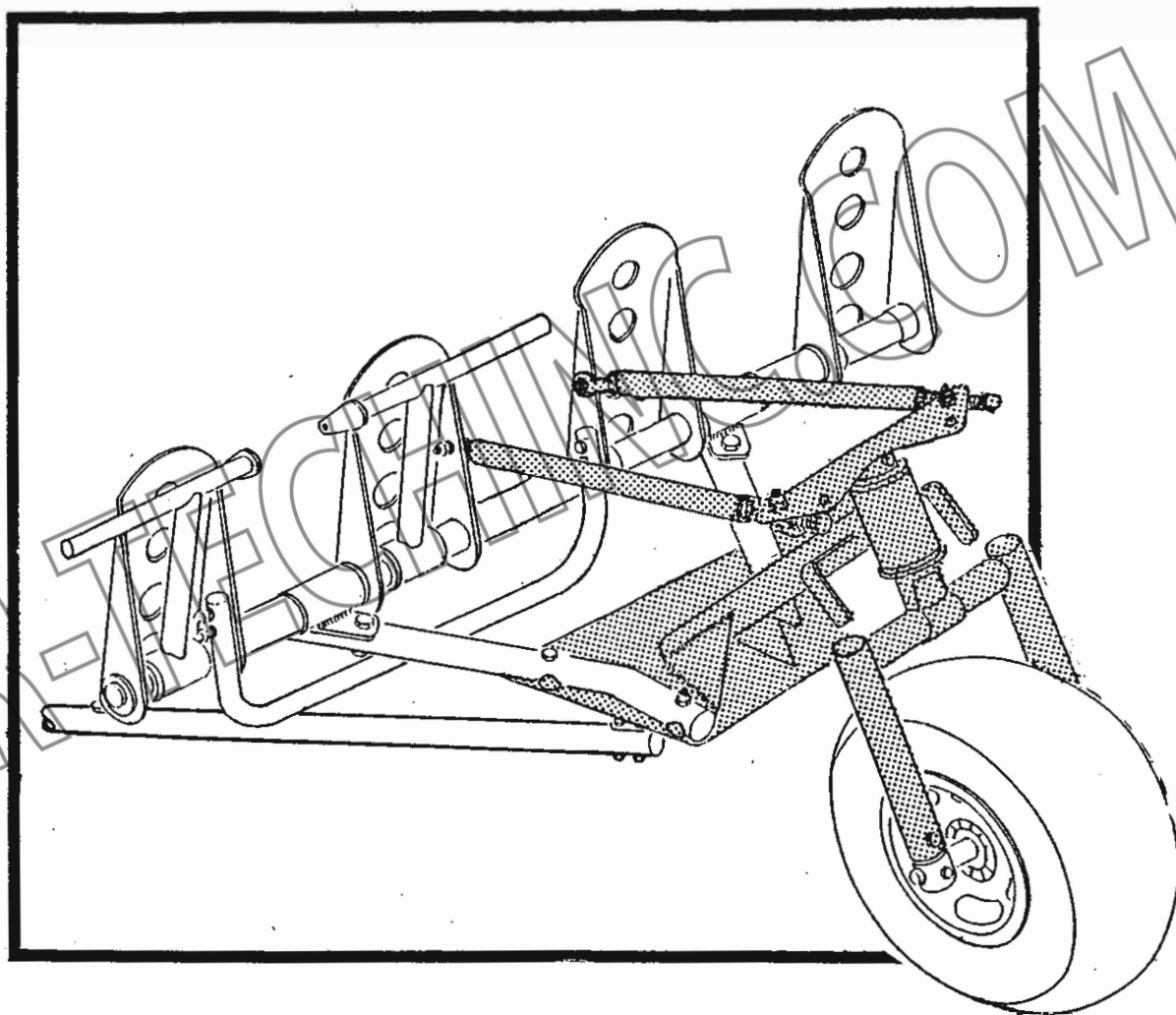




STEERABLE
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STEERABLE
NOSEWHEEL (TWO PLACE)



ASSEMBLY INSTRUCTIONS

DOC# 872-03 A

FOR KIT# 91230

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GENERAL NOTES

The addition of a Steerable Nose Wheel to your Quicksilver MX series aircraft will provide greatly improved ground handling characteristics by allowing the pilot to turn his aircraft 180 degrees within one wing span utilizing dual shock dampening pushrods.

CONSTRUCTION NOTES

This manual describes and illustrates the recommended sequence of assembly and attachment of the Quicksilver Steerable Nose Wheel Kit. Please read the entire manual through at least once to familiarize yourself with the text and assembly drawings.

We have factory assembled most of the components leaving you with relatively little drilling and deburring.

While it is possible to complete this kit in a relatively short period of time, accuracy and thoroughness are factors more important than time actually spent.

NOTE: Any part that requires disassembly and the reassembly should be secured with all NEW Locknuts.

PARTS LIST INTERPRETATION

In each sequence, when we call out an Item in the text we will give it an Item Number which is repeated on the Illustration and keys with the Parts List.

If the Item is a NEW Part contained in this Kit, it will have a Part Number and Quantity in the Parts List which matches the part to be used.

EXAMPLE:

Pt.	P.N.	Qty.	Description.
1.	60560	1	Steerable Nose Wheel Fork Support.

If the Item is an EXISTING Part of the Aircraft (or previously assembled), it will appear in the Parts List with a dotted line after the Item Number.

EXAMPLE:

Pt.	P.N.	Qty.	Description
1.....			Nose Wheel Assy.

REMINDER: Each page, in each sequence, is an independent unit.

'AN' BOLT GAUGE

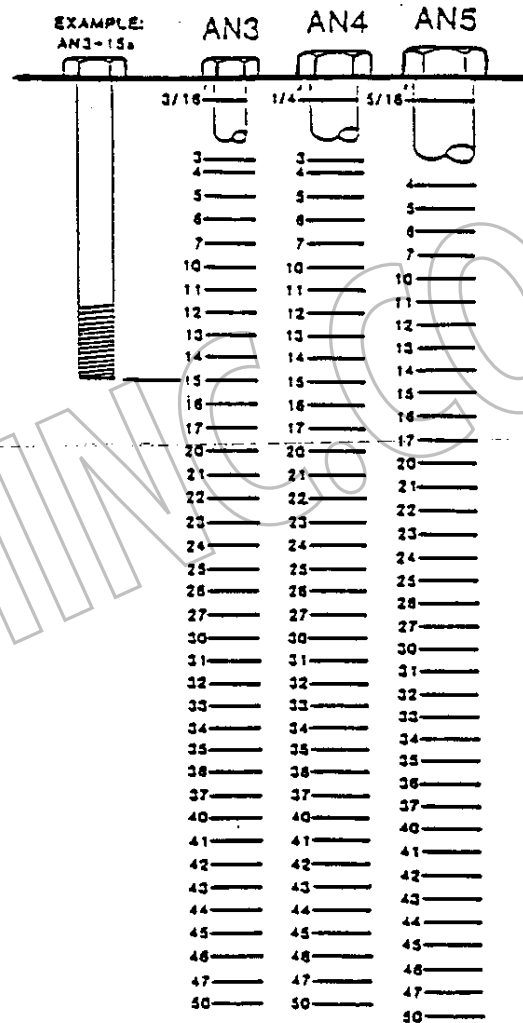
Use this Gauge to determine
AN Bolt Sizes and Lengths.

DO NOT USE Substitutes!
Call your Quicksilver Dealer for
replacements, whenever necessary.

AN3 = 3/16" diameter Shank.

AN4 = 1/4" diameter Shank.

AN5 = 5/16" diameter Shank.



TORQUE VALUES

SPECIFIED TORQUE VALUES

	in./lbs.	ft./lbs.	Newton Meter
3/16".....(AN3).....	20-25	1.5-2.0	2.25-2.75
" with thin locknut	12-15	1.0-1.25	1.25-1.75
1/4"(AN4).....	50-70	4.0-5.75	5.5-8.0
" with thin locknut	30-40	2.5-3.25	3.5-4.5
1/4"-20 thread (Coarse)	40-50	3.25-4.0	4.5-5.5
3/8".....(AN6).....	160-190	13.3-15.8	

RUN-ON TORQUE AND PROPER TORQUE

Run-on Torque is the amount of resistance encountered when you thread a nut onto a bolt until the bolt threads appear through the nut.

When you thread a new Nut onto a Bolt, resistance is felt due to minute machining differences. It is sometimes possible to reach the Torque Values in the above chart even before the Bolt threads appear through the Nut, particularly when working with Locknuts. The effect is that the Torque Wrench shows you the "correct" torque, yet this can be a completely false reading and the nut and bolt will not be correctly tightened!

Therefore, when reading any Torque Specification in this manual we will expect you to use Proper Torque.

FORMULA

$$\text{PROPER TORQUE} = \text{RUN-ON TORQUE} + \text{TORQUE VALUE}$$

EXAMPLE 1.

Using the Torque Wrench, run a 3/16" (AN3) Locknut onto a (AN3) Bolt until the threads just begin to appear past the nut. Note the reading on the Torque Wrench - (Lets say, it reads 8 in./lbs.). That reading is the "Run-on Torque".

In the Specified Torque Value chart above, you will see that the Torque Value for AN3 is 20-25 in./lbs. ADD that to the Torque Wrench reading (8 in./lbs). Therefore, this AN3 bolt will be correctly tightened when the Torque Wrench shows a reading of 28-33 in./lbs. This is PROPER TORQUE.

EXAMPLE 2.

If the Run-on torque read 16 in./lbs., the AN3 bolts' PROPER TORQUE would be correct when the Torque Wrench shows a reading of 36-41 in./lbs.

IMPORTANT: Nylock Nuts and Locknuts should never be used more than twice as they become less vibration resistant with each removal.

When using the Torque Wrench, apply a smooth, even pull. If chattering or a jerking motion occurs during final torque, back off and re-torque.

TOOLS NEEDED FOR ASSEMBLY

- * Center Punch
- * Drill Motor or Hand Drill with 3/16" and 1/4" Drill Bits
- * Deburring Tool
- * Marking Pencil or Pen
- * Torque Wrench that registers in./lbs. or Newton Meters.
- * Vice Grips or Channel Locks
- * Wrenches: Open end, Box, and Socket
3/8", 7/16", 1/2", 9/16"

PREPARATION FOR ASSEMBLY

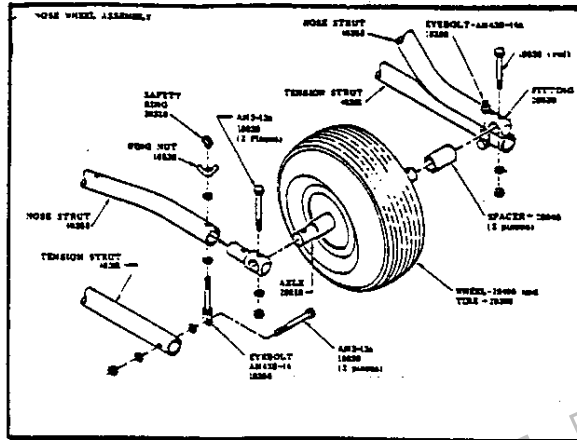
1. Inventory and inspect the component parts of the kit (see Parts List on Page 18) leaving them in their clear wrapped packaging until ready for assembly.
2. Assemble the tools needed and ensure that they are clean and sharp.
3. Always use the specified components and hardware. NEVER use substitutes. (See 'AN' Bolt Gauge on Page 4).

IMPORTANT

7

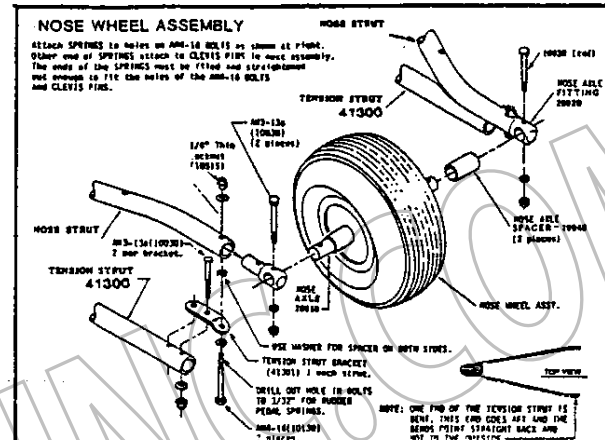
READ BEFORE CONTINUING

IF YOU HAVE THE EARLY VERSION NOSE TO TENSION STRUT ATTACHMENT FOUND ON THE QUICKSILVER MX MODEL AND OR CAST ALUMINUM FOOT PEDALS, IT WILL BE NECESSARY TO UPDATE YOUR TENSION STRUTS, FOOT PEDALS AND HARDWARE BEFORE CONTINUING ON WITH THESE INSTRUCTIONS. SEE DETAILS A', B', C', AND D' BELOW. ALSO, IF YOUR PLANE IS EQUIPED WITH RUDDER CABLES THEY WILL HAVE TO BE REVISION "A" OR LATER AS THE ORIGNAL CABLES WILL BE ONE INCH TOO LONG



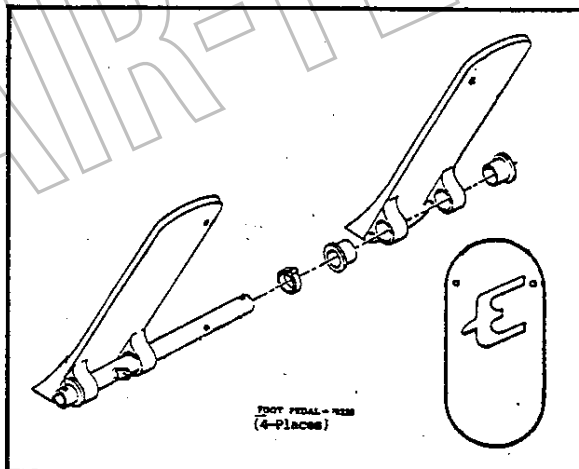
OLD VERSION

DETAIL A



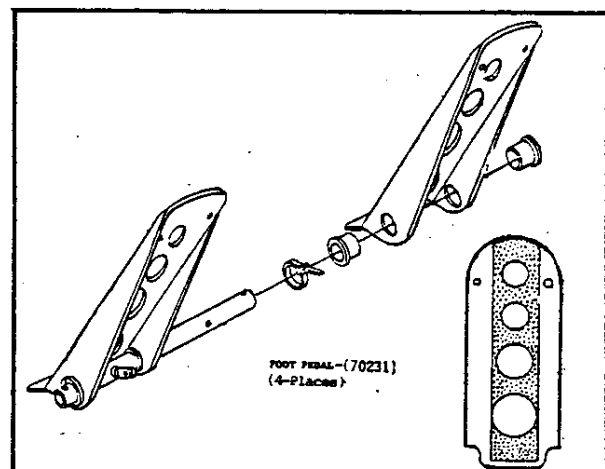
NEW VERSION

DETAIL B



OLD VERSION

DETAIL C



NEW VERSION

DETAIL D

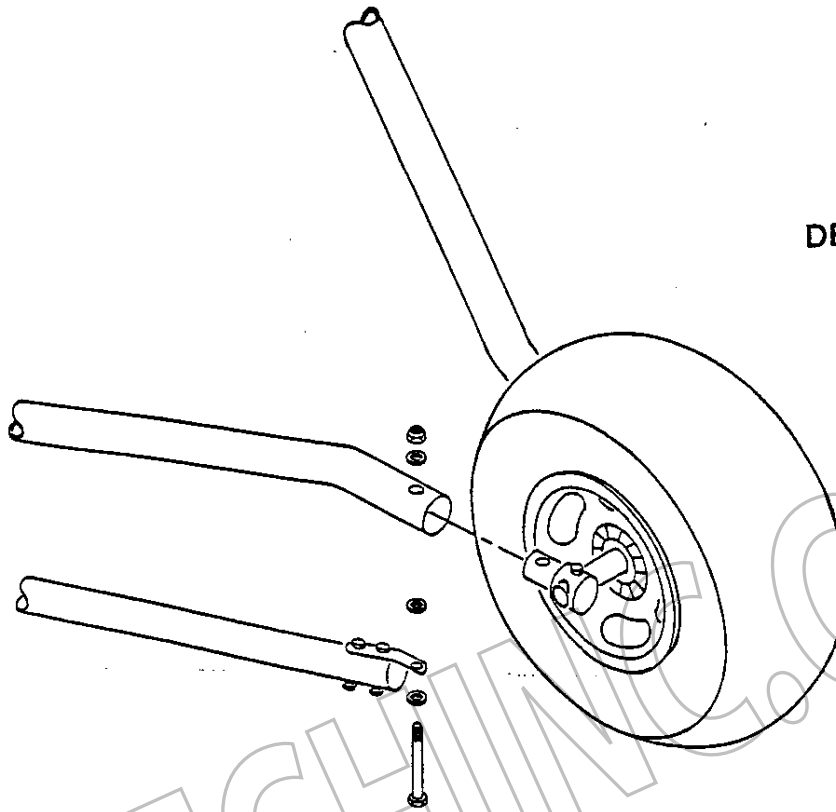
FIGURE 1

FORK SUPPORT ATTACHMENT

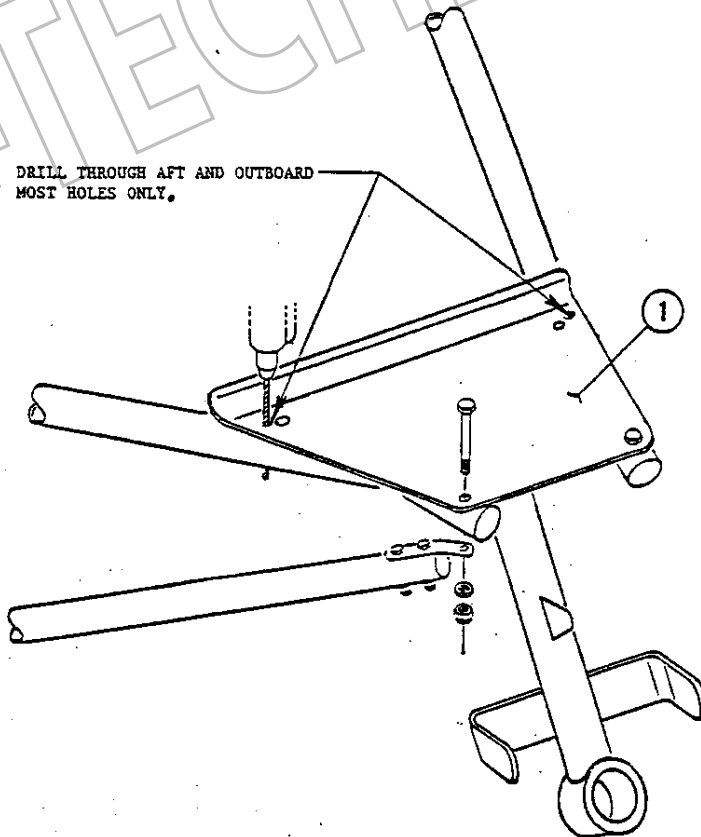
1. Refer to Detail 'A'. Disassemble Nose Wheel Assy. from Nose Struts leaving the wheel, axle, spacers and nose strut fittings all bolted together for attachment in a future step. NOTE; If your plane has rudder pedal springs, the springs are to be removed at this time as they are no longer required.
2. Refer to Detail 'B'. Attach Steerable Nose Wheel Fork Support (1) to the top of Nose Struts and Tension Struts to the bottom of Nose Struts, using existing disassembled hardware, through forward holes as shown. NOTE: Add washers as needed.
3. Align Aft and Outboard most holes at the Aft end of Fork Support (1) on the center line of each Nose Strut. Clamp or hold firmly and drill a 1/4" hole completely through both tubes. Unbolt Fork Support (1) and deburr holes.

Pt.	P.N.	Qty.	Description
1.	60560	1	Steerable Nose Wheel Fork Support

DETAIL 'A'



DRILL THROUGH AFT AND OUTBOARD
MOST HOLES ONLY.



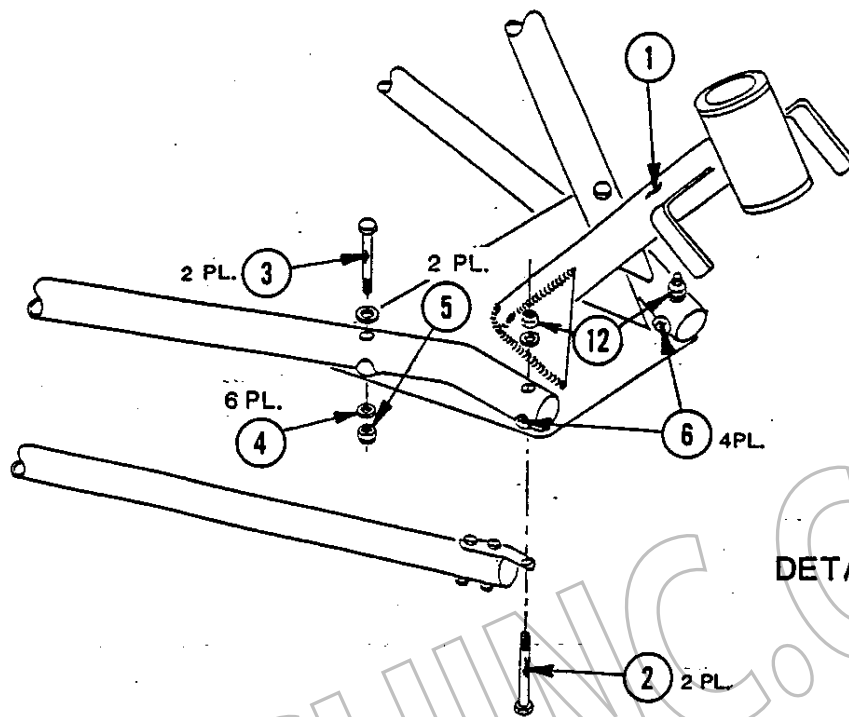
DETAIL 'B'

FORK SUPPORT / FORK ATTACHMENT

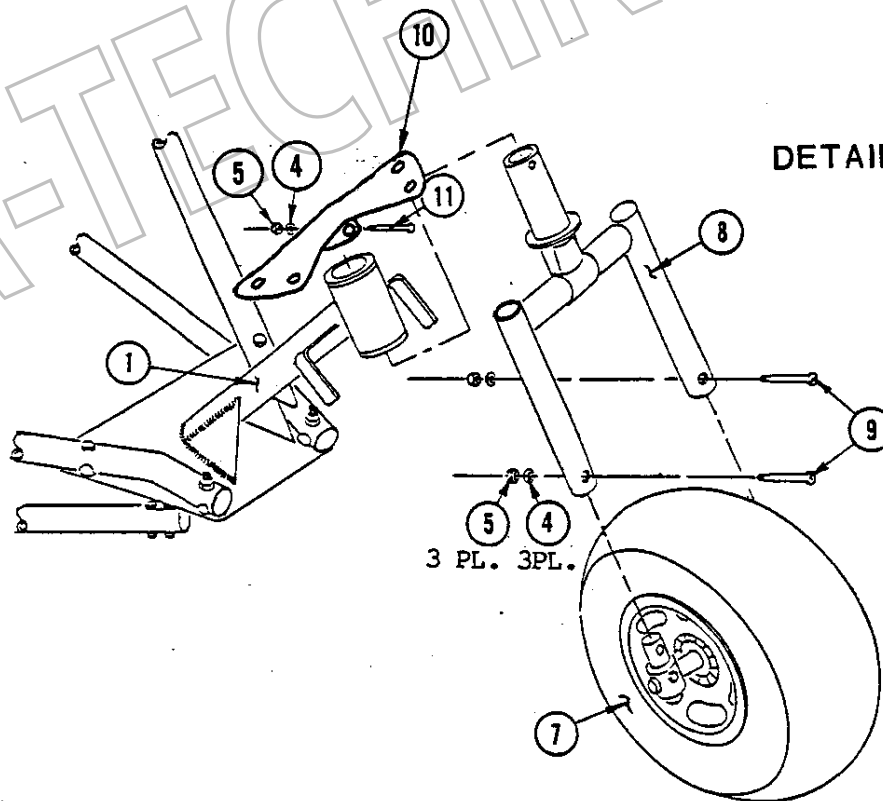
1. Refer to Detail 'A'. Attach Steerable Nose Wheel Fork Support (1) and Tension Struts to Nose Struts using hardware (2,3,4,5,6,12) shown. Tighten to proper torque.
2. Refer to Detail 'B'. Attach Nose Wheel Assy. (7) to Steerable Nose Wheel Fork (8) using hardware (4,5,9) shown. Tighten to proper torque.
3. Slide Steerable Nose Wheel Fork (8) up into Steerable Nose Wheel Fork Support (1) and secure in place using Steerable Nose Wheel Control Arm Assy. (10) and hardware (11, 4, 5,) shown. Tighten to proper torque.

NOTE: Control Arm orientation.

pt.	P.N.	Qty.	Description
1.....			Steerable Nose Wheel Fork Support
2.	10130	2	AN4-16 Bolt
3.	10140	2	AN4-16a Bolt
4.	10560	9	1/4" Flat Washer
5.	10510	5	1/4" Locknut
6.	20270	4	1"X1/8" Saddle
7.....			Nose Wheel Assy.
8.	60561	1	Steerable Nose Wheel Fork
9.	10080	2	AN4-13a Bolt
10.	91012	1	Steerable Nose Wheel Control Arm Assy.
11.	10100	1	AN4-14a Bolt
12.	10515	2	1/4" Thin Locknut



DETAIL 'A'



DETAIL 'B'

FOOT PEDAL MODIFICATION

NOTE: Ensure ALL required holes have been added to the pedals per your specific Assembly Instructions BEFORE Proceeding. If the aircraft has already been constructed and the Steerable Nosewheel is an addition, the COMPLETE Foot Pedal Assembly will have to be REMOVED, Foot Pedals Modified then reassembled per the following.

The Brakes, as illustrated, are to be operated from the LEFT seat.

1. Locate the Foot Pedal Templates on Pages 19, 21 and 23. Remove the Templates from the Assembly Instructions. Follow the directions on the templates and position the templates one at a time on the specified Foot Pedals (4) using the LARGE factory punched holes as a guide. Centerpunch the appropriate locations, drill and deburr. NOTE: Each template is for a specific Foot Pedal. Use a pencil and label each as RIGHT or LEFT 'SEAT' and RIGHT or LEFT 'SIDE'.

2. Insert TWO Bushings (3) as illustrated into each Pedal (4). Insert TWO Bushings into each Pedal Tube Mount (5 and 8) and each Brake Pedal (7 and 9) as illustrated. Temporarily slide all the Pedals (4) one at a time, onto the end of the Pedal Mount Tube (1) and verify the Pedals, Pedal Tube Mounts (5 AND 8) and Brake Pedals (7 and 9) rotate freely. If not, ream the INSIDE of the Bushings and/or the INSIDE of the Pedal Tube Mount and the Brake Pedals as necessary to allow free rotation of the components (4, 5, 7, 8 and 9). Remove items (4, 5, 7, 8 and 9) from the Pedal Mount Tube.

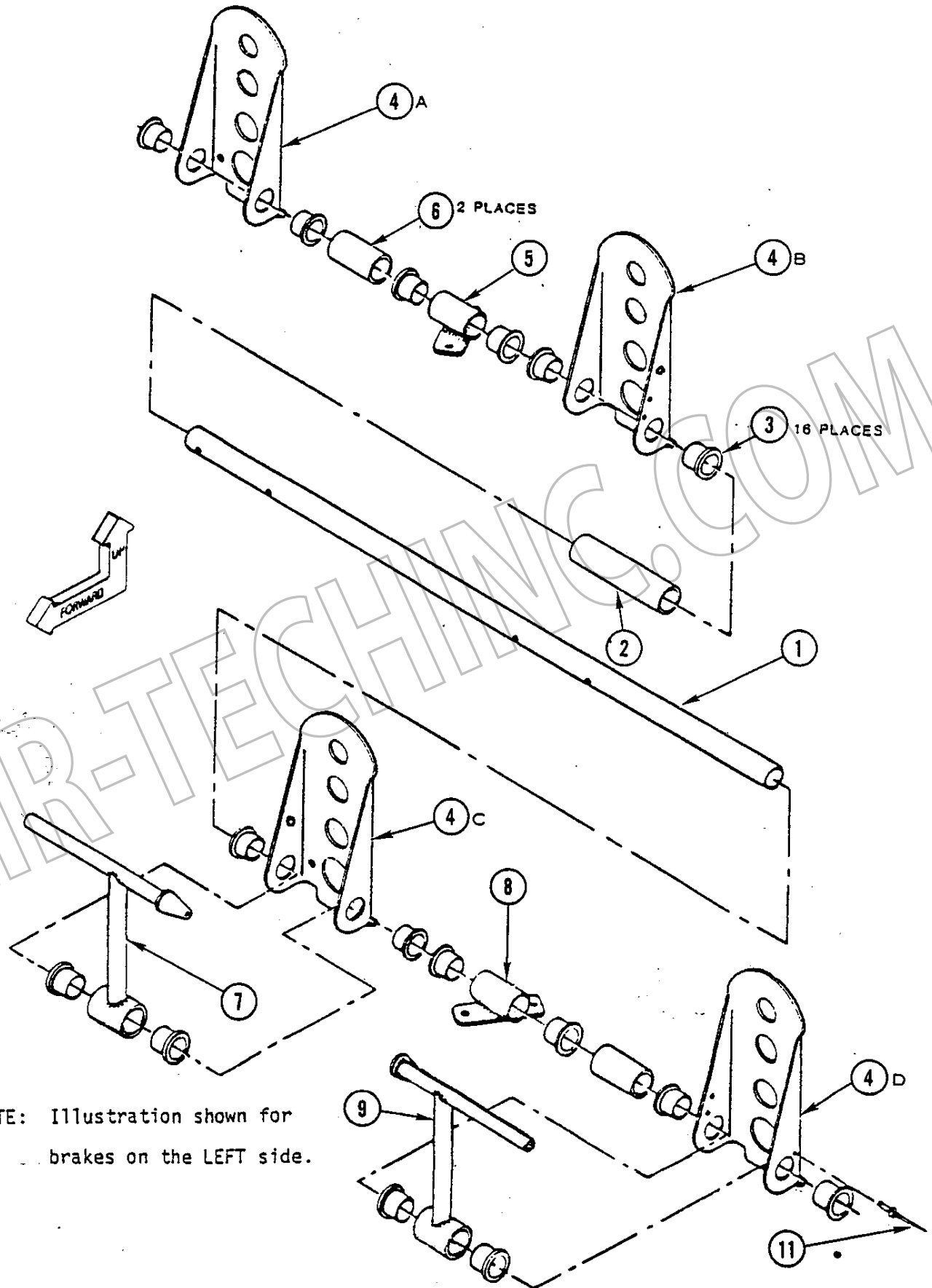
3. Place the Pedal Mount Tube (1) in FRONT of you. The end WITHOUT holes to your RIGHT. Slide the Spacer (2) OVER either end and place it at the approximate CENTER of the Pedal Mount Tube.

4. Slide the RIGHT Seat, LEFT Pedal (4B) onto the LEFT Side of the Pedal Mount Tube (1) followed by the Pedal Tube Mount (5) with the 1/4" (6.4 mm) hole positioned FORWARD or TOWARD you. Add a Spacer (6) and the RIGHT Seat, RIGHT Pedal (4A).

5. Assemble the remaining components for the opposite side as illustrated.

6. Drill and deburr a 1/8" (3.2 mm) diameter hole thru the Pedal (4D) on your RIGHT (LEFT Seat, LEFT Pedal) next to the Bushing (3) and install a Rivet (10) as illustrated with the head of the Rivet OVER-LAPPING the Bushing (3) to keep it from working its way out.

Item	P/N	Description	Item	P/N	Description
1...	40438..	Pedal Mount Tube	6...	40426..	Spacer, 1" x 2 1/4"
2...	40429..	Spacer, 1" x 4 11/16"	7...	40418..	Brake Pedal, Right
3...	70250..	7/8" Bushing	8...	40433..	Pedal Tube Mnt Left
4...	70231..	Foot Pedal	9...	40419..	Brake Pedal, Left
5...	40434..	Pedal Tube Mount, Rt.	10...	20201..	1/8" S. Steel Rivet



NOTE: Illustration shown for
brakes on the LEFT side.

FOOT PEDAL MODIFICATION (CONT'D.)

1. Position the COMPLETE Pedal Assembly (14) OVER the EXISTING holes the Nose Struts (2). Align the 1/4" (6.4 mm) holes in the Pedal Tube Mounts (3 and 4). Secure with Hardware (5,6 and 7) TWO places. Tighten to correct torque. Do not distort the tube.

2. Align the 1/4" (6.4 mm) holes in the RIGHT Seat, RIGHT Pedal (15A) with the holes in the Pedal Mount Tube (1). NOTE: The Bushings (12) will cover the holes in the Pedal Mount Tube however a lighted Flashlight located directly BEHIND them should make the holes more visible. Backdrill the Bushings thru the EXISTING holes in the Pedal Mount Tube with a 1/4" (6.4 mm) bit while holding the Bushings tight against the Pedal. Secure with Bolt (13), Washer (6), and Locknut (7) as illustrated. CAUTION: Over tightening will prohibit smooth operation of the Foot Pedal system. Repeat for the opposite side of the SAME Pedal.

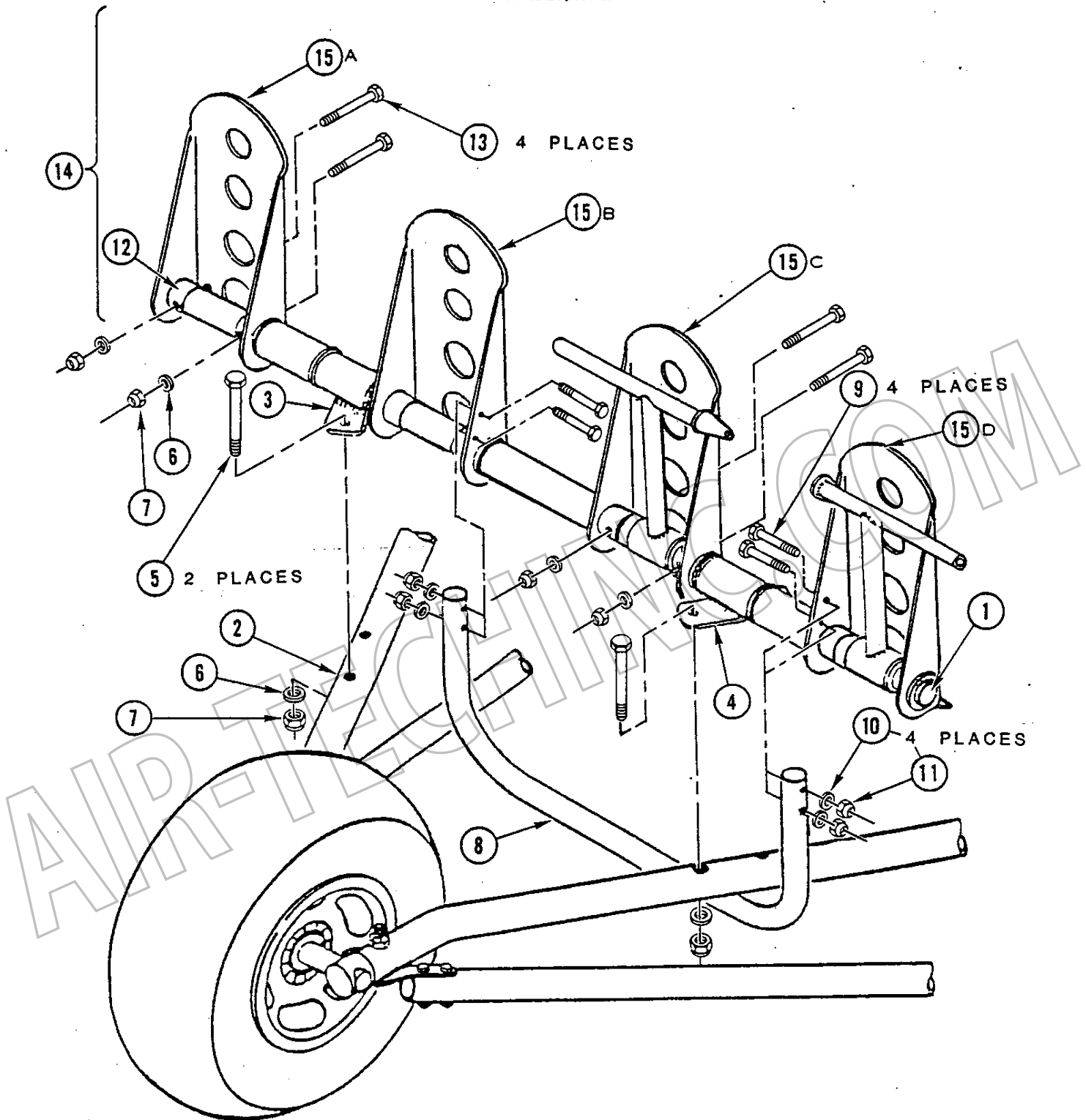
3. Align the holes in the Pedal (15C) with the holes in the Pedal Mount Tube and backdrill with a 1/4" (6.4 mm) bit. Secure with Bolt (13), Washer (6), and Locknut (7). Tighten to correct torque. Do not overtighten.

4. Secure the remaining 3/16" (4.7 mm) hole in the Pedal Tube Mounts (3 and 4) with Hardware per your specific aircraft Assembly Instructions. Tighten to correct torque. Do not distort the Tube. Repeat for the opposite Nose Strut.

5. Position the Torque Tube (8) UNDER the Nose Strut (on your RIGHT) and attach it with Hardware (9,10 and 11) Tighten to proper torque. Do not distort the Tube.

Item	P/N	Description
------	-----	-------------

1....	40438....	Pedal Mount Tube
2....	40360....	Nose Strut
3....	40434....	Pedal Tube Mount Assembly (Right)
4....	40433....	Pedal Tube Mount Assembly (Left)
5....	10100....	AN4-14A Bolt
6....	10560....	1/4" Washer
7....	10510....	1/4" Locknut
8....	40437....	Dual Rudder Torque Tube
9....	10025....	AN3-11A Bolt
10....	10550....	3/16" Washer
11....	10500....	3/16" Locknut
12....	70250....	7/8" Bushing
13....	10170....	AN4-20A Bolt
14.....		Pedal Assembly (complete)
15....	70231....	Foot Pedal





PUSHROD ATTACHMENT

1. Refer to Detail "A" on page 17. Pass Bolt (2) through Washer (11), Springs (3), Rod End Bearing Assy. (4).
2. Run Bolt (2) threads into one end of Foot Pedal Pushrod (1) until it bottoms out and then tighten.
3. Run Jam Nut (6) onto Rod End Bearing (9) half way and then thread Bearing (9) into the other end of the Pushrod (1). Do not tighten, adjustment to be done at a later step.
4. Pass Bolt (7) through Washer (11), Foot pedal Spacer (8), and Rod End Bearing (9) attaching hardware (10, 11) to opposite side. Tighten to proper torque.
5. Run Jam Nut (13) onto the end of Rod End Bearing Assy. (4) threads, then insert Rod End Bearing Assy. (4) through 3/8" Outboard hole in Steerable Nose Wheel Control Arm Assy. and attach hardware (5, 12) shown. Tighten to proper torque.
6. Align Foot Pedals parallel with each other. Sighting over the top of the Steerable Nose Wheel Fork, the Cross Tube of the Fork should be parallel with the Foot Pedals.
7. To adjust Parallelism between Cross Tube and Pedals, thread Pushrod (1) in or out until satisfactory adjustment is achieved.
NOTE; If your plane is equiped with rudder cables, the cable tension is now adjusted and maintained by the foot pedal pushrod assy.
- NOTE; If your plane is equiped with spoilers, then connect and adjust the control lines at this time.
8. Tighten Jam Nut (6), then repete steps 2 through 9 for Left Seat Right Pedal Pushrod attachment. See Detail "B"- Illustration of completed kit.

Pt.	P.N.	Qty.	Description
1.	40349	2	Foot Pedal Pushrod Assy., 2-PL
2.	10296	2	AN4-40a Bolt
3.	10806	6	Spring, 1 5/64" x .39
4.	10689	2	CM 6 Rod End Bearing Assy.
5.	10547	2	3/8" Locknut
6.	10631	2	1/4" Non-Locking Nut
7.	10070	2	AN4-12A Bolt
8.	40422	4	Spacer, 3/8" x .058 x 1/8" Long
9.	10680	2	CM 4 Rod End Bearing
10.	10510	2	1/4" Locknut
11.	10560	6	1/4" Flat Washer
12.	10575	2	3/8" Flat Washer
13.	13132	2	3/8" Jam Nut



STEERABLE NOSEWHEEL PARTS LIST

(TWO PLACE)

REF. (DOC# 875-03 A)

TOP NUMBER : 91230
 DESCRIPTION : KIT, STEERABLE NW, 2PL
 QUANTITY : 1

P/N	QTY	DESCRIPTION
	0	**** NOT IN PARTS MASTER FILE ****
10070	2	AN4-12A
10080	2	AN4-13A
10100	1	AN4-14A
10130	2	AN4-15
10140	2	AN4-16A
10296	2	AN4-40A
10510	7	NUT, 1/4 LOCKNUT, (AN365-428N)
10515	2	NUT, 1/4 THIN, LOCK (AN364-428A)
10547	2	NUT, 3/8-24, LOCK, (AN363-624)
10560	15	WASHER, 1/4 (AN960-416)
10575	2	WASHER, 3/8" (AN960-616)
10631	2	NUT, 1/4" NONLOCKING
10680	2	BEARING, ROD END, CM-4
10689	2	BEARING, ROD END, CM6 ASSY
10806	6	SPRING, 1.078 x .390 DIA
13132	2	NUT, 3/8-24 JAM
20270	4	SADDLE, 1 x 1/8
40349	2	PUSHROD, STEERABLE NW ASSY
40422	4	SPACER, 3/8 x .058 x 1/8
60560	1	FORK SUPPORT, STEERING NW ASSY.
60561	1	FORK, NOSEWHEEL, STRBL, ASSY
872-03	1	INSTR, ASSY, STEERABLE NW, 2PL
91012	1	CONTROL ARM, STEERABLE NW ASSY

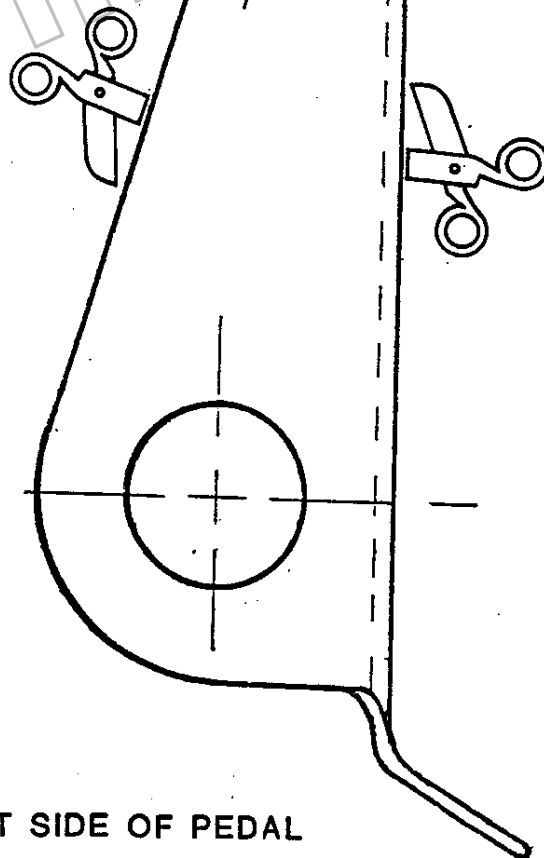
TEMPLATE

LEFT PEDAL "RIGHT SEAT"

REVERSE TEMPLATE FOR

RIGHT PEDAL "LEFT SEAT"

1/4" Diameter Hole
Thru Both Sides



VIEW FROM LEFT SIDE OF PEDAL

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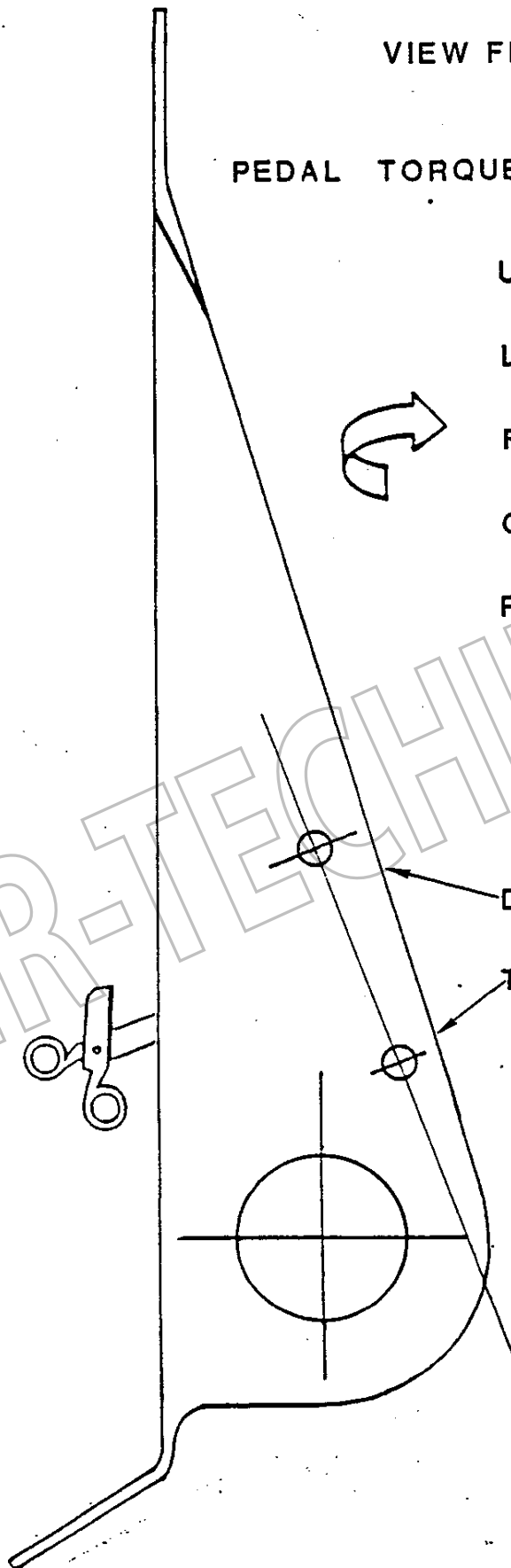
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VIEW FROM RIGHT SIDE OF PEDAL

PEDAL TORQUE TUBE DRILL PATTERN

USE THIS SIDE FOR THE
LEFT SEAT, LEFT PEDAL.

FLIP OVER AND USE THE
OPPOSITE SIDE FOR THE
RIGHT SEAT, LEFT PEDAL.



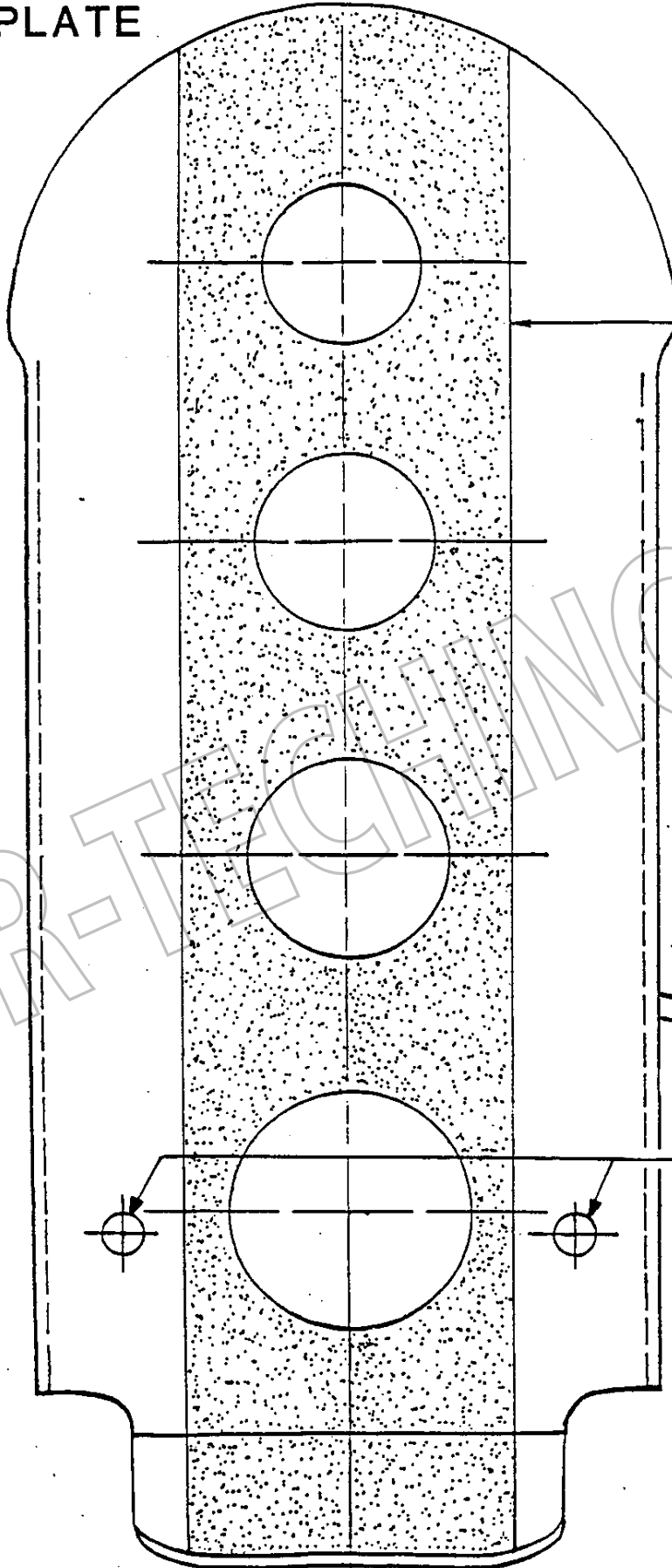
DRILL THRU
NEAR SIDE ONLY.

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TEMPLATE

FRONT VIEW



DRILL ALL HOLES.
APPLY GRIP TAPE (20190)
TO THE FRONT OF THE
PEDALS AND TRIM WITH
HOT KNIFE OR RAZOR BLADE.

RUDDER (FOOT) PEDALS

DRILL AND DEBURR
1/4" (6.4 MM) DIAMETER HOLES
IN THE RIGHT HAND PEDAL,
BOTH SEATS.

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