



Service Instruction

TAT SI11-01, Revision A

Issued: 03/31/2011

Revised: 06/22/2016

Model SR22 w/ Turbonormalizer

Installed per STC SA10588SC

And SE10589SC

SUBJECT

Exhaust system inspection, cleaning, and lubrication

COMPLIANCE

RECOMMENDED: Tornado Alley Turbo considers compliance with these Service Instructions to be an important part of the aircraft maintenance program that should not be ignored. These instructions are effective on the date of issue. First inspection should be completed concurrent with the next scheduled maintenance event. Continued inspections should occur at each annual inspection and all V-band clamp replacement occurrences. The service activities described in this document should occur more often if the routine inspections of the exhaust system condition reveal evidence of excessive deposits or lack of movement at the slip joints.

EFFECTIVITY

All Cirrus Design SR22 aircraft equipped with a Tornado Alley Turbo Inc. Turbonormalizing System installed per STC SA10588SC and SE10589SC.

APPROVAL

Engine Technologies, Inc., the Turbonormalizing System STC holder, has approved all technical data in this Service Instruction that affect the type design.

PURPOSE

The purpose of this Service Instruction is to instruct owners of Turbonormalized Cirrus Design SR22 airplanes to have the exhaust slip joints inspected, cleaned and lubricated on a regular basis to prevent damage to the exhaust. This Service Instruction does not preclude the need for thorough inspections of the entire exhaust system on a regular basis as outlined in the turbonormalizing system Instructions for Airworthiness, TATI Report 22-6460004 (available at www.taturbo.com/drawings/).

DESCRIPTION

The exhaust systems on Cirrus SR22 aircraft with the turbonormalizing system installed per STC's SA10588SC and SE10589SC employ traditional slip joints to accommodate expansion and contraction of the exhaust system during normal operation of the aircraft. Over time, the slip joints may bind due to build up of combustion byproducts, galling, hardening of the slip joint compound, misalignment of the exhaust components, operation at excessive TIT/EGT's, or a combination of the above. It is very important that the slip joints in the exhaust system remain free to prevent damage to the exhaust during thermal cycling which may then lead to deformation, cracking or rupture of the exhaust manifold and, thereby, leading to possible engine compartment damage, or even fire. If the exhaust is breached, then there may also be a risk of carbon monoxide finding its way into the cabin. Field experience suggests that slip joint binding may be found more often on the left hand side, than the right hand exhaust.

FREQUENCY

The initial exhaust system slip joint inspection is to be completed at the next scheduled maintenance event. Inspection intervals after the initial inspection should coincide with subsequent annual inspections and the V-band clamp replacement intervals as outlined in TATI SB09-01 and the TATI Instructions for Airworthiness, document number 22-6460004. Otherwise, at any time the cowling is removed, the slip joints should be observed for any indication of binding, distortion, or damage due to excessive temperatures. The intent of this Service Instruction is to ensure that the slip joints in the exhaust system remain unrestricted in their ability to allow the exhaust components to slide at the slip joints as the exhaust components expand and contract during heat cycles under normal engine operations. Monitor the condition of the exhaust system during every inspection required by TATI SB09-01 and TATI Instructions for Airworthiness, document no. 22-6460004, and adjust the interval times for this procedure for each side of the exhaust as required.

WARRANTY INFORMATION

Initial and repetitive inspection labor time is not covered under warranty.

MANPOWER REQUIREMENTS

For inspection of exhaust system slip joints: One mechanic, ten to twenty minutes

For removal, cleaning, lubrication and installation of one side of exhaust: One mechanic, 4 to 5 hours

WEIGHT AND BALANCE

Weight change: None.

MATERIAL INFORMATION

The following items should be replaced when complying with the cleaning procedures of this Service Letter

For each exhaust side:

3 each Continental P/N 653458 exhaust gaskets

1 each Continental P/N 636465 turbocharger gaskets

2 each FG0120830 wastegate gaskets

Never-Seez® Pure Nickel Special high-temp anti-seize lubricant (P/N for 8 oz. brush top can: NSBT-8N)

The following items may be replaced upon condition. (The following list is based upon later model stamped exhaust manifold and straight tail pipe system. Item numbers are the same as item numbers listed in Report 22-6460006. Earlier model welded exhaust systems use 1.00 inch diameter heater SCEET instead of the 1.25 inch diameter SCEET listed below.)

Right Side Exhaust Hardware List			
ITEM	PART NUMBER	DESCRIPTION	QTY
3	AN3-3A	Bolt Heat Shield	3
4	AN4C12A	Bolt Wastegate Bracket Right	4
5	AN4C7A	Bolt Support Angle	2
6	AN5C6A	Bolt Lower Support	1
7	AN5C7A	Bolt Right Lateral Support	2
8	AN6C12A	Bolt Turbo	4
9	AN970-3	Washer Heat Shield	3
10	04-6400001-5-74-4	Heater SCEET Cooler To Pipe	1
11	04-6400001-5-120-4	Heater SCEET Pipe To Valve	1
29	MS20500-428	Nuts Exhaust	12
30	MS21046C4	Nut Support Angle	2
31	MS21046C4	Nut Wastegate Bracket Right	4
32	MS21046C5	Nut Lower Support	1
33	MS21046C5	Nut Lateral Support	2

34	MS21046C6	Nut Turbo	4
Right Side Exhaust Hardware List (continued)			
35	NAS1149C0463R	Washer Support Angle	4
36	NAS1149C0463R	Washer Wastegate Bracket Right	8
37	NAS1149C0563R	Washer Lateral Support	4
38	NAS1149C0563R	Washer Lower Support	2
39	NAS1149C0663R	Washer Turbo	8
40	10016H	Clamp-Heatshields	4
41	10028H	Clamp-Heat Shields	2
42	22-6400030	Heater SCEET Adapter	2
44	11-1180001	SCEET Hanger Kit	1

Left Side Exhaust Hardware List			
ITEM	PART NUMBER	DESCRIPTION	QTY
3	10028H	Clamp Heat Shield	3
6	AN3-3A	Bolt Heat Shield	3
7	AN4C11A	Bolt Wastegate Bracket Left	1
8	AN4C12A	Bolt Wastegate Bracket Left	2
9	AN4C13A	Bolt Wastegate Bracket Left	1
10	AN4C6A	Bolt Bushing Bracket	1
11	AN4C7A	Bolt Rod Support Angle	2
12	AN5C7A	Bolt Left Lateral Support	2
13	AN6C12A	Bolt Turbo	4
14	AN970-3	Washer Heat Shield	3
15	04-6400001-5-56-4	Heater SCEET Cooler To Pipe	1
16	04-6400001-5-140-4	Heater SCEET Pipe To Valve	1
22	10016H	Clamp-Heat Sceet	4
34	M21046C4	Nut Bushing Bracket	1
35	MS20500-428	Nuts Exhaust	12
36	MS21046C4	Nut Support Angle	2
37	MS21046C4	Nut Wastegate Bracket Left	4
38	MS21046C5	Nut Lateral Support	2
39	MS21046C6	Nut Turbo	4
40	AN525-832R6	Screw	2
41	NAS1149C0463R	Washer Support Angle	4
42	NAS1149C0463R	Washer Wastegate Bracket Left	8
43	NAS1149C0463R	Washer Bushing Bracket	1
44	NAS1149C0563R	Washer Lateral Support	4
45	NAS1149C0663R	Washer Turbo	8

ACCOMPLISHMENT INSTRUCTIONS (initial and repetitive inspections)

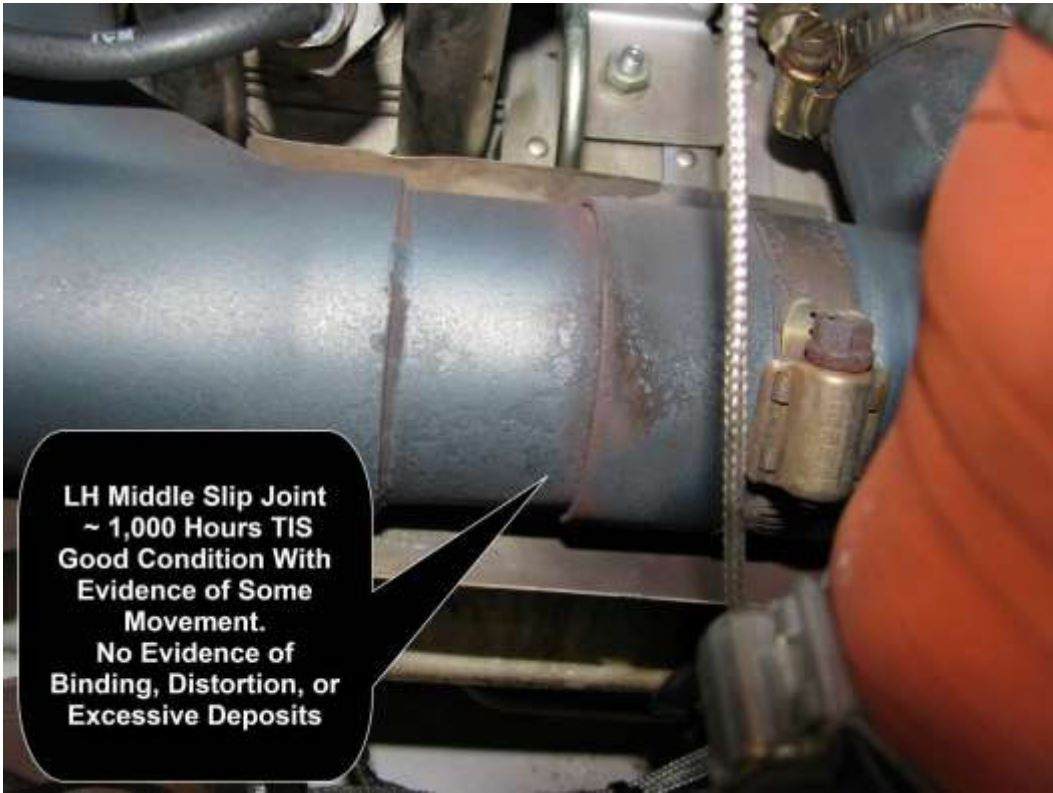
1. Visually inspect the slip joints on both sides of the exhaust system. Use a flashlight and mirror where needed to be sure that each slip joint is inspected completely. Remove the heat shields on the exhaust to gain improved visual access to the slip joints. Replace the heat shields when done inspecting the slip joints. The heat shields are held on the exhaust with stainless steel clamps. Replace heat shield clamps as needed. Look for signs that each slip joint remains unrestricted in its ability to allow the exhaust components to slide at that slip joint. Examples of normal slip joints are shown below:



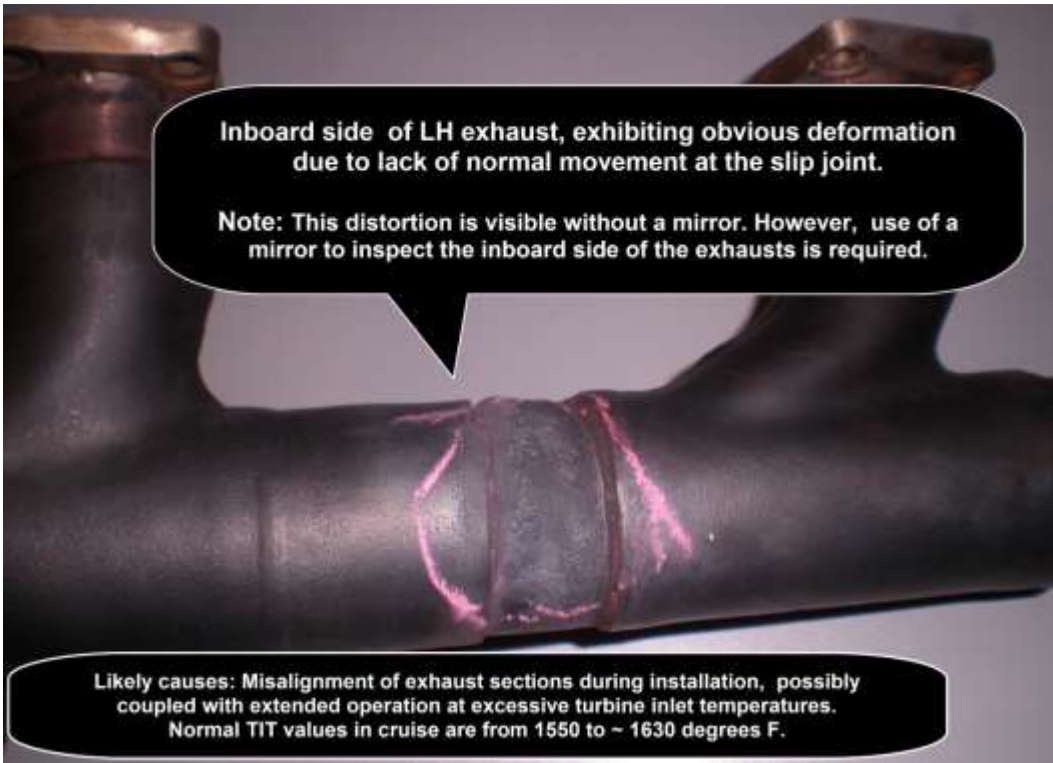
**LH Side Exhaust. ~ 1,000 Hours TIS.
Overall Good Condition. Heat Shields
in Place. No Evidence of Binding,
Distortion, or Excessive Exhaust
Leakage.**



**Left Hand Side
Forward Slip Joint
~ 1,000 Hours TIS
Good Condition With Evidence of Some
Movement / Slippage
No Evidence of Binding or Excessive
Exhaust Leakage**



An example of a binding slip joint:



2. If inspection of the exhaust system shows signs of one or more slip joints binding, disassemble the exhaust as required to gain access to the binding slip joint(s) and clean them as outlined in the Cleaning Instructions below. Damaged exhaust components must be replaced with new or serviceable components.

NOTE: The Cleaning Instructions are for an entire side of the exhaust. Disassemble exhaust as needed to clean and lubricate the binding slip joint(s).

CLEANING INSTRUCTIONS (per side)

1. Remove tailpipe, turbocharger, wastegate, and exhaust manifold as outlined in TATI Report 22-6460006. Report 22-6460006 is available on-line at www.taturbo.com/drawings/.
2. Disassemble exhaust manifold assembly. The slip joints may have to be soaked in penetrating fluid such as Mouse Milk® to loosen them.
3. Inspect exhaust components for cracks, bulges, wear, etc. per Instructions for Airworthiness, TATI Report 22-6460004 and TATI Service Bulletin SB09-01. Repair or replace parts as needed.
4. Clean all areas of slip joints with Scotchbrite® discs and/or pads to remove exhaust byproducts, signs of galling, oxidation, etc. Make sure all slip joint surfaces are as clean and smooth as practical. Verify that each slip joint allows relative movement of the mating components.
5. Apply a thin layer of Never-Seez® Pure Nickel Special high-temp anti-seize lubricant to both surfaces of each slip joint and reassemble exhaust manifolds.
6. Reinstall exhaust system using Report 22-6460006 as a guide. Use new exhaust gaskets and wastegate gaskets and turbocharger gasket. If the exhaust nuts do not have any run-on resistance replace with new ones. Torque all nuts and bolts to torque values listed in Instructions for Airworthiness, TATI Report 22-6460004 (also available at www.taturbo.com/drawings/).
7. Continue to monitor exhaust system condition as outlined in Instructions for Airworthiness, TATI Report 22-6460004 and TATI Service Bulletin SB09-01. Repeat Steps 1 through 7 as required.

PARTS AVAILABILITY: Contact Tornado Alley Turbo Inc. for replacement exhaust system components.