YAMAHA 2017

SERVICE MANUAL

MTN1000D
MTN1000DH

MT-10 SP

BW8-28197-E0

EAS20002

MTN1000D
MTN1000DH
SERVICE MANUAL

First edition, December 2016

EAS20003

IMPORTANT

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

TIP

Designs and specifications are subject to change without notice.

EAS30001

IMPORTANT MANUAL INFORMATION

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.**

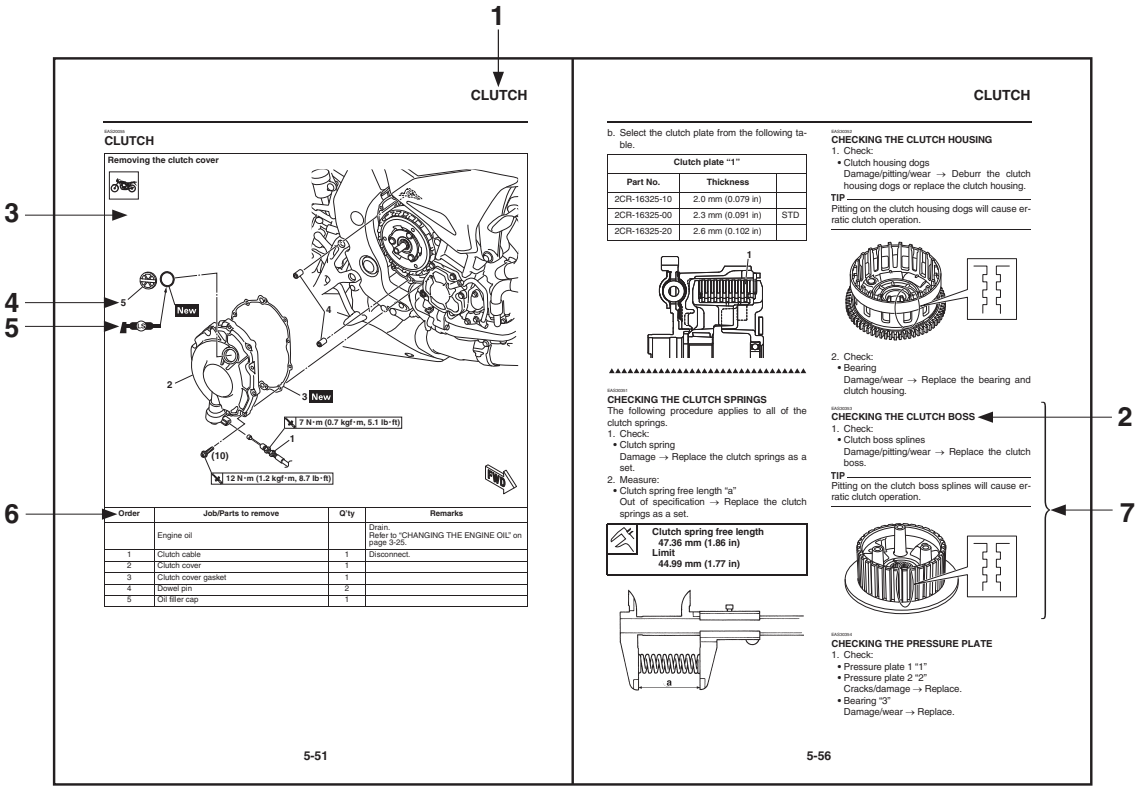
TIP	A TIP provides key information to make procedures easier or clearer.

EAS20004

HOW TO USE THIS MANUAL

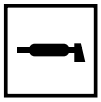
This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

- The manual is divided into chapters and each chapter is divided into sections. The current section title "1" is shown at the top of each page.
- Sub-section titles "2" appear in smaller print than the section title.
- To help identify parts and clarify procedure steps, there are exploded diagrams "3" at the start of each removal and disassembly section.
- Numbers "4" are given in the order of the jobs in the exploded diagram. A number indicates a disassembly step.
- Symbols "5" indicate parts to be lubricated or replaced.
  Refer to "SYMBOLS".
- A job instruction chart "6" accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc. This step explains removal and disassembly procedure only. For installation and assembly procedure, reverse the steps.
- Jobs "7" requiring more information (such as special tools and technical data) are described sequentially.



EAS20005
SYMBOLS
The following symbols are used in this manual for easier understanding.

TIP
The following symbols are not relevant to every vehicle.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Serviceable with engine mounted		Gear oil
	Filling fluid		Molybdenum disulfide oil
	Lubricant		Brake fluid
	Special tool		Wheel bearing grease
	Tightening torque		Lithium-soap-based grease
	Wear limit, clearance		Molybdenum disulfide grease
	Engine speed		Silicone grease
	Electrical data		Apply locking agent (LOCTITE®).
	Engine oil		Replace the part with a new one.
	Silicone fluid		

EAS10003

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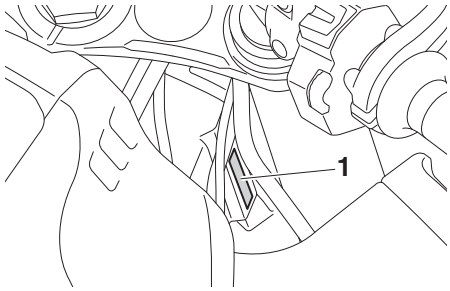
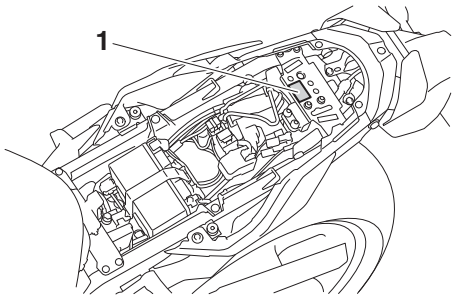
EAS20007
IDENTIFICATION

EAS30002
VEHICLE IDENTIFICATION NUMBER
The vehicle identification number “1” is stamped into the right side of the steering head pipe.

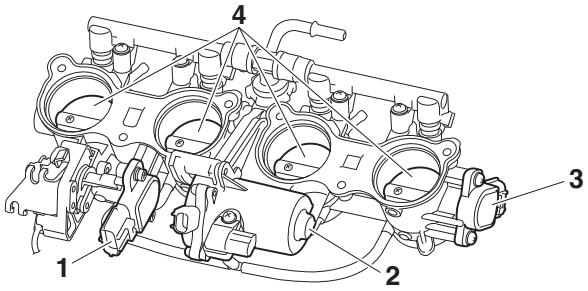


EAS30003
MODEL LABEL
The model label “1” is affixed to the frame under the passenger seat. This information will be needed to order spare parts.



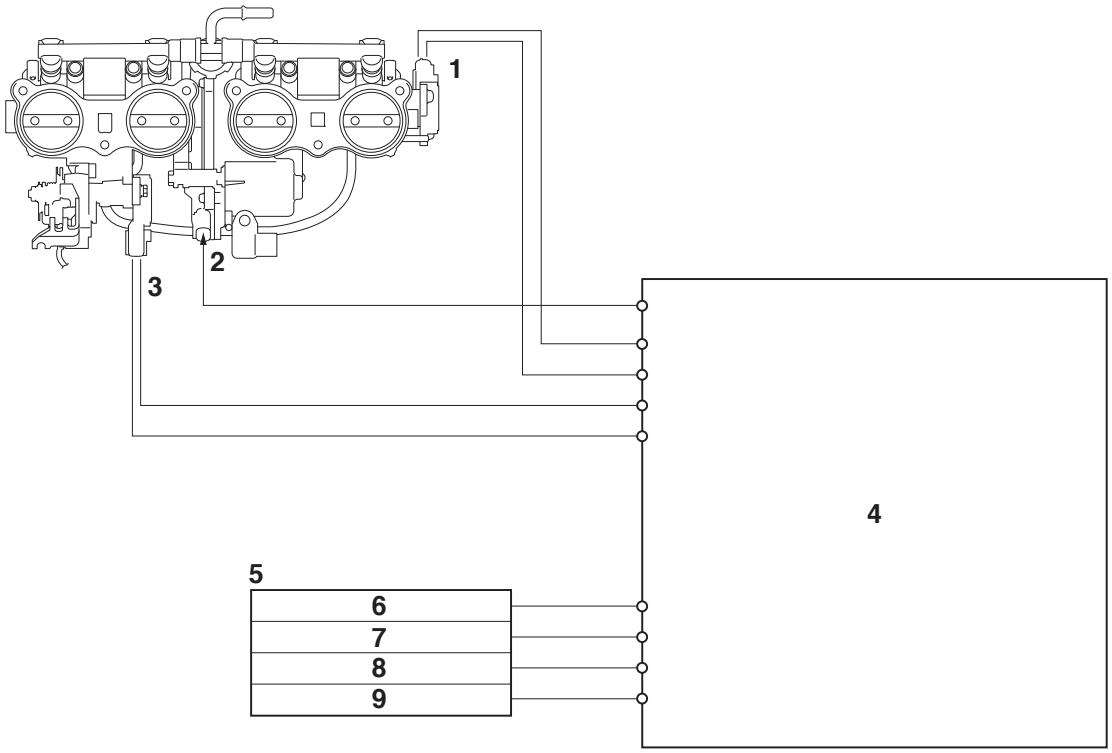
EAS20008
FEATURES

EAS30852
YCC-T (Yamaha Chip Controlled Throttle)
Mechanism characteristics
Yamaha developed the YCC-T system employing the most advanced electronic control technologies. Electronic control throttle systems have been used on automobiles, but Yamaha has developed a faster, more compact system specifically for the needs of a sports motorcycle. The Yamaha-developed system has a high-speed calculating capacity that produces computations of running conditions every 1/1000th of a second.
The YCC-T system is designed to respond to the throttle action of the rider by having the ECU instantaneously calculate the ideal throttle valve opening and generate signals to operate the motor-driven throttle valves and thus actively control the intake air volume.
The ECU contains two CPUs with a capacity about five times that of conventional units, making it possible for the system to respond extremely quickly to the slightest adjustments made by the rider. In particular, optimized control of the throttle valve opening provides the optimum volume of intake air for easy-to-use torque, even in a high-revving engine.
Aims and advantages of using YCC-T
- Increased engine power
  By shortening the air intake path, higher engine speed is possible → Increased engine power.
- Improved driveability
  Air intake volume is controlled according to the operating conditions → Improved throttle response to meet engine requirement.
  Driving force is controlled at the optimal level according to the transmission gear position and engine speed → Improved throttle control.
- Engine braking control
  Due to the throttle control, optimal engine braking is made possible.
- Simplified idle speed control (ISC) mechanism
  The bypass mechanism and ISC actuator are eliminated → A simple mechanism is used to maintain a steady idle speed.
- Reduced weight
  Compared to using a sub-throttle mechanism, weight is reduced.



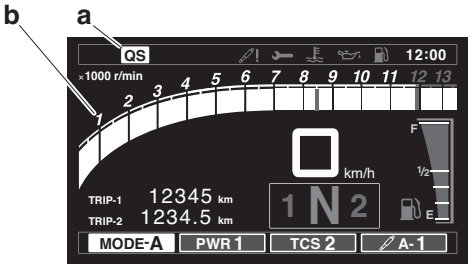
1. Accelerator position sensor
2. Throttle servo motor
3. Throttle position sensor
4. Throttle valves

YCC-T system outline



1. Throttle position sensor
2. Throttle servo motor
3. Accelerator position sensor
4. ECU (Engine Control Unit)
5. Sensor input
6. Gear position sensor
7. Crankshaft position sensor
8. Rear wheel sensor
9. Coolant temperature sensor

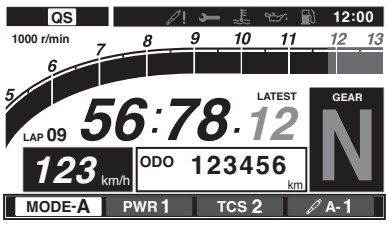
EAS31625
ELECTRONIC CONTROL-RELATED FEATURES
Digital instrument panel with TFT liquid crystal display
All of the instrument function displays have been concentrated into a single 4.2-inch screen that adopts a fully transmissive Thin Film Transistor (TFT) liquid crystal display.
A white background and a black background can be selected for the background illumination, and the display also features automatic brightness adjustment activated by a sensor that measures ambient light conditions.
For the display mode, there is also a choice between a “Street” mode with a priority on displaying information needed for riding on public roads, and a “Track” mode with a priority on information desired for racing or circuit riding.
The “Street” mode features items like a gear position display, with a fade-out, fade-in type transition when the gear is shifted, and is designed to add analog elements with a natural visual appearance even though it is a fully digital display. In addition, the tachometer bar display is designed to change color with the engine’s rpm range in order to give a perceptual recognition of the engine’s current rpm at any given moment.
Items that can be displayed include the odometer, tripmeters, intake air temperature, coolant temperature, real-time fuel efficiency, average fuel efficiency and amount of fuel consumed.



a. Icons show whether each control function is set On or Off and the settings of the control modes

b. The tachometer bar display changes color in mid- and high-speed ranges (rpm range change points adjustable)

The “Track” mode displays information needed in racing. The tachometer displays the over-5,000 rpm to redline range used most often in racing with a high degree of clarity and detail. This mode features high priority displays of lap number, lap times as well as a stopwatch function, all useful items for racing. Each display also has a memory function that enables lap-by-lap time verification for quick post-race analysis.



Quick Shift System (QSS) for smooth up-shifting even at full throttle

A Quick Shift System (QSS) is adopted to help provide speedy up-shifts. When the switch positioned on the shift lever rod detects motion in the shift lever, it adjusts engine output according to ECU calculations and instantly cancels out the drive torque of the gear engaged by the clutch dog to promote swifter shifting of gears.

Systems to control machine motion characteristics

Electronic Racing Suspension (ERS) providing integrated control of the front and rear suspensions

An Öhlins Electronic Racing Suspension (ERS) is adopted to further bring out performance potential in circuit riding. The system's Suspension Control Unit (SCU) makes integrated adjustments of both the front and rear suspensions' compression stroke and rebound stroke damping force based on running conditions.

With data from the various sensors, the ERS assesses the running conditions and at the same time the SCU calculates the ideal damping force for the front and rear suspensions. Signals activate the step motors built into the suspensions to operate the needles that function to adjust the damping force.

This ERS has a choice of "Automatic" and "Manual" modes. Within each of these modes there is also a selection of three running modes ("Manual" modes) and two running modes ("Automatic" modes) to make a total of five different settings to fit rider preferences or the riding environment. In addition, two of the running modes in the "Automatic" mode have fine adjustment functions for the damping force to meet the needs of a wide range of running conditions.

To further increase the latitude for damping force adjustment, the front suspension adopts separate damping force generating mechanisms for the two sides of the fork, with compression stroke damping on the left and rebound stroke damping on the right. This design also makes the unit less susceptible to fluctuations in the hydraulic fluid (oil) pressure and contributes to more stable performance in repetitious operation. In addition, it is possible to adjust compression stroke and rebound stroke damping force independently on both the front and rear suspensions. Also, spring preload is made by means of a hand-operated nut.

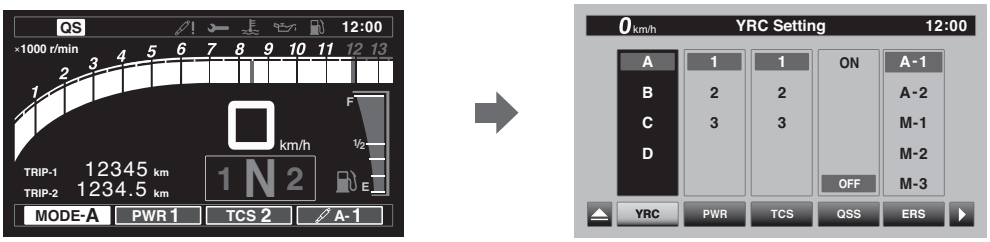
PWR for power mode selection and YAMAHA Ride Control adopted

A power mode selection system (PWR) for a choice of running modes to fit rider preferences and the riding environment, and also the YAMAHA Ride Control (YRC) system are adopted.

The PWR system consists of three different control maps to regulate throttle valve opening depending on the degree of throttle opening, thus providing the user with a selection of modes to fit his/her preferences and the riding environment. Each of the modes (1 to 3) is pre-set with recommended settings for the PWR system, but each of these control modes can be freely adjusted into new combinations based on user preferences and riding environment.

The YRC system is a memory bank for the separate setting data for each of the control setting of each running mode. This data is saved in the form of four patterns of settings designated A, B, C and D.

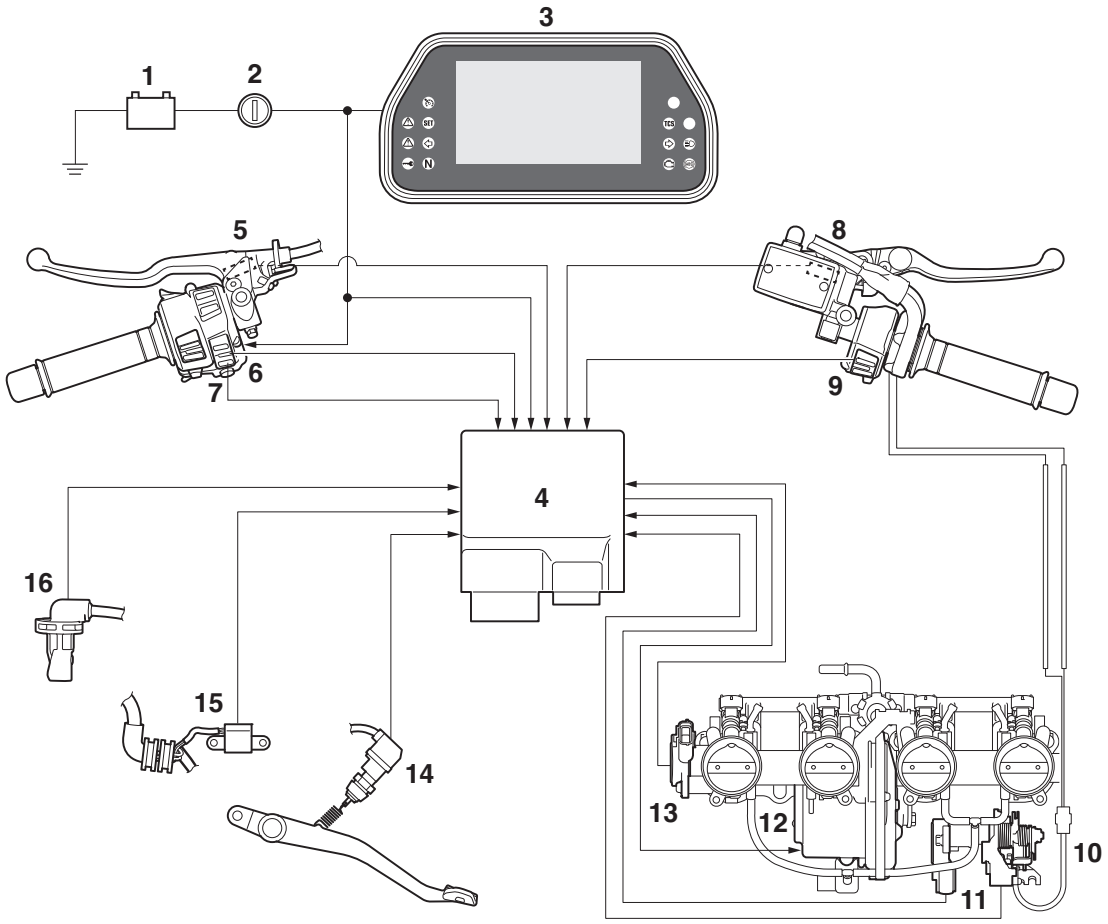
A



A. Image showing the TFT instrument panel for control mode adjustments

EAS30940
OUTLINE OF THE CRUISE CONTROL SYSTEM

This model is equipped with a cruise control system designed to maintain a set cruising speed. Because the vehicle is equipped with the YCC-T system, the cruise control system can be controlled electronically. Based on the signals that are received from the sensors and switches, the ECU calculates the required throttle valve opening and operates the throttle servo motor to control the throttle valves. Because the system allows the rider to maintain a set cruising speed without operating the throttle, the system reduces the burden of maintaining a constant speed during long-distance touring. In addition, the cruise control system is equipped with a self-diagnosis function.



1. Battery
2. Main switch
3. Meter assembly
4. ECU (Engine Control Unit)
5. Clutch switch
6. Cruise control power switch
7. Cruise control setting switch
8. Front brake light switch
9. Start/engine stop switch
10. Grip cancel switch
11. Accelerator position sensor
12. Throttle servo motor
13. Throttle position sensor
14. Rear brake light switch
15. Crankshaft position sensor
16. Rear wheel sensor

EWA17451

WARNING

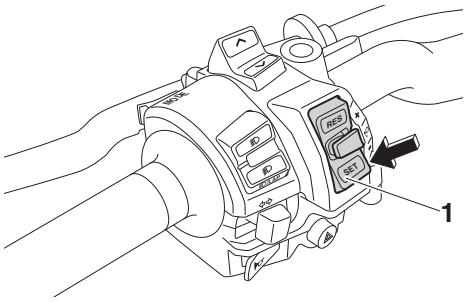
- **Improper use of the cruise control system may result in loss of control, which could lead to an accident. Do not activate the cruise control system in heavy traffic, poor weather conditions, or among winding, slippery, hilly, rough or gravel roads.**
- **When traveling uphill or downhill, the cruise control system may not be able to maintain the set cruising speed.**
- **To prevent accidentally activating the cruise control system, turn it off when not in use. Make sure that the cruise control system indicator light is off.**

Activating and setting the cruise control system

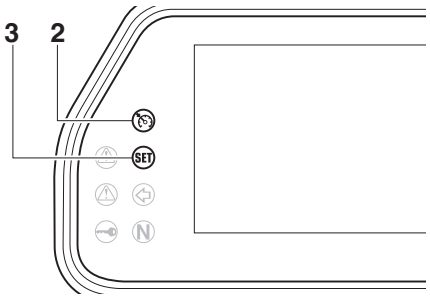
1. Push the cruise control power switch "" located on the left handlebar. The cruise control system indicator light "" will come on.
2. Push the "SET–" side of the cruise control setting switch to activate the cruise control system. Your current traveling speed will become the set cruising speed. The cruise control setting indicator light "SET" will come on.

TIP

The cruise control system operates only when riding in 4th, 5th or 6th gear at speeds between about 50 km/h (31 mi/h) and 180 km/h (112 mi/h).

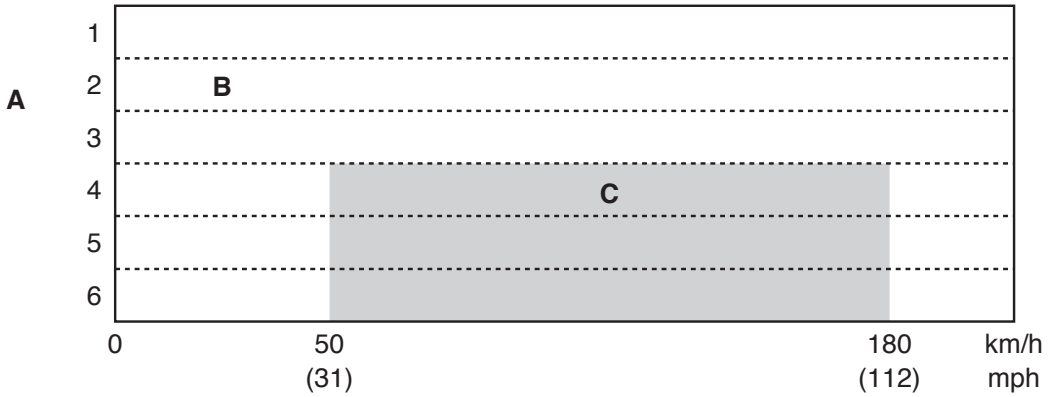


1. Cruise control setting switch "RES+/SET–"
2. Cruise control system indicator light ""



3. Cruise control setting indicator light "SET"

Operating range of cruise control system



A. Gear position
B. Cruising speed cannot be set
C. Cruising speed can be set

Adjusting the set cruising speed

While the cruise control system is operating, push the "RES+" side of the cruise control setting switch to increase the set cruising speed or the "SET–" side to decrease the set speed.

TIP

Pushing the setting switch once will change the speed in increments of approximately 2.0 km/h (1.2 mph). Holding the "RES+" or "SET–" side of the cruise control setting switch down will increase or decrease the speed continuously until the switch is released.

You can also manually increase your traveling speed using the throttle. After you have accelerated, you can set a new cruising speed by pushing the "SET–" side of the setting switch. If you do not set a new cruising speed, when you return the throttle grip, the vehicle will decelerate to the previously set cruising speed.

Deactivating the cruise control system

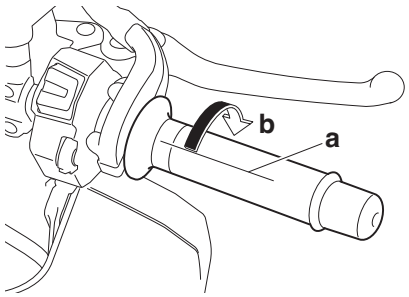
Perform one of the following operations to cancel the set cruising speed. The "SET" indicator light will go off.

- Turn the throttle grip past the closed position in the deceleration direction.
- Apply the front or rear brake.
- Disengage the clutch.

Push the power switch to turn off the cruise control system. The "" indicator light and the "SET" indicator light will go off.

TIP

Traveling speed decreases as soon as the cruise control system is deactivated; unless the throttle grip is turned.



a. Closed position
b. Cruise control cancel direction

Using the resume function

Push the "RES+" side of the cruise control setting switch to reactivate the cruise control system. The traveling speed will return to the previously set cruising speed. The "SET" indicator light will come on.

EWA17460

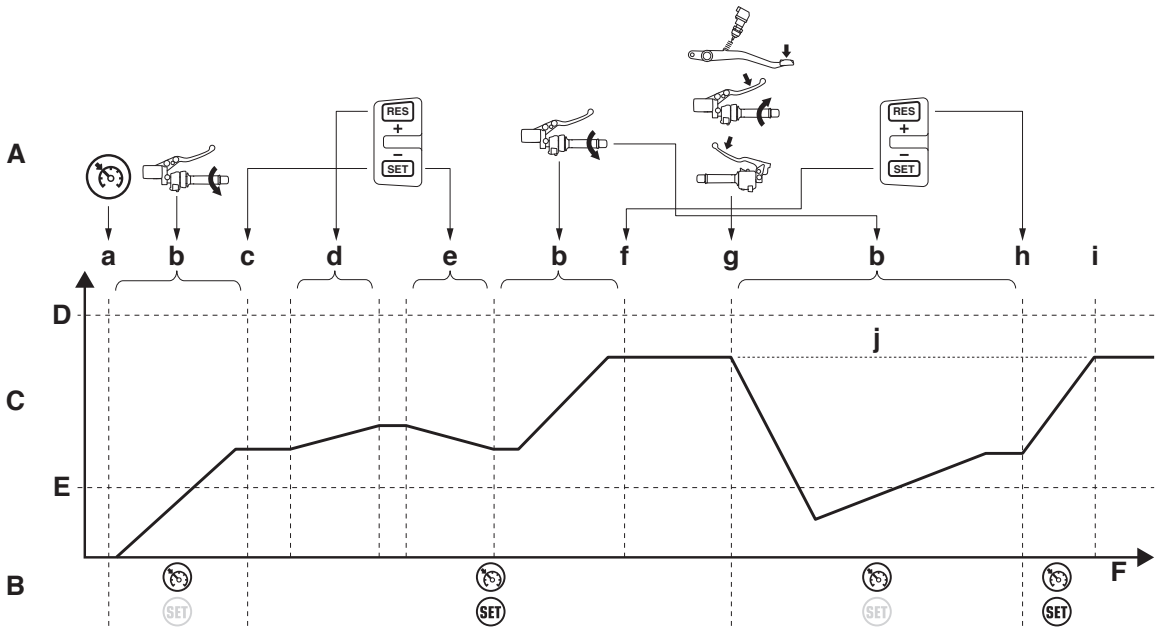
⚠ WARNING

It is dangerous to use the resume function when the previously set cruising speed is too high for current conditions.

TIP

Pushing the power switch while the system is operating will turn the system off completely and erase the previously set cruising speed. You will not be able to use the resume function until a new cruising speed has been set.

Operation chart



A. Operation
B. Indication
C. Speed
D. 180 km/h (112 mph)
E. 50 km/h (31 mph)
F. Time

a. Cruise control power switch "" "ON"
b. Manual acceleration
c. Push the "SET–" side of the cruise control setting switch
d. Currently set cruising speed increases
e. Currently set cruising speed decreases
f. New cruising speed is set
g. Currently set cruising speed is canceled
h. Resume operation starts
i. Resume operation finishes
j. Currently set cruising speed