

Table of Contents

IH: Electrical System	1
FUSES, RELAYS, CHARGING SYSTEM	1
<i>Circuit Breakers</i>	1
<i>Fuse Wire</i>	2
Generator	6
<i>Sub Documents</i>	6
<i>13 Amp Generator 1982 →</i>	6
<i>Polarizing</i>	7
Starter Relay	7
<i>1974-1979 Starter Relay</i>	7
Voltage Regulator	7

[Go To Technical Menu](#)

IH: Electrical System

FUSES, RELAYS, CHARGING SYSTEM

See also illustrated [1959-1985 Sportster Main Wiring Diagrams \(created with reference to the OEM manual\)](#) in the REF section of the Sportsterpedia.

Circuit Breakers

Be sure to review the basic [Electrical Concepts](#) in the Reference Section, especially wire gauging.

The Circuit Breakers (CB) used on Sportsters are of the self-resetting type. Once they break contact, they will automatically reset after a period of time. These breakers function based on a bi-metallic strip that is heated by current flowing through the strip. More current will cause more heat.

If the rated amperage for the CB is exceeded, the strip will be overheated, causing it to bend away from the internal contact, thereby opening the circuit and removing the current flow. Once the bi-metallic strip has cooled sufficiently, it will return from its heated position and once again make contact. This will allow the current to begin flowing again. If the circuit is still drawing excessive current, the CB will repeat the open & close cycling until the current level is reduced below the current rating and no longer causing the bi-metallic strip to overheat.

Although very reliable, over time & usage, the CB may no longer function at the rated current, requiring replacement of the Circuit Breaker.

The following quotation makes the point that fuses are often slow to react to overcurrent situations. It is critical to replace rated fuses with the same rating in order to properly protect the circuits.

First, fuse ratings can be a bit misleading. A 10A ATO (automotive) fuse will conduct 11 amps for 100 hours minimum. At 13.5 Amps a 10A ATO fuse can take as long as 10 minutes to blow. It is not like once you draw 10 amps "poof" the fuse is gone. (From FUSE SIZING PRIMER located at <http://www.powerlet.com/learningCenter/fuseSizing>)

Fuse Wire

L1973-1974 XL/XLCH:

In late 1973, a 2" long 20 gauge wire (70105-73) was added in the wiring circuit on FL,FLH, FX, FXE, XL and XLCH models to act as a fuse wire. (TSB #659) ¹⁾

The fuse wire protects the wiring between the battery and the lighting, ignition and accessory circuit breakers.

The theory is that because the motorcycle wiring is heavier gauge, this fuse will burn out first in case of a short or overload and open the circuit.

Caution: Do not use heavier gauge wire for a fuse wire. In place of this HD part, any 20 gauge braided wire will work also.

Before replacing the fuse wire, check for short circuits in the wiring and ignition switch to determine the cause of burnout.

When troubleshooting the electrical system for loss of power, check this wire for burnout at the following locations;

- FL/FLH: The fuse wire is connected to the starter relay terminal (#1) and to the connector in the conduit leading to the battery positive terminal.
- FXE: The fuse wire is connected to the starter solenoid (long) terminal and to the connector in the conduit leading to the starter relay tan wire terminal.
- FX: The fuse wire is connected to the battery positive terminal and to the tan wire connector in the conduit.
The tan wire terminates at the "B" terminal on the ignition switch.
- XL: The fuse wire is connected to the regulator "BAT" terminal and to the red wire connector in the conduit leading to the starter solenoid (long) terminal.
- XLCH: The fuse wire is connected to the battery positive terminal and to the red wire connector in conduit leading to the regulator "B+" terminal.

The fuse wire doesn't show up in the -74 FSM schematic but does in the -78 FSM.

Neither the fuse wire nor the connector (#35 in the -78 FSM) for it show up in the parts catalogs or supplement catalogs thru -78B.

But a pic of the wire itself can currently be seen at NOSParts.com

<https://nosparts.nl/cgi-bin/dbsql/db...umber=70105-73>

The pic shows the wire skimmed on each end for connectors.

Looking closer at the wiring diagram, connector #35 also shows up as a splice tap on the green wire coming off the turn signal flasher.

So it appears they simply cut the red wire and used a small crimp connector on it inside the conduit to install the fuse wire inline at the factory.

As to 'connector #35', the FSM wiring diagrams do not distinguish between what type connector they refer to. It seems they are not referring to a specific part or type but rather denoting a wire splice of sorts.

#35 is designated for the fuse wire, TS flasher, ignition and turn signal lamp wires (some years) etc.

But, going beyond the manual, it has to be small enough to fit inside the wire jacket or conduit without hindering the other wires beside it, especially with the vibration.

Since it doesn't seem to show up in the catalogs specifically for the fuse wire, it could be as simple as a

small folded piece of steel.

The TS flasher connector appears to be an permanent 3 way tap as should be the fuse wire with a permanent 2 way.

Permanent meaning a crimp connector instead of a 2 piece socket.

The connectors in the parts books look to range from crimp types to plastic housing punch connectors and simply listed as 'connector'.

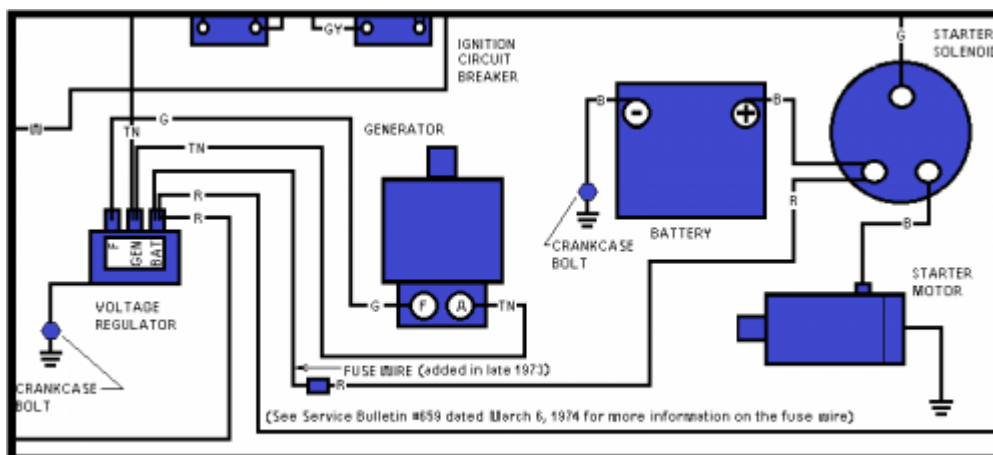
If the fuse wire connector could fit in the jacket (like the 75 wire does) then it can't take up much space, as a socket connector would.

Due to positioning, it would need to be a structural sound connection.

The TSB does not require dealers to retrofit this change to previous models.

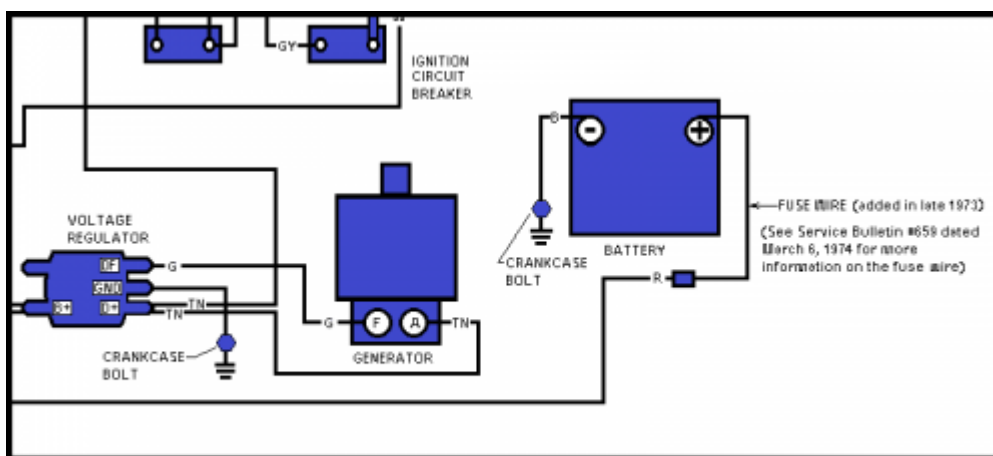
And a crimp splice is probably what they are referring to in the service bulletin.

Fuse wire placement:



L1973-1974 XL fuse wire addition www.sportsterpedia.com

2)



L1973-1974 XLCH fuse wire addition www.sportsterpedia.com

3)

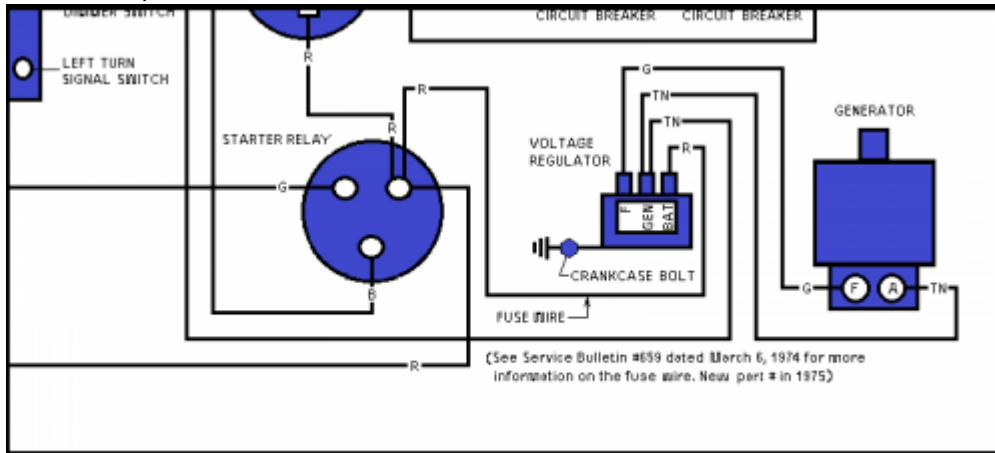
1975-1976 XL/XLCH:

The splice connector for the fuse wire is present in both drawings in the -78 FSM but the word "Fuse Wire" has been omitted on both.

So the fuse wire was also present on 75-76 models.

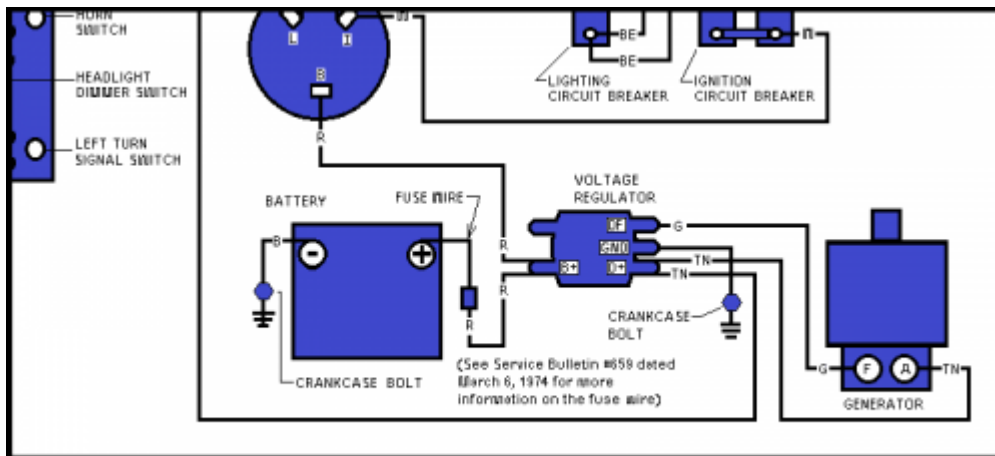
On the 75-76 XL drawing, the connector is on the wire between the starter solenoid and the starter relay.

Fuse wire placement:



1975-1976 XL fuse wire

www.sportsterpedia.com 2-7-2020 4)



1975-1976 XLCH fuse wire

www.sportsterpedia.com 2-7-2020 5)

1977 XL/XLCH:

XL:

The fuse wire was replaced with a main circuit breaker in 1977.

Connector #35 is still shown in the wiring key for the splice tap at the turn signal flasher.

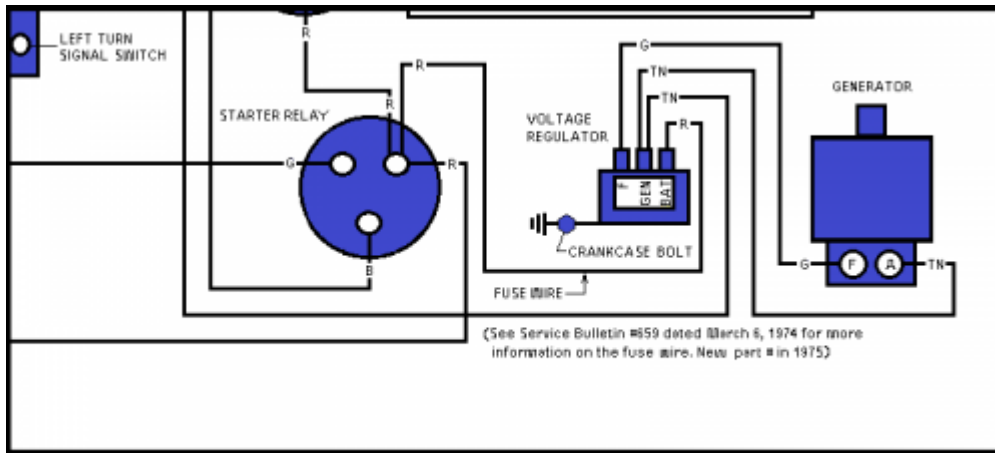
The 30 amp (main) breaker (74599-77) doesn't show up in the 77 supplement catalog although it is in the 78 FSM drawing as being installed on 77 models.

It doesn't show up for parts order until the 78 supplement (October 1977 (78 year model season)) and even then it shows up for 78 XLH, XLCH (not 77).

The -78B catalog shows it for 78 models as well so E77 models should have come with the fuse wire.

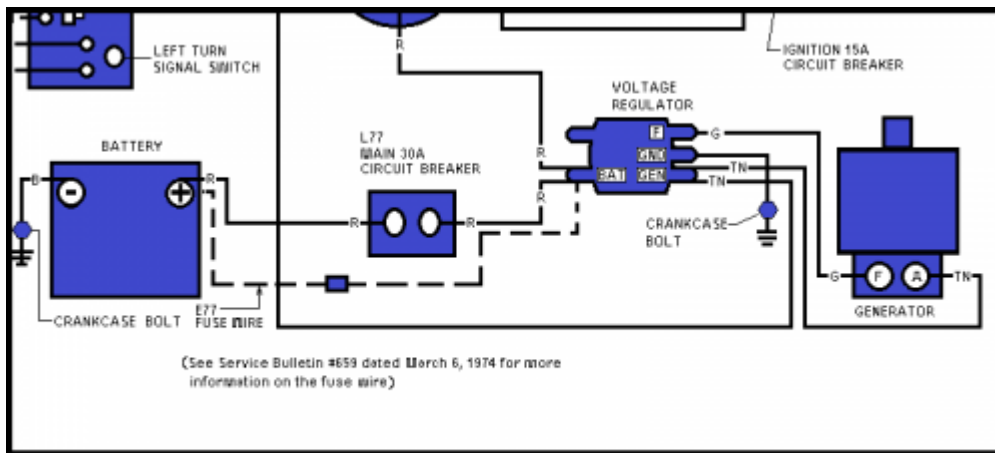
The only reference found to a main circuit breaker being installed on a 77 Sportster at all is the -78 FSM wiring diagram.

Fuse wire placement:



1977 XL fuse wire

www.sportsterpedia.com 2-7-2020 6)



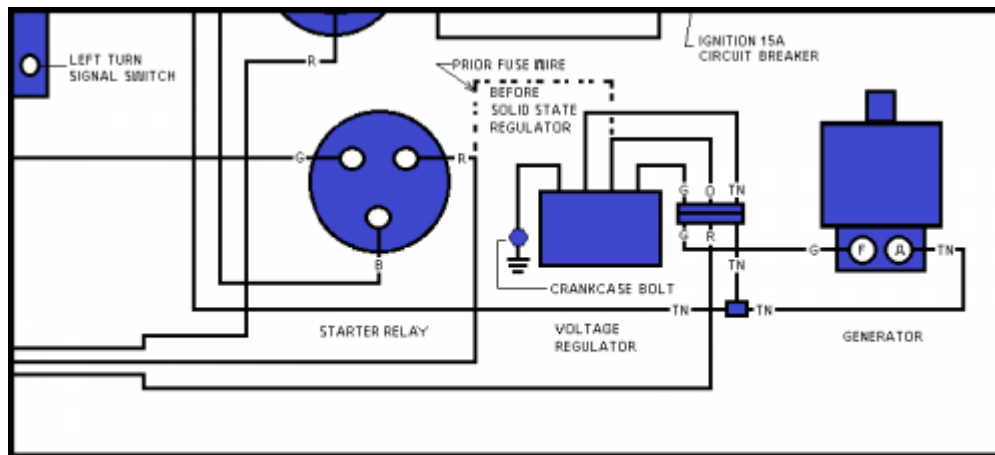
1977 XLCH fuse wire

www.sportsterpedia.com 2-7-2020 7)

1978 XL:

The solid state regulator came out in 78 and the hookup for it changed to a plugged set of wiring. Yet the 75 fuse wire was being sold for 78 models also so there may be some E78s that came with the fuse wire and older regulator.

Fuse wire placement:



1978 XL fuse wire

www.sportsterpedia.com 2-7-2020 8)

Generator

Sub Documents

- [Bench testing a generator](#)

13 Amp Generator 1982 →

- New 13 amp generators were used in 1982 production XLs featuring thrust washers (4 thicknesses to adjust armature endplay from .004"–0.010") between the rear end cover and rear ball bearing. ⁹⁾
- After engine VIN (1HD1CAH1XCY111183) the torque spec was lowered for the armature gear shaft nut at the oil separator washer to 6-8 ft/lbs in order to prevent bowing of the oil separator washer (which can lead to generator noise). Engines exhibiting unusual generator 'whistling' should be checked for this condition. If the washer is found to be deformed it must be replaced. ¹⁰⁾
- This generator can be retrofitted to 1965 models with some guidelines for retrofitting: ¹¹⁾

1. A new voltage regulator (74504-82) must also be used to realize the full 13 amp output.
 2. A new style drive gear (31073-63A) must be used.
 - The internal spline of the old style drive gear will not properly match the spline on the new armature shaft.
- Do not use the new style voltage regulator (74504-82) with a 10 amp generator, component damage can result.

See these XLForum Threads regarding Generator Operation & Testing:

<http://xlforum.net/forums/showthread.php?t=39146>

<http://xlforum.net/forums/showthread.php?t=559976>

Polarizing

Polarizing procedure is same for positive or negative ground, 6 or 12 volt.

The purpose of polarizing is to tell the generator whether to output positive or negative ground.

Starter Relay

1974-1979 Starter Relay

In some cases, the starter relay used on 1974 to 1979 1200, 1340 and 1000cc models may develop corroded contacts because of moisture under wet road conditions. ¹²⁾

Testing

- Using a 12 volt test light, ground one of the leads and touch the other lead to each large relay terminal.
 - With ignition switch "on", one of the terminals should light test lamp.
 - When starter button is depressed, the relay should operate and the other large terminal should light the test lamp.
- If lamp does not light, touch test lamp lead to small relay terminal with starter button depressed. If lamp lights, relay is defective and must be replaced. If relay does not light, control circuit from starter button to relay is faulty and must be checked for continuity.

Installation

- Caution, before removing the relay, disconnect the battery.
- Before installing the relay (71463- 73), dip the base of relay in insulating paint or apply with a brush (sealing agent such as GE Glyptal insulating paint) to ensure a good gasket joint seal. This paint (No. 1201 Red Enamel) is available in one quart cans from General Electric distributors.
- The relay is mounted by 2 screws below the battery carrier.
- When reinstalling relay, add two shake proof washers between base plate and battery carrier to provide a good grounding circuit.
- Reconnect the wiring to the relay and the battery and check starter operation.

Voltage Regulator

Regulator Test Specifications (as revised 2-70).

Regulator Test Specifications

Delco-Remy Regulators

Regulator Part Number		For Testing Procedure see Delco-Remy Service Bulletin #	Regulator Type	Adjustment and Range (Amps)	Adjustment and Range (Volts)		Used with Harley-Davidson Generator and the following Motorcycle Models
Harley-Davidson	Manufacturer's Number			Current Regulator Setting	Cutout Relay Closing Voltage	Voltage Regulator Setting	
74511-51	1118 388	1R 116	3 Unit Current & Voltage	18.0	6.6	7.5	1950-1951 model 38 2-brush fan-cooled generator. (Superseded by 74511-51A for parts order.)
74511-51A	1118 707 1118 707B 1118 707C 1118 707D	1R 116 1R 118 1R 118 1R 118A	3 Unit Current & Voltage	20.0 (17.5 - 20.5)	6.6 (5.9 - 6.7)	7.5 (7.2 - 7.5)	Model 5, 2-brush fan-cooled generator
74511-58	1119 187C 1119 187D	1R 118 1R 118A	3 Unit Current & Voltage	15.0 (13.5 - 16.5)	6.6 (5.9 - 6.7)	7.4 (7.2 - 7.5)	Model 58 Generator
74510-47	1118 307	1R 116	2 Unit Voltage		6.4	7.0	Models 125-165 Generators Regulator superseded by 74510-47A for parts order
						7.4	
	1118 794	1R 116	2 Unit Voltage		6.4	7.0	
						7.4	
74510-47A	1118 995	1R 116	2 Unit Voltage		6.4 (5.9 - 6.7)	7.2 (7.0 - 7.3)	Model 52K, 58 and 61 Generators. Model 125-165 Generators
74510-59	1118 989	1R 116	2 Unit Voltage		5.5 (5.0 - 6.0)	6.7 (6.5 - 6.8)	Model 58 and 61 Generators
74510-64	1119 614	1R119A	3 Unit Current & Voltage	10 (9.0 - 11.0)	12.4 (11.8 - 13.0)	14.3* (13.9 - 14.5)*	Model 64 and later 12V Generator. (*Upper contact operation. Operation on lower contacts must be .1 to .3 volt lower.)
74510-65	1119 516	1R 262	2 Unit Voltage		12.5 (11.5 - 13.5)	14.4* (13.5 - 14.9)*	Delcotron Alternator
All 6-Volt Regulators		Current Regulator Air Gap .075 in.			Cutout Relay Point Opening .020 in.		
		Voltage Regulator Air Gap .075 in.			Cutout Relay Air Gap .020 in.		
All 12-Volt Regulators		Current Regulator Air Gap .075 in.			Cutout Relay Air Gap and Point Opening .020 in.		
		Voltage Regulator Air Gap Varies With Setting			Voltage Regulator Point Opening .016 in.		

Bosch Regulators

Harley-Davidson	Manufacturer's Number	Relay Cut-In Voltage	Regulator Voltage		Used with Harley-Davidson Generator and Motorcycle Models
			NO LOAD	LOAD	
74511-65	TBA 130 - 150/12/2	12.4 - 13.1	13.8 - 15.4	12.7 - 14.5 @ 10 Amps	1965 Model 65 Generator for 1965-1966 Sportster XLH and 1965 and Later XLCH

See Section 51 - Electrical - Regulator - Revised 2/1970 - Related to Models: Duo-Glide / Electra-Glide / Sportster / Servi-Car

13)

Go To Technical Menu

1)

HD Service Bulletin #659 dated March 6, 1974 pg 1

2) 3) 4) 5) 6) 7) 8)

drawing by Hippysmack

9)

HD Service Bulletin #M-837 dated October 2, 1981

10) 11)

HD Service Bulletin #M-840 dated October 2, 1981

12)

HD Service Bulletin #M-763 dated December 21, 1979

13)

photo by IXL2Relax

From:
<http://sportsterpedia.com/> - **Sportsterpedia**

Permanent link:
<http://sportsterpedia.com/doku.php/techtalk:ih:elec02>

Last update: **2020/03/22 18:11**

