

# Ignition System

## Description

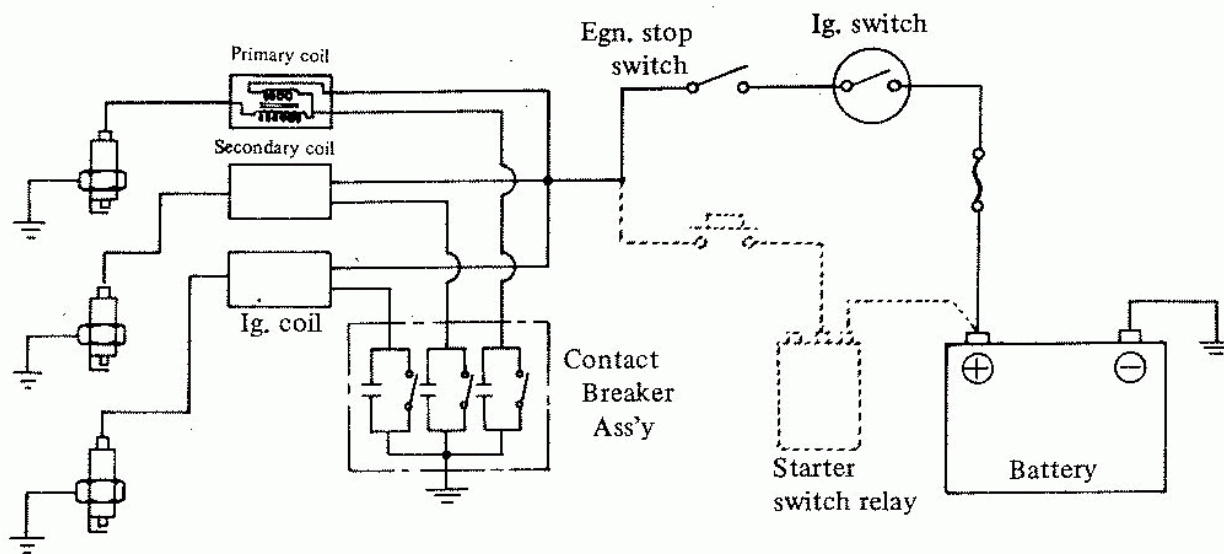


Fig. 10-35 GT750 ignition system wiring diagram

The ignition system consists of the contact breaker assembly, three ignition coils, three spark plugs, an ignition switch and a battery. The contact breaker assembly is located on the engine left side and made up of each three contact points and condensers on the stator base, which are marked with „L“, „C“ and „R“ corresponding to the cylinder location, and the breaker cam shaft on which the cam and timing plate are installed. The breaker cam shaft is not coupled to the crankshaft directly, but through the pin on the water pump drive gear to prevent the vibration.

The ignition coils which are combined with the holder are installed under the fuel tank to obtain the excellent cooling and increased insulation.

## Operation

When the ignition switch is turned on and the crankshaft is rotated, a current from the battery flows through the primary coil windings of each ignition coil and contact points if they are closed.

At the time when the point is just opened, a counter electromotive force which is much higher voltage than before is induced within the primary coil by the self induction, and moreover it is stepped up to a high tension current within the secondary coil by the mutual induction so enough as to ignite the spark plug.

A condenser connected in parallel with the contact point is equipped to absorb the electric energy and keep it from sparking between the contact breaker points.

## Specification

### Spark plug:

Standard

NGK B-7ES or DENSO W22ES

Optional

NGK B-6ES, B-8ES or DENSO W20ES, W24ES

Point gap

NGK: 0.7~0.8 mm (0.028~0.032")

DENSO: 0.6~0.7 mm (0.024~0.028")

Contact point gap

0.3~0.4 mm (0.012~0.016")

Condenser capacity

0.16~0.20  $\mu$ F

Ignition timing

24°  $\pm$  2 B.T.D.C.

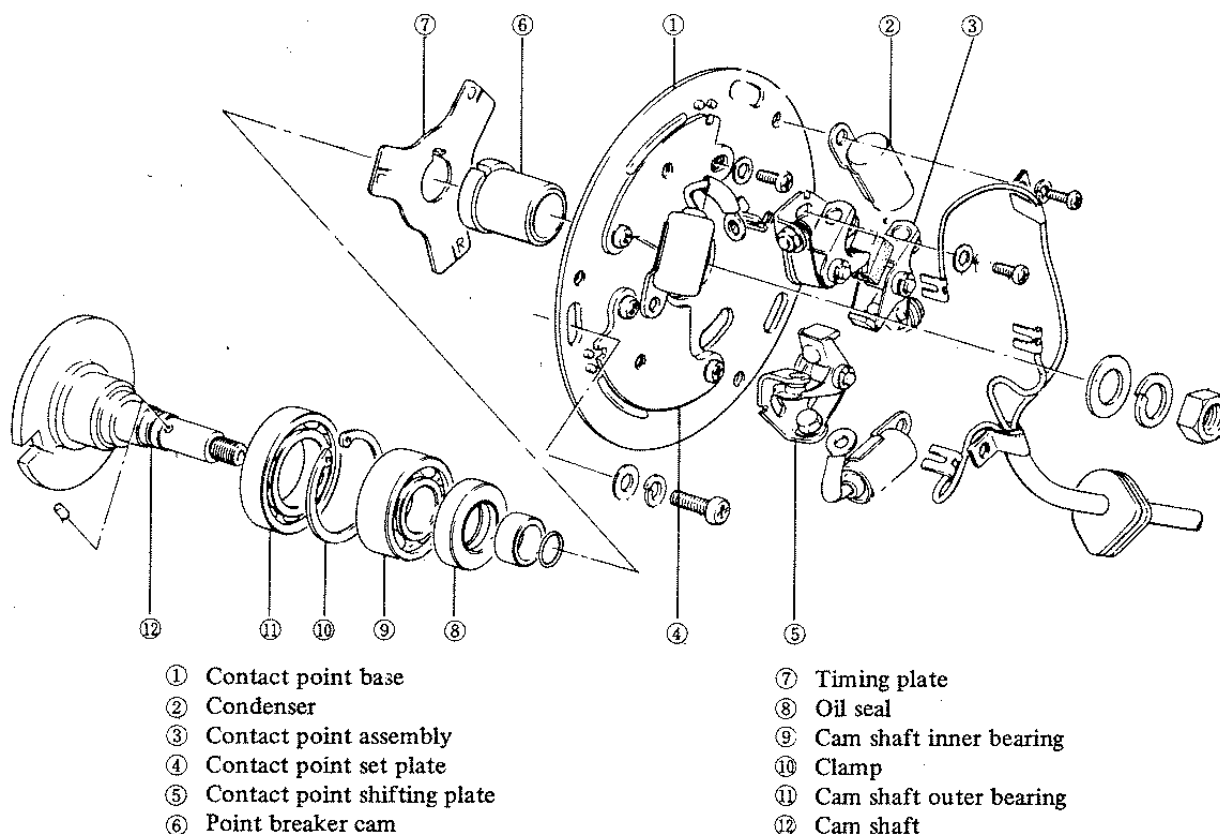


Fig. 10-36 Exploded view of contact breaker assembly

## Removal

1. Dismount the fuel tank from the frame, and remove the ignition coil assembly.
2. Remove the contact breaker cap, and the contact point base with the points and condensers on it after scribing a mark both on the base and the case near the fitting bolt in order to indicate the position of the base in the case of reassembling.
3. Disconnect the contact breaker lead coupler from the holder plate.

## Disassembly

1. Dismount each contact point and condenser from the base by removing fitting screws.
2. Remove the breaker cam shaft nut and washers, then take off the breaker cam and timing plate from the shaft.
3. Extract the breaker cam shaft from the case.  
**Caution:** When removing the breaker cam shaft inner bearing from the case, use the Snap ring opener (09920-70120).

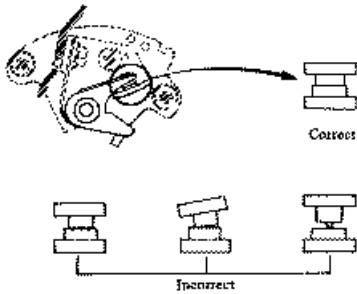
## Inspection & Repair

1. Check the contact breaker point for wear, dirt or oil film.

a. If the point surface is worn out or pitted, the conductivity is decreased and results in misfiring. Dress the surface with either a point file or emery sand paper, if the excessive wear is found, remove the contact points of both the moving and stationary sides and dress them with an oil stone, or replace with new one.

b. If the dirt or oil is left on the point surfaces, it will bring about the burnt surface. Clean with a waste cloth soaking a trichloroethylen.

c. Check to see if the points are in perfect contact. Dress or replace the points if necessary.

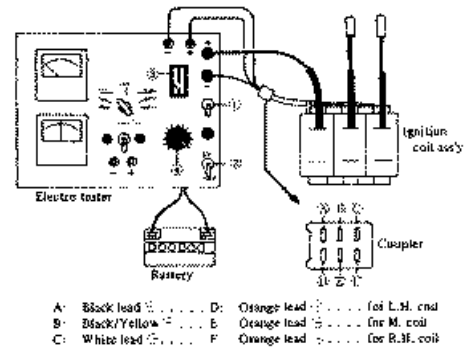


**Fig. 10-37 Contact point**

d. Check to see if the point gap is between 0.3~0.4 mm (0.012~0.016") using the filler gauge, when the point gap is at maximum opening.

2. Check the ignition coils for defects using an electro tester.

a. Connect the ignition coil to be tested with the tester as illustrated in the figure.



**Fig. 10-38 Testing ignition coil**

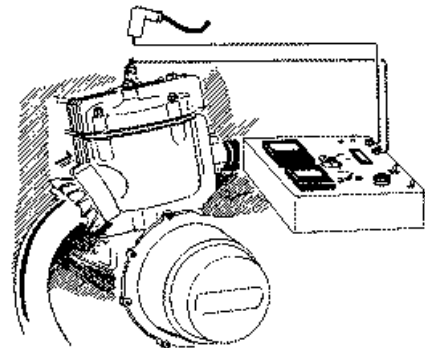
b. Turn down the change-over switch (2) for electric source to 12 V (use a 12 volt battery), and that (1) for coil test to „COIL TEST“. Then the spark will jump between the three prong gap (3) if the coil has no defects.

c. Adjust the tester three prong gap turning the dial (4) to have 6 mm (0.24") of distance. Check the spark for about 5 minutes.

The coil is satisfactory if the gap is more than 6 mm and the spark is still strong and blue.

d. When testing the ignition coil without removing from the frame, remove the spark plug cap and connect the positive tester lead to the high tension cord and the negative lead to the spark plug.

e. Start the engine and check to see if the spark is maintained over 6 mm of distance.

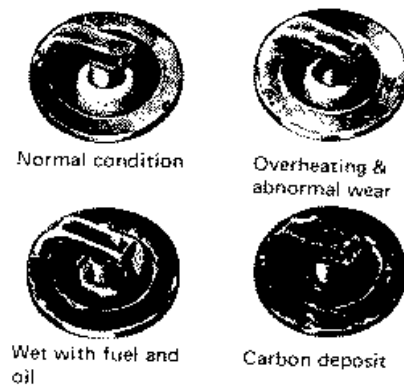


**Fig. 10-39 Testing ignition system**

3. Check the spark plug cap and high tension cord for crack or deterioration. If it is found to be in improper condition, replace it with new one because the high tension current may leak through the defective parts, resulting in mis-firing.

4. Check the spark plug for defects.

- a. Check the plugs for cracks or chips on the porcelain.
- b. Check the electrodes for wear.
- c. Check for excessive carbon deposits. If carbon deposit is excessive, it indicates that the improper heat range spark plug has been used or a too rich fuel-air mixture has been supplied. Replace with a hot type plugs (B-6ES or W20ES) or adjust the carburetors. If the porcelain is excessively white-colored or the electrode is worn out, replace with a cold type plugs (B-8ES or W24ES). When NGK and DENSO plugs are not available, other corresponding plugs may be used in accordance with the conversion chart written on bottom of this page.

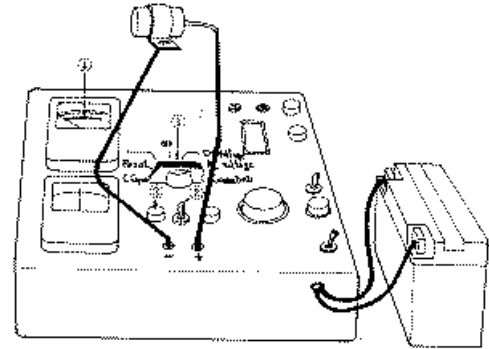


**Fig. 10-40 Condition of spark plug**

- d. Check the plug gasket for defect.
- e. Check the porcelain for glaze or blister.
- f. Adjust the plug gap to the specified value:  
 0.7~0.8 mm (0.028~0.032") for NGK make,  
 0.6~0.7 mm (0.024~0.028") for DENSO make.

5. Check the condenser capacity using the electro tester.

- a. Connect a 12 V battery as the electric source for the electro tester.
- b. Position the selector knob (1) to „C. Capacity“.



**Fig. 10-41 Testing condenser**

- c. Turn up the change-over switch (2) for calibrating test, and turn the capacity adjusting knob (3) to „CAP. CAL.“ until the meter pointer (4) comes to show the equivalent value to the capacity (inscribed in the name plate) of the standard condenser built in the electro tester.
- d. Connect the tester leads to the terminal marked „TEST-TERMINAL“, and the other ends of the lead to the condenser to be tested as illustrated in the figure.
- e. Turn down the change-over switch (2), then the pointer will show the capacity of the condenser to be tested. The specified condenser capacity is 0.16~0.20  $\mu\text{F}$ .

6. Check the condenser insulation resistance using the electro tester.

- a. Position the selector knob to „Insulation“ (Megohm).

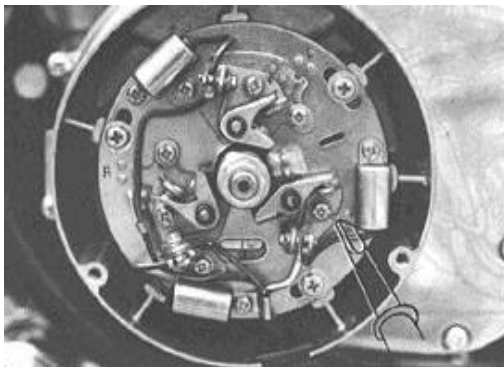
b. Turn up the change-over switch to „CAL“ position, and then turn the zero adjustment knob marked „RES. CAL.“ until the meter pointer comes to 0.

c. Connect the tester leads to the terminals marked „TEST-TERMINAL“, turn down the change-over switch, and apply the other ends of lead to the condenser to be tested. The pointer will move to the right and then quietly back to the left. Keeping the connection till the pointer comes to stand still, read the pointer on the scale by Megohm. Bring the condenser wire near the body, so a spark will jump between the wire and the body. The specified insulation resistance is over 10 Meg-ohm.

### Timing Adjustment & Test

When adjusting the ignition timing, both the ignition timing and the breaker point gap should be adjusted. Start the adjustment from the cylinder at left always.

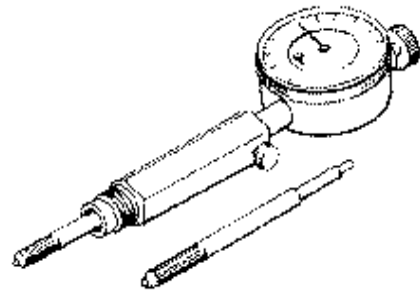
1. Adjust the point gap to 0.35 mm (0.014") for the points with marking „L“ on the base at the position where the point gap is at the maximum opening. Loosen the point set plate fitting screw and move the plate with a screw driver.



**Fig. 10-42 Adjusting point gap**

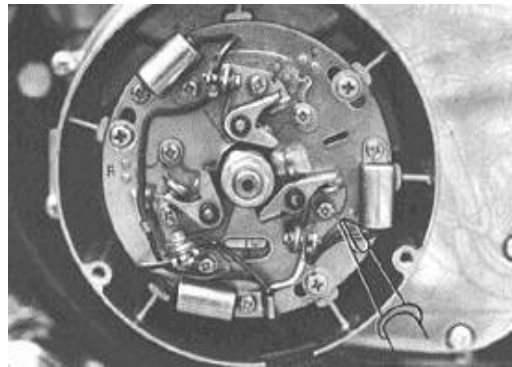
2. Remove the spark plug from left cylinder head, and install the timing dial gauge holder into the plug hole and set the gauge stem where the small needle (1) of the dial

gauge indicates „4“ at T.D.C. Turn the outer ring scale (3) so that the large needle indicates „0“ on the scale.



**Fig. 10-43 Dial gauge**

3. Connect one of the leads of timing tester to the positive terminal where white and a black leads are connected, and the other to somewhere on the engine to ground it.



**Fig. 10-44 Adjusting timing**

4. Turn the crankshaft counterclockwise slowly, and tone of the timing tester buzzer changes and the lamp on the tester goes out. These changes tell you the precise position where contact points begin to open that is ignition timing. Read the dial gauge at this moment. The standard ignition timing is 3.64 mm (0.143") for left cylinder.

**Caution: Be careful that the gauge stroke is not uniform because of the difference in inclination of spark plug hole at each cylinder.**

Standard ignition timing :  $24^\circ \pm 2^\circ$  (B.T.D.C.)

Crank angle (B.T.D.C.)		22°	23°	24°	25°	26°
Piston distance from B.T.D.C. mm ( in )	R & L	3.20 (0.126)	3.35 (0.134)	3.64 (0.143)	3.94 (0.155)	4.25 (0.167)
	C	2.88 (0.113)	3.15 (0.124)	3.42 (0.136)	3.72 (0.146)	3.99 (0.157)

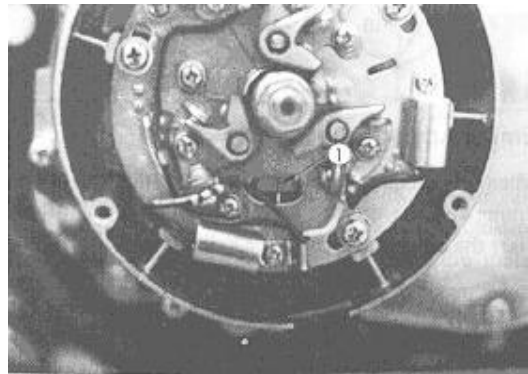
R & L: Right and left cylinder - C: Center cylinder

**Fig. 10-45 Ignition timing table**

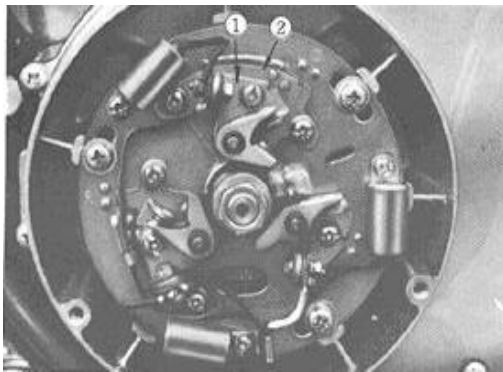
If the reading is different from the standard, turn the contact point base to and fro until the correct timing is obtained.

5. Adjust the points with markings „R“ and „C“ in a similar manner as „L“ after adjusting point gaps to 0.35 mm (0.014") by moving each point set plate (1).

**Note: If the dial reading on the center and right cylinders is different from the standard, move the shifting plate (2) by loosening two fitting screws.**



**Fig. 10-47 Ignition timing marks**



**Fig. 10-46 Adjusting ig. timing for R,H, and L cylinders**

6. When adjusting the ignition timing with timing marks (1) both on the timing plate and on the casing, rotate the crankshaft counterclockwise to check if the point opens when „L“ marking line on the timing plate is in alignments with an aligning mark of the casing in the adjusting window. If it is out of order, turn the contact point base to and fro until the correct timing obtains.