YZF-R1 2022 KIT MANUAL

GYTR®

GENUINE YAMAHA TECHNOLOGY RACING

PERFORMANCE PRODUCTS

Introduction

- This manual is intended for persons with knowledge and experience of motorcycles. Please refer to the YZF-R1 service manual, which shall be published from YAMAHA MOTOR CO. LTD., for information on part assembly and maintenance.
- The design of the YZF-R1 racing kit is based on YZF-R1, according to FIM racing rules, but that does not mean the kit conforms to all competitions. When used in races, riders must mount the YZF-R1 racing kit at their own discretion after checking the rules of competition issued by the sponsor.

About Warranty

- Please understand that these parts are not covered by warranty.
- The Manufacturer does not take any responsibility for problems caused by these parts.

Request

- These kit parts are intended exclusively for racing purposes. You are strictly requested not to use them on public roads.
- The specifications and usage methods of these kit parts along with the contents of this manual are subject to change without notice for improvement.

Parts List Symbols

- The star mark (*) means that the part is included in the kit set and is a genuine Yamaha part. Therefore, you can easily purchase the part at any Yamaha part dealer when necessary.
- The circle mark (°) means that although the part is included in the kit set it can also be purchased individually.

	No.	PART No.	PART NAME	Q'TY	REMARKS
°	1	4C8-11181-70	GASKET, CYLINDER HEAD 1	3	t=0.30mm
*	2	5VY-11351-00	GASKET, CYLINDER 1	3	
*	3	4C8-11603-00	PISTON RING SET	12	
	4	5VY-1165A-01	BOLT, CONNECTING ROD SPECIAL	24	
*				24	

Symbol Marks

Particularly important information is distinguished in this manual by the following notations.

⚠ **This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**

⚠ WARNING **A WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

NOTICE **A NOTICE indicates special precautions that must be taken to avoid damage to the vehicle or other property.**

TIP **A TIP provides key information to make procedures easier or clearer.**

CONTENTS

1 Engine Specifications

Spec		SBK/JSB	SST	STD
Displacement		998cm^3	998cm^3	998cm^3
Bore/Stroke		79.0 × 50.9 mm	79.0 × 50.9 mm	79.0 × 50.9 mm
Maximum engine speed (limiter controlled speed)		14750 rpm	14750 rpm	14500 rpm
Compression ratio (recommended value)		13.0 – 13.4	13.0	13.0
Valve timing (event angle)	INT	105°	108° *106°	108°
	EXT	109°	110° *109°	110°
Clearance between valve and piston (minimum)	INT	0.95 mm	0.95mm	–
	EXT	1.90 mm	1.95mm	–
Valve (tappet) clearance	INT	0.09 – 0.17 mm	0.09 – 0.17 mm	0.09 – 0.17 mm
	EXT	0.18 – 0.23 mm	0.18 – 0.23 mm	0.18 – 0.23 mm
Squish recommended value	INT	0.65 – 0.75 mm	0.65 – 0.75 mm	0.65 – 0.75 mm
	EXT	0.95 – 1.05 mm	0.95 – 1.05 mm	0.95 – 1.05 mm

* Recommended value when it can be changed.

2 Kit Parts

2-1 Installing Electrical Parts

1. ECU Set (B3L-8591A-72/B3L-8591A-A0)

Parts List

for SBK

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-8591A-72	ECU SET for SBK	1	
	2	B3L-2818Y-73	CD	1	YMS SOFT & MANUAL

The ECU in this set has base data (R1-22_BaseData_00_SBK.ycz) written for SBK (Superbike).
The base data for SBK is for modified engines.

for SST

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-8591A-A0	ECU SET for SST	1	
	2	B3L-2818Y-73	CD	1	YMS SOFT & MANUAL

The base data (R1-22_BaseData_00_STK.ycz) for SST (Stock Sports) is written in the ECU of this set.
The base data for SST is for standard engine.

- Use of this set and a wire harness included in the kit enables regulation (or setting) of fuel injection and ignition timing, etc.
- For details as to how to regulate (or set) fuel injection and ignition timings, etc., and the method of writing the base data, refer to the FI matching system manual in the CD-ROM that comes with the set.

* **Recommended muffler**
Made by Akrapovic (For details of the specification, please access the website.)
Web https://www.akrapovic.com/en/intro?returnUrl=%2F

Both for SBK and SST, the mode can be switched between Sprint and EWC by inserting and removing the 2-pole coupler of the kit harness.
When the coupler is connected, the mode is for EWC.
When the coupler is disconnected, the mode is for sprint.
When shipped, the coupler is connected.
(See figure below.)

The set of the camshaft, cam sprocket, valve spring, ECU and air funnel must be used in the following combination.

MODEL	SHAFT CAM 1 INT	SHAFT CAM 2 EXT	CAM SPROCKET	VALVE SPRING SET	AIR FUNNEL SET	ECU SET	WIRE HARNESS SET	METER(REPAIR SET)
2015					MGC-191114-00	2CR-8591A-70		
2016				2CR-A2110-70 2CR-A2110-71 2CR-A2110-72				R1:2CR-83500-00 (SET No.2CR-28130-70)
2017	2CR-12170-70	2CR-12180-70	B3L-12176-70		2CR-1440B-70	2CR-8591A-71 2CR-8591A-72	2CR-F2590-70	R1M:2KS-83500-00 (2KS-28130-70)
2018 2019	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	BX4-8591A-70 BX4-8591A-71	BX4-F2590-70	R1:BX4-83500-30 (SET No.B3L-28130-70) R1M:2KS-83500-60 (SET No.2KS-28130-80)
2020 2021 2022	B3L-12170-70	B3L-12180-70	B3L-12176-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	B3L-1440B-70	B3L-8591A-71	B3L-F2590-70	R1:B3L-83500-00 (SET No.B3L-28130-70) R1M:B4S-83500-00 (SET No.B4S-28130-70)
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	Use with original cam sprocket of YZF-R1.	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	B3L-12177-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SBK	B3L-12170-80	B3L-12180-80	B3L-12176-70	2CR-A2110-72	B3L-1440B-80	B3L-8591A-72		

NOTICE

Using in other combinations may possibly damage the engine.
Be sure to use in the combination as stated above.

2. Cable Interface (2CR-8533A-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	2CR-8533A-70	CABLE, INTERFACE	1	USB
	2	2CR-N81CD-71-1	CD	1	USB driver Windows 10 supported

- This cable connects the kit wire harness to the personal computer on which YEC FI Matching System (YMS) is installed.

- Please see the YMS manual for instructions on how to use YMS.

- When connecting the cable to the PC for the first time, it is necessary to install the USB driver. Refer to the USB Driver Installation Manual provided on the CD for details on how to install the USB driver.

Self-Diagnosis Functions

The ECU is equipped with a self-diagnostic function in order to ensure that the fuel injection system is operating normally. If this function detects a malfunction in the system, it immediately operates the engine under substitute characteristics and illuminates the engine trouble warning light to alert the rider that a malfunction has occurred in the system. Once a malfunction has been detected, a fault code is stored in the memory of the ECU.

To check the following codes, connect an OBD tool (commercially available) to the vehicle using the genuine Yamaha part "90890-03249 OBD/ GST LEADWIRE KIT".
For details,refer to the STD service manual published by Yamaha Motor Co.,Ltd.
You can purchase "90890-03249 OBD/GST LEADWIRE KIT" at any Yamaha part dealer.

DTC CODE	DTC English name/check item
C0520	Multi-axis Acceleration Sensor Module "A"
C1000	Steering Damper Solenoid Control Circuit
P0030	HO2S Heater Control Circuit Bank 1 Sensor 1
P0050	HO2S Heater Control Circuit Bank 2 Sensor 1
P00D1	HO2S Heater Control Circuit Range/Performance Bank 1 Sensor 1
P00D3	HO2S Heater Control Circuit Range/Performance Bank 2 Sensor 1
P0069	Manifold Absolute Pressure - Barometric Pressure Correlation
P0105	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit
P0106	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Range/Performance
P0107	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Low
P0108	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit High
P0110	Intake Air Temperature Sensor 1 Circuit Bank 1
P0111	Intake Air Temperature Sensor 1 Circuit Range/Performance Bank 1
P0112	Intake Air Temperature Sensor 1 Circuit Low Bank 1
P0113	Intake Air Temperature Sensor 1 Circuit High Bank 1
P0115	Engine Coolant Temperature Sensor 1 Circuit
P0116	Engine Coolant Temperature Sensor 1 Circuit Range/Performance
P0117	Engine Coolant Temperature Sensor 1 Circuit Low
P0118	Engine Coolant Temperature Sensor 1 Circuit High
P0122	Throttle/Pedal Position Sensor/Switch "A" Circuit Low
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High
P0132	O2 Sensor Circuit High Voltage Bank 1 Sensor 1
P0133	O2 Sensor Circuit Slow Response Bank 1 Sensor 1
P0134	O2 Sensor Circuit No Activity Detected Bank 1 Sensor 1
P0152	O2 Sensor Circuit High Voltage Bank 2 Sensor 1
P0153	O2 Sensor Circuit Slow Response Bank 1 Sensor 1
P0154	O2 Sensor Circuit No Activity Detected Bank 1 Sensor 1
P0201	Cylinder 1 Injector "A" Circuit
P0202	Cylinder 2 Injector "A" Circuit
P0203	Cylinder 3 Injector "A" Circuit
P0204	Cylinder 4 Injector "A" Circuit
P0222	Throttle/Pedal Position Sensor/Switch "B" Circuit Low
P0223	Throttle/Pedal Position Sensor/Switch "B" Circuit High
P0300	Random/Multiple Cylinder Misfire Detected
P0301	Cylinder 1 Misfire Detected
P0302	Cylinder 2 Misfire Detected
P0303	Cylinder 3 Misfire Detected
P0304	Cylinder 4 Misfire Detected
P0335	Crankshaft Position Sensor "A" Circuit
P0340	Camshaft Position Sensor "A" Circuit Bank 1 or Single Sensor
P0342	Camshaft Position Sensor "A" Circuit Low Bank 1 or Single Sensor
P0343	Camshaft Position Sensor "A" Circuit High Bank 1 or Single Sensor
P0351	Ignition Coil "A" Primary Control Circuit/Open
P0352	Ignition Coil "B" Primary Control Circuit/Open
P0353	Ignition Coil "C" Primary Control Circuit/Open
P0354	Ignition Coil "D" Primary Control Circuit/Open

DTC CODE	DTC English name/check item
P0475	Exhaust Pressure Control Valve "A"
P0476	Exhaust Pressure Control Valve "A" Range/Performance
P0480	Fan 1 Control Circuit
P048B	Exhaust Pressure Control Valve "A" Position Sensor/ Switch Circuit
P048C	Exhaust Pressure Control Valve "A" Position Sensor/ Switch Circuit Range/Perfomance
P048D	Exhaust Pressure Control Valve "A" Position Sensor/ Switch Circuit Low
P048E	Exhaust Pressure Control Valve "A" Position Sensor/ Switch Circuit High
P0500	Vehicle Speed Sensor "A" Circuit
P0560	System Voltage
P0563	System Voltage High
P0601	Internal Control Module Memory Checksum Error
P0606	Control Module Processor
P062F	Internal Control Module EEPROM Error
P0638	Throttle Actuator Control Range/Performance Bank 1
P0657	Actuator Supply Voltage "A" Circuit/Open
P0914	Gear Shift Position Circuit
P0915	Gear Shift Position Circuit Range/Performance
P0916	Gear Shift Position Circuit Low
P0917	Gear Shift Position Circuit High
P1400	Secondary Air Induction System Control Solenoid Circuit
P1500	VSS - NGS - CES Correlation
P1600	Lean Angle Sensor Circuit / Open
P1601	Side Stand Switch Circuit
P1602	Internal Control Module Shutoff Circuit
P1806	Shift Sensor "A" Circuit Low
P1807	Shift Pedal Position "A" Circuit High
P2122	Throttle/Pedal Position Sensor/Switch "D" Circuit Low
P2123	Throttle/Pedal Position Sensor/Switch "D" Circuit High
P2127	Throttle/Pedal Position Sensor/Switch "E" Circuit Low
P2128	Throttle/Pedal Position Sensor/Switch "E" Circuit High
P2135	Throttle/Pedal Position Sensor/Switch "A"/"B" Voltage Correlation
P2138	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation
P2158	Vehicle Speed Sensor "B" Circuit
P2195	O2 Sensor Signal Biased/Stuck Lean Bank 1 Sensor 1
P2197	O2 Sensor Signal Biased/Stuck Lean Bank 2 Sensor 1
P21CF	Cylinder 1 injector "B" circuit/open
P21D0	Cylinder 2 injector "B" circuit/open
P21D1	Cylinder 3 injector "B" circuit/open
P21D2	Cylinder 4 injector "B" circuit/open
P2228	Barometric Pressure Sensor "A" Circuit Low
P2229	Barometric Pressure Sensor "A" Circuit High
U0125	Lost Communication With Multi-axis Acceleration Sensor Module
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module

3．Wire Harness Set (B3L-F2590-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-82590-70	WIRE HARNESS ASSY.	1	
○	2	B3L-82386-70	WIRE,SUB-LEAD for TH INJECTOR	1	
○	3	B3L-82318-70	WIRE,SUB-LEAD for AC INJECTOR	1	
○	4	B3L-82309-70	WIRE,SUB-LEAD for IG. COIL	1	
○	5	2CR-8231Y-70	WIRE,LEAD for FUEL PUMP	1	
○	6	B3L-83553-70	WIRE,LEAD for METER	1	
	7	B3L-2128A-70	BRKT., REGULATOR 1	1	For REC./REG.
*	8	92017-06020	BOLT,BUTTON HEAD	2	
*	9	90201-07081	WASHER,PLAIN	2	
*	10	95607-06200	NUT,U FLANGE	2	
○	11	B3L-2331W-70	BRKT.,UPPER	1	For ECU
○	12	B3L-2331X-70	BRKT.,UNDER	1	For ECU
*	13	90338-06018	PLUG	4	
*	14	90111-06116	BOLT,HEX. SOCKET BUTTON	1	M6×16mm
*	15	90111-06140	BOLT, HEX.SOCKET BUTTON	1	M6×20mm
*	16	95817-06010	BOLT,FLG.	2	
	17	B3L-2830X-70	BRKT.,CONTROL UNIT	1	For Hydraulic unit assy.
*	18	90110-06163	BOLT,HEX. SOCKET HEAD	1	
*	19	92017-06010	BOLT,BUTTON HEAD	2	
*	20	5GF-83976-00	SW., HANDLE 1	1	TAIL LIGHT SW.

This wire harness is weight-saved by doing away with connecting wires for lights.

NOTICE

This wire harness will not function unless it is combined with the kit's ECU.

4. WIRE, SUB-LEAD(2KS-82509-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	21	2KS-82509-70	WIRE, SUB-LEAD	1	SCU

This wire harness is for mounting the KIT harness to a vehicle with the Electric racing suspension (ERS) function.

TIP

If the E-SD (STD steering damper) is not used, removing its coupler will pose no problem.

NOTICE

- **Before using the KIT ECU for the first time, use YMS to perform writing of the base map.**
- **Remove the coupler of the main switch before starting assembling work.**

NOTICE

- **Do not remove the AC generator but leave it to function. Use on the battery alone will make the machine unable to run in a short time.**
- **Be sure to connect the Hydraulic unit assy. to the wire harness. The ABS does not function when using the KIT ECU, but every electronic control does not work without the connection.**
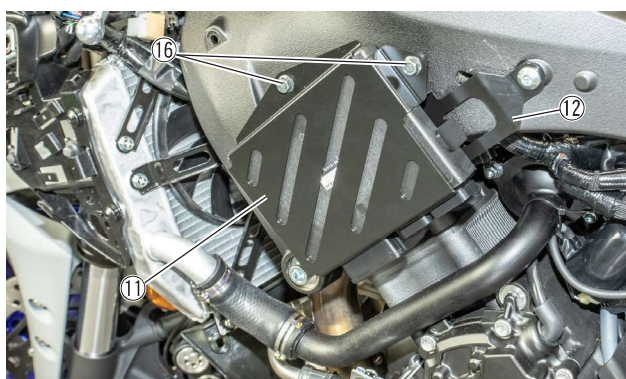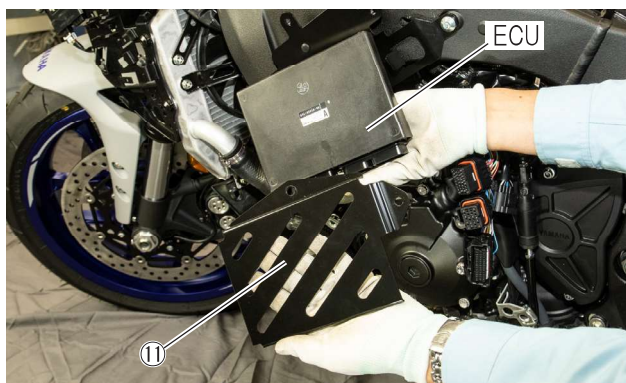- **Do not disassemble the Hydraulic unit assy.**

Installing Wire Harness:
1. Remove the STD wire harness from the chassis.
2. Remove the side cover bracket(left) from the vehicle.
3. Install the PLUG⑬ to the BRKT.,UNDER⑫.
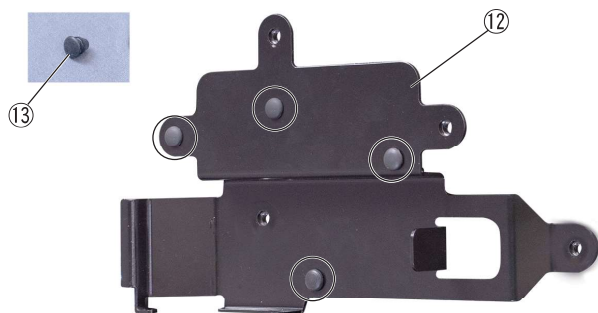
4. Install the BRKT.,UNDER⑫ using the
   BOLT,HEX.SOCKER BUTTON ⑭and⑮ to
   the frame.
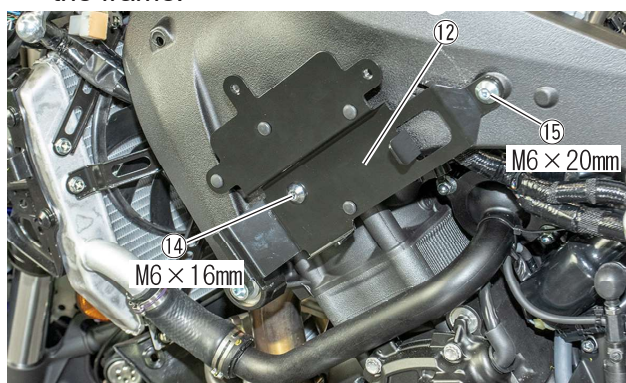
5. Install the ECU and BRKT.,UPPER ⑪ using
   theBOLT,FLG ⑯ to the BRKT.,UNDER⑫.

6. Remove the Hydraulic unit and EXUP servo motor from the vehicle.
   Install the Hydraulic unit using the BOLT,BUTTON HEAD⑲ to the BRKT.,CONTROL UNIT⑰.
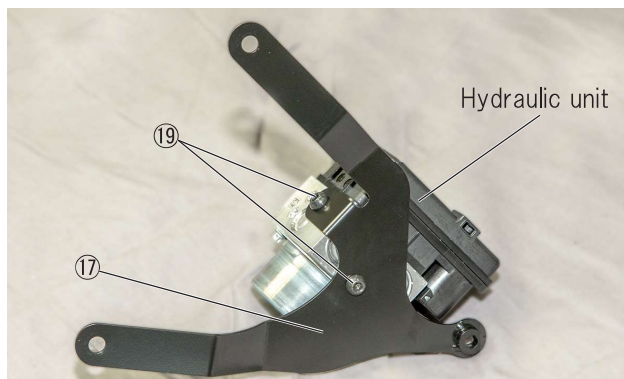
7. Install the BRKT.,CONTROL UNIT⑰ using the STD Bolt and collar,BOLT,HEX. SOCKET HEAD⑱ to the vehicle.
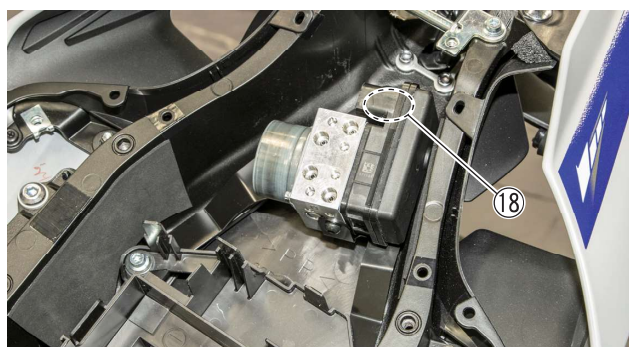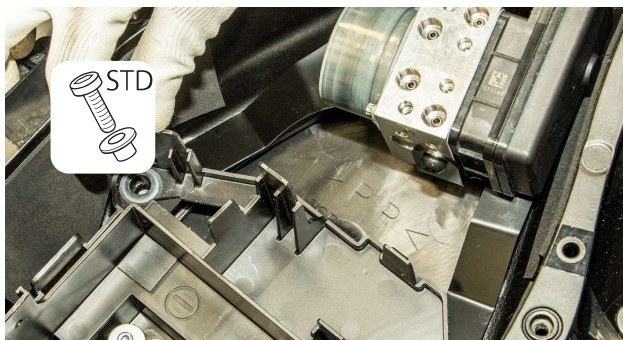
8. Remove from the chassis the STD rectifier/regulator that is installed on the right side of the radiator.

9. Install the BRKT.,REGULATOR 1⑦ using the BOLT.,BUTTON HEAD⑧ and WASHER,PLAIN⑨ to the vehicle.
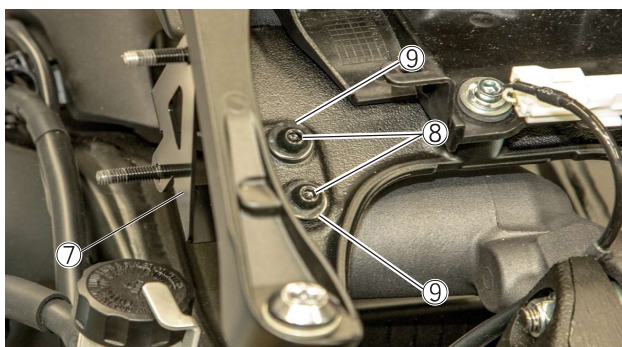
10. Install the rectifier/regulator to the BRKT.,REGULATOR 1⑦ using the NUT,U FLANGE ⑩.
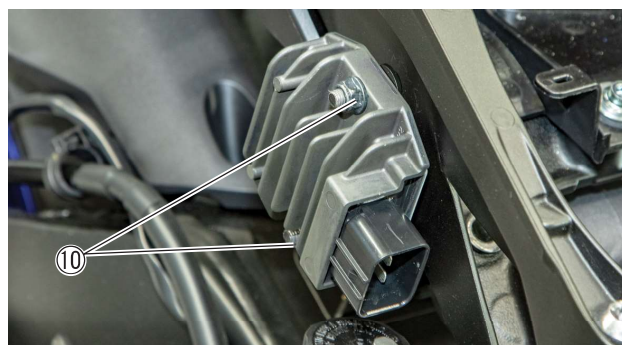
11. Install the wire harness of the kit as the diagram.

HANDLE SW LH&RH

POWER SUPPLY

㉑ **2KS-82509-70 WIRE,SUBLEAD**

SCU

⑥ **B3L-83553-70 WIRE,LEAD for METER**

MAIN SW

E-SD SOLENOID

METER

① **B3L-2331W-70 BRKT.,UPPER**

⑫ **B3L-2331X-70 BRKT.,UNDER**

ECU

TPS

ACM

CRANK SHAFT SENSOR

CAM SENSOR IG COIL

AC INJECTOR

TH INJECTOR

⑦ **B3L-2128A-70 BRKT.,REGULATOR1**

EG EARTH

GP SENSOR

OIL SW *

SHIFT SENSOR

FR.WHEEL SENSOR
PRESSURE SENSOR(Pa)
PRESSURE SENSOR(Pb)
AIR TEMP SENSOR
VI MOTOR
THROTTLE MOTOR
WATER TEMP SENSOR

REC/REGU

FUEL PUMP

PC I/F
SELECT SW
LIGHT SW
NEUTRAL SW

ABS ECU
OBD
CCU
IMU
FUSE BOX
RR WHEEL SENSOR
BTRY MINUS

TAIL LIGHT
POWER SUPPLY
RELAY ASSY
STARTER RELAY
MAIN FUSE
BTRY PLUS

indicate the names of parts to be connected.

NOTICE

* Connect securely. A warning light lights on the meter.

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MAIN SW

METER

AC INJECTOR 2

AC INJECTOR 3

AC INJECTOR 1

AC INJECTOR 4

⑥B3L-82318-70
WIRE,SUB-LEAD
for AC INJECTOR

indicate the names of parts to be connected.

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IG COIL 1

IG COIL 2

AIR TEMP SENSOR

VI MOTOR

IG COIL 3

④B3L-82309-70
WIRE,SUB-LEAD for IG.COIL

AC INJECTOR

THROTTLE MOTOR

②B3L-82386-70
WIRE,SUB-LEAD for TH INJECTOR

PRESSUER SENSOR(Pa)

CAM SENSOR

FR WHEEL SENSOR

IG COIL 4

TH INJECTOR 1

TH INJECTOR 2

TH INJECTOR 3

TH INJECTOR 4

PRESSUER SENSOR(Pb)

WATER TEMP SENSOR

STD SUB-LEAD
for WATER TEMP SENSOR

REC/REGU

⑦B3L-2128A-70
BRKT.,REGULATOR1

⑤2CR-8231Y-70
WIRE,LEAD

FUEL PUMP

SELECT SW

PC I/F

NEUTRAL SW

LIGHT SW

indicate the names of parts to be connected.

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The name and function of each switch

\<Left\>

Keep the switch at low position
Hi position→the LAP switch becomes non-functional

LAP switch

Mode switch

Up button

Center button

Down button

Not used

Pit road limiter
ON⇔ON
PUSH=OFF

MAP SELECT
OFF →MAP 1
△→MAP 2

\<Right\>

Starter switch/Engine stop switch

Wheel switch
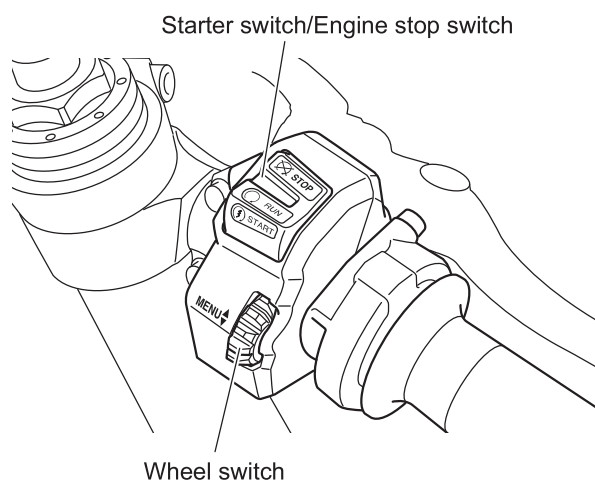
YRC : Yamaha Ride Control

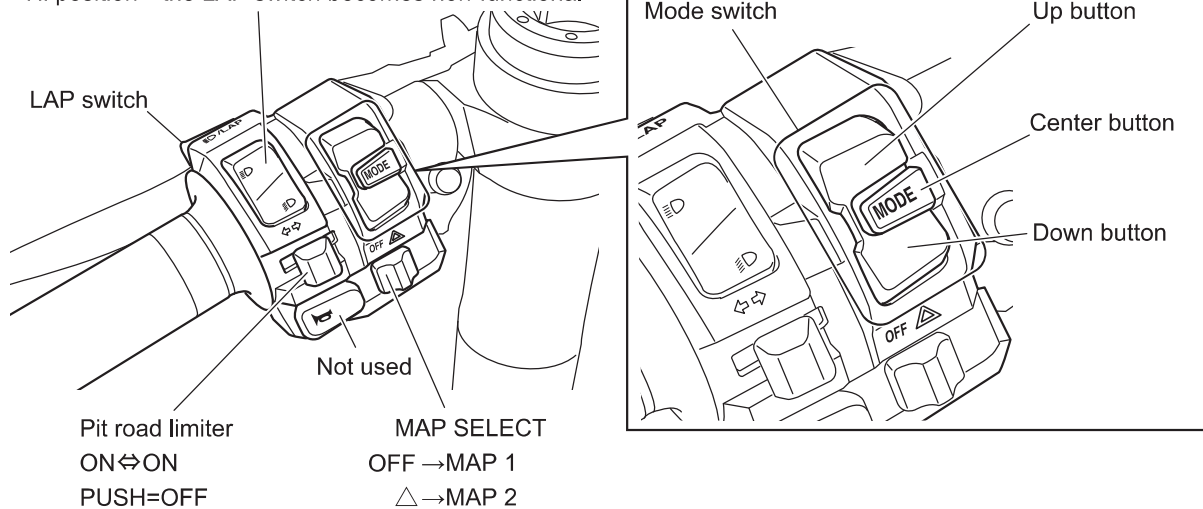Yamaha Ride Control is a system that controls the engine output based on data received from the sensors and IMU.

The functions listed below represent individual YRC items which can be turned on/off or adjusted to suit various riders and riding conditions.

For details on the settings, see "MENU" in the Owner's Manual.

 * The meter MENU screen cannot be displayed if "T.TRIP" is selected when the battery or meter is reconnected.

IMU : Inertial Measurement Unit
PWR : Power Delivery Mode
TCS : Spin control system
SCS : Slide control system
LCS : Launch control system
QSS : Quick shift system
LIF : Lift control system
ERS : Electric racing suspension by ÖHLINS (available only with 2KS)
EBM : Engine brake managment system

IMU : Inertial Measurement Unit

IMU is 6-axis inertial measurement unit. It consists of three gyro sensors (angular sensors) that measure a: machine pitch, b: roll, and c: yaw, and three G-sensors (accelerometer) that measure acceleration in the forward-backward, up-down and right-left directions. YRC controls the engine output based on data received from those sensors.
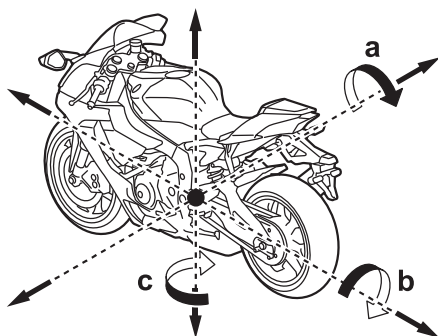
TIP

If the installation position or angle of the inertial measurement unit is changed, YRC does not function properly because measurements are not available.

PWR : Power Delivery Mode

The power mode selection system consists of four different control maps to regulate throttle valve opening depending on the degree of throttle opening, thus providing the rider with a selection of modes to fit rider's preferences and the riding environment.
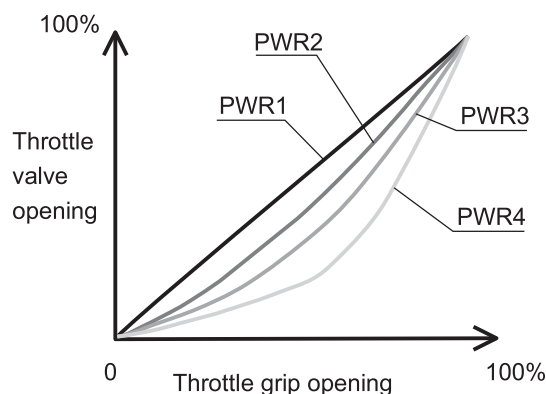
TCS : Spin control system

The spin control system helps maintain traction when accelerating. If sensors detect that the rear wheel is
starting to slip (uncontrolled spinning), the spin control system assists by regulating engine power as needed until traction is restored.

This system supports the SCS to contribute to a smoother ride.

The TCS-1 effect becomes 0.
If TCS is set to "OFF", SCS, LCS, QSS and LIF are also set to OFF automatically.
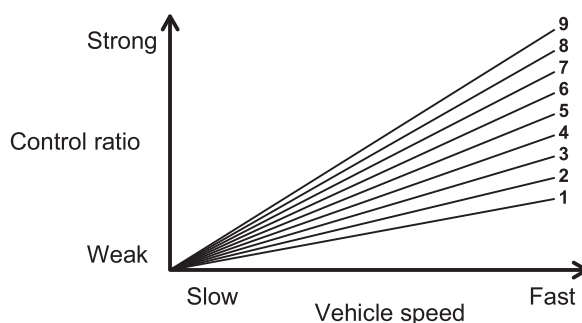
SCS : Slide control system

The slide control system controls engine power output when a sideward slide is detected in the rear wheel.

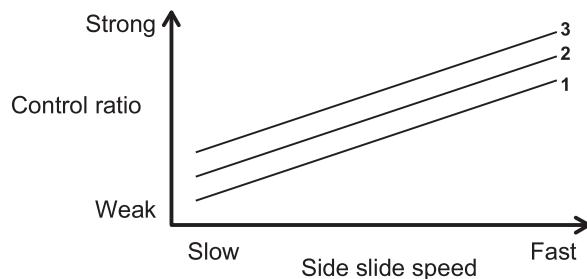It adjusts output to an optimum level based on data from the IMU, thus helping the rider focus on riding without distraction.

This system supports the TCS to contribute to a smoother ride.

LCS : Launch control system

The launch control system helps ensure smooth and swift starts.

The LCS maintains an optimum level of engine output in conjunction with input from the TCS and LIF systems even with the throttle fully open.

This allows the rider to concentrate on clutch engagement and vehicle control to reduce stress during starts.

LCS works in conjunction with TCS and LIF systems.

If TCS is set to "OFF", LIF is also set to OFF automatically.

QSS：Quick shift system

The quick shift system allows for clutch lever-less, electronically-assisted shifting.

When the sensor on the shift rod detects the appropriate motion in the shift pedal, engine power output is momentarily adjusted to allow for the gear change to occur.

LIF : Lift control system

The lift control system reducing wheel lift rate during extreme acceleration, such as during starts or out-of-corner acceleration.

When front-wheel lift is detected by the IMU, engine output is adjusted to the optimum level to compensate for it and thus assist the rider's vehicle control.
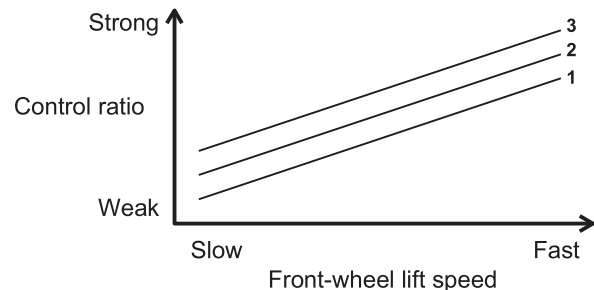
ERS : Electronic racing suspension

The Ohlins electronic racing suspension takes data from the IMU and the suspension control unit (SCU) makes integrated adjustments of both the front and rear suspension's damping force based on running conditions.

EBM : Engine brake management system

The engine brake management system reduces engine torque when decelerating. The fuel injection, ignition timing, and electronic throttle valve are electronically adjusted by the ECU. There are 3 settings to suit the track, riding conditions, or your personal preference.
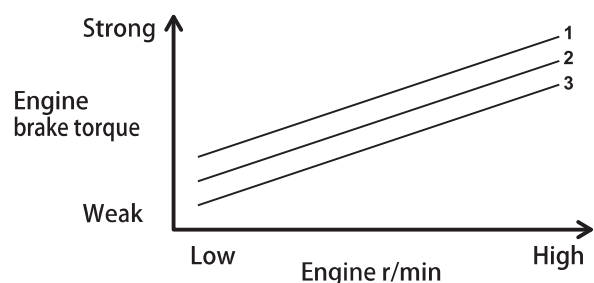
About the front and rear wheel speed sensor

Do not remove the speed sensors installed at the front and rear wheels because they are used for regulating YRC controls.

- If you change the front and rear wheels to non-standard parts, manufacture and attach a rotor and sensor referring to the diagram below.
- If you change the front fork/rear brake bracket to a non-standard part too, create a mount for the sensor assembly and attach the front and rear wheel sensors referring to the diagram below.

*1. When manufacturing a rotor and sensor, use a steel type material with magnetic properties.

*2. Make the angle of attachment in the rotation direction of the rotor of the sensor assembly the same as the angle indicated in the diagram below.

*3. If you change the rotor sensor or sensor assembly attachment bracket to a non-standard part, there is a possibility of malfunction due to vibration or noise even if the part is attached properly.

40×4±0.05
(when D=Φ90: 4 mm, when D=Φ180: 8 mm)

Holes (40 locations)

40×8±0.2

(4)

(40 parts equiangularly)

Diameter at sensor detecting position ΦD (90 – 180)

2CR-85970-00
FR. WHEEL SENSOR ASSY.
2CR-85980-00
RR. WHEEL SENSOR ASSY.

t2

ROTOR, SENSOR

100°

Rotation direction

Center of sensor

0.8 – 2.3

D/2±0.2

A

A–A

ROTOR, SENSOR

14±0.1

Φ11.8 $^{+0.1}_{0}$

M6×1.0

Sensor mount

Reference shape

⊕⊟ **THIRD ANGLE PROJECTION METHOD**

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5.   Headlight Harness Set (BX4-F4350-71)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	BX4-84359-71	CORD, HEAD LIGHT	1	
*	2	5GF-83976-00	SW., HANDLE 1	3	Light ON/OFF SW. x 2 Emergency SW.

This set is used in endurance races in combination with the kit harness for turning on the STD headlights and taillights.

It assumes that the standard headlights and taillights are used.

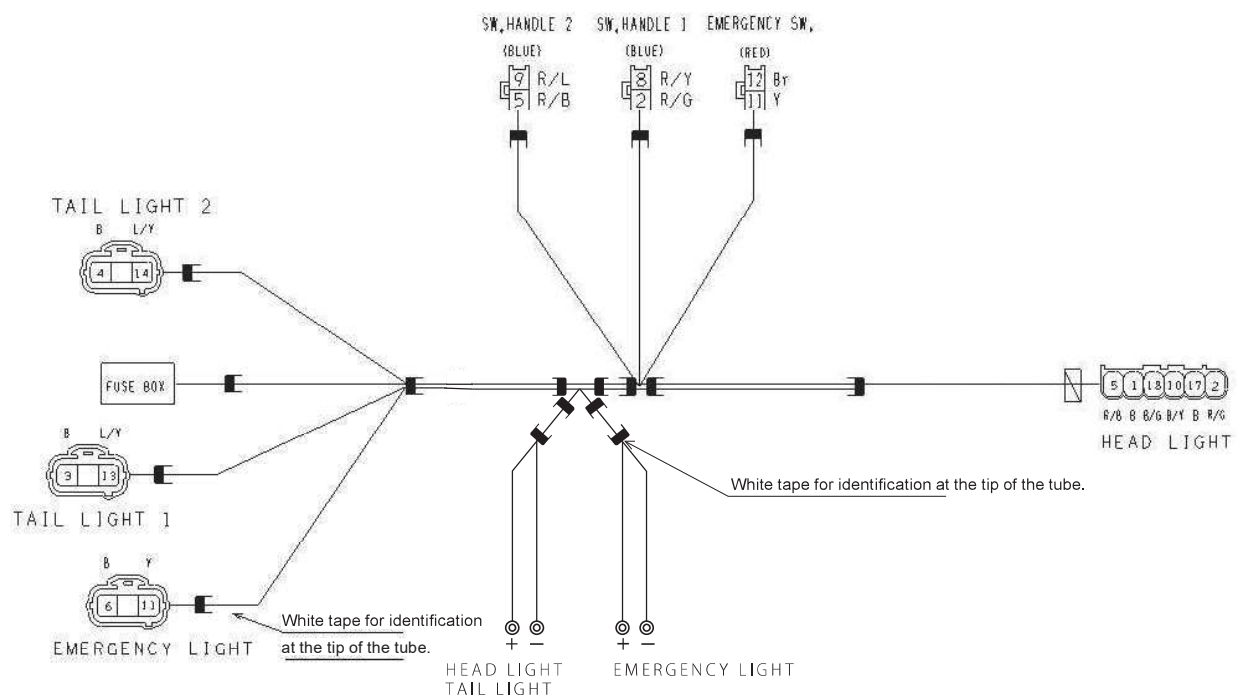There are three light switches.

SW.1 : Turns on the headlight (high beam) and taillight 1

SW.2 : Turns on the headlight (low beam) and taillight 2

EMERGENCY SW. : Turns on the emergency light

Use the appropriate light according to the racing rules of the endurance race.

(Diagram)

White tape for identification at the tip of the tube.

White tape for identification at the tip of the tube.

6. Repair set

Select the part set corresponding to your model.

Parts List
2CR-28130-70 (for 2015~2017 YZF-R1(2CR/BX4))

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	2CR-83500-00	METER ASSY.	1	
*	2	2CR-83963-00	SWITCH HANDLE 3	1	
*	3	2CR-83969-00	SWITCH HANDLE 5	1	
*	4	2CR-85970-00	FR.WHEEL SENSOR	1	
*	5	2CR-85980-00	RR.WHEEL SENSOR	1	

R1J20191108Rev

Parts List
BX4-28130-80 (for 2018,2019 YZF-R1(BX4))

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	BX4-83500-30	METER ASSY.	1	
*	2	2CR-83963-00	SWITCH HANDLE 3	1	
*	3	2CR-83969-00	SWITCH HANDLE 5	1	
*	4	2CR-85970-00	FR.WHEEL SENSOR	1	
*	5	2CR-85980-00	RR.WHEEL SENSOR	1	

R1J20191108Rev

Parts List
B3L-28130-70 (for 2020~2022 YZF-R1 (B3L))

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	B3L-83500-00	METER ASSY.	1	
*	2	B3L-8291R-00	SWITCH HANDLE 3	1	
*	3	B3L-83969-00	SWITCH HANDLE 5	1	
*	4	2CR-85970-00	FR.WHEEL SENSOR	1	
*	5	2CR-85980-00	RR.WHEEL SENSOR	1	

R1 EN0102 2022Rev

Parts List
2KS-28130-70 (for 2015~2017 YZF-R1M (2KS))

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	2KS-83500-00	METER ASSY.	1	
*	2	2CR-83963-00	SWITCH HANDLE 3	1	
*	3	2CR-83969-00	SWITCH HANDLE 5	1	
*	4	2CR-85970-00	FR.WHEEL SENSOR	1	
*	5	2CR-85980-00	RR.WHEEL SENSOR	1	

R1YEC20191005Rev

Parts List
2KS-28130-80 (for 2018, 2019 YZF-R1M(2KS/BAF))

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	2KS-83500-60	METER ASSY.	1	
*	2	2CR-83963-00	SWITCH HANDLE 3	1	
*	3	2CR-83969-00	SWITCH HANDLE 5	1	
*	4	2CR-85970-00	FR.WHEEL SENSOR	1	
*	5	2CR-85980-00	RR.WHEEL SENSOR	1	

R1J20191108Rev

Parts List
B4S-28130-70 (for 2020~2022 YZF-R1M (B4S))

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	B4S-83500-00	METER ASSY.	1	
*	2	B3L-8291R-00	SWITCH HANDLE 3	1	
*	3	B3L-83969-00	SWITCH HANDLE 5	1	
*	4	2KS-85970-00	FR.WHEEL SENSOR	1	
*	5	2CR-85980-00	RR.WHEEL SENSOR	1	

R1 EN0102 2022Rev

7. CCU COMP. (2KS-85800-72)

The CCU (Communication control unit) facilitates checking or settings of the vehicle information, and enhances rider's relationship with the vehicle.

The CCU COMP. consists of the CCU ASSY. and GPS unit.

Download the application onto the tablet before use.

The CCU of RACING KIT PARTS is equipped with the general-purpose analog voltage (0 to 5 V) interface.

For information about the standard features, refer to the OWNER'S MANUAL for the vehicle or the explanation of the store application in addition to this manual.

R1 EN2911 2019Rev

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	2KS-85810-72	CCU ASSY.	1	dedicated software embedded
*	2	2KS-88107-00	GPS unit	1	
	3	2KS-85721-71	Sub-harness	1	
			Application		Download from App Store/Google Play Store

R1 EN2911 2019Rev

CCU Compatibility chart

PART No.	MODEL	
	2015 ～ 2017	2018 ～ 2022
2KS-85810-70	✓	✘
2KS-85810-71	✓	✓
2KS-85810-72	✓	✓

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Components
CCU ASSY.

(dedicated software embedded)

GPS unit

Sub-harness

Application

Download from App Store/Google Play Store

TIP

The functions of the CCU unit
- Data logging (GPS positioning information, vehicle information, analog voltage)
- Line passing detection
- Wireless LAN main unit (IEEE 802.11b/g/n)

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Preparation

- Install the units to the vehicle.

The gray and black cable is for AIN-1 (analog Ch1), and the purple and black cable is for AIN-2 (analog Ch2).
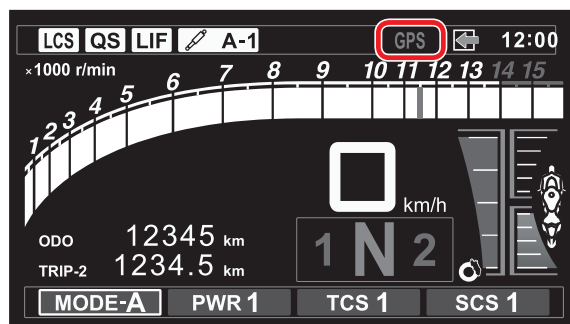
Since the eight-digit number (S/N:) on the CCU unit will be used as the password for wireless LAN connection between the tablet and CCU, be sure to write down the number.

When using it for the first time, check if the GPS icon lights up on the meter before riding.
(It may take about 10 minutes for GPS positioning even in an outdoor location.)

Since the GPS and oil-pressure warning icons are at the same location, the GPS icon does not light up when the the oil-pressure warning icon lights up (such as engine stop).
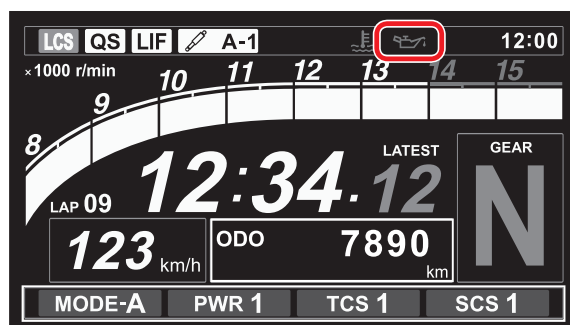
If GPS positioning is not available, it will affect functioning of logging.

- Download the application onto the tablet.

For Android, visit Google Play Store and download "Y-TRAC" and "CCU Config".

For iOS, visit App Store and download "Y-TRAC". (Y-TRAC is equipped with the CCU Config feature.)

In this manual, iOS version screens are used as examples.

Usage

|	Operations on the tablet	Application to be used	Network to be connected
Before riding	Draw a circuit record line on the map. (See Fig. 1.)	CCU Config (Y-TRAC for iOS version)	Internet
	Transfer the record line to the CCU.	CCU Config (Y-TRAC for iOS version)	CCU
	Set the logging mode of the CCU to "Track". (See Fig. 2.)	CCU Config (Y-TRAC for iOS version)	CCU
While riding			
After riding	Download the logging data from the CCU.	Y-TRAC	CCU
	Display the logging data (with map).	Y-TRAC	Internet

(Fig. 1.)
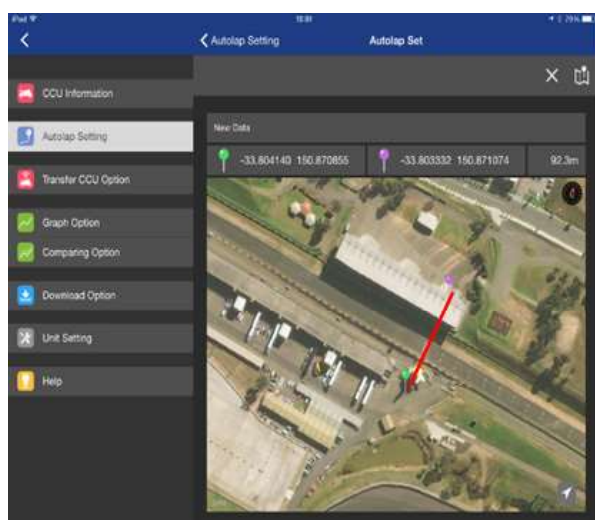
(Fig. 2.)
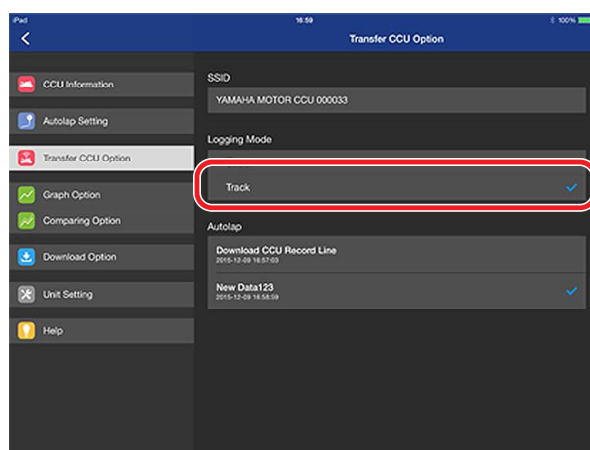
TIP

When connecting the tablet to the network, select CCU (when communicating with the CCU) or Internet (when displaying the map) according to the use.

Connecting to the CCU		Label on the CCU (See Fig.3.)
Network name (SSID)	YAMAHA MOTOR CCU ddeeff	MAC: aa-bb-cc-dd-ee-ff
Password	12345678	S/N: 12345678

(Fig. 3.)

When viewing logging data, analog Ch is not displayed by Y-TRAC default setting. To display it, tap Graph Setting in the Graph Option mode.
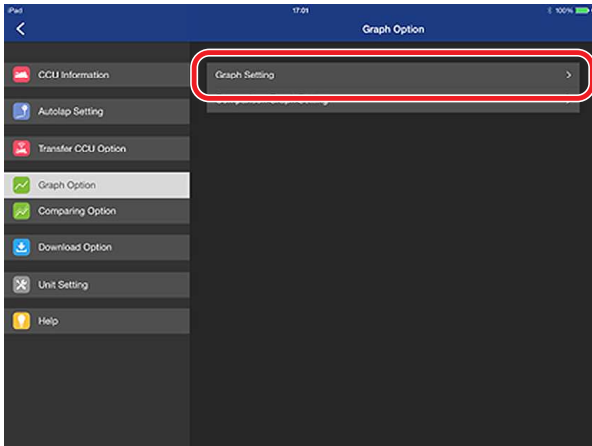
On the screen, tap AIN-1 or AIN-2 to display the arbitrary CH.
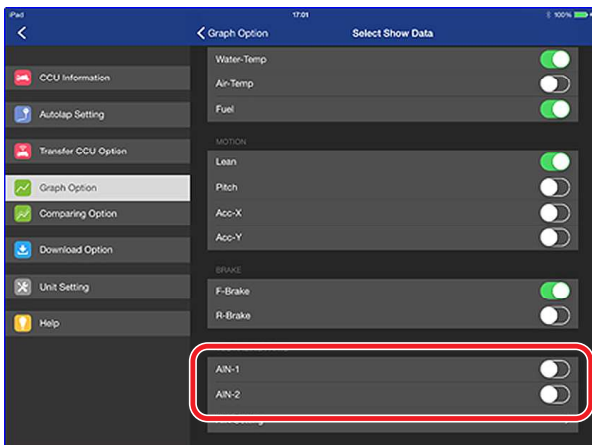
In the analog display mode, the voltage is indicated by level (0 to 5) by default. The display value can be changed according to the specification of the installed sensor. To change the display value, tap AIN Setting.

<Example 1>
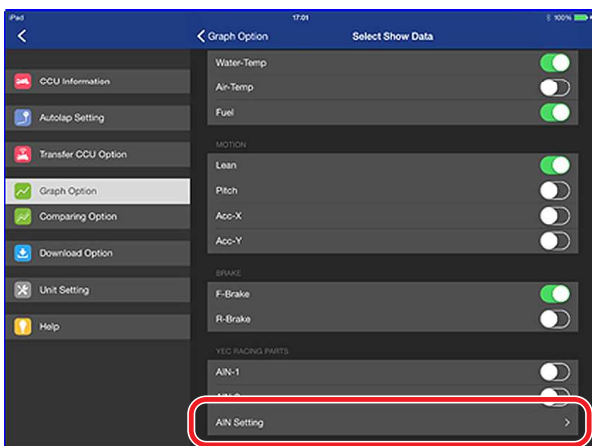
When the following is stated in the sensor's manual

"AF value: voltage x 1.6 +10"

Factor **1.6000**
Offset **10.0000**
Min Y-axis **10.00**
Max Y-axis **20.00**
(Min Y-axis and Max Y-axis can be any given values)

<Example 2>

When the following is stated in the sensor's homepage

"Output voltage is three times the λ value."
↓
AF value: output voltage x 14.7 / 3

Factor **4.9000**
Offset **0.0000**
Min Y-axis **10.00**
Max Y-axis **20.00**
(Min Y-axis and Max Y-axis can be any given values)
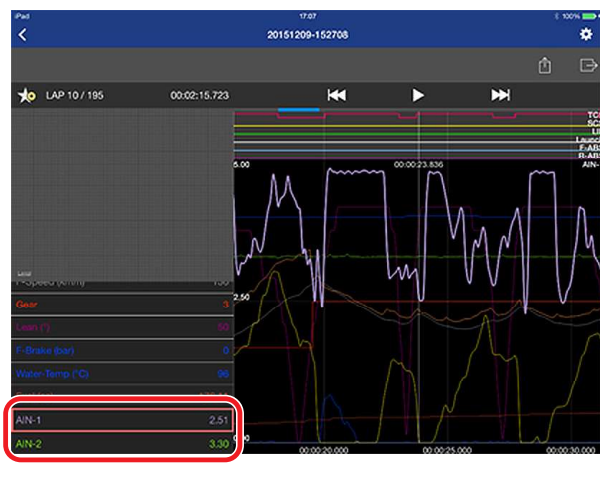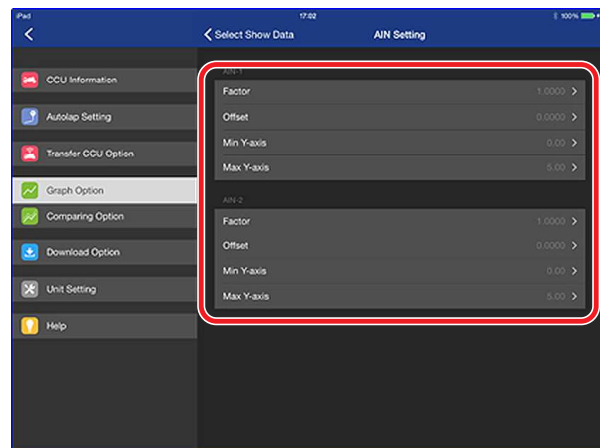
Other usages

Meter setting

To indicate CCU's detection of line passing on the meter, enable the stop watch function on the meter (blink ":" (column) and "." (period) in area 2).

<Wheel switch operation procedure>
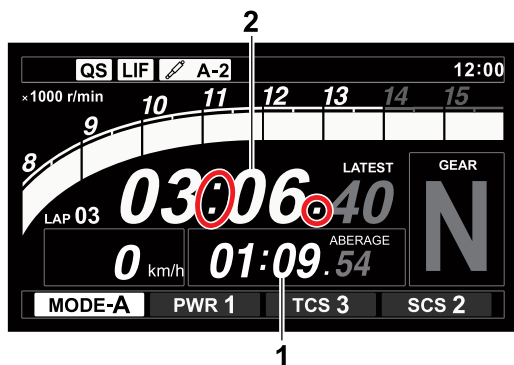
Press the wheel switch to blink area 1.

   ↓

Rotate the wheel switch to blink area 2.

   ↓

Press and hold the wheel switch to blink only ":" (column) and "." (period) in area 2.

This operation is required each time after the main switch is set to ON.

TIP

Regardless of the meter setting, lap data will be recorded in the logging data when line passing is detected,

2-2 Installing Engine Parts

8. Maintenance Set (B3L-MAINT-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	B3L-11181-00	GASKET, CYLINDER HEAD 1	3	t=0.60 mm (STD)
*	2	2CR-11351-00	GASKET, CYLINDER 1	3	t=0.20 mm (STD)
*	3	2CR-11603-10	PISTON RING SET	12	
	4	2CR-1165A-00	BOLT, CONNECTING ROD SPECIAL	24	
*	5	93450-18169	CIRCLIP	24	
*	6	3P6-12129-00	SEAL, VALVE STEM OIL 2	24	INT
*	7	4TE-12119-00	SEAL, VALVE STEM OIL	24	EXT
*	8	BX4-13414-00	GASKET, STRAINER	3	OIL PAN
°	9	2CR-15451-70	GSKT., CRANKCASE COVER 1	3	GENERATOR COVER
°	10	2CR-15461-70	GSKT., CRANKCASE COVER 2	3	CLUTCH
°	11	2CR-15456-70	GSKT., 1	3	PICK UP
*	12	2CR-15462-00	GSKT., CRANKCASE COVER 3	3	BREATHER
*	13	93102-40330	SEAL, OIL	3	DRIVE AXLE
*	14	90149-06082	SCREW	9	MAIN AXLE
*	15	90119-09010	BOLT, HEX. W/WASHER	30	CRANK JOURNAL BOLT
*	16	93210-07540	O-RING	24	BALANCER BOLT
*	17	90119-09016	BOLT, HEX. W/WASHER	30	CYLINDER HEAD BOLT

These sets of parts necessary for engine disassembly and maintenance are provided in three (3) sets.
Tighten the connecting rod bolt (4) using the angle tightening method or the elongation control method.

R1 EN0306 2020Rev

NOTICE

The connecting rod bolts should be used in their original condition. Do not apply any oil or degrease. Be careful not to get engine oil or grease on the bolt seat surface or threads. If oil is applied or degrease, replace the bolts with new ones. Use only new bolts for assembly, and do not reuse them.

Angle tightening method

1. Degrease the bolt seat surface and female thread on the connecting rod side, and allow it to dry for at least 5 minutes.
2. Tighten the bolts with a torque wrench to an initial tightening torque of 25.0 ± 2.0 N•m (2.5 ± 0.2 kgf•m).
3. Retighten at an angle of 180° ± 5°.
4. Check that the final tightening torque is between 40.0 and 85.0 N•m (4.0 and 8.5 kgf•m). If the final tightening torque is outside the range, replace the connecting rod bolt with a new one and retighten it.

Elongation control method

1. Measure the total length of the connecting rod bolts before tightening.
2. Tighten the two connecting rod bolts alternately to 10.0 N•m (1.0 kgf•m) each.
3. Retighten the two bolts until they reach 50.0N•m (5.0kgf•m).
   1st time: Tighten both bolts at 10.0N•m (1.0kgf•m).
   2nd time: Tighten both bolts to 20.0 N•m (2.0 kgf•m).
   ↓ ...
   5th time: Tighten both bolts to 50.0 N•m (5.0 kgf•m).
4. Tighten the connecting rod bolts so that the amount of elongation is 0.330 ± 0.005mm from the state before tightening.

If the amount of elongation exceeds the specified value, replace the connecting rod bolts with a new one and retighten it.

R1 EN0102 2022Rev

9. Spark Plug Set (14B-R465B-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	14B-1119C-70	PLUG, SPARK	4	NGK R0465B-10

The spark creating portion of this spark plug is of a semi-surface discharge type of shape.

TIP

Since these spark plugs have a copper gasket, caution is needed during installation on the following points.

1. **The tightening torque is 12 – 15 N•m (1.2 – 1.5 kgf•m).**
2. **When not checking the torque, tighten by rotating through 30° after manual tightening in the case of new plugs. When reusing plugs, tighten by rotating through 15° .**

Reused
(15˚)

New gasket
(30˚)
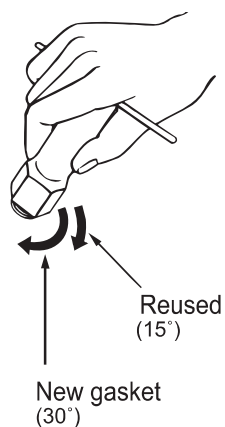
10. Cylinder Head Gasket

Parts List

No.	PART No.	PART NAME	Q'TY	REMARKS
1	B3L-11181-70	GASKET CYLINDER HEAD	1	t=0.45mm Stamp:00
2	B3L-11181-80	GASKET CYLINDER HEAD	1	t=0.50mm Stamp:01
3	B3L-11181-90	GASKET CYLINDER HEAD	1	t=0.55mm Stamp:02

*the thickness of a standard part is t=0.60mm.

This parts are used to adjust the compression ratio for improving performance by selecting given gasket (thickness).

Be sure to measure the squish height and choose the appropriate gasket so that it meets the recommended height.

(Recommended squish height: INT:0.65~0.75mm, EXT:0.95~1.00mm)

TIP

Squish height means the gap between the flat portion of the piston and the head cylinder.

Stamping location
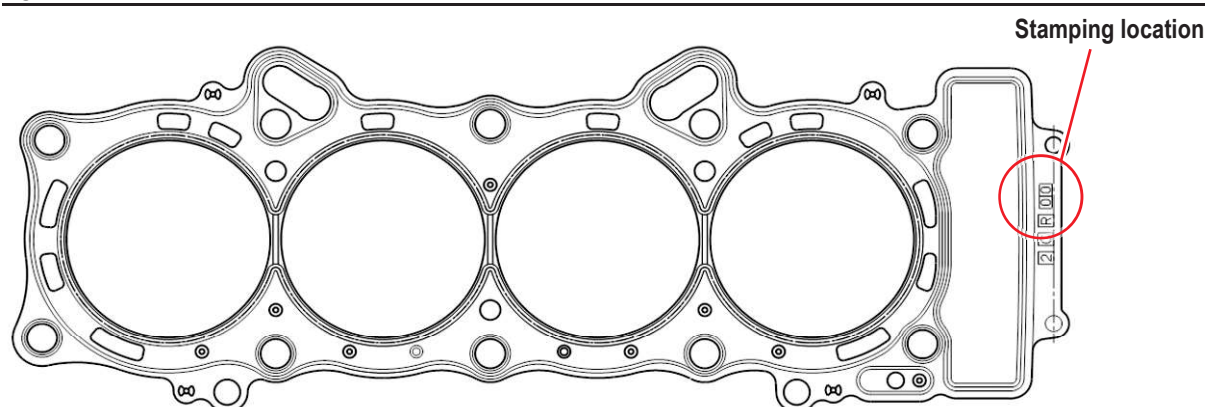
Measuring the volume of the cylinder head combustion chamber

TIP

Squish height means the gap between the flat portion of the piston and the head cylinder.

Measure the volum of the combustion chamber of the cylinder head (commonly cakked the dome volime) as follouws.

The combustion chamber volume (commonly known as dome volume) of a cylinder head is measured as follows

Measuring equipment
1. Burette
2. Clear plastic plate
3. Oil (3:1 mixture of torque converter oil and white gasoline)
4. Vaseline (to seal the valve and the plastic plate)

Measurement method
1. Tighten a regulation spark plug to the regulation torque in the cylinder head to be measured .
2. Set so that the alignment surface of the combustion chamber is level.
3. Apply a thin coat of Vaseline to the valve face and set the IN and EX valves.
4. Apply a thin coat of Vaseline to the combustion chamber alignment surface, and set the plastic plate.
5. Add drops of oil from the burette. The total added amount minus the valve back clearance is the volume of the combustion chamber.

11．Piston Set (2CR-116A0-71)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	2CR-11631-10	PISTON	4	
*	2	2CR-11603-10	PISTON RING SET	4	
*	3	2CR-11633-00	PIN, PISTON	4	
*	4	93450-18169	CIRCLIP	8	

This set consists of a combination of four genuine pistons so that the weight difference of each item does not exceed 0.5 g.

12．Connecting Rod Set (2CR-1165B-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	2CR-11650-00	CONN. ROD ASSY. 1	4	

This set consists of four genuine connecting rod assemblies and the weight difference of each item does not exceed 2 g and combine them so that the small end weights are uniform.(by Yamaha's measuring method)

13．Crankshaft (B3L-11400-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	B3L-11400-70	CRANK ASSY.	1	

This item is a genuine crankshaft with good balance.

About compatibility between the piston set, connecting rod set and crankshaft (by model year)

MODEL	Piston set	Connecting Rod Set	Crankshaft
2015	2CR-116A0-70		2CR-11400-70
2016			
2017			2CR-11400-71
2018	2CR-116A-71	2CR-1165B-70	
2019			
2020			
2021			B3L-11400-70
2022			

Piston set:

As the component parts (piston and piston ring) of the 2016 to 2022 models are different from that of the 2015 model, the 2015 model and 2016 to 2022 models are not compatible each other.

Be sure to use a combination of a piston and a piston ring of same model year.

Since the piston set of the kit consists of pistons, piston rings and piston pins, the set enables installing those items on any model-year engine at once.

Connecting rod:

No change.

Crankshaft:

As a thrust bearing is added to the #4 cylinder for the 2016 to 2022 model engine, the 2015 model and 2016 to 2022 models are not compatible each other.

The 2015 model crankshaft is currently not available in the kit.

Please purchase a Yamaha genuine part when a 2015 model crankshaft is needed.

14. High-lift Camshafts for SBK

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-12170-80	SHAFT CAM 1	1	INT
	2	B3L-12180-80	SHAFT CAM 2	1	EXT

Tightening torque 24±2Nm
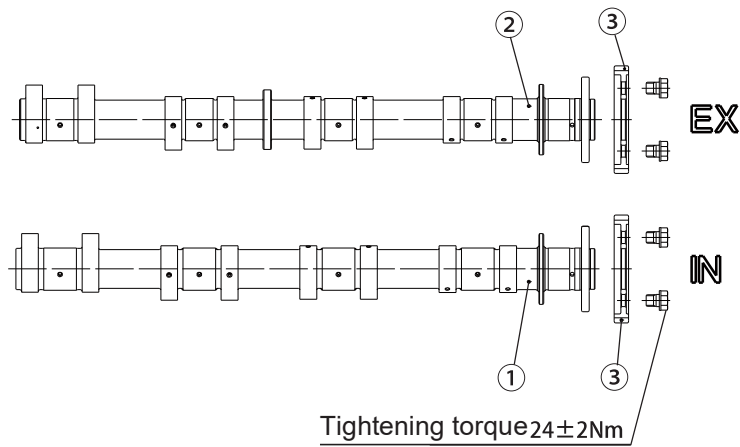
15. Cam Sprocket for SBK (B3L-12176-70)

	No.	PART No.	PART NAME	Q'TY	REMARKS
	3	B3L-0012176-70	SPROCKET, CAM	1	INT/EXT-shared use

Possible to adjust the valve timing using the long holes on the cam sprocket.

USE THESE OVAL HOLES FOR TIMING ADJUSTMENT.
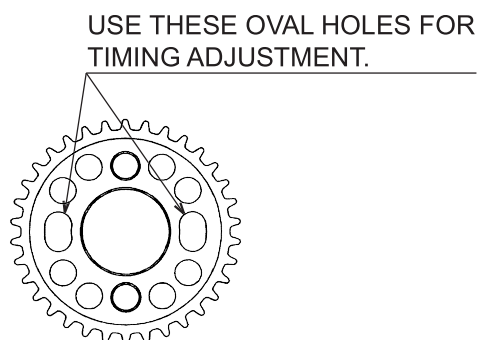
Installation

1. Fit the scratch line on the camshaft to the compression top dead point 105 degree (K mark position) to combine the camshaft and cylinder head surface.

2. Adjust the valve timing (to the value stated on the normal specifications) using the long holes.

<How to position at #1 cylinder's compression top dead point 105°>

Fit the assembly (K) mark of the rotor assembly to the case surface line. (#1 cylinder compression top dead point 105 degree)

< Position to install the cam sprocket at #1 cylinder compression top dead point 105°>

Tighten using the long holes on the cam sprocket.

Intake valve timing mark (Scratch line)

IN

EX

Exhaust #1 cam nose

Exhaust valve timing mark (Scratch line)

Intake #1 cam nose

Exhaust side

#1 #2 #3 #4

Intake side
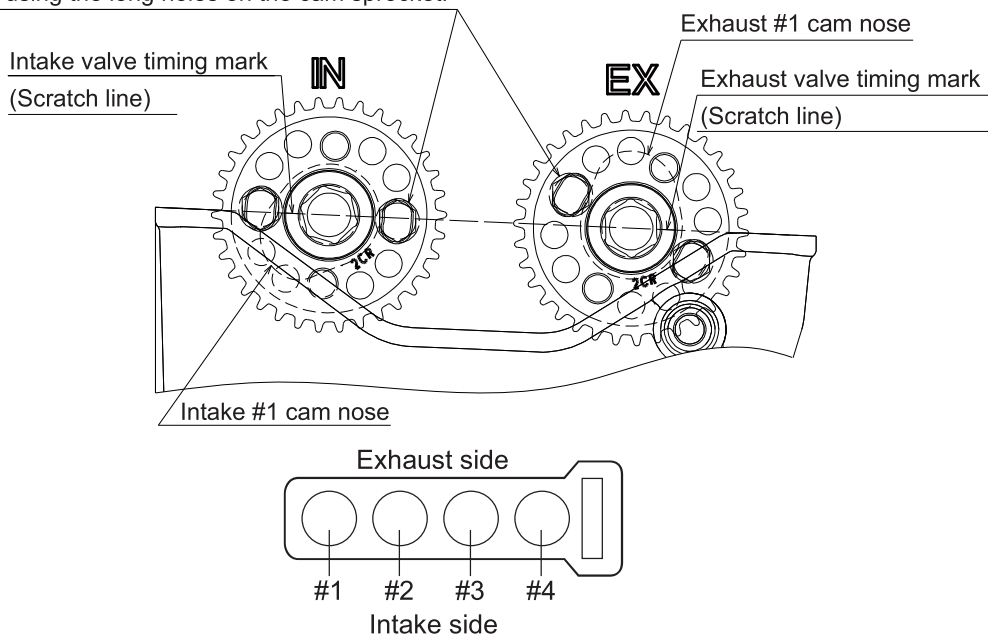
NOTICE

When fitting the camshaft, use the slotted holes of the cam sprockets and always set the timing to match. If otherwise, no intended performance can be expected and more over, the engine may be damaged.

The set of the camshaft, cam sprocket, valve spring, ECU and air funnel must be used in the following combination.

MODEL	SHAFT CAM 1 INT	SHAFT CAM 2 EXT	CAM SPROCKET	VALVE SPRING SET	AIR FUNNEL SET	ECU SET	WIRE HARNESS SET	METER(REPAIR SET)
2015					MGC-191114-00	2CR-8591A-70		
2016 2017	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-70 2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	2CR-8591A-71 2CR-8591A-72	2CR-F2590-70	R1:2CR-83500-00 (SET No.2CR-28130-70) R1M:2KS-83500-00 (2KS-28130-70)
2018 2019	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	BX4-8591A-70 BX4-8591A-71	BX4-F2590-70	R1:BX4-83500-30 (SET No.B3L-28130-70) R1M:2KS-83500-60 (SET No.2KS-28130-80)
2020 2021 2022	B3L-12170-70	B3L-12180-70	B3L-12176-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	B3L-1440B-70	B3L-8591A-71	B3L-F2590-70	R1:B3L-83500-00 (SET No.B3L-28130-70) R1M:B4S-83500-00 (SET No.B4S-28130-70)
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	Use with original cam sprocket of YZF-R1.	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	B3L-12177-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SBK	B3L-12170-80	B3L-12180-80	B3L-12176-70	2CR-A2110-72	B3L-1440B-80	B3L-8591A-72		

NOTICE

Using in other combinations may possibly damage the engine.
Be sure to use in the combination as stated above.

16. Cam Sprocket ASSY. for SST (B3L-12177-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	0WX2-12176-00	CAM SPROCKET	2	INT/EXT-shared use
	2	0WX2-90003-00	HOLDER, CAM SPROCKET	2	
	3	0WX2-90004-00	SCREW, CAM SPROCKET	6	

This part is attached to the STD camshaft and changes the valve timing to improve the output.

Meaning of the symbol marks in the figures

: Tighten based on the specified tightening torque

Installation

1. Mark the camshaft end face on the sprocket mountain centerline at the "I" mark on the INT/EXT cam sprocket.

INT   EXT
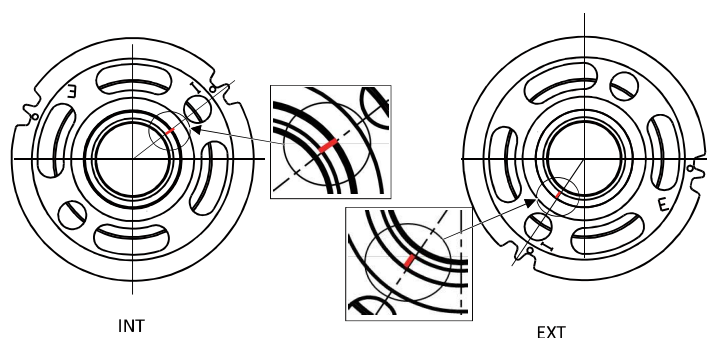
2. Remove the STD cam sprocket from the camshaft using a press machine.

3. Align the center of the screw hole of the cam sprocket holder with the phase of the mark made in step 1, and press-fit the cam sprocket holder. Press-fit the cam sprocket holder until the end face of the cam sprocket holder meets the end face of the camshaft.

Align the center of the M6 screw hole of the cam sprocket holder

Camshaft   Align the end faces

Cam sprocket holder
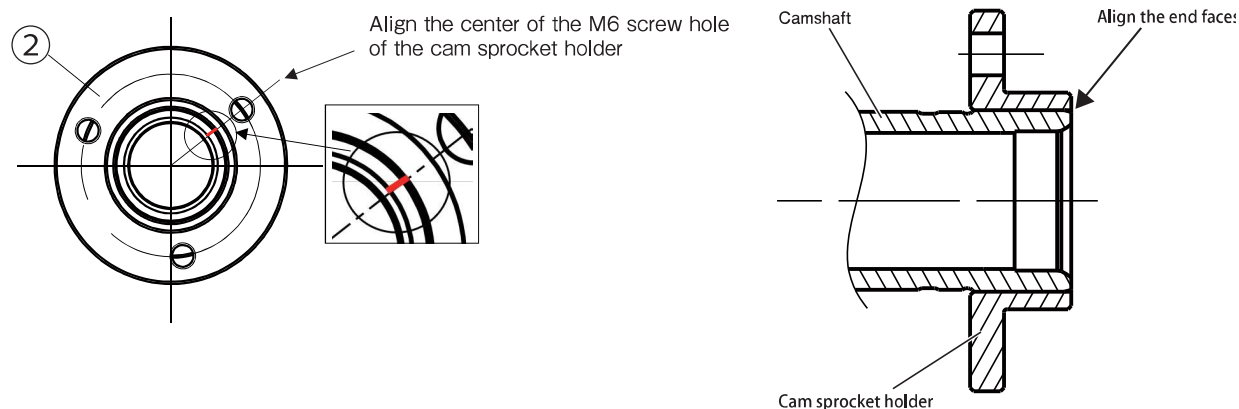
4. Assemble the kit cam sprocket in the position where the mark made in step 1. and the "B3L" mark are diagonal.

🔧 **12±2 N·m**

"B3L" mark

🔧 **12±2 N·m**
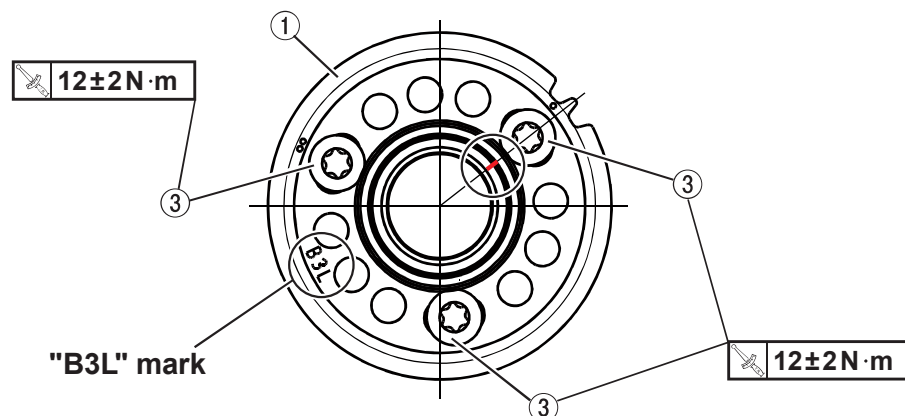
5. When assembling to the cylinder head, align the center of the two exhaust marks on the kit cam sprocket with the top surface of the exhaust side cylinder head.

[2 punches]
EXT alignment mark

[A punch]
INT alignment mark

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The set of the camshaft, cam sprocket, valve spring, ECU and air funnel must be used in the following combination.

MODEL	SHAFT CAM 1 INT	SHAFT CAM 2 EXT	CAM SPROCKET	VALVE SPRING SET	AIR FUNNEL SET	ECU SET	WIRE HARNESS SET	METER(REPAIR SET)
2015					MGC-191114-00	2CR-8591A-70		
2016	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-70 2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	2CR-8591A-71 2CR-8591A-72	2CR-F2590-70	R1:2CR-83500-00 (SET No.2CR-28130-70) R1M:2KS-83500-00 (2KS-28130-70)
2017								
2018 2019	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	BX4-8591A-70 BX4-8591A-71	BX4-F2590-70	R1:BX4-83500-30 (SET No.BX4-28130-70) R1M:2KS-83500-60 (SET No.2KS-28130-80)
2020 2021 2022	B3L-12170-70	B3L-12180-70	B3L-12176-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	B3L-1440B-70	B3L-8591A-71	B3L-F2590-70	R1:B3L-83500-00 (SET No.B3L-28130-70) R1M:B4S-83500-00 (SET No.B4S-28130-70)
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	Use with original cam sprocket of YZF-R1.	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	B3L-12177-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SBK	B3L-12170-80	B3L-12180-80	B3L-12176-70	2CR-A2110-72	B3L-1440B-80	B3L-8591A-72		

NOTICE

Using in other combinations may possibly damage the engine.
Be sure to use in the combination as stated above.

17. Valve Spring Set (2CR-A2110-72)
Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	2CR-12130-71	SRG'ASSY.1	8	I.D.Color: Blue (INT)
	2	2CR-12140-71	SRG'ASSY.2	8	I.D.Color: Red (EXT)
*	3	2CR-12117-00	RET.VALVE SPRING	8	INT
*	4	2CR-12127-00	RET.VALVE SPRING2	8	EXT

This valve spring is used when the camshaft is mounted from the kit.

This set consists of a valve spring, a valve spring seat and a retainer valve spring.

The set of the camshaft, cam sprocket, valve spring, ECU and air funnel must be used in the following combination.

MODEL	SHAFT CAM 1 INT	SHAFT CAM 2 EXT	CAM SPROCKET	VALVE SPRING SET	AIR FUNNEL SET	ECU SET	WIRE HARNESS SET	METER(REPAIR SET)
2015	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-70 2CR-A2110-71 2CR-A2110-72	MGC-191114-00	2CR-8591A-70	2CR-F2590-70	R1:2CR-83500-00 (SET No.2CR-28130-70)
2016					2CR-1440B-70	2CR-8591A-71 2CR-8591A-72		
2017								R1M:2KS-83500-00 (2KS-28130-70)
2018 2019	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	BX4-8591A-70 BX4-8591A-71	BX4-F2590-70	R1:BX4-83500-30 (SET No.B3L-28130-70) R1M:2KS-83500-60 (SET No.2KS-28130-80)
2020 2021 2022	B3L-12170-70	B3L-12180-70	B3L-12176-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	B3L-1440B-70	B3L-8591A-71	B3L-F2590-70	R1:B3L-83500-00 (SET No.B3L-28130-70) R1M:B4S-83500-00 (SET No.B4S-28130-70)
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	Use with original cam sprocket of YZF-R1.	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	B3L-12177-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SBK	B3L-12170-80	B3L-12180-80	B3L-12176-70	2CR-A2110-72	B3L-1440B-80	B3L-8591A-72		

NOTICE

Using in other combinations may possibly damage the engine.

Be sure to use in the combination as stated above.

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18. Air Funnel Set (B3L-1440B-80)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-14479-80	SECONDARY FUNNEL	1	
	2	B3L-14469-80	PRIMARY FUNNEL 1	1	
*	3	92014-06025	BUTTON HEAD BOLT	3	
	4	B3L-1446C-80	PRIMARY FUNNEL 2	1	
*	5	92014-06025	BUTTON HEAD BOLT	3	

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Installation

1. Assembling the primary funnel

Secure the primary funnel 1 and 2 to the throttle body with the supplied button head bolts. At this time, install the STD lever 1 and 2 and fix them.

Lever 1   Lever 2

2. Assembling the secondary funnel

Install the secondary funnel to the lever 1 and 2. Then, fit the STD bushes to the lever assembling positions. (5 locations)

Bush (5 locations)

*The funnel shape differs from the photo.

TIP

The STD seal rubber is not used at the bottom surface (face to the primary funnel) of the secondary funnel.

Ycci System Control

You can use the Ycci system as the kit funnel. You can control the operation timing by using the YMS software packed together with the kit ECU.

You can also control the STD funnel by using the YMS software.

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The set of the camshaft, cam sprocket, valve spring, ECU and air funnel must be used in the following combination.

MODEL	SHAFT CAM 1 INT	SHAFT CAM 2 EXT	CAM SPROCKET	VALVE SPRING SET	AIR FUNNEL SET	ECU SET	WIRE HARNESS SET	METER(REPAIR SET)
2015					MGC-191114-00	2CR-8591A-70		
2016	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-70 2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	2CR-8591A-71 2CR-8591A-72	2CR-F2590-70	R1:2CR-83500-00 (SET No.2CR-28130-70) R1M:2KS-83500-00 (2KS-28130-70)
2017								
2018 2019	2CR-12170-70	2CR-12180-70	B3L-12176-70	2CR-A2110-71 2CR-A2110-72	2CR-1440B-70	BX4-8591A-70 BX4-8591A-71	BX4-F2590-70	R1:BX4-83500-30 (SET No.B3L-28130-70) R1M:2KS-83500-60 (SET No.2KS-28130-80)
2020 2021 2022	B3L-12170-70	B3L-12180-70	B3L-12176-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	B3L-1440B-70	B3L-8591A-71	B3L-F2590-70	R1:B3L-83500-00 (SET No.B3L-28130-70) R1M:B4S-83500-00 (SET No.B4S-28130-70)
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	Use with original cam sprocket of YZF-R1.	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SST	Use with original cam shaft of YZF-R1. B3L-12170-00	Use with original cam shaft of YZF-R1. B3L-12180-00	B3L-12177-70	Use with original valve springs of YZF-R1. BX4-12113-00 BX4-12114-00 BX4-12123-00 BX4-12124-00	Use with original air funnel of YZF-R1. B3L-1440B-01	B3L-8591A-A0		
2020 2021 2022 for SBK	B3L-12170-80	B3L-12180-80	B3L-12176-70	2CR-A2110-72	B3L-1440B-80	B3L-8591A-72		

NOTICE

Using in other combinations may possibly damage the engine.
Be sure to use in the combination as stated above.

19. AIS-plug Set (2CR-A4890-70)

This plug set is used when the AIS (Air Induction System), an exhaust gas purifying system, is removed.

Parts List

No.	PART No.	PART NAME	Q'TY	REMARKS
1	5SL-1482L-70	PLATE, 2	2	
2	2CR-11159-70	PLUG, BLIND	4	
3	90336-10020	PLUG, TAPER	1	

Installation

1. Remove the hose attached to the cylinder head cover and the air cut-off valve accompanying the hose.

2. Remove the cap fitted to the hose, remove the reed valve and plate from inside.

3. Install the ① PLATE,2 (5SL-1482L-70) in replacement of the cap. Be sure to apply liquid gasket.

4. Remove the cylinder head cover and the four collars fitted to the head cover, and install the ② PLUG, BLIND (2CR-A4890-70).

5. After removing the hose connected to the air filter casing form the air-cut valve assembly, insert the ③ PLUG, TAPER (90336-10020) onto the side of the air filter casing to close the opening.
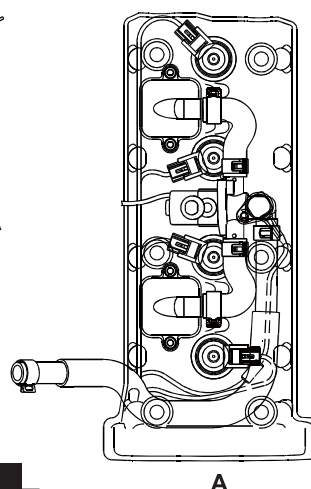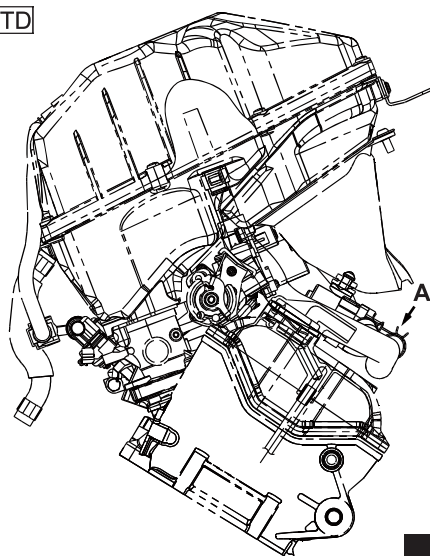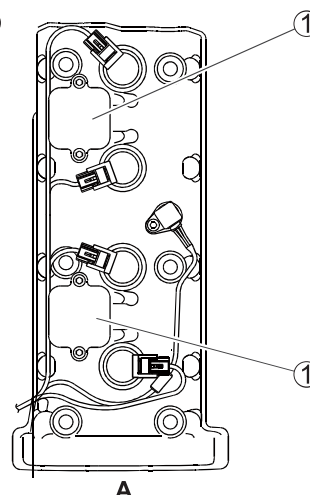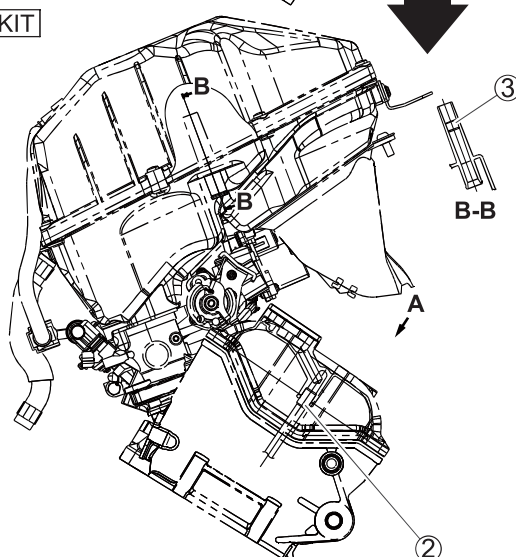
20. Clutch Spring Spacer(B3L-16332-70)

Parts List

No.	PART No.	PART NAME	Q'TY	REMARKS
1	90387-06037	COLLAR	3	

This spacer is intended to reduce rear tire hopping during deceleration.

Installation

1. Install between the pressure plate 1 and the pressure plate 2.

Pressure plate 2

①
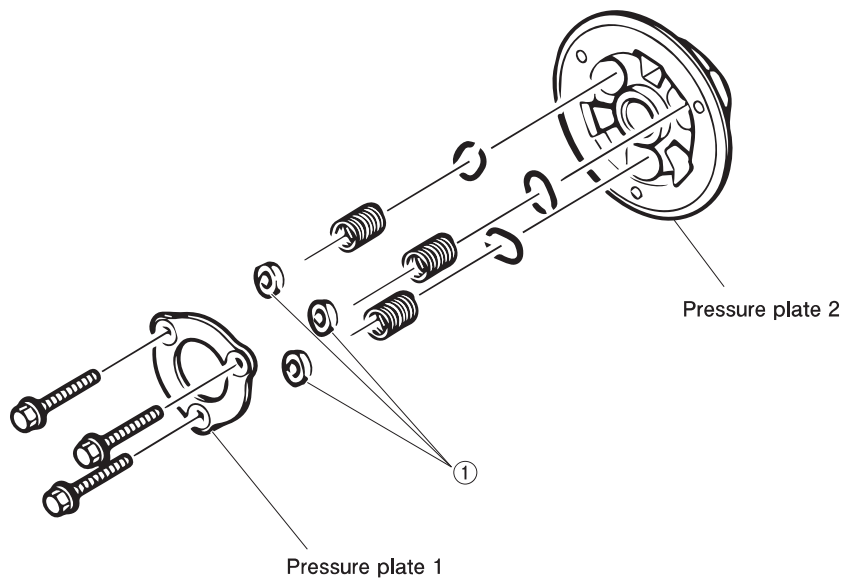
Pressure plate 1

2. Remove the clutch cover damper plate and clutch cover damper from the clutch cover, then install the clutch cover.

Clutch cover damper plate

Clutch cover damper

Clutch cover
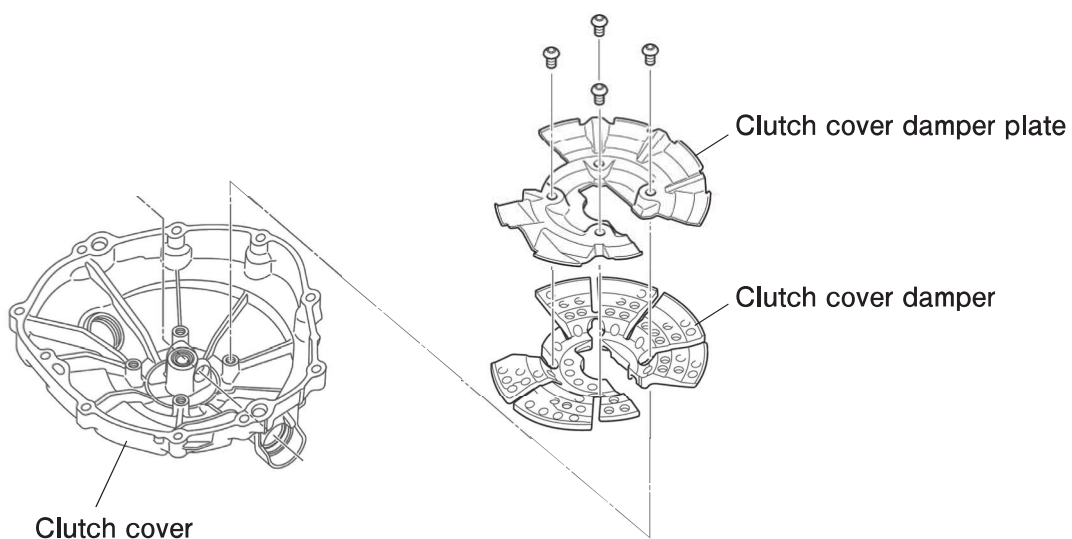
21. Cluch boss set (B3L-16370-70)

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-16371-70	BOSS,CLUTCH	1	
	2	B3L-16350-70	PRESSURE PLATE ASSY.,1	1	

By using this part together with Clutch Spring
Spacer(B3L-16332-70),the hopping of the
rear tire during deceleration can be further
reduced.

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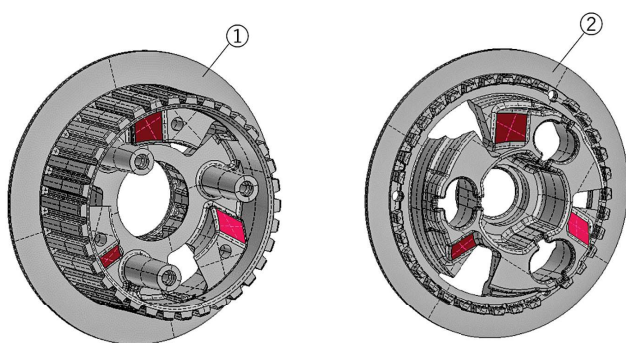
22. Transmission Gear

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	2CR-17401-70	MAIN AXLE ASSY.	1	
	2	2CR-17121-70	GEAR, 2ND PINION	1	
	3	2CR-17131-70	GEAR, 3RD PINION	1	
	4	2CR-17151-70	GEAR, 5TH PINION A	1	
	5	2CR-17151-80	GEAR, 5TH PINION B	1	
	6	2CR-17161-70	GEAR, 6TH PINION A	1	
	7	2CR-17161-80	GEAR, 6TH PINION B	1	
*	8	2CR-17402-00	DRIVE AXLE ASSY.	1	
	9	2CR-17211-70	GEAR, 1ST WHEEL	1	
	10	2CR-17221-70	GEAR, 2ND WHEEL	1	
	11	2CR-17231-70	GEAR, 3RD WHEEL	1	
	12	2CR-17241-70	GEAR, 4TH WHEEL	1	
	13	2CR-17251-70	GEAR, 5TH WHEEL A	1	
	14	2CR-17251-80	GEAR, 5TH WHEEL B	1	
	15	2CR-17261-70	GEAR 6TH WHEEL A	1	
	16	2CR-17261-80	GEAR 6TH WHEEL B	1	

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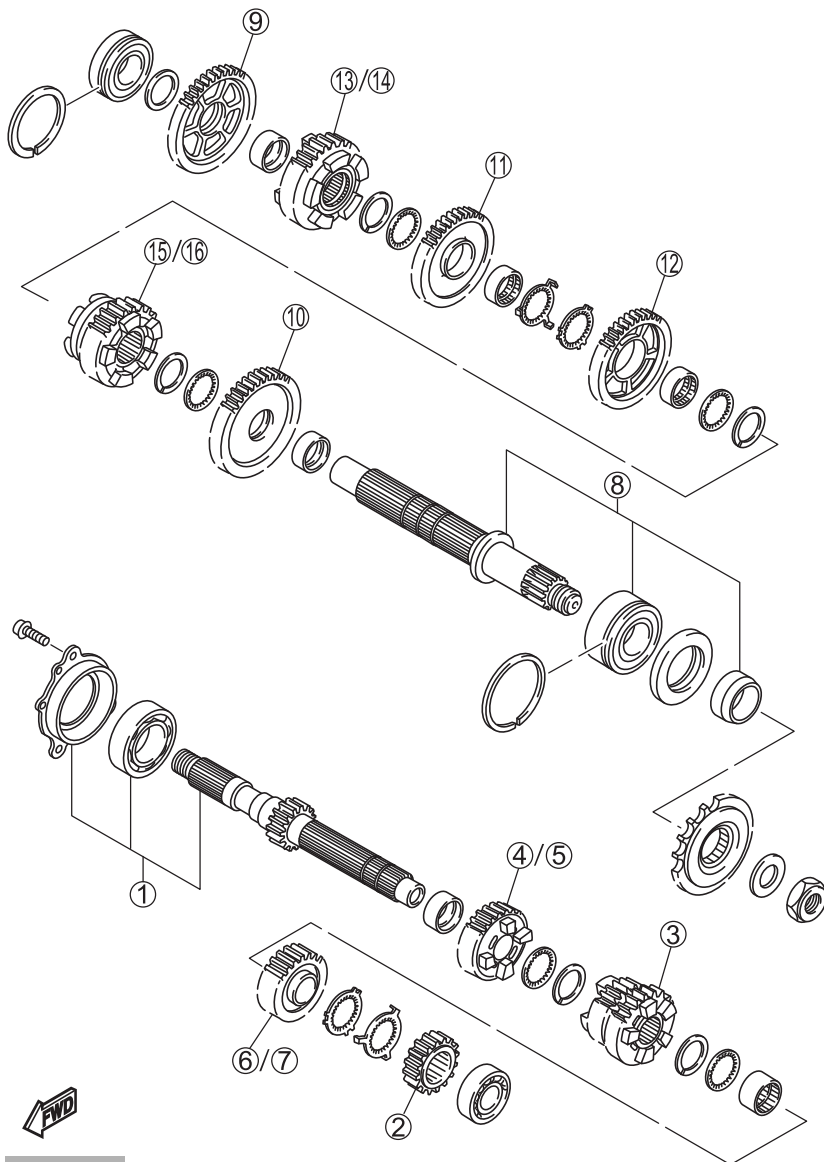
NOTICE

This set contains modified gear ratios and docks compared with the STD gearbox. Kit gears cannot use combine standard gear.

Gear ratio

	STD	KIT
1st	39/15 (2.600)	39/16 (2.438)
2nd	37/17 (2.176)	35/17 (2.059)
3rd	35/19 (1.842)	34/19 (1.789)
4th	30/19 (1.579)	33/21 (1.571)
5th(A)	29/21 (1.381)	32/22 (1.455)
5th(B)	-	31/22 (1.409)
6th(A)	30/24 (1.250)	30/22 (1.364)
6th(B)	-	33/25(1.320)

YZF-R1 Speed List

Engine speed (rpm) 13900
Primary reduction ratio 1.63
Tire diameter (mm) 642

GEAR	PLAN	P	W	Ratio	16/46	15/43	14/40	16/45	15/42	14/39	16/44	15/41	14/38	16/43	15/40	16/42	15/39	16/41	15/38	16/40	16/39	16/38
1st	STD	15	39	2.60	137.6	138.0	138.5	140.7	141.3	142.0	143.9	144.8	145.8	147.2	148.4	150.7	152.2	154.4	156.2	158.3	162.3	166.6
1st	KIT	16	39	2.44	146.8	147.2	147.7	150.1	150.7	151.5	153.5	154.4	155.5	157.1	158.3	160.8	162.3	164.7	166.6	168.8	173.2	177.7
2nd	STD	17	37	2.18	164.4	164.9	165.4	168.1	168.8	169.7	171.9	172.9	174.2	175.9	177.3	180.1	181.8	184.5	186.6	189.1	193.9	199.0
2nd	KIT	17	35	2.06	173.8	174.3	174.9	177.7	178.5	179.4	181.7	182.8	184.1	185.9	187.4	190.4	192.2	195.0	197.3	199.9	205.0	210.4
3rd	STD	19	35	1.84	194.3	194.8	195.5	198.6	199.5	200.5	203.1	204.3	205.8	207.8	209.4	212.8	214.8	218.0	220.5	223.4	229.1	235.2
3rd	KIT	19	34	1.79	200.0	200.6	201.2	204.4	205.3	206.4	209.1	210.3	211.8	213.9	215.6	219.0	221.1	224.4	226.9	230.0	235.9	242.1
4th	STD	19	30	1.58	226.6	227.3	228.1	231.7	232.7	233.9	236.9	238.4	240.1	242.5	244.3	248.2	250.6	254.3	257.2	260.6	267.3	274.4
4th	KIT	21	33	1.57	227.7	228.4	229.1	232.8	233.8	235.0	238.1	239.5	241.2	243.6	245.5	249.4	251.8	255.5	258.4	261.9	268.6	275.7
5th	STD	21	29	1.38	259.1	259.9	260.8	264.9	266.1	267.4	270.9	272.6	274.5	277.2	279.4	283.8	286.5	290.7	294.1	298.0	305.6	313.7
5th	KIT(A)	22	32	1.45	246.0	246.7	247.6	251.5	252.6	253.9	257.2	258.8	260.6	263.2	265.2	269.5	272.0	276.0	279.2	282.9	290.2	297.8
5th	KIT(B)	22	31	1.41	254.1	254.8	255.7	259.7	260.9	262.2	265.6	267.3	269.1	271.8	273.9	278.3	281.0	285.1	288.4	292.2	299.7	307.6
6th	STD	24	30	1.25	286.3	287.1	288.1	292.6	293.9	295.5	299.3	301.1	303.2	306.3	308.6	313.5	316.6	321.2	324.9	329.2	337.7	346.6
6th	KIT(A)	22	30	1.36	262.4	263.2	264.1	268.3	269.5	270.8	274.4	276.0	278.0	280.7	282.9	287.4	290.2	294.4	297.8	301.8	309.5	317.7
6th	KIT(B)	25	33	1.32	271.1	271.9	272.8	277.1	278.4	279.8	283.4	285.1	287.2	290.0	292.3	296.9	299.8	304.2	307.7	311.8	319.8	328.2

GEAR	PLAN	P	W	Ratio	14/49	14/48	14/47	14/46	15/49	14/45	15/48	14/44	15/47	14/43	15/46	16/49	14/42	15/45	16/48	16/47	15/44	14/41
1st	STD	15	39	2.60	113.1	115.4	117.9	120.4	121.1	123.1	123.7	125.9	126.3	128.8	129.0	129.2	131.9	131.9	131.9	134.7	134.9	135.1
1st	KIT	16	39	2.44	120.6	123.1	125.7	128.5	129.2	131.3	131.9	134.3	134.7	137.4	137.6	137.8	140.7	140.7	140.7	143.7	143.9	144.1
2nd	STD	17	37	2.18	135.1	137.9	140.8	143.9	144.7	147.1	147.7	150.4	150.9	153.9	154.1	154.4	157.6	157.6	157.6	160.9	161.1	161.4
2nd	KIT	17	35	2.06	142.8	145.7	148.9	152.1	153.0	155.5	156.2	159.0	159.5	162.7	162.9	163.2	166.6	166.6	166.6	170.1	170.4	170.6
3rd	STD	19	35	1.84	159.6	162.9	166.4	170.0	171.0	173.8	174.5	177.7	178.2	181.8	182.1	182.4	186.2	186.2	186.2	190.1	190.4	190.7
3rd	KIT	19	34	1.79	164.3	167.7	171.3	175.0	176.0	178.9	179.7	182.9	183.5	187.2	187.5	187.7	191.6	191.6	191.6	195.7	196.0	196.3
4th	STD	19	30	1.58	186.2	190.0	194.1	198.3	199.5	202.7	203.6	207.3	208.0	212.1	212.5	212.8	217.2	217.2	217.2	221.8	222.1	222.5
4th	KIT	21	33	1.57	187.1	191.0	195.0	199.3	200.4	203.7	204.6	208.3	208.9	213.2	213.5	213.8	218.2	218.2	218.2	222.9	223.2	223.6
5th	STD	21	29	1.38	212.9	217.3	221.9	226.7	228.1	231.8	232.8	237.0	237.8	242.6	242.9	243.3	248.3	248.3	248.3	253.6	254.0	254.4
5th	KIT(A)	22	32	1.45	202.1	206.3	210.7	215.3	216.5	220.1	221.0	225.1	225.7	230.3	230.6	231.0	235.8	235.8	235.8	240.8	241.1	241.5
5th	KIT(B)	22	31	1.41	208.7	213.1	217.6	222.3	223.6	227.3	228.3	232.4	233.1	237.8	238.2	238.5	243.5	243.5	243.5	248.7	249.0	249.4
6th	STD	24	30	1.25	235.2	240.1	245.2	250.5	252.0	256.1	257.2	261.9	262.7	268.0	268.4	268.8	274.4	274.4	274.4	280.2	280.6	281.0
6th	KIT(A)	22	30	1.36	215.6	220.1	224.7	229.6	231.0	234.7	235.8	240.1	240.8	245.6	246.0	246.4	251.5	251.5	251.5	256.8	257.2	257.6
6th	KIT(B)	25	33	1.32	222.7	227.3	232.2	237.2	238.6	242.5	243.6	248.0	248.7	253.8	254.2	254.5	259.8	259.8	259.8	265.3	265.7	266.1

23. Mission Maintenance Set (2CR-A7000-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	21	90387-28003	COLLAR	3	
*	22	90209-25011	WASHER	6	
*	23	93440-28184	CIRCLIP	6	
*	24	90387-25023	COLLAR	3	
*	25	90214-25004	WASHER, CLAW	3	
*	26	90214-25003	WASHER, CLAW	3	
*	27	90387-31003	COLLAR	3	
*	28	90209-28008	WASHER	9	
*	29	93440-31187	CIRCLIP	9	
*	30	90387-28004	COLLAR	6	
*	31	90214-29002	WASHER, CLAW	3	
*	32	90214-28002	WASHER, CLAW	3	
*	33	90387-25008	COLLAR	3	
*	34	93102-40330	SEAL, OIL	3	
*	35	93440-62032	CIRCLIP	3	
*	36	90201-257H0	WASHER, PLAIN	3	
*	37	93306-27214	BRG.	3	
	38	5VY-17166-00	BRG., 2	3	

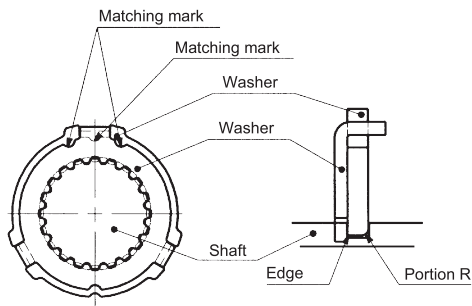This kit contains three (3) sets of parts necessary for transmission disassembly and maintenance.
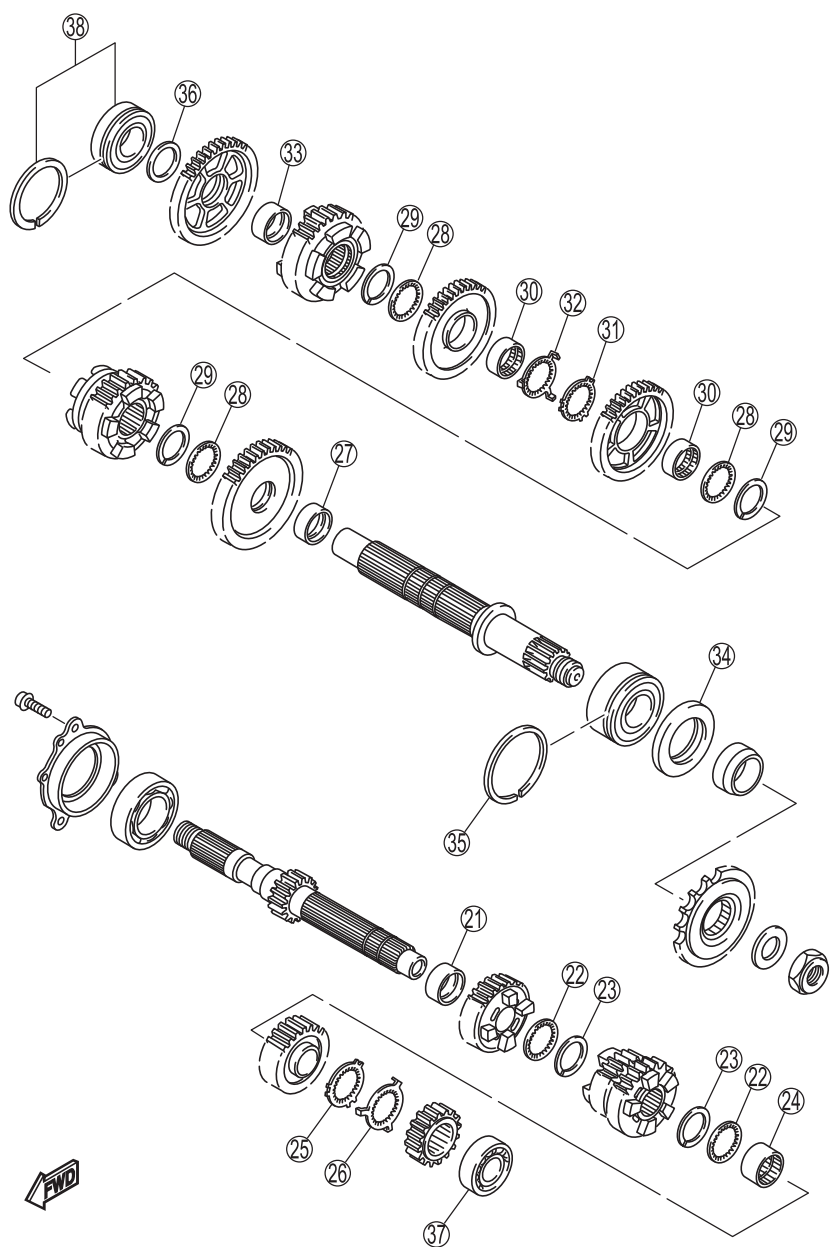
Transmission Assembly

The seal side should face outward (one side seal bearing) and press in the bearing cup all the way into the case until it touches bottom.

A M1 **B** M3 **B** M1 M1

M1 Apply molybdenum oil to inside of diameter. After assembly, it should rotate smoothly.

M2 Apply molybdenum oil to the inside diameter and end. After assembly, it should rotate smoothly.

M3 Apply molybdenum oil to teeth of spline. After assembly, it should slide smoothly.

The seal side should face outward (one side seal bearing) and assembled toward the case right side edge.

Points to be careful of the oil seal assembly
The convex part on the oil seal should be put into the case groove vertically so that the oil seal does not fall over and is tightly fit into the bearing cup of the bearing. (Apply grease to the lip.)

M2 **B** M3 **B** M2 **C** **B** M3 M2

TIP
- **Always use a new circlip.**
- **Do not mistake the washer and circlip directions.**
  (See drawing below.)

Matching mark
Matching mark
Washer
Washer
Shaft
Edge   Portion R

Circlip   Washer
Shaft   Gear
Edge   PortionR

Install the circlip with its inner diameter R portion to the gear side and its edge portion to the opposite side.

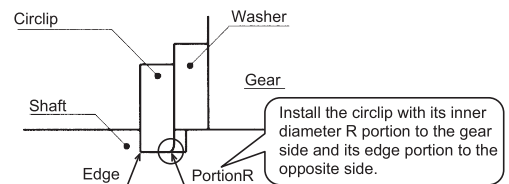Position the center of the abutment joint of the circlip right with the spline threads.

Ⓐ Detail of installation of washer

Rotate washer so that its teeth meet axle-spline teeth on the axle, and then lock with washer's claw.
Assemble washer with putting together their matching mark.
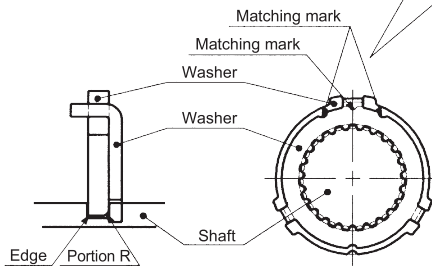
Ⓑ Detail of installation of circlip

Matching mark
Matching mark
Washer
Washer
Edge Portion R
Shaft

Ⓒ Detail of installation of washer

24. Drive Sprockets

Parts List

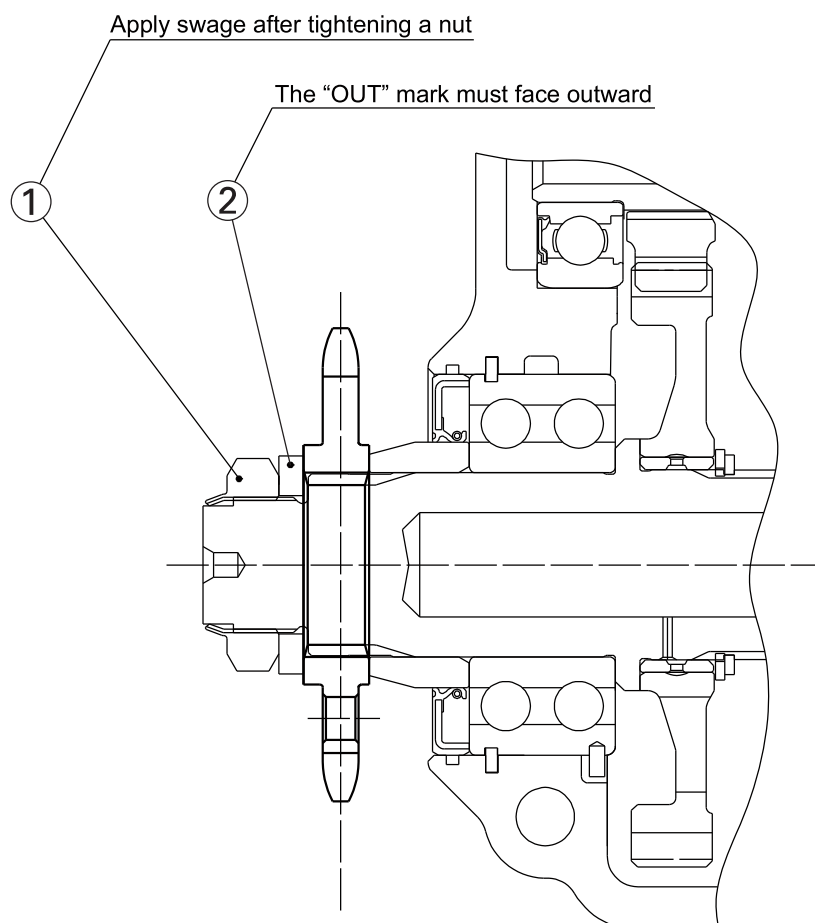| No.	PART No.	PART NAME	Q'TY	REMARKS
1	2CR-17460-74	SPROCKET, DRIVE	1	14T, 520SIZE
2	2CR-17460-75	SPROCKET, DRIVE	1	15T, 520SIZE
3	2CR-17460-76	SPROCKET, DRIVE	1	16T, 520SIZE

This sprocket is weight-saved by changing the
chain size to 520 in relation to the STD one.
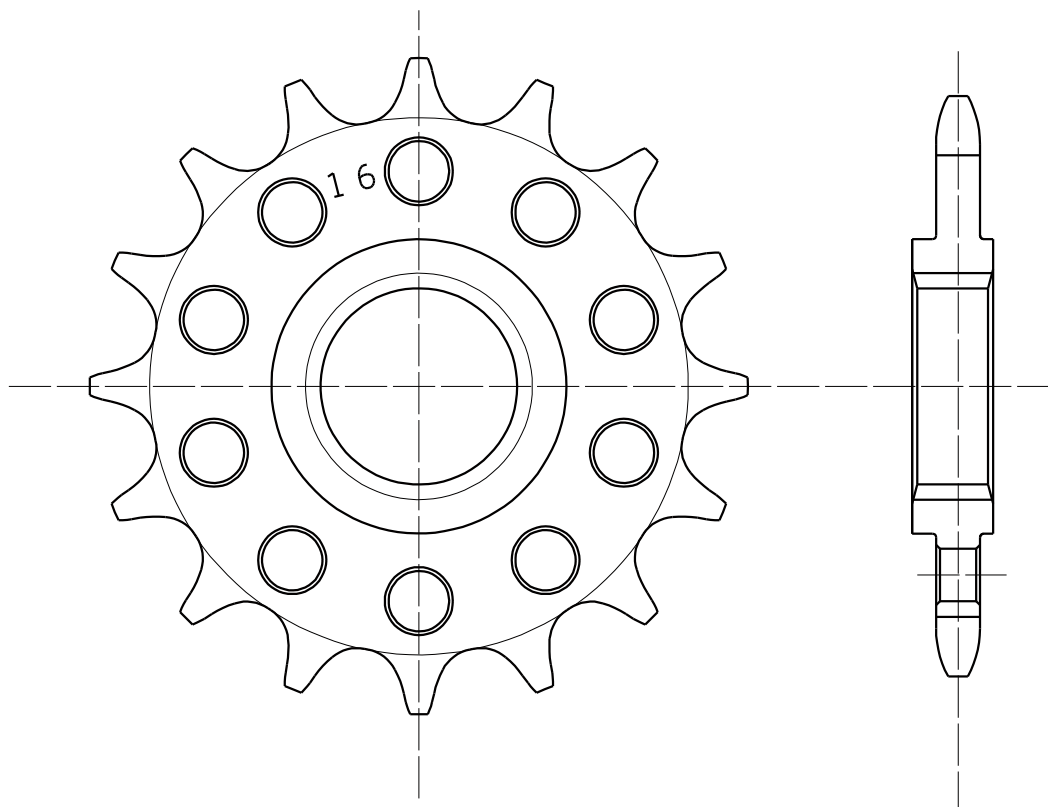
25. Sprocket Nut Set (2CR-A7463-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
*	1	90179-22018	NUT	3	
*	2	90208-22002	WASHER, CONICAL SPRG.	3	

Apply swage after tightening a nut

The "OUT" mark must face outward

26. Strainer Cover Set (2CR-13400-71)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
○	1	2CR-13410-71	STRAINER HSG.ASSY.	1	
○	2	2CR-13576-70	SPACER	1	
*	3	93210-22M93	O-RING	2	2 attachment, Grease outer surface
*	4	92017-06014	BOLT,BUTTON HEAD	2	2 attachment
*	5	90110-06172	BOLT, HEX. SOCKET	2	1 attachment
○	6	2CR-13418-70	PIPE,OIL 2	1	
○	7	2CR-13416-71	PIPE,OIL 1	1	
*	8	93210-14003	O-RING	3	6, 7 attachment, Grease outer surface
*	9	90110-06393	BOLT,HEX. SOCKET	1	6 attachment
*	10	90110-06182	BOLT,HEX. SOCKET	1	7,23 attachment
○	11	2CR-13161-70	PIPE,DELIVERY 1	1	
*	12	90480-13010	GROMMET	1	1,11,23 attachment
*	13	5VY-13117-10	COLLAR,DISTANCE	1	1,11,23 attachment
*	14	90109-06015	BOLT	1	1,11,23 attachment
○	15	2CR-1310A-70	PAN,OIL	1	The number of the oil window changed: 2 ('16 kit) → 1 ('17~ kit)
	16	0NC0-90100-00	BOLT	12	15 attachment M6×1.0×L25
*	17	90340-14019	PLUG,STRAIGHT SCREW	1	
*	18	90430-14005	GASKET	1	
○	19	2CR-13414-70	GASKET, STRAINER	1	1 attachment
○	20	2CR-13317-70	BAFFLE, PLATE	1	
*	21	90119-06115	BOLT	4	20 attachment
*	22	90201-09M01	WASHER,PLAIN	1	1,11,23 attachment
○	23	2CR-13428-70	BRKT.,STRAINER 1	1	1,11 attachment

The tightening torque of this set is same as that of STD.

Use the screw locking solvent and grease same as STD.

For details, refer to the STD service manual published by Yamaha Motor Co.,Ltd.

For details on installation of this set, see the next page.

Meaning of the symbol marks in the figures

: Apply LOCTITE 620

: Tighten based on the specified tightening torque

– 51 –

Installation

1. Put (**8**) O-RING at (**7**) PIPE,OIL **1**, and connect (6) PIPE,OIL **2** to (**7**)PIPE,OIL **1**.
2. Attach (**6**) PIPE,OIL **2** to the engine by using (**8**) O-RING and (**9**) BOLT,HEX. SOCKET.
3. Attach (**7**)PIPE,OIL **1** and (**23**)BRKT.,STRAINER 1 to the engine by using(**8**)O-RING and(**10**) BOLT,HEX. SOCKET (tighten (**7**) PIPE,OIL **1** together with (**23**) BRKT.,STRAINER **1**).
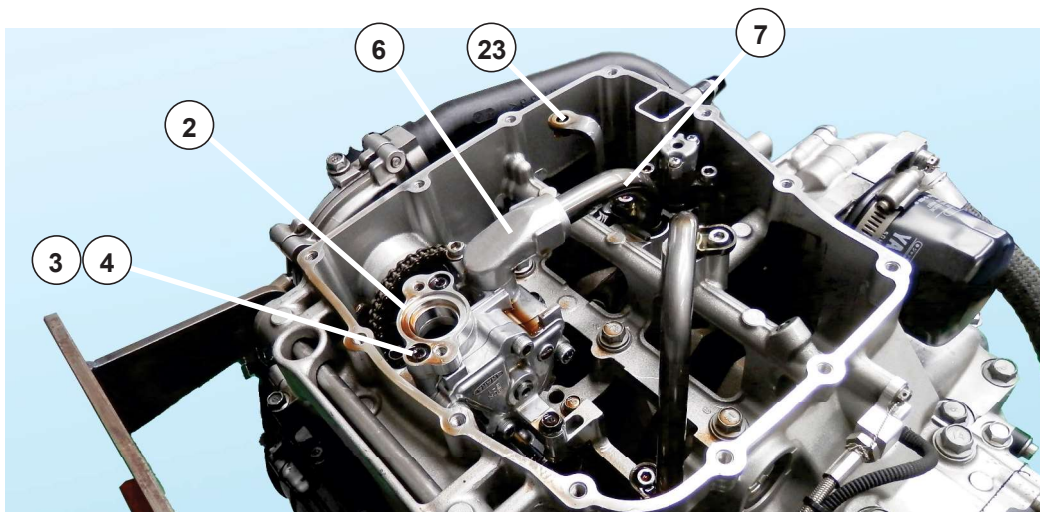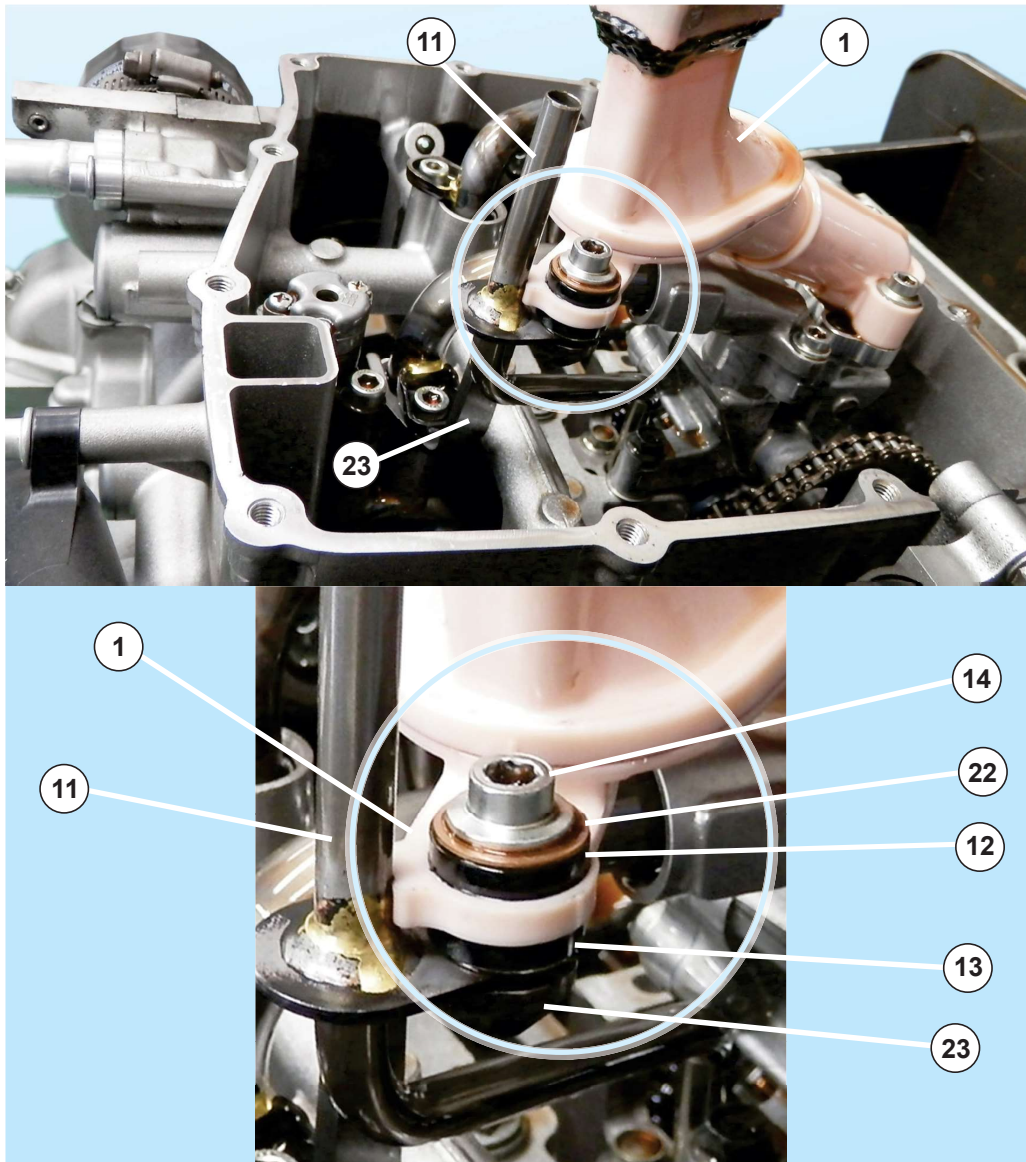

TIP

**Visually confirm the condition of 6 PIPE,OIL 2 and 7 PIPE,OIL 1 periodically.**

4. Attach (11)PIPE, DELIVERY 1 to the engine.
5. Fix (1) STRAINER HSG.ASSY. to the engine by using (5)BOLT,HEX. SOCKET and (19 GASKET, STRAINER.
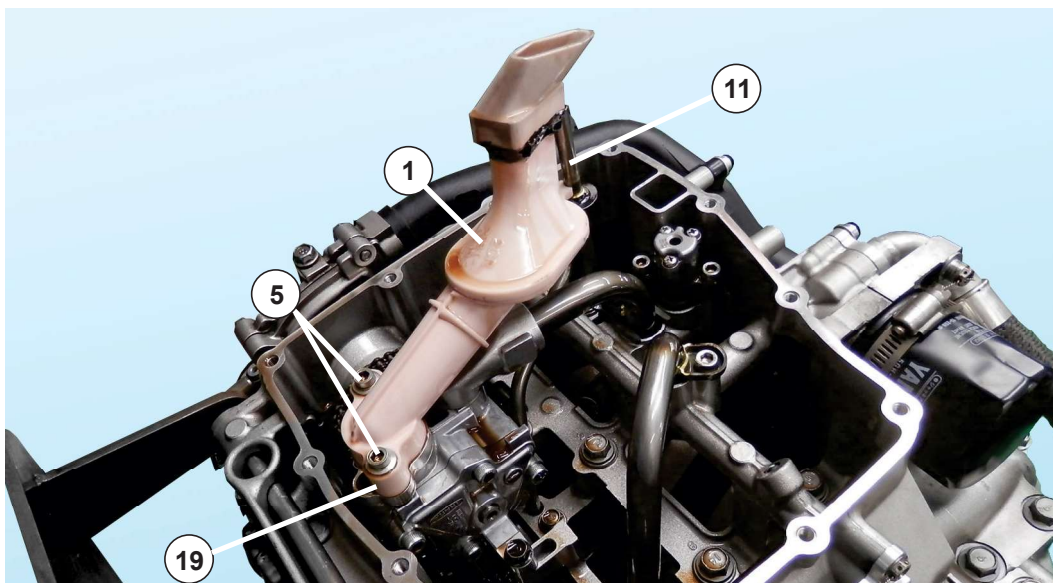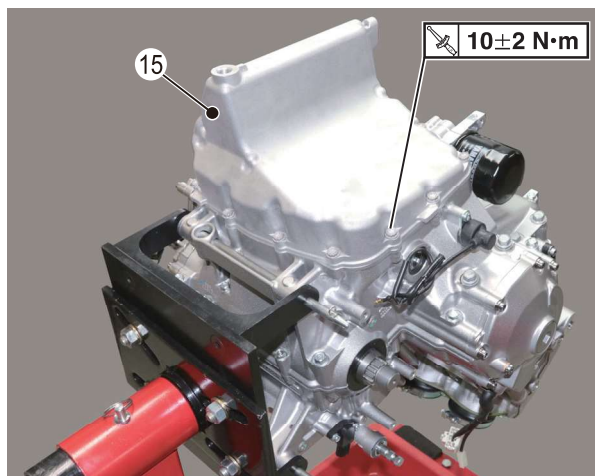
6. Fix **(1)** STRAINER HSG.ASSY., **11** PIPE,
   DELIVERY **1** and **(23)**BRKT.,STRAINER
   1 by using (**12**)GROMMET, (**13**)
   COLLAR,DISTANCE, (**14**) BOLT and (**22**)
   WASHER,PLAIN.

7. Attach (**20**)BAFFLE,PLATE to (**15**)
   PAN,OIL by using **21** BOLT.
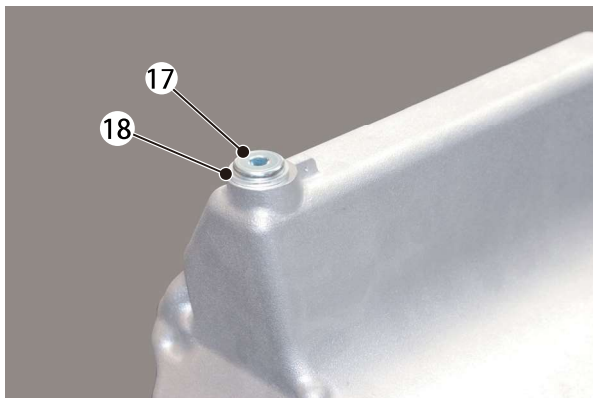

10±2 N·m

LT
620
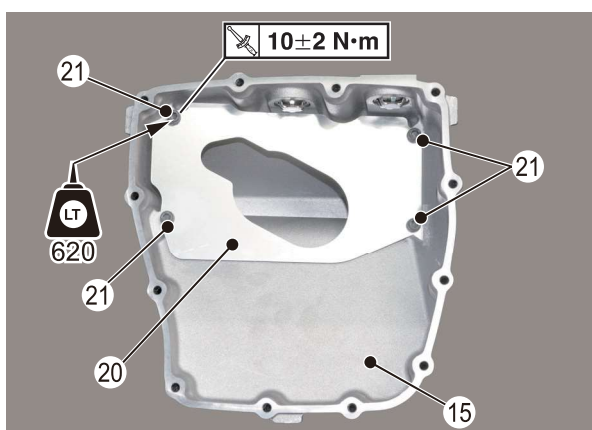
8. Attach (15) PAN,OIL to the engine by using (16)BOLT,BUTTON HEAD.

15   10±2 N·m

TIP

Be sure to check the torque when installing.

9. Attach (17)PLUG,STRAIGHT SCREW and (18)GASKET to (15)PAN,OIL.

17
18

Recommended oil level

After engine warm-up (water temperature of 75 to 80 degrees), while using the racing (rear) stand, and check that the oil level is within a range of the upper limit of the oil pan window (right side of the vehicle) to the lower limit of the engine crank case oil window (left side of vehicle).
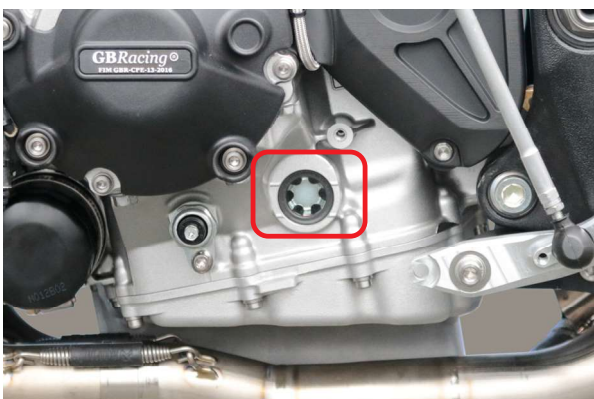
If it is out of range, adjust the oil level.

<Oil pan window (right side of vehicle)>

<Engine crank case oil window (left side of vehicle)>
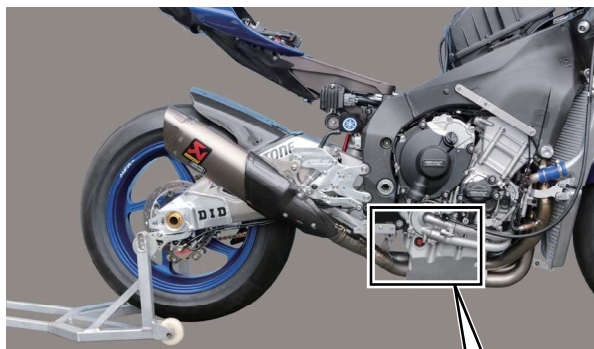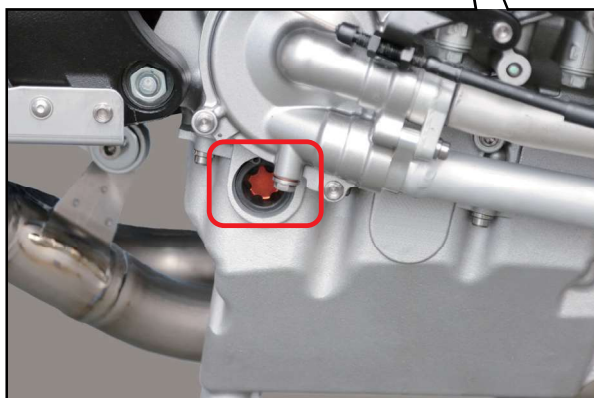
27. Strainer Cover Set (B3L-13400-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
○	1	B3L-13411-70	STRAINER,OIL	1	
○	2	2HC-13411-00	STRAINER,OIL	1	1 attachment
*	3	93210-22M93	O-RING	1	1 attachment
*	4	91312-06020	BOLT,HEX. SOCKET HEAD	2	1, 10 attachment
	5	0WX2-90013-00	PLATE,STOPPER	1	1 attachment
*	6	91312-06016	BOLT,HEX. SOCKET HEAD	1	5 attachment
*	7	90480-13010	GROMMET	1	1, 25, 34 attachment
*	8	5VY-13117-10	COLLAR,DISTANCE	1	1, 25, 34 attachment
*	9	90110-06173	BOLT,HEX. SOCKET	1	1, 25, 34 attachment
○	10	B3L-13576-70	SPACER	1	
*	11	93210-22M93	O-RING	1	10 attachment, Grease outer surface
*	12	91312-06016	BOLT,HEX. SOCKET HEAD	2	10 attachment
	13	0WX2-13479-00	SEAT,VALVE	1	
	14	0WW2-13483-00	PLUNGER	1	
	15	0WS4-90433-00	SPRG.	1	
	16	0WT3-13486-00	RET,RELIEF VALVE	1	
*	17	93210-15566	O-RING	1	13 attachment
*	18	91312-06016	BOLT,HEX. SOCKET HEAD	2	13 attachment
	19	0WX2-90012-00	HOSE,OIL	1	10, 13 attachment
○	20	2CR-13418-70	PIPE,OIL 2	1	
○	21	2CR-13416-71	PIPE,OIL 1	1	
*	22	93210-14003	O-RING	3	20, 21 attachment
*	23	90110-06393	BOLT,HEX. SOCKET	1	20 attachment
*	24	90110-06182	BOLT,HEX. SOCKET	1	21, 34 attachment
○	25	2CR-13161-70	PIPE,DELIVERY 1	1	
○	26	2CR-1310A-70	PAN,OIL	1	
	27	0NC0-90100-00	BOLT	12	26 attachment
*	28	90340-14019	PLUG,STRAIGHT SCREW	1	26 attachment
*	29	90430-14005	GASKET	1	28 attachment
○	30	2CR-13414-70	GASKET, STRAINER	1	26 attachment
○	31	2CR-13317-70	BAFFLE, PLATE	1	
*	32	90119-06115	BOLT	4	31 attachment
*	33	90201-09M01	WASHER,PLAIN	1	1, 25, 34 attachment
○	34	2CR-13428-70	BRKT.,STRAINER 1	1	1, 21, 25 attachment

Compared to the strainer cover set (2CR-13400-71), this set reduces horsepower loss and improves functionality by changing the oil strainer and oil relief valve passage.

The tightening torque of this set is same as that of STD.
Use the screw locking solvent and grease same as STD.
For details, refer to the STD service manual published by Yamaha Motor Co.,Ltd.

For details on installation of this set, see the next page.

Meaning of the symbol marks in the figures

: Apply LOCTITE 620

: Tighten based on the specified tightening torque

Installation
1. Assemble 14, 15, 16 and 17 to 13.
2. Secure 13 to the engine with 18.
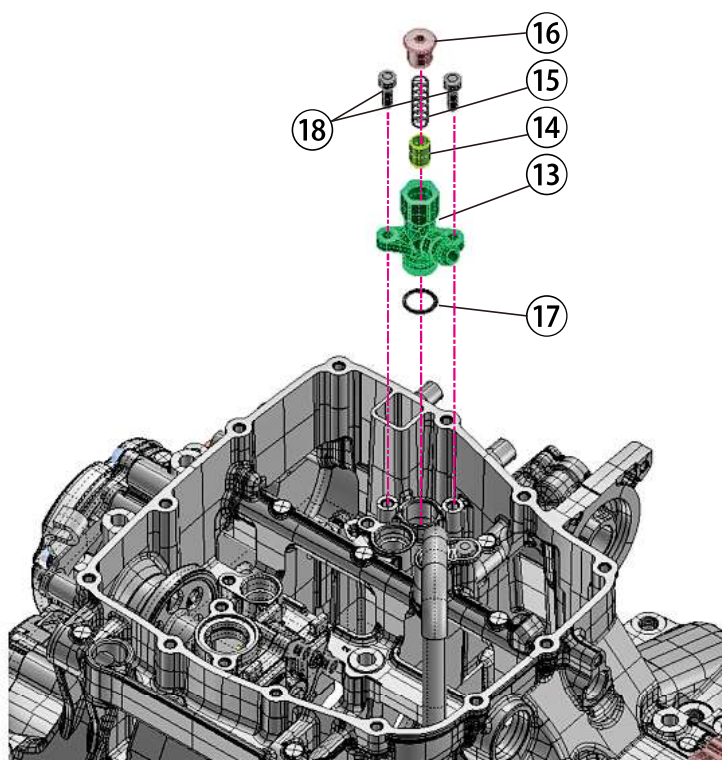
3. Pass 22 through 21 and assemble to 20.
4. Pass 22 through 20 and secure it to the engine with 23.
5. Fasten 21 and 34 to the engine with 24.
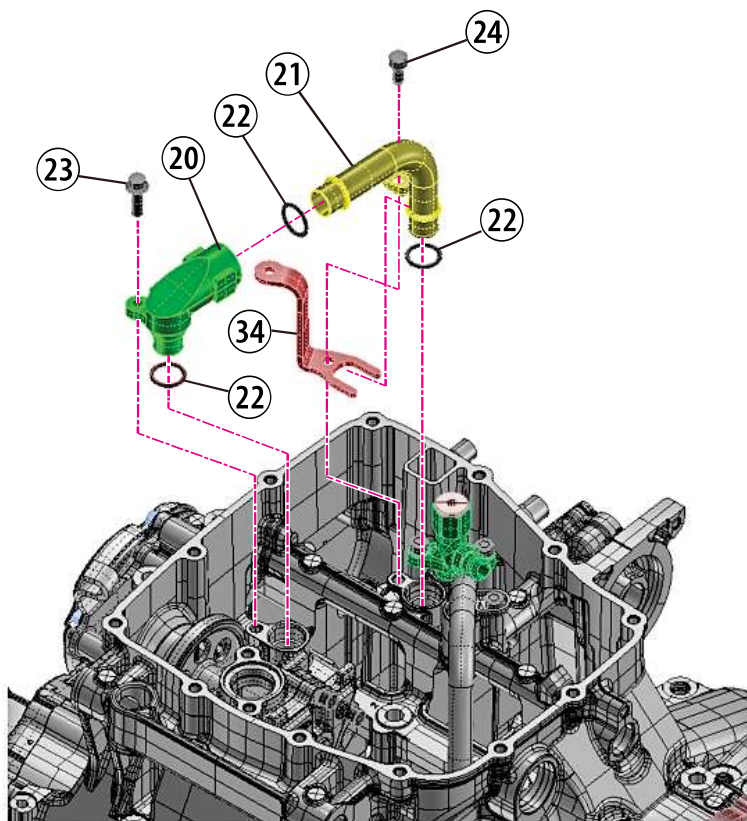
6. Fix 10 and 11 to the engine with 12.
7. Assemble 2 to 1 and fix 2 with 5 and 6.
8. Attach 1 and 3 to 10 with 4.
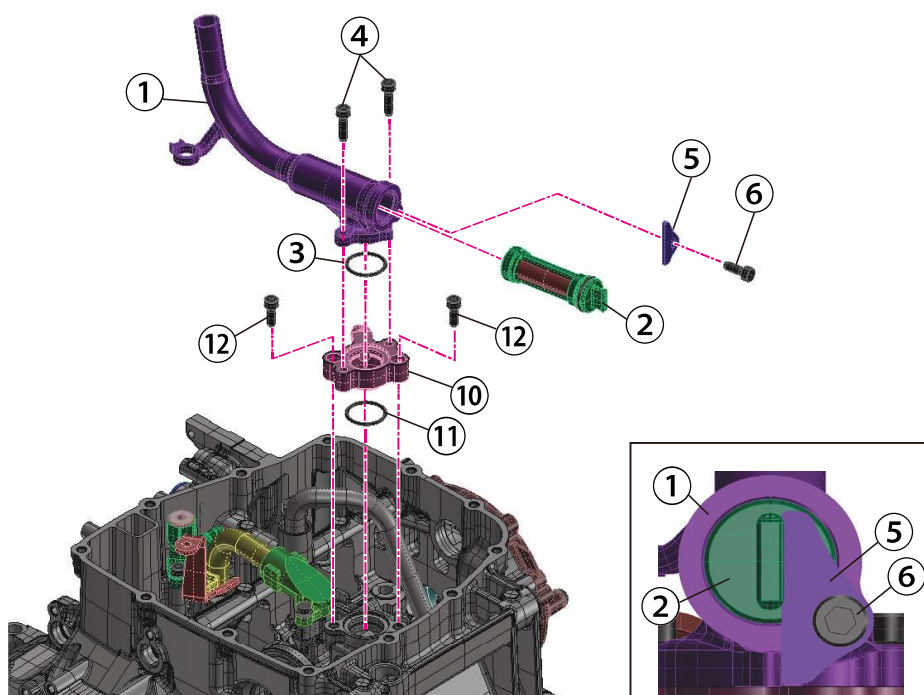
9. Assemble 1, 25, and 34 using 7, 8, 9, and 33.
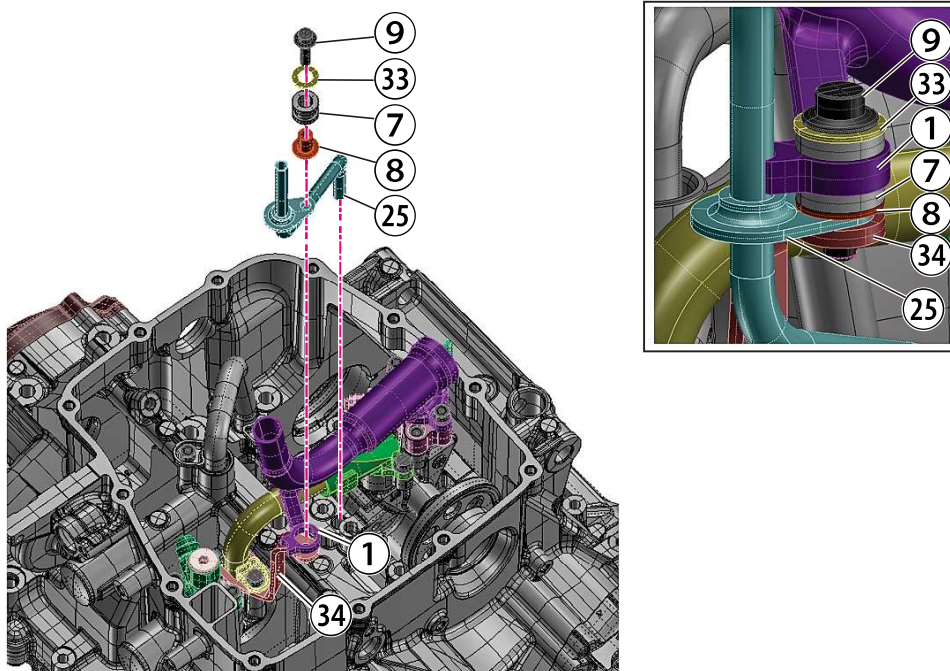
10. Assemble the 19 to the 10 and 13.
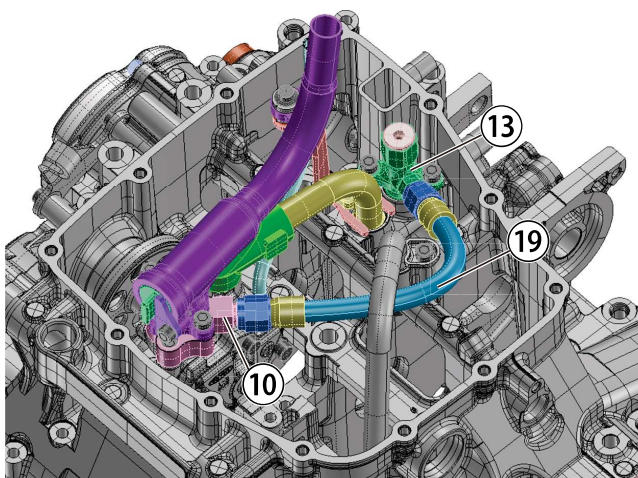
7. Attach 31 BAFFLE,PLATE to 26 PAN,OIL by using 32 BOLT.
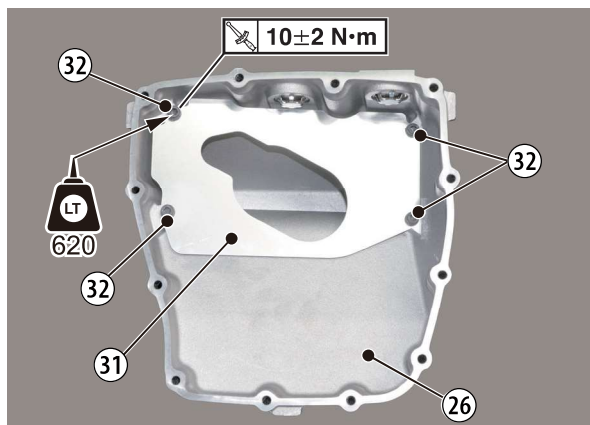
8. Put 30 between 26 and the engine, and assemble 26 to the engine with 27.

TIP
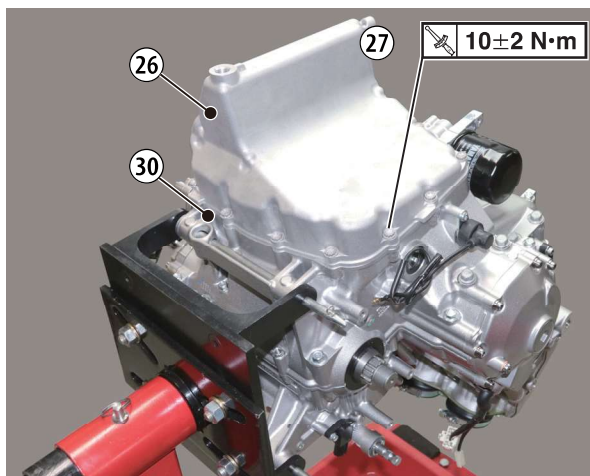
Be sure to check the torque when installing.

9. Assemble 28 and 29 to 26.

R1 EN0102 2022Rev
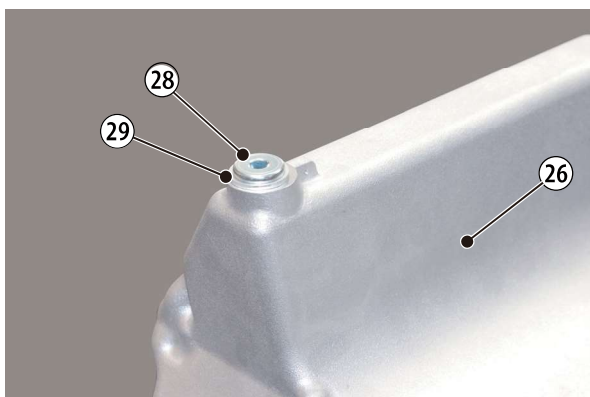
Recommended oil level

After the engine has warmed up (water temperature 75-80°C), stop the engine and wait for 10 minutes. Refill the oil to the upper limit of the oil pan window on the right side of the vehicle with the racing (rear) stand in place.

Add another 200cc from there.

<Oil pan window (right side of vehicle)>

<Engine crank case oil window (left side of vehicle)>
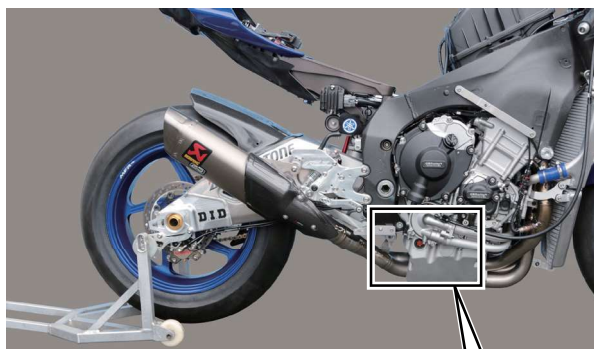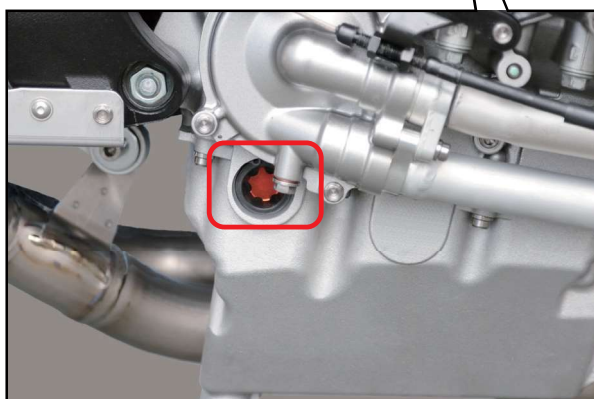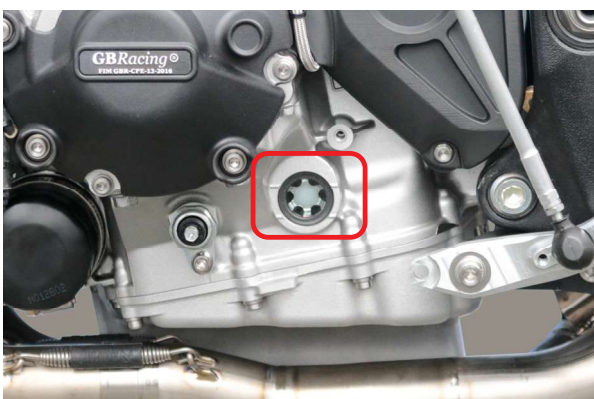
2-3 Installing Chassis Parts

28. Spring Rear Shock

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	2CR-22222-A0	SPRG., REAR SHOCK	1	83 N/mm Identifying stamp: 159.5-56-83
	2	2CR-22222-70	SPRG., REAR SHOCK	1	93 N/mm Identifying stamp: 159.5-56-93
	3	2CR-22222-75	SPRG., REAR SHOCK	1	98 N/mm Identifying stamp: 159.5-56-98
	4	2CR-22222-80	SPRG., REAR SHOCK	1	103 N/mm Identifying stamp: 159.5-56-103
	5	2CR-22222-85	SPRG., REAR SHOCK	1	108 N/mm Identifying stamp: 159.5-56-108

- There is a stamp on the side of the springs for rate identification.
- Free length is 159.5 mm for the both STD spring and KIT spring.
- For spring replacement, see the 2CR STD. Service Manual.
- The spring rate of the standard rear suspension is 88 N/mm.

29. Spring Front Fork

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	BN6-2314-75	SPRG., FRONT FORK	1	9.5 N/mm Identifying slits 1
	2	BN6-23141-80	SPRG., FRONT FORK	1	10.0 N/mm Identifying slits 2

- There are slits at the ends of the spring for rate identification.
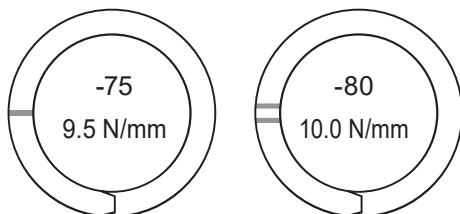
- There are slits at the ends of the spring for rate identification.

- Free lengths are STD spring andKIT spring = 219.5mm.
- The spring rate of the STD is 9.0 N/mm.
- For information about spring replacement, see STD. Service Manual.

References

Front and rear load changes and front and rear suspension movement in different scenarios.
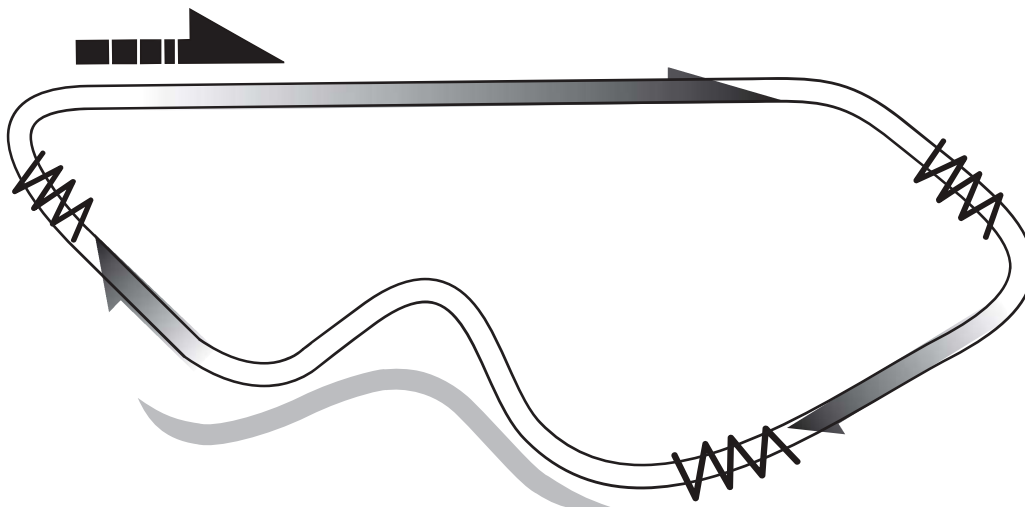
Accelerating
· Load change
  The wider the throttle is opened, the more the load is concentrated on the rear.
· Front fork
  Reaches nearly maximum extended stroke.
· Rear cushion
  Up to 20 to 30mm stroke displacement, depending on conditions.
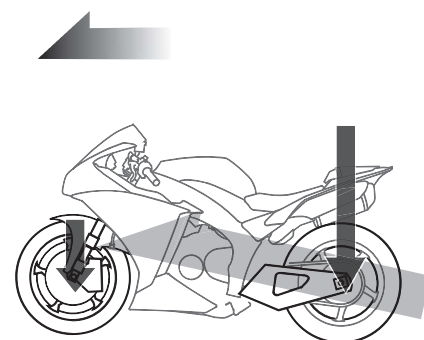
Braking
· Load change
  The harder the brake is applied, the more the load is concentrated on the front.
· Front fork
  Displaces until stroke has almost bottomed.
· Rear cushion
  Reaches nearly maximum extended stroke.
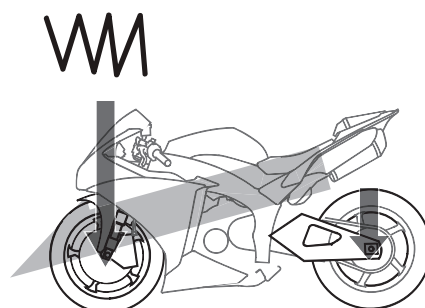
Cornering
· Load change
  Increases the load on the front fork and rear cushion on both sides.
· Front fork
  Up to 30 to 90mm stroke displacement depending on the size of the corner.
· Rear cushion
  Up to 25 to 40mm stroke displacement, depending on conditions.
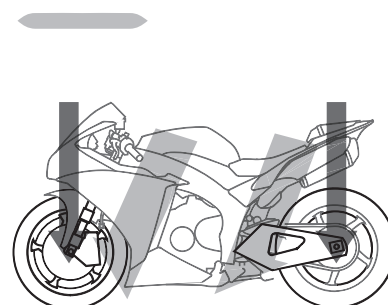
30. Seat Cushion (13S-24713-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	13S-24713-70	CUSHION SEAT	1	

Anti slip seat.

Cut to any size for use.

FWD
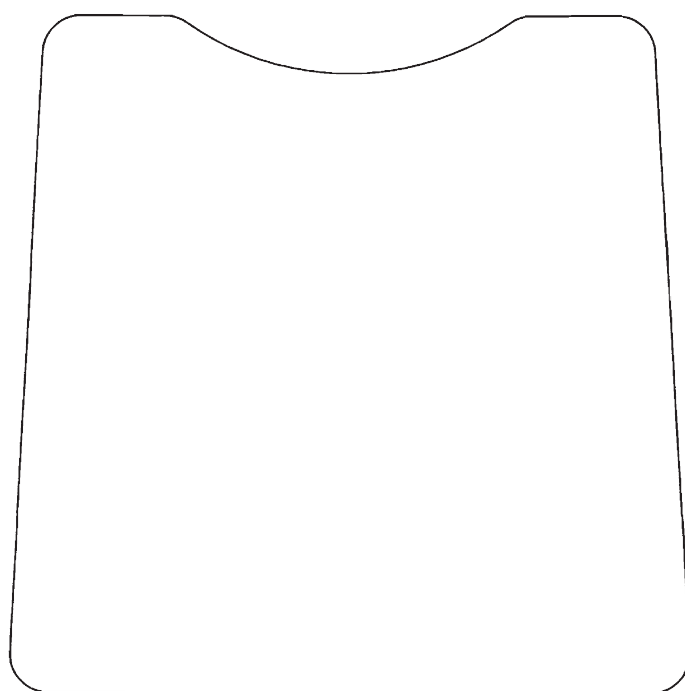
31. Front Spare Wheel ASS'Y (2CR-25100-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	2CR-25160-00	CAST WHEEL ASSY.	1	
*	2	93900-00030	VALVE, RIM	1	
*	3	1SD-2517G-00	ROTOR, SENSOR	1	
*	4	2CR-2514A-00	RING, WHEEL 1	1	
*	5	90149-05037	SCREW	5	
*	6	93210-47440	O-RING	1	

*This kit does not include a tire.

This part is the STD wheel, bearing, spacer,
air valve and center rotor combined.
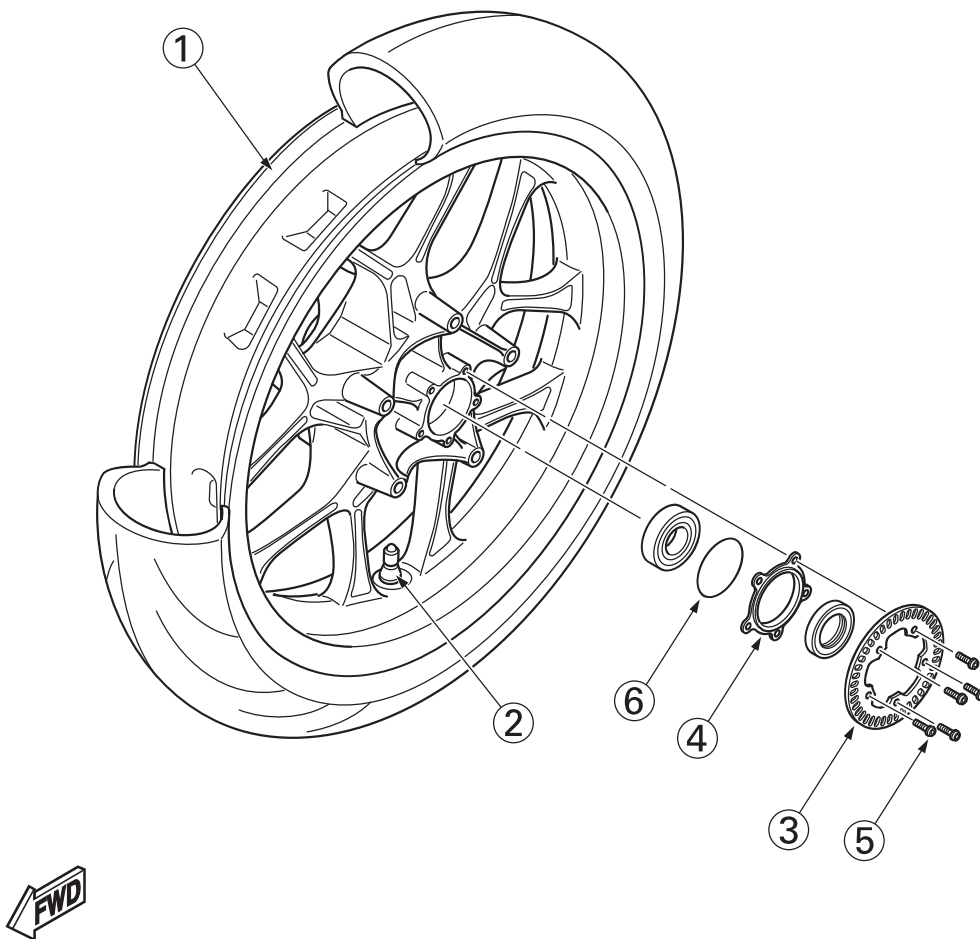
32. Rear Spare Wheel ASS'Y (B3L-25300-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-25370-00	CAST WHEEL ASSY.	1	
	2	B3L-25840-00	DISK BRAKE ASSY.	1	
*	3	90111-08085	BOLT, HEX. SOCKET BUTTON	5	
*	4	93900-00030	VALVE, RIM	1	

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*This kit does not include a tire.

This part is the STD wheel, bearing, spacer, air valve, rear disk brake and center rotor combined.
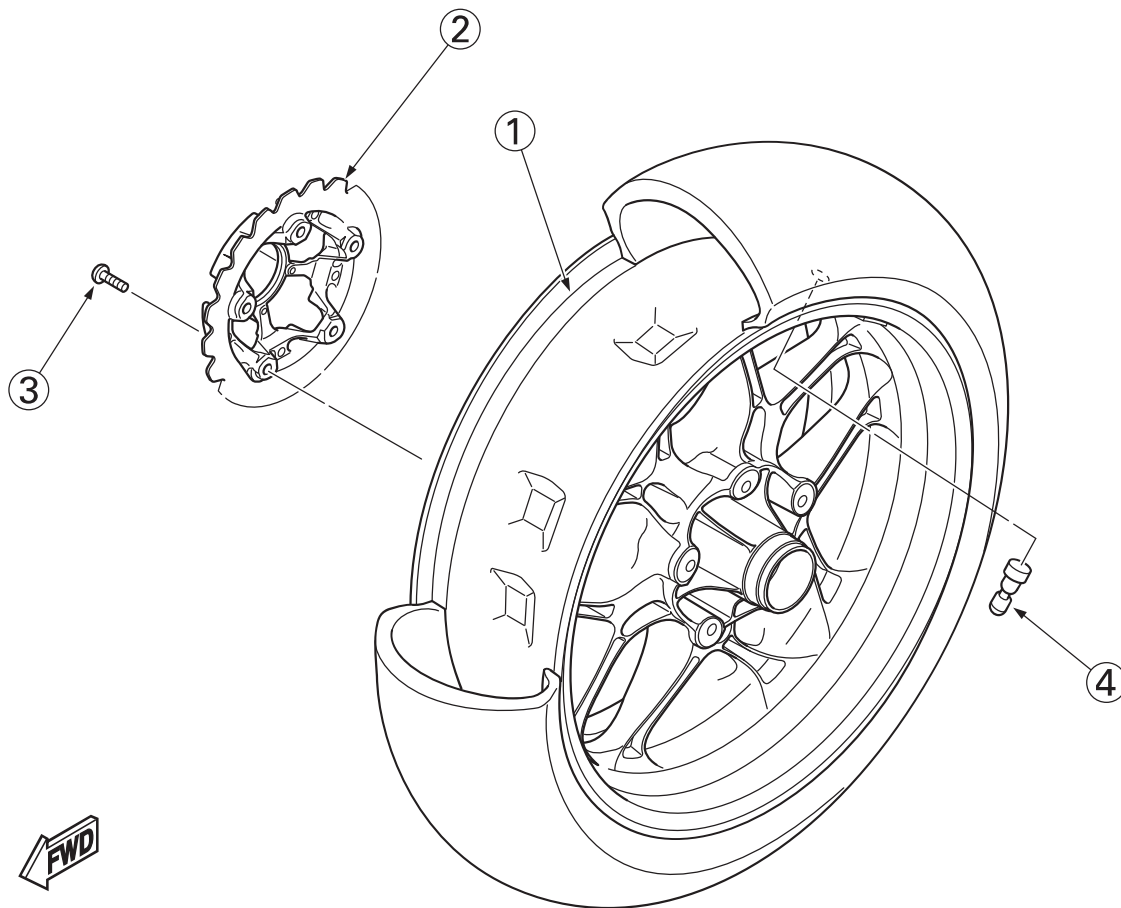
33. Rear Sprocket

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-12170-70	Rr. SPROCKET 38T	1	
	2	B3L-12180-70	Rr. SPROCKET 39T	1	
	3	B3L-12180-71	Rr. SPROCKET 40T	1	
	4	B3L-12180-72	Rr. SPROCKET 41T	1	
	5	B3L-12180-73	Rr. SPROCKET 42T	1	
	6	B3L-12180-74	Rr. SPROCKET 43T	1	
	7	B3L-12180-75	Rr. SPROCKET 44T	1	
	8	B3L-12180-76	Rr. SPROCKET 45T	1	
	9	B3L-12180-77	Rr. SPROCKET 46T	1	
	10	B3L-12180-78	Rr. SPROCKET 47T	1	
	11	B3L-12180-79	Rr. SPROCKET 48T	1	
	12	B3L-12180-80	Rr. SPROCKET 49T	1	

This sprocket changes the chain size to 520
for the STD and is lighter weight than tha
STD. It is used for the STD wheel.

34. Front Caliper Piston set (B3L-25809-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	4SV-25814-00	FR.CALIPER PISTON 30mm	4	
	2	4SV-25814-10	FR.CALIPER PISTON 27mm	4	
	3	5PW-25815-00	FR.CALIPER PISTON SEAL 30mm	4	
	4	3GM-25816-00	FR.CALIPER DUST SEAL 30mm	4	
	5	5PW-25815-10	FR.CALIPER PISTON SEAL 27mm	4	
	6	3MA-25816-00	FR.CALIPER DUST SEAL 27mm	4	

Compared to STD parts, heat resistance has
been improved by changing the material.

35. Tube Guide (B3L-26243-70)

Parts List

	No.	PART No.	PART NAME	Q'TY	REMARKS
	1	B3L-26243-70	TUBE, GUIDE	1	

About the Throttle Tube Guide Specifications

As shown below, the operating angle of the throttle grip when the throttle is fully opened is 57.5° as against STD 67°.

(Except this part, all other parts should be STD parts)
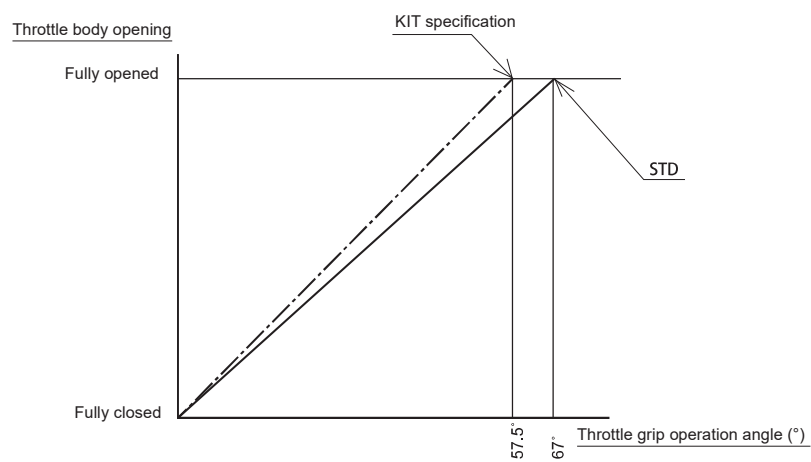
NOTICE

When the tube guide is changed, use the YEC FI Matching system (YMS) to switch the STD⇔KIT.

3 Tightening Torque List

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
Plug for sand drain hole	90340-18004	PLUG, STRAIGHT SCREW	M18 × 1.5	25 ± 2 (2.5 ± 0.2)	2	APPLY LOCKING AGENT (LOCKTITE® TO BOTH SCREW THREAD AND TAPERED PORTION.
Install SPARK PLUG	94700-00424	PLUG, SPARK	M10S × 1.0	12 – 15 (1.2 – 1.5)	4	FOR DETAILS, SEE page 27.
Tighten HEAD	90119-09016	BOLT, HEXAGON WITH WASHER	M9 × 1.25	TURN OF NUT METHOD: AXIAL FORCE TARGET VALUE OF 40kN ± 2kN	10	FOR DETAILS, SEE page 83.
Tighten HEAD	90110-06430	BOLT, HEXAGON SOCKET HEAD	M6 × 1.0	8.5±1.5 (0.85±0.15)	2	
CAP x HEAD	90105-06027	BOLT, FLANGE	M6 x 1.0	[When using the bolt continuously] Apply oil to the bearing surface and thread part of the bolt, and tighten with tightening torque 8.0±1.0 N•m (0.8±0.1 kgf•m). [When replacing with a new bolt] Tighten with tightening torque 10.0±2.0 N•m (1.0±0.2 kgf•m). It is not necessary to apply oil to the bearing surface and thread part of the bolt Use it in the delivery condition (corrosion-proof oil is applied).	10	
CAP x HEAD	90105-06209	BOLT, FLANGE	M6 x 1.0		10	
Tighten HEAD COVER	5VY-1119E-00	BOLT, COVER HEAD	M6 x 1.0	10±2 (1.0±0.2)	6	
Embedded in HEAD (Install EX.PIPE)	95612-08615	BOLT, STUD	M8 x 1.25	15±3 (1.5±0.3)	8	
AI CAP	90110-06175	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	4	APPLY TO SCREW ROCKING

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
HEAD x JOINT, ASSY	90110-06168	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	6	APPLY TO SCREW ROCKING
ROCKER AXIS PLUG	90340-12013	PLUG, STRAIGHT SCREW	M12 x 1.0	10±2 (1.0±0.2)	3	APPLY TO SCREW ROCKING
ROCKER AXIS FIXING PIN	90109-05015	BOLT	M5 x 0.8	6±1 (6.0±0.1)	4	APPLY TO SCREW ROCKING
CON ROD	2CR-11654-00	BOLT, CON-ROD, BIG END	M9 x 0.75	Refer to page 27. .	8 each	Angle tightening method or elongation control method.
ACM rotor	90109-10061	BOLT	M10 x 1.25	85±5 (8.5±0.5)	1	Remove oil from the taper surface. Apply oil to the bearing surface and thread part of the bolt, and the both sides of the washer.
SPROCKET, CRANK	2CR-12157-00	BOLT	M12 x 1.25	72±5 (7.2±0.5)	1	Apply oil to the bearing surface and thread part of the bolt.
CAM CHAIN, TENSIONER	90110-06178	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Install PIPE 1, 4 (Water pump)	90110-06246	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	1	APPLY TO SCREW ROCKING. WATER PUMP SIDE
Install THERMO-STAT ASSY.	90110-06163	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	The rear of the head cylinder
Install PIPE 1 (Body cylinder, case)	90105-06127	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	4	
PIPE 4 (Case)	91312-06014	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	1	
Install PUMP	91314-06035	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	
THERMOSTAT ASSY	90176-06017	CAP, NUT	M6 x 1.0	10±2 (1.0±0.2)	2	

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Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
Install OIL PUMP ASSY.	95817-06035	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	2	
	95817-06025	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	1	
Tighten DRAIN BOLT	90340-14019	PLUG, STRAIGHT SCREW	M14 x 1.5	23±2 (4.3±0.4)	1	
Install PIPE, OIL 1	90110-06182	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Install HOUSING, STRAINER	90110-06173	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	3	APPLY TO SCREW ROCKING
Install RELIEF VALVE	90110-06169	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Install PIPE HOLDER	90110-06182	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Install oil delivery pipe 2	90110-06182	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Install oil delivery pipe 5	90149-06158	SCREW	M6 x 1.0	10±2 (1.0±0.2)	1	APPLY TO SCREW ROCKING
Tighten CLEANING BOLT, UNION	90401-20008	BOLT, UNION	M20 x 1.5	70±10 (7.0±1.0)	1	Apply oil when tightening the case.
Install OIL CLEANER ASSY	5GH-13440-60	OIL CLEANER ASSY	M20 x 1.5	17±2 (1.7±0.2)	1	APPLY GREASE TO O-RING.
Install OIL PAN BAFFLE	90111-06168	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Install COVER, STRAINER	90109-06300	BOLT	M6 x 1.0	FOR DETAILS, SEE page 73. (List of tightening AL bolts)	12	STRAINER COVER
Tighten the main gallery side of OIL PIPE COMP.	90110-06395	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	1	APPLY TO SCREW ROCKING

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
Tighten together with OIL PIPE COMP.	90110-06389	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Tighten the cover side of OIL PIPE COMP.2	90110-06295	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	1	APPLY TO SCREW ROCKING
Install OIL HOSE	90110-06211	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	4	APPLY TO SCREW ROCKING
Install OIL COOLER STAY	90110-06341	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	3	
Install the upper side of the OIL COOLER	90110-06346	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	
Install the lower of the OIL COOLER	95827-06030	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	1	
Install THROTTLE WIRE	2CR-26302-00	BOLT, ADJUSTING	M6	3.5 – 5.5 (0.35 – 0.55)	2	
JOINT ASSY x THROTTLE BODY	90450-60004	HOSE CLAMP	M5 x 0.8	3±0.5 (0.3±0.05)	4	Collar striking or torque management
THROTTLE x FUNNEL	90110-06163	BOLT	M6 x 1.0	8±2 (0.8±0.2)	6	
UPPER COVER	98907-05020	SCREW, BINDING HEAD	M5 x 0.8	2.0±0.5 (0.2±0.05)	10	(TARGET VALUE OF 2.0 N•m)
AIR FILTER CASE	90110-06233	BOLT. HEXAGON SOKET	M6x1.0	6.5-8.0 (0.65-0.8)	2	
NUT, RING x CYLINDER HEAD	90179-08442	NUT	M8 x 1.25	20±2 (2.0±0.2)	8	
EX. PIPE x CHAMBER	95024-08035	BOLT, FLANGE (SMALL HEAD)	M8 x 1.25	20±2 (2.0±0.2)	2	
CHAMBER x STAY MUFFLER	90109-08238	BOLT	M8 x 1.25	20±2 (2.0±0.2)	2	

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
CHAMBER x SIDE STAND	90110-08099	BOLT, HEXAGON SOCKET	M8 x 1.25	20±2 (2.0±0.2)	1	
CHAMBER x SILENCER	90110-06343	BOLT, HEXAGON SOCKET	M6 x 1.0	10±2 (1.0±0.2)	1	
SILENCER x STAY MUFFLER3	90110-08071	BOLT, HEXAGON SOCKET	M8 x 1.25	20±2 (2.0±0.2)	1	
Install WIRE PULLEY DOUBLE NUT	2CR-1133E-□□	WIRE, PULLEY,1	M6 x 1.0	5 – 7 (0.5 – 0.7)	2	
	2CR-1133F-□□	WIRE, PULLEY,2				
CHAMBER x PROTECTOR ASSY.	90111-06153	BOLT, HEXAGON SOCKET BUTTON	M6 x 1.0	10±2 (1.0±0.2)	3	
OIL PATHWAY THROTTLING NOZZLE	2CR-15138-00	NOZZLE	M8 x 1.25	2.5 – 3.5 (0.25 – 0.35)	5	Control by additional tightening method
CRANKCASE 1 x CRANKCASE 2	90119-09010	BOLT, HEXAGON WITH WASHER	M9 x 1.25	FOR DETAILS, SEE page 72. (Installing the Crankcase)	10	Apply oil to the thread part and bearing surface. Do not reuse a mended part.
CRANKCASE 1 x CRANKCASE 2	14B-15156-00	BOLT, CRANKCASE JOURNAL	M8 x 1.25	24±2 (2.4±0.2)	8	Apply oil to the thread part, bearing surface and O-RING part. Do not reuse a mended O-RING.
CRANKCASE 1 x CRANKCASE 2	95812-08060	BOLT, FLANGE	M8 x 1.25	24±2 (2.4±0.2)	2	APPLY OIL TO BOTH SCREW THREAD AND BEARING.
CRANKCASE 1 x CRANKCASE 2	90109-06100	BOLT	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY OIL TO BOTH SCREW THREAD AND BEARING.
CRANKCASE 1 x CRANKCASE 2	95812-06070	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	1	APPLY OIL TO BOTH SCREW THREAD AND BEARING.
CRANKCASE 1 x CRANKCASE 2	95812-06060	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	6	APPLY OIL TO BOTH SCREW THREAD AND BEARING.

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
CRANKCASE 1 x CRANKCASE 2	95812-06050	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	4	APPLY OIL TO BOTH SCREW THREAD AND BEARING.
CRANKCASE 1 x CRANKCASE 2	90105-06213	BOLT	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING. APPLY OIL TO THE BEARING SURFACE ONLY.
CRANKCASE 1 x CRANKCASE 2	95812-06040	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	5	APPLY OIL TO BOTH SCREW THREAD AND BEARING.
Install NOZZLE ASSY. (15105)	90149-06158	SCREW	M6 x 1.0	10±2 (1.0±0.2)	4	APPLY TO SCREW ROCKING
Install COVER CRANK CASE 1 (15411)	90109-06300	BOLT	M6 x 1.0	FOR DETAILS, SEE page 73. (List of tightening AL bolts)	8	ACM COVER
Install COVER CHAIN CASE (15418)	90110-06387	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	3	DRIVE SPROCKET COVER
Install COVER CRANK CASE 2 (15421)	90109-06301	BOLT	M6 x 1.0	FOR DETAILS, SEE page 73. (List of tightening AL bolts)	10	CLUTCH COVER
Install COVER 1 (15416)	90109-06299	BOLT	M6 x 1.0	FOR DETAILS, SEE page 73. (List of tightening AL bolts)	5	CAM CHAIN COVER
Install COVER (15413)	90109-06300	BOLT	M6 x 1.0	FOR DETAILS, SEE page 73. (List of tightening AL bolts)	8	BREATHER COVER
Install PLATE, BREATHER	90149-06158	SCREW	M6 x 1.0	10±2 (1.0±0.2)	4	APPLY TO SCREW ROCKING
Install PLUG to COVER CRANK CASE 1	90340-27003	PLUG, STRAIGHT SCREW	M27 x 1.5	15±2 (1.5±0.2)	1	FOR CRANK ROTATION
Install COVER CRANK CASE 1	90109-08239	BOLT	M8 x 1.25	15±2 (1.5±0.2)	1	CHECK TIMING.
Install PLUG to COVER CRANK CASE 2	2CR-15363-01	PLUG, OIL	M20 x 1.5	Attached firmly to the bearing surface.	1	

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
Install DAMPER to COVER CRANK CASE 2	90149-06158	SCREW	M6 x 1.0	10±2 (1.0±0.2)	4	APPLY TO SCREW ROCKING
PLUG for REAR PATHWAY of OIL FILTER	4H7-15189-00	PLUG	M20 x 1.5	8±2 (0.8±0.2)	2	TAKE CARE NOT TO OVERTIGHTEN.
Install CLUTCH WIRE HOLDER	90110-06340	BOLT	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
ACM LEAD	90110-06182	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	1	APPLY TO SCREW ROCKING
Install STATOR	90149-06128	SCREW	M6 x 1.0	10±2 (1.0±0.2)	3	APPLY TO SCREW ROCKING. TORQUES
Install PLUG (2CR-15189-00-1)	90110-06396	BOLT, HEXAGON SOCKET	M6 x 1.0	10±2 (1.0±0.2)	2	
Install JOINT (15319)	90149-06068	SCREW	M6 x 1.0	10±2 (1.0±0.2)	1	TAKE CARE NOT TO OVERTIGHTEN. FOR HYDRAU-LIC SENSOR.
Install PLATE (15113)	90110-06108	BOLT, HEXAGON SOCKET	M6 x 1.0	12±2 (1.2±0.2)	4	APPLY TO SCREW ROCKING
Install IDLER SHAFT	90110-06401	BOLT, HEXAGON SOCKET	M6 x 1.0	10±2 (1.0±0.2)	1	APPLY TO SCREW ROCKING
Install STARTER ONE-WAY OUTER	90149-06158	SCREW	M6 x 1.0	14±2 (1.4±0.2)	3	APPLY TO SCREW ROCKING
Install CLUTCH BOSS	90179-20007	NUT	M20 x 1.0	125±5 (12.5±0.5)	1	APPLY OIL TO BOTH SCREW THREAD AND BEARING. 1 POINT SWAG-ING AFTER TIGHTENING
Install CLUTCH SPRING	2CR-16337-00	SCREW, SPRING1	M6 x 1.0	10±2 (1.0±0.2)	3	
Install BEARING HOUSING	90149-06082	SCREW	M6 x 1.0	12±2 (1.2±0.2)	3	APPLY TO SCREW ROCKING

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
Tighten DRIVE SPROCKET	90179-22018	NUT	M22x 1.0	125±10 (12.5±1.0)	1	2 POINT SWAGING AFTER TIGHTENING
Install STOPPER, SHIFT BAR and PLATE, STOPPER 2	90149-06158	SCREW	M6 x 1.0	10±2 (1.0±0.2)	2	APPLY TO SCREW ROCKING
Install STOPPER SCREW	1D7-18127-00	STOPPER, SCREW	M8 x 1.25	22±2 (2.2±0.2)	1	APPLY TO SCREW ROCKING
Install ARM, SHIFT	90105-06127	BOLT, FLANGE	M6 x 1.0	10±2 (1.0±0.2)	1	CHECK SERRATION FOR TIGHTENING UP
Install SENSOR, GEAR POSITION	90110-05067	BOLT, HEXAGON SOCKET	M5 x 0.8	3 – 5 (0.3 – 0.5)	2	APPLY TO SCREW ROCKING
Install NEUTRAL SWITCH	3GB-82540-01	NEUTRAL SWITCH ASSY.	M10 x 1.25	17±3 (1.7±0.3)	1	OVERTIGHTENING MAY DAMAGE THE PART
Install COVER, SERVOMOTOR	97702-50514	SCREW, TRUSS HEAD TAPPING	M5	1 – 3 (0.1 – 0.3)	2	
Install THERMO SENSOR (for water temperature)	4P9-83591-00	THERMO SENSOR ASSY	M10 x 1.25	16±2 (1.6±0.2)	1	
SENSOR, CAM POSITION	90110-06175	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	7.5±1.5 (0.75±0.15)	1	APPLY TO SCREW ROCKING
Install PICKUP ASSY	90110-05034	BOLT, HEXAGON SOCKET HEAD	M5 x 0.8	6±1 (0.6±0.1)	2	APPLY TO SCREW ROCKING
OIL PRESSURE SWITCH	1WS-82504-00	SW. OIL PRESSURE	PT1/8	12.5±2 (1.25±0.2)	1	When mended, use 67F-82504-00 and apply the sealing agent to the thread part ThreeBond MEC #2403

Engine

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
Install OIL PRES-SURE SWITCH LEAD WIRE	WS-82504-00 accessory	BOLT	M4 x 0.7	1.5 – 2.0 (0.15 – 0.2)	1	
Install STARTER MOTOR	91312-06030	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	10±2 (1.0±0.2)	2	

Chassis

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
E/G BRACKET, FRONT, LEFT	90110-12007	BOLT, HEXAGON SOCKET	M12 x 1.25	64 – 76 (6.4 – 7.6)	1	PROCEDURE TO INSTALL THE ENGINE. FOR DETAILS, SEE page 87.
E/G BRACKET, FRONT, RIGHT	90111-12003	BOLT, HEXAGON SOCKET BUTTON	M12 x 1.25	64 – 76 (6.4 – 7.6)	1	PROCEDURE TO INSTALL THE ENGINE. FOR DETAILS, SEE page 87.
E/G BRACKET, REAR UPPER	90110-12008	BOLT, HEXAGON SOCKET	M12 x 1.25	50 – 62 (5.0 – 6.2)	1	PROCEDURE TO INSTALL THE ENGINE. FOR DETAILS, SEE page 87.
	90179-12004	NUT				
E/G BRACKET, REAR UNDER	90110-12010	BOLT, HEXAGON SOCKET	M12 x 1.25	50 – 62 (5.0 – 6.2)	1	PROCEDURE TO INSTALL THE ENGINE. FOR DETAILS, SEE page 87.
	90179-12004	NUT				
ADJUST BOLT for E/G BRACKET, REAR	5YU-21495-00	BOLT, ENGINE ADJUSTING	M18 x 1.0	7 – 9 (0.7 – 0.9)	2	PROCEDURE TO INSTALL THE ENGINE.. FOR DETAILS, SEE page 87. Apply grease or engine oil (10W-30 or 20W-40 equivalent) and tighten it. Be sure to tighten at the nut side.
STAY and FRAME on the front side of the tank			M6 x 1.0	7 – 10 (0.7 – 1.0)	1	
MAIN FRAME & REAR FRAME	90149-10002	SCREW	M10 x 1.25	33 – 40 (3.3 – 4.0)	4	
SHAFT, PIVOT & FRAME	14B-22141-00	SHAFT, PIVOT	M30 x 1.0	5 – 8 (0.5 – 0.8)	1	PROCEDURE TO INSTALL THE PIVOT SHAFT PERIPHERAL PARTS. FOR DETAILS, SEE page 88.
SHAFT, PIVOT & LOCK NUT	4C8-22252-00	NUT, 2	M30 x 1.0	50 – 80 (5.0 – 8.0)	1	PROCEDURE TO INSTALL THE PIVOT SHAFT PERIPHERAL PARTS. FOR DETAILS, SEE page 88.

Chassis

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
SHAFT, PIVOT & U NUT	90185-20008	NUT, SELF LOCKING	M20 x 1.5	80 – 130 (8.0 – 13.0)	1	PROCEDURE TO INSTALL THE PIVOT SHAFT PERIPHERAL PARTS. FOR DETAILS, SEE page 88.
ARM RELAY and FRAME	90109-10017	BOLT	M10 x 1.25	31 – 49 (3.1 – 4.9)	1	
	95602-10200	NUT, U FLANGE				
ARM, RELAY & ARM	90109-12010	BOLT	M10 x 1.25	31 – 49 (3.1 – 4.9)	1	
	92902-12600	WASHER, PLAIN				
	90185-12011	NUT, SELF LOCKING				
ARM & REAR ARM	90109-12010	BOLT	M10 x 1.25	31 – 49 (3.1 – 4.9)	1	
	92902-12600	WASHER, PLAIN				
	90185-12011	NUT, SELF LOCKING				
REAR CUSHION & ARM, RELAY	90105-10017	BOLT, FLANGE	M10 x 1.25	31 – 49 (3.1 – 4.9)	1	
	95602-10200	NUT, U FLANGE				
REAR CUSHION and FRAME	95602-10200	NUT, U FLANGE	M10 x 1.25	31 – 49 (3.1 – 4.9)	1	
	90105-10609	BOLT, FLANGE				
ADJUST NUT for CHAIN PULLER	90101-08013	BOLT, HEXAGON	M8 x 1.25	12 – 19 (1.2 – 1.9)	2	
	95302-08600	NUT, HEXAGON				
	90201-08057	WASHER, PLAIN				
HANDLE, CROWN & OUTER TUBE	91314-08030	BOLT, HEXAGON SOCKET HEAD	M8 x 1.25	23 – 28 (2.3 – 2.8)	2	
HANDLE, CROWN & STEERING SHAFT	90170-28419	NUT, HEXAGON	M28 x 1.0	100 – 125 (10.0 – 12.5)	1	
HANDLE & OUTER TUBE	91314-08025	BOLT, HEXAGON SOCKET HEAD	M8 x 1.25	28 – 35 (2.8 – 3.5)	2	

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Chassis

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
HANDLE and HANDLE, CROWN	91380-06025	BOLT, HEXAGON SOCKET HEAD	M6 x 1.0	5 – 8 (0.5 – 0.8)	2	
STEERING SHAFT and RING NUT	90179-30691	NUT	M30 x 1.0	40 – 64 (4.0 – 6.4) 12 – 15 (1.2 – 1.5)	1	
OUTER TUBE and UNDER BRACKET	91314-08030	BOLT, HEXAGON SOCKET HEAD	M8 x 1.25	20 – 25 x 2 (2.0 – 2.5 x 2)	4	
FUEL TANK & FUEL PUMP	90119-05015	BOLT, HEXAGON WITH WASHER	M5 x 0.8	3 – 5 (0.3 – 0.5)	4	
FRONT STAY for FUEL TANK & FUEL TANK	90110-06233	BOLT, HEXAGON SOCKET	M6 x 1.0	3 – 5 (0.3 – 0.5)	1	
REAR STAY for FUEL TANK & REAR FRAME	90111-06071	BOLT, HEXAGON SOCKET BUTTON	M6 x 1.0	5 – 8 (0.5 – 0.8)	4	
REAR STAY for FUEL TANK & FUEL TANK	95812-06090	BOLT, FLANGE	M6 x 1.0	3 – 5 (0.3 – 0.5)	1	
	95702-06500	NUT, FLANGE				
FRONT WHEEL SHAFT & NUT	90179-24004	NUT	M24 x ***	100 – 130 (10.0 – 13.0)	1	
REAR WHEEL SHAFT & NUT	90185-24007	NUT, SELF LOCKING	M24 x 1.5	160 – 220 (16.0 – 22.0)	1	
FRONT CALIPER & FRONT FORK	90105-10397	BOLT, FLANGE	M10 x 1.25	30 – 40 (3.0 – 4.0)	4	
DISC BRAKE & WHEEL (FRONT)	2CR-2589H-00	SCREW	M6 x 1.0	14 – 19 (1.4 – 1.9)	10	
DISK BRAKE & PLATE DISK 1	90149-08009	SCREW	M8 x 1.25	23 – 37 (2.3 – 3.7)	5	
REAR WHEEL SPROCKET & CLUTCH HUB	90185-10011	NUT, SELF LOCKING	M10 x 1.25	90 – 109 (9.0 – 10.9)	5	
SPLIT BOLT for FRONT AXLE	91314-08040	BOLT, HEXAGON SOCKET HEAD	M8 x 1.25	18 – 23 (1.8 – 2.3)	4	

For reference

	Tightening torque N•m
M5 × 0.8	4.5 – 7.0
M6 × 1.0	7.5 – 12
M8 × 1.25	18 – 28
M10 × 1.25	37 – 58
M12 × 1.25	68 – 108
M14 × 1.5	105 – 167

Tightening the Cylinder Head

1. In the following order (1→10), apply initial tightening of 10 N•m (1.0 kgf•m).

2. In the following order (1→10), apply additional tightening of 25 N•m (2.5 kgf•m).

3. In the following order (1→10), apply additional tightening of 45 N•m (4.5 kgf•m).

4. In the following order (1→10), loosen each bolt. Then, tighten at 15 N•m (1.5 kgf•m) and tighten at rotating angle of 160°.
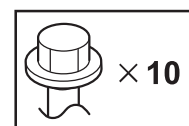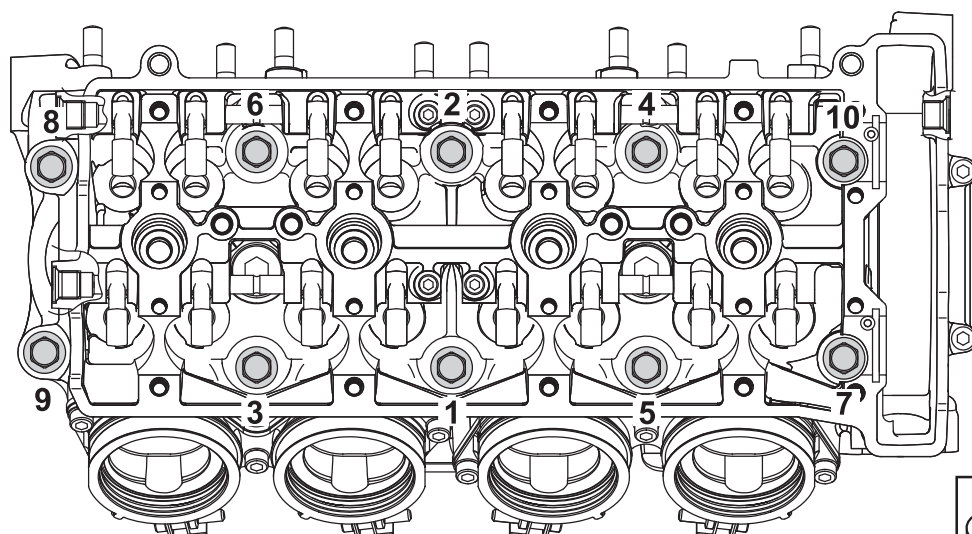   (Note: Do not loosen all bolts at once. Repeat loosening and tightening operation one by one bolt.)

TIP

The numbers 1 to 10 show the sequence in which the bolts are tightened.
Apply engine oil to the bearing surface and thread part of the bolt.
**Use a new bolt only. (Do not reuse)**

Installing the Crankcase

1. Tighten the bolts in the tightening sequence of 1 to 10 to 20 N•m (2.0 kg•m).

2. After loosening the bolts once in the tightening sequence of 1 to 10, retighten them one by one to 15 N•m (1.5 kg•m).
   (Note: Do not loosen all bolts at once. Repeat loosening and tightening operation one by one bolt.)

3. Retighten the bolts in the tightening sequence of 1 to 10 to a turn-of-nut angle of 75°±5°.

4. Tighten the bolts in the tightening sequence of 11 to 20 to 24±2 N•m (2.4±0.2 kgf•m).

5. Tighten the bolts in the tightening sequence of 21 to 40 to 10±2 N•m (1.0±0.2 kgf•m).

TIP

The numbers 1 to 40 show the sequence in which the bolts are tightened.

Apply engine oil to the bolts 1 to 10, 21 to 27 and 29 to 39, and the both sides of the washer. Apply screw rock agent to the bolts 28 and 40 (apply engine oil to the bearing surface only). Apply oil to the thread part, bearing surface and O-RING part of the bolts 11 to 20. Do not reuse a mended O-RING.

– 84 –
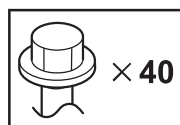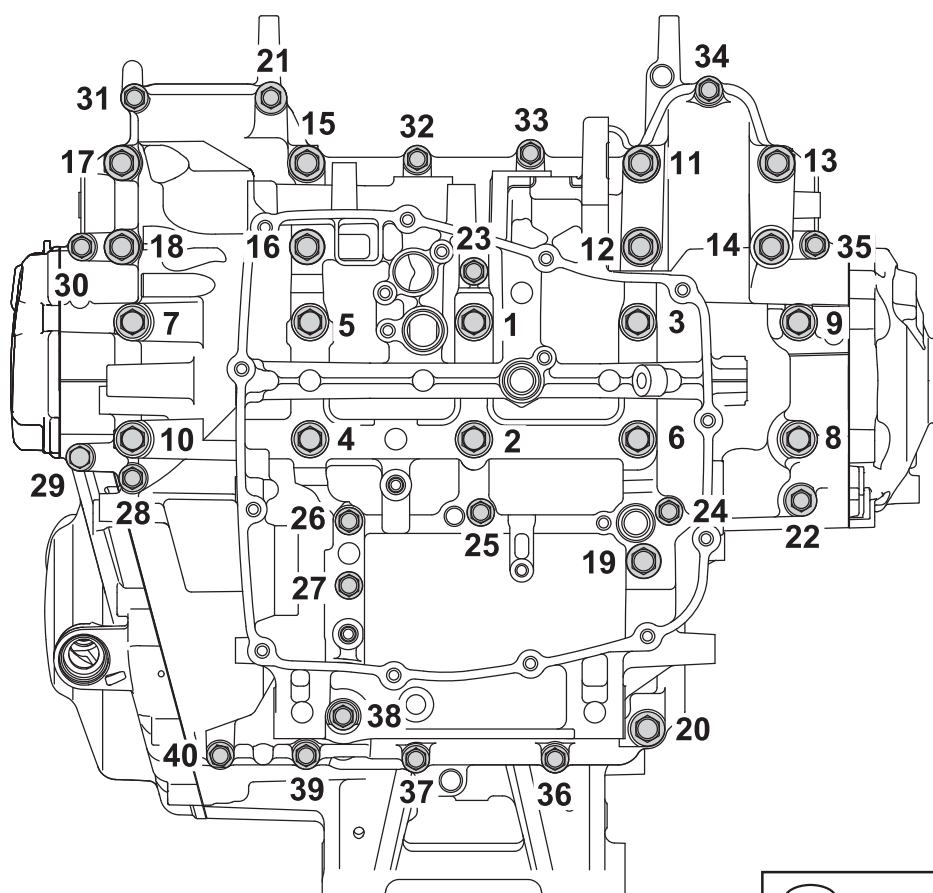
Procedure to tighten the aluminum bolts

1. In the following order, tighten the bolt at 6N•m (0.6kgf•m).
2. In the following order, loosen each bolt, tighten at 3 N•m (0.3 kgf•m), and apply snap and angle tightening at rotating angle of 90°.

   (Note: Do not loosen all bolts at once. Repeat loosening and tightening operation one by one bolt.)

TIP

The numbers 1 to 12 show the sequence in which the bolts are tightened.

Use a new bolt only. (Do not reuse)
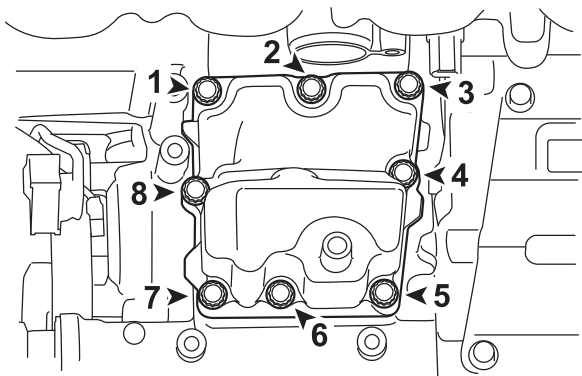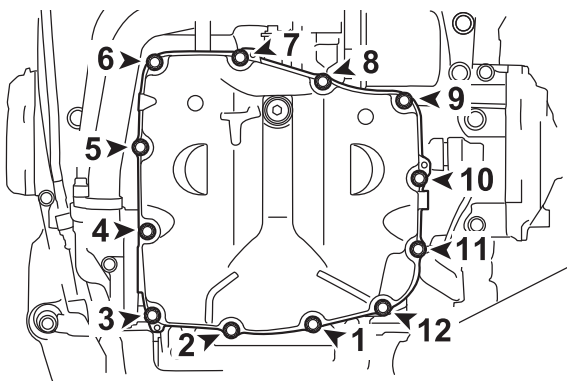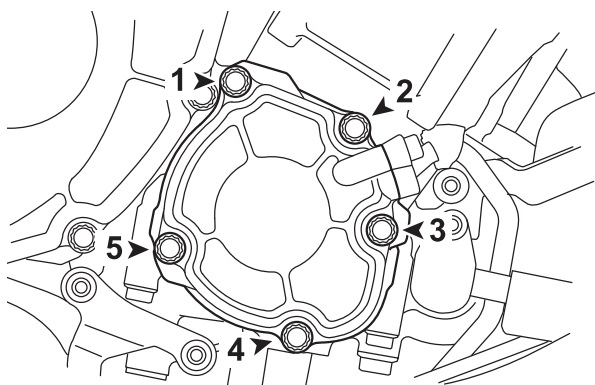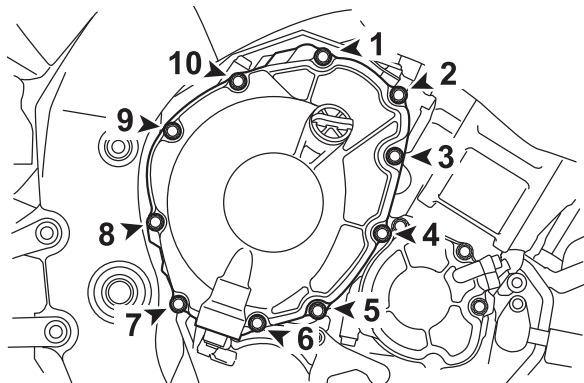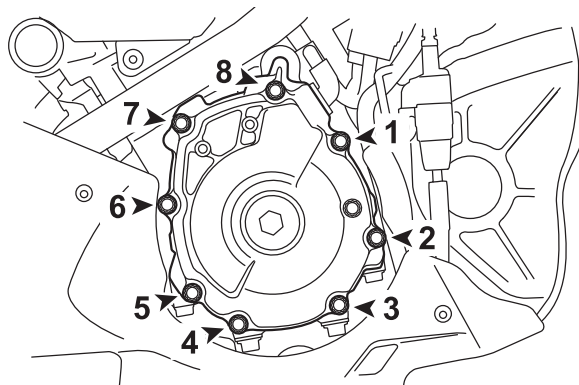
When replacing aluminum bolts with iron bolts

Use the following table as a reference when replacing aluminum bolts with iron bolts.

To be tightened	Part No.	Part Name	Thread dia. x pitch	Tightening torque N•m (kgf•m)	Q'ty	Remarks
Install COVER, STRAINER	90110-06390	BOLT, HEXAGON SOCKET	M6 x 1.0	12±2 (1.2±0.2)	12	APPLY TO SCREW ROCKING STRAINER COVER
Install COVER CRANK CASE 1 (15411)	90110-06387	BOLT, HEXAGON SOCKET	M6 x 1.0	12±2 (1.2±0.2)	8	ACM COVER
Install COVER CRANK CASE 2 (15421)	90110-06388	BOLT, HEXAGON SOCKET	M6 x 1.0	12±2 (1.2±0.2)	10	CLUTCH COVER
Install COVER 1 (15416)	90110-06396	BOLT, HEXAGON SOCKET	M6 x 1.0	12±2 (1.2±0.2)	5	CAM CHAIN COVER
Install COVER (15413)	90110-06387	BOLT, HEXAGON SOCKET	M6 x 1.0	12±2 (1.2±0.2)	8	BREATHER COVER

Procedure to install the engine (unchangeable)

1. Attach the two engine adjusting bolts 1 to the frame COMP. temporarily.
2. Fit the engine installation position to the frame COMP and attach the bolts 2 and 3 temporarily.
3. Attach the bolt 4 temporarily.
4. Attach the engine mount boss 5 and 6 to the frame COMP. temporarily and then attach the bolt 7 temporarily.
5. Tighten the two engine adjusting bolts 1 at specified torque.
    Check that the bearing surface of the bolts 1 completely fit the surface of the engine.
6. Tighten the two nuts 8 and 9 at specified torque. Tighten the nut 8 (lower side) at first, then tighten the nut 9 (upper side).
7. Tighten the bolt 4 at specified torque.
8. Tighten the bolt 7 at specified torque.

TIP

For information about tightening torque and requirement for lubricant agent, see the list of tightening torque.
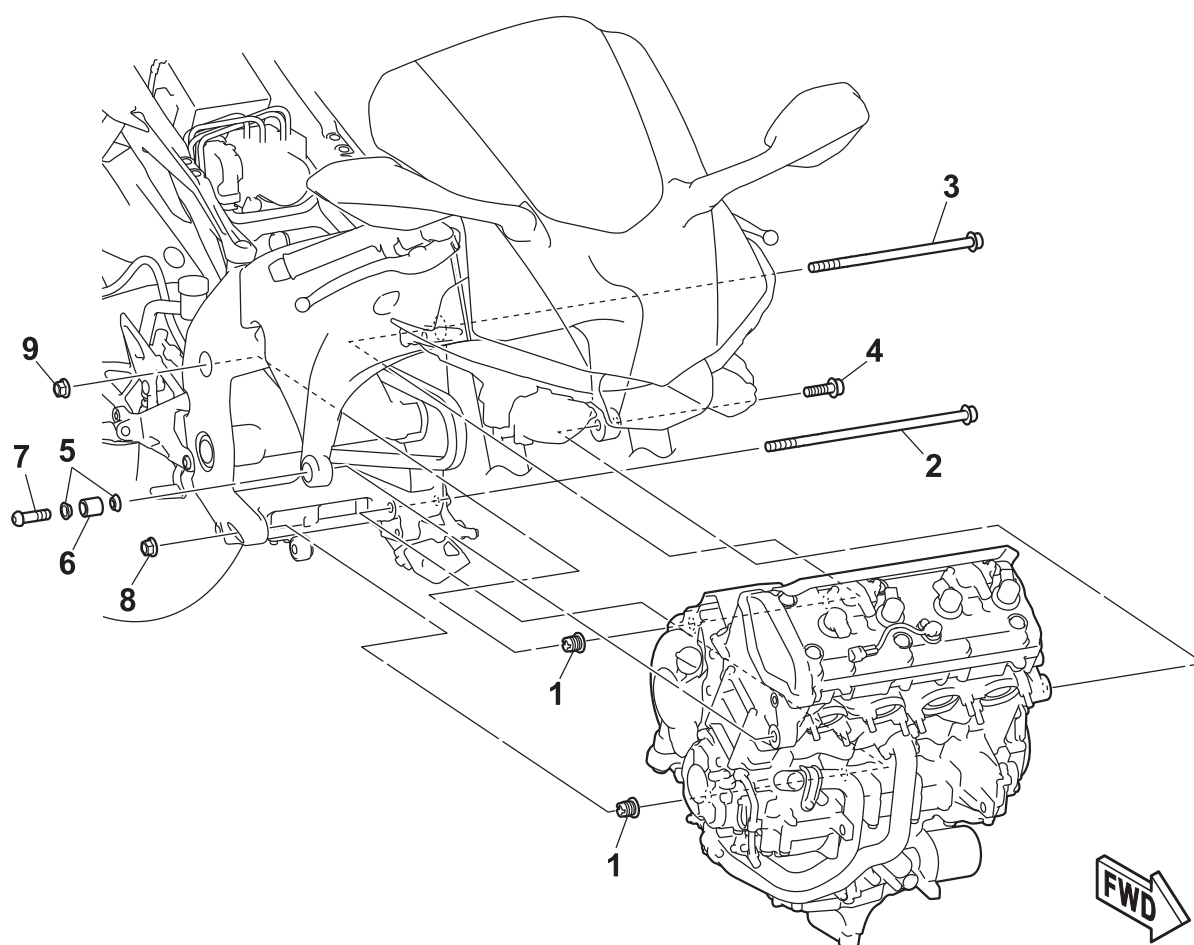
Procedure to install the pivot shaft peripheral parts

1. Tighten the pivot shaft 1 at specified torque.
2. Tighten the nut 2 at specified torque.
3. Tighten the nut 3 (self-rocking) at specified torque.
   Be sure to secure the pivot shaft 1 so that it is not co-rotated.

2

90201-30016
WASHER, PLAIN

1

Apply grease to the outer surface of the pivot shaft.

R

L

90201-20026
WASHER, PLAIN

3
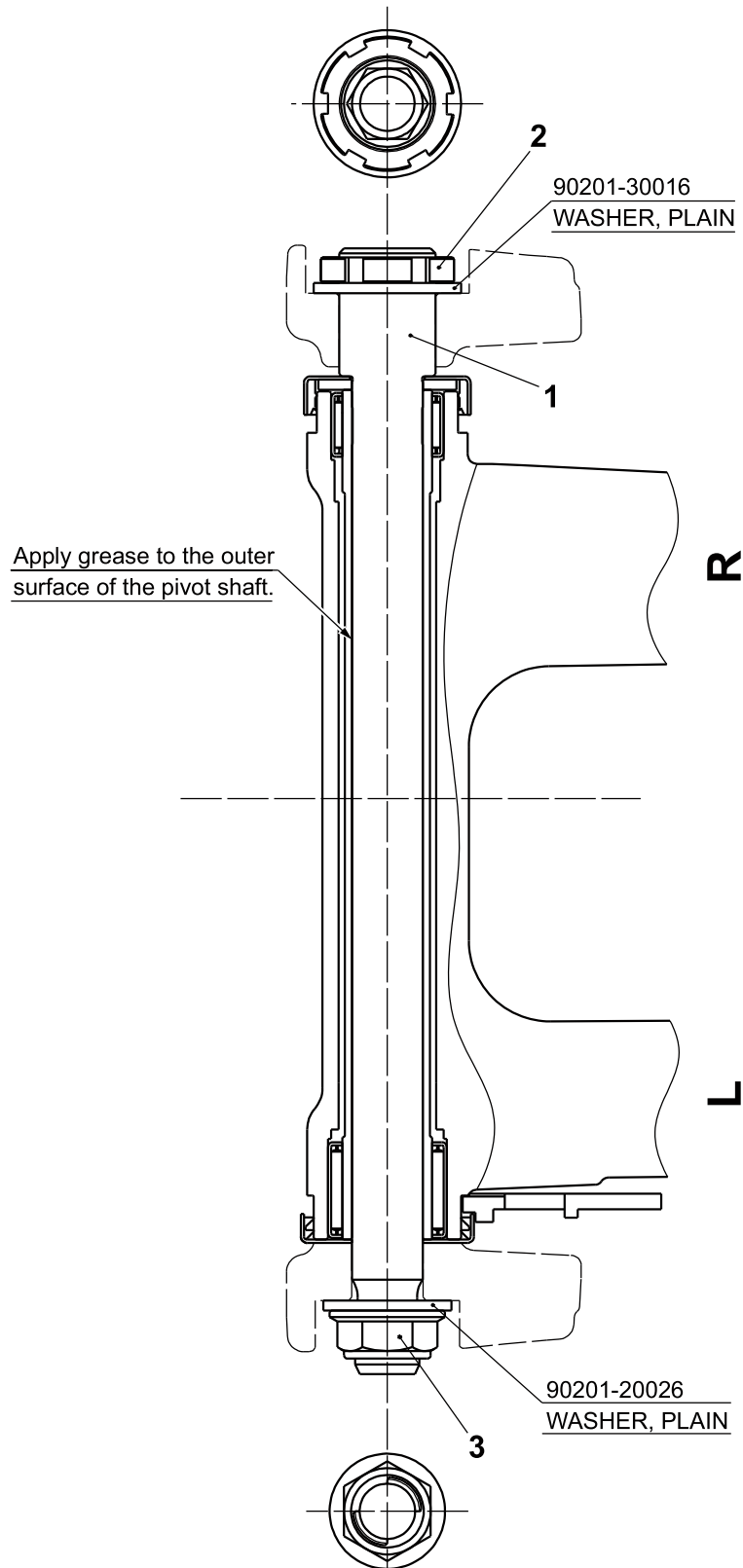
4 Headlight Cord Wiring Diagram

No.	COMPONENTS
1	BTRY.
2	SW.HANDLE 1
3	SW.HANDLE 2
4	EMERGENCY SW.
5	FUSE 1 (15A)
6	FUSE 2 (15A)
7	FUSE 3 (5A)
8	HEAD LIGHT
9	TAIL LIGHT 1 (Hi-side)
10	TAIL LIGHT 2 (Low-side)
11	EMERGENCY LIGHT

OBD	REC/REG	PC_I/F	TPS	CAM_SNSR	CCU1	CCU2	GPS1	GPS2	T/L	LIGHT_SW.	A-MAP_SELECT_SW.
RED	DARK_GRAY	BLACK	BLACK	BLACK	BLACK	BLACK			BLACK	RED	BLACK

INJ_42	INJ_22	INJ_32	INJ_12	SHIFT_SNSR	IG_COIL_2	IG_COIL_4	IG_COIL_3	IG_COIL_1	THROTTLE_MOTOR	WT_SNSR	PB_SNSR
GRAY	GRAY	GRAY	GRAY	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	DARK_BLUE

FR_SP_SNSR	RR_SP_SNSR	AT_SNSR	PA_SNSR	GP_SNSR	FP	IMU	POWER_SUPPLY	POWER_SUPPLY_2	ST_RELAY3	ST_RELAY2	ST_RELAY1
		BLACK	DARK_BLUE	DARK_BLUE	BLACK	BLACK	GRAY	GRAY			BLACK

MAIN_FUSE	SW_HANDLE_L1	SW_HANDLE_L2	SW_HANDLE_R2	SW_HANDLE_R3	SW_HANDLE_R1	APSG(SW_HANDLE_R)	J/C01		RELAY_ASSY
		BLACK			BLACK	BLACK			

MAIN_SW	VI_MOTOR	E-SD_SOLENOID	INJ_21	INJ_31	INJ_11	INJ_41	J/C02	J/C09	ACM	CRK_SNSR

NL_SW	BTRY_MINUS	BTRY_PLUS	BD_EARTH1	BD_EARTH2	MINUS_LEAD_1	ST_MOTOR	OIL_SW

ABS_ECU	METER	FUSE_BOX1	ECU2	ECU1	ECU3
BLACK	GRAY	BLACK	BLACK	BLACK	BLACK

SPARE SPARE

BONDA1	BONDA2	BONDA3

WIRE_SUB_LEAD_2(OIL_SW)	CCU1_SUB_LEAD	WIRE_SUB_LEAD_8(IG)	WIRE_SUB_LEAD_10(METER_1)	WIRE_SUB_LEAD_10(METER_2)	WIRE_SUB_LEAD_6(INJ_1)	WIRE_SUB_LEAD_7(INJ_2)
MAIN_HARNESS(OIL_SW)	MAIN_HARNESS(SL_4)	BLACK	BLACK	BLACK	BLACK	MAIN_HARNESS(INJ_2)
		MAIN_HARNESS(IG)	MAIN_HARNESS(METER_1)	MAIN_HARNESS(METER_2)	MAIN_HARNESS(INJ_1)	
		BLACK	BLACK	BLACK	BLACK	

WIRE_SUB_LEAD_11(WT)	CCU2_SUB_LEAD	WIRE_SUB_LEAD_12(FP)
MAIN_HARNESS(WT)	MAIN_HARNESS(CCU2)	MAIN_HARNESS(FP)