

**EA02-025**

**FORD**

**10/27/03**

**BOOK 28 OF 61**

**PART 2 OF 5**

**BOX 23 OF 28**

YES E7SC-2B091-AA

## ENGINEERING SPECIFICATION

**RESTRICTIONS TO HELP SAFEGUARD  
HEALTH, SAFETY AND THE ENVIRONMENT  
APPLY TO SUBSTANCES USED IN THE  
ITEM(S) ADDRESSED BY THIS DOCUMENT.**  
**ENGINEERING MATERIAL SPECIFICATION**  
**WSS-M99P9999-A1 APPLIES**

### 1. GENERAL

The valve assembly controls hydraulic pressure to the rear brakes. After reaching a predetermined pressure (split-point) the valve maintains a constant ratio of rear to front braking pressure. This function optimizes overall braking performance.

This engineering specification is a supplement to the released drawing at CM, above part, and all requirements herein must be met in addition to all other requirements of the part drawing. Minimum measures necessary for demonstrating compliance to these requirements are given in each section.

The engineering tests, sample sizes, and test frequencies contained within this engineering specification reflect the minimum requirements established to provide a regular evaluation of conformance to design intent. This engineering test program is intended as a supplement to normal material inspections, dimensional checking, and in-process controls, and should in no way adversely influence other inspection operations. QI suppliers may implement different test sample sizes and frequencies providing these changes have been included in an alternate Critical Item approved by the design responsible Product Engineering Office and concurred in by SQA.

### PRODUCTION VALIDATION AND IN-PROCESS TESTS

Production Validation (PV) tests must be completed satisfactorily with parts from production tooling (and processes where possible) before LHM approval and authorization for shipment of production parts can be effected. Parts must be re-validated completely, or per Section V whenever any change is made which could possibly affect part function or performance.

In-Process Test Phase 1 (IP-1) - IP-1 tests are used to demonstrate process capability and must be completed using initial production parts from production tooling and processes prior to first production shipment approval. IP-1 tests are to continue in effect until process capability is demonstrated.

In-Process Test Phase 2 (IP-2) - IP-2 test programs may be implemented only after process capability has been established. Tests must be completed with production parts on a continuing basis. Samples for these tests must be selected on a random basis to represent the entire production population as much as possible. In the event that any portion of these tests are not met, Ford Q-101 Section III, II, 2 "IN Test Performance Requirements" shall be invoked.

**✓ CONTROL ITEM -- AFFECTS GOVERNMENT  
REGULATION COMPLIANCE OR CRITICAL VEHICLE  
FUNCTION AND MUST COMPLY WITH APPLICABLE  
REQUIREMENTS OF FORD Q-101 OR MANUFACTURER'S  
PRACTICE 102 -- AREAS MARKED **✓** ARE  
CONTROL ITEM CHARACTERISTICS -- CHANGE IN  
DESIGN, COMPOSITION OR PROCESSING FROM THE  
PART PREVIOUSLY APPROVED FOR PRODUCTION RE-  
QUIRES PRIOR PRODUCT ENGINEERING APPROVAL.**

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## ENGINEERING SPECIFICATION

Test Level	PRODUCTION VALIDATION			IN-PROCESS IP-1		IN-PROCESS IP-2	
	Test Number	Minimum Sample Size	Statistical Test Acceptance Criteria	Minimum Sample Size and Frequency	Statistical Test Acceptance Criteria	Minimum Sample Size and Frequency	Statistical Test Acceptance Criteria
<u>Functional Audit</u>							
Vacuum Pull-Down	H	See Functional Tests For PV Requirements	12/Ho.	All must pass	8/3 Ho.	All must pass	
Low Pressure Leakage	H		12/Ho.	All must pass	8/3 Ho.	All must pass	
Medium Pressure Leakage	G		12/Ho.	All must pass	8/3 Ho.	All must pass	
High Pressure Leakage	H		12/Ho.	All must pass	8/3 Ho.	All must pass	
Medium Pressure Leak-Filled Primary	H		12/Ho.	All must pass	8/3 Ho.	All must pass	
High Pressure Leak-Filled Primary	H		12/Ho.	All must pass	8/3 Ho.	All must pass	
Input/Output Characteristics	H		12/Ho.	All must pass	8/3 Ho.	All must pass	
Strength Test	H		3/Ho.	All must pass	2/3 Ho.	All must pass	
Structural Test	H		3/Ho.	All must pass	2/3 Ho.	All must pass	
Tube Seat Leakage	H		3/Ho.	All must pass	2/3 Ho.	All must pass	
Internal Cleanliness	G		2/Day	All must pass	2/Day	All must pass	
Corrosion Test	H		3/Ho.	All must pass	2/3 Ho.	All must pass	
Pressure Switch Calibration	G		12/Ho.	All must pass	8/3 Ho.	All must pass	
<u>Functional - 100%</u>							
High Pressure Leakage IV.A (Failed Primary)	IV.A	All	All Pass	100%	All must pass	100%	All must pass
By Pass-(Failed Primary)	IV.B		All Pass	100%	All must pass	100%	All must pass
Low Pressure Leakage IV.C	IV.C		All Must Pass	100%	All must pass	100%	All must pass
High Pressure Leakage IV.D	IV.D		" "	100%	All must pass	100%	All must pass
Input/Output Characteristics	IV.E		" "	100%	All must pass	100%	All must pass
<u>Functional-Int. Control</u>							
None							

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## MANUFACTURE VALIDATION

Test Name	Test Number	IN-PROCESS IP-1		IN-PROCESS IP-2	
		Minimum Sample Size	Statistical Test Acceptance Criteria	Minimum Sample Size and Frequency	Statistical Test Acceptance Criteria
<b>Functional Tests</b>					
Vacuum Pull-Down	E	24	P.90-.91	12	P.90-.94
Low Pressure Leakage	F	24	P.90-.91	12	P.90-.94
Medium Pressure Leakage	G	24	P.90-.91	12	P.90-.94
High Pressure Leakage	H	24	P.90-.91	12	P.90-.94
Medium Pressure Leak-Failed Primary	I	24	P.90-.91	12	P.90-.94
High Pressure Leak-Failed Primary	J	24	P.90-.91	12	P.90-.94
Leak-Failed Primary	K	24	P.90-.91	12	P.90-.94
Input/Output Characteristics	L	6	P.90-.72	3	P.90-.54
Strength Test	M	6	P.90-.72	3	P.90-.54
Structural Test	N	6	P.90-.72	3	P.90-.54
Tube Seat Leakage	O	6	P.90-.72	3	P.90-.54
Internal Cleanliness	P	6	P.90-.72	3	P.90-.54
Corrosion Test	Q	6	P.90-.72	3	P.90-.54
Pressure Switch Calibration	R	24	P.90-.91	12	P.90-.94

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**III. TEST REQUIREMENTS AND PROCEDURES****A. Life Cycle****1. Test Requirements:**

- a. The pressure control valve shall be cycled by an external pressure source. The external pressure source is required to increase the valve inlet pressure at a rate of  $10,340 \pm 1160$  kPa per second. Time cycle below 170 kPa must not be less than 0.15 seconds.

$1499 \pm 200$  psf  
Second

- b. The valve shall be cycled from 0 to  $10,340 \pm 1160$  kPa at a maximum rate of 2500 per hour.

$1499 \pm 200$  psf  
0.7 kx

- c. After 500,000 cycles, test valve per test requirements of Section III.F., G., H., K., and Q.

**2. Acceptance Requirements:**

- a. External fluid leakage from the valve shall not exceed 2.5 cc.

- b. Must conform with acceptance requirements of Section III.F., G., H., and Q.

- c. The input-output characteristics of the valve shall not deviate by more than 15% from the acceptance requirements of Section III.K.

- d. No audible noise detected during application or release of hydraulic fluid pressure.

**B. Low Temperature Cycling****1. Test Requirements (See Figure 2):**

- a. The fluid ambient temperature is to be maintained at  $-40^\circ$  to  $-45^\circ$ .

- b. The pressure control valve shall be cycled by an external pressure source capable of increasing the valve inlet pressure to  $4140 \pm 930$  kPa.

- c. The hydraulic circuit is from the pressure source to a shut-off valve (A) to a second shut-off valve (B) to shut-off valve (C).

- d. A means to determine the pressure differential in the circuit is between valve (A) to valve (B) to valve (C).

- e. The hydraulic circuit volume from valve (A) to valve (B) must equal the circuit volume from valve (B) to valve (C) within 0.50 cc.



## ENGINEERING SPECIFICATION

### III. TEST REQUIREMENTS AND PROCEDURES (Continued)

#### B. Low Temperature Cycling (Continued)

##### 1. Test Requirements (Continued)

- f. Install valve in the cold chamber and release hydraulic pressure in the system. Soak for  $16 \pm 0.5$  hours with the cold chamber at temperature.

g. Cycle the valve at temperature to the following schedule:

1. Pressurize the valve inlet port to  $1035 \pm 70$  kPa and hold for 15 seconds. Allow pressure to drop to 0 kPa. Repeat this procedure six times at approximately 60 second intervals.
2. Repeat Section III.F.B.1.g.1 with a hydraulic pressure of  $4140 \pm 350$  kPa.

h. After cycling, test valve at temperature per test requirements of Section III.K.

i. Allow valve to soak for a minimum of 4 hours at room temperature.

After room temperature soak period, test valve per test requirements of Section III.K., and Q.

##### Acceptance Requirements

a. Leakage from the valve for Section III.B.1.g.1 shall not exceed an amount indicated by maximum differential pressure across valve assembly of 69 kPa.

b. Leakage from the valve for Section III.B.1.g.2 shall not exceed an amount indicated by maximum differential pressure across valve assembly of 690 kPa.

c. For Section III.B.1.h. and j., the input-output characteristics of the valve shall not deviate by more than 1% from the acceptance requirements of Section III.K.

d. No audible noise detected during application or release of hydraulic fluid pressure.

**ENGINEERING SPECIFICATION**

**III. TEST PROCEDURES AND REQUIREMENTS (Continued)**

**C. High Temperature Cycling**

**1. Test Requirements**

- a. The fluid ambient temperature is to be maintained at 116° - 121°C.
- b. The pressure control valve shall be cycled by an external pressure source capable of increasing the valve inlet pressure to  $6895 \pm 150$  kPa.
- c. The external pressure source can be located inside or outside of the heat chamber. If the pressure source is located outside of the heat chamber it must be connected with sufficient tubing to the valve in the chamber to prevent fluid temperature change in the valve during cycling.
- d. Install valve in the heat chamber and release hydraulic pressure in the system. Soak for 3 ± 0.25 hours with heat chamber at temperature.
- e. Cycle valve from 0 to  $6895 \pm 350$  kPa at a rate of 1000 ± 100 cycles per hour at temperature.
- f. After 70 hours, test valve at temperatures per test requirements of Section III.K.
- g. Allow the valve to cool for 20 hours minimum at room temperature.
- h. After cooling period, test valve per test requirements of Section III.G., H. K., and Q.
- i. Disassemble valve noting residual wear products or other evidence of excessive wear.

**2. Acceptance Requirements**

- a. External fluid leakage from the valve shall not exceed 0.4 cc/s.
- b. Must conform with acceptance requirements of Section III.G., H., and Q.
- c. For Section III.G.i.f. and f., the input-output characteristics of the valve shall not deviate by more than 1% from the acceptance requirements of Section III.K.

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## ENGINEERING SPECIFICATION

### III. TEST PROCEDURES AND REQUIREMENTS (Continued)

#### 6. High Temperature Cycling (Continued)

#### 2. Acceptance Requirements (Continued)

a. There shall be no cracked, broken or loose parts.

b. No audible noise detected during application or release of hydraulic fluid pressure.

#### D. Service Test

##### 1. Test Requirements

a. The pressure control valve shall be cycled by an external pressure source. The external pressure source must be capable of increasing the valve inlet pressure to 7000 kPa.

b. The valve inlet port shall be connected to a relief valve set at 6900 + 350 kPa and the relief valve outlet shall be connected to the reservoir of the external pressure source.

c. The valve inlet pressure shall be increased to 690 kPa min. in the first 0.10 second max. of the stroke and up to 6900 kPa min. in the first 0.14 second max. of the stroke.

d. The valve shall be cycled at a rate of 1500 ± 500 cycles per hour.

e. Test to be run in two modes: a) Full system, b) failed primary.

f. After 200 ± 2 cycles, test valve per test requirements of Section III.G., H., K and Q.

g. Disassemble valve noting residual wear products or other evidence of excessive wear.

##### 2. Acceptance Requirements

a. Must conform with acceptance requirements of Section III.G., H., K, and Q.

b. The input-output characteristics of the valve shall not deviate by more than 15% from the acceptance requirements of Section III.K.

c. There shall be no cracked, broken or loose parts.

d. No audible noise detected during application or release of hydraulic fluid pressure.

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### III. TEST EQUIPMENT AND PROCEDURES (Continued)

#### E. Vacuum Pull-Down

##### 1. Test Requirements:

- a. Mount the brake valve assembly in a test fixture as shown in Figure 1. Valve test fixture should contain vacuum transducers common to inlet ports (A) and (B) and at each outlet port (D) and (C). Shut-off valves should be located at inlet ports (A) and (B). Transducers and shut-off valves shall be located as close as possible to test valve in order to keep system volume to a minimum. Vacuum supply pump shall be capable of evacuating at a rate of 300 l/min. max.

With all valves closed, record time to reach 2 mm Hg at vacuum transducer 1.

Open ports (B) and (C) and record time to reach 2 mm Hg.

Close ports (B) and (C). Open ports A, D, and E and record time to reach 2 mm Hg.

To obtain true evacuation time, subtract time obtained in Section III.E.1.c and III.E.1.d from time obtained in Section III.E.1.b.

##### 2. Acceptance Requirement:

- a. Using true evacuation times for front and rear sections, the vacuum level must reach 2 mm Hg in 15 sec. at transducers 2 and 3.

#### F. Low Pressure Leakage

##### 1. Test Requirements:

- a. Pressurize the pressure control valve inlet ports to  $10 \pm 2$  kPa and allow a minimum of 130 cc of brake fluid to bleed through the valve at this pressure.

b. Seal off the valve outlet port.

c. Hold valve inlet pressure at  $10 \pm 2$  kPa for  $24 \pm 0.5$  hours.

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## ENGINEERING SPECIFICATION

### III. TEST REQUIREMENTS AND PROCEDURES (Continued)

#### F. Low Pressure Leakage (continued)

##### 2. Acceptance Requirements

- a. External fluid leakage from the valve shall not exceed 0.5 cc.

#### G. Medium Pressure Leakage

##### 1. Test Requirements

- a. Seal off the pressure control valve outlet port.
- b. Pressurize the valve inlet ports to  $1035 \pm 7$  kPa.
- c. Allow 5 to 10 seconds for pressure stabilization.
- d. Close off the pressure source sealing pressure inside the valve for a minimum of 10 seconds.

##### 2. Acceptance Requirements

- a. Leakage from the valve shall not exceed an amount indicated by a pressure drop of 7 kPa in 10 seconds.

#### H. High Pressure Leakage

##### 1. Test Requirements

- a. Seal off the pressure control valve outlet port.
- b. Pressurize the valve inlet ports  $13600 \pm 700$  kPa.
- c. Allow 5 to 10 seconds for pressure stabilization.
- d. Close off the pressure source sealing pressure inside the valve for a minimum of 10 seconds.

##### 2. Acceptance Requirements

- a. Leakage from the valve shall not exceed an amount indicated by a pressure drop of 170 kPa in 10 seconds.

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## ENGINEERING SPECIFICATION

### III. TEST REQUIREMENTS AND PROCEDURES (Continued)

#### I. Medium Pressure Leakage (Failed Primary)

##### 1. Test Requirements

- a. Seal off the pressure control valve outlet port.
- b. Pressurize the valve inlet port A to  $1724 \pm 7$  kPa.
- c. Allow 5 to 10 seconds for pressure stabilization.
- d. Close off the pressure source sealing pressure inside the valve for a minimum of 10 seconds.

##### 2. Acceptance Requirements

- a. Leakage from the valve shall not exceed an amount indicated by a pressure drop of 7 kPa in 10 seconds.
- b. Pressure at outlet port (E) must be equal to inlet pressure.

#### J. High Pressure Leakage (Failed Primary)

##### 1. Production Validation and In-Process Test

##### a. Test Requirements

1. Seal off the pressure control valve outlet port.
2. Pressure the valve inlet port A to  $19800 \pm 700$  kPa.
3. Allow 5 to 10 seconds for pressure stabilization.
4. Close off the pressure source sealing pressure inside the valve for a minimum of 10 seconds.

##### b. Acceptance Requirements

1. Leakage from the valve shall not exceed an amount indicated by a pressure drop of 170 kPa in 10 seconds.
2. Pressure at outlet port (E) must be equal to inlet pressure.

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### IV. TEST PROCEDURES AND INSTRUMENTS (CONTINUED)

#### E. Input-Output Characteristics

##### 1. Test Requirements

- a. The pressure control valve shall be cycled by an external pressure source. The external pressure source must be capable of applying and releasing pressure to the inlet sides of the valve at a rate of  $1380 \pm 345$  kPa per second.
- b. The valve outlet ports SHALL BE CONNECTED to test blocks assemblies which will simulate nominal fluid transfer through the valve.
- c. Pressurize the valve inlet ports to 1380 kPa greater than the split point specified on the valve assembly drawing and hold for 10 sec.
- d. Increase the valve inlet pressure to 23100 kPa and hold for 10 sec.

##### 2. Acceptance Requirements

- a. Pressure at the valve outlet port (b) must be within the limits specified on the valve assembly drawing at the low and high pressure shock points specified in Section III.E.1.c. and d.

#### F. Strength Test

##### 1. Test Requirements

- a. Seal off the pressure control valve outlet ports.
- b. Pressurize the valve inlet ports to  $34500 \pm 500$  kPa at a rate of  $3450 \pm 700$  kPa per second.
- c. Allow 3 to 10 seconds for pressure stabilization.
- d. Close off the pressure source sealing pressure from the valve for a minimum of 10 seconds.

After a minimum of 10 seconds at pressure, test valve per test requirements of Section III.E., M., N., P., and Q.

NOTE: After completion of Section III.E., the valve assembly must be thoroughly identified so as to prevent its reuse.

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# **ENGINEERING SPECIFICATION**

## **III. TEST PROCEDURES AND REQUIREMENTS (Continued)**

### **2. Acceptance Requirements**

- a. No visible leakage of fluid from the valve.
- b. Must conform with acceptance requirements of Section III-G, H., and Q.
- c. The input-output characteristics of the valve shall not deviate by more than 15% from the acceptance requirements of Section III-K.

### **M. Structural Test - Valve Body to Bracket (Pneumatic)**

#### **1. Test Requirements**

- a. With valve body restrained by any suitable means, apply a load of 300 lbs. as shown in Fig. 4 to the mounting bracket

#### **2. Acceptance Requirements**

- a. Bracket ~~is~~ still be attached to valve body with no perceptible looseness.

### **N. Tube Seat Leakage**

#### **1. Test Requirements**

- a. Install the correct tube end and tube nut in the pressure control valve inlet and outlet ports.
- b. Torque tube nut to  $13.7 \pm 1$  N-m.
- c. Pressurize the valve inlet ports to 20700 kPa and hold for a minimum of 30 seconds.

#### **2. Acceptance Requirements**

- a. Leakage from the valve shall not exceed an amount indicated by a pressure drop of 140 kPa in 30 seconds.
- b. No visible leakage of fluid at fitting.

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**III. TEST PROCEDURES AND REQUIREMENTS (Continued)**

**D. Internal Cleanliness**

**1. Test Requirements**

- a. Wash exterior of pressure control valve and discard residue.
- b. Disassemble valve.
- c. Wash all component parts with  $1000 \pm 10$  cc of clean, previously filtered (5 micron filter) isopropyl-alcohol. Collect alcohol into clean container.
- d. Flush inside of valve body with a total of  $2000 \pm 10$  cc of clean, previously filtered (5 micron filter) isopropyl alcohol. Alcohol is to be forced into inlets and outlets and collected from open ports end. Average flow rate through each path to be no less than 15 cc per second, until  $500 \pm 25$  cc have passed through each set of ports. Collect alcohol into clean container.
- e. Thoroughly wash 5-micron filter with isopropyl-alcohol. Bake washed filter at  $90 \pm 10^\circ\text{C}$  for a minimum of 10 minutes.
- f. Filter alcohol used in Section III.C.1.c. and d through 5" filter.
- g. Place filter in heat chamber and bake at  $90 \pm 10^\circ\text{C}$  for minimum of 10 minutes.
- h. Remove filter from heat chamber and weigh.
- i. Examine filter under microscope with measuring device for the largest metal particle and largest non-metal particle (size indicated by measurement of length and width). Identify particle material.

**2. Acceptance Requirements**

- a. Total residue must not exceed 5 milligrams per assembly.
- b. Residue particles must be in accordance with the following:
  1. 75 microns or less in width, 4300 maximum microns in length.
  2. 75 to 150 microns in width, 3500 maximum microns in length.
  3. 150 to 500 microns in width, 2000 maximum microns in length.
  4. When a sample contains residue particles exceeding requirements of Section III.N.2.b.(3.) it is permissible to check four additional samples. If these samples do not exceed the requirements of Section III.N.2.b.(3.) the production made in the 8-hour shift will be considered acceptable.

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**III. TEST PROCEDURES AND REQUIREMENTS (Continued).****P. Corrosion Test****1. Test Requirements**

- a. Seal off the pressure-control valve inlet-and outlet-ports.
- b. Test valve per ASME B117 for 48 hours.
- c. After 48 hours, test valve per test requirements of Section III.E., and Q.
- d. Disassemble valve and inspect for rust-on the internal surfaces of the valve.

**2. Acceptance Requirements**

- a. Must conform with acceptance requirements of Section III.E. and Q.
- b. No visible rust-on any of the internal parts.

**Q. Pressure Switch Calibration****1. Test Requirements**

- a. Switch calibration is to be checked at room temperature (16°C-18°C) using ambient air, brake fluid or equivalent. Calibration settings shall be as specified on the part drawing with settings checked after two or more pressure cycles. Pressure cycle range is to be determined by the switch manufacturer to insure switch calibration stability. The cut-out and differential set points are to be measured while conducting 5-10 millampere with 13.0 ± 1.0 volts D.C. applied. The cut-in point is to be checked with increasing pressure.
- b. The cut-out point is to be checked with decreasing pressure, and the differential set point is to be calculated using the cut-out pressure.

**2. Acceptance Requirements**

- a. Switch cut-in, cut-out, and differential must be within the tolerance limits specified on the part drawing.

**ENGG. SPECIFICATION****IV. PRODUCTION TEST PROCEDURES AND REQUIREMENTS**

The following tests should be performed at room temperature using dry filtered air.

**A. High Pressure Leakage (Failed Primary)****1. Test Requirements**

- a. Pressurize the valve inlet port A to 1794 ± 70 kPa.
- b. Allow 5 to 20 seconds for pressure stabilization.
- c. Close off the pressure source sealing pressure inside the valve for a minimum of 3 seconds.

**2. Acceptance Requirements**

- a. Leakage from the valve shall not exceed an amount indicated by a pressure drop of 7 kPa in 5 seconds.
- b. Pressure at outlet port (E) must be equal to inlet pressure.

**B. Low Pressure (Failed Primary)****1. Test Requirements**

- a. Pressurize the valve inlet port B to a test-pressure 1379 kPa greater than the specified split point.

**2. Acceptance Requirements**

- a. Pressure at outlet port (E) must be equal to inlet pressure.

**C. Low Pressure Leakage (Full system)****1. Test Requirements**

- a. Pressurize the valve inlet-ports A and B to 81 ± 14 kPa.
- b. Close off the pressure source sealing pressure inside the valve for a minimum of 3 seconds.

**2. Acceptance Requirements**

- a. Leakage from the valve shall not exceed an amount indicated by a pressure drop of .025 kPa.
- b. Pressure at outlet ports must be equal to pressure applied within 2 seconds.



## ENGINEERING SPECIFICATION

### IV. PRODUCTION TEST PROCEDURES AND ACCEPTANCE (continued)

#### D. High Pressure Leakage (Full System)

##### 1. Test Requirements

- a. Pressurize the valve inlet ports A and B to 1324 ± 69 kPa.
- b. Close off the pressure source sealing pressure inside the valve for a minimum of 5 seconds.

##### 2. Acceptance Requirements

- a. Leakage from the valve SHALL NOT exceed an amount indicated by a pressure drop of 7 kPa in 5 seconds.

##### 3. Input-Output Characteristics

##### 1. Test Requirements

- a. Pressurize the control valve inlet ports A and B to 1380 kPa greater than the split point specified on the valve assembly drawing and hold for 5 seconds.

##### 2. Acceptance Requirements

- b. Pressure at the valve outlet port (B) must be within the limits specified on the valve assembly drawing.

### V. STATISTICAL ACCEPTANCE METHODS

Following are the methods for reducing the test data to compare the statistical values.

#### A. P.90-91, P.90-94, P.90-72 and P.90-56

1. Test the number of samples specified in Section II per the requirements in Section III.
2. If a failure occurs, stop the test; part fails to meet the statistical acceptance criterion.
3. If no failures occur, the statistical acceptance criterion is met.

#### B. Q-101

1. Test the number of samples specified in Section II per the requirements in Section III.
2. If a failure occurs, the procedure outlined in Q-101 Section III. E. shall be followed.

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VII. REVALIDATION REQUIREMENTS:

No change to processing, material, or supplier may be allowed without prior engineering approval.

The following revalidation is required for a change in processing or material, new supplier qualification (new material source), or subsequent years production. The "ES Test Required" column refer to the ES test number in the table in Section II.

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Component	Specific Process Change	ES Test Required	Material Change	New Supplier
Housing	Threads, Tolerance(s)	III A,B,C,E, I,J,K,L	III A,B,C,E, H,I,J,K, L,M	III A,B,C,E, H,I,J,K, L,N
Adapter	Threads, Machining Hole	III A,B,C,E, I,J,K,L	III A,B,C,E, H,I,J,K, L,M,N	III A,B,C,E, H,I,J,L, M,N
	Any	III A,B,C,E, I	III A,B,C,D, E,H,I	III A,B,C,E, H,I
Springs	Finish	III A,B,C,E, I,O	III A,B,C,E, H,I	III A,B,C,D, I
Seals	Any	III I,J,O	III S,O	III J,O
Platens	O.D., Sealing Surfaces, Machining Finish	III A,B,C	III A,B,C,D, H,I,N	III A,B,C,D, H,I
O'Rings	Any	III A,B,C,D, E,F,G,H,I	III A,B,C,D, E,F,G,H	III A,B,C,D, E,F,G,H,I



## ENGINEERING SPECIFICATION

### VII. VALIDATION REQUIREMENTS (Continued)

#### MANUFACTURE YEAR VALIDATION

—Carryover Design III A, B, C, E, F, G, K, M, Q.

### VIII. TEST DEFINITION

A lot is defined as one shift's production.

### VIII. RECORD RETENTION

Recording and record retention shall conform to Part Q-101, Section 2.11 and 2.11.1.

Test reports of all production validation and in-process tests, except 100% production tests, will be sent to PGPO, Brake Department, within 10 days of test completion. A monthly summary of 100% production tests will be sent to PGPO, Brake Department, within 10 days of last day of month.

### IX. INSTRUCTIONS AND NOTES

For the purpose of this specification "brake fluid" shall refer to Ford Motor Company currently released brake fluid (for engineering approved source - see Engineering Balance).

All valve assemblies must be void of entrapped air during tests using brake fluid.

During testing, the valve assembly is to be mounted essentially in the in-service condition, unless otherwise specified.

All production validation and audit tests will be performed at room temperature using brake fluid, unless otherwise specified.

The valve outlet ports shall be directly connected to a pressure gage. The pressure gage will be the terminal point in the hydraulic circuit, unless otherwise specified.

All valve assemblies used for production validation and in-process tests must have passed the 100% production tests.

Test circuitry total volume cannot exceed 100 cc for 100% production test and 350 cc for production validation and in-process tests.

Test Section III.Q to be omitted for valve assemblies not requiring a pressure switch.

The tests defined in Section III shall be performed in the sequence defined below.

▼ES E7SC-2B091-AA

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**ENGINEERING SPECIFICATION**

**III. IDENTIFICATION AND TESTS (to follow)**

**A. Production Validation**

1. Thirty six (36) pressure control valve assemblies shall be tested per the following sections (6 assemblies per section) III.L., M., O., and P.
2. Twenty-four (24) pressure control valve assemblies shall be tested per Section E., F., G., H., I., J., K and Q. These valve assemblies will then be divided into four (4) groups of six (6) and tested to Section III.A., B., C., and D.

**B. Production IP-1**

1. Eighteen (18) pressure control valve assemblies shall be tested per the following sections (3 assemblies per section) III.L., M., N., O., and P.
2. Twelve (12) pressure control valve assemblies shall be tested per Section III.E., F., G., H., I., J., K and Q. The valve assemblies will then be divided into four (4) groups of three (3) and tested to Sections III.A., B., C., and D.

**C. Production IP-2**

1. Nine (9) pressure control valve assemblies shall be tested per the following sections (2 assemblies per section) III.L., M., N., O., and P.
2. Eight (8) pressure control valve assemblies shall be tested per Section III.E., F., G., H., I., J., K and Q. These valve assemblies will then be divided into four (4) groups of two (2) and tested to Sections III.A., B., C., and D.
3. One (1) pressure control valve assembly will be tested per section III.O daily.

**E. EXPLANATION OF REFERENCE DOCUMENTS**

**A. Quality Control Specification**

Q-101 Revised June, 1983 Edition

0725

PAGE 2/

00061985

00703047-a2

3713 8117

 ENGINEERING SPECIFICATION

VES E73C-2B091-AA

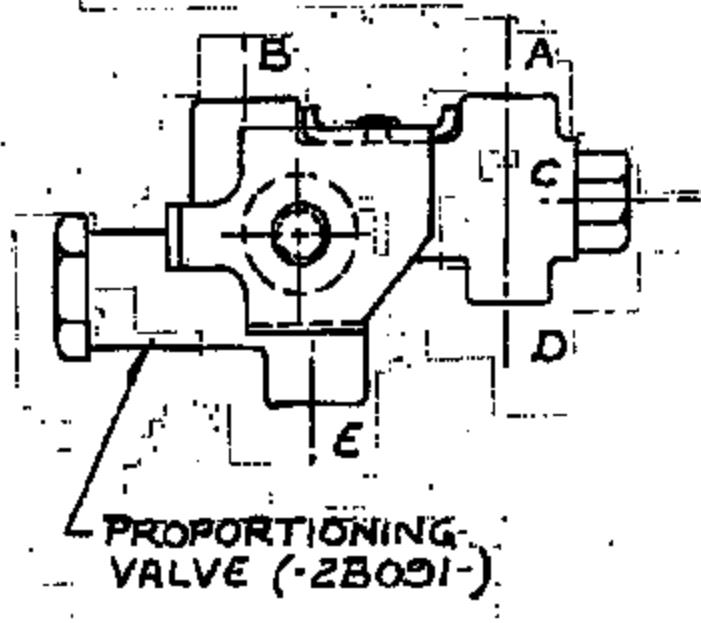
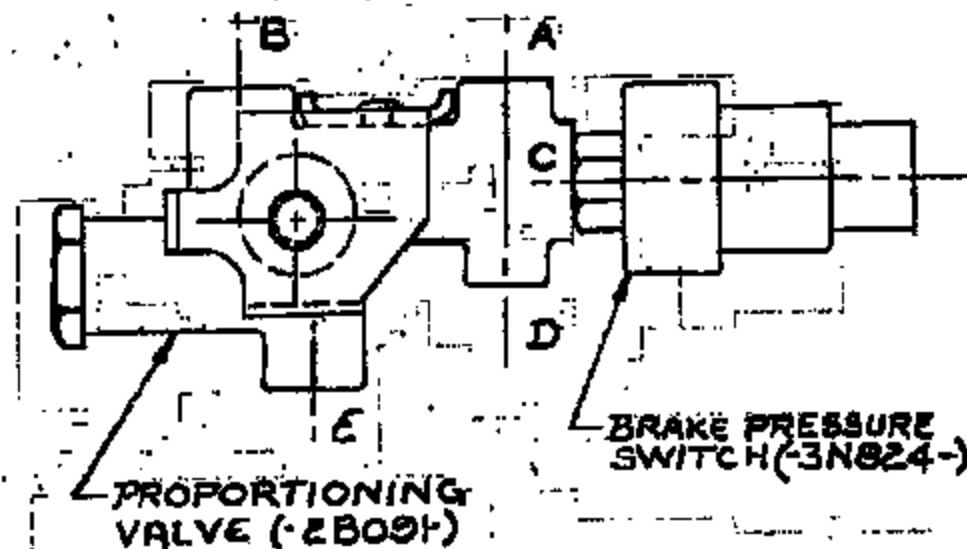
Review

25

22

Form 3047-A2

FIGURE 1



3713 8118

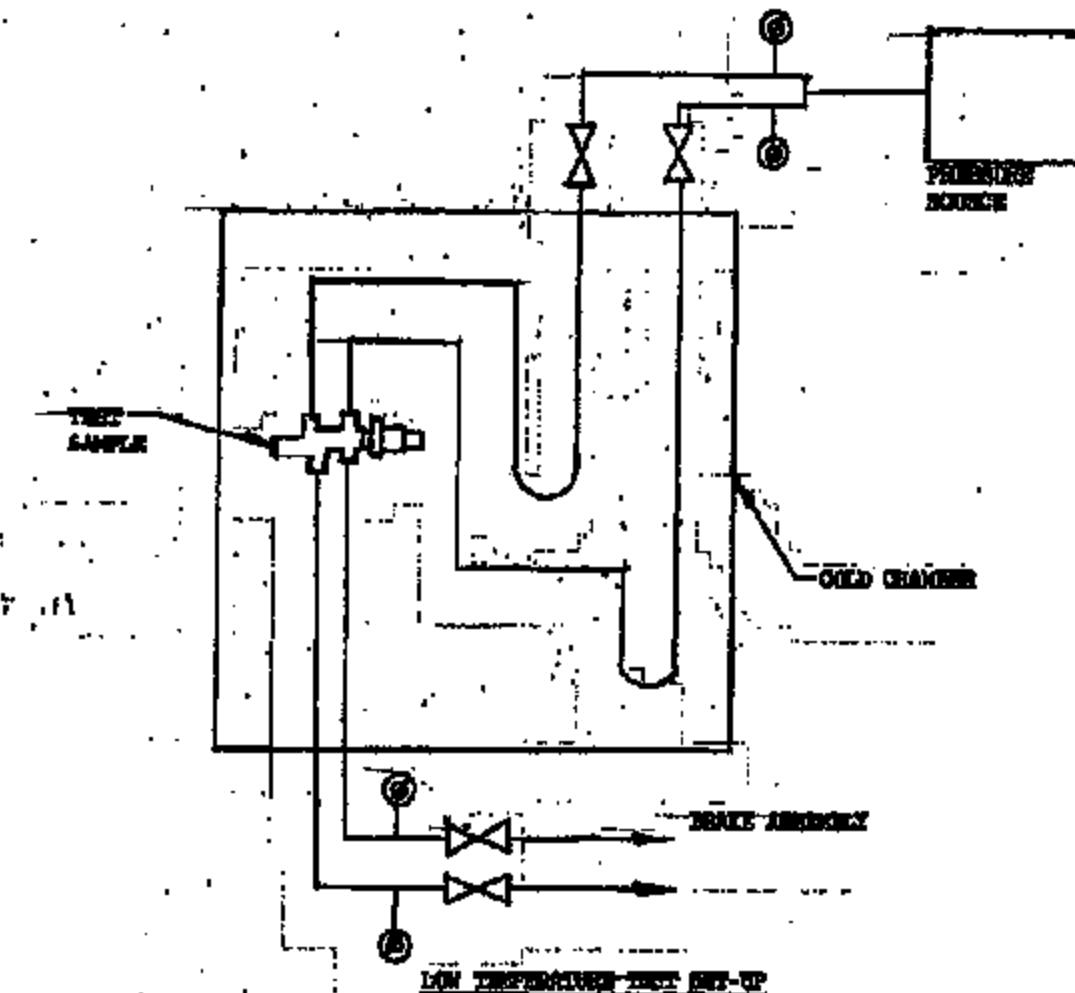
Mark 23

Rev 25

VES ESC-28091-AA

ENGG. SPECIFICATION

7100 Rev 2



Rev 204742

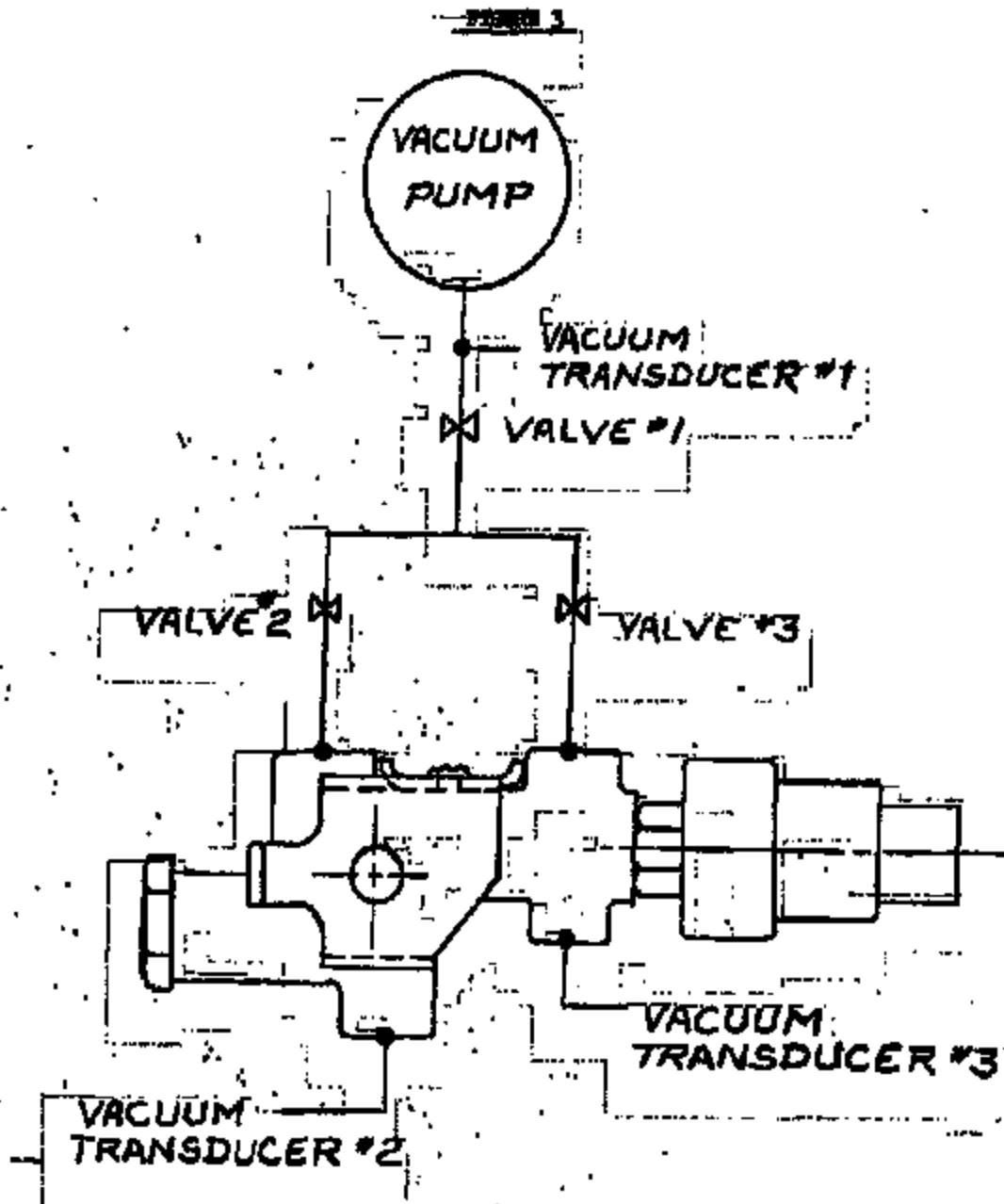
3713 8119

**ENGINEERING SPECIFICATION**

REVISED  
VES E7SC-2809-A3

Page 24 25

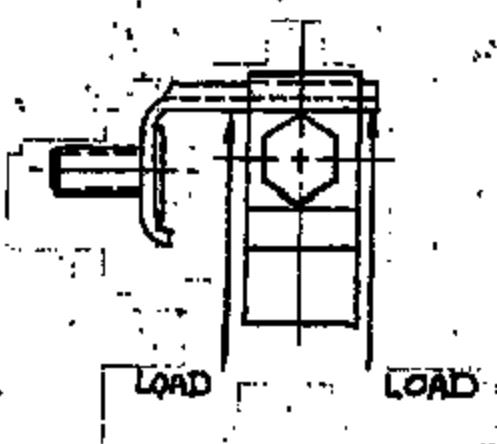
12-11-3947-42



3713 8120

**ENGINEERING SPECIFICATION**

**FIGURE 4**



VES E7SC-2B091-AA

Rev. 25 1-25

500-3047-02

3713 8121

**Reimers, Steve (S.J.)**

---

From: sberinghause@email.mc.ti.com  
Sent: Monday, October 18, 1999 1:52 PM  
To: SREIMERS  
Subject: RE: Data

MSG:FROM: PROUK3IO--EXTERNAL TO: SREIMERS--DRBN007  
13:52:30  
To: SREIMERS--DRBN007 Steve Reimers

10/18/99

FROM: Beringhause, Steven WZ4 (UTC -0400)  
Subject: RE: Data

Address "PROUK3IO--EXTERNAL" mapped from "sberinghause@email.mc.ti.com"

Steve,

Thanks for getting back to me. I have started the process to get the switch component prints as of 1991-1993. The old prints are on microfiche so it will take a while. I will let you know when it is complete. Please keep me up to date on the teardown analysis of the switches.

Steve

> -----  
> From: Steve ReimersfSMTP:sreimers@ford.com'  
> Sent: Monday, October 18, 1999 12:16 PM  
> To: sberinghause@email  
> Subject: Data  
>  
> I have not yet put together the info for you regarding vehicle build date,  
> mile  
> age, and date code for modules involved in fires. It will take some  
> searching a  
> nd I am 100% involved with the teardown of the 11 melted switches.  
Sorry.  
>  
> Steve Reimers building 5 3E008  
> RVT Chassis E/E System Applications mail drop 5011  
> 39-03286 SREIMERS sreimers@ford.com fax 39-04145 ;>  
>

MSG FROM: SREIMERS--DRBN007 TO: PIR43P4A--EXTERNAL 06/24/99 13:14:36

To: PIR43P4A--EXTERNAL A.McGuirk, a-megui

cc: FPORTER --DRBN007 Porter, F.J. JRENTIS --DRBN007

FROM: Steve Reimers USART(UTC -04:00)

Subject: SPC Data Records

Andy, Please provide a hardcopy of the documents that report the statistical process control data for the brake pressure switch used on Town Car, Crown Victoria, Grand Marquis model years 1992 and 1993. Please include the most recent 12 months of production of these parts.

Steve Reimers building 5 3B008

RVT Chassis E/E System Applications mail drop 5011

39-03286 SREIMERS sreimers@ford.com fax 39-04145 >

---

=  
MSG FROM: SREIMERS-DRBN007 TO: PIR43P4A-EXTERNAL 06/24/99 13:07:22

To: PIR43P4A-EXTERNAL A.McGuire, a-mcgui

cc: FPORTER -DRBN007 Porter, F.J.

FROM: Steve Reimers USAET(UTC -04:00)

Subject: Change Management Documents

Andy, Please provide a hardcopy of the documents that define the changes made to the brake pressure switch used on Town Car, Crown Victoria, Grand Marquis model years 1992 and 1993. Please include changes made to the production line equipment and processes.

Steve Reimers building 5 3E008

RVT Chassis E/E System Applications mail drop 5011

39-03286 SREIMERS sreimers@ford.com fax 39-04145

## **Brake Pressure Switch Usage Thru MY99**

3713 8126

	<b>Brake Pressure Switch Usage Thru MY99</b>								
	<b>(by NAVIS start date)</b>								
VL / MY	92	93	94	95	96	97	98	99	
town	11/04/91								
crown vic	02/05/92								
grand marquis	02/05/92								
econo	04/22/91								
club wagon	04/22/91								
f-series		05/28/92							
bronco		05/28/92							
explor			08/11/94						
ranger				08/11/94					
exped					05/07/96				
navi						12/18/96			
sho		04/23/92							
mark VIII		08/18/92							
windstar			12/15/93						
Capri			08/11/93						
			Not used						

3713 8127

## Deactivation Switch Tech Review Info for Meeting 12/13/99

The latest 14D is dated 9/14/99. There have been no updates since the last tech review on 9/14/99.

278,645 vehicles involved in recall.

167,229 total completed units as of 12/9/99

Issued 25325 Yellow tags (through 12/5/99) for parts to be returned

Received 12,845 as of 12/7/99.

Visually examined 1500 parts .... Found 10 heat damaged ( 6 -AB, 1-BB, 2-AA, 1 F3TA -AA)  
Electrical measured 300 parts .... Found 3 with resistance anomalies ( 2 -AB, 1 -BB)

11600 parts sent to outside agency for visual inspection and electrical measurement.

1100 parts completed and further activity suspended.

Looking for electrical anomalies without heat damage or leakage that would be indicating a developing failure.

Looking for candidates to complete DOE samples.

Summary of results for analysis of 8 heat damaged parts ( 2 - AB not analyzed)

- metal switch components corroded, if present, in all switches
- the spring arm was not intact in any switch.
- All Kapton shows delamination, tears, cracks, ridges and buckling.

- Several of the washers had a heavy build up of copper material in the bevel region. The zinc plating is missing in the bevel as well, exposing the base steel, and initiating rust formation.

- Heat damage includes bulging, bubbled, and missing plastic switch base

- Chemicals found in switch cavity are predominantly brake fluid and water

- 1 part had no parts in the switch cavity

- 1 part built 1999 was melted by external heat source.

10 Units at TI for Impulse testing to compare remaining life of early vs late date coded parts.

2 units failed at < 100K cycles (date codes 2008 and 2015)

Testing is in progress at 100K + cycles, target completion is 1/15/2000.

All units are from cars with approx 105,000 miles

6 units have date codes compatible with original build date of car (4 are service parts)

5 units are from January 1992 TI production

5 units are from October 1992 TI production

25 Units returned to TI for failure analysis

Summary of results: No trouble found.

Parts were all built in 1999 for the recall kits.

All switches were within specification;

No current path to ground was detected;

No leaks were discovered;

2 switches were mis-handled during the install/removal cycle.

The yellow tags had the following reasons for returning the parts:

- 9-no description;
- 6-brake fluid leak;
- 4-admin. parts return;
- 2-engagement trouble;
- 2-disengagement trouble;
- 1-other electrical trouble.

7 Units given to Central Lab for comparative analysis.

2-AB built in 1999, 2-AB built Sept 92, 1-AB built in Dec 91,  
1-AB built in Jan 92, 1-BB built in Oct 91.

Analysis to begin in Jan 2000.

Collecting 18 Samples for a DOE (5 factors with mileage neutralized at 80K)

Determine factors effects on remaining life.

9 samples were found in first 1500 parts.

	M# prod volume total recall	11/4/91 thru 1000's fc	11/30/92 my92 tc	2/5/92 thru my93 gm	11/30/92 my92 gm	my92 cv	my93 cv
08/31/91							
09/30/91							
nov 10/31/91							
dec 11/30/91	5485	5485	5485				
jan 12/31/91	8935	8935	8935				
feb 01/31/92	4747	4747	4747				
mar 02/28/92	30854	30854	11747		10714		8393
apr 03/31/92	34853	34853	13301		10136		11216
may 04/30/92	29285	29285	9680		9285		10310
june 05/31/92	27702	27702	10027		7882		10013
july 06/30/92	34461	34461	10163		11608		12690
aug 07/31/92	21108	21108	7247		6629		7032
sept 08/31/92	29812	29812		10748	2246	8376	2363
oct 09/30/92	29582	29582		10589		10215	8778
nov 10/31/92	28438	28438		11187		9178	7073
dec 11/30/92	23939	23939		9680		7808	6461
12/31/92	0						
01/31/93							

308881

my92 data from hardcopy dated 9/1/92

my 93 data from hardcopy dated 1/3/94

FROM: Bhugra, Gurjeet (G.)

Subject: RE: 92/93 Weekly Prod'n volumes

**Data Log**  
**Brake Pressure Switch**

Log Updated 1/22/00

Star ID	Star Date Code	Vehicle	VIN or ROLL or Tag	Event	Mileage	Term-Hexport Resistance	Leaker?	Kaption #1	Kaption #2	Kaption #3	Present Status	Parts Received	config
Memphis	2058	Town Car	PY [REDACTED]	Sw. Firs				crack	crack	crack	Analysis Complete		
A	2281	Town Car	PY [REDACTED]	Underhood Firs				no info	no info	no info	Analysis Complete		
B	2114	Town Car	PY [REDACTED]	Underhood Firs							Sw. not available		
C	2003	Town Car	PY [REDACTED]	Underhood Firs							Analysis In Progress		
D	2137	Crown Vic Police Car,02/25/99	PY [REDACTED]	Cruise Inop		4.8MEGAOHMS	yes	crack	crack	crack	Analysis Complete		
E	2128	Town Car	PY [REDACTED]	Reference		OPEN	no	worn, no crack	worn, no crack	worn, no crack	Analysis Complete		
F	2008	Town Car	PY [REDACTED]	Cruise Inop		4MEGAOHM	yes	crack	crack	crack	Analysis Complete		
1	2015	Town Car	PY [REDACTED]	Reference	79184	OPEN					Analysis Complete		
3	2048	Town Car	PY [REDACTED]	Reference	71237	OPEN							
4	2084	Town Car	PY [REDACTED]	Reference	88087	OPEN							
5	3025	Town Car	PY [REDACTED]	Reference	96348						Analysis In Progress		
6	2069	Town Car	PY [REDACTED]	Reference	47325						Analysis In Progress		
7	3025	Town Car	PY [REDACTED]	Reference	86822	OPEN							
8	2280	Town Car	PY [REDACTED]	Reference	65614	OPEN							
9	2281	Town Car	PY [REDACTED]	Reference	??	OPEN							
10	2281	Town Car	PY [REDACTED]	Reference	82224	OPEN							
11	3028	Town Car	PY [REDACTED]	Reference	91388	OPEN							
12	2233	Town Car	PY [REDACTED]	Reference	68889	OPEN							
13	2080	Town Car	PY [REDACTED]	Reference	63237	OPEN							
14	2071	Town Car	PY [REDACTED]	Reference	94145	OPEN							
15	3081	Town Car	PY [REDACTED]	Reference	??	OPEN							
16	??	Town Car	PY [REDACTED]	Reference	97199	OPEN							
17	??	Town Car	PY [REDACTED]	Reference	72114	OPEN							
18	2308	Town Car	PY [REDACTED]	Reference		OPEN							
19	??	Town Car	PY [REDACTED]	Reference	67549	OPEN							
20	??	Town Car	PY [REDACTED]	Reference	42521	OPEN							
21	??	Town Car	PY [REDACTED]	Reference	43531	OPEN							
22	2274	??	PY [REDACTED]	Reference	??								
23	??	Town Car	PY [REDACTED]	Reference	68302	OPEN							
From TX trip of 2/10 to 2/12, John Molinemey Group													
1	2028	Town Car	PY [REDACTED]	Reference									
2	3053	Crown Vic Police Car	PY [REDACTED]	Reference	188988								
3	3295	Grand Marquis	RH [REDACTED]	Reference	??								
4	3025	Crown Vic	PY [REDACTED]	Reference	40842								
5	2083	Town Car	PY [REDACTED]	Reference	73115								

Steve Reimann, 313 39 08286,  
steve\_reimann@ford.com,  
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3713 8131

**Data Log**  
**Brake Pressure Switch**

8	??	Town Car	NY [REDACTED]	Underhood Fire	??							
7	3081	Town Car	PY [REDACTED]	Reference	??							
8	2046	Town Car	NY [REDACTED]	Underhood Fire	108610							
9	3088	Town Car	PY [REDACTED]	Reference	??							
10	2272	Crown Vic	PX [REDACTED]	Reference	72614							
11	2115	Town Car	NY [REDACTED]	Reference	??							
12	3086	Town Car	PY [REDACTED]	Reference	??							
13	3089	Town Car	PY [REDACTED]	Reference	105046							
<b>OASIS</b>												
Baton Rouge, LA	2082	Town Car	P [REDACTED]	Dealership Return	88003	yes	crack	crack	crack	Analysis In Progress	Switch	
Memphis, TN	2128	Town Car, 5/29/92	1LNLM881WGP [REDACTED]	Dealership Return	158688	yes	crack	crack	crack	Analysis In Progress	Switch	
<b>EAA</b>												
Davenport, FL	2080	Town Car	NY736847	Underhood Fire	100000+	?	burned	burned	burned	Analysis In Progress	Switch	
Aurora, IL	2089	Town Car, 27-AUG-1991	1LNLM882WGP [REDACTED]	Underhood Fire	?	?	burned	burned	burned	Analysis In Progress	Switch, #12 15A Fuse	
Naples, FL	?	Town Car, 12-MAR-1991	1LNLM881WSN [REDACTED]	Underhood Fire	73825	?				Brake Fluid Only		
Gibsonston, FL	?	Grand Marquis, 2/26/92	2MECM74WSN [REDACTED]	Underhood Fire	58 - 60,000	?	tbd	tbd	tbd	Switch, Portion of Master Cyl, Wiring Harness		
Ypsilanti, MI test car	1200	Town Car	NY [REDACTED]	Underhood fire reference -BB	42000	base gone open	no			Chem Analysis comple P2vo-9824-AB en5-3e000	P2vo-9824-BB	
98a15	1291	town car	[REDACTED]	98a15	98253					To CSL 9/27/98 for cox -BB part		
98a15	2056	town car	[REDACTED]	98a15	75000					To CSL 9/27/98 for cox -AB part		
98a15	2268	town car	[REDACTED]	98a15	88164					To CSL 9/27/98 for cox -AB part		
98a15	2267	town car	[REDACTED]	98a15	64307					To CSL 9/27/98 for cox -AB part		
98a15	1845	grand marquis	[REDACTED]	98a15	88201					To CSL 9/27/98 for cox -AB part		
98a15	unused	NEW A	[REDACTED]	reference	0					To CSL 9/27/98 for cox -AB part		
98a15	unused	NEW B	[REDACTED]	reference	0					To CSL 9/27/98 for cox -AB part		
Meade, Kansas	3288	F-150 , 1994, 12/7/93	1FTEX14H8RKA [REDACTED]	smoke	150000	5 ohms	yes			To CSL 10/1/98	F3TA-9824-aa and c	506
98a15 recall	1275	town car, 3/2/92	[REDACTED]	melted	254359					To CSL 10/1/1998	-BB part and connector	
98a15 recall	2052	grand marquis, 5/20/92	[REDACTED]	base gone	475561					To CSL 10/1/1998	-AB with base gone.	
98a15 recall	1280	crown vic, 2/20/92	[REDACTED]	switch old open	76198					To CSL 10/1/1998	-BB with connector	
98a15 recall	2008	grand marquis, 4/23/92	[REDACTED]	switch old open	111443					To CSL 10/1/1998	-AB part	
98a15 recall	2282	town car, 12/2/91	[REDACTED]	melted	49864					To CSL 10/1/1998	-AA part	
98a15 recall	2263	crown vic, 9/14/92	[REDACTED]	melted	15386					To CSL 10/1/1998	-AA part	
98a15 recall	2036	cv, 4/1/92	[REDACTED]	melted	91856					To CSL 10/1/1998	-AB part	
98a15 recall	2030	tc	[REDACTED]	base vacant	63137					To CSL 10/1/1998	F3TA-9824-AA	

Steve Reimers, 313 39 03288,  
steve@ford.com,  
file SwitchLog.xls

99e15 recall	9138	to, 3/13/92
99e15 recall	2104	to, 3/18/92
99e15 recall	9142	ts
99e15 recall	9141	ts
99e15 recall	9142	ts
99e15 recall	9134	ts
99e15 recall	9133	ts
99e15 recall	9142	ts
99e15 recall	9132	ts
99e15 recall	9128	ts
99e15 recall	9108	ts
99e15 recall	9131	ts
99e15 recall	9142	cr
99e15 recall	9133	cr
99e15 recall	9133	cr
99e15 recall	9145	cr
99e15 recall	9142	cr
99e16 recall	9188	gm
99e15 recall	9138	gm
99e15 recall	9142	gm
99e15 recall	9133	gm
99e15 recall	9138	gm
99e15 recall	9142	gm
99e15 recall	9133	gm
99e15 recall	9138	gm
99e15 recall	9128	gm
99e15 recall	9142	gm
99e15 recall	9133	gm
99e15 recall	9132	gm
99e15 recall	9138	gm
99e15 recall	9133	ts
99e15 recall	2084	to, 6/19/92
99e15 recall	1331	to, 9/21/92
99e15 recall	2030	to, 3/26/92
99e15 recall	2062	gm, 10/2/92
99e15 recall	1338	to, 7/17/92
99e15 recall	2013	cv, 4/22/92
99e15 recall	2254	to, 6/22/92
99e15 recall	2281	gm, 2/13/92
99e15 recall	2276	ts, 6/2/92
99e15 recall	2281	ts, 9/25/92
99e15 recall	2287	ts, 11/24/92

Steve Rainmers, 313 39 03286,  
 steve@ford.com,  
 file SwitchLog.xls

232077407

## Data Log Brake Pressure Switch

melted	107612	to CSL 10/1/1999	-AB part
melted	78904	~25 ohms	may
	71900	to TI for ts 10/4/99	-AB
	123084	to TI for ts 10/4/99	-AB
	90052	to TI for ts 10/4/99	-AB
	72153	to TI for ts 10/4/99	-AB
	80875	to TI for ts 10/4/99	-AB
	45531	to TI for ts 10/4/99	-AB
	84867	to TI for ts 10/4/99	-AB
	27202	to TI for ts 10/4/99	-AB
	124734	to TI for ts 10/4/99	-AB
	91425	to TI for ts 10/4/99	-AB
	91174	to TI for ts 10/4/99	-AB
	63093	to TI for ts 10/4/99	-AB
	84934	to TI for ts 10/4/99	-AB
	65048	to TI for ts 10/4/99	-AB
	116662	to TI for ts 10/4/99	-AB
	80306	to TI for ts 10/4/99	-AB
	76828	to TI for ts 10/4/99	-AB
	37768	to TI for ts 10/4/99	-AB
	68338	to TI for ts 10/4/99	-AB
	81298	to TI for ts 10/4/99	-AB
	54693	to TI for ts 10/4/99	-AB
	51742	to TI for ts 10/4/99	-AB
	71210	to TI for ts 10/4/99	-AB
	69440	to TI for ts 10/4/99	-AB
	48180	to TI for ts 10/4/99	-AB
	80509	to TI for ts 10/4/99	-AB
	107612	to TI for ts 10/4/99	-AB
melted	86972	steve's desk	-AB
melted	84618	Exponent- Visual Expl	-AB
heat damage	48856	Exponent	-AB
heat damage	88247	Exponent	-AB
heat damage	45220	Exponent	-AB
heat damage	132848	Exponent	-AB
no visible damage	108428	No Results from TI	
no visible damage	103580	cycles before leak per TI (1/3/00)	
no visible damage	108088	cycles before leak per TI (1/3/00)	
no visible damage	106338	cycles before leak per TI (1/3/00)	
no visible damage	103042	cycles before leak per TI (1/3/00)	

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99e15 recall	2008	ls, 8/13/02
99e15 recall	2008	ls, 8/15/02
99e15 recall	2015	ls, 10/23/02
99e15 recall	2013	ov, 5/14/02
99e15 recall	2014	ls, 4/1/02
99e15 recall	2013	ov, 8/5/02
99e15 recall	2003	gm, 10/30/02

## Data Log

### Brake Pressure Switch

no visible damage	108862	open	351k	cycles before leak per TI (1/3/00)	to TI 11/28/99, for remaining life test
no visible damage	107259	open	78k	cycles before leak per TI (1/3/00)	to TI 11/28/99, for remaining life test
no visible damage	104099	open	57k	cycles before leak per TI (1/3/00)	to TI 11/28/99, for remaining life test
no visible damage	104872	open	346k	cycles before leak per TI (1/3/00)	to TI 11/28/99, for remaining life test
no visible damage	108886	open	264k	cycles before leak per TI (1/3/00)	to TI 11/28/99, for remaining life test
no visible damage erratic ohms	108752	open	280k	cycles before leak per TI (1/3/00)	to TI 11/28/99, for remaining life test
	108891	open			clerk's desk 11/28/99 -AB



Central Laboratory  
15000 Century Drive  
Dearborn, MI 48120-1267  
FAX (313) 322-1614

Report 8903801

December 1, 1989

---

To: S. J. Reimers (313) 39-03286  
From: A. Zinkosky (313) 59-41444  
Subject: Brake Pressure Switch  
Part Number: F2VC-9F924-AB  
Specification: Not Provided  
Supplier: TI (Texas Instruments)

Received: One suspect cruise control cutoff brake pressure switch was received on November 30, 1989.

---

Object: Provided radiographic service per request.

---

**Data and Analysis:**

The sample and documentary photographs were taken by the requester upon completion of the radiographic service.

X-ray Film  
X-ray Video Tapes  
X-ray Photographs

were provided to the requester for his/her interpretation.<sup>1</sup>

---

<sup>1</sup> Corporate records retention policy requires that all negatives, tapes, and photographs be retained for three years from date of issue and then be properly disposed of. If your office does not wish to maintain the records as required, please return the radiographs for our file.

Concur:

P. F. Klaas, Supervisor  
Metallurgy & Mechanical Section

By:

Alex Zinkosky (AZINKOSK)  
Laboratory Specialist

AZ/acj

*Serial*

## Request for Central Laboratory Service

All shaded areas apply to this section - Not required  
unless otherwise indicated.

/Laboratory Number

Date

9703701

11-30-91a

15000 Century Dr., Dearborn MI 48120-1267 Phone (313) 32-21676 FAX (313) 32-21644

Your Name (Send report to)

Steven J Reimers

Telephone

312

PROFS ID

SREIMERS

FAX

Secondary Contact

Telephone

PROFS ID

FAX

## Send Report To:

Room No./Mail Drop/PO Box	Department/Activity	Building	Location Code	Dept. #	Work Task # (For \$100 Loc. Only)
3E008	J700	AVTS	5100	T402	J400

Samples

Total # of Samples	Sample Handling	TOXICAS#	Source	Supplier Code
1	Return after test	Dispose after test	Dispose after 30 days	
Part/Material Name		Sample Identification (Continue below if needed)	Part Number (If any)	Material Specification (If any)
Brake Pressure switch		R.O. 58351-02	F2VC-9F924-AB	060606 TI
			11/A	

## Investigation

## Nature of Investigation/Specific Test Required (Check all that apply)

Requester Info. Box [For requester use]

- Production/Plant problem     Perform Test as in Lab No. \_\_\_\_\_  
 Failure Analysis     Photograph [Describe below]  
 Legal     Use Specifications \_\_\_\_\_ as a guide  
 Specification Compliance     Other [Describe below]

Stop testing upon failure?    Does this support CAE testing? [If "Yes", what is the expected outcome?]    Do you need to know your CL contact and timing?    Yes  
 No     No     Yes

## Additional Sample Information/Testing Requirements

XRAY Electrical Components

Sample info:  
12/1/99

## Report

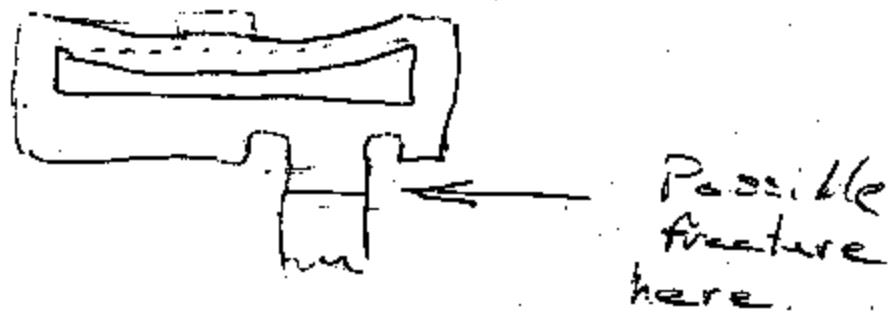
## Format (Check all that apply)

Date you would like report 12/1/99     FAX preliminary results     FAX hand written  
 Date you must have report 12/1/99     FAX typed report     Mail hand written

 Mail typed report Electronically transfer report Phone preliminary results

For information about services or assistance in completing this form, please refer to the Central Laboratory WEB page. [\[www.gto.ford.com/central/home.htm\]](http://www.gto.ford.com/central/home.htm)  
 Laboratory number and date cannot be assigned without receipt of samples.  
 Samples will be disposed of after 30 days unless otherwise indicated above.

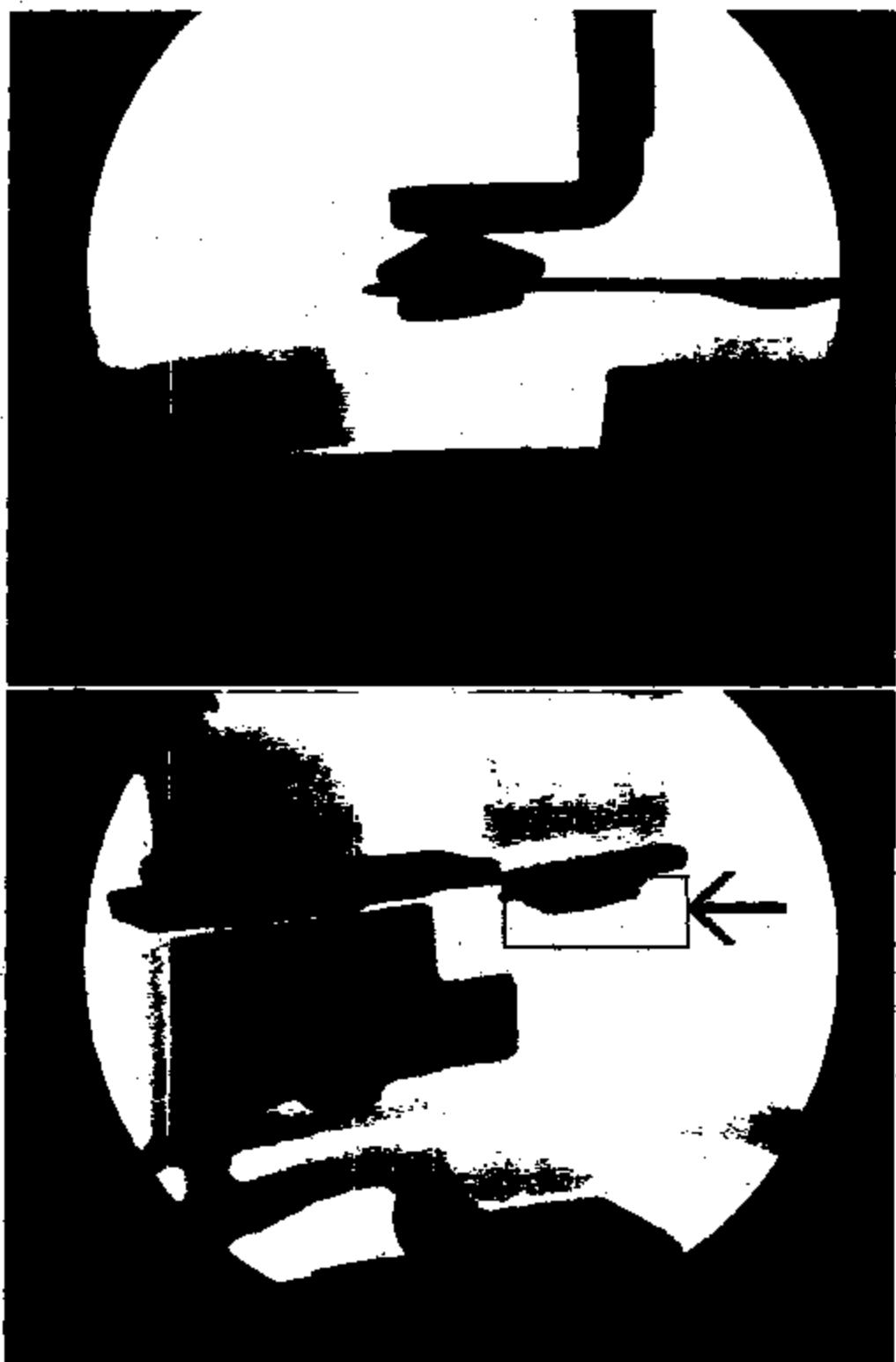
- No obvious contamination.
- Possible fracture in Boxed Area.
- ALSO noted, Slot long edges are not parallel as in drawings.



SW DATE CODE  
2003  
erratic elec. reading

3713 8137

F2VC-9F9Z4-AB DATE CODE 2003

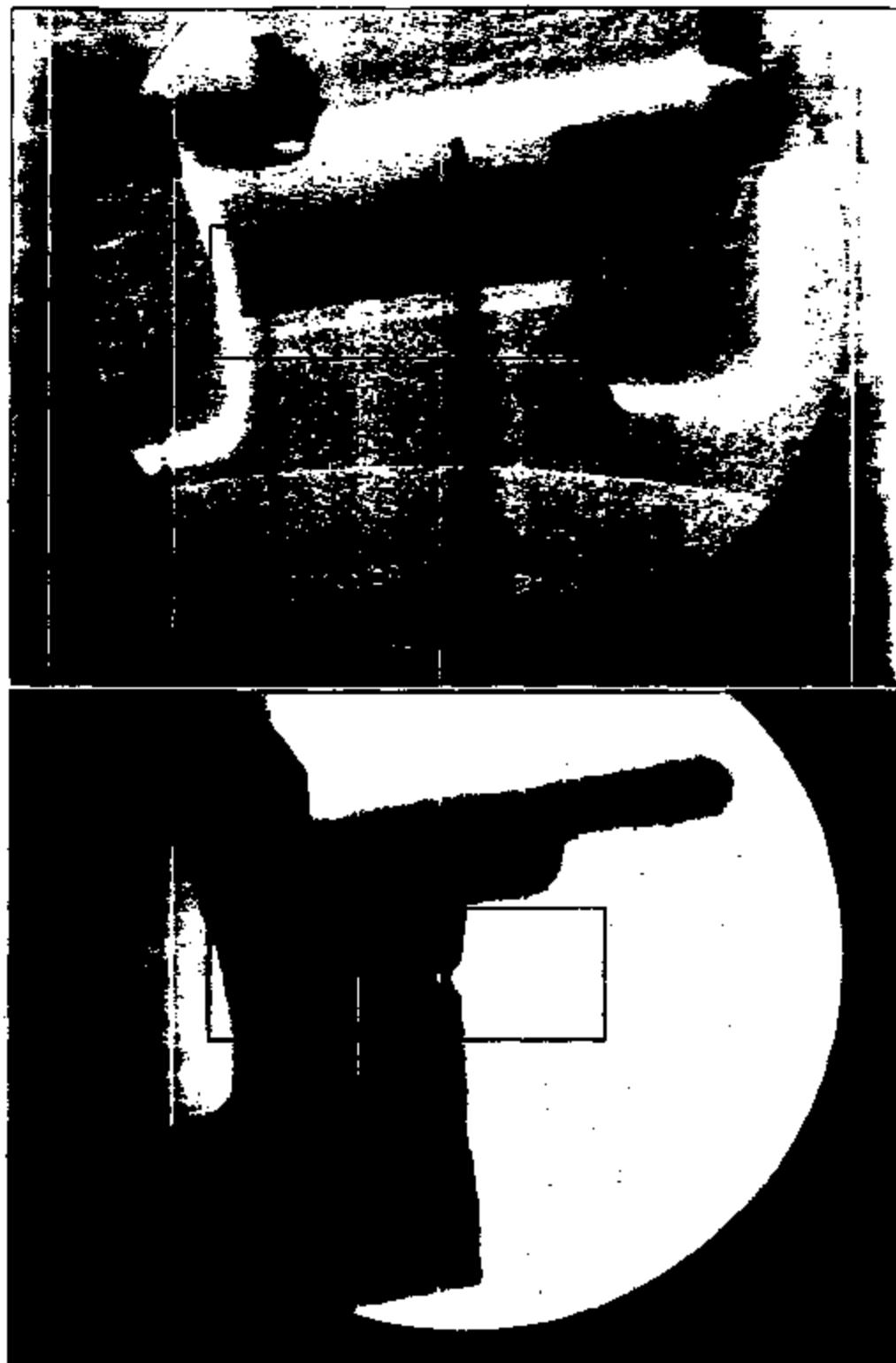


R.O. 58351-02  
Lab No. 9903901

3713 8138

1 of 2

F21C-9F924-A8 DATE CODE 2003



R.O. 58351-02  
LAB No. 9903901.

3713 5139

2 of 2



Central Laboratory  
15000 Century Drive  
Dearborn, MI 48120-1287  
FAX (313) 322-1614

Report 9903182

September 28, 1999

To: S. Reimers (313) 39-03286 (313) 39-04145 FAX

From: A. Zinkosky (313) 59-41444

Subject: Brake Pressure Switch

Part Number: F2VC-9F924-BB

Specification: Not Provided

Supplier: Texas Instruments

Melted

Received: One used brake pressure switch was received on September 27, 1999 and was identified as: 108857-1.

Object: Provide radiographic service per request.

**Data and Analysis:**

The radiographic service was performed at the direction of the requestor who took the sample and documentary photographs upon completion of the examination.

X-ray Film

X-ray Video Tapes

X-ray Photographs

were provided to the requestor for his/her interpretation.<sup>1</sup>

<sup>1</sup> Corporate records retention policy requires that all negatives, tapes, and photographs be retained for three years from date of issue and then be properly disposed of. If your office does not wish to maintain the records as required, please return the radiographs for our file.

Concur:

P. F. Klaas, Supervisor  
Metallurgy Section

By:

Alex Zinkosky (AZINKOSK)  
Laboratory Specialist

AZ:aw

All shaded areas must be filled in to process your request

Information Use Only

Laboratory Number	Date
PLC3182	9/27/94

Third

### Request for Central Laboratory Service

15000 Century Dr., Dearborn, MI 48120-1267 Phone [313] 32-21676 FAX [313] 32-21614

Your Name (Send report to)	Telephone	PROPS ID	FAX
Steve Reimers	39 03286	SREIMERS	39 04195
Secondary Contact	Telephone	PROPS ID	FAX

#### Send Report To:

BU To:

Room No/Mail Drop/PO Box	Department/Activity	Building	Location Code	Dept. #	Work Task # (For S100 Loc. Only)
3E008 / 5011	EMC/CHASSIS	AUTS	5100T402	J	04A/P

Sample

Total # of Samples	Sample Handling	TOX/CAS#	Source	Supplier Code
1	X Retain after test _____ Dispose after test _____ Dispose after 30 days _____			
Part/Material Name	Sample Identification (Continue below if needed)	Part Number (If any)	Material Specification (If any)	CPS Code
<del>FAUCET</del>	R.C.#			
Brake Pressure Sensor 108857-1	F2VC-9F924-RB	N/A	06 0606	TI

#### Specification

Nature of Investigation/Specific Tests Required (Check all that apply)		Requester Info. Box (For requestor use)
<input type="checkbox"/> Production/Plant problems	<input type="checkbox"/> Perform Test as in Lab No. _____	
<input type="checkbox"/> Failure Analysis	<input type="checkbox"/> Photograph (Describe below)	
<input type="checkbox"/> Legal	<input type="checkbox"/> Use Specification _____ as a guide	
<input type="checkbox"/> Specification Compliance	<input checked="" type="checkbox"/> Other (Describe below)	

Stop testing upon failure?	Does this support CAE testing? (If "Yes", what is the expected outcome?)	Do you need to know your CL contact and timing? _____ Yes
<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	

#### Additional Sample Information/Testing Requirements

X-RAY @ AUTS - 3E008 SP 10/11/94  
Scan 99815 recall.

~~Sample in tank~~

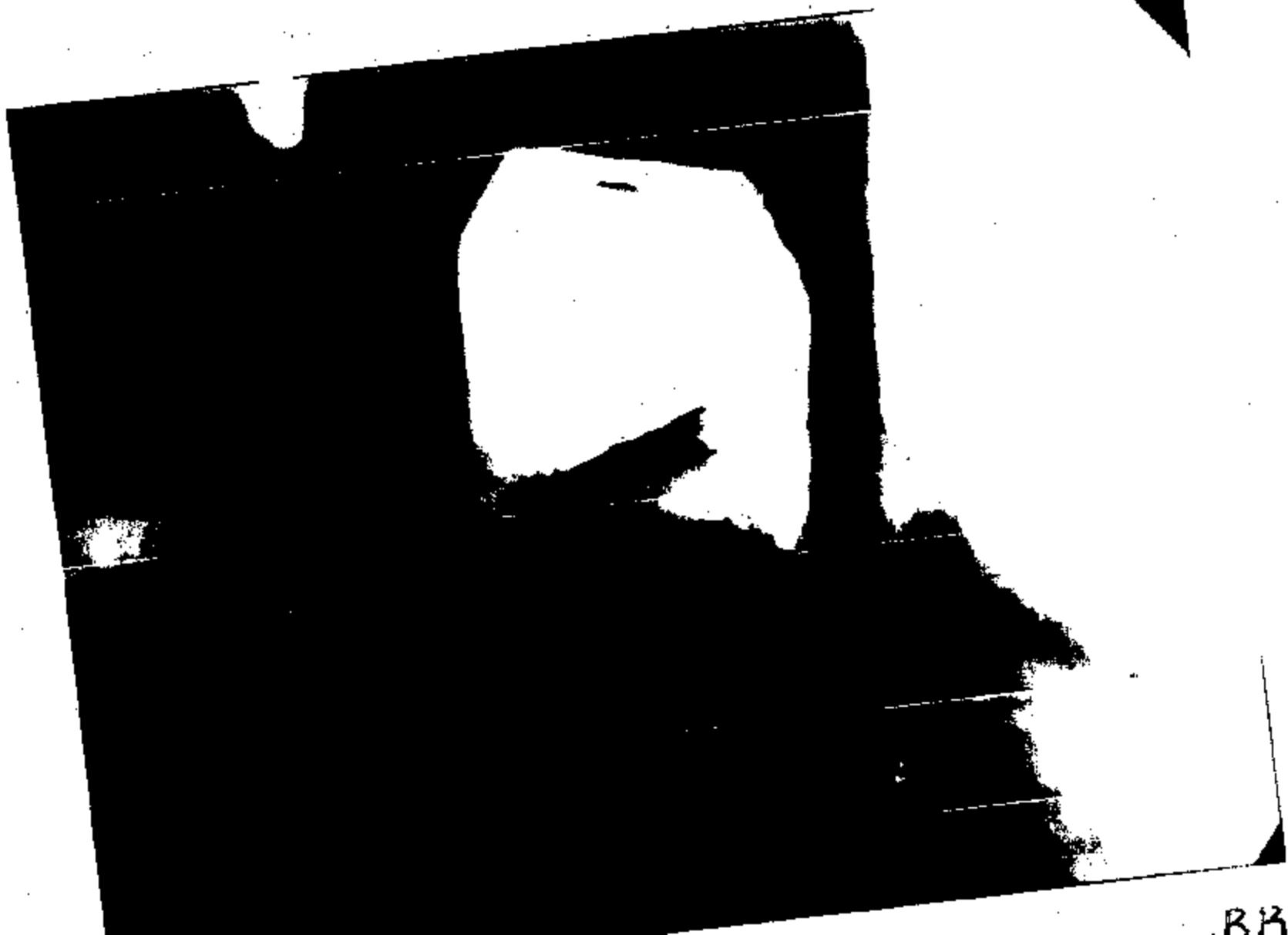
~~Sample in tank~~

#### Report

##### Format (Check all that apply)

<input type="checkbox"/> Date you would like report by: 10/12/94	<input type="checkbox"/> FAX preliminary results	<input type="checkbox"/> FAX hand written	<input checked="" type="checkbox"/> Mail typed report
<input type="checkbox"/> Date you must have report: 9/27/94	<input type="checkbox"/> FAX typed report	<input type="checkbox"/> Mail hand written	<input type="checkbox"/> Electronically transfer report
Phone preliminary results			

For information about services or assistance in completing this form, please refer to the Central Laboratory Web page: [www.gto.ford.com/central/home.htm](http://www.gto.ford.com/central/home.htm)  
Laboratory number and date cannot be assigned without receipt of samples.  
Samples will be disposed of after 30 days unless otherwise indicated above.





371388143

RO# 108857-1

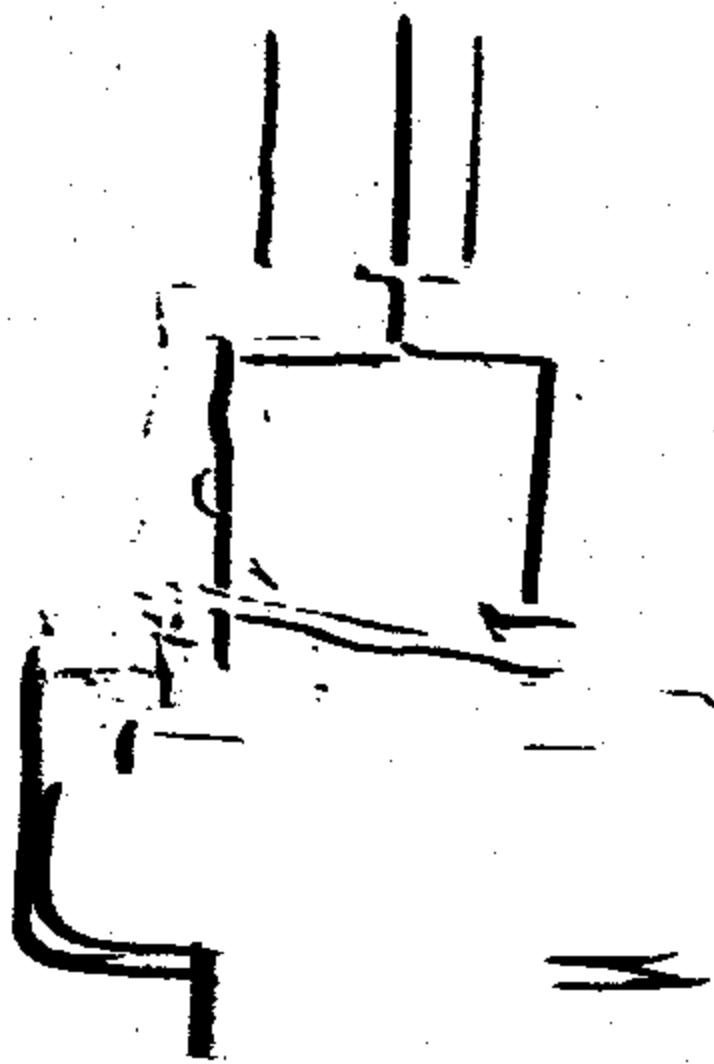
-BB

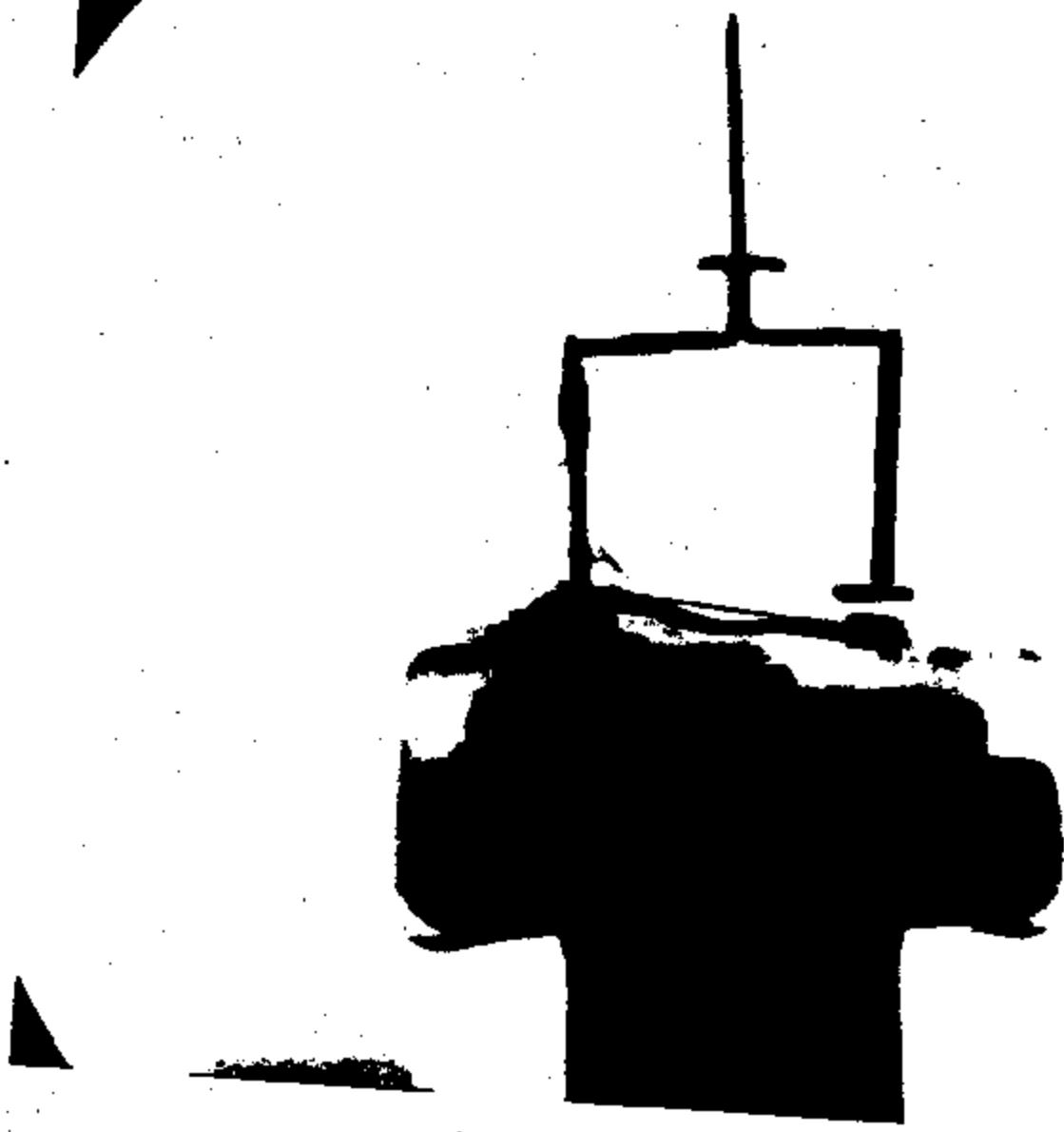
3713 8144



Roth 108857-1

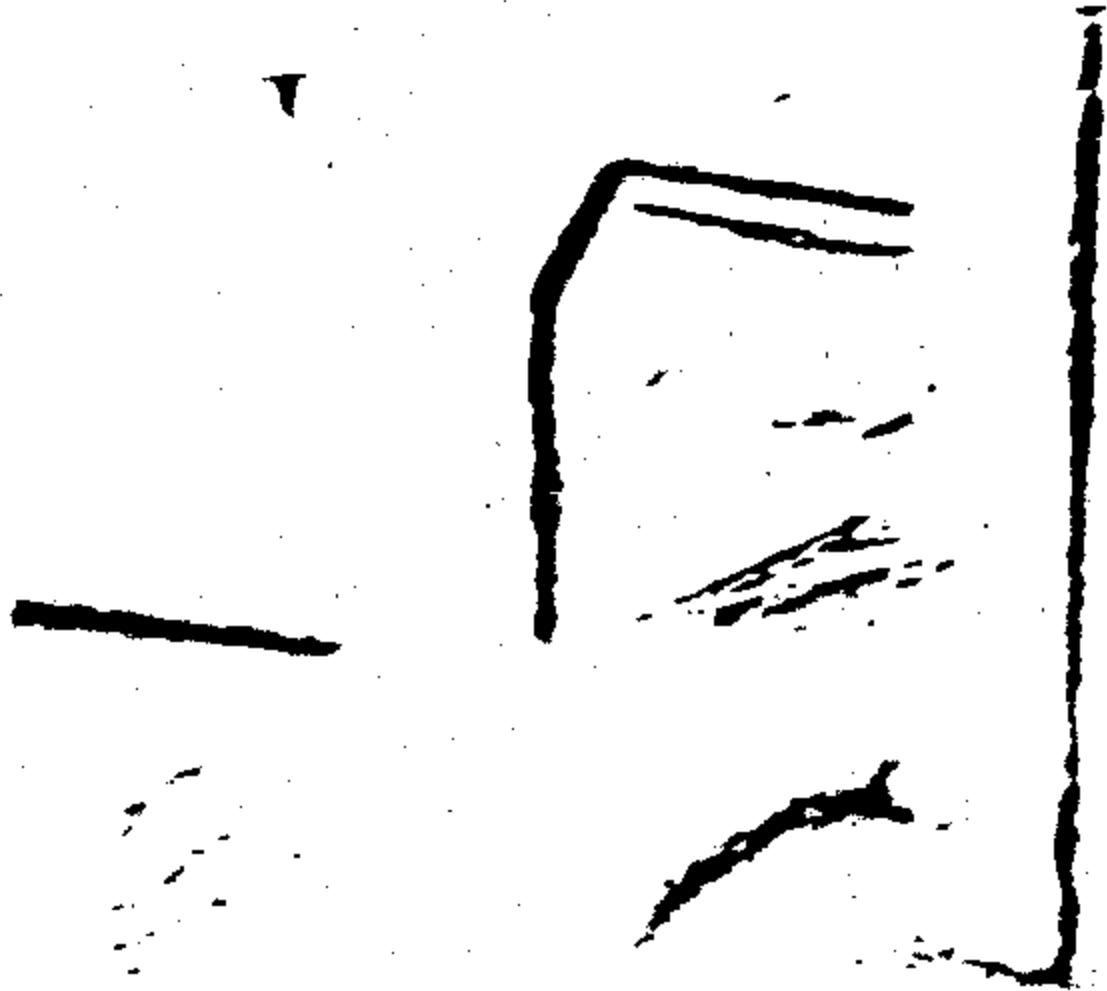
3B





3713 8146

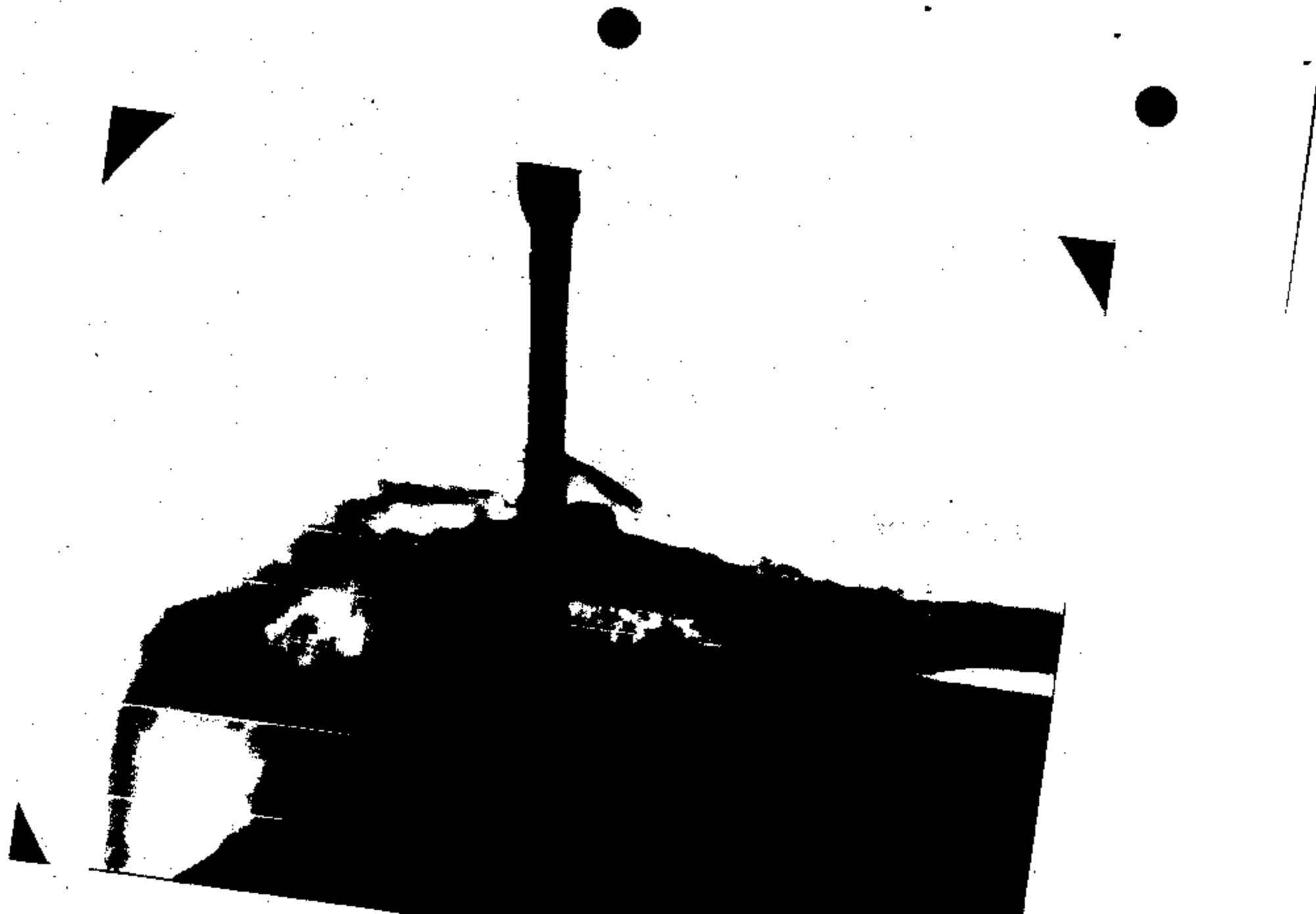
Reg. U.S. Pat. Off.



3713814

3713814-1

3F

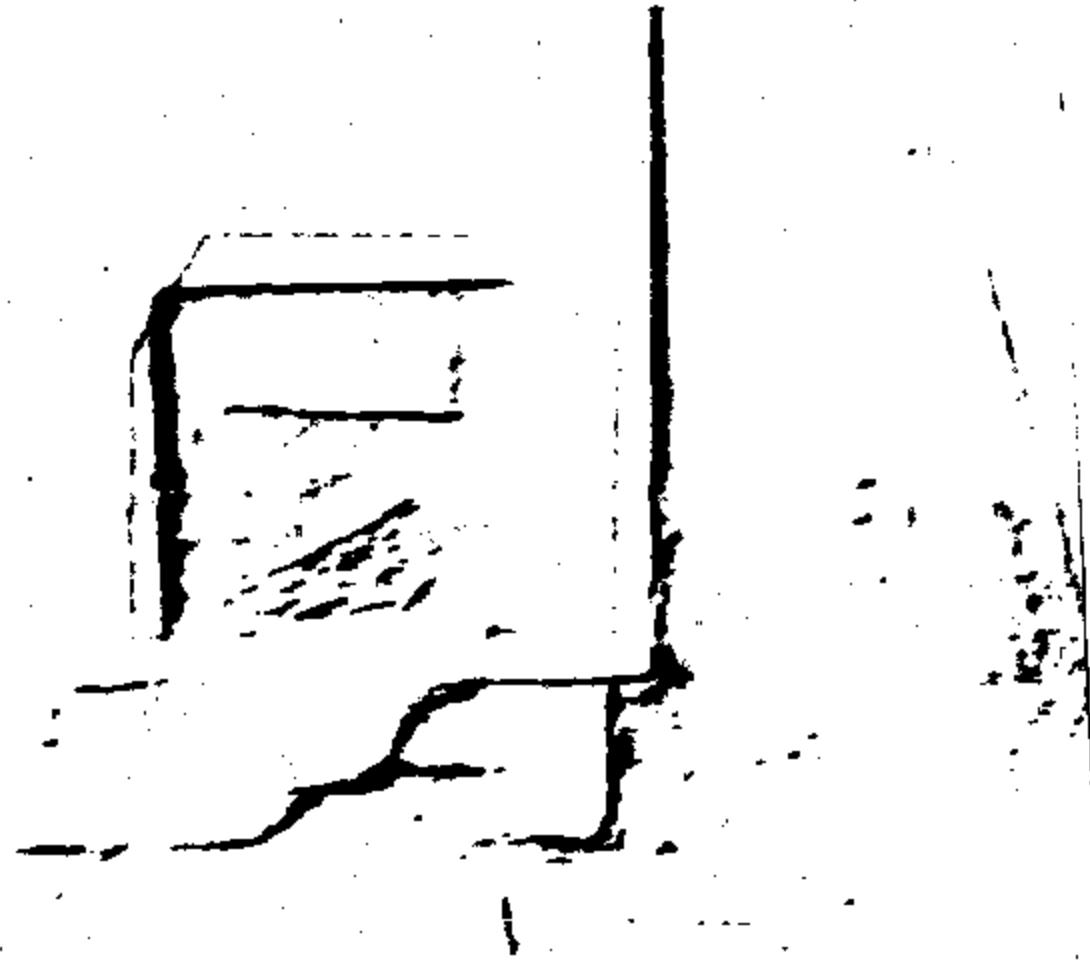




3713 6148



3713 8160



3713 8151

R# 108857-1

-38



9713 8152

Re# 108857-1

BB

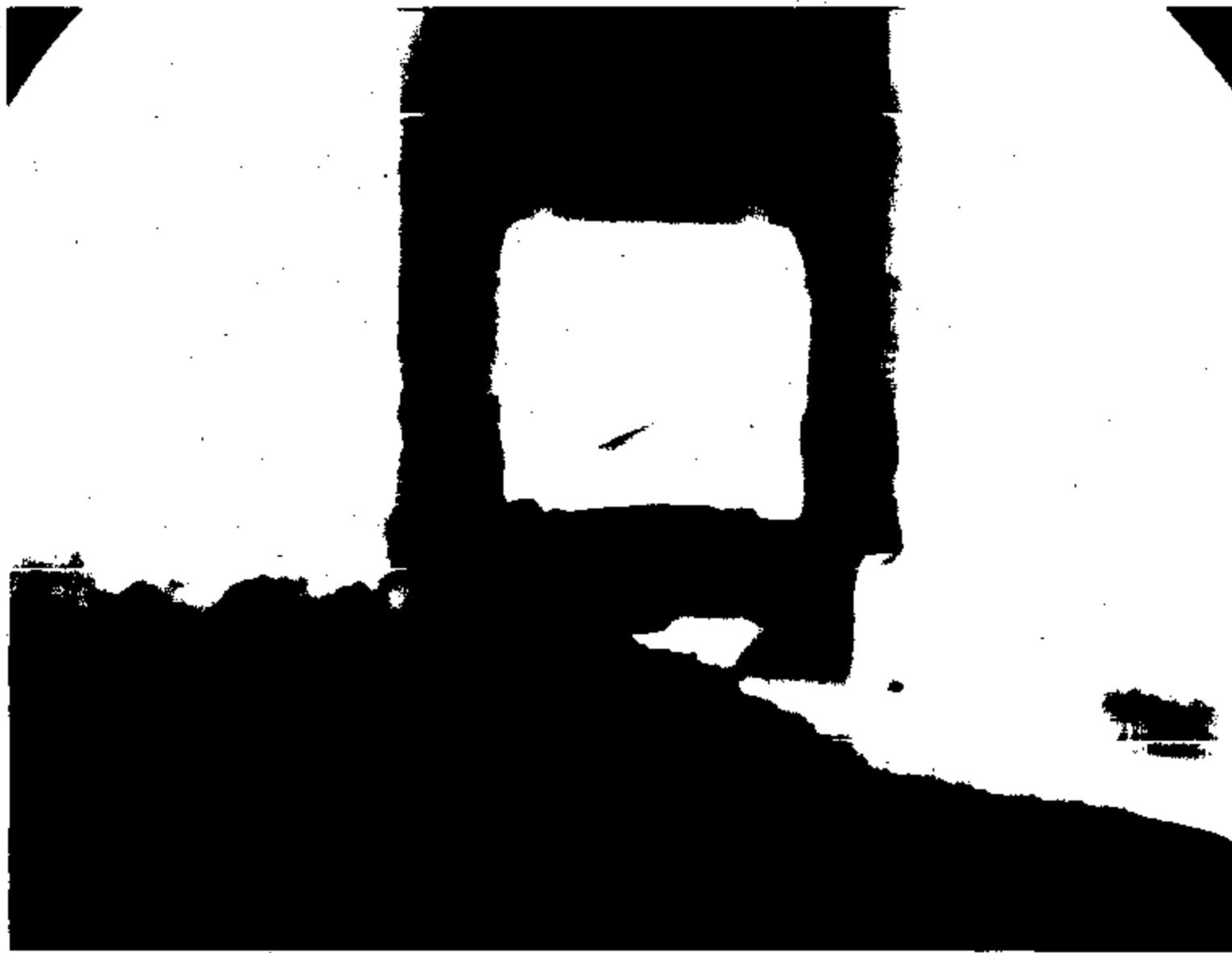
3719 8153



Ro# 108857-1

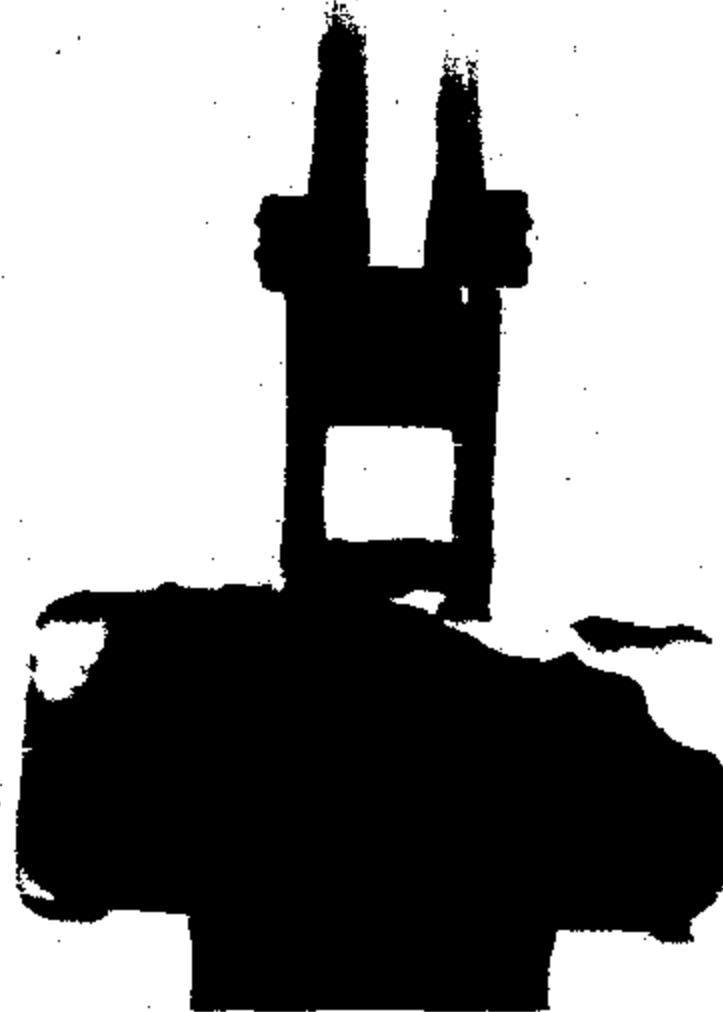
- 57

37138154



RO 108857-1

B3



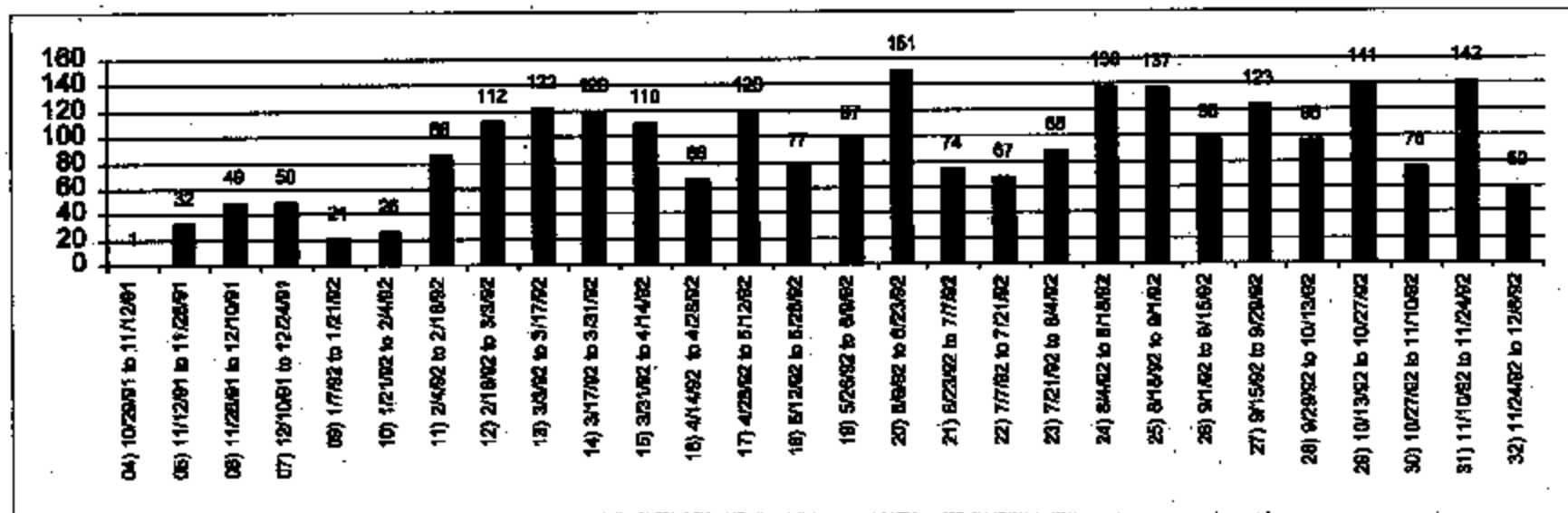
3713 8165

RO#108857-1

B6

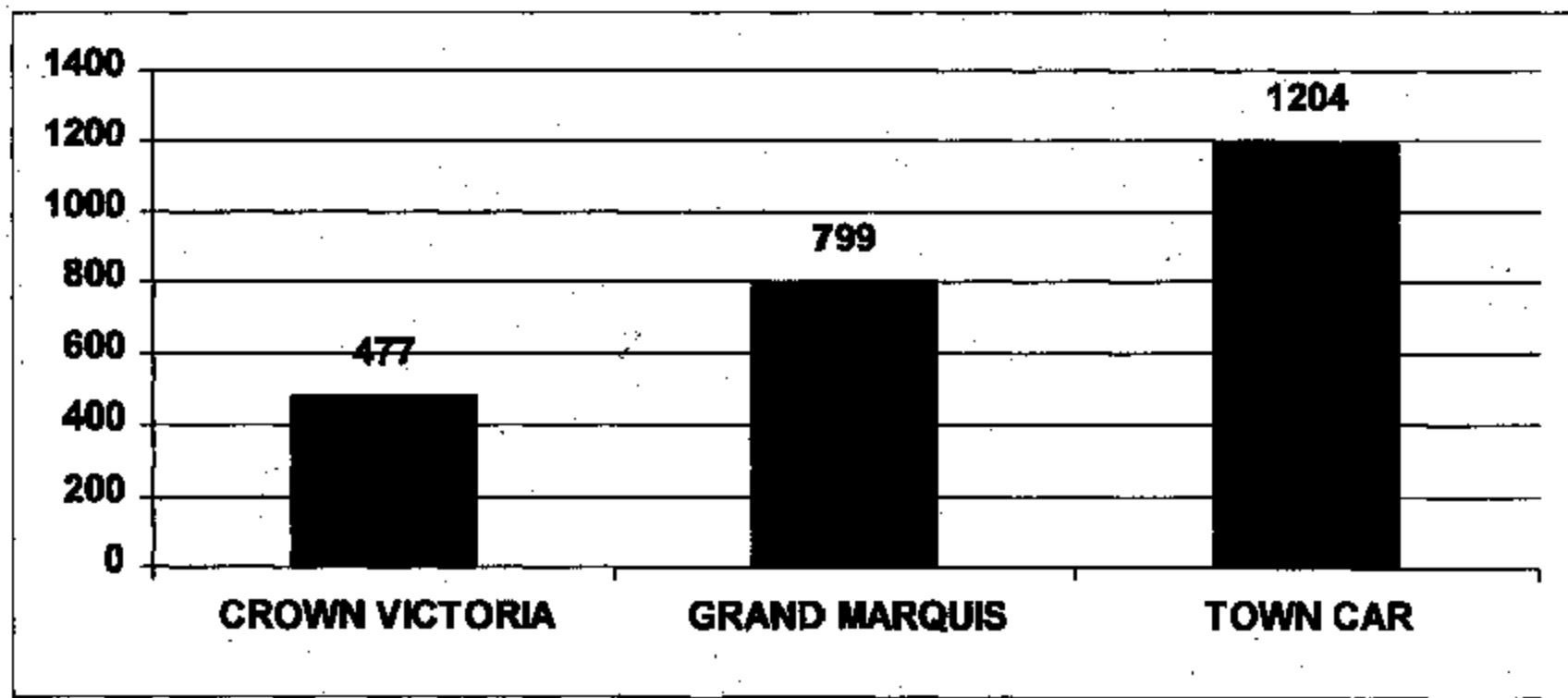
## Summary of Parts by Vehicle Build Date

Date Ranges	Number of Parts	Date Ranges	Number of Parts	Date Ranges	Number of Parts
04) 10/29/91 to 11/12/91	1	18) 4/14/92 to 4/28/92	66	27) 8/15/92 to 9/29/92	123
05) 11/12/91 to 11/28/91	32	17) 4/28/92 to 5/12/92	120	28) 8/29/92 to 10/13/92	66
06) 11/28/91 to 12/10/91	48	18) 5/12/92 to 5/26/92	77	29) 10/13/92 to 10/27/92	141
07) 12/10/91 to 12/24/91	50	19) 6/26/92 to 6/9/92	97	30) 10/27/92 to 11/10/92	76
08) 1/7/92 to 1/21/92	21	20) 6/9/92 to 6/23/92	151	31) 11/10/92 to 11/24/92	142
10) 1/21/92 to 2/4/92	26	21) 6/23/92 to 7/7/92	74	32) 11/24/92 to 12/8/92	60
11) 2/4/92 to 2/18/92	86	22) 7/7/92 to 7/21/92	87		
12) 2/18/92 to 3/3/92	112	23) 7/21/92 to 8/4/92	89		
13) 3/3/92 to 3/17/92	122	24) 8/4/92 to 8/18/92	136		
14) 3/17/92 to 3/31/92	120	25) 8/18/92 to 8/1/92	137		
15) 3/31/92 to 4/14/92	110	26) 8/1/92 to 8/15/92	98		



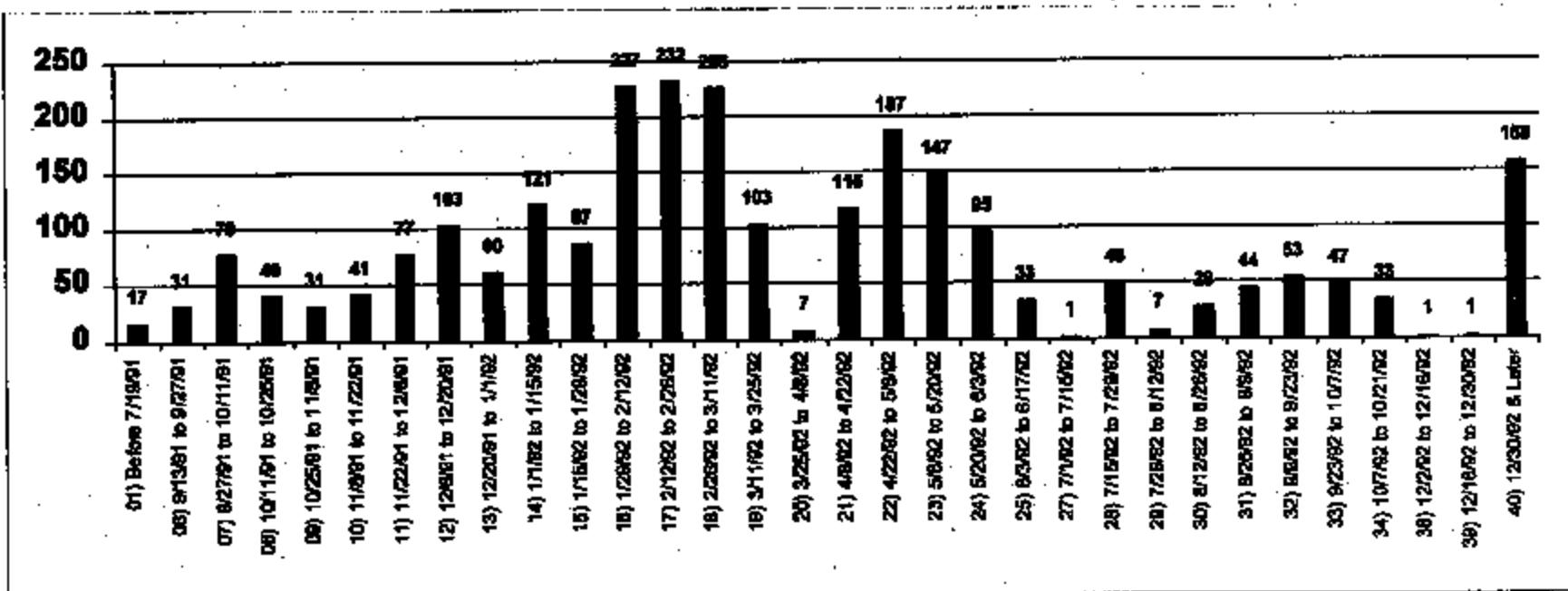
## *Summary of Parts by Vehicle Type*

<i>Vehicle Description</i>	<i>Number of Parts</i>
CROWN VICTORIA	477
GRAND MARQUIS	799
TOWN CAR	1204



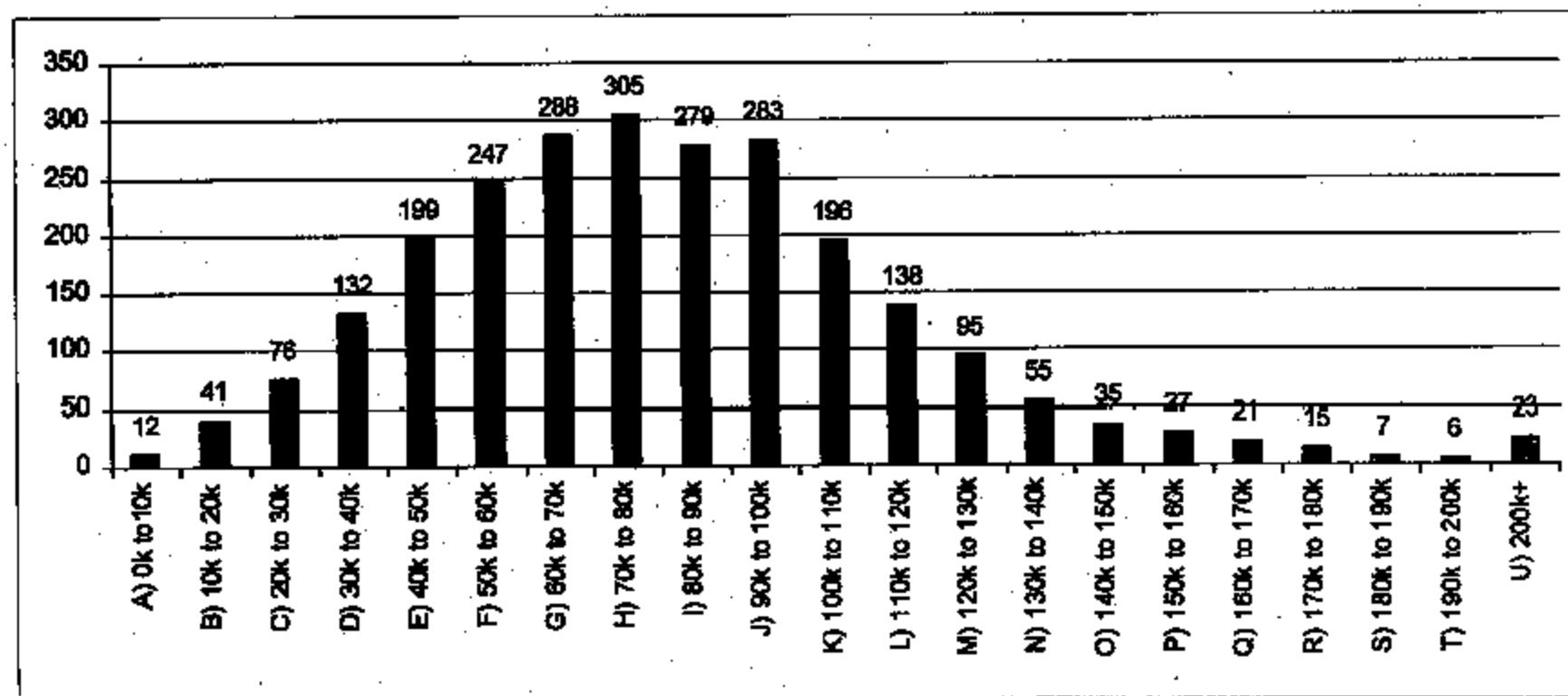
## Summary of Parts by Part Build Date

<i>Date Ranges</i>	<i>Number of Parts</i>	<i>Date Ranges</i>	<i>Number of Parts</i>	<i>Date Ranges</i>	<i>Number of Parts</i>
01) Before 7/1/91	17	17) 2/12/92 to 2/26/92	232	30) 8/12/92 to 8/28/92	28
06) 9/18/91 to 9/27/91	31	18) 2/26/92 to 3/11/92	228	31) 8/28/92 to 9/9/92	44
07) 9/27/91 to 10/11/91	78	19) 3/11/92 to 3/28/92	103	32) 9/9/92 to 9/23/92	53
08) 10/11/91 to 10/25/91	40	20) 3/25/92 to 4/8/92	7	33) 9/23/92 to 10/7/92	47
09) 10/25/91 to 11/8/91	31	21) 4/8/92 to 4/22/92	116	34) 10/7/92 to 10/21/92	33
10) 11/8/91 to 11/22/91	41	22) 4/22/92 to 5/8/92	187	35) 12/2/92 to 12/16/92	1
11) 11/22/91 to 12/6/91	77	23) 5/8/92 to 5/20/92	147	39) 12/16/92 to 12/30/92	1
12) 12/6/91 to 12/20/91	103	24) 5/20/92 to 6/3/92	96	40) 12/30/92 & Later	158
13) 12/20/91 to 1/1/92	60	25) 6/3/92 to 6/17/92	33		
14) 1/1/92 to 1/15/92	121	27) 7/1/92 to 7/15/92	1		
15) 1/15/92 to 1/28/92	87	28) 7/15/92 to 7/29/92	48		
16) 1/29/92 to 2/12/92	227	29) 7/29/92 to 8/12/92	7		



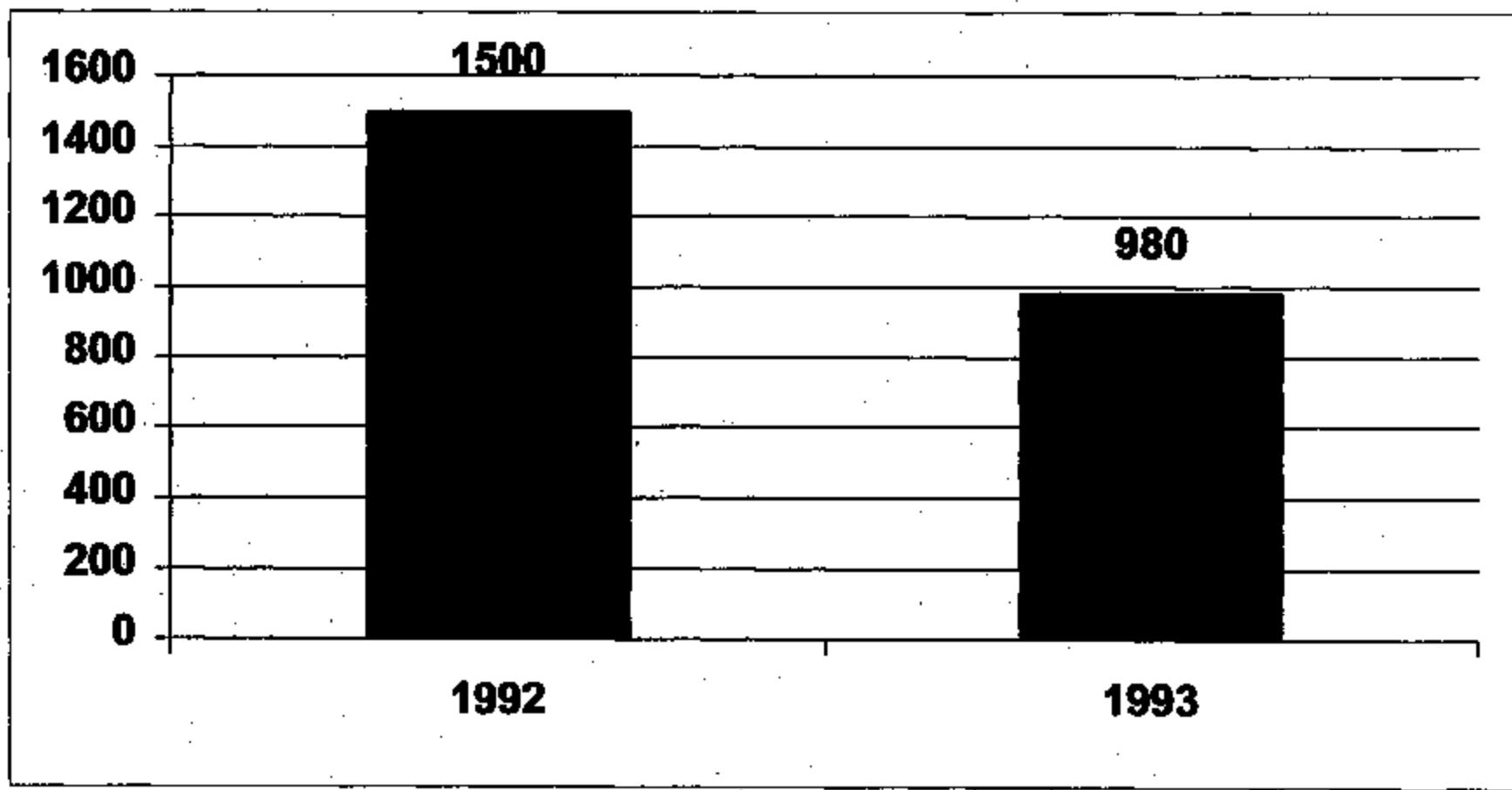
## Summary of Parts by Mileage

Mileage	Number of Parts	Mileage	Number of Parts
A) 0k to 10k	12	M) 120k to 130k	95
B) 10k to 20k	41	N) 130k to 140k	55
C) 20k to 30k	76	O) 140k to 150k	35
D) 30k to 40k	132	P) 150k to 160k	27
E) 40k to 50k	199	Q) 160k to 170k	21
F) 50k to 60k	247	R) 170k to 180k	15
G) 60k to 70k	288	S) 180k to 190k	7
H) 70k to 80k	305	T) 190k to 200k	6
I) 80k to 90k	279	U) 200k+	23
J) 90k to 100k	283		
K) 100k to 110k	196		
L) 110k to 120k	138		



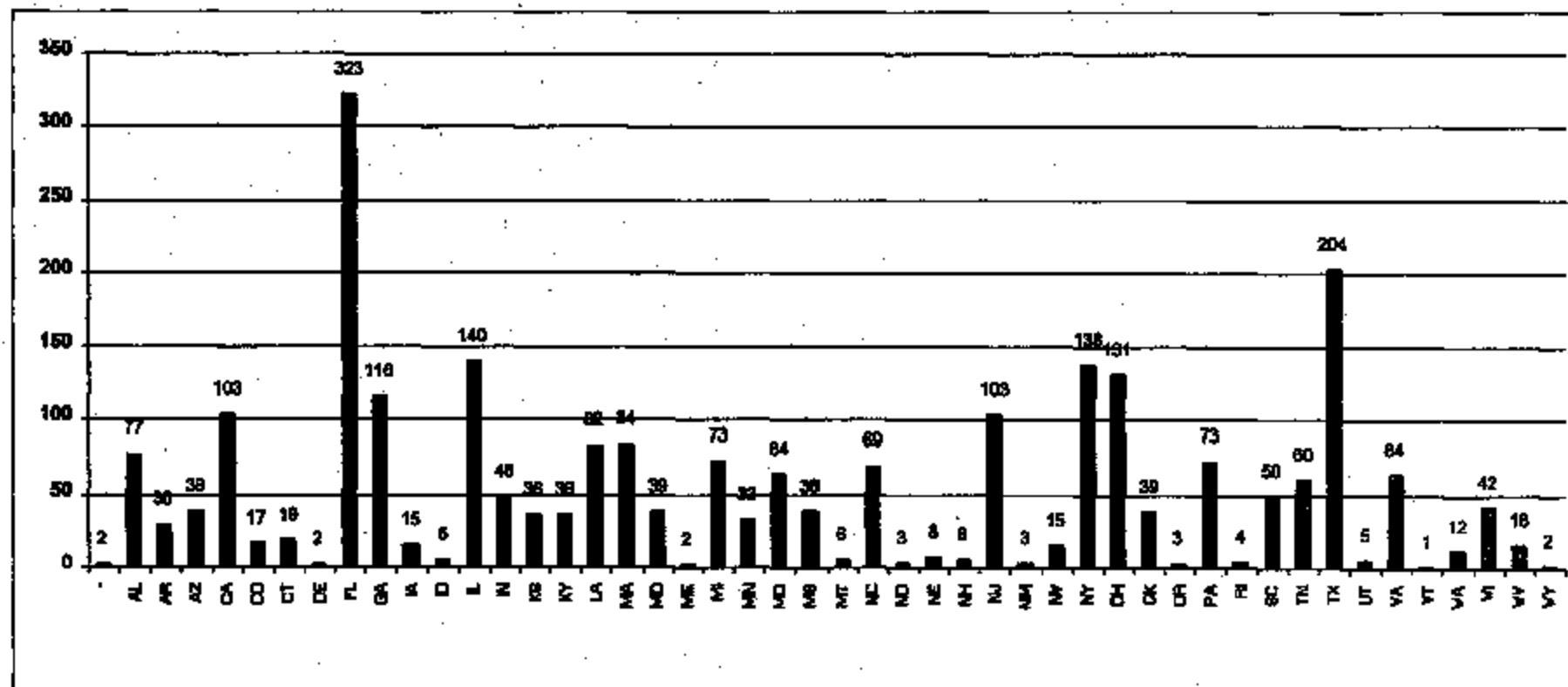
## *Model Year Summary of Parts*

<i>MY</i>	<i>Number of Parts</i>
1992	1500
1993	980

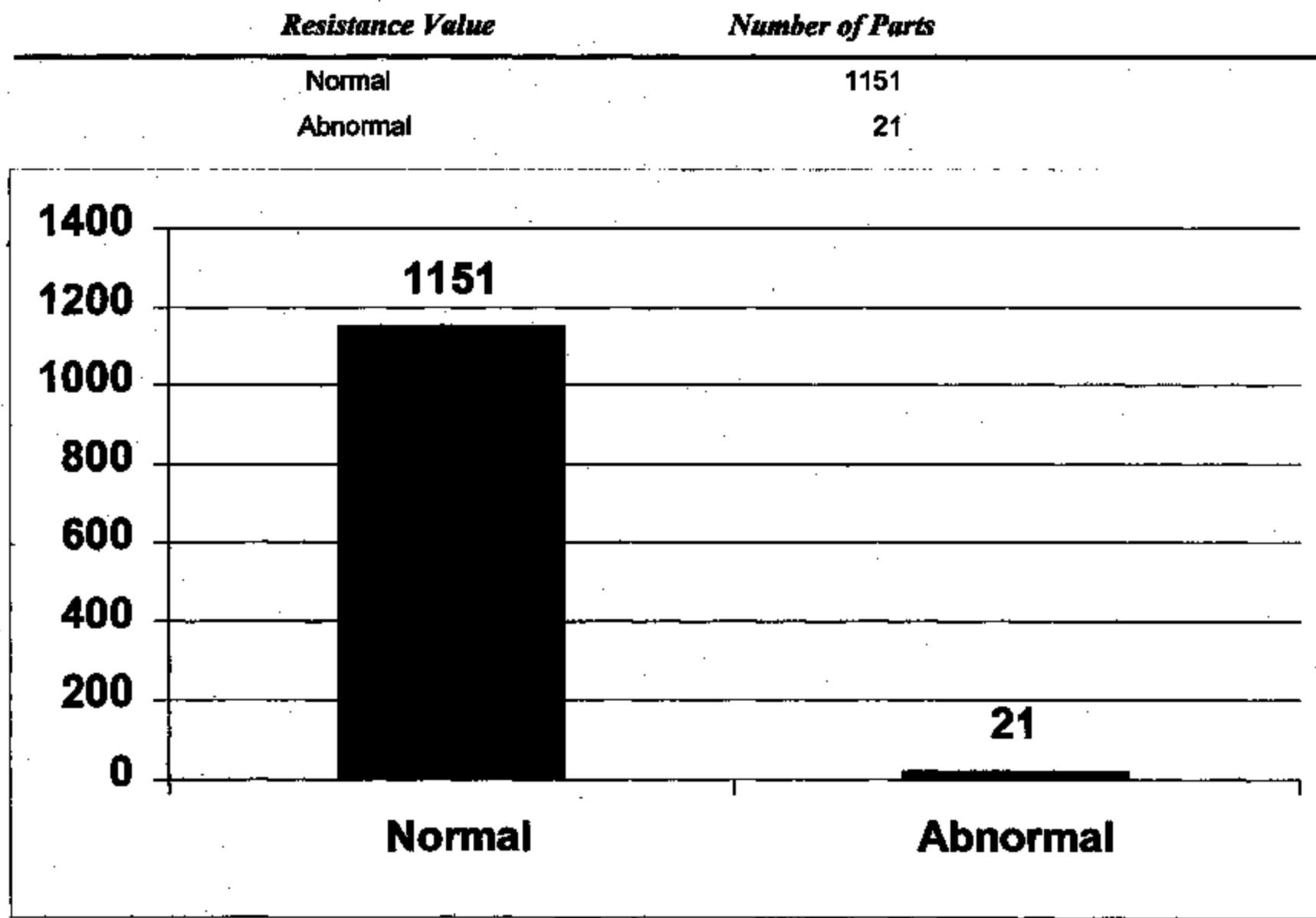


## Number of Parts by State

<i>State</i>	<i># of Pts.</i>												
*	2	DE	2	KS	38	NN	33	NH	6	OR	3	VA	64
AL	77	FL	323	KY	36	MO	64	NJ	103	PA	73	VT	1
AR	30	GA	118	LA	42	MS	38	NM	3	RI	4	WA	12
AZ	39	IA	15	MA	54	MT	6	NV	15	SC	50	WI	42
CA	103	ID	5	ND	39	NC	89	NY	138	TN	60	WV	18
CO	17	IL	140	ME	2	ND	3	OH	131	TX	204	WY	2
CT	16	IN	48	ME	73	NE	8	OK	38	UT	5		



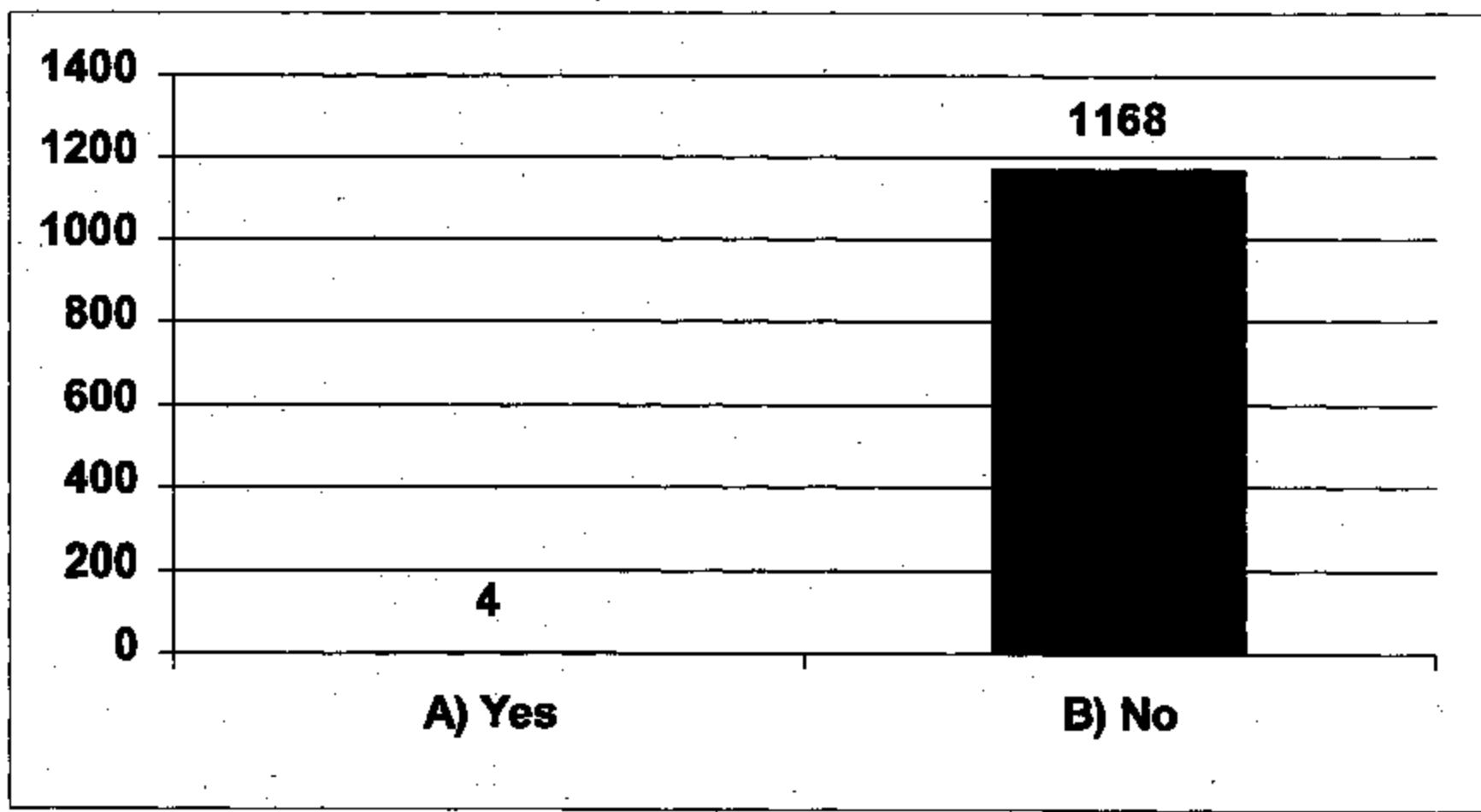
## *Part Summary by Terminal to Terminal Resistance*



37138162

## *Summary of Parts by External Signs Exhibited*

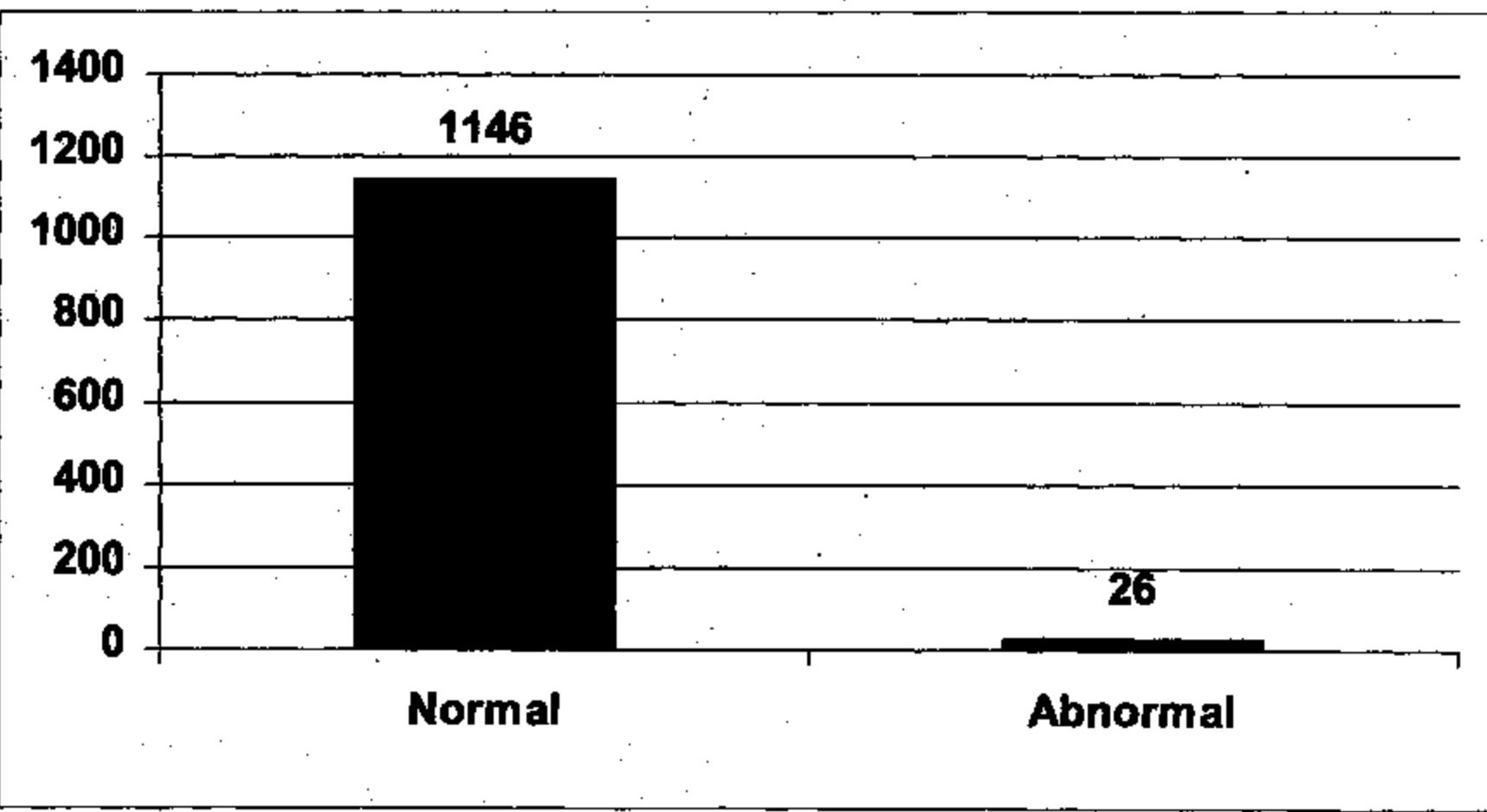
<i>Did Part Exhibit External Signs of a Problem ?</i>	<i>Number of Parts</i>
A) Yes	4
B) No	1168



3719 618

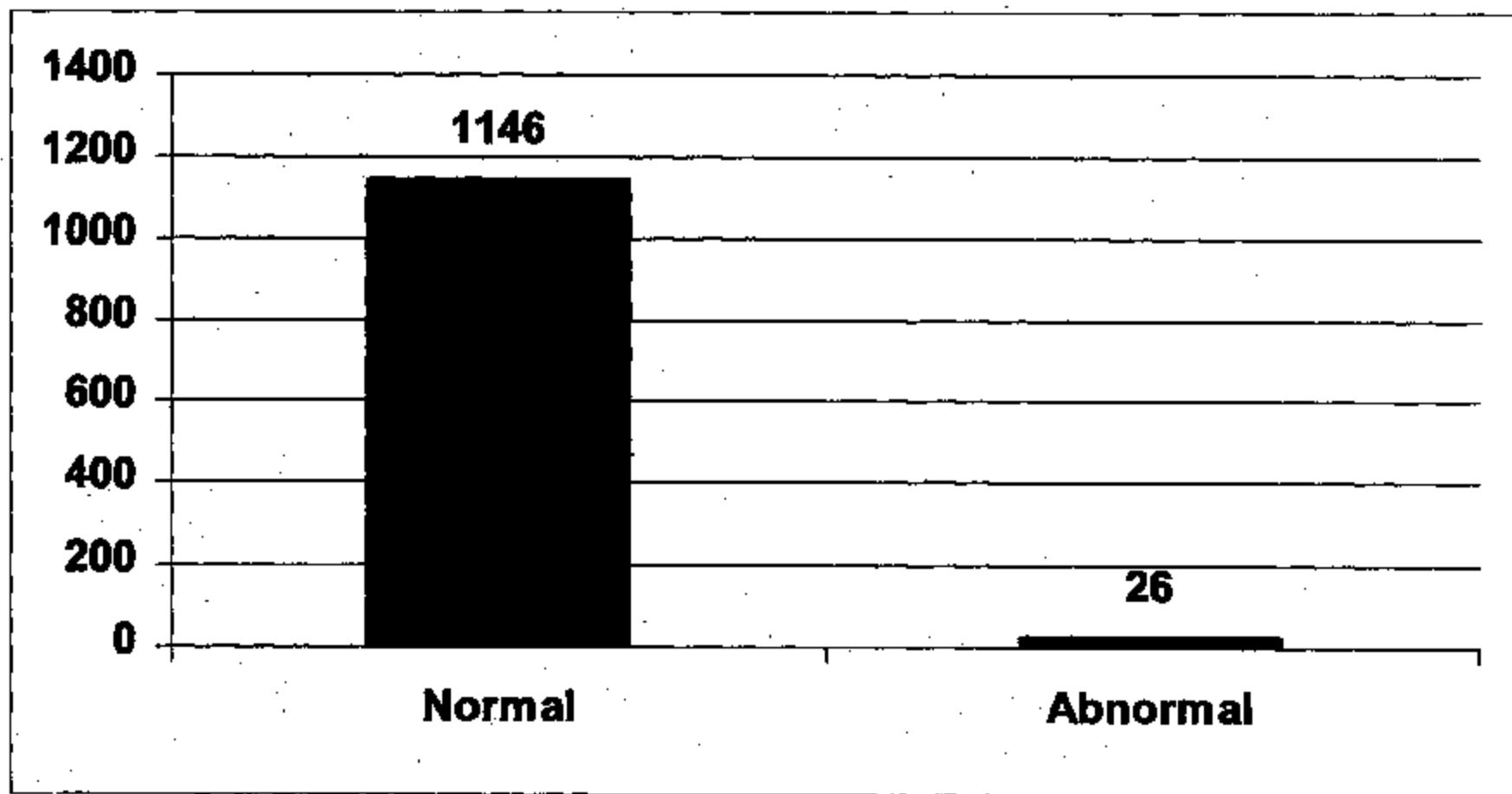
### *Part Summary by Stationary Terminal to Hex Port Resistance*

<i>Resistance Value</i>	<i>Number of Parts</i>
Normal	1146
Abnormal	26



*Part Summary of Moveable Terminal to Hex Port Resistance*

<i>Resistance Value</i>	<i>Number of Parts</i>
Normal	1146
Abnormal	26



# Vehicle Information Report

*Recall Part*

*- 5B  
switch with date code 131*

## GENERAL VEHICLE INFORMATION:

### (Related Claims)

VIN:	1LNLM82W9P [REDACTED]	Veh Line:	CVB - TOWN CAR (PN16/PNT [REDACTED])	Eng Serial No.:	W
Model Year:	1993	Market Derived:	C/M - L-M DIVISION DERIVATIVE	Body Shell:	*
Veh Type:	C	Drive Code:	C/B - 2 WHL L/M REAR DRIVE	Engine:	C/VN - R-M 4.6L SOHC EPI N
Inv. Dealer:	11877	Body Cab Style:	C/P/C - 4 DOOR SEDAN-G LITE	Transmission:	C/DK - 4 SPD AUTO TRANS P
		Version/Status:	C/HB - SIGNATURE VERSION		

## BUILD INFORMATION:

Region: NA - MINNEAPOLIS Plant: BA - WIXOM PLANT BUILD  
Country: USA - WIXOM Prod Date: 30-NOV-1992

## SALE INFORMATION:

Region: NA - MINNEAPOLIS Selling Dealer: 334329 \*  
Country: USA - WIXOM Selling Dir StProv: CA  
Buyer StProv: CA

Arrival Date: 11-DEC-1992 Red Carpet Lease: \*  
Sale Date: 24-OCT-1994 Fleet/Rental/Co. Lease: R  
Warranty Start Date: 25-MAY-1993 Modified Vehicle: \*  
Orig Warranty Date: 15-FEB-1993 Recquired Vehicle: \* Vehicle Export Flag: N

## VOC/EOC:

— 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 —  
[REDACTED] 43 A 2 0203934 ME E 2 RXT 32A54 JT LG A EB 549091 4V13A DW 2 64 M  
LEVEL 3 D TRAIL SWP

## INSTALLED OPTION INFORMATION:

Air Conditioning:	C/C - ATC AIR CONDITIONER	GVM Codes:	*
Alternator Amp Rating:	* [N/A]	GVM Class Codes:	L
Audio Disk:	AC - AUDIO DISC CHANGER/PLAYER	Instrumentation:	AC - ELECTRONIC INSTRUMENTATION
Axis Ratios:	EQACC - 3.08 FINAL DRIVE RATIO	Mirror(Driver Side):	AD - DRIVER POWER MIRROR
Axis Type:	EQAC - LIMITED SLIP REAR AXLE	Mirror(Pass Side):	AD - PASS POWER CONVEX MIRROR
Battery Amp Rating:	72	Paint:	PNPAA - DEEP JEWEL GREEN CC
Brake Code:	PEAAC - 4 WHL ANTI-LOCK BRAKES	Power Antenna:	* - [N/A]
Brake Code(Servos):	* - [N/A]	Radio:	AQ - EL2TR PREMIUM AM/FM STRO/CSTB
Calibration Codes:	318QR11A	Sound System:	* - [N/A]
Color(Accent):	* - [N/A]	Suspension Axles:	* - [N/A]
Color(Tinted):	* - [N/A]	Tire Brand:	AJ - MICHELIN TIRE VENDOR
Delivery Type:	O	Tire Size:	D10GSP - P215/70R15 WSW
Driveshaft Codes:	*	Traction Control:	* - [N/A]
Front Seats:	* - [N/A]	Wheel Base:	* - [N/A]
Fuel Types:	* - [N/A]		

3713 8166

**ESP INFORMATION: EMISSIONS INFORMATION:**

ESP Code:	• Emission Code:	C/C - C/C
ESP Coverage(Miles):	• Emissions Cert Type:	C
ESP Coverage(Time):	• Emissions Decal Suffix:	JKA
ESP Plan Year:	• Engine Family:	PFM46V5FDGX
ESP Signature Date:		

---

Any comments? You can contact



[webmaster@aws-ford.com](mailto:webmaster@aws-ford.com)

3713 8167

# Standard Claims List For Model Year 1993

*Note: All Costs are in US Dollars*

1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	USA	D	6Y	
AWS Claim Key:		Trx Code:	LNC		Labor Hrs:	1	Labor Cost:	0		Material Cost:	D	To	
Dir Cd-Sub Cd:	11877-*	Name:	FULLERTON							St: CA	Ctry Cd:	USA	
Cost Comment:		Lincoln-Mercury										Rm	
Tech Comment:					Pls:	*.*							
1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	USA	I	7W	
AWS Claim Key:		Trx Code:	I		Labor Hrs:	1.3	Labor Cost:	14.1		Material Cost:	91.53	To	
Dir Cd-Sub Cd:	11877-*	Name:	FULLERTON							St: CA	Ctry Cd:	USA	
Cost Comment:		Lincoln-Mercury										Rm	
Tech Comment:					Pls:	*.*							
1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	USA	6	7W	
AWS Claim Key:		Trx Code:	I		Labor Hrs:	0	Labor Cost:	0		Material Cost:	0	To	
Dir Cd-Sub Cd:	11877-*	Name:	FULLERTON							St: CA	Ctry Cd:	USA	
Cost Comment:		Lincoln-Mercury										Rm	
Tech Comment:					Pls:	*.*							
1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	USA	16	7W	
AWS Claim Key:		Trx Code:	BM4		Labor Hrs:	3	Labor Cost:	17.7		Material Cost:	29.69	To	
Dir Cd-Sub Cd:	11848-*	Name:	QUALITY							St: CA	Ctry Cd:	USA	
Cost Comment:		Lincoln-Mercury										Rm	
Tech Comment:					Pls:	714-5335100							
1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	354329	USA	18	6M
AWS Claim Key:	12839291	Trx Code:	B84		Labor Hrs:	4	Labor Cost:	33.6		Material Cost:	35.38	To	
Dir Cd-Sub Cd:	11848-*	Name:	QUALITY							St: CA	Ctry Cd:	USA	
Cost Comment:		Lincoln-Mercury										Rm	
Tech Comment:					Pls:	714-5335100							
1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	354329	USA	18	7W
AWS Claim Key:	12839294	Trx Code:	B84		Labor Hrs:	5	Labor Cost:	35.4		Material Cost:	218.08	To	
Dir Cd-Sub Cd:	11848-*	Name:	QUALITY							St: CA	Ctry Cd:	USA	
Cost Comment:		Lincoln-Mercury										Rm	
Tech Comment:					Pls:	714-5335100							
1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	354329	USA	18	7W
AWS Claim Key:	12839291	Trx Code:	B80		Labor Hrs:	2.4	Labor Cost:	141.6		Material Cost:	0	To	
Dir Cd-Sub Cd:	11848-*	Name:	QUALITY							St: CA	Ctry Cd:	USA	
Cost Comment:		Lincoln-Mercury										Rm	
Tech Comment:					Pls:	714-5335100							
1LNLM82W9P	C/VB	C/M	C/F/C	C/BR	C/B	BA	C/DK	C/VN 30-NOV-1992	25-MAY-1993	354329	USA	27	*

AWS Claim Key:	<u>16226863</u>	Trx Code:	94B56	Labor Hrs:	.6	Labor Cost:	36.11	Material Cost:	8.18	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	W PROGRAM94B56 ANTI-THEFT MOD>													
Tech Comments:	>RECALL REPLACE IGN KEY AND TUMBLER>													
1LNLM82W9PY	C/VB	C/M	C/PC	C/BR	C/B	BA	C/DK	C/VN	30-NOV-1992	25-MAY-1993	354329	USA	37	70
AWS Claim Key:	<u>16226862</u>	Trx Code:	EB3	Labor Hrs:	.3	Labor Cost:	48.14	Material Cost:	0	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	W REPAIR LUMBAR DRIVERS SIDE, SWITCH-STICKS>													
Tech Comments:	>CROSSED WIRE ACCESS FRONT SEAT>													
1LNLM82W9PT	C/VB	C/M	C/PC	C/BR	C/B	BA	C/DK	C/VN	30-NOV-1992	25-MAY-1993	354329	USA	33	*
AWS Claim Key:	<u>19635207</u>	Trx Code:	95B64	Labor Hrs:	.5	Labor Cost:	30.09	Material Cost:	11	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	W RECALL 95B64 RANGE SENSOR													
Tech Comments:	RECALL REPLACE SENSOR													
1LNLM82W9P	C/VB	C/M	C/PC	C/BR	C/B	BA	C/DK	C/VN	30-NOV-1992	25-MAY-1993	354329	USA	35	60
AWS Claim Key:	<u>19618893</u>	Trx Code:	EB4	Labor Hrs:	1.9	Labor Cost:	114.34	Material Cost:	36.36	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	W SPEAKER COVERS FADED													
Tech Comments:	FADED TRIM PANEL-FRONT DOOR - REPLACE													
1LNLM82W9P	C/VB	C/M	C/PC	C/BR	C/B	BA	C/DK	C/VN	30-NOV-1992	25-MAY-1993	354329	USA	35	70
AWS Claim Key:	<u>19635208</u>	Trx Code:	EB3	Labor Hrs:	4.6	Labor Cost:	268.83	Material Cost:	15.86	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	W CK. RADIO,ALWAYS HAS HAD POOR RECEPTION ON F.M.													
Tech Comments:	BROKEN ANTENNA CABLE RADIO - REMOVE													
1LNLM82W9P	C/VB	C/M	C/PC	C/BR	C/B	BA	C/DK	C/VN	30-NOV-1992	25-MAY-1993	354329	USA	35	3A
AWS Claim Key:	<u>19618894</u>	Trx Code:	EB4	Labor Hrs:	10	Labor Cost:	601.8	Material Cost:	139.98	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	W CK. TRANS. OPERATION FOR SLIPAGE ETC.													
Tech Comments:	INT. ONE WAY CLUTCH GONE ELECTRONIC TRANSMISSION DIAGNOSIS - DIAGNOSIS													
1LNLM82W9P	C/VB	C/M	C/PC	C/BR	C/B	BA	C/DK	C/VN	30-NOV-1992	25-MAY-1993	354329	USA	76	*
AWS Claim Key:	<u>24604613</u>	Trx Code:	99S15	Labor Hrs:	.5	Labor Cost:	33.64	Material Cost:	11.19	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	>RECALL 99S15 SPEED CONTROL DEACTIVATION SWITCH													
Tech Comments:	>RECALL REPLACE SPEED CONTROL													
1LNLM82W9P	C/VB	C/M	C/PC	C/BR	C/B	BA	C/DK	C/VN	30-NOV-1992	25-MAY-1993	354329	USA	76	70
AWS Claim Key:	<u>24679315</u>	Trx Code:	SPW	Labor Hrs:	.6	Labor Cost:	40.36	Material Cost:	11.19	Total:				
Dir Cd-Sub Cd:	10099-* Name: ANAHEIM		LINCOLN-MERCURY	Ph:	714-5335100	St: CA		Ctry Cd:	USA	Req				
Cost Comments:	SERVICE PARTS,REPLACE SPD CONTROL DEACTIVATION SW,EO 67080 DATE 7/23/99 AT 34178 MILES ACC MIL													
Tech Comments:	REPLACE SPD CONTROL DEACTIVATION BAD SWITCH													

Any comments? You can contact

3713 8189

[webmaster@aws-ford.com](mailto:webmaster@aws-ford.com)

3713 8170

# Claim Detail Report

*Note: All costs are in US dollars*  
**Model Year = 1993; Claim Key = 12839293**

#### Vehicle Information

Model Year: 1993  
 Market Derived: C/M - L-M DIVISION DERIVATIVE  
 Body/Cab Type: C/FC - 4 DOOR SEDAN-6 LITE  
 Version/Series: C/BR-SIGNATURE VERSION  
 Drive Type: C/B-2 WHL L/H REAR DRIVE  
 Vehicle Line: C/VB-TOWN CAR (FN36/FN116)  
 [91-97]  
 Warranty Start Date: 25-MAY-1993  
 Production Date: 30-NOV-1992  
 VIN: 1LNLM82W9P[REDACTED]

#### Claim Information

Document Number: 455821  
 Repair Date: 01-NOV-1994  
 Distance: 12004  
 TIS: 18

#### Dealer Information:

**Dealer Name** QUALITY LINCOLN-MERCURY  
**Dealer Code:** 11848 - \*  
**Address:** 1221 AUTO CENTER DRIVE SOUTH  
**City:** ANAHEIM  
**State:** CA Zip Code: 92806  
**Country:** USA **Region Code:** NA  
**Phone:** (714)510-5100

**Customer Paid Amount:** 0  
**Deductible Amount:** 0  
**Dealer Paid Amount:** 0  
**Labor Cost:** 141.6  
**Misc. Expense Amount:** 0  
**Part Markup Amount:** 0  
**Material Cost:** 0  
**Total Cost Gross:** 141.6

Cust. Concern Code: A99 - ADMINISTRATIVE (PARTS RETURN/ETC.)

Condition Code: X1 - POOR GROUND

Technician Comment: TEST SYSTEM CHECK FUSES CHECK GROUND CIRCUIT 848 DG O OK  
 R AND I AIR BAG TO TEST SPEED CONTROL SWITCHES OK R AND I  
 CRASH PAD TO ACCESS DASH TO REPAIR OPEN NEAR CONNECTOR  
 283 LB BK RETEST SPEED CONTROL OK

Customer Comment: CRUISE CONTROL INOP

<u>Labor Op Code</u>	<u>Labor Op Description</u>	<u>Labor Op Cost</u>
9818A	SPEED CONTROL DIAGNOSIS	0
3600A	STEERING WHEEL REPLACE	0
04320B	INSTRUMENT PANEL ACCESS	0
9818A6	WIRING ASSEMBLY - SPEED CONTROL REPAIR	0

<u>Causal</u>	<u>Full Part Number</u>	<u>Part</u>	<u>Part</u>	<u>Extended</u>
<u>Flag</u>	<u>PREF</u>	<u>BASE</u>	<u>SUFF</u>	
Y	*	9A840	*	WIRE SPEED CNTL 100302 0 0

3713 8171

# Claim Detail Report

*Note: All costs are in US dollars*  
Model Year = 1993; Claim Key = 24605613

**Vehicle Information**

Model Year: 1993  
 Market Derived: C/M - L-M DIVISION DERIVATIVE  
 Body/Cab Type: C/FC - 4 DOOR SEDAN-6 LITE  
 Version/Series: C/BR-SIGNATURE VERSION  
 Drive Type: C/B-2 WHL L/H REAR DRIVE  
 Vehicle Line: C/VB-TOWN CAR (FN36/FN116)  
 [91-97]

Warranty Start Date: 25-MAY-1993

Production Date: 30-NOV-1992

VIN: 1LNLM82W9PY [REDACTED]

**Claim Information**

Document Number: 06708051  
 Repair Date: 23-JUL-1999  
 Distance: 34178  
 TIS: 76

**Dealer Information:**

**Dealer Name** ANAHEIM LINCOLN-MERCURY  
**Dealer Code:** 10099 - \*  
**Address:** 1221 AUTO CENTER DRIVE SOUTH  
**City:** ANAHEIM  
**State:** CA **Zip Code:** 92806  
**Country:** USA **Region Code:** NA  
**Phone:** (714)510-5100

**Expense Information**

Customer Paid Amount: 0  
 Deductible Amount: 0  
 Dealer Paid Amount: 0  
 Labor Cost: 33.64  
 Misc. Expense Amount: 6.73  
 Part Markup Amount:  
 Material Cost: 11.19  
 Total Cost Gross: 51.56

Cust. Concern Code: \* -

Condition Code: \* -

Technician Comment: RECALL REPLACE SPEED CONTROL

Customer Comment: RECALL 99S15 SOED CONTROL DEACTIVATION SWITCH

<b>Labor Op Code</b>	<b>Labor Op Description</b>	<b>Labor Op Cost</b>
99S15B		33.64

<b>Causal</b>	<b>Full Part Number</b>	<b>Part</b>	<b>Part</b>	<b>Extended</b>			
<b>Flag</b>	<b>PREF</b>	<b>BASE</b>	<b>SUFF</b>	<b>Description</b>	<b>CPSC</b>	<b>Quantity</b>	<b>Amount</b>
N	XW7Z	9G652	AA		060605	1	11.19

Any comments? You can contact

[webmaster@aws-ford.com](mailto:webmaster@aws-ford.com)

3713 8172

# Claim Detail Report

*Note: All costs are in US dollars*  
**Model Year = 1993; Claim Key = 24629538**

## Vehicle Information

Model Year: 1993  
 Market Derived: C/M - L-M DIVISION DERIVATIVE  
 Body/Cab Type: C/FC - 4 DOOR SEDAN-6 LITE  
 Version/Series: C/BR-SIGNATURE VERSION  
 Drive Type: C/B-2 WHL L/H REAR DRIVE  
 Vehicle Line: C/VB-TOWN CAR (FN36/FN116)  
 [91-97]  
 Warranty Start Date: 25-MAY-1993  
 Production Date: 30-NOV-1992  
 VIN: 1LNLM82W9P[REDACTED]

## Dealer Information:

**Dealer Name** ANAHEIM LINCOLN-MERCURY  
**Dealer Code:** 10099 - \*  
**Address:** 1221 AUTO CENTER DRIVE SOUTH  
**City:** ANAHEIM  
**State:** CA **Zip Code:** 92806  
**Country:** USA **Region Code:** NA  
**Phone:** (714)510-5100

## Claim Information

**Document Number:** 06738551  
**Repair Date:** 30-JUL-1999  
**Distance:** 34239  
**TIS:** 76

## Expense Information

<b>Customer Paid Amount:</b>	0
<b>Deductible Amount:</b>	0
<b>Dealer Paid Amount:</b>	0
<b>Labor Cost:</b>	40.36
<b>Misc. Expense Amount:</b>	0
<b>Part Markup Amount:</b>	
<b>Material Cost:</b>	11.19
<b>Total Cost Gross:</b>	51.55

**Cust. Concern Code:** A99 - ADMINISTRATIVE (PARTS RETURN/ETC.)

**Condition Code:** 42 - DOES NOT OPERATE PROPERLY

**Technician Comment:** REPLACE SPED CONTROL DEACTIVATION BAD SWITCH

**Customer Comment:** SERVICE PARTS, REPLACE SPED CONTROL DEACTIVATION SW, RO 67080 DATE 7 23 99 AT 34178 MILES ACC MILES 6

## Labor Op Code Labor Op Description Labor Op Cost

M1	40.36
----	-------

<u>Causal</u>	<u>Full Part Number</u>	<u>Part</u>	<u>Part</u>	<u>Extended</u>	
<u>Flag</u>	<u>PREF</u> <u>BASE</u> <u>SUFF</u>	<u>Description</u>	<u>CPSC</u>	<u>Quantity</u>	<u>Amount</u>
N	XW7Z 9G652 AA		060605	1	11.19
Y	*	SWITCH SPD CNTRL	031904	0	0

Any comments? You can contact

3713 8173

\*\*\*\*\*  
\* Note printed by SREIMERS on 4 Aug 1999 at 09:14:08 \*  
\*\*\*\*\*

From: BE5CH1 --DRBN006  
To: SREIMERS--DRBN007

Date and time 08/03/99 16:14:08

FROM: Becky Esch  
Subject: More Dates....

USAET(UTC -04:00)

Steve: Here are the additional/final dates ranges you request...sorry for the delay(s):

1995 Explorer - 8/11/94 thru 8/28/95

1995 Ranger - 1/5/94 thru 8/18/95

1993 F-Series - 5/29/92 thru 8/24/93

1993 Taurus SHO - 4/23/92 thru 8/9/93

1998 Navigator - 12/18/96 thru 1/2/99 (only one veh. produced on this date but it was the "last" date)

1997 Expedition - 5/7/96 thru 8/3/97

1993 Bronco - 5/28/92 thru 8/13/93

Regards,

Becky Esch - FCSD Recall/Service Programs  
Phone 313-39-05579 Fax 313-84-51024

DSCII Suite 783

\*\*\* Forwarding note from SREIMERS--DRBN007 08/03/99 09:34 \*\*\*

To: BE5CH1 --DRBN006

FROM: Steve Reimers

USAET(UTC -04:00)

Subject: More Dates....

I did not find a FAX so I assume this note supersedes your voice message.

Steve Reimers

RVT Chassis E/E System Applications building 5 3E008  
39-03286, SREIMERS mail drop 5011  
sreimers@ford.com fax 39-04145 ;>  
\*\*\* Forwarding note from BE5CH1 --DRBN006 08/02/99 13:42 \*\*\*

To: SREIMERS--DRBN007 Reimers, Steve

FROM: Becky Esch

USAET(UTC -04:00)

Subject: More Dates....

Steve: I apologize, but once again, I have gone back to the programmer to get some additional dates...the problem lies in the fact that we merely have our Navis reports set up to do a first and last production date by plant, not by vehicle and there are multiple vehs. produced at the same plant for instance Mich. Truck produced F-Series, Broncos, Expeditions and Navs. I thought the programmer and I had an understanding on this and once again I'm looking at a report that just has one start and end date per plant so I have gone back to him again and requested the breakdown of start and stop dates by veh at a plant. We don't have an stop sales this weeks, or safety recalls launching so

I am hoping to get this info back to you by days end or by the a.m.  
but here is more of what we have for now:

92 Econoline 4/22/91 thru 9/28/92

94 Capri(I think you have) 6/11/93 thru 7/13/94

93 Mark VIII - 6/18/92 thru 7/29/93

95 Windstar - 12/15/93 thru 8/11/95

I will send the dates for F-Series, Bronco, Taurus Sho, Expedition,  
Navigator, Ranger and Explorer ASAP.

Regards,

Becky Esch - FCSD Recall/Service Programs

Phone 313-39-05579 Fax 313-84-51024

DSCII Suite 783

3713 8175



Central Laboratory  
15000 Century Drive  
Dearborn, MI 48120-1267  
FAX (313) 322-1614

Report 9902832

September 24, 1999

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**To:** S. Reimers (313) 39-08286 (313) 39-04145 FAX

**From:** M. C. Haga (313) 39-78386

**Subject:** Brake Pressure Switch  
Part Number: F2VC-9F924-AB  
Supplier: TI

**Received:** One disassembled brake pressure switch with sample identification NY748604 was received on August 26, 1999.

---

**Object:** Determine composition of contaminants in the switch.

**Conclusion:**  
**Discussion:** The material in the switch consists of brake fluid, water, ester, polyester, carboxylic acid salts and corrosion products (aluminum, copper, iron and zinc). The moisture in the system was likely responsible for the corrosion products. A polyester gasket in the system was found to be deformed. This is the source of the polyester and possibly the carboxylic acid salt, since this would be a likely degradation product of polyester in the presence of metals and moisture. The presence of calcium and magnesium in the system would likely contribute to the formation of the carboxylic acid salt.

---

#### **Data and Analysis:**

##### **Visual Observation / Sample Preparation**

The parts were rinsed with petroleum ether and then with chloroform. The insoluble portion (mainly a grayish powder) was collected in an 8 micron nylon filter. After rinsing the metal parts showed blue and white corrosion products and the gasket showed evidence of deformation (see photographs 1 -3)

##### **Molecular Characterization** (FTIR, Qualitative, Microscopic)

Spectra of the petroleum ether solubles are characteristic of glycol ether (brake fluid), ester and other material.

Spectra of the chloroform solubles are characteristic of glycol ether (brake fluid), water and other material including ester.

Spectra of the insoluble material are characteristic of a carboxylic acid salt, polyester and other material.

Spectra of the gasket are characteristic of polyester.

OXYLATES ARE THESE.

BUT NOT ALL CARBOXYLIC ACID SALTS ARE OXYLATES.



Central Laboratory

Report 9902832

**Data and Analysis:**

**Photographs**



Photograph 1  
Aluminum Parts



Photograph 2  
Other Metal Parts



Photograph 3  
Gasket

**Data and Analysis:**

**Elemental Analysis, approximate % by weight<sup>1</sup>**  
(Rigaku X-ray Fluorescence)

Aluminum	32
Calcium	9
Chlorine	4
Chromium	<1
Copper	12
Iron	12
Lead	<1
Magnesium	2
Manganese	<1
Nickel	<1
Potassium	1
Phosphorus	<1
Silicon	17
Strontium	<1
Sulfur	1
Titanium	<1
Zinc	10

<sup>1</sup> The XRF results are normalized to 100% based upon detected elements (The instrument cannot detect elements lighter than fluorine). They do not include contributions from elements not listed above.

The precision and accuracy of this technique has been estimated to  $\pm$  10% for a standard size specimen.

**Preliminary Test Data Issued:** Preliminary information phoned to requester on 9/15/99

Contributor: C. Wilson

Concur: J. Haga

G. Gullén  
Chemistry Section

By:

Mary C. Haga (MHAGA)  
Laboratory Development Analyst

All shaded areas must be filled in to process your request

Administrative Use Only

## Request for Central Laboratory Service

15000 Century Dr., Dearborn MI 48120-1267 Phone [313] 32-21676 FAX [313] 32-21614

Your Name [Send report to]

*Steve Reimers*

Telephone

*39 03286*

PROFS ID

*SREIMERS*

FAX

*39 04145*

Secondary Contact

*FRED Porter*

Telephone

*84 53722*

PROFS ID

*FPORTER*

FAX

Third Report To

Room No./Mail Drop/PO Box

*MD 5011*

Department/Activity

*7402 INC*

Building

*AVTS*

Location Code

*(5100) 7402*

Dept. #

*XQG-64*

Work Task # [For 5100 Loc. Only]

Category of Sample	Sample Handling	TOXIC/CAIR	Source	Supplier Code
1	Return after test _____ Dispose after test _____ Dispose after 30 days _____			
Test/Material Name	Sample Identification [Continue below if needed]	Part Number [If any]	Material Specification [If any]	CPSC Code
<i>Brake Pressure SWITCH</i>	<i>N [REDACTED] F2K-9F914 -AB</i>	<i>N/A</i>		<i>060601 TI</i>

### Investigation

Nature of Investigation/Specific Tests Required [Check all that apply]

- Production/Plant problem       Perform Test as in Lab No. \_\_\_\_\_  
 Failure Analysis       Photograph [Describe below]  
 Legal       Use Specification \_\_\_\_\_ as a guide  
 Specification Compliance       Other [Describe below]: \_\_\_\_\_

Requester Info. Box [For requester use]

Stop testing upon failure?      Does this support C&E testing? [If "Yes", what is the expected outcome?]  
 No     Yes       No     Yes

Do you need to know your CL contact and timing?       Yes

Additional Sample Information/Testing Requirements

*ANALYZE CHEMICAL CONTAMINANTS*

*AND PROPERTIES PER PROCEDURE for Brake Pressure  
Switch*

*Developed by Steve LaRouch, Pete Klaa  
Greg Lewicki*

### Report

Format [Check all that apply]

*ASAP 9/13/99  
Data you would like report \_\_\_\_\_  
Data you want have report /D-1-99*

- FAX preliminary results       FAX hand written  
 FAX typed report       Mail hand written

- Mail typed report  
 Electronically transfer report  
 Phone preliminary results

For information about services or assistance in completing this form, please refer to the Central Laboratory WEB page.  
Laboratory number and date cannot be assigned without receipt of samples.  
Samples will be disposed of after 30 days unless otherwise indicated above.

[www.gto.ford.com/central/home.htm]

**Reimers, Steve (S.J.)**

---

**From:** LaRouche, Steve (S.)  
**Sent:** Wednesday, November 10, 1999 3:45 PM  
**To:** Reimers, Steve (S.J.)  
**Cc:** Lengyel, Jim (J.J.); LaRouche, Steve (S.)  
**Subject:** RE: Kapton Crack Analysis

Steve: I have completed examination of the Kapton seals. We are starting to photograph them this afternoon. All the switches show similar patterns of damage to the seals:

1. The Kapton has been permanently deformed to the contour of the washer and converter. The Teflon has delaminated in these areas and is stretched across the depressions almost like a drum.
2. The Kapton has been buckled in a radial direction where it has been deformed into the doughnut shaped cavity formed by the washer and converter. All of the seals exhibit cracks in the Kapton which occur along this buckle. Some of the seals also exhibit cracks in the Kapton which extend around the tips of the buckles. The Kapton has been discolored (dark) at the cracks. The source of the discoloration is not known.
3. All the seals show tears in the Teflon usually which in some instances coincide with the cracks in the Kapton, and in other instances occur where the Teflon has been stretched across the depressions in the Kapton.
4. The seals show evidence of abrasion as well as a buildup of deposits in the areas where they contacted the converters and washers. The mechanical damage and cracking seems most severe in the seals which contacted the converters and washers. This suggests that the damage may have started in those seals and progressed to the other seals.

I also examined the washers and converters under a bench microscope and found no burns or other surface or plating imperfections that could have caused damage to the seals. This will be confirmed by examining some of these parts with the scanning electron microscope. I did see a lot of deposits which may have caused abrasion. Some of the deposits are copper colored which may suggest metal transfer like we found in earlier investigations.

**Steve LaRouche** (SLAROUCH)  
Metallurgy Section, Central Laboratory, Room N410  
(313) 843-4876 (313) 322-1814 FAX

—Original Message—

**From:** Reimers, Steve (S.J.)  
**Sent:** Wednesday, November 10, 1999 2:27 PM  
**To:** LaRouche, Steve (S.)  
**Subject:** Kapton Crack Analysis

Steve, Have you completed the examination of the Kapton layers for cracking in the 11 samples of test number 99032447 .

Steve Reimers  
RV&T EESE, Chassis E/E Systems  
313 39 03286, fax 313 39 04145

FYI  
S. Beringer

## Return Analysis on 77PSL2-1

10/8/99

### Background:

25 switches were reported to have failed during the change-out procedure currently being conducted by Ford Dealers. These returns were all built in 1999 and supplied to Ford as part of the *Brake Repair Kit* (XW7Z-9G632-AA).

### Objective:

Find any functional deficiencies with the 25 switches returned.

### Visual Inspection:

Upon receipt of the 25 switches, TI did a visual inspection. Twenty-three of the switches appeared to be in like new condition. However, 2 of the switches showed obvious signs of abuse. These 2 switches appeared to have been installed or removed with pliers by applying torque to the crimp ring and base; not the hex flats. The results of this inspection are summarized below:

Indications of proper installation	17
No signs of installation	4
Improper installation techniques used	2
Damaged threads	1

Only 2 switches were returned with caps and still had brake fluid retained in the pressure cavity of the switches. We were able to obtain 2 small samples of this fluid.

It should be noted that the switches were returned with yellow tags containing information about why the switch was replaced. The tags listed the following reasons for returns:

No Description	9
Brake Fluid Leak	6
Administrative Parts Return	4
Engagement Troubles	2
Disengagement Troubles	2
ABS Warning Light	1
Other Electrical Accessory Trouble	1

### Calibration and Electrical Testing:

All 25 switches were checked for actuation and release as defined by the specification. All were within specified limits.

In addition to the normal electrical parameters defined in the product specification, TI also measured current leakage from the terminal to the hexport. This test was done by applying a current limited 14 Vdc power supply to the terminals of the switch. While a voltage is applied to terminal and the hexport is held at ground, the current flow into the switch is measured. All switches measured 0.0 mA.

During the calibration check the switch is pressurized to 200psi with air. All switches sealed properly during this test.

### Dissection:

Since no issues were discovered, it was determined that only a sub set would be dissected and internally inspected. Removing the crimp ring and the base would allow internal inspection and direct leak check of the sensor. Six switches were selected for dissection (2 from the Brake Fluid Leak group, 1 from Administrative Parts, 1 from Disengagement Troubles, 1 from other Electrical Accessory Troubles, and 1 from Brake ABS Warning Light Troubles).

The internal inspections confirmed no fluid leakage into the connector cavity, no contamination, and good electrical contacts. Further leak testing of the sensor using refrigerant and a leak detector confirmed no leakage. It is possible that brake fluid leakage may occur on the vehicle due to insufficient installation torque, contaminated threads, contaminated sealing surface, or damaged components.

**Summary:**

- All switches were within specification.
- No current path to ground was detected.
- No leaks were discovered.
- 2 switches were mis-handled during the install/removal cycle.

End of Document.

From:  
S. Berg - haase

## 77PSL2-1 Field Campaign Analysis Report September 1, 1999

### Objective:

The purpose of this report is to document the general condition of field campaign pressure switches obtained by TI.

### Procedure:

- 1) TI visited and requested some of the local dealers to set replaced switches aside for TI to pick up later. As a result of the recent field campaign, dealers responded by saving the replaced switch for TI.
- 2) TI conducted the analysis per the attached sheet.

### Results/Observations:

The condition and state of the switches received to be analyzed varied widely. Some were returned loose, some in the new switch box, some with mating connectors, some with seals, and some completely wrong part numbers. Only those switches that could be identified as TI part number 77PSL2-1 were included in this analysis.

To date 40 switches have been obtained and analyzed. The date codes obtained are as follows:

2057									
2057									
2058									
2054									
2052	2078								
2048	2069								
2048	2065								
1352	2014	2045	2065						
1347	2013	2038	2063						
1347	2009	2038	2062						
1348	2006	2038	2062	2120	2126	2276			
1282	1331	1338	2008	2029	2062	2104	2126	2276	
Oct '91	Nov '91	Dec '91	Jan '92	Feb '92	Mar '92	Apr '92	May '92	Oct '92	

From this group of switches the following observations were made:

- 1) There were no signs of fluid leakage into the connector cavity.
- 2) 28 switches were returned with foam connector seals, 1 with silicone seals and 11 with no seals.
- 3) Terminal to terminal resistance on all 40 switches was within specification.
- 4) With hexport grounded and terminals subject to 14 Vdc, there was no detectable current flowing from terminal to ground.
- 5) Internal inspection of the internal components (pin, arm, washers, converters, and Kapton) showed wear as would be expected in a part that has seen significant number of pressure cycles.
- 6) All switches pass the sensor leak check.
- 7) First layer of Teflon on all switches showed some signs of delamination, as would be expected with cycling, while some switches had two or three layers delaminated.
- 8) No cracking was seen on the second and third layer of Kapton.
- 9) Four switches had Kapton cracks on the first layer.
- 10) Wear from all of the internal components was seen to settle and discolor the converter side Kapton.
- 11) Environment seal gasket and internal pressure media seal gasket were present and in good condition on all switches.
- 12) Teardrops were seen on roughly 60% of the switches. No correlation between level of wear and teardrops.

No indication of damage to the internal components.

TI Pressure Sensors Division



Figure 1. Ceramic pin with wear marks seen on top and around the sides

3713 8184



**Figure 2.** Wear marks can be seen as a flat spot on the bump and curved discoloration on the arm.

3713 8185



Figure 3. Delamination of the Teflon from the Kapton can be seen as a circular bubble.

3713 8186

Date code	Region	n/s	ew	Prod date	VL	Mileage
1 late	coast	n	e	early	cv	main mass ri conn nyc
2 late	coast	n	e	late	cv	main mass ri conn nyc
3 late	coast	s	w	late	tc	so.cal so.tex ark
4 late	Inland	n	e	early	tc	penn ohio ky tenn
5 late	Inland	s	w	late	tc	utah colo
6 late	Inland	s	w	early	cv	utah colo
7 late	dry	n	e	early	tc	ver newham
8 late	dry	n	w	late	cv	mont idaho wyom
9 late	dry	s	e	late	cv	tenn missouri
10 early	coast	n	w	late	tc	oreg wash, freemont ca
11 early	coast	s	e	early	tc	fla geog carolinas
12 early	coast	s	w	early	cv	so.cal so.tex ark
13 early	Inland	n	e	late	cv	penn ohio w.vir
14 early	Inland	n	w	early	cv	neb dak
15 early	Inland	s	e	late	tc	ky tenn
16 early	dry	n	w	early	tc	mont idaho dakota
17 early	dry	s	e	late	cv	tenn missouri
18 early	dry	s	w	early	tc	ariz new mex okla.

samples	possibles	41622	3218
✓ 8/1		115701	2266
✓ 8/1		204100	2267 - PA
✓ 1	0		
	0		1
	0		
	0		
✓ 8/1	1233197	2262	-AA
✓ 8/1	47540	2027	
✓ 8/1	65182	2059	
✓ 2/1	64777	2055	
✓ 8/1	73999	2036	
✓ 8/1	32152	1338	
✓ 8/1	237856	2027	

samples needed

- 5 early
- 4 early
- 4 late
- 5 late

- early 35tc, 20cv or gm
- late 31tc, 30 cv or gm
- early 2tc, 2 cv
- late 2tc, 2 cv

55 candidates  
 61 candidates  
 0 candidates plus 11 service parts with unknown mileage  
 4 candidates @ 100k to 80K miles  
 plus 6 candidates 120K to 100K miles  
 possibles

n	a	dry	n	w	mont idaho dakota
b	coast	s	e		fla geog carolinas
c	dry	s	w		ariz new mex okla
d	Inland	n	w		neb dak
e	coast	s	w		so.cal so.tex ark
f	Inland	e	e		ky tenn
g	coast	n	w		oreg wash
h	Inland	n	e		penn ohio w.vir
i	dry	s	e		tenn missouri
j	Inland	s	w		utah colo
k	dry	n	e		ver newham
l	dry	n	w		main mass ri conn nyc
m	coast	n	e		

In  
 WI  
 La  
 ohio; york, pa; i  
 fl freemont.ca  
 mi; valley stream, ny  
 ks; al; houston, tx  
 tenn;

valley stream, york pq

San francisco bay

AB SUFFIX

		+				
DATE CODE	1 FOG MAR 92		2 AUG SEP OCT 92		COLD/DRY / INLAND/DRY NORTH/SUMM EAST/WEST	
MILEAGE	1 80K		1 80K			
REGION	1 COAST 2 INLAND 3 DRY					
	1 N 2 S					
	1 E 2 W					
PRODUCTION DATE	1 MAR/APR 92 30		2 SEP/OCT 92 31		T/C/CV	
DATE 1 CODE 23	COLD 1 DRY 3	N 12 S 3	E 11 W 23	SEASIDE 12 DRY 3		
1	FEB/MAR	COLD	N	E	MAR/APR	
2	FEB/MAR	COLD	N	W	MAR/APR	
3	FEB/MAR	COLD	S	W	SEP/OCT	?
4	FEB/MAR	INLAND	N	E	MAR/APR	
5	FEB/MAR	INLAND	N	W	SEP/OCT	?
6	FEB/MAR	INLAND	S	W	MAR/APR	
7	"	DRY	N	W	MAR/APR	
8	"	DRY	N	W	"	
9	"	DRY	S	E	SEP/OCT ?	
10	AUG/SEP	COLD	N	W	SEP/OCT	
11	"	"	N	E	MAR/APR ?	
12	"	"	S	W	MAR/APR ?	
13	"	INLAND	N	W	OCT/NOV	
14	"	"	N	W	MAR/APR ?	
15	"	"	S	E	MAR/APR ?	
16	"	DRY	N	W	MAR/APR ?	
17	"	"	N	E	SEP/OCT ?	
18	"	"	S	W	MAR/APR ?	

2213 2309 106-207 2/1/92 11/08/92

~~2011~~ - 2011 FOG - MAR 2/1/92 - 4/1/92  
1357

✓

3713 8188

Date code	Region	n/a	ew
1 late	coast	n	e
2 late	coast	n	e
3 late	coast	s	w
4 late	inland	n	e
5 late	inland	s	w
6 late	inland	s	w
7 late	dry	n	e
8 late	dry	n	w
9 late	dry	s	e
10 early	coast	n	w
11 early	coast	s	e
12 early	coast	s	w
13 early	inland	n	e
14 early	inland	n	w
15 early	inland	s	e
16 early	dry	n	w
17 early	dry	s	e
18 early	dry	s	w

	Prod date	VL	
early L	cv	80,000 miles	
late	cv	main mase ri conn nyc	
late	tc	main mase ri conn nyc	
early L	tc	so.cal so.tex ark	
late	tc	penn ohio ky tenn	
early L	cv	utah colo	
late	tc	utah colo	
early L	tc	ver newham	
late	cv	mont idaho wyom	
late	cr	tenn missouri	
late	tc	oreg wash	
early	tc	fla geog carolinias	
early	cr	so.cal so.tex ark	
late	cr	penn ohio w.vir	
early	cv	neb dakota	
late	tc	ky tenn	
early	tc	mont idaho dakota	
late	cv	tenn missouri	
early	tc	ariz new mex okla	

#### CANDIDATE FAULTS

samples needed

5	early
4	early
4	late
5	late

early	35tc, 20cv or gm	55 candidates
late	31tc, 30 cv or gm	61 candidates
early	0 candidates plus 11 service parts with unknown mileage	◀
late	2tc, 2 cv or gm 4tc, 3 cv or gm	4 candidates @ 100k to 60K miles plus 6 candidates 120K to 100K miles

*As candidate faults*

Early Date/Code	Early Bid date	Veh line	miles	roff	ro-#	tc	mont idaho dakota fla geog carolinas ariz new mex okla
1347	3/3/92	tc	69876	99935	1	tc	
2031	4/2/92	tc	89667	10150	1	tc	
1338	3/20/92	tc	85541	68228	52	tc	
2027	4/10/92	tc	84578	237866	A	cv	
2038	4/28/92	tc	84372	70921	45	cv	neb dakota
2038	4/28/92	tc	84372	70921	45	cv	so.cal so.tex ark
→ 2059	03/06/92	tc	82944	65182	51 - FLA		
✓ 2003	03/20/92	tc	82025	58610	1 - OHIO		
→ 1338	4/7/92	tc	81949	42238	A - TN		
→ 2059	4/2/92	tc	81863	58582	A - IL		
→ 1338	3/27/92	tc	81064	370137	A - OKLA		
→ 1354	3/26/92	tc	76815	175359	A - MD		
→ 2059	4/3/92	tc	75626	83882	1 - VA		
✓ 2009	3/26/92	tc	74278	22695	1 - TEX, HARRINGTON	Centr.	
→ 2059	3/26/92	tc	74278	22695			Texas
2038	4/13/92	tc	74213	96586	1		
1347	4/14/92	tc	72798	33601	1		
1345	3/12/92	tc	71685	9615	1		
2008	4/21/92	tc	71652	23523	1		
1345	4/6/92	tc	71616	57426	1		
2014	4/9/92	tc	71000	33470	1		
1365	3/9/92	tc	70741	71651	1		
2009	04/28/92	tc	70231	53328	A		
2014	04/07/92	tc	70138	102477	2		
2009	3/31/92	gm	86175	3888	A		
2059	4/8/92	gm	83832	18025	1		
1343	3/17/92	gm	83553	81506	1		
→ 2065	4/23/92	gm	81683	47168	51 - N.J.		
2009	4/8/92	gm	78589	370141	A - OKLA		
1362	4/16/92	gm	75231	28209	3		
1362	4/16/92	gm	75231	28209	3		
2054	3/23/92	cv	86957	80024	1		
1338	3/11/92	cv	86046	17881	51		
2008	4/7/92	cv	85763	47176	1		
2014	4/21/92	cv	84323	121151	A		
→ 2042	3/24/92	cv	78847	81480	1 - MISSOURI		
2038	3/24/92	cv	73659	81487	1		
2056	4/9/92	cv	73703	419284	1		
2013	3/11/92	cv	72188	85429	1		

Early	Late	Need 4 samples from this group, 2 tc 2 cv or gm						
2086	10/22/92	tc	89675	47689	B		tc	ky tenn
2027	11/9/92	tc	89354	57923	1		tc	oreg wash
2042	8/10/92	tc	89338	58333	A		cv	penn ohio w.vir
1338	09/29/92	tc	89022	244975	1		cv	tenn missouri
2062	9/25/92	tc	89022	454130	1			
2057	9/2/92	tc	88630	22805	1			
2057	10/7/92	tc	88324	52708	A			
2069	08/16/92	tc	87358	54919	D			
2062	8/31/92	tc	86994	34387	1			
2036	10/23/92	tc	86009	73999	1			
2063	8/18/92	tc	85047	98731	51			
2063	10/1/92	tc	84178	28338	D			
2055	10/05/92	tc	84135	26136	4			
2038	08/11/92	tc	83918	436865	A			
2055	11/24/92	tc	82579	448268	1			
2079	8/9/92	tc	81648	98180				
2056	8/20/92	tc	80703	27155	1			
2055	10/30/92	tc	80010	53208	A			
2019	11/16/92	tc	79824	181102	A			
2071	8/14/92	tc	79677	54247	51			
2008	9/16/92	tc	79366	179542	C			
2054	11/20/92	tc	78235	39322	A			
1365	11/25/92	tc	77935	11196				
2062	8/26/92	tc	77500	54353				
2042	9/1/92	tc	77178	71683	51			
2009	9/16/92	tc	75493	142700	A			
2054	10/20/92	tc	75371	180624	B			
2054	8/3/92	tc	75278	72160	1			
2080	10/5/92	tc	75155	25804	1			
1362	8/13/92	tc	74802	3392	50			
2048	10/14/92	tc	74216	28235	51			
2063	9/10/92	tc	74000	55049				
2064	10/19/92	tc	71582	291204	1			
2027	10/13/92	tc	71430	971540	C			
2063	8/3/92	tc	71377	48787	7			
2055	10/28/92	gm	89406	108856	1			
2062	10/28/92	gm	84452	98514	51			
2054	8/26/92	gm	81061	10317	1			
2057	8/21/92	gm	80867	216976	1			
2069	8/29/92	gm	80592	58394	A			
2065	8/27/92	gm	80670	46333	1			
1345	8/8/92	gm	80400	237025	1			
1345	9/8/92	gm	80400	237025	1			
2042	08/31/92	gm	79902	99586	2			
2069	11/13/92	gm	78758	20529	51			
2045	9/8/92	gm	78160	71024	45			
2045	9/8/92	gm	78160	71024	45			
1345	11/11/92	gm	74070	21230	2			
1345	11/11/92	gm	74070	21230	2			
2069	11/25/92	gm	73704	588377	1			
2069	10/2/92	gm	71863					
2069	10/20/92	gm	71598	142636	A			
2065	9/15/92	gm	70571	963830	C			
1338	10/19/92	gm	70216	32152	1			
2071	10/23/92	cv	88214	33990	1			
1343	9/18/92	cv	88076	95106	4			

all next  
for more

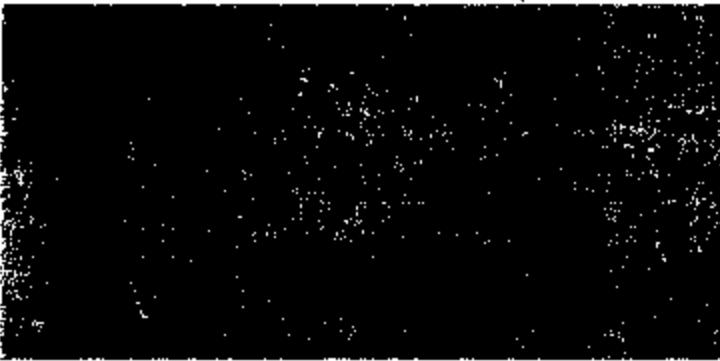
2042	10/30/92	cv	87971	101942	1
1347	10/28/92	cv	86161	113140	1
1385	9/15/92	cv	83700	62402	A
2042	11/30/92	cv	81712	150561	A
2056	9/16/92	cv	75335	64777	A
2069	11/18/92	cv	78228	82381	1
2052	09/28/92	cv	72612	48132	1
2039	11/17/92	cv	70817	48256	1

Late      Early      Need 4 samples from this group, 2 tc 2 cv or gm  
 Late      Late      Need 5 samples from this group, 2 tc 3 cv or gm

- 2267	11/9/92	tc	89635	204100	5	tc	so.cal so.tex ark
- 2267	11/9/92	tc	89535	204100	5	tc	penn ohio
- 2278	10/14/92	tc	83051	154300	A	tc	utah color
- 2287	11/28/92	tc	77967	20374	A	tc	ver newham
- 2278	11/17/92	tc	72053	75489	51		
- 2266	11/12/92	tc	70450	115701	A 1451	cv	mont idaho wyom
- 2282	11/11/92	gm	83884	233197	1	cv	tenn missouri
- 2278	11/30/92	cv	85897	41678	1	cv	utah color
- 2238	11/12/92	cv	83656	28144	1 <i>ARC 601</i>	cv	main mass ri conn nyc
- 2262	11/27/92	cv	72057	40466	51	cv	main mass ri conn nyc

Late      Early

no candidates because these would be service parts built after the car was built with unknown mileage.



Date/Code	Bld date	Veh line	miles	ro#	ro#
1338	09/29/92	tc	89022	244975	1
1338	3/11/92	cv	86045	17661	51
1338	3/20/92	tc	85541	66228	52
1338	4/7/92	tc	81949	42238	A
1338	3/27/92	tc	81084	370137	A
1338	10/19/92	gm	70218	32152	1
1343	9/18/92	cv	88076	95106	4
1343	3/17/92	gm	83553	61506	1
1345	9/8/92	gm	80400	237025	1
1345	9/8/92	gm	80400	237025	1
1345	11/11/92	gm	74070	21250	2
1345	11/11/92	gm	74070	21250	2
1345	3/12/92	tc	71665	9515	1
1345	4/6/92	tc	71618	57425	1
1347	3/3/92	tc	89876	99935	1
1347	10/26/92	cv	85161	113140	1
1347	4/14/92	tc	72798	33601	1
1352	4/16/92	gm	75231	28209	3
1352	4/16/92	gm	75231	28209	3
1352	8/13/92	tc	74802	3392	50
1354	3/26/92	tc	78815	175359	A
1365	9/15/92	cv	83700	52402	A
1365	11/25/92	tc	77935	11196	
1365	3/9/92	tc	70741	71651	1
2003	03/20/92	tc	82025	58610	1
2003	4/7/92	cv	85783	47176	1 DICKINSON TX
2003	9/18/92	tc	79368	179542	C LITTLE ROCK ARK
2003	4/21/92	tc	71662	23623	1 OHIO
2003	3/31/92	gm	86175	3888	A BRACKTON MA
2003	4/6/92	gm	78599	37644	A OKLA
2003	9/16/92	tc	75493	442700	A BALT MD
2009	3/26/92	tc	74278	22695	1
2009	04/28/92	tc	70231	52389	A -LYNN Ma -AB
2010	3/11/92	cv	72188	85429	1 FAIRFAX VA
2014	4/21/92	cv	84323	121151	A Charles WVA
2014	4/9/92	tc	71000	93470	1 LONGVIEW TX
2014	04/07/92	tc	70138	102477	2 KY
2019	11/16/92	tc	79924	181102	A Wm Brg, Vq
2027	11/9/92	tc	89354	57923	1
2027	4/10/92	tc	84576	237856	A Phoenix, AZ
2027	10/13/92	tc	71430	971540	C Fremont, CA
2031	4/2/92	tc	89557	10150	1
2036	10/23/92	tc	88009	73999	1
2036	08/11/92	tc	83918	436865	A

2038	4/28/92	tc	84372	70921	45
2038	4/28/92	tc	84372	70921	45
2038	4/13/92	tc	74213	96586	1
2038	3/24/92	cv	73859	61467	1
2039	11/17/92	cv	70817	48256	1
2042	8/10/92	tc	69339	58333	A
2042	10/30/92	cv	87971	101942	1
2042	11/30/92	cv	81712	150581	A
2042	08/31/92	gm	79902	99586	2
2042	3/24/92	cv	78947	61450	1
2042	9/1/92	tc	77176	71583	51
2045	9/8/92	gm	76160	71024	45
2045	9/8/92	gm	76160	71024	45
2048	10/14/92	tc	74216	28235	51
2052	09/28/92	cv	72612	48132	1
2054	3/23/92	cv	86957	80024	1
2054	8/26/92	gm	81061	10317	1
2054	11/20/92	tc	76235	39322	A BARRINGTON OHIO
2054	10/20/92	tc	76371	180624	B
2054	9/3/92	tc	75278	72160	1
2055	10/28/92	gm	89405	106856	1

2055	10/05/92	tc	84135	26136	4
2055	11/24/92	tc	82579	448269	1
2055	8/20/92	tc	80703	27155	1
2055	10/30/92	tc	80010	53208	A
2055	9/16/92	cv	75335	64777	A
2055	4/9/92	cv	73703	419264	1
2056	10/22/92	tc	89675	47689	B
2057	9/9/92	tc	88530	22605	1
2057	10/7/92	tc	88324	52708	A
2057	8/21/92	gm	80987	215976	1
2059	4/8/92	gm	83932	10025	1
2059	03/06/92	tc	82944	65182	51
2059	4/2/92	tc	81663	56582	A
2059	4/3/92	tc	75626	83882	1
2062	9/25/92	tc	89022	454430	1
2062	8/31/92	tc	86994	34387	1
2062	10/28/92	gm	84452	98514	51
2062	8/26/92	tc	77500	54353	
2063	8/18/92	tc	85047	98731	51
2063	10/1/92	tc	84178	28338	D
2063	9/10/92	tc	74000	55048	
2063	8/3/92	tc	71377	48787	7
2064	10/19/92	tc	71592	291204	1
2065	4/23/92	gm	81683	47186	51
2065	8/27/92	gm	80570	48333	1
2069	09/16/92	tc	87358	58886	D
2069	9/28/92	gm	80592	58394	A
2069	11/13/92	gm	79756	20529	51
2069	11/16/92	cv	75228	62381	1
2069	10/2/92	gm	71863		
2069	10/20/92	gm	71586	54296	A
2071	10/23/92	cv	89214	33990	1
2071	8/14/92	tc	79877	54247	51
2079	9/9/92	tc	81648	98180	a
2080	10/5/92	tc	75155	25804	1
2085	9/15/92	gm	70571	963830	C
2089	11/25/92	gm	73704	588377	1

Party	Party	Need 8 samples from this group, 3 to 2 cv or grn					
			lo	mont blair delco	dryer	a	
			lo	fla greg caroline	cst, sr	b	
			lo	california/mex cities	dry, swr	c	2
			cv	nab delco	inhd, nw	d	
			cv	so cal so tex ark	cst, swr	e	

DateCode	Bid date	Veh type	miles	ref	ro#		
1347	3/20/02	tr	80878	00095	1	pa	
2021	4/21/02	tr	89697	10180	1	ny	
1326	3/20/02	tr	86541	00228	52	nc	
2036	4/26/02	tr	84372	70827	48	la	b
2036	4/26/02	tr	84372	70821	48	la	c
2033	03/20/02	tr	82026	59810	1	ohio	
1338	4/7/02	tr	81948	42238	A	tenn	
2060	4/29/02	tr	81863	58682	A	il	
1388	2/27/02	tr	81084	270157	A	ohio	
1354	3/28/02	tr	78816	175308	A	md	
2059	4/5/02	tr	75226	42882	1	va	
2059	3/28/02	tr	74278	22695	1	tex, houston	central time
2086	4/13/02	tr	74213	98385	1	pa	
1347	4/14/02	tr	72798	38801	1		
1346	2/12/02	tr	71085	8615	1	ny	
2006	4/21/02	tr	71822	22923	1	ohio	
1346	4/8/02	tr	71618	57425	1		
2014	4/6/02	tr	71000	33470	1	tx, longview	
1365	3/6/02	tr	70241	71851	1	ohio	
2008	04/28/02	tr	70231	53326	A	Mass, Lynn	
2014	04/07/02	tr	70158	102477	2	ky	
2009	3/31/02	pm	68175	3188	A	Mass, Brockton	
2069	4/6/02	pm	63932	10025	1	il	0777
1348	3/17/02	pm	63553	51606	1	il	
2025	4/23/02	pm	61683	47168	51	il	
2008	4/6/02	pm	78598	370141	A	ohio	
1352	4/18/02	pm	75281	26208	3	pa	
1352	4/18/02	pm	75281	26209	3		
2054	2/23/02	cv	68957	90334	1	la	
1336	3/11/02	cv	68048	17861	51	il	
2008	4/7/02	cv	65783	47175	1	pa, dickinson	
2014	4/21/02	cv	54223	121151	A	Wv, Charleston	
2042	3/24/02	cv	78947	81452	1	missouri	
2038	3/24/02	cv	73860	81467	1	mo or md???	
2005	4/9/02	cv	73703	419284	1	la	
2012	3/11/02	cv	72188	88429	1	va, Fairfax	

Early Late Need 4 samples from this group, 2 to 2 ov or gen

							Is	Is	ky lons	Inted. no.	1	1
							to	to	ong wash	est. no.	0	
							or	or	oenn ohio wtr	Inted. no.	n	2
							ov	ov	latoe missouri	dry, no	1	
2006	10/22/92	Is	88670	47659	B	nd						
2027	11/6/92	Is	88254	57623	1	ny						
2042	8/10/92	Is	88254	58131	A	ny						
1336	08/23/92	Is	88022	244976	1	nd						
2082	9/25/92	Is	88022	484130	1	Tx, Ft. Worth						
2057	8/30/92	Is	88530	22005	1	ny						
2057	10/7/92	Is	88324	62708	A	il						
2080	08/16/92	Is	87304	84919	D	Pa, York						
2022	8/21/92	Is	88694	34897	1	pa						
2043	8/18/92	Is	88047	88731	B1	nd						
2033	10/1/92	Is	84178	28336	D	ohio						
2056	10/6/92	Is	84135	28136	4	Ohio						
2038	08/11/92	Is	83918	428966	A	nd						
2055	11/24/92	Is	82579	448289	1	ohio						
2079	8/29/92	Is	81844	28120	9	ca						
2055	8/20/92	Is	82703	27155	1	Alabama						
2055	10/30/92	Is	80010	53208	A	il						
2010	11/18/92	Is	79524	181102	A	Va, Westing						
2071	8/14/92	Is	79877	84247	B1	ny						
2084	9/16/92	Is	78386	178542	C	Ark, N. Little Rock						
2054	11/20/92	Is	78235	36222	A	Ohio						
1885	11/25/92	Is	77926	11196								
2022	8/28/92	Is	77300	54553								
2042	8/14/92	Is	77171	71523	B1	Pa						
2008	9/16/92	Is	75463	142700	A	Md, Bal						
2054	10/20/92	Is	75371	180824	B	ca						
2060	10/5/92	Is	75156	25804	1	ohio						
1882	8/13/92	Is	74802	3392	80							
2048	10/14/92	Is	74218	28235	51	Ge						
2053	9/10/92	Is	74000	52049								
2054	10/19/92	Is	71502	201284	1	ny						
2053	8/28/92	Is	71377	48767	7	ny						
2058	10/28/92	gm	89406	105886	1	ca						
2052	10/28/92	gm	84452	98514	B1	Tx, Houston						
2054	8/28/92	gm	81061	10317	1	il						
2057	8/21/92	gm	82867	215676	1	ca						
2059	9/28/92	gm	80682	58384	A	Ny, Valley Stream						
2053	8/27/92	gm	80570	46333	1	Pa, York						
1345	8/8/92	gm	80480	237025	1	il						
1345	8/8/92	gm	80400	237025	1	nm						
2042	08/31/92	gm	79902	99596	2	nm						

2049	11/13/92	gm	78026	26226	51			
2045	9/8/92	gm	78180	71024	46	M		
2045	9/8/92	gm	78180	73234	46			
1345	11/11/92	gm	74070	21250	2			
1345	11/11/92	gm	74070	21250	2			
2069	11/26/92	gm	72704	588377	1			
2069	10/23/92	gm	71862					
2069	10/23/92	gm	71862	14236	A	M1, SW		
2066	8/15/92	gm	70571	983800	C	ca		
2066	8/15/92	gm	70571	983800	C	ca		
2071	10/23/92	or	88274	32820	1	ri		
1343	9/18/92	or	88076	98108	4	re		
1347	10/26/92	or	86141	113140	1	la		
1365	9/15/92	or	83700	89402	A	ii		
2042	11/20/92	or	817712	150281	A	rm		
2059	11/10/92	or	78226	82381	1	is		
2062	9/26/92	or	72812	48182	1	ca		
2039	11/17/92	or	70617	46206	1	re		

Late Early Need 4 samples from this group, 2 to 2 or orgm  
 Late Late Need 6 samples from this group, 2 to 3 or orgm

2270	10/14/92	or	72051	44201				
2270	10/14/92	or	72051	184300	A	Fl. Shrub	C, S, L	it
2287	11/25/92	or	77257	20374	A	NL Gleason	C, S, L	ic
2278	11/17/92	or	72055	75400	51	Fl. Shrub	C, S, L	re
2282	11/27/92	or	72057	45466	61	In. Clintonville	AA	rr72

Late Early

no candidates, because these would be service parts built after the car was built with unknown mileage.

3713 8168

data code	roll	State, City
- 1338	17861	51 - IL
- 1338	66226	52 - NC
- 1338	244075	1 - NJ
- 1338	32152	1 - AL
- 1343	61506	1 - NC
- 1343	96108	4 - NC
- 1345	96115	1 - NY
- 1345	57425	1
- 1345	237025	1 - NC
- 1345	21230	2
- 1347	20035	1 - PA
- 1347	33801	1
- 1347	113140	1 - LA
- 1352	28209	3 - PA
- 1352	3382	50
- 1355	71651	1 - OH
- 1355	52402	A - IL
- 1355	11198-	2
- 2027	57923	1 - KY
- 2031	10150	1 - NY
- 2035	438855	A - NC
- 2036	73860	1 - TN
- 2036	61467	1 - NC
- 2036	98880	1 - FL
- 2036	70821	40 - NC
- 2039	46200	1 - NC
- 2041	58333	A - NY
- 2042	98880	2 - NC
- 2042	71683	51 - FL
- 2042	101842	1 - GA
- 2042	150861	A - NC
- 2045	71024	40 - NC
- 2048	26255	51 - GA
- 2052	48132	1 - GA
- 2054	60824	1 - LA
- 2054	10917	1 - WI
- 2054	72160	1 - FL
- 2054	180884	B - TX
- 2055	419284	1 - FL
- 2055	27105	1 - AL
- 2058	64777	A - GA
- 2060	26135	4 - NC
- 2060	108888	1 - FL
- 2060	63228	A - IL
- 2060	446380	1 - NC
- 2060	47888	B - NC
- 2067	216878	1 - GA
- 2067	22805	1 - NC
- 2067	82708	A - IL
- 2068	10025	1 - NC
- 2062	54303	- 44 - A - TX
- 2062	34387	1 - GA
- 2063	48787	7 - NC
- 2063	98731	51 - NC
- 2063	98049	
- 2063	26538	D - NC
- 2064	291204	1 - NC
- 2065	46383	1 - m
- 2066	30289	51
- 2066	52281	1 - GA
- 2071	94247	51 - NC
- 2071	33880	1 - NC
- 2070	98180	B - NC
- 2080	28884	1 - d
- 2080	953830	C - GA
- 2080	588377	1

AL

This is the  
revised list

I have gone thru  
the 2 boxes in  
the lab for 20  
thru 2089.

1345 Please check for  
1347  
1352 the 2027-2089

parts in the  
Hydraulic Lab  
and the 1338  
thru 1365 in  
both labs ;

Thanks  
Steve

co (3)  
11/11  
20/11

3713 8199

# Request for Central Laboratory Service

15000 Century Dr., Dearborn MI 48120-1367 Phone (313) 32-21676 FAX (313) 32-21614

All shaded areas must be filled in to process your request.

Administrative Use Only

Facility Number	Date
0903185	4/27/94

Your Name (Send report to)  
**Steve Reimers**  
 Secondary Contact

Telephone  
**39 03286**  
 Telephone

PROPS ID	FAX
<b>JREIMERS</b>	<b>39 03286</b>
PROPS ID	FAX

Send Report To		Bill To				
Room No/Mail/Drop/PO Box	Department/Activity	Building	Location Code	Dept. #	Work Task # [For \$100 Loc. Only]	
<b>3E008/5011</b>	<b>EMC/CHASSIS</b>	<b>AUT S</b>	<b>5100</b>	<b>TY02</b>	<b>J00AP</b>	

Total # of Samples	Sample Handling	TOX/CASH	Source	Supplier Code
<b>7</b>	<input checked="" type="checkbox"/> Return after test <input type="checkbox"/> Dispose after test <input type="checkbox"/> Dispose after 30 days			
Part/Material Name	Sample Identification [Continue below if needed]	Part Number [If any]	Material Spec/Options [If any]	CPSC Code
<b>EMC-FP921-AB</b>				
D Brake Pressure Switch	See below	<b>F2VC-9F921-AB</b>	<b>N/A</b>	<b>06 06 06 TI</b>
2	"	<b>F3VC-9F924-AB</b>	"	<b>06 06 06 TI</b>

Nature of Investigation/Specific Tests Required [Check all that apply]

Production/Plant problem    Perform Test as in Lab No \_\_\_\_\_  
 Failure Analysis    Photographs [Describe below]  
 Legal    Use Specification \_\_\_\_\_ as a guide  
 Specification Compliance    Other [Describe below]

Requester Info. Box [For requester use]

Stop testing upon failure?    Does this support CAR testing? [If "Yes", what is the expected outcome?]  
 No     Yes     No     Yes

Do you need to know your CL contact and name?     Yes

Additional Sample Information/Testing Requirements

*Perform comparison of parts per attached scope of work (reviewed with Pete Klaes).*

Sample I.D. - AB

New A

-BB

R.O. # 064126-A

New B

RO # 071803-01 2267

RO # 271517-04 2406

RO # 064126-A 2406

RO # C66028-A 2267

RO # 064231-A 1345

## INITIAL ROUTING

Metallurgy/Mechanical (313) 32-21613

Chemistry (313) 33-78277

Polymers, Coatings & Corrosion (313) 99-46698

## Report

Format [Check all that apply]

Date you would like report **10/22/99**  
 Date you must have report **10/22/99**

FAX preliminary results     FAX hand written  
 FAX typed report     Mail hand written

Mail typed report  
 Electronically transfer report  
 Faxes preliminary results

For information about services or assistance in completing this form, please refer to the Central Laboratory WEB page.  
 Laboratory number and date cannot be assigned without receipt of samples.  
 Samples will be disposed of after 30 days unless otherwise indicated above.

[www.gto.ford.com/central/home.htm]

also Copy #3 in permanent file; attach copies in  
hand to guard at plant gate or building exit.

cac 36

A-Chargeable Material  
Personal Property Pass

DATE

9/27/89

NAME  
ID#PF. & NO.1  
Steve Reiners  
7302 / AVT 5

WITH THE FOLLOWING:

Company Property  Personal Property

DESCRIPTION:

#6 F2VC-9F924-AB  
#1 F2VC-9F924-BD

Authorized  
Releasing  
Signature

NAME

Pete Klaas

LOCATION

Central Lab

24248

Receiving  
Signature

Pete Klaas