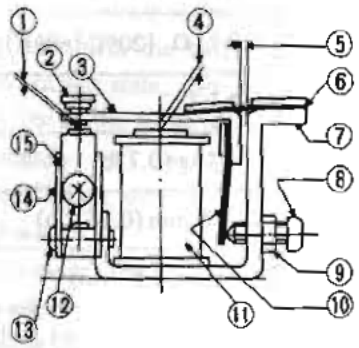
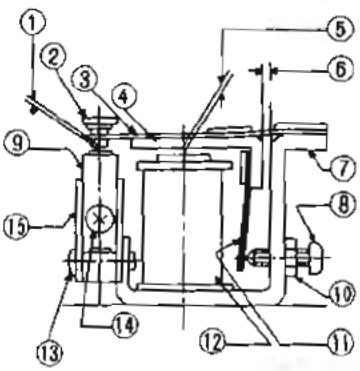
As for the construction, the voltage regulator is very similar to the charge relay as shown in Figure EE-62.



1	Point gap	10	Adjust spring
2	Lower contact	11	Coil
3	Aramture	12	3 mm dia. (0.1181 in dia.) screw
4	Core gap		
5	Yoke gap	13	4 mm dia. (0.1575 in dia.) screw
6	Connecting spring		
7	Yoke	14	Contact set
8	Adjusting screw	15	Upper contact
9	Lock nut		

(a) Construction of voltage regulator



1	Point gap	9	Voltage regulator contact
2	Charge relay contact	10	Lock nut
3	Connecting spring	11	Adjust spring
4	Armature	12	Coil
5	Core gap	13	3 mm dia. (0.1181 in dia.) screw
6	Yoke gap		
7	Yoke	14	4 mm dia. (0.1575 in dia.) screw
8	Adjusting screw		
		15	Contact set

(b) Construction of charge relay

Fig. EE-62 Structural view

MEASUREMENT OF REGULATING VOLTAGE

Regulating voltage is measured with the regulator combined with the specified generator. Theoretical measurement differs from that made actually on the vehicle. The methods are described as follows:

1. Theoretical method

Prepare a DC voltmeter, DC ammeter, techometer, battery, and resistor (0.25 Ω), and form a circuit as shown in Figure EE-63.

(1) Operate the generator under the rated speed (5,000 rpm).

(2) Read the indication on the voltmeter. The pointer indicates the regulating voltage.

(3) At the same time, make sure that the current is less than 5 amperes.

Note: Be sure to measure regulating voltage when the generator speed has reached the rated speed. The rated voltage (regulating voltage) varies depending on the ambient temperature. When measuring voltage, measure ambient temperature and calibrate appropriately.

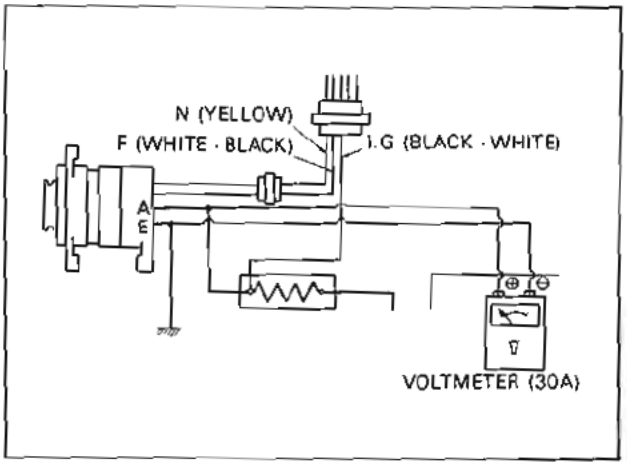


Fig. EE-63 Theoretical regulating voltage measuring circuits

2. Measuring regulating voltage of regulator mounted on a vehicle

(1) Use the same equipment as for the theoretical method, and connect them as shown in Figure EE-64. Install the regulator perpendicularly by facing the connector downward in this case, also.

(2) Make sure that all electrical loads (such as head lamps, air conditioner, radio, etc.) on the vehicle have been interrupted.

(3) Before starting the operation, be sure to short-circuit the line between fuse side terminal of the resistor for voltage measurement and (−) terminal of the ammeter. Pointer of the ammeter may deflect rapidly and reversely due to discharge current flowing from the battery resulting damaged ammeter. (See Figure EE-64.)

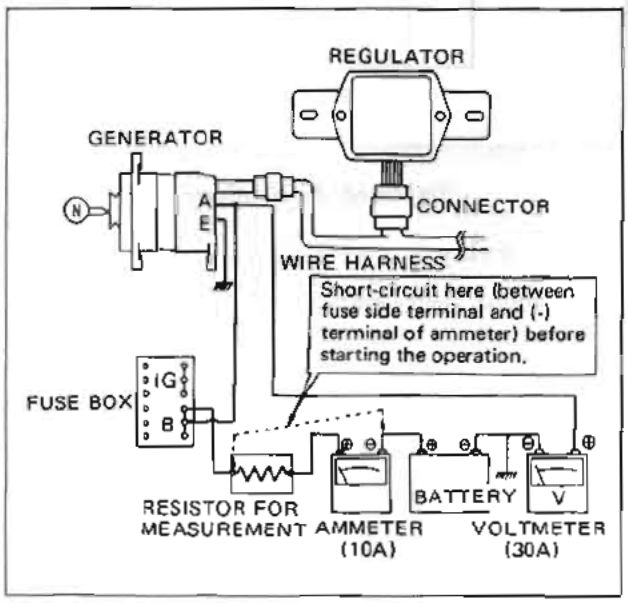


Fig. EE-64 Regulating voltage measuring circuit with regulator mounted on the vehicles

(4) Raise the engine speed gradually, and measure voltage when the engine speed reaches the rated level. The measured voltage is the regulating voltage when the regulator is mounted on the vehicle.

Note: **a. Do not race the engine when starting but operate under idling speed.**

b. Raise the engine speed gradually from idling to the rated normal speed, and measure voltage.

c. When two to three minutes are elapsed after starting the regulator operation, voltage rises approximately 0.3V from the normal voltage due to the self-heating. Thus, be sure to measure voltage within one minute after starting the operation. When measurement cannot be made within one minute, cease the operation once and measure again after cooling the regulator.

ADJUSTMENT

Voltage regulator

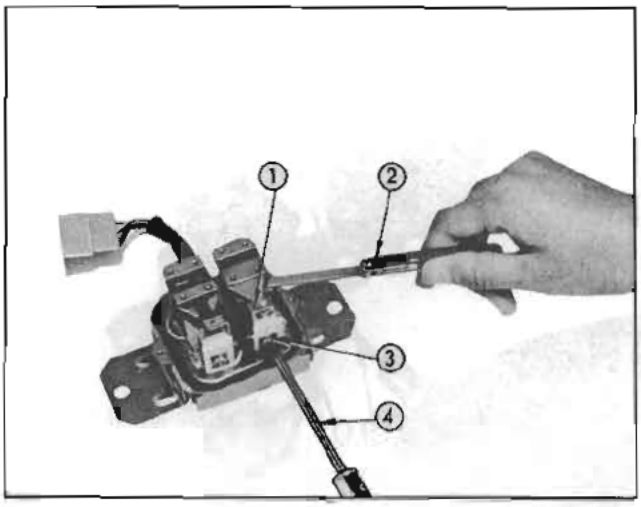
As the result of above measurement, when the regulating voltage is deviated from the rated value, adjust the regulator in accordance with the following instructions.

1. Inspect contact surface, and if rough, lightly polish the surface with fine emery paper (#500 or 600).

2. Measure each gap, and adjust if necessary. Adjust the core gap and point gap in that order. No adjustment is required for the yoke gap.

3. Adjusting core gap

Loosen the screw [4 mm diameter (0.1575 in diameter)] which is used to secure the contact set on the yoke, and move the contact upward or downward properly. (See Figure EE-65.)

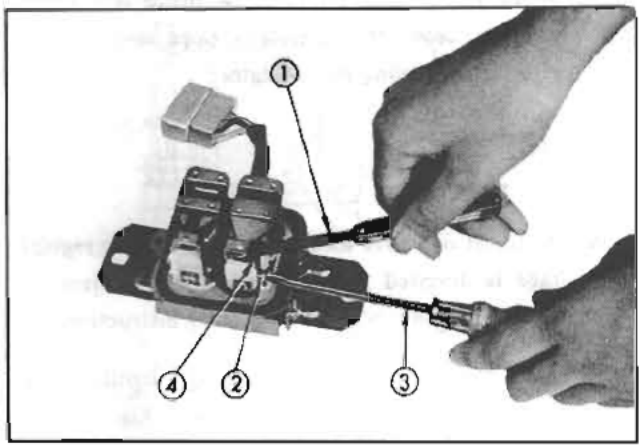


1	Contact set	3	4 mm dia. (0.1575 in dia.) screw
2	Thickness gauge	4	Cross-head screwdriver

Fig. EE-65 Adjusting core gap

4. Adjusting point gap

Loosen the screw [3 mm diameter (0.1181 in diameter)] used to secure the u per contact, and move the upper contact upward or downward adequately. (See Figure EE-66.)

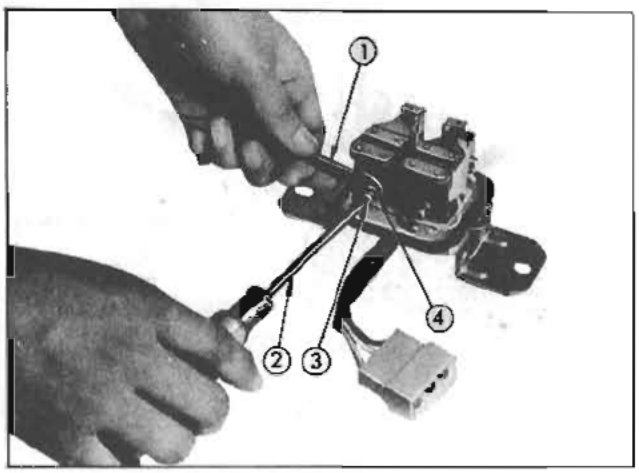


1	Thickness gauge	3	Cross-head screwdriver
2	3 mm dia. (0.1181 in dia.) screw	4	Upper contact

Fig. EE-66 Adjusting point gap

5. Adjusting voltage

Adjust regulating voltage with the adjusting screw. When increasing voltage, loosen the lock nut (used to secure the adjusting screw) and screw the adjusting screw. When decreasing, unscrew the adjusting screw. (See Figure EE-67.)



1	Spanner	3	Adjusting screw
2	Cross-head screwdriver	4	Lock nut

Fig. EE-67 Adjusting regulating voltage

Note: Upon completion of the regulating voltage adjustment, retighten the lock nut and securely set the adjusting screw stationarily.

Under the normal (satisfactory) condition, difference between the lower contact operating voltage and upper contact operating voltage rises 0 to approximately 0.5V as shown in Figure EE-68.

Reduce the core gap when the difference exceeds 0.5V, and increase when the difference is less than 0V.

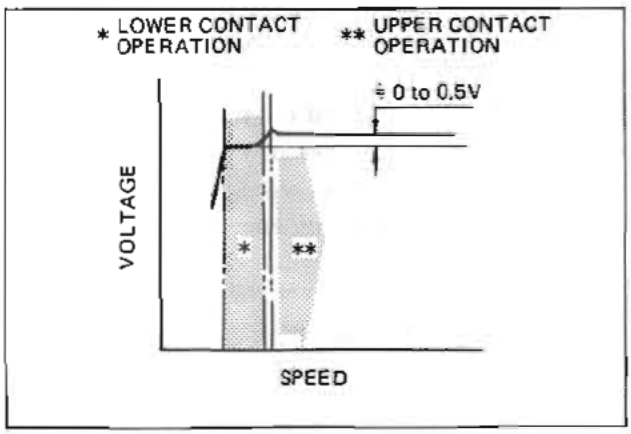


Fig. EE-68 Jump voltage

Charge relay

The normal charge relay operating voltage is 8 to 10V at the generator "A" terminal. However, it operates at 4 to 5V because one half of the "A" terminal voltage ("N" terminal voltage) is applied to the charge relay voltage coil.

It is difficult to measure this operating voltage with the regulator mounted on the vehicle.

Prepare a battery, voltmeter and variable resistor, and measure operating voltage after dismounting the regulator. Figure EE-69 shows the measuring circuit.

Set the variable resistor to "MAX" position, apply current (turn on the switch), and reduce resistance gradually. When resistance is reduced to a certain level, the charge lamp goes out. This level indicates the charge relay operating voltage.

Set the variable resistor to "MAX" position, apply current (turn on the switch), and reduce resistance gradually. When resistance is reduced to a certain level, the charge lamp goes out. This level indicates the charge relay operating voltage. The rated value is 4 to 5 volts. When deviated, readjust. The adjustment is carried out in the same manner as the voltage regulator.

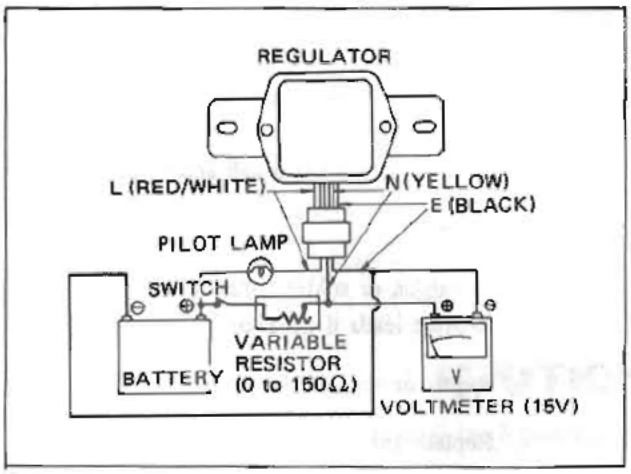


Fig. EE-69 Charge relay operating voltage measuring circuit

Precautions for adjustment

1. Upon completion of the adjustment, reinstall the cover and make sure that the regulator operates correctly.

2. When the cover is removed or adjusting screw is adjusted while adjusting voltage, be sure to disconnect the regulator once, and reconnect when measuring actually. The battery circuit may be short-circuited.

SPECIFICATIONS AND SERVICE DATA

Voltage regulator

Model	TL1Z-37
Regulating voltage (with fully charged battery and connected faced downward)	* 14.3 to 15.3 V [at 20°C (68°F)]
Voltage coil resistance	10.5 Ω [at 20°C (68°F)]
Rotor coil inserting resistance	10 Ω
Voltage coil series resistance	25 Ω
Smoothing resistance	40 Ω
Core gap	0.6 to 1.0 mm (0.0236 to 0.0394 in)
Point gap	0.3 to 0.4 mm (0.0118 to 0.0157 in)

Charge relay

Release voltage	8 to 10 V at "A" terminal
Voltage coil resistance	37.8 Ω [at 20°C (68°F)]
Core gap	0.8 to 1.0 mm (0.0315 to 0.0394 in)
Point gap	0.4 to 0.6 mm (0.0157 to 0.0236 in)

*Standard temperature gradient: -0.015 V/°C

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Corrective action
No output	Sticking brushes	Correct or replace brush and brush spring.
	Dirty brushes and slip rings	Clean.
	Loose connections or broken leads	Retighten or solder connection. Replace leads if necessary.
	Open stator winding	Repair or replace the stator.
	Open rotor winding	Replace the rotor.
	Open diodes	Replace the diodes.
	Shorted rotor	Replace the rotor.
	Shorted stator	Repair or replace the stator.
	Grounded "BAT" terminal	Replace the insulator.
	Broken fan belt	Replace the belt.
Excessive output	Broken neutral wire (color of wire is white.)	Replace the wire.
	Defective voltage regulator	Check the regulator operation and repair or replace as required.
	Poor grounding of the alternator and voltage regulator "E" terminal	Retighten the terminal connection.
	Broken ground wire (color of wire is black.)	Replace the wire.
Low output	Loose or worn fan belt	Retighten or replace the belt.
	Sticking brushes	Correct or replae brushes and spring if necessary.
	Low brush spring tension	Replace the brush spring.
	Defective voltage regulator	Check the regulator operation and repair or replace as required.
	Dirty slip rings	Clean.
	Partial short, ground, or open in stator winding	Replace the stator.
	Partially shorted or grounded rotor winding	Replace the rotor.

	Open or defective diode	Replace the diode
Noisy alternator	Loose mounting	Retighten the mounting bolts.
	Loose drive pulley	Retighten the pulley correctly.
	Defective ball bearing	Replace the bearing.
	Improperly seated brushes	Seat brushes correctly.

IGNITION CIRCUIT

The ignition circuit includes the distributor, ignition coil, ignition switch, spark plugs, high tension cable and the battery.

DISTRIBUTOR

CONTENTS

Distributor model	Applied engine
D612-52	L24 (with Emission Control)
D606-52	L24 (with Single and Twin carb.) L20A (Premium Gas)
D609-56	L20A (Regular Gas)

Fig. EE-70 D612-52

CONSTRUCTION AND OPERATION

Figure EE-71 shows ignition system of gasoline engine. The distributor consists of high tension voltage part, switch off part, centrifugal advancing angle part, vacuum advance mechanical part and driving part.

Figure EE-72 shows the construction.

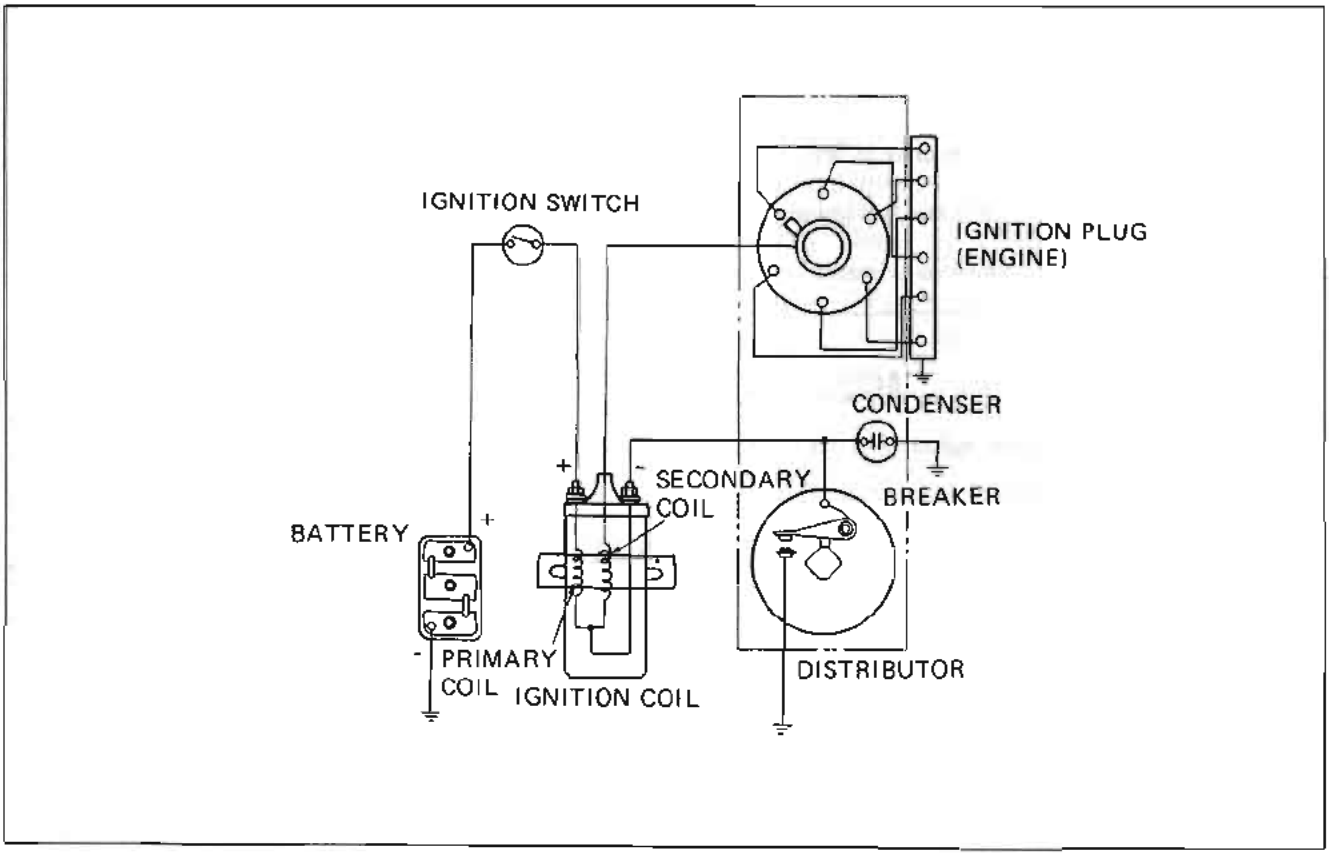


Fig. EE-71 Ignition system circuit diagram

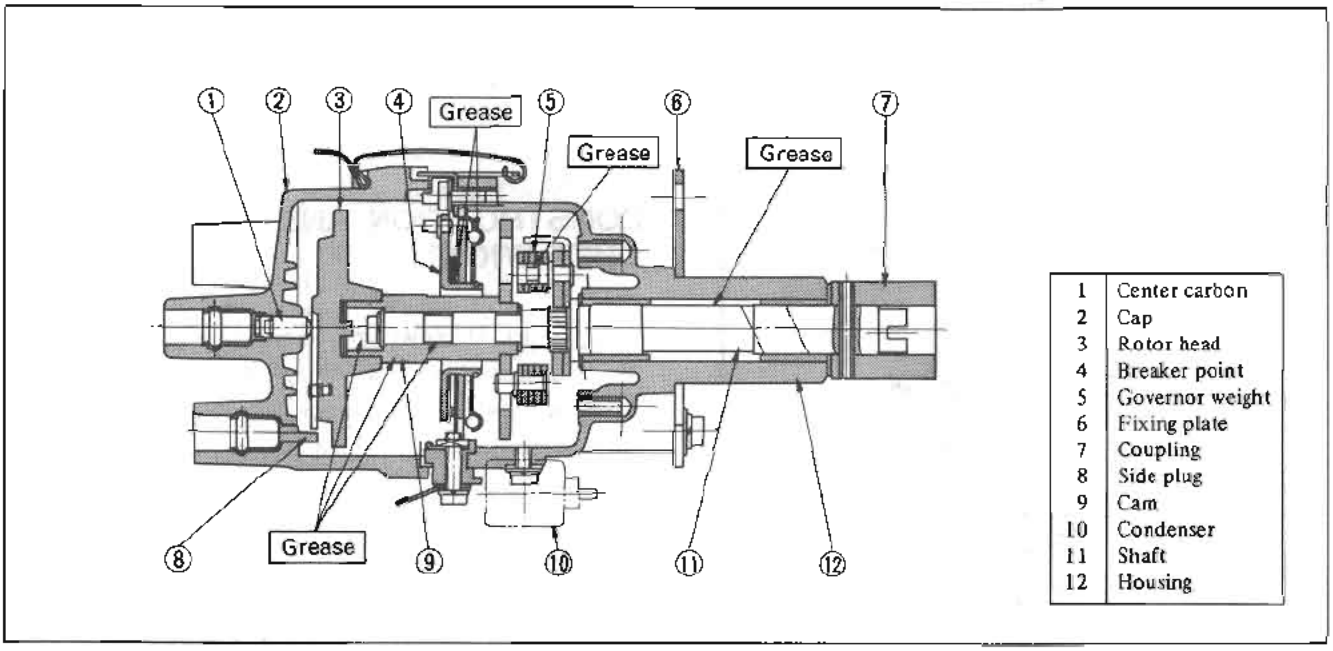


Fig. EE-72 Structure

1	Assembly clamp cap
2	Assembly clamp cap
3	Assembly shaft
4	Assembly pinion set
5	Assembly cam
6	Assembly weight governor
7	Spring governor
8	Screw
9	Assembly rotor head
10	Washer thrust
11	Assembly breaker
12	Set contact
13	Assembly terminal
14	Assembly control vacuum
15	Screw
16	Assembly condenser
17	Screw
18	Assembly cap distributor
19	Assembly point carbon
20	Plate fixing
21	Bolt

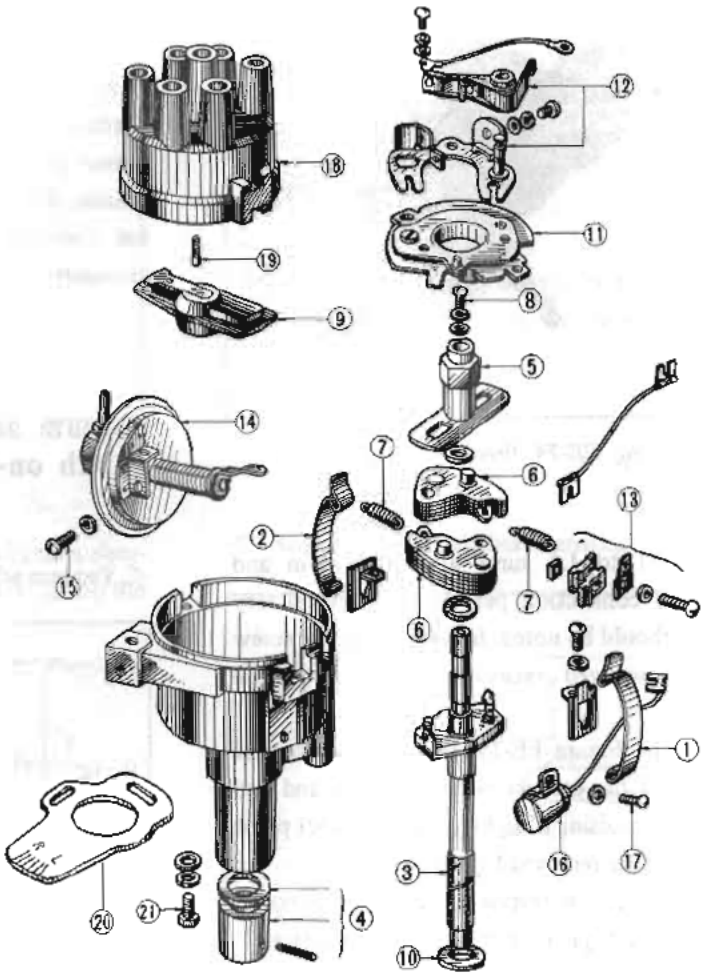


Fig. EE-73 Components of distributor

CHECKING AND ADJUSTMENT

Cap and rotor head

Cap and rotor head must always be kept clean to maintain good insulation durability since high tension voltage from ignition coil is imposed on them. Sometimes, inside of the cap and rotor head is covered with fine carbon particles and dust. Cleaning with gasoline is required once a month. Whenever crack or trace of leakage is found on the cap, replace with a new one.

Point

Standard point gap is 0.45 to 0.55 mm (0.0177 to 0.0217 in). When the gap is off the standard, adjust by loosening point screws. Gap gauge is required for adjustment. However, without gap gauge, it may be adjusted by holding down the contact arm the stopper of which is 0.5 mm (0.0197 in) thick.

As for those with tungsten point, point gap must be checked at every 4,000 km (2,500 miles) run.

When surface of the point is not smooth, polish with fine emery paper (No. 500 or 600) or oil stone.

At this time, grease both arm pivot receiver and surface of cam. When point is worn remarkablly, replace with a new one. At the same time, replace the contact arm and contact point, also. Details for replacement are described in the forthcoming sub section.

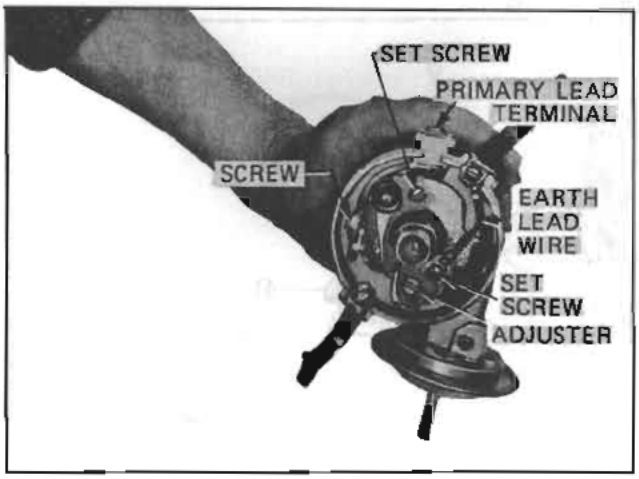


Fig. EE-74 Breaker

First unscrew 1 to 1.5 turns at contact arm and primary lead wire connection part to pull out primary lead terminal. It should be noted, however, that the screw should not be unscrewed excessively. Refer to Figure EE-75.

As shown in the Figure EE-75, take off the stopper from stem bar, hold the contact point by fingers and pull it out toward you by raising it slightly. Both contact point and contact arm can be removed together.

Set new contact set in reverse sequence of removal. Slightly grease both arm pivot receiver and cam surface.

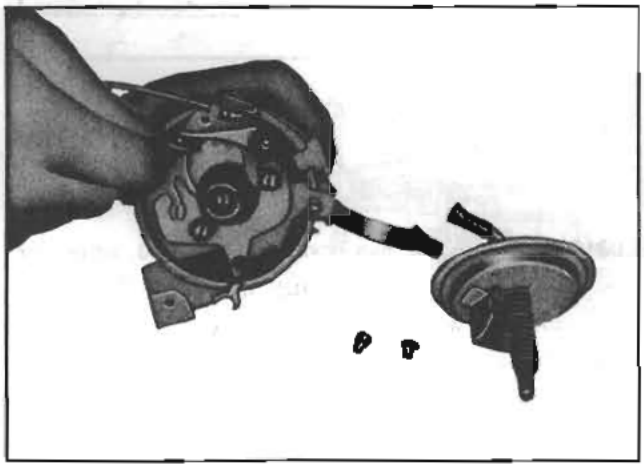


Fig. EE-75 Disassembling the contact arm and contact point

Condenser

Performance of condenser depends on the setting and insulating condition. Thus, periodical checking is required to maintain the outlet of lead wire clean and to prevent set screw from loosening. Checking the condenser is checked by the use of a capacity meter. It may be also checked by the use of a tester by adjusting its range to measure large resistance value. When the condenser is normal, the tester pointer swings largely and rapidly, and moves gradually back to the infinite side. When the pointer does not stay still or it points Zero in resistance, the transformer is out of order, and replacement is necessary.

Vacuum advance mechanical part and switch on-off part

≪ Vacuum advance characteristic ≫

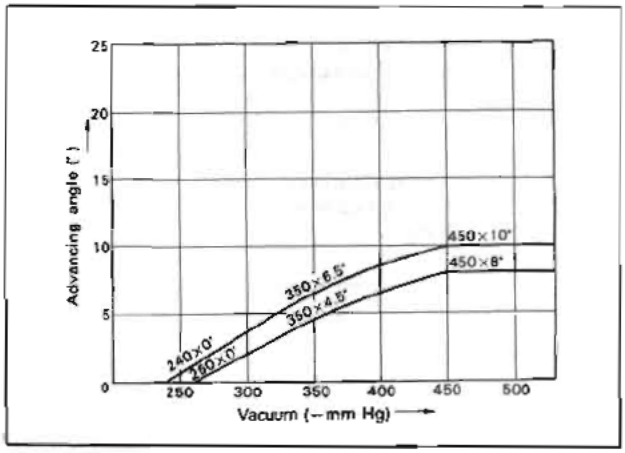


Fig. EE-76 D612-52

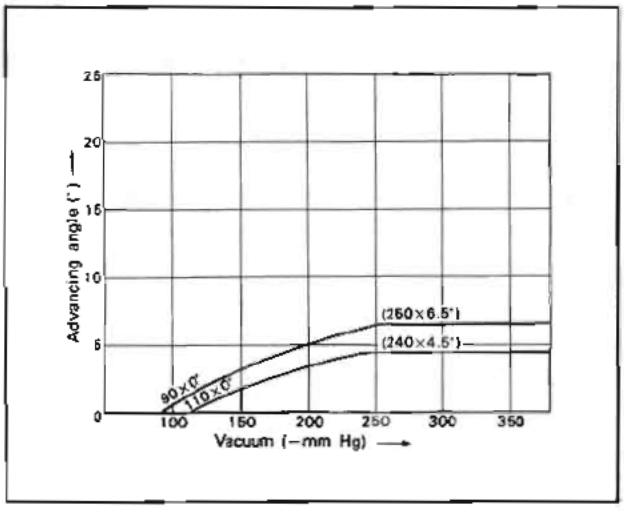


Fig. EE-77 D606-52

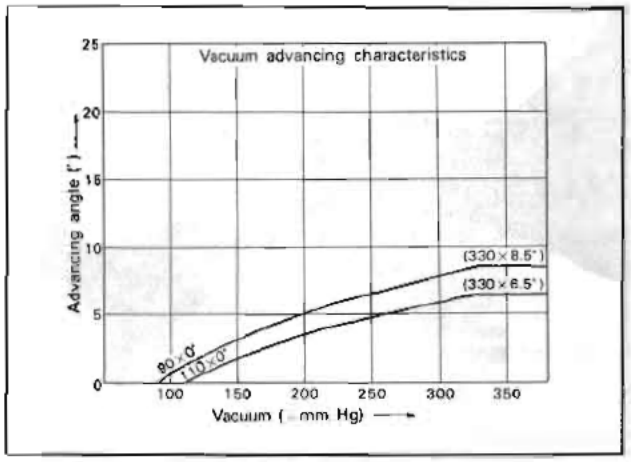


Fig. EE-78 D609-56

Make sure that the vacuum advance mechanism operates correctly with the operation indicator attached to the vacuum advance mechanism.

The following causes are considered for improper operation.

1. Leakage of air due to incomplete fastening of vacuum inlet

2. Leakage due to defective diaphragm

3. Stationary side and moving side of the breaker plate are sticked.

Solution for 1. is to make complete fastening and 2. is to replace it with a new one. Solution for 3. is as follows:

(1) The moving side of the breaker plate is supported by three steel balls at upper and lower sides.
Make sure that these balls work smoothly.

(2) The moving side of the breaker plate is rotated with the stationary side pivot receiver.
Make sure that this pivot receiver operates correctly
When assemblin, be sure to apply three steel balls to the upper and lower sides and to grease them.

Centrifugal advance mechanical part

When cause of engine trouble is traced to centrifugal advance mechanical part, use distributor tester to check its characteristics.

When nothing is wrong with its characteristics, conceivable causes are defectiveness or abnormal wearing-out of driving part or others.

Do not disassemble it. When characteristics are improper, remove the switch on-off part and check cam assembly, governor weight, shaft and governor spring, and other relative parts carefully.

When reassembling the centrifugal advance mechanical part, be sure to check advance characteristics by the use of a distributor tester.

≪ Centrifugal advance characteristics ≫

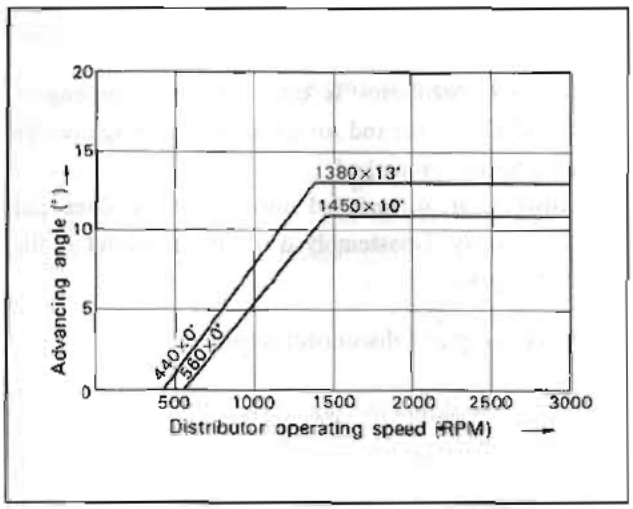


Fig. EE-79 D612-52

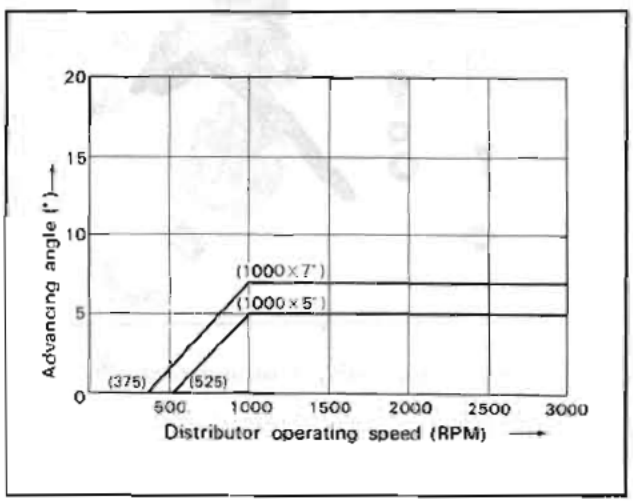


Fig. EE-80 D606-52

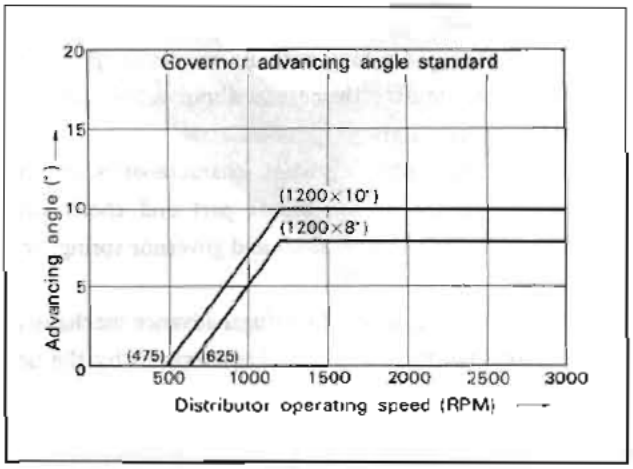


Fig. EE-81 D609-56

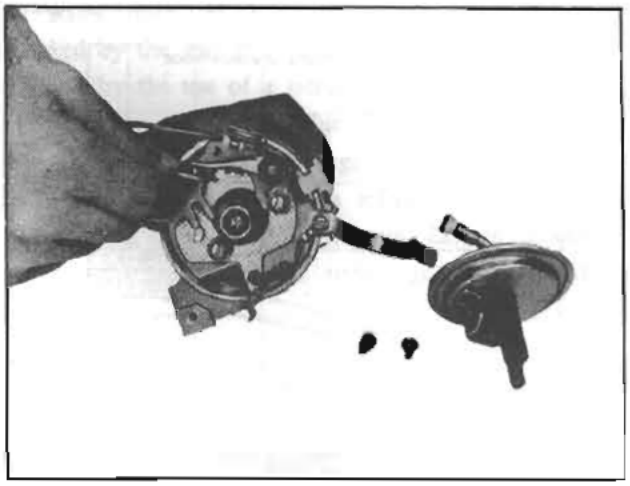


Fig. EE-83 Removal of contact set

DISASSEMBLY AND REASSEMBLY

Disassembly

When the distributor is disconnected from engine, position of distributor and rotor head for housing must be well remembered or marked.

If distributor is installed incorrectly, it does not operate correctly. Disassembly is to be carried out in the following sequence.

1. Remove cap and disconnect rotor head.

2. Remove vacuum controller.

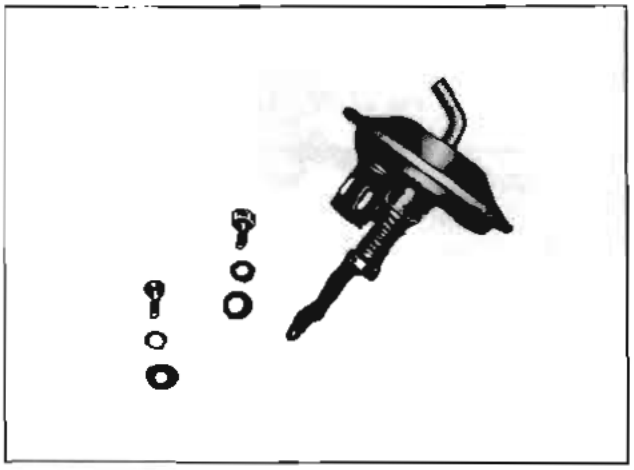


Fig. EE-82 Disassembly of vacuum controller

3. Remove contact breaker.

Refer to page EE-34 when disconnecting the contact set.

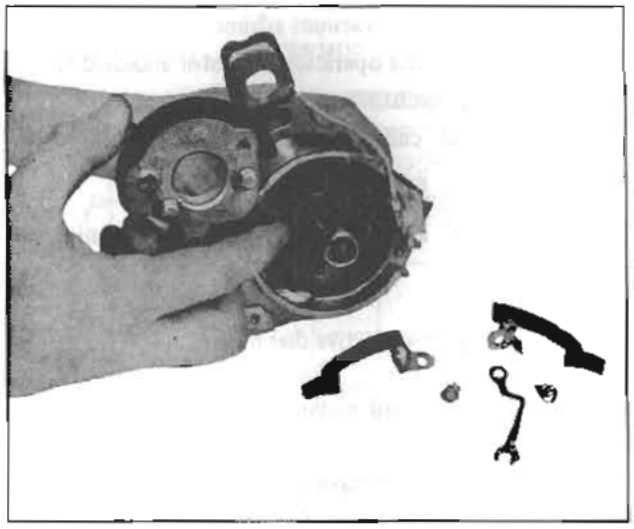


Fig. EE-84 Removal of contact breaker

4. When contact breaker is disassembled, remove the clip to disconnect breaker plate (fixed) by depressing the moving breaker plate downward.

Be careful not to lose steel balls applied between breaker spring and breaker plate as well as those between breaker plates.

5. Pull the knock pin and disconnect the gear to remove the whole rotary unit. However, before removing, put counter marks on the gear and shaft or remember the relationship between the coupling and setting groove of the cam rotor head.

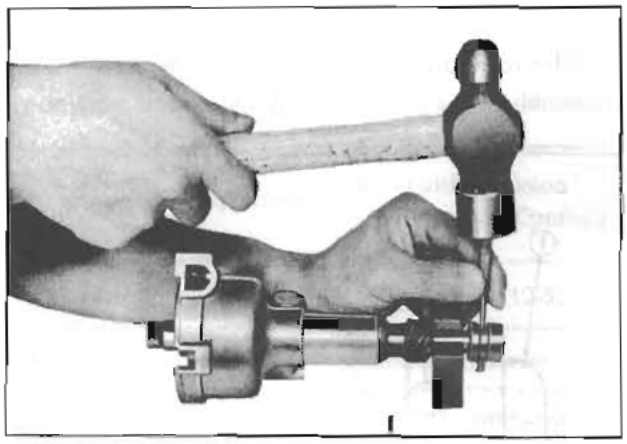


Fig. EE-85 Removal of knock pin

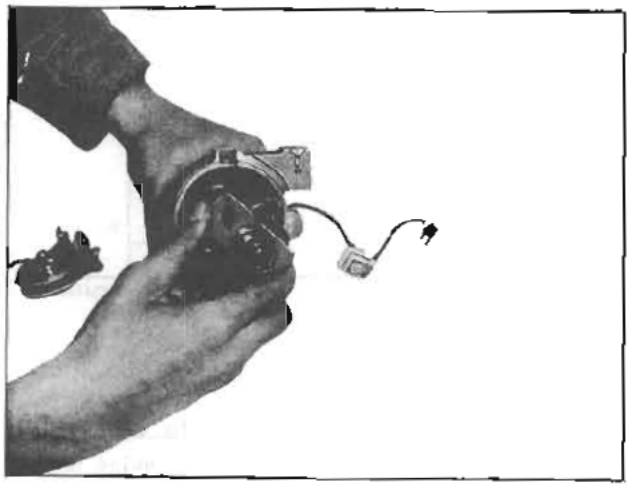


Fig. EE-86 Removal of rotation part

6. When the cam is disconnected, remove the set screw first, since the shaft head is fastened by the screw to hold the cam down. Be sure to put counter marks on the cam and shaft or remember the relationship with ignition timing.

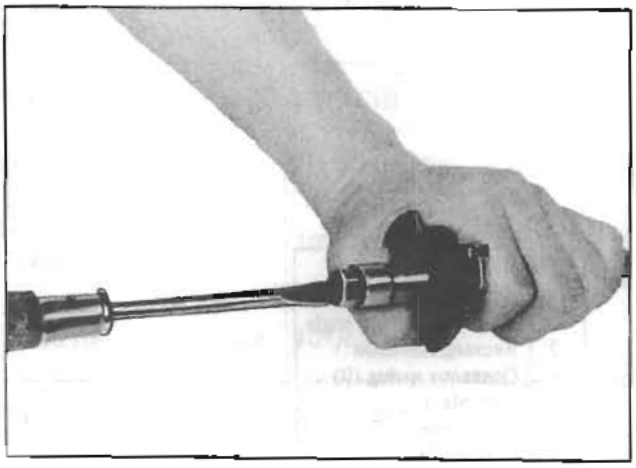


Fig. EE-87 Removal of cam

7. When disconnecting the governor spring from the governor weight, be careful not to stretch or deform the governor spring. When disassembly is completed, apply grease to the weight pivot.

8. Figure EE-90 shows the exploded view.

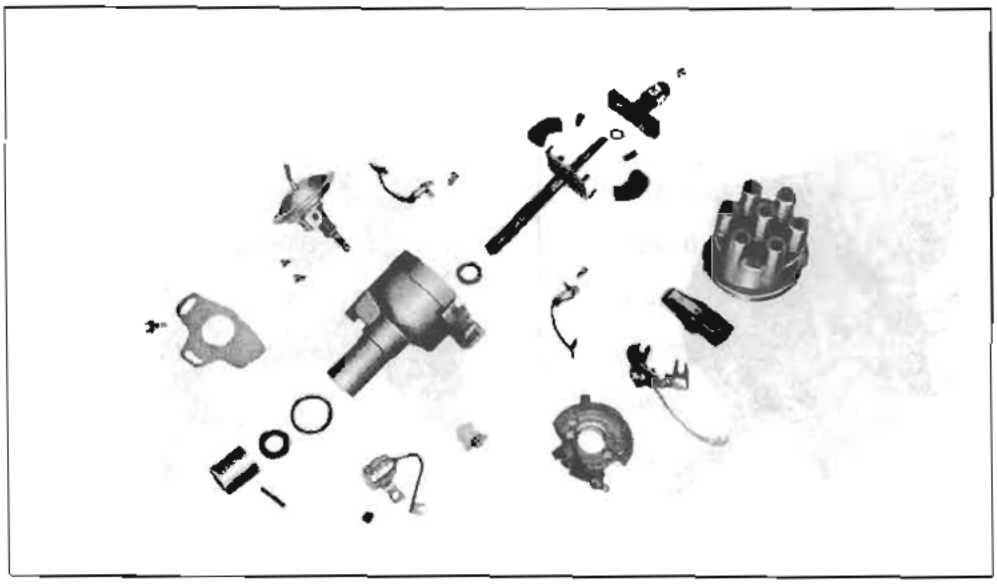


Fig. EE-88 Exploded view (D410-58, D409-54)

Reassembly

The distributor is reassembled in reverse sequence of disassembly.

Refer to Figure EE-91 at the time of replacement and reassembly of the governor spring and cam.

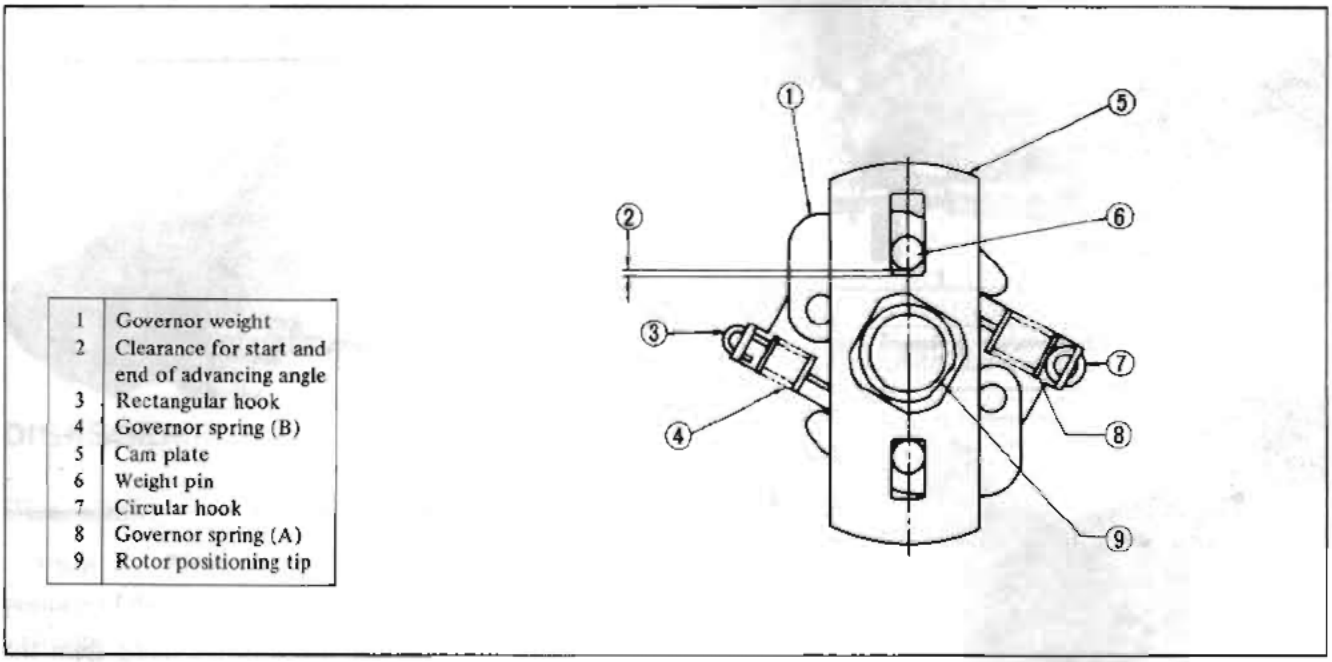


Fig. EE-89 Setting of governor spring and cam

At the time of assembly, rotor head positioning tip at cam is to be set to governor spring circular hook side. Then weight pin for governor spring (A) with circular hook comes in long rectangular hole. It leaves clearance at the start and end of advancing. Meanwhile, weight pin on opposite side comes in short rectangular hole. It does not leave clearance either at the start and end of advancing.

When assembly is completed, set it to engine after checking advance characteristic and confirming performance. Be sure to make adjustment of ignition timing after this.

Adjustment must be made to let off the distributor point at degree position of upper dead point of first cylinder compression of engine.

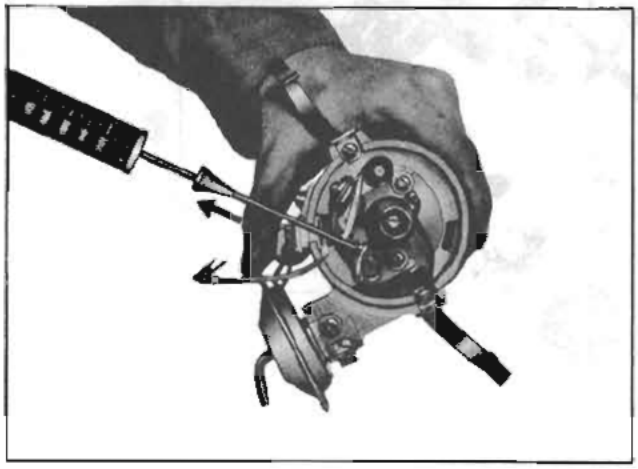


Fig. EE-90 Point pressure test

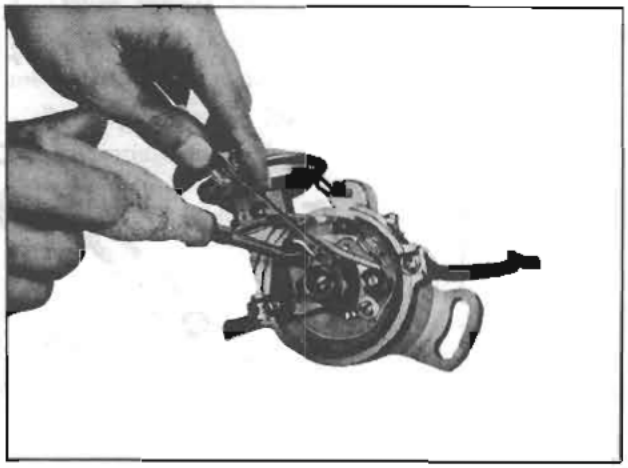


Fig. EE-91 Point gap measure

SPECIFICATIONS AND SERVICE DATA

Specifications

Engine to which applicable			L24 (with Emission Control)	L24 (with Single and Twin carb.) L20A (Premium Gas)		L20A (Regular Gas)
Make and type			HITACHI D612-52	HITACHI D606-52		HITACHI D609-56
Firing order			Counterclockwise	Counterclockwise		Counterclockwise
Ignition timing (B.T.D.C.)	Manual T/M		5°/750 rpm	L24 Twin 17°/650 rpm	L24 Single L20A 17° 550 rpm	10°/550 rpm
	Automatic T/M (at "N" range)			17°/700 rpm	17°650 rpm	10°/650 rpm
Dwell angle			35° to 41°	35° to 41°		35° to 41°
Advance characteristics	Centrifugal	Start	500 rpm	450 rpm		550 rpm
		Maximum	12°/1,415 rpm	6°/1,000 rpm		9°/1,200 rpm
	Vacuum	Start	250 mm/Hg (9.84 in/Hg)	100 mm/Hg (3.94 in/Hg)		100 mm/Hg (3.94 in/Hg)
		Maximum	9°/450 mm/Hg (17.7 in/Hg)	5.5°/245 mm/Hg (9.6 in/Hg)		7.5°/330 mm/Hg (13.0 in/Hg)
Weight			1.0 kg (2.2 lb)	1.0 kg (2.2 lb)		1.0 kg (2.2 lb)

Service data

All distributors

Point gap	0.45 to 0.55 mm (0.0177 to 0.0217 in)
Point pressure	0.50 to 0.65 kg (1.1 to 1.4 lb)
Condenser capacity	0.20 to 0.24 μ F
Condenser isolate resistance	5 M Ω
Cap isolate resistance	50 M Ω
Rotor head isolate resistance	50 M Ω
Cap carbon point	12 mm (0.472 in)
Shaft diameter (lower part)	$12.45\ ^{-0.010}_{-0.020}$ mm ($0.4902\ ^{-0.0004}_{-0.0008}$ in)
Housing inner diameter	$12.45\ ^{+0.018}_{0}$ mm ($0.4902\ ^{+0.0007}_{0}$ in)

Clearance between shaft and housing	0.010 to 0.038 mm (0.0004 to 0.0015 in)
Amendment limit of clearance	0.08 mm (0.0031 in)
Shaft diameter (upper part)	$8\ \frac{-0.005}{-0.014}$ mm ($0.3150\ \frac{-0.0002}{-0.0006}$ in)
Cam inner diameter	$8\ \frac{+0.015}{0}$ mm ($0.3150\ \frac{+0.0006}{0}$ in)
Clearance between shaft and cam	0.005 to 0.029 mm (0.0002 to 0.0011 in)
Weight pivot diameter	$5\ \frac{-0.010}{-0.028}$ mm ($0.1969\ \frac{-0.0004}{-0.0010}$ in)
Weight hole diameter	$5\ \frac{-0.018}{0}$ mm ($0.1969\ \frac{+0.0007}{0}$ in)
Clearance between pivot and hole	0.01 to 0.046 mm (0.0004 to 0.0018 in)

IGNITION COIL

CONTENTS

DESCRIPTION

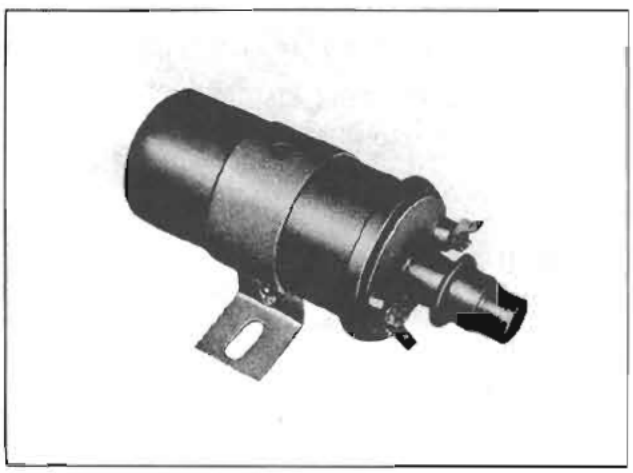
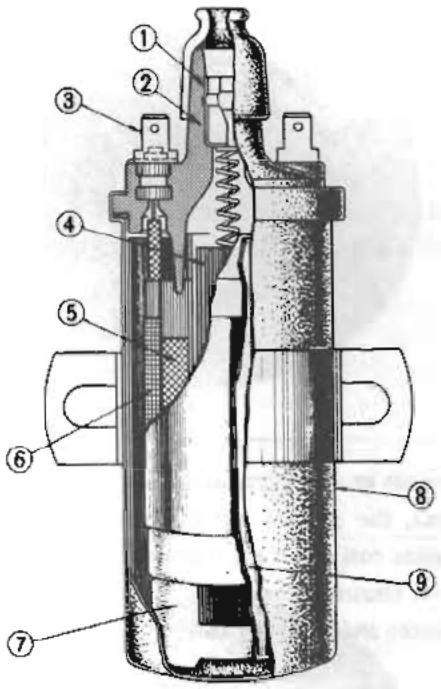


Fig. EE-92 HPS-13E

The ignition coil is a pitch type coil. The coil is equipped with resistor for improved spark performance at high revolution. The number of turns in primary winding results in a higher inductance in this winding, which makes it possible for this coil to provide a higher secondary voltage output throughout the speed range.

For optimum starting performance, the resistor is by-passed during cranking, thereby connecting the ignition coil directly to battery. This provides full battery voltage available at coil and thus keeps ignition voltage as high as possible during cranking. The resistor is by-passed automatically through the ignition and starting switch when switch is in the "start" position.



1	Primary terminal	6	Primary coil
2	Cap	7	Insulator
3	Secondary terminal	8	Case
4	Inside iron core	9	Outside iron core
5	Secondary coil		

Fig. EE-93 Construction

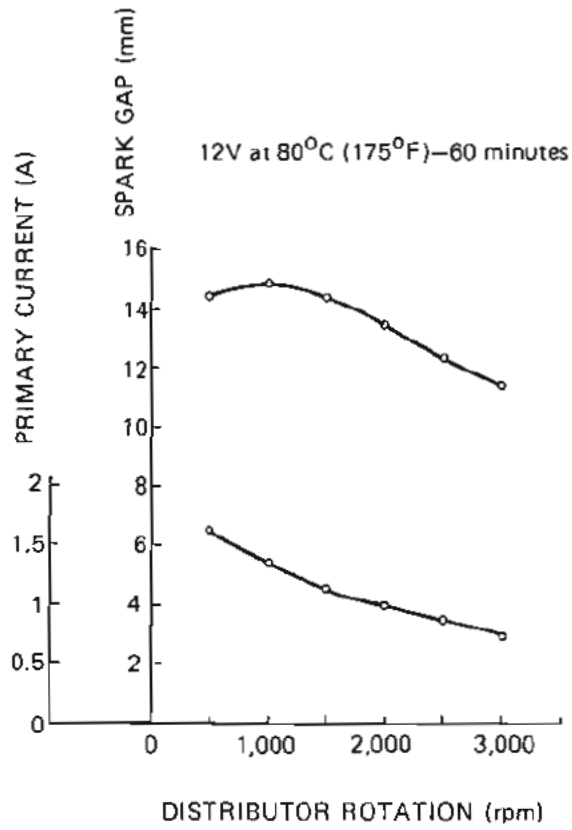


Fig. EE-94 C6R-200, HP5-13E characteristic curve

SPECIFICATION

Make and Type	HITACHI C6R-200	HANSHIN HP5-13E
Primary voltage	12V	12V
Spark gap	more than 7 mm (0.2756 in)	more than 7 mm (0.2756 in)
Primary resistance at 20°C (68°F)	1.5 to 1.7 Ω	1.5 to 1.7 Ω
Secondary resistance at 20°C (68°F)	9.5 to 11.6 KΩ	9.5 to 11.6 KΩ
Resistor	1.6 Ω	1.6 Ω

SPARK PLUGS

CONTENTS

PERIODICAL SERVICES

Plugs should be removed for cleaning, inspection and regapping periodically (actual time depending on operating conditions).

INSPECTION

Spark plug life is affected to a large extent by operating conditions and plug life varies consequently. In order to secure peak performance, spark plugs should be checked, cleaned and regapped every 12 months or 20,000 km (12,000 miles).

Worn or dirty plugs will give satisfactory operation at idling speed, but under high speed operation, they frequently fail. Faulty plugs are evident in a number of ways such as increased fuel consumption, power loss, loss of speed, hard starting and general poor engine performance.

Spark plug failure, in addition to normal wear, may be due to dirty or leaded plugs, excessive gap or broken insulator.

Dirty or leaded plugs may be evident by black carbon deposits, or red, brown, yellow or blistered oxide deposits, on the plugs. The black deposits are usually the result of slow-speed driving and short runs where sufficient engine operating temperature is seldom reached.

Worn piston rings, faulty ignition, over-rich carburetion and spark plugs which are too "cold" will also result in carbon deposits. Red or brown oxide deposits and a consequence of the use of leaded fuel, usually result in spark plug failure under severe operating conditions. The oxides have no adverse effect on plug operation as long as they remain in a powdery state. But, under high speed or hard pull, the powder oxide deposits melt and form a heavy glaze coating on the insulator which, when hot, acts as a good electrical conductor, allowing current to follow the deposits and short out the plug.

Excessive gap wear on plugs of low mileage, usually indicates the engine is operating at high speeds or loads that are consistently greater than normal or that a plug which is too "hot" is being used. In addition, electrode wear may be the result of plug overheating, caused by combustion gases leaking through the threads and gasket, due to insufficient compression of the spark plug gasket, dirt under the gasket seat. Too "lean" carburetion will also result in excessive electrode wear.

Broken insulators are usually the result of improper installation or carelessness when regapping the plug. Broken upper insulators usually result from a poor fitting wrench or an outside blow. The cracked insulator may not make itself evident immediately, but soon oil or moisture will penetrate the fracture. The fracture is usually just below the crimped part of shell and may not be visible.

Broken lower insulators usually result from carelessness when regapping and generally are visible. In fairly rare instances, this type of break may result from the plug operating too "hot" such as encountered in sustained periods of high-speed operation or under extremely heavy loads. When regapping a spark plug, to avoid lower insulator breakage, always make the gap adjustment by bending the ground side electrode. Spark plugs with broken insulators should always be replaced.

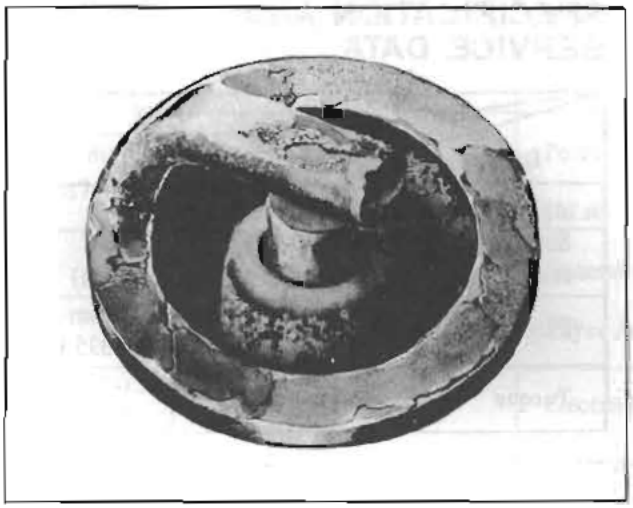


Fig. EE-95 Normal

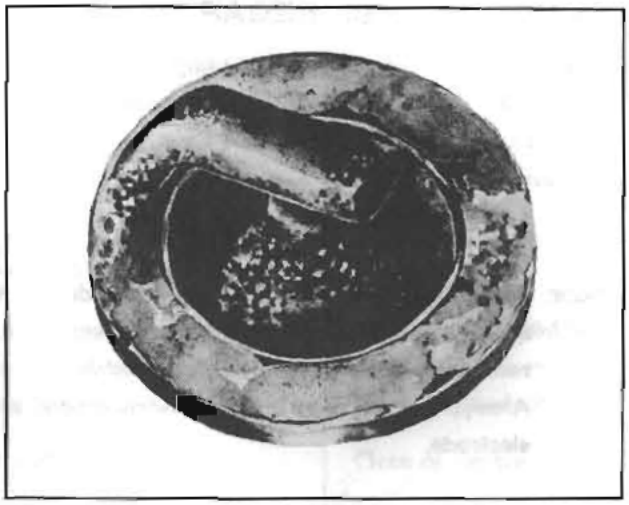


Fig. EE-98 Overheating (II)

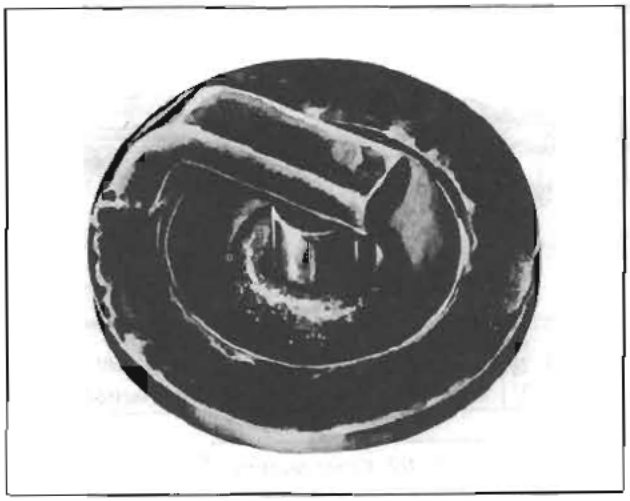


Fig. EE-96 Wet

Fig. EE-99 Overheating (III)

Fig. EE-97 Overheating (I)

Fig. EE-100 Life

CLEANING AND REGAP

Clean spark plugs thoroughly using an abrasive-type cleaner. All spark plugs must be of the same make and number or heat range. Use a round feeler gauge to adjust the spark plug gaps.

Note: Before adjusting gap, file center electrode falt. In adjusting spark plug gap, never bend center electrode which extends through porcelain center. Always make adjustments by bending ground side electrode.

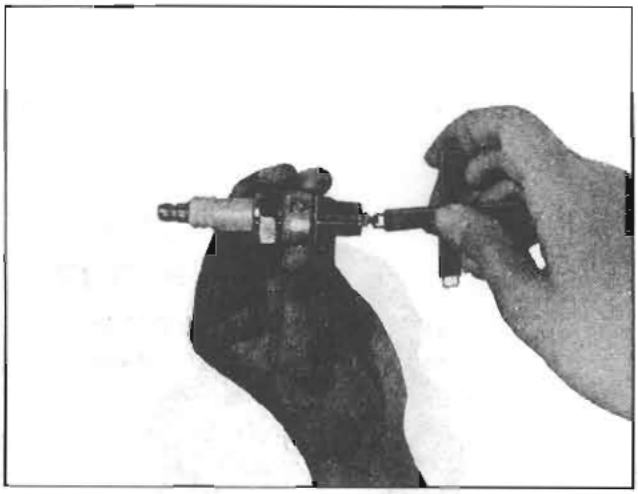
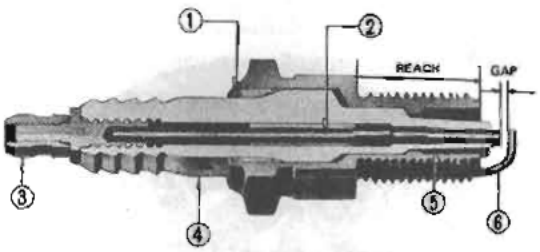


Fig. EE-101 Measuring spark plug gap

SPECIFICATION AND SERVICE DATA

Item \ Make / Model	NGK BP-6E
Applied engine	L24, L20A
Size (screw diameter x reach)	14 x 19 mm (0.55 x 0.75 in)
Plug gap	0.8 to 0.9 mm (0.031 to 0.035 in)
Torque	1.5 to 2.0 kg-m (11.0 to 15.0 ft-lb)



1	Ring	4	Insulator
2	Center electrode	5	Insulator
3	Terminal nut	6	Ground electrode

Fig. EE-102 Cross section of spark plug

TROUBLE DIAGNOSES AND CORRECTIONS

1. The engine does not start.

If there is no trouble in the fuel system, the ignition system should be checked. This can be easily done by detaching the high tension cord from spark plugs, start the engine by the starting motor and observe the condition of the sparks that occur between the high tension cord and cylinder block. After checking this, use the proper countermeasures.

Spark gap	Trouble location	Causes	Corrective action
No sparks at all	Distributor	Defective insulation of condenser	Replace.
		Breakage of lead-wire on low tension side	Repair.
		Defective insulation of cap and rotor head	Replace.
		Point does not open or close.	Repair.
	Ignition coil	Wire breakage or short circuit of coil	Replace with new one.

	High tension code	Wire coming off	Repair.
		Defective insulation	Replace.
1 to 2 mm (0.0394 to 0.0787 in) or irregular	Distributor	Point gap too wide	Correct.
		Oil sticking on point	Clean.
		Excessively burnt point	Replace.
		Layer short-circuit	Replace with good one.
Less than 6 mm (0.2362 in)	Spark plugs	Electrode gap too wide	Correct or replace.
		Excessively accumulated carbon	Clean or replace.
		Broken insulator neck	Replace.
		Expirty of plug's life	Replace.

2. The engine rotates but does not run smoothly.

There are may causes for this trouble, and it is difficult to point out the right cause. However, when considering the ignition system only, pay special attention to the following points.

Troubles	Trouble location	Causes	Corrective action
Engine misses.	Distributor	Dirty point	Correct.
		Improper point gap	Correct.
		Leak of electricity of cap and rotor head	Clean or replace.
		Defective insulation of condenser	Replace.
		Defective insulation of lead wire of condenser	Correct.
		Defective arm	Oil the shaft.
		Defective arm spring	Correct or replace.
		Near-breakage of lead wire	Correct.
		Worn or shaky breaker plate	Correct.
		Worn or shaky distributor shaft.	Correct.
	Ignition coil	Layer short-circuit or use of inferior quality	Replace with good one.
	High tension code	Deterioration of insulation and leak of electricity	Replace.

	Spark plugs	Dirty	Clean or replace.
		Electricity leaks at the upper porcelain insulator	Clean.
Engine causes knocking very often.	Distributor	Improper advance timing	Adjust.
		Come off or breakage of governor spring	Correct or replace.
		Worn out pin or hole of governor portion	Replace.
	Spark plugs	Excessively burnt spark plug	Replace.
Engine does not provide enough power	Distributor	Improper or retarded timing	Adjust.
		Defective function of governor	Correct.
		Dirty point	Correct.
		Point gap too narrow	Correct.
	Spark plugs	Dirty	Clean.

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT