

# CHAPTER 5

## ✓ RUDDER PEDAL, PULLEY, & TOWER ASSEMBLY

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# ✓ CHAPTER 5

## RUDDER, PULLEY, TOWER & PEDAL ASSEMBLY

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### Section 1

#### Rudder Pedal Assembly

#### Figures RP-1 & RP-1A

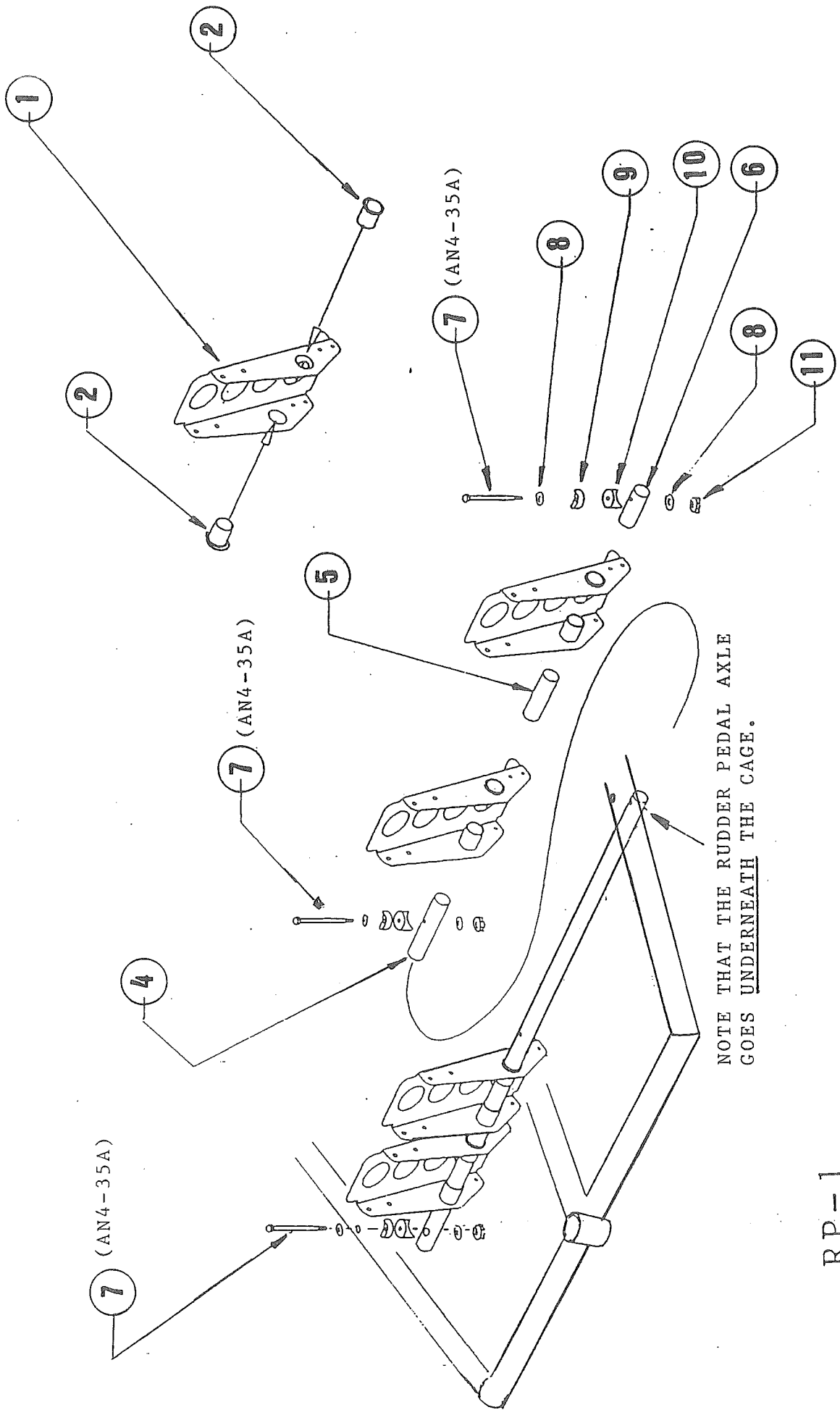
1. **Figure RP-1 ATTACHING THE RUDDER PEDALS TO RUDDER PEDAL AXLE**
  - a) Prepare the four rudder pedals (1) by inserting two delrin bushings (2) into each, as shown in Figure RP-1. They will fit rather tight. Take the time to correctly align the bushing square to the hole. Place the rudder pedal over the edge of a work bench with the side of the pedal flat on the table. Lightly tap the bushings into the pedals.
  - b) To assemble the rudder pedals to the rudder pedal axle, slide the center pedal axle spacer (4) over the rudder pedal axle (3) and into position in the center of the axle, taking care to correctly align the holes. Slide the first pedal, then an inner pedal spacer (5), followed by the second pedal onto the pilot's right side of the rudder pedal axle. Repeat this procedure for the pilot's left side of the axle.
  - c) Return to the pilot's right side and slide the end pedal axle spacer (6) onto the end of the rudder pedal axle (3), taking care to correctly align the holes. The end pedal axle spacer might need to be trimmed with a file for a perfect fit. Allow for freedom of movement. Verify that the pedals are free to rotate. There can be up to 1/4" of clearance between the pedals and axle spacers. Repeat this procedure on the other side.
  - d) To attach the completed rudder pedal axle assembly to the cage, position the pedal axle assembly as shown in Figure RP-1. Begin on the pilot's right side by placing washer (8) on bolt (7). Add the two plastic saddles (9) & (10), taking care to position them as shown. Feed into the end of pedal axle spacer (6). Finish with a second washer (8) and a finger tightened locknut (11). Repeat this procedure on opposite end and on the center pedal axle spacer (4).
2. **Figure RP-1A OVERVIEW OF CORRECT PEDAL POSITIONS**

To complete, refer to Figure RP 1-A to verify that the four pedals are in the correct position and tighten the nuts securely.

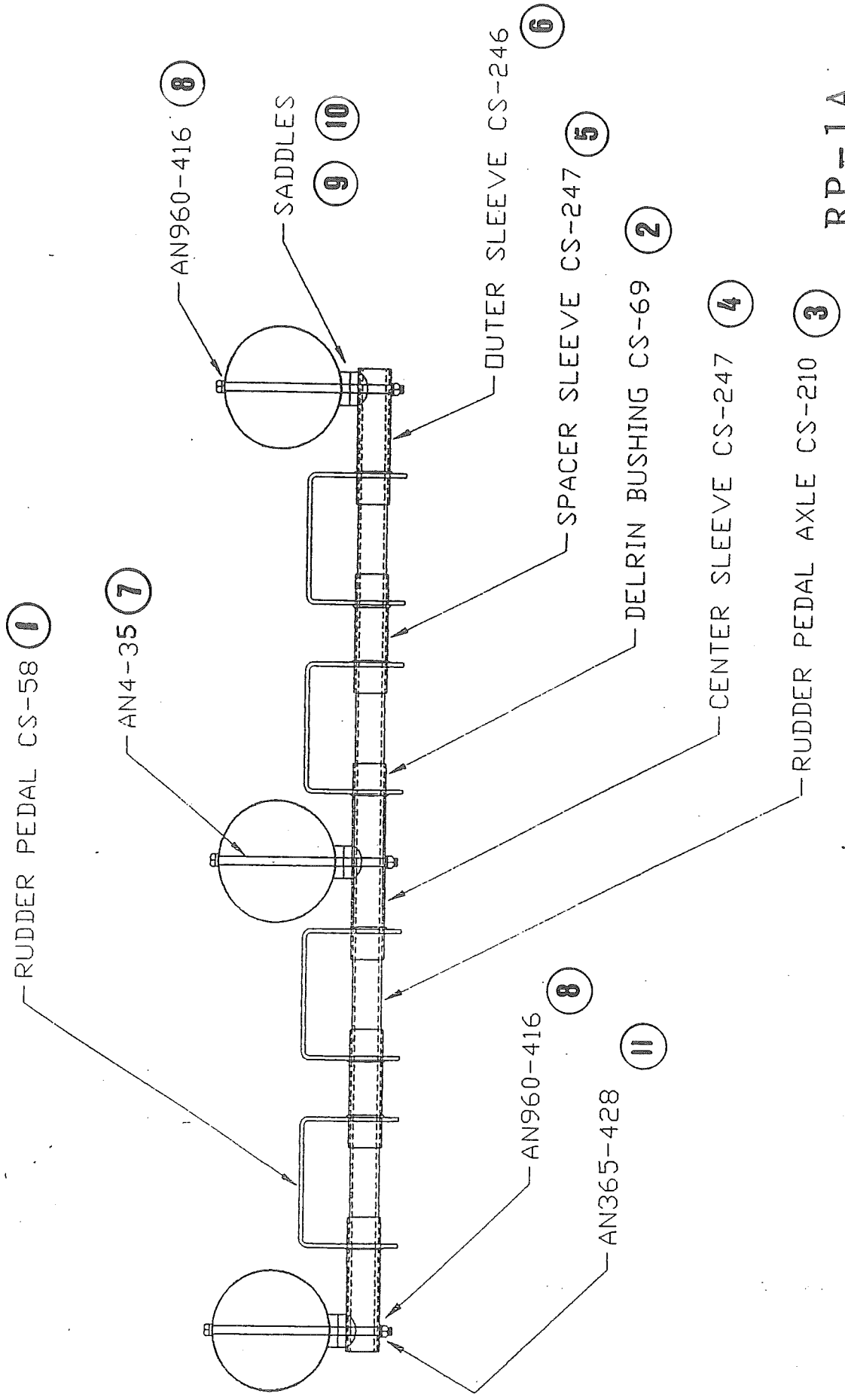
✓ Chapter 5 SECTION 1 RUDDER PEDAL ASSEMBLY

Section 1  
Rudder Pedal Parts List  
Figures RP-1 & RP-1A

INDEX#	PART #	QTY	DESCRIPTION
1.	CS-58	4	RUDDER PEDAL
2.	CS-69	8	DELTRIN PEDAL BUSHING
3.	CS-210	1	RUDDER PEDAL AXLE
4.	CS-247	1	CENTER PEDAL AXLE SPACER
5.	CS-247-1	2	INNER PEDAL SPACER
6.	CS-246	2	END PEDAL AXLE SPACER
7.	AN4-35A	3	1/4" BOLT
8.	AN960-416	6	1/4" WASHER
9.	SO1-44	3	PLASTIC SADDLE
10.	SO1-14	3	PLASTIC SADDLE
11.	AN365-428	3	1/4" LOCKNUT







LAYOUT OF RUDDER PEDALS AND SLEEVES. (NOT TO SCALE)





✓ Chapter 5 SECTION 1 RUDDER PEDAL ASSEMBLY

Section 1  
Rudder Pedal Parts List  
Figures RP-1 & RP-1A

INDEX#	PART #	QTY	DESCRIPTION
1.	CS-58	4	RUDDER PEDAL
2.	CS-69	8	DELFIN PEDAL BUSHING
3.	CS-210	1	RUDDER PEDAL AXLE
4.	CS-247	1	CENTER PEDAL AXLE SPACER
5.	CS-247-1	2	INNER PEDAL SPACER
6.	CS-246	2	END PEDAL AXLE SPACER
7.	AN4-35A	3	1/4" BOLT
8.	AN960-416	6	1/4" WASHER
9.	SO1-44	3	PLASTIC SADDLE
10.	S01-14	3	PLASTIC SADDLE
11.	AN365-428	3	1/4" LOCKNUT



✓ Chapter 5 SECTION 2 PULLEY ASSEMBLY

Section 2  
Pulley Assembly  
Figure RCP-1

1. Figure RCP-1 ASSEMBLING OF PULLEYS

- a) Prepare the pulleys for assembly to the rudder pedals by first positioning an upper pulley mount tang (2) as shown in Figure RCP-1, over a large MS pulley (4). Insert bolt (1) into the end hole of the upper pulley mount tang (2) and down through the large MS pulley. Loop the rudder carry through cable (3) around the large MS pulley before continuing. (THIS WILL BE ATTACHED TO THE RUDDER PEDAL LATER) Place a second bolt through the middle hole of the upper pulley mount tang (2) and slide an aluminum bushing (5) onto it. Fit the lower pulley mount plate (6) onto both bolts. Add washers (7) and locknuts (8) to both bolts. BE CERTAIN THAT THE PULLEY AND CABLE PIVOT FREELY. Repeat this entire procedure, making a second assembly. (The completed pulley assembly will be attached to the rudder pedals in Chapter 5 Section 3 / Cable Tang Assembly).
- b) Locate the previously attached stainless channel and bolt (Refer to Chapter 2 / Section 2 / Figure CA-2 for identification). Remove the existing washer and nut and place the forward hole of the upper pulley mount tang (2) on bolt. Finish by reinstalling the washer (7) and securing with the locknut (8). Repeat this procedure on the right side.

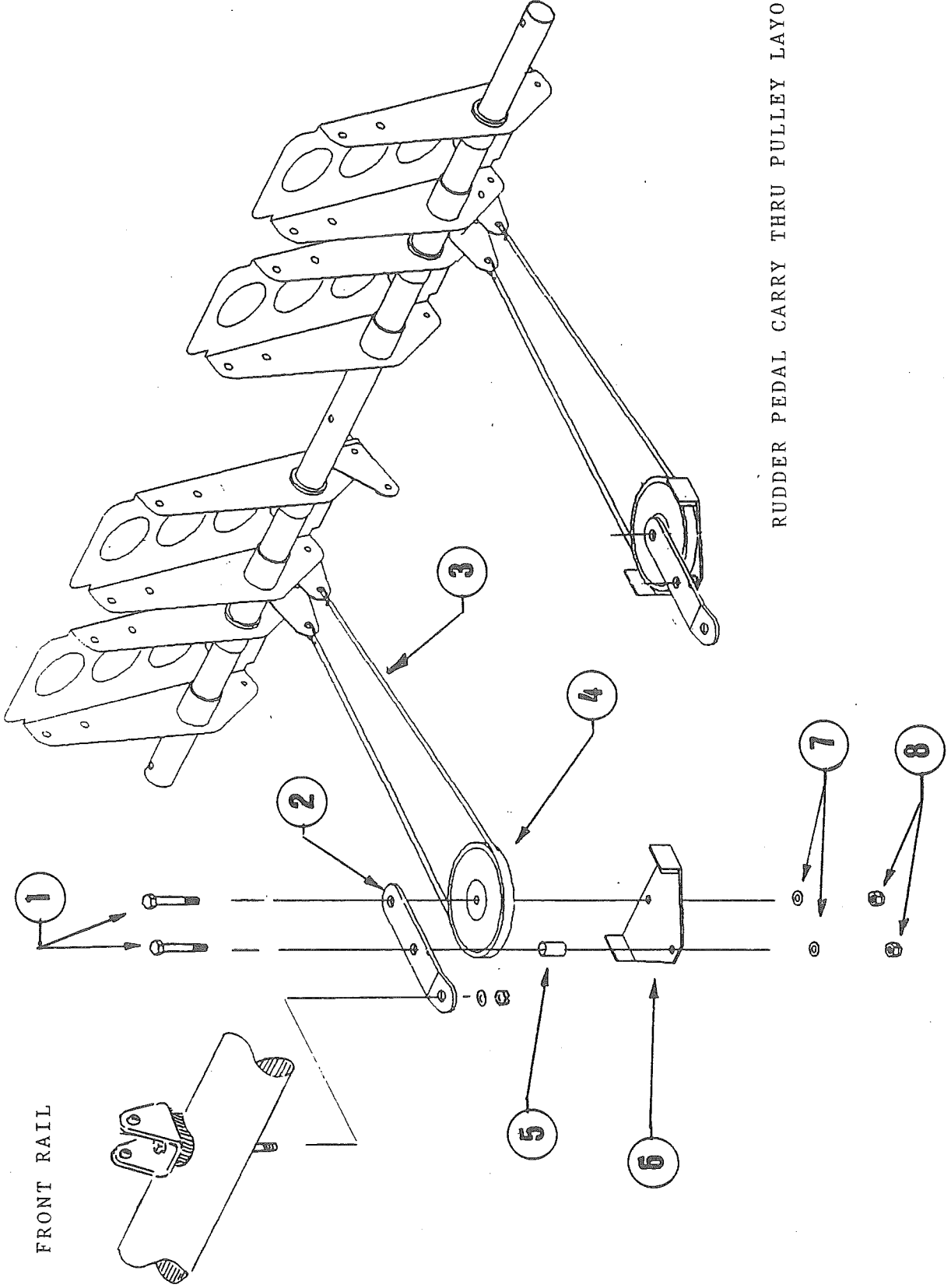
✓ Chapter 5

Section 2  
Pulley Assembly Parts List  
Figure RCP-1

INDEX#	PART #	QTY	DESCRIPTION
1.	AN3-6A	4	3/16" BOLT
2.	CS-229	2	UPPER PULLEY MOUNT TANG
3.	CS-232	2	RUDDER CARRY THROUGH CABLE
4.	MS24566-2B	2	LARGE MS PULLEY
5.	C-235-3	2	SMALL ALUMINUM BUSHING
6.	CS-228	2	LOWER PULLEY MOUNT PLATE
7.	AN960-10	4	3/16" WASHER
8.	AN365-1032	4	3/16" LOCKNUT



(AN3-6A)



RUDDER PEDAL CARRY THRU PULLEY LAYOUT



✓ Chapter 5 SECTION 3 CABLE TANG ASSEMBLY

Section 3  
Cable Tang Assembly  
Figure RP-2

1. Figure RP-2 ATTACHING PULLEY / CABLE / TANG ASSEMBLY TO RUDDER PEDALS
  - a) To install the just completed pulley / cable / tang assembly to the rudder pedals, refer to Figure RP-2 for individual assembly and Figure RCP-1 for proper positioning.
  - b) Position the rudder cable tang (2) on the inside edge of the two inner rudder pedals. Place bolt (1) through the top hole of the rudder cable tang and the rudder pedal. Secure with locknut (3). Repeat the procedure on lower hole. Be certain that the bolts point inward toward the pedal and that the locknuts are on the inside. Repeat this on the other side of same pedal. Finally, repeat the entire assembly procedure for the second cable tang onto other rudder pedals.

✓ Chapter 5

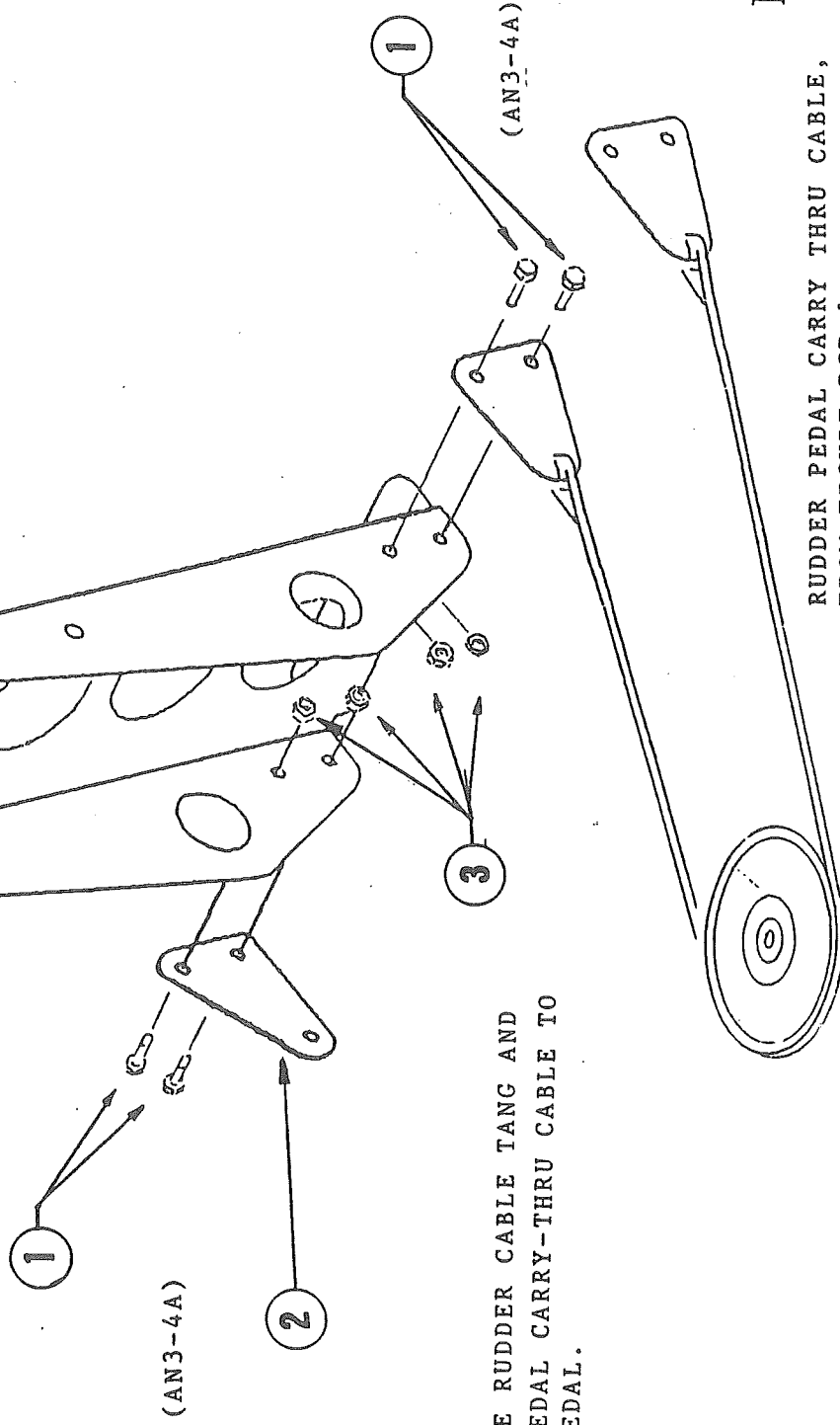
Section 3  
Cable Tang Assembly Parts List  
Figure RP-2

INDEX#	PART #	QTY	DESCRIPTION
1.	AN3-4A	12	3/16" BOLT
2.	CS-256	2	RUDDER CABLE TANG
3.	AN365-1032	12	3/16" LOCKNUT





PILOTS RIGHT PEDAL  
LOOKING FROM THE FRONT



ATTACHING THE RUDDER CABLE TANG AND  
THE RUDDER PEDAL CARRY-THRU CABLE TO  
THE RUDDER PEDAL.



✓ Chapter 5 SECTION 4 CABLE ASSEMBLY

Section 4  
Cable Assembly  
Figure RP-3

1. Figure RP-3 ATTACHING RUDDER CABLE TO RUDDER PEDAL TANGS

Note: Before assembling, refer to Figure RP-3 to note correct positioning of the forward rudder cable assemblies. The multi-hole adjuster plate goes toward the rear.

- a) To attach the forward rudder cable (3) to the previously assembled inside rudder pedal tangs (Refer to Chapter 5 / Section 3 / Figure RP-2) place thin washer (2) on bolt (1). Insert through rudder cable tang as shown in Figure RP-3. Add a second washer (2) before inserting through the forward rudder cable assembly, then add castle nut (4) and secure with cotter pin (5). ALLOW THE CABLE TANG TO PIVOT ON THE RUDDER PEDAL TANG WITH NO SLOP. Repeat this procedure, attaching the second forward rudder cable assembly to the other inside rudder pedal tang. (not pictured)
- b) To ensure tension on the pedals, loop an 1/8" diameter BUNGEE cord (6) around the cage rail as shown in Figure RP-3. Lead through the pictured hole on the left side outer rudder pedal. Secure the ends of the BUNGEE cord with a square knot while leaving approximately 1 to 1 1/2" tails. Secure the tails with several wraps of tape or sear the end with a soldering iron to prevent unraveling. Cut approximately 1" off of the tails. Repeat this procedure on the right side outer rudder pedal.

✓ Chapter 5  
Section 4  
Cable Assembly Parts List  
Figure RP-3

INDEX#	PART #	QTY	DESCRIPTION
1.	AN4-5	2	1/4" DRILLED BOLT
2.	AN960-416L	4	1/4" THIN WASHER
3.	CS-233-1	2	FORWARD RUDDER CABLE ASSEMBLY
4.	AN310-4	2	1/4" CASTLE NUT
5.	AN380-2-2	2	COTTER PIN
6.	L-100-3	2	1/8" DIA. RUDDER PEDAL BUNGEE CORD







✓ **Chapter 5** SECTION 5 RUDDER PEDAL, PULLEY & TOWER  
Section 5  
Tower Assembly  
Figure RP-4

1. **Figure RP-4 ATTACHING THE RUDDER CABLE TOWER TO RUDDER CABLE**

Assemble the rudder cable pulleys (4) and keepers (3) by placing thin washer (2) on bolt (1) and inserting through the bottom hole of pulley keeper (3). Insert a second bolt, and washer through the top hole of the pulley keeper. Slide small aluminum spacer (6) over the top bolt. Slide the first large MS pulley (4) over the bottom bolt.

Install this partial assembly onto the welded pulley mount on the bottom of the rear cage rail. Slide small aluminum spacer on the top bolt and the second large MS pulley on the lower bolt. Next fit the second rudder pedal pulley keeper (3), thin washers, and locknuts, finger tight (8) over both bolts.

- a) Loosen the bolts on the tower assembly and insert the aft rudder cables (5). Place the aft rudder cable assembly (5) into the large MS pulley. Place the second aft rudder cable assembly (5) into that large pulley. Retighten the assembly.
- b) The shorter forward cable (see figure RP-3) and the longer rear cable (5) each have a 5 HOLE CABLE ADJUST TANG at the end. The holes on these tangs are ADJUSTER HOLES and bolt placement through them will determine cable tension. As a starter point, align the two outermost holes on the 5 HOLE CABLE ADJUST TANGS. Place washer (11) on bolt (10). Insert through the two aligned holes. Add a second washer and a finger tightened locknut (8). FINAL ADJUSTMENT OF THE RUDDER CABLE TENSION WILL BE PERFORMED LATER.

11.

**NOTE:**  
FINAL ATTACHMENT OF THE  
RUDDER CABLES WILL BE  
CONTINUED IN  
CHAPTER 14 - SECTION 3 -  
RUDDER PUSH-PULL CABLE  
ASSEMBLY

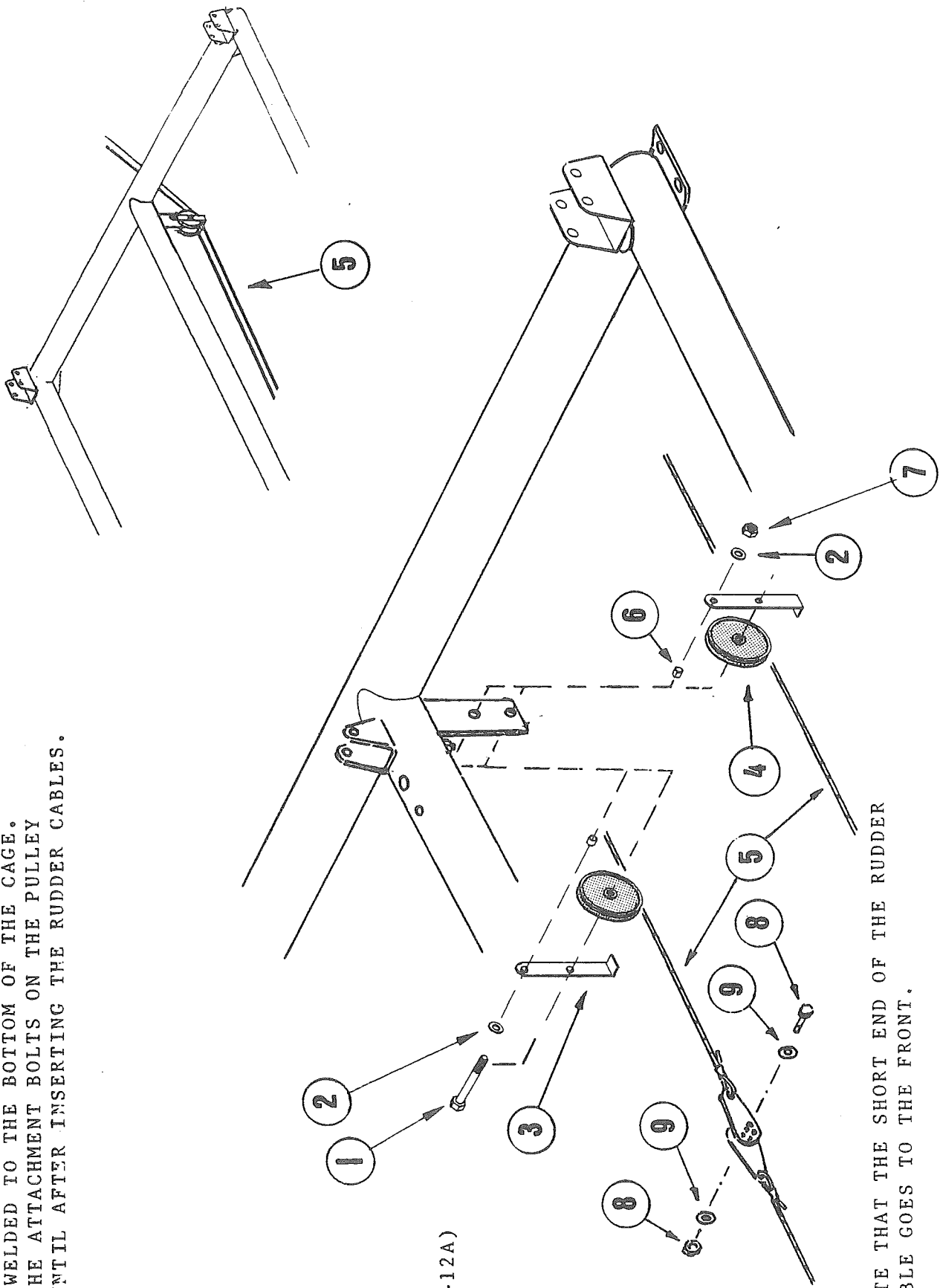
✓ Chapter 5 SECTION 5 RUDDER PEDAL, PULLEY & TOWER

Section 5  
Tower Assembly Parts List  
Figure RP-4

INDEX#	PART #	QTY	DESCRIPTION
1.	AN3-12A	2	3/16" BOLT
2.	AN960-10L	4	3/16" THIN WASHER
3.	CS-237	2	RUDDER PEDAL PULLEY KEEPER
4.	MS24566-2B	2	LARGE MS PULLEY
5.	CS233	2	RUDDER CABLE AFT ASSEMBLY
6.	C-235-3	2	SMALL ALUMINUM SPACER
7.	AN365-1032	4	3/16" LOCKNUT
8.	AN3-4A	2	3/16" BOLT
9.	AN960-10	4	3/16" WASHER



NOTE THAT THE RUDDER PULLEY "TOWER"  
 IS PRE WELDED TO THE BOTTOM OF THE CAGE.  
 LEAVE THE ATTACHMENT BOLTS ON THE PULLEY  
 LOOSE UNTIL AFTER INSERTING THE RUDDER CABLES.



(AN3-12A)

NOTE THAT THE SHORT END OF THE RUDDER  
 CABLE GOES TO THE FRONT.

RP-4 ASSEMBLING AND ATTACHING THE RUDDER  
 PULLEY TOWER AND THE FORWARD RUDDER CABLES.



✓ Chapter 5 SECTION 6 STEERING ASSEMBLY

Section 6  
Steering Assembly  
Figure RP-5

1. **Figure RP-5**                      **ASSEMBLING THE STEERING PUSH RODS**  
Assemble the steering push rods by first threading two jam nuts (2) down on each end of steering push rod (3). A rough measurement of 6" between the jam nuts is a good place to start. The rod ends should be set at 90 deg. to each other. Thread female rod ends (1) 3/4" down on the push rod ends, also, noting to position the female rod ends as shown in Figure RP-5, for attachment to the rudder pedal and to the steering head. A drop of oil on the threads will allow for easier threading. Repeat this procedure with the second steering push rod.
  
2. **Figure RP-5**    **ATTACHING THE PUSH ROD ASSEMBLY TO RUDDER PEDALS**  
To attach the push rod assembly to the inner rudder pedal, place a thin washer (7) on a bolt (4) and insert through the second hole from the top on an inside rudder pedal. The bolt head should be on the outside of the pedal. Add washer (5) and slide female rod end of the steering push rod assembly over the bolt. Add a final washer (7) and a finger tightened locknut (6). Repeat this procedure on the other side.
  
3. **Figure RP-5**                      **ATTACHING PUSH ROD ASSEMBLY TO FORK**
  - a) To attach the push rod assembly to the previously assembled steering head on the fork (Refer to Chapter 2 / Section 1 / Figure CA-1), align the hole in female rod end with hole on steering head. Place washer (5) on bolt (4), and insert through the rod end. Add a second washer (5) and insert the bolt through the steering head. Secure this with a finger tightened locknut (6). Repeat this procedure on the other side.
  
  - b) Verify that the nose wheel is straight and that the 4 rudder pedals are even. It's o.k. if the two outside pedals are *slightly* higher than the inside two pedals; they will settle after use. Expect the adjustment to change slightly when the attachment bolts are tightened. To avoid this, add extra washers and finger tighten the assembly for adjustment, then remove the extra washers and secure the locknuts.

INDEX#	PART #	QTY	DESCRIPTION
1.	CW-4	4	FEMALE ROD END
2.	AN316-4R	4	1/4 " JAM NUT
3.	CS-323	2	STEERING PUSH ROD 7" LONG
4.	AN4-10A	4	1/4" BOLT
5.	AN960-416	6	1/4" WASHER
6.	AN365-428	4	1/4" LOCKNUT
7.	AN960-416L	4	1/4" THIN WASHER



