LUFTFARTSVERKET
Luftfartsinspektionen

LUFTVÄRDIGHETSDIREKTIV (LVD)

A. Helikopter
Robinson
LVD Nr 2656
Upphäver LVD 2580

Sektion 2. Utlandstillverkad flygmateriel

TITEL: **Kontroll av stjärtrotorväxel för avsaknad av låskil.**

GÄLLER: Modell R22 med installerad växel tillverkad eller översedd av Robinson Helicopter Company före 8 juni 1992, undantaget växlar med S/N angivna i bifogad kopia av FAA AD 95-23-05.

ÅTGÄRD: Utför åtgärder angivna FAA AD 95-23-05.

TID FÖR ÅTGÄRD:

(a) Före nästa flygning.

(b) Före första flygning varje dag.

(c) Slutlig åtgärd vid nästa 100 timmars tillsyn.

UNDERLAG: FAA AD 95-23-05.

REFERENS: FAA AD 95-23-05.

UTGIVNINGS-DATUM: 1995-12-18

LFS: 1995:69

Åtgärd enligt LVD utgör nödvändig förutsättning för ifrågavarende flygmateriels luftvärdighet. Referens BCL M 1.11. Anteckning om åtgärd, som vidtagits i enlighet med LVD, skall införas i teknisk journal för berörd flygmateriel med hänvisning till ifrågavarande LVD-nummer. Angivet underlag refererar till senaste gällande revision/utgåva. LVD utges i luftfartsverkets författningssamlingar LFS.

L 1563-1

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601 79 NORRKÖPING	Vikboplan 11	Int +46 11 - 19 20 00	Norrköping	64250

AIRWORTHINESS DIRECTIVE

REGULATORY SUPPORT DIVISION
P.O. BOX 26460
OKLAHOMA CITY, OKLAHOMA 73125-0460

U.S. Department
of Transportation
Federal Aviation
Administration

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Federal Aviation Regulations, Part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference FAR Subpart 39.3).

95-23-05 ROBINSON HELICOPTER COMPANY: Amendment 39-9425. Docket No. 95-SW-06-AD. Supersedes AD 94-17-07, Amendment 39-9059.

Applicability: Model R22 series helicopters certified in any category, with tail rotor (T/R) gearboxes that were manufactured or overhauled by Robinson Helicopter Company prior to June 8, 1992. The following gearbox serial numbers have been determined to have the T/R input and output shaft keys installed and are therefore exempt from this AD: 0012, 0013, 0014, 0015, 0018, 0020, 0021, 0030, 0040, 0054, 0062, 0079, 0091, 0095, 0098, 0107, 0108, 0121, 0134, 0137, 0146, 0149, 0153, 0169, 0179, 0184, 0185, 0191, 0193, 0201, 0205, 0227, 0228, 0235, 0239, 0241, 0248, 0258, 0262, 0269, 0272, 0277, 0280, 0296, 0304, 0321, 0333, 0342, 0345, 0346, 0355, 0365, 0385, 0387, 0392, 0415, 0417, 0424, 0431, 0432, 0439, 0444, 0447, 0503, 0504, 0505, 0525, 0542, 0546, 0547, 0548, 0554, 0558, 0559, 0565, 0574, 0576, 0579, 0592, 0594, 0597, 0603, 0604, 0605, 0615, 0619, 0632, 0634, 0639, 0641, 0644, 0650, 0656, 0662, 0663, 0665, 0674, 0686, 0689, 0696, 0697, 0700, 0701, 0702, 0707, 0722, 0734, 0735, 0736, 0742, 0755, 0756, 0759, 0767, 0777, 0778, 0784, 0786, 0805, 0811, 0832, 0836, 0839, 0842, 0845, 0850, 0862, 0863, 0866, 0868, 0880, 0885, 0887, 0892, 0926, 0937, 0939, 0952, 0970, 0983, 0986, 0996, 0997, 0998, 0999, 1007, 1016, 1018, 1021, 1029, 1030, 1035, 1048, 1062, 1072, 1078, 1081, 1087, 1104, 1116, 1121, 1126, 1129, 1132, 1141, 1151, 1176, 1182, 1186, 1187, 1197, 1199, 1205, 1208, 1217, 1222, 1224, 1228, 1233, 1237, 1245, 1249, 1252, 1254, 1255, 1269, 1274, 1290, 1293, 1299, 1301, 1307, 1310, 1311, 1323, 1328, 1330, 1333, 1338, 1339, 1341, 1342, 1350, 1351, 1361, 1371, 1379, 1385, 1388, 1392, 1404, 1412, 1414, 1428, 1429, 1435, 1438, 1442, 1450, 1460, 1468, 1494, 1499, 1505, 1508, 1509, 1512, 1514, 1526, 1541, 1544, 1565, 1578, 1586, 1593, 1595, 1597, 1605, 1610, 1627, 1628, 1629, 1636, 1643, 1647, 1648, 1652, 1654, 1661, 1676, 1677, 1686, 1687, 1698, 1701, 1702, 1706, 1708, 1710, 1714, 1724, 1731, 1732, 1738, 1739, 1741, 1750, 1752, 1754, 1757, 1759, 1766, 1767, 1769, 1783, 1785, 1786, 1800, 1803, 1807, 1808, 1814, 1816, 1823, 1828, 1830, 1833, 1837, 1844, 1846, 1851, 1852, 1858, 1861, 1868, 1869, 1871, 1874, 1886, 1889, 1893, 1898, 1899, 1909, 1911, 1912, 1913, 1920, 1922, 1927, 1928, 1948, 1951, 1959, 1961, 1963, 1965, 1966, 1974, 1978, 1983, 1992, 1996, 2002, 2025, 2028, 2034, 2037, 2043, 2051, 2058, 2071, 2100, 2101, 2103, 2108, 2115, 2126, 2129, 2136, 2160, 2166, 2170, 2180, 2182, 2193, 2197, 2203, 2216, 2231, 2242, 2254, 2265, 2269, 2272, 2279, 2280, 2283, 2285, 2289, 2294, 2298, 2299, 2303, 2304, 2308, 2314, 2337, 2346, 2357, 2360, 2362, 2364, 2377, 2380, 2381, 2387, 2395, 2406, 2408, 2410, 2414, 2416, 2419, 2420, 2421, 2422, 2423, 2425, 2431, 2435, 2436, 2459, 2467, 2479, 2492, 2498, 2513, 2529, 2531, 2536, 2539, 2551, 2556, 2557, 2574, 2579, 2582, 2587, 2591, 2604, 2605, 2607, 2609, 2616, 2627, 2634, 2642, 2651, 2672, 2682, 2683, 2687, 2690, 2697, 2716, 2719, 2720, 2721, 2731, 2736, 2784, 2797, 2799, 2815, 2826, 2841, 2842, 2845, 2862, 2863, 2873, 2937, 2945, 3004, 3109.

NOTE 1: This AD applies to each helicopter identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For helicopters that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must use the authority provided in paragraph (d) to request approval from the FAA. This approval may address either no action, if the current configuration eliminates the unsafe condition, or different actions necessary to address the unsafe condition described in this AD. Such a request should include an assessment of the effect of the changed configuration on the unsafe condition addressed by this AD. In no case does the presence of any modification, alteration, or repair remove any helicopter from the applicability of this AD.

Compliance: Required as indicated, unless accomplished previously.

To prevent slippage of the T/R drive, loss of directional control, and subsequent loss of control of the helicopter, accomplish the following:

(a) Before further flight, install alignment dots as follows: Remove the transparent inspection cover on the tail cone and rotate the T/R blades so that one blade leading edge is aligned with the tail cone centerline. Mark a dot on the tail cone skin aligned with the tip of the blade leading edge. With the same alignment, mark a dot on the centerline of the tail cone skin at the edge of the inspection hole, and mark a corresponding dot on the drive shaft flange (see figure 4).

(b) Conduct the following daily preflight checks for misalignment of the alignment dots until compliance with paragraph (c) of this AD has been accomplished: Check for misalignment of the alignment dots installed on the tail cone skin and the drive shaft flange by rotating the T/R blade so that the alignment dot is visible in the inspection window and the tip of the T/R blade leading edge aligns with the dot on the tail cone skin. Ensure that the drive shaft flange dot is aligned with the dot on the centerline of the tail cone skin at the edge of the inspection window. If any misalignment is detected, before further flight, replace the T/R gearbox with an airworthy one that has been determined to have both the input and output keys installed in accordance with paragraph (c) of this AD or other FAA-approved procedures, or is exempt from the requirements of this AD as listed in the applicability section of this AD. The daily preflight checks required by this AD may be performed by an owner/operator holding at least a private pilot certificate and must be entered into the aircraft records showing compliance with paragraph (b) of this AD, in accordance with sections 43.11 and 91.417(a)(2)(v) of the Federal Aviation Regulations.

(c) Within the next 100 hours time-in-service (TIS) after the effective date of this AD, or at the next annual inspection, whichever occurs first, verify installation of both the input and output shaft keys as follows:

(1) Cut and remove the safety wire securing the chip detector to the sight gage on the T/R gearbox. Place a container under the T/R gearbox to catch the drained oil and remove the chip detector. Remove and discard the gasket on the chip detector.

(2) Remove the T/R gearbox from the helicopter in accordance with the applicable maintenance manual.

(3) Cut and remove the safety wire securing the filler vent plug to the sight gage on the T/R gearbox and remove the filler vent plug and sight gage. Remove and discard the gasket on the filler vent plug and sight gage.

(4) Remove and disassemble the output cartridge, P/N A111-1, from the T/R gearbox case, P/N A109-1 (see figure 1) as follows:

(i) Place a mark across the gear case, P/N A109-1, and output cartridge, P/N A111-1, with a felt pen or grease pencil to ensure proper reassembly.

(ii) Cut and remove the safety wire around the four MS20074-04-06 bolts securing the output cartridge to the gear case. Remove and retain each of the four bolts and their associated AN960-416L washer(s), noting the washer stacks for reassembly. Separate the output cartridge from the gear case (see figure 1).

(iii) Remove and discard the safety wire, MS16562-24 or 52-022-094-0437 roll pin, and MS14145L6 or LCN6M-624 retaining nut. Remove the AN960-616L washer(s) and the washer, P/N A141-2, noting the washer(s) location for reassembly. Do not damage the output shaft, P/N A107-1, or the shim(s), P/N A118-1 through -6, located next to the flange of the output cartridge when removing the retaining nut.

(iv) Visually inspect for the presence of the output shaft key, P/N A114-2, between the pinion gear, P/N A545-1, and the output shaft (see figure 2).

(v) If the output shaft key is missing, replace the T/R gearbox with an airworthy gearbox that has been determined to have the output key installed. Report any T/R gearbox that has a missing key within 10 days after the inspection to the Manager, Los Angeles Manufacturing Inspection Office, FAA, Northwest Mountain Region, 3960 Paramount Blvd., Lakewood, California 90712, telephone (310) 627-5290, fax (310) 627-5293. Reporting requirements have been approved by the Office of Management and Budget and assigned OMB control number 2120-0056.

(vi) If the output key is installed, reinstall the washer, P/N A141-2, and AN960-616L washer(s). Install an MS14145L6 or LCN6M-624 retaining nut, and torque to 225-275 in.-lbs. Install a MS16562-24 or 52-022-094-0437 roll pin, and safety wire using 0.032-inch stainless steel safety wire. The safety wire pigtail must be wrapped tightly around the retaining nut.

(5) Remove and disassemble the input cartridge, P/N A110-1, from the T/R gear case, P/N A109-1, as follows:

(i) Place two marks across the gear case, P/N A109-1, and input cartridge, P/N A110-1, with a felt pen or grease pencil to ensure proper reassembly.

(ii) Cut and remove the safety wire around the four MS20074-04-06 bolts securing the input cartridge to the gear case. Remove each of the four bolts and their associated AN960-416L washer(s), noting the washer stacks for reassembly. Separate the input cartridge from the gear case (see figure 1).

(iii) Secure the input cartridge to a block of wood through the two bolt holes in the input shaft assembly, P/N A116-1 (see figure 1). Place the block of wood in a vise. Remove and discard the safety wire, roll pin, and retaining nut. Remove the AN960-616L washer(s), and washer, P/N A141-1, noting the washer(s) location for reassembly. Do not damage the input shaft or shim(s), P/N A118-1 through -6, located next to the flange of the input cartridge.

(iv) Visually inspect for the presence of the input shaft key, P/N A114-1, between the gear, P/N A545-2, and the input shaft (see Note on figure 2).

(v) If the input shaft key is missing, replace the T/R gearbox with an airworthy gearbox that has been determined to have the input key installed. Report any T/R gearbox that has a missing key within 10 days after the inspection to the Manager, Los Angeles Manufacturing Inspection District Office, FAA, Northwest Mountain Region, 3960 Paramount Blvd., Lakewood, California 90712, telephone (310) 627-5290, fax (310) 627-5293. Reporting requirements have been approved by the Office of Management and Budget, and assigned OMB control number 2120-0056.

(vi) If the input key is installed, reinstall the AN960-616L washer(s) and washer, P/N A141-1. Install an MS14145L6 or LCN6M-624 retaining nut, and torque to 225-275 in.-lbs. Install a MS16562-24 or 52-022-094-0437 roll pin and safety wire using 0.032-inch stainless steel safety wire. The safety wire pigtail must be wrapped tightly around the retaining nut. Remove the two bolts securing the input shaft assembly to the block of wood. Vibro-etch the final rule AD number on the input cartridge attachment flange.

(6) Reassemble the input and output cartridges to the T/R case as follows:

(i) Color the "X" marked on the pinion gear, P/N A545-1, (one tooth only) of the output cartridge and on the gear, P/N A545-2, (located on two consecutive teeth) of the input cartridge with a red marker to make reinstallation easier. Note that these three gear teeth may already be colored (see figure 3).

(ii) Visually inspect the edge of the chamfers in the gear case, making sure they are round and smooth so that the O-ring will not be damaged upon installation.

(iii) Remove and discard the O-ring on both the input cartridge and output cartridge. Replace the O-ring with National P/N AS142 B46-70, or Parker P/N 2-142 N674-70 O-ring. Lubricate the replacement O-ring with oil, P/N A257-2, and install an O-ring on each cartridge.

(iv) Reinstall the output cartridge on the gear case with the four MS20074-04-06 bolts and AN960-416L washer stacks that were removed in accordance with paragraph (c)(4)(ii). Reinstall the input cartridge on the gear case with the four MS20074-04-06 bolts and AN960-416L washer stacks that were removed in accordance with paragraph (c)(5)(ii). Do not torque the bolts at this time.

(v) Look through the sight gage opening while using a flashlight pointed into the filler vent hole to verify the gears are meshed properly. Gears are properly meshed when the "X" marked on the pinion gear of the output cartridge is between the two "X's" marked on the gear of the input cartridge (see figure 3). Do not torque the MS20074-04-06 bolts until both cartridges are installed on the case and the gears are properly meshed. Torque the output cartridge bolts to 60 in.-lbs. first, then torque the input cartridge bolts to 60 in.-lbs. Safety wire with 0.032-inch stainless steel safety wire.

(vi) Reinstall sight gage with MS35769-11 or AN900-10 gasket. Oil threads to prevent threads from locking up. Torque to 200 in.-lbs.

(vii) Reinstall the chip detector with a MS35769-8 or AN900-9 gasket after lubricating the threads with oil. Torque the chip detector to 150 in.-lbs. Safety wire the sight gage to the chip detector using 0.032-inch stainless steel safety wire.

(viii) Fill the T/R gearbox with oil to the level indicated on the T/R sight glass decal. Reinstall the filler vent plug, P/N A610-1, with a MS35769-9 or AN900-8 gasket, after lubricating the threads with oil.

(ix) Inspect the T/R gearbox assembly to ensure that the shafts and gears rotate freely.

(7) Reinstall the T/R gearbox onto the helicopter in accordance with the applicable maintenance manual. Verify that the oil level of the T/R gearbox is at the recommended mark on the sight glass.

(d) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used when approved by the Manager, Los Angeles Aircraft Certification Office, FAA. Operators shall submit their requests through an FAA Principal Maintenance Inspector, who may concur or comment and then send it to the Manager, Los Angeles Aircraft Certification Office.

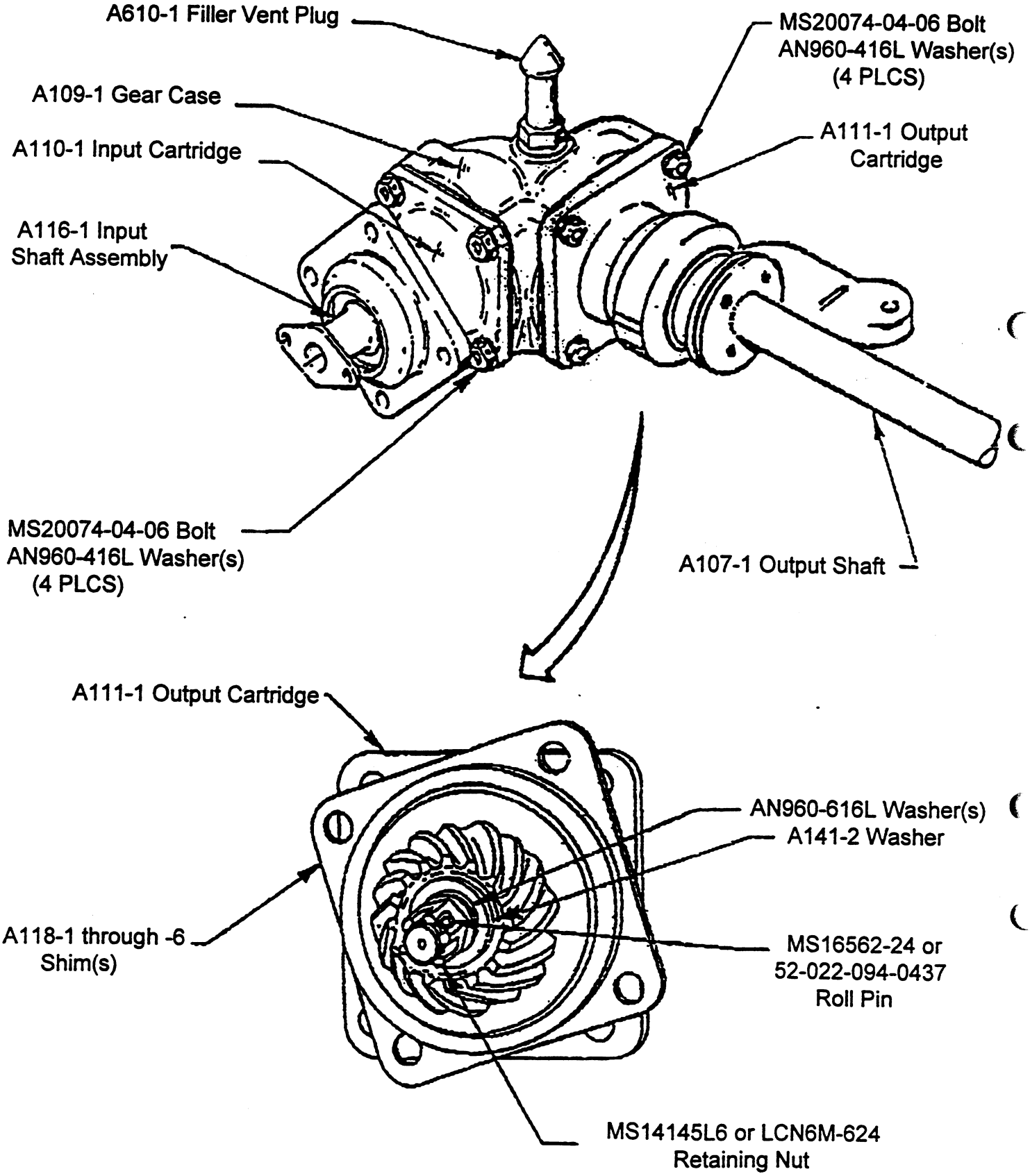
NOTE 2: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Los Angeles Aircraft Certification Office.

(e) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the helicopter to a location where the requirements of this AD can be accomplished.

(f) This amendment becomes effective on December 27, 1995.

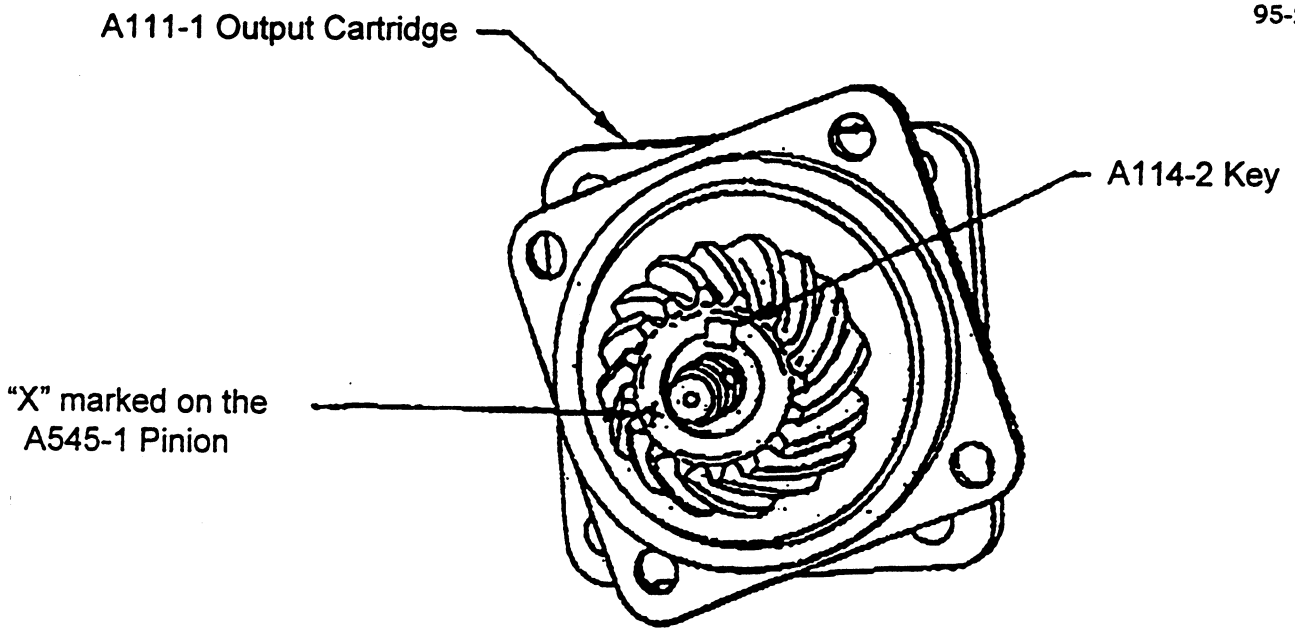
FOR FURTHER INFORMATION CONTACT:

Ms. Elizabeth Bumann, Aerospace Engineer, FAA, Los Angeles Aircraft Certification Office, 3960 Paramount Blvd., Lakewood, California 90712, telephone (310) 627-5265, fax (310) 627-5210.



Note: The safety wire has been removed for clarity

Figure 1



Note: The A114-1 Key for the A110-1 Input Cartridge is located similar to the A111-1 Output Cartridge depicted above

Figure 2

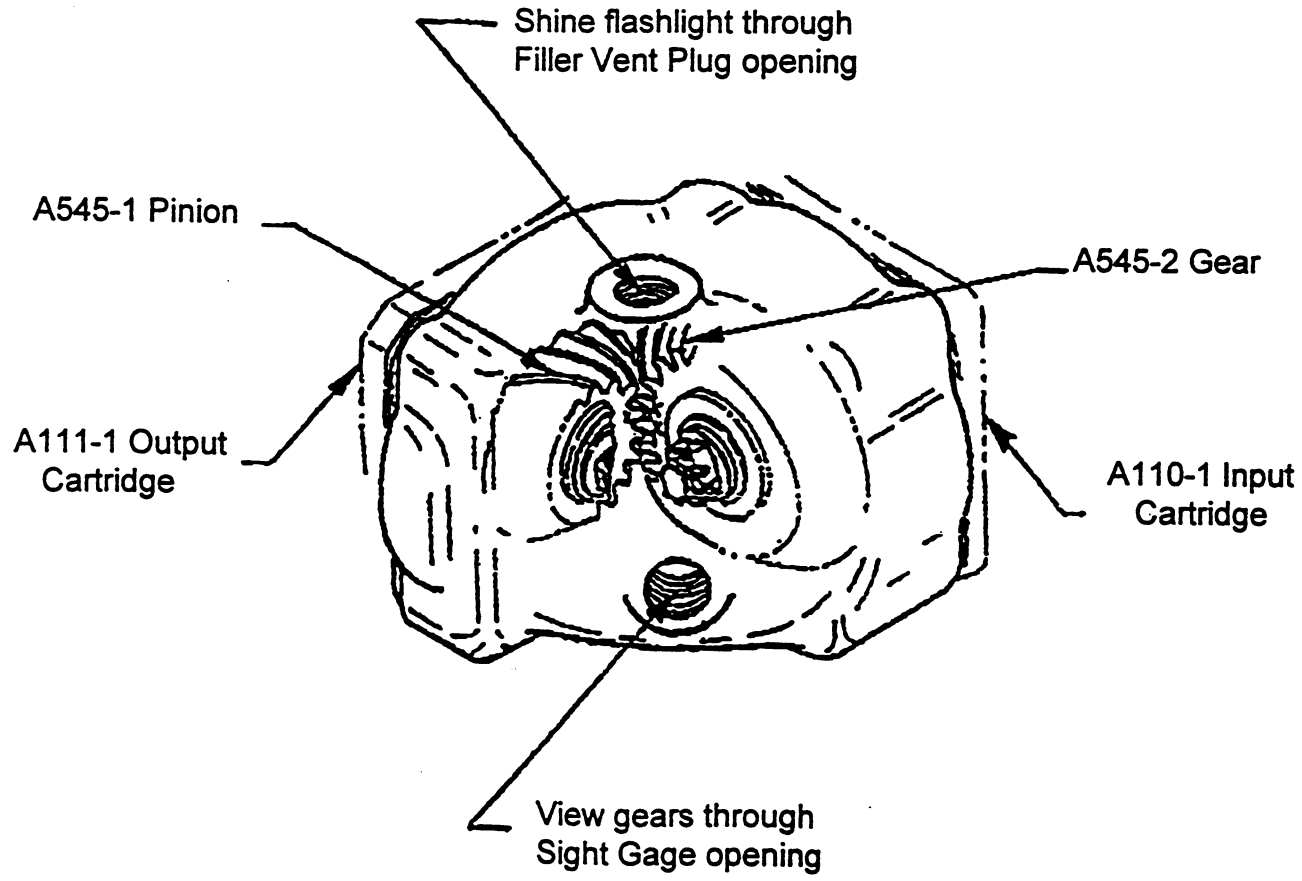


Figure 3

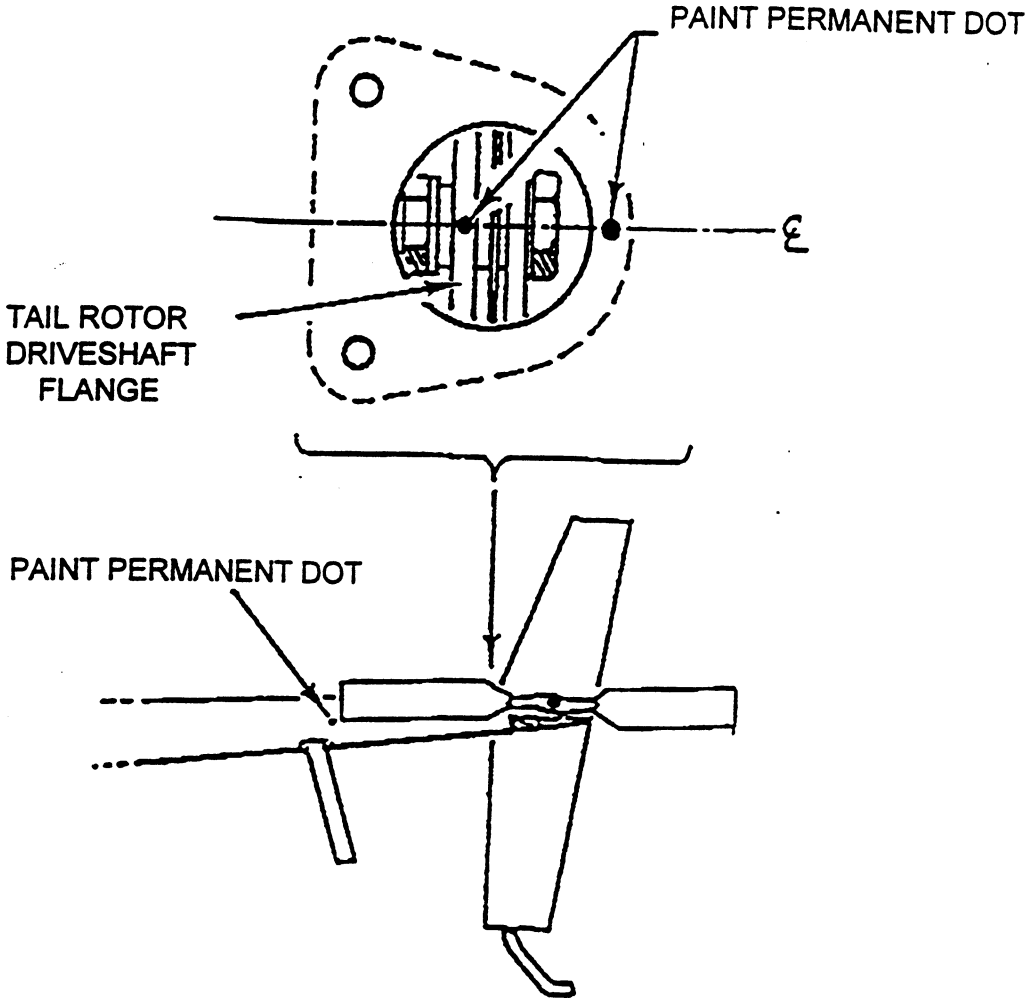

PAINT PERMANENT DOT
TAIL ROTOR
DRIVESHAFT
FLANGE
PAINT PERMANENT DOT

Figure 4