

TECHNICAL BULLETIN

Bell Helicopter **TEXTRON**

A Subsidiary of Textron Inc

No. 212-00-182

Date: 06-30-00

Page 1 of 10

DATE
REV

MODEL AFFECTED: 212

SUBJECT: CYCLIC AND COLLECTIVE JACKSHAFTS,
INSPECTION AND MODIFICATION OF.

HELICOPTERS AFFECTED: Model 212 helicopters S/N 30502 through
31311, 32101 through 32152 and S/N 35001
through 35103.

[Model 212 helicopters S/N 35104 and
subsequent will have the intent of this bulletin
accomplished prior to delivery.]

COMPLIANCE: At operator's option but recommended at the
next 3000-hour/5-year inspection.

DESCRIPTION:

Bell Helicopter has been made aware that some cyclic and collective jackshaft assemblies have experienced internal corrosion. This bulletin outlines the details of a one-time jackshaft inspection and shows how to reassemble the jackshaft assemblies to further reduce the possibility of corrosion.

APPROVAL:

The engineering design aspects of this bulletin are FAA/DER approved.

MANPOWER:

Approximately 30 man-hours are required to accomplish this bulletin. Man-hours are based on hands-on time and may vary with personnel and facilities available.

MATERIAL:

Consumable Material:

The following material is required to accomplish the bulletin, however this material is considered consumable (bench stock) material and may not require ordering depending on the operators consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

Part Number	Nomenclature	Qty	Reference
MILS81733TY II-2 4OZ	Sealant	1	(C-392)
MILC81706 CL1AFORM11	Chemical Film Treatment	1	(C-100)
MIL-P-85582,TY1,CL2 (513X395/910X710 or equivalent)	Primer(1 Gal, 1 QT)	1	(C-204)
Corrosion Treatment for magnesium parts (see note below), made by mixing:			
CHROMIC ACID	Chromic Acid	1 LBS	(C-116)
CALCIUM SULFATE	Calcium Sulfate	1 Gal	(C-120)

-NOTE-

Calcium Sulfate will not completely dissolve. See Standard Practices Manual, paragraph 3-15, step 2 for mixing procedure.

SPECIAL TOOLS:

15° taper reamer

WEIGHT AND BALANCE:

Not affected.

ELECTRICAL LOAD DATA:

Not affected.

REFERENCES:

BHT 212 Maintenance Manual, Chapter 67
BHT 212 Component Repair and Overhaul Manual, Chapter 67
BHT 212 Illustrated Parts Catalog
BHT-ALL-SPM Standard Practices Manual
BHT-MED-SRM-1 Structural Repair Manual

PUBLICATIONS AFFECTED:

BHT 212 Maintenance Manual, Chapter 67
BHT 212 Component Repair and Overhaul Manual, Chapter 67

ACCOMPLISHMENT INSTRUCTIONS:

1. Make helicopter ready for maintenance.
2. Remove crew seats, carpets (if installed), control panels from pedestal and access panels under crew seats & aft of the pedestal to gain access to cyclic and collective jackshafts.
3. Remove cyclic jackshaft from helicopter. Refer to Maintenance Manual, chapter 67. Tag and identify hardware for reinstallation.

-NOTE-

Refer to figure 1 for the following steps.

4. Separate levers (1) & (5) from tubes (2) & (4). Tag and identify hardware for reinstallation.

-NOTE-

Levers (1), (3) & (5) may have been manufactured from aluminum or magnesium. Material should be identified (refer to Structural Repair Manual, Appendix B-3) and the appropriate surface treatment applied, when required. Aluminum is to be treated with chemical film (C-100) and magnesium with corrosion treatment (C-114), refer to Standard Practices Manual, Chapter 3. In order to remove corrosion and to ease the reassembly of the components, the levers (1), (3) and (5) may be machined down to 1.558 to 1.560 inch (125 RMS finish), treated with the appropriate surface treatment (C-100 or C-114) and primed (C-204). If the majority of the parts are found damaged beyond repair, a complete jackshaft assembly P/N 212-001-003-109A may be ordered. This assembly is pre-drilled & reamed and includes levers (1), (3) & (5), tubes (2) & (4) and necessary hardware.

5. Inspect levers P/N 204-001-332-001/-005 (1) and 204-001-356-001 (5) as per figure 2. Repair or replace parts that are found damaged or corroded beyond limits. Refer to C R & O Manual.

6. Inspect lever P/N 212-001-321-001 (3) as per C R & O Manual. Repair or replace parts that are found damaged or corroded beyond limits.

-NOTE-

The best way to transfer the holes to a new tube assembly is to have them drilled slightly undersized in a machine shop and taper-reamed on the aircraft.

7. Inspect tubes P/N 204-001-326-011 (2) & (4) per figure 3. Repair or replace parts that are found damaged or corroded beyond limits. Refer to C R & O Manual.
8. Reassemble lever (1) and tube (2) using Maintenance Manual, chapter 67 and the following instructions:
 - a. Insert lever into tube and wet-install the bushing and bolts using sealant (C-392).
 - b. Torque nuts to 50 to 70 in-lbs.
 - c. Completely coat both ends of bolts including washers and bushings with sealant (C-392).
 - d. Seal joint between tube and lever using sealant (C-392).
9. Reassemble lever (4) and tube (5) using steps 8a thru d.
10. Reinstall cyclic jackshaft in helicopter using steps 8a thru d and referring to Maintenance Manual, chapter 67.
11. Remove collective jackshaft from helicopter. Refer to Maintenance Manual, chapter 67. Tag and identify hardware for reinstallation.

-NOTE-

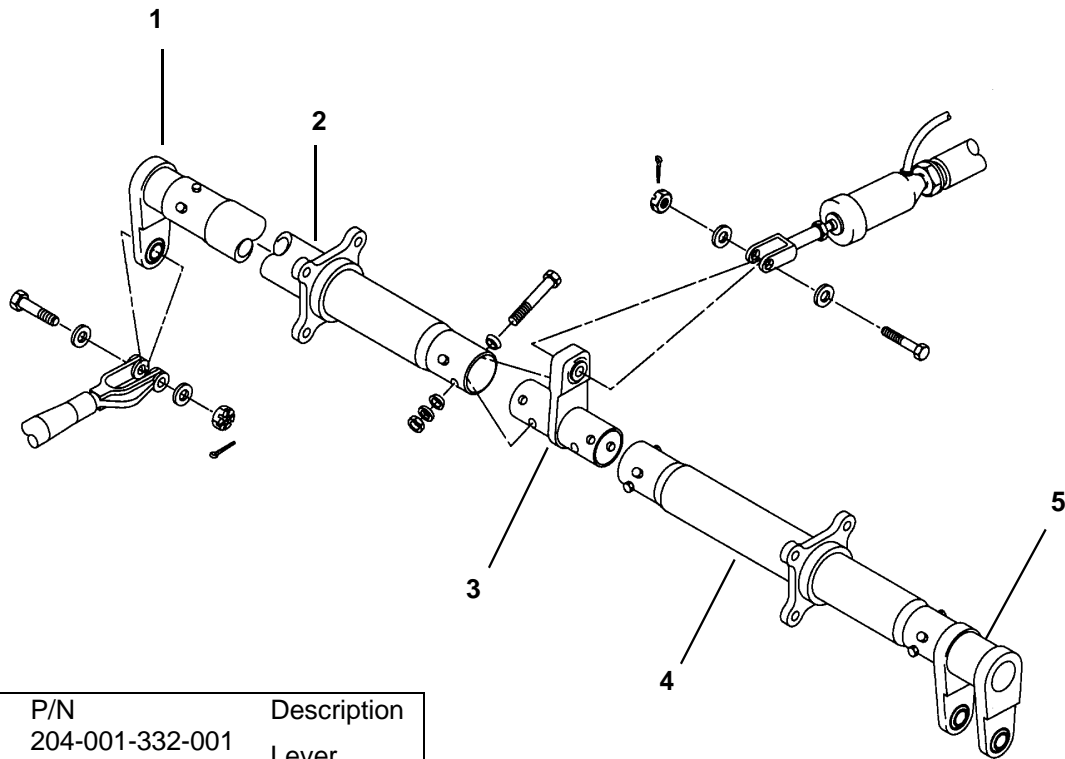
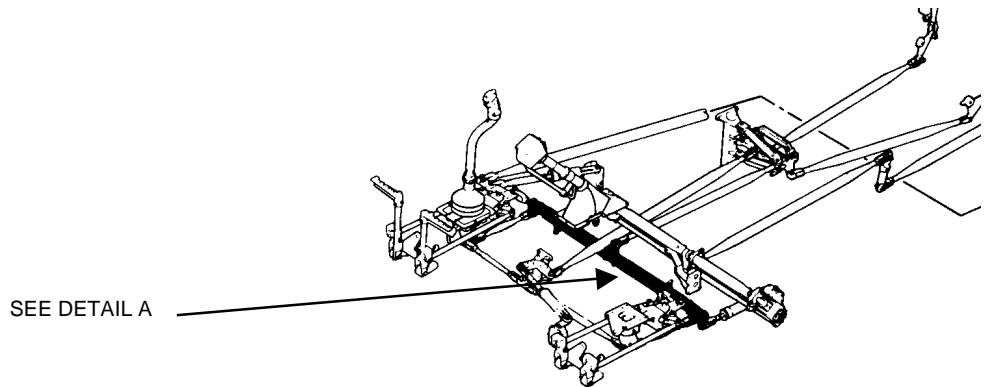
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12. Inspect collective jackshaft levers P/N 212-001-105-001 (1) & 212-001-124-001 (5) as per Component Repair and Overhaul, chapter 67. Repair or replace parts that are found damaged or corroded beyond limits.
13. **(S/N 30502 through 31311, 32101 through 32152 & 35001 through 35048)** Inspect collective jackshaft lever P/N 204-001-185-005 (3) as per Component Repair and Overhaul, chapter 67. Repair or replace parts that are found damaged or corroded beyond limits.
14. **(S/N 35049 through 35103)** Inspect collective jackshaft lever P/N 212-001-248-001 (3) as per figure 5. Repair or replace parts that are found damaged or corroded beyond limits.

-NOTE-

The best way to transfer the holes to a new tube assembly is to have them drilled slightly undersized in a machine shop and taper-reamed on the aircraft.

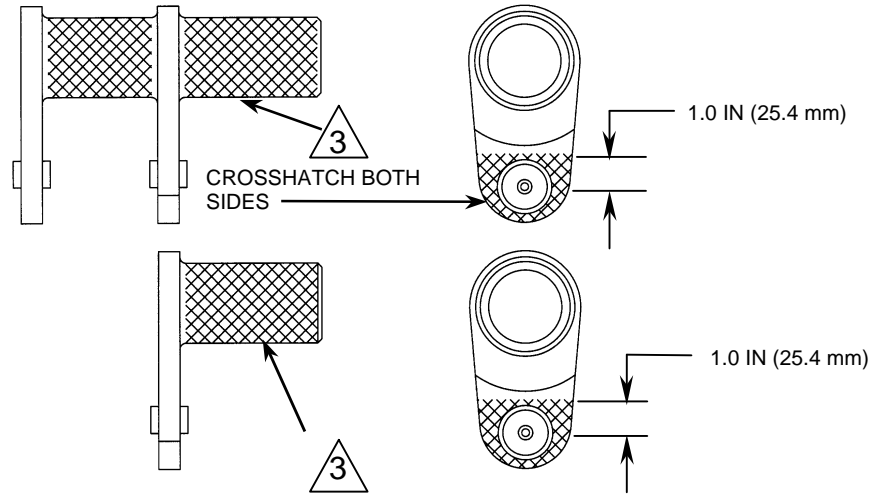
15. Inspect collective jackshaft tubes (2) & (4) as per figure 3. Repair or replace parts that are found damaged or corroded beyond limits. Refer to C R & O Manual.
16. Reinstall collective jackshaft using Maintenance Manual, chapter 67 and the following instructions:
 - a. Insert elbow or lever into tube and wet install the bushing and bolts using sealant (C-392).
 - b. Torque nuts to 50 to 70 in-lbs.
 - c. Completely coat both ends of bolts including washers and bushings with sealant (C-392).
 - d. Seal joint between tube and lever using sealant (C-392).
17. Verify rigging per Maintenance Manual, chapter 67.
18. Reinstall panels removed at step 2.
19. Make helicopter ready for flight.
20. Make an entry in helicopter historical records indicating compliance with this technical bulletin.



Item	P/N	Description
1	204-001-332-001 or -005	Lever
2	204-001-326-011	Tube
3	204-001-358-001	Lever
4	204-001-326-011	Tube
5	204-001-356-001	Lever

DETAIL A

FIGURE 1
Cyclic Jackshaft



ARM ASSEMBLY
204-001-356 AND 204-001-332
DAMAGE LIMITS

212-TB-99050-2

DAMAGE LOCATION SYMBOLS:



<u>TYPE OF DAMAGE</u>	<u>MAXIMUM DEPTHS AND REPAIR AREAS ALLOWED</u>	
MECHANICAL BEFORE AND AFTER REPAIR	0.020 IN.(0.508 mm)	0.040 IN (1.016 mm)
CORROSION BEFORE CLEANUP	0.010 IN (0.0254 mm)	0.020 IN (0.508 mm)
AFTER CLEANUP	0.020 IN. (0.508 mm)	0.040 IN. (1.016 mm)
MAXIMUM AREA PER FULL DEPTH REPAIR	0.10 SQ.-IN (64.52 SQ.-mm)	0.25 SQ.-IN (161.3 SQ.-mm)
NUMBER OF REPAIR AREAS	One per area	Two per surface 1.0 in. (25.4 mm) minimum spacing
EDGE CHAMFER	0.030 IN (0.762 mm) BY 45	0.060 IN (1.524 mm) BY 45
CRACKS ALLOWED	NONE	NONE

NOTES

1. **Bearing bore damage not to exceed 0.001 inch (0.025 mm) for ¼ circumference. Limit one repair per bore.**
2. **Tapered hole damage shall not exceed 0.002 inch (0.0508 mm) for ¼ circumference. Limit one repair per bore.**
3. **Tapered holes (ref) these surfaces (4 places).**

FIGURE 2



Tube assembly
204-001-326-011
204-001-109-001
204-001-190-001
(Typical Tube assembly shown)

TTB00201

DAMAGE LOCATION SYMBOLS:



TYPE OF DAMAGE

MAXIMUM DEPTHS AND REPAIR AREAS ALLOWED

CRACKS ALLOWED

NONE

MECHANICAL



CORROSION



MAXIMUM AREA PER FULL DEPTH REPAIR

1.0 sq.-in. (6.45 sq-cm)



NUMBER OF REPAIR AREAS

NOT CRITICAL

BORE ELONGATION

0.01 in. (0.25 mm)

NOTES



Mechanical damage to both exterior and interior surfaces of control tube shall not exceed 10% of tube wall thickness.

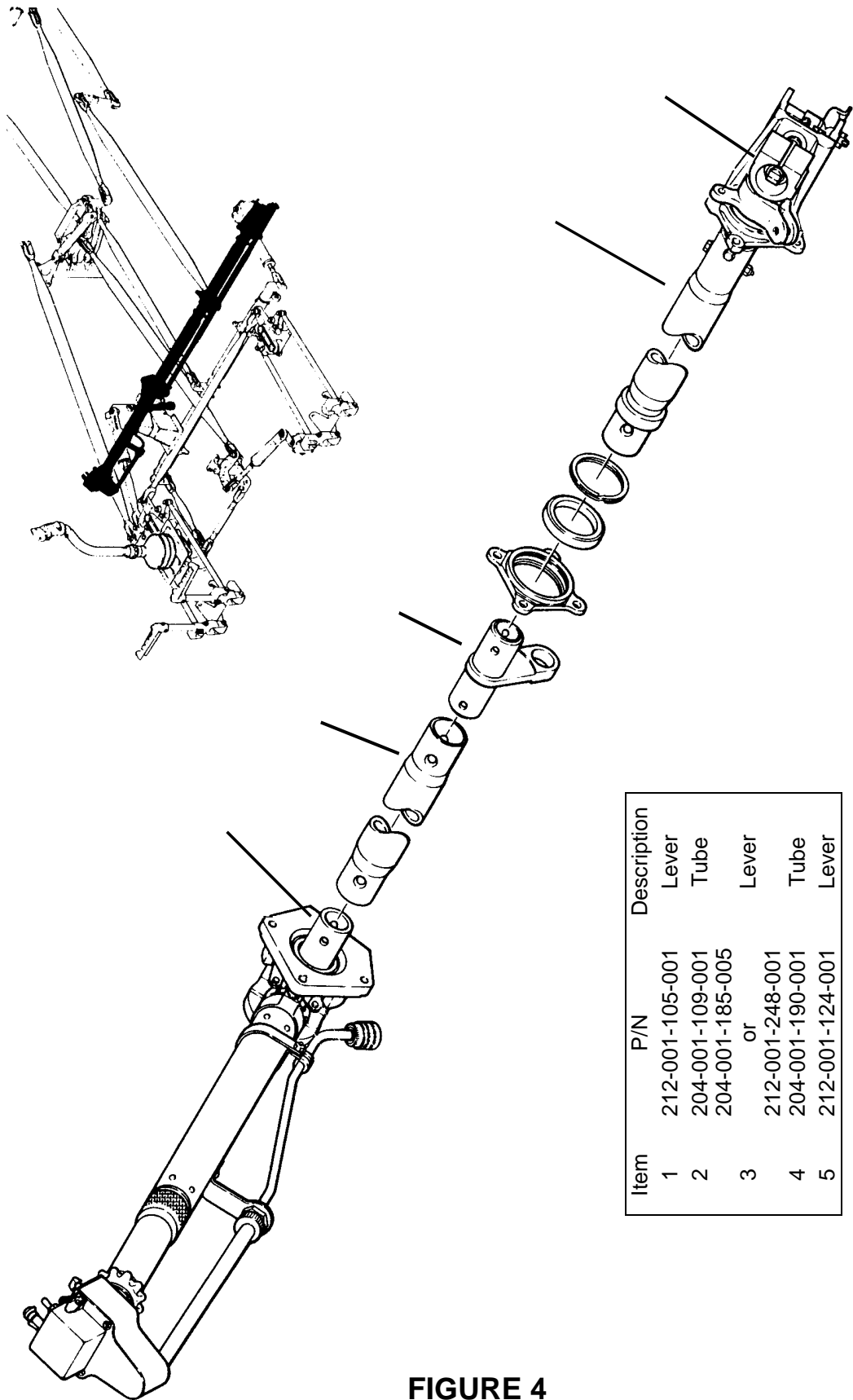


Corrosion damage to both exterior and interior surfaces of control tube shall not exceed 5% of tube wall thickness before cleanup and 10% after cleanup.



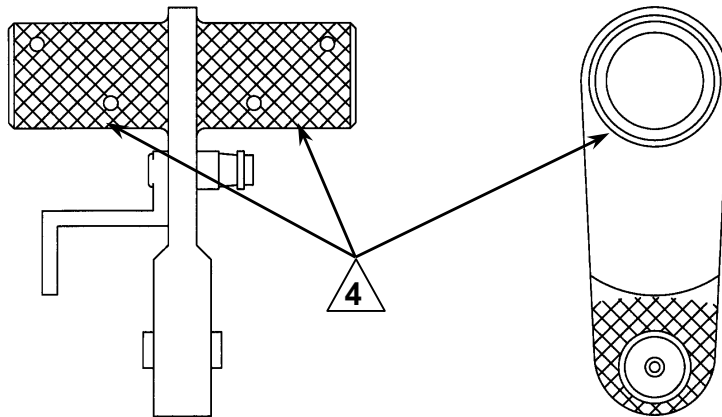
Width of repair shall not exceed one third of tube circumference.

FIGURE 3



Item	P/N	Description
1	212-001-105-001	Lever
2	204-001-109-001	Tube
3	204-001-185-005 or 212-001-248-001	Lever
4	204-001-190-001	Tube
5	212-001-124-001	Lever

FIGURE 4
Collective Jackshaft




LEVER AND SUPPORT ASSEMBLY
212-001-248

DAMAGE LOCATION SYMBOLS:



<u>TYPE OF DAMAGE</u>	<u>MAXIMUM DEPTHS AND REPAIR AREAS ALLOWED</u>	
MECHANICAL BEFORE AND AFTER REPAIR	0.020 in (0.508 mm)	0.040 in (1.016 mm)
CORROSION BEFORE CLEANUP	0.010 in (0.254 mm)	0.020 in (0.508 mm)
AFTER CLEANUP	0.020 in (0.508mm)	0.040 in (1.016 mm)
MAXIMUM AREA PER FULL DEPTH REPAIR	0.100 sq. in (64.52 sq. mm)	0.250 sq. in (161.3 sq. mm)
NUMBER OF REPAIR AREAS	One per area	Two per surface, Five total
EDGE CHAMFER	0.030 in (0.762 mm) by 45 degrees	0.060 in (1.524 mm) by 45 degrees

NOTES

1. No cracks allowed.
2. Bearing bore damage not to exceed 0.001 inch (0.0254 mm) for ¼ circumference.
3. Tapered hole  damage shall not exceed 0.002 inch (0.0508 mm) for ¼ circumference. Limit one repair per hole.



Tapered holes (ref) these surfaces (8 places).

FIGURE 5