

service bulletin

M83-3

Technical Portions are
FAA-DER Approved

14 February, 1983

TO: Aircraft Manufacturers, Distributors, Dealers, Engine Overhaul Facilities,
Owners and Operators of Teledyne Continental Motors' Aircraft Engines.

SUBJECT: ROTO MASTER (Rajay) SERVICE LETTER 27 REVISION A DATED
SEPTEMBER 24, 1982 AND ADDENDUM THERETO DATED FEBRUARY 9,
1983 IN RESPONSE TO FAA AD 82-07-03.

MODELS

AFFECTED: New and Rebuilt L/TSIO-360E, EB, F, FB, GB and KB engines having the
following serial numbers:

NEW

TSIO-360E New Serial No's	303252 thru 303999, 304736 thru 304849, 307000 thru 307367
TSIO-360EB New Serial No's	307391 thru 307999, 311000 thru 311715
LTSIO-360E New Serial No's	304367 thru 304999, 306000 thru 306360
LTSIO-360EB New Serial No's	306382 thru 306999, 312000 thru 312700
TSIO-360F New Serial No's	305000 thru 305704
TSIO-360FB New Serial No's	305737 thru 305999, 310000 thru 310831
TSIO-360GB New Serial No's	309004 thru 309779
TSIO-360KB New Serial No's	315001 thru 315537
LTSIO-360KB New Serial No's	314000 thru 314516

REBUILT

TSIO-360E Rebuilt Serial No's.	225000 thru 225102
TSIO-360EB Rebuilt Serial No's.	234551 thru 234666
LTSIO-360E Rebuilt Serial No's.	225500 thru 225599
LTSIO-360EB Rebuilt Serial No's.	233751 thru 233863
TSIO-360F Rebuilt Serial No's.	232751 thru 232777
TSIO-360FB Rebuilt Serial No's.	237301 thru 237370
TSIO-360GB Rebuilt Serial No's.	237401 thru 237414
TSIO-360KB Rebuilt Serial No.	242901
LTSIO-360KB Rebuilt Serial No.	242922

COMPLIANCE: Within the next 50 hours of operation, the next annual or 100 hour inspection,
whichever comes first and at each 200 hour interval thereafter until the P/N
643931 housing is installed.

A new turbocharger, part number 646396, with a new exhaust housing is now in production on
the above listed engine models. The new turbocharger has serial numbers 203570 thru 203654
and 204000 and after.

All affected engines must comply with the attached Roto Master Service Letter 27 Rev.A. All affected housings have the single letter "N" cast on the housing.

The new housing, P/N 643931 are manufactured using ni-resist D5S material and are identified by the letters "DN" cast on the housing.

1. GOLD MEDALLION COVERAGE

If compliance with the above Service Letter required replacement of the turbine housing within the first six (6) months or 240 hours of operation (whichever occurs first) of any engine covered by the Gold Medallion Warranty, TCM will replace the housing, TCM P/N 643931, and gasket TCM P/N 643932, and pay for one (1) hour of labor costs associated with such replacement.

2. ADDITIONAL PARTS COVERAGE

If compliance with the above Service Letter required replacement of the turbine housing after the expiration of the applicable six (6) month or 240 hour period described above and before the expiration of a total of 12 months. TCM will replace the housing, TCM P/N 643931, and gasket, TCM P/N 643932, but will pay no labor costs in connection with such replacement.

3. SPECIAL POLICY DUE TO AD 82-17-03

After expiration of the 12 month period described above on those housings with 300 hours or less time in service, TCM will supply replacement housing at no charge pending verification by inspection that replacement was in accordance with Roto Master Service Letter 27 Revision A. No labor will be authorized. This special program expires on February 1, 1984. All claims and parts must be submitted to TCM by April 15, 1984.

When purchasing the above parts for replacement under any of the adjustments specified above, please refer to Service Bulletin M83-3 and the warranty claim number.

Replacement parts will be available for purchase for engines not qualifying for any of the adjustments described above. The standard replacement parts warranty (Aircraft Engine Parts, Component and Accessory Warranty) will apply to such purchases.

NOTE...The 2 P/N 633358 clamps that attach the tail pipe and exhaust system to the turbocharger utilize two different style attach bolts. These clamp attach bolts are interchangeable and both are acceptable.



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REVISION A

7101 FAIR AVENUE - NORTH HOLLYWOOD, CALIFORNIA 91605 - (213) 982-4500

SERVICE LETTER NUMBER 27

FAA APPROVED

REFERENCE: AD 82-27-03 (Effective December 30, 1982)

SUBJECT: Rajay Turbocharger Model 325E10 Inspection of Turbocharger Turbine Housings P/N TC-60-11 and/or 600510-01, 600510-02.

EQUIPMENT AFFECTED: Applies to all affected engines and airplanes certificated in all categories that have installed Rajay turbocharger model 325E10.

DISTRIBUTION TO: Aircraft Manufacturers-
Aircraft Engine Manufacturers-
Aircraft Maintenance and/or Modification Bases

Time of Compliance: Inspection of the turbocharger turbine housing required:

Within 50 hours unit time in service, or at the next aircraft annual or 100 hour inspection, whichever comes first, and Then at 200 hour time-in-service intervals.

Reason:

Formation of hairline cracks has been discovered in the inlet area of the turbocharger turbine housing (Rajay part number TC-60-11 or 600510-02) used on Model 325E10 Rajay turbochargers in production since June 1976. In some cases, the crack in the above referenced area (tongue area) may have propagated through the outer wall of the turbine housing.

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Therefore, visual inspection is required as referenced in above "Time of Compliance" paragraph to detect the possible formation and/or propagation of subject hairline cracks in the turbine housing.

Upon replacement of the subject turbine housing per instructions Ala, A2b(2) with a new improved-material turbine housing (D5S Ductile Ni-Resist), P/N 600510-04 (TCM P/N 643931**), this Service Letter no longer applies.

DESCRIPTION:

Perform a visual inspection of the turbine housing P/N TC-60-11 and/or P/N 600510-01, 600510-02, to determine existence of cracks as indicated in Figure 2, Views 1, 2 and 3.

A. Turbocharger Inspection (See Section B for detailed inspection instructions)

1. Inspection of Turbocharger Installed on Engine - After the initial 50 hours Turbocharger time-in-service operation and/or at next aircraft annual and/or 100 hours inspection, whichever occurs first, and thereafter at every 200 hours unit time-in-service, but not later than May 31, 1983. Visually inspect the Turbocharger turbine housing to ascertain possible presence of cracks penetrating the outer wall as shown in View 3.
 - a. If Outer Wall Is Penetrated - Replace the turbine housing and gasket with a new P/N 600510-04 (TCM P/N 643931**) housing and new P/N 600400-00 (TC-6-30) (TCM P/N 643932**) gasket prior to the next flight.
2. Inspection of Turbocharger Removed from Engine - Visually inspect the turbocharger turbine housing through the exhaust port for presence of cracks as shown in View 1.

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- a. If No Cracks Are Found - on the inner or outer wall of the turbine housing, reinstall turbocharger, and at the 200 hours time-in-service repeat the inspection of the unit per A.1. above
- b. If An Internal Crack Is Found - remove turbine housing and inspect for cracks as shown in View 3.
 - (1) If All Internal Cracks are found within the limits of Views 1, 2 and 3, then the turbine housing may be returned to service, but continue to monitor the crack propagation at next and subsequent 200 hours time-in-service.
 - (2) If An Internal Crack Exceeds The Limit - as shown in Views 1, 2 or 3, then the turbine housing and gasket must be replaced with new housing as specified in A. 1.a above.

CAUTION

In any case, when a crack penetrates the outer wall of a turbine housing as shown in View 3, the turbine housing and gasket must be replaced prior to the next flight.

If a crack has penetrated the housing, inspect the surrounding engine components, hoses, clamps and mounts for possible heat damage and replace as necessary.

If unable to determine the part number or revision letter of the turbine housing, assume it is an affected part and perform inspections per this Service Letter.

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B. Detail Inspection Instructions

In certain aircraft installations, it may be possible to inspect the turbine housing inner and outer walls for penetrating cracks per Views 1 and 3, without removal of the turbocharger from the aircraft. In any event, the exhaust manifold must be disconnected from the coupling V-band so that the turbine housing internal area near the nozzle can be seen as shown in View 2. If a thermal blanket is installed on the turbine housing, it must be removed. (See Figure 1.)

To inspect the turbine housing for internal cracks per View 2, remove the complete turbocharger from the aircraft as per aircraft maintenance manual.

CAUTION

Before removing the turbocharger, make sure spare turbine housing gaskets are available. Do not attempt to reuse the gasket. (P/N 600400-00 or TC-6-30 or TCM P/N 643932**)

1. Remove the turbine housing blanket (if installed). (See Figure 1.)
2. Disconnect the exhaust manifold by removing the coupling V-bands.
3. Make "index marks" on the turbine housing and on the aluminum bearing housing so the turbine housing will be reinstalled in the same correct rotational position.
4. Remove the V-band nut and carefully remove the bearing housing V-band (P/N 600391).
5. Remove the turbine housing from the bearing housing and inspect per Description A.1. and 2. Light tapping at the joint with a rawhide mallet will help separate them.
6. While the housing is off, inspect the turbine wheel and heat shield for condition and/or foreign object damage.

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NOTE: When the turbine housing is off, the turbine wheel should be in contact with the adjacent heat shield and rotating it should be difficult. If not, a Roto-Master or TCM service representative should be contacted.

7. Carefully remove all parts of the turbine housing gasket and replace with a new P/N 600400-00 or TC-6-30 or TCM P/N 643932** gasket.
8. If a new turbine housing is needed, order Roto-Master P/N 600510-04 (or TCM P/N 643931**).
9. After inspection, clean the two mating diameters and gasket surfaces on the turbine housing and bearing housing.
10. Reinstall the same or a new turbine housing as appropriately mandated by this inspection onto the bearing housing in the original rotational position.

NOTE:

The turbine housing and bearing housing must be pressed together while the V-band is being reinstalled. A light tapping on the V-band with a rawhide mallet will help to tighten and seat the V-band.

11. Assure that the turbine housing is in the exact same rotational position (use the marks made earlier), the V-band is in the approximate same position and tighten the V-band nut to 15 to 20 inch/pounds torque. Do not overtighten.
12. Reinstall the turbine blanket (if used - see Figure 1) and check for free rotation of the turbine wheel. Do not reinstall if rotation is difficult or scraping noises are heard.
13. Reinstall the turbocharger on the aircraft per aircraft maintenance manual. Take special care that all oil lines and fittings are clean, undamaged and unobstructed.

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14. If housing -is replaced because of cracks, complete the FAA Malfunction or Defect Report, Form 8330-2 and submit to the local FAA GADO office.
15. Check that the V-band torque is still 15 to 20 inch/pounds after next flight or run-up.

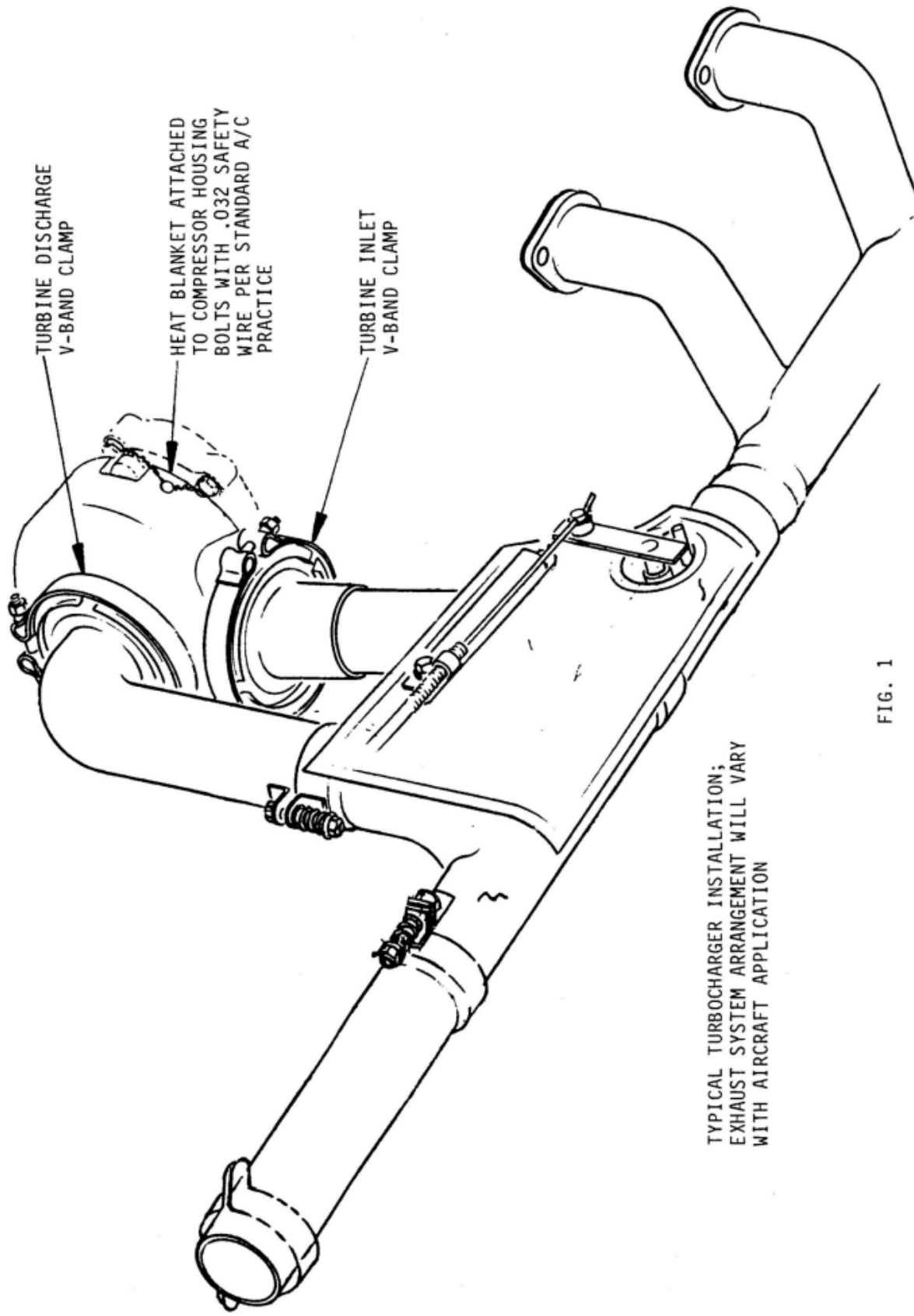
References and Notes:

** Teledyne Continental Motors (TCM) part numbers.

Roto-Master plans to offer a rebuilt exchange program.

For additional information, contact:

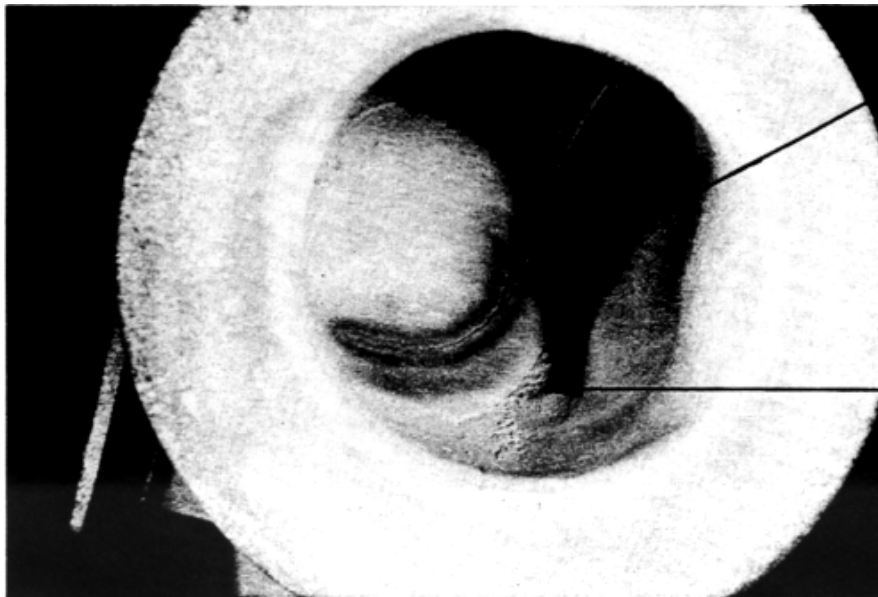
Roto-Master, Inc.
7101 Fair Avenue
North Hollywood, CA 91605
ATTN: Aircraft Field Sales Manager



TYPICAL TURBOCHARGER INSTALLATION;
EXHAUST SYSTEM ARRANGEMENT WILL VARY
WITH AIRCRAFT APPLICATION

FIG. 1

VIEW 1 Turbine Housing Exhaust Inlet Internal Cracks.



INTERNAL CRACK

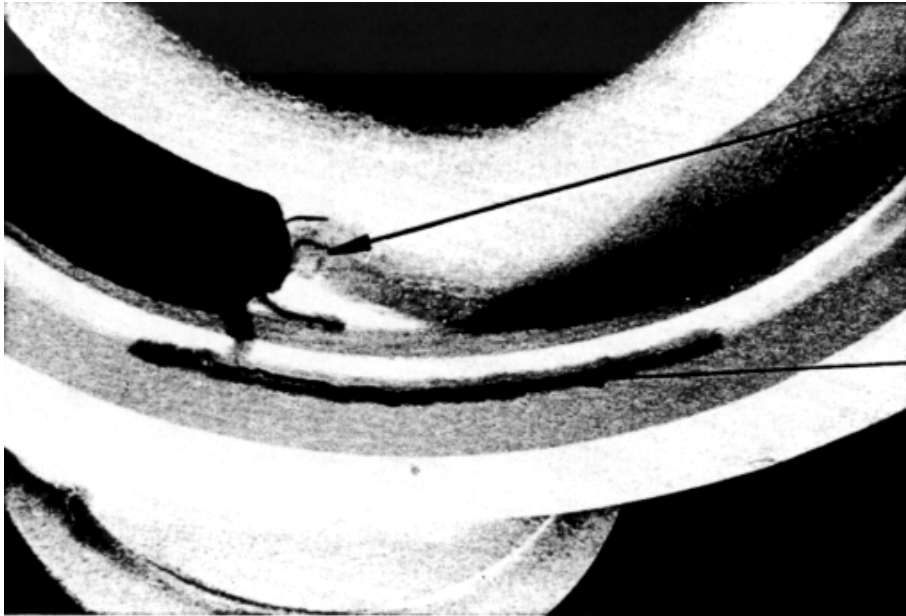
Cracks in this area are allowable to a length of .75 inch maximum.

NOTE

Do not misrepresent the casting parting line in this area as a crack.

FIG. 2 TURBINE HOUSING VIEWS

VIEW 2 View of Turbine Housing with turbo center section removed.



Cracks in this area allowable to 3/4 inch.

Cracks in this area allowable to 2 inches.

VIEW 3 View of Turbine Housing with external cracks



No cracks of any length in this area. If cracked, replace immediately.

FIG. 2 (cont.) TURBINE HOUSING VIEWS

SERVICE LETTER 27A ADDENDUM

The following information is an addendum to Roto-Master Service Letter 27A and should be attached thereto and made a part thereof.

The model number 325E10 includes models 325E10-1 and 325E10-2. The new Rajay model number 3AT6EE10J2 is identical to the older model number 325E10-1 and is also affected by AD 82-27-03.

Roto-Master turbochargers after serial number 203570 came equipped with a 600510-04 D5S Ductile Ni-Resist turbine housing and are therefore not affected by AD 82-27-03.

The 600510-02 Type 3 Ni-Resist housing that is affected by AD 82-27-03 has the letter "N" cast on the outside of the scroll. The 600510-04 D5S Ductile Ni-Resist turbine housing that terminates this AD has the letters "DN" cast on the outside of the scroll.

The following Rajay engine STC's are affected by AD 82-27-03:

STC

SE14WE
SE154SO
SE32WE

ENGINES

LYC 10-320, LIO-320
LYC 0-360
LYC 10-360, LIO-360

The TCM TSIO-360 engine is affected by AD 82-27-03 when it is equipped with a Rajay turbocharger that has a serial number prior to 203570.

The other engines mentioned in the AD do not come factory equipped with a Rajay model 325E10 turbocharger. The Rajay systems for these engines do not use a model 325E10 turbocharger. These engines are affected by AD 82-27-03 only when model 325E10 or 3AT6EE10J2 has been installed in place of the original turbocharger by an FAA field approval or a non Rajay STC. The engines that fall into this category are as follows:

Lycoming 0-320, TO-360, 0-540, and TIO-540

Continental 0-470, 10-470, 10-520, and TIO-540

The Rajay turbine inlet gasket part number is RJ0115. The Rajay turbine discharge gasket part number is RJ0114. The turbine inlet and discharge V-band clamps are tightened to 20-30 in. lbs. The TCM TSIO-360 does not use turbine inlet or discharge gaskets.