



SERVICE BULLETIN

224
No.

Piper Aircraft Corporation

Lock Haven, Pennsylvania, U.S.A.

April 7, 1965

S/M

SUBJECT: Mitchell Bulletin No. A55 — Modification of Pitch Servo

MODELS AFFECTED: PA-24-250, PA-24-260 and PA-24-400 Comanches (as listed below)
PA-30 Twin Comanches (as listed below)

COMPLIANCE DATE: Prior to but not later than next 25 hours of operation

The modification outlined in Mitchell Industries, Inc. Bulletin No. A55 (copy attached) is applicable to the aircraft listed below by serial numbers:

PA-24-250 Comanches

Applies only to field installation of Altimatec II with rack and pinion servo.

PA-24-260 Comanches

24-4000	24-4048	24-4081	24-4112	24-4162	24-4199
24-4012	24-4049	24-4083	24-4127	24-4170	24-4201
24-4018	24-4053	24-4100	24-4143	24-4181	24-4205
24-4036	24-4055	24-4105	24-4148	24-4190	24-4209
24-4040	24-4057	24-4108	24-4152	24-4194	

PA-24-400 Comanches

26-2	26-10	26-20	26-35	26-43	26-52	26-75	26-89	26-113
26-3	26-12	26-21	26-36	26-44	26-54	26-76	26-91	26-114
26-5	26-13	26-29	26-37	26-45	26-61	26-78	26-95	26-116
26-6	26-15	26-30	26-38	26-46	26-62	26-82	26-96	26-119
26-7	26-17	26-31	26-39	26-48	26-63	26-83	26-99	26-120
26-8	26-18	26-33	26-40	26-49	26-67	26-86	26-102	26-121
26-9	26-19	26-34	26-42	26-51	26-74	26-88	26-106	26-123

(over)

PA-30 Twin Comanches

30-549	30-585	30-612	30-645	30-668	30-696	30-720	30-745	30-774
30-551	30-588	30-614	30-647	30-669	30-698	30-721	30-746	30-775
30-553	30-591	30-615	30-648	30-671	30-699	30-722	30-750	30-776
30-554	30-592	30-621	30-649	30-672	30-700	30-724	30-752	30-784
30-556	30-593	30-622	30-651	30-673	30-702	30-726	30-754	30-785
30-557	30-595	30-624	30-652	30-678	30-703	30-727	30-755	30-789
30-565	30-596	30-625	30-654	30-679	30-706	30-729	30-756	30-793
30-566	30-597	30-626	30-655	30-680	30-707	30-730	30-760	30-803
30-569	30-600	30-627	30-658	30-682	30-709	30-731	30-763	
30-572	30-602	30-632	30-659	30-684	30-710	30-734	30-764	
30-574	30-603	30-633	30-660	30-687	30-711	30-735	30-765	
30-575	30-604	30-636	30-661	30-688	30-713	30-738	30-766	
30-579	30-607	30-638	30-664	30-690	30-715	30-739	30-767	
30-583	30-610	30-639	30-665	30-691	30-717	30-742	30-768	
30-584	30-611	30-640	30-667	30-693	30-719	30-744	30-771	

Compliance with this Service Bulletin will be required on all AltiMatic kits in inventory, as follows: Kits Numbers 756 836, 756 837, 756 842 and 756 843. Also, any field installations made prior to the issuance date of this Bulletin and any stock of pitch servos, part number 753 678, received prior to the issuance of this Bulletin must also be modified.

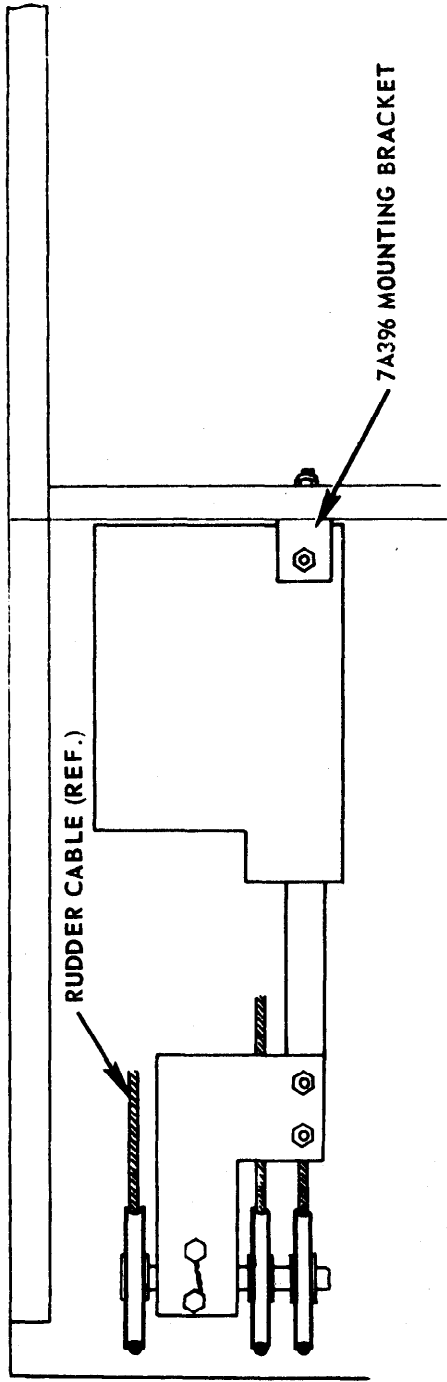
NOTES

1. See Piper Electronic News Letter No. EL-48 for lubrication instructions
2. See attached sketch for details and installation of fairlead which is a part of this modification.

IMPORTANT

DONOT FAIL TO COMPLY WITH PARAGRAPH G OF MITCHELL BULLETIN REQUESTING RETURN OF RACK ASSEMBLY WITH SERVO SERIAL NUMBER INDICATED.

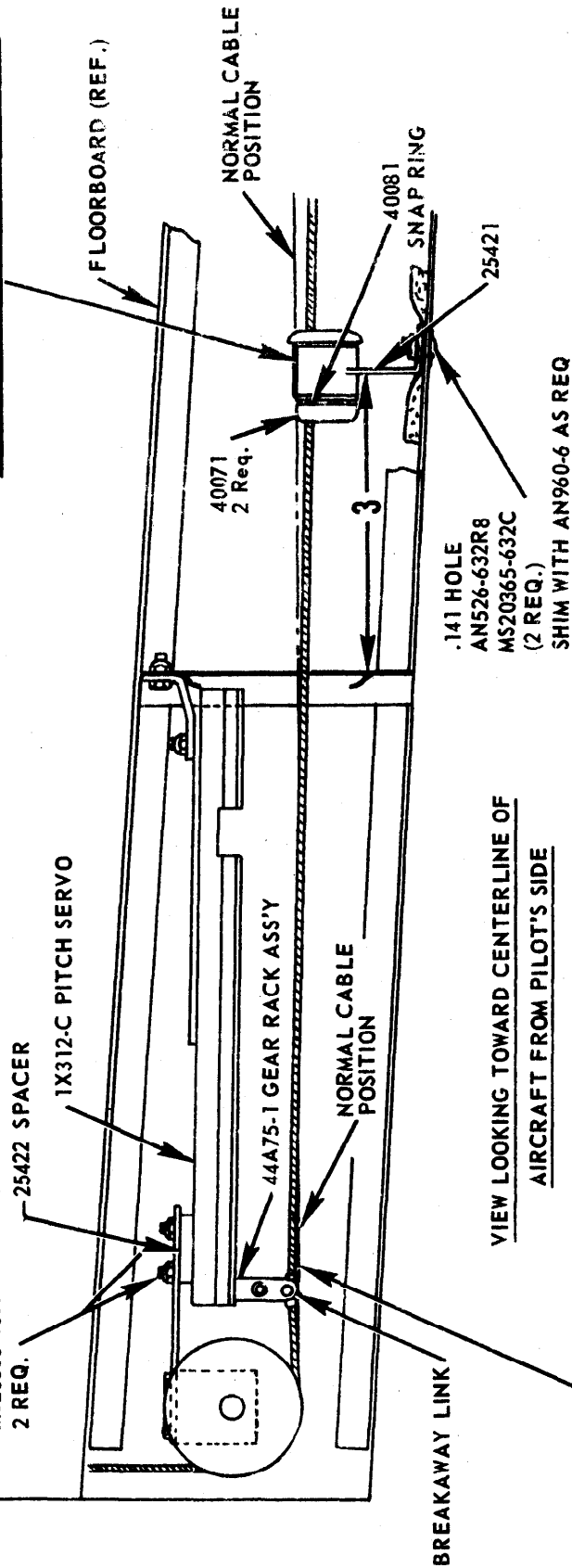
Distributors shall order Kit 756 923 in sufficient quantities to comply with this Bulletin. Credit will be issued for the kit and five (5) hours of labor upon return of this servo rack, Piper part number 755 942, (Mitchell No. 44A75-1), accompanied by a Warranty and Credit Claim. It will not be necessary to secure prior claim authorization.



Install this bracket so the upper portion of the fairlead contacts the top of the cable. Use shim washers between skin and bracket to prevent cable deflection of more than 1/8 inch from its normal position.

VIEW LOOKING DOWN THROUGH FLOORBOARD ON PILOT'S SIDE

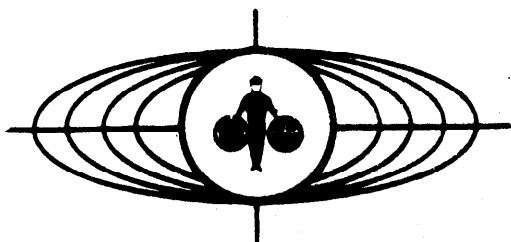
WALL (REF.)
 AN510-10R16
 AN960-10
 MS20365-1032C
 2 REQ.



VIEW LOOKING TOWARD CENTERLINE OF AIRCRAFT FROM PILOT'S SIDE

Cable must have upward deflection of 1/16" thru full travel of rack assy.

SERVICE INFORMATION



MITCHELL INDUSTRIES, INC.

BULLETIN

NO. A-55
FAA APPROVED, SW REGION

DATE 3-23-65

SUBJECT: PITCH SERVO BREAKAWAY
PIPER ALTIMATIC-COMANCHE
PA24-250/260/400 & PA-30
TO: Piper Distributors, Dealers

Compliance: Before next 25 flight hours
Models: Comanche Pitch Servo Model 1X312C (Altimatic II)
Serial No.: See Attached List (Pitch Servo No.)
Effected Part: Rack Gear/Post Assy. #44A75

Inspection has revealed that the above pitch servo may have insufficient clearance for maximum safety between the rack post and stabilator cable after the "breakaway" ball is snapped out. To determine if this condition exists, remove scuff plate, carpet and inspection panel from floor below pilots rudder pedals. Snap cable ball free of servo and by moving control column full fore and aft, insure that ball does not catch or drag on servo post in any possible location along the post travel. If ball or cable tends to catch, replace servo rack gear and post assy. with P/N 44A75-1. (See attached Dwg)

- A. Remove Pitch Servo from aircraft and orient with adjustment Dwg. 12B20.
- B. With Servo motor disengaged, slide gear rack (1) out of servo channel pulling post out first.
- C. Using replacement gear rack P/N 44A75-1, install and adjust per Spec. Dwg. #12B20.
- D. Re-install servo in aircraft per Dwg. #69D326 using the longer mounting screws and spacer block furnished with kit.
- E. Before snapping cable ball into place on servo, insure that sufficient clearance is possible per instructions in first paragraph. Note: Cable must have upward deflection of at least 1/16" thru full travel of 44A75-1 rack assy. to engage in servo rack post cavity.
- F. Re-time pitch servo follow-up condenser per Piper EL-32A.
- G. Tag old gear rack assembly with pitch servo serial No. and return to Piper Aircraft Corp., Lock Haven, Pa.
- H. Make entry in aircraft log as to compliance with this bulletin.

Parts necessary for this bulletin:

- (1) 44A75-1 Gear Rack Assy
- (1) 43A284 Spacer Block (Piper P/N 25422)
- (2) 10-32 x 7/8 Flat Head Screws

Enclosures:

- Dwg. 12B20
- Dwg. 44A75-1
- Dwg. 69D326

William P. Layne
Service Manager
Mitchell Industries, Inc.

Below is a list of the Serial Numbers of all 1X312C Piper Altimatic II Pitch Servos that Mitchell Service Bulletin A-55 applies to:

860, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899

900, 901, 902, 903, 904, 905, 906, 907, 908, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958

1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1087, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099,

1100, 1101, 1102, 1103, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1186, 1187, 1189, 1190

1215, 1216, 1217, 1218, 1219, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1253, 1254, 1255, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299

1300, 1301, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1399

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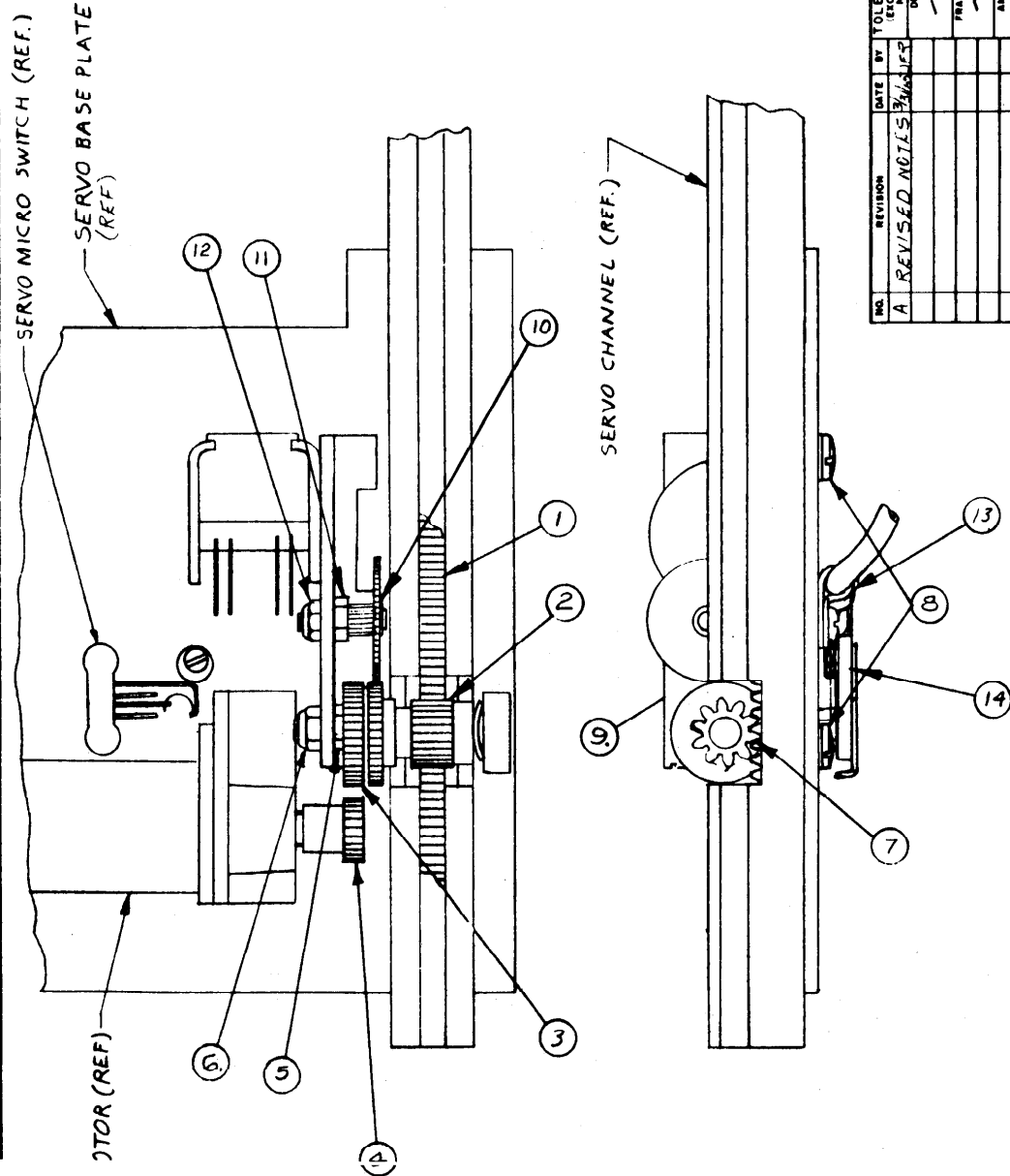
1501, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593,

1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611

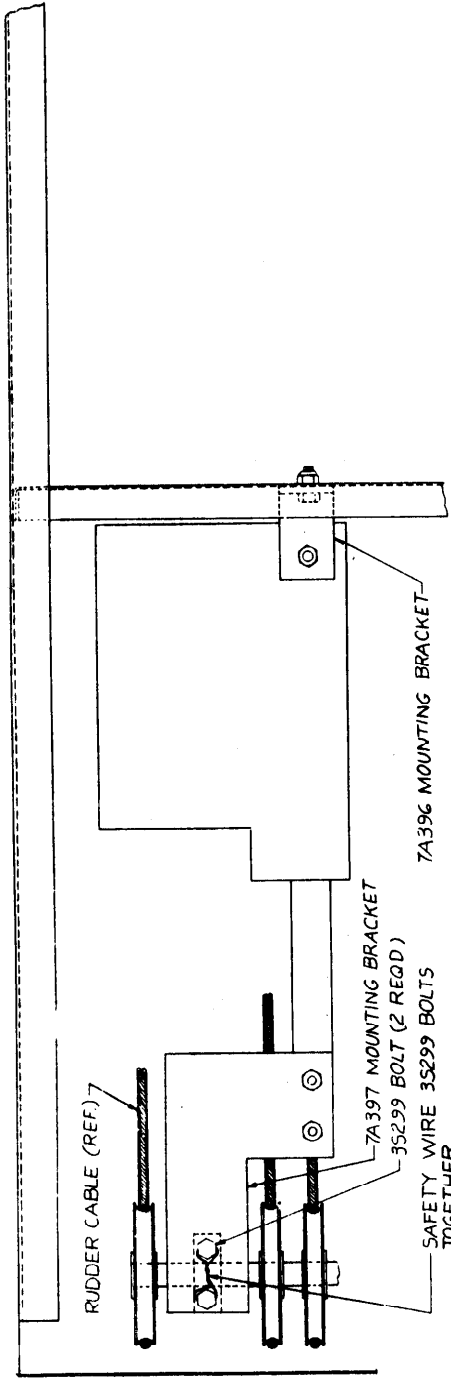
All subsequent 1X312C Pitch Servos bearing S/N 1612 and higher have the 44A75-1 gear rack and the 43A284 spacer installed.

NOTES:

1. Disengage servo motor to obtain clearance between motor gear (4) and gear train (3).
2. Slide gear rack (1) into servo channel and under pinion (2). Move gear rack to both extremities in small increments to determine if gap (7) has minimum backlash and rack is free from binding.
3. If not properly adjusted, loosen gear train lock nut (6) and using a 1/2" open end wrench no thicker than 1/16", rotate gear train cam (5) until gear rack (1) will slide freely into position under pinion (2).
4. Idler gear (10) may have to be repositioned to obtain adequate clearance for adjustment of gear train (3). Loosen lock nut (12) and rotate cam (11) to obtain clearance.
5. Adjust cam (5) for minimum backlash between pinion (2) and gear rack (1) without binding.
6. Repeat step 2. to insure proper pinion adjustment.
7. Tighten lock nut (6) while holding cam (5) with 1/2 x 1/16 wrench.
8. Readjust idler gear (10) for minimum backlash without binding to gear train (3) by rotating cam (11), then tighten lock nut (12) securely.
9. Engage motor and observe mesh between motor gear (4) and gear train (3).
10. Servo motor micro switch should make contact before gears (4) and (3) start to mesh. If necessary, gear train support bracket (9) may be adjusted in either direction by loosening clamp screws (8).
11. Recheck all above points after screws and nuts are tightened.
12. After installation in aircraft, the servo lever (13) travel and engage control knob on console may be coordinated by slipping cable housing in the appropriate direction thru housing clamp (14).

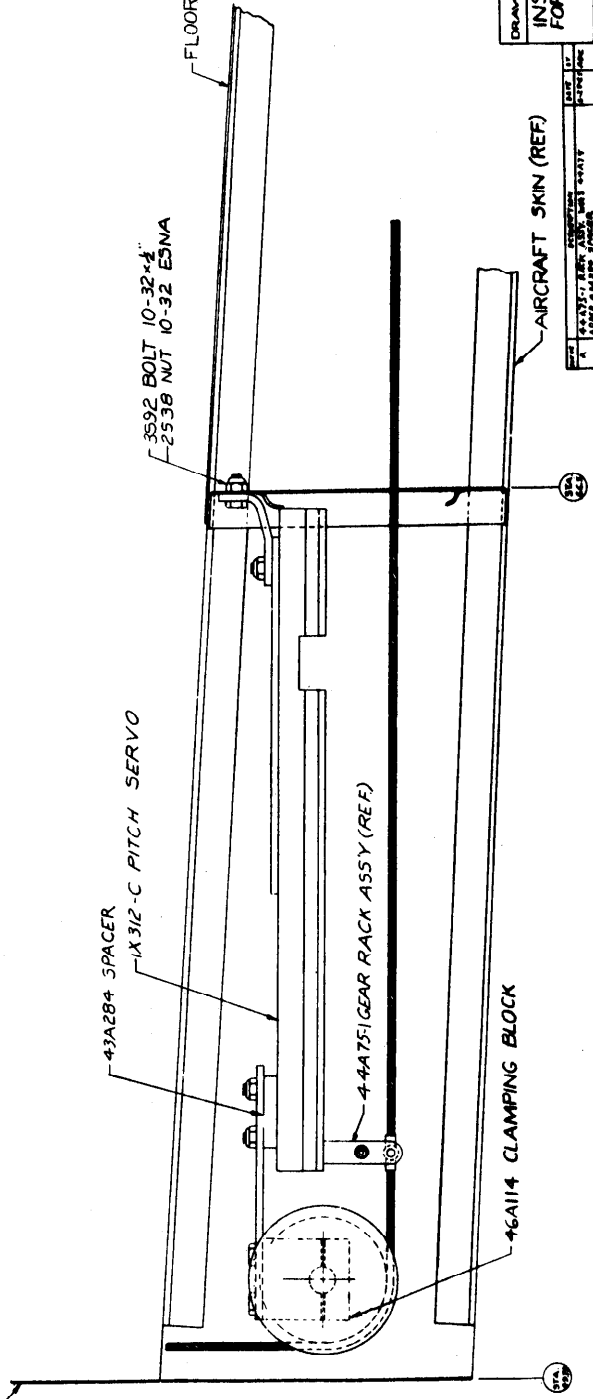


NO.	REVISION	DATE	BY	TOLERANCES (EXCEPT AS NOTED)	FRAC.	ANG.	SCALE
A	REVISED	3/25/65	JEP	DECIMAL	~	~	1:1
NEXT ASSY		NO. REQD.	PART NO.	DESCRIPTION			
MATERIAL		FINISH:					
TITLE: ADJUSTMENT PROCEDURE							
DWG. FOR: IX312, IX244, IX212 SERVO							
DRAFTER: ABC		DATE: 3-25-65	USED ON: 1724 SERVO				
<small>THIS DRAWING IS THE PROPERTY OF MITCHELL INDUSTRIES INC. IT IS TO BE KEPT IN THE OFFICE OF THE DRAFTER OR THE PERSON IMMEDIATELY RESPONSIBLE FOR THE ISSUE OF THIS DRAWING. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.</small>							
DRAWING NUMBER: 12B20						SHEET 1 OF 1	
MITCHELL INDUSTRIES INC. MUNICIPAL AIRPORT MINERAL WELLS, TEXAS							



VIEW LOOKING DOWN THROUGH FLOORBOARD
ON PILOT'S SIDE

FIREWALL (REF)



VIEW LOOKING TOWARD CENTERLINE OF
AIRCRAFT FROM PILOT'S SIDE

DRAWING NO: 69D326
 INSTALLATION DRAWING
 FOR PITCH SERVO IN
 PIPER ALTIMATIC II
 MITCHELL INDUSTRIES INC.
 MUNICIPAL AIRPORT
 MINERAL WELLS, TEXAS

REV	DATE	BY	CHKD
1	10-15-68	J. H. HARRIS	J. H. HARRIS
2	11-15-68	J. H. HARRIS	J. H. HARRIS
3	12-15-68	J. H. HARRIS	J. H. HARRIS
4	1-15-69	J. H. HARRIS	J. H. HARRIS
5	2-15-69	J. H. HARRIS	J. H. HARRIS
6	3-15-69	J. H. HARRIS	J. H. HARRIS
7	4-15-69	J. H. HARRIS	J. H. HARRIS
8	5-15-69	J. H. HARRIS	J. H. HARRIS
9	6-15-69	J. H. HARRIS	J. H. HARRIS
10	7-15-69	J. H. HARRIS	J. H. HARRIS
11	8-15-69	J. H. HARRIS	J. H. HARRIS
12	9-15-69	J. H. HARRIS	J. H. HARRIS
13	10-15-69	J. H. HARRIS	J. H. HARRIS
14	11-15-69	J. H. HARRIS	J. H. HARRIS
15	12-15-69	J. H. HARRIS	J. H. HARRIS
16	1-15-70	J. H. HARRIS	J. H. HARRIS
17	2-15-70	J. H. HARRIS	J. H. HARRIS
18	3-15-70	J. H. HARRIS	J. H. HARRIS
19	4-15-70	J. H. HARRIS	J. H. HARRIS
20	5-15-70	J. H. HARRIS	J. H. HARRIS
21	6-15-70	J. H. HARRIS	J. H. HARRIS
22	7-15-70	J. H. HARRIS	J. H. HARRIS
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24	9-15-70	J. H. HARRIS	J. H. HARRIS
25	10-15-70	J. H. HARRIS	J. H. HARRIS
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29	2-15-71	J. H. HARRIS	J. H. HARRIS
30	3-15-71	J. H. HARRIS	J. H. HARRIS
31	4-15-71	J. H. HARRIS	J. H. HARRIS
32	5-15-71	J. H. HARRIS	J. H. HARRIS
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41	2-15-72	J. H. HARRIS	J. H. HARRIS
42	3-15-72	J. H. HARRIS	J. H. HARRIS
43	4-15-72	J. H. HARRIS	J. H. HARRIS
44	5-15-72	J. H. HARRIS	J. H. HARRIS
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54	3-15-73	J. H. HARRIS	J. H. HARRIS
55	4-15-73	J. H. HARRIS	J. H. HARRIS
56	5-15-73	J. H. HARRIS	J. H. HARRIS
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66	3-15-74	J. H. HARRIS	J. H. HARRIS
67	4-15-74	J. H. HARRIS	J. H. HARRIS
68	5-15-74	J. H. HARRIS	J. H. HARRIS
69	6-15-74	J. H. HARRIS	J. H. HARRIS
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73	10-15-74	J. H. HARRIS	J. H. HARRIS
74	11-15-74	J. H. HARRIS	J. H. HARRIS
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76	1-15-75	J. H. HARRIS	J. H. HARRIS
77	2-15-75	J. H. HARRIS	J. H. HARRIS
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80	5-15-75	J. H. HARRIS	J. H. HARRIS
81	6-15-75	J. H. HARRIS	J. H. HARRIS
82	7-15-75	J. H. HARRIS	J. H. HARRIS
83	8-15-75	J. H. HARRIS	J. H. HARRIS
84	9-15-75	J. H. HARRIS	J. H. HARRIS
85	10-15-75	J. H. HARRIS	J. H. HARRIS
86	11-15-75	J. H. HARRIS	J. H. HARRIS
87	12-15-75	J. H. HARRIS	J. H. HARRIS
88	1-15-76	J. H. HARRIS	J. H. HARRIS
89	2-15-76	J. H. HARRIS	J. H. HARRIS
90	3-15-76	J. H. HARRIS	J. H. HARRIS
91	4-15-76	J. H. HARRIS	J. H. HARRIS
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95	8-15-76	J. H. HARRIS	J. H. HARRIS
96	9-15-76	J. H. HARRIS	J. H. HARRIS
97	10-15-76	J. H. HARRIS	J. H. HARRIS
98	11-15-76	J. H. HARRIS	J. H. HARRIS
99	12-15-76	J. H. HARRIS	J. H. HARRIS
100	1-15-77	J. H. HARRIS	J. H. HARRIS

MITCHELL INDUSTRIES, INC.
 MINERA LLS, TEXAS
 DRAWN BY: AL DATE: 2-25-64
 MFG. APP.: GR DATE: 2-26-64
 APPROVED: GR DATE: 2-26-64

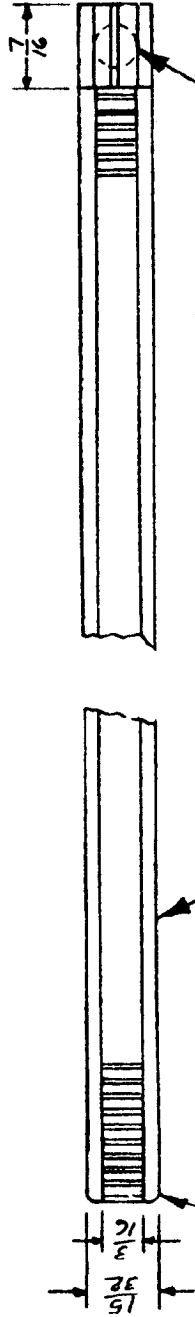
PART NAME: PITCH SERVO ACK
 USED ON: PK 312C PITCH SERVO
 MATERIAL: NOTED

FINISH: NIC PL. AFTER ASSY
 SCALE: 1:1

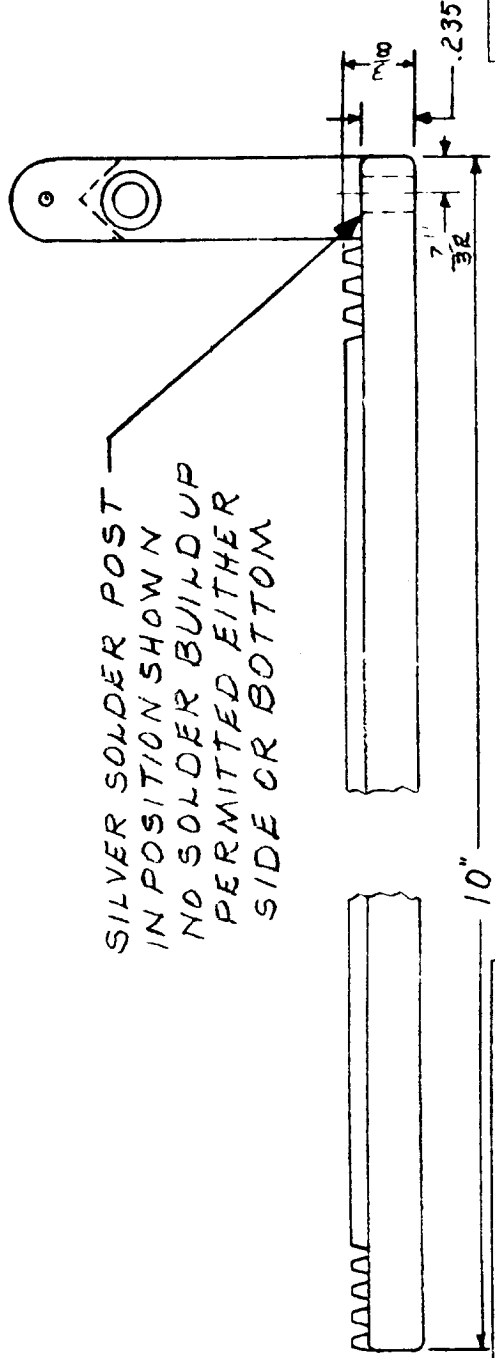
PART NO. 44A75 1
 ISSUE: A
 CHANGES: 45A51 WAS ADDED
BA. ADDED SER, & NOTE 3. E0180RUF 3/23/64

MEMO:

- NOTE:
1. TEETH TO BE REMOVED $\frac{7}{16}$ " FOR POST MOUNTING.
 2. POLISH BOTTOM SURFACE BEFORE AND AFTER PLATING.
 3. PART TO BE FREE OF ALL BURRS.



10M71 GEAR RACK
 $\frac{3}{16}$ D.I.A. HOLE
 MINIMUM OF $\frac{3}{32}$ " R. ON CORNERS OF EACH END OF RACK



SILVER SOLDER POST IN POSITION SHOWN
 NO SOLDER BUILDUP PERMITTED EITHER SIDE OR BOTTOM

TOLERANCES UNLESS OTHERWISE SPECIFIED	
DECIMAL DIMENSIONS	+ - .005
FRACTIONAL DIMENSIONS	+ - $\frac{1}{64}$
ANGULAR DIMENSIONS	+ - 1°

A SAMPLE OF THE FINISHED PART MUST BE SUBMITTED TO MITCHELL INDUSTRIES ENGINEERING DEPARTMENT FOR APPROVAL BEFORE PROCEEDING WITH PRODUCTION ON INITIAL ORDER FROM EACH SUPPLIER.

June 11, 1965

SUPPLEMENT TO SERVICE BULLETIN NO. 224

SUBJECT: Mitchell Bulletin No. A-55 - Modification of Pitch Servo

There have been several reports of interference occurring between the pitch servo rack assembly and the screw heads of the AN510-10R16 screws that attach the forward end of the servo to the forward mounting bracket. These screw heads should be inspected to be sure they are flush.

If the screws are not flush, then the pitch servo spacer block, part number 25422 should be removed and the two (2) holes increased to 1/4" diameter. Any subsequent installation should have the holes in the pitch servo block, part number 25422, drilled to 1/4" before it is installed.

NOTE

This supplement is a part of and must be attached to Service Bulletin No. 224.

650525