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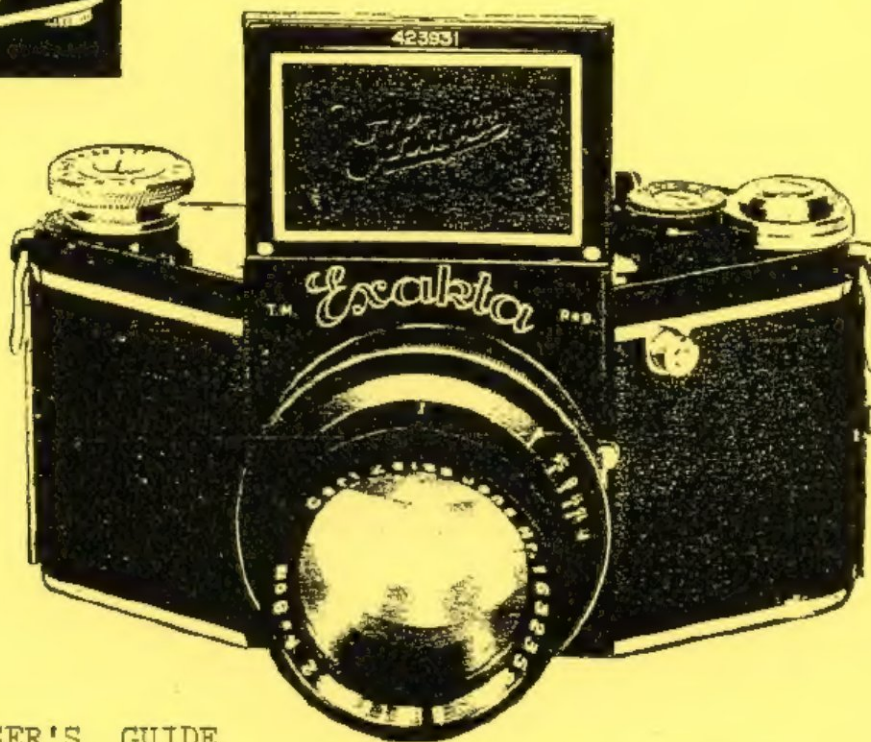
IHAGEE

EXAKTA

CAMERA REPAIR



COVERS 1933 VEST POCKET EXAKTA , KINE, VX
VXIIa, VXI 000, VX 500 TO RTL ...



REPAIR AND USER'S GUIDE

NIGHT EXAKTA

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PUBLISHERS OF TEXTS ON PHOTOGRAPHY & CAMERA REPAIR

ED ROMNEY'S EXAKTA REPAIR TEXT
Repair and User's Guide With Identification Guide for Collectors

Exakta was the first modern small single lens reflex. The 127 Roll-film "Vest Pocket Exakta" dates to 1933, the 35mm Kine Exakta was introduced in 1936 by the East German firm of Ihagee. The firm also made a variety of roll film and plate cameras of interesting design before World War II. There is considerable collector and user interest in Ihagee and Exakta. It is the most widely collected 35mm reflex, much in demand, with prices rising rapidly. There is a West German Exakta Real and Japanese cameras bearing the name Exakta made by Petri and others. These are not covered here since they are familiar to any repairman who knows modern cameras. The RTL Exakta which is really a Praktica with Exakta mount is covered briefly. Most people consider it inferior to the classic Exakta VX, or Varex as it is known overseas. Exakta production of the classic cameras continued into the 1960's. The last one, the VX500 lacked the delayed action and slow speeds. The VX1000 is really a fine camera. It is a classic Exakta with added modern features. It has an instant return mirror of unique design. The regular Exakta mirror mechanism opens it, then the closing curtain roller gear drives a linkage that pulls it instantly back down into place.

EXAKTA THE CLASSIC SLR

The conservatism in the Exakta VX1000 shows how little the designers wanted to change the original design. Indeed, all the cameras from the 1936 Exakta I to the VX1000 have the same basic configuration and many interchangeable parts. It is meaningful that the original design could easily accept Penta Prism, Auto-diaphragm, X synch, as they were invented. The original design is modern, indeed revolutionary for the 1930's-having lever wind, auto mirror cocking, auto film wind with optional intentional double exposures by winding the shutter separately. It has certain features specific to Exakta, double cartridges with film cutting knife built in as well as provision to use regular 35mm cartridges...the special Exakta bayonet mount later used on Topcon...left hand wind and release. Exakta is NOT a camera for left handed people since you must focus and set the other controls, aperture and shutter speed with your right hand. The 127 rollfilm ExAKTA is remarkably similar in appearance and just slightly bigger than the KINE 35mm Exakta. It is also lever wind, by planetary gears and red window instead of by sprocket.

2.

BRIEF EXAKTA IDENTIFICATION GUIDE..

The original Kine Exakta of 1936 was continued to 1946. It has waist level finder only, non removable with an eye level sports finder. It has two contacts for synch with focal plane bulbs only, the VACU-BLITZ holder is a rare accessory. The name on Pre-World War II cameras is spelled Exakta. Some later Exakta I's are spelled Exacta. The 1949 Exakta II has a "II" marking below the nameplate, may be spelled EXACTA, usually reads EXAKTA. It has a sheet metal cover for the focussing magnifier. The 1951 Exakta V is the first model with removable finder and focus screen permitting the modern pentaprism and interchangeable finder screens to be used. It has an additional X synch contact for strobe at 1/50 sec. This is a fairly rare camera (equivalent to Leica IIIf in rarity... not as rare as Exakta II). Exakta VX of 1952 followed the V. It is the most common Exakta. Its body is cast in one piece in a loop as Leica, not with a removeable plate around the film opening in back held by seven screws as in earlier cameras. This is an important distinction! VX parts will fit many of the later cameras. VX mechanical parts will fit many of the earlier cameras, but body is different. There is a lot of hand fitting in Exakta parts and slight differences between models. Often in service a camera has been fitted with a later part...thus true originality is hard to assure. There is lots of interesting research for Exakta collectors. VX Exaktas are called Varex if sold in Europe. Here the name is trade-marked to the Argus people for the shutter on the Argoflex. Several hundred thousand VX or Varex Exaktas were made. The 1954 Automatic VX adds a cover to protect the shutter release button. It was usually offered with auto diaphragm lenses. The earlier cameras accept the later auto lenses, too. VXIIa Exakta is considered by some experts the best made Exakta of all. It has a quieter slow speed shutter mechanism. It is the last Exakta (1958) to have the old time Exakta script nameplate. Some VXIIa cameras were fitted with modern block letter nameplate at Bronxville to help their sales. The VXIIb of 1963 has modern styling; the VX1000 has instant return mirror, and the VX500 is a low price camera equivalent to Leica II's-lacking the slow speed timer. Some people felt the VX1000 was a cheapened camera. Exakta expert S.Sherman believes people mistreated the cameras because they were low priced, blamed the cameras instead of themselves when they failed.

ESTIMATED EXAKTA PRODUCTION ...VP Model A 20 000, other VP 100,000, Kine 150,000, Exakta II 7000, Exakta V 40,000, VX and later plentiful...

EXAKTA 500 is a different camera, like EXA, not covered here. The 127 rollfilm VP Exakta Junior, prewar, scarce, has front-element focus non-interchangeable triplet lens, lacks slow speed device... 1/500 sec F4.5

VEST POCKET EXAKTAS use 127 film...I have owned four of them and repaired several more. I believe they are some of the finest SLR cameras ever produced. Focus mount is built into the body and the interchangeable lenses screw in with the same 37mm thread as the Exakta extension tubes for the 35mm camera. There is a cute 55mm Zeiss F8 WA which is a 2x scaled up version of the Contax WA. You sometimes see an English F6.5 Dallmeyer WA 60mm. Normal lens is a 75mm F3.5 Exaktar, Tessar or Xenar. You also find 75mm F2.8 Zeiss Tessar and 70mm F3.5 Tessar. Much publicity is now given by collectors to the "Night Exakta" which has 80mm F1.9 Biotar or Dallmeyer, Meyer or Xenon lens. The only difference is a larger focus ring since the fast lens is so big you couldn't reach to focus otherwise. I believe Ihagee used surplus lenses from previous overproduction of roll film cameras in Europe. The 105mm F4.5 Exakta Ihagee tele is obviously off a 120 or 6 x 9 cm German plate camera. You find the 120, 135mm, 180mm and 250mm Zeiss Tele Tessars mounted in tubes to fit the VP Exakta. These are all F6.3 lenses, also found in shutters for press-view cameras and in barrel for Graflex-type German reflexes. The 150mm F5.5 Tele Megor of Hugo Meyer, also a Leica accessory lens, is popular on the VP Exakta. I liked mine. Most VP Exaktas today have ruined cloth curtains. You must make new ones. We show you how.

The first VP Exakta was black without slow speed timer. The later "B" Vest Pocket Exakta of 1935 has slow speeds and delayed action mechanism identical to the one on the Kine Exakta. Some B Exaktas are plated instead of black. The C Exakta VP has an accessory plate back with a spacer you remove from around the lens to focus with it. It is extremely rare. All the VP Exaktas give eye level reflex focus with an upside down image through an extra mirror. They lock the shutter release until lens is focussed forward. This feature may make you think the camera broken. Many parts interchange with 35mm Exaktas. Repair is similar. See picture of VP Exakta mechanism in picture section.

Highly collectible is the 120 prewar Exakta resembling the VP... and the Exakta 66, a postwar vertically styled 120 camera. They are too rare to obtain parts cameras for practice, thus I have no experience fixing them. S. Sherman reports the Exakta 66 is a fine camera.

KINE EXAKTA LENSES AND ACCESSORIES were made by Ihagee, Schacht, Zeiss, Isco, Schneider, Meyer, Angenieux and other firms. The Magnear focussing attachment, a waist level finder taking a bayonet mount 50mm lens for VIEWING...very clear...is a favorite of careful workers.

Illustration from early Ihagee literature shows 1936 Vest Pocket Exakta B with most of its accessory lenses in a line. See 55mm F8 WA, 75mm F2.8 Tessar, 105mm F4.5 Ihagee tele, 120mm F6.3 Tele Tessar, 150mm F5.5 Tele Megor, 180mm and 250mm Tele-Tessars F6.3



NUMEROUS INTERCHANGEABLE LENSES

make the Exakta camera a really universal instrument for portrait work, landscapes, street scenes, etc. For Telephoto and wide-angle purposes special lenses are available. There is no sphere

in which its numerous advantages cannot be utilised. For night and stage photography the Exakta can be equipped with a lens of large aperture up to F/1.9. The lenses can be interchanged even whilst the camera is loaded and the mirror-
reflected image of every lens can exactly be controlled in its original size, free from parallax, on the ground glass screen.

The 1933
VP 127
Exakta A
(ORIGINAL EXAKTA!) ✓



early Exakta lenses very rare...

5.

Using the Exakta , faults, defects.... Many customers think the camera is broken when they are not working it correctly. Models before VX lock when finder is closed, will not snap. VP locks unless lens is racked forward. VX will not rewind unless you press in center of rewind button which is on bottom of camera. Some auto diaphragm lenses have to be cocked to open after each shot. If you make a long exposure and do not continue to press on the shutter release on late auto-diaphragm lenses, the lens will open full aperture. Shutter can only be set after it is wound and you must lift knob to set. There is no 1/15 sec. Few people can work slow speeds-often think they are broken. SLOW SPEED TIMER is also a self timer. You must wind it each time. It works by blocking the camera open when shutter is set to bulb. It will not work unless wound and shutter is set to bulb, or time. The black figures are slow speeds. The red figures are self-timer speed times. After you have cocked both timers by winding the shutter and turning the slow speed knob as far clockwise as possible, lift up the ring and set it next to the black figure you want for up to 12 sec. timed. If you put the mark on the ring next to a red figure you get slow speed-plus-up to twelve sec delay. If you change the high speed knob to a high speed you then get that speed (like 1/125), after self timed delay. Remember in conclusion to wind both timers, set high speed knob to bulb and use black figures for a good slow speed. The 1/8 sec or 1/10 sec is quite accurate and much more reliable than smaller slow speed timers on recent cameras.

There is considerable interest in Schacht and Examat meter prisms for the Exakta. Experts believe the Schacht better built. It meters stopped down and it is not coupled, but since you seldom change shutter speed for the careful scientific photography the Exakta is renowned for...it is no problem. Poor battery contacts are the usual problem in meters. There are no absolute standards of comparison of meters in SLR cameras. No two modern SLR cameras will read the same on the same scene. You test meters by comparing with a known accurate hand held meter at various light levels. Movements are beyond home repair.

GETTING STARTED IN CAMERA REPAIR...If you are an absolute beginner at working on cameras you may need to read our popular TRADE SECRETS, BASIC TRAINING IN CAMERA REPAIR. The work is not really difficult. Model trains, airplanes, gunsmith work, auto tune-up, radio-tv or stereo are similar in the skills you need. It does take patience but that patience pays off when you are able to do a hundred dollar repair in an evening. There is pleasure and status and being able to keep on using the EXAKTA precision 35mm cameras at low cost, cameras that it would be impossible to keep running without special skills. You can make a good part-time living buying up Exakta cameras that do not work and fixing them up for resale to the many Exakta collectors and enthusiasts all over the country. Read my TRADE SECRETS OF PHOTO DEALERS TO LEARN HOW TO SELL CAMERAS YOU FIX FOR BIG PROFIT.....

6.

In these texts, we take the position that it is best to remove as few parts as possible in repair. Any mechanism taken fully to pieces will never fit quite as well again. Much of the work involves cleaning, adjustment, lubrication. You seldom need parts.

GET YOURSELF AND EXAKTA JUNKYARD... If an EXAKTA is dropped, often the body is cracked near the back opening. Bodies may be cracked in other places. These cameras are not practical to repair but they contain many good parts. Buy them for \$10 or so. Brooklyn Camera Exchange, 549 E 26th St Brooklyn NY 11210 often sells Exaktas for parts at low prices. SEYMOURS at 350 31st NYC 10001 has sold Exaktas for years. Mr. Seymour is highly regarded among Exakta enthusiasts. They sell used cameras and junk bodies as well as many rare lenses and accessories. Another importer is Exakta Camera Co. 705 Bronx River Rd Bronxville NY 10708, Jules Swerdlin. It is best to phone these people, mention this text.

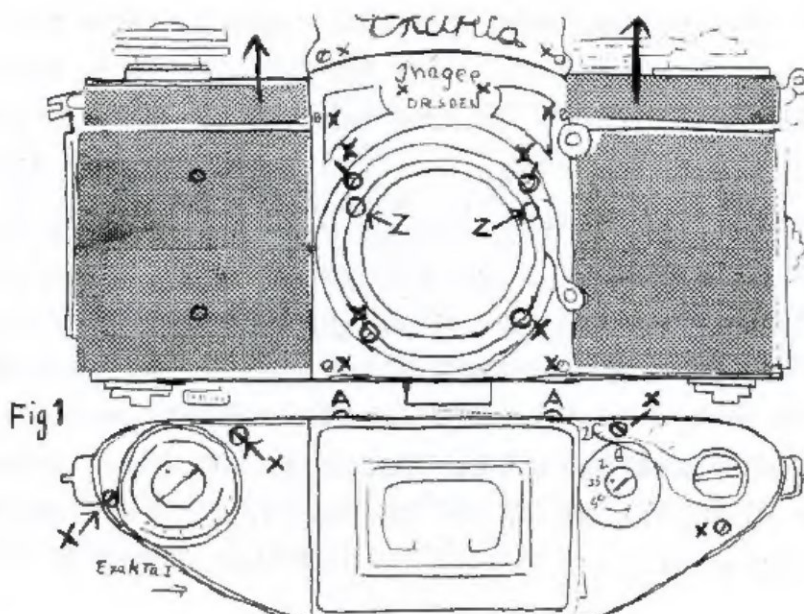
You need few tools. Many you already have. Keep them sharp. Replace worn screwdrivers rapidly. Beginners are known.... to damage cameras cosmetically by slipping with a screwdriver ... Buy your jewelers tools at the lowest price from a jewelers supply house in your city or nearby big city, or starting Spring 1981 .. from ROMNEY..).. or.. from Brookstone Corp, Peterborough, NH 03458. Try Edmunds, 300 Edscorp Bld Barrington NJ for lens spanners, mirror materials, epoxies, lens cement and small tools....screws, etc. National Camera, the repair school also sells parts and tools. Tools to get include, jewelers screwdrivers, pins and drifts, pin vise, little drill bits, jewelers files, a file to put slots in screws, tweezers of straight and curved shapes, magnetic and anti-magnetic, needle nose pliers, maybe an electric drill and grinder to make parts. You can turn out pins from a nail with the usual quarter inch drill, use it like a lathe. It's easy.

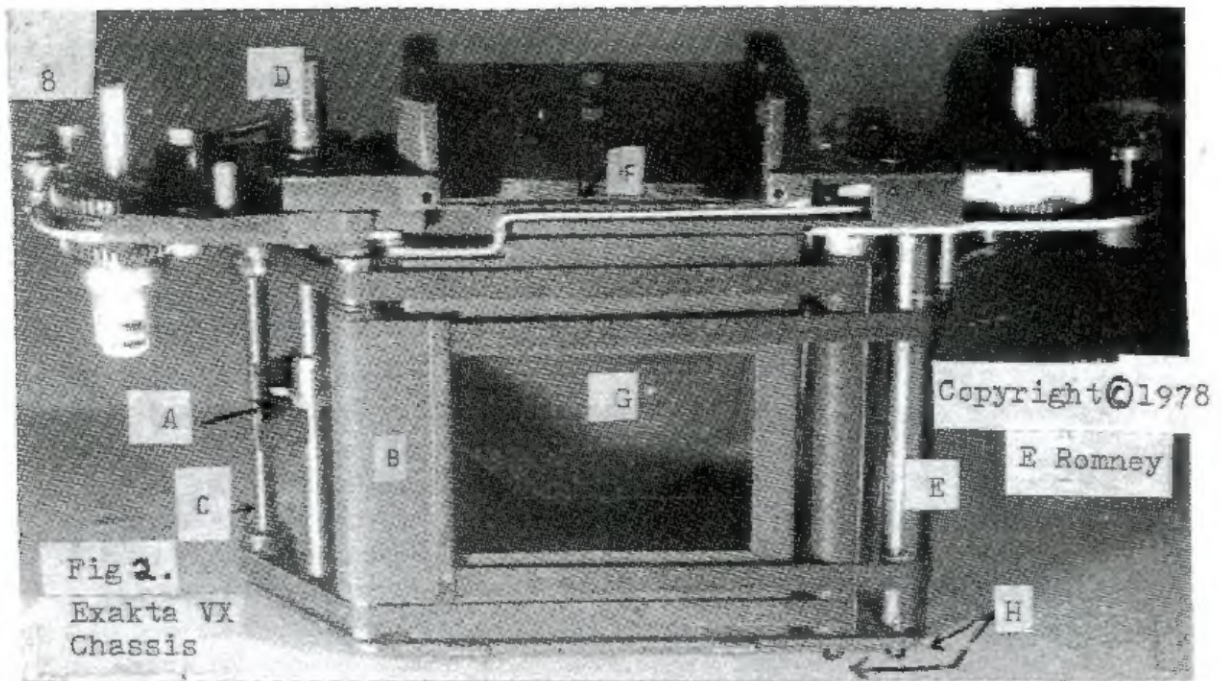
- SOME OF THE MOST FREQUENT EXAKTA REPAIRS ARE THE EASIEST...The Exakta body is a shell fitted around the camera chassis. You take off the knobs, lens mount, screws inside the film chamber and right and left chrome top plates AND THE CHASSIS LIFTS UP OUT OF THE BODY. SHELL. (We show how in detail with pictures later.) The point is...a running chassis in a camera with cracked body may be put into a body shell from a camera mechanically defective...You need know little of camera repair to restore EXAKTAS by switching parts. It is like an engine swap in an automobile.

First take off the lens. Now remove four screws that hold the lens flange and lift it off. Now remove the screws marked Z beneath the lens flange and all the other screws marked X you see on the front sheet metal panel. In the original Kine Exakta, the screws in center top of the panel are not there. In the VP, the screws are in the ring around the focus mount and in VX1000, the bottom screws as well as the screws near where it says "Ihagee" are not there. VX1000 is easier to strip. Now lift off the front trim plate of light sheet metal. Now remove all the screws you see beneath it. Go slowly and remember what went to which place. Have another camera to follow as well as the one you are repairing, in case you forget.

NOW TURN THE CAMERA AROUND TO THE BACK AND UNSCREW THE SCREWS MARKED "A" YOU SEE IN THE TOP BACK..as shown in drawing of the top. In early cameras before VX, you remove the screws that hold the panel around the film gate (the opening where the picture is taken). Cock the shutter and the slow speed timer. Unscrew the screw in center of speed set dial, screws in center of wind lever and slow speed timer. Now lift off slow speed dial, speed setting dial and spring, and take tweezers and stick them in the two tiny holes in ring around wind lever shaft. Unscrew this ring. Unscrew with similar tweezers or two point tool the ring around slow speed timer shaft. Lift it off. You will see some interesting cams and holes beneath that control the slow speed timer.

OPEN EXAKTA BACK...remove sprocket and sprocket gears and all screws in THE FILM CHAMBERS...(not shown in this drawing.) Unscrew the chrome screws in the two bright sheet metal sides, left and right, I have marked X. The prism will be removed, of course. Take these plates off. Probably the spring that holds the wind lever a big clock mainspring type thing.... probably it will spring loose. Lift off the counter, ratchet assembly. There are little ratchets and springs that will fly out to positions where they don't belong, and you will have to put them back in place to get the camera together again. If the ratchets or pawls are chewed up, or the binding post for the spring is pulled loose, you know instantly why your camera will not work. With all these parts off, shutter cocked and mirror down, the whole inside chassis will lift right up out of the camera in the direction of the arrows in the drawing below...It's fairly easy !

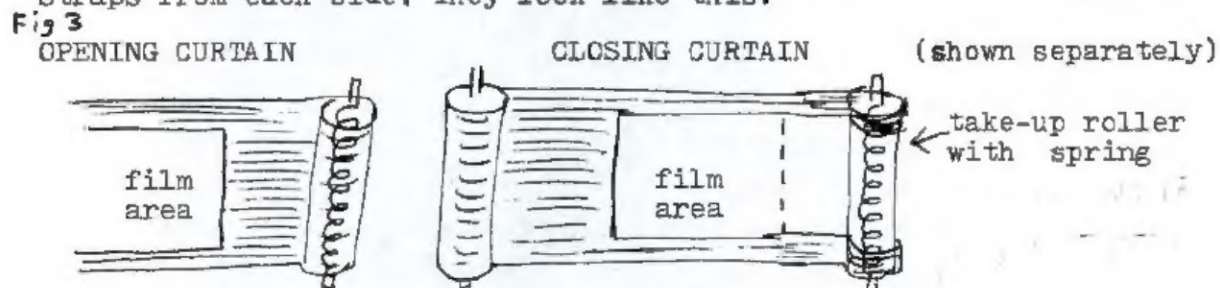




NOW...HOLDING THE CHASSIS IN YOUR HAND..put back the speed set knob and you will be able to operate the shutter. Exakta is much easier than late cameras because you do not have to peel any leather to get at screws AND you do not have to unsolder any wires going to synch contacts or meter. You will see the entire focal plane shutter. It is easy to replace it, or repair a broken strap since it is all out in the open.

LOOK AT THE PICTURE ABOVE...A is a prong on shaft D which turns around and winds the mirror when you wind the shutter. Shaft D has two gears you cannot see. One winds the shaft C with two rollers for the curtain straps. The other winds B the closing curtain on to the roller near B. The curtains are pulled by springs inside rollers at E...one spring for each roller. See the diagram and later pictures in the text. E is on the roller of the closing or second curtain. To the left of E is the opening or first curtain. The camera is a BULB or B in this picture. The opening curtain is wound up on its roller and the closing curtain is ready to begin its travel. F is the long rod that works the slow speeds from the slow speed timer. At G, we see the mirror which normally would be up, but I have pulled it down by hand for this picture. You see up at the back top the two screw holes for the screws in the back you have to remove to lift this chassis out of the body shell. H POINTS TO CURTAIN TENSION ADJUSTERS !

HOW THE EXAKTA WORKS... It is a two curtain shutter. The first or opening curtain covers the film BEFORE the shutter is snapped. The SECOND or CLOSING CURTAIN covers the film after the shutter has been snapped. They run on separate rollers and pulleys and are pulled by straps from each side. They look like this:



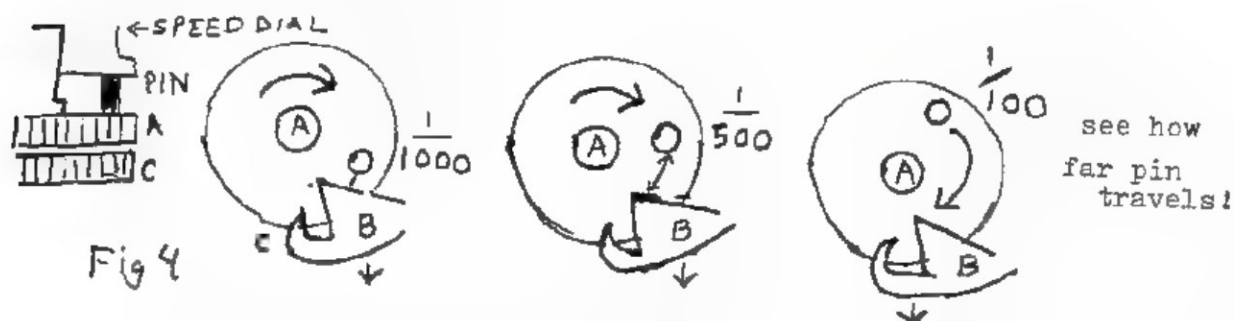
moves this way during exposure----->

SPRINGS INSIDE THE TWO TAKE UP ROLLERS PULL THE CURTAINS...No matter what shutter speed is used the curtains travel at the same speed !

This is a little known fact important to remember. There is no more wear on a focal plane shutter fired at $1/1000$ sec than at $1/25$ sec. The difference in speeds is obtained by changing the width of the slit ONLY! A very narrow slit gives a high speed, a wide slit a slow speed. At high speeds the different parts of the film are exposed SUCCESSIVELY as the film is lit by the moving slit. Actually the speed of the Exakta curtain is about $1/50$ sec to travel 36mm so to get $1/1000$ sec, the slit must be a little less than 2mm wide. So you see how you get $1/1000$ without any strain. READ THIS OVER AGAIN! Math is that shutter speed is inversely proportional to slit width directly proportional to travel time. Changing either will change the shutter speed.

THE TWO CURTAINS WIND TOGETHER SO NO LIGHT CAN GET THROUGH. They are released separately, the second curtain after the first, a timed distance apart. After they are released, there is no connection between them. Each is pulled by its own separate spring inside its own separate take-up roller. So you see, if one spring were much stronger than the other, the slit could not stay the same throughout the curtain travel. One roller would overtake the other and the slit would get narrower if the closing curtain spring were stronger. If the opening curtain spring were stronger the slit would get wider as the curtain travelled across the aperture. It is only the delicate balance of the tension of these two springs that keeps the slit the same width giving an even exposure all along. Each spring may be adjusted separately by screws in the bottom of the Exakta. See picture section.

YOU GET SLITS OF DIFFERENT WIDTHS FOR SPEEDS OF $1/25$ sec to $1/1000$ in the Exakta by means of a pin-hole type of timer. It releases the second curtain a timed distance after the first curtain. In later cameras you may know, clockwork timers are employed at the higher speeds. In Exakta the only clockwork is at $1/10$ sec and slower. The EXAKTA gets all the higher speeds, $1/25$ to $1/1000$ by adjusting the width of the slit. Look at the picture on the next page which shows the left side of the camera which has shutter speed knob removed. The knob has a pin in it which can fit into any of the holes you see in the big gear A. Note that only the top gear has holes and it controls or releases the opening curtain when you trip the release. This gear turns counterclockwise to wind and clockwise when taking a picture. Look at the little drawings below. If the pin is in the $1/1000$ sec hole see what a tiny distance it goes before it hits B which releases the bottom gear. At $1/500$ sec, it travels farther and at slow speeds like $1/100$ sec it travels a long distance so there is a lot of time between the release of the first curtain and the release of the second curtain...a WIDE SLIT...READ THIS AGAIN...



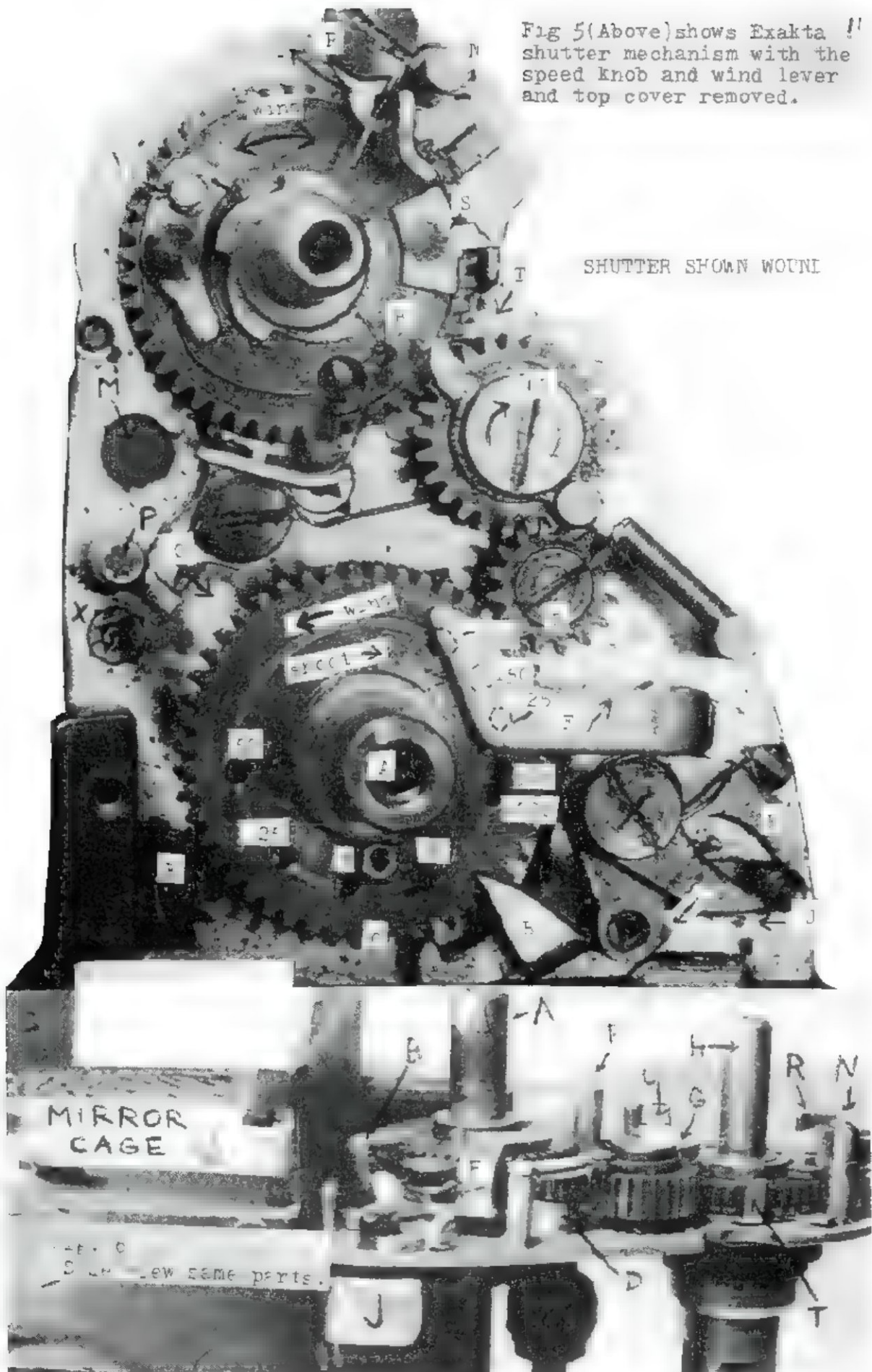
EXAKTA SHUTTER DIAGRAM

NOTE : $1/50$ and $1/25$ sec not shown.

Note that Gear A on top drives D (which does not touch the gear C beneath). Gear C which you see in the drawing drives E when it is released by the claw part of B. B and F are on the same big screw pivot where I put an X. When the shutter is wound, F is pushed out like the small arrow! B is pushed UP so the pin when it comes round can push it DOWN. Gear C, the bottom one of the stack, turns E which releases the closing curtain...pays it out. Power to pull both curtains is provided by the springs in the two take up rollers. Let me sum up.. We have two gears stacked like coins. By lifting and setting the shutter dial, we put the pin in one of the holes of the top gear. When the shutter is tripped, it turns around as the first curtain opens and the pin strikes arm B that releases the bottom gear in the stack which releases the closing curtain.

Fig 5(Above) shows Exakta !!
shutter mechanism with the
speed knob and wind lever
and top cover removed.

SHUTTER SHOWN WORKING



Now here is something very interesting about Exakta which few people understand. When the shutter is released and D is turning counterclockwise, G turns clockwise and H, a gear in a stack under the wind level...H turns counterclockwise. All these gears turning put a drag on the first curtain, so the first curtain spring has to have a lot more tension than the second curtain. Any friction or binding in these parts will slow the first curtain so the picture will be weak or dark or cut off in the right side of the frame (looking at the camera from the back.) Snap it and look through it and see if that is what is happening... Second problem..if the Exakta is overlubricated the first curtain can travel too fast giving uneven exposure with too much negative density at the right side of the picture.

Note also that wear in B or in the Pin or a bent pin will give inaccurate exposures. All these problems are worst at high speeds may not show at all at 1/100 sec.

EXAKTA COMPARED TO SCREW MOUNT LEICA...Exakta drives the curtains with a step-up gear which can wear. Leica has both curtains on a big drum, direct drive to the pin-hole timer. Its arm, equivalent to B in Exakta, has adjustments for slit width. In Exakta you must recement the curtain or file . BUT Exakta slow speed timer and mechanism in general is better protected from film chips, easier to clean. It wears faster but there are plenty of junk parts.

THE 1/50 and 1/25 sec SPEEDS are worked with the holes at left on the picture on Page 11. Obviously, they cannot trip B since they are past it. For 1/25 sec, the pin goes all the way around in a circle until it pushes F out. F has a little catch under it that releases the bottom wheel with the second curtain. The same thing happens at 1/50 sec but the gear doesn't turn as far. You should get a little over full frame at 1/50 sec, a speed that will X synch. A good way to test an Exakta is to see if you get full frame at 1/50 sec. The VX1000 is similar in construction but with modern 1/30 , 60, 125, 250...speed sequence. The Vest Pocket Exakta is similar except for the wind which puts no drag on first curtain spring.

BULB AND TIME... At TIME ,the pin goes completely around and past F about to where 1/500 hole is in pix. Tripping shutter again moves

moves B up and F to Right and the foot under F releases the bottom gear in the stack AND the closing curtain. This foot does not bear on the bottom gear; but on a notch in the rotating part above it. In TIME position both TIME catch, the foot of F, and BULB catch the claw of B are holding bottom gear from turning. In BULB position the pin is in BULB, B hole and claw at C is the only thing holding second gear from turning after first gear turns around. Foot of F is not in line with its slot in bottom gear. So, the moment you release pressure on the shutter button J, when you let go, K moves Right and its other end B moves down releasing the second curtain. Look at the picture Fig 6 to see some of these parts in side view. B is sometimes called a BULB lever...and F is sometimes called a TIME lever. It is correct to say that the Time lever also makes the lowest speeds and that the Bulb lever and its prong make the speeds of 1/100 sec and faster. Speeds below 1/25 sec are made by the slow speed timer in the other side of the Exakta.

This stack of gears is made of fairly soft brass. They can wear. The slots that the feet of the release levers fit into...they can wear too. If your Exakta shutter speed dial moves a bit when you release the shutter the second time for TIME, the camera is worn. Best cure is new parts off a little-used camera. If you remove the pivot screw marked X in Fig 5, you can lift off these gears. Look at the picture to remember placement of the little spring that holds both catches. If it breaks, the camera will fail. This often happens. Buy it for \$10 for yourself if the owner doesn't appreciate EXAKTA.

There is an interesting freewheel thing between the two stacked gears so they wind together and release separately. If it gets sticky-greasy, it may jam the camera. Clean with cleaning fluid, ether or benzine. Be careful of fumes and fire!

LET US NOW STUDY THE WIND...You will need Fig 5 and Fig 6. Gear H is really two gears. Its center and the gear UNDER it is turned by the wind lever. Gear H itself is turned by an arm on the counter wind drum with the big spring in it. The stud is forced IN so it pushes one of five catches in center of Gear H. Gear H winds the shutter. The distance to wind the shutter is just enough to wind the sprocket one frame or 8 sprocket holes. The sprocket is driven by a gear at M (which I removed). It is an idler that drives the sprocket gear beneath which is on the shaft marked by K. If the L ratchet thing

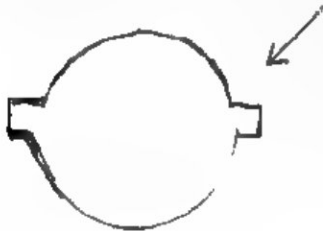
gets dirty or worn, the spring thing around the wind crank can wind up so tight it breaks or pulls Post N right out by the roots. It is merely staked in place. I epoxy them back if they are broken on cameras I own. This is a common Exakta failure.

The gear beneath H works the ratchet at O so the wind cannot turn backward when the lever returns. For rewind, the rewind button which fits over Pin P...the rewind button pushes O in the direction of the arrow so the film can be rewound. At R we see the support for the ratchet for the counter. It always slips out like this when you take it apart. Push it back in direction of arrow when you put the counter back on. At S, we see ratchet for the wind lever. It has teeth for about three fourths of its travel but then it runs out of teeth so it can spring back. If these teeth and ratchets wear or the springs get weak, the camera will jam. Repair is easy if you have a junk camera, or two, for parts. Cameras with bad shutter curtains often have good interior parts, metal parts.

THE EXAKTA MIRROR is wound by the shaft the shutter wind and top gear runs on. It works a kicker that kicks a lever that slaps the mirror down. In the VX1000 after the film is exposed the closing curtain roller over on the other side of the camera, it works a little gear in the bottom that cranks the mirror back down again so you get instant mirror return...very fine system!!!

Wind spool is hitched to a socket with a sheet metal plug in it you take out to turn a screw to adjust tension on this spool. If it does not slip enough, it will tear film, common failure. People with access to chrome plating should try plating the soft brass parts to increase size if worn..and increase durability.

COMMON QUICK EXAKTA REPAIRS YOU CAN DO WITH NO MORE THEORETICAL INFORMATION....Replace the mirror! Pull it down, bend out the tabs that hold the glass in place and remove it through the slots cut in the mirror box...just so it can be removed..They look like this:



Now cut a new mirror of front surface glass you get from Edmunds and cement in place with epoxy. Bend the tabs back if you can, if not, epoxy will hold. I've found epoxy used in cameras as expensive as Linhof, would prefer to repair an original part with epoxy than use a non-original part.

ADJUST THE MIRROR...an older camera may have a different focus on the finder than on the film because the mirror release is worn. Most VP Exaktas are worn here. Epoxy on a brass or aluminum shim. Put camera back in body, install lens flange and check that ground glass image is sharp all over the field at infinity. You can put a ground glass or an extra finder screen in the back and view the film image with a magnifier to be sure it is sharp at infinity, too. I suggest a 10x Hastings triplet from Edmunds. Use it to examine worn parts, too. It takes a good light to work on cameras. I suggest a fluorescent light. Not all finders have the same focus...better check them, file to fit.

CLEAN SYNCH CONTACTS...Use eraser or file. Bend them so they are closed when the shutter is fully open for X synch. FP synch contacts close when the mirror goes up. See picture section.
Warning... DO NOT REMOVE SHEET METAL BOTTOM PLATE THAT COVERS THE ENTIRE MIRROR BOX AND HOLDS THE CURTAIN ROLLERS....

HOW THE SELF TIMER WORKS.... Look at the picture plate of the entire top of the camera. The self timer is worked by Lever A being moved up by lever C which works on a curved cam beneath it that I have removed. A moves up blocking lever B which is connected to the mirror so the mirror cannot rise. After the 12 sec. have passed and the cam comes to the dip in it Lever A moves back down and B allows the mirror to rise. Note...Shutter release on Exakta cannot work until mirror rises and releases a second catch to the opening curtain gear. That catch is under the chassis. You see it with the camera upside down. Leica has two shutter release catches for safety, also. So you get self timing by holding up mirror rise....

THE SLOW SPEED TIMER IS WORKED BY A LONG ROD AT D which goes across the entire back of the camera. You can also see it in F in Fig 2
When that rod is allowed to move in the direction of the arrow after the shutter slow speed timer is wound and the shutter set to Bulb... then...a little catch under the shutter release blocks it open after it has been released ...until...the rod D moves back in the direction of the self timer.

THE SLOW SPEED AND SELF TIMER CLOCKWORK IS UNDER THIS PANEL, RUGGED SPRINGS AND GEARS...SELDOM GIVE TROUBLE...You see all the little holes the dial pin fits in for the different speeds. If the rod is bent

10
or jammed, the self timer can work all the time, jamming the camera. It should be pointed out that the long lever holds up the closing of the second curtain. The short lever holds up the mirror. The cam I removed from the slow speed timer looks like this..
Put it back with the pin of the knob in the notch...



Adjust for a good 1/10 by bending rod end near D.
THE EXAKTA EXPOSURE COUNTER...in VP VEST POCKET
is red window. After the shutter is wound the wind to the shutter slips but the film keeps on winding. If people forget the red window, they get overlapping exposures, common new VP Exakta owners. In KINE EXAKTA, the counter is a gear around the wind lever socket that is pushed ahead each time the wind lever slams it against a stop. In VX and later, the wind appears to have a window for the counter. Actually the counter is still a wheel but there is a little gear to reset it part of the top housing. Back in Fig 5 on Page 11...see how when the wind lever goes all the way, S hits T which is part of a disk under the gear set H. U which is over to the other side is also part of T and is forced left and its arm pushes the counter ahead one notch. In the VX1000 the counter works the same way but is subtractive. It counts off the exposures REMAINING...

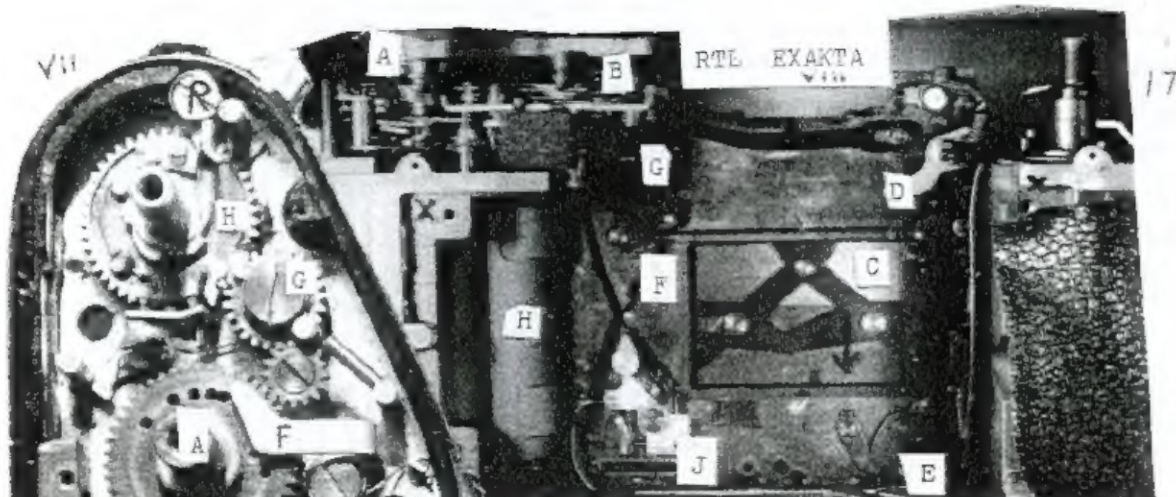
VEST POCKET EXAKTA SHUTTER MECHANISM IS SHOWN IN MIDDLE

PICTURE PAGE 17. A is set of shutter gears just as the gears in Kine or VX. B is release. At C, we see a large rugged chassis that holds both curtain gears. They are right together instead of 180 degrees apart as in VX and Kine. D gives a very clear view of the mirror wind. The kicker comes around when shutter is wound and pushes a rocker that winds mirror. E points to the two gears that wind the shutter from the roll film wind. They are on a chassis you see at F and only when lever is pushed to wind, do they swing around to wind A. A large wind gear above F, I removed so you could take a good look at the mechanism. It is a fine high quality mechanism!

REPLACING EXAKTA CURTAINS...Buy focal plane shutter cloth and tape from the National Camera people at 2000 W. Union, Englewood Col. If anyone knows another source PLEASE let us know. Do not remove the curtain rollers or you will have to fit the curtains trial and error, a slow job. Cut new curtains and straps slightly longer than needed including part glued on. Burn the old curtains to get off the brass strapping at the edges to use over. Or make new brass edges with shim stock from auto supply places. I order from JC Whitney, the mail order auto supply place in Chicago. .

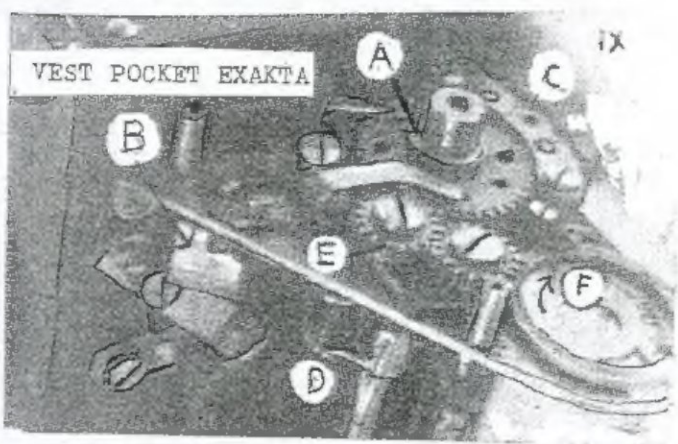
Clean up cement on curtain shafts before installing new curtains. Install new ones with shutter released so that the curtains just touch at the leading edges of the brass at the middle of the opening curtain roller take up. That position is marked H in the picture of the entire camera next page. Also H has arrows pointing to the two ends of the take up roller spring shafts. They have a cotter pin stuck through them you have to take off to adjust tension. You usually have to remove the coil spring going to the slow speed timer linkage first. In this VX you can adjust the curtains tension by turning the tops which are slotted. The cotter pins are held by a screw J. In the Vest Pocket and Kine versions, you must adjust tension from the bottom. (See K in Fig 2.) The top is held by a cotter pin that slides out. VX1000 is similar to the VX shown.

I suggest use of Scotch Super Strength adhesive for cementing the curtains. Be sure the edges are parallel, the slit same width top and bottom or exposure may be uneven. You can adjust slit length by changing length of straps. If your cloth is thinner than original, you may have to shim the rollers that pay out the curtain to increase their diameter.

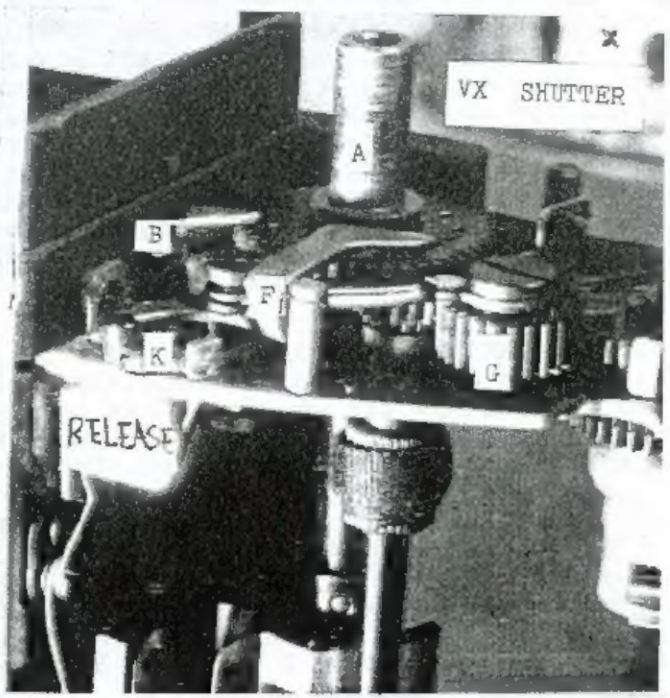


shutter shown released..

TOP VIEW
EXAKTA VX



VEST POCKET EXAKTA



VX SHUTTER

RELEASE

EXAKTA LENSES...have more reliable auto diaphragms than most recent Japanese lenses. Pressing the release on the usual Biotar releases a trigger so the diaphragm snaps closed. Parts are big and rugged. If diaphragm sticks try a bit of lighter fluid in it. If lens is loose in bayonet mount, you can spread the flanges of the mount with a screwdriver working carefully not to slip and scratch the finish.

LENSES, CONTINUED... It would be impossible to describe the assembly of all the many Exakta lenses. You take a lens apart by turning rings that hold it in place counterclockwise. Stick blades of scissors, dividers, or a two-point spanner into slots and turn. In some lenses, you may have to drill two holes, insert two pointed tool and turn. When repaired, fill in holes. You can even drill a hole in a block of hardwood same size as lens barrel, cut block in two, and put it around the lens, tighten with bolts of vise grips and pull. If lens is cemented in place, acetone will loosen threads. It is best to only work on a single type of lens and have spare parts around. Lighter fluid will often loosen stiff focussing mounts. Soap is said to tighten them. Lenses focus by means of a helix which is several parallel threads so the thread will turn further in a single turn. If you get the lens threaded back together wrong, it will not come to infinity. Then you have a long trial and error job getting it right. The backs of a large number of recent Zeiss and Aus Jena Exakta lenses are similar so if your diaphragm is bad on a very expensive lens like the 20 Flektogon, you can get parts from a Pancolar. Likewise many lens elements are the same for Praktica, Praktina and Exakta so you can interchange good elements into a damaged Exakta lens. The test is...does it work and does it look original. An infinity test taking pictures is more accurate than most repairmen's collimeters so if the lens is cheap, be brave..you have lots to learn and little to lose. A tenth of a millimeter seems small and very scientific but it equals out to almost a quarter turn on the usual small screw on a camera or lens.

PUTTING YOUR CLASSIC EXAKTA TOGETHER... Here are a few points where beginners may get confused. The rachets R and S have to be put back into place when you install the upper wind gears. Don't forget the release button which works J which simply lays inside the case. Don't forget light-tight cloth gaskets in various places in the different models. If, torn, cut new ones and glue them in. Works shutter a few times out of the case before you put the case back on. COCK it before you put it back in the case. Don't force a tiny screw with a big head by treating it as if it were a big screw. The head is big only for SUPPORT. If there are shims in the lens mount, get them all back exactly as removed. Make notes, little drawings to help you remember. Always proof a camera by taking a roll of film....

ADJUSTING SHUTTER SPEEDS is best done by shooting film and comparing density with a known accurate shutter in another camera. A TV set gives 15750 lines per sec so it can be used to test. For 1/100 sec you will have exactly 157½ lines. There is a gap and interlace so shoot several times. If you overlubricate the Exakta with modern silicone and moly, you'll have trouble getting the curtain travel even. It needs friction to work. Florescent lights and neon tubes give 120 flashes per sec..one for each positive and one of them for each negative pulse of the 60 cycle AC. Use this method for speeds of 1/60 sec and slower where the curtain is fully open. You may also have access at work or school to synchroscopes, strobotach or other motion study apparatus. I like the Bogen shutter tester.

THE RTL EXAKTA IS REALLY A PRAKTICA ADAPTED TO TAKE EXAKTA LENSES. You take it apart differently. Remove the top and the front comes out by peeling back leather and removing screws under the leather as shown in the picture. Shutter is a set of metal doors for the opening curtain that slide and a set of metal doors for the closing curtain that follow it. Springs pull them and only adjustment is slit width which is set by a clockwork timer which releases the closing shutter blades after the opening shutter blades to produce a slit. The shutter must open fully for 1/125 sec, the strobe synch speed. People seem to jam RTL Exaktas by pulling the wind out by the roots. The shaft on the wind simply breaks. You can test if the shutter is still OK by winding the camera by pushing the film sprocket and snapping it. It should snap OK. If these parts are broken maybe you can get good ones from a camera with some other trouble. If the metal shutter sticks, often ether will clean it. The timer works as a Leica M, Pentax or other newer camera and you bend a slit to set the high speed. You can snap your RTL with the front off by pulling forward a little lever shown in picture...which is worked by the mirror with the camera together. RTL's either work on they don't, Exakta experts tell me. They are extremely low priced broken. It is too soon to calculate their true quality or worth.

RTL EXAKTA INSIDES ARE PICTURED at top Right on Page 17.

Wind lever at A often has broken shaft. Timer is around it. X marks some of the screws you take out after peeling back leather to remove front. Front carries self timer. B shows the position of slot to set 1/125 sec on cam. Shutter has been fired in this picture and "curtain" (really sliding overlapping metal blades) shown is closing curtain at C. At D we see pivot and spring for arms to closing curtain. Spring is short stiff coil spring. At E we see similar mechanism for opening curtain blades. Direction of curtain travel to take a picture is DOWN. It is UP to wind. F IS THE CATCH or latch for opening curtain. Latch for closing curtain is near G. Their arms travel down the curved slots that cross. Just above G is a little arm that will set off the camera shutter is you pull it forward. It is worked by the mirror with the RTL together. Mechanism that winds the shutter and film metering sprocket is behind H. It is well lubricated. X synch is at J.

I really wish you success, enjoyment and profit in your Exakta repairs and restoration. They are fine cameras, real classics, sure to be appreciated more and more as time passes. They take pfine pictures, too. Join Exakta collectors groups, buy any camera you can get reasonably, study and research the interesting variations and the unusual history of the firm of Ihagee. We publish a large number of camera repair texts on all the best cameras as well as other books on photography and other subjects. For a full catalog send a self-addressed stamped envelope to this address, below.

ABOUT THE AUTHOR :

Ed Romney has written and published the only successful manuals on amateur camera repair. He has written many articles on photography and edited a book, THE NEW PICTORIALIST BULLETINS. His work has been mentioned in nearly every photographic magazine. He is regarded as the National expert on the Graflex camera by Kalton C. Lahue and Norb Nelson. He is an active worker in Bromcil, neo-classic car collector, holds ham radio and FCC First Phone licenses, as well as a Masters Degree from University of Conn. Romney directed adult and vocational education programs and taught college courses for many years and has been a studio



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