SERIES 7889 METER PRESET

MANUAL
DESCRIPTION - INSTALLATION - OPERATION - SERVICING

U508217-e – Revision 02 – 24 February 2009

This document consists of 12 pages, including the flyleaf

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Summary

SECTION 1. INTRODUCTION

A. GENERAL

These instructions are for servicing the Series 7889 Preset Registers.

Every Meter Register is thoroughly tested at the meter factory when installed on the meter. However, like any precision mechanism, it requires periodic care to ensure maximum service. This manual is for use in areas where factory rebuilding facilities and adequate exchange stocks are not readily accessible.

Where manufacturer's replacement stocks are available, it is important that no attempt be made to repair any meter register defective within the terms of the warranty as by doing so, the warranty is void and the user is deprived of the protection provided by the warranty. It is recommended that, when possible, meter registers be replaced and the defective unit returned to the meter manufacturer.

SECTION 2. DESCRIPTION

A. GENERAL

1. The Series 7889 Meter Preset is used in fluid flow applications where it is desired to close a valve after a predetermined amount of liquid has passed through.

2. In technical terms, the Preset is a non-repeating, predetermining counter that is driven by and normally mounted on a flow meter. It has a two-stage output that is normally used to close a valve in two stages.

3. The Preset is used in combination with other Veeder-Root meter accessories.

B. SPECIFICATIONS.

1. Input. The Preset is driven by a rotating shaft from a customer-supplied flow meter. The type of input coupling should be specified when ordering. Maximum torque to drive the Preset through a knockoff is 40 ounces per inch. Average running torque is below 4 ounces per inch.

2. Mounting. See Figure 1. There are eight tapped mounting holes for use with *¼-28* screws. The Preset is designed to mount directly on a.

3. Valve and Switch Connections. The Preset can be connected to a two-stage valve by customer supplied, direct linkage or by an electrical switch with linkage. Either linkage connects to a rotating knockoff plate on the bottom of the Preset case with a *114-28* screw (Figure 1). The rated first-stage valve load is 60 pounds.

4. Outline Dimensions. See Figure 1.

5. Flow Rate. The maximum speed of the right-hand wheel (least significant digit) is 250 rpm. With a 1:1 ratio between the input and the right-hand wheel, the maxi- mum input speed would also be 250 rpm. If one revolution of the right-hand wheel represents 10 gallons, the maxi- mum flow rate would be 2500 gallons per minute. Gear plates are available to provide various ratios of input revolutions of the right-hand wheel.

6. Preset Number. 4 or 5 digits. Preset in additive direction by individually actuating five preset buttons (maximum preset capacity 99999)

7. Display. 4 or 5 wheels with ½ inch white digits on black background.

8. Output (Knockoff). Two-stage knockoff. Unit counts down from preset number. First stage knockoff point is set at the factory to customer's specification at 90, 80, 70, 60, 50, 40, 30, 20, 10, 9, 8, 7, 6, 5,4, or 3. An option al three-finger rake provides first stage knockoff at a number between 900 through 100 in increments of 100. The setting can be internally changed by the customer in the field. Second (final stage) knockoff occurs when all wheels reach zero. See Figure 1 for angular travel of knockoff plate.

9. Interlock. The Preset has a unique interlock feature. The Preset buttons cannot be actuated until the SET button is depressed (latched). The SET button cannot be latched with the valve load applied. Therefore, the preset number cannot be changed while fluid is flowing.

WARNING: IF THE PRESET OPERATING HANDLE IS MOUNTED IN THE 5 O'CLOCK POSITION, THE HANDLE COULD STRIKE THE OPERATOR'S HAND WHEN DEPRESSING THE EMERGENCY STOP BUTTON.

10. Emergency Stop. The STOP button will "dump" both first and final stages of the valve to provide complete shutdown.

11. Options. Presets are available with a Series 7856 explosion-proof switch for use with electrically operated valves. The Preset can be integrally mounted to a Veeder-Root Meter Register or to a Meter Register with Ticket Printer.

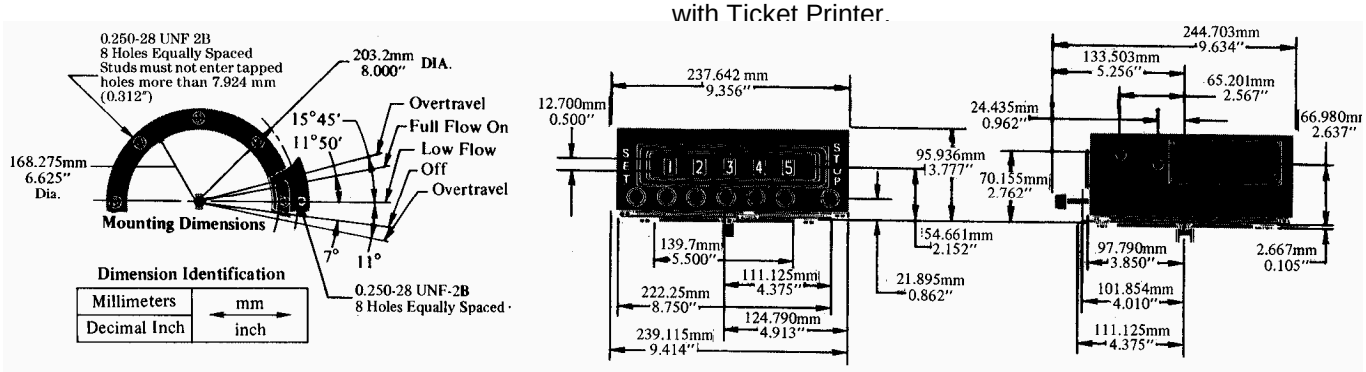


Figure 1. Dimensions

SECTION 3. INSTALLATION

WARNING: WHEN THE PRODUCT IS USED TO CONTROL A MACHINE OR PROCESS WHERE PERSONAL INJURY OR EQUIPMENT DAMAGE MIGHT OCCUR AS A RESULT OF FAILURE OF ANY ELECTRICAL OR OTHER PRODUCT FUNCTION, YOU ARE URGENTLY RECOMMENDED TO INSIST ON INSTALLATION OF SAFEGUARDS WHICH WOULD PROTECT THE OPERATION AND/OR MACHINE IN THE EVENT OF ANYUNEXPECTED OPERATION OF THE MACHINE OR PROCESS.

A. MOUNTING.

CAUTION: BEFORE INSTALLING THE METER PRESET, REMOVE AND DISCARD THE TWO HEX HEAD SCREWS AND WASHERS THAT SECURE THE KNOCK OFF PLATE TO THE BOTTOM OF THE PRESET. THEN, HOLD THE SPRINGLOADED KNOCKOFF PLATE AGAINST THE PRESET UNTIL INSTALLED ON A FLOW METER OR ADAPTER. FAILURE TO COMPLY MAY RESULT IN DAMAGE TO THEKNOCKOFF PLATE RETURN SPRING.

1. Remove and discard the two hex head screws and washers that secure the spring loaded knockoff plate to the bottom of the Preset (Figure 2). Ensure that the knockoff plate does not rail away from the Preset or damage to the knockoff plate return spring may result.

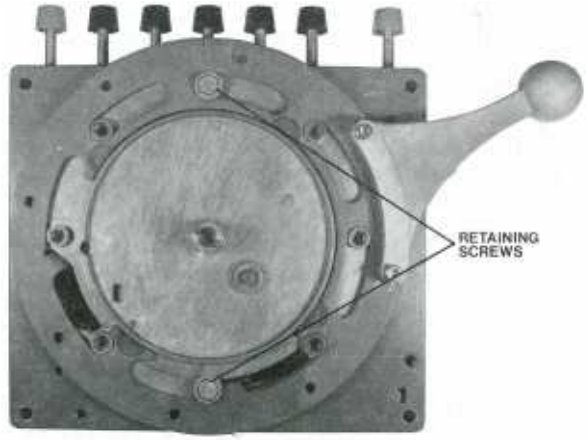


Figure 2. Removal of Preset Retaining Screws.

2. Install the Preset on a flow meter or adapter, taking care to properly engage mating couplings. Secure with 1/4-28 screws and lock washers. CAUTION: Screws must not enter tapped holes more than 0.312 in.

WARNING: IN INSTALLATION AND USE OF THIS PRODUCT WITH AN ELECTRICAL SWITCH, COMPLY WITH THE NATIONAL ELECTRICAL CODE; FEDERAL, STATE AND LOCAL CODES; AND TURN OFF POWER AND TAKE OTHER NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

3. Install the linkage between the knockoff plate and valve or switch. If the Preset is equipped with a Series 7856 explosion-proof switch, connect wires per installation instructions packed with the switch.

4. Ensure that there is still some knockoff plate over travel after the valve is fully open.

5. Verify that after the valve closes, the knockoff plate has rotated the correct distance of 15°, 45' plus 7 ° (Figure 1) and that there is some over travel still left in the plate.

B. TRIMMING RIGHT-HAND WHEEL TO ZERO.

If the right-hand wheel does not read zero after product flow stops, adjust as follows:
Note: SET button must be released (unlatched) during trimming procedure

1. Remove the lockwired plate covering the trim holes on the right Side of the Preset. Older models have trim hole plugs. Insert one small screwdriver blade in each of the two trim holes (Figure 3).

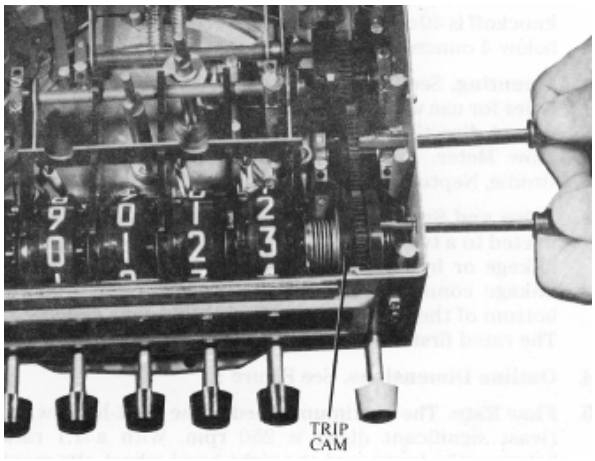


Figure 3. Trimming the Right-Hand Wheel.

2. Fit the tips of the screwdrivers into the slots in the side of the plastic parts. By prying with the front screwdriver and holding the gear train stationary with the rear screwdriver, adjust the knockoff cam as follows:

CAUTION: ADJUST THE KNOCKOFF CAM ONLY IN THE DIRECTION INDICATED IN THE FOLLOWING STEPS. ADJUSTMENT OF THE CAM IN THE WRONG DIRECTION COULD DAMAGE THE INTERNAL STOP AND CAUSE A RUNA WAY DELIVERY. IF STRONG RESISTANCE IS ENCOUNTERED IN ONE DIRECTION DURING ADJUSTMENT, THE INTERNAL STOP HAS BEEN REACHED. DO NOT ATTEMPT FURTHER ADJUSTMENT IN THAT DIRECTION.

a. If the final knockoff point is greater than zero, adjust the cam backward (clockwise when looking into the trim hole) only. Do not attempt to adjust the cam forward since you cannot reach zero without breaking the internal stop. The cam must be adjusted 10 clicks for a 1 digit change in the right-hand wheel. For example, if a Preset final knockoff point was 0003, the cam would be moved 30 clicks.

b. If the final knockoff point is less than zero, adjust the cam forward (counterclockwise when looking into the trim hole) only. Do not attempt to adjust the cam backward since you cannot reach zero without breaking the internal stop. The cam must be adjusted 10 clicks for a 1 digit change in the right-hand wheel. For example, if a Preset final knockoff point was 9998, the cam would be adjusted 20 clicks.

3. After adjustment, set a small number into the Preset and deliver product. The final knockoff point should be zero. If not, repeat the adjustments until zero is reached.

4. Install the trim hole plugs or plate. Secure the plate with screws and a new lockwire.

C. FIRST STAGE KNOCKOFF CHANGE.

Proper operation of the Preset depends on the correct relationship between the first and second stage rakes and the notches in the wheels. If this factory setting is disturbed, the unit will not operate properly. To change the first stage knockoff setting, perform the following procedure:

1. Cut the lockwire that is threaded through the four bolts securing the Register to the Preset.

2. Remove the four mounting bolts.

3. With the assembly in an upright position, lift the Meter Register from the Meter Preset.

CAUTION: DO NOT BEND OR TWIST RAKES WHEN SETTING FIRST STAGE KNOCKOFF. IF RAKES ARE DAMAGED, SEE SECTION 5 FOR TEMPORARY EMERGENCY ADJUSTMENT.

4. Lift both rakes away from the wheels in the Preset (Figure 4).

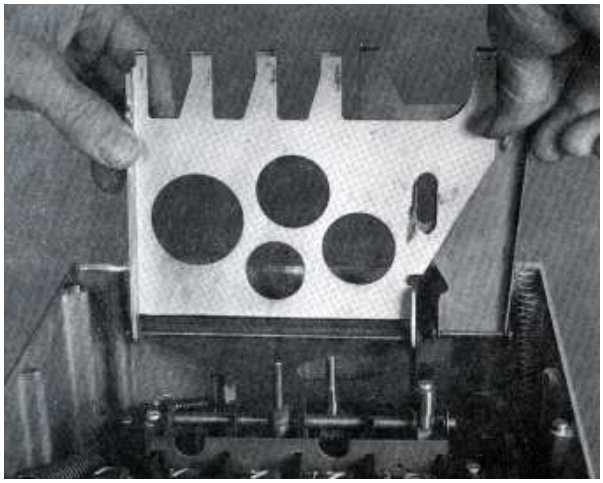


Figure 4. Lifting Rakes.

5. Set the first stage knockoff at a number from 3 through 900 by first depressing the SET button, then one, two or three character wheel Preset buttons. The Preset must be equipped with an option al three-finger rake to obtain a first stage knockoff at a number between 100 and 900.

6. Release the SET button by rotating the knockoff plate.

7. Ensure that the character wheel disc inserts (Figure 5) are located as follows:

a. For first stage knockoff at a number from 3 through 9, ensure that all disc inserts are installed in the second character wheel (second wheel from right). .

b. For first stage knockoff at a number from 10 through 90, remove the disc insert nearest the top of the second character wheel and install it in any other open position in the wheel. Save the disc insert for future changes in knockoff settings if there are no open positions.

c. For first stage knockoff at a number from 100 through 900, remove the disc insert nearest the top of the second and third character wheels. Install them in any other open positions in these two wheels. Save the disc inserts for future changes in knockoff settings if there are no open positions.

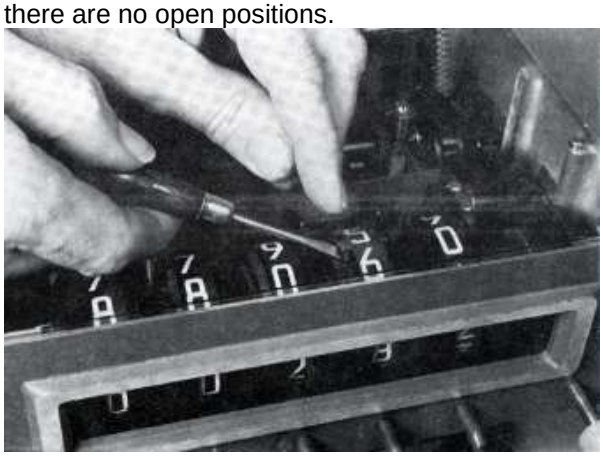


Figure 5. Removal of Disc Insert from Wheel.

8. Push the trip cam to the left to disengage it from the drive gear (Figure 6).

9. Rotate the trip cam until its operating surface is straight up (Figure 6). In this position, the operating surface pulls the rake when the desired number on the first character wheel is displayed in the window.

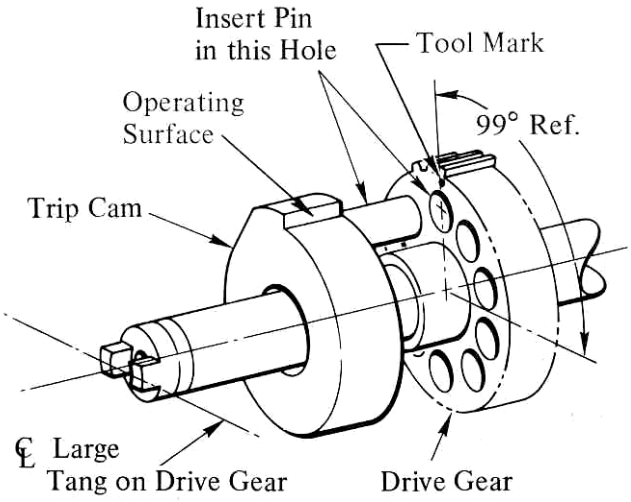


Figure 6. Trip Cam Positioning for First Stage Knockoff.

10. Engage the trip cam with the drive gear (Figure 6).

Note: If the first stage knockoff number is set very low, both the first and final knockoffs could appear to occur simultaneously during a high flow rate.

11. Lower the rakes toward the front of the Preset to their operating position.

CAUTION: DO NOT BEND OR TWIST RAKES. BE SURE RAKES ARE PROPERLY POSITIONED OVER ECCENTRIC WHEN METER REGISTER IS LOWERED ONTO THE PRESET. BE SURE PROTRUDING SHAFTS DO NOT CONTACT THE RAKES. IF RAKES ARE DISTURBED, SEE "TEMPORARY/EMERGENCY ADJUSTMENT" IN SECTION 5.

12. Install the Meter Register on top of the Meter Preset with attention to proper alignment of the two "up-down" shafts (Figures 7 and 8). Secure the units together with the four bolts and a new lockwire.

D. OPERATIONAL CHECK.

Before putting the Preset into use, perform a complete check of the unit and associated delivery equipment per Section 4.

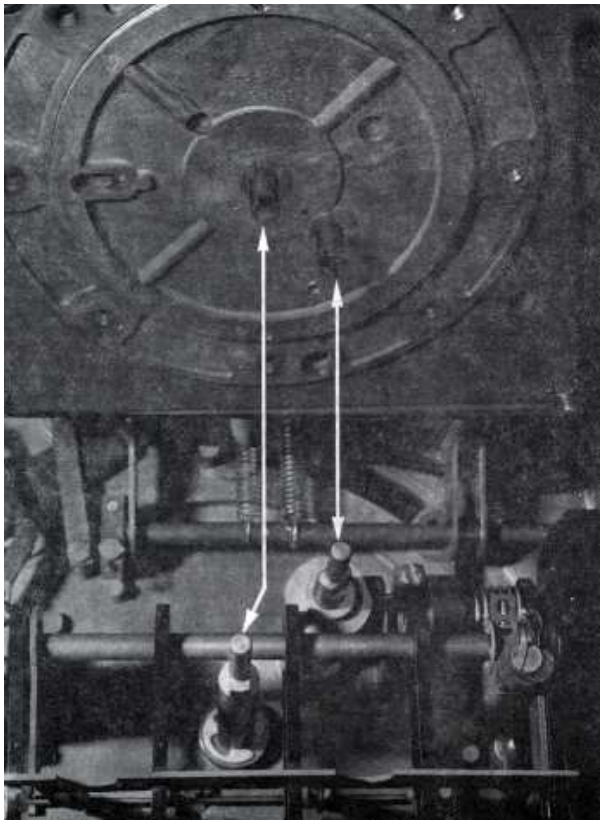


***Figure 7. Shaft Alignment Before Installation of Meter Register on Meter Preset*.**

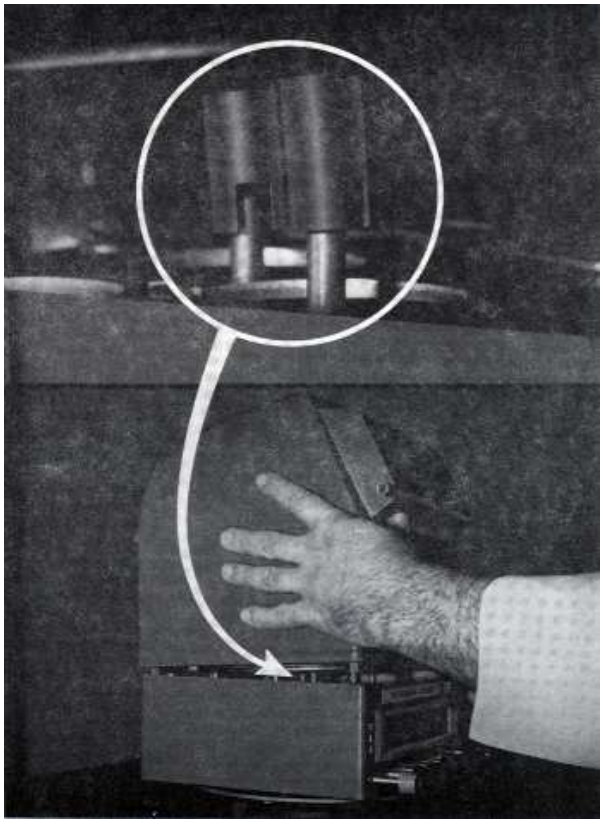


Figure 8. Installation of Meter Register on Meter Preset.

SECTION 4. OPERATION

1. Depress the SET button into its latched position. The inward movement of the SET button causes:

a. The input drive to de-clutch so that its internal parts are disconnected from the flow meter.

b. A "gate" to open that had blocked the Preset buttons from operating.

2. Depress the appropriate Preset buttons to display the quantity of fluid to be delivered. One depression of each button will rotate its corresponding wheel 1/10 revolution or one digit in an additive direction. Presetting one wheel will not affect other wheels.

3. Open the valve to start fluid flow by moving the linkage between the Preset and the valve. (A handle is normally supplied by the valve or meter manufacturer for this function. Units with Series 7856 Switch are equipped with a handle.) This action rotates the knockoff plate on the bottom of the Preset case and:

a. The SET button pops out which locks out the Preset buttons and engages the clutch between the input shaft and the wheels.

b. The knockoff plate on the bottom of the Preset case has two tabs that project into the case. When the valve load is applied and the knockoff plate rotates, the tabs move internal latches into their "loaded" positions.

c. The knockoff movement locks out the SET button.

d. Fluid starts to flow. The flow meter drives the Preset wheels directly in a subtractive direction.

e. When the first stage knockoff number is reached, a series of notches in the wheels becomes aligned and the first stage rake drops into the notches. Then, a cam pulls the rake forward to release one of the previously loaded latches. The release of the latch allows the knockoff plate to move back approximately 15°, 45' for a partially closed valve .

f. When the wheels reach zero, a second rake drops into the notches and another cam pulls this rake forward. This action releases the final latch and allows the plate to move another 7° for a fully clo sed valve.

SECTION 5. SERVICE

A. GENERAL.

The Meter Preset is adjusted and lubricated at the factory, but periodic cleaning and lubrication is required for maximum service. Service intervals must necessarily be left to individual users due to varying conditions of operation.

B. CLEANING.

Remove dirt from character wheels and ail drive gears with a small brush.

C. RECOMMENDED LUBRICANTS.

OIL: Temperature Range -65℉ to +275℉
Chemlube 201 Oil
Exxon Instrument Oil
Aero shell Fluid No. 12 or Equivalent
GREASE: Temperature Range -65℉ to +300℉

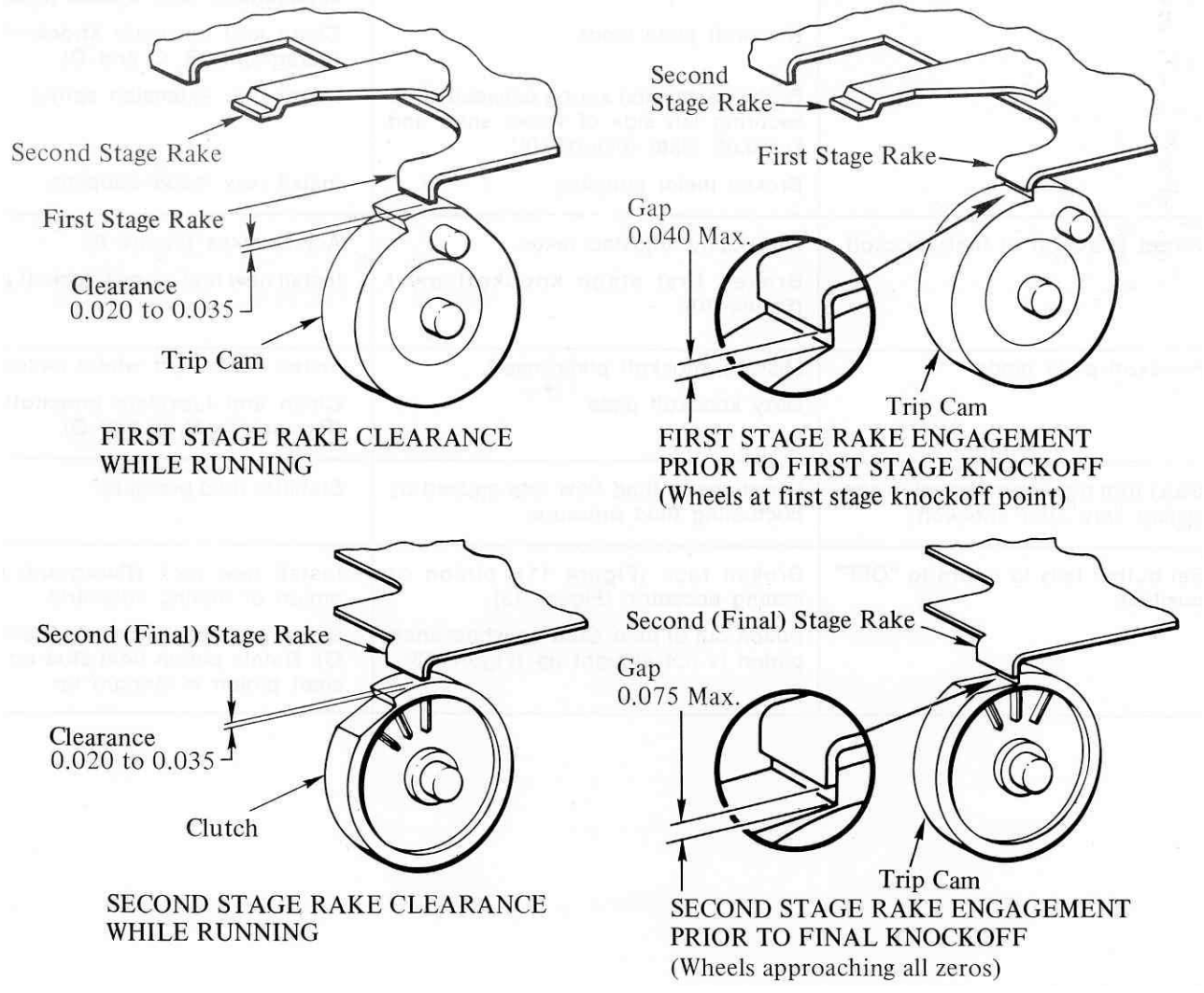
D. LUBRICATION.

1. Apply oil to all rotating parts.
2. Apply grease to all other moving metal parts.

E. TEMPORARY/EMERGENCY RAKE ADJUSTMENT.

1. If the Preset fails to knock off due to damaged rakes caused by banging, bending or twisting, temporary adjustments can be made while waiting for a replacement unit.
2. Using extreme caution, bend the rake fingers to obtain proper rake positioning (Figure 9).

Figure 9. Rake Positioning



F. TROUBLESHOOTING.

Refer to Figures 10, 11, and 13 for parts identification when using Troub1eshooting Table 1.

Table 1. Series 7889 Meter Preset Troubleshooting.

TROUBLE	POSSIBLE CAUSE	CORRECTION
Any wheel cannot be preset	Broken preset pawl (Figure 11). Displaced extension spring between base of Preset and Preset pawl (Figure 11).	Install new preset pawl (Paragraph G). Replace extension spring.
Any wheel split (Number not centered in window).	Broken rack (Figure 11). pin ion or mating eccentric (Figure 13). Pinion out of time. Stud on wheel shaft pinion is not straight up (Figure 13). Groove pin not flush with bottom of rack (Figure 11).	Install new rack (Paragraph H), or pinion or mating eccentric. Remove wheel shaft group (Paragraph G). Rotate pin ion until stud on pinion is straight up. Drive groove pin flush with bottom of rack.
First knockoff fails.	Bent rake.	Align rake for proper clearance and engagement with wheels (Figure 9).
Final knockoff fails.	Misalignment of rake with wheels. Knockoff plate binds. Broken extension spring between strap securing left si de of wheel shaft and knockoff plate (Figure 10). Broken meter coupling.	Align rake for proper clearance and engagement with wheels (Figure 9). Clean and lubricate knockoff plate (Paragraphs B, C and D). Install new extension spring. Install new meter coupling.
Preset shuts off at first knockoff.	Improperly adjusted rakes. Broken first stage knockoff pawl (Figure 10).	Adjust rakes (Figure 8). Install new first stage knockoff pawl.
Knockoff plate binds.	Missing knockoff plate insert. Dirty knockoff plate.	Install new insert where necessary. Clean) and lubricate knockoff plate (Paragraphs B, C and D).
Can't trim right-hand wheel to consistent zero after knockoff.	Variations in fluid flow rate caused by fluctuating fluid pressure	Stabilize fluid pressure.
Set button fails to return to "OFF" position.	Broken rack (Figure 11). pinion or mating eccentric (Figure 13). Pinion out of time. Stud on wheel shaft pin ion is not straight up (Figure 13).	Install new rack (Paragraph H), or pinion or mating eccentric. Remove wheel shaft group (Paragraph G). Rotate pinion until stud on wheel shaft pinion is straight up.

Figure 10. Meter Preset Parts Identification (Wheels Installed).

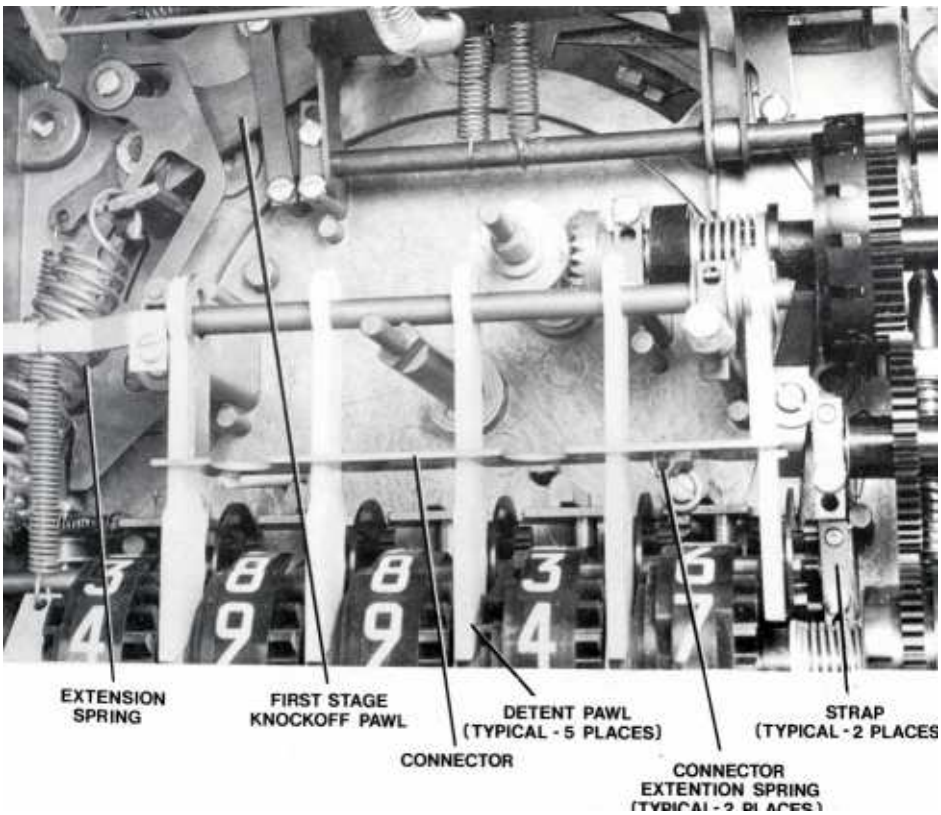


Figure 11. Meter Preset Parts Identification (Wheels Removed).

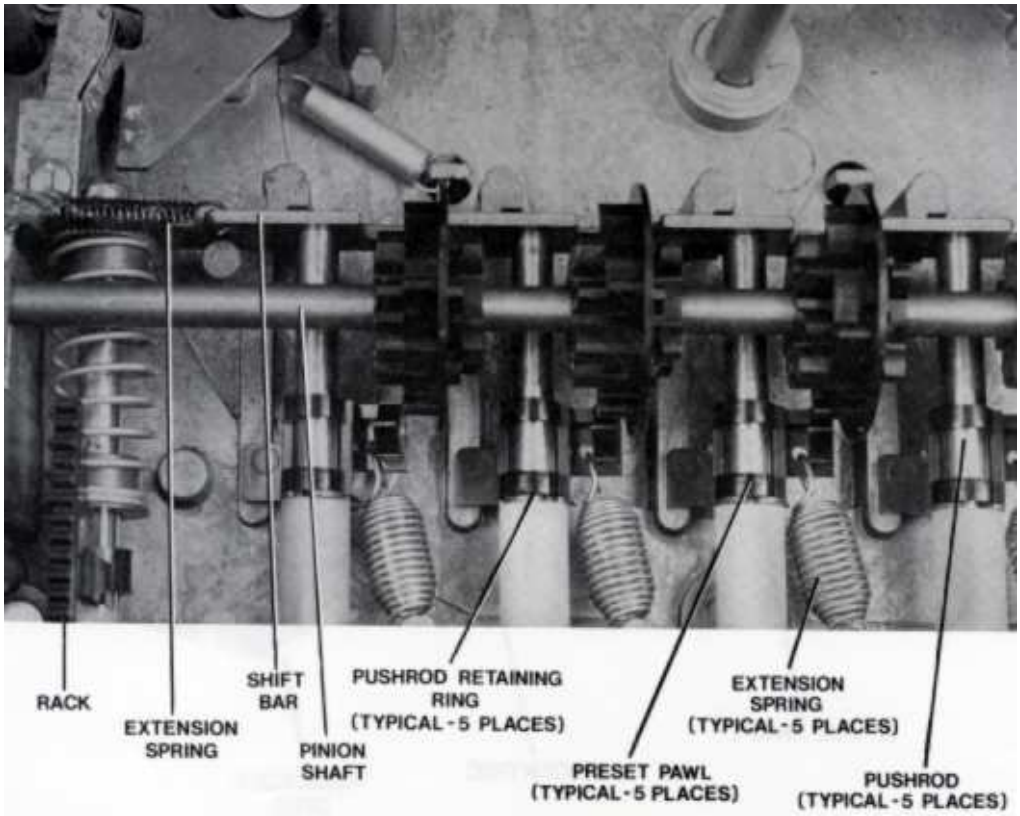


Figure 12. Aligning Transfer Pillions on Pinion Shaft.

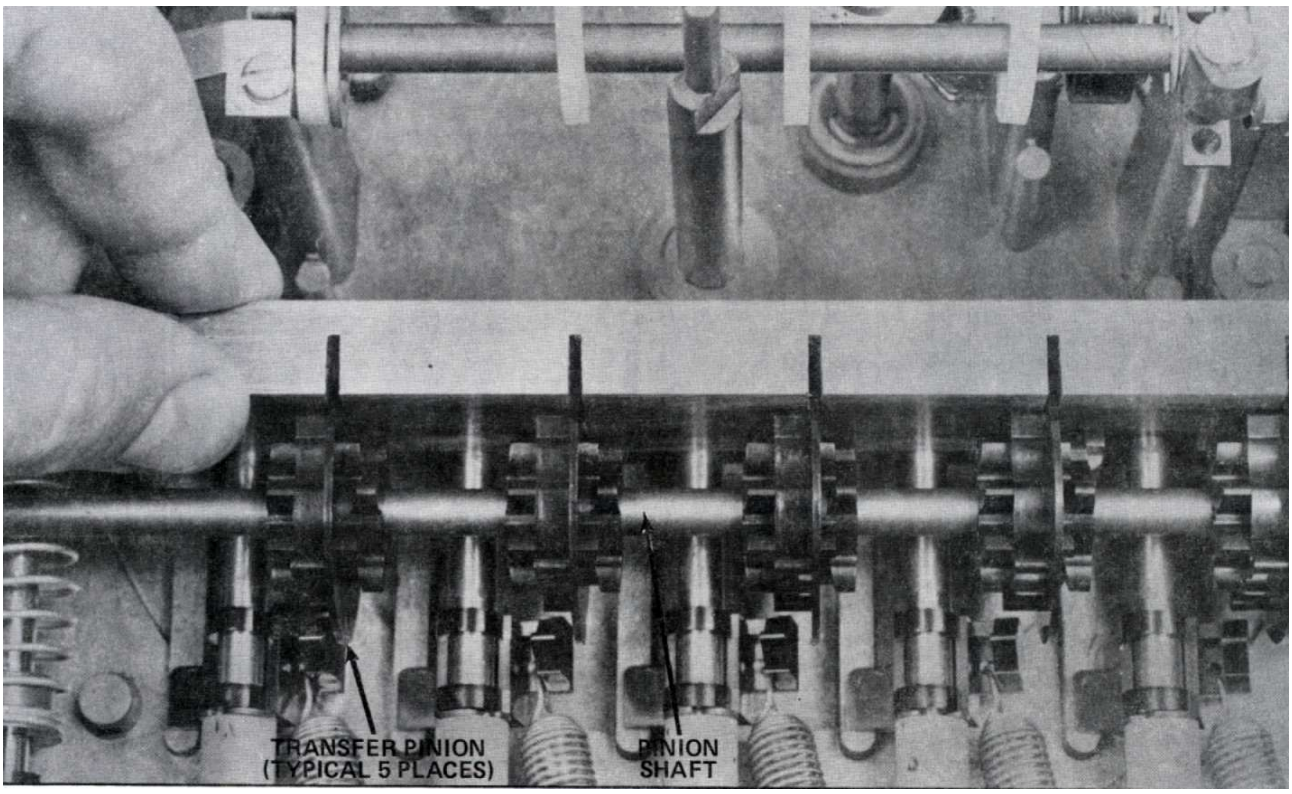


Figure 13. Character Wheel Shaft Group Parts Identification.