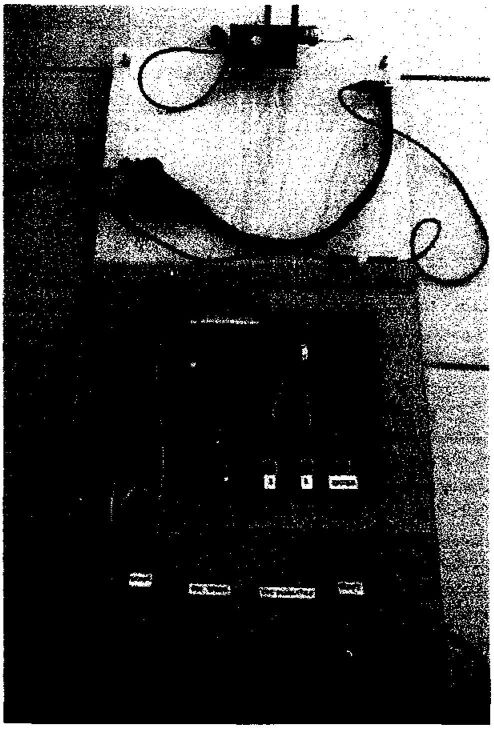
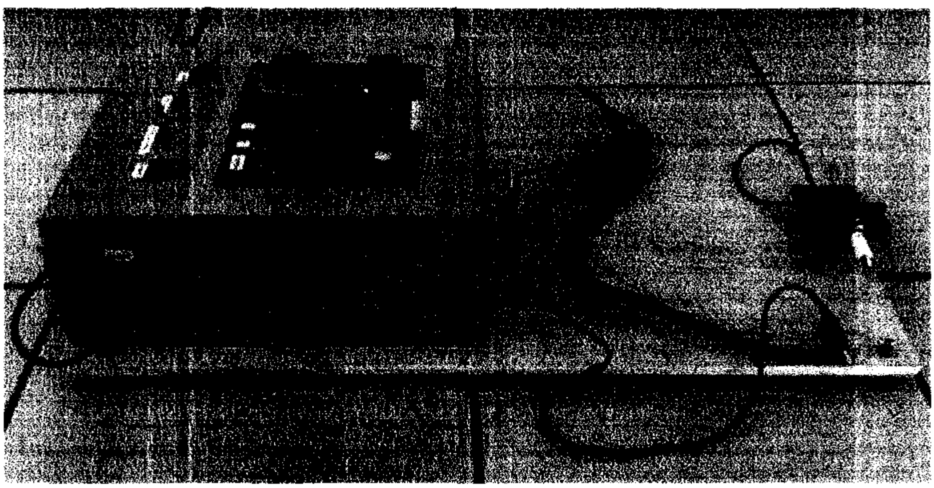
LAMPIRAN

LAMPIRAN A

GAMBAR ALAT

Dibawah ini adalah gambar alat penguji kualitas koil kendaraan bermotor:





LAMPIRAN B

CARA PENGGUNAAN ALAT

Dibawah ini merupakan penjelasan mengenai cara pengoperasian alat penguji kualitas kendaraan bermotor.

1. Tekan tombol *on/off* untuk menyalakan alat.
2. Pilih jenis pengujian yang akan dilakukan (pengujian *spark* atau pengujian kualitas) dengan menggunakan *toggle swicth* pada alat.
3. Untuk pengujian *spark*:
   - Geser *toggle switch* pada tulisan tes *spark*
   - Siapkan koil yang akan diuji
   - Hubungkan *output* sekunder koil ke cop busi yang ada pada alat
   - Hubungkan massa (resistansi primer) koil dan kabel warna merah yang terpasang pada penyangga busi ke *cable probe ground* bagian tes *spark* yang terletak pada alat
   - Hubungkan *input* primer koil ke *cable probe input* bagian tes *spark* yang terletak pada alat
   - Tekan tombol start tes *spark* yang terletak pada alat bagian atas untuk memulai pengujian
   - Amati *spark* yang keluar pada *gap* busi
4. Untuk pengujian kualitas koil:
   - Geser *toggle switch* pada tulisan tes kualitas
   - Siapkan koil yang akan diuji

- Hubungkan massa (resistansi primer) koil ke *cable probe ground* bagian tes kualitas yang terletak pada alat
- Hubungkan *output* sekunder koil ke *cable probe output* bagian tes kualitas yang terletak pada alat
- Tekan tombol *start* tes kualitas yang terletak pada bagian atas alat untuk memulai pengujian
- Setelah penekanan tombol *start* layar LCD akan menyala dan muncul tulisan judul alat, nama penulis, dan tulisan untuk memilih koil yang akan diuji, tekan *enter*
- Muncul menu pilihan koil: (1) Shogun 125R dan (2) Smash 110. Tekan tombol 1 untuk memilih pengujian kualitas koil Shogun 125R atau tombol 2 untuk memilih pengujian koil Smash 110
- Setelah itu akan muncul nilai resistansi sekunder koil yang terukur dan nilai resistansi standarnya sesuai dengan pilihan koil yang diuji, lalu tekan tombol *enter*
- Muncul hasil kualitas koil dan nilai resistansi sekunder dari koil yang diuji
- Tekan tombol *enter* untuk kembali ke menu pilihan koil

5. Tekan tombol *on/off* untuk mematikan alat.

LAMPIRAN C

LISTING PROGRAM

```
#include <mega32.h>
#include <delay.h>

#asm
   .equ __lcd_port=0x12              ;LCD ada di PORTD
#endasm

#include <lcd.h>
#include <stdio.h>

#define ADC_VREF_TYPE 0x60


unsigned char read_adc(unsigned char adc_input)       // ADC 8 bit
{
      ADMUX=adc_input | (ADC_VREF_TYPE & 0xff);

      ADCSRA|=0x40;                                  .

      while ((ADCSRA & 0x10)==0);
      ADCSRA|=0x10;

      return ADCH;
}

#define tombol1 PINC.7
#define tombol2 PINC.6
#define tombol3 PINC.5



void main(void)
{

      char k;
      unsigned int     sz, pembanding_min, pembanding_max;
      unsigned int volt,sum,mean,szSum;
```

```
        char lcd_buffer[33];
        unsigned int szArray[10];


        PORTC.7 = 1;
        DDRC.7  = 0;

        PORTC.6 = 1;
        DDRC.6  = 0;
        PORTC.5 = 1;
        DDRC.5  = 0;

// ADC initialization
// ADC Clock frequency: 31.250 kHz
// ADC Voltage Reference: AVCC pin
// Only the 8 most significant bits of
// the AD conversion result are used
        ADMUX=ADC_VREF_TYPE & 0xff;
        ADCSRA=0x87;

// Global enable interrupts
        #asm("cli")

// LCD module initialization
        lcd_init(16);

        lcd_gotoxy(0,0);
        lcd_putsf(" ALAT PENGUJI  ");
        lcd_gotoxy(0,1);
        lcd_putsf(" KUALITAS KOIL ");

        delay_ms(1000);
        lcd_clear();

        lcd_gotoxy(0,0);
        lcd_putsf(" YOHANES MARIO ");
        lcd_gotoxy(0,1);
        lcd_putsf("  5103002051   ");

loop:
        while (tombol3 == 1);

        delay_ms(300);
```

```
lcd_clear();

lcd_gotoxy(0,0);
lcd_putsf("   Pilih Koil   ");
lcd_gotoxy(0,1);
lcd_putsf("Untuk Pengetesan");

while (tombol3 == 1);

delay_ms(300);
lcd_clear();

lcd_gotoxy(1,0);
lcd_putsf("1.Shogun125R");
lcd_gotoxy(1,1);
lcd_putsf("2.Smash 110");

while ((tombol1 == 1) && (tombol2 == 1));          // nunggu jika tombol1 dan
tombol 2 belum ditekan

        if (tombol1==0) {
                lcd_gotoxy(0,0);
                lcd_putsf(" Koil Shogun125R ");
                lcd_gotoxy(0,1);
                lcd_putsf("   tekan START   ");
                pembanding_min = 50;
                pembanding_max = 80;
        }

        else if (tombol2==0) {
                lcd_gotoxy(0,0);
                lcd_putsf(" Koil Smash 110  ");
                lcd_gotoxy(0,1);
                lcd_putsf("   tekan START   ");
                pembanding_min = 110;
                pembanding_max = 180;
        }


while (tombol3 == 1);

delay_ms(300);
lcd_clear();
```

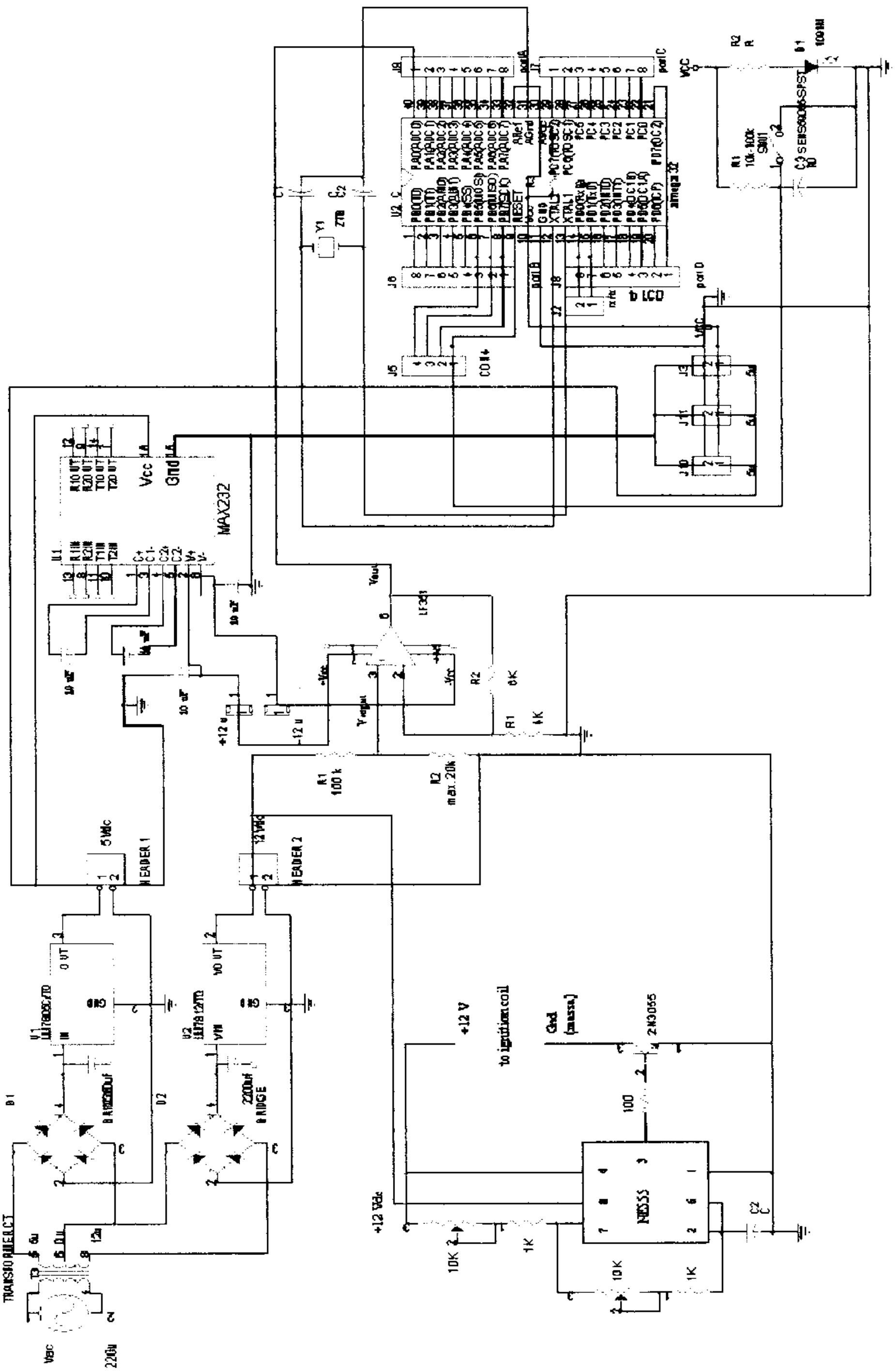
```
    lcd_gotoxy(0,0);
    lcd_putsf("R =");
    lcd_gotoxy(0,1);

    sprintf(lcd_buffer,"STD:%i K - %i K ", pembanding_min/10,
pembanding_max/10);
    lcd_puts(lcd_buffer);

    sum = 0;
    for (k=0;k<20;k++) {
        sum = sum + read_adc(0);
        delay_ms(1);
    }
    mean = sum/2;
    volt = (unsigned int) mean*5/256;
    sz =  (1000*volt)/(295-volt);
    for (k=0;k<10;k++) {
        szArray[k] = sz;
    }

while (tombol3 == 1)
   {

        szSum = 0;
        for (k=9;k>0;k--) {
            szArray[k] = szArray[k-1];
            szSum = szSum + szArray[k];
        }

        sum = 0;
        for (k=0;k<20;k++) {
            sum = sum + read_adc(0);
            delay_ms(1);
        }
        mean = sum/2;


        lcd_gotoxy(4,0);

        volt = (unsigned int) mean*5/256;
```

```
        szArray[0] =  (1000*volt)/(295-volt);
        szSum = szSum + szArray[0];

        sz = szSum/10;

        if (sz<190) {

              lcd_putchar(((sz % 1000) / 100) + 0x30);
              lcd_putchar(((sz % 100) / 10) + 0x30);
              lcd_putchar('.');
              lcd_putchar((sz % 10)  + 0x30);
              lcd_putchar(' ');
              lcd_putchar('K');
        }
        else {
              lcd_putsf(">19 K     ");
        }

        delay_ms(300);



};

  lcd_clear();

  lcd_gotoxy(0,0);
  if ((sz >= pembanding_min) && (sz <= pembanding_max))
        {       lcd_putsf("Kualitas = bagus");

        }
  else
        {       lcd_putsf("Kualitas = buruk"); }

  lcd_gotoxy(0,1);
  if (sz<190) {
        lcd_putsf("R Coil = ");

        lcd_putchar(((sz % 1000) / 100) + 0x30);
        lcd_putchar(((sz % 100) / 10) + 0x30);
        lcd_putchar('.');
        lcd_putchar((sz % 10)  + 0x30);
        lcd_putchar(' ');
```

```
        lcd_putchar('K');
    }
    else {
        lcd_putsf("R Coil = >19 K     ");
    }

    delay_ms(300);

    goto loop;

}
```

LAMPIRAN D

RANGKAIAN LENGKAP



National Semiconductor

December 1995

LF351 Wide Bandwidth JFET Input Operational Amplifier

General Description

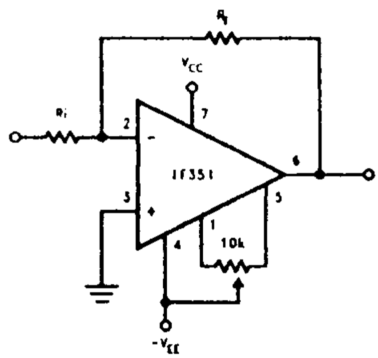
The LF351 is a low cost high speed JFET input operational amplifier with an internally trimmed input offset voltage (BI-FET II™ technology). The device requires a low supply current and yet maintains a large gain bandwidth product and a fast slew rate. In addition, well matched high voltage JFET input devices provide very low input bias and offset currents. The LF351 is pin compatible with the standard LM741 and uses the same offset voltage adjustment circuitry. This feature allows designers to immediately upgrade the overall performance of existing LM741 designs.

The LF351 may be used in applications such as high speed integrators, fast D/A converters, sample-and-hold circuits and many other circuits requiring low input offset voltage, low input bias current, high input impedance, high slew rate and wide bandwidth. The device has low noise and offset voltage drift, but for applications where these requirements are critical, the LF356 is recommended. If maximum supply current is important, however, the LF351 is the better choice.

Features

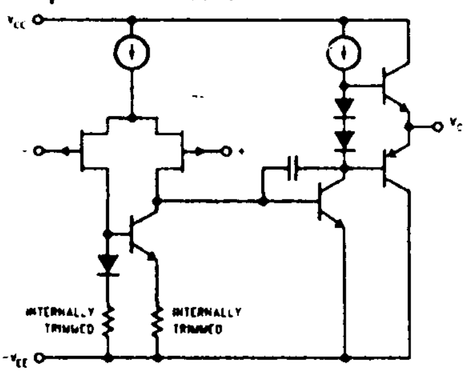
- Internally trimmed offset voltage — 10 mV
- Low input bias current — 50 pA
- Low input noise voltage — 25 nV/$\sqrt{Hz}$
- Low input noise current — 0.01 pA/$\sqrt{Hz}$
- Wide gain bandwidth — 4 MHz
- High slew rate — 13 V/μs
- Low supply current — 1.8 mA
- High input impedance — $10^{12}\Omega$
- Low total harmonic distortion $A_V = 10$, $R_L = 10k$, $V_O = 20$ Vp-p, BW = 20 Hz–20 kHz — $<0.02\%$
- Low 1/f noise corner — 50 Hz
- Fast settling time to 0.01% — 2 μs

Typical Connection



TL/H/5648-11

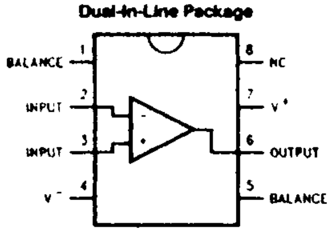
Simplified Schematic



TL/H/5648-12

Connection Diagrams

Dual-In-Line Package



TL/H/5648-13

Order Number LF351M or LF351N
See NS Package Number M08A or N08E

RRD-B30M115/Printed in U. S. A.

olute Maximum Ratings

tary/Aerospace specified devices are required, contact the National Semiconductor Sales /Distributors for availability and specifications.

Voltage	±18V
Dissipation (Notes 1 and 6)	670 mW
ting Temperature Range	0°C to +70°C
)	115°C
ntial Input Voltage	±30V
Voltage Range (Note 2)	±15V
Short Circuit Duration	Continuous
e Temperature Range	65°C to +150°C
Temp. (Soldering, 10 sec.)	
al Can	300°C
	260°C

θ_{jA}	
N Package	120°C/W
M Package	TBD
Soldering Information	
Dual-In-Line Package	
Soldering (10 sec.)	260°C
Small Outline Package	
Vapor Phase (60 sec.)	215°C
Infrared (15 sec.)	220°C

See AN-450 "Surface Mounting Methods and Their Effect on Product Reliability" for other methods of soldering surface mount devices.

ESD rating to be determined.

Electrical Characteristics (Note 3)

ool	Parameter	Conditions	LF351 Min	LF351 Typ	LF351 Max	Units
	Input Offset Voltage	$R_S = 10\ k\Omega$, $T_A = 25°C$		5	10	mV
		Over Temperature			13	mV
/ΔT	Average TC of Input Offset Voltage	$R_S = 10\ k\Omega$		10		μV/°C
	Input Offset Current	$T_j = 25°C$, (Notes 3, 4)		25	100	pA
		$T_j \le 70°C$			4	nA
	Input Bias Current	$T_j = 25°C$, (Notes 3, 4)		50	200	pA
		$T_j \le +70°C$			8	nA
	Input Resistance	$T_j = 25°C$		10^{12}		Ω
	Large Signal Voltage Gain	$V_S = \pm 15V$, $T_A = 25°C$ $V_O = \pm 10V$, $R_L = 2\ k\Omega$	25	100		V/mV
		Over Temperature	15			V/mV
	Output Voltage Swing	$V_S = \pm 15V$, $R_L = 10\ k\Omega$	±12	±13.5		V
	Input Common-Mode Voltage Range	$V_S = \pm 15V$	±11	+15		V
				−12		V
ι	Common-Mode Rejection Ratio	$R_S \le 10\ k\Omega$	70	100		dB
	Supply Voltage Rejection Ratio	(Note 5)	70	100		dB
	Supply Current			1.8	3.4	mA

AC Electrical Characteristics (Note 3)

Symbol	Parameter	Conditions	LF351			Units
			Min	Typ	Max	
SR	Slew Rate	$V_S = \pm 15V$, $T_A = 25°C$		13		V/μs
GBW	Gain Bandwidth Product	$V_S = \pm 15V$, $T_A = 25°C$		4		MHz
e_n	Equivalent Input Noise Voltage	$T_A = 25°C$, $R_S = 100\Omega$, $f = 1000$ Hz		25		$nV/\sqrt{Hz}$
i_n	Equivalent Input Noise Current	$T_j = 25°C$, $f = 1000$ Hz		0.01		$pA/\sqrt{Hz}$

Note 1: For operating at elevated temperature, the device must be derated based on the thermal resistance, θ_{jA}

Note 2: Unless otherwise specified the absolute maximum negative input voltage is equal to the negative power supply voltage.

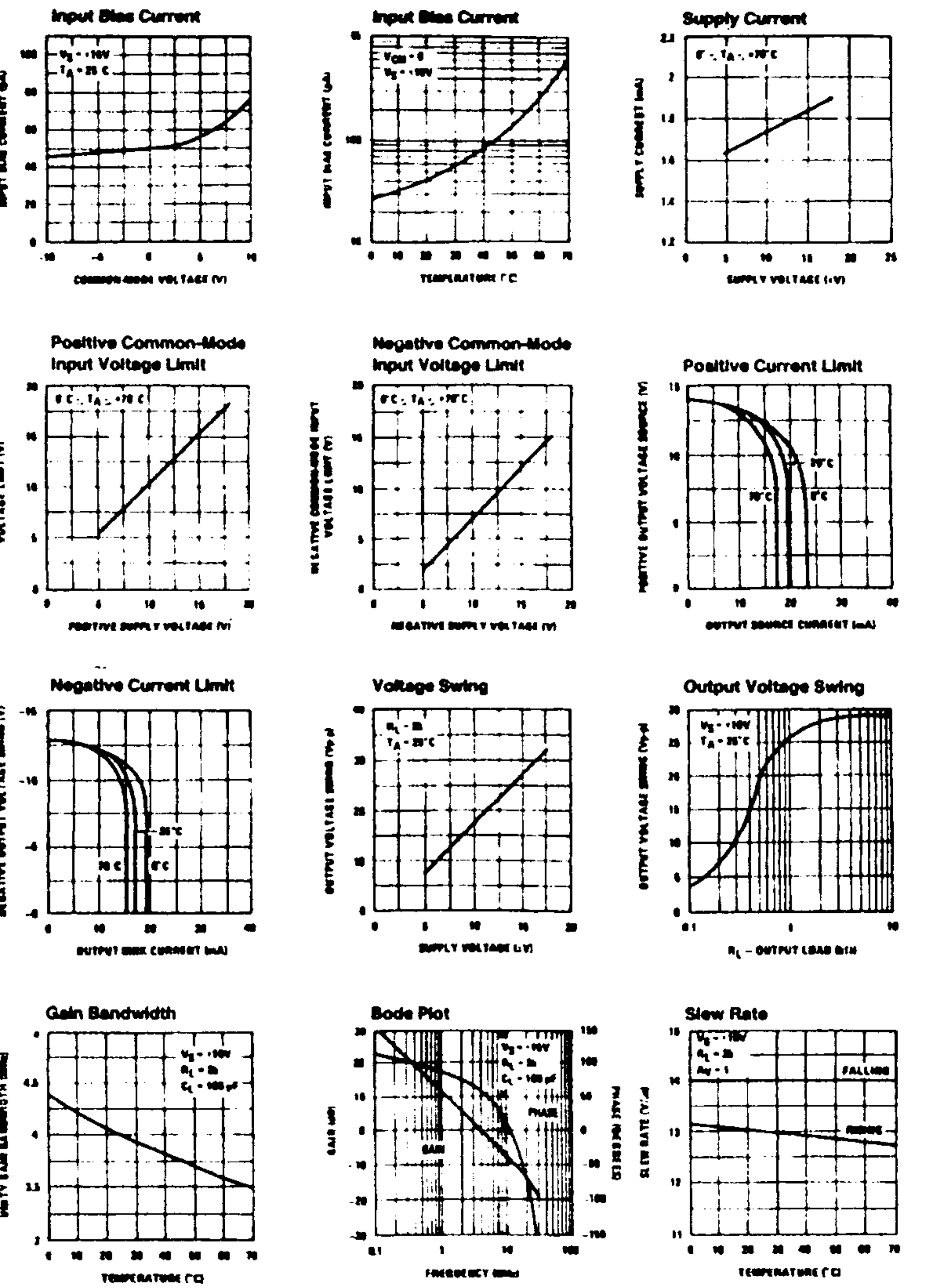
Note 3: These specifications apply for $V_S = \pm 15V$ and $0°C \leq T_A \leq +70°C$. V_{OS}, I_B and I_{OS} are measured at $V_{CM} = 0$

Note 4: The input bias currents are junction leakage currents which approximately double for every 10°C increase in the junction temperature, T_j. Due to the limited production test time, the input bias currents measured are correlated to junction temperature. In normal operation the junction temperature rises above the ambient temperature as a result of internal power dissipation, P_D. $T_j = T_A + \theta_{jA} P_D$ where θ_{jA} is the thermal resistance from junction to ambient. Use of a heat sink is recommended if input bias current is to be kept to a minimum.

Note 5: Supply voltage rejection ratio is measured for both supply magnitudes increasing or decreasing simultaneously in accordance with common practice. From $\pm 15V$ to $\pm 5V$.

Note 6: Max. Power Dissipation is defined by the package characteristics. Operating the part near the Max. Power Dissipation may cause the part to operate outside guaranteed limits.

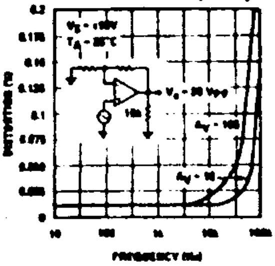
pical Performance Characteristics



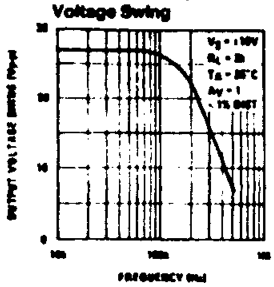
TL/H/5648-2

Typical Performance Characteristics (Continued)

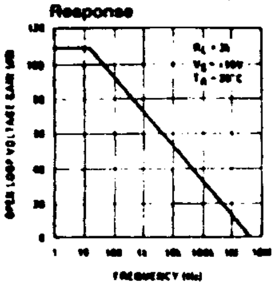
Distortion vs Frequency



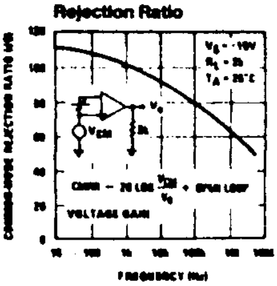
Undistorted Output Voltage Swing



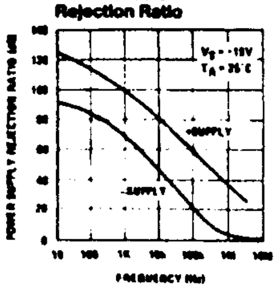
Open Loop Frequency Response



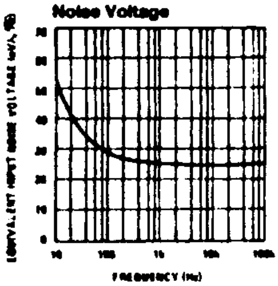
Common-Mode Rejection Ratio



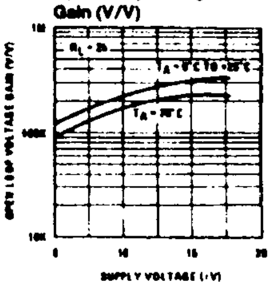
Power Supply Rejection Ratio



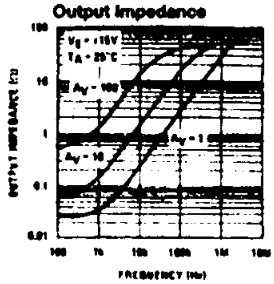
Equivalent Input Noise Voltage



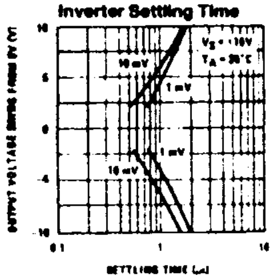
Open Loop Voltage Gain (V/V)



Output Impedance



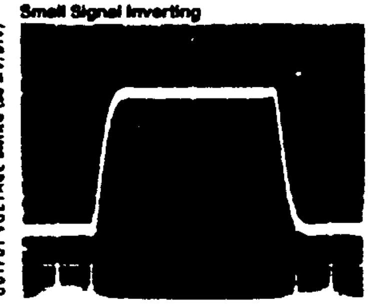
Inverter Settling Time



TL/H/5648-3

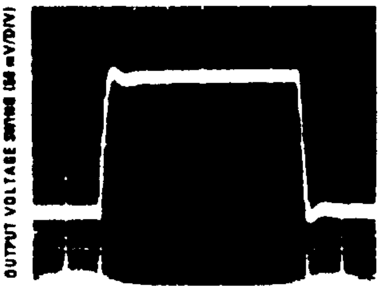
e Response

Small Signal Inverting



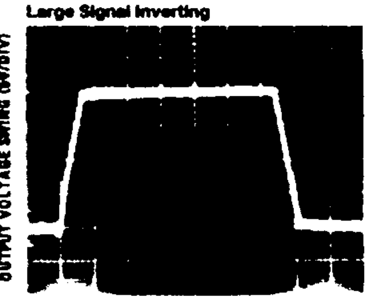
TL/H/5648-4

Small Signal Non-Inverting



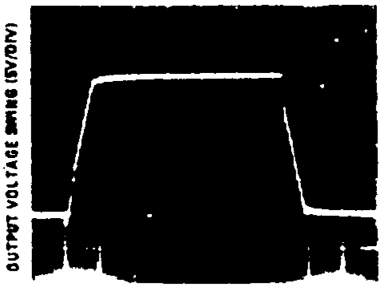
TL/H/5648-5

Large Signal Inverting



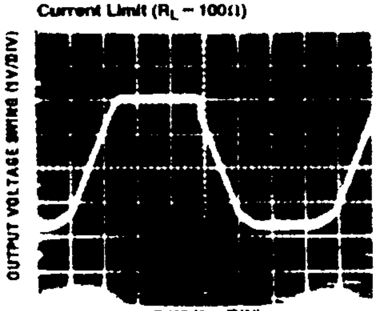
TL/H/5648-6

Large Signal Non-Inverting



TL/H/5648-7

Current Limit (R_L = 100Ω)



TL/H/5648-8

lication Hints

F351 is an op amp with an internally trimmed input voltage and JFET input devices (BI-FET II™). These have large reverse breakdown voltages from gate to and drain eliminating the need for clamps across the Therefore, large differential input voltages can easily ommodated without a large increase in input current. aximum differential input voltage is independent of pply voltages. However, neither of the input voltages be allowed to exceed the negative supply as this will cause large currents to flow which can result in a destroyed unit.

Exceeding the negative common-mode limit on either input will force the output to a high state, potentially causing a reversal of phase to the output.

Exceeding the negative common-mode limit on both inputs will force the amplifier output to a high state. In neither case does a latch occur since raising the input back within the

Application Hints (Continued)

common-mode range again puts the input stage and thus the amplifier in a normal operating mode.

Exceeding the positive common-mode limit on a single input will not change the phase of the output; however, if both inputs exceed the limit, the output of the amplifier will be forced to a high state.

The amplifier will operate with a common-mode input voltage equal to the positive supply; however, the gain bandwidth and slew rate may be decreased in this condition. When the negative common-mode voltage swings to within 3V of the negative supply, an increase in input offset voltage may occur.

The LF351 is biased by a zener reference which allows normal circuit operation on ±4V power supplies. Supply voltages less than these may result in lower gain bandwidth and slew rate.

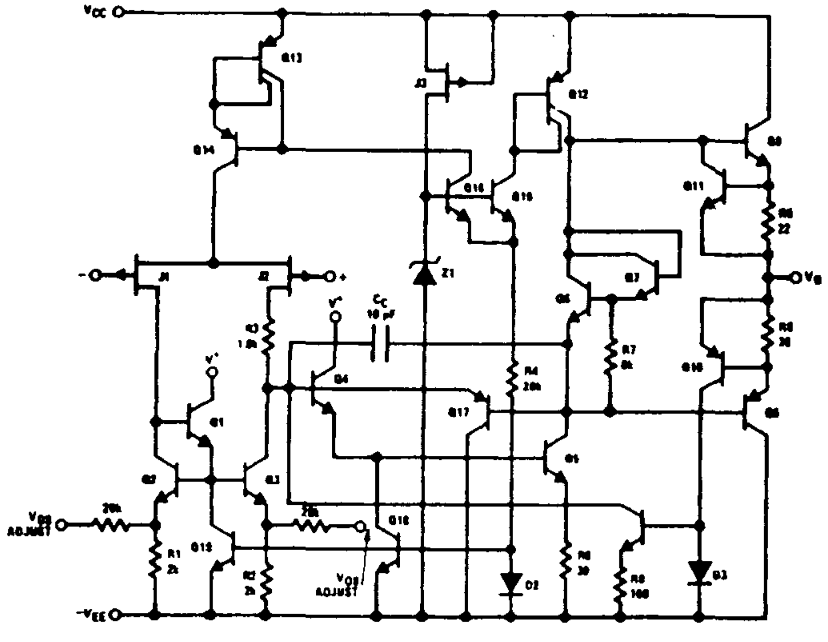
The LF351 will drive a 2 kΩ load resistance to ±10V over the full temperature range of 0°C to +70°C. If the amplifier is forced to drive heavier load currents, however, an increase in input offset voltage may occur on the negative voltage swing and finally reach an active current limit on both positive and negative swings.

Precautions should be taken to ensure that the power supply for the integrated circuit never becomes reversed in polarity or that the unit is not inadvertently installed backwards in a socket as an unlimited current surge through the resulting forward diode within the IC could cause fusing of the internal conductors and result in a destroyed unit.

As with most amplifiers, care should be taken with lead dress, component placement and supply decoupling in order to ensure stability. For example, resistors from the output to an input should be placed with the body close to the input to minimize "pick-up" and maximize the frequency of the feedback pole by minimizing the capacitance from the input to ground.

A feedback pole is created when the feedback around any amplifier is resistive. The parallel resistance and capacitance from the input of the device (usually the inverting input) to AC ground set the frequency of the pole. In many instances the frequency of this pole is much greater than the expected 3 dB frequency of the closed loop gain and consequently there is negligible effect on stability margin. However, if the feedback pole is less than approximately 6 times the expected 3 dB frequency a lead capacitor should be placed from the output to the input of the op amp. The value of the added capacitor should be such that the RC time constant of this capacitor and the resistance it parallels is greater than or equal to the original feedback pole time constant.

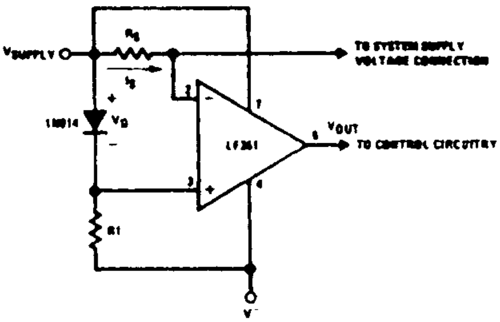
Detailed Schematic



TL/H/5648-9

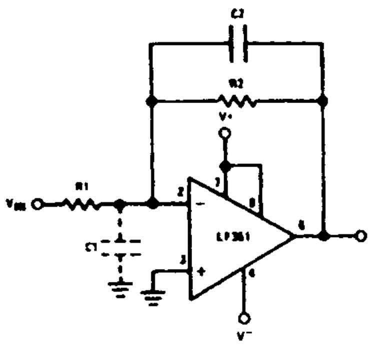
Typical Applications

Supply Current Indicator/Limiter



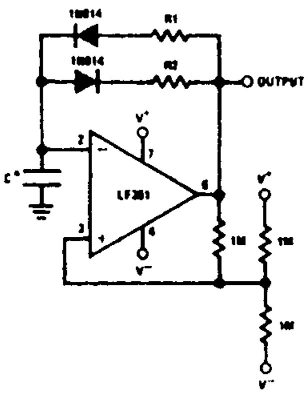
• V_{OUT} switches high when $R_S I_S > V_D$

Hi-Z$_{IN}$ Inverting Amplifier



Parasitic input capacitance C1 ≈ (3 pF for LF351 plus any additional layout capacitance) interacts with feedback elements and creates undesirable high frequency pole. To compensate, add C2 such that R2C2 ≈ R1C1.

Ultra-Low (or High) Duty Cycle Pulse Generator



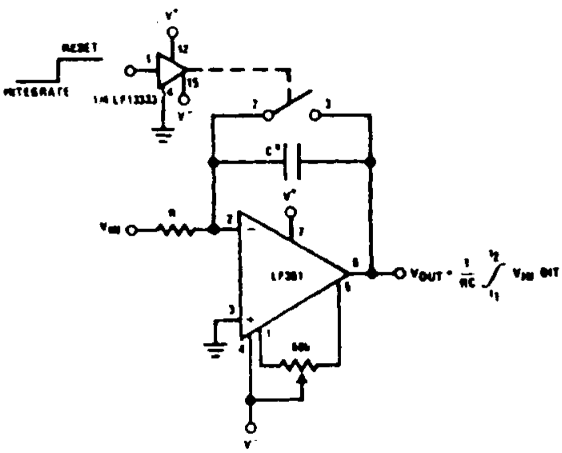
• $t_{OUTPUT\ HIGH} \approx R1C\ \ell n \frac{4.8 - 2V_S}{4.8 - V_S}$

• $t_{OUTPUT\ LOW} \approx R2C\ \ell n \frac{2V_S - 7.8}{V_S - 7.8}$

where $V_S = V^+ + |V^-|$

*low leakage capacitor

Long Time Integrator



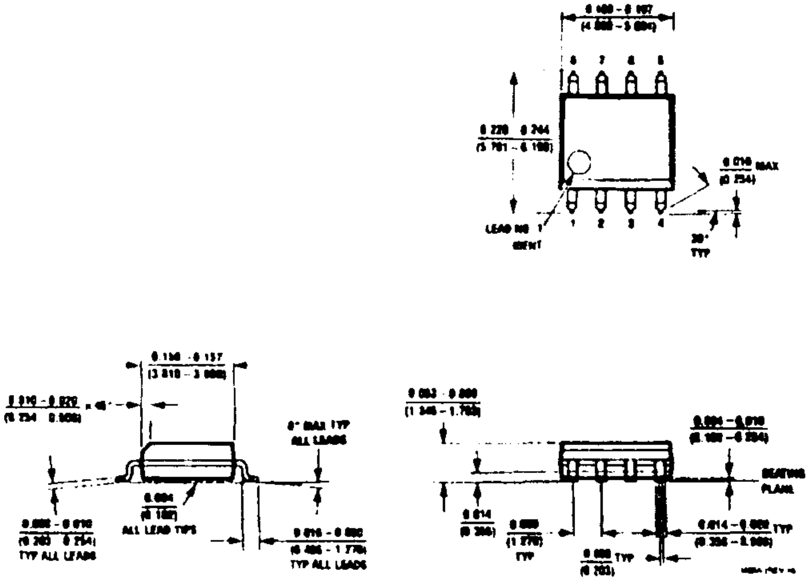
$V_{OUT} = \frac{1}{RC}\int_{t_1}^{t_2} V_{IN}\, dt$

TL/H/5646-10

*Low leakage capacitor

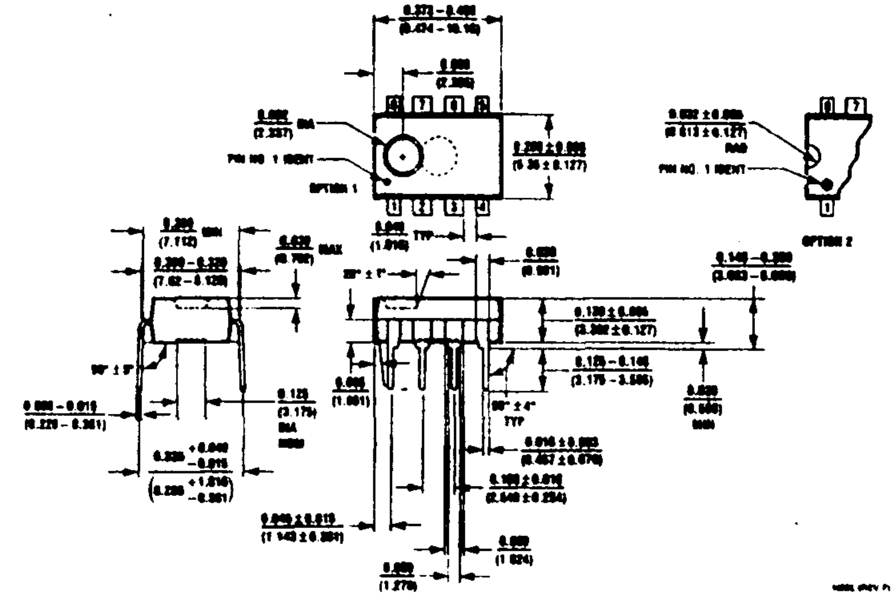
• 50k pot used for less sensitive V_{OS} adjust

Physical Dimensions inches (millimeters)



SO Package (M)
Order Number LF351M
NS Package Number M08A

Physical Dimensions inches (millimeters) (Continued)



Molded Dual-In-Line Package (N)
Order Number LF351N
NS Package Number N08E

LIFE SUPPORT POLICY

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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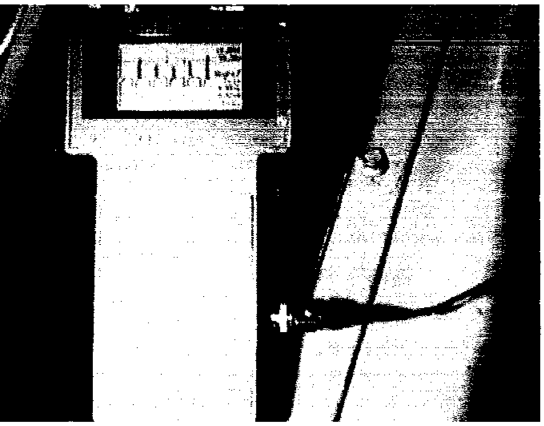
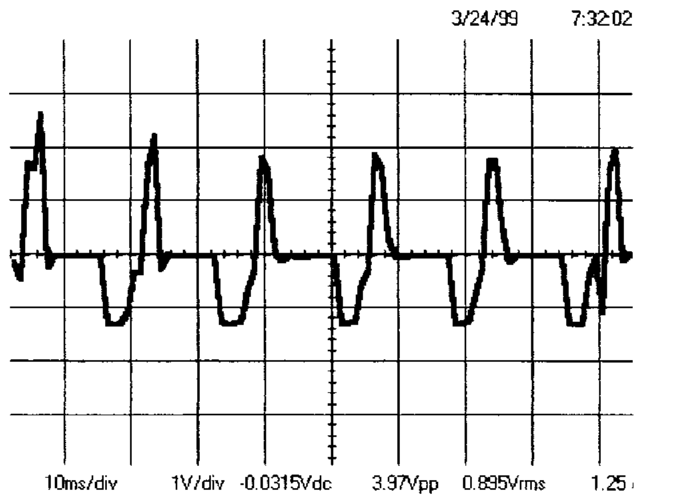
OLD BURB CLUB

Ignition System Problems

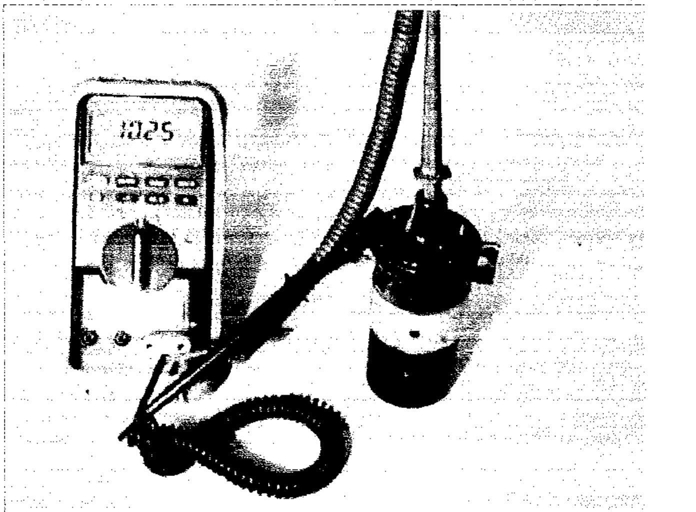


ample of a running engine at idle (my 400, of course) is looking at the tachometer line of the HEI ignition em. A standard ignition doesn't look all that different se the points do the same job as the module in an HEI IEI has the coil as part of the cap to reduce spark loss. l it keeps the coil away from engine heat better. The ching transistors in the module make for a faster coil pse and hotter spark then mechanically moving points Points also move position, and build up arc material on the contacts, reducing efficiency.



The wave form of the tachometer output line of the HEI. T lower valleys are the voltage sags as the coil draws curren during buildup of inductive charge, and the tall spikes are coil's discharge kickback. This happens at 55 cycles per second (18 milliseconds apart) at an idle speed of 900 RP in this engine. These pulses on the coil's minus side are wh a tachometer counts and displays as RPM.

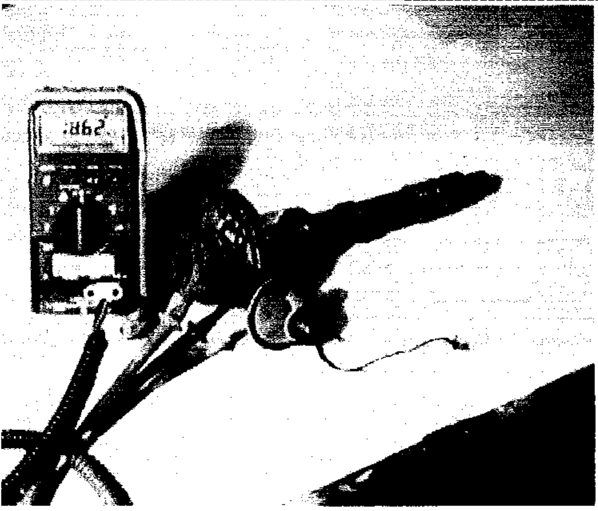
g a standard ignition coil. Set the meter for ohms, and re across the plus (+) and minus (-) terminals. It should tween 1.5 and 2.0 ohms. This one is 1.6 ohms. Measure each terminal to the coil's case also. The meter should

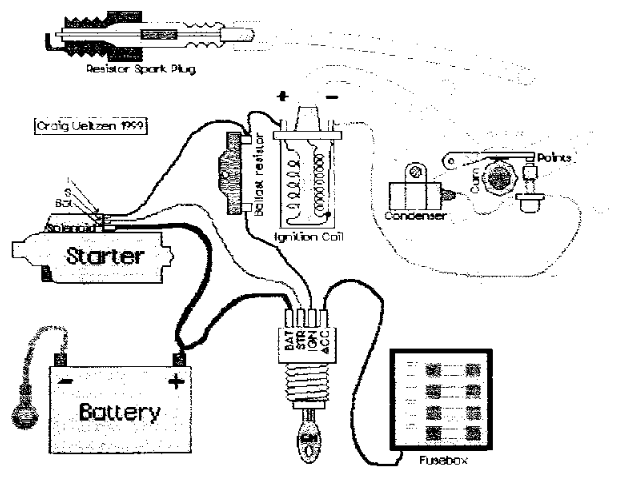


Measure from the coil's minus (-) to the inside of the tower should be several thousand ohms, and at least 4,000 minimum. This one is 10.25k ohms. (10,250 ohms) If it measures more than 40,000, the coil is bad. (unless it's a

NOT read anything here.

special high output coil like an Accel) Measure from the terminal to the coil's case also. The meter should NOT re: anything. An ignition coil is called an autotransformer. Th just means the coils are tied to a common point. In this ca the - terminal





…t click and select "View image" for a better look. …ng the condenser. (capacitor) Open the points and set …neter on ohms. The meter should start out at several …ms and drop to 0, then start rising again. Reverse the …and it should do the same again. A steady low reading …ns a shorted condenser. No reading at all, (OL on a …tol) means an open condenser. A condenser is a 0.25 …ofarad (approx) capacitor with high voltage and heat …ts. It absorbs the reverse kick-back from the coil as the … begin to open. If the condenser is open, the points will …r as they open up and the engine will have weak if any …, because the coil's current falls off too slowly. If the …s aren't all that old, but have massive contact buildup, …ng bad. If it's shorted, it's the same as points that aren't …ning at all. If the engine runs but won't rev up past a …n RPM, the advance plate may have loose rivets and is moving around.

Right click and select "View image" for a better look. This is the entire ignition system on most older vehicles. T… key switch has an IGN terminal that stays powered in eve… position except OFF. The ACC powers in the ACC and O… positions, and is OFF during START. The START power… the starter solenoid. The I terminal on the starter bypasses … ballast resistor during starting to increase the spark. The ballast resistor is about 2 - 4 ohms and reduces the total current to the coil to prevent overheating. During startup … battery voltage can drop very low, and the coil may not ev… produce spark without the starter's bypass terminal. The running engine will measure about 4 to 7 volts on the coil terminal. This is normal due to the resistor. The distributo… function is to position the rotor somewhere in the middle … the cap terminal during cylinder sparking. When things a… right, the rotor moves in position, then the spark jumps t… gap as the points open. Harley Davidsons don't have a distributor because both plugs fire at the same time, the ot… cylinder is in it's exhaust stroke and doesn't care. More cylinders need better coordination than that, hence the distributor.

Intermittent Stalling

…roblem drives most people crazy. It shuts off when …down the road, then mysteriously starts running again …ay run for minutes or hours before the next stallout. My …nd true way to find it is to get 2 test lights. Run wires …he + and - terminals of the coil into the cab. Extend …f necessary. Have a friend hold the lights and then go …ive. The light on the + side will be steady, and the - …ll be dim and/or flickering. This is normal. Have the …watch the lights like a hawk. When the ignition cuts …e which light goes out.

…the flickering light (- terminal): Look for shorts in the …utor, bare spots in the wire leading to it, points that are … far from the cam to open, or a bad condenser. If it has

Hard Starting

There can be several things that cause this, but 9 out of 10 times it isn't the carburetor. I can't count the times I've see… someone start turning the idle jets when the truck won't fir… up. Spare me please

A bad or missing resistor bypass line can do it. Put a test light on the + side and watch it during starts. If the light al… but goes out, use a clip lead to connect straight to the batte… for full coil power as a test.

A failing condenser will cause weak spark.

If the distributor was removed, it may have been put in wrong. Yes, it can make a difference where it lands as it's reinstalled. If it's too far off, the coil will fire during correc… timing with the rotor all but out of position. If it's a half …

oints, one set may set so close that they are
ttently not opening.

steady light goes out (+ terminal) Look for shorts or
m the + wire. Typically, the wire leading to the starter
nto the manifold and intermittently shorts, kills the
hen it moves away again. The ballast resistor may be
he firewall connector may be loose. It could also be a
ition switch

lights stay on, or go out at the same time, then the
s a heat failure problem. Replace it. They heat up, then
ttently for a few minutes

away from the cap terminal, it will either not fire, not start easily, or rev up much if it does start. If you can't seem to time it, pull it out and start over with TDC and then reset i in the hole.

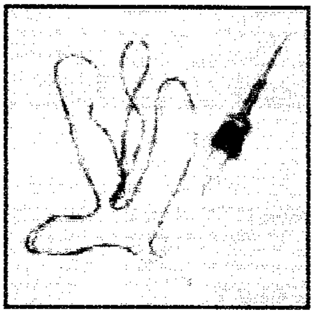
Bad spark plug wires are not too uncommon, but they don't all fail at once! They degrade over time, but not catastrophically and all 8 (or 6), same for plugs. Measure t wires. They should be several thousand ohms depending or the type used. They should be within 10% of each other though.

Buildup on the points will cause the timing to move off, an if it's bad enough, the points will fail to switch anymore.

ELECTRICAL TROUBLE SHOOTING

Prove all things; hold fast that which is good.
1 Thessalonians 5:21

Electrical problems can pop up at any time and can seem hard to fix but they really aren't. Most of the time, anyway. Most everything can be "Proved" (tested) with an Ohmmeter and a some things can be proved with a simple circuit tester.

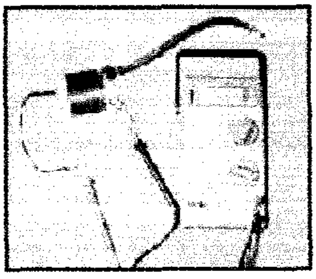


can get a good cheap ohmmeter, sometimes called a meter, from a hardware store or an auto parts store. They generally run about)0. If you want, you can pay hundreds of dollars for one, but for the tests we will rforming, a cheap one will work just fine.

hmmeter sends a very low power electrical charge through a wire and measures much resistance there is in the wire to the charge going through it. This ance is measured in Ohms. Your shop manual will give you the correct ance for each wire that you test. The multimeter will measure a bunch of ent things such as ohms, DC volts, AC volts, etc. Here are a few of the basic They are all performed at room temperature (70 degrees or so). The word inuity means voltage is passing through the wire from one end to the other. No inuity means the wire is broken and voltage is NOT passing through it. Also, if iy something is wired in parallel, it means they are wired side by side. If two 12 batteries are wired parallel, the negative terminals would be wired together. vise for the positive terminals. This would still give us a 12 volt battery, only r. If something is wired in series, it means they are wired one after the other in . The two 12 volt batteries would be wired positive to negative, giving us one lt battery.

op manual will be very handy to give you the Specifications on the different and wires. It also will have a wiring diagram, that will give you the different s of the wires you are going to want to test. Most of the specifications I give are just general ones to get you in the ball park. The Shop Manual will give you xact ones.

re you do any testing make sure you have a fully charged battery, if there is a ry, in the bike you intend to test. Just because it will start and run without the ry DOESN'T mean it will run right. Time after time guys will bring a bike in ay "It runs good and then it don't. Misses on one side then the miss changes to ther side." Some of them just will not believe it's a bad battery or the wrong size ry. "But it runs." they say, "It just can't be the battery." But it can be the battery. ieeds a battery, and you take the battery out of the system, things can charge, overheat and burn out. If the system calls for a battery, make sure a good fully charged, is in there. The only time this would not be true, is when the ion System is a magneto and the battey is only used to run the horn and tail Now when I say "The right size of battery" I mean the battery must have gh amps to run all the things you want to test. If you don't have the right battery, can use a big, fully charged battery, say from a car, BUT it MUST have the right ge (6 or 12) and you MUST use big, thick jumper cables. DO NOT connect the ers to the old dead battery. Take the old, dead battery completely out of the Connect the positive jumper cable to the positive cable on the bike. Connect egative to a good ground on the bike. Now you can run your electrical tests. The hat the battery is a lot bigger then the stock bike battery will not hurt anything. electrical components on the bike will only draw the powerr they need from the ry. The battery will not "Over Power" the components as long as the it is of the ct voltage. If you leave the old, dead battery in the system, it will try to pull r from the bigger battery. At best this will throw your electrical tests off. At t the battery can BLOW UP ! Usually, small bike batteries don't blow up... but, take the chance ?



ion coils. Measure the resistance between the primary -tension) wire and ground or ground terminal. It should be low. Like .5 to 1.5 Ohms. The primary wire is the small going to the CDI box or points. Next measure the ndary (high-tension) wire and ground. (Note that on most these days, the coil mounting bar, that passes through the and mounts it to the frame, is the ground for the coil primary and secondary .) This should be quite high, like 6000 to 13000 ohms. If the coil is out side the given in the shop manual the coil might be bad. Sometimes, a coil will work when cool but fail when it warms up. Let them cool and they work again. They machines that will test coils under load. They are nice to have but can be y. Remember to take the plug cap off for the test. The cap can add 300 ohms ance.

MISI + RANTAI PENGGERAK

BAGIAN		STANDAR		BATASAN
dingan reduksi awal		3,409 (75/22)		------------
dingan reduksi akhir		2,428 (34/14)		------------
dingan gear	Rendah	2,909 (32/11)		------------
-	Ke - 2	1,785 (25/14)		------------
	Ke - 3	1,294 (22/17)		------------
	Top	1,052 (20/19)		------------
gangan garpu		No.1, No.2	0,1-0,3	0,50
lah celah			------------	------------
cellah garpu pemindah		No.1, No.2	4.5-4.6	------------
lan garpu pemindah		No.1, No.2	4,3-4,4	------------
penggerak		Tipe	DAIDO-DID428	------------
		Jumlah Mata	100 Mata	------------
		Panjang 20 PITCH	------------	259
ngan rantai		15-25		------------

RATOR

BAGIAN		SPESIFIKASI
arburator		MIKUNI VM 18 SS
er karburator		18 mm
		20G0
er		1,400 ± 100 r/min
pelampung		16,0 ± 1,0 mm
t		# 97,5
r jet	(MAJ)	1,6 ± 1,0 mm
dle	(JN)	4 HP 49-2
jet	(NJ)	D-8
ay	(CA)	# 45
	(PJ)	# 12,5
tlet	(PO)	0,7 mm
udara	(PAS	1 ½ Put. balik
eat	(VS)	1,5 mm
jet	(GS)	# 22,5
nain kabel gas		3 - 4 mm

TRIKAN

BAGIAN		SPESIFIKASI
engapian		10° Seb.TMA dibawah 1.500 RPM.
	Type	NGK.C 6 HS
		ND.U 20 FS-U
	Gap	0,6-0,7 mm

BAGIAN	SPESIFIKASI		CATATAN
ya Pengapian	Lebih dari 8 pada 1 atm		
hanan Kumparan pengapian	Primary	(+) tap - massa 0,3 - 0,5 Ω	
	Secondary	Cap busi-massa 5 - 8 kΩ	
gangan primer	Lebih dari 130 V	⊕ massa, ⊖ P/B	
gangan pick up coil	Lebih dari 4 V	⊕ Hi/P ⊖ B/K	
hanan kumparan magnit	Penerangan	K/P - H/P 0,3 - 1,5 Ω	
	Pengisian	P/M - H/P 0,5 - 2,0 Ω	
	Pick Up	Hi/P - B/K 180 - 280 Ω	
gangan Regulator	13,0 - 16,0 V pada 5.000 r/min		Wkt malam
tere	Tipe	FT Z 5S	FD 125 XD, XDS
	Kapasitas	12 V 3,5 Ah/10 HR	
	Standar Berat Jenis Elektrolit	1,33 pada 20°C	
	Tipe	YT Z 3	FD 125 XC / XCS
	Kapasitas	12 V 2,5 Ah/10 HR	
	Standar Berat Jenis Elektrolit	1,32 pada 20°C	
kering	Utama	10 A	

A

BAGIAN		SPESIFIKASI
npu Utama	Jauh	25 x 2
	Dekat	25 x 2
npu belakang / rem		5/18
npu sein		10
npu indikator sein		LED
npu speedometer		LED
npu Indikator sein		1,4
npu indicator		LED
npu indicator posisi gigi		LED

1 + RODA

BAGIAN	STANDAR	BATASAN
ak main tuas rem (tipe tromol)	15 - 25	-------------
ak main pedal rem	15 - 25	-------------
tebalan kampas rem	---------------	1,5
tebalan cakram rem	3,5 ± 0,2	3
nyimpangan cakram rem	---------------	0,30

Smash 110

ANSMISI + RANTAI PENGGERAK

BAGIAN	STANDAR		BATASAN
Perbandingan reduksi awal	3.666 (77/21)		——
Perbandingan reduksi akhir	2.428 (34/14)		——
Perbandingan gear Rendah	3.000 (33/11)		——
Ke - 2	1.875 (30/16)		——
Ke - 3	1.368 (26/19)		——
Top	1.052 (20/19)		——
Kerenggangan garpu	No.1, No.2	0.1-0.3	0.50
pemindah celah		——	——
Lebar cellah garpu pemindah	No.1, No.2	4.5-4.6	——
Ketebalan garpu pemindah	No.1, No.2	4.3-4.4	——
Rantai penggerak	Tipe	DAIDO-DID428	——
	Panjang	98	——
	Panjang 2- PITCH		259
Ketegangan rantai	15-25		——

RBURATOR

BAGIAN		SPESIFIKASI
enis karburator		MIKUNI VM 17 SS
Diameter karburator		17 mm
lo. I.D		09G1
tationer		1500 ± 100 r/min
inggi pelampung		16.0 ± 1.0 mm
lain jet		# 92.5
lain air jet	(MAJ)	1.6 mm
et needle	(JN)	4PAII-2
leedle jet	(NJ)	E-0
ut away	(CA)	# 45
ilot jet	(PJ)	# 12.5
ilot outlet	(PO)	0.8 mm
etelan udara	(PAS	$1^5/_8$ Put. balik
alve seat	(VS)	1.5 mm
tarter jet	(GS)	# 22.5
arak main kabel gas		2-4 mm

LISTRIKAN

BAGIAN		SPESIFIKASI
aat pengapian	15° Seb.TMA dibawah 1500 RPM.	
usi	Type	NGK.C 6 HS
		ND.U 20 FS-U
	Gap	0.6-0.7 mm

BAGIAN	SPESIFIKASI		CATATAN
gapian	Lebih 8 pada 1 atm		
Kumparan pengapian	Primary	(+) tap - massa 0.3 - 1.1 Ω	
-	Secondary	Gap busi-massa 11 - 18 k Ω	
umparan magnit	Penerangan	K/P - H/P 0.3 - 1.5 Ω	
	Pengisian	P/M - H/P 0.5 - 2.0 Ω	
	Pick Up	Hi/P - B/K 180 - 280 Ω	
Regulator	13.0 - 16.0 V pada 5000 r/min		Wkt malam
	Tipe	YB5L - B	
	Kapasitas	12V 5A h/10HR	
	Standar	1.28 pada 20°C	
	Pusat	10 A	

BAGIAN		SPESIFIKASI
ma	Jauh	32
	Dekat	32
akang / rem		5/18
n 5/18		10
ikator sein		1.7
eedometer		3
likator sein		1.7
licator		1.7
licator posisi gigi		1.7

ODA

BAGIAN	STANDAR	BATASAN
n tuas rem (tipe tromol)	15 - 25	————
n pedal rem	15 - 25	————
kampas rem	————	1.5
cakram rem	4 ± 0.2	3
ngan cakram rem	————	0.30

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