

MODEL "D"

**TYPE "AK" ADJUSTABLE DISC
AIR-FRICTION CLUTCH & BRAKE
MANUAL A-151-D**

BLISS TYPE "AK" CLUTCH

The Bliss "AK" clutch is a combination pneumatic friction clutch and spring-loaded disc brake. Compressed air is used to engage the clutch. When the air pressure is released, the springs set the brake.

The clutch has an adjustable feature to insure instant engagements and full energy transfer after normal wear has taken place on the linings.

OPERATION

The single disc clutch consists of two friction discs, one for the clutch (K-24), and one for the brake (K-17). See Figure 1. Brake and clutch linings (K-5) and (K-7), respectively, are fastened on each side of these discs. (K-5) and (K-7) are furnished as assemblies. Other major parts consist of one driving disc (K-38A), eight driving pins (K-45), two clutch friction disc pins (K-30), two brake friction disc pins (K-11), eight brake springs (K-8), piston (K-9) with one large packing (K-3), one small packing (K-2), clutch body (K-1), air cylinder (K-46), clutch cylinder head (K-25), brake driving disc (AK-62), and the adjusting ring (AK-63).

The double disc clutch consists of three friction discs, two for the clutch (K-24), and one for the brake (K-17). See Figures 2 and 4. The double disc clutch is similar to the single disc except for the additional clutch driving disc (K-38), friction disc (K-24), and plate and block assemblies (K-7).

The double disc clutch and the double disc brake consists of two clutch friction discs (K-24) and two brake friction discs (K-17). See Figure 3. This model is similar to the double clutch, single brake except for the additional driving disc (K-38), friction disc (K-17), and plate and block assemblies (K-7).

The clutch friction disc revolves with the flywheel while the brake friction disc is stationary. The clutch friction disc is held to the flywheel by clutch friction disc pins (K-30 and K-11). The brake friction disc is held to the brake bracket by the brake friction disc pins (K-11 and K-30). Both clutch and brake friction discs float on their respective pins. The friction discs are guided on the pins by disc bushings (K-23 and K-16).

NOTE: The clutch friction disc and the brake friction disc have one fixed end and one floating end. The floating end has flats on the pin and clearance in the friction disc bushing for allowing expansion of the clutch due to heat.

The clutch and brake friction discs are separated by the "driving assembly" which consists of the clutch driving disc (K-38A), the brake driving disc (AK-62), and the adjusting ring (AK-63) with screws (AK-64). This assembly rotates with the driveshaft, the clutch body (K-1), and the air cylinder (K-46). The "driving assembly" is moved by air pressure to engage the clutch, and by spring pressure to set the brake.

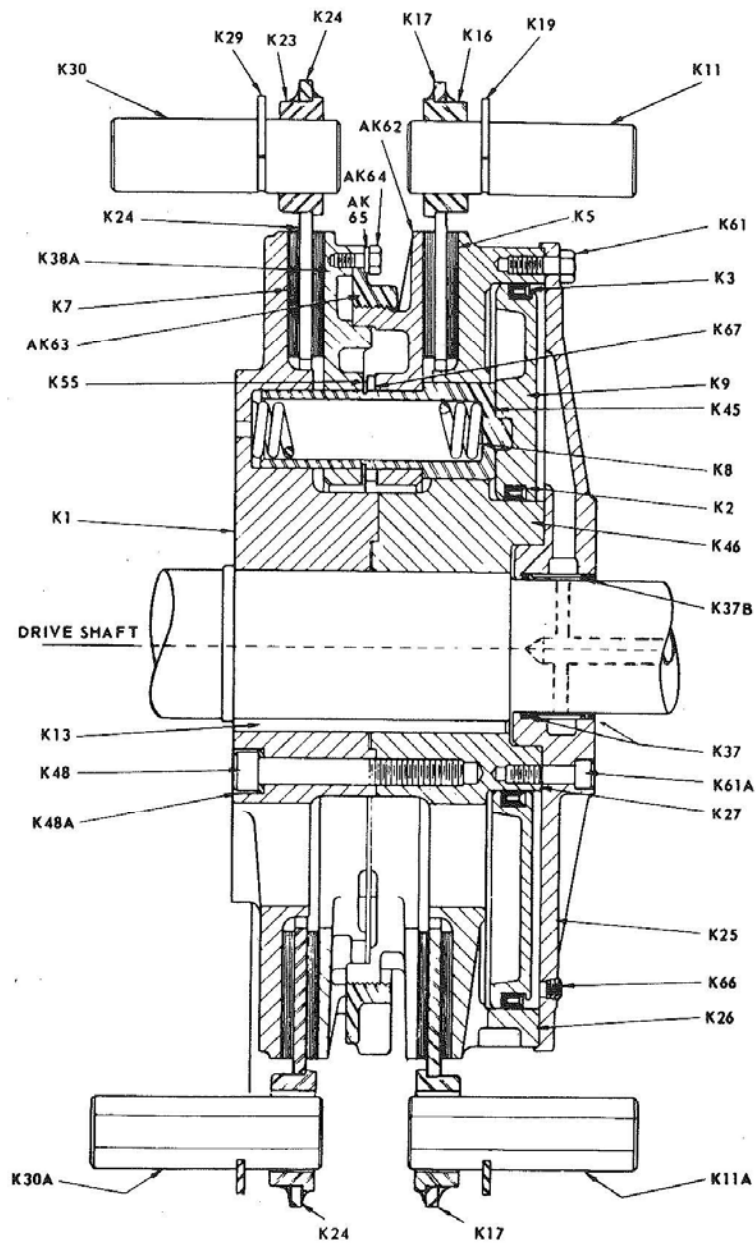
To engage the clutch, compressed air is admitted to the air cylinder (K-46) through the driveshaft and the cylinder head (K-25). The air pressure moves the piston (K-9) which compresses springs (K-8) and moves the driving discs (K-38A) away from the brake disc toward the clutch disc. This grips the rotating friction disc (K-24) between the driving disc (K-38A) and the clutch body (K-1), thus creating the friction for starting the driveshaft, rotating and transferring the flywheel energy to the driveshaft. Air pressure must then be maintained in the line to the air cylinder (K-46) during the required operation of the press.

When air pressure is released, the brake springs move the driving disc away from the clutch disc and toward the brake disc. This grips the motionless brake disc, disengaging the clutch and creating the friction necessary to stop the crankshaft.

An air pressure failure will disengage the clutch and automatically set the brake. (Section 3. 5. 2. 11 of ANSI-BII.1 1971).

BLISS TYPE "AK" CLUTCH

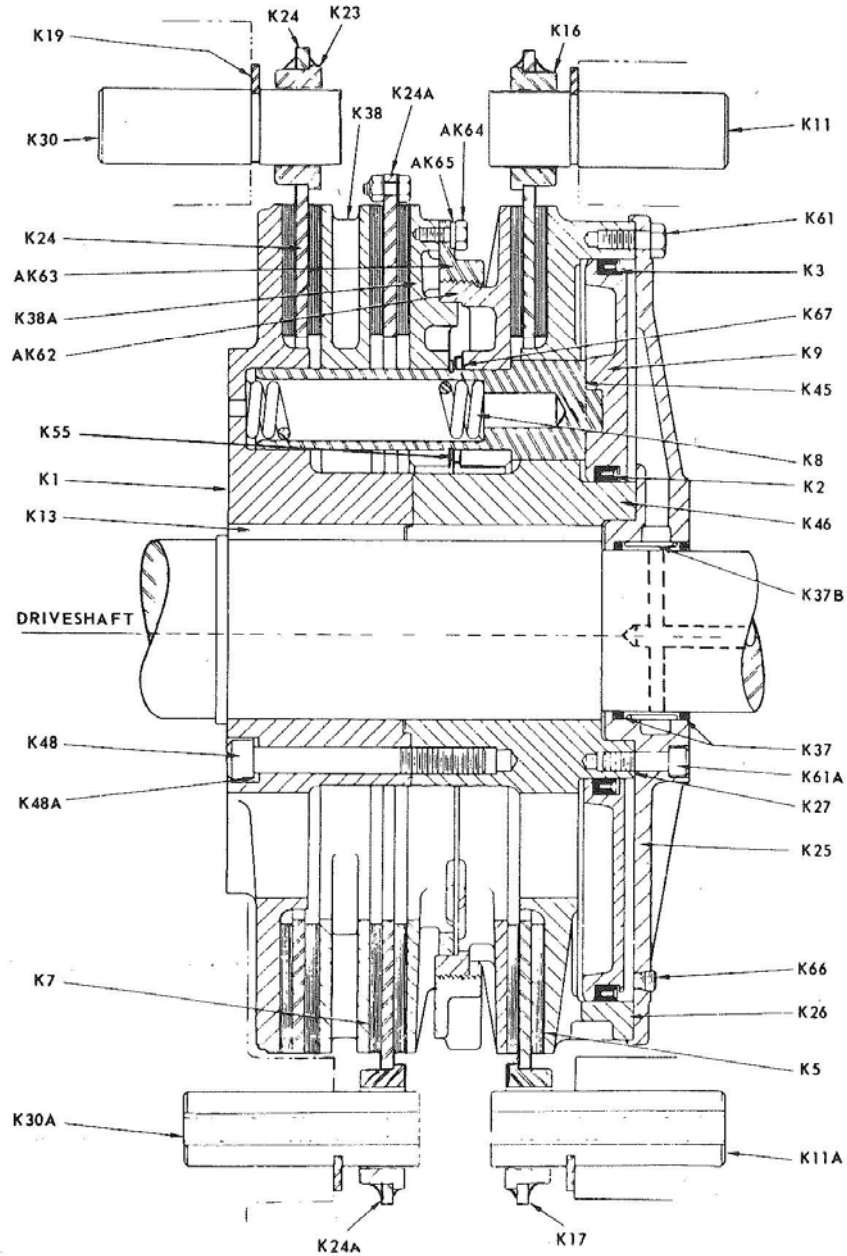
FIGURE 1



REFER TO PARTS LIST ON PAGE 6.

BLISS TYPE "AK" CLUTCH

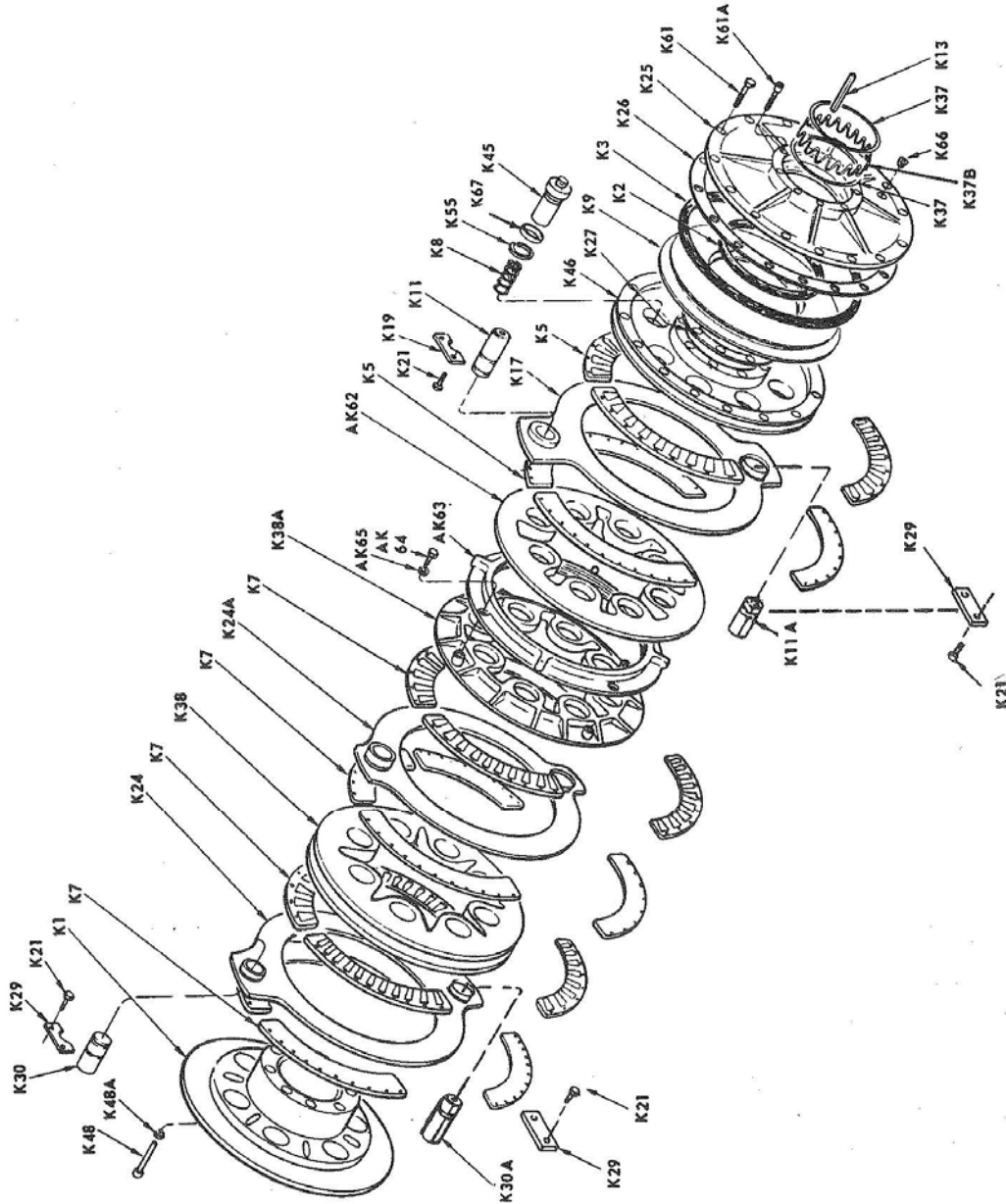
FIGURE 2



REFER TO PARTS LIST ON PAGE 6.

BLISS TYPE "AK" CLUTCH

FIGURE 3



REFER TO PARTS LIST ON PAGE 6.

BLISS TYPE "AK" CLUTCH

PARTS LIST FOR ILLUSTRATIONS ON PAGES 3, 4 AND 5

K1	Clutch Body	K26	Cylinder Head Gasket (Large)
K2	Piston Packing - Small	K27	Cylinder Head Gasket (Small)
K3	Piston Packing - Large	K29	Friction Disc Pin Retainer
K5	Plate - Block Assembly - Brake	K30	Clutch Friction Disc Pin (Fixed End)
K7	Plate - Block Assembly - Clutch	K30A	Clutch Friction Disc Pin (Floating End)
K8	Brake Spring	K37	"O" Ring
K9	Piston	K37B	"O" Ring Spacer
K11	Brake Friction Disc Pin (Fixed End)	K38	Clutch Driving Disc
K11A	Brake Friction Disc Pin (Floating End)	K38A	Clutch Driving Disc
K13	Clutch-Shaft Key	K45	Driving Pin
K16	Brake Friction Disc Bushing	K46	Air Cylinder
K17	Brake Friction Disc Assembly	K48	Clutch Body Screws
		K48A	Washer
K19	Friction Disc Pin Retainer	K55	Driving Pin Snap Ring
K21	Friction Disc Pin Retainer Screw	K61	Cylinder Head Screw - Outer
		K61A	Cylinder Head Screw - Inner
K23	Clutch Friction Disc Bushing	AK62	Brake Driving Disc
K24	Clutch Friction Disc Assembly	AK63	Adjusting Ring
K24A	Clutch Friction Disc Assembly	AK64	Adjusting Ring Screw
K25	Cylinder Head	AK65	Lock Washer
		K66	Pipe Plug
		K67	Wear Ring

When ordering spare parts or replacements, give the PRESS NUMBER, the SERIAL NUMBER, the NUMBER and NAME of the part wanted, and the PAGE NUMBER of this service manual.

WARNING: If it is necessary to disassemble clutch, remove two (K-48) clutch body screws and add two longer screws or studs. This is to prevent cylinder (K-46) from coming off shaft as spring (K-8) has tendency to separate cylinder and clutch body.

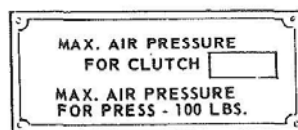
Flywheel Bearings must be greased approximately once every three months. One shot or one stroke of grease gun is sufficient. Use American Oil Rykon Grease #EP or equivalent.

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Air service must be provided to operate the clutch. A single air line inlet is usually provided on the press, to which the shop air line must be connected. Piping is arranged so that all compressed air passes through a common filter or separator. Branch lines leave the outlet side of the filter to the clutch and other air devices, when furnished. An air pressure regulator in each branch line maintains proper operating pressure for these devices. See Figure 3.

Recommended maximum operating air pressure is 70 P.S.I.

Actual requirement for each press is shown on an instruction plate attached to press frame (Figure A)



(Figure A)

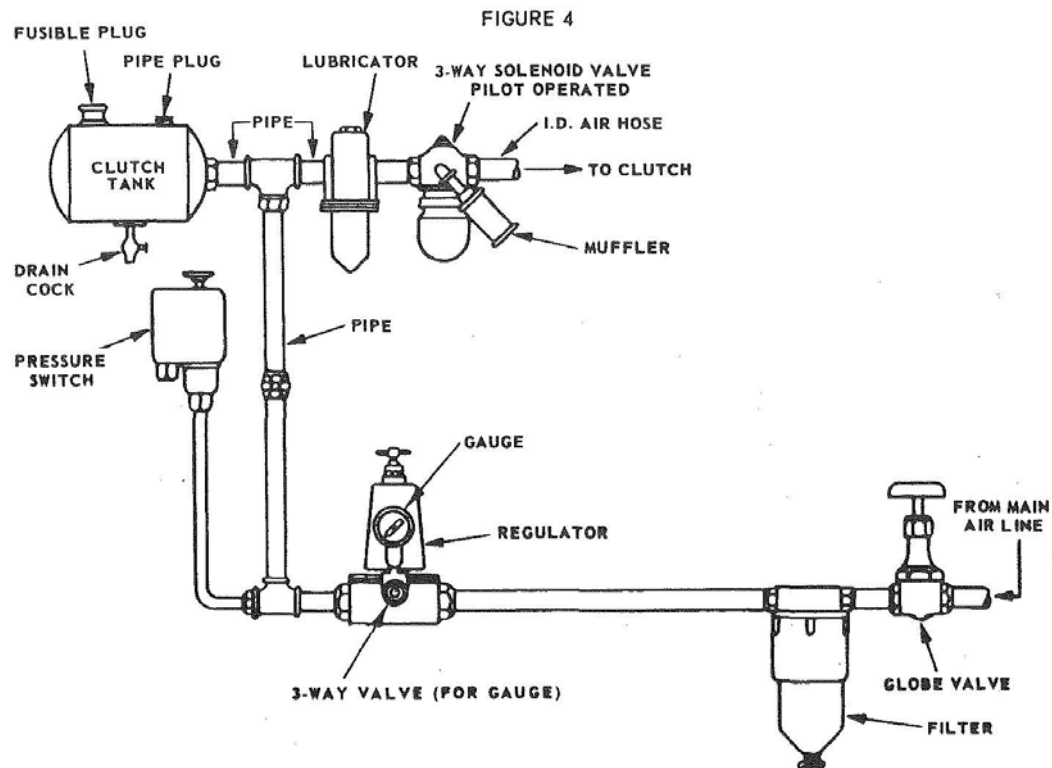
An air line lubricator is provided in the branch line to the clutch, and is installed between the clutch pressure regulator and clutch operating valve. The lubricator should be adjusted to a fine mist on every clutch engagement. Use a high grade straight mineral lubricating oil with a viscosity of 145-165 SSU @ 100° F. SAE No. 10.

An air tank is required in the clutch line to reduce the pressure drop at each clutch engagement.

The air line filter bowl must be drained regularly for effective performance. There is a "drain cock" at lower end of bowl for this purpose. Never permit moisture to fill bowl above baffle or up to filter element, otherwise, collected moisture and emulsion may be carried into the air line.

Note that the air tanks are provided with drain cocks to remove accumulated moisture.

An air swivel and hose provide a flexible connection between the clutch operating valve and the drive shaft.



BLISS TYPE "AK" CLUTCH

PARTS LIST

K-5A	Brake lining plate bolt and nut
K-7A	Clutch lining plate nut and bolt
K-5	Brake lining - 1 inner, 1 outer
K-7	Clutch lining - 1 inner, 1 outer
K-23	Clutch friction disc bushing
K-16	Brake friction disc bushing
K-11	Brake friction disc pin
K-30	Clutch friction disc pin

K-24	Clutch friction disc
K-17	Brake friction disc

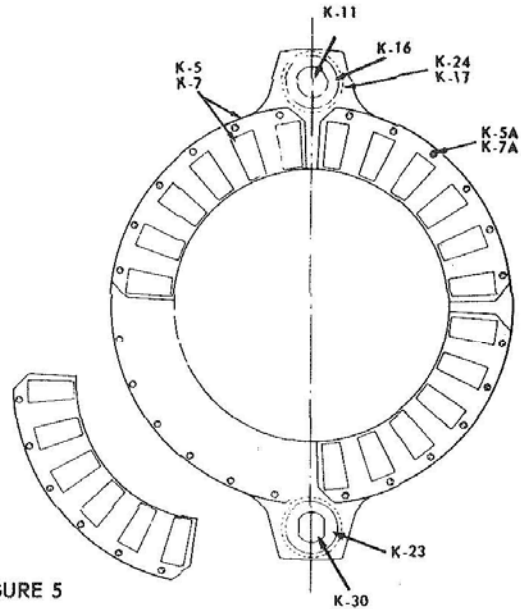
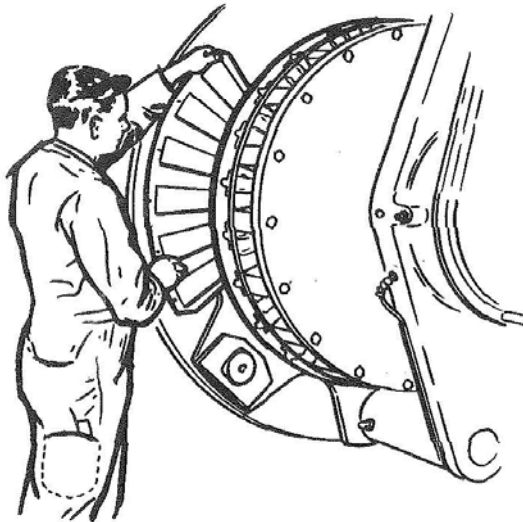


FIGURE 5

FIGURE 6



CLUTCH LINING REPLACEMENT

The replacement of the clutch and brake linings can be made without dismantling the clutch. The clutch friction block assemblies are made in quadrants requiring four per friction face or eight for each friction disc. See Figure 5.

The lining assemblies can be removed by, first, removing the bolts and nuts (K-7A) and then withdrawing the friction lining assemblies. New lining assemblies can be installed by reversing this procedure.

BRAKE LINING REPLACEMENT

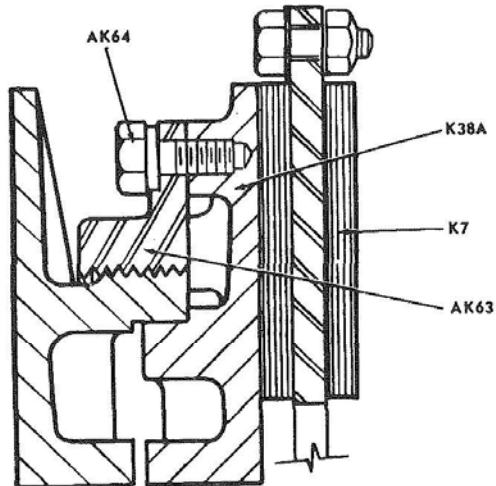
This is the same as mentioned above for the clutch except that air pressure must first be applied to release the brake disc.

Be sure stroke is down when changing linings.

◀ **Figure 6.** This illustration indicates the ease with which the clutch friction plates can be replaced. This is accomplished without disassembling the clutch and with a minimum of down time.

BLISS TYPE "AK" CLUTCH

FIGURE 7



ADJUSTMENT FOR LINING WEAR

The clutch can easily be adjusted to take up any clearance between the driving disc (K-38A) and linings (K-7) which may have resulted from lining wear. Correct adjustment will insure instant clutch engagement, full energy transfer from flywheel to driveshaft, and will minimize air consumption.

Adjustment should be made when the amount of clearance between the driving disc (K-38A) and linings (K-7) exceed 3/16 inch.

First remove the four cap screws (AK-64) then tap driving disc (K-38A) until it is free from (AK-63) and turn adjusting ring (AK-63) until there is no clearance between clutch driving disc (K-38A) and linings (K-7). Then back off adjusting ring (AK-63) 1/2 to 3/4 turn. Turn back additional amount if necessary to line up cap screw holes and replace cap screws (AK-64).

IMPORTANT: These clutches must be adjusted regularly to prevent clutch slipping and creating excess heat.

GENERAL ASSEMBLY OF AIR SWIVEL AND HOSE

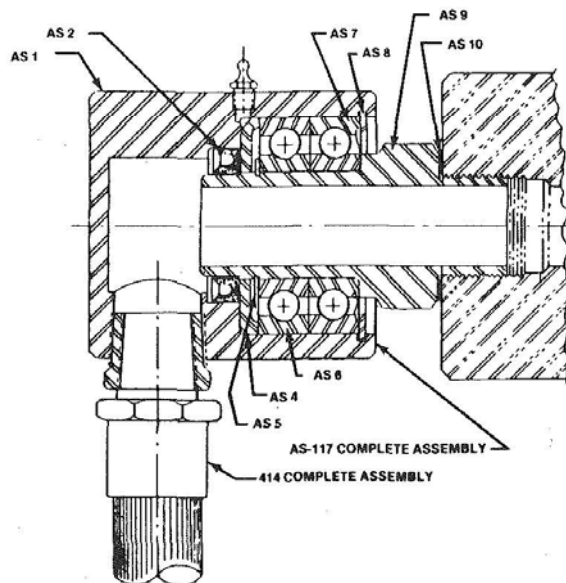


FIGURE 8

PARTS LIST

AS-1	Swivel Housing
AS-2	Packing Ring
AS-4	Spacer Ring
AS-5	Truarc Retainer
AS-6	Bearing
AS-7	Bearing
AS-8	Truarc Retainer
AS-9	Sleeve
AS-10	Gasket
AS-117	Air Swivel - complete
414	Flexible Hose - complete