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Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the **SportStar^{plus}** Airplane

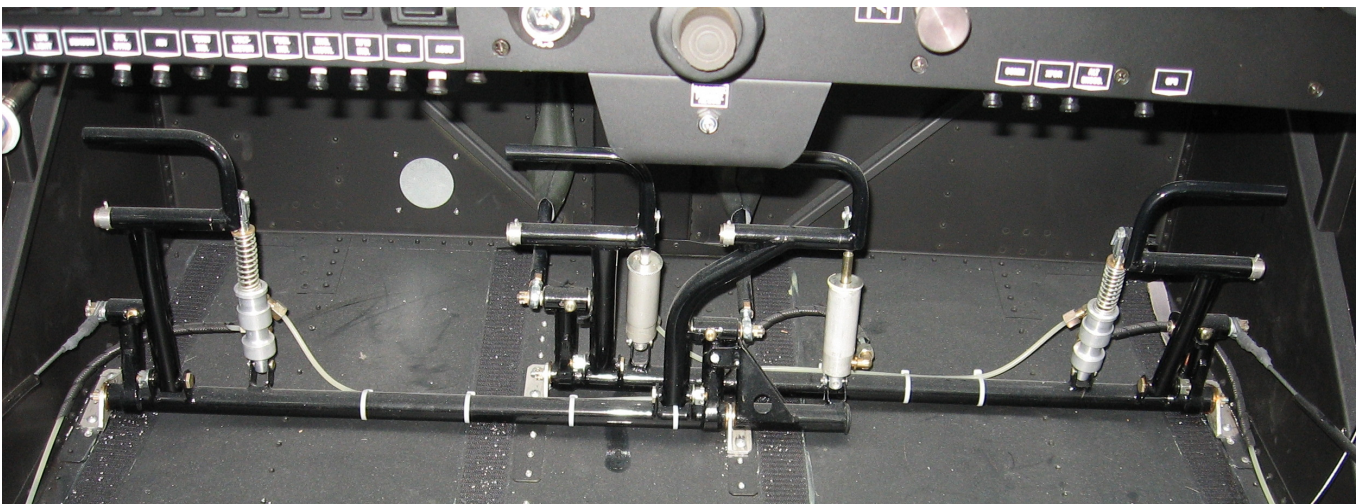




Table of Contents

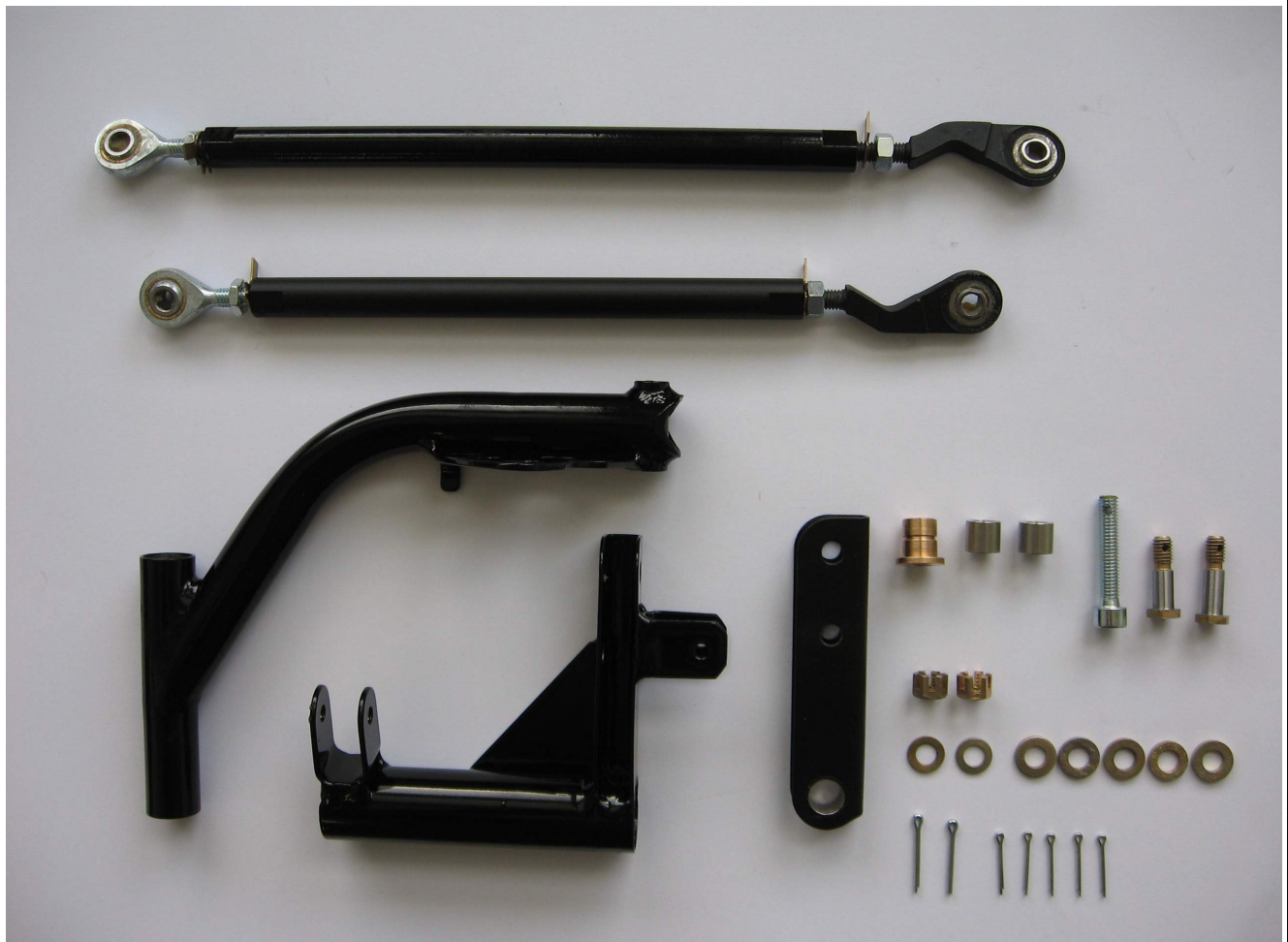
ASSEMBLY MANUAL	2
1.1 KIT TO REDUCE SENSITIVITY.....	1
1.2 LIST OF PARTS.....	2
1.3 WORKING SPACE.....	4
1.4 LIST OF DRAWINGS.....	4
1.5 LIST OF TOOLING AND MANUFACTURING TOOLS.....	4
1.6 AUTHORIZED PERSON.....	4
1.7 TYPE OF MAINTENANCE.....	4
1.8 DETAILED INSTALLATION INSTRUCTIONS.....	5



ASSEMBLY MANUAL



1.1 Kit to Reduce Sensitivity





Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.2 List of Parts

Position	Title	Pcs.	Figure
01	WELDED LEVER E4 90-21 01	1	
02	BRAKE PUMP BRACKET E4 90-24 01	1	
03	SPACER E4 90-28 01	2	
04	MODIFIED BOLT E4 90-29 01	1	
05	BRONZE BEARING E4 90-30 01	1	
06	ROD 12 SL – L E4 90-31 01	1	
07	ROD 12 SL – P E4 90-31 02	1	
08	RIGHT PEDAL E4 90-12 01	1	

Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



10	BOLT 6x21 ONL 3120.14 (ONL = Czech Aviation Standard)	1	
11	BOLT 6x23 ONL 3120.14	1	
15	NUT M6 ČSN 02 1413.44 (ČSN = Czech Government Standard)	2	
20	WASHER 6 ČSN 31 3282.11	2	
21	WASHER 6x1.5 ONL 3271	5	
25	COTTER PIN 1.6x14 ČSN 02 1781.05	5	
	COTTER PIN 2x18 ČSN 02 1781.05	1	
	COTTER PIN 2x20 ČSN 02 1781.05	1	



Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.3 Working Space

Workshop.

1.4 List of Drawings

E4 90-20 01 SP-STAR-SL Nose Wheel Steering Sensitivity Reduction

1.5 List of Tooling and Manufacturing Tools

Order No.	Name	Pcs.
1.	Aluminum hammer 200gr. (0.4 lb)	1
2.	Nut wrench 9 (size)	1
3.	Nut wrench 13	1
4.	Combination pliers	1
5.	Flat screwdriver	1
6.	Phillips screwdriver	1
7.	Allen wrench 2.8	1
8.	Tube or Bar Length 55 cm (21.6 in) for the standard pedals 60 cm (23.6 in) for pedals moved of 50 mm (2 in) forward	1

1.6 Authorized person

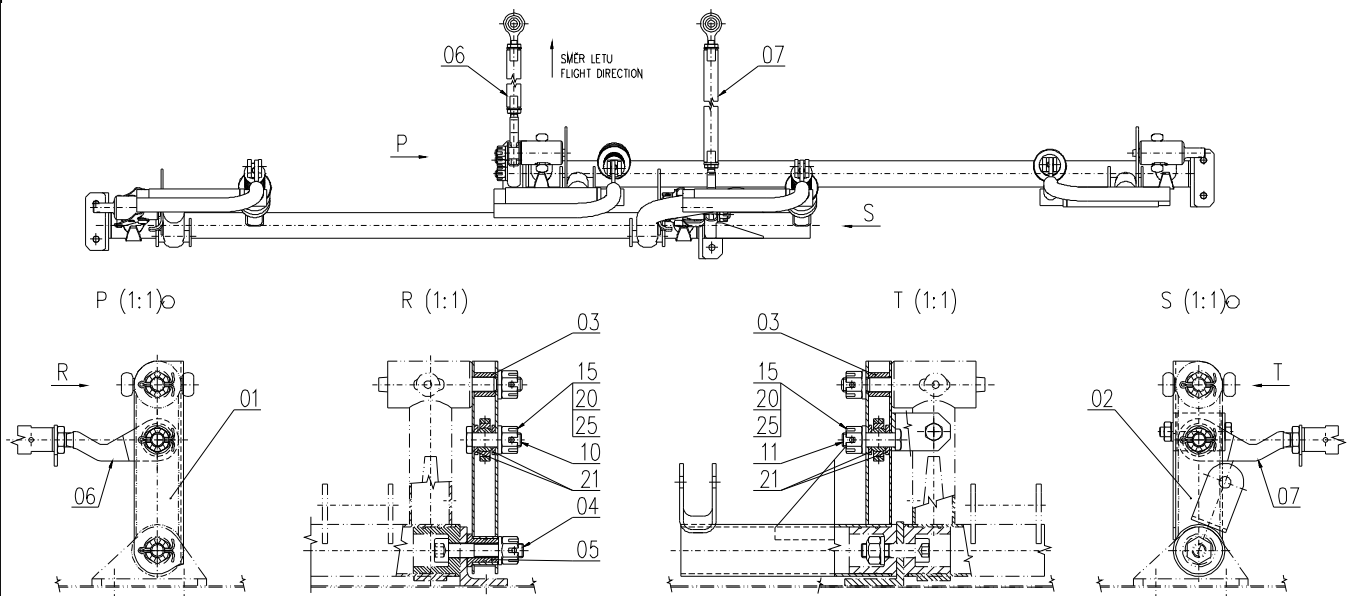
Airplane owner or authorized mechanic

1.7 Type of Maintenance

Line



1.8 Detailed Installation Instructions



2. CHECK CONTROL ROUTING AND ADJUST DEFLECTIONS, LUBRICATE RATION FIT
1. COTTER THE NUT POS.15 ACC. TO ONL 1336.52

2. U TRAS ŘÍZENÍ PROVĚŘIT FUNKCI A SEŘÍDIT VÝCHYLKY, OTOČNÁ ULOŽENÍ MAZAT
1. MATICE POZ.15 POJISTIT DLE ONL 1336.52



Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.7.1. Upper Cover Removal

Demount an upper cover above the dashboard to ensure better access to rudder pedals. Use a Phillips screw driver to screw off the cover attachment screws. Be careful to not scratch cover painting. Remove the cover.



Demount engine upper and lower cowlings to ensure better access to the rods on the nose leg. Use a Phillips screw driver to screw off the cowlings attachment screws. Remove the cowlings



Produce the stop so that the nose landing gear and the rudder will be in neutral position. Use a suitable tube or bar of 55 cm length (21.7 in) to fix the standard pedals. If your airplane has the pedals moved of 50 mm (2 in) forward, then length of the tube or bar should be longer – 60 cm (23.6 in).



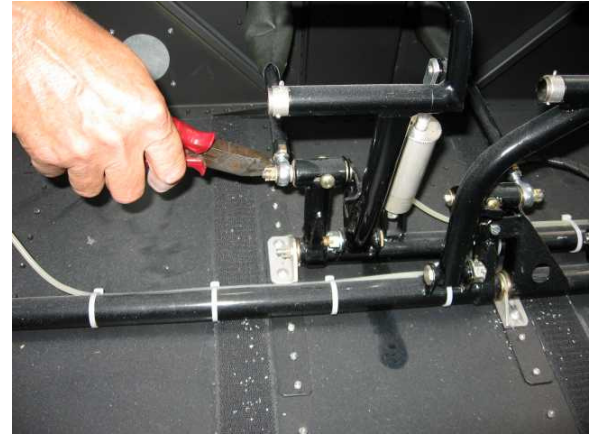
Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



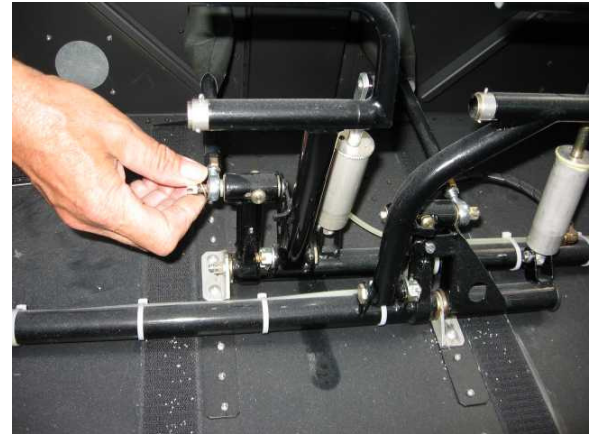
1.7.2. Left Control Rod Disassembly

STEP 1

Use combination pliers to draw out a cotter pin which secures the nut on the left rod connection to the pilot right pedal.



Use nut wrench 9 to unscrew the nut.



Pull the left rod rear end off the pedal.





Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

Use a combination pliers to draw out a cotter pin securing the nut of the left rod front end connection bolt to the nose leg lever

Note: The pictures on the right do not show installed engine



Use again nut wrench 9 to unscrew the nut M6 and then pull out the connection bolt.

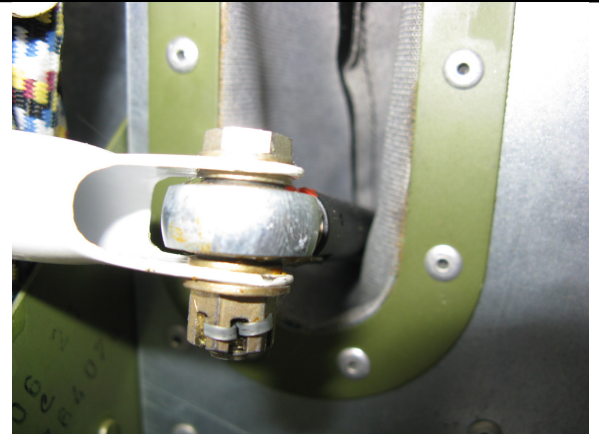
Note: Be careful to not loose 2 washers which will fall down after bolt removal – see picture below.



Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



The picture shows 2 washers which adjust clearance of the rod swivel bearing inside the nose leg lever.



Pull the left rod front end off the nose leg lever and remove the rod out of the plane.

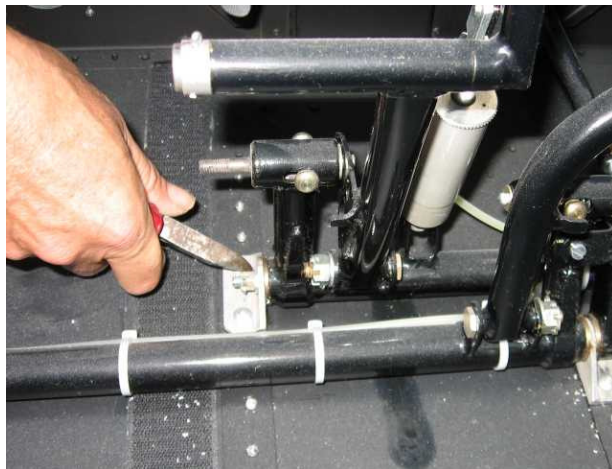




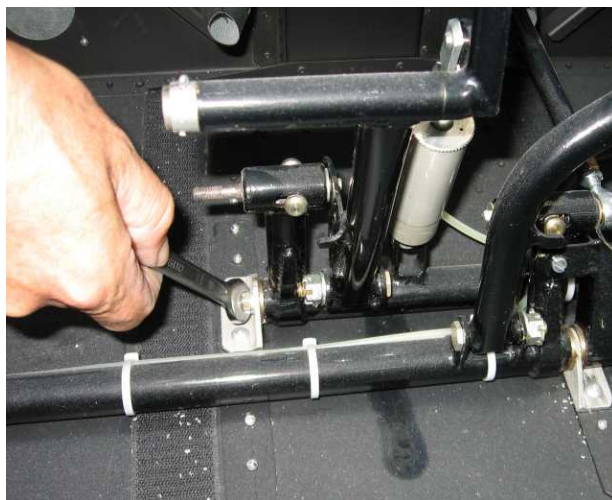
Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

STEP 2

Use the combination pliers to draw out a cotter pin which secures a nut on bottom bracket of the Pilot right pedal.



Use again nut wrench 9 to unscrew the nut M6.



Use Allen wrench 2.8 to unscrew the pedal bottom bracket attachment screws.



Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



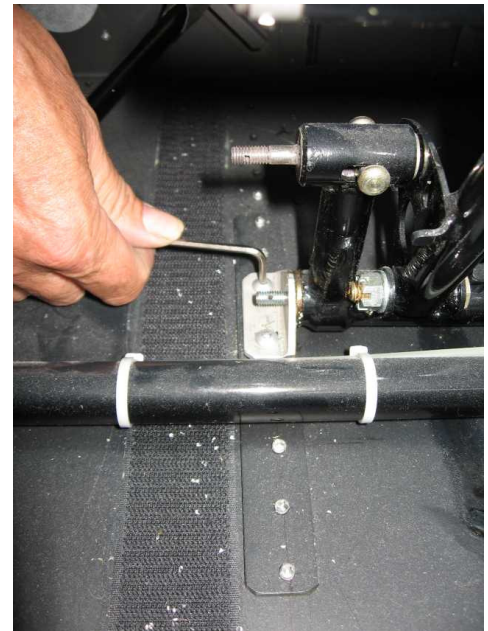
Replace the bracket bolt by the MODIFIED BOLT E4 90-29 01 (Pos. 04) supplied with the kit.



Put the bracket back on its place, set a WASHER 6 on the bolt and screw on nut M6.



Use Allen wrench 2.8 to screw down the bracket attachment screws.



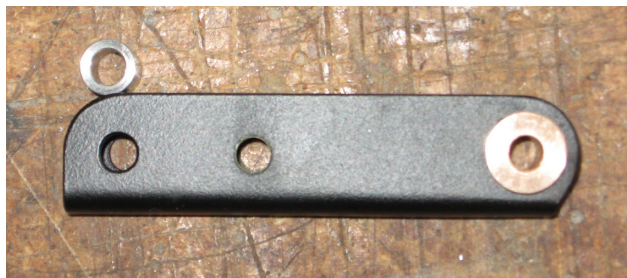


Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.7.3. Left Control Rod Assembly

1. Insert SPACER E4 90-28 01 into the WELDED LEVER E4 90-21 01.

2. Insert BRONZE BEARING E4 90-30 01 into the WELDED LEVER E4 90-21 01.



Bent washer tab to secure a nut on the rod end.



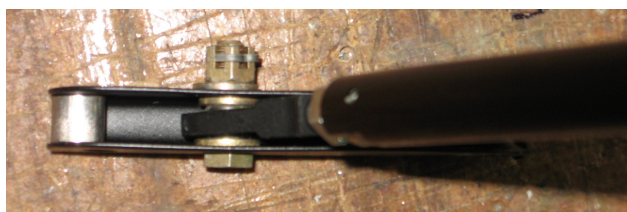
Bent another washer tab according to the picture.



Insert SPACER E4 90-28 01 according to the picture.

Use bolt, 2 washers, nut, cotter pin as listed below to connect the new LEFT ROD E4 90-31 01 to the WELDED LEVER E4 90-21 01.

BOLT 6x21	1 pc.
WASHER 6x1.5	2 pcs.
NUT M6	1 pc.
COTTER PIN 1.6x14	1 pc.



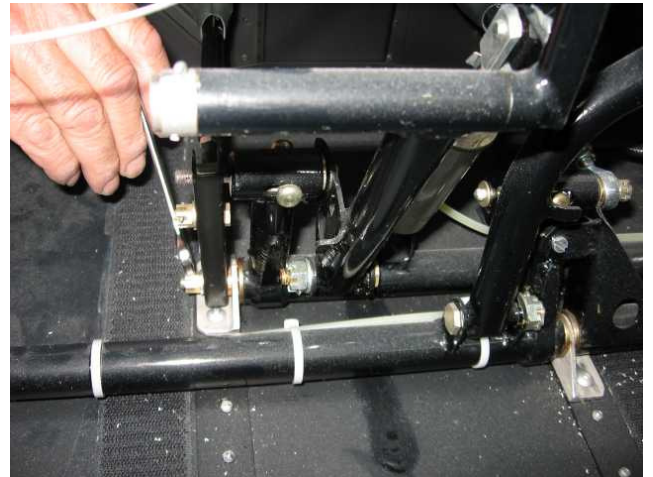
Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



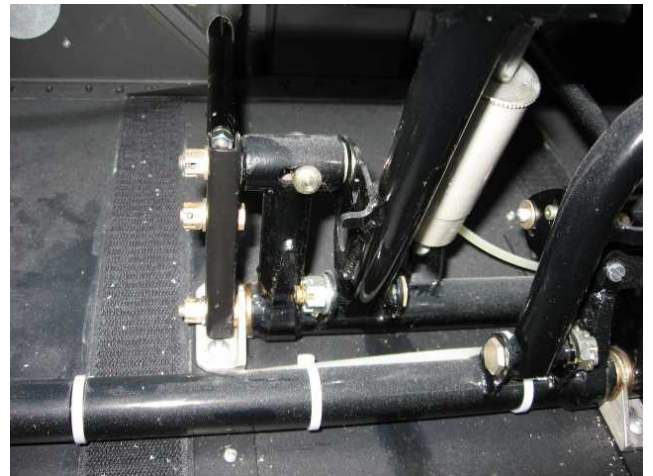
Put the WELDED LEVER E4 90-21 01 on the lower bearing.



Use nut wrench 9 to screw down nut M6.



Insert new COTTER PIN 1.6x14 and bent ends to secure it.

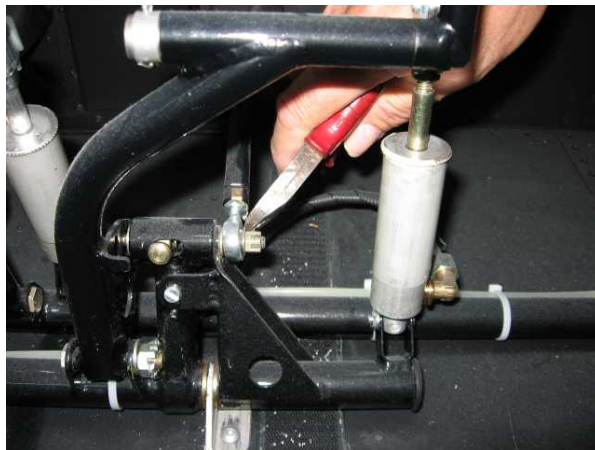




Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.7.4. Right Control Rod Disassembly

Use the combination pliers to draw out a cotter pin which secures the nut on the right rod connection to the co-pilot left pedal.



Use nut wrench 9 to screw off the nut M6.



Use the combination pliers to draw out a cotter pin securing the nut of the right rod front end connection bolt to the nose leg lever.
Note: The picture on the right does not show installed engine.



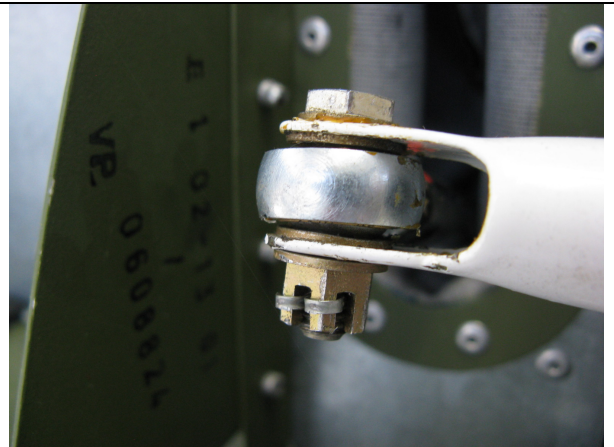
Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



Use again nut wrench 9 to unscrew the nut M6 and then pull out the connection bolt.
Note: Be careful to not lose 2 washers which will fall down after bolt removal – see picture below.



The picture shows 2 washers which adjust clearance of the rod swivel bearing inside the nose leg lever.



Remove the right rod out of the plane.

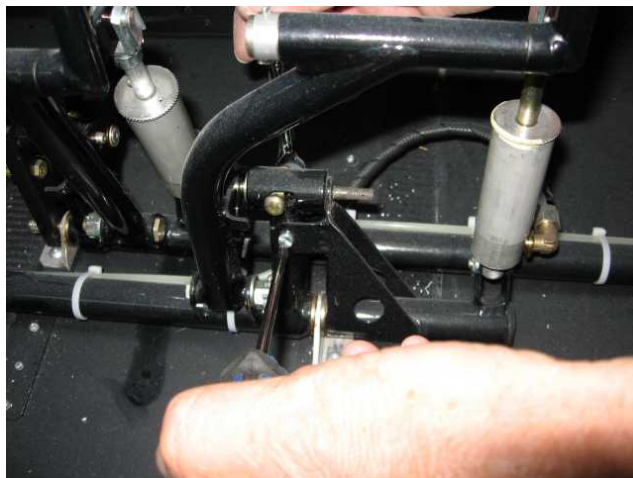




Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.7.5. Brake Pump Bracket Disassembly

Use a flat screwdriver to screw a small screw off the co-pilot left pedal.



Use the combination pliers to draw out a securing clamp which secures a pin that connects the brake pump top fork to the co-pilot left pedal. Then pull out the pin.



Pull the brake pump bracket sideward.



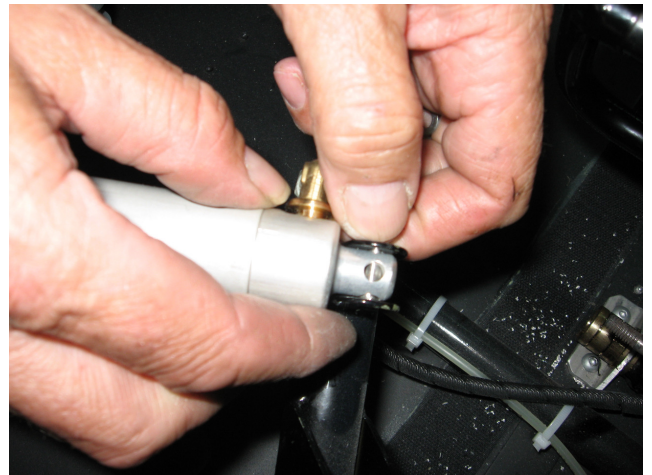
Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



Use the combination pliers to draw out a cotter pin which secures the brake pump lower connection pin.



Pull the connection pin out.





Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.7.6. Brake Pump Bracket Re-installation

Bent washer tab to secure a nut on the rod end.



Bent another washer tab according to the picture.



Use a bolt, 2 washers, nut, cotter pin as listed below to connect the new BRAKE PUMP BRACKET E4 90-24 01 to a new RIGHT ROD E4 90-31 02.

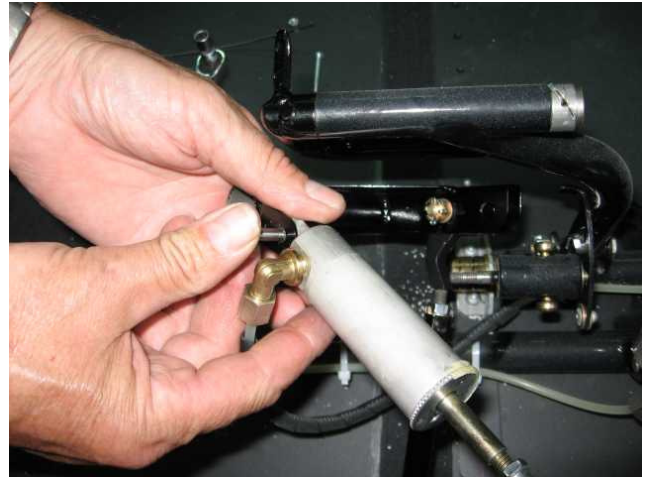
BOLT 6x23	1 pc.
WASHER 6x1.5	2 pcs.
NUT M6	1 pc.
COTTER PIN 1.6x14	1 pc.



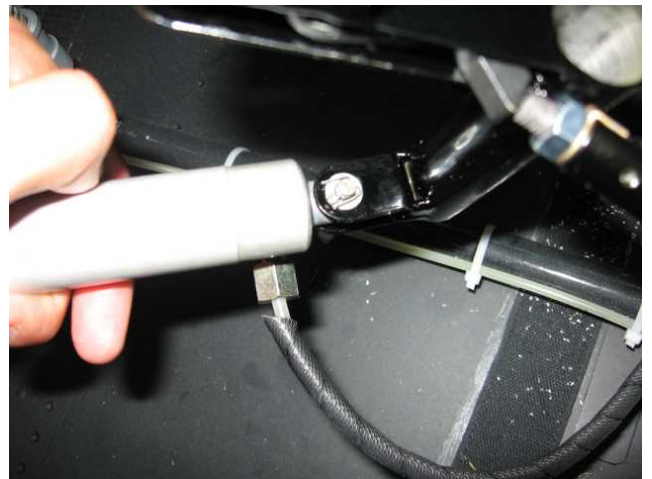
Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



Insert a pin to connect the Brake pump to the BRAKE PUMP BRACKET E4 90-24 01.



Insert new COTTER PIN 1.6x14 and bent its ends.



Put the BRAKE PUMP BRACKET E4 90-24 01 back onto the screw.





Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

Use nut wrench 9 to screw on the nut M6.



Install new COTTER PIN 1.6x14 to secure the nut.



Use a flat screwdriver to screw in the copilot left pedal the small screw.



Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane



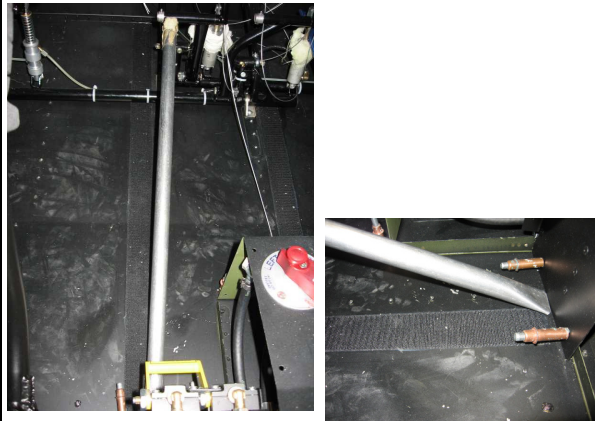
Re-insert the pin to connect brake pump top fork to the co-pilot left pedal.



Set the nose wheel as well as the rudder into the neutral position.

Use a suitable tube or bar of 55 cm length (21.7 in) to fix the standard pedals.

If your airplane has the pedals moved of 50 mm (2 in) forward, then length of the tube or bar should be longer – 60 cm (23.6 in).



Adjust length of both rods by turning their front ends to fit the nose leg lever with the rudder and nose wheel set in the neutral position.

Then tight the rod nuts and bent the washer tabs.



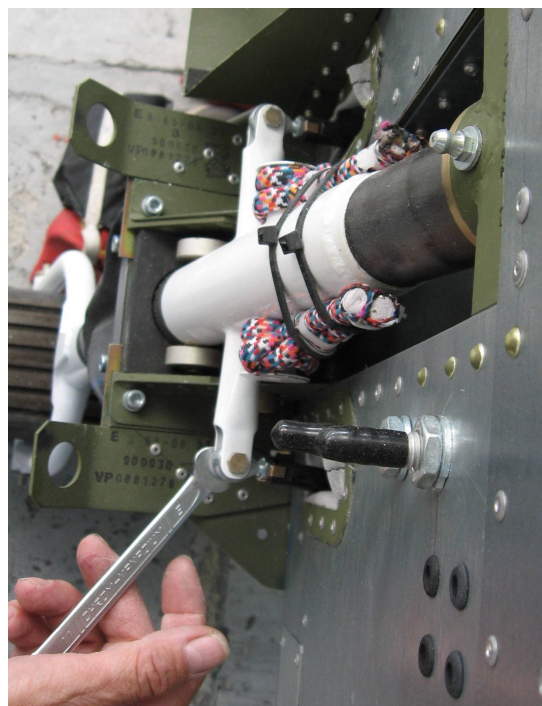


Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

Insert the right control rod connection bolt and do not forget to insert 2 washers between the swivel bearing and the nose leg lever (see detail picture). Screw on the nut M6 using nut wrench 9 and then secure with the COTTER PIN 1.6x14.



Follow the previous procedure to connect and secure left control rod.





1.7.7. Installation of the New Copilot Left Pedal

The shape of new co-pilot left pedal was designed in order to increase a gap between this pedal and pilot's right pedal. This was achieved by larger diameter of bending the copilot left pedal.

1. Use combination pliers to draw out a cotter pin 2x18 (see 1.).
2. Use the combination pliers to draw out a cotter pin 2x20 (see 2.) and release the nut M8 using nut wrench 13.
3. Remove the co-pilot left pedal and replace it by the new one E4 90-12 01 supplied with the kit.
4. Re-insert cotter pin 2x18 and bend its ends.
5. Screw on the nut M8, secure with the cotter pin 2x20.





Installation Procedure to Reduce Nose Wheel Steering Sensitivity of the SportStar Airplane

1.7.8. Re-installation of Dashboard Upper Cover

Re-install engine cowlings. First the lower one and then the upper one.



Position dashboard cover, screw slightly all attachment screws and then tight them using a Phillips screwdriver. Be careful to not scratch the paint.



1.7.9. Check of the Installation

Visually check that all connections are secured.

Turn fully the nose wheel to the left and check that there is no collision between the new control rods and levers. Then turn the nose wheel fully to the right and repeat the check.

Before the next takeoff perform several turns during taxiing to check the nose wheel steering and familiarize with the reduced sensitivity. Also cross over some bumps (a catchwater etc.) to check there is no collision of nose leg control and damping. Check that the plane does not turn with the rudder and nose leg neutralized (it should be no cross wind during such testing).

If the plane turns, adjustment of the control rod length at the nose leg connection will be necessary.

You can takeoff if everything is found OK.

Finally make an entry into the Airplane Log Book