

# Hondacb750FOUR

Background History of the Honda CB750 Four: In the U.S. where motorization has advanced to such a degree, all the cars produced are larger in body and engine capacity than foreign cars. Likewise, motorcycles made in U. S.A. are larger in body and engine capacity. There is even a motorcycle with an engine capacity of 1,200c.c. well equivalent to that of a small car. The motorcycle is being produced by the Harley Davidson corp., the only mass-production maker in the U.S. One of the main reasons for such a motorcycle is that the U.S. has a network of broad highways extending in all directions over the vast land. In these highways a substantial high-speed not less than 100km is allowed. Highways with such a high speed limit gave birth to a heavy-weight motorcycle called "roadster". To speed along on these highways, it is essential for a motorcycle to have a large engine capacity to enable a high speed, durability to facilitate continuous riding for long hours and stability at high speed. A motorcycle with such performance necessarily leads to a heavy motorcycle with large displacement. If we take an actual case, it will be readily understood which of the two is easier to ride in every way-a car with a maximum speed of 150km/h or one with that of 200km/h.

In 1959, the Honda Company of Japan established the Honda America inc. in the U.S. to start a full-fledged export thereto. With this beginning, the Honda motorcycle gradually gained popularity among the Americans. One of the potential reasons for such a popularity was that the Honda won overwhelming victories in many motorcycle Grand-prix races.

Just one month before establishment of the Honda America, the Honda's entry won the 6th place in the T.T 125c.c. race held in the Man Isle in Britain, which is one of the biggest motorcycleGPrace in the world. It should be added that this was its first entry in the race of this kind.

With this successful start, the Honda cheerfully advanced on the road to successive victories in themotorcycleGPraces.Almost three years after the innitial victory, the Honda had no rival in those races. Year after year, it continued to win. Indeed, in 1961, it won all the five places from the top in both 125c.c. and 250c.c.classes T.T races. It was a great feat. Eventually, two other Japanese motorcycle makers, the Yamaha and the Suzuki joined the Honda to overwhelm foreign participants in every class races of the motorcycle GP events. In 1968 when the Honda Factory Team withdrew from the GP races, the name of "the Honda of motorcycle" was world-famous. And as a saying goes that "a race is a laboratory on the run", the Honda feedbacked all the valuable technology and experiences gained during the races to the massproduced products which led to a better and better motorcycle with increasingly higher performance. The SOHC, double-row, 2-cylinder engine of the CB72, antecedent of the current CB250 and the series 4-cylinder engine of the Honda sports-cars like the S600 and the S800-all these superior products are intensive technical achivements directly resulting from experiences in those races. Further, the Honda's prominent



activities including two GPs win in the F1 races, events for the racing-cars during 1964 to 1968, served to impress the image of high-performance not only of the Honda cars but also the motorcycles. The fact was there for all to see. Anyway it was certain that the Honda had since gained a wide popularity day by day. However, this popularity was limited to smaller displacemen motorcycles and the market for the heavy, large displacement motorcycles of more than 500c.c. was exclusively shared by such ones as the British Triumph and BSA, the German BMW and the U.S. Harley Davidson.

It was to intrude into this heavy-motorcycle market that the Honda introduced the CB450. Its 450c.c. engine worked on a 4-cycle, 2-cylinder DOHC mechanism just like the one of any GP racer. This engine mechanism enabled such a



high performance as a maximum speed of 180 km/h and 13.2-second acceleration time in S.S. 1/4 mile.

This high performance could match that of a heavy-class machine, one class above its own. Even that of a Harley=Davidson's Electraglide 1200c.c., a motorcycle with the world's largest displacement was far below the CB450's. In fact, the Electraglide's maximum speed reaching 158km/h and acceleration time of 14.7 seconds in S.S.1/4 mile was no match for the CB450's. With this equal or much superior performance,

however, the CB450 was still the CB450 and it was said that the CB450 lacked the peculiar "relish" of a heavy motorcycle. Also, in its early type, the CB450 had a clumsy-shaped

Fuel tank slanderously decribed as a camel's back. Due to these minus factors, the CB450 could not threaten superiority and popularity of the large engine-power motorcycles of the U.S. and Europe.

In the spring of 1969, the Honda intrduced its first heavy-class motorcycle, the CB750 Four. Its aim, of course, was to capture some of the last heavy motorcycle market still left in the U.S. Later in the summer, the motorcycle was put on the market in Japan and opened a heavyclass motorcycle market in the Japanese motorcycle world.

Mechanism

Engineers of the Honda said that the CB750 was produced and based on a designing idea to "make the long-distance touring on highways safer and more comfortable". The idea could be realized when a motorcycle gifted with a combination of the following three elements was produced: Engine with a great reserve of power, superior stability during the run and a reliable brake.

The CB750 has a displacement of 750c.c. (736 c.c. to be exact) as its name shows. The figure stands as the largest one for any motorcycle produced in Japan. But when comared with those of its counterparts throughout the world, such a displacement was not a rare example, although in case of a motorcycle with a 4cylinder engine, only two or three examples are known. Further, such a motorcycle is produced in a very small, limited number, while the CB750.

2



Front Disc Brake

is a mass-produced one being monthly produced by 2,000. Such a mass-produced one does not exist except the CB750. The CB750, therefore, has a great appeal just as the high-performance GT car like the Ferrari and the Lomborghini with a V-type, 12-cylinder engine in the world of the cars.

The reason why the Honda adopted this 4-cylinder engine was to held down vibration of engine. In the case of a 4-cycle engine, a single cylinder engine has one explosion during two revolutions of crankshaft. In a 2-cylinder engine, one revolution for one explosion while with a 4-cylinder engine, two explosions during one revolution. The 4-cylinder engine, therefore, enables smooth revolution of crankshaft, by reducing engine vibrations. Needless to say, with reduced vibrations, more comfortable movement of the motorcycle can be expected while the rider will have less fatigue. However, design of a parallel, 4-cylinder engine necessarily leads to a broad engine, much wider in breadth.

Engine of a motorcycle must be designed extremely compact. Especially its breadth must be as narrow as possible. It is absolutely necessary in order to get a better riding position. a deeper bank angle during cornering and also to reduce frontal area so that less air resisttance will result. The Honda's effort to produce a compact engine is also shown in the fact that the Honda has unusually adopted engine of a long-stroke type such as this. In an engine of this type, stroke of a piston (distance of vertical piston motion) is much longer than piston diameter. But in general, most engines of the current motorcycles excepting of

the off-road type, are either of a square type in which bore is equal to stroke, or of an oversquare one where bore is much longer than stroke. This is because such a bore-stroke relationship is much favourable to get a larger power as it increases number of engine revolutions. However, if displacement is the same, cylinder diameter (e.i. bore) of such an engine is much longer than that of a longer-stroke engine, and the engine breadth, more wider. In the case of the CB750, even though its engine is of a long-stroke type, resulting decrease of engine power poses little problem. In fact, it is proud of the world's highest power amounting to 67ps. The real problem, therefore, is rather that of engine design and how to get the engine more compact in shape and body. Its power of 67ps amonts to 91ps when calculated in terms of ps per litre. This looks rather small when placed beside 120ps per litre of the CB250 which is also produced by the same Honda. The Honda engineers said that this was because they tried to have an engine gifted with balanced power and torque per each revolution by checking increase of power itself. Engine of the CB750. therefore, has been designed substantially easier to handle when its high displacement and power is taken into consideration. As a result, the

Supervision of Honda Motor Co., Ltd. Honda R & D Co., Ltd.

CB750 will be described as a uninteresting machine from the viewpoint of a veteran rider. Being compact, SOHC mechanism contains only a single cam shaft on the cylinder-head. The mechanism has an important point not easily passed over. The CB450, on the other hand, adopts DOHC mechanism. OHC stands for Overhead Cam Shaft. The mechanism directly opens and closes intake and exhaust valves by means of cam shaft on the head of cylinder. The mechanism is useful as it facilitates highspeed revolution of engine. The difference between SOHC and DOHC is that one uses only a single cam shaft (Single) while the other, two (Double). In the case of Single OHC, a single cam shaft opens and closes intake and exhaust valves while in Double OHC, two cam shafts do the same seperately.

Of the two mechanisms, DOHC work better and could show high performance. But as its efficiency increases and performance gets higher, its mechanism always becomes more and more complicated. This problem of complication could not be avoided. In contrast, SOHC mechanism is relatively simple without entailing undue complication. The simpleness met the supreme demand on the part of the Honda to have a compact engine, and SOHC was adopted by the latter. The advantage in this case is clearly shown when the cylinder-head portion of the CB750 is compared to that of the CB450.

Lubrication of both engine and transmission portions is done by the dry-sump system. The system is complicated in mechanism and costs high. It is a rare case for the Honda to adopt the system on its machine. And most machines on the market rarely use the system. The usual system is the wet-sump on which suspends a large lubrication oil pan below engine. However, with this system, production of a compact engine is a hopeless task. For a compact engine, the dry-sump system is better suited. Besideds this system has another advantage. In this system lubrication oil is placed much further from engine. Due to this removed location, rise of oil temperature by heat of engine and deterioration of oil eventually leading to inferior performance are prevented. Traces of many other efforts to produce a compact engine are evident in various portions such as crankshaft, bearing and others. The machine is equip-ped with a Keihin-made CW28 carburetter. For an engine of a parallel, 4-cylinder design, this one is surprisingly compact. Its power reaches 67ps/8,000r.p.m. and produces torque of 6.1kg/ 7,000r.p.m. With these power and torque, the engine can even make the big machine that weighs 202kg at a high speed of 200km/h.

Frame construction of the CB750, too, is a point that needs close examination. It was the first time for the Honda to adopt the double-cradle type. For, the Honda has never used the doublecradle type even in its GP racer which required the limit of performance. It has been usual with the Honda to adopt the diamond type which utilizes the engine as a part of frame to facilitate reduction of weight. Both the CB450 and the CB250 are considered to be machines of the cradle type. However, both machines are not those of the genuine double cradle type which builds up and reinforces each portion of a machine with two pipes laid in parallel. A machine built in a frame of the diamond type is delicately affected in its stability during cornering because twist due to the curve centers on other parts of the machine than the engine portion which is a rigid body. In the case of the double cradle type, this twist effect is dispersed over the whole body of the machine.

An artistically sharp effect, therefore, disappears. Instead, an almost imperceptable and more like a natural one is felt. The result is improvement of cornering performance. In fact, almost all the heavy machines of the world, which are said to be gifted with high cornering performance, adopt the double-cradle type construction. With this machine, furthermore, proper values of wheel arrangement of caster and trail wheel-base, etc., and fully-reinforced suspension facilitate better stability and driving property during high-speed movement. Also, confidence of the Honda's technical staffs in stability and maneuverability of the CB750 is such that the machine is not equipped with a steering damper to hold down its rolling motion. Because tires, too, are important facters to maintain safe and stable high-speed running and because cornering performance depends on whether tires are of good or dad quality, the CB750 employs those specially developed jointly by the Honda and the Dunlop Rubber Go. This rear tires are called. and its right and left are completely "K87" symmetrical. For unsymmetrical rear tires will not be practical because it tends to cause the machine violently oscillate during high-speed running. Cross section of the tire is shaped like a "omusubi" (rice-ball, nearly oval-shaped), roughly the same shape as that of a motorcycle racer's tire.

As this shape of the cross section enables a wider area of the tire touch the ground during cornering, it, too, contributes to make the machine more stable. Also, thick appearance of the tire itself gives big sense of security to a rider. Further, good performance of a brake is essen

tial for the safety of a high-speed machine. It is necessary, therefore, to have a brake that fully meets requirements during a high-speed operation. In this sense, the brake adopted for the CB750 should be said more than enough in meeting the requirements. First of all, the disk brake is compact. Its performance will not deteriorate due to the fade phenomenon because the disk surface is always exposed to the air streem and radiates heat much readily. Lastly, the drum brake is affected little by water. All these features serve to remedy defects of a brake of the drum type: Deterioration of braking performance due to the fade phenomenon caused by overheat of the drum and also extremely bad working of the brake when water gets inside the drum. Needless to say, a high-performance car nowadays tries its best to remove those defects by the use of an improved brake of the drum type, which is equipped with a ventilation hole and a device to stop inflow of water. But all is not good with the disk brake. For it lacks a self-servo control and needs a great force when it works. In the CB750, therefore, its brake works in an oil-pressure system just In this system, braklike that of a car. ing can be performed without the aid of a large force. And although in practice, the brake of a high-performance car is tasked much harder than generally imagined, the front disk brake of the Tokiko-made single calliper of 296mm diameter looks very durable enough to bear such a hard task and gives a rider confidence in its

durability just in the case of the K87 rear tire. Before the CB750, motorcycles, even high-performance ones, made in Japan usually have been equipped with a headlight that has a power of 35w at most. The CB750, however, is equipped with one of a large shield beam type, that possesses a power of 50w. This large power secures a much safer high-speed motion during the night time. Also, a speed-meter and a tachometer of the seperate type placed on the headlight are so designed as to face the rider squarely for easy and quick reading. Also, care is taken for a rider not to irritate his eyes with unnecessary reflecting light by painting upper bracket and the installation portion of handle bar in matted black. Further, a special kill-switch is attached to cut flow of ignition current and stop engine in time of emergency. A large gasoline tank containing 19 & oil is mounted indirectly onto the frame with soft rubber custion in between not to harass the rider with undue vibration.

There are still many other safe-driving devices to be mentioned and it should be said that safety considerations for this machine is almost complete. Maximum speed, 200km/h; acceleration time in S.S.1/4mile; 12.4sec and maximum power, 67ps/8,000 r.p.m. Judging from these spectacular figures, one may imagine extraordinary huge machine. But actually the CB750 is an easy to ride machine for everyone, although equipped with frame and suspension more high-performance than engine. Besides, its safty devices may be regarded as the best of their kind attained at present throughout the world. The CB750, therefore, should be said as the most high-performance and extremely refined motorcycle assured with almost full-proof safety in the whole world but absolutely not a "Vicious horse".

Essential Specifications

Overall length: 2,160mm Overall height: 1,120mm Width: 855mm Wheel-base: 1,455mm Weight: 202kg

Engine: A parallel, 4-cylinder SOHC

Engine capacity: 736c.c

Maximum power: 67PS/8,000rpm

Maximum torque: 6.1kgm/7,000rpm

Maximum speed: 200km/h (depending on running conditions)

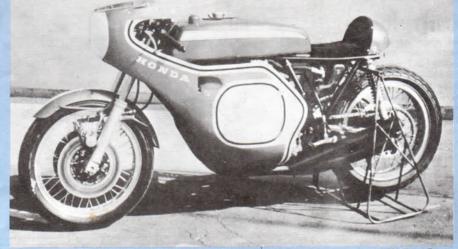
Acceleration time in S.S.1/4mile: 12.4seconds Transmission: 5-speed one specially made by

the Honda Brake: Front one, a Girling-patented, Tokiko-made 296mm-diameter single calliper disk brake. Operated by oil-pressure mechanism.

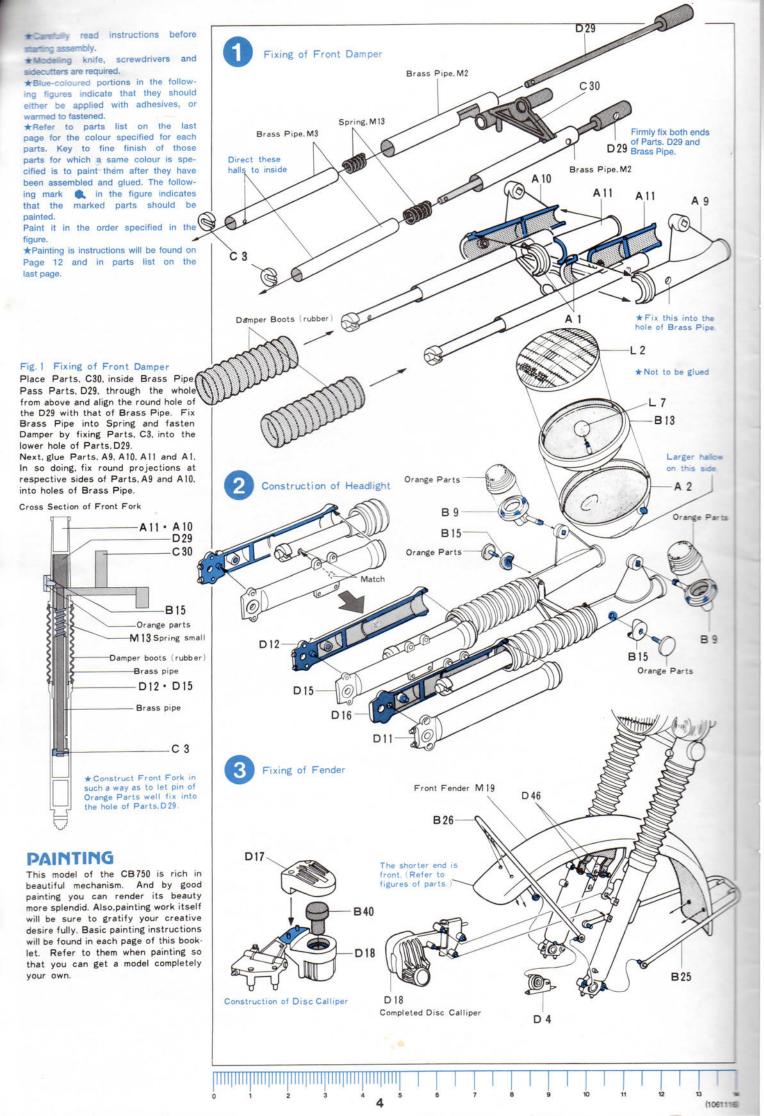
> Rear one, a leading-trailing brake worked by mechanical system

Suspension: Front one, telescopic type Rear one, a swing arm type.

Frame: A double-cradle type



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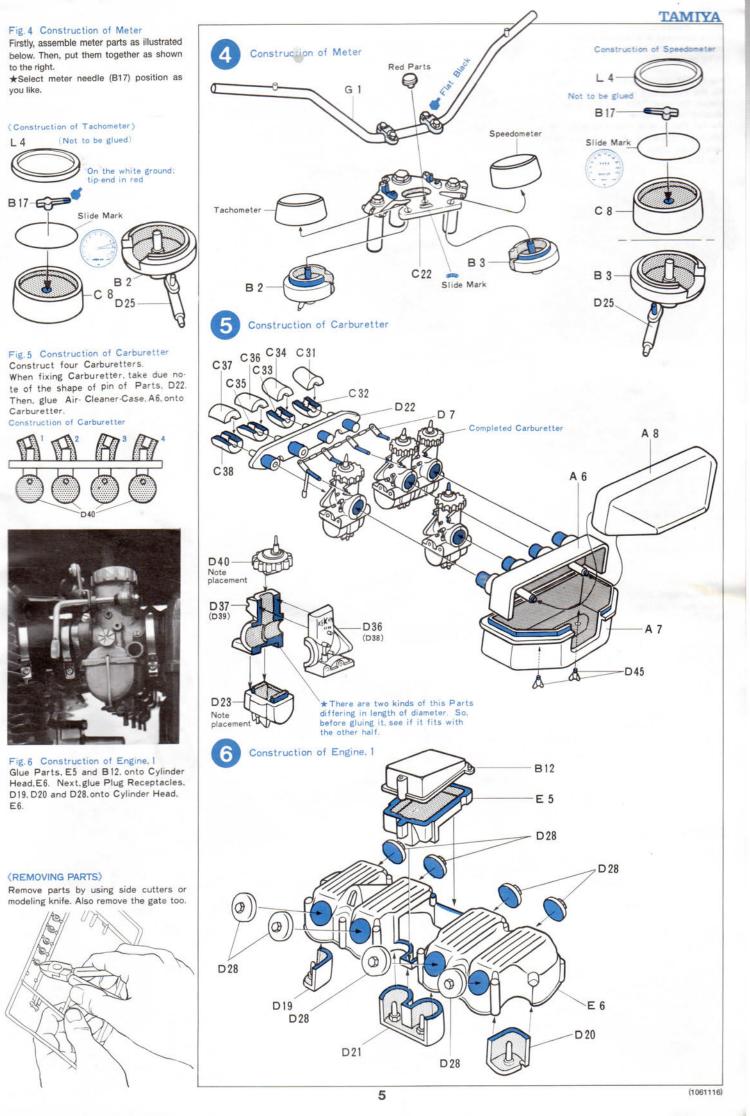


Fig.7 Construction of Engine 2

Pass Sprocket, B14, through Parts, C28, and secure the whole with Parts, C29. In so doing, be sure not to smear Parts, C28, with adhesives. Then, firstly fix Parts, E12, onto Crankcase, E4. Next, fix the Parts, C28, portion of the completed Sprocket onto the place as indicated in the figure.

As for Parts, B18, insert it into the place as shown in the figure after Chain has been constructed. (See Fig. 17.)



Fig. 8 Construction of Engine, 3 Glue Clutchcase, E8, in such a way as to let a thin pin of Parts, B27, pass through the hole in Clutchcase.

#### Length of Cords

Cut the thin black Vinyl Cords Clutch cord 23cm Speedometer cord 18cm Brake cord 17cm Throttle cord (a longer one) 12cm Tachometer cord 12cm Plug cord (two outside ones) 6cm Plug cord (two inner ones) 5cm Breather cord 5cm \*Cut the thick black Vinyl Cord Cam Cover Breather Pipe 12.5cm

#### Fig. 9 Construction of Stand. Fender Snip Stand, C24, with Parts, C14, and

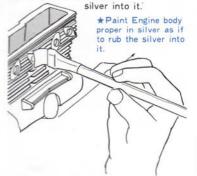
Ship Stand, C24, with Parts, C14, and glue the whole onto Parts, C4. Fix Spring onto Parts, C12. Then, fix the whole onto the place as shown in the figure.

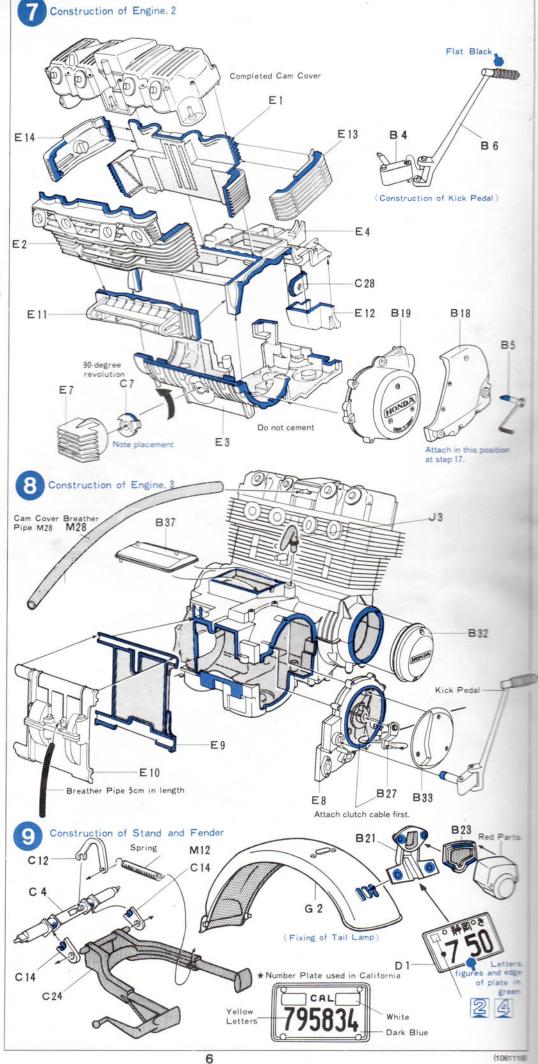
Next, fix respective Parts onto Fender. When gluing Number Plate, paint it first before doing so.

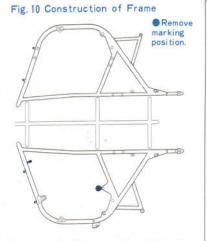
### PAINTING

Painting of Engine:

Engine body proper in a Honda CB750 is made of cast metal. So, the model's one has to look that way. Paint it in silver as if to rub the silver into it. Use the half-dried silver.





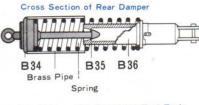


Snip and glue Frame portions, F4 and F5, Fender, G2, Parts, C6, and Stand with Main Frames, F11 and F12. Use a rubber band to glue those parts fully well onto Main Frames.

#### Fig. 11 Construction of Parts

Firstly, glue Rear Forks, F2 and F3. Then, fix respective Parts.

Construct Fuel Tank and apply Decal onto the tank. Lastly, construct Rear Damper and apply Decal onto the Damper.



The Picture of A Completed Fuel Tank

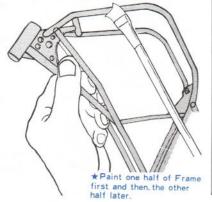


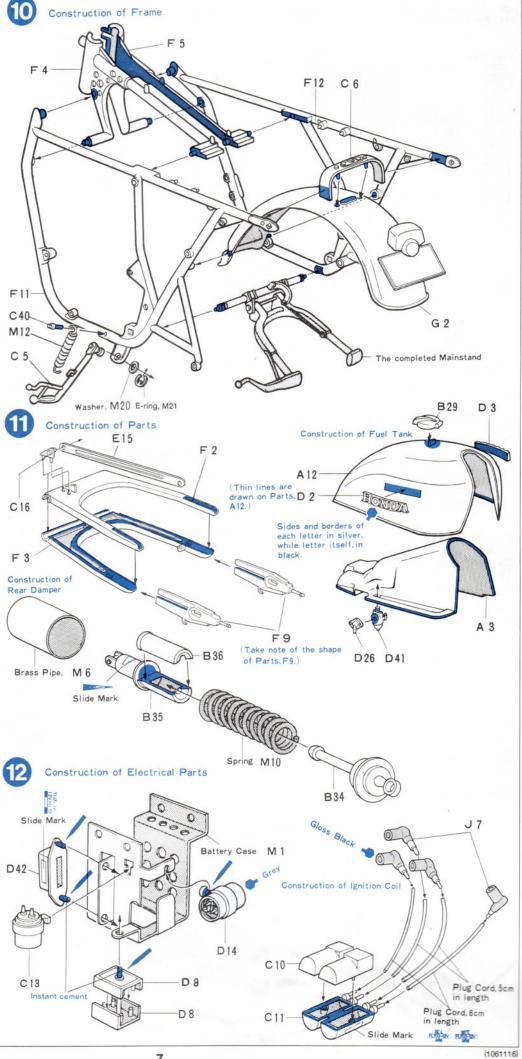
Fig. 12 Construction of Electrical Parts Attach D8 and D42 on battery case with instant cement. Then attach C13 and D14.

## PAINTING

Painting of Frame:

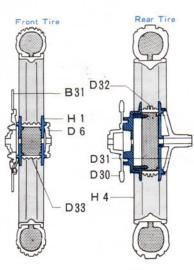
Paint the black parts in black. Do it scrupulously a half at a time so that no portion will be left unpainted.



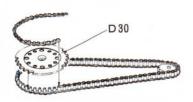


#### Fig. 13 Construction of Wheel

Construct Wheel, referring to the figure right. Don't glue Brass Pipe and Parts, D31. Paint letters on Tire in white.



#### (Construction of Chain)



#### (Construction of Brake Pedal)

As for Brake Pedal,B28,pass it through Frame and then fasten its spring with Frame and Parts, C39, as shown in the figure

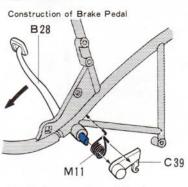


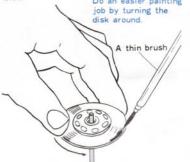
Fig. 15 Construction of Seat

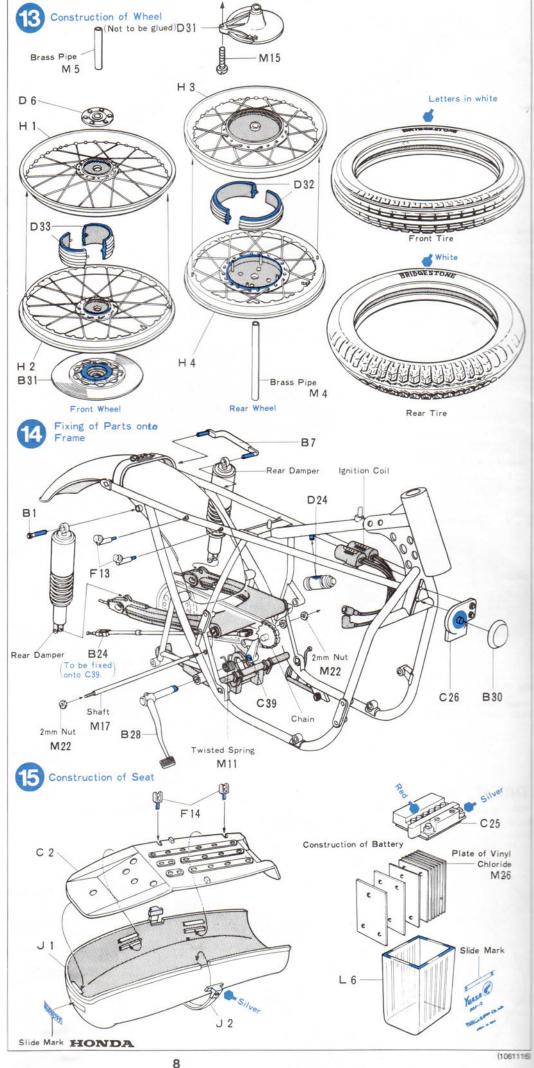
Fix Parts, C2, into Seat, J1. Glue Decal at the backside of Seat. Pile vinyl chloride plates of Battery alternately as shown in the illustration. Then, place the whole inside the case.

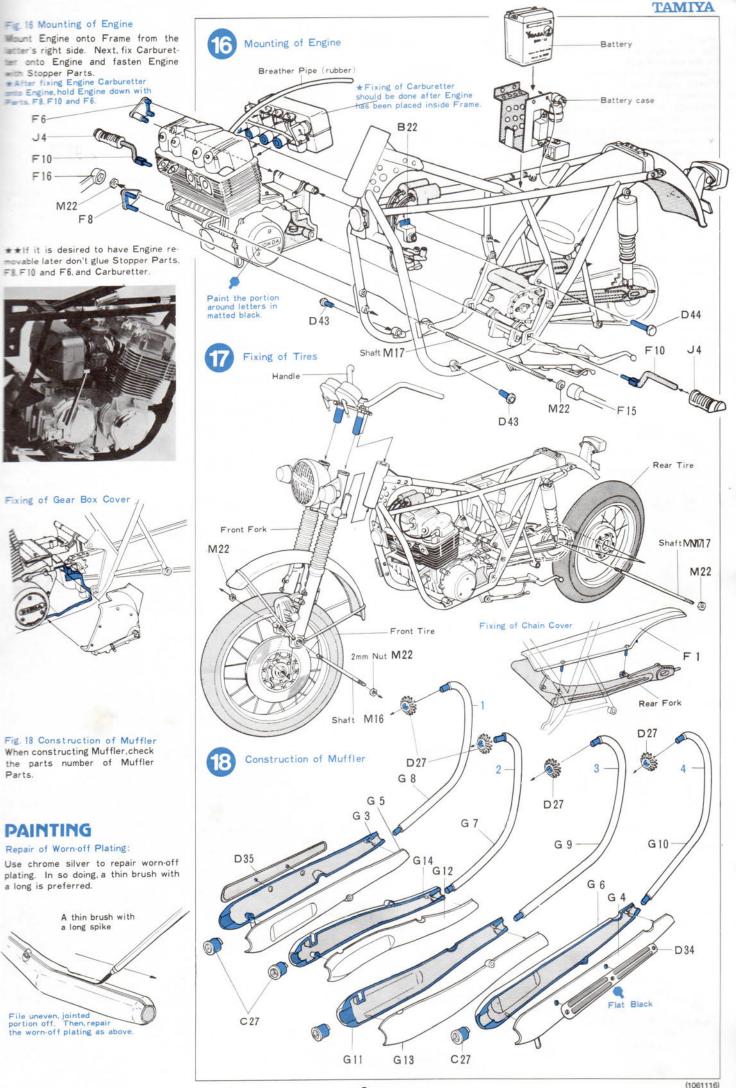
## PAINTING

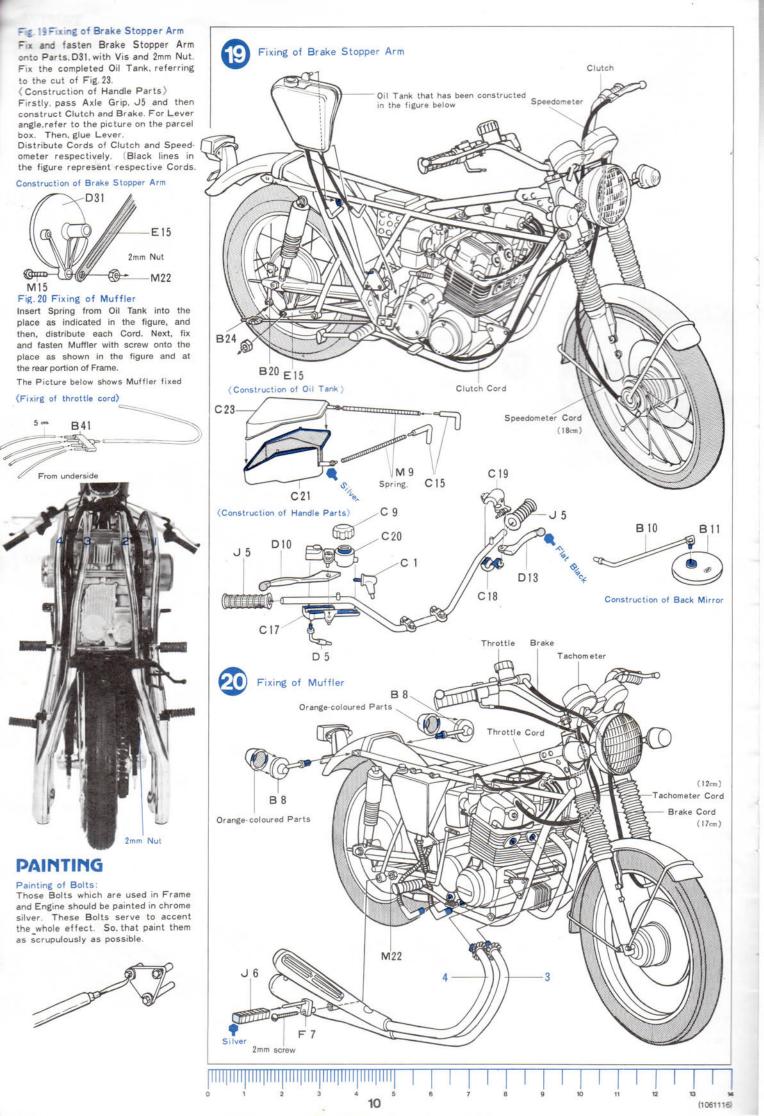
#### Painting of Disk Brake:

Firstly, polish the silver ground with compound. Then, paint Brake Shoeline in chrome silver. In so doing, turn the Disk. Do an easier painting









#### Fig. 21 Fixing of Fuel Tank Don't glue but just put Fuel Tank,

Side Cover, and Seat onto the frame.

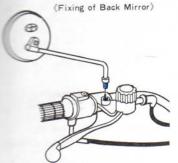


Fig. 22 Display of Engine Construct Display Stand and display Engine on the stand as shown in the photo.

Angle of Supports on Display Stand PAINTING

Finish of the Whole: After decals have been glued and dried up apply wax onto the whole to polish. In so doing, use a soft cloth with a little bit of wax.

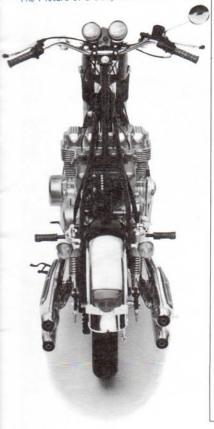
Even plating parts will be finished so beautifully that it will look completely different.



21 Fixing of Fuel Tank B16 Fuel Tank HONDA 44.1 A 5 Seat Metal Net 00 000 0000 000 a ()and a T MAG TIM I Metal Net A 4 1 Display of Engine ∟ 3 HONDACETSO Displaying engine. Black L 5

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The Picture of a Completed Model





TAMIYA

# PAINTING APPLYING DECALS

#### Painting:

Painting is done not only to change the colour of each parts. It is done so that shape and function of a particular parts will be made all the more clear.

Seven colours in all are to be used to increase a massive feeling of the model. Name of each colour will be found in right side of this page.

#### **Before Painting:** Parts:

Before painting, clean out any dusts and oils from the surface of each part with soft cloth. Wash out with detergent if needed. Those portions of parts on which cement has been overflowed can not be concealed by paint. After cement has dried, remove overflows with modeling knife and file to realize smooth surface.

Irreguler parting-line (place of joint between parts, or metals), too, should be corrected by filing.

Key to fine finishing of parts is to paint them after they have been assembled in their Band around fuel tank places. Parts of a same colour should be When Body colour is either painted together as far as possible after they blue or red, use a golden have been glued and their uneven jointed band. places, made fully even.



Needless to say, those parts which could not be reached by a painting brush once they have been constructed, should be painted before construction.

#### Painting tools:

Get a brush, a dissolving dish and a waste ready. For a painting brush, use one for design work. Use two kinds of brushes: A flat one and a thin one. And both should be of soft hairs and with long spikes.

For a dissolving dish, use either a china dish or a transparent prepackage in which the model parts has been contained. Or again, a palette bought at a paint shop will do.

painting, remove paints off After with lacquer thinner and brushes then wash them with water. Keep the cleansed brushes in good state for future use

#### Paints and Solvents

There two kinds of paints for the the alcohol-induced ones plastics and the enamel paints. For the former type, methyl-alcohol and for latter, the turpentine respectively can be used in place of thinner. So, get them at a pharmacy or a paint shop. Even in case of a same colour, each kind of paints could represent a colour feeling distinctly its own. Use either of them, therefore, to get a colour feeling best



For brush cleansing, cheap lacque thinner will be used. However, in using it, take care that lacquer thinner won't dissolve the plastics. Also, take full caution when useing paints and solvents as they catch fires easily.

#### Colours of Paints to be Used

Black: Glossy black, common to both kinds of paints.

#### Flat black:

Flat black, common to both kinds of paints.

Chrome silver: Bright silver colour. Glittering silver peculiar to a enamel one.

Silver: Common silver of the alcohol-type without gloss.

#### Chrome plating:

Plastic plating parts themselves. In repair, use chrome silver.

Gun Metal: Used for painting chain.

Express metal place with black leather

(Body colour : In a Honda CB750 model, metallic colours should be used.

#### (Other colours:)

Seven colours in all are used to paint the whole of the model. Also, some other colours like red, white and grey will be used to accent the painting effect.

See further colour photogravures of the original motorcycle or pictures in catalogue to produce a much better feeling of actuality by painting.

#### Applying Decals

Where to apply decals are indicated in the two-view plan below. However, each precise spot to be applied with a decal will be found in each figure for construction. See it for precise work.

(1) A decal to be applied should be cut off beforehand.

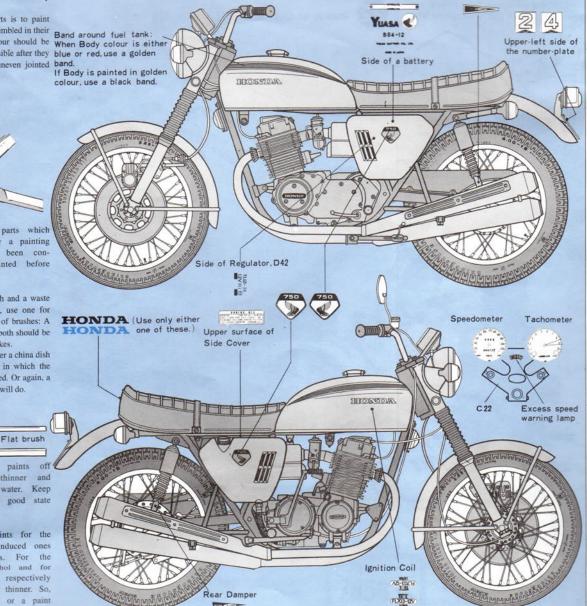
2 Dip it in water. When the ground paper it is on arches, get the whole out of water to place on a cloth such as a towel.

(3) A minute or two later, hold edge of the ground paper to slide the decal onto the model from the ground paper.

(4) Then, get a little of water on your finger to wet the decal so that the latter will be moved more easily onto the right spot.

(5) Press the decal down with a soft cloth such as a towel to force air bubbles out of underside of the decal. Continue the work until the excess water, too, will be fully absorbed.

When the surface to be applied with a decal is uneven or curved, press the decal down with a steamed towel so that the warmed, wet decal will fit the surface well. Cut off the excess transparent portion around a decal before applying. When so done, you can expect a sharp finish with the decal precisely in its specified place.



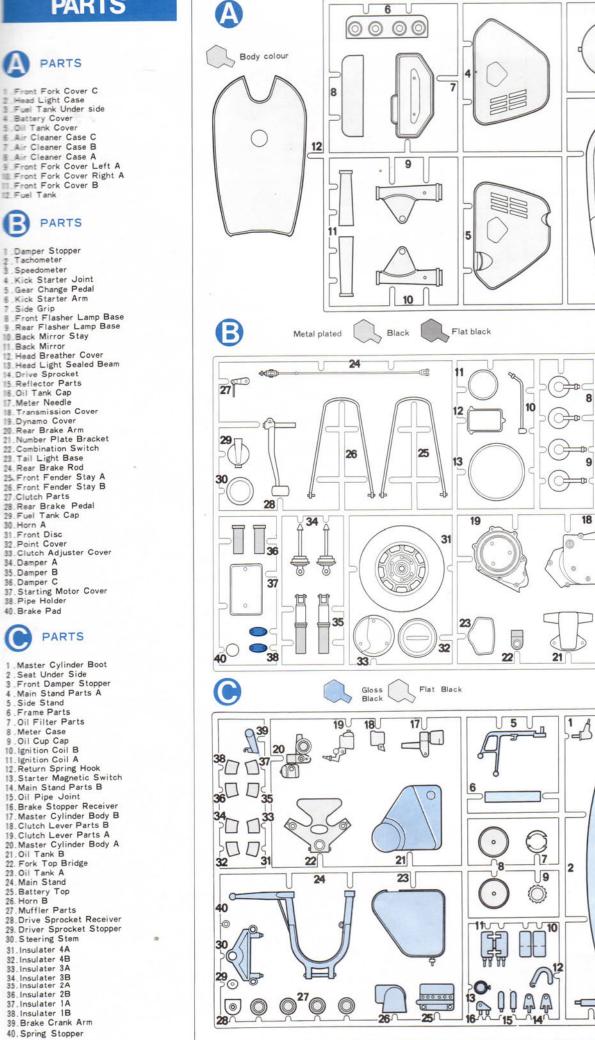
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This is not needed.

# PARTS

B



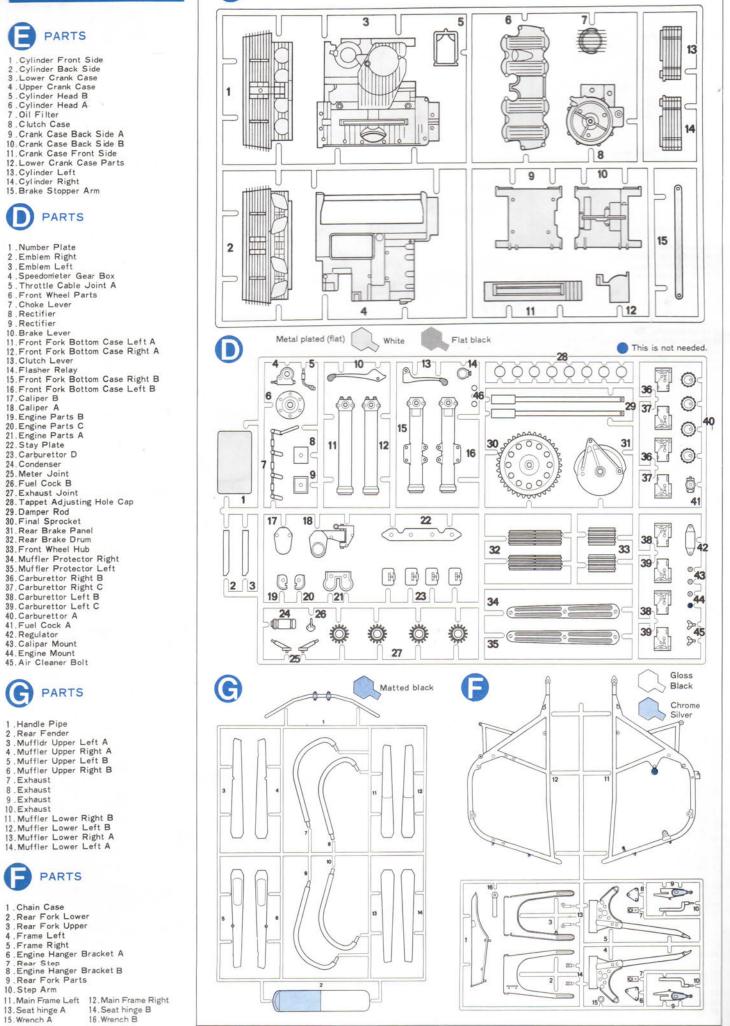
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# PARTS

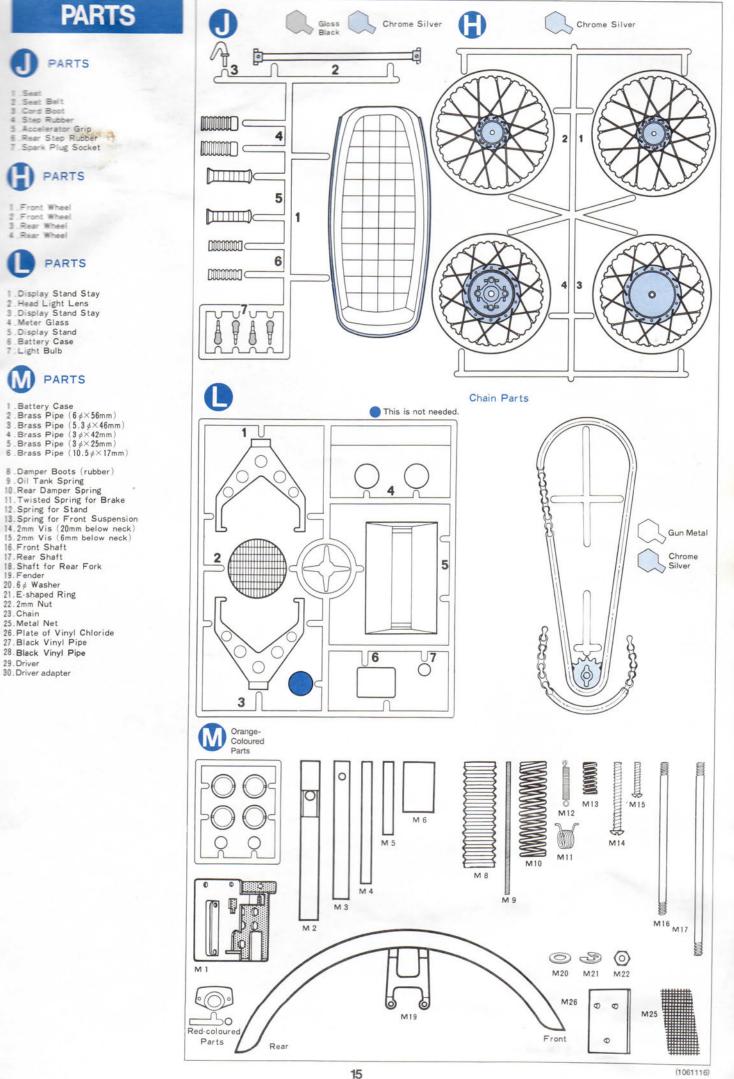
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29. Driver

