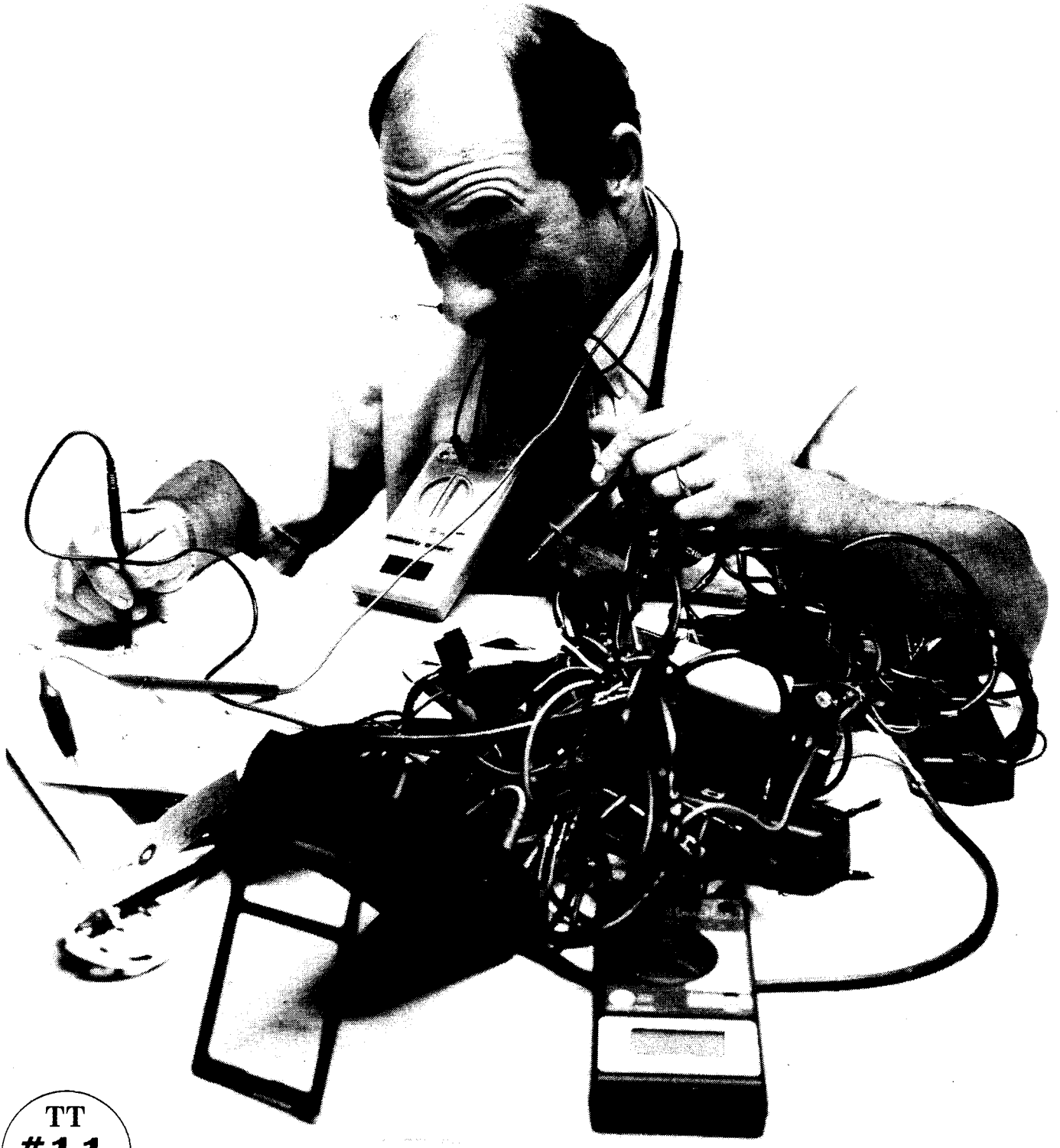
TECHNICAL TIPS



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#11

DATE 12 / 15 / 87

1. Let us take a look at diagnosing the electronic ignition system. Later in this text we'll be discussing hair transplants and how they relate to multimeters.

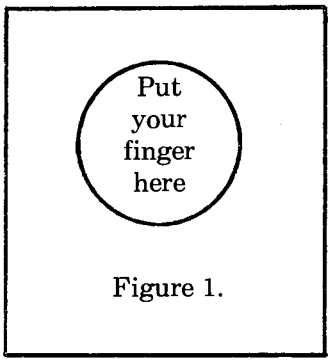


Figure 1.

INTERMITTENT OR ERRATIC IGNITION DIAGNOSTICS

The Order of Things!

GETTING DRESSED

Your object is to look presentable, but if you didn't do it in the proper order the results might be down right strange.

Example:

Put your shoes on first then your socks. Then pants and shirt. Now your underwear. What a picture! What a human!

Customer complains: I'm running down the road and my bike just shuts off.

What do you do? Park it in the corner and wait for God to fix it? Put it on the lift, stand back and throw parts at it?

When the vehicle runs erratic your diagnostic's should become systematic.

THE BEGINNING

A.) Check state of battery's charge. (New does not mean good).

B.) Check all vehicle's grounds and connections.

C.) Hot wire vehicle. Procedure described in Sept. '85 Tech Tips.

See Figure #1 and read Sept. '85 Tech Tips, Question #4. Thank you.

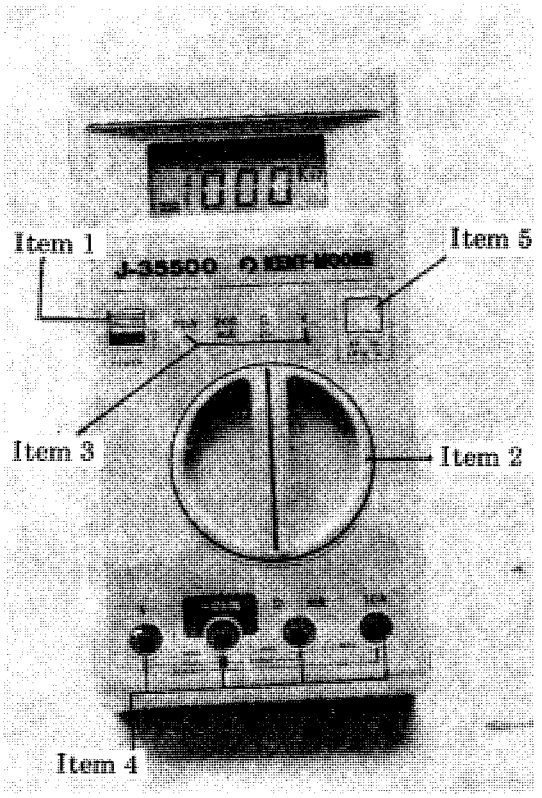
Let's go on. During the test ride try nursing on the choke. If it's a carb problem it may improve or change performance.

Don't try to nurse on the CV carbs enrichener. It won't do a thing.

D.) Maybe it sounds like a miss in one cylinder. Try clipping your inductive timing light on one spark plug lead then the other.

Could it be a bad plug wire or coil?

As a fatter of mact . . . this procedure is outlined along with "No Spark Diagnostics" in the service manuals.



offshoot

O•hi•o (ō-hī'ō). A Middle Western and leading industrial state of the United States, 41,222 square miles in area, bounded on the south by the Ohio River and on the north by Lake Erie. It was admitted to the Union in 1803. Population, 10,652,000. Capital, Columbus. See map at **United States of America.** [Iroquois *ohíyo,* "grand river."] —**O•hi'o•an** *n. & adj.*

Ohio buckeye. A tree, *Aesculus glabra,* of the central United States, having compound leaves and yellowish-green flowers.

O•hi•o River (ō-hī'ō). A river formed by the Allegheny and Monongahela rivers at Pittsburgh, Pennsylvania, and flowing 980 miles west and southwest to the Mississippi River at Cairo, Illinois.

ohm (ōm) *n. Symbol* Ω A unit of electrical resistance equal to that of a conductor in which a current of one ampere is produced by a potential of one volt across its terminals. See **measurement.** [After Georg Simon *Ohm* (1787–1854), German physicist.]

ohm•age (ō'mĭj) *n. Electricity.* Resistance expressed in ohms.

ohm-me-ter (ōm'me'ter) *n. Electricity.* A thing that drives mechanics nuts.

o-ho (ō-hō') *interj.* Used especially to express surprise or mock astonishment. [Middle English (expressive formation), perhaps combination of OH and HO.]

By the way! How are you setting the timing on 1986, 1987 and 1988 XL vehicles? By ear? Don't do that. It's important to set the timing between 1650 and 1950 rpm's, that requires a tach. Thanks.

THE MULTI-METER

Feared by many! Part #HD-35500 owned by few and needed by all.

Let us become familiar with this thing. Maybe we can make it easy.

Item 1 — On/Off Switch (no rubbing required)
Item 2 — Select function switch
Item 3 — Functions (from left to right)

A.) 10A is 10 amps. 1 amp is the same as 1000 milliamps.

B.) 200 mA is 200 milliamps or $\frac{200}{1000}$ of an amp.

C.) Ω is not the track made by a 1-legged horse. It is the sign for ohms.

C1.) sign is the obnoxious noise produced by your meter when set on ohms and you have found a complete circuit.

Complete circuit = continuity

C2.) → ← is? How about, I feel very strongly both ways!

D.) 'V' is Volts not veracious, yet I am veracious.

Item 4 — Appropriate outlets for appropriate probe plugs corresponding to the appropriate funtion appropriately needing to be measured.
(match the match) Example: (10A to 10A etc.)

Item 5 — with function switch set on Volts you can select either AC or DC current by pushing the button.

The LP Ω /Ω will allow you to read very high resistance, which translates into very low numbers. Note . . . you'll never use LP ohms.

Where is this L.E.D.ing?

The meter we are discussing is no longer available.

Now watt?

We've got a new Kent-Moore multi-meter, same part number. What's different? It has one more function, a diode test.

6.) → is a diode test function. This will allow you to accurately determine which component "module or sensor" that truly needs replacing. Diode test is read in millivolts.

If you have the earlier multi-meter from Kent Moore you **may** be able to check the diodes **if**:

1.) Meter battery is good,

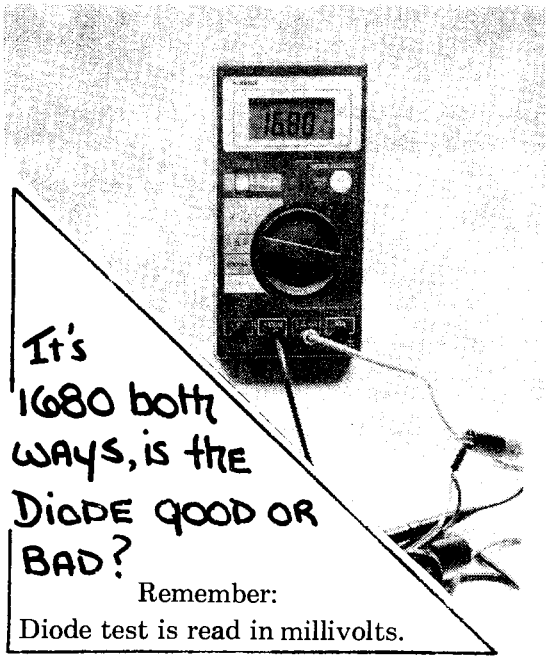
2.) Qualify your meter by performing the recommended test on page (8) with known good parts.

Remember . . . if your meter (any brand of meter) reads infinity in both directions when performing the sensor power supply diode test **and** the meter's battery is good, it does not mean all your sensors are bad. It means your meter can't perform these checks.

What numbers are you going to get? When doing these tests with either the new meter set on diode test or the earlier meter set on ohms.

A good diode — The meter will read high numbers in one direction and low numbers in the other.

A bad diode — The meter will read low numbers in both directions or high numbers in both directions. Replace.



— Impotent! —

Don't put your fingers on the probes when taking your readings. They'll be inaccurate! Also . . . diode tests will not reveal a intermittent or heat sensitive component unless you reproduce the conditions in which they failed.

1.) Warranty won't pick up travel expenses so the Antarctic and/or Death Valley trips are out of the question. Check manual for recommended procedures.

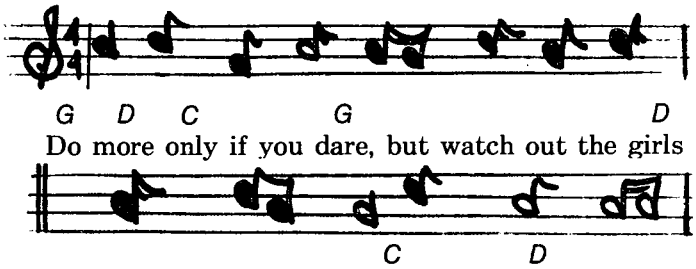
You're not rebuilding a computer!

Maximum hair loss can be expected if you let your good sense take a hike. Become acquainted with your meter. Take it with you bowling, buy it a beer, get it a date! But, whatever ya do, don't learn to use it too late!!

2. Oh *!? ★ — I can't get the module out of this '87 FXST. I'll have ta pull the oil tank. That's gonna cut in ta my time with Joann, Mona and Marsha. What can I do?

Don't freak out, all you've gotta do is remove the starter motor.

NOTE: The following song should be sung to the old Brill Cream jingle.



will all pursue ya, they'll love ta get their fingers in your hair.

Remember on '87 1340's the same is true for removing the inner primary. Pull the starter motor and drop the module from under the oil tank to get to the starter reduction housing bolts.

3. What can't get that brake caliper off?

Try applying hand pressure to the side of the caliper to retract the piston slightly. This will make removal of the caliper an easier job.

XLH TRANSMISSION CAM FOLLOWERS

A slightly different type of cam follower is now being used in Sportster transmissions. This cam follower is DIFFERENT from the two types of followers described in Service Bulletin M-949.

This latest cam follower is aluminum alloy. It is different in that it is counterbored like the steel cam followers. See Figure 1. It is important that you be familiar with the identifying features of all three cam followers. **ONLY** those followers used in the VIN range given in M-949 may require replacement.

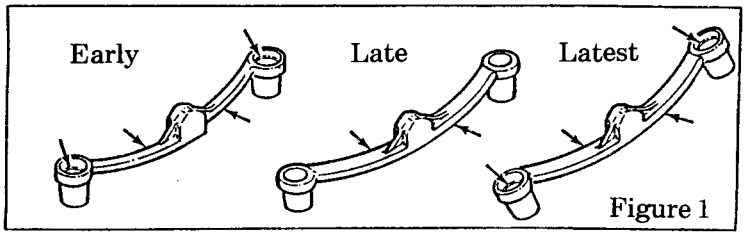
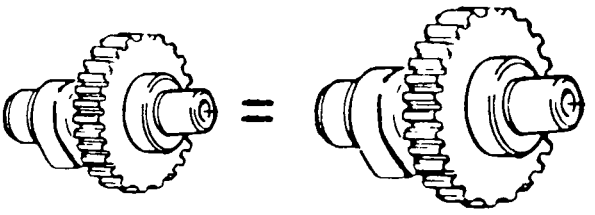


Figure 1

If you have any further questions regarding correct usage, review Service Bulletin M-949 or contact Technical Service.



SPORTSTER CAMSHAFT INTERCHANGEABILITY

A new camshaft is being used in 1988 883/1200's. It is identified by the stamped "C" on the cam lobe. These camshafts have a slightly different lift and duration from the "T" cams we used on 1986/87 XL's. Harley-Davidson will be obsoleting "T" cams and offering only "C" cams. "C" cams CAN be retrofit to earlier Evolution vehicles, but should be done in pairs, i.e. both intakes or both exhausts.

SPORTSTER TRANSMISSION LUBRICANT

Sportster Transmission Fluid is now available for use in all wet clutch Sportsters*. When servicing a motorcycle, Harley-Davidson recommends that this fluid be used to **replace** earlier transmission lubricants. This would include Primary Chaincase Lubricant, Power Blend 20/50 engine oil, or 58 w Special Light. Sport Transmission Fluid provides maximum gear protection with increased shear stability over a very wide temperature range. It is also compatible with all clutch plate materials used in XL's. Sport Transmission Fluid is available in quarts — Part No. 99896-88, gallons — Part No. 99895-88, 55 gallon drum — Part No. 99894-88.

*NOTE: 1976 and earlier vehicles required that the transfer valve be blocked to prevent fluid transfer to the flywheel compartment.

TUNE-IN — RADIO FACTS

Radio static with turn signals on? Left or Right? Check the socket where it's riveted to the housing. If the socket is loose we have a poor ground that will create static each time it is activated.

Hey! Parts counter don't just write it in the parts book . . . remind the technicians.

Part Number 65731-82 is used on both FXR's and FXST's.

LOST & FOUND

Well, I know you all figured Lucky the dog was history, but I received a telegram from one of our field service rep.'s. It read . . . Lucky the dog lives — stop — Gun shot wound healed — stop — Chrome prosthesis — stop — Warranty voided — stop — Lucky repaired — stop — after market shop.

Signed R.T. Berman

MECHANIC'S NOTES

Removing an oil filter can be a truly enjoyable experience and a real education in execration.

This particular section is for those who find it necessary to overtighten oil filters.

1.) Apply a light coat of oil or grease to the filter gasket.

2.) Spin the filter on until you've removed visible shake.

NOTE: The shake will stop when the gasket has made contact with the mounting plate suraface.

3.) At this point turn the filter a half turn tighter.

4.) Don't touch it again, that's enough, whoa, stop, freeze, call it good.

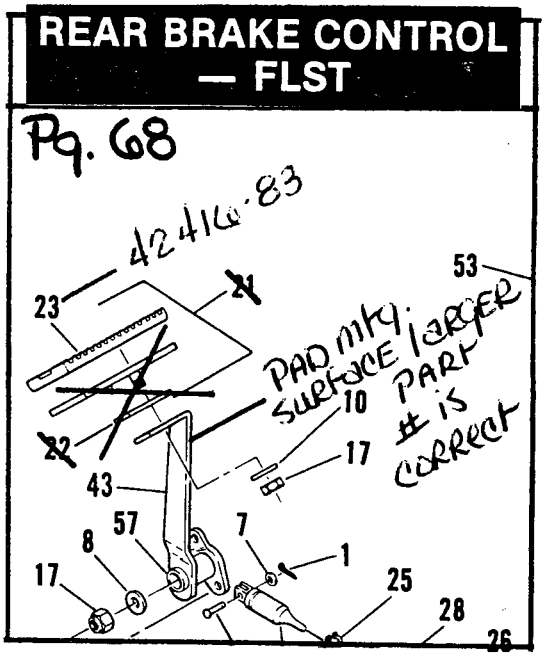
Please review Tech Tips Nov. '85, page 4 - Oil carry-over catch bottle test. You put the hose into the catch bottle (baby bottle). Make this NOTE — Do not seal the top of the catch bottle. You will pressurize the breathing system.

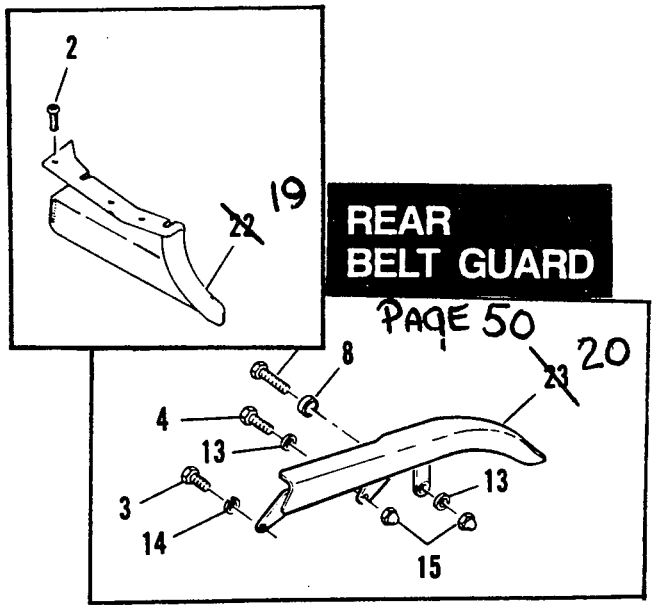
OK . . . I just found out a good way to keep the wheel weights on cast wheels and you don't have to wait. 48 hours for it to cure. Apply 1 drop of Loctite 430 super bond . . . it works great!

Hey! Review Service Bulletin 902A. It says Loctite will damage ABS. Don't use it around the fairing, or any plastic parts.

After market lower handle bar clamps commonly known as risers which raise handlebars higher than stock are a no, no! They place stress on the assembly which exceeds design limitations.

ADDITIONS AND CORRECTIONS — 1340 PARTS CATALOG —





6	56323-81A	IDLE CONTROL	--	87-EJ; 87"-EA/B	87"-ALL
	56327-81B	~~IDLE CONTROL~~ THROTTLE CONTROL	87"-ALL	--	--
	56337-83	IDLE CONTROL	--	87-EL; 87"-EC/G	
	56342-88	IDLE CONTROL	--	88"-EL	
7	56324-81A	THROTTLE CONTROL	--	87-EJ; 87"-EA/B	
	56328-81B	~~THROTTLE CONTROL~~ IDLE CONTROL	87"-ALL	--	
	56336-83	THROTTLE CONTROL	--	87-EL; 87"-EC/G	
	56343-88	THROTTLE CONTROL	--	88"-EL	--

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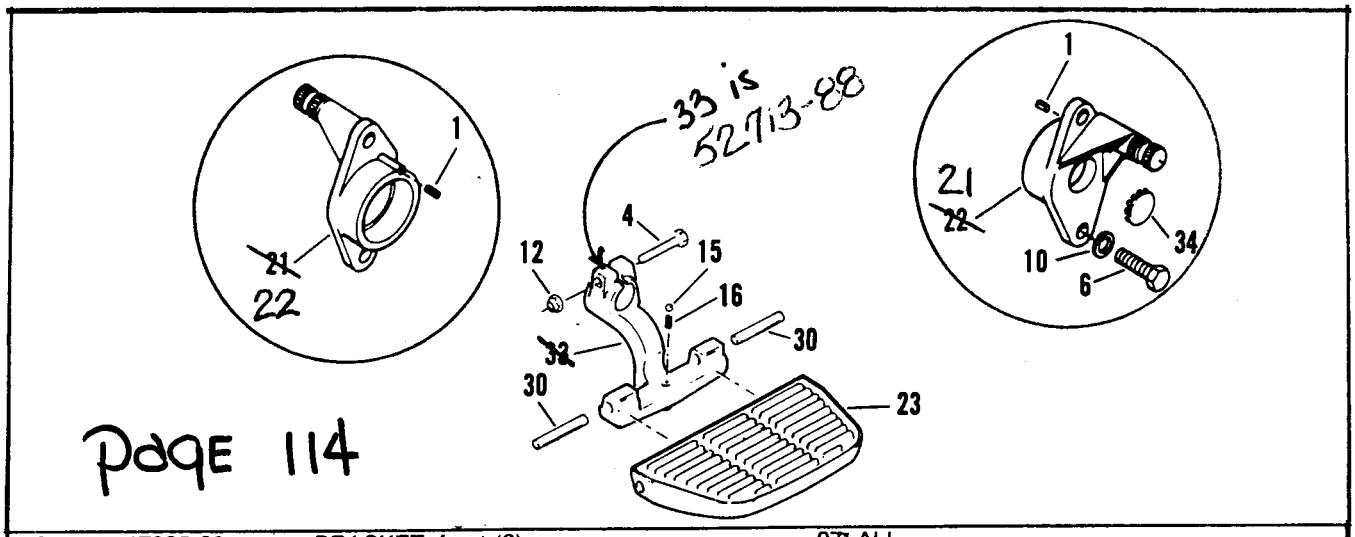

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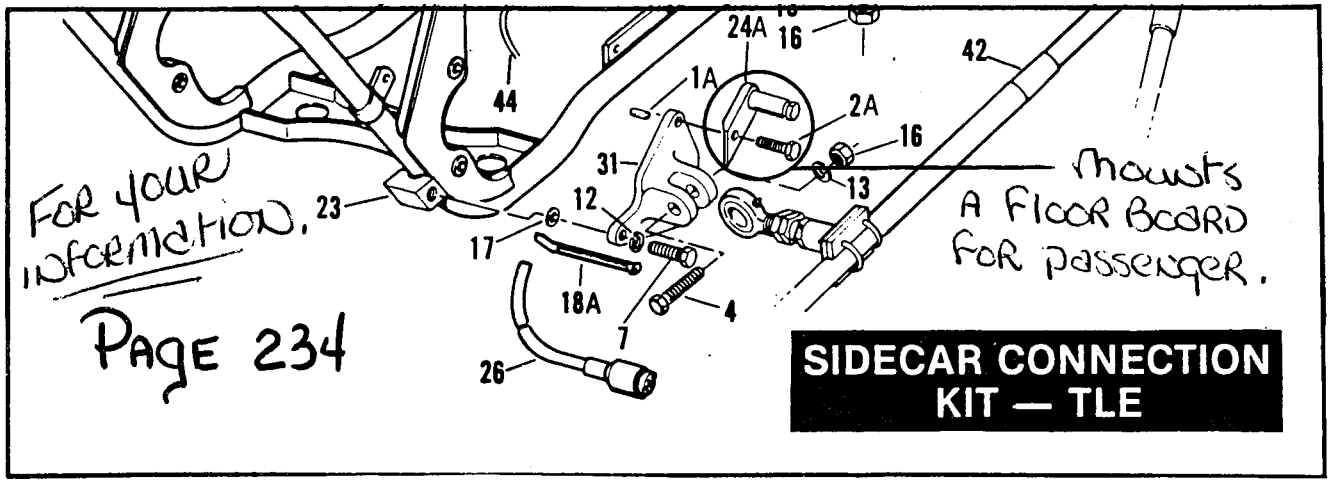
19	47365-83	BRACKET, front (2)	87"-ALL	--	--
20	50518-83	BRACKET, right rear	87"-ALL	--	--
21	50584-87	BRACKET, ~~left~~ Right	87"-ALL	--	--
22	50585-87	BRACKET, ~~right~~ Left	87"-ALL	--	--
23	50606-86	PAD (2)	87"-ALL	--	--
	50613-86	FOOTBOARD, passenger (2)	87"-ALL	--	--



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IGNITION MODULE

Module Resistance .....

Grounded Circuit _____ Ohms _____ Ohms

Power Supply Diode Check

Positive/White, Negative/Black _____ Ohms/mv _____ Ohms/mv

Negative/White, Positive/Black _____ Ohms/mv _____ Ohms/mv

Readings taken in one direction then reverse the probes and read opposite direction.

mv = millivolts

Coil Driver Transistor Check

Positive/Blue, Negative/Black _____ Ohms/mv _____ Ohms/mv

Negative/Blue, Positive/Black _____ Ohms/mv _____ Ohms/mv

IGNITION SENSOR

Sensor Resistance _____

Grounded Sensor _____ Ohms _____ Ohms

Sensor Output

Positive/Green, Negative/Black _____ Ohms/mv _____ Ohms/mv

Negative/Green, Positive/Black _____ Ohms/mv _____ Ohms/mv

Readings taken in one direction then reverse the probes and read opposite direction.

mv = millivolts

Power Supply — Diode Check

Positive/Red, Negative/Black _____ Ohms/mv _____ Ohms/mv

Negative/Red, Positive/Black _____ Ohms/mv _____ Ohms/mv

FLOW CHART

NO SPARK

- Battery & connections
- Power at coil (both terminals)
- Spark at coil
- Voltage at module
- Arc pins (module plug)
- Measure resistance

RUNS ERRATIC

- Check battery & connections
- Hot wire
- Tach wire
- Try choke
- Timing light