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RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 883122
W.O. #481104
JANUARY 9, 1989

DESIGN ACCEPTANCE FOR STRAIGHT TAPER TURKEY CHOKE TUBES

DESIGN ACCEPTANCE FOR STRAIGHT-TAPER TURKEY CHOKE TUBES

ABSTRACT:

Research finds the design change of the turkey choke tube, from a parabolic taper to a straight taper, to be acceptable. The evaluation consisted of, patterns shot at 40 yards, using one Model 11-87, two barrels, two with straight taper and two with parabolic taper choke tubes.

Prepared by: D.R. Thomas
Date Prepared: JANUARY 9, 1989

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Staff Engineer

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J.R. Snedeker 13 Jan '89

W.H. Coleman II 14 Jan '89

DESIGN ACCEPTANCE FOR STRAIGHT-TAPERED TURKEY CHOKE TUBES

TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

On November 7, 1988 a request was received from T. Powers to conduct a Design Acceptance test on the proposed change in 12 gauge turkey choke tubes. The parabolic taper was changed to a straight taper to facilitate inspection of the tube. The test was done to assure that no pattern performance would be lost due to the change.

The test would use one Model 11-87 12 gauge shotgun, two barrels, two straight taper choke tubes, and two parabolic taper choke tubes. The testing was to compare pattern densities and central thickening of the patterns shot with the two designs.

SCOPE OF TEST:

To verify that the proposed straight taper design would perform as well as the parabolic taper in pattern density and central thickening.

TEST RESULTS:

The straight taper tube is comparable to the parabolic taper tube in density and central thickening.

REPORT TEXT:

EQUIPMENT REQUIRED:

GUN: Model 11-87 serial number P170340V
2 choke tubes with a parabolic taper
2 choke tubes with a straight taper

AMMUNITION: Remington SP12NM-6 (3in., 1 5/8oz., 4 dr. eq. Nitro
Magnum)
Lot number 6201504

SHOOTERS: D.Thomas and J. Selan

TEST PROCEDURE:

Five patterns were shot per shooter, per barrel, per choke tube, for a total of eighty patterns. Five cartridges were cut down to determine a pellet count.

Patterns were shot by D.R. Thomas and J.E. Selan in the Research and Development pattern range located in building 52-1A.

Remington ammunition code SP12NM-6 lot# 6201504 was used for all patterns.

The patterns were analyzed for pattern density and central thickening using the HP9000 and digitizing tablet.

An Analysis of Variance evaluation of the choke tube patterns for the Straight Taper tube vs. the Parabolic taper tube shows that there is not a significant difference between the two types for pattern percentage at the 95% level of confidence.

ANALYSIS OF VARIANCE (pattern percentages)

SOURCE	DF	SS	MS	F	P
FACTOR	1	2.81	2.81	0.31	0.581
ERROR	78	713.30	9.14		
TOTAL	79	716.11			

INDIVIDUAL 95 PCT CI'S FOR MEAN BASED ON POOLED STDEV

LEVEL	N	MEAN	STDEV	
str-tapr	40	82.598	2.695	(-----*-----)
par-tapr	40	82.223	3.320	(-----*-----)
POOLED STDEV =		3.024		81.90 82.60 83.30

The critical F value $[F(.05)(1,78)]$ for this set of data is ~ 3.96. Therefore, since the observed F value is $0.31 < 3.96$ we must accept the null hypothesis (i.e. there is no significant difference between the two groups relative to pattern %).

The analysis further shows that there is not a significant difference between the two types of choketubes relative to Central Thickening (at the 95% level of confidence).

ANALYSIS OF VARIANCE (central thickening)

SOURCE	DF	SS	MS	F	P
FACTOR	1	0.263	0.263	0.96	0.331
ERROR	78	21.476	0.275		
TOTAL	79	21.739			

INDIVIDUAL 95 PCT CI'S FOR MEAN BASED ON POOLED STDEV

LEVEL	N	MEAN	STDEV	
STR-TAPR	40	2.9537	0.4694	(-----*-----)
PAR-TAPR	40	2.8390	0.5747	(-----*-----)
POOLED STDEV =		0.5247		2.70 2.85 3.00 3.15

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DATA SHEET

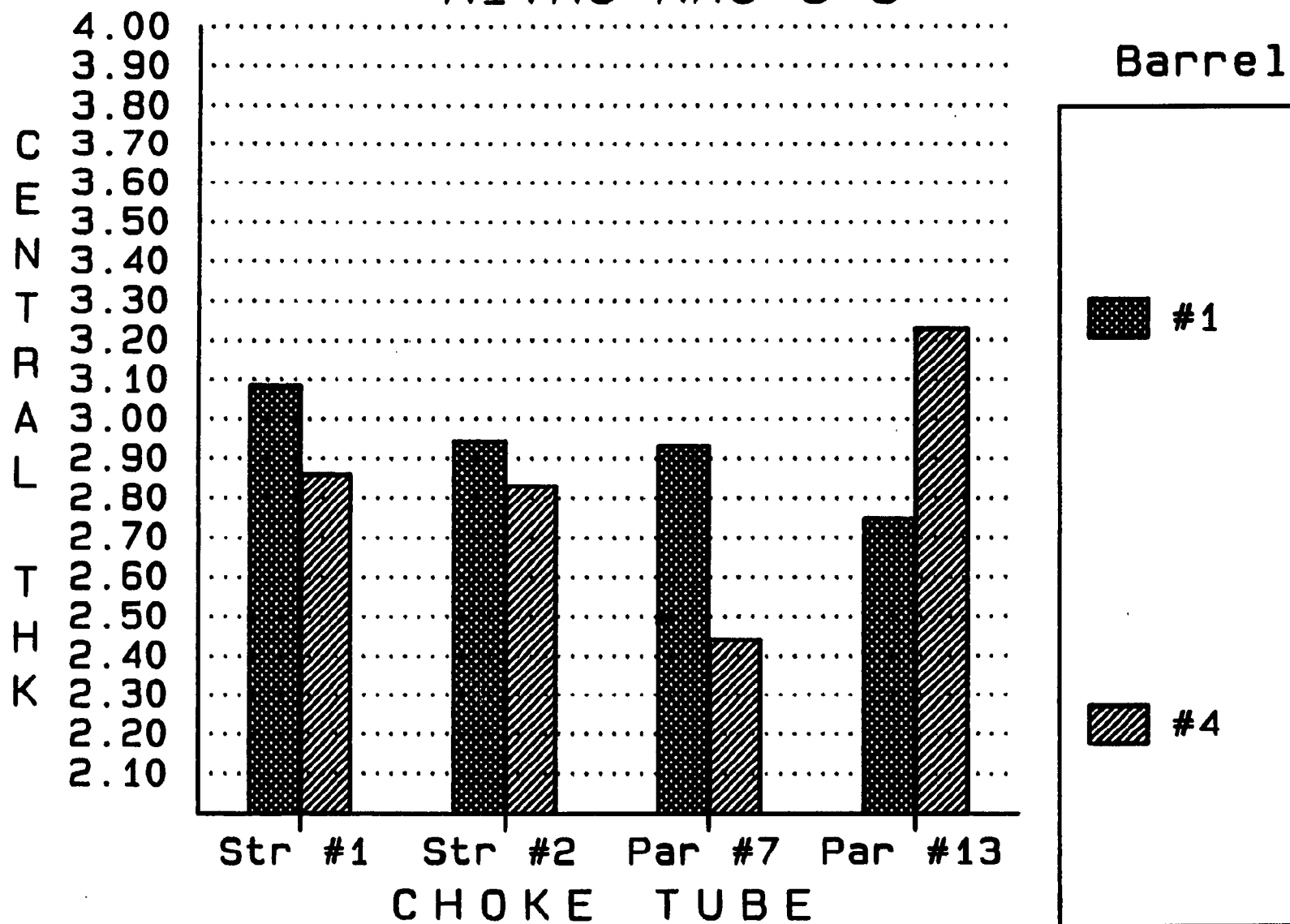
RP#883122

TURKEY CHOKE TUBE PATTERNS
using Nitro Mag 6's (SP12NM-6) 369 pellet avg.

	pat.#	shooter	26 in. barrel #1		26 in. barrel #4	
			pat. %	cen. thk.	pat. %	cen. thk.
Straight Taper #1	1	JS	84.8	2.82	82.4	3.54
	2	JS	84.8	2.82	84.3	2.62
	3	JS	87.8	3.00	76.6	2.25
	4	JS	80.5	2.71	82.9	3.03
	5	JS	82.9	4.56	82.4	3.00
	6	DT	81.8	3.25	79.1	2.89
	7	DT	83.2	2.94	78.9	2.64
	8	DT	84.8	3.41	80.2	2.44
	9	DT	81.8	2.92	83.7	2.96
	10	DT	82.7	2.43	85.1	3.24
AVERAGE			83.5	3.09	81.6	2.86
Straight Taper #2	1	JS	84.0	2.78	79.9	2.01
	2	JS	81.6	3.49	85.9	3.28
	3	JS	83.2	2.89	79.9	2.73
	4	JS	86.2	2.88	80.8	2.27
	5	JS	81.8	2.68	78.3	2.57
	6	DT	83.7	3.07	87.5	3.42
	7	DT	87.5	3.31	85.6	3.72
	8	DT	84.0	3.25	82.9	3.25
	9	DT	79.9	2.39	77.8	2.19
	10	DT	80.8	2.73	81.8	2.87
AVERAGE			83.3	2.95	82.0	2.83
Parabola Taper #7 Dsn/Acpt	1	JS	84.8	3.82	75.6	2.17
	2	JS	88.6	3.04	76.7	2.11
	3	JS	88.3	2.66	84.0	2.60
	4	JS	82.4	3.47	82.7	2.72
	5	JS	79.7	2.38	83.5	2.76
	6	DT	79.7	2.54	81.3	2.41
	7	DT	82.4	2.49	86.7	2.55
	8	DT	87.0	2.87	78.3	2.40
	9	DT	82.4	3.75	75.3	2.16
	10	DT	83.7	2.32	82.7	2.55
AVERAGE			83.9	2.93	80.7	2.44
Parabola Taper #13 Dsn/Acpt	1	JS	82.1	2.61	81.6	3.12
	2	JS	81.6	2.58	81.3	2.85
	3	JS	79.9	2.31	82.7	4.65
	4	JS	81.8	2.36	84.3	3.64
	5	JS	83.2	2.34	83.5	3.11
	6	DT	85.6	2.67	80.2	2.70
	7	DT	74.0	2.17	81.8	2.47
	8	DT	80.8	3.81	85.1	3.42
	9	DT	79.1	3.71	85.4	3.26
	10	DT	86.2	2.93	82.9	3.08
AVERAGE			81.4	2.75	82.9	3.23

Turkey Chk Patterns

NITRO-MAG 6's



Turkey Chk Patterns

NITRO-MAG 6's

