



SCHWEIZER SERVICE INFORMATION NOTICE

NOTICE NO. N-135

DATE 23 Jan 1976

PAGE 1 OF 15

SUBJECT: Field Modification and Repair - Manually Operated Searchlight Installation, PN 269A4333-27/-29/-39 and 269A4335-1

MODELS AFFECTED: All Model 269B and 269C Helicopters equipped with subject Searchlight Kit Installations

TIME OF COMPLIANCE: At Owners and Operators discretion

PREFACE: Part I of this Service Information Notice provides instructions for a field modification to improve the structural strength and operating capability of the Dovsek 300B searchlight assembly.

Part II of this Notice lists a procedure for complete bench disassembly and assembly of the Dovsek 300B searchlight assembly.

Part III of this Notice describes troubleshooting procedures for the subject searchlight kit installations, and corrective action to be taken.

It is to be noted that referenced Service Information Notice No. N-129 provides for inspection of the searchlight mounting bolts, to determine if adequate clearance exists between the bolts and tail rotor control rods.

Reference

269 Series - Basic HMI, Issued 1 April 1973; Revision No. 3, 15 March 1975

269 Series - HMI Appendix A, Issued 1 April 1973

Hughes Service Information Notice No. N-129, dated 31 March 1975

Installation Instructions - Model 269B and Model 269C Helicopters,

Manually Operated Searchlight Kit, PN 269A4333, Issued 15 April 1971,

Revised 15 July 1971

PART I - FIELD MODIFICATION

Dovsek searchlight assemblies having the identifying part number '300B' stamped on the upper gearbox housing have already been modified at the factory. The following procedure applies to any Dovsek searchlight assembly having the part number '300B' located other than the above.

The procedure defines a modification to permit additional weight (i. e., quad lamps) to be supported by the searchlight mount. The field rework consists primarily of installing a new upper rotating shaft and shaft tubing assembly, and a new lower shaft tubing, all having greater diameter and strength. The upper gear adjusting bushing, piston guide, lower gear housing adapter, and telescope handle pin are reworked to accommodate the larger diameters of the new upper rotating shaft, and upper and lower shaft tubing. Also included are larger attach screws to secure the switch housing assembly; and additional set screws and countersinking of the lower shaft, to adjust and maintain proper elevation of the lamp assemblies.

Any Dovsek 300B searchlight assembly having an 'H' or 'M' following the part number has special hardened spiral gears installed in the upper gearbox. Installation of Kit No. B101-3 to incorporate hardened spiral gears is recommended for searchlight assemblies not having the identifying 'H' or 'M' after the part number.

As applicable, accomplish the following in conjunction with installation of the 269A4335-1 Quad Lamps Searchlight Kit.

PARTS LIST

NOTE: Procure parts directly from H. Dovsek Research and Development, 927 Hedgebath, Hacienda Heights, CA 91745; Phone (213) 330-6498

<u>Nomenclature</u>	Dovsek <u>Part Number</u>	<u>Replaces</u>	<u>Qty</u>
Shaft Tubing - Upper Rotating Assy	B30-3	B30	1
Upper Rotating Shaft	B31-2	B31	1
Shaft Tubing - Lower Rotating Assy	B32-2	B32	1
*Kit, Hardened Gears	B101-3		1

*Installation recommended. Not applicable to 300B searchlight assemblies having 'H' or 'M' after part number.

1. Removal of Searchlight Assembly (Refer to HMI Appendix A)

a. Check all cockpit switches for OFF condition; pay particular attention to MAG switch.

b. Remove side fairings, if installed; remove lower forward fairing; remove or displace cabin floor carpeting.

c. Disconnect battery cables from battery posts; disconnect searchlight wiring at splices, relay(s) and ground studs.

d. Remove coil wiring from clamp on searchlight assembly tubing (B16). Remove straps securing coil wiring to supports on bottom T-housing (B24), or remove wiring clamp from T-housing, as applicable. (See Figure 1.)

e. Remove bolts securing searchlight mount to cabin floor.

CAUTION: Have assistant hold lower section of searchlight to prevent its falling to ground. Also use care to retain telescope handle pin which is under spring tension.

f. Loosen telescope handle set screw inside piston (B22); disengage and lower extendable section of searchlight to floor (searchlight assembly may have to be tilted at an angle).

g. Remove upper section of searchlight and mounting base.

h. Remove lower section of searchlight from helicopter.

2. Rework - Upper Section of Searchlight.

a. Remove two screws securing switch housing (B12) to assembly tubing (B16) and upper gearbox (B11). (See Figure 1.)

b. Remove or fold back rubber grip (B47) from handle (B10); loosen set screw and remove handle.

c. Back off and remove friction locknut (B17); remove friction bushing (B29) from shaft (B28).

d. Remove four screws securing gearbox plate (B11); remove plate.

e. Unscrew and remove assembly tubing (B16) from lower threaded end of spacer (B13).

f. Loosen set screw in spacer and lower adjusting bushing (B14) to disengage top spiral gears.

g. Remove top rotating shaft (B28) and spiral gear with bearing.

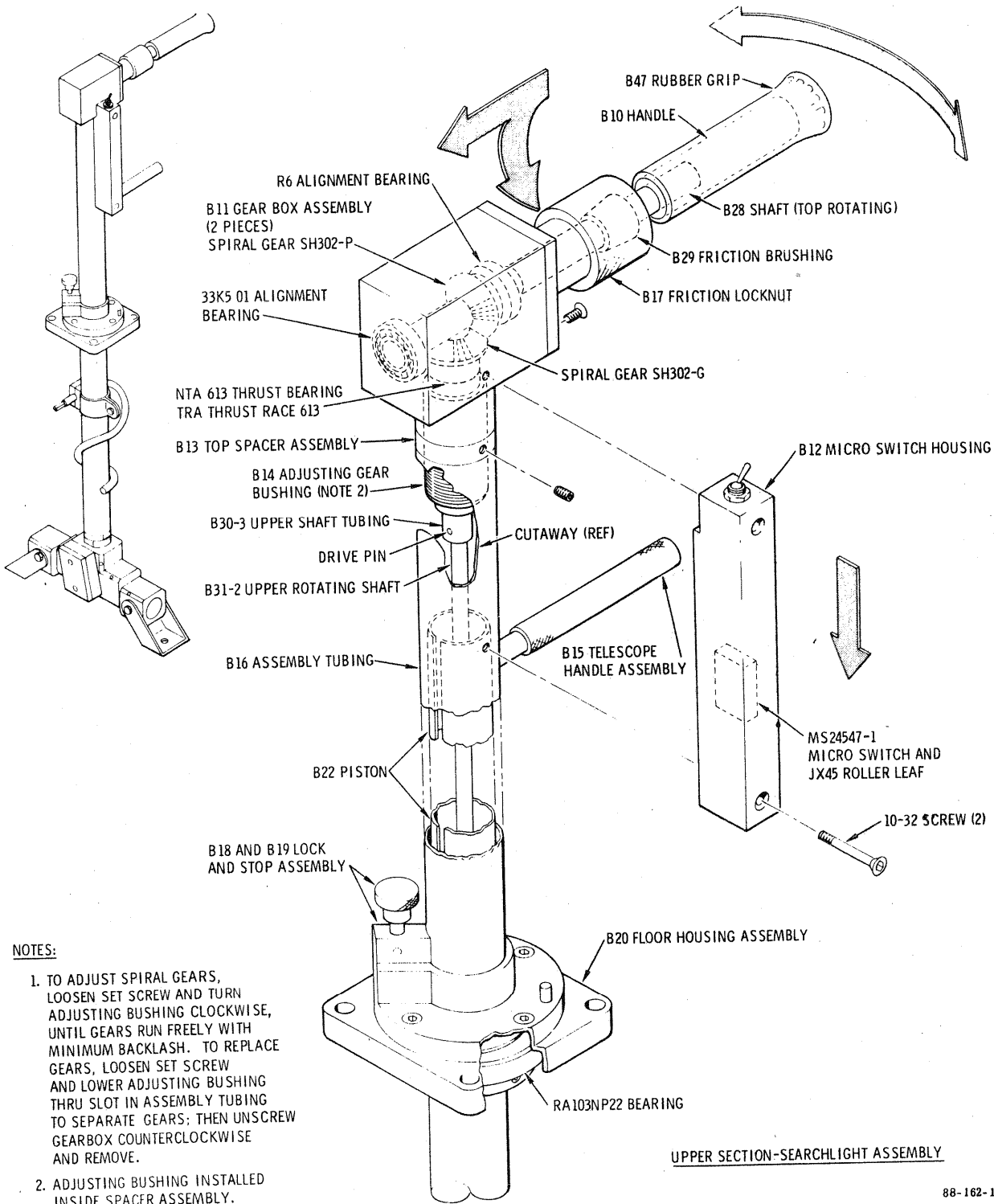
h. Unscrew upper threaded end of spacer from gear box.

i. Drive out roll pin and remove spiral gear, thrust bearing and thrust race from upper shaft tubing (B30).

j. Remove adjusting bushing (B14) from shaft tubing; discard existing shaft tubing (B30) and connected upper rotating shaft (B31).

k. Drill and ream ID of adjusting bushing to 0.004 inch greater than OD of new upper shaft tubing (B30-3).

l. Assemble new upper shaft tubing (B30-3) and new upper rotating shaft (B31-2); secure shafts with roll pin.



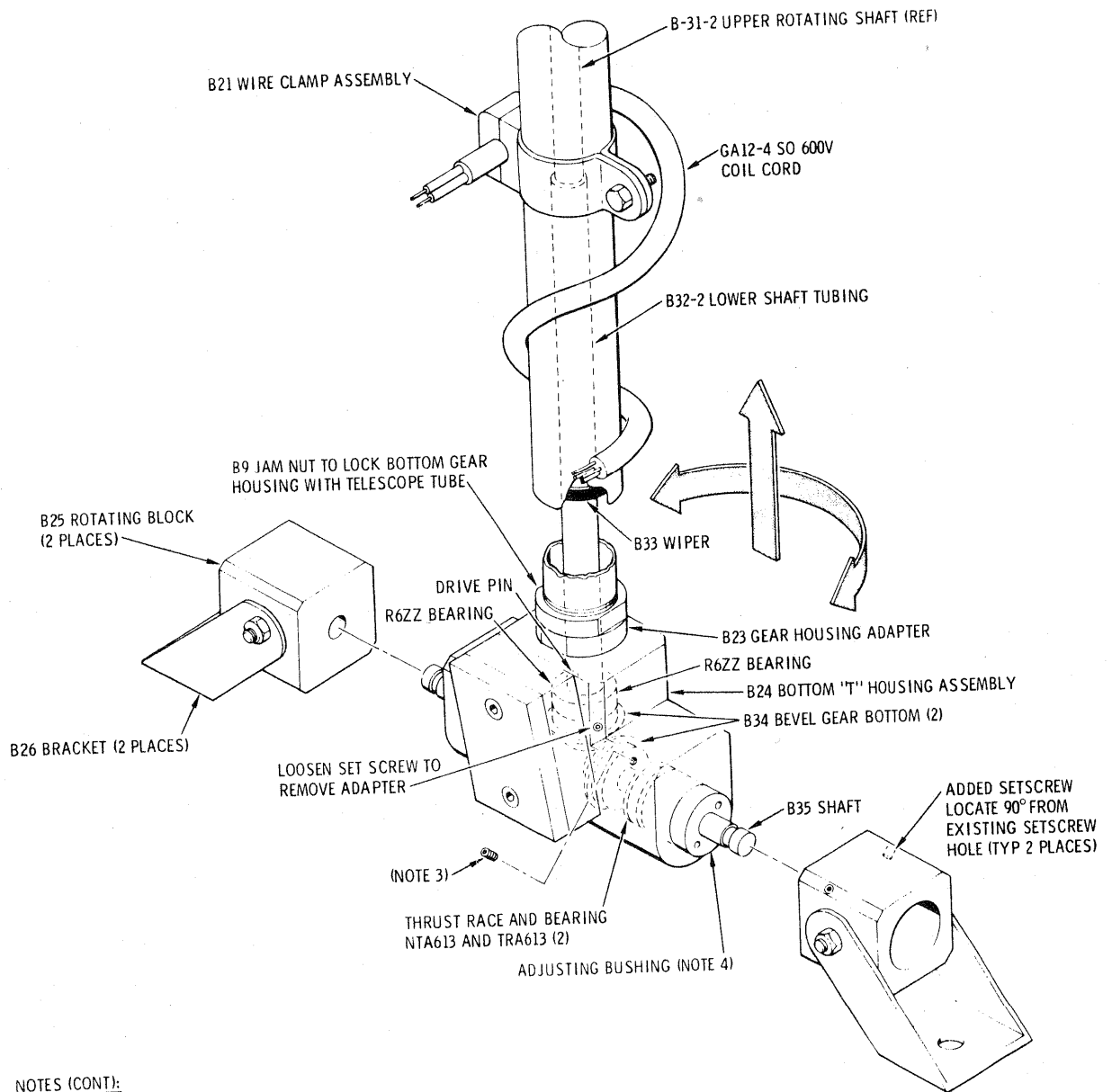
NOTES:

1. TO ADJUST SPIRAL GEARS, LOOSEN SET SCREW AND TURN ADJUSTING BUSHING CLOCKWISE, UNTIL GEARS RUN FREELY WITH MINIMUM BACKLASH. TO REPLACE GEARS, LOOSEN SET SCREW AND LOWER ADJUSTING BUSHING THRU SLOT IN ASSEMBLY TUBING TO SEPARATE GEARS: THEN UNSCREW GEARBOX COUNTERCLOCKWISE AND REMOVE.
2. ADJUSTING BUSHING INSTALLED INSIDE SPACER ASSEMBLY.

UPPER SECTION-SEARCHLIGHT ASSEMBLY

88-162-1

Figure 1. Dovsek 300B Searchlight Assembly (Sheet 1 of 2)



NOTES (CONT):

3. LOOSEN SET SCREW FOR ADJUSTING GEARS OR FOR REMOVING SHAFT WITH GEAR. ROTATE BUSHING CLOCKWISE FOR ADJUSTING GEARS.
4. ADJUSTING BUSHING PART OF B24 "T" HOUSING ASSEMBLY.

LOWER SECTION- SEARCHLIGHT ASSEMBLY

Figure 1. Dovsek 300B Searchlight Assembly (Sheet 2 of 2)

NOTE: Inspect existing spiral gears to see if hardened gears are installed (hardened gear part numbers begin with SH or HL). As applicable, install new hardened gears (Kit No. B101-3).

m. Insert new upper shaft tubing assembly into reworked adjusting bushing; install thrust race, thrust bearing and hardened spiral gear (SH302-G) on shaft tubing; secure gear with 10-32 set screw.

NOTE: Adjusting bushing should still be assembled in spacer. Prior to reassembling gearbox, tap out screw hole in gearbox and in assembly tubing, and screw holes in switch housing, to accept larger diameter 10-32 attach screws.

n. Install top rotating shaft (B28) with hardened spiral gear (SH302-P) and bearings into gearbox; install gearbox cover plate and secure with screws.

o. Apply light coat of grease to spiral gear and insert gear end of shaft tubing (B30-3) into gearbox; screw spacer and tighten (clockwise) for clamp up against gearbox.

p. Screw bushing (clockwise) and adjust gears to rotate freely with minimum backlash; tighten set screw in spacer to secure adjusting bushing.

q. Install upper end of assembly tubing on lower threaded end of spacer. Tighten assembly tubing and align screw holes in gearbox and assembly tubing. Install switch housing (B12) and secure with 10-32 set screws.

NOTE: When aligning screw holes, do not overtighten, as backing off assembly tubing to align holes will leave assembly tubing loose.

r. Install friction bushing (B29) and screw friction locknut (clockwise) in place to apply friction.

s. Install handle and secure with set screw; allow clearance with locknut.

3. Rework - Lower Section of Searchlight Assembly

a. Remove lamps and attach brackets (B26) from rotating blocks (B25), two places. (See Figure 1.)

b. Loosen jam nut (B9) and unscrew telescoping piston (B22) from threaded end of gear housing adapter (B23).

c. Loosen set screw on T-housing (B24) and remove adapter and lower shaft tubing (B32) with thrust bearing and bevel gear (B34) from T-housing. Remove adapter from shaft tubing.

d. Drive out roll pin from lower end of tubing and remove shaft stub with bevel gear and bearing from shaft tubing.

NOTE: Inspect bevel gear teeth for wear or damage; replace gear if excessive wear or damage is noted.

- e. Assemble shaft stub with bevel gear and bearing on new lower shaft tubing (B32-2); secure with roll pin.
- f. Drill and ream ID of bushing in adapter to 0.004 inch greater than OD of new lower shaft tubing (B32-2). Install reworked adapter on new tubing.
- g. Loosen set screw and remove rotating block (B25); loosen set screw on T-housing and back off adjusting bushing (B34).
- h. Coat gear teeth with grease; insert gear end of shaft tubing in gear housing. Install adapter and tighten against T-housing; secure adapter with set screw in T-housing.
- i. Adjust bevel gears by rotating the adjusting bushing on shaft (B35). Adjust gears to rotate freely with minimum backlash. After gear adjustment, secure bushing with set screw in T-housing.
- j. Drill and ream ID of guide inside upper end of telescoping piston (B22) to 0.004 inch greater than OD of new upper rotating shaft (B31-2).
- k. Install jam nut (B9) on adapter; bottom jam nut but do not tighten.
- l. Install piston on adapter to within one or two threads from jam nut; tighten jam nut (counterclockwise) to provide clamp up against piston.
- m. Remove set screw from each rotating block (B25). Tap out each screw hole to accept larger diameter 1/4 x 28 set screw. Drill and tap a second screw hole for 1/4 x 28 set screw; locate 90° from existing set screw hole, each rotating block.

4. Installation of Searchlight Assembly (Refer to HMI Appendix A)

NOTE: Prior to installing searchlight assembly, rework telescoping handle pin by shortening length of pin. Cut approximately 1/32 inch from end of pin; do not cut into countersink at end of pin.

- a. Place upper section of searchlight through opening in cabin floor. Do not install bolts at this time; allow upper end of handle to angle backwards in cabin.
- b. Insert lower section of searchlight into upper section; engage upper and lower sections by turning twist grip until single key and keyway meet; rotate lower section to align slots with wire conduits in upper section.
- c. Assemble telescoping handle; insert end of pin in hole at top of piston; use suitable tool to compress and hold spring. Tighten set screw in top of guide to secure pin. Ensure that screw is tight and seated flush in countersink of pin. Remove tool used to hold spring in compression.
- d. Rotate searchlight mount so that rotational lock is forward. Install and tighten searchlight mount attach bolts.
- e. Unlock rotational lock and rotate handle so that lights (if installed) would point forward; also rotate grip to adjust elevation so that lamps (if installed) would point downward at approximately a 45° angle.

f. Position rotating blocks with set screws removed on shaft; mark center of two set screw holes, each block, on shaft; remove blocks.

g. Countersink shaft approximately 0.12 inch deep x 0.25 inch diameter at center point of each of four set screw holes; install rotating blocks on shaft; install and tighten set screws flush in countersinks in shaft.

h. Install lamp assemblies and attach brackets to rotating blocks with existing hardware; install coil wiring to supports on T-housing with straps, or to wiring clamp on housing and secure with set screws, as applicable.

i. Reconnect searchlight wiring; install coil wiring to clamp (B21) on assembly tubing and secure with set screws.

j. Reconnect battery cables

k. Perform a functional check of searchlight extension, retraction, rotation and operation. Check that instrument panel light illuminates when searchlight is in extended position.

l. Reinstall floor carpeting, lower forward fairing and side fairing, as applicable.

m. Record rework of searchlight assembly, per Part I of this Notice in Component Record of helicopter Log Book.

PART II - DISASSEMBLY AND ASSEMBLY OF 300B SEARCHLIGHT ASSEMBLY

The following defines a procedure for bench disassembly and assembly of the Dovsek 300B searchlight, with lower extendable section separated from upper section of searchlight.

1. Disassembly - Lower Extendable Section

a. Remove screws and coil wiring from clamp block on T-housing (B24); or remove straps securing coil wiring to supports on clamp block, as applicable. (See Figure 1.)

b. Remove hardware securing lamp assembly and light support attach bracket (B26) on rotating block (B25), two places.

c. Loosen two set screws and remove rotating block from shaft (B35), two places.

NOTE: Index shaft (B35) and lower shaft tubing (B32-2) relative to T-housing, for easier orientation of the gears during reassembly.

d. Loosen set screw on T-housing; back off and remove threaded bushing (B24), and shaft (B35) with thrust bearing and bevel gear (B34) from T-housing. Remove thrust race and bearing from shaft.

e. Drive out roll pin and remove bevel gear from shaft.

f. Loosen jam nut (B9) and back off piston (B22) from threaded end of adapter (B23) on T-housing; withdraw piston and remove jam nut from adapter.

g. Loosen set screw on neck of T-housing and remove adapter; remove lower shaft tubing (B32-2) with thrust bearing and bevel gear (on shaft stub) from housing.

h. Drive out roll pin and remove bevel gear from shaft stub.

i. Drive out roll pin from lower end of shaft and remove shaft stub with bearing; remove bearing from shaft stub.

2. Disassembly - Upper Non-Extendable Section

a. Remove or fold back rubber grip (B47) from handle (B10). (See Figure 1.)

b. Loosen set screw and remove handle.

c. Back off and remove friction locknut (B17); remove friction bushing (B29) from top rotating shaft (B28).

d. Remove four screws securing gearbox plate (B11); remove plate.

e. Remove two screws securing switch housing (B12) to gearbox (B11) and assembly tubing (B16).

f. Unscrew assembly tubing from threaded end of spacer (B13); withdraw tubing from upper rotating shaft (B31-2).

g. Unscrew gearbox from threaded end of spacer.

h. Remove top rotating shaft (B28) with spiral gear and bearings from gearbox.

i. Press outboard alignment bearing from end of shaft.

j. Drive out roll pin and remove spiral gear from shaft.

k. Press inboard alignment bearing from shaft.

l. Loosen set screw and remove spiral gear, thrust bearing and thrust race from upper shaft tubing (B30-3); withdraw tubing from adjusting bushing (B14).

m. Drive out roll pin connecting upper shaft tubing (B30-3) and upper rotating shaft (B31-2).

n. Loosen set screw and unscrew bushing from spacer.

o. Remove wire clamp (B21) from assembly tube.

NOTE: Index stop (B19) prior to removal, to facilitate reassembly at same location on assembly tubing, and at same orientation position relative to the grip handle.

p. Loosen set screws and remove floor housing (B20) and stop (B19) from assembly tubing. Loosen set screw and remove lock (B18) from stop. Remove four screws securing floor housing plate; remove bearing.

NOTE: Perform the following if microswitch housing is to be disassembled.

q. Remove electrical connectors from ends of microswitch wiring; remove grommets from assembly tubing and wiring.

r. Attach 3-foot leader (coded wire or cord) to end of each wire; withdraw wiring upwards through conduits inside assembly tubing. Do not pull end of leader wires through hole in assembly tubing.

s. Loosen set screws and remove microswitch from housing; remove toggle switch from top of switch housing.

3. Assembly - Lower Extendable Section

a. Install bevel gear (B34) on shaft (B35) and secure with roll pin; position thrust bearing and adjusting bushing on shaft. (See Figure 1.)

b. Install bevel gear (B34) and bearing on stub of shaft (B32-2) and secure with roll pin. Position stub, gear and bearing assembly on lower shaft tubing (B32-2) and secure with roll pin.

NOTE: Apply light coat of grease on bevel gears at installation.

c. Install gear end of lower shaft tubing in adapter (B23) and screw adapter until clamped up against neck of T-housing (B24). Secure adapter with set screw in neck of T-housing.

d. Position thrust bearing and adjusting bushing on shaft (B35); install gear end of shaft in T-housing; align index mark on shaft (B35) and lower shaft tubing (B32-2) with index marks on T-housing. Mate and adjust gears by rotating bushing (clockwise) until gears rotate freely with minimum backlash. Secure bushing with set screw in T-housing.

NOTE: The lower shaft tubing (B32-2) and shaft (B35) have to be correctly aligned for proper orientation of the lamp assemblies at installation on helicopter.

e. Install jam nut (B9) on adapter; bottom jam nut but do not tighten.

f. Install piston (B22) on adapter to within one or two threads from jam nut; tighten jam nut (counterclockwise) to provide clamp up against piston.

g. Install rotating blocks (B25) on shaft (B35) and secure with set screws; check that set screws are seated in countersinks on shaft.

h. Install lamp assemblies to light support or attach brackets, using existing hardware.

i. Secure coil wiring to clamp block on T-housing; or secure with straps to supports on clamp block, as applicable, using existing hardware.

4. Assembly - Upper Non-Extendable Section

NOTE: Perform steps a and b if microswitch housing has been disassembled.

a. Attach electrical wiring to coded wire leaders and route wiring through conduits and out hole in assembly tubing (B16). Position grommets on wiring and install grommets in assembly tubing. Install electrical connectors at wire ends.

b. Connect electrical wiring to terminals of toggle switch and microswitch and install switches in housing (B12); secure microswitch with screws.

c. Install lock (B18) on stop assembly (B19); secure with set screw. Position stop at indexed location on assembly tubing (B16) and secure with set screw. (See Figure 1.)

d. Position bearing in floor housing (B20) and install housing plate with screws. Position floor housing on assembly tubing against stop, with stop assembly in locked position, and secure with set screw.

e. Install wire clamp (B21) on assembly tubing as shown.

NOTE: Inspect existing spiral gears to see if hardened gears are installed (hardened gear part numbers begin with SH or HL). As applicable, install new hardened gears (Kit No. B-101-3).

f. Apply light coat of grease to spiral gears at installation.

g. Install spiral gear and alignment bearings on end of top rotating shaft (B28); secure gear with roll pin.

h. Assemble top rotating shaft and gearbox plate (B11); install plate to gearbox housing with four screws.

i. Position friction bushing (B17) on shaft and insert bushing into threaded neck of plate; install friction locknut (B17) but do not tighten.

j. Install handle (B10) on shaft and secure with set screw.

NOTE: Allow sufficient clearance between handle and friction locknut, to allow for backing off locknut to release friction.

k. Rotate friction locknut (clockwise) to apply friction for desired twist grip handle operation.

NOTE: Do NOT back off friction locknut against handle grip to adjust friction. To apply friction, rotate locknut clockwise only. To release friction, back off locknut towards, but not against, handle grip. If friction will not release properly, remove handle and unseat friction bushing. Replace handle and rotate (clockwise) to apply desired friction.

l. Install adjusting bushing (B14) in spacer (B13); insert upper shaft tubing (B30-3) through adjusting bushing and install thrust race, bearing and spiral gear on shaft tubing. Secure spiral gear with set screw.

- m. Install upper rotating shaft (B31-2) to lower end of upper shaft tubing (B30-3); secure shaft and shaft tubing with roll pin.
- n. Install gear end of shaft assembly in gearbox; install and tighten threaded end of spacer for clamp-up against gearbox. To adjust gears, thread adjusting bushing (clockwise) until gears mate and operate freely with minimum backlash. Secure adjusting bushing with set screw in spacer.
- o. Position assembly tubing (B16) over upper rotating shaft assembly; thread assembly tubing in place on spacer assembly.
- p. Tighten assembly tubing, aligning screw holes in gearbox and assembly tubing to accept microswitch housing (B12); install switch housing with two 10-32 screws.

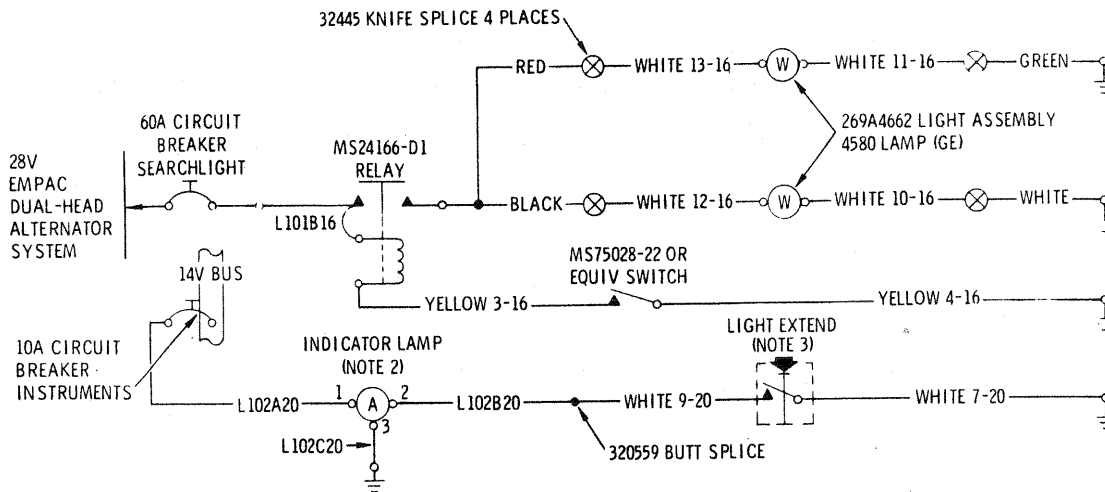
NOTE: When aligning screw holes, do not overtighten as backing off assembly tubing to align holes will leave assembly tubing loose.

After disassembly and reassembly of upper gears, it may be necessary following reinstallation on helicopter to remove gearbox plate (B11) and disengage the upper gears, to obtain proper orientation of the lights for elevation control. Remesh gears and secure the gearbox plate.

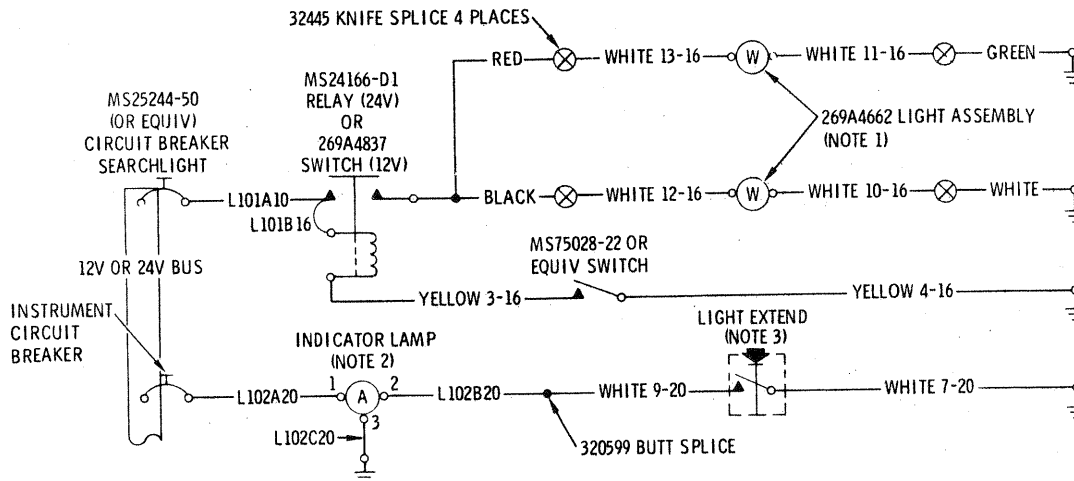
PART III - TROUBLESHOOTING THE SEARCHLIGHT INSTALLATION

Symptom	Probable Trouble	Corrective Action
Looseness between gearbox (B11) and assembly tubing (B16)	Assembly tubing or spacer (B13) overtightened and backed off during assembly.	Check that spacer and assembly tubing are tightened (clockwise) against gearbox when switch housing holes align. Shim if required.
	Attach screws stripped due to misalignment of attach holes in gearbox and switch housing.	Tap out screw holes to accept larger diameter 10-32 screws; check proper alignment of screw hole.
	Assembly tubing not tightened clockwise against gearbox.	Tighten spacer (clockwise) for clamp-up against gearbox. Assure that holes for switch housing align. Shim if required.

Symptom	Probable Trouble	Corrective Action
Looseness in telescope handle (B15); lower section will not stay in retracted position.	Set screw not seated properly in recess of handle pin, or set screw not tight.	Reseat set screw so that it is flush with recess in handle pin. Tighten set screw.
Piston (B22) will not stay tight.	Jam nut tightened against adapter (B23) instead of piston.	Tighten jam nut (counter clockwise) against piston.
Lights will not stay adjusted in elevation.	Inability of set screw (3/16 x 10-32) in rotating block (B25) to remain tight on round shaft (B35).	Countersink shaft; drill a tap set screw hole in rotating block for the 1/4 x 28 set screw. Adjust elevation at assembly. See Part I of Notice.
Rough or difficult operation - spiral gears in upper gearbox (B11).	Gears not mated properly; gears worn or sheared. Friction locknut (B17) tightened against handle (B10); shaft (B28) and gear not seated properly in gearbox.	Adjust spiral gears, using adjusting bushing (B14); replace gears, as required. Remove handle (B10) and release friction bushing (B29); reseat shaft and gear and adjust gears with bushing. Tighten friction locknut clockwise only, to apply friction.
Rough or difficult operation - bevel gears in T-housing (B24).	Gears not mated properly; worn or sheared.	Adjust bevel gears, using adjusting bushing (B24). Replace gears as required.
Light switch toggle arm broken.	Excessive force applied to arm; toggle arm hit by heavy object.	Replace switch with stronger 269A4665 switch or PN SF1SCY19 Cutler Hammer Co. switch.
Handle grip sticky or soft.	Ketone or chlorinated cleaning solution used to clean grip.	Replace grip. Do not use ketones or chlorinated solution around grip.



WIRING DIAGRAM-269A4333-29 AND -39 SEARCHLIGHT CONFIGURATIONS WITH 28V EMPAC DUAL ALTERNATOR

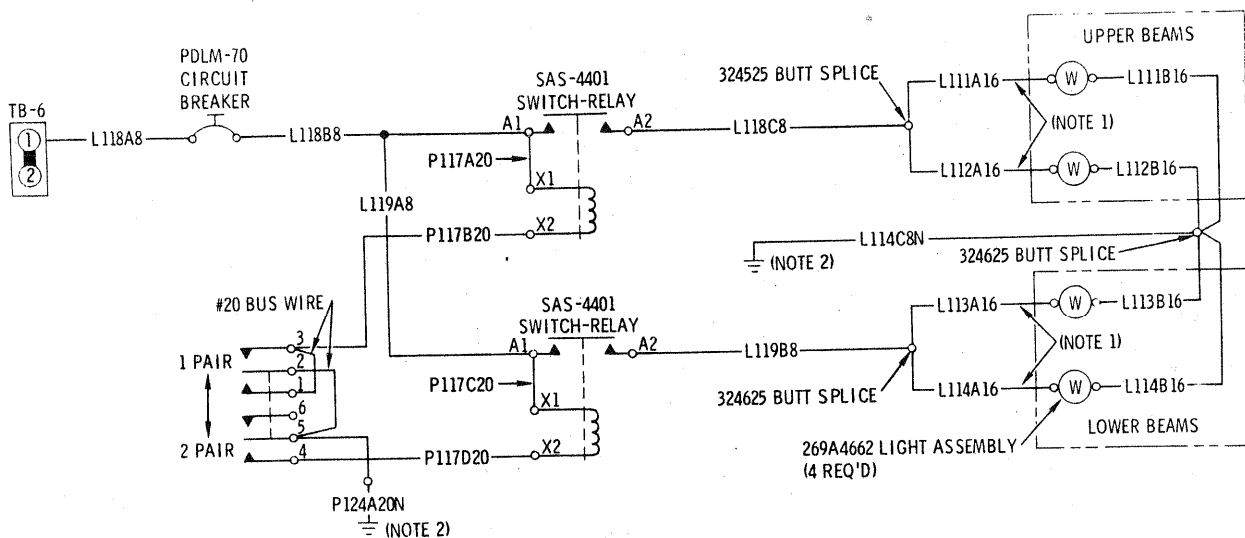
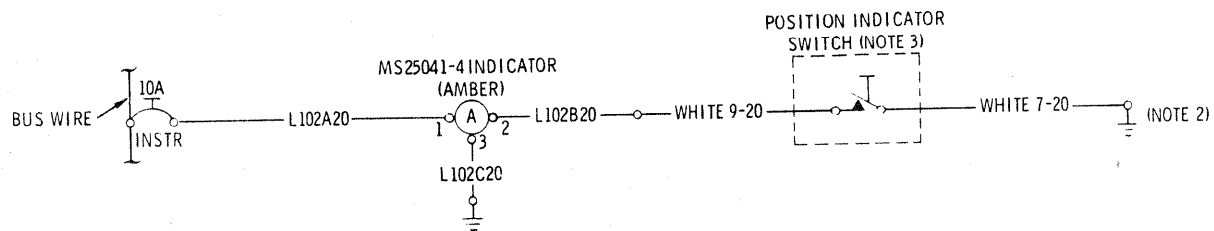


WIRING DIAGRAM-269A4333-27, -29 AND -39 SEARCHLIGHT CONFIGURATIONS WITH 12 OR 24 VDC HELICOPTER ELECTRICAL SYSTEM

NOTES:

1. GE NO. 4522 FOR 12 VDC; GE NO. 4580 FOR 24 VDC.
2. SEARCHLIGHT INDICATOR LAMP (AMBER) FURNISHED WITH SEARCHLIGHT; LOCATE ON INSTRUMENT PANEL. GE NO. 330 FOR 12 VDC; GE NO. 327 FOR 28 VDC.
3. LIGHT EXTEND SWITCH PART OF SEARCHLIGHT (ENCLOSED WITHIN LIGHT HANDLE); SWITCH CLOSES WHEN SEARCHLIGHT IS EXTENDED DOWNWARD.
4. REPLACES EXISTING SWITCH INSTALLED IN LIGHT HANDLE.

Figure 2. Wiring Diagram - Dovsek 300B Searchlight Assembly (Sheet 1 of 2)



NOTES:

1. STRIP WIRES TEN (10) INCHES AND DOUBLE BACK BEFORE CRIMPING IN BUTT SPLICES.
2. GROUND ON SAS-4401 RELAY MOUNTING BOLTS.
3. POSITION INDICATOR SWITCH ENCLOSED WITHIN LIGHT HANDLE AND ACTUATES WHEN LIGHT IS EXTENDED.

WIRING DIAGRAM

269A4335 SEARCHLIGHT INSTALLATION-QUAD LAMPS

88-168

Figure 2. Wiring Diagram - Dovsek 300B Searchlight Assembly (Sheet 2 of 2)