



Automatic Connector Application Machine (ACAM)

1101 and up

Instruction Manual and Parts List

30-959, 30-971, 30-972, 30-973, 30-974



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Part I. General Coverage

A. Introduction

The Automatic Connector Application Machine (ACAM) is especially designed to quickly and firmly apply IDEAL Wire-Nut® Wire Connectors to a wide range of conductor types and sizes.

ACAM is a computer controlled machine with easy-to-set controls that allow an operator to set variable torque settings for specific applications, insuring integrity and consistency for each electrical connection. ACAM is the only computer controlled machine that applies “screw-on” type wire connectors, with precision, faster than manual assembly operators.

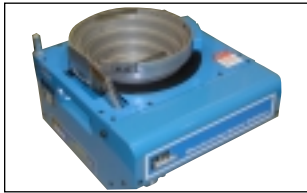
B. ACAM Models

Model	Connector
30-959	59B, 59 Tan
30-971	71B®, 71B®-Black, 71 Tan
30-972	72B®, 72B®-Black, 72 Tan
30-973	73B®, 73B®-Black, 73 Tan
30-974	74B®

C. ACAM Components

Each ACAM Model consists of the following components:

■ Console Unit



■ Hopper Unit



■ Bowl Component Unit



■ Hand Gun Assembly



The Console Unit contains the main control components, including the:

- Electronic Modules
- Drive Motors
- Connector Feed Bowl

The Hopper Unit holds the wire connectors and feeds them to the feed bowl. This system is controlled by a proximity sensor which constantly monitors and maintains the correct level of connectors in the feed bowl at all times.

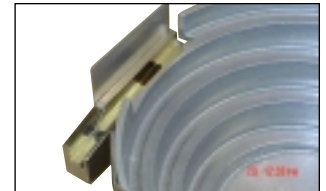
The Feeder Unit consists of two tubes and the connector adapter which transfer connectors from the Bowl Component Unit to the Hand Gun Assembly.



An optical sensor in the connector adapter is used to monitor the level of connectors in the transfer tube, maintaining a correct level of connectors in the Hand Gun Assembly. When the optical sensor does not sense connectors in the transfer tube, it will automatically start the vibrator bowl to feed additional connectors to the Hand Gun Assembly.



The Bowl Component Unit contains the alignment ramp. These units orient and align the connectors in the proper position prior to entering the feed tube.



The Hand Gun Assembly applies the connector to the stripped conductor ends. It is a lightweight hand-held unit that is torque controlled from the Console Unit.



D. ACAM Accessories

- Mounting Stand; adjustable, stand to properly position the machine in the assembly area.
- Bench mount for positioning the Hand Gun; for applications where the work can be brought to the tool. (Usually small components that can be hand held).
- Tool Balancer; for suspending the Hand Gun near the work area in an efficient location.



Part II. Equipment Set-Up Instructions

A. Unpacking ACAM

■ Carefully remove the machine components from the packing material. Make sure that all components have been removed. The components consist of those items covered in Part I C.

NOTE: Do not lift feeder unit by vibrator bowl.

B. Assembling Mounting Stand (Optional)

■ Place the single-frame base on the floor and mount two corner brackets 12 inches from end. To mount bracket to frame, assemble bolts and nuts to corner bracket with nut flush with end of bolt. Mount corner bracket on frame, fitting nuts in frame channel. Turn bolt with finger and nut will turn and lock into position across channel. Then tighten both corner brackets and mount remaining corner bracket facing each other with all of its bolts and nuts mounted loose.



■ Mount sliding upright frame with the closed side flush with corner brackets set 12 inches from end. Slide the second set of corner brackets flush with open channel frame. Pass two 3-1/2 inch socket head bolts through top holes in the corner brackets and tighten nuts. Tighten all bolts between corner bracket and base frame. Mount remaining two 3-1/2 inch socket head bolts through bottom holes in corner bracket and tighten with nuts.



■ To mount plate and bracket assembly, use 3/8-16 bolt through bracket with nut flush with end of bolt. Slide 3/8-16 nut into sliding upright channel and tighten.



■ Mount support arm, if necessary, to either the right or left of the machine. Use bolt and nut holding plate and bracket together to mount support arm.



C. Adjusting Mounting Stand

■ Loosen four socket head bolts in sliding channel.

■ With socket head wrench on one of the bolts, lift cross bar to raise the machine. After the machine is raised to proper level, tighten four socket head bolts.

■ Slide mounting stand base under work bench.

■ Stand should be weighted or fixed to floor to prevent tipping.



D. *Mounting the Console Unit to Mounting Stand*

■ Remove bolts from bottom of base unit. Retain the bolts and washers for mounting the machine to the mounting stand platform.

■ The machine should be mounted on the steel frame platform, furnished with the mounting stand. It is important to insure the machine is on a level and solid platform. Inadequately constructed platforms will greatly influence the orientation and feeding of the connectors. (If you are using your own platform, it will be necessary for you to drill two holes - 1/2" in diameter and 11-1/2" apart, located 7-1/2" from front of the platform.) (Please consult your sales engineer before building your own.)

* After placing feeder unit on steel platform, check to ensure that vibrator air gap adjustment nut is accessible through hole in steel platform.

■ It is recommended that the connector machine be mounted approximately 36" above the work area to insure a free flow of connectors to the Hand Gun during operation.



E. *Connecting Flexible Shaft to Console Unit*

■ Attach flexible drive shaft to motor shaft on front panel of Console Unit and tighten screw. Slide on flexible shaft sheath over flexible drive shaft.



F. *Mounting Hopper Unit to Console Unit*

■ Mount Hopper arm with rubber bumpers to right rear corner of Console Unit.



■ Using 10-24 x 1/2" B.H.S.S. Mount other arm to Hopper.

■ Slide arm over left rear Hopper mount post.

■ Secure with 10-24 x 1/2" screw.



G. *Installing and Adjusting Hopper Level Sensor*

- Fill bottom of feed bowl with connectors to about one inch depth.
- Adjust sensor nuts to allow sensor to protrude through bracket about two inches.



- Plug proximity sensor into Hopper sensor connector located on left side of Console Unit.



- Plug Hopper power cord into outlet on back of Console Unit.

- If sensor light is on, turn adjustment screw counter clockwise until light just goes off.

- With sensor light off, turn adjustment screw clockwise until light just comes on.

The level sensor is now adjusted. Slight adjustments can be made to the connector level by turning adjusting screw counter clockwise to increase the level and clockwise to decrease the level.



H. *Attach Counter Balance (Optional)*

- A counter balance is supplied with each unit to locate height of hand tool to desired height position. The counter balance can be mounted on a swivel arm extending from the platform either to the left or right side of the connector machine. Swivel hook on counter balance will later be attached to mounting eye on hand tool.



I. *Attach Hand Gun*

- Remove wrap from flexible drive shaft, spring coupling and Hand Gun cord.



- Pull feed tube coupling nut over spring coupling and attach to Hand Gun and connector adapter.



- Insert male plug from Hand Gun cord into female receptacle on Console Unit



- Squeeze trigger on Hand Gun to start flexible drive shaft. Insert flexible shaft onto slotted drive shaft, extending from Hand Gun, while trigger is squeezed. Once drive shaft is seated against Hand Gun, tighten set screw.



- Adjust height of Hand Gun by locating counter balance cable stop to proper length.

- Adjust tension on counter balance.

—To apply tension, turn knurled outer drum in a clockwise rotation until desired tension is obtained.

—To release tension, press lever projecting from the lower part of the housing and adjust with a slight clockwise rotation.



J. *Assembling Bench Mounting Stand (Optional).*

- Place Hand Gun in Bench Mount Stand.
- Secure with #8 x 3/8" socket screws.
- Position Hand Gun and Bench Mount Stand in convenient working location on bench.
- Fasten Mounting Stand to bench securely. (Mounting fasteners not supplied.)



- Substitute Foot Switch Control for Hand Control.



- Insert male plug from Foot Switch Control into female receptacle on Console Unit front panel.



K. *Loading Hopper Unit*

- Fill Hopper
- IMPORTANT - use only IDEAL Wire-Nut® Wire Connectors in ACAM. Do not mix different sizes in Hopper Unit.



L. *Check Hopper Solenoid Adjustment*

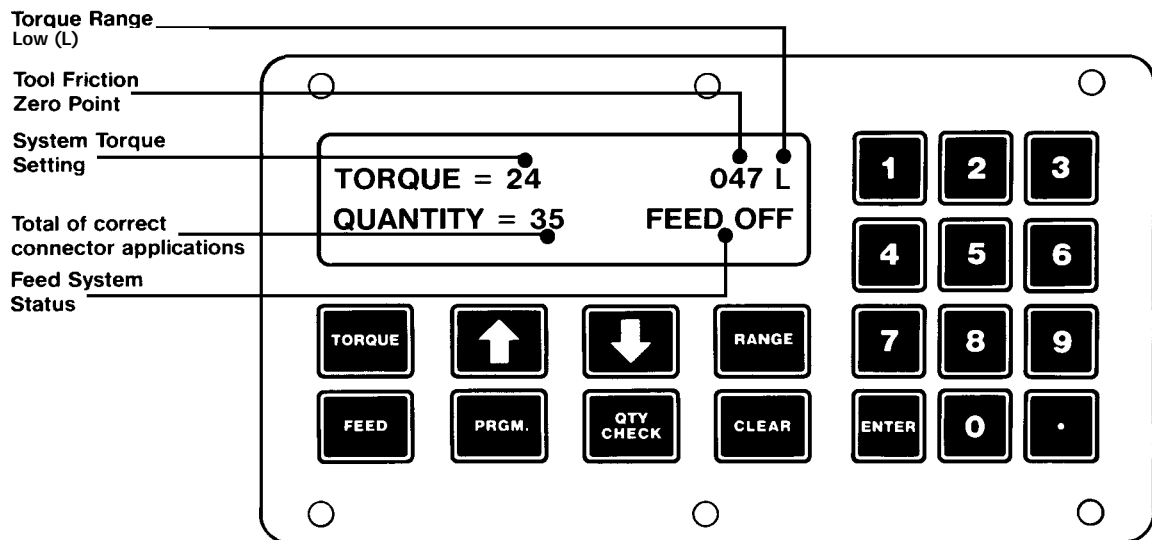
- Gate should clear the connector entry path with the solenoid plunger completely seated in the solenoid coil. Gate should not touch bottom of Hopper Chute when in the open position.
Note: Improper solenoid adjustment will result in premature solenoid failure.

- To correct solenoid position, loosen mounting screws, slide solenoid forward or back as required, retighten screws and double check adjustment.

Part III. Operational Instructions

A. Feed System

- Security code and keyboard lockout (See page 15)
- Follow set-up instructions to complete the assembly of the ACAM.
- Turn on power and wait for the display to show the current torque setting and a zero count for quantity. The machine is now ready for operation.
- Fill the Hopper with connectors and press the FEED key. Immediately the Hopper will dump connectors and the feed vibratory bowl will begin to vibrate and feed them to the Hand Gun through the feed tube spring. The Hopper will continue to dump connectors every fifteen seconds until the Feed Bowl is full. The vibratory feed bowl will continue to feed connectors until the feed tube is full, sensed by the optical sensor in the feed tube block. The system will automatically keep the vibratory feed bowl and the feed tube full at all times. If the Hopper becomes empty, the system will keep trying to dump connectors every 15 seconds. If this occurs four times and the feed bowl has not been filled, a “Hopper Empty” message will be displayed, and an audible alarm will beep to indicate an error condition.



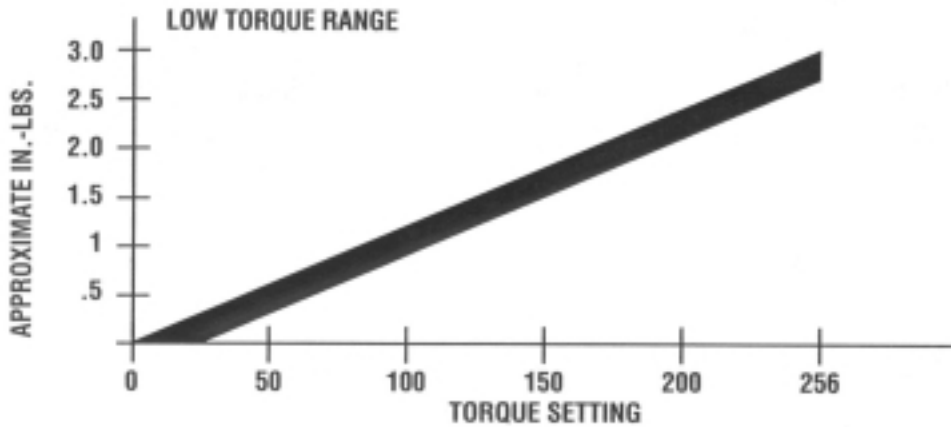
- Press the CLEAR key to turn off the audible alarm and refill the Hopper with connectors. The machine remains operational during this condition. The operator should not have to stop while the Hopper is being filled. The feed system can be turned on/off by pressing the FEED key.

B. Connector Torque Entry

- There is only one range of torque (Low) in which the ACAM can operate. (There is no High range.) See ACAM (Version 4.0) Keyboard Lockout on page 15. The low range has 256 levels of torque within it and covers the lower 1/3 of the total torque range with precise levels of adjustment.
- The “RANGE” key when pushed will activate the keyboard lockout.

■ The desired torque setting is entered by pressing the “Torque” key, then entering a number from 1 to 256 and then pressing the “Enter” key which automatically returns the machine to the **RUN MODE**. One and one-half to three twists in the wire below the skirt of the connector is sufficient to assure a proper connection.

Absolute inch-pound settings will vary from one machine to another and no claims are made as to the accuracy of the settings. These graphs give approximate ranges of torque for the torque setting. Once a setting has been determined by trial wire combinations, the



ACAM will consistently apply the IDEAL Wire Nut® Wire Connectors.

C. *Machine Operation*

■ The ACAM machine should now be ready to operate. The current torque setting is displayed and the quantity shows the number of connectors applied since the last time the power was turned on. This number resets to zero every time power is turned off. Hit RANGE key to lock out keyboard and activate once desired settings are achieved.

■ Squeeze the Hand Gun trigger switch and notice that the connector is spinning at the wire entry end of the tool. Release the Hand Gun trigger and the tool will stop and momentarily reverse to drop in the next connector. The quantity display should not change unless a connector was applied.



■ Again squeeze the Hand Gun trigger and insert the wire combination to be connected into the tool. The tool will spin the connector onto the wire until the correct torque is reached then stop, allowing the operator to remove the completed connection.



■ Releasing the trigger switch will then drop the next connector into place, ready for the next connection. Notice that the quantity display should have increased, counting the applied connector. One and one-half to three twists in the wires is enough torque to assure a tight connection.



Part IV. Reset Procedure

A. Feed Control

■ The connector feed rate is preset at the factory for normal applications and installations. Due to variations in voltages and/or mounting practices, it may be necessary to change the vibration rate to obtain the desired feed rate. This should be set so that movement of the connectors is observed but not to the extent that they bounce. The control for this adjustment can be reached with a screw driver through a small hole located on the right side panel of the feeder. Counter clockwise rotation of the control shaft will decrease the vibration or amplitude of the feeder bowl.



Part V. Maintenance Service Program

A. General

■ It is recommended that a regular preventative maintenance program be established to insure the utmost service from the equipment. The schedule for such a program will largely depend upon the usage of the equipment. The greater the use the more frequent the maintenance schedule.

■ The IDEAL field sales engineer will train your personnel on the operation, care and maintenance of the equipment at the time of installation. He will also establish a parts program.

B. Automatic Connector Driver (Hand Gun)

■ Adjustment - particular attention has been given to the ease of adjusting the Hand Gun. Should adjustment become necessary, a connector of the correct size must be in position in the drive head before commencing the adjustment operation.

1. The large hex jam nut on the barrel should be loosened by a clockwise rotation as viewed from the barrel end of the Hand Gun (left hand threads).
2. With wire connectors in position, and the Hand Gun in operation, rotate the barrel in the counter clockwise direction until there is a distinct change in the rotational speed of the hand tool. At this point, rotate the barrel in the clockwise direction approximately 1/8 of a turn. Release the switch lever and lightly lock the barrel into position with the hex nut.
3. With the Hand Gun trigger in the "on" position, use a small blunt object to push against the exposed edge of the connector at the drive head. The connector should move no more than 1/16" back into the shaft and no less than 1/64" movement.
4. If the movement is greater than 1/16", then the gun is too loose requiring additional counterclockwise adjustment.
5. If the movement is less than 1/64" the gun is too light, requiring a clockwise adjustment.
6. When proper adjustment is achieved, firmly tighten the jam nut to prevent accidental movement, and recheck the adjustment to be sure it was not altered while tightening jam nut.

■ Periodic Service - can be done in the following manner:

1. The barrel assembly shall be completely disassembled, the lower shaft, return spring, shaft bushings, barrel drive head, and finger receiving washer are removed from the barrel.

2. The lower shaft, shaft housing, return spring, and drive head should be cleaned.

The oil impregnated bronze bushings and finger receiving washer should be wiped clean - **DO NOT USE SOLVENT.**

3. The barrel may then be reassembled in the normal fashion. **Do not use oil to lubricate the parts upon assembly.**

4. Flexible Shaft - The flexible shaft shall be removed from its sheath until 3" or 4" of shaft remain in the sheath. The old grease shall be wiped from the shaft with a clean, dry paper or cloth. A small quantity of general purpose grease will then be applied to the entire length of the exposed shaft. The shaft will be returned to the sheath and the assembly placed back on the machine.

Part VI. Machine Limitations

A. Feeder System

■ The connector feed rate is dependent upon the connector size and type. The maximum number of connectors that can be fed far exceeds the number that can be applied in any given length of time.

■ The mounting of the Feeder Unit may possibly affect operation. Please consult your IDEAL sales engineer for proper mounting procedure.

■ The flexible shaft and feed tube length are restricted for efficient operation. Longer flexible shafts result in shaft breakage and inconsistent torque applications.

B. Hand Gun

■ A distribution of the connectors to the Hand Gun is effected by a flexible spring coil tube system attached to the Hand Gun, thereby restricting the feeder location to the length of such flexible coil tube.

■ Hand Gun position is restricted to a maximum of 45 degrees from the vertical, assuming the gun barrel is pointing downward. The gun cannot be used in a horizontal or inverted vertical position.

C. General

■ Maximum speed of 10 to 12 joints per minute is obtainable. However, operator technique, etc. appears to be the governing factor.

ACAM Software Lockout

A programmable software lockout feature has been added.

Security Code:

The security codes are three digits. All units come with an initial security code of “111.” If the keyboard is locked, one must hit “PRGM” key and then the security code entry prompt will appear on the display:

ENTER IN 3 DIGIT SECURITY CODE –

Once the security code is entered successfully, the keyboard is unlocked. The keyboard can be locked again by hitting the “RANGE” KEY.

The security code can be changed by entering the program menu, going into setup, then selecting “CHANGE PASSCODE.” The machine will then prompt for the current security code. Upon successful entry of the current code, the machine will prompt for the entry of the new code.

ACAM (Version 4.0) Keyboard Lockout

The following procedure will permit access to the keyboard should the security code be misplaced or forgotten.

Step 1. Actuate Hand Gun trigger once to obtain a hand tool friction number.

Step 2. Obtain hand tool friction 3-digit number (located in upper right hand corner of digital display). This number must read anything but “000.”

Step 3. Reading the 3-digit number from left to right, individually add “3” to the first number, “2” to the second number, and “1” to the third number, for example:

If the hand tool friction reads “032,” the following would occur:

$$\underline{0} + 3 = 3$$

$$\underline{3} + 2 = 5$$

$$\underline{2} + 1 = 3$$

Therefore “353” will allow the operator to unlock the keyboard.*

*If a 2-digit number is obtained with the addition of the “3”, “2”, or the “1”, use the second digit only. For example:

Correct:

$$1+3+4$$

$$0+2=\underline{2}$$

$$9+1=\underline{0}$$

Incorrect:

$$1+3=4$$

$$0+2=2$$

$$9+1=\underline{10}$$

Notice that during the addition of the 9 and 1, the sum was “0” and not “10.”

Step 4. Hit the “PRGM” key and the display will read: “Enter 3-digit Security Code.” Enter the 3-digit number obtained from Step 3. ***Note that if the code is not entered immediately, and the ‘KEYBOARD LOCKED’ is displayed, hit the “PRGM” key again and re-enter the security code.***

Step 5. Next, the display will read: “Enter New Code

New Code=”

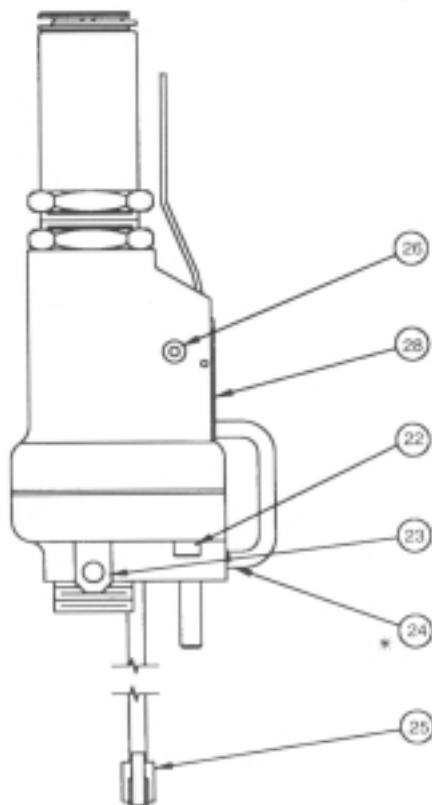
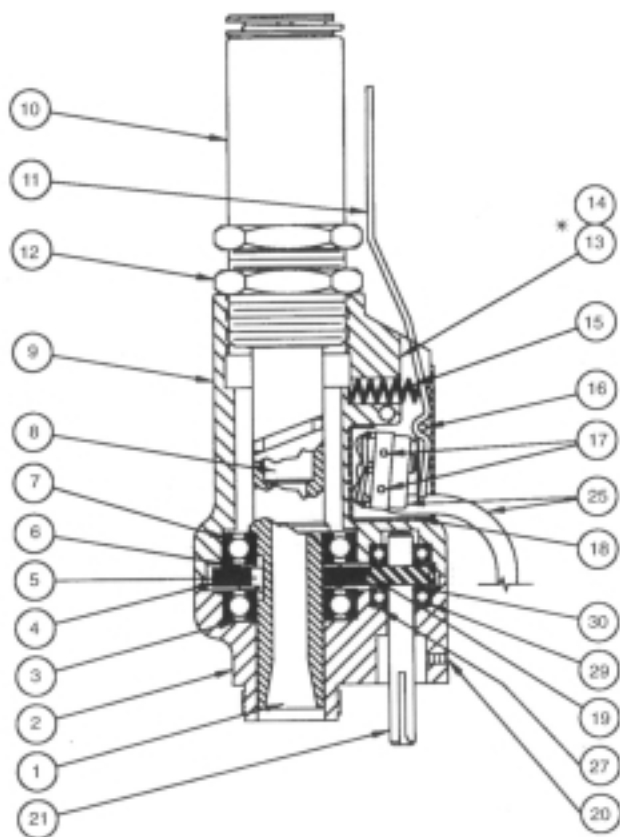
Enter in a 3-digit number of your choice for a new security code. (Retain this number for future access.) The keyboard is now unlocked.

Step 6. Make any necessary changes in settings.

Step 7. Hit “RANGE” key to lock keyboard.

Part VII. Parts Lists

A. Hand Gun

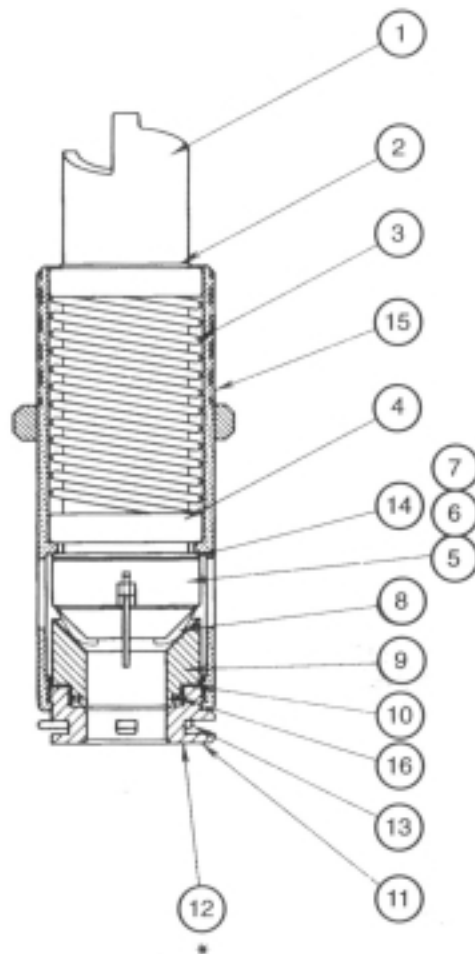


Hand Gun

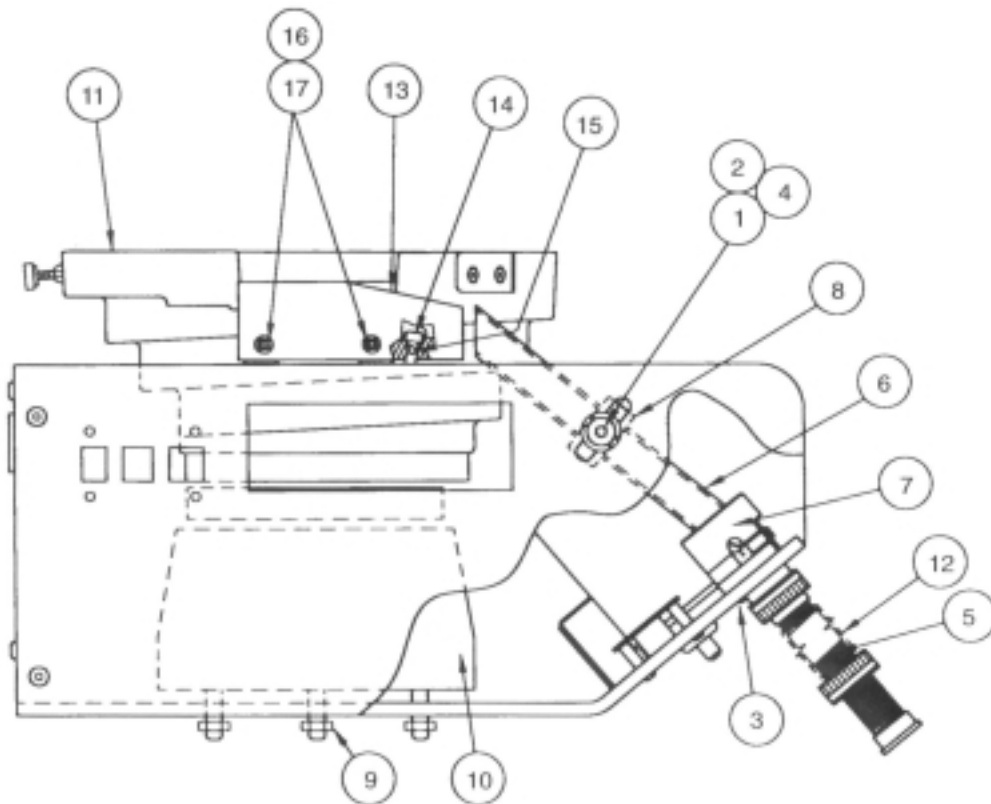
Item	Req	Description	59	71	72	73	74
			<u>30-952</u>	<u>30-953</u>	<u>30-954</u>	<u>30-955</u>	<u>30-956</u>
1	1	BACK DRIVE SHAFT	I-2391	I-2348	I-2347	I-2390	I-2391
2	1	REAR DRIVE SHAFT	H-2355	H-2354	H-2354	H-2355	H-2355
3	1	PRESSURE WASHER	L-6954	L-6917	L-6917	L-6954	L-6954
4	1	SPUR GEAR	L-6953	L-6913	L-6913	L-6953	L-6953
5	1	KEY	L-6916	L-6916	L-6916	L-6916	L-6916
6	2	SPACER	L-5814	L-5672	L-5672	L-5814	L-5814
7	2	BALL BEARING	021.066	021.064	021.064	021.066	021.066
8	1	GUIDE SLEEVE	K-4692	K-4663	K-4662	K-4691	K-4692
9	1	FRONT GEAR CASE	H-2357	H-2356	H-2356	H-2357	H-2357
10	1	BARREL ASSEMBLY	I-2337	I-5947	I-5948	I-2334	I-2335
11	1	SWITCH LEVER	L-8989	L-8989	L-8989	L-8989	L-8989
12	1	LOCKNUT	L-6539	L-6540	L-6540	L-6539	L-6539
13	1	PIN		L-9009	L-9009		
14	1	SPRING		L-9007	L-9007		
15	1	SPRING	L-6910	L-6910	L-6910	L-6910	L-6910
16	1	PIN	281.081	281.081	281.081	281.081	281.081
17	2	PIN	281.067	281.067	281.067	281.067	281.067
18	1	FISH PAPER	L-8993	L-8993	L-8993	L-8993	L-8993
19		GREASE	1181.011	1181.011	1181.011	1181.011	1181.011
20	1	SET SCREW #8-32 x .187	1333.021	1333.021	1333.021	1333.021	1333.021
21	1	PINION	L-5817	L-5817	L-5817	L-5817	L-5817
22	4	SHCS #8-32 x .88	113.109	113.109	113.109	113.109	113.109
23	1	EYE	L-5681	L-5681	L-5681	L-5681	L-5681
24	1	CABLE CLAMP	I-2059	I-2059	I-2059	I-2059	I-2059
25	1	CABLE/SWITCH ASSY	LB-1038	LB-1038	LB-1038	LB-1038	LB-1038
26	1	BHC SCREW #6-32 x.25	115.019	115.019	115.019	115.019	115.019
27	1	PRESSURE WASHER	635.019	635.019	635.019	635.019	635.019
28	1	SWITCH COVER	K-4660	K-4660	K-4660	K-4660	K-4660
29	2	BALL BEARING	021.024	021.024	021.024	021.024	021.024
30	2	SPACER	028.004	028.004	028.004	028.004	028.004

*Indicates items not shown on drawing

B. Barrel Assembly



C. Feed Assembly w/Ramp Components



Barrel Assembly

<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>59</u>	<u>71</u>	<u>72</u>	<u>73</u>	<u>74</u>
--	--	Packaged Assembly	LB0844	L-9982	L-9983	L-9014	L-9015
--	--	Unpackaged Barrel Assy	I-2337	I-5947	I-5948	I-2334	I-2335
1	1	Front Drive Shaft Assy (1)	K-4711	K-5056	K-5057	K-4707	K-4710
2	1	Retaining Ring	482.031	482.023	482.023	482.031	482.031
3	1	Return Spring	L-9972	L-5673	L-5673	L-9972	L-9972
4	2	Sleeve Bearing	L-8926	L-6934	L-6934	L-8926	L-8926
5	1	Finger Ring Retainer	L-7644	L-5728	L-5728	L-7644	L-7644
6	1	Wire Form	--	L-9978	L-9978	--	--
7	1	Finger Ring	L-5806	L-7673	L-7673	L-5806	L-5806
8	5	Finger (2)	LB0842	L-9979	L-9979	L-7628	L-7628
9	1	Finger Receiving Washer	K-5036	K-7144	K-7145	K-5033	K-5034
10	1	Thrust Washer	L-8995	--	--	L-8995	L-8995
11	1	Drive Head Assembly (3)	LB0843	K-5050	K-5051	L-9969	L-9970
12*	2	Pin	281.076	281.076	282.076	281.076	281.076
13	1	Spring clip	K-4656	K-4651	K-4652	K-4653	K-4655
14	1	Ring	L-9988	L-9977	L-9977	L-9988	L-9988
15	1	Front Shaft Housing	K-5090	L-6926	L-6926	K-5089	K-5089
16	1	Ring	L-9964	--	--	L-9964	L-9964

*Indicates items not shown on drawing

- Notes: (1) Assembly includes items: 5, 7, 8
 (2) Assembly includes items: 9, 10, 12, 13

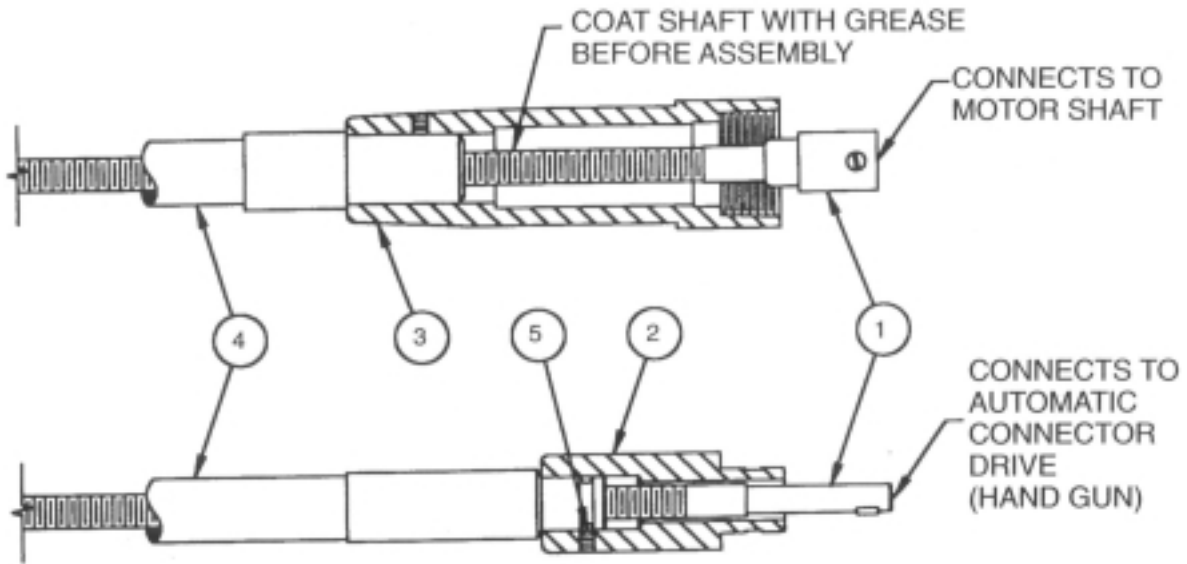
Feed Assembly

<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>59, 74</u>	<u>71</u>	<u>72</u>	<u>73</u>
			<u>Conn</u>	<u>Conn</u>	<u>Conn</u>	<u>Conn</u>
1	1	BHCS 5/16-18 x .50	115.018	115.018	115.018	115.018
2	1	Washer 5/16	632.133	632.133	632.133	632.133
3	2	BHCS #6-32 x .50	115.003	115.003	115.003	115.003
4	1	Set Screw 1/4-20 x .25	1333.002	1333.002	1333.002	1333.002
5	1	Feed Spring Assembly	IA1658	IA1656	IA2344	IA1657
6	1	Feed Tube	K-6993	K-6991	K-6991	K-6992
7	1	Adapter Assembly	K-6994	K-6996	K-7380	K-6995
8	1	Tube Bracket	LB0983	LB0982	LB0982	LB0981
9	3	Hex Jam Nut 5/16	372.005	372.005	372.005	372.005
10	1	Vibrator	K-7083	K-7083	K-7083	K-7083
11	1	Bowl Assembly	H-2413	H-2413	H-2413	H-2413
12	1	Sleeve	LB1283	LB1283	LB1283	LB1283

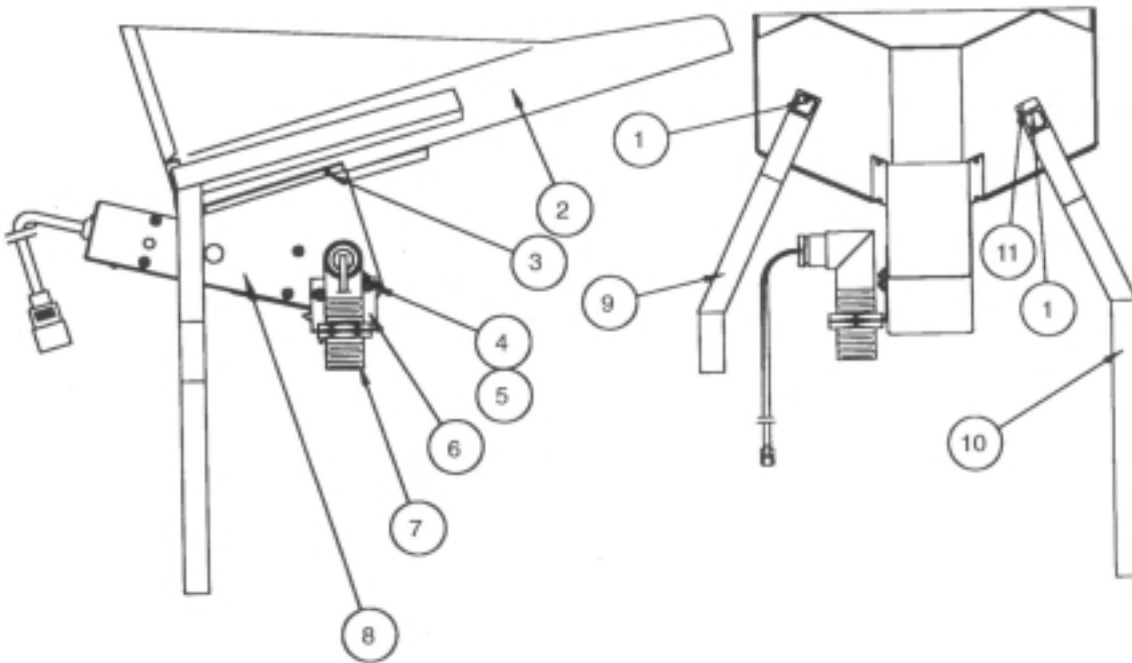
Ramp Components

13	1	Ramp	59: K-6952		72: K-6956
			74: K-6953	71: K-6957	73: K-6954
14	1	Socket Head Cap Screw	113.114	113.115	113.114
15	1	Set Screw	1333.103	1333.103	1333.103
16	2	SHCS #6-32 x 1.25	113.099	113.099	113.099
17	2	Washer	632.102	632.102	632.102

D. Flexible Drive Shaft



E. Hopper



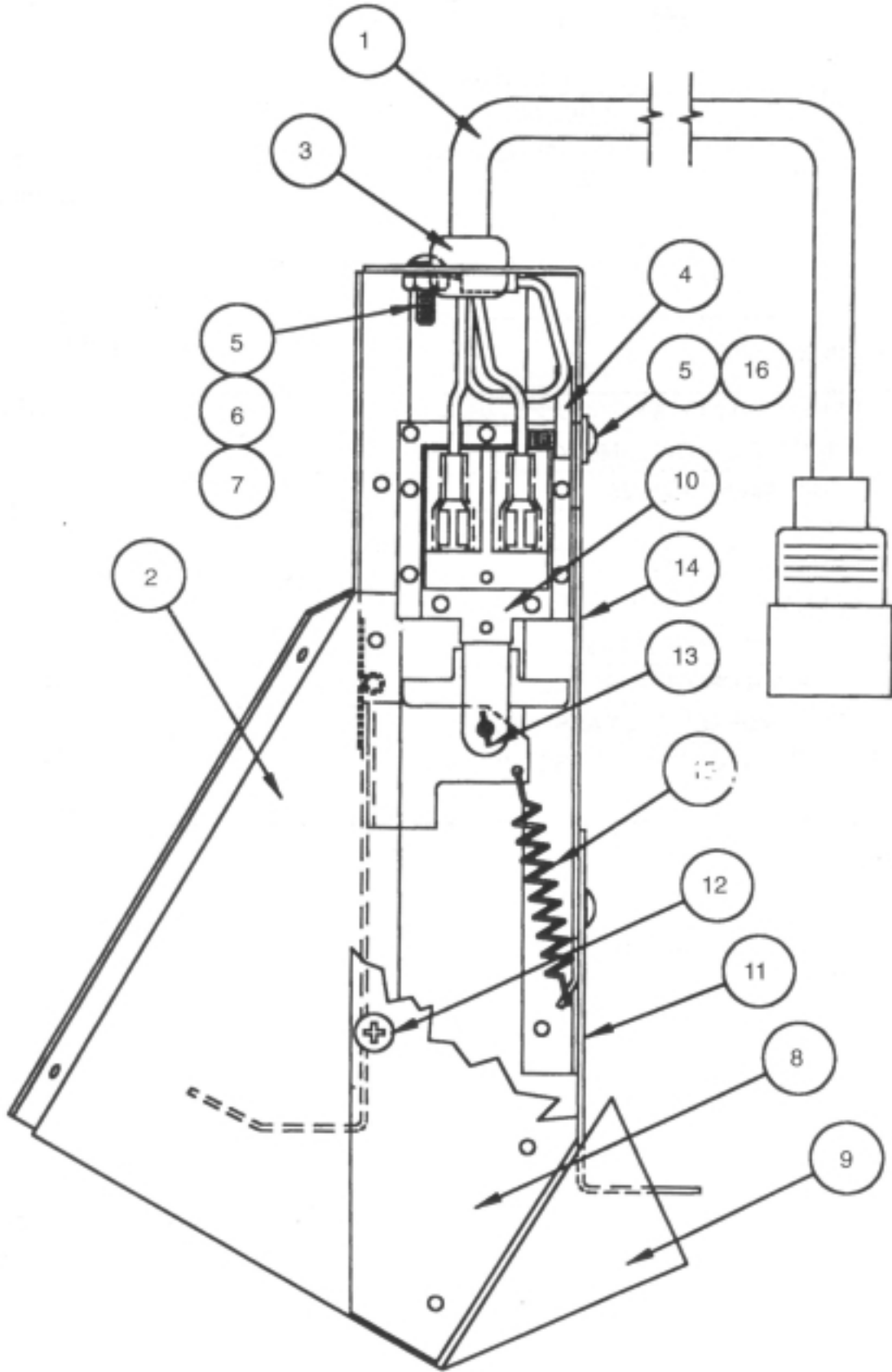
Flexible Drive Shaft

<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>2-9051</u>
1	1	Flexible Shaft	221.003
2	1	Coupling	K-2565
3	1	Motor Coupling	231.004
4	1	Sheath	231.003
5	1	Set Screw #8-32	1333.065
6	--	Grease	181.011

Hopper

<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>Complete Unit</u>
1	8	BHSC #10-24 x .50	<u>30-951</u> 115.015
2	1	Hopper Sub Assembly	K-6692
3	4	Phil Pan HD #6 x .25	501.055
4	2	Nut #6-32	371.003
5	2	BHCS #6-32 x .50	115.003
6	1	Sensor Bracket	LB1102
7	1	Hopper Sensor Assembly	K-6693
8	1	Hopper Chute Assembly	IA1165
9	1	Left Side Bracket Assembly	IA1168
10	1	Right Side Bracket Assembly	IA1169
11	2	Foot	081.009

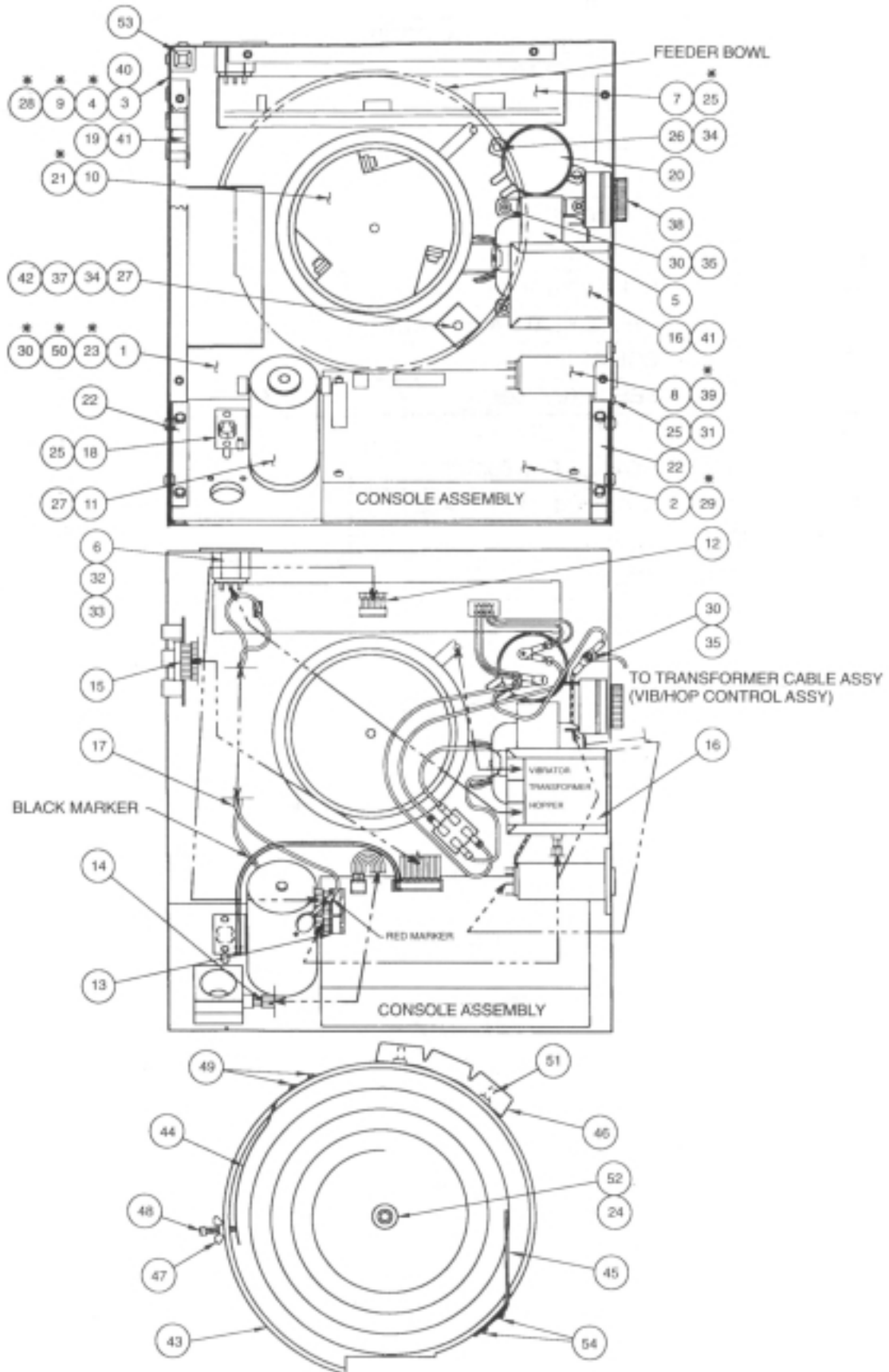
F. Hopper Chute



Hopper Chute

<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>IA1165</u>
1	1	Solenoid Cable Assembly	K-6622
2	1	Gate Assembly	K-6666
3	1	Strain Relief	272.004
4	1	Securing Plate	L-7922
5	3	BHCS #6-32 x .38	115.009
6	1	Nut #6-32	371.003
7	1	Int Washer #6	633.006
8	1	Side Cover	K-5110
9	1	Chute Plate Assembly	K-5112
10	1	Solenoid	1532.006
11	1	Feed Bracket	L-9321
12	8	Phil Pan HD #6 x .25	501.055
13	1	Cotter Pin .090 x .75	283.001
14	1	Solenoid Mtg Plate	K-5108
15	1	Spring	L-6973
16	2	Lockwasher	633.049

G. Console Assembly

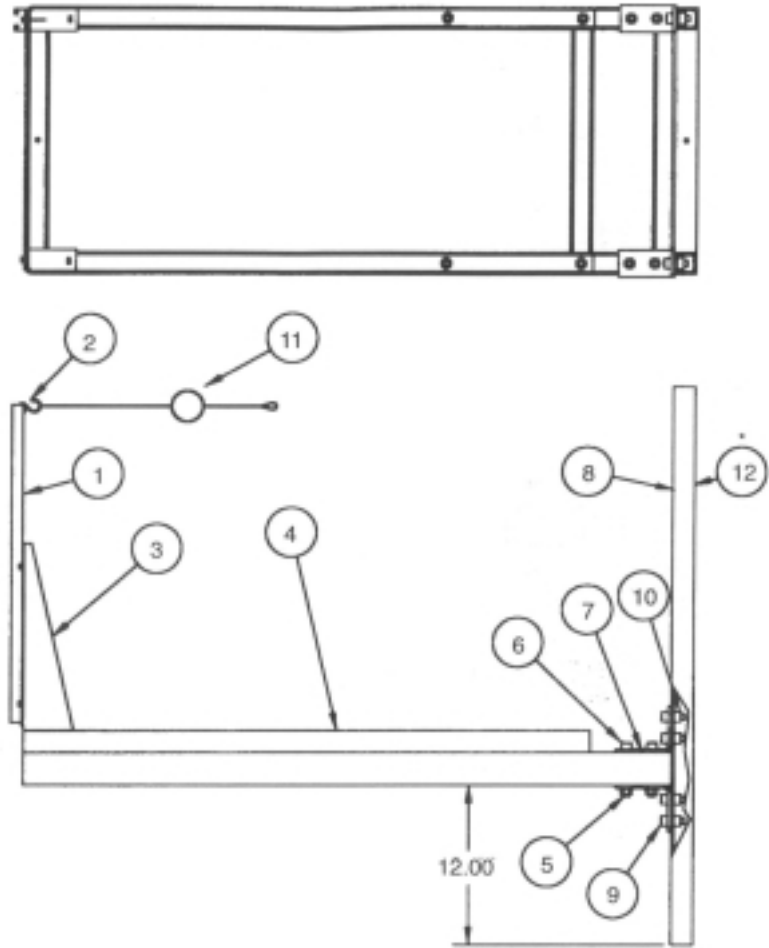


Console Assembly

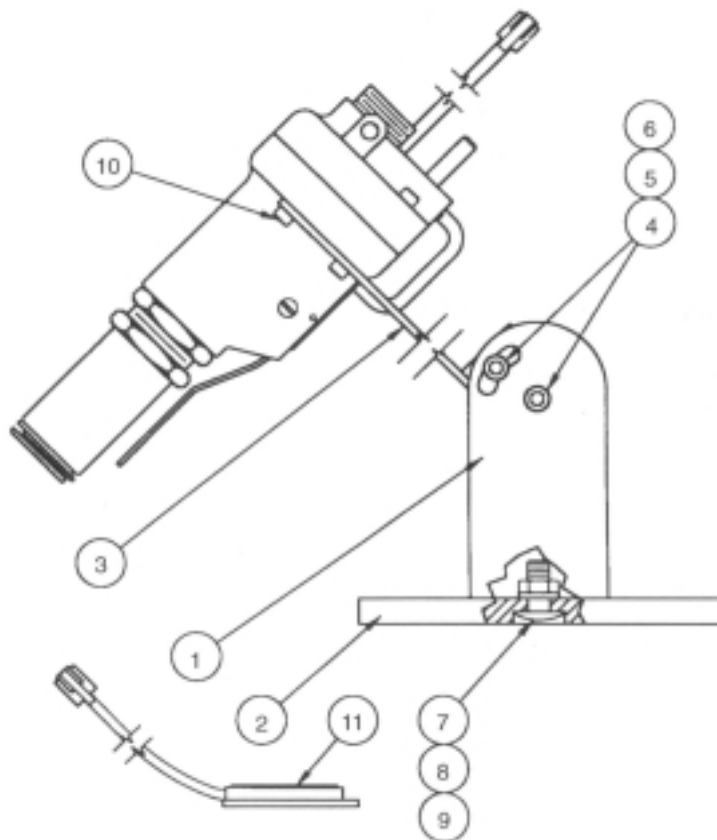
<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>H-2225</u>
1	1	Base Plate	H-2197
2	1	Control Assembly	H-2230
3	1	Case Assembly	IA1153
4*	1	Case Top	IA1154
5	1	Transformer Assembly	I-9884
6	1	Cable (Hopper & Power)	IA1163
7	1	DC Motor Control Assembly	IA1164
8	1	Power Entry Module	K-6361
9*	1	Case Front	K-6624
10	1	Vibrator	K-7083
11	1	Motor Assembly	K-6630
12	1	Cable (DC Motor to CPU)	K-6639
13	1	Cable (CPU to Vib/Hop & Alarm)	K-6640
14	1	Cable (CPU to Counter)	K-6641
15	1	Cable (CPU to HD SW and Cust Int)	K-6642
16	1	Control (Vibrator/Hop) Assembly	K-6644
17	1	Wire (DC Motor)	K-6651
18	1	Circuit Board (Hand Switch) Assembly	K-6655
19	1	Circuit Board (Cust Interface) Assembly	K-6656
20	1	Capacitor Assembly	K-6818
21	1	Guard	L-9997
22	2	Front Support Assembly	LB0969
23*	4	Feet	081.014
24	1	SHCS 5/16-18 x 1.25	113.104
25*	11	BHCS #6-32 x .50	115.003
26	2	BHCS #6-32 x .38	115.009
27	3	BHCS #6-32 x .75	115.011
28*	14	BHCS #10-24 x .25	115.013
29*	6	BHCS #8-32 x .38	115.014
30*	20	BHCS #10-24 x .50	115.015
31	2	Hex Nut #6-32	371.003
32	2	Hex Nut #4-40	371.011
33	2	FHCS #4-40 x .50	113.089
34	3	#6 Plain Washer	632.123
35	5	#10 Hel Spring Lockwasher	633.033
36	1	#6 Int Lockwasher	633.041
37	1	Rectifier	741.036
38	1	Audio Alarm	742.003
39*	1	Main Power Cord	851.088
40	1	Edge Protector	1681.013
41	6	BHCS #6-32 x .25	115.002
42	1	Washer #6 Spring	633.041
43	1	Feeder Bowl	H-2383
44	1	Deflector	LB1114
45	1	Deflector	LB1115
46	1	Counterweight	LB1119
47	1	Wing-Nut®	375.010
48	1	SHCS #8-32 x 1.00	113.091
49	2	BHCS #8-32 x .19	115.031
50*	4	BHCS #8-32 x .62	115.001
51	2	FHCS #10-32 x .62	113.097
52	1	5/16 x .75 Plain Washer	632.111
53	1	Column Brackett	K-6782
54	2	BHCS #8-32 x .25	115.006

*Indicates items not shown on drawing

H. *Mounting Stand*



I. *Bench Mount*



Mounting Stand

<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>2-9053</u>
1	1	Support Arm	L-5773
2	1	S-Hook	L-6030
3	1	Plate Bracket Assembly	L-5772
4	1	Upright Assembly	L-5777
5	4	Hex Jam Nut 1/2-13	372.010
6	4	SHCS 5-13 x 3.5 x 1	113.032
7	4	Corner Bracket	L-5878
8	1	Frame	L-5774
9	8	SHCS 1/2-13 x 1.00	113.031
10	8	Nut 1/2-13	379.004

The following items are not included on 2-9053:

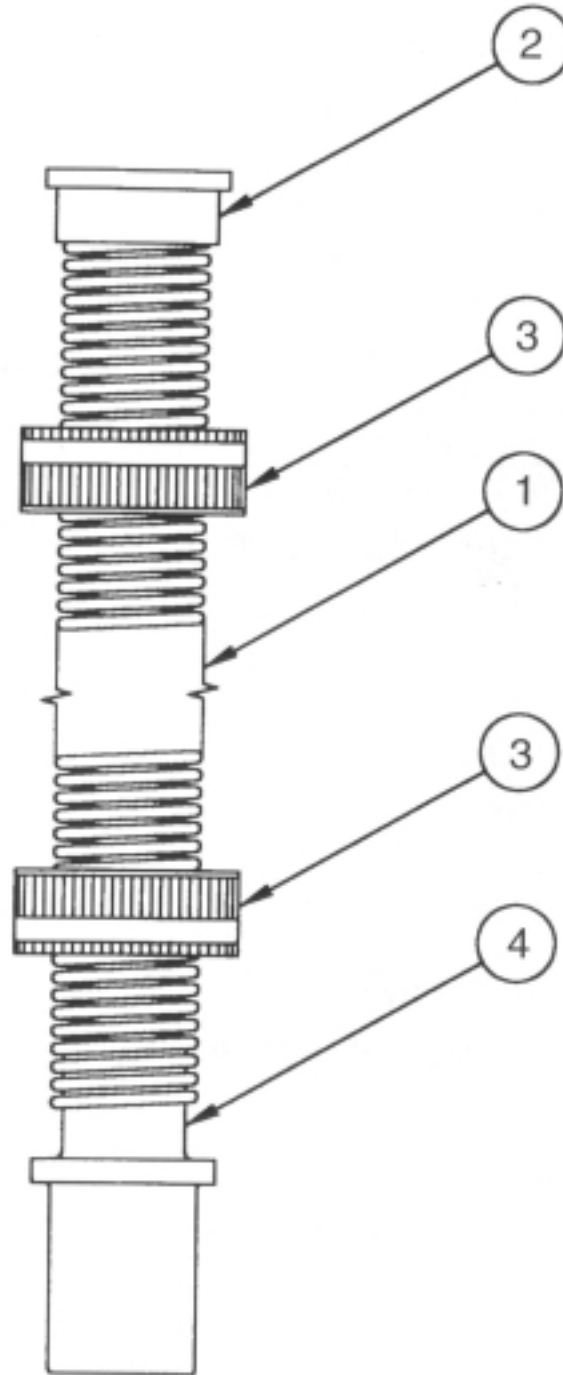
11*	1	Tool Balancer	1161.033
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*Indicates items not shown on drawing

Bench Mount

<u>Item</u>	<u>Req</u>	<u>Description</u>	<u>30-984</u>
1	1	Base	K-4702
2	1	Base Plate	K-4703
3	1	Holder	I-2995
4	3	SHC Screw 1/4-20 x .50	113.017
5	3	Nut 1/4-20	371.001
6	3	Lockwasher	633.003
7	1	Carriage Bolt 5/16-18 x .75	51.004
8	1	Nut 5/16-18	371.018
9	1	Lockwasher	633.012
10	4	SHC Screw #8-32 x .375	113.073
11	1	Foot Switch Assembly	K-7123

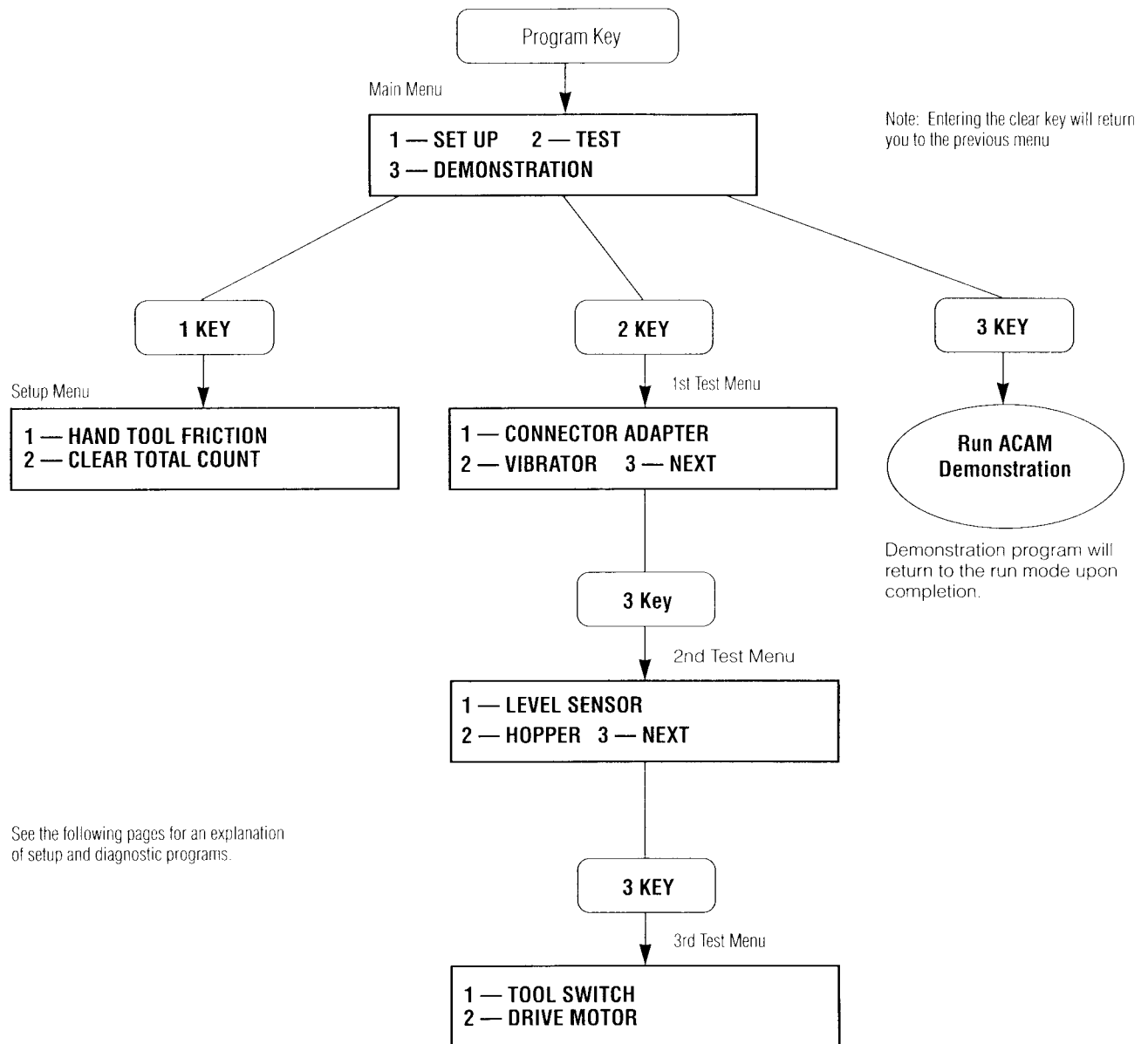
J. Feed Spring Assembly



		Catalog Number	30-971	30-972	30-973	30-959 30-974
		Description	Part Number			
Item	Req	Feed Spring Assembly	IA1656	IA2344	IA1657	IA1658
1	1	Feed Spring	K-6902	K-7381	K-6903	K-6904
2	1	Spring Coupling	K-6544	K-7382	K-6545	K-6546
3	2	Coupling Nut	379.003	379.003	379.003	379.003
4	1	Adapter Coupling	K-6908	K-7269	K-6909	K-6910

Part VIII. ACAM Setup and Diagnostic Programs

To enter the setup and diagnostic menus press the program key:



See the following pages for an explanation of setup and diagnostic programs.

Part VIII. ACAM Setup and Diagnostic Programs

A. System Diagnostics and Test Menus

■ These menus and associated test programs allow the user to test various system assemblies. Enter the **TEST MENU** by depressing the **PROGRAM KEY** then the **2 KEY**. This puts you into the first test menu. Further system test menus are available by entering the **3 KEY**. When a test is complete the system will return to the current test menu. Entering the **CLEAR KEY** will move backwards through the test and main menus until the system is back in the **RUN MODE**. The test programs are as follows:

■ 1st TEST MENU

1. Connector Adapter Test

This will check out the function of the optical sensor in the connector adapter and associated circuitry. Remove the feed tube spring from the adapter by unscrewing the adapter coupling nut on the front of the machine. Insert a pen or pencil approximately the diameter of the connector into the adapter. When the sensor is blocked, the beeper should sound. If no beep is heard, then the adapter is not functioning. Check the wiring between the adapter circuit board and the **CPU MODULE**. Make sure that all connectors are plugged in. If a constant beep is heard, then the adapter is probably dirty and must be cleaned using a short blast of compressed air and caution to protect eyes.

2. Feed Bowl Vibrator

This test will check out the feed bowl vibrator motor and associated circuitry. Pressing the **1KEY** will turn on the vibrator. Pressing the **2 KEY** will turn off the vibrator. If the bowl does not vibrate, check wiring between the vibrator motor and the **VIB/HOP MODULE** located on the inside right hand of the case. Also check the wiring between the **VIB/HOP MODULE** and the **CPU MODULE**. Make sure all connectors on the harnesses are plugged in.

■ 2nd TEST MENU

1. Hopper Level Sensor Test

This test will check out the hopper level sensor on the left hand side of the hopper. The beeper will sound if connectors are sensed. The red light on the sensor will also light when connectors are sensed. If neither occurs when connectors are in range, then the sensor should be adjusted. If this does not cure the problem, check the sensor wire and make sure its plugged in to the connector marked **HOPPER SENSOR**. Also check the wiring between the external interface on the inside left cover and the **CPU MODULE**.

2. Hopper Dump Test

This test will check out the hopper dump solenoid and associated circuitry. Pressing the **1 KEY** will cause the hopper to initiate a dump cycle. If the hopper does not cycle, make sure that the hopper is plugged into the connector in the back marked **HOPPER SOLENOID**. Also check the wiring between that connector and the **HOP/VIB MODULE** located on the inside right hand cover, and the wiring to the **CPU MODULE**. Make sure that all wire connectors are plugged in.

■ 3rd TEST MENU

1. Tool Switch Test

This test will check out the tool switch and the associated circuitry. Depress the tool switch, the beeper should beep when the switch is closed. If this does not occur check the wiring from the tool switch to the switch input on the front of the ACAM. Also, check the wiring between the tool interface board where the switch plugs in and the **CPU MODULE**.

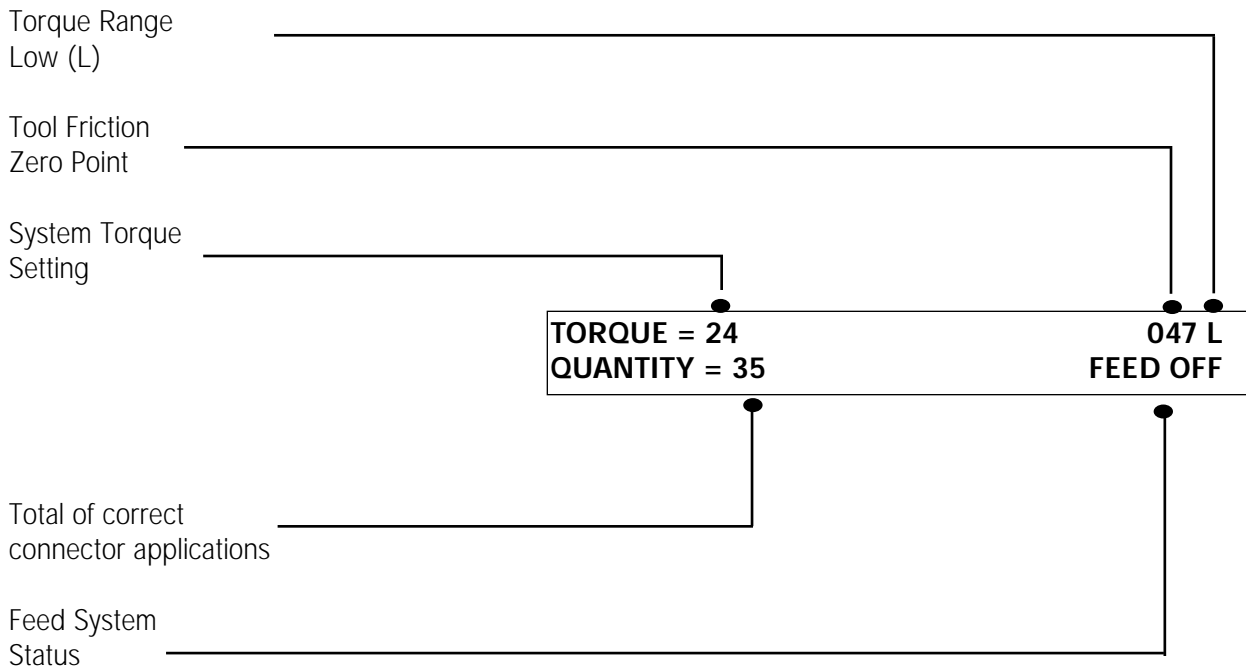
2. Tool Drive Motor Test

This test will check out the drive motor and associated modules and circuitry. Press the **1 KEY** to run the motor forward and the **2 KEY** to run it in reverse. If the test fails, check the wiring between the motor and the **POWER MODULE** located in the back of the ACAM on the base plate. Check all connectors plugged into the **POWER MODULE** and the interconnect cable to the **CPU MODULE**.

B. Hand Tool Friction

This setup procedure allows you to set a point at which the ACAM will abort the torque sequence to alleviate any bad connections. To set this number, the tool friction zero point must be determined. This is found by cycling the tool on and off by depressing the tool switch and releasing a short time later. Do this a number of times and note the number in the upper right hand corner of the display. Now enter the **HAND TOOL FRICTION** program by depressing the **PROGRAM KEY** and then the **1 KEY** to get to the Setup Menu and then the **1 KEY** again. The ACAM System is now ready to accept a number from 1 to 256. The number that you actually enter should be approximately 50 counts over the tool friction zero point that was determined earlier. Press the enter key and the value will be updated and you will return to the run mode.

ACAM RUN MODE Display





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