

BRIDGESTONE / FIRESTONE, INC.

September 27, 1990

ORIGINAL EQUIPMENT SALES AND ENGINEERING

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Mr. R. J. Schneider
Light Truck Engineering
Ford Motor Company
20000 Rotunda Drive
Bldg. #1 - Room 1109
Dearborn, MI 48121

SUBJECT: RANGER/EXPLORER WEAR TESTING

Dear Ray:

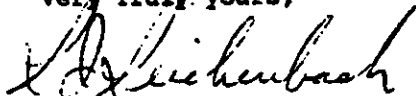
Tabulated below are projected mileages to wear-out for the current production P235/75R15 SL ATX tire from 10K irregular wear tests conducted on an Explorer and a Ranger:

	<u>EXPLORER</u>	<u>RANGER</u>
Avg. Fronts	79,500	85,500
Avg. Rears	46,109	69,296
Avg. Front & Rear	62,805	77,398
Front Outside Shld. Grv.	99,591	78,452

This data indicates that the Ranger is less sensitive to irregular wear than the explorer in all areas with the exception of the outside front shoulder grooves. Typically the most significant mileage projection figure for the 10K test is the average front wear. It should be noted that the explorer test was run in January of 1989 at Uvaldi and the Ranger test was run in October of 1989 at our facility in Acuna, Mexico. Because of the difference in the time period during which the tests were run and the different locations, direct vehicle to vehicle comparisons are questionable.

At your earliest convenience, I would like to discuss a specific test plan for the new reduced rolling resistance tire in the subject size to be qualified for use on the 1992 Explorer and Ranger vehicles. As soon as this test plan can be finalized, I will work up a timing chart showing critical mile stones for meeting Job 1, 1992.

Very Truly yours,



R. J. Reichenbach
O.E. Account Representative

RJR/mar
049.RJR

cc: Mr. T. A. Mast

bcc: A. W. Stuart
J. E. Behr
J. D. Firestone
W. J. Freund
C. Kocaj
T. N. Coppock

TYPE TEST/MFG: 10000 MILE IRREGULAR WEAR EVALUATION/FIRESTONE

REPORT CERTIFIED BY: _____

TEST SITE: UVALDE, TEXAS

PROJECT NO. 06000-62

DATE: JANUARY 5, 1989

TIRE MFG. CONDUCTING TEST: FIRESTONE

NEW TEST TIRE SIZE/BRAND/CONST #: (A) P235/75R15 ATX S1531J

CONTROL TIRE SIZE/BRAND/CONST #: (B) P235/75R15XL ATX SL079F

TEST VEHICLES & ALIGNMENT: '90 UN46 4X4 NMNL CSTR/CMBR; TOE-IN: +5/32"

TEST VEHICLES LOAD/PSI: CURB + DRIVER; 35 PSI (FRONT/REAR)

TEST VEHICLES MILES: 10125

NEW TEST TIRE SIZE/BRAND: (A) P235/75R15 ATX	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.436 ✓	0.436 ✓	0.435 ✓	0.435 ✓	0.435 ✓	0.440 ✓
REMAINING GROOVE	0.411 ✓	0.393 ✓	0.348 ✓	0.381 ✓	0.347 ✓	0.362 ✓
WEAR	0.025	0.043	0.087	0.054	0.088	0.078
RATE WEAR/MILES (10125)	.0000024 ✓	.0000042 ✓	.0000085 ✓	.0000053 ✓	.0000086 ✓	.0000077 ✓
PROJECTED LIFE (INIT-.063)/RATE	155417 ✓	88810 ✓	43765 ✓	70189 ✓	43256 ✓	48961 ✓

PROJECTED LIFE (AVG)
O/S GROOVE= 99591 FRONTS= 79500 REARS= 46109 VEH= 62805

CONTROL TEST TIRE SIZE/ BRAND: (B) P235/75R15XL ATX	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.438 ✓	0.438 ✓	0.439 ✓	0.439 ✓	0.439 ✓	0.440 ✓
REMAINING GROOVE	0.406 ✓	0.392 ✓	0.329 ✓	0.378 ✓	0.346 ✓	0.363 ✓
WEAR	0.032	0.046	0.110	0.061	0.093	0.077
RATE WEAR/MILES (10125)	.0000031 ✓	.0000045 ✓	.0000108 ✓	.0000060 ✓	.0000091 ✓	.0000076 ✓
PROJECTED LIFE (INIT-.063)/RATE	120968 ✓	83333 ✓	34815 ✓	62667 ✓	41319 ✓	49605 ✓

PROJECTED LIFE (AVG)
O/S GROOVE= 77892 FRONTS= 73000 REARS= 45462 VEH= 59231

(COMPARISON RESULTS)	(BRAND/SIZE)	(PROJECTED)	(%VARIANCE)
FRONT ACROSS TREAD	(A) P235/75R15 ATX	(LIFE)	(NEW VS CONTROL)
FRONT ACROSS TREAD	(B) P235/75R15XL ATX	(A) 79500 ✓ (B) 73000 ✓	+8.9 %
O/S FRONT GROOVES	(A) P235/75R15 ATX	(A) 99591 ✓	+27.9 %
O/S FRONT GROOVES	(B) P235/75R15XL ATX	(B) 77892 ✓	
REAR ACROSS TREAD	(A) P235/75R15 ATX	(A) 46109 ✓	+1.4 %
REAR ACROSS TREAD	(B) P235/75R15XL ATX	(B) 45462 ✓	
VEHICLE (F/R)	(A) P235/75R15 ATX	(A) 62805 ✓	+6.0 %
VEHICLE (F/R)	(B) P235/75R15XL ATX	(B) 59231 ✓	

*(SEE ATTACHMENT FOR ADJUSTMENT OF O/S GROOVES IF REQ'D)

F.M.CO. FORM 3/'88
PROCEDURE: ES-881A-1508-AA

TYPE TEST/MFG: 10K IRREGULAR WEAR/FIRESTONE

REPORT CERTIFIED BY:

TEST SITE: ACUNA, MEXICO

PROJECT NO. 21005-96

DATE: OCTOBER 3, 1989

TIRE MFG. CONDUCTING TEST: FIRESTONE

NEW TEST TIRE SIZE/BRAND/CONST #: (A) P235/75R15 ATX SL537J

CONTROL TIRE SIZE/BRAND/CONST #: (B) P215/75R15 ATX SIR42J

TEST VEHICLES & ALIGNMENT: 88 RANGER 4X4; NML. CASTER/CAMBER, MAX TOE-IN: +5/3

TEST VEHICLES LOAD/PSI: CURB+DRIVER, 35 PSI (F)

TEST VEHICLES MILES: 10000

NEW TEST TIRE SIZE/BRAND: (A) P235/75R15 ATX	O/S (RF) GROOVE	(R.F.)	O/S (LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.439	0.443	0.439	0.443	0.444	0.444
REMAINING GROOVE	0.403	0.403	0.362	0.393	0.388	0.390
WEAR	0.036	0.040	0.077	0.050	0.056	0.054
RATE WEAR/MILES (10000)	.0000035	.0000040	.0000076	.0000050	.0000056	.0000054
PROJECTED LIFE (INIT-.063)/RATE	107429	95000	49474	76000	68036	70556

PROJECTED LIFE (AVG)
O/S GROOVE= 78452 FRONTS= 85500 REARS= 69296 VEH= 77398

CONTROL TEST TIRE SIZE/ BRAND: (B) P215/75R15 ATX	O/S (RF) GROOVE	(R.F.)	O/S (LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.402	0.409	0.403	0.409	0.409	0.409
REMAINING GROOVE	0.314	0.350	0.279	0.344	0.351	0.349
WEAR	0.088	0.059	0.124	0.065	0.058	0.060
RATE WEAR/MILES (10000)	.0000087	.0000059	.0000124	.0000065	.0000058	.0000060
PROJECTED LIFE (INIT-.063)/RATE	38966	58644	27419	53231	59655	57667

PROJECTED LIFE (AVG)
O/S GROOVE= 33193 FRONTS= 55938 REARS= 58661 VEH= 57300

(COMPARISON RESULTS)	(BRAND/SIZE)	(PROJECTED)	(%VARIANCE)
FRONT ACROSS TREAD	(A) P235/75R15 ATX	(A) 85500	(NEW VS CONTROL)
FRONT ACROSS TREAD	(B) P215/75R15 ATX	(B) 55938	
			+52.8%
O/S FRONT GROOVES	(A) P235/75R15 ATX	(A) 78452	
O/S FRONT GROOVES	(B) P215/75R15 ATX	(B) 33193	
			+ 136%
REAR ACROSS TREAD	(A) P235/75R15 ATX	(A) 69296	
REAR ACROSS TREAD	(B) P215/75R15 ATX	(B) 58661	
			+18.1%
VEHICLE (F/R)	(A) P235/75R15 ATX	(A) 77398	
VEHICLE (F/R)	(B) P215/75R15 ATX	(B) 57300	
			+35.1%

*(SEE ATTACHMENT FOR ADJUSTMENT OF O/S GROOVES IF REQ'D)

F.M.CO. FORM 3/'88
PROCEDURE: ES-EHTA-1508-AA

TYPE TEST/MFG: ~~XXXXXXXXXX~~ EDGE WEAR EVALUATION/FIRESTONE

REPORT CERTIFIED BY: *[Signature]*

TEST SITE: ACUNA, MEXICO

PROJECT NO. 21006-35

DATE: JANUARY 19, 1990

TIRE MFG. CONDUCTING TEST: FIRESTONE

NEW TEST TIRE SIZE/BRAND/CONST #: (A) ~~P215/75R15 FR480~~

CONTROL TIRE SIZE/BRAND/CONST #: (B) P215/75R15 FR480 SI170J

TEST VEHICLES & ALIGNMENT: RANGER 4X4; NMNL CSTR/CMBR, MAX TOE-IN: +5/32"

TEST VEHICLES LOAD/PSI: CURB+DRIVER, 35 PSI (FR)

TEST VEHICLES MILES: 4800

NEW TEST TIRE SIZE/BRAND: (A) P215/75R15 FR480	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.352	0.360	0.354	0.360	0.359	0.359
REMAINING GROOVE	0.294	0.316	0.264	0.308	0.313	0.328
WEAR	0.058	0.044	0.090	0.052	0.046	0.031
RATE WEAR/MILES (4800)	.0000120	.0000091	.0000187	.0000108	.0000095	.0000064
PROJECTED LIFE (INIT-.063)/RATE	24083	32637	15561	27500	31158	46250

PROJECTED LIFE (AVG)
O/S GROOVE= 19822 FRONTS= 30069 REARS= 38704 VEH= 34387

CONTROL TEST TIRE SIZE/ BRAND: (B) P215/75R15 FR480	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.359	0.359	0.359	0.359	0.360	0.359
REMAINING GROOVE	0.299	0.317	0.263	0.308	0.309	0.315
WEAR	0.060	0.042	0.096	0.051	0.051	0.044
RATE WEAR/MILES (4800)	.0000125	.0000087	.0000200	.0000106	.0000106	.0000091
PROJECTED LIFE (INIT-.063)/RATE	23680	34023	14800	27925	28019	32527

PROJECTED LIFE (AVG)
O/S GROOVE= 19240 FRONTS= 30974 REARS= 30273 VEH= 30624

(COMPARISON RESULTS)	(BRAND/SIZE)	(PROJECTED)	(%VARIANCE)
FRONT ACROSS TREAD	(A) P215/75R15 FR480	(LIFE)	(NEW VS CONTROL)
FRONT ACROSS TREAD	(B) P215/75R15 FR480	(A) 30069	
		(B) 30974	
O/S FRONT GROOVES	(A) P215/75R15 FR480	(A) 19822	
O/S FRONT GROOVES	(B) P215/75R15 FR480	(B) 19240	
REAR ACROSS TREAD	(A) P215/75R15 FR480	(A) 38704	
REAR ACROSS TREAD	(B) P215/75R15 FR480	(B) 30273	
VEHICLE (F/R)	(A) P215/75R15 FR480	(A) 34387	
VEHICLE (F/R)	(B) P215/75R15 FR480	(B) 30624	

*(SEE ATTACHMENT FOR ADJUSTMENT OF O/S GROOVES IF REQ'D)

F.M.CO. FORM 3/'88
PROCEDURE: ES-ESTA-1508-AA

TYPE TEST/NEAR EDGE WEAR EVALUATION/FIRESTONE

REPORT CERTIFIED BY: *L. J. Leichtenbach*

TEST SITE: ACUNA MEXICO

PROJECT NO. 21006-34

DATE: FEBRUARY 22, 1980

TIRE MFG. CONDUCTING TEST: FIRESTONE

NEW TEST TIRE SIZE/BRAND/CONST #: (A) ~~P215/70R14 FR480~~ 4x5 1/2 WHEEL

CONTROL TIRE SIZE/BRAND/CONST #: (B) P215/70R14 FR480 H905JA

TEST VEHICLES & ALIGNMENT: RANGER 4X2; NMNL CSTR/CMBR. MAX TOE-IN: +5/32"

TEST VEHICLES LOAD/PSI: CURB PLUS DRIVER, 35 PSI (FRONT AND

TEST VEHICLES MILES: 4800

NEW TEST TIRE SIZE/BRAND: (A) P215/70R14 FR480	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.361	0.363	0.360	0.363	0.363	0.363
REMAINING GROOVE	0.318	0.330	0.316	0.333	0.313	0.321
WEAR	0.043	0.033	0.044	0.030	0.050	0.042
RATE WEAR/MILES (4800)	.0000089	.0000068	.0000091	.0000062	.0000104	.0000087
PROJECTED LIFE (INIT-.063)/RATE	33483	44118	32637	48387	28846	34483

PROJECTED LIFE (AVG)
O/S GROOVE= 33060 FRONTS= 46253 REARS= 31665 VEH= 38959

CONTROL TEST TIRE SIZE/ BRAND: (B) P215/70R14 FR480	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
INITIAL DEPTH	0.360	0.358	0.358	0.358	0.361	0.359
REMAINING GROOVE	0.317	0.324	0.315	0.327	0.302	0.307
WEAR	0.043	0.034	0.043	0.031	0.059	0.052
RATE WEAR/MILES (4800)	.0000089	.0000070	.0000089	.0000064	.0000122	.0000108
PROJECTED LIFE (INIT-.063)/RATE	33371	42143	33146	46094	24426	27407

PROJECTED LIFE (AVG)
O/S GROOVE= 33259 FRONTS= 44119 REARS= 25917 VEH= 35018

COMPARISON RESULTS	(BRAND/SIZE)	(PROJECTED)	(%VARIANCE)
FRONT ACROSS TREAD	(A) P215/70R14 FR480	(LIFE) (A) 46253	(NEW VS CONTROL)
FRONT ACROSS TREAD	(B) P215/70R14 FR480	(B) 44119	
O/S FRONT GROOVES	(A) P215/70R14 FR480	(A) 33060	
C/S FRONT GROOVES	(B) P215/70R14 FR480	(B) 33259	
REAR ACROSS TREAD	(A) P215/70R14 FR480	(A) 31665	
REAR ACROSS TREAD	(B) P215/70R14 FR480	(B) 25917	
VEHICLE (F/F)	(A) P215/70R14 FR480	(A) 38959	
VEHICLE (F/R)	(E) P215/70R14 FR480	(B) 35018	

*(SEE ATTACHMENT FOR ADJUSTMENT OF O/S GROOVES IF REQ'D)

F.M.CO. FORM 3/'88
PROCEDURE: ES-EFTA-1508-AA

TYPE TEST/MFG: ~~SAFARI~~ EDGE WEAR EVALUATION/FIRESTONE

REPORT CERTIFIED BY: *L. Leiberbach*

TEST SITE: ACUNA, MEXICO

PROJECT NO. 21006-71

DATE: JANUARY 15, 1990

TIRE MFG. CONDUCTING TEST: FIRESTONE

NEW TEST TIRE SIZE/BRAND/CONST #: (A) ~~P195/70R14 FR480 SH941J~~ 14X5 1/2 WHEEL

CONTROL TIRE SIZE/BRAND/CONST #: (B) P195/70R14 FR480 SH941J

TEST VEHICLES & ALIGNMENT: RANGER 4X2, NMNL CSTR/CMBR, MAX TOE-IN: +5/32"

TEST VEHICLES LOAD/PSI: CURB + DRIVER, 35 PSI FRONT AND REAR

TEST VEHICLES MILES: 4800

NEW TEST TIRE SIZE/BRAND:	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
(A) P195/70R14 FR480	0.343	0.347	0.345	0.350	0.347	0.348
INITIAL DEPTH						
REMAINING GROOVE	0.272	0.288	0.267	0.295	0.272	0.279
WEAR	0.071	0.059	0.078	0.055	0.075	0.069
RATE WEAR/MILES (4800)	.0000147	.0000122	.0000162	.0000114	.0000156	.0000143
PROJECTED LIFE (INIT-.063)/RATE	19048	23279	17407	25175	18205	19930

PROJECTED LIFE (AVG)
O/S GROOVE= 18228 FRONTS= 24227 REARS= 19068 VEH= 21648

CONTROL TEST TIRE SIZE/ BRAND:	*O/S(RF) GROOVE	(R.F.)	*O/S(LF) GROOVE	(L.F.)	(R.R.)	(L.R.)
(B) P195/70R14 FR480	0.342	0.348	0.348	0.350	0.348	0.347
INITIAL DEPTH						
REMAINING GROOVE	0.256	0.287	0.261	0.297	0.268	0.275
WEAR	0.086	0.061	0.087	0.053	0.080	0.072
RATE WEAR/MILES (4800)	.0000179	.0000127	.0000181	.0000110	.0000166	.0000150
PROJECTED LIFE (INIT-.063)/RATE	15587	22441	15746	26091	17169	18933

PROJECTED LIFE (AVG)
O/S GROOVE= 15667 FRONTS= 24266 REARS= 18051 VEH= 21159

(COMPARISON RESULTS)	(BRAND/SIZE)	(PROJECTED)	(%VARIANCE)
FRONT ACROSS TREAD	(A) P195/70R14 FR480	{ (LIFE) 24227	(NEW VS CONTROL)
FRONT ACROSS TREAD	(B) P195/70R14 FR480	{ 24266	1.2%
O/S FRONT GROOVES	(A) P195/70R14 FR480	{ (A) 18228	
O/S FRONT GROOVES	(B) P195/70R14 FR480	{ (B) 15667	16.3%
REAR ACROSS TREAD	(A) P195/70R14 FR480	{ (A) 19068	
REAR ACROSS TREAD	(B) P195/70R14 FR480	{ (B) 18051	5.6%
VEHICLE (F/R)	(A) P195/70R14 FR480	{ (A) 21648	
VEHICLE (F/R)	(B) P195/70R14 FR480	{ (B) 21159	2.3%

*(SEE ATTACHMENT FOR ADJUSTMENT OF O/S GROOVES IF REQ'D)

F.M.CO. FORM 3/'88
PROCEDURE: ES-E8TA-1508-AA

EXPA 1016