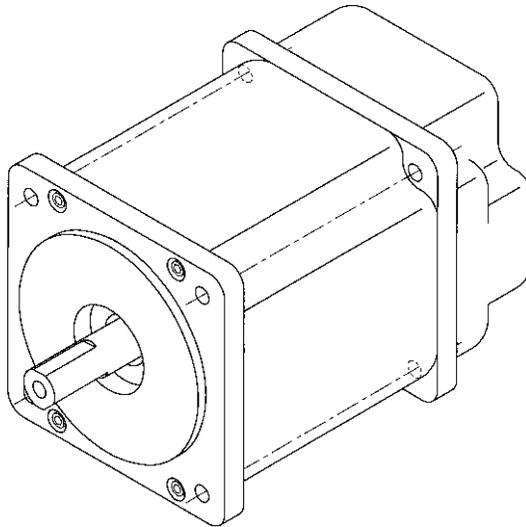


CLINTON MODEL 990 MINI-TAURUS

VARIABLE SPEED
DC SERVO MOTOR

NEEDLE POSITIONER THREAD TRIMMER



SERVICE MANUAL

40-0253-01



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SECTION I

PROGRAMMING MODE

There are two ways to go from the operating to the programming mode. Press the  button to go to the first group (SPEEDS). Continue pressing this key to step through the groups or press the  button to go to the last changed parameter.

After changing the parameters press the  button to return to the operating mode.

A. HOW TO PROGRAM

1. SPEEDS, TIMERS, COUNTERS

Select the parameter group with the  button to the desired parameter group (example SPEEDS).

Select the desired parameter (example SOFTSTART) by pressing the  button.

Change displayed number with  (increase) or  (decrease) button.

2. TOGGLE SWITCHES

Select the parameter group "TOGGLE SWITCHES" with the  button.

Select the desired parameter to be changed with the  button.

Toggle the desired parameter with the  or  button.

B. ACCESS TO HIDDEN PARAMETERS

Step 1: Turn power off.

Step 2: Press the  and  buttons at the same time.

Step 3: Turn power on while both buttons are pressed.

Step 4: Release the buttons.

The display shows stars (*****) which are counting down.

Step 5: Press the  button before the stars disappear.

Step 6: Select the desired parameter as usual.

The hidden parameters have stars in front of the group name

Normal parameter: SPEEDS

Hidden parameter: ***** SPEEDS

Note: Access to HIDDEN PARAMETERS is disabled after power is shut off.

C. MASTER RESET (Caution: Overrides the program memory with default settings).

Step 1: Turn power off.

Step 2: Press the ,  and  buttons simultaneously.

Step 3: Turn on power while all three buttons are pressed.

The display alternates between "PUSH SET" and "FOR RESET".

Step 4: Push the  button within 10 cycles.

The display will read: "PROGRAMMING".

Note: If the  button is not pressed within 10 cycles the program goes to the main menu without executing the MASTER RESET.

SECTION II

EXPLANATION OF PARAMETERS

A. PARAMETERS WITH DIRECT ACCESS

1. **SPEEDS** (spm, stitches per minute is the same as R.P.M.)
 - a. **SOFTSTRT** (Soft start)

Sets the r.p.m. of the machine while in the soft start option.
(See page 1-3 (3a) and page 1-4 (4c)).
Range: 140 to 2000 r.p.m.
Steps: 20 r.p.m.
Default setting: 500 r.p.m.
2. **TIMERS** (ms = milli seconds)
 - a. **START DEL** (Start delay)

This delays the motor from starting in order to allow the presser foot sufficient time to come completely down before the machine starts sewing. If the presser foot is already in the down position this setting will not effect the start.
Range: 10 to 500 ms
Steps: 10 ms
Default: 80 ms
 - b. **VENT DEL** (Venturi delay)

This sets the amount of time that the venturi continues to run after the motor has stopped.
Range: 10 to 2500 ms
Steps: 10 ms
Default: 350 ms
 - c. **WASTErem** (Waste Removal)

Sets the amount of time that the venturi is turned off if the waste removal function is selected.
Range: 10 to 2500 ms
Steps: 10 ms
Default: 350 ms
 - d. **CUTTER**

This sets the amount of time that the scissor or guillotine cutter is on.
Range: 50 to 250 ms
Steps: 10 ms
Default setting: 80 ms
 - e. **COMPENS.** (CUTTER COMPENSATION)

This parameter is used to compensate for the amount of time needed to fully close a scissor or guillotine cutter. This parameter needs to be set to the type of cutter being used so that it will cut accurately at different machine speeds.
Range: 10 to 250 ms
Steps: 10 ms
Default setting: 80 ms

3. COUNTERS

a. **SOFT ST** (SOFT START)

Sets the number of beginning stitches of a new cycle sewn at "SOFTSTRT" speed.
(See page 1-2 (1b)).

Range: 1 to 5 stitches

Steps: 1 stitch

Default: 3 stitches

b. **VENTfrt** (Venturi front cut)

This sets the number of stitches sewn with the venturi and chain cutter on once the eye has been covered at the beginning of the cycle.

Range: 0 to 50 stitches

Steps: 1 stitch

Default setting: 25 stitches

c. **VENTend** (Venturi end cut)

This sets the number of stitches sewn with the venturi and chain cutter on once the eye has been uncovered at the end of the cycle.

Range: 1 to 50 stitches

Steps: 1 stitch

Default setting: 30 stitches

d. **WASTErem** (Waste removal)

Sets the number of stitches sewn with the venturi turned on in the seam if the waste removal function is selected.

Range: 35 to 100 stitches

Steps: 1 stitch

Default setting: 50 stitches

4. TOGGLE SWITCHES (Switches set by software)

a. **PF SEAM** (Presser foot while in the seam)

This sets the position of the presser foot while sewing in the seam. If "up" is selected the presser foot will raise every time that the motor stops while in the seam.

Default setting: Down

b. **PF EOC** (Presser foot end of cycle)

Sets the position of the presser foot at the end of the cycle.

Default setting: Down

c. **SOFTSTRT** (SOFT START)

Enables or disables the soft start function.

Default: Off

d. **WASTErem** (Waste removal)

Enables or disables the waste removal function.

Default: Off

e. **POSITION**

Sets the needle position while in the seam.

Default: Down

f. POS. EOC (Position End of Cycle)

Sets the needle position at the end of the cycle.

Default: Up

g. VENTURI

This parameter sets how the chain cutter can be turned on if a cut was missed at the end of a cycle. If set to "heel bck" the cutter will start by heeling back on the treadle.

If set to "with eye" the cutter will start by breaking the beam of the electric eye.

Default: With eye

B. HIDDEN PARAMETERS**1. **** SPEEDS****a. TRIM / POS**

This parameter determines the speed of the trim and position cycle and the minimum speed of the machine.

Range: 100 to 400 s.p.m.

Steps: 10 s.p.m.

Default: 220 s.p.m.

b. MAXIMUM (Maximum speed). Sets the maximum speed of the machine.

Range: 500 to 9900 r.p.m.

Steps: 1000 r.p.m.

Default: 4200 r.p.m.

2. ** MISCEL** (Miscellaneous)**a. NEED.dwn** (Needle down)

Sets the needle down position. (See TEACH-IN MODE page 3-1)

Range: 0 to 255

Steps: 1

Default: 35

b. NEEDLEup (Needle up)

Sets the needle up position. (See TEACH-IN MODE page 3-1)

Range: 0 to 255

Steps: 1

Default: 150

c. CLAMP DTY (Clamp duty cycle or percentage of current applied to keep the solenoid energized). The clamp duty cycle should be set at the minimum value required to keep the solenoid energized. (a) If the duty cycle value is too low the solenoid will vibrate (this will cause it to make a chattering noise) and the clamp may drop. (b) If the clamp duty cycle value is too high the solenoid may get hot and the deenergize time will greatly increase.

Range: 2 to 10

Steps: 1

Default: 4

3. **** TOGGLE SWITCHES

a. DIRECTION

Sets the direction of the motor either clockwise (++cw) or counterclockwise (--ccw).
Default: --ccw

b. AUTOMODE (Automatic mode)

If set to "AUTO" when material is placed in the machine covering the photo eye and the treadle is pressed the machine will sew at maximum speed until the photo eye is uncovered.

Default: man (manual)

c. CYC. STRT (Cycle start)

If selected this parameter will only let the cycle start if the photo eye is covered.

Default: Eye Cov. (Eye Covered)

d. TREADLE

If this parameter is set to;

continue: The new cycle will start depending on the condition of the photo eye (covered or uncovered) and the setting of the "CYC. STRT" parameter.

ped.neut. (pedal neutral). The new cycle will start only after the pedal has been returned to the neutral position.

Default: ped. neut

e. SFTY SW (Safety Switch)

This parameter enables or disables the safety switch if one is used.

Default: Off

f. SFTY SW SEW

This parameter sets, whether the safety switch is normally opened or normally closed, in order for the machine to start.

Default: cls (closed)

SECTION III
TEACH-IN MODE

1. SETTING THE NEEDLE-DOWN AND NEEDLE-UP POSITIONS

NOTE: The index signal from the motor must be set prior to setting the needle up and down positions. (See systems test section for instruction on setting the index signal).

a. NEEDLE DOWN

To set the needle down position access the "**** MISC." group of the hidden parameters then select the "NEED.dwn" parameter. Rotate the hand wheel of the machine until the needle is in the down position. Press the treadle forward, the machine will make one revolution then save the needle down position.

b. NEEDLE UP

To set the needle up position access the "**** MISC." group of the hidden parameters then select the "NEEDLEup" parameter. Rotate the hand wheel of the machine until the take-up levr is in the top dead center position. Press the treadle foreward, the machine will make one revolution then save the needle up position.

SECTION IV

TEST MODE

A. BUILT-INTEST PROGRAM

A test program is available to test the major functions for proper operation. To access the program press the  and  buttons simultaneously.

The display will read "SYSTEM TEST" briefly then "PRESS "SET" !!", after which the following may be tested:

1. TREADLE
2. EYE AND INDEX SIGNAL
3. ENCODER
4. MOTOR BALANCE

1. Treadle Test

Press the  button until "TEST TREADLE" will be displayed briefly then " NEUTRAL".

- a. Move the pedal from neutral to heel 1 then to heel 2.
The display should show each position.
- b. Move the pedal forward slowly. As the pedal is moved, a number (0 to 255) will be displayed.

NOTE: This number is proportional to how far the pedal is moved. The lowest number should be no more than "8" and the highest number greater than "250".

2. Setting the Index Signal

- a. Remove the drive belt.
- b. **Press** the  button. The display will read "TEST INDEX" briefly then show a broken line "-----". If the eye is uncovered the display will show "-----Eye-----". Rotate the motor by hand until the display shows "Index-Eye". Rotate the machine by hand until the needle point is approximately level with the throat plate on it's downward stroke. replace the belt and tighten with the machine and motor in this position.

3. Encoder Test

CAUTION: Remove the sewing machine belt. The belt has to be removed because the motor may not develop sufficient torque to turn the machine.

Press the  button. The display will read "TEST ENCODER" briefly then "PUSH START (enc)". Press the  button the motor will begin to rotate slowly and the display will read "PLEASE WAIT !!". After 2 or 3 seconds the motor will stop and the display shows the number of counts. The number should be between 240 and 260 pls.

3. Motor balance Test

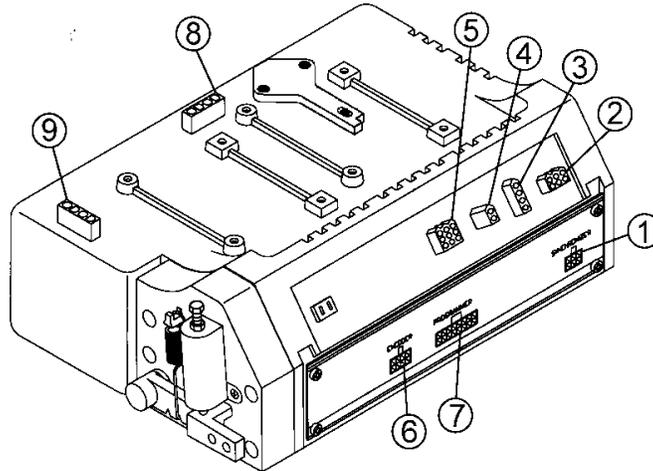
CAUTION: Remove the sewing machine belt.

Press the  button. The display will read "CHECK BALANCE" briefly then "PUSH START (bal)". Press the  button the motor will begin to rotate slowly in one direction and then the other, the display will read "PLEASE WAIT !!". When the motor stops the display will show a balance number (0-255). The balance number should be below 10.

NOTE: If the motor is too far out of balance the display may read "DIRECTION FAILED". This error message will also occur if the motor is unplugged from the control box when the balance is being tested.

SECTION V**CONNECTOR DIAGRAMS**

Listed below are the pinouts for the Model 990 control box connectors.



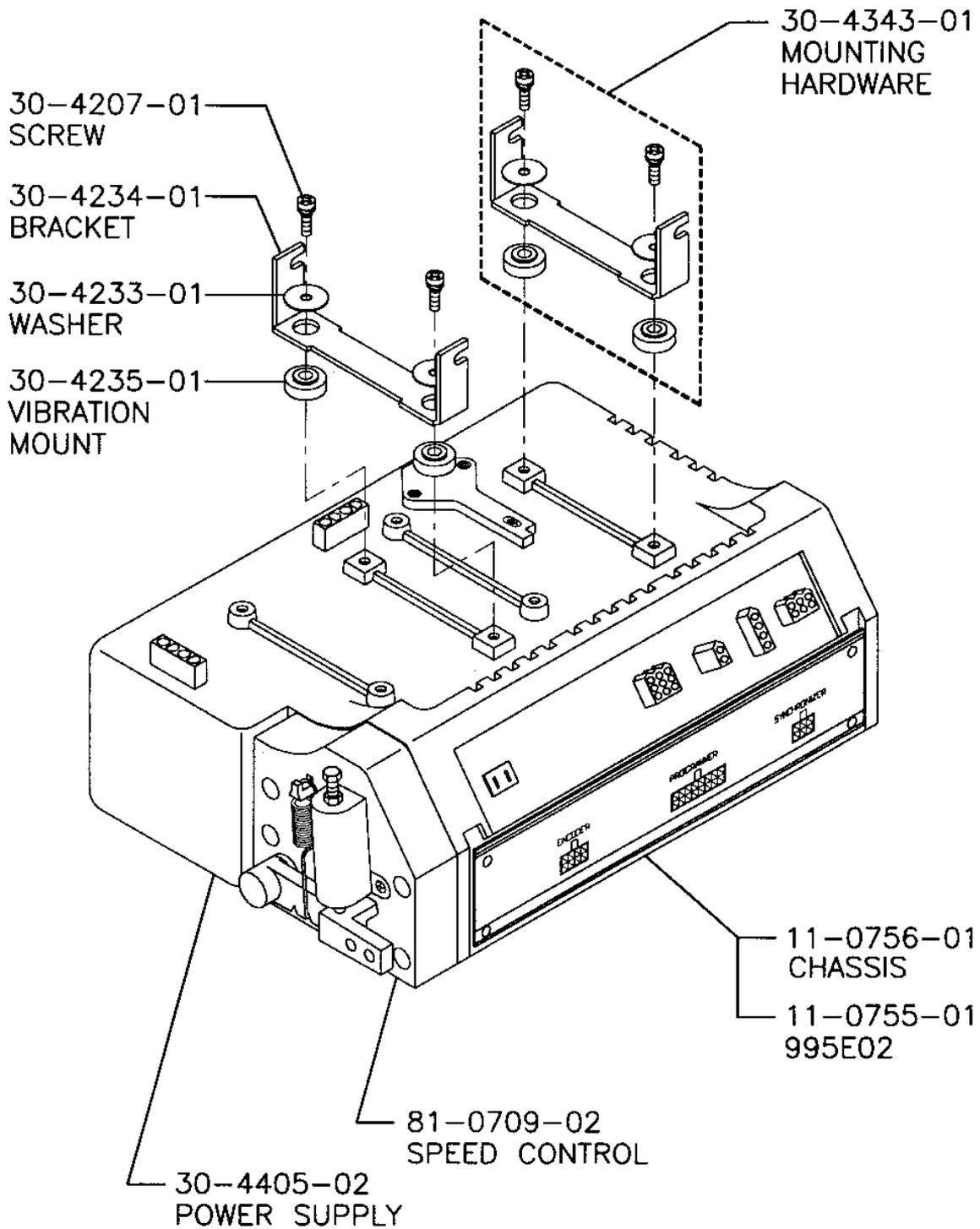
NO.	TOTAL PINS	CONNECTOR	PIN NO.	FUNCTION
1	6	SYNCHRONIZER	1 2 3 4 5 6	+5 DOWN SENSOR UP SENSOR TRIM SENSOR GND LED
2	6	AUX INPUTS	1 2 3 4 5 6	+5 GND CHASSIS GND I1 I2 I3
3	4	AUX OUTPUTS	1 2 3 4	+48 V R1 +48 V R2
4	2	FOOTLIFT	1 2	FOOTLIFT SOL. +48V
5	9	TRIM, WIPER, BACKTACK SOLENOIDS, AND MANUAL BACKTACK SW.	1 4 2 5 3 6 7 8 9	WIPER SOL. - WIPER SOL. +(48V) TRIMMER SOL. - TRIMMER SOL. +(48V) BACKTACK SOL. - BACKTACK SOL. +(48V) + MANUAL BACK - TACK SWITCH NOT USED

NO.	TOTAL PINS	CONNECTOR	PIN NO.	FUNCTION
6	8	ENCODER	1 2 3 4 5 6 7 8	+5V ENCODER (S1) ENCODER (S2) SIG. GND PHASE C PHASE B PHASE A INDEX
7	16	LCD DISPLAY	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	EXT1 CHASSIS GND +5V GND D0 D1 D2 D3 D4 D5 D6 D7 CA1 E ERD CA0
8	4	AC POWER 220V 3	1 2 3 4	PHASE A PHASE B PHASE C CHASSIS GND
9	4	MOTOR VOLTAGE	1 2 3 4	PHASE A PHASE B PHASE C CHASSIS GND

NO.	TOTAL PINS	CONNECTOR	PIN NO.	FUNCTION
6	12	NOT USED	-	-
7	12	NOT USED	-	-
8	8	COMMUTATOR	1 2 3 4 5 6 7 8	+5V ENCODER (S1) ENCODER (S2) SIG. GND PHASE C PHASE B PHASE A -5V
9	16	LCD DISPLAY	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	EXT1 CHASSIS GND +5V GND D0 D1 D2 D3 D4 D5 D6 D7 CA1 E ERD CA0
10	4	AC POWER 220V 3	1 2 3 4	PHASE A PHASE B PHASE C CHASSIS GND
11	4	MOTOR VOLTAGE	1 2 3 4	PHASE A PHASE B PHASE C CHASSIS GND

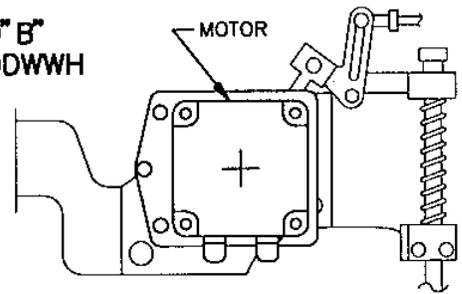
CONTROL BOX - DC SERVO

MODEL 990
81-0879-01

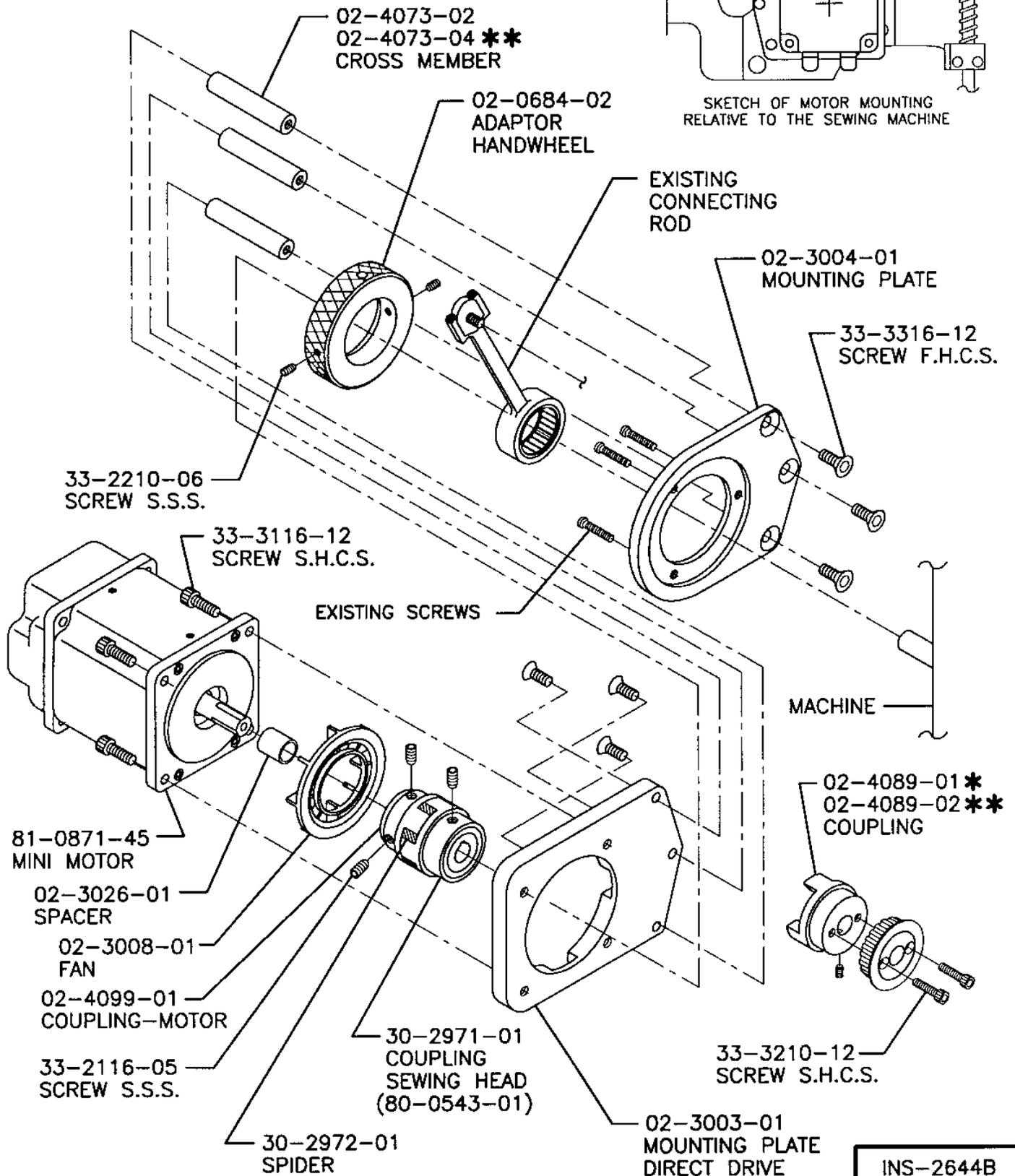


MOTOR MOUNT ASSEMBLY

- 80-0543-01, MODEL 960DD
- * 80-0543-02, MODEL US 35800" B"
- ** 80-0543-03, MODEL US 35800DWWH

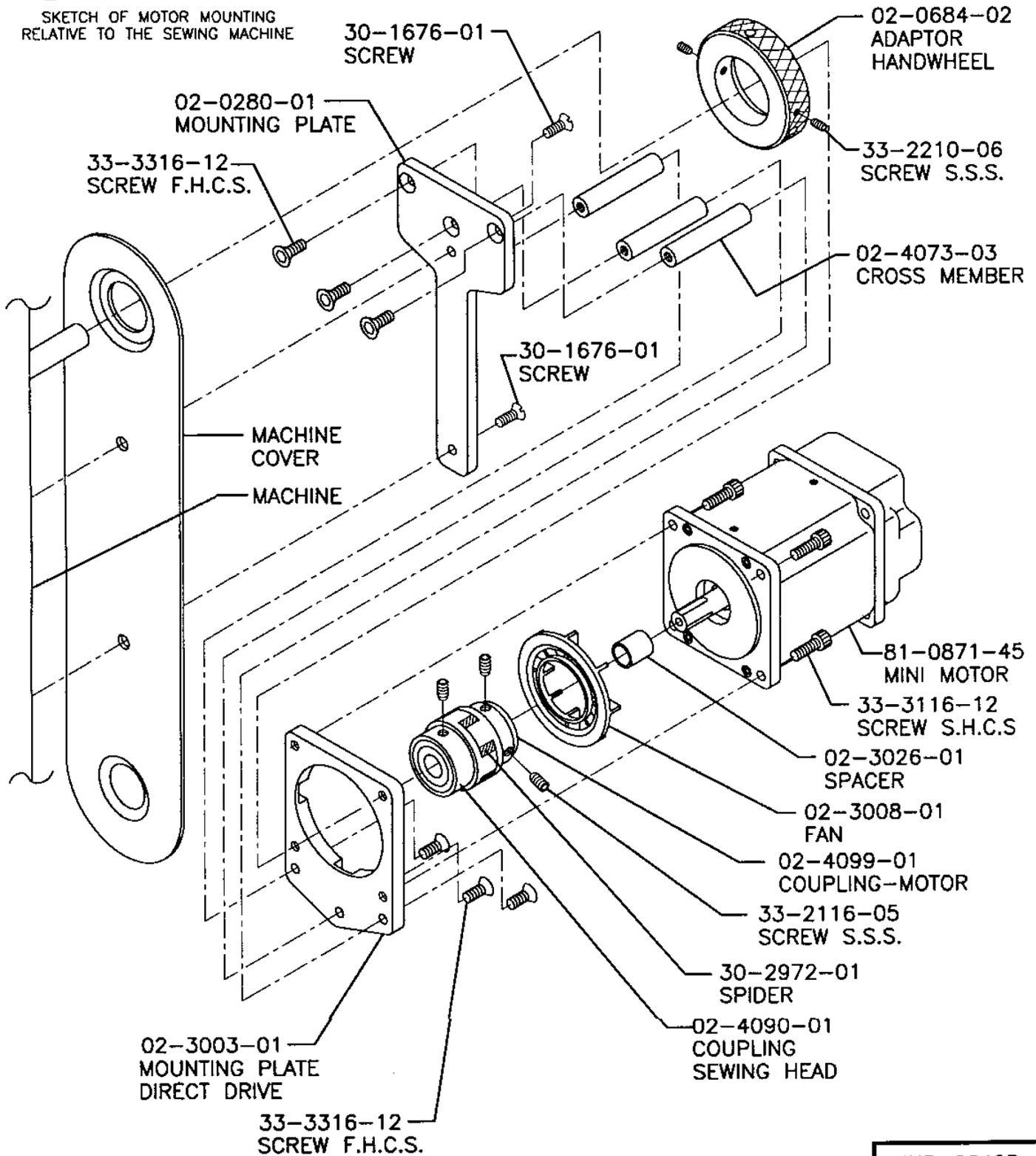
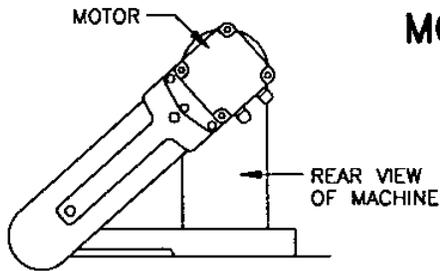


SKETCH OF MOTOR MOUNTING
RELATIVE TO THE SEWING MACHINE



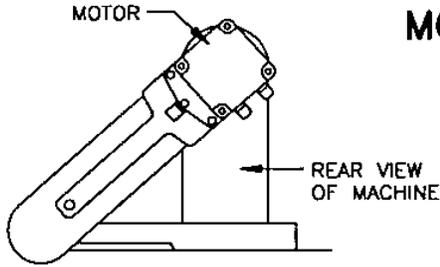
MOTOR MOUNT ASSEMBLY

MODEL 9000
SINGER 261
80-0543-04

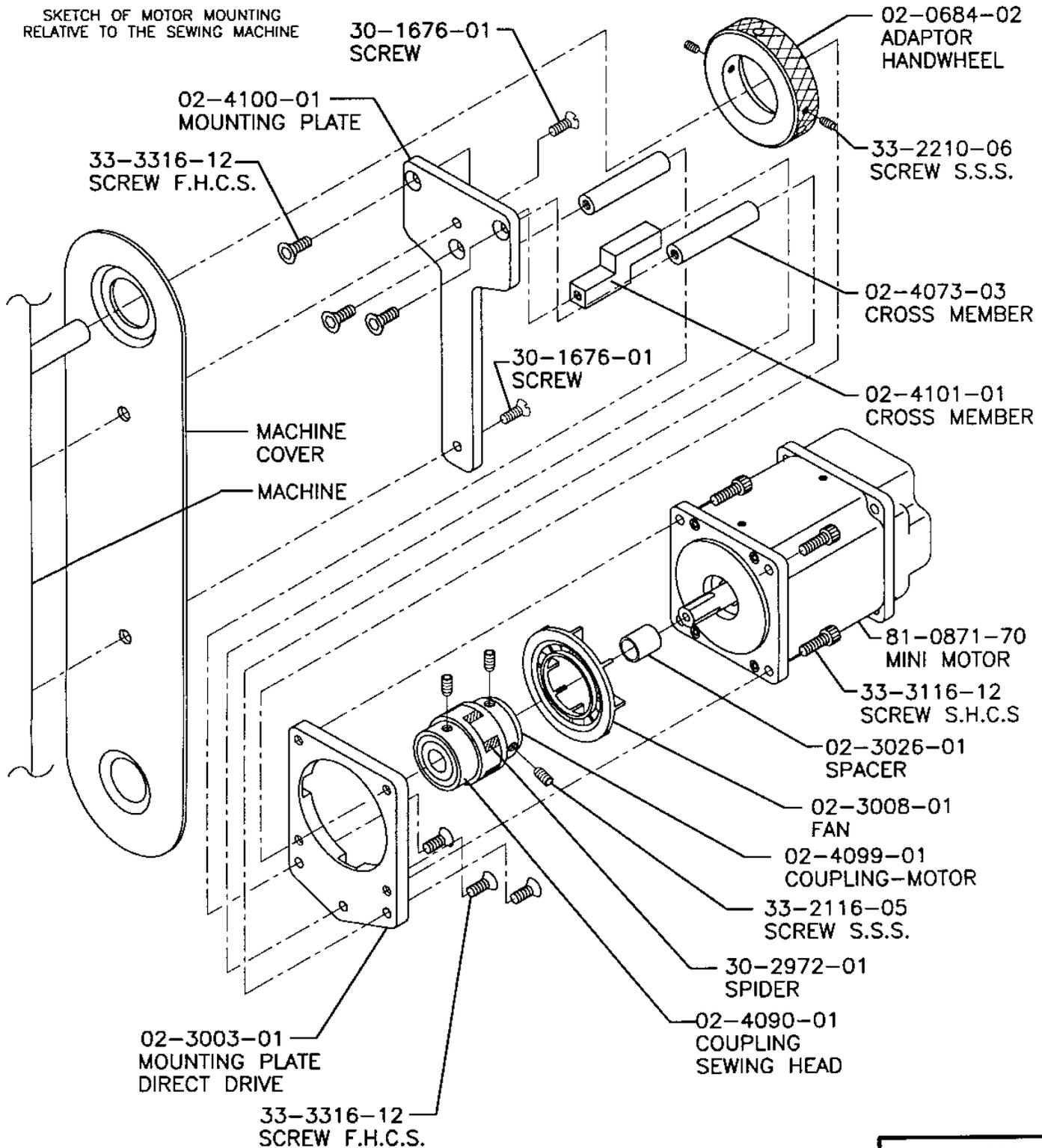


MOTOR MOUNT ASSEMBLY

MODEL 9000
CONSEW 347
80-0543-07



SKETCH OF MOTOR MOUNTING
RELATIVE TO THE SEWING MACHINE



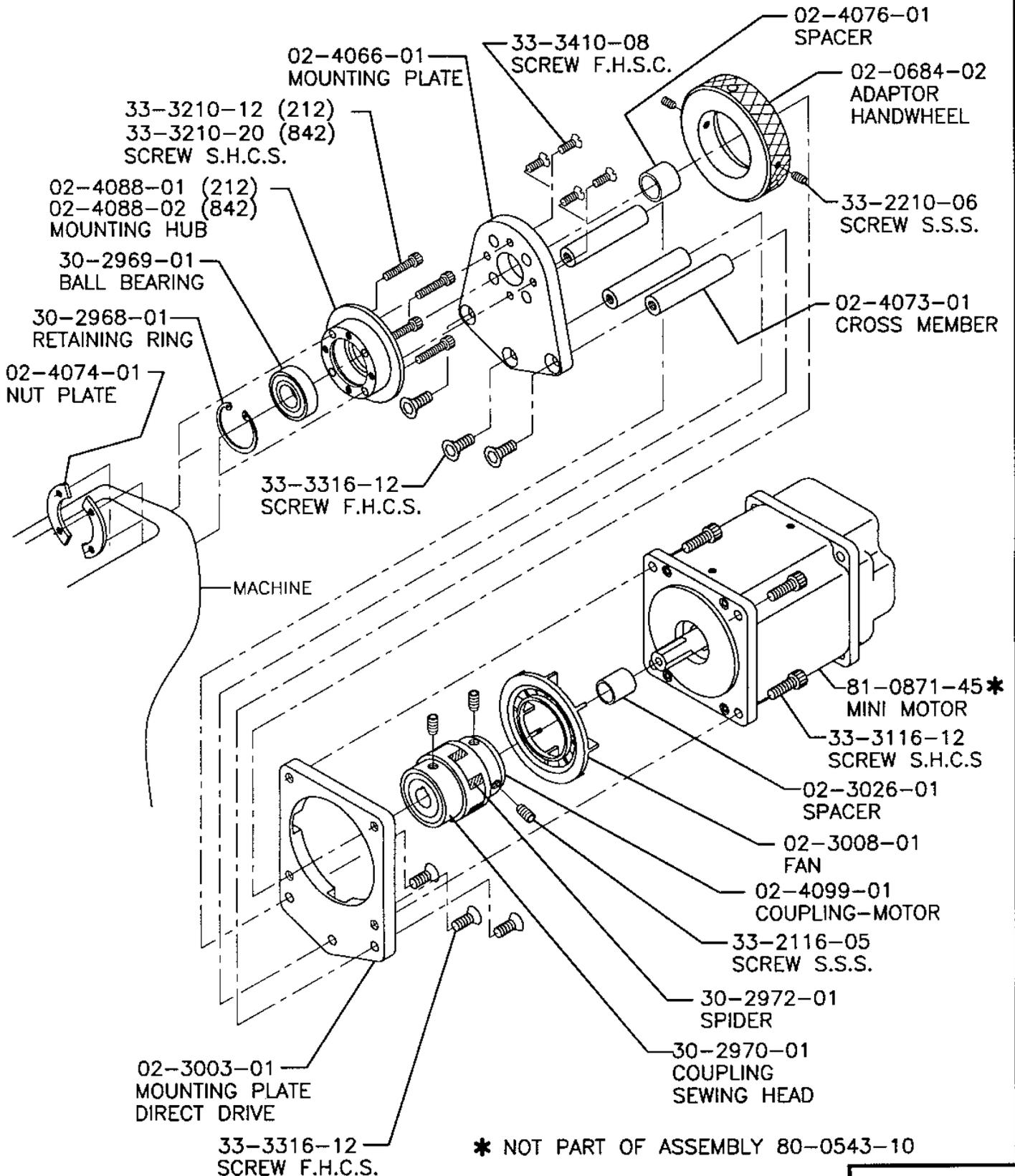
INS-2653B

MOTOR MOUNT ASSEMBLY

MODEL 9000DH

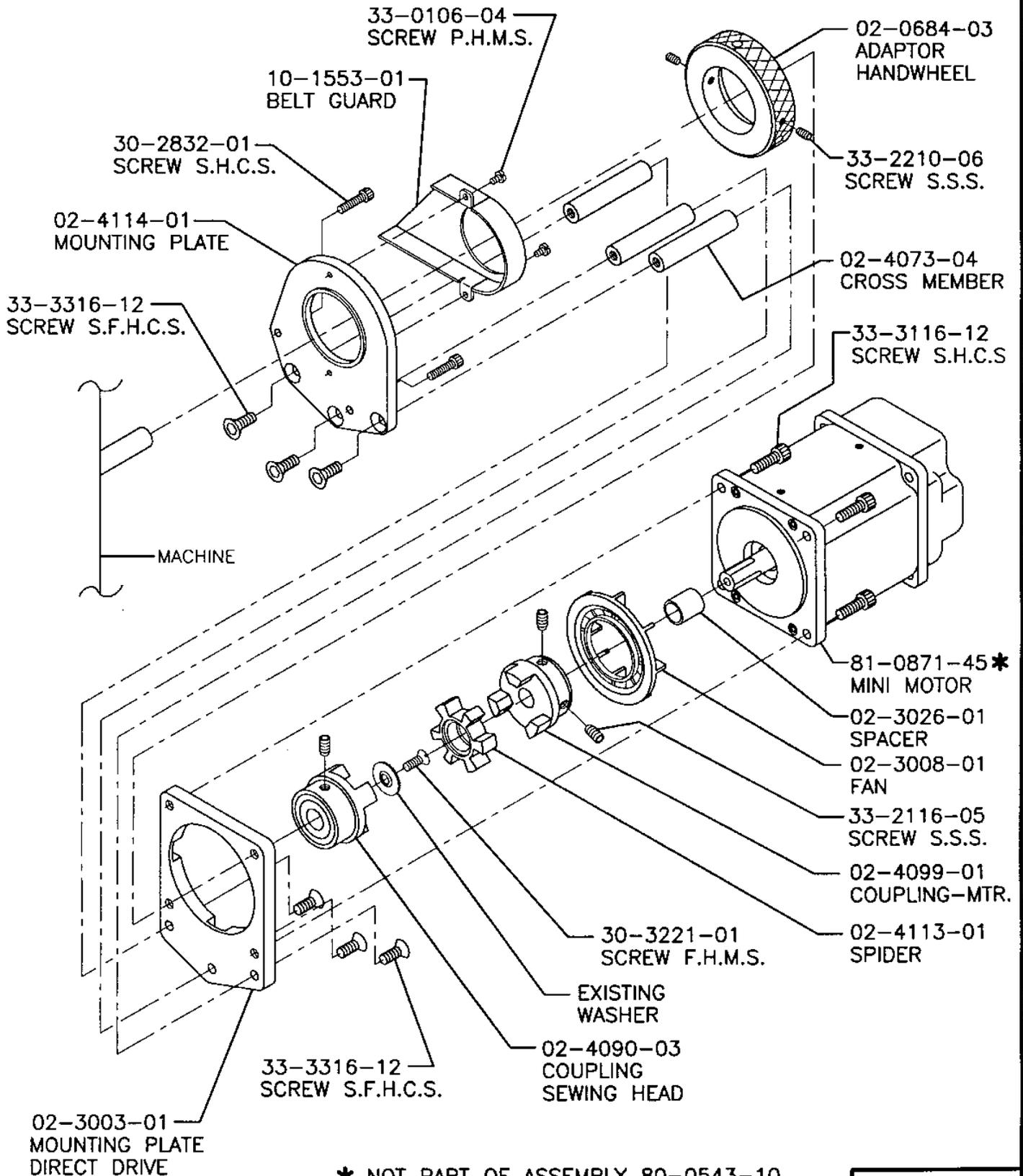
80-0543-10 SINGER 212

80-0543-11 BROTHER 842



MOTOR MOUNT ASSEMBLY

MODEL 990
PFAFF 5489
80-0543-12



INS-2674