F.B Mondial

CR125

Motorcycle Service Manual

KS MOTORCYCLES - https://ksmotorcycles.com

Quick Reference Guide

This quick reference guide will assist You in locating a desired topic or procedure.
Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
Refer to the sectional table of contents for the exact pages to locate the specific topic required.

CR125

Motorcycle Service Manual

©2017 PELPI INTERNATIONALS,R,L First Edition (1) :march.30,2017 (K)

LIST OF ABBREVIATIONS

A	ampere(s)	lb	pound(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	min	minute(s)
ATDC	after top dead center	N	newton(s)
BBDC	before bottom dead center	Pa	pascal(s)
BDC	bottom dead center	PS	horsepower
BTDC	before top dead center	psi	pound(s) per square inch
℃	degree(s) Celsius	r	revolution
DC	direct current	rpm	revolution(s) per minute
F	farad(s)	TDC	top dead center
°F	degree(s) Fahrenheit	TIR	total indicator reading
ft	foot, feet	V	volt(s)
g	gram(s)	W	watt(s)
h	hour(s)	Ω	ohm(s)
L	liter(s)		

Foreword

This manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic in-Formation to make it useful to the owner who de-Sires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, The proper use of tools, and workshop proce-Dures must be understood in order to carry out maintenance and repair satisfactorily. When-Ever the owner has insufficient experience or doubts his ability to do the work, all adjust-ments, maintenance, and repair should be car-ried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thor-Oughly familiarize yourse Lf with the procedures Before starting work, and then do the work care-fully in a clean area. Whenever special tools or Equipment are specified, do not use makeshift tools or equipment. Precision measurements Can only be made if the proper instruments are Used, and the use of substitute tools may ad-versely affect safe operation.

For the duration of the warranty period, we recommend that all repairs and scheduled Maintenance be performed in accordance with this service manual. Any owner maintenance or Repair procedure not performed in accordance with this manual may void the warranty.

To get the longest life out of your vehicle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and MONDIAL,PELPI Mo-torcycle parts. Special tools, gauges, and testers that are necessary when servicing MONDIAL,PELPI motorcycles are introd-uced by the Service Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual care-fully. Don't take shortcuts.
- Remember to keep complete records of main-tenance and repair with dates and any new parts installed.

How to Use This Manual

In this manual, the product is divided into its major systems and these systems make up The manual's chapters. The Quick Reference Guide shows you all of the product's system And assists in locating their chapters. Each Chapter in turn has its own comprehensive Ta-ble of Contents.

For example, if you want ignition coil informa-Tion, use the Quick Reference Guide to locate The Electrical System chapter. Then, use the Table of Contents on the first page of the chap-ter to find the Ignition Coil section.

Whenever you see these WARNING and CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

This warning symbol identifies special Instructions or procedures which, if not Correctly followed, could result in per-sonal injury, or loss of life.

CAUTION

This caution symbol identifies special Instructions or procedures which, if not Strictly observed, could result in dam-age to or destruction of equipment.

This manual contains four more symbols (in Addition to WARNING and CAUTION) which will Help you distinguish different types of informa-tion.

NOTE

◦ This note symbol indicates points of par-Ticular interest for more efficient and con-venient operation.

- Indicates a procedural step or work to be done.

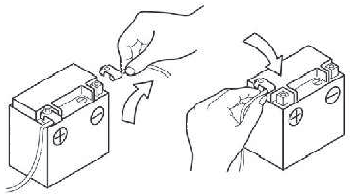
◦ Indicates a procedural sub-step or how to do The work of the procedural step it follows. It also precedes the text of a NOTE.

★Indicates a conditional step or what action to Take based on the results of the test or inspec-Tion in the procedural step or sub-step it fol-lows.

In most chapters an exploded view illustration Of the system components follows the Table of Contents. In these illustrations you will find the Instructions indicating which parts require spec-Ified tightening torque, oil, grease or a locking agent during assembly.

General Information

Table of Contents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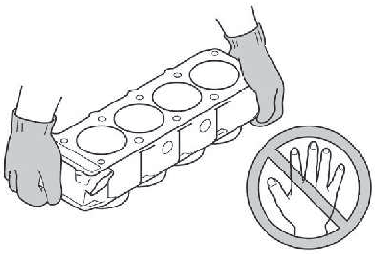

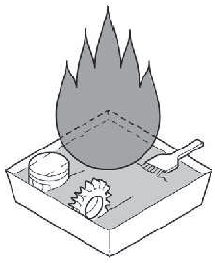

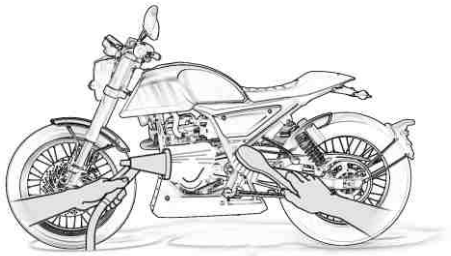

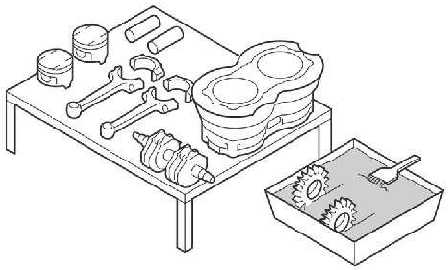

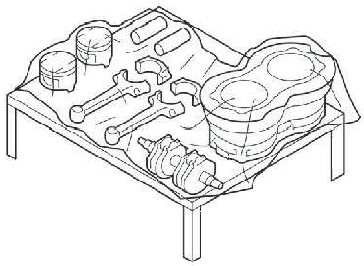

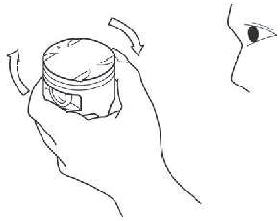

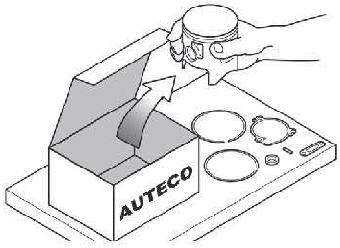
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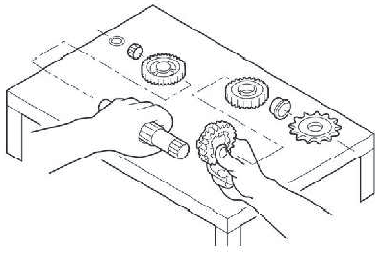

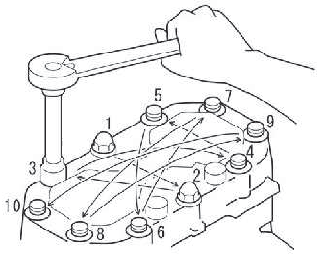
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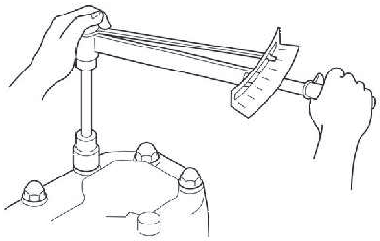

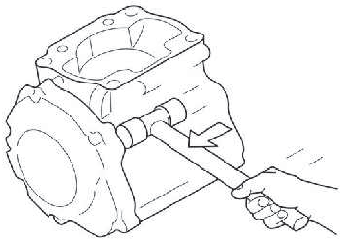

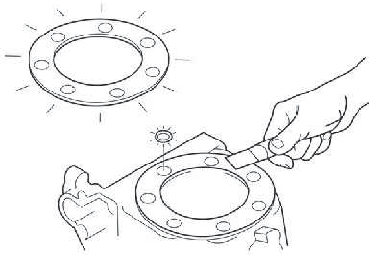

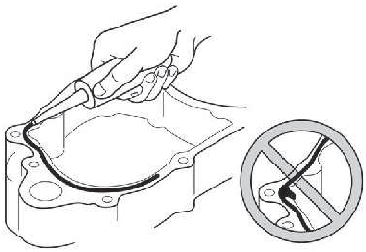

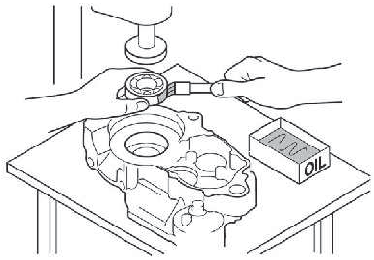
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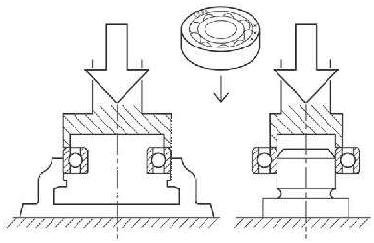

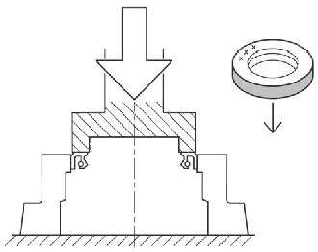

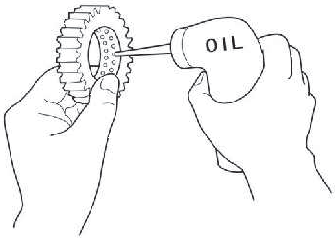
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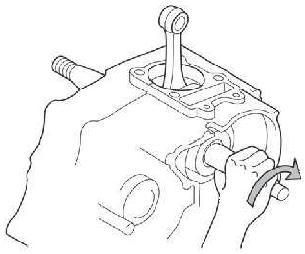
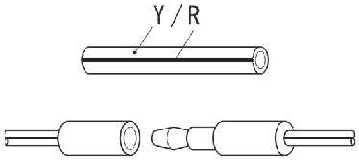


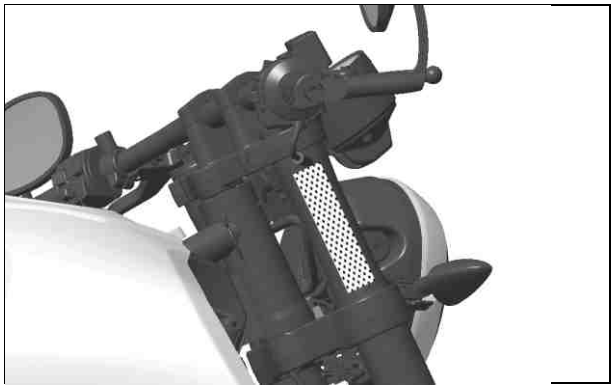

Y/R

Model Identification

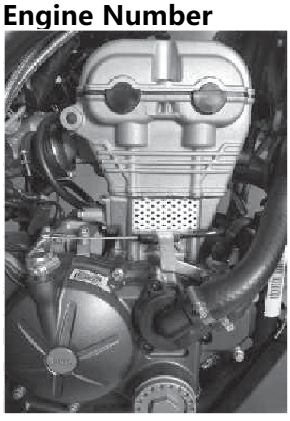
CR 125 Left Side View

CR 125 Right Side View

Frame Number



Engine Number



General Specifications

Items	CR125
Dimensions	
Overall Length	2025mm (79.72 in.)
Overall Width	710mm (27.95 in.)
Overall Height	1050mm (41.34 in.)
Wheelbase	1360mm (53 54 in.)
Road Clearance	300 mm(11 .81in .)
Seat Height	910mm (35.82 in.)
Curb Mass:	208kg (458.64 lb)
Front	97kg (213.89 lb)
Rear	111kg (244.76 lb)
Fuel Tank Capacity	1 1 L (2 . 9 Us gal)
Declared maximum vehicle speed	99 km/h
Performance	
Minimum Turning Radius	2.1 m (6.9 ft)
Engine	
Type	4-stroke, single cylinder,
Cooling System	Liquid-cooled
Bore and Stroke	58×47mm (2.28×1.85in.)
Engine capacity	124 cm^3
Volumetric compression ratio	12.0 ± 0.5 : 1
Maximum net power combustion engine	10.0 kW at 9750 min-1 at A/F ratio: 1.237
Maximum net torque combustion engine	10.5Nm at 8000 min-1 at A/F ratio: 1.051
Number of inlet and exhaust valves	2 inlet valves and 2 exhaust valves
Number and minimum cross-sectional areas of inlet and outlet ports	450mm^2 at the inlet conduit 300mm^2 at the outlet of the exhaust
Firing order	Single cylinder
Timing Advance	Idle advance angle
Ignition Timing	8° BTDC @1 400 r/min (rpm) ~30° BTDC @4 000 r/min (rpm)
Spark Plug	NGK CR8EB
Valve Timing:	When rising 1mm
Inlet:	
Open	17° BTDC
Close	27° ABDC
Exhaust:	When rising 1mm
Open	28° BBDC
Close	8° ATDC
Lubrication System	Pressure and splash
Engine Oil:	
Type	10w/40

General Specifications

Items	CR125
Drive Train	
Primary Reduction System:	
Type	Gear
Reduction Ratio	3.35
Clutch Type	Wet, multi disc
Transmission:	
Type	6-speed, constant mesh, return shift
Gear Ratios:	
1st	2.270
2nd	2.000
3rd	1.500
4th	1.200
5th	1.080
6th	1.045
Final Drive System:	
Type	Chain drive
Reduction Ratio	3.308 (43/13)
Overall Drive Ratio	9.051 @Top gear
Frame	
Type	Tubular, cradle
Steering Angle	≤47℃
Caster (rake angle)	26℃
Trail	53.5mm
Front Tire:	
Size	100/90-18 56P
Rear Tire:	
Size	130/80-17 65P
Rim Size:	
Front	2.15×18
Rear	3.00×17
Front Suspension:	
Type	Telescopic fork
Rear Suspension:	
Type	Swingarm (Uni-trak)
Brake Type:	
Front and Rear	disc
Effective Disc Diameter:	
Front (effect. dia.)	280mm (11.02 in.)
Rear (effect. dia.)	220mm (8.66 in.)
Electrical Equipment	
Battery	12M6AS-3B
Ignition coil(s):	
Type	GF500-LK1

General Specifications

Items	CR125
Headlight:	
Type	Semi-sealed beam
Bulb	12 V 35W/35W (Hi/Lo)
Tail/Brake Light	12 V 5W/21W
Alternator:	
Type	Full-wave DC
Rated Output	–
PCUs/ECUs:	
Type	CM275601
Identification number	34 36 34 32 41 46 41 4F 20 20 20 [4642AFAO]

Specifications subject to change without notice, and may not apply to every country.

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	×1 000 000
kilo	k	×1 000
centi	c	×0 .01
milli	m	×0.001
micro	U	×0.000001

Units of Mass:

Kg ×	2. 205	=	Lb
G ×	0.03527	=	oz

Units of Volume:

L ×	0.2642	=	gal (US)
L ×	0.2200	=	gal (imp)
L ×	1.057	=	qt (US)
L ×	0.8799	=	qt (imp)
L ×	2.113	=	pint (US)
L ×	1.816	=	pint (imp)
ML ×	0.03381	=	oz (US)
ML ×	0.02816	=	oz (imp)
ML ×	0.06102	=	cu in

Units of Force:

N ×	0.1020	=	kgf
N ×	0.2248	=	lb
Kgf ×	9.807	=	N
kgf ×	2.205	=	lb

Units of Length:

Km ×	0.6214	=	mile
M ×	3.281	=	ft
Mm ×	0.03937	=	in

Units of Torque:

N·m ×	0.1020	=	kgf·m
N·m ×	0.7376	=	Ft·lb
N·m ×	8.851	=	in·lb
Kgf·m ×	9.807	=	N·m
Kgf·m ×	7.233	=	ft·b
Kgf·m ×	86.80	=	in·lb

Units of Pressure:

Kpa ×	0.01020	=	kgf/cm ^{2}
Kpa ×	0.1450	=	psi
Kpa ×	0.7501	=	cm Hg
Kgf/cm^2 ×	98.07	=	kPa
Kgf/cm^2 ×	14.22	=	psi
Cm Hg ×	1.333	=	kPa

Units of Speed:

Km/h ×	0.6214	=	mph

Units of Power:

KW ×	1.360	=	PS
KW ×	1.341	=	HP
PS ×	0.7355	=	kW
PS ×	0.9863	=	HP

Units of Temperature:

Periodic Maintenance

Table of Contents

Periodic Maintenance Chart

The scheduled maintenance must be done in accordance with this chart to keep the motorcycle in Good running condition.**The initial maintenance is vitally important and must not be neglected.**

Periodic Inspection

FREQUENCY / ITEM	Whichever comes first ■ / Every ■	* ODOMETER READING ×1 000 km (× 1 000 mile) 1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	36 (22.5)	See Page
Fuel System									
Air cleaner element - clean				•		•		•	2-13
Throttle control system (play, Smooth return, no drag) - inspect	year	•		•		•		•	2-14
Choke operation - inspect	year	•		•		•		•	2-14
Idle speed - inspect		•		•		•		•	2-15
Fuel leak - inspect	year	•		•		•		•	2-15
Fuel hose damage - inspect	year	•		•		•		•	2-15
Fuel hose installation condition - inspect	year	•		•		•		•	2-15
Engine Top End									
Valve clearance - inspect				•		•		•	2-16
Air suction system damage - inspect				•		•		•	2-17
Clutch									
Clutch operation (play, disengagement, engagement) - inspect		•		•		•		•	2-18
Wheels and Tires									
Tire air pressure - inspect	year			•		•		•	2-19
Wheel/tire damage - inspect				•		•		•	2-19
Tire tread wear, abnormal wear - inspect				•		•		•	2-19
Wheel bearings damage - inspect	year			•		•		•	2-20
Spoke tightness and rim runout - inspect		•	•	•	•	•	•	•	2-20
Final Drive									
Drive chain lubrication condition - inspect #	Every 600 km (400 mile)								2-21
Drive chain slack - inspect #	Every 1 000 km (600 mile)								2-22
Drive chain wear - inspect #			•	•	•	•	•	•	2-24
Drive chain guide wear - inspect				•		•		•	2-25
Brakes									
Brake fluid leak - inspect	year	•	•	•	•	•	•	•	2-26
Brake hose damage - inspect	year	•	•	•	•	•	•	•	2-27
Brake hose installation condition - inspect	year	•	•	•	•	•	•	•	2-27

Periodic Maintenance Chart

FREQUENCY / ITEM	Whichever comes first ■ / Every ■	* ODOMETER READING ×1 000 km (× 1 000 mile) 1 (0.6)	6 (3.75)	12 (7.5)	18 (11.25)	24 (15)	30 (18.75)	36 (22.5)	See Page
Brake fluid level - inspect	6 months	●	●	●	●	●	●	●	2-27
Brake pad wear - inspect #			●	●	●	●	●	●	2-28
Brake operation (effectiveness, play, no drag) - inspect	year	●	●	●	●	●	●	●	2-27
Brake light switch operation - inspect		●	●	●	●	●	●	●	2-28
Suspension									
Front forks/rear shock absorber Operation (damping and smooth stroke) - inspect				●		●		●	2-29
Front forks/rear shock absorber oil leak - inspect	year			●		●		●	2-29, 2-30
Rocker arm bearings - lubricate						●			2-30
Rocker arm operation - inspect				●		●		●	2-30
Tie-rods operation - inspect				●		●		●	2-30
Swingarm pivot - lubricate						●			2-31
Steering									
Steering play - inspect	year	●		●		●		●	2-31
Steering stem bearings - lubricate	2 years					●			2-32
Electrical System									
Lights and switches operation - inspect	year			●		●		●	2-33
Headlight aiming - inspect	year			●		●		●	2-37
Engine stop switch operation - inspect	year			●		●		●	2-38
Others									
Chassis parts - lubricate	year			●		●		●	2-38
Bolts and nuts tightness - inspect		●		●		●		●	2-40

#: Service more frequently when operating in severe conditions; dusty, wet, muddy, high speed or frequent starting/stopping.
*: For higher odometer readings, repeat at the frequency interval established here.

Periodic Maintenance Chart

Periodic Replacement Parts

FREQUENCY / ITEM	Whichever comes first ■ / ■ Every	* ODOMETER READING ×1 000 km (× 1 000 mile) ■ 1 (0.6)	12 (7.5)	24 (15)	36 (22.5)	48 (30)	See Page
Air cleaner element # - replace	2 years		●	●	●	●	2-41
Fuel hose - replace	4 years			●		●	2-42
Engine oil # - change	year	●	●	●	●	●	2-43
Oil filter - replace	year		●	●	●	●	2-43
Brake hose - replace	4 years			●		●	2-44
Brake fluid - change	2 years		●	●	●	●	2-45
Rubber parts of master cylinder and caliper - replace	3 years					●	2-47, 2-49
Spark plug - replace				●		●	2-52

#: Service more frequently when operating in severe conditions; dusty, wet, muddy, high speed or frequent starting/stopping.

*: For higher odometer readings, repeat at the frequency interval established here.

2-6 PERIODIC MAINTENANCE

Torque and Locking Agent

Non-permanent locking agent or silicone sealant etc.

Fastener	Torque		
	N•m	Kgf•m	Ft•lb
Left-side cover and Frame bolts (M6x20)	5~8	0.5~0.8	3.7~5.9
Right-side cover and Frame bolts (M6x20)	5~8	0.5~0.8	3.7~5.9
Meter and Meter Bracket bolts (M6x20)	6~10	0.6~1.0	4.4~7.4
Ignition lock and Direction of the column webs bolts (M8x16)	15~20	1.5~2.0	11~15
Fuel tank and frame bolts (M8x30)	25~30	2.5~3.0	18~22
Left rear pedal and frame bolts (M8x30)	25~30	2.5~3.0	18~22
Right rear foot and frame bolts (M8x30)	25~30	2.5~3.0	18~22
Engine front support and the frame bolt (M8x80)	20~25	2.0~2.5	15~18
Engine and Engine front support bolt (M10x16)	37~39	3.8~4.0	27.3~28.8
Engine and the frame bolt (M8x95)	37~39	3.8~4.0	27.3~28.8
Cushion and frame bolts (M6x16)	6~9	0.6~0.9	4.4~6.6
Ignition coil and the frame bolt (M3x25)	6~9	0.6~0.9	4.4~6.6
Battery bracket and frame bolts (M6x16)	6~9	0.6~0.9	4.4~6.6
Battery bracket and frame bolts (M6x20)	6~9	0.6~0.9	4.4~6.6
After the license holder and Rear fender bolts (M6x16)	6~9	0.6~0.9	4.4~6.6
Intake manifold and engine bolts (M6x20)	17~19	1.7~1.9	12.5~14
Horn and frame bolts (M6x12)	17~19	1.7~1.9	12.5~14
Rectifier and frame bolt (M6x25)	6~9	0.6~0.9	4.4~6.6
Tool box and frame bolts (M6x16)	6~9	0.6~0.9	4.4~6.6
Mileage Clamps and Under the direction of the column webs bolts(M6x12)	50~60	5~6	36.9~44.3
Front fender bracket and Front shock bolts (M6x12)	6~9	0.6~0.9	4.4~6.6
Rear fender bracket and Fork bolts (M6x20)	6~9	0.6~0.9	4.4~6.6
After the left turn signal bracket and rear fender bolt (M8x16)	15~20	1.5~2.0	11~15
After the right turn signal bracket and rear fender bolt (M8x16)	15~20	1.5~2.0	11~15
Mileage Clamps and former damping Screws (M5x30)	3~5	0.3~0.5	2.2~3.7
Fill valve and frame bolts (M6x20)	6~9	0.6~0.9	4.4~6.6
Fuel tank and fuel tank lock screws (M5x20)	5~8	0.5~0.8	3.7~5.9
Engine skid plate and frame screws (M6x16)	5~8	0.5~0.8	3.7~5.9
Rear mudguard and rear license plate lamp socket screw(ST4.2x13)	2.5~5	0.3~0.5	1.8~3.7
Mufflerand engine bolts (M8x25)	20~25	2~2.5	15~18
Muffler and frame bolt(M8x45)	20~25	2~2.5	15~18
Front disc brake hose clamp offline and former damping bolt(M6x16)	6~9	0.6~0.9	4.4~6.6
Rear disc brakes front pump and the frame bolt (M6x25)	25~30	2.5~3.0	18~22
Rear disc brake hose and fork bolt(M6x12)	4~7	0.4~0.7	3.0~5.2
Rear disc pump bolts (M8x20)	25~30	2.5~3.0	18~22

Torque and Locking Agent

Fastener	Torque		
	N•m	Kgf•m	Ft•lb
Frame (rear brake arm limit) Bolts (M6x35)	6~9	0.6~0.9	4.4~6.6
After the disc oil cup and frame bolts (M6x16)	5~8	0.5~0.8	3.7~5.9
Muffler cover screws (M6x16)	5~8	0.5~0.8	3.7~5.9
Pump and front disc brakes at the front shock absorber bolts(M8x35)	30~40	3.0~4.0	22~30
Sprocket wheel and After Article wheel bolts (M10x1.25x25)	17~19	1.7~1.9	12.5~14
Rear axle locknut (M14x1.5)	70~80	7~8	51.6~59
After the shock and frame bolts(M10x1.25x70)	25~30	2.5~3.0	18~22
Rear shock and fork bolt(M10x1.25x70)	25~30	2.5~3.0	18~22
Fork shaft nut(M14x1.5)	70~75	7~7.5	51.6~55.3
Side of the bracket and frame bolt (M10x1.25x35-20)	17~19	1.7~1.9	12.5~14
Radiator and frame bolts	8~10		
Flameout switch and side bracket bolts	2.5~3.5		
Direction and the upper plate	22~24		
Left front pedal frame	17~19	1.7~1.9	12.5~14
Right front pedal frame	17~19	1.7~1.9	12.5~14
Left rear pedal frame	17~19	1.7~1.9	12.5~14
Right rear pedal frame	17~19	1.7~1.9	12.5~14

Torque and Locking Agent

Fastener	Torque		
	N•m	Kgf•m	Ft•lb
Bearing plate	8~16	0.8~1.6	5.9~12
Shifting arm bolts	11~13	1.1~1.3	8.1~9.6
Co-Box Bolt	8~16	0.8~1.6	5.9~12
Oil drain plug	20~30	2.0~3.0	15~22
Pressure pin body baffle	8~16	0.8~1.6	5.9~12
Gear indication	8~16	0.8~1.6	5.9~12
Positioning plate bolts	8~16	0.8~1.6	5.9~12
Five Star board	8~16	0.8~1.6	5.9~12
Start shaft stopper plate	8~16	0.8~1.6	5.9~12
Oil pump bolt	8~16	0.8~1.6	5.9~12
Clutch bolts	38~45	3.8~4.5	28~33
Filter Nut	50~65	5.0~6.5	37~48
Balancer shaft nut	38~45	3.8~4.5	28~33
Oil filter cover screws	5~11	0.5~1.1	3.7~8.1
Co-head bolts	8~16	0.8~1.6	5.9~12
AB bolt	9~12	0.9~1.2	6.6~8.9
Chain guard bolt	8~16	0.8~1.6	5.9~12
Cylinder head exhaust port studs	12~18	1.2~1.8	8.9~13
Spark Plug	10~20	1.0~2.0	7.4~15
Camshaft baffle bolts	8~16	0.8~1.6	5.9~12
AB bolt nut	32~38	3.2~3.8	24~28
Cylinder casing bolts	8~16	0.8~1.6	5.9~12
Being driven sprocket clockwise bolt	12~14	1.2~1.4	8.9~10
Tensioner	8~16	0.8~1.6	5.9~12
Valve adjusting screw	11~13	1.1~1.3	8.1~9.6
Cylinder head cover oil passage bolts	8~16	0.8~1.6	5.9~12
Cylinder head cover bolts	6~7	0.6~0.7	4.4~5.2
Start the motor mounting bolts	8~16	0.8~1.6	5.9~12
Magneto mounting nut	50~60	5.1~6.1	40~44
Stator	7~15	0.7~1.5	5.2~11
Sensing	7~15	0.7~1.5	5.2~11
	8~16	0.8~1.6	5.9~12

Torque and Locking Agent

The table below, relating tightening torque to thread diameter, lists the basic torque for the bolts and Nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

Basic Torque for General Fasteners

Threads Diameter (mm)	Torque		
	N•m	Kgf•m	Ft•lb
8	25 - 30	2.55 - 3	18.4 - 22.1 in·lb
10	40 - 50	4.08 - 5.1	29.5 - 36.8in·lb
10	40 - 50	4.08 - 5.1	29.5 -36.8
10	35 - 45	3.57 - 4.5	25.8 -33.1
8	15 - 20	1.52 -2.04	11.0 -14.7
10	30 - 40	3.05 - 4.08	22.1 - 29.5
14	50 - 60	5.1 - 6.11	36.8 -44.2

Specifications

Item	Standard	Service Limit
Fuel System (DFI)		
Throttle Grip Free Play	2~ 3 mm (0.08~0.12 in.)	— — —
Idle Speed	1 400 ±100 r/min (rpm)	— — —
Air Cleaner Element	Polyurethane Foam	— — —
Air Cleaner Element Oil	High quality form air filter oil	— — —
Engine Top End		
Valve Clearance:		
Exhaust	0.05±0.01 mm(0.0019±0.0039in)	— — —
Inlet	0.05±0.01 mm(0.0019±0.0039in)	— — —
Clutch		
Clutch Lever Free Play	2 - 3 mm (0.08 -0.12 in.)	— — —
Engine Lubrication System		
Engine Oil:		
Type	10w/40	— — —
Viscosity	SAE 10W-40	— — —
Capacity	1000mL (0.90 US qt) (when filter is not removed)	— — —
	0.95 L (1.00 US qt) (when filter is removed)	— — —
	1.10 L (1.16 US qt) (when engine is completely dry)	— — —
Level	Between upper and lower level lines (Wait Several minutes after idling or running)	— — —
Wheels/Tires		
Tread Depth:		
Front	6.5 mm (0.26 in.)	0.8 mm (0.03 in.)
Rear	8.0 mm (0.31in)	0.8 mm (0.03 in.)
Air Pressure (When Cold):		
Front	190 kPa (1.5 kgf/cm², 22 psi)	— — —
Rear	210 kPa (1.5 kgf/cm², 22 psi)	— — —
Rim Runout:		
Axial	TIR 0.8 mm (0.031 in.) or less	TIR 2.0 mm (0.08 in.)
Radial	TIR 1.2 mm (0.047 in.) or less	TIR 2.0 mm (0.08 in.)
Final Drive		
Drive Chain Slack	25 -40 mm (1.0 -1.6 in.)	— — —
Drive Chain Wear (20-link Length)	317.5mm	327mm
Standard Chain:		
Make	ZHENGHE	— — —
Type	520	— — —
Link	106links	— — —

Specifications

Item	Standard	Service Limit
Brakes		
Brake Fluid:		
Grade	DOT3 or DOT4	— — —
Brake Pad Lining Thickness:		
Front	7mm (0.27 in.)	1 mm (0.04 in.)
Rear	7mm (0.27 in.)	1 mm (0.04 in.)
Brake Light Timing:		
Front	5~10mm (0.19~0.39in)	— — —
Rear	ON after about 10 mm (0.39 in.) of pedal travel	— — —
Electrical System		
Spark Plug:	Make:NGK	
Type	CR9EB ; CR8E	— — —

Periodic Maintenance Procedures

Fuel System

Air Cleaner Element Cleaning

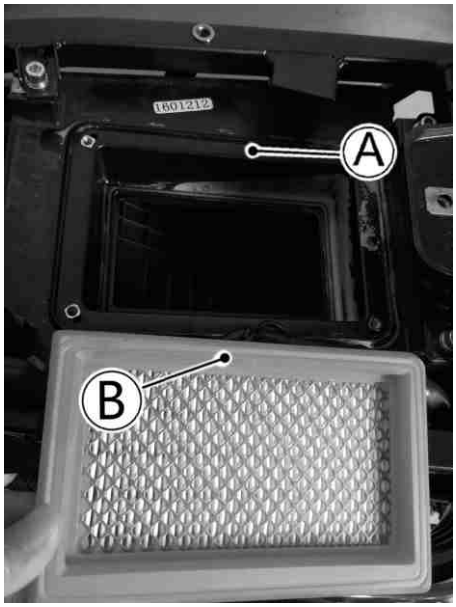
NOTE

- In dusty areas, the element should be cleaned more frequently than the recommended interval.
- After riding through rain or on muddily roads, the element should be cleaned immediately.

⚠ WARNING

Clean the element in a well-ventilated areas, and Make sure that there are no spark or flame any Where near the working area; this includes any Appliance with a pilot light. Because of the danger Of highly flammable liquids, do not use gasoline or a low flash-point solvent to clean the element.

- Remove the air cleaner element (see Air Cleaner Element Replacement).
- Separate the frame [A] from the element [B].



- Check that the air filter is clogged,filter clogging when using compressed air to blow dust filter and clean or replace the air filter.

CAUTION

Do not twist or blow the element. The element can be damaged.

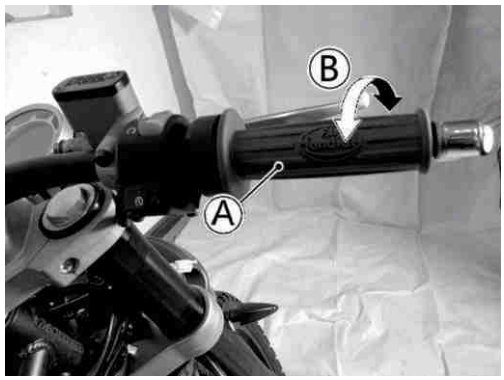
- Check the element and frame for visible damage.

★If the element and frame are damaged, replace them.

- Prohibit the use of cleaning agents to clean the air filter air filters,such as gasoline, low flash point Solvents,acidic, alkaline, organic volatile oil.

Periodic Maintenance Procedures

Throttle Control System Inspection

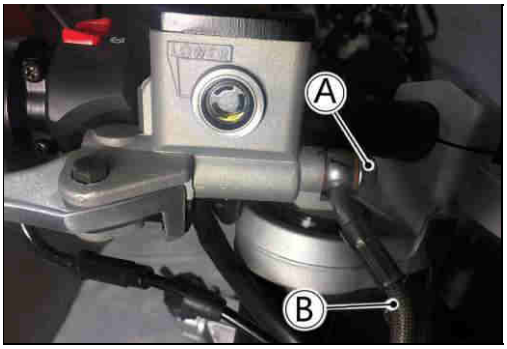


- Check that the throttle grip [A] moves smoothly from full Open to close, and the throttle closes quickly and completely by the return spring in all steering positions.

★If the throttle grip does not return properly, inspect the Throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cable.

- Check the throttle grip free play [B].

Throttle Grip Free Play
Standard: 2~ 3 mm (0.08~ 0.12 in.)

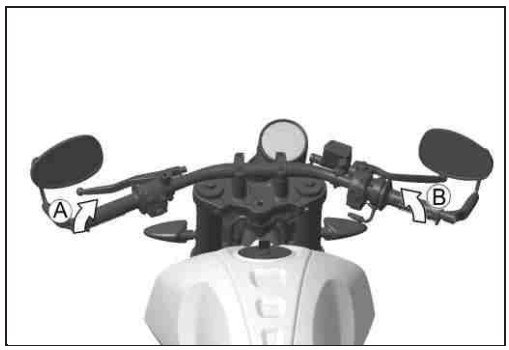


★If the free play is incorrect, adjust the throttle cable as follows.

- Loosen the locknut [A] at the throttle cable upper ends.
- Turn the accelerator cable adjuster [B] until 2~ 3 mm (0.08 ~0.12 in.) of throttle grip play is obtained.
- Tighten the locknut.

Periodic Maintenance Procedures

Idle Speed Inspection



- Start the engine and warm it up thoroughly.
- With the engine idling, turn the handlebar to both sides [A].

★If handlebar movement changes the idle speed, the Throttle cables may be improperly adjusted or incorrectly Routed or damaged. Be sure to correct any of these Conditions before riding (see Throttle Control System Inspection and Cable, Wire, and Hose Routing section in the Appendix chapter).

⚠ WARNING

Operation with improperly adjusted, incorrectly Routed or damaged cables could result in an unsafe riding condition.

Periodic Maintenance Procedures

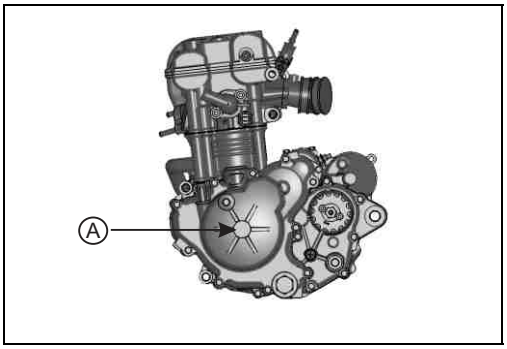
Engine Top End

Valve Clearance Inspection

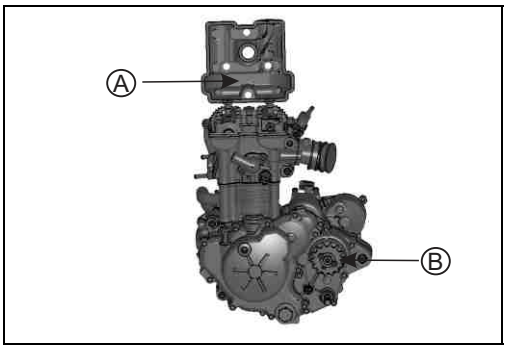
NOTE

◦ Valve clearance must be checked and adjusted when the engine is cold (at room temperature).

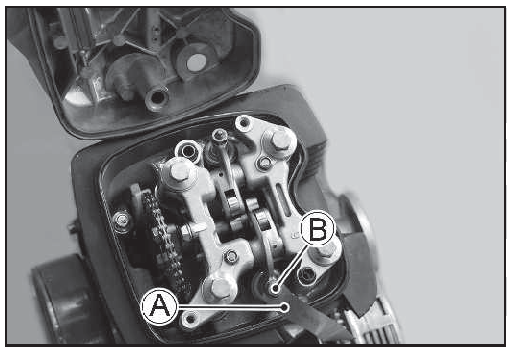
• Remove:
Alternator Cover Center Cap [A]



• Turn the alternator rotor bolt counterclockwise.
◦ Align the mark [A] of the camshaft sprocket with the pro-Jection [B] of the cylinder head. This shows that piston TDC is at the end of the compression stroke.



● With the thickness gauge [A], measure the valve clearance between the adjusting screw [B] and valve stem.
◦ Measure the clearance for both valves at a time.



Valve Clearance
Standard:
Exhaust 0.05±0.01 mm(0.0019±0.0039in)
Inlet 0.05±0.01 mm(0.0019±0.0039in)

NOTE

◦ Check the valve clearance using this method only. Checking the clearance at any other cam position may result in improper valve clearance.

★If the valve clearance is not within the specified range, adjust it.

Valve Clearance Adjustment

● Loosen the locknut, and turn the adjusting screw.

Special Tool - Valve Adjusting Screw Holder: 57001-1217

● Tighten:

Torque - Valve Adjusting Screw Locknuts: 8.8 N•m (0.90 kgf•m, 78 in•lb)

● Install the valve adjusting cap.
● Tighten:

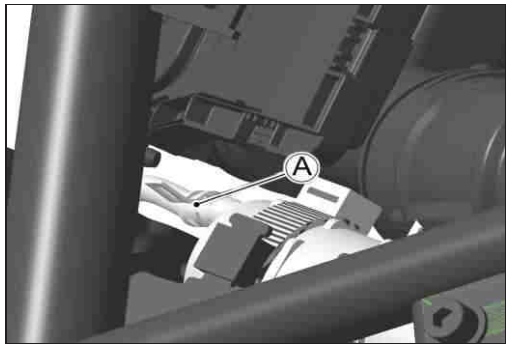
Torque - Valve Adjusting Cap Bolts: 8.8 N•m (0.90 kgf•m, 78 in•lb)

● Install the removed parts (see appropriate chapters).

Air Suction System Damage Inspection

● Remove the seat (see Seat Removal in the Frame chapter).
● Separate the vacuum switch valve hose [A] from the air cleaner housing.

● Start the engine and run it at idle speed.
●Plug the vacuum switch valve hose end [A] with your finger and feel vacuum pulsing in the hose.
★If there is no vacuum pulsation, check the hose line for leak.
★If there is no leak, check the vacuum switch valve (see Vacuum Switch Valve Operation Inspection in the Engine Top End chapter).

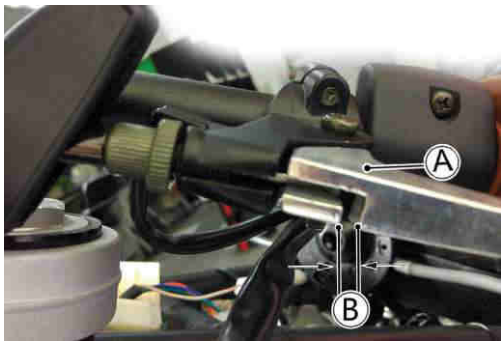


Periodic Maintenance Procedures

Clutch

Clutch Operation Inspection

- Pull the clutch lever [A] lightly, and check the clutch lever free play [B].

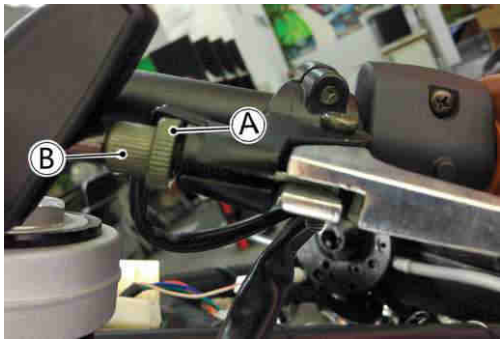


Clutch Lever Free Play
Standard: 2~ 3 mm (0.08~ 0.12 in.)

★If the free play is incorrect, adjust it.

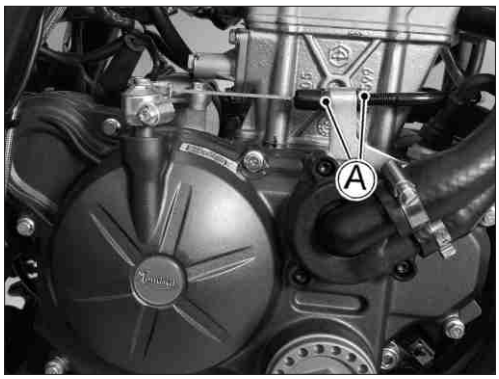
- Loosen the locknut [A].
- Turn the adjuster [B] to adjust the free play.
- Tighten the locknut.

★If the free play can not be adjusted with the adjuster at The clutch lever, use the adjuster at the lower end of the clutch cable.



- Turn the locknuts [A] until the free play is correct.
- After adjustment, start the engine and check that the clutch does not slip and that it release properly.
- Replace the exhaust pipe cover gaskets with new ones.
- Apply a non-permanent locking agent to the exhaust pipe cover bolts.
- Install the exhaust pipe cover.
- Tighten:

Torque - Exhaust Pipe Cover Bolts:4~7 N•m

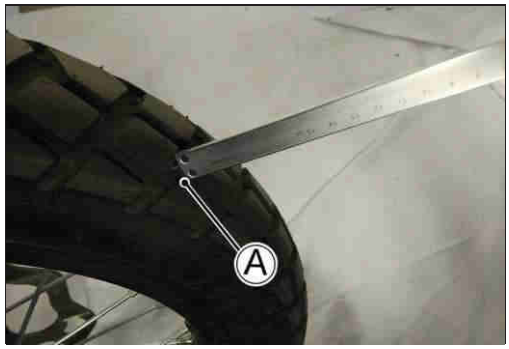


⚠ WARNING

When inspecting by running the motorcycle, note a Surrounding traffic situation enough in the place of safety.

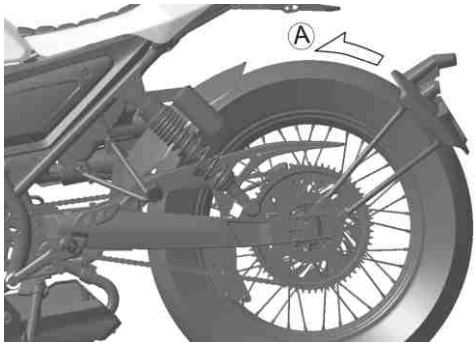
2

2



⚠ WARNING

To ensure safe handling and stability, use only the Recommended standard tires for replacement, inflated to the standard pressure.



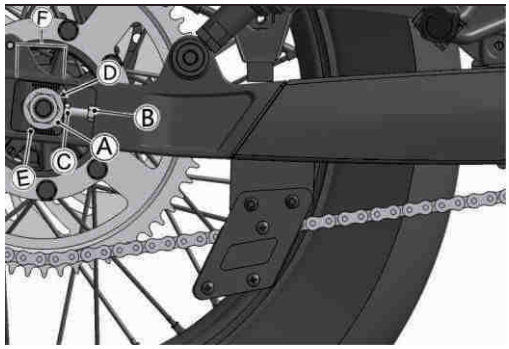
⚠ WARNING

If any spoke breaks, it should be replaced immedi-Ately. A missing spoke places an additional load on The other spokes, which will eventually cause other spokes to break.

-

A

F



⚠ WARNING

Misalignment of the wheel will result in abnormal Wear and may result in an unsafe riding condition.

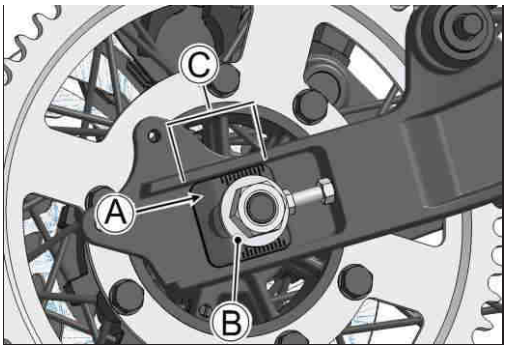
⚠ WARNING

If the axle nut is not securely tightened and the cot-Ter pin is not installed, an unsafe riding condition may result.

Wheel Alignment Inspection

- Check that the notch [A] on the right alignment indicator [B] aligns with the same swingarm mark or position [C] That the left alignment indicator notch aligns with.

★If they do not, adjust the chain slack and align the wheel alignment (see Drive Chain Slack Adjustment).

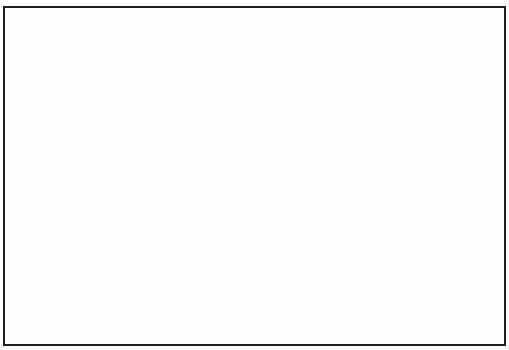


NOTE

◦ Wheel alignment can be also checked using the Straightedge or string method.

⚠

Misalignment of the wheel will result in abnormal Wear, and may result in an unsafe riding condition.



⚠ WARNING

If the drive chain wear exceeds the service limit, re-Place the chain or an unsafe riding condition may Result. A chain that breaks or jumps off the sprock-Ets could snag on the engine sprocket or lock the Rear wheel, severely damaging the motorcycle and causing it to go out of control.
For safely, use only the standard chain. It is an end-less type and should not be cut for installation.

Standard Chain

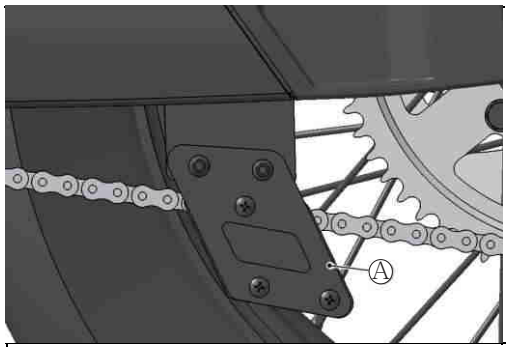
Make:	**ZHENGHE**
Type:	**520**
Link:	**106**

Periodic Maintenance Procedures

Chain Guide Wear Inspection

- Visually inspect the following parts.

Chain Guide [A]



★If the chain guides, chain slipper and chain guide roller Show any signs of abnormal wear or damage, replace them.

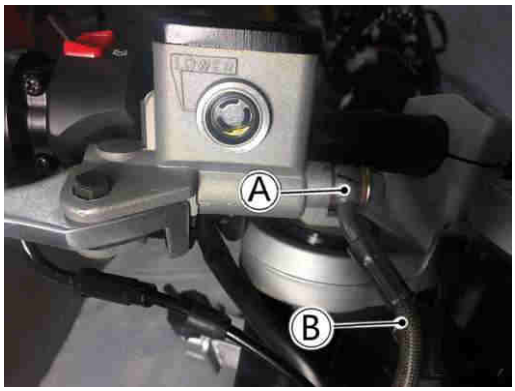
Periodic Maintenance Procedures

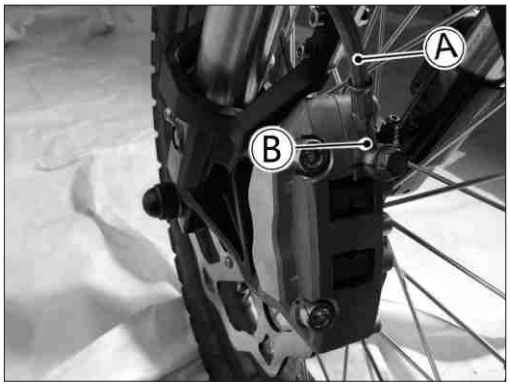
Brake System

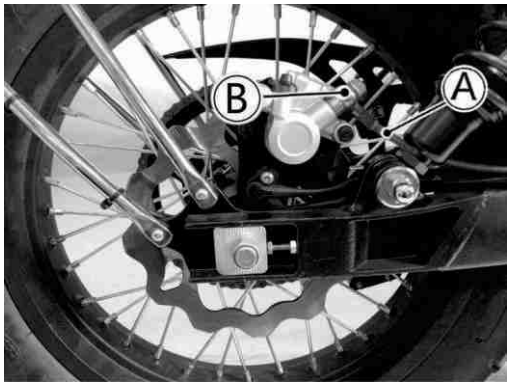
Brake Fluid Leak Inspection

- Apply the brake lever or pedal and inspect the brake fluid Leak from the brake hoses [A] and fittings [B].

★If the brake fluid leaked from any position, inspect or replace the problem part.





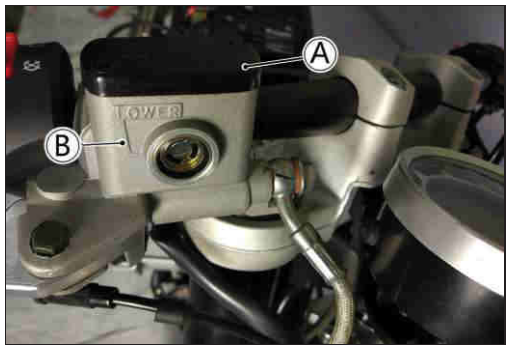


⚠ WARNING

When inspecting by running the vehicle, note a Surrounding traffic situation enough in the place of safety.

Brake Fluid Level Inspection

● Check that the brake fluid level in the front brake reservoir [A] is above the lower level line [B].



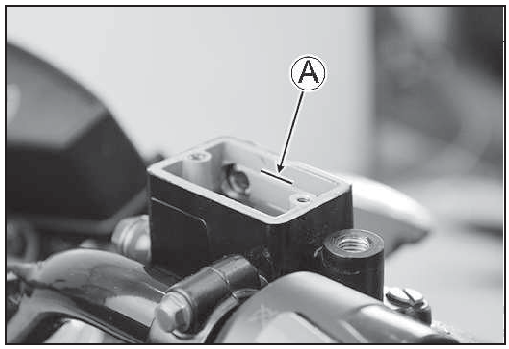
NOTE

◦ Hold the reservoir horizontal by turning the handlebar when checking brake fluid level.

★If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [A] in the reservoir.

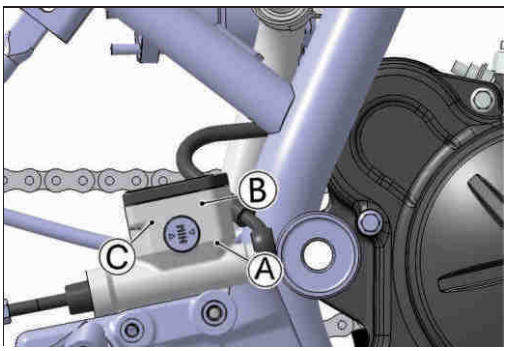
● Install the front master cylinder reservoir cap.

Torque - Front Brake Reservoir Cap Screws: 1.5 N•m (0.15 kgf•m, 13 in•lb)



- Check that the brake fluid level in the rear brake reservoir [A] is above the lower level line [B].

★If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [C].



⚠ WARNING

Change the brake fluid in the brake line completely If the brake fluid must be refilled but the type and Brand of the brake fluid that is already in the reser-Voir are unidentified. After changing the fluid, use Only the same type and brand of fluid thereafter.

Recommended Disc Brake Fluid
Grade: DOT3 or DOT4

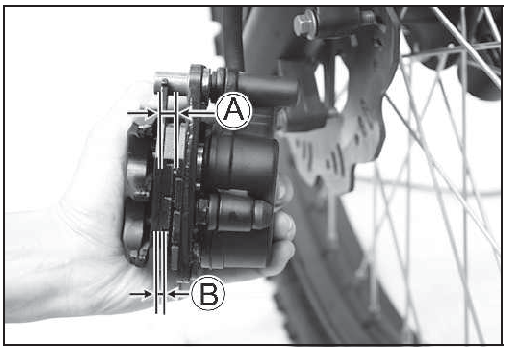
- Install the rear master cylinder reservoir cap.

Torque - Rear Brake Reservoir Cap Screws: 1.5 N• m(0.15 Kgf•m, 13 in•ib)

Brake Pad Wear Inspection

- Remove the caliper (see Front/Rear Caliper Removal in the Brakes chapter).
- Check the lining thickness [A] of the pads in each caliper.

★If the lining thickness of either pad is less than the service limit [B], replace both pads in the caliper as a set.

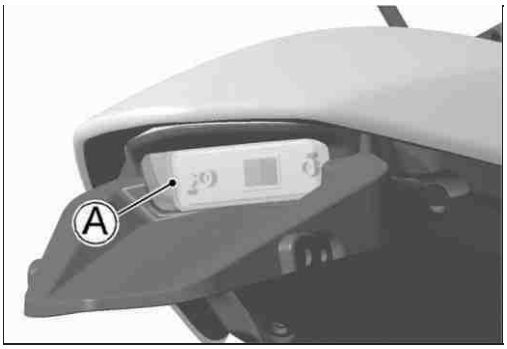


Pad Lining Thickness
Standard:

Front	**5.2 mm (0.20 in.)**
Rear	**4.5 mm (0.18 in.)**
Service Limit:	**1 mm (0.04 in.)**

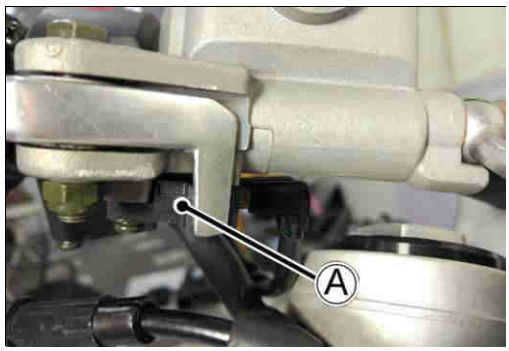
Brake Light Switch Operation Inspection

- Turn the ignition switch ON.
- The brake light [A] should go on when the brake lever is Applied or after the brake pedal is depressed about 10 mm (0.39 in.).



Periodic Maintenance Procedures

★If it does not go on, inspect or replace the following items.
Battery (see Battery Condition in the Electrical System chapter)
Brake Light (see Tail/Brake Light Bulb Replacement in the Electrical System chapter)
Main Fuse 15 A (see Fuse Inspection in the Electrical System chapter)
Front Brake Light Switch [A] (see Switch Inspection in the Electrical System chapter)
Rear Brake Light Switch (see Switch Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)

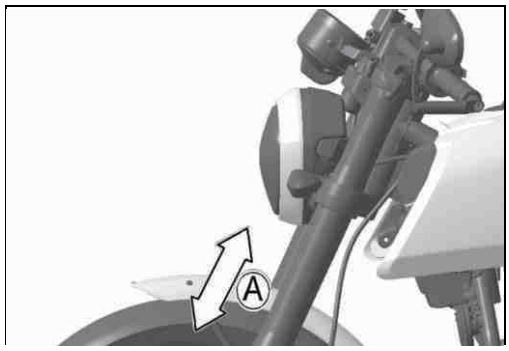


Suspensions

Front Forks/Rear Shock Absorber Operation Inspection

- Pump the forks down and up [A] 4 or 5 times, and inspect the smooth stroke.

★If the forks do not smoothly or noise is found, inspect the Fork oil level or fork clamps (see Front Fork Oil Change in the Suspension chapter).



- Pump the tail portion down and up [A] 4 or 5 times, and inspect the smooth stroke.

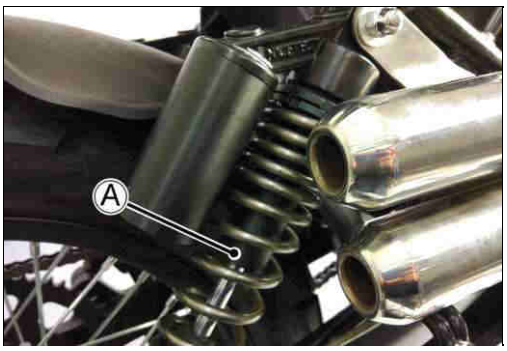
★If the shock absorber does not smoothly stroke or noise Is found, inspect the oil leak (see Rear Shock Absorber Oil Leak Inspection).

Periodic Maintenance Procedures

Rear Shock Absorber Oil Leak Inspection

- Visually inspect the shock absorber [A] for oil leakage.

★If the oil leakage is found on it, replace the shock absorber with a new one.



Periodic Maintenance Procedures

Steering System

Steering Play Inspection

- Raise the front wheel off the ground with jack.

  Special Tools - Jack: 57001-1238

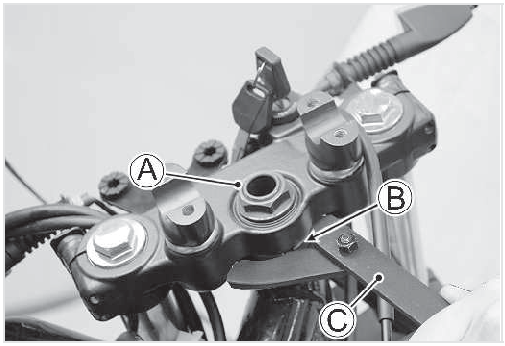
- With the front wheel pointing straight ahead, alternately Tap each end of the handlebar. The front wheel should Swing fully left and right from the force of gravity until the fork hits the stop.

★If the wheel binds or catches before the stop, the steering is too tight.

- Feel for steering looseness by pushing and pulling the forks.

★If you feel looseness, the steering is too loose.

Steering Play Adjustment



- Remove:
  Handlebar (see Handlebar Removal in the Steering chapter)
- Loosen:
  Front Fork Clamp Nuts (see Front Fork Removal in the Suspension chapter)
  Steering Stem Head Nut [A]
- Adjust the steering stem nut [B], using the steering stem nut wrench [C].

Special Tool - Steering Stem Nut Wrench: 57001-1100

★If the steering is too tight, loosen the stem nut a fraction of a turn.
★If the steering is too loose, tighten the stem nut a fraction of a turn.

NOTE

◦ Turn the stem nut 1/8 turn at time maximum.

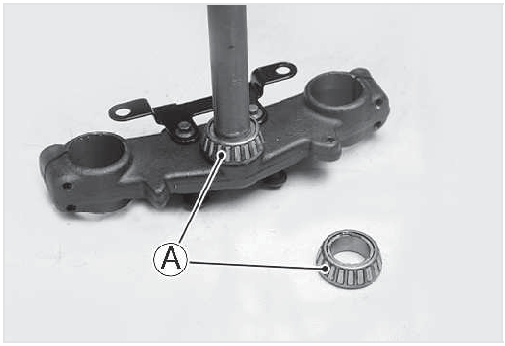
- Tighten:

Torque - Steering Stem Head Nut: 64 N•m (6.5 kgf•m, 47 ft•lb)
Front Fork Clamp Nuts: 40 N•m (4.1 kgf•m, 30 ft•lb)

- Check the steering again.

★If the steering is still too tight or too loose, repeat the adjustment.

Steering Stem Bearing Lubrication



- Remove the steering stem (see Stem, Stem Bearing Removal in the Steering chapter).
- Using a high-flash point solvent, wash the upper and Lower tapered roller bearings [A] in the cages, and wipe The upper and lower outer races, which are press-fitted into the frame head pipe, clean off grease and dirt.
- Visually check the outer races and rollers.

★If the rollers or races are worn, or if either race is dented, replace both races and all the bearings as a set.

- Pack the upper and lower tapered roller bearings in the Cages with grease, and apply a light coat of grease to the upper and lower outer races.
- Install the steering stem (see Stem, Stem Bearing Installation in the Steering chapter).
- Adjust the steering (see Steering Play Adjustment).

Periodic Maintenance Procedures

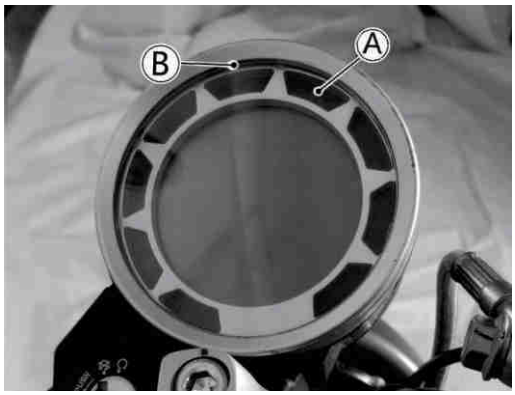
Electrical System

Lights and Switches Operation Inspection

First Step

- Set the gear position in the neutral position.
- Turn the ignition switch to ON.
- The following lights should go on according to below table.

Neutral Indicator Light [A]	goes on
Meter Panel Illumination Light [B]	goes on



★If the light does not go on, inspect or replace the following item.
Battery (see Battery Condition in the Electrical System chapter)
Main Fuse 15 A (see Fuse Inspection in the Electrical System chapter)
Neutral Indicator Light Bulb (see Meter Unit Light Bulb Replacement in the Electrical System chapter)
Illumination Light Bulb (see Meter Unit Light Bulb Replacement in the Electrical System chapter)
Ignition Switch (see Switch Inspection in the Electrical System chapter)
Neutral Switch (see Switch Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)

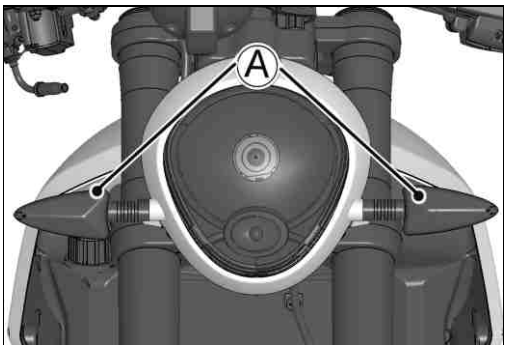
- Turn the ignition switch to OFF.
- The all lights should go off.

★If the light does not go off, replace the ignition switch.

Second Step

- Turn the ignition switch to ON.
- Push the turn signal switch [A] to ON (left or right position).

- The left or right turn signal lights [A] (front and rear) according to the switch position should flash.

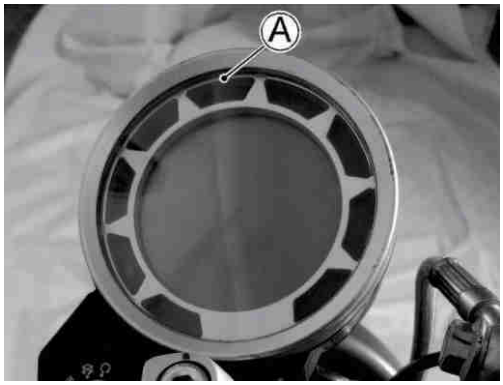


Periodic Maintenance Procedures

● The turn signal indicator light [A] in the meter unit should flash.

★If the each light does not flash, inspect or replace the following item.

Turn Signal Light Bulb (see Turn Signal Light Bulb Replacement in the Electrical System chapter)
Turn Signal Light Indicator Light (see Meter Unit Light Bulb Replacement in the Electrical System chapter)
Turn Signal Switch (see Switch Inspection in the Electrical System chapter)
Turn Signal Relay (see Turn Signal Relay Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)



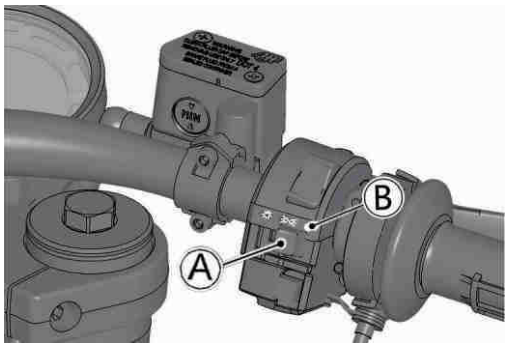
● Push the turn signal switch.
● The turn signal lights and indicator light should go off.

★If the light does not go off, inspect or replace the following Item.

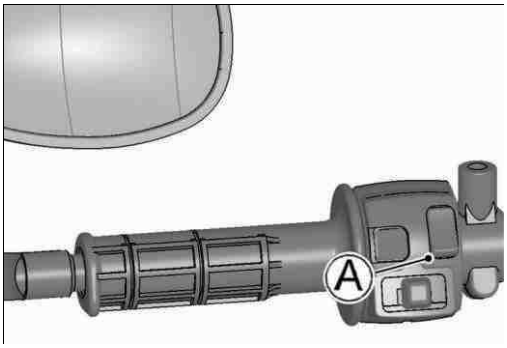
Turn Signal Switch (see Switch Inspection in the Electrical System chapter)

Third Step (ID Model)

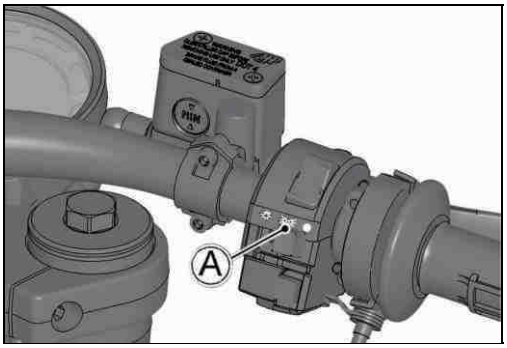
● Push the lighting switch [A] to"●" (OFF) position [B].



● Push the dimmer switch to low beam position [A].

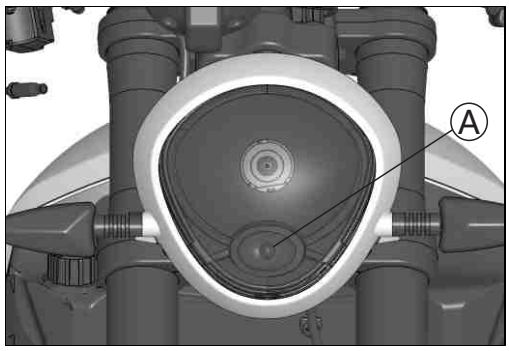


● Start the engine.
● Push the lighting switch to "■(City light) position [A].



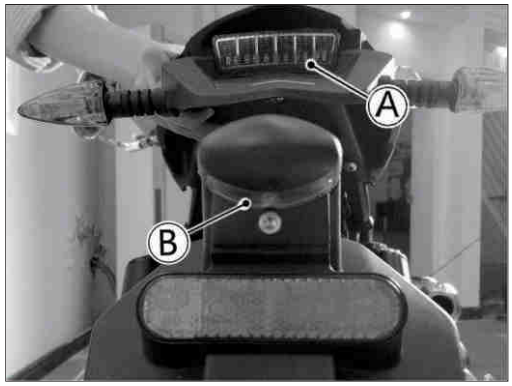
Periodic Maintenance Procedures

- The city light [A] should go on.



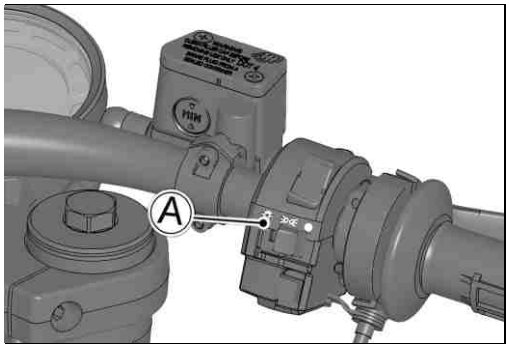
- The taillight [A] should go on.
- The license plate light [B] should go on.

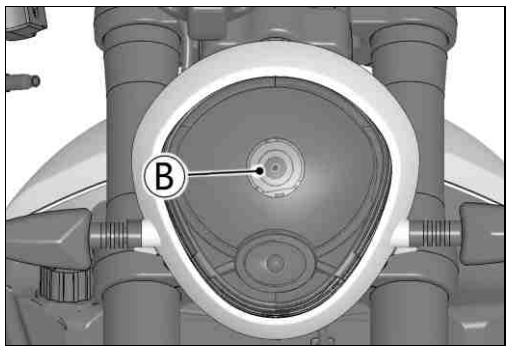
★If each light does not go on, inspect or replace the following parts.
City Light Bulb (see City Light Bulb Replacement (ID Model) in the Electrical System chapter)
Tail/Brake Light Bulb (see Tail/Brake Light Bulb Replacement in the Electrical System chapter)
License Plate Light Bulb (see License Plate Light Bulb Replacement in the Electrical System chapter)
Lighting Switch (see Switch Inspection in the Electrical System chapter)
Alternator (see Alternator Inspection in the Electrical System chapter)
Regulator/Rectifier (see Regulator/Rectifier Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)



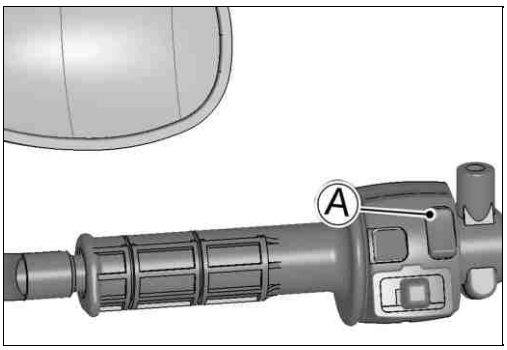
- Push the lighting switch to " ON) position [A].
- The low beam headlight [B] should go on.

★If the low beam headlight does not go on, inspect or replace the following parts.
Headlight Bulb (see Headlight Bulb Replacement in the Electrical System chapter)
Lighting Switch (see Switch Inspection in the Electrical System chapter)
Dimmer Switch (see Switch Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)

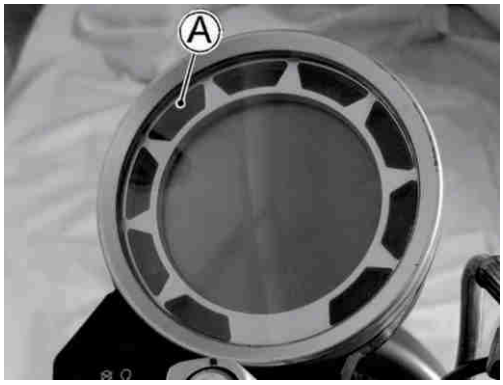




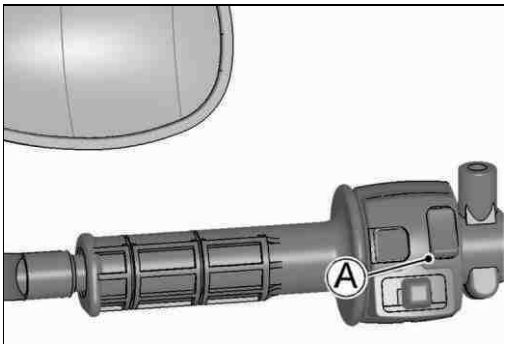
● Push the dimmer switch to high beam position [A].
● The high beam headlight should go on.



● The high beam indicator light [A] should go on.
★If the high beam headlight and/or high beam indicator light Does not go on, inspect or replace the following parts.
Headlight Bulb (see Headlight Bulb Replacement in the Electrical System chapter)
High Beam Indicator Light Bulb (see Meter Unit Light Bulb Replacement in the Electrical System chapter)
Dimmer Switch (see Switch Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)
● Push the lighting switch to "●"(OFF) position.
● The headlight, city light, taillight and license plate light should go off.
★If these lights do not go off, inspect or replace the light-Ing switch (see Switch Inspection in the Electrical System chapter).
● Stop the engine.



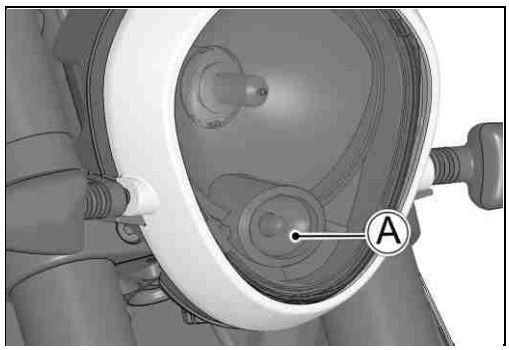
Third Step (other than ID Model)
● Push the dimmer switch to low beam position [A].

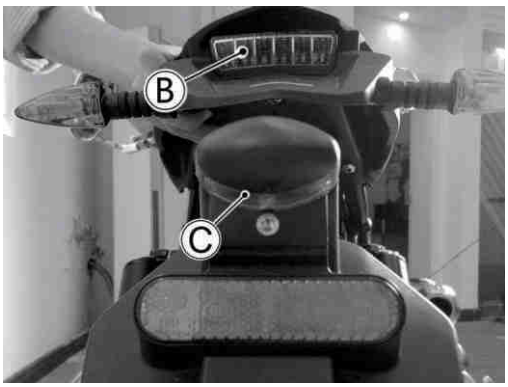


Periodic Maintenance Procedures

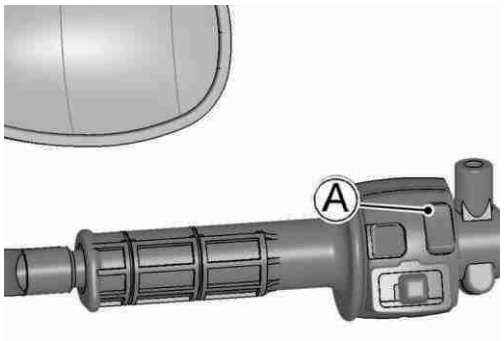
- Start the engine.
- The low beam headlight [A] should go on.
- The taillight [B] should go on.
- The license plate light [C] should go on.

★If each light does not go on, inspect or replace the following parts.
Headlight Bulb (see Headlight Bulb Replacement in the Electrical System chapter)
Tail/Brake Light Bulb (see Tail/Brake Light Bulb Replacement in the Electrical System chapter)
License Plate Light Bulb (see License Plate Light Bulb Replacement in the Electrical System chapter)
Dimmer Switch (see Switch Inspection in the Electrical System chapter)
Alternator (see Alternator Inspection in the Electrical System chapter)
Regulator/Rectifier (see Regul Ator/Rectifier Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)





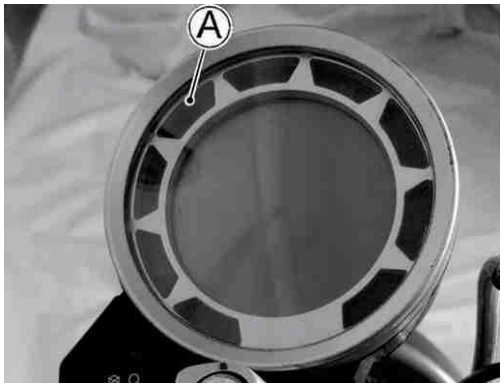
- Push the dimmer switch to high beam position [A].
- The high beam headlight should go on.



- The high beam indicator light [A] should go on.

★If the high beam headlight and/or high beam indicator light Does not go on, inspect or replace the following parts.
Headlight Bulb (see Headlight Bulb Replacement in the Electrical System chapter)
High Beam Indicator Light Bulb (see Meter Unit Light Bulb Replacement in the Electrical System chapter)
Dimmer Switch (see Switch Inspection in the Electrical System chapter)
Harness (see Wiring Inspection in the Electrical System chapter)

- Stop the engine.



Headlight Aiming Inspection
- Inspect the headlight beam for aiming.

★If the headlight beam points too low or high, adjust the vertical beam.

Periodic Maintenance Procedures

Headlight Beam Vertical Adjustment

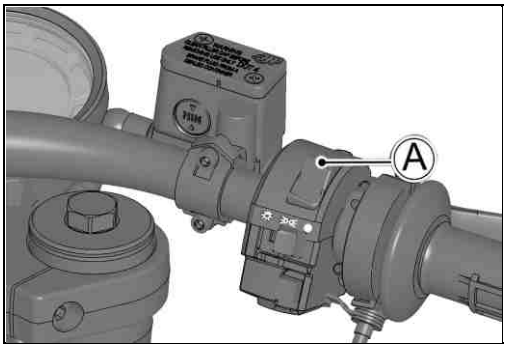
- Turn the vertical adjuster [A] on the headlight with the Screwdriver in or out to adjust the headlight vertically.

NOTE

- ON high beam, the brightest points should be slightly Below horizontal with the motorcycle on its wheels and The rider seated. Adjust the headlight to the proper an-Gle according to local regulations.

Engine Stop Switch Operation Inspection

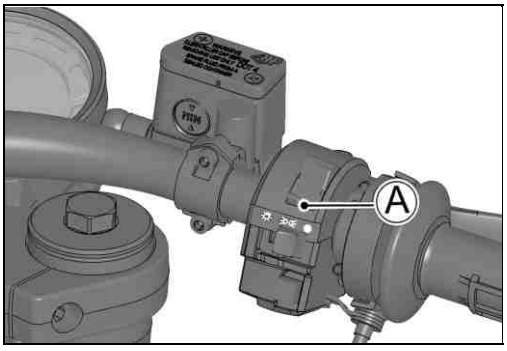
First Step



- Turn the ignition switch to ON.
- Set the gear position in the neutral position.
- Push the engine stop switch to stop position [A].
- Push the starter button.
- The engine does not start.

★If the engine starts, inspect or replace the engine stop Switch (see Switch Inspection in the Electrical System chapter).

Second Step



- Turn the ignition switch to ON.
- Push the engine stop switch to run position [A].
- Push the starter button and start the engine.
- Push the engine stop switch to stop position.
- Immediately the engine should be stop.

★If the engine does not stop, inspect or replace the engine Stop switch (see Switch Inspection in the Electrical System chapter).

Others

Chassis Parts Lubrication

- Before lubricating each part, clean off any rusty spots with Rust remover and wipe off any grease, oil, dirt, or grime.
- Lubricate the points listed below with indicated lubricant.

NOTE

- Whenever the vehicle has been operated under Wet or rainy conditions, or especially after using a High-pressure water spray, perform the general lubrication.

Pivots: Lubricate with Grease.

Brake Lever (Apply silicone grease.)
Brake Pedal
Sidestand

Periodic Maintenance Procedures

Bolts, Nuts and Fasteners Tightness Inspectio

- Check the tightness of the bolts and nuts listed here. Also, check to see that each cotter pin is in place and in good condition.

NOTE

◦ For the engine fasteners, check the tightness of them when the engine is cold (at room temperature).

★If there are loose fasteners, retighten them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not in the appropriate chapter, see the Standard Torque Table. For each fastener, first loosen it by 1/2 turn, then tighten it.

★If cotter pins are damaged, replace them with new ones.

Bolt, Nut and Fastener to be checked

Engine:
- Clutch Lever Pivot Bolt Locknut
- Engine Bracket Nuts
- Engine Mounting Bolt and Nuts
- Exhaust Pipe Holder Nuts
- Muffler Clamp Bolt
- Muffler Body Mounting Bolts

Wheels:
- Front Axle Nut
- Front Axle Nut Cotter Pin
- Rear Axle Nut
- Rear Axle Nut Cotter Pin

Brakes:
- Brake Lever Pivot Bolt and Locknut
- Brake Pedal Joint Cotter Pin
- Caliper Mounting Bolts
- Front Master Cylinder Clamp Bolts
- Brake Pad Pins
- Rear Master Cylinder Mounting Bolts

Suspension:
- Front Fork Clamp Bolts and Nuts
- Rear Shock Absorber Bolts and Nut
- Swingarm Pivot Shaft Nut
- Tie-Rod Nuts
- Rocker Arm Pivot Shaft Nut

Steering:
- Handlebar Clamp Bolts
- Handlebar Holder Nuts
- Handlebar Holder Nuts Cotter Pins
- Steering Stem Head Nut

Others:
- Footpeg Stay Bolts
- Front Fender Bolts
- Sidestand Bolt and Nut

Periodic Maintenance Procedures

Replacement Parts

Air Cleaner Element Replacement

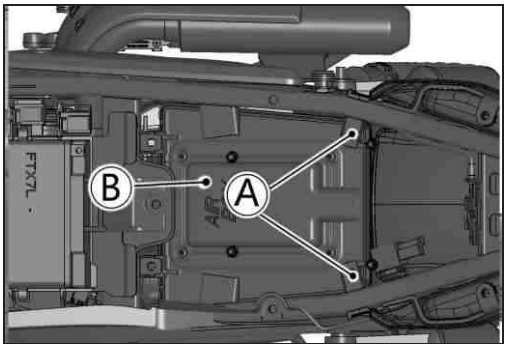
NOTE

- In dusty areas, the element should be replaced more frequently than the recommended interval.
- After riding through rain or on muddily roads, the element should be replaced immediately.

⚠ WARNING

If dirt or dust is allowed to pass through into the Carburetor, the throttle may become stuck, possibly causing accident.

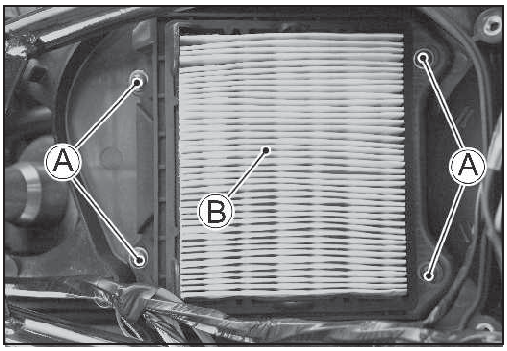
- Remove:
  Left Side Cover (see Side Cover Removal in the Frame chapter)
  Air Cleaner Element Cover Bolts [A]
  Air Cleaner Element Cover [B]



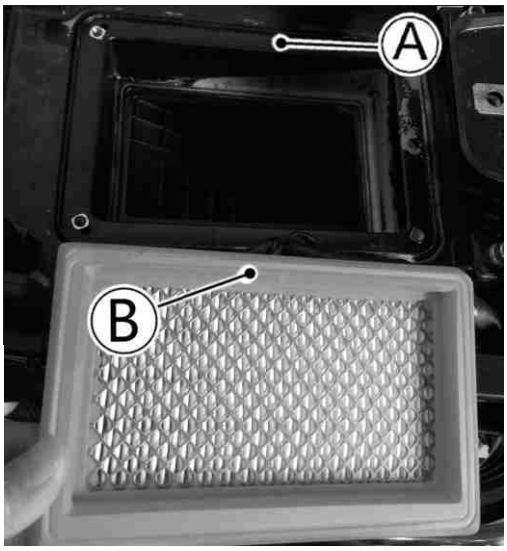
- Remove:
  Wing Bolt [A] and Washer
  Air Cleaner Element [B]
- Stuff pieces of lint-free, clean cloth into the air cleaner Housing to keep dirt out of the carburetor and engine.

CAUTION

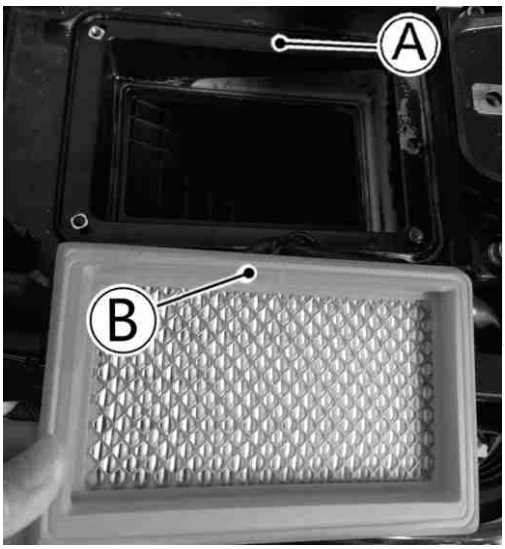
If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.



- Separate the frame [A] from the element [B].
- Discard the air cleaner element.



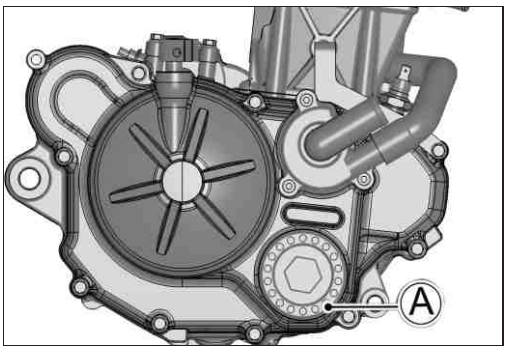
- Install the frame into the new element.
- Coat the lip of the element with a thick layer of all pur-Pose grease [A] to assure a complete seal against the air Cleaner element base. Also, coat the base where the lip of the element fits.



- Install the element, and tighten the wing bolt securely.
- Install the air cleaner element cover.
- Tighten:

Torque - Air Cleaner Element Cover Bolts: 1.5 N• m(0.15 kgf•m, 13 in•ib)

- Install the removed parts (see appropriate chapters).



⚠ WARNING

To avoid a serious burn, never touch the exhaust pipe during oil change.

- Remove the oil filler cap with level gauge.
- Remove the engine oil drain plug [A], and let the oil drain completely.
- Replace the oil drain gasket with a new one.
- After draining, install the drain plug.

Torque - Engine Oil Drain Plug: 18 N•m (1.8 kgf•m, 13 ft•lb)

- Fill the engine with a good quality engine oil specified below.

Recommended Engine

Viscosity: **10W/40**

Capacity: **0.93 L (0.98 US qt) (when filter is not removed)**

0.95 L (1.00 US qt) (when filter is removed)

1.10 L (1.16 US qt) (when engine is completely dry)

NOTE

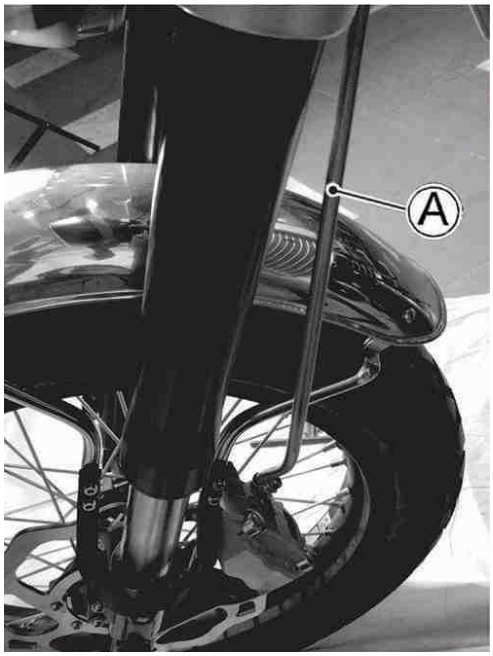
- Do not add any chemical additive To the oil. Oils fulfilling The above requirements are fully formulated and provide Adequate lubrication for both the engine and the clutch.
- Although 10W-40 engine oil is the recommended oil For most conditions, the oil viscosity may need to be Changed to accommodate atmospheric conditions in your riding area.

Periodic Maintenance Procedures

Brake Hose Replacement

CAUTION

Brake fluid quickly ruins painted plastic surfaces; Any spilled fluid should be completely washed away immediately.



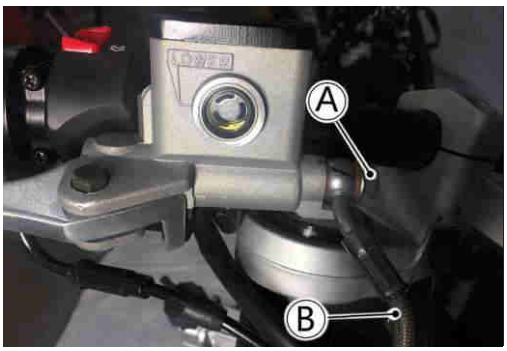
● Remove:
Brake Hose [A]

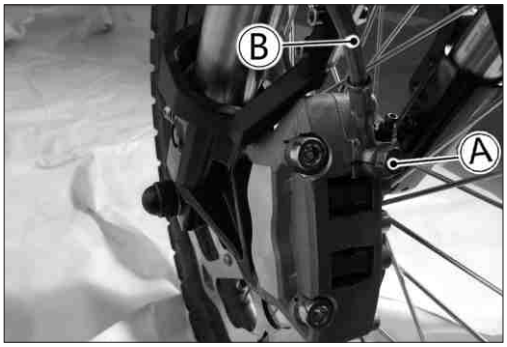
Periodic Maintenance Procedures

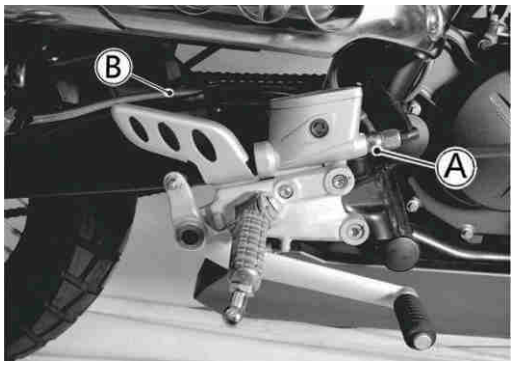
- Remove the brake hose banjo bolts [A].
- When removing the brake hose, take care not to spill the brake fluid on the painted or plastic parts.
- When removing the brake hoses [B], temporarily secure The end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.
- There are washers on each side of the brake hose fitting. Replace them with new ones when installing.
- Tighten:

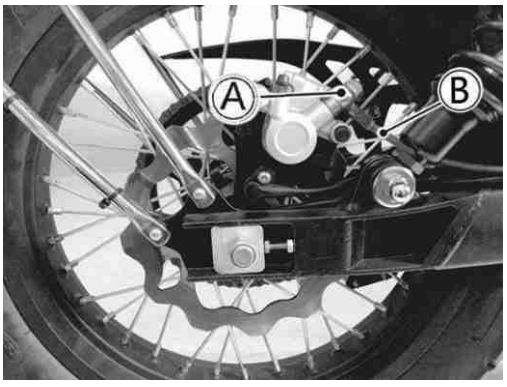
Torque - Brake Hose Banjo Bolts: 25 N• m (2.5 kgf•m, 18 Ft•lb)

- When installing the hoses, avoid sharp bending, kink-Ing, flatting or twisting, and route the hoses according to Cable, Wire, and Hose Routing section in the Appendix chapter.
- Fill the brake line after installing the brake hose (see Brake Fluid Change).









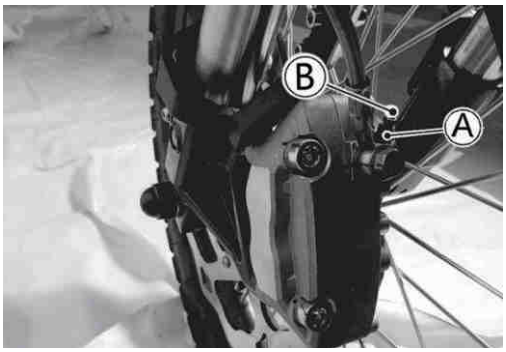
Brake Fluid Change

NOTE

◦ The procedure to change the front brake fluid is as fol-Lows. Changing the rear brake fluid is the same as for the front brake.

Periodic Maintenance Procedures

- Level the brake fluid reservoir.
- Remove the reservoir cap and diaphragm.
- Remove the rubber cap from the bleed valve [A] on the caliper.
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.
- Fill the reservoir with fresh specified brake fluid.

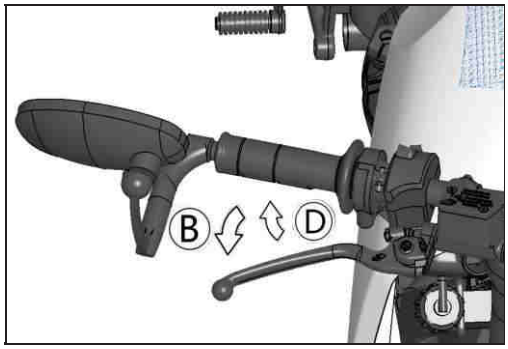


- Change the brake fluid.
  - Repeat this operation until fresh brake fluid comes out From the plastic hose or the color of the fluid changes.

1. Open the bleed valve [A].
2. Apply the brake and hold it [B].
3. Close the bleed valve [C].
4. Release the brake [D].

NOTE

- The fluid level must be checked often during the chang-Ing operation and replenished with fresh brake fluid. If The fluid in the reservoir runs out any time during the Changing operation, the brakes will need to be bled since air will have entered the brake line.

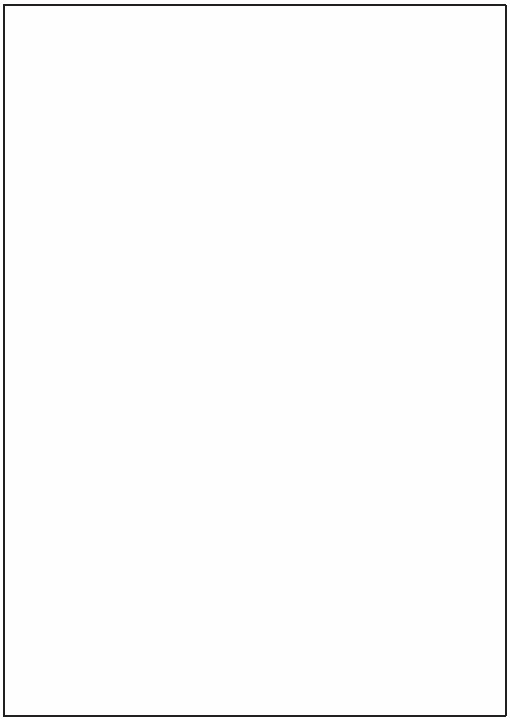


- Remove the clear plastic hose.
- Install the diaphragm and reservoir cap.
- Tighten:

Torque - Brake Reservoir Cap Screws: 1.5 N•m (0.15 kgf•m, 13 in•lb)
Caliper Bleed Valves: 5.4 N•m (0.55 kgf•m, 48 in•lb)

- Install the rubber cap on the bleed valve.
- After changing the fluid, check the brake for good braking Power, no brake drag, and no fluid leakage.

★If necessary, bleed the air from the lines.



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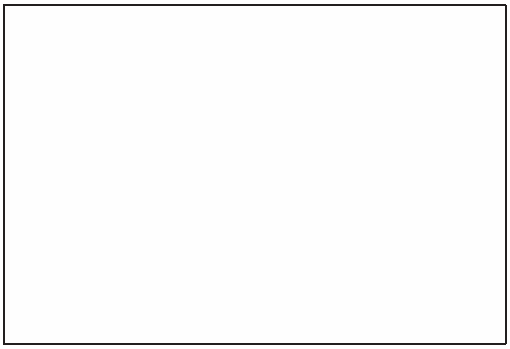
Special Tool - Inside Circlip Pliers: 57001-143

- Remove the washer [G].
- Pull out the piston assy [H].

CAUTION
Do not remove the secondary cup from the piston since removal will damage it.

- Replace:
  Diaphragm [B]
  Dust Cover [E]
  Circlip [F]
  Piston Assy [H]



Rear Master Cylinder Disassembly

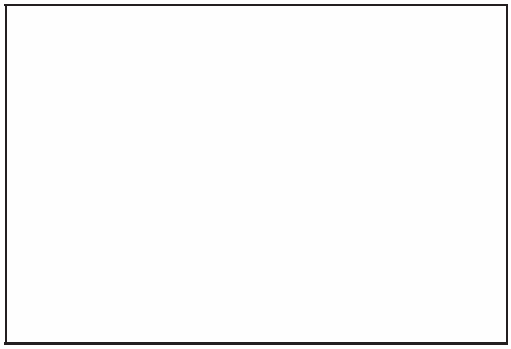
- Remove the rear master cylinder (see Rear Master Cylinder Removal in the Brakes chapter).
- Remove the reservoir cap [A] and diaphragm [B], and pour the brake fluid into a container.
- Remove the circlip [C], fitting [D] and O-ring [E].

Special Tool - Inside Circlip Pliers: 57001-143

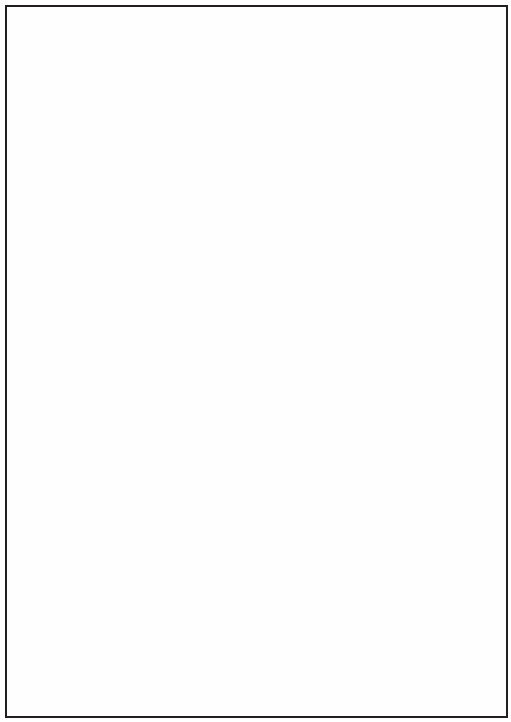
- Slide the dust cover [F] out of place, and remove the circlip [G].
- Pull out the push rod assy [H].
- Take off the piston assy [I] and return spring [J].

CAUTION
Do not remove the secondary cup from the piston since removal will damage it.

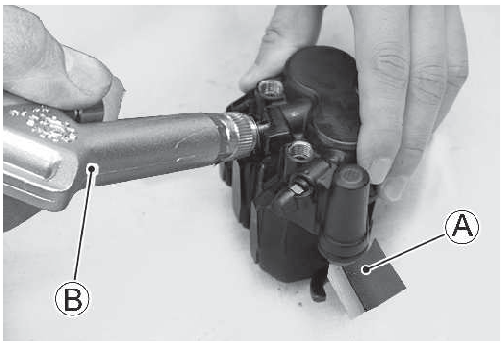
- Replace:
  Diaphragm [B]
  Circlip [C]
  O-ring [E]
  Circlip [G]
  Push Rod Assy [H]
  Piston Assy [I]
  Hose [K]



Torque - Brake Lever Pivot Bolt: 5.9 N•m (0.60 kgf•m, 52 In•ib)
Brake Lever Pivot Bolt Locknut [C]: 5.9 N•m (0.60 Kgf•m, 52 in•ib)
Brake Reservoir Cap Screws [D]: 1.5 N•m (0.15 Kgf•m, 13 in•ib)
Front Brake Light Switch Screw [E]: 1.2 N•m (0.12 Kgf•m, 11 in•ib)



- Attach the brake hose [A] and the rear brake reservoir [B] To the rear master cylinder and set the upper hose clamp [C] and the lower hose clamp [D] as shown in the figure.
  Front [E]



⚠ WARNING

To avoid serious injury, never place your fingers or Palm in front of the piston. If you apply compressed Air into the caliper, the piston may crush your hand or fingers.

◦ Pull out the pistons by hand.
● Remove the dust seals [A] and fluid seals [B].
● Remove the bleed valve [C] and rubber cap [D].

NOTE

◦ If compressed air is not available, with the brake hose Still attached, apply the brake lever to remove the pis-Ton. The remaining process is as described above.

Front Caliper Assembly

● Clean the caliper parts except for the pads.

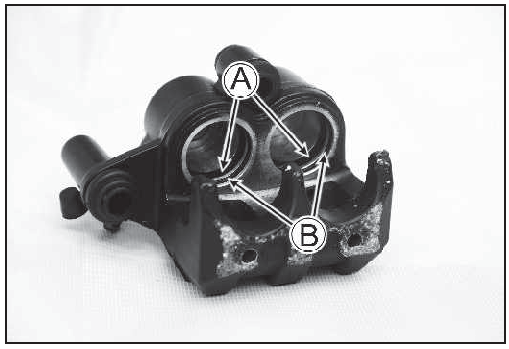
CAUTION

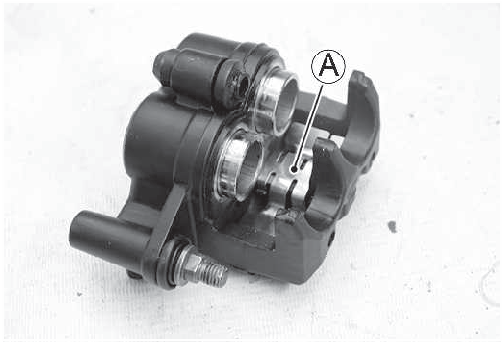
For cleaning the parts, use only disc brake fluid, Isopropyl alcohol, or ethyl alcohol.

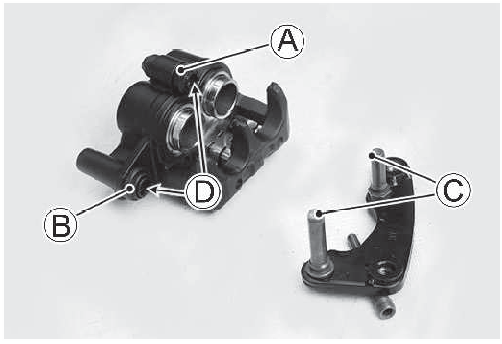
● Install the bleed valve and rubber cap.

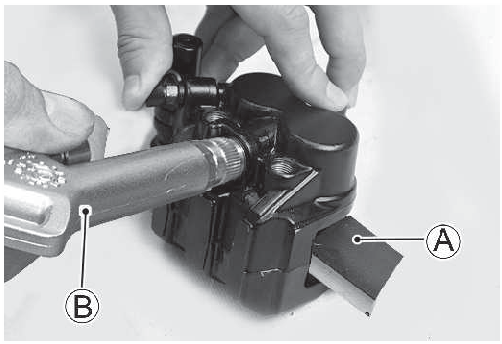
Torque - Caliper Bleed Valve: 5.4 N•m (0.55 kgf•m, 48 in•lb)

● Replace the fluid seals [A] with new ones.
◦ Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to The fluid seals, and install them into the cylinders by hand (PBC is a special high-temperature, water-resistance grease).
● Replace the dust seals [B] with new ones if they are damaged.
◦ Apply brake fluid to the dust seals, and install them into the cylinders by hand.









⚠ WARNING

To avoid serious injury, never place your fingers or Palm inside the caliper opening. If you apply com-Pressed air into the caliper, the piston may crush your hand or fingers.

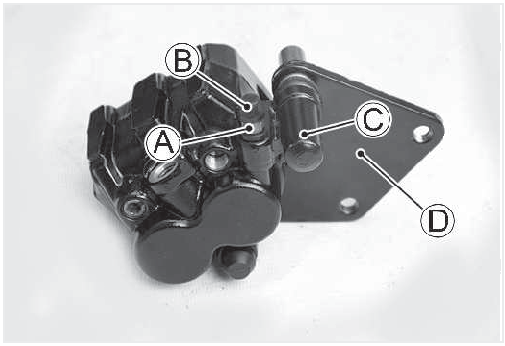
● Remove the dust seal [A] and fluid seal [B].

NOTE

◦ If compressed air is not available, with the brake hose Still attached, apply the brake pedal to remove the pis-Ton. The remaining process is as described above.

Periodic Maintenance Procedures

- Remove:
  Bleed Valve [A]
  Rubber Cap [B]
- Loosen the caliper holder pin [C] fully.
- Remove the caliper holder [D].



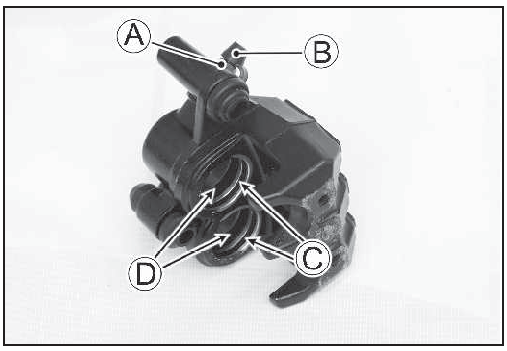
Rear Caliper Assembly

- Clean the caliper parts except for the pads.

CAUTION
For cleaning of the parts, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol.

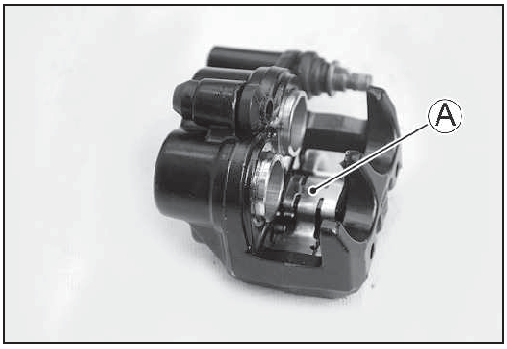
- Install the bleed valve [A] and rubber cap [B].

Torque - Bleed Valve: 5.4 N·m (0.55 kgf·m, 48 in·lb)

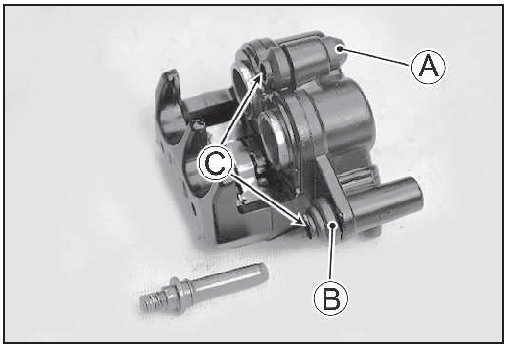


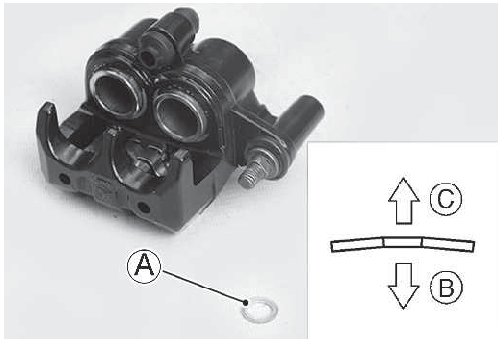
- Replace the fluid seal [C] with a new one.
  - Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to The fluid seal, and install it into the cylinder by hand (PBC Is a special high-temperature, water-resistance grease).
- Replace the dust seal [D] with a new one.
  - Apply brake fluid to the dust seal, and install it into the cylinder by hand.

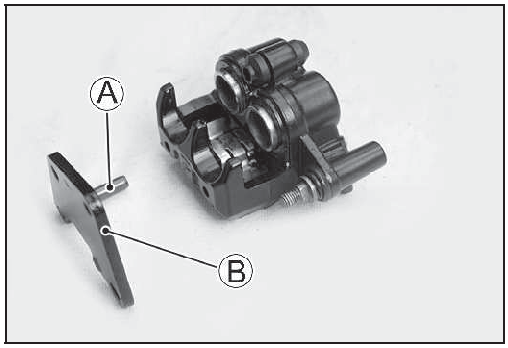
- Apply brake fluid to the outside of the piston, and push it into the cylinder by hand.
- Install the anti-rattle spring [A] in the caliper as shown.



- Replace the shaft rubber friction boot [A] and dust boot [B] if they are damaged.
- Apply a thin coat of PBC (Poly Butyl Cuprysil) grease To the caliper holder pin groove and holder holes [C] (PBC is a special high-temperature, water-resistance grease).







Torque - Caliper Holder Pin: 22 N• m (2.2 kgf•m ,16ft • lb)

- Install the pads (see Rear Brake Pad Installation in the Brakes chapter).
- Wipe up any spilled brake fluid on the caliper with wet cloth.

Spark Plug Replacement

- Remove the spark plug cap [A] from the spark plug.
- Remove the spark plug [B] using the plug wrench.

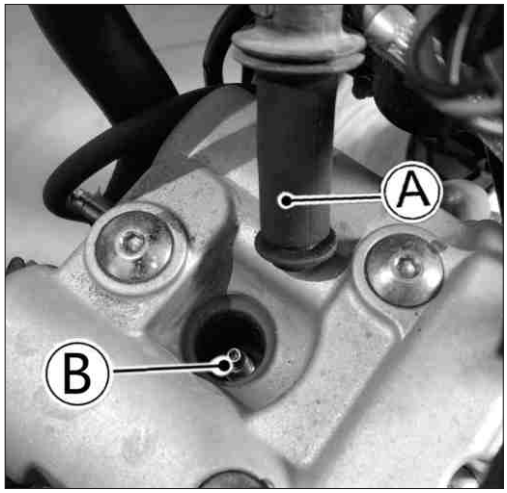
Special Tool - Spark Plug Wrench, Hex 16: 57001-1262

Owner`s Tool - Spark Plug Wrench, Hex 16: 92110-0050

- Replace the spark plug with a new one.

Standard Spark Plug
Type: NGK CPR8EA

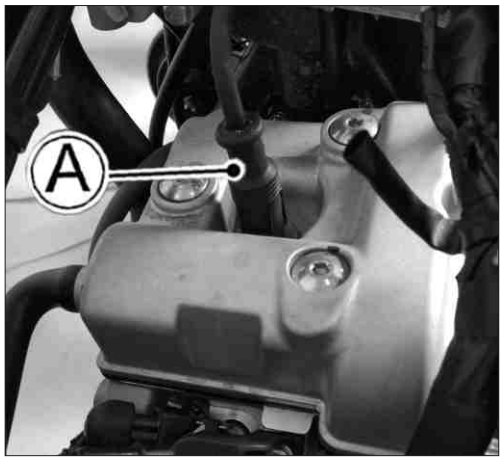
- Insert the spark plug into the plug hole and tighten it by hand at first.



- Tighten the spark plug with the plug wrench [A].

Special Tool - Spark Plug Wrench, Hex 16: 57001-1262

Owner?s Tool - Spark Plug Wrench, Hex 16: 92110-0050



CAUTION
The insulator of the spark plug may break if when the wrench is inclined during tightening.

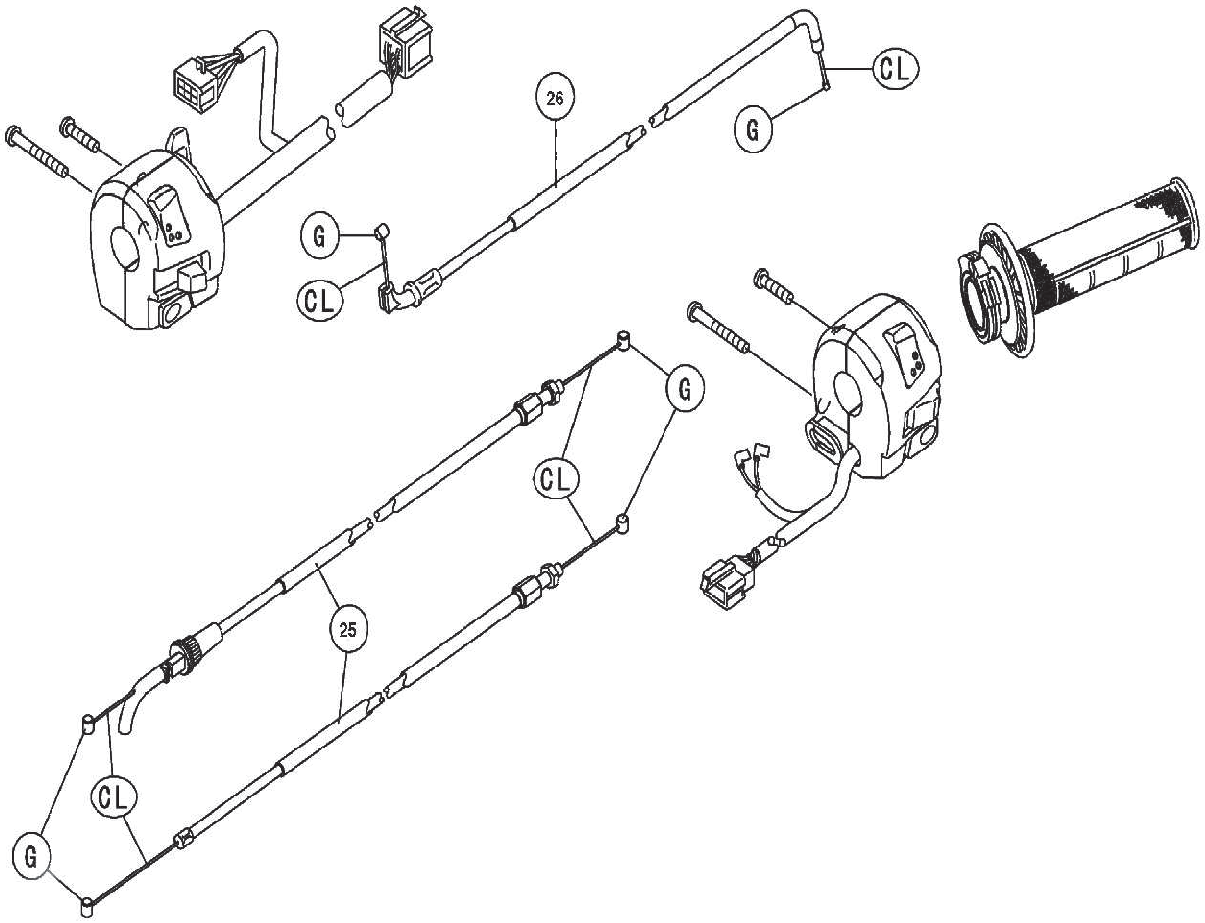
- Tighten:

Torque - Spark Plug: 13 N•m (1.3 kgf• m, 115 in•lb)

- Install the spark plug cap securely.
  - Be sure the spark plug cap is installed by pulling up it lightly.

Fuel System

Table of Contents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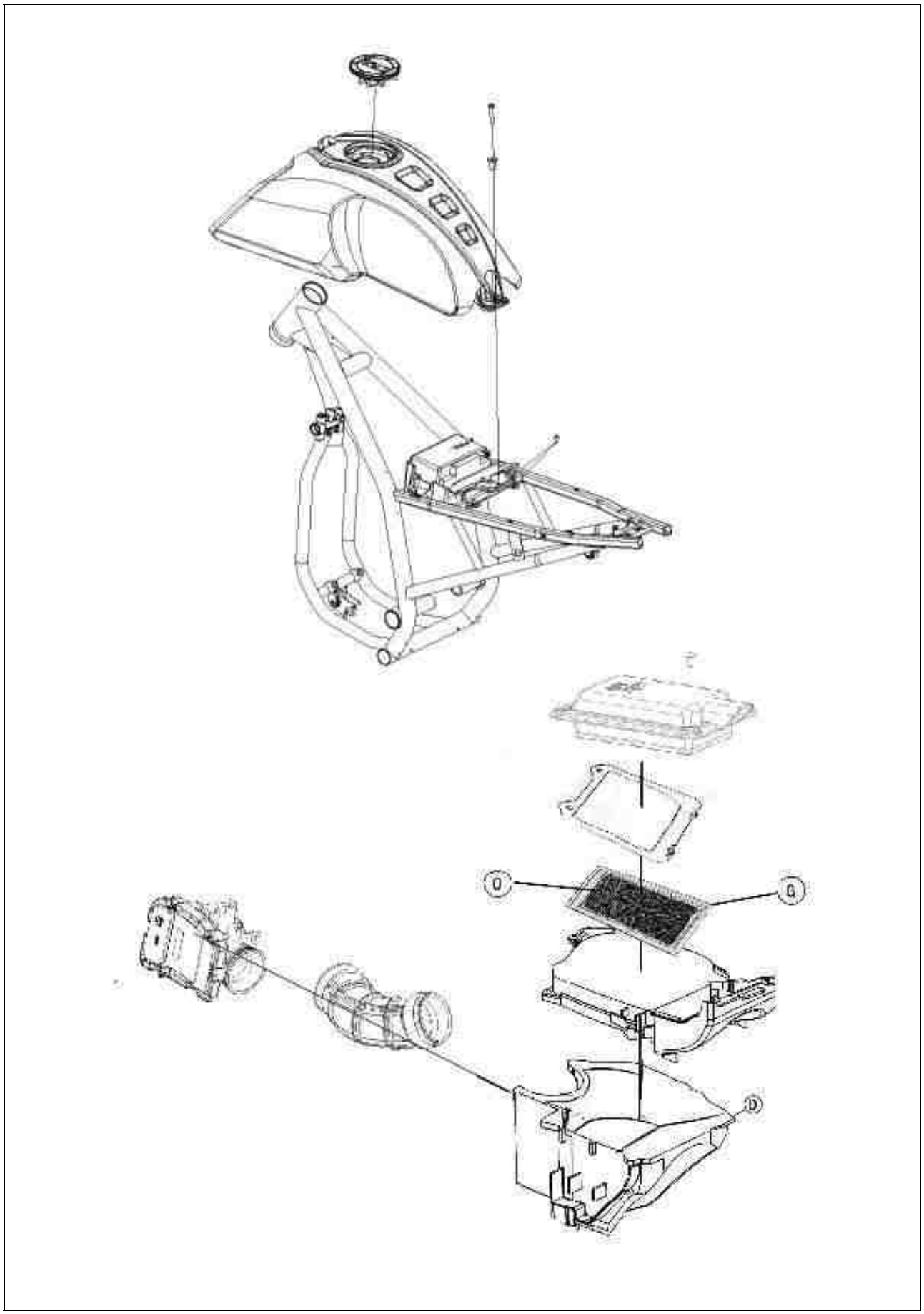
Exploded View

1. Throttle Cables
2. Choke Cable

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Air Cleaner Housing Bolt	5.2	0.53	46 in·lb	
2	Air Cleaner Element Cover Bolt	1.5	0.15	13 in·lb	
3	Fuel Tap Bolts	5.0	0.51	44 in·lb	

AD: Apply adhesive cement.
G: Apply grease.
O: Apply high-quality foam air filter oil.
R: Replacement Rarts

Specifications

Item	Standard
Throttle Grip and Cable	
Throttle Grip Free Play	2—3 mm (0.08 0.12 in.)
Air Cleaner	
Air Cleaner Element Oil	High quality form air filter oil

Throttle Grip and Cable

Throttle Grip Free Play Inspection

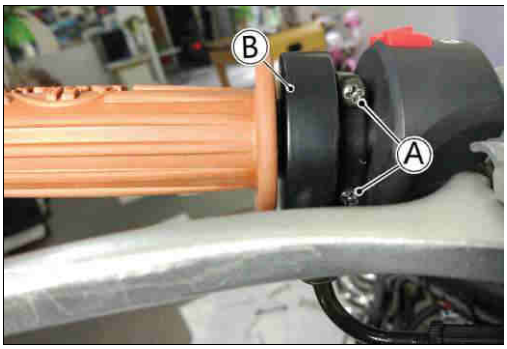
- Refer to the Throttle Grip Free Play Inspection in the Periodic Maintenance chapter.

Throttle Grip Free Play Adjustment

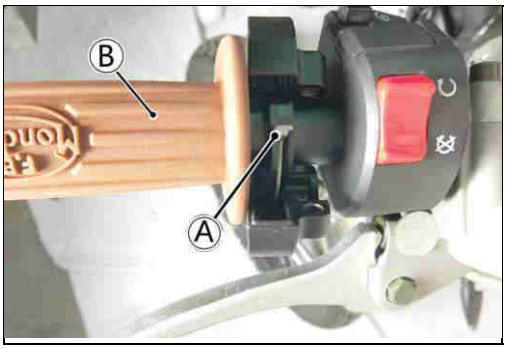
- Refer to the Throttle Grip Free Play Adjustment in the Periodic Maintenance chapter.

Throttle Cable Removal

- Remove the screws [A]
- Disassemble the Throttle housing [B].

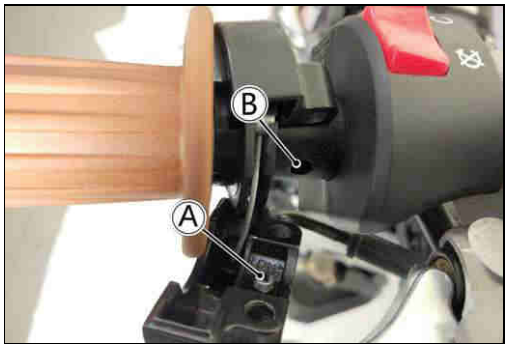


- Take off the throttle cable tips [A] from the throttle grip [B].



Throttle Cable Installation

- Lubricate the throttle cables (see Chassis Parts Lubrication in the Periodic Maintenance chapter).
- Install the cable correctly according to Cable, Wire, and Hose Routing section in the Appendix chapter.
- Install the cable lower ends to the original positions.
- Install the cable upper ends.
  - Engage the throttle cable tips to the throttle grip.
- Assemble the right switch housing.
  - Fit the projection [A] to the hole [B].



Throttle Grip and Cable

- After installation, adjust each cable properly (see Throttle Control System Inspection in the Periodic Maintenance chapter).

⚠ WARNING

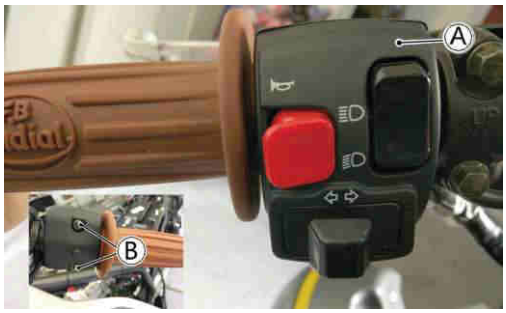
Operation with an incorrectly routed or improperly Adjusted cable could result in an unsafe riding condition.

Throttle Cable Lubrication

- Refer to the Chassis Parts Lubrication in the Periodic Maintenance chapter.

Choke Cable Removal

- Remove:
  Left Switch Housing [A]
  Screws [B]



EFI System

- The primary function of the EFI system is to atomize the fuel supplied from the fuel tank and mix with the air to form a homogeneous mixture and into the combustion chamber.

The Structure And Working Principle Of EFI System

- EFI system mainly consists of electronic control unit (ECU), nozzle, throttle body assembly, intake air temperature, pressure integrated sensor, engine temperature sensor, ignition coil, crankshaft position sensor, oil pump assembly, oxygen sensor
- The engine electrospray management system can precisely control the mixing ratio of air and fuel into the engine cylinder, the combustion process and the exhaust gas conversion to optimize engine performance, improve driving performance, and more stringent control of exhaust emissions from motorcycles for air Of pollution
- Engine control module (ECU) is a microcontroller as the core of the microprocessor. The engine control module through the installation of the engine and the body at different locations of the sensor and the work request switch, the engine's working state analysis, to determine the working conditions of the engine, and then through the engine and the body of the actuator, the engine and the corresponding institutions Precise control
- Engine speed and crank angle sensor for the magnetic type, the system uses it to determine the crankshaft rotation position and speed.
- The crank angle sensor is mounted on the gearbox clutch housing and works with the 24x ring gear on the flywheel
- Air intake absolute pressure (MAP) sensor installed in the intake pipe used to measure the pressure of the intake pipe, ECU through this signal to determine the amount of air into the engine.
- The MAP sensor consists of a sealed elastic diaphragm and a ferromagnetic core. The diaphragm and the core are precisely placed in the coil. When the pressure is sensed, a 0 to 5V output signal proportional to the input pressure is generated
- The throttle position sensor is mounted on the throttle body assembly and is coaxial with the throttle rod and throttle valve. It is a linear variable resistor structure with its sliding terminal driven by the throttle shaft.
- The opening of the throttle valve is different, the sensor response to the ECU resistance signal is also different, the system according to its output signal value and its rate of change to determine the real-time load and dynamic changes in the engine, the timely control of the engine.
- The intake air temperature sensor is installed on the inlet line of the intake system to detect the air temperature entering the engine. It is also a thermistor with a negative temperature coefficient as the sensing element.
- As the gas temperature changes will directly affect its density changes, therefore, the intake air temperature sensor is to calculate the actual amount of air Into the cylinder one of the important parameters.
- The nozzle structure is an electromagnetic switchgear. The coil leads to the poles through the engine harness and ECU communication, the coil by the ECU control plus voltage, the magnetic force to overcome the spring force, fuel pressure and intake pipe vacuum suction, sucking iron core, fuel through the core with the ball Sealing surface, sprayed from the guide hole to form a mist injection; after power failure, the magnetic force disappears the nozzle closed.

EFI System

- The top of the injector is made of a rubber seal and a fuel rail interface to form a reliable pressure fuel seal. The lower part also uses a rubber seal to form an air seal with the engine intake pipe. The nozzle will spray into the intake valve.
- The throttle body is installed in front of the intake pipe, and the throttle body Is composed of a valve body body, a throttle position sensor and an idle control valve. The main function is to control the engine when the air intake. It is the electronic control system and the driver of the most basic channels of dialogue.
- The oxygen sensor is mounted on the exhaust pipe of the engine and is an important landmark part of the closed-loop fuel control system.
- The main sensitive material of the oxygen sensor is zirconia, and when the zirconia is heated by heating (300 ° C), oxygen ions pass through the zirconia element to reach its external electrode, and the zirconia element senses the oxygen content of the engine exhaust and changes its Output voltage value.
- Oxygen sensor using Teflon insulated wire, stainless steel forming elements. Reference air is input by wire, no blocking problem.
- When the empty ratio of the engine combustion is tapering, the oxygen accumulation content in the exhaust gas increases, the output voltage of the oxygen sensor decreases, and the output voltage value increases, thereby feeding the ECU back to the engine in real time.

Second, The EFI System Demolition And Maintenance

- The motorcycle EFI system has been commissioned at the factory, EFI system failure, it is strictly forbidden to adjust the throttle body idling screw, is strictly prohibited to replace or adjust the EFI system parts. If you have any questions, please visit our special maintenance service station for maintenance.
- Motorcycle EFI system in the instrument with EFI fault indicator, when you open the ignition system circuit, the normal working conditions of the indicator light long, if the fault does not light; when the engine starts, the normal work of the The lamp goes out, in case of failure the light will be long or flashing.

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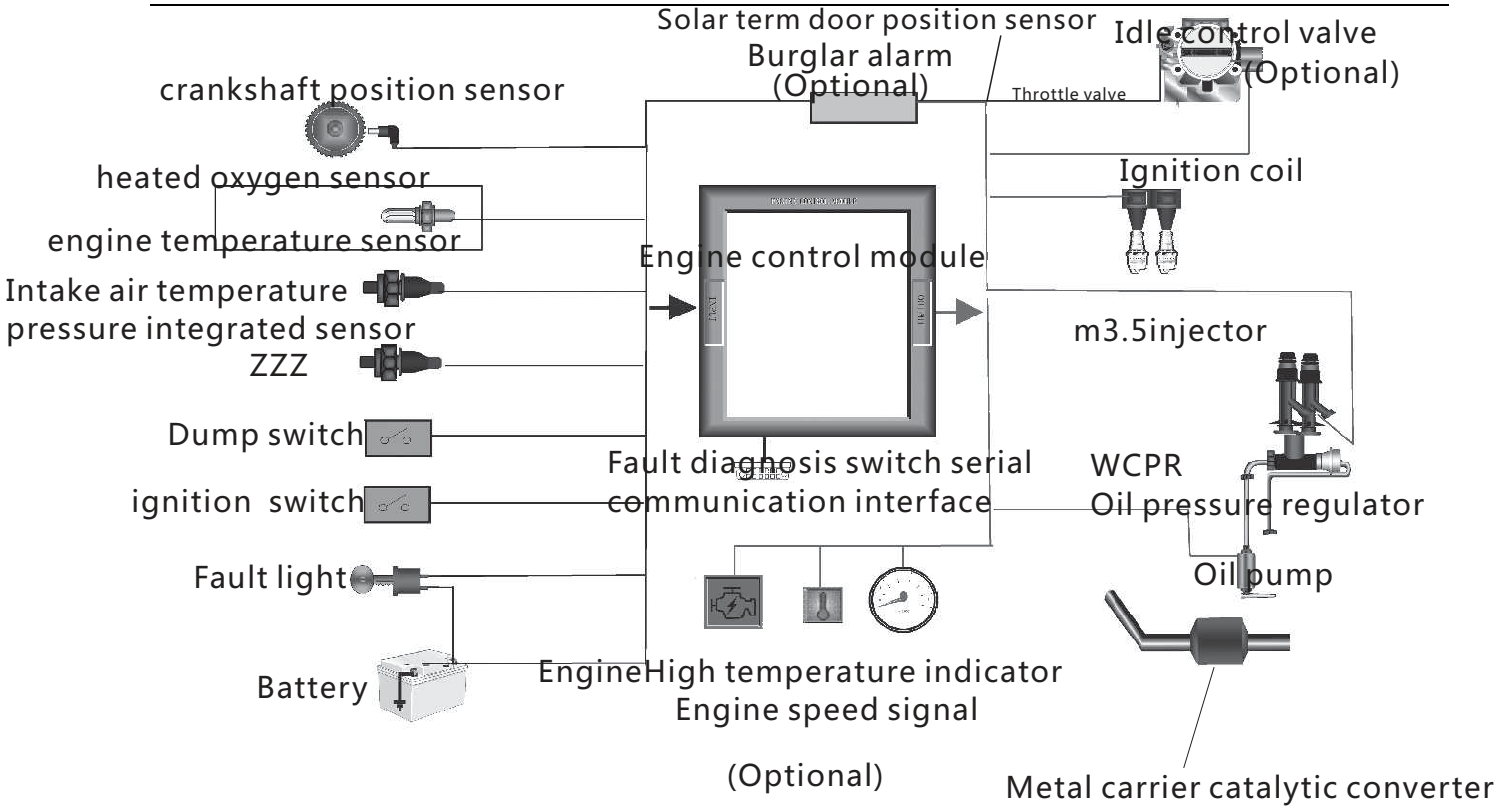
EFI System



Third, The Common Phenomenon Of EFI System

- Through the fault diagnosis device to diagnose the EFI system to see if there is fault information, if any failure, then replace the corresponding EFI parts, if no fault, please check the following:
  1. Check whether the line connection is normal, with or without damage;
  2. Check whether the voltage reaches more than 9V;
  3. Check whether the vehicle insurance and EFI insurance are damaged;
  4. Check the oil circuit is normal, tubing is blocked, squeeze, damage, to ensure smooth oil.

Air Cleaner

Air Cleaner Element Removal/Installation

- Refer to the Air Cleaner Element Replacement in the Periodic Maintenance chapter.

Air Cleaner Element Cleaning

- Refer to the Air Cleaner Element Cleaning in the Periodic Maintenance chapter.

Air Cleaner Element Inspection

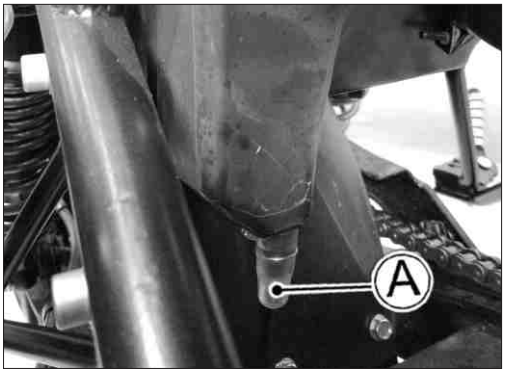
- Remove the air cleaner element (see Air Cleaner Element Replacement in the Periodic Maintenance chapter).
- Visually check the element [A] for tears or breaks.

★If the element has any tears or breaks, replace the element.

Air Cleaner Oil Draining

A drain hose is connected to the bottom of the air cleaner To drain water or oil accumulated in the cleaner part.

★If any water or oil accumulates in the hoses, remove the Plugs [A] from the drain hoses and drain it.



WARNING

Be sure to reinstall the plug in the drain hose after Draining. Oil on tires will make them slippery and can cause an accident and injury.

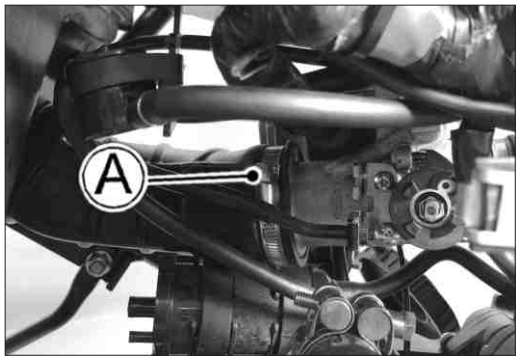
Air Cleaner Housing Removal

- Remove:
  Side Covers (see Side Cover Removal in the Frame chapter)
  Seat (see Seat Removal in the Frame chapter)
  Battery (see Battery Removal in the Electrical System chapter)
  Muffler Body (see Muffler Body Removal in the Engine Top End chapter)
  Rear Fender (see Rear Fender Removal in the Frame chapter)
  Mud Guard (see Mud Guard Removal in the Frame chapter)

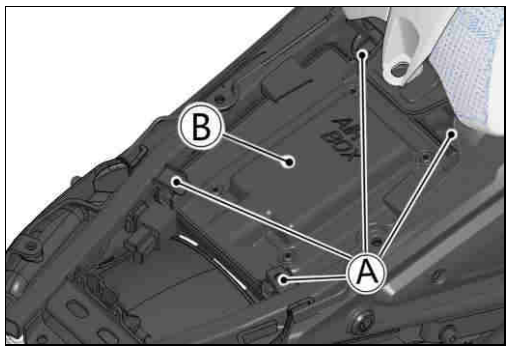
- Remove:
  Breather Hose [A]

Air Cleaner

- Loosen the clamp screw [A].



- Remove:
  Air Cleaner Housing Bolt [A]
  Air Cleaner Housing [B]



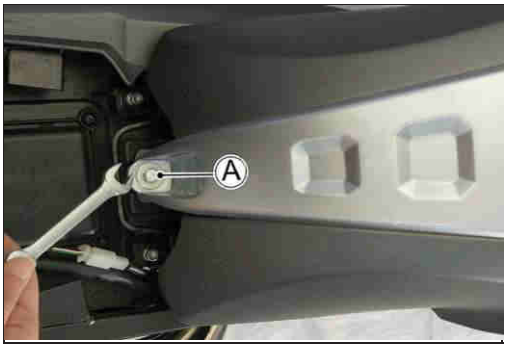
Air Cleaner Housing Installation
- Installation is the reverse of removal.
- Tighten:

Torque - Air Cleaner Housing Bolt: 5.2 N•m (0.53 kgf•m, 46 In•lb)

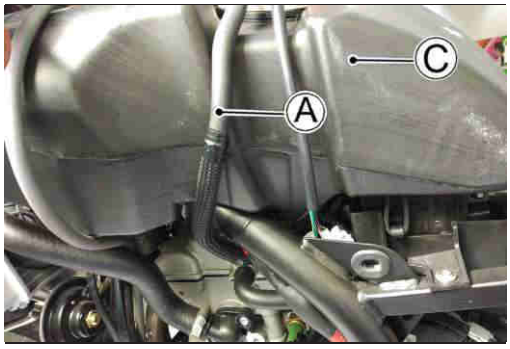
⚠ WARNING

Gasoline is extremely flammable and can be ex-Plosive under certain conditions. Always stop the Engine and do not smoke. Make sure the area is Well-ventilated and free from any source of flame Or sparks; this includes any appliance with a pilot light.

- Remove:
  Seat (see Seat Removal in the Frame chapter)
  Shrouds (see Shroud Removal in the Frame chapter)
  Bolt [A]



- Remove:
  Fuel Tank Over Flow Hose [A]
  Fuel Tank [C]

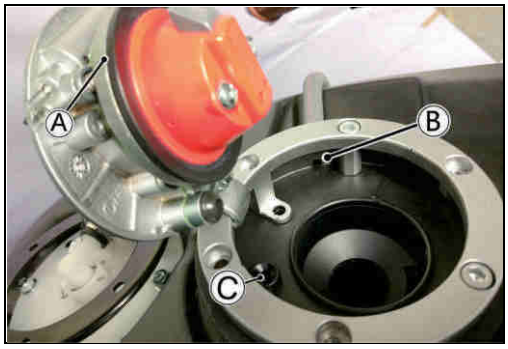


- Draw the fuel out from the fuel tank with a commercially available pump [A].
  - Use a soft plastic hose [B] as a pump inlet hose in order to insert the hose smoothly.
  - Put the hose through the fill opening [C] into the tank and draw the fuel out.

⚠

The fuel could not be removed completely from the fuel tank. Be careful for remained fuel spillage.

Fuel Tank



Fuel Tank Inspection

- Visually inspect the gasket [A] on the tank cap for any damage.

★Replace the tank cap if gasket is damaged.

- Check to see if the water drain pipe [B] and fuel breather Pipe [C] in the tank are not clogged. Check the tank cap breather also.

★If they are clogged, remove the tank and drain it, and then blow the breather free with compressed air.

CAUTION

Do not apply compressed air to the air vent holes [D] in the tank cap. This could cause damage and clogging of the labyrinth in the cap.

Fuel Tank Cleaning

WARNING

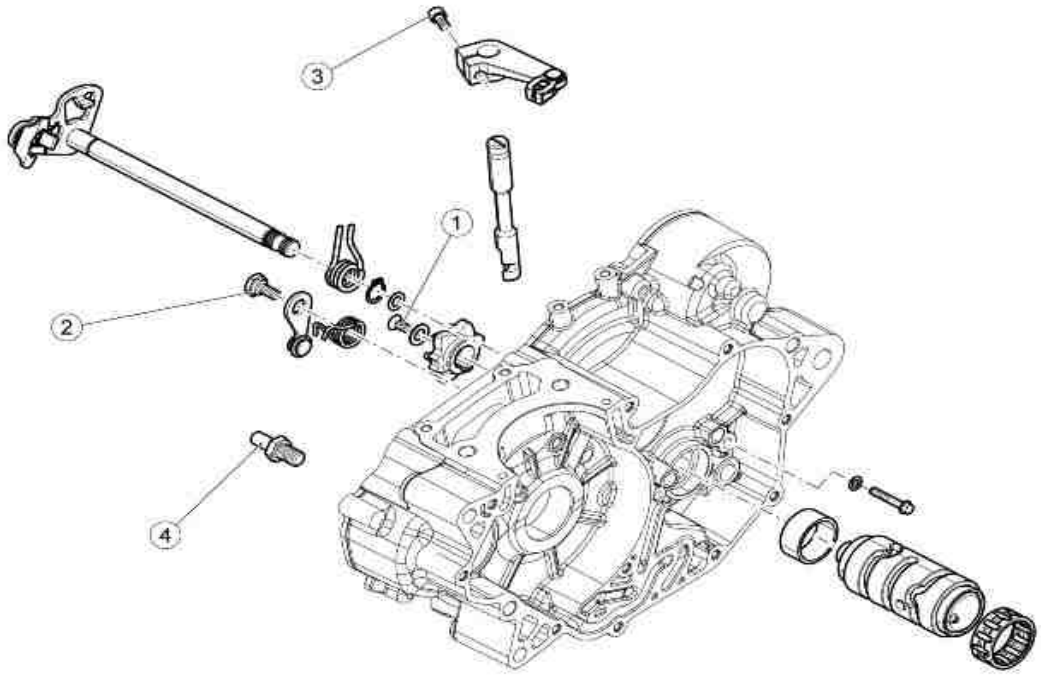
Clean the tank in a well-ventilated area, and take Care that there are no sparks or flame anywhere Near the working area. Because of the danger of Highly flammable liquids, do not use gasoline or low flash-point solvents to clean the tank.

- Remove the fuel tank and drain it (see Fuel Tank Removal).
- Pour some high-flash point solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.
- Pour the solvent out of the tank.
- Remove the fuel tap (see Fuel Tap Removal).
- Clean the fuel tap filter screens in a high-flash point solvent.
- Dry the tank and the fuel tap with compressed air.
- Install the fuel tap (see Fuel Tap Installation).

ENGINE

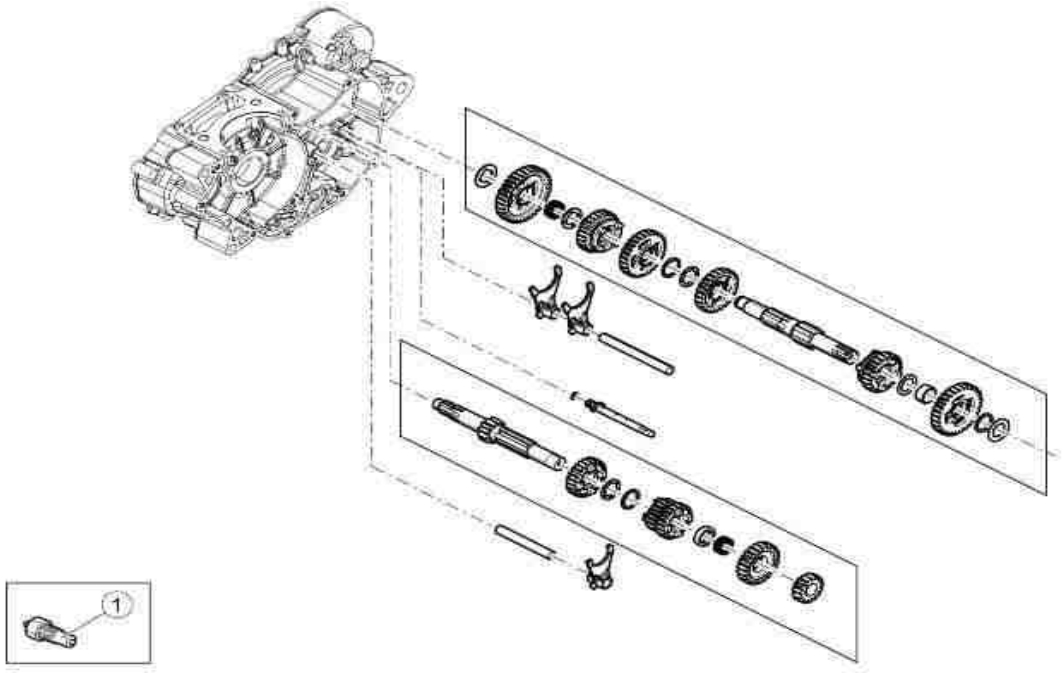
Table of Contents

Gearbox



GEAR SELECTOR

pos.	Description	Type	Quantity	Torque	Notes
1	Selector sprocket fastener screw	M5	1	4 Nm (2.95 lb ft)	-
2	Lever fastener screw	M6	1	9 Nm (6.64 lb ft)	-
3	Clutch lever fastener screw	-	1	9 Nm (6.64 lb ft)	-
4	Gear shift selector pin fixing	-	1	9 Nm (6.64 lb ft)	-



COMPONENTS OF GEARBOX

pos.	Description	Type	Quantity	Torque	Notes
1	Gear sensor retainer	-	1	3 Nm (2.21 lb ft)	-

Filtro oli

Place a recipient with a capacity of at least 900 cm?(54.91 cu.in) under the drain plug (1) on the clutch side. Remove the plug and drain the oil into the recipient for a few minutes.

NOTE

CHECK AND, IF NECESSARY, REPLACE THE DRAIN PLUG SEAL WASHER

Remove the gearbox oil filter (2) and replace.

Remove the drain plug (3) on the alternator side.

NOTE

CHECK AND, IF NECESSARY, REPLACE THE DRAIN PLUG SEAL WASHER

Remove the oil filter (4) and clean thoroughly before refitting.

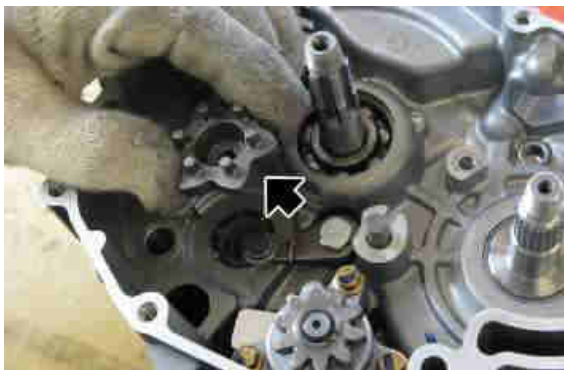
NOTE

CHECK AND, IF NECESSARY, REPLACE THE FILTER SEAL WASHER

Gearbox shafts

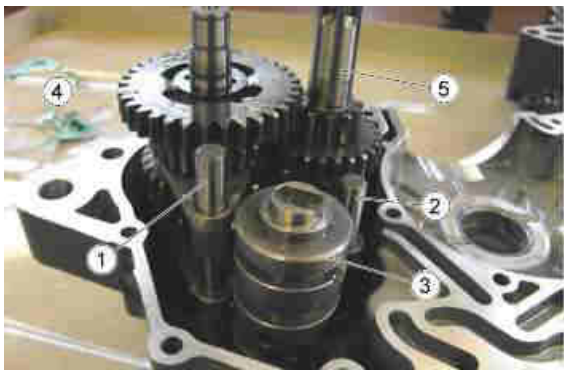
Disassembling the gearbox

Remove the desmodromic drum



Separate the crankcase halves.
Remove the gasket from the crankcase.

Remove both the gearbox selector fork rods and the forks (1) (2).
Remove the desmodromic selector (3).
Remove the secondary shaft (4).
Remove the primary shaft (5).



Removing the primary shaft

CAUTION

THE PRIMARY SHAFT CANNOT BE DISASSEMBLED. IF NECESSARY, REPLACE THE ENTIRE PRIMARY SHAFT.

Removing the secondary shaft

CAUTION

FIT NEW CIRCLIPS WHEN REASSEMBLING

Disassemble the secondary shaft as follows:

- Remove the shim washer (1)

- Remove the first speed gear (2).

- Remove the roller bearing cage (3).

Removing the primary shaft

- Remove the spacer washer (4)

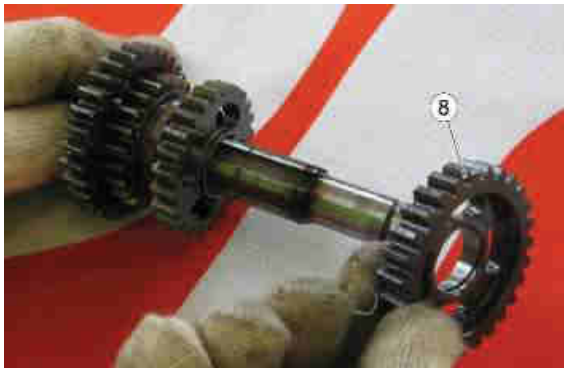
- Remove the fifth speed gear (5).

- Remove the circlip (6).

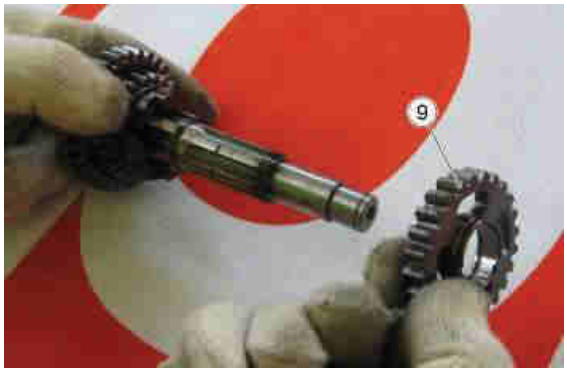
- Remove the spacer washer (7)

Removing the primary shaft

- Remove the third speed gear (8).



- Remove the fourth speed gear (9).

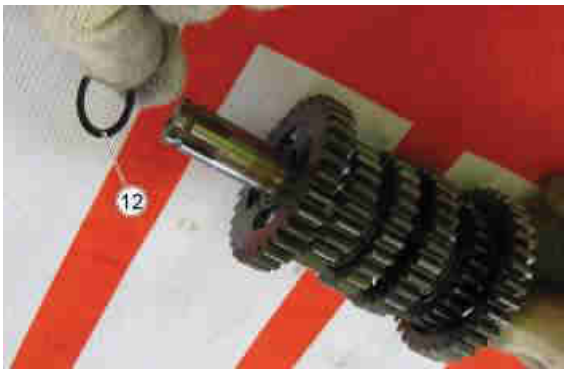


- Remove the sixth speed gear (10).

- Remove the spacer washer (11)

Removing the primary shaft

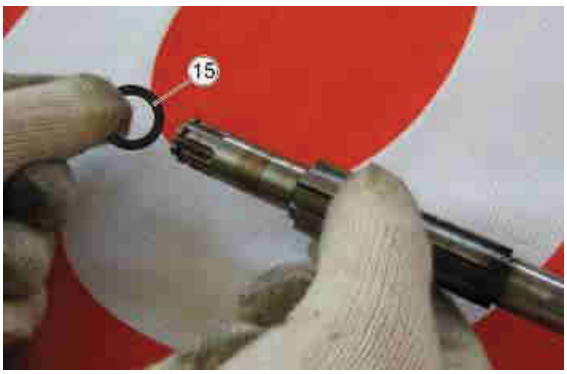
- Remove the spacer washer (12)



- Remove the second speed gear (13).

- Remove the bush (14).

- Remove the shim washer (15)



Desmodromic demounting

- Remove the fork carrier shaft (1)

- Remove the desmodromic shaft (2)

- Remove the forks (3)

Checking the primary shaft

Characteristic

Maximum wear limit for selector gear splines

... mm (... in)

Minimum wear limit for primary shaft seat, sprocket side

... mm (... in)

Minimum wear limit for primary and secondary shaft seats, clutch side

... mm (... in)

Checking the secondary shaft

Characteristic

Maximum wear limit for selector gear splines

... mm (... in)

Minimum wear limit for primary shaft seat, sprocket side

... mm (... in)

Minimum wear limit for primary and secondary shaft seats, clutch side

... mm (... in)

Checking the desmodromic drum

Check the desmodromic shaft and drum for any signs of damage, scratches or wear, and replace if necessary.

Check the channels in the desmodromic drum for any signs of damage or and replace the drum if necessary.

Check the desmodromic drum bearing for any signs of damage or pitting, and change the drum if necessary.

Checking the forks

NOTE

THE FOLLOWING PROCEDURE IS APPLICABLE FOR ALL THE GEARBOX SELECTOR FORKS

? Check that the fork moves uniformly and without impediment; check for damage, dents and signs of wear on the roller (1) and on the teeth (2) of the fork.

? Replace the fork if necessary.

Characteristic

Maximum endfloat of selector forks

... mm (... in)

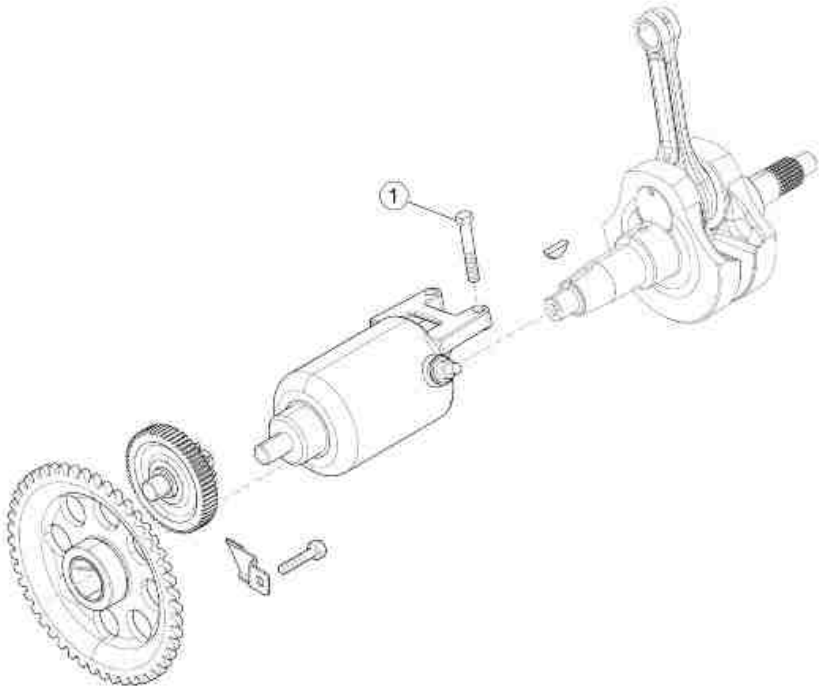
Minimum wear limit of selector fork guide pins

... mm (... in)

Maximum eccentricity of the two fork guide shafts

... mm (... in)

Starter motor



STARTER MOTOR

pos.	Description	Type	Quantity	Torque	Notes
1	Starter motor fastener screw	M6x25	2	12 Nm (8.85 lb ft)	-

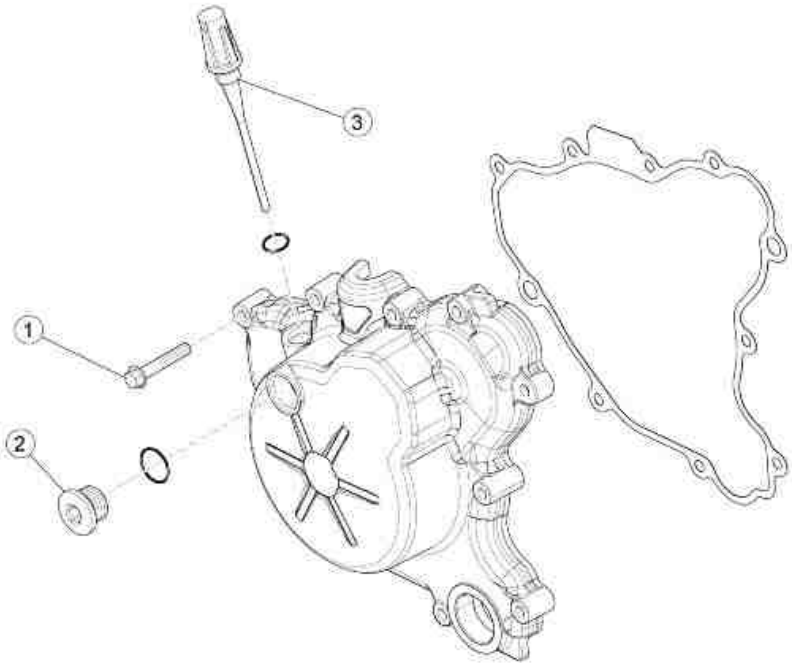
Removing the starter motor

- Undo and remove the two fixing screws (1).
- Remove the starter motor (2).

NOTE

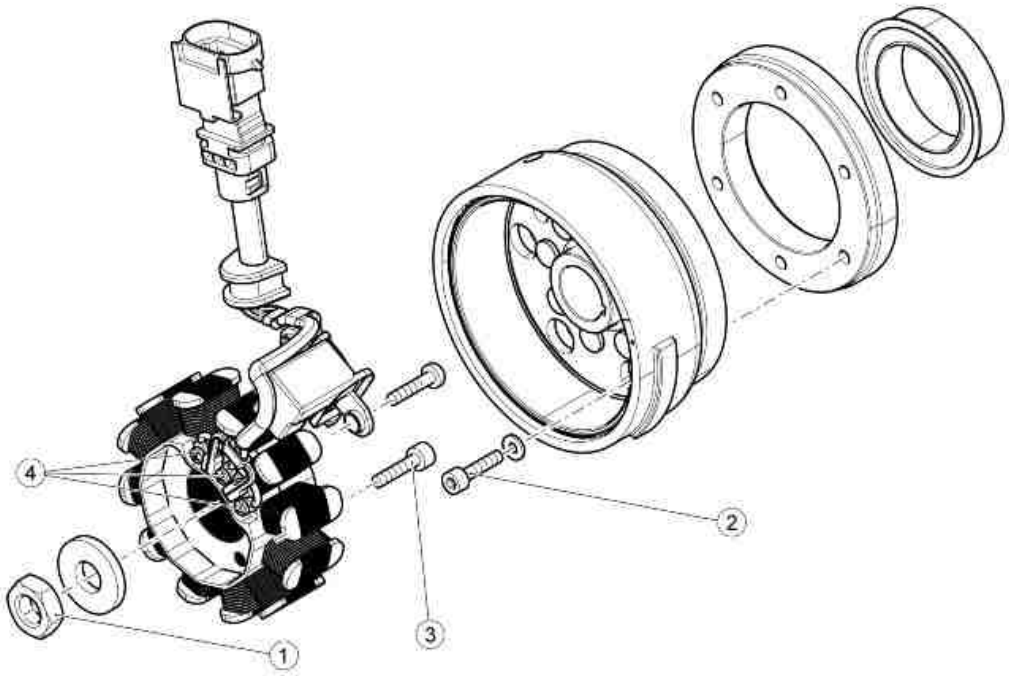
THE STARTER MOTOR CAN ALSO BE REMOVED IF THE ENGINE IS FITTED TO THE VEHICLE.

Generator side



FLYWHEEL COVER

pos.	Description	Type	Quantity	Torque	Notes
1	Flywheel cover fastener screw	M6	10	12 Nm (8.85 lb ft)	-
2	Timing control cap	M18	2	4 Nm (2.95 lb ft)	-
3	Oil dipstick	M12x1.5	1	5 Nm (3.69 lb ft)	-

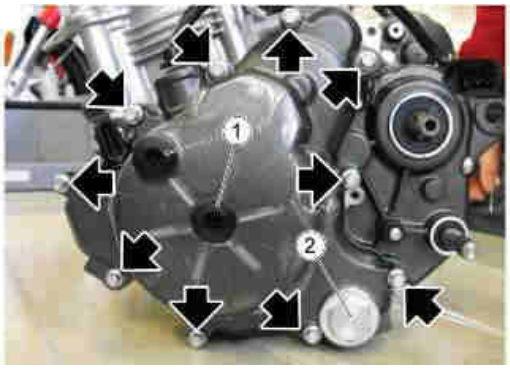


IGNITION UNIT

pos.	Description	Type	Quantity	Torque	Notes
1	Flywheel rotor fixing nut	M14x1.5	1	86 Nm (63.43 lb ft)	-
2	Rotor fastener screw	-	6	12 Nm (8.85 lb ft)	-
3	Stator clamping screws	-	2	6 Nm (4.43 lb ft)	-
4	Pick-Up clamping screw	-	3	3.5 Nm (2.58 lb ft)	-

Removing the flywheel cover

- Unscrew and remove the two adjustment plugs (1).
- Unscrew and remove the engine oil pre-filter plug (2).
- Remove the engine oil pre-filter.
- Undo and remove the ten screws fixing the flywheel cover.
- Remove the flywheel cover.



Rimozione rotore

- Remove the starter motor gear.

- Fit the specific tool.
- Undo and remove the hex socket screw.

Specific tooling

865259 Flywheel retainer

- Retrieve the washer.

- Fit the tool and pull out the rotor.

Specific tooling

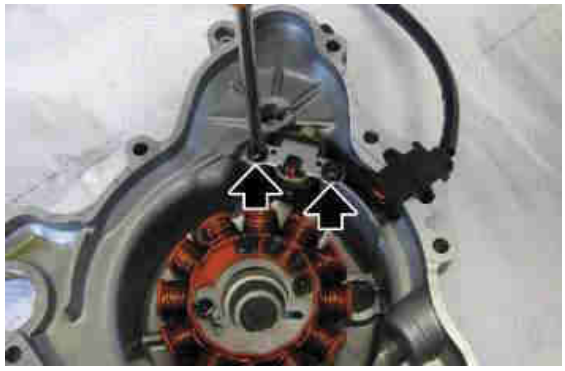
864868 Flywheel extractor

- Remove the rotor.

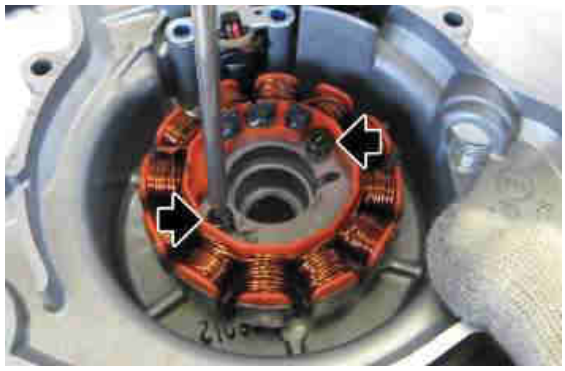
- Remove the key.

Removing the stator

- Remove the two screws fastening the plate securing the stator cable



- Remove the two screws fastening the stator



- Remove the stator.

Freewheel removal

- Undo and remove the indicated retainer screw with the relative plate.

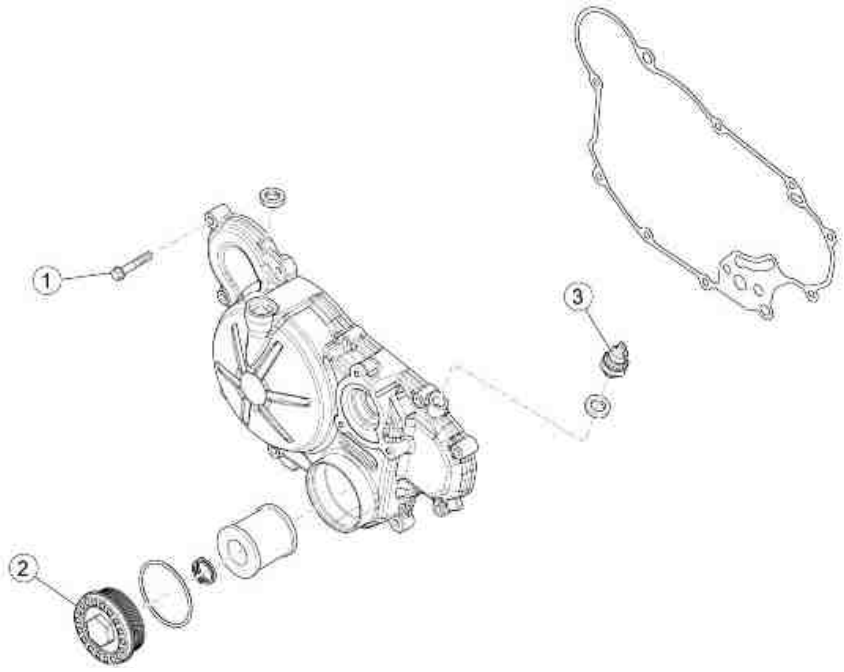
- Remove the freewheel.

Muffler

Muffler Body and Exhaust Pipe Installation

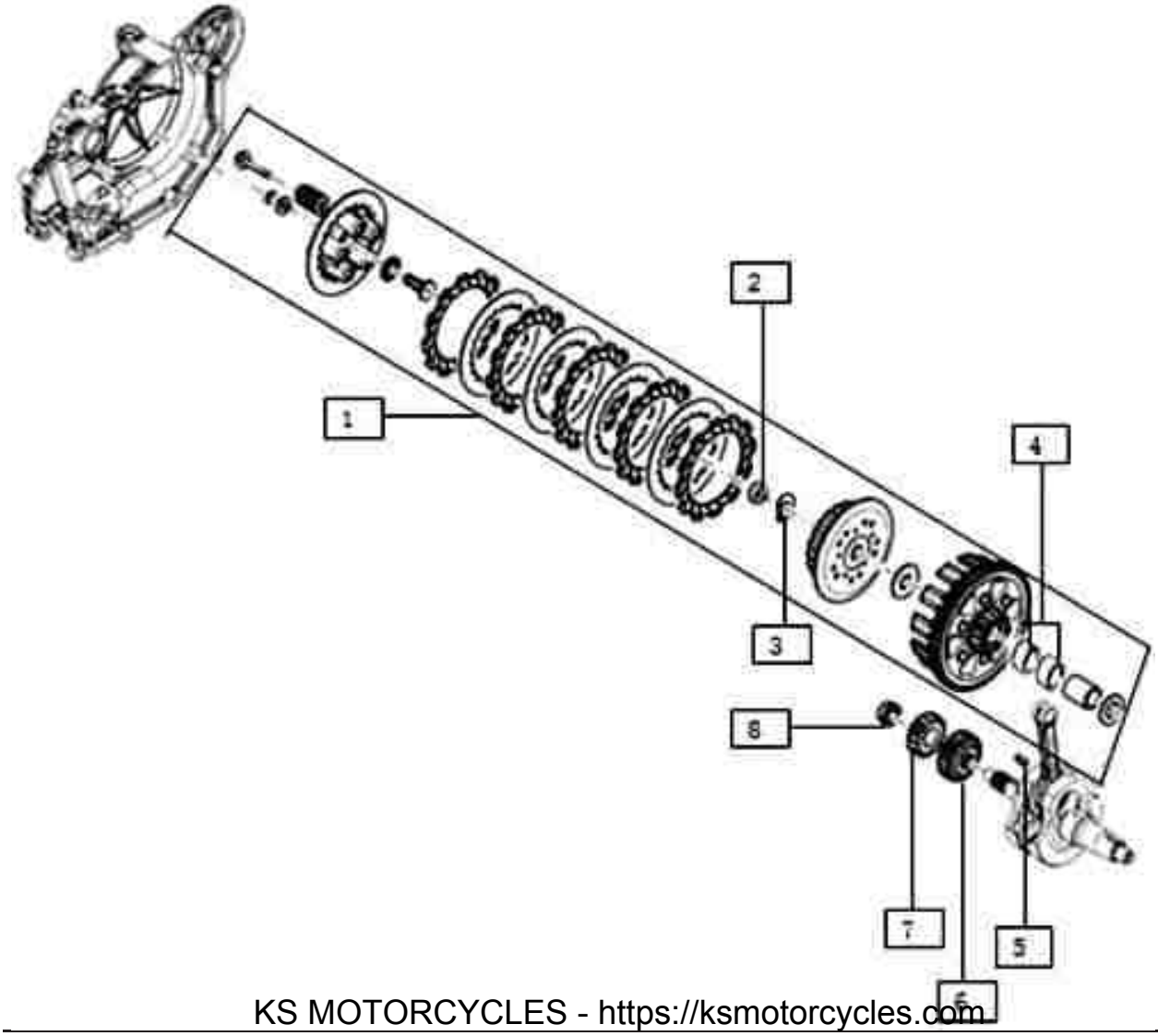
- Replace the muffler gasket and exhaust pipe gasket with new ones.
- Install the exhaust pipe and muffler body temporary.
- Tighten the exhaust pipe holder nuts, and then the muffler clamp bolt.
- Tighten the front mounting bolt, and then the rear mounting bolt.
- Install the removed parts (see appropriate chapters).

Clutch side



CLUTCH COVER

pos.	Description	Type	Quantity	Torque	Notes
1	Clutch cover fastener screw	M6x35	10	12 Nm (8.85 lb ft)	-
2	Oil filter cover	M56x1.5	1	25 Nm (18.44 lb ft)	-
3	Oil pressure sensor	M10	1	13 Nm (9.59 lb ft)	-

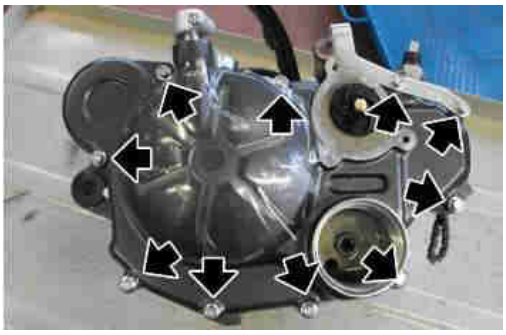


CLUTCH

pos.	Description	Type	Quantity	Torque	Notes
1	Clutch spring screw	M5	5	4 Nm (2.95 lb ft)	-
2	Crankshaft primary gear fastener nut	M12	1	79 Nm (58.27 lb ft)	-
3	Clutch nut	-	1	40 Nm (29.50 lbf ft)	-

Removing the clutch cover

Undo and remove the ten screws of the clutch cover.



- Remove the clutch cover.

NOTE

- Do not remove the clutch release lever and shaft as-Sembly unless it is absolutely necessary. If removed, The oil seal replacement may be required. Apply grease to the oil seal lips.

Remove the gasket (1) and retrieve the locating dowels (2).

WARNING

REPLACE THE GASKET WHEN REASSEMBLING.

• Disassembling the clutch

Unscrew and remove the six screws by loosening them 1/4 of a turn at a time; operate in stages and diagonally, and retrieve the washers and the clutch springs.

- Remove the thrust bearing.
- Remove the discs.

- Release the screw by lowering the lock tab.

- Block clutch bell rotation using the specific tool.
- Unscrew and remove the clutch bell fixing nut.
- Remove the clutch hub.

Specific tooling

00H05300041 Clutch lock

- Remove the shim and the clutch hous-ing.

- Remove the shim.

Checking the clutch plates

Characteristic

Driving plates thickness

2.85 - 2.95 mm (0.112 - 0.116 in)

Number of driving plates

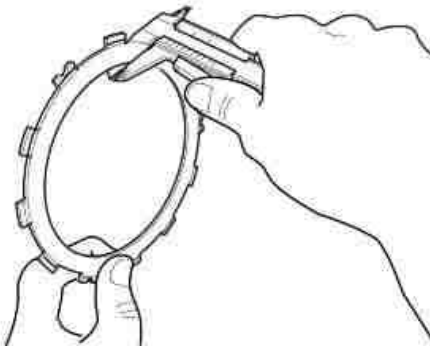
5

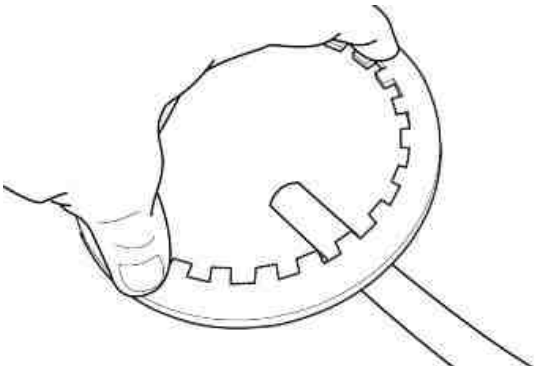
Driven plates thickness

1.46 - 1.53 mm (0.057 - 0.06 in)

Number of driven plates

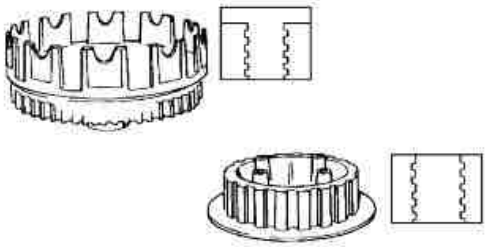
4



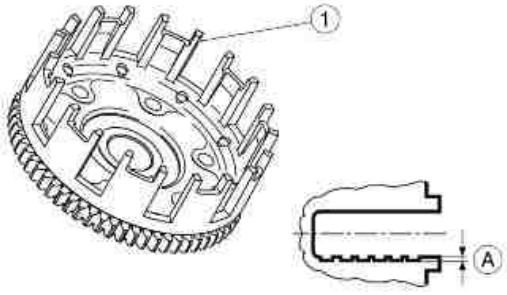


Checking the clutch housing

- Check the primary driven gear for damage and wear and, if necessary, replace the primary driven gear and the clutch bell all together.
- Make sure there is not excessive noise during operation; if necessary, replace the primary drive gear and the clutch bell all together.

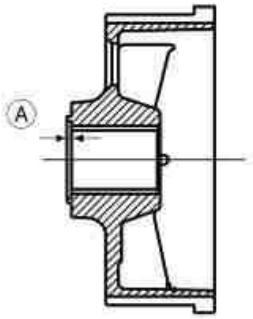


- Check the worn guiding grooves of the clutch bell (1); max. insertion depth (A) = 0.5 mm (0.020 in).

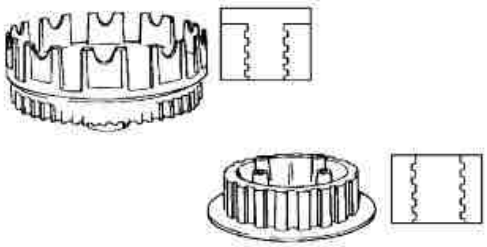


Checking the clutch hub

When the clutch hub is worn it can create problems with sliding of the housing. The hub should be replaced if the surface of the spring has exceeded the wear limits. Max. wear limit (A) 0.3 mm (0.012 in).

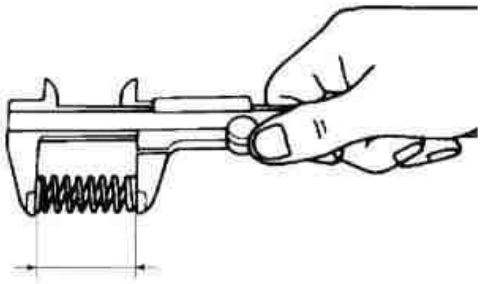


Check the clutch hub for damage and wear that may result in clutch irregular operation. If necessary, replace the hub.



Checking the springs

- Check the springs for damage and, if necessary, replace the them all together.
- Measure the clutch spring length when unloaded; if necessary, replace the springs all together.



Characteristic

Minimum wear limit in the release position of the individual clutch springs

31.6 mm (1.24 in)

Assembling the clutch

- Insert the shim.

- Fit the clutch housing.

  Fit the shim washer.

Insert the clutch hub.

Screw in the retainer nut locking the rotation of the clutch housing with the specific tool.

Specific tooling

00H05300041 Clutch lock

- Lift one side of the lock tab.

Insert the disc covered with the friction material into the bell.

Continue inserting, alternating a metal disc with one with friction material, finishing with a friction material disc with a black tooth.

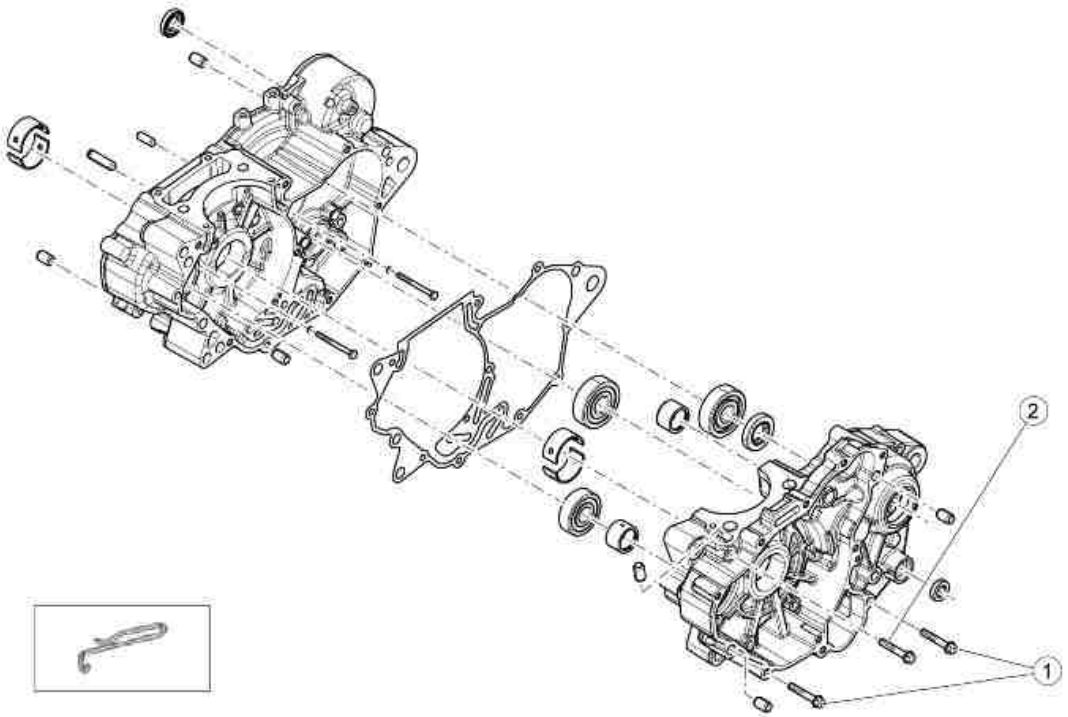
Place the thrust plate.

Fit the clutch springs.

Fit the screw washers.

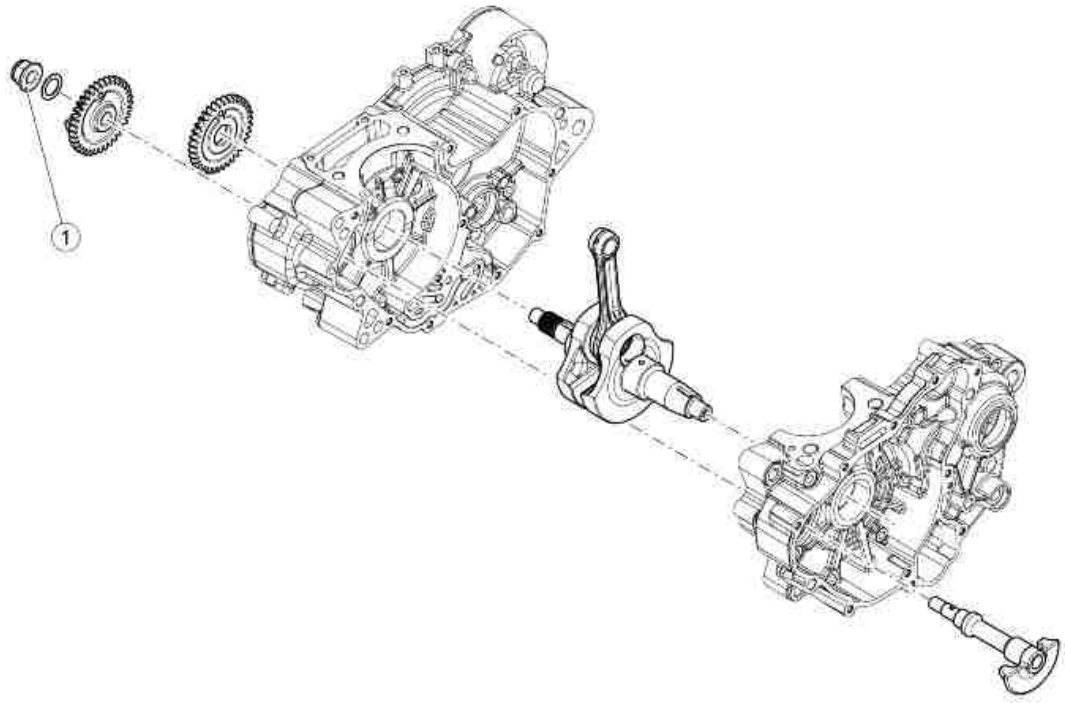
Tighten the six screws operating in stages and diagonally.

Crankcase



ENGINE CRANKCASE

pos.	Description	Type	Quantity	Torque	Notes
1	Crankcase retainer screw	M6x60	4	12 Nm (8.85 lb ft)	-
2	Crankcase retainer screw	M6x75	4	12 Nm (8.85 lb ft)	-



CRANKSHAFT

pos.	Description	Type	Quantity	Torque	Notes
1	Gear retainer nut	M10	1	40 Nm (29.50 lb ft)	-

Balancing countershaft removal

- Before taking out the balancing countershaft the clutch cover and flywheel cover must be removed.
- Lock the countershaft with the specific tool.

Specific tooling

864486 Countershaft lock tool

Unscrew and remove the nut and collect the washer

Remove the countershaft gear.

Remove the countershaft from the alternator side.

Balancing countershaft fitting

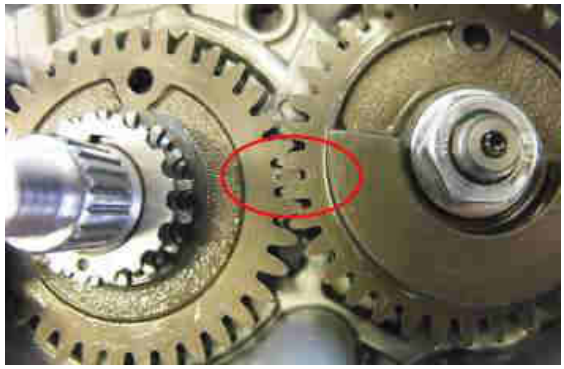
- Insert the countershaft from the alternator side.

Insert the gear aligning its reference to the primary gear.

Using the specific tool, tighten the nut remember first to place the washer.

Specific tooling

864486 Countershaft lock tool



Crankcase opening

Beforehand remove the clutch cover and the clutch.

Remove the gear selector.

Install the countershaft blocking tool.

Specific tooling

864486 Countershaft lock tool

Remove the primary gear unscrewing and removing the nut.

Collect the washer.

Remove the countershaft gear.

- Remove the primary remaining gears.
- Remove the head and cylinder.

- Remove the chain guide slider, unscrewing and removing the fixing screw.
- Remove the timing chain gear.

- Remove the pump drive gear, removing the seeger and recovering the washer.

- Remove the base gear of the main shaft.
- Remove the cotter.

Remove the oil pump unscrewing the three fixing screws.
Collect the gasket.

- Remove the gear spider screw, unscrewing and removing the fixing screw.

- Moving from the left side of the engine, remove the flywheel and all of its components beforehand.
- Unscrew and remove the six screws on the outside of the crankcase (1).

- Unscrew and remove the longest screw (2).

- Unscrew and remove the five screws (3).
- Unscrew and remove the short screw (4).

- Remove the left crankcase.

Bearing removal

- Heat the crankcase surface with a heat gun.
- Remove the bearing using the specific extractor.

List of extractors to be used with sleeve 020376Y:

RIGHT CRANKCASE

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo bearing: 020439Y+020357Y Removal of desmo bearing: 020891Y
- Insertion of secondary shaft roller bearing cage: 020891Y Removal of the secondary shaft roller bearing cage:020363Y

- Insertion of countershaft bearing: 020412Y+020358Y Removal of countershaft bearing: 020375Y

LEFT CRANKCASE

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo roller bearing cage: 020375Y Removal of desmo roller bearing cage: use universal extractor
- Insertion of secondary shaft roller bearing cage: 020363Y Removal of the secondary shaft roller bearing cage: use universal extractor
- Insertion of countershaft roller bearing cage: 020483Y Removal of countershaft roller bearing cage: 020364Y

Crankcase check

- Before checking the crankcase halves, thoroughly clean all the surfaces and the oil pipes.
- For the crankcase half on the transmission side, take particular care when handling the housing and hoses for the oil pump, the duct with the by-pass valve and the main bushings.
- As already described in the lubrication chapter, it is especially important that the by-pass valve housing shows no wear that may impair the proper sealing of the lubrication pressure adjustment ball.
- Check that the surfaces are free from dents or deformations, with special attention to both the crankcase coupling and the cylinder-crankcase surfaces.
- Defects in the crankcase coupling gasket or the surfaces indicated in the figure can cause a drop in the oil pressure and affect the lubrication pressure for the main bushings and the connecting rod.
- Check that the surfaces that limit crankshaft axial clearance show no signs of wear. To measure and check sizes follow the procedure described previously for checking crankshaft axial clearance and dimensions.

Bushing selection

BUSHING SEAT DIAMETER ON CRANKCASE

Specification	Desc./Quantity
Class 1	**MIN 36.500 mm (1.4370 in)** **MAX 36.508 mm (1.4373 in)**
Class 2	**MIN 36.508 mm (1.4373 in)** **MAX 36.516 mm (1.4376 in)**

CRANKSHAFT DIAMETER

Specification	Desc./Quantity
Class 1	**MIN 32.480 mm (1.2787 in)** **MAX 32.485 mm (1.2789 in)**

Specification	Desc./Quantity
Class 2	**MIN 32.485 mm (1.2789 in)** **MAX 32.490 mm (1.2791 in)**

BUSHING THICKNESS

Specification	Desc./Quantity
Red	**MIN 2.005 mm (0.0789 in)** **MAX 2.010 mm (0.0791 in)**
Blue	**MIN 2.010 mm (0.0791 in)** **MAX 2.015 mm (0.0793 in)**

CRANKSHAFT COUPLING/BUSHING SEAT DIAMETER

Specification	Desc./Quantity
Crankshaft type 2	**Type 1 crankcase diameter RED + RED** **Type 2 crankcase diameter RED + BLUE**
Crankshaft type 1	**Type 1 crankcase diameter RED + BLUE** **Type 2 crankcase diameter BLUE + BLUE**

Bearing fitting

- Heat up the crankcase using the thermal gun.
- Fit the bearing in the seat with the aid of the specific tool.

List of tools for refitting, to be coupled with sleeve 020376Y:

RIGHT CRANKCASE

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo bearing: 020439Y+020357Y Removal of desmo bearing: 020891Y
- Insertion of secondary shaft roller bearing cage: 020891Y Removal of the secondary shaft roller bearing cage:020363Y
- Insertion of countershaft bearing: 020412Y+020358Y Removal of countershaft bearing: 020375Y

LEFT CRANKCASE

- Insertion of main shaft bearing: 020439Y+020359Y Removal of the main shaft bearing: 020358Y
- Insertion of desmo roller bearing cage: 020375Y Removal of desmo roller bearing cage: use universal extractor
- Insertion of secondary shaft roller bearing cage: 020363Y Removal of the secondary shaft roller bearing cage: use universal extractor
- Insertion of countershaft roller bearing cage: 020483Y Removal of countershaft roller bearing cage: 020364Y

NOTE: insertion of the roller bearing cages in line with the crankcase is recommended from the inside to the outside.

Crankcase closing

- After installing the gearbox, fit a new gasket.
- Join the two crankcase halves together, using the locating dowels to align correctly.

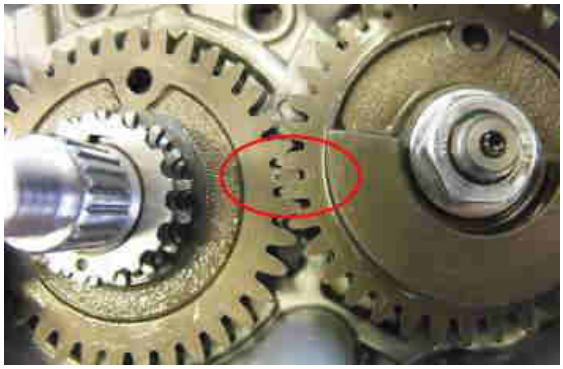
- Fit and tighten the short screw (1).
- Fit and tighten the five screws (2).
- Fit and tighten the long screw (3).
- Move to the left hand side of the crankcase and fit and tighten the six screws (4).

- Install the countershaft.

- Fit the selector star.
- Fit and tighten the screw.

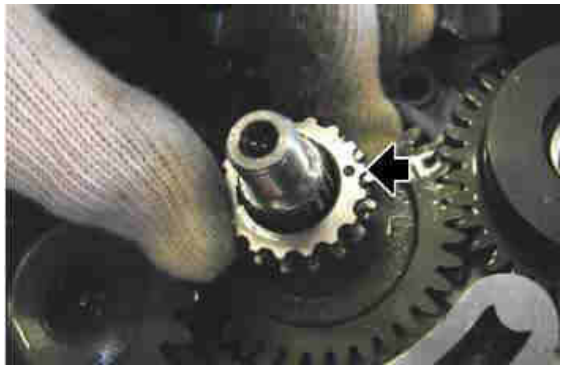
- Fit a new oil pump gasket.
- Fit the oil pump, screwing the three screws.

- Insert the countershaft gear and position the washer.
- Use the specific tool to tighten the nut.
- Apply the cotter to the main shaft.
- Position the base gear of the primary, aligning the two references.



- Insert the pump drive gear.
- Insert the washer and apply the fixing seeger.

- Insert the timing chain gear, paying attention to the direction. The engraving must face upward.
- Fit the timing chain.

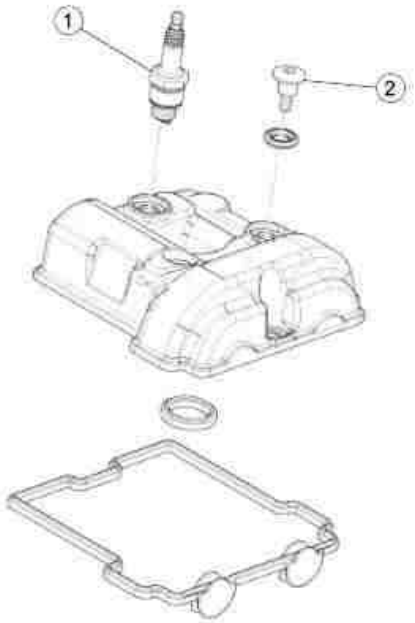


- Position the chain guide slider.
- Position and screw the fixing screw.

- Fit the rest of the primary gears.
- Tighten the fixing nut.
- Remove the countershaft locking tool.

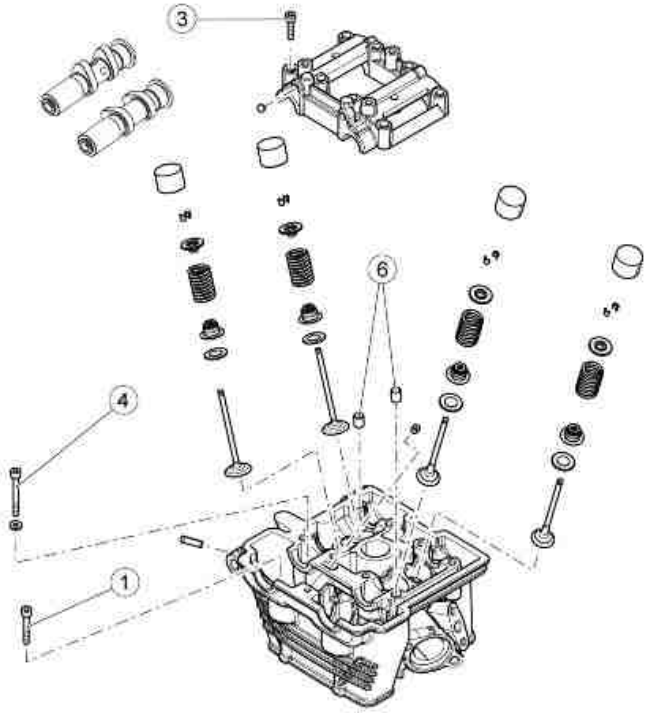
- Fit the gear selector.

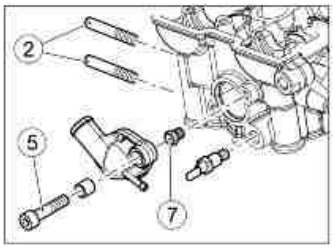
Head and timing



HEAD COVER

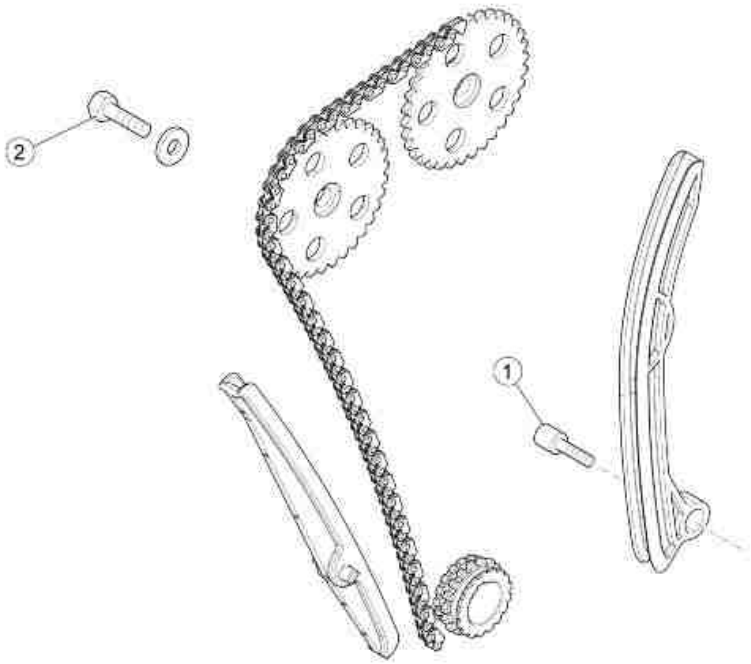
pos.	Description	Type	Quantity	Torque	Notes
1	Spark plug	M10	1	13 Nm (9.59 lb ft)	-
2	Head cover fastener screw	M6	4	11 Nm (8.11 lb ft)	-





HEAD - VALVES

pos.	Description	Type	Quantity	Torque	Notes
1	Head fastener screw	M6x130	2	12 Nm (8.85 lb ft)	-
2	Drainage side stud bolt retainer	M8x40	2	12 Nm (8.85 lb ft)	-
3	Camshaft cover fastener screw	M6x40	4	11 Nm (8.11 lb ft)	-
4	Head fastener screw	M8x166	4	27 Nm + 90?(19.91 lb ft + 90?	-
5	Thermostat cover fastener screw	M6x20	2	11 Nm (8.11 lb ft)	-
6	Head dowels retainer	M8x10	2	6.5 Nm (4.79 lb ft)	-
7	Thermostat retainer	-	1	9 Nm (6.64 lb ft)	-



TIMING SYSTEM

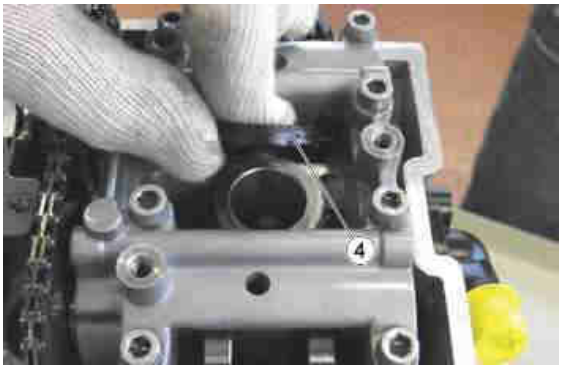
pos.	Description	Type	Quantity	Torque	Notes
1	Chain tensioner pad fastener screw	M6x16	1	10 Nm (7.38 lb ft)	Loctite 243
2	Timing system gear fastener screw	M8x40	2	27 Nm (19.91 lb ft)	Loctite 243

Removing the head cover

- Remove the adjuster screw covers (1).

- Unscrew and remove the four cylinder head screws (2).
- Remove the cylinder head (3).

- Remove the gasket (4).



- Remove the spark plug.

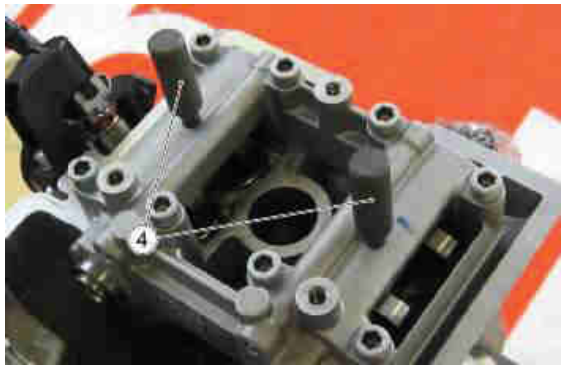
Removing the timing control

- Turn the crankshaft from the hole on the cover (1)
- Take the piston to TDC.
- The sign (2) must be aligned with the sign (3).

- Insert the specific pins (4) on the valves cam tower.

Specific tooling

864567 Camshaft timing adjustment lock pins



- Remove the starter motor beforehand.
- Loosen and remove the tensioner screw (5).

- Remove the spring.
- Unscrew and remove the two screws (6) and remove the entire tensioner control.

- Lock the timing gear using the specific tool.

Specific tooling

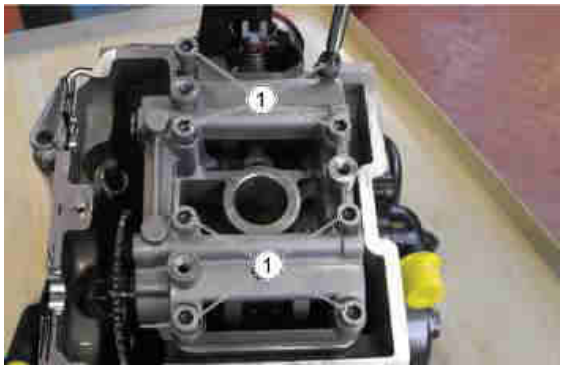
865260 Camshaft sprocket lock tool

- Unscrew and remove the gear.
- Repeat the operation with the other gear.

Cylinder head

Removing the overhead camshaft

- Remove the two pins from the cam tower.
- Remove the eight screws (1).



- Remove the cam tower (2).

- Remove the two camshafts (intake side and exhaust side).

- Undo and remove the six screws fastening the head (3)

- Remove the head (4).

Removing the valves

- Remove the head.
- Place the head on supporting surface.
- Number the valves and their bucket tappets in order to position them correctly upon refitting.

- Remove the valve bucket tappets.

- Compress the valve spring using the specific tool.

Specific tooling

020382Y011 Valve removal/installation tool

- Remove both cotter pins.

- Release the valve springs.
- Remove the cap and the valve spring.

Checking the overhead camshaft

- Check the camshaft bearings for signs of abnormal wear.

Characteristic

Standard diameter - Bearing A

19.980 - 19.959 mm (0.7866 - 0.7858 in)

Minimum diameter allowed - Bearing A

19.95 mm (0.7854 in)

Inlet cam height

31.488 mm (1.23968 in)

Exhaust cam height

30.864 mm (1.21511 in)

- Check that the holes used for timing and their shoulders are not worn.
- If values measured are not within the specified limits or there are signs of wear, replace the defective components with new ones.

Characteristic

Maximum axial clearance allowed:

0.4 mm (0.0157 in)

Valve check

- Measure the width of the sealing surface on the valve seats and on the valves themselves.
- If the sealing surface on the valve is wider than the specified limit, damaged in one or more points or curved, replace the valve with a new one.

CAUTION

DO NOT CHANGE THE VALVE FITTING POSITION (RH - LH).

Characteristic

Minimum diameter allowed - Intake

3.96 mm (0.1559 in)

Minimum diameter allowed - Exhaust:

3.95 mm (0.1555 in)

Standard clearance - Intake

0.15/0.20 mm (0.0059/0.0079 in)

Standard clearance - Exhaust

0.20/0.25 mm (0.0079/0.0098 in)

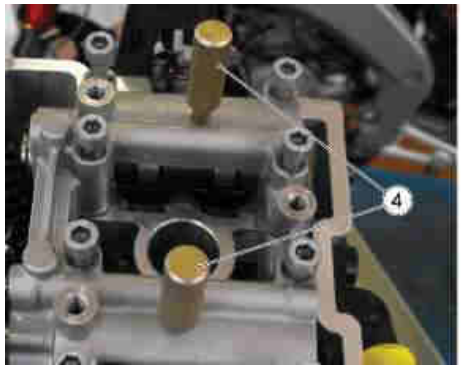
Maximum clearance admitted - Intake:

0.060 mm (0.0023 in)

Maximum clearance admitted - Exhaust:

0.070 mm (0.0027 in)

- Remove the head cover.
- Bring the engine to reach the top dead centre and lock it at that position using the specific tool (4).



Specific tooling

864567 Camshaft timing adjustment lock pins

- Use a feeler gauge to check clearance on the four valves.
- If the values measured differ from the values specified, record the difference between MAXIMUM ALLOWED CLEARANCE e CLEARANCE MEASURED.

- Remove the chain tensioner.
- Undo and remove the eight screws and remove the cam tower.

- Remove the timing chain and the gears of the camshaft of the valves in question.

- Remove the bucket tappet of the valve in question and read the calibration value for that bowl, found inside the bucket tappet itself.
- Replace the bucket tappet with new one of a size suitable to restore the correct clearance.

Characteristic

Standard clearance - Intake

0.15/0.20 mm (0.0059/0.0079 in)

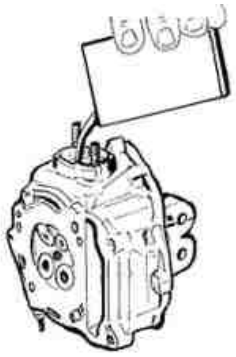
Standard clearance - Exhaust

0.20/0.25 mm (0.0079/0.0098 in)

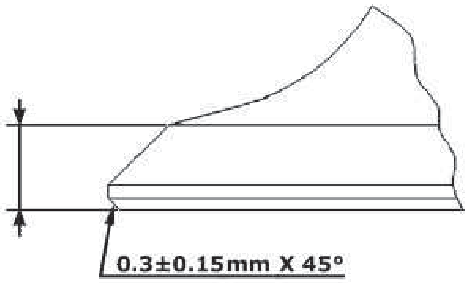
- Fit the camshaft, the gears and the chain in their correct positions, using the references located on the flywheel side of the crankcase.
- Fit the cam tower and tighten the eight screws to the prescribed torque.
- Fit the chain tensioner.
- Check for correct valve clearance.
- Fit the head cover.

Inspecting the valve sealings

- Fit the valves into the cylinder head.
- Alternatively test the intake and exhaust valves.
- This test should be carried out by filling the manifold with petrol and checking that the head does not excessively ooze through the valves.



- Measure the sealing surface width on the valve seats.



VALVE SEALING SURFACE

Specification	Desc./Quantity
Inlet valve - seal surface	2.30 +/- 0.15 mm (0.0905 +/- 0.0059 in)
Outlet valve - seal surface	2.95 +/- 0.15 mm (0.1161 +/- 0.0059 in)
Valve chamfering	0.2 +/- 0.1 mm x 45?(0.0079 +/- 0.0039 in x 45?

Inspecting the valve housings

- Remove any carbon deposits from the valve guides.
- Measure the inside diameter of each valve guide.
- Measure according to the thrust direction at three different heights.

Characteristic

Intake guide - standard diameter

4.012 mm (0.1579 in)

Intake guide: Wear limit

4.020 mm (0.1582 in)

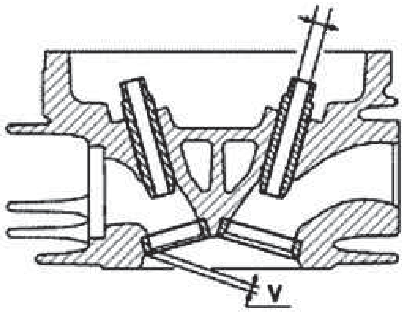
Discharge guide - standard diameter

4.012 mm (0.1579 in)

Discharge guide: Wear limit

4.020 mm (0.1582 in)

- Replace the head if the values corresponding to the width of the mark on the valve seat or the valve guide diameter exceed the specified limits.
- Check the width of the mark on the valve seat 生?



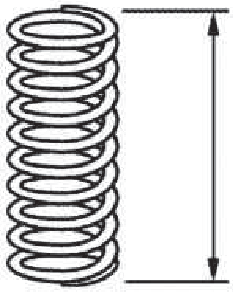
Characteristic

Wear limit for the width of the mark on the valve seat "V"

- Intake: 1.6 mm (0.0630 in)
- Outlet: 1.8 mm (0.0708 in)

Inspecting the springs and half-cones

- Check that the spring upper supporting caps and the cotters show no signs of abnormal wear.
- Check the unloaded spring length.



Characteristic

Valve spring length:

33.24 +/- 0.25 mm (1.3086 +/-0.0098 in)

Checking the cylinder head

- Using a trued bar, check that the head surface is not worn or distorted.

- Check that the camshaft bushings are not worn.
- Check that the head cover surface, the intake manifold and the exhaust manifold are not worn.

Installing the valves

- Lubricate the valve guides with engine oil.
- Position the two oil seals on the cylinder head.

- Fit the valves, the springs and the caps. Using the specific tool, compress the springs and fit the cotters in their seats.

Specific tooling

020382Y011 Valve removal/installation tool

Timing

Checking the chain tensioner

- Remove the centre screw with the washer and the tensioner spring. Check that the one-way mechanism is not worn.
- Check the condition of the tensioner spring.
- Replace the whole unit if any wear is found.

Checking the chain

- Check that the guide slider and the tensioner pad are not excessively worn.
- Check that the chain assembly, the camshaft driving pulleys and the sprocket wheel are not worn.
- Replace the parts if signs of wear are found.

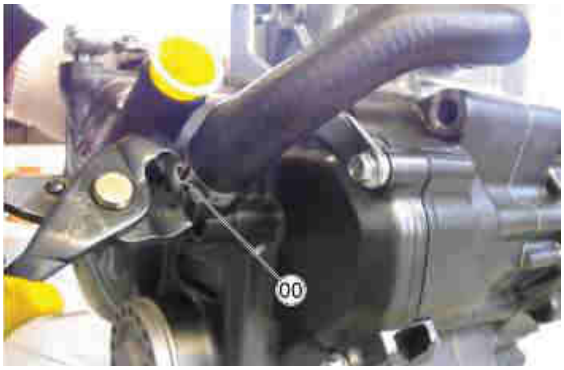
Cylinder-piston assembly

Removing the cylinder

- Remove the head gasket (1).

- Remove the guide shoe (2).

- Remove the water hose clamp (3).



- Remove the cylinder (4).
- Remove the gasket (5).

Disassembling the piston

- Apply the tool under the piston (1).
- Cover the base of the cylinder with a cloth.

Specific tooling

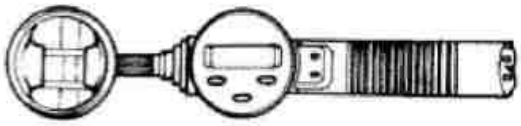
865261 Piston retainer

- Remove the retainer ring which locks the pin (2).

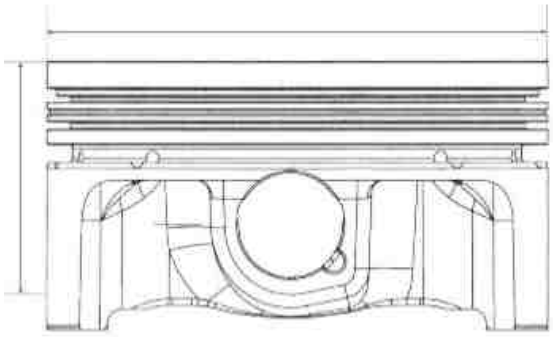
- Remove the pin (3).
- Remove the piston (4).

Checking the piston

- Measure the pin seat diameter on the piston.
- Calculate the pin - piston coupling clearance.



- Measure the piston outside diameter, perpendicular to the pin axis.
- Take the measurement at 6 mm (0.24 in) from the base, at the position shown in the figure.



- Carefully clean the sealing rings housings.
- Measure the sealing rings - grooves coupling clearance using suitable sensors, as shown in the diagram
- If clearances measured exceed the limits specified in the table, the piston should be replaced by a new one.

NOTE

MEASURE CLEARANCE BY INSERTING THE BLADE OF THE FEELER GAUGE FROM THE 2nd SEALING RING SIDE.

Characteristic

Piston / cylinder

Piston pin hole - standard: 15.003 - 15.008 mm

(0.5907 - 0.5908 in)

Maximum piston / cylinder coupling clearance after use

- top ring: 0.075 mm (0.0029 in)
- middle ring: 0.065 mm (0.0025 in)
- oil scraper: 0.25 mm (0.0098 in)

Standard piston / cylinder coupling clearance

- top ring: +0.03 / 0.062 mm (0.0012 / 0.0024 in)
- middle ring: +0.02 / 0.052 mm (0.0008 / 0.0020 in)
- oil scraper: +0.01 / 0.19 mm (0.0004 / 0.007480 in)

cylinder check

- Using a bore meter, measure the cylinder inside diameter at three different points according to the directions shown in the figure.
- Check that the coupling surface with the head is not worn or misshapen.

CAUTION

THE MARKING IS LOCATED ON THE PISTON CROWN.

Characteristic

Maximum run-out allowed:

0.05 mm

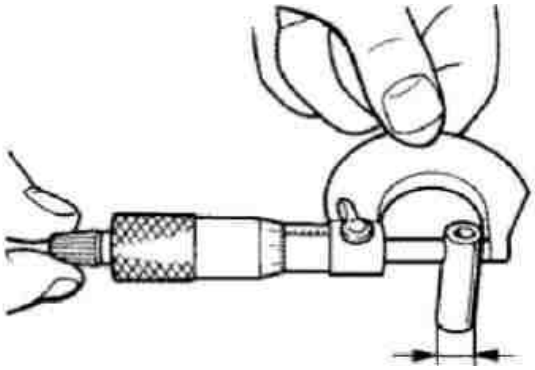
CYLINDER - PISTON COUPLING CLEARANCE 125 CM?

Coupling categories with cast-iron cylinder

NAME	ABBREVIATION	CYLINDER		PISTON		FITTING CLEARANCE	
		min	max	min	max	min	max
Cylinder/Piston	M	58.010	58.017	57.963	57.970	0.040	0.054
Cylinder/Piston	N	58.017	58.024	57.970	57.977	0.040	0.054
Cylinder/Piston	O	58.024	58.031	57.977	57.984	0.040	0.054
Cylinder/Piston	P	58.031	58.038	57.984	57.991	0.040	0.054

Inspecting the wrist pin

- Check the pin outside diameter.



Characteristic

Pin

Minimum diameter: 14.995 mm (0.590 in)

Standard diameter: 15.0000 +0/-0.0030 mm (0.00012 in)

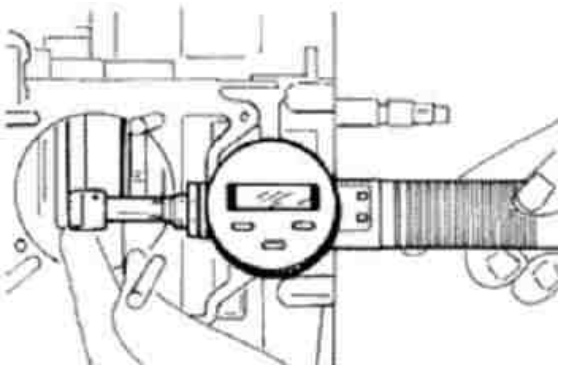
Inspecting the piston rings

ANELLI DI TENUTA

Specification	Desc./Quantity
Compression ring (top)	0.2 / 0.35 mm (0.0079 / 0.014 in)
Compression ring (middle)	0.2 / 0.35 mm (0.0079 / 0.014 in)
Oil scraper ring	0.2 / 0.7 mm (0.0079 / 0.027 in)
Top ring maximum value	0.45 mm (0.18 in)
Middle ring maximum value	0.45 mm (0.18 in)

Checking the connecting rod small end

- Measure the inside diameter of the connecting rod small end using a specific micrometer.



NOTE

IF THE CONNECTING ROD SMALL END DIAMETER EXCEEDS THE MAXIMUM DIAMETER ALLOWED, SHOWS SIGNS OF WEAR OR OVERHEATING, REPLACE THE CRANKSHAFT AS DESCRIBED IN THE "CRANKCASE AND CRANKSHAFT" CHAPTER.

Characteristic

Rod small end

Maximum diameter: 15.023 mm (0.591 in)

Standard diameter: 15.010 - 15.018 mm (0.5910 - 0.5912 in)

Fitting the piston

- Install the piston and the piston pin on the connecting rod, orienting the piston with the arrow facing towards the exhaust side.

- Fit the retainer circlip.

- Provisionally fit the cylinder onto the piston, without fitting the cylinder base gasket.
- Fit a dial gauge on the specific tool.
- Bring the piston to TDC.
- Place the dial gauge against one side of the cylinder and fasten securely to ensure that the zero position is read correctly.

Specific tooling

AP8140266 Dial gauge mount

- Move the dial gauge diagonally and measure the protrusion of the piston relative to the reference surface.
- Calculate the thickness of the gasket necessary and select the appropriate gasket by referring to the values indicated in the table in the chapter "SELECTING BASE GASKETS".

Installing the cylinder

- Fit a new cylinder base gasket of the chosen thickness.
- Refit the cylinder as indicated in the figure using the specific clamp tightener tool.

NOTE

BEFORE FITTING THE CYLINDER, CAREFULLY BLOW AIR INTO THE LUBRICATION DUCT AND LUBRICATE THE CYLINDER LINER.

Specific tooling

020287Y Tool for installing seal rings

- Fit a new gasket between the cylinder and the head.
- Place the two dowels.
- Install the head.

Selecting the base gasket

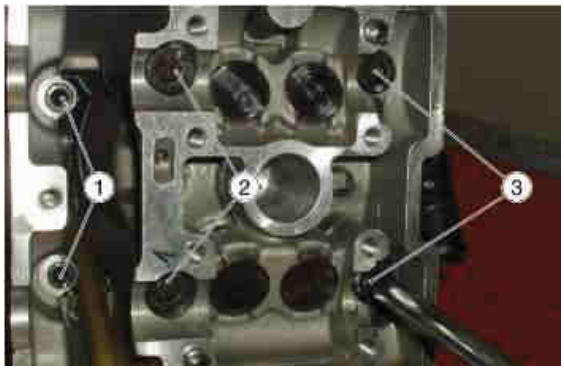
BASE GASKET SELECTION

Specification	Desc./Quantity
Size measured: 0.95 / 1.09 mm (0.037 - 0.042 in)	Gasket 0.3+/-0.05 mm (0.012+/-0.001 in)
Size measured: 1.1 / 1.25 mm (0.043 - 0.049 in)	Gasket 0.4+/-0.05 mm (0.015+/-0.001 in)
Size measured: 1.26 / 1.45 mm (0.049 - 0.057 in)	Gasket 0.5+/-0.05 mm (0.019+/-0.001 in)

Installing the cylinder head

- Fit the chain guide slider onto the cylinder.
- Fit the head gasket and the alignment dowels
- Fit the head.

- Screw but do not tighten both central long screws (3) and position the washers.
- Screw but do not tighten both central long screws (2) and position the washers.
- Screw but do not tighten the two side short screws (1).



NOTE

BEFORE INSTALLING THE HEAD, MAKE SURE THAT THE LUBRICATION CHANNEL IS GENERALLY CLEAN AND USE A JET OF COMPRESSED AIR FOR CLEANING.

- Tighten the four central screws (2 - 3) crosswise.
- Lastly, tighten the two side screws (1).

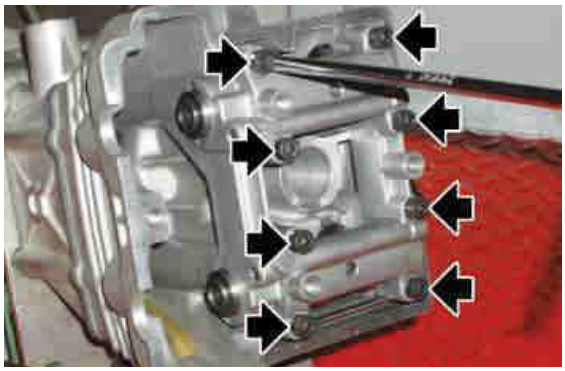
- Insert the timing control chain on the crankshaft.
- Insert the chain tensioner pad of the head and lock it with the fixing screw.

- Insert the camshafts in their seats on the head, remember to position the camshaft marked with the letter (A) on the intake side and the camshaft marked with the letter (S) on the exhaust side.

WARNING

POSITION THE CAMS OF BOTH SHAFTS FACING OUTWARDS.

- Position the cam tower cap.
- Screw but do not and tighten the eight screws.



- Place the pins in their positions on the overhead camshafts.

Specific tooling

864567 Camshaft timing adjustment lock pins

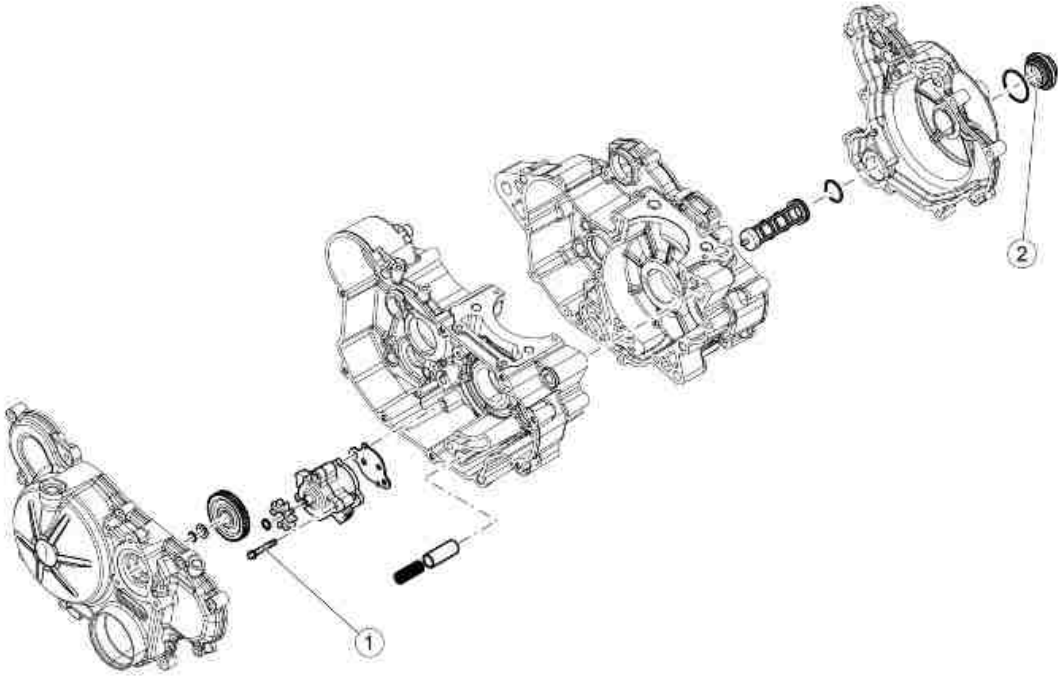
- Place the camshaft gears on the chain, be careful not to invert the original direction of rotation.
- Keep the camshafts locked with the pins and screw but do not tighten the screws fixing the gears using Loctite 243.

- Fit the chain tensioner on the cylinder using a new gasket, and tighten the two screws (1) to the prescribed torque.
- Insert the spring with the central screw (2) and o-ring, and tighten the cap to the prescribed torque.

- Tighten the screws fixing the camshaft gears to the prescribed torque.
- Remove the pins on the camshafts.
- Remove the specific crankshaft locking tool.
- Tighten the screw on the crankcase.

- Check the valve clearance and adjust it if required.
- Refit the tappet cover.

Lubrication



OIL PUMP

pos.	Description	Type	Quantity	Torque	Notes
1	Oil pump fastener screw	M5x35	3	4 Nm (2.95 lb ft)	Loctite 243
2	Oil cap retainer	-	1	25 Nm (18.44 lb ft)	-

Oil pump

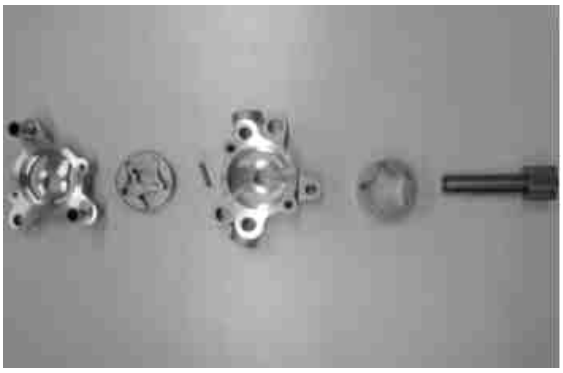
Removing

- Remove the Seeger ring.

- Remove the pump gear.

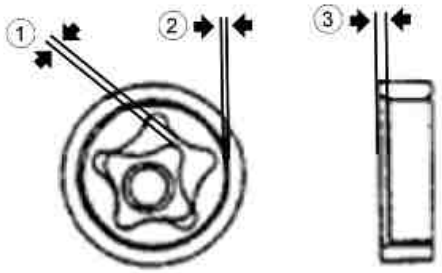
- Remove the pump gear.

- Separate the components to inspect them.



Inspection

- Measure distance between rotors with a feeler gauge at the positions shown in the picture.



Characteristic

Oil intake rotor

Thickness: 13.5 mm (0.53 in)

Oil supply rotor

Thickness: 8.5 mm (0.33 in)

Standard values

Radial clearance (1) between points of the rotor:

0.04 mm (0.0015 in)

Radial clearance (2) between points of the rotor: 0.08 mm (0.003 in)
Radial clearance (3) between rotor 1 and the pump body: 0.04 mm (0.0015 in)
Radial clearance (3) between rotor 2 and the pump body: 0.05 mm (0.0019 in)

Installing

- Refit the oil pump proceeding in reverse order of disassembly. Pay attention to the direction of the rotor, the dot should stay on the opposite part of the resting face.

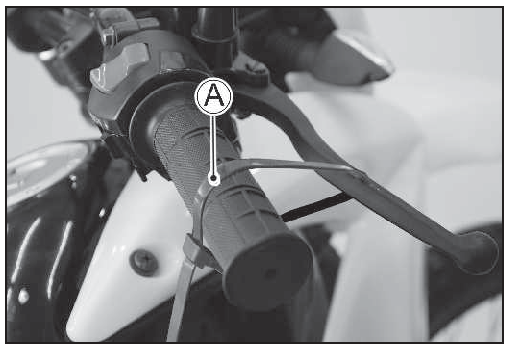
Engine Removal/Installation

Engine Removal

- Place the jack under the frame to support the motorcycle.

  Special Tool - Jack: 57001-1238

- Squeeze the brake lever slowly and hold it with a band [A].



Be sure to hold the front brake when removing the Engine, or the motorcycle may fall over. It could cause an accident and injury.

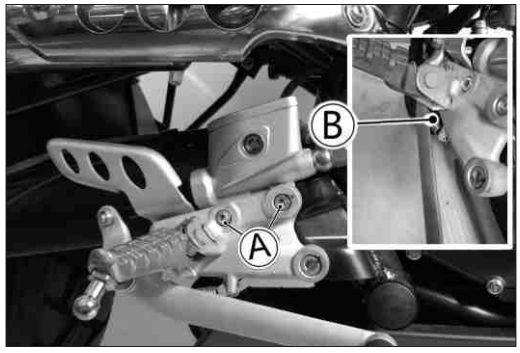
CAUTION

Be sure to hold the front brake when removing the Engine, or the motorcycle may fall over. The engine or the motorcycle could be damaged.

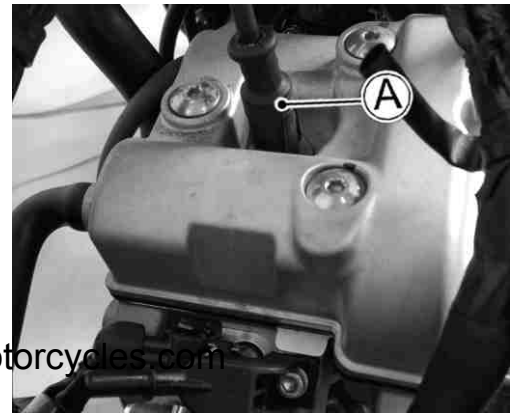
- Drain the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).

- Remove:
  Carburetor (see Carburetor Removal in the Fuel System chapter)
  Exhaust Pipe (see Exhaust Pipe Removal in the Engine Top End chapter)
  Muffler Body (see Muffler Body Removal in the Engine Top End chapter)
  Vacuum Switch Valve (see Vacuum Switch Valve Removal in the Engine Top End chapter)
  Engine Sprocket (see Engine Sprocket Removal in the Final Drive chapter)
  Shift Pedal

- Remove:
  Rear Master Cylinder Mounting Bolts [A]

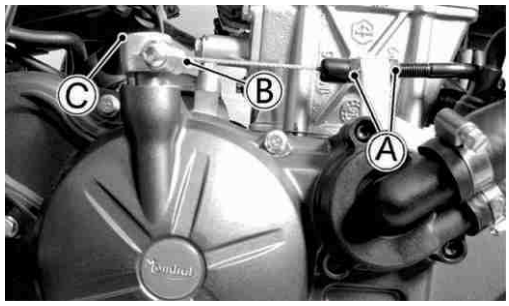


- Remove the spark plug cap [A].

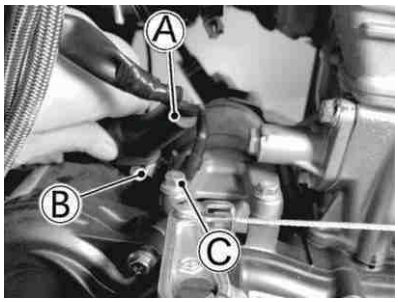


Engine Removal/Installation

- Remove the clutch cable upper end (see Clutch Cable Removal in the Clutch chapter).
- Loosen the locknuts [A] fully.
- Take off the clutch cable lower end [B] from the clutch release shaft [C].

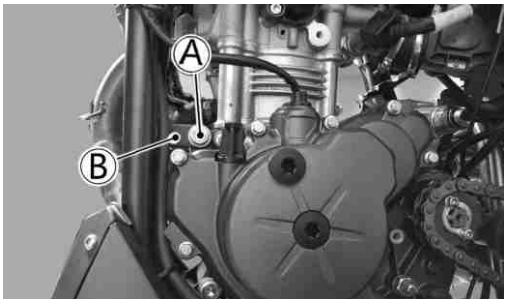


- Slide the dust cover [A].
- Remove the starter motor terminal nut [B] and the engine ground terminal bolt [C].



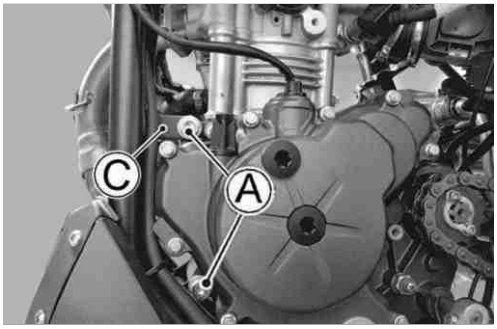
- Disconnect the alternator lead connector [A], and clear the clamp [B].

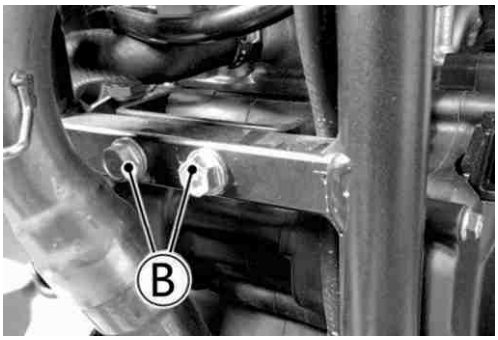
- Remove:
  Middle Engine Mounting Bolt/Nut [A]
  Middle Engine Bracket [B]



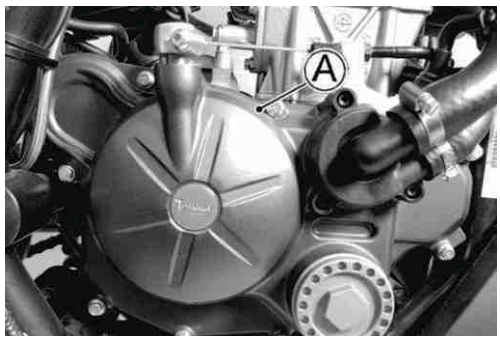
Engine Removal/Installation

- Remove:
  Front Engine Mounting Bolts/Nuts [A]
  Front Engine Bracket Bolts/Nuts [B]
  Front Engine Bracket [C]





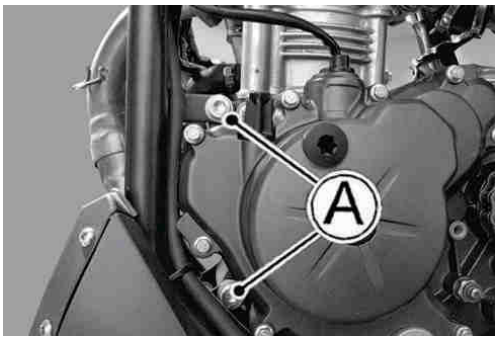
- Remove the engine [A] from the right side.



Engine Installation

- Install the engine body and the engine brackets, and Tighten lightly all mounting bolts and nuts temporarily.
  - Install all nuts to right side.
  - Insert the rear engine mounting bolt first.
- Tighten the engine mounting nuts.

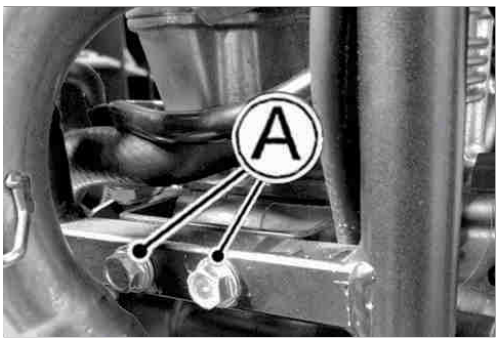
  Torque - Engine Mounting Nuts [A]: 38 Nm (3.9 kgf•m, 28 Ft•lb)



- Tighten the engine bracket bolts and nuts.

  Torque - Engine Bracket Bolts [A](both sides): 23 Nm (2.3 Kgf•m, 17 ft•lb)

- Install the removed parts.



Engine Removal/Installation

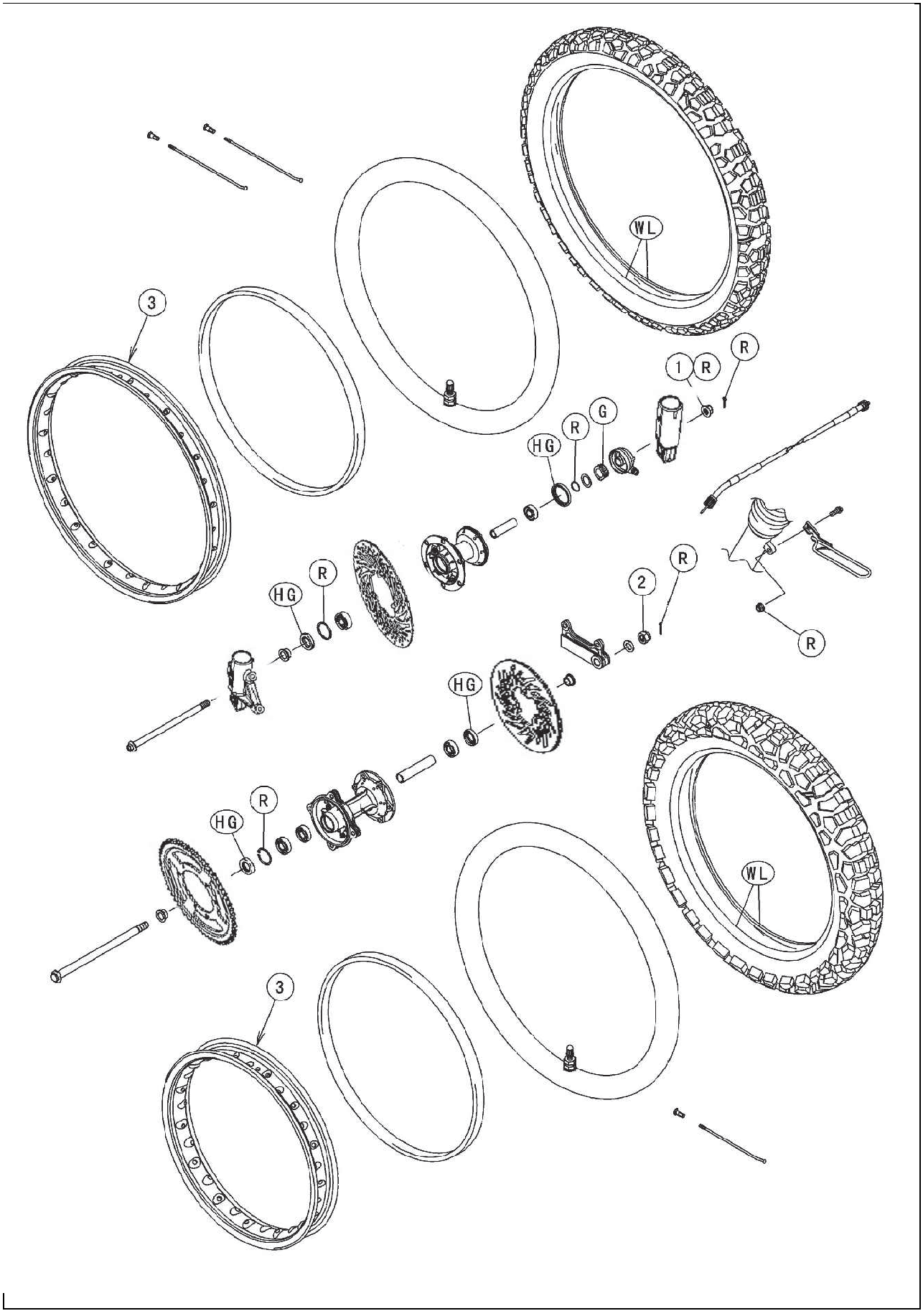
- Run the cables, hoses and leads according to the Cable, Wire and Hose Routing section in the Appendix chapter.
- Fill the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Adjust:
  Throttle Cable (see Throttle Grip Free Play Adjustment in the Periodic Maintenance chapter)
  Clutch Cable (see Clutch Lever Free Play Adjustment in the Periodic Maintenance chapter)
  Drive Chain (see Drive Chain Slack Adjustment in the Periodic Maintenance chapter)
- Adjust the idling (see Idle Speed Adjustment in the Periodic Maintenance chapter).
- Check the operation of the clutch lever.
- Check the brake effectiveness.

Do no attempt to drive the motorcycle until you Pump the brake pedal until the pads are against The disc. The brake will not function on the first application of the pedal if this is not done.

Wheels/Tires

Table of Contents

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Front Axle Clip bolt	7~11	0.7~1.1	5.2~8.1	R
2	Rear Axle Nut	60~70	6.1~7.1	44.2~51.6	

3. Install the rim so that the marked side faces right side.
G. Apply grease.
HG. Apply high-temperature grease.
R. Replacement Parts
WL. Apply soap and water solution or rubber lubricant.

Specifications

Item	Standard	Service Limit
Wheels (Rims)		
Rim Runout:		
Axial	TIR 0.8 mm (0.03 in.) or less	TIR 2.0 mm (0.08 in.)
Radial	TIR 1.2 mm (0.05 in.) or less	TIR 2.0 mm (0.08 in.)
Axle Runout/100 mm (3.94 in.):		
Front	TIR 0.1 mm (0.004 in.) or less	TIR 0.2 mm (0.008 in.)
Rear	TIR 0.03 mm (0.001 in.) or less	TIR 0.2 mm (0.008 in.)
Rim Size:		
Front	2.15×18	- - -
Rear	3.00×17	- - -
Tires		
Air Pressure (when Cold):		
Front	190 kPa (1.5 kgf/cm^2 22 psi)	- - -
Rear	210 kPa (1.5 kgf/cm^2 22 psi)	- - -
Tread Depth:		
Front	6.5 mm (0.26 in.)	0.8 mm (0.03 in.)
Rear	8.0 mm (0.35 in.)	0.8 mm (0.03 in.)
Standard Tires:	Make, Type	Size
Front	IRC, GP-21F	100/90-18 M/C 56P
Rear	IRC, GP-22R	130/80-17 M/C 65P

⚠

Use the same manufacturer?s tires on both front and rear wheels.

Wheels (Rims)

Front Wheel Removal
- Loosen the front axle clip bolt [A].

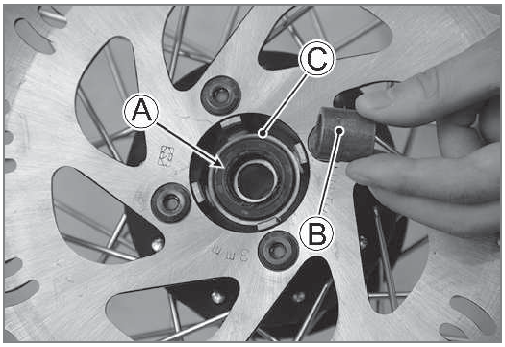
- Raise the front wheel off the ground wtih jack.
  Special Tool - Jack: 57001-1238
- Remove the front axle nut.
- Pull out the front axle [A] to the left and drop the front wheel out of the front forks.

CAUTION

Do not lay the front wheel on the ground with the Disc facing down. This can damage or warp the Disc. Place blocks under the wheel so that the disc does not touch the ground.

Wheels (Rims)

- Apply high-temperature grease to the grease seal lip [A].
- Fit the collar [B] on the wheel hub [C].



- Replace the front axle clip bolt [A] with a new one.
- Insert the front axle from the left side of the wheel, and Tighten the front axle clip bolt .

Torque - Front Axle Nut:7~11 N• m

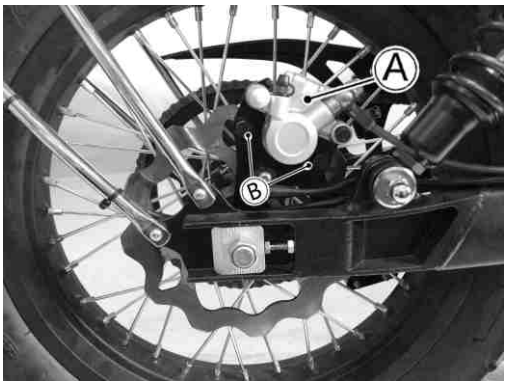
⚠ WARNING

If the front axle nut is not securely tightened or the Cotter pin is not installed, an unsafe riding condition may result.

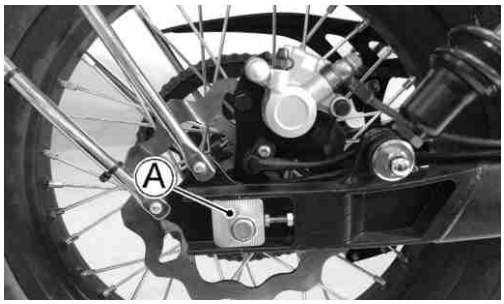
Wheels (Rims)

Rear Wheel Removal

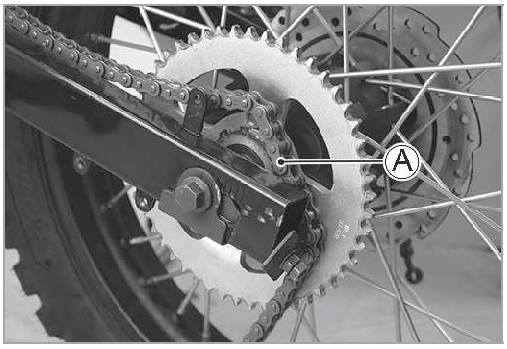
- Remove:
  Rear Brake Caliper [A]
  Brake Caliper Mounting Bolts [B]



- Remove the rear axle nut[A]
- Raise rear wheel on the ground.
- Pull out the rear axle to the left and drop the rear wheel.



- Remove the drive chain [A], and hang the chain on the swingarm.
- Move the rear wheel back and remove it.

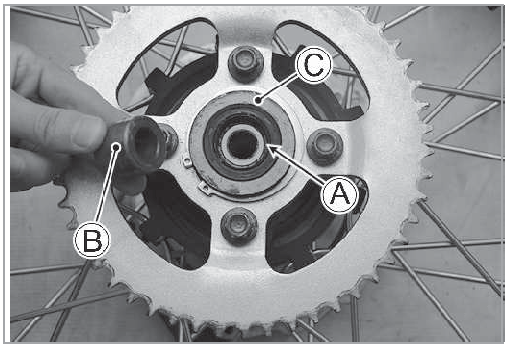


CAUTION

Do not lay the wheel on the ground with the disc Facing down. This can damage or warp the disc. Place wooden blocks under the wheel so that the disc does not touch the ground.

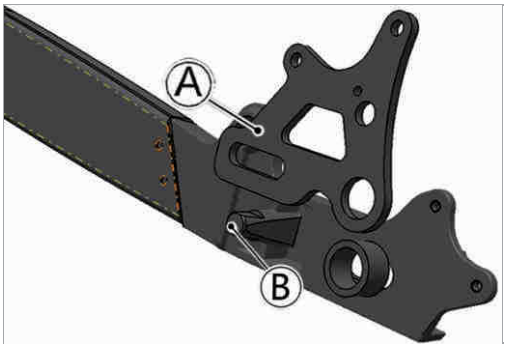
Rear Wheel Installation

- Apply high-temperature grease to the grease seal lips [A].
- Fit the collars [B] on the both sides of the hub [C].
  - The collars are identical.



- Install the caliper bracket [A] onto the stopper [B] of the swingarm.
- Engage the drive chain with the rear sprocket.
- Insert the rear axle from the left side of the wheel.
- Adjust the drive chain slack before tightening the rear Axle nut (see Drive Chain Slack Inspection in the Periodic Maintenance chapter).
- Tighten:

Torque - Rear Axle Nut:60~70 N•m



⚠ WARNING

If the rear axle nut is not securely tightened or the Cotter pin is not installed, an unsafe riding condition may result.

- Install the rear brake caliper (see Caliper Installation in the Brakes chapter).
- Check the rear brake effectiveness (see Brake Operation Inspection in the Periodic Maintenance chapter).

⚠

Do not attempt to drive the motorcycle until a full Brake pedal is obtained by pumping the brake pedal Until the pads are against the disc. The brake will Not function on the first application of the pedal if this is not done.

Wheel Inspection

- Refer to the Wheel/Tire Damage Inspection in the Periodic Maintenance chapter.

Spoke Inspection

- Refer to the Spoke Tightness and Rim Runout Inspection in the Periodic Maintenance chapter.

Rim Inspection

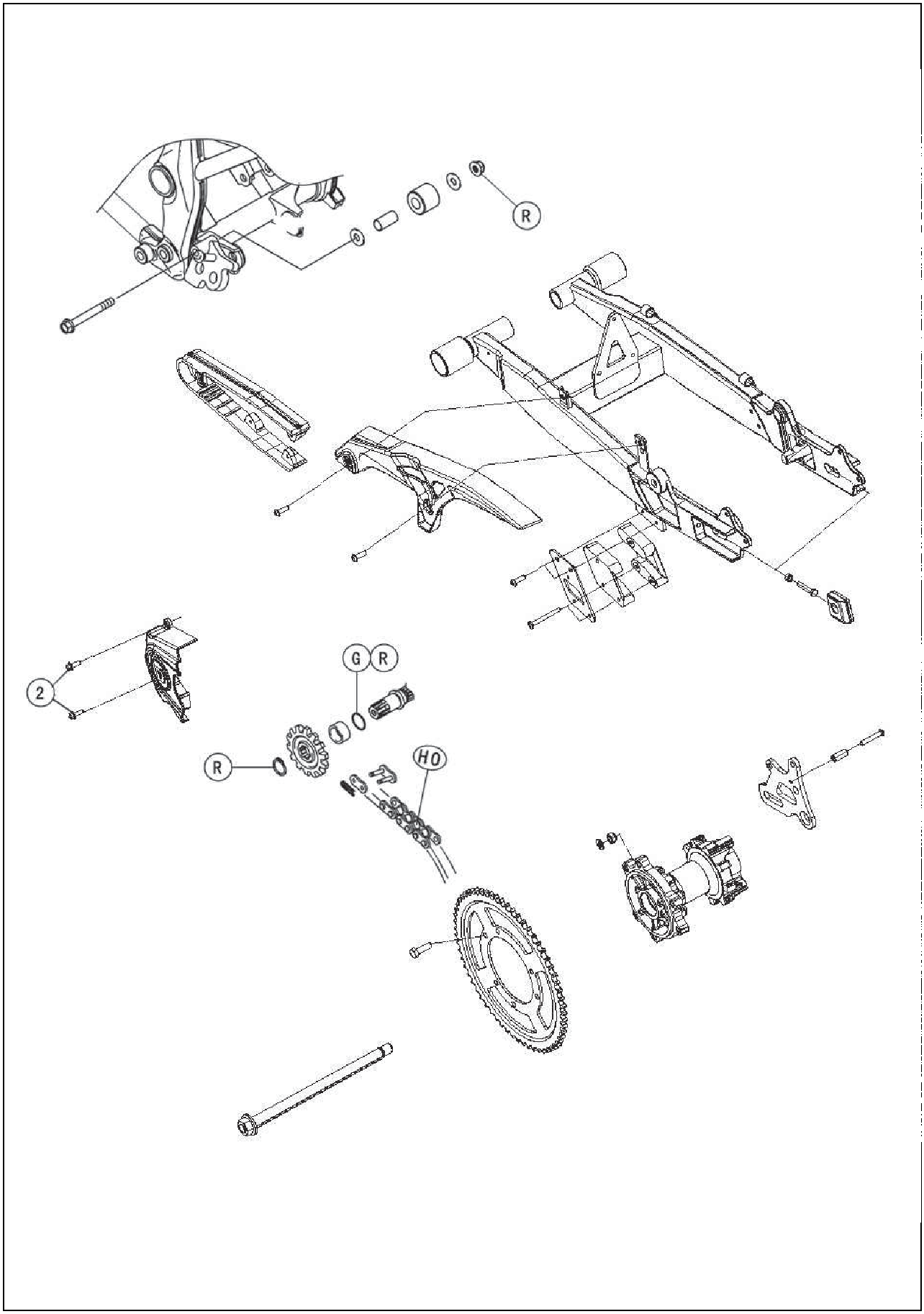
- Refer to the Spoke Tightness and Rim Runout Inspection in the Periodic Maintenance chapter.

Final Drive

Table of Contents

6-2 FINAL DRIVE

Exploded View



Exploded View

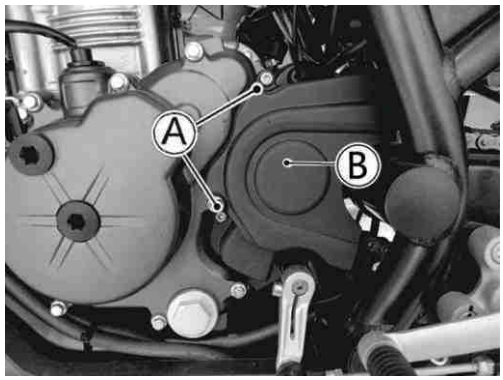
No	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Rear Sprocket Bolts	45~55	4.59~5.61	33.2~40.6	R
2	Engine Sprocket Cover Bolts	8.8	0.90	78 in·lb	

G: Apply grease.
HO: Apply heavy oil.
R: Replacement Parts

6-4 FINAL DRIVE

Specifications

Item	Standard	Service Limit
Drive Chain		
Chain Slack	25 - 40 mm (1.0 - 1.6 in.)	- - -
Chain 20-link Length	317.5mm	327mm
Standard Chain:		
Make	ZHENGHE	- - -
Type	520	- - -
Length	106Links	
Sprocket		
Rear Sprocket Warp	TIR 0.4 mm (0.016 in.) or less	TIR 0.5 mm (0.020 in.)


A
B

⚠ WARNING

For safety, use only the standard chain.

- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link from the frame side.
- Install the clip [A] so that the closed end of the "U" points In the direction of chain rotation [B]. (The open end of the "U" points in the reverse direction of chain rotation).
- Adjust the drive chain slack (see Drive Chain Slack Adjustment in the Periodic Maintenance chapter).
- Check the brake for good braking power, and no brake drag.

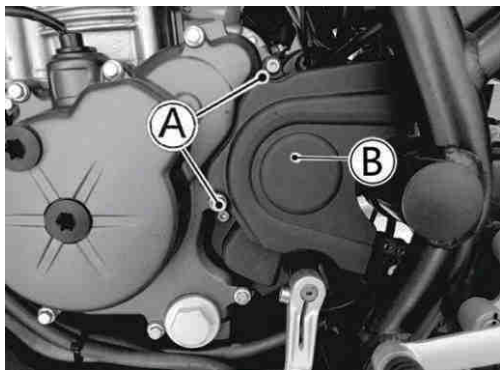
⚠

If a full brake pedal is not obtained, disassemble And inspect the brake parts. Worn parts cause lock of the brake or loss of braking.

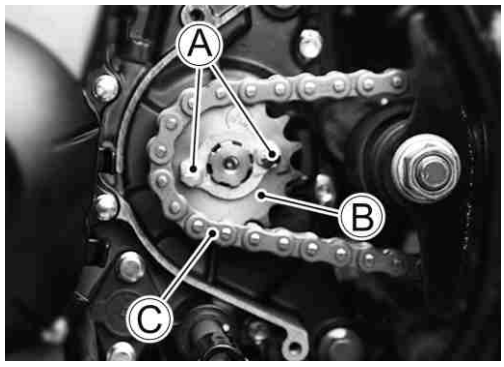
Sprockets

Engine Sprocket Removal

- Remove:
  Engine Sprocket Cover Bolts [A] with Collar
  Engine Sprocket Cover [B]

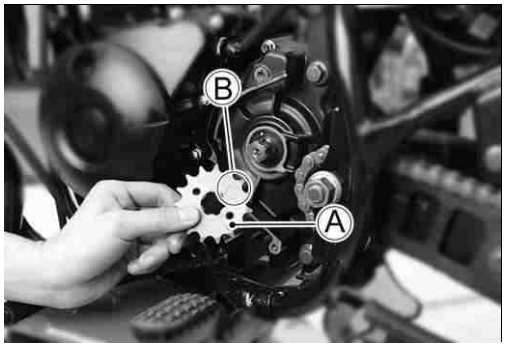


- Remove the circlip [A] and the engine sprocket [B] with the drive chain [C].
  Special Tool - Outside Circlip Pliers: 57001-144
- Take off the sprocket from the chain.

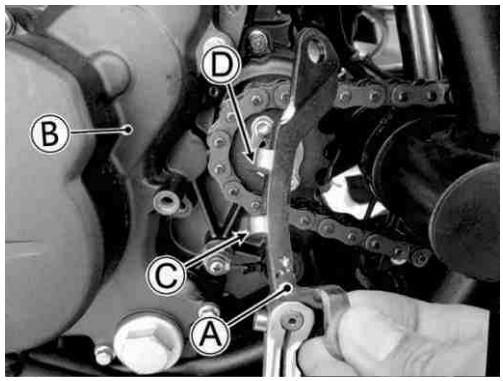


Engine Sprocket Installation

- Install the engine sprocket [A] so that the marked [B] side faces outward.
- Replace the circlip with a new one, and install it.
  Special Tool - Outside Circlip Pliers: 57001-144



- Install the engine sprocket cover with the chain guide [A].
  ◦ Run the neutral switch lead [B] to inside of the lower rib [C] and outside of the upper rib [D].
  Torque - Engine Sprocket Cover Bolts : 8.8 Nm (0.90 Kgfgm, 78 in•lb)



Rear Sprocket Removal

- Remove the rear wheel (see Rear wheel Removal in the Wheels/Tires chapter).

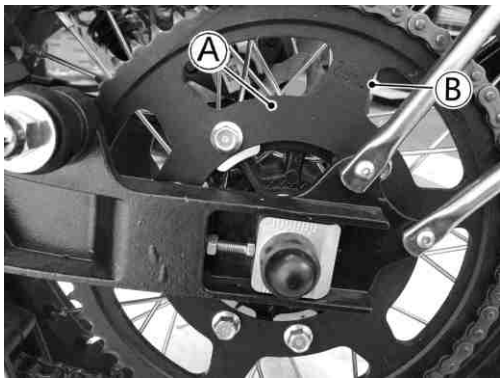
CAUTION
Do not lay the wheel on the ground with the disc Facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

- Unscrew the rear sprocket bolts [A] and nuts, then remove the rear sprocket [B].

bolts

- Install the rear sprocket [A] so that the marked [B] side faces outward.
- Tighten:

Torque - Rear Sprocket bolts:45~55N.m
(4.5~5.5 kgf• m, 33 ~ 44 ft•lb)



Sprocket Wear Inspection

- Visually inspect the engine and rear sprocket teeth for wear and damage.

★If the teeth are worn as illustrated, replace the sprocket, And inspect the drive chain wear (see Drive Chain Wear Inspection in the Periodic Maintenance chapter).

Worn Tooth (Engine Sprocket) [A]
Worn Tooth (Rear Sprocket) [B]
Direction of Rotation [C]

NOTE

◦ If a sprocket requires replacement, the chain is proba-Bly worn also. When replacing a sprocket, inspect the chain.

Rear Sprocket Warp Inspection

- Raise the rear wheel off the ground with jack so that it will turn freely.

Special Tool - Jack: 57001-1238

- Set a dial gauge [A] against the rear sprocket [B] near the Teeth as shown, and rotate [C] the rear wheel to measure The sprocket runout (warp). The difference between the Highest and lowest dial gauge readings is the amount of runout (warp).

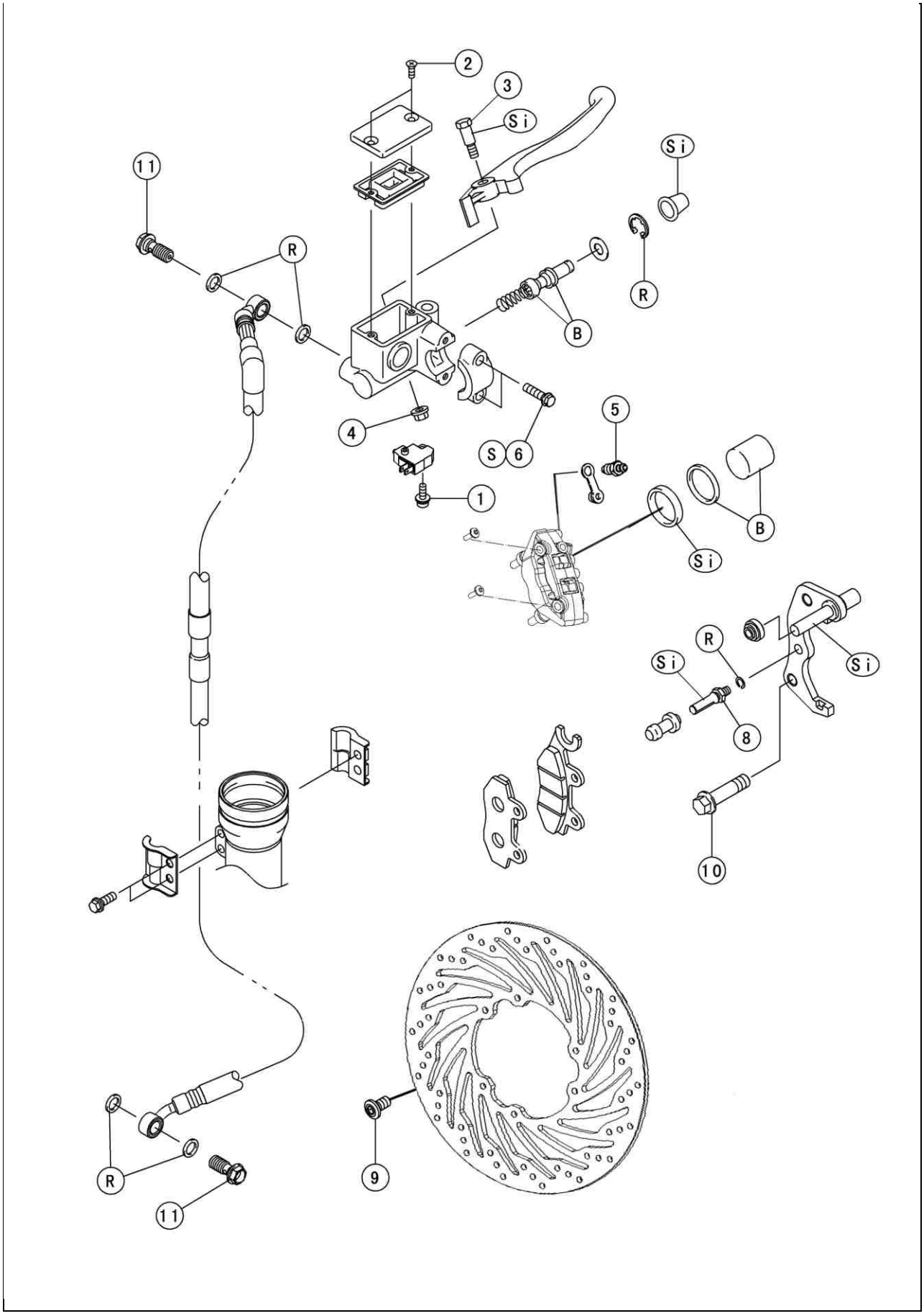
Rear Sprocket Warp
Standard: 0.4 mm (0.016 in.) or less
Service Limit: 0.5 mm (0.02 in.)

★If the runout exceeds the service limit, replace the rear sprocket.

Brakes

Table of Contents

Exploded View

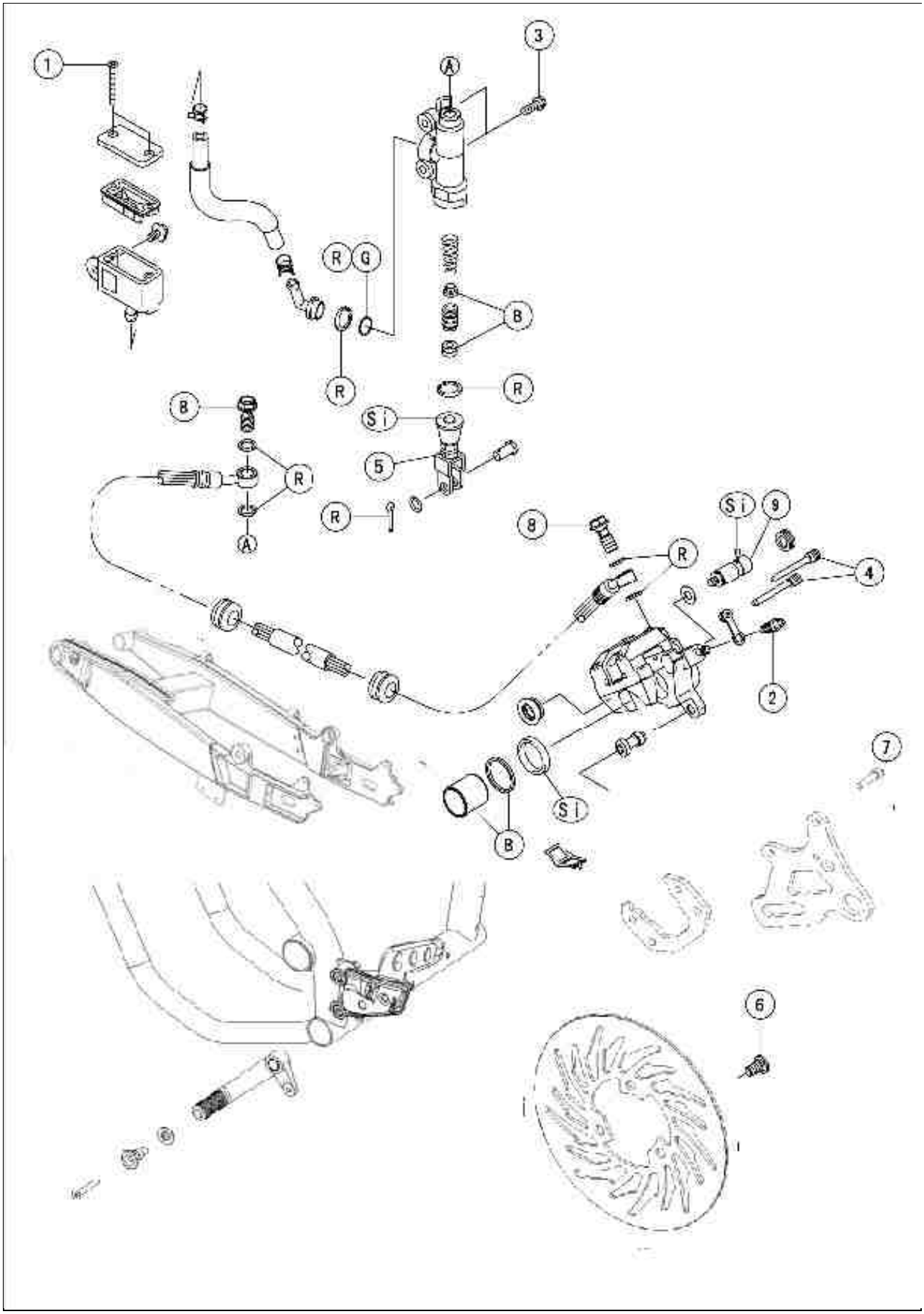


Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Front Brake Light Switch Screw	1.2	0.12	11 in•lb	
2	Front Brake Reservoir Cap Screws	1.5	0.15	13 in•lb	
3	Brake Lever Pivot Bolt	5.9	0.60	52 in•lb	Si
4	Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in•lb	
5	Caliper Bleed Valve	5.4	0.55	48 in•lb	
6	Front Master Cylinder Clamp Bolts	8.8	0.90	78 in•lb	S
7	Front Caliper Brake Pad Pins	17	1.7	13	
8	Front Caliper Holder Shaft	17	1.7	13	Si
9	Front Brake Disc Mounting Bolts	25~30	2.55~3.06	18.4~22.1	
10	Front Caliper Mounting Bolts	34	3.5	25	
11	Brake Hose Banjo Bolts	25	2.5	18	

B: Apply brake fluid.
R: Replacement Parts
S: Follow the specified tightening sequence.
Si: Apply silicone grease (ex. PBC grease).

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft •lb	
1	Rear Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
2	Caliper Bleed Valve	5.4	0.55	48 in·lb	
3	Rear Master Cylinder Mounting Bolts	10	1.0	89 in·lb	
4	Rear Caliper Brake Pad Pins	17	1.7	13	
5	Rear Master Cylinder Push Rod Locknut	17	1.7	13	
6	Rear Brake Disc Mounting Bolts	25~30	2.55~3.06	18.4~22.1	
7	Rear Caliper Mounting Bolts	25	2.5	18	
8	Brake Hose Banjo Bolts	25	2.5	18	
9	Caliper Holder Pin	22	2.2	16	

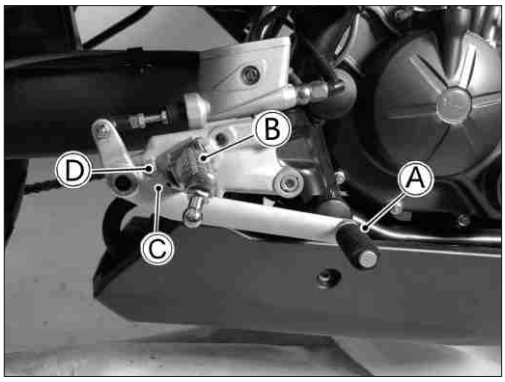
B: Apply brake fluid.
G: Apply grease.
R: Replacement Parts
Si: Apply silicone grease (ex. PBC grease).

Specifications

Fastener	Standard	Service Limit
Brake Lever, Brake Pedal		
Brake Lever Free Play	Non-adjustable	- - -
Pedal Free Play	Non-adjustable	- - -
Pedal Position	About 12.8 mm (0.504 in.) above top of footpeg	
Brake fluid		
Grade:		
Front	DOT3 or DOT4	- - -
Rear	DOT3 or DOT4	- - -
Brake Pads		
Pad Lining Thickness:		
Front	5.2 mm (0.20 in.)	1 mm (0.04 in.)
Rear	4.5 mm (0.18 in.)	1 mm (0.04 in.)
Brake Disc		
Thickness:		
Front	3.4 - 3.7 mm (0.13- 0.15 in.)	3.0 mm (0.12 in.)
Rear	3.4 - 3.7 mm (0.13- 0.15 in.)	3.0 mm (0.12 in.)
Runout	TIR 0.15 mm (0.0059 in.) or less	TIR 0.3 mm (0.01 in.)

Brake Pedal

Brake Pedal Position Inspection



- Check that the brake pedal [A] is in the correct position.
  Footpeg [B]

Pedal Position

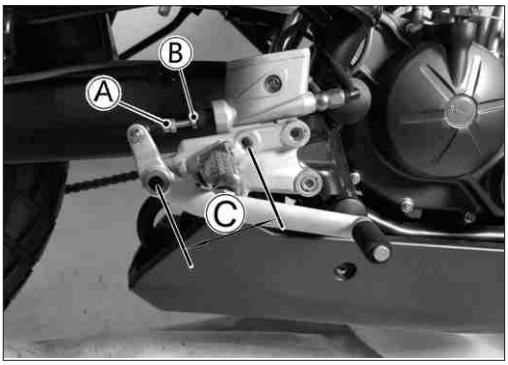
Brake pedal limit [C] and foot limit [D] matching

★If it is wrong, adjust the brake pedal position.

Brake Pedal Position Adjustment

NOTE

◦ Usually it is not necessary to adjust the pedal position, But always adjust it when the push rod locknut has been loosened.



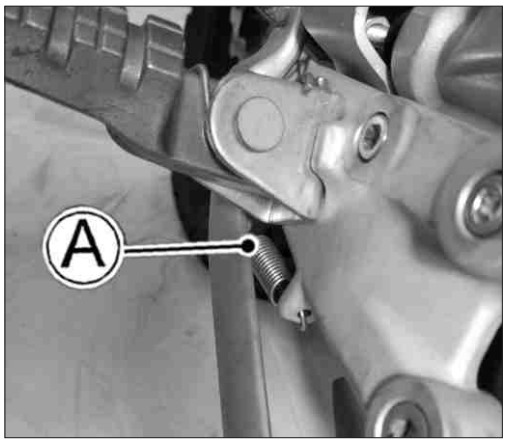
- Loosen the locknut [A] and turn the push rod with the hex head [B] to achieve the correct pedal position.

- Tighten:

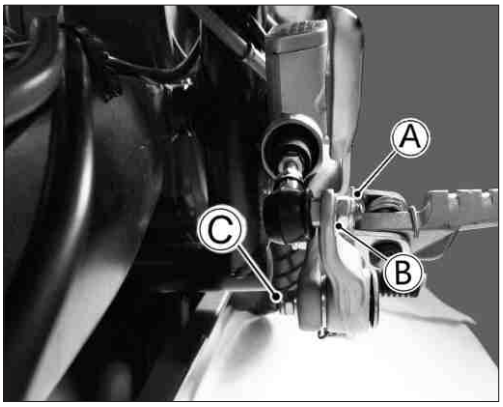
Torque - Rear Master Cylinder Push Rod Locknut: 17 N•m (1.7 kgf•m, 13 ft•lb)

- Check the brake light switch operation (see Brake Light Switch Operation Inspection in the Periodic Maintenance chapter).

Brake Pedal Removal

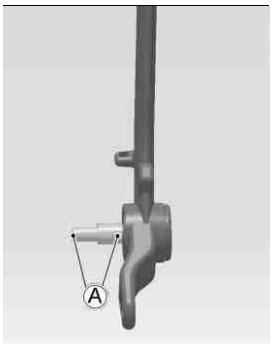


- Remove:
  Brake Pedal Return Spring [A]



- Remove:
  Cotter Pins [A]
  Joint Pin [B]
  Washers [C]
  Brake Pedal

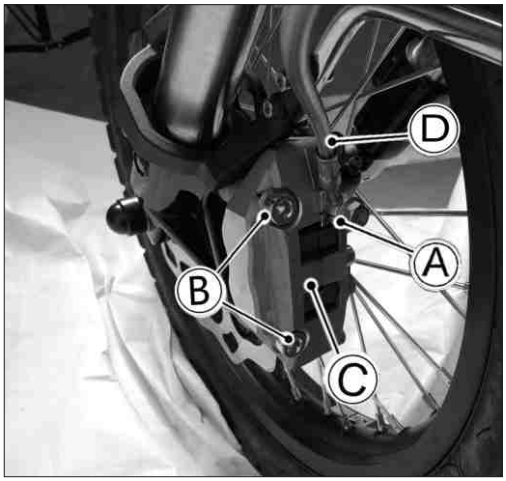
Brake Pedal



Brake Pedal Installation
- Replace O-rings [A] with new ones, and apply grease to the O-rings.
- Apply grease to the shaft portion of the brake pedal.
- Install the brake pedal onto the frame with the return spring and brake light switch spring.
  - Face the return spring ends forward.
- Replace the cotter pins of the brake pedal pivot and rear master cylinder joint pin with new ones.
- Insert washer and cotter pin into the shaft portion of the brake pedal, and bend cotter pin end.
- Insert a cotter pin into the joint pin, and bend its ends.
- Adjust the brake pedal position (see Brake Pedal Position Adjustment).
- Check the brake light switch operation (see Brake Light Switch Operation Inspection in the Periodic Maintenance chapter).

Calipers

Front Caliper Removal



- Loosen the banjo bolt [A] at the brake hose lower end, and tighten it loosely.
- Unscrew the caliper mounting bolts [B], and detach the caliper [C] from the disc.
- Unscrew the banjo bolt and remove the brake hose [D] from the caliper (see Brake Hose Replacement in the Periodic Maintenance chapter).

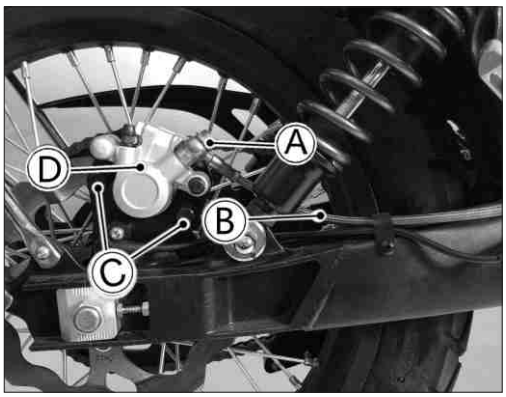
CAUTION

Immediately wash away any brake fluid that spills.

NOTE

◦ If the caliper is to be disassembled after removal and if compressed air is not available, disassemble the caliper before the brake hose is removed (see Caliper Rubber Parts Replacement in the Periodic Maintenance chapter).

Rear Caliper Removal



- Remove:
  Brake Hose Banjo Bolt [A]
  Brake Hose [B]
  Rear Caliper Mounting Bolts [C]
  Rear Caliper [D]

CAUTION

Immediately wash away any brake fluid that spills.

NOTE

◦ If the caliper is to be disassembled after removal and if Compressed air is not availabl E, disassemble the caliper before the brake hose is removed (see Caliper Rubber Parts Replacement in the Periodic Maintenance chapter).

Caliper Installation

- Install the caliper and brake hose lower end.
- Replace the washers on each side of hose fitting with new ones.
- Tighten:

Torque - Caliper Mounting Bolts
Front: 34 N•m (3.5 kgf•m, 25 ft•lb)
Rear: 25 N•m (2.5 kgf•m, 18 ft•lb)
Brake Hose Banjo Bolt: 25 N•m (2.5 kgf•m, 18 ft•lb)

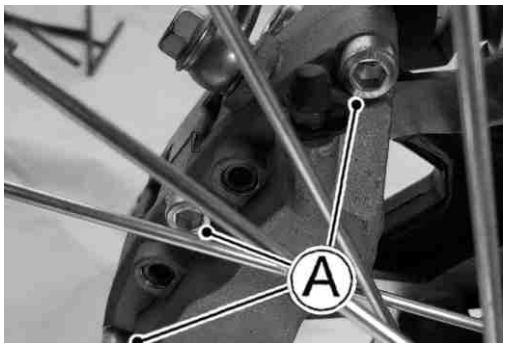
- Bleed the brake line (see Brake Line Bleeding).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠ WARNING

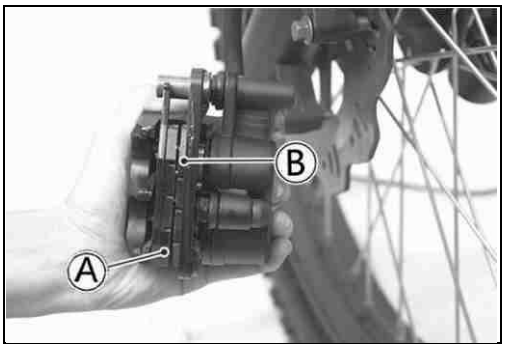
Do not attempt to drive the motorcycle until a full Brake lever or pedal is obtained by pumping the Brake lever or pedal until the pads are against the Disc. The brakes will not function on the first application of the lever or pedal if this is not done.

Brake Pads

Front Brake Pad Removal
- Loosen the brake pad pins [A].



- Remove the front caliper with the brake hose installed (see Front Caliper Removal).
- Remove the pad pins.
- Remove the pad [A] of the jaw side.
- Remove the pad [B] of the piston side.



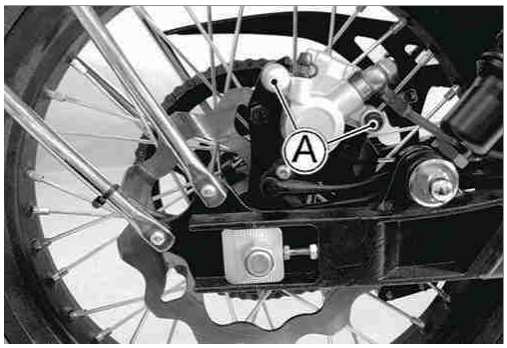
Front Brake Pad Installation
- Push the caliper pistons in by hand as far as they will go.
- Install the anti-rattle spring in its correct position.
- Install the pad on the piston side first, then install the other Pad.
- Tighten the brake pad pins temporary.
- Install the front brake caliper (see Caliper Installation).
- Tighten:

Torque - Front Caliper Brake Pad Pins: 17 N• m(1.7 kgf • m, 13 ft•Ib)

WARNING

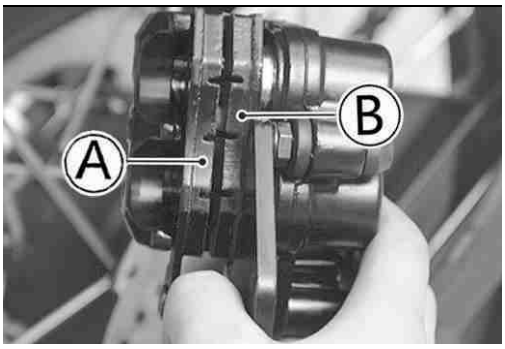
Do not attempt to drive the motorcycle until a full Brake lever is obtained by pumping the brake lever Until the pads are against the disc. The brake will Not function on the first application of the lever if this is not done.

Rear Brake Pad Removal
- Loosen the brake pad pins [A].



Brake Pads

- Remove the rear caliper with the brake hose installed (see Rear Caliper Removal).
- Remove:
  Pad Pin
  Jaw Side Pad [A]
  Piston Side Pad [B]



Rear Brake Pad Installation
- Push the caliper piston in by hand as far as it will go.
- Install the anti-rattle spring in its correct position.
- Install the pad on the piston side first, then install the other pad.
- Tighten the brake pad pins temporary.
- Install the rear brake caliper (see Caliper Installation).
- Tighten:

Torque - Rear Caliper Brake Pad Pins: 17 N• m (1.7 kgf • m, 13 ft•lb)

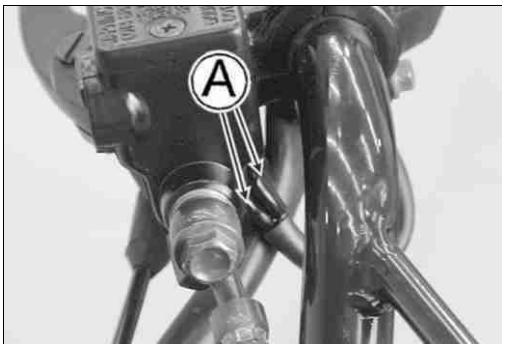
WARNING

Do not attempt to drive the motorcycle until a full Brake pedal is obtained by pumping the brake pedal Until the pads are against the disc. The brake will Not function on the first application of the pedal if this is not done.

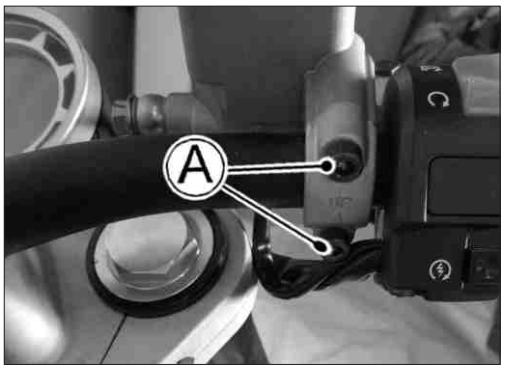
Brake Pad Wear Inspection
- Refer to the Brake Pad Wear Inspection in the Periodic Maintenance chapter.

Master Cylinder

Front Master Cylinder Removal



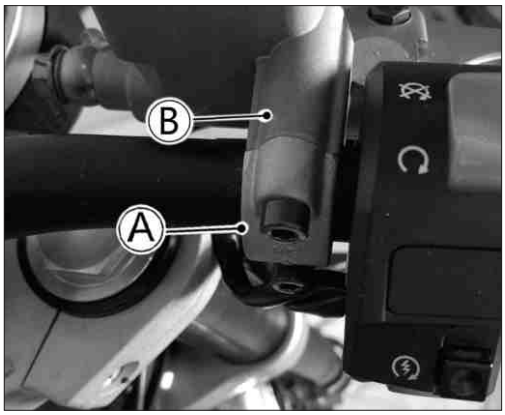
- Disconnect the brake hose from the master cylinder (see Brake Hose Replacement in the Periodic Maintenance chapter).
- Disconnect the front brake light switch connectors [A].



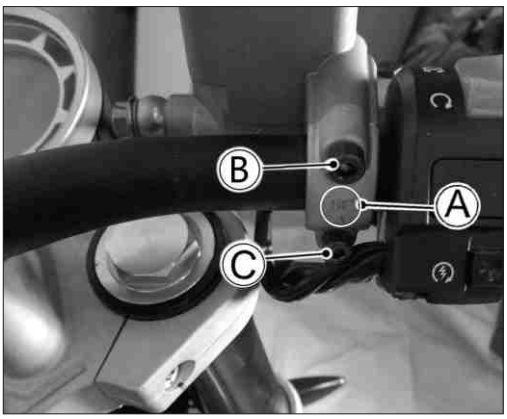
- Unscrew the clamp bolts [A], and take off the master cylinder as an assembly with the reservoir, brake lever and brake light switch installed.

CAUTION
Immediately wash away any brake fluid that spills.

Front Master Cylinder Installation



- Install the front master cylinder so that the punch mark [A] Of the handlebar is aligned with the mating surface [B] of the master cylinder clamp to level the reservoir.



- The master cylinder clamp must be installed with the arrow mark [A] upward.
- Tighten the upper clamp bolt [B] first, and then the lower clamp bolt [C].
  - There will be a gap at the lower part of the clamp after tightening.

Torque - Front Master Cylinder Clamp Bolts: 8.8 N8m (0.90 Kgfg•m, 78 in•lb)

- Replace the washers on each side of the hose fitting with new ones.
- Tighten:

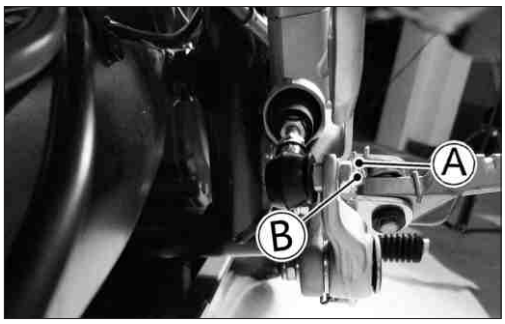
Torque - Brake Hose Banjo Bolt: 25 N5m (2.5 kgf•m, 18 ft•lb)

- Bleed the brake line (see Brake Line Bleeding).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

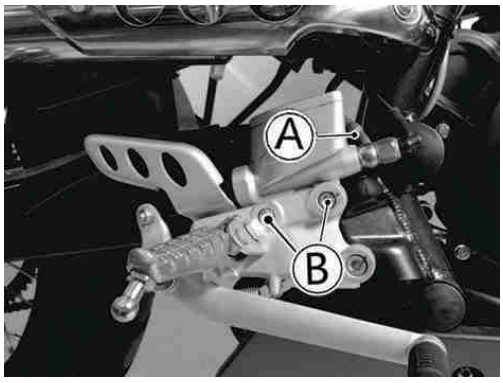
Master Cylinder

Rear Master Cylinder Removal

- Remove:
  Cotter Pin [A]
  Joint Pin [B]
  Washer [C]



- Unscrew the brake hose banjo bolt [A] on the master cylinder (see Brake Hose Replacement in the Periodic Maintenance chapter).
- Remove:
  Rear Master Cylinder Mounting Bolts [B]



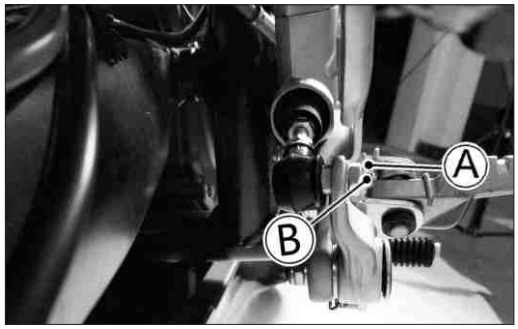
- Slide the reservoir hose lower end clamp [A].
- Pull off the reservoir hose lower end, and drain the brake fluid into a container.

Rear Master Cylinder Installation

- Replace the washers on each side of hose fitting with new ones.
- Tighten:

Torque - Rear Master Cylinder Mounting Bolts: 10 N•m (1.0 Kgf•m, 89 in•lb)
Brake Hose Banjo Bolts: 25 N•m (2.5 kgf• m, 18 Ft•lb)

- Replace the cotter pin [A] with a new one.
- Install the joint pin [B] and washer [C].
- Insert the cotter pin and bend the pin ends.
- Bleed the brake line (see Brake Line Bleeding).
- Check the brake for good braking power, no brake drag, and no fluid leakage.



Front Master Cylinder Disassembly

- Refer to the Master Cylinder Rubber Parts Replacement in the Periodic Maintenance chapter.

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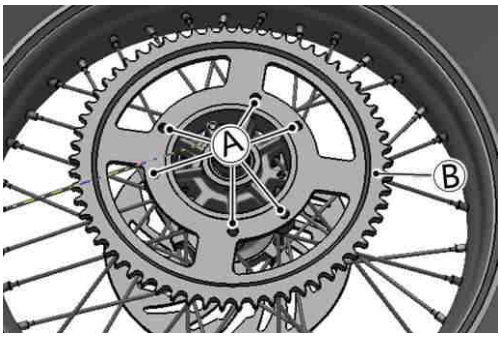
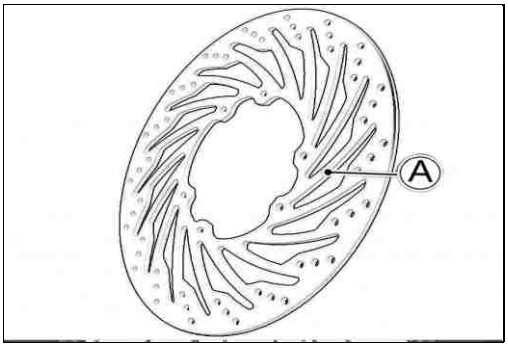


25~30N.m

(2.55~3.6kgf•m 18.4~22.1Ft•lb)

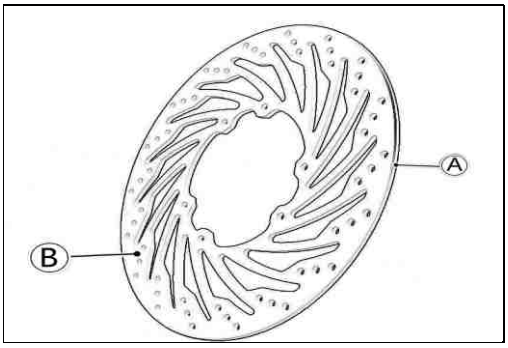


Brake Disc Wear

- Measure the thickness of each disc [A] at the point where it has worn the most.

★If the disc has worn past the service limit, replace it.

Measuring Area [B]



Brake Discs Thickness

Standard:

Front: 3.4~ 3.7 mm (0.13 ~0.15 in.)

Rear 3.4~ 3.7 mm (0.13 ~0.15 in.)

Service Limit:

Front 3.0 mm (0.12 in.)

Rear 3.0 mm (0.12 in.)

Brake Disc Warp

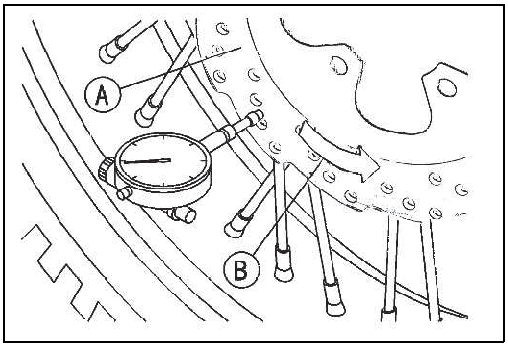
- Raise the wheel off the ground with jack (see Front/Rear Wheel Removal in the Wheels/Tires chapter).

Special Tool - Jack: 57001-1238

◦ For front disc inspection, turn the handlebar fully to one side.

- Set up a dial gauge against the disc [A] as shown and Measure disc runout, while turning [B] the wheel by hand.

★If runout exceeds the service limit, replace the disc.



Disc Runout

Standard: TIR 0.15 mm (0.0059 in.) or less

Service Limit: TIR 0.3 mm (0.01 in.)

Brake Fluid

Brake Fluid Level Inspection

- Refer to the Brake Fluid Level Inspection in the Periodic Maintenance chapter.

Brake Fluid Change

- Refer to the Brake Fluid Change in the Periodic Mainte-Nance chapter.

Brake Line Bleeding

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever or pedal is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever or pedal movement will be partially used in compressing the air. This will make the lever or pedal feel spongy, and there will be a loss in braking power.

⚠ WARNING

Be sure to bleed the air from the brake line when-Ever brake lever or pedal action feels soft or Spongy after the brake fluid is changed, or when-Ever a brake line fitting has been loosened for any reason.

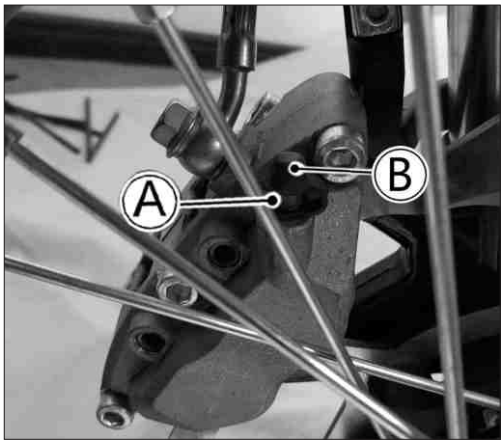
NOTE

◦ The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.

- Remove the reservoir cap [A] and diaphragm.
- Fill the reservoir with fresh brake fluid to the upper level line in the reservoir.
- Slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir.

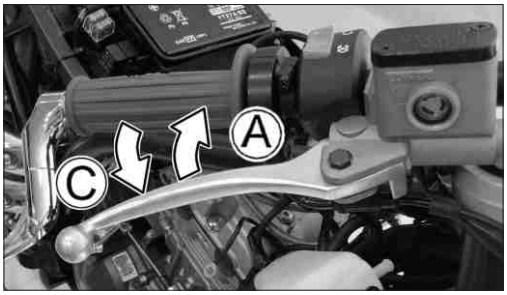
◦ Bleed the air completely from the master cylinder by this operation.

- Remove the rubber cap from the bleed valve [A] on the Caliper.
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.



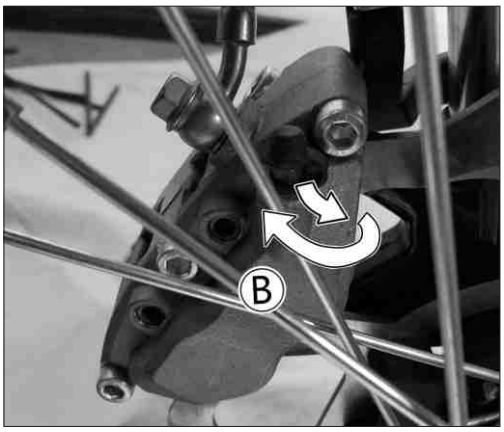
Brake Fluid

- Bleed the brake line and the caliper.
  - Repeat this operation until no more air can be seen coming out into the plastic hose.
    1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
    2. Quickly open and close [B] the bleed valve while holding the brake applied.
    3. Release the brake [C].



NOTE

- The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.
- Tap the brake hose lightly from the caliper to the reservoir for more complete bleeding.



- Remove the clear plastic hose.
- Install the diaphragm and reservoir cap.
- Tighten:

Torque - Brake Reservoir Cap Screws: 1.5 N•m (0.15 kgf•m, 13 in•lb)

- Tighten the bleed valve, and install the rubber cap.

Torque - Caliper Bleed Valve: 5.4 N•m (0.55 kgf•m, 48 in•lb)

- Check the fluid level (see Brake Fluid Level Inspection in the Periodic Maintenance chapter).
- After bleeding is done, check the brake for good braking power, no brake drag, and no fluid leakage.

Brake Fluid

⚠ WARNING

When working with the disc brake, observe the precautions listed below.

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types and brands of fluid for use in The brake. This lowers the brake fluid boiling point And could cause the brake to be ineffective. It may Also cause the rubber brake parts to deteriorate.
4. Don`t leave the reservoir cap off for any length of Time to avoid moisture contamination of the fluid.
5. Don`t change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc Brake fluid, isopropyl alcohol, or ethyl alcohol for Cleaning of the brake parts. Do not use any other Fluid for cleaning these parts. Gasoline, engine oil, Or any other petroleum distillate will cause deterio-Ration of the rubber parts. Oil spilled on any part will Be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.
7. When handling the disc pads or disc, be careful that No disc brake fluid or any oil gets on them. Clean off Any fluid or oil that inadvertently gets on the pads or Disc with a high-flash point solvent. Do not use one Which will leave an oily residue. Replace the pads With new ones if they cannot be cleaned satisfacto-rily.
8. Brake fluid quickly ruins painted surfaces; any Spilled fluid should be completely wiped up imme-diately.
9. If any of the brake line fittings or the bleed valve is opened at any time, the**AIR MUST BE BLED FROM THE BRAKE LINE.**

Brake Hose

Brake Hose Removal/Installation
- Refer to the Brake Hose Replacement in the Periodic Maintenance chapter.

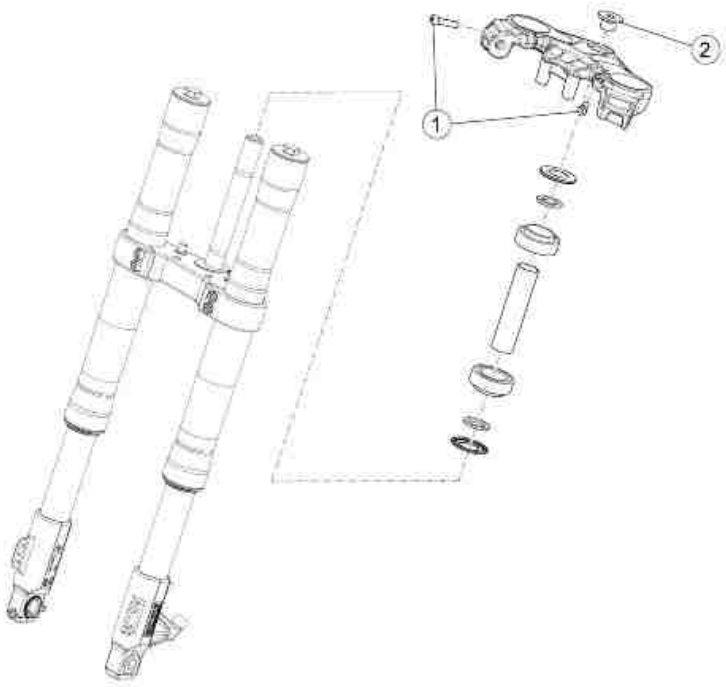
Brake Hose Inspection
- Refer to the Brake Hose Damage and Installation Condition Inspection in the Periodic Maintenance chapter.

Suspension

Table of Contents

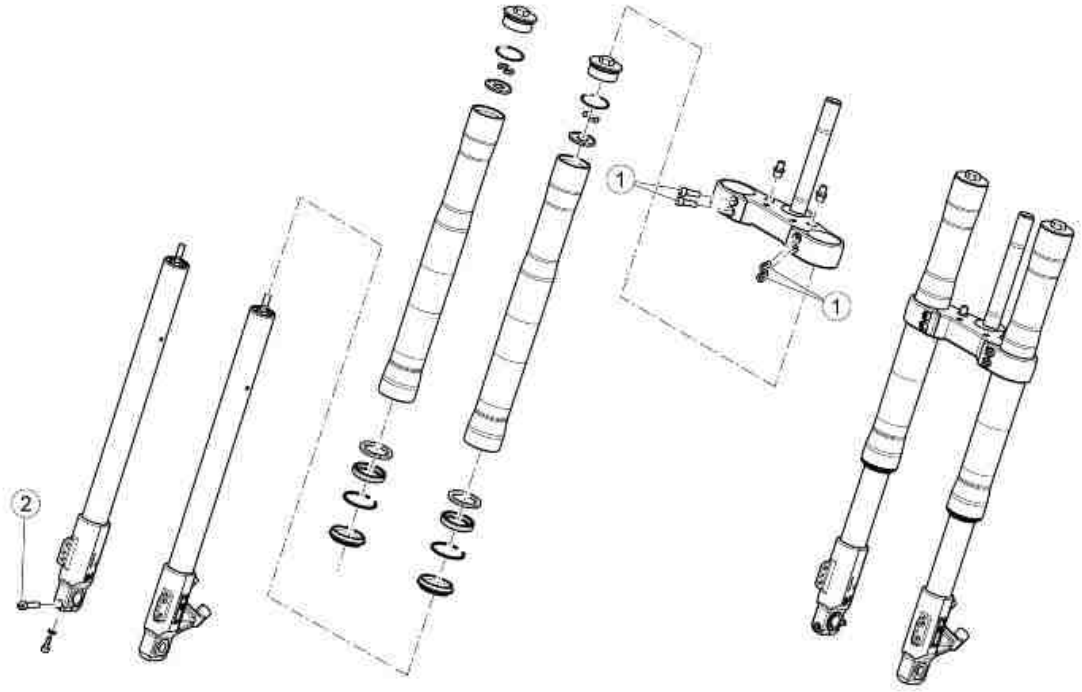
8-2 SUSPENSION

Exploded View



STEERING

Pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening top steering yoke to fork	M8	2	25 Nm (18.44 lb ft)	-
2	Handlebar fastener nut	M20	1	48 Nm (35.40 lb ft)	-

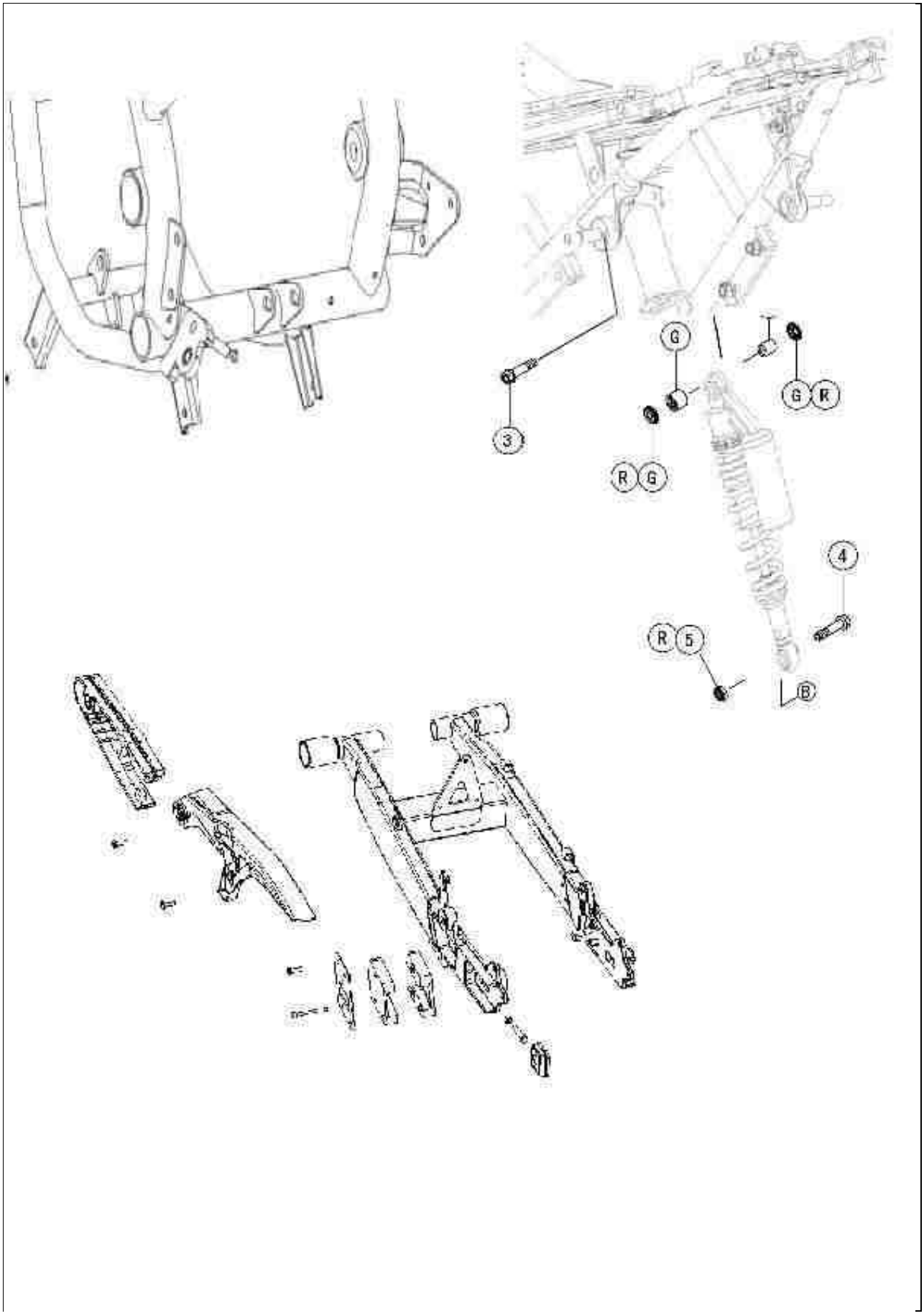


Exploded View

FRONT SUSPENSION

Pos.	Description	Type	Quantity	Torque	Notes
1	Screw fastening bottom steering yoke to fork	M8	4	25 Nm (18.44 lb ft)	-
2	Screw fastening calliper mounting bracket	M8x35	1	20 Nm (14.75 lb ft)	-

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Swingarm Pivot Shaft Nut	108	11.0	80	
2	Tie-rod Mounting Nuts	59	6.0	44	R
3	Rear Shock Absorber Bolt (Upper)	39	4.0	29	
4	Rear Shock Absorber Bolt (Lower)	39	4.0	29	
5	Rear Shock Absorber Nut	29	3.0	21	R

G: Apply grease.
R: Replacement Parts

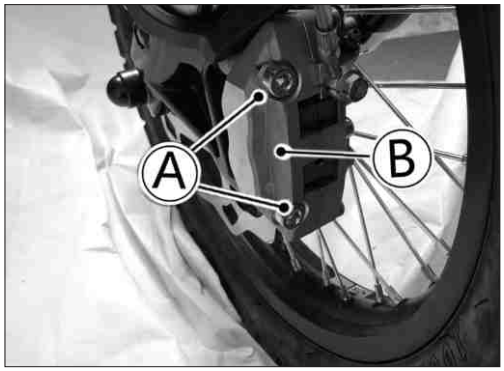
Specifications

Item	Standard	Service Limit
Front Fork (Per One Unit)		
Fork Inner Tube Diameter	ϕ33 mm (1.3 in.)	
Air Pressure	Atmospheric pressure (Non-adjustable)	- - -
Fork Spring Setting	Non-adjustable	- - -
Damper Setting	Non-adjustable	- - -
Fork Oil:		
Viscosity	SHOWA SS-8 or equivalent SAE 10W	- - -
Amount:	Approx. 225 mL (7.6 US oz.) (when changing oil) 350mL (After disassembly and completely dry)	- - -
Fork Oil Level:	138± 2 mm (5.4± 0.08 in.) (fully Compressed, without fork spring, below from the top of the inner tube)	- - -
Fork Spring Free Length	396.6 mm (15.61 in.) (Service limit 389 mm (15.3 in.)	- - -
Rear Suspension (Uni-Trak):		
Rear Shock Absorber		
Spring Preload Adjustment	(The gap between the fourth and fifth screw threads counted from the bottom up.)	
Tie-Rod,		
spring Outside Diameter:	12mm	

Front Fork

- For the left fork leg, remove the following parts.

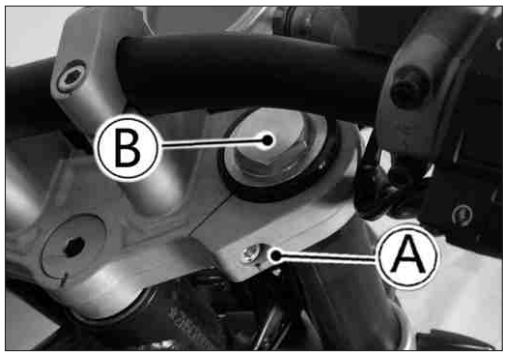
  Front Caliper Mounting Bolts [A]
- Put the front caliper [B] on a suitable stand.



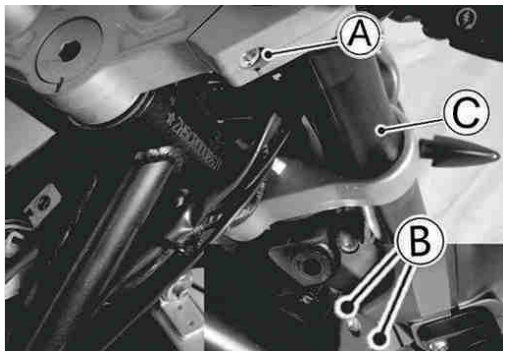
★Loosen the front fork clamp bolt [A] and top plug [B] beforehand if the fork leg is to be disassembled.

NOTE

◦ Loosen the top plug after loosening the front fork clamp bolt.



- Loosen the front fork clamp bolt [A] and front fork clamp nut [B].
- With a twisting motion, work the fork leg [C] down and out.



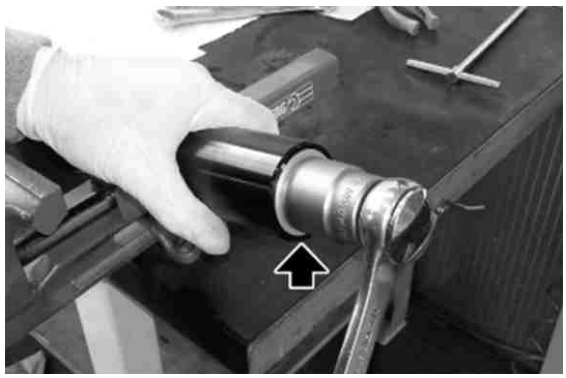
Front Fork

CAUTION

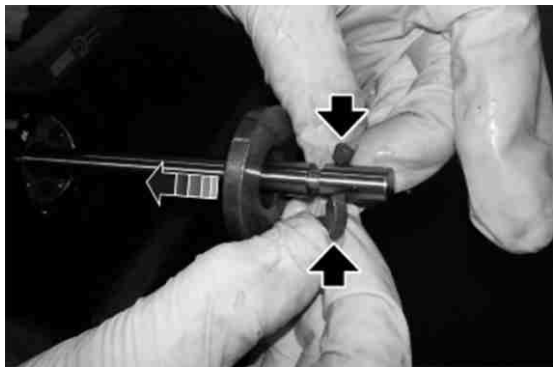
THE FOLLOWING OPERATIONS REFER TO A SINGLE WHEEL HOLDER STEM / SLEEVE BUT APPLY TO BOTH.

- Fit the fork in the vice using the special Teflon grips.

- Unscrew and remove the cap



- Remove the internal piston and, lowering the lock washer, remove the two half cylinders



Front Fork

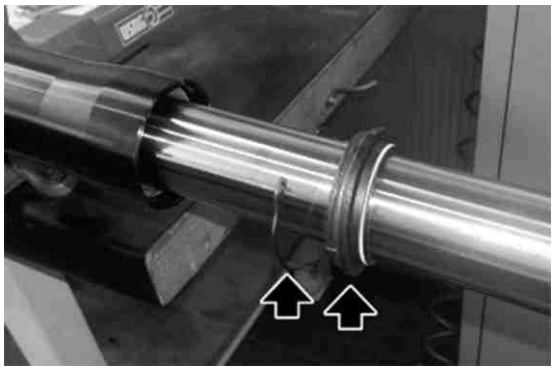
- Remove the lock washer

CAUTION

BEFORE PROCEEDING WITH THE FOLLOWING OPERATIONS GET A SUITABLE COLLECTION CONTAINER.

- Remove the stem from the vice and drain off the oil inside it into the collection container.

- Reposition the stem in the vice using the specific Teflon shoes.
- Remove the dust gaiter, taking care for the surface of the stem and the integrity of the dust gaiter.
- Remove the retainer ring.



- Remove the stem from the sleeve.

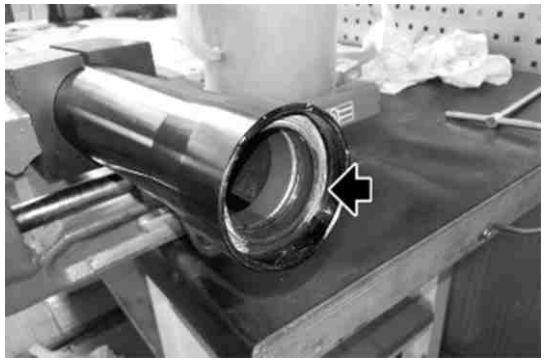
CAUTION

BE CAREFUL NOT TO DAMAGE THE SLEEVE INTERIOR WHEN REMOVING THE DIFFERENT COMPONENTS.

- Remove the oil seal from the sleeve, taking care not to damage it

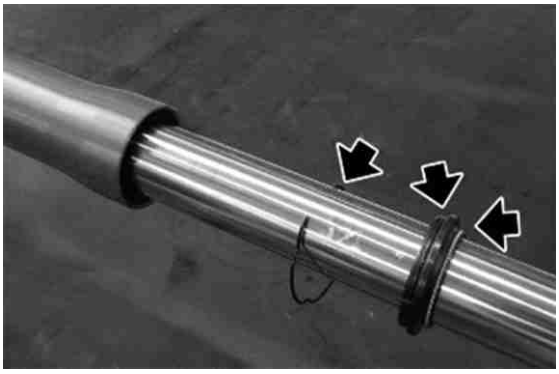
Front Fork

- Remove the oil seal from the sleeve, taking care not to damage it



Checking the components

WHEEL HOLDER STEM



- Check the sliding surface for scorings and/or scratches. These scorings can be eliminated by rubbing them with wet sandpaper (grain 1).
- If the scorings are deep, replace the stem.
- Use a dial gauge to check that the stem bending is below the limit value.
- If over the value, replace the stem.

Bending limit: 0.2 mm

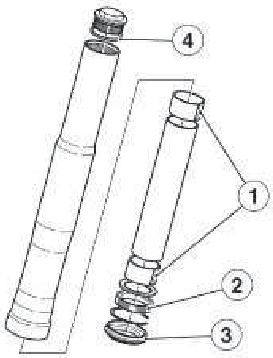
CAUTION

A BENT STEM SHOULD NEVER BE STRAIGHTENED BECAUSE ITS STRUCTURE WOULD BE WEAKENED AND USING THE VEHICLE MAY BECOME DANGEROUS.

- Replace the following components with new ones:

- sealing ring;
- dust guard;
- O-ring gasket on the cap.

- Check that there are no damages and/or cracks; otherwise, replace it.
- Check that the sliding bushings (1) for good conditions.
- If there are signs of excessive wear or damage, replace the affected component.



CAUTION

REMOVE ANY IMPURITY IN THE BUSHINGS, TAKING CARE NOT TO SCRATCH THEIR SURFACE.

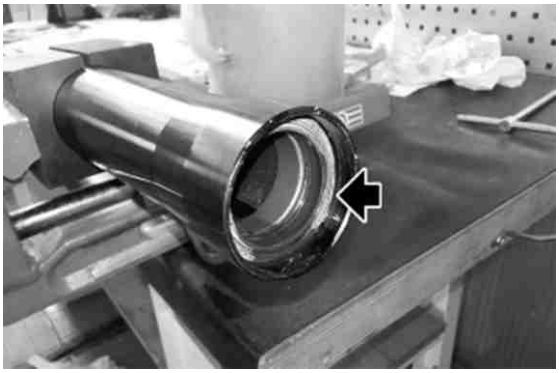
Front Fork

Reassembling the fork

CAUTION

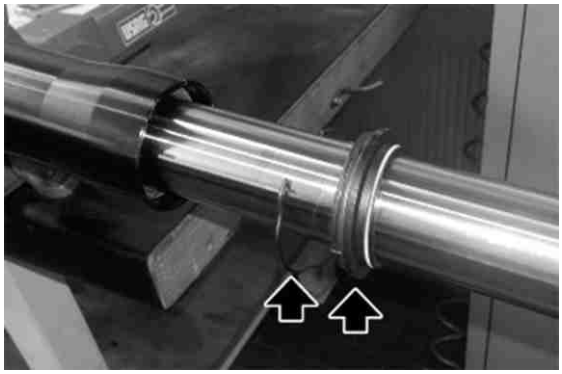
THE FOLLOWING OPERATIONS REFER TO A SINGLE WHEEL HOLDER STEM / SLEEVE BUT APPLY TO BOTH.

- Insert the oil seal in the sleeve



- After inserting the dust gaiter in the stem as well as the retainer ring, insert the stem itself in the sleeve

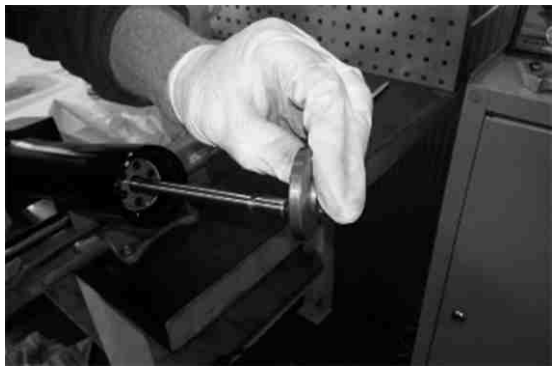
- Position the retainer and push the dust gaiter into its seat



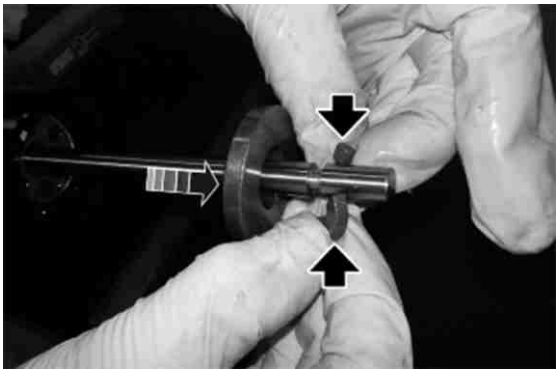
- Insert the retainer ring

Front Fork

- Insert the retainer ring



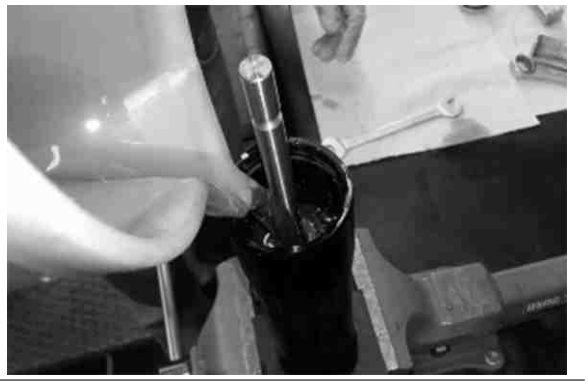
- Position the two half cylinders and lock them in place with the retainer ring



Front Fork

? Position the fork vertically in a vice

? Fill the fork with oil



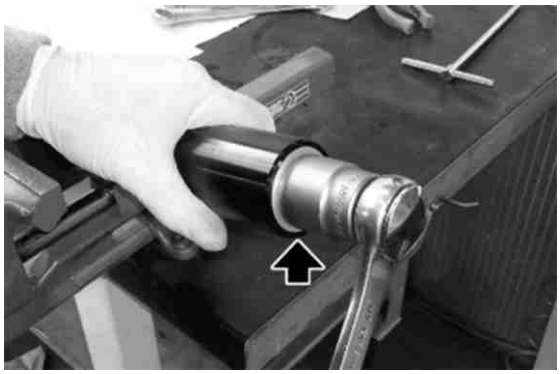
Characteristic

Fork MingXing oil quantity

Right stem: 355+/-5 ml (0.0781+/-0.0011 UK gal; 0.0938 +/-0.0013 US gal)

Left stem: 360 +/-5 ml (0.0792+/-0.0792+/-0.0011 UK gal; 0.0951 +/-0.0013 US gal)

? Screw the cap on the sleeve



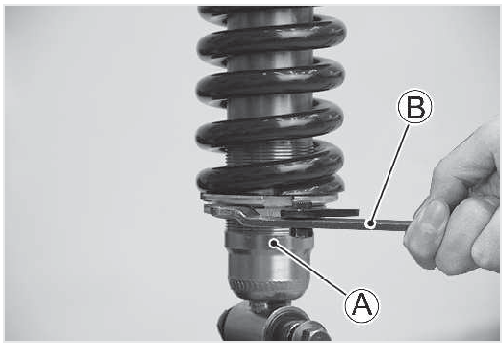
Rear Suspension (Uni-Trak)

Spring Preload Adjustment

- Remove:
  Rear Shock Absorber (see Rear Shock Absorber Removal)
- Turn the rear shock absorber up side down.
- Hold the upper of the rear shock absorber with a vise.
- Turn the adjusting nut [A] as required using the steering Stem nut wrench [B]. Turning the adjusting nut downward marks the spring action harder and upward softer.

Special Tool - Steering Stem Nut Wrench: 57001-1100

Spring Preload Adjustment
Standard: 2nd position
Adjustable Range: 1~4th position

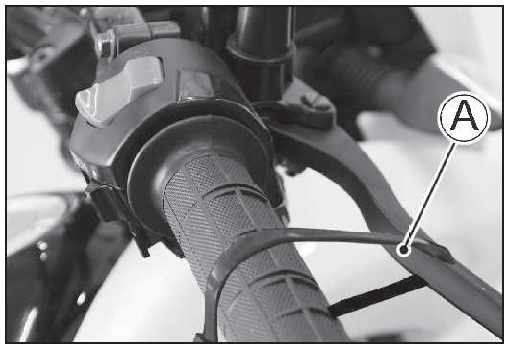


Rear Shock Absorber Removal

- Raise the rear wheel off the ground with the jack.

Special Tool - Jack: 57001-1238

- Squeeze the brake lever slowly and hold it with a band [A].



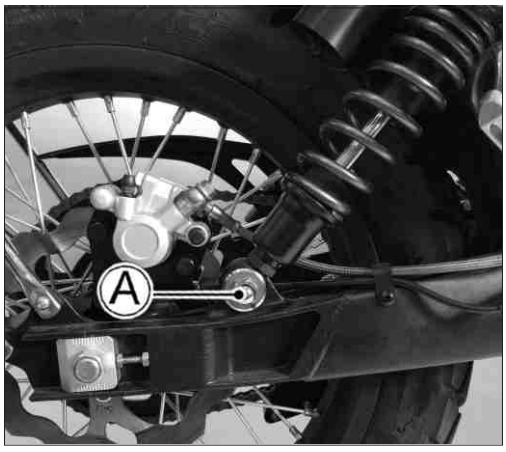
⚠ WARNING

Be sure to hold the front brake when removing the Shock absorber, or the motorcycle, may fall over. It could cause an accident and injury.

CAUTION

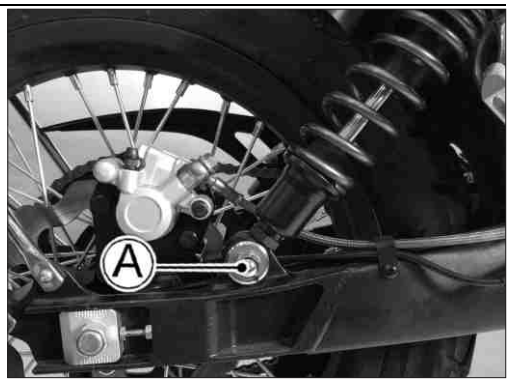
When pulling out the mounting bolts, lift the rear Wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve and bearing.

- Remove the rear shock absorber nut [A].

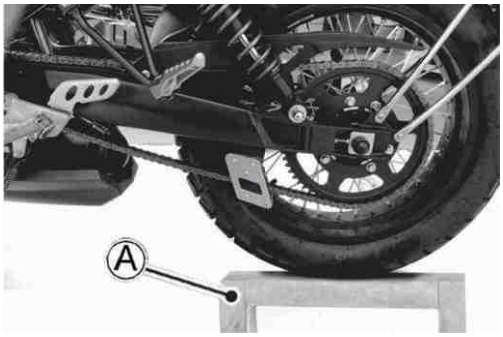


Rear Suspension (Uni-Trak)

- Remove the tie-rod rear mounting bolt and nut [A],



- Using the available stand [A] or jack, lift the rear wheel as shown.



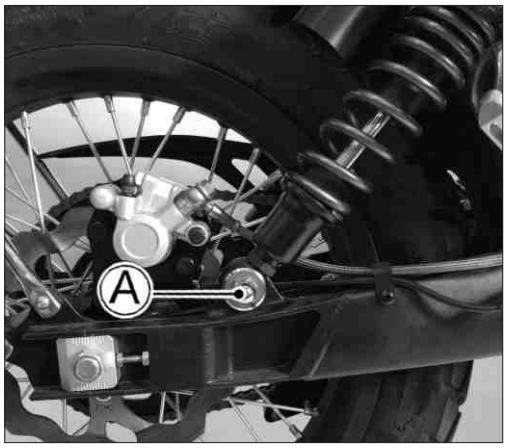
- Remove the upper rear shock absorber bolt [A].

Rear Shock Absorber Installation

- Pack the rocker arm needle bearings with grease.
- Replace the rear shock absorber nut [A] with a new one.
- Tighten:

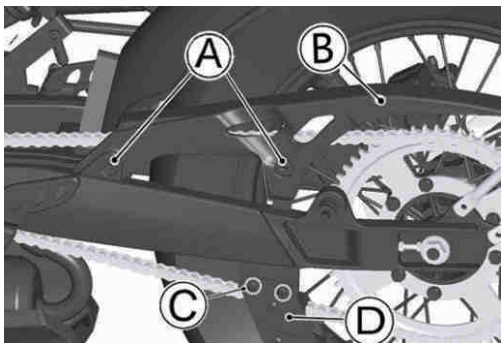
Torque - Rear Shock Absorber Bolt (Upper, Lower): 39 N•m (4.0 kgf•m, 29 ft•lb)
Rear Shock Absorber Nut: 29 N• m (3.0 kgf•m, 21 ft•lb)
Tie-Rod Mounting Nut (Rear): 59 N?m (6.0 kgf•m, 44 ft•lb)

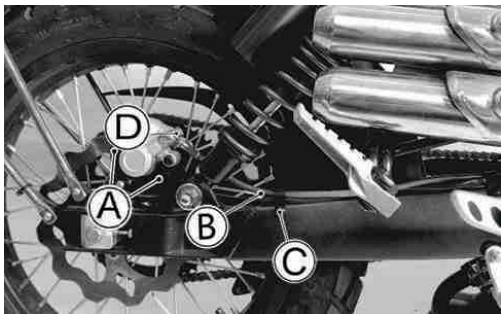
- Install the other removed parts.



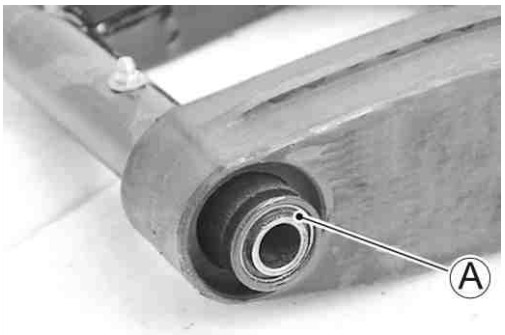
⚠ WARNING

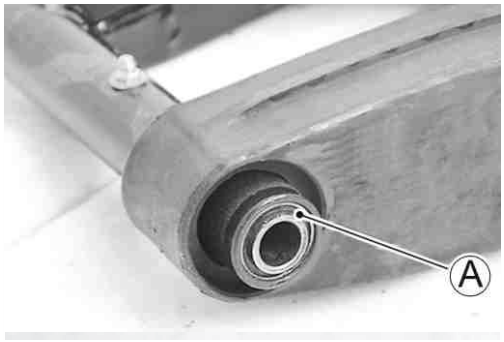
Since the rear shock absorber contains nitrogen Gas, do not incinerate the rear shock absorber without first releasing the gas or it may explode.
Before a rear shock absorber is scrapped, drill a Hole at the point [A] shown to release the nitrogen Gas completely. Wear safety glasses when drilling The hole, as the gas may blow out bits of drilled metal when the hole opens.


A
B
C
D


D
A
B
C


A


A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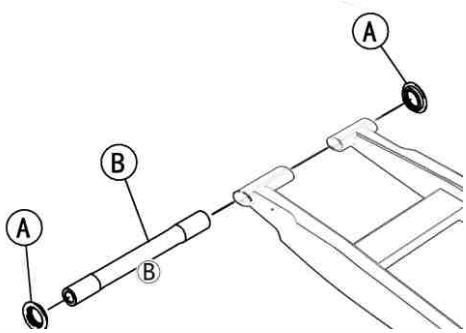
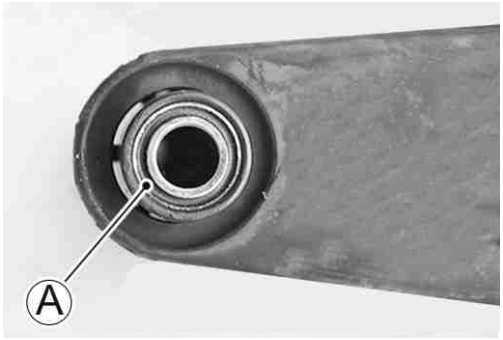
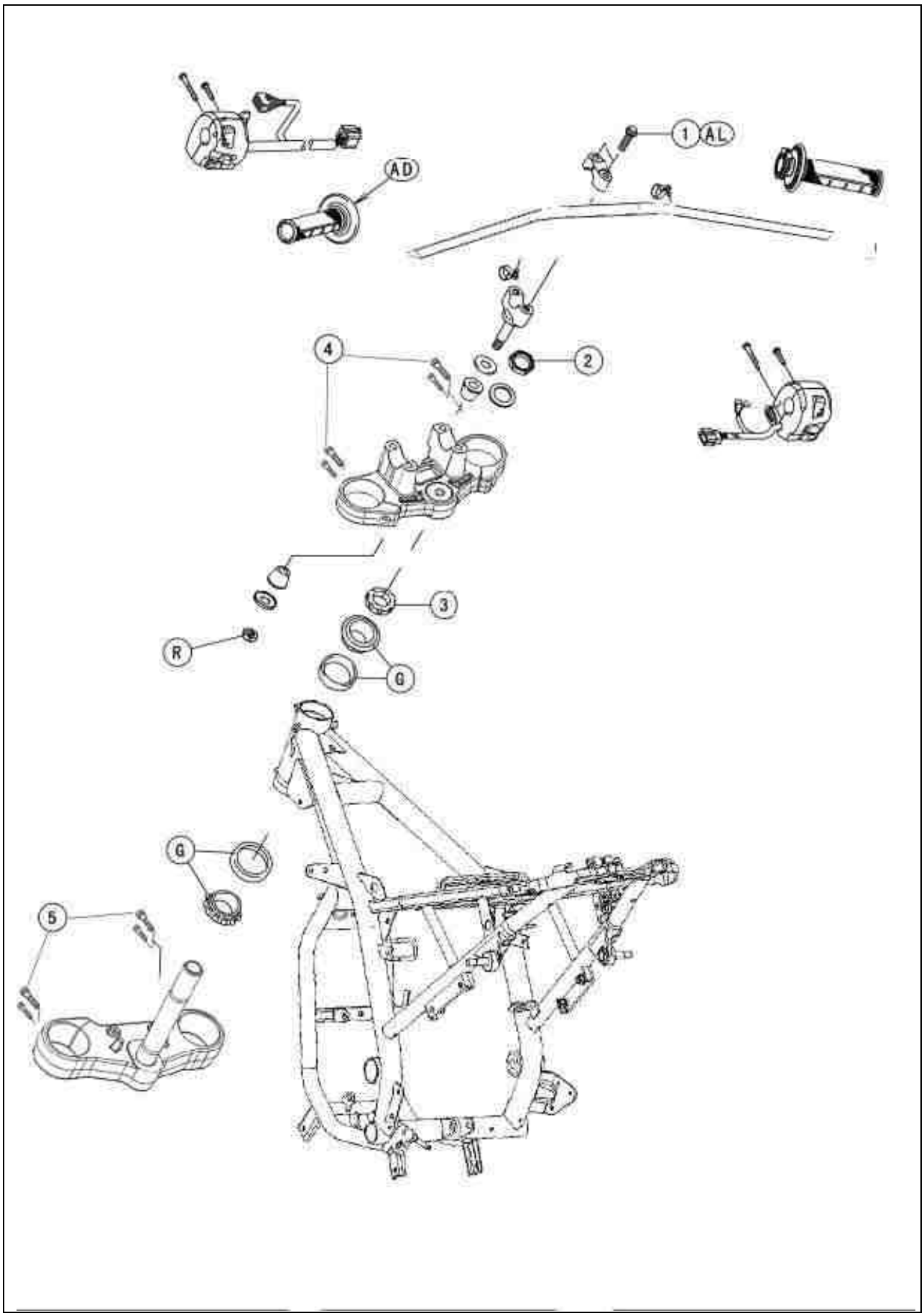

A
B
A
B


A

Steering

Table of Contents

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Handlebar Clamp Bolts	25	2.5	18	AL
2	Steering Stem Head Nut	64	6.5	47	
3	Steering Stem Nut	4.9	0.50	43 in·lb	
4	Front Fork Clamp Bolt	20	2.0	15	
5	Front Fork Clamp Bolt	40	4.1	30	

AD: Apply adhesive.
AL: Tighten the clamp bolts alternately two times to ensure even tightening torque.
G: Apply grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts

Steering

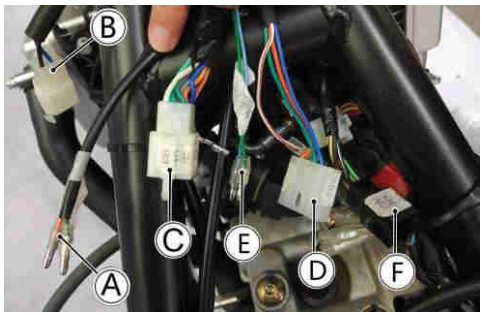
Steering Inspection
- Refer to the Steering Play Inspection in the Periodic Maintenance chapter.

Steering Adjustment
- Refer to the Steering Play Adjustment in the Periodic Maintenance chapter.

Steering Stem

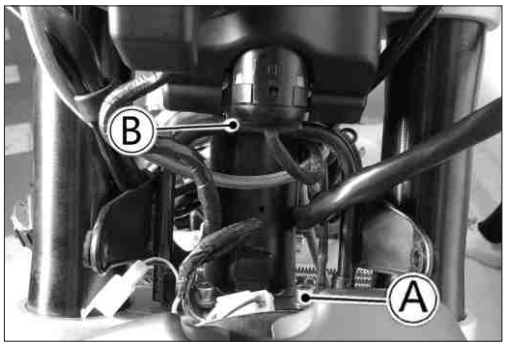
Stem, Stem Bearing Removal

- Remove:
  Headlight Unit (with the headlight cover installed, see Headlight Unit Removal in the Electrical System chapter)
  Meter Unit (see Meter Unit Removal in the Electrical System chapter)
  Front Brake Hose Banjo Bolt (Upper, see Front Master Cylinder Removal in the Brakes chapter)
  Handlebar (see Handlebar Removal)
  Front Fender (see Front Fender Removal in the Frame chapter)
- Disconnect:
  Front Left Turn Signal Light Lead Connector [A]
  Fan lead connector[B]
  Left Handlebar Switch Housing Lead Connector [C]
  Ignition Switch Lead Connector [D]
  Front Right Turn Signal Light Lead Connector [E]
  Right Handlebar Switch Housing Lead Connector [F]

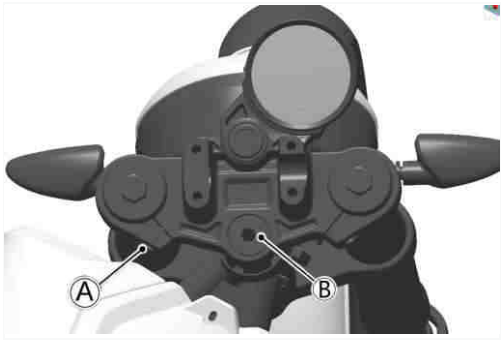


- Remove:
  Bolts [A]
  Headlight Cover Bracket [B]

When removing the headlight cover bracket, clear the Cables and hose from the guide of the headlight cover bracket.



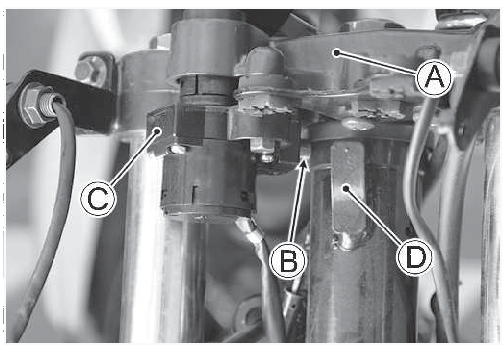
- Loosen the front fork clamp bolts [A].
- Remove the steering stem head nut [B].

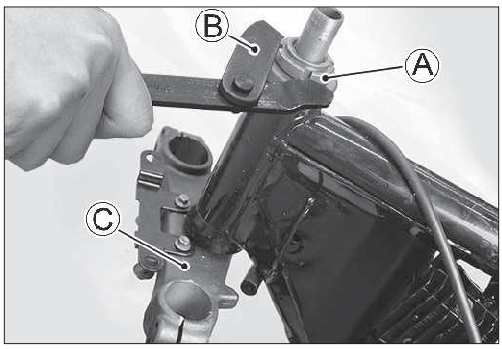


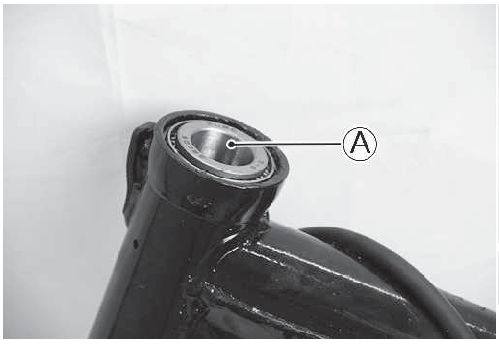
- Turn the steering fully to the right, and remove the steering stem head [A].

When removing the steering stem head, clear the stopper Portion [B] of the ignition switch [C] from the steering lock portion [D] of the head pipe.

- Remove the front forks (see Front Fork Removal (Each Fork Leg) in the Suspension chapter).




B
A
C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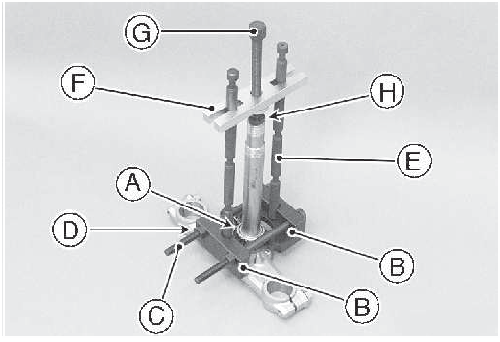
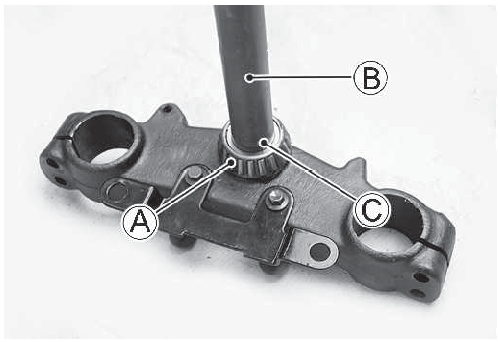
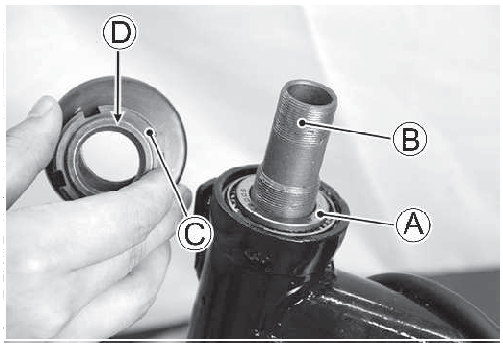

G
F
H
E
A
D
B
C
B


B
A
C


D
B
C
A

⚠ WARNING

Do not impede the handlebar turning by routing the Cables, harnesses and hoses improperly (see Ca-Ble, Wire, and Hose Routing section in the Appendix chapter).

- Install the removed parts (see appropriate chapters).
  - Run the cables, leads and hose correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).

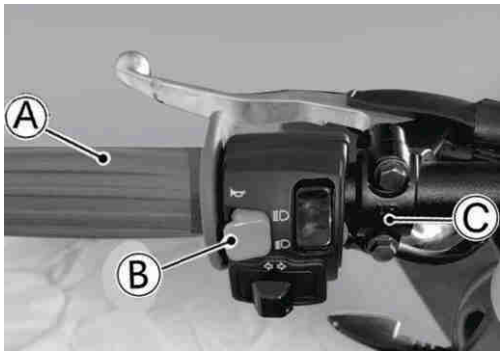
Stem Bearing Lubrication

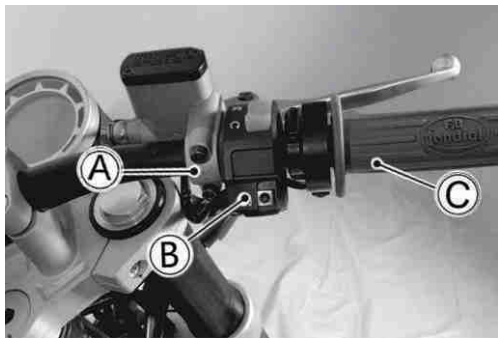
- Refer to the Steering Stem Bearing Lubrication in the Periodic Maintenance chapter.

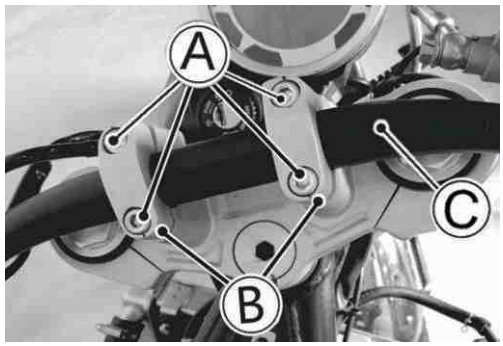
Steering Stem Warp

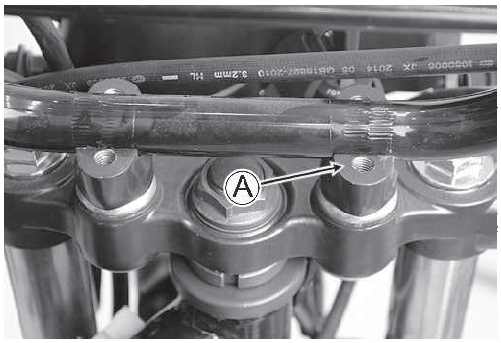
- Whenever the steering stem is removed, or if the steering Cannot be adjusted for smooth action, check the steering stem for straightness.

★If the steering stem [A] is bent, replace the steering stem.


A
B
C


A
B
C


A
B
C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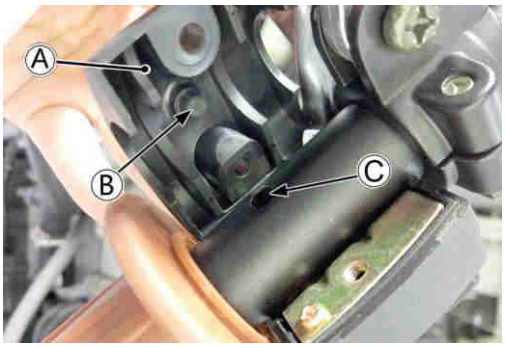
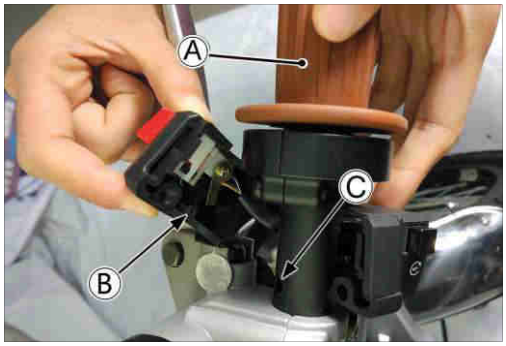
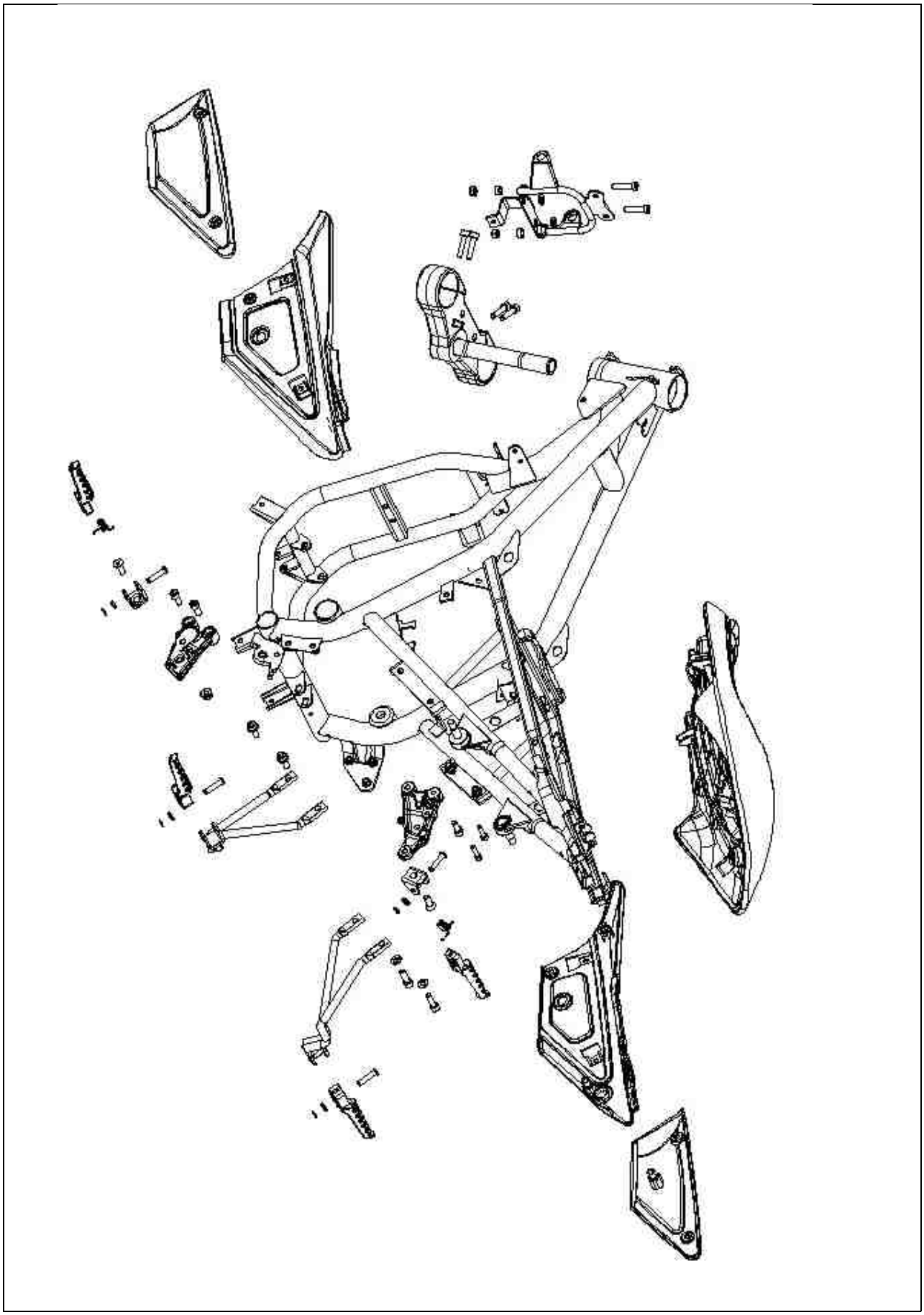

A
B
C


A
C
B

Frame

Table of Contents

Exploded View

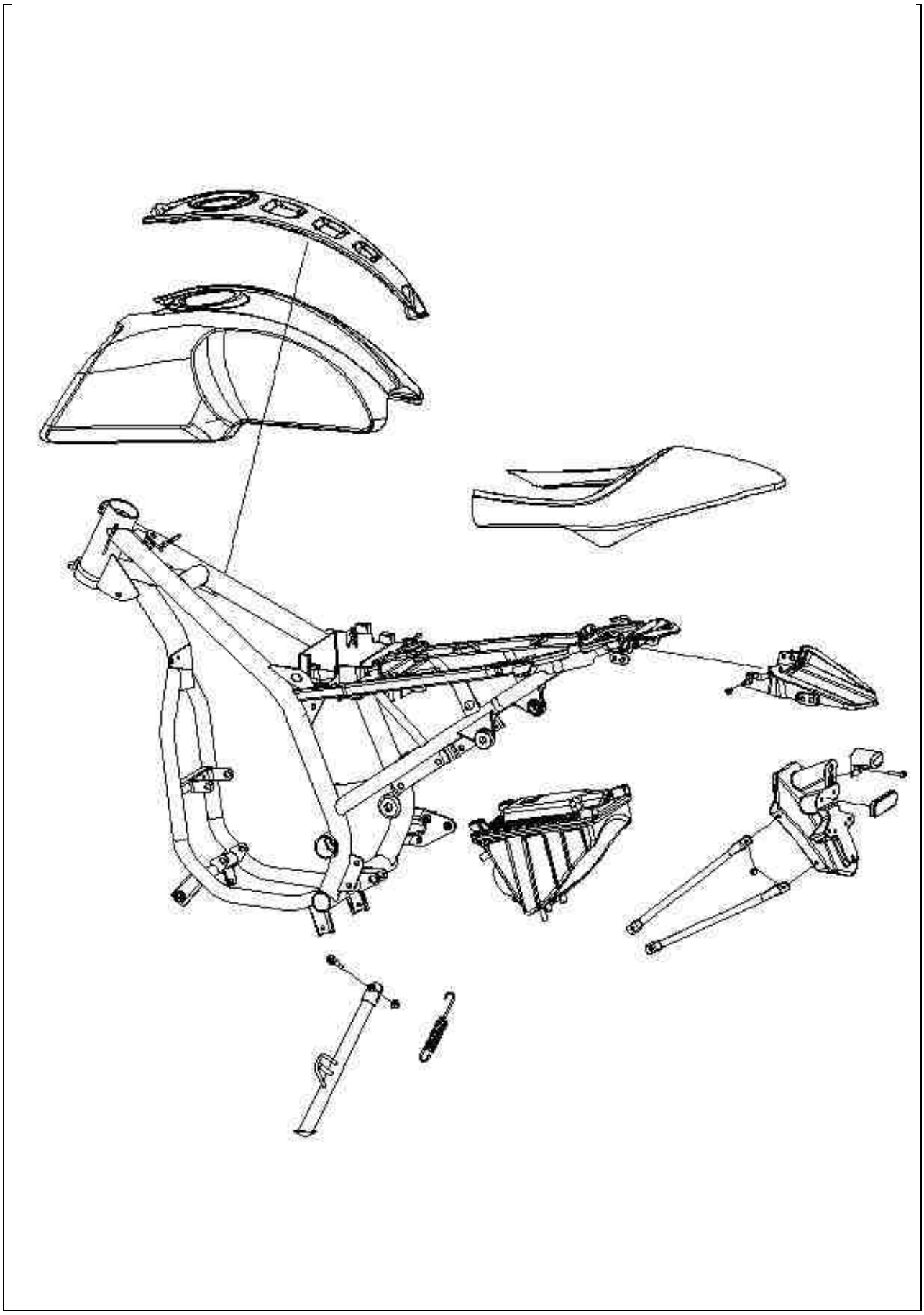


Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Front Footpeg Stay Bolts	18	1.8	13.3	
2	Rear Footpeg Stay Bolts	18	1.8	13.3	

G: Apply grease.
R: Replacement Parts

Exploded View



Exploded View

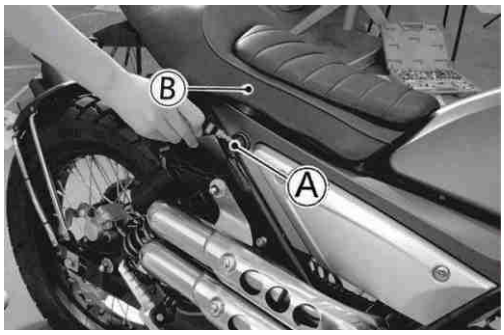
G: Apply grease.
R: Replacement Parts

Seat

Seat Removal

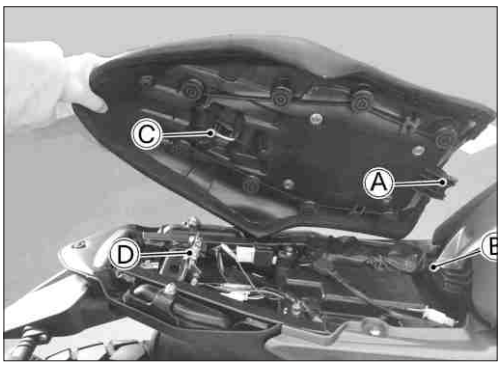
- Remove:
  Side Covers (see Side Cover Removal)

  Saddle Lock[A]
- Remove the seat [B] backward while lifting up the rear part of the seat.



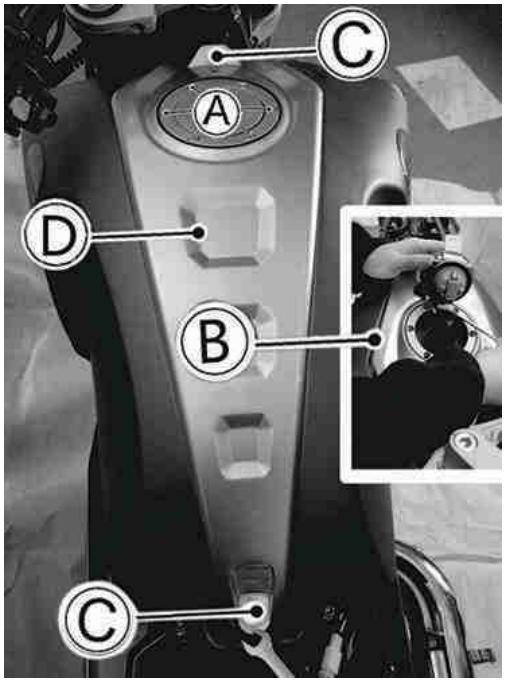
Seat Installation

- Installation is the reverse of removal.
  - Fit the hook portion [A] on the fuel tank into the slot [B].
  - Slip the seat hook [C] under the rib [D] on the frame.



Tank shell

Tank shell Removal



- Remove:

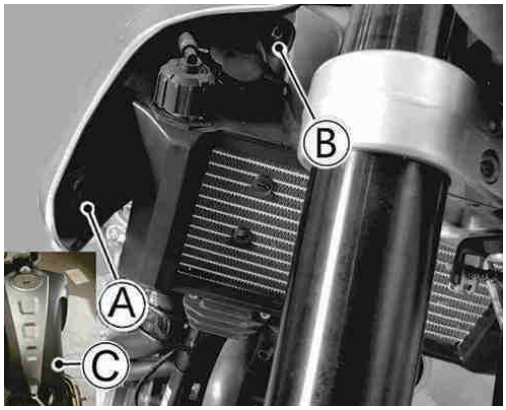
  Seat (see Seat Removal)

  Bolts [A] with Fuel Tank Lock

  Screw [B]

  Screw [C]

  Shroud [D]



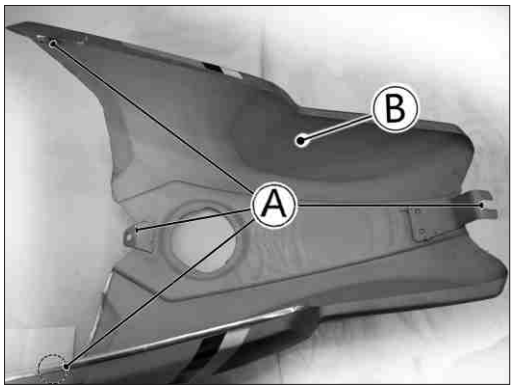
- Remove:

  Remove the Screw [A] (Both sides) and Screw [B] (Both sides)

  Tank shell [C]

Tank shell Installation

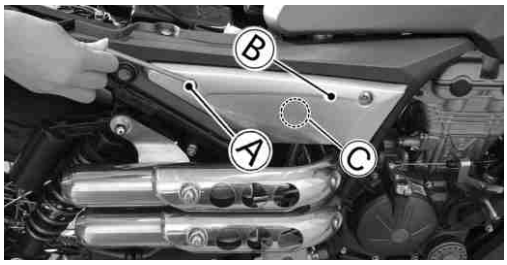
- Installation is the reverse of removal.
  - Check that the dampers [A] are in place on the shroud [B].



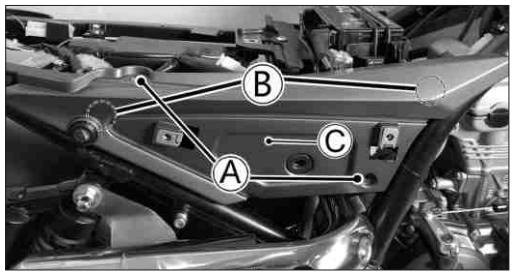
Side Covers

Side Cover Removal

- Remove the bolt [A] with washer.
- Pull the side cover [B] evenly outward to clear the projection [C], and remove it.



- Remove the bolt [A] with washer.
- Pull the side cover [C] evenly outward to clear the projection [B], and remove it.



- Remove the screws [A] and separate the side cover as necessary.

  Right Side Cover [B]

Side Cover Installation

- Insert the projection [A] into the grommet [B] on the frame.

Fenders

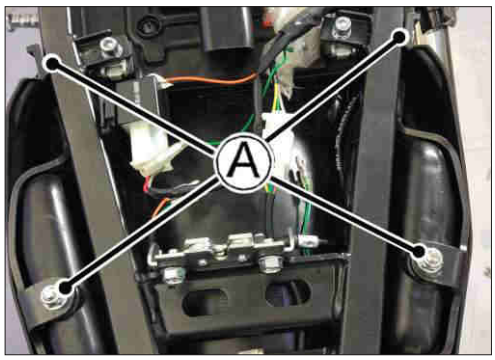
Front Fender Removal

- Remove the bolts [A] with washers, and pull out the front fender [B].

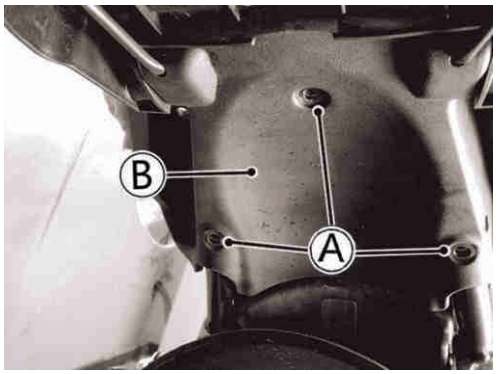
Rear Fender Removal

- Remove:

  Mud Guard (see Mud Guard Removal)
  Bolts [A] with Washers



- Remove the bolts [A] with washers, and pull out the rear Fender [B] forward while pushing down the front part of the fender.



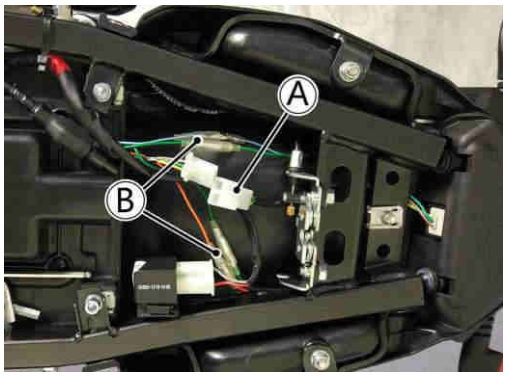
Rear Fender Installation

- Installation is the reverse of removal.
  - Run the leads correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).
  - Check that the dampers are in place on the frame Cover [A].

Fenders

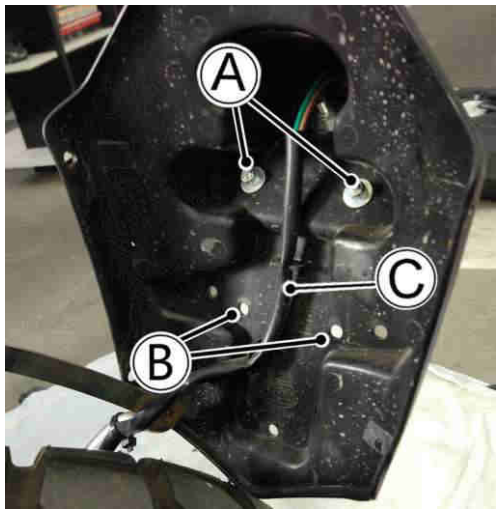
Flap Removal

- Remove:
  Seat (see Seat Removal)
  Tool Kit Bag (see Tool Kit Bag Removal)
  Frame Cover (see Rear Fender Removal)



- Disconnect:
  Tail/Brake Light Lead Connector [A]
  Left / right turn signal lamp lead[B]

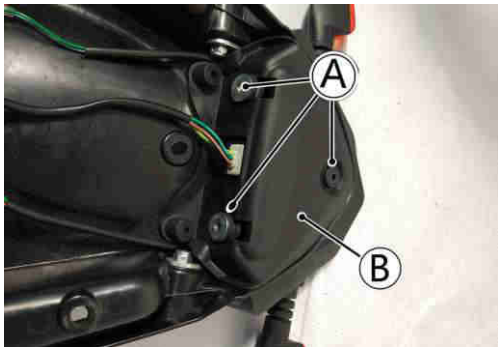
- Remove:
  Bolts [A] with Washers
  License Plate Stay [B]
  License lamp line [C]



Fenders

Flap Removal

- Bolts [A] with Washers
  - Pull out the Cover [B]

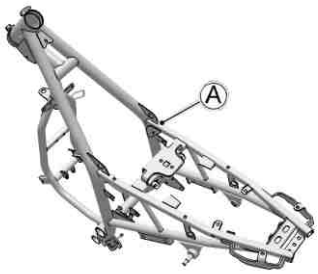


Frame

Frame Inspection

- Visually inspect the frame [A] for cracks, dents, bending, or warping.

★If there is any damage to the frame, replace it.

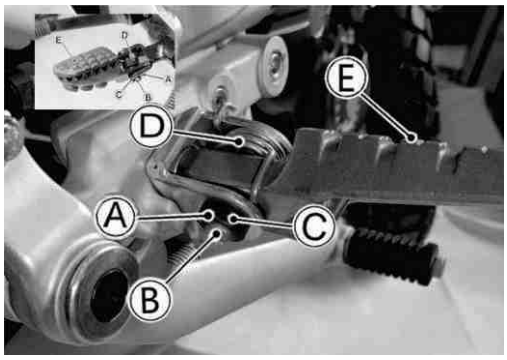


⚠

A repaired frame may fail in use, possibly causing An accident. If the frame is cracked, dented, bent, or warped, replace it.

Footpegs

Front Footpeg Removal

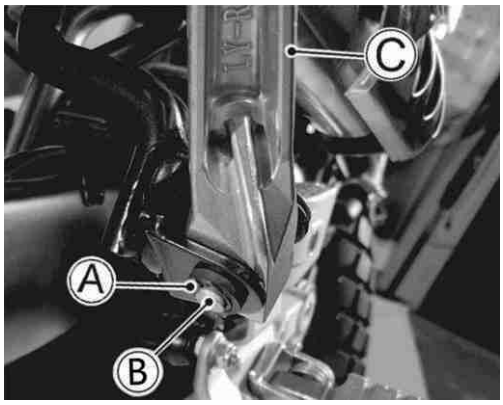


- Remove:
  - Cotter Pin [A]
  - Pivot Pin [B]
  - Washer [C]
  - Spring [D]
  - Front Footpeg [E]

Front Footpeg Installation

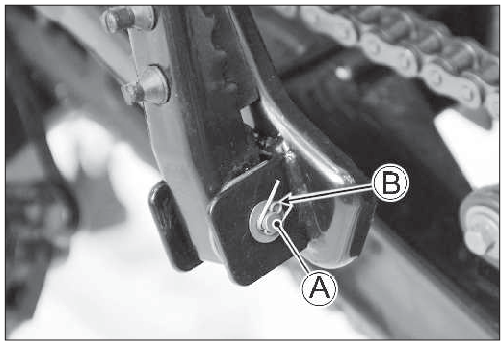
- Hook the spring end [A] onto the footpeg bracket as shown.
  - Upside View [B]
  - Front [C]
- Apply grease to the sliding surface of the pivot pin [D].
- Insert the pivot pin from the front side.
- Install the washer [E].
- Replace the cotter pin [F] with a new one.
- Insert the cotter pin and bend the cotter pin ends.

Rear Footpeg Removal

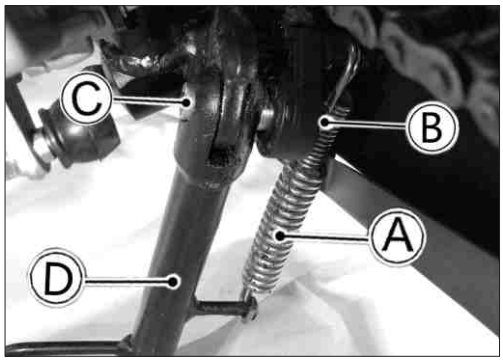


- Remove:
  - Cotter Pin [A]
  - Pivot Pin [B]
  - Rear Footpeg [C]

Rear Footpeg Installation



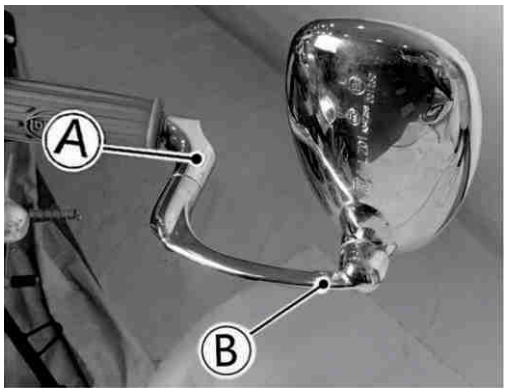
- Apply grease to the sliding surface of the pivot pin [A].
- Insert the pivot pin from the front side.
- Replace the cotter pin [B] with a new one.
- Insert the cotter pin and bend the cotter pin ends.


C
B
A
D

Rear View Mirrors

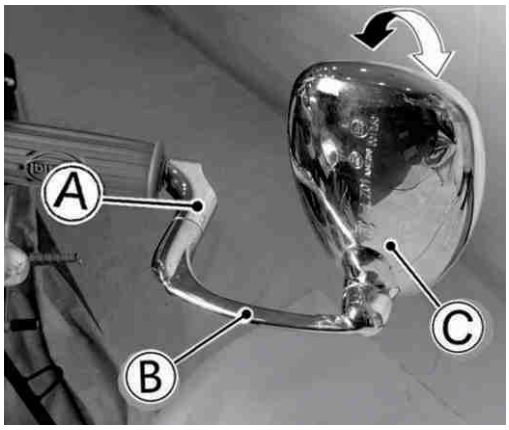
Rear View Mirror Removal

- Loosen the adapter nut [A] for tightening to remove the rear view mirror [B] from the holder.



Rear View Mirror Installation

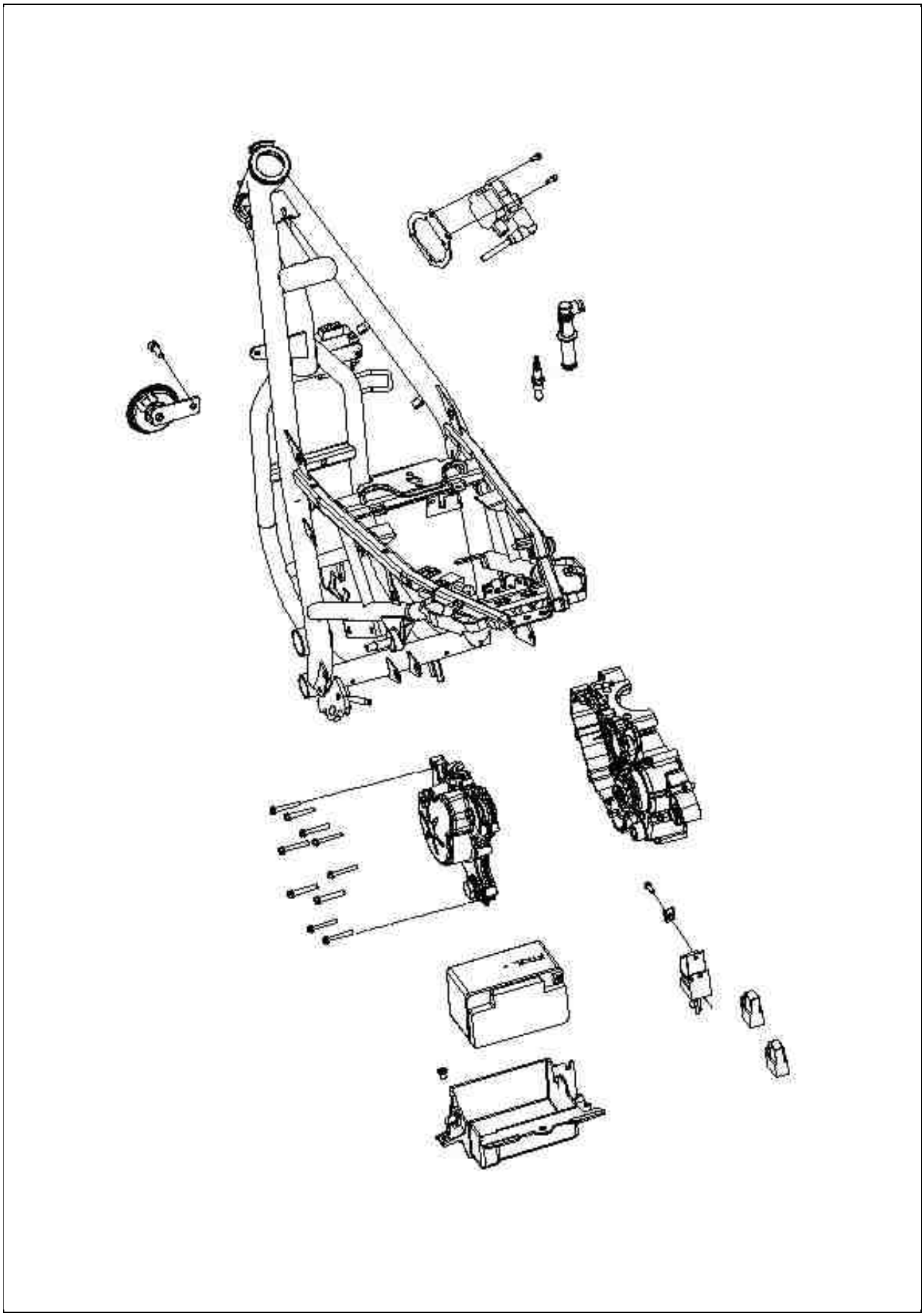
- Screw the rear view mirror into the holder all the way, and tighten the adapter nut [A] securely.
- Turn the stay [B] to assure the safe conditions of the rear with operator sat on the motorcycle.
- Adjust the rear view mirror slightly with its mirror [C].
  - Installation and adjustment of the right side are common With those of the left side. Follow the procedure specified at the left side.



Electrical System

Table of Contents

Exploded View

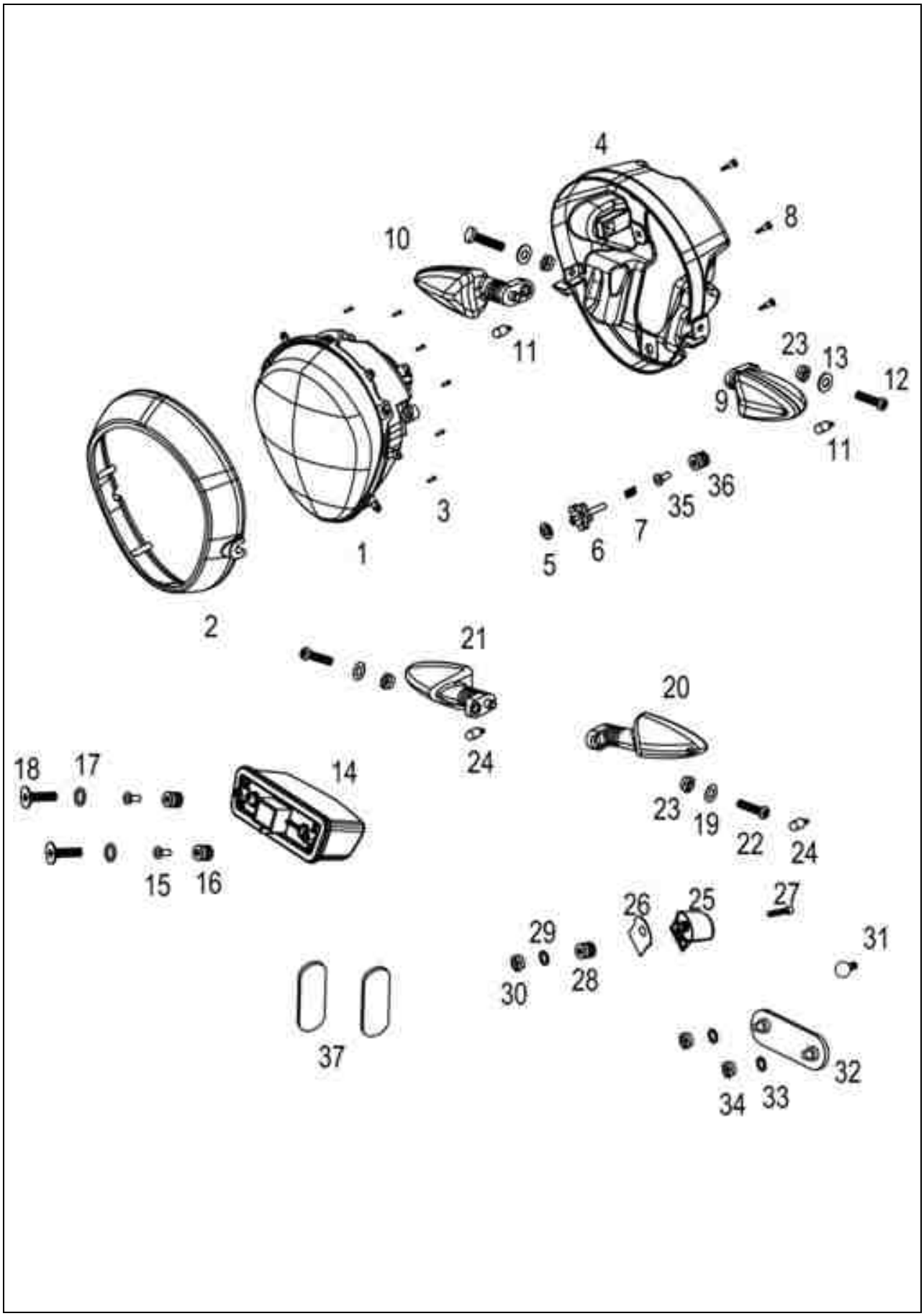


Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Regulator/Rectifier Bolt	8.8	0.90	78 in·lb	
2	Ignition Coil Mounting Bolts	2.9	0.30	26 in·lb	
3	Spark Plug	10-20	1-2	7.4-14.8	
4	Starter Relay Terminal Screws	2.9	0.30	26 in ·lb	
5	Starter Motor Terminal Nut	5-6	0.5-0.6	3.7-4.4	
6	Starter Motor Terminal Locknut	6-8	0.6-0.8	4.4-5.9	
7	Starter Motor Mounting Bolts	8-16	0.8-1.6	5.9-11.8	
8	Starter Motor Through Bolts	5-6	0.5-0.6	3.7-4.4	
9	Starter Motor Clutch Bolts	8-12	0.8-1.2	5.9-8.9	L
10	Alternator Rotor Nut	50-65	5-6.5	36.8-47.9	MO
11	Lead Clamp Screws	8-16	0.8-1.6	5.9-11.8	
12	Stator Coil Bolts	7-15	0.7-1.5	5.2-11.1	
13	Crankshaft Sensor Screws	7-15	0.7-1.5	5.2-11.1	
14	Alternator Cover Bolts	8-16	0.8-1.6	5.9-11.8	
15	Timing Inspection Cap	2.5	0.25	22 in·lb	
16	Alternator Cover Center Cap	2.5	0.25	22 in·lb	

G: Apply grease.
L: Apply a non-permanent locking agent.
MO: Apply molybdenum disulfide oil solution
(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1).
R: Replacement Parts
SS: Apply silicone sealant.

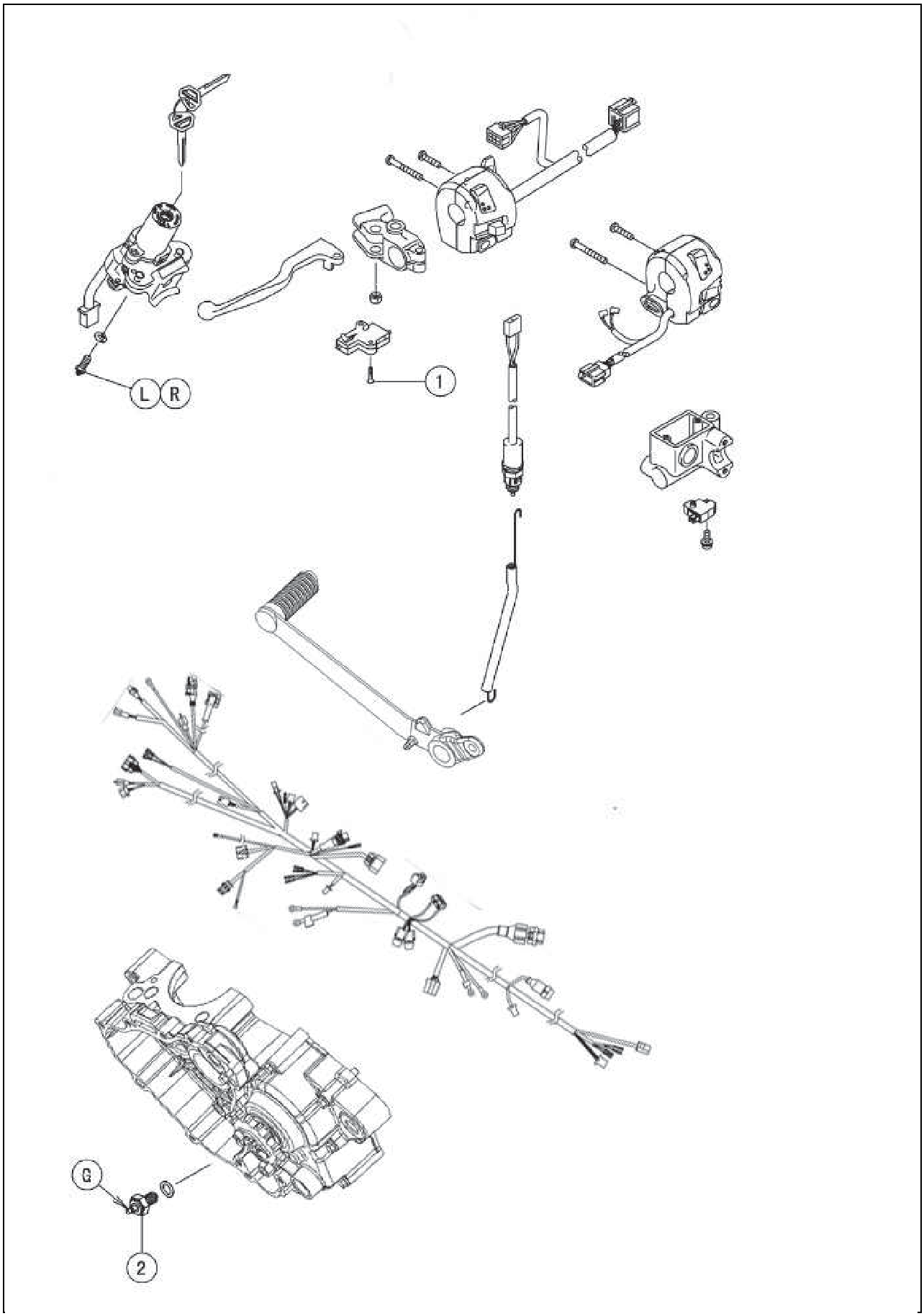
Exploded View



Exploded View

1.Headlight
2.Headlight FR. cover (black. white. titanium)
3.Screw 3.5*16
4.Headlight RR. cover (black. white. titanium)
5.Lock washer
6.Adjusting bolt
7.Adjusting bolt spring
8.Bolt M5*14
9.Lh front flasher
10.Rh front flasher
11.Flasher bulb (philips H8/4191)
12.Bolt M6*16
13.Nut M6
14.Tail light
15.Spacer
16.Grommet
17.Washer 4.3*12*1
18.Screw 3.5*20
19.Washer R3
20.LH rear flasher
21.RH rear flasher
22.Bolt M6*16
23.Nut M6
24.Flasher bulb (philips H8/4191)
25.License plate light
26.License plate light rubber
27.Bolt M5*16
28.Grommet
29.Washer R2.5
30.Nut M5
31.License plate light bulb
32.Rear reflector (red)
33.Washer R2.5
34.Nut M5
35.Spacer
36.Grommet

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N•m	kgf•m	ft•lb	
1	Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
2	Neutral Switch	15	1.5	11	

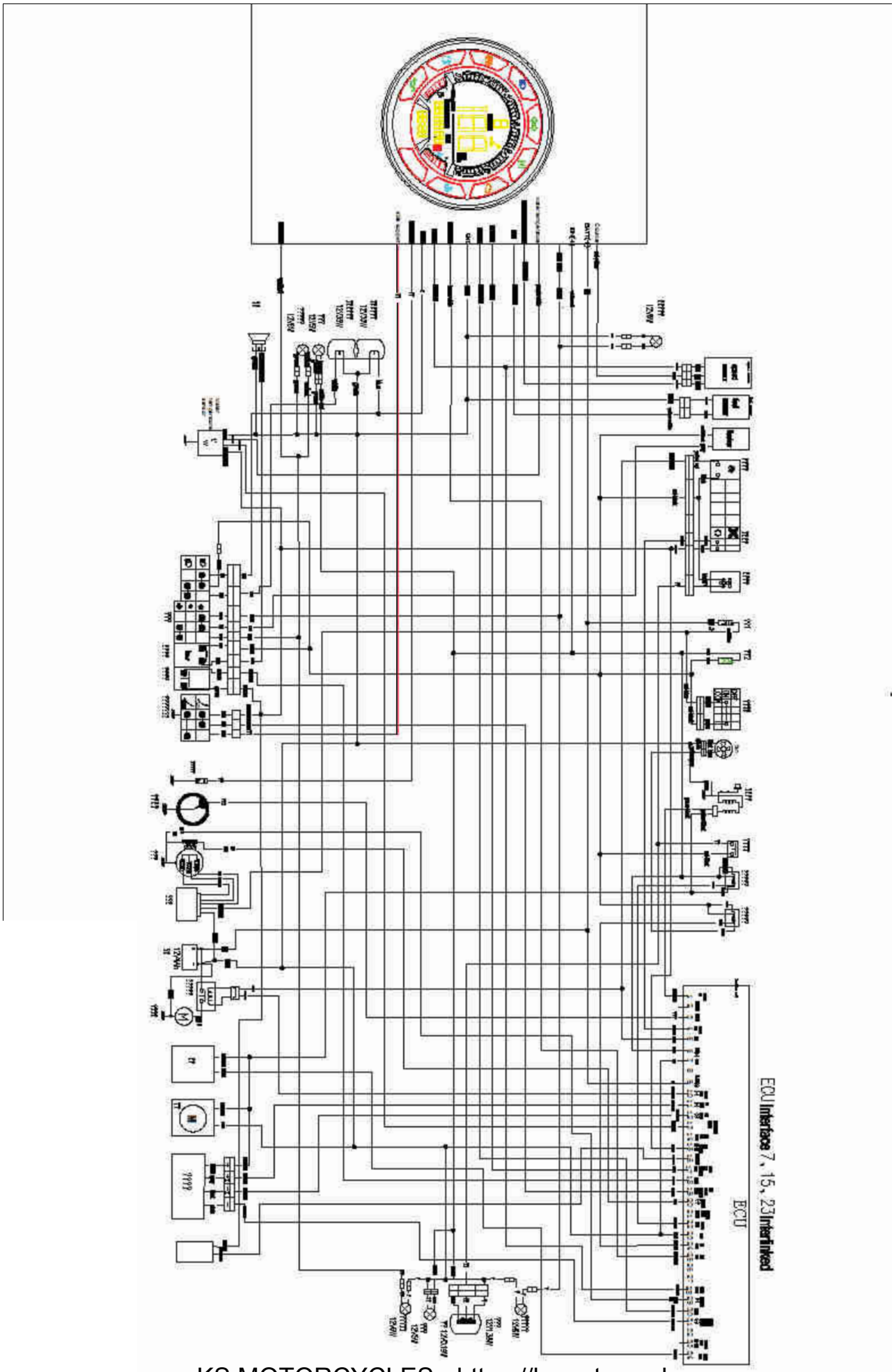
G: Apply grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts

Specifications

Item	Standard	Service Limit
Battery		
Type	Sealed Battery	- - -
Model	12M6AS-3B	- - -
Capacity	12V6A	- - -
Voltage	12 V or more	- - -
Charging System		
Alternator Type	Single-phace AC	- - -
Charging Voltage (Regulator/Rectifier Output Voltage)	14.4± 0.5 V	- - -
Alternator Output Voltage	in the text	- - -
Stator Coil Resistance	in the text	- - -
Regulator/Rectifier Resistance	in the text	- - -
Ignition System		
Ignition Coil:		
3 needle Arcing Distance	6mm or more	- - -
Primary Winding Resistance	0.27Ω±25%	- - -
Secondary Winding Resistance	3.6KΩ±25%	- - -
Spark Plug:		
Type	NGK	- - -
Spark Plug Gap	0.9±0.1 mm (0.035±0.003 in.)	- - -
Spark Plug Cap Resistance	5.1kΩ±20%	- - -
Crankshaft Sensor:		
Crankshaft Sensor Resistance	91 - 137Ω At 20℃ (68 °F)	- - -
Crankshaft Sensor Peak Voltage	5 V or more	- - -
Electric Starter System		
Starter Motor:		
Brush Length	7 mm (0.28 in.)	3.5 mm (0.14 in.)
Commutator Diameter	22.1 mm (0.87 in.)	21.6 mm (0.85 in.)
Switches		
Rear Brake Light Switch Timing	On after about 10 mm (0.39 in.) pedal travel	- - -

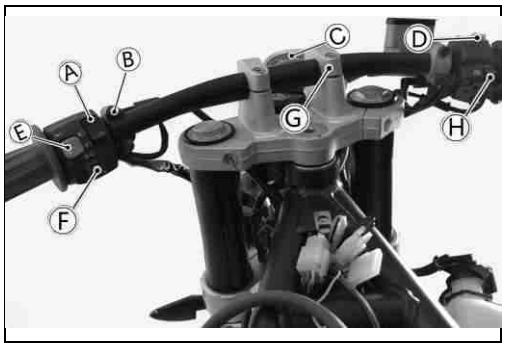
Rotor Puller M18×1.5,M16×1.5:

Wiring Diagram (ID Model)

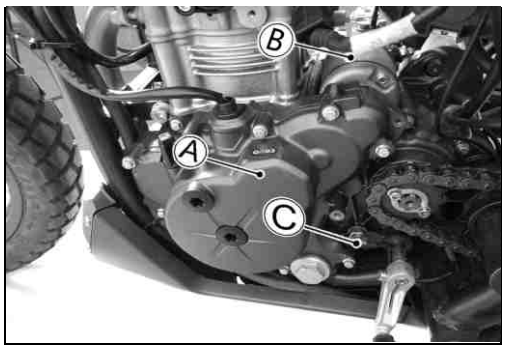


Parts Location

Dimmer Switch [A]
Starter Lockout Switch [B]
Meter Unit [C]
Engine Stop Switch [D]
Horn Button [E]
Turn Signal Switch [F]
Ignition Switch [G]
Starter Button [H]

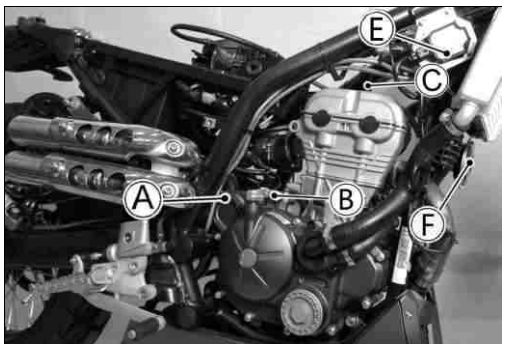


Alternator [A]
Starter Motor [B]
Neutral Switch [C]



Battery 12 V 6 Ah [A]
Main Fuse 15 A [B]
Rectifier [C]
Starter Relay [D]

Engine Ground [A]
Starter Motor [B]
Spark Plug [C]
Frame Ground [D]
Ignition Coil [E]
Horn [F]



Precautions

There are numbers of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below:

- Do not reverse the battery cable connections. This will burn out the diodes in the electrical parts.
- Always check battery condition before condemning other Parts of an electrical system. A fully charged battery is a must for conducting accurate electrical system tests.
- The electrical parts should never be struck sharply, as With a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- To prevent damage to electrical parts, do not disconnect The battery cables or any other electrical connections When the ignition switch is ON, or while the engine is running.
- Because of the large amount of current, never keep the Starter button pushed when the starter motor will not turn Over, or the current may burn out the starter motor windings.
- Take care not to short the cables that are directly connected to the battery positive (+) terminal to the chassis ground.
- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some Other item or items, they must be repaired or replaced, or the new replacement will soon fail again.
- Make sure all connectors in the circuit are clean and tight, And examine leads for signs of burning, fraying, etc. Poor Leads and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).
- Color Code

BK: Black	GY: Gray	W: White
BL: Blue	LG: Light green	Y: Yellow
BR: Brown	O: Orange	
G: Green	R: Red	

- Visually inspect the wiring for signs of burning, fraying, etc.

★If any wiring is poor, replace the damaged wiring.

- Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.

★If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.

- Check the wiring for continuity.
  - Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
  - Connect the hand tester between the ends of the leads.

Special Tool - Hand Tester: 57001-1394

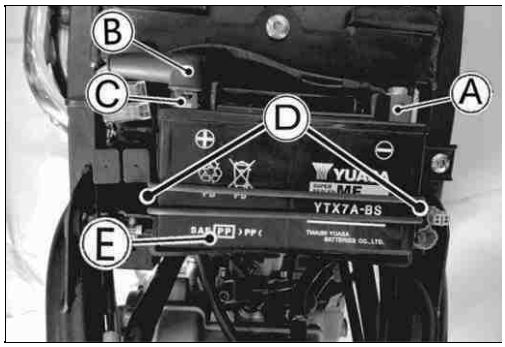
  - Set the tester to the ×1Ω Range, and read the tester.

★If the tester does not read 0 Ω, The lead is defective. Replace the lead or the wiring harness [B] if necessary.

- Remove the tank (see tank Removal in the Frame chapter).
- Disconnect the negative (-) cable [A].

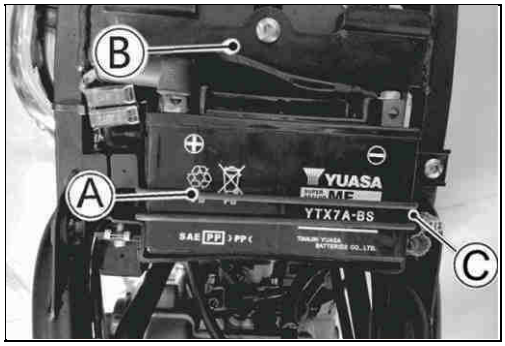
CAUTION
Be sure to disconnect the negative (-) cable first.

- Slide the cap [B].
- Disconnect the battery positive (+) cable [C].
- Remove:
  Bolts [D]
  Battery Holder [E]
  Battery

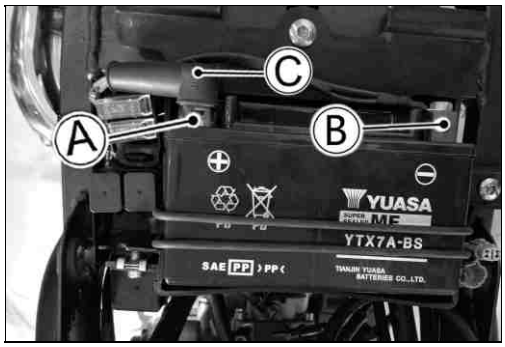


Battery Installation

- Check that the dampers [A] are properly on the air cleaner housing [B].
- Check that the guard tapes are properly on the battery Holder [C].



- Visually inspect the surface of the battery container.
  ★If any signs of cracking or electrolyte leakage from the sides of the battery.
- Put the battery onto the battery dampers.
- Connect the positive cable [A] to the (+) terminal first, and Then the negative cable [B] to the (-) terminal.
- Apply a little grease on the terminals to prevent corrosion.
- Cover the positive (+) terminal with the cap [C].
- Install the battery holder and tighten the bolts.
- Install:
  Battery Holder
  Bolts



Battery Activation

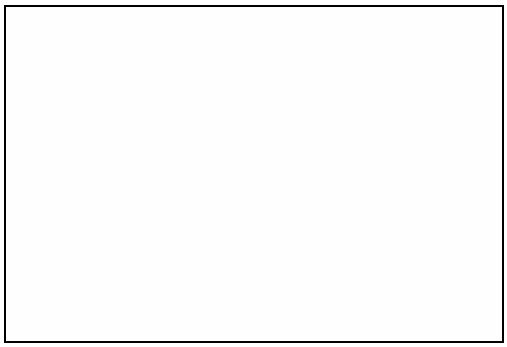
Electrolyte Filling

- Make sure that the model name [A] of the electrolyte con-Tainer matches the model name [B] of the battery. These names must be the same.

Battery Model Name:CB6L-B

CAUTION
Be sure to use the electrolyte container with the Same model name as the battery since the elec-Trolyte volume and specific gravity vary with the Battery type. This is to prevent overfilling of the Electrolyte, shorting the battery life, and deterioration of the battery performance.

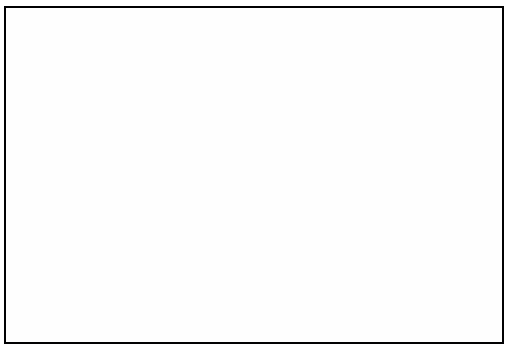
- Place the battery on a level surface.
- Check to see that the sealing sheet has no peeling, tears, or holes in it.
- Remove the sealing sheet.



NOTE

◦ The battery is vacuum sealed. If the sealing sheet has Leaked air into the battery, it may require a longer initial charge.

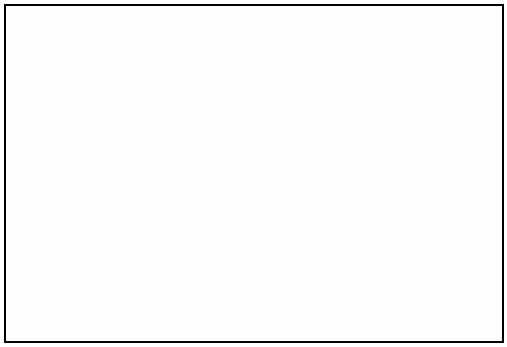
- Remove the electrolyte container from the vinyl bag.
- Detach the strip of caps [A] from the container and set aside, these will be used later to seal the battery.



NOTE

◦ Do not pierce or otherwise open the sealed cells [B] of The electrolyte container. Do not attempt to separate individual cells.

- Place the electrolyte container upside down with the six Sealed cells into the filler ports of the battery. Hold the Container level, push down to break the seals of all six Cells. You will see air bubbles rising into each cell as the ports fill.



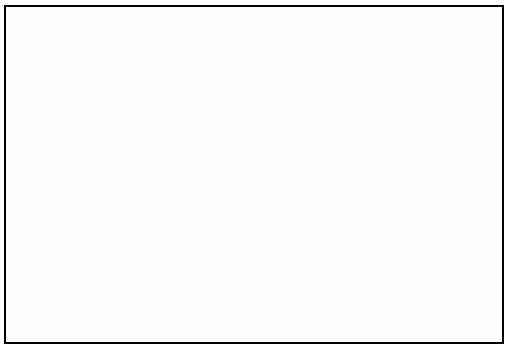
NOTE

◦ Do not tilt the electrolyte container.

- Check the electrolyte flow.

★If no air bubbles [A] are coming up from the filler ports, or If the container cells have not emptied completely, tap the container [B] a few times.

- Keep the container in place for 20 Minutes or more. Don`t Remove the container from the battery until it`s empty, the Battery requires all the electrolyte from the container for proper operation.



CAUTION
Removal of the container before it is completely Empty can shorten the service life of the battery. Do Not remove the electrolyte container until it is completely empty and 20 minutes have elapsed.

- Gently remove the container from the battery.
- Let the battery sit for 30 Minutes prior to charging to allow The electrolyte to permeate into the plates for optimum performance.

NOTE

◦ Charging the battery immediately after filling can Shorten service life. Let the battery sit for at least 30 minutes after filling.

Initial Charge

- Place the strip [A] of caps loosely over the filler ports.
- Newly activated sealed batteries require an initial charge.

Standard Charge 0.7 A × 5~10 hours

★If using a recommended battery charger, follow the Charger`s instructions for newly activated sealed battery.

AUTECO-recommended chargers:

Optimate III

Yuasa 1.5 Amp Automatic Charger

Battery Mate 150 - 9

★If the above chargers are not available, use equivalent one.

NOTE

◦ Charging rates will vary depending on how long the Battery has been stored, temperature, and the type of Charger used. Let battery sit 30 minutes after initial Charge, then check voltage using a voltmeter. If it is not at least 12.8 volts, repeat charging cycle.

- After charging is completed, press down firmly with both Hands to seat the strip of caps [A] into the battery (don`t Pound or hammer). When properly installed, the strip of the caps will be level with the top of the battery.

CAUTION

Once the strip of the caps [A] is installed onto the Battery, never remove the caps, nor add water or electrolyte to the battery.

NOTE

◦ To ensure maximum battery life and customer satisfac-Tion, it is recommended the battery be load tested at three times its amp-hour rating for 15 seconds. Re-check voltage and if less than 12.8 volts repeat the Charging cycle and load test. If still below 12.8 volts the battery is defective.

Precautions

1) No need of topping-up

No topping-up is necessary in this battery until it ends its life under normal use. F orcibly prying off the seal cap to add water is very dangerous. Never do that.

However

⚠ WARNING

Keep the battery away from sparks and open flames during charging, since the battery Gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger.
This procedure prevents sparks at the battery terminals which could ignite any battery gases.
No fire should be drawn near the battery, or no terminals should have the tightening loosened.
The electrolyte contains sulfuric acid. Be careful not to have it touch your skin or eyes. If touched, wash it off with liberal amount of water. Get medial attention if severe.

Interchange

A sealed battery can fully display its performance only when combined with a proper vehicle electric System. Therefore, replace a sealed battery only oN a motorcycle which was originally equipped with a sealed battery.

Be careful, if a sealed battery is installed on a motorcycle which had an ordinary battery as original equipment, the sealed battery`s life will be shortened.

Charging Condition Inspection

◦ Battery charging condition can be checked by measuring battery terminal voltage with a digital voltmeter [A].

- Remove the seat (see Seat Removal in the Frame chapter).
- Disconnect the battery terminals.

CAUTION

Be sure to disconnect the negative (-) cable first.

- Measure the battery terminal voltage.

NOTE

◦ Measure with a digital voltmeter which can be read one decimal place voltage.

- Remove the battery [A] (see Battery Removal).
- Do refresh charge by following method according to the battery terminal voltage.

⚠ WARNING

This battery is sealed type. Never remove seal cap [B] even at charging. Never add water. Charge with current and time as stated below.

Terminal Voltage: 11.5 less than 12.8 V
Standard Charge 0.7 A × 5~10 h (see following chart)
Quick Charge 3 A×1 h

CAUTION

If possible, do not quick charge. If quick charge is done unavoidably, do standard charge later on.

Terminal Voltage: less than 11.5 V
Charging Method: 0.7 A×20 h

NOTE

◦ Increase the charging voltage to a maximum voltage of 25 V if the battery will not accept current initially. Charge For no more than 5 minutes at the increased voltage then Check if the battery is drawing current. If the battery Will accept current decrease the voltage and charge by The standard charging method described on the battery Case. If the battery will not accept current after 5 minutes, replace the battery.

Battery [A]
Battery Charger [B]
Standard Value [C]
Current starts to flow [D].

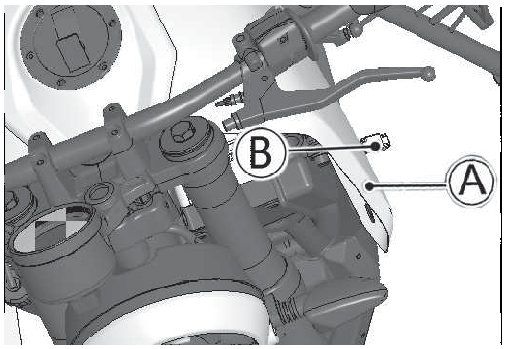
- Determine the battery condition after refresh charge.
  ◦ Determine the condition of the battery left for 30 minutes After completion of the charge by measuring the terminal voltage according to the table below.

Criteria	Judgement
12.8 V or higher	Good
12.0 - lower than 12.8 V	Charge insufficient → Recharge
lower than 12.0 V	Unserviceable → Replace

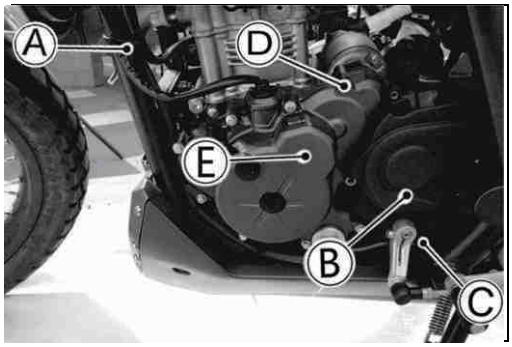
Charging System

Alternator Cover Removal

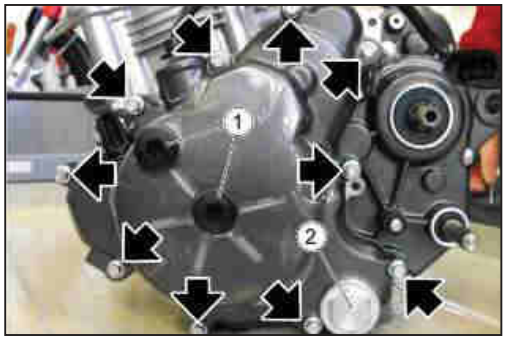
- Drain the engine oil (see Engine Oil Change in the Periodic Maintenance chapter).
- Remove:
  Seat (see Seat Removal in the Frame chapter)
  Shrouds (see Shroud Removal in the Frame chapter)
  Fuel Tank Bolt
- Move the fuel tank [A] right to be see the alternator lead connector [B].
- Disconnect the alternator lead connector.



- Remove:
  Clamp [A]
  Drive Chain Cover [B] (see Engine Sprocket Removal in the Final Drive chapter)
- Disconnect the neutral switch lead connector [C].
- Remove:
  Torque Limiter Cover Bolts [D]
  Torque Limiter Cover [E]



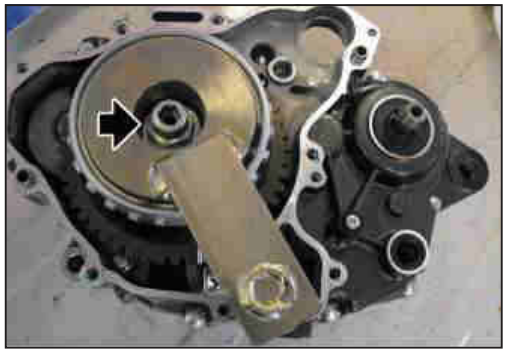
- Unscrew and remove the two adjustment plugs (1).
- Unscrew and remove the engine oil pre-filter plug (2).
- Remove the engine oil pre-filter.
- Undo and remove the ten screws fixing the flywheel cover.
- Remove the flywheel cover.



Remove the starter motor gear.

- Fit the specific tool.
- Undo and remove the hex socket screw.

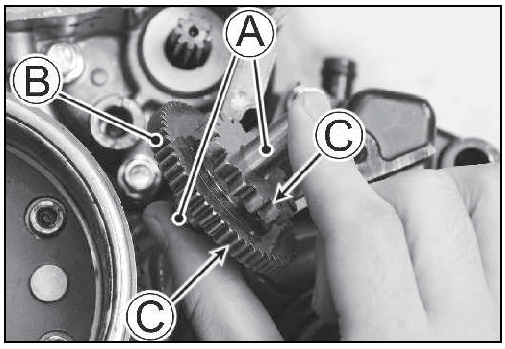
Specific tooling **865259 Flywheel retainer**



- Install:
  Alternator Cover
  Alternator Cover Mounting Bolts
- Tighten:

Torque - Alternator Cover Bolts:8-16 N• m
(8.0-1.6 kgf •m, 5.9-11.8 In•lb)

- Apply a thin coat of molybdenum disulfide oil to the shafts [A] of the torque limiter [B].
- Install:
  Torque Limiter and Washers [C]
  Torque Limiter



NOTE

◦ If the torque limiter is difficult to install when the starter Motor is installed, remove the center cap on the alter-Nator cover and turn the crankshaft little to engage the gears.

- Install:
  New Gasket
  Torque Limiter Cover
  Torque Limiter Cover Bolts
- Tighten:

Torque - Torque Limiter Cover Bolts:8-16 N•m
(8.0-1.6 kgf •m, 5.9-11.8 In•lb)

- Connect:
  Alternator Lead and Neutral Switch Lead Connectors (See Cable, Wire, and Hose Routing in the Appendix chapter)
- Install:
  Drive Chain Cover (see Engine Sprocket Installation in the Final Drive chapter)
- Install the other removed parts (see appropriate chapters).

Charging System

- Retrieve the washer.

- Fit the tool and pull out the rotor.

  Specific tooling

  864868 Flywheel extractor

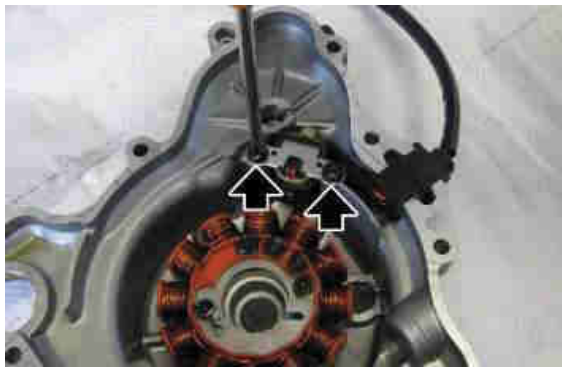
- Remove the rotor.

- Remove the key.

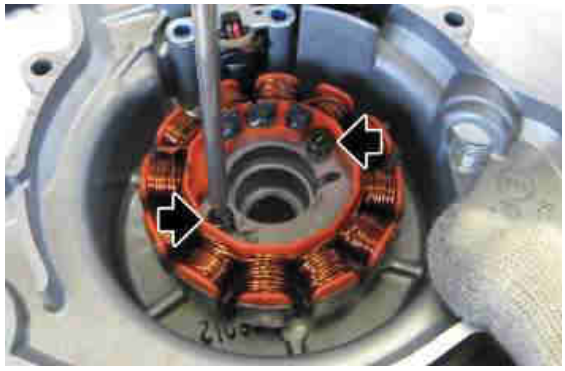
Charging System

Removing the stator

- Remove the two screws fastening the plate securing the stator cable



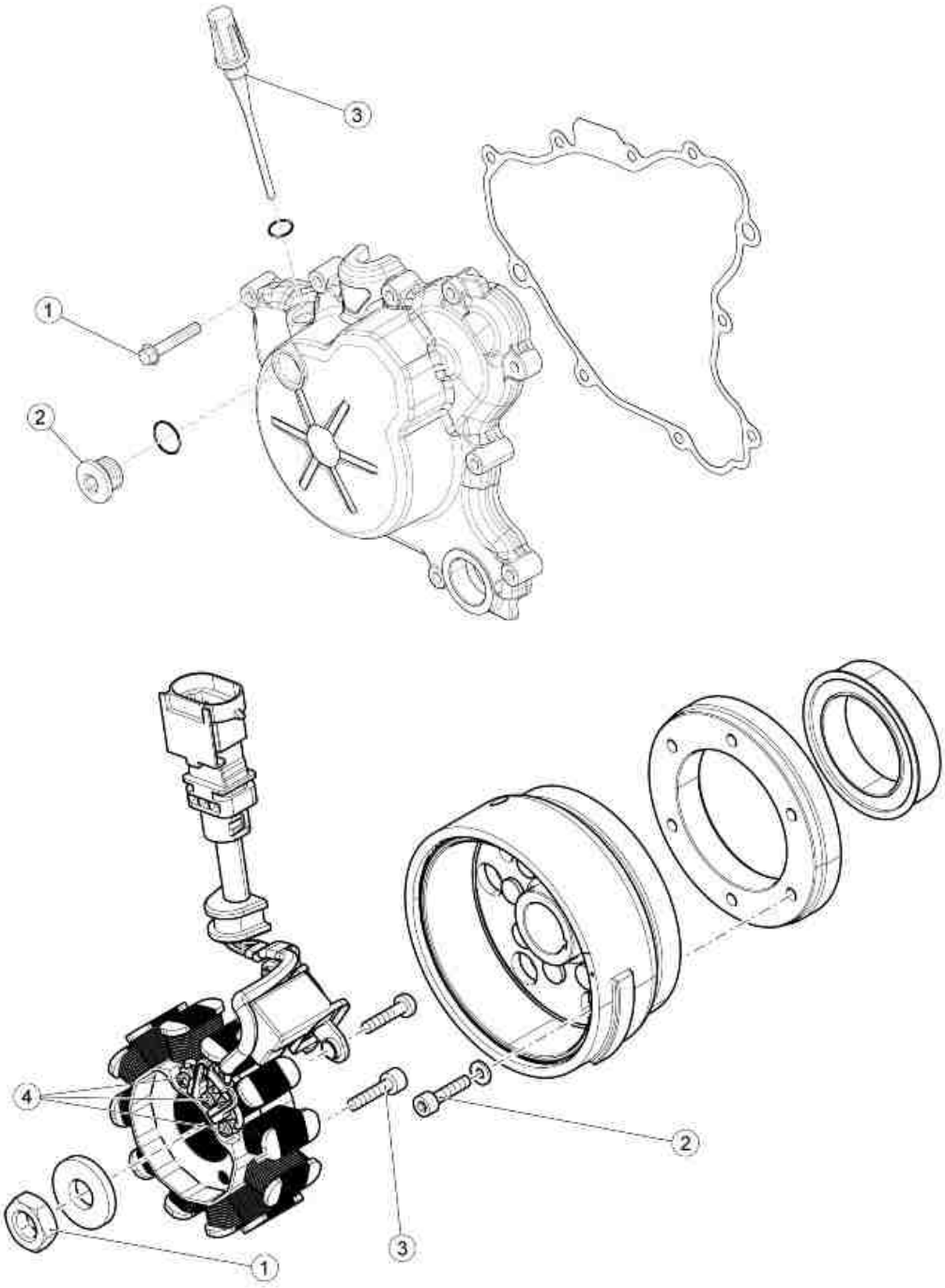
- Remove the two screws fastening the stator



- Remove the stator.

Charging System

Exploded View

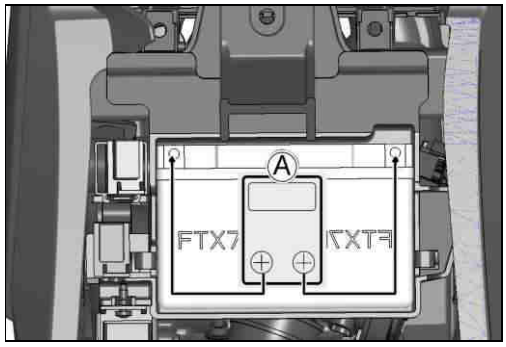


Charging System

Charging Voltage Inspection

- Remove the seat (see Seat Removal in the Frame chapter).
- Check the battery condition (see Charging Condition Inspection).
- Warm up the engine to obtain actual alternator operating conditions.
- Connect the hand tester [A] as shown in the table.

Special Tool - Hand Tester: 57001-1394



Charging Voltage

Tester Range	Connections		Reading
	Tester (+) to	Tester (−) To	
25 V DC	Battery (+) Terminal	Battery (-) Terminal	14.4± 0.5 V

- Start the engine, and note the voltage readings at various Engine speeds. The readings should show nearly battery Voltage when the engine speeds is low, and, as the engine Speed rises, the readings should also rise. But they must be kept under the specified voltage.
- Stop the engine and disconnect the hand tester.

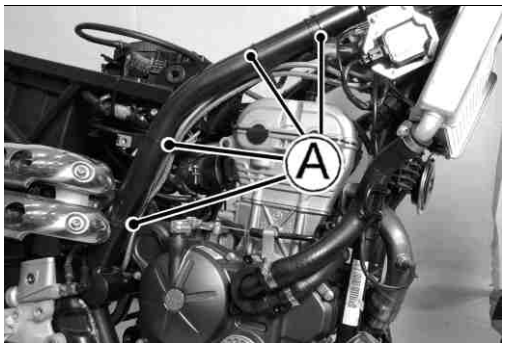
★If the charging voltage is kept between the values given in The table, the charging system is considered to be working normally.

★If the charging voltage is much higher than the values Specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.

★If the charging voltage does not rise as the engine speed Increases, the regulator/rectifier is defective or the alter-Nator output is insufficient for the loads. Check the al-Ternator and regulator/rectifier to determine which part is defective.

Charging System

◦ Remove:
Clamp [A]



- To check the stator coil resistance as follows.
◦ Stop the engine.
◦ Disconnect the alternator lead connector [A].
◦ Connect the hand tester as shown in the table 2.
◦ Note the readings.

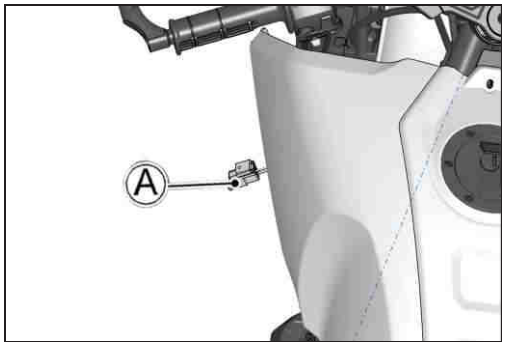


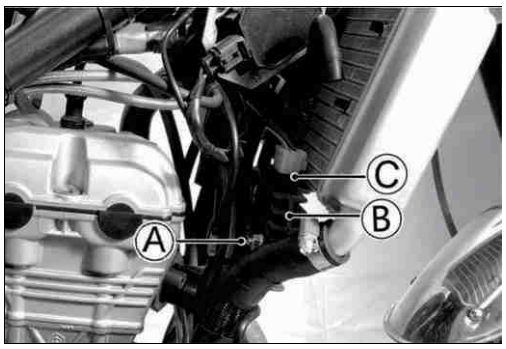
Table 2, Stator Coil Resistance **at 20℃ (68˚F)**

Tester Range	Connections		Reading
	Tester (+) to	Tester (to	
×1Ω	W lead	BK/R lead	0.5 ~ 0.9Ω
	Y lead	BK/R lead	0.4 ~ 0.7Ω

★If there is more resistance than shown in the table, or no Hand tester reading (∞) The stator has an open lead and Must be replaced. Much less than this resistance means the stator is shorted, and must be replaced.

★If the stator coils have normal resistance, but the voltage Check showed the alternator to be defective; then the rotor Have probably weakened, and the rotor must be replaced.

- Remove:
  Left Shroud (see Shroud Removal in the Frame chapter)
  Left Shroud Bracket (see Alternator Inspection)
  Regulator/Rectifier Bolt [A]
  Regulator/Rectifier [B]
- Move the rubber cover [C] and disconnect the connector.



- With the AUTECO hand tester, measure the internal resistance in both directions between the terminals.

  Special Tool - Hand Tester: 57001-1394

★If the reading is not the specified value, replace the regulator/rectifier.

Internal Resistance at 20℃ (68℉). Unit: KΩ

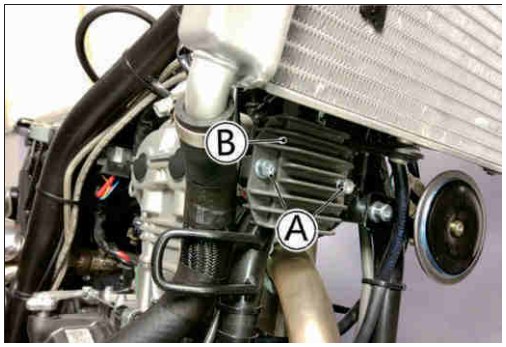
		Tester (+) Lead			
	Terminal	C	L	B	E
(-)*	C	-	∞	2.5 ~ 26	∞
	L	∞	-	∞	4.7 ~ 48
	B	∞	∞	-	∞
	E	∞	4.7 ~ 48	∞	M

(-)*: Tester ( ) Lead

CAUTION

Use only Hand Tester 57001-1394 for this test. An Ohmmeter other than the Hand Tester may show Different readings. If a megger or a meter with a Large-capacity battery is used, the regulator will be damaged.

- Connect the regulator/rectifier lead connector and install the rubber cover over the connector.
- Fix the rectifier [B] on the frame by using bolt [A]



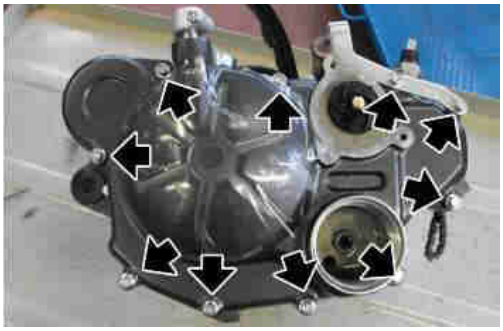
- Tighten:

  Torque - Regulator/Rectifier Bolt: 8.8 N•m (0.90 kgf•m, 78 in•lb)

Starter Motor Clutch

Removing the clutch cover

- Undo and remove the ten screws of the clutch cover.



- Remove the clutch cover.

- Remove the gasket (1) and retrieve the locating dowels (2).

Ignition System

WARNING

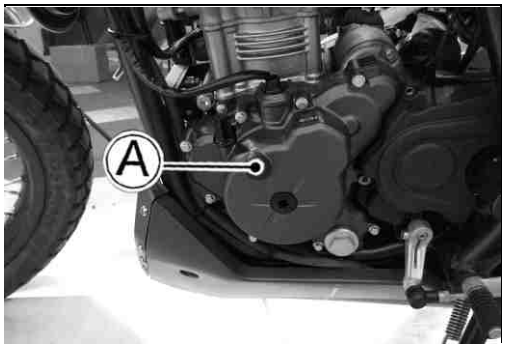
The ignition system produces extremely high volt-Age. Do not touch the spark plug, ignition coil or High-tension cable while the engine is running, or you could receive a severe electrical shock.

CAUTION

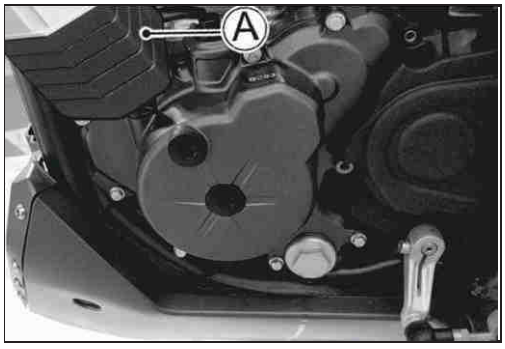
Do not disconnect the battery cables or any other Electrical connections when the ignition switch is On, or while the engine is running. This is to prevent igniter damage.
Do not install the battery backwards. The negative Side is grounded. This is to prevent damage to the diodes and igniter.
Use the standard regulator/rectifier, or the igniter will be damaged.

Ignition Timing Inspection

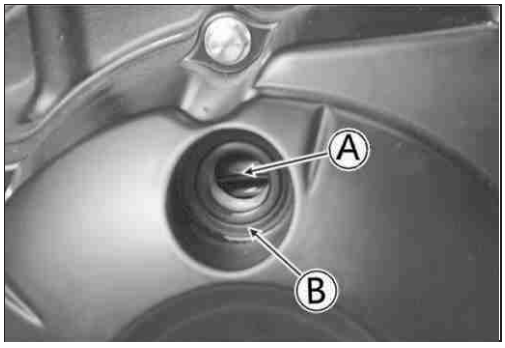
- Remove:
  Left Shroud (see Shroud Removal in the Frame chapter)
  Timing Inspection Cap [A]



- Attach the timing light [A] to the ignition coil lead in the manner prescribed by the manufacturer.
  Special Tool - Timing Light: 57001-1241



- Start the engine and aim the timing light at the ignition timing mark [A] on the rotor.
- Run the engine at the speeds specified and note the alignment of the ignition timing mark.
  - Check the engine speed, using the engine revolution tester for high accuracy.



Ignition Timing

Engine speed [r/min (rpm)]	Projection [B] in hole aligns with:
1 400	F mark on alternator rotor

★If the ignition timing is incorrect, check the crankshaft sensor (see Crankshaft Sensor Inspection).
★If the crankshaft sensor are normal, replace the igniter.

- Tighten the timing inspection cap.
  Torque - Timing Inspection Cap: 2.5 N• m (0.25 kgf •m, 22 In•lb)

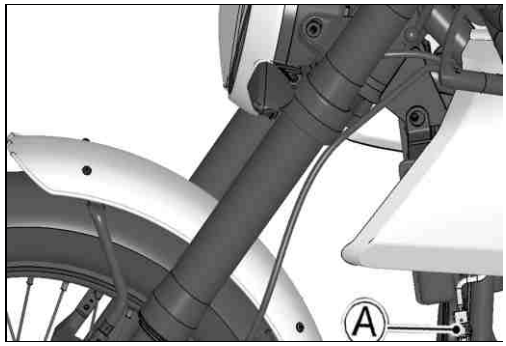
- Refer to the Stator Removal.

Crankshaft Sensor Installation

- Refer to the Stator Installation.

Crankshaft Sensor Inspection

- Remove:
  Left Shroud (see Shroud Removal in the Frame chapter)
- Disconnect the alternator lead connector [A] (see Alternator Inspection).



- Set the hand tester [A] to the×10 Ω Range and connect It to the BL/Y lead [B] in the alternator lead connector [C] and ground.

  Special Tool - Hand Tester: 57001-1394

  Crankshaft Sensor Resistance
  Standard: 91~137Ω At 20℃ (686℉)

★If there is more resistance than the specified value, the Coil has an open lead and must be replaced. Much less Than this resistance means the coil is shorted, and must be replaced.

Crankshaft Sensor Peak Voltage Inspection

NOTE

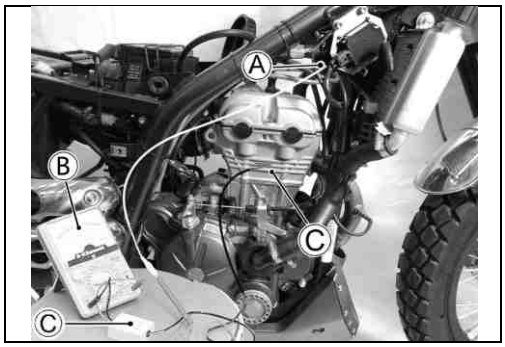
- Be sure the battery is fully charged.
- Using the peak voltage adapter is more reliable way to Determine the condition of the crankshaft sensor than Crankshaft sensor internal resistance measurements.

- Set the gear position in the neutral position.

- alternator connector
tor Inspection).
- Set the hand tester [B] to the DC 10 V range, and connect it to the peak voltage adapter [C].

Special Tools - Hand Tester: 57001-1394
Peak Voltage Adapter: 57001-1415
Type: KEK-54-9-B

Hand Tester Range: DC 10 V



- Connect the adapter to the terminal of the alternator lead connector and ground.

Connections:

Alternator Lead Connector		Peak Voltage Adapter		Handtester
BL/Y Lead [D]	←	R Lead	→	(+)
Ground [E]	←	BK Lead	→	(-)

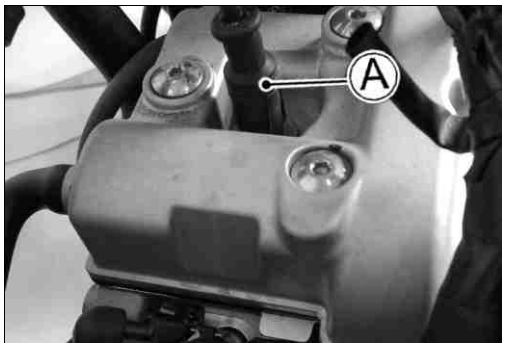
- Turn the engine stop switch to run position.
- Turn the ignition switch to ON.
- Pull in the clutch lever and hold it.
- Pushing the starter button, turn the engine 4 ~ 5 seconds to measure the peak voltage.
- Repeat the measurements 5 times.

Crankshaft Sensor Peak Voltage
Standard: 5 V or more

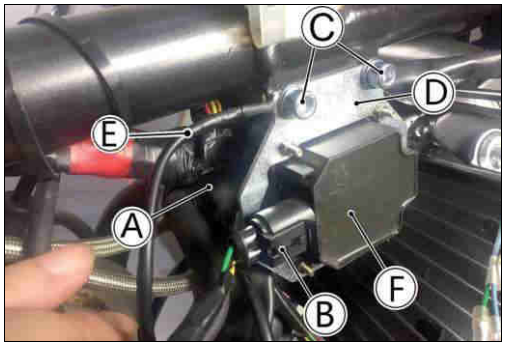
★If the reading is less than the standard, inspect the crankshaft sensor (see Crankshaft Sensor Inspection).

Ignition Coil Removal

- Remove:
Right Shroud (see Right Shroud Removal in the frame chapter)
Spark Plug Cap [A]



- Remove:
Clamp [A]
Primary Lead Connector [B]
Ignition Coil Mounting Bolts [C] and Collars
Clamp [D]
Frame Ground Lead [E]
Ignition Coil [F]



- Installation is basically the reverse of removal and refer to The Cable, Wire and Hose Routing in the Appendix chapter.
- Install:
  Ignition Coil
  Frame Ground Lead
  Clamps
  Ignition Coil Mounting Bolts and Collars
- Tighten:

  Torque - Ignition Coil Mounting Bolts: 2.9 N•m (0.30 kgf•m, 26 in•lb)
- Install the spark plug cap securely.
  - Be sure the spark plug cap is installed by pulling up it lightly.

Ignition Coil Inspection

Measuring Arcing Distance

The most accurate test for determining the condition of the Ignition coil is made by measuring arcing distance using a Suitable commercially available Coil tester for the 3-needle method.

- Remove the ignition coil (see Ignition Coil Removal).
- Connect the ignition coil [A] (with the spark plug cap left Installed on the high-tension cable) to the tester [B], and measure the arcing distance.

⚠ WARNING

To avoid extremely high voltage shocks, do not touch the coil or cable.

3 Needle Arcing Distance
Standard: 7 mm (0.26 in.) or more

★If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.

- To determine which part is defective, measure the arcing Distance again with the spark plug cap removed from the high-tension cable.

★If the arcing distance is subnormal as before, the trouble Is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.

- Remove the ignition coil (see Ignition Coil Removal).
- Measure the primary winding resistance [A].
  - Connect an ohmmeter between the coil terminals.
  - Set the meter to the ×1Ω range, and read the meter.
- Measure the secondary winding resistance [B].
  - Unscrew the spark plug cap off the lead.
  - Connect an ohmmeter between the high tension lead and the ground lead terminal.
  - Set the meter to the ×1KΩ Range, and read the meter.

Ignition Coil Winding Resistance
Primary windings: 0.31 - 0.37Ω At 20℃ (68°F)
Secondary windings: 7.0 - 8.6 kΩ At 20℃ (686°F)

★If the meter does not read as specified, replace the coil.
★If the meter reads as specified, the ignition coil windings Are probably good. However, if the ignition system still Does not perform as it should after all other components Have been checked, test replace the coil with one known to be good.

- Check the high-tension cable for visible damage.

★If the high-tension cable is damaged, replace the coil.

Ignition Coil Primary Peak Voltage Inspection

NOTE

- Be sure the battery is fully charged.

- Remove:
  Right Shroud (see Shroud Removal in the Frame chapter)
- Remove the spark plug cap but do not remove the spark plug.
- Install a spark plug into the spark plug cap.

- Connect the peak voltage adapter [A] to the hand tester [B].

  Special Tools - Hand Tester: 57001-1394
  Peak Voltage Adapter: 57001-1415
  Type: KEK-54-9-B

  Hand Tester Range: DC 250 V

- Insert the needle adapter [C] into the ignition coil primary lead connector [D].

  Special Tool - Needle Adapter Set: 57001-1457

- Connect the peak voltage adapter to the needle adapter and the ground [E].

  Connections:

		Peak Voltage Adapter		Handtester
Ignition Coil Primary Lead Connector	←	**R Lead**	→	**(+)**
Ground	←	**BK Lead**	→	**(-)**

Ignition Coil [F]
Igniter [G]

⚠ WARNING

To avoid extremely high voltage shocks, do not touch the spark plug or tester connections.

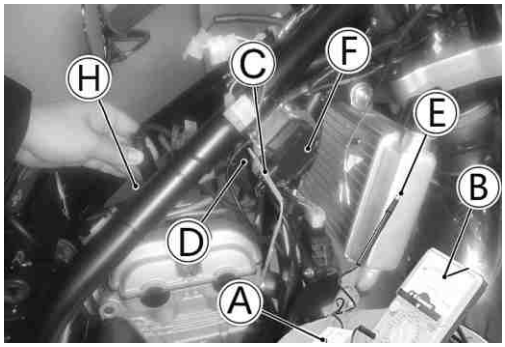
- Push the engine stop switch to run position.
- Turn the ignition switch to ON.
- Ground the spark plug [H] onto the engine.
- Pushing the starter button, turn the engine 4~5 seconds With the transmission in neutral to measure the primary peak voltage.
- Repeat the measurements 5 times.

Ignition Coil Primary Peak Voltage
Standard: 130 V or more

★If the reading is less than the specified value, check the following:
Ignition Coils (see Ignition Coil Inspection)
Crankshaft Sensor (see Crankshaft Sensor Inspection)

★If the ignition coils and crankshaft sensor are normal, Check the other parts (see the Ignition System Troubleshooting in this section).

★If the all parts are good, replace the igniter.



Spark Plug Removal

- Refer to the Spark Plug Replacement in the Periodic Maintenance chapter.

Spark Plug Installation

- Refer to the Spark Plug Replacement in the Periodic Maintenance chapter.

- Clean the spark plug, preferably in a sandblasting device, And then clean off any abrasive particles. The plug may Also be cleaned using a high-fl Ash point solvent and a wire brush or other tool.

★If the spark plug center electrode [A] and/or side elec-Trode [B] are corroded or damaged, or if the insulator [C] is cracked, replace the plug.

◦ Use the standard spark plug or its equivalent.

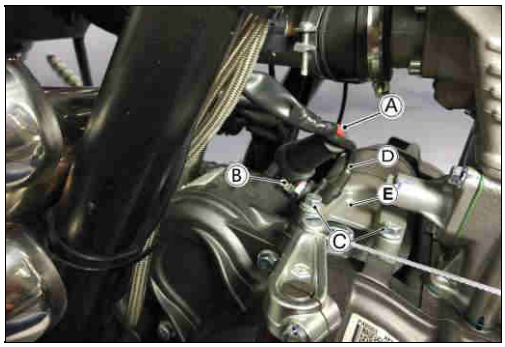
Spark Plug: NGK

- Measure the gap [D] with a wire-type thickness gauge.

★If the gap is incorrect, carefully bend the side electrode with a tool to obtain the correct gap.

Spark Plug Gap: 0.6~0.7 mm (0.024~0.028 in.)

- Take out the hoses [A] from the clamp.
- Remove:
  Exhaust Pipe (see Muffler Removal in the Engine Top End chapter)
  Starter Motor Terminal Nut [B]
  Starter Motor Mounting Bolts [C]
  Engine Ground Cable [D]
  Clamp
- Pull out the starter motor [E] to right side.

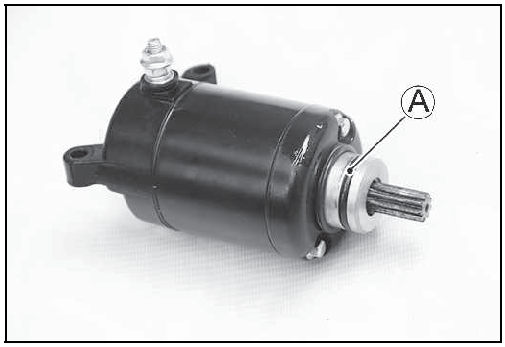


Starter Motor Installation

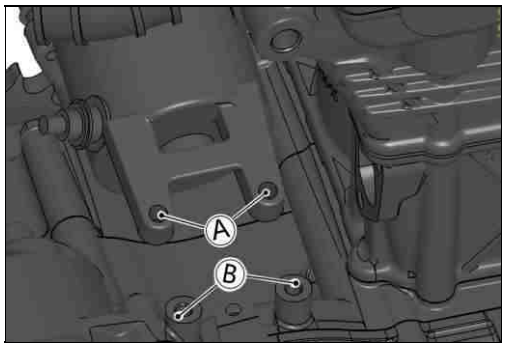
CAUTION

Do not tap the starter motor shaft or body. Tapping the shaft or body could damage the motor.

- Replace the O-ring [A] with a new one.
- Apply grease to the O-ring



- Clean the starter motor legs [A] and crankcase bosses [B] where the starter motor is grounded.



- Install the following parts as shown in the figure.
  Clamp [A]
  Engine Ground Cable [B]
- Tighten:

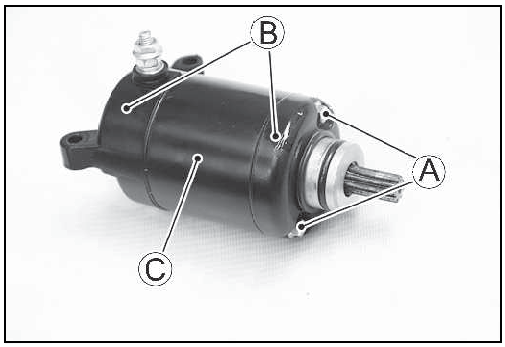
Torque - Starter Motor Mounting Bolts [C]: 6.9 N• m (0.70 Kgf•m, 61 in•lb)

- Position the starter motor cable [A] as shown in the figure.
  About 45° [B]
- Tighten:

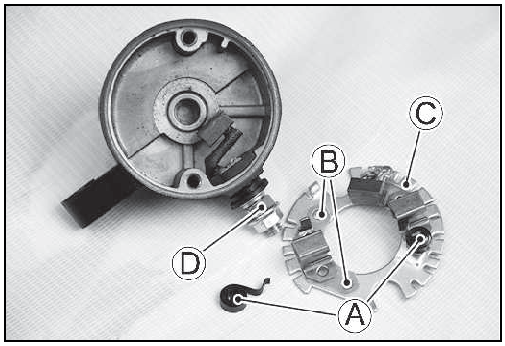
Torque - Starter Motor Terminal Nut [C]: 5.2 N• m (0.53 Kgf•m, 46 in•lb)

- Install the removed parts (see appropriate chapters).

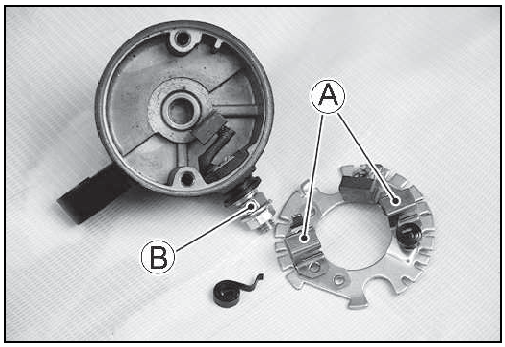
- Remove the starter motor (see Starter Motor Removal).
- Remove:
  Starter Motor Through Bolts [A]
  Both End Covers [B]
- Pull the armature out of the yoke [C].



- Remove:
  Springs [A]
  Screws [B] and Washer
  Brush Plate [C]
  Starter Motor Terminal Locknut [D], Washer and Collars

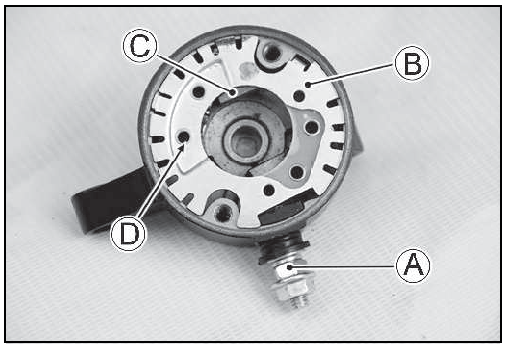


- Remove:
  Plates [A]
  Starter Motor Terminal [B]



Starter Motor Assembly

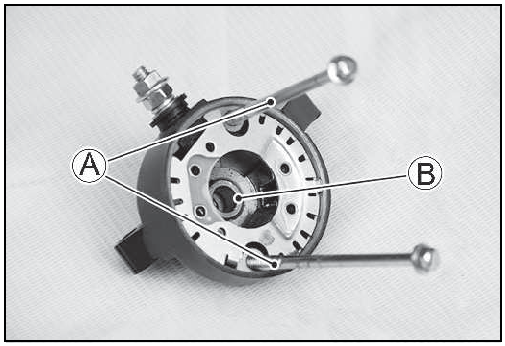
- Install:
  Plates
  Starter Motor Terminal [A]
  Brush Plate [B]
  Negative Brush [C] and Screw
  Screw [D] and Washer



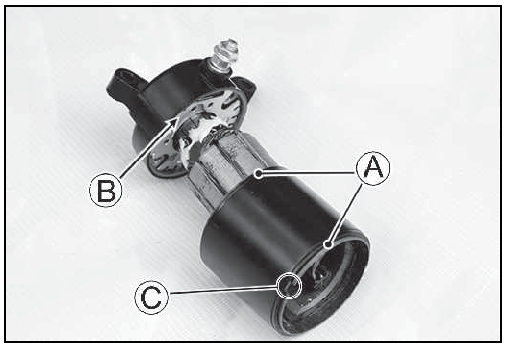
- Replace the O-ring [A] with a new one.
- Install the following parts to the starter motor terminal [B].
  O-ring
  Insulator Collars [C]
  Insulator Washer [D]
  Washer [E]
  Starter Motor Terminal Locknut [F]
- Tighten:

Torque - Starter Motor Terminal Locknut:6-8 N• m
(0.6-0.8 Kgf•m,4.4-5.9ft•ib)

- Press the springs and holding the brush leads with suitable clips [A] as shown in the figure.
- Install the washers [B].
- Insert the armature in the end cover.



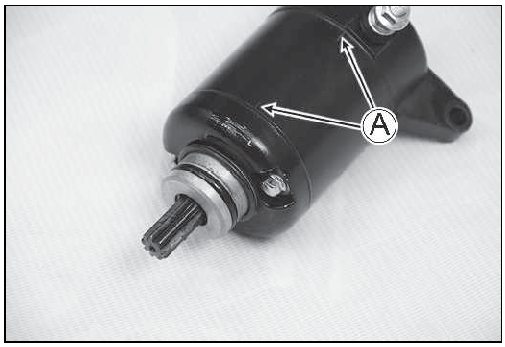
- Replace the O-rings [A] with new ones.
- Align the stopper [B] in the hollow [C] of the yoke.



- Replace the O-ring [A] with a new one.
- Apply a thin coat of high-temperature grease to the oil seal and the needle bearing in the end cover [B].
- Fit the toothed washer [C] into the end cover.
  Thin Washer [D]
  Thick Washer [E]

- Align the marks [A] of the yoke with the marks of the end covers.
- Install the new O-rings to the starter motor through bolts.
- Tighten:

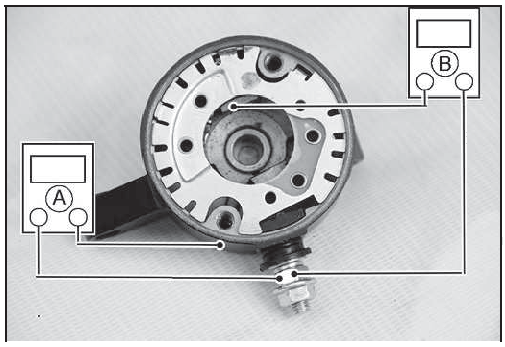
Torque - Starter Motor Through Bolts:5-6 N•m
(0.5-0.6 kgf•m, 3.7-4.4in•lb)



- Using the highest hand tester range, measure the resistance as shown.
  Terminal Bolt and End Cover [A]
  Terminal Bolt and Negative Brush [B]

  Special Tool - Hand Tester: 57001-1394

★If there is any reading, the brush holder assembly and/or Terminal bolt assembly have a short. Replace the brush holder assembly and the terminal bolt assembly.



- Connect the hand tester [A] and 12 V battery [B] to the starter relay [C] as shown in the figure.

  Special Tool - Hand Tester: 57001-1394

★If the relay does not work as specified, the relay is defective. Replace the relay.

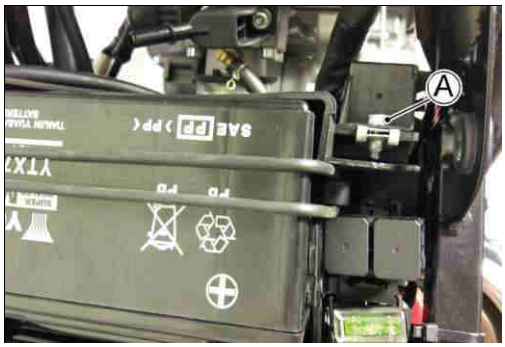
Starter Relay Inspection

Tester range: ×1Ω

Standard: **When battery is connected** →0Ω

When battery is disconnected → ∞ Ω

- Remove the starter circuit relay [A] from the bracket.



- Connect the hand tester [A] and a 12 V battery [B] to the relay [C] as shown in the figure.

  Special Tool - Hand Tester: 57001-1394

★If the relay does not work as specified, the relay is defective. Replace the relay.

Starter Circuit Relay Inspection

Tester range: ×1Ω

Standard: **When battery is connected** →0Ω

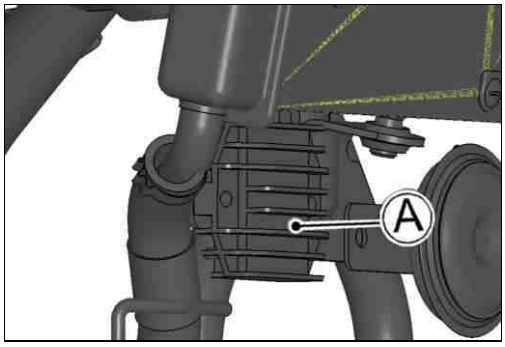
When battery is disconnected → ∞ Ω

Relay Coil Terminals: [1] and [2]

Relay Switch Terminals: [3] and [5]

Rectifire Inspection

- Remove:
  Seat (see Seat Removal in the Frame chapter)
  Rectifier [A]



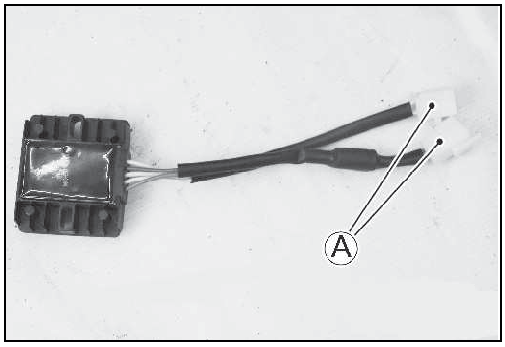
- Check conductivity of the terminals [A] in the rectifier.

  Special Tool - Hand Tester: 57001-1394

★The resistance should be low in one direction and more Than ten times as much in the other direction. If the rectifier shows low or high in both directions, the rectifier is defective and the rectifier must be replaced.

NOTE

◦ The actual meter reading varies with the meter or tester Used and the individual diode, but generally speaking, The lower reading should be from zero to one half the scale.



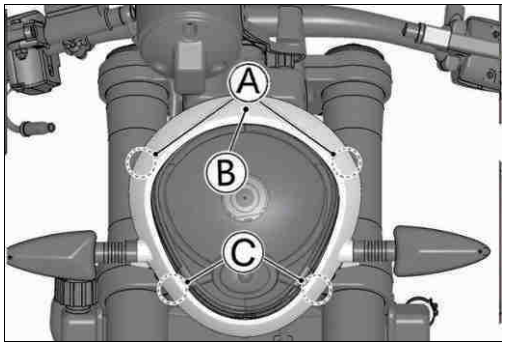
Lighting System

Headlight Beam Horizontal Adjustment

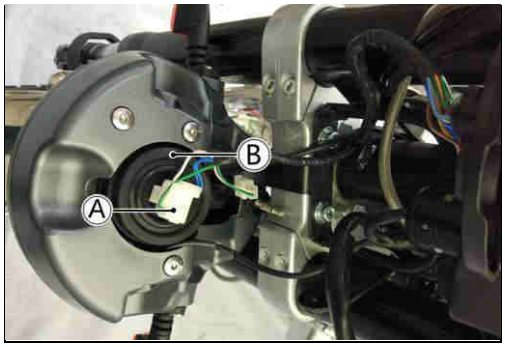
- Refer to the Headlight Aiming Inspection in the Periodic Maintenance chapter.

Headlight Unit Removal

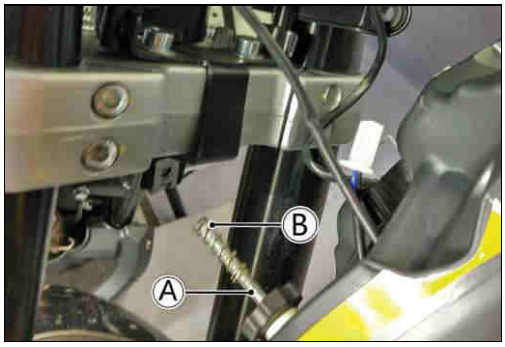
- Remove:
  Bolts [A]
- Pull up the headlight assembly [B] to remove it from the stoppers [C].



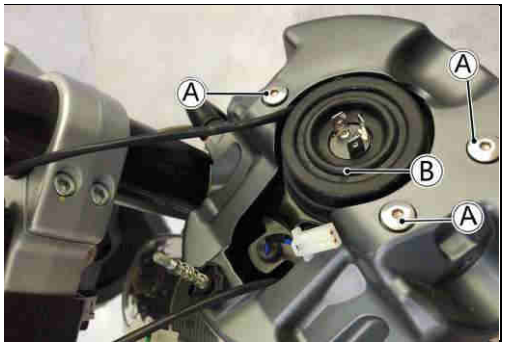
- Disconnect:
  Headlight Lead Connector [A]
- Remove:
  Headlight Assembly [B]



- Remove:
  Horizontal Adjuster Screw [A]
  Spring [B]



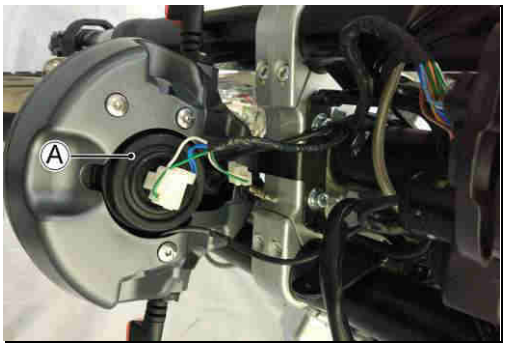
- Remove:
  Screws [A]
- Remove the headlight unit [B] from the headlight cover.



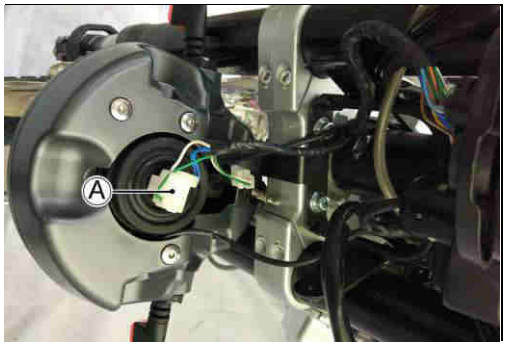
Lighting System

Headlight Bulb Replacement

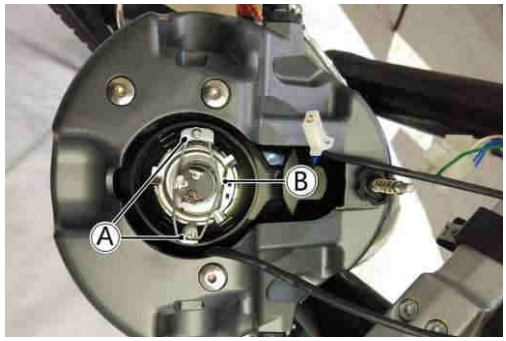
- Remove:
  Headlight Assembly (see Headlight Unit Removal)
  Headlight Bulb Dust Cover [A]



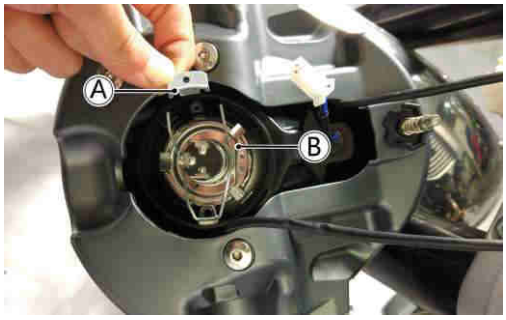
- Disconnect:
  Headlight Connector [A]



- Unscrew screw [A]
  Headlight bulb assembly [B]

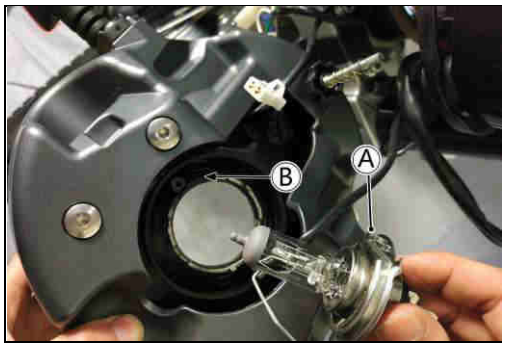


- Remove headlight clip [A]
  Headlight bulb assembly [B]



Lighting System

- Replace the headlight bulb with a new one.
- Fit the projections [A] of the bulb in the hollow [B] of the headlight.



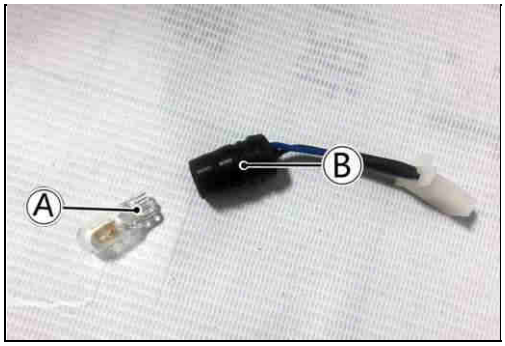
City Light Bulb Replacement (ID Model)

- Remove:
  Headlight Assembly (see Headlight Unit Removal)
- Pull out the socket [A] with the bulb.

- Pull the bulb [A] straight out of the socket [B].

CAUTION

Do not turn the bulb. Pull the bulb out to prevent damage to the bulb.
Do not use bulb rated for greater wattage than the specified value.



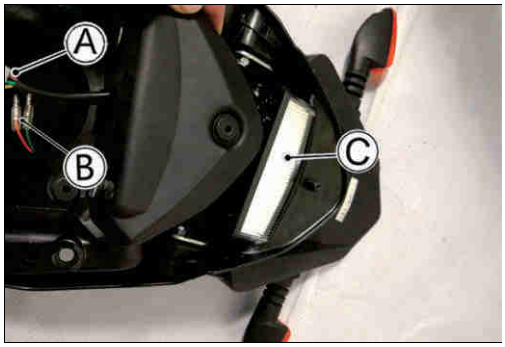
- Replace the bulb with a new one.
- Insert the bulb straight in the socket.
- Install the socket in the headlight firmly.
- Install the headlight assembly (see Headlight Unit Installation).

Lighting System

Tail/Brake Light Removal

- Remove:
  Bolts [A]

- Disconnect the tail/brake light lead connector [A].
- Remove:
  Joint[B]
  Tail/Brake Light [C]

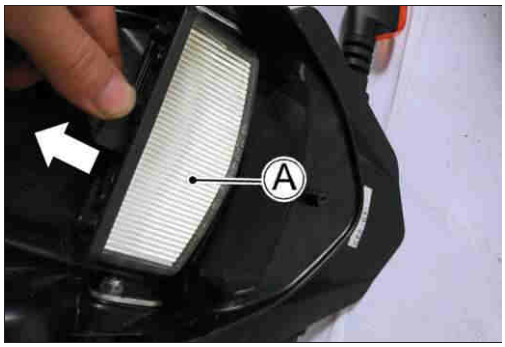


Tail/Brake Light Installation

- Installation is basically the reverse of removal.
- Remove the screws and remove the cover
  the stud [A] is facing the hole [B]
- Run the harness and leads correctly (see Cable, Wire, and Hose Routing section in the Appendix chapter).

Tail/Brake Light Bulb Replacement

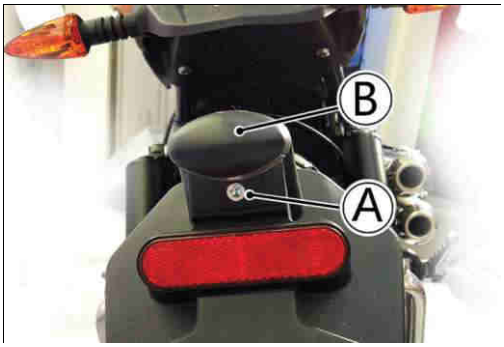
- Remove:
  Remove rear light [A] as shown in the figure



- Replace the bulb with a new one.

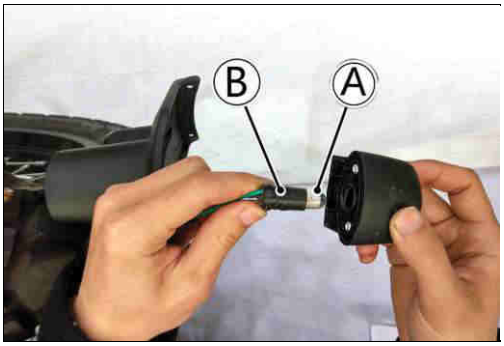
Lighting System

License Plate Light Bulb Replacement



- Remove:
  Screws [A]
  License Plate Light Cover [B]

- Pull the bulb [A] straight out of the socket [B].



CAUTION

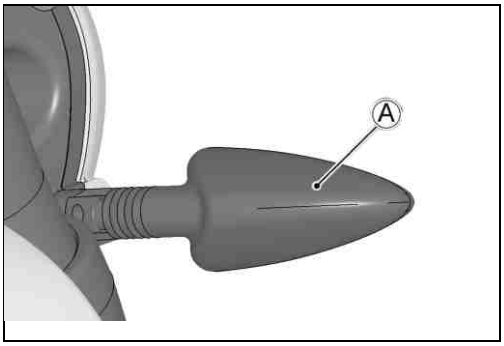
Do not turn the bulb. Pull the bulb out to prevent damage to the bulb.
Do not use bulb rated for greater wattage than the specified value.

- Replace the bulb with a new one.
- Insert the bulb straight in the socket.
- Install the license plate light cover.
- Tighten the screws.

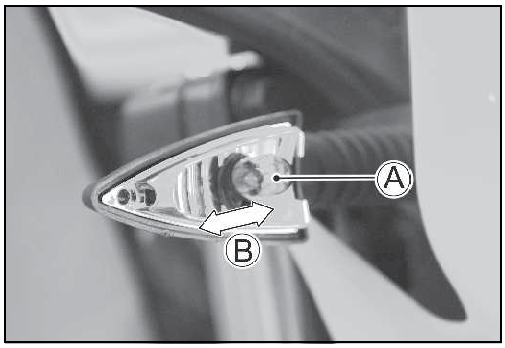
Lighting System

Turn Signal Light Bulb Replacement

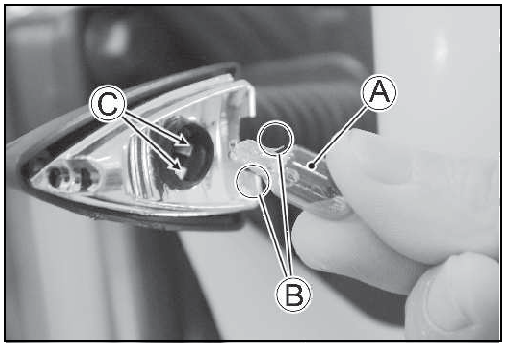
- Remove:
  Turn Signal Light Lens [A]



- Push and turn the bulb [A] counterclockwise [B], and remove it.
- Replace the bulb with a new one.



- Insert the new bulb [A] by aligning its pins [B] with the Grooves [C] in the socket, and turn the bulb clockwise.

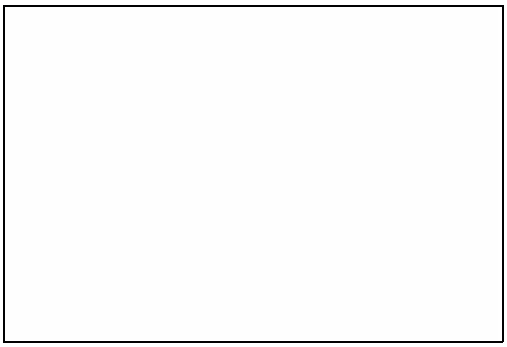


- Install the turn signal light lens so that the mark [A] align with drain hole [B].

Turn Signal Relay Inspection

CAUTION
Never drop the turn signal relay, especially on a hard surface. **Such a shock to the relay can damage it.**

- Connect 12 V battery and turn signal lights as indicated In the figure, and count how many times the lights flash for one minute.
  Turn Signal Relay [A]
  Turn Signal Lights [B]
  12 V Battery [C]



Testing Turn Signal Relay

Load		Flashing times (c/m)*
The Number of Turn Signal Light	Wattage (W)	
1**	10	140~ 250
2	20	75~ 95

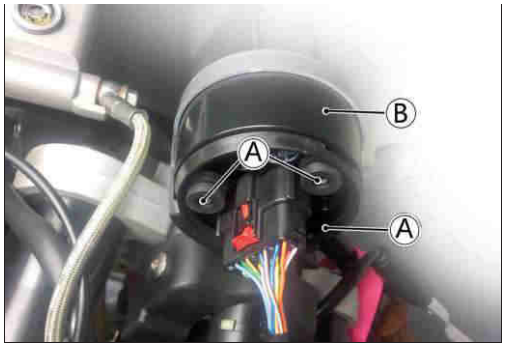
(*): Cycle(s) per minute
(**): Corrected to" one light burned out"

★If the lights do not flash as specified, replace the turn signal relay.

Meter Unit

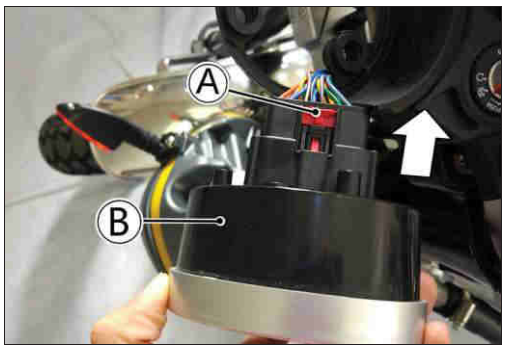
Meter Unit Removal

- Remove:
  Headlight Assembly (see Headlight Unit Removal)
  Meter Unit Mounting Bolts [A],
  Meter Unit [B]

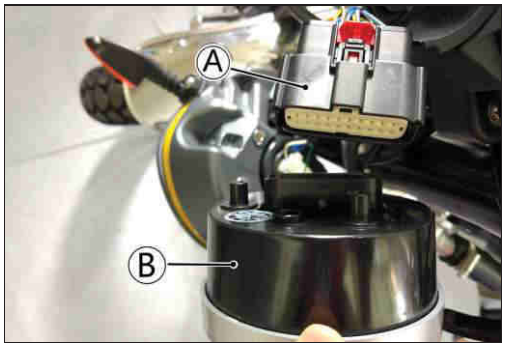


Meter Unit Light Bulb Replacement

- Remove:
  Meter Unit (see Meter Unit Removal)
- Toggle clip [A] remove instrument unit [B]



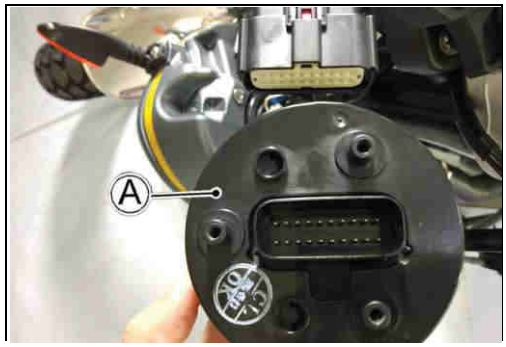
- Meter connector [A]
- Instrument unit [B]



- Remove instrument unit [A] as shown in Figure

Meter Unit

- Remove instrument unit [A] as shown in Figure



Switches and Sensors

Rear Brake Light Switch Adjustment

- Refer to the Brake Light Switch Operation Inspection in the Periodic Maintenance chapter.

Switch Inspection

- Using the hand tester, check to see that only the connections shown in the table have continuity (about zero ohms).

  Special Tool - Hand Tester: 57001-1394

  ◦ For the handlebar switch housings and the ignition switch, refer to the tables in the Wiring Diagram.

★If the switch has an open or short, repair it or replace it with a new one.

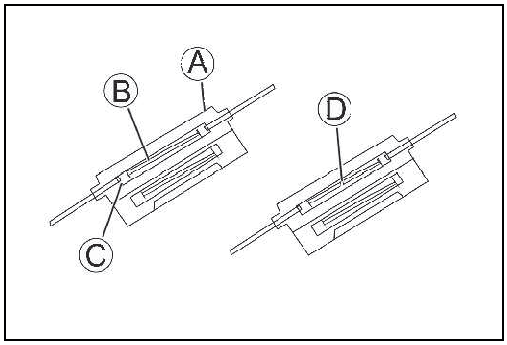
Rear Brake Light Switch Connection

Neutral Switch Connection

- Remove the fuse (see Main Fuse 15 A Removal) and inspect the fuse element.

★If the fuse element is blown, replace the fuse.

Housing [A]
Fuse Element [B]
Terminal [C]
Blown Element [D]



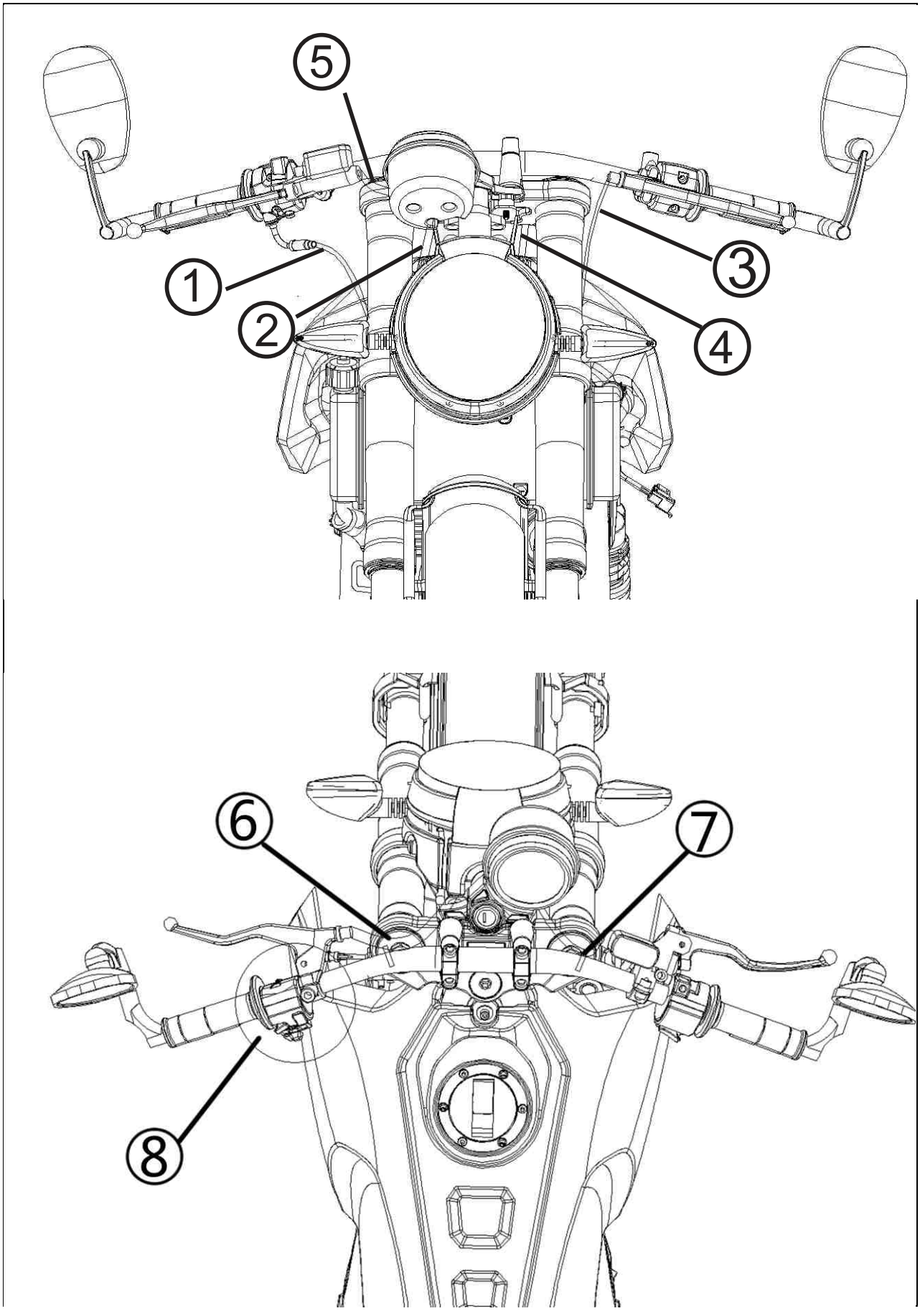
CAUTION

When replacing a fuse, be sure the new fuse Matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring ad components.

Appendix

Table of Contents

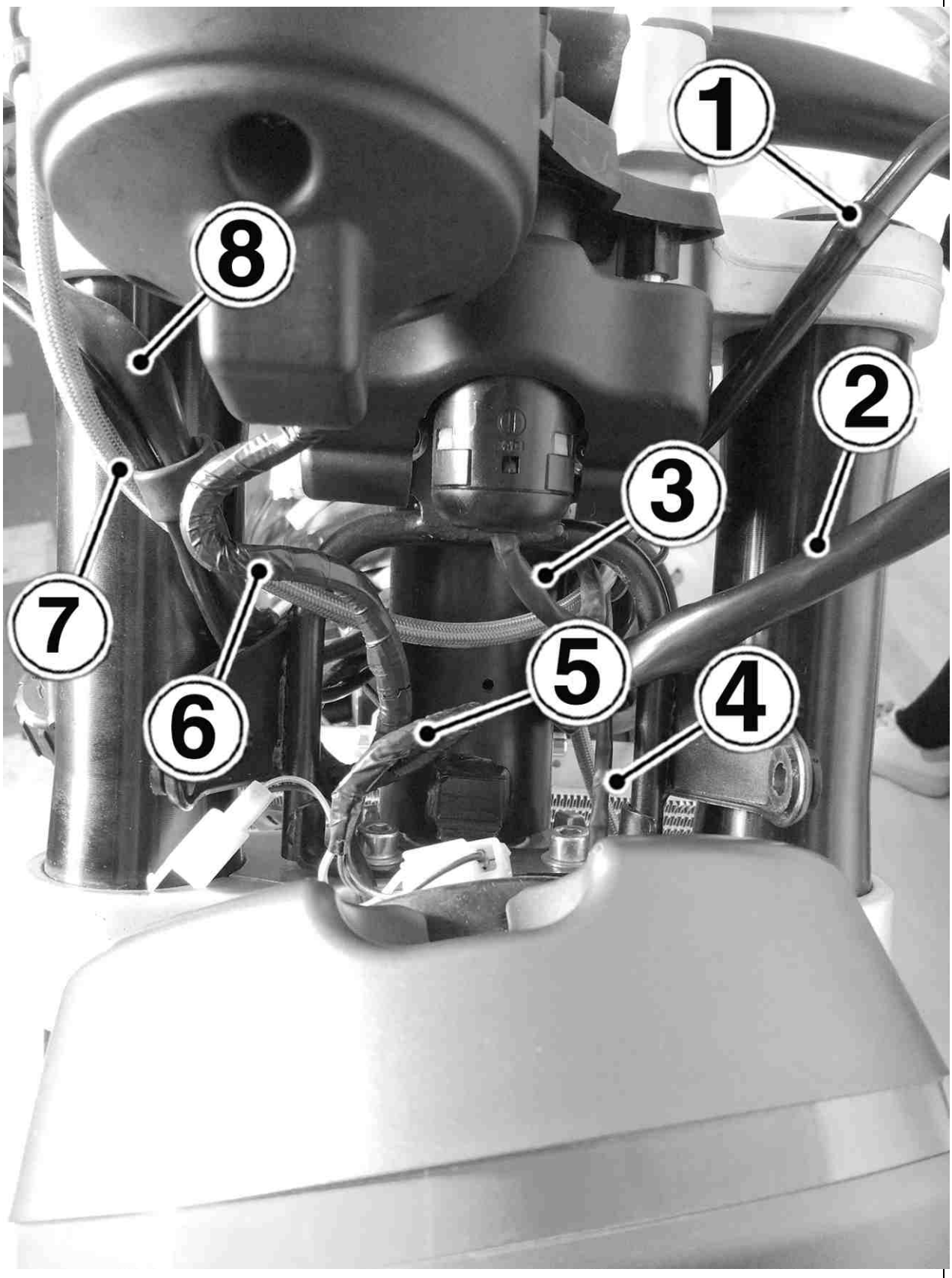
Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

1. Throttle Cables
2. Speedometer Cable
3. Clutch Cable
4. Choke Cable
5. Front Brake Hose
6. Clamp the left handlebar switch housing lead and choke cable.
7. Clamp the right handlebar switch housing lead.
8. Route the right handlebar switch housing lead out of the bolt.

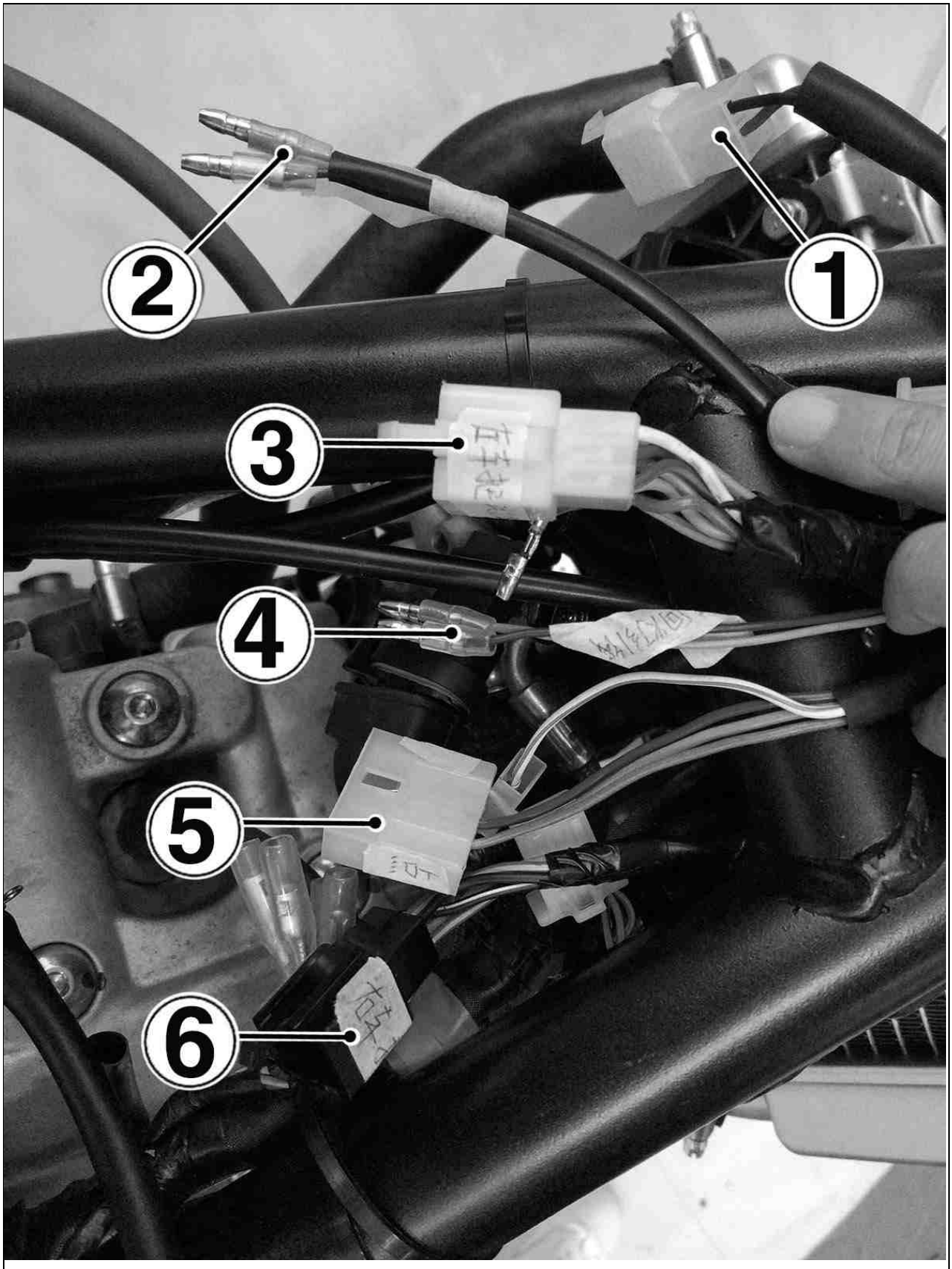
Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

1. Clutch
2. Left Handlebar Switch Housing Lead
3. Ignition switch lead
4. Left turn signal signal lead
5. Headlights lead
6. Instrument lead
7. Front disc brakes
8. Right Handlebar Switch Housing Lead

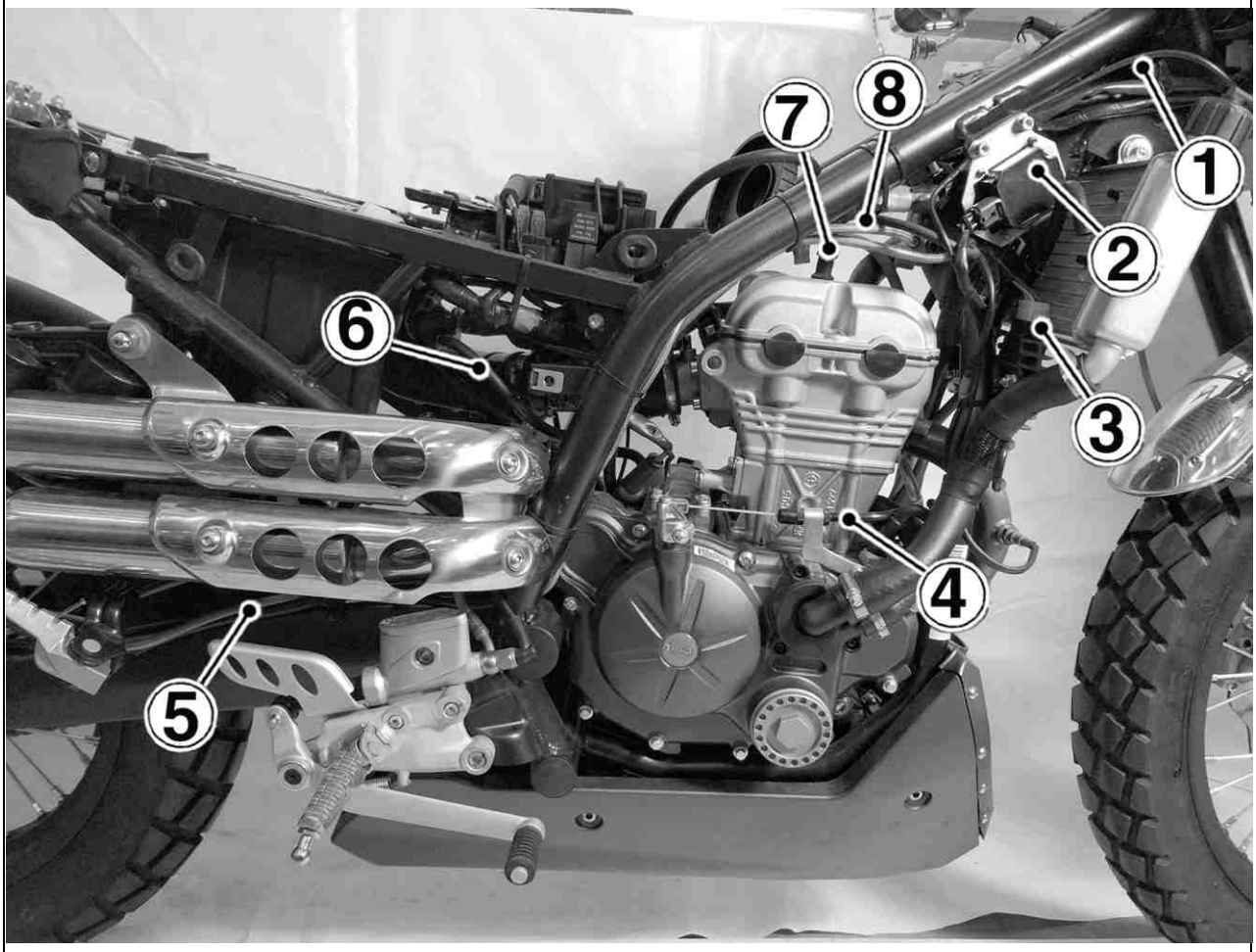
Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

1. Fan lead connector
2. Front Left Turn Signal Light Lead Connector
3. Left Handlebar Switch Housing Lead Connector
4. Front Right Turn Signal Light Lead Connector
5. Ignition Switch Lead Connector
6. Right Handlebar Switch Housing Lead Connector

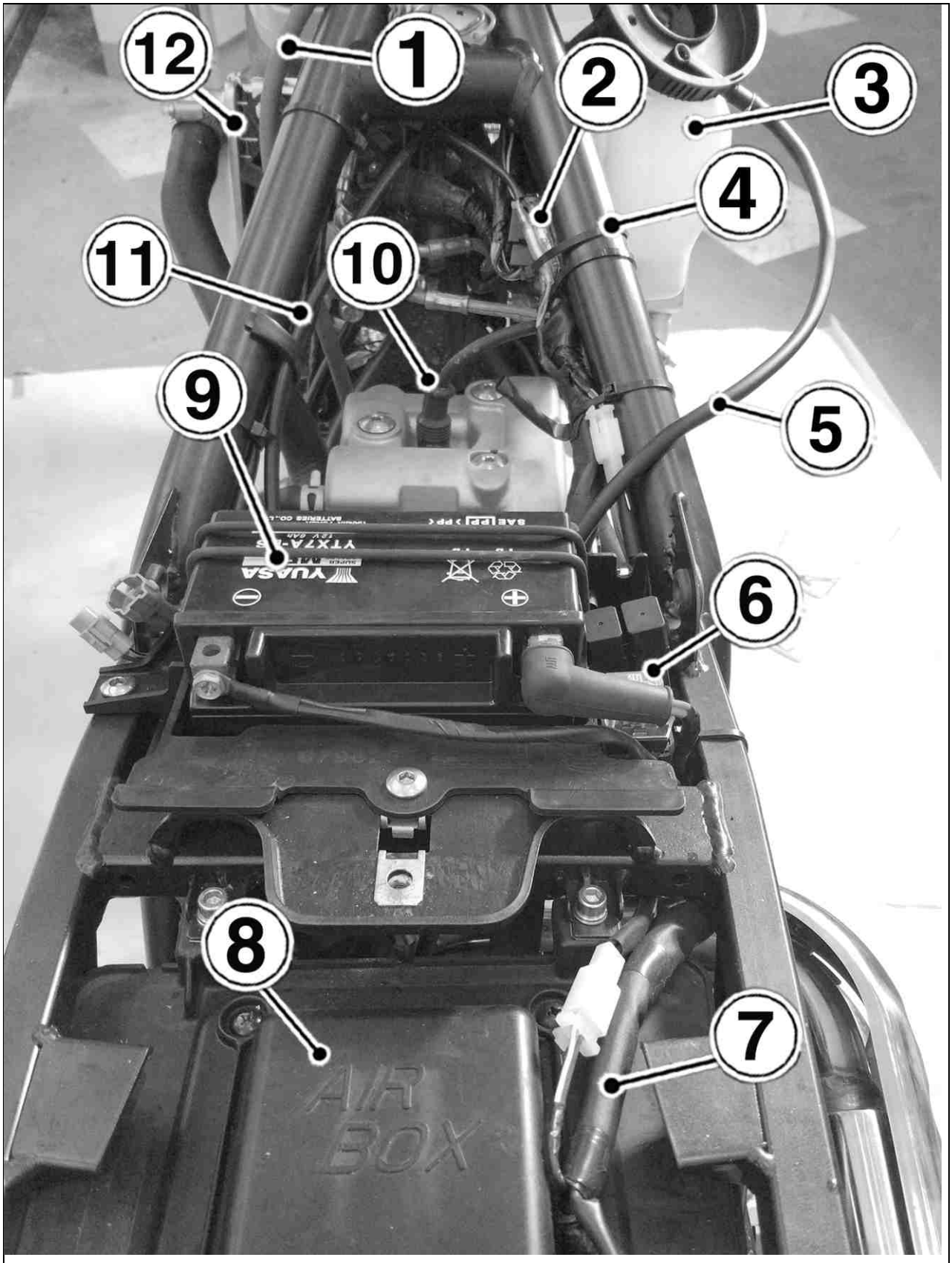
Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

1. Throttle lead
2. Ignition coils
3. Rectifier
4. Clutch leads
5. Rear discs
6. Spark plug
7. Starter Motor
8. Rear discs

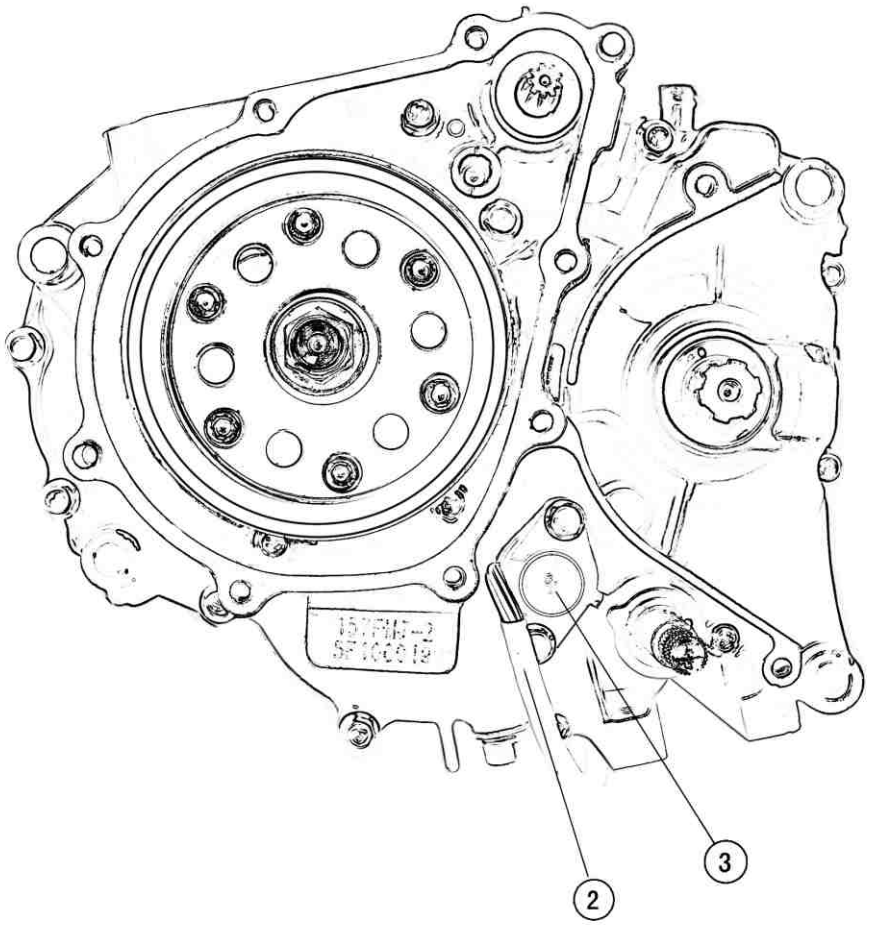
Cable, Wire, and Hose Routing

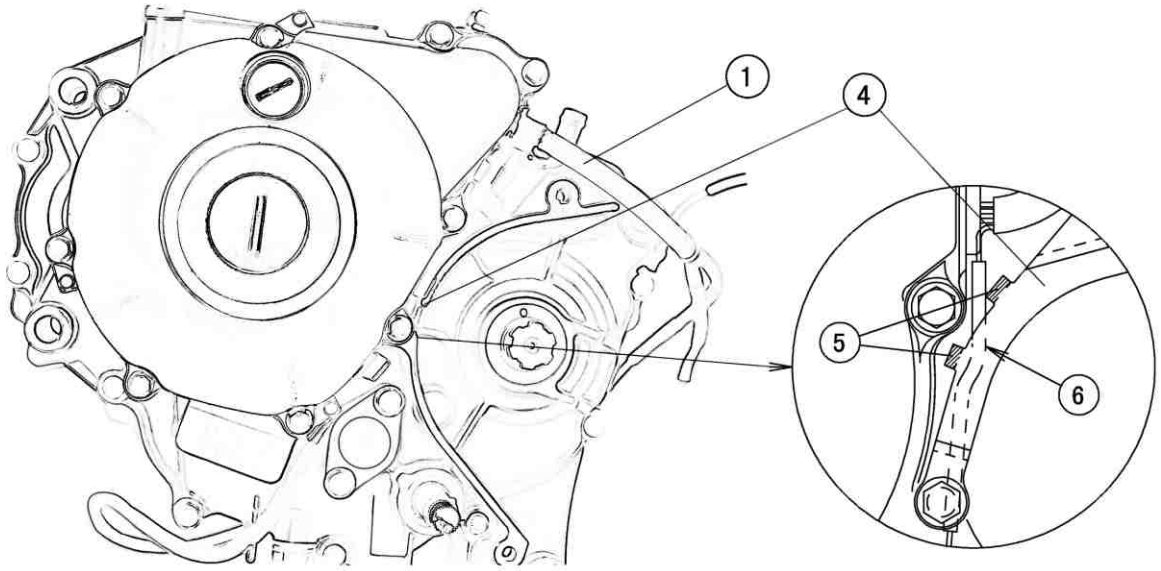


Cable, Wire, and Hose Routing

1. Tank drain pipe
2. Front left turn signal lead
3. kettle
4. Tie
5. Fuel breathing tube
6. Safe box
7. Main cable
8. Air filter
9. battery
10. Spark plug
11. Throttle lead
12. heat sink

Cable, Wire, and Hose Routing

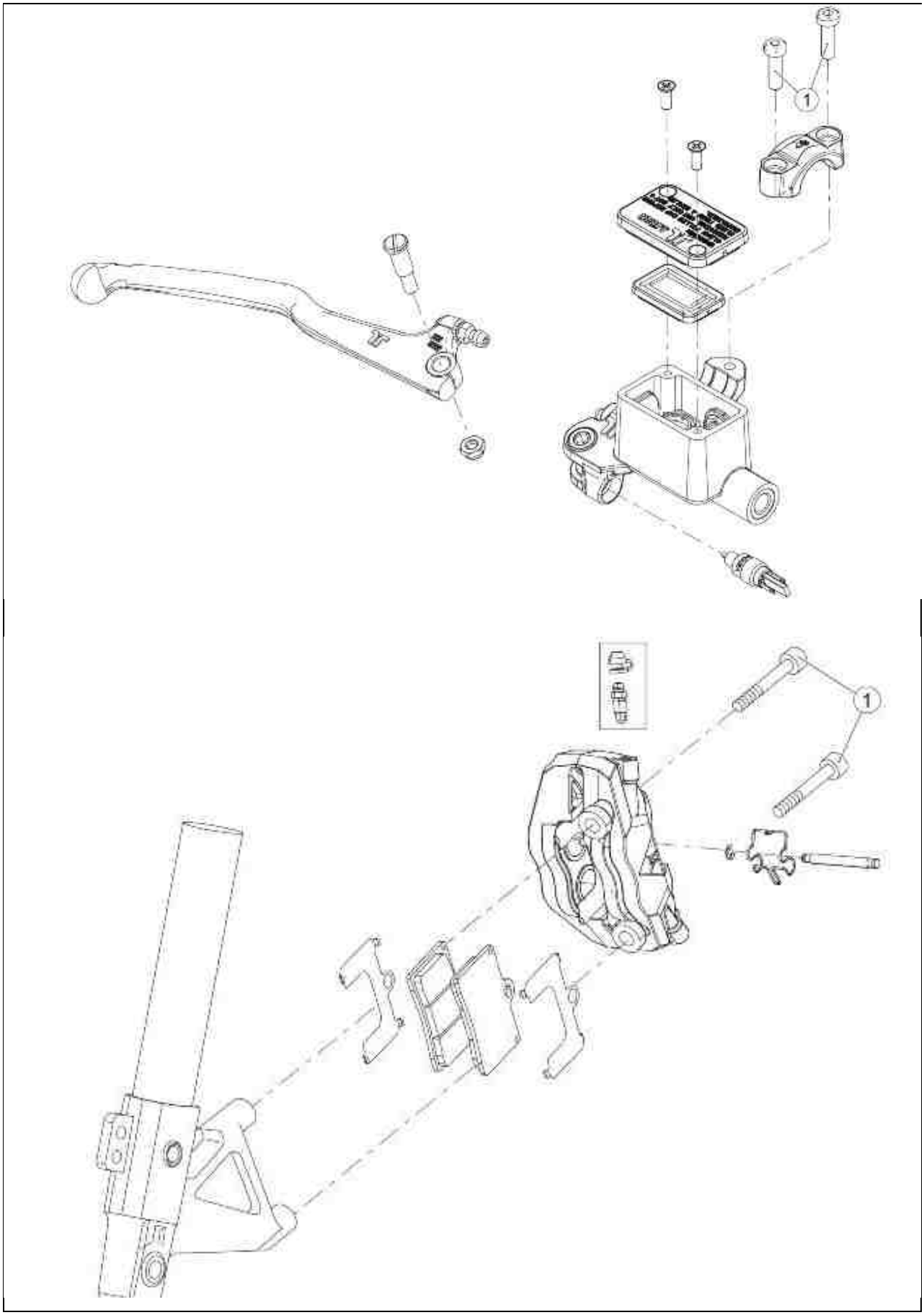




Cable, Wire, and Hose Routing

1. Alternator Lead
2. Route the neutral switch lead along the alternator cover as shown in the figure.
3. Neutral Switch
4. Chain Guide
5. Ribs
6. Run the neutral switch lead between the ribs of the chain guide.

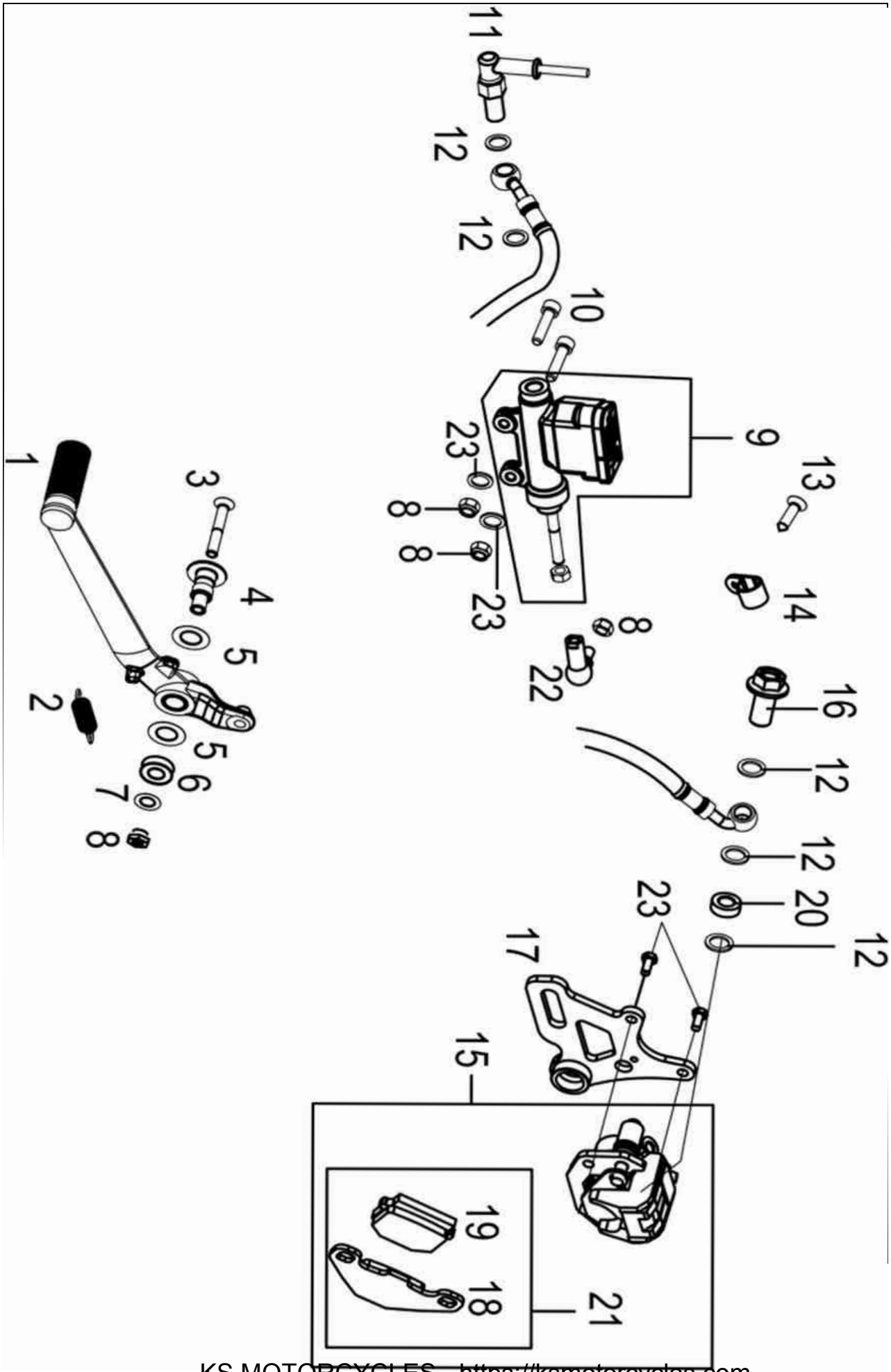
Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

1. Install the front brake hose so that the front brake hose and the upper end of the front brake master cylinder become parallel.
2. Stamp Side
3. Front Brake Master Cylinder
4. Clamp
5. Front Brake Hose
6. Front Brake Caliper
7. Install the front brake hose so that it touch the front brake caliper.

Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

1.Rear brake lever
2.Spring
3.Bolt M6*40
4.Rear brake lever bushing
5.Wave washer 12*22*0.4
6.Washer 8.5*25*2.3
7.Washer 6.5*12*1.5
8.Nut M6
9.Bear brake master cylinder
10.Bolt M6*40
11.Bear brake switch
12.Sealihg washer
13.Screw 4.8*19
14.Reatiner cable
15.Rear brake caliper
16.Banjo bolt
17.Rear brake pump bracket
18.External brake pads
19.Inner brake pads
20.Bushing
21.Brake pad
22.Rear disc connecting
23.Washer R3

Troubleshooting Guide

This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the Troubleshooting for some of the more common difficulties.

Engine Doesn`t Start, Starting Difficulty:

Starter motor not rotating:
- Ignition and engine stop switch not ON
- Starter lockout or neutral switch trouble
- Starter motor trouble
- Battery voltage low
- Starter relay not contacting or operating
- Starter button not contacting
- Starter system wiring open or shorted
- Ignition switch trouble
- Engine stop switch trouble
- Fuse blown

Starter motor rotating but engine doesn` t turn over:
- Starter motor clutch or idle gear trouble

Engine won`t turn over:
- Valve seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end, big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure
- Starter idle gear seizure
- Kick shaft return spring broken
- Kick ratchet gear not engaging

No fuel flow:
- No fuel in tank
- Fuel tank air vent obstructed
- Fuel tap clogged
- Fuel tap turned off
- Fuel filter clogged
- Fuel line clogged
- Carburetor float valve clogged

Engine flooded:
- Fuel level in carburetor float bowl too high
- Float valve worn or jammed with foreign matter
- Starting technique faulty (When flooded, Crank the engine with the throttle fully opened to allow more air to reach the engine.)

Fuel/air mixture incorrect:
- Pilot screw and/or idle speed adjuster maladjusted
- Pilot jet or air passage clogged
- Air cleaner clogged, poorly sealed or missing
- Starter jet clogged
- Leak from oil filler cap or air cleaner drain plugs

No spark; spark weak:
- Ignition switch not ON
- Engine stop switch turned OFF
- Clutch lever not pulled in or gear not in neutral
- Battery voltage low
- Spark plug dirty, broken or gap maladjusted
- Spark plug cap or high-tension cable trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- Igniter trouble
- Crankshaft sensor trouble
- Ignition coil trouble
- Ignition or engine stop switch shorted
- Neutral or starter lockout switch trouble
- Starter system wiring shorted or open
- Fuse blown

Compression Low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn Or carbon accumulation on the seating surface)

Poor Running at Low Speed:

Spark weak:
- Battery voltage low
- Spark plug dirty, broken or gap maladjusted
- Spark plug cap or high-tension cable trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- Igniter trouble
- Crankshaft sensor trouble
- Alternator rotor damaged
- Ignition coil trouble
- Wiring connector not in good contact

Fuel/air mixture incorrect:
- Pilot screw maladjusted
- Pilot jet or air passage clogged
- Needle Jet or air passage clogged
- Air cleaner clogged, poorly sealed or missing
- Choke plunger stuck open

Troubleshooting Guide

Fuel level in carburetor float bowl too high or too low
Fuel tank air vent obstructed
Fuel tap clogged
Carburetor holder loose
Air cleaner duct loose

Compression low:
Spark plug loose
Cylinder head not sufficiently tightened down
No valve clearance
Cylinder, piston worn
Piston ring bad (worn, weak, broken or sticking)
Piston ring/groove clearance excessive
Cylinder head gasket damaged
Cylinder head warped
Valve spring broken or weak
Valve not seating properly (valve bent, worn or carbon accumulation on the seating surface)
Camshaft cam worn

Other:
Igniter trouble
Carburetor vacuum piston does not slide smoothly
Carburetor Vacuum piston diaphragm damage
Engine oil level too high
Engine oil viscosity too high
Brake dragging
Drive train trouble
Engine overheating
Clutch slipping
Vacuum switch valve trouble

Poor Running or No Power at High Speed:

Firing incorrect:
Spark plug dirty, broken or gap maladjusted
Spark plug cap or high-tension cable trouble
Spark plug cap shorted or not in good contact
Spark plug incorrect
Igniter trouble
Crankshaft sensor trouble
Alternator rotor damaged
Ignition coil trouble
Wiring connector not in good contact

Fuel/air mixture incorrect:
Choke plunger stuck open
Main jet clogged or wrong size
Jet needle or needle jet worn
Air jet clogged
Fuel level in carburetor float bowl too high or too low
Needle Jet or air passage clogged
Air cleaner clogged, poorly sealed or missing
Air cleaner duct loose
Water or foreign matter in fuel
Carburetor holder loose
Fuel tank air vent obstructed
Fuel tap clogged
Fuel filter clogged
Fuel line clogged

Compression low:
Spark plug loose
Cylinder head not sufficiently tightened down
No valve clearance
Cylinder, piston worn
Piston ring bad (worn, weak, broken or sticking)
Piston ring/groove clearance excessive
Cylinder head gasket damaged
Cylinder head warped
Valve spring broken or weak
Valve not seating properly (valve bent, worn Or carbon accumulation on the seating surface.)

Knocking:
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Spark plug incorrect
Igniter trouble

Other:
Throttle valve won`t fully open
Carburetor vacuum piston does not slide smoothly
Carburetor Vacuum piston diaphragm damage
Brake dragging
Air cleaner clogged
Water or foreign muffler in fuel
Clutch slipping
Engine overheating
Engine oil level too high
Engine oil viscosity too high
Drive train trouble
Crankshaft bearing worn or damaged

Engine Overheating:

Firing incorrect:
Spark plug dirty, broken or maladjusted
Spark plug incorrect
Igniter trouble

Fuel/air mixture incorrect:
Main jet clogged or wrong size
Fuel level in carburetor float bowl too low
Carburetor holder loose
Air cleaner clogged, poorly sealed or missing

Air cleaner duct loose
Choke plunger stuck open

Compression high:
Carbon built up in combustion chamber

Engine load faulty:
Clutch slipping
Engine oil level too high
Engine oil viscosity too high
Brake dragging
Drive train trouble
Vacuum switch valve trouble

Lubrication inadequate:
Engine oil level too low
Engine oil poor quality or incorrect

Clutch Operation Faulty:

Clutch slipping:
No clutch lever play
Clutch cable maladjusted
Clutch inner cable sticking
Friction plate worn or warped
Steel plate worn or warped
Clutch spring broken or weak
Clutch release function trouble
Clutch hub or housing unevenly worn

Clutch not disengaging properly:
Clutch lever play excessive
Clutch spring compression uneven
Engine oil deteriorated
Engine oil viscosity too high
Engine oil level too high
Clutch housing seized
Clutch release function trouble
Clutch hub nut loose
Clutch plate warped or rough
Clutch hub spline damaged

Gear Shifting Faulty:

Doesn`t go into gear; shift pedal doesn`t return:
Clutch not disengaging
Shift fork bent, worn, or seized
Shift return spring pin loose
Shift return spring weak or broken
Shift shaft lever broken
Pawl guide plate broken
Shift pawl broken
Shift pawl spring weak
Gear seized
Gear set lever operation trouble
Shift drum broken

Jumps out of gear:
Shift fork ear worn, bent
Gear groove worn
Gear dogs and/or dog holes worn
Shift drum groove worn
Gear set lever spring weak or broken
Shift fork guide pin worn
Drive shaft, output shaft and/or gear splines worn

Overshifts:
Gear positioning lever spring weak or broken
Pawl guide plate worn
Shift shaft spring broken

Abnormal Engine Noise:

Knocking:
Igniter trouble
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Spark plug incorrect
Engine overheating

Piston slap:
Cylinder/piston clearance excessive
Cylinder, piston worn
Connecting rod bent
Piston pin, piston pin hole worn

Valve noise:
Valve clearance incorrect
Valve spring broken or weak
Camshaft bearing or cam face worn
Camshaft journal worn

Other noise:
Connecting rod big end and/or small end clearance excessive
Piston ring worn, broken or stuck
Piston seizure, damaged
Cylinder head gasket leaking
Exhaust pipe leaking at cylinder head connection
Crankshaft runout excessive
Engine mounts loose
Crankshaft bearing worn
Camshaft chain tensioner trouble
Camshaft chain, sprocket or chain guide worn
Primary gear worn or damaged
Alternator rotor loose
Vacuum switch valve damaged

Abnormal Drive Train Noise:

Clutch noise:
Clutch housing finger and friction plate tang worn
Clutch housing gear worn
Metal chips jammed in clutch housing gear teeth

Transmission noise:
Bearings worn
Transmission gears worn or chipped
Metal chips jammed in gear teeth
Engine oil insufficient, low viscosity

Troubleshooting Guide

Kick ratchet gear not properly disengaging from kick gear
Kick shaft idle gear worn or chipped

Drive chain noise:
Drive chain maladjusted
Drive chain worn
Rear and/or engine sprocket worn
Drive chain lubrication insufficient
Rear wheel misaligned

Abnormal Frame Noise:

Front fork noise:
Oil insufficient or too thin
Spring weak or broken

Rear shock absorber noise:
Shock absorber trouble
Spring weak or broken

Disc brake noise:
Pad surface glazed
Disc warped
Caliper trouble
Pad installed incorrectly
Master cylinder damaged

Other noise:
Bracket, nut, bolt, etc., not properly mounted or tightened

Abnormal Exhaust Color:

White smoke:
Piston oil ring worn
Cylinder worn
Valve oil seal damaged
Valve guide worn
Engine oil level too high
Cylinder head gasket damaged

Black smoke:
Air cleaner element clogged
Main jet too large or fallen off
Choke plunger stuck open
Fuel level in carburetor float bowl too high

Brown smoke:
Main jet too small
Fuel level in carburetor float bowl too low
Air cleaner duct loose
Air cleaner poorly sealed or missing

Handling and/or Stability Unsatisfactory:

Handlebar hard to turn:
Cable, hose, wire routing incorrect
Steering stem nut too tight
Steering stem bearing damaged
Steering stem bearing lubrication inadequate
Steering stem bent
Tire air pressure too low

Handlebar shakes or excessively vibrates:
Tire worn
Swingarm pivot bearings worn
Rim warped or not balanced
Spokes loose
Wheel bearing worn
Handlebar holder bolt loose
Steering stem head nut loose
Front, rear axle runout excessive

Handlebar pulls to one side:
Frame bent
Rear wheel misalignment
Swingarm bent or twisted
Swingarm pivot shaft bent
Steering maladjusted
Steering stem bent
Front fork bent
Right and left front fork oil level uneven

Suspension operation trouble:
(Too hard)
Tire air pressure too high
Front fork oil excessive
Front fork oil viscosity too high
Rear shock absorber adjustment too hard
Front fork bent

(Too soft)
Front fork oil insufficient or leaking
Front fork oil viscosity too low
Rear shock absorber adjusted too soft
Front fork, rear shock absorber spring weak
Rear shock absorber oil or gas leaking
Tire air pressure too low

Brake Doesn Hold:

Air in brake system
Pad, disc worn
Brake fluid leakage
Contaminated pad
Brake fluid deteriorated
Brake master cylinder cups damaged
Master cylinder scratched inside
Disc warped

Battery Trouble:

Battery discharged:
Charge insufficient
Battery faulty (too low terminal voltage)
Battery cable making poor contact
Load excessive (e.g., bulb of excessive wattage)
Alternator trouble
Wiring faulty
Regulator/rectifier trouble
Ignition switch trouble

Battery overcharged:
Regulator/rectifier trouble
Battery faulty

MODEL APPLICATION

Year	Model	Beginning Frame No.

□ :This digit in the frame number changes from one machine to another.

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