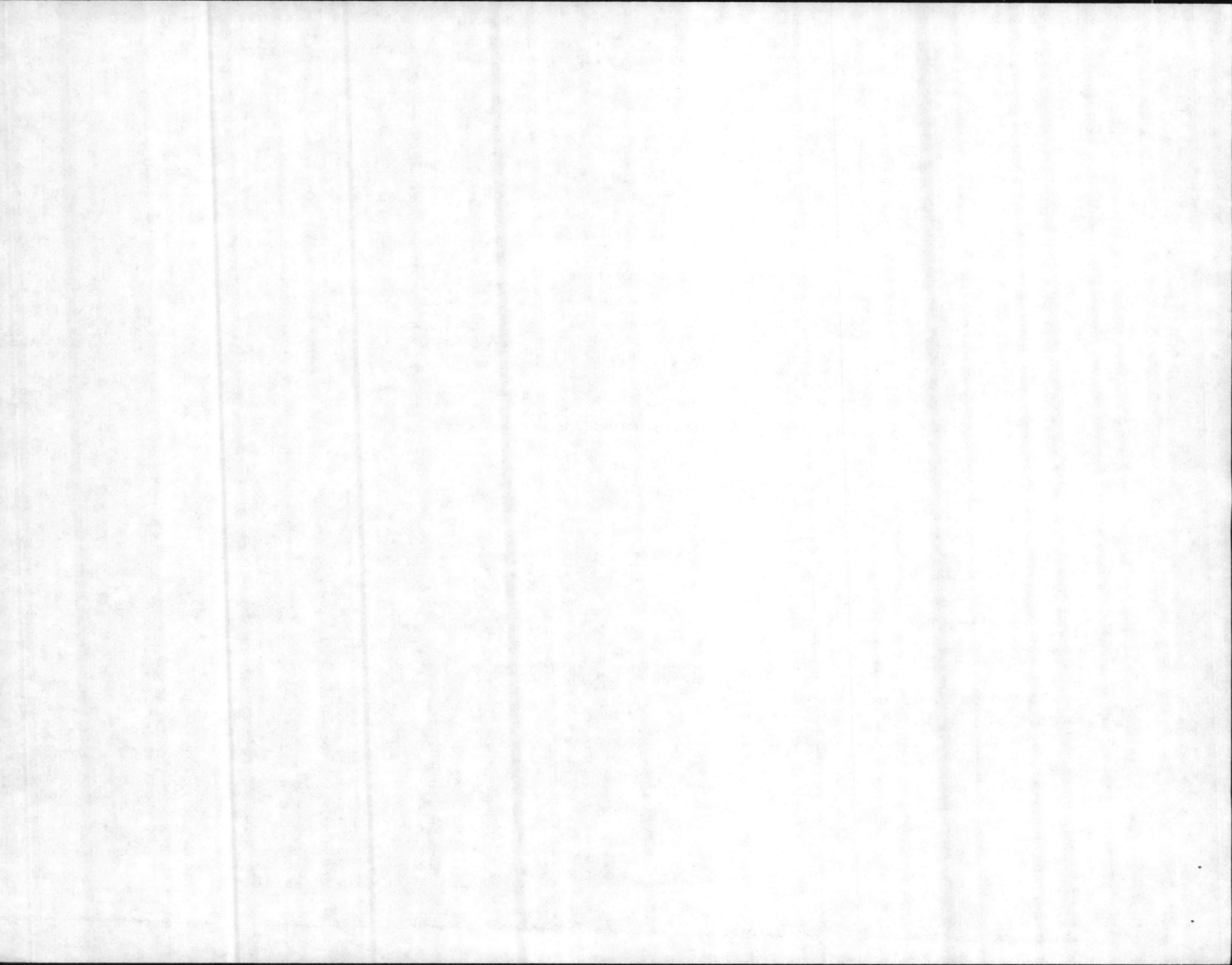




FIELD OPERATIONS REPORT

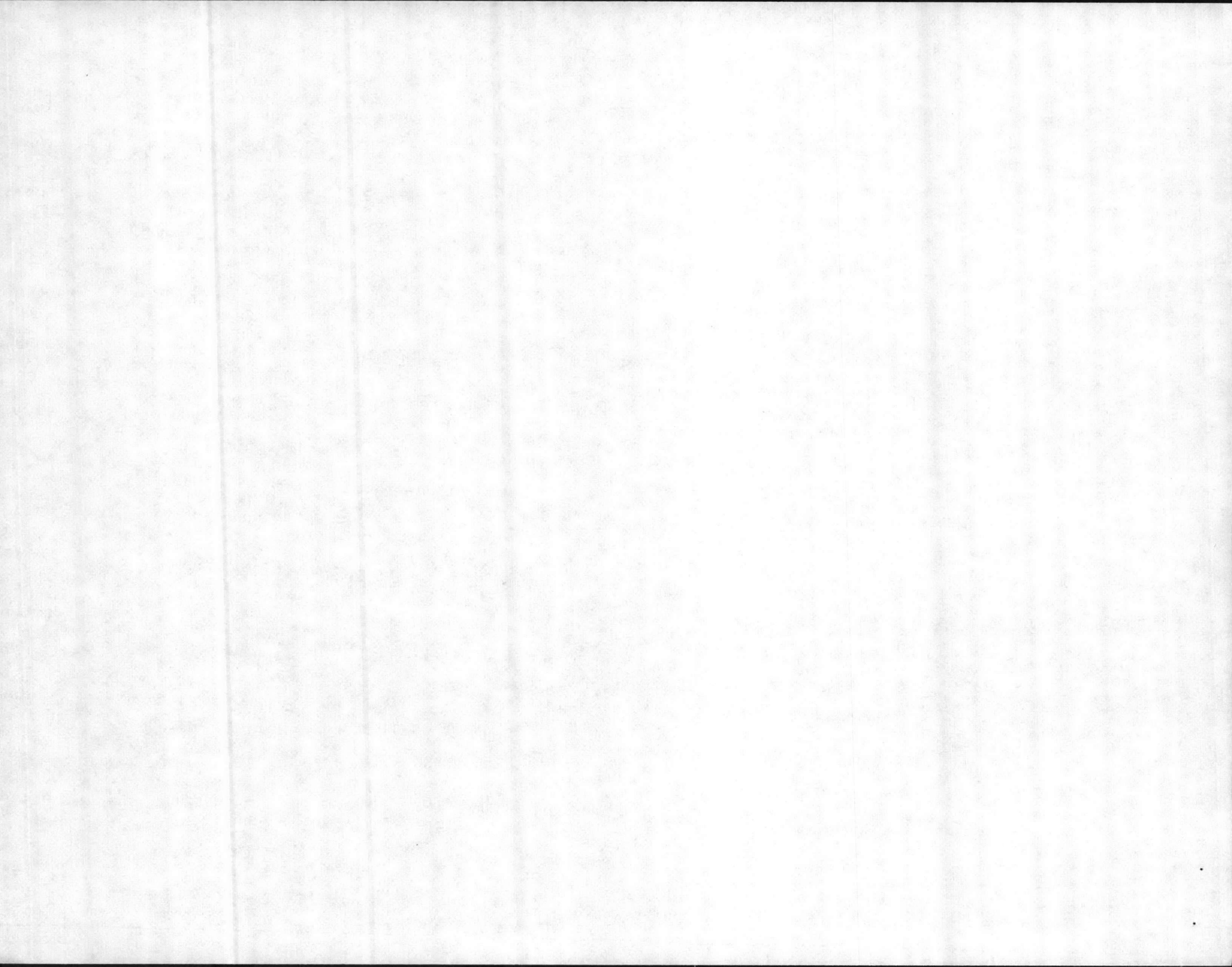
PAGE 98

WGE	03/12/84	I	F	2/64 AR
A7A1 001209	FUEL PUMP 12285597		M1 L-0210	
WGE	04/16/84	I	F	REPLACED RIGHT REAR 2/64 AR
A7A1 000309	FUEL PUMP 12285597 R-430 R-507		M1 L-0213	
WGE	02/24/84	I	F	REPLACE RIGHT REAR. 1/3 ID
A7A1 000300	FUEL PUMP 12285597 L-540 L-526		M1 L-0213	
WGE	02/24/84	I	F	REPLACED LEFT REAR. 1/3 ID
A7A1 001135	FUEL PUMP 12285597 453 1032		M1 L-0216	
WGE	06/05/84	I	F	REPLACED RIGHT REAR. 1/3 ID
A7A1 001099	FUEL PUMP 12285597 521		M1 L-0216	
WGE	05/31/84	I	F	REPLACED LEFT REAR PUMP. 3/69 AR
A7A1 000291	FUEL PUMP 12285597 479 600		M1 L-0220	
WGE	02/21/84	I	F	REPLACED RIGHT REAR. 2/64 AR
A7A1 001251	FUEL PUMP 12285597 3814 460		M1 L-0223	
WGE	04/11/84	I	F	REPLACED RIGHT REAR 1/3 ID
001087	FUEL PUMP 12275597 396 743		M1 L-0224	
WGE	05/29/84	I	F	3/69 AR
	FUEL PUMP		M1	



FIELD OPERATIONS REPORT

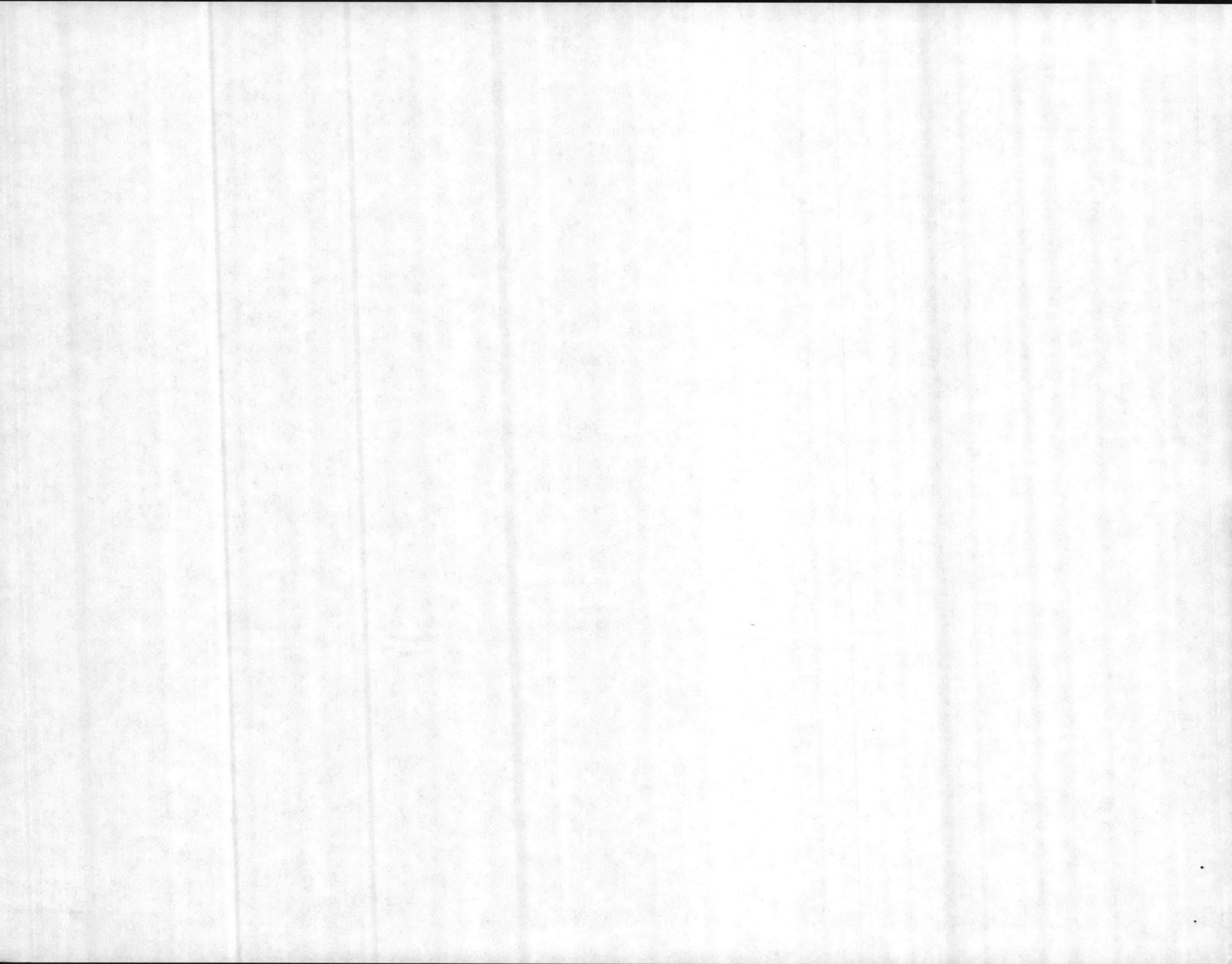
WGE	04/17/84	1	P	1/3 ID
A701 001201	FUEL PUMP 12285597 1112 594		M1 L-0231	
WGE	04/13/84	1	F	REPLACED RIGHT REAR 1/3 ID
A701 001252	FUEL PUMP 12285597 518 596		M1 L-0234	
WGE	04/11/84	1	F	REPLACED RIGHT REAR 1/3 ID
A701 001101	FUEL PUMP 12285597 2193 0854		M1 L-0242	
WGE	05/31/84	1	F	3769 6E
A701 000939	FUEL PUMP 12285597 0570 3034		M1 L-0248	
WGE	05/04/84	1	F	1/3 ID
A701 000902	FUEL PUMP 12285597 617 3943		M1 L-0257	REPLACED LEFT REAR FUEL PUMP.
WGE	04/24/84	1	F	1/3 ID
A701 000362	FUEL PUMP 12285597 656 1235		M1 L-0258	CB 12 KEPT TRIPPING SO REPLACED PUMP (LEFT REAR).
WGE	02/07/84	1	F	1/3 ID
A701 001214	FUEL PUMP 12285597 721 4010		M1 L-0258	
WGE	04/17/84	1	F	REPLACED RIGHT REAR 1/3 ID
A701 001217	FUEL PUMP 12285597 609 4039		M1 L-0260	
WGE	04/18/84	1	F	REPLACED RIGHT REAR 1/3 ID
			M1	



FIELD OPERATIONS REPORT

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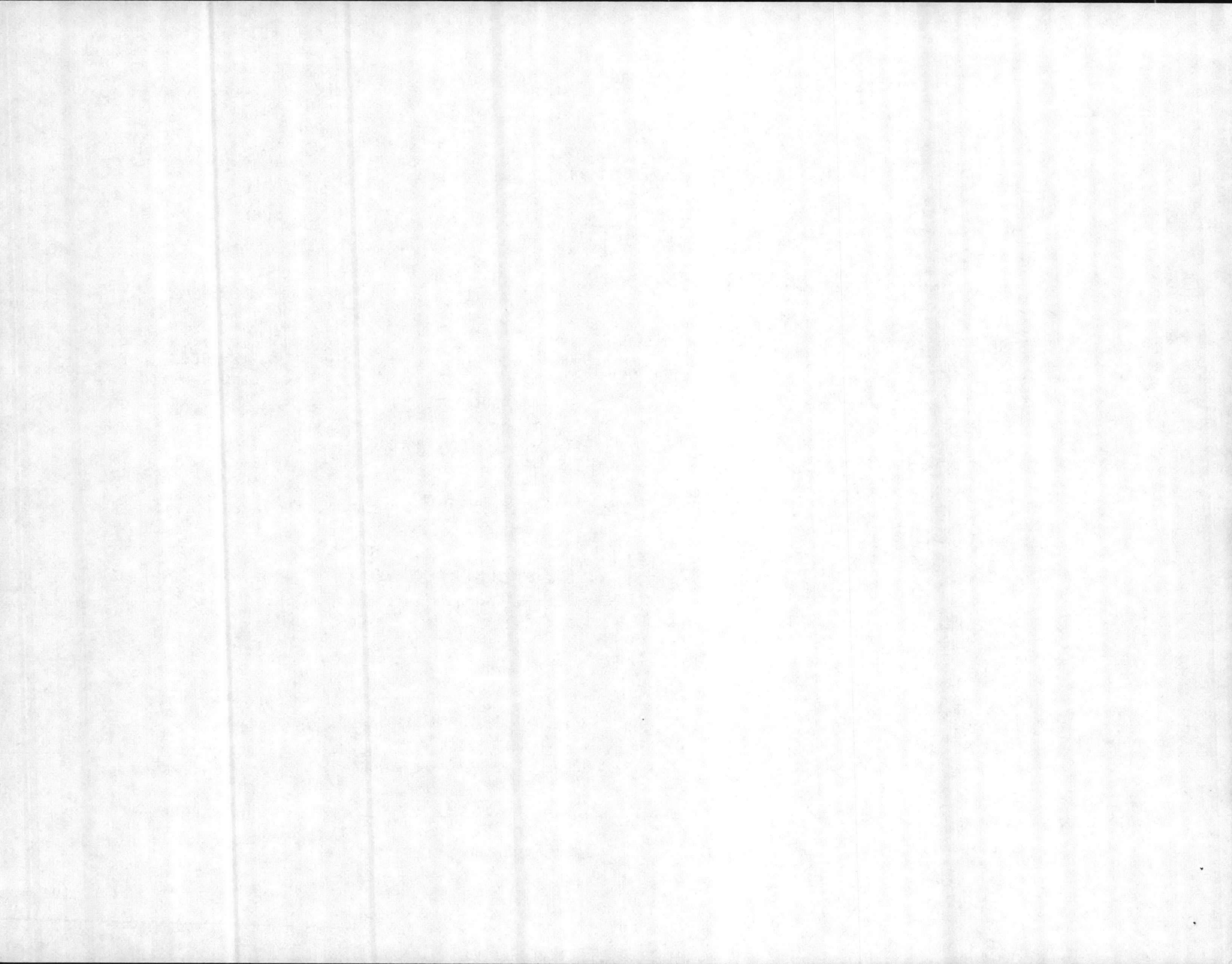
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A7A1 001246	FUEL PUMP 12285597 670 4001 04/23/84		M1 L-0270	REPLACED RIGHT REAR 1/3 ID
WGE	04/23/84	I	P	1/3 ID
A7A1 001245	FUEL PUMP 12285597 1124 3959 04/23/84		M1 L-0270	REPLACED LEFT REAR 1/3 ID
WGE	04/23/84	I	P	1/3 ID
A7A1 000846	FUEL PUMP 12285597 663 548 04/06/84		M1 L-0272	REPLACED LEFT REAR.
WGE	04/06/84	I	P	1/3 ID
A7A1 001138	FUEL PUMP 12285597 289 3997 06/06/84		M1 L-0275	1/3 ID
WGE	06/06/84	I	P	1/3 ID
A7A1 000849	FUEL PUMP 12285597 620 558 04/06/84		M1 L-0276	REPLACED RIGHT REAR.
WGE	04/06/84	I	P	1/3 ID
A7A1 000491	FUEL PUMP 12285597		M1 L-0277	RIGHT REAR
WGE	03/06/84	I	P	1/64 AR
A7A1 000700	FUEL PUMP 12285597 182 261 03/22/84		M1 L-0280	REPLACED LEFT REAR 2/64 AR
WGE	03/22/84	I	P	2/64 AR
A7A1 000848	FUEL PUMP 12285597 680 310 04/06/84		M1 L-0280	REPLACED RIGHT REAR.
WGE	04/06/84	I	P	1/3 ID
	FUEL PUMP		M1 L-0281	



FIELD OPERATIONS REPORT

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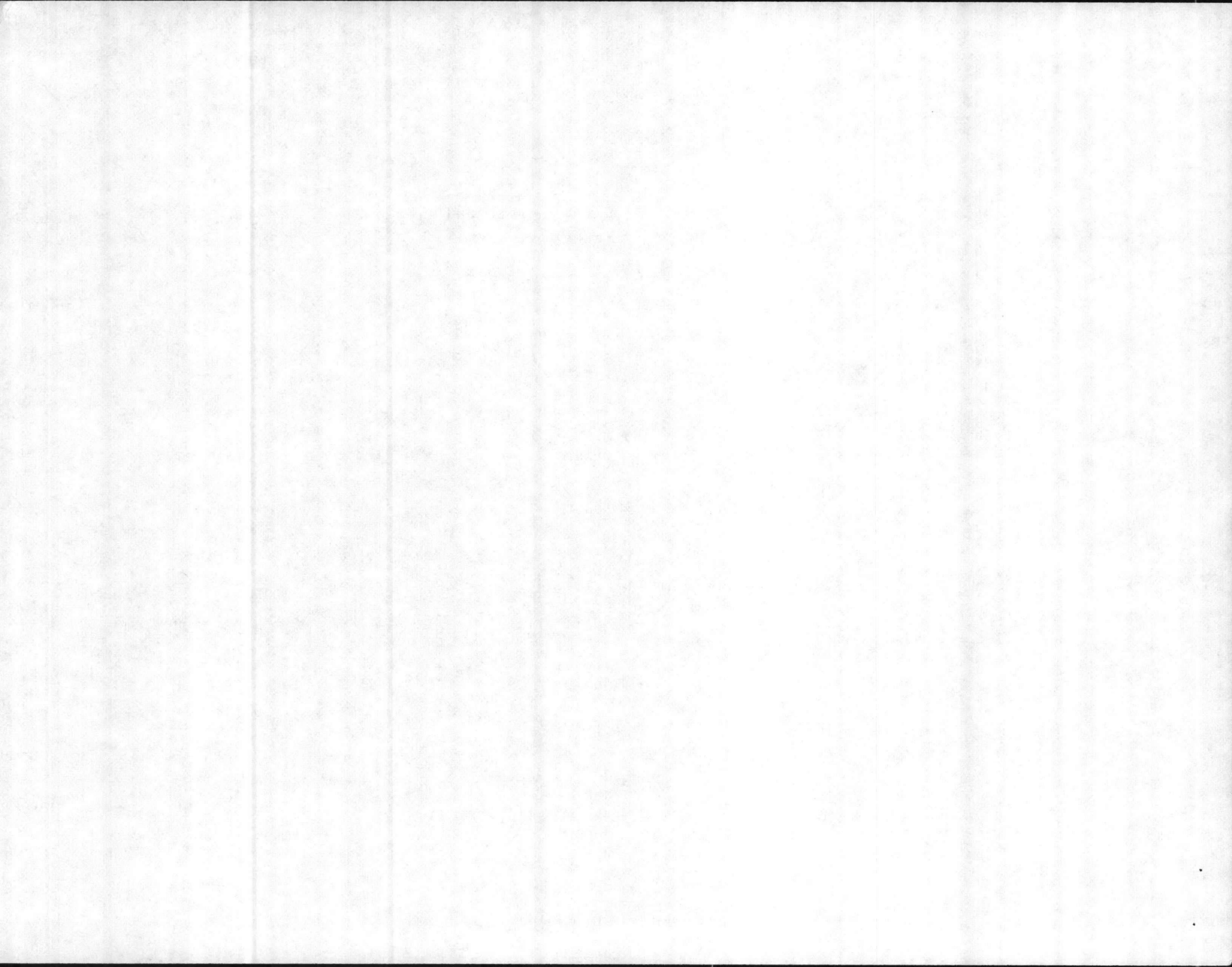
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A7A1 001221	FUEL PUMP 12285597		M1 L-0291	
WGE	04/18/84	I	P	REPLACED RIGHT REAR 1/3 ID
A7A1 000492	FUEL PUMP 12285597		M1 L-0300	RIGHT REAR
WGE	03/06/84	I	F	1/64 AR
A7A1 001474	FUEL PUMP 12285597 719 1205		M1 L-0300	REPLACED RIGHT REAR
WGE	01/03/84	I	F	1/3 ID
A7A1 001136	FUEL PUMP 12285597 749 1944		M1 L-0309	
WGE	06/05/84	I	F	1/3 ID
A7A1 000361	FUEL PUMP 12285597		M1 L-0309	
WGE	540 02/07/84	I	F	REPLACED LEFT REAR. 1/3 ID
A7A1 000702	FUEL PUMP 12285597		M1 L-0311	REPLACED RIGHT REAR.
WGE	03/22/84	I	F	2/64 AR
A7A1 000738	FUEL PUMP 12285597 761 463		M1 L-0311	
WGE	03/24/84	I	F	REPLACED LEFT REAR 2/64 AR
A7A1 000701	FUEL PUMP 12285597 761 463		M1 L-0311	REPLACED LEFT REAR.
WGE	03/22/84	I	F	2/64 AR
	FUEL PUMP		M1	



FIELD OPERATIONS REPORT

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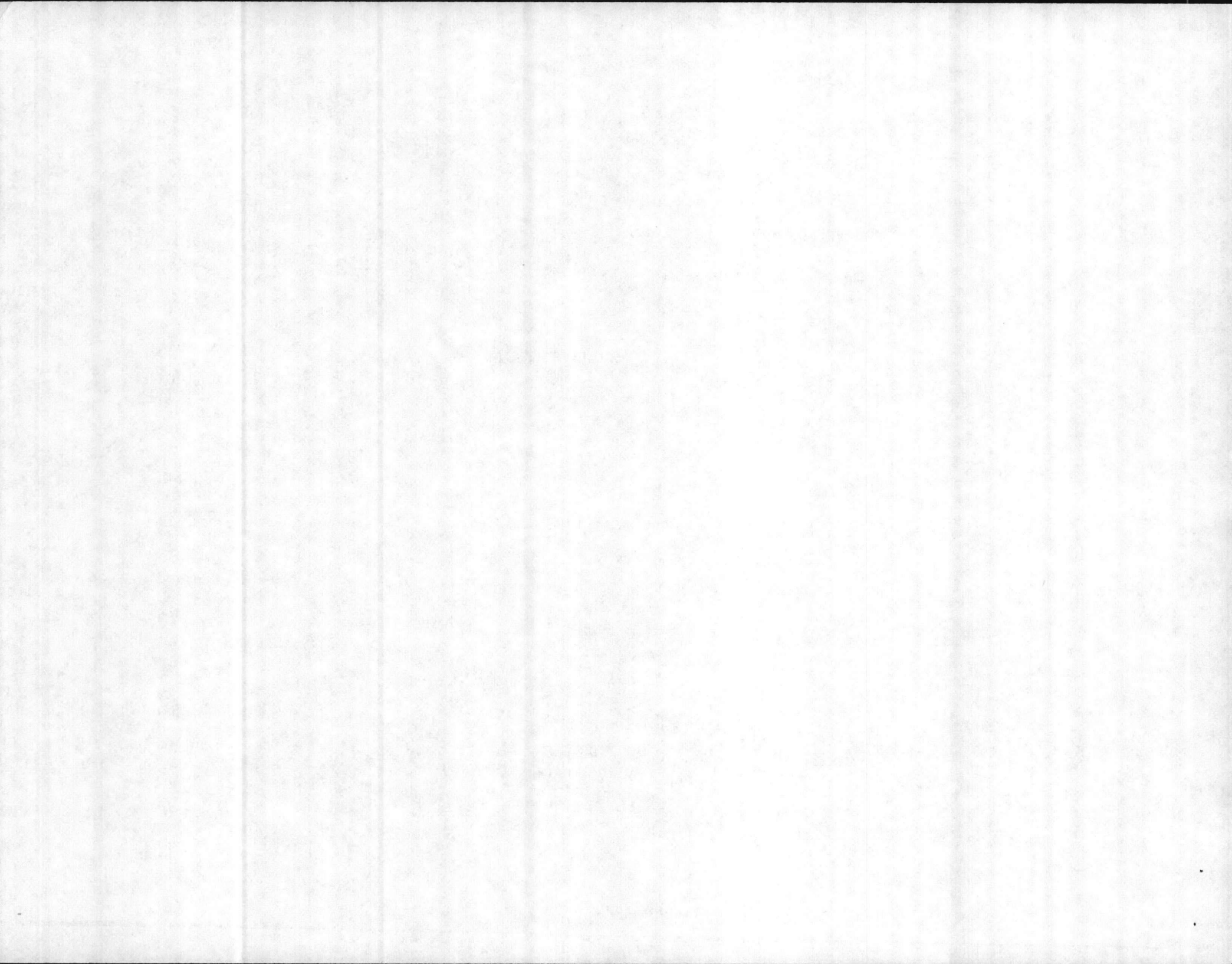
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A7A1 000890	FUEL PUMP 12285597 763 2748		M1 L-0312	REPLACED RIGHT REAR PUMP.
WGE	04/09/84	1	F	1/3 ID
A7A1 000179	FUEL PUMP 12285597		M1 L-0337	
WGE	02/13/84	1	P	REPLACED LEFT REAR. 1/64 AR
A7A1 000178	FUEL PUMP 12285597		M1 L-0337	
WGE	02/13/84	1	P	REPLACED RIGHT REAR. 1/64 AR
A7A1 000469	FUEL PUMP 12285597		M1 L-0373	
WGE	03/05/84	1	F	2/11 ACR
A7A1 000468	FUEL PUMP 12285597		M1 L-0381	
WGE	03/05/84	1	F	2/11 ACR
A7A1 000470	FUEL PUMP 12285597		M1 L-0383	
WGE	03/05/84	1	F	2/11 ACR
A7A1 000467	FUEL PUMP 12285597		M1 L-0390	
WGE	03/05/84	1	P	2/11 ACR
001986	FUEL PUMP 12284468		M1 L-0450	FUEL LEAK.
WGE	09/29/84	1	F	LAO 3 ID
A7A1	FUEL PUMP		M1 L-0618	



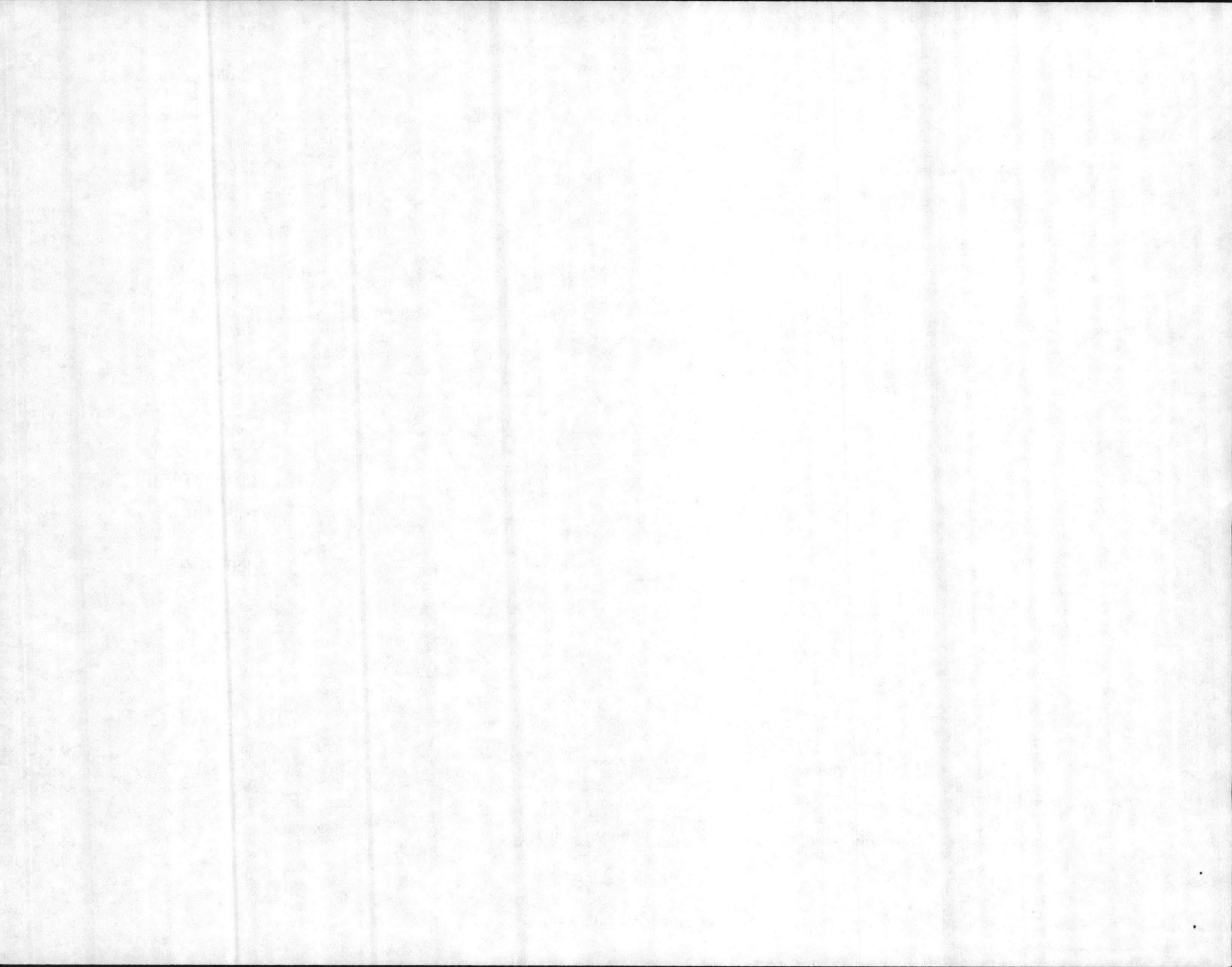
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AGE	03/09/84	I	P	1/64 AR
7A1 00513	FUEL PUMP 12285597 1971		M1 L-0618	
AGE	03/08/84	I	P	REPLACED LEFT REAR 1/64 AR
7A1 01132	FUEL PUMP 12285597 755 3951		M1 L-0638	REPLACED RIGHT REAR PUMP.
AGE	06/05/84	I	P	1/3 ID
7A1 02152	FUEL PUMP 12285597 4241		M1 L-0696	RIGHT REAR.
AGE	09/07/84	I	P	1/11 ACR
7A1 002159	FUEL PUMP 12285597 2765 589		M1 L-0707	LEFT REAR PUMP REPLACED.
AGE	09/21/84	I	P	1/11 ACR
7A1 001649	FUEL PUMP 12285597 3029 199		M1 L-0714	REPLACED RIGHT REAR.
AGE	10/26/84	I	P	1/11 ACR
7A1 001652	FUEL PUMP 12285597 3037 1112		M1 L-0714	REPLACED LEFT REAR.
AGE	10/26/84	I	P	1/11 ACR
7A1 001654	FUEL PUMP 12285597 2970 3806		M1 L-0716	REPLACED LEFT REAR.
AGE	10/26/84	I	P	1/11 ACR
7A1 002128	FUEL PUMP 2285597		M1 L-0720	REPLACED LEFT REAR. SN ARE UNKNOWN.
AGE	07/27/84	I	P	1/11 ACR
			M1	REPLACED RIGHT REAR. SN ARE UNKNOWN.



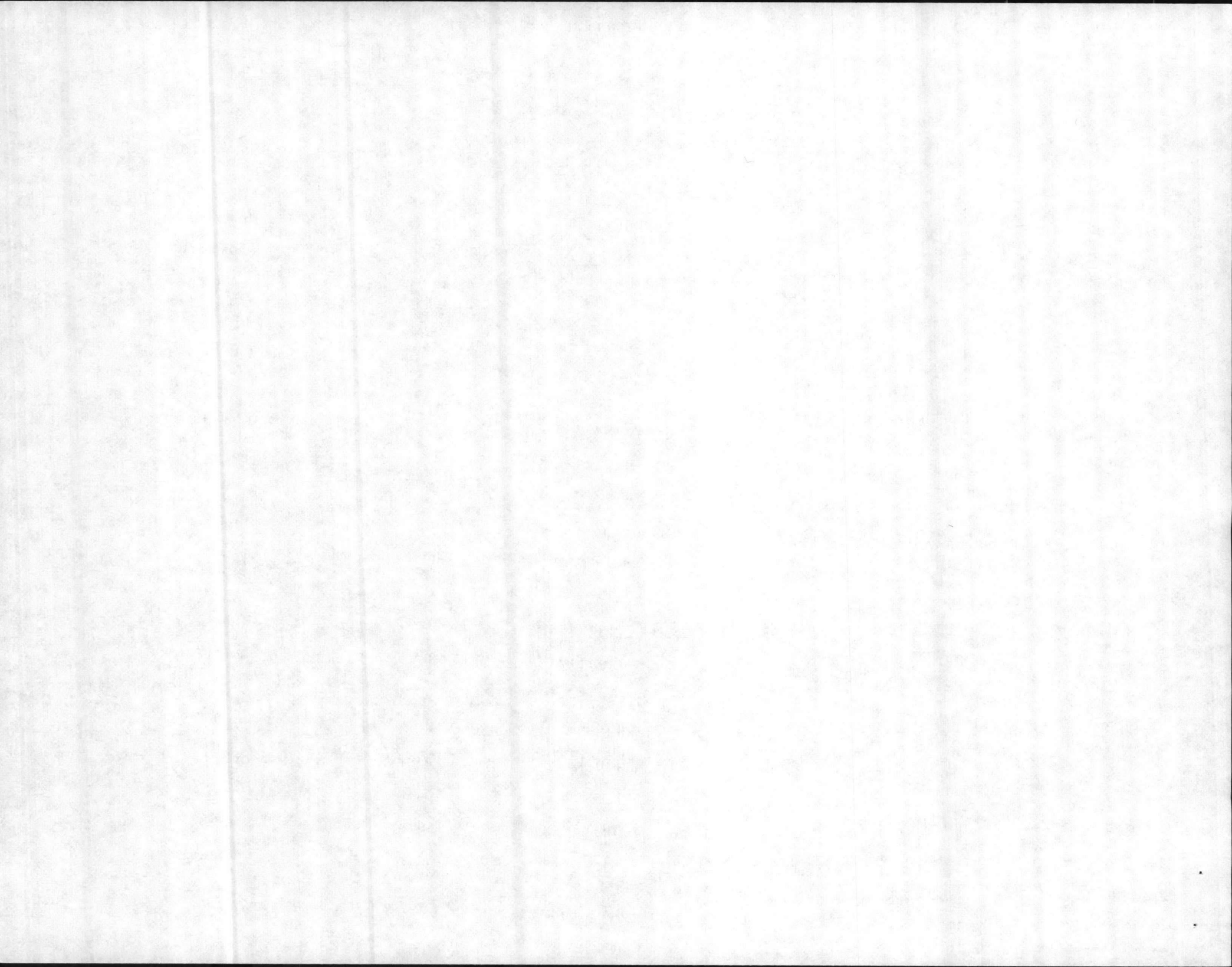
WGE	07/27/84	I	P	1/11 ACR
A7A1 002134	FUEL PUMP 12285597		M1 L-0722	REPLACED RIGHT REAR. SN ARE UNKNOWN.
WGE	07/27/84	I	P	1/11 ACR
A7A1 002130	FUEL PUMP 12285597		M1 L-0722	REPLACED LEFT REAR. SN ARE UNKNOWN.
WGE	07/27/84	I	P	1/11 ACR
A7A1 001653	FUEL PUMP 12285597 3025 3774		M1 L-0726	REPLACED LEFT REAR.
WGE	10/26/84	I	P	1/11 ACR
A7A1 002131	FUEL PUMP 12285597 2273 617		M1 L-0727	REPLACED LEFT REAR PUMP.
WGE	09/21/84	I	P	1/11 ACR
A7A1 002156	FUEL PUMP 12285597 1787 617		M1 L-0728	LEFT REAR.
WGE	09/07/84	I	P	1/11 ACR
17A1 002157	FUEL PUMP 12285597 1888 3806		M1 L-0728	RIGHT REAR.
WGE	09/07/84	I	P	1/11 ACR
A7A1 000030	FUEL PUMP 12285597 991 3641		M1 L-0765	REPLACED LEFT REAR.
WGE	01/31/84	I	P	3/69 AR
A7A1 000031	FUEL PUMP 12285597 907 3727		M1 L-0765	REPLACED RIGHT REAR.
WGE	01/31/84	I	P	3/69 AR
A7A1	FUEL PUMP		M1	
	12285597		L-0811	



FIELD OPERATIONS REPORT

AGE 105

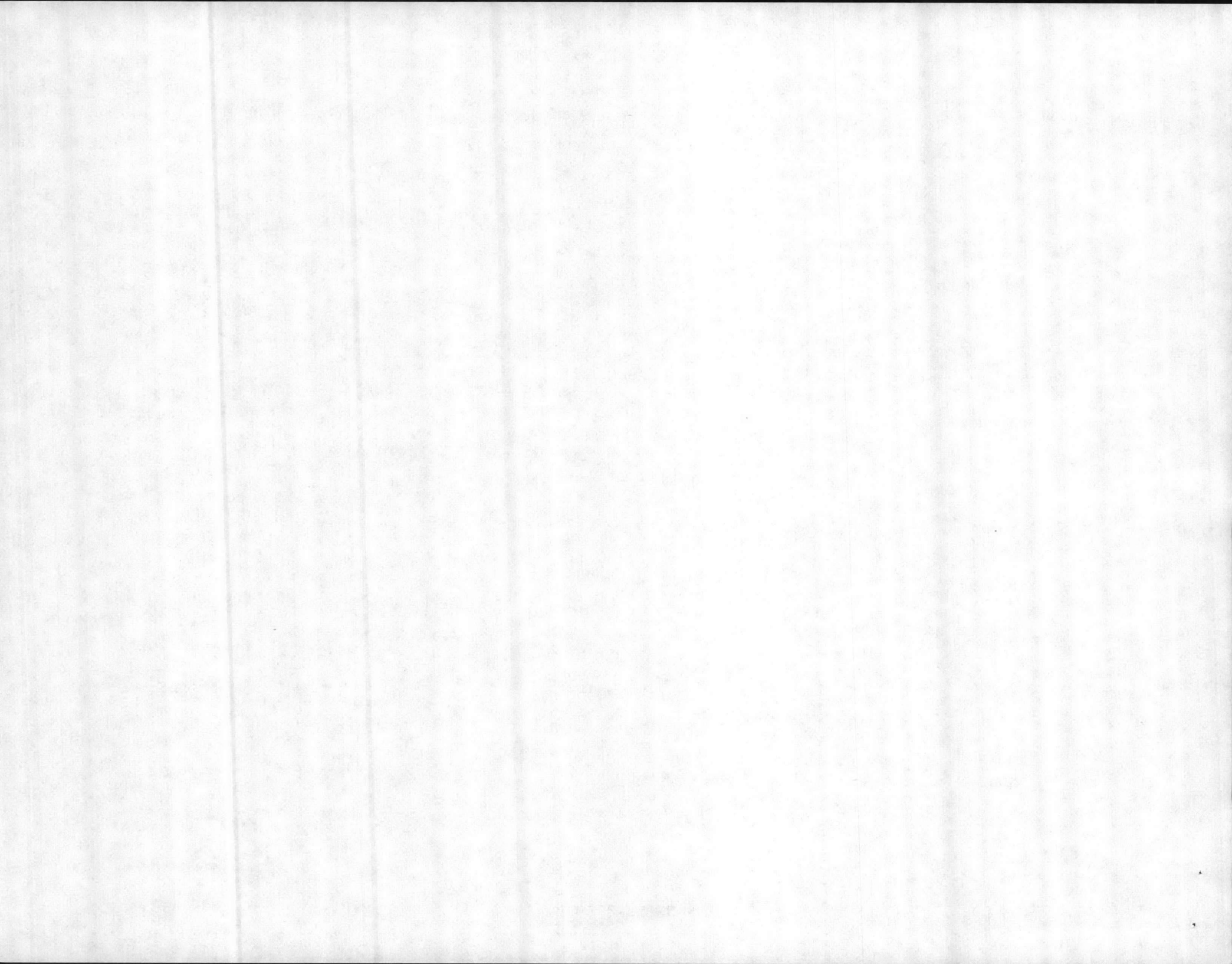
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A7A1 002160	FUEL PUMP 12285597 3073 671		M1 L-0974	RIGHT REAR FUEL PUMP.
AGE	09/21/84	1	F	1/11 ACR
A7A1 002132	FUEL PUMP 12285597 3014 4058		M1 L-0977	REPLACED LEFT REAR PUMP.
AGE	09/21/84	1	F	1/11 ACR
A7A1 002133	FUEL PUMP 12285597 3058 4061		M1 L-0977	REPLACED RIGHT REAR PUMP.
AGE	09/21/84	1	F	1/11 ACR
A7A1 002110	FUEL PUMP 12285597 2546 634		M1 L-1443 2465 320	MAINTENANCE MONITOR LIGHT WAS ON. REPLACED LEFT REAR PUMP.
AGE	10/29/84	1	F	3/11 ACR
A7A1 000893	FUEL PUMP 12285597 1186 3841		M1 L-0185	REPLACED RIGHT REAR FUEL PUMP.
AGE	04/09/84	1	F	1/3 ID
A7A1 001257	FUEL PUMP 12285597 0441 3771		M1 L-0194	REPLACED RIGHT REAR 1/3 ID
AGE	04/11/84	1	F	
A7A1 000195	FUEL PUMP 12285597		M1 L-0195	REPLACED LEFT REAR. 1/3 ID
AGE	01/26/84	1	F	
A7A1 000612	FUEL PUMP 12285597		M1 L-0195	
AGE	03/16/84	1	F	RIGHT REAR INOPERATIVE 2/64 AR
	FUEL PUMP		M1	REPLACED LEFT REAR PUMP.



FIELD OPERATIONS REPORT

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WGE	03/29/84	I	P	3/69 AR
A7A1 00575	FUEL PUMP 12285597		M1 D-0924	
WGE	03/05/84	I	P	REPLACED RIGHT REAR 1/11 ACR
A7A1 00574	FUEL PUMP 12285597		M1 D-0924	
WGE	03/05/84	I	P	REPLACED LEFT REAR 1/11 ACR
A7A1 001648	FUEL PUMP 12285597 2072 453		M1 D-0935	
WGE	10/26/84	I	P	REPLACED LEFT REAR. 1/11 ACR
A7A1 000121	FUEL PUMP 12285597 2072 453		M1 D-0939	
WGE	10/12/84	I	P	REPLACED LEFT REAR. 1/11 ACR
A7A1 001651	FUEL PUMP 12285597 2291 3771		M1 D-0962	
WGE	10/26/84	I	P	REPLACED LEFT REAR. 1/11 ACR
A7A1 000120	FUEL PUMP 12285597 2196 663		M1 D-1002	
WGE	10/12/84	I	P	REPLACED RIGHT REAR. 1/11 ACR
A7A1 000843	FUEL PUMP 12285597		M1 D-1088	
WGE	11/30/84	I	P	2/11 ACR
A7A1 000844	FUEL PUMP 12285597		M1 D-1088	
WGE	11/30/84	I	P	2/11 ACR
	FUEL PUMP		M1	REPLACED RIGHT REAR.



FIELD OPERATIONS REPORT

GE 107

E

11/30/84

I

P

2/11 ACR

A1
0695

FUEL PUMP
12285597

M1
D-1110

REPLACED LEFT REAR.

GE

11/30/84

I

P

2/11 ACR

A1
02079

FUEL PUMP
12285597
4615
4306

M1
D-1672
1578
232

RIGHT REAR REPLACED.

GE

12/07/84

I

P

2/2 ACR

A1
02080

FUEL PUMP
12285597
4639
3981
12/07/84

M1
D-5024
774
196

REPLACED RIGHT REAR.

GE

FUEL PUMP
12285597

I

P

2/2 ACR

A1
00892

529
4051
04/09/84

M1
L-0113

REPLACED RIGHT REAR FUEL PUMP.

WGE

FUEL PUMP
12285597

I

P

1/3 ID

A1
000940

0528
3604
05/04/84

M1
L-0119

REPLACED LEFT REAR
1/3 ID

WGE

FUEL PUMP
12285597

I

P

1/3 ID

A1
000211

547
37
01/28/84

M1
L-0166

REPLACED LEFT REAR.
1/3 ID

WGE

FUEL PUMP
12285597

I

P

1/3 ID

A1
001205

1110
3770
04/16/84

M1
L-0167

REPLACED RIGHT REAR
2/64 AR

WGE

FUEL PUMP
12285597

I

P

2/64 AR

A1
000561

0496
3654
01/12/84

M1
L-0172

2/64 AR

WGE

01/12/84

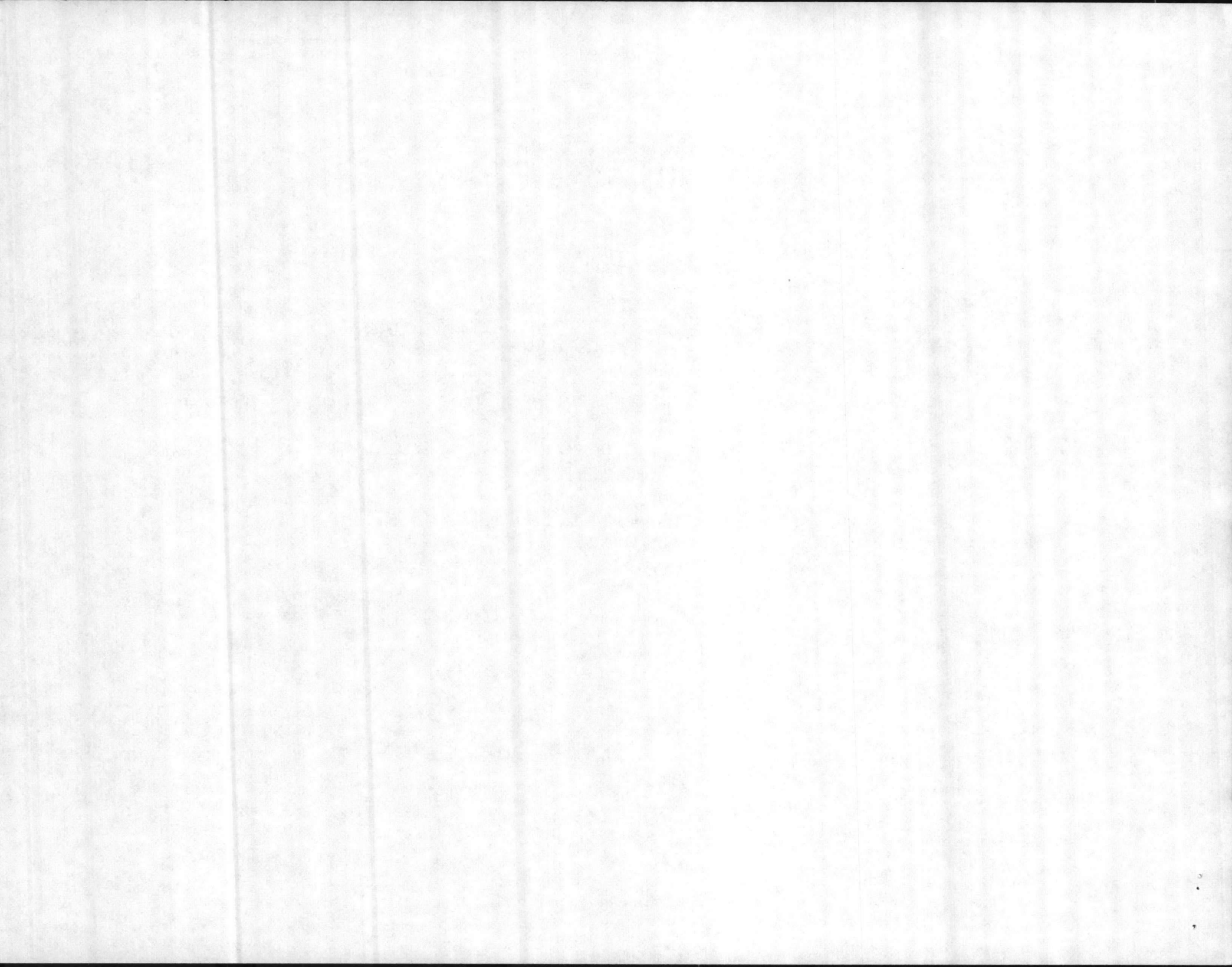
I

P

2/64 AR

M1

REPLACED LEFT REAR FUEL PUMP.



FIELD OPERATIONS REPORT

AGE 108

WGE	04/24/84	I	P	1/3 ID
A7A1 000558	FUEL PUMP 12285597		M1 L-0173	
WGE	03/12/84	I	P	REPLACED RIGHT REAR 2/64 AR
A7A1 001241	FUEL PUMP 12285597 108 3753		M1 L-0173	
WGE	04/23/84	I	P	REPLACED RIGHT REAR 1/3 ID
A7A1 000557	FUEL PUMP 12285597 0322 0342		M1 L-0173	
WGE	03/12/84	I	P	REPLACED LEFT REAR 2/64 AR
A7A1 001141	FUEL PUMP 12285597 626 3742		M1 L-0175	
WGE	06/06/84	I	P	REPLACED LEFT REAR PUMP. 1/3 ID
A7A1 000315	FUEL PUMP 12285597 8140 3807		M1 L-0179	
WGE	03/30/84	I	P	DIP LIGHT WAS ON. REPLACED LEFT REAR. 1/3 ID
A7A1 000831	FUEL PUMP 12285597 8104 3807		M1 L-0179	
WGE	03/31/84	I	P	1/3 ID
A7A1 001143	FUEL PUMP 12285597 1216 3763		M1 L-0183	
WGE	06/06/84	I	P	REPLACED RIGHT REAR PUMP. 1/3 ID
A7A1 001953	FUEL PUMP SENSOR 5930-01-072-9973		M1 L-0245	
WGE	08/28/84	I	P	DIP LEFT REAR FUEL PUMP LIGHT WAS ON. REPLACED THE SENSOR. 1/3 ID
	FUEL PUMP SENSOR		M1	DIP LEFT REAR FUEL PUMP LIGHT WAS ON. REPLACED THE SENSOR.



GENERAL DYNAMICS

Land Systems Division

P.O. Box 527, Warren, Michigan 48090

Inter-Office Memo

HJR/85-88
27 August 1985

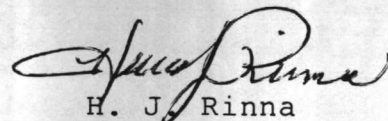
To: G. Biddlingmeier, A. Comer, A. DeStefano, W. Fitzgerald,
J. Heibeck, B. Hudson, J. Lasser, J. Roach

Subject: In-Tank Pump Failures

Enclosure: IOM MJM/85-057 Dated 22 August 1985

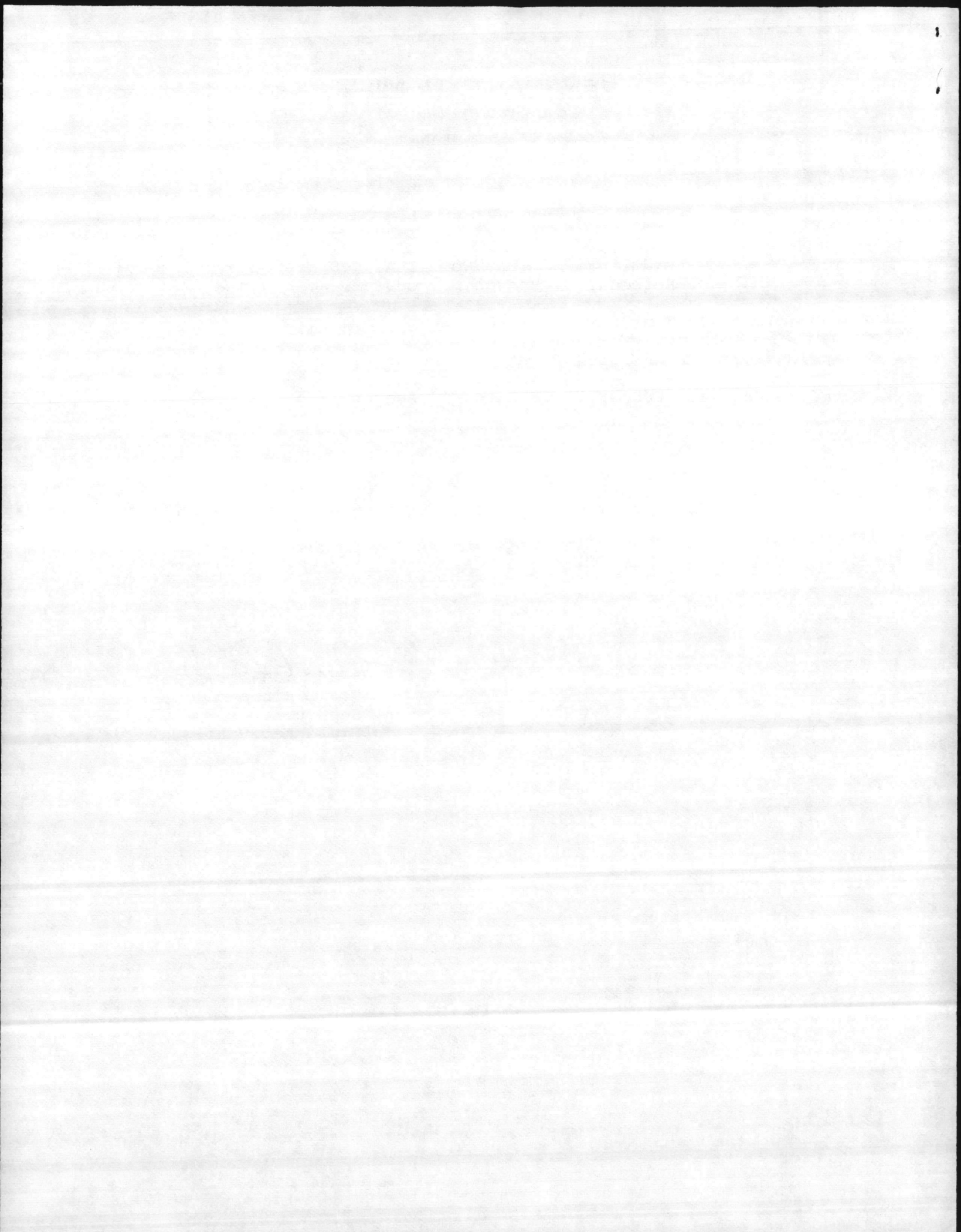
Reference: IOM HJR/dr:85-78 Dated 12 August 1985

1. Attached is minutes of a meeting that was held 15 August 1985 between GDLS and TRW personnel. This information is a follow-up to the above reference.



H. J. Rinna
Supervisor
Field Activities

HJR/km



FO Chief
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GENERAL DYNAMICS
Land Systems Division
P.O. Box 1743, Warren, Michigan 48090
MJM/85-057
22 August 1985

WFB
FB
LVC
RJF
DCF

Inter-Office Memo

To: J. J. Ruma

cc: T. Bartkowicz, K. M. Belling, D. E. Brown, K. Davies,
P. L. Erickson, B. E. Ewing, R. Lafferty, R. T. Lentz,
G. M. McBean, J. J. McCuen, S. Millimet, R. A. Moss,
E. M. Mustonen, R. F. Schwalm, S. L. Schwalm, E. E. Smith,
J. W. Thomas, D. Thorson, S. Vazana, B. Waldrep,
G. Weber, L. P. Wolken

From: M. J. Morris

Subject: GDLS/TRW In Tank Fuel Pump Meeting of 15 August 1985

On 15 August 1985 a meeting was established with GDLS/TRW personnel to discuss the completed design and field performance (life) analysis of the TRW in tank fuel pumps. Items discussed and final recommendations/actions to eliminate the TRW in tank fuel pumps as a top reliability failure item are summarized below:

1. DESIGN PERFORMANCE

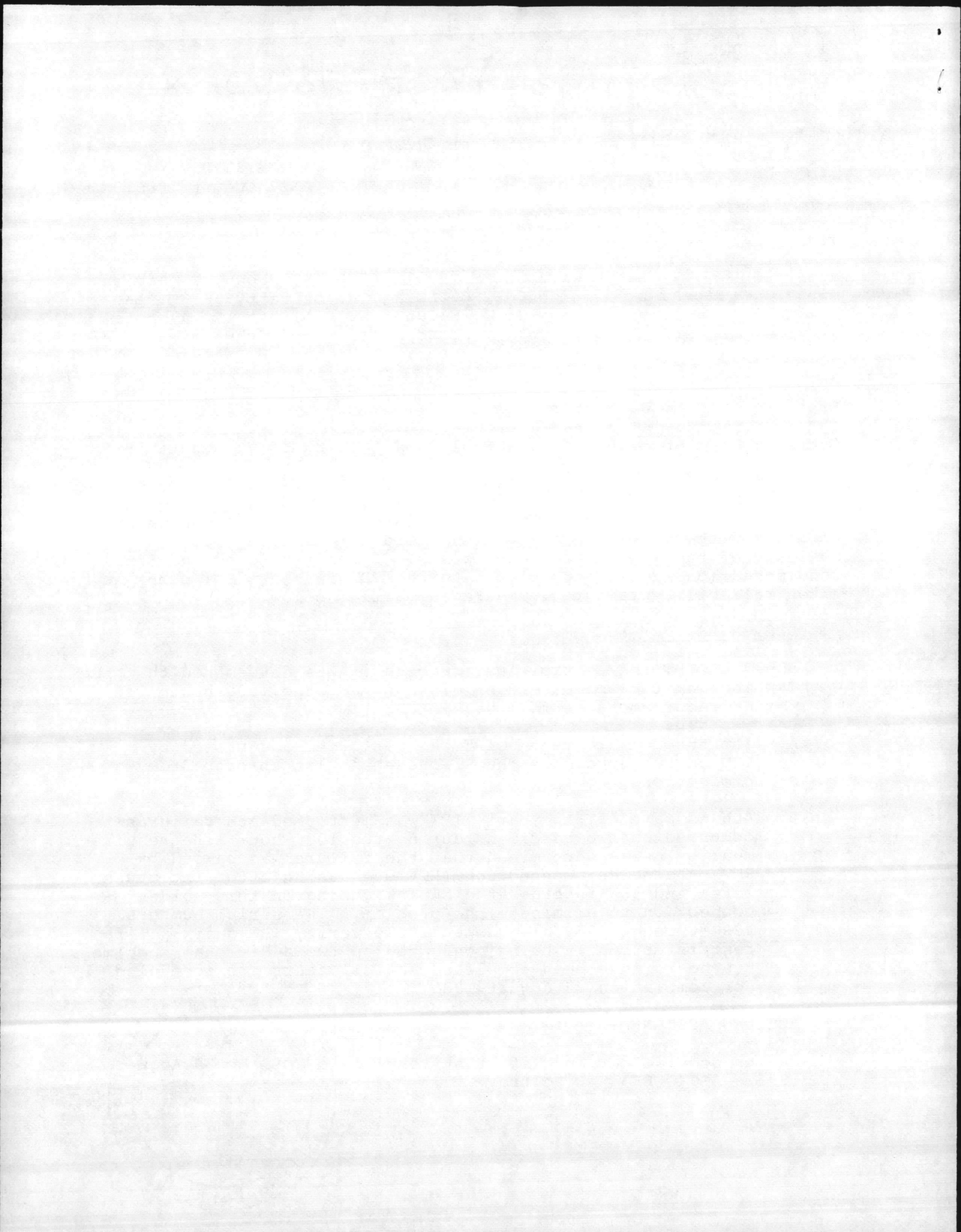
Based on IPT and Control Test reports it was determined that the TRW in tank fuel pumps did or did not meet the 1000-hour life design requirement as follows:

- A. 1st through 3rd year - IPT was performed and passed by TRW on two specimens that represented 1st through 3rd year production.
- B. 4th to part of 6th year - IPT was performed and failures occurred on two specimens during the 1000-hour life requirement. It was determined that the failure was caused by RTV on a solder connection (RTV outgassing affecting brush life) and TRW incorporated shrink tubing on this solder connection to eliminate the problem. TRW serial numbers 4207 through 6932 are suspect. To verify TRW's fix a life test is currently being conducted on two additional specimens. 800 hours have been completed and all tests are scheduled for completion 23 August 1985.

ACTIONS ASSIGNED:

TRW to provide current life test results to GDLS by 30 August 1985. **ACTIONEE:** W. Pelfrey





TRW to determine equitable compensation to U. S. Army for suspect lower life fuel pumps. GDLS Program Office has suggested 600 new pumps be supplied to the U. S. Army free of charge. Agreement required by 30 August 1985.

ACTIONEE: S. Millimet/W. Pelfrey

2. FIELD PERFORMANCE

Based on sample data collection, field life of the TRW in tank fuel pumps was determined to be 600 hours between replacement (not necessarily failure). Contributing factors to this lower than expected life are:

A. Sample data deficient - All data available 1st through 3rd year only. 247 incidents included 39 pumps that met 1000-hour requirement and 1st year incidents that relate to 1st year supplier Applied Industries.

B. Mechanical damage to bottom of fuel pump caused by interference with bottom of fuel cell (vibration). Actions to eliminate this problem are:

Determine if requirement for fuel pump to be $\frac{1}{2}$ inch from bottom of fuel cell is correct and is being followed/inspected by plants. **ACTIONEES:** M. J. Morris/G. Weber provide report to J. J. Ruma by 30 August 1985.

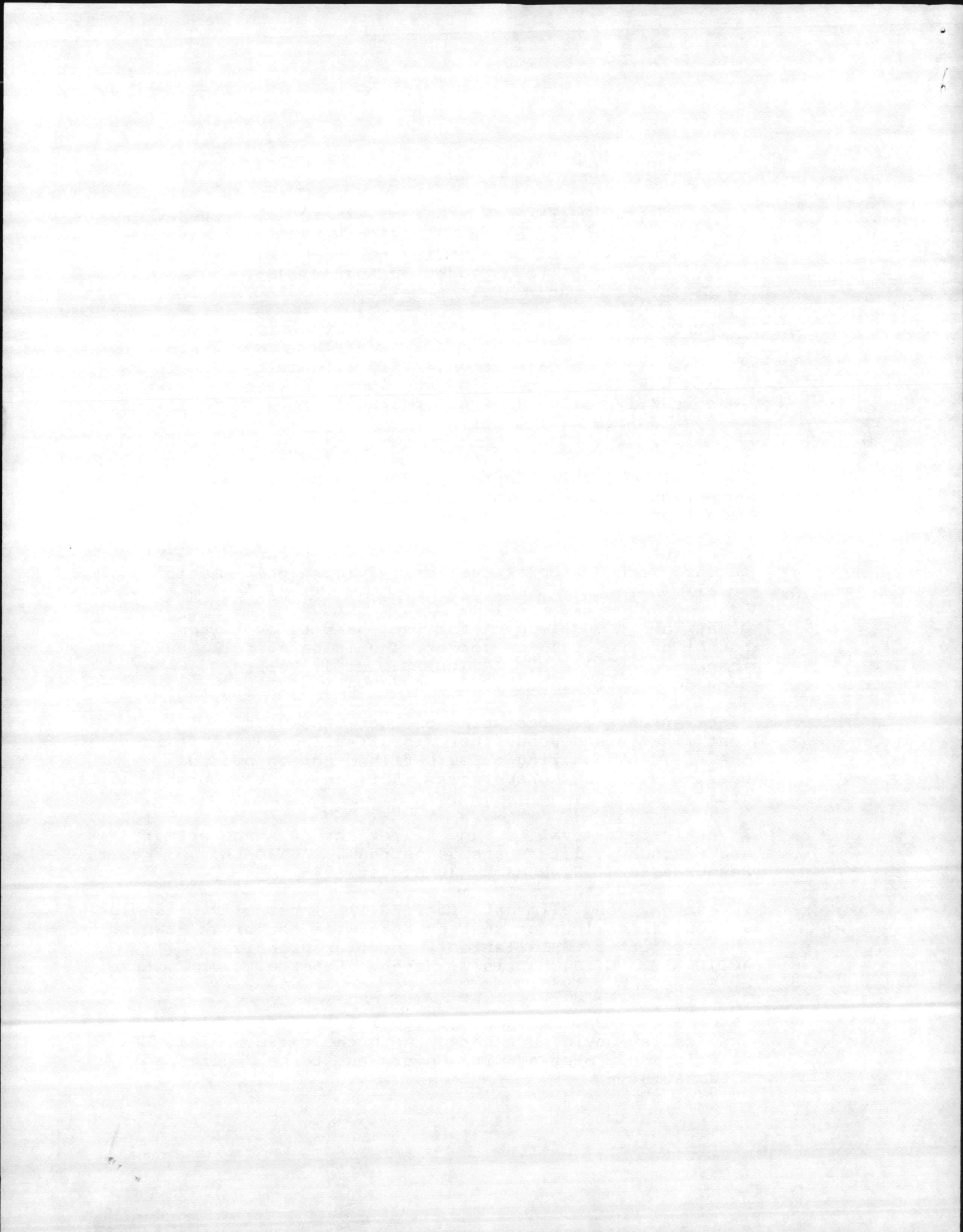
C. Black substance consisting of Loctite 515, diesel fuel contaminants and wood fibers is affecting pump life in the field by adhering to pump filter screen possibly causing overheating/overwork. Actions for this problem are:

Investigate removal of pump filter screen since primary and secondary filters are downstream. **ACTIONEE:** G. Weber. Response to J. J. Ruma by 30 August 1985.

Investigate and eliminate Loctite 515 internally by design action for callout of sealant that will not break down in fuel or better installation/inspection practices.

ACTIONEES: M. J. Morris/G. Weber. Reponse to J. J. Ruma by 6 September 1985.

Recommend to PMO that annual service to decontaminate fuel cells should be adhered to in the field. **ACTIONEE:** P. Erickson. Meeting with Government to be determined by J. J. Ruma.



- D. No evidence of Government repair program in U.S. or that proper rebuild is being performed or that correct spare parts are procured. P. Erickson recommend the Government initiate U.S. repair program and that they investigate that the repair program in Germany is performed properly.
- E. U.S. Army does not always replace right pump at failure distorting the actual life of pumps. P. Erickson and J. J. Ruma to inform Governemnt at TBD meeting.

3. FINAL RECOMMENDATIONS:

- A. 1000-hour life design requirement is not sufficient. Investigate need for increased life requirement. Sample data and other investigations suggests 3000-hour life requirement. A work directive is in process by Engineering. Report status of work directive to J. J. Ruma by 30 August 1985. **ACTIONEE:** P. Erickson.
- B. Airborne 7th year design consists of a wet motor. Contaminants may affect 7th year pump field perofrmance since contaminants will pass through the motor. Engineering to investigate and report recommendations to J. J. Ruma by 30 August 1985. **ACTIONEE:** P. Erickson.
- C. A meeting should be held with the PMO, GDLS and TRW after 6 September 1985 to inform the PMO of all findings.
ACTIONEE: J. J. Ruma

If there are any questions concerning this correspondence, contact the undersigned at 952-5528. All closeout actions must be reported to J. J. Ruma.

M. J. Morris

M. J. Morris
M1 Quality Program Manager

