

Table of Contents

- IH: Engine Control - Sub-01B** 3
- Magneto Ignition System** 3
- Mounting Adapters** 3
- Bearing and Support Housing** 7
- Keyed Mags** 7
- Solid Mount Magneto** 8
- Adjustable Mount Magneto** 9
 - Timing Advance Spring*** 9
 - Timing Advance Cable*** 10
- Various Documentation** 10
- Related Links** 14

[Go To Technical Menu](#)

Seal Styles: ⁷⁾

IH: Engine Control - Sub-01B

A) a square section rubber ring that gets installed into the cam cover bore under the mount plate.

- B): a square section rubber ring that gets installed into the cam cover bore. .

An O-ring & washer installs between the top of the mount plate & the bottom of the mag (washer to mag & O-ring to plate).

Magneto Ignition System

C) a seal that gets installed into the cam cover bore under the mount plate.

Cam Cover to Adapter Gasket:

1958-1965 adapters use gasket (32522-37). ⁸⁾

The parts catalogs say the gasket was available for 1958-1969 XLCH. However, gaskets are known to lose their structural integrity (used on movable mount systems) resulting in the hub working loose from the cover.

It also eliminated the need for a battery for ignition. ³⁾ as you can kick start or bump start the bike at HD got away from the gasket in mid 1965 for this reason.

So L1965-1969 setups don't use a gasket.

A bike with no seals barely leaks because the mag drive gears don't get very much oil.

The oil they do get is "splash" oil. A very small amount of oil gets to drive gears by oil passing thru #2 breaker and a circuit breaker cam.

• Ignition is timed when the front cylinder piston is 11/16" / (45° of crankshaft rotation) before TDC on the compression stroke.

Screw and Washers:

Upon setting the proper timing adjustments at the factory;

The 2 big holes on the 62> mag lower housing slots are access holes for 2 of the 4 screws that hold the lower mag housing to the mag body. Timing alignment marks were stamped on the drive housing plate and rear edges of the magneto adapter plate for future timing adjustments. ⁶⁾

L62-64 had rectangular 'washers' that straddled the big holes. 65-69 had the arm that control cable attached to that straddled the holes.

• A grounding circuit is connected to a button on the right handlebar (stop switch) that breaks the circuit to the ignition and stops the engine.

Uses #12-24 x 15/32" countersunk flat slot head screws (1865W) to hold plate to cam cover.

Fixed Position Magneto Adapters:

• (1958-1964) Magneto is mounted in a fixed position producing advanced spark timing only.

1958-E1962:

Used with magneto (29504-48A).

Magneto Adapter (29600-48), Oil Seal (29603-48), Adapter to Crankcase Gasket (32522-37).

1 pc mount. Mag bolts 'hard' to plate. Timing is fixed because the mag can't move once bolted. ⁹⁾

Mag to plate bolt pattern is at 12:00 & 6:00 (when your sitting on the bike looking down).

Special #12-24 slot head screws (29601-48) hold plate to cam cover. Uses 'no tach mag' and SEAL STYLE A.

Uses gasket between the mount plate and cover surface.

L1962-1964:

Used with magneto (29504-48B).

Magneto Adapter (29600-62), Oil Seal (29603-48), Adapter to Crankcase Gasket (32522-37). ¹⁰⁾

1 pc mount. Mag bolts 'hard' to plate. Timing is fixed because the mag can't move once bolted.

Mag to plate bolt pattern is at 2:00 & 8:00. Uses #12-24 x 15/32" countersunk flat slot head screws (1865W) to hold plate to cam cover.

Uses tach drive mag and SEAL STYLE A. Uses gasket between the mount plate and cover surface.

Adjustable Magneto Adapters:

A lot of parts got modified by owners over the years so you could have something that don't match the descriptions below. ¹¹⁾

These are the basics to the OEM moveable mount hubs:

Plain hub (no counterbore or slot) = E1965

Counterbored (only) = L1965-E1967

Counterbored and slotted = L1967-E1968

Slotted (only) = L1968-1969

E1965:

Used with magneto (29504-48B).

Upper Magneto Adapter (29600-65), Lower Magneto Adapter (29604-65), Oil Seal (29603-48), Adapter to Crankcase Gasket (32522-37).

The 1st 'movable' setup. 2 pc (ring & hub) mount. Timing screw has a spring over it to hold adjustment (for minor adjustments). ¹²⁾

Uses tach mag and SEAL STYLE A. Very rare. Uses #12-24 x 15/32" countersunk flat slot head screws (1865W) to hold plate to cam cover.

No counterbore in hub. Uses gasket between the mount plate and cover surface.

Mount plate hub height is .390".

L1965-E1967:

Used with magneto (29504-48B).

Upper Magneto Adapter (29600-65A), Lower Magneto Adapter (29604-65A), O-ring Seal (11101), Mounting Spacer (5944), NO GASKET.

2 pc (ring & hub) mount. Hub now has a counter bore added on it's top surface to accept an O-ring with a washer on top of O-ring. ¹³⁾

Timing screw has a spring over it to hold adjustment. Uses tach mag and SEAL STYLE B.

Uses #12-24 x 15/32" countersunk flat slot head screws (1865W) to hold plate to cam cover.

Timing screw (1074W), #8-32 x 7/8" fillister head, allows for minor adjustments.

Timing screw spring (64409-47).

Mount plate hub is height .375".

L1967-E1968:

Used with magneto (29504-48B).

Upper Magneto Adapter (29600-65B), Lower Magneto Adapter (29603-67), O-ring Seal (11101), Mounting Spacer (5944), NO GASKET.

2 pc (ring & hub) mount. Hub now has counterbore and added slot at 12:00 to accept a roll pin that limits the amount of available timing rotation. ¹⁴⁾

Ring gets drilled at 12:00 for this roll pin to install into. Timing screw has a locknut over it to hold adjustment (only). FSM says no screw.

What they meant was no "adjustment" screw. Timing gets set by moving mag to plate position.

Uses tach drive mag & SEAL STYLE B. NO GASKET.

Uses #12-24 x 15/32" countersunk flat slot head screws (1865W) to hold plate to cam cover.

Mount plate hub height is .375".

L1968-1969:

Used with magneto (29505-67).

Upper Magneto Adapter (29600-65C), Lower Magneto Adapter (29603-67), Lipped Oil Seal (12023), NO GASKET.

2 pc (ring & hub) mount. Hub is changed again. Still has the slot but the counterbore (introduced in L65) is deleted. ¹⁵⁾

The pilot extension on the bottom of hub that registers into the cam cover bore is shortened to make room for the real oil seal to fit.

Timing screw has a locknut over it to hold adjustment (only). FSM says no screw. What they meant was no 'adjustment' screw.

Timing gets set by moving mag to plate position. Uses tach drive mag & SEAL STYLE C.

Uses #12-24 x 15/32" countersunk flat slot head screws (1865W) to hold plate to cam cover.

Mount plate hub height is .250".

1958-E1962 Magneto Adapter Plate 29600-48 ¹⁶⁾



L1962-1964 XLCH Magneto Adapter Plate 29600-62 ¹⁷⁾





Adapter pics from Dr Dick. ¹⁸⁾



L1968-1969 Upper Magneto Adapter (29600-65C) came with oil seal: ¹⁹⁾, 1965-1969 Lower Adapter to the right ²⁰⁾





Bearing and Support Housing

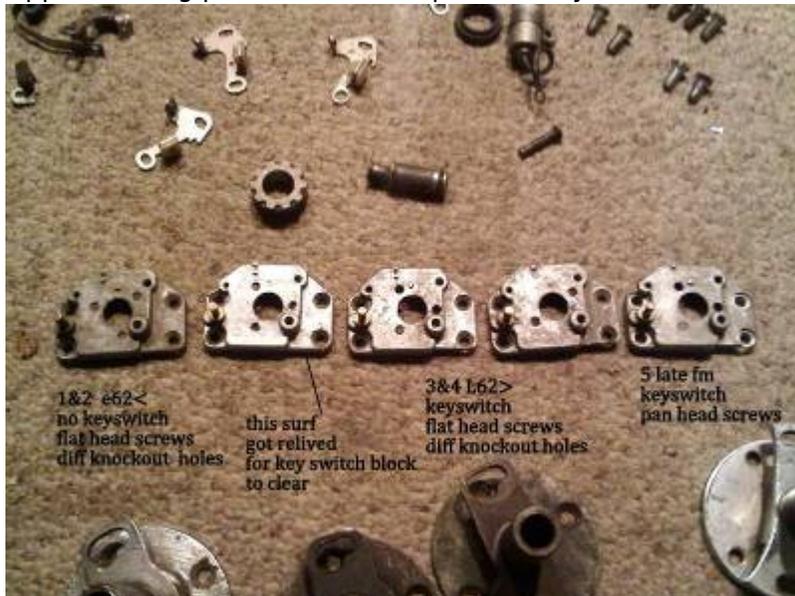
From 1958-1969, these parts had the same part number but the bearing support was factory modded several times.

Bearing support (29561-55)

Rotor cam end (upper) bearing (29562-59)

Rotor shaft end (lower) bearing (29563-59)

Upper bearing plate differences provided by Dr Dick ²¹⁾



Keyed Mags

The key mounted to the magneto locks or unlocks the ground to the system. ²²⁾

When locked, the spark is sent to ground and the bike shuts off. ²³⁾

When unlocked, the spark is sent to the mag (removes the ground) and the bike will operate.

Lights were operated by a toggle on the visor, no other key needed.
Or, no key needed as long as the mag is in the unlocked position.

Keys on mags have been known to break, i.e. stuck or worse sending there little metal bits into the mag.
²⁴⁾

However, some run fine with the key.

Keys can be made / replaced (using the number on the lock) in the case of a broken one. ²⁵⁾

Solid Mount Magneto

Fairbanks-Morse Magneto (keyed) ²⁶⁾



Fairbanks-Morse Magneto ²⁷⁾



Magneto on a 72 XLCH ²⁸⁾



Magneto on a 77 XLCH ²⁹⁾



Adjustable Mount Magneto

AKA Retard Mag (Timing is mechanically advanced)

It's almost like a VOES switch for your mag!³⁰⁾

The Morris Auto Advance, uses a small spring under the mag base.³¹⁾

The MM3 uses a bronze ring and a steel base.³²⁾

The MM2 uses a steel ring and a bronze base.

Tighten up the nuts to create a slight drag, retard the spark for starting and the vibration + the spring will advance the unit.

Morris Magneto (MM3)³³⁾



Keyed magneto on a 69 XLCH³⁴⁾



Timing Advance Spring

The spring used is not a heavy one.

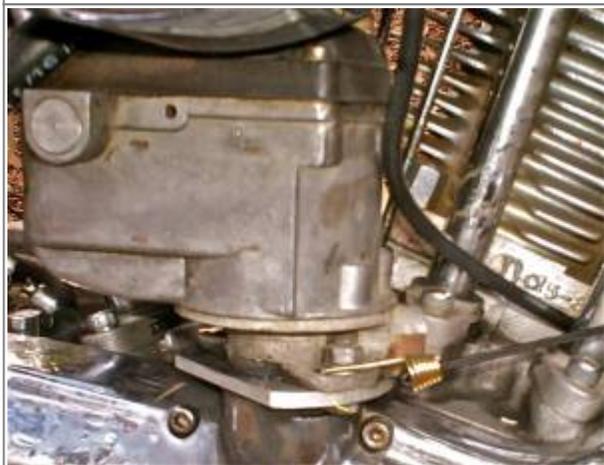
You can use a spring similar the old carb return springs on autos.³⁵⁾

Or a simple coil hook spring: ³⁶⁾

Hooked it to the bolt on the tappet block and the spring hooked to the indent for the coil bolts.

Unhook, retard, start, hook it back up.

Makeshift Advance Spring ³⁷⁾



Timing Advance Cable

You can also attach a choke cable to the primary to control the advance. ³⁸⁾

Or, a twist lock cable setup:

Do a search for push-pull controls and look for a locking one.

The L-bracket on the case can be fabricated to mount the T-handle cable lock.

The arm on the magneto, at the cable connect, is possibly available through a vintage parts supplier or used.

The cable is held by a pivot and a set screw. ³⁹⁾



Various Documentation

Instructions for the Joe Hunt Early Sportster Magneto:

Click on a pic to enlarge: ⁴⁰⁾

JOE HUNT MAGNETOS

INSTRUCTIONS FOR THE JOE HUNT EARLY SPORTSTER MAGNETO

The Joe Hunt magneto designed for the Sportster generates its own voltage to produce a high voltage discharge to the spark plugs. It consists of an induction coil with primary and secondary circuits, a rotating magnet (rotor), condenser, points and breaker cam. A grounding circuit cuts the ignition and stops the engine. The magneto is sturdily constructed for years of use with minimal maintenance.

INSTALLATION: Insert the rotor shaft into the gear case. Install Magneto onto the adaptor plate and attach with bolts and nuts. On magnetos with manual retard, install the control arm before replacing the tach drive gear at the bottom of the mag with a goodall purpose grease before installation. Make sure the tach cable turns freely before going any further. NOTE: we do manufacture our magneto to Harley Davidson tach drive specifications. However, because we manufacture one part and Harley Davidson the other, we cannot warranty any parts of the tach drive.

TIMING: The ignition is timed in the advanced position to occur when the front cylinder piston is 11/16 inches (or 45 degrees) before top dead center. Timing should be routinely checked once a year or whenever points are replaced. Timing is adjusted by rotating the magneto housing after loosening the mounting bolts. This is how to time the mag properly:

1. Remove spark plugs, remove timing inspection hole plug in the left side of the crankcase. Next, remove the front intake pushrod cover so valve action can be seen. Remove the magneto cap and check the point gap, making sure it is in the area of .012 to .015.
2. Turn engine over in normal operating manner until just after front intake valve closes and the piston is coming up on compression stroke. Turn engine very slowly until the timing mark (170) on flywheel is exactly in the center of the inspection hole.
3. On 1964 and earlier models make sure the the timing marks on the magneto base and mounting plate are in alignment.
4. The narrow cam lobe should now be located counter-clockwise from the cam follower on the moveable point which should just be opening. If the points are already well open or nowhere close, the mag must be shifted to get correct timing.
5. A static timing light or Joe Hunt timing device can be used to accurately determine when the points open as follows: disconnect coil lead from the breaker point and attach to open coil side of the timing device. Reattach the other 2 wires to breaker point. Connect the other side of the timing device to the housing. When the points are closed, the light will be on and when the points open the light will go out.
6. If the points cannot be opened by rotating the housing within the limits of the slots or if the housing bumps the air cleaner, reposition the magneto by unbolting it from the case and lifting it away from the case enough to clear the gears. Adjust the cam position and remesh the gears. If point opening still cannot be obtained by

-2-

rotating the housing lift the magneto and remesh the gears until the proper timing point is obtained.

7. After correctly timing the magneto and bolting the base down, recheck the timing by turning the engine over in the direction it runs until the timing light goes out. Then see if the flywheel timing mark is centered. If the timing mark is not dead center, loosen the mounting bolts and adjust the housing rotation. After you have the timing correct, tighten the mag down, reconnect the coil lead, put the cap back on and gap the plugs to .018 before reinstalling.

A STROBE TYPE TIMING LIGHT WILL NOT BE ACCURATE SINCE IT IS A DC DEVICE AND A MAGNETO IS AN AC DEVICE. COIL DAMAGE MAY OCCUR.

POINT ADJUSTMENT AND REPLACEMENT

Use the kick starter to turn the engine over until the cam follower is on the high point of either lobe (maximum opening). Set the points at .015 by loosening the 2 screws at either end of the fixed breaker point, adjust to proper setting, then retighten the same 2 screws.

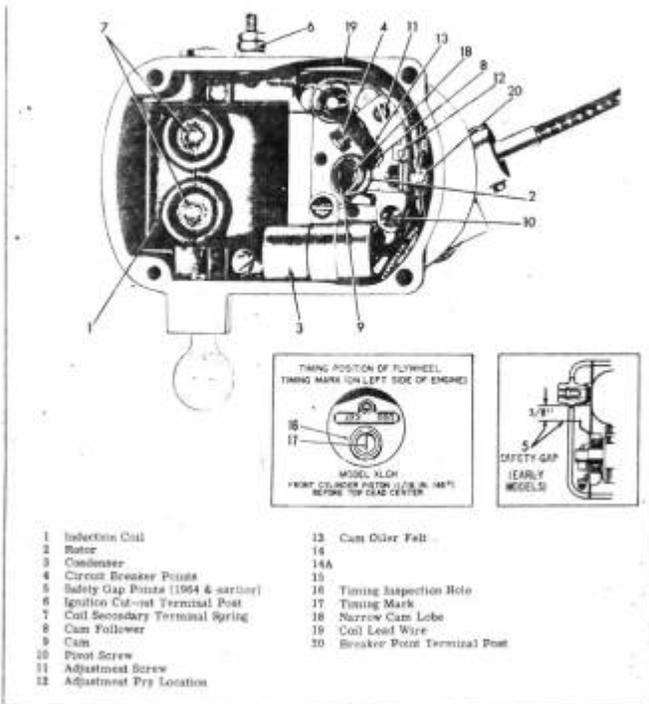
TROUBLESHOOTING & TESTING

The magneto is often blamed for problems caused by spark plugs, wires, carburetors, heads, etc. Fortunately there are simple tests which can be done in the field to eliminate the mag as a problem. When the bike is not running, hold the end of one ignition wire over 1/8 inch from the end of the plug (or any ground) and kick it over. Repeat with the other wire. Be sure the wire not being tested is on the plug or grounded. There should be a healthy spark generated and the magneto is fine. You could also get the engine started and try the same test about 1/4 inch off the plug. If no spark occurs or only a very weak spark is present, the mag needs some service. Before sending it off to the factory, check the points, kill switch and associated wires, condenser and coil. The condenser and coil are both long term parts with a long life. The condenser can be detected as bad by either excessive arcing at the points or no arc at all. No arc at the points would indicate a short either through a bad condenser or a ground in the primary circuit. Check for bare wires close to the point plate or forgotten insulators in the ground post assembly, especially the nylon one through the housing. The spark plug wires and terminals on the cap end are frequently at fault. Note: Make sure wire is copper or stainless type-carbon type compression wire will not work.

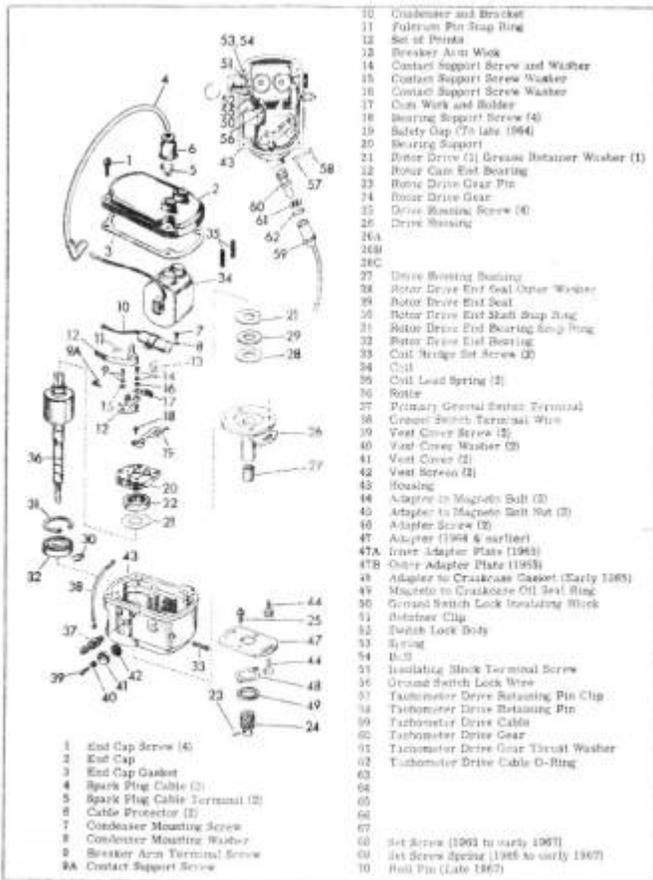
DISASSEMBLY

Remove cap and gasket. Remove points. Remove condenser. Take point plate out. Tap the roll pin through the rear with a 1/12 punch, then take gear off. Base will then slide off the shaft after the 4 screws into the housing are removed. Pry off the outer part of the oil seal on the lower end, then the rubber oil seal. The inner part of the seal will drop out. Remove the snap ring from the shaft. The rotor (magnet) can now be pressed out through the top of the housing. The snap ring and lower bearing can now be removed from the lower inside of the housing. Take the vent screen assembly off the outside of the housing and unscrew the 2 coil screws. The coil will now lift out after the insulator block and key switch have been removed. The lock may be taken out by gently depressing the small brass ring inside the housing with a feeler gauge and slowly turning the key at the same time. The insulating block can then be removed. There is a tiny ball and spring which may drop out after

the lock slides out. These go between the lock and under the grounding screw in the insulating block. Reassembly is the reverse of the disassembly. To reinsert the lock, use a thin stiff wire to depress the locking ring on the lock through the inside of the housing. Again use the key and slowly turn it. There will be a click when it is correctly seated inside the housing and insulator block. Lube the bearings generously. Do not tan the magnet while reinstalling.



1724 Crenshaw Blvd. Torrance, California 90501
 Phone: (213) 320-1871



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Phone: (213) 326-1871

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1952-1959 HD Spare Parts Catalog for all Sportster and K Models pg 19

2)
1960-1970 HD Sportster Parts Catalog pg 18

3)
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5) 6)

1959-1964 HD Sportster 55 OHV FSM pg 5F-13

7) 9) 10)

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