

HONDA

250,300

Shop Manual



HONDA MOTOR CO., LTD



HONDA 250 MODEL C72



HONDA 250 MODEL CS72



HONDA 250 MODEL CB72

PREFACE

This Shop Manual contains general data and information, and procedures relative to motorcycle maintenance, over-haul and repairs for the models covered by Honda 250 and Honda 300 equivalent to Model C72 · C77, CB72 · CB77, CS72 · CS77.

Therefore, information in this manual will be suitable instruction for servicemen and mechanics of Honda to assist them to efficiently service and repair these machines.

Now, in this case, mechanical arrangement means to repair a motorcycle when it is out of order and restore it to the ordinary state as well as to prevent it from any trouble by periodically inspecting the motorcycle.

The contents of this book are divided into five chapters, including main standards, disassembly-assembly, construction, wiring diagram and trouble shooting.

Each chapter is separated into sections. Disassembly-assembly (the 2nd chapter) is divided into 2 sections – Engine and Frame. The section of Engine is described both model C72 · 77, CB72 · 77, but that of Frame is done only model CB72 · 77.

In regard to the Frame of model C72 · 77, please refer to the previously published Shop Manual for Honda 125 · 150.

An effort has been made to produce a manual avoiding fundamental principle and theory by explaining the actual mechanism.

Special emphasis has been placed on illustrations and charts to make it easy for the service man to understand without reading every line. We hope this will be of some use to you.

This manual will be revised without notice.

January, 1960.

HONDA MOTOR CO., LTD.

TECHNICAL SECTION

EXPORT DEPARTMENT

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| | | |
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MAINTENANCE STANDARDS,C 72•77

For maintenance operation for **HONDA** 250・300, Maintenance Standards, specification and dimension are listed hereafter for reference.

EXPLANATION :

| | |
|--------------------------|--|
| Maintenance Items | Items to be inspected, service-wise. |
| Standard Value | This indicates the manufacturer's standard size or the standard size after newly assembling or adjusting, and shows the size-limit of completed part in the permissible limit of adjustment. |
| Repairing Limit | Unusable wear limit of parts requiring correction or replacement, function-wise. |
| Remarks | Unmarked numbers are mm unit and inch unit shown underneath, and others according to the unit indicated. |

UNIT IN CHART :

Unmarked numbers are mm unit and inch unit shown underneath, and others according to the unit indicated.

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MAINTENANCE STANDARDS (Model C72)

This maintenance standards is listed only about the data of Model C72. In this list, dimensions without units indicate "mm" (upper step) and "inch" (down step), and others according to the units indicated.

1. GENERAL PERFORMANCE

| Item | Standard | Repairing Limit | Remarks |
|-----------------------|---|---------------------------------|---|
| Compression pressure | 8.5 kg/cm ² 120.87 lb/in ² | 7.0 99.54 lb/in ² | Check with kick |
| Fuel consumption | 42—45 km/ℓ 26.04—27.90 mile/ℓ | 29 17.98 | 35 km/h (21.7 mile/h) |
| Lubricant consumption | 120 cc/1000 km or less 120 cc/620 mile | 200/1000 more 200/620 mile | |
| Max. speed | 130 km/h 80.60 mile/h | 90 less 55.80 mile/h | The posture is leaning forward one thirds of the body |

2. ENGINE

A. Cylinder, Cylinder Head

| Item | Standard | Repairing Limit | Remarks |
|------------------------------|--|----------------------|--|
| Cylinder | Inner dia. 53.99—54.00 2.1255~2.1259 | 54.1 more 2.129 | |
| | Max. out of round within 0.001 | 0.05 more 0.00019 | |
| | Taper within 0.001 | 0.05 more 0.00019 | |
| Over size of cylinder | Over size 0.25 0.00984 | | 3 category of 0.25 10.00981 over size |
| Cylinder head valve sheet | Width 1.0~1.5 0.0393—0.0590 | 2.0 more 0.0787 | |
| | Angle 45° | | |
| Compression ratio | 8.3 0.326 | | The capacity of the combustion chamber. 16.94 cc |
| Cylinder head gasket surface | Flatness within 0.03 0.0011 | 0.06 more 0.0023 | |
| Cylinder head gasket | Thickness 1.0—1.1 0.039—0.043 | | In case of binding |
| Cylinder stud nut | Tightness 2.1 m·kg 15.189 ft lb | | |

B. Crank Shaft (Piston, Connecting Rod)

| item | | Standard | Repairing Limit | Remarks |
|-----------------------------|----------------|--|--------------------------------|---|
| Piston | Top diameter | 53.55~53.60 2.108~2.110 | 53.5 less 2.106 | The progressive direction of the lower parts of skirt |
| | Max. dia. | $54 + 0$ $-0.02 = D$ | 53.9 less 2.122 | |
| | Out of round | $D - (0.14 \sim 0.16) = d$ $D - (0.005 \sim 0.006) = d$ | | |
| | | | | |
| Piston & cylinder | Min. clearance | 0 | 0.1 more 0.0039 | |
| Piston pin | Dia. | 15.0 - 15.0006 0.59 - 0.5907 | 15.05 more 0.5925 | |
| Piston over size | Over size | 0.25 0.0098 | | 3 category of 0.25 to 0.00981 over size |
| | Toper | $D - 0.08d - 0.08$ $D - 0.0031d - 0.003$ | | |
| | | | | |
| Top-2nd ring | Thickness | 2.4~2.6 0.094~0.102 | 2.3 less 0.0905 | |
| | Width | 1.780~1.795 0.0700~0.0706 | 1.7 less 0.0669 | |
| | Tension | 1.75~1.05kg (top) 1.70~1.00kg (2nd) 1.653~2.315 lb 1.543~2.205 lb | 0.6 kg less 1.3230 less | Tangential tension In case of binding |
| | End gap | 0.15~0.35 0.0059~0.0137 | 0.8 more 0.0314 | |
| Top. 2nd ring & ring groove | Clearance | 0.01~0.04 0.0003~0.0015 | 0.1 more 0.0039 | |
| Oil ring | Thickness | 2.4~2.6 0.0944~0.1023 | 2.0 less 0.0787 | |
| | Width | 2.780~2.795 0.1094~0.1100 | 2.7 less 0.10629 | |
| | Tension | 0.7~0.9 kg 1.5435~1.9845 lb | 0.5 less 1.1025 lb | Tangential tension |
| | End gap | 0.1~0.3 0.0039~0.0118 | 0.8 more 0.0314 | In case of binding |
| Oil ring & ring groove | Clearance | 0.01~0.04 0.0003~0.0015 | 0.1 more 0.0039 | |
| Piston over size | Over size | 0.25 0.0098 | | 3 category of 0.25 to 0.00981 over size |
| Piston pin | Out. dia. | 14.994 - 15.0 0.5903 - 0.5905 | 14.95 less 0.5885 | |
| | Total length | 45.5~45.7 1.7913~1.7992 | | |

| Item | | Standard | Repairing Limit | Remarks |
|------------------------------------|--------------------|--------------------------------|-------------------------|--|
| Piston pin & piston | Clearance | 0—0.012 0—0.0004 | 0.05 more 0.00196 | In cold. push in softly by fingers |
| Connecting rod small end | In. dia. | 15.016—15.043 0.5911~0.5922 | 15.08 more 0.5936 | |
| Con. rod small end & piston pin | Clearance | 0.016—0.049 0.0006—0.0019 | 0.08 more 0.0031 | |
| Con. rod small end | Swing | | 3.0 more 0.118 | Max. amplitude to axial direction of crank pin |
| Lower end of ton. rod | Axial clearance | 0.07—0.33 0.0027~0.012 | 0.5 more 0.0196 | |
| | Diagonal clearance | 0.006—0.016 0.0002~0.0006 | 0.05 more 0.00196 | |
| | Amount of parallel | within 0.02 0.00078 | over 0.1 0.0039 | At length of 100 mm 13.93 in) |
| Big end+small end of con. rod | Distortion | within 0.02 0.00078 | over 0.1 0.0039 | At length of 100 mm 13.93 in) |
| Baranser weight crankpin | Out. dio. | 24.99~25.00 0.9838~0.9842 | 24.95 or less 0.9822 | |
| R. L crank rhoft | Dia. of rhoft | 30.82~30.86 1.213~1.214 | 30.6 or less 1.204 | |
| Crank rhoft bearing | Axial clearance | 0.005 0.00019 | over 0.1 0.0039 | Center bearing |
| | Radial clearance | 0.014~0.016 0.0005~0.0006 | over 0.05 0.0019 | |
| | Max. swing | 0.03 less 0.0011 | over 0.1 0.0039 | In case of supporting Center bearing, the swing of both ends |
| Cam chain | Overall length | 723.0~723.8 28.46~28.49 | over 728 28.66 | |

C. Cam • Timing and Valve Mechanism

| Item | | Standard | Repairing Limit | Remarks |
|---------------------|-------------------|----------------------------|------------------------|---------|
| Ex. In. valve guide | In. dia. | 7.0—7.01 0.2755—0.2759 | over 7.05 0.2775 | |
| Ex. valve | Overall length | 88.65~88.85 3.490~3.498 | 88.2 or less 3.472 | |
| | Out. dio. of stem | 6.97~6.98 0.2744~0.2748 | 6.95 or less 0.273 | |
| | Thickness of head | 1.0 0.03937 | 0.5 or less 0.01968 | |
| | Overall length | 89.18~89.38 3.511—3.518 | 88.7 or less 3.492 | |
| In. valve | Out. dio. of stem | 6.97~6.98 0.2744~0.2748 | 6.95 or less 0.273 | |

| Item | | Standard | Repairing Limit | Remarks |
|--|------------------------------|--|-----------------------|---|
| Ex. In. valve | Thickness of head | 1.0 0.03936 | 0.5 or less 0.019 | |
| | Width | 1.0—1.5 0.0393—0.059 | over 2.0 0.787 | |
| Ex. valve stem and guide | Clearance | 0.02—0.04 0.0007—0.0015 | over 0.08 0.0031 | |
| In. valve stem and guide | Clearance | 0.01—0.03 0.0039—0.0011 | over 0.07 0.00275 | |
| Valve spring outer | Free length | 43.82 1.725 | 42.3 or less 1.665 | |
| | Tension | 11.6—12.4 kg 24.2—25.8 kg 25.57—27.3 lb 53.36—56.8 lb | | At 34.5 mm (1.35) of binding length At 27.5 mm (1.08) of max. lift |
| | Decline | within 1. 0.03937 | 1.5 more 0.059 | |
| Valve spring inner | Free length | 34.66 1.364 | 33.4 less 1.314 | |
| | Tension | 3.9—4.8 kg 14.5—15.5 kg 8.59—9.48 lb 31.97—34.17 lb | | At 31.5 mm (1.24) of binding length At 24.5 mm (0.96) of max. lift |
| | Decline | within 1. 0.0393 | 1.5 more 0.059 | |
| Cam shaft | Shaft dia | 19.98—19.99 0.786—0.787 | 19.95 less 0.785 | |
| | Bend of shaft | within 0.01 0.0003 | 0.05 more 0.0019 | |
| | Height of cam | 26.98—27.02 1.062—1.063 (—) (+) | 26.7 less 1.051 | |
| Cam shaft and bearing of journal | Clearance | 0.003—0.03 0.0011—0.0011 | 0.08 more 0.0031 | |
| Valve timing Ex. [at 1.1 mm 10.0431 of Lift length] | Opening angle | before lower dead point 25" | ±5° | P. 6 cam |
| | Closing angle | after upper dead point 10" | ±5° | Non-clearance |
| Valve timing In. [at 1.1 mm 10.0431 of Lift length] | Opening angle | before upper dead point 10° | ±5° | P. 6 cam |
| | Closing angle | after lower dead point 25" | ±5° | Non-clearance |
| Cam sprocket | Bottom diameter | 74.766 2.943 | 74.2 less 2.922 | |
| | To fix steps on slipper face | | 0.3 more 0.0118 | In case of having some trouble on slipper surface |

| Item | | Standard | Repairing Limit | Remarks |
|----------------------------|---------------------------------------|------------------------------|---------------------|--------------------------|
| Rocker arm crankpin | In. dia | 13.0~13.027 0.511~0.512 | 13.1 more 0.515 | Cool state |
| | Out. dia. | 12.966~12.984 0.510~0.511 | 12.9 less 0.5078 | |
| | Clearance to rocker arm | 0.16~0.61 29 | 0.1 more 0.0039 | |
| | Ex. In. valve adjust Tappet clearance | 0.006~0.024 0.09~0.11 | out of standard | |
| Cam chain tensioner spring | Free length | 0.0035~0.0043 73 | 70 less | Without injury of rubber |
| | Tension | 2.874 16.0~16.2 kg | 2.755 10 less | |
| | | 35.28~35.71 lb | 22.05 | |
| Cam chain tensioner roller | Out. dia. | 59.2~59.8 2.33~2.35 | 58.5 less 2.303 | |
| | | | | |

| Item | | Standard | Repairing Limit | Remarks |
|----------------------------|-----------------|------------------------------|---------------------|---------|
| Hale. shift drum | In dia. | 34.0~34.02 1.338~1.339 | 34.2 more 1.346 | |
| | In dia. of axle | 12.0~12.01 0.472~0.473 | 12.2 more 0.4803 | |
| | Out. dia. | 13.966~13.984 0.549~0.550 | 13.9 less 0.547 | |
| Cam chain guide roller pin | | | | |
| Chain guide roller | In. dia. | 14.0~14.01 0.5511~0.5515 | 14.1 more 0.5551 | |

| Item | | Standard | Repairing Limit | Remarks |
|------------------------|-----------------|------------------------------|---------------------|---------|
| Clutch center | In. dia. | 25.0~25.021 21.0~21.084 | 24.9 20.9 less | |
| | | 0.984~0.985 0.826~0.830 | 0.980 0.822 | |
| | | within 0.1 0.0039 | 0.2 more 0.0078 | |
| | | | | |
| Primary drive sprocket | Bottom diameter | 39.11~39.21 1.5397~1.5436 | 38.3 less 1.5078 | |
| Clutch friction disc | Thickness | 4.8~4.9 0.1889~0.1929 | 4.4 less 0.1732 | |
| | Strain | within 0.2 0.0078 | 0.5 more 0.0196 | |
| | | | | |

| Item | | Standard | Repairing Limit | Remarks |
|---|---------------|---|-----------------------|---|
| Clutch plate | Strain | within 0.2 0.0078 | 0.5 more 0.0196 | At 25 mm 10.981 of binding length At 23 mm 10.901 of max. lift |
| | Width of hook | 13.7 ~ 13.8 0.5393—0.5433 | 13.0 less 0.5118 | |
| Teeth and outer of clutch pressure plate | Rotary play | within 0.2 0.0078 | 0.8 more 0.0314 | |
| Clutch spring | Free length | 33.4 1.3149 | 32.4 less 1.2755 | |
| | Tension | 15.3—16.7 kg 19.8 kg 33.736~36.823 l 43.659 lb | 15.0 less 123 0751 | |
| | | | | |
| | | | | |
| | | | | |

F. Transmission

| Item | | Standard | Repairing Limit | Remarks |
|--|-------------|---|--|----------------------|
| Mission case lubricat- ing oil | Capacity | 0.396 gal U.S. | out of standard | In crank and mission |
| Main shaft | Out. dio. | 24.959 ~ 24.98 0.9826—0.9834 | 24.9 less 0.980 | |
| Main shaft and M2 gear | Clearance | 0.07—0.074 | 0.1 more 0.0039 | Spline parts |
| Axial direction of main shaft | Clearance | 0.1—0.75 0.0039 ~ 0.0295 | 1.2 more 0.0472 | |
| Turning direction of M3 gear | Clearance | 0.03—0.078 0.0011 ~ 0.0030 | 0.1 more 0.0039 | |
| Teeth surface of gear relating to mission | Axis play | 0.089 ~ 0.178 | 0.2 more 0.0078 | |
| Top gear bush 18φ | In. dio. | 18.0 ~ 18.018 0.708 ~ 0.709 | 18.1 more 0.712 | |
| Top gear bush 20.5φ | In. dia. | 20.5 ~ 20.52 0.8070—0.8078 | 20.6 more 0.811 | |
| Top gear bush & main shaft | Clearance | 0.04—0.082 0.0016—0.0032 | 0.1 more 0.0039 | |
| Drive sprocket | Bottom dia. | 71.5—71.51 65.649 ~ 65.776 2.814 ~ 2.815 2.584 ~ 2.589 | 70.5 less 64.7 less 2.77 2.54 | |
| | Rotary play | 0.03—0.078 | 0.5 more 0.019 | |
| | | | | |
| Primary driven sprocket | Bottom dio. | 136.06—136.16 5.356—5.360 | 35.3 less 5.326 | |
| Main shaft & top gear bearing | Axis play | 0.005 | 0.1 more 0.0039 | |

| | | | |
|----------------------------------|-------------|---------------------------------|---------------------------------|
| Counter shaft & C2 gear | Rotary play | 0.01—0.098 | 0.5 more |
| Low gear bush | In. dia. | 11.00039—0.0038 17.13~17.15 | 0.0196 17.2 more |
| Low gear bush & 14mm bush | Clearance | 3.674—0.675 0.02—0.058 | 0.677 0.1 more |
| Kick starter spindle | Out. dia. | 0.00078~0.0022 14.341~14.353 | 0.0039 14.25 less |
| Kick starter spindle & each bush | Clearance | 0.564~0.565 0.06—0.09 | 0.561 0.15 more |
| Kick spindle pole | R-port | 0.0023—0.0035 | 0.0059 with step 0.3 more |
| Kick spindle pole spring | Free length | 14 0.5511 | 0.0118 |
| Primary chain | Looting | 5~10 0.1968~0.3937 | 2.0 less 0.787 |

G. Magneto, Contact Point

| Item | | Standard | Repairing Limit | Remarks |
|--|---------------|--|-----------------|---|
| Contact breaker arm spring | Tension | 0.2—0.4 0.85—1.05 kg 0.441—0.882 | | In case of 24.5 mm (0.964) of binding length In case of 25.9 mm 11.0191 of max. lift |
| Contact point | Gap | 1.874—2.315 0.3—0.4 | out of standard | |
| Ignition timing | Crank angle | 0.0118—0.0157 after upper | | |
| Spark advancer; beginning of advance angle | Rotary number | dead point 5" 1100 r.p.m. | | |
| Spark advancer : end of advance angle | Rotary number | 3000 r.p.m. | out of standard | |

H. Oil Pump • Oil Filter

| Item | | Standard | Repairing Limit | Remarks |
|--|-------------------|--------------------------------|---------------------|--------------------|
| Oil pump drive gear | Gearing eccentric | 0.063 less | 0.1 more 0.0039 | Adjust by packing |
| Oil pump drive gear & center crank gear | Back lash | 0.01 less 0.0039 | 0.5 more 0.0196 | |
| Oil pump packing | Thickness | 0.4 0.0157 | | In case of binding |
| Addendum and internal wall of oil pump gear | Clearance | 0.025~0.05 0.00098~0.0019 | 0.1 more 0.0039 | |
| Oil pump gear | Back lash | 0.106~0.210 0.0041~0.0082 | 0.5 more 0.0196 | |
| Side and side cover of oil pump gear | Clearance | 0.089~0.04 0.00350~0.0030 | 0.15 more 0.0059 | |
| Gear pin and gear | Clearance | 0.05~0.13 0.0019~0.0051 | 0.1 more 0.0039 | |
| Oil filter shaft and oil filter rotor | Clearance | 0.012~0.048 0.000472~0.0018 | 0.1 more 0.0039 | |
| Oil filter rotor | Out. dia. | 57 2.244 | | |
| Oil filter chain | Loosing | 5~10 0.196~3.937 | 15 more 5.905 | |

I. Kick • R. Crank Case Cover

| Item | | Standard | Repairing Limit | Remarks |
|--|-----------|------------------------------|--------------------|----------------|
| Kick starter joint & hole of crank case cover | Clearance | 0.03~0.205 0.00314~0.0080 | 0.5 more 0.0196 | In case of use |
| Kick starter spring | Torque | 47.6 m.kg 344.290 ft lb | 40 less 289.32 | |

J. Under Crank Case and Change

| Item | | Standard | Repairing Limit | Remarks |
|--|-------------------------|----------------------------------|---------------------|-------------------------|
| Shift drum | Out. dia. | 33.95—33.97 1.336—1.337 | 33.9 less 1.334 | |
| | Out. dia. of axial part | 11.966—11.984 0.4722~0.4718 | 11.9 less 0.4685 | |
| Shift drum & hole of crank case | Clearance | 0.025—0.075 0.00098~0.0029 | 0.2 more 0.00787 | |
| Shift drum | Groove width | 8.50 —8.515 0.334~0.335 | 9.0 more 0.354 | |
| Shift fort | In. dio. of hole | 34.0~34.02 1.338~1.339 | 34.1 more 1.34 | 26 x P1.0 28 x P1.25 |
| | Thickness at end | 4.9~5.0 0.1929—0.1968 | 4.5 less 0.177 | |
| | Bend at end | 0.1 within 0.0039 | 0.8 more 0.031 | |
| Setting stud bolt of upper. under crank case | Torque | 0.5—0.7 m.kg 3.616~5.063 ftlb | out of standard | |
| | | | | |
| Stud | Torque | 1.7~2.0 m.kg 12.29~14.46 ftlb | | |

3. FRAE

A. Handle

| | | Standard | Repairing Limit | Remarks |
|--|--------|----------------------|-----------------|-----------------------------|
| Throttle grip | Ploy | 2—4 0.0787~0.157 | out of stondord | Check by external periphery |
| Throttle wire differ- ence between outer & inner | Length | 61 2.4015 | | |
| Brake lever | Ploy | 25—30 0.984—1.181 | out of rtondord | Check by lever end |
| Clutch wire ditto | Length | 118 4.645 | | Check by lever end |
| Clutch lever | Play | 15—25 0.590~0.984 | out of standard | |

B Front Cushion

| Item | | Standard | Repairing Lim | Remarks |
|-----------------------------|----------------|-------------------------------|--------------------|---|
| Front cushion under bush | Out. dia. | 26.04—26.07 1.025~1.026 | out of standard | |
| Pivot bush & suspension arm | Clearance | 0.037—0.08 0.01014—0.00314 | | |
| Pivot collar | Overall length | 24.5—24.6 0.964—0.968 | | |
| Pivot bush & collar | Clearance | 0.016—0.07 0.00062~0.0027 | 0.3 more 0.0118 | |
| Front cushion | Stroke | 60.3 2.374 | | |
| Front cushion damper | Damping force | 38—45 kg 83.79—99.22 lb | 20 less 44.10 | By 0.5m/sec 119.68in) of piston White spindle oil #60 |
| | Oil capacity | 39 cc | 25 less | |
| Front cushion spring | Free length | 278.8 10.976 | 268 less 10.551 | |
| | Tension | 127.5 kg 281.13 lb | 110 less 242.55 | |
| | Fall | 1° within | out of standard | |
| | | | | |

C. Front Fork • Steering • Fuel Tank

| Item | | Standard | Repairing Limit | Remarks |
|------------------------|----------|----------------------------------|-----------------|-------------------------------------|
| Steering head stem nut | Torque | 6.5—7.5 m.kg 47.014~54.2 ftlb | out of standard | |
| Steering head | Angle | 90" | | Angle between trident and head pipe |
| Caster | | 60" | | |
| Trail | | 75 2.952 | | |
| Fuel tank | Capacity | 11.8 ℓ 3.117 gal U.S. | | |

| | | | | |
|---------------------------|-----------|----------------------------|--------------------|--|
| Steel ball | Out. dia. | 1/4 0.0098 | | |
| Rear fork pivot bolt bush | In. dia. | 12.2 ~ 12.3 0.480—0.484 | 12.6 more 0.496 | |

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |

F. Rear Fork • Chain Case

| Item | | Standard | Repairing Limit | Remarks |
|----------------------------|---------------|------------------------------|--------------------|----------|
| Rear broke torque link end | Hole | 12.1 ~ 12.2 0.476 ~ 0.480 | 12.4 more 0.488 | 95 teeth |
| Rear fork pivot bush | Out. dia. | 28.0—28.03 1.102—1.103 | | |
| Drive chain | Amount of sag | 10—20 0.393 ~ 0.787 | out of standard | |

G. Rear Cushion

| Item | | Standard | Repairing Limit | Remarks |
|---------------------|------------------|--------------------------------|---------------------------|--|
| Rear cushion | Stroke | 61 2.401 | | At 0.5 m/sec 119.681 of piston White spindle oil #60 |
| Rear cushion damper | Damping force | 50—56 kg 110.25—123.48 | 30 less 60.15 | |
| | Oil capacity | 39 cc | 30 less | |
| Rear cushion spring | Free length | 218.4 ~ 218.9 8.598 ~ 8.618 | 207 less 8.149 | |
| | Tension | 150—166 kg 330.75—366.03 | 143 kg less 315.315 lb | |
| | Tangential angle | 1° within | out of standard | |

H. Front Wheel

| Item | | Standard | Repairing Limit | Remarks |
|------------------------------|--------------------|---|---------------------|---|
| Front wheel hub ball bearing | Axial play | 0.005 less | 0.1 more 0.00393 | |
| | Radial play | 0.01~0.02 | 0.05 more | |
| Front brake panel spacer | Out. dia. | 21.972~21.993 0.8650~0.8658 | 21.9 less 0.8622 | |
| | Overall length | 34.9~35.1 1.374~1.381 | | |
| Front axle distance collar | Overall length | φ98 - SOZ 1.960~1.976 | | |
| Brake cam | Thickness | 11.9~12.1 0.468~0.476 | | |
| Front brake shoe | Out. dia. | 174.1~174.4 6.854~6.866 | | Cutter out. dia. |
| Front brake lining | Thickness | 3.5~4.5 0.137~0.177 | 2.5 less 0.0984 | |
| Brake drum | In. dia. | 174.8~175.2 6.881~6.891 | 176.0 more 6.929 | |
| Brake shoe spring | Free length | SS 2.165 | 58 more 2.283 | |
| Front axle | Out. dia. | 15.0 0.5905 | 14.9 less 0.586 | |
| Front axle | Bend | 0.05 within | 0.2 more 0.0078 | Both ends support on V block, measure bend at center part |
| Front wheel rim | Lateral deflection | 1.0 within 0.0393 | 3.0 more 0.118 | |
| Front tire | Air pressure | 1.5 kg/cm ² 21.330 lb/in ² | out of standard | |

I. Rear Wheel

| Item | | Standard | Repairing Limit | Remarks |
|---------------------------|--------------------|----------------------------|---------------------|------------------|
| Final driven sprocket | Bottom dia. | 145.76 5.738 | 44.7 less 5.696 | Cutter out. dio. |
| Rear wheel hub bearing | Axial play | 0.005 within 0.000196 | 0.1 more 0.00393 | |
| | Radial play | 0.01 —0.02 | 0.05 more | |
| Rear axle distance collar | Overall length | 73.8—74.2 2.905~2.921 | | |
| Rear axle sleeve | Overall length | 9.5—9.7 | | |
| | | 0.374 —0.381 | | |
| Rear wheel axle | Out. dia. | 16.9~17.0 0.665~0.669 | 16.85 less 0.663 | |
| Rear brake shoe | Bend | 0.05 within | 0.2 more 0.0078 | |
| | Out. dia. | 174.1—174.3 6.854~6.862 | | |
| Rear brake lining | Thickness | 3.5—4.5 | 3.0 less | |
| | | 0.137~0.177 | 0.118 | |
| Rear broke shoe spring | Free length | 27.88 | 32.0 more | |
| | | 1.0976 | 1.259 | |
| Rear broke cam | Thickness | 11.9~12.1 | | |
| | | 0.468~0.476 | | |
| Rear broke pedal | Foot width | 20—30 0.7874~1.1811 | out of standard | |
| Rear wheel rim | Lateral deflection | 1.0 within | 3.0 more | |
| | | 0.0393 | 0.181 | |
| Rear tire | Air pressure | 2.0 kg/cm ² | out of standard | |
| | | 28.44 lb/in ² | | |

MAINTENANCE STANDARDS,CB72•77

For maintenance operation For HONDA 250•300, Maintenance Standards, specification and dimension are listed hereafter for reference.

EXPLANATION :

| | |
|--------------------------|--|
| Maintenance Items | Items to be inspected, service-wise. |
| Standard Value | This indicates the manufacturer's standard size or the standard size after newly assembling or adjusting, and shows the size-limit of completed part in the permissible limit of adjustment. |
| Repairing Limit | Unusable wear limit of parts requiring correction or replacement, function-wise. |
| Remarks | Unmarked numbers are mm unit and inch unit shown underneath, and others according to the unit indicated. |

UNIT IN CHART :

Unmarked numbers are mm unit and inch unit shown underneath, and others according to the unit indicated.

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MAINTENANCE STANDARDS (Model CB72, CB77)

In this list, the dimensions without units indicate "mm" (upper step) and "inch" (down step), and others according to the units indicated. Mark * is exclusively used only for model CB77 and others are common both model CB72 and CB77.

1. GENERAL PERFORMANCE

| I t e m | | Standard | Repoiring Limit | Remarks |
|-----------------------------|--|--|---|--------------------------|
| Compression pressure | | 10.5 kg/cm ² 149.31 lb/in ² | 8.0kg/cm less 113.76 lb/in ² | Measure with kick |
| Fuel Consumption | | 45 km/ℓ 127 Br m.p.g. | 26km/ℓ less 73 Br mpg | Speed 40km/h 124.8mph |
| Compression ratio | | 9.3~9.7 | out rtondard | |
| Lubricating oil consumption | | 120 cc/1000 km less 120 cc/620 mile | 200cc/ 1000km more 200cc/ 620 mile | |
| Lubricating oil capacity | | 1500 cc | out standard | Check with oil gauge |
| Rear wheel output | | 16PS more 18PS more | 12.5PS less 14PS less | (Max. output) |
| Caster | | 62' | out standard | (Referential value) |
| Trail | | 85° | out rtondard | (Referential value) |

2. ENGINE

A. Cylinder, Cylinder Head

| I t e m | | Standard | Repoiring Limit | Remarks |
|-----------------|--|--|--|--|
| Cylinder sleeve | Difference between max. in. dia. and min. in. dio. | within 0.01 0.0003 | 0.05 more 0.00196 | After boring, honing should be enforced |
| Cylinder sleeve | In. dia. | 54.00—54.01 2.1259~2.1263 60.00—60.01 2.3622~2.3625 | 54.10 more 2.129 60.10 more 2.366 | After boring, honing should be enforced |
| Cylinder barrel | Height | 83.45—93.5 3.285~3.681 | out standard | |
| Cylinder sleeve | Out. dio. | 62.02—62.03 2.441—2.442 67.02—67.03 2.638~2.6389 | | (Referential value) |
| | Inlaying space | 0.02~0.05 .00078~0.00196 | | Be pressed in at the normal temperature |

| i t e m | | Standard | Repairing Limit | Remarks |
|---|--------------------------------------|----------------------------------|-----------------------------|--|
| Cylinder (oversize) | Over size | 0.25 0.0098 | | 3 category of 0.25 |
| Cylinder head (Cam shaft bearing par) | In. dia. | 41.994—42.01 1.653~1.653 | 42.06 more 1.655 | |
| Cylinder head (rocker arm pin) | In. dia. | 17.0—17.018 0.669~0.669 | 17.05 more 0.671 | |
| Cylinder head (rocker arm pin) | Combustion chamber capacity | 29.3~29.7 cc | | (Referential value) |
| Cylinder head (attaching force) | Bend | 0.03 less 0.001 | 0.06 more 0.002 | |
| Cylinder head (head cover attaching face) | Bend | 0.03 less 0.001 | 0.06 more 0.002 | |
| Cylinder head (inlet port) | In. dia. | 25.5 1.003 | | |
| Carburettor insulator | Gap of the in. dia. of inlet port | 0.5 less 0.0196 | 1.0 more 0.039 | |
| Cylinder head gasket | Width | 1.0~1.1 0.039—0.043 | | When lighting |
| Cylinder packing | Width | 0.3—0.4 0.0118—0.0157 | | When lighting |
| Tachometer gear | In. dia. of Bush | 7.0—7.015 0.275—0.276 | 7.2 more 0.283 | |
| Tachometer gear | Out. dia. of Bush | 13.982—14.0 0.550—0.551 | | |
| Tachometer gear "O" ring, 14m/m | Tightness | 0.4 0.015 | | Unless omission. there are no troubles |
| Tachometer gear and bush | Clearance | 0.028~0.043 1.0011—0.0016 | 0.2 more 0.0078 | Unless omission. there are no troubles |
| Cylinder head cover | Flatness | 0.03 less 0.001 | 0.06 more 0.002 | |
| Breather shield plate | Thickness | 1.0 0.0393 | | |
| Breather shield plate | Attaching direction | put forward an arrow | | Be careful of the mark |
| Cylinder head cover | Tighting torque | 1.9—2.3 m·kg 3.74~16.63 ft·lb | 1.9m·kg less 13.74 ft·lb | 8 sports are equal |
| Cylinder head cap | Tighting torque | 0.45 m·kg 3.25 ft·lb | 0.35m·kg less 2.53 ft·lb | |
| Cylinder head cap "O" ring | Dia. | 3.2 0.125 | 2.5 less 1.0984 | |

B. Crank Shaft, Connecting Rod, Piston

| I t e m | | Standard | Repairing Limit | Remarks |
|-----------------------------------|-------------------------------|----------------------------------|----------------------|----------------------|
| Crank shaft comp. | Crank angle (I B) | 180" | | |
| | Crank angle (II B) | 360' | | |
| Sprocket. center crank shaft | Tooth | 16 | | |
| | Bottom dio. | 36.285—36.286 1.42854~1.42857 | | |
| | | | | |
| Gear, center crank shaft sprocket | No. of tooth | 22 | | |
| | Thickness of cross over teeth | 15.295~15.337 0.602—0.603 | 15.1 less 0.594 | No. of cross teeth 3 |
| | Out. dia. | 47.9~48.0 1.885~1.889 | 47.7 less 1.877 | |
| | Out. dia. | 38.003—38.015 1.4961~1.4966 | 38.05 more 1.498 | |
| | Radial clearance | 0.006—0.014 | 0.05 more | |
| | Out. dia. of pin | 25.991—25.999 1.0232~1.0235 | 25.95 less 1.021 | |
| | | | | |
| Center crank weight | | | | |
| Center crank shaft. pressed port | in. dio. | 25.0—25.02 0.984—0.985 | 0.00401 | (Referential value) |
| R. crank shaft. bearing port | In. dia. | 25.907~25.921 1.019—1.020 | | |
| R. crank shaft. bearing part | Out. dia. | 29.983~29.993 1.1804—1.1808 | 29.95 less 1.179 | |
| Crank shaft comp. | Max. swing | 0.03 less 0.001 | 0.1 more 0.003 | |
| R. Crank shaft key groove | Width | 4.0—4.03 0.157~0.158 | 4.10 more 0.161 | |
| | Thickness | 4.0—4.1 0.157~0.161 | | [Referential value] |
| | Length | be processed with one cutter | | [Referential value] |
| L. crank shaft pin, pressed part | In. dia. | 25.907~25.921 1.019~1.020 | | |
| L. crank shaft pressed port | Out. dio. | 30.002—30.015 1.181—1.186 | 25.95 less 1.021 | |
| | | * 30.004—30.009 1.1812~1.1814 | *29.97 less 1.179 | |
| | | | | |
| Primary drive sprocket | No. of tooth | 15 | | |
| | Measuring | 39.11~39.21 | 38.9 less | |

| I t e m | | Standard | Repairing Limit | Remarks |
|---------------------------|---------------------|----------------|-----------------|-------------------------------------|
| Oil filter drive sprocket | No. of tooth | 24 | | |
| | In. dia. | 25.0—25.01 | 26.0 more | |
| | | 0.9842—0.9846 | 1.023 | |
| | Measuring bottom di | 45.15~45.348 | 45.05 less | |
| Connecting rod small end | | 1.777~1.785 | 1.773 | |
| | In. dia. | 15.016~15.043 | 15.1 more | |
| | | 0.591—0.592 | 0.594 | |
| | Twist | without 0.02 | 0.1 more | |
| Connecting rod big end | | 0.0007 | 0.0039 | |
| | Thickness | 17.97—18.03 | 17.5 less | |
| | | 0.707—0.709 | 0.688 | |
| | In. dia. | 31.005~31.015 | 31.04 more | |
| | | 1.220—1.221 | 1.222 | |
| | Axial clearance | 0.07—0.33 | 0.5 more | |
| | | 0.002~0.012 | 0.0196 | |
| | Diagonal clearance | 0~0.008 | 0.05 more | |
| Needle roller | | 0—0.0003 | 0.0019 | |
| | Out. dio. | 2.502—2.51 | 2.5 less | |
| | | 0.0985—0.0988 | 0.098 | |
| | Length | 13.45—13.5 | | |
| Piston pin | | 0.529—0.531 | | |
| | No. reqd. | 48 pcs | | |
| | Out. dia. | 14.994—15.0 | 14.95 less | |
| | | 0.590—0.5905 | 0.588 | |
| Piston head | Overall length | 45.9~46.1 | | (Referential value) |
| | | 1.807~1.814 | | |
| | | 51.9—52.1 | | |
| | | 2.043—2.051 | | |
| | Dia. | 53.65—53.7 | 53.6 less | |
| | | 2.112~2.114 | 2.110 | |
| Piston skirt | | 59.65—59.7 | 59.6 less | |
| | | 2.348~2.350 | 2.346 | |
| | Dia. | 53.98~54.0 | 53.9 less | At the pin boss |
| | | 2.125—2.126 | 2.122 | diagonal direction |
| Piston | | 59.98—60.0 | 59.9 less | |
| | | 2.361—2.362 | 2.358 | |
| | Taper | first step | out-standard | |
| | | >—0.06—0.07 | | |
| | | >—0.0023~0.002 | | |
| | | second step | | Measure at the |
| | | >—0.12—0.14 | | boss diagonal |
| | | >—0.004~0.005 | | direction |
| | Ellipse | 0.14~0.16 | out-standard | Measure at 5 m, |
| | | 0.005—0.006 | | 10.1961 upper p from the foot of |

| I t e m | | Standard | Repairing Limi | Remarks |
|-----------------------------|----------------|--|--|---|
| Piston ring groove (Top) | Groove width | 1.505~1.52 0.0592—0.0598 | 1.55 more 0.061 | 3 category of 0.25 10.00981 oversize |
| Piston ring groove (Second) | Groove width | 1.505~1.52 0.0592—0.0598 | 1.55 more 0.061 | |
| Piston ring groove (Oil) | Groove width | 2.805~2.82 0.110~0.111 | 2.95 more 0.1161 | |
| Piston ring groove | Out. dio. | 48.1—48.2 1.893~1.897 53.3—53.4 2.098~2.102 | 47.9 less 1.885 53.1 less 2.090 | |
| Piston & cylinder | Min. clearance | | 0.06 more 0.0023 | |
| Piston oversize | Oversize | 0.25 0.0098 | | |
| Piston ring (Top) | Width | 1.45—1.46 0.057—0.0574 1.45—1.465 0.057~0.0576 | 1.4 less 0.0551 1.4 less 0.0551 | |
| Piston ring (Second) | Thickness | 2.4~2.6 0.0944~0.102 2.6~2.8 0.102~0.110 | 2.2 less 0.0866 2.4 less 0.0944 | |
| Piston ring (Top) | Tension | 0.62—0.82 kg 1.367~1.808 lt 0.7~1.0 kg 1.543~2.204 lt | 0.5 kg less 1.102 lbs 0.6 kg less 1.323 lbs | |
| | End gap | 0.15—0.35 0.0059—0.013 0.2—0.4 0.0078—0.0157 | 0.6 more 0.023 0.65 more 0.0255 | Tangential tension |
| Piston ring (Second) | Width | 1.48—1.495 0.0582~0.0588 | 1.43 less 0.0562 | When attaching |
| | Thickness | 2.4~2.6 0.0944~0.102 2.6~2.8 0.102~0.110 | 2.2 less 0.0866 2.4 less 0.0944 | Tangential tension |
| | Tension | 0.6~0.8 kg 1.323~1.764 lt 0.7~1.0 kg 1.543~2.204 lt | 0.5 kg less 1.102 lbs 0.6 kg less 1.323 lbs | |
| | End gap | 0.15—0.35 0.0059—0.013 0.2~0.4 0.0078—0.0157 | 0.6 more 0.023 0.65 more 0.0255 | When attaching |

| I t e m | | Standard | Repairing Limi | Remarks |
|-------------------------------|-----------|----------------|----------------|--------------------|
| Piston ring (Oil) | Width | 2.4~2.6 | 2.0 less | Tangential tension |
| | | 0.0944—0.102 | 10.07871 | |
| | | 2.78~2.795 | | |
| | Thickness | 0.109—0.110 | | |
| | | 2.78~2.795 | 2.7 less | |
| | | 0.109~0.110 | 0.106 | |
| Piston ring & groove (Top) | Tension | 2.6~2.8 | 2.5 less | When attaching |
| | | 0.0944—0.110 | 0.0984 | |
| | | 0.7—0.9 kg | 0.5 kg less | |
| | End gap | 1.543~1.984 lb | 1.102 lbs | |
| | | 0.9~1.15 kg | 0.7 kg less | |
| | | 1.984~2.53 lbs | 1.543 lbs | |
| Piston ring & groove (Second) | Clearance | 0.1~0.3 | 0.8 more | |
| | | 0.00393—0.0118 | 0.0314 | |
| | | 0.045—0.07 | 0.15 more | |
| Piston ring & groove (Oil) | Clearance | 0.04—0.07 | 0.15 more | |
| | | 0.01—0.04 | 0.1 more | |
| | | 0.01—0.04 | 0.00393 | |
| Piston ring oversize | Oversize | 0.25 | | 3 category of 0.25 |
| | | 0.00984 | | |

C. Cam Shaft Valve Cam Chain

| I t e m | | Standard | Repairing Limi | Remarks |
|--------------------------|---------------|----------------|----------------|-----------|
| Cam shaft (Bearing part) | Out. dia. | 19.996~20.009 | 19.95 less | Max. lift |
| Cam (Bearing part) | Height | 0.787—0.787 | 0.785 | |
| | | in 31.67—31.71 | 31.4 | |
| | | 1.246~1.248 | 1.236 | |
| | | x. 30.54—30.58 | 30.2 less | |
| | | 1.202—1.203 | 1.188 | |
| Cam shaft | Lift | in 5.69 | | |
| Cam sprocket complete | Nos. of teeth | 0.118 | | |
| | | Ex. 4.56 | | |
| | | 0.179 | | |
| | | 32 | | |
| | Bottom dia. | 74.766 | 74.2 less | |
| | | 2.943 | 2.921 | |

| I t e m | | Standard | Repairing | Remarks |
|--|-----------------|------------------|--------------|---------|
| Cam chain | Type | DK-219 | | |
| | Length | 723.0~723.8 | 728.0 | |
| | | 28.464~28.496 | 28.661 m | |
| Ex. valve | Thickness | 1.0 | 0.5 less | |
| | | 0.0393 | 0.0196 | |
| Ex. valve (Stem) | Out. dia. | 6.96~6.97 | 6.94 less | |
| | | 0.2740~0.2744 | 0.273 | |
| Ex. valve (Seat face) | Angle | 90~91° | out-stand | |
| Ex. valve | Overall length | 88.74~88.76 | 89.4 less | |
| | | 3.493~3.494 | 3.519 | |
| In. valve | Thickness | 1.0 | 0.5 less | |
| | | 0.039 | 0.019 | |
| In. valve (Stem) | Out. dia. | 6.98~6.99 | 6.96 less | |
| | Angle | 0.2748~0.2751 | 0.274 | |
| In. valve (Seat) | | 90~91° | out-stand | |
| In. valve | Overall length | 89.96~89.98 | 89.6 less | |
| | | 3.541~3.542 | 3.521 | |
| Valve spring (Inner) | Free length | 37.54 | 36.0 less | |
| | | 1.477 | 1.417 | |
| | Diagonal degree | 0.8 less | 1.5 more | |
| | Tension | 7.6~8.4 kg | 60 kg less | |
| | | 18.9~20.1 kg | 16.0 kg less | |
| | | 16.758~18.522 | 13.230 | |
| | | 41.674~44.320 | 35.280 | |
| Valve spring (Outer) | Free length | 43.36 | 42.0 less | |
| | | 1.707 | 1.653 | |
| | Diagonal degree | 0.8 less | 1.5 more | |
| | Tension | 16.9~18.1 kg | 15.0 kg less | |
| | | 34.4~34.7 kg | 32.0 kg less | |
| | | 37.264~29.910 lb | 3.075 lbs | |
| | | 75.852~76.293 lb | 0.560 lbs | |
| Ex. valve guide | In. dia. | 7.0~7.01 | 7.05 more | |
| | | 0.275~0.2759 | 0.2775 | |
| In. valve guide | In. dia. | 7.0~7.01 | 7.05 more | |
| | | 0.275~0.2759 | 0.2775 | |
| Valve seat | Touch width | 1.0 | 20 more | |
| | | 0.039 | 0.08 | |
| Rocker arm | In. dia. | 1.30~13.027 | 13.1 more | |
| | | 0.511~0.512 | 0.515 | |
| Rocker arm shaft (Rocker arm part) | Out. dia. | 12.966~12.984 | 12.9 less | |
| | | 0.510~0.511 | 0.507 | |
| Rocker arm shaft (Inlay part of head) | Out. dia. | 16.994~16.976 | 16.95 less | |
| | | 0.669~0.668 | 0.667 | |

Repair of cylinder
head

| I t e m | | Standard | Repoiring Limit | Remarks |
|--|---------------|--------------------------------|-------------------------|---|
| Rocker arm shaft (Oil part) | In. dia. | 2.5 0.0984 | | |
| Tappet clearance | In. Ex. | 0.08~0.12 0.003—0.0047 | out-standard | Cold type |
| Cam chain tensioner roller | Out. dio. | 40 1.574 | 38 less 1.496 | Aging and crank of rubber should not be. |
| Cam chain tensioner roller (Spring) | Free length | 63.3 2.492 | 60.0less 2.362 | |
| | Tension | 7 kg 15.435lbs | 5.5kg less 12.127lbs | Referential value- control by over all length |
| Valve timing ex | Opening angle | before lower dead point 35° | out-standard ± 5° | Check at 1.1 m/m 0.0452(In case of lift) |
| | Closing angle | after upper dead point 10° | out-standard ± 5° | Check at 1.1 m/m 0.0452(In case of lift) |
| Valve timing In. | Opening angle | before upper dead point 5' | out-standard ± 5° | Check at 1.1 m/m 0.0452(In case of lift) |
| | Closing angle | after lower dead point 30° | out-rtandard ± 5° | Check at 1.1 m/m 0.0452(In case of lift) |

D. Upper • Under Crank Case

| I t e m | | Standard | Repoiring Limit | Remarks |
|---|----------|--|--|--|
| Upper•under crank case (Part of center bearing) | In. dio. | 65.97~65.987 2.597~2.597 | 66.04more 2.59 | Combined with upper and under and then measure |
| Upper•under crank case (Part of bearing L/H, R/H) | In. dia. | L/H76.97~76.987 R/H64.97~65.987 3.0303—3.0309 2.557—2.558 | 76.93 more 64.93 more 3.0287 2.5566 | Combined with upper and under and then measure |
| Upper•under crank case (Part of mission shaft) | In. dio. | 61.985~61.996 2.440~2.4407 | 2.04 more 2.442 | Combined with upper and under and then measure |
| Upper-under cronk case (Part of kick spindle) | In. dia. | 25.0—25.021 0.984~0.985 | 25.1 more 0.988 | Combined with upper anc under and then measure |
| Upper-under crank case (Seam surface) | Flatness | within 0.03 0.001 | 0.06 more 0.002 | |
| Cylinder attaching face of upper crank case | Flatness | within 0.03 0.001 | 0.06 more 0.002 | |

| I t e m | | Standard | Repairing Limit | Remarks |
|---|------------------------|-------------------------------|---------------------|---|
| L/H cover attaching face of upper crank case | Flatness | within 0.03 0.001 | 0.06 more 0.002 | Aging and crank of rubber should not remain |
| Cam chain guide roller | Out. dia. | 59.5 2.342 | 59.0 less 2.28 | |
| | In. dio. | 14.0— 14.018 0.551—0.5518 | 14.1 more 0.555 | |
| Cam chain guide roller pin | Out. dia. | 13.966— 13.984 0.549—0.550 | 13.9 less 0.547 | |
| Oil level gouge | Dia. | 2.9~3.1 | 2.8 less | |
| "O" ring 22 mm | | 0.114—0.122 | 0.110 | |
| | Tightness | 2.0 0.078 | 0.5 less 0.019 | |
| Under crank case attaching face of cover L/H | Flatness | within 0.03 0.001 | 0.06 more 0.002 | |
| Under crank case (Seam surface of upper, under) | Flatness | within 0.03 0.0011 | 0.06 more 0.0023 | |
| Under crank case seam surface | Slip out of L/H or R/H | within 0.05 0.0019 | 0.1 more 0.0030 | |

E Clutch. Crank Case Cover L/H

| I t e m | | Standard | Repairing Limit | Remarks |
|---------------------------------|-------------------------------|-------------------------|--------------------|---------------------------------|
| Clutch friction disc | Thickness | 2.9~3.0 0.114—0.1181 | 2.5 less 0.984 | One set is 6 sheets |
| | In. dia. | 112 4.409 | | |
| | Flatness | within 0.2 0.0078 | 0.4 more 0.015 | |
| Clutch plate | Thickness | 2.0 0.078 | 1.6 less 0.0629 | Use 5 sheets |
| | Flatness | within 0.2 0.0078 | 0.4 more 0.015 | |
| | Out. dia. | 135 5.314 | | |
| Clutch center and clutch plate | Clearance of rotary direction | within 0.3 0.0118 | 0.3 more 0.0118 | Clearance at out. dio. of plate |
| Clutch center and mission shaft | Clearance of rotary direction | within 0.1 0.0039 | 0.3 more 0.0118 | |

| I t e m | | Standard | Repairing Limit | Remarks |
|---|-----------------|--------------------------------|----------------------------|--|
| Clutch outer comp. (with sprocket) | Teeth | 47 (1.85) | | |
| | Bottom dia. | 136.15~136.16 5.3602~5.3606 | 135.5 less 5.334 | Measure bottom dia. roller dia. 0.35 0.015 Referential value |
| | In. dia. | 88.0~88.035 3.464~3.465 | | |
| Clutch center and mission shaft | Axial clearance | 0.027~0.067 0.001~0.0026 | 0.2 more 0.0078 more | |
| Clutch pressure plate | Flatness | within 0.1 0.0039 | 0.3 more 0.0118 | |
| | In. dia. | 112 4.409 | | |
| | Free length | 33.4 1.314 | 32.4 less 1.275 | |
| Clutch spring | Diagonal degree | 1.0 less 0.0393 | 2.0 more 0.0787 | |
| | Load | 15.3~15.7 kg 33.73~34.61 lb | 13.6 kg less 29.988 lbs | |
| | Flatness | within 0.01 0.0003 | 0.06 more 0.0023 | |
| Crank case cover L/H | In. dia. | 58.0~58.046 2.283~2.285 | | |
| Crank case cover L/H (Part of oil filter) | Tightness | 0.5 more 0.0197 | out-standard | |
| Crank case cover L/H ("O" ring) | In. dia. | 14.0~14.018 0.551~0.5518 | 14.1 more 0.555 | |
| Crank case cover L/H (Part of shift spindle) | Thickness | 0.3~0.4 0.0118~0.0157 | | When disassembly and maintenance, exchange should be done each time |
| Crank case cover L/H (Packing) | | | | |

F. Transmission

| I t e m | | Standard | Repairing Limit | Remarks |
|------------------------------------|-----------------|----------------------------------|--------------------|---------|
| Transmission | Type | Four speed Constant mesh gear | | |
| Main shaft | Out. dia. | 24.959~24.98 0.982~0.983 | 24.9 less 0.980 | |
| Main shaft and M ₂ gear | Clearance | 0.02~0.074 0.007~0.00291 | 0.1 more 0.0039 | |
| Main shaft | Axial Clearance | 0.1~0.75 0.0039~0.0295 | 1.2 more 0.0472 | |

| I t e m | | Standard | Repairing Limit | |
|---------------------------------------|-------------------------------|--------------------------------|----------------------|-----------------|
| Main shaft and M ₃ gear | Clearance of rotary direction | 0.03—0.078 1.00118—0.00307 | 0.1 more 0.0039 | (Part of 20.5φ) |
| Mission gear | Back rush | 0.089~0.178 0.0035—0.0070 | 0.2 more 0.0078 | |
| Top gear | In. dio. | 18.0~18.018 0.708—0.709 | 18.2 more 0.716 | |
| Top gear (lifter rod par | In. dia. | 8.0—8.015 0.314~0.315 | 8.06 more 0.317 | |
| Top gear (Bush) | In. dia. | 20.5—20.521 0.807—0.8079 | 20.6 more 0.811 | |
| Top gear bush and mission shaft | Clearance | 0.081 0.00318 | 0.1 more 0.0039 | |
| Drive sprocket | Bottom dio. | 65.649~65.776 2.584~2.589 | 64.7 less 2.547 | |
| Drive sprocket (Rotary direction) | Clearance | 0.03—0.078 1.00118~0.00307 | 0.25 more 0.00984 | |
| Counter shaft (gear side) | In. dio. | 24.37~24.385 0.959~0.960 | 24.4 more 0.9606 | |
| Counter shaft | Out. dio | 24.96—24.939 0.982—0.981 | 24.9 less 0.980 | |
| Bush 14 mm | In. dio. | 14.375~14.393 0.565~0.566 | 15.2 more 0.598 | |
| | Out. dio | 24.98—25.013 0.983—0.984 | | |
| Counter shaft and C ₂ gear | Clearance of rotary direction | 0.01—0.098 1.00039—0.0038 | 0.2 more 0.0078 | |
| Low gear | Crossover thickness | 21.667—21.714 0.853~0.854 | 21.6 less 0.850 | |
| Kick startor spindle and bush 14 mm | Clearance | 0.022~0.052 1.00086~0.00204 | 0.15 more 0.0059 | |
| Bush C 14 mm | Out. dia. | 17.094~17.112 0.672~0.673 | 17.05 less 0.671 | |
| | In. dia. | 14.413~14.431 0.567~0.568 | 14.53 more 0.572 | |
| Mission gear ratio | First | 3.12 | | |
| | 2nd | 1.74 | | |
| | 3rd | 1.27 | | |
| | Top | 1.00 | | |
| Kick spindle pole spring | Free length | 14 0.551 | 13.5 less 0.531 | |

| I t e m | | Standord | Repoiring Limit | Remarks |
|----------------------------|----------------|---------------------|--------------------|------------------------------|
| Kick spindle pole bush pin | Out. dio. | 5 0.196 | 4.5 less 0.177 | Show by max. swing of loosng |
| | Overall length | 13 0.511 | 12.5 less 0.492 | |
| | | 5—10 0.196—0.393 | 20 more 0.7874 | |
| Primary chain | Deflection | | | |
| Roller 5X6.25 | No. Reqd. | 12 pieces | | |

G. Gear Change

| I t e m | | Stondord | Repairing Limit | Remarks |
|---------------------|-----------|--------------------------------|---------------------|---------|
| Gear shift fort | In. dia. | 34.0—34.025 1.338~1.339 | 34.2 more 1.346 | |
| Gear shift drum | Out. dia. | 33.95—33.975 1.336~1.337 | 33.9 less 1.334 | |
| Drum and shift fork | Clearance | 0.025~0.075 0.00098~0.00295 | 0.25 more 0.0098 | |
| Gear change pedal | In. dio. | 17.0—17.027 | 17.3 more | |
| | | 0.669~0.670 | 0.681 | |

H. Kick, Crank Case Cover R/H

| I t e m | | Standard | Repoiring Limit | Remarks |
|---------------------------------|-----------------|--------------------------------|---------------------|---------|
| Kick startor gear | Shaft Out. dia. | 14.341—14.353 0.564~0.565 | 14.25 less 0.561 | |
| Kick startor gear and cover R/H | Clearance | 0.016—0.104 0.00062~0.00409 | 0.3 more 0.0118 | |
| Cover R/H | Flatness | within 0.05 0.00196 | 0.1 more 0.0039 | |

I. 011 Pump, Oil Filter

| I t e m | | Stondord | Repairing Limit | Remarks |
|---------------------------------------|-------------|------------------------------|---------------------|-------------------|
| Oil pump drive gear | Teeth width | 4 0.157 | | Adjust by pocking |
| | Bend | 0.05 0.00196 | 0.1 more 0.00393 | |
| | Back rush | 0.085~0.127 0.00334~0.050 | 0.15 more 0.059 | |
| Oil pump drive gear and M. crank gear | | | | |
| Oil pump gear top and inside wall | Clearance | 0.025—0.05 0.0098~0.0019 | 0.1 more 0.00393 | |

| I t e m | | Standard | Repairing Limit | Remarks |
|--|-----------|---------------------------------|---------------------|-------------------------------------|
| Oil pump gear | Back rush | 0.106~0.21 0.00417—0.0082 | 0.4 more 0.015 | |
| Oil pump gear side face and ride cover | Clearance | 0.04—0.089 0.0015—0.0035 | 0.1 more 0.0039 | |
| Oil pump gear and pin | Clearance | 0.013—0.05 0.00051 ±0.0019 | 0.3 more 0.00118 | |
| Oil filter shaft and oil filter rotor | Clearance | 0.012—0.048 0.000472~0.00188 | 0.1 more 0.0039 | |
| Oil filter rotor | Out. dia. | 57 2.244 | | |
| Oil filter chain | Loosing | 5—10 0.196—0.3937 | 15 more 0.5905 | Measure the amplitude at the center |

J. A.C. Dynamo Starting Motor

| i t e m | | Standard | Repairing Lim | Remarks |
|---|------------------|----------------------------|--------------------|--|
| Spark performance on ignition | 3 Needle gap | more 300 r.p.m. 0.314 | 7 less 0.275 | 3 Needle gap |
| Charging performance on dynamo | Charging current | 2.0~3.0A | out-standar | Start of charging, at 1700 r.p.m., after that. at 500 r.p.m. |
| Dynamo starter and rotor | Clearance | 0.5 0.0196 | 0.8 more 0.0314 | |
| Starting clutch outer and dynamo | Out. dia. gap | 0—0.06 0—0.00236 | 0.1 more 0.0039 | |
| Cross screw 6×24 | Tighting torque | 0.5 m·kg 3.615 ft lb | out-rtondor | When lighting, screw rock should be needed. |
| Clutch roller spring | Free length | 25—31 0.984—1.220 | 24 less 0.944 | |
| Clutch roller spring (Cap) | In. dio. | 4.1—4.25 0.161—0.167 | 4.3 more 0.169 | |
| | Out. dia. | 5.2~5.3 0.2047—0.2086 | 5.0 less 0.196 | |
| Starting sprocket of clutch outer journal | Out. dia. | 37.175~37.2 1.463~1.464 | 37.1 less 1.460 | |
| Starting motor | Voltage | 12 V | | |
| | Horse power | 0.4 KW | out-rtondor | |
| | Rating | 30 sec | out-standar | |

| I t e m | | Standard | Repairing Limit | Remarks |
|---|-----------------|---|-------------------------------|---------|
| Contact point | Max. gap | 0.35 0.01377 | out-rondord | |
| Ignition timing | Crank angle | before upper dead point 5° | 3° less 7" more | |
| Spark advancer advanced beginning | R. P. M. | 1100 r.p.m. (5°) | out-standard | |
| Spark advancer advanced finish | R. P. M. | 3300 r.p.m. (45°) | out-standard | |
| Spark advancer advanced max. advanced angle | Crank angle | 40° | 37° ~ 43° out-range | |

| I t e m | | Standard | Repairing Limit | Remarks |
|-------------|------------|---|-----------------|---------|
| Carburetter | Type | PW22H ^R _L A40 * PW26 | | |
| | Main jet | # 100 * # 135 | | |
| | | AB 1 | | |
| | | * 1.8φ × 4 | | |
| | Needle jet | A0 3 0.7φ × 4 | | |
| | Jet needle | * 0.7φ × 2 2.6φ | | |
| | Cutter way | * 22402-2 step 24231-3 step | | |
| | | # 3 width 1.2 | | |
| | Air screw | cutting depth 0.05, * # 2 nothing | | |
| | | * 1 - 1½ return | | |
| | Slow jet | * 1¼ return # 35 | | |
| | | * # 42 (0.8φ × 2pieces × 4 step) | | |

K. Contact Breaker

| I t e m | | Stondord | Repairing Limit | Remarks |
|-------------|---------------|----------|-----------------|---------|
| Carburetter | Valve seat , | 2.56 | | |
| | | * 2.0φ | | |
| | Pilot outlet | 1.2φ | | |
| | Power jet | # 160 | | |
| | Power air jet | # 90 | | |

3. FRAME BLOCK

A. Handle

| I t e m | | Standard | Repairing Limit | Remarks |
|---|-----------|-----------------------------|-------------------|------------------------------|
| Circumference direction of throttle grip | Play | 4—8 | out-standard | Measure at out circumference |
| Difference between outer and inner of throttle wire | Length | 0.157—0.314 | out-standard | |
| Clutch wire difference between outer and inner | Length | 55 2.165 | | |
| Clutch lever | Play | 133 5.236 | out-standard | Check by lever end |
| Brake lever | Play | 25—30 0.984—1.181 | out-standard | |
| Front fork cover cesion | Thickness | 15—25 0.590~0.984 | out-standard | |
| | Out. dia. | 6.5 0.255 39 1.535 | 6.0 less 0.236 | |

B. Front Cushion

| I t e m | | Stondord | Repairing Limit | Remarks |
|-----------------------------|-----------------------------------|-----------------------------|-------------------|-----------------|
| Front cushion | Type | Telescope type | out-standard | |
| | Stroke | 80 3.149 | out-standard | |
| | Oil capacity | both of R. and L. 250 cc | out-standard | |
| Front cushion spring | Free length (One step) | 185.5 7.303 | 180 less 7.086 | Reference value |

| I t e m | | Standard | Repairing Lin | Remarks |
|-----------------------------|-------------------------|---------------|---------------|--|
| ront cushion spring | Free length | 221.5 | 216.5 less | Reference value |
| | (Two step) | 8.720 | 8.523 | |
| | Overall length | 407.0 | 396.0 less | |
| | | 16.024 | 15.590 | |
| | Available winding Nos. | 32 | | Reference value |
| | (First step) | | | |
| | Available winding Nor. | 30 | | |
| | (Secondary step) | | | |
| | Height in case of bind | 374 | | Reference value |
| | | 14.724 | | |
| | Torque in case of bind | 24.1 kg | | Reference value |
| | | 53.14 lbr | | |
| | Overall winding Nor. | 62 | standar | Reierence value |
| | Dia. of coil | 4.5 | | |
| | | 0.177 | | |
| | Coil out. dia. | 25.0~25.5 | | |
| ront fork pipe comp. | | 0.984—1.003 | | |
| | Bend. | within 0.1 | 0.15 more | |
| | | 0.0039 | 0.0059 | The bend of pipe nut. when made the plating port a fulcrum |
| ront fork pipe piston | Out. dia | 37.45—37.475 | 37.4 less | |
| | | 1.474~1.475 | 1.472 | |
| ront fork valve | In. dio. | 32.98~33.019 | 33.1 more | |
| | | 1.298~1.299 | 1.303 | |
| ront fork pipe piston valve | Space between fork pipe | 0.055~0.109 | 0.2 more | |
| | | 0.0021—0.0042 | 0.0078 | |
| | Foot face flat degree | 0.02 | out-standar | |
| | | 0.00078 | | |
| ront fork bottom case | In. dia. | 37.5~37.539 | 37.65 more | |
| | | 1.476~1.4779 | 1.482 | |
| | Out. dia. | 41.236—41.275 | 41.15 | |
| | | 1.623~1.625 | 1.620 less | |
| ront fork bottom piece | In. dio | 15.0~15.043 | 15.1 more | |
| axis port IRI | | 0.590—0.592 | 0.594 | |
| ront fork bottom piece | In. dia. | 20.0—20.52 | 20.2 more | |
| axis part (L) | | 0.7874~0.807 | 0.795 | |
| edal housing bottom | In. dio. | 41.3—41.362 | 41.5 more | |
| case inlaying space | | 1.625~1.628 | 1.633 | |

| I t e m | | Standard | Repairing Limit | Remarks |
|--|----------------|-------------------------------|--------------------|---------|
| Seal housing and oil seal | In. dia. | 46.0—46.039 1.811 ~ 1.812 | out-standard | |
| | Inlaying space | 0.06—0.3 0.0023—0.011 | | |
| | Overall length | 36 1.417 | | |
| Fork pipe guide | In. dia. | 33.0—33.039 1.299— 1.300 | 33.1 more 1.303 | |
| | Out. dia. | 37.466—37.491 1.475— 1.476 | | |
| | Overall length | 173.8— 174.2 6.842 ~ 6.858 | | |
| Front fork upper (Upper part) | Out. dia. | 42 1.654 | out-standard | |
| Front fork upper (Cover cushion inlaying part) | Out. dia. | 34.4—34.6 1.354 ~ 1.362 | | |
| | In. dia. | 33.2—33.4 1.307 ~ 1.314 | | |
| Front fork under cover | Overall length | 175 6.889 | | |
| Front fork under cover (Upper part) | Out. dia. | 54 2.125 | | |
| | In. dia. | 38.5 1.515 | | |
| Fork rib upper cover inlaying part | In. dia. | 54.5—54.7 2.145 ~ 2.153 | out-standard | |
| Fork rib under cover inlaying part | Out. dia. | 55 2.165 | | |
| | In. dia. | 38.1 ~ 38.3 1.499 ~ 1.507 | | |

C. Steering Stem, Front Fender

| I t e m | | Standard | Repairing Limit | Remarks |
|---|----------------|---------------------------------------|----------------------------|---------|
| Stem and bottom cone race | Binding space | 0.007—0.041 | 0.004 less | |
| Steering head stem nut | Binding torque | 6.5 ~ 7.5 m·kg 47.01 — 54.24 ft lb | 5 m·kg less 36.16 ft lb | |
| Steering stem top cone race inlaying part | Out. dia. | 25.979—26.0 1.022 ~ 1.023 | 38.25 more 1.505 | |
| Steering stem front fork pipe inlaying part | In. dia. | 38. ~ 38.062 1.496 ~ 1.498 | | |

| | | Standard | Repairing Limit | Remarks |
|-----------------------------|-------------------|---------------------------------|-----------------|--|
| Steering stem bottom bridge | Stopper angle | 76° (double, ride ± 5 mm) | out-standard | Measured by jig (referential value) |
| Steering top cone race | In. dio. | 26.0—26.021 1.023—1.024 | out-standard | |
| Front fender | Plank Material | 0.8 0.031 SPC-I | | |

D. Fuel Tank

| I t e m | | Standard | Repairing Limit | Remarks |
|-----------|---------|-------------------------------|-----------------|---------|
| Fuel tank | Volume | 14 e 3.698galus | | |
| | Reserve | 1.2~1.5 e 0.317~0.396galus | | |

E. Frame Body

| I t e m | | Standard | Repairing Limit | Remarks |
|-------------------------------|---------------|------------------------------|--------------------|---------|
| Head pipe comp. top boll race | Binding space | 0.051—0.0575 0.002—0.0022 | out-standard | |
| Head pipe comp. bottom race | | 0.001—0.051 | out-standard | |
| Steel ball | Out. dia. | ¼" 0.009 | | |
| Steel ball top | No. Reqd. | 18 pcs | out-standard | |
| Steel boll bottom | No. Reqd. | 19 pcs | out-standard | |
| Rear fork center bush | In. dia. | 14.01—14.02 0.551—0.551 | 14.1 more 0.555 | |
| | Binding space | 0.03—0.08 0.001—0.003 | | |

| I t e m | | Standard | Repairing Limi | Remarks |
|--|-------------|------------------------------|----------------------------|--|
| Step arm comp. | In. dia. | 12.2 0.480 | 12.7 more 0.499 | In case of binding, max. stretch and load (referential value) |
| Step arm fixing bolt | Out. dia. | 16.957~16.984 0.667~0.668 | 16.7 less 0.657 | |
| Main stand pipe | Thickness | 2.3 0.090 | | |
| Main stand the hole of binding part | In. dia. | 14.0~14.027 0.551—0.552 | 14.3 more 0.562 | |
| Main stand setting bolt | Out. dia. | 13.9—13.968 0.547~0.549 | 13.5 less 0.531 | |
| Main stand setting spring | Free length | 86 3.385 | 83 less 3.26 | |
| | Load | 87.5 kg 192.937 lbs | 86.2kg less 190.071 lbs | |
| | | | | |
| Broke pedal | In. dia. | 17.0—17.027 0.669~0.670 | 17.2 more 0.677 | |
| | Clearance | 20—30 0.787—1.18 | out-standarc | |
| | | | | |

G. Rear Fork, Rear Fender

| I t e m | | Standard | Repairing Limi | Remarks |
|-----------------------|----------------|------------------------------|--------------------|--|
| Rear fork pivot | In. dia. | 26.0—26.021 1.023~1.024 | | After pressed in give a finishing touch to the in. dia. |
| Rear fork pivot bush | Out. dia. | 26.04—26.08 1.025—1.026 | | |
| | In. dia. | 20.05~20.08 0.789—0.790 | 20.5 more 0.807 | |
| | Pressed space | 0.019—0.08 0.0007—0.003 | Clearance | |
| Rear fork. pivot bolt | Out. dia. | 13.925—13.968 0.548~0.549 | 13.8 less 0.543 | |
| | Overall length | 301 11.850 | | |
| Drive chain | Type | DK 530 | | |
| | Teeth | 94 teeth | | |
| | Slack | 9—13 0.354~0.511 | out-standarc | |
| | | | | |

| I t e m | | Standard | Repairing Limit | Remarks |
|------------------------|----------------|--------------------------|-----------------|---------|
| Rear brake stopper arm | In. dia. | 10.0~10.2 0.397—0.401 | 0.7 more | |
| | Thickness | 9 0.354 | out-standard | |
| | Overall length | 385 15.1571 | | |
| | | | | |

H. Rear Cushion

| I t e m | | Standard | Repairing Limit | Remarks |
|---------------------|------------------|---|------------------------|--|
| Rear cushion | Stroke | 60 2.362 | out-standard | # 60 spindle oil |
| | Oil capacity | 52 cc | out-standard | |
| | Declined tension | 60—67 kg/0.5m/s 13227—147.70 lbs/0.5m/s | out-standard | |
| Rear cushion spring | Free length | 210 8.267 | 207 less 8.149 | In case of 185 mm (binding height) 7.283 |
| | Load | 37.5 kg 82.687lbs | 33 kg less 72.76lbs | |
| | | | | |

I. Front Wheel

| I t e m | | Standard | Repairing Limit | Remarks |
|----------------------------|----------------|------------------------------|-------------------------|--|
| Front axle distance collar | Overall length | 49.9—50.1 1.964~1.972 | | Shave out. dia. |
| Front brake cam | Thickness | 10 0.393 | 8 less 0.314 | |
| Front brake shoe | Out. dia. | 199.8—200 7.866~7.874 | | |
| Front brake lining | Thickness | 5 0.196 | 2.5 less 0.098 | |
| Brake drum | In. dia. | 199.85~200.15 7.868~7.879 | 201 more 7.913 | In case of 67.5mm (setting length) 2.657 |
| Brake shoe spring | Free length | 63.0—63.5 2.480~2.499 | 66.5 more 2.618 | |
| | Load | 5 kg 11.025 lbs | 3.5 kg less 7.717lbs | |
| Front axle | Out. dia. | 14.966~14.984 0.589~0.589 | 14.9 less 0.586 | |

| I t e m | | Standard | Repairing Limit | Remarks |
|------------------|----------------|------------------------|-----------------|---------|
| Front axle | Overall length | 238 | | 4R |
| | | 9.370 | | |
| | | Bend | 0.05 | |
| Front wheel rim | Swing | 0.00019 | 0.2 more | |
| | | | 0.007 | |
| | | 1.0 | 3.0 more | |
| Front tire | Dimension | 0.0393 | 0.118 | |
| | | 2.75~18 | | |
| | | 0.108~0.708 | | |
| Front panel axle | Air pressure | 1.7 kg/cm ² | out-rondord | |
| | | 24.174 lb/i | | |
| | | In. dio. | 15.1 more | |
| | | 15.0—15.018 | | |
| | | 0.590—0.591 | 0.594 | |

J. Rear Wheel

| I t e m | | Standard | Repairing Lim | Remarks |
|---------------------------|----------------|------------------------|---------------|-----------------|
| Final driven sprocket | Bottom dia. | 151.8 | 150.8 less | |
| | | 5.975 | 5.936 | |
| | | | out-standar | |
| Rear axle distance collar | Overall length | 100—100.2 | | |
| | | 3.937~3.944 | | |
| | | | | |
| Rear wheel axle | Out. dia. | 19.947~19.98 | 19.8 less | |
| | | 0.785~0.787 | 0.780 | |
| | | | 0.2 more | |
| | Bend | 0.05 | | |
| | | | | |
| | | | | |
| Rear brake shoe | Overall length | 280 | | |
| | | 11.024 | | |
| | | | | |
| Rear brake shoe | Out. dia. | 199.8~200 | | Shave out. dia. |
| | | 7.866~7.874 | | |
| | | | | |
| Rear brake lining | Thickness | 5 | 2.5 less | |
| | | 0.197 | 0.0984 | |
| | | | | |
| Rear wheel rim | Swing | 1.0 | 3.0 more | |
| | | 0.0394 | 0.118 | |
| | | | | |
| Rear wheel tire | Air pressure | 2.2 kg/cm ² | | |
| | | 31.284 lb/in | | |
| | | | | |
| | Dimension | 3.00—18 | | 4R |
| | | 0.118—0.708 | | |
| | | | | |
| Rear brake panel axle | In. dio. | 20.0—20.033 | 20.1 | |
| | | 0.787~0.789 | 0.791 | |
| | | | | |
| Rear brake panel torque | In. dia. | 10.1~10.2 | 10.5 | |
| | | 0.398—0.402 | 0.41 | |
| | | | | |
| Broke cam | In. dia. | 15.0~15.043 | 15.3 | |
| | | 0.591—0.592 | 0.602 | |
| | | | | |

K. Electric Equipments

| I t e m | | Standard | Repairing Lim | Remarks |
|---------------------|------------------------------------|---------------------|---------------------------------------|-----------------|
| Head light bulb | Electric current | 35/30W 2.67A | | 12V |
| Stop lamp | Electric current | 7.5W 0.58A | | |
| Tail lamp | Electric current | d W 0.28A | | |
| Selenium rectifier | Output volt | DC 30V | | |
| | Input power | AC 40W | | |
| Phon | Phon | 95~105 phon | 95 phon less | Adjust by screw |
| Fuse | Capacity | 15A | | |
| Battery | Electrolyte capacity | 0.7ℓ 0.184 galus | out-standar | |
| | Capacity | 10AH | | |
| | Volt | 12V | when 1 A i charging, 10.6V less | |
| | Specific gravity of electrolyte | 1.260~1.280 | 1.18 less | |
| Stop switch | Max. ampere | PE 2A | | |
| | Stroke | 6—8 | | |
| Combination switche | Max. ampere | 6A | | |
| | Max. ampere | dA | | |
| | Insulation | 50MΩ | 1MΩ less | |
| | Resistance | 10MΩ | 0.1MΩ less | |
| Speedometer | Error | —0+5% | out-standar | |
| Tachometer | 4000 r.p.m. less | ±200 r.p.m | out-standar | |
| | 4000~6000 | 1ZES | out-standar | |
| | 6000~8000 | 1Z70 | out-standar | |
| | 8000~10000 | ±300 | out-standar | |
| | 10000~12000 | ±400 | out-standar | |

DISASSEMBLY AND ASSEMBLY

In this chapter, mainly Disassembly operation was explained. and for assembly special attention was only called for where needed, as both operation are similar.

| | | |
|--|---|---|
| <div>Procedure for Disassembly operation</div> <div>For item if not clarified its model, it means each model is common.</div> <div>↓</div> | <div>Procedure for Assembly operation</div> <div></div> | <div>General and common caution</div> <div>&</div> <div>Tools</div> |
|--|---|---|

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DISASSEMBLY AND ASSEMBLY

1. ENGINE (C72 · 77)

A. Engine Replacement (L. ride,)

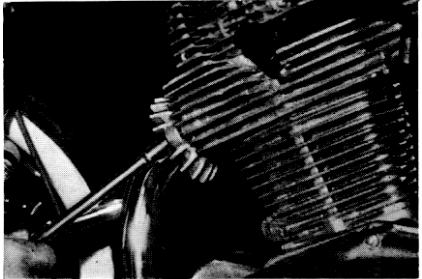
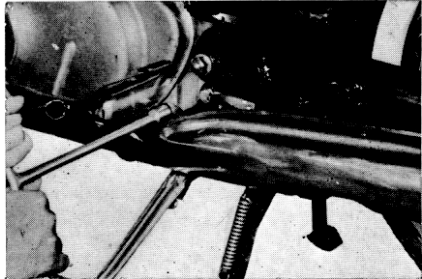
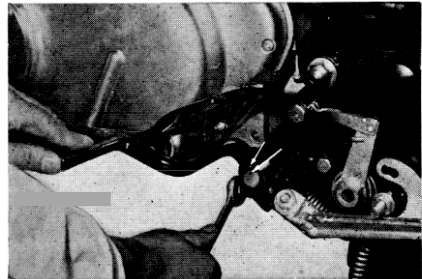
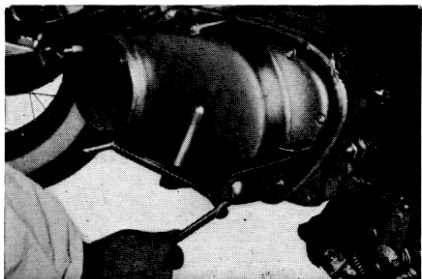
| Disassembly | Assembly | Precaution Tools |
|------------------------------|---|--|
| 1. | | |
| L. Exhaust pipe joint nut | Tighten not to leak ex haust gas. | 10 ^m / _m rocket wrench |
| | |  |
| | | Fig. 1 |
| 2. | | |
| L. Exhaust pipe muffler | | 14 ^m / _m rocket wrench 17 ^m / _m spanner |
| | |  |
| | | Fig. 2 |
| 3. | | |
| L. step bar | Be cautious of the posi- tion of seration in case of fitting. As- semble with putting in position at the punch mark. Tighten- ing torque 2.1kgm (15ft. lb) | 14% spanner |
| | |  |
| | | Fig. 3 |
| 4. | | |
| Gear change pedal | Fitting angle, One sera- tion foreword in- clined from horizon- tal position. | 10 ^m / _m spanner |
| | |  |
| | | Fig. 4 |



Fig. 5

5.

L frame dust shield

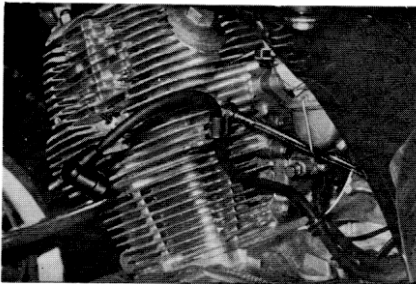


Fig. 6

6.

Plug cap

Air vent tube

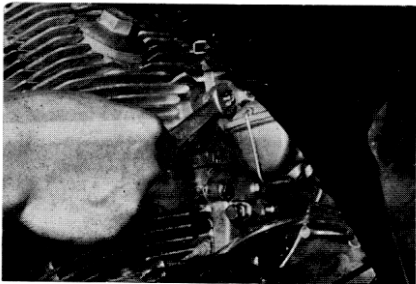


Fig. 7

7.

Carburettor
setting nut

Fit securely

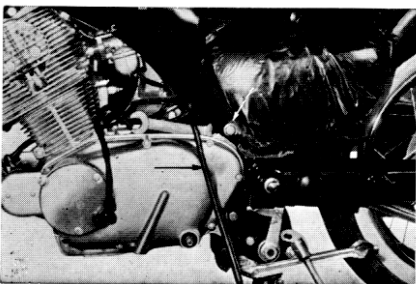
10³/₁₆" spanner

Fig. 8

8.

Breather pipe

Tightening torque

2.1kgm (15ft. lb)

17³/₁₆" socket wrench

Engine hanger bolt

Tightening torque

4.4kgm (32ft. lb)

17³/₁₆" spanner

| Disassembly | Assembly | Precaution Tools |
|-------------|----------|---------------------|
|-------------|----------|---------------------|

9.

(R.-side)

| | | |
|-----------------------|---------------------|------------------|
| R. exhaust pipe joint | Tighten not to leak | |
| joint nut | exhaust gas. | Refer to L. side |

10.

| | |
|-------------------------|------------------|
| R. exhaust pipe muffler | |
| | Refer to L. side |

11.

| | | |
|------------|--|------------------|
| R step bar | Assemble with nutting in position at the punch mark, tighten- ing torque 2.1kgm (15ft. lb) | |
| | | Refer to L. side |

12.

Starting motor cable

10^m/_m spanner

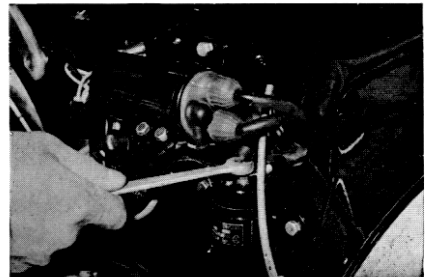


Fig. 9

| | Disassembly | Assembly | Precaution Tools |
|--|-------------|----------|---------------------|
|--|-------------|----------|---------------------|

13.

R. dust shield

Refer to L side

T-Handle forehead
driver (#3)

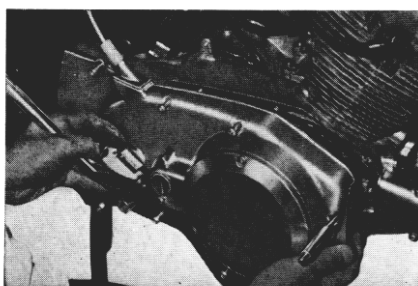


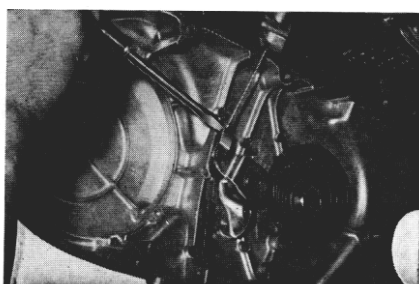
Fig. 10

14.

R. crank case cover

T-Handle forehead
driver (#3)

10^m/_m socket wrench



F.g. 11

15.

Clutch wire

Fore driver

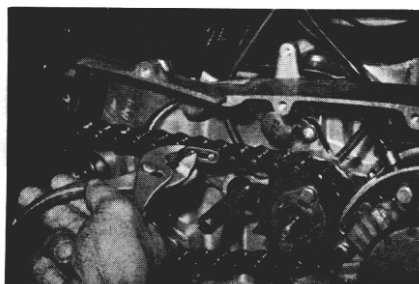


Fig. 12

16.

Drive chain joint

Drive sprocket cover

Pliers

17.

Chain joint clip

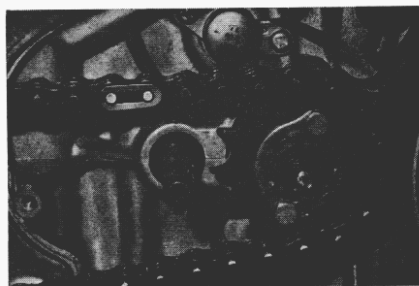


Fig. 13

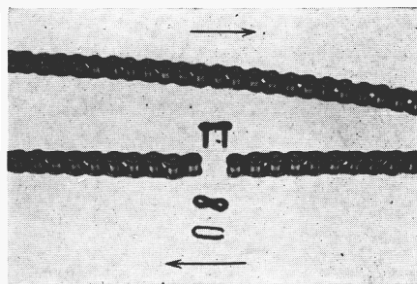


Fig. 14

18.

Engine wiring



Fig. 15

19.

Plug cap

Air vent tube

Refer to L 306

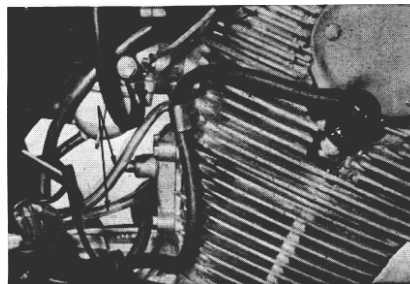
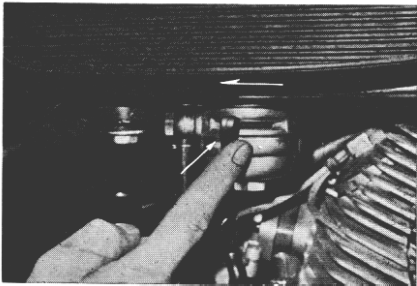
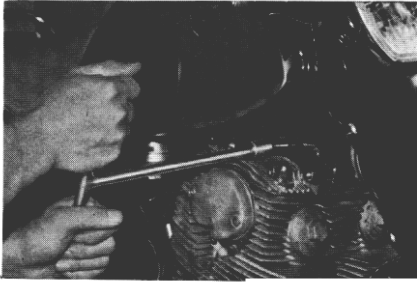
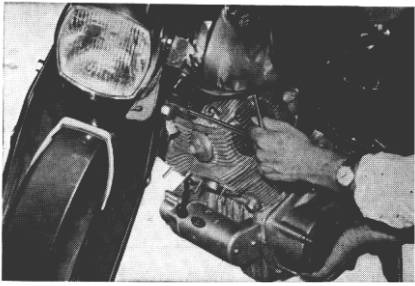
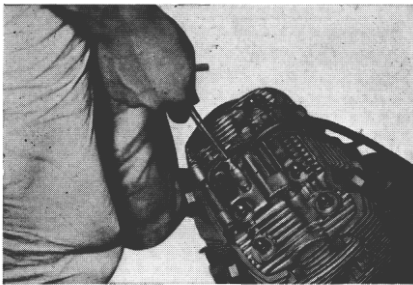
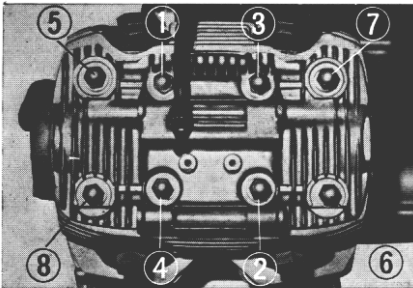
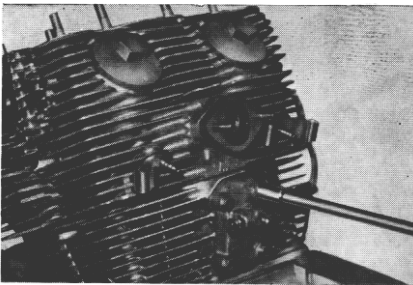
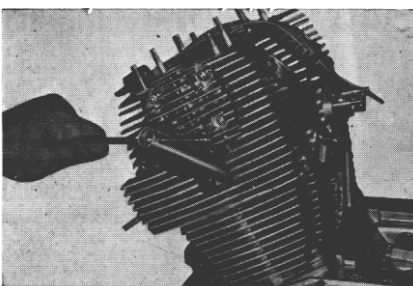


Fig. 16

| | Disassembly | Assembly | Precaution Tools |
|--|--|---|--|
|  <p>Fig. 17</p> | 20. Carburettor setting nut | | Set lever of fuel cup stop. 10 $\frac{7}{8}$ " spanner |
| | | | |
|  <p>Fig. 18</p> | 21. Engine hanger bolt | | 17 $\frac{1}{8}$ " rocket wrench 17 $\frac{1}{8}$ " spanner |
| | | | |
| | 22. Engine setting bolt | | 14 $\frac{1}{8}$ " socket wrench |
|  <p>Fig. 19</p> | 23. The point of taking down engine | In case of fitting, be cautious not to dam- age on the front fender. | |
| | | | |

B. Cylinder

| Disassembly | Assembly | Precaution Tools |
|----------------------------|--|--|
| 1. Condenser | | 9% rocket wrench |
| | |  |
| | | Fig. 20 |
| 2. Head cover | To tighten setting nuts on the head cover. follow order as shown here and repeat 2 to 3 times to tighten securely. | Pay attention to the color of nuts. 14 ^m / _m rocket wrench |
| | ①②③④→white nut ⑤⑥⑦⑧→yellow nut |  |
| | | Fig. 21 |
| 3. Corn chain tensioner | | 10 ^m / _m socket wrench |
| | |  |
| | | Fig. 22 |
| 4. Sparking plug | | Plug rocket wrench |
| | |  |
| | | Fig. 23 |

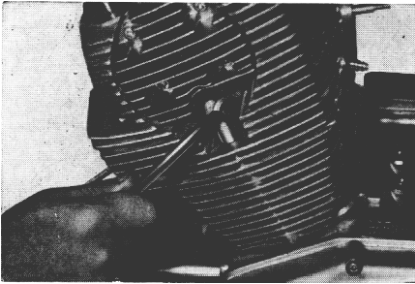


Fig. 24

6mm nut

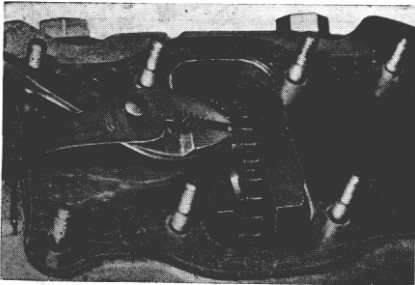
Steering top cone race
box wrench

Fig. 25

5.

Cam chain

Tightening torque
2.1kgm (15ft. lb)In case of disassembly
and fitting of the
cam chain, be care-
ful not to drop clip
into the cylinder
head.

Pliers

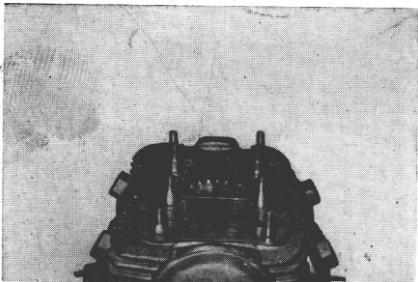


Fig. 26

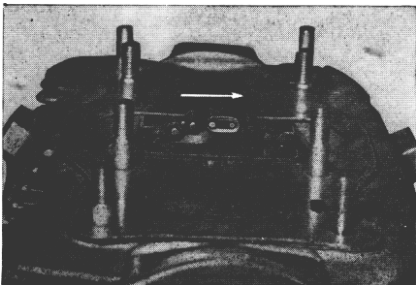
Tie a wire at the end
of chain to prevent
chain from dropping
into the cylinder.

Fig. 27

Fitting direction of clip:
fit the joint to the
direction of revolu-
tion of the crank
(→)

Combination process

- ① Coincide "T" punch mark on the dynamo rotor with the arrow mark on the starter.

$14\frac{7}{8}$ spanner

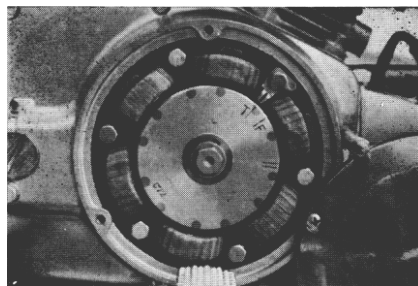


Fig. 28

- ② Coincide punch mark on the right tooth surface of the cam sprocket complete with the center line of the cylinder head, and combine sprocket of crank shaft by chain.

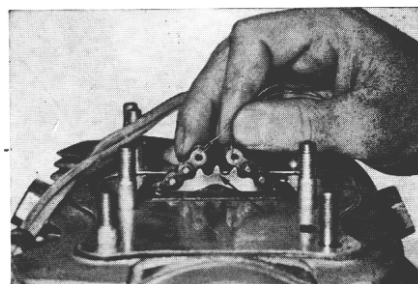


Fig. 29

6.

Cylinder head

Beforehand, valve rocker arm, cam shaft and valve should be subassembled.

Plastic hammer

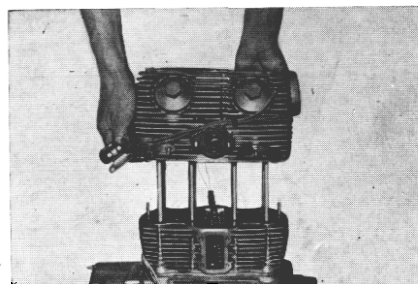


Fig. 30

Pay attention to "O" ring and gasket.

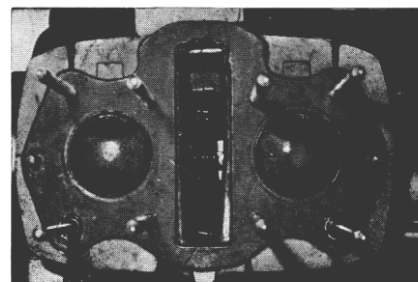


Fig. 31

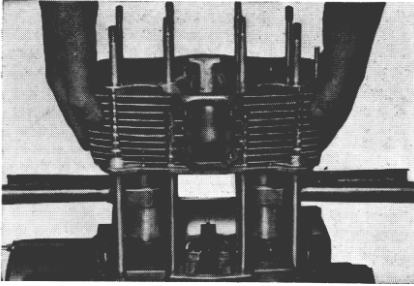


Fig. 32

7.

Cylinder

In setting the cylinder on the piston, divide piston rings in 3 parts separately and put the ring retainer on the piston and push in the cylinder laying the stopper between piston and case.

Plastic hammer

Cylinder

Put in knock pin and packing securely

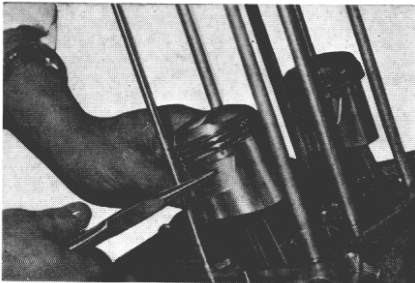


Fig. 33

8.

Piston

Use new piston pin clips, avoiding such clips lost elasticity.

Thin nose pliers

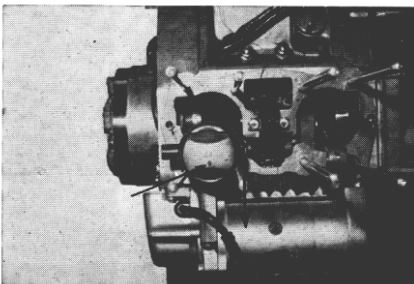


Fig. 34

In assembling piston, put the punch mark on the head of piston to the forward direction.

In fitting the piston, be careful on selection of clearance with cylinder previously. If the cylinder is over-sized, select piston fittable to this cylinder and assemble.

9.**Piston ring**

After setting rings on the piston, check to avoid any hooking between ring and piston.

In fitting rings, be careful upper and lower surface of the rings. (Generally on the upper surface maker's punch mark is shown.)

In case of using oversized cylinder, use a ring fittable with the cylinder.

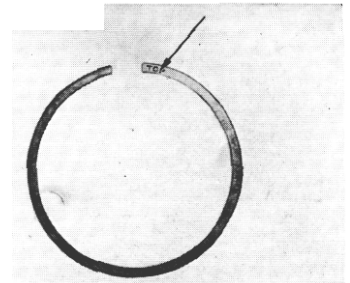


Fig. 35

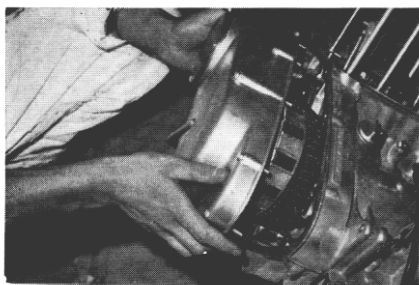


Fig. 36

1.

L. cover
Packing
Dowel pin

In fitting L cover, be
careful the oil filter
cover not to bite
on a dowel pin of T-Handle forehead
the oil filter shaft. driver (#3)
10³/₁₆ rocket wrench
Plastic hammer

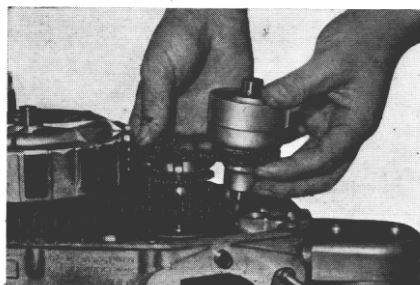


Fig. 37

2.

Oil filter.

Set oil filter drive
sprocket pin facing
R. outward.

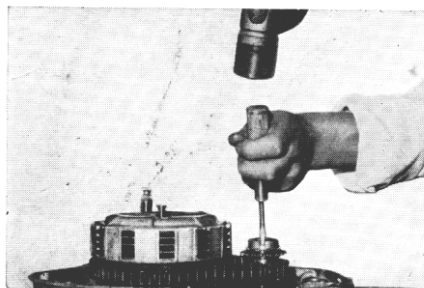


Fig. 38

3.

Lock washer

Forehead driver
Plastic hammer

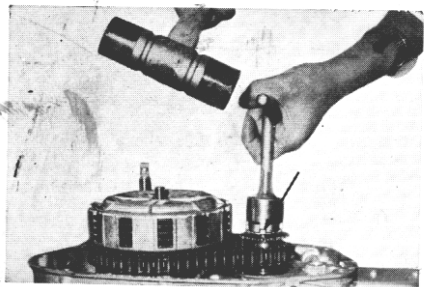


Fig. 39

4.

Lock nut

After tightening per-
fectly, turn up the
torque of lock wash-
er. If not torque
and nut coincided.
nut should be locked
after turning to the
tightening direction
without losing it.

| Disassembly | Assembly | Precaution Tools |
|-------------|----------|---------------------|
|-------------|----------|---------------------|

5.

Clutch pressure
plate

To tighten plate setting
bolts. lighten them
evenly. diagonally
as shown in the
picture. Check ex-
istence of spring.

10^m/_{mm} socket wrench

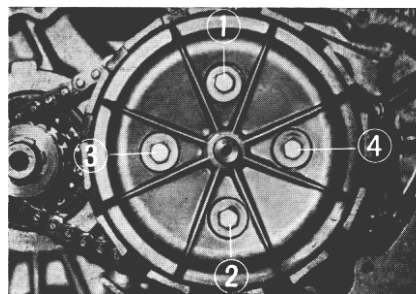


Fig. 40

6.

Clutch lifter
joint piece

In assembly, check op-
eration of oil metal
guide.

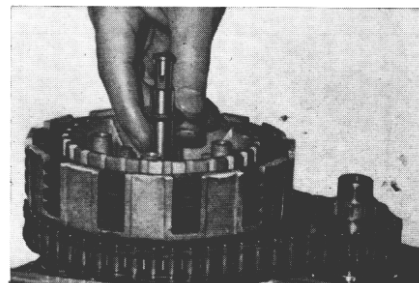


Fig. 41

7.

25^m/_{mm} set ring

Be careful about
cripple

snap ring remover

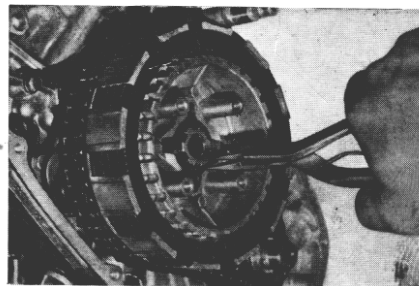


Fig. 42

8.

Clutch center

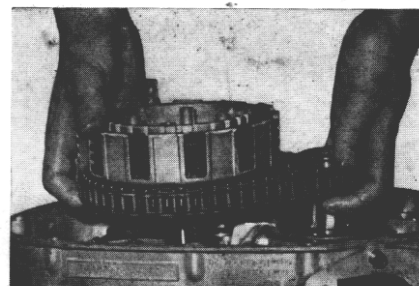


Fig. 43

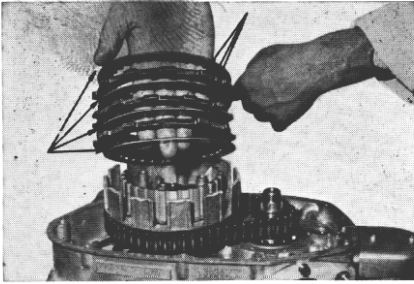


Fig. 44

9.

Clutch plate
Clutch friction disc

Pay attention for order
order of fitting.

In **disassembly** and
assembly, do it
perpendicularly to the
crank shaft and trans
mission main shaft

Be careful about size.

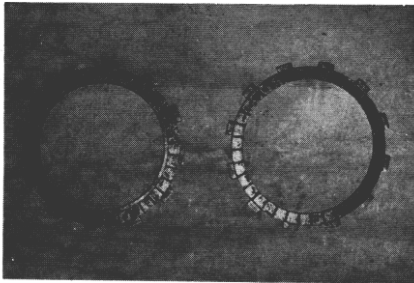


fig. 45

10.

Shift spindle

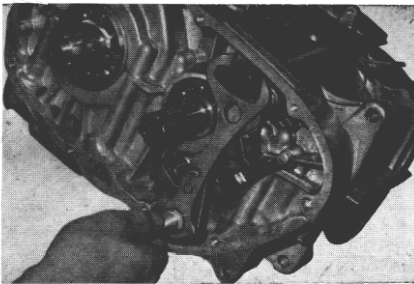


Fig. 46

11.

Shift drum stopper
Shift drum stopper
guide

10 $\frac{m}{m}$ socket wrench

17 $\frac{m}{m}$ socket wrench

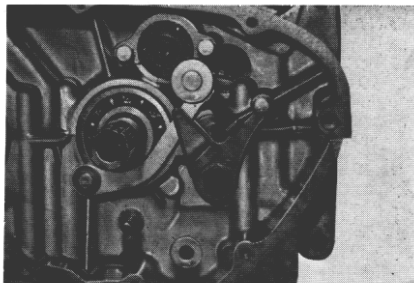


Fig. 47

Disassembly

Assembly

Precaution
Tools

in tightening stopper
bolt of tick starter.
the mark on the
end of kick starter
spindle should be
seen through the
hole.



Fig. 48

D. R. Cover

Disassembly

Assembly

Precaution
Tools

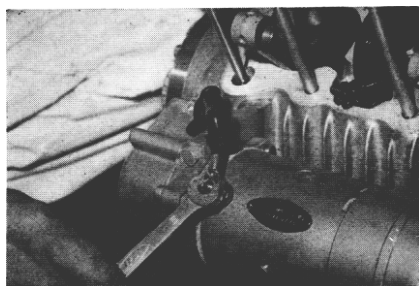


Fig. 49

1.

Starting motor cable

10 $\frac{3}{4}$ mm spanner

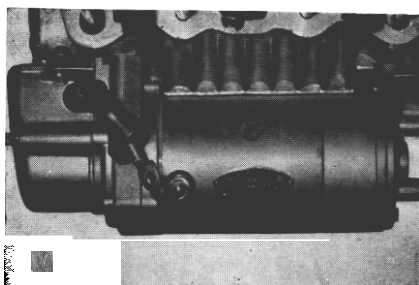


Fig. 50

2.

Starting motor

R. L. ride cover

T-Handle forehead
driver (#2)

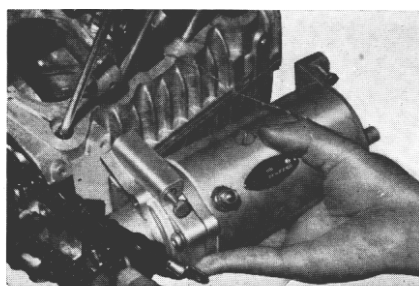


Fig. 51

3.

Starting motor

10 $\frac{3}{4}$ mm socket wrench

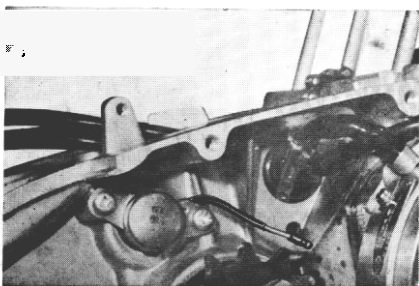


Fig. 52

4.

Neutral switch

5.

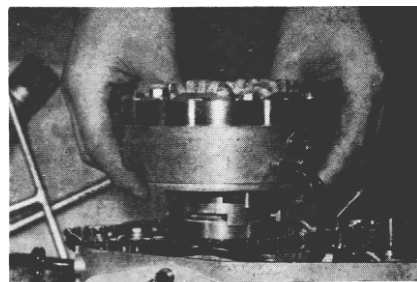
A.C. dynamo
starterAfter starter assem-
bled, check rotation
of the starter
sprocket. $10\frac{m}{m}$ rocket wrench

Fig. 53

6.

A.C. dynamo Rotor

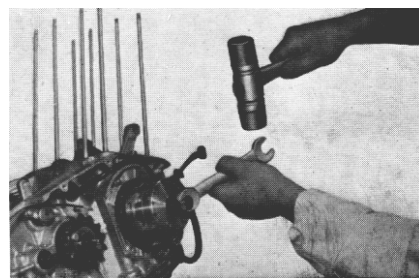
 $14\frac{m}{m}$ rocket wrench
Plastic hammer
Dynamo rotor puller
 $17\frac{m}{m}$ spanner

Fig. 54

7.

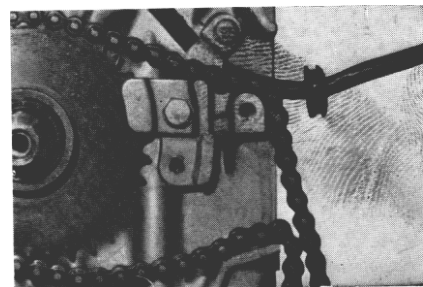
Starting sprocket
stopper $10\frac{m}{m}$ socket wrench
Plastic hammer
Forehead driver

Fig. 55

8.

Starter sprocket

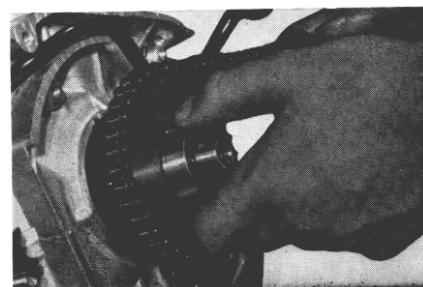


Fig. 56

E Mission (Crank)

Disassembly

Assembly

Precaution Tools

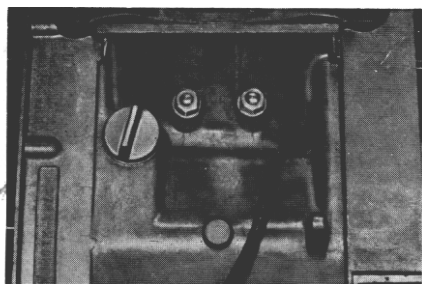


Fig. 57

1.
upper crank case
Setting nut

14^{3/16} socket wrench

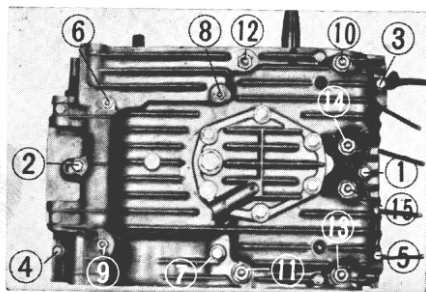


Fig. 58

2.
Under crank
case setting nut
& bolt

In tightening nut and
bolt, follow order
as shown in figure
starting temporary
tightening and then
actual tightening.

10^{3/16} rocket wrench
14^{3/16} rocket wrench
Plastic hammer

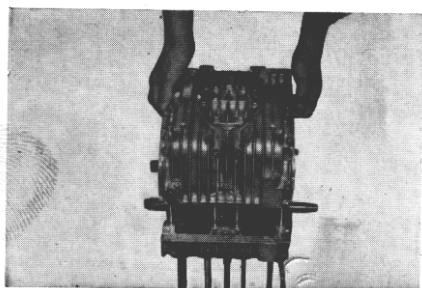


Fig. 59

3.
Under crank case

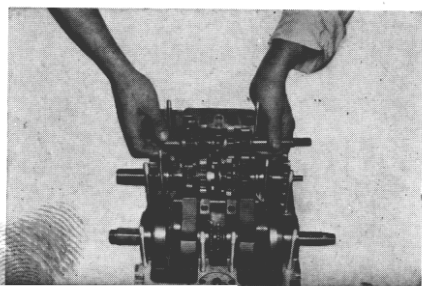
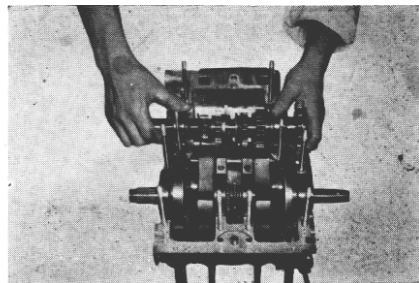
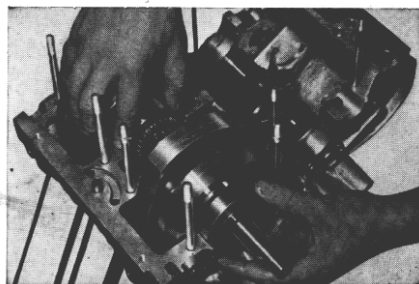


Fig. 60

4.
Main shaft

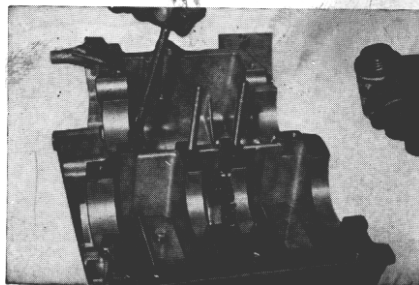
5.**Counter shaft****Fig. 61**

To set bearing oil seal
do it securely.

**Fig. 62**

Point liquid packing on
the case.

Note: lease the sur-
face of packing be
fore pointing. Don't
use with attaching
cleansing oil or oil.
Paint without chok-
ing oil holes.

**Fig. 63**

F. Cylinder Head

Disassembly

Assembly

Precaution
Tools

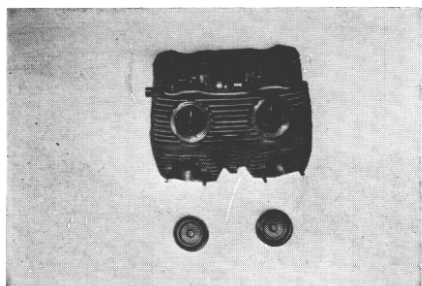


Fig. 64

1.

Cylinder head cap

23 $\frac{3}{4}$ mm spanner

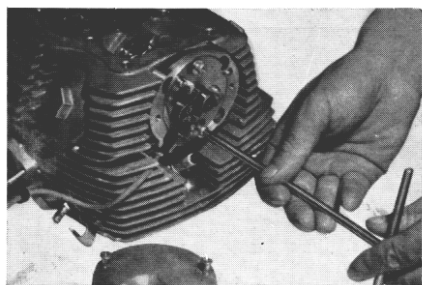


Fig. 65

2.

Contact breaker

T-Handle forehead
driver (#2)

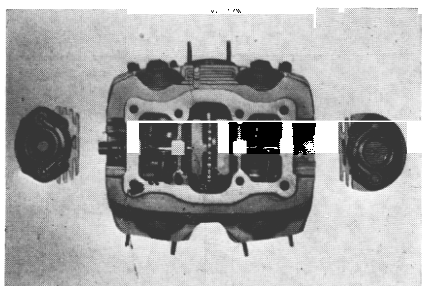


Fig 66

3.

R.L. cylinder head
ride cover

T-Handle forehead
driver (#3)

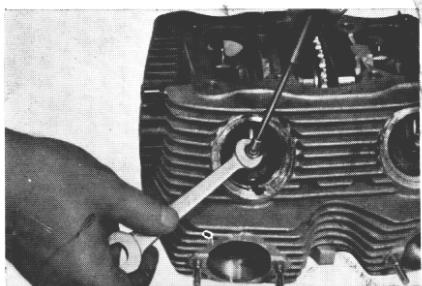


Fig. 67

Tappet adjusting
screw

10 $\frac{3}{4}$ mm spanner

Tappet adjusting sock-
et wrench

5.

Valve

Attach tag on L and
R. valves not to be
mixed each other.

Valve lifter

Thin nose pliers

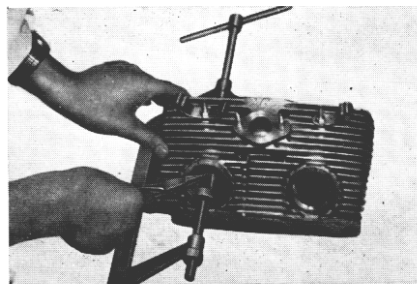


Fig. 68

6.

Rocker arm crank
pin

Rocker arm

In assembly rock arm
crank pin. pay atten-
tion to outer diam-
eter of inlet rocker
arm crank pin and
of exhaust rocker
arm pin to insert
inside the cylinder
head. Former pin
is larger than diam-
eter of that of
the latter.

Rocker arm crank pin
extrator

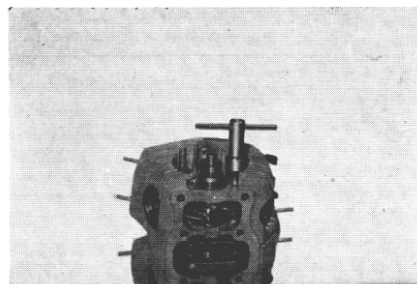


Fig. 69

Cutting-grooves on the
rocker arm crank pin
at two places are
set for oil passage
and retreat for stud
bolt. So need spe-
cial attention to al-
locate pin to assem-
ble.

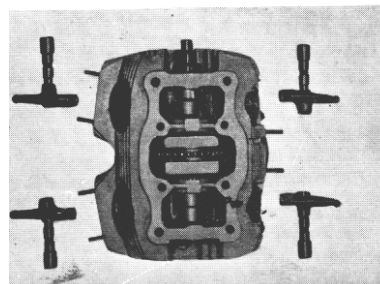


Fig. 70

7.

Cam shaft lock nut

Forehead driver
Plastic hammer

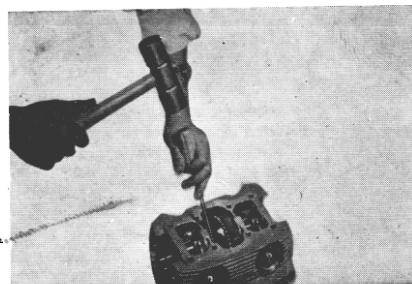


Fig. 71

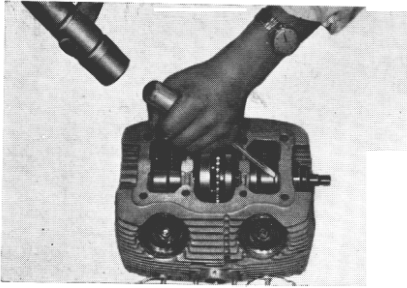


Fig. 72

8.

R. cam shaft

Forehead driver

Plastic hammer

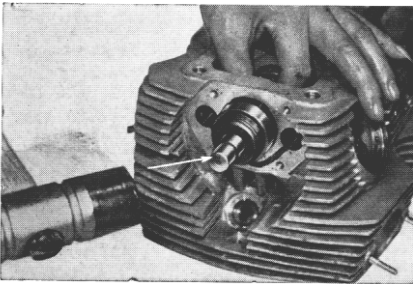


Fig. 73

Assembly process of
L. cam shaft. After
coinciding spline, put
the red line of the
point shaft cam on
the punched mark
of the cam sprocket
(facing upward) then
insert.

Plastic hammer

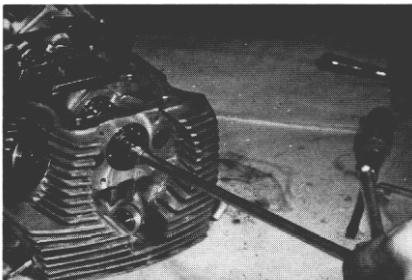


Fig. 74

9.

Cam shaft lock nut

L. cam shaft

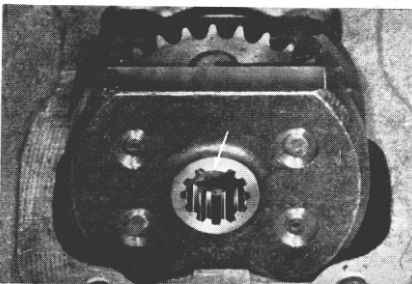
10^{mm} rocket wrench

Fig. 75

10

In assembly the cam
shaft, coincide the
spot where a tooth
of spline of the cam
sprocket complete is
lacking with the cor-
responding spot on
the cam shaft and
then insert

Disassembly

Assembly

Precaution
Tools

11.

Cam sprocket comp. Put the punched mark upward and cam shaft rocker nut to the right side.

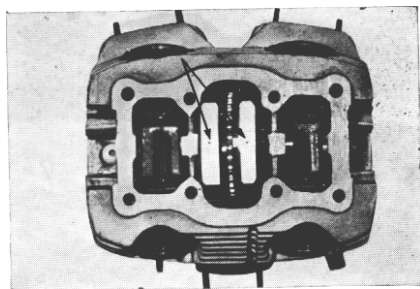


Fig. 76

Valve sheet cutter

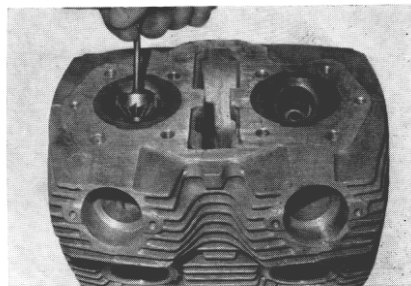


Fig. 77

G. Oil Pump

Disassembly

Assembly

Precaution
Tools

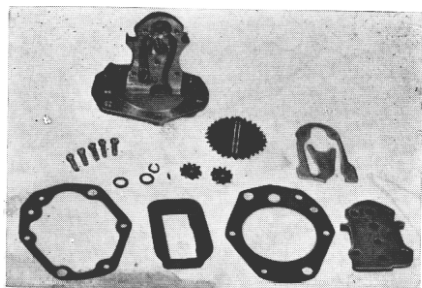


Fig. 78

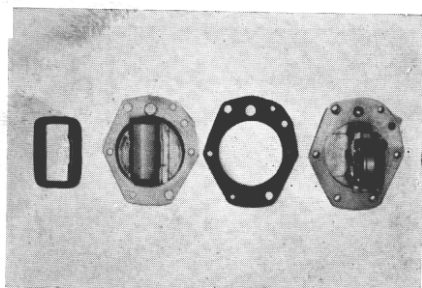


Fig. 79

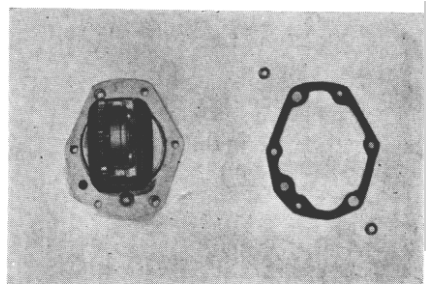


Fig. 80

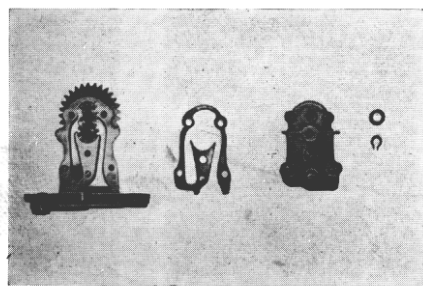


Fig. 81

1.

Oil pump strainer
Oil pump packing B
Oil receiver
Oil pump body

2.

Oil pump packing A
Dowel pin

3.

Snap ring

Check smooth running
of the drive gear.

Snap ring remover

Disassembly

Assembly

Precaution
Tools

4.

Side cover

Refer to the engine
minor overhaul and
assembly.

T-Handle forehead
driver (#3)

5.

Oil pump ride cover
dowel pin

Oil pump gear A

Oil pump gear B

Oil pump drive gear

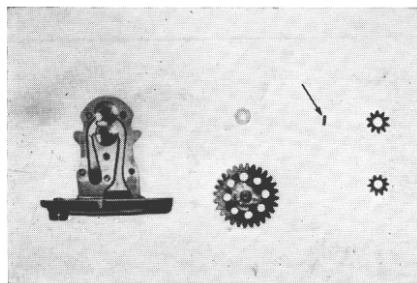


Fig. 82

2. ENGINE (CB72 · 77)

A. Engine replacement

Disassembly

Assembly

Precaution
Tools

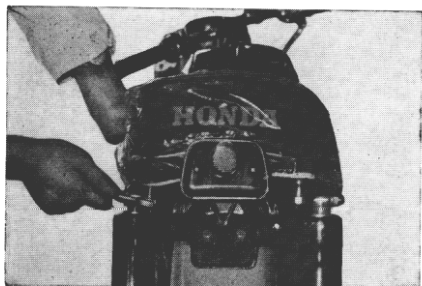


Fig. 83

1.
(L-side)
Dual seat

14 $\frac{m}{m}$ spanner



Fig. 84

2.
Fuel tank setting bolt

10 $\frac{m}{m}$ socket wrench



Fig. 85

Take out tubes A and
B stopping choke.

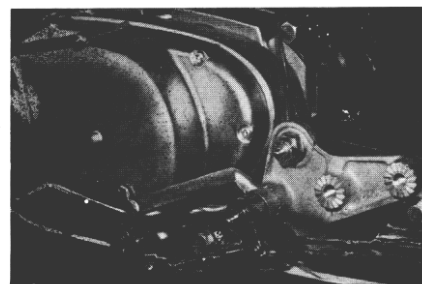


Fig. 86

3.
Gear change
pedal
Step bar

In assembly the step
bar, coincide the
punched mark with
line of the bracket.

14 $\frac{m}{m}$ socket wrench

10 $\frac{m}{m}$ spanner

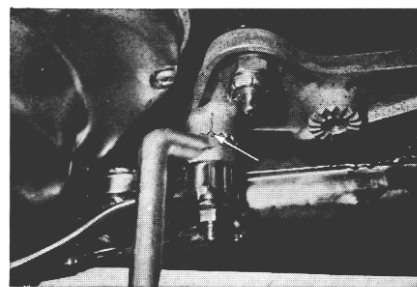


Fig. 87

4.

L. exhaust pipe joint

nut

L. exhaust muffler

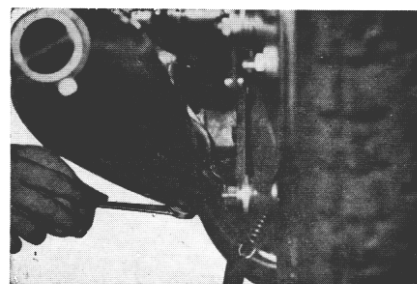
10 $\frac{m}{m}$ socket wrench14 $\frac{m}{m}$ socket wrench14 $\frac{m}{m}$ spanner (2)

Fig. 88



Fig. 89

6.

Speed-tachometer

cable

17 $\frac{m}{m}$ spanner

Fig. 90

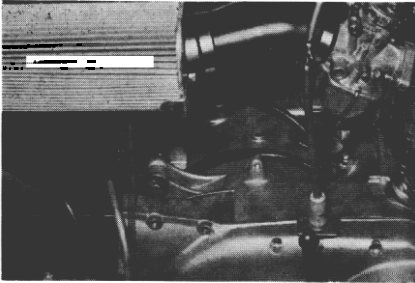


Fig. 91

7.

L. air cleaner cover
Starting motor cable

10 $\frac{m}{m}$ spanner

Fig. 92

8.

Air cleaner connect-
ing tube
Throttle wire (refer
to L. side)

T-Handle forehead
driver (#2)

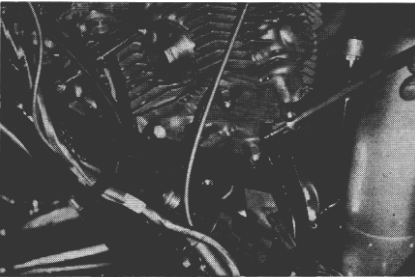


Fig. 93

9.

Engine setting bolt

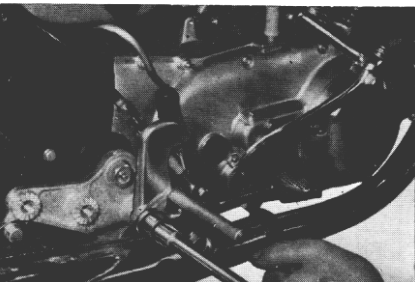
17 $\frac{m}{m}$ socket wrench

Fig. 94

10.

(R. side)
Brake pedal
Step bar
Stop switch

14 $\frac{m}{m}$ socket wrench
Refer to L. side

| Disassembly | Assembly | Precaution Tools |
|-------------|----------|---------------------|
|-------------|----------|---------------------|

11.

- R. exhaust pipe joint
- nut
- R. exhaust muffler

10^{m/m} rocket wrench

14^{m/m} "

14^{m/m} spanner

Refer to L. ride

12.

Dynamo cover

T-Handle forehead
driver (#2)

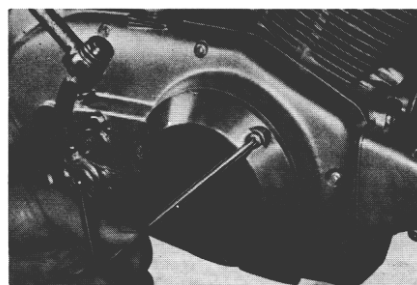


Fig. 95

13.

- R. crank care cover
- Clutch wire
- Drive sprocket cover

T-Handle forehead
driver (#3)
Forehead driver

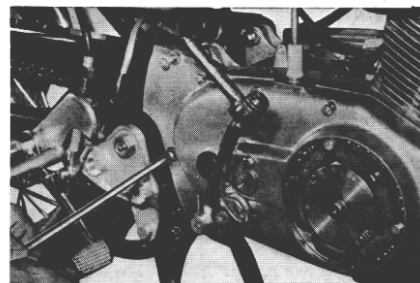


Fig 96

14.

Drive chain

Pliers

Refer to the item of
frame.

15.

Air cleaner case

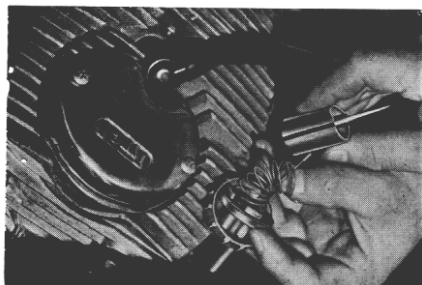


Fig. 97

16.

Throttle wire

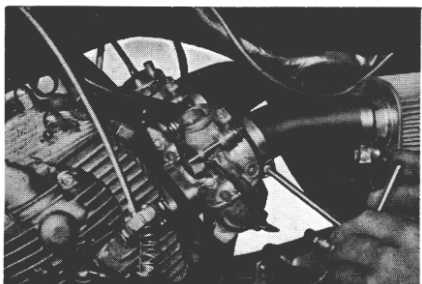


Fig. 98

17.

Aircleaner connect-
ing tube

About throttle wire
refer to the item
of Engine Replace-
ment for Model
CB 72, 77
T-Handle forehead
driver (#2)

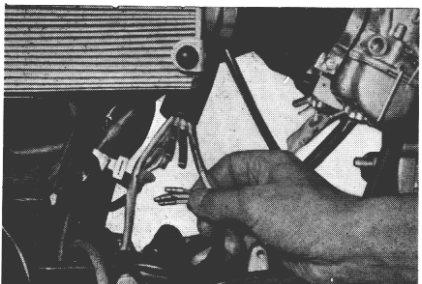


Fig. 99

18.

Engine wiring

19.

Contact breaker
cover
Contact breaker

T-Handle forehead
driver (#2)

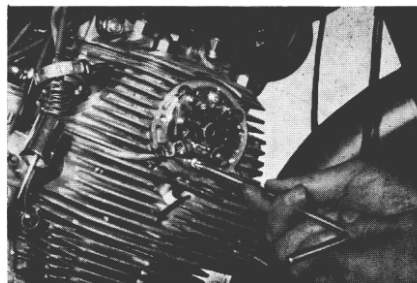


Fig. 100

20.

Engine hanger bolt

17 $\frac{m}{m}$ socket wrench
17 $\frac{m}{m}$ spanner

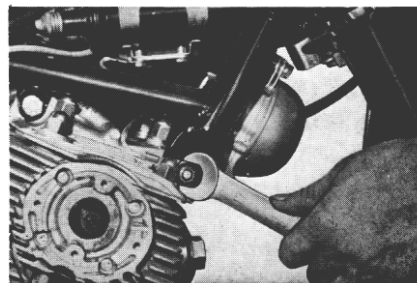


Fig. 101

21.

Engine setting bolt

Insert T-Handle forehead driver. Take out the former driver and lay down engine to take out the latter driver.

14% spanner
14% rocket wrench
17% spanner

B. Cylinder

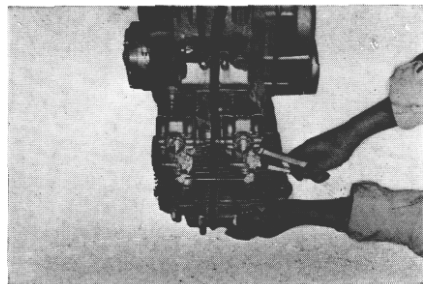


Fig. 102

Disassembly

Assembly

Precaution
Tools

1.

Carburettor

10 $\frac{m}{m}$ spanner

2.

Cylinder head cover

Cam chain tensioner

Refer to Model C72

77 Engine Replace-

ment.

C Engine minor overhaul and assembly

Disassembly

Assembly

Precaution
Tools

1.

R. L Cylinder head
ride cover

T-Handle forehead
driver (#3)

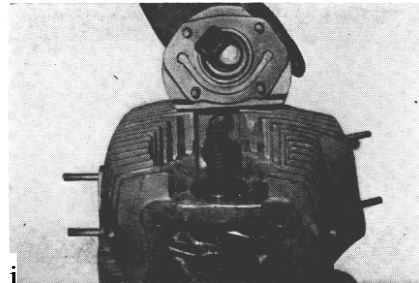
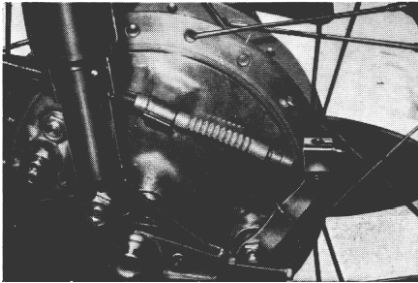
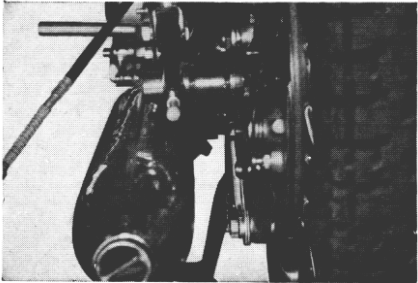
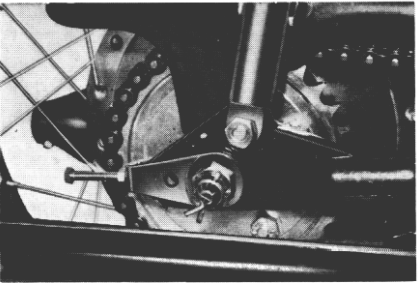
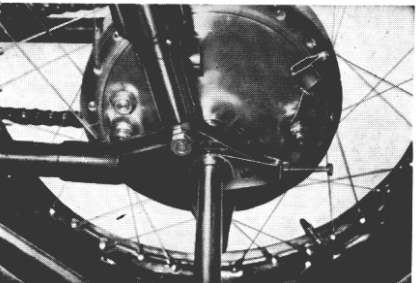


Fig. 10 5

3. FRAME (CB72 · 77)

A. Rear Fork

| | Disassembly | Assembly | Precaution Tools |
|---|---------------------------------|----------|--|
|  | 1. Rear brake wire comp. | | 14 ^m / _m spanner |
|  | 2. Rear broke stopper arm | | Pliers 14 ^m / _m spanner |
|  | 3. Cotter Pin Axle nut | | Pliers |
|  | 4. Rear wheel axle | | Plastic hamme |

5.

Drive chain

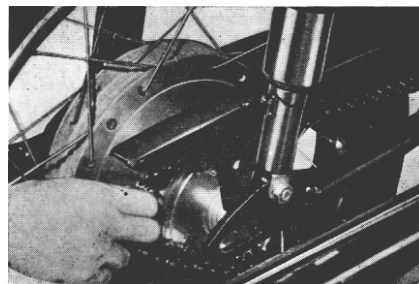


Fig. 108

6.

Rear wheel

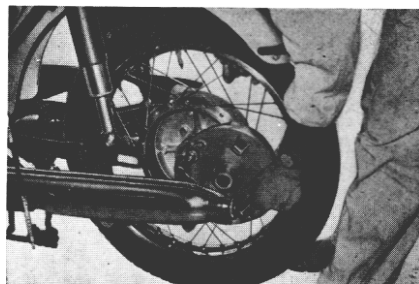


Fig. 109

7.

Chain case

$10\frac{1}{16}$ spanner
 $10\frac{9}{16}$ socket wrench

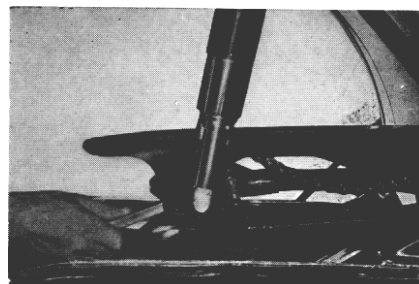


Fig. 110

8.

R. rear cushion

17 X rocket wrench
 $17\frac{1}{2}$ spanner



Fig. 111

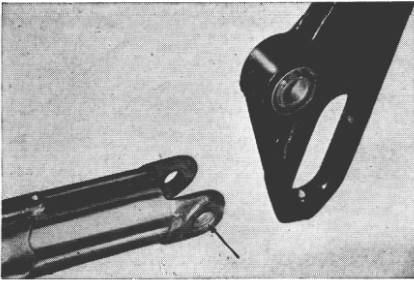


Fig. 112

In assembly, put the
screwed side of the
rear cushion under
bolt hole to face
outward.

9.

Exhaust muffler
Change pedal
Broke pedal
Step bar

Refer to the previously
mentioned items of
Engine Replacement.

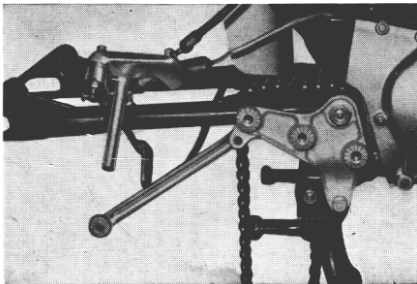


Fig. 113

10.

R. step bar bracket

$17\frac{m}{m}$ socket wrench

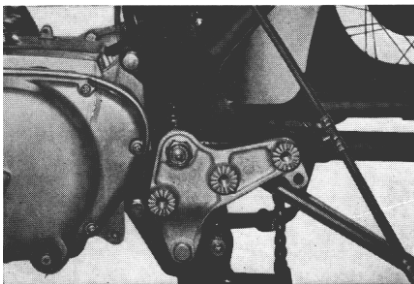


Fig. 114

11.

L. step bar bracket

$17\frac{m}{m}$ rocket wrench
Plastic hammer

B. Front fork

Disassembly

Assembly

Precaution
Tools

1.

Head light

T-Handle forehead
driver (#2)

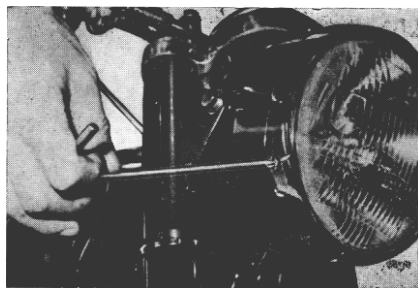


Fig. 115

2.

Wiring

Draw out only white.
red and blue wires.

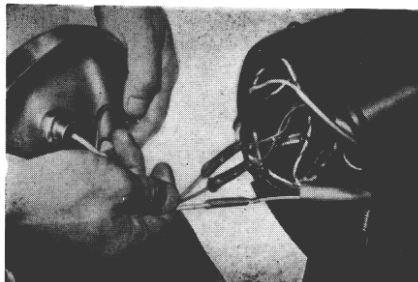


Fig. 116

3.

Wire Harness termi-
nal

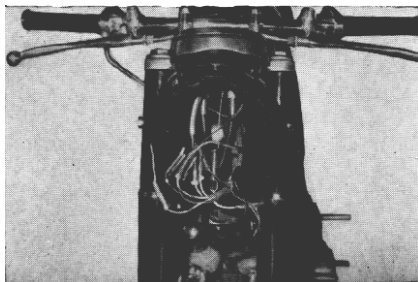


Fig. 117

4.

Speedometer cable
Tachometer cable

Pliers

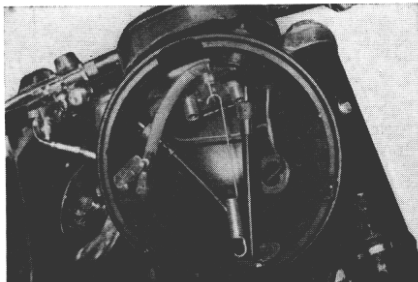


Fig. 118

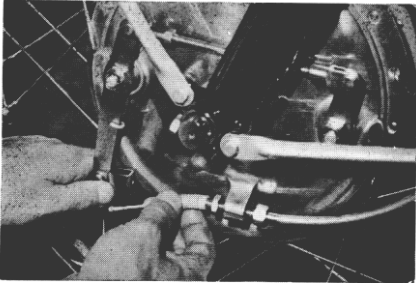


Fig. 119

5.
Broke wire

$14\frac{3}{4}$ spanner

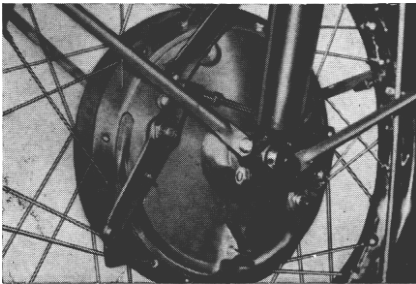


Fig. 120

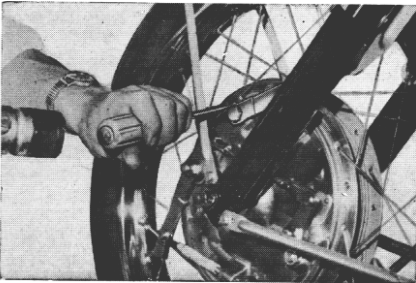


Fig. 121

6.
Front brake stopper
arm

Plastic hammer
Forehead drive

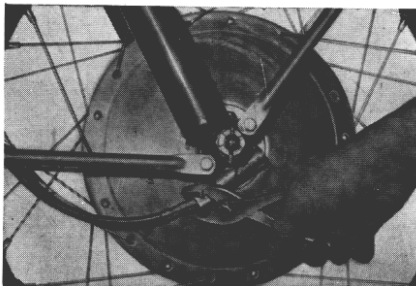


Fig. 122

7.
Speedometer cable
ass'y

Pliers

| Disassembly | Assembly | Precaution Tools |
|-------------|----------|---------------------|
|-------------|----------|---------------------|

8.

Cotter pin (3 × 28)
Front wheel axle nut

Pliers

23% rocket wrench

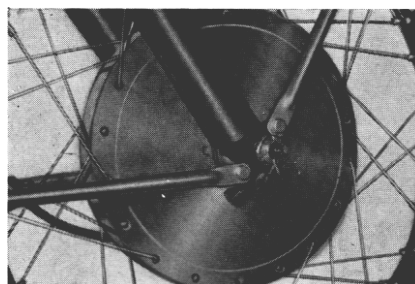


Fig. 123

9.

Front wheel axle

14^{mm} spanner
Plastic hammer

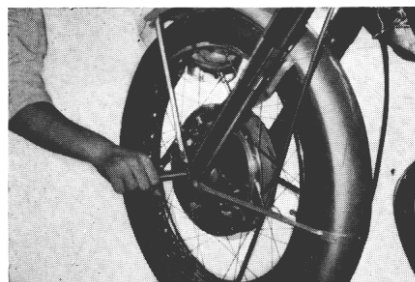


Fig. 124

10.

Front fork comp.
Front fender

10^{mm} spanner

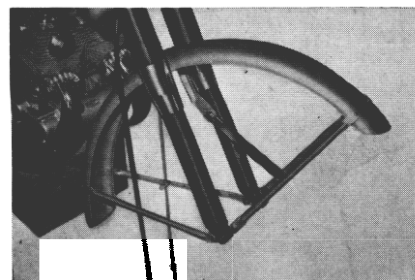


Fig. 125

11.

Starter switch ass y

H-handle forehead
driver (#2)

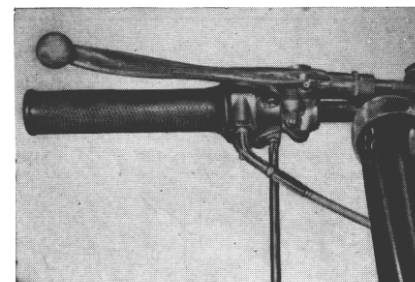


Fig. 126

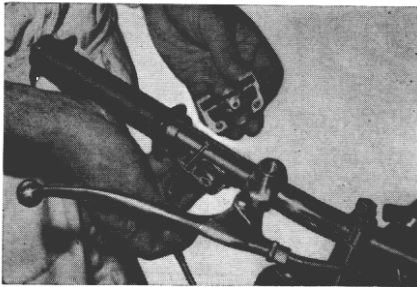


Fig. 127

12.

Throttle grip pipe

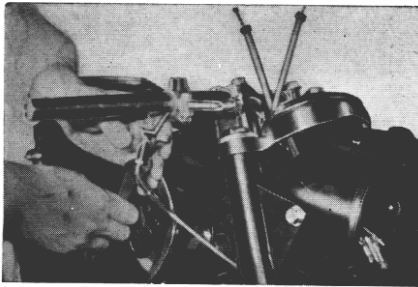
T-Handle forehead
driver (#2)

Fig. 128

13.

Throttle wire comp.

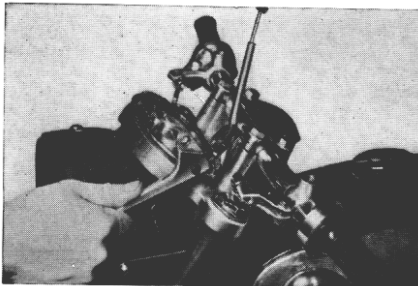
14 $\frac{m}{m}$ spanne

Fig. 129

14.

Clutch wire comp.

Front brake wire
comp.Clutch wire adjust
bolt.

Fixing nut

Pliers

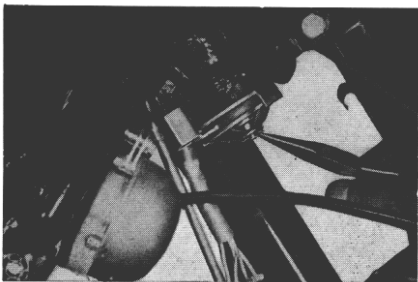


Fig. 130

15.

Snap pin 6 $\frac{m}{m}$ Steering damper`
(lock spring nut
spring
Plate
Friction dirk

Pliers

16.

Hex. bolt 8×30

Steering handle pipe
comp.In assembly. pay atten-
tion on punched
mark.

14% socket wrench

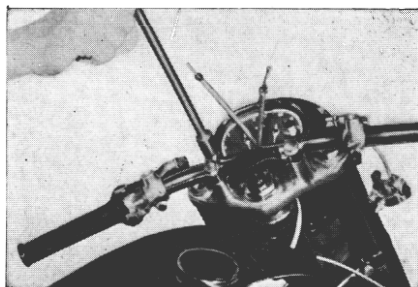


Fig. 131

17.

Steering damper
knob comp.
{lock springDamper lock spring
set bolt.17 $\frac{1}{16}$ rocket wrench

Fig. 132

18.

Speedometer ass'y

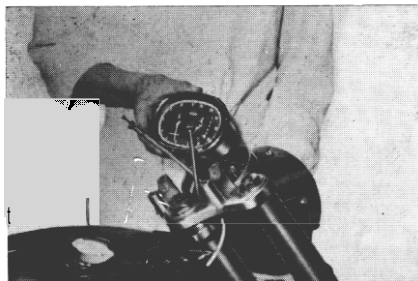


Fig. 133

19.

Front fork bolt

Steering head stem
nut.

Stem nut

26% spanner

35% spanner

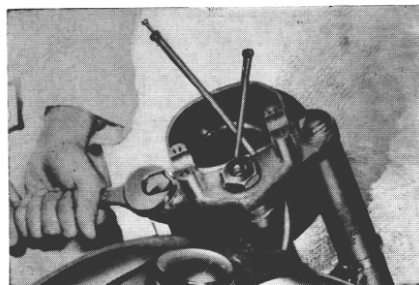


Fig. 134

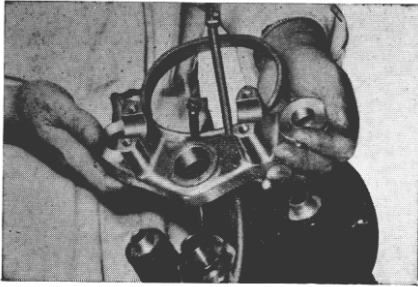


Fig. 135

Fork top bridge

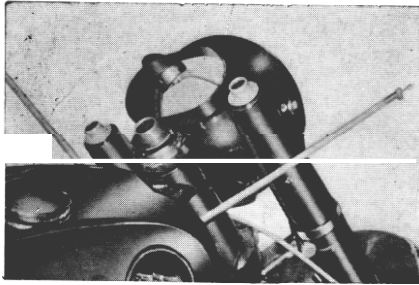


Fig. 136

2 .

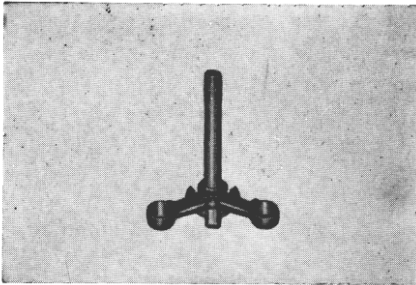
Steering head thread
comp.Steering top corn
race

Fig. 137

22.

Steering stem comp.

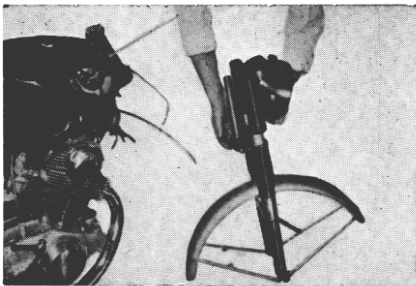


Fig. 138

Disassembly

Assembly

Precaution
Tools

23.

Front fender

Take out on arrow
marked bolt.

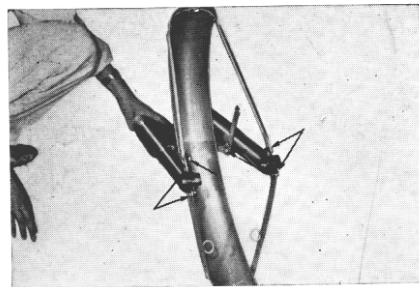


Fig. 139

24.

Front fork comp.

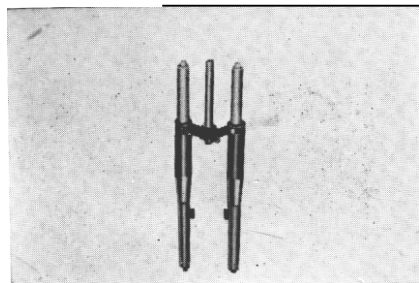


Fig 140

Put the front fork
under cover with
welded clip as the
R ride.

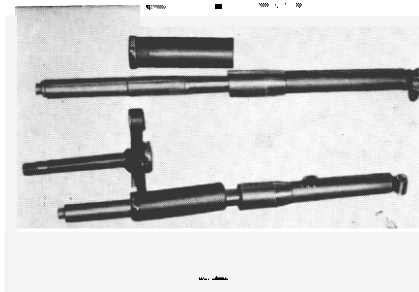


Fig. 141

CONSTRUCTION

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CONSTRUCTION

1. POINTS OF CONSTRUCTIONAL DIFFERENCE BETWEEN HONDA 250, 300 MODEL C72, 77 AND CB72, 77

Honda 250, 300 Super Sport Model CB72, 77 has a newly designed chassis equipped with engine which partly reconstructed from those of Model C72, 77, and aimed mainly to be used as sports car maintaining availability as racer interchanging some of its parts. As this engine is high rotation, high power type and chassis is light weight, high rigidity type, the special constructional featurer comparing with Model C72, 77 could be cited as follow.

A. Engine

1. Twin carburettor

To raise horse power adopted Twin carburettor system removing junction of suction manifold.

2. Reciprocating change

Change control system suitable for high speed running and racing.

3. Kick of forward step

Considering relation with frame, direction of step of kick arm was set forward.

4. 180 degree (I-Type) crank angle

To get stability at high speed reducing vibration left and right crank arm angle was set as 180 degrees.

B. Frame

1. Frame and rear fork of steel tubing

To attain light weight and raise rigidity main constructional member is constructed by high carbon steel pipes.

2. Telescopic type fork

To raise stability at high speed running on rough road maintaining rigidity, telescopic type fork was adopted on the front wheel suspension.

3. Rear cushion of three step adjustment

Rear cushion is adjustable according to load and road condition.

4. 18 inch type

To enlarge bank angle and to help pleasant feeling on rough road, equipped with front wheel 2.75-18, and rear wheel 3.00-18.

5. Speed Tachometer

Speedometer and Tachometer were set in the same case.

6. Step and handle easy to move or interchange

To make easy riding posture suitable for general, high speed or race riding.

MEMO

2. ENGINE

A. Main parts of engine

Cylinder and Cylinder Head are the most important parts of engine and its construction, material and its machining rate of precision affect engine performance.

This type of engine adopted most suitable O.H.V. type valve arrangement to attain efficient combustion chamber form. On the other hand the cam shaft is set in the cylinder head and the valves are actuated by rocker arm (O.H.C.), accordingly reciprocating parts are reduced very much comparing with other types.

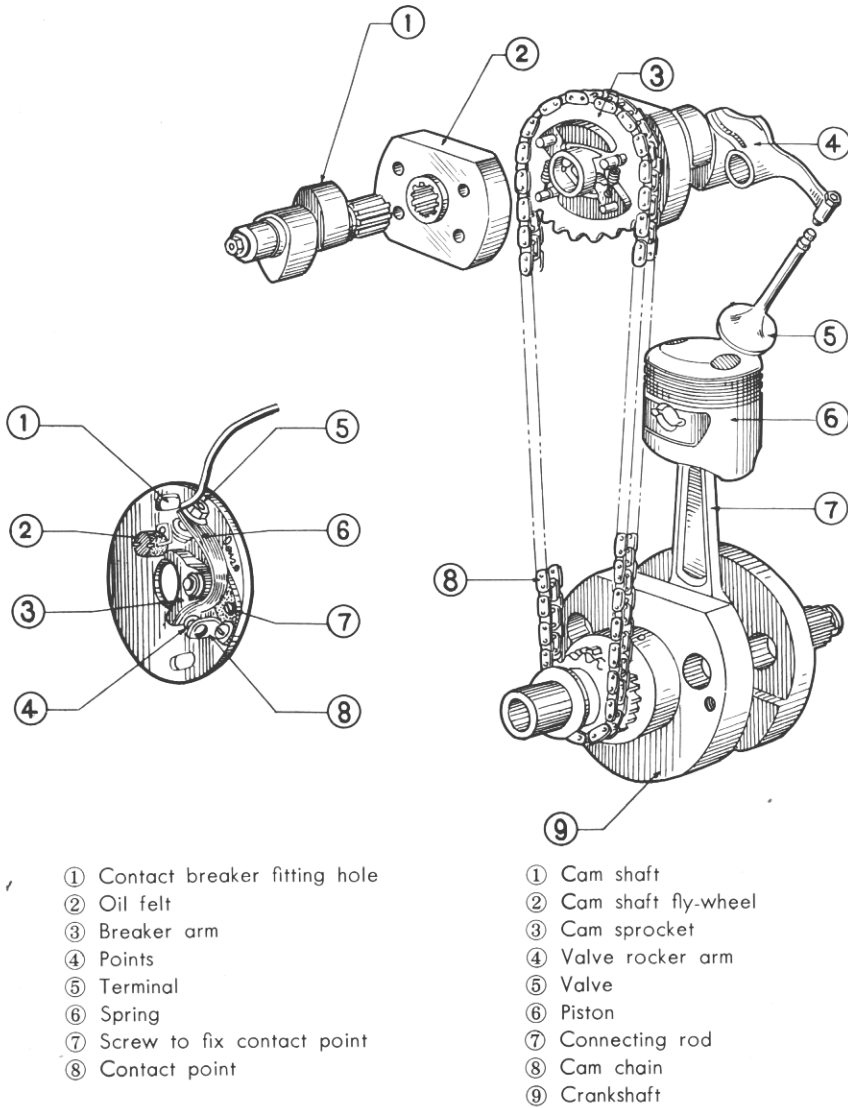


Fig. 2-1.

The cam shaft is driven by chain through the timing gear reductioned $1/2$. As the cylinder head is made of light alloy, not only it is light but cooling efficiency is excellent as heat conductivity is good, and shape of combustion chamber is ideal semi-spherical one to get efficient combustion of mixture and also to attain larger compression ratio. As the cylinder is machined with high rate of precision cooling efficiency and lubrication are favorable, accordingly wearing effect is very small. Single row W-type needle bearing is used at the big end of the connecting rod to get ample loading capacity at the bearing.

On the other hand single row ball bearings are used on the crankshaft, where W-type middle parts at 2 stations single row the needle bearing are used to get larger loading capacity.

As crankshaft has an important function to convert reciprocating motion to rotation, inertia force due to reciprocating motion of piston and connecting rod should be reduced by putting balance weight to get smooth revolution. The crankshaft can rotate smooth running as it is balanced by dynamic balance on the balancing machine after complete machining.

To reduce vibration at high speed revolution and to get stability at high speed running the right and left crank arm angle of Model CB72, CB77-I crankshaft is set 180 degree. (For Model C72, C77 type angle is 360 degree)

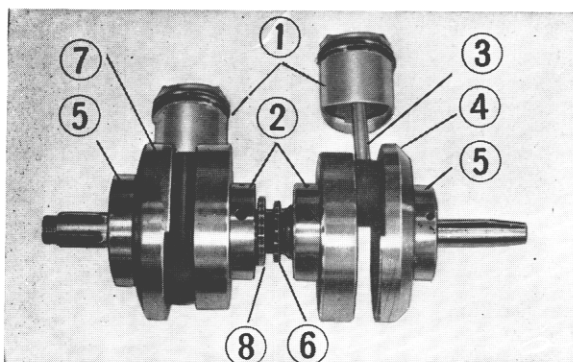


Fig. 2-2. Type-I crankshaft

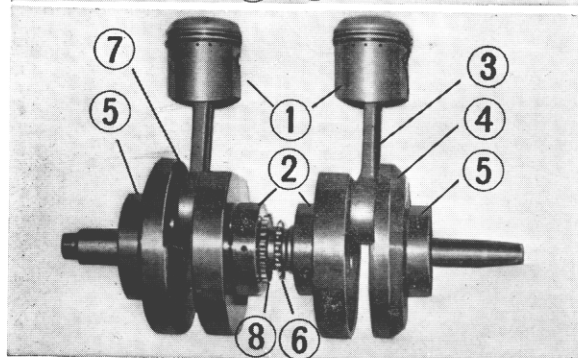


Fig. 2-3. Type-II crankshaft

B. Lubricating system

Construction and operation

For Honda 250, 300 oil is supplied under pressure by gear pump and wet-sump system is applied. The oil pump is attached under crankcase by 6 bolts. The oil pump is shown in Fig. 2-5 and (1) is driving gear and (2) driven gear. Power is transmitted by driving gear (3) meshing with crankshaft gear. As for operation of gear pump, the driving gear (1) rotates to the arrow direction and the driven gear (2) rotates counterwise, then degree of vacuum increases on the right side sucking oil from this side to feed the left side.

Therefore each part of the pump should be carefully inspected to avoid engine burning or other troubles due to mal-lubrication. Such troubles after occur due to oil leakage through inadequate gap between gear teeth and pump main body, or between gear face and pump body or pump side cover causing drop of degree of vacuum.

Lubricating oil sumped in the crankcase is sucked by oil pump to pass through the

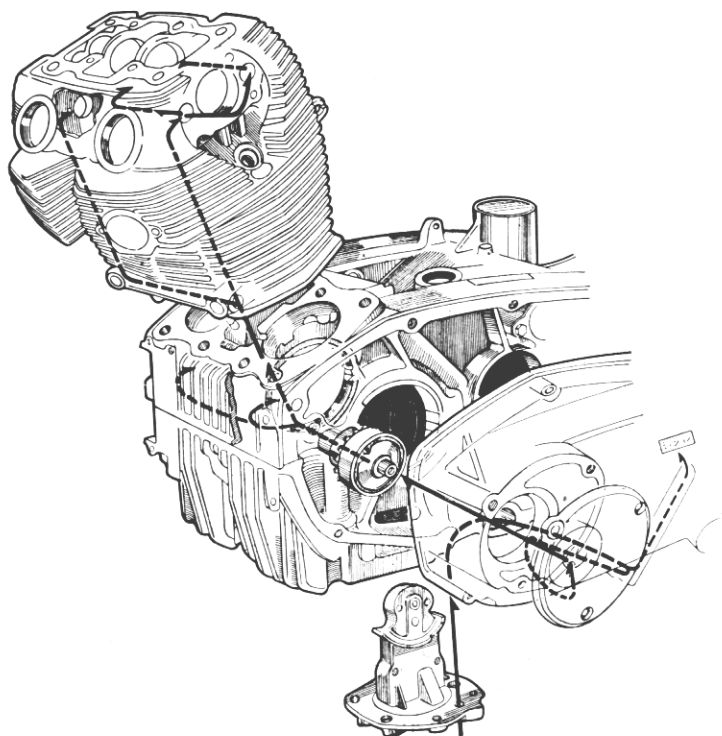
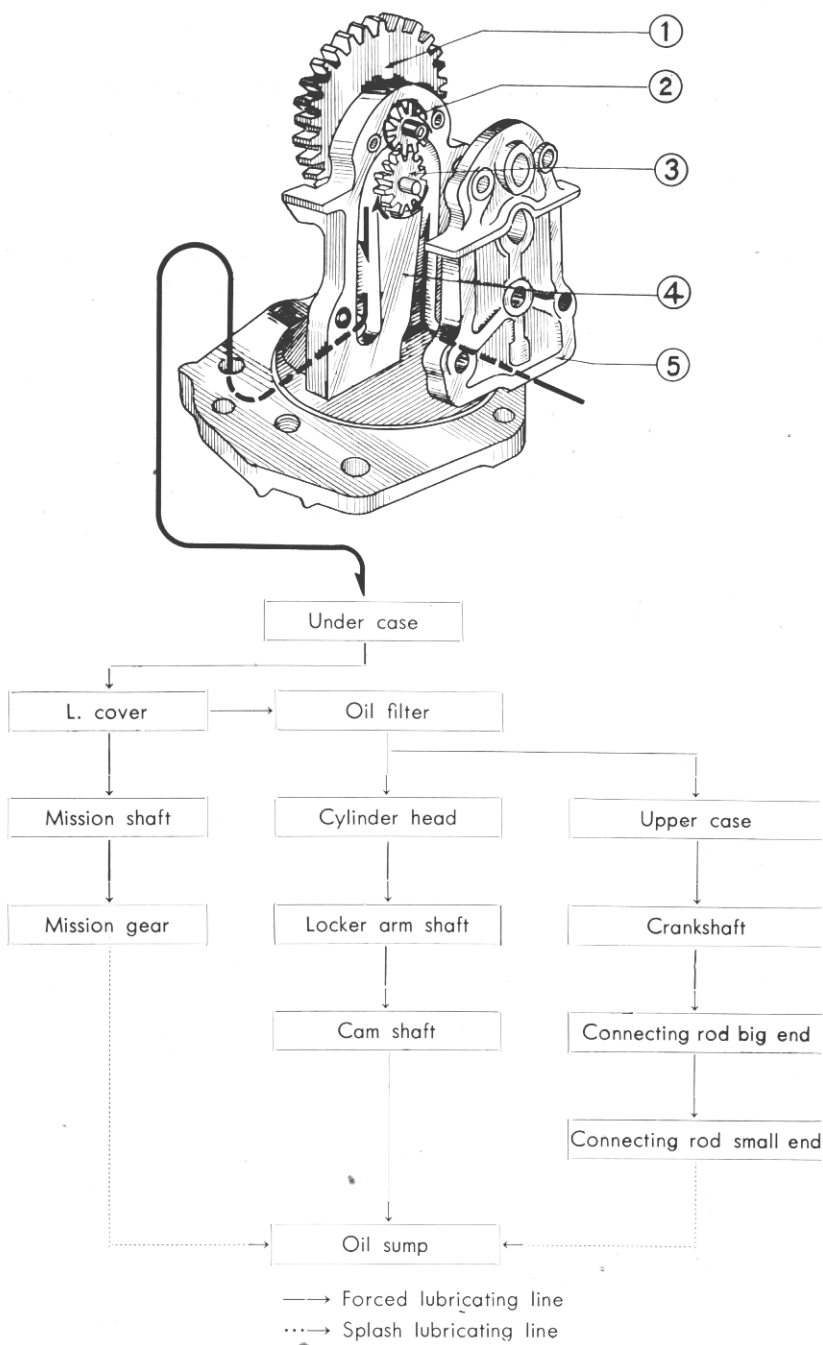


Fig. 2-4. Lubricating circulation



- | | |
|----------------------------------|-----------------------|
| ① Drive gear | ④ Oil pump body |
| ② Oil pump gear (driving gear) ① | ⑤ Oil pump side cover |
| ③ Oil pump gear (driving gear) ② | |

Fig. 2-5.

under crankcase and L. crankcase cover then the pipe line is splitted to 2-ways, one to the oil filter.

Oil cleaned in the oil filter is feeded to the crankcase where the line is splitted again to 2-ways, one is guided to the crankshaft through the center bearing and lubricate the big end of connecting rod and also the small end by splashing, and another line is guided up to the cylinder head along the cylinder stud bolts from the upper crankcase to lubricate cam shaft and locker arm separately in the front and rear rocker arm in the head then drop in the crankcase through the space around the cam chain. On the other hand, one line splitted in the L. crankcase cover is guided into the transmission mainshaft through the oil guide metal which is fixed on the L. crankcase cover by spring, and then drop in the crankcase lubricating mission gear through oil hole bored in the shaft.

C. Centrifugal oil filter

Oil filter is located on the front side of L. crankcase cover and oil is cleaned and separated by centrifugal force driven by the drive sprocket of the crankshaft and chain.

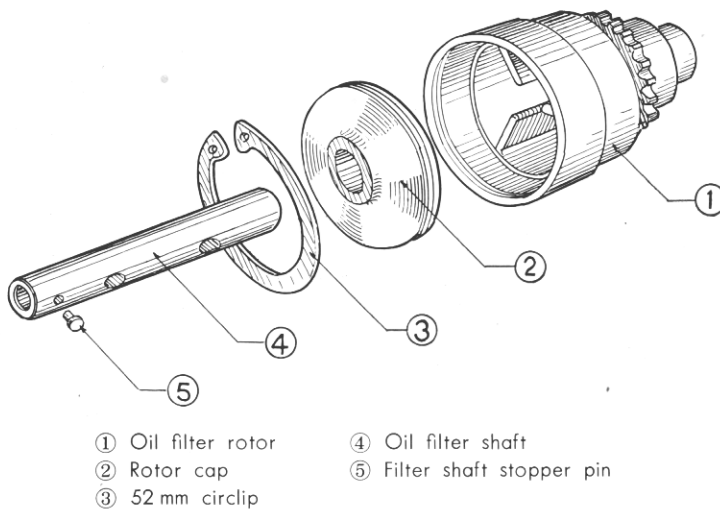


Fig. 2-6.

3. POWER TRANSMISSION

Power transmission is defined such mechanism as rotation of crankshaft is transmitted to rear wheel. The first step of transmission from crankshaft to clutch is done by chain. This clutch is wet multiple plate type, so there is no heat generated by friction and also no noise perfectly.

As this transmission is such type of advance 4-step and constant meshing, there is no gear sound while in gear changing, and consequently made it possible to widen rear wheel driving power of powerful engine.

Further power is transmitted to the rear wheel sprocket by chain drive from the mission, and through rear wheel damper of rubber made to the rear wheel sprocket and the rear wheel torque is transmitted between the final driven flange.

So that torque is transmitted very smoothly without chain knock getting smooth running. Especially as clutch is located on the mission shaft, made it possible to minimize deflection of crankshaft and also to stabilize clutch function reducing clutch inertia.

A. Clutch and primary chain

Clutch

(1) Function and kinds

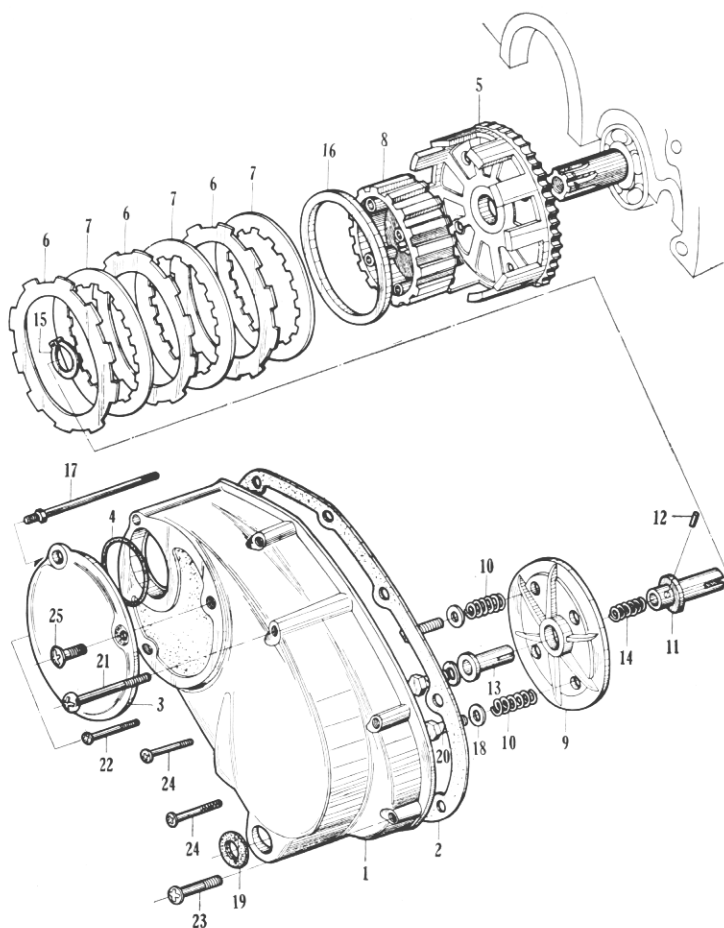
Function of clutch is to cut or engage power transmission in case of changing gear or starting location between the engine and the transmission mechanism. Therefore fineness of cutting and smoothness of engaging and disengaging are important feature.

There are several kinds of clutch system as cone clutch, centrifugal clutch, multiple plate clutch and single clutch, and we call wet type when merged in oil and dry system when oil is not used inside.

(2) Construction and function

For Honda 250, 300 we adopted type of wet multiple plate clutch.

As shown in Fig. 3-1 (disassembled figure) and Fig. 3-2 (cross sectional figure), there is clutch outer complete when crankcase cover is taken out. In the clutch outer complete, clutch spring (10) is set by 4 of 6×24 hexagonal bolts pressing clutch pressure plate (9) and sandwiching clutch friction disc (6) by clutch plate (7). Inside of the clutch plate teeth are cut which mesh with that of outer part of clutch center (8), and the clutch center is connected with the transmission mainshaft by spline and rotates with (7), (8) and (9) as a whole with the transmission mainshaft.



- | | | |
|------------------------------|--|-------------------------|
| ① L. crankcase cover | ⑨ Clutch pressure plate | ⑰ 6×19 washer |
| ② L. crankcase cover packing | ⑩ Clutch spring | ⑱ 14257 oil seal |
| ③ Oil filter cover | ⑪ Clutch lifter joint piece | ⑲ 6×24 Hex. bolt |
| ④ 57×3 O-ring | ⑫ Oil guide metal pin | ⑳ 6×74 cross head screw |
| ⑤ Clutch outer comp. | ⑬ Oil guide metal | ㉑ 6×10 cross head screw |
| ⑥ Clutch friction disc | ⑭ Oil guide metal spring | ㉒ 6×45 cross head screw |
| ⑦ Clutch plate | ⑮ 25 ^m / _m circlip | ㉓ 6×35 cross head screw |
| ⑧ Clutch center | ⑯ L. leg sealed lower bolt | ㉔ 6×16 cross head screw |

Fig. 3-1. Disassembled picture of clutch

On the other hand, with the groove cut along the outer perimeter of clutch outer, the clutch friction disc is connected through flange mating with said groove, and the transmission mainshaft can rotate freely.

Therefore in case of disengaging clutch, (9) (6) (7) (6) (7) (6) (7) (6) (7) (8) and (5) are pressed by clutch springs, rotating power of crank is transmitted to the mission as a whole by friction.

Inside of the clutch outer, the primary driven sprocket is fixed by rivetting and as primary chain is set on this sprocket, power is transmitted to the transmission main shaft through the primary chain from the crank.

Handle the clutch lever, the clutch lifter thread turns right by clutch wire, and the lifter thread is pushed out inside by the screw inside of clutch adjuster fixed on the R. crankcase and push outside the clutch lifter piece (11) through clutch lifter rod.

As the clutch pressure plate 191 is pushed on side by the clutch lifter joint piece. clutch spring (10) is compressed to free 161 171 of each 4 pieces. Therefore rotation of (5) 161 (6) 161 161 is not transmitted to (8).

Note :

Number of clutch plate and clutch friction disc is four sheet each for Model C72 and 5 sheets each for Model C77. CB72, 77.

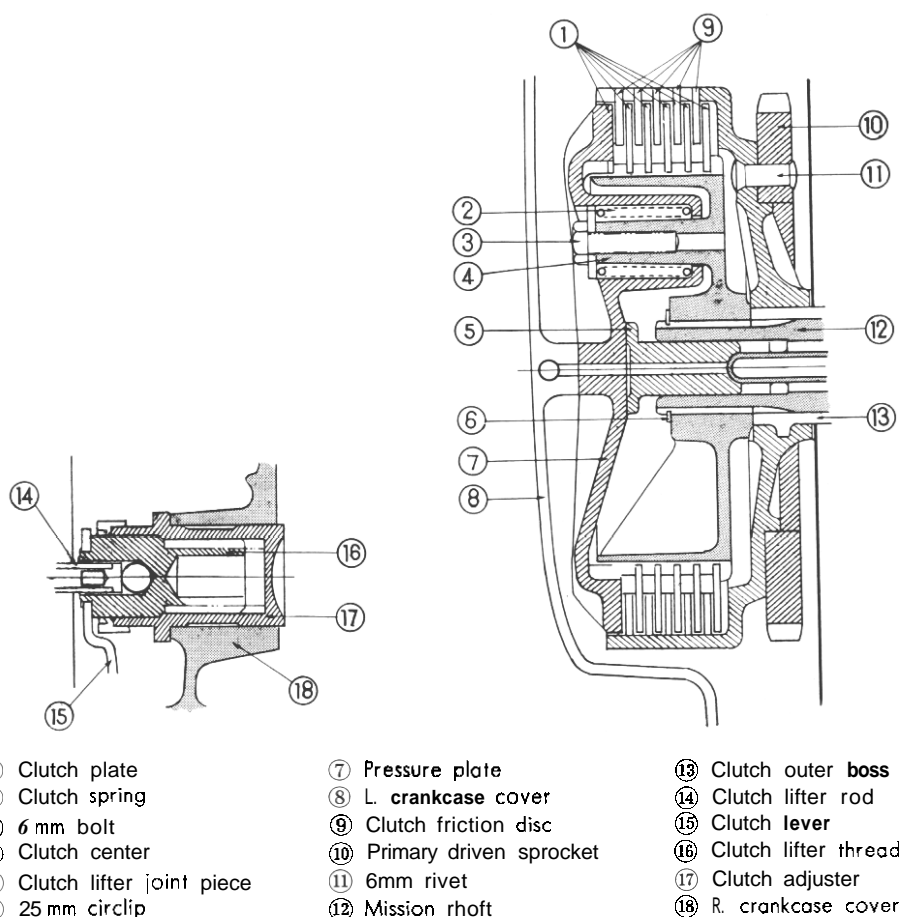
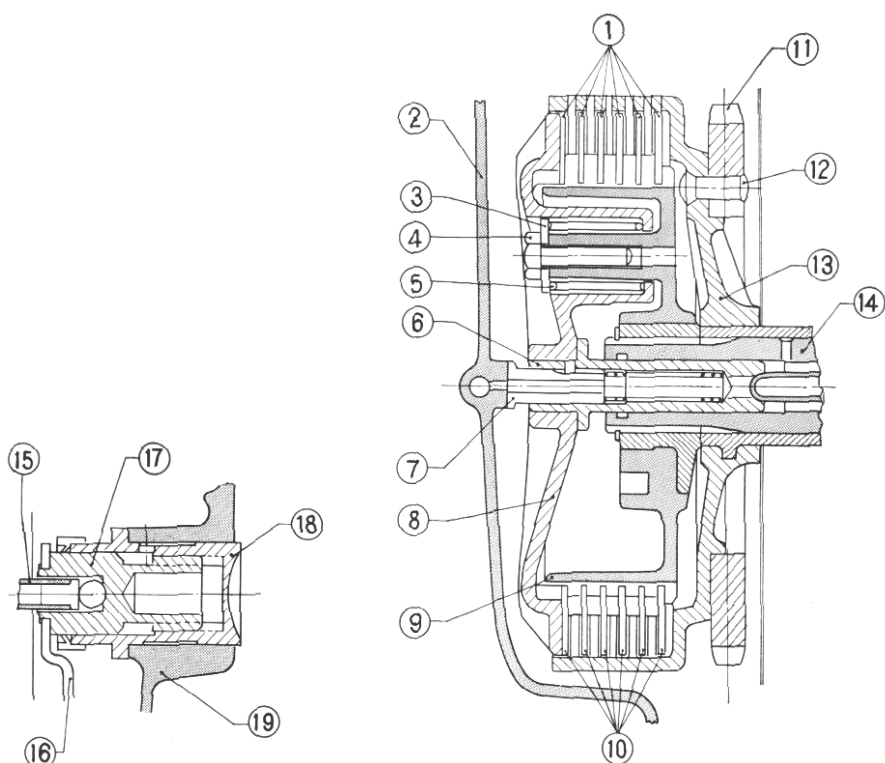


Fig. 3-2. Cross section of clutch for Model C72



- | | | |
|-----------------------------|---------------------------|------------------------|
| ① Clutch friction disc | ⑧ Clutch pressure plate | Q Clutch lifter rod |
| ② L. crankcase cover | ⑨ Clutch center | ⑮ Clutch lever |
| ③ 6×19 washer | ⑩ Clutch plate | ⑯ Clutch lifter thread |
| ④ 6×24 Hex. bolt | ⑪ Primary driven sprocket | ⑰ Clutch adjuster |
| ⑤ Clutch spring | ⑫ 6 mm rivet | ⑱ R. crankcase cover |
| ⑥ Clutch lifter joint piece | ⑬ Clutch outer | |
| ⑦ Oil guide metal | ⑭ Mission shaft | |

Fig. 3-3. Cross-section of clutch for Model C77, CB72, 77

B. Transmission system

1. Function and kinds

Following clutch, function of transmission is to convey power transmission. and convert torque by means of meshing gears of different number of teeth. As shown in Fig. 3-4 if driving gear is smaller than driven gear, No. of rotation of the driven side will be smaller transmitting large torque. Here it is called reduction ratio showing the ratio of each gear numbers.

There are two systems of gear meshing for transmission of auto-bicycle i.e. selective sliding system and constant meshing.

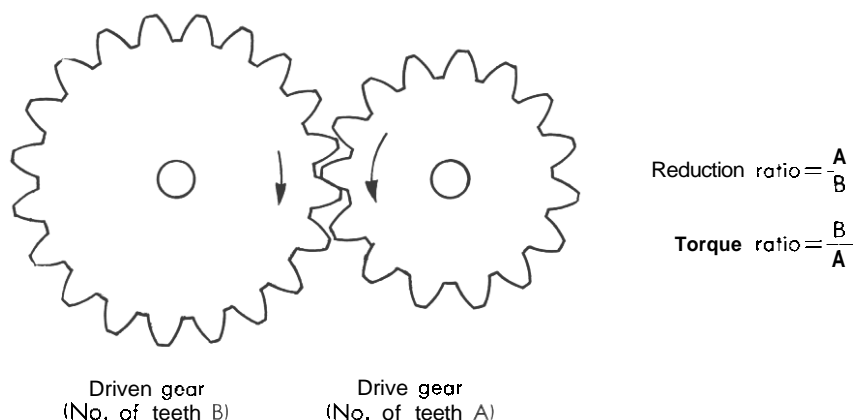


Fig. 3-4. Relation between reduction ratio and torque ratio

By selective sliding system, shift gear is slid by gear shift fork to get adequate reduction ratio by changing gear to be meshed, and by constant meshing system, each gear can be rotated freely always each gear in meshing state, and can be changed reduction ratio by actuating optional gear by means of special clutch.

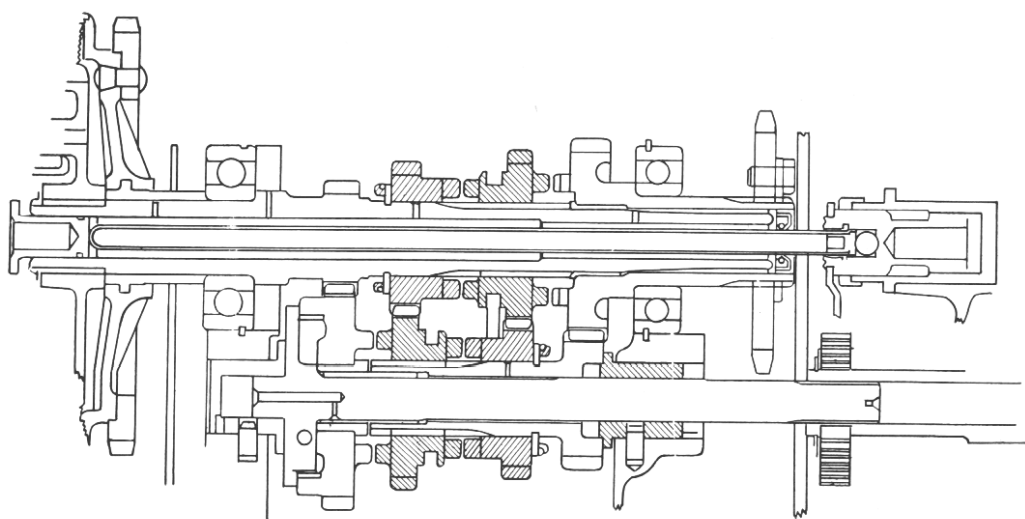


Fig. 3-5. Cross-sectional figure of transmission gear

2. Construction and function

The transmission system of Honda 250 • 300 is constant mesh and advance 4 stage rotary type. In Fig. 3-5 to Fig 3-9, neutral, first, second, third and to stage are shown. Function of transmission as shown in Fig. 3-5 and Fig. 3-10 is as follows, that is

power is transmitted from crankshaft to primary drive chain, clutch outer, clutch center and transmission.

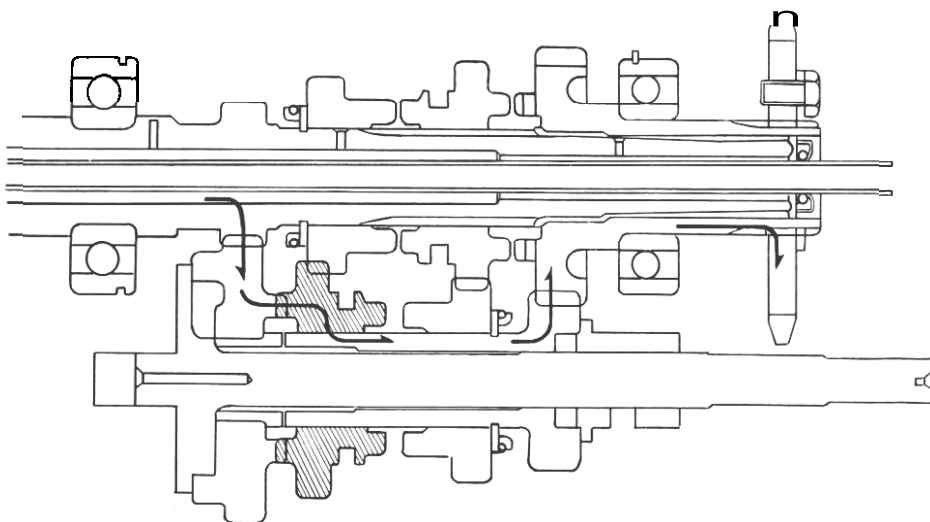


Fig. 3-6. The first

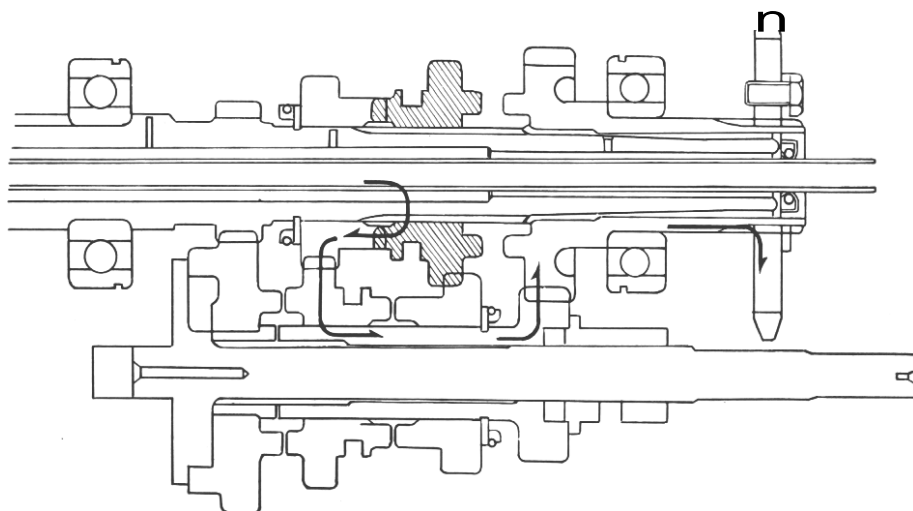


Fig. 3-7. The second

Explaining in order, from the crank rotation is transmitted to the clutch, and the transmission shaft is rotated to turn the low gear (7). The low gear turns sliding over the kick-starter spindle (19). As the counter shaft 2 gear 191 which is connected with the spline

on the counter shaft complete can move freely axially, move this to the left side by gear shift fork to mate with low gear (Fig. 3-61 then the low gear combines with the counter shaft as one body to transmit power to the top gear (12). Here the axial movement of mainshaft gear is restricted by the gear cotter 1141 and the set ring (15) but not restricted rotationally. (Similarly counter shaft 3 gear (11).

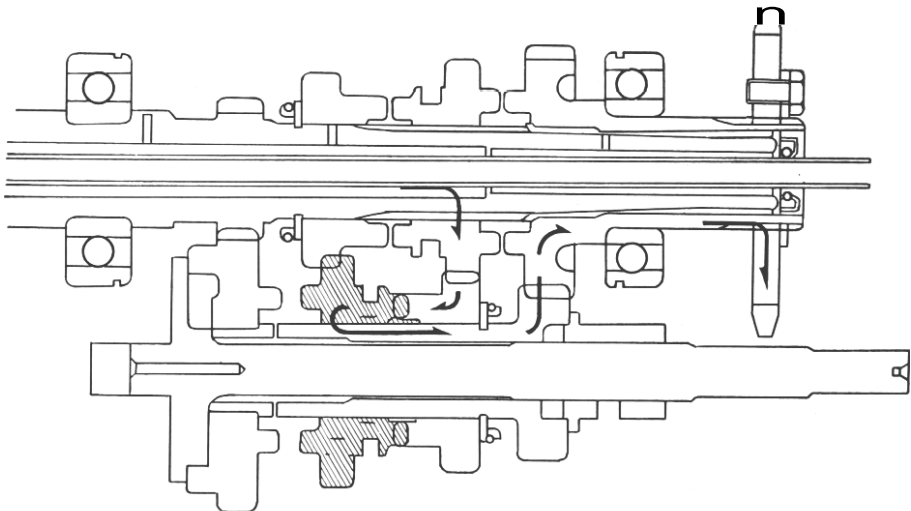


Fig. 3-8. The third

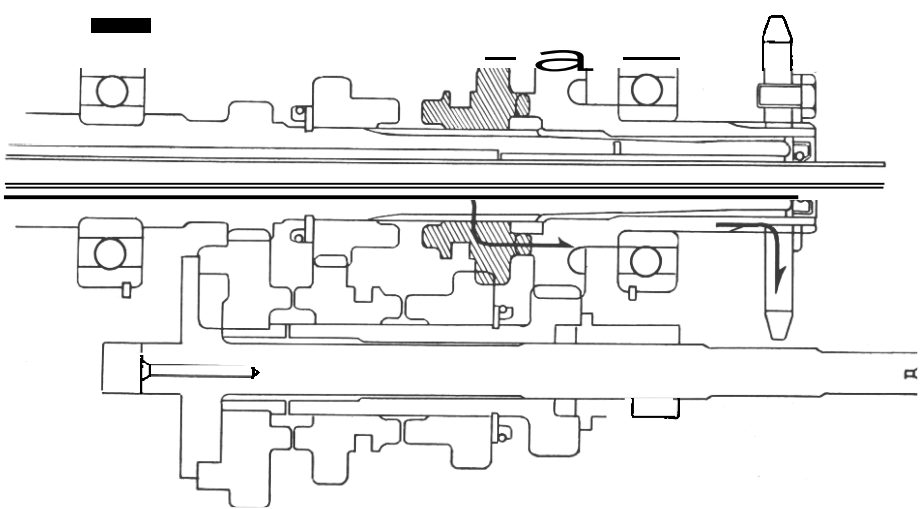


Fig. 3-9. The fourth (Top)

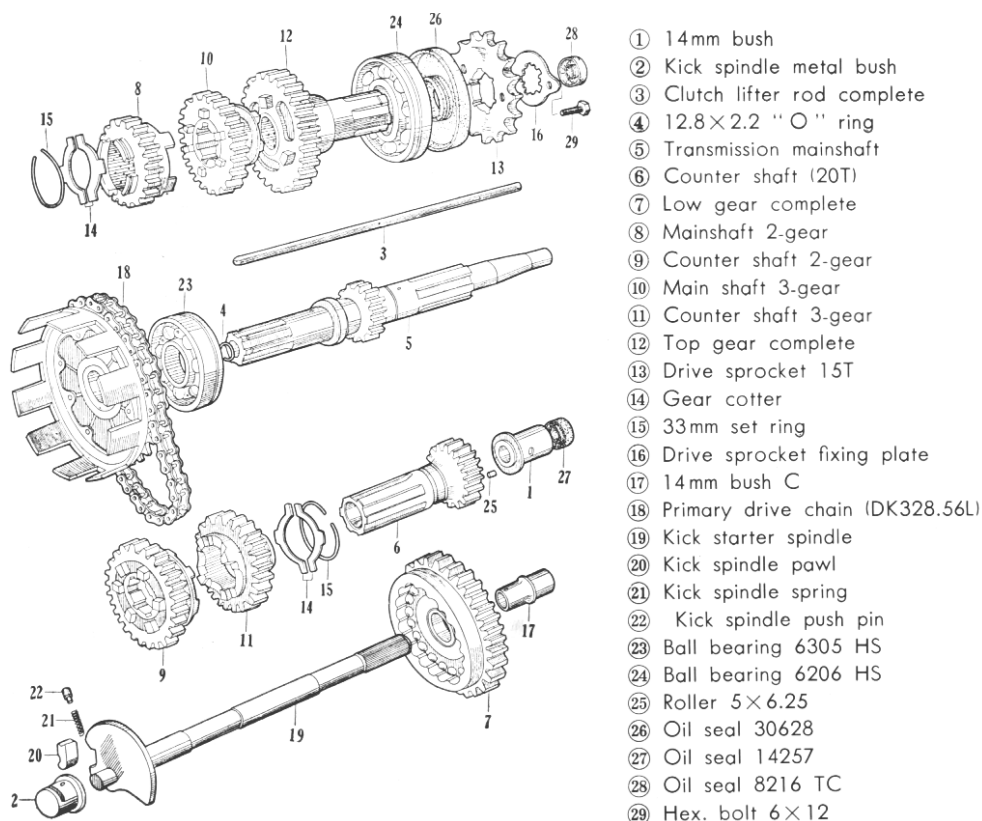


Fig. 3-10.

Similarly for the second, protrusion of mainshaft 3 gear (10) combine with that of mainshaft 2 gear (8) by actuating another shift fork, and power is transmitted by rotating mainshaft 2 gear (8) connected by protrusion with mainshaft 3 gear (10) mounted on the spline of mainshaft transmitting to counter gear (3) and by spline from counter shaft to the top gear.

As for the third, protrusion of counter shaft 2 gear (9) combine with that of counter shaft 3 gear (11) to transmit power to the top gear (12) through counter shaft (6). And for the top, mainshaft 3 gear (10) combine with the protrusion of the top gear and rotation of mainshaft is transmitted straightly to the drive sprocket to drive the drive chain. As for the neutral, each protrusion is not combined so power is not transfer to the top gear.

Other parts of the kick starter system are kick spindle pawl (20) and kick spindle pawl spring (21). This pawl mates with the inside groove of the low gear to rotate low gear. When not kicked, the head part of this pawl is pushed by protruded part inside crankcase, and pawl is pulled in to free the gear.

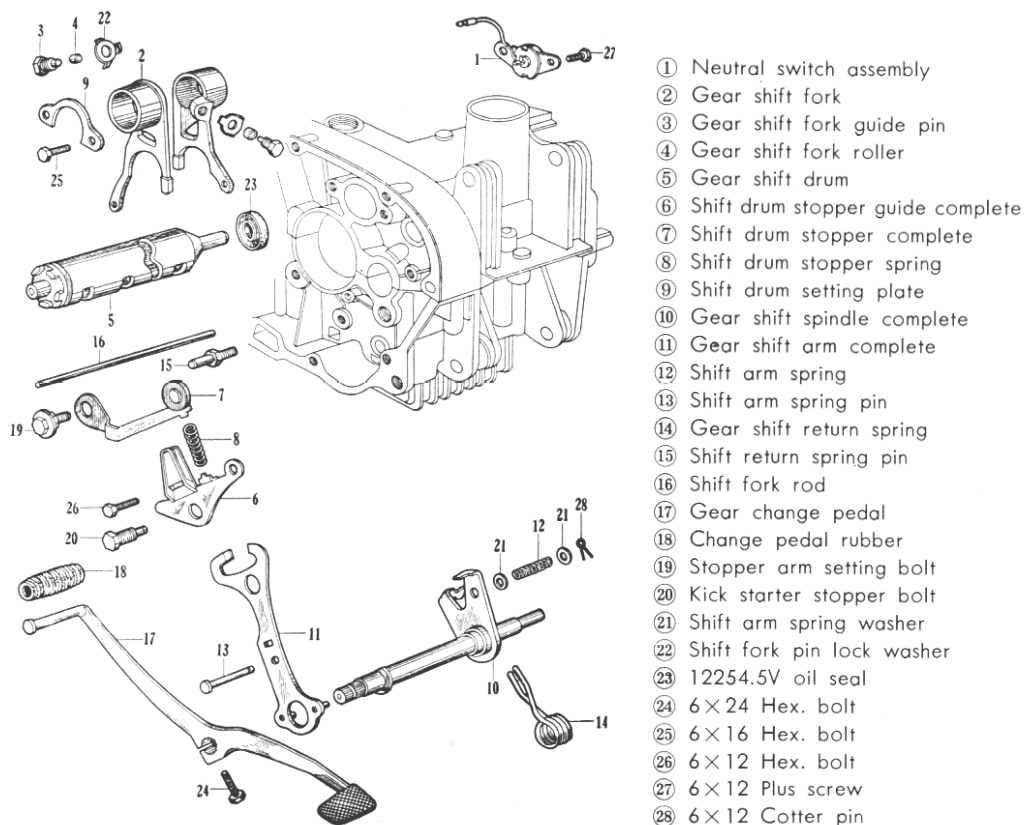


Fig. 3-11.

Besides, there is equipped a switch to indicate neutral state, which put light on a indicator lamp when the rotary switch combined on the shift drum is in neutral state. The shift mechanism to actuate the above mentioned counter shaft 2 gear and the mainshaft 3 gear is explained as follows. In Fig. 3-11 when the gear change pedal (17) is pushed down, the gear shift spindle (10) is turned, and consequently the gear shift arm (11) will turn the drum (5) being pushed by the protrusion on the left end of this gear shift drum.

As there are shift fork guide pin (3) and guide pin roller (4) which fitted on the gear shift fork (2) in the groove on the center part of the shift drum, rotation of drum actuates gear shift fork to move along the form of the groove from side to side and the shift gear is actuated. Here gear shift return spring (14) is fitted to return the change pedal to original position and prepare next action and shift drum stopper (6) is guide (7) for it.

C. Final drive mechanism

The drive mechanism from crank to the rear wheel is called final drive mechanism. The main parts are as shown in figure, primary reduction lintermediate reductionl. clutch, mission, final drive (propeller shaft, final reductionl wheel and tyre.

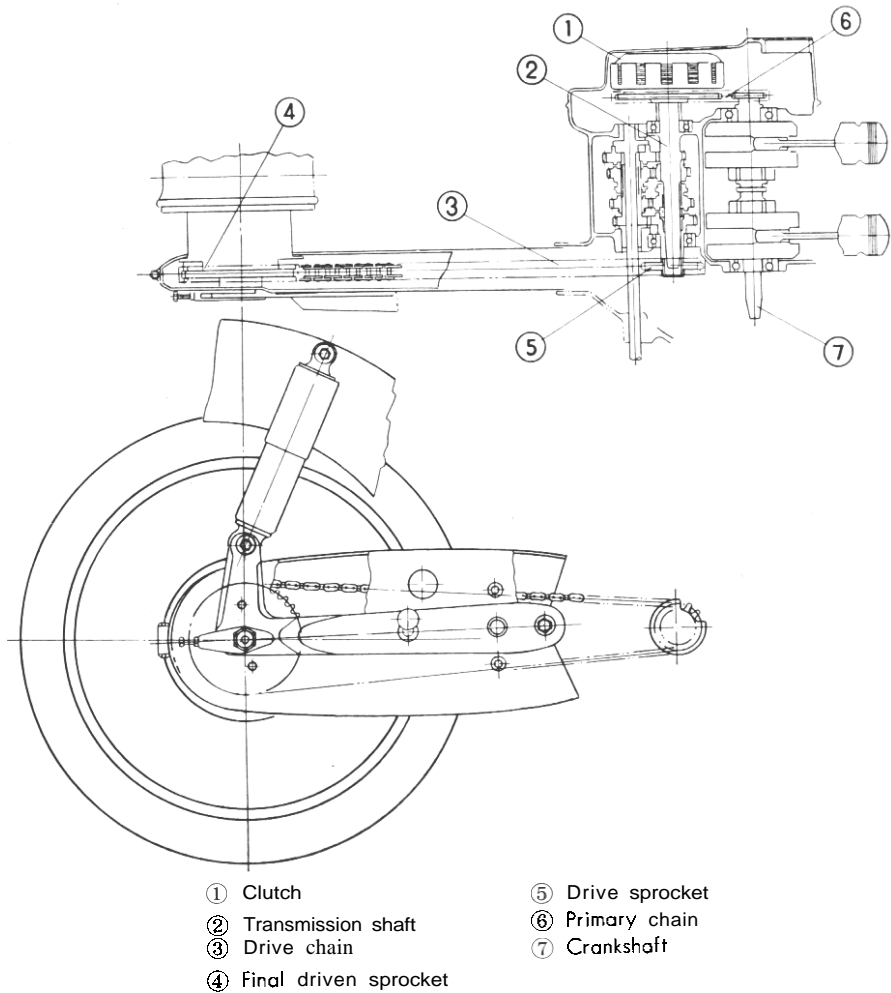


Fig. 3-12.

4. AUXILIARY PARTS

A. Funnel type breather

Breather chamber of funnel type is located on the rear upper side of the upper crankcase. Inside the chamber breather body is supported by a spring and back pressure is guided along the direction as shown in the figure separating oil to outside of crankcase. Here a check valve is fitted to avoid outside vapour to be sucked,

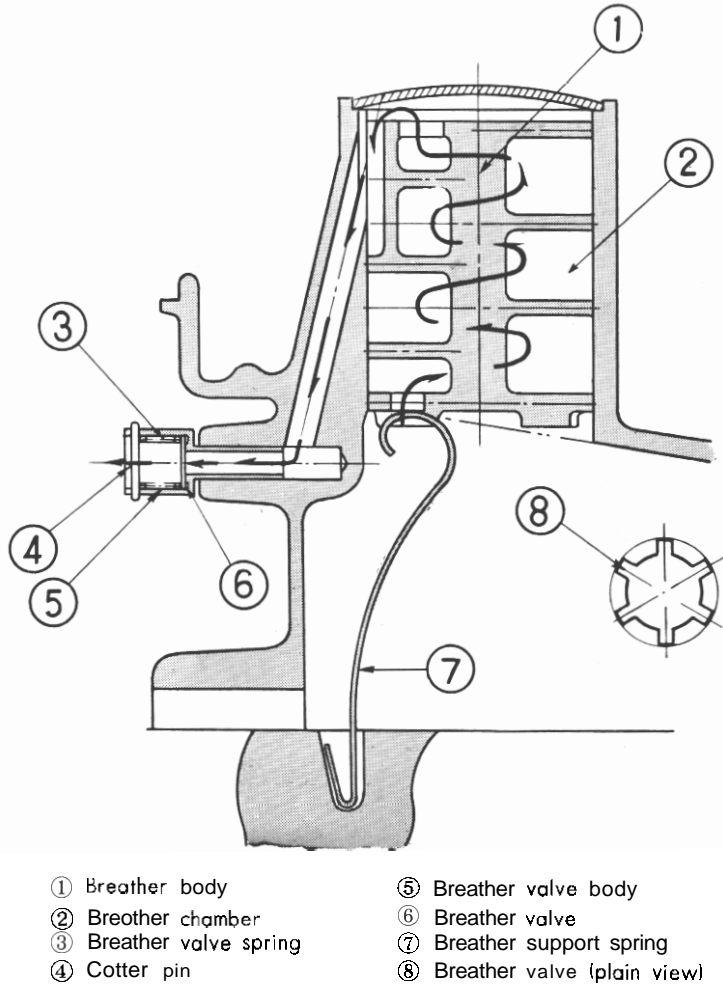
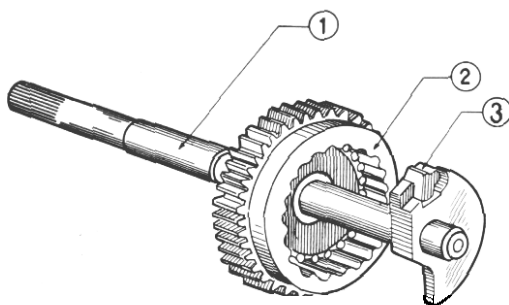


Fig. 4-1.

B. Kick starter mechanism

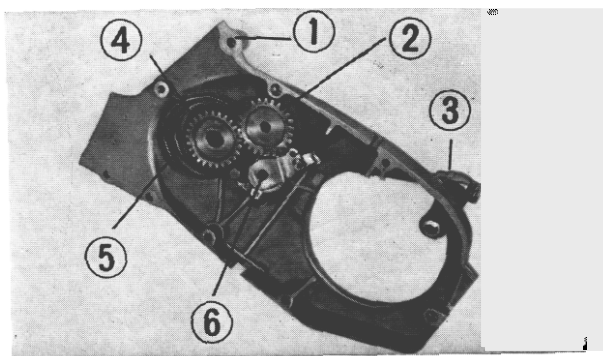
Kick spindle pawl for Model C72, 77 mates with the inside groove of low gear by pawl spring to rotate low gear. When not in kick, the head of pawl is pressed down by kick spindle metal bush so that low gear attains free state.



- ① Kick starter spindle
- ② Low gear complete
- ③ Kick spindle panel

Fig. 4-2.

For Model CB72, 77 considering relation with the chassis, advance step kick system was applied. A piece of gear was set inside the R. crankcase cover to reverse direction of rotation and can start engine transmitting rotational power to the kick spindle pawl. (Fig. 3-31

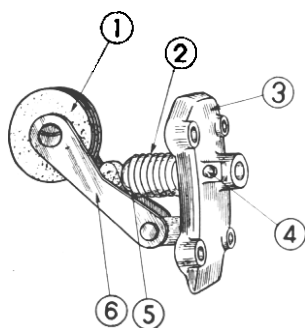


- ① R. crankcase cover comp.
- ② Kick starter gear
- ③ Kick arm
- ④ Kick starter pinion
- ⑤ Kick starter spring
- ⑥ Clutch lifter thread comp.

Fig. 4-3. Crankcase cover

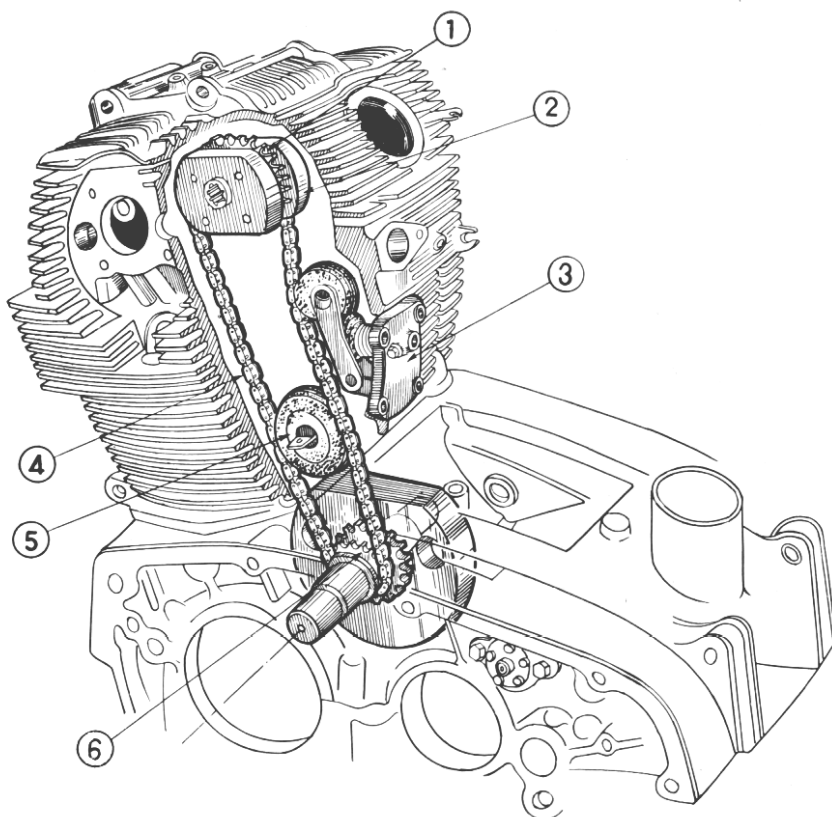
C. Cam chain tensioner

Inside cam chain chamber located at center port of cylinder cam chain (DK219-94L) is set to transmit rotational motion of crank to cam shaft, and cam chain tension is applied to make high speed motion of cam chain correctly and smoothly. Here the cam chain tension works to suppress waving of chain by pressing cam chain. In Fig. 4-4, 6mm bolt fitted on the tensioner push bar be loosen, the roller will be pushed out by a spring to give a adequate tension on the chain. According to slackness of chain adjustment can be done by this set screw. To make sure tightness of chain, it is favorable to adjust putting the crankshaft at the bottom dead center.



- ① Cam chain tensioner
- ② Cam chain tensioner spring
- ③ Tensioner holder
- ④ 6mm bolt
- ⑥ Cam chain tensioner push bar
- ⑧ Cam chain tensioner arm

Fig. 4-4.



- ① Cam sprocket
- ② R. cam shaft flywheel
- ③ Cam chain tensioner
- ④ Cam chain
- ⑤ Cam chain guide roller
- ⑥ Center crankshaft

Fig. 4-5

5. CARBURETTOR

The carburettor is a device for supplying fuel and air into the engine. The performance of the carburettor will depend upon such factors as most suitable mixture proportion of atomized fuel under all conditions of speed and load of the engine. Therefore it must has precision for each part and high resistance for wear to assure the reliable performance for a long period, and so it is required inspection and maintenance.

The revised parts of Model C72 from Model C71 are as follow.

- (1) Elimination of manifold.
- (2) Fitting type down draft type.
- (3) Addition of power jet.

Comparing Model CB72, 77 with Model C72, 77 2-carburettor system was adopted to increase horse power by eliminating branch to suction post. Concerning the power jet mentioned above. when MJA is set, the best condition is at 4000 r.p.m., and at 8000 r.p.m. mixture becomes lean, but when MJB is set as 8000 r.p.m. the best and at 4000 r.p.m. becomes rich.

Therefore to get fovoroble condition between 4000 r.p.m. and 8000 r.p.m., MJA was selected to apply the power jet from 6000 r.p.m. to meet high rotation developing performance at medium and high power.

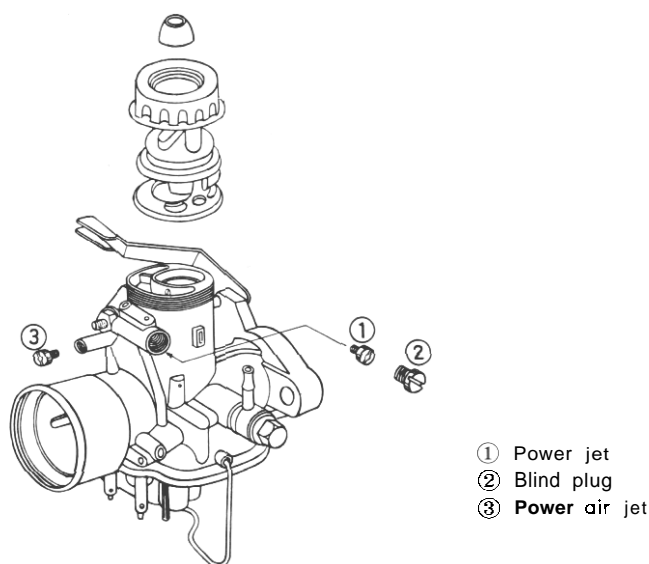


Fig. 5-1. Power jet system

Construction

- (1) Air from the air cleaner passes through the suction port (1), lower side of the throttle valve (6), main bore (8) and into the cylinders.

This air stream produces a partial vacuum in the area around the power nozzle 1241, by which fuel in the float chamber (2) flows through power jet fuel pipe 1231, power jet (22) to the power nozzle 1241. At this area, fuel is mixed with air introduced through the power air jet (21). Then they are mixed with air flowing from the suction port, vaporized and drawn into the cylinder (Fig. 5-21).

- (2) Main fuel system

Air from the air cleaner passes through the suction port (1), lower side of the throttle valve (6) main bore (8) and into the cylinders. This air stream produces a partial vacuum in the area around the needle jet (4), by which fuel in the float chamber (2) flows through the main jet (10) into the needle jet holder 131. As this area, fuel is mixed with air (bleed air) introduced through the air jet (5) and the holes (9) provided around the needle jet holder (3). Then fuel and air travel the gap between the needle jet (4) and the jet needle (7), and discharge to the lower side of the throttle valve. Then they are mixed with air flowing from the suction port, vaporized and drawn into the cylinder (Fig. 5-21).

- (3) Slow speed fuel system (pilot system)

Air from the suction port (1) passes through the outside 1121 of the air screw (11) which regulates the rate of air flow. Then air passes through the bleed holes (14) of the slow speed jet 1131 to the slow speed jet (13) where introduced into fuel stream from the orifice (15) provided with the bottom of the slow speed jet (13). The rich mixture produced at this area discharges to the lower side of the throttle valve and is mixed with air flowing from the suction port (1) and drawn into the cylinder. The minor mixture adjustment is made by means of the air screw (11). Turn the air screw to the right to enrich the mixture and to the left to lean the mixture. The major mixture adjustment is made by replacing the slow speed jet 1131. Replace the jet with one carrying bigger number to enrich the mixture and with one carrying smaller number to lean the mixture (Fig. 5-21).

- (4) Float chamber

The carburettor must supply the correct mixtures which suit to the throttle opening and the engine running speed. In this connection, the fuel level must be held constant. The float system is a device to maintain this constant height. The operation of the float system is given in the following. Fuel from the tank enters the float chamber

121 through the passage 1161. the valve seat 1171 and valve (18). **As** fuel enters the float chamber. the float (19) will raise and move the valve (18) upperword by means of the float arm (20). When the valve touches the valve seat, flow of fuel will be restricted. **As** fuel level drops. the float lowers. opening the valve to allow fuel to enter the float chamber. Thus. any change in the fuel level causes a corresponding movement of the float. opening or closing the valve to maintain the fuel level constant. There is a spring installed, against vibration, between the needle valve and its body at the location where the valve contracts the float arm (20). (Fig. 5-21

(5) Choke system

The choke valve (21) must be in a closed position with the choke lever moved upwards, and in a open position with the choke lever moved downward, as shown in Fig. 5-2.

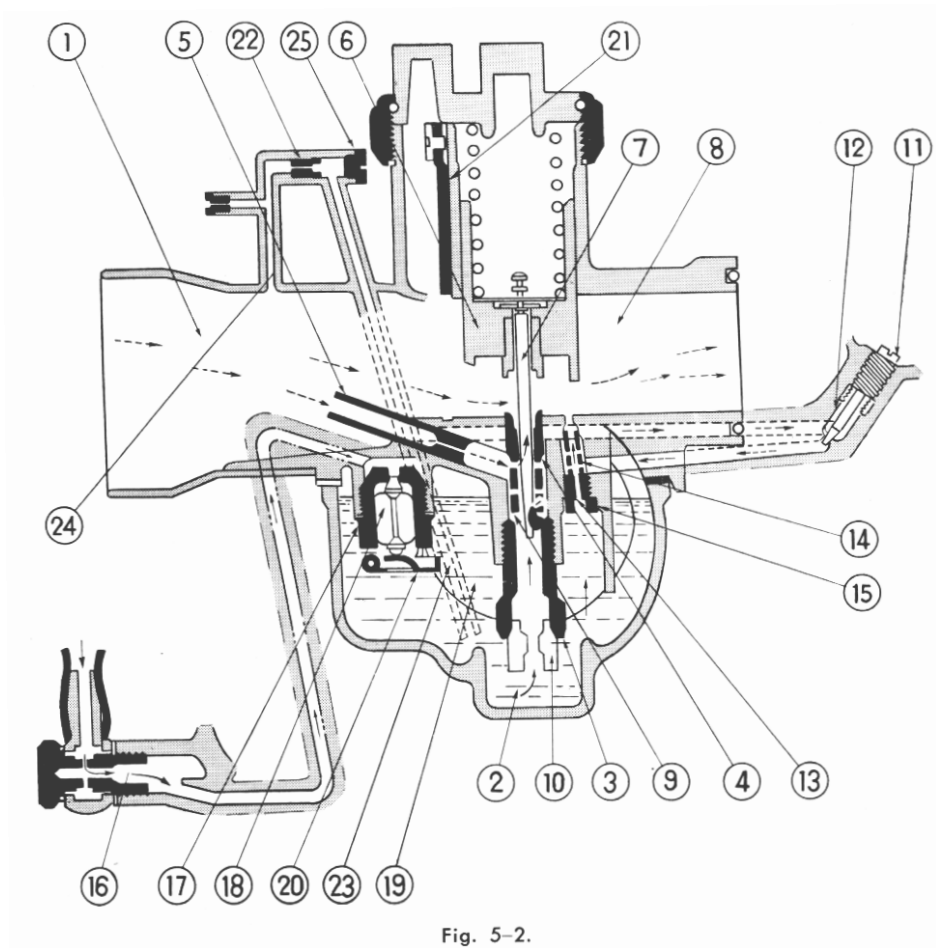


Fig. 5-2.

(6) Adjustment

a) High speed fuel mixture adjustment

Fuel mixture between full and half open throttle positions is controlled by the main jet. To determine whether the main jet is correct, slightly close the choke valve with the engine running at full throttle

1. If the engine speed increases, the fuel mixture is too lean.
2. If the engine speed decreases, the main jet is correct or too big.

Replace the main jet as necessary in such cases.

b) Moderate speed fuel mixture adjustment

Fuel mixture between half and one eighth throttle positions is controlled by the adjustable jet needle and cut away of throttle valve.

1. If the muffler is black smoking, the mixture is too rich. Lower the jet needle to the next lower position.
2. If the engine misfires or hesitates when accelerated or driven at moderate speed, the mixture is too lean. Raise the jet needle to the next upper position.

The throttle **valve** cut away carrying larger number bring the mixture leaner while one carrying smaller number bring mixture the richer. Since the change on the cut away affects the engine performance below one eighth throttle position, the replacement of the throttle valve should be done carefully.

c) Low speed fuel mixture adjustment

Fuel mixture between one eighth and idle throttle positions is controlled by the air screw and throttle cut away.

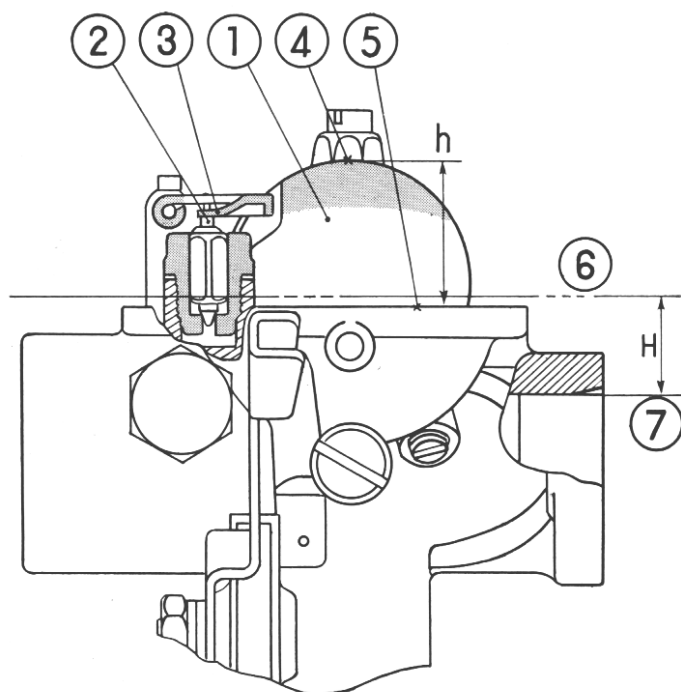
1. Adjustment must be done by the air screw mostly. Turn the air screw "in" to enrich the mixture and "out" to lean the mixture.
2. If the correct adjustment cannot be obtained by the turning of air screw, replace the throttle valve.

(7) Fuel level adjustment

As shown in Fig. 5-3, fuel **level** is determined by the height **H** measured from the bottom of main bore, which varies among each different engines. However, since the fuel level cannot be measured easily, it is recommended to determine by height **h**, of the float.

Float adjustment

- a) Place the carburettor upside down



- | | |
|----------------------|-----------------------------|
| ① Float | ⑤ Parts of carburettor body |
| ② End of float valve | ⑥ Fuel standard level |
| ③ Float arm | ⑦ Main bore bottom line |
| ④ End of float | |

Fig. 5-3. Measurement of fuel standard level

- b) When the float is supported with fingers, find the position where the float arm is about to touch the top of the float valve or the position having clearance of 0.1mm. (0.04 in.)
- c) At this position height difference between the end of float and the carburettor body should equal to h and if it is more or less than this amount, adjust the height, raising or bending the float arm carefully.

h of Pw 22 26.5 mm (1.043 in.)

h of Pw 26 22.5 mm (0.885 in.)

Note -

At the tip of the float valve there is inserted a spring which creeps inside when pushed. As it prevent to show the actual position where the valve is to be closed. it is necessary to be cautious to see the contact point between the float arm and float valve.

6. FRAME

Construction of frame body

The frame supporting engine contacts with ground through the front and rear wheels and is the skeleton of whole chassis. Further it has important feature affecting its form and design. The main function of frame is to maintain chassis strength, supporting engine, rider, and load on the carrier, and has to endure shock due to roughness of road through tyre and shock absorber.

On the other hand it requires rigidity from viewpoints of control ability, and further requires lightweight to attain better running performance. The frame body of Hondo 250 • 300 Model C72, 77 is made of steel of stress skin construction and adopted such **cross** sectional form as refrigerator having round corner. The type of form has high strength to bending moment and torsion. Therefore this would be most favorable form of construction for motor cycle frame having high rigidity from manufacturing viewpoints.

Especially welding is done by new type of seam welder to attain reliable connection and also uniform products having beautiful outlook. On the other hand for the frame of Model CB72, 77, as main strength members, high carbon steel tubings were adopted to attain light weight and to increase rigidity.

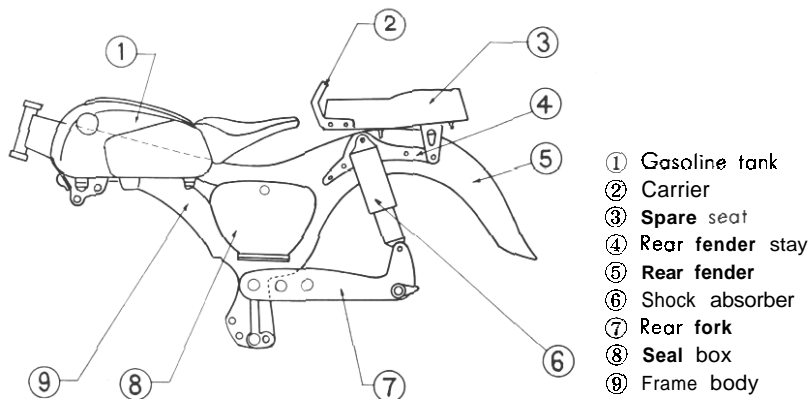
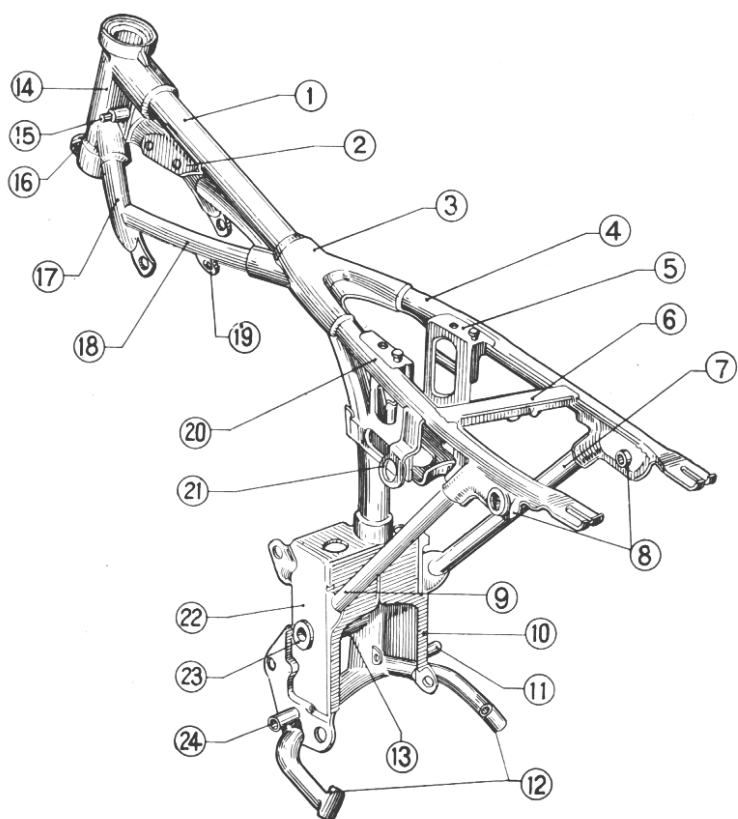


Fig. 6-1. Frame body far Model C72, 77



- | | | |
|-------------------------------------|------------------------|------------------------|
| ① Main pipe | ⑨ L. sub-tube holder | ⑰ Front down tube |
| ② Coil setting plate | ⑩ R. bottom plate | ⑱ Driver's tube |
| ③ Tube holder | ⑪ R. step holder piece | ⑲ Engine hanger plate |
| ④ R. sub-tube | ⑫ Muffler setting pipe | ⑳ L. sub-tube |
| ⑤ Battery support stay | ⑬ Center pipe | ㉑ Main switch bracket |
| ⑥ Sub-tube cross-member | ⑭ Steering head pipe | ㉒ L. bottom plate |
| ⑦ R. sub-tube holder | ⑮ Fuel tank holder | ㉓ Center pipe bushing |
| ⑧ R. L. rear cushion upper brackets | ⑯ Key hole | ㉔ L. Step holder piece |

Fig. 6-2. Frame body for CB72, 77

7. SUSPENSION

A. Front wheel suspension

The front fork of Model C72, 77 is made of pressed steel and for Model CB72, 77 telescopic fork **was** adopted to increase rigidity and to attain better running stability **on** rough road. **As** the cushion, the link system made it possible to reduce wheel base variation and to attain better feeling **on** riding and better controllability.

As shown in the figure of shock absorber, it consists of the main spring and double cylindrical oil damper. The spring takes up compression load and the damper takes up recoiling force.

For Model C72, 77, left and right front cushions are combined by the suspension arm as one body, but for Model CB72, 77 there is no suspension arm. In the oil damper of Model CB72, 77 there contains white spindle oil 220 cc, and maximum stroke is 80 mm (3.1496 in.).

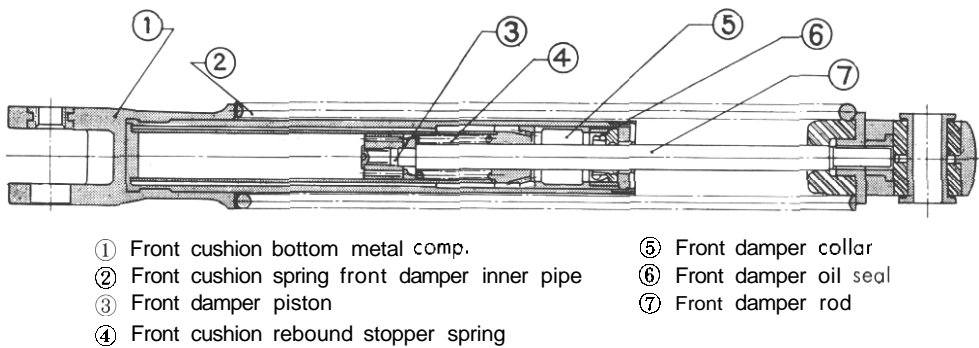


Fig. 7-1. Cross-section of front cushion for Model C72, 77

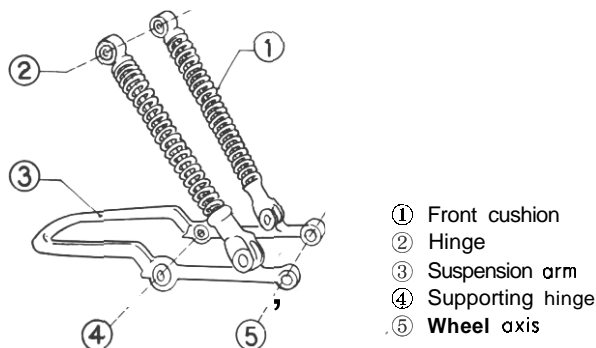
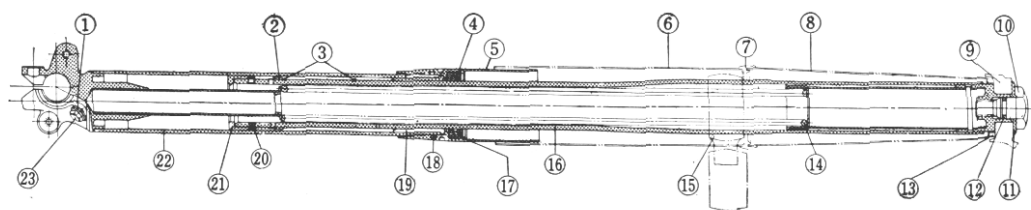


Fig. 7-2.



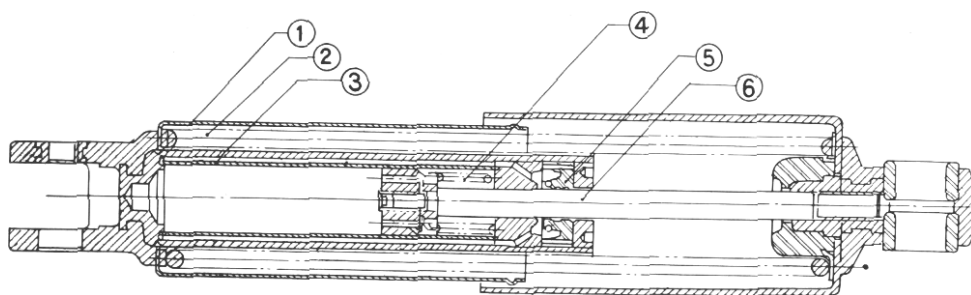
- | | | |
|---------------------------|----------------------------|--------------------------------|
| ① Fork drain cock pocking | ⑨ Fork top bridge | ⑰ Front fort oil seal retainer |
| ② Front damper valve | ⑩ Front fork bolt | ⑱ Ring, 40.5X3.0 |
| ③ Fork pipe stopper ring | ⑪ Front fork washer | ⑲ Front fork pipe guide |
| ④ 334610, oil seal | ⑫ "O" ring, 9.4 X 2.4 | ⑳ Fork piston knock pin |
| ⑤ Front fork seal housing | ⑬ Front fork cover pocking | ㉑ Front fork piston |
| ⑥ Front fork upper cover | ⑭ Front cushion spring | ㉒ Front fork bottom case |
| ⑦ Front fork rib | ⑮ Fork bottom bridge | ㉓ Front fork drain cock bolt |
| ⑧ Front fork upper cover | ⑯ Front fork pipe comp. | |

Fig. 7-3. Cross-section of front cushion of Model CB72, 77

B. Rear wheel suspension

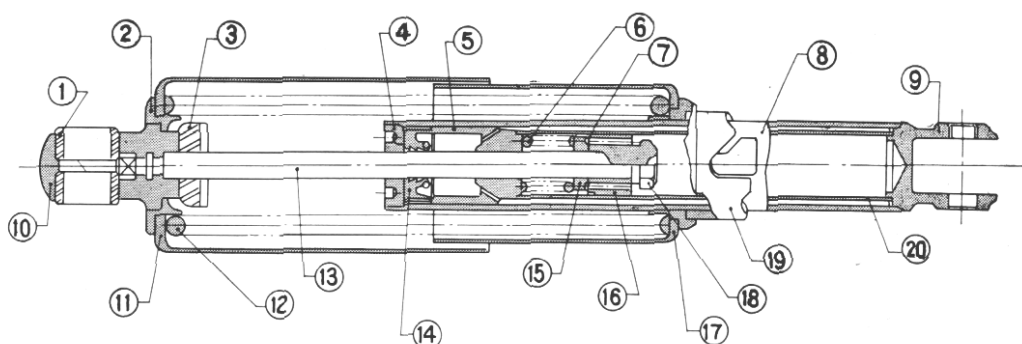
The rear wheel is pivot type construction equipped with also shock absorber. The principle of construction of the shock absorber is alike that of the front wheel excepting such point as side pressure don't act on the sliding part and construction of orifice on the absorber is different. Special attention was paid on the suspension system on the pivot side as performance of shock absorber, manufacturing around the pivot and rigidity of rear fork affect on feeling of riding greatly.

As the rear fork of Model CB72, 77, main strength members were made of high carbon steel tubing to attain light weight and to raise rigidity.



- | | |
|----------------------------|-------------------------------|
| ① Rear cushion metal comp. | ④ Rear rebound stopper spring |
| ② Rear cushion spring | ⑤ Rear damper oil seal |
| ③ Rear damper inner-pipe | ⑥ Rear damper rod. |

Fig. 7-4. Cross-section of rear cushion of Model C72.



- | | | |
|---------------------------------------|----------------------------|--------------------------------|
| ① Rear cushion rubber bushing | ⑦ Rear damper valve | ⑭ Rear damper oil seat |
| ② Rear cushion spring seat | ⑧ Rear damper case comp. | ⑮ Rear damper valve stopper |
| ③ Rear cushion stopper | ⑨ Rear damper under joint | ⑯ Rear damper piston |
| ④ Rear damper nut | ⑩ Rear cushion upper joint | ⑰ Rear cushion bottom case |
| ⑤ Rear damper rod guide | ⑪ Rear cushion upper case | ⑱ Rear damper piston nut |
| ⑥ Rear cushion rebound stopper spring | ⑫ Rear cushion spring | ⑲ Rear cushion spring adjuster |
| | ⑬ Rear damper rod | ⑳ Rear damper inner-pipe |

Fig. 7-5. Cross-section of rear cushion of Model CB72, 77

In the cylinder of the rear cushion there contains 60# spindle oil 37 cc for Model C72, 77 and 47cc for Model CB72, 77. When the rear wheel got shock rear cushion spring is compressed to absorb it and rebounding force is restricted by the oil damper to give adequate cushioning.

If the amount of oil contained in the damper is not suitable, effective stroke of cushion becomes to short or leaks oil or sometimes become origin of shock sound. The rear cushion of Model CB72, 77 is designed to enable three steps of adjustment according to road condition and running state.

MEMO

8. STEERING SYSTEM

A. Steering handle

Special attention was paid in designing the steering handle as this affects feeling of riding and easy control.

Especially for Model C72, it was aimed to take riding posture easy to correspond quick manipulation of control, which would be determined by the form of the handle, saddle and step. Moreover on control parts, adjustment equipments are attached according to each riders' choice. These features could be said to symbolize Honda's kindness.

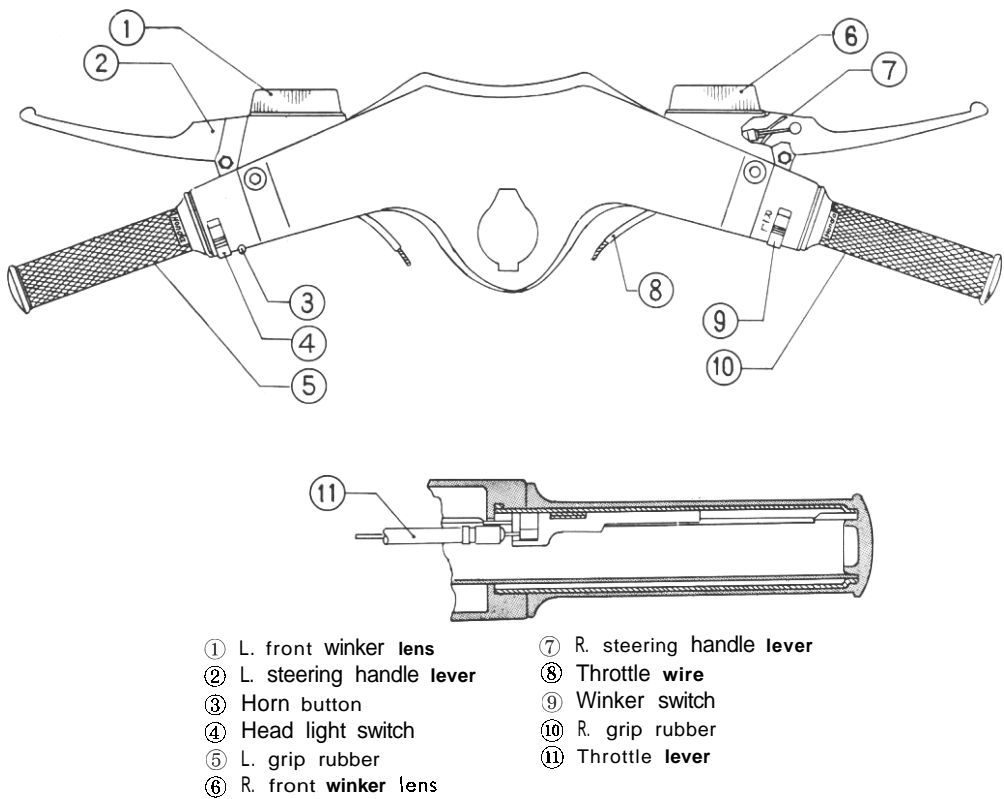
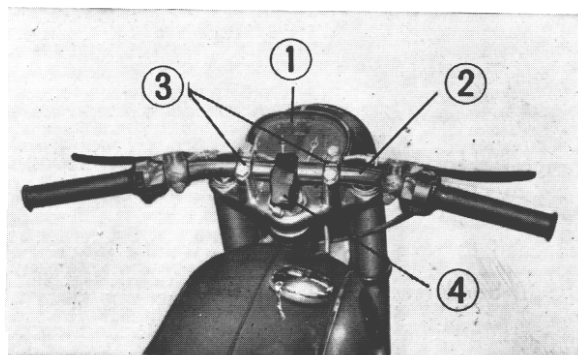


Fig. 8-1. Handle of Model C72, 77

The handle complete of Model CB72, 77 is made of one piece of steel tubing attached to the fork top bridge by means of the handle pipe holder. The fork top bridge is fixed on the front cushion by 2 front fork bolts. Each wire is exposed in assembly to make it easy to replace the handle.



- ①. Speedo-tachometer ass'y
- ② Steering handle comp.
- ③ Handle pipe holder
- ④ Steering damper knob

Fig. 8-2. Handle assembly of Model C872, 77

B. Steering

Construction of steering of Model C72, 77, as shown in the Figure, is such having ball bearing and steering damper of friction plate system to meet requirement from controllability and stability at low and high speed running.

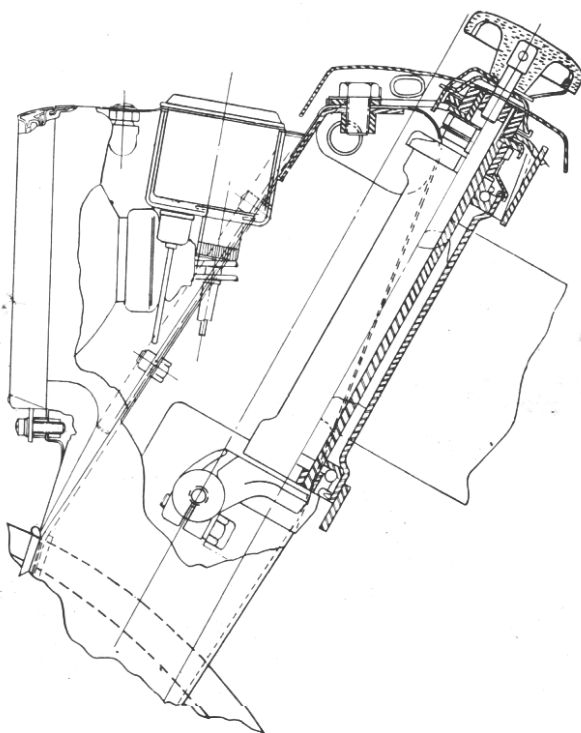


Fig. 8-3. Cross section of steering head of Model C72, 77

For Model CB72, 77, the steering stem which has cone lathe inside supported on the front cushion by means of 8×32 hexagonal bolt is the rotational axis centering frame head pipe and is important part for steering. On the steering stem, steering damper is attached and can be adjusted according to road condition, running state and loading condition.

If the knob of steering damper be turned to the right, steering damper spring nut is raised upward to clamp steering damper friction disc by means of steering damper plate A and B, consequently handle steering becomes heavy. On the contrary, if the knob be turned to the left, steering damper spring nut is lowered to make gap between plater A and B to become easy steering. (Fig. 8-41

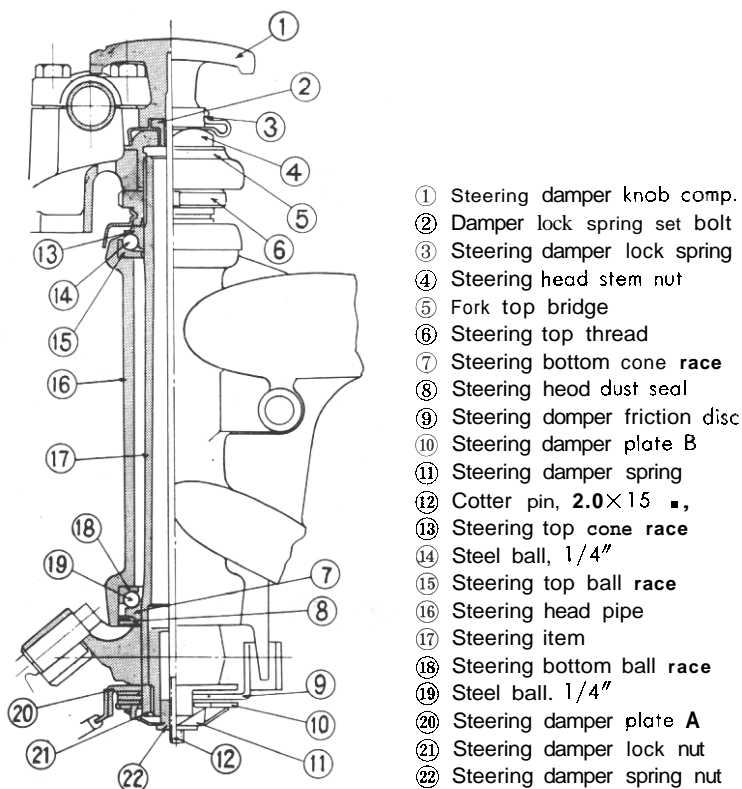


Fig. 8-4. Cross section of steering of Model CB72, 77

9. BRAKE INSTALLATION

As reliability and durability of brake installation are indispensable condition for it, manufacturing brake was paid special attention. Rear wheel braking is done by expanding the brake lining installed in the brake drum which is actuated by link motion to turn the brake cam by pushing right foot.

Here special attention was paid to emit friction heat generated to get better durability. For the front brake, by right hand operation wire transmits force to work and brake mechanism is alike with the rear installation.

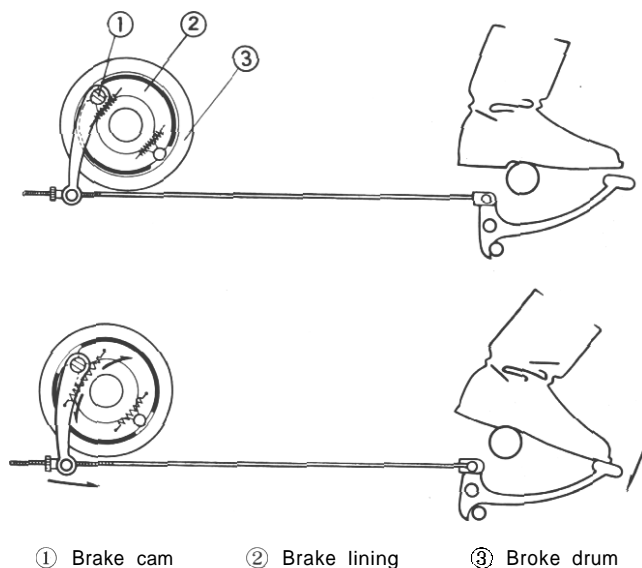


Fig. 9-1.

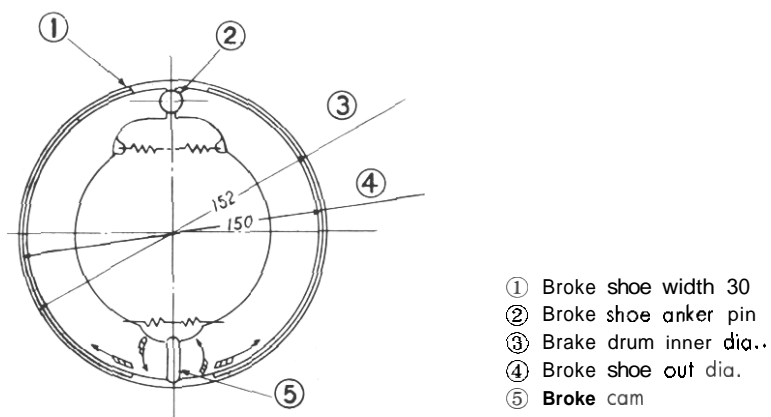
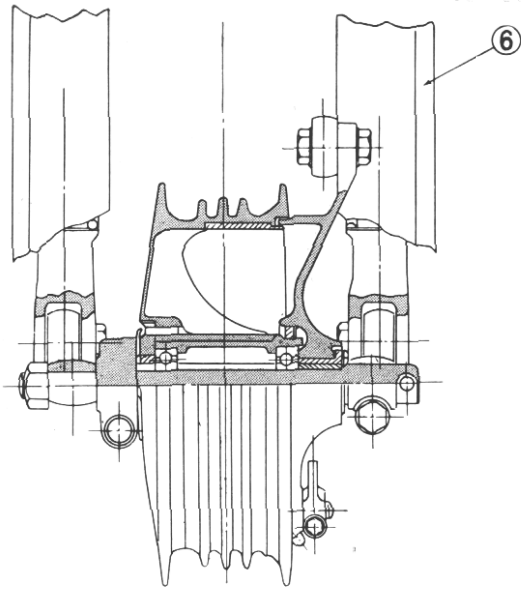


Fig. 9-2,



⑥ Front fork

Fig. 9-3.

MEMO

10. CONSTRUCTION OF WHEEL

A. Front wheel

Front wheel body made of aluminum casting of whole width hub containing ball bearings and brake drum inside is fitted with brake panel and speedometer unit by wheel axis and nuts. To assemble the front wheel to the chassis. it on the lower end of front fork slide pipe by the axle fitting. Reaction occurred during braking can be caught by the left side bearing through the stopper of the brake panel.

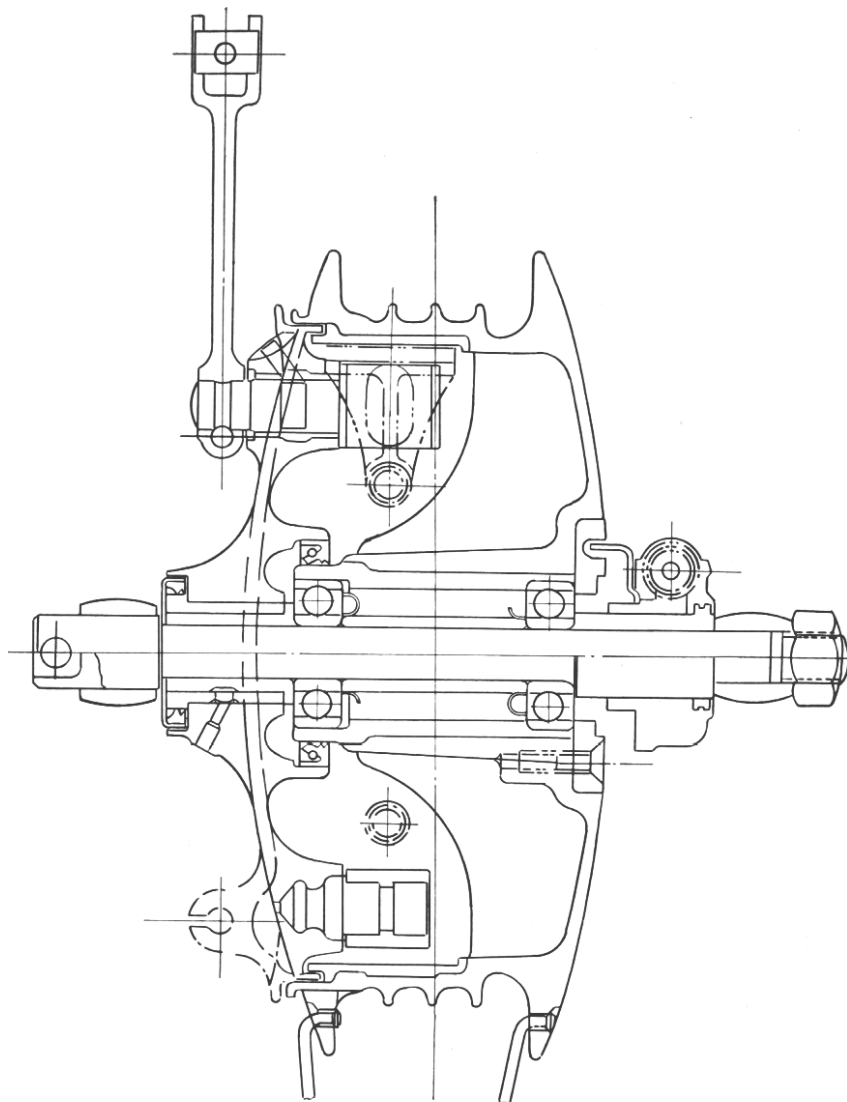


Fig. 10-1. Cross Section of front hub

B. Rear wheel

The rear wheel of Model C72, 77 is consisted of wheel bearing, rear wheel hub of aluminium equipped with the brake drum, the final drive flange serving chain case partially and brake panel. On the left side, the brake panel is equipped through the distance collar, and between the wheel hub and the final drive flange there is fitted rear wheel damper.

On the right side of the wheel hub containing ball bearing, the chain case is equipped through the final drive flange fitted with the rear wheel damper and the final driven sprocket, and is tighten on the rear axle passing through the left side of the rear fork through the distance collar on the left side.

The rear wheel damper absorbs not only abrupts variation of rotation during braking and driving force of the rear wheel hub, but also is useful to protect transmission mechanism.

The rear wheel of Model CB72, 77 is consisted of ball bearing (6304), the rear wheel hub of aluminium casting equipped with the brake drum and the brake panel.

On the left side there equipped the rear brake panel of twin can type through the panel side collar and on the right side of the wheel hub, and the final driven sprocket are fixed by the sprocket setting bolt, and fixed on the rear fork by the rear axle through the rear side collar.

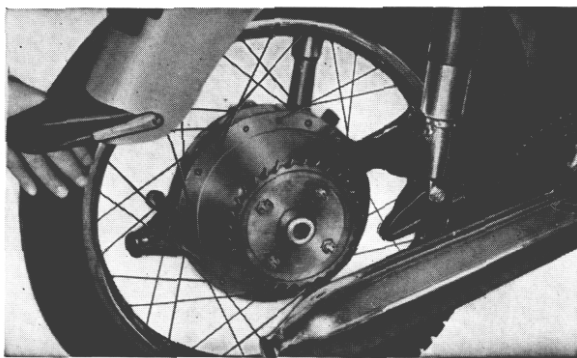
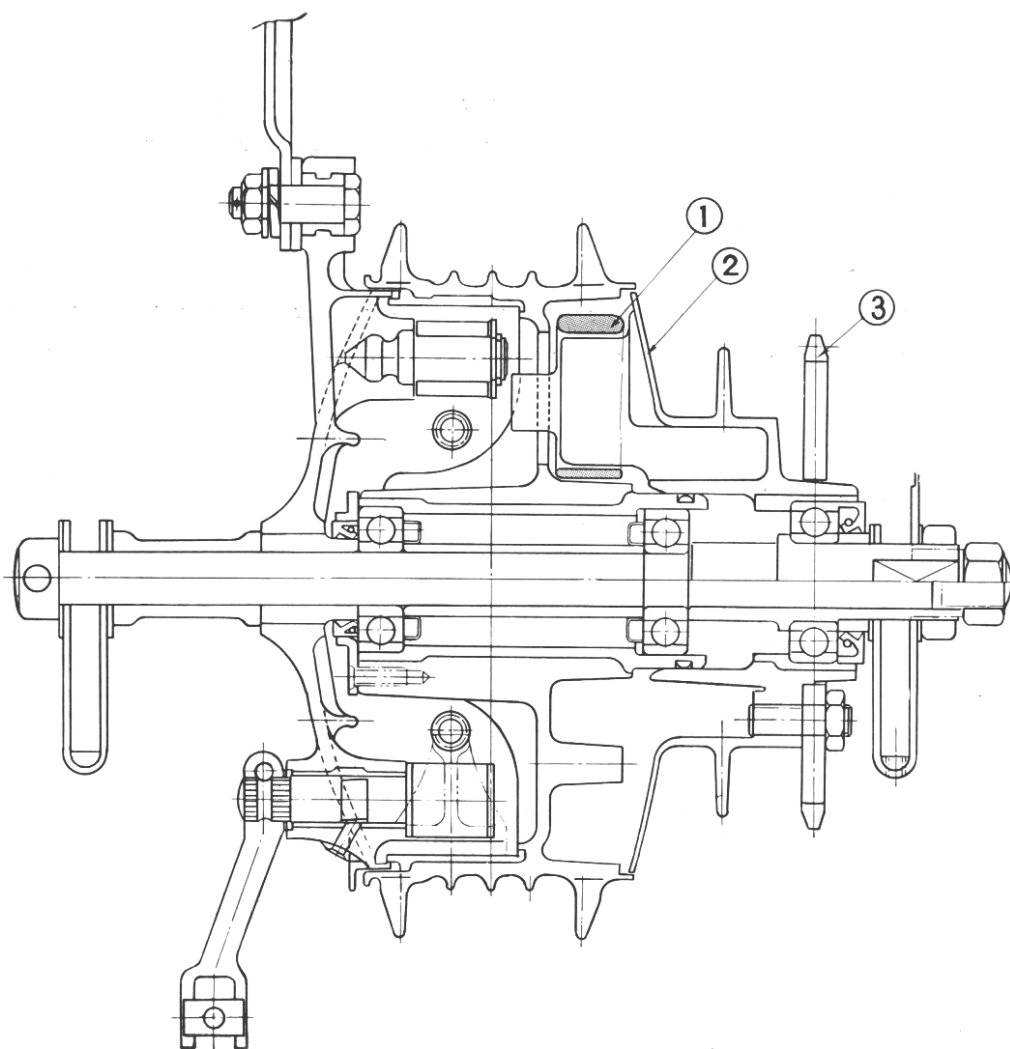


Fig. 10-2. To draw out the rear wheel from the frame (Model CB72, 77)



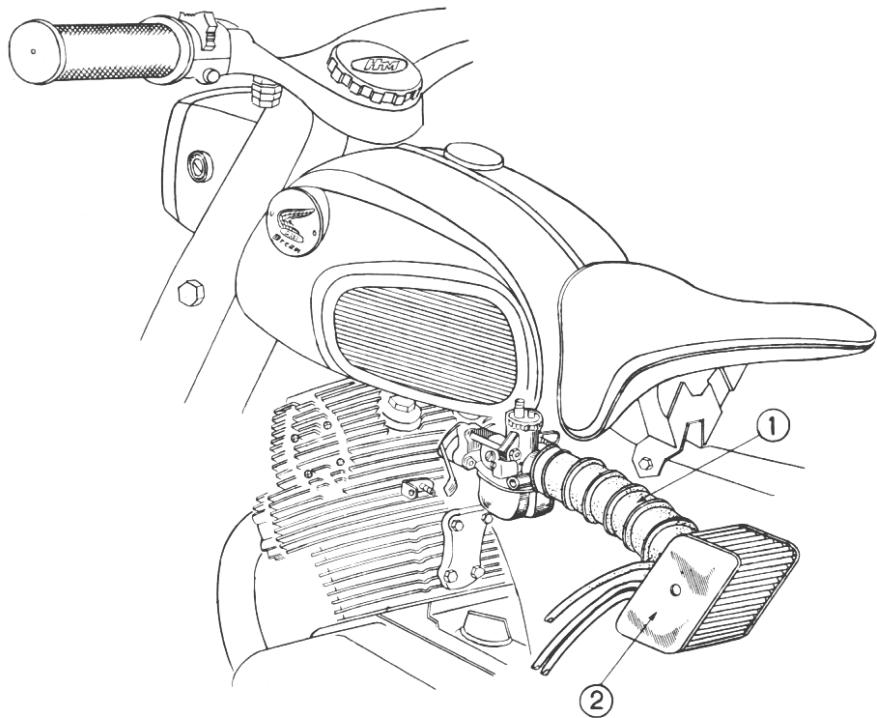
① Rear wheel damper ② Final drive flange ③ Final driven sprocket

Fig. 10-3. Cross-section of rear hub

11. AUXILIARY EQUIPMENT

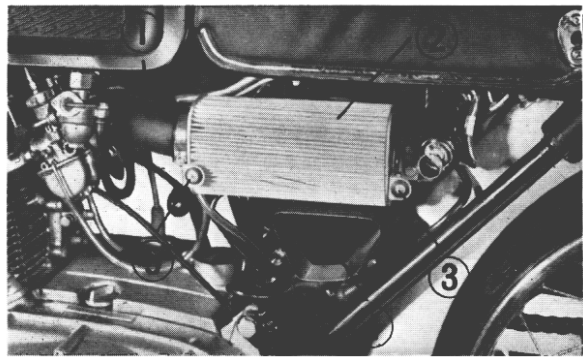
A. Air cleaner

The air cleaner element made of filter paper is stored at the center part of the body utilizing a point of excellence that the frame is made of steel sheet. It is aimed to get better filter effect by expanding surface area and also to prevent rain water to enter. For Model CB72, 77, as 2 carburetors are equipped, air cleaners are fixed on both sides each.



① Air cleaner connecting tube ② Air cleaner element

Fig. 11-1. Air cleaner of Model C72, 77



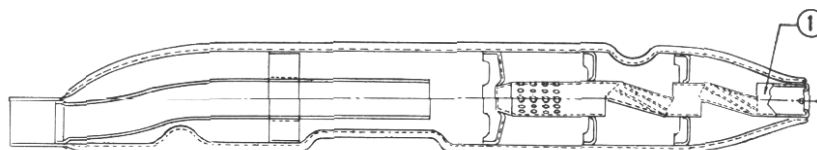
① Air cleaner connecting tube
② Air cleaner element
③ R. air cleaner support stay
④ Tool box complete
⑤ L. air cleaner support stay

Fig. 11-2. Air cleaner for CB72, 77

B. Muffler

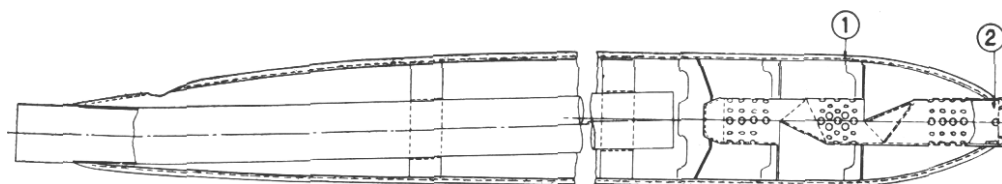
Construction of exhaust muffler.

Exhaust pipe conducts exhaust gas from cylinder head to muffler. Curvature of this pipe affects horse power developed exhaust gas conducted through exhaust pipe is damper inside of muffler by choking passage and further discipote sound of the diffuser pipe to get silencing effect.



① Diffuser pipe

Fig. 11-3. Cross-section of Muffler of Model C72, 77



① Muffler ② Diffuser pipe

Fig. 11-4. Cross-section of Muffler of Model CB72, 77

MEMO

ELECTRIC EQUIPMENT

1. Ignition system (Ignition coil, Magneto, Contact breaker, Spark **plug**)
2. Electric power generator (Rotor type A.C. Generator, D.C. Dynamo)
3. **Rectifier** (Selenium rectifier)
4. Battery
5. **Loading** (Illumination light, Winker, Horn, Starter)

Electric system is important part for the motorcycle alike nervous system for humankind. Even a partial damage at engine ignition, light at night or horn function will affect quite often its smooth running. We adhere on JIS standard from viewpoint of manufacturing and traffic transportation motorcycle low and security standard for laws and standards.

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1. SYSTEM OF ELECTRIC EQUIPMENT

As ignition system. ignition coil and contact breaker are used. For electric generator, Rotor-type **A.C.** Generator is used, charging battery through selenium rectifier and discharging according to several loading.

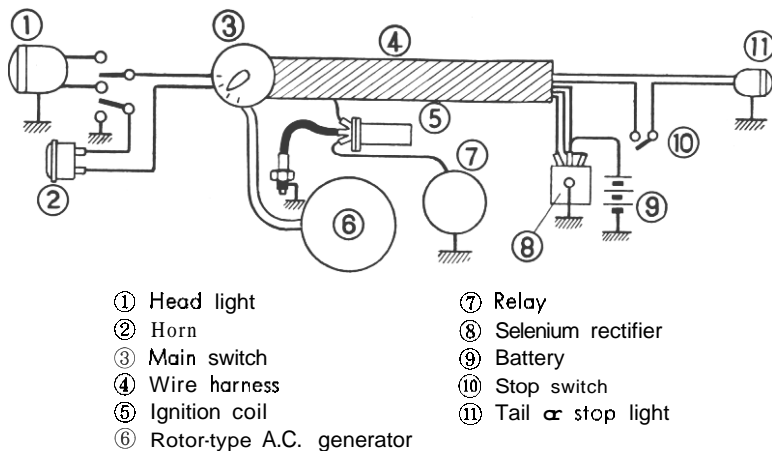


Fig. 1-1.

A. Ignition circuit

1. Ignition system

In gasoline engine, at the favorable time of the uppermost position of compression stroke mixture gas should be burned and exploded by any means of ignition.

For both Model C and Model CB, high tension battery ignition system is adopted (Fig. 1-2).

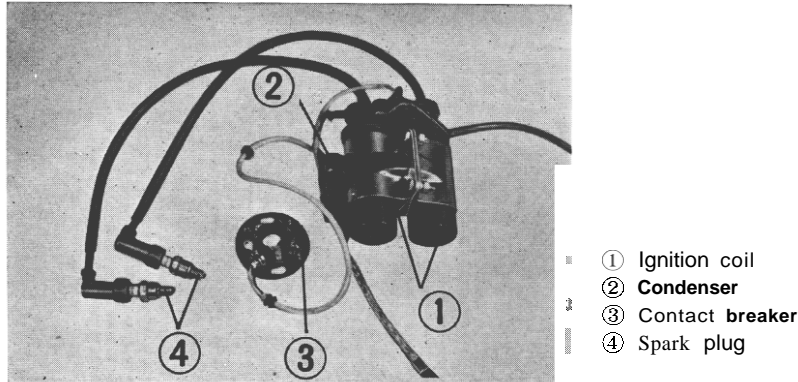


Fig. 1-2. Ignition system

2. Ignition coil

Ignition coil is the same construction with that for Model C72. For Model CB72, 77-I type, there equipped with one coil each corresponding to 2 cylinders right and left, as the crankshaft angle is 180 degree. But for Model CB72, 77-11 type, alike Model C72. one coil of simultaneous ignition system is equipped as the crankshaft angle is 360 degree (Fig. 1-31).

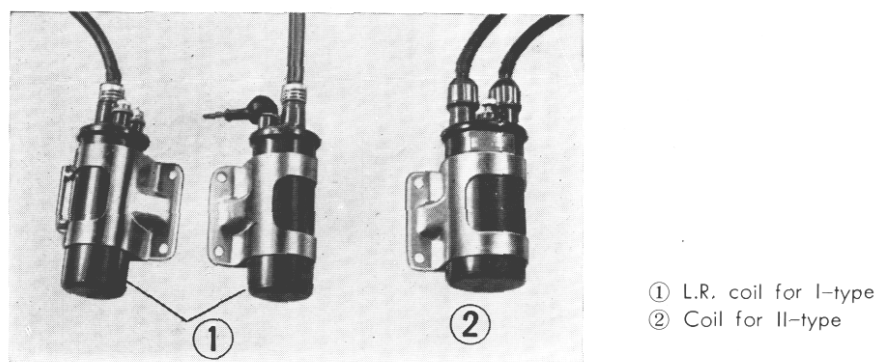


Fig. 1-3. Ignition coil

A. Construction of ignition coil

Ignition coil is shown in Fig. 1-4 where fine enamel wire of 0.08 mm dia. is wound over the iron core about 1,000—2,000 rounds as the secondary coil on which further enamel wire of 0.6 mm dia. is wound over it about 200—300 round as the primary coil. And stored in the cylindrical case after insulating process and drawing out the terminals (Fig. 1-41).

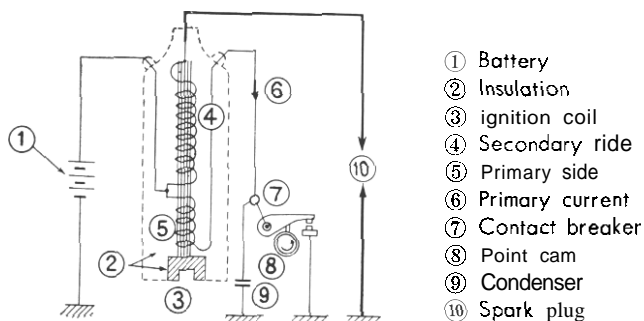


Fig. 1-4. Cross-section of ignition coil

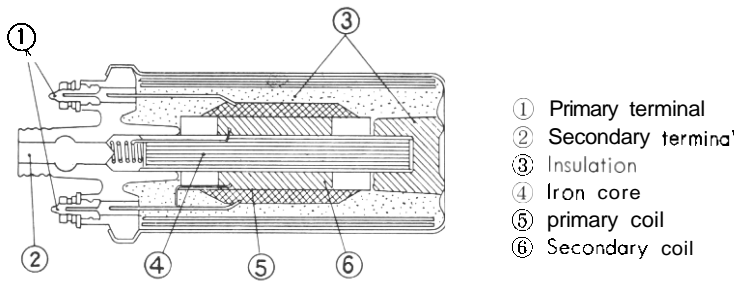


Fig. 1-5. Function diagram of ignition coil of Modal CB72, 77

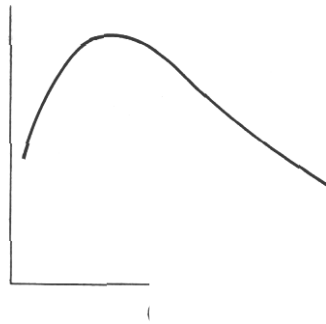
B. Function of ignition coil

The principle of ignition coil is similar to that of induction coil. As shown in Fig. 1-5, rotating cam axle and crank with constant periodical relation. there generates high voltage on the secondary coil as follows.

- a. When the point of the contact breaker is closed primary current flows in the direction as shown by arrow and generates magnetic flux inside the iron core.
- b. When the point is opened by the cam. the magnetic flux which is generating by primary current is going to disappear suddenly.
- c. Due to large variation of magnetic flux and large number of winding, there generates high voltage in the secondary coil.
- d. Here generated high voltage will charge on distributed static electric volume of the secondary coil itself. then as it voltage increase, further start charging on volume of high tension cord and plug continuing increase of voltage.
- e. When voltage increases up to ample amount. spark will occur at the plug gap. As soon as spark started sparking voltage drops down instantaneously. Accordingly electric load charged on the distributed static electric volume will be discharged totally (volumetric spark). And continues discharge of energy contained in the wire by disappearing magnetic flux induction sparkl.
- f. Magnetic flux approaches down to **zero** instantly where voltoge no more maintain spark voltage and discharging spark disappears.
- g. Still energy in wire due to remaining minute magnetic flux will generate damping vibrotron inside secondary and primary coil. and disappear acting as resistance **loss** on the circuit.
- h. Then returning cam angle to original state to actuate the function as stated (a) to follow the same process repeatedly (Fig. 1-5~1-7).

- ⑧
- ① Contact breaker
 - ② Point cam
 - ③ Condenser
 - ④ Battery
 - ⑤ Insulation
 - ⑥ Ignition coil
 - ⑦ Primary coil
 - ⑧ Secondary coil
 - ⑨ Spark plug

coil of Model C72, 77, CB72, 77



- ① Spark gap
- ② Contact number of contact breaker per minute

plug gap diagram

of mechanism to operate contacting and breaking or magneto ignition coil securely. It is stored type magneto and fitted on the fixed stand for for separated flywheel type and battery ignition unit. The contact breaker is consisted of the contact point and fixed point, terminal of the

pregnated with cloth or pressed thin steel attached other end of each part movable contact point is ly.

red to move very lightly, so it is designed to be ke inertia small. It is necessary to put a con- tile in short of the point. On the other hand ighth to avoid disordering of firing timing due to

Generally contact point pressure is designated between 700 and 900 gr. and to prevent wear of the cam follower grease should be applied on oil felt.

Required characteristics for point are as follow.

- 1) High anti-wearing property.
- 2) High heat conductivity.
- 3) High melting point.
- 4) High anti-oxidation.
- 5) Have a moderate hardness.

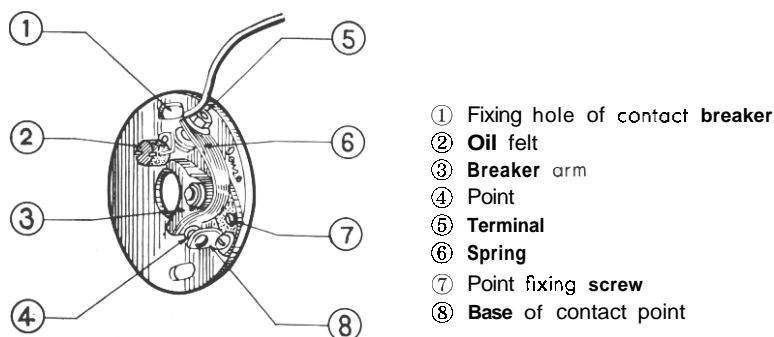


Fig. 1-8.

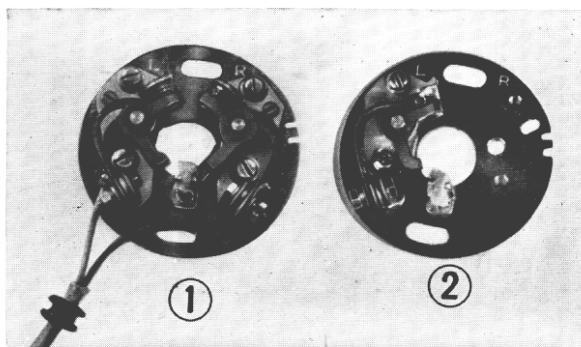


Fig. 1-9. Contact breaker assembly

- ① 2 points for Model CB72, 77-1 type
- ② 1 point for Model C72, 77, for CB72, 77-11 type

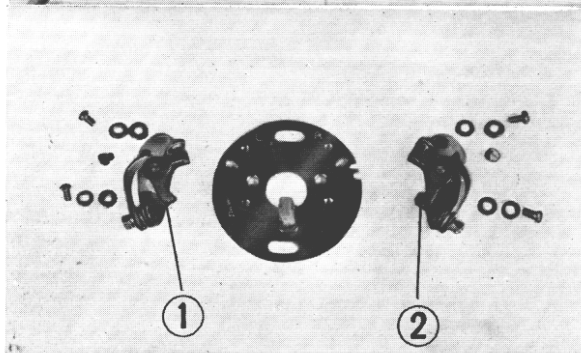


Fig. 1-10. Contact breaker of Model CB72, 77-1 type

Generally for automotive use, 4—5mm (0.157~0.196 in.) tungsten is applied. Sparking is generated by magneto cam contacting and breaking of timing of crankshaft and cam shaft by the contact breaker.

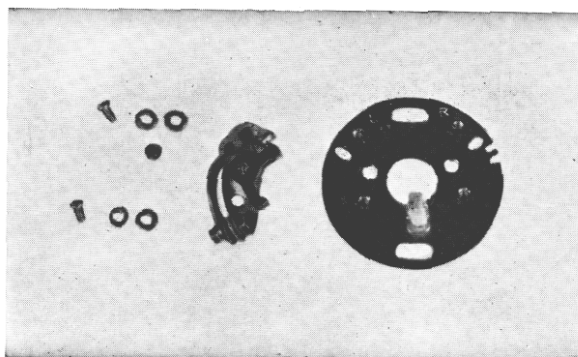


Fig. 1-11. Contact breaker of Model C72, 77, and Model CB72, 77-11 type

One cam is profiled at the end of the point shaft connected with the spark advance inside of the cylinder head for Model CB72, 77-1 type, and 2 sets of contact breakers are set relatively at 90 degree on the base, and designed to operate at correct timing of L. and R. cylinders. 2 coils, 2 points, 1 mount cam for Model CB72, 77-1 type.

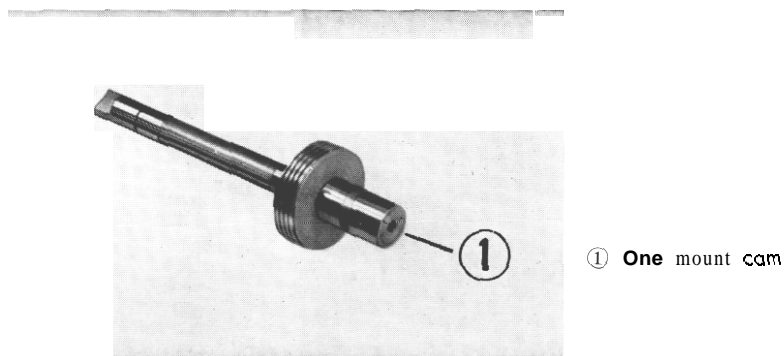


Fig. 1-12. Point shaft cam profile (Model CB72, 77-1 type)

For Model C72, 77 and Model CB72, 77, 2 cams are profiled on the point shaft and 1 contact breaker is fixed on the base. Here simultaneous ignition system is adopted as explained in the paragraph about the ignition coil.

Model CB72, 77-11 type : 1 coil, 1 point, 2 cams and simultaneous spark.

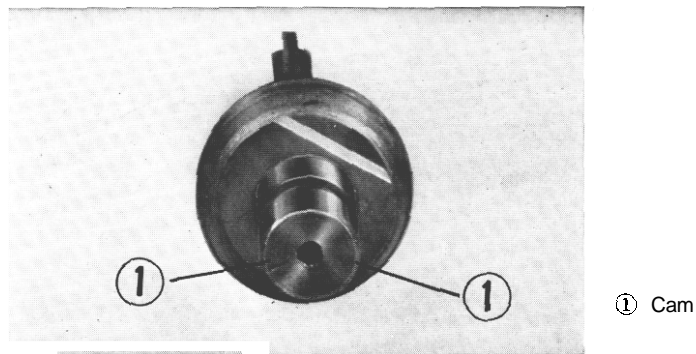


Fig. 1-13. Point cam profil (Model CB72, 77 and Model CB72, 77-11 type)

Note :

Surface of point becomes rough with working time elapse. Especially there occurs extraordinary wear if attached oil or grease on the point surface. Further if attached oil or grease on the point surface be left alone for a long time, it solidifies and forms insulating surface to effect ignition be impassible. So special precaution is needed to prevent attaching oil.

If the surface of point becomes rough or dirty, use a fine file or sandpaper to polish and adjust, and if case is more worser, take out the contact breaker base and the breaker arm, polish both contact surfaces with oil stone. In this case special attention is needed to avoid one side wear. This one side wearing affects very bad influence for a new part or repaired part.

Therefore centering and parallel adjustment of both contact point is essential requirement. Also if there is found too much play within axle hole of the breaker arm it is needed to replace with new one.

On the other hand, terminals of contact breaker and insulating parts of wire have to maintain ample insulating standard, so that special precaution is required to keep clean avoiding vapour, oil, dirt to be attached. In case of adjustment of the surface of point wipe its surface with clean cloth stained with trichrene to avoid grease, oil or dirt to be attached.

C. Condenser

Function of condenser is to avoid harmful spark between points, and if taken its volume value too large spark performance becomes worse. Therefore generally it is selected adequate value between 0.1 and 0.35 microfarad.

On the other hand it is required such feature to resist high voltage as high voltage of

several hundred volt acts on the condenser at the point opening instance. So it is prescribed in the JIS standard that it should resist more than one minute under such condition as A.C. 700V (50 or 60 c/s) maintaining insulation of more than $5\text{ M}\Omega$ after heating 30 minutes at 80°C (Fig. 1-14, 1-15).

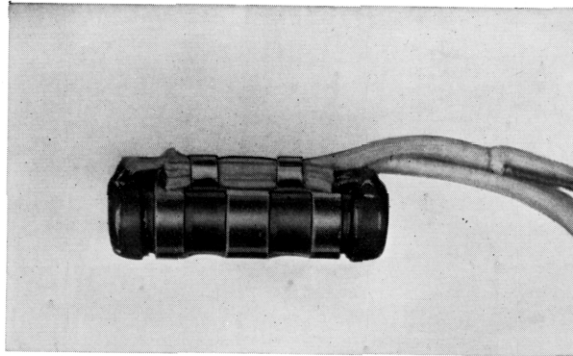


Fig. 1-14. Condenser (Model CB72, 77-I type)

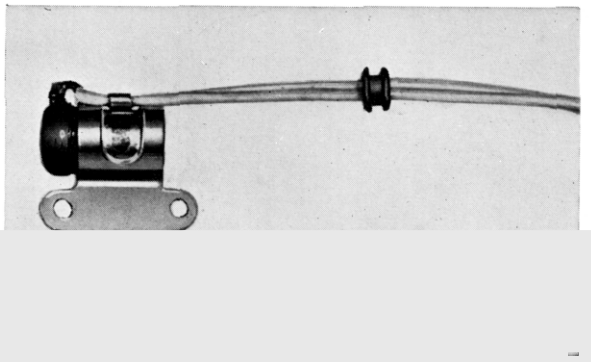


Fig. 1-15. Condenser (Model C72, 77 and Model CB72, 77-11 type)

Simple test for condenser is done like the following. After checking insulating value by mega, disconnect both poles of condenser from mega while mega is running. then short both poles by wire. At this instance, if spark occurs large enough. it is decided the volume value is good standard. By use of the service tester it can be tested precisely volume value and insulating performance.

D. Spark plug

Spark plug plays the most important part within ignition system of engine, and it takes charge of starting engine, receiving high voltage generated by ignition coil or magneto

to make combustion of mixture gas by high voltage spark occurred spark gap within plug in the combustion chamber.

a) Conditions needed to embody for spark plug

There are five subjects to be solved to fulfil its function perfectly, which will be explained as follows.

(A) Current

Electric current flows through the shortest way, and always tries to spark out of spark gap. At normal temperature electric insulating character of insulation is high, but at high temperature this character decreases. Therefore it is needed high insulation material which is hard to decrease its character even at high temperature.

(B) Explosion pressure

Inside the cylinder, 35 — 45 atmospheric pressure due to explosion always seeks path to escape. If air tightness of plug is inadequate, combustion gas of high temperature will penetrate inside it to lose its function due to overheating.

(C) Combustion heat

Temperature of combustion of mixture gas will reach up to 2000°C. It is needed to dissipate this heat sooner to develop engine performance preventing overheating of plug, sparking in advance or burning electrode.

(D) Carbon in case of incomplete combustion

If get dirty on the insulating part, engine will fail its smooth running due to high voltage leaks partially and poor sparking.

(E) Lead compound

4-ethyl lead is contained in gasoline to control explosion, and lead oxidized compound is made due to combustion. If it is deposited on the plug, this compound becomes a medium having conductivity at high temperature and high voltage current will escape as explained before.

E. Construction of plug

Here is shown the plug used generally for automobile (Fig. 1-16).

a) Electrode

As material of electrode it is required to be hard to wear, low sparking voltage, high heat conductivity, high resistant to oxidation, high conductivity and easy to manufacture. At present Nickel alloy or heat resistant alloy is used (Fig. 1-17).

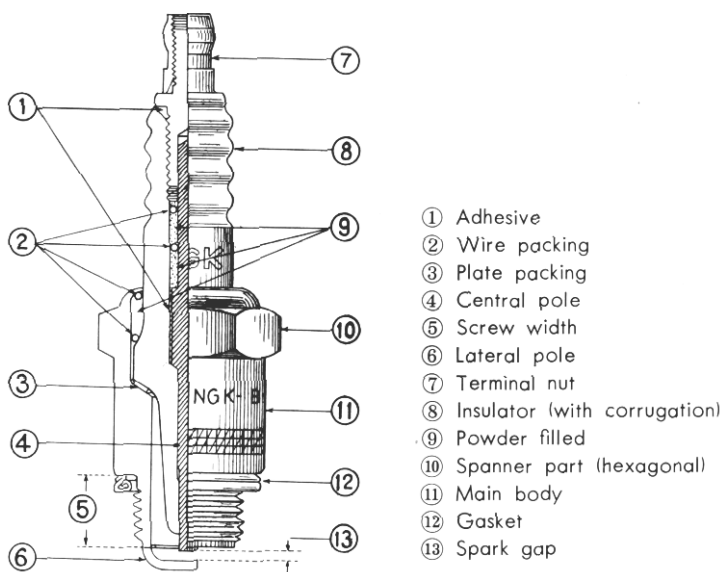


Fig. 1-16. Plug construction

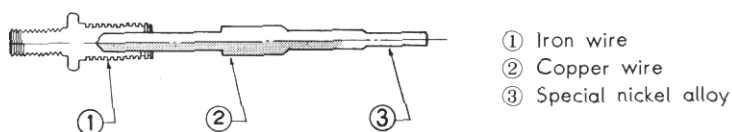


Fig. 1-17. Construction of electrode

b) Insulator

As insulator, special high alumina substance is used mainly. This material has a very excellent character comparing with that of famed foreign product. This superb character can be attributed to high content of alumina and a perfect material refinery process and can maintain high performance due to burning process in high temperature tunnel oven (Fig. 1-18).

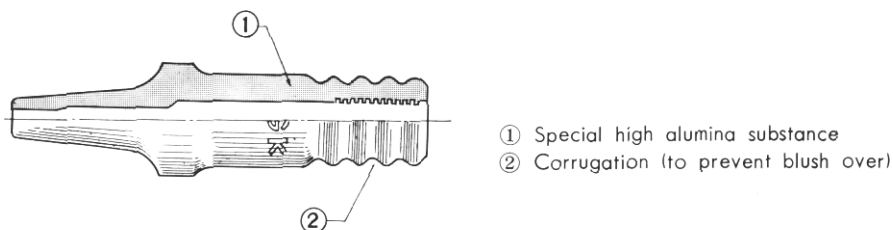


Fig. 1-18. Insulator

c) Concerning plug insulator (Insulator of special high alumina substance)

Characteristic of insulator and spark plug

| Item | Compositions | | Apparent specific gravity | Insulation resistance MΩ | | | | Compression strength | Coefficient of heat expansion | Coefficient of heat conductivity | Heat shock resistance | Amount of erosion (Lead bromide) | Amount of erosion (Lead oxide) |
|------|-------------------------------------|-----------------------|---------------------------|-----------------------------|-------|-------|-------|----------------------|---|----------------------------------|-----------------------|----------------------------------|--------------------------------|
| | Al ₂ O ₃ % | SiO ₂ % | | 200°C | 300°C | 400°C | 500°C | | | | | | |
| | g/cc | g/cc | | 200°C | 300°C | 400°C | 500°C | | | | | | |
| | 90.2 | 7.1 | 3.51 | ∞ | ∞ | 800 | 80 | 11,800 (1677%) | 7.8 × 10 ⁻⁶ 20°C ~ 1000°C | 0.026 ~ 0.029 Cal/cm | 6 times | 0.07 PbBr ₂ | 13.2 PbO |

Main benefits of this insulator are as following :

- As insulating character is excellent, it is not trouble of misfire due to decreasing of insulating character at high speed loading condition with preventing effect of flush over by the head corrugation.
- Due to high heat conductivity, heat conducted to plug can be discipated quickly preventing over heat.
- Due to high resisting character to heat shock, there is no trouble of damage on the insulator by sudden raise and drop of heat no gas leakage due to strong construction.

To join the central electrode with insulator, and insulator with main metal body, special powder is used. This way of filling powder is prevailed method in the aircraft plug manufacturing and comparing usual cement adhesion. Air tightness is perfect for long range use accordingly central electrode can discipate heat evenly and distribute heat evenly.

Amount of wear of electrode is indistrict. Larger size of diameter of electrode is adopted to ease heat discipation and to get least wear and special alloy having heat resistant character was selected corresponding to such circumstances of high compression and high rotation. Very strict testing is done before using as even a minute crack in the material might be the cause of extraordinary wear.

d) Heat value of plug

a) Favorable condition for plug function

Ignition part of plug is up to be dirty by carbon generated by combustion gas

during engine revolution or by oil penetrated into the combustion chamber. This deposit is electric conductible itself, and makes short circuit of high voltage electricity. Accordingly weaken spark to decrease engine power misfiring and in worst case will stop engine revolution. To prevent such phenomenon surface of insulator should be heated enough to cut off carbon deposited, and this is called "self cleaning temperature" (about $450^{\circ}\text{C} \sim 600^{\circ}\text{C}$ according to engine statel. On the other hand, it burned sparking part of plug at higher temperature, sparking part will become over heated point which invites harmful knocking to burn mixture gas before hand than sparking the plug, which affect decreasing of engine power. Therefore it is requested that temperature of whole body of spark plug should be maintained less than that of premature sparking (less than 800°C according to engine state). As a result it can be said "sparking part of plug is no good if too cooled also if too hot".

b) Escaping of heat

Heat received from combustion gas escapes as shown in the figure and sparking port maintains a certain temperature balancing heat quantity escaping and receiving.

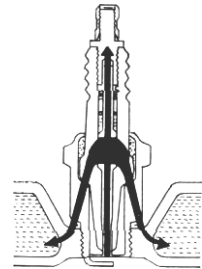


Fig. 1-19.

Way of escaping heat

- c) Necessity of different types of plug having each different heat value.—Difference of heat quantity received by each plug. Heat quantity of plug received from engine depend on kinds of engine (air cooled or water cooled, 2 cycle or 4 cycle), design (compression ratio, shape of combustion chamber, plug position) and running state (speed, loading, different fuel, flat ground or climbing slope) greatly.

Therefore it is necessary to furnish different types of plug to function satisfactorily under each different operating condition. This rote of escaping of heat is called "heat value of plug", and it is determined by its construction, form, dimension and material. It is called "cold type" (for high temperature use) which discipates heat easily and is hard to be over heated. and on the contrary such types as hard to discipate heat and easy to be heated is called "hot type" (low temperature use).

In Fig. 1-20, difference between types functionally are shown.

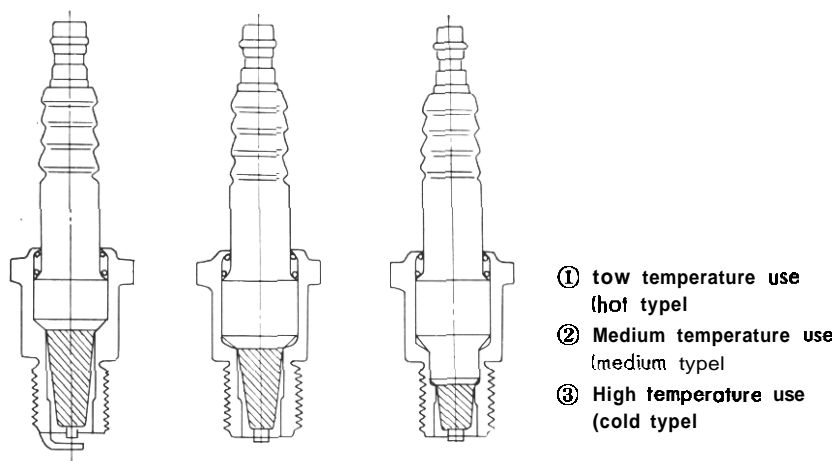


Fig. 1-20. Different plug for heat condition

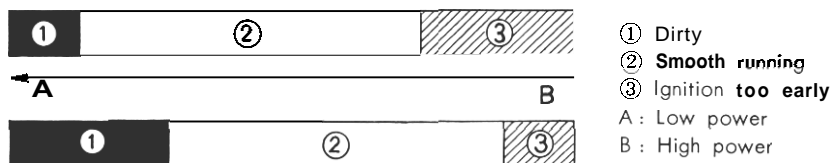
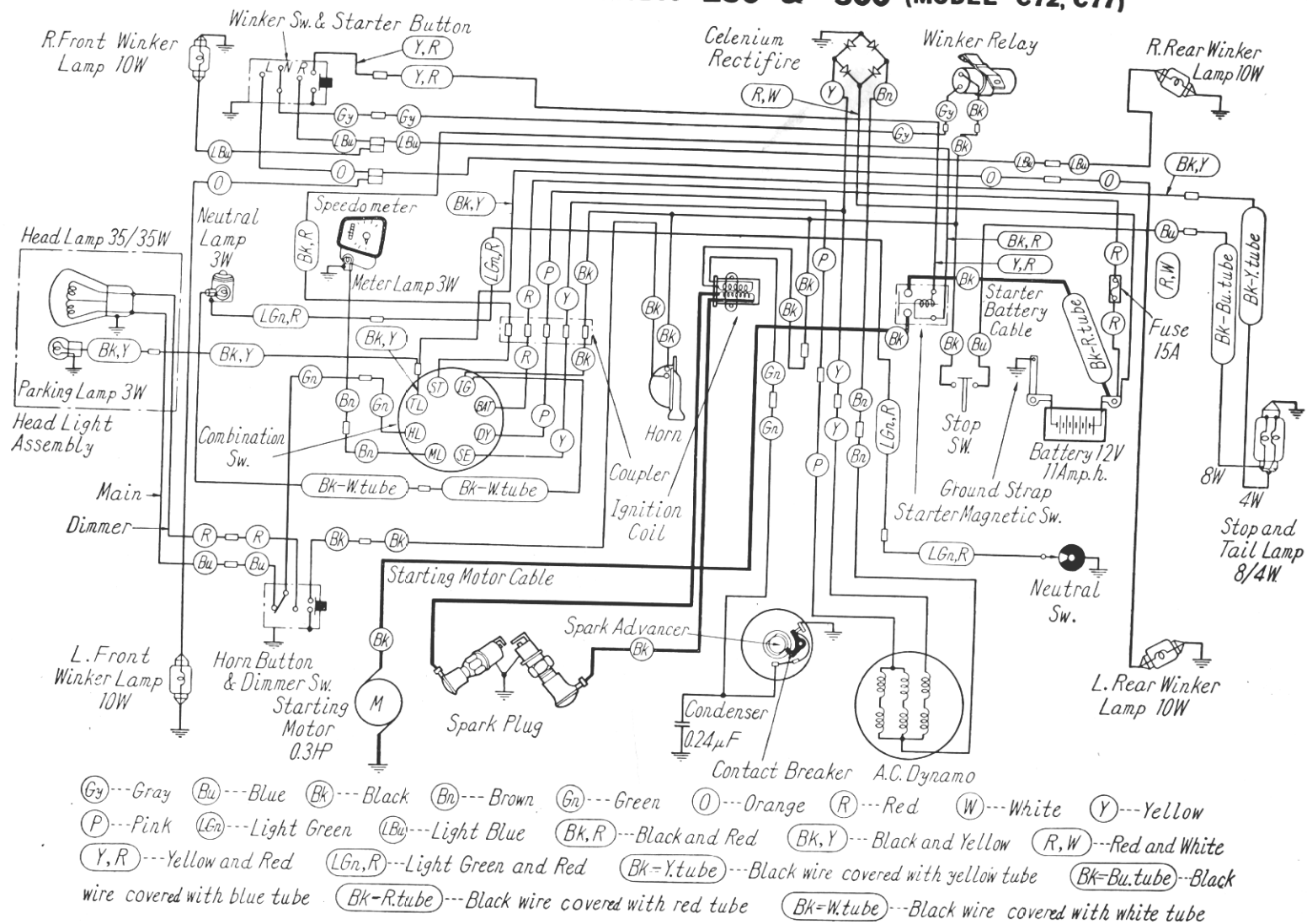


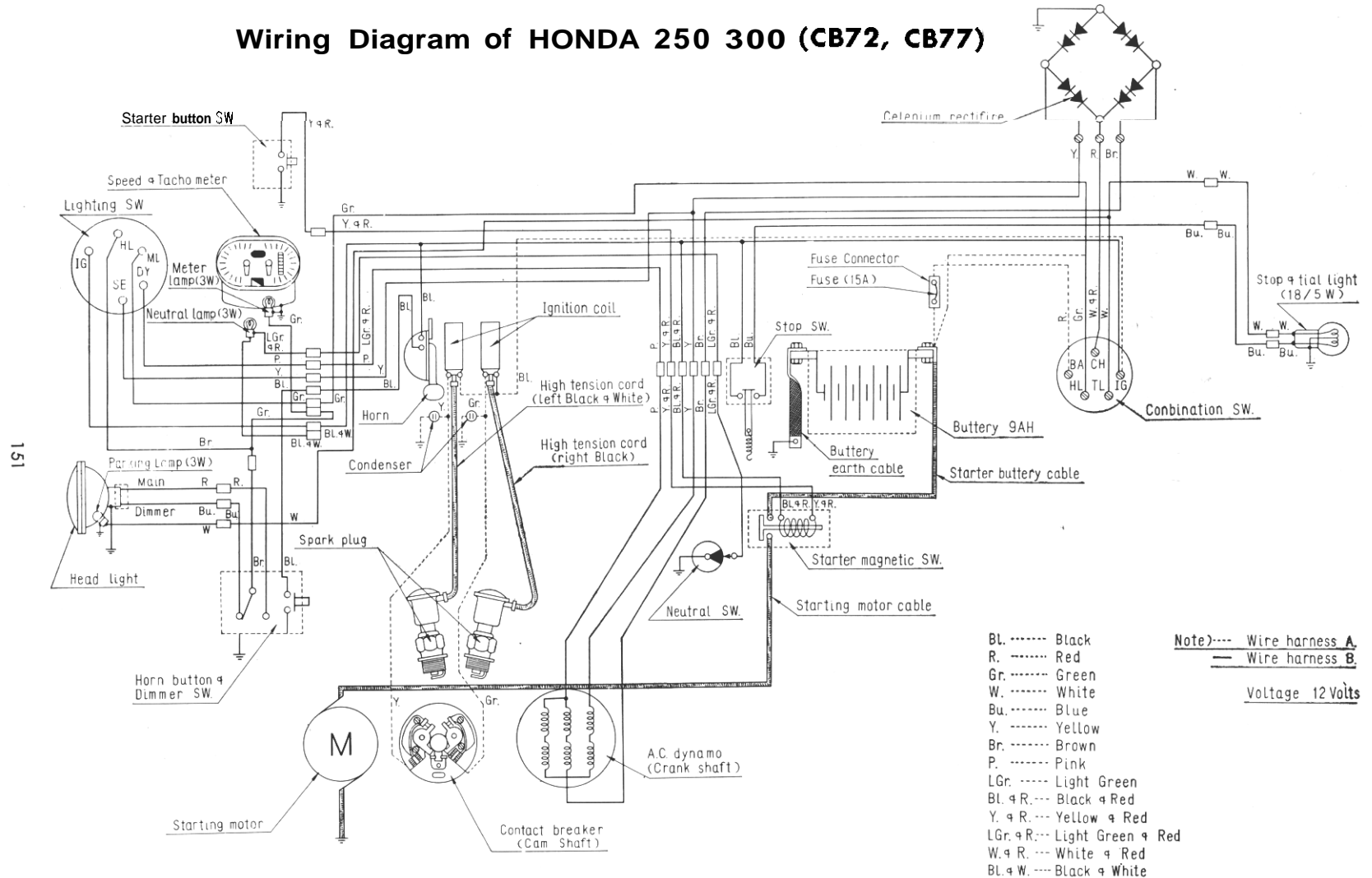
Fig. 1-21. Hot type plug (for low temperature use)

MEMO

WIRING DIAGRAM OF HONDA 250 & 300 (MODEL C72, C77)



Wiring Diagram of HONDA 250 300 (CB72, CB77)



2. CHARGING SYSTEM

A. Rotor-type A.C. Generator

The principle of generation of electricity by Rotor-type A.C. Generator is same as that of the flywheel magnets. Magnetic flux in the iron core of coil turn its direction as much times as number of magnetic pole for each a turn of the magnetic iron. For each a turn of the magnetic iron, as magnetic flux in the iron core changes with

$$\frac{\text{magnetic pole number}}{2}$$

cycles (3 cycles per one turn for 6 poles generator), so there generates A.C. voltage in the generating coil due to this variation of magnetic flux.

The more magnetic force of magnetic iron, and the earlier rate of change of magnetic flux in the core (the more quick the rotation of magnetic iron, and the more number of magnetic poles) and also the more number of winding of coil, the large A.C. voltage is generated (Fig. 2-1, 2-3).

All these conditions couldn't be satisfied from viewpoint of manufacturing, and among magnetic force of magnetic iron, number of magnetic poles and number of winding of coil there is such inter relation as to increase one sacrificing other. Due to defects of Rotor-type A.C. Generator (Flywheel, generating coil of Generator), which works with wrong voltage variation and not equipped with a voltage regulator, there occur too much raise or drop of voltage if take the loading at random not using regular loading. But recently these defects have been overcome by magnets manufacturers' effort.

On the other hand for magnetic weakening of magnetic iron preventive measures have been taken in the course of design. (Fig. 2-21

A point of excellence of Rotor-type A.C. Generator due to its simple and strong construction is almost no trouble and lack of wear parts. Special feature of using Rotor-type A.C. Generator combined with ignition coil is to make it possible emergency starting

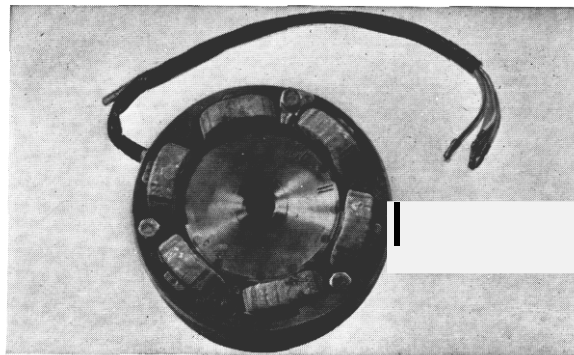
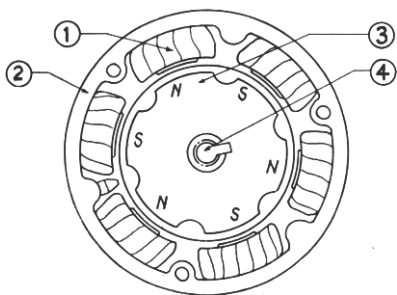


Fig. 2-1. Rotor-type A.C. Generator

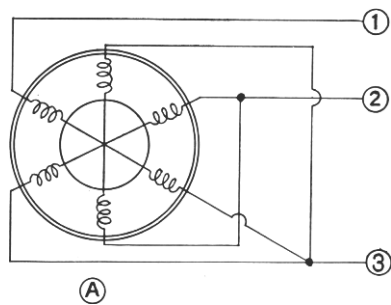
which is impossible to be followed by Rotor-type **A.C.** Generator. Frequently there occurs perfect discharging carelessly from capacity battery mounted on motor cycle, due to its small capacity.

For the battery ignition system, it is impossible to spark **unless** replacing battery or recharging. but for the Rotor-type **A.C.** Generator system it is still possible to spark by kicking even after perfect discharging of battery due to its feature of steep and high induction voltage of Rotor-type **A.C.** Generator under light load where generated voltage be conducted ta ignition coil in D.C. or **A.C.** as it is through selenium rectifier. Therefore it enables emergency starting by switching of adequate circuit connection.



- ① Coil
- ② Fixed core (iron core and coil)
- ③ Rotor (magnetic iron)
- ④ Crankshaft

Fig. 2-2. Construction of Rotor-type A.C. Generator



- A : Generator**
- ① Yellow (usual use)
- ② White (day and night)
- ③ Brown (common use)

Fig. 2-3. Circuit diagram of Rotor-type A.C. Generator

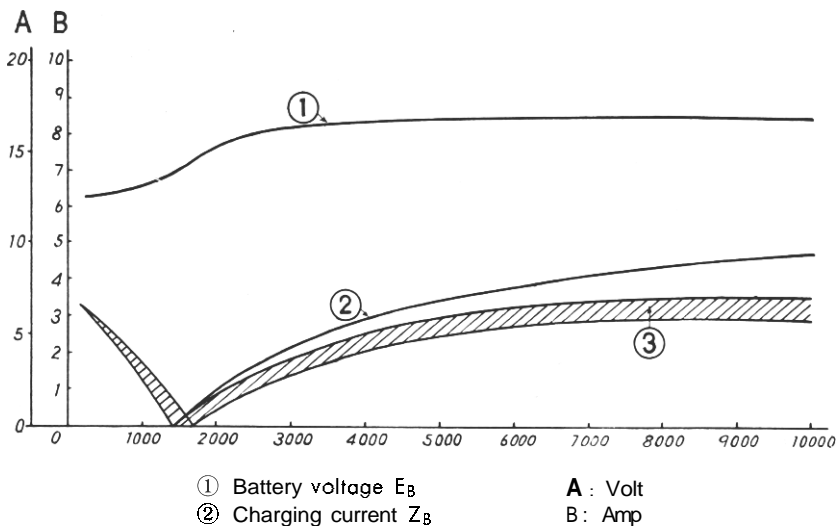


Fig. 2-4 (a). Characteristics of Rotor-type A.C. Generator (daytime)

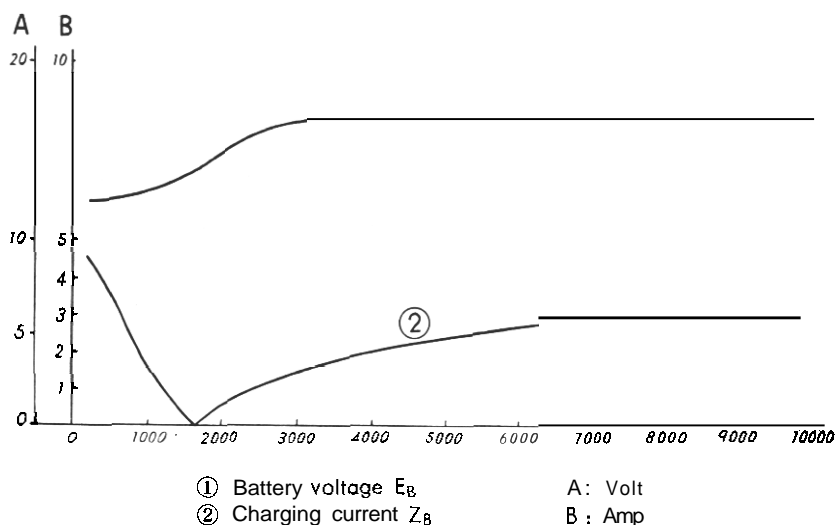


Fig. 2-4 (b). Characteristics of Rotor-type A.C. Generator (during night)

B. Selenium rectifier

The selenium rectifier is used for rectifying the D.C. current from the **A.C.** current, always combined with Rotor-type **A.C.** Generator or **A.C.** generating coil.

There are several kinds of construction, material and form for this rectifier. but the principle is some utilizing its special character of easy flow current to one direction and closing to other. Types of rectifier generally used are selenium rectifier, copper oxide rectifier, and germanium rectifier. Rectifying unit to rectify by the selenium rectifier is shown is Fig. 2-5 (a), and is composited by rectifying plates combined with end plates

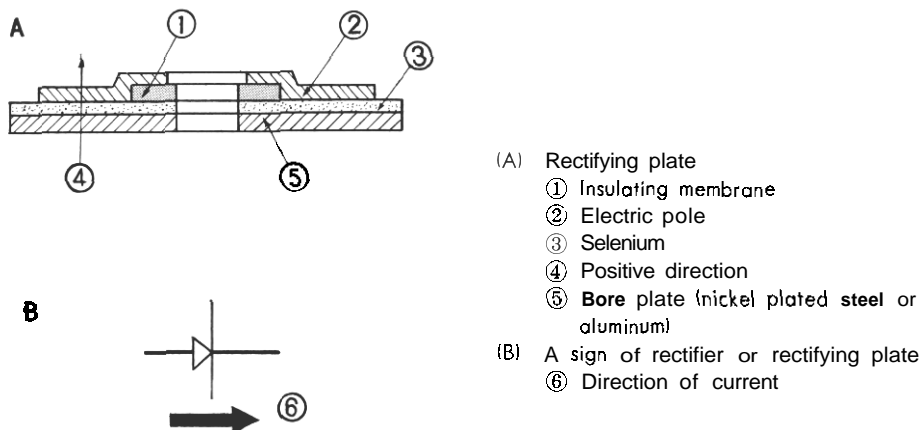


Fig. 2-5 (a).

and spacers of required number in series or parallel and further according to rectifying system it is set in comb-like arrangement on different rectifying circuit style. Rectifying plate is shown in Fig. (A), where on the base steel sheet or aluminium plate of nickel plated circular or rectangular form, refined selenium mixed with an adequate amount of impurity is spattered in vacuum and further ready fusible alloy of Cd, Bi or Sn is pured on its surface to make electric pole after perfect heat treatment to make it active metal selenium.

Then it becomes possible to get such phenomenon as current is easy to flow to positive direction and almost shut to flow to another direction if put current to the reverse direction to that shown by arrow. This is called rectifying action of selenium rectifying plate. This characteristics caused by unsymmetric conductivity due to the layer of barrier on the contacting surface between pole and metal selenium of semi-conductivity. As moisture is very harmful effect on the selenium rectifying plate. unit-moisture processing is done by moisture resistant point to prevent corrosion.

The selenium rectifying unit which is common for Model C72, 77 and Model CB72, 77 is connecting in bridge and number of selenium rectifying plate becomes much and the ignition coil works for both cycles of positive and negative loading. Durability of the selenium rectifier depends on temperature largely, and it is prohibited to raise more than 30°C. So is requested not to flow over current for a long time.

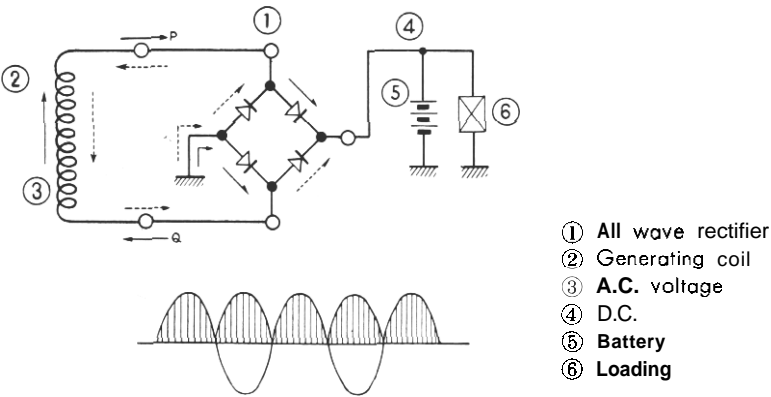


Fig. 2-5 (b).

On the other hand, there is so-called resisting reverse voltage which more voltage is put to reverse direction there occurs puncture (Here punctured part turns to be insulating substance at once and this damage self-restores its function reducing effective rectifying area. The more number of puncture, the more rectifying efficiency will be decreased to

be overheated). Therefore it is necessary to raise total resisting reverse voltage by putting required number of plates in series corresponding to **A.C.** voltage generated by the generator coil.

In Fig. 2-5 (b), put **A.C.** voltage between terminals P.O. of the generating coil as (A) : (B) : (C) = 1 : 2 : 1, it is evident (C) is most suitable for high **A.C.** voltage rectifier as the reverse voltage per **one** rectifying plate is smallest. Generally speaking is selenium rectifying system for use of automotive **A.C.** generating coil (C) > (B) > (A) is the order to select corresponding to voltage.

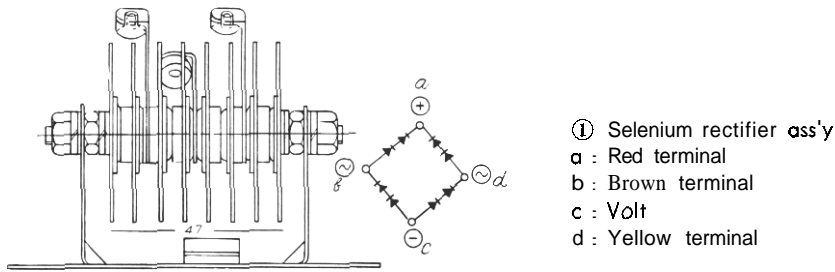


Fig. 2-5 (c).

Remarks :

Special precaution is necessary in using selenium rectifier not to run engine under such condition as no loading state (for instance unloading state of battery during daytime or taking out state yellow of fuse), as high voltage generated by generating coil under no load or light load condition acts to the reverse direction. This leads to puncture trouble and will damage the selenium rectifier if continued a long time.

On the other hand, there occurs ageing change in the selenium rectifier for a long term use increasing internal resistance in the rectifier plate to decrease output voltage and to increase temperature.

The largest cause of ageing change is temperature raise and at more than 70°C in the rectifier this change occurs rapidly, therefore it is required to select cool position to equip it.

There is such tendency as to increase current to reverse direction if selenium rectifier has not been used for a long time. In such case, before using raise voltage slowly during one hour from lower voltage (about half of standard) to restore its function.

C. Battery

All the battery for automotive use are lead storage battery and its construction is as shown in the figure that is anode plate group and cathode plate group (one plate more than anode group) are put together in turn inserting separator between anode and cathode plates, and these combined plates are stored in the cell lebonite or stirol model dipped with electrolysis solution. One unit as shown in the figure is called on unit cell and

generates about 2.1 Volt (in case of perfect charge, this will be up to 2.5 Volt during charging).

For Model C72, 77, 6V is used and for Model CB72, 77, 12V is used, connecting each cell of each 3 piece or 6 piece by connecting rod in series.

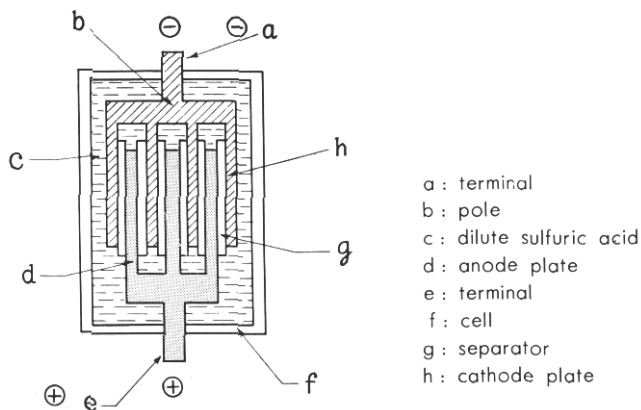


Fig. 2-6. Storage battery

The pole plate is made of lead antimony lattice painted with powder of lead oxide in paste state and dried. For anodic plate, hard lead oxide in dark brown color is filled up and for cathode plate gray porous sponge like lead is filled.

There contains expanding substance to prevent contracting solidification while in use as for separator thin cypress sheet (recently rubber sheet with fine holes or sythetic plates are used) is used, and glass mat is inserted between anodic plate and separator to prevent oxidation of separator and dropping substance of anodic action.

There occurs discharge when connected load between both terminals of battery, and gradually substance of both pole plate changes to lead sulphate, accordingly, specific gravity of dilute sulphuric acid will decrease to drop terminal voltage. This rate of decrease of specific gravity is proportional to amount of discharge approximately as shown in Fig. (a). So it will be determined amount of discharge or remaining amount by checking variation of specific gravity if known the initial specific gravity (sg. at complete charge 1.260 and sg. at complete discharge 1.10). Specific gravity of dilute sulphuric acid varies with change of temperature. If also depend on the kind of battery but generally about 1.260 is selected with converting standard temperature 20°C.

If put current on the discharged battery in the direction reversal to discharging, lead sulphate generated on both plates restore their original state, i.e. become lead oxide

and sponge lead again, and specific gravity of dilute sulphuric acid increase gradually and increase terminal voltage as charging progress.

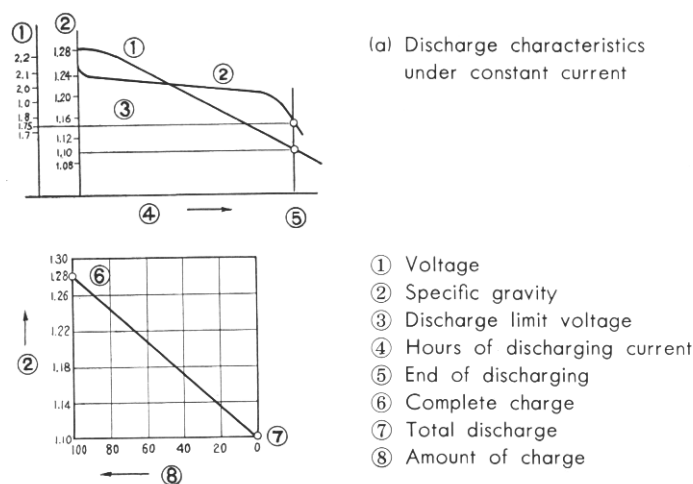


Fig. 2-7. Battery

a) Volume and rate of discharge (rate of charging)

Volume of battery is defined as amount of volume dischargeable down to discharge end voltage at terminals regulated by JIS from complete charged battery discharging under constant current (mean value 1.575V per each unit cell). To express its value Ampere hour (Ah) (discharging current times discharging hours) is used.

Volume of battery depends on temperature of discharging current and specific gravity. As conditions of volumes test regulated by JIS for use of battery for motor cycle, specific gravity of electrolysis solution should be 1.260 ± 0.005 (converted to 20°C), current 10 hours rate, and temperature of solution $25 \pm 2^\circ\text{C}$. Concerning rate of discharge, given here the battery completely charged, discharge down to the end discharge voltage with X ampere within T hours, volume of this battery is expressed by XT ampere-hours (Ah), and X ampere is called the current of rate of discharge of T hours.

Therefore battery of 10 hours rate volume 11 Ah means such capacity as to discharge 10 hours down to the end discharge volt and current of 10 hours rate of discharge is 11A. Similarly for charging current, it is expressed 10 hours rate of charging. To express amount of charging or discharging current, duration of time in hours down to the end discharging volt is used.

b) Initial charging

Battery can be stored after assembly for a fairly long time, if not electrolysis solution

be poured in and sealed tightly a pouring orifice. Therefore when battery not charged yet is to be used initial charging is necessary. This is done after pouring electrolysis solution charging with regular initial charging current for about 70 hrs. continuously to attain both pole plates a perfect charging state for the first time.

It is required the initial charging should be done perfectly, otherwise this battery will not display its volume 100% for future use and its life be shortened seriously.

Precaution necessary before starting for use :

Inspection should be done before use of battery finished initial charging as follow :

- (1) Inspect if there is something unusual or not, as damage, happens sometimes during transportation. Especially due to damage on the case there happens leakage of solution.
- (2) Peep inside through pouring port after taking cap, or check the level of solution to be on regular height. If its level is lower, check damage if any on the case. If no damage, supplement dilute sulphuric acid of same specific gravity with other cell.
- (3) If time elapsed more than two weeks after the initial charging, it is necessary to supplement charge to supply amount of self discharged electricity while let alone. During this supplement charging, it is desirable to check level of solution to adjust regular height and further measure and keep record of voltage, specific gravity and temperature for each cell for future reference.

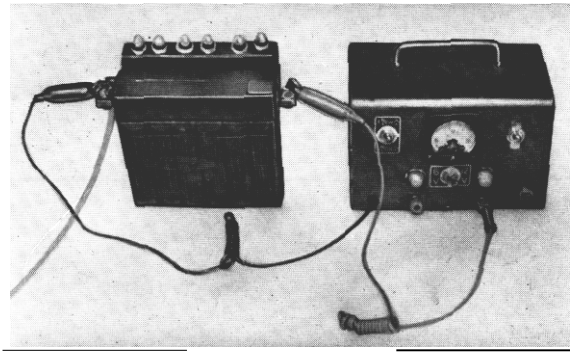


Fig. 2-8. Supplement charging of Battery

Precautions while in use :

- (1) Inspect battery periodically, once a week for automotive use. At least twice a month or after each 1,000—2,000 km (620~1,860 mile) running.

- (2) Special attention should be paid on the level of solution and if short supply distilled water or drinking water (no content of metal as ferrous). If the case of battery is transparent there is shown level of solution. but generally the height of solution should be adjusted about 13mm 10.51 in.) over the separator. If the pole plate be exposed in the air due to drop of level, there occurs oxidation on the plate making white sulphuric lead which decrease volume of battery, and effect the performance of exposed plate to be serious cause of inner shorting. So many troubles are experienced due to this cause. therefore it wouldn't be exaggeration to say that is the most part of causes to shorten it life.
- (3) Keep always in charged state. If used for a long time in insufficient charged state trouble called sulphation will be accelerated and at last it invites such difficulty as to make it hard to restore original substance by usual charging. Such pole plate warps easy to short. On the other hand, if used with thin solution due to over discharging separator gets damage. Therefore it is requested to supplement change before the discharge limit. (Fig. 2-8~2-10)

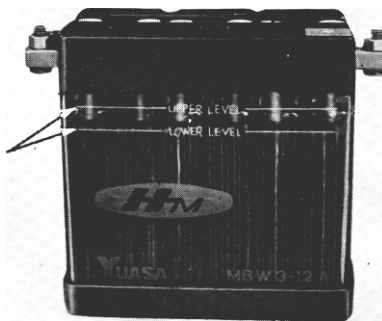


Fig. 2-9. Sign of level of solution

**STORAGE BATTERY,
FOR MOTOR-CYCLE, CHARGED & DRY**

| Type | Voltage (V) | Capacity at 25°C (Ah) (20 hr) | Charging Current (A) | Filling Electrolyte Specific Gravity (25°C) |
|------------|----------------|-------------------------------------|----------------------------|---|
| 8101-12-12 | 12 | 5 | 0.5 | 0.4 |
| | | | | 1.260 |

PRECAUTION BEFORE USE

1. **FILLING ELECTROLYTE:** Never loosen the filler plugs until the battery is used. For filling, use the dilute sulphuric acid with the specific gravity of 1.260, cooled to below 86°F beforehand. After cutting off sealed end of the vinyl pipe, fill it up to the upper level line on container side.
2. **STANDING:** After filling the electrolyte, leave the battery, standing still for 2 to 3 hours. After the standing period, adjust the electrolyte level to the upper line.
3. **CHARGING:** Charge the battery at 0.5A for 15 to 20 hours. To use a battery after

the expiry date of its dry-charge effect one below for the date-charge it for 60 hours. Be careful to keep the cell temperature always below 113°F.

4. **COMPLETION OF CHARGE:** At the final period of charging, adjust the electrolyte specific gravity to between 1.250 and 1.270 (at 68°F).

CAUTIONS WHILE IN USE

1. If the electrolyte level falls, fill the distilled water up to the upper line.
2. When installing the battery, never make the vinyl pipe clogged.
3. Be sure whether positive and negative polarities are rightly connected.
4. Charge the battery as early as possible after it has discharged.
5. Charge the battery at least once every month even when it has not been discharged.

YUASA BATTERY CO., LTD
Tokatsuki, Osaka, JAPAN

Fig. 2-10. Precaution for use

For the battery, MBJ4-12 type (Voltage 12V, volume 10 hours rate 10 Ah) is applied. Duration of battery is expressed by hours from the complete charging state to the complete discharged state using electricity for each separate loading while in stationary state. Therefore if the loading overlapped duration will be shorten so much, This relation could be presumed from the following table.

| Kinds of loading on bottery | Standard | Mean consumption of current | Duration of bottery (approximate) |
|-----------------------------|-----------|--------------------------------|--------------------------------------|
| Head light | 35/35W | 3 A | 2 hrs |
| Starting motor | 0.4kW | 10~50 A | Listed on other port |
| Magnetic starter switch | — | 3.5 A | Listed on other part |
| Neutral lamp | 3 w | 0.25 A | 40 hrs |
| Winker lamp | 10W×2 | 1 A | 10 hrs |
| Tail light | 4 w | 0.35 A | 30 hrs |
| Stop light | 8W | 0.7A | — |
| Speedometer lamp | 3w | 0.25A | 40 hrs |
| Ignition | Stop — | * 3.5 A | 1.6 hrs |
| | Running — | 0.8~1.2 A | — |
| Horn | 100 P | 1.5 A | 6 hrs |

* In case of point classed and switch on

For instances, if the head light 35W is on, consumption is 3A only and duration will be about 2 hrs. but if the taii lamp (0.35A) and ignition (3.5A) were used simultaneously total consumption will be 6.85A. From the figure above shown duration becomes 35—40 minutes.

While in running, charging is done corresponding to engine revolution, so that difference between charging and discharging current will behave charging or discharging.

Charging current > discharging current

→charge bottery

Charging current < discharging current

→discharge battery

Especially as large current flows while in use of starting motor, it is required to control less than 5 seconds for one action, after that takes rest 10~15 sec. to repeat next action.

There occurs rapid drop of voltage if large current taken out from the battery but it restores the original voltage if taken a rest. ■

Therefore continuous pushing on the starter button causes voltage drop preventing restoration to the effect of early exhaustion.

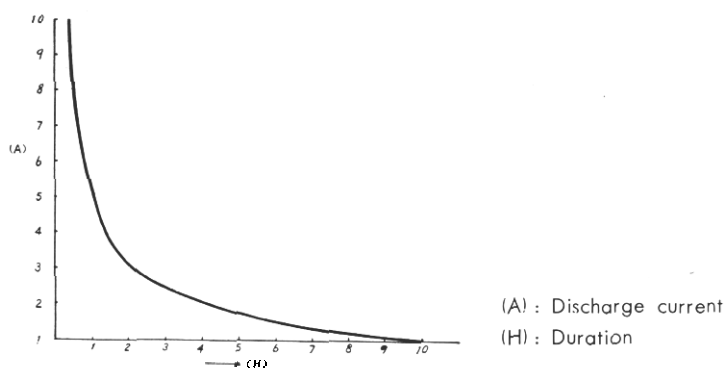


Fig. 2-11. Relation between discharge current and duration for MBJ 4-12 type 112 V, 10AH battery

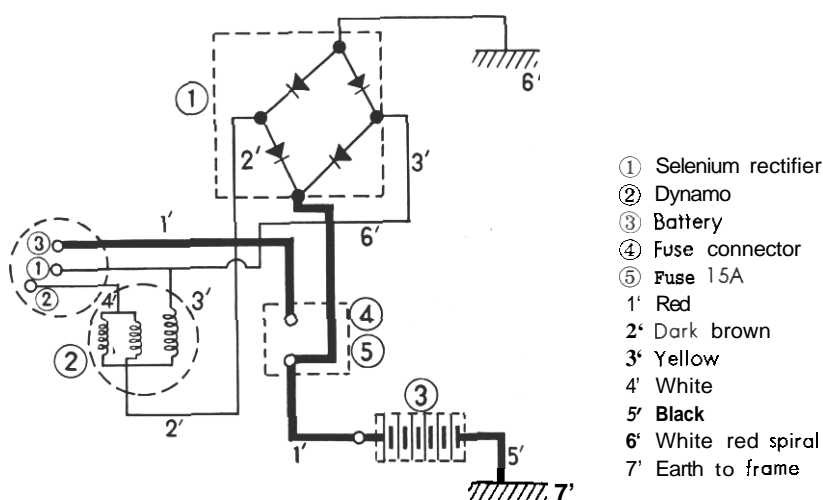


Fig. 2-12. Charging current circuit diagram

D. Starting Motor

a) Starting circuit

The starter switch of push button style is equipped on the right side of the handle. Pushing it, the starter magnetic switch is operated to feed current of about 100A to the starting motor from the battery for Model C72, 77, and about 60A for Model CB72, 77 to rotate the starting motor.

The starting motor is equipped in front of the crankcase and the crankshaft is rotated by starting chain through the overrunning clutch from the dynamo side.

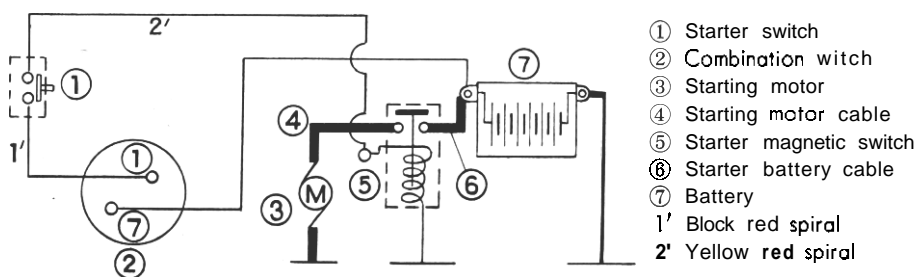


Fig. 2-13. Wiring of starting motor

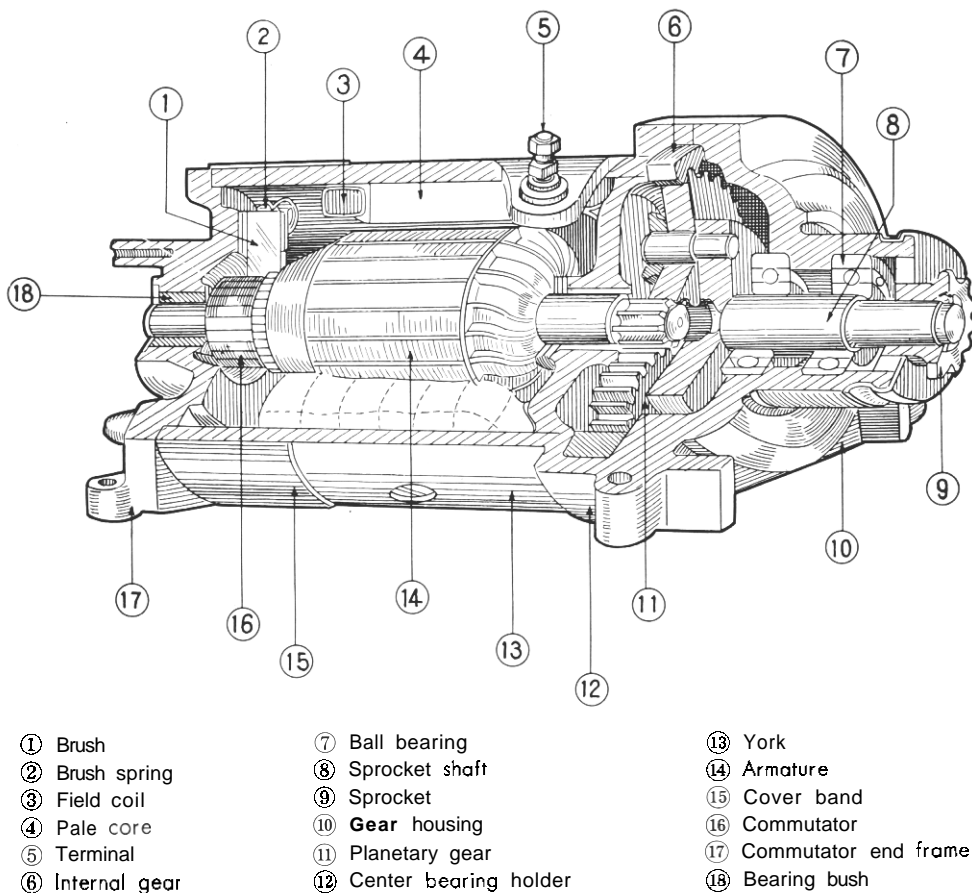


Fig. 2-14. Starting motor

b) Reduction of starter

To get required torque and revolution to rotate the crankshaft by reducing revolution of the motor mechanical reduction is necessary. To complete this in high weight the

primary reduction is done by planetary gear and further the secondary reduction by starting chain.

| | |
|---------------------------|--------------------------|
| Primary reduction ratio | 5.78 :1 (planetary gear) |
| Secondary reduction ratio | 2.77 :1 lchainl |
| Total reduction ratio | 1691:1 |

As the starting motor does not run constantly there seldom occurs wear but to prevent moisture its construction is closed type.

Therefore after each 5.000~10.000 km run the following points should be checked with case

- ① Check wearing on carbon brush and commutator.
- ② Eliminate carbon powder (blow off by compressed air).
- ③ Supply grease in the gear case.

If required by any reason to take out the starting chain, do not disassemble the starting sprocket from the motor.

By any chance if the starting sprocket were taken out it is necessary to disassemble

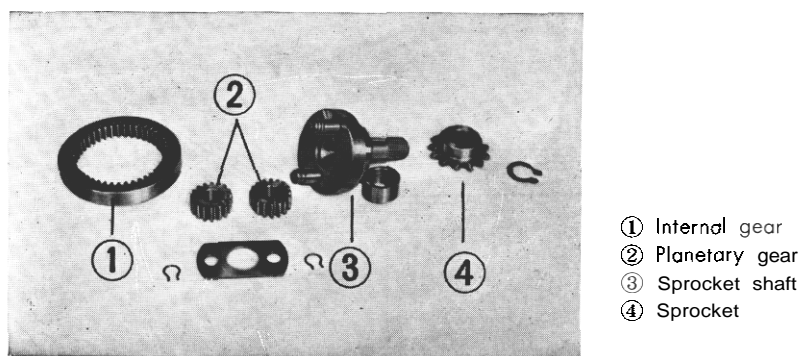


Fig. 2-15.

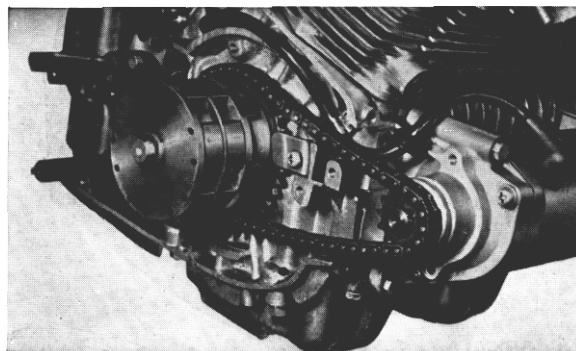


Fig. 2-16. Starting motor attached on engine

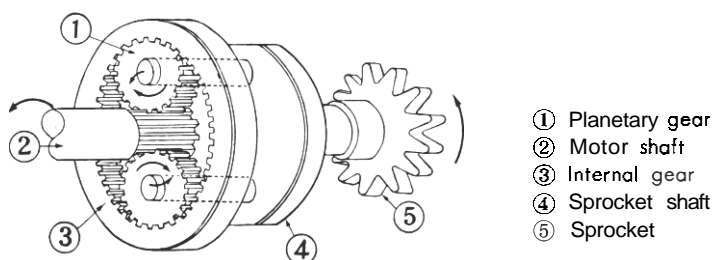


Fig. 2-17. Reduction mechanism

were taken out it is necessary to disassemble even the planetary gear and the starting sprocket should be combined before reassemble the starting motor.

If the sprocket were set in, without disassembling the starting motor by mistake there happens rotation impossible due to hitting against the case by the planetary gear. (Fig. 2-15~2-17)

c) Dismounting the starting motor

- a. Take off the starting motor cable from terminal.
- b. Loosen each two screws of 6mm tightening the starting sprocket cover and take off the cover.
- c. Loosen two screws of 5mm on the starting motor side cover and take off the side cover.
- d. While loosening 4 bolts of 6mm fitted on the crankcase and taking out the starting motor from the engine case, it will be separated from engine by removing the starting sprocket from the chain. (Fig. 2-18)



Fig. 2-18.

E. Maintenance of the Starting Motor

1. Removal of the carbon brush
 - a. Take off the cover bond complete of the commutator
 - b. Loose 2 bolts fitted on the Commutator end frame and take it out
 - c. By taking out the carbon brush pressing spring, take out the carbon brush loosening the connecting screw of the field coil and carbon brush.

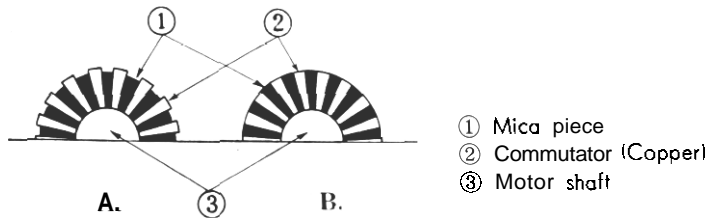


Fig. 2-19. Cross-section of commutator

2. Commutator

The commutator is as shown in Fig. (A) while in use copper part get wear to turn like (B).

In such cases it is requested to adjust to be (A).

It is advisable to rely on specialist shops as this adjustment requires highly technics (under cutting of mica). Fig. 2-19)

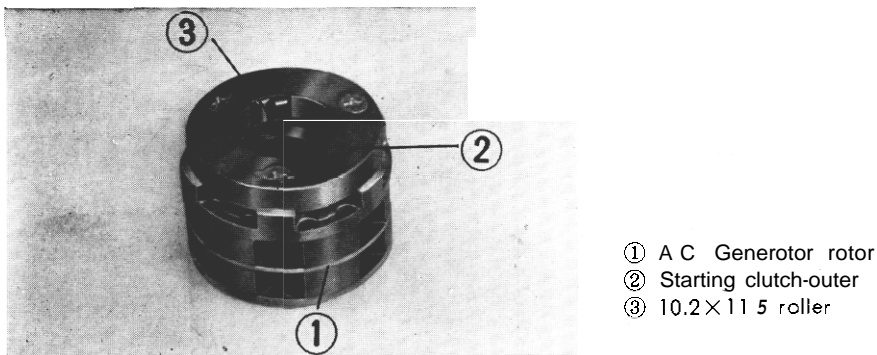


fig. 2-20. Generator starter and starting clutch

3. Over running clutch

This transmit rotation from the starting motor to the crankshaft, but reversally from the crankshaft can not rotate the starting motor.

This construction is quite same with Model C72. (Fig. 2-20)

1. If turns the starting motor

- a. When the starting chain is pulled along the direction of arrow as shown in the picture.
- b. By rotating the sprocket. the clutch outer is turned when the roller is joined with the starting sprocket and the clutch outer moving to the narrow side. Accordingly the dynamo rotor is turned which is fixed with the clutch outer as one unit.
- c. On the rotor is fixed on the crankshaft by a key of 4mm rotation of the clutch outer is transmitted on the crankshaft.
- d. The starting clutch roller spring is useful for smooth running of roller without any irregular meshing.

Furthermore a spring cop is used to make smooth motions of the starting clutch roller spring and the roller.

2. When the engine starts running

- a. Rotational speed of the crankshaft becomes faster than that of the sprocket.
- b. Transmission from the starting motor is cut, due to centrifugal force on the roller which presses the spring and moves to the wider space of the clutch outer.

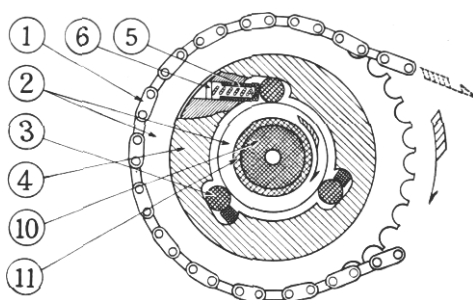


Fig. 2-21. Picture showing principle of function of the, overrunning clutch (A)

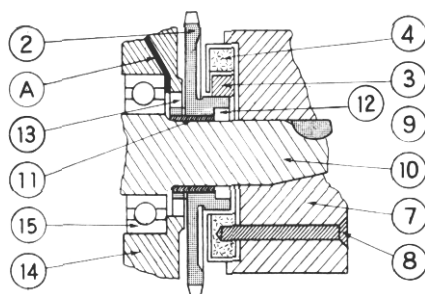


Fig. 2-22. Picture showing principle of function of the overrunning clutch (B)

3. Lubrication

Lubrications for the over running clutch is done by oil dropped through the hole (A) in the figure which passes through the groove at three parts (B) and starts inside of the inner oil seal 2035 of 20mm bush and the lock oil seal 326575 to prevent burning.

Therefore after disassembly it is necessary to clean oil holes (A) and (B) by compressed air.

4. Precaution about maintenance

As life of the over running clutch depends on the function of roller, special attention is needed for its handling.

- a. Grease put on the roller should be used designated one. (Part No. 71911), silicon grease)

This designated grease have several features, that is high resistant to cold and hot ($-40^{\circ}\text{C} \sim 200^{\circ}\text{C}$), least variation for frictions coefficients due to temperature and other variation.

Before putting this grease cleanse each port by gasoline, and after drying up, paint grease thinly all over the surface of the roller.

- b. Be careful about magnetic force

Not only roller or roller spring, but also parts around the clutch should be avoided from magnetizing. Any time resistance will unfavorably affect smooth running of roller.

| NO. | Part name | Quantity | No. | Part name | Quantity |
|-----|-----------------------------------|----------|-----|--------------------------|----------|
| 1 | Starting chain | 1 | 8 | Cross hole screw | 3 |
| 2 | Starting sprocket | 1 | 9 | Half moon key (large) | 1 |
| 3 | Roller | 3 | 10 | R. crankshaft | 1 |
| 4 | Clutch outer | 1 | 11 | Bush | 1 |
| 5 | Starting clutch roller spring cup | 3 | 12 | 20305 oil seal | 1 |
| 6 | Starting clutch roller spring | 3 | 13 | 326275 lock oil seal | 1 |
| 7 | A.C. dynamo rotor | 1 | 14 | R. crank bearing housing | 1 |
| | | | 15 | Z bearing | 1 |

F. Starter magnetic switch

Current to rotate the starting motor will reach about 100A. To reduce resistance big wire is needed, and also the switch to make on or off should be larger size at the contacting part. Accordingly it will be difficult to find such place as easy to operate switch. feeding current directly on the starting motor.

In such cases, switch utilizing magneto can be equipped at the most convenient place between the battery and the starting motor and put the switch to operate this magneto separately to make possible remote control with least current.

1. Principle of function

- a) If current flows on the primary side, an electromagnet actuates to attract iron core resisting spring force.
 - b. The contact point at the end of the iron core connects the secondary circuit.
- (Fig. 2-241

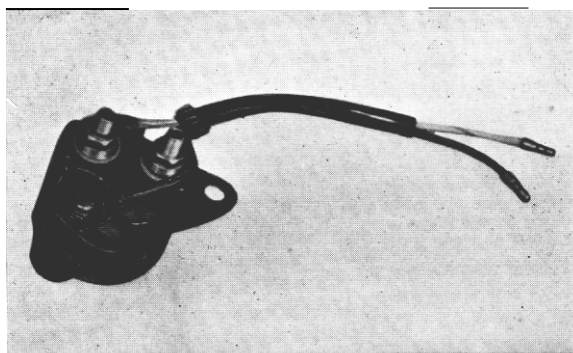


Fig. 2-23. Starter magnetic switch

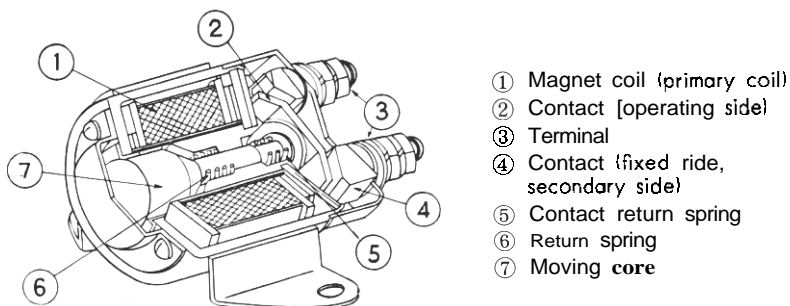


Fig. 2-24. Construction of starter magnetic switch

2. Precaution

- a) When put voltage of 12V between both terminal of the primary circuit, if heard cracking sound, the contact point of the primary circuit is connected.

- b) If used for a long time, contact point gets were and damage to increase resistance. and sometimes no current **flows** (even if sound of cracking is heard, sometimes the starting motor forced to stop). In such cases, disassemble it **and** polish the contact point with a **file** or a sandpaper. To disassemble take this switch from the body.
- c) Operational current on the primary side less than 12V, 3.5A. (Fig. 2-5, 2-61

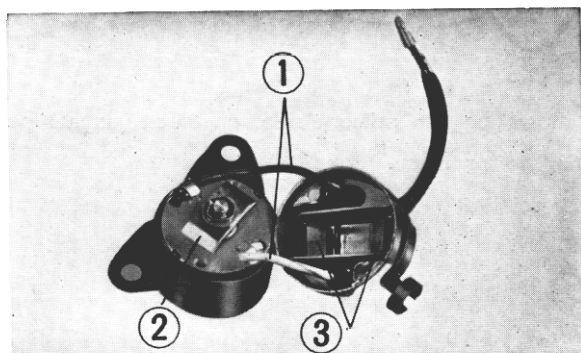


Fig. 2-25. Disassembly of magnetic switch (cap is opened)

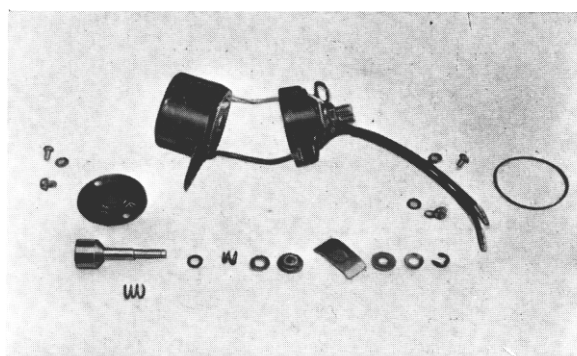


Fig. 2-26. Disassembly of magnetic switch (assemble part)

3. PARTS FOR USE OF SAFE GUARD

Speedometer, Tachometer

For Model C72, 77 is equipped only a speedometer but not a tachometer.

The speedometer is generally magnetic type, and rotation proportional to that of the wheel is transmitted to the speedometer by means of a flexible cable.

For the tachometer, magnetic tachometer is used alike the speedometer and rotation proportional to that of the cam shaft in the cylinder head is transmitted to the tachometer. (Fig. 3-1)



Fig. 3-1 Speed tachometer

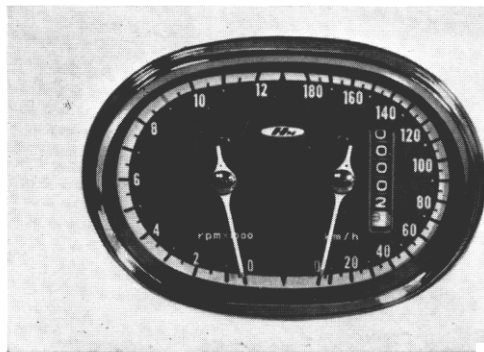


Fig. 3-2. Dial of Speed-tachometer

The speedometer is consisted of speed indicator and distance meter, and speed is expressed by km/h, and running distance is integrated up to 99.999 km by the distance meter.

The tachometer shows revolution number per minute by indicator (r.p.m.). Constructionally it is same type with speedometer and stored in the same case of the speedometer.

Only different points are that no integration mechanism and different sign and measures on the dial plate.

Construction of the speedometer and tachometer is shown in the figure.

The magnets rotate with some rotational speed with that of the flexible cable and the induction disc (of aluminium or copper made) moves with indicator as one unit.

The magnet shelter disc furnishes magnetic field to generate eddy current on the disc by the rotating magnet.

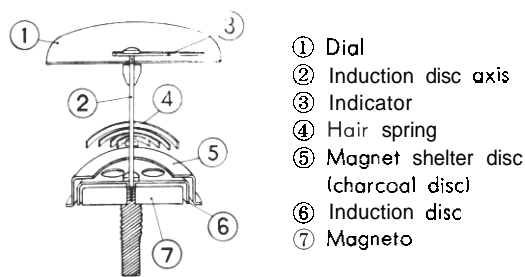


Fig. 3-3. Principle of speedometer

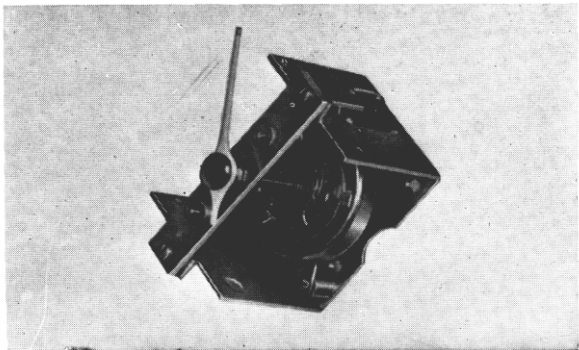


Fig. 3-4. Parts of speedometer

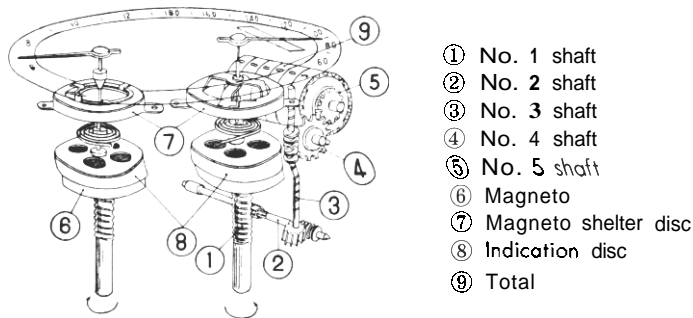


Fig. 3-5. Construction of total distance meter

By means of this eddy current the magnet shelter disc is moved by proportional revolving force to the magnet and indicator shows on the dial balancing with reaction of the correctly adjusted hair spring.

When the cam is stopped, (on the tachometer, engine is stopped) the indicator and the induction disc come back to the zero by restoring force of the hair spring.

For the speedometer revolution of the front wheel is reduced in the gear box, and the cable turns 1400 revolutions per 1 km running, on the other hand for the tachometer, revolution of the cam shaft is reduced further.

Reduction ratio of the tachometer axis to the crankshaft is 3 : 20. (Fig. 3-41

$$\frac{\text{Total distance meter}}{\text{reduction}}$$

JIS Regulation

| Type | Flexible shaft | Reduction ratio | Speedometer indication |
|----------------------|----------------|-----------------|------------------------|
| two or tri wheel car | 1400 | 1/1400 | 60 km/h |
| 4-wheel car | 637 | 1/637 | 60 km/h |

The distance meter is shown constructionally on Fig. 3-5, this magnet shaft cutted worm on it transmit its rotation as No. 2—shaft No. 3—shaft No. 4→wheel No. 5—wheel reducing each speed.

On the dial of the total distance meter figures as 0, 1, 2 . . . 9 are marked, and teeth are cut so as to rotate each wheel for one turn, the succeeding wheel rotates ¹/₁₀ revolution. (Fig. 3-51

MEMO

TROUBLE SHOOTING

TROUBLE SHOOTING

Procedures of diagnosis for finding out causes of trouble and their probable causes are discribed as follows :

1. Engine does not start or hard to start

- (1) Remove the carburetter float chamber and check for fuel flow, if fuel is not supplied enough;
 - 1-1. Clogged fuel line
 - 1-2. Clogged fuel tank cap vent hole
 - 1-3. Clogged fuel cock
 - 1-4. Clogged carburetter line or stuck needle valve
- (2) Remove the spark plugs, attach them to the spark plug caps. turn in the ignition switch and rotate the crank shaft with starter motor while the (-) electrodes are grounded. If the spark plugs do not spark well or nil;
 - 2-1. Faulty spark plug, Ito make sure, check the spark plug with spark plug tester.)
 - 2-2. Sooty or wet spark plug
 - 2-3. Contact breaker point
 - 2-4. Faulty condenser
 - 2-5. Incorrect adjustment of contact breaker point
 - 2-6. Short circuit or breakage in ignition coil or wiring
 - 2-7. Damaged combination switch
- (3) Check compression pressure at the cylinder with a compression gauge and if lack or nil of compression is indicated in either cylinder;
 - 3-1. Incorrect tappet clearance
 - 3-2. Incorrect seating of valves in valve seats
 - 3-3. Excessive wear in valve
 - 3-4. Excessive wear in piston ring, piston cylinder
 - 3-5. Blown out cylinder head gasket
 - 3-6. Seized valve in valve guide
 - 3-7. Faulty valve timing
- (4) Start engine following the procedure of starting but engine seems to start but won't continue running;
 - 4-1. Too wide opened choke shutter in cold weather
 - 4-2. Wide opened air screw of carburetter adjusting air-screw
 - 4-3. Damaged carburetter insulator or gasket

2. Engine does not develop full power

- (1) Stand the motorcycle on the main stand and rotate the rear wheel by hand when the charging gear is set in neutral, if wheel does not turn easily;
 - 1-1. Dragging rear brake-incorrect adjustment
 - 1-2. Damaged wheel bearing
 - 1-3. Too tight drive chain tension, in correct adjustment
- (2) Check the tyre air pressure and inflate to the specific amount.
- (3) Check the clutch for slip and if it is found slipping;
 - 3-1. Improper adjustment of clutch
 - 3-2. Worn clutch facing
 - 3-3. Weakened clutch springs
- 141 Measure the highest revolutions of crankshaft with a revolution counter and if the engine does not develop full revolution;
 - 4-1. Choked carburettor at somewhere
 - 4-2. Clogged air cleaner
 - 4-3. Insufficient supply of fuel to the intake
 - 4-4. Clogged muffler
 - 4-5. Faulty ignition coil or contact breaker points
 - 4-6. Faulty seating of valve
 - 4-7. Incorrect ignition timing
 - 4-8. Excess weak valve springs
 - 4-9. Faulty spark plug; test the spark plug with spark plug tester
- (5) Check oil level in the crankcase and adjust the level to the specification, or excess amount of oil result in the trouble.
- 161 Inspect for excess heating of engine and if found it same;
 - 6-1. Excess carbon deposit in combustion chamber
 - 6-2. Inferior grade of fuel is used
 - 6-3. Slippery clutch
 - 6-4. Lean air-fuel mixture : improper size of main jet in carburettor
 - 6-5. Dirty cylinder and cylinder head
- (7) Check for the engine developing or knocking when it submit to quick acceleration or successive running at high speed and if it is so; The probable causes are same as NO. 16).

3. Engine **runs** erratic and/or with miss tiring

- (1) Adjust air screw of carburetter properly **and** still runs under same circumstances.
 - 1-1. Faulty ignition timing
 - 1-2. Damaged carburetter insulator or packing
 - 1-3. Faulty spark **plug**
 - 1-4. Faulty condenser
 - 1-5. Faulty ignition coil
 - 1-6. Faulty contact breaker point
 - 1-7. Incorrect tappet clearance
- (2) Check for missing at high speed and if the engine is still under the same.
 - 2-1. Insufficient supply of fuel
 - 2-2. Incorrect valve timing
 - 2-3. Damaged or ~~weak~~ valve springs
 - 2-4. Other causes mentioned in No. (1)

4. Excessive oil consumption or exhaust blue **or** black smoke

- (1) If the engine exhausts smoke while continuous running at high or low **RPM**
 - 1-1. Worn cylinder or piston rings
 - 1-2. Reversely assembled rings in piston
 - 1-3. Excess clearance between exhaust valve and guide
- 121 If the engine exhausts smoke just after when closing throttle valve suddenly from certain opening ;
 - 2-1. Excess clearance between inlet valve and guide
 - 2-2. Clogged air vent hole or plastic tube

5. Clutch **jerks** or engages **unsmoothly**

- (1) If the machine moves off with jerking or the engine stops at the moment when the clutch engaged.
 - 1-1. Uneven tensions of clutch springs
 - 1-2. Distorted clutch plates or facings
 - 1-3. Sticky movement of clutch plate in the clutch outer

6. Gear shifting does not operate correctly

- (1) When the changing gear does not engage.
 - 1-1. Worn notch on the shift drum
 - 1-2. Stuck shift fork to the shift drum
 - 1-3. Worn shift fork

- (2) If the gear jumps out while running ;
 - 2-1. Worn dogs on the gear shifter
 - 2-2. Worn or distorted shift fork
 - 2-3. Weakened shift drum stopper spring

7. Engine runs with unusual noise when the tappet clearances assumed correctly:

- (1) If knocking noise is heard from cylinder when accereroting engine
 - 1-1. Excess clearance between cylinder and piston
- (2) If chattering noise is heard even if the cam chain has been adjusted ;
 - 2-1. Excess worn cam chain
 - 2-2. Excess worn cam chain tensioner spring or roller
- (3) When knocking noise is heard from crank case
 - 3-1. Worn crank shaft big end
 - 3-2. Worn crank shaft bearing
- (4) If the clutch incures noise when operating clutch lever.
 - 4-1. Excess clearance between the clutch plate and clutch outer
 - 4-2. Excess clearonce between the clutch center and clutch plate

8. Troubles in steering

- (1) If it is felt that the steering is hard at turning;
 - 1-1. Over-tight steering boll races
 - 1-2. Damaged steering
 - 1-3. Bent steering stem
- (2) Steering wanders or pull to one side while running.
 - 2-1. Worn front and/or rear wheel bearing
 - 2-2. Distorted front and/or rear wheel rim
 - 2-3. loosen spokes
 - 2-4. Worn rear fork pivot bushing or front arm pivot bushing
 - 2-5. Bent front fork or frame or rear fork
 - 2-6. Incorrect rear wheel alignment
 - 3-7. Uneven strength of cushion springs on both side

9. Troubles of brakes

- (1) The brake does not actuate properly **even** after the free play is adjusted correctly
 - 1-1 Worn broke shoes

- # MEMO

[illegible]

HONDA 250.300 MODEL C72, C77, CS72, CS77, CB72, CB77
SHOP MANUAL

HONDA MOTOR CO., LTD.

SERVICE DEPARTMENT. FOREIGN SALES DIVISION

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