DOCKET NO.: SA-515

# NATIONAL TRANSPORTATION SAFETY BOARD
# WASHINGTON, D.C.

## MAINTENANCE GROUP CHAIRMAN'S FACTURAL REPORT

## ATTACHMENT 8

## PRATT & WHITNEY JT8D ENGINE MANUAL
## FRONT COMPRESSOR HUB INSPECTION
## SECTION 72-33-31

## (12 PAGES)

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INSPECTION

Inspection

Task 72-33-00-2

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orescent penetran
See Task 72-33-31-
Repair-05 and

Figure 801.
following areas

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tion of hub.
ee instructions in
Inspection-01.

OF CONTRARY INSTRUCTIONS, THE ONLY CHEMICAL CLEANING METHOD ALLOWED FOR ROUTINE OVERHAUL CLEANING OF TITANIUM AND TITANIUM ALLOY PARTS IS SPOP 18. ALSO, THIS CLEANING METHOD SHOULD ONLY BE APPLIED WHEN SPECIFICALLY CALLED FOR.

TITANIUM WELDMENTS AND ASSEMBLIES SHOULD NOT BE PROCESSED THROUGH TRICHLORETHYLENE DEGREASERS OR ANY CLEANER CONTAINING CHLORIDES. IN ORDER TO AVOID POSSIBILITY OF STRESS CORROSION ASSOCIATED WITH ENTRAPMENT OF CHLORINE CONTAINING MATERIALS IN TIGHT FITTING AREAS. THIS RESTRICTION ALSO APPLIES TO PARTS SUCH AS TITANIUM DISKS OF HUBS CONTAINING PLUGS, SLEEVES, OR PINS. TITANIUM DISKS MUST BE DEBLADED PRIOR TO CLEANING AND FLUORESCENT PENETRANT INSPECTION.

DO NOT WIRE BRUSH TITANIUM DISKS AND HUBS FOR ANY REASON SUSPECTED DEPOSITS OF CADMIUM

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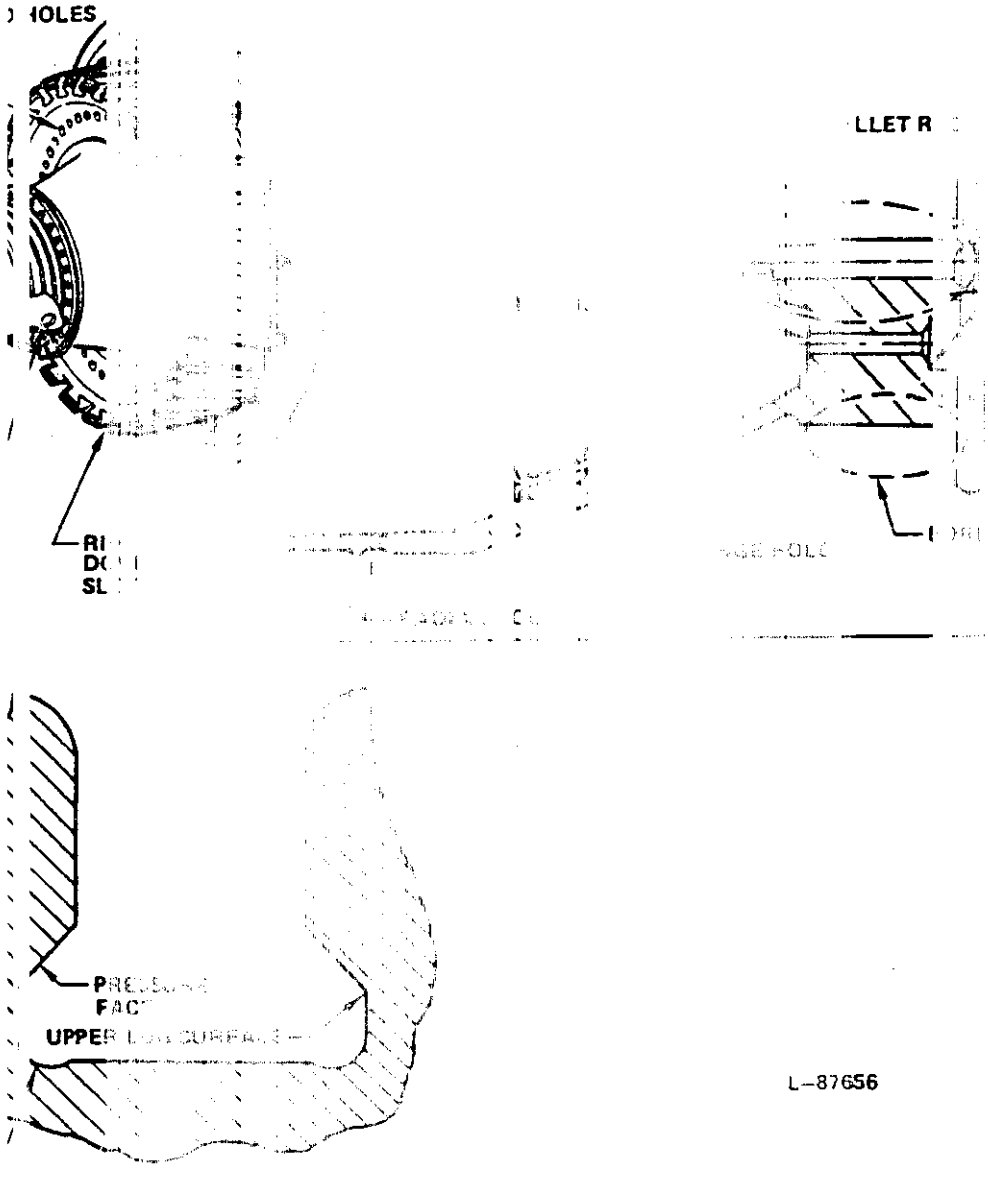


Critical Inspection Areas
Figure 801
(Task 72-33-31-22-00

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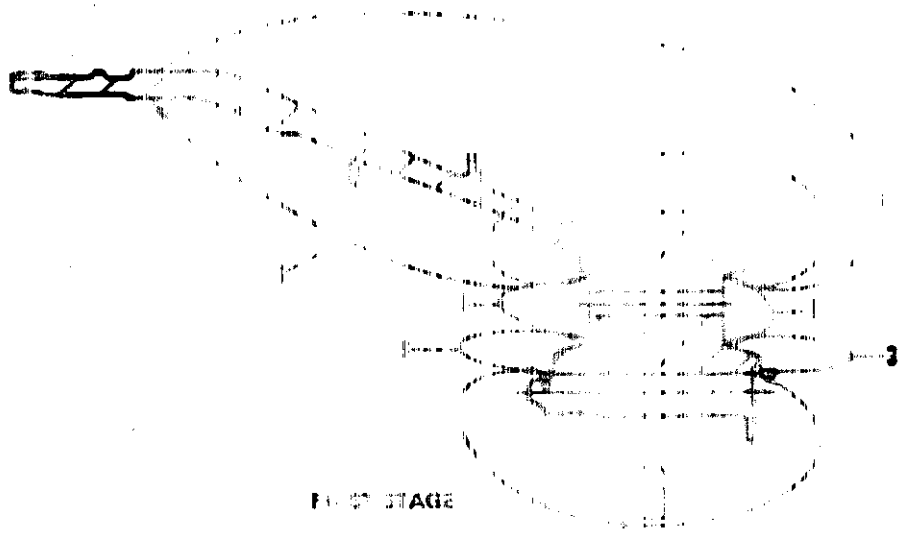


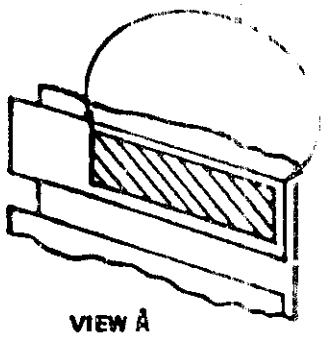


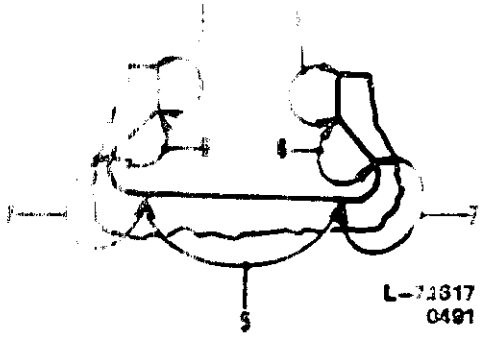


Surface Damage Limits
Figure 802
(Task 72-33-31-22-030)

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Unre Allowed In Snag Framework. Damage To
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r Tas Repair-06) No Damage Is Allowed
adius Snag Diameter Greater 0.125 Inch
3.175 Surface
atter Damage To 0.00 Inch (0.076 mm) Deep In Slot
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atter Damage And Round Bottom Depressions Up To
.001 mm) Deep Are Acceptable Without Repair.
vider Shall Be Removed By Shotpeening Per Task
2-33- Repair-02). Scattered Surface Damage Up To
.005 mm) Shall Be Shotpeened Per Referenced
epai Grinding After Shotpeening May Be Locally
lend Inch (0.076 mm) Deep And Reshotpeened To
equi
Unre Damage Allowed Local Blend Repairing
o Ma Inch (0.127 mm) Depth Is Permitted

To Figure 8

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b) ...to co... which repairs ... acceptable ... desirable to blend repair these areas. The sharper the surface finish the more desirable it is to blend area. Blend repair per Task 72-33-03-04. (Repair-14.

c) Repeatability and repairability of specific areas of disk shall be made with reference to Figure 803. Enclosed areas are to corners, points of tangency between surfaces, or flat points opposite one of these locations.

CAUTION UNDER NO CIRCUMSTANCES SHALL THE SNAP DIAMETER OF DISK BE CHANGED, AS EVALUATION OF DISK GROWTH WOULD BE IMPAIRED.

d) A ripple observed in web or in a surface between bore and snap does not cause a material reduction in thickness and is acceptable.

Subtask 72-33-31-22-062
(4) Service time marking
See Figure 803.
(a) Inspect disk for markings. Markings in areas other than disk OD tang are unacceptable. Such areas must be blended out and disk remarked in acceptable area.
(b) Use metal stamp (roll) drag impression, or non-etching ink for marking
(c) See Time Limits, for disk life.

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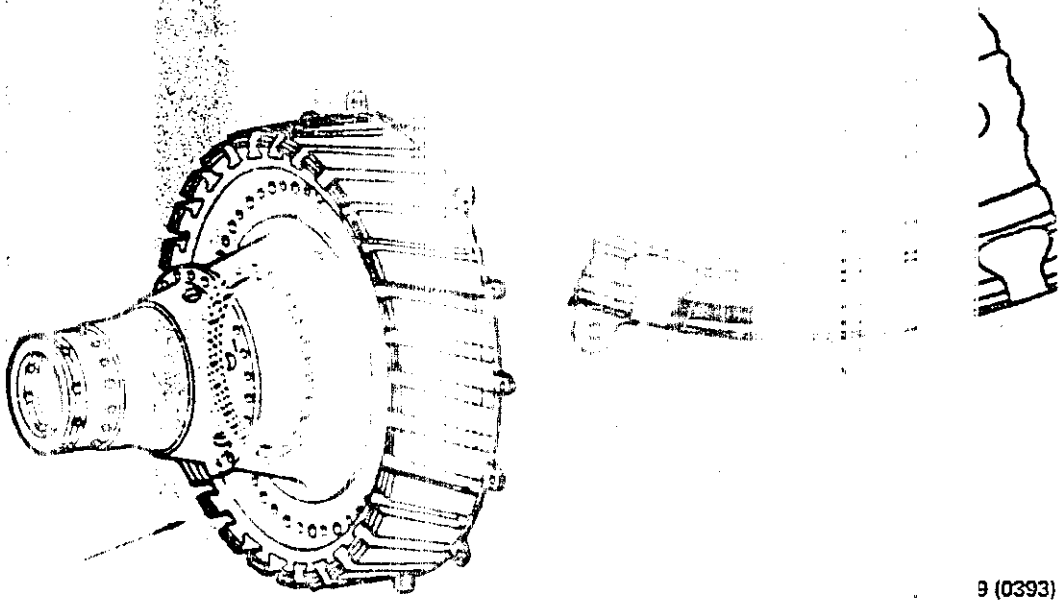

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1. Service and Time Marking Area
2. 0.060 Inch (1.524 mm) Minimum Radius Around

R Hub Service Time Marking
R Figure 803
Task 72-33-31-22-010



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13.3 95 Inches (338.4...
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4.91 ches (124.84 -

Key To Fig...

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imum width of 0.... 4.762 mm). These
nits may be indivi... cumulative total.
tal scoring of ent... length of journal to maxi-
a 0.010 inch (0.254 ...) depth and maximum width
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lividual or cumula... total.
oring and/or gall... of journals in area other
an bearing seating ... acceptable to depth o
015 inch (0.381 mm ... as not more than 15
rcent of area is affected.
arp ridges and meta... pick up must be removed to
sure smooth surfac... mmetrable to remainder of
rnal.
aged journals must ... hardness tested in three
ces around circumfe... to Rockwell C32 - 41,
equivalent. Blend ... hardness test marks.
pair damaged journ... per Task 72-33-31-30-016,
epair-16).

Subta... -22-056
( ... slots inspection
cial attention shall be given to surface of
ont compressor rotor front hub broached slots.
spect broached slots for machining demarkations,
ops, irregularities and/or discontinuities.

(b) Hubs showing evidence of surface tears, sharp depressions, or folded material indicative of displaced metal, attributed to shotpeening of a rough broached surface, should be scrapped.
(c) Strip blade slots of antigalling compound, shotpeen, and reapply compound per Task 72-33-31-30-002, (Repair-02).

Subtask 72-33-31-22-057
→ (9) Tiered and/or counterweight hole inspection.
(a) Clean hub per Task 72-33-00-10-001, (Cleaning-01).
(b) Clean each hole with acetone and cotton swab.
(c) Mount hub on tilted, rotating holding fixture and illuminate opposite end of hole from viewing end.

NOTE: EACH HOLE MUST BE INSPECTED FROM BOTH SIDES.

(d) Smooth, continuous finish for entire surface of hole is acceptable.
(e) Superficial tool marks such as those caused by normal cutting tool removal following machining or by tiered installation and removal are acceptable. Deep tool marks or steps that interrupt normal, smooth machined surface of hole are cause for rejection.
(f) Shallow circumferential tool marks in a thread pattern are acceptable. Circumferential tool marks showing tearing or smearing of metal are cause for rejection.
(g) Evidence that finish machining did not remove all traces of semi-finished machined surface is cause for rejection. Repair tiered holes per Task 72-33-31-30-015, (Repair-15).

NOTE: Hubs with holes displaying metal tearing or smearing, deep circular scoring, or machining discoloration shall be scrapped.

Subtask 72-33-31-22-058
(10) Inspect labyrinth seals as follows.
(a) No cracks are permitted on seals except those cracks in knife-edge seal area which can be blended within limits.
(b) If seals are dropped or subjected to accidental shock, inspect knife-edges and end faces for damage.

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FROM COMPRESSOR REAR HUB (STAGE 8R) - INSPECTION-01

[illegible]-edge seals bent [illegible] than 0.0[illegible] inch
[illegible] mm) as measured [illegible] relative to normal
vertical position may be [illegible] without repair
provided there are [illegible] Knife-edge seals
bent in excess of [illegible] 0.381 mm) may be
straightened per Table [illegible] 72-30-001, (Repair-01)
provided that there are [illegible] number of cracks before
straightening is performed.
Knife-edge seals may be
blended provided blending can be done within
limits that follow:

(1) Removal of material must not exceed one inch per each inch of circumference. Blends of three inches minimum length are required at knife-edges of each seal. However, blended areas must not be adjacent or overlap. See Table 72-30-001, (Repair-01).
(2) No cracks are permitted in any location after repair.
(3) OD diameters of seal rings must be matching ID diameters of seal rings and must be such that, when assembled, applicable clearances shall be within those given in Section 71-00-00 Inspection-02, Reference 210).
(4) One knife-edge per seal may be 0.003 inch (0.076 mm) over present replace limits provided all other knife-edges on same seal are within service limits.

Subtask [illegible]-33-31-22-059
(11) Inspect disk airseal knife-edges
See Figure 805

CAUTION: IF AN AIRSEAL IS REMOVED, IT MUST BE REPLACED WITH A NEW AIRSEAL.

(a) Seals damaged in Area A may be blended by profiling, provided depth of blend does not extend into Area B. See figure
(b) Removal of material from knife-edge seal must not exceed 0.500 linear inch (12.7 mm) total (measured circumferentially around seal).
(c) Bent seals may be straightened provided such straightening does not result in seal cracking.
(d) Radial cracks in Area A are reparable provided they do not extend into Area B, or can be removed per step (a). Cracks beyond this point are unacceptable.

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Maximum [illegible]
Broken Sharp [illegible]
Reference Area
Reference Area

Non Cutting Edge Radius
Figure 40
Substrate [illegible]

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