

May 3, 1929.

THE LUBRICATION OF NATIONAL
CASH REGISTERS.

When a film of oil or other lubricant can be kept between two working surfaces, wear will be reduced to a minimum, operation will be made much easier, and the length of service will be greatly increased.

Lubrication has been given a great deal of thought and study by the factory because of its importance in connection with the successful operation of our registers. The results of years of experience in building registers and the knowledge gained from many exhaustive tests for efficient lubrication have been put into charts. These charts are closely followed in constructing registers in the factory.

Copies of these charts are printed in this issue. They show that different lubricants must be used on different register parts. The information in these charts will serve as a guide to our servicemen when relubricating registers that have been overhauled and repaired. The charts show plainly why all work of this kind should be done by those who are thoroughly familiar with the work done by each register part.

The quality of lubrication is very important. National Cash Registers are being operated more times each day, and under severer conditions, than ever before. For this reason, their proper lubrication is of extreme importance. The user should understand that a register must be relubricated and cleaned at least once every two years if the best service is to be obtained from it.

In order to insure that our registers in the field are properly lubricated, we must insist on the use of the materials that we advise. Our experience in building registers and our factory tests have demonstrated fully that these materials are the only ones that can be relied upon.

LUBRICATION CHART COVERING
CLASS 900 REGISTERS.

Cash Registers, like any other kind of mechanical device, begin to wear as soon as they are put into use. Under ideal conditions and with the proper attention given to the lubrication of the wearing parts, the life of any machine may be prolonged. A certain amount of wear under the right conditions is good up to a certain period in the life of the mechanism.

LUBRICATION PROBLEMS GREATLY INCREASED.

With the increasing number of working parts placed in our machines, the problem of the proper kind of lubrication and the proper renewal of this lubrication become items of the utmost importance. The factory has given this matter a great deal of attention, for it recognizes that users of National Cash Registers cannot be entrusted with the task of renewing the lubrication of the different wearing parts of their machines. A careful study of the lubrication charts, which follow, will prove conclusively that it requires a mechanic with considerable cash register experience to properly lubricate registers in the field.

The ordinary user of a cash register is unfamiliar with the kind of material used in the construction of the different parts and he, therefore, has but little conception of the attention which should be given to the wearing of the different parts.

REGISTERS SHOULD BE RELUBRICATED EVERY TWO YEARS.

These lists were prepared only after a careful analysis of all the requirements of the different wearing surfaces and after thorough tests had been made in our laboratory. These tests show that our lubrication should be renewed every two years, and it is a part of your service work to offer customers in your territory the opportunity of having this attention given to their machines at the proper time. With these charts as a reference, you should have no difficulty in convincing any user of the importance of having his machine lubricated with the materials which our tests have proven to be the most satisfactory. Keep these charts conveniently at hand for reference:

CLASS 900 CHART.

KEY LATCH MECHANISMS.

Graphite

Bearings in side frame for transfer line.
Bearings in side frame for throw-out line.
Bearings in side frame for No. 3 lock line.
Bearings in side frame for gear line.
Bearings in side frame for release key line.
Intermediate motor gear stud.
Hubs on segments inside and outside.
Crank pitman studs.
Locking cams on bearing edge and actuating lug.
Working points on retaining bars.
Special counter operating lever in hubs and race cuts.
Stud in throw-out yoke and inside of yoke.
Raceway in indicator flash lever cams.
No. 3 drawer lock pitman crank stud.
Hub of flash trip-lever on inside motor stud.
Electric motor driving gear.
Finger shaft lever stud.
Connecting gears on side way.

Hub on ratchet cam when bell is used.
Crank arrester ratchet cam.
Bearing in lever bank for locking cam line.
Throw-out and key arrester straps.
All working parts on key arrester.
Check and slip key mechanism.

Champion Oil

Latch pawls.
Latch pawl stops.
Top studs on flash levers.
Segment plunger link bearings.
Throw-out lever bearings.

KEY OPERATING MECHANISMS.

Vaseline

Inside slots in bank for keys.
Slots in detents.
Race cut in detents for guide pins.
Key stops.

COUNTER REEL OPERATING MECHANISMS.

Graphite

Counter reel shaft in reel.
Transfer bar shaft (both ends and in notches).
Counter reel transfer cams in raceways.
Counter reel guide.
Counter reel guide operating lever cam.
Guide lever in hole of hub.
Counter reel shaft lock lever.
Stud for counter reel carrying pawl trip.
Bearing surface on platen and in slideway.
Toggle rolls and trip lever.
All bearing points on counter reel pitman.
Platen operating cam No. 5, inside and out.
Platen operating cam No. 6, on edge.
Counter reel transfer arm shaft pitman cam.
Key lock lever release pawl.
All roll studs and rolls.
Clutch release lever stud and cam.

Champion Oil

All reel counters, shafts, and stop pawls.
Transfer pawls.
No. 8 lock line bearings.
Flexible pawl on reel lock lever.
Switch operating pitman studs.
Switch lock lever stud.
Switch operating pitman restoring cam.
Roll and stud and working points of counter pitman.

Type segment lock lever cam.
All bearings of side lock lever No. 2.
Key lock lever cam bearing.
Kicker and key lock lever retaining pawl.
Projection on transfer line gear hub.
Locking cams.
Throw-out cams.
Key release lever cam on electric registers.
Toggle stud and rolls.
Counter turn back stop pawl.
Counter transfer cams.
Transfer bar roll and stud.
Type segment lock lever spring pin.
Key release lock lever screw.
Intermediate motor gear stud.
End of transfer line.
End of motor line.
End of reel counter throw-out line.
Motor line, cam and stud and motor line gears.
Counter reel operating tubes.
Hub of lever intermediate gear.

Champion Oil

Counter gears and transfer arm.
Counter transfer bar stud on counter transfer arm.
Counter turn back ratchet and pawl.
Bearings on type segment block line.
Multiple drawer gear line.
Pinch lever throw-out line.
Turn-to-zero lock lever.
All studs in key stop control lever.
Bearings on counter pinion line.
Bearings on key lock line.
Locking cam line.
Toggle connections.

SPECIAL COUNTER OPERATING MECHANISMS.

Vaseline

shaft and Bearing in frames for special counter operating line
counter reel segment shaft.
Stud and inside of hub on special counter operating arm.
Bearing on base for special counter shaft segment.
Bearing for locking cam line in counter reel operating key.
Bearing in frame for counter reel lock lever shaft.
Bearing edge of key lock trip lever connection No. 1 and
also on lever bank below index plates.
Lower screw hole in key lock trip lever.
All segment teeth.

Champion Oil

Both cushion plungers.

Coupling on key lock trip lever.
Links on operating key.
Special counters.
Special counter carrying pawls.
Stop pawl and special counter shaft at its bearings.

PRINTER MECHANISMS (PRINTERS NARROW).

Graphite

Upper and lower automatics, also studs on same.
Type wheel segment operating arms in raceway.
Bearing in side frames for segments.
Bearing in check printer frame for lever bank segment.
Type wheel segments.
Bearing in check printer and side frames for motor line.
Hub on gear and cams on motor line.
Lock lever frame stud and stud on lock lever.
Back cylinder sleeve and stud.
Lower impression roll stud and hole in frame for same.
Stud on lower impression roll stud crank.
Cam and lower impression roll.
Roll stud on lower impression roll pitman.
Lower impression roll eccentric.
Slot and lower impression roll pitman screw.
Raceway for impression block.
Bearing in frame cap and side frame for type wheel shaft.
Bearing points and hubs on type wheels.
Type wheel gears.
Lining pawl shaft and eccentric stud.
Lining pawl lock lever roll stud.
Studs for ink pad rack pitman.
Stud for ink pad arm and raceway in inter-gear.
Detail bracket stud.
Detail bracket operating arm and roll stud on same.
Slots on detail receiving roll, driving arm, and for same.
Detail receiving roll studs.
Detail impression roll studs.
Detail receiving roll.
Both ends of cylinder.
Cylinder cam.
Stud in cam that operates detail driving arm.

Champion Oil

Impression roll pitman line on bearing points.
Ink pad rack plungers.

RECEIPT PRINTING MECHANISMS AUTOGRAPHIC PRINTERS.

Graphite

Race way in printer carriage cam.
Operating handle stud.

Printer carriage lever roll stud.
Raceway for ribbon feed arm.
Operating lever for intermediate motor gear stud No. 3.
End of lever for printer carriage lever block.
Slideway for printer slide.
Slideway for carriage lever.
Bearing for impression roll line No. 3.
Bearing for cylinder cam No. 2.
Bearing for detail spacing lever.
Bearing for cylinder.
Bearing for impression roll stud B.
Impression roll lock lever stud.
Check printer cylinder sleeve stud.
Ribbon feed arm.
Check ejector stud.
Check impression operating lever eccentric stud.
Check impression operating lever roll stud.
Operating in check impression operating lever for the screw.
Impression roll line No. 3 for impression roll No. 1.
Check printer cylinder sleeve crank stud.
Check printer intermediate gear stud No. 5.
Impression platen stud.
Bearings for paper chute.
Raceway in check printer slide operating cam No. 3.
Bearing for impression roll stud B.
Slot for stud in impression roll E.
Raceway in cylinder cam No. 2 and boss on frame.
Raceway in detail driving arm cam.
Stud for detail receiving roll hub No. 3.
Detail driving arm No. 3.
Raceway in impression platen guide No. 2.
Eccentric on impression roll stud B.
Raceway in check ejector operating lever cam.
Check ejector cam lever roll stud.
Check ejector arm plate.
Bearing on studs for ribbon spool ratchet No. 1 and No. 2.
Bearing for check guide screw No. 2 and check guide lever
stud.
Bearing for check guide lever screw.
Impression roll adjusting plates for impression platen
guide stud.
Check ejector pitman stud.
Impression roll lock lever stud for cylinder cam stud.
Opening in impression roll lock lever for stud in impres-
sion roll crank.
Bearings for type wheels and gears.
Inside of On and Off knob.

Champion Oil

Detail spacing and retaining pawl studs.
Check ejector lever link stud.
Check ejector pawls.
Ribbon feed pawls.

RECEIPT PRINTER MECHANISMS
WIDE PRINTERS.

Graphite

Bearings for impression roll pitman line.
Bearings for type wheel segments.
Raceway in type wheel segment operating arm.
Sideway in automatic check lever upper and lower.
Bearings in lower automatic check lever for pitman line
crank stud.
Bearings in lining pawl lock lever.
Studs for roll in lining pawl lock lever.
Bearings in side frame for printer motor line.
Raceway in lining pawl lock lever cam.
Both holes in cylinder sleeve crank link.
Impression roll lock lever cam.
Bearings in impression roll lock lever for impression
roll crank stud.
Bearings in pitman line crank link for impression roll
shaft crank stud.
Raceway in detail impression cam.
Bearings in the cam.
Bearings in the cam shaft yoke link.
Bearings in the side frame for type wheel shaft.
Slideway in detail impression pitman.
Bearings in detail impression pitman.
Bearings in cam shaft bracket.
Raceway in cam shaft bracket.
Bearings in cam shaft gear.
Bearings in feed roll lifting cam No. 2.
Bearings in cam yoke.
Bearings in cam shaft bracket No. 1.
Raceway on slip feed cam No. 3 for feed segment operating
lever.
Bearings in lining pawl for shaft.
Bearings in lining pawl lever for adjusting stud.
Bearings in printer frame for feed roll arm line.
Bearings in feed segment operating lever for feed roll
arm line.
Bearings in feed segment for feed roll line.
Bearings in feed roll lever shaft bracket for feed roll
arm line.
Bearings in feed roll arm No. 2 for feed roll line.
Bearings in all ribbon and detail paper rolls.
Bearings in feed segment operating arm.
Bearings in printer frame for type wheels.
Consecutive number carrying pawl arm.
Bearings in printer frame for detail impression crank line.
Bearings in printer frame for printer motor line.
Bearings in frame for impression roll stud.
Bearings in printer frame for impression lever line.
Raceway in impression block cam.
Bearings in detail impression block.

Slideway in frame for detail impression block.
Bearings in consecutive number carrying pawl frame.
Bearings in printer frame for detail impression cam line.
Bearings in ribbon feed pawl lever.
Bearings in ribbon feed link.
Bearings in ribbon feed pitman.
Bearings in consecutive number lever.
Bearings in printer frame for detail spacing lever line.
Bearings in slip character.
Bearings in consecutive number carrying pawl frame.
Bearings in consecutive number turn back knob.

DRY GRAPHITE ON LEDGER NUMBERING
DEVICE TYPE WHEELS.

on ledger Bearings on type wheels, but use DRY GRAPHITE on bearings
number type wheels.
Bearings in knife lever hub.
Bearings in operating handle gear.
Bearings in operating handle auxiliary sleeve.
Bearings in operating handle.
Cylinder sleeve.
Bearings in cylinder No. 5.
Bearings in check impression roll.
Bearings in cylinder gear.
Bearings with bearings in printer frame cap.
Bearings in detail feed roll plate.
Bearings in detail receiving roll hub.
Bearings in detail receiving roll hub.
Bearings in type wheel shaft brace.
Bearings in feed roll No. 1.
Bearings in check retainer.
Bearings in detail cap.
Bearings in consecutive number turn back sleeve.
Bearings in consecutive number wheels.
Bearings in printer cap No. 5B.
Bearings in detail equalizing arm.
Bearings in retaining roll plate.
Bearings in ribbon roll ratchets.
Bearings in ribbon retaining pawl.
Raceway and bearings in check impression roll cam.
Raceway and bearings in knife lever cam.
Raceway and bearings in consecutive number cam.

INDICATOR OPERATING MECHANISMS.

Vaseline

All holes in frame for main lines.
Inside of hubs and gears on all indicators.
Top indicator operating segment and cam.
Bearings on top indicator brackets.
Flash arms.
Bearing in top of frames for back indicator driving lines.

Top indicator shaft.
Top indicator liner.
Top indicator flash arms.

METAL CABINET PARTS.

Graphite

Operating handle stud.
Spacing lever bracket and stud.
Stud on No. 8 lock.
Stud on No.1 lock.
Shoulder of screws in reel hood flash lever,
Stud in end of reel hood flash lever.
Key lock locking line lever stud in reel hood flash lever.
Shoulder of screws in special counter flash lever.
Shoulder of screw in shutter at end of special counter

hood.

Stud in special counter flash lever lock.
Detail supply roll stud.
Main counter slide.
Shoulder of screw in side counter lever.
Lower end of side counter lever.

Champion Oil

Check printer hood catch.
Motor hood catch,
Screws in driving arm and stop pawl on side counter and
reel hood counter.

DRAWER OPERATING MECHANISMS.

Graphite

Finger shaft pitman cam.
Multiple drawer gears.
Finger shaft at bracket.
Bell hammer trip pawls.
Bell muffler pawls.
Bell muffler lock cam.
Back door lock.

Champion Oil

Drawer release lever rivet.
Finger shaft at multiple drawer gears.
Multiple drawer gear line at frame bearings.
Drawer rolls.
Bell muffler.
Drawer catches.

CHART COVERING CLASS 800 LUBRICATION

KEY LATCH MECHANISMS.

Graphite

Crank pitman stud.
Segment hubs.
Retaining par studs.
Roll on special counter operating lever.
Hole in special counter operating lever.
Side of locking cams.
Retaining bars on locking cam line.
Latch plunger studs.
Throw-out cam on locking cam.
Roll on flash arm operating lever.
Crank arrester ratchet pawl.
Bell hammer stud.
Release key lever stud.
Upper throw-out lever stud and slot.
Bell muffler stud.
Bell stud for bell muffler.
Bell post, where bell muffler is used.

Vaseline

All key springs.
Detents in guide pin groove.
All slots in detents.
Holes in release lever 842 X.
Key stop stud.
Release lever stud.
Latch pawls in throw-out pitman studs.
Latch link studs on both ends.
Locking cam line.
Transfer line.
Switch lock lever release line.
Stud in crank on transfer line.
Latch plunger stop pawls.
Release key line.
Throw-out lines.
Bell muffler pitman shaft.

COUNTER MECHANISMS

Graphite

Counter pinion pitman stud, roll and slot.
Stud on counter pinion arm.
Intermediate motor gear stud.
Inking arm collar and pitman stud roll and slot.
Roll on No. 1 type segment lock lever; also end of spring
plunger at hole in No. 1.
Type segment lock lever.

Special top indicator lock lever at hole in hub and
on roll.
No. 2 type segment lock lever at hole and on end.
Type segment tubes and hubs.
Motor line shaft; also cam on motor line gear.
Transfer line at hole in check printer frame.
Transfer bar studs, rolls, and both slots.
Cams on both ends of main counter shaft.
Turn-to-zero lock lever at hole and slot.
Key lock lever cam and stud.
Clutch release lever roll and hole at hub.
Clutch release lever spring guide.
Switch lock lever at block and under side of strap.

Champion Oil

Counter pinion line.
Counter pinion studs.
Type segment lock line.
Retaining pawls and springs.
Trip pawls, and trip pawl springs and plungers.
Counter wheels at bearings; also counter ratchets.
Trip cams and auxiliary counter transfer pawls and springs.
Motor line at bearings in printer frame and side frame.
Bearing point between inking arm and drop segment index.
Type segment tubes at bearings in side frames.
Segment cam shaft.
Segment cam lever slot hole and roll.
No. 4 retaining bar at locking cam shaft; also roll and
milled surface.
Special key detent collars.
Key lock that operates registers.
Switch lock lever operating stud in retaining bar.
Switch lock lever tripping end and hole.
Block on special key arrester and where it fits in crank;
also key arrester cam.
Key arrester stud.
All tubes and key lever lines.
Switch lock lever retaining pawl, both ends, stud, and
hole.
Stud in switch lock lever trip lever.
Key lock teeth.
Pawls on key lock stop.

Vaseline

Divided bank detents at contact points.
Long key pin on both sides.

RECEIPT PRINTER MECHANISMS.

Graphite

Studs in key guide for impression roll pitman.

Impression roll pitman No. 1 1/2 and block roll on lock lever; also at hole.
Slots in impression roll pitman No. 3; also stud.
Hole in check printer intermediate gear.
Inking lever rivet.
Cylinder cam stud and raceway.
Both ends of cylinders.
Both ends of check ejector shaft.
Supply roll stud and spring.
Receiving roll stud and spring.
Detail retaining pawl.
End of motor line.
Slideway in check printer frame cap.
Check printer platen slide.
Check printer cam roll stud and roll.
Check printer cam raceway.
Check ejector compression plunger and spring.
Positive check ejector gear stud.
Intermediate gear and stud.
Electro roll stud.
Lower impression roll stud.
Hole in electro roll.
Grooves in impression rolls.
Check ejector slide pins.
Knife slides.
Check ejector gear for lower printer.
Both ends and hole in detent impression roll lifting arm.
Both ends index lever lining pawl line.
Cam on frame gear.
Index type segment hub.
Slip printer platen operating arm at hole.
Slip printer gripper arm.
Slip printer actuating cam.
Hole in slip printer detail driving arm.

Champion Oil

Detail driving arm pawl.
Impression roll crank stud.

INDICATOR AND SPECIAL COUNTER MECHANISMS.

Graphite

Customer counter driving arm stud.
Stud in special counter operating lever.
Operating handle stop stud.

Vaseline

Indicator hubs and gears and all grooves.
Indicator gear line through holes in side frames.
Indicator gears where flash arms fit over hub.
Top indicator segment stud.

Top indicator shaft, both ends.
Top indicator flash arms.
Top indicator flash pitmans, both ends.
Top indicator segment pitman, three slots and opening in
lower end.
Segment cam stud.

Champion Oil

Customer counter driving arm.
Customer counter carrying pawls.
Customer counter retaining pawls.
Customer counter wheels.
Special counter driving arm.
Special counter carrying pawls.
Special counter retaining pawls.
Special counter wheels.

CASH DRAWER OPERATING MECHANISMS AND CABINET.

Graphite

Top and bottom of drawers.
Catch on all drawer guides.

Vaseline.

Drawer lock mechanism.
Drawer plunger and bracket.
Drawer plunger pitman on transfer line and stud.
Operating handle stud.
Shoulder of side lock lever screw.
No. 1 lock stud.
Counter slide rivets.
End of counter slide bracket.
Shoulder of detail driving arm, pitman screw.
Operating handle groove.
Drawer release line at each bank.
Hole in drawer lock lever.
Hole in hub of drawer lock lever.
Hub and slot in drawer lock operating line crank.
Back end and lever of drawer lock operating line.
Slot in front end of bell muffler pitman.

Champion Oil

Around drawer plunger at top of bracket.
Rolls on drawer roll plates.
Roll on drawer catch.

These charts show why the lubrication of the user's register should always be done by those who are thoroughly familiar with the functions of the different devices and of the thousands of parts in them.