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SUPERMATIC SHUTTER INFORMATION SHEET. 10 January 1950

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ALL REFERENCES ARE TO REPAIR SERVICE MANUAL A-436-A

The supermatic #2 shutter has a variety of instaneous speed settings, nine in number. They are 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/200 and 1/400 of a second. There are also time and bulb settings.

A complete cycle of operation of the supermatic shutter consists of the cocking cycle and the trip cycle.

THE COCKING CYCLE

The cocking lever (#46 Fig 5) has a long coil spring (#45 Fig 5) attached, and also a stud. The spring is attached to a stud in the shutter housing. The stud on the lever is positioned in a recessed portion of the main drive cam. Attached to the main drive cam is the blade controller latch (J Fig 2). The blade controller latch is attached to one side of the cam and gives it an eccentric action when the main drive cam revolves. The blade controller latch has a recessed section that comes in contact with a stud on the blade controller ring (P Fig 4).

As the cocking lever is moved clockwise the spring is stretched and the main drive cam is rotated clockwise. The eccentric action of the blade controller latch causes it to come out of contact with the stud on the blade controller ring. This action allows the shutter blades to remain closed during the cocking cycle. A spring like the one attached to the cocking lever, except larger, is attached to the main drive cam. This spring is called the main drive spring (I Fig 2).

The main drive cam rotates slightly more than 1/4 turn. The trigger latch (I Fig 2) then comes in contact with the main drive cam and holds it with the tension on the two springs

THE TRIP CYCLE

Tripping is accomplished by moving the trigger latch assembly (1 Fig 2) out of the path of the main drive cam. The two springs then move the main drive cam in a counterclockwise direction. During the movement the blade controller latch comes in contact with the stud on the blade controller ring. The eccentric action of the blade controller latch then pulls the shutter blades open and pushes them closed again.

The various speeds are obtained through a braking action on the main drive cam. This action is called the retarding action. Retarding action is used on all speeds except 1/200 and 1/400. Retarding is accomplished through a series of gears, pallets and springs which are referred to as the retard pallet and spring (32 Fig 3), escapement wheel (34 Fig 3), #3retard gear (36 Fig 3), #2 retard gear (35 Fig 3), #1 retard gear (37 Fig 3) and the retard sector and spring. (11 Fig 2). The retard sector has a long point or nose that is brought out into the path of the main drive cam and held there by spring tension to cause the changes in speed. The retard sector and the pallet bracket have studs on them. The studs cause the retard sector and pallet to be positioned by the rotation of the speed ring (3 Fig 1). The speed ring has a series of graduated steps which determine the position of the studs.

At speeds of 1 second and 1/10 of a second the entire retard gear train is in operation. The speeds of 1/25, 1/50 and 1/100 of a second occur when the pallet is held out of engagement with the escapement wheel by the speed ring. At speeds of 1/200 and 1/400 of a second the speed ring moves the retard sector from the path of the main drive cam and no resistance is offered. Therefore we have the free speeds. In the 1/400 position, the speed ring holds the high speed cam so that, when the shutter is cocked, additional tension will be applied to the main drive cam by the high speed spring. This boosts the speed to 1/400 of a second and is the maximum speed for the supermatic #2 shutter.

THE RETARDING ACTION

The retarding action takes place while the shutter blades are full open. The high part of the main drive cam comes in contact with the nose of the retard sector. The springs on the main drive cam, being stronger than the ones in the retard sector allow the main drive cam to overcome the resistance of the retard sector. The main drive cam, forcing its way past the retard sector, causes the retard sector to actuate the retard gear train. After the main drive cam forces the nose of the retard sector out of its way, it then continues its movement to close the shutter blades.

Incorporated in the supermatic shutter are two other features which must be taken into consideration. They are the delayed action and the press focus.

The delayed action is basicaly the same type of gear train as the retard gear train. The delayed action is cocked by the delayed action cocking lever (4 Fig 1). This lever rotates about one quarter of a turn and in so doing winds the delayed action spring that is attached to the #1 pinion gear (19 Fig 2). When this gear is moves during the winding of the spring, the other other gears of the gear train are prevented from moving by the ratchet on the #2 pinion gear (22 Fig 2). The delayed action spring has a certain amount on initial tension (About 3 or 4 strokes of the delayed action cocking lever), or enough tension to cause the mechanism to trip in from 9 to 14 seconds. The cocking lever can not be wound, or cocked, until the shutter is cocked. The cocking of the shutter rotates the actuating cam, which has a raised portion or lip that strikes a safety latch and forces it out of contact with the delayed action cocking lever, allowing it to be cocked

THE TRIPPING OF THE DELAYED ACTION

The delayed action cocking lever will stay cocked because the end of the trip latch assembly comes in contact with the delayed action pallet. It must be tripped by the trip latch assembly. The delayed action winding lever travels counter clockwise and should trip in from 9 to 14 seconds. The tripping is accomplished by the high side or nose of the delayed action cocking lever coming in contact with the trigger latch assembly and forcing it counter clockwise in the same manner as tripping manualy.

The press focus button (52 Fig 5) is located just above the cocking lever Its purpose is to allow you the advantage of ground glass focus and composition without setting the shutter on time or bulb. To use it, the shutter must be cocked and the button depressed. and whise holding the button depressed, trip the shutter. The press focus button has a lever extending through the shutter housing and hooks in a slot cut in the cocking lever and will hold the shutter blades open until the mechanism is recocked The button has a spring under it that will return it to its original position, allowing the shutter to then be tripped with the previous setting undisturbed.

Time and bulb are not instaneous exposures. The opening and closing of the shutter blades are the same as for 1/25 of a second, but the length of time that the blades remain open is controled by the manual operation of the time and bulb levers. The time lever controls the time setting with the aid of the bulb lever and is located near the trigger latch assembly. When the speed ring is set to indicate a time exposure the bulb lever catches the lip on the main drive cam and holds the blades in the full open position until the trigger latch assembly is released. At this time the contact is broken and the cam rotates just enough to allow the time lever to catch the lip of the cam. It holds the blades open until the latch is again actuated. The bulb lever (18 Fig 2) is very similar in shape but just a little longer than the time lever. It is placed and operates underneath the time lever and controls the bulb exposure. Since the bulb lever is the longer of the two it is to be expected and does come into operation before the time lever in rotating the speed ring from instantaneous exposure settings. The bulb lever comes in contact with the main drive cam and holds it with the shutter blades fully open only for the length of time that the trigger latch assembly is depressed. Upon releasing the trigger latch assembly a spring attached to the bulb lever causes it to release the main drive cam. The main drive cam then continues its rotation to close the shutter blades.

The shutter blades (44 Fig 4) and the blade controller ring fit with precision but must not bind. There are five blades in the supermatic shutter. In some models, one of these blades is a double blade. All the supermatic shutters have the same blade sequence, 1,2,3,4 and 5 counterclockwise starting at the position just to the left of the stud, and on shutters with the double blade the sequence is the same, with the #6 blade being placed over the top of #1. All the blades are alike except #1 and #6. #1 has two studs instead of one stud and one hole, and #6 has two holes.

The supermatic shutter has 5 diaphram leaves (42 Fig 4), with one end attached to the diaphram retaining plate. The other end has a stud on it and is placed in the slot in the diaphram setting lever. These blades are interchangeable.

TIMING THE SHUTTER

The timing of this shutter is accomplished by having the proper relation between the retard sector and the #1 retard gear. The proper position for the gear is so that it will at all times be engaged with the retard sector and still add enough resistnace to cause the shutter opening time to be one second. The entire retard train will be in operation. The positioning of these two gears is the major adjustment. A minor adjustment, and to be used ONLY as a last resort, is to bend the stud on the retard sector. Bending the stud toward the center of the shutter will increase the exposure time. Bending the stud away from the center will shorten it. NEVER BEND THIS STUD WITH PLIERS. ALWAYS USE A PIECE OF TUBEING. The speeds of the shutter are greatly affected by the condition of the springs, amount of dirt in the shutter, lubrication and temperature.

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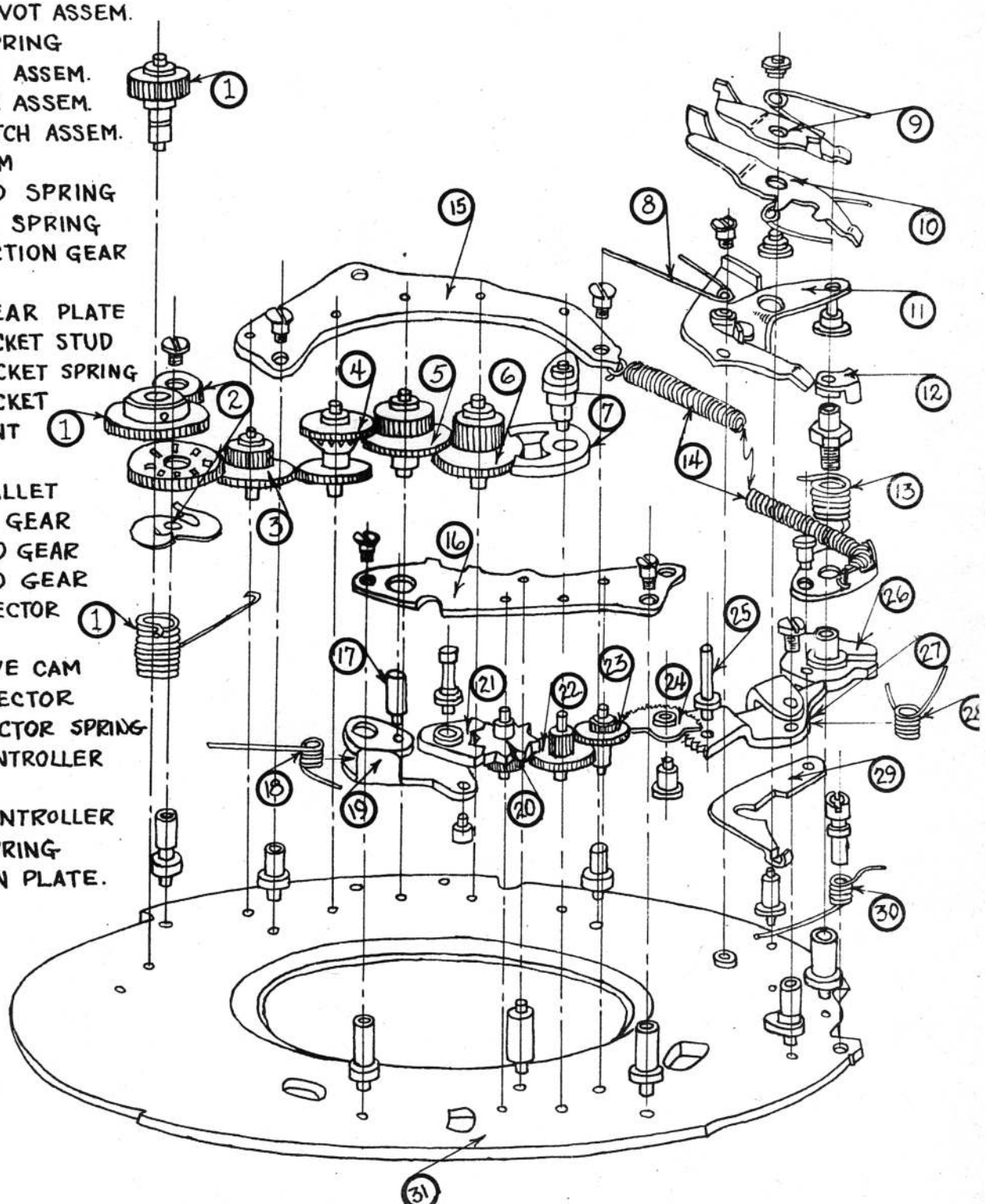
The lubrication of this unit is very important. DO NOT use any grease or oil on the gears or shutter blades. A small amount of grease may be used on the main drive cam and under the speed ring. If and when the shutter is to be lubricated, be sure that it is clean and dry. Then a small amount of graphite may be used on the blades and gears.

If the shutter is properly adjusted with no bindings, the trigger latch assembly should be checked for tripping with a weight of not more than three ounces. If it will trip from the weight of three ounces it should be nearly correct. However, the heavier the weight that it will support, the more energy will be required to trip the shutter by the solenoid.

1. #1 DELAYED ACTION GEAR & SPRING ASSEMBLY
2. CLUTCH
3. #3 DELAYED ACTION GEAR & PINION
4. #4 DELAYED ACTION GEAR & PINION
5. #5 DELAYED ACTION GEAR & PINION
6. #6 DELAYED ACTION GEAR & PINION
7. PALLET & PIVOT ASSEM.
8. TRIGGER SPRING
9. TIME LEVER ASSEM.
10. BULB LEVER ASSEM.
11. TRIGGER LATCH ASSEM.
12. SPRING CAM
13. HIGH SPEED SPRING
14. MAIN DRIVE SPRING
15. DELAYED ACTION GEAR PLATE.
16. RETARD GEAR PLATE
17. PALLET BRACKET STUD
18. PALLET BRACKET SPRING
19. PALLET BRACKET
20. ESCAPEMENT WHEEL
21. RETARD PALLET
22. #1 RETARD GEAR
23. #2 RETARD GEAR
24. #3 RETARD GEAR
25. RETARD SECTOR STUD.
26. MAIN DRIVE CAM
27. RETARD SECTOR
28. RETARD SECTOR SPRING
29. BLADE CONTROLLER LATCH.
30. BLADE CONTROLLER LATCH SPRING
31. MECHANISN PLATE.



SUPERMATIC SHUTTER #2