



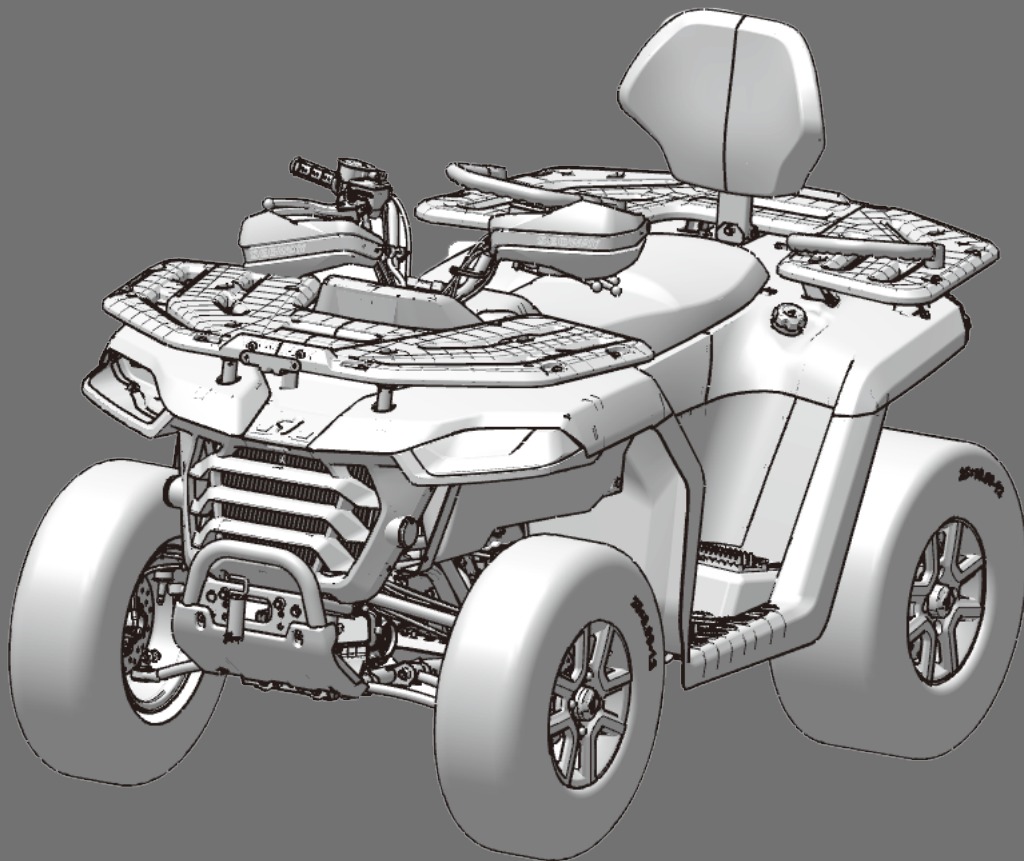


**SEGWAY**

**2026**

**AT10/AT10 W  
SERIES MODELS**

# **SERVICE MANUAL**



V1.0



# INDEX

GENERAL INFORMATION	Ch.1
REGULAR MAINTENANCE	Ch.2
ENGINE	Ch.3
FRONT AND REAR AXLE	Ch.4
FUEL SYSTEM	Ch.5
COOLING SYSTEM	Ch.6
INTAKE SYSTEM	Ch.7
DRIVE CHAIN SYSTEM	Ch.8
FRONT AND REAR SUSPENSION	Ch.9
WHEEL AND TIRE	Ch.10
BRAKE SYSTEM	Ch.11
STEERING SYSTEM	Ch.12
FRAME/BODY AND TRIM	Ch.13
ELECTRICAL SYSTEM	Ch.14

# SUMMARY

This manual provides information on diagnostics, maintenance procedures, adjustments and specifications for the 1000ATV series for use by service technicians.

All materials, illustrations and product descriptions contained in this manual are in accordance with the status at the time of publication to ensure the efficient safety of vehicles, continuous research and development, may lead to parts of the manual account do not tally with the vehicle actual situation, so the state of the vehicle body shall prevail, when in doubt it is suggested that you contact the Segway Powersports dealership, for the latest status of this manual or information relating to the product part number or special tools.

No part of this manual may be reproduced or stored in any form without the permission of Segway Technology Ltd.

The above statement applies to all text, images, and forms.

1. This manual is provided by Segway Technology Ltd. and is intended for qualified professional and technical personnel.

If you do not have the proper training and do not proper tools and equipment, attempting to perform repairs and maintenance can injure the repairer himself or others, and may also damage the vehicle or cause it to not be operated properly.

2. Proper vehicle maintenance and repair is very important for the personal safety of maintenance personnel and the safe, reliable operation of motor vehicles. If you need to replace a part, please use the same part or the part specified by Segway, do not use parts that are not recognized by Segway. Do not use parts not approved by Segway for replacement.

3. The recommended maintenance procedures described in this manual are an effective way to perform repairs and maintenance, some of which require the use of specialized tools.

Therefore, if replacement parts, repair procedures or tools not approved or recommended by Segway are used, you must first verify that there is no risk to personal safety or safe operation of the vehicle. or safe operation of the vehicle.



**SEGWAY®**

**SEGWAY TECHNOLOGY CO., LTD.**

**POWERSPORTS.SEGWAY.COM**

# TERMINOLOGY

A	ampere(s)	lb	pounds(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	mm	Millimeter(s)
ATDC	after top dead center	min	minute(s)
BBDC	before bottom dead center	N	newton(s)
BDC	bottom dead center	Nm	Newton meters
BTDC	before top dead center	Pa	pascal(s)
C	degree(s) Celcius	HP(PS)	horsepower
CVT	centrifugal variable Transmission	psi	pound(s) per square inch
DC	direct current	r	revolution
F	farad(s)	rpm	revolution(s) per minute
F	degree(s) Fahrenheit	TDC	top dead center
ft	foot, feet	TIR	total indicator reading
g	gram(s)	V	volt(s)
kg/cm <sup>2</sup>	Kilograms per square centimeter	W	watt(s)
h	hour(s)	Ω	ohm(s)
L	liter(s)		

This manual is applicable to the following vehicle models: :

SEGWAY AT10/SEGWAY AT10 W

SEGWAY AT10 MUD/SEGWAY AT10 W MUD

SEGWAY AT10 ABS/SEGWAY AT10 W ABS

# NOTES BEFORE MAINTENANCE

This manual includes a variety of "warnings", "attention", "tips", etc., which must be carefully followed in order to reduce the risk of injury during repair or maintenance. Improper repair or maintenance will damage the vehicle or bring safety hazards to the vehicle.

## **⚠ WARNING**

**WARNING** indicates a potential hazard that may result in severe injury or death to the operator, bystander or person(s) inspecting or servicing the vehicle.

## **⚠ CAUTION**

**CAUTION** indicates a potential hazard that may result in personal injury or damage to the vehicle.

## **TIPS**

**TIPS** provide maintenance information to give the corresponding reminder, express and explanation.

## **IMPORTANT**

**IMPORTANT** provides key reminders during disassembly, assembly, and inspection of components.

Please understand the construction, performance, repair methods and safety requirements of the vehicle being repaired before servicing.

### **Preparation of tools and gauges**

Prepare the necessary tools and measuring instruments before the repair work.

### **Specialized tools**

The disassembly of some parts requires the use of special tools, please do not use other tools instead.

### **Parts disassembly**

Before repair work, first identify the cause of the malfunction and confirm whether disassembly or disassembly is required based on the actual condition of the malfunction.

### **Disassemble**

If the disassembly process is complex and requires too many parts to be disassembled, take care that the performance or shape of all parts is not damaged.

### **Parts**

When parts are damaged and need to be replaced, use parts approved or recommended by Segway.

### **Replacements**

All components should be assembled with strict adherence to standard values such as torque and indeed adjustment values.

If disassembled, the following parts must be replaced with new ones:

- shims
- O-ring
- cotter pin

Use the recommended lubricant in the specified position before assembly

### **Rubber parts and hoses**

Prevent rubber parts and hoses from coming into contact with gasoline or lubricating oil.

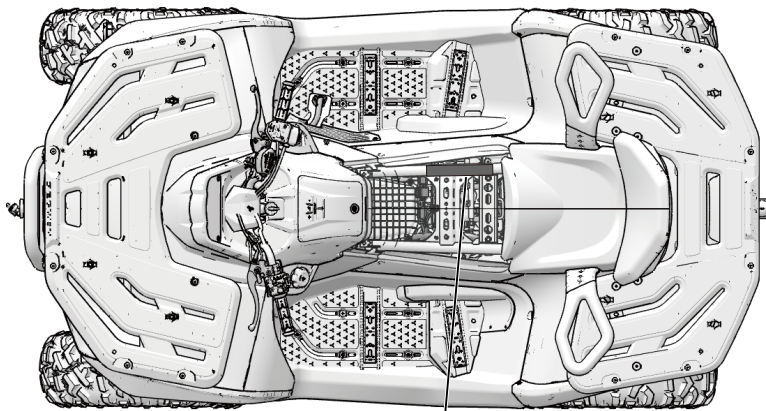
# GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER/ENGINE SERIAL CODE ..... 1-2  
TECHNICAL PARAMETERS OF VEHICLE ..... 1-3  
UNIT CONVERSION TABLE ..... 1-9  
TORQUE ..... 1-10

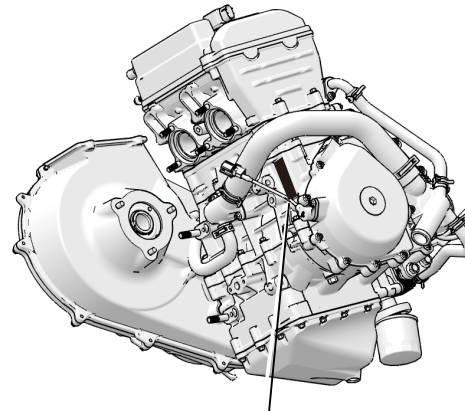
## VEHICLE IDENTIFICATION NUMBER/ENGINE SERIAL CODE

### Vehicle identification number

The vehicle identification number is located on the frame cross tube under the seat cushion and the engine number is embossed on the engine. It is used to assist the customer when ordering spare parts from the dealer or as a reference in case the vehicle is stolen. when the customer needs to order spare parts from the dealer or as a reference in the event of theft of the vehicle.



Vehicle Frame Identification Number (VFIN)



Engine Serial No.

### VEHICLE IDENTIFICATION CODE COMPOSITION

\*A0SAAPX1? X X X X X X X X \*

1
2
3
4
5
6
7
8
9
10

No.	Serial Number Meaning	Digits	No.	Serial Number Meaning	Digits
1	OEM CODE	3	6	INSPECTION	1
2	MODEL	1	7	DATE	1
3	ENGINE CODE	1	8	SERIAL NUMBER	1
4	DISPLACEMENT	1	9	FACTOR NUMBER	1
5	POWER	1	10	PRODUCTION NUMBER	6

TECHNICAL PARAMETERS OF VEHICLE



ITEM	SEGWAY AT10	SEGWAY AT10 W
Length	2410mm	2430mm
Width	1260mm	1490mm
Height	1452mm	1530mm
Wheel base	1455mm	
Ground clearance	275mm	275mm(27") 320mm(30")
Turning diameter	9000mm	8000mm
Curb weight	517 kg	521kg
Front rack load	40kg	
Rear rack load	60kg	
Recommended Traction quality Pulled load quality)	450kg	

ITEM	SPECIFICATIONS	
	SEGWAY AT10	SEGWAY AT10 W
Engine		
Engine model	293MY-2	
Engine type	Four stroke, single cylinder, water cooled, vertical, double overhead camshaft	
Cylinder diameter × stroke	93×73.6	
Engine displacement	999.99 ml	
Compression ratio	10.9:1	
Idle speed	1450±145 r/min	
Maximum power	71kW / 8000 r/min	
Maximum torque	88 N·m / 7500 r/min	
Starting way	Electric start	
Lubrication way	Pressure spray	
Engine oil type	SAE 5W-40 SN or higher	
Engine oil capacity	2200 mL	
Front axle gear oil type	SAE 80W-90 GL-5	
Empty Volume	310 mL	

ITEM	SPECIFICATIONS					
	SEGWAY AT10			SEGWAY AT10 W		
Rear axle gear oil model	SAE 80W-90 GL-5					
Empty Volume	1200 mL					
Air filter	Paper filter element					
Fuel tank type	Barrier type plastic fuel tank					
Fuel tank capacity	23 L					
Fuel type	Petrol(E10)/87#(US)/92 #(GB)					
Spark plug type	B7RTC/B8RTC					
Spark plug clearance	0.6~0.8mm					
Variable speed way	CVT					
Variable speed ratio	0.717~2.976					
L Transmission ratio	13.192~54.755					
H Transmission ratio	8.802~36.534					
Reverse gear ratio	11.515~47.794					
Tire						
Tire type	Vacuum tire					
Front tire specification	27×9.00-14	27×9.00 R14	27×9.00-14	27×9.00R14	30×10.00R14	
Rear tire specification	27×11.00-14	27×11.00 R14	27×9.00-14	27×9.00R14	30×10.00R14	
Front tire pressure	7.0psi (48.3kPa)					
Rear tire pressure	7.0psi (48.3kPa)					
Brake type	Disc brake					
Front wheel front beam:	-5~20mm			-5~20mm		
Main pin rear camber (°)	5			3		
Wheel Camber (°)	-0.1			-0.1		
Main pin camber (°)	8			8		
Main pin offset (mm)	3.5			-0.5		
Suspension System						
Foot brake mode	Foot operation					
Front braking mode	Hand operation					
Brake fluid type	DOT4					
Front suspension	Double-wishbone independent suspension					
Rear suspension	Double-wishbone independent suspension					
Front shock absorber	Hydraulic Spring/Air sac					
Rear shock absorber	Hydraulic Spring/Air sac					

ITEM	SPECIFICATIONS	
	SEGWAY AT10	SEGWAY AT10 W
Fr. Suspension stroke	185mm	173mm
Rr. Suspension stroke	210mm	210mm
Electrical System		
Ignition mode	electricity (ECU)	
Charge	980W/5500 rpm / 680W/5500 rpm	
Battery	12V 32Ah	
Headlamp	Head light	LED or H4/55W
	Day Light	LED
	Turn signal	LED
	Front Position Light	LED
Rear tail light - position light	LED or 5 W P21/5W	
Rear taillights - Brake lights	LED or 21 W P21/5W	
Turn signal lamp	LED or 10W RY10W	



Length	SEGWAY AT10 MUD	SEGWAY AT10 MUD W
Width	2410mm	2429mm
Height	1259mm	1489mm
Wheel base	1452mm	1530mm
Ground clearance	1450mm	
Turning diameter	275mm	320mm
Curb weight	9000mm	8000mm
Front rack load	513kg	522kg
Rear rack load	60kg	
Recommended Traction quality Pulled load quality)	450kg	

ITEM	SPECIFICATIONS	
	SEGWAY AT10 MUD	SEGWAY AT10 MUD W
Engine		
Engine model	293MY-2	
Engine type	Four stroke, single cylinder, water cooled, vertical, double overhead camshaft	
Cylinder diameter × stroke	93×73.6	
Engine displacement	999.99 ml	
Compression ratio	10.9:1	
Idle speed	1450±145 r/min	
Maximum power	71kW / 8000 r/min	
Maximum torque	88 N·m / 7500 r/min	
Starting way	Electric start	
Lubrication way	Pressure spray	
Engine oil type	SAE 5W-40 SN or higher	
Engine oil capacity	2200 mL	
Front axle gear oil type	SAE 80W-90 GL-5	
Empty Volume	310 mL	
Rear axle gear oil model	SAE 80W-90 GL-5	
Empty Volume	1200 mL	
Air filter	Paper filter element	

ITEM	SPECIFICATIONS				
	SEGWAY AT10 MUD		SEGWAY AT10 MUD W		
Fuel tank type	Barrier type plastic fuel tank				
Fuel tank capacity	23 L				
Fuel type	Petrol(E10)/87#(US)/92 #(GB)				
Spark plug type	B7RTC/B8RTC				
Spark plug clearance	0.6~0.8mm				
Variable speed way	CVT				
Variable speed ratio	0.717~2.976				
L Transmission ratio	13.192~54.755				
H Transmission ratio	8.802~36.534				
Reverse gear ratio	11.515~47.794				
Tire					
Tire type	Vacuum tire				
Front tire specification	27×9.00-14	27×9.00 R14	27×9.00-14	27×9.00R14	30×10.00R14
Rear tire specification	27×11.00-14	27×11.00 R14	27×9.00-14	27×9.00R14	30×10.00R14
Front tire pressure	7.0psi (48.3kPa)				
Rear tire pressure	7.0psi (48.3kPa)				
Brake type	Disc brake				
Front wheel front beam:	-5~20mm		-5~20mm		
Main pin rear camber (°)	5		3		
Wheel Camber (°)	-0.1		-0.1		
Main pin camber (°)	8		8		
Main pin offset (mm)	3.5		-0.5		
Suspension System					
Foot brake mode	Foot operation				
Front braking mode	Hand operation				
Brake fluid type	DOT4				
Front suspension	Double-wishbone independent suspension				
Rear suspension	Double-wishbone independent suspension				
Front shock absorber	Hydraulic Spring/Air sac				
Rear shock absorber	Hydraulic Spring/Air sac				
Fr. Suspension stroke	185mm		173mm		
Rr. Suspension stroke	210mm		210mm		

ITEM	SPECIFICATIONS	
	SEGWAY AT10 MUD	SEGWAY AT10 MUD W
Electrical System		
Ignition mode	electricity (ECU)	
Charge	980W/5500 rpm / 680W/5500 rpm	
Battery	12V 32Ah	
Headlamp	Head light	LED or H4/55W
	Day Light	LED
	Turn signal	LED
	Front Position Light	LED
Rear tail light - position light	LED or 5 W P21/5W	
Rear taillights - Brake lights	LED or 21 W P21/5W	
Turn signal lamp	LED or 10W RY10W	

## UNIT CONVERSION TABLE

TORQUE		
Unit	coefficient	Convert to
N·m	× 0.1020	kg·m
N·m	×0.7376	ft·lbs
N·m	×8.851	in·lbs
kg·m	×9.807	N·m
kg·m	×7.233	ft·lbs
kg·m	×86.80	in·lbs
in·lbs	×0.833	ft·lbs
in·lbs	×0.116	kg·m
PRESSURE		
kPa	× 0.01020	kg/cm <sup>2</sup>
kPa	× 0.1450	psi
kPa	× 0.7501	cmHg
kg/cm <sup>2</sup>	× 98.07	kPa
kg/cm <sup>2</sup>	× 14.22	psi
cm Hg	× 1.333	kPa
POWER		
N	× 0.1020	kg
N	× 0.2248	lb
kg	× 9.807	N
kg	× 2.205	lb
VOLUME		
L	× 0.2642	gal (US)
L	× 0.2200	gal (imp)
L	× 1.057	qt (US)
L	× 0.8799	qt (imp)
L	× 2.113	pint (US)
L	× 1.816	pint (imp)
mL	0.03381	oz (US)
mL	0.02816	oz (imp)
mL	0.06102	cu in
SPEED		
km/h	× 0.6214	mph
POWER		
kW	× 1.360	PS
kW	× 1.341	HP
PS	× 0.7355	kW
PS	× 0.9863	HP
TEMPERATURE		
°C to °F : °C x 9/5 + 32 = °F		
°F to °C : °F - 32 x 5/9 = °C		

## TORQUE

The following tables list the tightening torque for the major fasteners, and the parts requiring use of a non-permanent locking agent or liquid gasket.

Letters used in the "Remarks" column mean:

L: Apply a non-permanent locking agent.

Firmware torque for key engine components				
Designation	Tightening torque range (n·m)	Mounting position	Mounting position	Glued or not
Plug npt3/8	(32±2) N·m	Upper crankcase	L	/
Piston nozzle regulators	20±2	Upper crankcase		/
Connecting rod bolt	5n·m+20n·m+110°	Connecting rod		12.9
Bolt assembly m10×1.25×110	12n·m+28n·m+90°	Crankcase		10.9
Bolt m8×90	34±1	Crankcase		10.9
Bolt m6×25	(10±2) N·m	Oil pump		8.8
Bolt m6×20	(10±2) N·m	Oil pump		8.8
Bolt m14	18±2	Oil sump		/
Bolt m6×30	(11±1) N·m	Crankcase		8.8
Hexagon socket pan head step bolts	12±2	Chain guides		8.8
Oil pressure sensor	14±2	Cylinder body		/
Cylinder head bolts m11×1.25×150	12n·m→35n·m→180°	Cylinder head		10.9
Hexagonal flange face bolts m6×12	18±2	Timing slave sprocket	L	12.9
Spark plugs(ngk)	13±2	Cylinder head		/
Hexagon socket cheese head screws m6×16	18±2	Magneto motor rotor	L	/
Bolt m12×1.25×30	155±8	Magneto motor rotor	L	12.9
Hexagonal flange face nuts m22×1	140±10	Starting primary driven gear Pinion	L	10
Viewport cover	12±2	Left crankcase cover		/
Oil filter fitting	35±5	Left crankcase cover		/
Water temperature sensor	12±2	Cylinder body		/
Hexagonal flange face bolts m10×1.25×30	70±5	Transmission bracket		/
Starter motor positive wire positive Nut m6	7±1	Starter motor		/
Nut m10×1.25	45±5	Engine gearbox combination Installation	L	10

# GENERAL INFORMATION

## SEGWAY AT10

Cvt driven wheel bolt m10×1.25×80	80±5	Cvt driven wheel		12.9
Bolt m12×1.25×185	120±8	Cvt active wheel		12.9
Hexagonal flange face bolts m10×1.25×25	50±5	Rear axle output gear (Differential)	L	8.8
Trunnion shaft	20±2	Rear output fork		/
Nut 33×1.5	245±5	Three-axis assembly/ turn front Output shaft		8
Bolt m8×70	25±2	Transmission combination box		8.8
Bolt m8×40	25±2	Transmission combination box		8.8
Hexagonal flange face nuts m22×1	140±5	Front output gear shaft	L	10
Hexagonal flange face lock nuts m14×1.5	120±5	Front output driven conical teeth Shafts		/
Solenoid valve assembly	35±2	Front output driven conical teeth Shafts		/
Conventional engine bolt torque				
M6	8~12			8.8
M8	20~30			8.8

Vehicle-specific fastener torque							
Projects	Standard part	Performance Grade	Tightening torque			Whether Glue	Remarks
			N·M	KGF·M	FT·LB		
Front engine mounting bolts	M12×1.25×80	10.9	108~127				Self-locking nuts
Engine mounting bolts	M12×1.25×110	10.9	108~127				Self-locking nuts
	M10×1.25×40	10.9	65~75				Self-locking nuts
Front axle mounting bolts	M10×1.25×125	10.9	65~75				Self-locking nuts
	M10×1.25×20	8.8	45~60			L	
	M10×1.25×16	8.8	45~60				
Install bolts in front of the front rocker arm	M10×1.25×90	10.9	55~65	5.5~6.5	40.5~48		Self-locking nuts
Rear lower rocker arm mounting bolts	M10×1.25×90	10.9	55~65	5.5~6.5	40.5~48		Self-locking nuts
Rear lower rocker arm mounting bolts	M10×1.25×95	10.9	55~65	5.5~6.5	40.5~48		Self-locking nuts
Rear down rocker arm mounting bolts	M10×1.25×140	10.9	55~65	5.5~6.5	40.5~48		Self-locking nuts
Front shock absorber mounting bolts	M10×1.25×55	10.9	40~50	4.0~5.0	29.5~36.9		Self-locking nuts
Rear shock absorber mounting bolts	M10×1.25×55	10.9	40~50	4.0~5.0	29.5~36.9		Self-locking nuts
Steering knuckle lower mounting bolts	M10×1.25×40	10.9	40~50	4.0~5.0	29.5~36.9		Self-locking nuts
Rear left and right rocker arms and rear wheel mounts	M10×1.25×100	10.9	55~65	5.5~6.5	40.5~48		Self-locking nuts
Oxygen sensor	/	/	15~20				Self-adhesive
Steering grip cover bolt	M8×1.25×45	8.8	22~29				Hexagon socket head cap screws
Wheel brake disc installation bolt	A03e10004001	8.8	25~28			L	Self-adhesive
Right side surround pipe assembly mounting bolts	M10×1.25×25	8.8	45~60			L	
Left side surround pipe assembly mounting bolts	M10×1.25×25	8.8	45~60			L	
Wheel side caliper body bolts	M10×1.25×25	10.9	40~50			L	
Brake master cylinder mounting bolts	M8×1.25×25	8.8	22~29			L	

# GENERAL INFORMATION

## SEGWAY AT10

Steel rim mounting nuts	T08000016002	10	70~80				Categorical
Aluminium rim mounting nuts	T08000011002	10	70~80				Categorical
Drive shaft mounting bolts	M10×1.25×25	10.9	40~50	4.0~5.0	29.5~36.9	L	Hexagon socket head cap screws
Balance bar mounting bolts	M8×30	8.8	22~29			L	
Wheel hub nut	M24×2	10	220~380				Categorical
Steering rocker arm and eps locking screw bolt	M8×40	10.9	35~40	3.5~4.0	25.8~29.5	L	Categorical
Eps installation bolt	M10×1.25×20	8.8	30~40	3.0~4.0	22.1~29.5	L	
Eps steering universal joint locking screw Bolt	M8×35	10.9	35~40	3.5~4.0	25.8~29.5	L	Categorical
Steering rocker arm spacer lock nut	M10	8	45~50				

# MAINTENANCE

<b>TECHNICAL SPECIFICATIONS</b> .....	<b>2-3</b>
<b>VEHICLE LIFTING SUPPORT POSITION</b> .....	<b>2-4</b>
<b>MAINTENANCE CYCLE TABLE</b> .....	<b>2-5</b>
BREAK-IN MAINTENANCE .....	2-6
PERIODIC MAINTENANCE.....	2-6
MAINTENANCE REFERENCE .....	2-8
GREASE .....	2-10
<b>GENERAL VEHICLE INSPECTION AND MAINTENANCE</b> .....	<b>2-11</b>
PRE-RIDE / DAILY INSPECTION .....	2-11
<b>ENGINE MAINTENANCE</b> .....	<b>2-12</b>
ENGINE OIL LEVEL CHECK .....	2-12
ENGINE OIL EMISSIONS .....	2-13
CLEANING THE FILTERS .....	2-14
FILLING THE ENGINE OIL .....	2-14
ENGINE/FUEL TANK HOSE INSPECTION .....	2-15
ENGINE CYLINDER LEAKAGE TEST.....	2-15
VALVE LASH CHECK .....	2-16
<b>FRONT GEARBOX AND REAR GEARBOX</b> .....	<b>2-17</b>
FRONT AXLE OIL LEVEL CHECK.....	2-17
CHECK FRONT AND REAR TRANSMISSION FLUID LEVELS.....	2-17
FRONT REDUCTION GEARBOX OIL DRAIN .....	2-18
FRONT REDUCTION GEARBOX GEAR OIL FILLING .....	2-18
REAR REDUCTION GEARBOX DRAIN .....	2-19
REAR REDUCTION GEARBOX GEAR OIL FILLING.....	2-19
<b>SHIFT LEVER INSPECTION/ADJUSTMENT</b> .....	<b>2-20</b>
<b>COOLING SYSTEM</b> .....	<b>2-21</b>
COOLING SYSTEM OVERVIEW.....	2-21
COOLING SYSTEM HOSES .....	2-21
RADIATOR CHECK.....	2-22
COOLANT BOTTLE COOLANT LEVEL CHECK AND REFILL.....	2-22
COOLANT REPLACEMENT .....	2-23
<b>INTAKE AND EXHAUST MAINTENANCE</b> .....	<b>2-24</b>
AIR FILTER .....	2-24
AIR FILTER DRAIN CHECK .....	2-24
SPARK ARRESTOR.....	2-25
EXHAUST HEAT SHIELD INSPECTION .....	2-25
<b>FUEL SYSTEM AND AIR INTAKE</b> .....	<b>2-26</b>
FUEL SYSTEM.....	2-26

FUEL FILTER .....	2-26
FUEL LINE .....	2-27
<b>CVT .....</b>	<b>2-28</b>
CVT INTAKE SCREEN CHECK .....	2-28
CVT BELT .....	2-28
INSTALLATION OF DRIVE BELTS .....	2-29
DRY CVT .....	2-29
<b>DRIVE SHAFT MAINTENANCE / TIRES .....</b>	<b>2-30</b>
DRIVE SHAFT DUST SLEEVE INSPECTION .....	2-30
WHEEL PARTS REMOVAL .....	2-30
WHEEL MOUNTING .....	2-30
TIRE TREAD DEPTH .....	2-31
TIRE PRESSURE CHECK .....	2-31
<b>STEERING MAINTENANCE .....</b>	<b>2-32</b>
STEERING SYSTEM CHECK .....	2-32
POWER STEERING (EPS MODELS) .....	2-32
TRANSVERSE TIE ROD INSPECTION .....	2-33
ANTERIOR BEAM CHECK .....	2-33
FRONT BEAM ADJUSTMENT .....	2-34
<b>SHOCK ABSORBER .....</b>	<b>2-35</b>
SHOCK ABSORBER INSPECTION .....	2-35
ADJUSTABLE PNEUMATIC SHOCK ADJUSTMENT .....	2-35
OIL SHOCK ABSORBER ADJUSTMENT .....	2-36
<b>BRAKING SYSTEM .....</b>	<b>2-37</b>
BRAKE FLUID LEVEL CHECK ON HANDBRAKE UPPER PUMP .....	2-37
<b>MUD VERSION .....</b>	<b>2-38</b>
BRAKE FLUID CUP LEVEL CHECK .....	2-38
BRAKE LININGS AND DISCS .....	2-38
BRAKE PEDAL AIR TRAVEL CHECK .....	2-39
PARKING HANDLE WORKING STROKE CHECK .....	2-39
PARKING HANDLE FREE TRAVEL ADJUSTMENT .....	2-39
<b>ELECTRICAL AND IGNITION SYSTEMS .....</b>	<b>2-40</b>
BATTERY MAINTENANCE .....	2-40
BATTERY REMOVAL .....	2-40
BATTERY INSTALLATION .....	2-41
BATTERY CHARGING .....	2-41
SPARK PLUGS .....	2-42
SPARK PLUG CHECK .....	2-42

## TECHNICAL SPECIFICATIONS

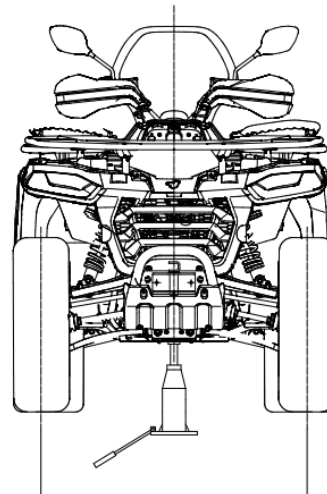
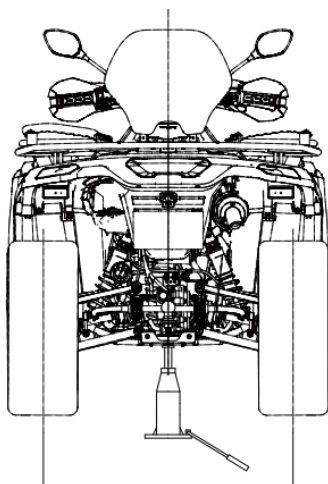
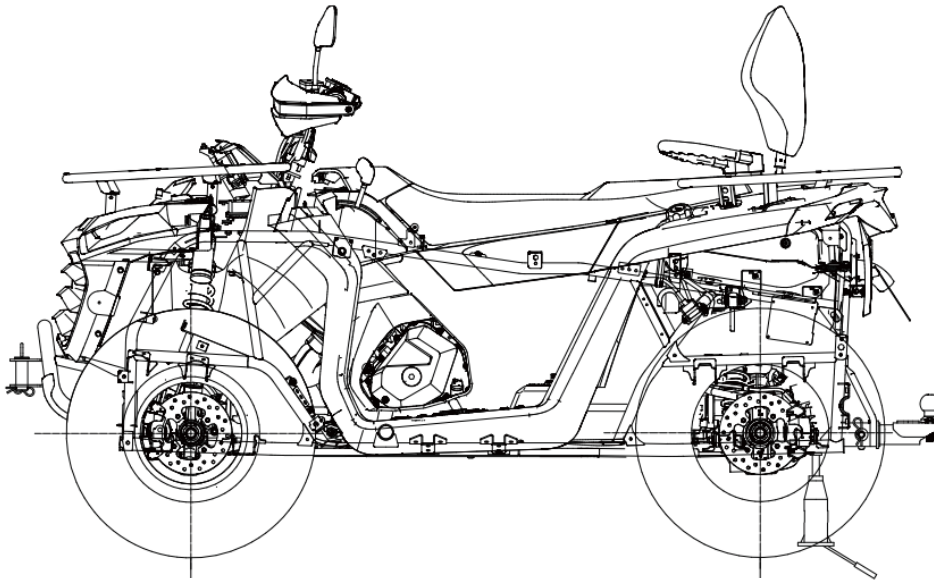
General specifications		
Item	standard	usage limit
Cylinder leakage	—	20%
Intake valve clearance (cold)	0.2 ~ 0.25mm (0.0079" ~ 0.0098")	—
Exhaust valve clearance (cold)	0.1 ~ 0.15mm (0.0039" ~ 0.0059")	—
Front Tire Pressure	7 psi ( 48 kPa)	—
Rear Tire Pressure	7 psi ( 48 kPa)	—
Wheel Front Beam	-5 ~ 5mm	—
Shock spring adjustment	1~5	—
Brake Pad Thickness	5mm	0.060 (1.5 mm)
Brake Disc Thickness	5mm	0.170 (4.32 mm)
Spark Plug Model	B7RTC/B8RTC	

Fluid Specifications		
Item	model number	Capacity
oil	SAE 5W-40 SN or higher	2200 ml
Engine coolant	Permanent antifreeze (green, soft water 50%, cooling water 50%)	5500 ml 5800 ml(MUD)
Front Gear box Fluid	SAE 80W-90 GL5	310 ml
Rear Gear Box Fluid	SAE 80W-90 GL5	1200ml
brake fluid	DOT4	—
grease nipple	semi-synthetic waterproof grease	Up to 2 pumps
Universal Joint Lubricant	semi-synthetic waterproof grease	Up to 2 pumps
fuels	Petrol(E10)/87#(US)/92 #(GB)	23 L

## VEHICLE LIFTING SUPPORT POSITION

Park the vehicle on a flat, non-slip surface. Make sure the vehicle shift lever is set to Park.

To lift the front or rear of the vehicle, place the jacks at the left and right centers of the front or rear of the vehicle as shown below:



Schematic diagram of jack stands location

## MAINTENANCE CYCLE TABLE

The periodic maintenance table describes the inspection, adjustment and lubrication of important parts. Inspect, clean, lubricate, adjust and replace parts as necessary. When inspections indicate the need for replacement parts, use genuine Segway parts from your Segway dealer.

SYMBOL	DESCRIPTION
▶	Perform these procedures more often for vehicles subjected to severe use.
D	Have an authorized dealer or other qualified person perform these services.

### Heavy use is defined:

- ◆ Frequent immersion in mud, water, or sand
- ◆ Frequent or prolonged operation in dusty environments
- ◆ Short trip cold weather operation
- ◆ Racing or racing style high RPM use
- ◆ Long periods of low-speed, heavy-duty operation
- ◆ Idle vehicles for long periods of time

### **WARNING**

The D-marking process may cause component failure and result in serious injury or death. Have an authorized dealer or other qualified person perform these services.

Perform all services with the first arriving maintenance condition. Record maintenance and services in the maintenance log.

### Break-in period

The break-in period is the first 25 hours or 320km of vehicle operation (whichever comes first).

Start by driving slowly, varying the throttle angle, and do not operate at constant idle.

Regularly check fluid levels, control switches and components on the daily pre-driving checklist.

During break-in, change the oil and filter within 25 hours or 320km (whichever comes first).

For additional break-in information, refer to the Owner's Manual.

### BREAK-IN MAINTENANCE

ITEM		MAINTENANCE INTERVAL (WHICHEVER COMES FIRST)			REMARKS
		HOURS	CALENDAR	MILES (KM)	
	Fuel System	25 H	1 M	200 (320)	Break-in check: cycle key to pressurize fuel pump. check lines and fittings for leaks and abrasion
	Engine oil change	25 H	1 M	200 (320)	Break-in check: oil and filter change
	Front gearcase oil	25 H	1 M	200 (320)	Break-in check: oil level check
	Rear gearcase oil	25 H	1 M	200 (320)	Break-in check: oil level check

### PERIODIC MAINTENANCE

Make sure to perform proper maintenance at recommended intervals as indicated in the tables. Some items of the maintenance schedule must be performed in function of the calendar, regardless of the distance or time of operation.

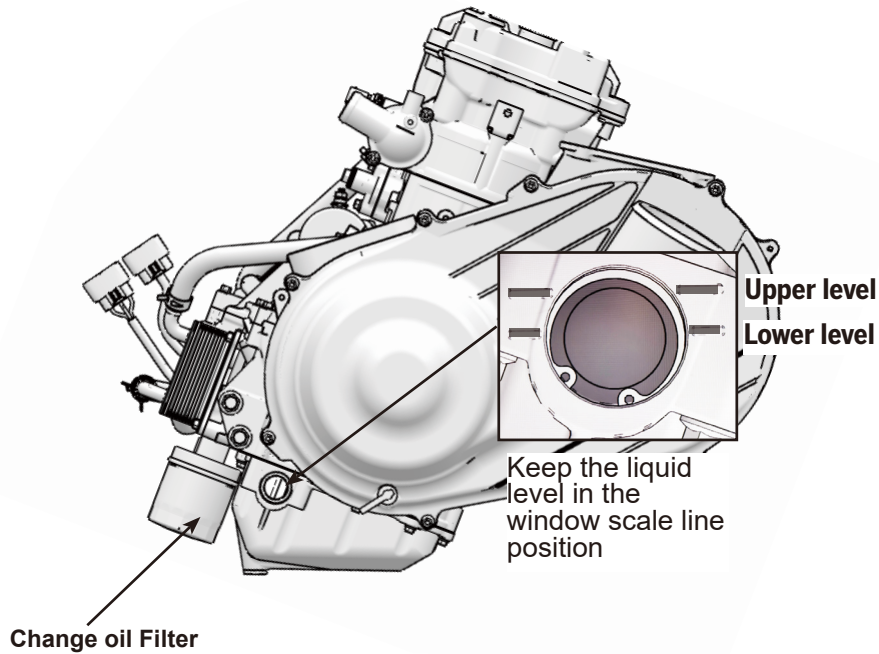
ITEM		MAINTENANCE INTERVAL (WHICHEVER COMES FIRST)			REMARKS
		HOURS	CALENDAR	MILES (KM)	
▶	Brake pad wear	10 H	Monthly	100 (160)	Inspect periodically. replace as needed
	Battery	20 H	Monthly	200 (320)	Check terminals. clean. test
▶	Air filter, main element	50H		500 (800)	Inspect. replace as needed. inspect frequently if subjected to severe use
▶	General lubrication	50 H	3 M	500 (800)	Lubricate all fittings, pivots, cables, etc.
	Throttle Body Intake Duct	50 H	6 M	500 (800)	Inspect duct for proper sealing/air leaks
	Drive belt	50 H	6 M	500 (800)	Inspect. adjust. replace as needed
	Cooling system	100 H	12 M	1000 (1600)	Inspect coolant strength seasonally. pressure test system yearly
▶	Engine oil change	100 H	12 M	1000 (1600)	Change the oil and filter
▶	Oil lines and fasteners	100 H	12 M	1000 (1600)	Inspect for leaks and loose fittings

ITEM		MAINTENANCE INTERVAL (WHICHEVER COMES FIRST)			REMARKS
		HOURS	CALENDAR	MILES (KM)	
▶	Front gearcase oil	100 H	12 M	1000 (1600)	Change fluid.
▶	Rear gearcase oil	100 H	12 M	1000 (1600)	Change fluid
D	Fuel system/filter	100 H	12 M	1000 (1600)	Cycle key to pressurize fuel pump. check for leaks at fill cap, fuel lines/rail and fuel pump. replace lines every two years
▶	Radiator (if applicable)	100 H	12 M	1000 (1600)	Inspect. clean external surfaces
▶	Cooling hoses (if applicable)	100 H	12 M	1000 (1600)	Inspect for leaks
▶	Engine mounts	100 H	12 M	1000 (1600)	Inspect
	Exhaust muffler/ pipe / Joints	100 H	12 M	1000 (1600)	Inspect. clean. replace worn parts
D	Spark plug	100 H	12 M	1000 (1600)	Inspect. replace as needed
D	Clutches (drive and driven)	100 H	12 M	1000 (1600)	Inspect. clean. replace worn parts
D	Front wheel bearings	100 H	12 M	1000 (1600)	Inspect. replace as needed
D	Brake fluid	200 H	24 M	2000(3200)	Change every two years
	Spark arrester	300 H	36 M	3000(4800)	Clean out
▶	Coolant		60 M		Replace coolant
D	Valve clearance	500 H		5000(8000)	Inspect. adjust
	Idle speed				Adjust as needed
D	Toe adjustment				Inspect periodically. adjust when parts are replaced
	Headlight aim				Adjust as needed

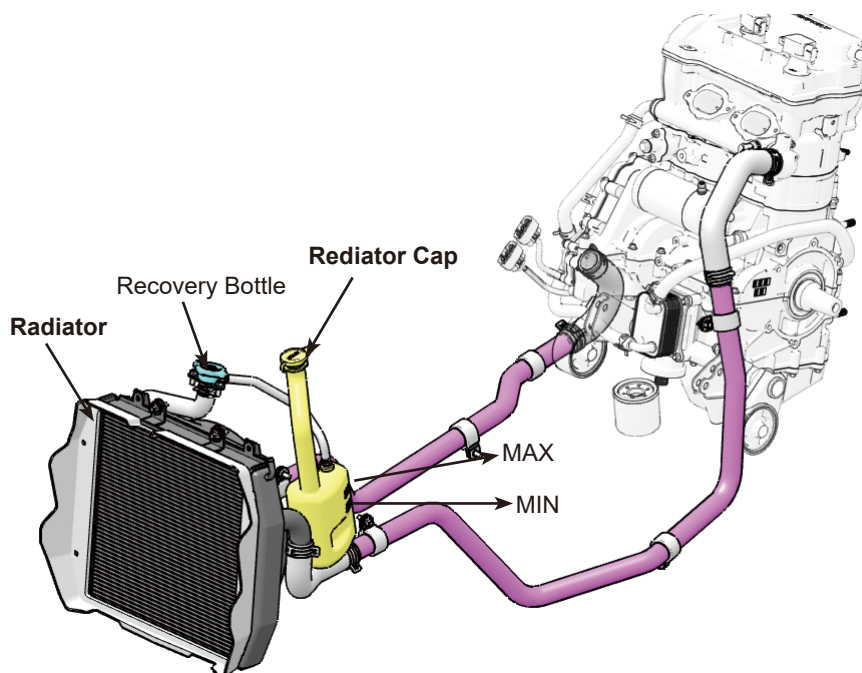
## MAINTENANCE REFERENCE

Item	Recommended Model	Capacity	Inspection Method	Schedule
Engine	SAE 5W-40/SN or higher	2200 mL	Keep the liquid level between the upper and lower scale lines of the window.	Refer to Maintenance Schedule
Engine Coolant	ECO BS -35 °C green	5500 mL 5800 mL (MUD)	Maintain the level between the fill lines.	Refer to Maintenance Schedule

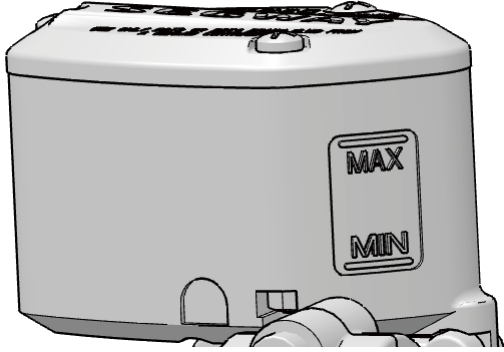
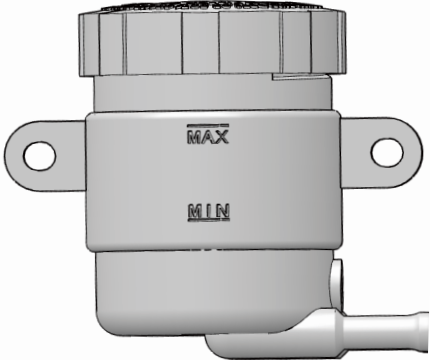
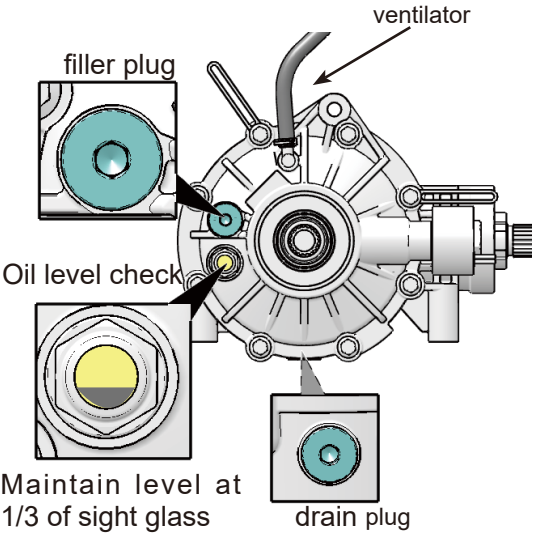
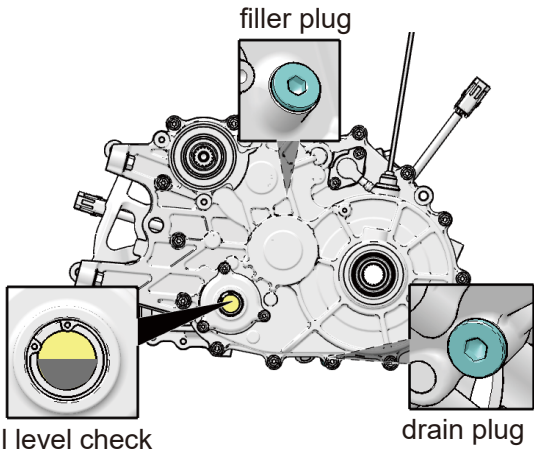
### Engine Oil



### Engine Coolant



Item	Recommended Model	Capacity	Inspection Method	Schedule
Brake fluid	DOT4	---	Maintain the level between the fill lines.	Refer to Maintenance Schedule
Front axle gear oil	SAE 80W-90 GL5	310 mL	Keep the liquid level in the 1/3 position of the window.	Refer to Maintenance Schedule
Rear axle gear oil	SAE 80W-90 GL5	1200 mL	Keep the liquid level in the middle of the window	Refer to Maintenance Schedule

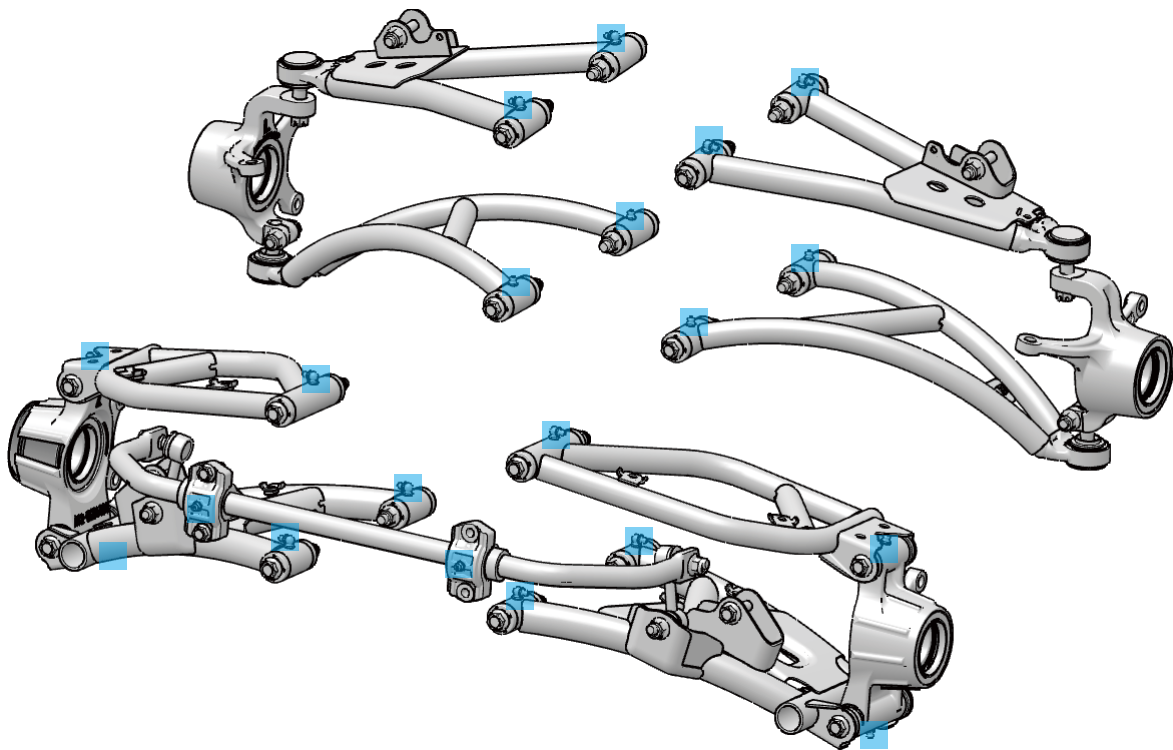
<p><b>Hand brake upper pump brake fluid cup</b></p> <p>LOWER is brake fluid Lower limit (when fluid is cold)</p> 	<p><b>Brake fluid</b></p>  <p>Keep the coolant level between the MIN and MAX mark on the bottle (while the liquid cools)</p>
<p><b>Front axle gear oil</b></p>  <p>Maintain level at 1/3 of sight glass</p>	<p><b>Rear Axle Gear Oil</b></p>  <p>Keep the liquid level in the middle of the window</p>

### GREASE

The front and rear suspension arms, balance rods and driving shafts of the vehicle are designed with fueling nozzles. Grease these parts with lubricating oil regularly, make sure these parts are dry before filling.

Item	Recommended Model	Capacity	Schedule
Front and rear rocker arms	Lithium grease	Grease Fittings (2 pumps max.)	Per 1600 miles
Rear axle support	Lithium grease	Grease Fittings (2 pumps max.)	Per 1600 miles
Rear stabilizer bar	Lithium grease	Grease Fittings (2 pumps max.)	Per 1600 miles

Rear axle support (left and right)/Rear balance bar



■ Lubricating Oil Service

### REMAINING LUBRICATION FILLING

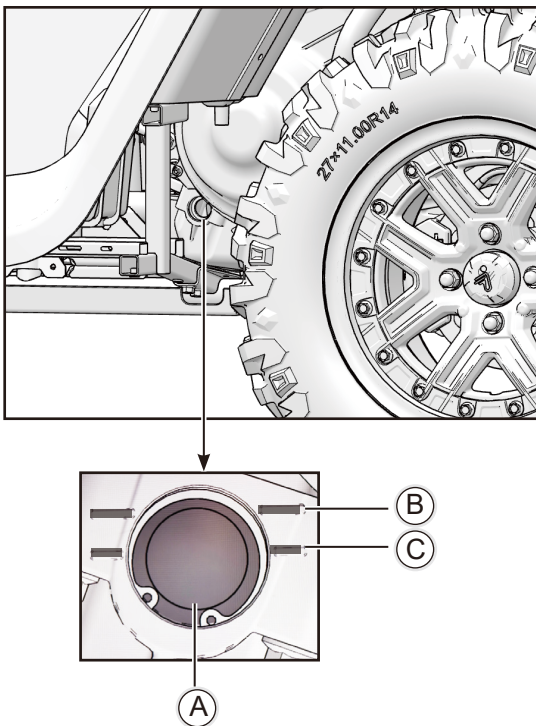
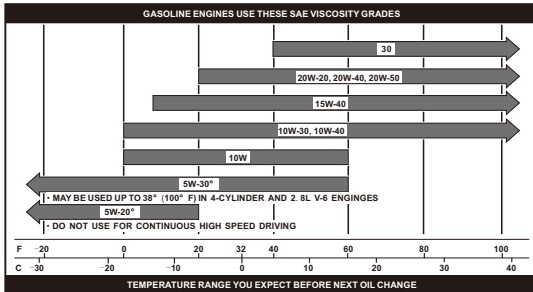
Oil filling part	number of locations	Annotations
splines of the transmission shaft	1	Lithium grease, no overflow
Front and rear shaft inner ball cage splines	4	Lithium grease, no overflow
Brake pedal pivot shaft	1	Lithium grease, no overflow
Shift arm shaft	1	Lithium grease, no overflow
Shift cable connection	2	Lithium grease, no overflow
Steering rod spherical seat	2	Lithium grease, no overflow
Parking cable connection point	3	Lithium grease, no overflow

**GENERAL VEHICLE INSPECTION AND MAINTENANCE****PRE-RIDE / DAILY INSPECTION**

The following pre-trip inspections are carried out daily and the vehicle is maintained at each regular maintenance. Engine Oil - Check for proper level on dipstick located in oil tank (refer to "Engine Oil Level" procedure)

- ◆ Check the engine oil level (refer to the "Engine Oil Level" procedure)
- ◆ Fuel tank - fill to proper level
- ◆ Check tire condition and tire pressure
- ◆ Fill the fuel tank to the proper oil level
- ◆ Check the working condition and brake fluid level of all brakes
- ◆ Headlights, taillights, and check the operation of all indicators, meters and switches at the same time
- ◆ Check whether the switch function is normal
- ◆ Check whether the wheel nut is fastened, and check whether the nut is fixed with a cotter pin
- ◆ Check the engine air intake and air filter, and replace the new air filter element if necessary
- ◆ Check whether the steering is running freely, and pay attention to whether there is abnormal looseness in any area
- ◆ Visual inspection of loose parts: Check the vehicle for any damage and loose nuts, bolts or fasteners
- ◆ Engine coolant, check whether the liquid level of the coolant recovery bottle is correct
- ◆ Check the drive shaft dust cover, whether the inner dust cover and outer dust cover on the front and rear drive shafts are torn or damaged
- ◆ Check whether all front and rear suspension components are worn or damaged
- ◆ Frames, nuts, bolts and fasteners
- ◆ Check the torque of all fasteners regularly according to the maintenance plan, check whether all cotter pins are in place, refer to the specific fastener torque listed in each chapter.

## ENGINE MAINTENANCE



### ENGINE OIL LEVEL CHECK

#### IMPORTANT

Running the engine with an incorrect oil level may result in serious engine damage.

#### Oil type:

**SAE5W-40/SN or higher**

#### Oil level check

- 【A】 Oil Window
- 【B】 Upper scale
- 【C】 Lower scale

1. Park the vehicle on a level surface with the engine stopped.

The engine oil dipstick is located above the left pedal side of the vehicle.

2. Unscrew the dipstick and pull it out.
3. Wipe the dipstick clean and reinsert it, then remove it and check the oil level.
4. Check the oil level as shown below: upper scale and lower scale. The oil level between the upper scale and the lower scale is the proper oil level, below the lower scale indicates that the oil quantity is too low, above the upper scale indicates that the oil quantity is too low.
5. After cleaning the dipstick, pump it in again and tighten it.
6. If the oil level is close to or below the lower level mark, add the proper amount of oil.

#### Oil level check after engine maintenance (oil change)

#### IMPORTANT

This procedure is only for the first oil level check after a new car or engine service (oil change).

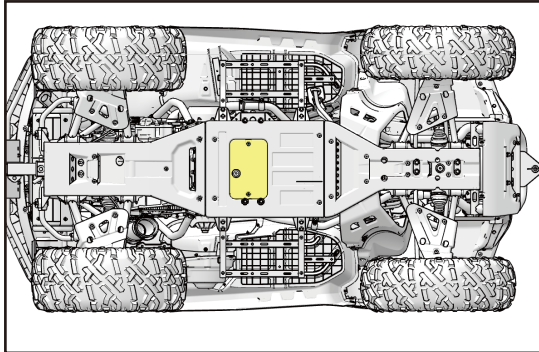
#### TIPS

During cold weather operation, checking for elevated oil levels may indicate a buildup of crankcase contaminants such as gas or moisture, and if the oil level exceeds the upper limit mark, change the oil immediately.

**ENGINE OIL EMISSIONS**

Always change the engine oil and oil filter at regular intervals.

Replacement intervals or replacement mileage are available in the Weekly Maintenance Schedule. Change the oil and oil filter at the times given in the Periodic Maintenance Chart.

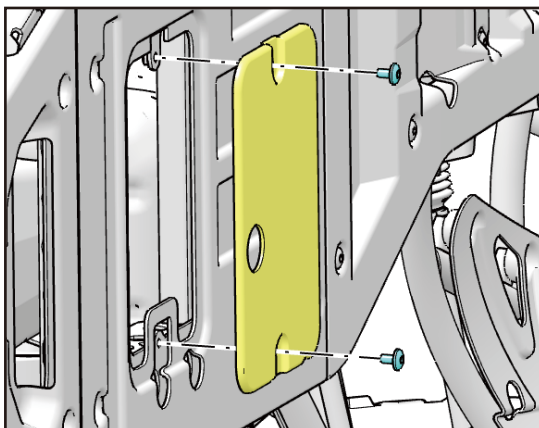


**⚠ WARNING**

Change the oil filter when you change the oil.

Hot oil can cause skin burns. Do not allow hot oil to come in contact with your skin.

The engine oil drain plug is located at the bottom of the vehicle engine.



**[A]** Bolt M6×16

**[B]** Frame bottom plate maintenance cover plate

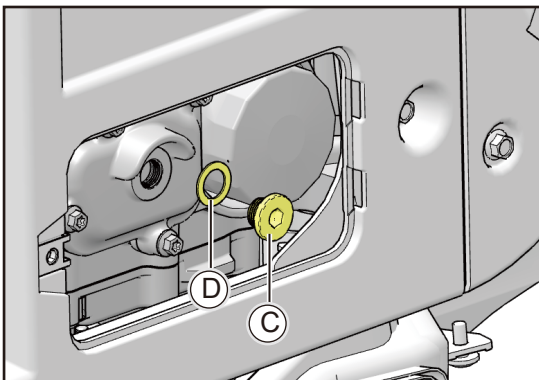
**[C]** Oil drain plug

**[D]** Copper washer 14×21×1

1. Place the vehicle on a level surface.
2. Start the engine and let it warm up for two to three minutes at idle time.

**⚠ WARNING**

The used oil and filters must be disposed of in a safe and environmentally compliant manner.



3. Remove the underframe maintenance cover.
4. Place a suitable container underneath the oil drain plug to collect the discharged used oil.
5. Remove the oil drain plug, take off the copper washer and wait for the used oil to be completely discharged.
6. Place a suitable container under the oil drain plug to collect the discharged used oil.
7. Wait for the used oil to be completely discharged.
8. Install the copper washer and oil drain plug in place.

Drain plug torque

16-20N.m(11.8-14.8ft·lb)

### CLEANING THE FILTERS

#### IMPORTANT

Clean the filter at every oil change.

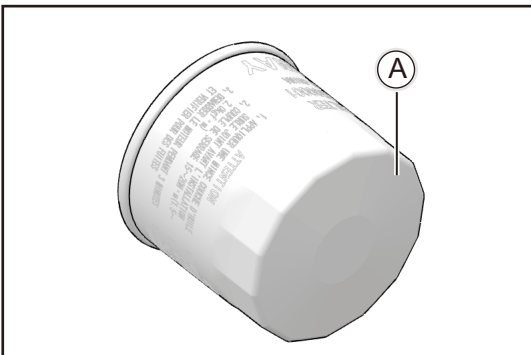
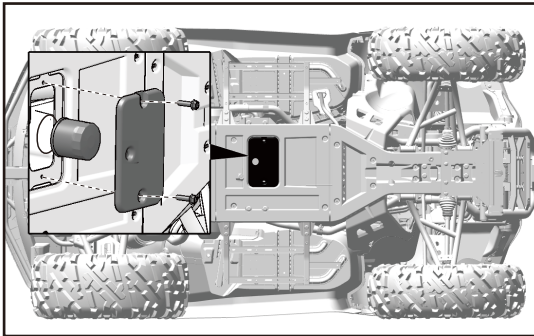
The oil filter is located under the bottom guard service cover.

#### 【A】 Oil Filter

1. Remove the screws from the underframe service cover, remove the underframe service cover where the oil filter is located, and place a towel under the oil filter.
2. Use an oil filter wrench to remove the oil filter.
3. Replace the o-ring with a new one, lubricate it with oil and install it on the new filter.
4. Tighten the new filter to the specified torque.

oil filter

20 N•m



### FILLING THE ENGINE OIL

The engine oil filler port is located under the seat cushion.

Add the proper amount of recommended oil, do not overfill.

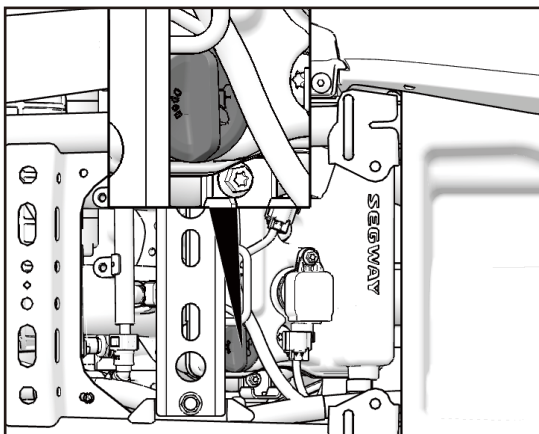
#### Oil type:

**SAE 5W-40/SN or higher grade**

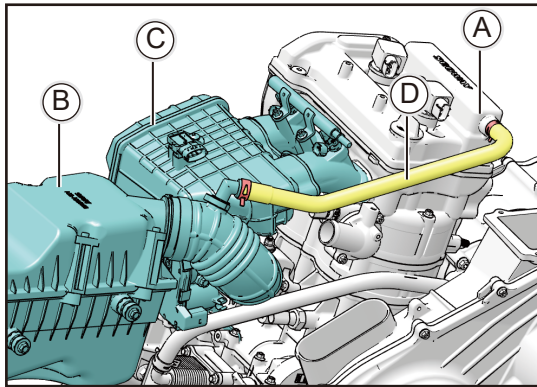
#### Oil capacity:

**2200mL**

1. Unscrew the motor oil filler cap.
2. Add the proper amount of the recommended type of oil, do not overfill, oil level between the oil sight glass is the proper level.
3. Retighten the oil filler cap.
4. Place the shifter in Park.
5. Lock the parking brake.
6. Start the engine and let it idle for 1 to 2 minutes.
7. Stop the engine.
8. Check for leaks.
9. Check the oil level and add oil as necessary to bring the oil level to the proper level.
10. Dispose of used filter and oil properly.

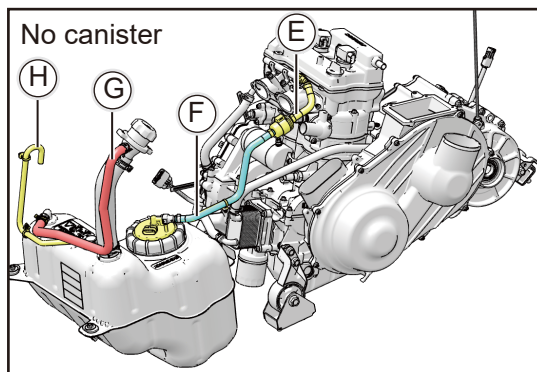


## ENGINE/FUEL TANK HOSE INSPECTION



The engine and fuel tank are equipped with vent hoses. Check for possible kinks or damaged, cracked air hoses. The hose is molded for proper installation.

- 【A】 Engine
- 【B】 Air filter
- 【C】 Pressure stabilizing chamber
- 【D】 Engine exhaust pipe
- 【E】 Oil rail end high-pressure oil pipe
- 【F】 Oil pump end high-pressure oil pipe
- 【G】 Ventilation hose
- 【H】 Breathing valve hose
- 【I】 Carbon canister desorption hose
- 【J】 Adsorption hose

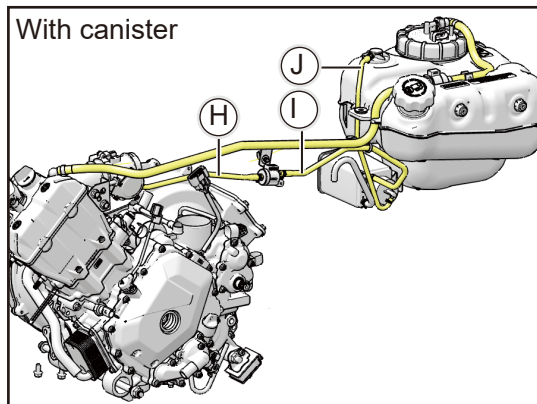


No canister

Engine Exhaust Gas Hose: Extends along the engine to the bottom port of the air filter.

Injector End High Pressure Hose: Extends from the engine along the frame main tube to the fuel tank inlet.

Fuel tank vent hose: extends vertically down the fuel tank.



With canister

### ⚠ CAUTION

Make sure the hose is not kinked or crushed.

## ENGINE CYLINDER LEAKAGE TEST

Cylinder leakage testing is the best indication of engine conditions. Follow the tester manufacturer's manufacturer's instructions for cylinder leakage testing. Never use a high pressure leak tester with high pressure tester, such as crankshaft seal movement and leakage.

**Cylinder leakage service limits:**

**20%.**

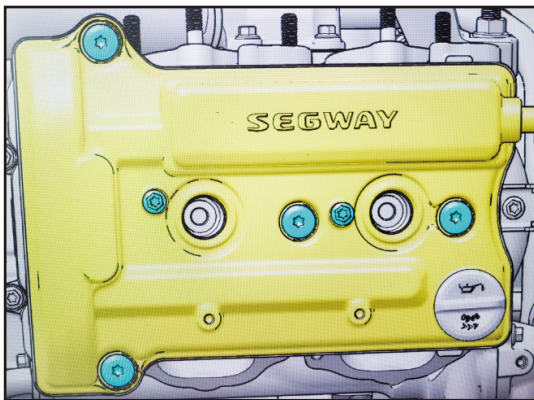
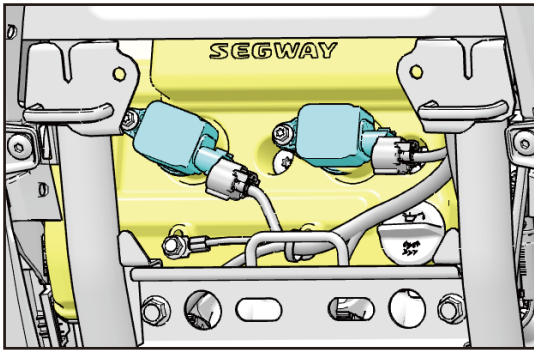
If leakage exceeds service limit, check engine for cause.

### VALVE LASH CHECK

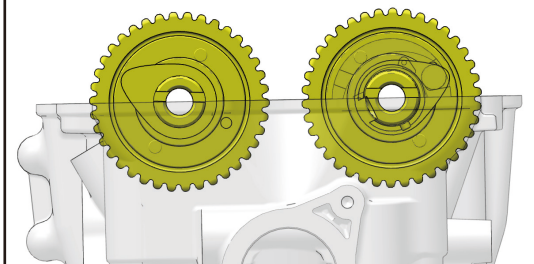
#### ⚠ CAUTION

Valve lash should be done at room temperature on a cold engine.

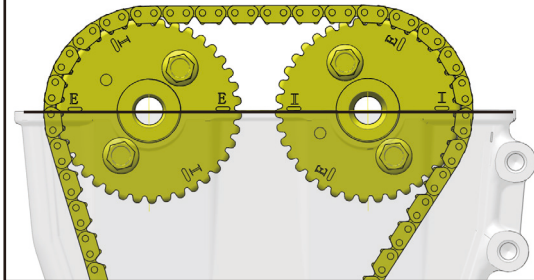
1. disconnect the negative (-) battery cable.
2. Remove the seat
3. Remove the ignition coil by unbolting the ignition coil with a tool.
4. Remove the spark plug with the spark plug socket included in the kit.
5. Remove the 3 hexagon socket head cap screws **【D】** securing the cylinder head cover. Remove the cylinder head cover **【E】**.



Timing View For Camshafts



Timing View For Sprockets

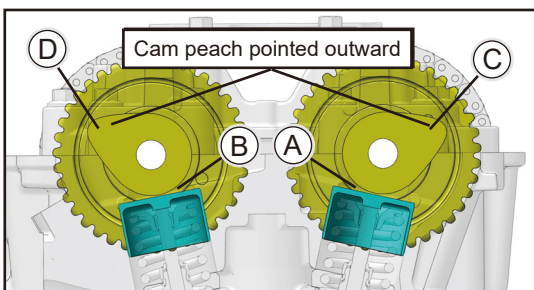


6. Rotate the camshaft until the cam tips **【C】** and **【D】** above the valve you are checking are facing upwards.
7. Measure the valve lash **【A】** and **【B】** with a thickness gauge (plug gauge).
8. Repeat until all four valves have been checked.

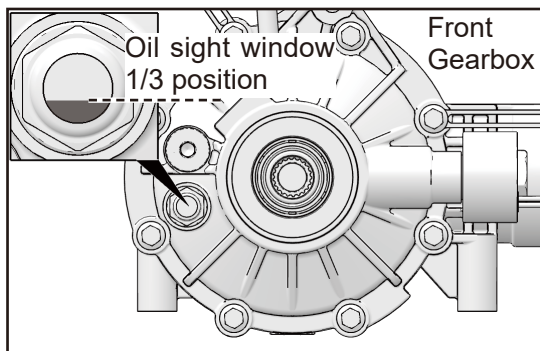
#### Measuring valve clearance (cold)

exhaust	0.2 ~ 0.3mm (0.0080" ~ 0.0120")
Import.	0.1 ~ 0.2mm (0.0040" ~ 0.0080")

If the valve clearance measurement does not meet the specifications, please refer to 3-5-36 for adjusting the clearance.



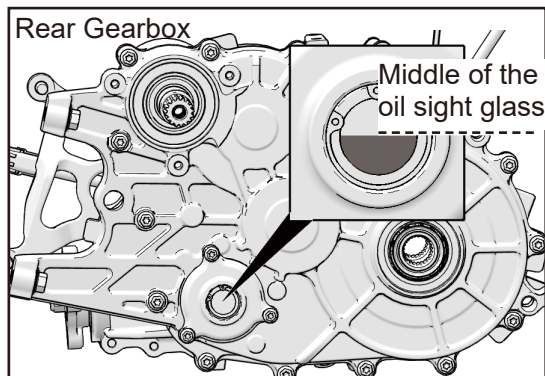
## FRONT GEARBOX AND REAR GEARBOX



### FRONT AXLE OIL LEVEL CHECK

Front axle oil level can be viewed through the oil window on the left side of the front axle to see the amount of oil, the amount of oil is located in the oil show window 1/3 position for the normal oil level, such as the oil level is too low, you should add the appropriate amount of recommended fluids.

### CHECK FRONT AND REAR TRANSMISSION FLUID LEVELS



Rear gearbox can be viewed through the oil window on the left side of the rear gearbox to see the oil level, the oil level is located in the middle of the oil show window for the normal oil level, if the oil level is too low, the appropriate amount of recommended fluid should be added..

Change the gearbox oil at the time specified in the Maintenance Interval Schedule. if an oil level check must be performed, perform the following procedure:

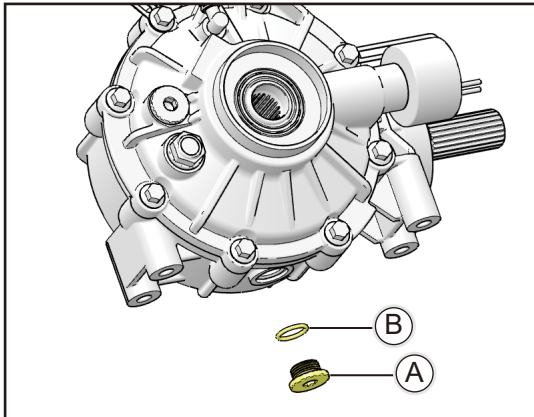
- ◆ Prepare a measuring cup and place it under the front (rear) gearbox drain plug.
- ◆ Remove the drain plug and wait for the gear oil to drain completely.
- ◆ Check the amount of oil in the measuring cup.

Front Transmission Fluid Volume: 310mL

Rear Transmission Fluid Volume: 1200mL

### FRONT REDUCTION GEARBOX OIL DRAIN

The front reduction gearbox oil drain plug is located at the very bottom of the front reduction gearbox.



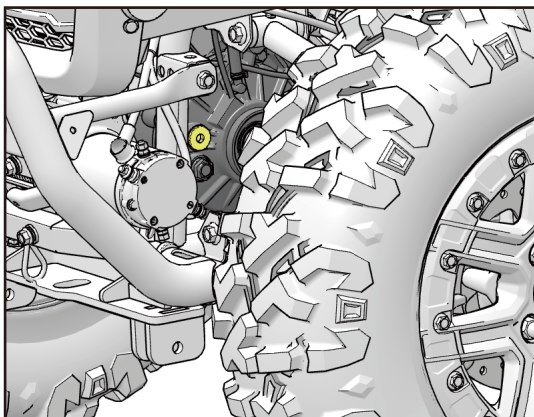
【A】 Oil drain plug

【B】 O-ring

- ◆ Place a container under the drain plug of the front reduction gearbox to collect the discharged waste oil.
- ◆ Place the vehicle on a level surface.
- ◆ Remove the drain plug and O-ring.
- ◆ After waiting for the gear oil to be completely drained, clean and install the drain plug, and replace with a new O-ring.
- ◆ The torque reaches the required value:.

#### Oil drain plug torque

16-20N.m(1.6-2.0 kgf·m, 11.8-14.8ft·lb)



### FRONT REDUCTION GEARBOX GEAR OIL FILLING

The front axle refueling plug is located on the left side of the front axle installation position and can be carried out through the left front wheel side.

【C】 Filler plug

【D】 O-ring

1. Remove the oil filler plug and O-ring.
2. Add the proper amount of recommended fluid

**Gear oil model:**

**SAE 80W-90 GL5**

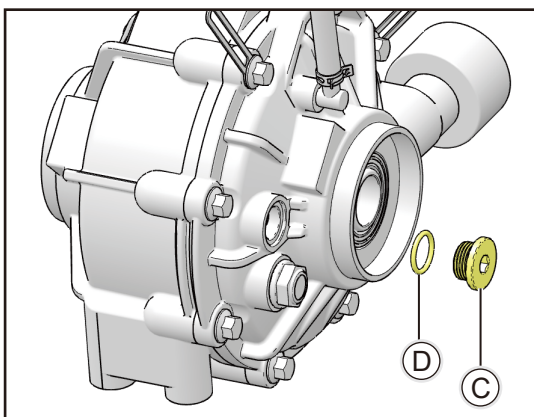
**Gear oil capacity:**

**310 mL**

3. Reinstall the filler plug. Tighten to the desired torque value.

#### Injection Plug Torque

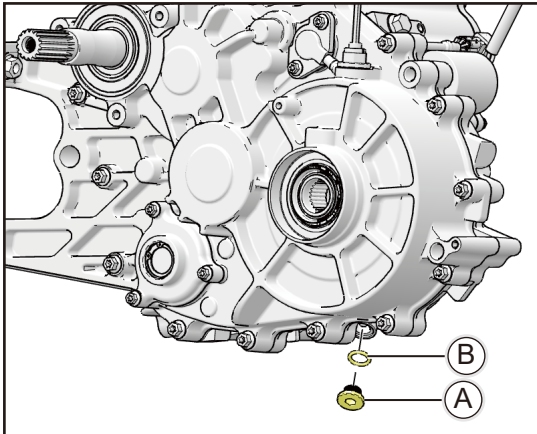
16-20N.m(1.6-2.0 kgf·m, 11.8-14.8ft·lb)



4. Check for spills.

5. Dispose of the discharged waste oil in a reasonable manner in accordance with local requirements.

## REAR REDUCTION GEARBOX DRAIN



The rear reduction gearbox oil drain plug is located at the very bottom of the rear reduction gearbox.

【A】 Oil drain plug

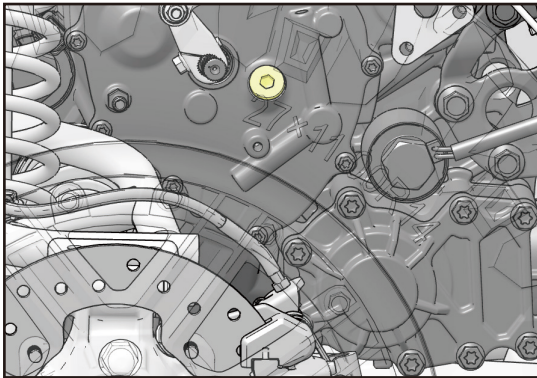
【B】 O-ring

- ◆ Place a container under the rear gearbox drain plug to collect the discharged waste oil.
- ◆ Place the vehicle on a level surface.
- ◆ Remove the oil drain plug and O-ring from the rear gearbox.
- ◆ Wait until the gear oil is completely drained, clean and install the drain plug, and install a new o-ring.
- ◆ The torque reaches the required value:

### Drain plug torque

16-20N.m(1.6-2.0 kgf·m, 11.8-14.8ft·lb)

## REAR REDUCTION GEARBOX GEAR OIL FILLING



The rear gearbox filler plug is located on the right side of the rear gearbox and can be entered through the rear side of the right rear wheel.

【C】 Filler plug

【D】 O-ring

1. Remove the filler plug and o-ring.
2. Add the proper amount of recommended gear oil.

**Gear oil model:**

**SAE 80W-90 GL5**

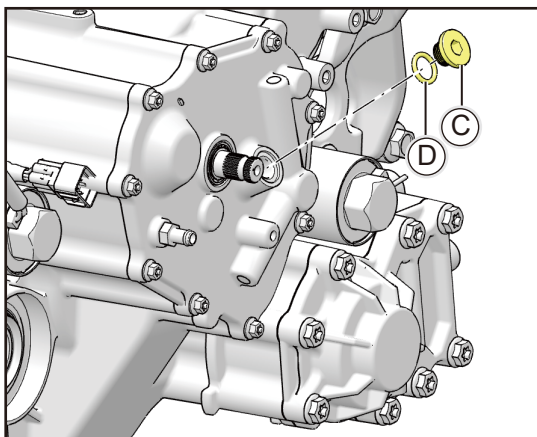
**Gear oil capacity:**

**1200 mL**

3. Reinstall the filler plug. Tighten to the desired torque value.

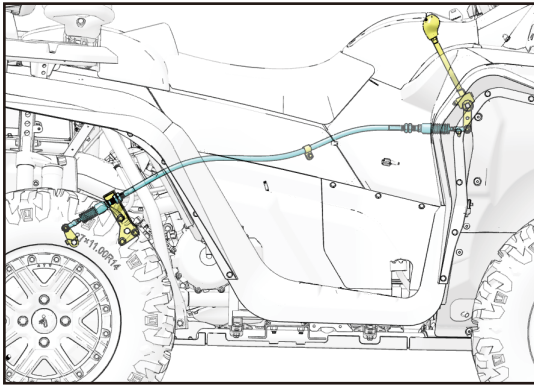
### Torque of injection plug

16-20N.m(1.6-2.0 kgf·m, 11.8-14.8ft·lb)



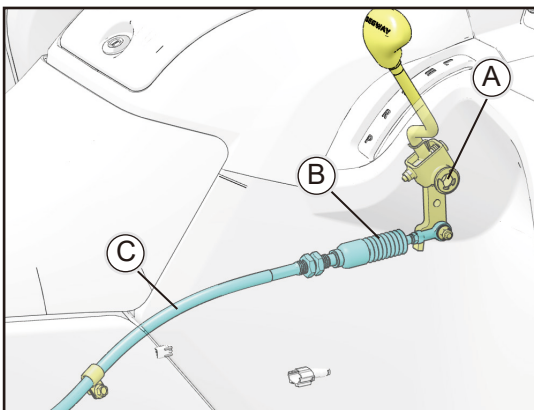
4. Check for spills.
5. Dispose of the discharged waste oil in a reasonable manner in accordance with local requirements.

## SHIFT LEVER INSPECTION/ADJUSTMENT



The shift cables may need to be adjusted if:

- ◆ No gear on the combination meter
- ◆ Gear noise during acceleration and deceleration
- ◆ Cannot put into gear
- ◆ Excessive gear clearance (noise)
- ◆ Shift lever moved out of desired range

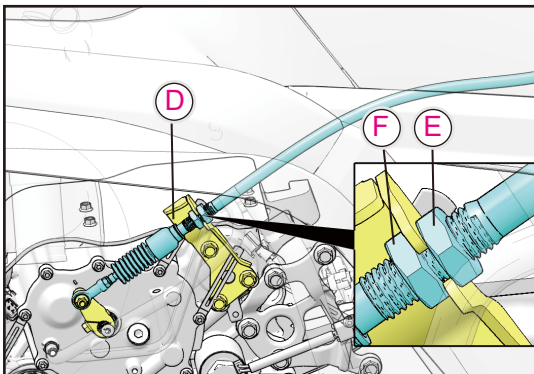


【A】 Shaft bushing

【B】 Dust cover

【C】 Shift cable

- ◆ Check the shift cable, shaft bushing and dust cover.
- ◆ If worn or damaged, please replace it..



The front and rear ends of the shift cable are equipped with lock nuts that can adjust the cable, and both ends can be adjusted. It is recommended to adjust the rear end. The rear end space is easy to operate.

【D】 shift cable rear bracket

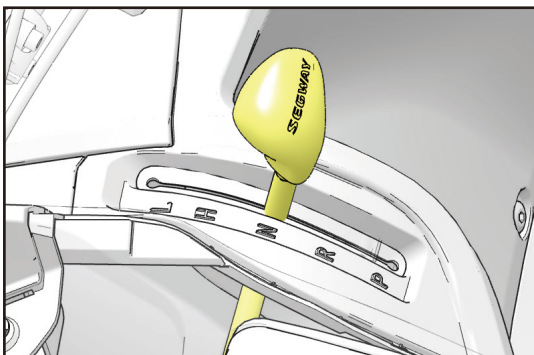
【E】 Locking nut on

【E】 Lower lock nut

- ◆ Loosen the upper and lower lock nuts, and adjust the shift cable appropriately by adjusting the position of the lock nut..
- ◆ Until the shift lever is aligned with the "N" position..

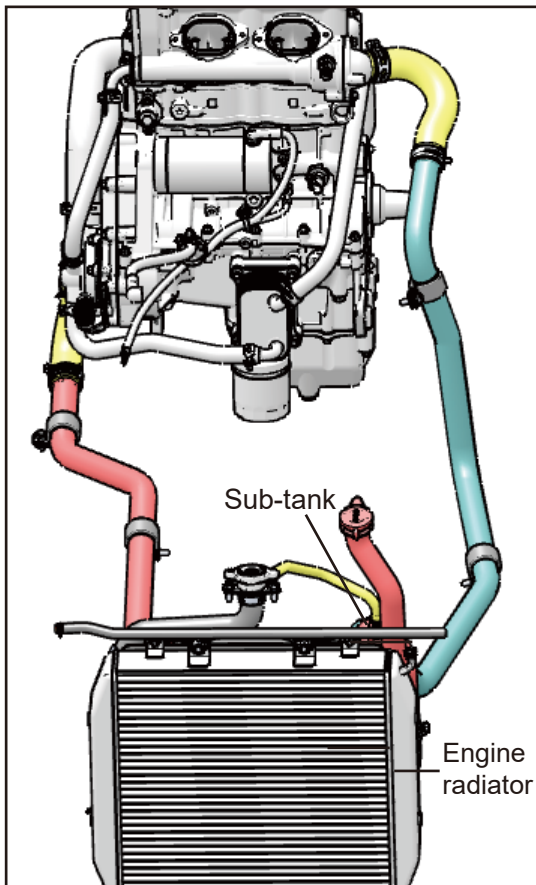
### TIPS

This process may take several attempts to adjust to the proper position.



- ◆ This process may require several attempts to adjust to the proper position. Once the proper position is obtained, move the cable and upper lock nut into the mount. Tighten the lower lock nut and rest against the mount.
- ◆ Start the engine and shift between all gears to ensure that the shift cable is adjusted correctly. If the transmission gear is still noisy, the transmission needs to be checked.

## COOLING SYSTEM



## COOLING SYSTEM OVERVIEW

The engine coolant level is controlled or maintained by the cooling system. The cooling system components are the sub-tank, radiator, radiator pressure cap and connecting hoses.

As the operating temperature of the coolant rises, it expands (heats up), and excess coolant is pushed out of the radiator through the pressure cap and into the sub-tank. As the engine coolant temperature decreases, the coolant shrinks (cools) and enters the radiator through the pressure cap from the sub-tank. The radiator.

**⚠ CAUTION**

The coolant level is normal to drop in a new car because the system is removing air from the machine. Observe the coolant level frequently during break-in.

If air is not completely removed from the cooling system, the engine may overheat.

## COOLING SYSTEM HOSES

High pressure in the radiator hose can cause coolant leakage **【A】** or hose breakage cracked, (if the line is not connected) to be properly maintained. Visually inspect the hose for signs of damage. Squeeze the hose. the hose should not be hard and brittle, nor should it be soft or swollen.

If there is wear, cracks **【B】** or bulging **【C】**, replace the hose with a new one.

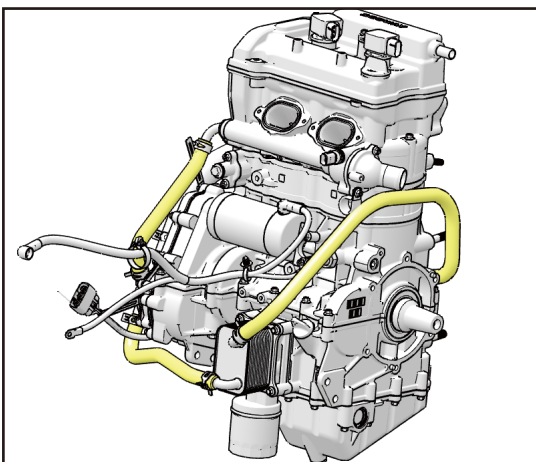
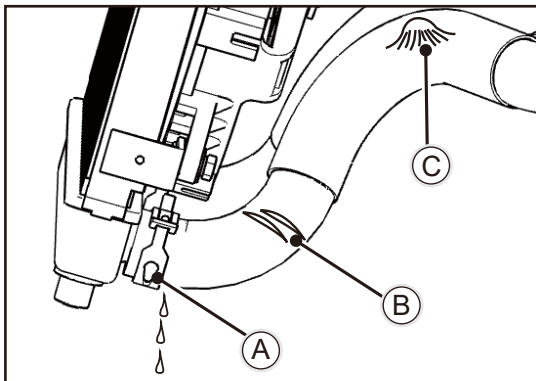
Check that hoses are securely connected and clamps are properly tightened.

Check all radiator hoses for cracks, deterioration, wear or leaks. Replace as necessary.

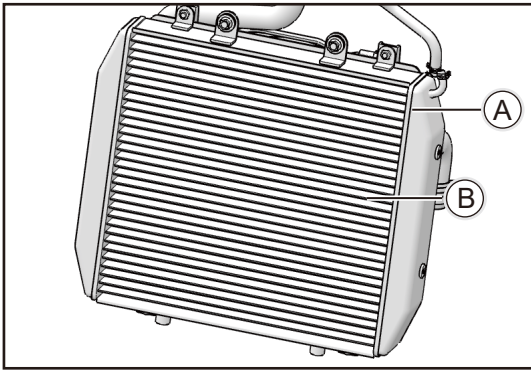
Check all hose clamps for sealing and securing hose clamps. Replace if necessary.

Check all engine hoses for cracks, deterioration, wear or leaks. Replace as necessary.

Check all hose clamps for sealing and securing hose clamps. Replace if necessary.



### RADIATOR CHECK



- ◆ Check the radiator air passages for blockage or damage or obstructions.
- ◆ If the corrugated fins **【A】** are deformed, carefully straighten them.

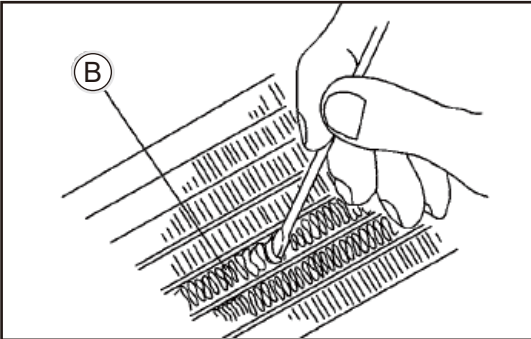
**【A】** Radiator

**【B】** Corrugated fins

- ◆ Remove obstructions with low-pressure compressed air or low-pressure water.

#### **⚠ CAUTION**

Washing the vehicle with a high-pressure water gun may damage the radiator fins and affect the radiator's cooling effect.



### COOLANT BOTTLE COOLANT LEVEL CHECK AND REFILL

The coolant bottle is located above the front left wheel of the vehicle.

- ◆ Observe the coolant level in the coolant sub-tank from the front left side of the vehicle.
- ◆ If the level is low, add coolant. Keep the coolant level at the minimum and maximum marks on the bottle (liquid cooling).

**【C】** Maximum

**【D】** Minimum

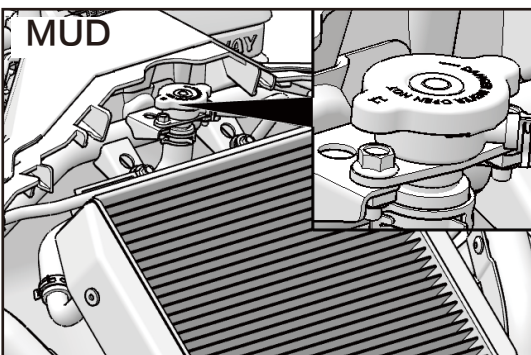
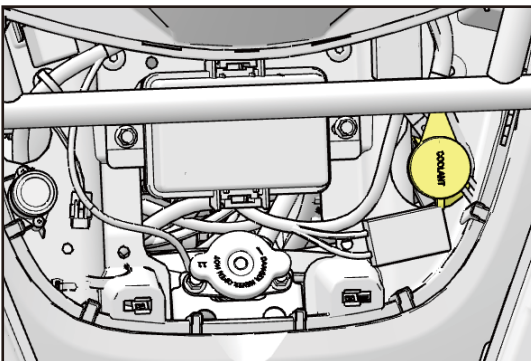
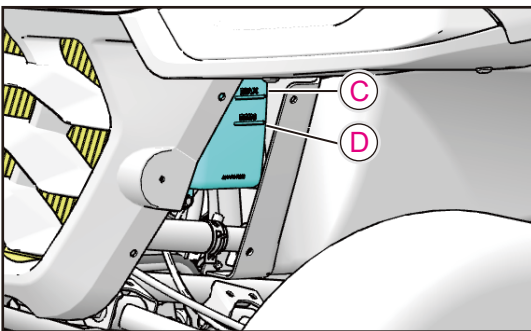
The regular version of the vehicle fills the coolant from the auxiliary water tank filling port. Mud version vehicles add coolant from the radiator filling port.

The sub-tank coolant filler is located under the front access cover.

1. Remove front rack
2. Remove the quick release front access cover.
3. Unscrew the cap and pour in fresh coolant. Observe the coolant level during pouring Do not exceed the maximum level.
4. Reinstall the front access cover and front rack.

#### **⚠ CAUTION**

Wait for the coolant to cool down to avoid high-temperature burns.



## COOLANT REPLACEMENT

To ensure that the coolant maintains its ability to protect the engine, we recommend that the system be completely drained and a new antifreeze 50/50 premix added every five (5) years.

**⚠ CAUTION**

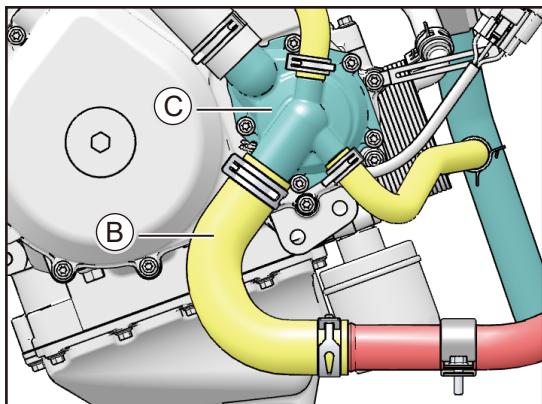
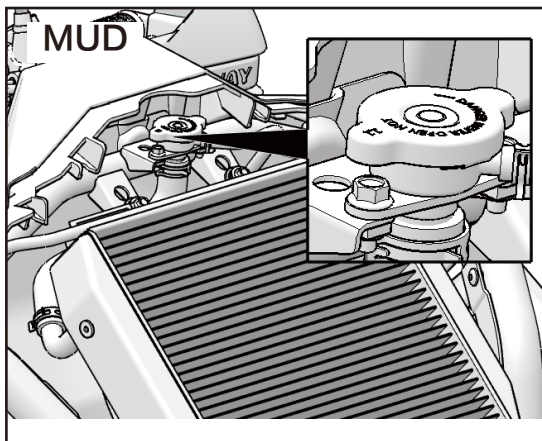
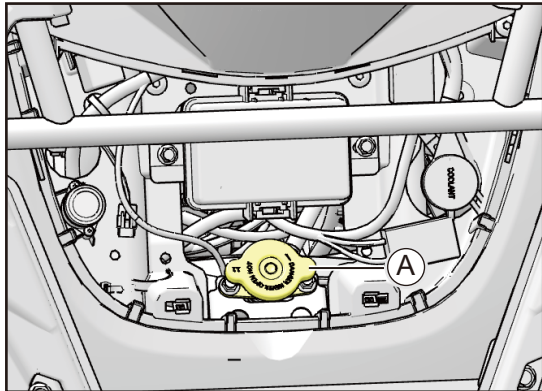
Steam spillage can burn the skin. Do not remove the pressure cover when the engine is warm. Remove the pressure cap. Allow engine to cool before removing pressure cap.

When any cooling system fluid is drained and serviced or repaired, replace the coolant with fresh antifreeze 50/50 premix. If the recovery bottle has run dry, check the fluid level in the radiator. Add coolant as needed.

【A】 Pressure cover

【B】 Engine water inlet hose

【C】 Water pump cover



1. Remove the front rack and front access cover.
2. Slowly remove the pressure cap to relieve cooling system pressure.
3. Place a drain pan under the water pump.
4. Remove the left foot pedal, slide the clamp back and remove the engine water inlet hose 【B】 from the water pump cover to drain the coolant from the cooling system.
5. Allow coolant to drain completely and dispose of used coolant properly.
6. Reinstall coolant hoses and hose clamps.
7. The cooling system must be vented before filling the coolant.
8. Using a funnel, slowly add the recommended coolant through the radiator fill port (pressure cap). When adding the recommended coolant, observe the level in the coolant bottle and keep the coolant level between the minimum and maximum marks on the bottle (liquid coolant).
9. Reinstall the pressure cap. Use of a non-standard pressure cap will affect the proper functioning of the recovery system. Qualified parts are available from your dealer.

**Coolant Model:**

**Permanent antifreeze  
(green, soft water 50%, cooling water 50%)**

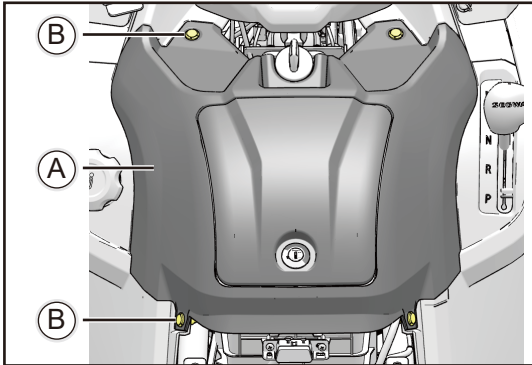
**Coolant Capacity:**

**5500mL**

**5800mL(MUD)**

## INTAKE AND EXHAUST MAINTENANCE

### AIR FILTER



**B** The air filter element of this vehicle is a paper air filter element. The vehicle needs to be cleaned or replaced after a period of use. See the periodic maintenance table for details.

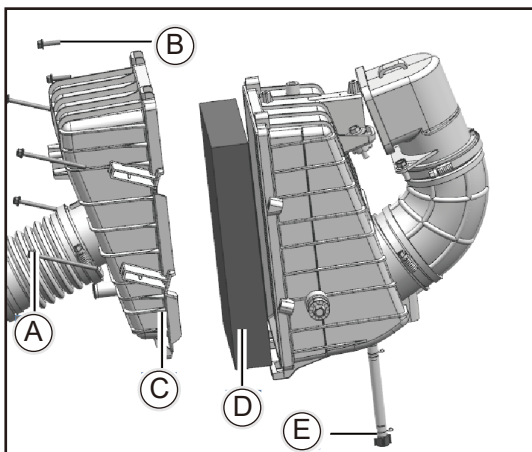
The air filter is located under the upper cover of the front storage box.

- 【A】** Upper cover of storage box
- 【B】** Expansion buckle assembly

1. Remove the 4-piece expansion buckle assembly on the upper cover of the front storage box. Lift the air filter cover off by removing the four tabs on the upper housing of the air filter.
2. Pull off the wire harness connector under the storage box. Remove the cartridge from the cassette and replace the cartridge for cleaning or replacement.
3. Remove the upper cover of the storage box.

Filter replacement steps are as follows:

- 【A】** bolt (2 pieces)                      **【B】** bolt (4 pieces)
- 【C】** Air filter cover                      **【D】** filter element
- 【E】** air filter plug



1. Remove the fixing bolts on the air cleaner cover and remove the air cleaner cover.
2. Remove the old air filter core.
3. Clean up the impurities inside the air filter box. If there is accumulated water, pull out the plug of the air filter and release the accumulated water before installing the plug again.
4. Remove the filter element for inspection. If the filter element is soaked in oil or ash-penetrating seriously, do not clean it up and replace it with a new filter element directly. If there is no oil immersion or serious ash penetration, you can turn the intake side down and knock it lightly on the ground. Most of the dust can fall off after vibration. If there is an air pump, you can use the air pump to blow out from the inside of the filter element (not from the intake side. Blow in) to blow off and clean the dust.
5. Refix the air filter cover with bolts.
6. Reinstall the front storage box.

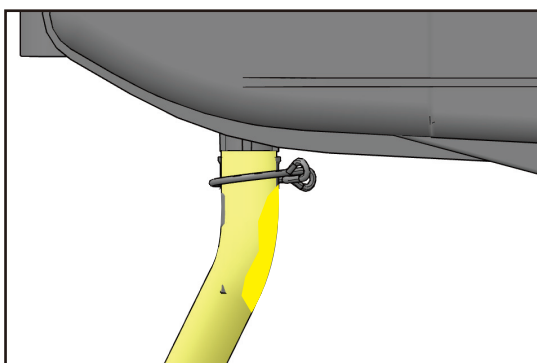
### AIR FILTER DRAIN CHECK

Check the air filter drain at each filter element change.

Service the air intake system drain.

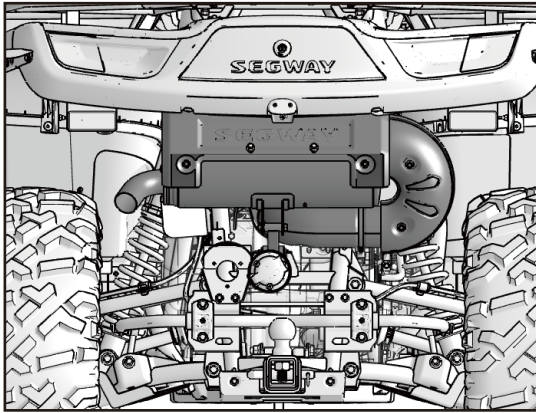
Check the drain opening to make sure it is not clogged with debris so that it drains properly.

If necessary, remove the leak plug under the drain opening to drain.



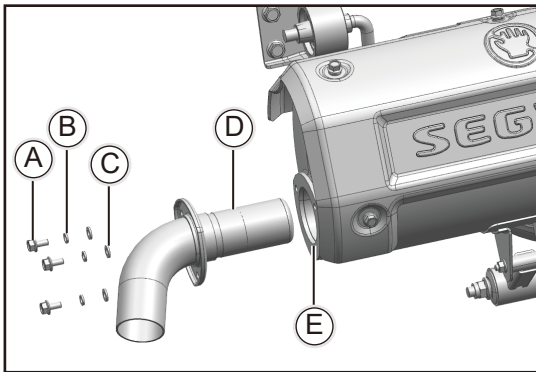
**SPARK ARRESTOR**

Spark arrestors prevent random sparks from igniting other combustibles. Regular maintenance can prevent carbon buildup. deferred maintenance can reduce engine performance.



**⚠ WARNING**

- ◆ Make sure the exhaust pipe is cool. The engine has just stopped working and can burn your skin due to overheating of the exhaust pipe.
- ◆ To reduce the risk of fire, ensure that no combustible materials are in the area at the time of removal.
- ◆ The use of safety glasses is recommended in this procedure..



It is important to remove the buildup of dirt in the exhaust pipe for periodic carbon emissions, as shown below:

- 【A】 Bolt M6\*16 (3 pcs)
- 【B】 Spring washer (3 pcs)
- 【C】 Flat washer (3 pcs)
- 【D】 Spark arrestor
- 【E】 Gasket

Let pipes completely cool down to avoid getting burned.

1. Remove three M6×16 bolts, spring washers, and flat washers.
2. Cleaning spark arrestor with soap and water, and as needed with a wire brush to remove all cinders.(Should be cleaned every 100 hours of service.)
3. Reinstall the muffler spark eliminator and bolts.

Torque of fastening bolts
11N.m(8ft·lb)

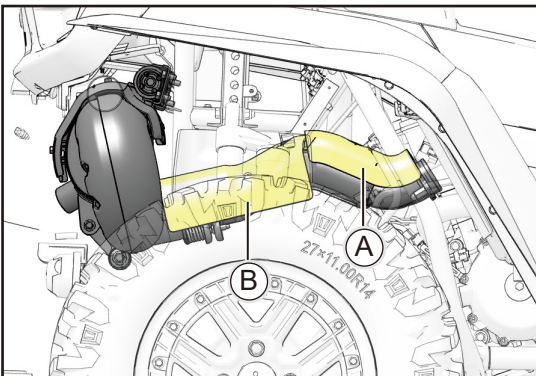
**⚠ CAUTION**

If the gasket is damaged, replace it with a new one. The gasket must be supplied by Segway.

**EXHAUST HEAT SHIELD INSPECTION**

**IMPORTANT**

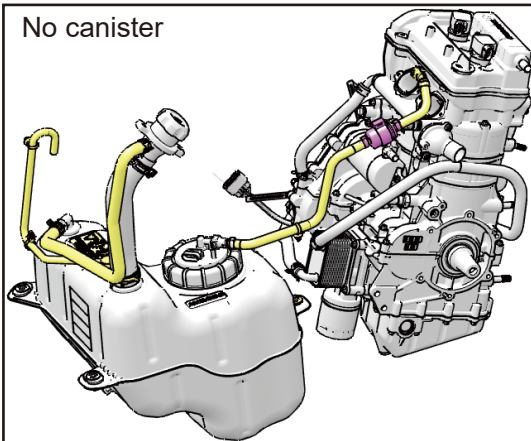
Check the exhaust heat shield to make sure it is in good condition and has been secured.



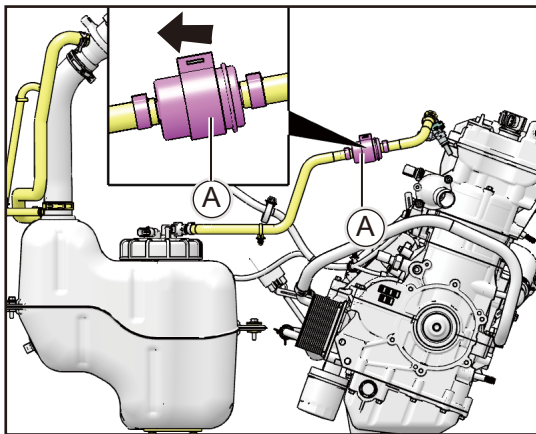
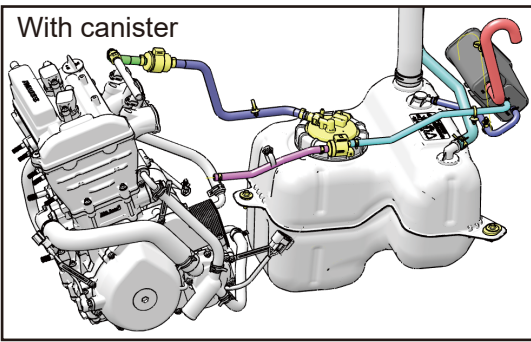
- 【A】 Front section insulation board of exhaust pipe
- 【B】 Exhaust pipe rear insulation panel

## FUEL SYSTEM AND AIR INTAKE

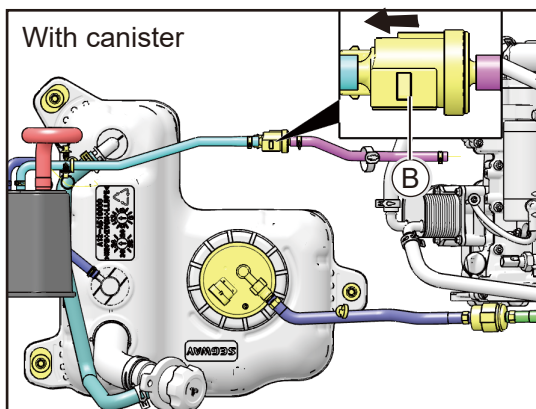
No canister



With canister



With canister



### FUEL SYSTEM

#### ⚠ WARNING

Gasoline burns easily under certain conditions

- ◆ You must be extremely careful when dealing with gasoline.
- ◆ When refueling, the engine must be shut off and must be done outdoors or in a well-ventilated area.
- ◆ At or near the refueling or gasoline storage place. No smoking, no open flames or sparks.
- ◆ Do not overflow when refueling. Do not fill the tank to the neck.
- ◆ If gasoline gets on your skin or clothes, wash them with soap and water immediately and change clothes.

### FUEL FILTER

Symptoms of a restricted fuel tank vent include the following: dented and distorted fuel tank, engine malfunction or stalling, reduced engine performance, or excessive exhaust gas temperatures high exhaust temperatures.

【A】 Fuel filter assembly

【B】 Carbon canister solenoid valve

The fuel filter is located under the seat cushion and is visible when the seat cushion is removed.

- ◆ Locate and inspect the fuel filter. Note the direction of the arrow on the filter (if removed).
- ◆ If there is visible debris in the filter, replace it.

#### ⚠ CAUTION

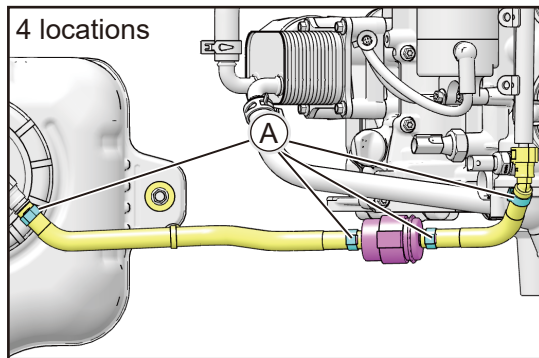
Be sure to install the filter in the direction shown (see left)

- ◆ Check the fuel tank high pressure tubing for signs of wear, cracks or damage. If necessary, replace the high-pressure oil line.
- ◆ Ensure that the high-pressure oil pipe is correctly arranged and fix the cable tie.

#### IMPORTANT

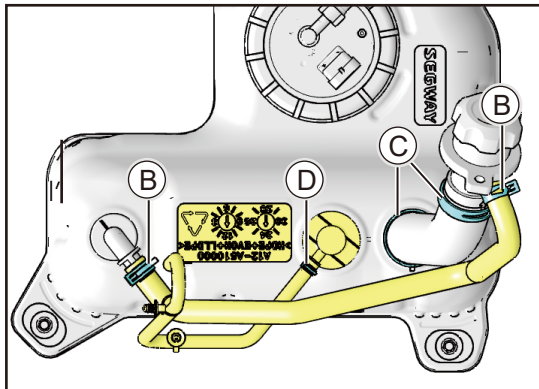
Make sure there are no kinks or crushes in the vent hose.

## FUEL LINE



- 【A】 Four joints of high-pressure oil pipe
- 【B】 Ventilation pipe joint
- 【C】 Gas port connection hose joint
- 【D】 Breather valve hose connector

First check the piping connections on the tank for leaks, wear, deterioration, damage, etc. Replace fuel lines if necessary. Inspect the fuel lines connecting the engine to the fuel tank for signs of wiring and quick connects for signs of failure, wear, deterioration, damage or leaks. Replace and connect lines if necessary.



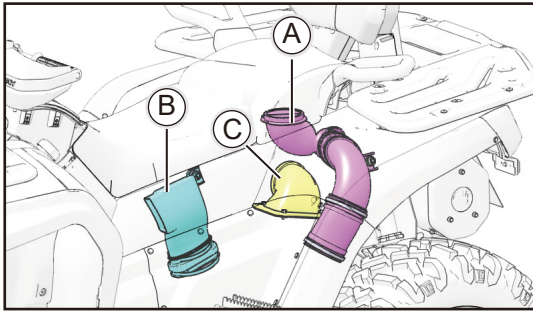
Replace if necessary, connect lines. Inspect the throttle disconnect hose that connects the fuel tank to the engine, check the lines and quick connects for signs of trouble, wear, deterioration, damage, or leaks. Replace and connect lines if necessary.

- ◆ Ensure fuel lines are properly laid out and secured.

**IMPORTANT**

Make sure lines are not twisted or pinched.

## CVT



### CVT INTAKE SCREEN CHECK

It is recommended that the CVT air intake filter be checked periodically and the following procedure should be followed:

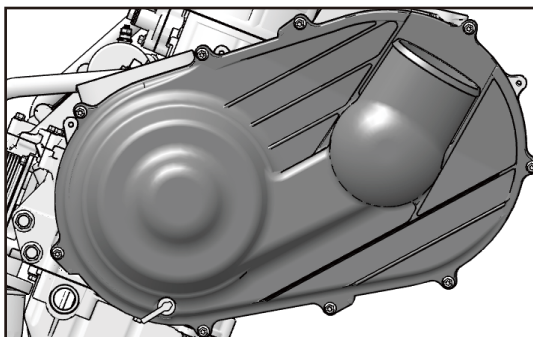
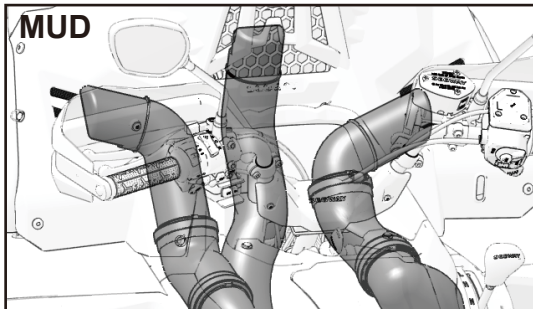
The CVT has 2 air inlets and 1 air outlet, both located under the seat cushion.

The air inlet of the mud version vehicle is located under the radiator cover.

- 【A】 Inlet 1
- 【B】 Inlet 2
- 【C】 Air outlet

Periodically clean and wash the CVT air inlet, inlet screen and outlet for impurities and foreign objects.

Replace the inlet and outlet filters with new ones if necessary.



### CVT BELT

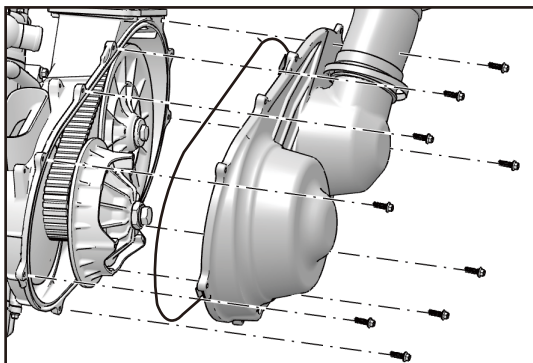
Replace the CVT drive belt at the time specified in the vehicle maintenance schedule. If the CVT belt is damaged, replace it as well.

#### ⚠ WARNING

Failure to remove all debris when replacing the belt could result in vehicle damage, loss of control and serious injury or death.

Stop the vehicle engine and allow the vehicle to cool sufficiently before replacing.

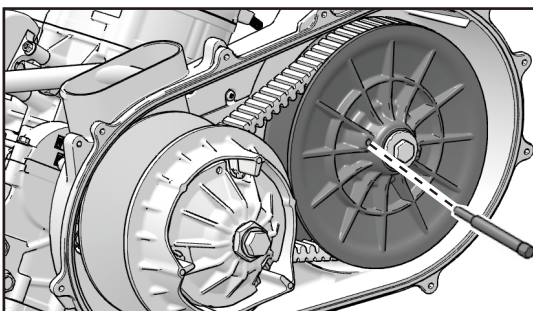
1. Remove the bolts of the CVT cover, and remove the CVT cover and the sealing ring of the CVT cover.
2. with the follower wheel top lever (special) against the hole of the follower wheel as shown in the figure, so that the the follower wheel disk open.



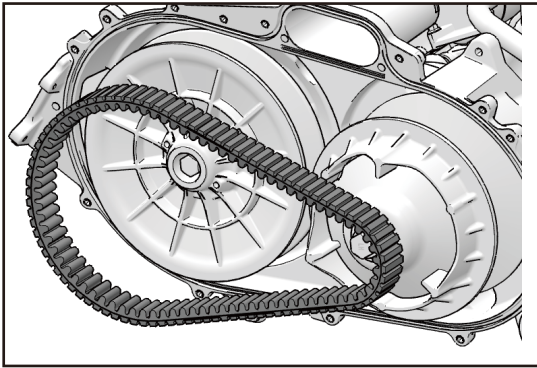
#### ⚠ CAUTION

Before removing the drive belt, note the direction of the marks on the drive belt (e.g., manufacturer's name, arrow mark, etc.) so that the drive belt can be reinstalled on the pulley in the original direction.

3. Remove the drive belt from the CVT driven wheel and the CVT driving wheel.
4. Take out the drive belt to be replaced and clean up the debris in the CVT compartment.



Transmission belt imprint CTecl RP52-4182-C MADE IN US



## INSTALLATION OF DRIVE BELTS

### ⚠ CAUTION

Make sure the new belt orientation is the same as the original belt installation.

Installation steps are essentially the reverse of those for removal.

1. Wrap the drive belt around the CVT master and follower pulleys.
2. Pull out the driven pulley top lever and tighten the CVT driven pulley disk.
3. Install the CVT seal and tighten the CVT outer cover.

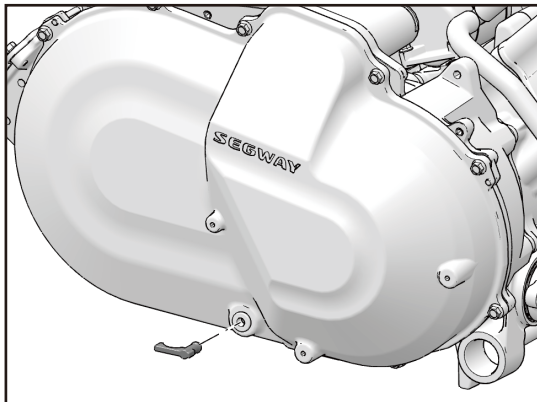
CVT outer cover bolts

10 N•m (1 kgf•m, 80 in•lb)

## DRY CVT

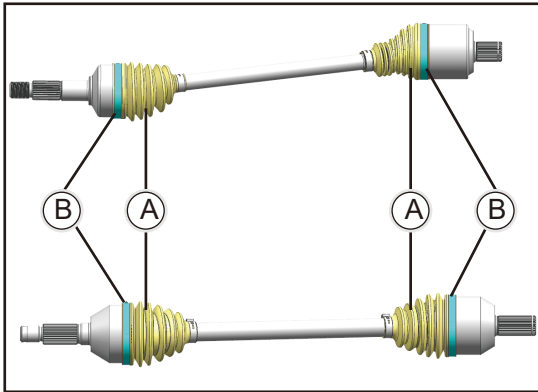
There are some instances where water can accidentally soak into the CVT system, before driving the vehicle dry it first.

1. Remove the clutch drain plug.
2. Wait for the water to drain and reinstall the drain plug.
3. Place the transmission in "P" and pull up the parking handle.
4. Start the engine.
5. Use varying throttle openings for 10-15 seconds to expel moisture and air, dry the belts and CVT, do not hold the throttle fully open for more than 10 seconds.
6. Allow the engine speed to remain at idle speed, apply the brake, and shift the transmission to the lowest available range.
7. Belt slip test, if belt slips, repeat process.
8. If the vehicle needs service, contact your Segway dealer to provide you with assistance.

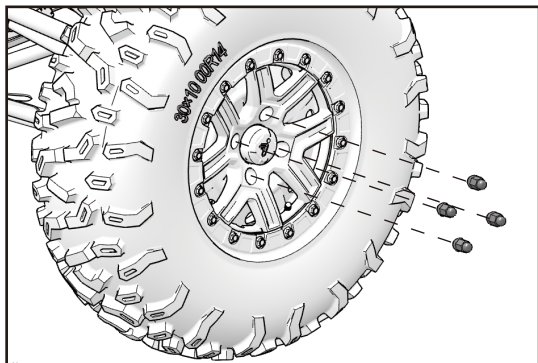


## DRIVE SHAFT MAINTENANCE / TIRES

### DRIVE SHAFT DUST SLEEVE INSPECTION



Inspect the front and rear driveshaft dust boots 【A】 for cuts, damage or grease leaks. If the dust boots show any of these symptoms, they should be replaced. Check dust boot clamps 【B】 for proper positioning.



### WHEEL PARTS REMOVAL

1. Stop the engine.
2. Place the shift lever in the "P" position and lock the parking brake.
3. Loosen, but do not remove, the four wheel mounting nuts with a tool.
4. Raise the side of the vehicle with jack support in a suitable location.
5. Remove the rim mounting nuts.
6. Remove the entire wheel.

### WHEEL MOUNTING

For tire mounting as opposed to removal, tighten the 4-piece tire mounting nuts to the specified torque value.

	front wheel	rear wheel
Tires Size	27×9.00-14	27×11.00-14
	27×9.00R14	27×11.00R14
	30×10.00R14 For AT10W only	30×10.00R14 For AT10W only

Wheel Mounting Nut
100~120N·m

### ⚠ CAUTION

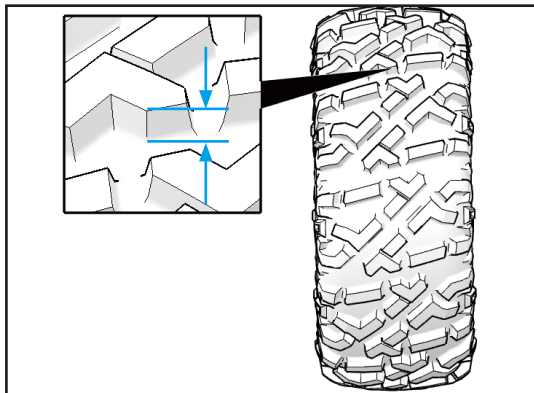
Always use wheels of the same size as recommended in the Service Manual or it may result in loss of vehicle control.

### ⚠ CAUTION

Do not lubricate bolts or nuts.

**TIRE TREAD DEPTH**

Check the tire tread block wear, when the tire tread block wear is at least 1.6mm above the tread, the tire should be replaced.

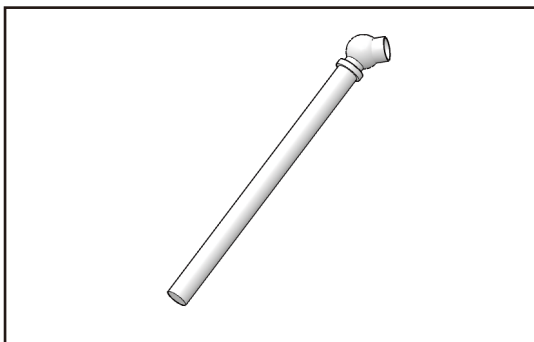


**⚠ WARNING**

Operating with worn tires increases the likelihood of vehicle skidding and possible loss of control. Worn tires can cause accidents. When tire tread wear reach the limit, always replace the tires.

**TIRE PRESSURE CHECK**

When checking tire pressure, follow these steps

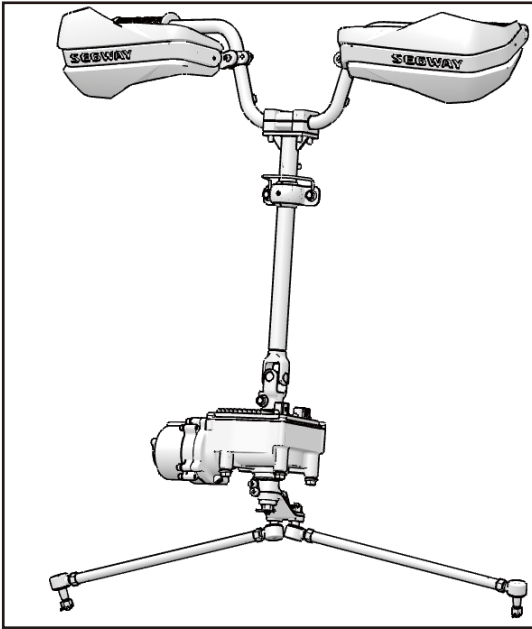


	front wheel	rear wheel
tire pressure	7.0psi(48.3kPa)	7.0psi(48.3kPa)

Tire Pressure Checking Guide, please observe the following when checking tire pressure:

- ◆ Inspect the tires only after they have cooled down.
- ◆ If the vehicle has been parked for at least 3 hours or has not been driven for more than 1.5km (kilometers), then checking at this time will give an accurate cold tire inflation pressure reading.
- ◆ Check tire pressure with a tire pressure checking device or the tire pressure gauge in your vehicle's tool kit.
- ◆ It is normal for tire pressure to increase after driving, do not lower the tire pressure.

## STEERING MAINTENANCE



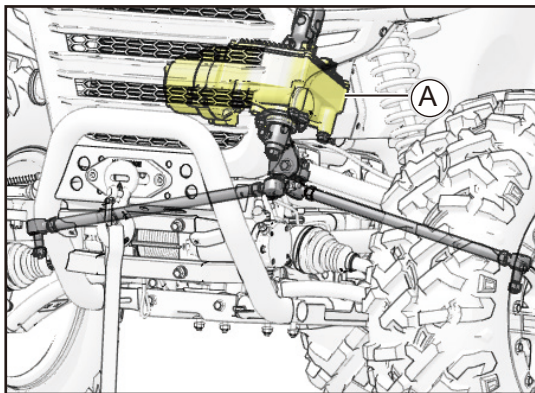
### STEERING SYSTEM CHECK

Steering system components should be checked periodically for loose fasteners, worn tie rod ends/transverse tie rod fasteners, loose steering shaft universal joints, and tie rod ball wear.

Replace any worn or damaged steering parts. The steering should travel the full range of travel of free movement with no sticking. Check all cables, hoses and wiring of the wiring to ensure that the steering mechanism is not restricted.

#### TIPS

Check front beam alignment when replacing steering components.



### POWER STEERING (EPS MODELS)

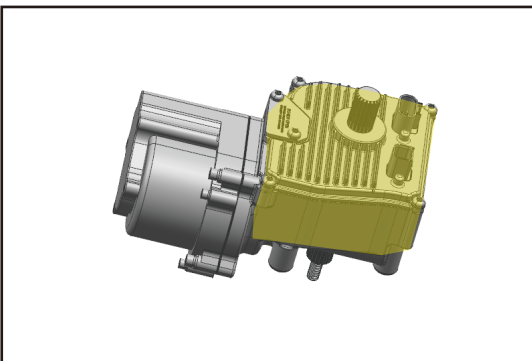
#### 【A】 Power steering

Removing the right front inner fender allows access to the power steering unit through the right front wheel cover.

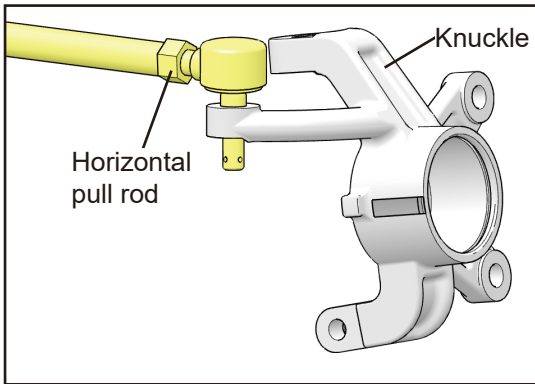
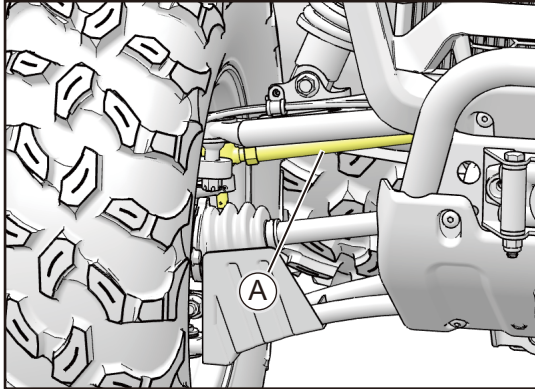
Clean the area around and on top of the power steering unit frequently for proper cooling.

#### TIPS

After riding in muddy conditions, be sure to thoroughly clean these areas



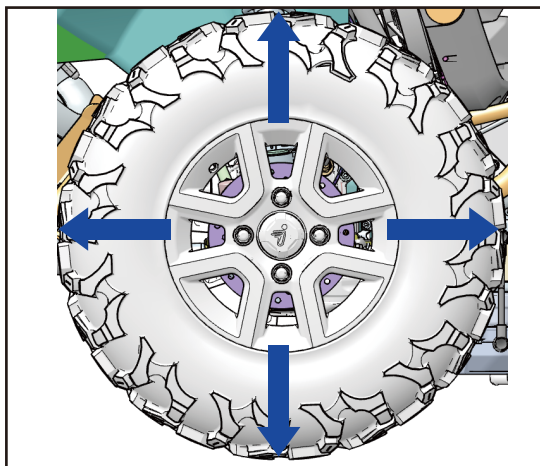
TRANSVERSE TIE ROD INSPECTION



TIPS

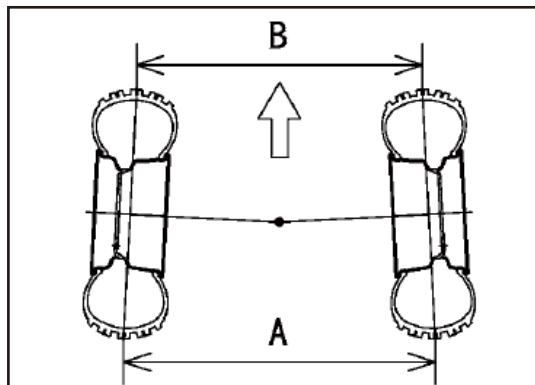
Whenever you replace a steering component, check the front beam for alignment

- ◆ To check the clearance of the transverse tie rod **【A】**, grasp the transverse tie rod and pull it in all directions to feel if there is any movement.
- ◆ Replace any worn or damaged steering parts. The steering should move freely throughout the entire travel range without sticking.
- ◆ Lift the front end of the vehicle so that the front wheels are off the ground, checking for a loose front wheel/hub assembly by grasping first the top and bottom of the vehicle's front wheels, then the front and rear of the vehicle's front wheels. Try pushing inward and pulling outward to move the wheel and hub.
- ◆ If abnormal movement is detected, inspect the hub and wheel assembly to determine the cause. cause (Loose wheel mounting nuts or loose front hub nuts.)



ANTERIOR BEAM CHECK

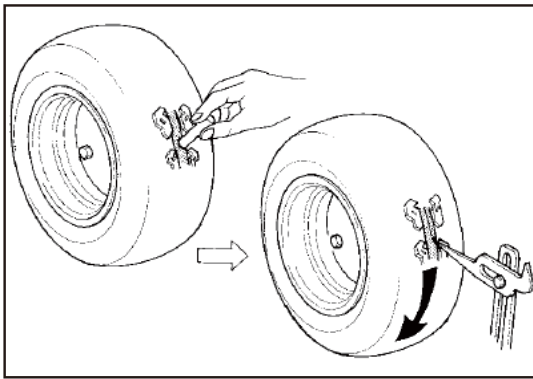
- ◆ Front beam means that the distance between the front ends of the two front wheels is less than the distance between the rear ends at the height of the axle. The difference in distance is called the front beam value. When there is a front beam, the distance A (rear) is greater than B (front) when looking down from the top of the car, as shown in the figure.
- ◆ The function of the front beam is to prevent the front wheels from running off at any time and to reduce the sliding friction between the tires and the ground. If the front beam is incorrect, the front wheels will slide against the ground, resulting in tread damage or abnormal wear.



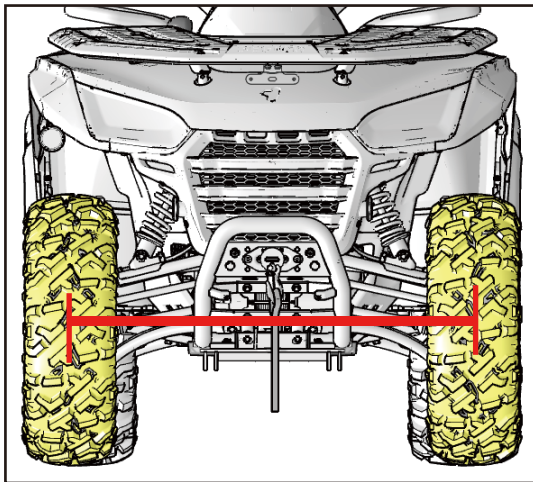
The main pin rear and camber angles are fixed and do not require adjustment.

$$A \text{ (rear)} - B \text{ (front)} = \text{front beam value}$$

(Distances A and B are measured at the height of the vehicle's axle when parked on a flat surface.)



- ◆ Apply a thick line of chalk or paint near the center of the front tire.
- ◆ As you turn the wheel, use a needle tip plotter to make a small mark near the center of the chalk coating.



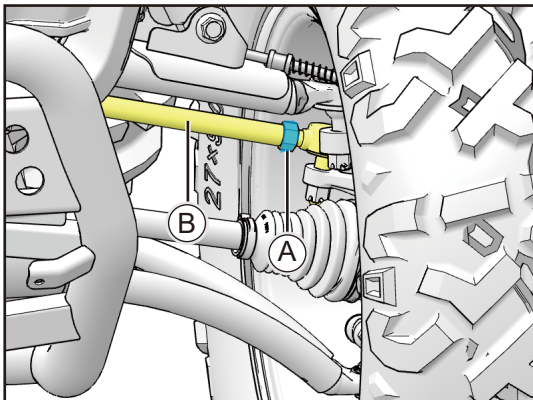
- ◆ Place the front wheels on the ground and turn the steering wheel upright to secure it.
- ◆ At axle height, measure the distance between the front and rear scribed or painted lines of the front tires.
- ◆ Subtract the front measurement from the rear measurement to obtain the front beam.

If the front beam is not within the specified range, continue the front beam adjustment procedure.

**Standard: -5 ~ -20 mm**

### FRONT BEAM ADJUSTMENT

- 【A】 Anti Loosening Nut
- 【B】 Tie rods



- ◆ Loosen the jam nut 【A】 and turn the adjusting tie rods 【B】 on both sides the same number of turns to achieve the specified front beam.

### **⚠ WARNING**

Adjust the length of the cross tie bar so that the visible threads on the ends of the cross tie bar are of uniform length, A non-uniform thread length can result in damage to the cross tie rod ends.

- ◆ Check the front beam.
- ◆ Tighten:

Cross tie bar adjustment lock nut torque

45 N.m (4.5 kgf·m, 34 ft·lb)

- ◆ Test drive vehicles.

**SHOCK ABSORBER**

**SHOCK ABSORBER INSPECTION**

Since the front shock absorbers are sealed units, they cannot be disassembled and only require external inspection. If one unit is damaged, replace both shock absorbers as a set. If only one unit is replaced and both are not balanced, it may cause the vehicle to become unstable at high speeds or the overall comfort deterioration of the vehicle at high speeds.

**ADJUSTABLE PNEUMATIC SHOCK ADJUSTMENT**

**Spring Preload Adjustment**

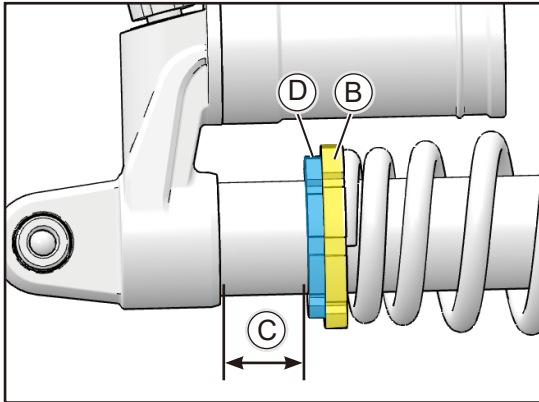
Adjust the upper spring end cap with a special tool

- ◆ Adjusting the end cap downward increases the spring preload.
- ◆ Decrease the spring preload by adjusting the end cap upward.

【A】 Lock nut 【B】 Adjustment nut

【C】 Spring preload position

- ◆ Screw the lock nut 【A】 to the desired position, and then unscrew the adjusting nut 【B】 , adjust the nut position 【C】 .



**Spring preload position 【C】 setting**

Standard (For AT10 only):

Front shock absorber 24mm(0.94in.).

**Usage range:** 10mm(0.39in.)~44mm(1.73in.)

**Rear shock absorber** 65mm(2.56in.)

**Operating range** 45mm(1.77in.)~85mm(3.35in.)

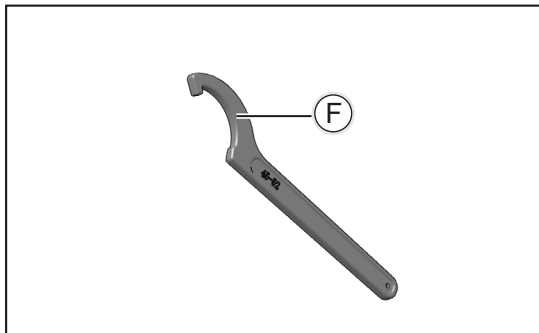
Standard (For AT10W only):

Front shock absorber 111mm(4.37in.),

**Usage range:** 91mm(3.58in.)~131mm(5.16in.)

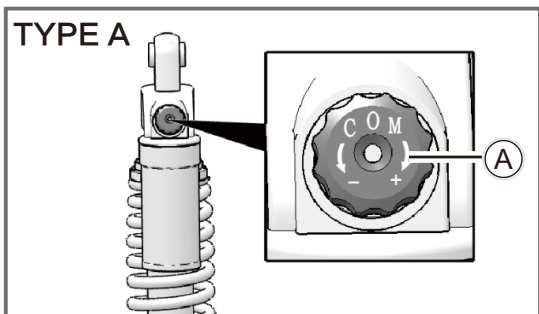
**Rear shock absorber** 112mm(4.41in.),

**Operating range** 92mm(3.62in.)~132mm(5.20in.)



**Spring Lock Nut Torque**

30 N·m

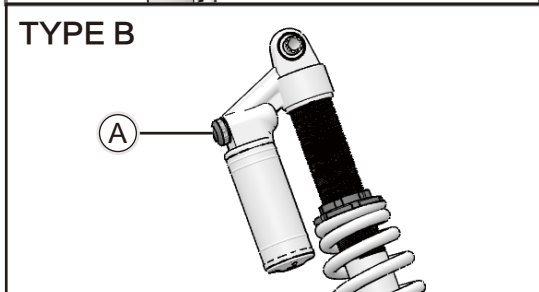


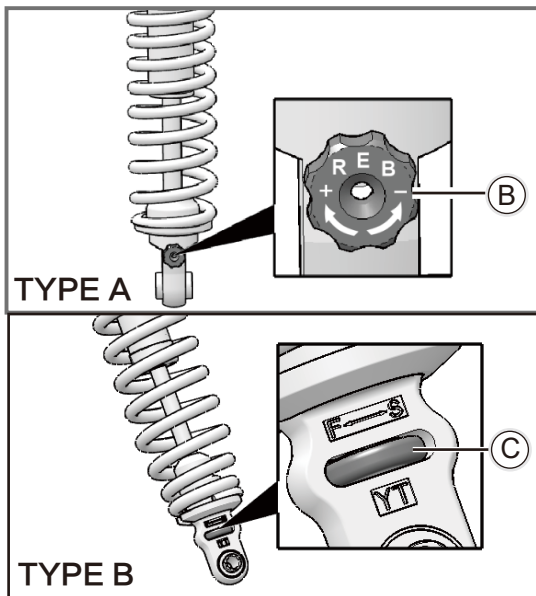
**Compression Damping Adjustment**

【A】 Compression damping adjustment valve

- ◆ Rotate the upper compression damping adjuster by hand, increasing the damping clockwise and decreasing it counterclockwise.

- ◆ The compression damping regulator has 7 gears, the initial gear is set to the 4th gear.



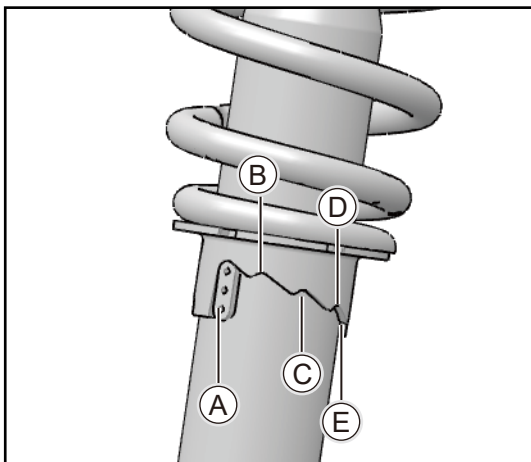


### Restoration damping adjustment

- 【B】** Recovering the damping adjusting valve
- ◆ Rotate the lower compression damping adjuster by hand, increasing the damping clockwise and decreasing it counterclockwise.
  - ◆ The compression damping regulator has 7 gears, the initial gear is set to the 4th gear.
- 【C】** Recovering the damping adjusting valve.
- ◆ Rotational recovery damping increases in the direction of “S”.
  - ◆ Turning in the “F” direction reduces the return damping.

### OIL SHOCK ABSORBER ADJUSTMENT

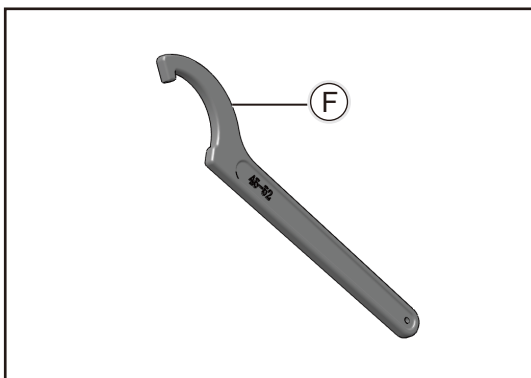
The damping has 5 positions for different loads or driving conditions.



position	sprung	environment	load	topography	speed
↑	soft	soft	Light	smooth	low
standard position	↑	↑	↑	↑	↑
↓	hard	hard	Heavy	bumpy	high

Position **【B】** : Standard position.

Position **【A】 【C】 【D】 【E】** : According to the vehicle load, speed increase, the  
Gradually adjust

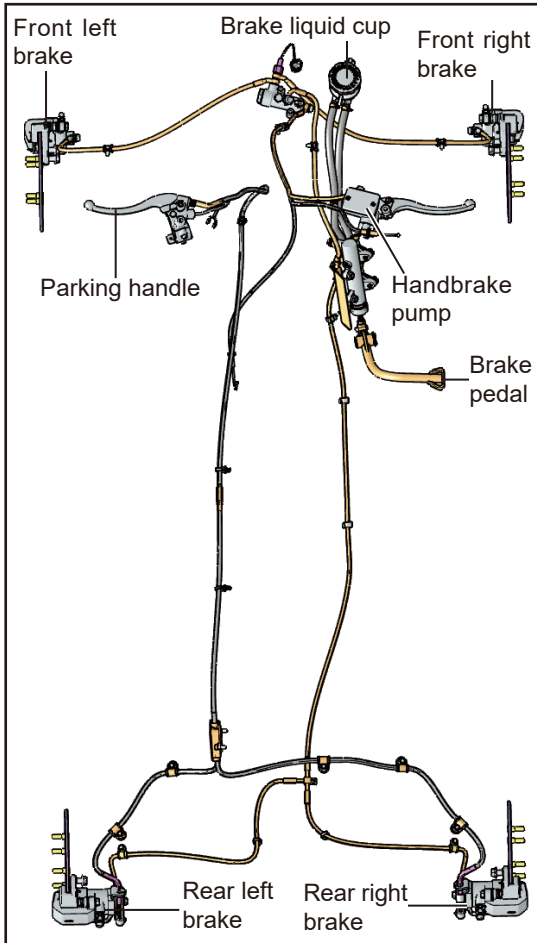


Use the hook wrench **【F】** (in the supplied tool bag) to adjust the shock spring pressure.

### ⚠ CAUTION

When adjusting the shock absorbers, always adjust both the left and right shock absorbers to the same position. gradually adjust upward or downward one position at a time. Do not attempt to make large adjustments as this may damage the shock absorbers.

**BRAKING SYSTEM**



Front and rear brakes are hydraulic disc brakes, activated by the brake pedal

**⚠ WARNING**

The brake fluid level must be checked periodically:

An overfilled brake cylinder may cause brake resistance or brake lock-up, which could result in serious injury or death. Keep the brake fluid at the recommended level and do not overfill. Brake Discs Brake discs must be checked for periodic wear: If the brake discs are worn, they should be replaced.

The following checks are recommended to keep the brake system in good working order. If the brakes fails during heavy use in normal operation, it should be checked frequently.

- ◆ Always keep the brake fluid at the proper level. Check for fluid leaks in the brake system.
- ◆ Check that the brake travel is not too long or feels uncomfortably soft.
- ◆ Check for worn, damaged or loose friction pads. Replace the brake pads when the remaining limit, you must replace the brake pads brake pad thickness is not less than 1.5mm.
- ◆ Check the safety and surface condition of the brake disk. Use the recommended brake cleaner to remove all grease. Do not use spray lubricants or other lubrication products. If there is damage (cracks, excessive corrosion, warping), contact your dealer before operation.

**BRAKE FLUID LEVEL CHECK ON HANDBRAKE UPPER PUMP**

Use the recommended brake fluid:

brake fluid	DOT4
-------------	------

Verify that the handbrake master pump reservoir level is at the specified level.

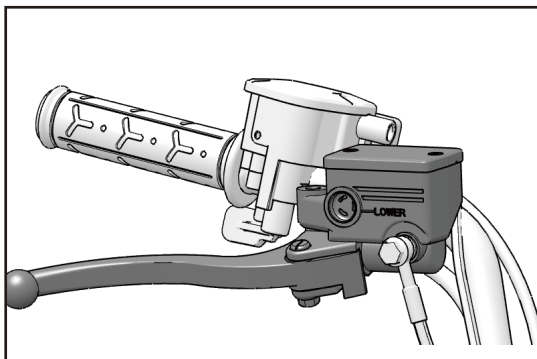
**【LOWER】** Brake fluid cup minimum level mark..

Check the fluid level through the fluid level sight hole, if it is below the minimum level line

**【LOWER】** , check and replenish the brake fluid..

For replenishing the flow brake fluid in the brake lines, the addition procedure is as follows: :

- ◆ Remove the screw on the brake fluid cup cover of the handbrake pump, and replenish the brake fluid cup with the same grade of brake fluid.
- ◆ Replenish the brake fluid cup with brake fluid of the same grade.



**⚠ CAUTION**

Brake fluid can damage plastic and painted surfaces, use caution when adding.  
 If brake fluid comes into contact with skin or eyes, flush immediately with plenty of water.  
 If there is any further discomfort, please consult a doctor immediately.

Check brake pads for wear.

## BRAKE FLUID CUP LEVEL CHECK

The rear brake oil cup is located between the left front upper inner fender and the front shock absorber.

The mud version rear brake oil cup is located under the radiator cover.

- ◆ Place the entire vehicle on a level surface and check is the fluid level in the oil cup.

**[A]** - MAX - High level in the brake fluid cup.

**[B]** - MIN - Minimum level in the brake fluid cup.

- ◆ If the fluid level falls below the minimum level line - LOWER - or below, replenish the brake fluid with the same grade.

**⚠ CAUTION**

After replenishing or replacing the brake fluid, check whether the oil cup pad under the oil cup cover is in an elongated state. If the oil cup gasket is elongated, it is necessary to reset the oil cup gasket (as shown in the figure). If the oil cup gasket is not reset, brake fluid will spill out of the oil cup when the oil cup cover is tightened.

- ◆ If the oil cup gasket is stretched, reset the oil cup gasket first.

- ◆ Tighten the oil cup cover.

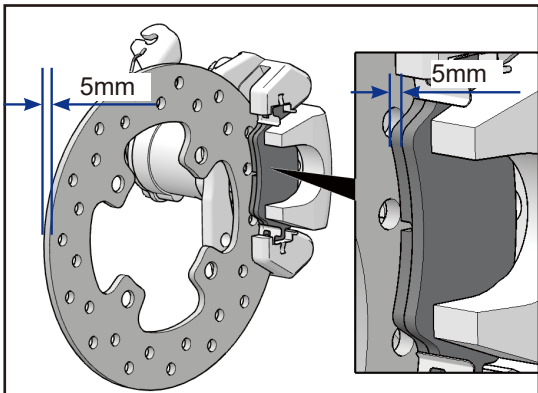
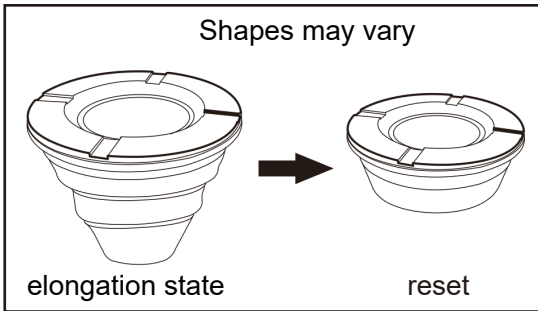
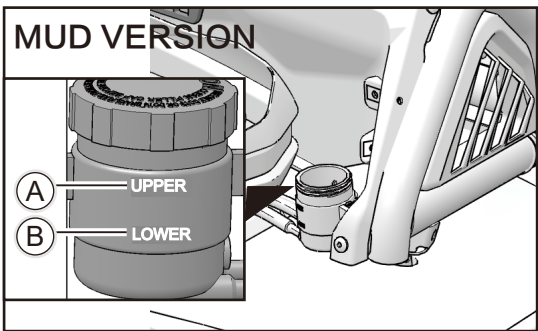
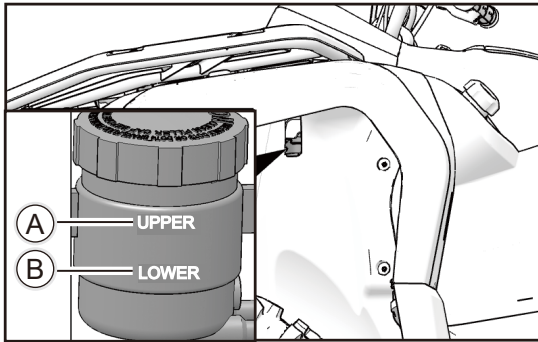
**⚠ CAUTION**

Replenish or refill DOT4 brake fluid as required.

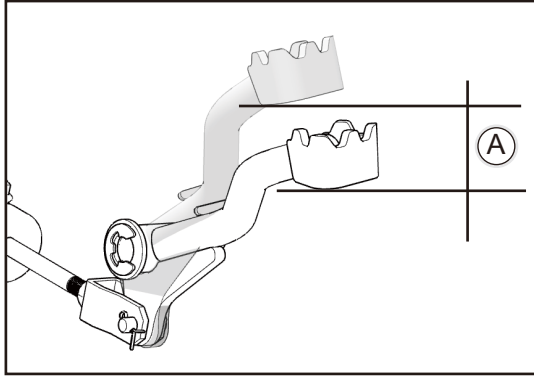
## BRAKE LININGS AND DISCS

Brake lining and disc wear will depend on the severity of use and driving conditions. Brake linings wear faster in wet and muddy conditions. Check the wear of the brake linings and discs regularly according to the maintenance schedule. If the brake lining and disc are worn beyond the required values, the brake lining and disc must be replaced. (See pages 10-13, 10-14, 10-18, 10-19 )

Brake Lining Thickness	Standard thickness	5.0mm
	Minimum thickness	1.5mm
Brake Disc Thickness	Standard thickness	5.0mm
	Minimum thickness	4.0mm



**BRAKE PEDAL AIR TRAVEL CHECK**



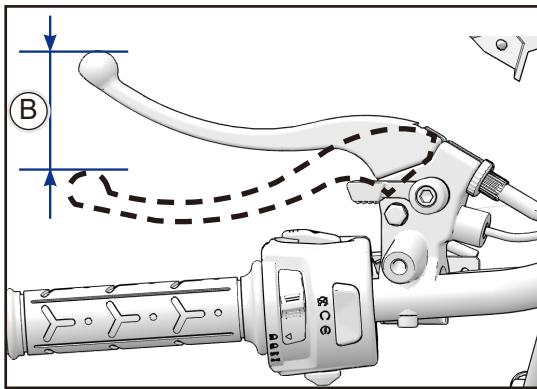
**【A】 Brake pedal travel**

- ◆ Check the empty travel of the brake pedal **【A】** .
- ◆ Depress the brake pedal gently with your foot until the brake pedal is depressed.

If the rear brake pedal has too much air travel, adjust it,

**Rear brake pedal travel standard:**

**(2 to 3) mm (0.08 to 0.12 inch)**



**PARKING HANDLE WORKING STROKE CHECK**

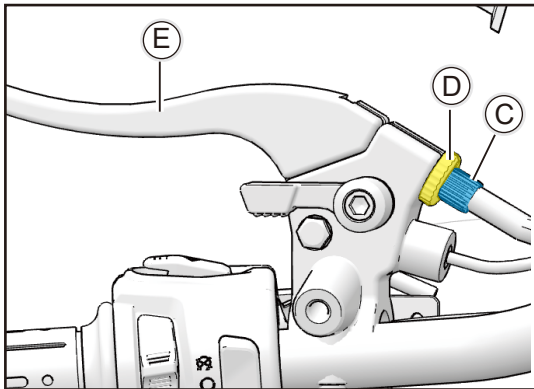
**【B】 Parking handle working stroke**

- ◆ Check the working stroke of the parking handle **【B】** .
- ◆ Squeeze the parking handle by hand until it is parked.

If the working travel of the parking handle is large, adjust it.

**Parking handle working travel standard:**

**(10 to 20) mm (0.4 to 0.8 inch)**



**PARKING HANDLE FREE TRAVEL ADJUSTMENT**

**【C】 Brake lever adjuster**

**【D】 Jam nut**

**【E】 Brake handle**

- ◆ Turn the brake lever adjuster to lock the jam nut **【D】** .
- ◆ Tighten the jam nut **【D】** .

until the correct travel is achieved.

## ELECTRICAL AND IGNITION SYSTEMS

### BATTERY MAINTENANCE

Keep battery terminals and connections free of corrosion, if cleaning is required, use a stiff wire. If cleaning is required, remove corrosion with a stiff wire brush, clean with a solution of one tablespoon of baking soda and one cup of water, rinse well with tap water, dry with a clean towel, lubricate with dielectric grease or vanadium. Rinse well with tap water, dry with a clean towel, and grease the terminals with dielectric grease or petroleum jelly. Apply dielectric grease or petroleum jelly to the end.

#### **⚠ WARNING**

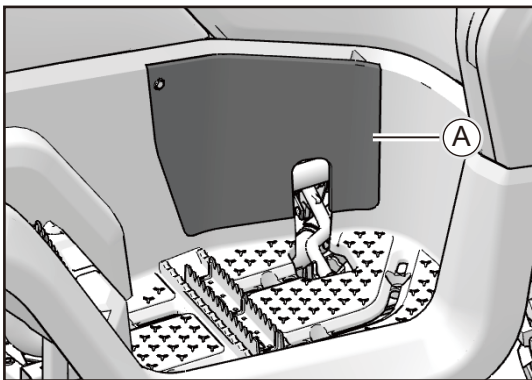
12V batteries contain toxic and corrosive sulfuric acid, skin contact may result in burns.

If the solution in the battery accidentally splashes on your eyes, skin or clothes, please wash them immediately with plenty of water and seek medical advice promptly.

Batteries can produce explosive gases, so keep away from sparks, flames, cigarettes, etc..

Always charge the 12V battery in an open area. Do not charge the 12V battery in a poorly ventilated garage or closed room.

Always wear eye protection when working near the battery.



### BATTERY REMOVAL

#### **⚠ CAUTION**

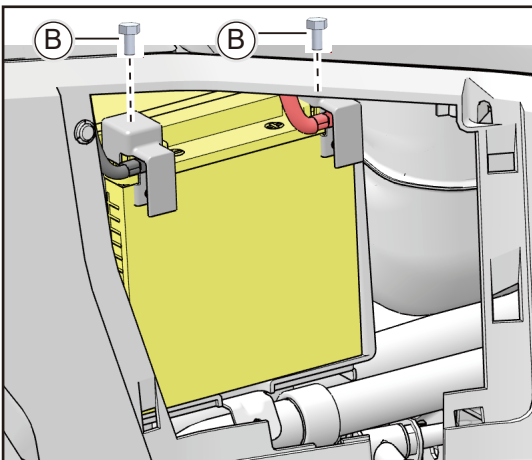
If the electrolyte overflows, immediately rinse with a solution of baking soda and water, and then rinse thoroughly with water to prevent damage to the vehicle.

The battery is located above the right footrest. To replace or service the battery, perform the following steps:

Turn off the vehicle power before removing the battery

**【A】** Battery maintenance cover

**【B】** Positive and negative battery terminal fixing bolts



1. Use a tool to remove the retaining screws of the battery access cover.
2. Remove the strap holding the battery in place.
3. Roll up the protective rubber boot.
4. Remove the negative battery screw and disconnect the black (negative) battery cable.
5. Remove the positive battery screw and disconnect the red (positive) battery cable.
6. Remove the battery from the vehicle. Battery Installation

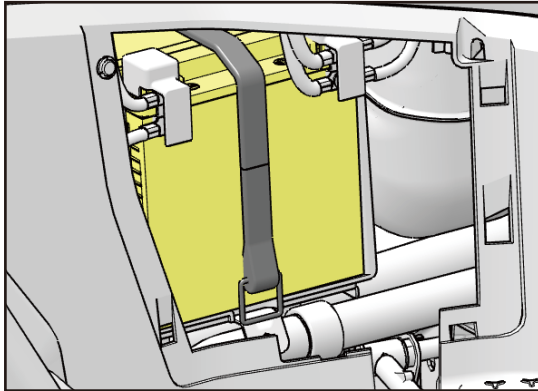
## BATTERY INSTALLATION

### ⚠ CAUTION

To reduce the possibility of sparking: each time the battery is removed, disconnect the black (negative) cable to reconnect. When reinstalling the battery, install the black (negative) cable last.

---

cable last when reinstalling the battery.



1. Clean battery cables and terminals with a stiff wire brush. Corrosion can be removed with a solution of one cup of water and one tablespoon of baking soda. Rinse well with water and dry thoroughly.
2. Place the battery in the tray.
3. Bolt the positive (red) cable to the positive battery terminal and return the insulating rubber boot into place.
4. Bolt the negative (black) cable to the negative battery terminal and return the insulating rubber boot to place.
5. Secure the battery with the battery tie-down straps.
6. Verify that the cables are properly routed.

## BATTERY CHARGING

### ⚠ CAUTION

If charging, the hydrogen gas produced by the 12V battery is a flammable explosive gas. Therefore, observe the following precautions before charging:

- ◆ If charging a 12V battery still installed in the vehicle, be sure to disconnect the ground cable.
  - ◆ When connecting and disconnecting the charger cable to the 12V battery, make sure the power switch on the charger is turned off.
  - ◆ Charge only slowly (5A or less). If fast charging is used, the 12V battery may explode.
-

## SPARK PLUGS

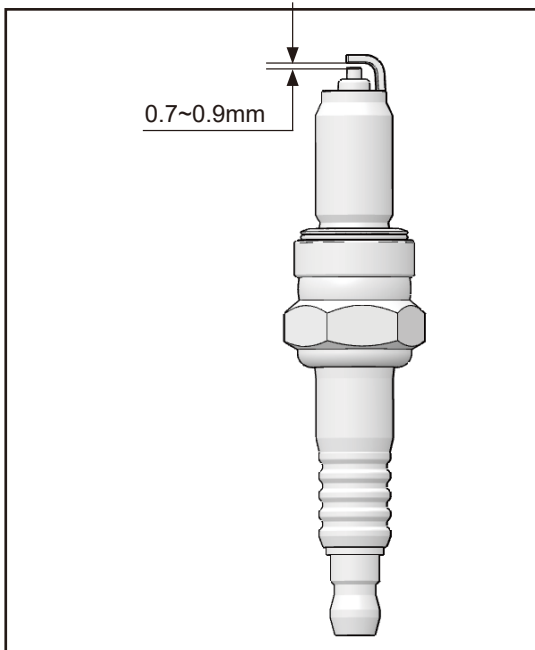
Refer to the recommended spark plug type and gap specifications. Spark Plug Torque Specifications.

### ⚠ CAUTION

Using non-recommended spark plugs can cause serious engine damage.

Always use recommended spark plugs or their equivalent.

spark plugs	model number	spark plug gap	Spark Plug Torque
	B7RTC / B8RTC	0.7~0.9mm	12 N.m (1.2 kgf·m, 8.8ft·lb)



## SPARK PLUG CHECK

Spark plug condition indicates engine operation. Check or refer to the maintenance replacement spark plug Periodic Maintenance Program for the time.

### ⚠ CAUTION

Hot exhaust systems and engines can cause burns. When removing spark plugs for inspection wear protective gloves.

- 【A】 Bolt
- 【B】 Ignition coil
- 【C】 Spark plug
- 【D】 Spark Plug Sleeve

The spark plug is located under the seat cushion

1. Remove the seat cushion and the windshield at the bottom of the seat cushion.
2. Unplug the ignition coil harness and remove the ignition coil retaining bolt.
3. Remove the ignition coil, with the spark plug located under the ignition coil.
4. Using the special wrench for the spark plug in the tool bag, turn the spark plug counterclockwise.

Installation is performed in the reverse order of removal, and tightening is performed to the specified torque.

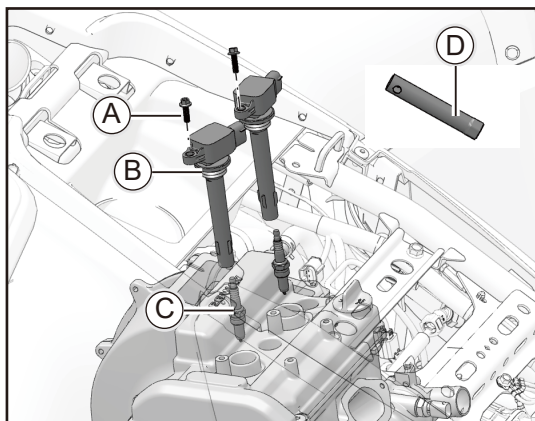
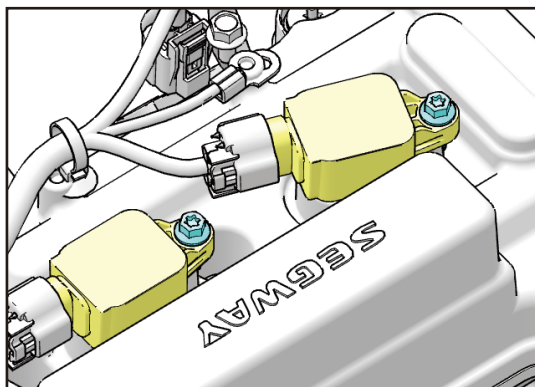
### Normal Plug

Normal insulator tips are gray, tan, or light brown. Very little there are burning deposits. The electrodes are not burned or corroded. This indicates that the engine is burning is adequate.

The tip should not be white. A white insulator tip indicates overheating due to use of improper spark plugs or incorrect throttle body adjustment.

### need to be replaced

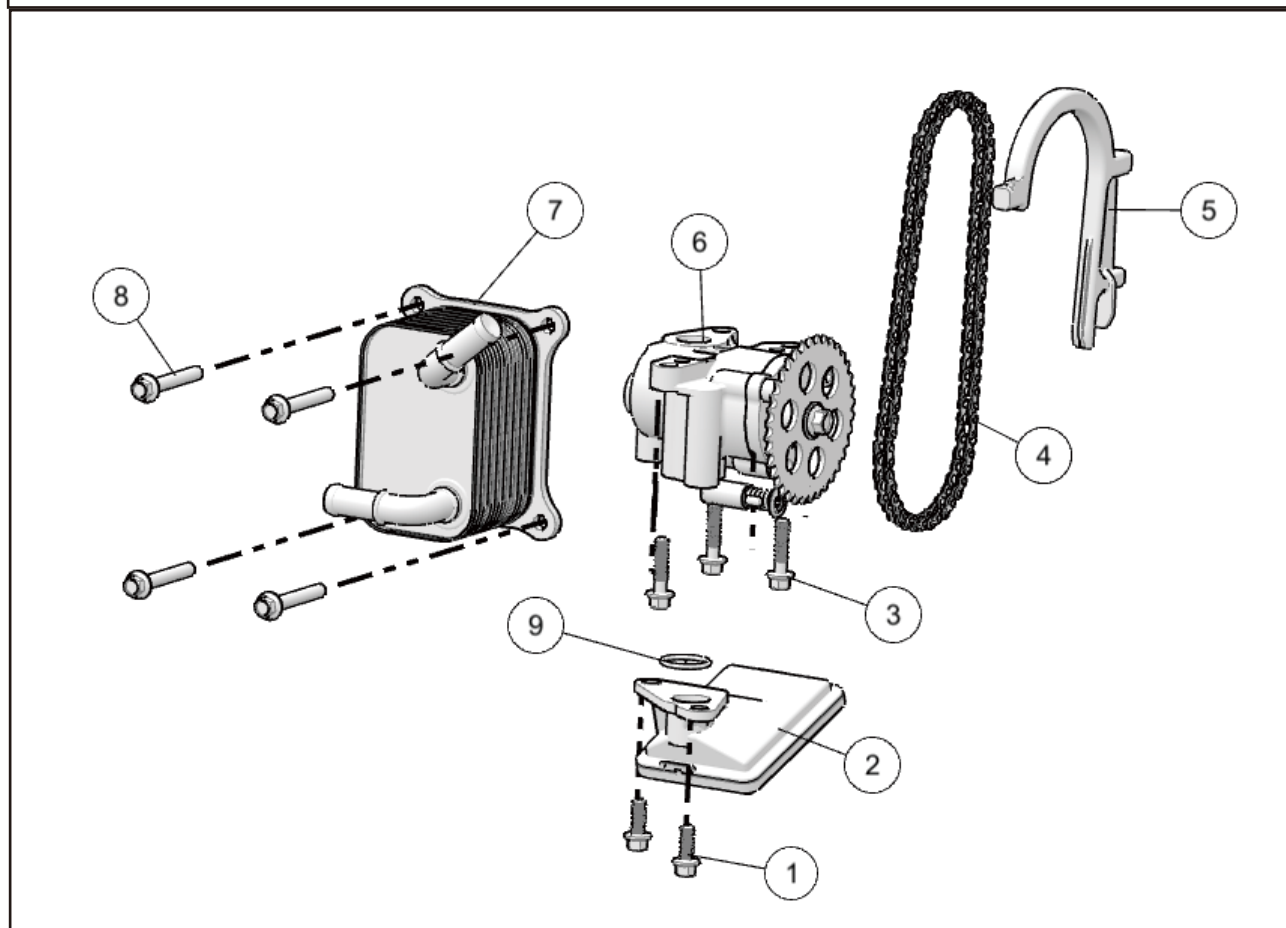
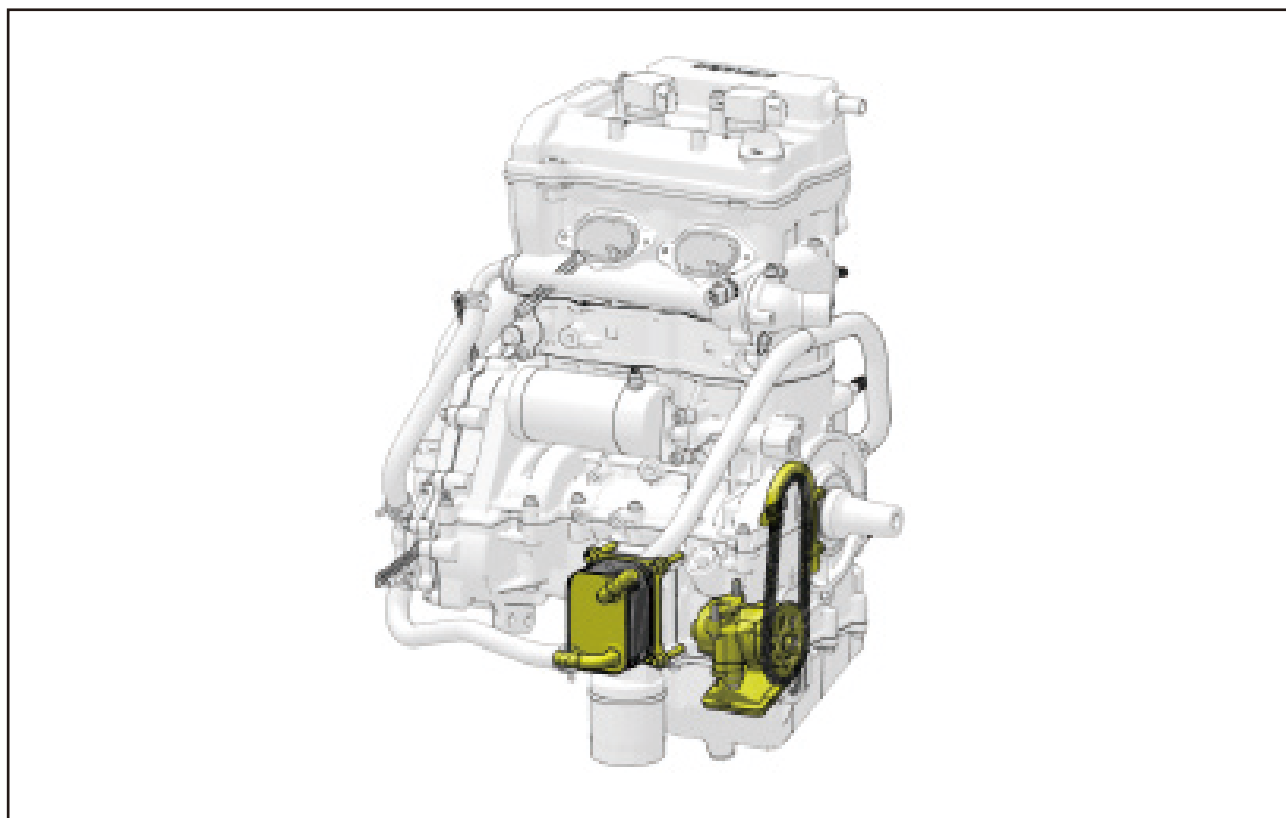
Contaminated insulator tips are black. Moist oil film covers the launching end. The entire head may have a carbon layer. Generally, the electrodes are not worn. A common cause of fouling general cause of fouling is excessive oil, use of unrecommended oil or poor fuel quality.



**ENGINE LUBRICATION SYSTEM**

<b>EXPLODED VIEW.....</b>	<b>3-2</b>
<b>TECHNICAL PARAMETER.....</b>	<b>3-4</b>
<b>SPECIAL TOOLS.....</b>	<b>3-5</b>
<b>ENGINE OIL FLOW CHART.....</b>	<b>3-6</b>
<b>OIL LEVEL CHECK.....</b>	<b>3-7</b>
CHECKING THE OIL LEVEL THROUGH THE OBSERVATION HOLE.....	3-7
<b>ENGINE ASSEMBLY REMOVAL.....</b>	<b>3-8</b>
<b>OIL PRESSURE.....</b>	<b>3-12</b>
MEASURE OIL PRESSURE.....	3-12
<b>OIL PUMPS.....</b>	<b>3-13</b>
REMOVING THE OIL FILTER ASSEMBLY.....	3-13
INSTALL THE OIL FILTER ASSEMBLY.....	3-13
DISASSEMBLE THE OIL PUMP ASSEMBLY.....	3-13
INSTALL THE OIL PUMP ASSEMBLY.....	3-13
<b>OIL COOLER ASSEMBLY.....</b>	<b>3-14</b>
REMOVE THE OIL COOLER ASSEMBLY.....	3-14
INSTALL THE OIL COOLER ASSEMBLY.....	3-14
<b>OIL FILTER.....</b>	<b>3-15</b>
REMOVING THE OIL FILTER.....	3-15
INSTALLATION OF OIL FILTER.....	3-15

## EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	BOLT M6×16	10	1.0	89 in·lb	
2	OIL SCREEN ASSEMBLY				
3	BOLT M6×25	10	1.0	89 in·lb	
4	OIL PUMP CHAIN				
5	OIL PUMP CHAIN GUARD				
6	OIL PUMP				
7	OIL COOLER				
8	BOLT M6×45	10	1.0	89 in·lb	
9	O-RING 19×2				

G: Apply grease for oil seal and O-ring.

L: Apply a non-permanent locking agent.

O: Apply gear oil(SAE 80W/90/GL-5).

## TECHNICAL PARAMETER

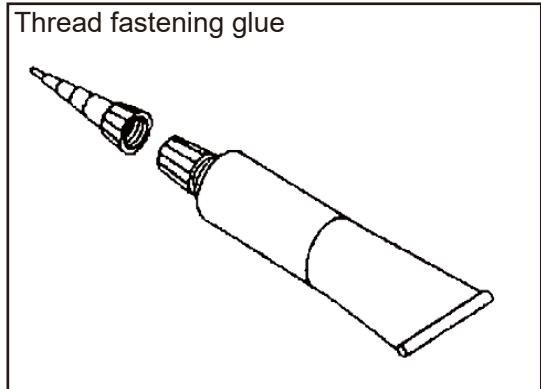
Item	Parameter
Engine Oil: Grade Viscosity Filling amount	API SN or higher 5W-40/SN or higher 2.5 L (First time, no residual oil in the engine) 2.2 L (Regular oil change)
Oil pressure measurement (working temperature):	More than 69 kPa (10psi) @1400r/min (rpm) More than 276 kPa (40 psi) @7000r/min (rpm)
Oil Pressure Sensor:	Always open, working pressure: 250±10kPa

**SPECIAL TOOLS**

Oil pressure gauge, 10 kgf/cm<sup>2</sup>



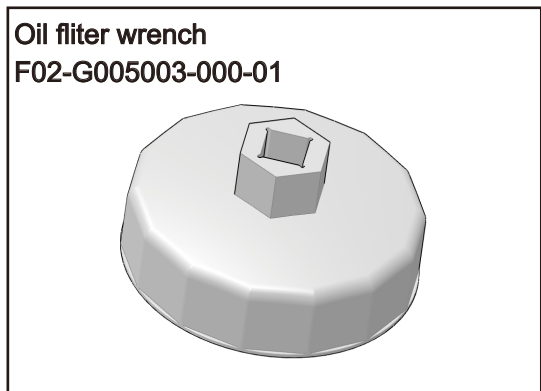
Thread fastening glue



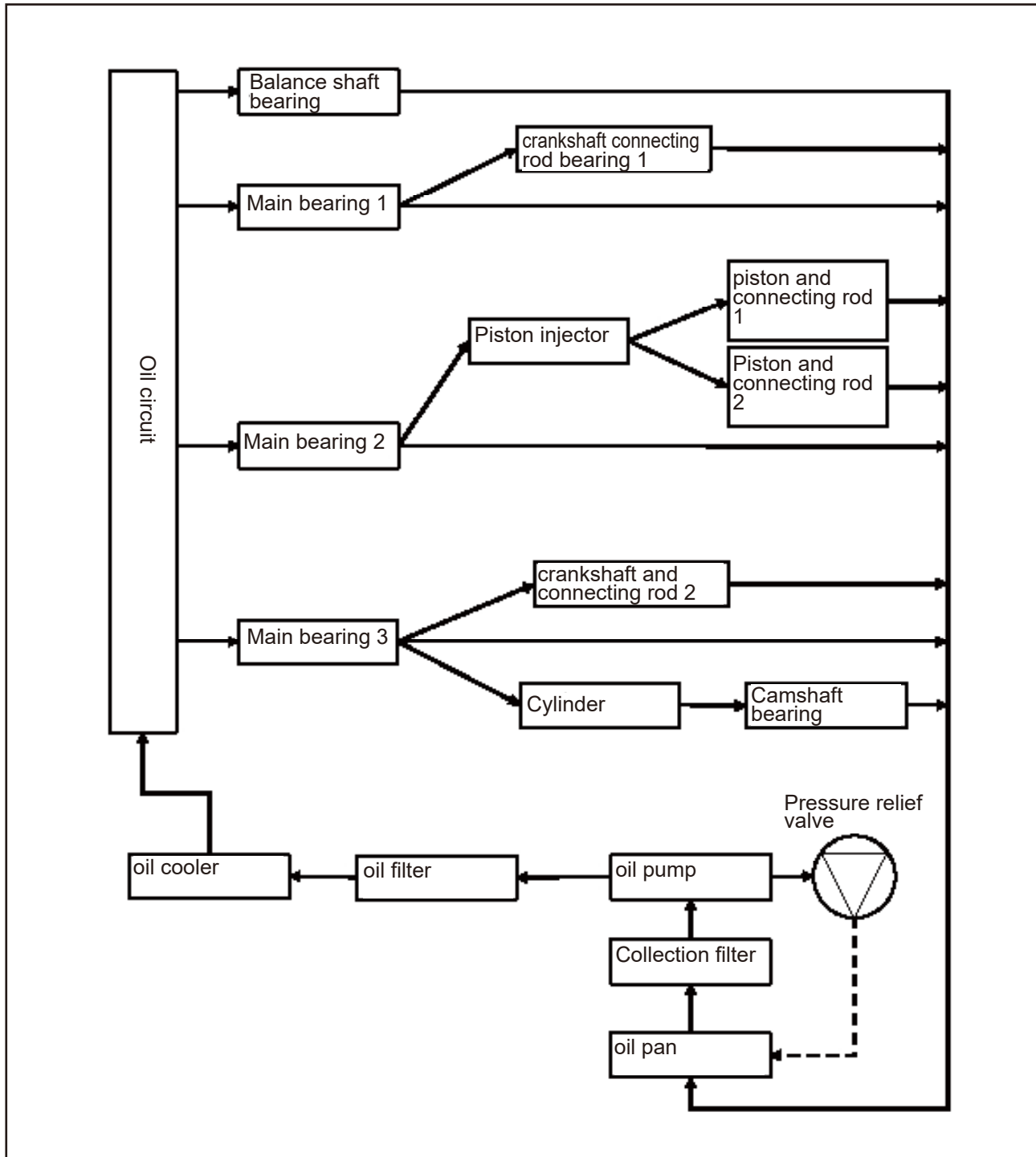
Oil pressure gauge connector



Oil filter wrench  
F02-G005003-000-01



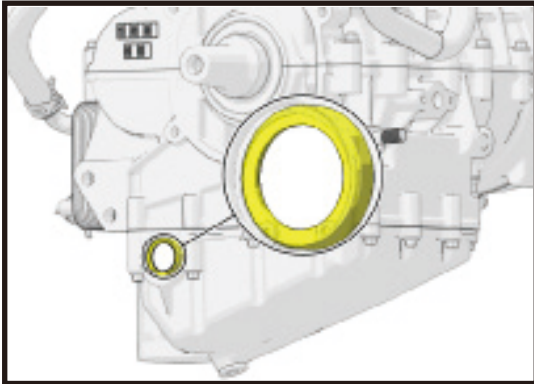
## ENGINE OIL FLOW CHART



## OIL LEVEL CHECK

**⚠ WARNING**

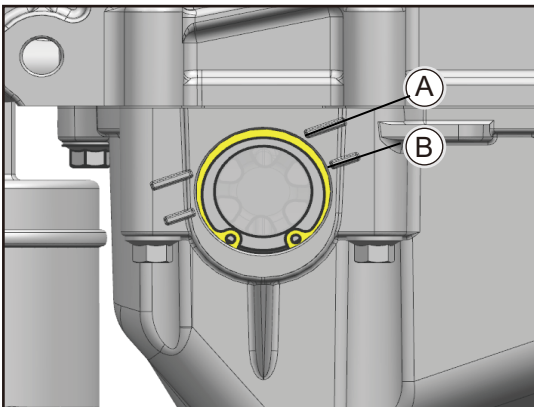
Operating the vehicle with insufficient, deteriorated or contaminated engine oil can result in engine or drivetrain stalling, malfunction and damage.

**CHECKING THE OIL LEVEL THROUGH THE OBSERVATION HOLE**

- ◆ Park the vehicle on a level surface so that it is level.
- ◆ If the oil has just been changed, start the engine and idle it for 5 minutes to fill the oil filter.

**⚠ CAUTION**

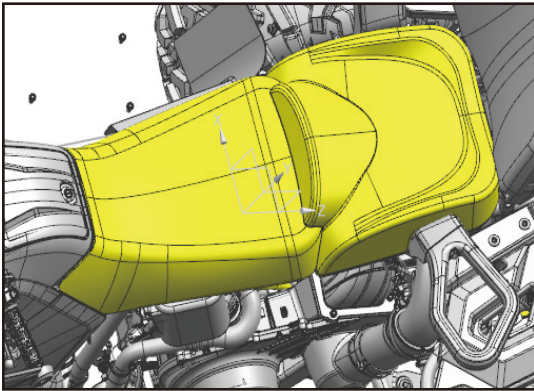
Let the engine idle for a few minutes so that the oil can reach all parts of the engine. Running the engine without oil can cause serious damage.



- ◆ Stop the engine and wait for 2 minutes for the oil in the oil circuit to return to the oil pan.
- ◆ Visualize the observation hole, the level should be between the highest point of the observation hole **【A】** and the middle point of the observation hole **【B】**.

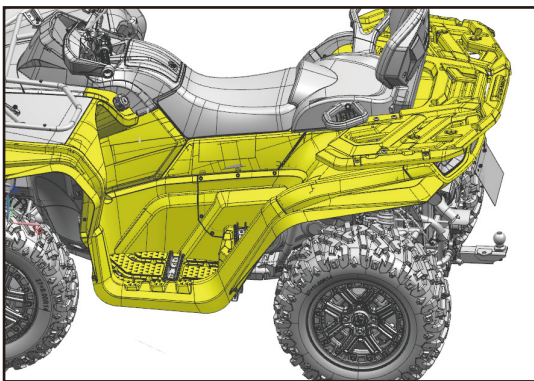
If the oil level is below the midpoint **【B】**, refill the oil through the filler neck. The specification of the refilled oil should be the same as the one originally used.

## ENGINE ASSEMBLY REMOVAL



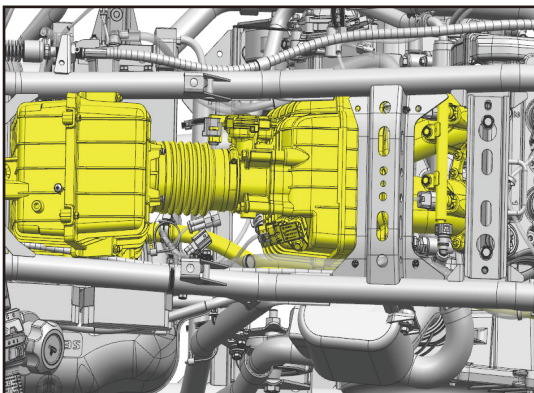
### Seat Removal

- ◆ Remove the air filter assembly. (See Chapter 13-Seat Removal)



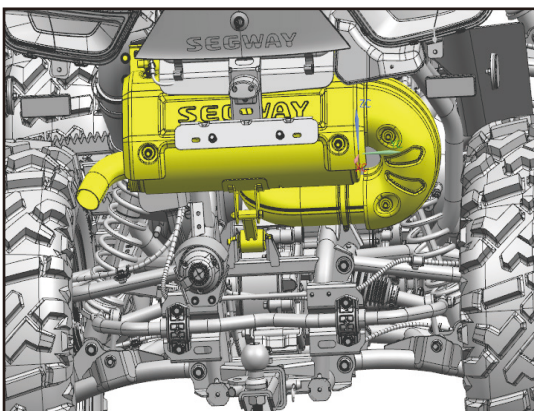
### Removal of plastic parts

- ◆ Remove the rear body plastic parts such as the rear cargo box. (See Chapter 13 for details)



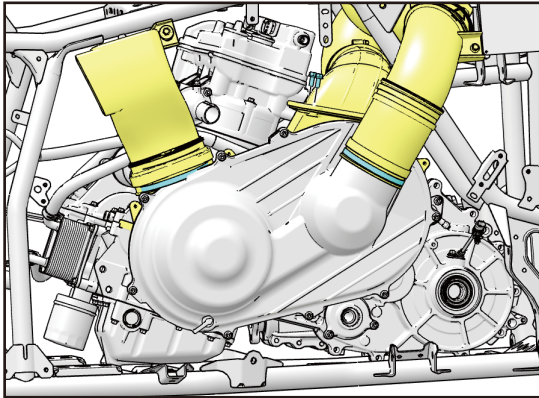
### Removal of air filter assembly

- ◆ Remove the air filter assembly. (See Chapter 7-Air Filter Removal)



### Removal of muffler assembly

- ◆ Remove the muffler assembly. (See Chapter 7-Muffler Removal)

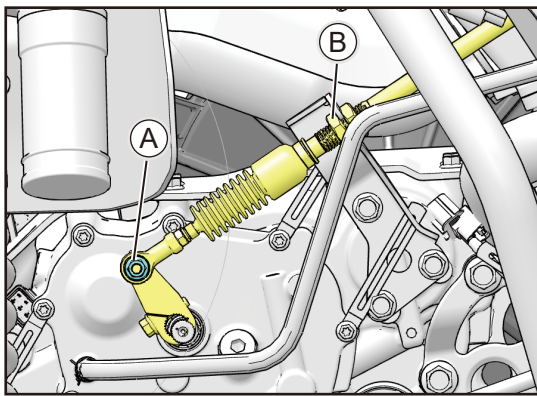


### Removal of CVT inlet and outlet ducts

- ◆ Loosen the hoop on the CVT inlet and outlet duct connected with the CVT.
- ◆ Remove the CVT air inlet pipeline and CVT air outlet pipeline.

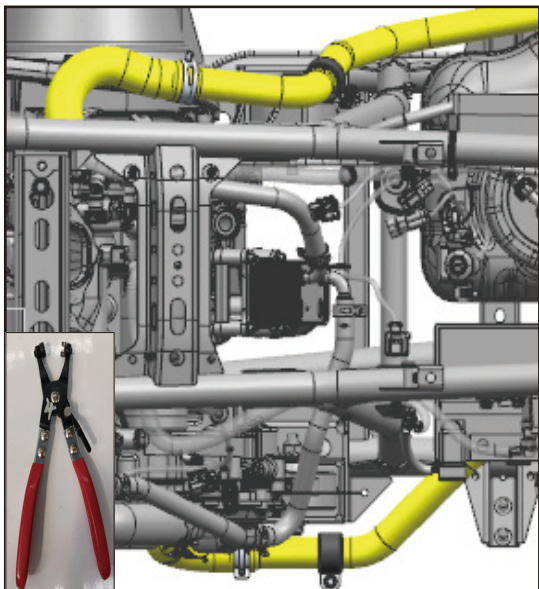
### **CAUTION**

After removing the CVT air duct, please effectively protect the CVT air inlet and outlet to prevent debris from falling into the engine and damaging the engine.



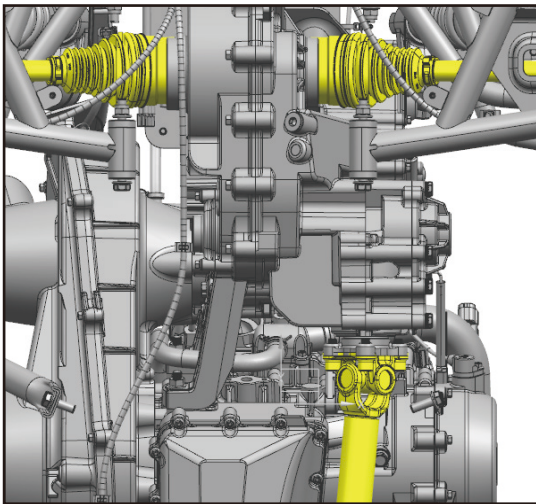
### Remove the shift lever

- ◆ Remove the nut M6 【A】 that fixes the shift part at the engine end】 .
- ◆ Loosen the shift adjusting nut 【B】 and remove the shift cable from the cable fixing bracket.



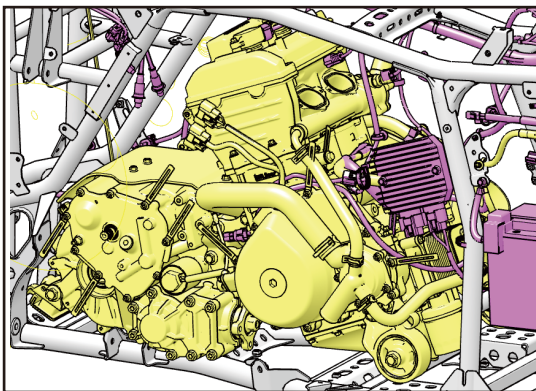
### Removal of cooling water inlet and outlet pipes

- ◆ Use water pipe clamp pliers, remove the clamp, remove the hose and drain the coolant.



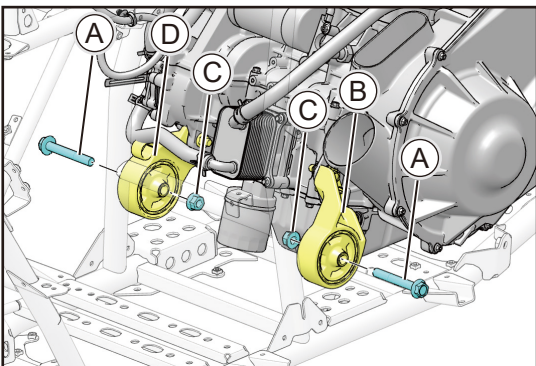
## Drive shaft removal

- ◆ Remove the rear section of the front drive shaft and the rear drive shaft. (See Chapter 8-Drive Shaft Removal)



## Engine Wire Harness Removal

- ◆ Unplug all wire harness connectors on the engine.

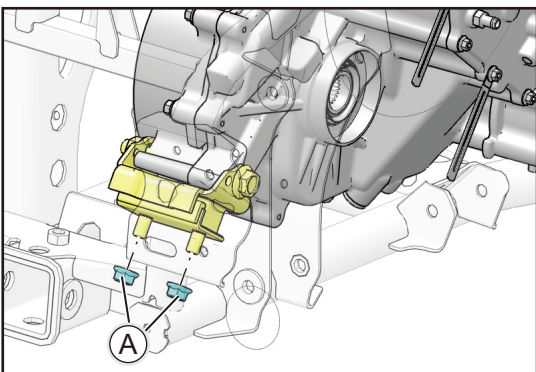


## Engine Front End Fix Removal

- ◆ Remove the hexagonal flange bolt M12 × 1.25 × 85 **【A】** and hexagonal flange lock nut M12 × 1.25 **【C】** fixed to the frame at the lower end of the front mount **【B】** **【D】** (left/right of the engine in turn) .

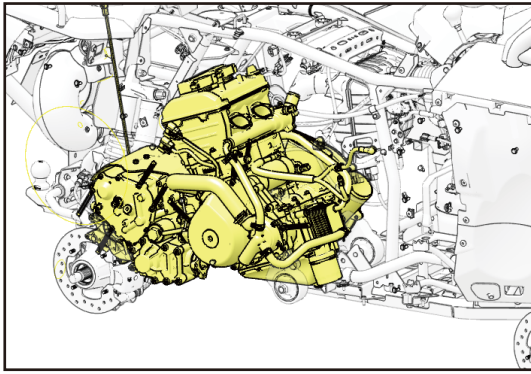
Hexagon flange bolt M12 × 1.25 × 85

108~127 N.m



## The rear end of the engine is fixed and removed

- ◆ Remove the 2 all-metal hexagonal flange lock nuts M10 × 1.25 fixed to the engine mount and the frame.



### Engine assembly removal

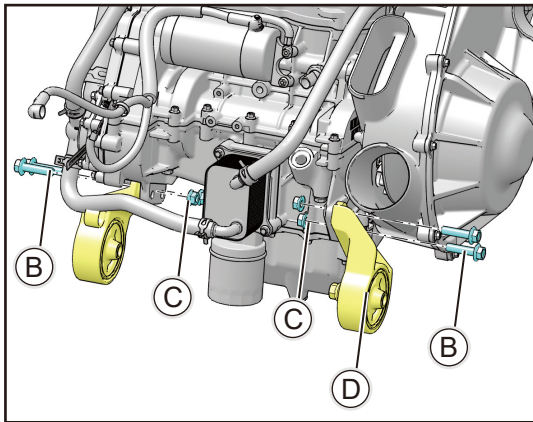
- ◆ Take out the engine assembly from the side of the vehicle.

#### ⚠ CAUTION

Due to the large volume and heavy weight of the engine, the removal space is limited, so the removal should be slow and the angle and position should be adjusted several times.

### Removal of front and rear suspension of engine assembly

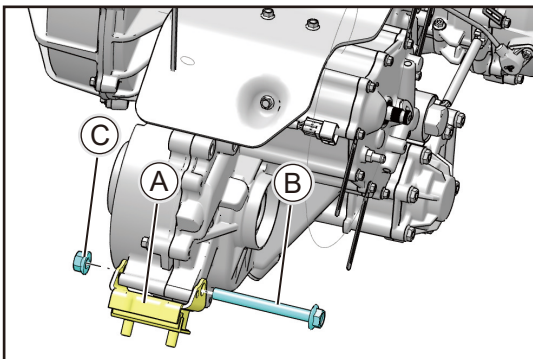
- ◆ Remove 4 hexagon flange bolts M10 × 1.25 × 40 and 4 hexagon flange lock nuts M10 × 1.25 of the front left suspension bracket and the front right left suspension bracket of the engine. Remove the front suspension of the engine.



Hexagon flange bolt M10 × 1.25 × 40

65~75 N. m

- ◆ Remove the mounting bolt (hexagon flange bolt M12 × 1.25 × 110) and nut (hexagon flange lock nut M12 × 1.25) of the engine rear suspension, and remove the engine rear suspension.



Hexagon flange bolt M12 × 1.25 × 110

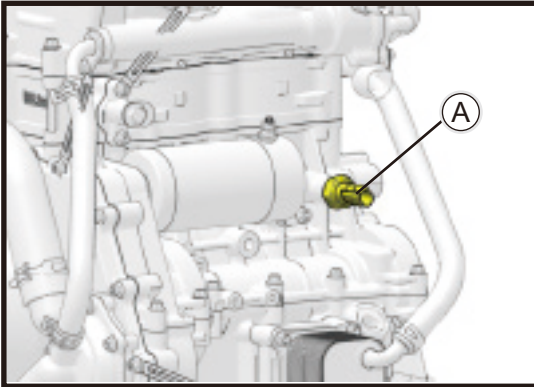
108~127 N. m

#### TIPS

The engine can be serviced by placing it on a solid and stable workbench.

- ◆ To install the engine, follow the reverse procedure.

## OIL PRESSURE



### MEASURE OIL PRESSURE

- ◆ Connect the oil pressure gauge connector 【C】 to the oil pressure gauge 【B】
- ◆ Clean the area around the oil pressure sensor 【A】 and remove the oil pressure sensor
- ◆ Connect the oil pressure gauge connector 【C】
- ◆ Start the engine, make the engine reach working temperature, observe the reading of the oil pressure gauge

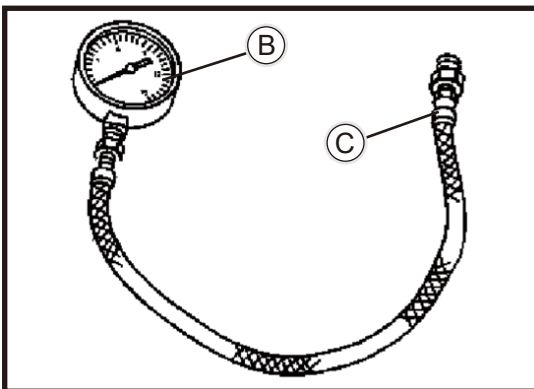
Special tools:

Oil pressure gauge, 10 kgf/cm<sup>2</sup> E01GZ0030001

Oil pressure gauge connector:E01GZ0031001

Oil pressure requirement (heat engine state)

More than 69 kPa (10 psi) @1400r/min (rpm)  
More than 276 kPa (40 psi) @7500r/min (rpm)



- ◆ Shutdown engine.
- ◆ Remove the oil pressure gauge and connector

### **⚠ WARNING**

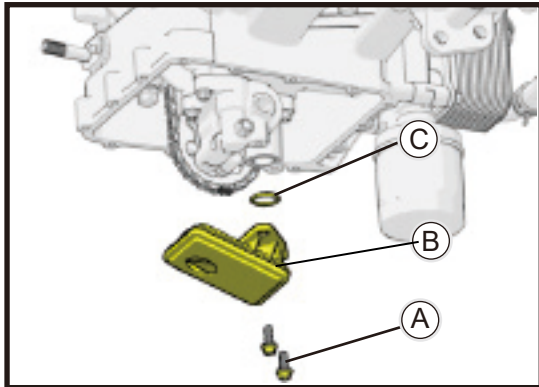
When disassembling the pressure gauge connector, pay attention to prevent the hot engine oil from being scalded. The hot engine oil will flow out through the oil passage.

- ◆ Install the oil pressure sensor and tighten it to the specified torque
- ◆ Tightening torque

Oil pressure sensor

15 N·m (1.5 kgf·m, 11 ft·lb)

## OIL PUMPS



## REMOVING THE OIL FILTER ASSEMBLY

- ◆ Disassembly:

【A】 Bolt M6×16

【B】 Oil filter assembly

【C】 O-ring 19×2

## INSTALL THE OIL FILTER ASSEMBLY

- ◆ Place 【C】 over the 【B】 pipe with the larger side of the outer ring in contact with the upper flange face of 【B】 .
- ◆ Apply appropriate amount of oil to the outer ring of 【C】 , align the position of the oil hole and press in 【B】 .
- ◆ Install the bolt 【A】 and tighten it according to the torque.
- ◆ Tightening torque

Bolt 【A】

10 N•m (1.0 kgf•m, 89 in•lb)

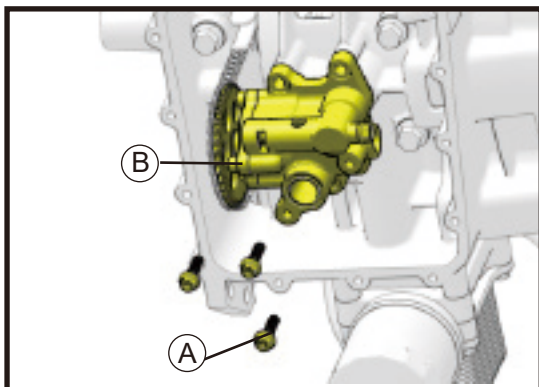
## DISASSEMBLE THE OIL PUMP ASSEMBLY

- ◆ Removal:

【A】 Bolt M6×25

【B】 Oil pump assembly

- ◆ Remove the bolt 【A】 , turn 【B】 at an appropriate angle, and take it out after disengaging the chain.



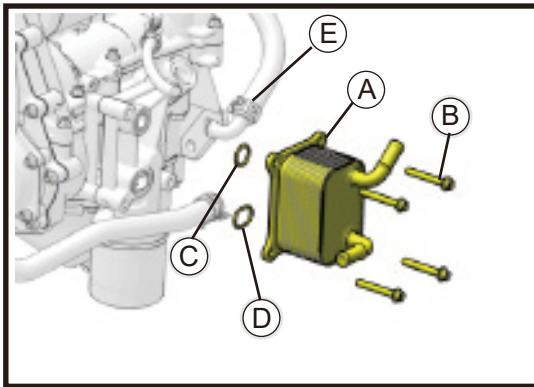
## INSTALL THE OIL PUMP ASSEMBLY

- ◆ Turn the oil pump 【B】 sprocket at an appropriate angle, the sprocket engages with the chain, and the oil pump end is aligned with the locating pin.
- ◆ Install the bolt 【A】 and tighten it according to the torque.
- ◆ Tightening torque

Bolt 【A】

10 N•m (1.0 kgf•m, 89 in•lb)

## OIL COOLER ASSEMBLY



### REMOVE THE OIL COOLER ASSEMBLY

- ◆ Drain engine coolant and oil.
- ◆ Disassembly
- 【A】 Oil Cooler Assembly
- 【B】 Bolt M6 × 40
- 【C】 Machine Cooler Seal Ring
- 【D】 O-ring 17 × 2
- 【E】 Steel Belt Elastic Hose Clamp × 2

### INSTALL THE OIL COOLER ASSEMBLY

- ◆ Use a new O-ring 【C】 【D】 and press it into the seal groove.
- ◆ Align the oil cooler bolt holes and screw in the bolts 【B】 .
- ◆ Tightening torque

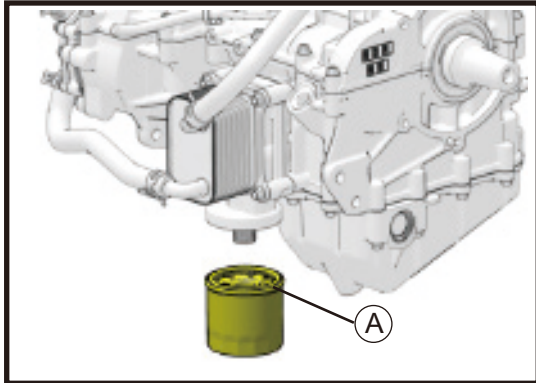
Bolt 【B】 【C】
10 N•m (1.0 kgf•m, 89 in•lb)

- ◆ Replenish engine coolant and oil

### **⚠ CAUTION**

When installing, it is necessary to check that the O-ring is intact and not twisted. If the O-ring is damaged, it will cause oil leakage, which may result in abnormal wear or even damage to internal engine parts. If necessary, replace the O-ring with a new one.

## OIL FILTER



### REMOVING THE OIL FILTER

- ◆ Drain engine coolant and oil.
- ◆ Disassembly

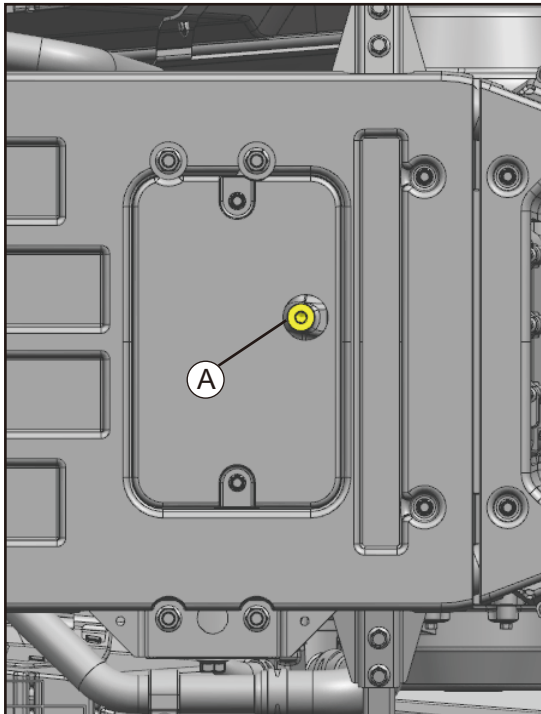
Use the filter wrench to remove the **【A】** oil filter.

### INSTALLATION OF OIL FILTER

- ◆ Use a new oil filter **【A】** , apply oil to the oil filter seal before installation, and tighten with a filter wrench.
- ◆ Tightening torque

Oil filter **【A】** tightening torque

25 N•m (2.55kgf•m, 222 in•lb)



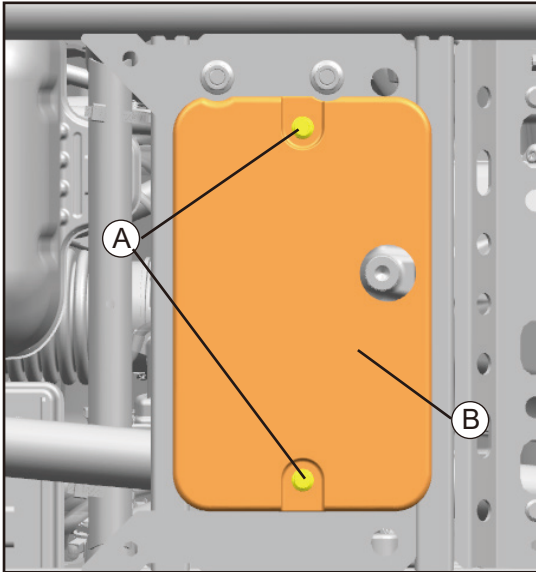
### Engine Oil Draining Procedure

- ◆ Remove the M14 plug assembly **【A】** to drain the engine oil.
- ◆ Installation
- ◆ Install the M14 plug assembly **【A】** and tighten it with a wrench.
- ◆ Tightening Torque

M14 plug assembly **【A】**

18 N•m (1.8 kgf•m, 159 in•lb)

## Remove the maintenance cover of the bottom protection plate

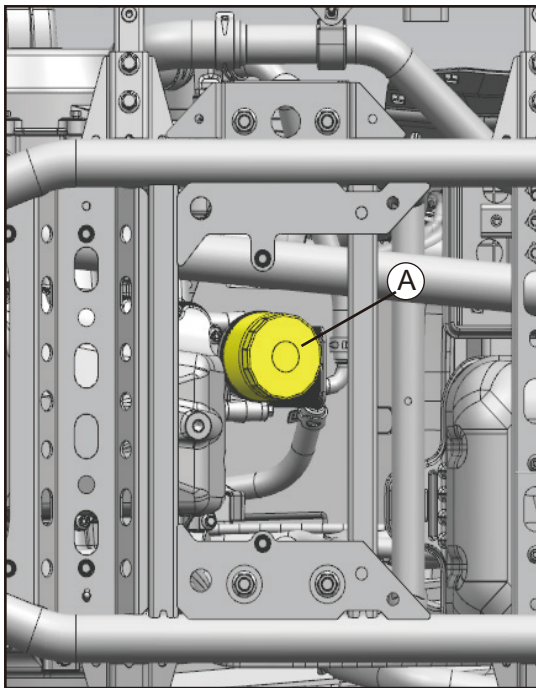


- ◆ Remove the 2 bolts 【A】 on the maintenance cover of the bottom protection plate 【B】
- ◆ Remove the maintenance cover of the bottom protection plate 【B】

## Install the maintenance cover of the bottom protection plate

- ◆ Align the maintenance cover of the bottom protection plate 【B】 bolt hole, screw in the bolt 【A】
- ◆ Tightening torque

Bolt 【A】
10 N•m (1.0 kgf•m, 89 in•lb)



## Removing oil filter assembly

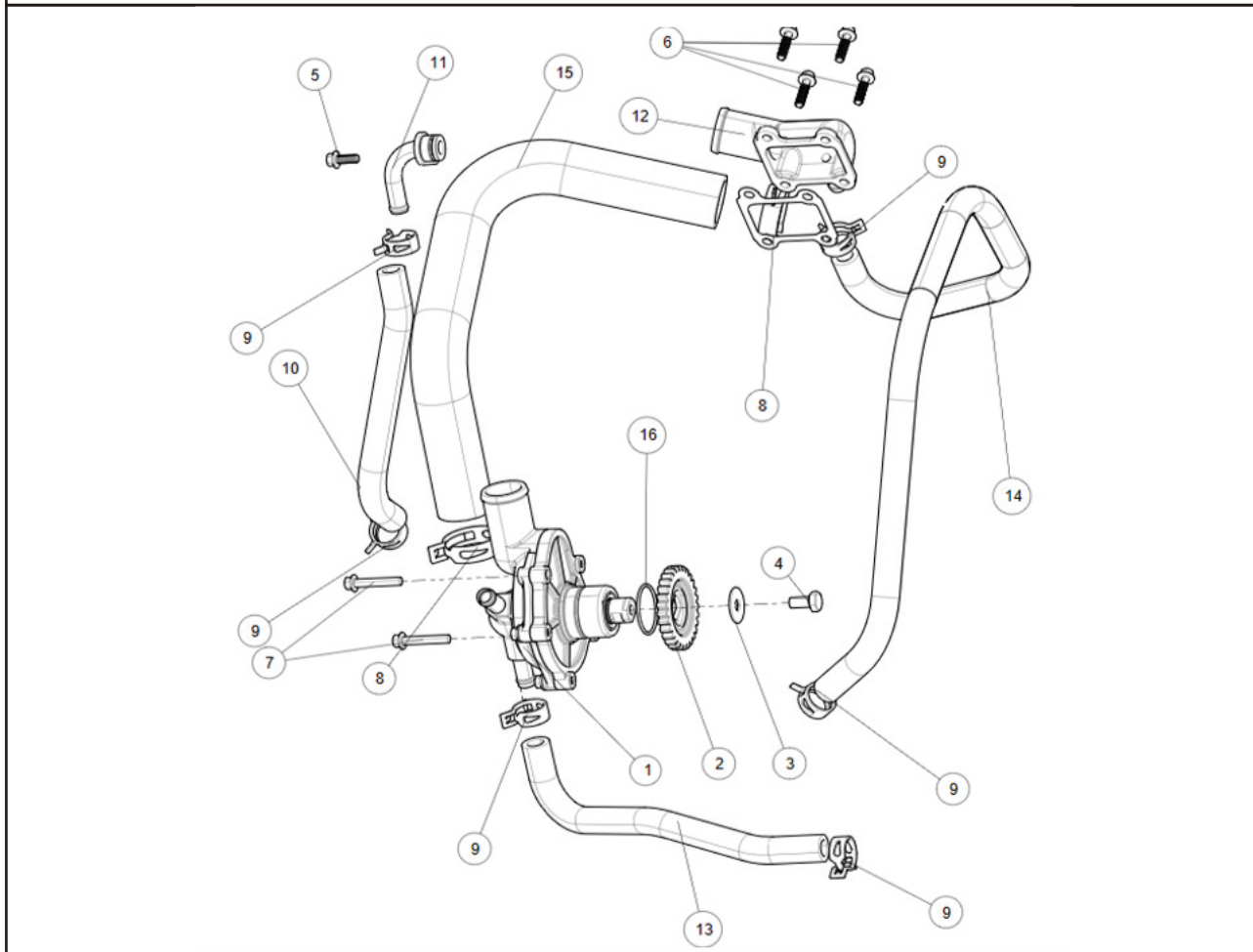
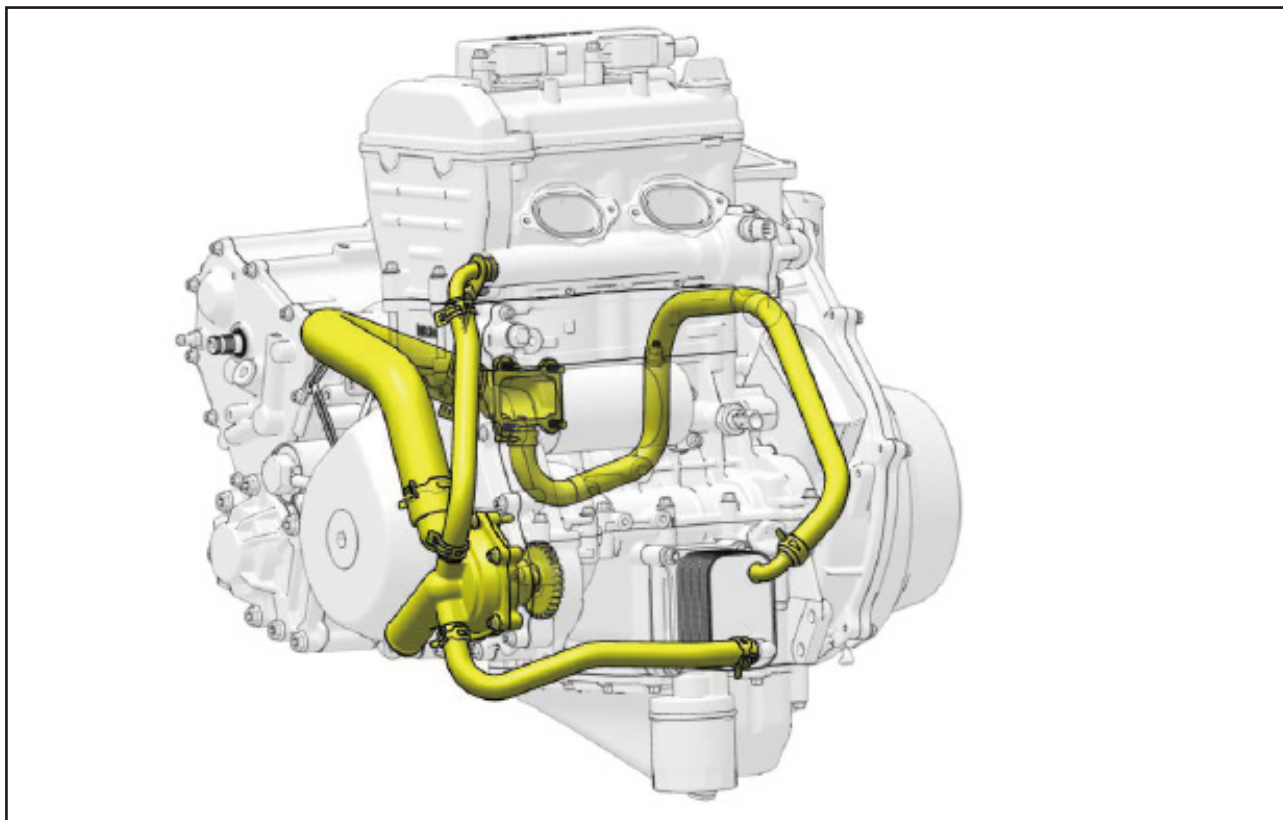
- ◆ Drain the Engine Oil
- ◆ Use an oil filter wrench to remove the oil filter 【A】 .
- ◆ Install the Oil Filter
- ◆ Use a new oil filter 【A】 . Before installation, apply engine oil to the filter's sealing ring, then tighten the filter with an oil filter wrench.
- ◆ Tightening Torque

Oil filter 【A】
20 N•m (2.0 kgf•m, 177 in•lb)

# WATER PUMP ASSEMBLY

**EXPLODED VIEW..... 3-18**  
**WATER PUMP ASSEMBLY ..... 3-20**  
    REMOVE WATER PUMP ASSEMBLY ..... 3-20

## EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	WATER PUMP				
2	WATER PUMP GEAR				
3	SHIM 8.5×26×1.5				
4	BOLT M8×16	35	3.5	26	
5	BOLT M6×16	10	1.0	89 in·lb	
6	BOLT M6×25	10	1.0	89 in·lb	
7	BOLT M6×35	10	1.0	89 in·lb	
8	CLAMP 38				
9	HOSE CLAMP 21				
10	CIRCULATING WATER PIPE				
11	WATER OUTLET CONNECTION				
12	INLET PIPE	10	1.0	89 in·lb	
13	OIL COOLER OUTLET PIPE				
14	OIL COOLER INLET PIPE				
15	OUTLET PIPE				
16	O RING 15.6X1.78				

G: Use grease suitable for oil seals and O-rings

L: Use fastening agent.

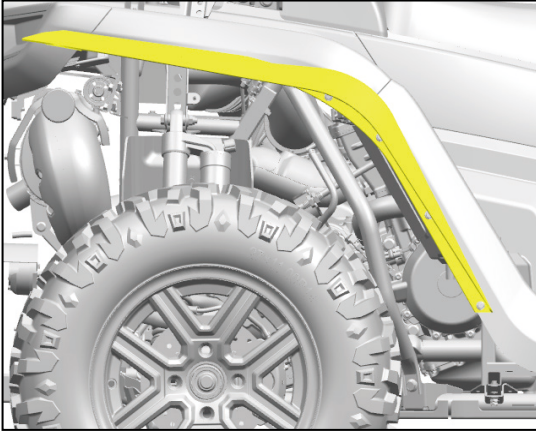
O: Apply oil.

## WATER PUMP ASSEMBLY

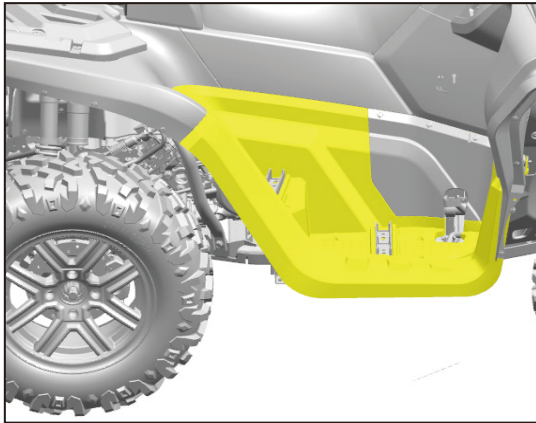
### REMOVE WATER PUMP ASSEMBLY

**⚠ WARNING**

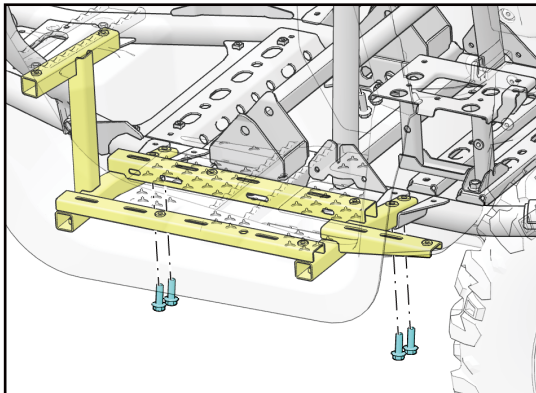
Make sure the engine has cooled down before removal. High temperature coolant and steam can cause serious injury.



- ◆ Remove the rear right widened fender. (See Chapter 13-Seat Removal)



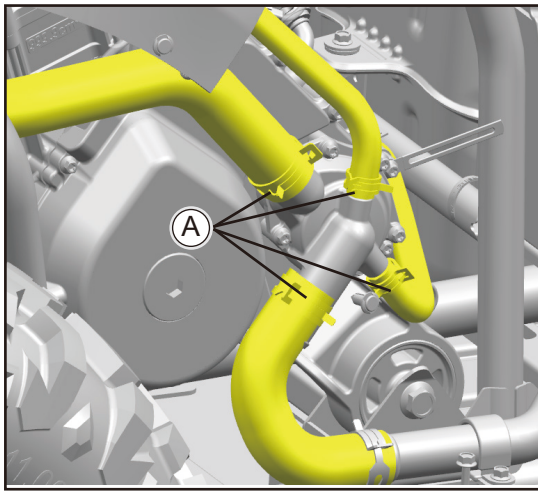
- ◆ Remove the right foot pedal. (See Chapter 13-Removal of Right Foot Pedal for details)



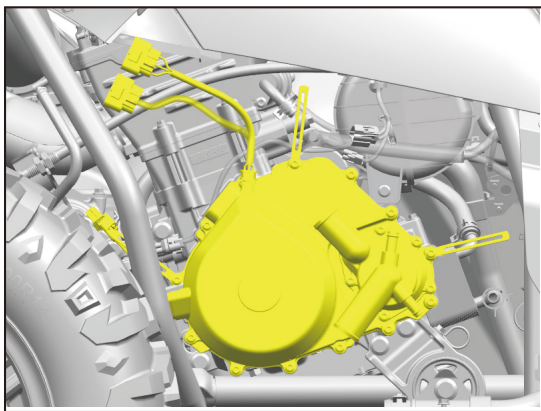
- ◆ Remove the welding assembly of the right foot pedal bracket. (See relevant section for details)

Bolt M8×25

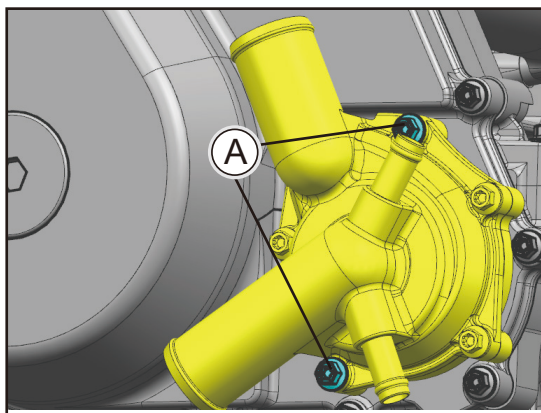
35 N.m



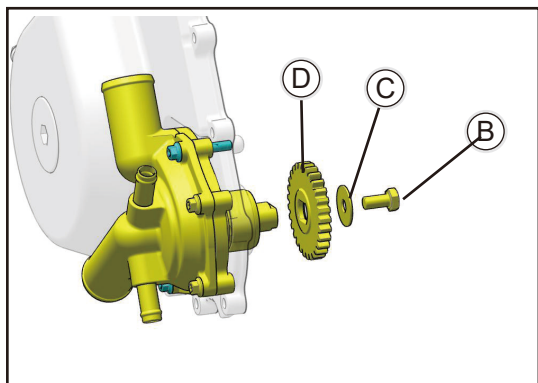
- ◆ Remove the 4 clamps **【A】** , then take off the major and minor circulation hoses.



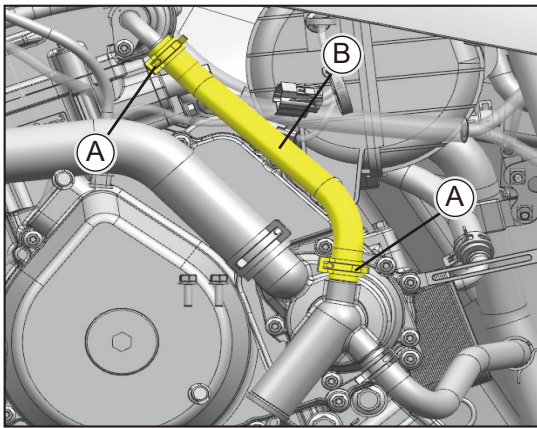
- ◆ Remove the left crankcase cover subassembly. (See relevant section for details)



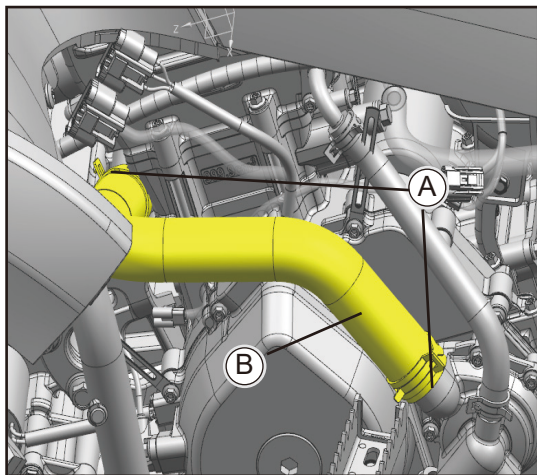
- ◆ Remove the bolt **【A】** ×2



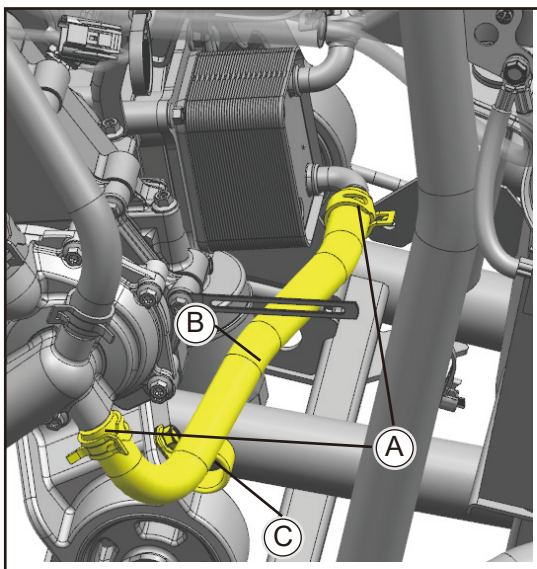
- ◆ Remove the bolt **【B】** , remove the gasket **【C】** and pump gear **【D】** in turn ] .
- ◆ Install the water pump assembly, please follow the reverse procedure.



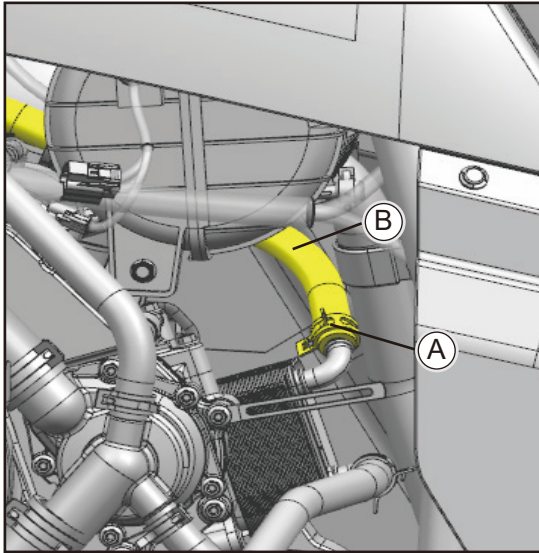
- ◆ Remove the two clamps 【A】 , and remove the small circulating water pipe 【B】 .
- ◆ Install the small circulating water pipe 【B】 , please follow the reverse procedure.



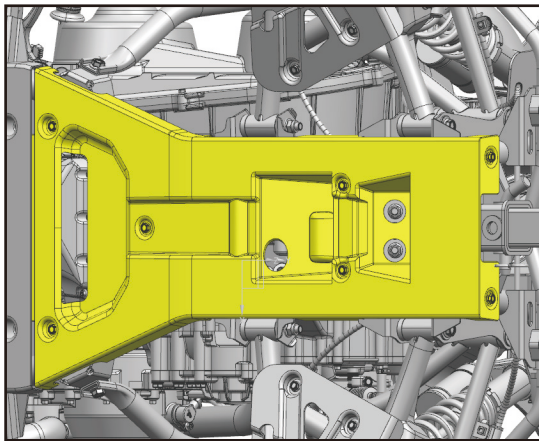
- ◆ Remove the two clamps 【A】 , and remove the water outlet pipe 【B】 .
- ◆ Install the outlet pipe 【B】 , please follow the reverse procedure.



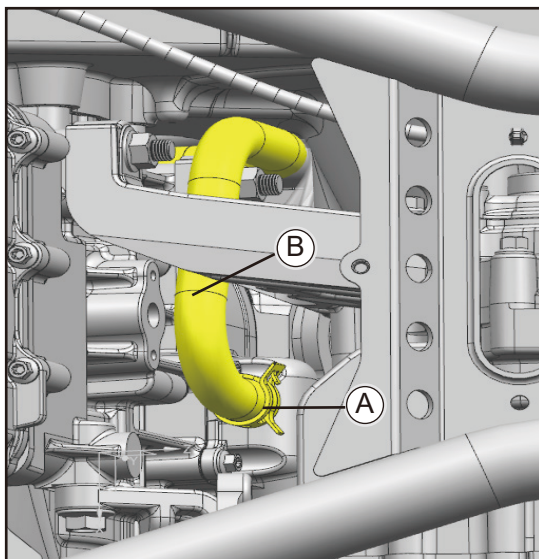
- ◆ Remove the water pipe clamp 【C】 , two clamps 【A】 and the oil cooler water outlet pipe 【B】 .
- ◆ Install the oil cooler outlet pipe 【B】 , please follow the reverse procedure.



- ◆ Remove the 4 clamps **【A】** , then take off the major and minor circulation hoses.



- ◆ Before the other end of the oil cooler water outlet pipe **【B】** , the rear bottom guard plate needs to be removed first. (See relevant section for details)

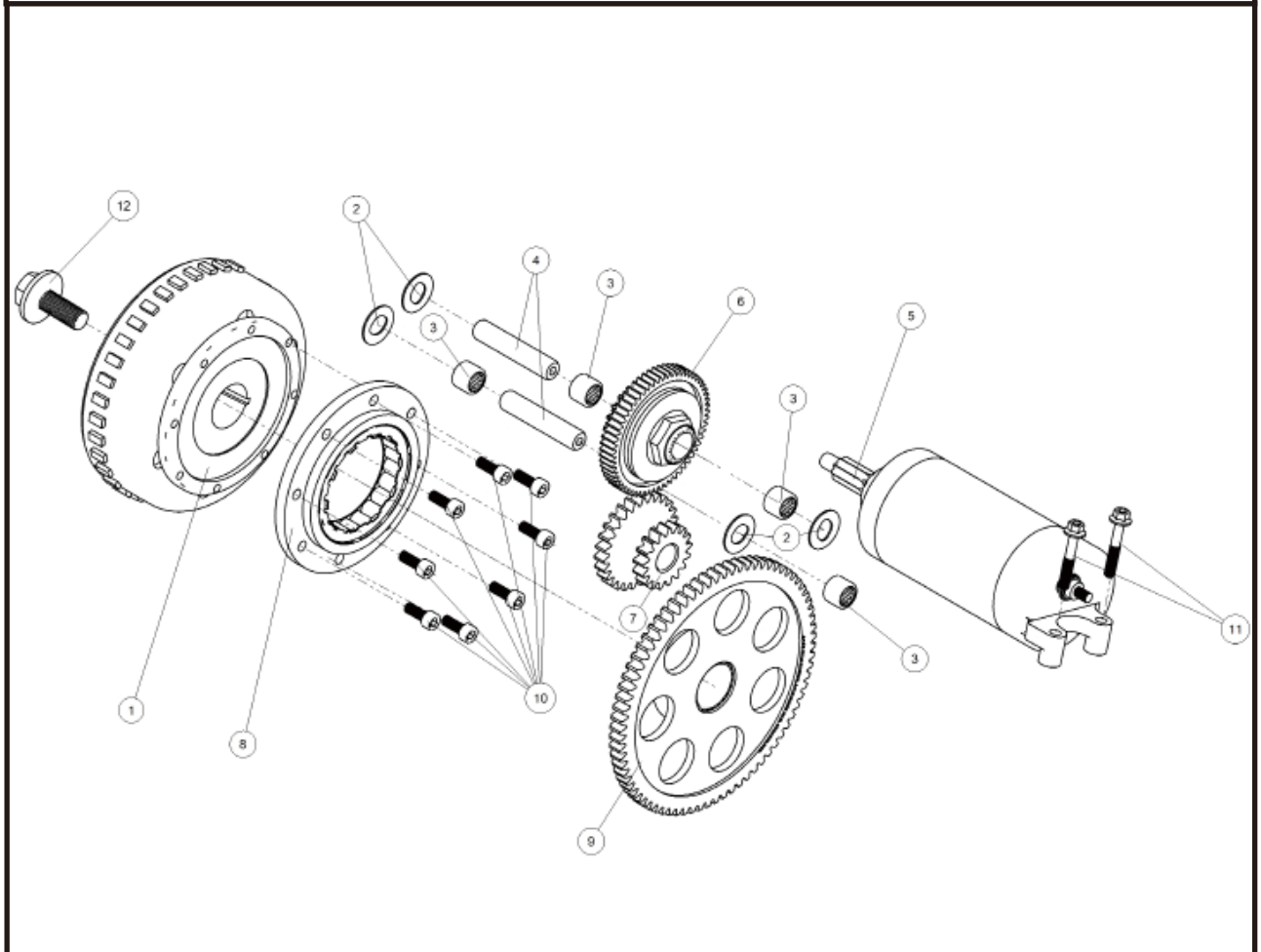
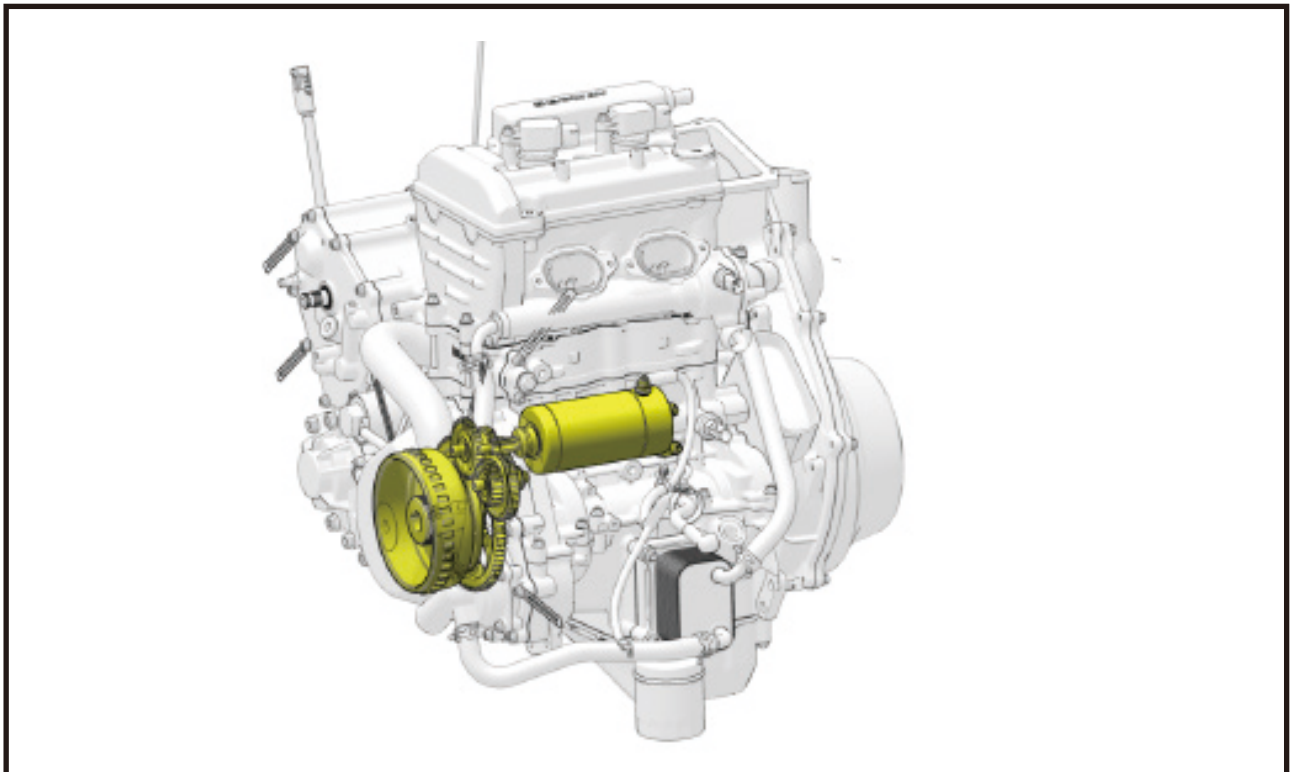


- ◆ Remove the 1 clamp **【A】** , then take off the other end of the oil cooler outlet hose **【B】** .
- ◆ To install the oil cooler outlet hose **【B】** , follow the reverse procedure.

## STARTING SYSTEM

<b>EXPLODED VIEW.....</b>	<b>3-25</b>
<b>SPECIAL TOOLS.....</b>	<b>3-27</b>
<b>STARTING SYSTEM.....</b>	<b>3-28</b>
REMOVE THE STARTER MOTOR.....	3-30
INSTALL THE STARTER MOTOR .....	3-30
<b>ALTERNATOR ROTOR.....</b>	<b>3-31</b>
DISASSEMBLE THE STARTING OVERLOAD PROTECTOR AND THE DOUBLE GEAR ASSEMBLY ...	3-33
INSTALL STARTING OVERLOAD PROTECTOR AND DOUBLE GEAR ASSEMBLY .....	3-33
DISASSEMBLE THE MAGNETO ROTOR.....	3-34
INSTALL THE MAGNETO ROTOR.....	3-34
CHECK THE STARTING OVERRUNNING CLUTCH .....	3-34
DISASSEMBLE THE STARTING OVERRUNNING CLUTCH .....	3-35
INSTALL THE STARTING OVERRUNNING CLUTCH.....	3-35

EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	MAGNETO ROTOR ASSEMBLY(680W)				
2	FLAT WASHER 12×24×1				
3	NEEDLE ROLLER BEARING HK121612				
4	DOUBLE GEAR SHAFT				
5	STARTER MOTOR				
6	ACTIVATE OVERLOAD PROTECTOR				
7	STARTING DOUBLE GEAR				
8	STARTING OVERRUNNING CLUTCH ASSEMBLY				
9	STARTING DRIVEN GEAR ASSEMBLY				
10	BOLT M6×16	10	1.0	89 in·lb	L
11	BOLT M6×35	10	1.0	89 in·lb	
12	BOLT M12×1.25×30	150	15.3	111	

G: Use grease suitable for oil seals and O-rings

L: Use fastening agent.

O: Apply oil.

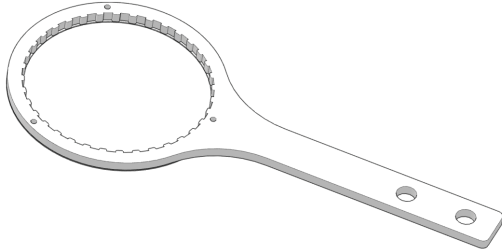
SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

SPECIAL TOOLS

Flywheel anti-rotation wrench  
E02J23002001



Magneto rotor puller  
E01GZ0010001



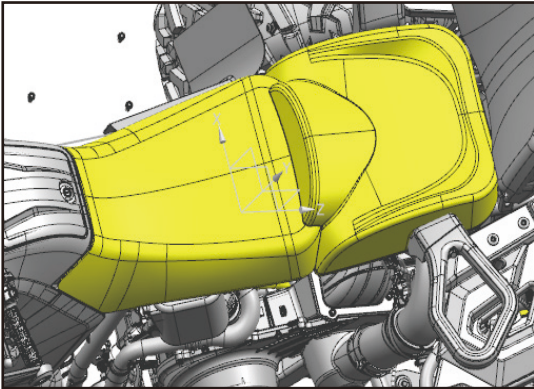
## STARTING SYSTEM

### **⚠ WARNING**

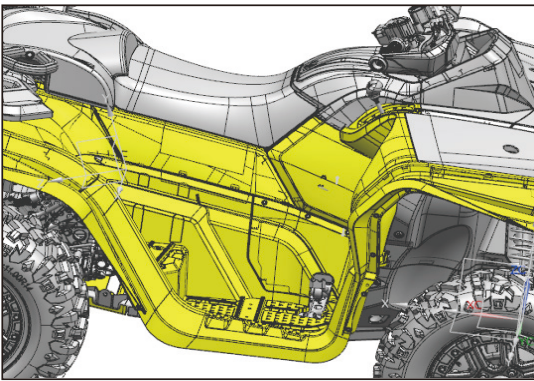
Make sure the engine has cooled down before removal. High temperature coolant and steam can cause serious injury.

Do these steps before servicing the engine starting system:

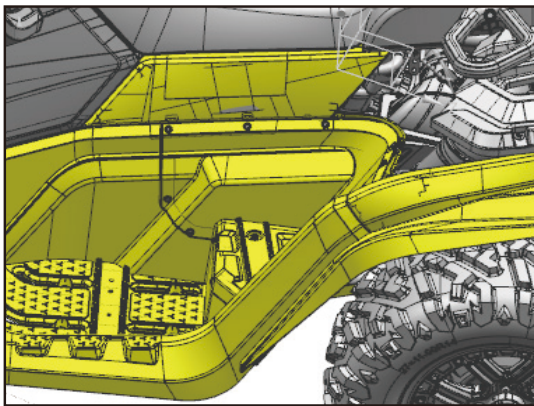
- ◆ Remove the seat parts. (See Chapter 13 for details)



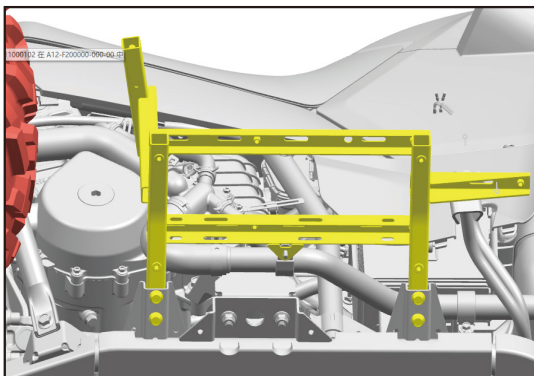
- ◆ Remove the right plastic cover. (See Chapter 13 for details)

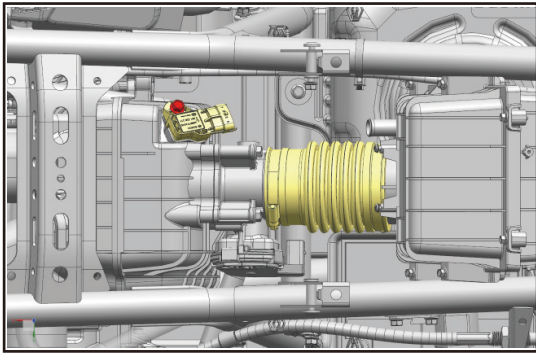


- ◆ Remove the left plastic cover. (See Chapter 13 for details)

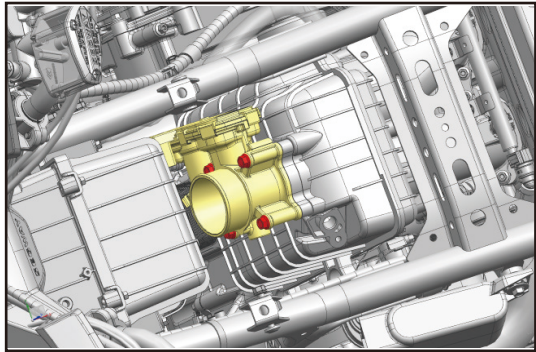


- ◆ Remove the right footrest bracket weld assembly. (See Chapter 13 for details)

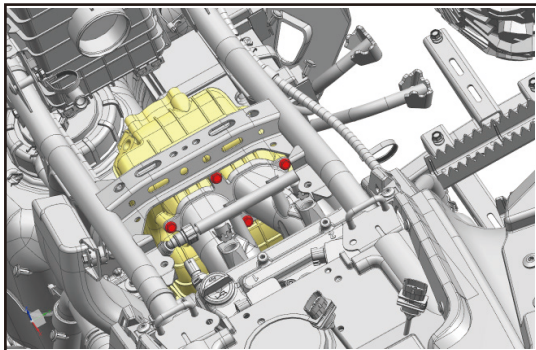




- ◆ Remove the intake pipe of the pressure stabilizing chamber. (See chapter 7-removal of surge chamber for details)

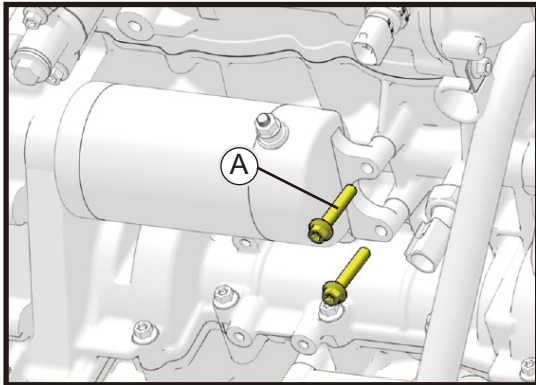


- ◆ Remove the 1000 electronic throttle body assembly. (See chapter 7-removal of surge chamber for details)

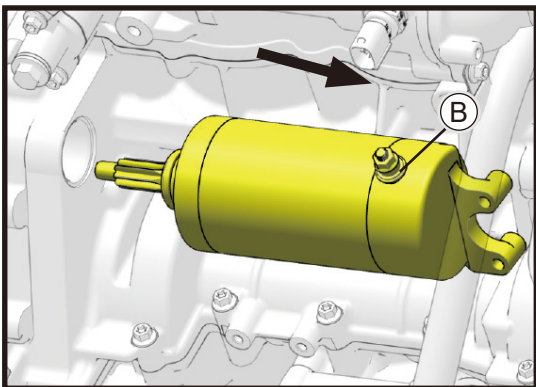


- ◆ Remove the pressure stabilizing chamber. (See chapter 7-removal of surge chamber for details)

## REMOVE THE STARTER MOTOR

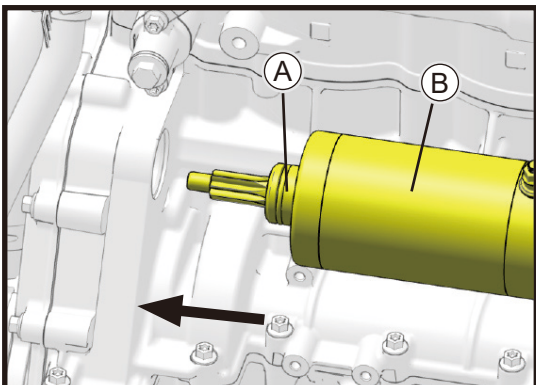


- ◆ Disconnect the connecting wire harness on the starter motor and remove the two bolts 【A】



- ◆ Pull out the starter motor 【B】 and remove the starter motor

## INSTALL THE STARTER MOTOR

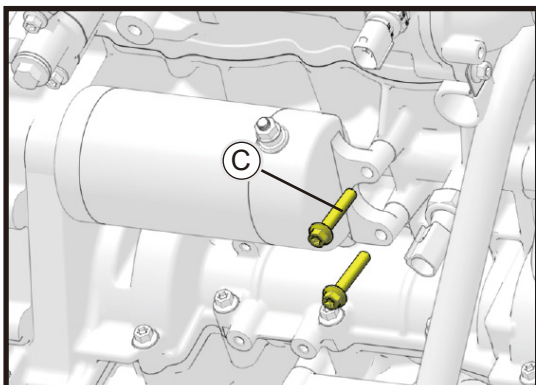


- ◆ Check whether the O-ring 【A】 at the gear end of the starter motor is intact, and apply a proper amount of engine oil on the surface of the O-ring
- ◆ Align the starter motor 【B】 with the mounting hole and insert

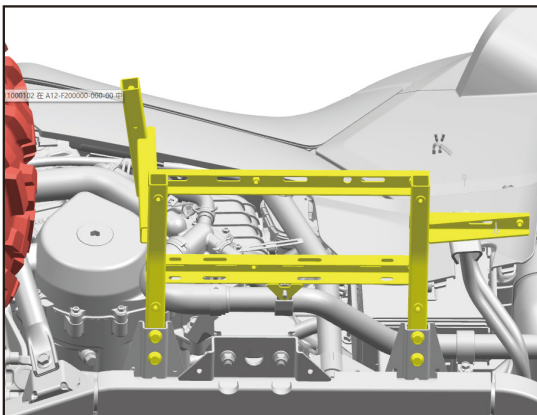
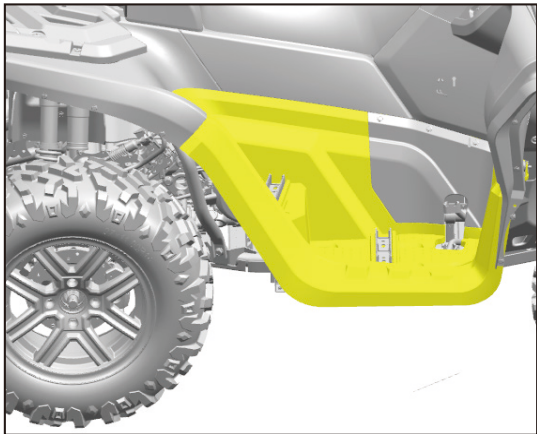
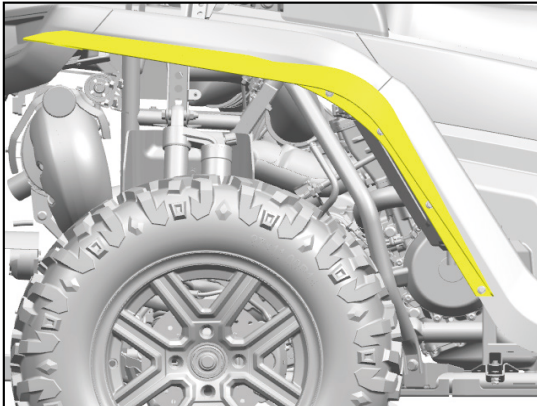
- ◆ Screw in two bolts 【C】 to fix the starter motor

Bolt 【C】

10 N·m (1.0 kgf·m, 89 in·lb)

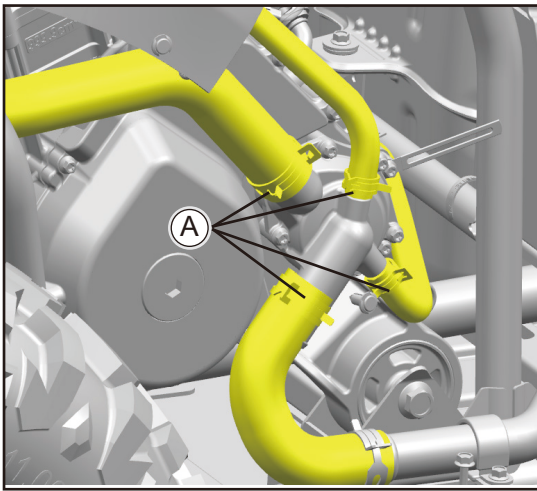


## ALTERNATOR ROTOR

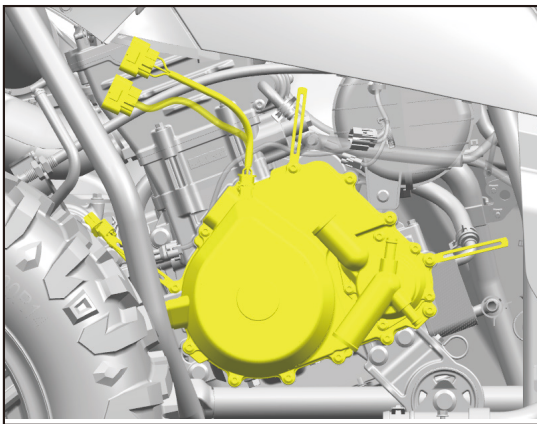
**⚠ WARNING**

Make sure the engine has cooled down before removal. High temperature coolant and steam can cause serious injury.

- ◆ Perform the following steps before servicing the engine magneto rotor assembly: :
- ◆ Widen the right fender after dropping. (See relevant section for details)
  
- ◆ Remove the right foot pedal. (See relevant chapter for details)
  
- ◆ Remove the welding assembly of the right foot pedal bracket. (See relevant section for details)



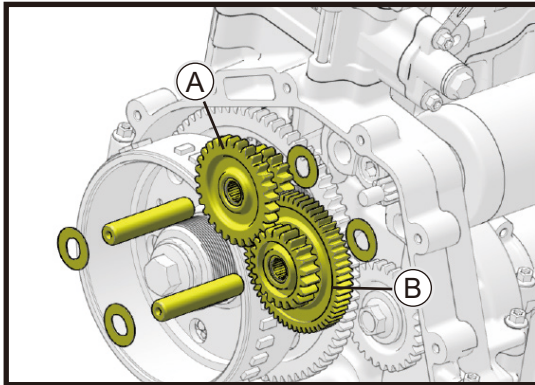
- ◆ Remove the 4 clamps 【A】 , then take off the major and minor circulation hoses. (Refer to the relevant section for details.)



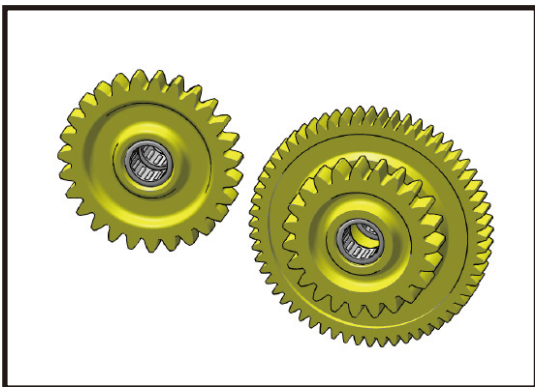
- ◆ Remove the left crankcase cover subassembly. (See relevant section for details)

- ◆ Installation, please follow the reverse procedure.

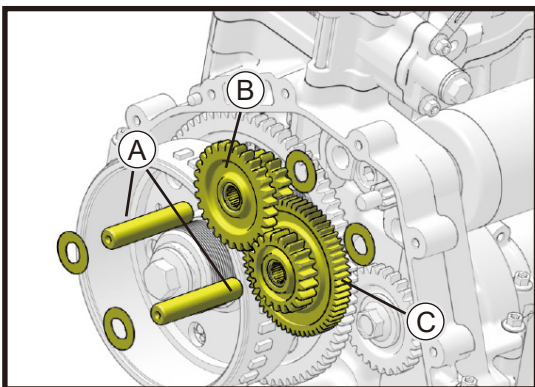
### DISASSEMBLE THE STARTING OVERLOAD PROTECTOR AND THE DOUBLE GEAR ASSEMBLY



- ◆ Remove the gasket and gear shaft, take out the double gear assembly 【A】 and the starting overload protector 【B】



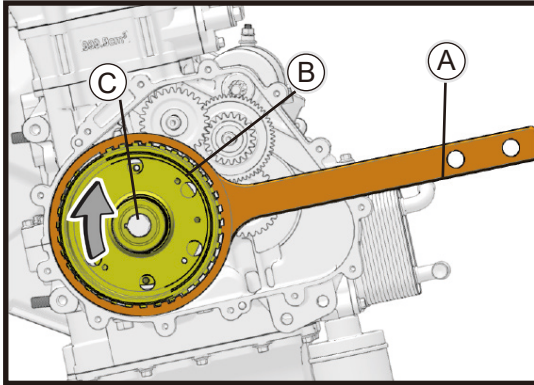
- ◆ Check whether the gear is damaged, check the clearance of the gear shaft hole, if the clearance is too large, you need to replace the gear assembly



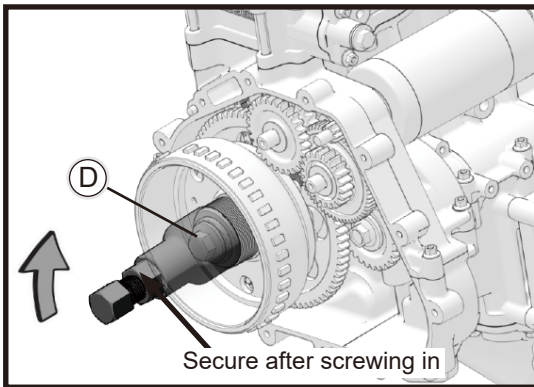
### INSTALL STARTING OVERLOAD PROTECTOR AND DOUBLE GEAR ASSEMBLY

- ◆ Install the gear shaft 【A】 into the starting double gear assembly 【B】 and the starting overload protector 【C】 , and install shims at both ends
- ◆ After meshing the large gear of 【B】 with the small gear of 【C】 , install it into the upper crankcase

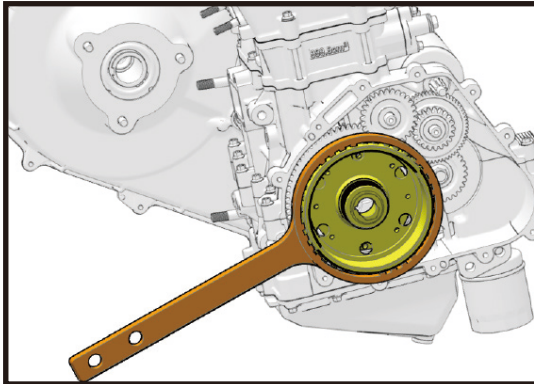
### DISASSEMBLE THE MAGNETO ROTOR



- ◆ Remove the left crankcase cover sub-assembly (see the chapter on crankcase assembly)
- ◆ Use the magneto rotor anti-rotation wrench **【A】** to fix the magneto rotor **【B】**, and at the same time turn the wrench clockwise to remove the bolt **【C】**



- ◆ Screw the magneto rotor puller **【D】** into the thread of the magneto rotor, fix the puller disc with a wrench, turn the puller rod with another wrench, and remove the magneto rotor

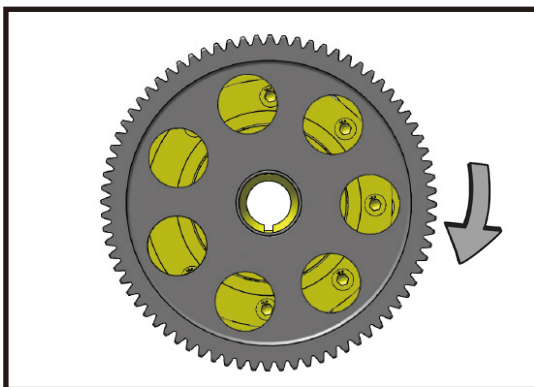


### INSTALL THE MAGNETO ROTOR

- ◆ Remove impurities and oil on the crankshaft installation cone and the matching cone of the magneto rotor
- ◆ Combine the magneto rotor and the overrunning clutch and align it with the crankshaft.
- ◆ Use special tools to fix the magneto rotor and tighten the mounting bolts

Bolt

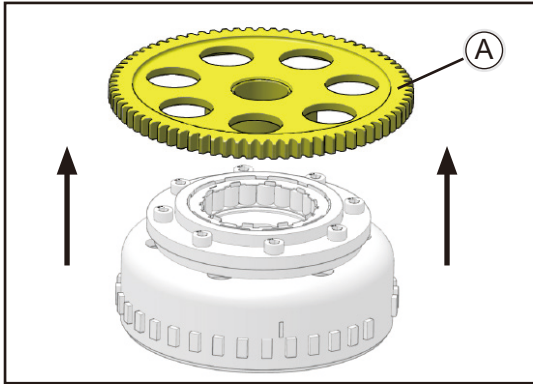
155 N•m (15.8 kgf•m, 1372 in•lb)



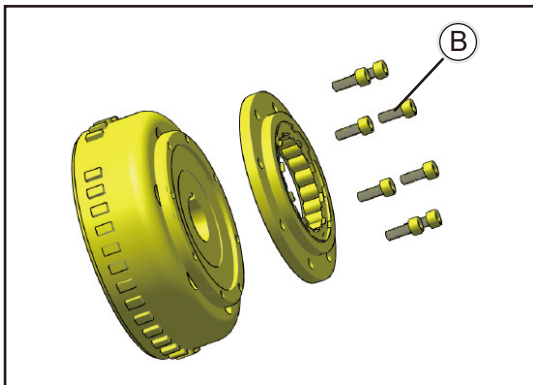
### CHECK THE STARTING OVERRUNNING CLUTCH

- ◆ Place the magneto rotor and the overrunning clutch on the worktable, and place the magneto rotor and overrunning clutch on the worktable on the gear surface, with the gear side facing up, and rotating the gear clockwise should rotate freely
- ◆ Rotate the gear counterclockwise, the gear should be locked in place immediately without slipping

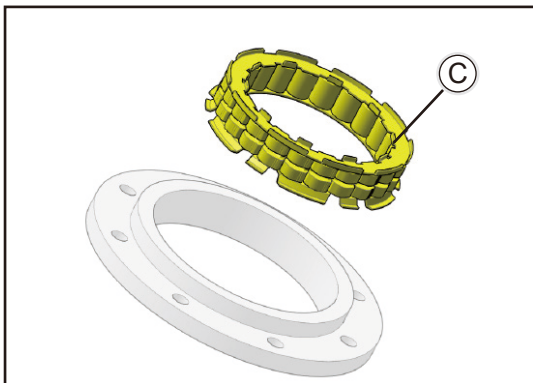
## DISASSEMBLE THE STARTING OVERRUNNING CLUTCH



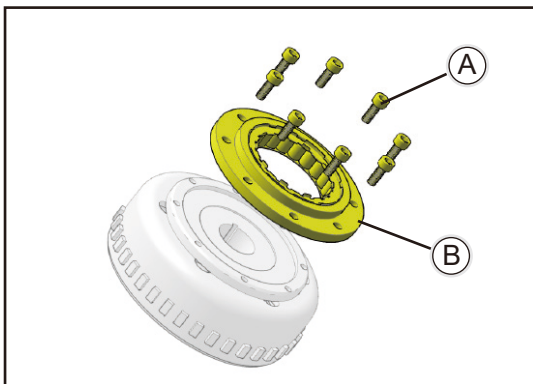
- ◆ Take out the starting driven gear assembly **【A】** from the overrunning clutch
- ◆ Check whether the bearing surface of the starting driven gear and the bushing surface are worn, check whether the bearing surface of the starting driven gear and the bushing surface are worn and damaged



- ◆ Remove 8 connecting bolts **【B】** to separate the overrunning clutch from the magneto rotor



- ◆ Separate the one-way assembly from the fixing seat, and check whether the roller surface in the one-way assembly is worn or damaged



## INSTALL THE STARTING OVERRUNNING CLUTCH

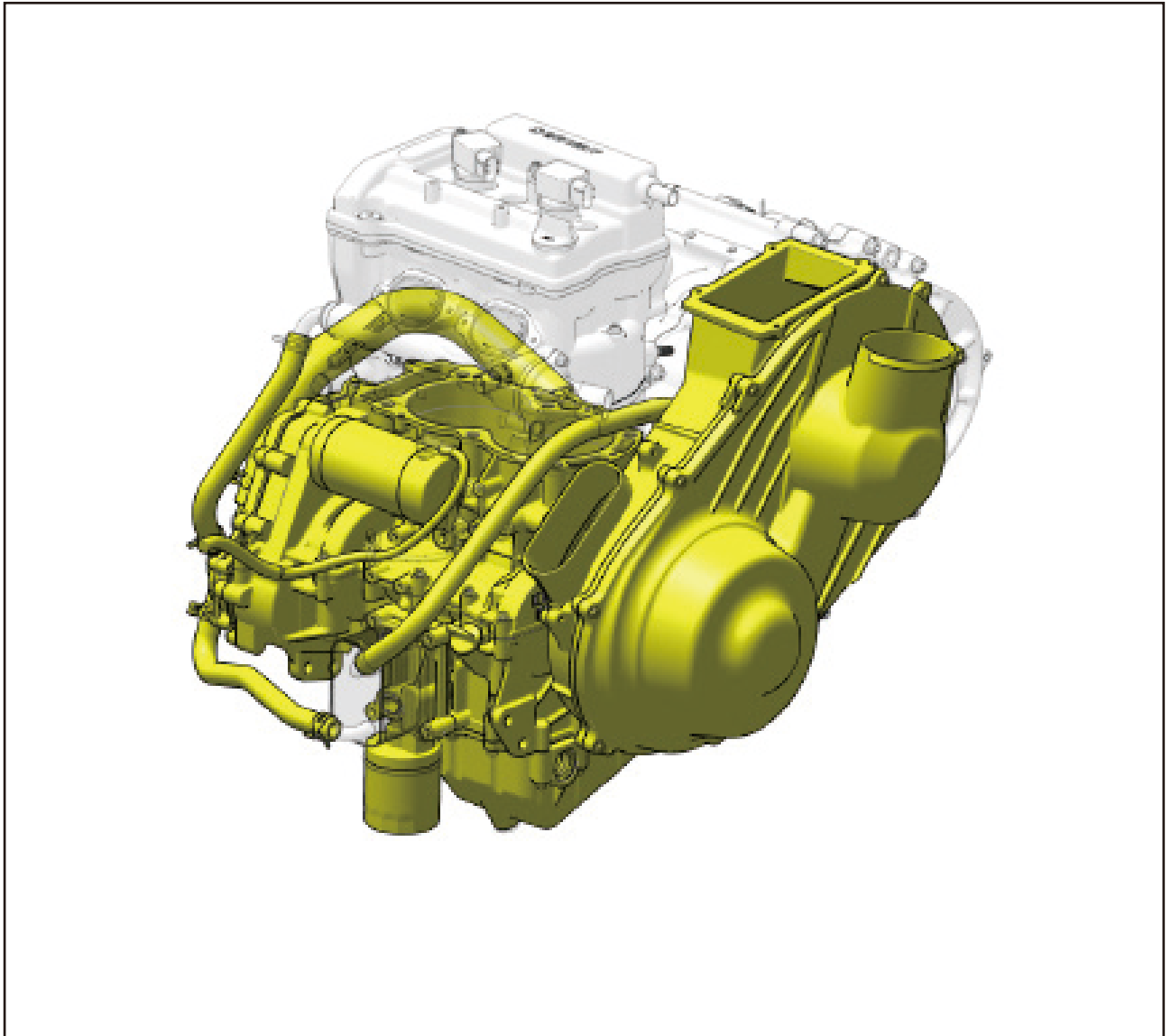
- ◆ Assemble the starting overrunning clutch **【B】**
- ◆ Apply thread fastening glue to the threaded surface of the mounting bolt **【A】**, assemble the starting overrunning clutch and the magneto rotor, and tighten the bolts

Bolt <b>【A】</b>
10 N·m (1.0 kgf·m, 89 in·lb)

## **CRANKCASE, CRANKSHAFT, BALANCE SHAFT**

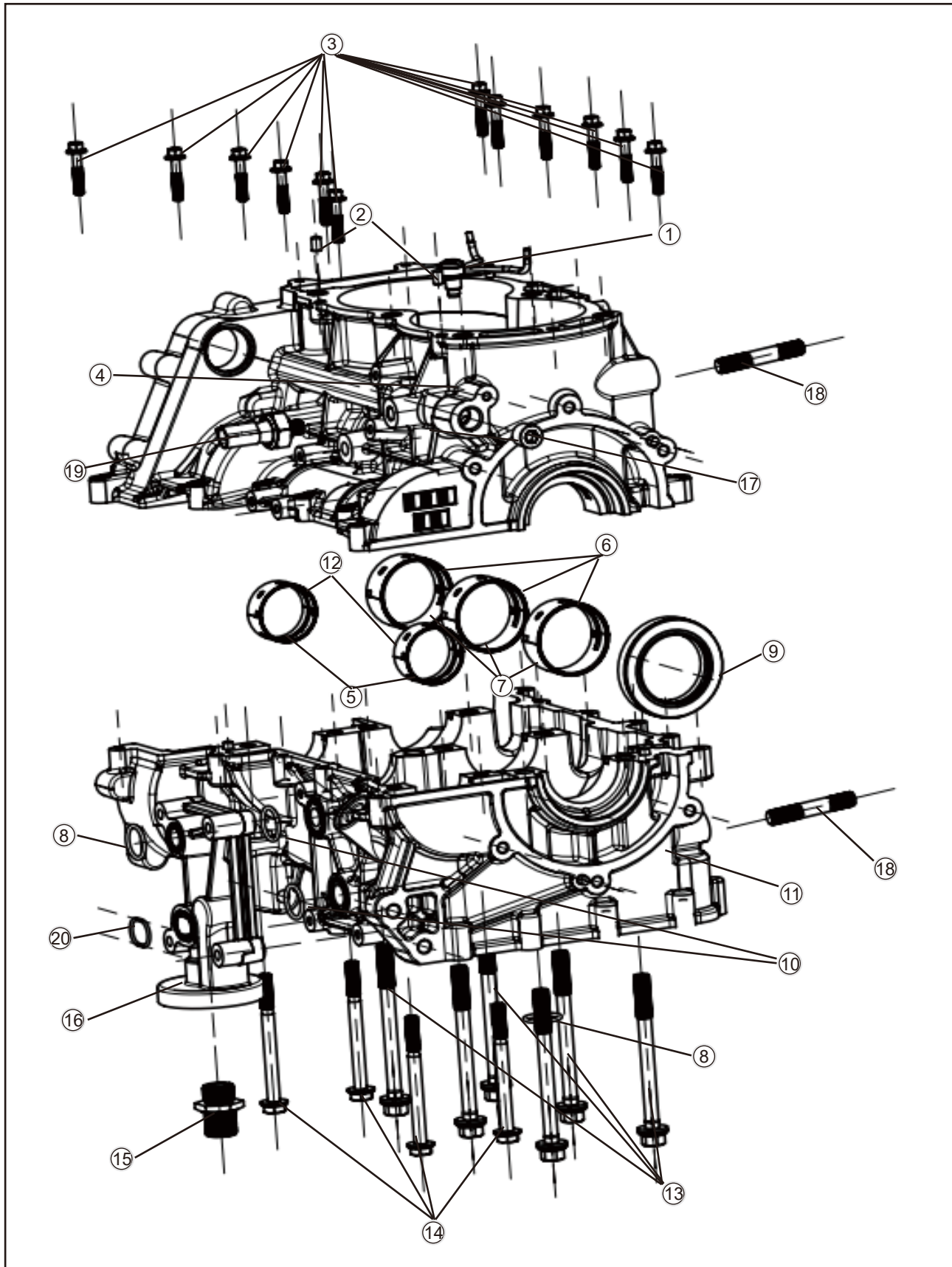
<b>EXPLOSIVE VIEW</b> .....	<b>3-37</b>
EXPLOSIVE VIEW OF UP AND DOWN THE CASE SUB-ASSEMBLY .....	3-38
LEFT CRANKCASE COVER SUB-ASSEMBLY .....	3-40
EXPLOSIVE VIEW OF OIL PAN SUB-ASSEMBLY .....	3-41
<b>TECHNICAL PARAMETER</b> .....	<b>3-42</b>
<b>SPECIAL TOOLS</b> .....	<b>3-43</b>
<b>LEFT CRANKCASE COVER</b> .....	<b>3-44</b>
REMOVING THE LEFT CRANKCASE COVER.....	3-44
LEFT CRANKCASE COVER INSPECTION .....	3-45
LEFT CRANKCASE COVER INSTALLATION .....	3-45
<b>CRANKCASE, CRANKSHAFT, BALANCE SHAFT</b> .....	<b>3-46</b>
REMOVING THE CRANKCASE .....	3-46
REMOVING THE BALANCE SHAFT .....	3-48
CHECK THE BALANCE SHAFT .....	3-48
REMOVING THE CRANKSHAFT .....	3-49
CHECK THE CRANKSHAFT .....	3-50
GROUPING MARK .....	3-51
BEARING SHELL SELECTION — SUBDIVISION OF MAIN BEARING SHELL SELECTION .....	3-52
BEARING SHELL SELECTION — SUBDIVISION OF BALANCE SHAFT BEARING SHELL SELECTION.....	3-52
CONNECTING ROD BEARING SHELL SELECTION .....	3-52
INSTALLATION OF BALANCE SHAFT .....	3-53
INSTALLATION OF CRANKSHAFT .....	3-53
CRANKCASE ASSEMBLY.....	3-54

**EXPLOSIVE VIEW**



# CRANKCASE, CRANKSHAFT, BALANCE SHAFT SEGWAY AT10

## EXPLOSIVE VIEW OF UP AND DOWN THE CASE SUB-ASSEMBLY



# SEGWAY AT10 CRANKCASE, CRANKSHAFT, BALANCE SHAFT

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Piston cooling nozzle	20	2	14.8	
2	Cylindrical pin 6 × 10				
3	Bolt M6 × 30	10	1.0	89 in·lb	
4	Upper crankcase				
5	Balance bearing shell				
6	Upper crankcase crankshaft				
7	Lower crankcase crankshaft				
8	O-ring 17 × 2				
9	Oil seal 47x70x12				
10	O-ring 19 × 2				
11	Lower crankcase				
12	Timing chain limit plate				
13	Bolt M10 × 1.25 × 110				
14	Bolt M8 × 90	30	3.0	21	
15	Embolism M14	34	3.4	26	
16	Oil Filter Mount	35	3.5	26	
17	Plug NPT3/8				
18	Double-end stud M10 × 1.25 × 60	32	3.2	23	
19	Oil pressure sensor	45	4.5	33	
20	Oil cooler sealing ring	14	1.4	10	

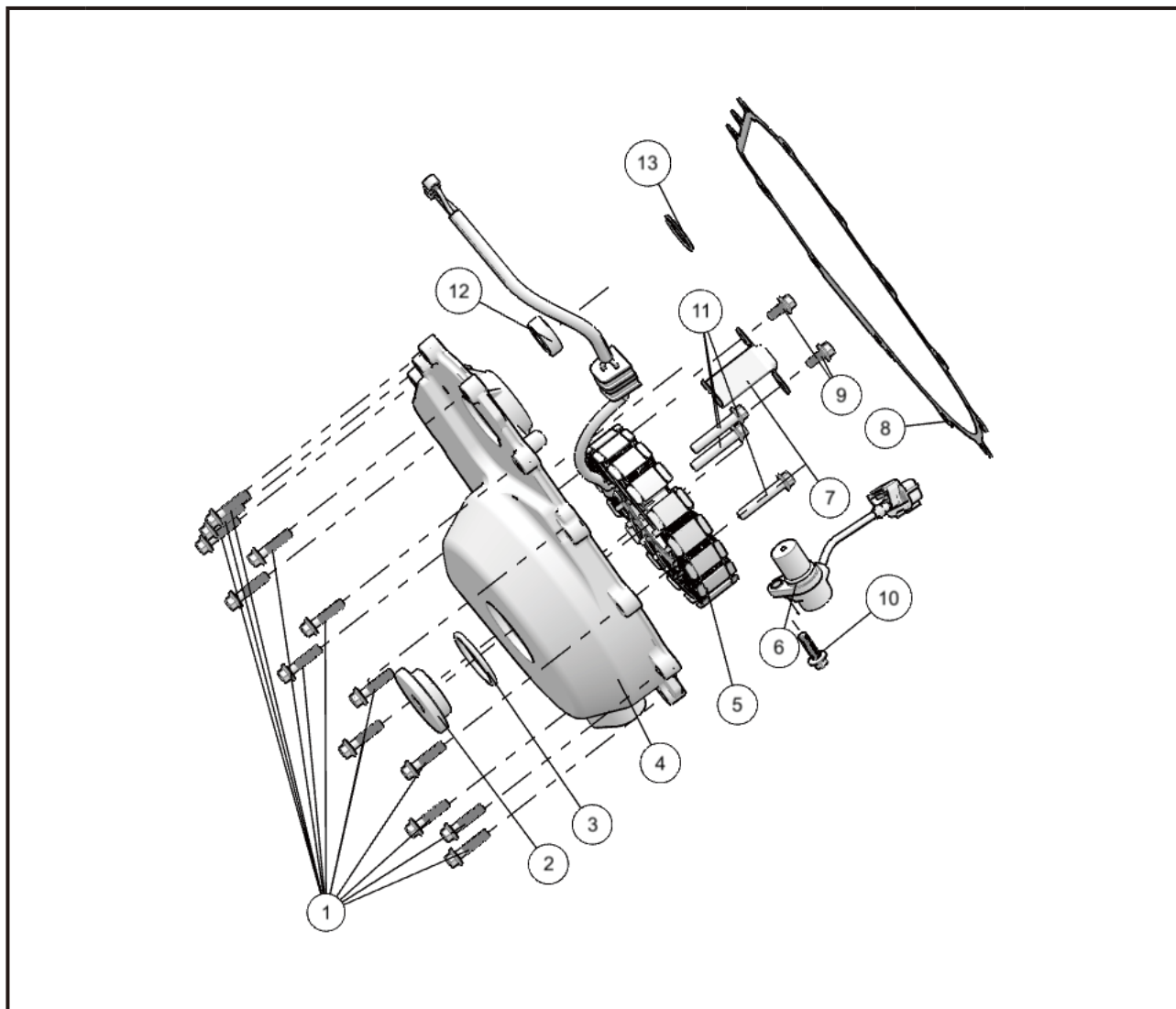
G: Use grease suitable for oil seals and O-rings

L: Use fastening agent.

O: Apply oil.

# CRANKCASE, CRANKSHAFT, BALANCE SHAFT SEGWAY AT10

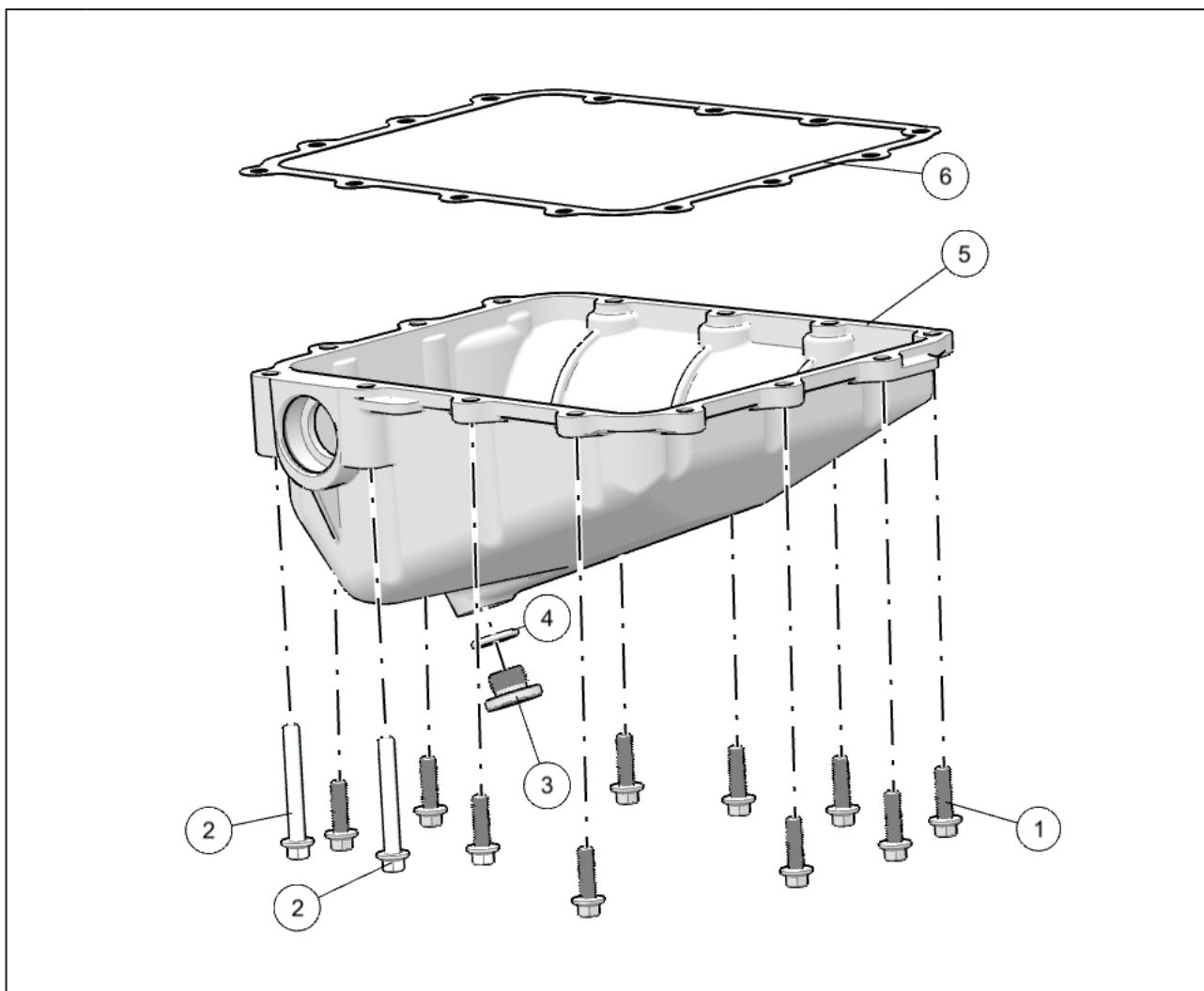
## LEFT CRANKCASE COVER SUB-ASSEMBLY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Bolt M6 × 25	10	1.0	89 in·lb	
2	View hole cover				
3	O-ring seal 35 × 3.5				
4	Left crankcase cover				
5	Magneto stator assembly				
6	Crankshaft position sensor				
7	crimping plate				
8	Left Crankcase Cover Gasket				
9	Bolt M6 × 12	10	1.0	89 in·lb	
10	Bolt M6 × 20	10	1.0	89 in·lb	
11	Bolt M6 × 35	10	1.0	89 in·lb	
12	Deep groove ball bearing 629-2RS				
13	Hole circlip 26				

# SEGWAY AT10 CRANKCASE, CRANKSHAFT, BALANCE SHAFT

## EXPLOSIVE VIEW OF OIL PAN SUB-ASSEMBLY

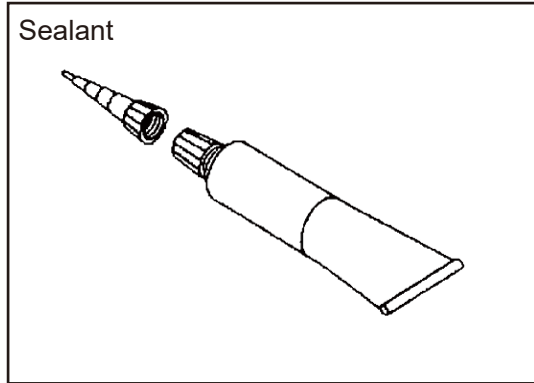


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	BOLT M6×20	10	1.0	89 in · lb	
2	BOLT M6×45	10	1.0	89 in · lb	
3	OIL DRAIN PLUG	16	1.6	11.8	
4	O-RING 13.8×2.5				
5	OIL PAN				
6	OIL PAN SEAL				

## TECHNICAL PARAMETER

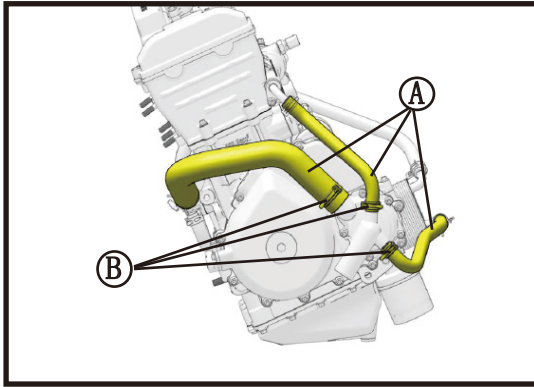
Item	Standard
Crankcase:	
spindle bore	I group: 51.007 ~ 51.012 mm (2.0082" ~ 2.0083") II group: 51.012 ~ 51.017 mm (2.0083" ~ 2.0085") III group: 51.018 ~ 51.026 mm (2.0086" ~ 2.0089")
Balance shaft bore	I group: 41.000 ~ 41.008 mm (1.6142" ~ 1.6145") II group: 41.008 ~ 41.016 mm (1.6145" ~ 1.6148")

**SPECIAL TOOLS**

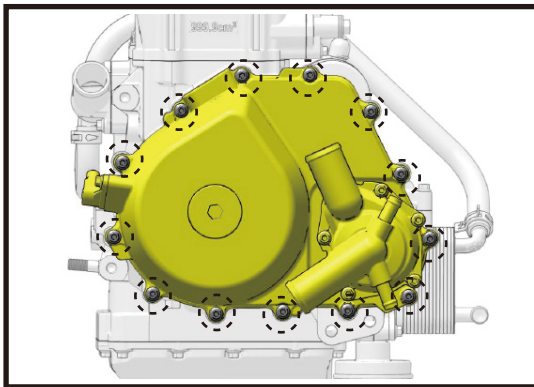


## LEFT CRANKCASE COVER

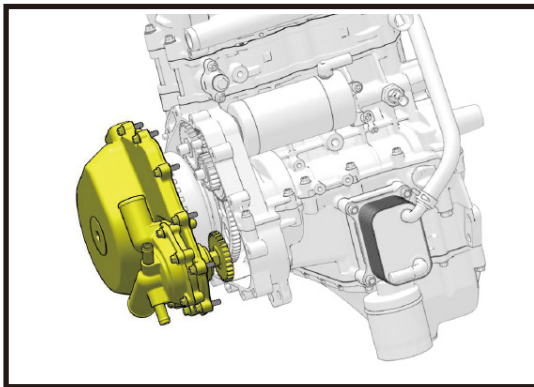
### REMOVING THE LEFT CRANKCASE COVER



- ◆ Loosen the three clamps 【B】 and remove the water pump hose 【A】 .



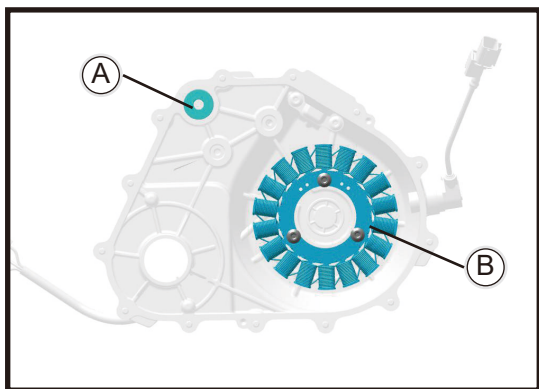
- ◆ Remove the 13 left crankcase cover bolts



- ◆ Gently pry around the left crankcase cover to remove the left crankcase cover as a whole from the crankcase.

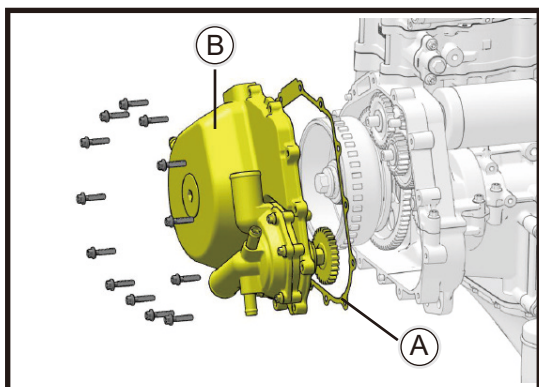
#### **⚠ CAUTION**

The magneto rotor is magnetic and care must be taken when installing and removing the left crankcase cover. Do not put your fingers between the left crankcase cover and the crankcase to avoid injury.



## LEFT CRANKCASE COVER INSPECTION

- ◆ Check bearing 【A】 , stator coil 【B】 condition.
- ◆ If the bearings need to be replaced, remove the bearings by heating the left crankcase cover bearing holes or by using the special bearing removal tool.

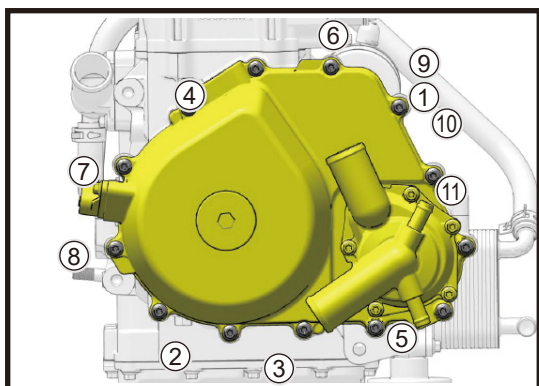


## LEFT CRANKCASE COVER INSTALLATION

- ◆ Install the left crankcase cover assembly 【B】 and the new gasket 【A】 , aligning the location of the locating pin on the crankcase, into the left crankcase cover.

### ⚠ CAUTION

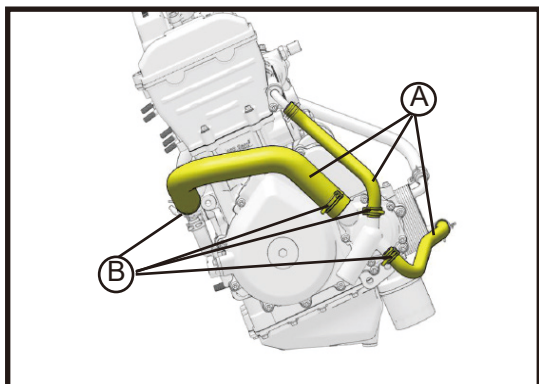
The magneto rotor is magnetic and care must be taken when installing and removing the left crankcase cover. Do not put your fingers between the left crankcase cover and the crankcase to avoid injury.



- ◆ Tighten the bolts sequentially in the installation tightening sequence.

Bolt

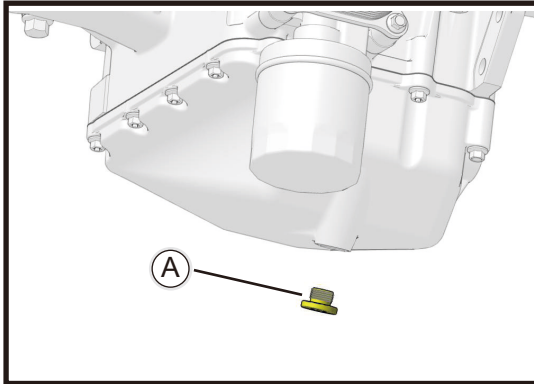
10 N·m (1.0 kgf·m, 89 in·lb)



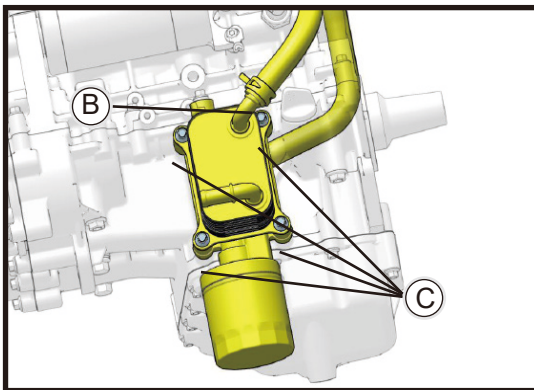
- ◆ To install the water pump hose 【A】 , install the clamps 【B】 .

## CRANKCASE, CRANKSHAFT, BALANCE SHAFT

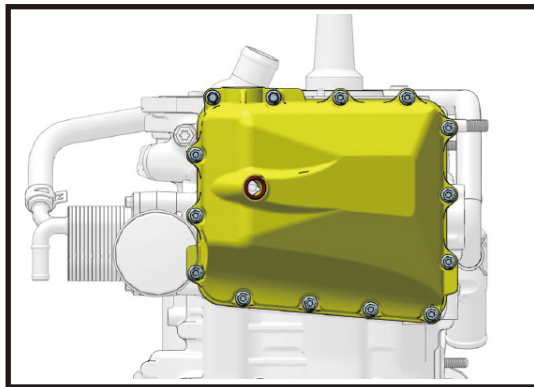
### REMOVING THE CRANKCASE



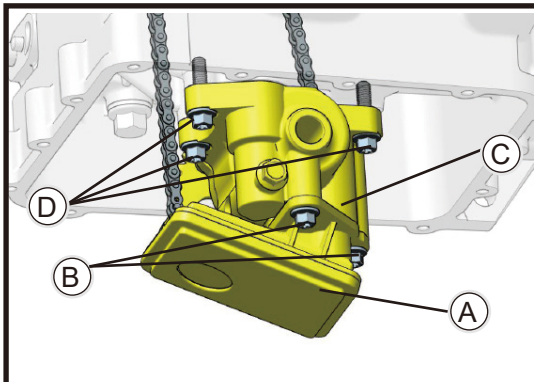
- ◆ The cylinders and gas distribution system need to be removed before removing the crankcase (see Cylinder Head Cylinder Block Subassembly section)
- ◆ Remove the oil pan drain screw **【A】** and drain the oil from the oil pan.



- ◆ Remove the hose fitting **【A】** and pull out the hose.
- ◆ Remove the 4 bolts **【B】** securing the oil filter element mounting base and attached oil cooler assembly.

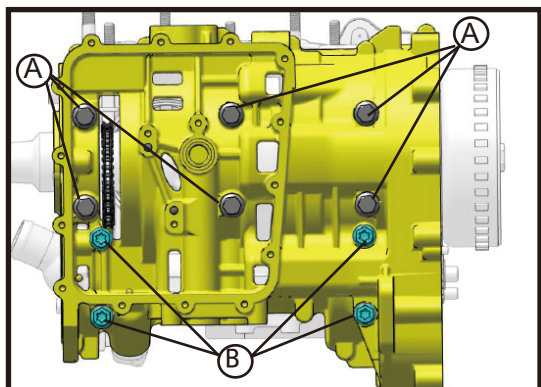


- ◆ Remove the 15 oil pan mounting bolts **【B】** and remove the oil pan from the crankcase.

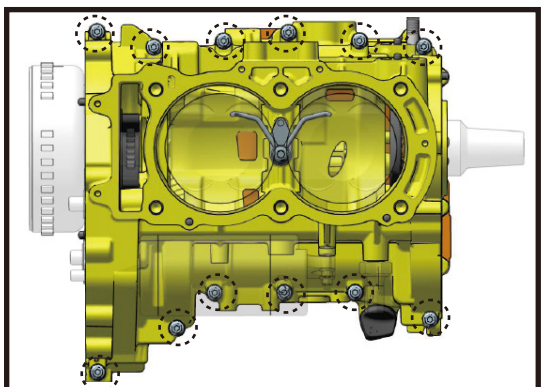


- ◆ Remove the two M6×16 bolts **【B】** and take the oil strainer **【A】** off the oil pump.
- ◆ Remove the three M6×25 bolts **【D】** and detach the oil pump **【C】** from the crankcase.

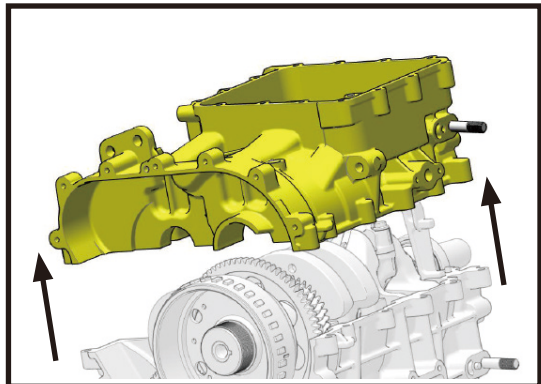
# SEGWAY AT10 CRANKCASE, CRANKSHAFT, BALANCE SHAFT



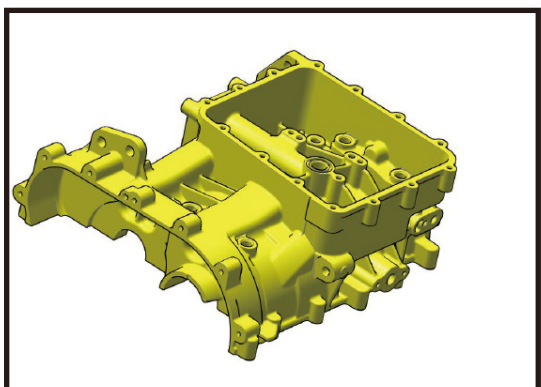
- ◆ Remove the six M10×110 bolts 【A】 and four M8×90 bolts 【B】 from the crankcase.
- ◆ Removal tools for M10×110 bolts 【A】 : Torque wrench, 13mm socket.
- ◆ Removal tools for M8×90 bolts 【B】 : Torque wrench, 13mm socket.



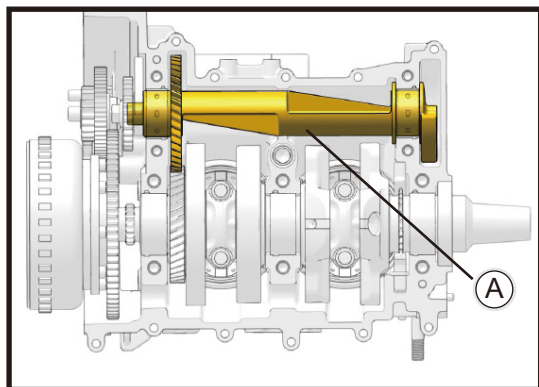
- ◆ Reverse the case and remove the 12 M6 x 30 crankcase upper and lower closing case bolts.



- ◆ Use a rubber mallet to gently tap around the lower crankcase and lift the lower crankcase up when it is loose.

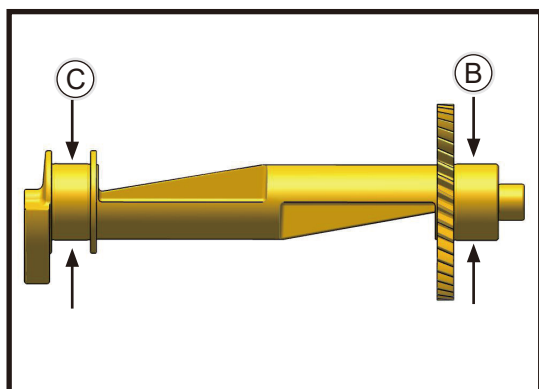


- ◆ After the lower crankcase has been successfully removed, take care to protect the main crank journal shingle mounting area from scratching the shingle mounting surface.



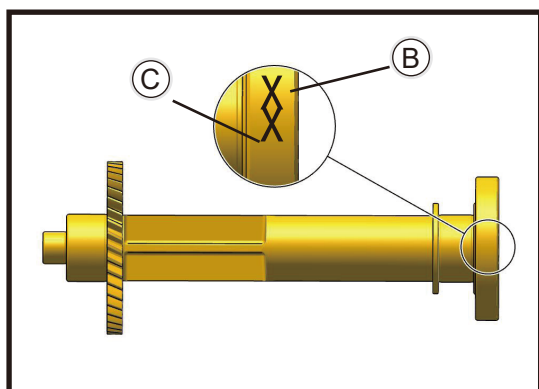
## REMOVING THE BALANCE SHAFT

- ◆ Slowly turn the balance shaft **【A】** and remove the balance shaft from the upper crankcase.



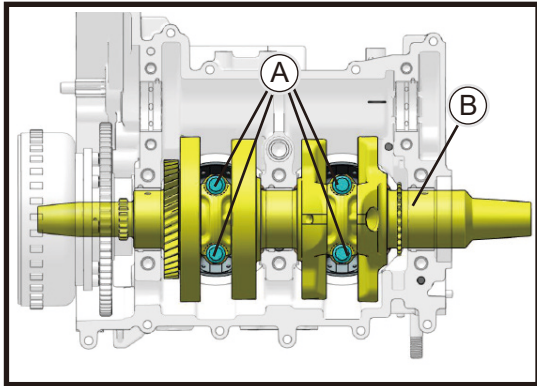
## CHECK THE BALANCE SHAFT

- ◆ Check the balance shaft gear for damage.
- ◆ Measure the shaft diameter **【B】** and **【C】** dimensions, choosing two directions 90° apart when measuring. If any of the journal dimensions are out of limits, it is necessary to replace the balance shaft.
- ◆ The journal size group marking is engraved on the plane of the balance block as shown in the figure, the outer measurement marking is journal **【C】** size, and the inner measurement is journal **【B】** size.
- ◆ The group marking is divided into "I" and "II", and the dimensions are shown in the table below. If the measured dimension exceeds the limit value, it is necessary to replace the balance shaft.

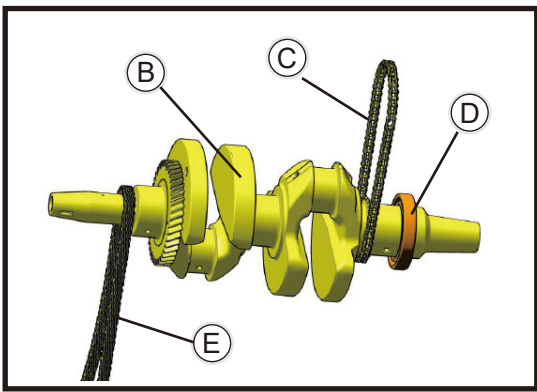


Balance shaft journal size		
	I	II
Standardized values:	37.992 ~ 37.996 mm (1.4957" ~ 1.4959")	37.996 ~ 38 mm (1.4959" ~ 1.4961")
Limit values:	37.973 mm(1.495")	

## REMOVING THE CRANKSHAFT

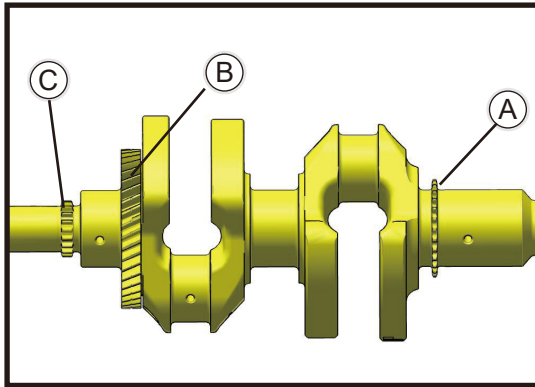


- ◆ Remove the 【A】 connecting rod bolts.
- ◆ Carefully remove the crankshaft 【B】 from the upper crankcase.

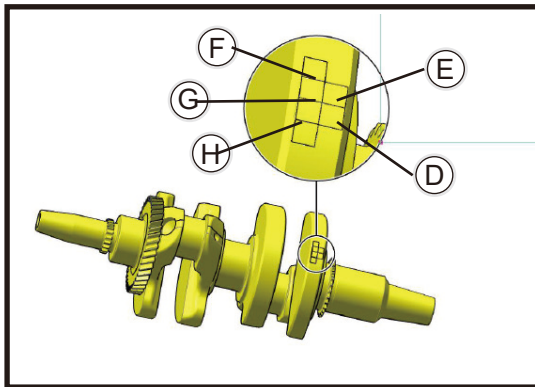


- ◆ Remove the oil pump chain assembly 【C】 , oil seal 【D】 , and timing chain assembly 【E】 from the crankshaft.

## CHECK THE CRANKSHAFT

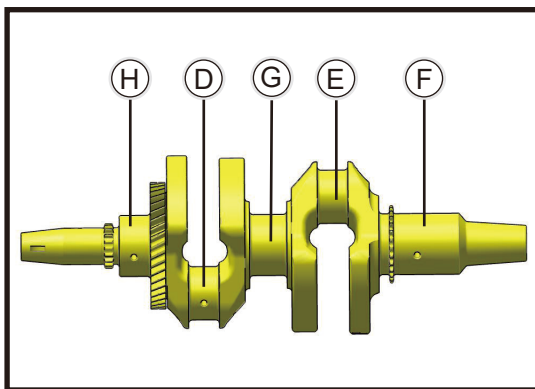


- ◆ Check the timing sprocket teeth **【A】**, balance main gear **【B】**, and oil pump sprocket teeth **【C】** on the crankshaft for damage or wear.
- ◆ If any of the teeth are damaged, the entire crankshaft component needs to be replaced.
- ◆ Measure the dimensions of each main journal and connecting rod journal, and select two directions at 90° intervals for each position when measuring. If the journal wear exceeds the limit, the crankshaft needs to be replaced.
- ◆ The balance block near the output end of the crankshaft is marked with two lines totaling six characters, one column with arabic numerals to identify the main journal groupings, and the other column with uppercase English letters to identify the connecting rod journal groupings.
- ◆ The following table lists the dimensions corresponding to each group. Check to see that the dimensions are within the specified limits. If they are outside the limits, the crankshaft component will need to be replaced.

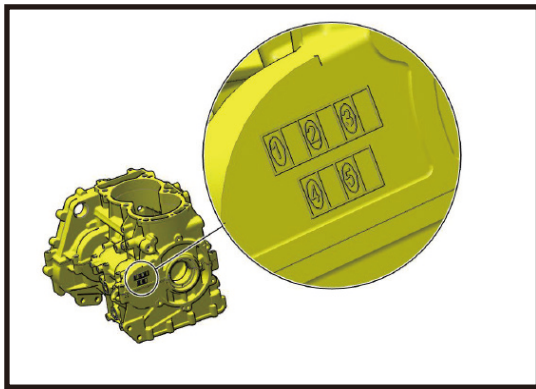


### ◆ Crankshaft journal diameter

spindle diameter		
1	Standards	46.98-46.987 mm (1.8496-1.8499 in.)
	limit value	46.933 mm(1.8478 in.)
2	Standards	46.988-46.995 mm (1.8499-1.8502 in.)
	limit value	46.947 mm(1.8483 in.)
3	Standards	46.996-47.004 mm (1.8502-1.8506 in.)
	limit value	46.963 mm(1.8489 in.)
Connecting rod shaft diameter		
A	Standards	40.992-40.997 mm (1.6139-1.6141 in.)
	limit value	40.963 mm(1.6127 in.)
B	Standards	40.997-41.002 mm (1.6141-1.6143 in.)
	limit value	40.968 mm(1.6129 in.)
C	Standards	41.002-41.007 mm (1.6143-1.6144 in.)
	limit value	40.965 mm(1.6128 in.)



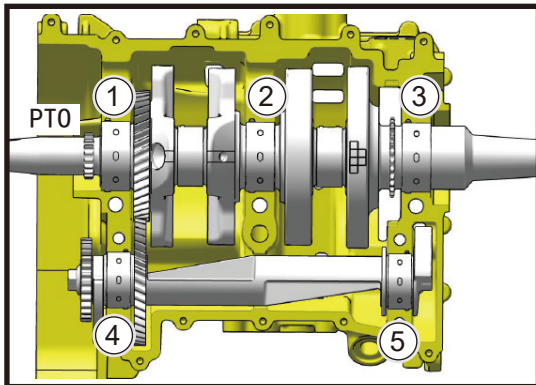
# SEGWAY AT10 CRANKCASE, CRANKSHAFT, BALANCE SHAFT



## GROUPING MARK

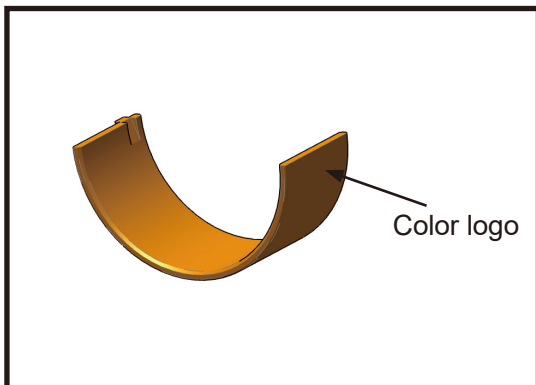
### Crankcase grouping

- ◆ The upper and lower box crankcase have two rows of grouping marks at the output end, one row for the main shaft, serial numbers 1, 2, 3, and the other row for the balancing shaft, serial numbers 4, 5. Mark the shaft sizes with numbers, corresponding to the table below:



Crankshaft grouping		
group	Grouping Size	grouping marker
I	51.007 ~ 51.012 mm	1
II	51.012 ~ 51.017 mm	2
III	51.018 ~ 51.026 mm	3

Balance shaft grouping		
group	Grouping Size	grouping marker
I	41.000 ~ 41.008 mm	1
II	41.008 ~ 41.016 mm	2



### Group of bearings

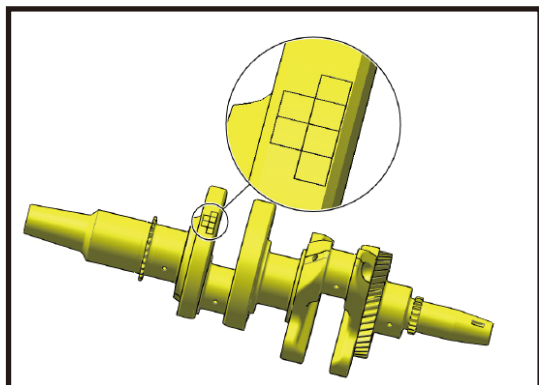
The bearings are grouped according to different thicknesses and the grouping markings are located on the outside of the bearings.

Crankshaft bearings are available in 4 thicknesses and are grouped in blue, white, red and black.

Balance shaft bearings are available in 3 thicknesses, grouped in blue, red and black.

Connecting rod bearings are available in 4 thicknesses, grouped in red, white, blue and green. Crankshaft bearing selection

## BEARING SHELL SELECTION — SUBDIVISION OF MAIN BEARING SHELL SELECTION



- ◆ Select the appropriate crankshaft shingles according to the grouping marks on the crankcase and crankshaft.

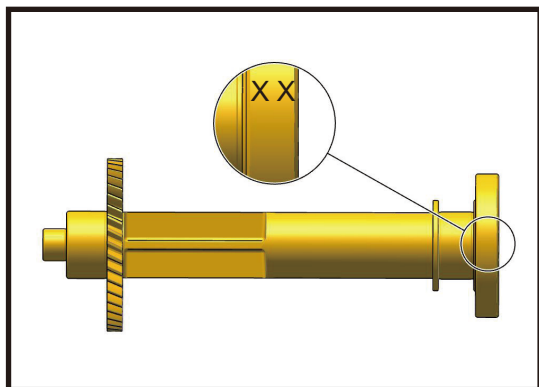
Crankshaft bearing sheet			
Crankcase-crankshaft group	Crankshaft group		
	1	2	3
	color selection		
1	red	white	blue
2	red	white	blue
3	black	red	white

- ◆ Example

Crankcase Grouping 1-2, 2-2, 3-2, 5-1, 6-1

Crankshaft grouping 2-3-3-A-A

According to the above table, the selected crankshaft colors are: white, blue, blue.



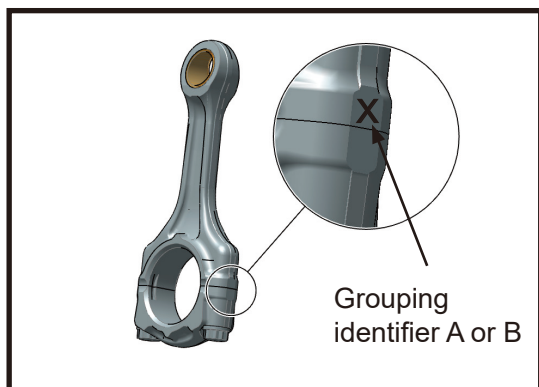
## BEARING SHELL SELECTION — SUBDIVISION OF BALANCE SHAFT BEARING SHELL SELECTION

- ◆ Select the appropriate balance shaft bearing according to the grouping marks on the crankcase and balance shaft.

Balance Shaft bearing sheet		
Crankcase-balance shaft group	Balance shaft group	
	I	II
	Color selection	
1	red	blue
2	black	red

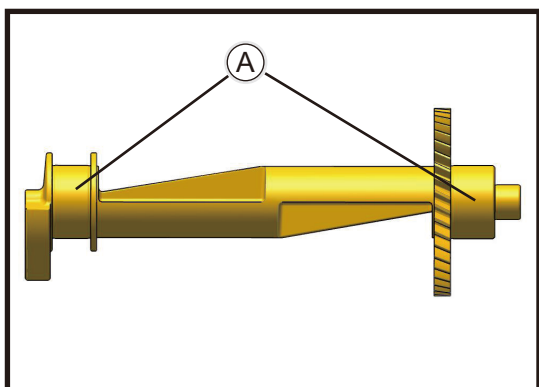
## CONNECTING ROD BEARING SHELL SELECTION

- ◆ Select the proper connecting rod bearing according to the grouping marks on the connecting rods and crankshaft.

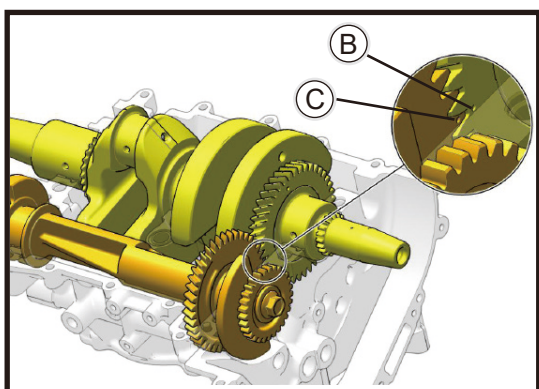


Connecting Rod Bearing sheet			
Connecting Rod Group	Crankshaft group		
	A	B	C
	Color selection		
A	blue	white	green
B	red	blue	white

## INSTALLATION OF BALANCE SHAFT



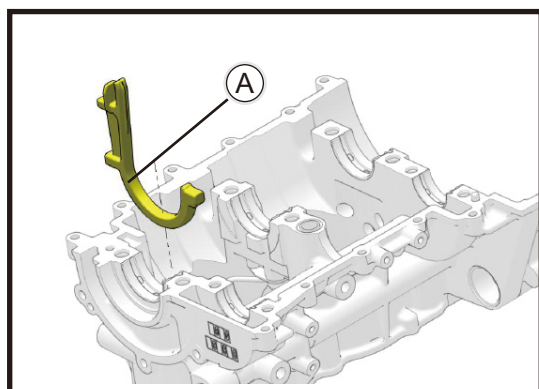
- ◆ Select the corresponding balance shaft shingles according to the grouping markings on the crankcase (see Shingle Selection section).
- ◆ Clean the surface of the balance shaft bore on the upper crankcase, and select the balance shaft shingles of the corresponding grouping to install in the bearing bore.
- ◆ Turn the crankshaft so that the mark **【C】** on the crankshaft gear faces the balance shaft side.
- ◆ Apply engine oil to the balance shaft journal **【A】**.
- ◆ Install the balance shaft and turn it at an appropriate angle to align the mark **【C】** on the balance shaft gear with the mark **【B】** on the crankshaft gear.



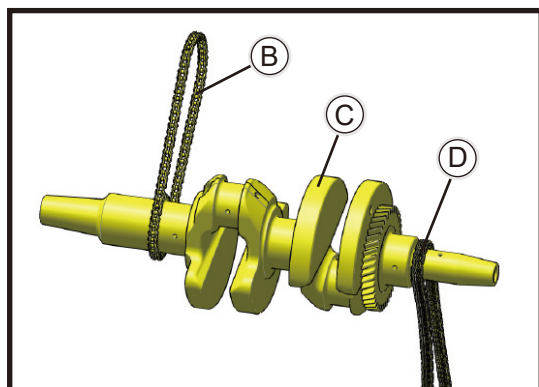
## INSTALLATION OF CRANKSHAFT

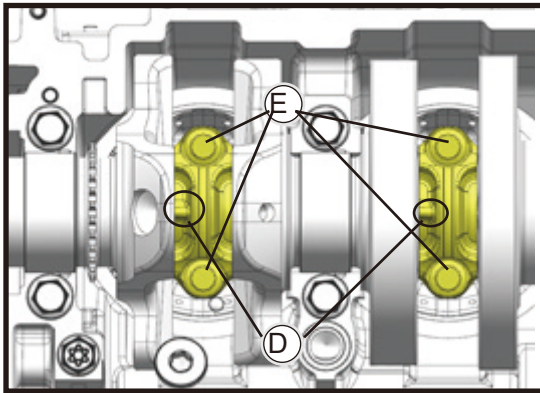
### TIPS

Whether you are using a new crankshaft or reassembling the original crankshaft, refer to the Shaft Shoe Selection section (see “Crankcase Assembly” chapter) to select the appropriate shaft shoe.



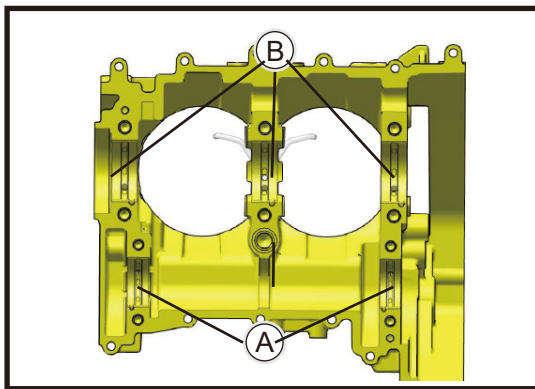
- ◆ Wipe the surfaces of the upper crankcase (main bearings), connecting rods, and connecting rod cover bearing holes clean.
- ◆ Install the main shaft tile and press the main shaft tile into the crankcase main bearing housing.
- ◆ Install the oil pump chain guard **【A】** into the upper crankcase.
- ◆ Apply engine oil to the main bearing shingles and connecting rod shingles.
- ◆ Install the timing chain **【D】** and oil pump chain **【B】** to the crankshaft **【C】** sprocket.
- ◆ Place the crankshaft and chain as a unit into the upper crankcase.
- ◆ Align the connecting rod big end with the crankshaft connecting rod journal and install the corresponding connecting rod cover.





- ◆ Install the connecting rod bolts **【E】** and tighten as required.

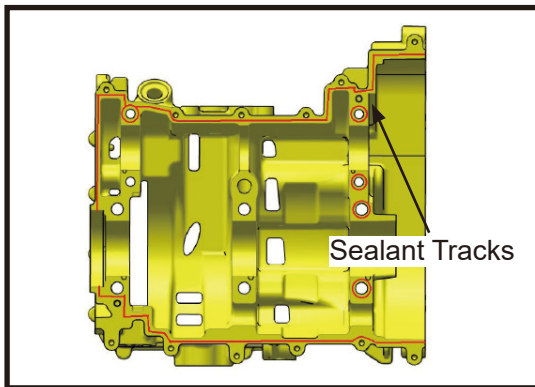
connecting rod bolt
initial step: 5 N·m (0.51kgf·m, 3.69 ft·lb)
second step: 20 N·m (2.04 kgf·m, 14.75 ft·lb)
Step 3: Turn 110°



## CRANKCASE ASSEMBLY

- ◆ Pre-assembly preparation:

1. Remove sealant and gaskets from crankcase seal mating surfaces. Marks. Inspect surfaces for scratches or damage.
2. Remove sealant and other contaminants from bolt holes.
3. Install the locating pin into the locating pin hole.
4. Check the oil passages to make sure they are clean and free of contaminants.



- ◆ According to the crankcase body, crankshaft and balance shaft grouping, select the appropriate axle shingles (see section on axle shingles selection).

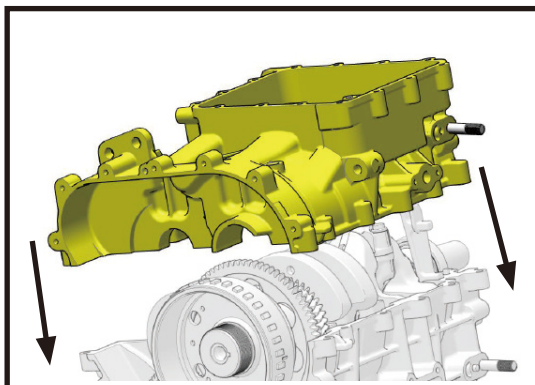
- ◆ Install the balance shaft shingles **【A】** and main shaft shingles **【B】** into the corresponding shaft holes of the upper and lower case bodies respectively.

- ◆ Install the crankshaft and balance shaft (refer to the crankshaft connecting rod piston assembly and balance shaft assembly chapters)

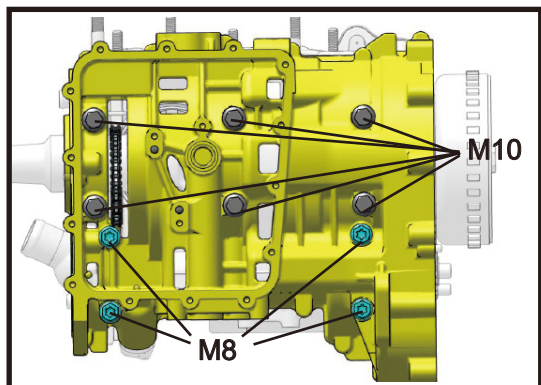
- ◆ Apply sealant to the bottom sealing surface of the upper crankcase, and trace the glue line as shown in the figure. The glue line should be continuous and even.

- ◆ Align the sealing surface of the upper crankcase bottom sealing surface with the glue line as shown in the figure.

- ◆ Gently tap around the crankcase with a rubber mallet to ensure there is no gap between the upper and lower case sealing surfaces.



# SEGWAY AT10 CRANKCASE, CRANKSHAFT, BALANCE SHAFT



- ◆ Screw in 4 M8 bolts and 8 M10 bolts.

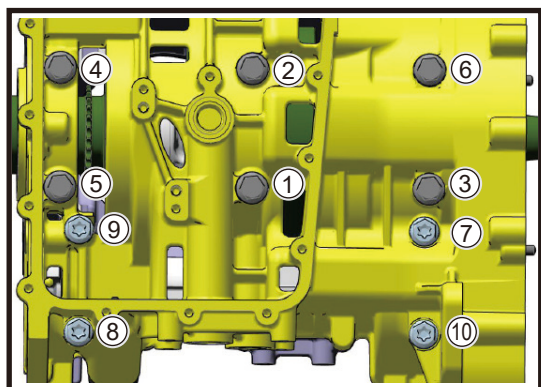
## ⚠ CAUTION

Replace the crankcase bolts with new M10 bolts each time you install the crankcase.

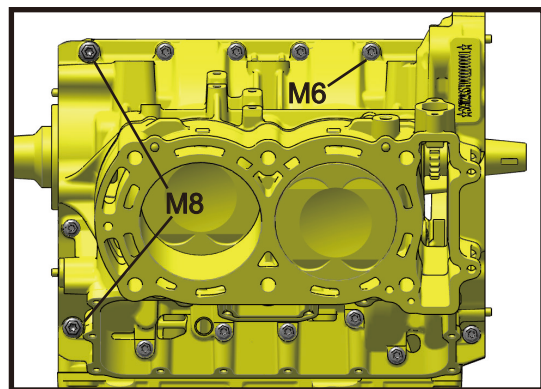
- ◆ Tighten the bolts in place in sequence.

Bolt M10
initial step: 12 N·m (1.2 kgf·m, 8.6 ft·lb)
second step: 28 N·m (2.8 kgf·m, 20.6 ft·lb)
Step 3: Turn 90°

Bolt M8
35 N·m (3.5 kgf·m, 26 ft·lb)

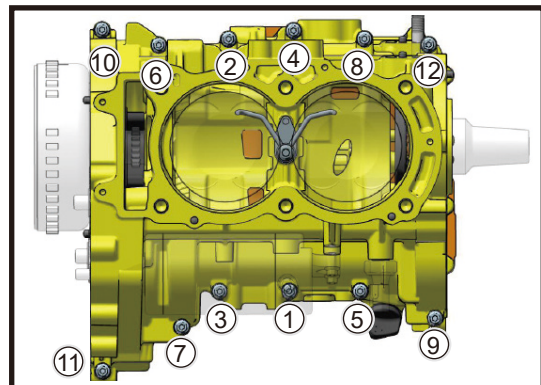


- ◆ Reverse the crankcase and screw in the 12 M6 x 30 crankcase bolts in sequence.

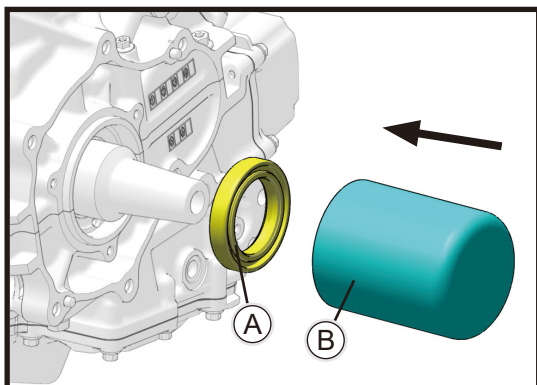


- ◆ Tighten the bolts in sequence to the specified torque.

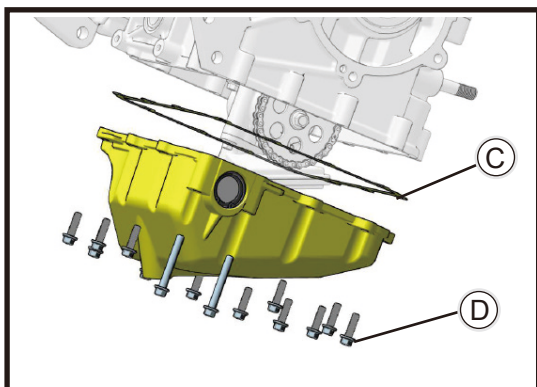
Bolt M6
10 N·m (1.0 kgf·m, 89 in·lb)



# CRANKCASE, CRANKSHAFT, BALANCE SHAFT SEGWAY AT10

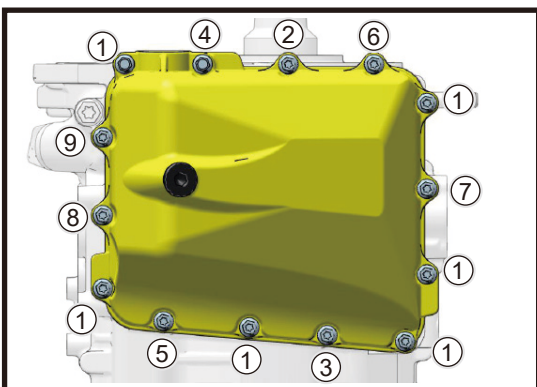


- ◆ Take a new rotary shaft oil seal **【A】** and apply an appropriate amount of engine oil to the lip and outer ring surface. With the lip side of the seal facing inwards, press it vertically into the crankcase using the crankshaft oil seal press-fit tool **【B】**.



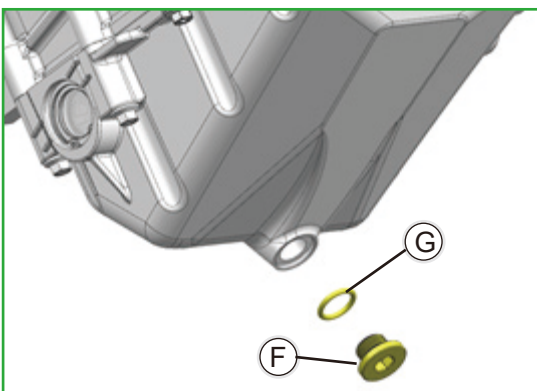
- ◆ Install the oil pump assembly (see Lubrication System section).

- ◆ Take a new oil pan gasket **【C】**, install it in the oil pan, and use a constant torque wrench to tighten the 12 M6 x 20 bolts and two M6 x 45 bolts **【D】** in sequence after pre-tightening them in sequence.



### Bolt **【D】**

10 N·m (1.0 kgf·m, 89 in·lb)



- ◆ Install the m14 plug assembly [f] and the o-ring seal 13.8×2.5 [G].
- ◆ First, insert the o-ring 13.8×2.5 [G] into the oil pan groove, then screw in the m14 plug assembly [f], and tighten it to the specified torque.

### Bolt **【F】**

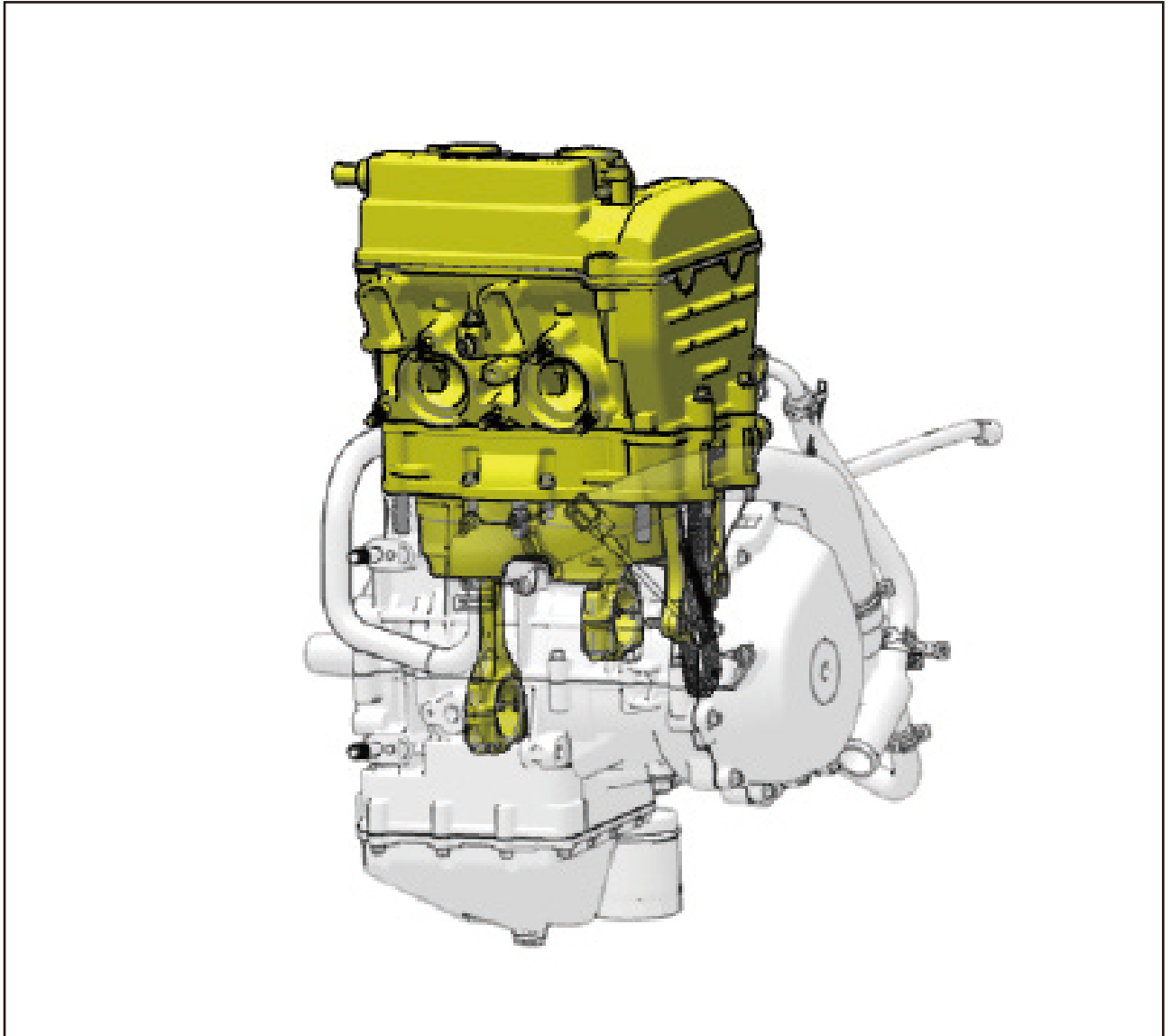
16~18 N·m (1.6~1.8 kgf·m, 142~159 in·lb)

# CYLINDER HEAD, CYLINDER, PISTON

<b>EXPLODED VIEW</b> .....	<b>3-59</b>
EXPLOSIVE VIEW OF CYLINDER HEAD COVER SUB-ASSEMBLY .....	3-60
EXPLOSIVE VIEW OF CYLINDER HEAD SUB-ASSEMBLY .....	3-61
EXPLOSIVE VIEW OF CYLINDER SUB-ASSEMBLY .....	3-63
EXPLOSIVE VIEW OF VALVE MECHANISM .....	3-64
EXPLOSIVE VIEW OF PISTON CONNECTING ROD ASSEMBLY .....	3-65
<b>TECHNICAL PARAMETERS</b> .....	<b>3-66</b>
<b>TECHNICAL PARAMETERS</b> .....	<b>3-67</b>
<b>SPECIAL TOOLS</b> .....	<b>3-68</b>
<b>CYLINDER HEAD COVER</b> .....	<b>3-69</b>
REMOVE CYLINDER HEAD COVER.....	3-69
INSTALL THE CYLINDER HEAD COVER.....	3-69
<b>CAMSHAFT COVER / CAMSHAFT</b> .....	<b>3-70</b>
REMOVE THE TENSIONER.....	3-70
INSTALL THE TENSIONER.....	3-70
DISASSEMBLE CAMSHAFT .....	3-71
CAMSHAFT SPROCKET INSPECTION .....	3-72
CAMSHAFT / CAMSHAFT LOBE INSPECTION .....	3-72
INSTALL CAMSHAFT SPROCKET .....	3-73
CAMSHAFT INSTALLATION / TIMING ADJUSTMENT .....	3-74
VALVE CLEARANCE ADJUSTMENT.....	3-76
<b>CYLINDER HEAD</b> .....	<b>3-80</b>
REMOVE CYLINDER HEAD.....	3-80
CYLINDER HEAD INSPECTION .....	3-80
REMOVE THERMOSTAT, WATER TEMPERATURE SENSOR.....	3-81
INSTALLATION OF THERMOSTAT, WATER TEMPERATURE SENSOR.....	3-81
THERMOSTAT CHECK .....	3-82
REMOVE SPARK PLUG.....	3-82
INSTALLING THE SPARK PLUG .....	3-82
REMOVE THE VALVE .....	3-83
VALVE GUIDE / VALVE INSPECTION .....	3-84
COMBUSTION CHAMBER CLEANING.....	3-85
SEAT RING REPAIR.....	3-86
SEAT RING INSPECTION .....	3-86
SEAT RING REPAIR (VALVE GRINDING).....	3-87

CYLINDER HEAD ASSEMBLY .....	3-89
<b>CYLINDER BLOCK AND PISTON .....</b>	<b>3-90</b>
CYLINDER BLOCK REMOVAL .....	3-90
CYLINDER BLOCK INSPECTION .....	3-90
DISASSEMBLE THE PISTON .....	3-91
PISTON MEASUREMENT .....	3-92
MEASURING PISTON RING GROOVE CLEARANCE .....	3-93
PISTON RING GROOVE WIDTH .....	3-93
PISTON RING THICKNESS .....	3-93
MEASURE THE PISTON PIN .....	3-94
MEASURE THE CLOSED GAP OF THE PISTON RING .....	3-94
CONNECTING ROD MEASUREMENT .....	3-94
PISTON RING INSTALLATION .....	3-95
PISTON CONNECTING ROD ASSEMBLY .....	3-95
CYLINDER BLOCK ASSEMBLY.....	3-96
<b>CYLINDER PRESSURE MEASUREMENT .....</b>	<b>3-97</b>

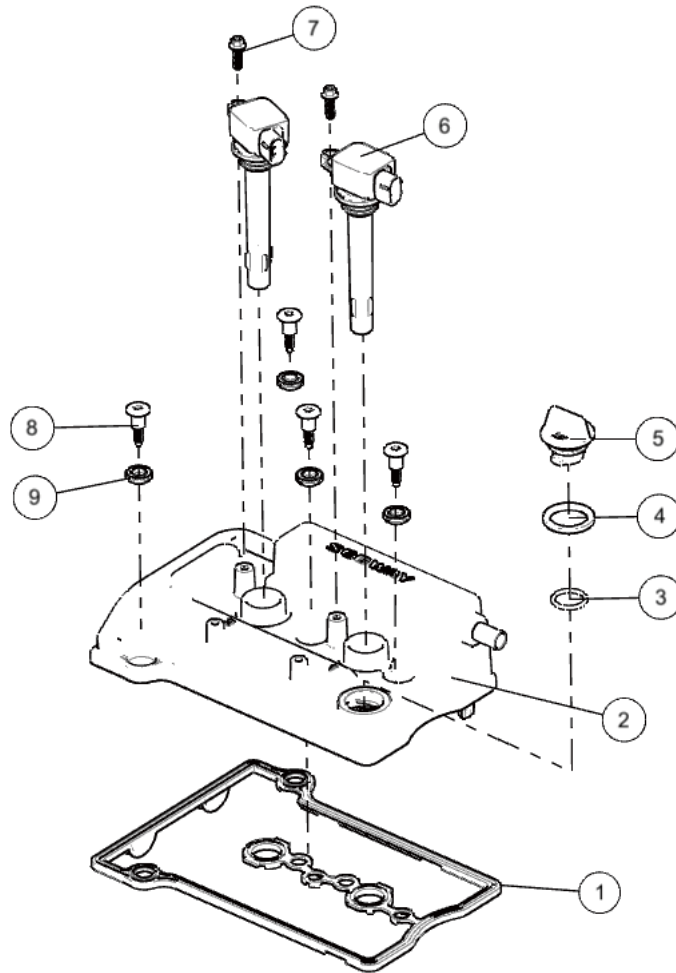
EXPLODED VIEW



# CYLINDER HEAD, CYLINDER, PISTON

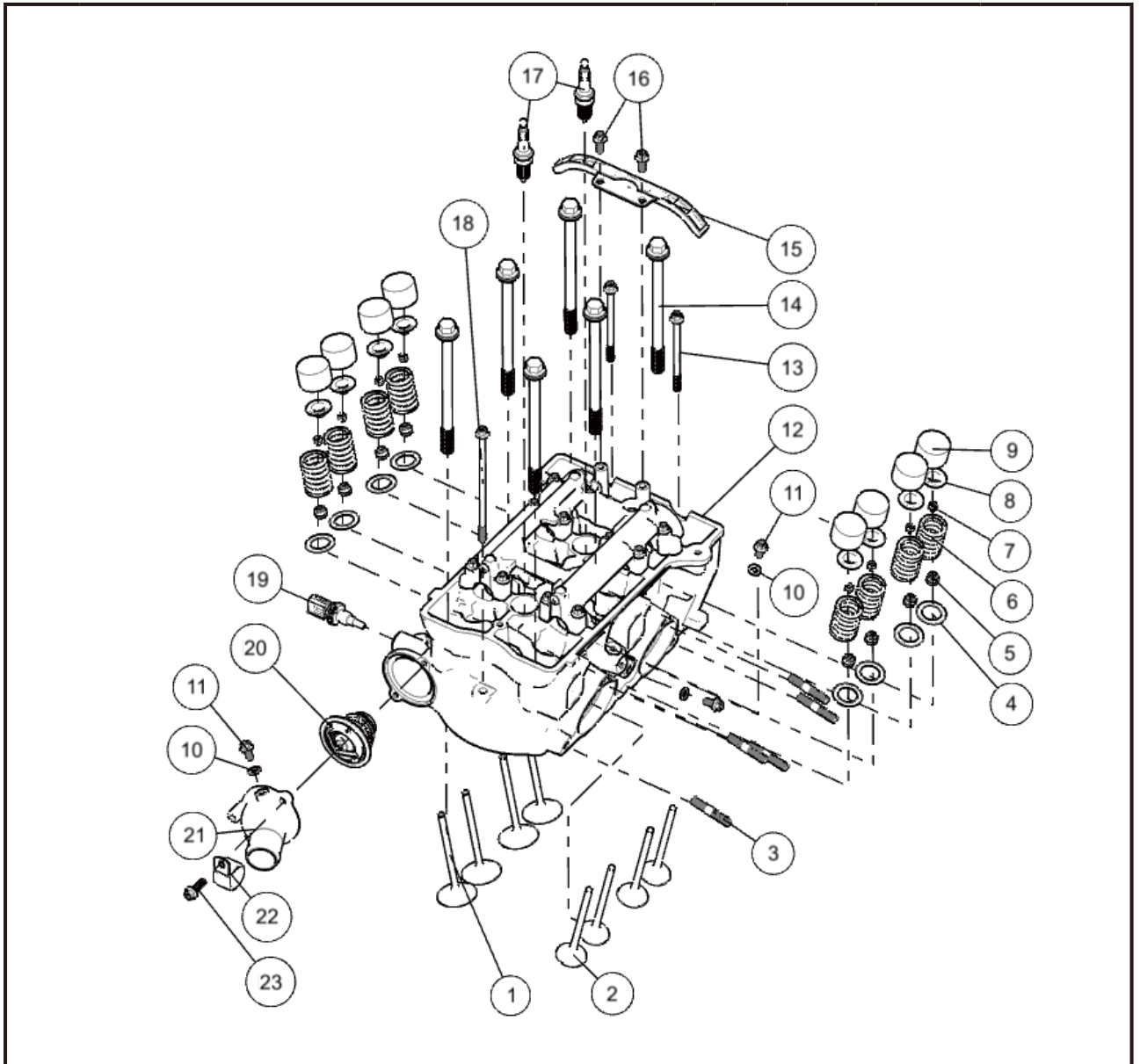
SEGWAY AT10

## EXPLOSIVE VIEW OF CYLINDER HEAD COVER SUB-ASSEMBLY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Valve cover gasket				
2	Cylinder head cover sub assembly				
3	O-ring 22×3				
4	Oil fill cap seal				
5	Oil fill cap				
6	Ignition coil				
7	Bolt m6×20	10	1.0	89 in·lb	
8	Valve cover bolt	10	1.0	89 in·lb	
9	Rubber isoator				

## EXPLOSIVE VIEW OF CYLINDER HEAD SUB-ASSEMBLY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Exhaust valve				
2	Intake valve				
3	Stud m8x43				
4	Valve spring seat				
5	Valve stem seal				
6	Valve spring				
7	Valve keeper				
8	Valve retainer				
9	Valve tappet				

# CYLINDER HEAD, CYLINDER, PISTON

SEGWAY AT10

10	Gasket 6				
11	Bolt m6×12	10	1.0	89 in•lb	
12	Cylinder head assy	10	1.0	89 in•lb	
13	Bolt m6×90				
14	Cylinder head bolt				S
15	Fixed cam chain guide				
16	Bolt m6×16	10	1.0	89 in•lb	
17	Spark plug(torch)	11	1.1	97 in•lb	
18	Bolt m6×135	10	1.0	89 in•lb	
19	Water temperature sensor	12	1.2	106 in•lb	
20	Thermostat assembly(74-87)				
21	Thermostat cover				
22	Hose clamp				
23	Bolt m6×20	10	1.0	89 in•lb	

G: Use grease suitable for oil seals and O-rings

L: Use fastening agent.

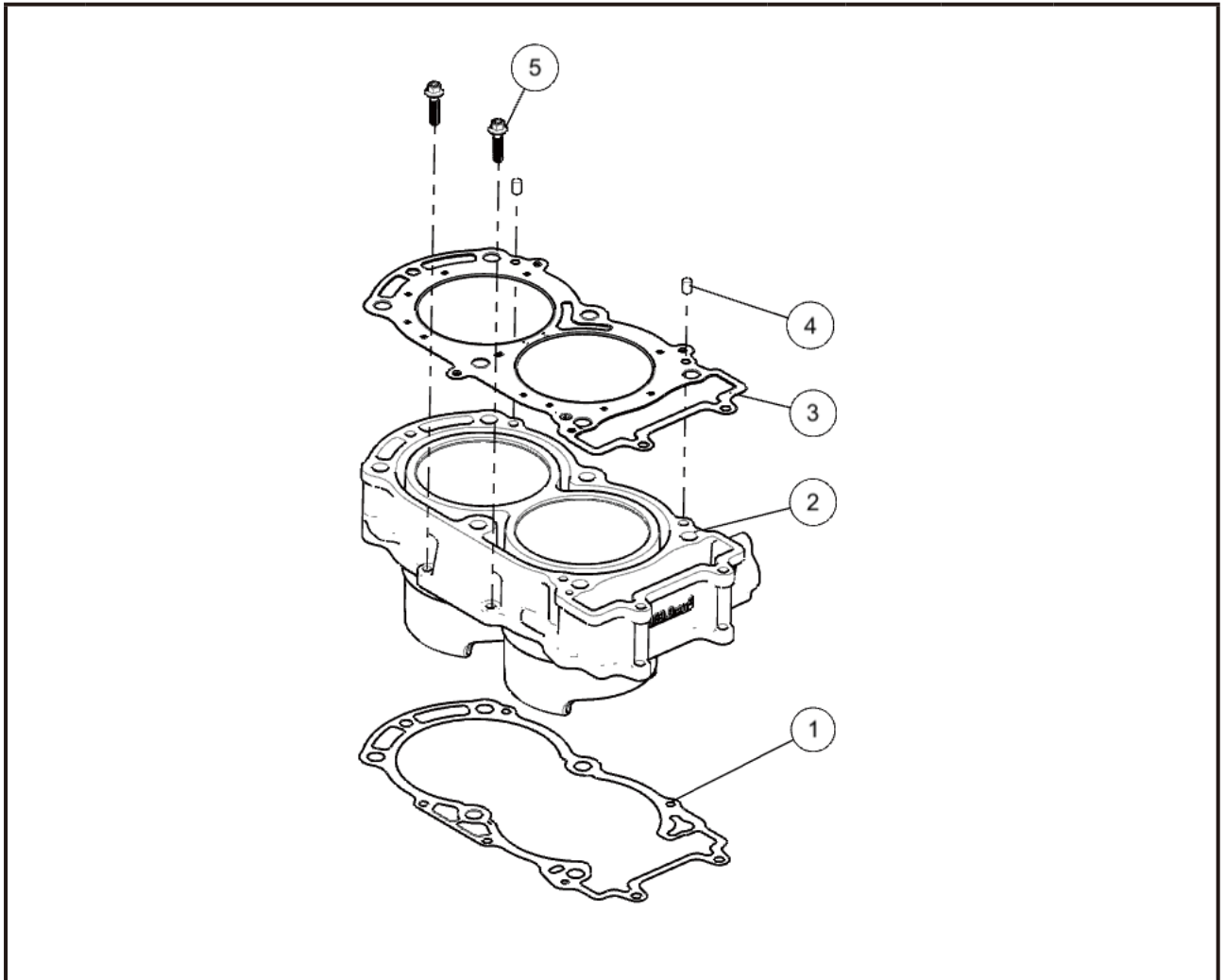
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

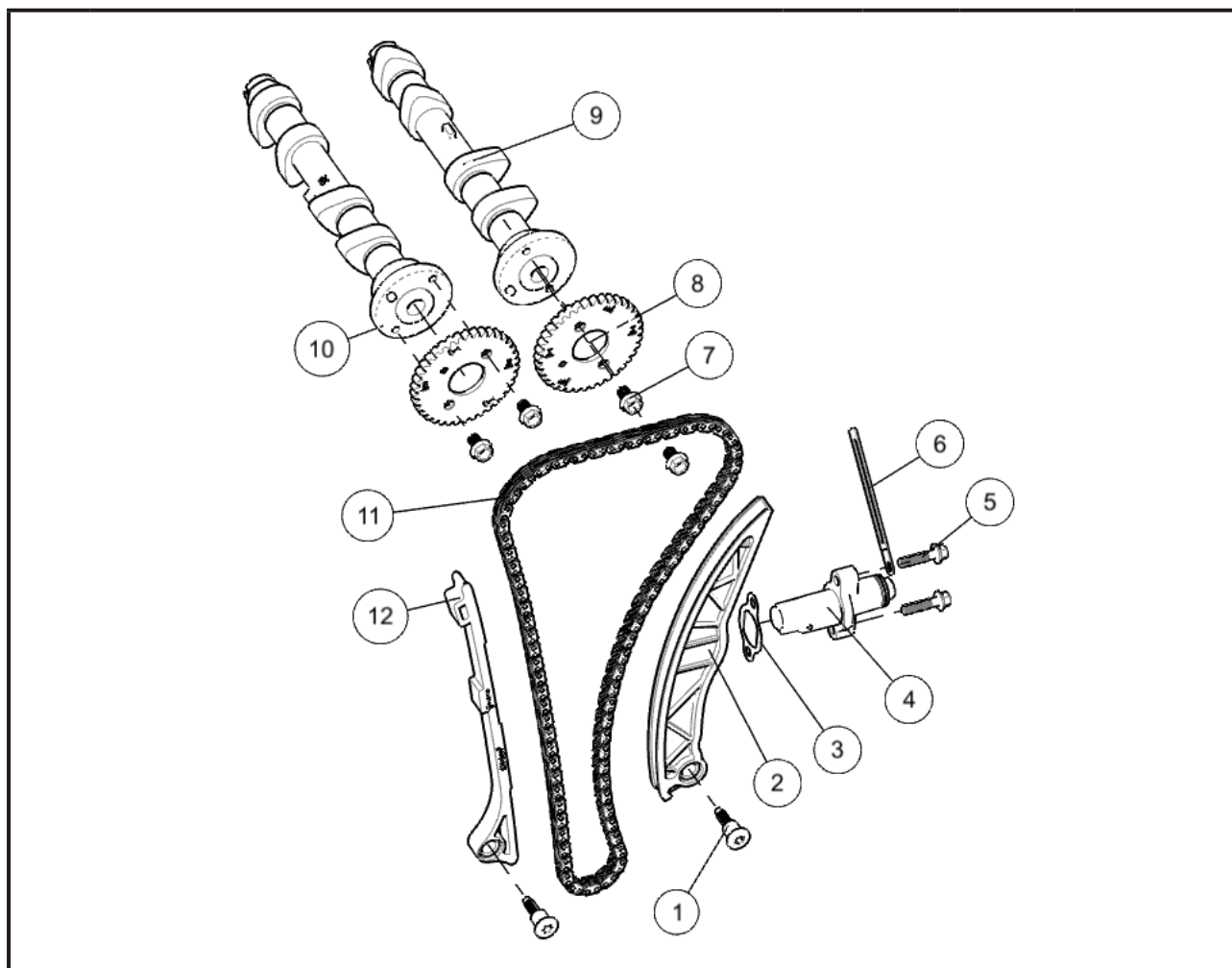
R: Spare parts

## EXPLOSIVE VIEW OF CYLINDER SUB-ASSEMBLY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Cylinder gasket				
2	Cylinder block				
3	Cylinder head gasket				
4	Dowel pin 6x 10				
5	Bolt m6×25	10	1.0	89 in·lb	

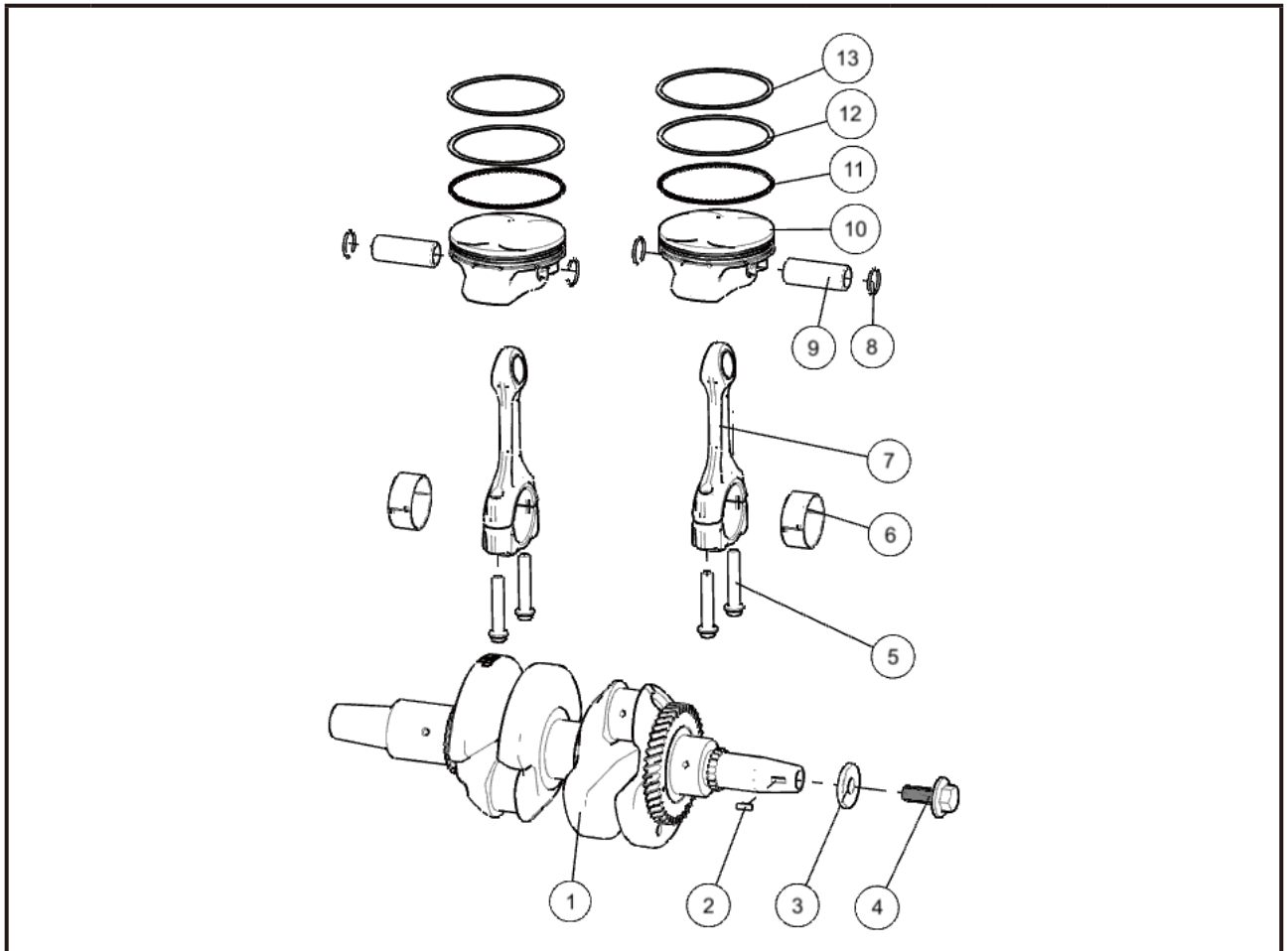
### EXPLOSIVE VIEW OF VALVE MECHANISM



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon socket pan head stepped bolts				
2	At10 chain tensioning plate				
3	Tensioner gasket				
4	Tensioner				
5	Bolt m6×25	10	1.0	87 in·lb	
6	Hose clamp				
7	Bolt m6×12	18	1.8	87 in·lb	L
8	Cam sprocket				
9	Intake cam				
10	Exhaust cam				
11	Timing chain				
12	At10 chain guide plate assembly				

L: Use non-permanent locking agent. (thread glue)

## EXPLOSIVE VIEW OF PISTON CONNECTING ROD ASSEMBLY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	At10 crankshaft parts				
2	Semicircular key				
3	Flat washer 12.5x36x4.8				
4	Bolt m12x1.25x30-lh	150	15.3	111	
5	Connecting rod bolt m9				
6	Connecting rod bearing				EO
7	Link assembly m9				
8	Piston pin retaining ring				
9	Piston pin				EO
10	Piston				
11	Oil ring combination				
12	Second gas ring				
13	First gas ring				

Note: Tightening torque corresponding to No. 5: 5N · m 20N · m 110 °  
 EO: Apply engine oil

### TECHNICAL PARAMETERS

Item	Standard	Limit
Cylinder head:		
Cylinder pressure value (use range)		
Electric starter	1.1 ~ 1.3 MPa (11~13 kgf/cm <sup>2</sup> , 159~188 psi)	---
Deformation of cylinder head	---	0.1 mm (0.004 in.)
Cylinder head height	120.5 ± 0.03 mm (4.7441" ± 0.0012")	---
Seat ring seal width-exhaust	1.5 ~ 1.6 mm (0.0591" ~ 0.0630")	1.9 mm (0.0748")
Seat ring seal width-intake	1.0 ~ 1.1 mm (0.0394" ~ 0.0433")	1.4 mm (0.0551")
Seat angle	30.0° ± 1.5° / 45.0° ± 0.5° / 60.0° ± 1.5°	---
Inner diameter of valve guide	5.500 ~ 5.512 mm (0.2165" ~ 0.2170")	---
Valve spring:		
Free length of valve spring	42.5 mm (1.6732" )	41.4 mm (1.6299" )
Valve:		
Valve clearance (cold state):		
exhaust	0.20 ~ 0.25 mm (0.0079" ~ 0.0098")	---
Intake	0.10 ~ 0.15 mm (0.0039" ~ 0.0059")	---
Bent valve stem	---	TIR 0.05 mm (0.020")
Valve stem diameter:		
exhaust	5.455 ~ 5.470 mm (0.2147" ~ 0.2153")	
Intake	5.475 ~ 5.490 mm (0.2155" ~ 0.2161")	
Valve stem clearance:		
exhaust	0.030 ~ 0.060 mm (0.0011" ~ 0.0023")	
Intake	0.010 ~ 0.040 mm (0.0003" ~ 0.0015")	
Total length of valve stem:		
exhaust	96.50 mm (3.7835")	
Intake	95.50 mm (3.7598")	
Valve/valve guide clearance (swing method):		
exhaust	0.09 ~ 0.17 mm (0.0035" ~ 0.0067")	0.34 mm (0.0133")
Intake	0.03 ~ 0.11 mm (0.0012" ~ 0.0043")	0.25 mm (0.0110")

## TECHNICAL PARAMETERS

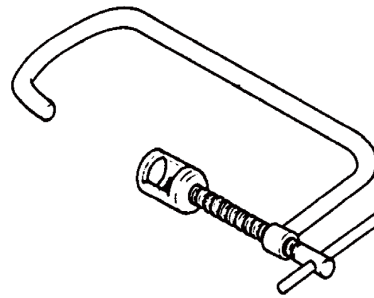
Item	Standard	Limit
Camshaft:		
Camshaft lobes height:		
exhaust	40.08 ± 0.04 mm (1.5780" ± 0.0015")	39.99 mm (1.5744")
Intake	40.36 ± 0.04 mm (1.5890" ± 0.0015")	40.27 mm (1.5854")
Camshaft journal diameter-all:	22.954 ~ 22.975 mm (0.9036" ~ 0.9045")	22.944 mm (0.9033")
Camshaft bearing bore-all:	23.000 ~ 23.021 mm (0.9055" ~ 0.9063")	23.044 mm (0.9072")
Camshaft oil clearance:	0.025 ~ 0.067 mm (0.0009" ~ 0.0026")	0.1 mm (0.0039")
Camshaft axial clearance:	0.10 ~ 0.25 mm (0.0039" ~ 0.0098")	0.4 mm (0.0157")
Camshaft journal runout	≤ 0.02 mm (0.0008")	TIR 0.1 mm (0.0039")
Piston:		
Piston outer diameter:		
I	92.951 ~ 92.959 mm (3.6594" ~ 3.6597")	92.858 mm (3.6558")
II	92.959 ~ 92.967 mm (3.6597" ~ 3.66")	92.885 mm (3.6569")
Piston pin hole inner diameter	20.009 ~ 20.018 mm(0.7877" ~ 0.7881")	20.05 mm(0.7893")
Piston pin:		
Piston pin outer diameter	20.000 ~ 20.005 mm(0.7873" ~ 0.7875")	19.98 mm(0.7866")
Piston ring		
Installation clearance:		
Top ring	0.20 ~ 0.35 mm (0.0079" ~ 0.0138")	0.5 mm (0.0197")
Second ring	0.35 ~ 0.55 mm (0.0138" ~ 0.0217")	0.7 mm (0.0276")
Oil ring	0.20 ~ 0.70 mm (0.0079" ~ 0.0276")	0.9 mm (0.0354")
Ring/groove gap:		
Top ring	0.020 ~ 0.060 mm (0.0007" ~ 0.0023")	0.12 mm (0.0047")
Second ring	0.020 ~ 0.060 mm (0.0007" ~ 0.0023")	0.12 mm (0.0047")
Piston ring groove width:		
Top ring	1.22 ~ 1.25 mm (0.0480" ~ 0.0492")	1.32 mm (0.0520")
Second ring	1.22 ~ 1.25 mm (0.0480" ~ 0.0492")	1.32 mm (0.0520")
Piston ring thickness:		
Top ring	1.17 ~ 1.19 mm (0.0461" ~ 0.0469")	1.10 mm (0.0433")
Second ring	1.17 ~ 1.19 mm (0.0461" ~ 0.0469")	1.10 mm (0.0433")

## SPECIAL TOOLS

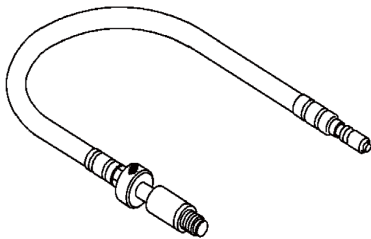
Cylinder pressure gauge



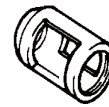
Valve spring presser assembly



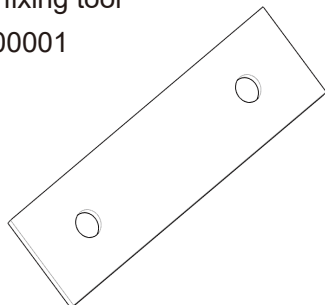
Cylinder pressure gauge connector,  
M10×1.0



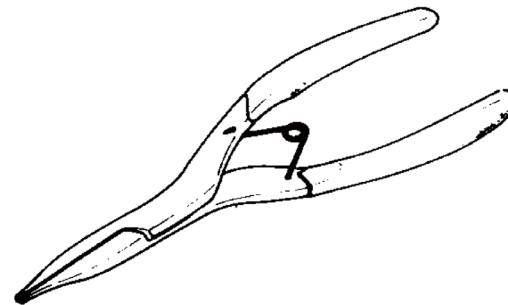
Valve spring press fitting head



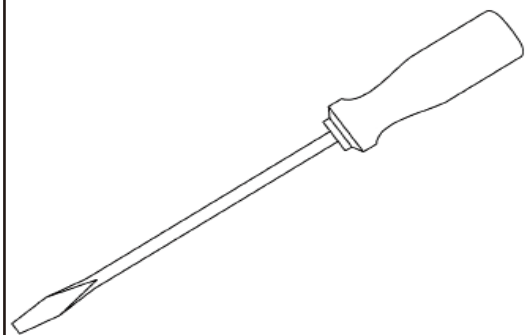
Camshaft fixing tool  
E02A4000001



Circlip pliers

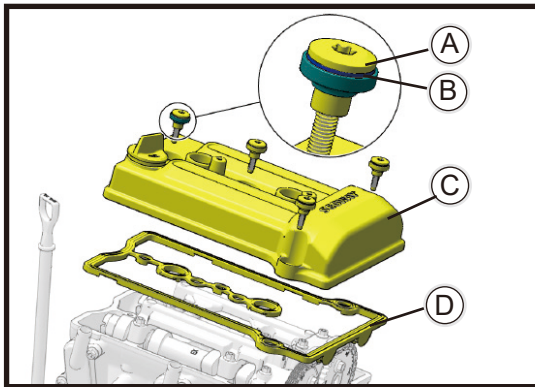


screwdriver



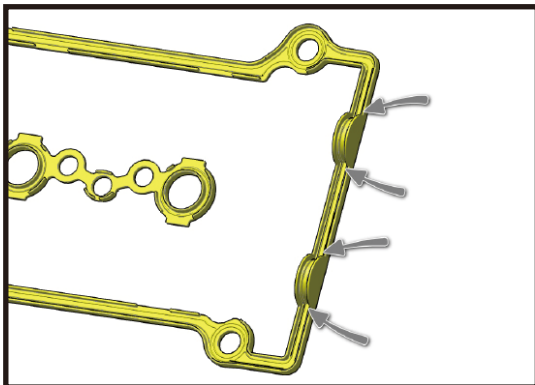
## CYLINDER HEAD COVER

### REMOVE CYLINDER HEAD COVER



- ◆ Disassembly:
  - 【A】 Hexagon socket pan head step bolts
  - 【B】 Bolt rubber sealing washer 10
  - 【C】 Cylinder head cover subassembly
  - 【D】 Cylinder head cover seal

### INSTALL THE CYLINDER HEAD COVER



- ◆ If oil leakage occurs, replace the gasket 【B】 and seal 【D】 .
- ◆ Apply silicone rubber sealant to the corners of the two raised blocks before the seal 【D】 is installed.
- ◆ Installation
  - 【A】 Hexagon socket head cap screws
  - 【B】 Bolt rubber sealing washer 10
  - 【C】 Cylinder head cover
  - 【D】 Cylinder head cover seal
- ◆ Tightening torque

Bolt
10 N•m (1.0 kgf•m, 89 in•lb)

## CAMSHAFT COVER / CAMSHAFT

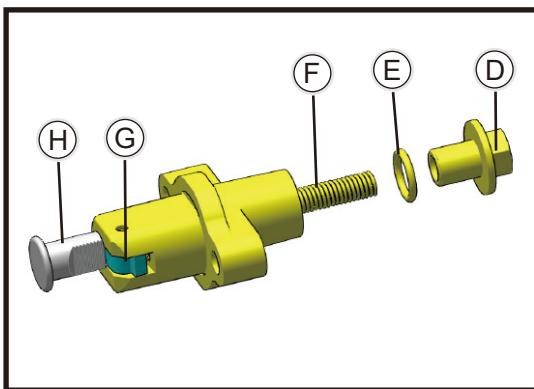
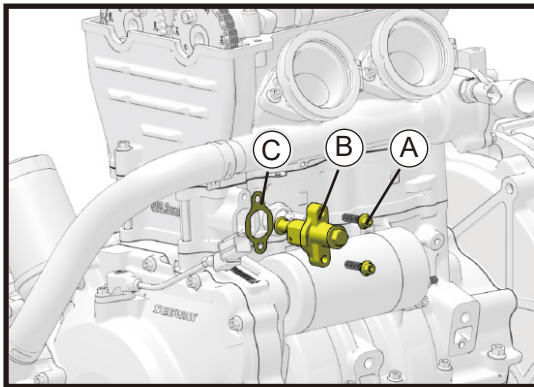
### REMOVE THE TENSIONER

#### ⚠ CAUTION

This is a non-return type timing chain tensioner. Once the push rod of the tensioner extends out of the tensioning chain, it cannot return to the initial position. Observe all the following rules:

When removing the tensioner, do not unscrew only part of the mounting bolts. Retightening the mounting bolts from this position may damage the tensioner and timing chain. After the bolts are loosened, the tensioner must be removed according to the instructions in "Timing Chain Tensioner Installation" and returned to its position.

After the tensioner is removed, do not turn the crankshaft. This may change the timing position and damage the valve



#### ◆ Disassembly:

【A】 Bolt M6×25

【B】 Tensioner combination

【C】 Tensioner gasket

### INSTALL THE TENSIONER

◆ Remove the tensioner adjusting hole bolt 【D】 , remove the O-ring 【E】 and the tension rod spring 【F】 .

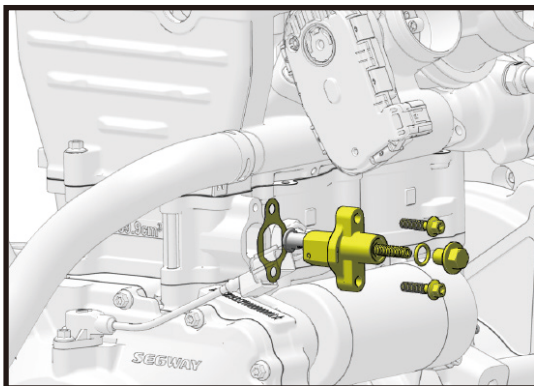
◆ Toggle the locking block 【G】 , and press the adjusting rod 【H】 into the tensioner.

◆ Replace with a new tensioner gasket 【C】 .

◆ Align the tensioner with the installation hole and install it, and screw in the tensioner bolt 【A】 .

◆ Put 【E】 on the bolt 【D】 , and install the spring 【F】 and bolt 【D】 in sequence.

◆ Tightening torque



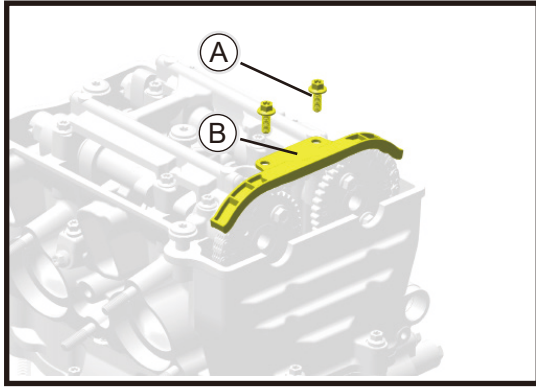
Chain tensioner mounting bolt

10 N•m (1.0 kgf•m, 89 in•lb)

Tensioner adjusting hole bolt

12 N•m(1.2 kgf•m,8.8 ft•lb)

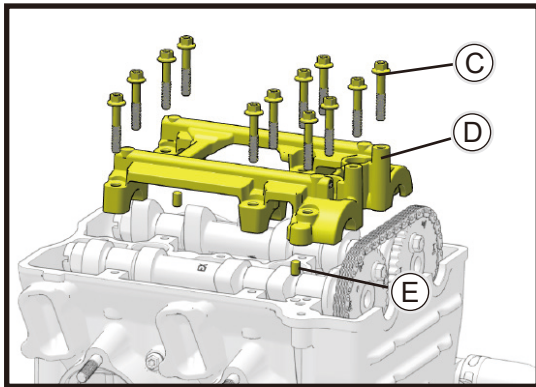
## DISASSEMBLE CAMSHAFT



◆ Disassembly

【A】 Bolt M6×16

【B】 Chain guide plate assembly II



◆ Disassembly

【C】 Bolt M6×35

【D】 Camshaft cover assembly

【E】 Cylindrical pin 6×10

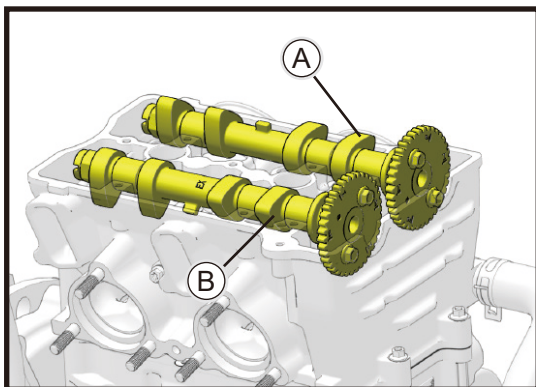
### TIPS

Loosen the bolts that secure the camshaft cover evenly, and carefully lift the camshaft cover from the camshaft.

◆ Remove the chain from the camshaft so that the camshaft can be taken out.

### TIPS

Be careful when removing the camshaft from the cylinder head



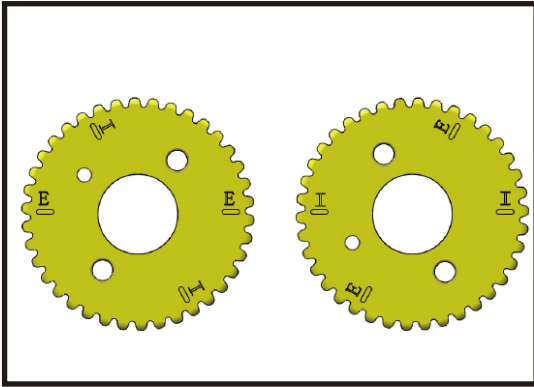
◆ Use a tool similar to an S-shaped hook to hang the timing chain. Prevent the chain from falling into the crankcase.

### TIPS

There is an integrated guide block on the crankcase to prevent the chain from falling off the crankshaft.

◆ Mark the intake camshaft 【A】 and exhaust camshaft 【B】 to ensure correct assembly.

### CAMSHAFT SPROCKET INSPECTION



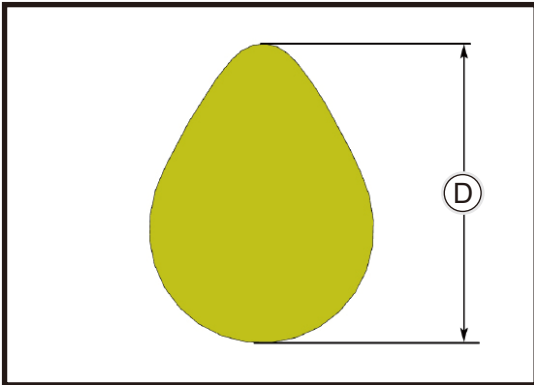
- ◆ Check whether the camshaft sprocket teeth are worn or damaged. If wear or damage is found, replace the timing chain and sprocket with a new one.

### CAMSHAFT / CAMSHAFT LOBE INSPECTION

- ◆ Visually check whether the camshaft lobe is worn or damaged.
- ◆ Use a micrometer to measure the height of the camshaft lobe **【D】**.

Camshaft lobe height:

	Standard	Limit
exhaust	40.08 ± 0.04 mm (1.5780" ± 0.0015")	39.99 mm (1.5744")
intake	40.36 ± 0.04 mm (1.5890" ± 0.0015")	40.27 mm (1.5854")



- ◆ Visually inspect each camshaft journal for scratches, wear or damage.
- ◆ Measure the journal value of the camshaft with a micrometer and compare with the specification.

Standard	Limit
22.954 ~ 22.975 mm(0.9036" ~ 0.9045")	22.944 mm (0.9033")

### TIPS

If the camshaft is damaged or the amount of wear on any part exceeds the limit, the camshaft should be replaced

- ◆ Assemble the camshaft cover separately to measure the bore of the camshaft bearing. Tighten the bolts in the specified order.

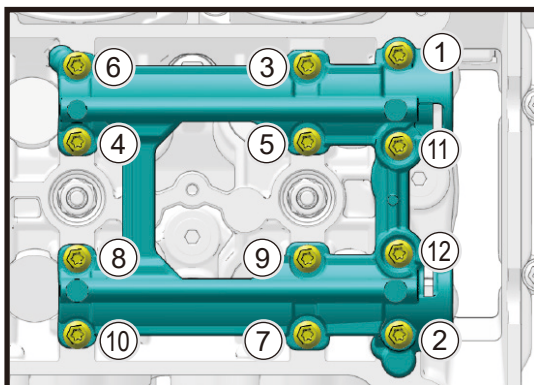
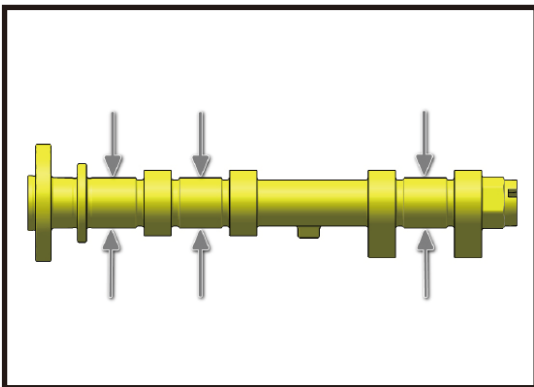
#### Camshaft cover bolt

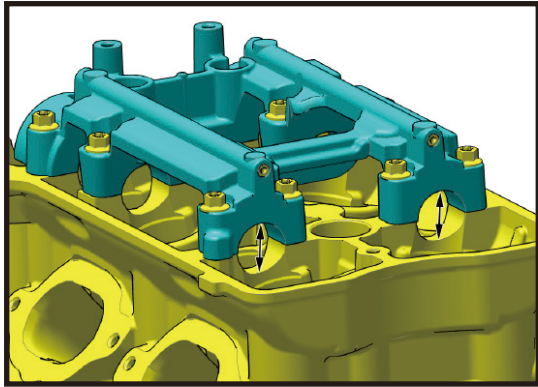
10 N•m (1.0 kgf•m, 89 in•lb)

Standard	Limit
23.000 ~ 23.021 mm(0.9055" ~ 0.9063")	23.044 mm (0.9072")

### TIPS

If the camshaft bearing bore is damaged or the amount of wear exceeds the limit, please replace the cylinder head assembly



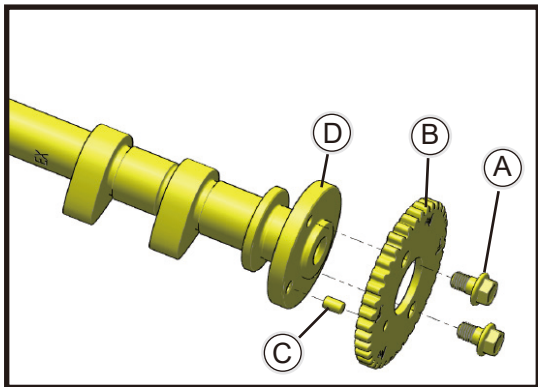


- ◆ Calculate the clearance value by subtracting the camshaft shaft diameter from the camshaft bearing bore, and compare it with the specification

Standard	Limit
0.025~ 0.067 mm (0.0009" ~ 0.0026")	0.10 mm (0.0039")

**⚠ CAUTION**

Cylinder head and camshaft cover are combined processing and must be replaced as a set

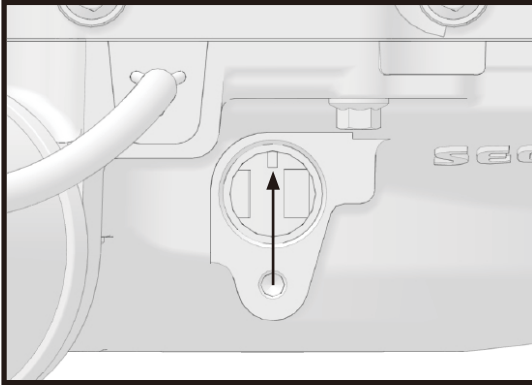


### INSTALL CAMSHAFT SPROCKET

- ◆ Install the cylindrical pin 【C】 into the camshaft 【D】 .
- ◆ Align the position of the pin hole and install the timing sprocket 【B】 , with the symbol on the side facing outward.
- ◆ Apply thread tightening agent to the bolt 【A】 , and tighten the bolt according to the torque.
- ◆ Tightening torque

Sprocket bolt
19 N•m (1.9 kgf•m, 14 ft•lb)

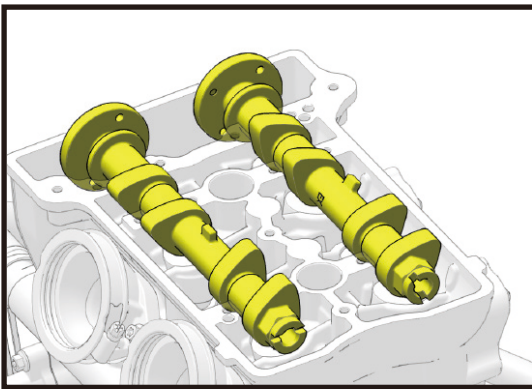
## CAMSHAFT INSTALLATION / TIMING ADJUSTMENT



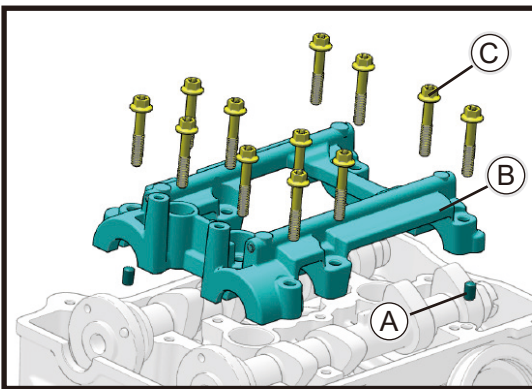
### ⚠ CAUTION

If any parts in the valve train have been replaced, please refer to the valve clearance adjustment procedure sequence.

### Camshaft installation/timing adjustment



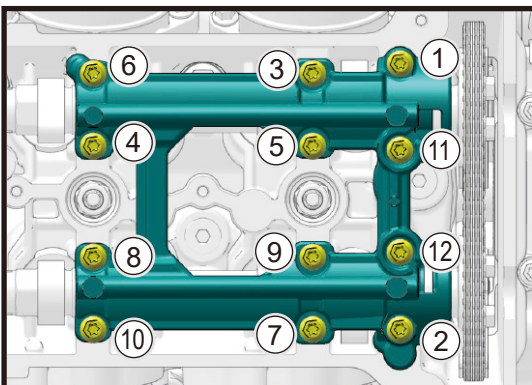
- ◆ Rotate the engine so that the top dead center (TDC) mark of the magneto rotor is aligned or in the center of the crankshaft position sensor (CPS) mounting hole.
- ◆ In accordance with the intake and exhaust camshaft marks made during disassembly. If you install a new camshaft or the camshaft is not marked, you can compare it with the electronic catalog according to the part number on the camshaft.
- ◆ Before installation, lubricate all camshaft tips and journal surfaces with engine oil.
- ◆ Put the intake and exhaust camshafts into the corresponding cylinder head bearing seats. Turn the camshaft so that the cam lobe points outwards.
- ◆ Installation:

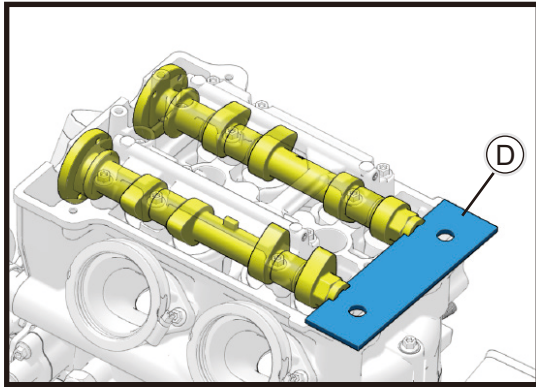


- 【A】 Cylindrical pin 6×10
- 【B】 Camshaft cover assembly
- 【C】 Bolt M6×35

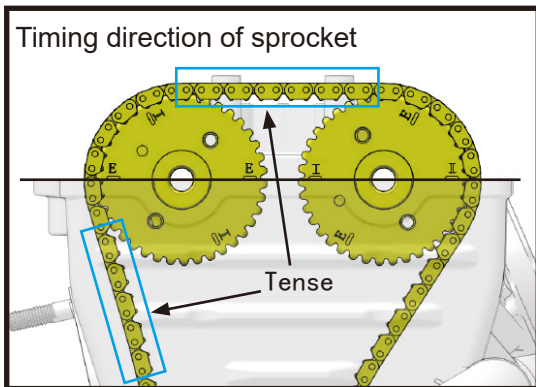
- ◆ Tighten the camshaft cover mounting bolts 【C】 in order.
- ◆ Tightening torque

Bolt M6
10 N•m (1.0 kgf•m, 89 in•lb)



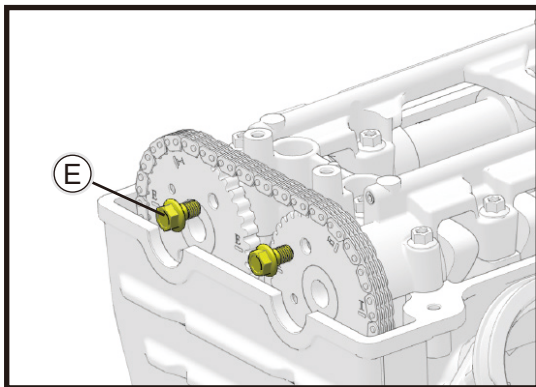


- ◆ Insert the camshaft fixing tool **【D】** into the camshaft end groove shown in the figure to fix the intake and exhaust camshafts. If necessary, use an open-end wrench to turn the camshaft.
- ◆ According to the method in the first step, confirm that the top dead center mark has not changed.
- ◆ Lift the timing chain and snap the sprocket into the chain. At the same time, the side of the sprocket marked with "I" and "E" is outside.
- ◆ Keep the chain tensioned as shown in the figure, install the sprocket on the camshaft, adjust the sprocket so that the top surface of the cylinder head is flush with the mark on the sprocket



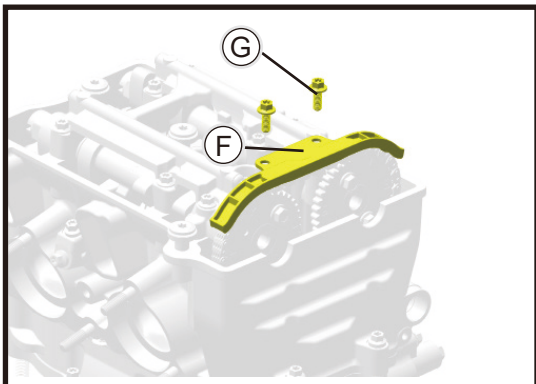
**⚠ CAUTION**

The "I" mark on the intake camshaft sprocket is aligned with the top surface of the cylinder head, and the "E" mark on the exhaust camshaft sprocket is aligned with the top surface of the cylinder head. Install the exhaust camshaft sprocket first (opposite the cam chain tensioner) to ensure accurate cam timing.



- ◆ Screw a bolt **【E】** into each sprocket and tighten it according to the torque. Apply thread tightening agent to the thread of the bolt **【E】** .
- ◆ Install the camshaft chain tensioner (see Install the tensioner).
- ◆ Rotate the crankshaft at an appropriate angle, insert the bolt **【E】** into the other bolt hole of the sprocket, and tighten it according to the torque. Apply thread tightening agent to the thread of the bolt **【E】** .

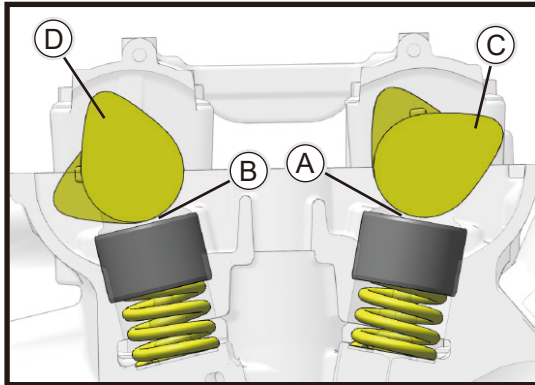
<b>Bolt M6</b>
10 N•m (1.0 kgf•m, 89 in•lb)



- ◆ Installation
- 【F】** Chain guide plate assembly II
- 【G】** Bolt M6×16
- ◆ Tightening torque

<b>Bolt M6</b>
10 N•m (1.0 kgf•m, 89 in•lb)

### VALVE CLEARANCE ADJUSTMENT



#### ⚠ CAUTION

Before installing the camshaft or finally assembling the engine, be sure to check the valve clearance

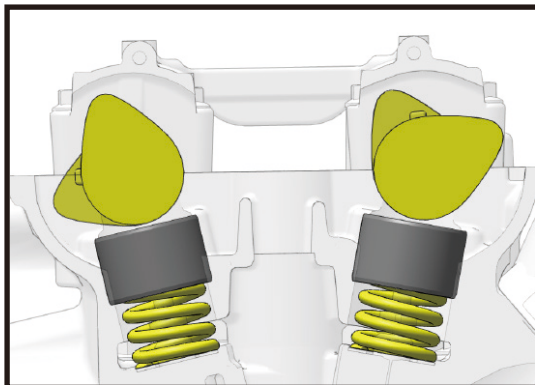
- ◆ Camshaft installation (see camshaft installation/timing adjustment)
- ◆ Camshaft cover installation (see camshaft installation/timing adjustment)
- ◆ Rotate the camshaft so that the lobes **【C】** and **【D】** of the cam above the valve to be measured face up.
- ◆ Use a thickness gauge (feel gauge) to measure the valve clearance **【A】** and **【B】**. If the gap exceeds the requirement, record the measurement result.
- ◆ Repeat the above steps until all valves are checked

Valve clearance requirements (cold)	
exhaust:	0.2 ~ 0.25mm (0.0079" ~ 0.0098")
Air intake:	0.1 ~ 0.15mm (0.0039" ~ 0.0059")

- ◆ If the valve clearance measurement does not meet the requirements, please remove the camshaft cover and camshaft.
- ◆ Remove the valve lifter that does not meet the valve clearance requirements.

#### TIPS

In order to ensure that the parts can be installed back to the original position, the matching parts should be put together and arranged according to their position on the cylinder head. The removed parts should be marked or placed on an arranged shelf.



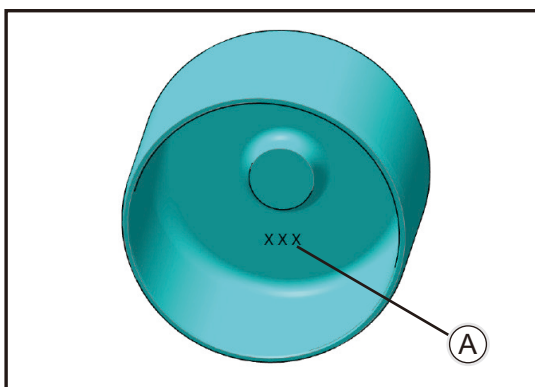
- ◆ Record the 3 digits **【A】** at the bottom of the tappet.
- ◆ Refer to the tappet selection matrix on the following page to select a suitable tappet.
- ◆ Install the selected tappet.
- ◆ Repeat the above steps until all valve clearances are adjusted.
- ◆ Reinstall the camshaft and camshaft cover, and tighten the bolts as required.
- ◆ Tightening torque:

Bolt (M6)

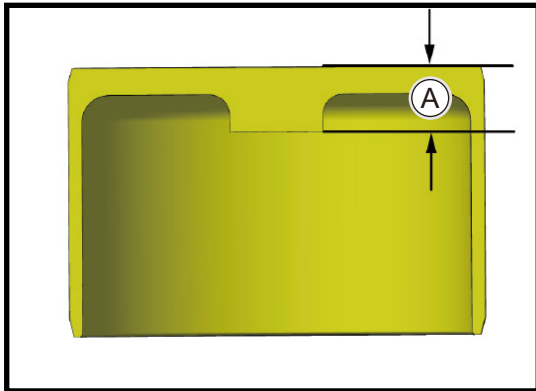
10 N•m (1.0 kgf•m, 89 in•lb)

- ◆ Measure and confirm that each valve clearance is within the required range.

If the valve clearance is not within the required range, repeat this procedure.



## Selection of valve tappet



### TIPS

Valve clearance specifications and measured valve clearance are calculated in millimeters (mm). A 480 tappet means that the center thickness of the tappet **【A】** is 4.80mm.

The valve tappet part number is F01A20007XXX, and "XXX" corresponds to the specified tappet thickness. As shown in the following table:

### Optional tappet specifications

Part number	F01A20007-	001	002	003	004	005	006	007	008	009	010
	3 digits	480	482	484	486	488	490	492	494	496	498
Part number	F01A20007-	011	012	013	014	015	016	017	018	019	020
	3 digits	500	502	504	506	508	510	512	514	516	518
Part number	F01A20007-	021	022	023	024	025	026	027	028	029	030
	3 digits	520	522	524	526	528	530	532	534	536	538
Part number	F01A20007-	031	032	033	034	035	036	037	038	039	040
	3 digits	540	542	544	546	548	550	552	554	556	558
Part number	F01A20007-	041	042	043	044	045	046	047	048	049	050
	3 digits	560	562	564	566	568	570	572	574	576	578



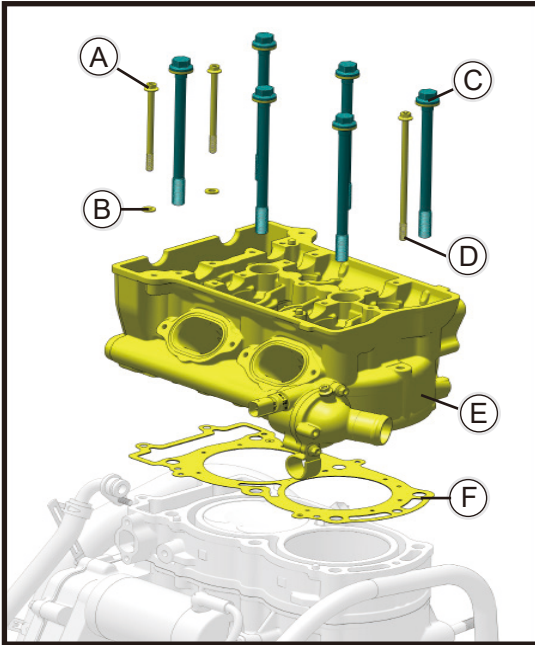


## CYLINDER HEAD

### REMOVE CYLINDER HEAD

#### TIPS

Cylinder head maintenance can be performed on the entire vehicle.



#### ◆ Disassembly:

【A】 Bolt M6×90

【B】 Aluminum washer 6

【C】 Cylinder bolt M11×1.25×150

【D】 Bolt M6×135

◆ Remove the cylinder head 【E】 and, if necessary, use a plastic hammer to gently tap the cylinder head to loosen it for easy removal.

◆ Remove the cylinder head gasket 【F】 .

### CYLINDER HEAD INSPECTION

◆ Thoroughly clean the cylinder head underside of the cylinder head of any head gasket material and traces of carbon buildup left on the underside of the cylinder head.

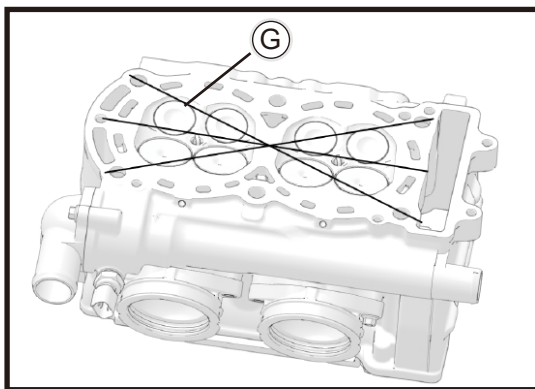
#### Check for cylinder head distortion

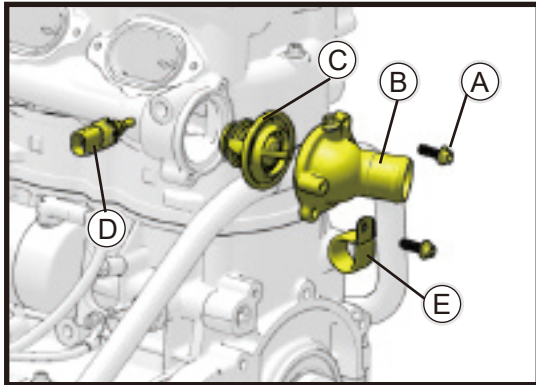
◆ Keep the bottom surface of the cylinder head clean.

◆ Place a straightedge 【G】 on the bottom surface of the cylinder head.

◆ Measure the distance between the straightedge 【G】 and different positions of the cylinder head with a plug gauge.

Cylinder head deformation limit: 0.1 mm (0.0039"), if the cylinder head deformation exceeds the limit, replace the cylinder head.



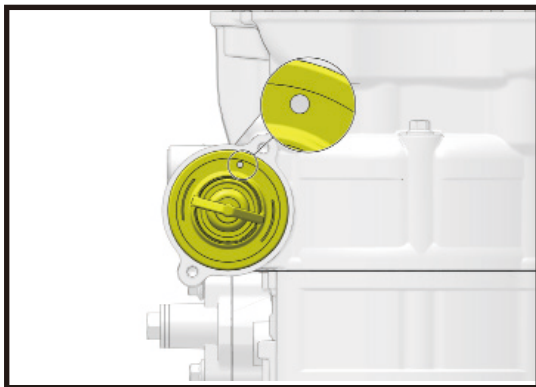


## REMOVE THERMOSTAT, WATER TEMPERATURE SENSOR

◆ Disassembly:

- 【A】 Bolt M6×20
- 【B】 Thermostat cover
- 【C】 Thermostat
- 【D】 Water temperature sensor assembly
- 【E】 Water hose clamp

## INSTALLATION OF THERMOSTAT, WATER TEMPERATURE SENSOR

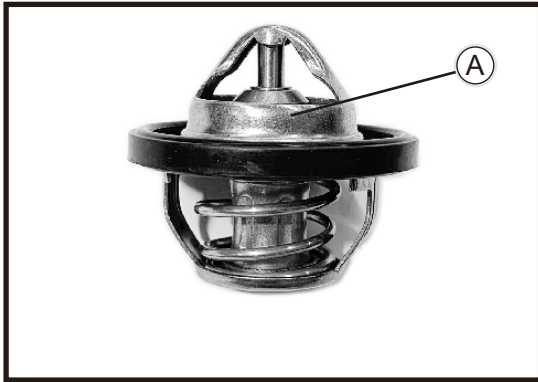


- ◆ Install the thermostat 【C】 , install with the thermostat vent hole up and aligned with the notch in the cylinder head.
- ◆ Install the thermostat cover 【B】 , install the hose clamp 【E】 and tighten the bolt 【A】 .
- ◆ Install the water temperature sensor assembly 【D】 and apply thread sealant during installation.
- ◆ Tightening torque

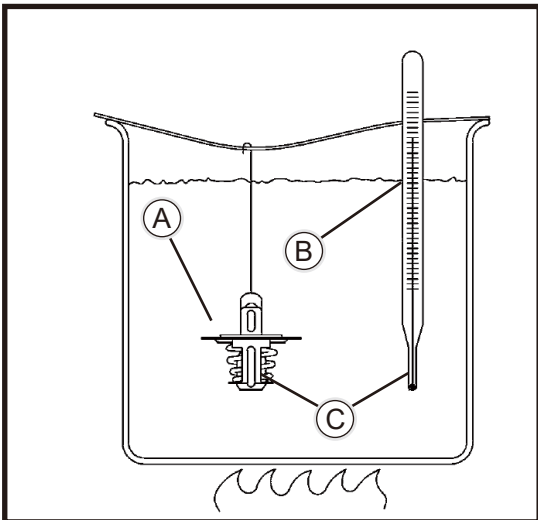
Thermostat cover bolts
10 N•m (1.0kgf•m, 89 in•lb)

Water temperature sensor assembly
12 N•m (1.2kgf•m, 107 in•lb)

### THERMOSTAT CHECK



- ◆ Remove the thermostat and check the thermostat 【A】 at room temperature.
- ◆ If the thermostat opens, replace it with a new one.
- ◆ Check the thermostat opening temperature by placing the thermostat 【A】 and an accurate thermometer 【B】 into the water with the temperature sensing part adjusted to the same height.
- ◆ Gradually increase the temperature of the water while gently stirring the water to even out the temperature.
- ◆ The thermostat opens at a temperature of 74 to 87°C (165.2~188.60F)
- ◆ If the measurement is out of range, replace the thermostat.

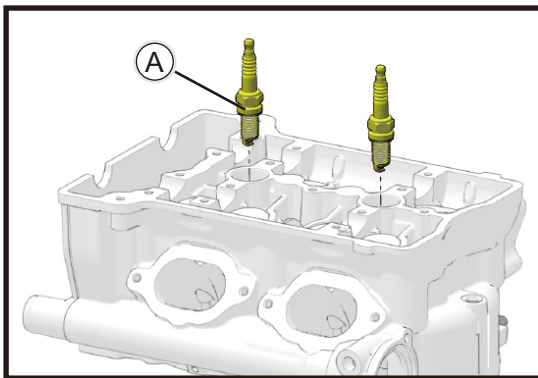


### REMOVE SPARK PLUG

- ◆ Removal:
- 【A】 Spark Plug

**⚠ CAUTION**

Never let a spark plug fall on a hard surface. Such an impact can damage the part.



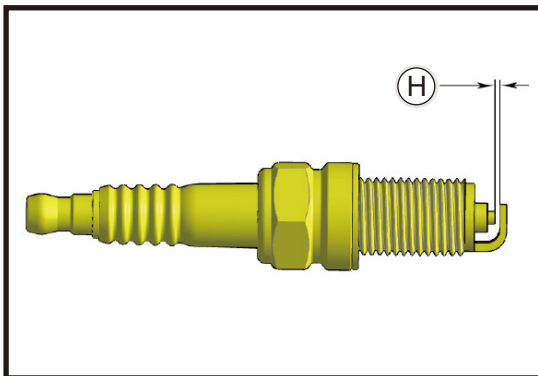
**TIPS**

Cover the spark plug hole with a rag when removing the spark plug to prevent anything from falling into the combustion chamber.

### INSTALLING THE SPARK PLUG

- ◆ Apply rust inhibitor to the spark plug threads.
- ◆ Install the spark plug.
- ◆ Tighten the torque:

spark plugs
11 N•m (1.1kgf•m, 97in•lb)



Spark Plug Inspection.

Spark plug electrode gap: 【H】 = 0.6 ~ 0.8

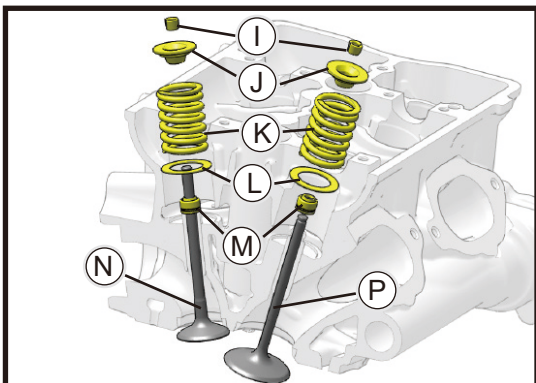
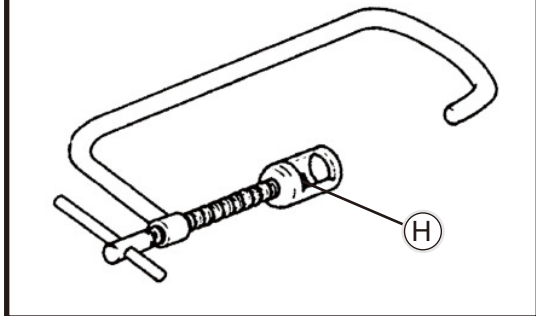
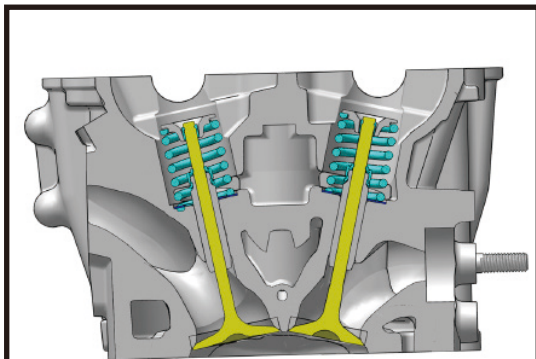
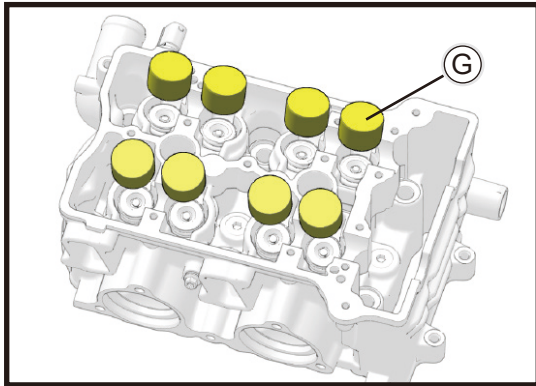
## REMOVE THE VALVE

**⚠ WARNING**

When disassembling and assembling the cylinder head or operating the valve spring, you need to wear goggles.

**TIPS**

In order to ensure that the parts can be installed back to the original position, the matching parts should be put together and arranged according to their position on the cylinder head. The removed parts should be marked or placed on an arranged shelf.

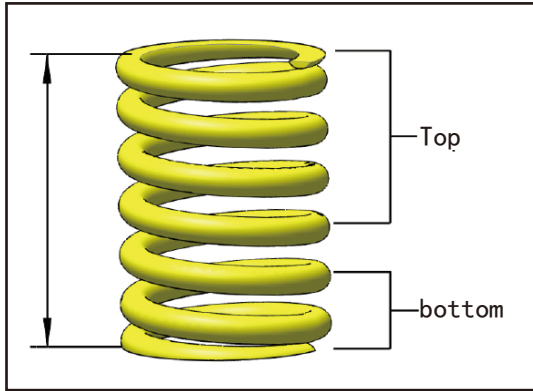


- ◆ Remove the valve lifter 【G】 from the cylinder head.
- ◆ Use the valve spring compressor 【H】 to press down the valve spring.
- ◆ Remove the valve lock clamp 【I】 .
- ◆ Slowly release the valve spring compressor and remove the compressor.
- ◆ Remove the lock clamp seat 【J】 , valve spring 【K】 , valve spring seat 【L】 and valve oil seal 【M】 .

**TIPS**

As long as the cylinder head is disassembled, the valve oil seal is replaced. Aging, cracking or abrasion of the valve oil seal will lead to increased oil consumption

- ◆ Lift the cylinder head, take out the valve 【N】 , and place it in an orderly manner so that it can be reinstalled in the same valve guide.
- ◆ Repeat the previous steps to remove the remaining valves.
- ◆ Clean the combustion chamber of the cylinder head and the bottom surface of the cylinder head.



- ◆ Measure the free length of each valve spring with a vernier caliper and compare it with the standard value.
- ◆ Free length of valve spring: standard: 1.726" (43.85 mm), service limit: 1.683" (42.75 mm)

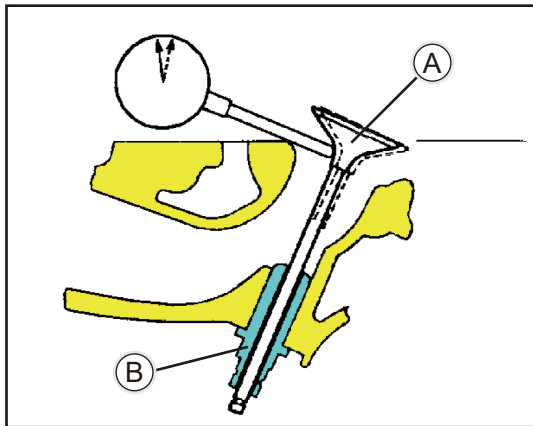
Standard	Limit
42.5 mm (1.6732")	41.4mm (1.6299")

### VALVE GUIDE / VALVE INSPECTION

- ◆ Valve stem clearance measurement:

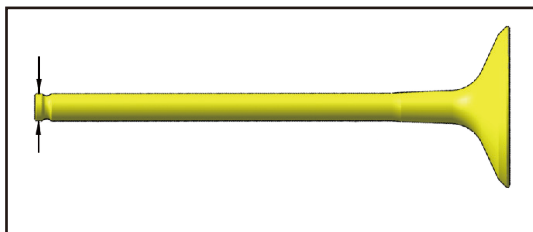
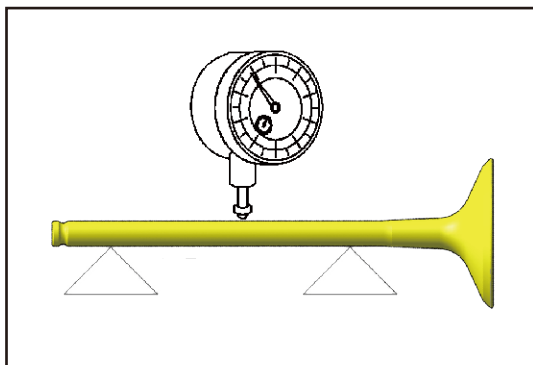
If there is no small aperture gauge, use the swing method to measure the gap between the valve and the valve guide and check the wear of the valve guide. The method is as follows.

- ◆ Insert a new valve **【A】** into the valve guide **【B】**, and place a dial indicator perpendicular to the valve stem on the valve stem, as close as possible to the cylinder head mating surface.
- ◆ Swing the valve lever to measure the valve/valve guide gap.
- ◆ Repeat the measurement in the direction at right angles to the first direction. If the reading exceeds the use limit, replace the cylinder head and camshaft cover assembly.



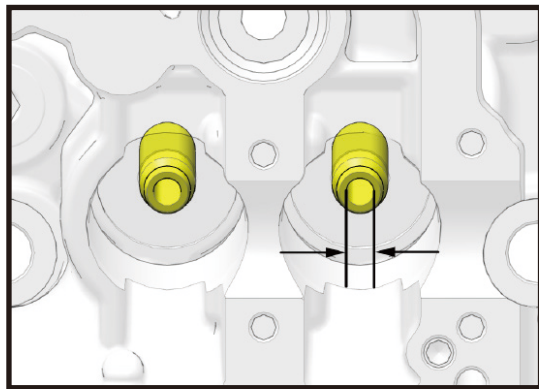
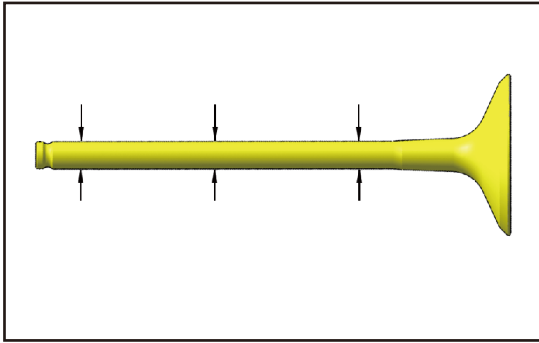
### TIPS

The reading is not the true gap between the valve and the valve guide, because the measurement position is above the guide.



Valve/valve guide clearance (swing method)		
	Standard	Limit
exhaust:	0.09 ~ 0.17 mm (0.0035" ~ 0.0067")	0.34 mm 0.0133"
Air intake:	0.03 ~ 0.11 mm (0.0012" ~ 0.0043")	0.28 mm 0.0110"

- ◆ Measure the beating, pitting and ablation of the valve stem. Check whether the valve rod is bent, clamp the valve on the machine tool or use a "V" block and measure it with a dial indicator.
- ◆ Check whether there is flaring, pitting, abrasion or damage at the end of the valve stem.
- ◆ Check whether there is flaring or abrasion at the lock clip groove.



## TIPS

If necessary, the valve can be re-dressed or ground. If it is severely worn, burned, bent or damaged, it must be replaced

- ◆ Use a micrometer to measure the diameter of the valve stem at three places, and then turn it 90° to measure again (a total of six measurements), and compare with the standard value.

Valve stem diameter:		
	Standard	Limit
exhaust	5.455 ~ 5.470 mm (0.2147" ~ 0.2153")	_____
intake	5.475 ~ 5.490 mm (0.2155" ~ 0.2161")	_____

- ◆ Measure the diameter of the top and bottom of the valve guide hole, and measure two directions at each position.

Valve guide aperture:	
5.500 - 5.515 mm (0.2165" ~ 0.2171")	

- ◆ Measure each valve and valve guide combination separately.

## TIPS

The valve guide cannot be replaced.

## COMBUSTION CHAMBER CLEANING

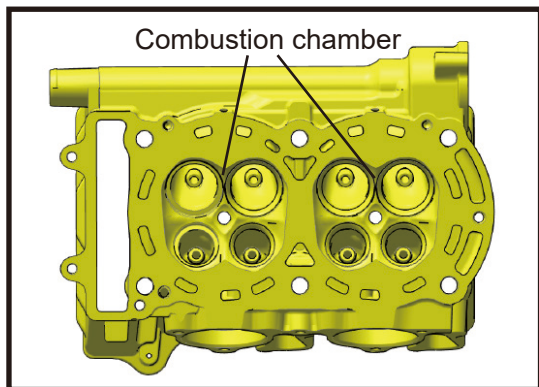
### ⚠ WARNING

Wear protective goggles when cleaning the combustion chamber.

- ◆ Clean all carbon deposits in the combustion chamber and valve seat area.
- ◆ Visually inspect the surface of the cylinder head gasket and the combustion chamber for cracks or damage. Pay close attention to the spark plug and seat ring area.

### ⚠ CAUTION

Do not use metal scrapers, thick wire brushes or abrasive cleaners to clean the cylinder head. May cause damage.



### SEAT RING REPAIR

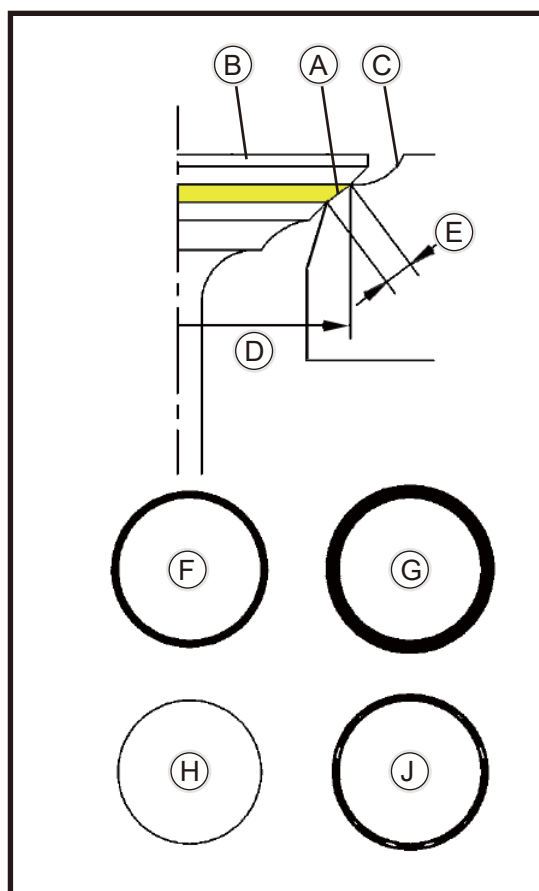
- ◆ Seat ring repair should be carried out by professionals who are proficient in cylinder head repair technology. Repair techniques vary, so please follow the valve repair equipment manufacturer's instructions. Do not over-grind the seat ring.

#### ⚠ WARNING

When disassembling and reassembling the cylinder head, wear goggles or face shield.

### SEAT RING INSPECTION

- ◆ Remove the valve.
- ◆ Check the contact surface **【A】** between the valve **【B】** and the seat ring **【C】**.
- ◆ Paint the seat ring.
- ◆ Push the valve into the valve guide.
- ◆ Use a grinding tool to press and rotate the valve relative to the seat ring.
- ◆ Take out the valve and check the pattern of the contact surface on the seat ring. The width of the entire circle must be appropriate.
- ◆ Measure the diameter of the outer ring of the contact surface on the seat ring **【D】**.
- ◆ If the outer diameter of the seat ring contact surface is too large or too small, repair the seat ring (see seat ring repair).



- 【F】** Good
- 【G】** Too wide
- 【H】** too narrow
- 【J】** Uneven

Outer diameter of seat ring contact surface	
exhaust	31.8 ~ 31.9mm (1.2520" ~ 1.2559")
intake	36.8 ~ 36.9mm (1.4488" ~ 1.4528")

#### TIPS

The valve stem and valve guide must be good, otherwise the check will be inaccurate.

- ◆ If the seat ring interface shape is not good, repair the seat ring (see seat ring repair).
- ◆ Use a vernier caliper to measure the width of the part without carbon deposits (bright part) on the seat ring **【E】**.

Width of contact surface of seat ring	
Exhaust	1.5 ~ 1.6mm (0.0591" ~ 0.0630")
intake	1.0 ~ 1.1mm (0.0394" ~ 0.0433")

If the width is too wide, too narrow or uneven, repair the valve seat (see valve seat repair)

## SEAT RING REPAIR (VALVE GRINDING)

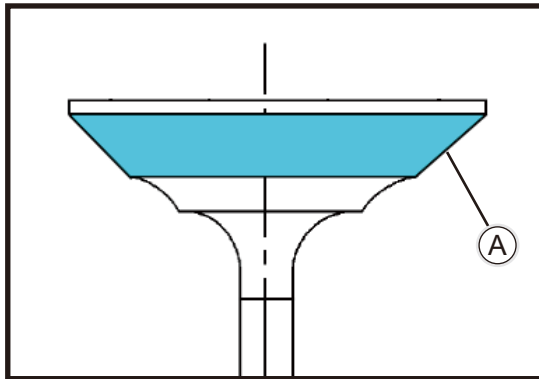
- ◆ Insert the guide into the valve guide.
- ◆ Apply cutting oil to the seat ring and tool.
- ◆ Place the 46° tool on the guide and perform light cutting.
- ◆ Check the cutting area of the seat ring:

If the contact area is less than 75% of the full circle of the seat ring, turn it 180° and do another light cut.

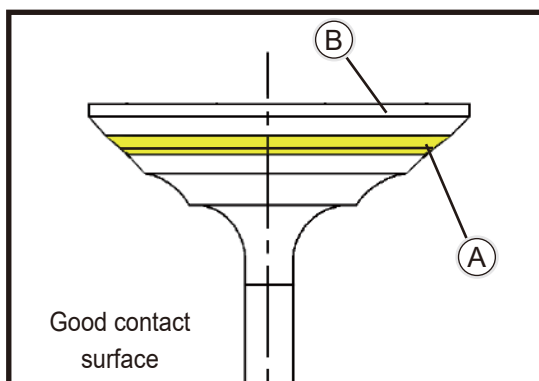
If the tool touches the uncut part of the seat ring, check the guide. Check for burrs, scratches, or excessive jumps. If the guide is bent, it must be replaced.

If the contact surfaces of the tools are all in the same position, it means that the valve guide has been deformed due to improper installation.

If the initial cutting contact area is greater than 75%, continue cutting the seat ring until all dents are removed and a clear seat ring surface appears.



- ◆ To check the contact area on the valve, apply a thin layer of Prussian Blue™ paint on the valve seat ring. If the interference angle is 46°, paint a black permanent mark **【A】** on the entire valve disc surface.
- ◆ Insert the valve into the catheter and tap the valve into place several times.
- ◆ Remove the valve, and use the paint on the valve to confirm where the valve is in contact with the seat ring. The seat ring should touch the middle or slightly higher position of the valve disc surface, and the width should be appropriate



If the contact position is at the top edge of the valve disc surface to the unpainted area **【B】**, it indicates that the contact position between the valve disc surface and the seat ring is too high. At this time, use a 30° tool to lower the seat ring.

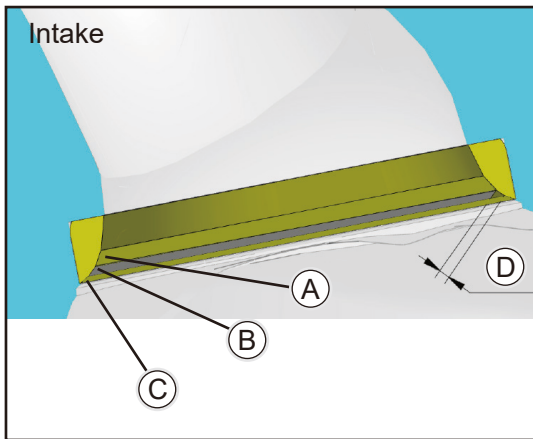
If it is too low, use a 60° tool to raise the seat ring. When the contact area is concentrated on the valve surface, measure the width of the valve seat.

If the seat ring contact surface is too wide or uneven, cut the top and bottom to narrow the seat ring.

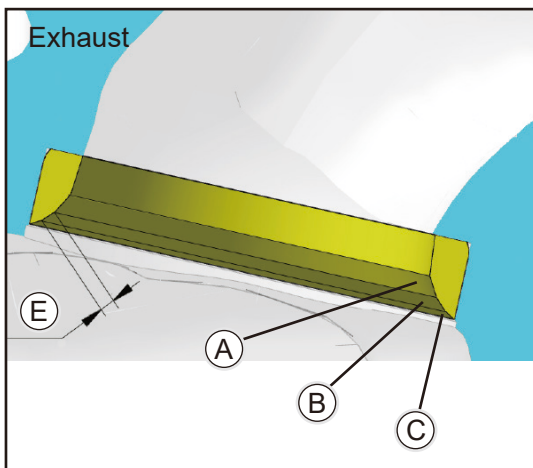
If the seat ring contact surface is too narrow, use a 45° tool to widen it, and recheck the valve surface and the contact surface width on the seat ring after each cut.

## TIPS

If it is an interference angle, under normal circumstances, the contact surface on the valve disc surface will be very narrow. A uniform and continuous contact surface **【A】** can be seen on the valve disc surface.



- 【A】 30°
  - 【B】 45°
  - 【C】 60°
  - 【D】 1.0 ~ 1.1mm (0.0394" ~ 0.0433")
- limit: 1.4mm (0.055")



- 【A】 30°
  - 【B】 45°
  - 【C】 60°
  - 【E】 1.5 ~ 1.6mm (0.0591" ~ 0.0630")
- limit: 1.9mm (0.075")

- ◆ Wash all the fillings in the area with hot soapy water, and then blow it off with compressed air.
- ◆ Lubricate the valve guide with clean engine oil, and apply an oil-based or water-based abrasive on the valve disc surface.

## TIPS

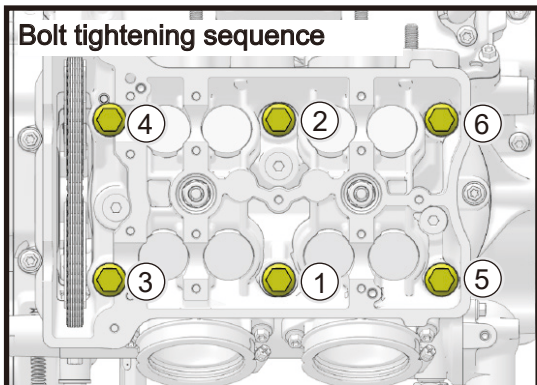
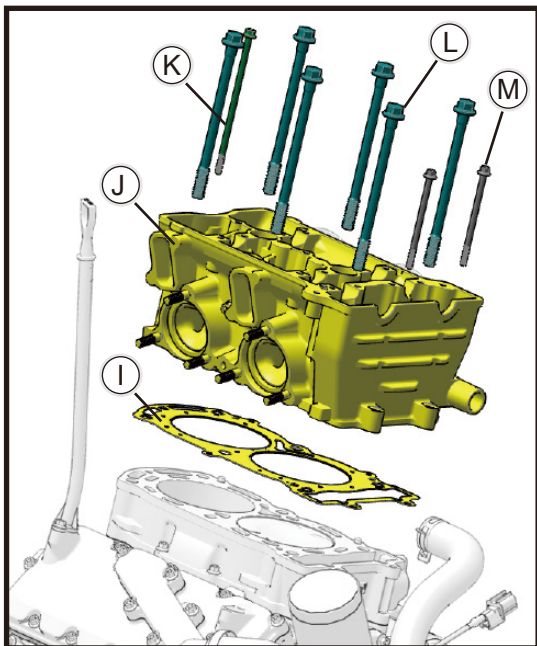
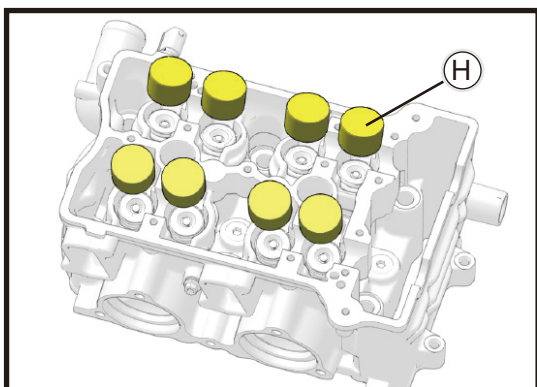
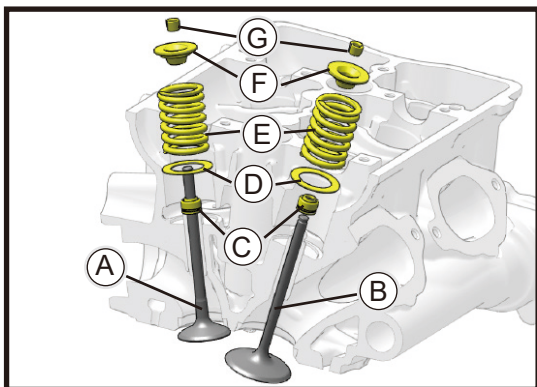
If the interference angle repair method is used, no grinding is required.

- ◆ Use a grinding tool or a section of fuel line connected to the valve stem to insert the valve into the respective guide rail and grind it.
- ◆ Rotate the valve back and forth quickly until the cutting sound is smooth. Lift the valve slightly away from the seat, rotate it 1/4 turn, and repeat the grinding process. Do this 4 to 5 times until the valve is completely seated and the surface of the valve seat is smooth, and then repeat this process for other valves.
- ◆ Thoroughly clean the cylinder head and valve.

## ⚠ CAUTION

Don't grind too much. Excessive grinding will cause the valve to sink into the cylinder head, thereby reducing the valve clearance. If the valve is sunk too deep, the clearance cannot be adjusted and the cylinder head must be replaced.

## CYLINDER HEAD ASSEMBLY



### ⚠ WARNING

When disassembling and assembling the cylinder head or operating the valve spring, you need to wear goggles.

- ◆ Install a new valve oil seal **【C】** on the valve guide, and press the valve oil seal into place with a special tool.
- ◆ Apply engine oil to the valve stem, and insert the exhaust valve **【A】** and intake valve **【B】** into the corresponding valve guides.
- ◆ Install the valve spring seat **【D】**, valve spring **【E】**, lock clip seat **【F】**, and lock clip **【G】** in sequence.
- ◆ Use special tools to compress the spring until there is enough space to install the valve lock clip.
- ◆ Clamp a pair of valve lock clamps into the valve lock clamp groove.
- ◆ Repeat the above steps to install the remaining valves in place.

### ⚠ CAUTION

The valve spring is marked with a mark or the end with a larger pitch is facing upwards.

- ◆ To install the valve lifter, refer to the chapters of "Valve Clearance Adjustment" and "Selection of Lifter".
- ◆ Align the positioning pins on the cylinder block and place the cylinder head gasket **【I】**. The gasket should be clean and free of grease.
- ◆ Align the position of the positioning pin, and place the cylinder head **【J】**. Install new cylinder head bolts **【L】** and tighten them in order.
- ◆ Install the bolts **【K】** and **【M】** at both ends and tighten them according to the torque.

#### Cylinder head bolt **【L】**

first step: 12N·m(1.2 kgf·m, 8.8 ft·lb)  
 Second step: 35N·m(3.57 kgf·m, 25.8 ft·lb)  
 Step 3: Rotate 180°

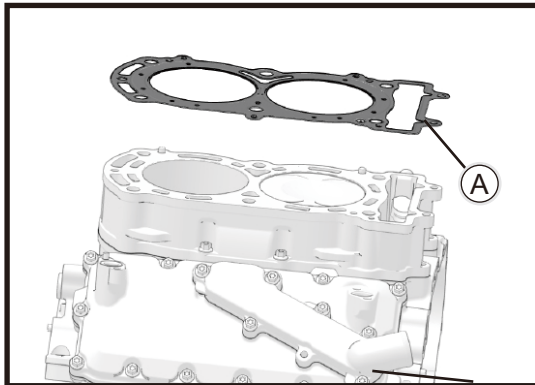
- ◆ Bolt **【K】** and **【M】** tightening torque:

#### Bolt **【K】**, **【M】**

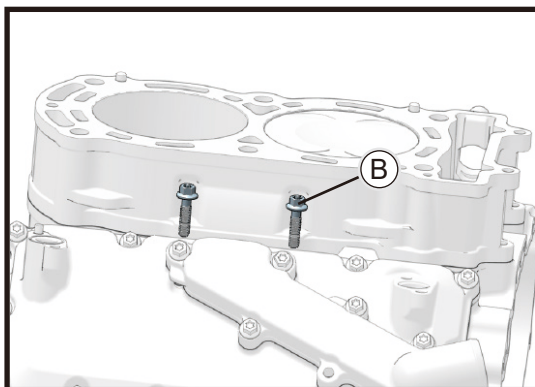
10 N·m (1.0 kgf·m, 89 in·lb)

## CYLINDER BLOCK AND PISTON

### CYLINDER BLOCK REMOVAL



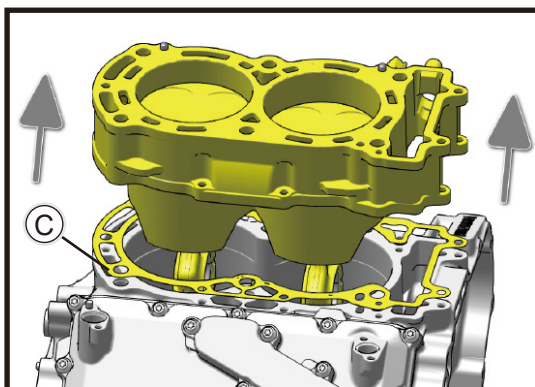
- ◆ Remove the cylinder head gasket 【A】 .



- ◆ Remove the two M6 connecting bolts 【B】 .
- ◆ Disassemble the crankshaft (see the chapter of crankshaft connecting rod piston assembly).
- ◆ Take out the cylinder block and piston as a whole from the crankcase, and remove the cylinder block gasket 【C】 .
- ◆ Remove the piston and connecting rod assembly from the cylinder block.

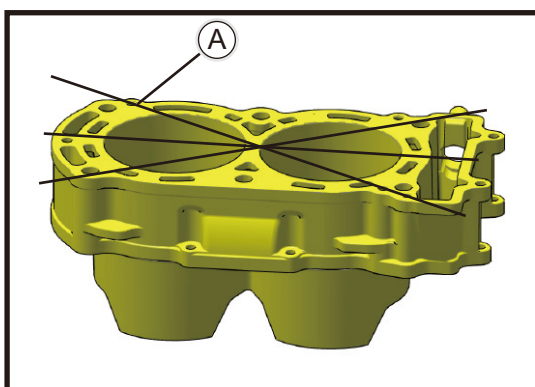
### TIPS

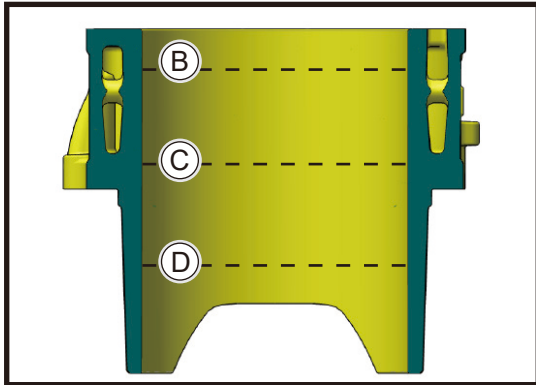
If the piston will continue to be used, please make a mark according to the installation position during disassembly, so that the same cylinder position can be installed in the next assembly.



### CYLINDER BLOCK INSPECTION

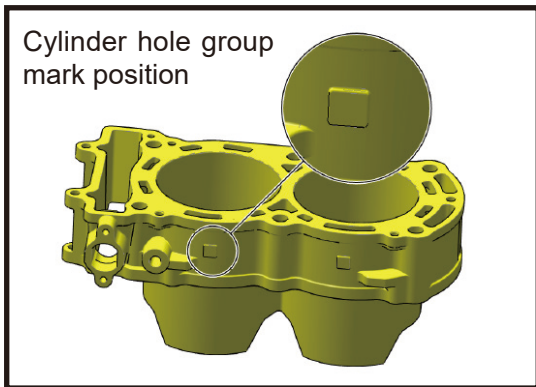
- ◆ Keep the top surface of the cylinder block clean, place a straightedge 【A】 on the top surface of the cylinder block, and use a plug rule to measure the distance between the straightedge 【A】 and different positions of the cylinder block. Measure the distance between the ruler 【A】 and different positions of the cylinder block with a plugging ruler. Cylinder head deflection limit: 0.05 mm (0.002"), if the cylinder head deflection exceeds the limit, replace the cylinder block.
- ◆ Check cylinder bore for wear, scoring or damage.
- ◆ Measure the inner diameter of the cylinder bores, at the three heights shown in the illustration ( 【B】 is 15 mm from the top surface, 【C】 is in the center, and 【D】 is 15 mm from the bottom), in two directions (front and rear, left and right), and at a total of six positions for each cylinder bore, and measure them separately.



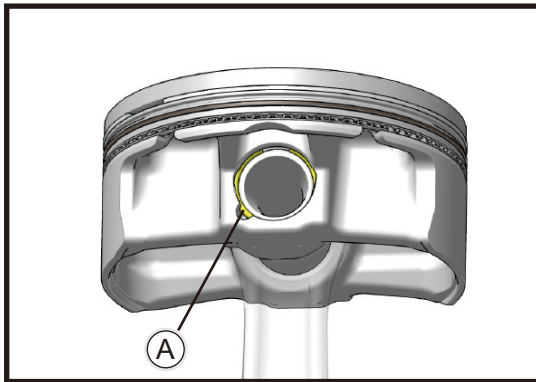


- ◆ A cylinder bore grouping notation ( I or II ) is marked on the step on the intake side of each cylinder in the cylinder block. Compare the bore measurement results with the corresponding grouping dimensions, and replace the cylinder block if the measured value of any bore exceeds the use limit.

Cylinder Bore Bore Diameter:		
standard:	I	92.992 ~ 93.000 mm (3.6611" ~ 3.6614")
	II	93.000 ~ 93.008 mm (3.6614" ~ 3.6617")
Limit:	I	93.027 mm (3.6653")
	II	93.035 mm (3.6655")



Roundness limit:	0.025(0.001")
Cylindricity limit:	0.025(0.001")

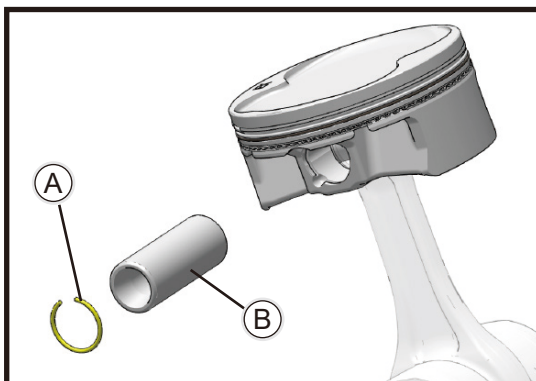


## DISASSEMBLE THE PISTON

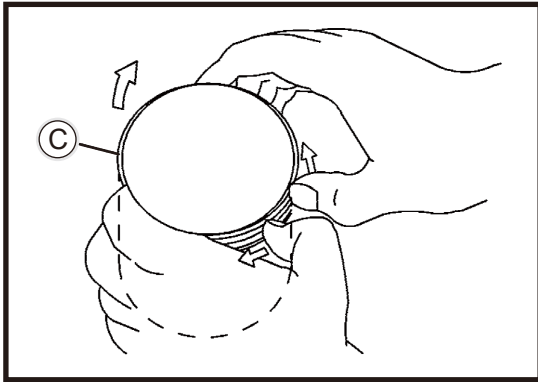
- ◆ Disassemble the cylinder block (see Cylinder Block Disassembly), and remove the piston connecting rod assembly.
- ◆ Put a clean cloth under the piston and remove the piston pin circlip **【A】** from the piston.

**⚠ CAUTION**

Do not reuse the circlip, because disassembly will weaken and deform the elastic force of the circlip. They may fall off and damage the cylinder bore wall.



- ◆ Remove the piston pin **【B】** .
- ◆ Remove the piston.



- ◆ Use your fingers to carefully open the opening of the piston ring **【C】**, then lift the piston ring up and remove it from the piston.
- ◆ Remove the remaining piston ring in the same way.

### ⚠ CAUTION

When disassembling the piston ring, do not open it too much, so as not to damage the piston ring or reduce the tension of the piston ring.



- ◆ The oil ring assembly **【D】** is composed of two upper and lower blade rings and an intermediate liner ring. When disassembling, first remove the upper blade ring, then the lower blade ring, and finally the intermediate liner ring.

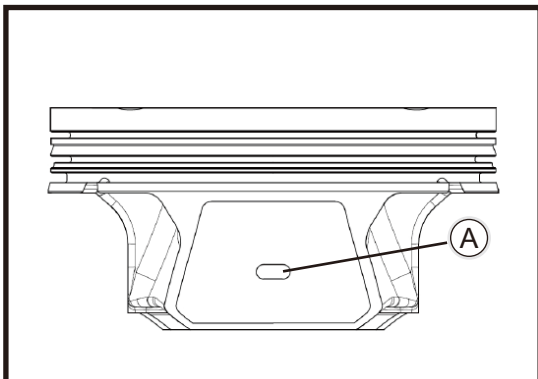


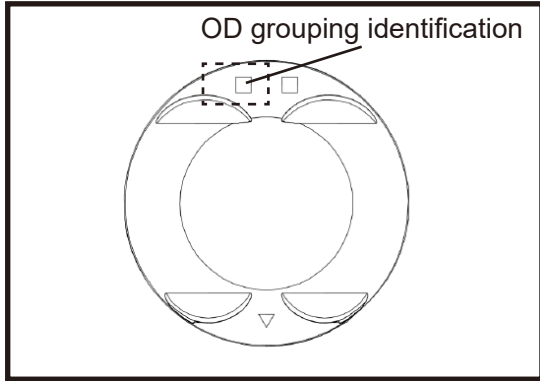
### PISTON MEASUREMENT

- ◆ Measure the diameter of the piston pin hole in two directions (90° apart). If the limit is exceeded, the piston needs to be replaced.

Piston pin hole diameter	
standard value:	20.009 ~ 20.018 mm(0.7877" ~ 0.7881")
Limit:	20.05 mm(0.7893")

- ◆ Measure the diameter of the large-diameter detection area on the piston, and record the measurement result.



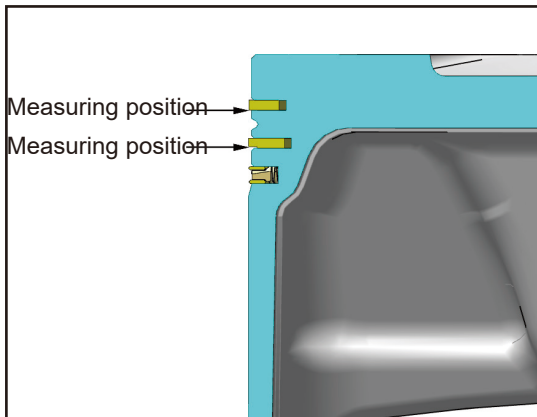


- ◆ Check the grouping marks on the top surface of the piston, compare the measurement results with the grouping values of the piston OD, if it exceeds the limit value, it needs to be replaced.

Piston diameter		
	standard	Limit
group I :	92.951 ~ 92.959 mm (3.6594" ~ 3.6597")	92.858 mm (3.6558")
group II :	92.959 ~ 92.967 mm (3.6597" ~ 3.66")	92.885 mm (3.6569")

## MEASURING PISTON RING GROOVE CLEARANCE

- ◆ The piston ring should be parallel to the surface of the piston ring groove. If not the piston and rings need to be replaced.
- ◆ With the piston ring in the piston ring groove, take several measurements with a plug gauge to determine the piston ring/groove clearance.



Piston ring groove clearance:	
First course:	0.020 ~ 0.060 mm (0.0007" ~ 0.0023")
Second course:	0.020 ~ 0.060 mm (0.0007" ~ 0.0023")
Limit values:	0.12 mm (0.0047")

If the piston ring groove clearance is greater than the service limit, measure the thickness of the piston rings and the width of the ring grooves as follows to determine whether to replace the rings or the piston or both.

## PISTON RING GROOVE WIDTH

- ◆ Measure with calipers at multiple locations on the piston.

Piston ring groove width		
	standard value	limit value
First course:	1.22 ~ 1.24 mm	1.31mm
Second course:	(0.0480" ~ 0.0489")	(0.0516")

If the width of either ring groove exceeds the limit, the piston needs to be replaced.

## PISTON RING THICKNESS

- ◆ Use a micrometer to measure at multiple locations on the piston ring.

Piston ring thickness		
	standard value	limit value
First course:	1.17 ~ 1.19 mm	1.10mm
Second course:	(0.0461" ~ 0.0469")	(0.0433")

### MEASURE THE PISTON PIN

- ◆ Measure the diameter of the piston pin in three positions and two directions (90° apart). If the limit is exceeded, the piston pin needs to be replaced.

Piston pin diameter	
standard:	20.000 ~ 20.005 mm(0.7873" ~ 0.7875")
limit:	19.98 mm(0.7866")

### MEASURE THE CLOSED GAP OF THE PISTON RING

- ◆ Use the piston to push the piston ring **【B】** into the cylinder bore **【A】**.
- ◆ Use a feeler gauge to measure the closed gap **【C】** when the piston ring is at the top and bottom of the cylinder bore.

#### TIPS

After the cylinder bore is worn and deformed, there will be a difference between the closed gap of the piston ring at the top and bottom of the cylinder bore. At this time, the cylindricity and roundness of the cylinder bore should be measured to determine whether the cylinder can continue to be used.

If the closed gap of the piston ring exceeds the limit, a new piston ring needs to be replaced.

Piston ring closed gap		
	standard	limit
first air ring:	0.25 ~ 0.35 mm(0.01" ~ 0.014")	0.5 mm(0.02")
The second air ring:	0.35 ~ 0.5 mm(0.014" ~ 0.02")	0.7 mm(0.028")
Oil ring	0.2 ~ 0.7 mm(0.008" ~ 0.028")	0.9 mm(0.035")

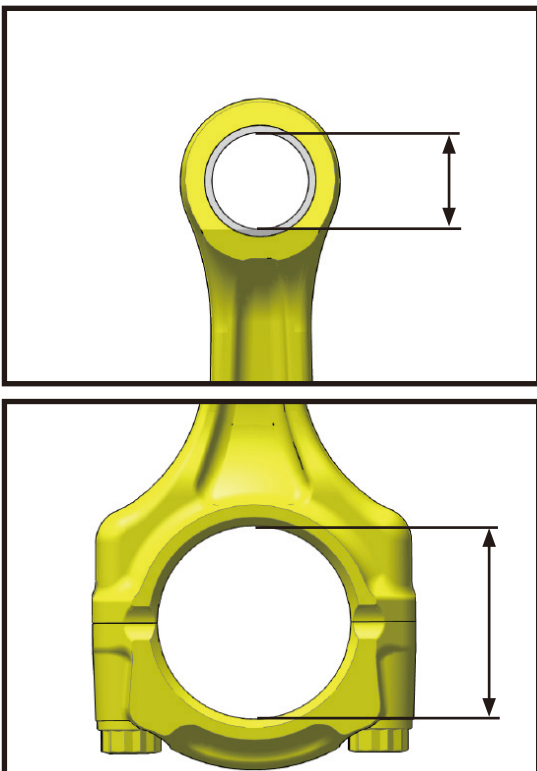
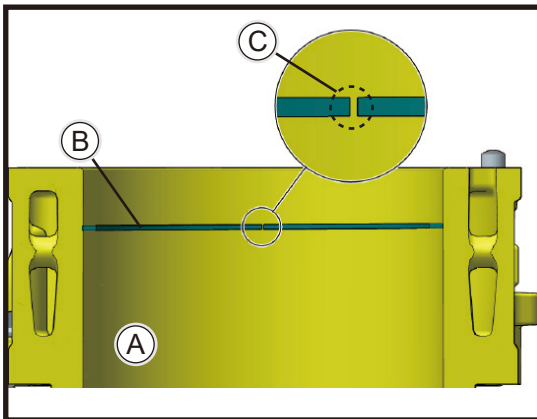
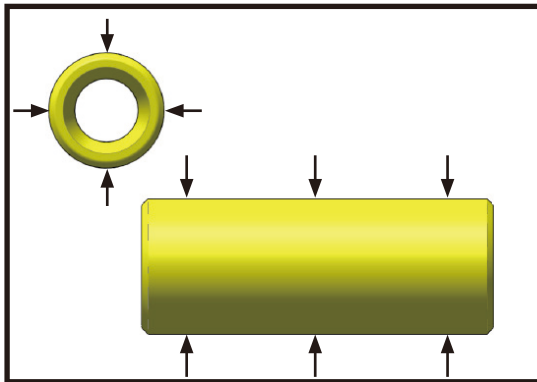
### CONNECTING ROD MEASUREMENT

- ◆ Measure the inner diameter of the small end hole of the connecting rod. If the limit is exceeded, the connecting rod needs to be replaced.

Connecting rod small head aperture	
standard :	20.015 ~ 20.030 mm(0.7879" ~ 0.7885")
limit:	20.06 mm(0.7897")

- ◆ Install the corresponding connecting rod cover (without bearing bushes), and screw in the connecting rod bolts.
- ◆ Tighten the connecting rod bolts to 25Nm (2.5 kgf·m, 18.4 ft·lb).
- ◆ Measure the diameter of the big end of the connecting rod. If it exceeds the limit, the connecting rod needs to be replaced.

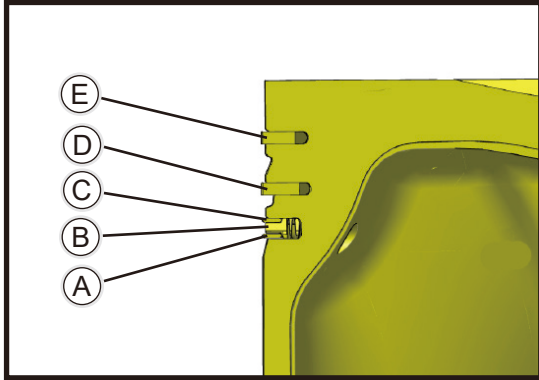
Big head aperture of connecting rod	
standard:	44 ~ 44.016 mm(1.7323" ~ 1.7329")
Limit:	43.96 mm(1.7307")



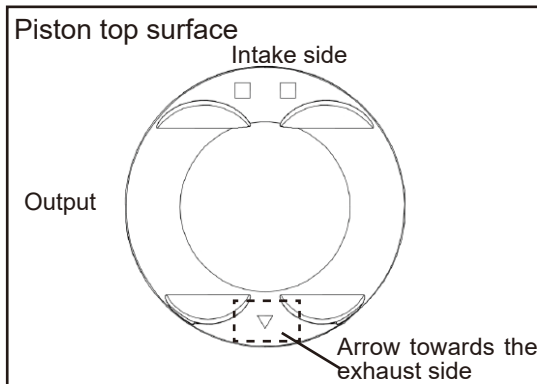
## PISTON RING INSTALLATION

### TIPS

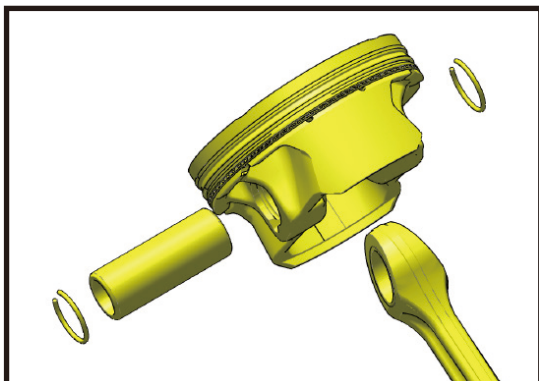
When installing the piston ring, apply clean engine oil to the surface. Check the clearance of the piston ring groove (see "Measuring the clearance of the piston ring groove"). If assembling a used piston, the carbon deposits in the piston ring groove and the oil hole of the oil ring groove should be cleaned first



- ◆ Install the oil ring backing ring **【B】** in the bottom piston ring groove so that the two ends are butt (not overlapping), and turn the backing ring so that the opening faces the engine output end.
- ◆ Install the bottom wiper ring **【A】** and turn it so that the ring port faces the intake side of the piston.
- ◆ Install the upper wiper ring **【C】** and turn it so that the ring opening faces the exhaust side of the piston.



- ◆ Install the second air ring, the side with the mark on the ring faces upwards, and turn it so that the ring opening faces the air inlet side.
- ◆ Install the first air ring, the side with the mark on the ring faces upwards, and turn it so that the ring opening faces the exhaust side.



## PISTON CONNECTING ROD ASSEMBLY

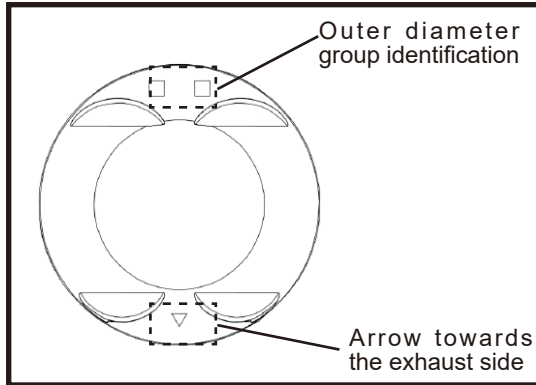
- ◆ Piston pin hole, connecting rod small end hole, and piston pin are smeared with clean engine oil.
- ◆ Insert the piston pin and install the new piston pin retaining ring. Turn the retaining ring so that the opening faces upward or downward.

### ⚠ CAUTION

Do not reuse the piston pin retaining ring, as the retaining ring will be deformed during disassembly.

Do not over-compress the retaining ring during installation, so as not to reduce the radial elastic force of the retaining ring

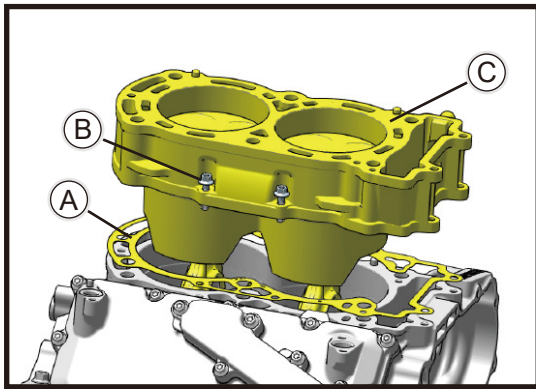
## CYLINDER BLOCK ASSEMBLY



- ◆ According to the grouping mark of cylinder bore and piston, select the combination of piston and cylinder block in the same group. For example, the pistons of group "I" correspond to the cylinder bores of group "I", and the pistons of group "II" correspond to the cylinder bores of group "II".
- ◆ After the piston connecting rod assembly is installed, press the piston ring with your fingers, and carefully insert the piston into the cylinder hole from the bottom of the cylinder block.

### ⚠ CAUTION

There is a triangle mark on the top surface of the piston, and the arrow points toward the exhaust side during installation.



- ◆ Keep the sealing surface clean, align the position of the positioning pin, and install a new cylinder block gasket **【A】**.
- ◆ Install the assembled piston and cylinder block assembly **【C】** into the upper crankcase.
- ◆ Screw in the bolt **【B】** and tighten it according to the torque.

### Bolt **【B】**

10 N•m (1.0 kgf•m, 89 in•lb)

## CYLINDER PRESSURE MEASUREMENT

### TIPS

Fully charge the battery before measuring

- ◆ Warm up the engine completely, then stop it.
- ◆ Disassemble the spark plug (refer to the spark plug chapter).
- ◆ Connect the cylinder pressure gauge and the connector firmly to the spark plug hole.
- ◆ Special tools-cylinder pressure gauge, cylinder pressure gauge connector.
- ◆ Keep the throttle fully open and use the starter motor to drive the engine several times.
- ◆ When the pressure gauge stops rising, stop rotating and read the pressure value.

Cylinder pressure (reasonable range)	
Electric starter:	1.1 ~ 1.3 MPa (11~13 kgf/cm <sup>2</sup> , 159~188 psi)

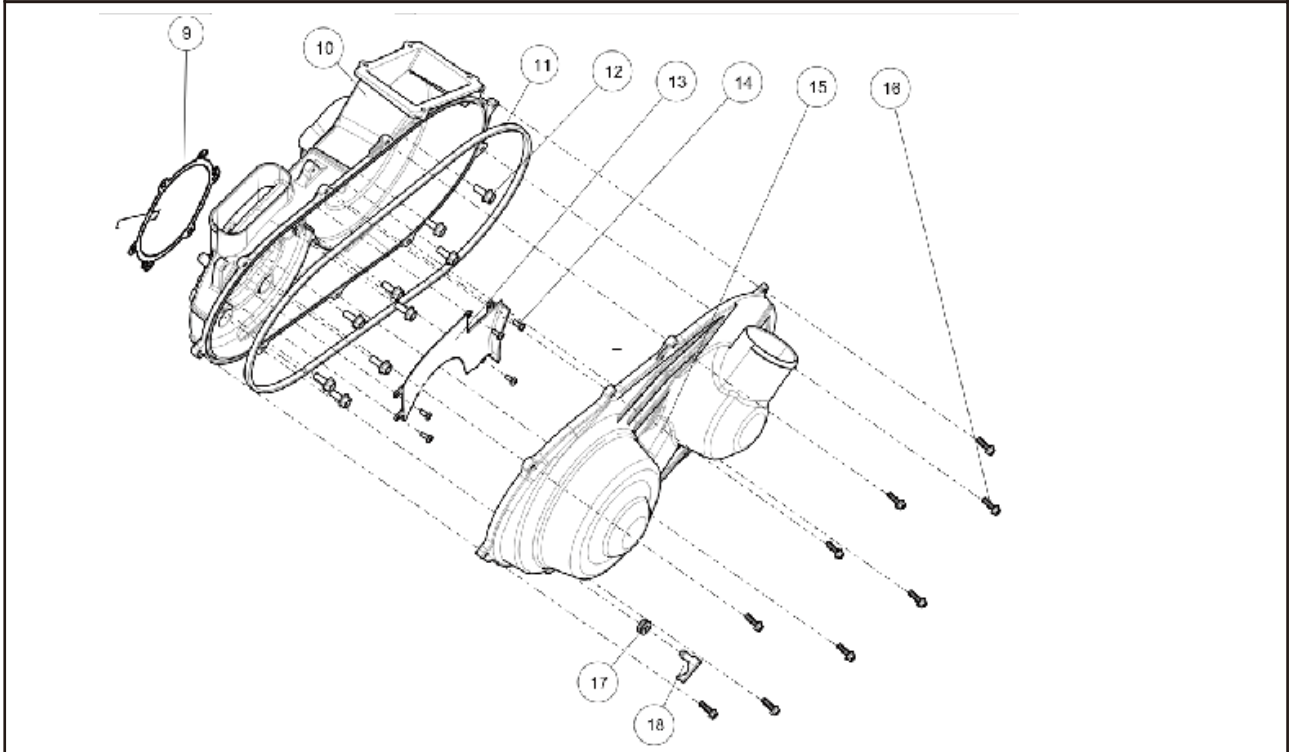
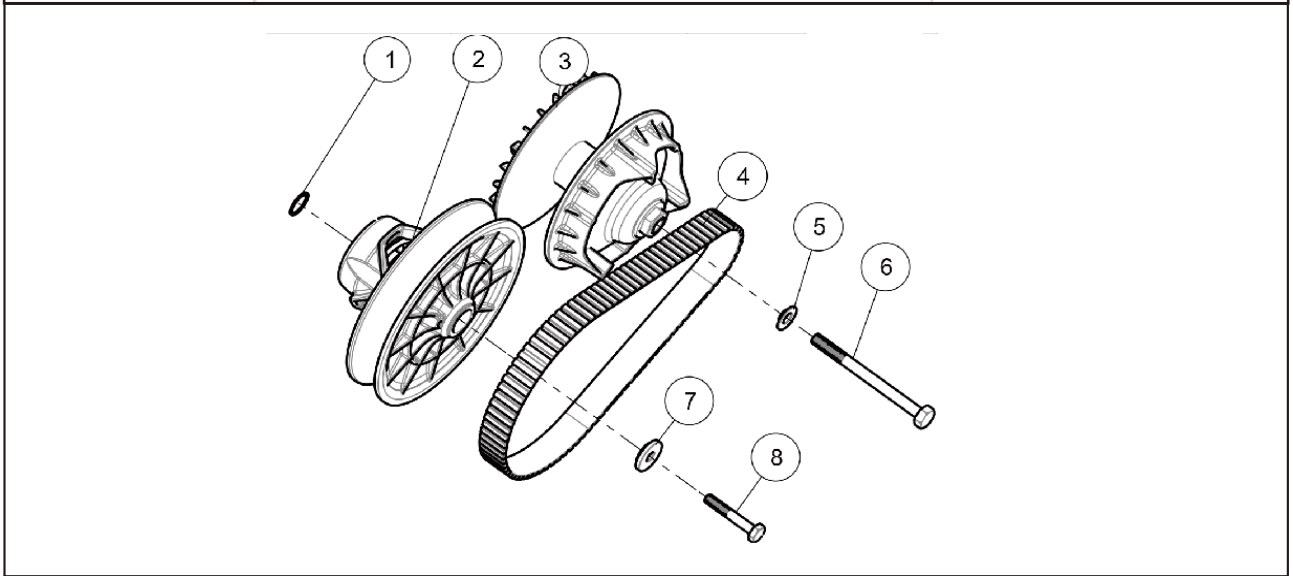
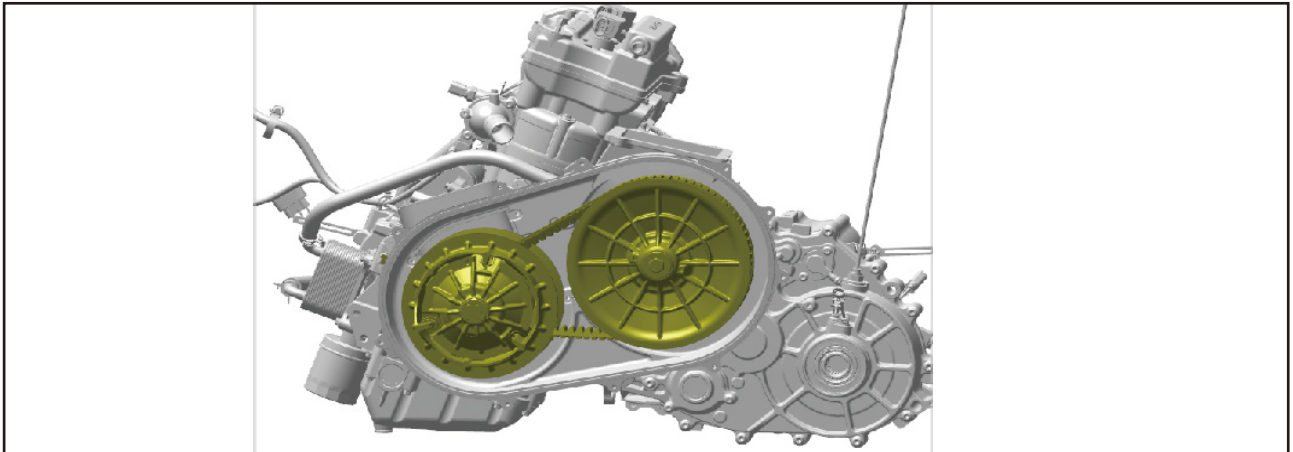
If the pressure value obtained is not within a reasonable range, you should refer to the following table.

problem	diagnosis	Measures (actions)
Cylinder pressure value is out of reasonable range	Due to the valve oil seal and/or piston oil ring damage, the piston, cylinder head and combustion chamber produce carbon deposits (can be determined by the white smoke exhaust).	Remove carbon deposits and replace damaged parts if necessary.
	The thickness of the cylinder head gasket is incorrect.	Replace with standard gaskets.
	the valve spring is damaged or the elastic force fails,	replace the spring.
Cylinder pressure value is lower than the reasonable range	Air leakage around the cylinder head	Replace the damaged cylinder head gasket and check for deformation of the cylinder head.
	Bad valve seat condition	Repair if necessary.
	Incorrect valve clearance	Adjust the valve clearance.
	Piston/cylinder hole clearance is unreasonable.	Check the cylinder block and replace/repair if necessary
	Bad condition of piston ring and/or piston ring groove	Replace the piston and/or piston ring.

# CVT SYSTEM

<b>CVT SYSTEM EXPLOSION DIAGRAM .....</b>	<b>3-99</b>
<b>SPECIAL TOOLS.....</b>	<b>3-101</b>
<b>CVT SYSTEM SEGWAY AT10.....</b>	<b>3-102</b>
CVT COVER .....	3-102
CVT DRIVING WHEEL, DRIVEN WHEEL AND BELT .....	3-103
GEOMETRIC SPECIFICATIONS OF PULLEY .....	3-105
CVT INNER COVER .....	3-106
<b>EXPLODED DIAGRAM OF DRIVE ASSEMBLY.....</b>	<b>3-107</b>
<b>DRIVE ASSEMBLY DISASSEMBLY AND INSTALLATION .....</b>	<b>3-108</b>
PULLEY REMOVAL FROM THE VEHICLE.....	3-108
DRIVE PULLEY DISASSEMBLY .....	3-109
DRIVE PULLEY RE-ASSEMBLY .....	3-110
TIGHTENING THE PULLEY .....	3-110
PULLEY TIGHTENING .....	3-111
<b>CVT DRIVEN PULLEY ASSEMBLY EXPLODED VIEW.....</b>	<b>3-112</b>
<b>PULLEY DISASSEMBLY .....</b>	<b>3-113</b>
REMOVING THE DRIVEN WHEEL .....	3-113
DRIVEN WHEEL REMOVAL .....	3-113
SPRING DISASSEMBLY .....	3-114
RECOMMENDED INSPECTION .....	3-115
<b>SLIDING FLANGE MAINTEN.....</b>	<b>3-116</b>
RECOMMENDED INSPECTION .....	3-116
REASSEMBLE THE DRIVEN WHEEL .....	3-117
ROLLERS ③ RE - ASSEMBLY .....	3-118

CVT SYSTEM EXPLOSION DIAGRAM



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	CVT ADJUSTING SHIM				
2	CVT DRIVEN PULLEY				
3	CVT DRIVE PULLEY				
4	CVT BELT				
5	SPACER 12×28×6				
6	BOLT M12×1.25×142	100	10.1	73	Lh
7	SPACER 10.5×36×8				
8	CVT DRIVEN PULLEY BOLTS	80	8.2	59	
9	CVT INNER COVER SEAL I				
10	CVT INNER COVER				
11	CVT INNER COVER SEAL				
12	HEXAGON FLANGE BOLT M8×20	23	2.3	17	L
13	CVT INNER COVER AIR DEFLECTOR				
14	SCREWS M5×12	5	0.5	3.8	L
15	CVT OUTER COVER				
16	BOLT M6×20	12	1.2	9.2	
17	CVT COVER PLUG SEAL				
18	PLUG				

G:Apply grease for oil seal and O-ring.

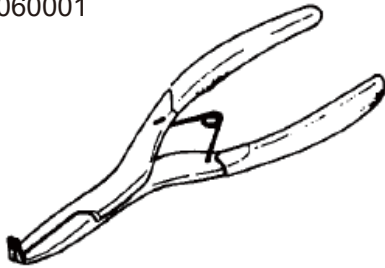
L:Apply a non-permanent locking agent.

Lh:Left-hand Threads

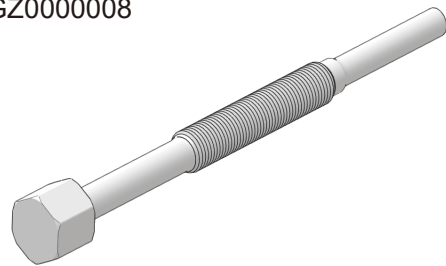
R:Replacement Part.

**SPECIAL TOOLS**

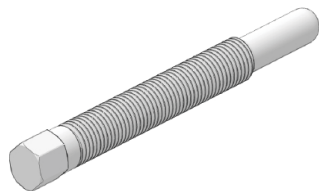
Back-up ring pliers:  
E01GZ0060001



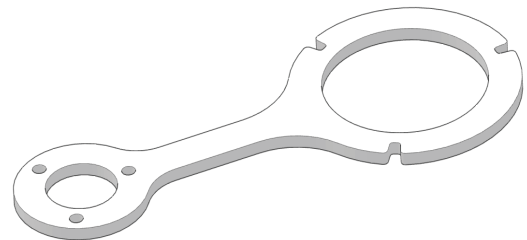
Drive pulley tightening bolt:  
E01GZ0000008



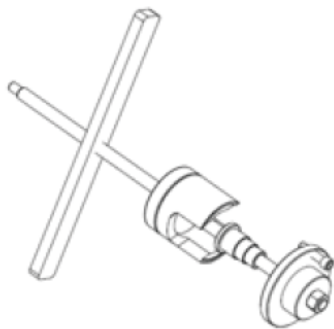
Driven wheel jack bolt:  
E01-E200001-000-00



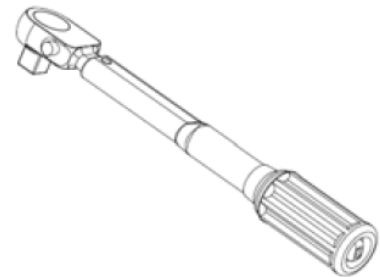
Retaining tool:



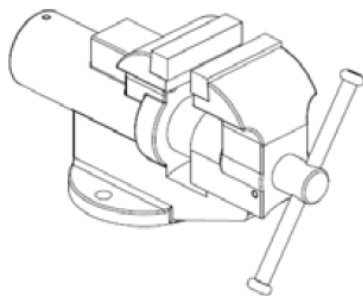
Assembly-Disassembly Tool



Drive pulley retainer:  
E01GZ0000012



Vise

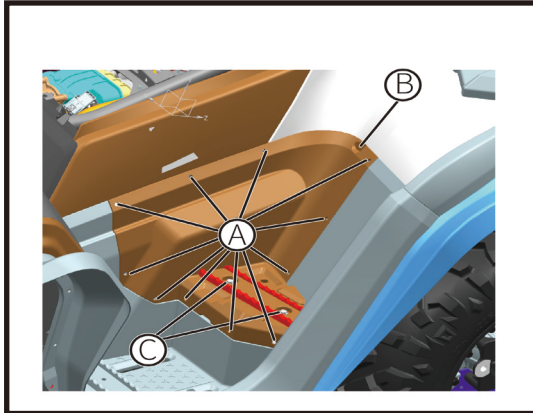


## CVT SYSTEM SEGWAY AT10

### CVT COVER

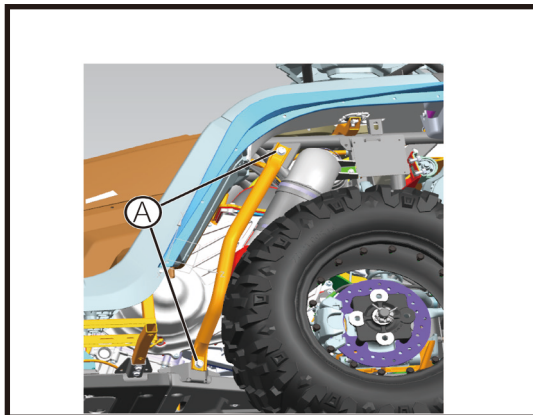
1. Remove the CVT access cover

- ◆ Remove 11 expansion buckle assemblies **【A】** .
- ◆ Remove one large pan head hexagon socket head M6 × 20 bolt **【B】** .
- ◆ Remove 2 hexagon flange bolts M6 × 16 **【C】** , and remove the CVT access cover



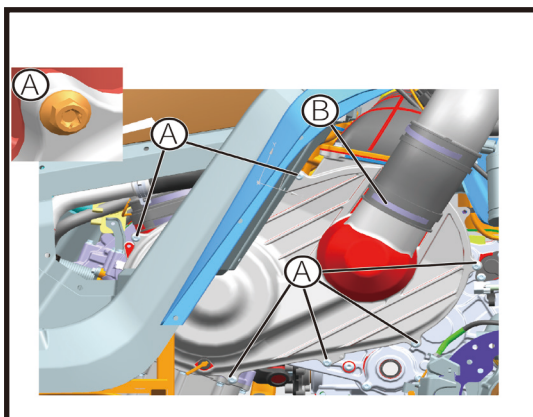
2. Remove the left-hand duct assembly

- ◆ Remove the 2 bolts **【A】** of the left tube assembly, and take down the left tube assembly.



3. Remove the CVT cover

- ◆ Remove 9 bolts M6 × 20 **【A】** .
- ◆ Remove the-type worm drive type hose hoop, disconnect the CVT rear intake pipe connector 1 **【B】** , and remove the CVT outer cover.

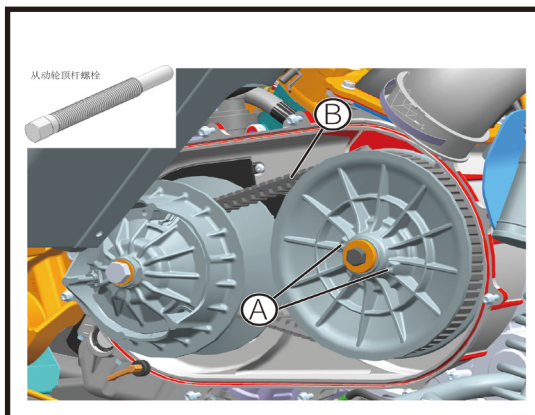


### ⚠ CAUTION

Excessive imbalance or high operating speed may lead to the failure of the CVT master and slave, resulting in serious injury or death. The driving and driven wheels of the continuously variable transmission are precision balancing components designed to operate within certain speed limits. Disassembly/assembly and maintenance procedures for the main and driven wheel assemblies must be strictly followed. Modify the engine or continuously variable transmission, increase the speed May cause malfunction.

4. Install the CVT cover, refer to the removal steps.

## CVT DRIVING WHEEL, DRIVEN WHEEL AND BELT



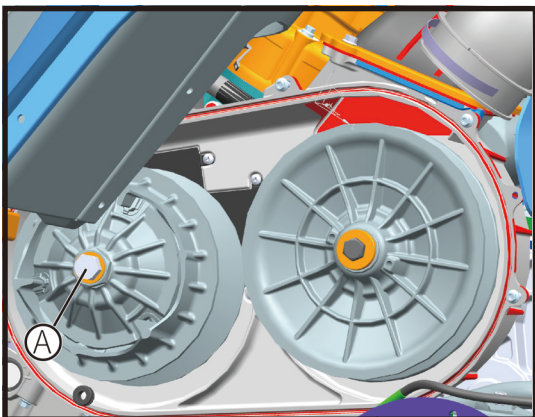
1. Remove the CVT cover

- ◆ Refer to-Removal and Installation-CVT Cover

2. Remove the CVT drive belt

- ◆ Insert the driven wheel ejector bolt into the driven wheel removal hole **【A】**, and open the driven wheel to move the disc, loosen the belt and take out the CVT drive belt **【B】**.

Special tool-driven wheel ejector bolt



## TIPS

Before removing the drive belt, please pay attention to the direction of the words (such as manufacturer's name, arrow mark, etc.) printed on the drive belt, and make sure that the drive belt is reinstalled in the original direction.

3. Disassemble the CVT drive wheel

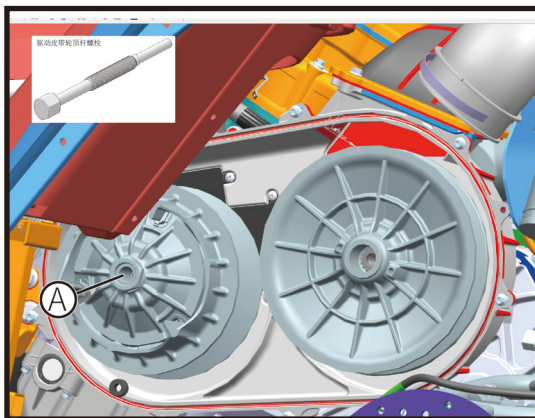
- ◆ Remove one CVT drive wheel bolt and flanging bushing **【A】**.

## TIPS

Counterclockwise rotation is required for the drive wheel bolt

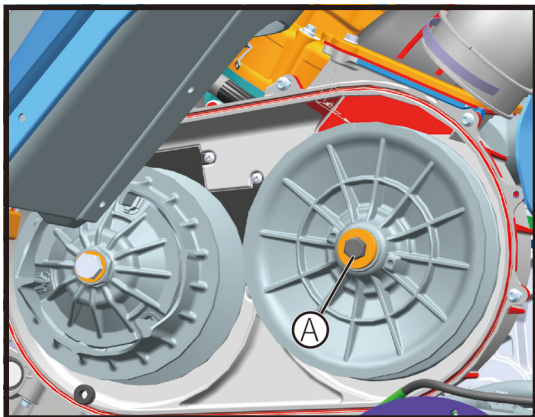
- ◆ Insert the top rod bolt of the drive pulley into the CVT driving wheel **【A】** and rotate clockwise to remove the CVT driving wheel.

Special tool-drive pulley ejector bolt



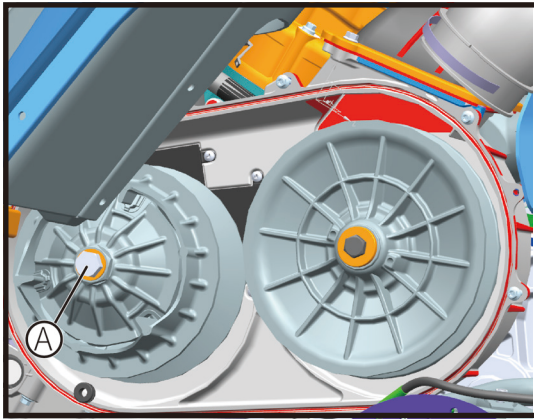
## TIPS

When the CVT drive pulley is removed, the drive pulley ejector bolt turns clockwise.



4. Disassemble the CVT driven wheel

- ◆ Remove one CVT driven wheel bolt and flanging bushing **【A】**, and remove the CVT driven wheel



### 5. Install CVT driving wheel

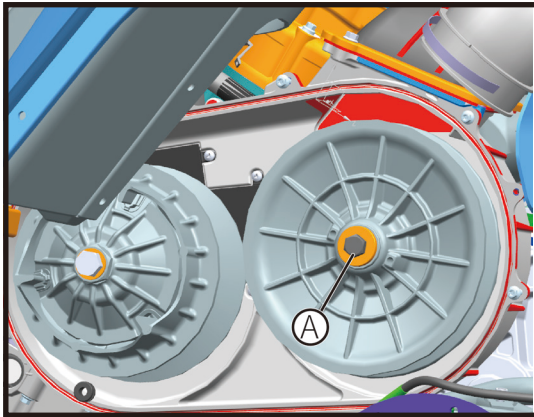
- ◆ Install 1 CVT drive wheel bolt and flanging bushing **【A】** .

#### TIPS

Install the drive wheel bolt counterclockwise.

CVT driving wheel bolt M12 × 1.25 × 142

100N·m(10.1kgf·m,73 ft·lb)

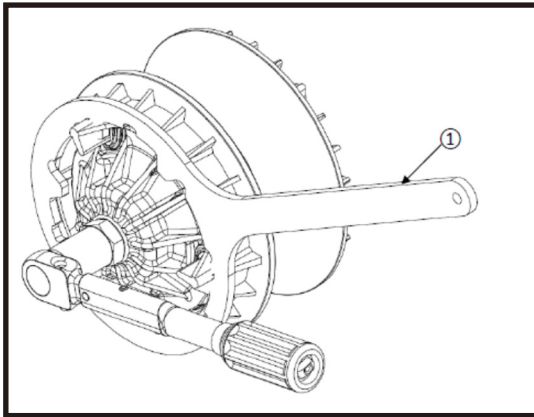


### 6. Install CVT driven wheel

- ◆ Install 1 CVT driven wheel bolt and flanging bushing **【A】** .

CVT driven wheel bolt

80N·m(8.2kgf·m,59ft·lb)



### 7. Use special tools to retighten the torque of the CVT driving wheel and driven wheel

- ◆ Use CVT fixed wrench to fix the driving wheel and driven wheel, and re-tighten the torque.

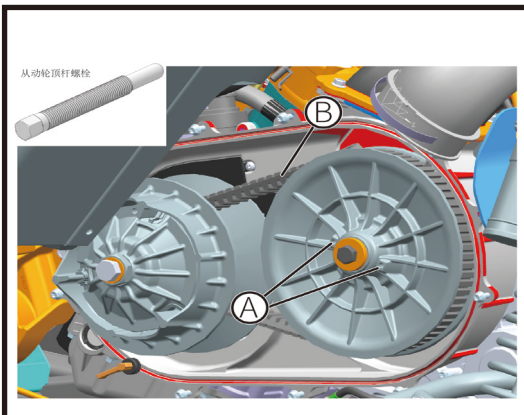
Special tool-Wheel clamp tool

### 8. Install the CVT belt.

- ◆ Insert the driven wheel ejector bolt into the CVT driven wheel mounting hole **【A】** and open it. The driven wheel shall be at the position where the belt can be installed, and the CVT belt **【B】** shall be installed **【】** .

#### TIPS

Make sure that the printed information face of the drive belt remains in the same orientation as it was before removal for the initial installation. When installing a new belt, the belt information is read from left to right, and make sure that the information printed on the belt can be read from the side of the vehicle.



**GEOMETRIC SPECIFICATIONS OF PULLEY****Inspection standard under idling condition**

When the CVT is in normal working condition, there should be an obvious gap between the moving disc of the driving wheel and the pulley.

**Adjustment method of driven pulley under idling condition**

If the driven wheel rotates, adjust the position of the driven wheel according to the following two conditions

- ◆ If there is no gap between the driving wheel and the pulley, the thickness of the adjusting shim of the driven wheel should be appropriately reduced.
- ◆ If there is an obvious gap between the driving wheel and the pulley, the thickness of the adjusting shim of the driven wheel should be appropriately increased.

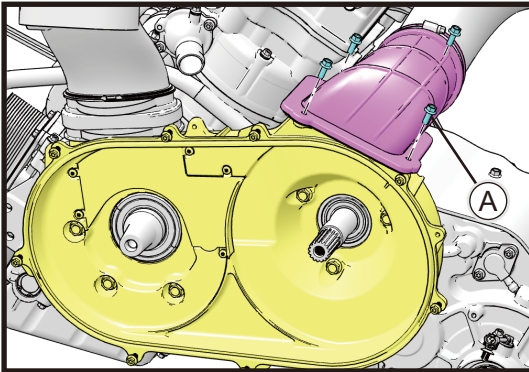
9. Install the CVT cover, refer to the removal steps.

### CVT INNER COVER

To remove the CVT inner cover, you need to remove the CVT outer cover and the CVT driving wheel, driven wheel and belt. For removal procedures, refer to-Removal and Installation-CVT Drive Wheel, Driven Wheel and Belt

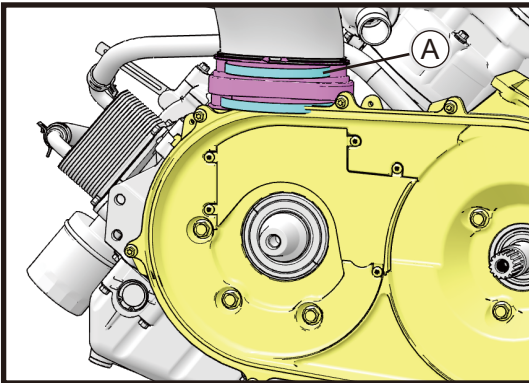
#### 1. Remove the CVT outlet pipe

- ◆ Remove 4 hexagon flange bolts M6 × 16 **【A】** . Disengage the CVT air outlet hose from the CVT inner cover.



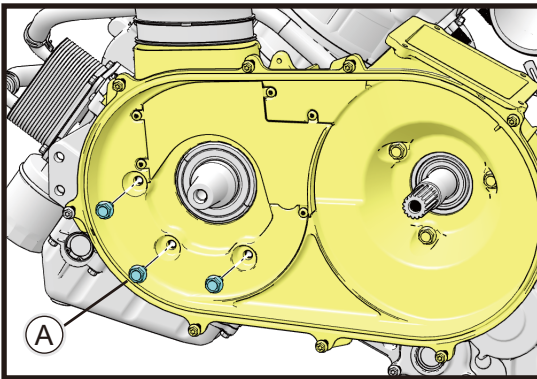
#### 2. Remove the CVT front air intake pipe

- ◆ Detach the Type A worm-driven hose clamp (110) at the lower end of the CVT front air intake pipe. Pull the CVT front air intake pipe out of the CVT cover.



#### 3. Remove the CVT inner cover bolts

- ◆ Remove the three hexagonal flange bolts (M8×20 **【A】** ).



Bolt M8×20

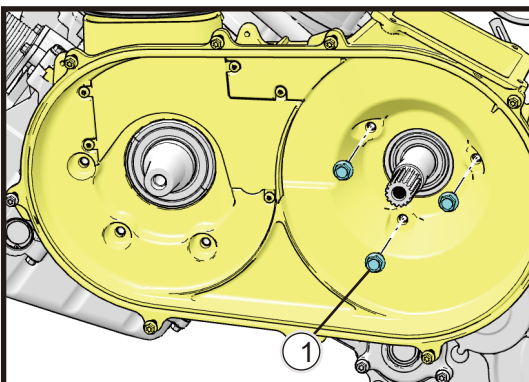
15N·m(1.53kgf·m,11.1ft·lb)

- ◆ Remove the three hexagonal flange bolts (M8×20 **【B】** ).

- ◆ Remove the CVT inner cover.

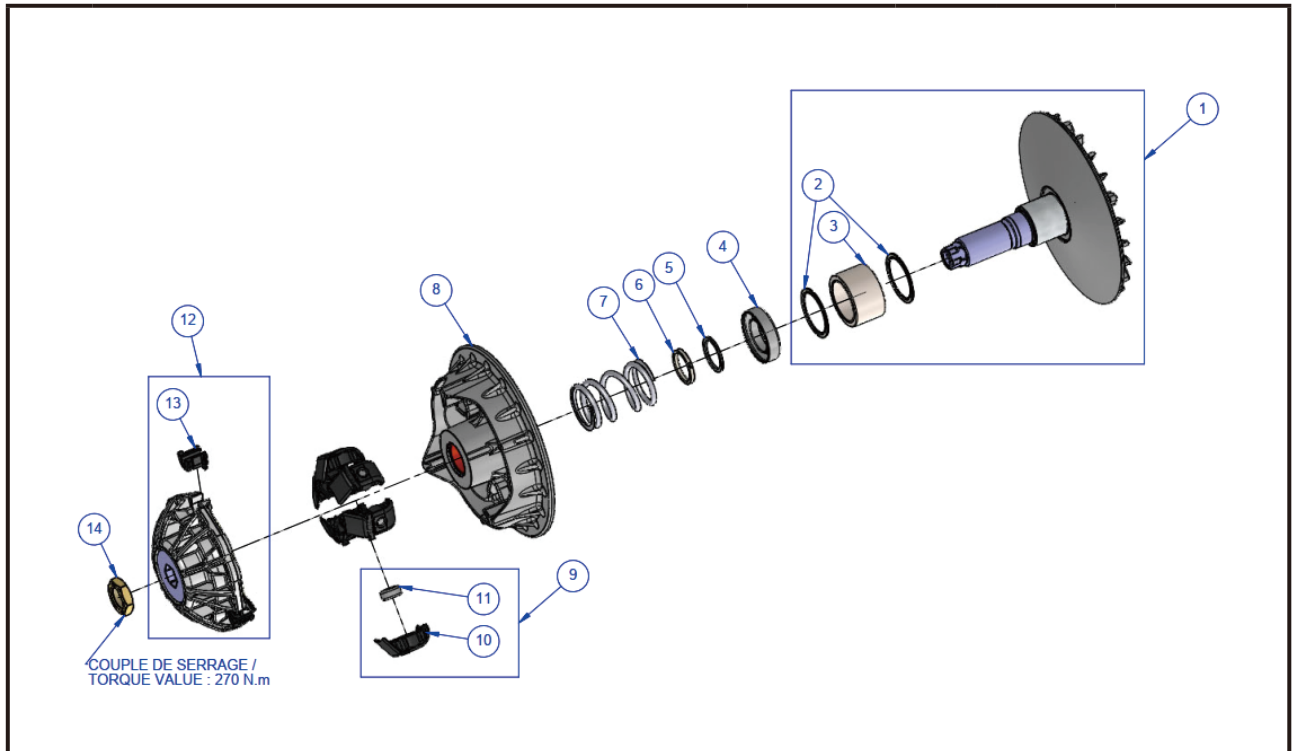
Plug M8×20

15N·m(1.53kgf·m,11.1ft·lb)



#### 4. Install the CVT inner cover, refer to the removal steps.

EXPLODED DIAGRAM OF DRIVE ASSEMBLY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Fixed disk				
2	Gasket				
3	Bearing				
4	Spring seat				
5	Gasket				
6	Speed limiting gasket				
7	Spring				
8	Rotating disc				
9	Centrifugal sling block				
10	Shell				
11	weight block				
12	Thruster disc				
13	Slide				
14	Nut (left-hand)	270	27.6	202	Lh

◆ Lh: Left-hand thread

## DRIVE ASSEMBLY DISASSEMBLY AND INSTALLATION

### PULLEY REMOVAL FROM THE VEHICLE

Removing the drive pulley:

- ◆ Remove the fixation bolt from the drive pulley (you will need to use the retaining tool to prevent the pulley from rotating).

- ◆ Screw the puller in the drive pulley shaft and use a breaker bar. torque the puller until the pulley comes off.

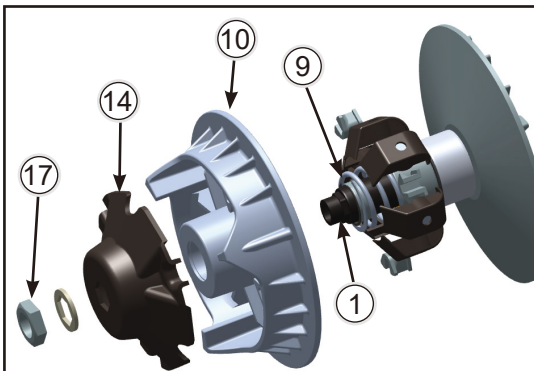
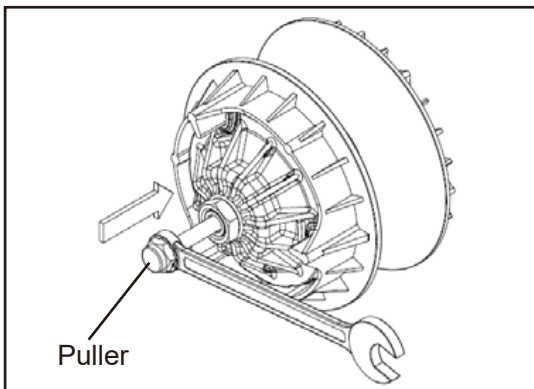
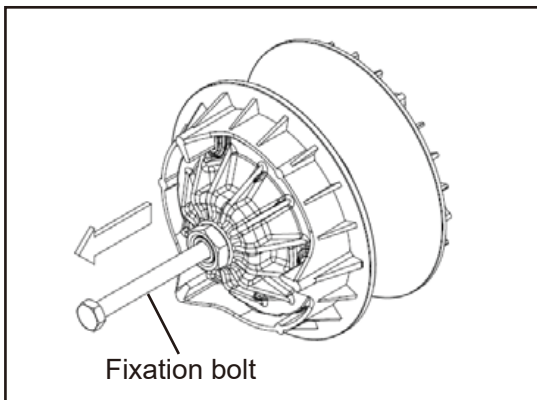
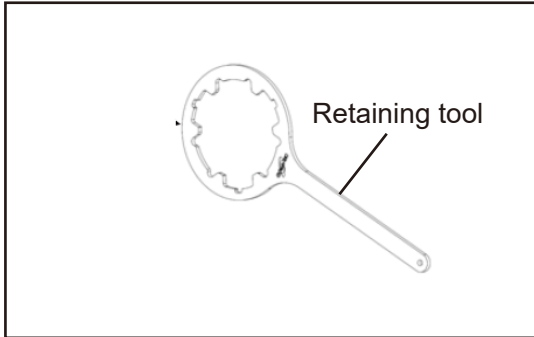
#### TIPS

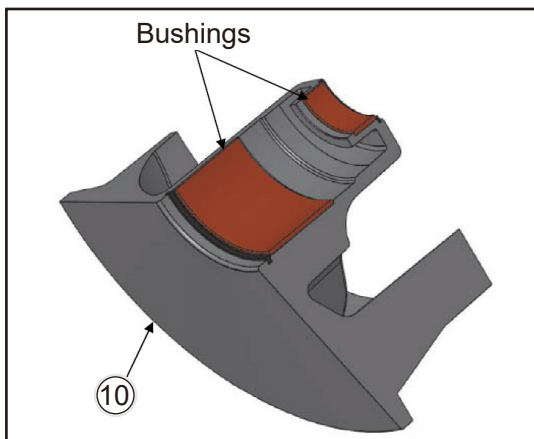
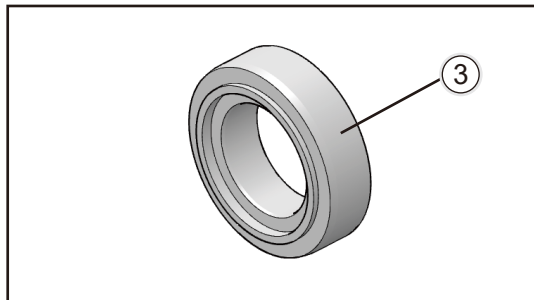
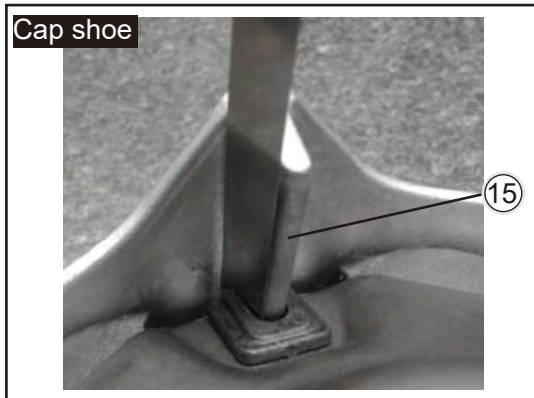
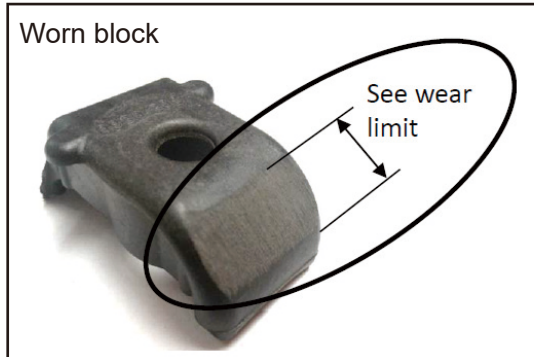
Hint: apply grease on the tip and on the threads of the puller

- ◆ If the pulley does not come off, please refer to the CVTech document #0046 - 5239 for complementary information on how to remove the drive pulley.

#### ⚠ CAUTION

The drive wheel moving disc ⑩ is spring loaded, and when the nut ⑭ is unscrewed, the spring ⑨ will push the moving disc ⑩ upward.





**DRIVE PULLEY DISASSEMBLY**

Recommended inspection and replacement

1. Check for wear marks on the blocks (12) .
  - ◆ Change the blocks (12) when the wear marks exceed the wear limit. Admissible wear limit of the block is less than 14mm.

**TIPS**

Always replace all centrifuge blocks simultaneously(12) .

2. Check for wear of the cap shoe (15) .
  - ◆ Change cap shoes (15) when a 1mm feeler gauge enters between the cap shoe (15) and sliding sheave (10) tower or if the pulley makes too much noise at idle.

Always change all 3 cap shoes (15) at the same time.

3. Check the Freewheel or idle bearing (3) .
  - ◆ Change when an irregular rotation is detected by hand or a creaky noise is heard when rotating the freewheel (3) .

Measure the spring (9) forces at the distances indicated on the CVTech website.

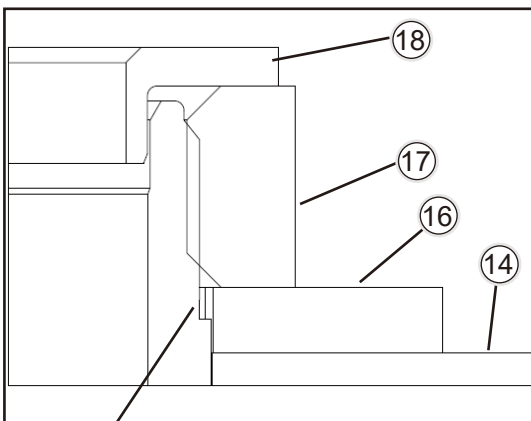
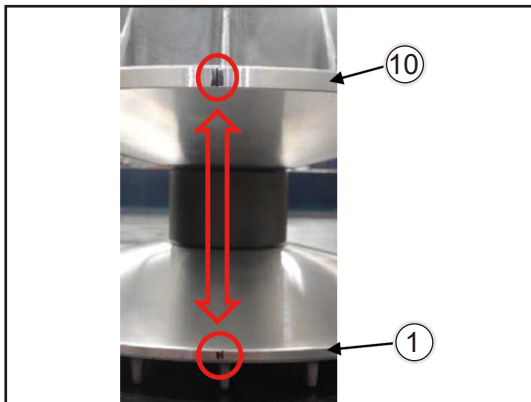
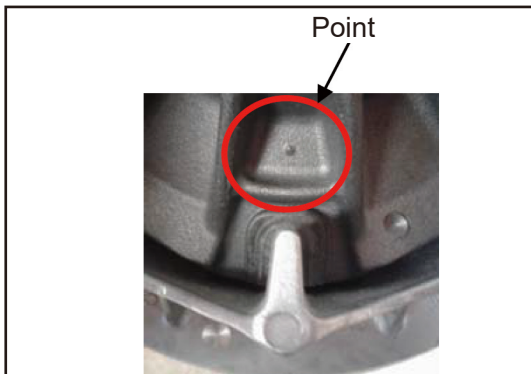
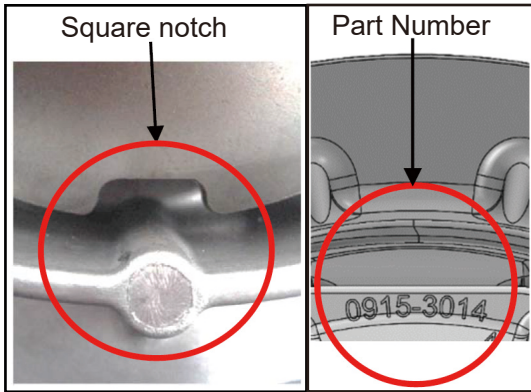
**TIPS**

To maintain the performance of the pulley, make sure the sliding sheave (10) bushings are cleaned with a microfiber towel or dry cloth.

**⚠ CAUTION**

Do not use acetone to clean the bushings.

### DRIVE PULLEY RE-ASSEMBLY



Hexagon top surface on the pulley shaft

Alignment of fixed sheave ①, sliding sheave ⑩ and cap ⑭.

- ◆ Align the two notches on the driving wheel fixed disc ① and the moving disc ⑩, and the square notch on the thrust disc 14 or the code 14 (depending on the type of thrust disc) on the parts to ensure the dynamic balance of the driving wheel.

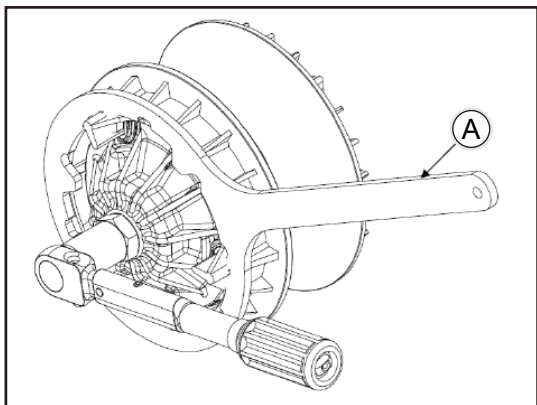
Nut
270 N•m (27.6kgf•m, 202in•lb)

### TIGHTENING THE PULLEY

- ◆ Use a torque wrench and a 30mm or 32mm socket (depending on the pulley model) to tighten the nut. Pulley nut ⑰

### TIPS

Before applying torque, make sure that the hex hole of the thrust disk ⑭ and the hexagon of the fixed disk ① are fully aligned.



## PULLEY TIGHTENING

- ◆ Once the pulley is properly installed, use a torque wrench to tighten the fixation bolt.
- ◆ To tighten the drive pulley, use the retaining tool **【A】** to lock the rotation.

### **⚠ WARNING**

Do not forget to remove the tools from the drive pulley.

### **TIPS**

Before you start the engine:

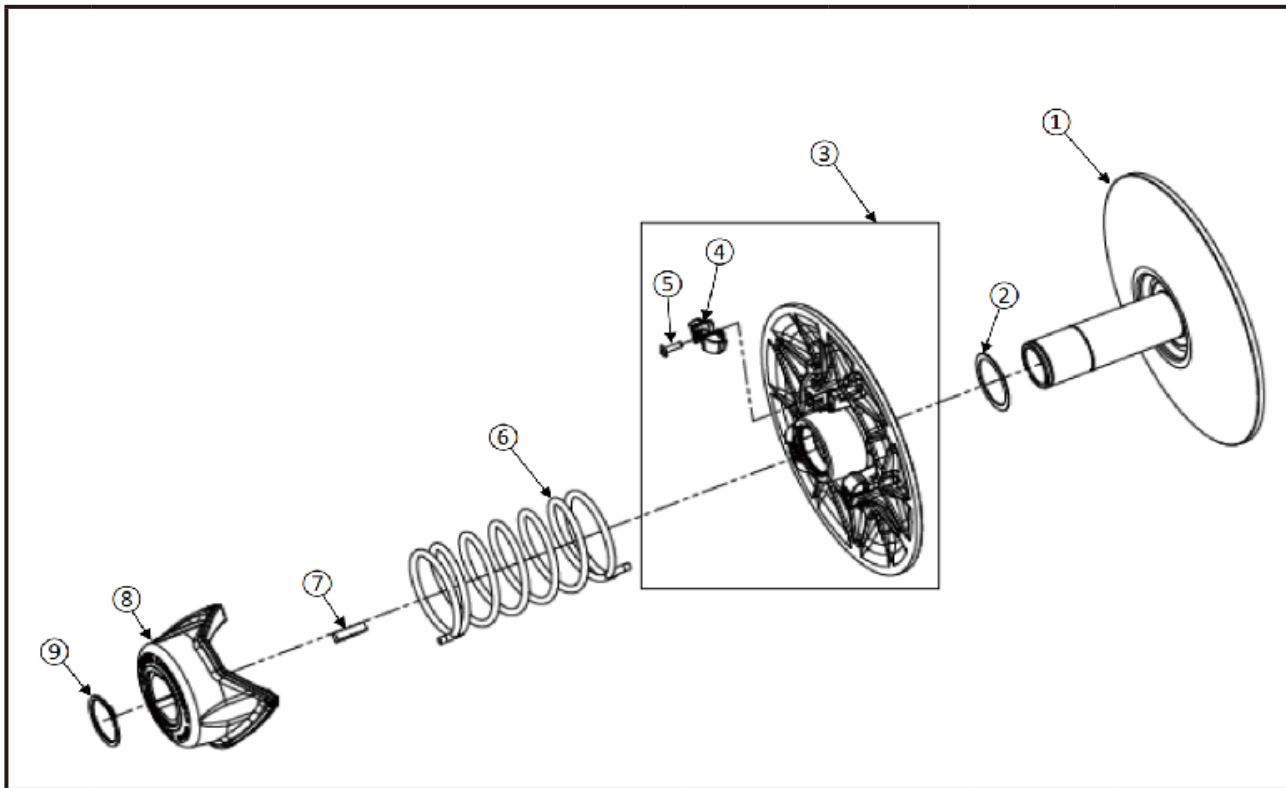
- ◆ Make sure all the components are clean without any trace of oil, dust and contaminants.
- ◆ Do not use any lubricants.

### **TIPS**

For optimal tightening force

- ◆ Repeat this tightening procedure after traveling a few kilometers with the vehicle.

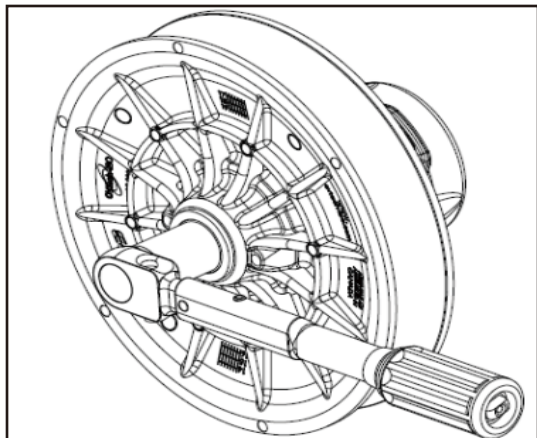
## CVT DRIVEN PULLEY ASSEMBLY EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Fixed disk				
2	Gasket (may not be available)				
3	Mobile disc				
4	Buffer Block				
5	Buffer block screw	3.5	0.36		R
6	Spring				
7	Key				
8	Cam				
9	snap ring				

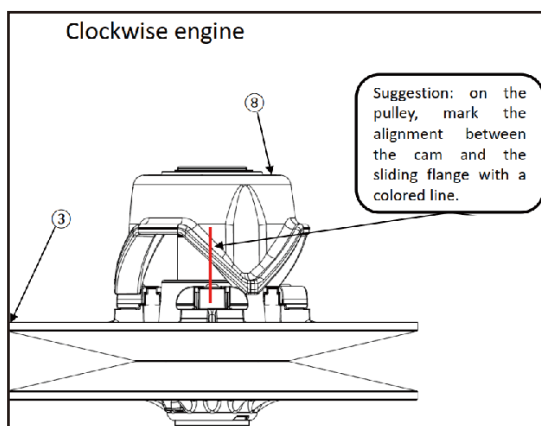
R:Replacement Part.

**PULLEY DISASSEMBLY**



**REMOVING THE DRIVEN WHEEL**

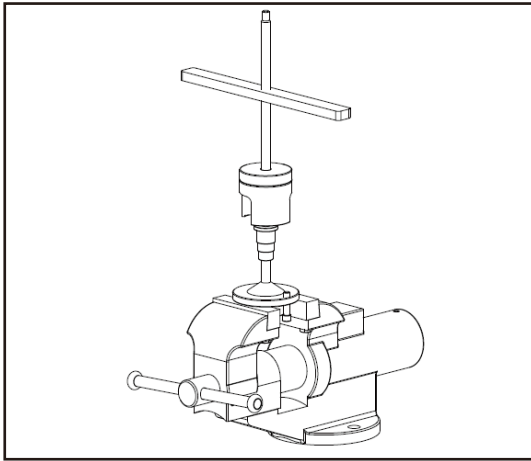
- ◆ Remove the driven wheel bolt and take out the driven wheel.



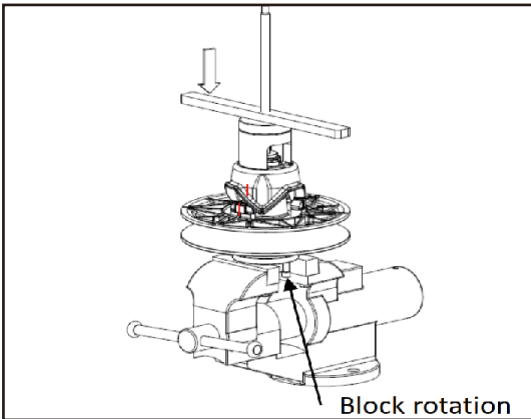
**DRIVEN WHEEL REMOVAL**

- ◆ Before removing the driven wheel, be sure to pay attention to the position of the spring ⑥ in the moving disc ③ and the cam ⑧ hole, and the alignment of the cam ⑧ and the buffer block.
- ◆ When reassembling the belt, the position must be the same as before disassembly, so as to ensure that the performance of the driven wheel is not affected.

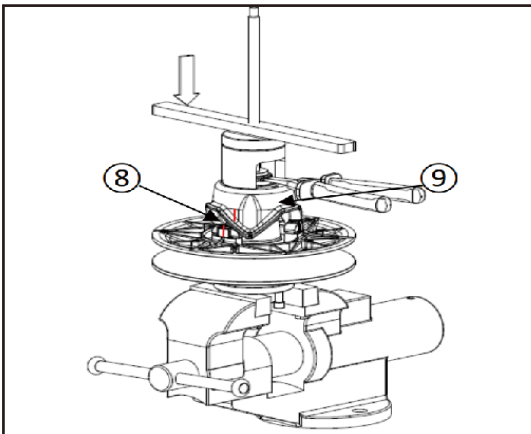
### SPRING DISASSEMBLY



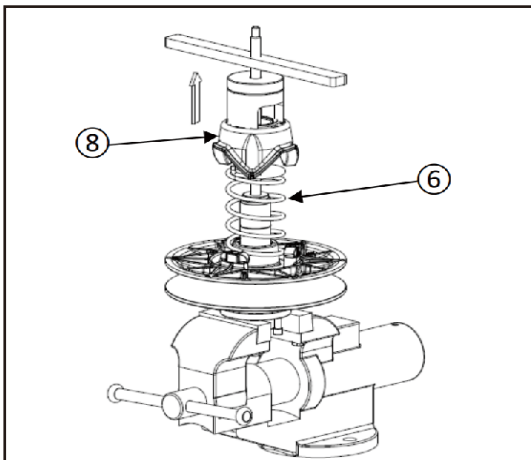
- ◆ Using a vise, mount the disassembly tool as shown .



- ◆ Install the pulley on the disassembly tool as shown .Use the lock screw to prevent the rotation of the pulley on the disassembly.
- ◆ By screwing the bar on the threaded rod, press down the spring seat ⑧(3 to 4 mm max.) in order to free up the external retaining ring ⑨.



- ◆ Remove the external retaining ring ⑨ using the snap ring pliers.



- ◆ Slowly unscrew the bar on the threaded rod to release the spring ⑥ tension.

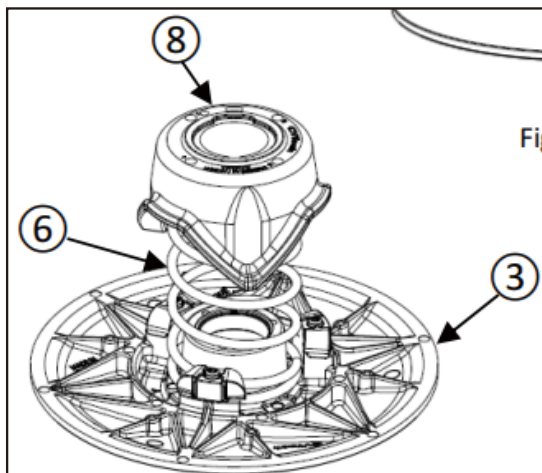
**⚠ WARNING**

Use the disassembly tool to disassemble the cam ⑧. The pulley is spring loaded with significant amount of force. the use of the disassembly tool will keep the pulley compressed.

**⚠ WARNING**

Slowly lift the cam ⑧ to free it from the shaft by unscrewing the disassembly tool once the external retaining ring ⑨ is removed.

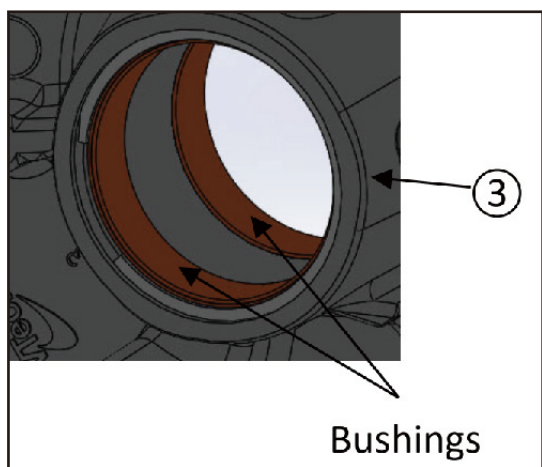
**RECOMMENDED INSPECTION**



- ◆ Check for wear marks on the cam ⑧.
- ◆ Check for wear marks on the spring ⑥.
- ◆ Perform a visual inspection of the compone.
- ◆ Check the wear of the sliding sheave ③ bushings(visual inspection only). If there is excessive wear, you must replace the whole sheave assembly ③.

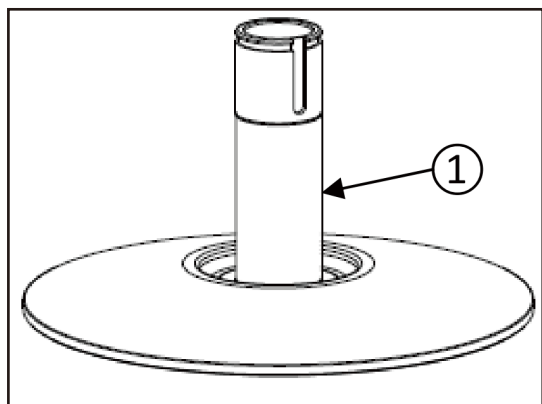
**⚠ WARNING**

The bushings cannot be removed from the sliding sheave ③ .



**⚠ WARNING**

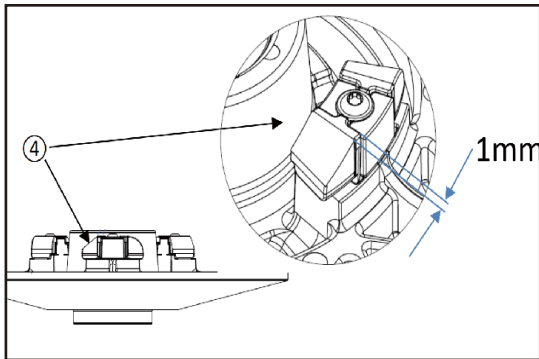
The shaft cannot be disassembled from the fixed sheave ① .



**⚠ WARNING**

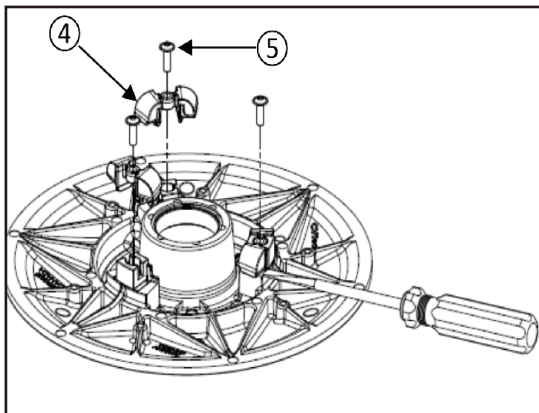
To maintain the performance of the pulley, make sure the sheave bushings are cleaned with a microfiber towel or dry cloth. CAUTION: Do not use acetone to clean bushing and do not use any lubricant.

### SLIDING FLANGE MAINTEN

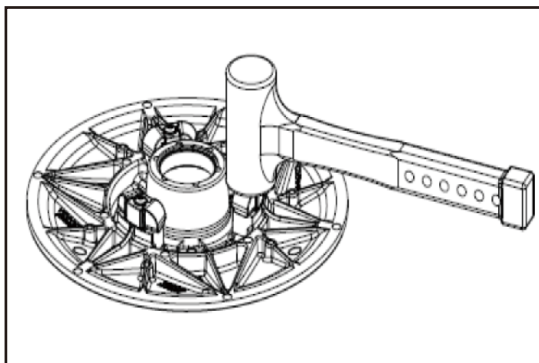


#### RECOMMENDED INSPECTION

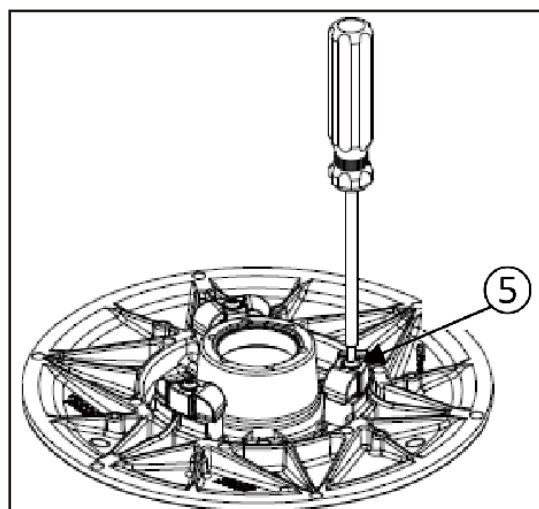
- ◆ If the cam shoes ④ are worn down to about 1 mm before making contact with the cam shoe support, they must be replaced.



- ◆ After removing the cam shoe screws ⑤ with a No. 20 torx screwdriver, the camshoes ④ may be removed using a flathead screwdriver.



- ◆ PMount the new cam shoes ④ using a hamme.

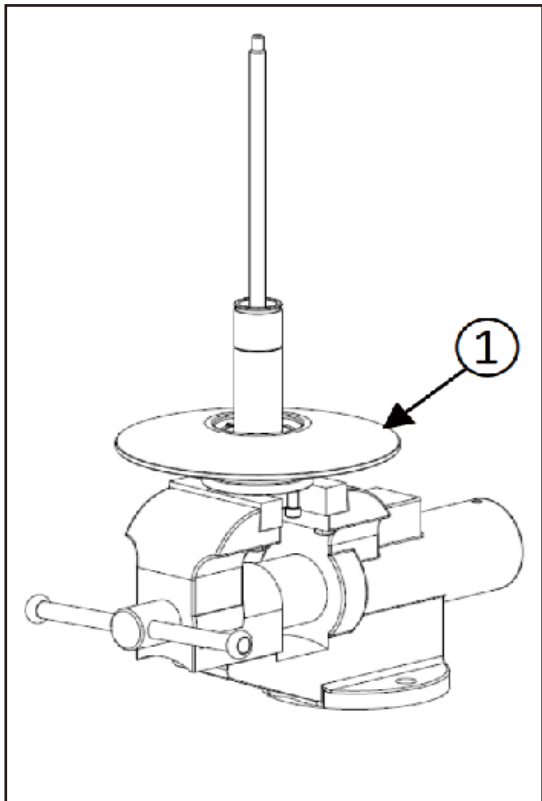


- ◆ Tighten the cam shoe screws ⑤ using no. 20 torx screwdriver to a value of 3.5N.m.

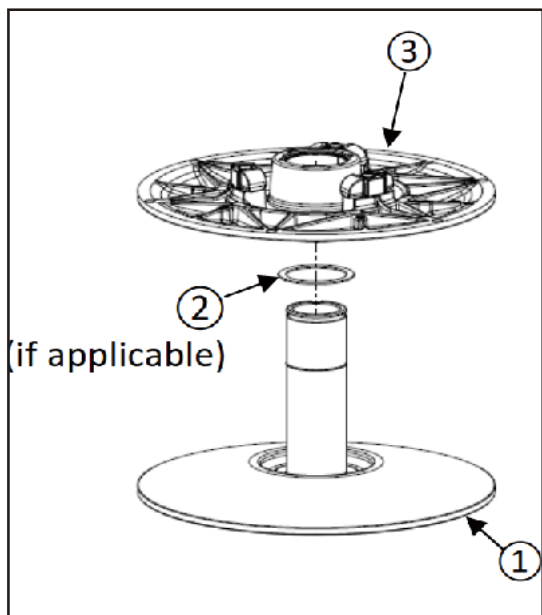
REASSEMBLE THE DRIVEN WHEEL

The removal tool is required to reassemble the driven wheel.

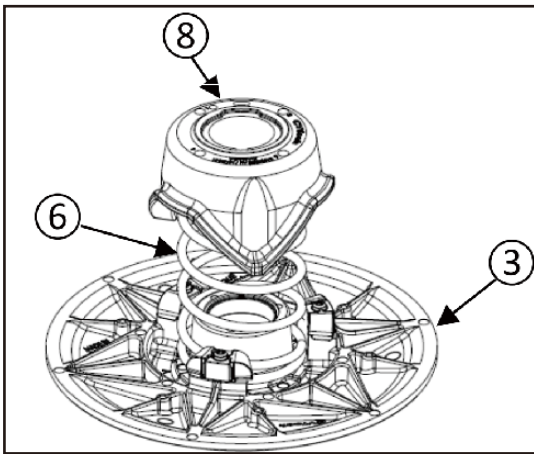
- ◆ Install the fixing plate ① on the bench vice



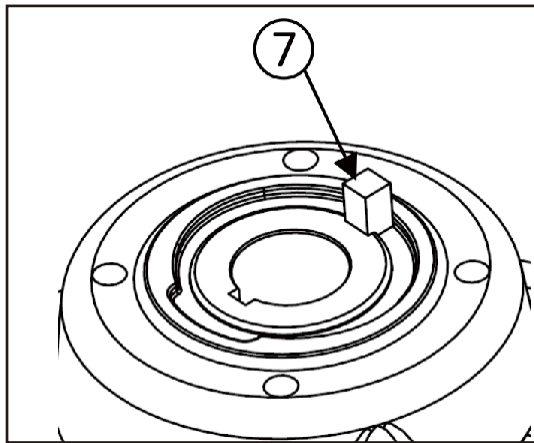
- ◆ Put the washer ② (if applicable) on the fixed sheave ① then put the sliding sheave ③ .



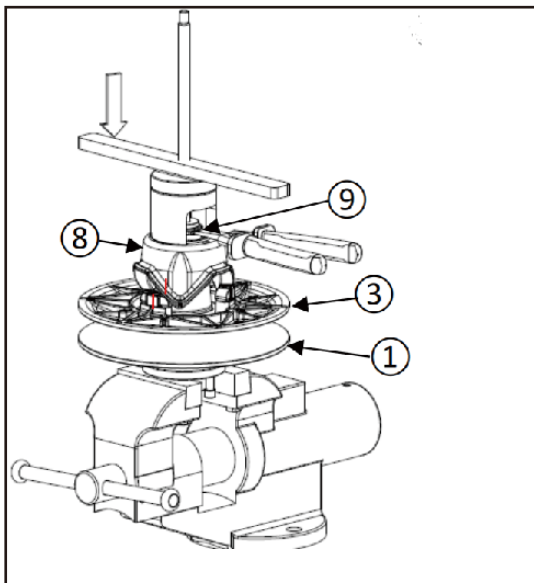
### ROLLERS ③ RE - ASSEMBLY



- ◆ Place the spring ⑥ lugs into the proper cam ⑧ hole and the proper sliding sheave ③ hole at the same positions noted during the disassembly steps.



- ◆ Press down the cam ⑧ onto the fixed sheave ① shaft with the disassembly tool. Position the key ⑦ into the fixed sheave ① shaft groove.



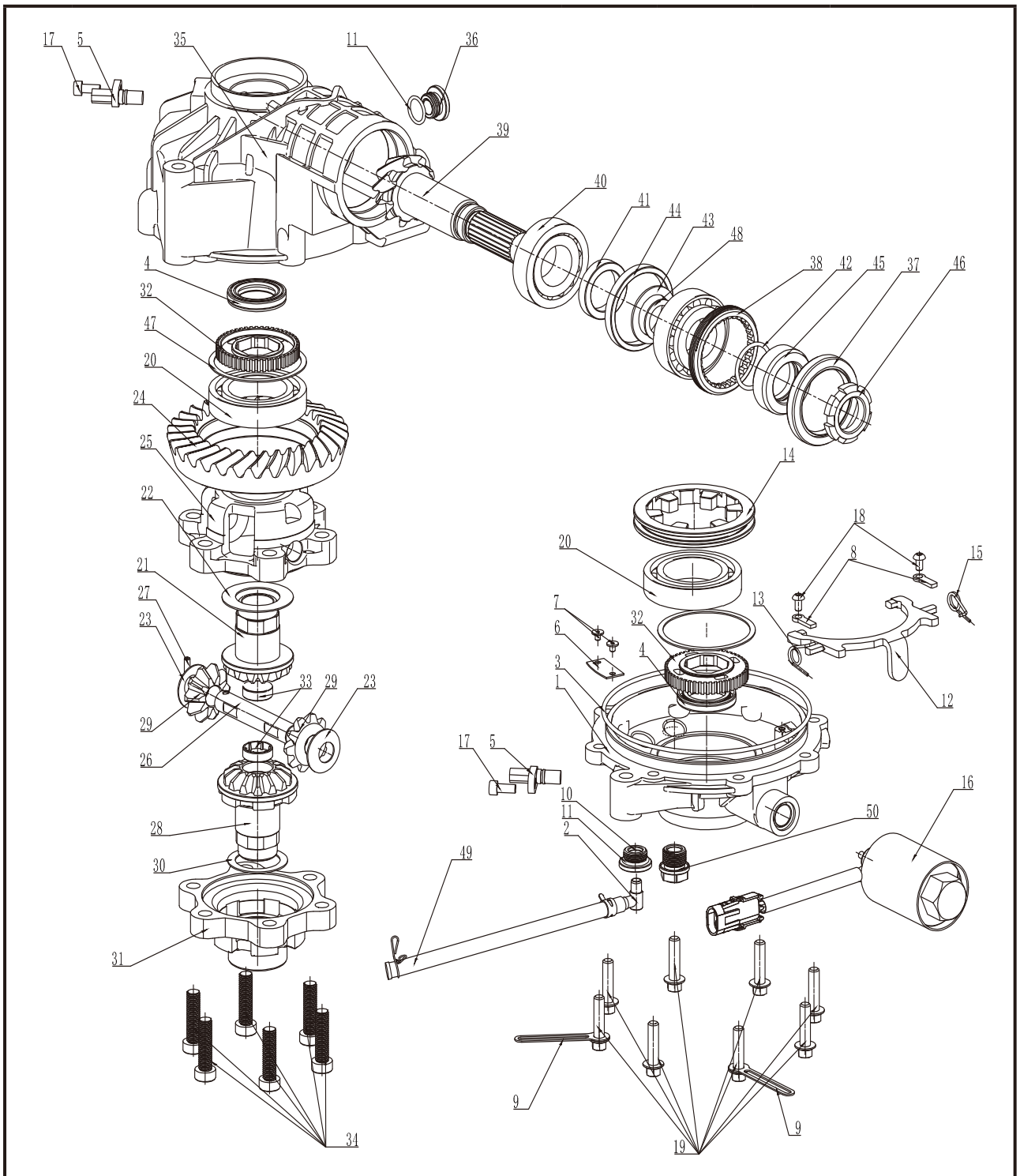
- ◆ Put the retaining ring ⑨ on Torque the 4 screws.
- ◆ Make sure that the fixed sheave ① is blocked in rotation, turn the sliding sheave ③ counter clockwise or clockwise to position the cam shoe ④ on the proper side of the cam sliding surface as it was before disassembly.
- ◆ Screw the disassembly tool bar until the cam ⑧ is low enough to install the external retai.

## FRONT AXLE AND REAR GEARBOX

<b>EXPLODED VIEW OF FRONT AXLE.....</b>	<b>4-3</b>
<b>TECHNICAL SPECIFICATIONS.....</b>	<b>4-5</b>
<b>SPECIAL TOOLS.....</b>	<b>4-6</b>
<b>REPLACEMENT OF FRONT AXLE GEAR OIL.....</b>	<b>4-7</b>
DRAIN THE OLD GEAR OIL.....	4-7
ADD NEW GEAR OIL.....	4-7
<b>FRONT AXLE ASSEMBLY REMOVAL/INSTALLATION .....</b>	<b>4-8</b>
<b>ADJUSTMENT OF GEAR CLEARANCE .....</b>	<b>4-9</b>
INSTALL .....	4-9
<b>EXPLODED VIEW OF REAR GEARBOX .....</b>	<b>4-10</b>
<b>REPLACEMENT OF GEARBOX GEAR OIL.....</b>	<b>4-14</b>
DRAIN THE GEARBOX OIL.....	4-14
ADD GEARBOX OIL.....	4-14
<b>REAR TRANSMISSION ASSEMBLY-REMOVAL/INSTALLATION .....</b>	<b>4-15</b>
<b>DISASSEMBLE THE GEARBOX .....</b>	<b>4-17</b>
GEAR SETTING.....	4-17
DISASSEMBLE THE DRIVEN BEVEL GEAR COVER ASSEMBLY .....	4-17
DISASSEMBLE THE NUT COVER PLATE AND NUT .....	4-17
DISASSEMBLE THE FOLLOWER BEARING HOUSING AND FRONT OUTPUT DRIVEN ASSEMBLY .....	4-17
DISASSEMBLE THE GEARSHIFT MECHANISM .....	4-18
DISASSEMBLE THE OIL PUMP ASSEMBLY AND PARKING ARM ASSEMBLY .....	4-18
DISASSEMBLE THE LEFT GEARBOX CONNECTOR .....	4-19
DISASSEMBLE THE RIGHT GEARBOX ASSEMBLY .....	4-19
DISASSEMBLE THE REVERSE IDLER SHAFT ASSEMBLY AND REAR OUTPUT ASSEMBLY .....	4-19
DISASSEMBLE THE GEARSHIFT LOCATING BOLT, DIFFERENTIAL FORK AND OIL FILTER.....	4-19
DISASSEMBLE THE SHIFT HUB AND FRONT DRIVE ASSEMBLY .....	4-20
DISASSEMBLE THE GEAR TRANSMISSION PARTS.....	4-20
DISASSEMBLE THE SECONDARY SHAFT ASSEMBLY.....	4-20
<b>ASSEMBLE THE GEAR BOX .....</b>	<b>4-21</b>
INSTALL THE LEFT CASE BEARING .....	4-21
INSTALL THE RIGHT GEARBOX COMBINATION BEARING.....	4-21
INSTALL THE SECONDARY SHAFT ASSEMBLY .....	4-22
ASSEMBLED OUTPUT COMPONENTS.....	4-22
INSTALL THE GEAR UNIT.....	4-23

ASSEMBLE THE HR-GEAR FORK SHAFT ASSEMBLY .....	4-23
ASSEMBLE THE L-GEAR FORK SHAFT ASSEMBLY .....	4-23
INSTALL THE HR-GEAR FORK ASSEMBLY, L-GEAR FORK ASSEMBLY, AND SHIFT HUB ASSEMBLY .....	4-24
INSTALL THE DRIVE SHAFT ASSEMBLY AND THE 2/4 WD FORK ASSEMBLY.....	4-25
INSTALL THE GEAR LOCATING ASSEMBLY .....	4-25
ASSEMBLE THE REVERSE IDLER SHAFT ASSEMBLY .....	4-25
INSTALL THE DIFFERENTIAL FORK ASSEMBLY AND OIL FILTER.....	4-26
INSTALL THE REAR OUTPUT GEAR ASSEMBLY .....	4-26
INSTALL THE LEFT CASE COMBINATION .....	4-26
INSTALL THE OIL SEALS AND O-RINGS .....	4-27
INSTALL THE DRIVEN BEVEL GEAR SHAFT .....	4-27
INSTALL THE DRIVE BEVEL GEAR AND FRONT OUTPUT ASSEMBLY .....	4-28
INSTALL THE DRIVEN BEVEL GEAR COVER .....	4-28
INSTALL THE OIL PUMP ASSEMBLY .....	4-29
INSTALL THE PARK ARM ASSEMBLY .....	4-29
INSTALL THE SHIFT MECHANISM.....	4-30
INSTALL THE SHIFT COVER .....	4-30
INSTALL THE SOLENOID VALVE ASSEMBLY.....	4-31
INSTALL THE SPEED SENSOR ASSEMBLY .....	4-31
INSTALL THE OIL FILLER PLUG AND DRAIN PLUG ASSEMBLY .....	4-31

EXPLODED VIEW OF FRONT AXLE



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front axle box cover				
2	Zinc alloy air nozzle				
3	O-Ring φ150×φ2.5				O
4	oil seals φ30×φ45×6.5				G
5	ABS Wheel Speed Sensor 90 degrees				
6	covers				

# FRONT AXLE AND REAR GEARBOX

SEGWAY AT10

7	Hexagon socket thin head screws M4×4	1.8	0.18		L
8	Fork stopper				
9	Wire Harness Clip				
10	Filling plug M18×1.5	20	2		
11	O-ring φ16×φ2.5				O
12	fork				
13	Reset spring (left-handed)				
14	bushings				
15	Reset spring (right-handed)				
16	Solenoid valve part (stroke 6mm)				
17	Hexagon socket head cap screws M6×14	11	1.1		L
18	Hexagon socket cheese head screws M5x10	6.5	0.65		L
19	Hexagonal flange face bolts M8×1.25×30	24	2.4		
20	Deep groove ball bearing 6009 φ45×φ75×16				
21	Right Half Shaft Gear				
22	Adjustment shim φ34.2×φ54.8×(0.8, 0.9, 1)				O
23	Bowl shaped gasket φ15.2×φ32×1				O
24	Front axle driven gear 31 teeth Right-handed				
25	Differential housing				O
26	Planetary gear shaft φ15×86				O
27	Elastic cylindrical pin φ4×35				
28	Front Left Half Shaft Gear				O
29	planetary gear				O
30	Adjustment shims φ34.2×φ46× (0.8, 0.9, 1, 1.1)				O
31	Differential cover				O
32	Signal ring				
33	plug				
34	Hexagon socket cheese head screws M10×1.25×36	70	7		10.9 level environmentally friendly white zinc Head coating adhesive
35	cabinet				
36	Oil drain screw plug M18×1.5	20	2		
37	oil seals φ48×φ65×9				G
38	locknut M64x1.5x9	66	6.6		L
39	Front axle main gear 9 teeth				
40	Tapered roller bearing 32206 φ30×φ62×21.25				
41	Spacer φ30.2×φ38×8.3				
42	O-ring φ30×φ2.8				O
43	Adjustment shim φ30.6×φ38×(1.8, 1.9, 2)				
44	Bearing spacer II φ53×φ62×7.6				
45	Input shaft bushing M27x1.5x10 Left-hand rotation				
46	locknut	125	12.5		L
47	Adjustment gasket φ67×φ74.9× (0.8, 0.9, 1, 1.1)				
48	Adjustment gasket φ30.6×φ40× (0.1, 0.15, 0.2)				
49	Ventilation hose component φ7×φ11×400				
50	Oil mirror M18×1.5				

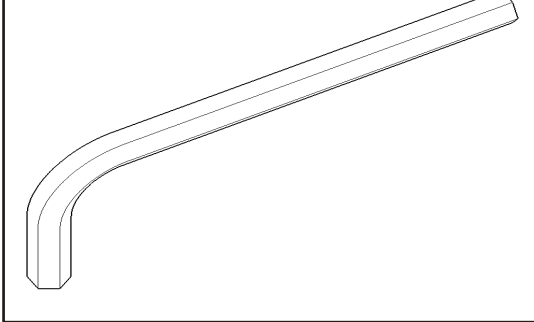
G: Apply grease for oil seal and O-ring.  
 L: Apply a non-permanent locking agent.  
 O: Apply gear oil(SAE 80W/90/GL-5).

## TECHNICAL SPECIFICATIONS

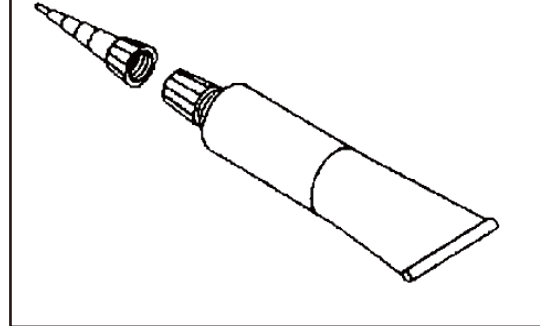
Item	Standard	Service limit
Front axle:		
Type	SAE 80W-90 GL-5	
Fill position	Side of the box(plug screw M18x1.5)	
Drain position	Bottom of box(plug screw M18x1.5 component)	
Volume	330 mL (0.35 US qt) (when there is no oil stains after internal cleaning) 310 mL (0.33 US qt) ( only when changing gear oil)	
Bevel gear backlash	0.15~0.25 mm(0.06~0.10 in.)	
Gearbox assembly:		
Type	SAE 80W-90 GL-5	
Fill position	Side (oil dipstick)	
Drain position	Bottom (M14 plug)	
Volume	1200 mL (1.27 US qt) (refill gear oil for the first time) 1200 mL (1.27 US qt) (change gear oil)	
Bevel gear backlash	0.15~0.25 mm(0.06~0.10 in.)	

## SPECIAL TOOLS

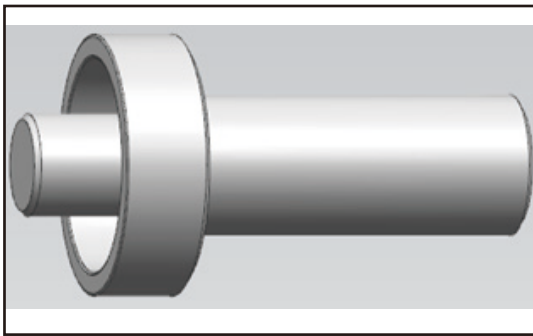
Allen wrench 2.5mm/5mm/8mm/12mm:



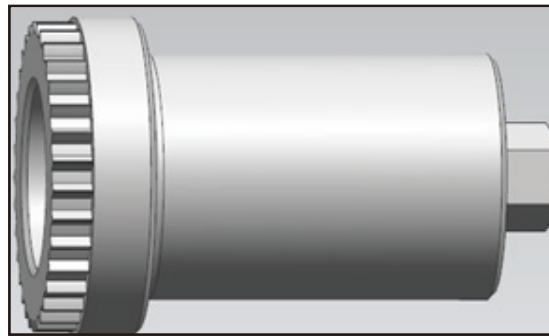
Silicone Sealant:



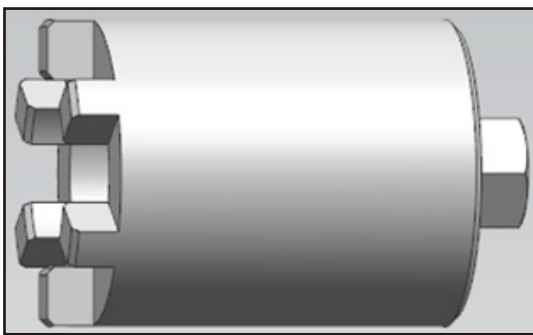
Bearing press fitting tool:



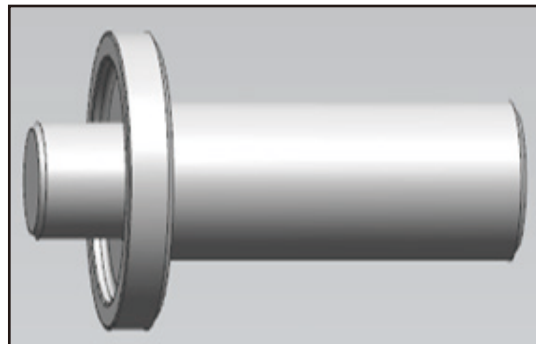
Input shaft gear locking nut tightening tool:



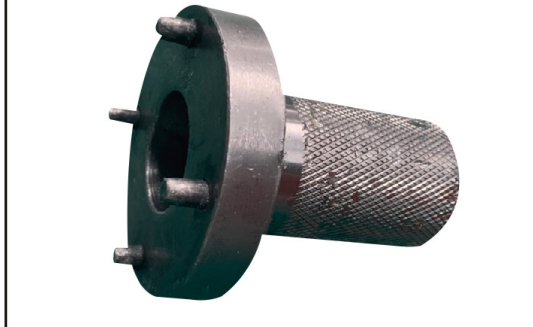
Locking nut tightening tool



Oil seal driving tool



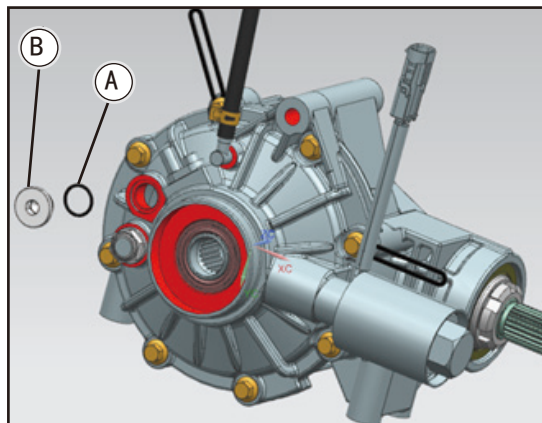
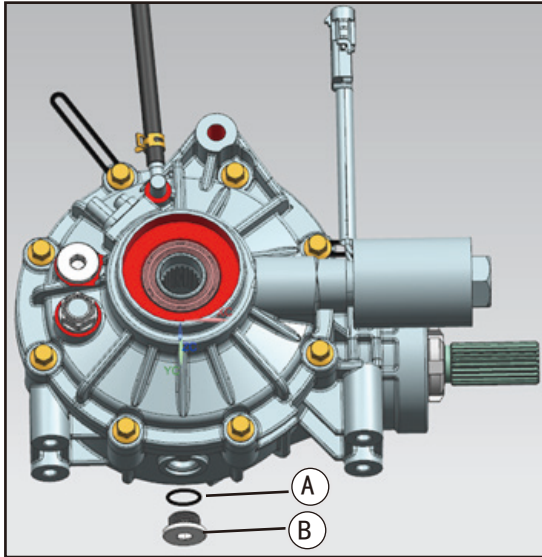
Input shaft drive tooth screw plug socket



T-sleeve 10mm



## REPLACEMENT OF FRONT AXLE GEAR OIL

**⚠ WARNING**

Vehicle operation with insufficient, deteriorated, or contaminated gear oil will cause accelerated wear and may result in Gearbox Damage, accident, and injury.

【A】 o-ring  $\phi 16 \times \phi 2.5$

【B】 screw plug M18X1.5 assembly

**DRAIN THE OLD GEAR OIL**

- ◆ Tools: 8mm Allen key
- ◆ Turn 【B】 counterclockwise and screw it out, let the old gear oil flow out for 10 minutes, then put 【A】 on the threaded end of 【B】, tighten it at the right time, and wipe clean the gear oil spilled around.
- ◆ Waste gear oil please environmental protection treatment, please be sure to take care of the environment

**ADD NEW GEAR OIL**

- ◆ Tools: 8mm Allen key
- ◆ Rotate 【B】 counterclockwise to unscrew it, add a certain amount of new gear oil, and then tighten the threaded end of sleeve 【A】 and 【B】 clockwise to wipe clean the gear oil spilled around.

**⚠ CAUTION**

Pay attention to check the O-ring during installation. If it is damaged, it will lead to poor sealing and leakage of gear oil, which will aggravate the internal wear of the gearbox and eventually cause damage to the gearbox. Please replace the damaged O-ring in time.

screw plug M18X1.5

20N·m(2.0kgf·m, 13ft·lb)

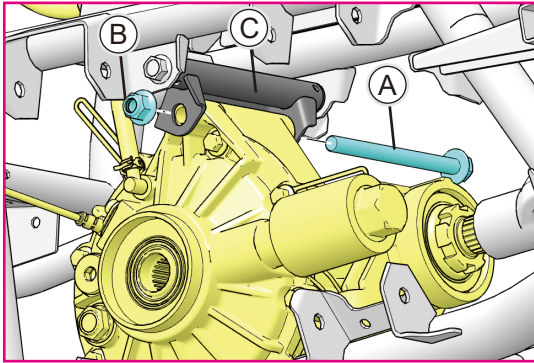
### FRONT AXLE ASSEMBLY REMOVAL/INSTALLATION

To remove the front axle from the vehicle, perform the following steps:

- ◆ Remove the front wheel and front drive shaft assembly first, refer to Chapter 8-Front Drive Shaft Assembly Removal Procedure for this removal procedure.

#### TIPS

The removal steps of the front left and right wheels and the front left and right drive shaft assembly are the same.

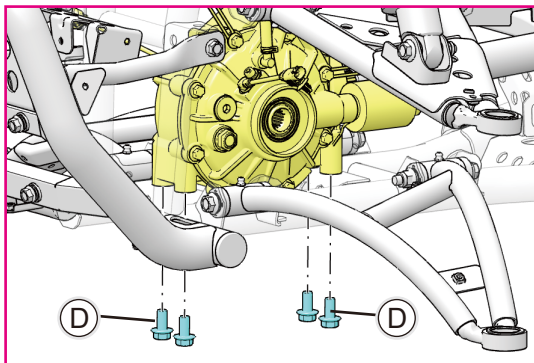


- 【A】 Hexagon flange bolt M10 × 1.25 × 125
- 【B】 Hexagon flange lock nut M10 × 1.25
- 【C】 Front axle upper bracket welding assembly

- ◆ Remove the bolts 【A】 and nuts 【B】 fixed by the front axle upper bracket welding assembly and the front axle upper bracket welding assembly

Hexagon flange bolt M10×1.25×125

70 N.m

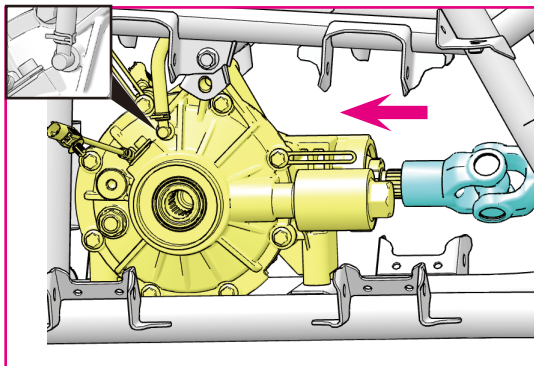


- 【D】 Hexagon flange bolt M10 × 1.25 × 20

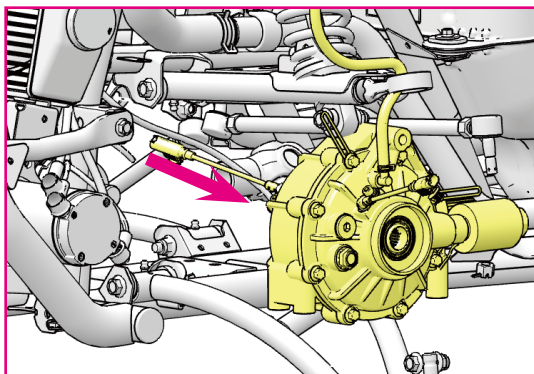
- ◆ Remove the four hexagon flange bolts m10×1.25×20 That secure the front axle at its bottom.

Hexagon flange bolt M10×1.25×20

55 N. m

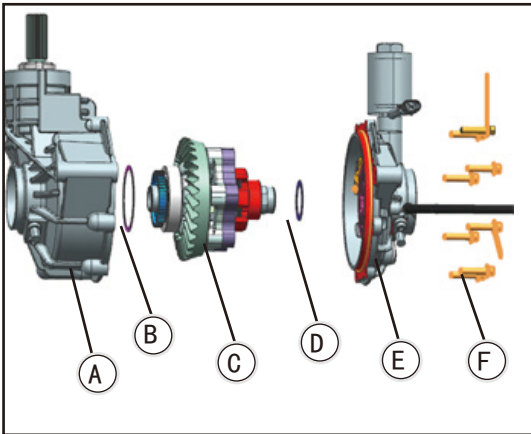
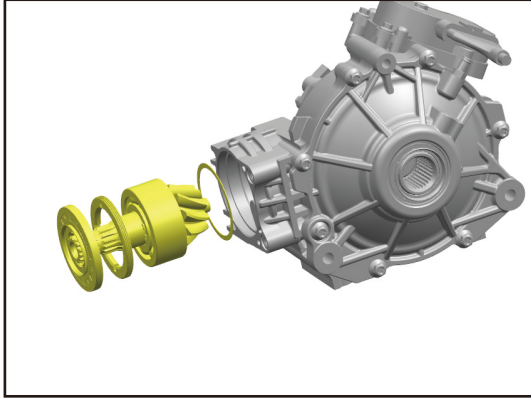


- ◆ Loosen the clamp on the front axle vent pipe and pull out the front axle vent pipe.
- ◆ Move the front axle to the front of the vehicle and pull out the front axle drive gear from the front drive shaft assembly.



- ◆ Take out the front axle assembly from the side.
- ◆ The installation steps of the front axle assembly are opposite to the removal steps.

## ADJUSTMENT OF GEAR CLEARANCE

**⚠ WARNING**

If the gear gap is not adjusted well, it will aggravate the wear of gear parts, resulting in abnormal gear transmission noise, gear surface pitting, reduced transmission efficiency, and shortened overall life.

- 【A】 Front axle box assembly
- 【B】 Adjust the gasket
- 【C】 Differential components
- 【D】 Adjust the gasket
- 【E】 Front axle box cover assembly
- 【F】 Bolt

**DISASSEMBLE**

- ◆ Tool: gear wrench
- ◆ Use a ratchet wrench to rotate clockwise to unscrew 【F】 , remove 8 【F】 , remove the E box cover assembly and 【D】 adjustment gasket, and then remove the 【C】 differential assembly and 【B】 adjustment gasket from the box assembly.

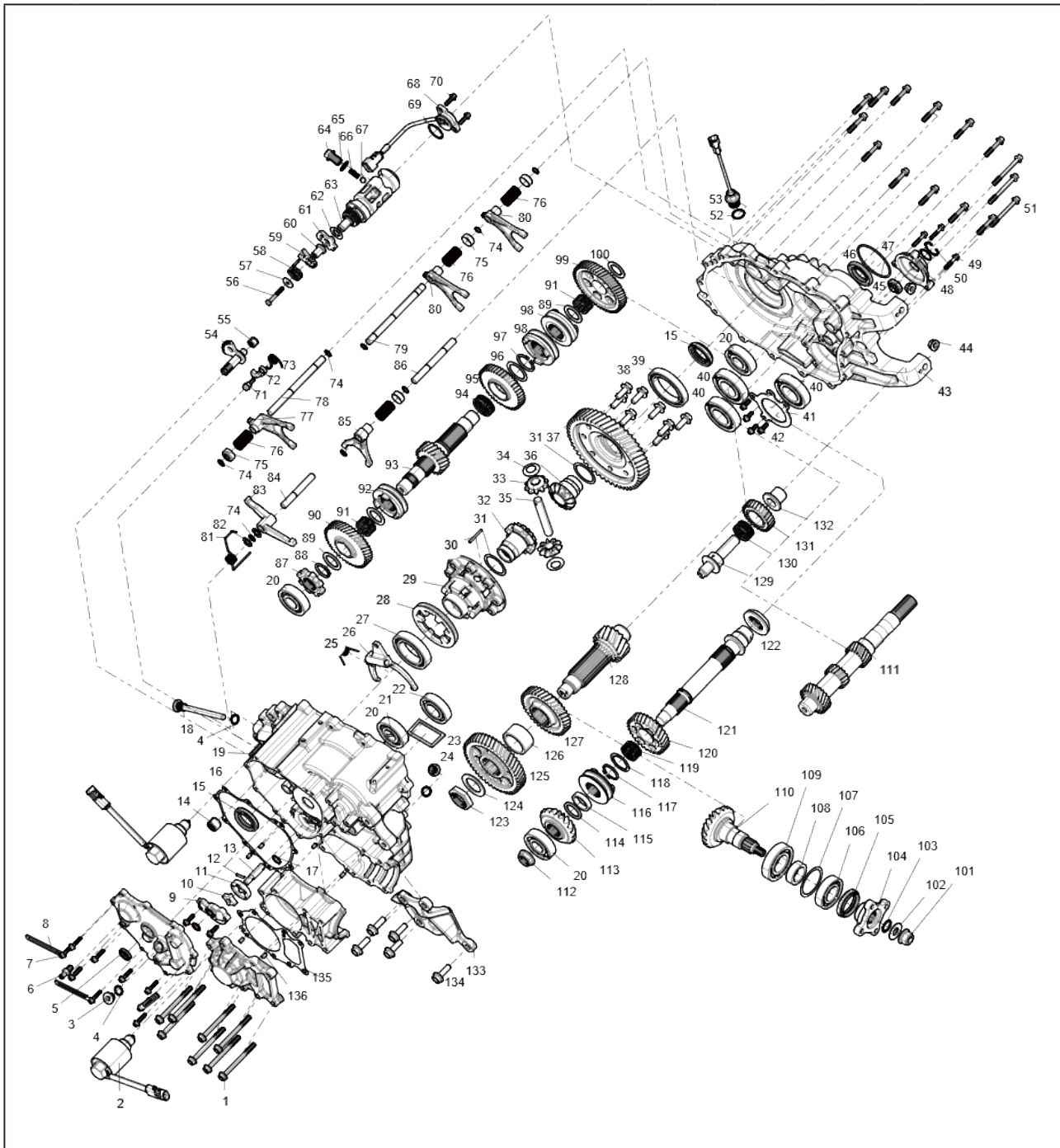
**INSTALL**

- ◆ Tool: gear wrench
- ◆ Take the corresponding thickness of 【B】 according to the gear clearance value, place 【B】 into the inner hole of 【A】 box component, and then insert 【C】 into the inner hole of 【A】 . Take the corresponding thickness of 【D】 according to the assembly requirements, and then install 【D】 on the differential component. Apply silicone rubber flat sealant on the box cover component, and then install the box cover component on the box component. Use a ratchet wrench to rotate F counterclockwise, tighten it, and confirm the gear clearance again. After accuracy (note that the oil seal lip should not be scratched, and the oil seal as a whole should not deform), wipe off the scattered gear oil around it.

**⚠ CAUTION**

Pay attention to the scratch and damage of the oil seal during installation. If damaged, it will cause the gearbox to leak gear oil, which will accelerate the internal wear of the gearbox and eventually cause damage to the gearbox. Please replace the damaged oil seal in time.

### EXPLODED VIEW OF REAR GEARBOX



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	BOLT M8×90	25	2.55	18.5	
2	Solenoid valve				
3	SCREW PLUG M14	15	1.53	11.1	
4	O-RING 13.8×2.5				
5	OIL SEAL 15×25×5				G
6	BREATHING JOINT	15	1.53	11.1	L
7	BOLT M6×25	12	1.22	8.86	
8	HOSE CLAMP				
9	OIL PUMP COVER				

10	INNER GEROTOR				
11	OUTER GEROTOR				
12	NEEDLE ROLLER 4×15.8				
13	OIL PUMP SHAFT				
14	NEEDLE ROLLER BEARING HK1516				
15	Oil seal 35 × 52 × 7/11				G
16	GEAR SHIFT COVER GASKET				
17	O RING 15.6X1.78				
18	DIFFERENTIAL SHIFT FORK SHAFT				
19	RIGHT GEARBOX				SS
20	BEARING 6305				
21	Needle roller P4 × 23.8				
22	BEARING 6206				
23	STRAINER FILTER				
24	SCREW PLUG M14	15	1.53	11.1	
25	RETURN SPRING				
26	DIFFERENTIAL SHIFT FORK				
27	BEARING 6010				
28	REAR DIFFERENTIAL OUTPUT SHIFT SLEEVE				
29	DIFFERENTIAL HOUSING				
30	PIN 4 × 35				
31	SHIM $\Phi$ 40.2 × $\Phi$ 50				
32	RIGHT REAR HALF SHAFT BEVEL GEAR				
33	TRANSMISSION PLANETARY GEAR				
34	BOWL SHAPED GASKET				
35	REAR OUTPUT PLANETARY GEAR SHAFT				
36	LEFT REAR HALF SHAFT BEVEL GEAR				
37	REAR OUTPUT GEAR				
38	BOLT M10×1.25×25	84	8.6	62	
39	BEARING 61912				
40	BEARING 6207				
41	FRONT BEARING PRESSURE PLATE				
42	BOLT M6×16	12	1.22	8.86	
43	AT10 LEFT GEARBOX				SS
44	NUT M10X1.25				
45	OIL WINDOW				
46	OIL SEAL 30 × 55 × 7				G
47	O RING 73×3.0				
48	FRONT NUT COVER PLATE				SS
49	BOLT M6×30	12	1.22	8.86	
50	CLIP 30				
51	BOLT M8×70	25	2.55	18.5	
52	O-RING 19.4×2.3				
53	VEHICLE SPEED SENSOR				
54	SHIFT SHAFT				
55	NEEDLE ROLLER BEARING HK121612				
56	HEXAGON HEAD BOLT M6×40	12	1.22	8.86	
57	SPACER 6.2×22×2				
58	SECTOR GEAR TORSION SPRING				
59	SECTOR GEAR				
60	SECTOR GEAR SPACER				
61	POSITIONING STAR				

# FRONT AXLE AND REAR GEARBOX

SEGWAY AT10

62	SPACER 15×28×1				
63	VARIABLE SPEED DRUM				
64	NEUTRAL POSITION SPRING PLUG	20	2.04	14.8	
65	GASKET 14×21×1.5				
66	NEUTRAL POSITION SPRING				
67	BALL 3/8				
68	GEAR SENSOR				
69	O-RING 29.6×2.4				
70	BOLT M6×20	12	1.22	8.86	
71	SHOULDER BOLT	15	1.53	11.1	
72	DETENT PAWL				
73	DETENT PAWL TORSION SPRING				
74	CIRCLIP 12				
75	SHIFT FORK SPRING SEAT				
76	SHIFT FORK				
77	L-GEAR FORK				
78	L-GEAR SHIFT FORK SHAFT				
79	HR SHIFT FORK SHAFT				
80	H/R GEAR SHIFT FORK				
81	PARKING ARM RETURN SPRING				
82	SPACER 12×20×1				
83	PARKING ARM				
84	PARKING ARM SHAFT				
85	2/4 WD FORK				
86	2/4 WD FORK SHAFT				
87	PARKING RATCHET				
88	CIRCLIP 28×2.5				
89	WASHER 28×40×2.5				
90	H-GEAR DRIVEN GEAR				
91	NEEDLE ROLLER BEARING K28×33×17				
92	H GEAR ENGAGEMENT SLEEVE				
93	COUNTERSHAFT				
94	NEEDLE ROLLER BEARING K35×40×13				
95	R GEAR DRIVEN GEAR				
96	SPACER 35×46×1.5				
97	CIRCLIP 35×2.5				
98	R/L GEAR COUPLING SLEEVE				
99	L GEAR DRIVEN GEAR				
100	WASHERS 25 × 38 × 2.5				
101	LOCKING NUT M14X1.5	120	12.2	88.6	L
102	WASHER 15x34x2				
103	O-RING 20×2.65				
104	FRONT OUTPUT FLANGE				
105	OIL SEAL 38×55×7				G
106	BEARING 7206				
107	SHIM 62×51×0.4				
108	BEARING SPACER				
109	BEARING 7207				
110	FRONT OUTPUT DRIVEN BEVEL GEAR SHAFT				
111	MAIN SHAFT				
112	NUT M22×1	145	14.8	107	L
113	FRONT OUTPUT DRIVE BEVEL GEAR				
114	DRIVE GEAR SHIM				

115	FRONT OUTPUT DRIVING GEAR BUSHING				
116	2 4WD COMBINING SLEEVE				
117	CLIP 32×2				
118	SPLINE WASHER OD43 × 1.5				
119	NEEDLE ROLLER BEARING 30 × 34 × 17LE ROL				
120	DRIVEN GEAR				
121	GEAR SHAFT				
122	HEXAGONAL FLANGE NUT M33 × 1.5	240	24.49	177.12	L
123	NUT M33×1.5	240	24.49	177.12	L
124	GASKET 34×52×3				
125	SECONDARY DRIVEN GEAR				
126	Bushing 40.5 × 52 × 27				
127	DRIVE GEAR				
128	TRIAxIAL				
129	REVERSE GEAR SHAFT				
130	NEEDLE BEARING K30×35×17				
131	REVERSE GEAR IDLER GEAR				
132	REVERSE SHAFT BUSHING				
133	TRANSMISSION CONNECTION BRACKET				
134	HEXAGON FLANGE BOLT M12×1.25×30	45	4.59	33.3	
135	BEVEL GEAR COVER GASKET				
136	DOWEL PIN 6X 10				

G: Use grease suitable for oil seals and O-rings

L: Use thread glue

O: Use gear oil (SAE 75W/GL-5 grade, AGL 80W/90/GL-5 grade)

SS: Coated with silicone sealant

R: Replacement Parts

## REPLACEMENT OF GEARBOX GEAR OIL

### ⚠ WARNING

Vehicle operation with insufficient, deteriorated, or contaminated speed gearbox oil will cause accelerated wear and may result in Gearbox Damage, accident, and injury.

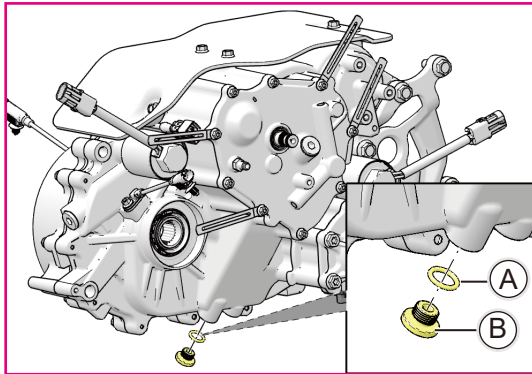
### DRAIN THE GEARBOX OIL

【A】 O-ring seal 13.8×2.5

【B】 Screw plug M14 assembly

◆ Tools: 8mm Allen key.

◆ Unscrew 【B】 counterclockwise, remove 【A】 and 【B】 , and let the transmission oil flow out for 10 minutes. Then put 【A】 on the bottom of 【B】 thread, tighten clockwise, and wipe the surrounding oil clean. Waste oil should be poured into special containers to avoid environmental pollution.



Tightening torque of screw plug M14 assembly

$18 \pm 2$  N. m

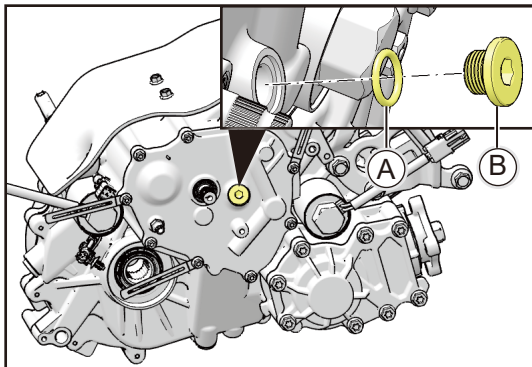
### ADD GEARBOX OIL

【A】 O-ring seal 13.8×2.5

【B】 Screw plug M14 assembly

◆ Tools: 8mm Allen key.

◆ Unscrew 【B】 counterclockwise, remove 【A】 and 【B】 and add new transmission oil. Put 【A】 on the bottom of 【B】 thread. Tighten 【B】 and wipe the surrounding oil clean.



Tightening torque of screw plug M14

$18 \pm 2$  N. m

### ⚠ CAUTION

During installation, check whether the O-ring is intact and not twisted. If the O-ring is damaged, it will cause gearbox oil leakage, which may cause abnormal wear of the internal parts of the gearbox or even damage the gearbox. Please replace the O-ring with a new one in time.

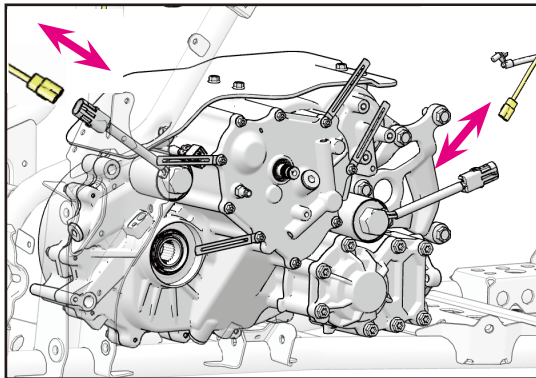
REAR TRANSMISSION ASSEMBLY-REMOVAL/INSTALLATION

To remove the rear transmission assembly from the vehicle, perform the following steps:

- ◆ Remove the rear (left and right) wheel and rear (left and right) drive shaft assembly first. Refer to Chapter 8-Rear Drive Shaft Assembly Removal for other procedures.

**TIPS**

The removal steps of the rear left and right wheels and the rear left and right drive shaft assembly are the same.



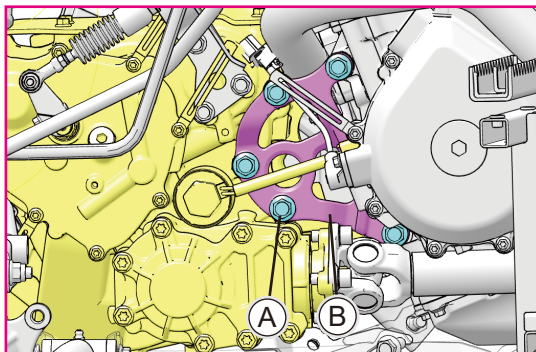
- ◆ Remove the CVT assembly again. For this removal procedure, please refer to Chapter 3-6-Removal of CVT Outer Cover, CVT Driving Wheel, Driven Wheel, Belt and CVT Inner Cover.

Do these steps after removing the rear wheel, drive shaft and CVT assembly:

- ◆ Pull out all the harness connectors connected to the rear gearbox.

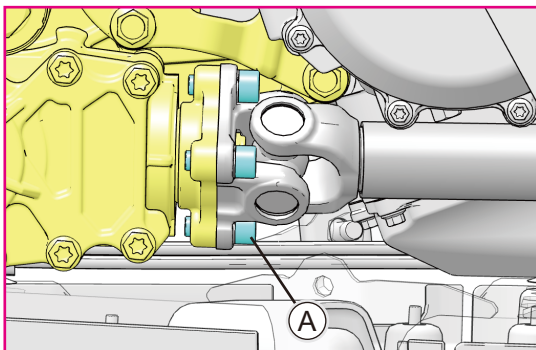
**TIPS**

The number of connectors varies with different vehicle models, and the operation shall be carried out according to the actual situation of the vehicle.



- 【A】 hexagon flange bolt m10×1.25×30
- 【B】 transmission connection bracket

- ◆ Remove the 5 bolts 【A】 that secure the engine and rear transmission, and then take off the transmission connection bracket.

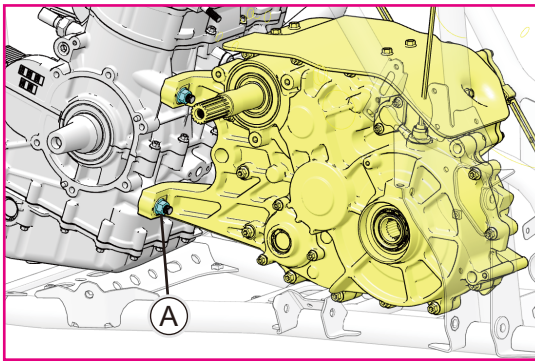


- 【A】 hexagon socket head cap screw m10×1.25×25

- ◆ Remove the four screws 【A】 connecting the rear gearbox and the front drive shaft assembly.

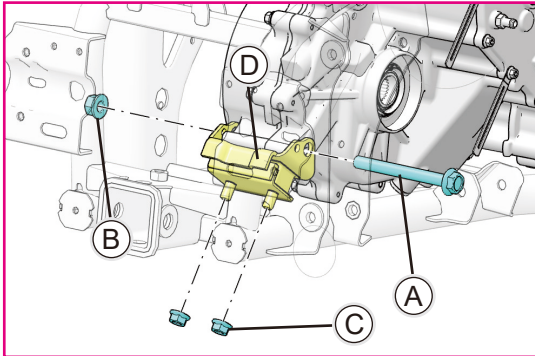
Bolt M10×1.25×30
55 N. m

Screws M10×1.25×25
45 N. m



【A】 nut m10×1.25

- ◆ Remove the two nuts 【A】 that secure the left side of the rear transmission to the engine end.



【A】 Hexagon flange bolt M12 × 1.25 × 110

【B】 All-metal hexagon flange lock nut M12 × 1.25

【C】 all-metal hexagon flange lock nut M10 × 1.25

【D】 rear suspension

- ◆ Remove the sum bolt 【A】 and nut 【B】 above the rear suspension

Hexagon flange bolt M12 × 1.25 × 110

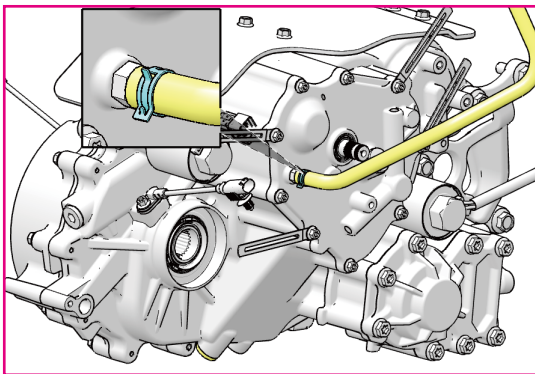
108~127 N.m

- ◆ Remove the 2 nuts 【C】 at the bottom of the rear suspension.

All-metal hexagon flange lock nut M10 × 1.25

45 N.m

- ◆ Loosen the clamp on the rear axle breather pipe and pull out the rear axle breather pipe.

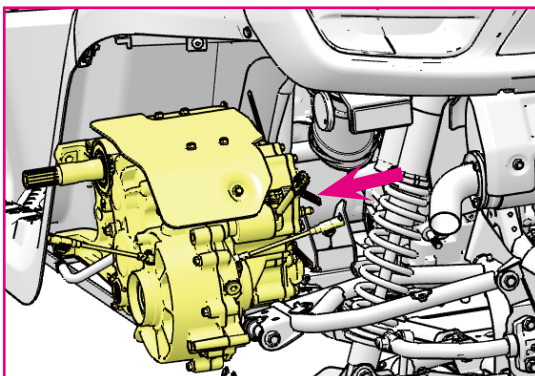


- ◆ Slowly take out the rear gearbox assembly from the left side.

### TIPS

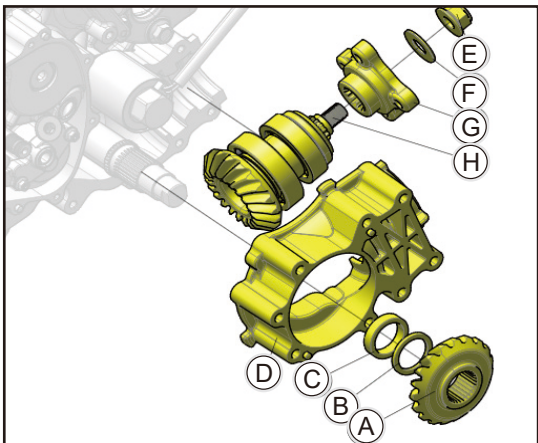
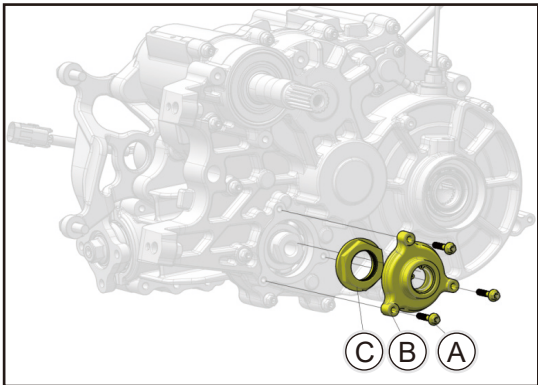
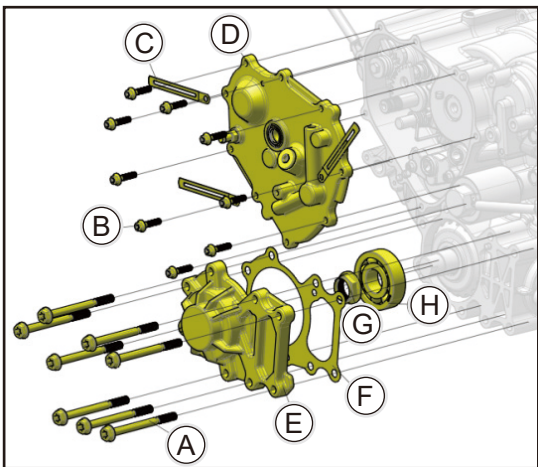
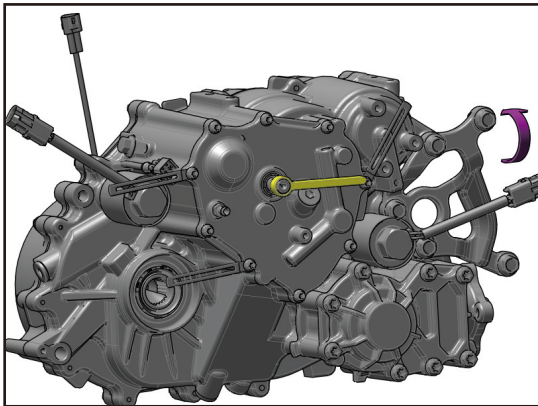
Due to the large size of the gearbox and limited operating space, it should be moved out slowly and need to adjust the angle and position several times.

Do not crush the brake tubing fixed to the frame during removal of the rear transmission assembly



- ◆ The installation steps of the rear gearbox assembly are opposite to the removal steps.

## DISASSEMBLE THE GEARBOX



## GEAR SETTING

- ◆ Tool: gear wrench
- ◆ Hang the gear counterclockwise to the end as P gear, the clockwise direction is R gear, N gear, H gear, L gear.

## DISASSEMBLE THE DRIVEN BEVEL GEAR COVER ASSEMBLY

- ◆ Disassembling
- 【A】 Bolt M8×90
- 【B】 Bolt M6×25
- 【C】 Plastic-coated wire clip
- 【D】 Gear box right box shift cover
- 【E】 Drive gear nut cover plate
- 【F】 Driven bevel gear cover gasket
- 【G】 Hexagonal flange nut M22×1
- 【H】 Bearing 6305
- ◆ Tools: 8mm socket, 13mm socket, 27mm socket.
- ◆ Unscrew 【A】 【B】 【C】 【G】 counterclockwise, remove the cover combination and bearings, and use a rubber mallet to tap the box periphery at the bonding surface if necessary.

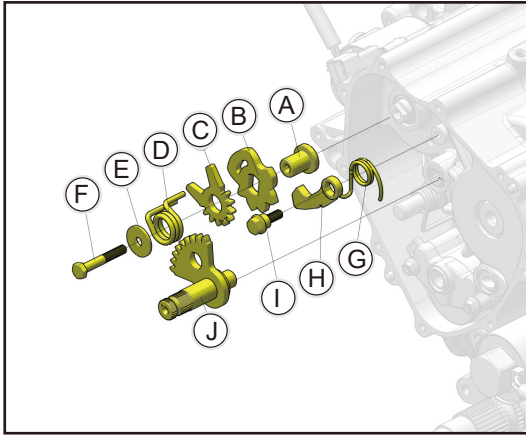
## DISASSEMBLE THE NUT COVER PLATE AND NUT

- ◆ Disassembly
- 【A】 Bolt M6×30
- 【B】 Nut cover plate
- 【C】 Hexagonal flange nut M33×1.5
- ◆ Tools: 8mm socket, 46mm socket
- ◆ Unscrew 【A】 clockwise, remove 【B】 , and unscrew 【C】 clockwise.

## DISASSEMBLE THE FOLLOWER BEARING HOUSING AND FRONT OUTPUT DRIVEN ASSEMBLY

- ◆ Disassembly
- 【A】 Front output drive bevel gear
- 【B】 Front output drive bevel gear adjusting shim
- 【C】 Front output drive bevel gear bushing
- 【D】 Driven bearing housing
- 【E】 Hexagonal flange nut M14×1.5
- 【F】 Washer 15×34×2
- 【G】 Front output flange
- 【H】 Front output driven tooth assembly
- ◆ Tool: 21mm socket
- ◆ Unscrew 【E】 clockwise and remove each part in turn.

### DISASSEMBLE THE GEARSHIFT MECHANISM



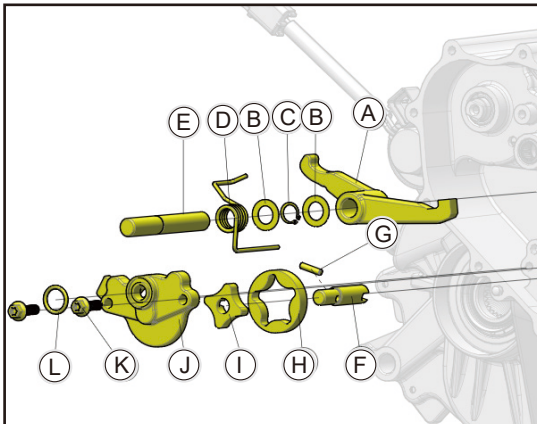
◆ Disassembly

- 【A】 Bush
- 【B】 Shift locating gear
- 【C】 Shift driven gear
- 【D】 Shift torsion spring
- 【E】 Washer 6.5×22×2
- 【F】 Hexagonal head bolts M6×40
- 【G】 Shift locating plate spring
- 【H】 Locating plate
- 【I】 Locating plate bolt M6×21
- 【J】 Shift shaft assembly

◆ Tool: 10mm socket.

- ◆ Remove 【J】, unscrew the bolts 【F】 counterclockwise, remove 【E】, 【D】, 【C】, 【B】, unscrew the bolts 【I】 counterclockwise, remove 【H】, 【G】, remove 【A】.

### DISASSEMBLE THE OIL PUMP ASSEMBLY AND PARKING ARM ASSEMBLY



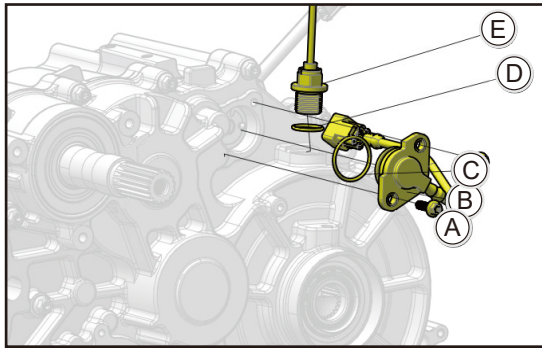
◆ Disassembly

- 【A】 Parking arm
- 【B】 Flat washer
- 【C】 Elastic retaining ring
- 【D】 Shift torsion spring
- 【E】 Parking arm shaft
- 【F】 Oil pump shaft
- 【G】 Needle roller P4×15.8
- 【H】 Oil pump outer rotor
- 【I】 Oil pump inner rotor
- 【J】 Oil pump cover
- 【K】 Bolt M6×30
- 【L】 O-ring 13.8×2.5

◆ Tool: 8mm socket.

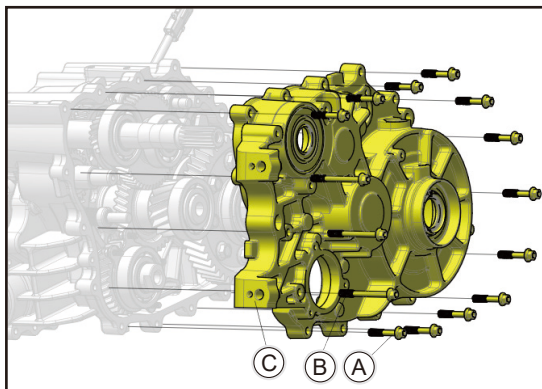
- ◆ Unscrew the bolt 【K】 counterclockwise and remove 【J】 【I】 【H】 【F】 【E】 【D】 【B】 【C】 【A】.

**DISASSEMBLE THE LEFT GEARBOX CONNECTOR**



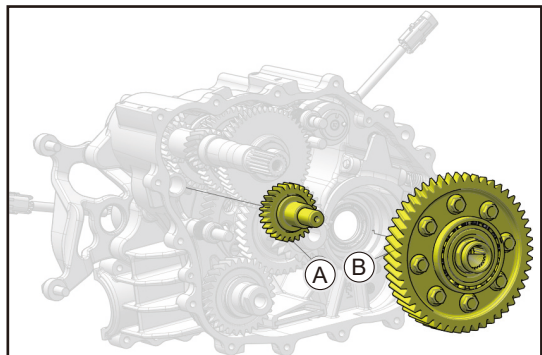
- ◆ Disassembly
- 【A】 Bolt M6×16
- 【B】 Gear sensor assembly
- 【C】 O-ring
- 【D】 O-ring 19.4×2.3
- 【E】 Speed sensor assembly
- ◆ Tools: 8mm socket, open-end wrench.
- ◆ Unscrew the bolts counterclockwise 【A】, remove 【B】, open-end wrench counterclockwise 【D】, 【E】.

**DISASSEMBLE THE RIGHT GEARBOX ASSEMBLY**



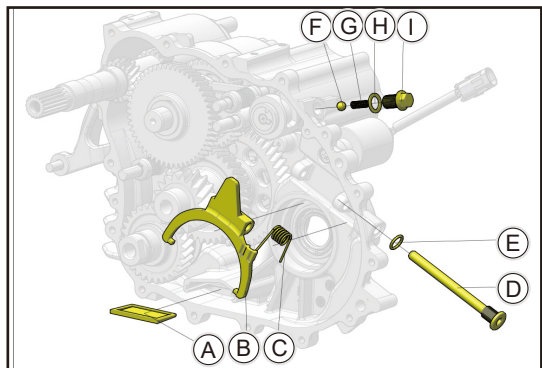
- ◆ Disassembly
- 【A】 Bolt M8×40
- 【B】 Bolt M8×70
- 【C】 Right gearbox assembly
- ◆ Tool: 10mm socket.
- ◆ Unscrew the bolts 【A】 and 【B】 counterclockwise and remove 【C】.
- ◆ Separate the right case assembly and use a rubber mallet to strike the case periphery at the bonding surface if necessary.

**DISASSEMBLE THE REVERSE IDLER SHAFT ASSEMBLY AND REAR OUTPUT ASSEMBLY**



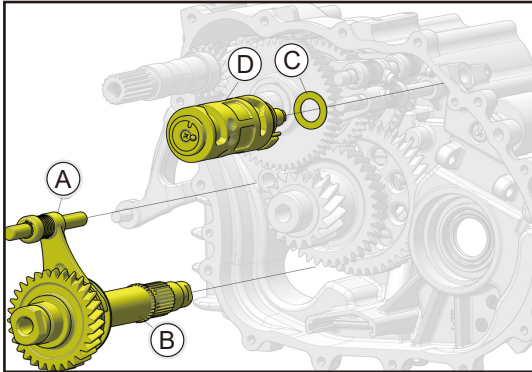
- ◆ Disassembly
- 【A】 Reverse idler shaft assembly
- 【B】 Rear output assembly
- ◆ Remove 【A】 and then 【B】.

**DISASSEMBLE THE GEARSHIFT LOCATING BOLT, DIFFERENTIAL FORK AND OIL FILTER**



- ◆ Disassembly
- 【A】 Oil filter
- 【B】 Differential fork
- 【C】 Return torsion spring
- 【D】 Differential fork shaft
- 【E】 O-ring 13.8×2.5
- 【F】 Steel ball 9.5
- 【G】 Shift locating spring
- 【H】 Aluminum washer 14×21×1.5
- 【I】 Shift locating bolt
- ◆ Tools: 14mm socket, 8mm hexagonal wrench
- ◆ Use the socket to unscrew the bolt counterclockwise 【I】 and take out 【F】 【G】 【H】, and use the Allen wrench to unscrew counterclockwise 【D】 and take out 【B】 【C】 【A】.

### DISASSEMBLE THE SHIFT HUB AND FRONT DRIVE ASSEMBLY



◆ Disassembly

【A】 2/4WD fork assembly

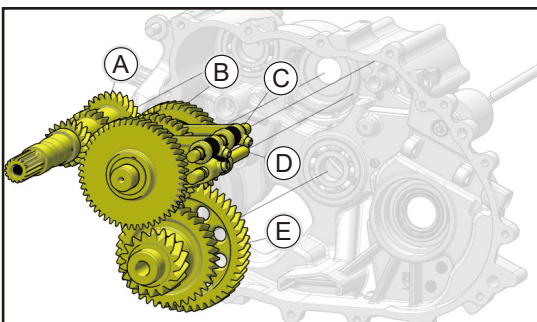
【B】 Drive assembly

【C】 Washer 15×28×1

【D】 Shift hub assembly

◆ Remove 【A】 , 【B】 , 【C】 and 【D】 in turn.

### DISASSEMBLE THE GEAR TRANSMISSION PARTS



◆ Disassembly

【A】 Main shaft

【B】 Countershaft assembly

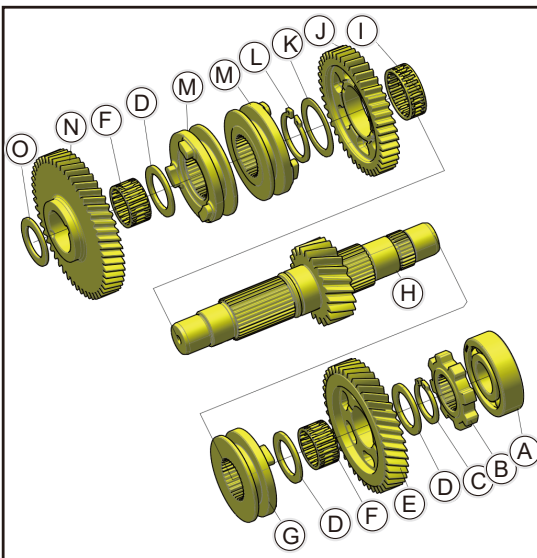
【C】 HR fork assembly

【D】 L fork assembly

【E】 Third shaft assembly

◆ Take out 【E】 first, then 【B】 , 【C】 , 【D】 and finally 【A】 .

### DISASSEMBLE THE SECONDARY SHAFT ASSEMBLY



◆ Disassembly

【A】 Bearing 6305

【B】 Parking ratchet

【C】 Shaft retaining ring 28×2.5

【D】 Washer 28×40×2.5

【E】 H-gear follower gear

【F】 Needle bearing K28×33×17

【G】 H-gear coupling sleeve

【H】 Countershaft

【I】 Needle roller bearing K35×40×13

【J】 R-gear driven gear

【K】 Washer 35×46×1.5

【L】 Shaft retaining ring 35×2.5

【M】 RL-gear coupling sleeve

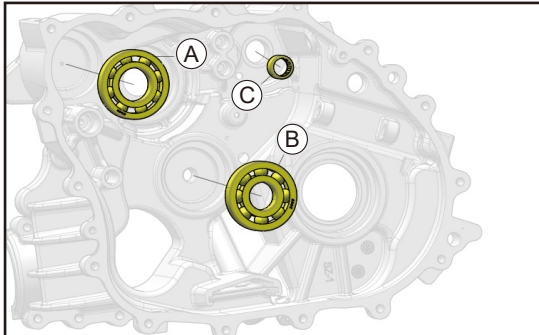
【N】 L-gear driven gear

【O】 Washer 25×38×2.5

◆ Tool: Circlip plier.

◆ Remove 【A】 【B】 , use the circlip plier to remove 【C】 , then remove 【D】 , 【E】 , 【F】 , 【G】 , and take out the other end of 【O】 【N】 【F】 【D】 【M】 in turn, and use the circlip plier to remove 【L】 , and then take out 【K】 【J】 【I】 in turn.

## ASSEMBLE THE GEAR BOX



## INSTALL THE LEFT CASE BEARING

## ◆ Installation

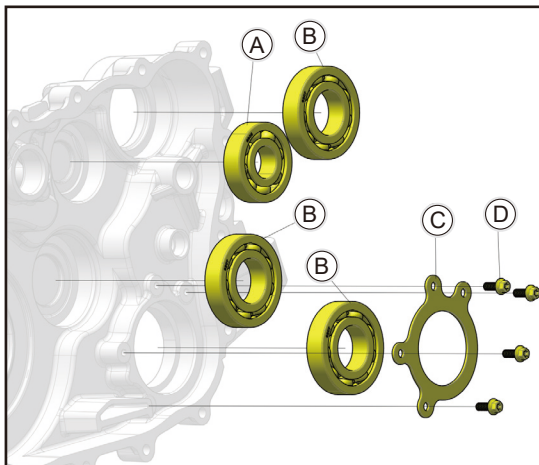
【A】 Bearing 6206

【B】 Bearing 6305

【C】 Needle roller bearing HK1516

◆ Tools: Bearing tooling 6305, bearing tooling 6206, needle roller bearing press fitting-HK121612.

◆ Lay the left case flat, the inner cavity faces up, press in the bearing 【A】 【B】 【C】.



## INSTALL THE RIGHT GEARBOX COMBINATION BEARING

## ◆ Installation

【A】 Bearing 6305

【B】 Bearing 6207

【C】 Bearing pressure plate

【D】 Bolt M6×16

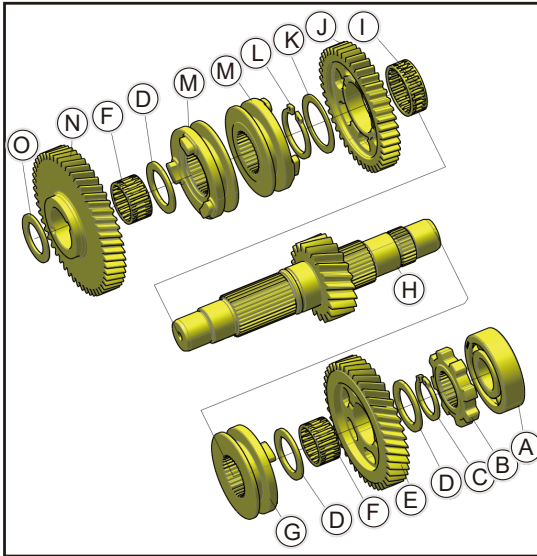
◆ Tools: 8mm socket, bearing tooling 6305, bearing tooling 6207

◆ Lay the right case flat, the inner cavity faces up, press in the bearing 【A】 【B】 , install 【C】 , apply thread adhesive and tighten the bolt clockwise 【D】.

Tighten torque of bolts M6

12N·m(1.22kgf·m,8.86ft·lb)

### INSTALL THE SECONDARY SHAFT ASSEMBLY

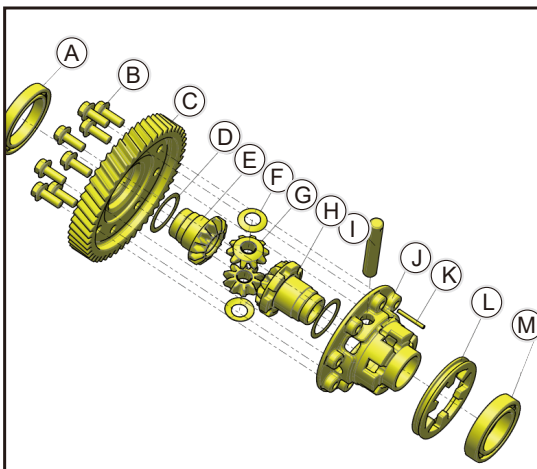


◆ Installation

- 【A】 Bearing 6305
- 【B】 Parking ratchet
- 【C】 Shaft retaining ring 28×2.5
- 【D】 Washer 28×40×2.5
- 【E】 H-gear driven gear
- 【F】 Needle roller bearing K28×33×17
- 【G】 H-gear coupling sleeve
- 【H】 Countershaft
- 【I】 Needle roller bearing K35×40×13
- 【J】 R-gear driven gear
- 【K】 Washer 35×46×1.5
- 【L】 Shaft retaining ring 35×2.5
- 【M】 RL gear coupling sleeve
- 【N】 L-gear driven gear
- 【O】 Washer 25×38×2.5

Tool: Circlip plier.

- ◆ Install 【G】 , 【D】 , 【F】 , 【E】 , 【D】 , 【C】 , 【B】 into 【H】 in order, then press 【A】 into the journal, and install other parts in order at the other end.



### ASSEMBLED OUTPUT COMPONENTS

◆ Installation

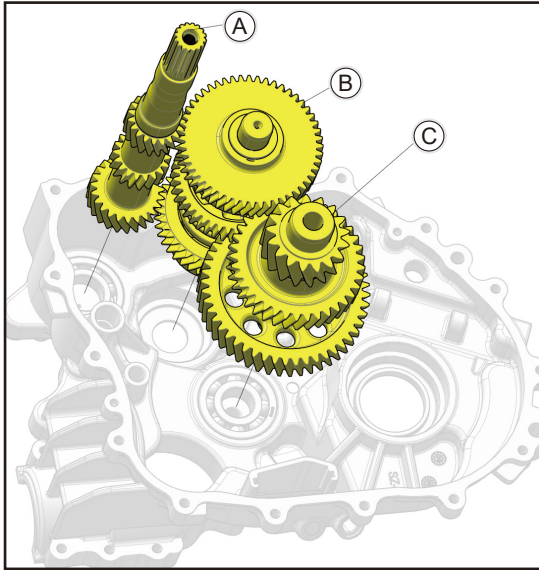
- 【A】 Bearing 61912
- 【B】 Bolt M10×1.25×25
- 【C】 Rear output gear
- 【D】 Adjustment washer
- 【E】 Left rear half shaft bevel gear
- 【F】 Bowl shims
- 【G】 Gearbox planetary gears
- 【H】 Bevel gear for right rear half shaft
- 【I】 Planetary gear shaft
- 【J】 Rear output differential case
- 【K】 Elastic cylindrical pin
- 【L】 Rear differential output sleeve
- 【M】 Bearing 6010

◆ Tools: Bearing tooling 61912, bearing tooling 6010, 17mm socket.

- ◆ Install 【H】 【D】 into the center hole of 【J】 respectively, and then insert 【I】 from the side, pay attention to the orifice of the shaft end opposite to the pin hole of 【J】 , and at the same time, put in two pairs of 【F】 【G】 placed on the upper and lower sides of 【H】 respectively. Insert 【D】 and 【E】 into the center hole of 【C】 in turn, and then connect it with 【J】 , and tighten 【B】 clockwise after applying thread fastening glue. Insert 【L】 and press in 【A】 and 【M】 .

Bolts M10×1.25×25

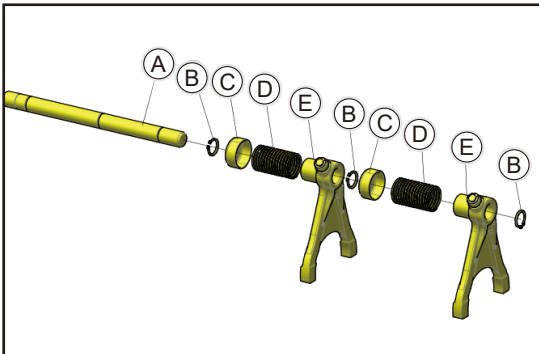
45N·m(4.59kgf·m,33.3ft·lb)



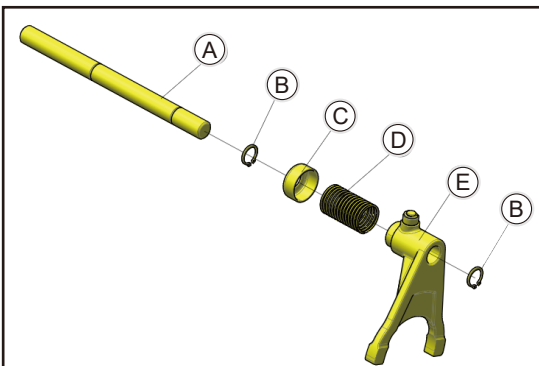
**INSTALL THE GEAR UNIT**

- ◆ Installation
- 【A】 Main shaft
- 【B】 Countershaft
- 【C】 Third shaft
- ◆ Install 【A】 into the left case first, and then install 【B】 and 【C】 together into the right case as shown in the illustration.

**ASSEMBLE THE HR-GEAR FORK SHAFT ASSEMBLY**

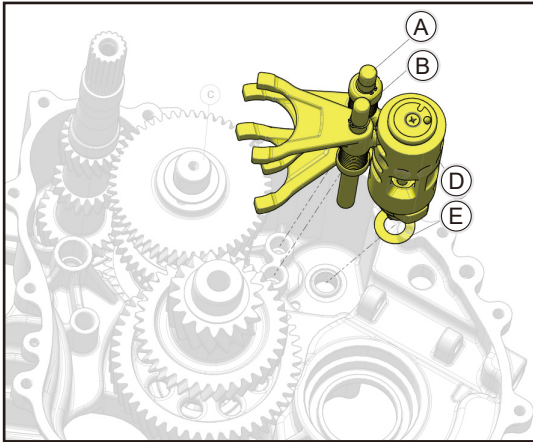


- ◆ Installation
- 【A】 HR-gear fork shaft
- 【B】 Shaft retaining ring 12
- 【C】 Fork spring holder
- 【D】 Fork spring
- 【E】 HR-gear fork assembly
- ◆ Tool: Circlip plier.
- ◆ Install the parts in order as shown in the illustration 【A】 .



**ASSEMBLE THE L-GEAR FORK SHAFT ASSEMBLY**

- ◆ Installation
- 【A】 L-gear fork shaft
- 【B】 Shaft retaining ring 12
- 【C】 Fork spring holder
- 【D】 Fork spring
- 【E】 L-shift fork assembly
- ◆ Tool: Circlip plier.
- ◆ Install the parts in order as shown in the illustration 【A】 .



### INSTALL THE HR-GEAR FORK ASSEMBLY, L-GEAR FORK ASSEMBLY, AND SHIFT HUB ASSEMBLY

◆ Installation

【A】 HR-gear fork assembly

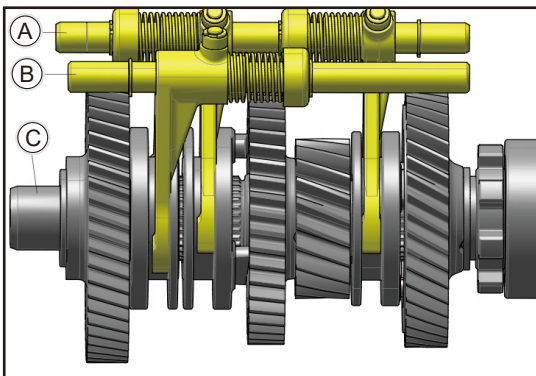
【B】 L-gear fork assembly

【C】 Right case assembly

【D】 Shift hub assembly

【E】 Washer 15×28×1

◆ Assemble 【A】 【B】 【D】 【E】 as shown in the illustration, and then install it into the right case 【C】 to connect it.



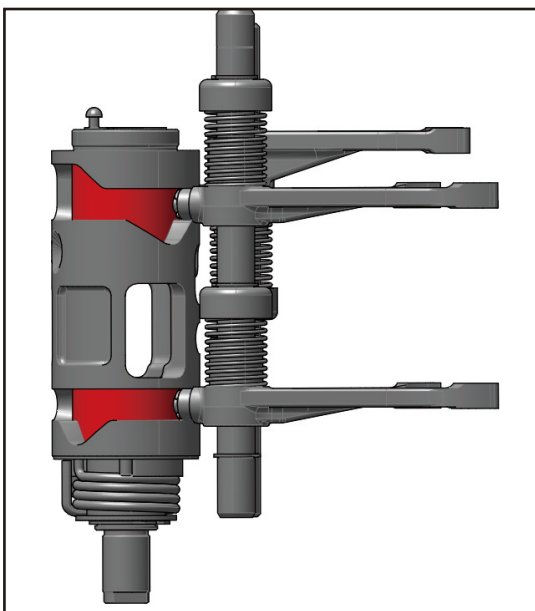
◆ ◆ Installation

【A】 L-gear fork assembly

【B】 HR-gear fork assembly

【C】 Countershaft assembly

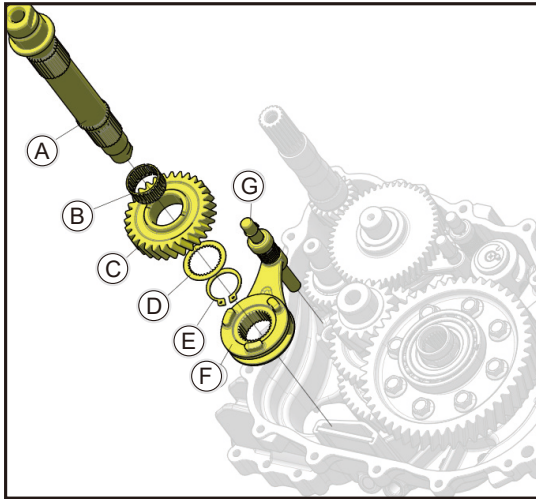
◆ ◆ Assemble 【A】 【B】 into the right case and connect it to 【C】 as shown in the illustration.



### ▲ CAUTION

When installing, check that the roller portion of the HR-gear fork and L-gear fork should be in the lead groove of the red painted portion of the shift drum.

**INSTALL THE DRIVE SHAFT ASSEMBLY AND THE 2/4 WD FORK ASSEMBLY**

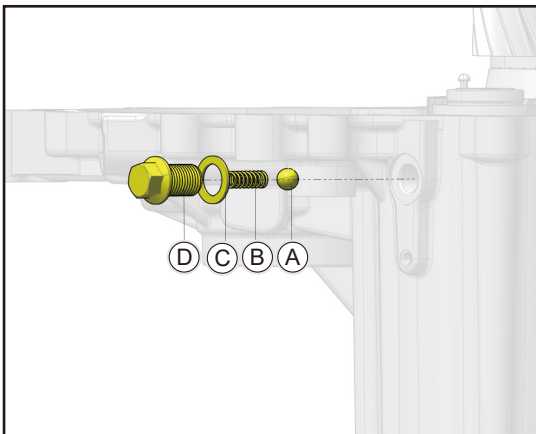


◆ Installation

- 【A】 Output gear shaft
- 【B】 Split needle roller bearing 30×34×17
- 【C】 Output driven gear
- 【D】 Spline washer
- 【E】 Shaft elastic retaining ring 32×2
- 【F】 Coupling sleeve for 2/4WD
- 【G】 2-4WD fork assembly

◆ Tool: Circlip plier.

- ◆ Assemble 【A】 【B】 【C】 【D】 【E】 【F】 as shown in the illustration and put it into the right case together with 【G】.



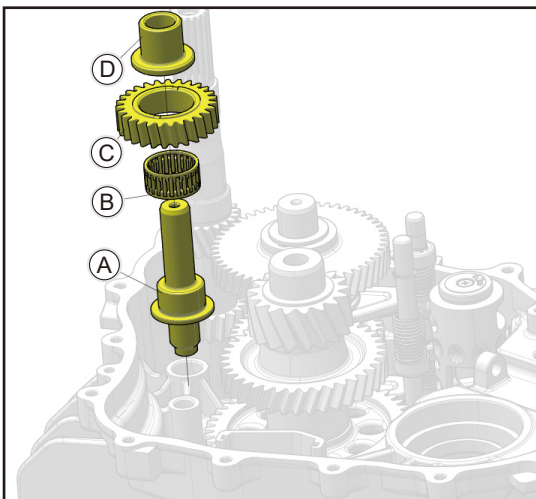
**INSTALL THE GEAR LOCATING ASSEMBLY**

◆ Installation

- 【A】 Steel ball 9.5
- 【B】 Shift locating spring
- 【C】 Aluminum washer 14×21×1.5
- 【D】 Shift locating bolt

◆ Tool: 14mm socket.

- ◆ Install 【A】 , 【B】 , 【C】 into 【D】 and then into the right case in order as shown in the illustration.



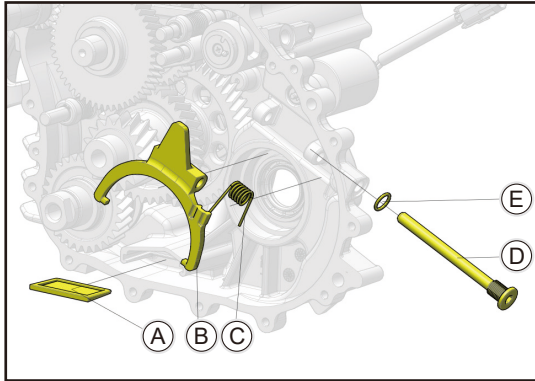
**ASSEMBLE THE REVERSE IDLER SHAFT ASSEMBLY**

◆ Installation

- 【A】 Reverse idler shaft
- 【B】 Needle bearing K30×35×17
- 【C】 Reverse idler pulley
- 【D】 Reverse idler shaft bushing

- ◆ Install 【B】 【C】 【D】 into 【A】 and then install all to right case as shown in the illustration, paying attention to the direction of the flat side of the right case and 【A】.

### INSTALL THE DIFFERENTIAL FORK ASSEMBLY AND OIL FILTER



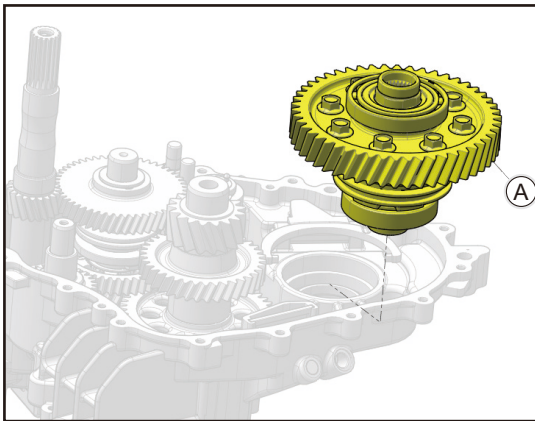
- ◆ Installation
- 【A】 Oil filter
- 【B】 Differential fork
- 【C】 Differential fork return torsion spring
- 【D】 O-ring 13.8×2.5
- 【E】 Screw plug M14

◆ Tools: 8mm hexagonal wrench

- ◆ Insert the 【A】 to right case as shown in the illustration, and then insert the 【D】 【E】 through the 【B】 【C】 into the position shown in the illustration.

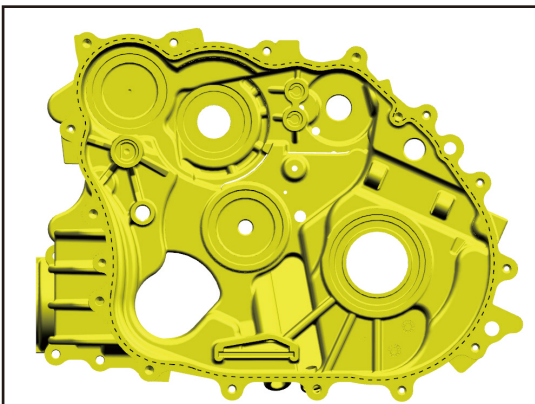
Tightening torque of screw plug M14 assembly

18±2 N.m



### INSTALL THE REAR OUTPUT GEAR ASSEMBLY

- ◆ Installation
- 【A】 Rear output gear assembly
- ◆ Install 【A】 into the right case first as shown in the illustration.



### INSTALL THE LEFT CASE COMBINATION

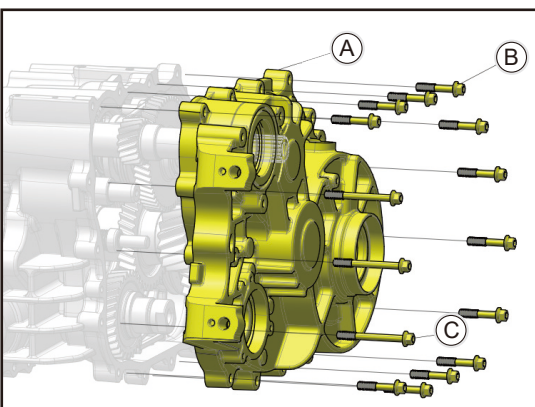
- ◆ Installation
- 【A】 Left gearbox combination
- 【B】 Bolt M8×40
- 【C】 Bolt M8×70
- ◆ Tool: 10mm socket.
- ◆ Apply sealant according to the gluing track shown in the drawing. The glue should be applied evenly and continuously, and the width of the glue line should be about 1.5-2mm.
- ◆ Align the left box body locating pin hole, install 【A】 and tighten the bolts in order.

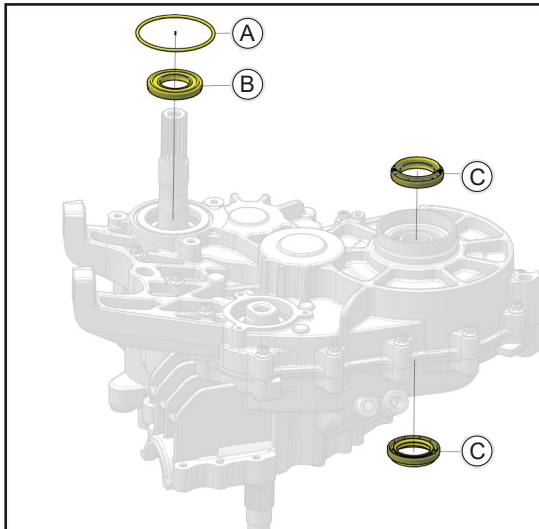
Bolt M8×40

35 N · m

Bolt M8×70

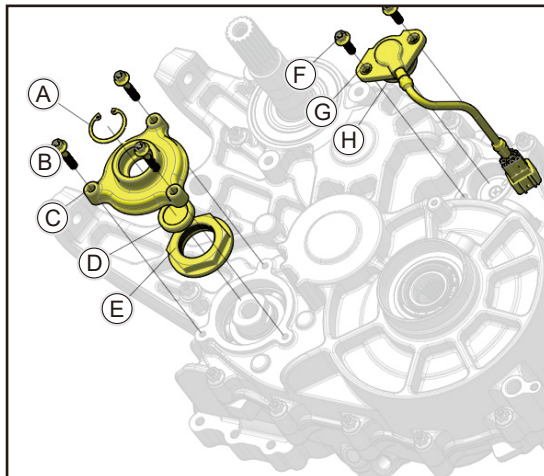
35 N · m





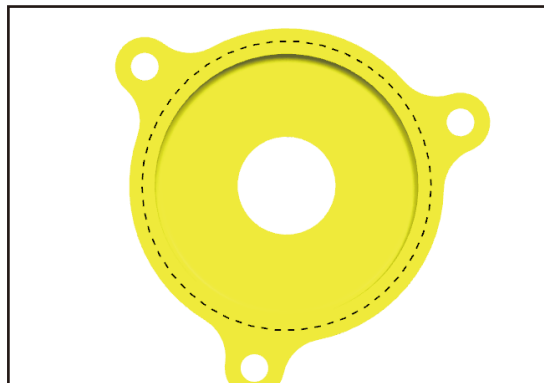
## INSTALL THE OIL SEALS AND O-RINGS

- ◆ Installation
- 【A】 O-ring 73×3
- 【B】 Oil seal 30×55×7
- 【C】 Oil seal 35×52×7/11
- ◆ Tool: Oil seal press fit tooling
- ◆ Install 【B】 and 【C】 into the gearbox in sequence with the oil seal press fitting tool according to the position shown in the illustration, and put 【A】 in the O-ring groove.



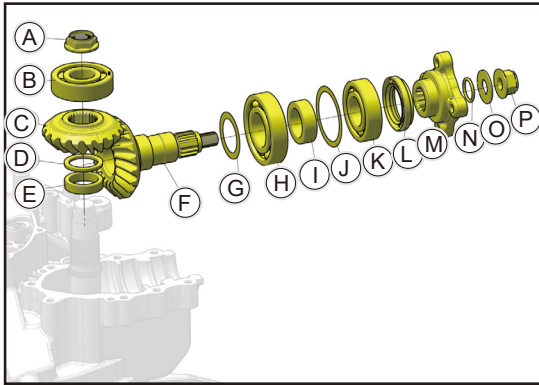
## INSTALL THE DRIVEN BEVEL GEAR SHAFT

- ◆ Installation
- 【A】 Elastic retaining ring
- 【B】 Bolt M6×30
- 【C】 Nut cover plate
- 【D】 Oil window assembly
- 【E】 Hexagonal flange nut M33×1.5
- 【F】 Bolt M6×16
- 【G】 Gear sensor assembly
- 【H】 O-ring
- ◆ Tools: 46mm socket, 8mm socket, circlip plier
- ◆ Apply thread tightening glue to 【E】 in the order shown in the drawing and then lock it clockwise on the output shaft with a tightening torque of 240 N·m. Install 【A】 and 【D】 into 【C】, and after applying glue to the bonding surface of 【C】, tighten it clockwise to the case with 【B】.
- ◆ Apply the sealant according to the gluing track shown in the diagram. The glue application should be even and continuous, and the width of the glue line should be about 1.5-2mm.



Bolt M6
12N·m(1.22kgf·m,8.86ft·lb)
Bolt M33
240N·m(1.22kgf·m,8.86ft·lb)

### INSTALL THE DRIVE BEVEL GEAR AND FRONT OUTPUT ASSEMBLY



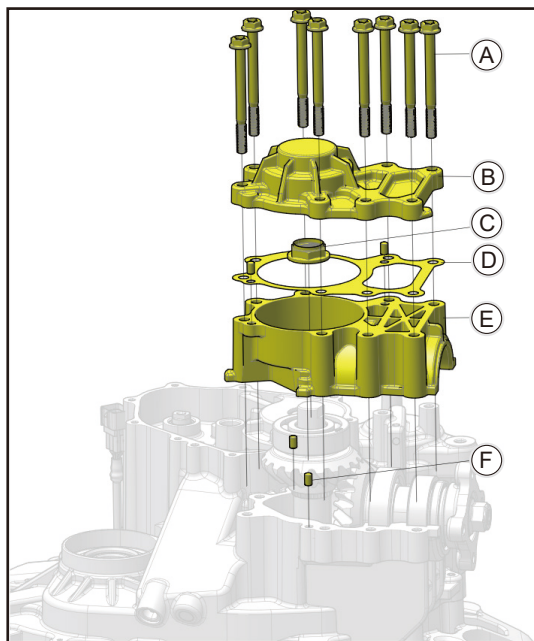
◆ ◆ Installation

- 【A】 Hexagonal flange face nut M22×1
- 【B】 Bearing 6305    【C】 Front output drive bevel gear
- 【D】 Adjustment pads for front output drive gear
- 【E】 Front output driven gear bushing
- 【F】 Front output driven bevel gear shaft
- 【G】 Adjustment shims    【H】 Bearing 7207
- 【I】 Front output bearing spacer
- 【J】 Front output adjusting spacer
- 【K】 Bearing 7206    【L】 Oil seal 38×55×7
- 【M】 Front output flange    【N】 O-ring 20×2.65
- 【O】 Washer 15×34×2    【P】 Nut M14×1.5

◆ Tool: 21mm socket

- ◆ Install 【G】 【H】 【I】 【J】 【K】 【L】 【M】 【N】 【O】 【P】 into 【F】 and then install all to the case, and then install 【E】 and 【D】 in the order as shown in the illustration, and then apply thread tightening adhesive and then lock counterclockwise 【P】.

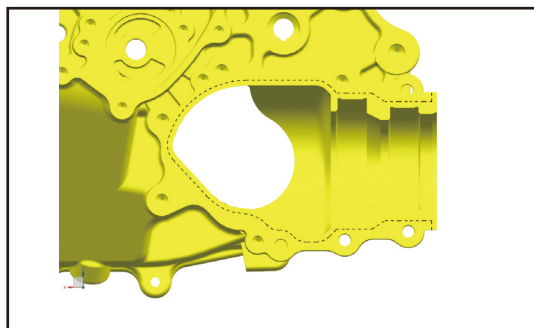
Nut M14×1.5
145N·m(21.4kgf·m,155ft·lb)



### INSTALL THE DRIVEN BEVEL GEAR COVER

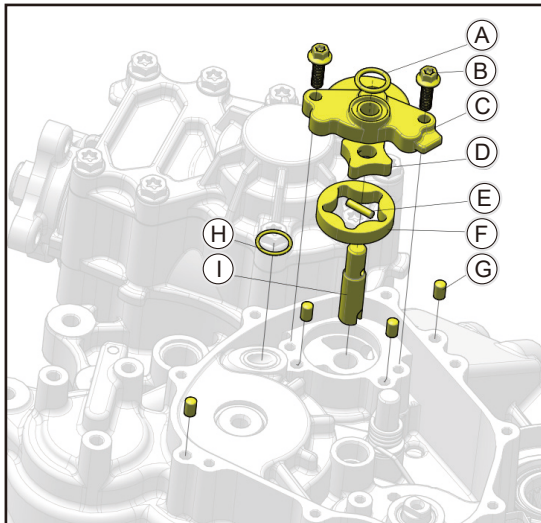
◆ Installation

- 【A】 Bolt M8×90    【B】 Cover plate of drive gear nut
- 【C】 Hexagonal flange nut M22×1
- 【D】 Driven bevel gear cover gasket
- 【E】 Driven bevel gear bearing housing
- 【F】 Cylindrical pin 6×10
- ◆ Tools: 10mm socket, 27mm socket, copper hammer.
- ◆ Tap in 【F】 at the position shown in the drawing.
- ◆ Apply sealant to the right case according to the gluing track shown in the illustration. The glue should be applied evenly and continuously, and the width of the glue line should be about 1.5-2mm.
- ◆ Align the box locating pin holes, install 【E】, put in the drive bevel gear and bearing 6305, tighten 【C】 clockwise after applying thread tightening glue, tighten the bolts 【A】 in order after installing 【D】 【B】.



Nut M22×1
145N·m(14.8kgf·m,107ft·lb)

Bolt M8×90
25N·m(2.55kgf·m,18.5ft·lb)



**INSTALL THE OIL PUMP ASSEMBLY**

◆ Installation

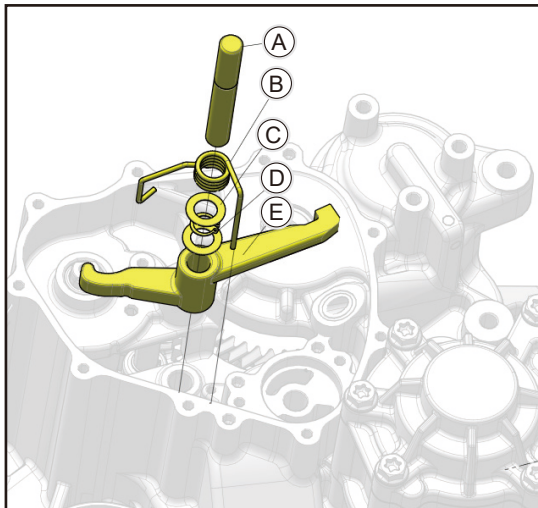
- 【A】 O-ring 13.8×2.5
- 【B】 Bolt M6×16
- 【C】 Oil pump cover
- 【D】 Oil pump outer rotor
- 【E】 Needle roller P4×15.8
- 【F】 Oil pump outer rotor
- 【G】 Cylindrical pin 6×10
- 【H】 O-ring 15.6×1.78
- 【I】 Oil pump shaft

◆ Tool: 8mm socket

◆ Put 【H】 into the right case O-ring groove as shown in the illustration and tap in 【G】 .

◆ Install 【I】 , 【F】 , 【E】 , 【D】 , 【C】 , 【A】 in turn, and finally lock the bolt 【B】 .

Nut M6×16
12N·m(1.22kgf·m,8.86ft·lb)

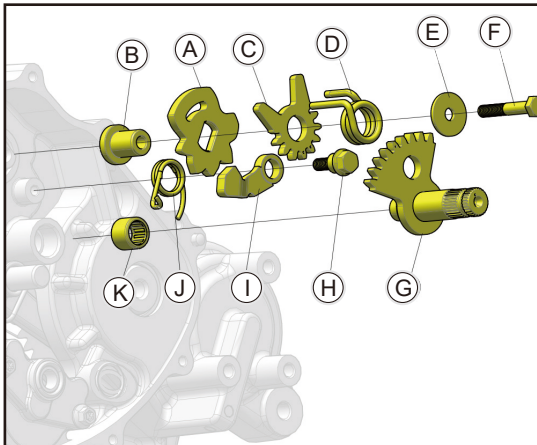


**INSTALL THE PARK ARM ASSEMBLY**

◆ Installation

- 【A】 Parking arm shaft
- 【B】 Parking arm return torsion spring
- 【C】 Flat spacer 12×20×1
- 【D】 Shaft retaining ring 12
- 【E】 Parking arm

◆ Install the parts into the right case in the position shown in the illustration.

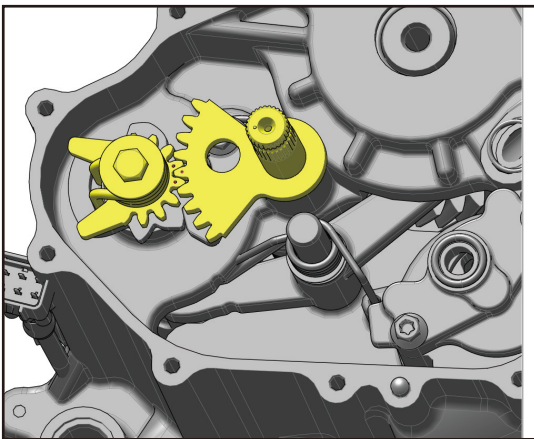
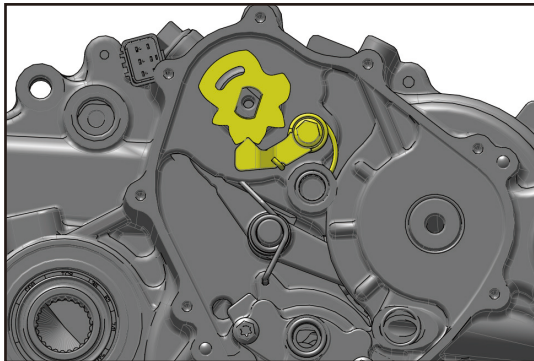


### INSTALL THE SHIFT MECHANISM

◆ Installation

- 【A】 Shift locating gear                      【B】 Bushing
- 【C】 Shift driven gear                      【D】 Shift torsion spring
- 【E】 Washer 6.5×22×2
- 【F】 Hexagonal head bolt M6×40
- 【G】 Shift shaft assembly
- 【H】 Locating plate bolts M6×21
- 【I】 Locating plate
- 【J】 Shift locating plate spring
- 【K】 Needle roller bearing HK121612

- ◆ Tools: Needle roller bearing press fitting-HK121612, brass hammer, 10mm socket.
- ◆ Press 【A】 into the case, install 【J】 into the case and then install 【I】 and 【H】 , then install 【A】 into the case and snap it to 【I】 as shown.
- ◆ Load 【 B 】 , 【 C 】 , 【 D 】 , 【 E 】 , 【 F 】 in order.
- ◆ Install the 【B】 , 【C】 , 【D】 , 【E】 , 【F】 into the case and tighten them.
- ◆ Finally, install 【G】 to align the points as shown in the illustration.



Bolt M6×40
15N·m(1.53kgf·m,11.1ft·lb)

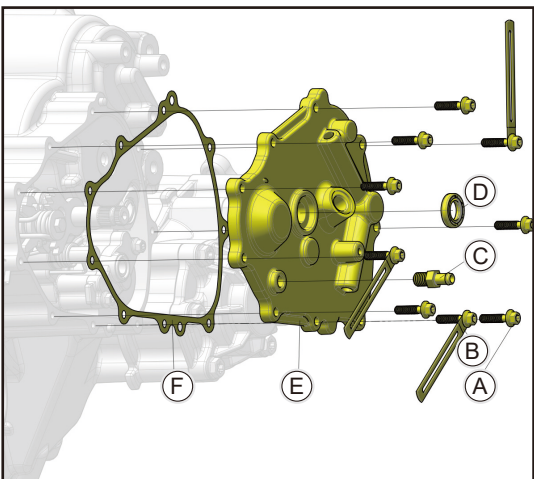
Bolt M6×21
15N·m(1.53kgf·m,11.1ft·lb)

### INSTALL THE SHIFT COVER

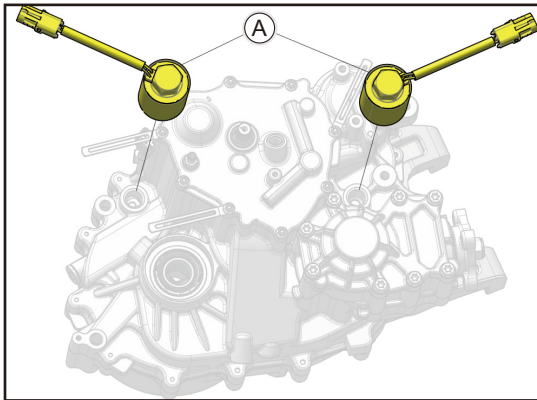
◆ Installation

- 【A】 Bolt M6×25                      【B】 Plastic-coated wire clip
- 【C】 Breathing connector
- 【D】 Oil seal 15×25×5                      【E】 Right case shift cover
- 【F】 Right case gearshift cover gasket

- ◆ Tools: Shift cover oil seal indenter, 8mm socket.
- ◆ Press 【D】 into 【E】 , then install 【F】 【E】 according to the position of the locating pin, and then install 【A】 【B】 in turn and tighten the bolts in order.

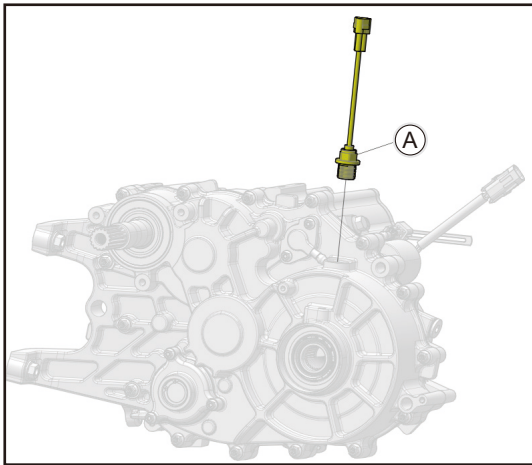


Bolt M6×25
12N·m(1.22kgf·m,8.86ft·lb)



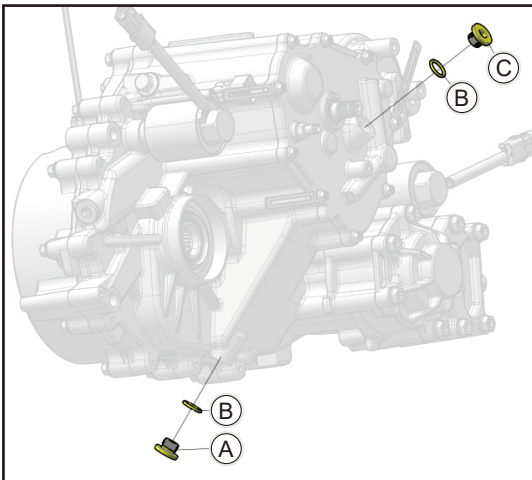
### INSTALL THE SOLENOID VALVE ASSEMBLY

- ◆ Installation
- 【A】 Solenoid valve assembly
- ◆ Tool: Torque wrench
- ◆ Install the 【A】 solenoid valve assembly into the right case in the position shown in the illustration, and tighten with a torque of 35Nm.



### INSTALL THE SPEED SENSOR ASSEMBLY

- ◆ Installation
- 【A】 Speed sensor assembly
- ◆ Tool: Torque wrench
- ◆ Install 【A】 into the right case according to the position shown in the illustration, and tighten it with a torque of 15Nm.



### INSTALL THE OIL FILLER PLUG AND DRAIN PLUG ASSEMBLY

- ◆ Installation
- 【A】 Screw plug M14 assembly
- 【B】 O-ring 13.8×2.5
- 【C】 Screw plug M14
- ◆ Tools: 8mm allen wrench.
- ◆ Assemble 【A】 and 【B】 , tighten 【B】 clockwise.
- ◆ Assemble 【C】 and 【B】 , tighten 【C】 clockwise.

Tightening torque of screw plug M14 assembly

18±2 N.m

Tightening torque of screw plug M14

18±2 N.m

# FUEL SYSTEM

<b>GENERAL INFORMATION</b> .....	<b>5-2</b>
FUEL SYSTEM MAINTENANCE CONSIDERATIONS .....	5-2
<b>EXPLODED VIEW OF FUEL TANK (WITHOUT CARBON CANISTER)</b> .....	<b>5-3</b>
<b>EXPLODED VIEW OF FUEL TANK (WITH CARBON CANISTER)</b> .....	<b>5-4</b>
<b>FUEL TANK EXPLOSION DIAGRAM (MUD VERSION)</b> .....	<b>5-5</b>
<b>FUEL TANK REMOVAL/INSTALLATION</b> .....	<b>5-6</b>
AB FUEL TANK ASSEMBLY REMOVAL .....	5-6
INSTALLATION OF FUEL TANK ASSEMBLY .....	5-8
<b>FUEL FILTER</b> .....	<b>5-9</b>
REMOVAL .....	5-9
INSTALLATION .....	5-10
<b>CARBON CANISTER ASSEMBLY REMOVAL/INSTALLATION</b> .....	<b>5-11</b>
REMOVAL .....	5-11
REMOVAL .....	5-12
INSTALLATION .....	5-12
<b>FUEL PUMP</b> .....	<b>5-13</b>
DISASSEMBLY .....	5-13
INSPECTION .....	5-13
INSTALL THE OIL PUMP ASSEMBLY .....	5-14

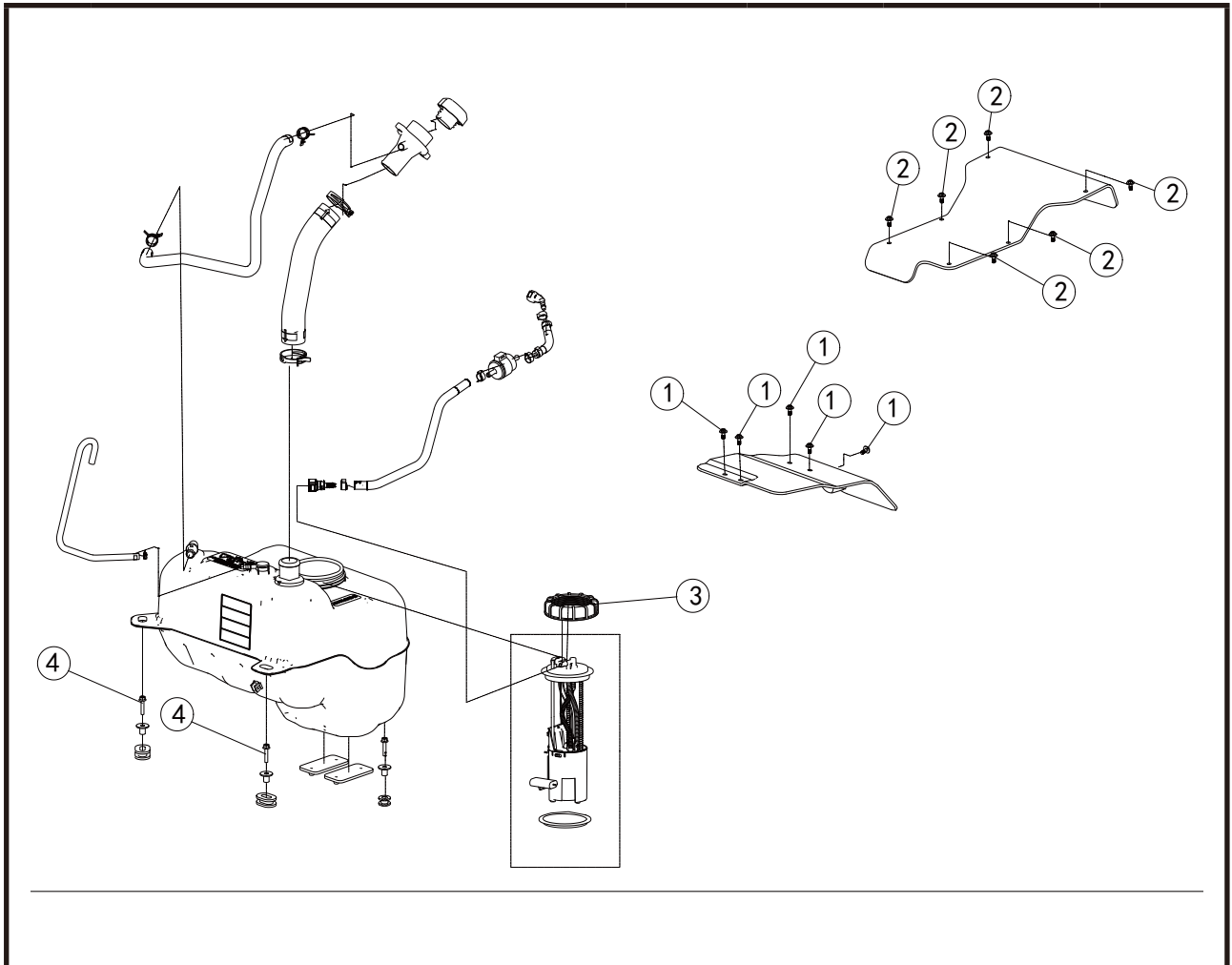
## GENERAL INFORMATION

### FUEL SYSTEM MAINTENANCE CONSIDERATIONS

#### **⚠ WARNING**

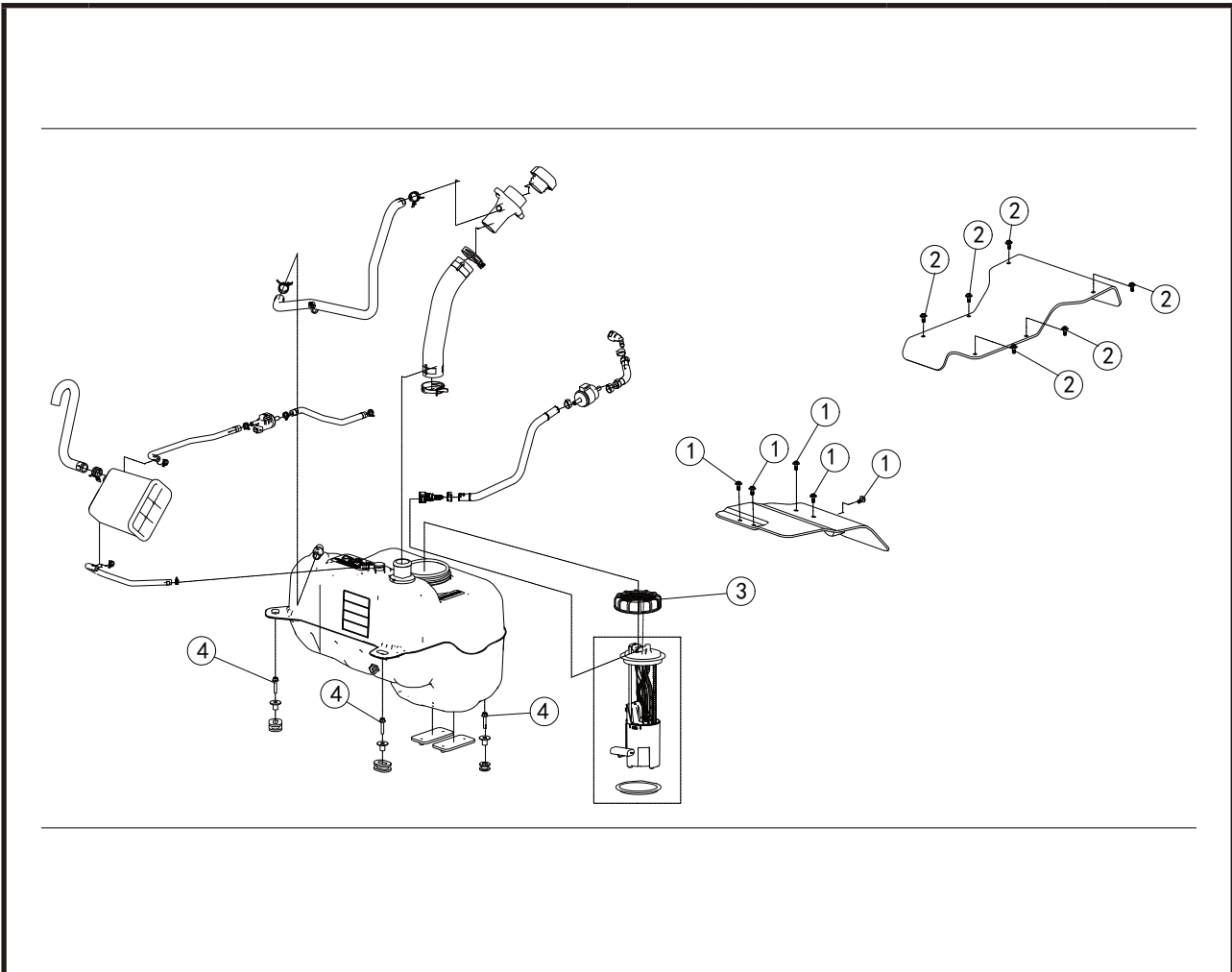
- ◆ Under certain conditions, gasoline is extremely flammable and explosive. Never disassemble the emissions fuel system while the engine is hot. Severe burns may result. Do not overfill the fuel tank. The tank is at full capacity when fuel reaches the bottom of the filler tube. Allow room for expansion of the fuel. Never start the engine or allow it to run in an enclosed area. Gasoline engines emit exhaust fumes that are toxic and can cause injury or death, consciousness and death in urban areas within a short period of time. Do not smoke or allow open flames or sparks in or near a fueling or gasoline storage de-oil. If you get gasoline in your eyes or if you accidentally swallow gasoline, get medical attention immediately.

EXPLODED VIEW OF FUEL TANK (WITHOUT CARBON CANISTER)



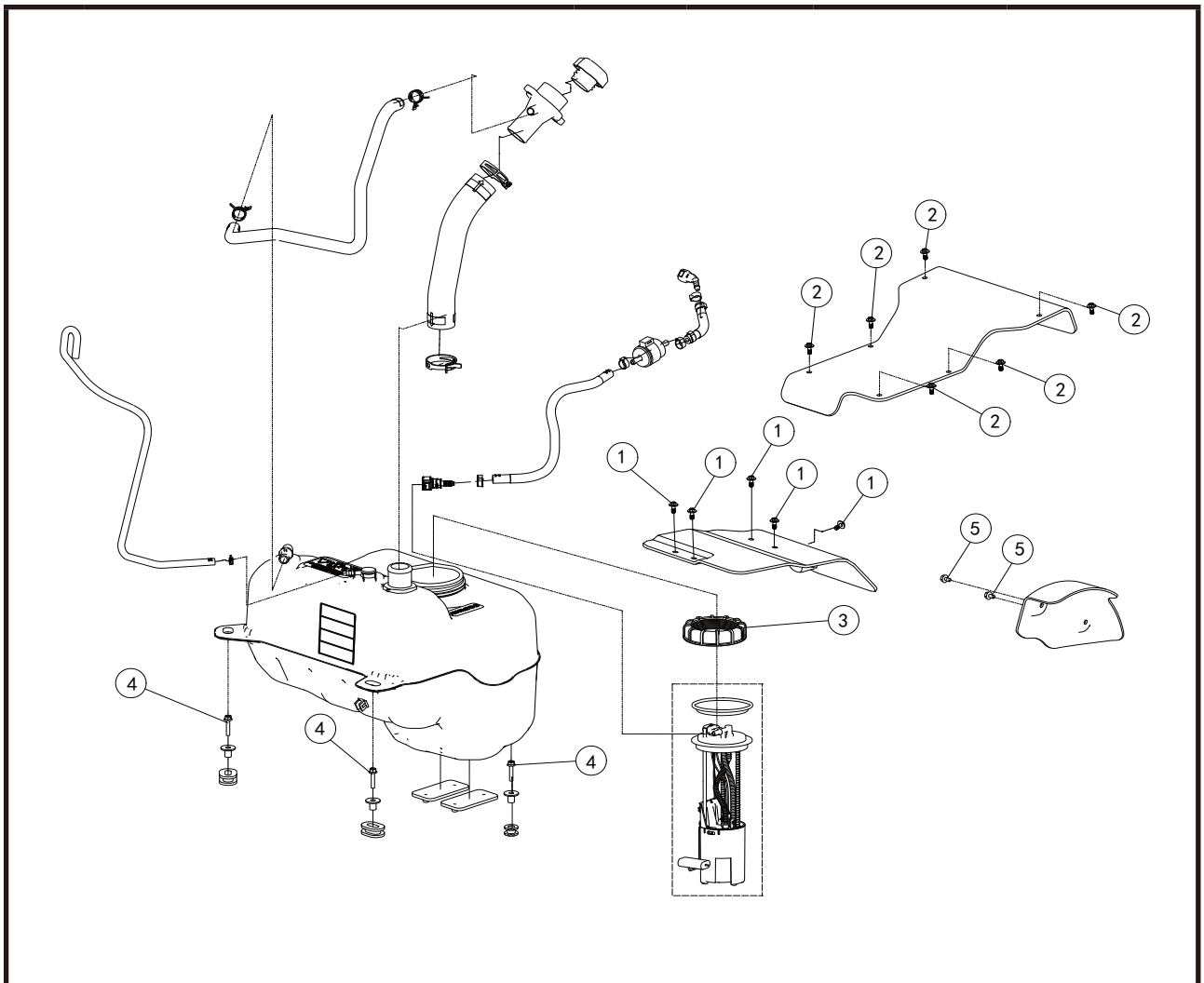
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Heat shield mounting bolt M6 × 10	8~12	0.8~1.2	69~103.6 in·lb	
2	Heat shield mounting bolt M6 × 16	8~12	0.8~1.2	69~103.6 in·lb	
3	Oil pump installation screw cap	75	7.5	55	
4	Oil tank mounting bolt M6 × 30	8~12	0.8~1.2	69~103.6 in·lb	

## EXPLODED VIEW OF FUEL TANK (WITH CARBON CANISTER)



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Heat shield mounting bolt M6 × 10	8~12	0.8~1.2	69~103.6 in·lb	
2	Heat shield mounting bolt M6 × 16	8~12	0.8~1.2	69~103.6 in·lb	
3	Oil pump installation screw cap	75	7.5	55	
4	Oil tank mounting bolt M6 × 30	8~12	0.8~1.2	69~103.6 in·lb	

FUEL TANK EXPLOSION DIAGRAM (MUD VERSION)

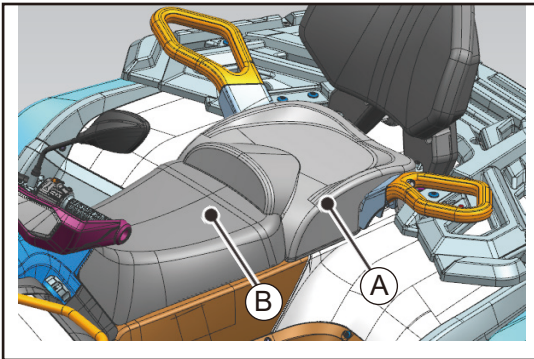


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Heat shield mounting bolt M6 × 10	8~12	0.8~1.2	69~103.6 in·lb	
2	Heat shield mounting bolt M6 × 16	8~12	0.8~1.2	69~103.6 in·lb	
3	Oil pump installation screw cap	75	7.5	55	
4	Oil tank mounting bolt M6 × 30	8~12	0.8~1.2	69~103.6 in·lb	
5	Heat shield mounting bolt M6 × 10	8~12	0.8~1.2	69~103.6 in·lb	

## FUEL TANK REMOVAL/INSTALLATION

### ⚠ WARNING

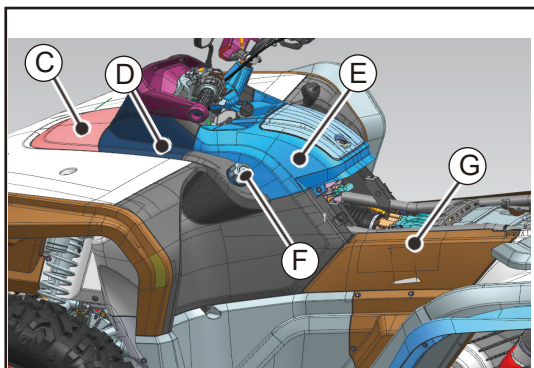
- ◆ Whenever the gasoline line is removed, the battery connection must be disconnected to prevent the accidental startup of the fuel pump.
- ◆ Whenever any repairs or inspections are made to the fuel system, there is a possibility that a fuel leak may occur. No welding, smoke, open flames, etc., should be allowed in the area.



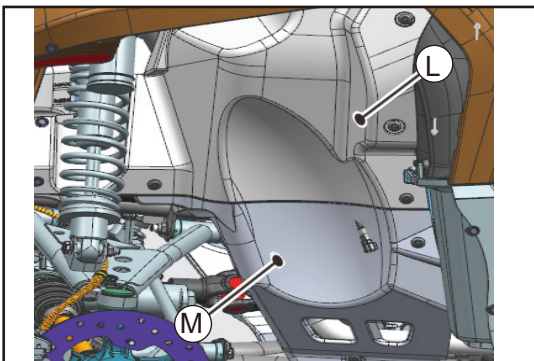
### AB FUEL TANK ASSEMBLY REMOVAL

The fuel tank assembly is located in the front position in the middle of the bottom of the frame and below the air filter assembly. If you need to remove the fuel tank, you must first remove the parts around the fuel tank. Perform the following steps:

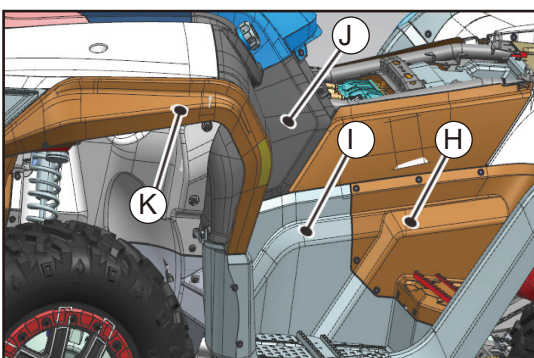
- ◆ Remove the rear seat assembly 【A】 and the front seat cushion assembly 【B】 .



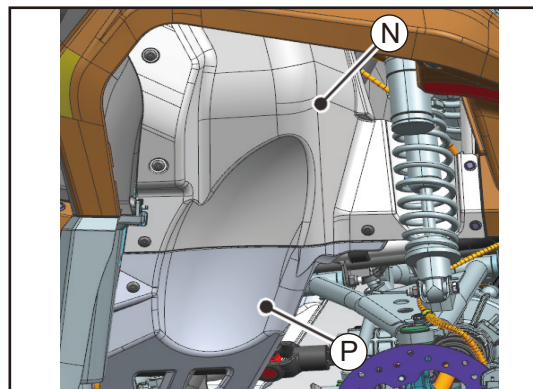
- ◆ Remove the upper cover of the front storage box 【E】 .
- ◆ Remove the front access cover 【C】 and remove the instrument lower cover 【D】 .



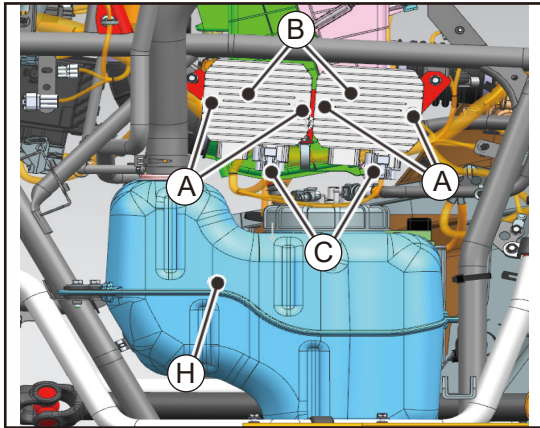
- ◆ Remove the left front upper fender 【L】 and the left front lower fender 【M】 .
- ◆ Remove the CVT access cover 【H】 and the left guard plate 【G】 . ;
- ◆ Remove the left front side strip 【K】 , and unscrew the fuel tank cap assembly 【F】 .
- ◆ Remove the left front fender 【J】 and the left foot pedal 【I】 .



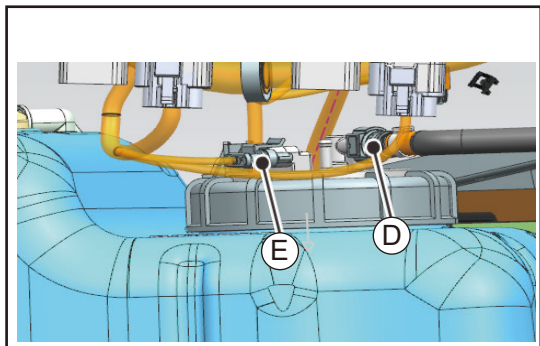
- ◆ Remove the right front upper fender 【N】 and the right front lower fender 【P】 .



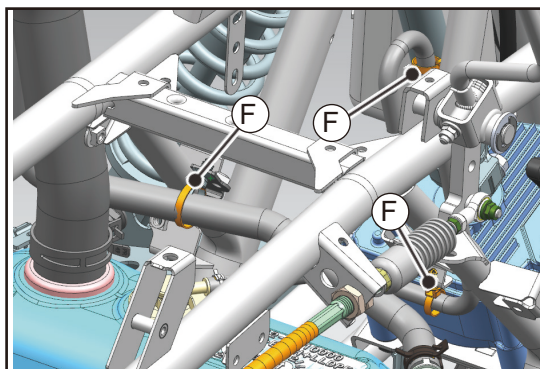
After the BAACH disassembles the plastic parts, you can clearly see the fuel tank assembly assembly. Do these steps to remove all the lines on the fuel tank:



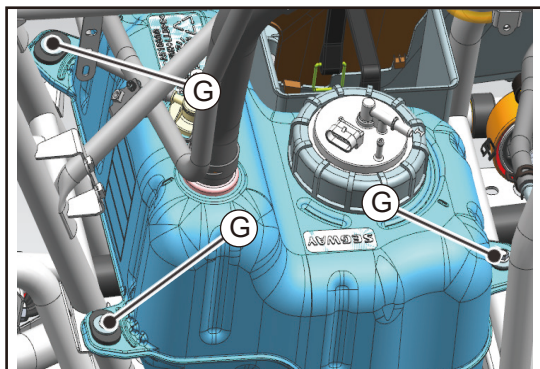
- ◆ Pull out the connector 【C】 , remove the part 【A】 with appropriate tools, and take down the voltage regulating rectifier 【B】 .



- ◆ Pull out the connector 【E】 , and pull out the quick-assembly connector 【D】 .



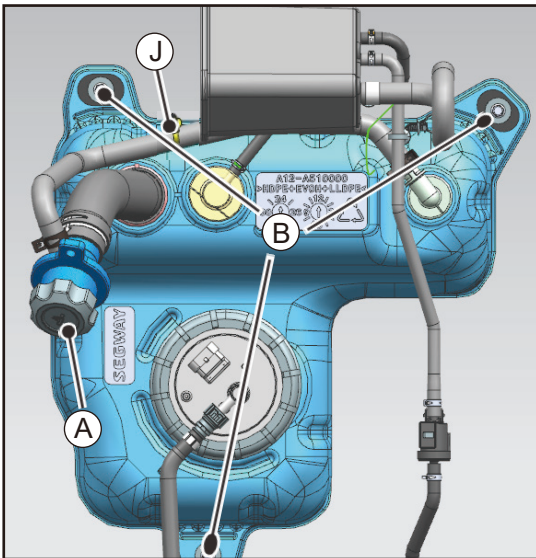
- ◆ Unplug fir tree-shaped positioning tie  $\phi 7 \times 180$  【F】 (3 places).



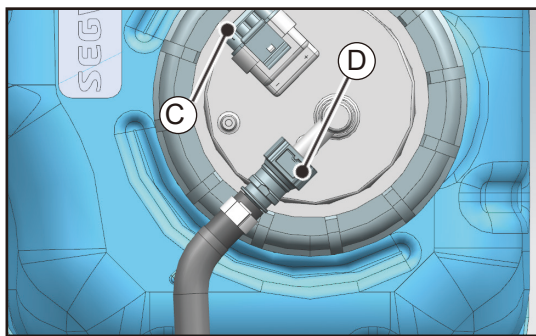
- ◆ Remove the bolt with a suitable tool 【G】 .
- ◆ Take out the fuel tank assembly assembly 【H】 .

**! CAUTION**

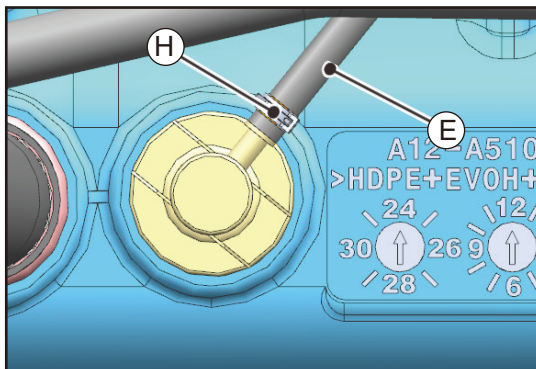
During the removal of any component of the fuel system, fuel leakage may occur. Wipe off the residual oil with a cloth.



- ◆ Remove the fuel tank cap 【A】 .
- ◆ Disconnect the connecting cable of the battery.



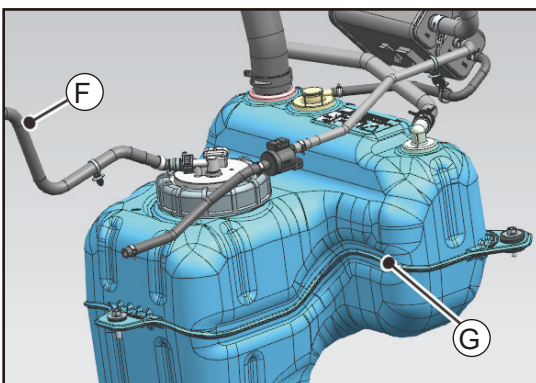
- ◆ Disconnect the fuel pump cable plug 【C】 and the high pressure oil pipe plug 【D】 .



- ◆ Use appropriate tools to move the steel band elastic hose clamp 【H】 along the direction of the hose until the clamp is completely separated from the mating surface of the hose and the breather valve, and remove the breather valve vent pipe/canister adsorption pipe 【E】
- ◆ Remove the cable tie 【J】
- ◆ Remove the high pressure oil pipe 【F】
- ◆ Remove 3 oil tank mounting bolts with tools 【B】 .
- ◆ Take out the fuel tank 【G】 . ;

**⚠ CAUTION**

That fuel leakage may occur during the removal of any component of the fuel system. Wipe off the residual oil with a cloth.



### INSTALLATION OF FUEL TANK ASSEMBLY

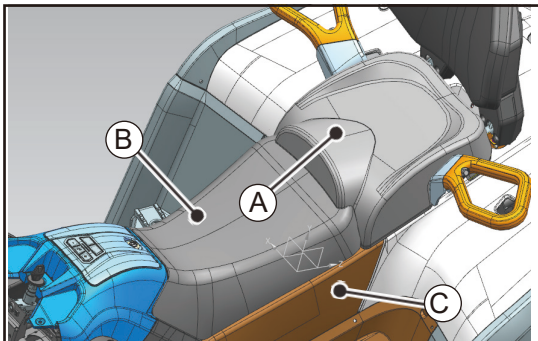
When installing and assembling the fuel tank assembly, reverse the assembly according to the disassembly sequence.

when assembling the high-pressure oil pipe plug, please confirm that the assembly is correct and reliable.

## FUEL FILTER

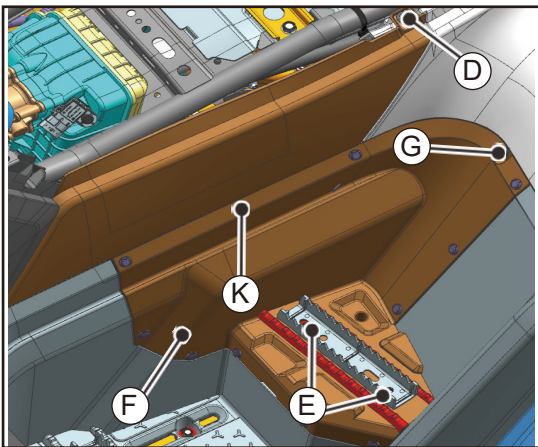
**⚠ WARNING**

- ◆ Whenever the gasoline line is removed, the battery connection must be disconnected to prevent the accidental startup of the fuel pump.
- ◆ Whenever any repairs or inspections are made to the fuel system, there is a possibility that a fuel leaks may occur. No welding, smoke, open flames, etc., should be allowed in the area.

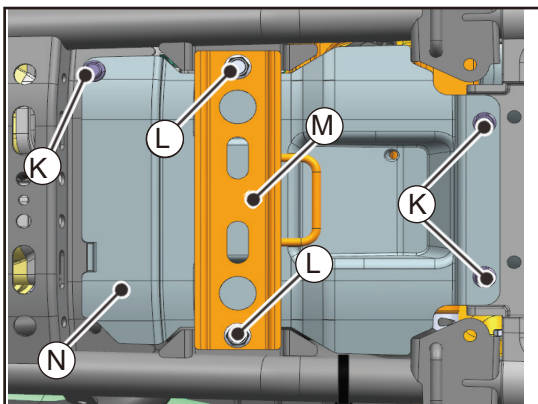
**REMOVAL**

The fuel filter is under the seat cushion, and the rear seat assembly is in the left guard plate 【A】

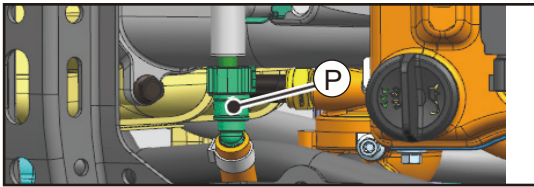
- 【A】 Rear seat
- 【B】 front cushion combination
- 【C】 Left guard plate



- 【D】 large pan head hexagon socket bolt m6 × 16
- 【E】 hexagon flange bolt m6 × 16 or m6 × 30
- 【F】 cvt access cover
- 【G】 large pan head hexagon socket bolt m6 × 20
- 【H】 fuel filter assembly
- 【J】 single-ear stepless clamp 16.5
- 【K】 expansion buckle assembly
- 【L】 hexagon flange bolt m8 × 16
- 【M】 seat bracket welding assembly
- 【N】 air shield at bottom of seat cushion
- 【P】 7.89 Quick-connect plug (135 degrees)



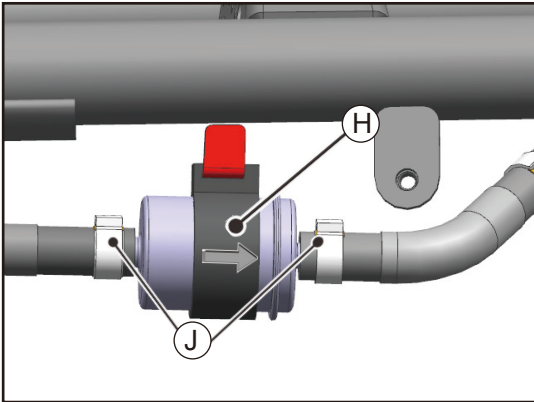
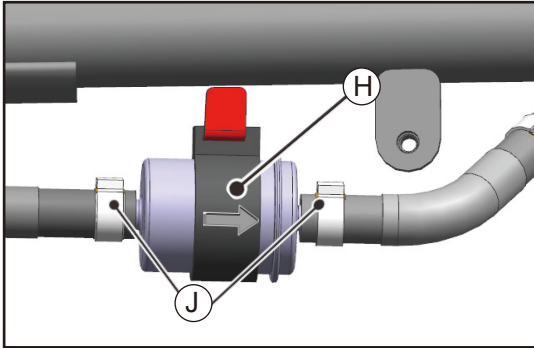
- ◆ Remove the rear seat assembly 【A】 and the front seat cushion assembly 【B】 . ;
- ◆ Remove 2 bolts 【E】 and 【G】 with proper tools【】
- ◆ Remove the 11 expansion buckle assemblies 【K】 and the removal parts 【F】 in Fig. 2 on the left with appropriate tools【】 .
- ◆ Remove the bolt 【D】 and the removal part 【C】 with appropriate tools【】 .
- ◆ Remove 2 bolts 【L】 with proper tools, and remove the part 【M】 .
- ◆ Remove the 3 expansion buckle assemblies 【K】 and the removal parts 【N】 in the left drawing with appropriate tools【】 .



- ◆ Pull out the quick connector 【P】 , remove the clamp 【J】 with an appropriate tool, and take out the fuel filter 【H】 .

### ⚠ CAUTION

During the removal of any components of the fuel system, fuel leakage may occur. wipe off the residual fuel with a cloth.



### INSTALLATION

【J】 Single-ear stepless clamp 16.5

【H】 Fuel filter

- ◆ When assembling the fuel filter, please confirm that the arrow is facing the direction of the fuel filter (as shown in the left picture).
- ◆ Replace the new clamp 【J】 and clamp it with professional tools.
- ◆ Assemble other parts, reverse assembly according to the disassembly sequence.

### ⚠ CAUTION

When replacing and assembling the fuel filter, please carefully check whether the fuel pipe is in good condition to avoid fuel leakage. After confirming that it is correct, use professional tools to clamp the clamp.

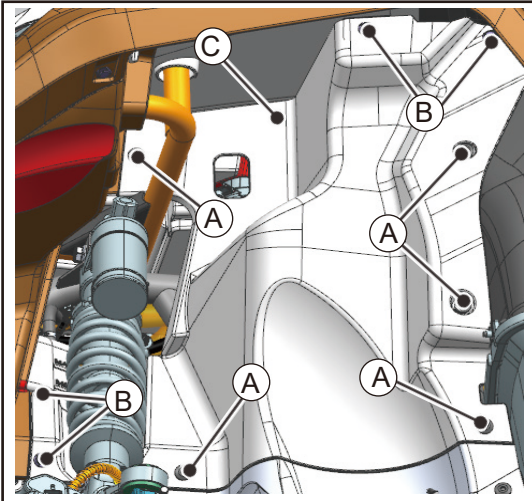
Fuel filter end face: "IN" means oil inlet.

End face of fuel filter: "OUT" means oil discharge.

## CARBON CANISTER ASSEMBLY REMOVAL/INSTALLATION

### ⚠ WARNING

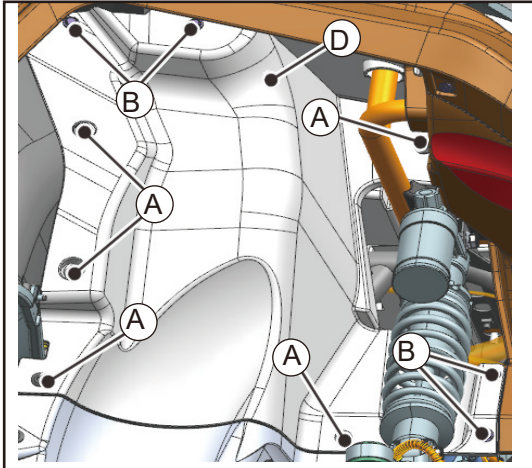
- ◆ Whenever the gasoline line is removed, the battery must be disconnected to prevent the fuel pump from accidentally starting.
- ◆ Whenever any maintenance or inspection of the fuel system is carried out, fuel leakage may occur, and there shall be no welding, smoke, open flame and other phenomena in this area.



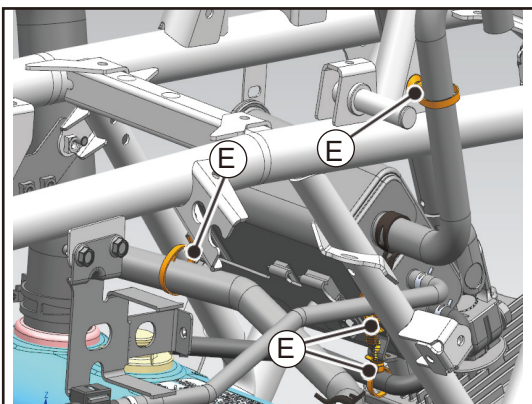
### REMOVAL

Canister assembly is installed in front of the fuel tank and behind the steering column assembly.

- 【A】 Large pan head hexagon socket bolt M6 × 16
- 【B】 Expansion buckle assembly
- 【C】 Left front upper fender



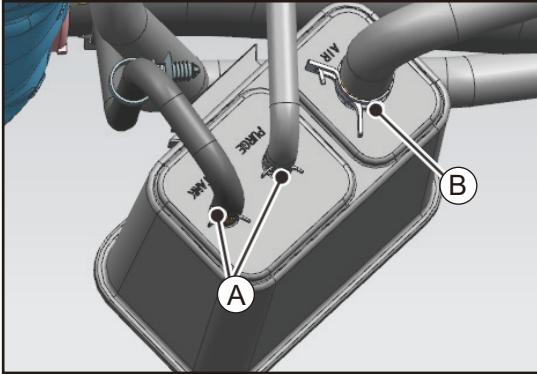
- 【D】 Right front upper fender



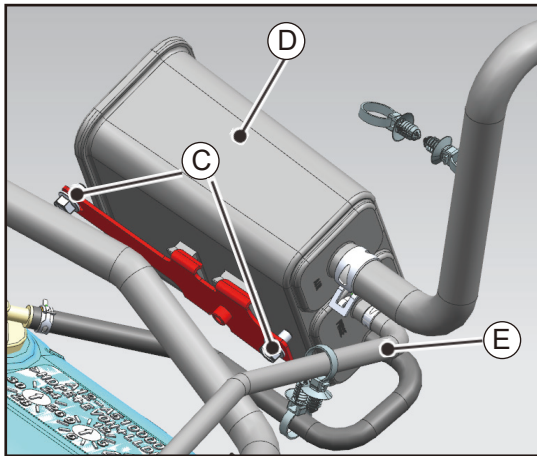
- 【E】 Fir-tree type positioning cable tie (φ7×180)

- ◆ Remove the bolt 【A】 with a suitable tool, detach the expansion fastener assembly 【B】 , and take off Part 【C】 and Part 【D】 .
- ◆ Remove the cable tie 【E】 with a suitable tool.

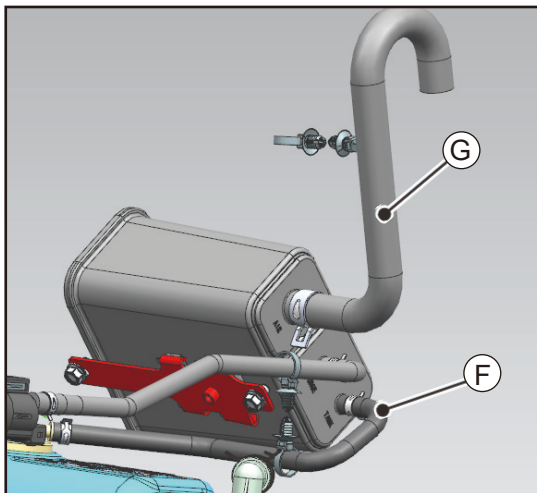
## REMOVAL



- 【A】 Steel band elastic hose clamp 11
- 【B】 Steel band elastic hose clamp 22



- 【C】 Canister mounting bolt M6 × 10
- 【D】 Carbon canister assembly
- 【E】 Canister desorption tube



- 【F】 Adsorption Tube
- 【G】 Carbon Canister Vent Tube
- ◆ Remove the right front fender (refer to the vehicle body section for details).
- ◆ Use a suitable tool to move the clamp 【A】 until it is completely disengaged from the working surface, then take out the carbon canister desorption tube 【E】 and adsorption tube 【F】 .
- ◆ Use a suitable tool to remove the clip clamp 【B】 , then take out the carbon canister vent tube 【G】 .
- ◆ Use a suitable tool to remove the bolt 【C】 , then take out the carbon canister assembly 【D】 .

### ⚠ CAUTION

During the removal of any components of the fuel system, fuel leakage may occur. Wipe off the residual fuel with a cloth.

## INSTALLATION

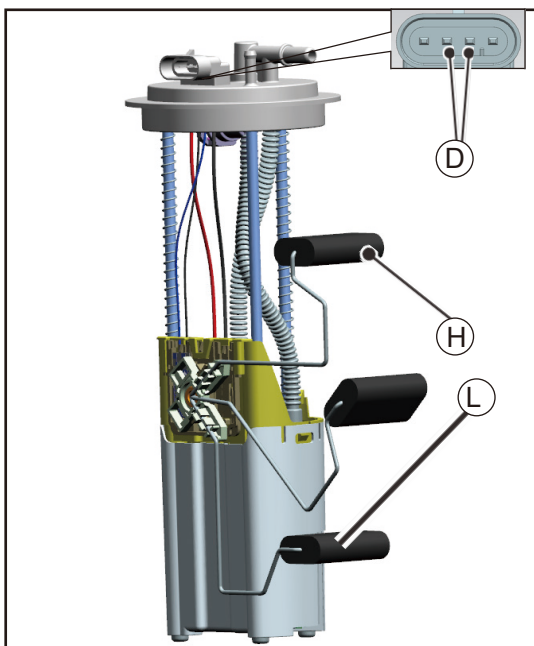
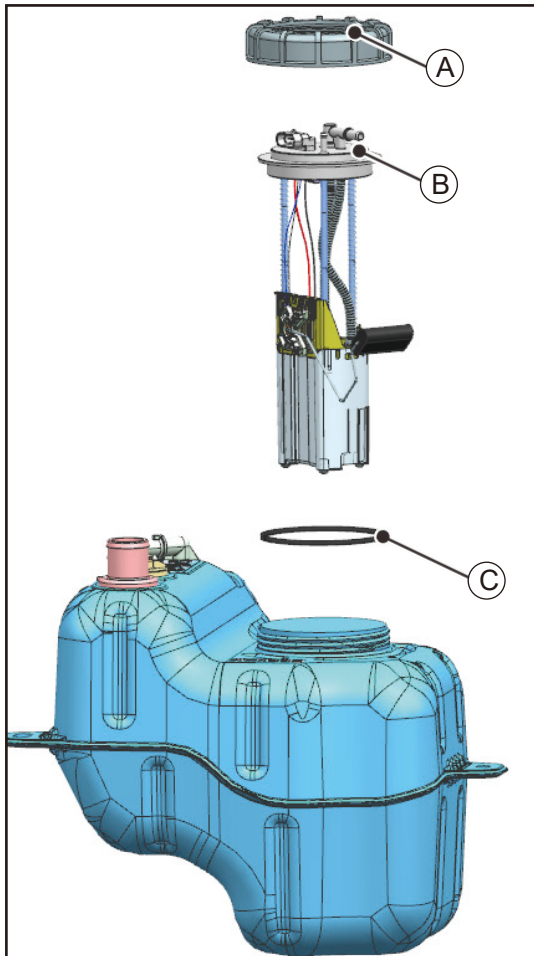
When assembling, reverse the assembly according to the disassembly sequence.

When assembling the oil pipe and clamp, please make sure that the assembly is correct and reliable.

### ⚠ CAUTION

When replacing and assembling the carbon canister assembly, please carefully check whether the oil pipe is in good condition to avoid oil and gas leakage. After confirmation, use professional tools to clamp the clamp.

## FUEL PUMP

**⚠ WARNING**

Whenever any maintenance or inspection of the fuel system is carried out, fuel leakage may occur, and there must be no welding, smoke, open flames, etc. in this area.

**DISASSEMBLY**

**【A】** Fuel pump mounting screw cap

**【B】** Fuel pump

**【C】** Seal ring

- ◆ Remove the fuel pump mounting screw cap counterclockwise **【A】**.
- ◆ Mark the orientation of the fuel pump on the tank and remove the fuel pump **【B】**.
- ◆ Keep the seal ring **【C】** well to prevent loss.

**⚠ CAUTION**

After removing the fuel pump, please protect the fuel tank opening effectively to avoid debris falling into the fuel tank, thus damaging the fuel pump

**INSPECTION**

**【D】** cable plug

**【H】** Position 1

**【L】** Position 2

- ◆ Move the float rod to check if it is free to move. Float components should be free to return to lower positions. If not, replace the fuel pump.
- ◆ Test the fuel level sensor by connecting a multimeter to the two middle pins of wiring connector **【D】**. The multimeter shall display a resistance of  $250 \pm 5 \Omega$  at full fuel position 1 **【H】**, and  $40 \pm 5 \Omega$  at empty fuel position 2 **【L】**.
- ◆ Test the pressure at the fuel supply port of the fuel pump with a pressure gauge. The measured pressure shall be  $400 \pm 20$  kPa under the power-on condition.

**⚠ CAUTION**

- ◆ If the resistance reading is unstable, clean the resistance scraper with alcohol and retest. If it is still incorrect, replace the fuel pump.
- ◆ If the fuel pump supply pressure test does not meet the required value, then replace the pump.

### INSTALL THE OIL PUMP ASSEMBLY

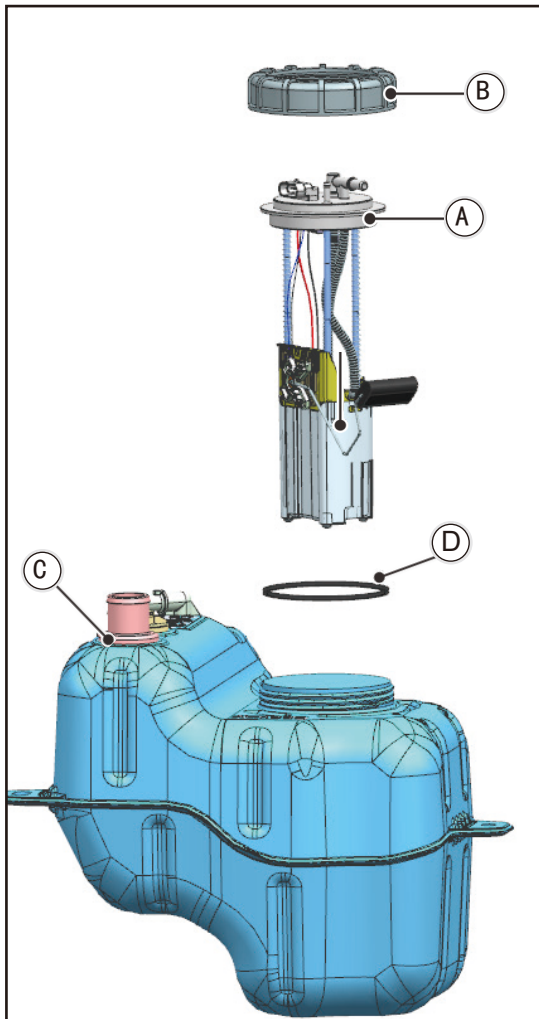
- ◆ Confirm that the seal 【D】 is installed on the fuel tank port.
- ◆ Confirm that the fuel pump is installed on the fuel tank in the facing position.
- ◆ Tighten the fuel pump mounting screw cap 【B】 clockwise.

Fuel pump mounting screw cap

75 N·m (7.6 kgf·m , 55 ft·lb)

#### ⚠ CAUTION

When disassembling the fuel pump, note that the vehicle must be turned off and left for more than 30min to ensure that the pressure of the high pressure fuel hose is relieved to avoid danger.

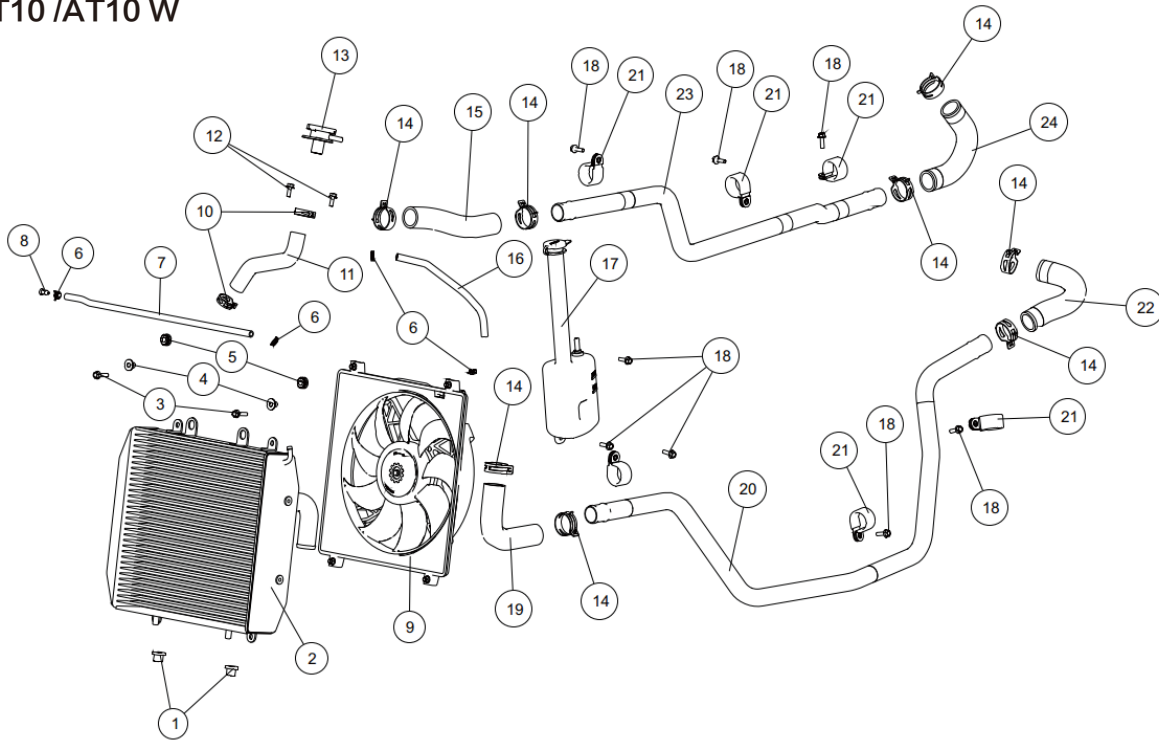


## COOLING SYSTEM

<b>EXPLODED VIEW OF COOLING SYSTEM</b> .....	<b>6-2</b>
<b>COOLANT FLOW</b> .....	<b>6-4</b>
<b>COOLANT FLOW</b> .....	<b>6-5</b>
<b>TECHNICAL PARAMETER</b> .....	<b>6-6</b>
<b>COOLING SYSTEM PRESSURE TEST</b> .....	<b>6-7</b>
<b>RADIATOR CAP PRESSURE TEST</b> .....	<b>6-8</b>
<b>RADIATOR REMOVAL/INSTALLATION</b> .....	<b>6-9</b>
<b>RADIATOR FAN REMOVAL/INSTALLATION</b> .....	<b>6-12</b>
<b>PRESSURE TEST OF COOLING SYSTEM (MUD VERSION)</b> .....	<b>6-13</b>
<b>RADIATOR CAP PRESSURE TEST (MUD VERSION)</b> .....	<b>6-14</b>
<b>RADIATOR REMOVAL/INSTALLATION (MUD VERSION)</b> .....	<b>6-15</b>
<b>DISASSEMBLY OF RADIATOR WATER PIPE</b> .....	<b>6-16</b>
<b>RADIATOR DISASSEMBLY</b> .....	<b>6-16</b>
<b>COOLING SYSTEM BLEEDING PROCEDURE</b> .....	<b>6-17</b>
<b>THERMOSTAT REPLACEMENT</b> .....	<b>6-18</b>
<b>WATER PUMP REMOVAL/INSTALLATION</b> .....	<b>6-19</b>

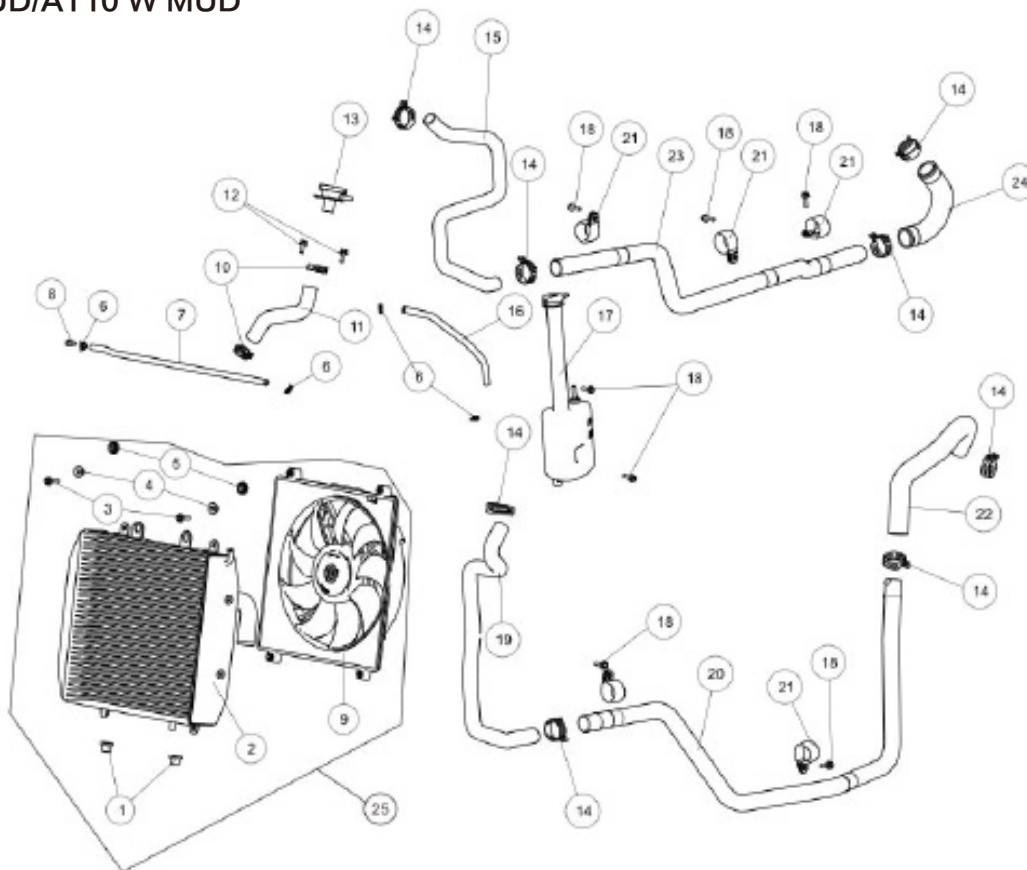
## EXPLODED VIEW OF COOLING SYSTEM

AT10 /AT10 W



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	RADIATOR BUSHING				
2	RADIATOR BODY				
3	HEXAGON FLANGE BOLT M6×25	8 ~ 12	0.8~1.2	6~9	
4	T BUSH V				
5	I-SHAPED RUBBER RING V				
6	CLAMP 11				
7	Engine Radiator Breather				
8	CVT DRAIN PLUG				
9	RADIATOR FAN				
10	STEEL BELT ELASTIC HOSE CLAMP 28				
11	WATER FILLING HOSE				
12	BOLT M6×16	8 ~ 12	0.8~1.2	6~9	
13	WATER FILLER				
14	CLAMP 38				
15	RADIATOR OUTLET HOSE				
16	OVERFLOW PIPE				
17	AUXILIARY WATER TANK				
18	HEXAGON FLANGE BOLT M6×20				
19	RADIATOR INLET HOSE				
20	ENGINE WATER OUTLET ALUMINUM PIPE				
21	32 CLAMPS				
22	ENGINE WATER OUTLET HOSE				
23	ENGINE WATER INLET ALUMINUM PIPE				
24	ENGINE WATER INLET HOSE				

AT10 MUD/AT10 W MUD



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	RADIATOR BUSHING				
2	RADIATOR BODY				
3	HEXAGON FLANGE BOLT M6×25	8 ~ 12	0.8~1.2	6~9	
4	T BUSH V				
5	I-SHAPED RUBBER RING V				
6	CLAMP 11				
7	Engine Radiator Breather				
8	CVT DRAIN PLUG				
9	RADIATOR FAN				
10	STEEL BELT ELASTIC HOSE CLAMP 28				
11	WATER FILLING HOSE				
12	BOLT M6×16	8 ~ 12	0.8~1.2	6~9	
13	WATER FILLER				
14	CLAMP 38				
15	RADIATOR OUTLET HOSE				
16	OVERFLOW PIPE				
17	AUXILIARY WATER TANK				
18	HEXAGON FLANGE BOLT M6×20	8 ~ 12	0.8~1.2	6~9	
19	RADIATOR INLET HOSE				
20	ENGINE WATER OUTLET ALUMINUM PIPE				
21	32 CLAMPS				
22	ENGINE WATER OUTLET HOSE				
23	ENGINE WATER INLET ALUMINUM PIPE				
24	ENGINE WATER INLET HOSE				

## COOLANT FLOW

Select permanent antifreeze as the coolant to prevent rust and corrosion of the cooling system. When the engine starts, the water pump rotates and the coolant circulates.

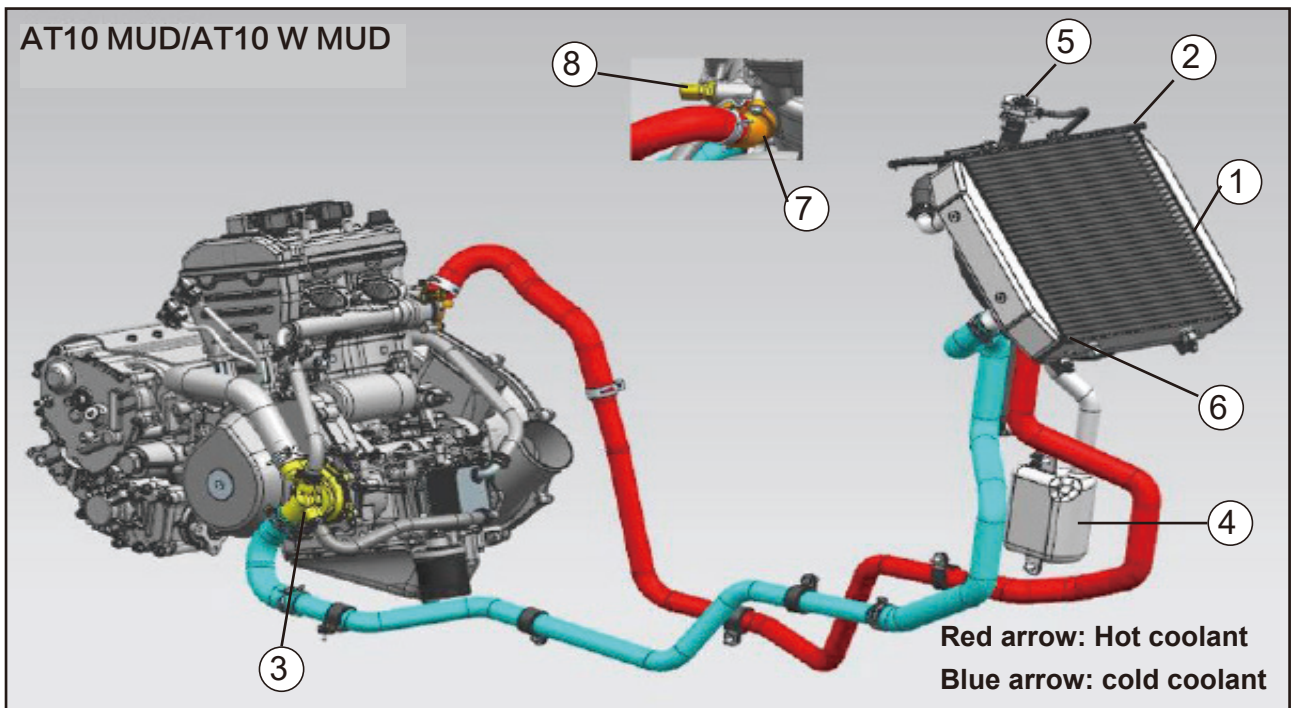
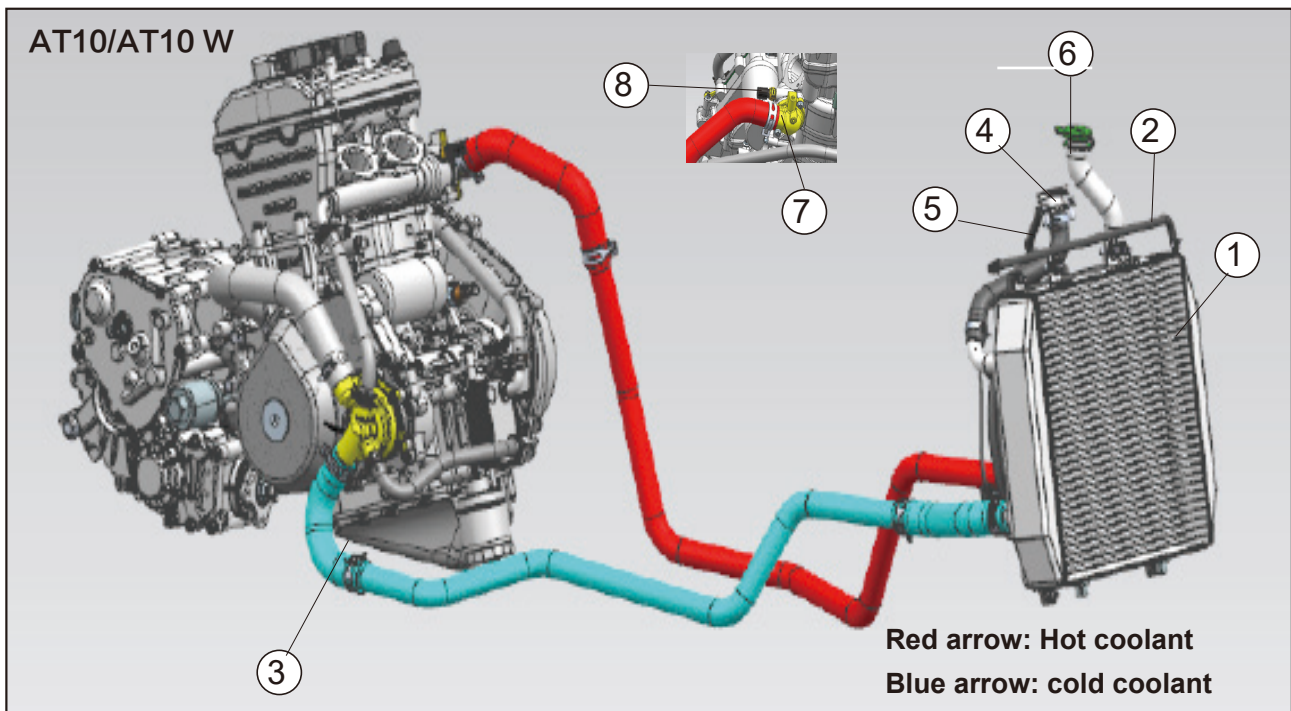
The thermostat is a wax particle type, which opens or closes with the change of the coolant temperature. The thermostat continuously changes its valve opening to keep the coolant temperature at an appropriate level. When the coolant temperature is lower than  $79 \sim 82^{\circ}\text{C}$  ( $174.2 \sim 179.6^{\circ}\text{F}$ ), the thermostat is closed. Therefore, the flow of coolant through the exhaust hole is restricted, which makes the engine warm up faster. When the coolant temperature exceeds  $79 \sim 82^{\circ}\text{C}$  ( $174.2 \sim 179.6^{\circ}\text{F}$ ), the thermostat will open and the coolant will flow. When the coolant temperature reaches  $88^{\circ}\text{C}$  ( $190.4^{\circ}\text{F}$ ), the radiator fan switch is turned on and the radiator fan works. When there is not enough airflow (for example, at low speeds). The radiator fan sucks in air through the radiator core. This increases the cooling effect of the radiator. When the temperature is lower than  $83^{\circ}\text{C}$  ( $181.4^{\circ}\text{F}$ ), the fan switch is turned off and the radiator fan stops working.

In this way, the system controls the engine temperature within the narrow range of engine operation. Even if the engine load changes, the engine has the highest working efficiency.

The system is pressurized through the radiator cap to suppress boiling and the resulting bubbles that may cause the engine to overheat. When the engine warms up, the coolant in the radiator and water circuit expands. The excess coolant flows into the water storage tank through the radiator cover and hoses. Conversely, when the engine cools, the coolant in the radiator and water circuit shrinks, and the stored coolant flows from the storage tank back to the radiator.

The radiator cover has two valves. One is a pressure valve, which maintains the pressure in the system when the engine is running. When the pressure exceeds  $93 \sim 123\text{kPa}$  ( $0.95 \sim 1.25 \text{ kgf/c m}^2$ ,  $14 \sim 18\text{psi}$ ), the pressure valve opens and releases the pressure to the water storage tank. Once the pressure overflows, the valve is closed and the pressure is maintained at  $93 \sim 123\text{kPa}$  ( $0.95 \sim 1.25\text{kgf/c m}^2$ ,  $14 \sim 18\text{psi}$ ). After the engine has cooled down, another small valve (vacuum valve) on the cover opens. When the coolant cools, the coolant shrinks, creating a vacuum in the system. The vacuum valve opens and allows the coolant to enter the radiator from the storage tank.

COOLANT FLOW



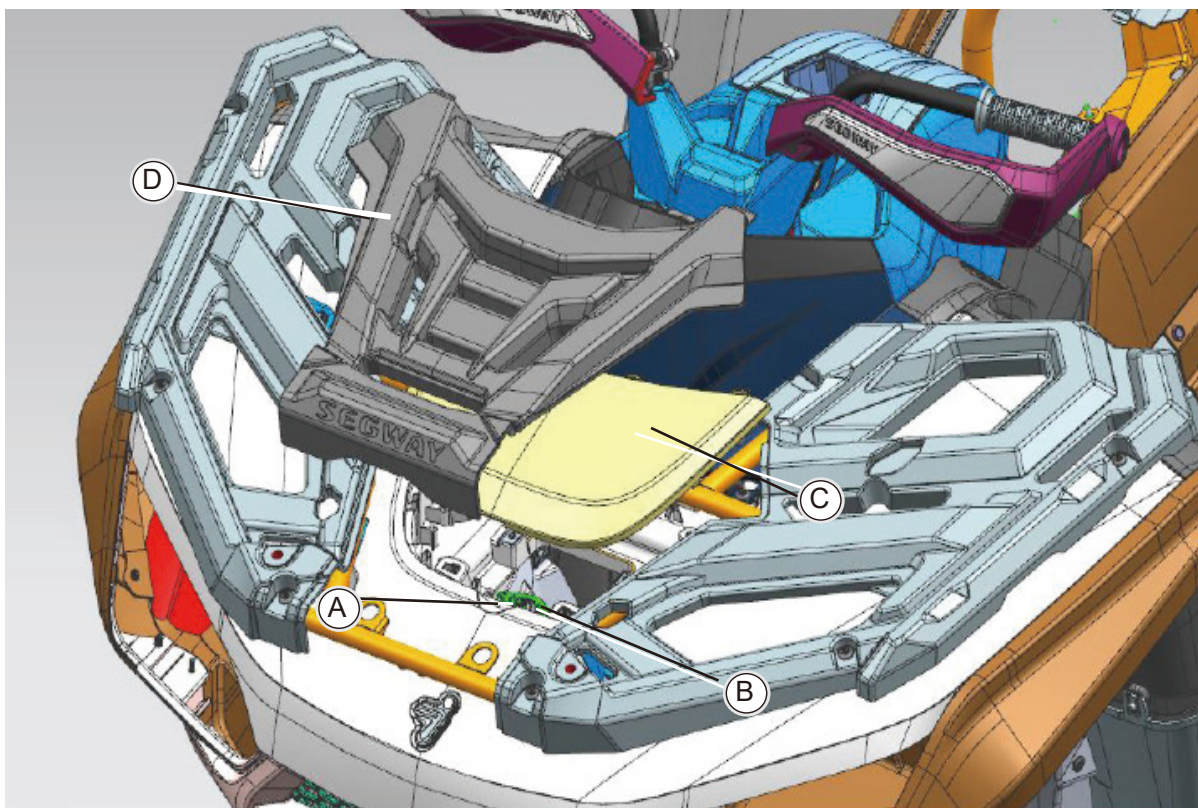
- 1. Radiator
- 2. Radiator vent hose
- 3. Water pump cover
- 4. Auxiliary radiator

- 5. Radiator cap
- 6. Auxiliary radiator cap
- 7. Thermostat cover
- 8. Coolant temperature sensor

## TECHNICAL PARAMETER

ITEM	STANDARD	SERVICE LIMIT
<b>Coolant provided during transportation:</b>		
<b>Type</b>	Permanent antifreeze (soft water and glycol for aluminum engines and radiators plus corrosion inhibitors and rust inhibitor chemicals)	- - -
<b>Color</b>	Green	- - -
<b>Mixing ratio</b>	Soft water 50%, cooling water 50%	- - -
<b>Total</b>	5.5 L (full reservoir level, including radiator and engine) (AT10) 5.8 L (full reservoir level, including radiator and engine) (AT10 MUD)	- - -
<b>Radiator cover</b>		
<b>Pressure relief</b>	93 ~ 123 KPA (0.95 ~ 1.25 KGF /CM <sup>2</sup> , 14 ~ 18PSI)	- - -
<b>Thermostat</b>		
<b>Valve opening temperature</b>	79 ~ 82°C (174.2 ~ 179.6°F)	- - -
<b>Valve fully open lift</b>	8~12mm or over 85°C (185°F)	- - -
<b>Coolant filter/valve</b>		
<b>Cooling valve closing temperature (For reference)</b>	83°C (181.4°F) OR OVER 24.5KPA (0.25KGF/CM <sup>2</sup> , 3.6 PSI)	- - -

## COOLING SYSTEM PRESSURE TEST



【A】 Radiator filler port   【B】 Radiator cap   【C】 Front service cover   【D】 Front shelf middle cover

- ◆ Remove the front shelf middle cover 【D】 , front service cover 【C】 and radiator cap 【B】 , then install a cooling system pressure tester on radiator filler port 【A】 .

### ⚠ CAUTION

Wet the cap sealing surface with water or coolant to prevent pressure leakage.

Pressurize slowly until the pressure rises to 123 kPa (1.25 kgf/cm<sup>2</sup>, 18 psi).

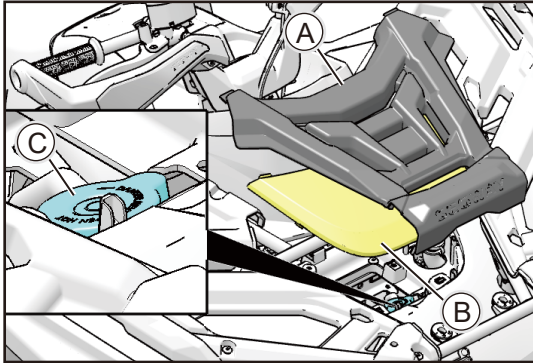
### ⚠ WARNING

Do not exceed the design pressure of the system during the pressure test. The maximum value pressure is 123kPa (1.25kgf/cm<sup>2</sup>, 18psi).

- ◆ Observe the pressure gauge for at least 6 seconds.
- ◆ If the pressure remains steady, the system is normal. If pressure drops quickly, check for leaks.

### RADIATOR CAP PRESSURE TEST

- ◆ Check the condition of the top and bottom seals of the radiator cover.
- ◆ If any of them are damaged, replace the radiator cover.

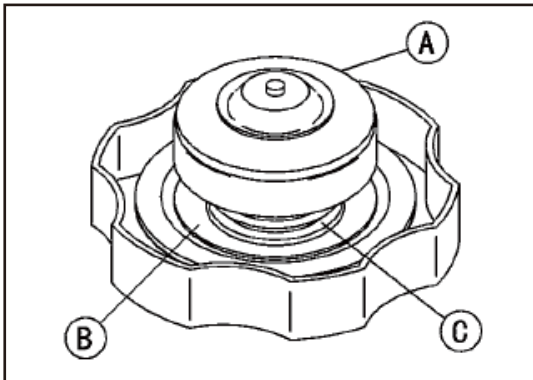


- ◆ Remove the middle cover plate of the front shelf first. The middle cover plate of the front shelf is a discount quick-release structure.
- ◆ The front access cover is a discount quick-release structure. Remove the front access cover and the radiator pressure cover is located below.

- 【A】 Front shelf middle cover plate
- 【B】 Front access cover
- 【C】 Radiator pressure cover

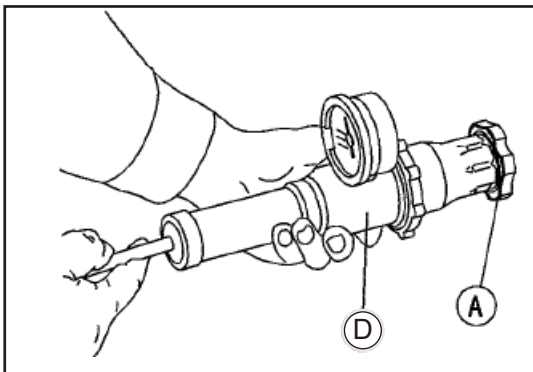
- ◆ Unscrew the radiator pressure cap.
- ◆ Install the seal at the bottom of the radiator pressure cap 【A】 on the cooling system pressure tester 【D】 for testing.

- 【A】 Bottom seal
- 【B】 Top seal
- 【C】 Pressure valve spring



#### ⚠ CAUTION

Observe the pressure gauge and slowly press the pressure tester to increase the pressure.



- ◆ Observe the pressure gauge and slowly press the pressure tester to increase the pressure.
- ◆ The radiator cap must open within the safe pressure range and the gauge needle
- ◆ must remain within the specified range for at least 6 seconds.

#### Radiator cap pressure relief value standard :

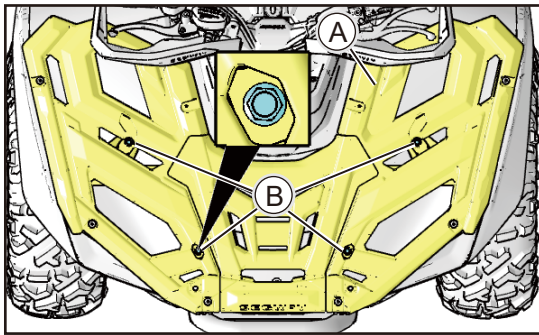
93~123kPa (0.95~1.25 kgf /cm<sup>2</sup>, 14~18psi)

#### ⚠ WARNING

Do not exceed the design pressure of the system during the pressure test. The maximum value pressure is 123kPa (1.25kgf/cm<sup>2</sup>, 18psi).

If the radiator valve fails to hold the specified pressure, or the pressure is too high, replace the radiator cap with a new one.

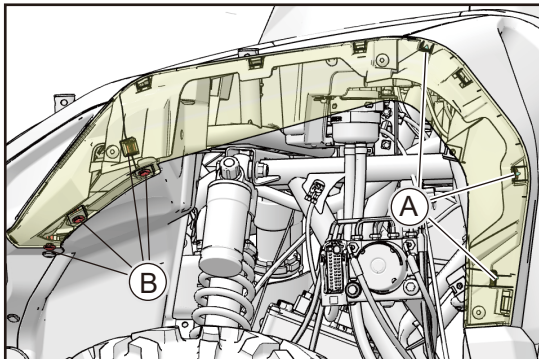
## RADIATOR REMOVAL/INSTALLATION



- ◆ Remove the parts around the radiator before removing the radiator.

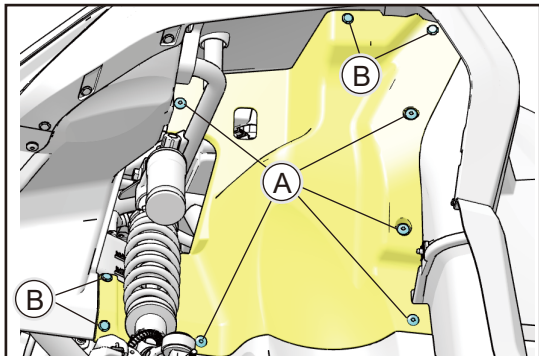
## REMOVAL/INSTALLATION OF FRONT SHELF ASSEMBLY

- ◆ 【A】 front shelf assembly
- ◆ 【B】 hexagon flange bolt M8 × 16 radiator



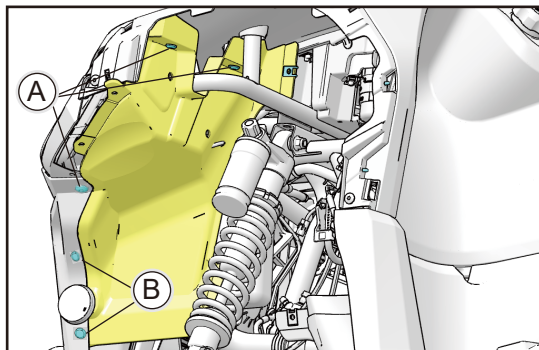
## FRONT EDGE STRIP REMOVAL

- ◆ Take out 3 self-tapping nails ST4.2 × 13 【A】 .
- ◆ Take out 4 expansion buckle assemblies 【B】 .
- ◆ The front edge strip can be taken out.
- ◆ The removal method of the front edge strip is the same on the left and right.



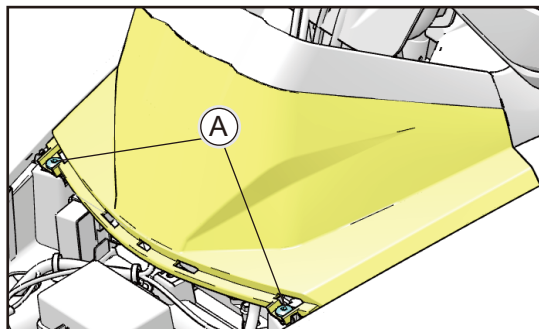
## BA FRONT UPPER FENDER REMOVAL

- ◆ Take out 5 large pan head hexagon socket head bolts M6 × 16 【A】 .
- ◆ Take out 4 expansion screws 【B】 .
- ◆ The front upper fender can be taken out
- ◆ The disassembly method of the front upper fender is the same on the left and right.



## REMOVAL OF THE LEFT FRONT HEADLIGHT COVER

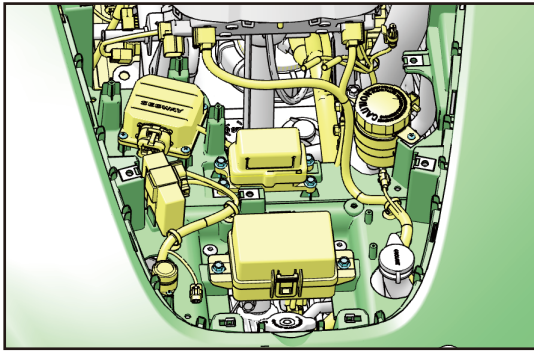
- ◆ Remove 3 large pan head hexagon socket head bolts M6 × 16 【A】
- ◆ Remove 2 expansion screws 【B】 to take out the left headlight cover
- ◆ The removal method of the left and right headlight covers is the same.



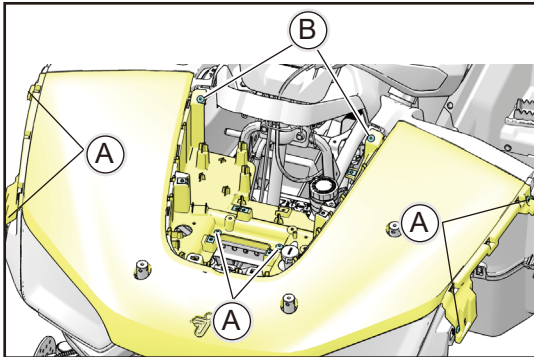
## REMOVAL OF THE FRONT ACCESS COVER AND LOWER INSTRUMENT PANEL COVER

- ◆ The front access cover is a discount quick-release structure. Place your hand on the front of the front access cover and pull it up to remove the front access cover.
- ◆ Take out the two large pan head hexagon socket bolts M6 × 16 【A】 on the lower cover of the instrument, and remove the lower cover of the instrument

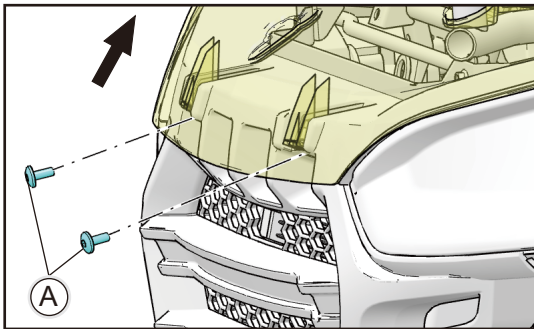
### FRONT PANEL REMOVAL



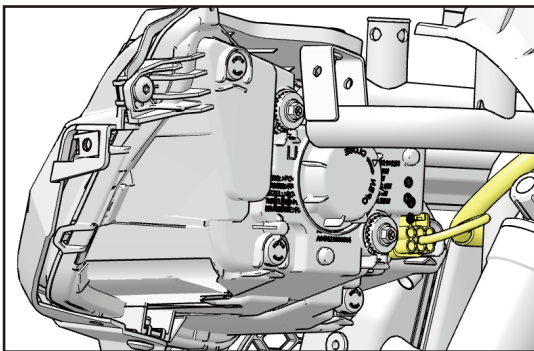
- ◆ Remove the fuse box, instrument relay, flasher, T-BOX and brake oil cup assembly in the middle of the front panel one by one.



- ◆ Remove 4 large pan head hexagon socket head bolts M6 x 16 【A】 above the front panel】
- ◆ Remove 4 large pan head hexagon socket bolts M6 x 16 【A】 on the left and right sides of the front panel】

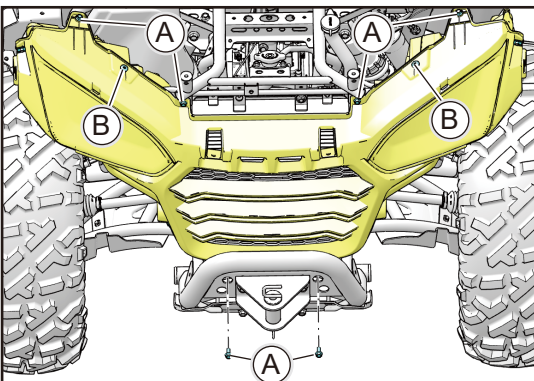


- ◆ Remove the two hexagon socket button head bolts (M6x16 [A]) on the foremost side of the front panel.
- ◆ Pull out the front panel along the direction of the arrows.



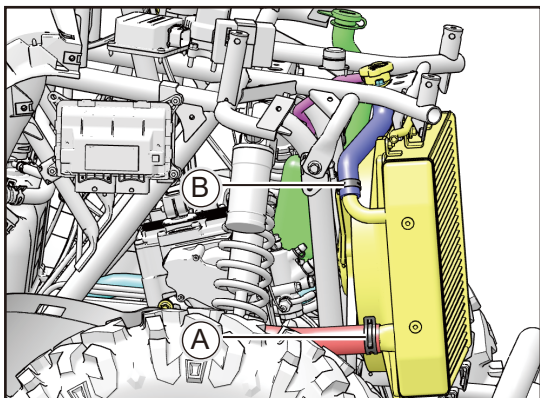
### HEADLAMP COVER ASSEMBLY REMOVAL

- ◆ Pull out the wiring harness on the left and right headlights.



- ◆ Remove the four hexagonal flange bolts (M6x16 [A]) on the upper and lower sides of the front headlight cover assembly.
- ◆ Remove the two hexagon socket button head bolts (M6x16 [B]) on the upper side of the front headlight cover assembly.
- ◆ Remove the front headlight cover assembly.

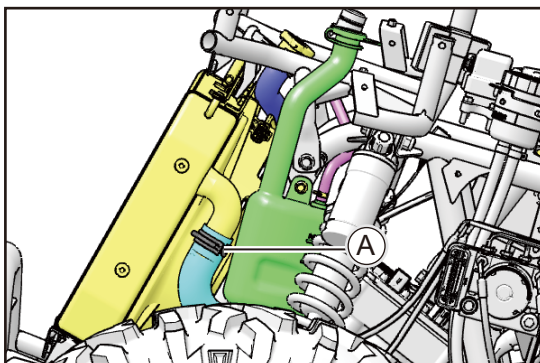
## REMOVING ENGINE RADIATOR



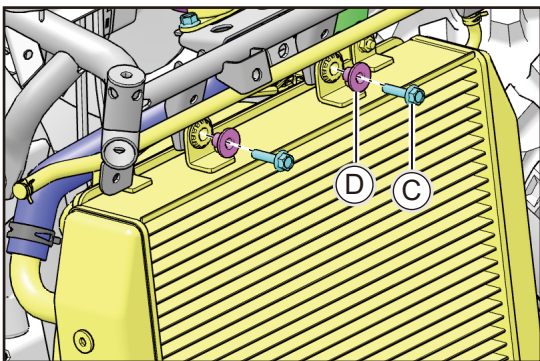
**⚠ WARNING**

When disassembling the radiator, it must be carried out in a cold car and in a flameout state.

- 【A】 steel band elastic hose clamp 38
- 【B】 steel band elastic hose clamp 28
- 【C】 Hexagon flange bolt M6 × 25
- 【D】 Install T-type bushing on radiator



- ◆ Remove the two clamps [A] and one clamp [B] on the left and right sides of the radiator with a suitable tool.



- ◆ Remove the two mounting bolts (M6X25) of the radiator

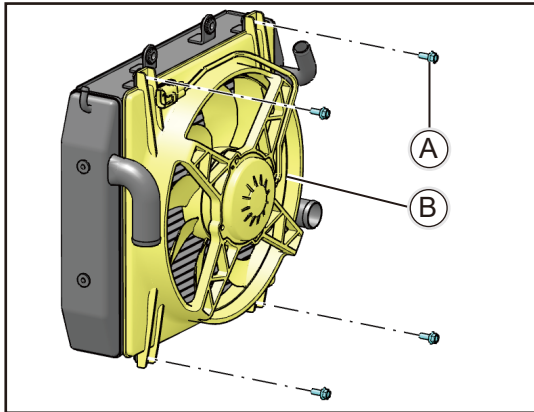
<b>Bolt [ A ]</b>
10 N·m

- ◆ Unplug the wire harness connector on the radiator fan
- ◆ Remove engine radiator components
- ◆ Install the radiator assembly in the reverse order of disassembly

**⚠ WARNING**

Do not touch the radiator core. This may damage the heat sink, resulting in reduced cooling efficiency.

## RADIATOR FAN REMOVAL/INSTALLATION



- ◆ Remove the four bolts [A] on the radiator fan.
- ◆ Take off the radiator fan assembly [B].

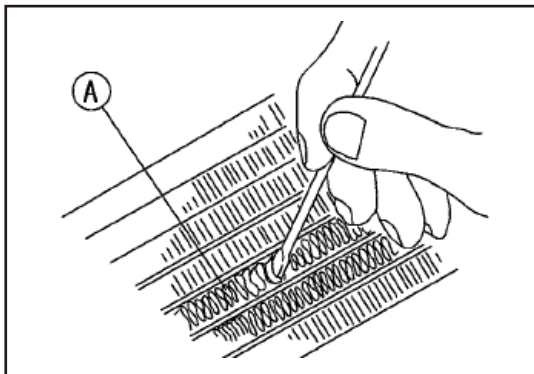
### ⚠ WARNING

The activation and deactivation of the radiator fan is controlled by the vehicle ECU. The fan turns on automatically when the engine cylinder head water temperature reaches 90 °C, and shuts off automatically only when the temperature drops below 85 °C.

- ◆ Radiator fan mounting nut [a]
- ◆ Radiator fan [b]
- ◆ The installation and removal sequence of the radiator fan is the opposite
- ◆ Tighten

Radiator fan assembly bolt 【A】

10 N·m



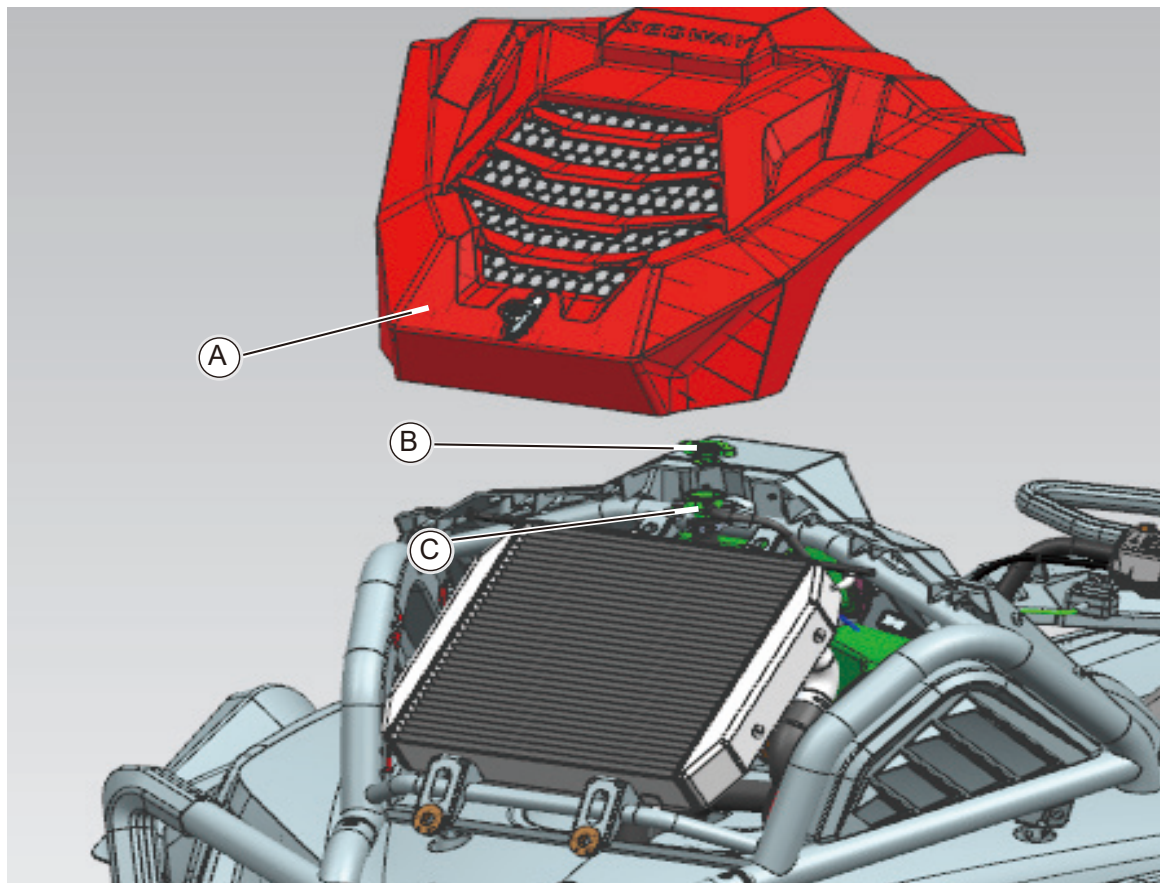
## RADIATOR CORE INSPECTION

- ◆ Check the radiator core.
- ◆ If there are obstacles in the air flow, please remove the radiator and remove the obstacles.
- ◆ If the corrugated fins 【A】 are deformed, please straighten them carefully.

### ⚠ CAUTION

If the air passage of the radiator core is blocked by more than 20%, but the obstacle cannot be removed or the deformation of the heat sink cannot be repaired, replace the radiator with a new one.

## PRESSURE TEST OF COOLING SYSTEM (MUD VERSION)



【A】 Radiator front cover      【B】 Filler cover      【C】 Filler

Remove the heater front cover A and water filler cover B, and then install a cooling system pressure tester on the radiator filler C.

**⚠ CAUTION**

Wet the sealing surface of the lid with water or coolant to prevent pressure leakage.

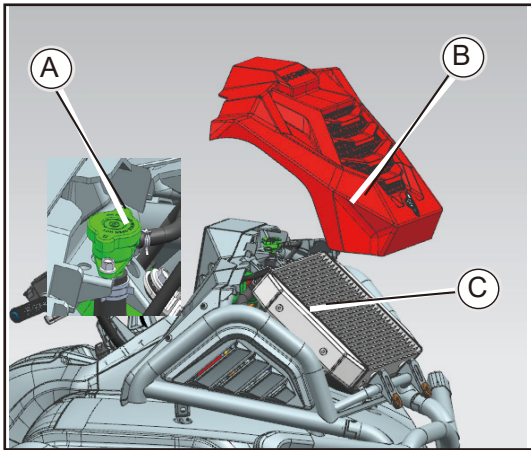
The pressure was slowly increased until the pressure rose to 123kPa(1.25kgf/cm<sup>2</sup>, 18psi).

**⚠ WARNING**

Do not exceed the design pressure of the system during the stress test. The maximum pressure was 123kPa(1.25kgf/cm<sup>2</sup>, 18psi).

- ◆ Observe the pressure gauge for at least 6 seconds.
- ◆ If the pressure remains stable, the system is normal. If the pressure drops quickly, check for leaks.

### RADIATOR CAP PRESSURE TEST (MUD VERSION)

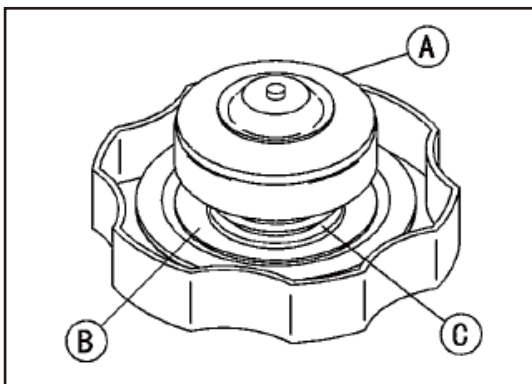


- ◆ Check the condition of the top and bottom seals of the radiator cover.
- ◆ If any of them are damaged, replace the radiator cover.
- ◆ Remove the middle cover plate of the front shelf first. The middle cover plate of the front shelf is a discount quick-release structure.
- ◆ The radiator front cover is a quick-release structure. Remove the radiator front cover, and the radiator pressure cover is located above the radiator.

【A】 Radiator pressure cover

【B】 Radiator front cover

【C】 Radiator



- ◆ Unscrew the radiator pressure cap.
- ◆ Install the seal at the bottom of the radiator pressure cap 【A】 on the cooling system pressure tester 【D】 for testing.

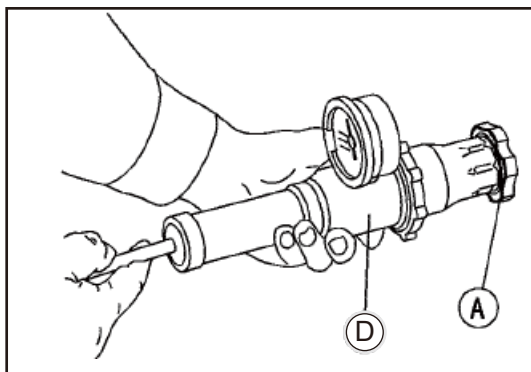
【A】 Bottom seal

【B】 Top seal

【C】 Pressure valve spring

#### ⚠ CAUTION

Wet the radiator cover sealing surface with water or coolant to prevent pressure leakage.



- ◆ Observe the pressure gauge and slowly press the pressure tester to increase the pressure.
- ◆ The radiator cover must be opened within the safe pressure range, and the meter pointer must be kept within the specified range for at least 6 seconds.

Radiator cover pressure relief value

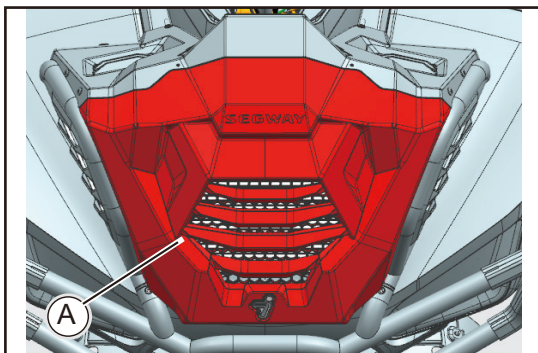
Standard : 93~123kPa (0.95~1.25 kgf/cm<sup>2</sup>, 14~18psi)

#### ⚠ WARNING

Do not exceed the design pressure of the system during the stress test. The maximum pressure was 123kPa(1.25kgf/cm<sup>2</sup>,18psi).

If the radiator valve cannot maintain the specified pressure, or the pressure is too high, replace the radiator pressure cap with a new one.

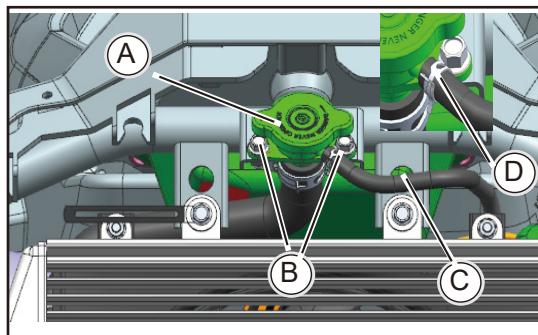
## RADIATOR REMOVAL/INSTALLATION (MUD VERSION)



- ◆ Remove the parts around the radiator before removing the radiator.

## RADIATOR FRONT COVER REMOVAL

- 【A】 Radiator front cover (quick release structure)

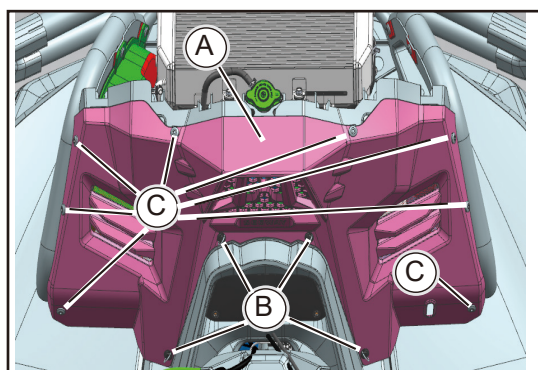


## RADIATOR WATER FILLER A- REMOVAL

- ◆ Unscrew the water filler cap 【A】 .
- ◆ Remove two M6 \* 16 hexagon flange bolts 【B】
- ◆ Remove the  $\phi 11$  pipe clamp 【D】 on the overflow pipe 【C】 , and take out the overflow pipe
- ◆ The radiator water filler can be removed
- ◆ The radiator water filler cover is installed back on the water filler body (to prevent liquid leakage)

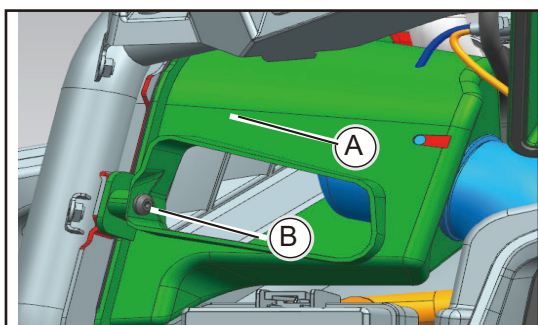
**⚠ WARNING**

When removing the radiator overflow pipe by ACCB, it must be carried out in a cold car and in a flameout state.



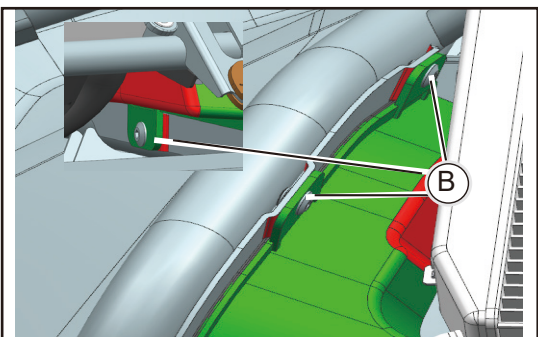
## RADIATOR REAR COVER REMOVAL

- ◆ Radiator rear cover 【A】 . .
- ◆ Remove 4 expansion buckle components B 【B】
- ◆ Remove 8 large pan head hexagon socket bolts M6  $\times$  16,
- ◆ The radiator rear cover can be removed

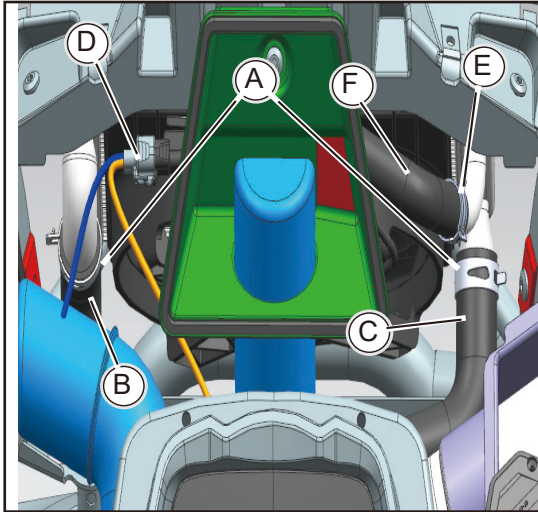


## REMOVE CVT INLET BOX

- ◆ CVT inlet box 【A】
- ◆ Remove 4 large pan head hexagon socket head bolts M6  $\times$  16 【B】
- ◆ Remove 8 large pan head hexagon socket head bolts M6  $\times$  16
- ◆ CVT air inlet box can be removed



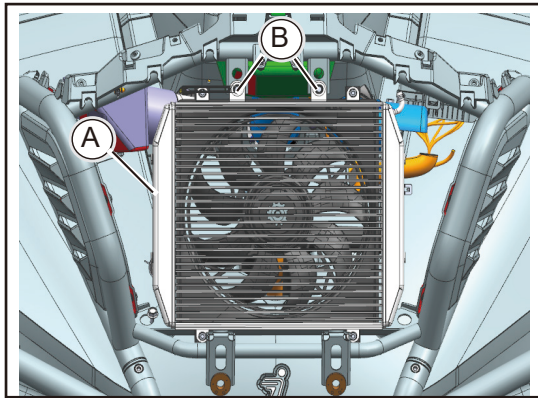
### DISASSEMBLY OF RADIATOR WATER PIPE



- ◆ Remove 2 steel band elastic hose clamps 38 (width 15) 【A】 respectively, and take out radiator water inlet hose 【B】 and radiator water outlet hose 【C】 respectively.
- ◆ Remove radiator fan plug-in 【D】
- ◆ Remove 1 steel band elastic hose clamp 28 【E】 , and take out water filler connecting hose 【F】

#### **⚠ WARNING**

When removing the radiator water pipe, be sure to do it in a cold car and in a flameout state.



### RADIATOR DISASSEMBLY

- ◆ Radiator 【A】 .
- ◆ Remove 2 hexagon flange bolts M6 × 25 【B】
- ◆ Remove the radiator
- ◆ Install the radiator assembly in the reverse order of disassembly

#### **⚠ WARNING**

Do not touch the radiator core. This may damage the heat sink, resulting in reduced cooling efficiency.  
Radiator Water Tube-Removal

## COOLING SYSTEM BLEEDING PROCEDURE

**⚠ WARNING**

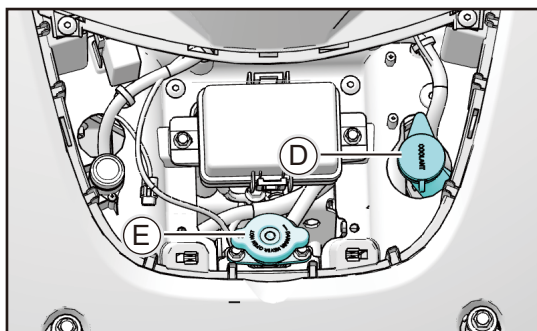
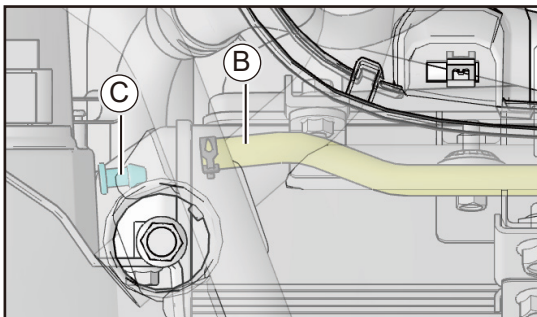
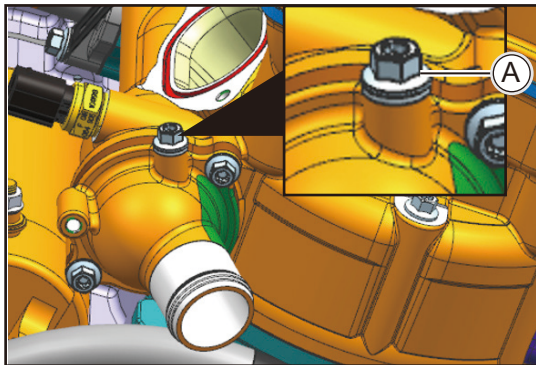
Always wear safety glasses and suitable work clothes when performing this procedure. Failure to do so may result in injury or death.

**TIPS**

If the coolant level in the radiator is low, or if there is a leak in the system, the coolant system will not draw coolant from the reservoir.

**⚠ CAUTION**

Spilled steam may cause a fire. Do not remove the pressure cover when the engine is warming up or warming up. Always let the engine cool down before removing the pressure cover



The exhaust steps are as follows:

The engine exhaust bolt is located above the engine thermostat cover under the seat.

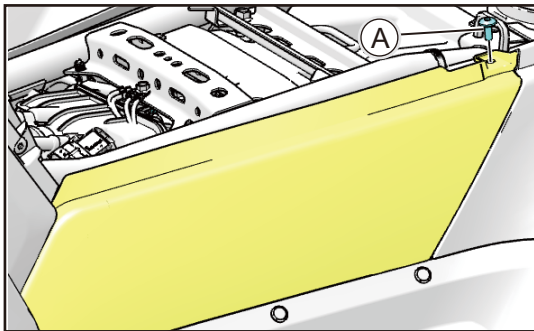
- ◆ Remove the seat (see Chapter 12 Seat Combination Removal for details).
- ◆ Remove the left guard plate (see thermostat replacement section for details)
- ◆ Remove the exhaust bolt **【A】** on the engine thermostat cover, and place an absorbent towel under the exhaust port to collect the overflow coolant.
- ◆ Pull out the engine radiator breather pipe **【B】** from the gap of the front panel, loosen the clamp at the tail of the breather pipe and take out the plug **【C】** at the tail. Place a suction towel under the exhaust pipe to collect the emerging coolant.
- ◆ Remove the front frame cargo assembly and the front access cover.
- ◆ Remove the auxiliary water tank cover **【D】** and add the coolant in the bottle to the maximum value.
- ◆ Remove the radiator pressure cap **【E】**, add an appropriate amount of coolant to let all the air remaining in the cooling system overflow, once the coolant starts to drain from the exhaust bolt and the vent pipe, re-tighten the exhaust bolt, Will allow the exhaust pipe plug to be reinstalled.

Exhaust bolt **【A】**

10 N·m

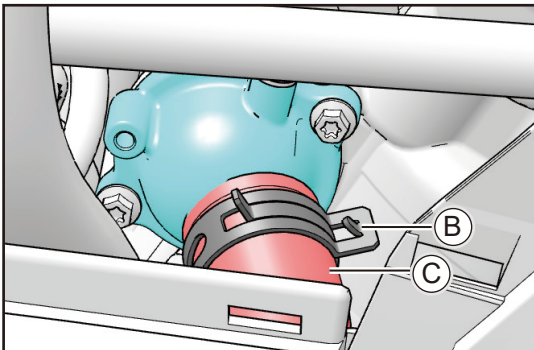
- ◆ Start the vehicle, stop the vehicle after idling for three minutes, remove the exhaust bolt at the engine, and tighten the bolt again when the coolant flows out from here.
- ◆ Reinstall all the removed parts.

### THERMOSTAT REPLACEMENT

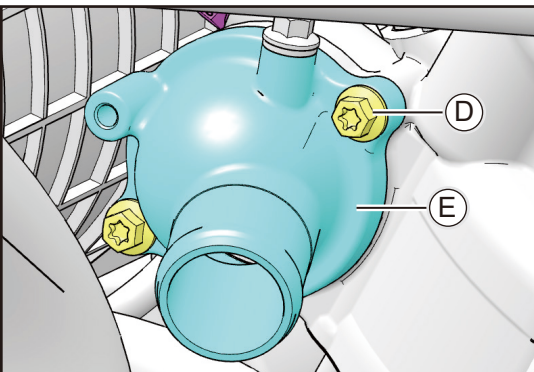


The thermostat is located on the left side of the engine.

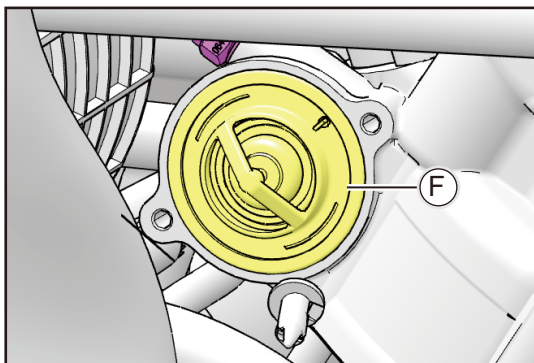
- ◆ Remove the front and rear seats (refer to Chapter 12 for details).
- ◆ Remove the one piece of hexagon socket button head bolt (M6×16 [A]) on the left guard plate, then take off the left guard plate.



- ◆ Remove the steel strap type elastic hose clamp [B] with a tool.
- ◆ Take the engine outlet rubber hose [C] off the thermostat cover.



- ◆ Remove the two bolts (M6×20 [D]) on the water pump, then take off the thermostat cover [E].



- ◆ Lift up and remove the thermostat [F] from the housing.

#### TIPS

The thermostat is a pop-up safety valve that allows the bypass system to operate until it opens.

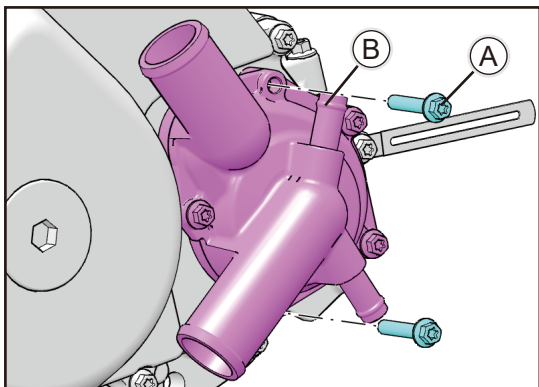
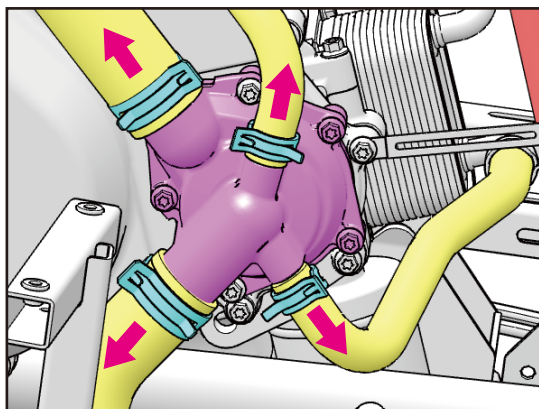
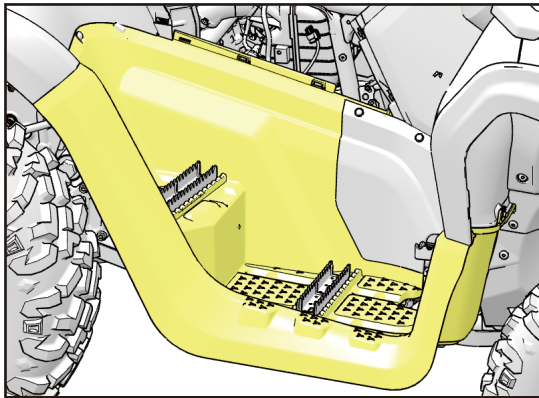
- ◆ Install a new thermostat in the reverse order of removal.

## WATER PUMP REMOVAL/INSTALLATION

The water pump is located on the rear left side of the vehicle.

**! WARNING**

Make sure the engine has cooled down before removal. High temperature coolant and steam can cause serious injury.



- ◆ Remove the front and rear seats. (See Chapter 12)
- ◆ Remove one large pan head hexagon socket bolt M6 × 16 **【A】** on the right guard plate, and remove the left guard plate. (Same as removing the left guard plate)
- ◆ Remove all the fastening bolts on the right foot pedal and lift up both sides of the right foot pedal. You need some patience here and don't use too much force.
- ◆ The water pump can be seen after removing the right foot pedal.

- ◆ Loosen the clamps of the 4 hoses connected to the pump cover with a tool.
- ◆ Remove the 4 hoses in the direction of the arrow.

- ◆ Remove 2 bolts M6 × 35 bolts **【A】** and then remove the water pump **【B】**.

M6 × 35 bolt **【A】**

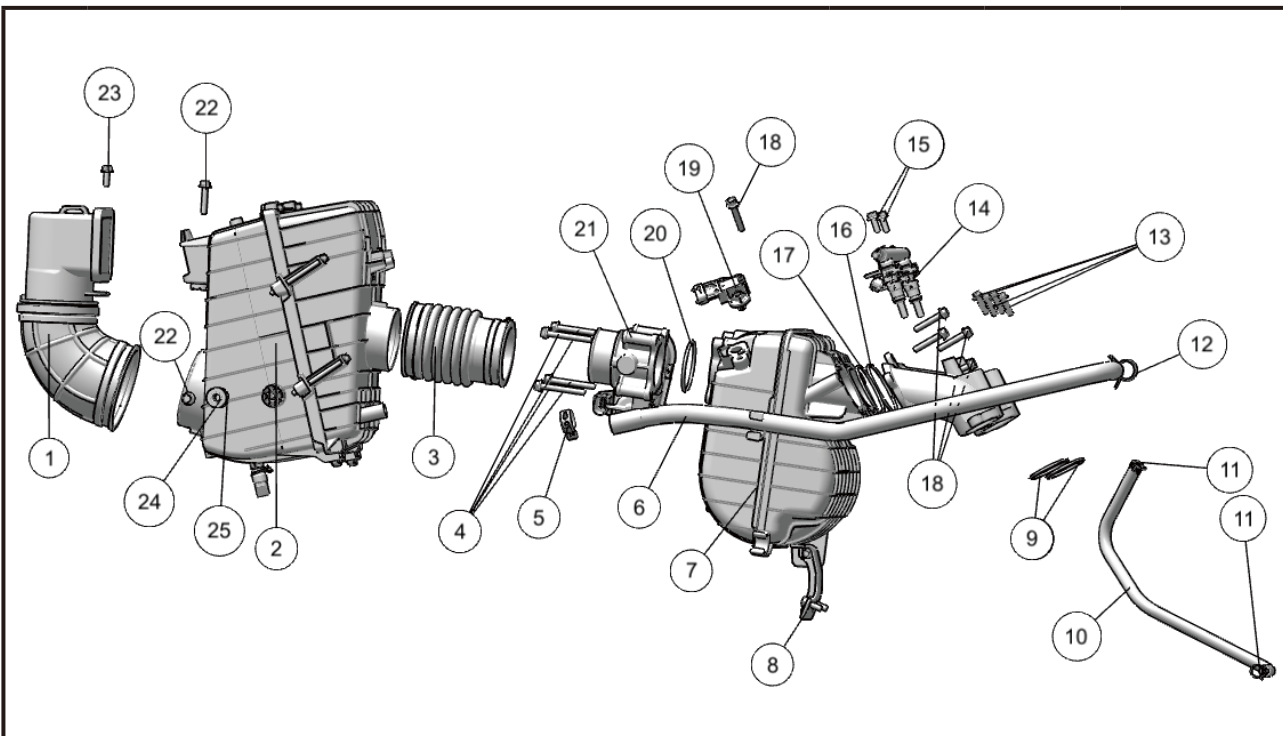
10 N·m

- ◆ Pump installation and removal in reverse order

# INTAKE / EXHAUST SYSTEM

<b>EXPLODED VIEW OF INTAKE SYSTEM .....</b>	<b>7-2</b>
<b>REPLACE THE AIR FILTER ELEMENT .....</b>	<b>7-4</b>
<b>AIR FILTER REMOVAL/INSTALLATION .....</b>	<b>7-5</b>
<b>DISASSEMBLY/INSTALLATION OF PRESSURE-MAINTAINING CHAMBER.....</b>	<b>7-6</b>
REMOVE THE SURGE CHAMBER.....	7-6
INSTALLATION OF PRESSURE STABILIZING CHAMBER.....	7-7
<b>EXPLODED VIEW OF EXHAUST SYSTEM.....</b>	<b>7-8</b>
<b>MUFFLERS AND EXHAUST PIPES .....</b>	<b>7-9</b>
MUFFLER-REMOVAL.....	7-9
G H EXHAUST PIPE REMOVAL .....	7-10
PROBE.....	7-12
MOUNTING.....	7-12
<b>EXPLODED VIEW OF CVT INLET AND OUTLET DUCT (STANDARD VERSION).....</b>	<b>7-13</b>
<b>EXPLODED VIEW OF CVT INLET AND OUTLET DUCT (MUD VERSION).....</b>	<b>7-14</b>
<b>CVT INLET DUCT AND OUTLET DUCT.....</b>	<b>7-15</b>
DISASSEMBLY OF CVT AIR INLET DUCT.....	7-15
DISASSEMBLY OF CVT INLET AND OUTLET AIR PIPES AND AIR FILTER INLET AIR PIPES (MUD VERSION).....	7-16

### EXPLODED VIEW OF INTAKE SYSTEM



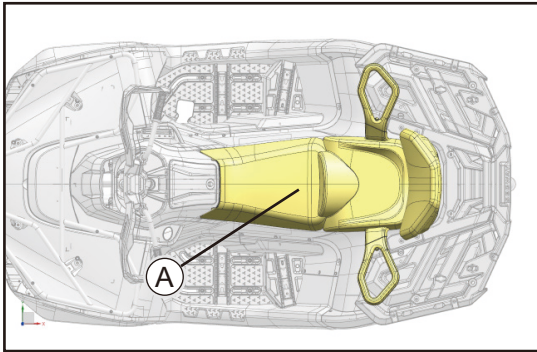
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Intake hood Assembly				
2	Air filter assembly				
3	Intake pipe of surge tank				
4	Hexagon flange bolt M6 × 45	8~12	0.8~1.2	6~9	
5	Steel Band Elastic Hose Clamp 22				
6	Engine exhaust pipe				
7	voltage stabilizing chamber				
8	Pressure stabilizing chamber mounting bracket				
9	Intake manifold seal O-ring				
10	Transmission exhaust pipe				
11	Steel Band Elastic Hose Clamp 13				
12	Steel Band Elastic Hose Clamp 20				
13	Bolt M6 × 20	8~12	0.8~1.2	6~9	
14	AT10 high pressure fuel rail				
15	Hexagon flange bolt M6 × 16	8~12	0.8~1.2	6~9	

# INTAKE / EXHAUST SYSTEM

## SEGWAY AT10

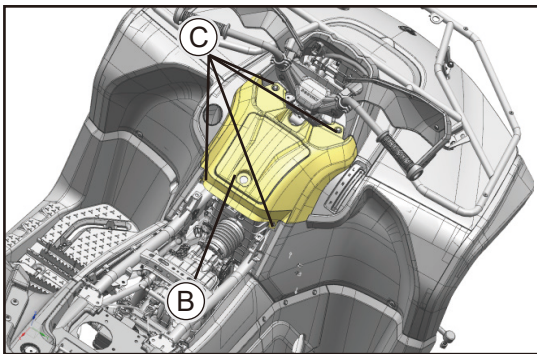
16	AT10 regulator chamber special-shaped O-ring				
17	O-ring of pressure stabilizing chamber				
18	Hexagon flange tapping screw ST6.3 * 20				
19	Intake air temperature and pressure sensor (0261230217)				
20	O-ring of valve body				
21	Electronic throttle body assembly (D44)				
22	Hexagon flange bolt M6 × 30	8~12	0.8~1.2	6~9	
24	turn-up bushing				
25	intake manifold				
25	I-shaped buffer rubber sleeve				

## REPLACE THE AIR FILTER ELEMENT

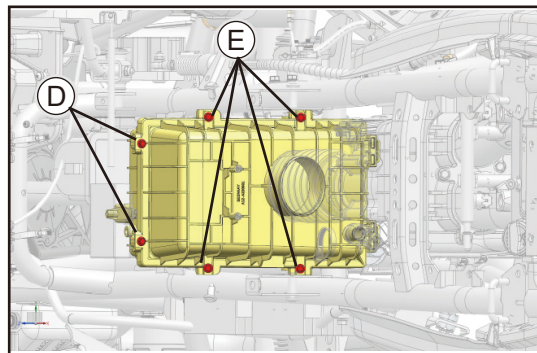


### Seat Removal

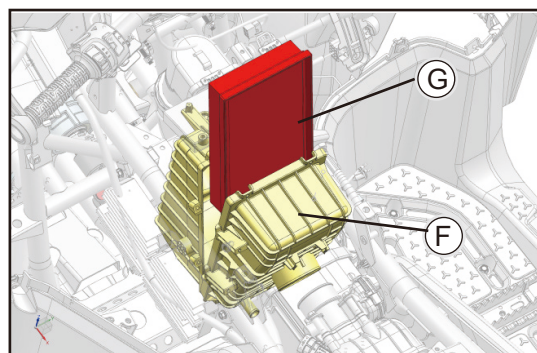
- ◆ Remove Seat 【A】



- ◆ Remove Expansion Clip 【B】
- ◆ Remove Front Storage Box 【C】

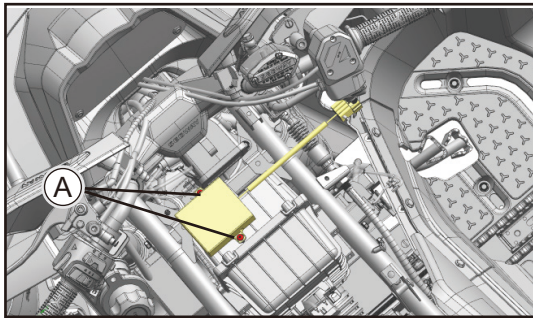


- ◆ Remove 2 M6 × 20 bolts 【D】 and 4 M6 × 70 bolts 【E】



- ◆ Move Back Air Filter Cover 【F】
- ◆ Remove Air Filter Element 【G】 , replace the air filter element and reinstall all parts in reverse order to reassemble.

## AIR FILTER REMOVAL/INSTALLATION

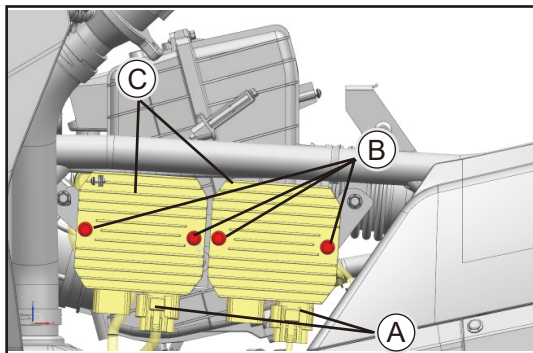


Disconnect the Battery

- ◆ Remove Front Fender
- ◆ Refer to Chapter 13 - Removal and Installation - Front Fender

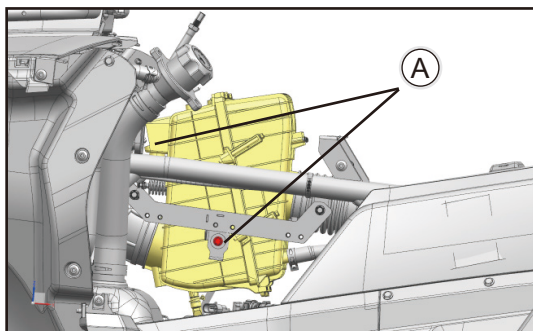
## REMOVE SOLENOID VALVE CONTROLLER

- ◆ Disconnect the connector of the solenoid valve controller, then remove the 2 Phillips self-tapping bolts **【A】** of the solenoid valve controller



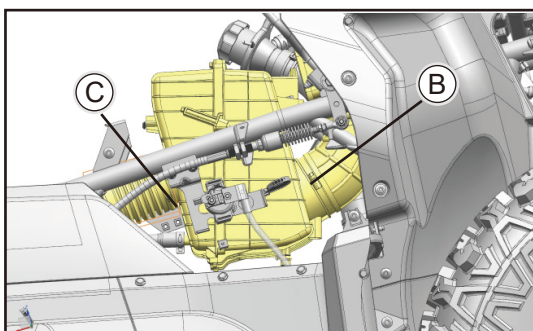
## REMOVAL OF VOLTAGE-REGULATING RECTIFIER CONTROLLER

- ◆ Disconnect the voltage regulating rectifier controller connector A
- ◆ Remove 4 M6 × 30 voltage regulating rectifier controller fixing bolts B,
- ◆ Remove voltage regulating rectifier controller C

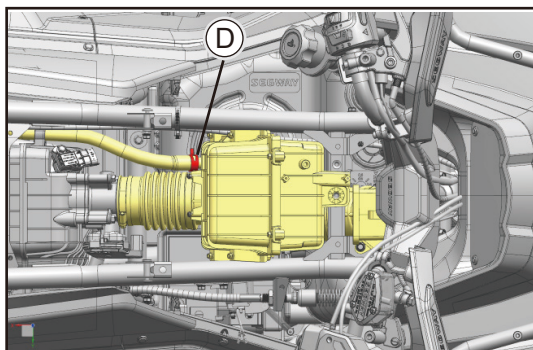


## REMOVE AIR FILTER

- ◆ Remove the M6×30 fixing bolts **【A】** on the left, right and top sides of the air filter



- ◆ Remove the Type A Worm Drive Hose Clamp **【B】** below the intake pipe that connects to the air filter air inlet, and separate the air filter from the intake pipe assembly.
- ◆ Remove the Type A Worm Drive Hose Clamp **【C】** on the surge tank intake pipe, and separate the air filter from the surge tank intake pipe.



- ◆ Remove the steel band elastic hose clip (22) **【D】** on the engine breather pipe, and separate the air filter from the engine breather pipe.

## AIR FILTER INSTALLATION

- ◆ Assemble in the reverse order of removal

Install and tighten the Type A worm drive hose clamps to a specified torque of 3–5 N·m

## DISASSEMBLY/INSTALLATION OF PRESSURE-MAINTAINING CHAMBER

### **! WARNING**

Whenever the components of the exhaust system are inspected or maintained, it is necessary to check whether the parts of the exhaust system are overheated to avoid being scalded by high temperature.

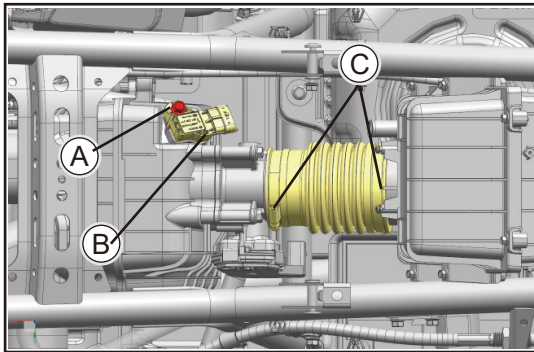
### REMOVE THE SURGE CHAMBER

- ◆ Remove the pedals on both sides

Refer to Chapter 13-Removal and Installation-Foot Pedals

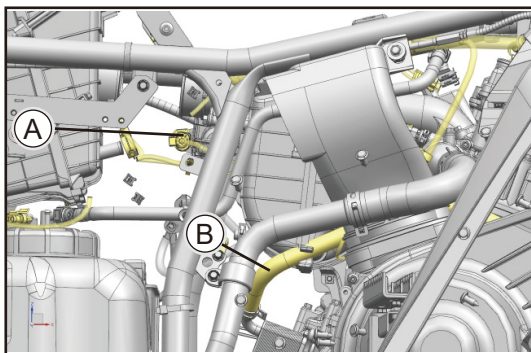
- ◆ Remove the wind deflector at the bottom of the cushion

Refer to Chapter 13-Refer to-Removal and Installation-Seat Bottom Windscreen

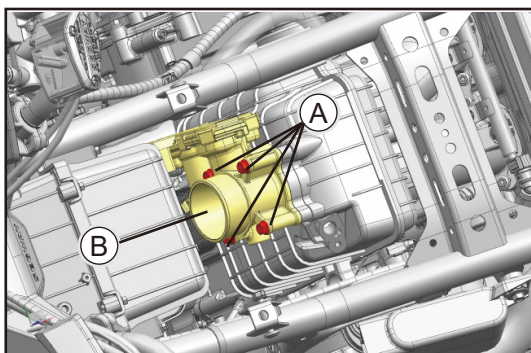


### C/REMOVE THE ACCESSORIES CONNECTED TO THE SURGE CHAMBER

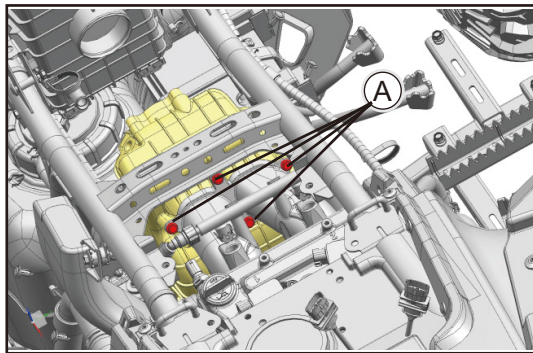
- ◆ Remove the M6 × 25 self-tapping screw of the fixing bolt of the intake air temperature and pressure sensor, remove intake air temperature pressure sensor B
- ◆ Loosen the two A- type worm drive hose hoops C that fix the intake pipe of the pressure stabilizing chamber



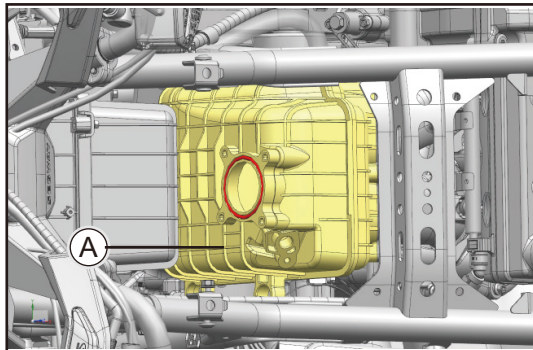
- ◆ Remove the engine oil cooler inlet rubber hose 【A】 mounted on the surge tank
- ◆ Remove the connector 【B】 connected to the throttle body



- ◆ Remove the four M6 × 55 fixing bolts A of the throttle valve
- ◆ Remove throttle valve B



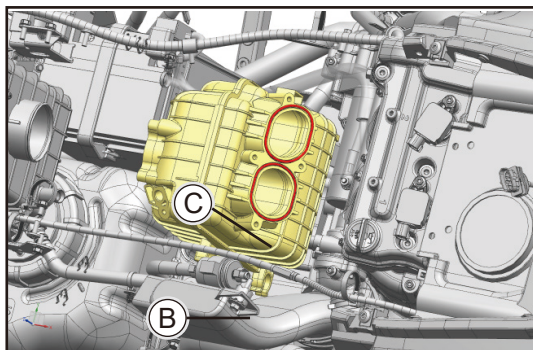
- ◆ Remove the 4 M6×25 self-tapping bolts 【A】 that secure the surge tank to the intake manifold.



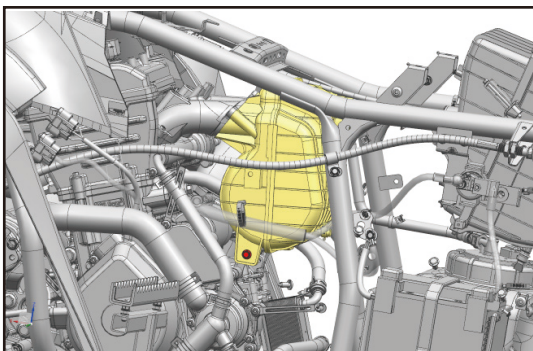
- ◆ Remove the surge tank valve body sealing ring 【A】 , and the surge tank O-rings 【B】 and 【C】

### TIPS

During reassembly, it is recommended to replace the aforementioned sealing rings 【A】 , 【B】 and 【C】 .



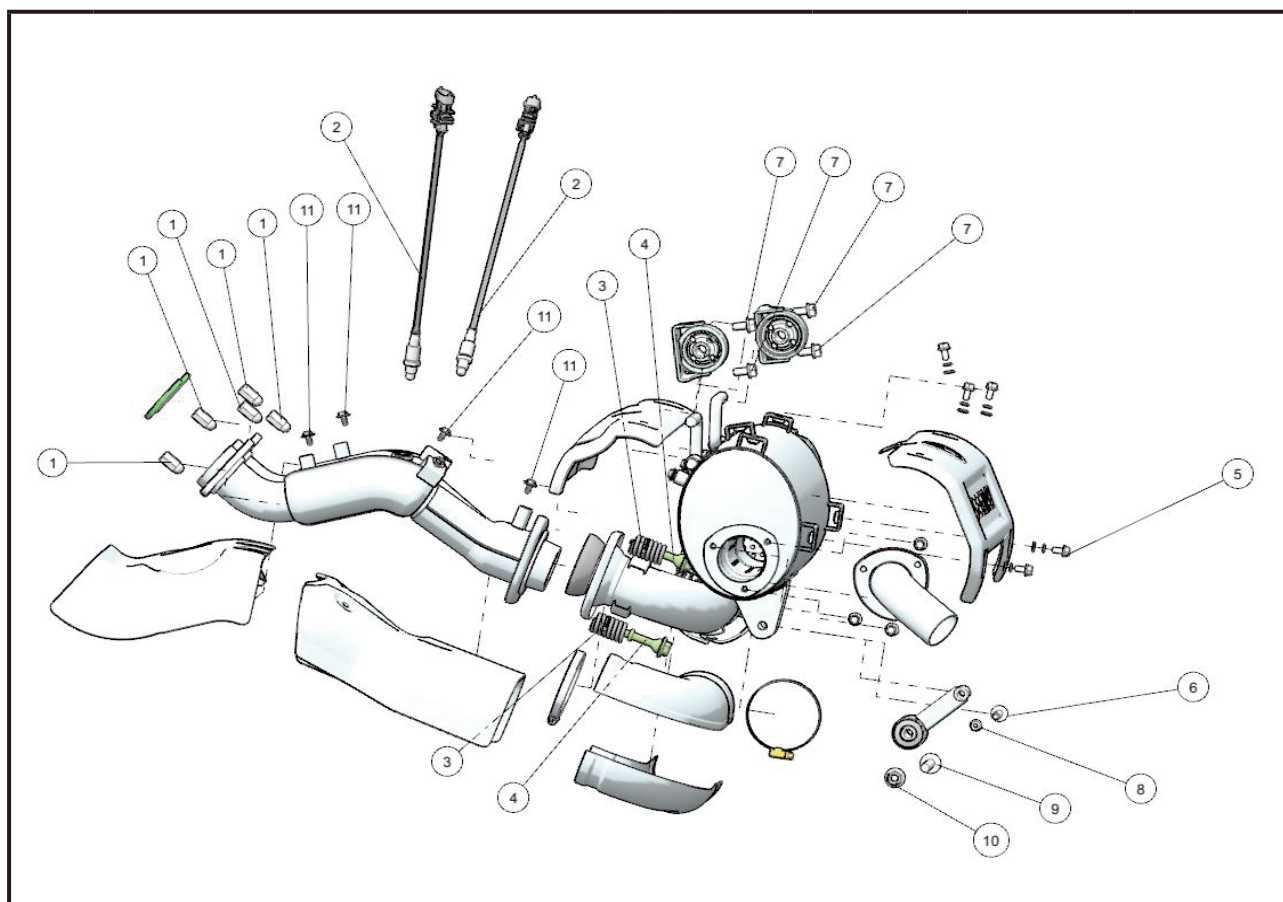
- ◆ Remove the M6 × 16 fixing bolt A below the pressure stabilizing chamber
- ◆ Take out the pressure stabilizing chamber from below



### INSTALLATION OF PRESSURE STABILIZING CHAMBER

- ◆ It can be installed in reverse order according to the disassembly steps

### EXPLODED VIEW OF EXHAUST SYSTEM

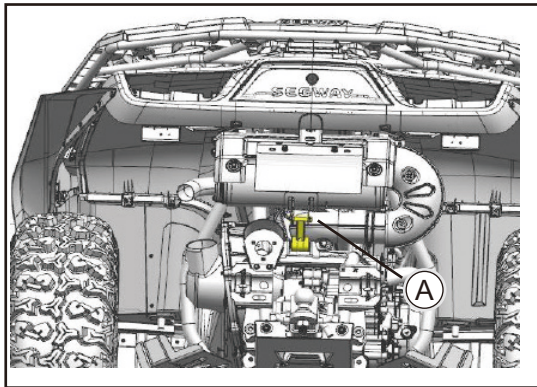


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	CAP NUT				
2	OXYGEN SENSORS				
3	EXHAUST PIPE INSTALLTION SPRING				
4	EXHAUST PIPE BOLT				
5	HEXAGON FLANGE BOLT M6×12	8 ~ 12	0.8~1.2	6~9	
6	BOLT M6×40×10				
7	HEXAGON FLANGE BOLT M8×16	20 ~ 25	2.0~2.5	14.7~18.4	
8	NUT M6	10	1	7.5	
9	BOLT M10×1.25×70	50	5.1	37	
10	HEXAGON FLANGE BOLT 8×25	20 ~ 25	2.0~2.5	14.7~18.4	
11	BOLT M6×12				

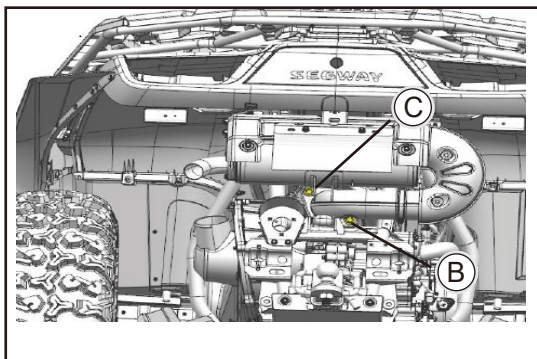
## MUFFLERS AND EXHAUST PIPES

**⚠ WARNING**

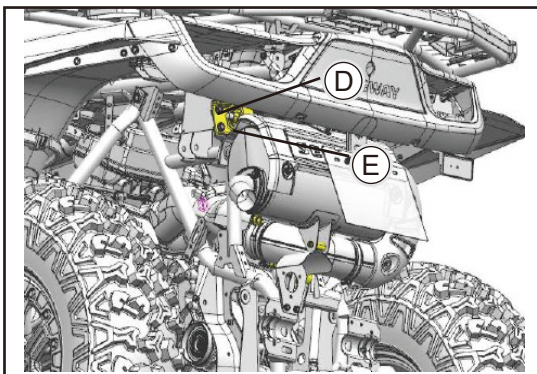
Whenever the components of the exhaust system are inspected or maintained, it is necessary to check whether the parts of the exhaust system are overheated to avoid being scalded by high temperature.

**MUFFLER-REMOVAL**

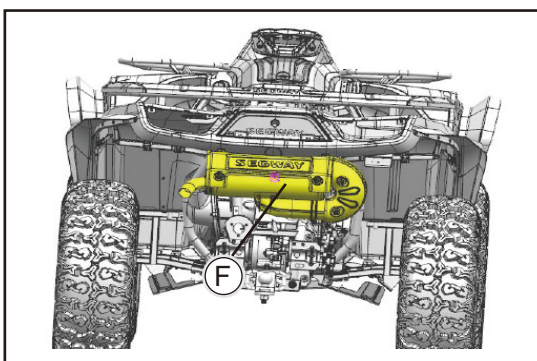
- ◆ Remove the hexagon flange step bolt 【A】



- ◆ Remove the exhaust pipe connecting bolts 【B】 2
- ◆ Take out the exhaust pipe installation spring 【C】 2

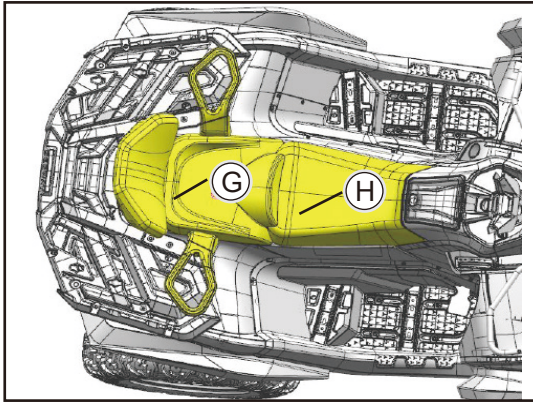


- ◆ Remove 4 hexagon flange bolts M8 × 16 【D】 on the left and right sides
- ◆ Take out 2 cylinder hanging bracket combinations 【E】

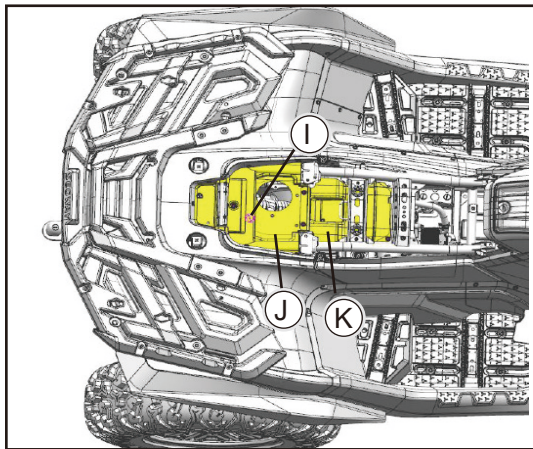


- ◆ Remove the muffler cylinder 【F】

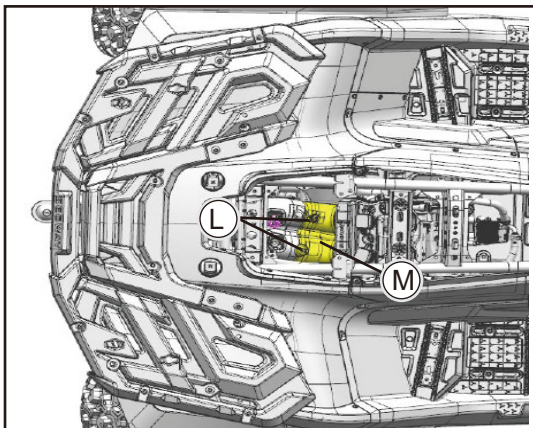
### G H EXHAUST PIPE REMOVAL



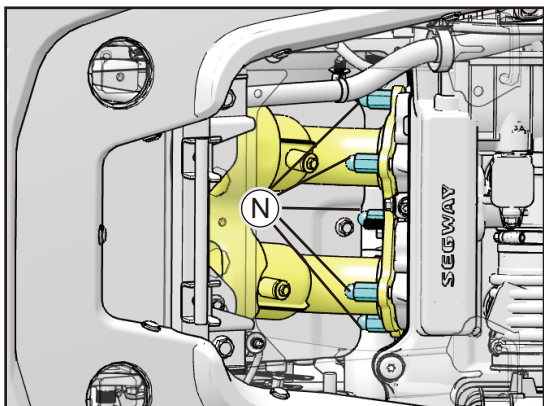
- ◆ Remove the cushion backrest 【G】
- ◆ Remove the cushion 【H】



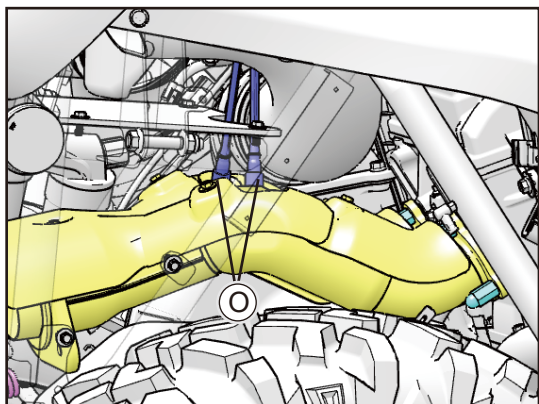
- ◆ Remove cover plate bolts 【I】 4
- ◆ Remove the cover plates 【J】 and 【K】
- ◆ Oxygen sensor cable plug 【H】
- ◆ Remove the exhaust pipe 【J】
- ◆ Remove the graphite sealing sleeve 【K】



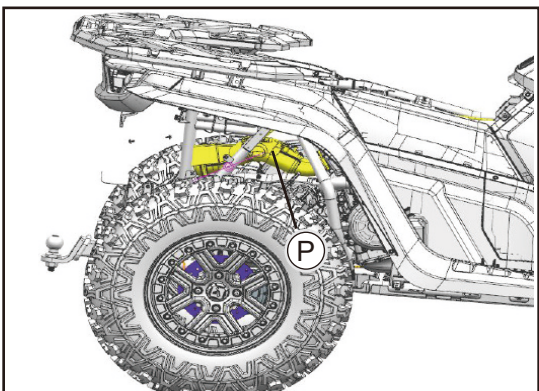
- ◆ Remove the cylinder head heat shield mounting bolts 【L】 2
- ◆ Take out the cylinder head heat shield 【M】



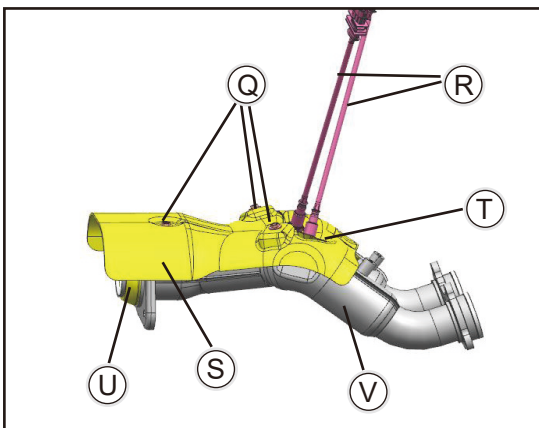
- ◆ Remove the 5 cap nuts 【N】 between the exhaust pipe and the cylinder head



- ◆ Unplug the wiring connector 【O】 of the oxygen sensor

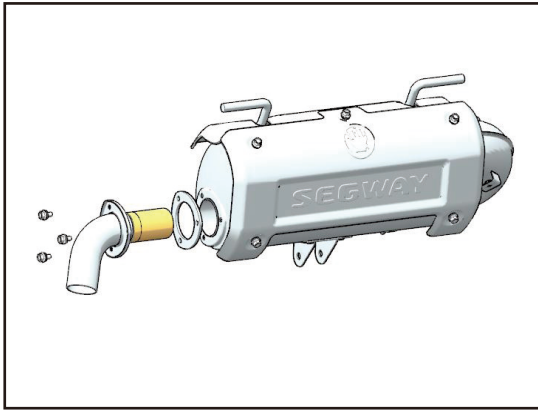


- ◆ Remove the exhaust pipe 【P】



- ◆ Remove the exhaust pipe elbow heat shield mounting bolts 【Q】 3
- ◆ Remove 2 oxygen sensors 【R】
- ◆ Remove the elbow heat shield 【S】
- ◆ Remove the heat shield cover 【T】
- ◆ Remove the graphite sealing sleeve 【U】
- ◆ Cancel the exhaust elbow 【V】

### PROBE

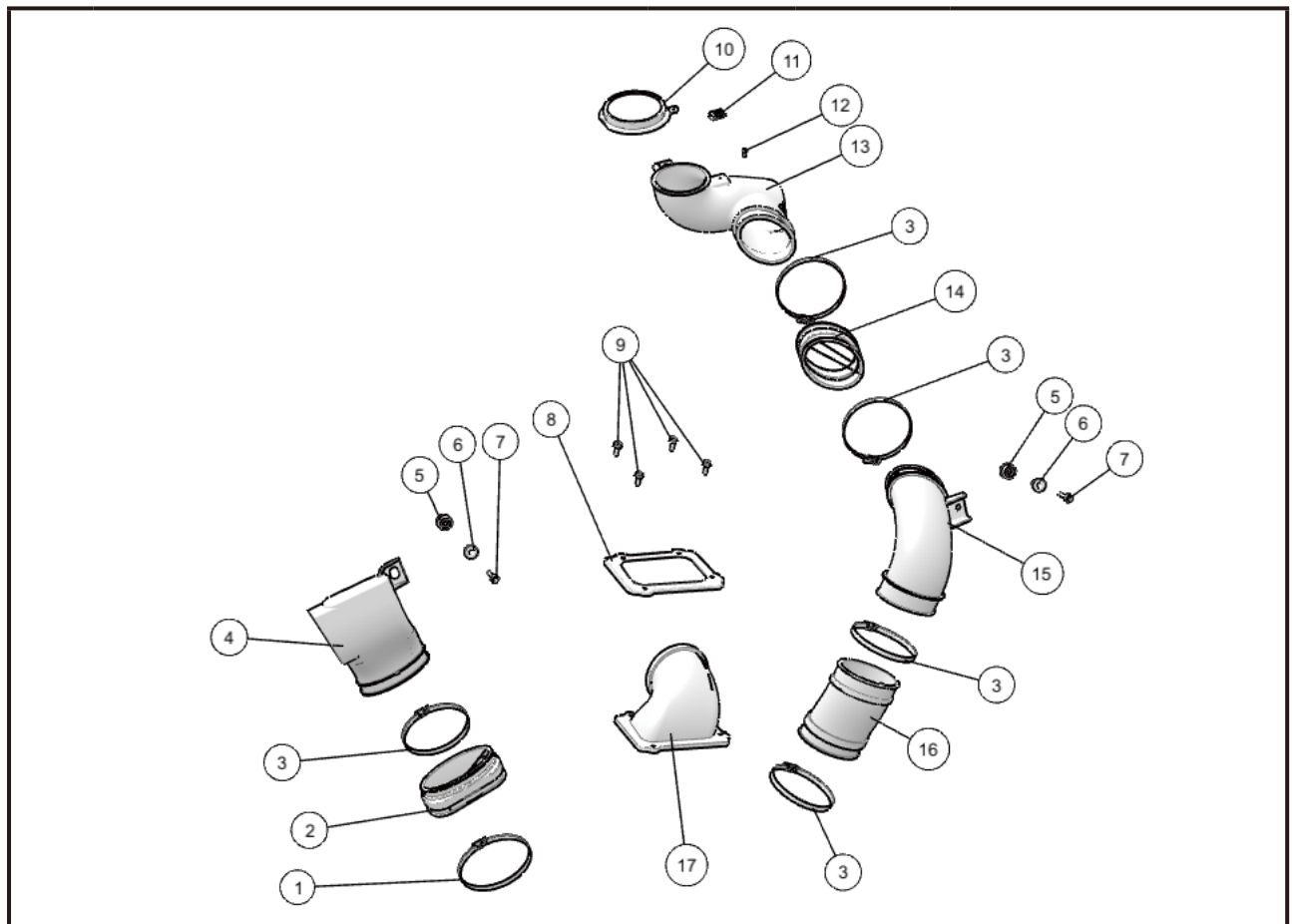


- ◆ Check externally for cracks, holes or ruptures in the muffler, as this can affect engine performance and emissions. Replace corresponding parts if necessary.
- ◆ Check for looseness, rattles, debris, etc. inside the muffler by rocking the muffler back and forth.
- ◆ Check for air leaks at the connection between the exhaust pipe and the engine cylinder head, if so tighten the nut or replace the gasket.
- ◆ Check for air leaks at the connection between the exhaust pipe and the muffler, if so, tighten the bolts or replace the muffler spring and sealing sleeve.
- ◆ Check if there is carbon buildup on the screen of the spark arrestor **【A】**, if so clean it with a suitable brush, if the screen or gasket is damaged, it must be replaced.

### MOUNTING

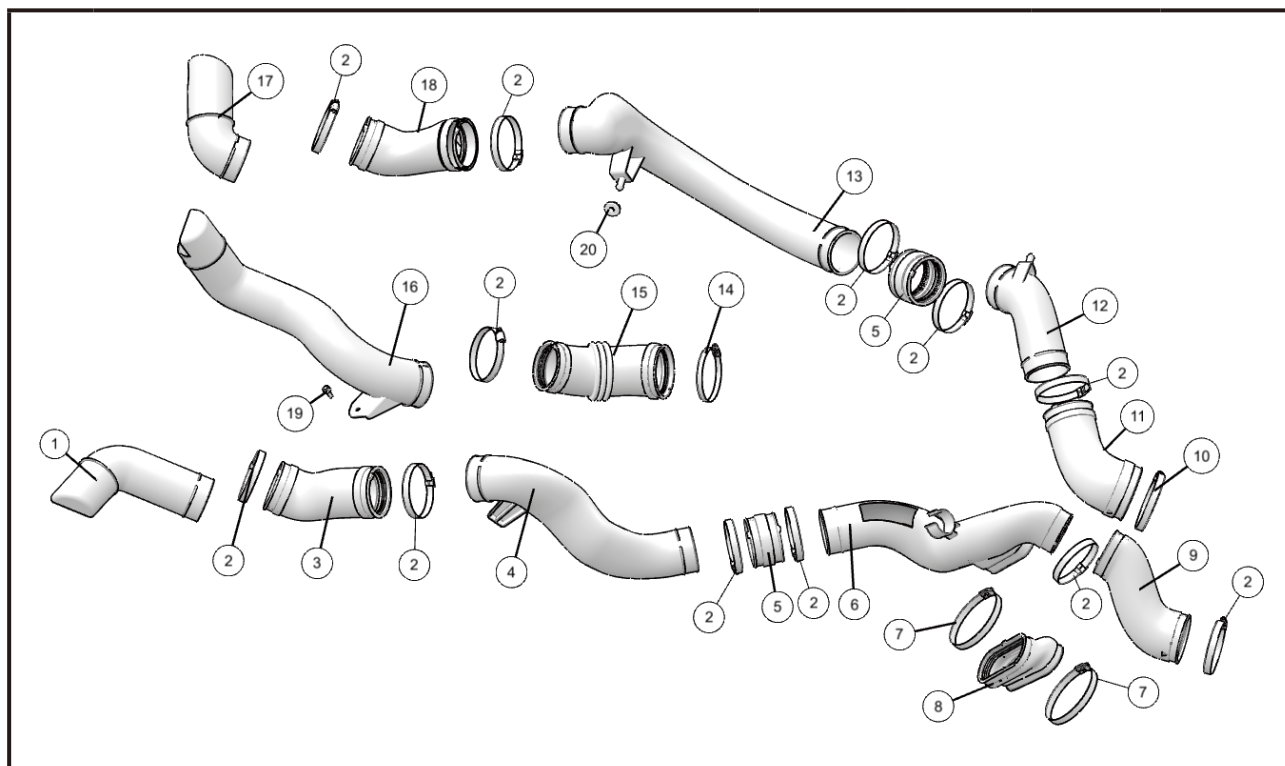
- ◆ Please assemble in reverse order of disassembly.

EXPLODED VIEW OF CVT INLET AND OUTLET DUCT (STANDARD VERSION)



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Type A worm drive type hose hoop 120				
2	CVT Intake Pipe Fitting 3				
3	Type A worm drive type hose hoop 110				
4	CVT intake manifold front				
5	Air filter installation buffer pad				
6	S01_flanging bushing_trivalent chrome				
7	Hexagon flange bolt M6 × 35	8~12	0.8~1.2	6~9	
8	CVT outlet pipe pressure plate				
9	Hexagon flange bolt M6 × 16	8~12	0.8~1.2	6~9	
10	CVT intake pipe net cover				
11	M6 nut clamp				
12	Black self-tapping nail ST4.2 × 13				
13	CVT intake pipe 3				
14	CVT Intake Pipe Fitting 2				
15	CVT intake manifold rear				
16	CVT intake pipe connector 1				
17	CVT outlet pipe				

### EXPLODED VIEW OF CVT INLET AND OUTLET DUCT (MUD VERSION)

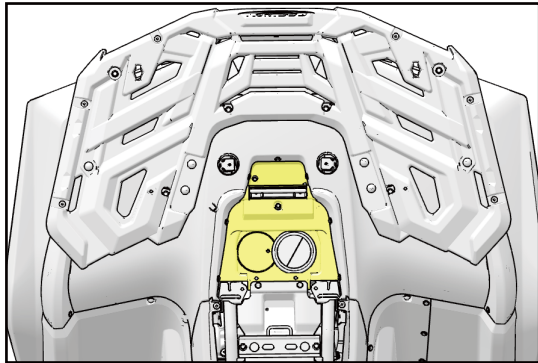


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	CVT inlet duct 1				
2	Type A worm drive hose hoop 90 width 12				
3	CVT Air Inlet Connector 1				
4	CVT inlet duct 2				
5	CVT air duct connector				
6	CVT inlet duct 3				
7	Type A worm drive type hose hoop 110 width 12				
8	CVT Air Inlet Fitting 3				
9	CVT Air Inlet Fitting 2				
10	Type A worm drive type hose hoop 100 width 12				
11	CVT outlet pipe connector 2				
12	CVT outlet duct 3				
13	CVT air duct 2				
14	Type A worm drive hose hoop 90				
15	Air filter inlet pipe joint				
16	Air filter inlet duct				
17	CVT air duct 1				
18	CVT outlet pipe connector 1				
19	Hexagon flange bolt M6 * 16				
20	Waist positioning rubber sleeve				

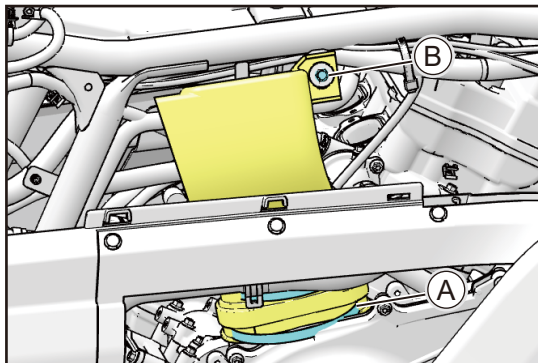
## CVT INLET DUCT AND OUTLET DUCT

**⚠ CAUTION**

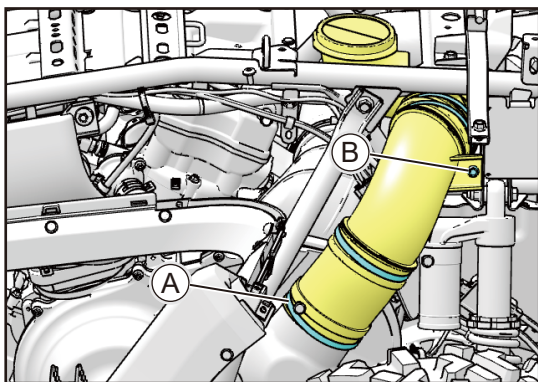
After removing the CVT air duct, please effectively protect the CVT air inlet and outlet to prevent debris from falling into the engine and damaging the engine.

**DISASSEMBLY OF CVT AIR INLET DUCT**

- ◆ Remove the seat. For this removal procedure, refer to Chapter 13-Seat Removal Procedure.
- ◆ Remove the middle storage box. Refer to Chapter 13-Removal Steps for the middle storage box.

**DISMANTLING OF CVT FRONT AIR DUCT ASSEMBLY**

- ◆ Loosen the hoop with tools 【A】
- ◆ Remove the bolt 【B】
- ◆ Remove the entire CVT forward air duct assembly.
- ◆ The installation steps are opposite to the removal steps.

**DISMANTLING OF REAR AIR INTAKE DUCT ASSEMBLY OF CVT**

- ◆ Loosen the hoop with tools 【A】
- ◆ Remove the bolt 【B】
- ◆ Remove the entire CVT rear air intake duct assembly.

**TIPS**

If a section of the inlet duct assembly needs to be removed separately, the corresponding hoop and bolt can also be loosened.

- ◆ The installation steps are opposite to the removal steps.

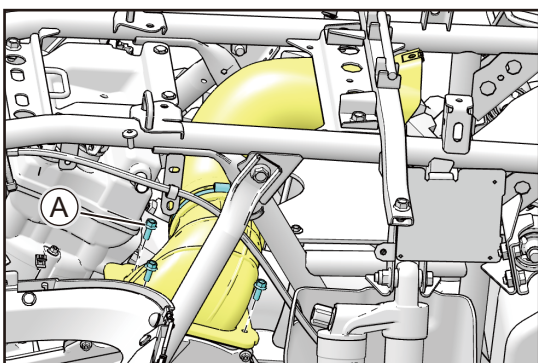
**REMOVAL OF CVT DUCT ASSEMBLY**

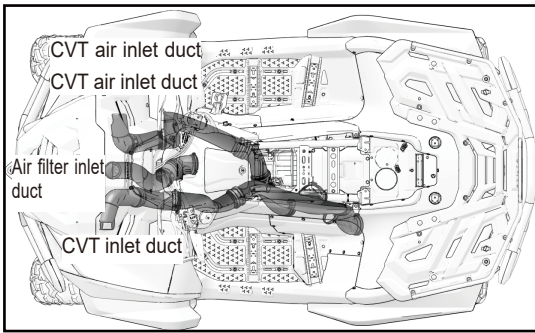
- ◆ Remove the bolt 【A】
- ◆ Remove the entire CVT air duct assembly.

**TIPS**

If it is necessary to remove a section of the duct assembly separately, loosen the corresponding hoop and bolt.

- ◆ The installation steps are opposite to the removal steps.



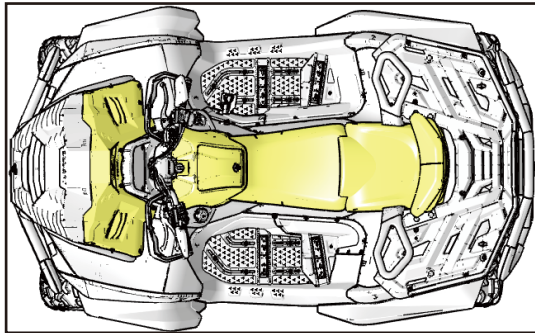


**⚠ CAUTION**

After removing the CVT air duct, please effectively protect the CVT air inlet and outlet to prevent debris from falling into the engine and damaging the engine.

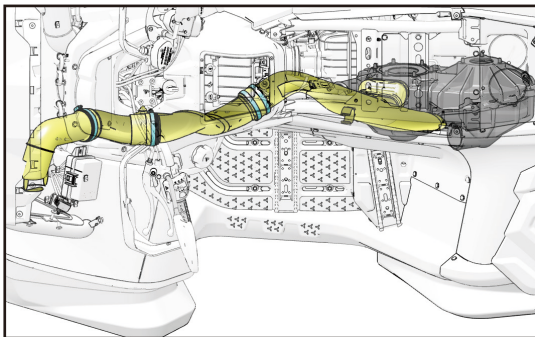
**DISASSEMBLY OF CVT INLET AND OUTLET AIR PIPES AND AIR FILTER INLET AIR PIPES (MUD VERSION)**

- ◆ Remove the seat. Refer to Chapter 13-Seat Removal for this removal procedure..
- ◆ Remove the front storage box assembly. Refer to Chapter 13-Removal of Front Storage Box Assembly for the removal steps..
- ◆ Remove the radiator rear cover. Refer to Chapter 13-Radiator Rear Cover Removal for the removal steps.



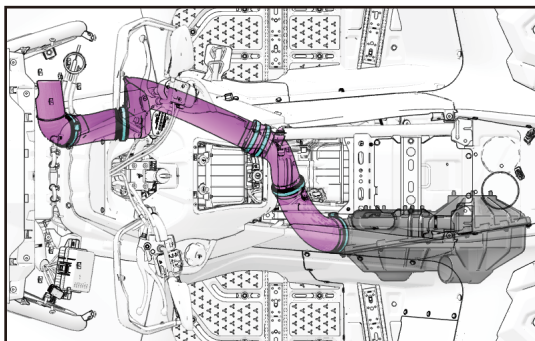
**CVT INLET DUCT ASSEMBLY REMOVAL**

- ◆ Loosen the hoop with a tool.
- ◆ Remove the bolts.
- ◆ Remove the air inlet pipe of the CVT to be removed.



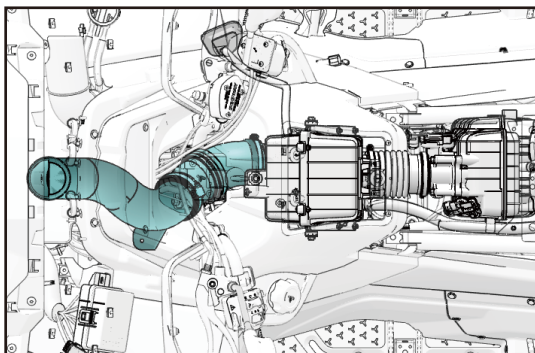
**REMOVAL OF CVT DUCT ASSEMBLY**

- ◆ Loosen the hoop with a tool.
- ◆ Remove the bolts.
- ◆ Remove the air duct of the CVT to be disassembled.



**AIR FILTER INLET DUCT ASSEMBLY-REMOVAL**

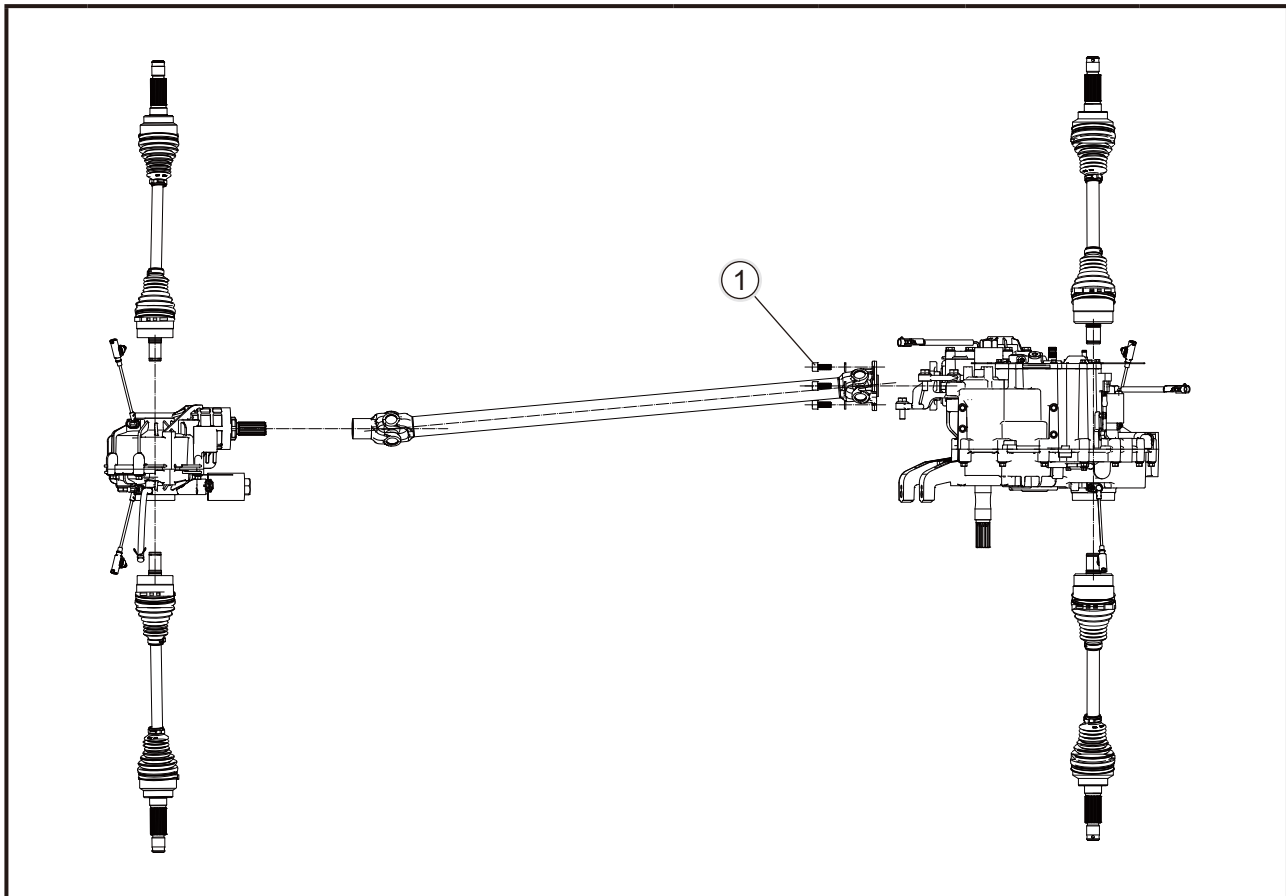
- ◆ Loosen the hoop with a tool.
- ◆ Remove the bolts.
- ◆ Take down the air inlet pipe of the air filter to be removed.



# DRIVE SYSTEM

**EXPLODED VIEW OF DRIVESHAFT ..... 8-2**  
**DRIVE SHAFT REMOVAL..... 8-3**  
    FRONT DRIVE SHAFT ASSEMBLY REMOVAL ..... 8-3  
    REAR DRIVE SHAFT ASSEMBLY REMOVAL..... 8-5  
    FRONT DRIVE SHAFT ASSEMBLY DISASSEMBLY ..... 8-6  
    INSTALLATION OF THE DRIVE SHAFT AND FRONT/REAR DRIVE AXLE ASSEMBLIES ..... 8-7  
**EXPLODED VIEW OF FRONT AND REAR LEFT/RIGHT CONSTANT VELOCITY DRIVE SHAFTS..... 8-8**  
**DOJ DRIVE SHAFT REPAIR..... 8-9**

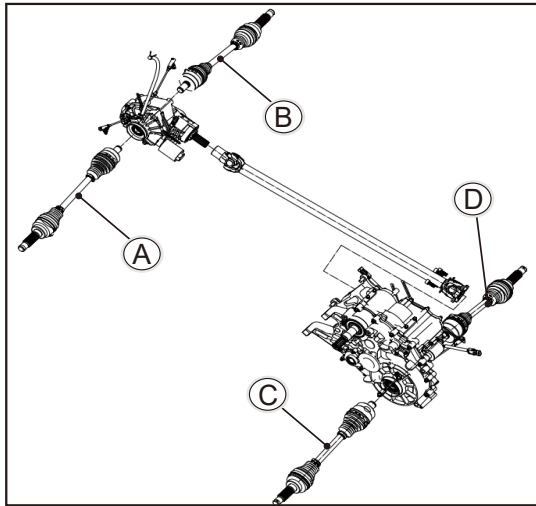
## EXPLODED VIEW OF DRIVESHAFT



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	HEXAGON SOCKET HEAD CAP BOLT M10×1.25×25	45	4.5	33	

A: Apply a non-permanent locking agent.

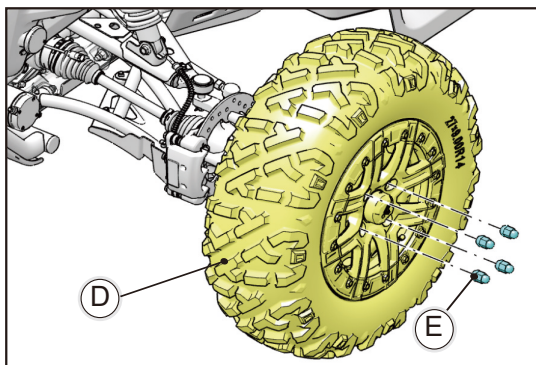
DRIVE SHAFT REMOVAL



**⚠ WARNING**

Do not remove the dust boot when removing the drive shaft, it is filled with grease.

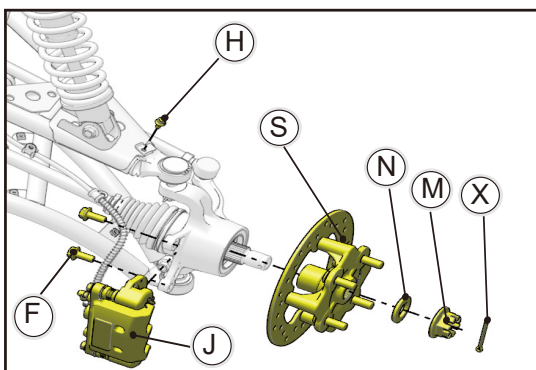
- 【A】 Front left constant velocity drive shaft assembly
- 【B】 Front right constant velocity drive shaft assembly
- 【C】 Rear left constant velocity drive shaft assembly
- 【D】 Rear right constant velocity drive shaft assembly



FRONT DRIVE SHAFT ASSEMBLY REMOVAL

- ◆ Remove (4 pieces) 【E】 rim mounting nuts
- ◆ Remove 【D】 Front wheel assembly.

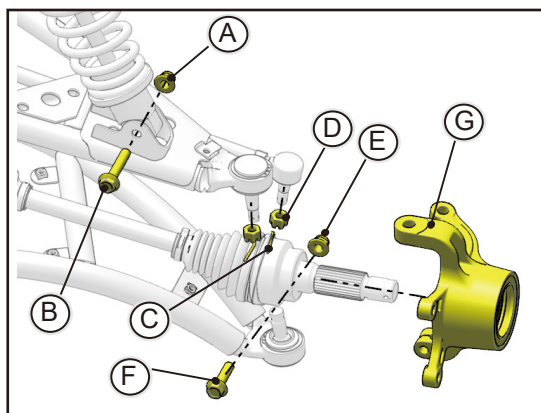
rim mounting nut torque
110~120 N·m



- ◆ Remove 【H】 M6 bolts
- ◆ Remove (2) 【F】 M10 × 1.25 × 25 bolts
- ◆ Remove 【J】 brake caliper assembly
- ◆ Remove 【X】 bolt
- ◆ Remove 【M】 M24 slotted nut
- ◆ Remove 【N】 gasket
- ◆ Remove 【S】 rim mounting seat assembly

Bolt M10×1.25×25 【F】
45 N.m

M24 slotted nut 【M】 torque
250 N.m



- ◆ Remove the M10 nut 【A】
- ◆ Remove the M10 bolt 【B】 of the shock absorber
- ◆ Remove the 2 cotter pins 【C】
- ◆ Remove the 2 M10 slotted nuts 【D】
- ◆ Remove the M10 bolt 【F】 of the lower ball joint
- ◆ Remove the M10 nut 【E】
- ◆ Remove the steering knuckle assembly 【G】

### Slotted nuts 【D】 torque

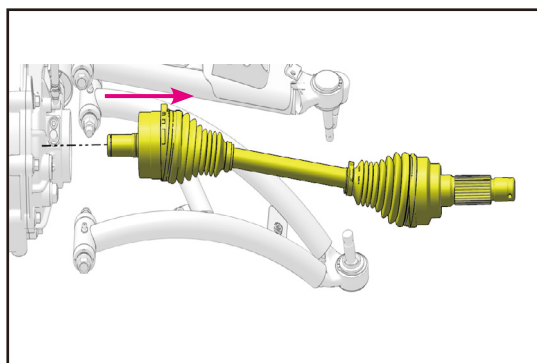
45 N. m

### Shock absorber M10 bolt 【B】 torque

45 N. m

### Lower ball pin M10 bolt 【F】 torque

60 N. m

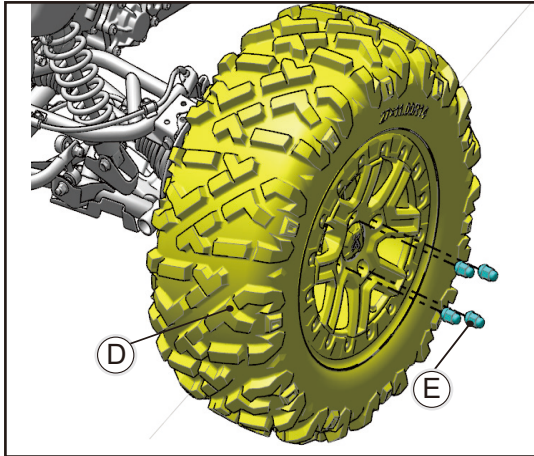


- ◆ Pull out the front drive shaft assembly from the inside of the axle in the direction shown by the arrow on the left until the drive shaft assembly is loose and can be pulled out.

### TIPS

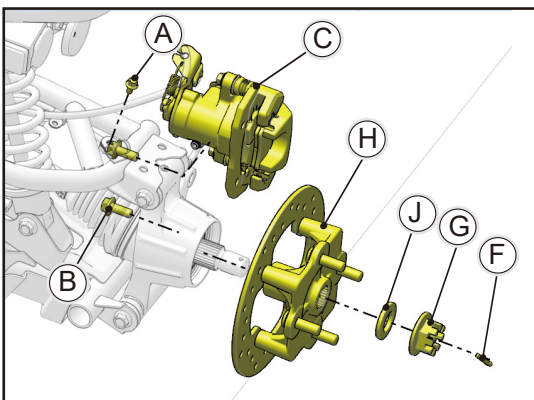
The removal steps of the front left and right drive shaft assemblies are the same.

REAR DRIVE SHAFT ASSEMBLY REMOVAL



- ◆ Remove (4 pieces) 【E】 rim mounting nuts
- ◆ Remove 【D】 rear wheel assembly.

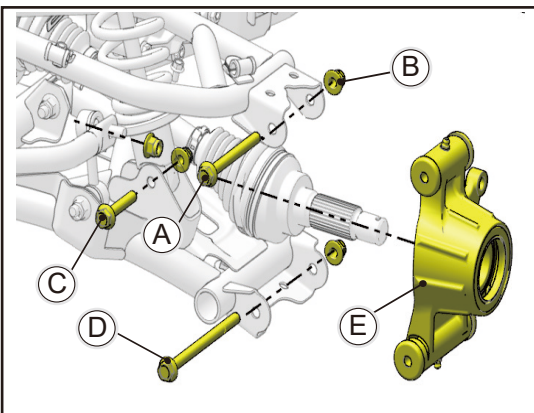
Rim mounting nut torque
110~120 N·m



- ◆ remove 【A】 M6 bolt
- ◆ remove (2 pieces) 【B】 M10 bolt
- ◆ remove 【C】 brake caliper assembly
- ◆ remove 【F】 bolt
- ◆ remove 【G】 M24 slotted nut
- ◆ remove 【J】 gasket
- ◆ remove 【H】 rim mounting seat assembly

M24 slotted nut 【g】 torque
250 N.m

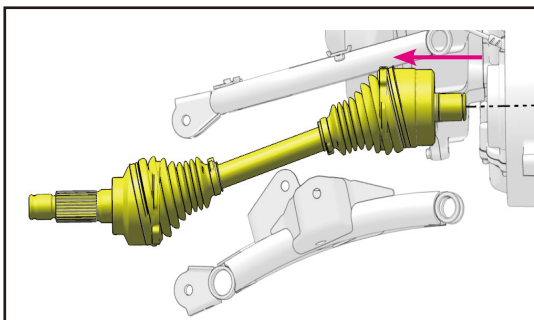
Bolt M10×1.25×25 【B】 torque
45 N.m



- ◆ Remove the M10 bolt of the upper rocker arm on 【A】
- ◆ Remove the four (4) M10 nuts of 【B】
- ◆ Remove the M10 bolt of the shock absorber on 【C】
- ◆ Remove the M10 bolt of the lower rocker arm on 【D】
- ◆ Remove the wheel carrier assembly of 【E】

Bolt M10 【C】 torque
45 N.m

Upper and lower rocker arm M10 bolt 【A】 【D】 torque
60 N.m

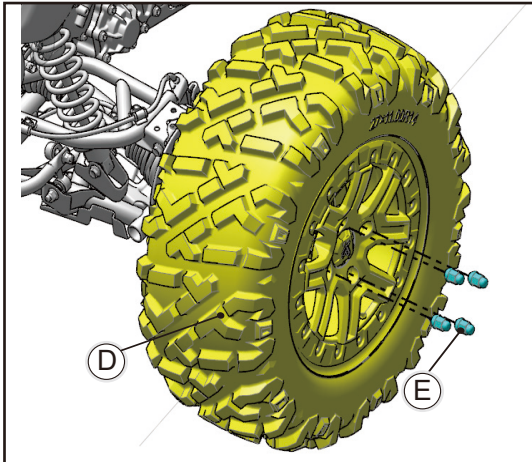


- ◆ Pull out the rear drive shaft assembly from the inside of the gearbox in the direction shown by the arrow on the left until the drive shaft assembly is loose and can be pulled out.

**TIPS**

The removal steps of the rear left and right drive shaft assembly are the same.

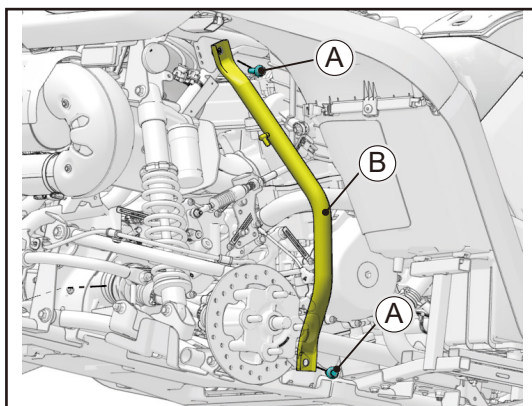
### FRONT DRIVE SHAFT ASSEMBLY DISASSEMBLY



- ◆ Remove (4 pieces) **【E】** rim mounting nuts
- ◆ Remove **【D】** rear right wheel assembly.

#### Rim mounting nut torque

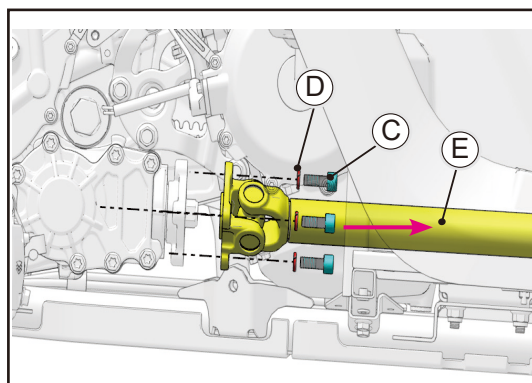
110~120 N·m



- ◆ Remove (2 pieces) **【A】** Hexagon flange bolt M10 × 1.25 × 25
- ◆ Remove **【B】** right side pipe assembly.

#### (2) M10 × 1.25 × 25 bolts **【A】** Torque

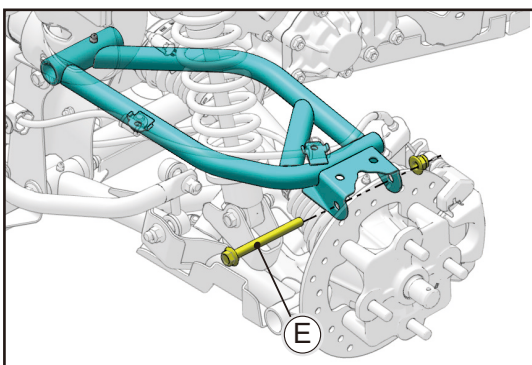
50 N.m



- ◆ Remove (4) **【C】** Hexagon socket head cap screws M10 × 1.25 × 25
- ◆ Remove (4) **【D】** Spring washers.
- ◆ Slide the **【E】** drive shaft assembly in the direction of arrow until it disengages from the transmission flange.

#### (4) M10 × 1.25 × 25 screws **【C】** Torque

45 N.m

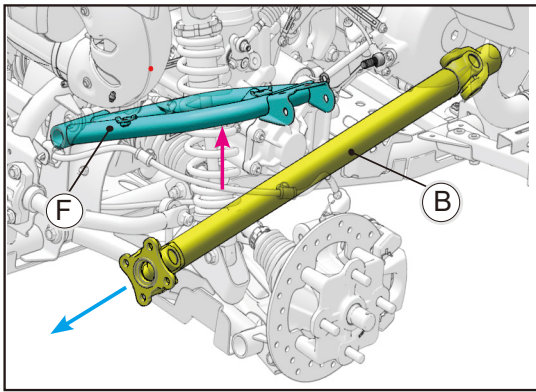


- ◆ Remove **【E】** Hexagon flange bolt M10 × 1.25 × 100

#### Upper rocker arm M10 bolt **【E】** Torque

60 N.m

## SEGWAY AT10

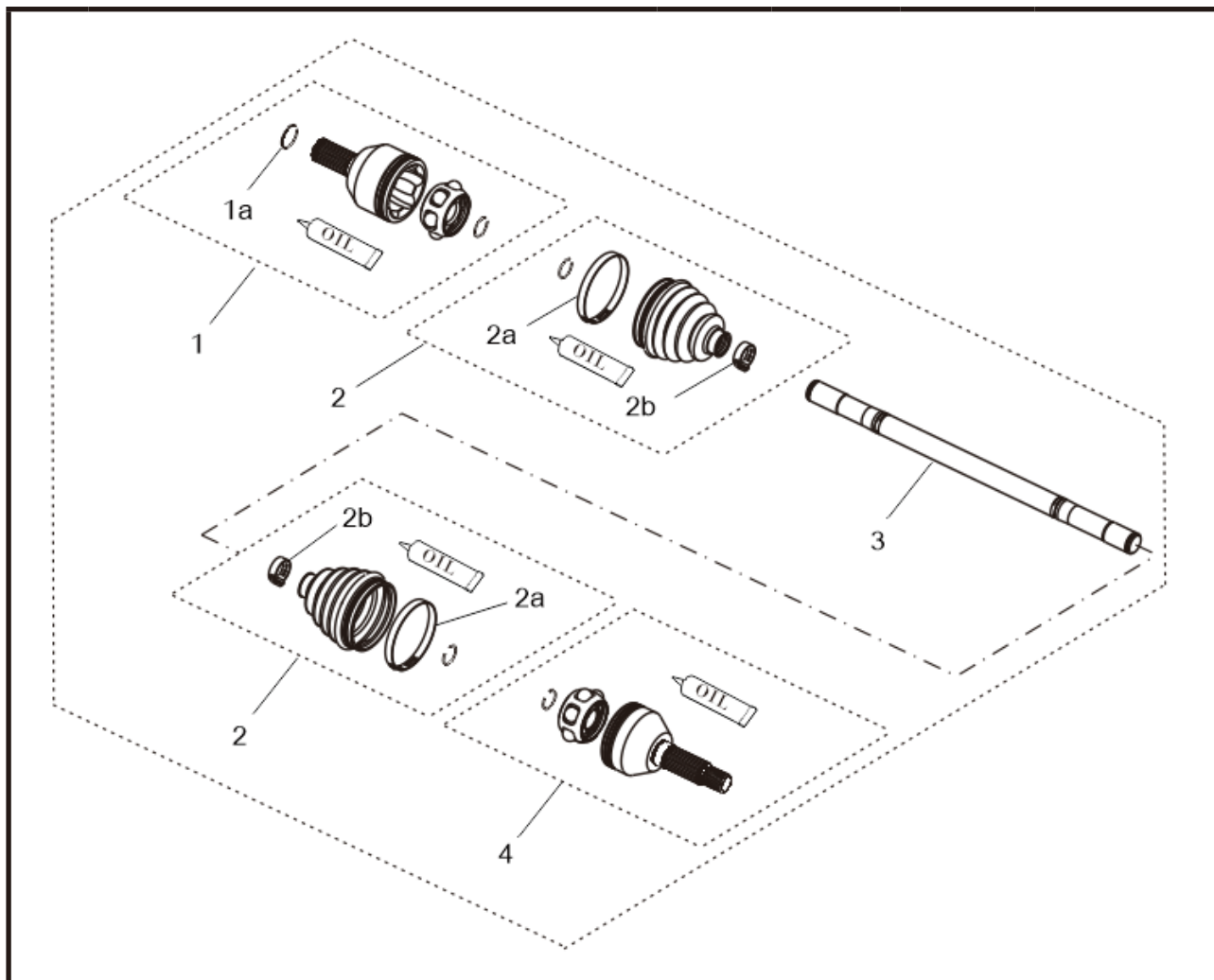


- ◆ Rotate the rear upper right welded assembly of **【F】** in the direction of the arrow.
- ◆ Withdraw the front propeller shaft assembly of **【B】** in the direction of the arrow until complete removal.

### INSTALLATION OF THE DRIVE SHAFT AND FRONT/REAR DRIVE AXLE ASSEMBLIES

- ◆ Install in the reverse order of removal.

### EXPLODED VIEW OF FRONT AND REAR LEFT/RIGHT CONSTANT VELOCITY DRIVE SHAFTS



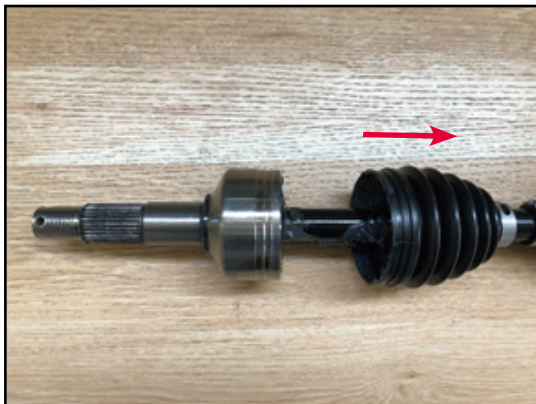
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front and rear left/right inner ball cage assemblies				
1a	Retaining ring				
2	Front and rear axle left/right corrugated sleeve repair kit				
2a	large clamp				
2b	Small clamp				
3	Intermediate shaft				
4	Front and rear left/right outer cage assemblies				

## DOJ DRIVE SHAFT REPAIR

**⚠ CAUTION**

The drive shaft is a precision part. Cleanliness must be ensured when replacing and installing, and the operation must be strictly followed the instructions. Do not use a hammer or sharp objects for disassembly and installation, which will affect the performance and service life of the half shaft.

- ◆ Use clamp pliers to clamp the clamp, then place a small screwdriver on the end of the clamp, lift the clamp up and release the clamp clamp at the same time, and remove the clamp.



- ◆ Remove the clamps at both ends of the dust cover, and pull the dust cover out for a certain distance along the direction of the middle axis.



- ◆ Use a sharper tool to take out the retaining ring in the universal joint.



- ◆ After taking out the retaining ring, you can directly pull out the intermediate shaft, pay attention not to drop the steel balls on the cage and the star sleeve, and clean the grease in the universal joint and the dust cover.

### ⚠ CAUTION

If only the lubricating grease is replaced, the remaining lubricating grease inside the universal joint needs to be cleaned up, and it is forbidden to mix different lubricating greases or use other lubricating greases instead.

---



- ◆ Use retaining ring pliers to remove the retaining ring of the star sleeve, after replacing the universal joint or dust cover, install the star sleeve in situ, and finally install the retaining ring.

### ⚠ CAUTION

The interior of the star sleeve is a precision component, and it is not recommended to disassemble and repair it separately. If it is damaged or the internal grease is polluted or liquefied, the universal joint needs to be replaced as a whole.

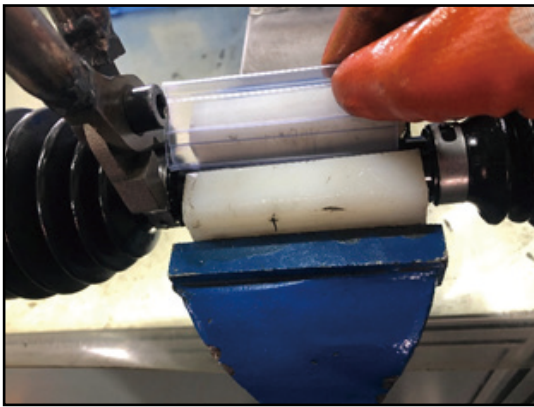
---

- ◆ Inject lubricating grease into the universal joint and dust cover, and then install the star-shaped sleeve assembly into the universal joint. Pay attention to the number of steel balls in the star-shaped sleeve. If the number is wrong, it is not allowed to install.

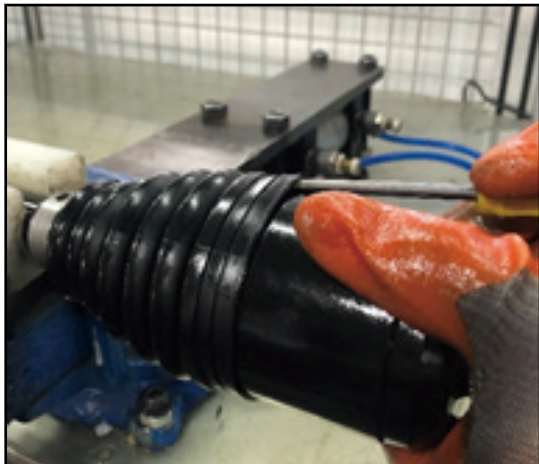
### ⚠ CAUTION

If only the lubricating grease is replaced, the remaining lubricating grease inside the universal joint needs to be cleaned up, and it is forbidden to mix different lubricating greases or use other lubricating greases instead.

---



- ◆ First install the small clamp, adjust the position of the dust cover to ensure that the dust cover is stuck in the groove of the intermediate shaft, and then use the clamp pliers to clamp the small clamp.

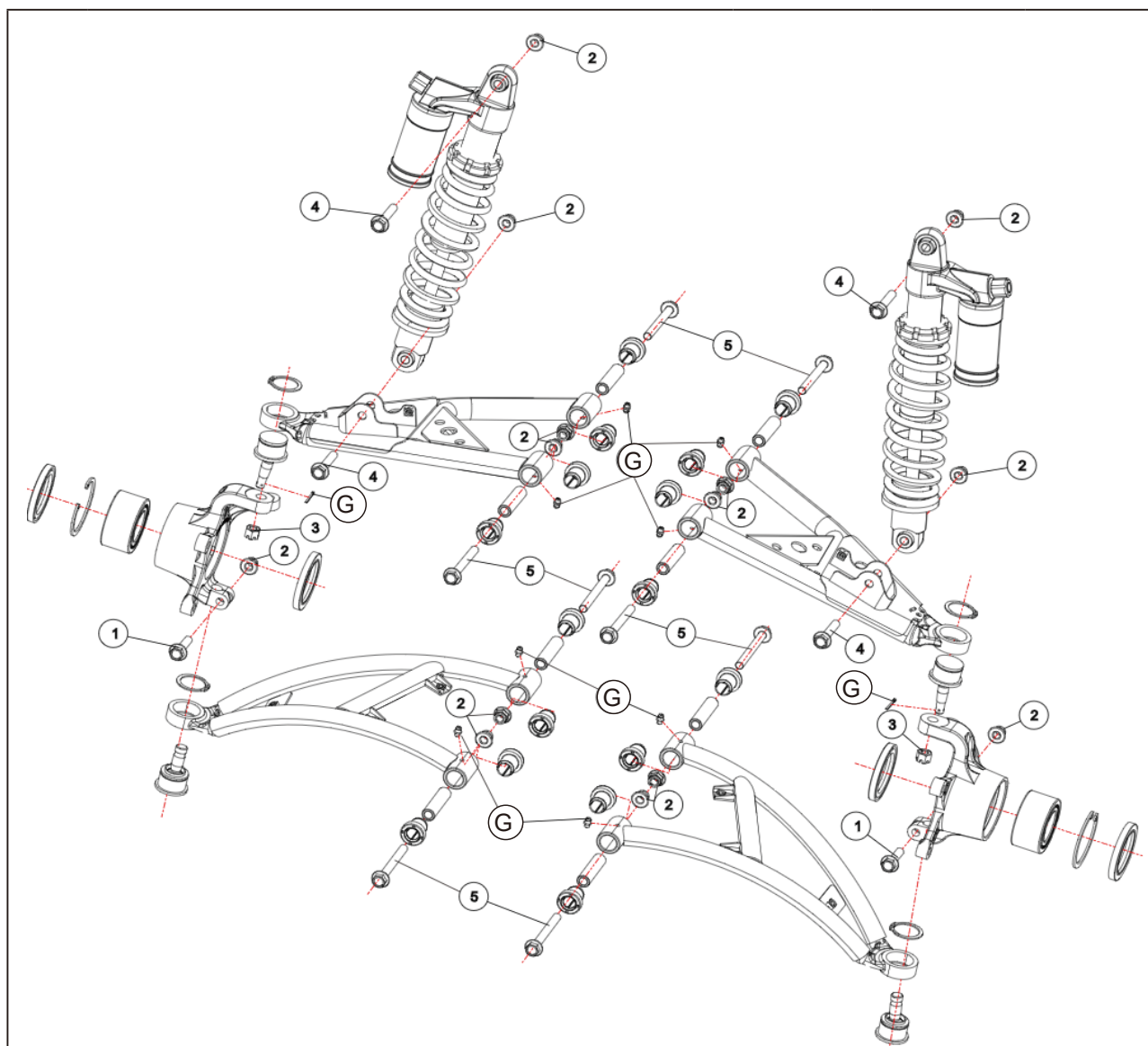


- ◆ When installing the large clamp, first clamp the dust cover in the groove of the universal joint, then discharge the gas in the dust cover, use a screwdriver to lift a corner of the dust cover, be careful not to puncture the dust cover, and then back and forth Push and pull the universal joint, you can hear the sound of gas flow, stop the universal joint in the middle position, take out the screwdriver and clamp the big clamp.
- ◆ Wipe the grease on the universal joint and the intermediate shaft before use.
- ◆ The above maintenance procedures are applicable to the inner and outer ball cages of the front and rear left/right equal drive shafts.

## INTAKE / EXHAUST SYSTEM

<b>EXPLODED DIAGRAM OF FRONT SUSPENSION.....</b>	<b>9-2</b>
<b>REAR SUSPENSION EXPLOSION DIAGRAM.....</b>	<b>9-3</b>
<b>TECHNICAL PARAMETER .....</b>	<b>9-4</b>
<b>DEDICATED TOOLS .....</b>	<b>9-5</b>
<b>SHOCK ABSORBER .....</b>	<b>9-6</b>
SHOCK ABSORBER INSPECTION .....	9-6
ORDINARY HYDRAULIC DAMPING AND SHOCK ABSORPTION PRELOAD ADJUSTMENT .....	9-6
AIR DAMPING SHOCK PRELOAD ADJUSTMENT.....	9-6
MEASURE THE FREE LENGTH OF THE SPRING .....	9-7
SHOCK ABSORBER DAMPING ADJUSTMENT .....	9-8
COMPRESSION DAMPING ADJUSTMENT.....	9-8
SHOCK ABSORBER SCRAPPED .....	9-10
ADJUSTABLE GAS SHOCK ABSORBER INSPECTION .....	9-10
<b>SUSPENSION.....</b>	<b>9-11</b>
DISASSEMBLY OF REAR AXLE SUPPORT ASSEMBLY .....	9-15
<b>REAR STABILIZER BAR.....</b>	<b>9-16</b>
DISASSEMBLY OF STABILIZER BAR.....	9-16
MAINTENANCE OF STABILIZER BAR .....	9-16

## EXPLODED DIAGRAM OF FRONT SUSPENSION

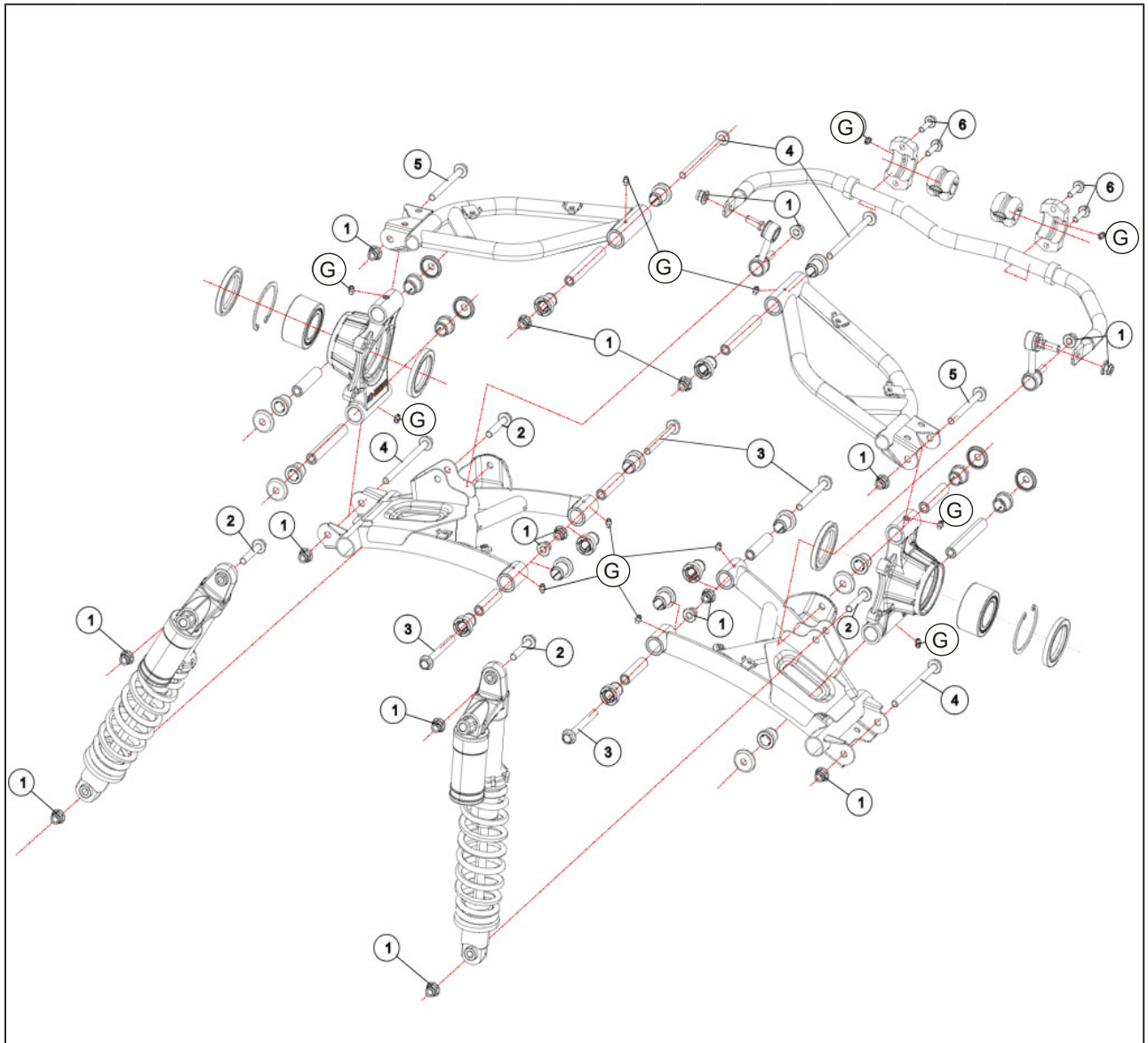


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	HEXAGON FLANGE BOLT M10×1.25×40	65~75	6.6~7.6	46.2~53.3	
2	2-NON-METALLIC HF NUT M10×1.25	65~75	6.6~7.6	46.2~53.3	
3	1-HEXAGON SLOTTED NUT M10	35~45	3.6~4.6	24.9~32	
4	HEXAGON FLANGE BOLT M10×1.25×55	65~75	6.6~7.6	46.2~53.3	
5	HEXAGON FLANGE BOLT M10×1.25×90	65~75	6.6~7.6	46.2~53.3	

Remarks:

G - Add lubricating grease through the oil cup nozzle (1000Km/time)

REAR SUSPENSION EXPLOSION DIAGRAM



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	2-NON-METALLIC HF NUT M10×1.25	65~75	6.6~7.6	46.2~53.3	
2	HEXAGON FLANGE BOLT M10×1.25×55	65~75	6.6~7.6	46.2~53.3	
3	HEXAGON FLANGE BOLT M10×1.25×90	65~75	6.6~7.6	46.2~53.3	
4	HEXAGON FLANGE BOLT M10×1.25×140	45~60	4.6~6.4	32~42.7	
5	HEXAGON FLANGE BOLT M10×1.25×100	65~75	6.6~7.6	46.2~53.3	
6	HEXAGON FLANGE BOLT M8×30	22~29	2.2~2.9	15.6~20.6	

Remarks:

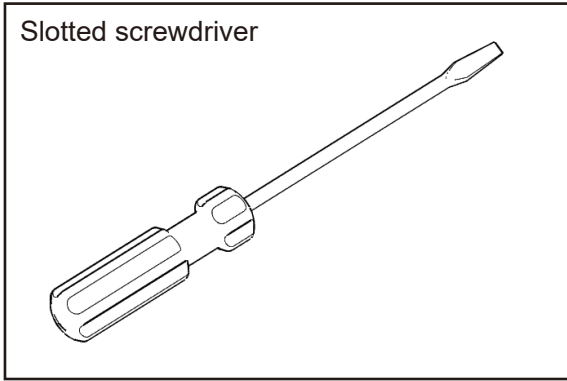
G - Add lubricating grease through the oil cup nozzle (1000Km/time)

## TECHNICAL PARAMETER

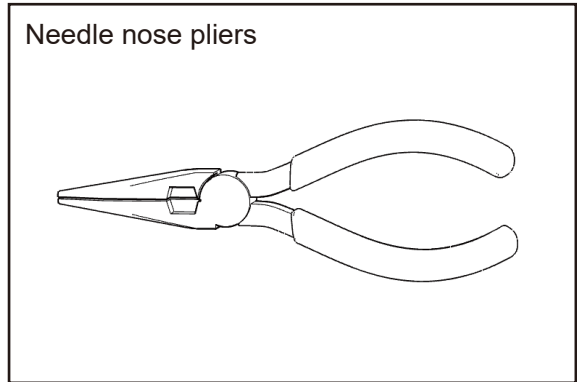
ITEM	SETTING	AVAILABLE RANGE
<b>Front Shock Absorber: (Optional)</b> <ul style="list-style-type: none"> <li>• Ordinary hydraulic damping shock absorber spring preload setting position</li> <li>• Type A: air pressure adjustable damping shock spring preload setting position (from the bottom of the upper mounting base to the position of the adjusting nut)</li> </ul>	AT10	
	2 gear	1 gear~5 gear
	Type A: 30mm (1.18in)	Type A: 15~45mm (0.59~1.77in)
	Type B: 24mm (0.94in)	Type B: 10~40mm (0.39~1.57in)
	AT10 W	
	Type A: 113mm(4.45in)	Type A: 98~128mm (3.86~5.04in)
Type B: 95mm (3.74in)	Type B: 80~110mm (3.15~4.33in)	
<b>Rear Shock Absorber: (Optional)</b> <ul style="list-style-type: none"> <li>• Ordinary hydraulic damping shock absorber spring preload setting position</li> <li>• Air pressure adjustable damping shock spring preload setting position (from the bottom of the upper mount to the position of the adjustment nut)</li> </ul>	AT10	
	2 gear	1 gear~5 gear
	Type A: 83mm (3.27in)	Type A: 68~98mm (2.68~3.86in)
	Type B: 65mm (2.56in)	Type B: 50~80mm( 1.97~3.15in)
	AT10 W	
	Type A: 100mm(3.94in.)	Type A: 85~115mm(3.35~4.53in)
Type B: 94mm (3.70in.)	Type B: 79~109mm(3.11~4.29in)	
<b>Barometric damping</b> <ul style="list-style-type: none"> <li>• Compression damping adjustment (adjust from clockwise)</li> <li>• Return damping adjustment (adjust from clockwise)</li> <li>• Gas pressure</li> </ul>	Type A: 4 gears Type B: 9 gears	Type A: 1st gear to 7th gear Type B: 1st gear to 18th gear
	Type A: 4 gears Type B: 9 gears	Type A: 1st gear to 7th gear Type B: 1st gear to 18th gear
	1Mpa	

DEDICATED TOOLS

Slotted screwdriver

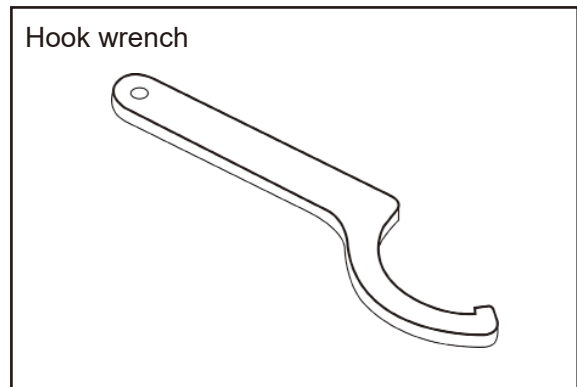


Needle nose pliers

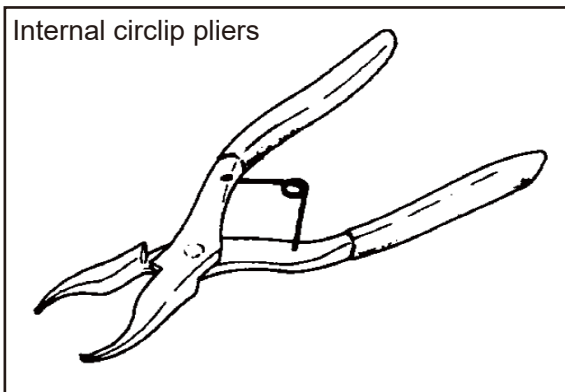


Grease gun

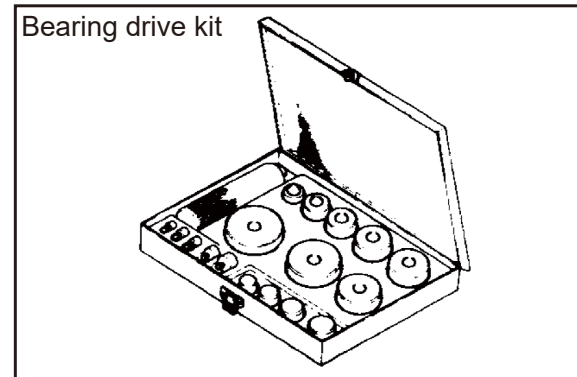
Hook wrench



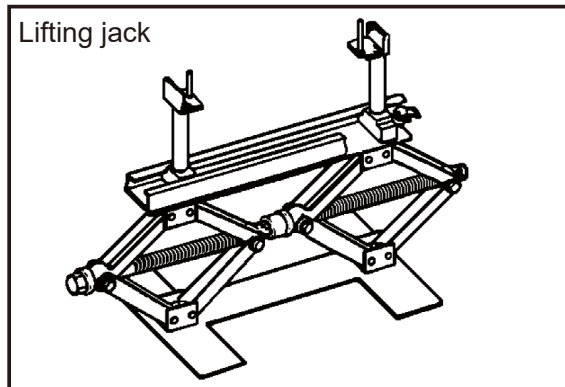
Internal circlip pliers



Bearing drive kit



Lifting jack



**SHOCK ABSORBER**

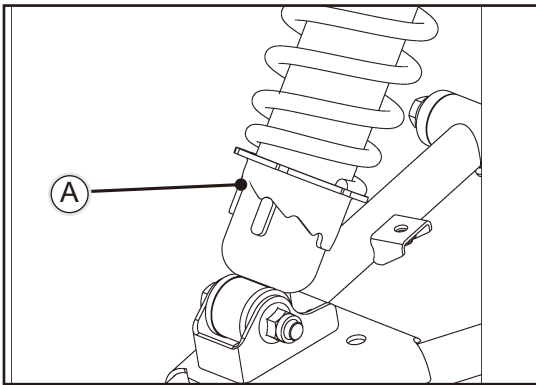
**SHOCK ABSORBER INSPECTION**

Since the front shocks are sealed units, they cannot be disassembled, only external inspection is required. If one unit is damaged, replace both shock absorbers as a set. If only one unit is replaced and both are not balanced, it may result in vehicle instability at high speeds or poor overall comfort.

**ORDINARY HYDRAULIC DAMPING**

**AND SHOCK ABSORPTION PRELOAD**

**ADJUSTMENT**



**【A】** Spring adjustment sleeve

The spring adjustment sleeve **【A】** of the hydraulic shock absorber has 5 adjustment gears, and the spring can be adjusted according to different terrain and loading conditions. If the spring action feels too soft or too hard, it can be adjusted according to the spring adjustment table.

**SPRING ADJUSTMENT TABLE**

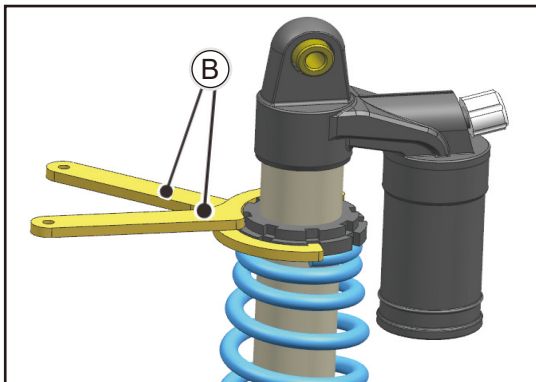
Position	Spring	Environment	Load	Terrain	Speed
1	Soft ↑	Soft ↑	Light ↑	Flat ↑	Low ↑
2 (STD)					
3					
4	Hard ↓	Hard ↓	Heavy ↓	Bumpy ↓	High ↓
5					

- ◆ Use a tool to turn the adjustment sleeve on the shock absorber to the required gear.

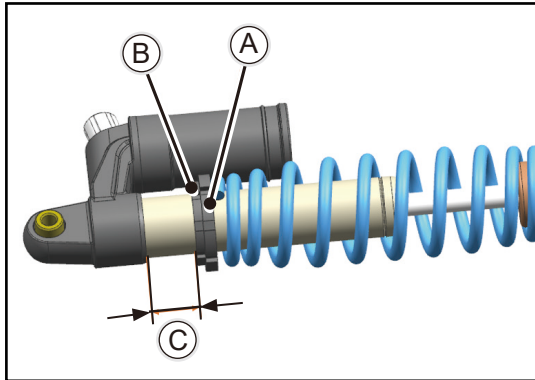
**AIR DAMPING SHOCK PRELOAD ADJUSTMENT**

**【B】** Hook wrench

- ◆ The spring adjusting nut of the gas pressure damping shock absorber is on the upper end of the spring, use tool **【B】** to loosen the locking nut. Then turn the adjusting nut to loosen.



MEASURE THE FREE LENGTH OF THE SPRING



【A】 Adjusting nut

【B】 Lock Nut

【C】 Spring preload position

◆ Screw the adjusting nut 【A】 to the desired position, then tighten the lock nut 【B】 , adjust the nut position 【C】

Standard: Front shock absorption

A10:

Type A:30mm(1.18in), Type B: 24(0.94in)

Use range Type A: 15mm(0.59in)~45mm(1.77in)

Type B: 10mm(0.39in)~40mm (1.57in)

A10 W:

Type A:113mm(4.45in), Type B: 95(3.74in)

Use range Type A: 98mm(3.98in)~128mm(5.04in)

Type B: 80mm(3.15in)~110mm (4.33in)

Rear shock absorption

A10 :

Type A:83mm(3.27in), Type B: 65(2.56in)

Use range Type A: 68mm(2.68in)~98mm(3.86in)

Type B: 50mm(1.97in)~80mm (3.15in)

A10 W:

Type A:100mm(3.94in), Type B: 94(3.7in)

Use range Type A: 85mm(3.35in)~115mm(4.53in)

Type B: 85mm(3.35in)~110mm (4.33in)

Spring lock nut torque	
30 N·m	

If the spring action feels too soft or too hard, tune it to:

position	spring	setting	load	terrain	speed
↑ standard position	soft	soft	light	smooth	low
	↑	↑	↑	↑	↑
↓	hard	hard	heavy	bumpy	high
	↓	↓	↓	↓	↓

## SHOCK ABSORBER DAMPING ADJUSTMENT

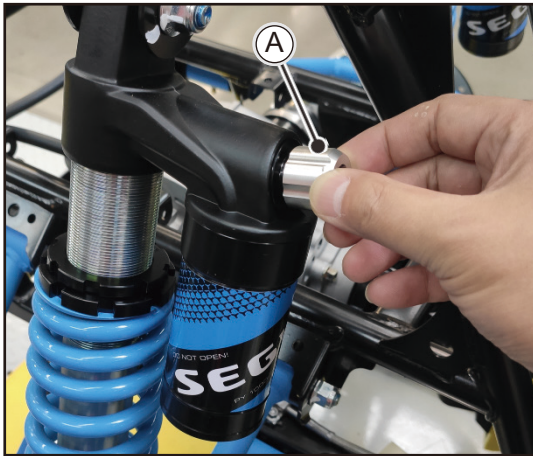
In order to adapt to various riding conditions, the spring preload can be adjusted on the shock absorber or the spring can be replaced. The damping force can also be easily adjusted without changing the oil viscosity.

## COMPRESSION DAMPING ADJUSTMENT

- ◆ Turn the upper compression damping adjuster **【A】** by hand, clockwise to increase the damping, counterclockwise to decrease the damping.

**Type A:** The compression damping adjuster has a total of 7 gears, and the factory setting gear is the 4th gear.

**Type B:** The compression damping adjuster has a total of 18 gears, and the factory setting gear is the 9th gear.



Type A

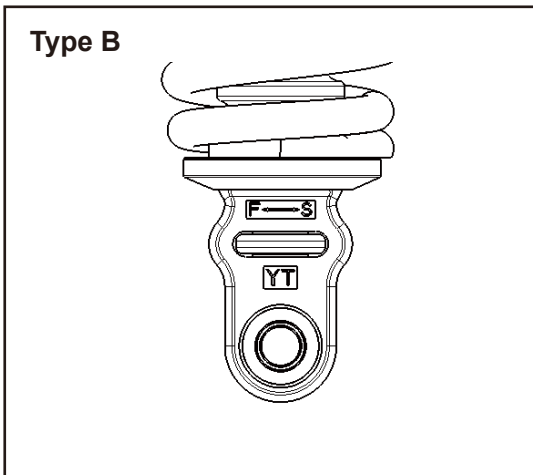


## RESTORATION DAMPING ADJUSTMENT

Type A: Turn the damping adjuster at the bottom by hand, increase the damping in clockwise direction (S) and decrease the damping in counterclockwise direction (F).

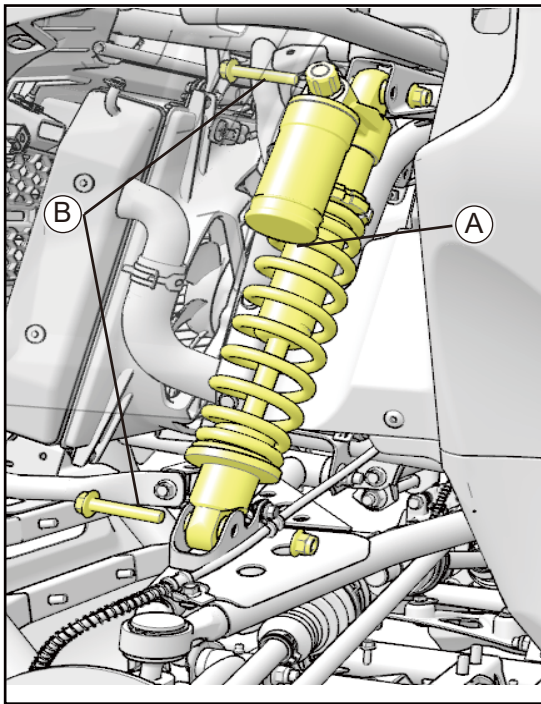
The restoring damping regulator has 7 gears, and the factory-set gear is the 4th gear.

Type B



Type B Type B: Turn the damping adjuster at the bottom by hand, increase the damping in clockwise direction (S) and decrease the damping in counterclockwise direction (F)

The restoring damping regulator has 18 gears, and the factory-set gear is 9 gears.



## SHOCK ABSORBER REMOVAL

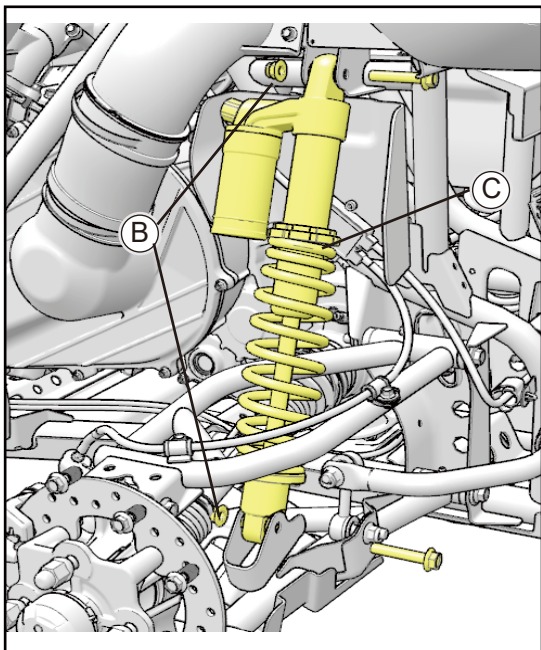
- 【A】 Front shock absorber
- 【B】 Mounting bolt
- 【C】 Rear shock absorber
- 【C】 Rear shock absorber

Use a jack or support frame to support the vehicle so that the wheels do not touch the ground.

- ◆ Remove the mounting bolts and nuts on the upper and lower parts of the shock absorber with tools 【B】
- ◆ Take out the front shock absorber 【A】 , 【C】

## FRONT SHOCK ABSORBER INSTALLATION

- ◆ Install the upper end of the front shock absorber into the frame mounting seat, and put on the bolts and nuts 【B】
- ◆ Install the lower end of the front shock absorber into the front rocker arm mounting seat, and put on the bolts and nuts 【B】
- ◆ Fasten the upper and lower mounting bolts and nuts with tools.



## REAR SHOCK ABSORBER INSTALLATION

- ◆ Install the upper end of the rear shock absorber into the frame mounting seat, and put on the bolts and nuts 【B】
- ◆ Install the lower end of the rear shock absorber into the front rocker arm mounting seat, and put on the bolts and nuts 【B】
- ◆ Fasten the upper and lower mounting bolts and nuts with tools.

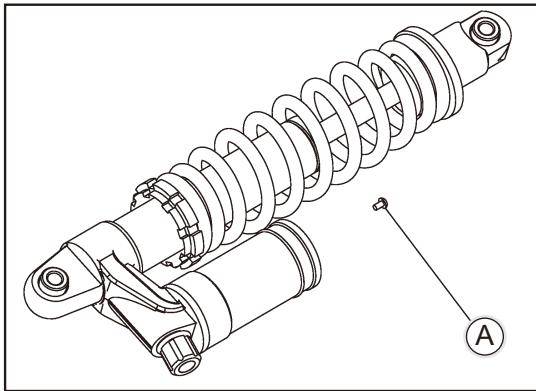
Shock absorber attaching nut torque

70 N·m (7.1kgf·m, 51ft·lb)

## SHOCK ABSORBER SCRAPPED

### ⚠ WARNING

Since the shock absorber reservoir contains nitrogen gas, do not incinerate any unreleased gas in the container or it may explode.

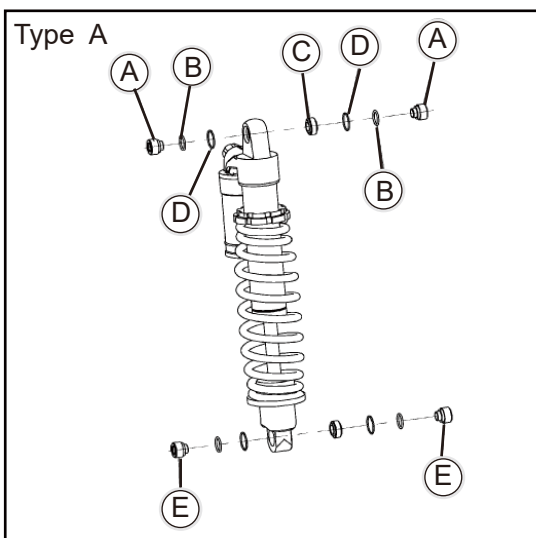


#### 【A】 Valve cover

- ◆ Remove the shock absorber (see Shock Absorber Removal)
- ◆ Remove the valve cover 【A】 and release nitrogen
- ◆ Remove the valve

### ⚠ WARNING

Because high-pressure gas is dangerous, do not point the valve at your face or body.

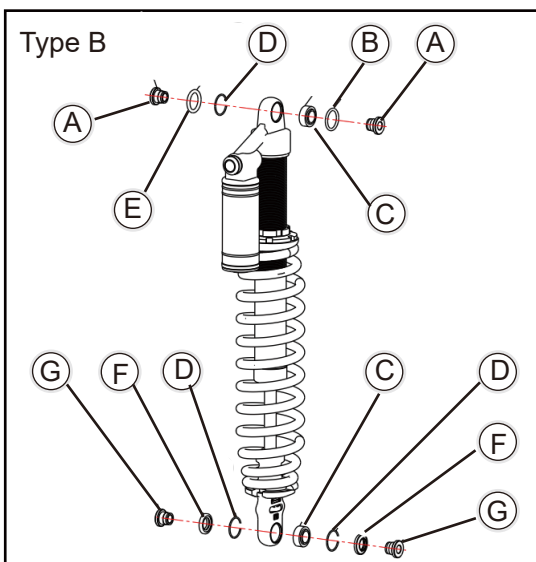


## ADJUSTABLE GAS SHOCK ABSORBER INSPECTION

### Type A

- ◆ Check the upper and lower mounting seats
- ◆ If the spacer ring, joint bearing combination and oil seal are damaged, replace them.

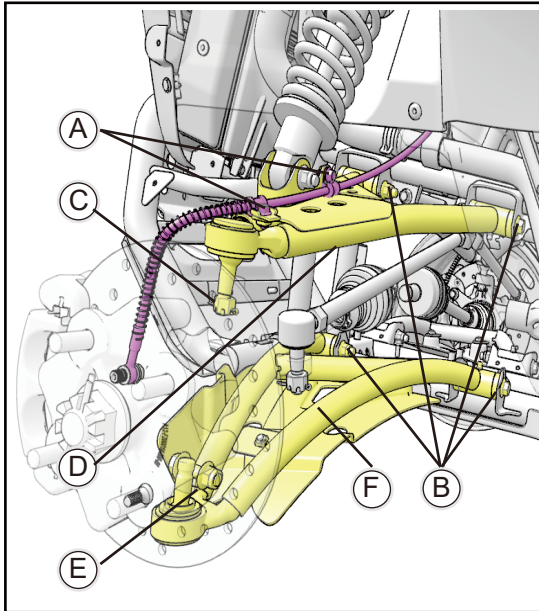
- 【A】 Upper spacer ring
- 【B】 O-ring
- 【C】 Joint bearing combination
- 【D】 Retaining ring
- 【E】 Lower spacer ring



### Type B

- 【A】 Upper spacer ring
- 【B】 O-ring I
- 【C】 Joint bearing combination
- 【D】 Retaining ring
- 【E】 O-ring II
- 【F】 Sealing rubber sleeve
- 【G】 Lower spacer ring

## SUSPENSION

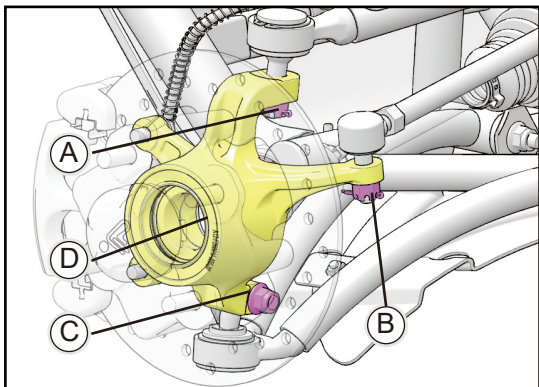


## FRONT SUSPENSION ROCKER ARMS REMOVAL

- 【A】 brake hose fixing bolt
  - 【B】 Front rocker arm mounting bolts and nuts
  - 【C】 fixing nut and cotter pin of front upper rocker arm king pin
  - 【D】 front upper rocker arm assembly
  - 【E】 Front lower rocker arm king pin fixing bolt and nut
  - 【F】 Front lower rocker assembly
- ◆ For tire removal, refer to Chapter 10 "Wheels and Tires"
  - ◆ Remove the shock absorber
  - ◆ Remove the brake hose fixing bolt 【A】
  - ◆ Remove the front rocker arm mounting bolts and nuts 【B】
  - ◆ Remove the fixing nut and cotter pin of the front upper rocker arm king pin 【C】
  - ◆ Remove the front upper rocker arm assembly 【D】
  - ◆ Remove the fixing bolts and nuts of the king pin of the front lower rocker arm 【E】
  - ◆ Remove the front lower rocker arm assembly 【F】

## Front rocker arm mounting nut torque

70 N·m (7.1kgf·m, 51ft·lb)



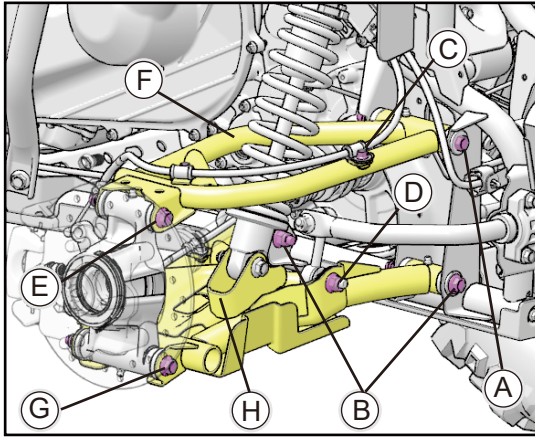
## FRONT SUSPENSION KNUCKLE ASSEMBLY REMOVAL

- 【A】 Front upper rocker arm king pin fixing nut, cotter pin
  - 【B】 Steering rod fixing nut, cotter pin
  - 【C】 Front lower rocker arm king pin fixing bolt and nut
  - 【D】 steering knuckle assembly
- ◆ For tire removal, refer to Chapter 10 "Wheels and Tires"
  - ◆ Remove the shock absorber
  - ◆ Remove the fixing nut and cotter pin of the front upper rocker arm 【A】
  - ◆ Remove the steering rod fixing nut and cotter pin 【B】
  - ◆ Remove the fixing bolts and nuts of the king pin of the front lower rocker arm 【C】
  - ◆ Refer to Chapter 8 "Transmission System" for removing the transmission half shaft"
  - ◆ Remove the brake caliper. Refer to Chapter 11 "Brake System"
  - ◆ Remove the steering knuckle assembly 【D】

## Front lower rocker arm king pin retaining nut

70 N·m (7.1kgf·m, 51ft·lb)

### REAR SUSPENSION ROCKER ASSEMBLY-REMOVAL

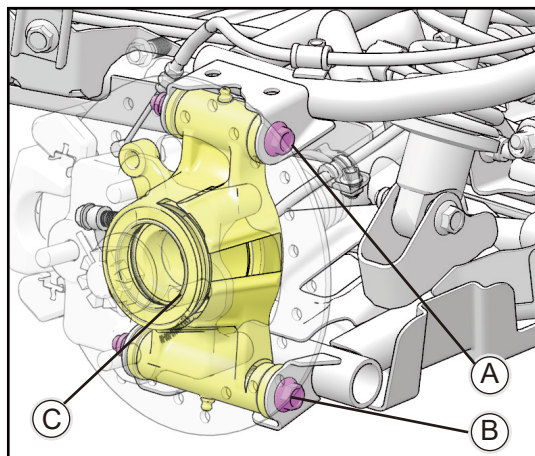


- 【A】 Rear upper rocker arm mounting bolt, nut
  - 【B】 Rear lower rocker arm mounting bolt, nut
  - 【C】 Brake pipe clamp fixing bolt
  - 【D】 Stabilizer rod fixing nut
  - 【E】 Rear wheel axle support upper fixing bolt, nut
  - 【F】 Rear upper rocker arm assembly
  - 【G】 Rear wheel axle support lower fixing bolt, nut
  - 【H】 Rear lower rocker arm assembly
- ◆ Refer to Chapter 10 "Wheels and Tires"
  - ◆ remove the shock absorber
  - ◆ Remove the brake pipe clamp fixing bolt 【C】
  - ◆ Remove the rear upper rocker arm mounting bolt and nut 【A】
  - ◆ Remove the rear wheel shaft support upper fixing bolt and nut 【E】
  - ◆ Remove the rear upper rocker arm component 【F】
  - ◆ Remove the rear lower rocker arm mounting bolt and nut 【B】
  - ◆ Remove the stabilizer bar tie rod fixing nut 【D】
  - ◆ Remove the rear wheel shaft support lower fixing bolt and nut 【G】
  - ◆ Remove the rocker arm assembly 【H】

Rear upper and lower rocker arm mounting nut

70 N·m (7.1kgf·m, 51ft·lb)

### REAR SUSPENSION REAR WHEEL AXLE MOUNT ASSEMBLY REMOVAL

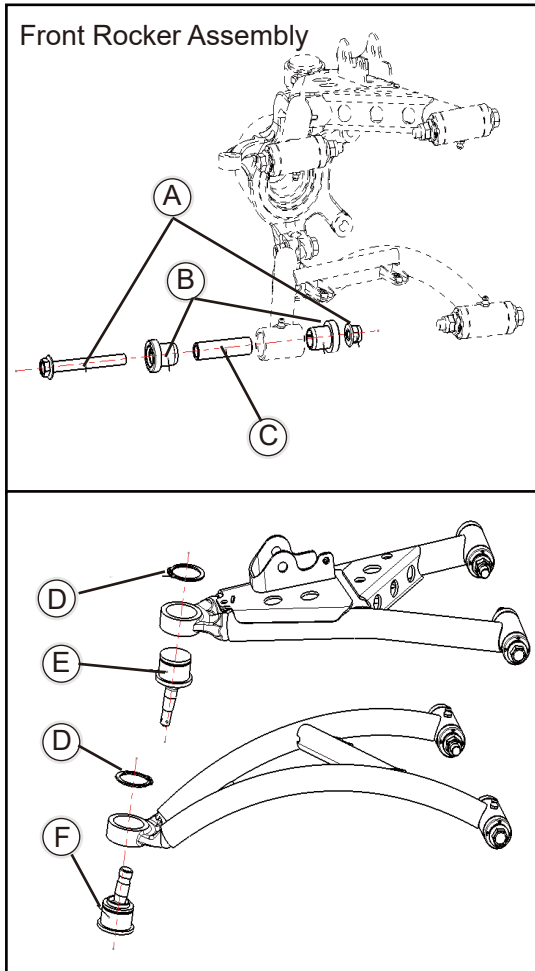


- 【A】 Fixing bolts and nuts on the rear wheel axle support
  - 【B】 Rear wheel axle support lower fixing bolts and nuts
  - 【C】 rear wheel axle support assembly
- ◆ For tire removal, refer to Chapter 10 "Wheels and Tires"
  - ◆ Remove the shock absorber
  - ◆ Remove the fixing bolts and nuts on the rear wheel axle support 【A】
  - ◆ Remove the lower fixing bolts and nuts of the rear wheel axle support 【B】
  - ◆ Refer to Chapter 8 "Transmission System" for removing the transmission half shaft"
  - ◆ Remove the brake caliper. Refer to Chapter 11 "Brake System"
  - ◆ Remove the rear wheel axle support assembly 【C】

Rear wheel axle support upper and lower fixing nuts torque

70 N·m (7.1kgf·m, 51ft·lb)

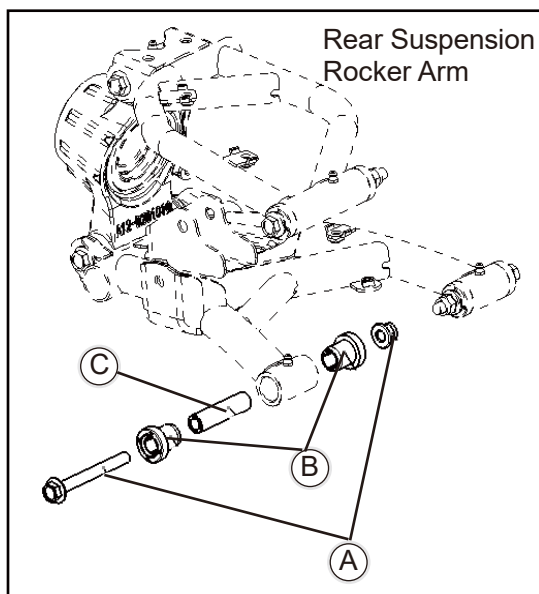
**DISASSEMBLY OF FRONT SUSPENSION  
ROCKER ARM**



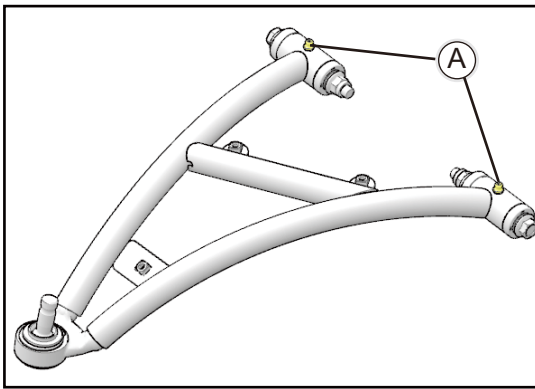
- 【A】 Rocker arm assembly mounting bolt and nut
- 【B】 Rocker arm buffer bushing
- 【C】 rocker liner

- 【D】 Elastic retaining ring for shaft
- 【E】 Upper kingpin assembly
- 【F】 lower kingpin assembly
- ◆ Remove the rocker arm assembly mounting bolts and nuts 【A】
- ◆ Remove the rocker arm liner 【C】
- ◆ Remove the rocker arm buffer bushing 【B】
- ◆ Remove the elastic retaining ring for shaft with circlip pliers 【D】
- ◆ Press out the upper kingpin assembly 【E】 and the lower kingpin assembly 【F】

**REAR SUSPENSION ROCKER ARM  
ASSEMBLY DISASSEMBLY**



- 【A】 Rocker arm assembly mounting bolt and nut
- 【B】 Rocker arm buffer bushing
- 【C】 Rocker Liner
- ◆ Remove the rocker arm assembly mounting bolts and nuts 【A】
- ◆ Remove the rocker arm liner 【C】
- ◆ Remove the rocker arm buffer bushing 【B】



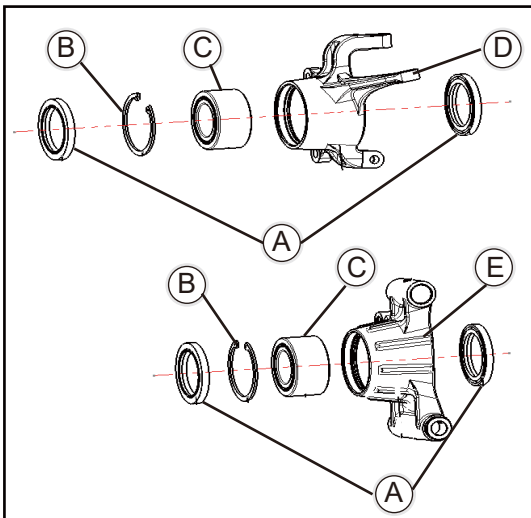
## ROCKER ARM MAINTENANCE

- ◆ **【A】** straight-through oil cup
- ◆ Fill the straight-through oil cup with grease gun
- ◆ When the inspection finds that the grease in the axle support sleeve is reduced, or after the vehicle travels every 1000Km, use a grease gun to add grease to the straight-through oil cup in the suspension system (including the rear axle support and the rear stabilizer bar).
- ◆ Special appliance: grease gun

### **⚠ WARNING**

If there is no proper amount of lubrication for the suspension joint, grease should be added and regular maintenance should be carried out to avoid excessive wear of the shaft sleeve.

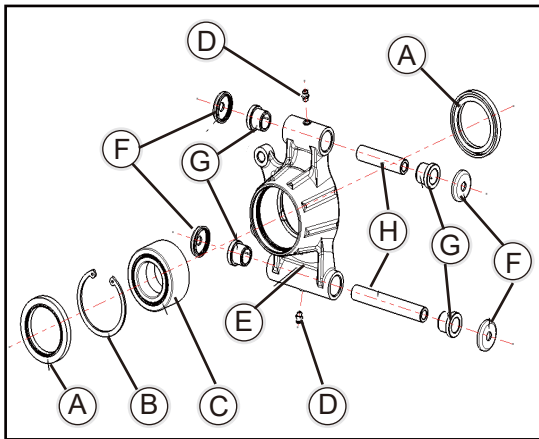
## WHEEL HUB BEARING REPLACEMENT



If the steering knuckle assembly and the wheel hub bearing in the rear wheel axle support assembly are damaged, they need to be replaced.

- ◆ **【A】** half shaft oil seal
- ◆ **【B】** open retaining ring
- ◆ **【C】** hub bearing
- ◆ **【D】** steering knuckle
- ◆ **【E】** Rear wheel axle support
- ◆ Remove the half shaft oil seal **【A】**
- ◆ Remove the opening retaining ring **【B】**
- ◆ Press out the hub bearing **【C】**
- ◆ Remove the steering knuckle **【D】** or rear wheel axle support **【E】**

Special appliances: circlip pliers, bearing driver group



## DISASSEMBLY OF REAR AXLE SUPPORT

## ASSEMBLY

- 【A】 Half Shaft Oil Seal
- 【B】 Open Retaining Ring
- 【C】 Hub Bearing
- 【D】 Straight Grease Nipple (Grease Cup)
- 【E】 Rear Axle Support
- 【F】 Oil Seal Cover
- 【G】 Buffer Sleeve
- 【H】 Axle Support Bushing Liner

- ◆ Remove the half shaft oil seal 【A】 .
- ◆ Remove the open retaining ring 【B】 .
- ◆ Press out the hub bearing 【C】 .

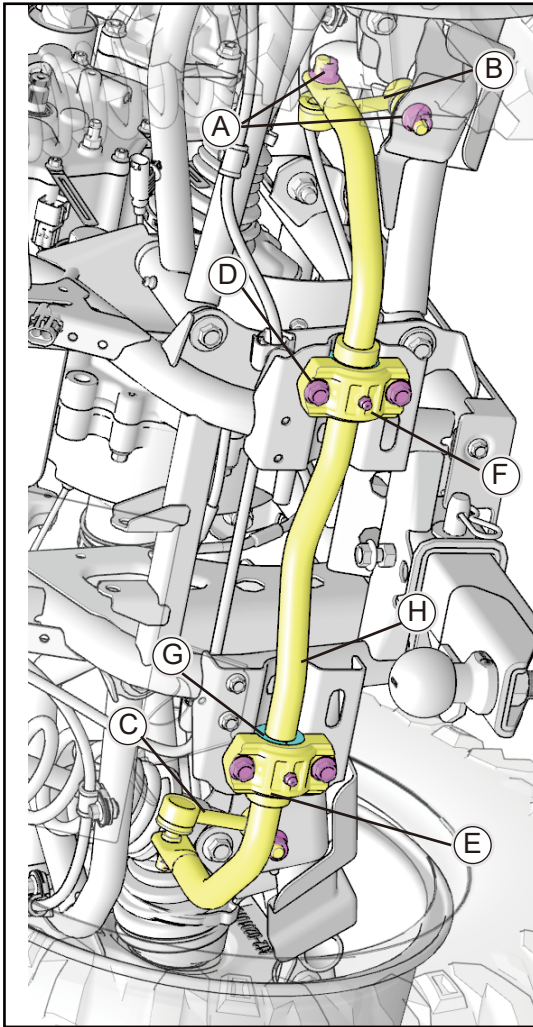
Special appliances: circlip pliers, bearing driver group

**⚠ CAUTION**

Check the buffer sleeve 【B】 , if the inner hole is severely worn, replace it, and refill the grease after assembly.

## REAR STABILIZER BAR

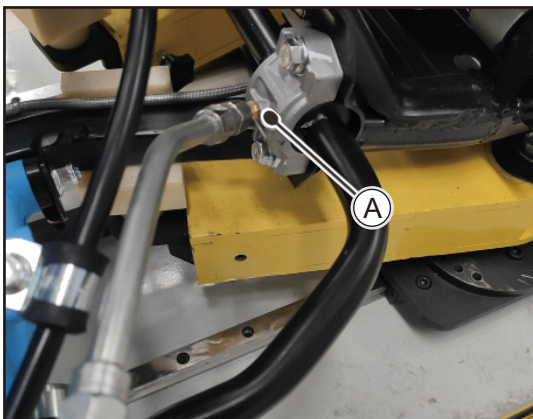
### DISASSEMBLY OF STABILIZER BAR



- 【A】 Stabilizer Bar Assembly Mounting Nut
  - 【B】 Left Stabilizer Bar Assembly
  - 【C】 Right Stabilizer Bar Assembly
  - 【D】 Mount Bracket Fixing Bolt
  - 【E】 Stabilizer Bar Mount Bracket
  - 【F】 Straight Grease Nipple
  - 【G】 Stabilizer Bar Bushing
  - 【H】 Rear Stabilizer Bar Assembly
- ◆ Remove the stabilizer bar assembly mounting nut 【A】 .
  - ◆ Remove the left stabilizer bar assembly 【B】 and right stabilizer bar assembly 【C】 .
  - ◆ Remove the mount bracket fixing bolt 【D】 .
  - ◆ Remove the stabilizer bar mount bracket 【E】 .
  - ◆ Remove the stabilizer bar bushing 【G】 and rear stabilizer bar assembly 【H】 .

Bolt
26 N·m (2.6kgf·m, 19ft·lb)

### MAINTENANCE OF STABILIZER BAR

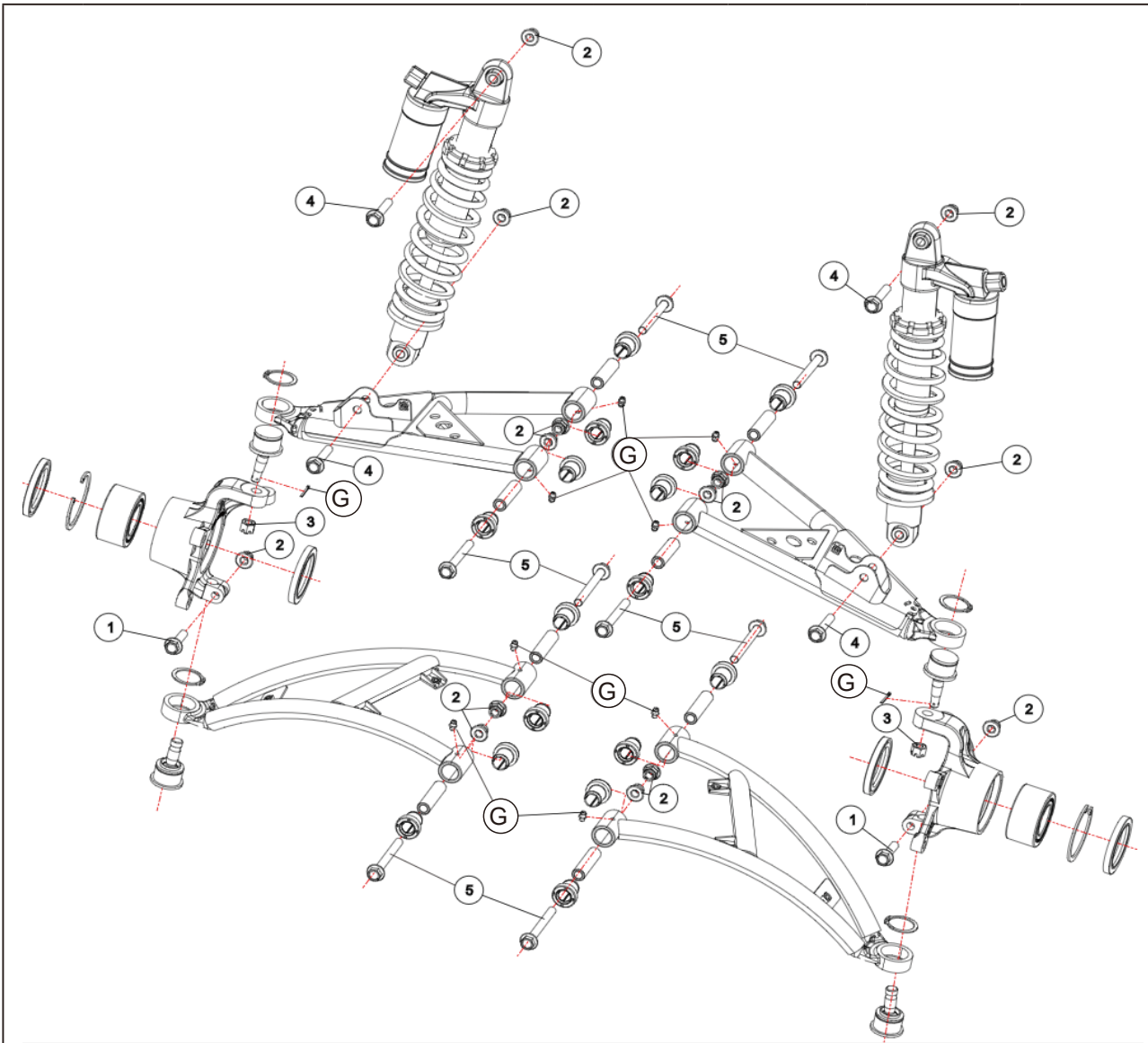


- 【A】 Straight Grease Nipple
- ◆ Fill an appropriate amount of grease into the stabilizer bar mounting bushing through the straight grease nipple 【A】 every 1000 km of vehicle operation.

# FRONT & REAR SUSPENSION

<b>EXPLODED DIAGRAM OF FRONT SUSPENSION.....</b>	<b>9-2</b>
<b>REAR SUSPENSION EXPLOSION DIAGRAM.....</b>	<b>9-3</b>
<b>TECHNICAL PARAMETER .....</b>	<b>9-4</b>
<b>DEDICATED TOOLS .....</b>	<b>9-5</b>
<b>SHOCK ABSORBER .....</b>	<b>9-6</b>
SHOCK ABSORBER INSPECTION .....	9-6
ORDINARY HYDRAULIC DAMPING AND SHOCK ABSORPTION PRELOAD ADJUSTMENT .....	9-6
AIR DAMPING SHOCK PRELOAD ADJUSTMENT.....	9-6
MEASURE THE FREE LENGTH OF THE SPRING .....	9-7
SHOCK ABSORBER DAMPING ADJUSTMENT .....	9-8
COMPRESSION DAMPING ADJUSTMENT.....	9-8
SHOCK ABSORBER SCRAPPED .....	9-10
ADJUSTABLE GAS SHOCK ABSORBER INSPECTION .....	9-10
<b>SUSPENSION.....</b>	<b>9-11</b>
DISASSEMBLY OF REAR AXLE SUPPORT ASSEMBLY .....	9-15
<b>REAR STABILIZER BAR.....</b>	<b>9-16</b>
DISASSEMBLY OF STABILIZER BAR.....	9-16
MAINTENANCE OF STABILIZER BAR .....	9-16

### EXPLODED DIAGRAM OF FRONT SUSPENSION

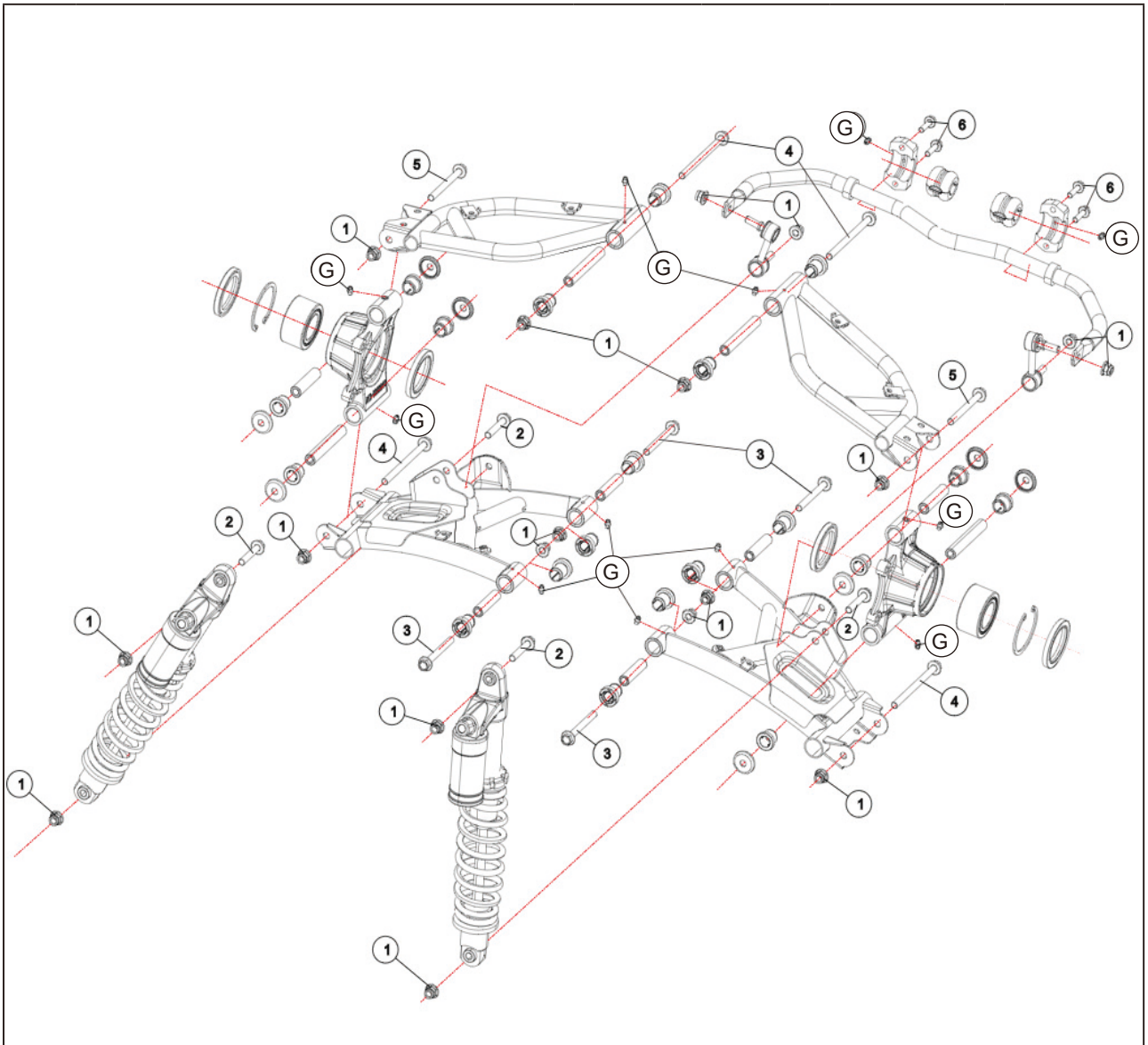


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	HEXAGON FLANGE BOLT M10×1.25×40	65~75	6.6~7.6	46.2~53.3	
2	2-NON-METALLIC HF NUT M10×1.25	65~75	6.6~7.6	46.2~53.3	
3	1-HEXAGON SLOTTED NUT M10	35~45	3.6~4.6	24.9~32	
4	HEXAGON FLANGE BOLT M10×1.25×55	65~75	6.6~7.6	46.2~53.3	
5	HEXAGON FLANGE BOLT M10×1.25×90	65~75	6.6~7.6	46.2~53.3	

Remarks:

G - Add lubricating grease through the oil cup nozzle (1000Km/time)

REAR SUSPENSION EXPLOSION DIAGRAM



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	2-NON-METALLIC HF NUT M10×1.25	65~75	6.6~7.6	46.2~53.3	
2	HEXAGON FLANGE BOLT M10×1.25×55	65~75	6.6~7.6	46.2~53.3	
3	HEXAGON FLANGE BOLT M10×1.25×90	65~75	6.6~7.6	46.2~53.3	
4	HEXAGON FLANGE BOLT M10×1.25×140	45~60	4.6~6.4	32~42.7	
5	HEXAGON FLANGE BOLT M10×1.25×100	65~75	6.6~7.6	46.2~53.3	
6	HEXAGON FLANGE BOLT M8×30	22~29	2.2~2.9	15.6~20.6	

Remarks:

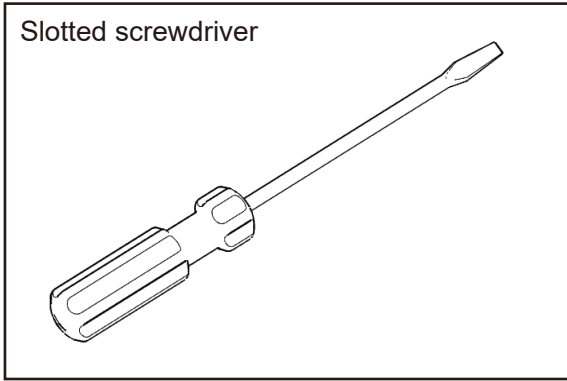
G - Add lubricating grease through the oil cup nozzle (1000Km/time)

## TECHNICAL PARAMETER

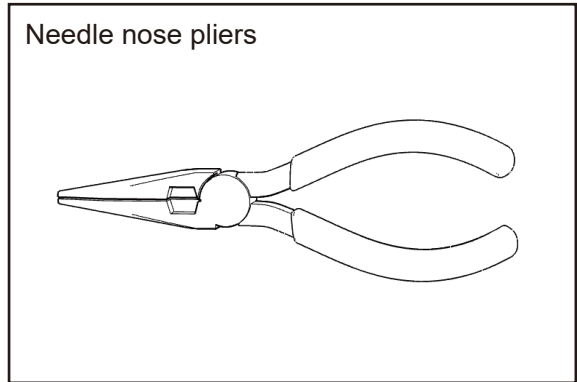
ITEM	SETTING	AVAILABLE RANGE
<b>Front Shock Absorber: (Optional)</b> <ul style="list-style-type: none"> <li>• Ordinary hydraulic damping shock absorber spring preload setting position</li> <li>• Type A: air pressure adjustable damping shock spring preload setting position (from the bottom of the upper mounting base to the position of the adjusting nut)</li> </ul>	AT10	
	2 gear	1gear~5 gear
	Type A: 30mm (1.18in)	Type A: 15~45mm (0.59~1.77in)
	Type B: 24mm (0.94in)	Type B: 10~40mm (0.39~1.57in)
	AT10 W	
	Type A: 113mm(4.45in)	Type A: 98~128mm (3.86~5.04in)
Type B: 95mm (3.74in)	Type B: 80~110mm (3.15~4.33in)	
<b>Rear Shock Absorber: (Optional)</b> <ul style="list-style-type: none"> <li>• Ordinary hydraulic damping shock absorber spring preload setting position</li> <li>• Air pressure adjustable damping shock spring preload setting position (from the bottom of the upper mount to the position of the adjustment nut)</li> </ul>	AT10	
	2 gear	1 gear~5 gear
	Type A: 83mm (3.27in)	Type A: 68~98mm (2.68~3.86in)
	Type B: 65mm (2.56in)	Type B: 50~80mm( 1.97~3.15in)
	AT10 W	
	Type A: 100mm(3.94in.)	Type A: 85~115mm(3.35~4.53in)
Type B: 94mm (3.70in.)	Type B: 79~109mm(3.11~4.29in)	
<b>Barometric damping</b> <ul style="list-style-type: none"> <li>• Compression damping adjustment (adjust from clockwise)</li> <li>• Return damping adjustment (adjust from clockwise)</li> <li>• Gas pressure</li> </ul>	Type A: 4 gears Type B: 9 gears	Type A: 1st gear to 7th gear Type B: 1st gear to 18th gear
	Type A: 4 gears Type B: 9 gears	Type A: 1st gear to 7th gear Type B: 1st gear to 18th gear
	1Mpa	

DEDICATED TOOLS

Slotted screwdriver

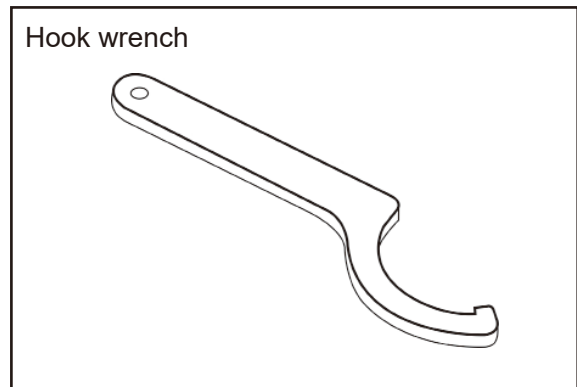


Needle nose pliers

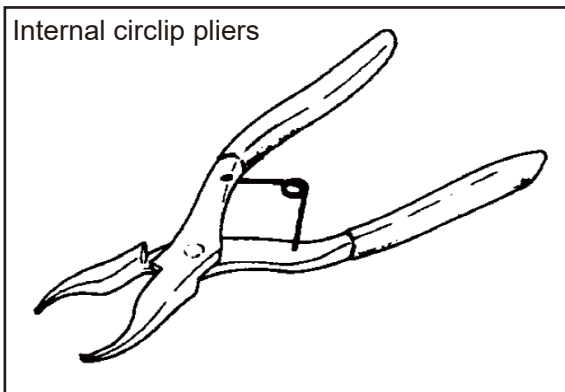


Grease gun

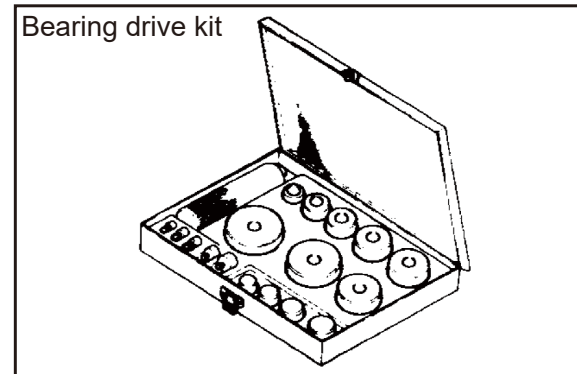
Hook wrench



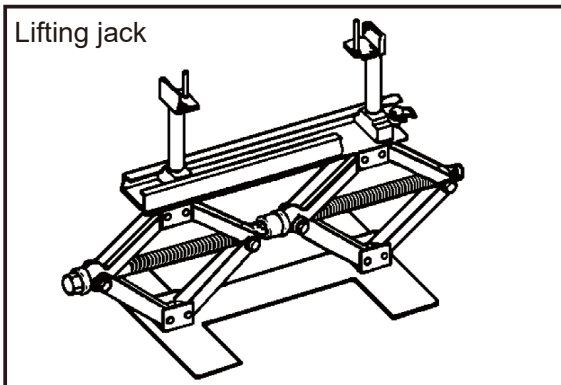
Internal circlip pliers



Bearing drive kit



Lifting jack



## SHOCK ABSORBER

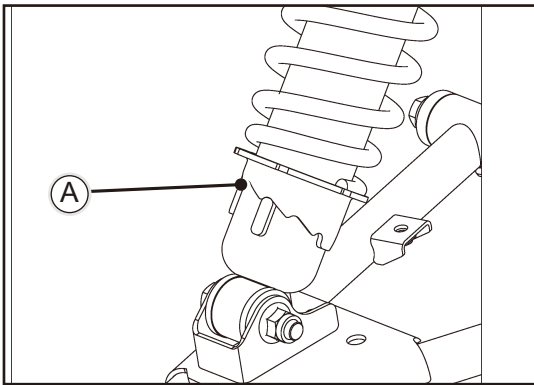
### SHOCK ABSORBER INSPECTION

Since the front shocks are sealed units, they cannot be disassembled, only external inspection is required. If one unit is damaged, replace both shock absorbers as a set. If only one unit is replaced and both are not balanced, it may result in vehicle instability at high speeds or poor overall comfort.

### ORDINARY HYDRAULIC DAMPING

### AND SHOCK ABSORPTION PRELOAD

### ADJUSTMENT



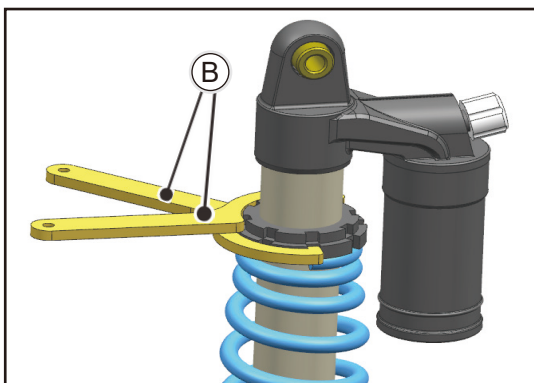
#### 【A】 Spring adjustment sleeve

The spring adjustment sleeve 【A】 of the hydraulic shock absorber has 5 adjustment gears, and the spring can be adjusted according to different terrain and loading conditions. If the spring action feels too soft or too hard, it can be adjusted according to the spring adjustment table.

### SPRING ADJUSTMENT TABLE

Position	Spring	Environment	Load	Terrain	Speed
1	Soft ↑	Soft ↑	Light ↑	Flat ↑	Low ↑
2 (STD)					
3					
4	Hard ↓	Hard ↓	Heavy ↓	Bumpy ↓	High ↓
5					

- ◆ Use a tool to turn the adjustment sleeve on the shock absorber to the required gear.

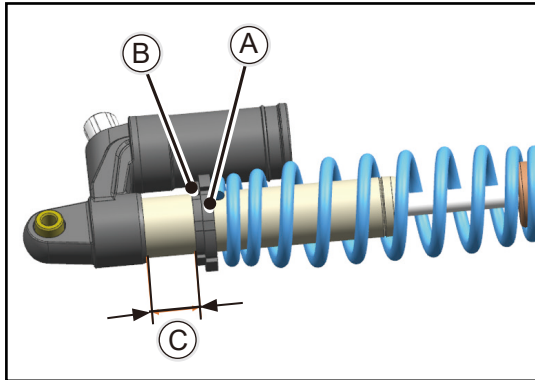


### AIR DAMPING SHOCK PRELOAD ADJUSTMENT

#### 【B】 Hook wrench

- ◆ The spring adjusting nut of the gas pressure damping shock absorber is on the upper end of the spring, use tool 【B】 to loosen the locking nut. Then turn the adjusting nut to loosen.

MEASURE THE FREE LENGTH OF THE SPRING



【A】 Adjusting nut

【B】 Lock Nut

【C】 Spring preload position

- ◆ Screw the adjusting nut 【A】 to the desired position, then tighten the lock nut 【B】 , adjust the nut position 【C】

Standard: Front shock absorption

A10:

Type A:30mm(1.18in), Type B: 24(0.94in)

Use range Type A: 15mm(0.59in)~45mm(1.77in)

Type B: 10mm(0.39in)~40mm (1.57in)

A10 W:

Type A:113mm(4.45in), Type B: 95(3.74in)

Use range Type A: 98mm(3.98in)~128mm(5.04in)

Type B: 80mm(3.15in)~110mm (4.33in)

Rear shock absorption

A10 :

Type A:83mm(3.27in), Type B: 65(2.56in)

Use range Type A: 68mm(2.68in)~98mm(3.86in)

Type B: 50mm(1.97in)~80mm (3.15in)

A10 W:

Type A:100mm(3.94in), Type B: 94(3.7in)

Use range Type A: 85mm(3.35in)~115mm(4.53in)

Type B: 85mm(3.35in)~110mm (4.33in)

Spring lock nut torque	
30 N·m	

If the spring action feels too soft or too hard, tune it to:

position	spring	setting	load	terrain	speed
↑ standard position	soft	soft	light	smooth	low
	↑	↑	↑	↑	↑
↓	hard	hard	heavy	bumpy	high
	↓	↓	↓	↓	↓

## SHOCK ABSORBER DAMPING ADJUSTMENT

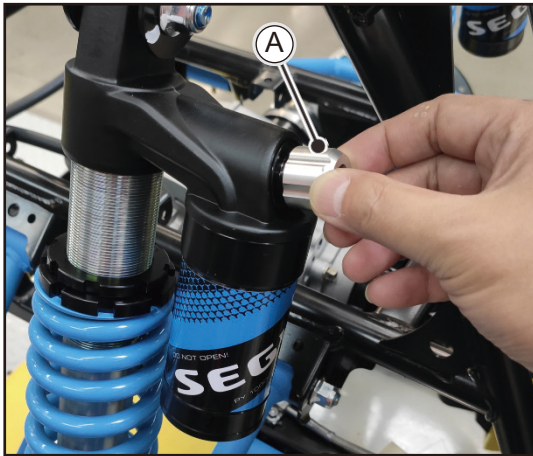
In order to adapt to various riding conditions, the spring preload can be adjusted on the shock absorber or the spring can be replaced. The damping force can also be easily adjusted without changing the oil viscosity.

### COMPRESSION DAMPING ADJUSTMENT

- ◆ Turn the upper compression damping adjuster **【A】** by hand, clockwise to increase the damping, counterclockwise to decrease the damping.

**Type A:** The compression damping adjuster has a total of 7 gears, and the factory setting gear is the 4th gear.

**Type B:** The compression damping adjuster has a total of 18 gears, and the factory setting gear is the 9th gear.



Type A

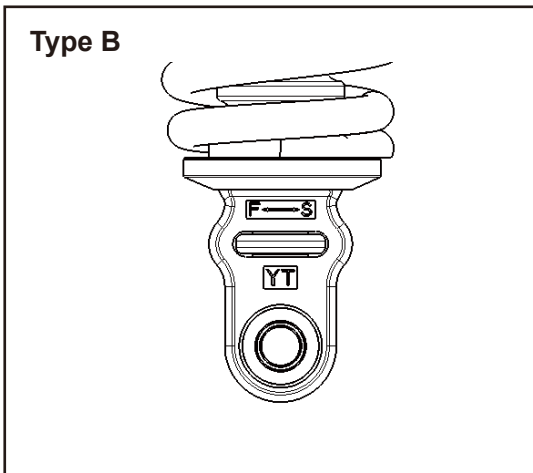


### RESTORATION DAMPING ADJUSTMENT

Type A: Turn the damping adjuster at the bottom by hand, increase the damping in clockwise direction (S) and decrease the damping in counterclockwise direction (F).

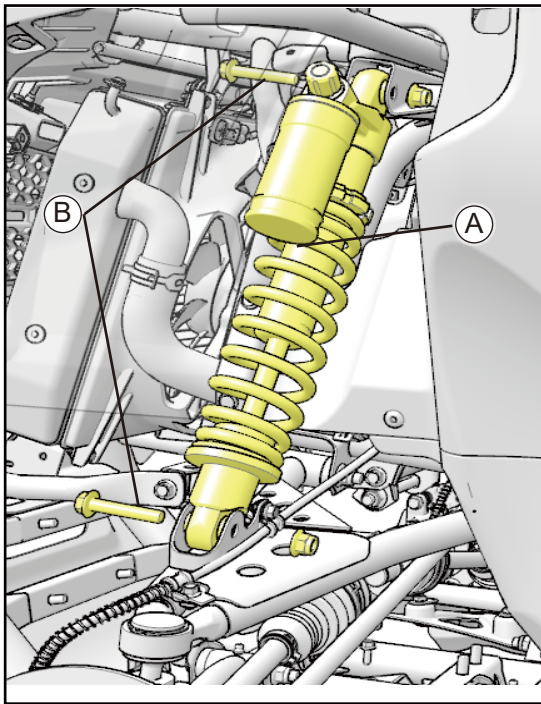
The restoring damping regulator has 7 gears, and the factory-set gear is the 4th gear.

Type B



Type B Type B: Turn the damping adjuster at the bottom by hand, increase the damping in clockwise direction (S) and decrease the damping in counterclockwise direction (F)

The restoring damping regulator has 18 gears, and the factory-set gear is 9 gears.



### SHOCK ABSORBER REMOVAL

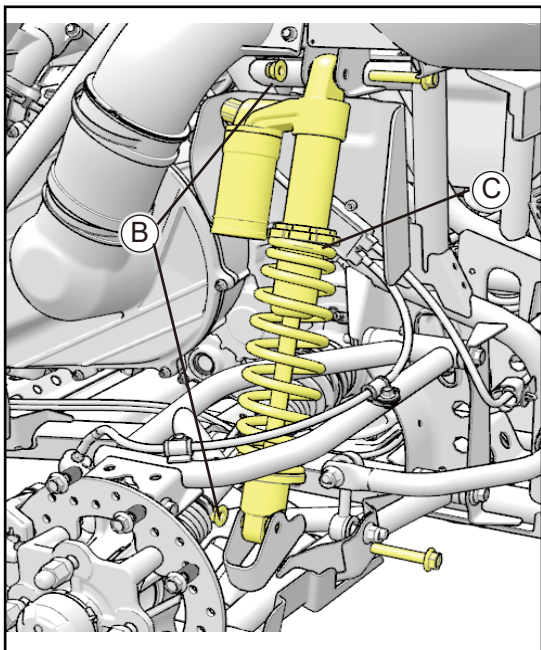
- 【A】 Front shock absorber
- 【B】 Mounting bolt
- 【C】 Rear shock absorber
- 【C】 Rear shock absorber

Use a jack or support frame to support the vehicle so that the wheels do not touch the ground.

- ◆ Remove the mounting bolts and nuts on the upper and lower parts of the shock absorber with tools 【B】
- ◆ Take out the front shock absorber 【A】 , 【C】

### FRONT SHOCK ABSORBER INSTALLATION

- ◆ Install the upper end of the front shock absorber into the frame mounting seat, and put on the bolts and nuts 【B】
- ◆ Install the lower end of the front shock absorber into the front rocker arm mounting seat, and put on the bolts and nuts 【B】
- ◆ Fasten the upper and lower mounting bolts and nuts with tools.



### REAR SHOCK ABSORBER INSTALLATION

- ◆ Install the upper end of the rear shock absorber into the frame mounting seat, and put on the bolts and nuts 【B】
- ◆ Install the lower end of the rear shock absorber into the front rocker arm mounting seat, and put on the bolts and nuts 【B】
- ◆ Fasten the upper and lower mounting bolts and nuts with tools.

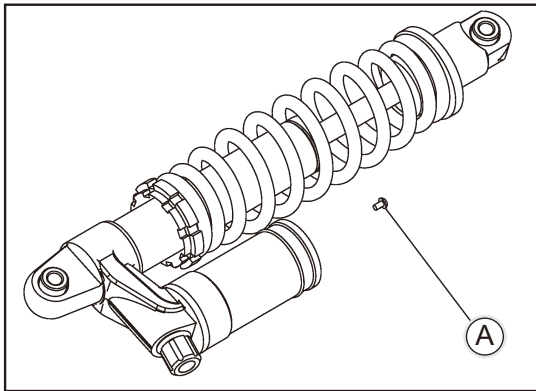
Shock absorber attaching nut torque

70 N·m (7.1kgf·m, 51ft·lb)

### SHOCK ABSORBER SCRAPPED

#### ⚠ WARNING

Since the shock absorber reservoir contains nitrogen gas, do not incinerate any unreleased gas in the container or it may explode.

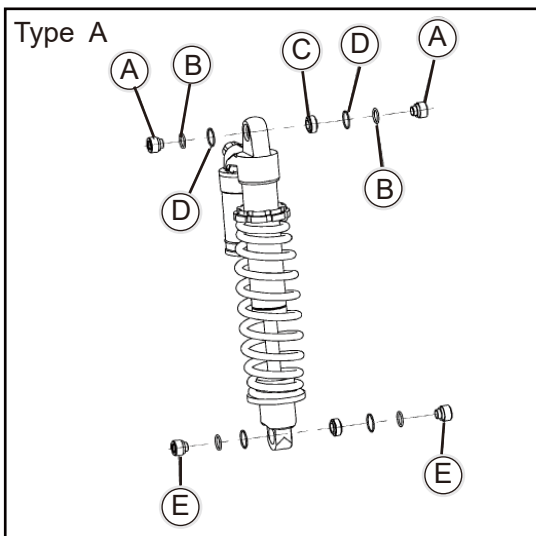


#### 【A】 Valve cover

- ◆ Remove the shock absorber (see Shock Absorber Removal)
- ◆ Remove the valve cover 【A】 and release nitrogen
- ◆ Remove the valve

#### ⚠ WARNING

Because high-pressure gas is dangerous, do not point the valve at your face or body.



### ADJUSTABLE GAS SHOCK ABSORBER INSPECTION

#### Type A

- ◆ Check the upper and lower mounting seats
- ◆ If the spacer ring, joint bearing combination and oil seal are damaged, replace them.

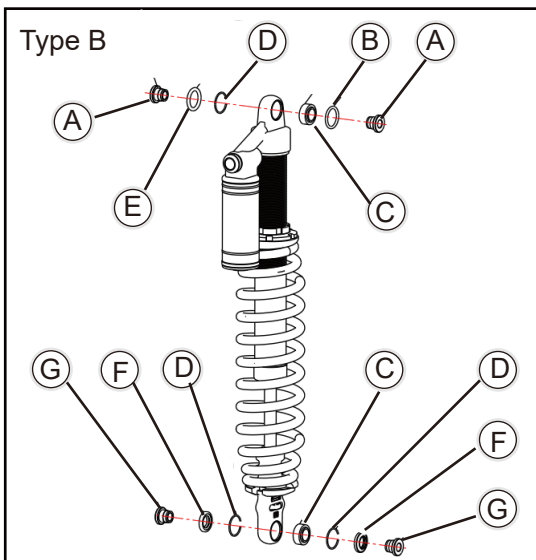
【A】 Upper spacer ring

【B】 O-ring

【C】 Joint bearing combination

【D】 Retaining ring

【E】 Lower spacer ring



#### Type B

【A】 Upper spacer ring

【B】 O-ring I

【C】 Joint bearing combination

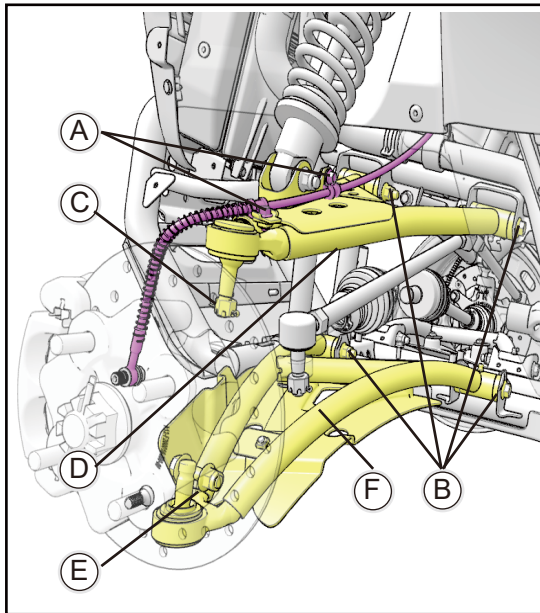
【D】 Retaining ring

【E】 O-ring II

【F】 Sealing rubber sleeve

【G】 Lower spacer ring

## SUSPENSION

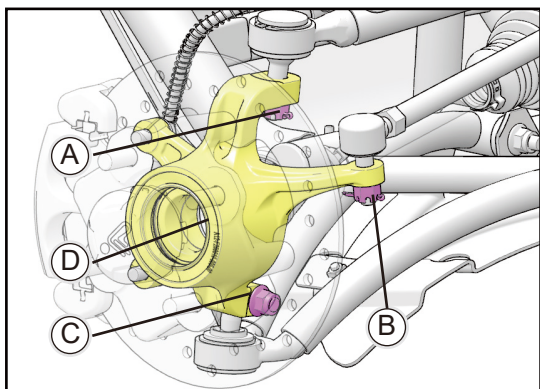


## FRONT SUSPENSION ROCKER ARMS REMOVAL

- 【A】 brake hose fixing bolt
  - 【B】 Front rocker arm mounting bolts and nuts
  - 【C】 fixing nut and cotter pin of front upper rocker arm king pin
  - 【D】 front upper rocker arm assembly
  - 【E】 Front lower rocker arm king pin fixing bolt and nut
  - 【F】 Front lower rocker assembly
- ◆ For tire removal, refer to Chapter 10 "Wheels and Tires"
  - ◆ Remove the shock absorber
  - ◆ Remove the brake hose fixing bolt 【A】
  - ◆ Remove the front rocker arm mounting bolts and nuts 【B】
  - ◆ Remove the fixing nut and cotter pin of the front upper rocker arm king pin 【C】
  - ◆ Remove the front upper rocker arm assembly 【D】
  - ◆ Remove the fixing bolts and nuts of the king pin of the front lower rocker arm 【E】
  - ◆ Remove the front lower rocker arm assembly 【F】

## Front rocker arm mounting nut torque

70 N·m (7.1kgf·m, 51ft·lb)



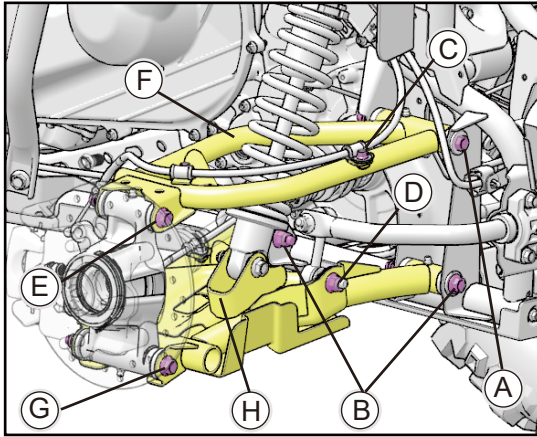
## FRONT SUSPENSION KNUCKLE ASSEMBLY REMOVAL

- 【A】 Front upper rocker arm king pin fixing nut, cotter pin
  - 【B】 Steering rod fixing nut, cotter pin
  - 【C】 Front lower rocker arm king pin fixing bolt and nut
  - 【D】 steering knuckle assembly
- ◆ For tire removal, refer to Chapter 10 "Wheels and Tires"
  - ◆ Remove the shock absorber
  - ◆ Remove the fixing nut and cotter pin of the front upper rocker arm 【A】
  - ◆ Remove the steering rod fixing nut and cotter pin 【B】
  - ◆ Remove the fixing bolts and nuts of the king pin of the front lower rocker arm 【C】
  - ◆ Refer to Chapter 8 "Transmission System" for removing the transmission half shaft"
  - ◆ Remove the brake caliper. Refer to Chapter 11 "Brake System"
  - ◆ Remove the steering knuckle assembly 【D】

## Front lower rocker arm king pin retaining nut

70 N·m (7.1kgf·m, 51ft·lb)

### REAR SUSPENSION ROCKER ASSEMBLY-REMOVAL

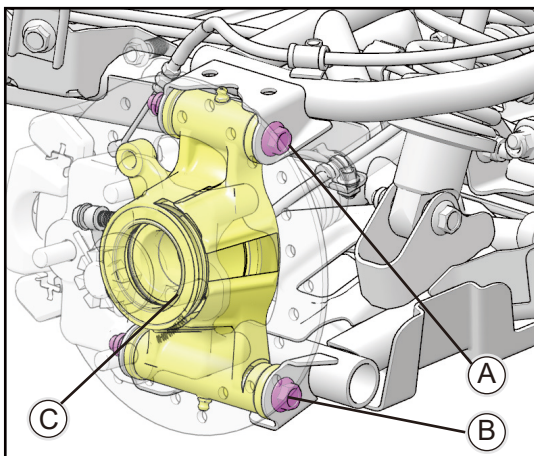


- ◆ **【A】** Rear upper rocker arm mounting bolt, nut
- ◆ **【B】** Rear lower rocker arm mounting bolt, nut
- ◆ **【C】** Brake pipe clamp fixing bolt
- ◆ **【D】** Stabilizer rod fixing nut
- ◆ **【E】** Rear wheel axle support upper fixing bolt, nut
- ◆ **【F】** Rear upper rocker arm assembly
- ◆ **【G】** Rear wheel axle support lower fixing bolt, nut
- ◆ **【H】** Rear lower rocker arm assembly
- ◆ Refer to Chapter 10 "Wheels and Tires"
- ◆ remove the shock absorber
- ◆ Remove the brake pipe clamp fixing bolt **【C】**
- ◆ Remove the rear upper rocker arm mounting bolt and nut **【A】**
- ◆ Remove the rear wheel shaft support upper fixing bolt and nut **【E】**
- ◆ Remove the rear upper rocker arm component **【F】**
- ◆ Remove the rear lower rocker arm mounting bolt and nut **【B】**
- ◆ Remove the stabilizer bar tie rod fixing nut **【D】**
- ◆ Remove the rear wheel shaft support lower fixing bolt and nut **【G】**
- ◆ Remove the rocker arm assembly **【H】**

Rear upper and lower rocker arm mounting nut

70 N·m (7.1kgf·m, 51ft·lb)

### REAR SUSPENSION REAR WHEEL AXLE MOUNT ASSEMBLY REMOVAL

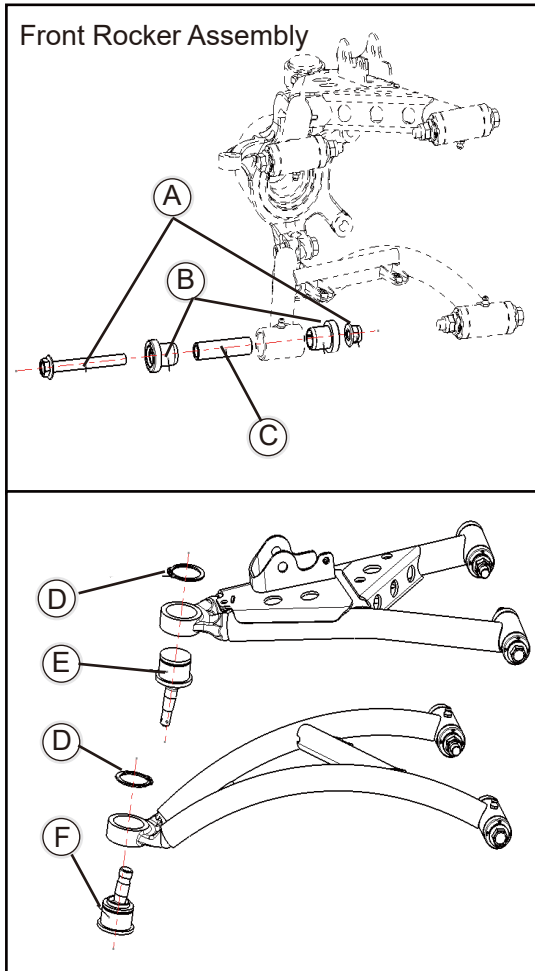


- ◆ **【A】** Fixing bolts and nuts on the rear wheel axle support
- ◆ **【B】** Rear wheel axle support lower fixing bolts and nuts
- ◆ **【C】** rear wheel axle support assembly
- ◆ For tire removal, refer to Chapter 10 "Wheels and Tires"
- ◆ Remove the shock absorber
- ◆ Remove the fixing bolts and nuts on the rear wheel axle support **【A】**
- ◆ Remove the lower fixing bolts and nuts of the rear wheel axle support **【B】**
- ◆ Refer to Chapter 8 "Transmission System" for removing the transmission half shaft"
- ◆ Remove the brake caliper. Refer to Chapter 11 "Brake System"
- ◆ Remove the rear wheel axle support assembly **【C】**

Rear wheel axle support upper and lower fixing nuts torque

70 N·m (7.1kgf·m, 51ft·lb)

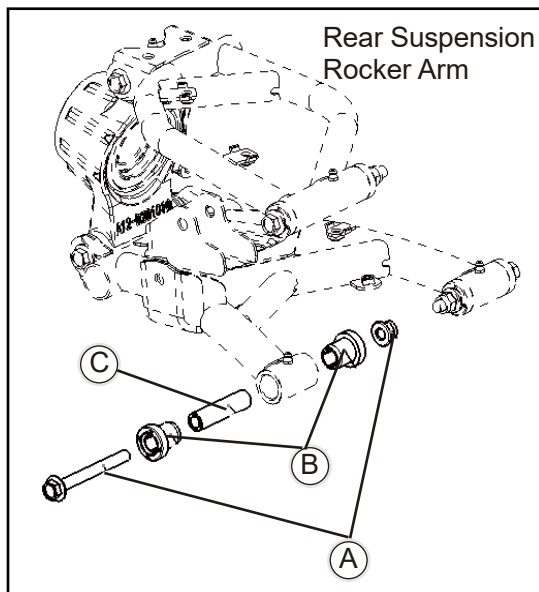
**DISASSEMBLY OF FRONT SUSPENSION  
ROCKER ARM**



- 【A】 Rocker arm assembly mounting bolt and nut
- 【B】 Rocker arm buffer bushing
- 【C】 rocker liner

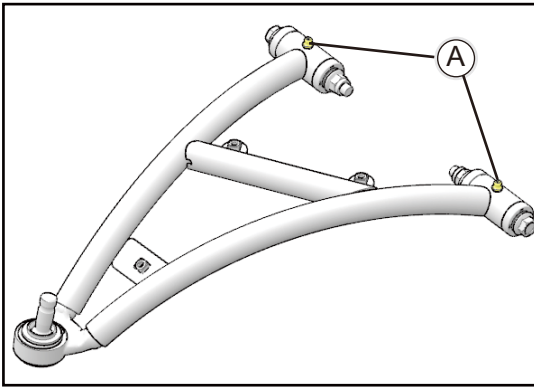
- 【D】 Elastic retaining ring for shaft
- 【E】 Upper kingpin assembly
- 【F】 lower kingpin assembly
- ◆ Remove the rocker arm assembly mounting bolts and nuts 【A】
- ◆ Remove the rocker arm liner 【C】
- ◆ Remove the rocker arm buffer bushing 【B】
- ◆ Remove the elastic retaining ring for shaft with circlip pliers 【D】
- ◆ Press out the upper kingpin assembly 【E】 and the lower kingpin assembly 【F】

**REAR SUSPENSION ROCKER ARM  
ASSEMBLY DISASSEMBLY**



- 【A】 Rocker arm assembly mounting bolt and nut
- 【B】 Rocker arm buffer bushing
- 【C】 Rocker Liner
- ◆ Remove the rocker arm assembly mounting bolts and nuts 【A】
- ◆ Remove the rocker arm liner 【C】
- ◆ Remove the rocker arm buffer bushing 【B】

### ROCKER ARM MAINTENANCE



【A】 straight-through oil cup

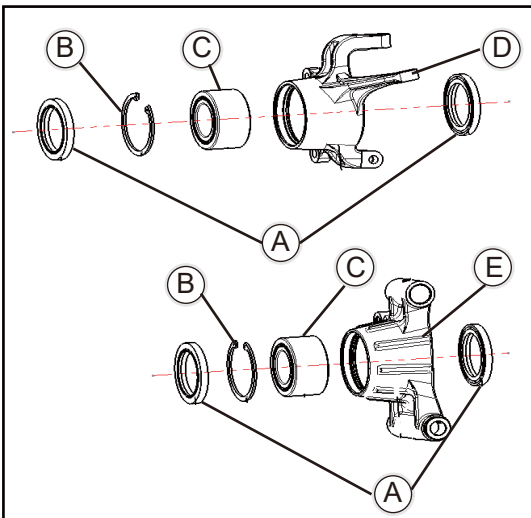
- ◆ Fill the straight-through oil cup with grease gun
- ◆ When the inspection finds that the grease in the axle support sleeve is reduced, or after the vehicle travels every 1000Km, use a grease gun to add grease to the straight-through oil cup in the suspension system (including the rear axle support and the rear stabilizer bar).
- ◆ Special appliance: grease gun

### ⚠ WARNING

If there is no proper amount of lubrication for the suspension joint, grease should be added and regular maintenance should be carried out to avoid excessive wear of the shaft sleeve.

### WHEEL HUB BEARING REPLACEMENT

If the steering knuckle assembly and the wheel hub bearing in the rear wheel axle support assembly are damaged, they need to be replaced.



【A】 half shaft oil seal 【B】 open retaining ring

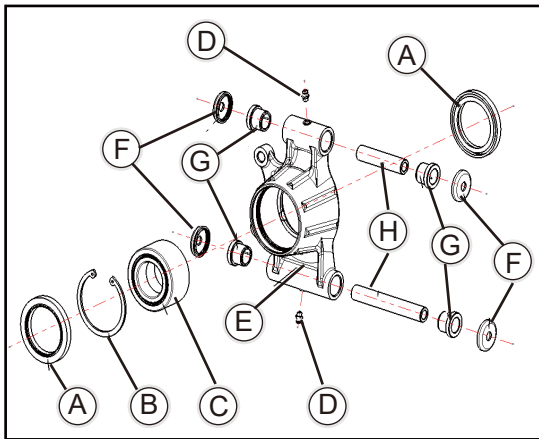
【C】 hub bearing

【D】 steering knuckle

【E】 Rear wheel axle support

- ◆ Remove the half shaft oil seal 【A】
- ◆ Remove the opening retaining ring 【B】
- ◆ Press out the hub bearing 【C】
- ◆ Remove the steering knuckle 【D】 or rear wheel axle support 【E】

Special appliances: circlip pliers, bearing driver group



## DISASSEMBLY OF REAR AXLE SUPPORT

## ASSEMBLY

- 【A】 Half Shaft Oil Seal
- 【B】 Open Retaining Ring
- 【C】 Hub Bearing
- 【D】 Straight Grease Nipple (Grease Cup)
- 【E】 Rear Axle Support
- 【F】 Oil Seal Cover
- 【G】 Buffer Sleeve
- 【H】 Axle Support Bushing Liner

- ◆ Remove the half shaft oil seal 【A】 .
- ◆ Remove the open retaining ring 【B】 .
- ◆ Press out the hub bearing 【C】 .

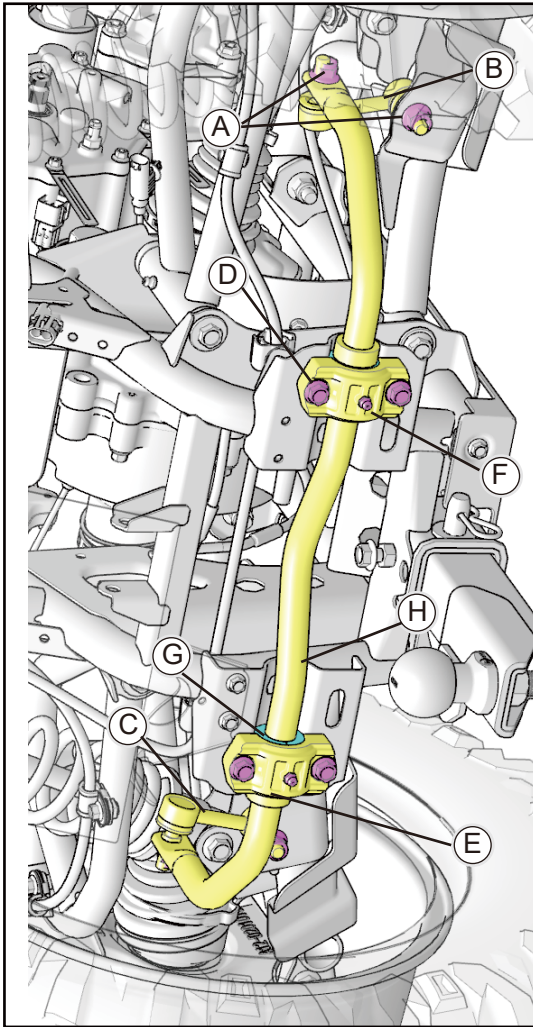
Special appliances: circlip pliers, bearing driver group

**▲ CAUTION**

Check the buffer sleeve 【B】 , if the inner hole is severely worn, replace it, and refill the grease after assembly.

## REAR STABILIZER BAR

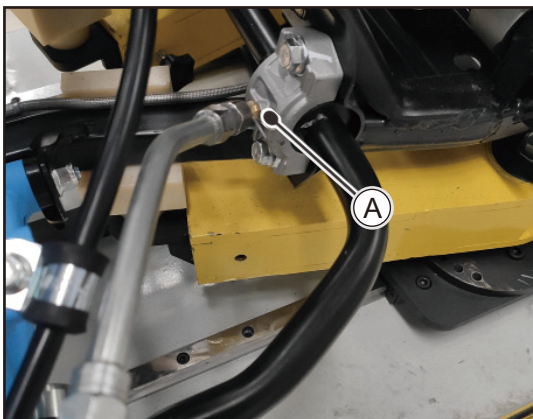
### DISASSEMBLY OF STABILIZER BAR



- 【A】 Stabilizer Bar Assembly Mounting Nut
  - 【B】 Left Stabilizer Bar Assembly
  - 【C】 Right Stabilizer Bar Assembly
  - 【D】 Mount Bracket Fixing Bolt
  - 【E】 Stabilizer Bar Mount Bracket
  - 【F】 Straight Grease Nipple
  - 【G】 Stabilizer Bar Bushing
  - 【H】 Rear Stabilizer Bar Assembly
- ◆ Remove the stabilizer bar assembly mounting nut 【A】 .
  - ◆ Remove the left stabilizer bar assembly 【B】 and right stabilizer bar assembly 【C】 .
  - ◆ Remove the mount bracket fixing bolt 【D】 .
  - ◆ Remove the stabilizer bar mount bracket 【E】 .
  - ◆ Remove the stabilizer bar bushing 【G】 and rear stabilizer bar assembly 【H】 .

Bolt
26 N·m (2.6kgf·m, 19ft·lb)

### MAINTENANCE OF STABILIZER BAR

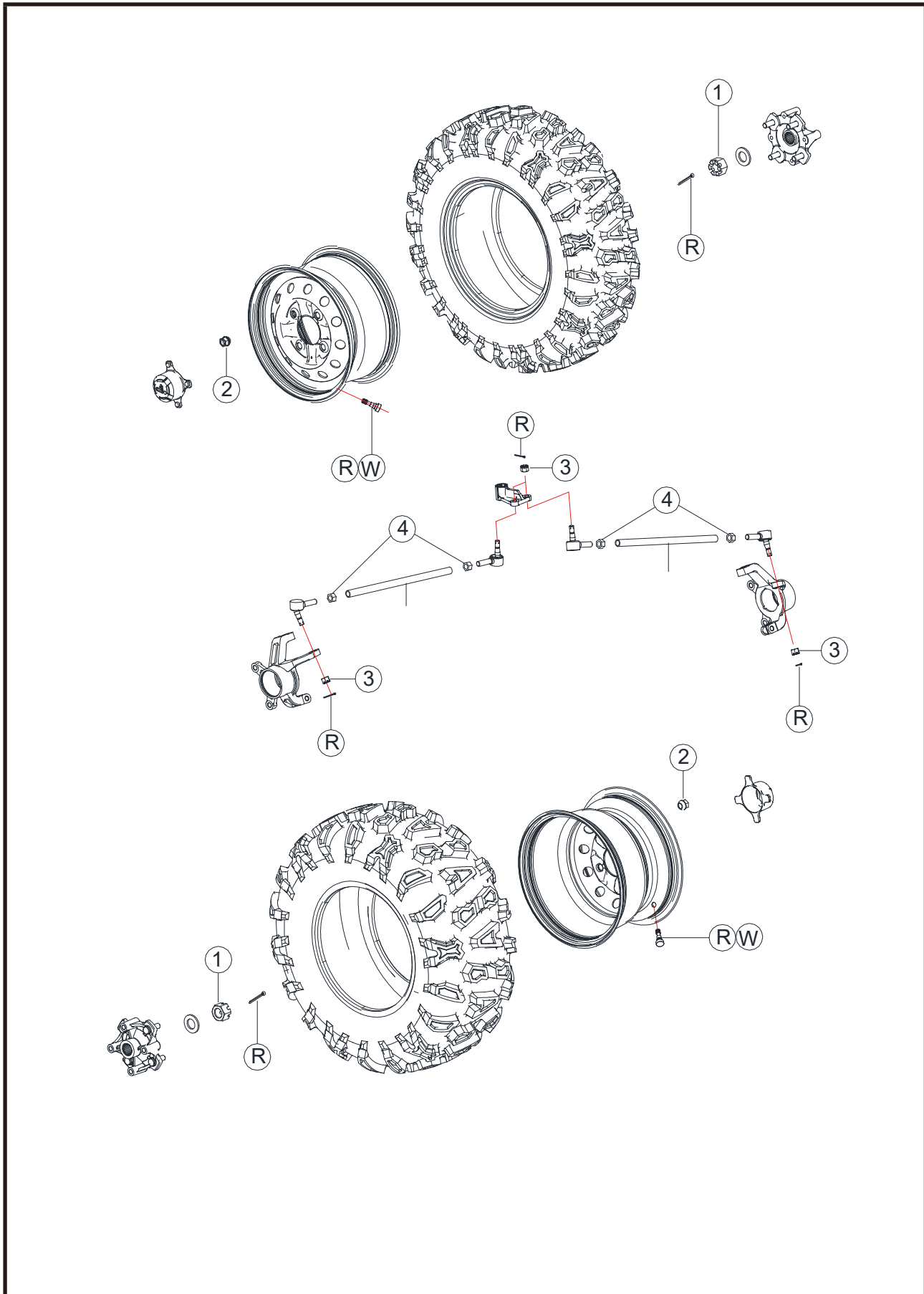


- 【A】 Straight Grease Nipple
- ◆ Fill an appropriate amount of grease into the stabilizer bar mounting bushing through the straight grease nipple 【A】 every 1000 km of vehicle operation.

# WHEELS AND TIRES

<b>EXPLODED VIEW OF WHEELS AND TIRES .....</b>	<b>10-2</b>
<b>TECHNICAL PARAMETERS.....</b>	<b>10-4</b>
<b>SPECIAL TOOLS.....</b>	<b>10-5</b>
<b>WHEEL ALIGNMENT .....</b>	<b>10-6</b>
FRONT BEAM INSPECTION.....	10-6
FRONT BEAM ADJUSTMENT .....	10-7
<b>WHEEL (RIM) .....</b>	<b>10-8</b>
WHEEL DISASSEMBLY.....	10-8
WHEEL ASSEMBLY .....	10-8
WHEEL CHECK .....	10-8
WHEEL (RIM) REPLACEMENT .....	10-9
<b>TIRE .....</b>	<b>10-10</b>
TIRE DISASSEMBLY .....	10-10
TIRE ASSEMBLY .....	10-10
TIRE DISASSEMBLY (FOR ANTI-DROP RIMS).....	10-12
TIRE ASSEMBLY .....	10-12
TIRE INSTALLATION (FOR BEADLOCK RIMS).....	10-13
TIRE INSPECTION .....	10-14
<b>WHEEL HUB .....</b>	<b>10-15</b>
TAKE THE WHEELS APART.....	10-15
WHEEL HUB ASSEMBLY .....	10-15
WHEEL HUB DISASSEMBLY/ASSEMBLY .....	10-15

## EXPLODED VIEW OF WHEELS AND TIRES



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Half shaft nut M24	250	25	184	
2	Wheel nut M12	110 ~ 120	11.0~12.0	74~88	
3	Tie rod end nut M10	40~50	4.0~5.0	30~36.9	
4	Tie rod adjustment lock nut M12	40~50	4.0~5.0	30~36.9	

**W: Water or soapy water solution.**

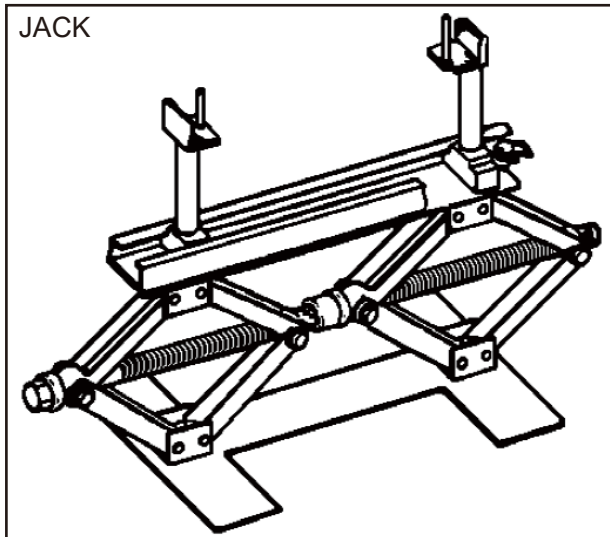
**R: Replacement parts**

### TECHNICAL PARAMETERS

Item	Standard	Use Limit
Wheel positioning: Front wheel and front bundle:	10±10mm (0.39±0.39inch)	---
Tires: Standard tire: <b>front</b>	27×9.00-14/27×9.00R14/30×10.00R14 (AT10 W)Tubeless Nylon	---
<b>rear</b>	27×11.00-14/27×11.00R14/30×10.00R14 (AT10 W)Tubeless Nylon	---
Tire pressure (in cold state) : <b>front</b>	48.3kPa (0.49 kgf/cm <sup>2</sup> , 7.0 psi)	---
<b>rear</b>	48.3kPa (0.49 kgf/cm <sup>2</sup> , 7.0 psi)	---
Maximum tire pressure (In cold state)	250 kPa (2.5 kgf/cm <sup>2</sup> , 36 psi)	---
Tread height of tire: <b>front</b>	---	3mm (0.12inch)
<b>rear</b>	---	3mm (0.12inch)

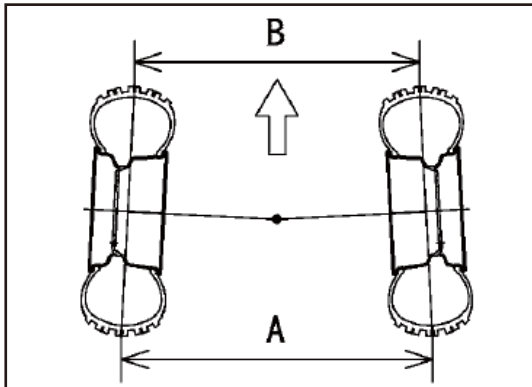
Item	AT10	AT10 W
Wheel alignment Front wheel front beam:	-5~20mm	-5~20mm
Main pin rear camber (°)	5	3
Wheel Camber (°)	-0.1	-0.1
Main pin camber (°)	8	8
Main pin offset (mm)	3.5	-0.5

### SPECIAL TOOLS



### WHEEL ALIGNMENT

#### FRONT BEAM INSPECTION

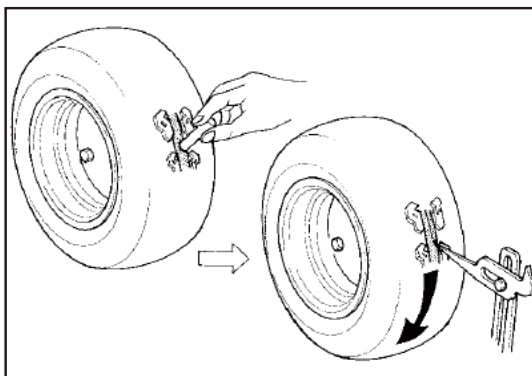


- ◆ The front beam is the distance between the front wheels at axle height and the rear. The difference in distance is called the anterior beam value. When there is A front beam, viewed from the top of the car, the distance A (rear) is greater than B (front), as shown in the figure.
- ◆ The function of the front beam is to prevent the front wheel from running off at any time and reduce the sliding friction between the tire and the ground. If the front beam is not correct, the front wheels will rub against the ground, causing tread damage or abnormal wear.

The caster and camber angles of the kingpin are built-in and do not require adjustment.

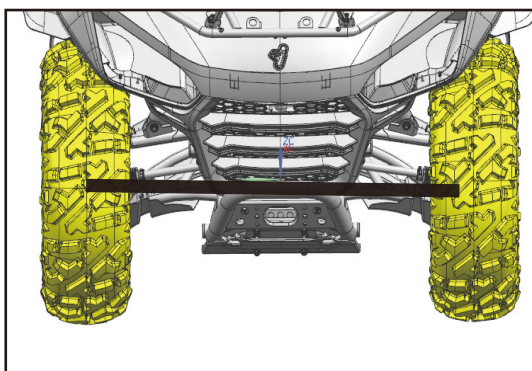
$$A \text{ (rear)} - B \text{ (front)} = \text{toe value}$$

(The distances A and B are measured at the height of the axle when the vehicle is parked on a flat surface.)

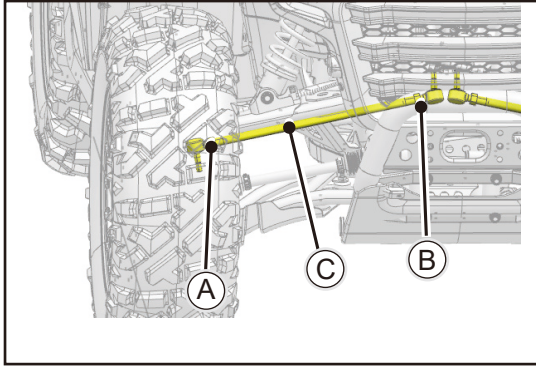


- ◆ Apply thick chalk or paint line near the center of the front tire.
- ◆ When turning a wheel, make a small mark near the center of the chalk coating with a needle marker.
- ◆ Place the front wheel on the ground and fix the handlebars.
- ◆ At axle height, measure the distance between front tire front and rear marking or paint line.
- ◆ The front beam is obtained by subtracting the measured value at the rear from the measured value at the front. If the forebeam is not within the specified range, continue the forebeam adjustment procedure.

**Standard: 10±10mm (0.39±0.39inch)**



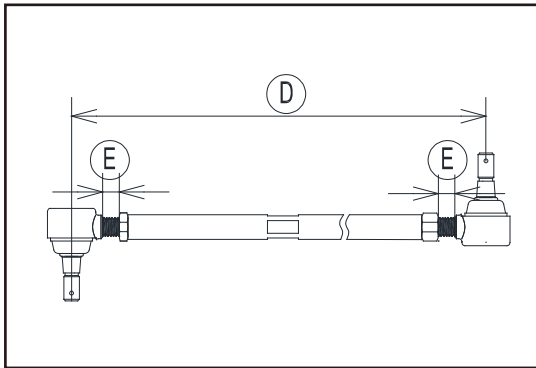
FRONT BEAM ADJUSTMENT



- ◆ Loosen the locknut [A][B] and turn the adjusting pull rod [C] for the same number of turns on both sides to reach the specified toe-in.

TIPS

- ◆ The lock nut 【A】 on the tie rod is a left-hand thread. Turn the locknut clockwise to loosen.
- ◆ If the toe-in reaches the specified value, the length 【D】 of each tie rod is 436~440mm(17.2~17.3 inches)



⚠ WARNING

Adjust the length of the horizontal pull rod so that the visible thread length 【E】 at both ends of the horizontal pull rod is even. Uneven thread length will cause damage to the end of the horizontal pull rod

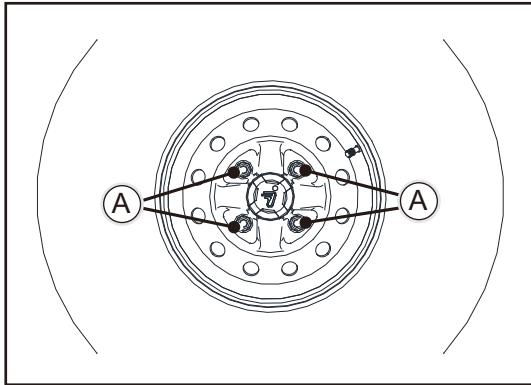
- ◆ Check the front beam
- ◆ Tighten:

Lock nut torque of Tie Rod
40~50N.m

- ◆ Test drive

## WHEEL (RIM)

### WHEEL DISASSEMBLY



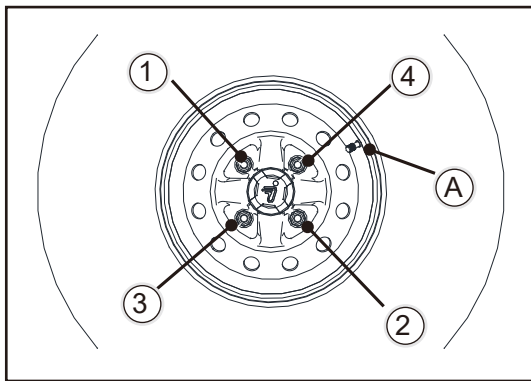
【A】 Wheel nut

- ◆ Loosen the wheel nut 【A】
- ◆ Support the vehicle with a bracket or jack to lift the wheels off the ground.

**Special tool: Jack.**

Tear down:

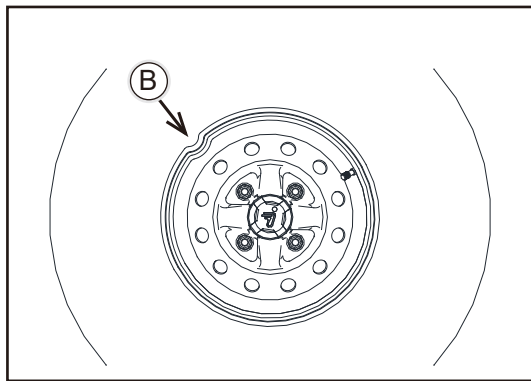
- ◆ Wheel nut
- ◆ wheel



### WHEEL ASSEMBLY

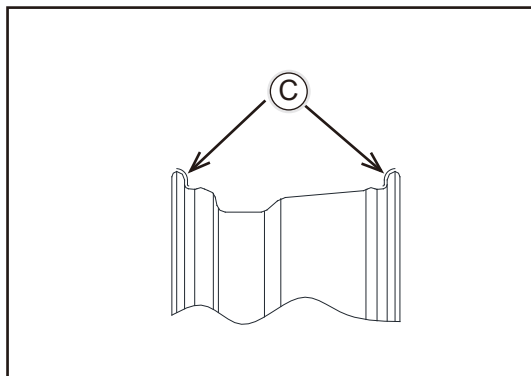
- ◆ Position the wheels so that the air valve 【A】 faces the outside of the vehicle
- ◆ Tighten the wheel nuts in a cross way

Tightening bolt torque
110 ~ 120N.M



### WHEEL CHECK

- ◆ Check whether there are depressions on both sides of the rim 【B】 . If there are depressions, please replace them.



- ◆ Remove the tire and check the air sealing surface 【C】 of the rim for scratches or scratches. If necessary, use a fine emery cloth to polish the air sealing surface.

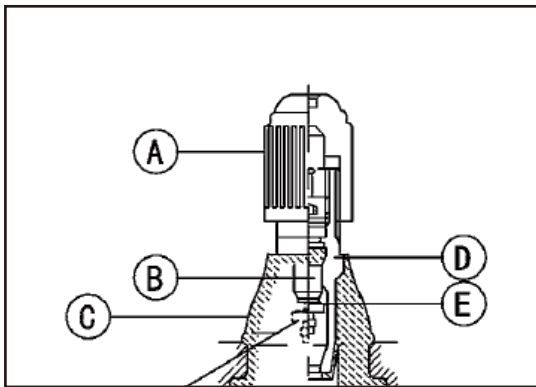
WHEEL (RIM) REPLACEMENT



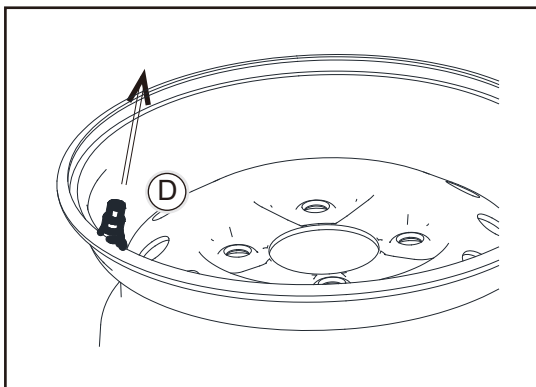
- ◆ Shake the wheel with both hands for excessive or abnormal movement, check whether the hub bearing is loose or damaged, if necessary, please replace the hub bearing.
- ◆ Remove the wheel (see Wheel removal).
- ◆ Remove tire from rim (see Tire removal).
- ◆ Remove the valve mouth assembly and throw away.

**⚠ CAUTION**

Replace the air valve every time you change the tire. Do not reuse the air valve.



- 【A】 Plastic cover
- 【B】 Spool
- 【C】 Stem seal
- 【D】 Stem
- 【E】 Seat



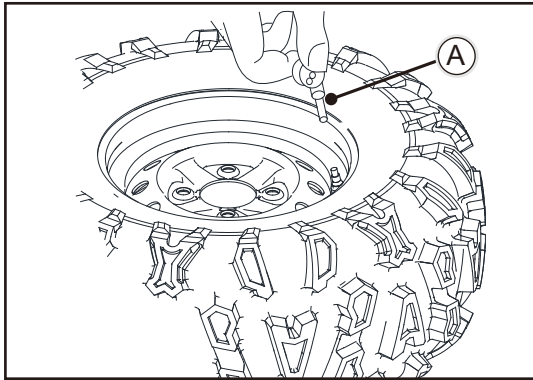
- ◆ Install new air valve on new rim.
- ◆ Remove bonnet, moisten stem with soap solution, and pull stem 【D】 from inside out through rim until it gets stuck in place.

**⚠ CAUTION**

Do not use oil or petroleum distillate to moisten the stem as it degrades rubber.

- ◆ Install the tire on the new rim (see Tire installation).
- ◆ Wheel mounting (please refer to wheel mounting)

### TIRE



#### TIRE DISASSEMBLY

- ◆ Remove the Tire
- ◆ Loosen the valve to deflate the tire.

#### USE THE APPROPRIATE SPOOL TOOL 【A】

- ◆ Lubricate the tires and rims on both sides of the wheel with soap solution or water 【B】. This helps the tires slide off the rim flange.

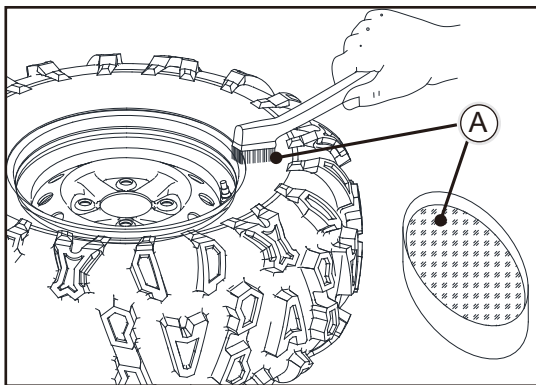
#### ⚠ CAUTION

Do not lubricate rim and tire rims with oil or petroleum fractions as they can spoil the tire.

- ◆ Remove the tire from the rim using a suitable commercial tire changer.

#### TIPS

Tires cannot be removed manually because they fit tightly to the rim.



#### TIRE ASSEMBLY

- ◆ Inspect the rim (see Wheel (Rim) Inspection).
- ◆ Replace the valve core with a new one.

#### ⚠ WARNING

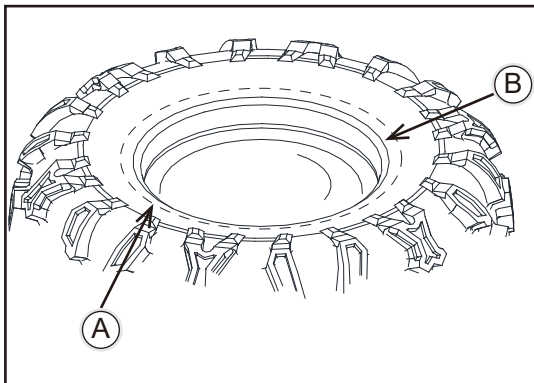
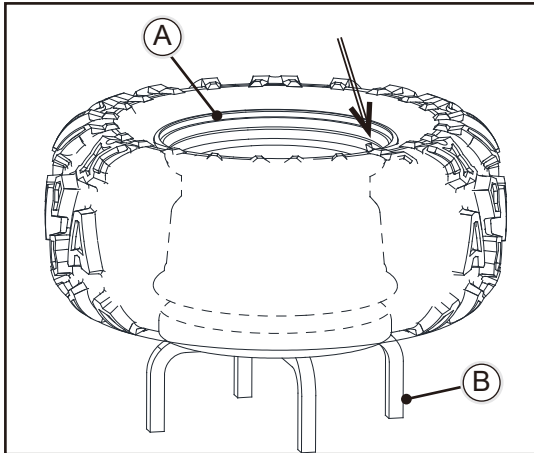
Whenever the tire is changed, the valve core must be replaced.

Do not reuse the valve core.

- ◆ Inspect tires for wear and damage (see Tire Inspection).
- ◆ Lubricate tire beads and rim flanges with a soap solution or water.

#### ⚠ CAUTION

Do not use lubricants other than a water-soap solution, and do not lubricate the beads and rims with water, as this may cause the tire to separate.



- ◆ Support the rim **A** on a suitable bracket **B** to prevent the tire from slipping off.

- ◆ Inflate the tire until the rim is fixed to the tire rim.

**Maximum air pressure of tire (fixed on wheel when cold)**

**front and rear: 250 kPa (2.5 kgf/cm<sup>2</sup>, 36 psi)**

### ⚠ WARNING

Do not inflate the tire above the maximum tire pressure. Overinflated air can cause a tire to explode, potentially causing injury and death.

- ◆ Check whether the rim lines **C** on both sides of the tire are parallel to the rim flange **D**.

- ◆ If the rim lines are not parallel to the rim flange, bleed the tire, moisten the sealing surface again, and inflate it again.

- ◆ Check whether there is air leak after the tire is in place correctly.

- ◆ Apply soap solution around the tire rim, and then check for air bubbles.

- ◆ Bleed the tire to the specified pressure.

### TIPS

Segway offers tire pressure gauges and user kits.

**Tire pressure (in cold state)**

**Front: 48.3 kPa (0.49 kgf/cm<sup>2</sup>, 7.0 psi)**

**Rear: 48.3 kPa (0.49 kgf/cm<sup>2</sup>, 7.0 psi)**

- ◆ Wheel mounting (see Wheel mounting).
- ◆ Wipe the soap and water solution from the tire and dry the tire before operation.

### ⚠ WARNING

Do not operate the vehicle while soap and water are still around the wheel rim, it can cause tyre separation and can lead to dangerous conditions.

### TIRE INSPECTION

- ◆ Refer to the "Wheels/Tires" section of the Regular Maintenance section.

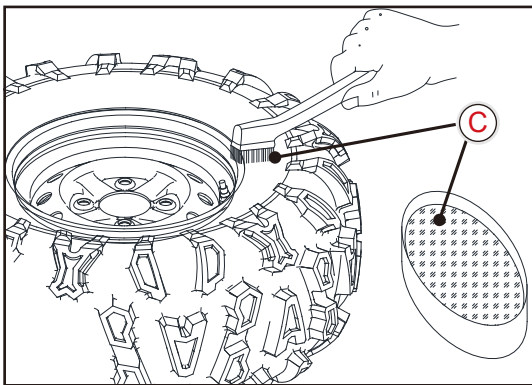
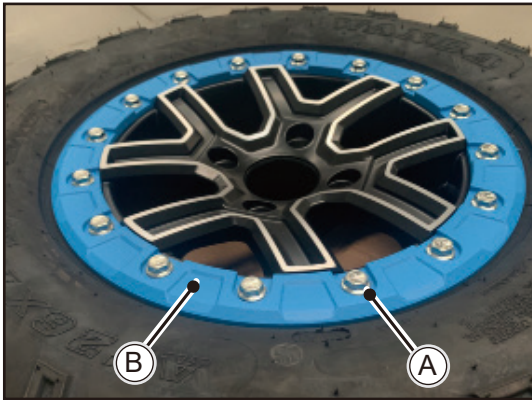
### TIRE DISASSEMBLY (FOR ANTI-DROP RIMS)

【A】 detachable ring fastening bolts

【B】 detachable coil

- ◆ Take off the wheel.
- ◆ Remove all detachable ring fastening bolts 【A】 .
- ◆ Remove the detachable coil 【B】 .

- ◆ Lubricate tires and rims on both sides of the wheel with soap solution or water 【C】 .This helps the tires slide off the rim flange.



#### ⚠ CAUTION

Do not lubricate rim and tire rims with oil or petroleum ingredients as they can spoil the tire.

- ◆ Remove the tire from the rim using a suitable commercial tire changer.

#### TIPS

Tires cannot be removed manually because they fit tightly to the rim.

### TIRE ASSEMBLY

- ◆ Check rim (refer to wheel check)
- ◆ Replace the valve mouth with a new one.

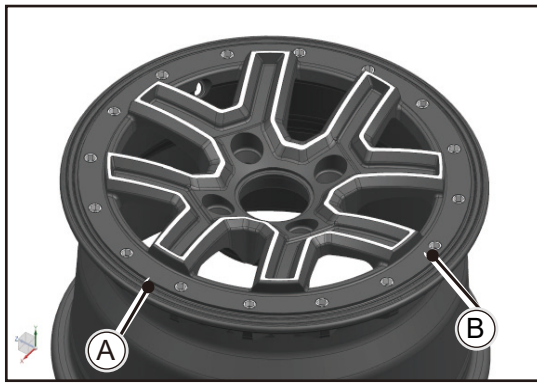
#### ⚠ WARNING

Whenever you change a tire, change the valve port. Do not reuse valve mouth.

- ◆ Check the tire for wear and damage (refer to tire inspection).
- ◆ Lubricate the tire rim and tire rim with soap solution or water.

#### ⚠ CAUTION

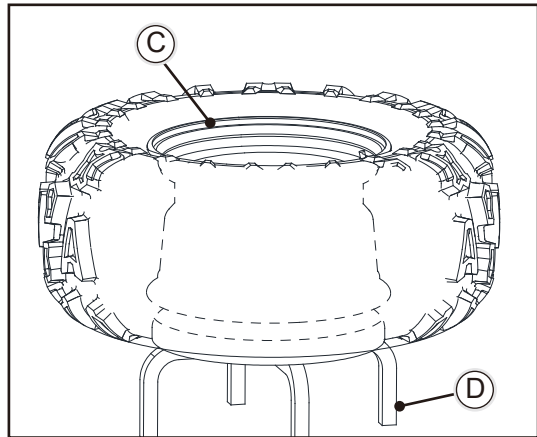
Do not use lubricants other than aqueous soap and water.



**TIRE INSTALLATION (FOR BEADLOCK RIMS)**

- ◆ Fasten the beadlock screw sleeve 【A】 to the rim 【B】 .
- ◆ If the beadlock rim screw sleeve 【A】 is damaged, replace the beadlock rim screw sleeve. If necessary, replace the rim 【B】 and the screw sleeve 【A】 as a whole.

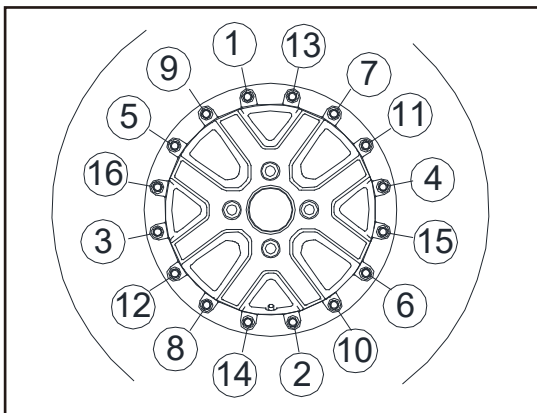
beadlock rim sleeve torque
22 ~ 25N.M



- ◆ Support the rim 【C】 on a suitable support 【D】 to prevent the tire from slipping.
- ◆ Apply tire mounting compound to the inner bead of the tire and the wheel on the side opposite to the beadlock to ensure that the tire is properly positioned when inflated and the inner bead is installed on the wheel.
- ◆ Place the outer bead of the tire on the shoulder of the inner ring of the beadlock and the center of the tire.
- ◆ Install all beadlock rim bolts.

**⚠ WARNING**

Never use an impact wrench to install the captive bolt. There is a risk of the bolt slipping or breaking when using an impact wrench.

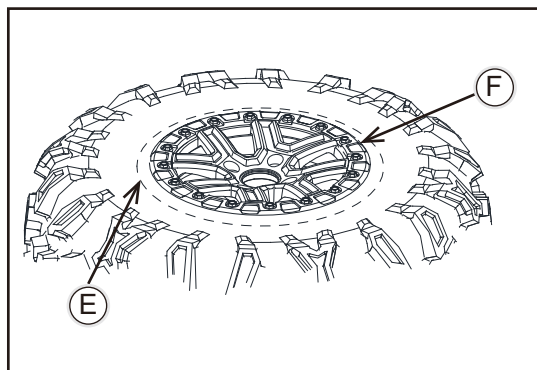


- ◆ Note: In order to ensure uniform force when locking the beadlock rim, tighten the torque diagonally manually for the first time.

Initial tightening torque of beadlock rim bolts
$14 \pm 1N \cdot M$

- ◆ For the second time, use a torque wrench to tighten the beadlock rim fastening bolts in a cross pattern as shown in the left figure.

Second tightening torque of beadlock rim bolt
$25 \pm 1N \cdot M$



- ◆ Check whether the rim line 【E】 on both sides of the tire is parallel to the edge of the beadlock/rim flange 【F】 and the relative clearance around the perimeter is uniform.
- ◆ If the rim line and the edge of the beadlock/rim flange are not parallel or the relative clearance around the perimeter is uneven, deflate the tire, lubricate the sealing surface again, and then re-inflate.
- ◆ Use a torque wrench for the last time and tighten in a clockwise direction.

The third tightening torque of the beadlock rim bolt
$25 \pm 1N \cdot M$

**⚠ CAUTION**

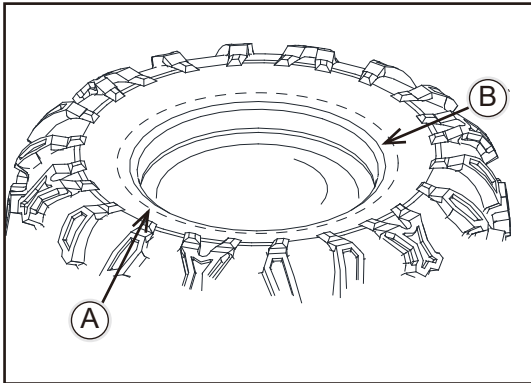
The beadlock rim bolts should be checked and retightened every 450 km the vehicle travels.

- ◆ Inflate the tire until the tire bead is fixed on the rim.
- ◆ Maximum tire inflation pressure (can be fixed on the rim when cold)

**Front and rear: 250 kPa (2.5kgf/cm<sup>2</sup>, 36 psi)**

### **⚠ WARNING**

Do not inflate tires above the maximum tire pressure. Overinflation can cause the tire to explode, potentially resulting in personal injury and death.



- ◆ After the tire is properly in place, check for leaks.
- ◆ Apply a soapy water solution around the tire bead, and then check for bubbles.
- ◆ Deflate the tire to the specified pressure.
- ◆ Use an air pressure gauge to check tire pressure.

### **TIPS**

Segway offers a tire pressure gauge and a user tool kit.

**Tire pressure (when cold)**

**Front: 48.3 kPa (0.49 kgf /cm<sup>2</sup>, 7.0 psi)**

**Rear: 48.3 kPa (0.49 kgf /cm<sup>2</sup>, 7.0 psi)**

- ◆ Install the wheel (see Wheel Installation).
- ◆ Wipe off the soap and water solution on the tire and dry the tire before operation.

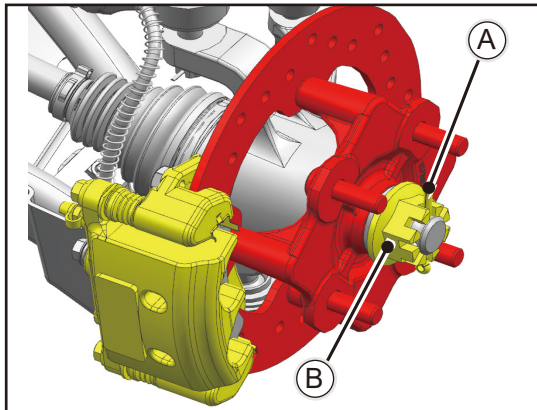
### **⚠ WARNING**

Do not operate your vehicle with the soap and water solution still around the rims, it can cause the tire to separate and could result in a dangerous situation.

### **TIRE INSPECTION**

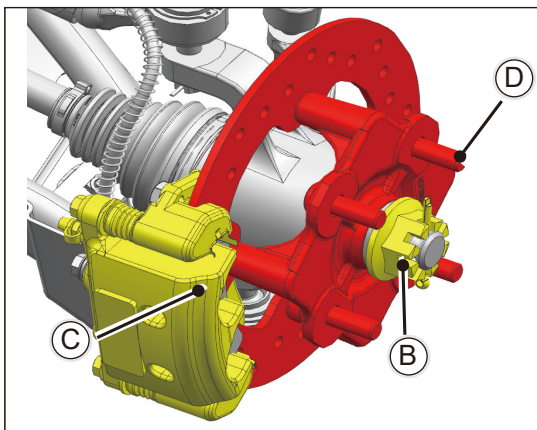
- ◆ Please refer to the "Wheels/Tires" chapter in the Periodic Maintenance section.

WHEEL HUB

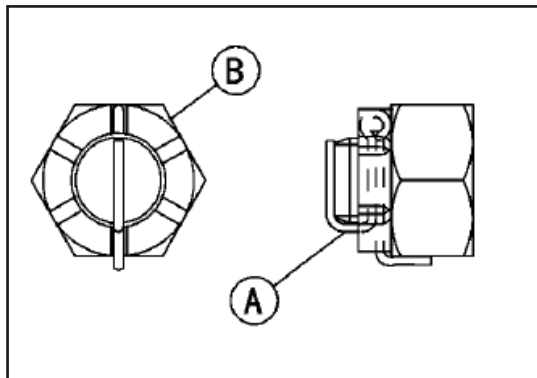


TAKE THE WHEELS APART

- ◆ Remove the wheel (see Wheel removal).
- ◆ Remove cotter pin 【A】
- ◆ Loosen half shaft nut 【B】



- ◆ Unscrew the mounting bolts, remove the calipers 【A】 , and do not let the calipers hang freely.
- ◆ Remove the axle nut 【B】 and then pull down the hub assembly 【C】 and brake disc.
- ◆ Separate the brake disc from the hub.



WHEEL HUB ASSEMBLY

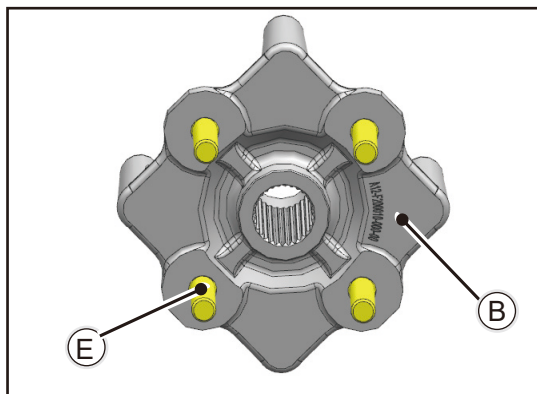
- ◆ Installing a brake disc (see "Braking" chapter)

Tighten axle nut torque
250 N.m ( 25 kgf·m, 184 ft·lb )

- ◆ Insert the new cotter 【A】 and bend it to the nut 【B】 .

**CAUTION**

- ◆ When inserting the cotter, if the slotted nut does not align with the open pin hole in the half shaft, tighten the nut clockwise until the next hole is aligned.
- ◆ Loosen once and tighten again as the slot passes through the nearest hole.



WHEEL HUB DISASSEMBLY/ASSEMBLY

- ◆ No need to press out hub bolts 【E】 .
- ◆ If any hub bolts are damaged, please replace hub mounting seat 【F】 and bolt 【E】 totally.

# BRAKE SYSTEM

<b>EXPLODED VIEW OF BRAKING SYSTEM</b> .....	<b>11-4</b>
<b>PARKING BRAKE EXPLOSION DIAGRAM</b> .....	<b>11-5</b>
<b>TECHNICAL PARAMETERS</b> .....	<b>11-6</b>
<b>SPECIAL TOOLS</b> .....	<b>11-6</b>
<b>BRAKE FLUID</b> .....	<b>11-7</b>
BRAKE FLUID FILLING FOR FOOT BRAKE MASTER CYLINDER .....	11-8
BRAKE FLUID FILLING FOR PARKING BRAKE MASTER CYLINDER .....	11-8
BRAKE BLEEDING .....	11-9
BLEEDING OF THE FOOT BRAKE SYSTEM .....	11-9
HAND BRAKE SYSTEM EXHAUST .....	11-10
<b>REMOVAL OF THE FOOT BRAKE MASTER CYLINDER/INSTALLATION</b> .....	<b>11-11</b>
REMOVAL OF THE FOOT BRAKE MASTER CYLINDER.....	11-11
INSTALLATION OF FOOT BRAKE MAIN PUMP .....	11-12
<b>FRONT BRAKE ASSEMBLY</b> .....	<b>11-13</b>
REMOVAL OF FRONT BRAKE ASSEMBLY .....	11-13
<b>FRONT BRAKE CALIPER BODY</b> .....	<b>11-14</b>
FRONT BRAKE CALIPER BODY REMOVAL .....	11-14
FRONT BRAKE CALIPER BODY INSTALLATION .....	11-15
<b>FRONT BRAKE PAD</b> .....	<b>11-16</b>
FRONT BRAKE PAD REMOVAL.....	11-16
FRONT BRAKE PAD INSTALLATION.....	11-16
FRONT BRAKE PAD WEAR INSPECTION .....	11-16
<b>FRONT BRAKE DISC</b> .....	<b>11-17</b>
FRONT BRAKE DISC CLEANING .....	11-17
FRONT BRAKE DISC REMOVAL .....	11-17
FRONT BRAKE DISC INSTALLATION .....	11-17
FRONT BRAKE DISC INSPECTION .....	11-17
<b>REAR BRAKE ASSEMBLY</b> .....	<b>11-18</b>
REAR BRAKE ASSEMBLY REMOVAL .....	11-18
REAR BRAKE ASSEMBLY INSTALLATION .....	11-18
<b>REAR BRAKE CALIPER BODY</b> .....	<b>11-19</b>
REAR BRAKE CALIPER BODY REMOVAL .....	11-19
REAR BRAKE CALIPER BODY INSTALLATION.....	11-20
<b>REAR BRAKE PAD</b> .....	<b>11-21</b>
REAR BRAKE PAD REMOVAL.....	11-21
REAR BRAKE PAD INSTALLATION .....	11-21

REAR BRAKE PAD WEAR INSPECTION .....	11-21
<b>REAR BRAKE DISC .....</b>	<b>11-22</b>
REAR BRAKE DISC CLEANING .....	11-22
REAR BRAKE DISC REMOVAL .....	11-22
REAR BRAKE DISC INSTALLATION.....	11-22
REAR BRAKE DISC INSPECTION.....	11-22
<b>REAR BRAKE PEDAL .....</b>	<b>11-23</b>
BRAKE PEDAL POSITION ADJUSTMENT .....	11-23
REAR BRAKE PEDAL REMOVAL .....	11-23
INSTALLATION OF REAR BRAKE PEDAL .....	11-23
<b>PARKING CABLE.....</b>	<b>11-24</b>
PARKING CABLE REMOVAL .....	11-24
INSTALLATION OF PARKING CABLE.....	11-24
TROUBLESHOOTING BRAKE NOISE.....	11-25
TROUBLESHOOTING BRAKE NOISE.....	11-25
<b>BRAKE SYSTEM TROUBLESHOOTING .....</b>	<b>11-25</b>

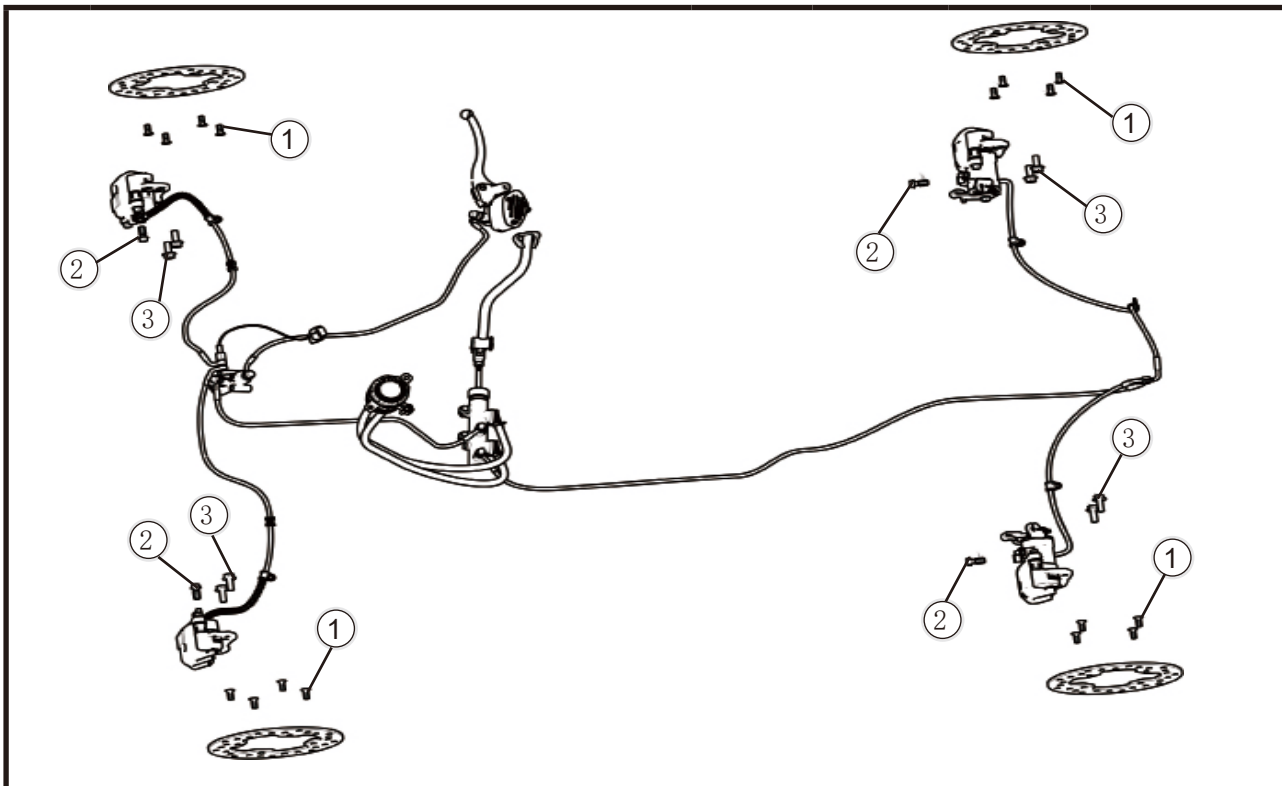
Disc brake systems are lightweight, low-maintenance and perform well in conditions commonly encountered by vehicles. When replacing disc brake pads or performing brake system repairs, there are a few things to remember to ensure proper system function and maximum brake pad life.

- ◆ Do not overfill the master cylinder reservoir.
- ◆ Make sure the brake pedal moves freely and is not stuck.
- ◆ After replacing or repairing the brake pads, check and adjust the fluid level in the master cylinder reservoir.
- ◆ Make sure the atmospheric vent on the reservoir is clear.
- ◆ Test brake drag after any brake system repairs and, if brake drag is evident, investigate the cause.
- ◆ Make sure the caliper moves freely on the guide pins (if applicable).
- ◆ Inspect the caliper piston seal for foreign matter that may prevent the caliper piston from returning freely.
- ◆ After installing new brake pads, perform a brake break-in procedure to extend service life.
- ◆ Do not use aerosols or petroleum products to lubricate or clean brake components. Use only approved brake cleaning products.

The braking system consists of the following components or assemblies: brake pedal, master cylinder, hydraulic brake lines, brake calipers, brake pads and brake discs.

When braking is initiated, pressure is applied to the piston in the master cylinder by pressing the brake pedal. As the master cylinder piston moves inward, it closes the small opening in the cylinder (the compensating port) and begins to build pressure within the braking system. When the pressure in the system increases, the piston in the brake caliper moves outward to push the brake pad into contact with the brake disc and apply clamping pressure to the brake disc. This creates a gap between the brake pad and the brake disc. Friction to achieve the purpose of deceleration or braking. The friction exerted on the brake pads causes the brake pads to wear. As these brake pads wear, the pistons in the calipers move further outward and adjust themselves to automatically compensate. As the brake caliper piston moves outward, fluid from the reservoir fills the increased amount of fluid in the lines required due to wear on the brake pads or discs. Brake fluid level is critical to the proper operation of the system. Too little fluid can allow air to enter the system and make the brakes feel spongy. Excess fluid can cause the brakes to drag due to fluid expansion. The compensation port is located in the master cylinder and opens and closes according to the movement of the master cylinder piston. This port compensates for the expansion or contraction of the fluid as the temperature within the hydraulic system changes. Since high temperatures are generated within the braking system during braking, it is important that the master cylinder reservoir has enough space to allow the fluid to expand. Never overfill the reservoir! Do not fill the reservoir above the maximum level line!

## EXPLODED VIEW OF BRAKING SYSTEM

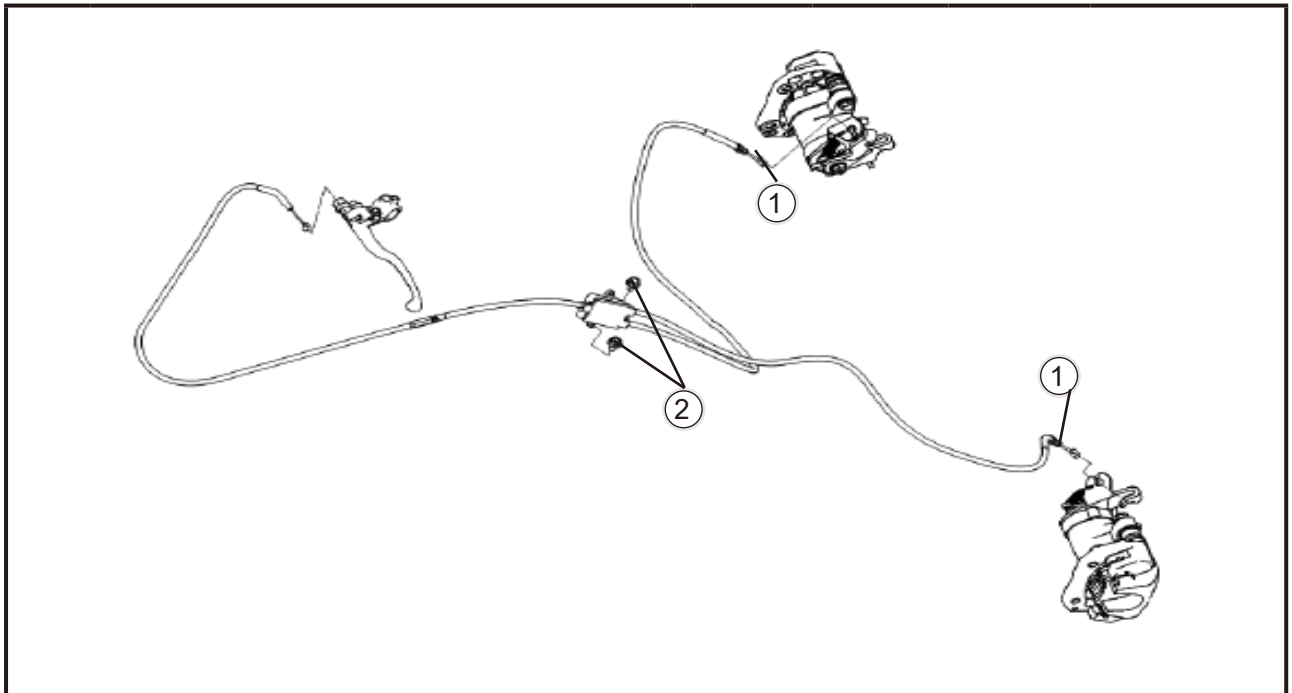


NO.	FASTENER	TORQUE			REMARKS
		N·M	KGF·M	FT·LB	
1	Brake disc mounting bolts	25	2.5	18	L
2	brake hose mounting bolts	25	2.5	18	
3	Brake fastening bolt	45	4.5	33	L

L: Use non-permanent locking agent

1. Brake disc bolts, brake main pump bolts, and brake fastening bolts need to be inspected and tightened regularly.
2. The dust cover of the brake sliding rod needs to be coated with silicone oil to ensure flexible movement.

**PARKING BRAKE EXPLOSION DIAGRAM**



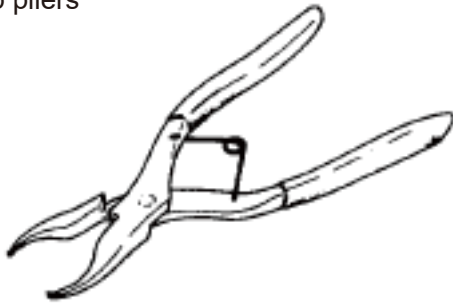
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Parking Brake Lever Screw	8.8	0.9	78in.lb	
2	Junction box fastening bolts	8.8	0.9	78in.lb	

## TECHNICAL PARAMETERS

Item	Standard	Use Limit
Brake fluid: type	Total DOT 4	---
Front and rear brake pad parameters: Brake pad thickness	5.0 mm (0.19 in)	1.5 mm (0.06 in)
Front and rear brake disc parameters: Brake disc thickness	4.8~5.2mm (0.19~ 0.205 in)	4 mm (0.16 in)
Brake disc jump	TIR 0.08 mm (0.003 in.) or less	TIR 0.1 mm (0.004 in)
Rear brake pedal: Parking handle working stroke	20~25 mm (0.8~ 0.98in.)	---
Rear brake pedal working stroke	25~30 mm (1.0~1.2in.)	---

## SPECIAL TOOLS

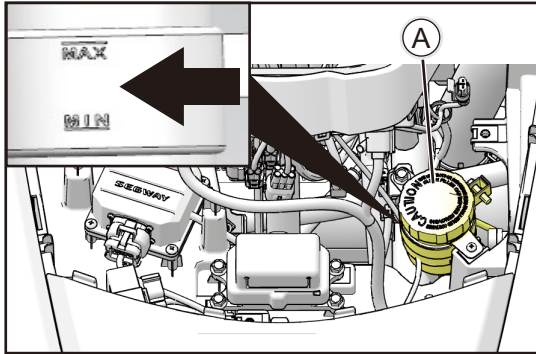
circlip pliers



**BRAKE FLUID****⚠ WARNING**

1. When using disc brakes, please observe the following precautions.
  2. 1. Never reuse old brake fluid.
  3. 2. Do not use brake fluid that is not sealed or has been opened for a long time.
  4. 3. Do not mix two brands of brake fluid. This lowers the boiling point of the brake fluid and may cause the brakes to become ineffective. It may also cause rubber brake components to deteriorate.
  5. 4. Do not open the brake fluid reservoir cap for a long time to prevent the brake fluid from being contaminated by moisture.
  6. 5. Do not change brake fluid on rainy days or when there is strong wind.
  7. 6. Only use isopropyl alcohol or ethanol to clean brake parts except brake pads and discs. Do not use any other liquid to clean these parts
  8. point. Gasoline, engine oil, or any other petroleum extract can cause rubber parts to deteriorate. Oil spilled anywhere is difficult to clean completely and will eventually deteriorate the rubber in your disc brakes.
  9. 7. When handling the brake pads and brake discs, be careful not to let brake fluid or any oil get on the brake pads and brake discs. Do not use products that leave an oily residue. If it cannot be cleaned, replace the brake pads with new ones.
  10. 8. Brake fluid will quickly damage the paint. any spilled fluid should be flushed immediately and completely
-

### BRAKE FLUID FILLING FOR FOOT BRAKE MASTER CYLINDER



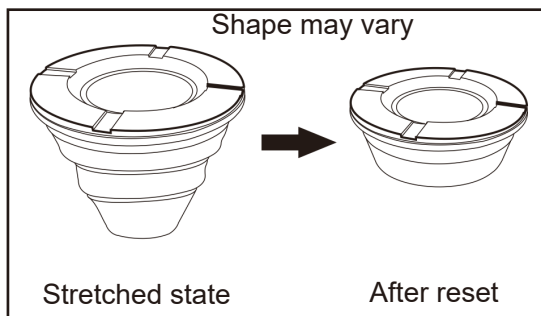
- ◆ Master Cylinder Fluid Level: Between the MIN and MAX marks.

【A】 Foot Brake Fluid Reservoir

1. The foot brake fluid reservoir 【A】 is located under the instrument panel assembly. For the removal of the instrument panel assembly, refer to Chapter 13 Instrument Panel Assembly Disassembly.

2. Unscrew the fluid reservoir cap of the foot brake master cylinder.

- ◆ Top up the brake fluid to between the MIN and MAX marks of the reservoir.
- ◆ The reservoir gasket must be reset before tightening the reservoir cap.
- ◆ Inspect the brake system for fluid leakage.

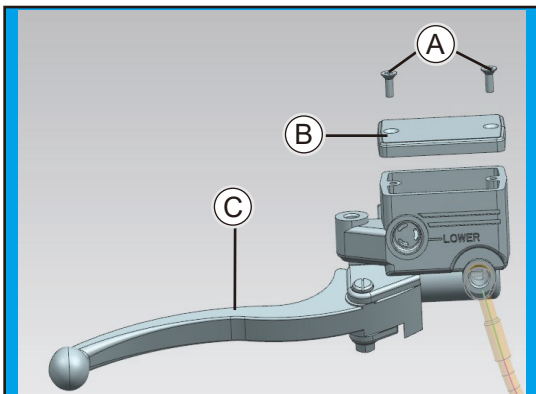


### BRAKE FLUID FILLING FOR PARKING BRAKE MASTER CYLINDER

between the min and max lines.

#### ⚠ CAUTION

Maintain at least a minimum level of brake fluid in the reservoir to prevent air from entering the master cylinder.



【A】 Oil cup cover fastening screw

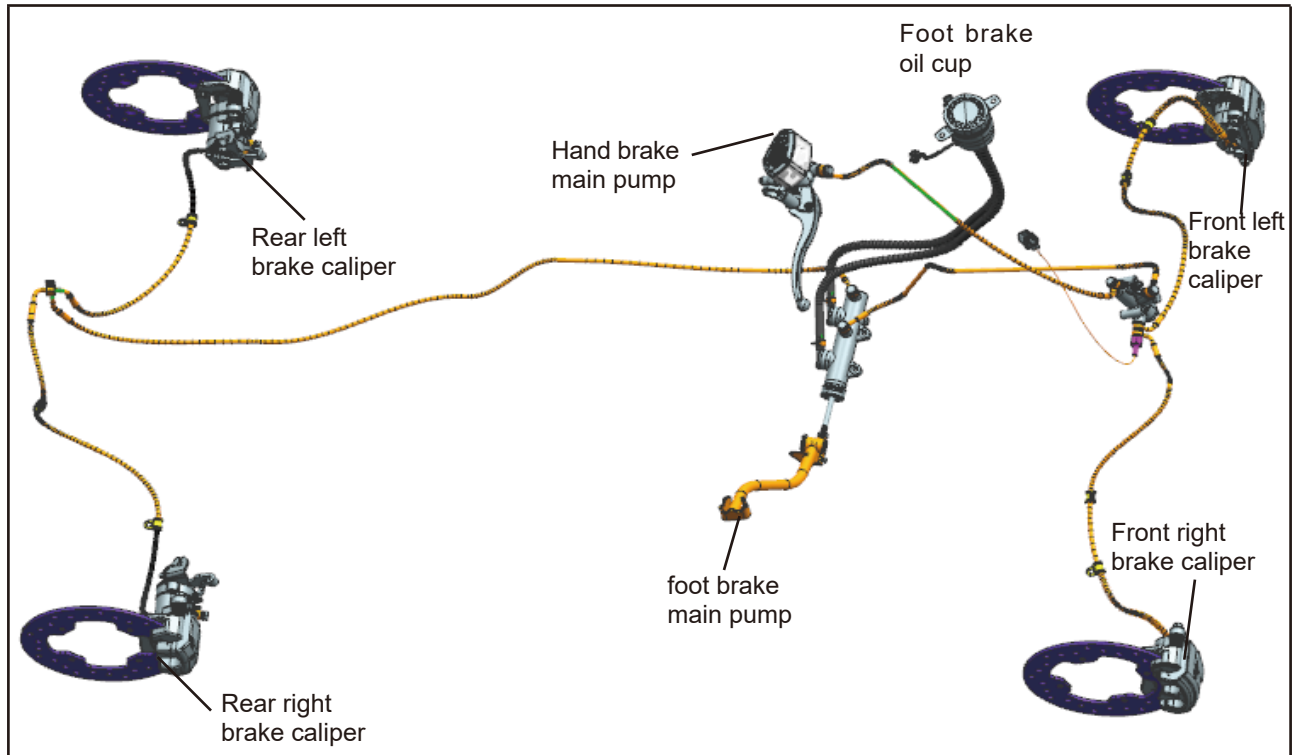
【B】 Oil cup cover

【C】 Front brake handle

- ◆ Before tightening the oil cup cap, the oil cup gasket must be reset.
- ◆ Before being put into use, conduct field tests on the complete vehicle at low speed. Check whether the front brake action and front brake handle free travel are correct. After the brake handle is pinched and released, the free travel of the brake handle should be no less than 1/2" (1.3cm).
- ◆ Check the brake system for fluid leaks

### BRAKE BLEEDING

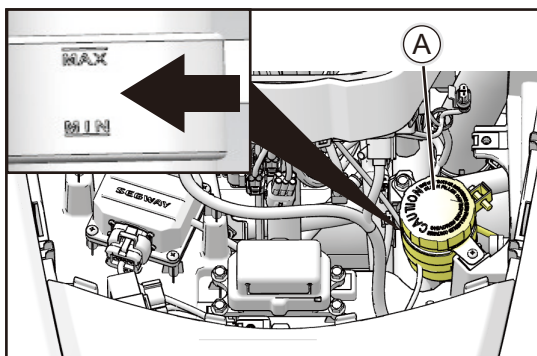
Replace any parts in the brake system, such as brake calipers, brake oil pipes, hand brake main pump, foot brake main pump assembly, foot brake oil cup, etc., and exhaust the brake system.



When bleeding your brakes or changing your brake fluid, always start with the caliper furthest from the master cylinder. Use this procedure to change the brake fluid or bleed the brakes during scheduled maintenance.

#### **⚠ WARNING**

Always wear safety glasses. Brake fluid can damage the surface of parts. Do not let brake fluid come into contact with the surface of the part.



### BLEEDING OF THE FOOT BRAKE SYSTEM

#### 【A】 Foot Brake Fluid Reservoir

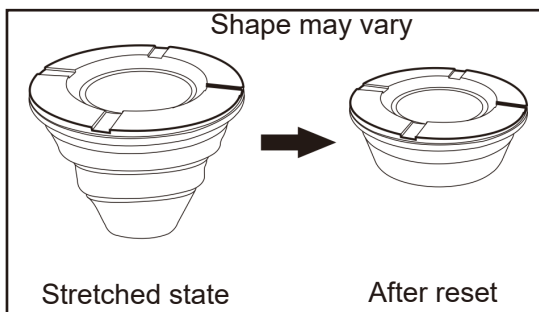
1. The foot brake fluid reservoir 【A】 is located under the instrument panel assembly. For removal of the instrument panel assembly, refer to Chapter 13 Instrument Panel Assembly Disassembly.
2. Unscrew the cap of the foot brake fluid reservoir 【A】.
3. Top up the brake fluid to the MAX (maximum fluid level) of the reservoir.

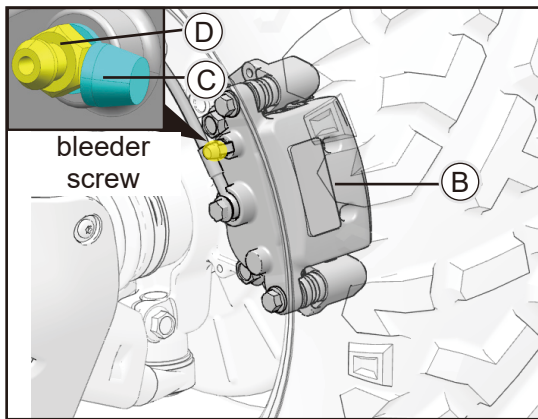
#### **⚠ CAUTION**

After adding or replacing brake fluid, check whether the oil coaster under the oil cup cover is in an extended state. If the oil coaster is in an extended state, the oil coaster needs to be reset (as shown in the figure). If the oil cup gasket is not reset, the brake fluid will overflow the oil cup when the oil cup cap is tightened.

Brake fluid can damage plastics and painted surfaces, so use caution when adding it.

If brake fluid comes into contact with skin or eyes, please rinse immediately with plenty of water. If you still feel unwell, please seek medical attention immediately.

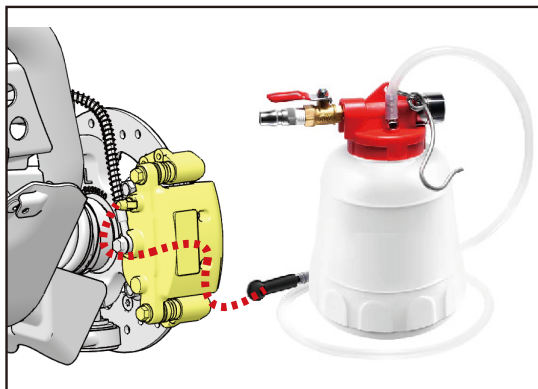




4. During bleeding, start sequentially from the caliper farthest from the master cylinder (the rear left brake caliper).
5. Peel back the dust boot 【C】 on the side of the rear left brake caliper 【B】, and loosen the bleeder screw with a wrench.
6. Connect one end of the hose of the special vacuum bleeding equipment to the bleeder screw.

### TIPS

The operating procedures for the special vacuum bleeding equipment vary slightly by model; follow the instructions for the actual equipment in use.



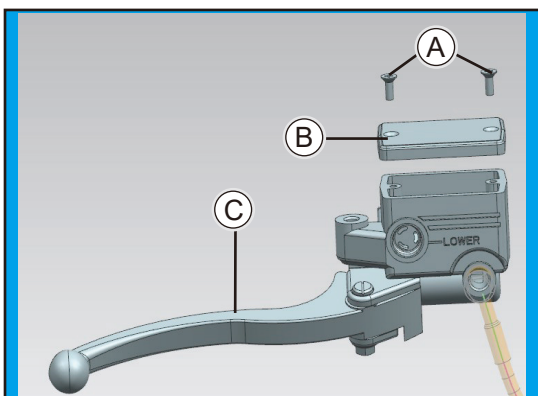
7. The brake fluid level will drop during vacuuming; continuously top up new brake fluid into the fluid reservoir and keep the fluid level between the MAX and MIN marks at all times.
8. Continue the process until no air bubbles are present in the hose, then remove the hose and tighten the bleeder screw to the specified torque.

#### Bleed screw torque

10-15 N·m

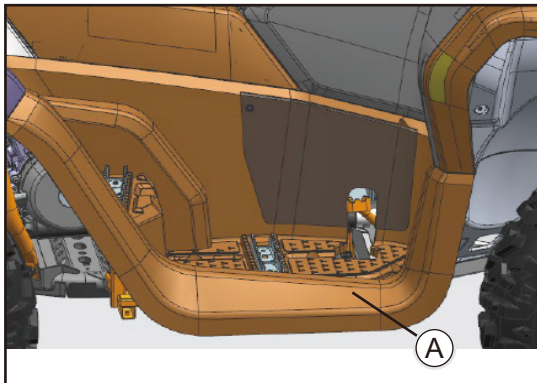
9. After the rear left brake caliper end is exhausted, then the rest of the brake card pliers (rear right, front left, front right) repeat steps 5-8 to exhaust.
10. After the 4 calipers are exhausted, re-tighten the cover of the foot brake oil cup.
11. Before putting into use, carry out field test on the whole vehicle at low speed. Check that the rear brake action and pedal idle travel are correct. After stepping on the pedal firmly, the pedal idle stroke shall not be less than 1/2 "(1.3cm).
12. Check the brake system for oil leakage.

### HAND BRAKE SYSTEM EXHAUST



1. The handbrake oil cup [A] is located on the right side of the steering handle.
2. Remove the bolt on the cover of the oil cup [A].
3. Refill the brake fluid to the highest level MAX of the oil cup.
4. Pinch the brake handle completely and hold it.
5. Release the brake handle, check the liquid level in the reservoir, add if necessary, and always ensure that the liquid level in the oil cup is between the "MAX" and "MIN" scale lines.
6. Repeat steps 5-6 until the brake handle is secure.

**REMOVAL OF THE FOOT BRAKE MASTER CYLINDER/INSTALLATION**

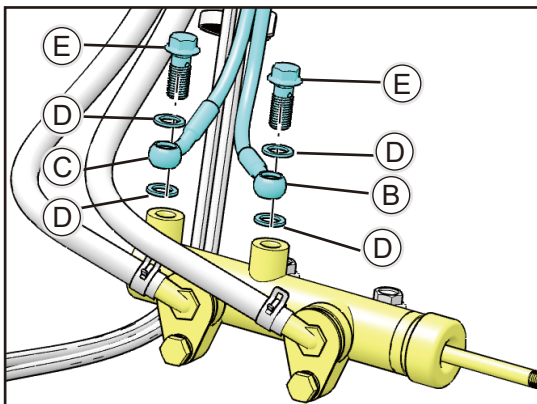


**REMOVAL OF THE FOOT BRAKE MASTER CYLINDER**

- ◆ Remove the right foot pedal assembly **【A】** .

**⚠ CAUTION**

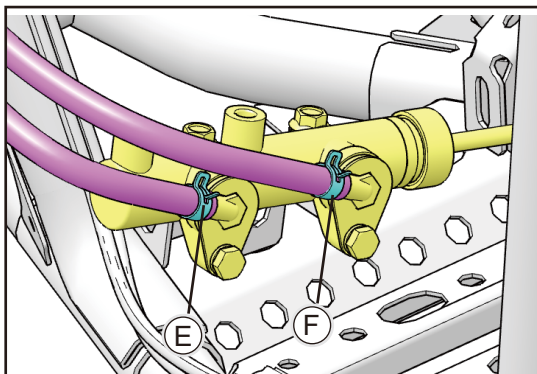
Brake fluid can damage component surfaces. Do not allow brake fluid to come into contact with component surfaces.



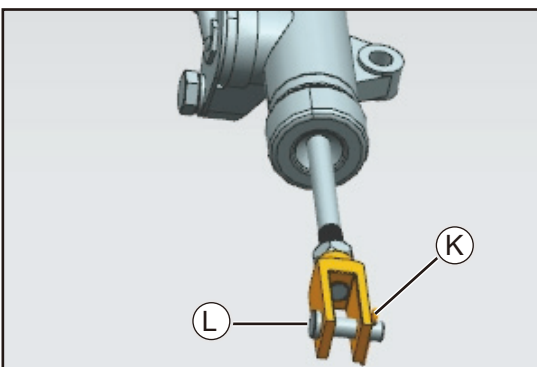
- ◆ Place a waste fluid collection container under the master cylinder brake lines.
- ◆ Remove the bolts **【G】** and gaskets **【D】** for the front brake line **【E】** and rear brake line **【F】** , then take off the front and rear brake lines.

**Bolt 【E】**

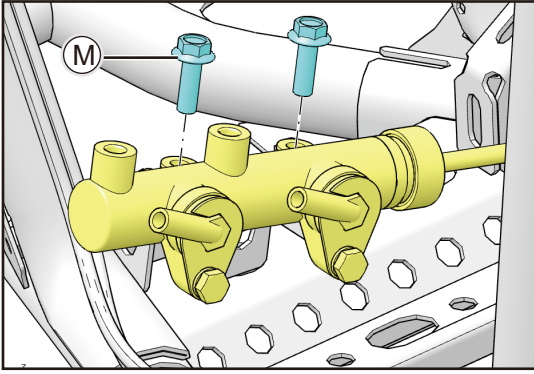
25 N·m (2.5 kgf·m, 18 ft·lbs)



- ◆ Loosen the clamps **【F】** on reservoir hose A and reservoir hose B, and pull out the two reservoir hoses.



- ◆ Remove from the pin shaft **【L】** and the cotter pin **【K】** connecting the master cylinder to the brake pedal lever from above.



- ◆ Remove the two M8×25 hexagonal flange bolts **【M】** that secure the foot brake master cylinder assembly.
- ◆ The foot brake master cylinder assembly can then be removed.

**Bolt 【A】**

30 N·m (3.0 kgf·m, 22 ft·lbs)

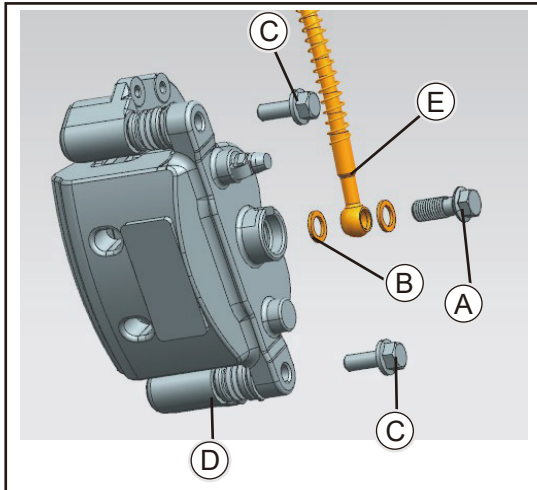
### INSTALLATION OF FOOT BRAKE MAIN PUMP

The installation method of the foot brake main pump is the reverse of the removal steps.

Note the following points during installation:

- ◆ A new seal to be replaced when installing the brake line.
- ◆ Pay attention to the installation angle of the brake pipeline during installation.
- ◆ Follow the previous brake fluid replacement/brake exhaust procedure.
- ◆ Before putting into use, the field test whether the device has proper braking effect. Check for fluid leaks and the brakes are secure.

## FRONT BRAKE ASSEMBLY



## REMOVAL OF FRONT BRAKE ASSEMBLY

- ◆ Remove the front wheel .
- ◆ Loosen the fixing bolt 【A】 at the lower part of the brake hose 【E】 , but do not completely remove it yet.
- ◆ Unscrew the brake assembly mounting bolt 【C】 .
- ◆ Remove the brake caliper body assembly 【D】 .
- ◆ Unscrew the oiled bolt 【a】 and remove the gasket 【b】 from the caliper.

**⚠ WARNING**

Flush any spilled brake fluid immediately. Brake fluid can damage the surface of parts. Do not let brake fluid come into contact with the surface of the part.

**⚠ CAUTION**

- ◆ When removing the brake caliper, be careful not to damage the brake lines.
- ◆ Support the brake caliper to avoid kinking or bending the brake lines.

## FRONT BRAKE ASSEMBLY INSTALLATION

- ◆ Install the front brake assembly and the lower end of the brake oil pipe.
- ◆ When installing the hose, replace the sealing gaskets on both sides of the brake hose with new ones.
- ◆ Tighten:

Brake assembly mounting bolts

45 N·m (4.5 kgf·m, 33 ft·lbs)

brake hose fixing bolt

25 N·m (2.5 kgf·m, 18.4 ft·lbs)

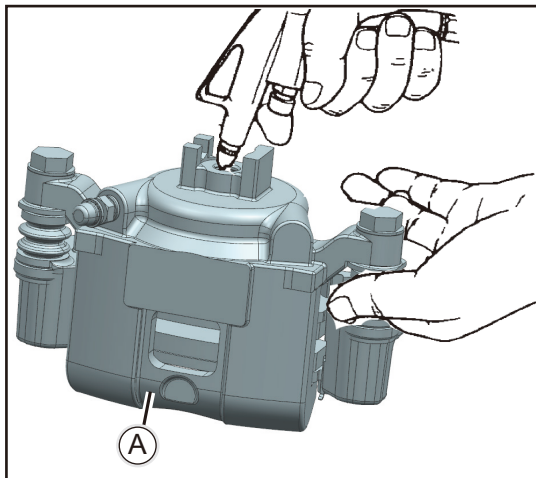
- ◆ Check the fluid level in the brake fluid cup.
- ◆ Bleed the brake lines.
- ◆ Check whether the brakes have good braking force, there is no drag on the vehicle, and there is no leakage in the brake lines.

**⚠ WARNING**

Before driving the vehicle, lightly press the brake pedal a few times to make the brake pads and brake discs fit effectively to reduce the idle travel during the initial braking.

- ◆ After the front brake assembly is installed on the vehicle and the pipes are connected, steps 9-11 of brake fluid replacement/brake bleeding are required.

## FRONT BRAKE CALIPER BODY



### FRONT BRAKE CALIPER BODY REMOVAL

- ◆ Remove the front brake assembly first (see Front Brake Assembly Removal)
- ◆ Remove the brake pad (see front brake pad removal)
- ◆ Using special tools, remove the piston.

Cover the brake caliper housing **【A】** with a clean thick cloth.

Clean the caliper body, piston and retaining bracket with brake cleaner or alcohol.

#### ⚠ WARNING

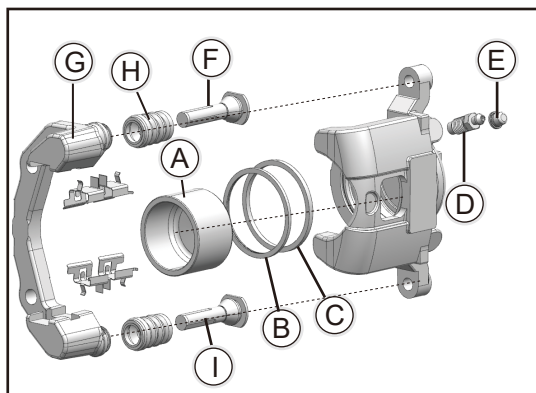
To avoid serious injury, never place your fingers or palms inside the caliper opening as the piston may crush your hands or fingers.

Make sure the sealing groove of the clamp body is clean.

#### ⚠ CAUTION

If compressed air is not available, follow these steps:

- ◆ Brake hose connected to caliper
- ◆ Prepare brake fluid container
- ◆ Use special tools



Dismantle in order:

Piston **【A】**

Dust ring **【B】**

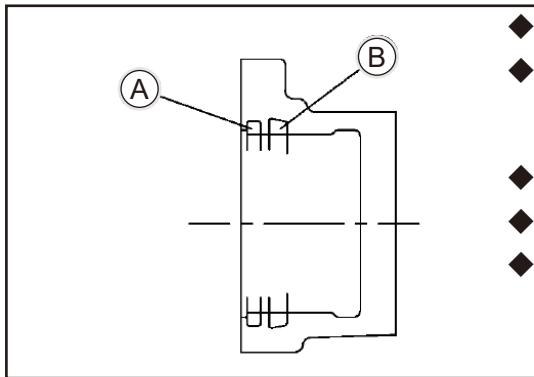
Rectangular circle **【C】**

Exhaust nozzle **【D】** and rubber cover **【E】**

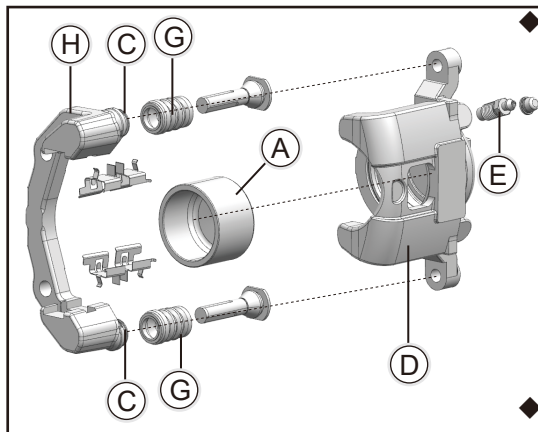
Upper guide rod **【F】** and caliper bracket **【G】**

Dust cover **【H】** and lower guide rod **【I】**

**FRONT BRAKE CALIPER BODY INSTALLATION**



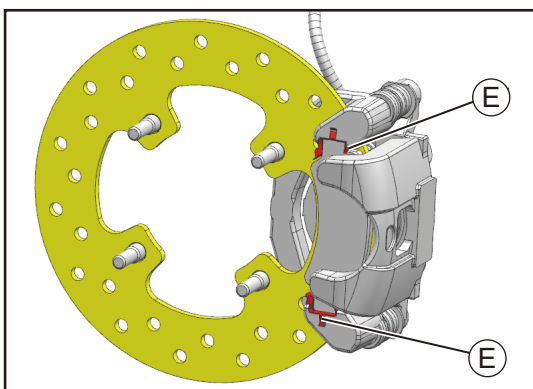
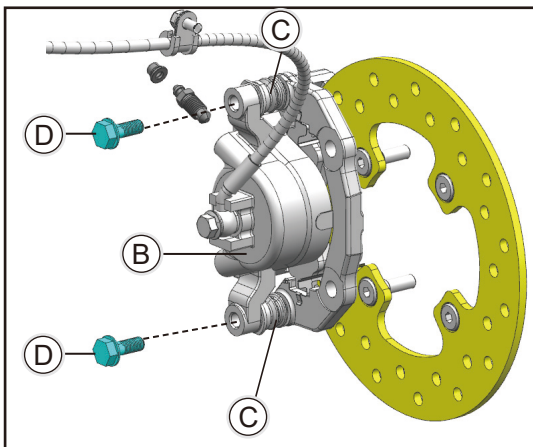
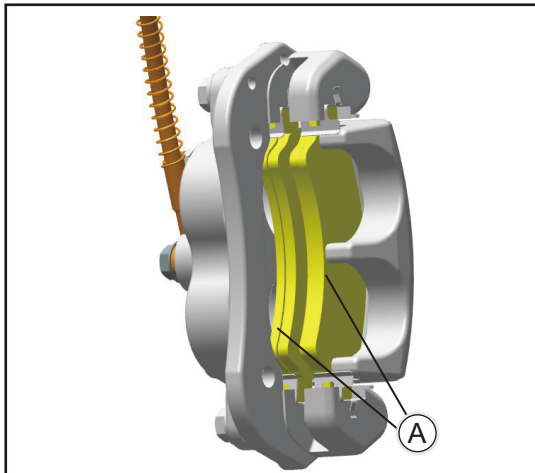
- ◆ Replace with a new rectangular circle **【B】** .
- ◆ Apply a thin layer of silicone grease to the rectangular ring and install it into the brake card
- ◆ Clamp.
- ◆ Replace with new dust ring **【A】** ,
- ◆ Apply a thin layer of silicone grease to the wiper and install it into the brake caliper.



- ◆ Apply a thin layer of silicone grease to the outside of the piston **【F】** and push the piston into the brake caliper **【D】** by hand. Be careful of scratches on the piston and piston skirt.
- ◆ If the dust cover **【G】** is damaged, replace it with a new one.
- ◆ Apply a thin layer of silicone grease to the upper guide rod, lower guide rod and the guide rod installation inner hole **【C】** of the caliper bracket for lubrication (silicone grease is a special high-temperature-resistant and water-resistant grease).
- ◆ Install the caliper bracket **【H】** and exhaust tip **【E】**

Exhaust nozzle <b>【E】</b>
7.9 N·m (0.8 kgf·m, 5.8 ft·lbs)

## FRONT BRAKE PAD



### FRONT BRAKE PAD REMOVAL

- ◆ Remove the front rim assembly.
- ◆ Loosen the fastening bolt **【D】** from the front brake assembly guide rod **【C】**. During the process of loosening the bolt **【D】**, it is required that the head of **【C】** is always in contact with the brake caliper body **【B】**. Otherwise, **【C】** will rotate with **【D】** because it is not limited, making **【D】** unable to be disassembled.
- ◆ Rotate the brake caliper body at least 90 degrees so that the brake pad **【A】** can be easily removed from the spring holder **【E】** on the inside and outside of the brake disc.

### FRONT BRAKE PAD INSTALLATION

- ◆ Push the caliper piston all the way in with your hand.
- ◆ Install the brake pads in the upper and lower spring holders **【E】** on the inner (or outer) side, and fit them into the brake discs respectively.
- ◆ Unscrew the front brake caliper so that its installation hole coincides with the hole of the brake assembly guide rod **【C】**, and the front brake assembly guide rod **【C】** must be limited to the brake caliper **【B】** and aligned with the brake assembly guide rod **【C】**. Brake calipers **【B】** fit snugly.
- ◆ Apply thread glue to the newly loosened fastening bolt **【D】**.
- ◆ Tighten the caliper mounting bolts **【D】**

Caliper mounting bolt **【D】**

25N·m(2.5kgf·m, 18 ft·lb)

### ⚠ WARNING

Do not attempt to drive the vehicle until the brakes are tightened. Braking force is obtained by depressing the brake pedal several times until the brake pads contact each brake disc. If you don't do this, the brakes will not work the first time they are applied.

### FRONT BRAKE PAD WEAR INSPECTION

- ◆ Refer to the Brake Pad Maintenance chapter in Scheduled Maintenance

### ⚠ WARNING

Do not use brake pads if they are contaminated with grease, oil, or soaking fluid. Use only new cleaning pads.

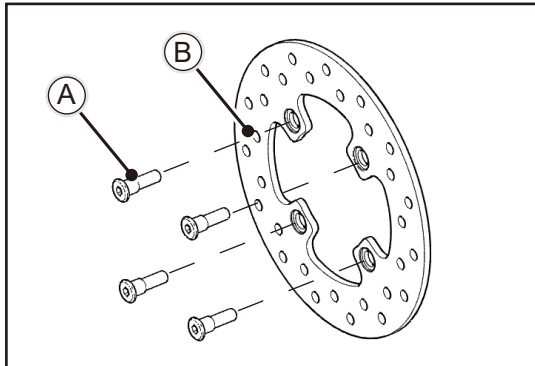
**FRONT BRAKE DISC**

**FRONT BRAKE DISC CLEANING**

Poor braking can be caused by dirt on the brake discs. Stains on brake discs must be cleaned with an oil-free cleaning fluid such as trichlorethylene or acetone.

**⚠ WARNING**

These cleaning fluids are often highly flammable and can be harmful to humans if inhaled over a prolonged period of time. Always heed the manufacturer's warnings.



**FRONT BRAKE DISC REMOVAL**

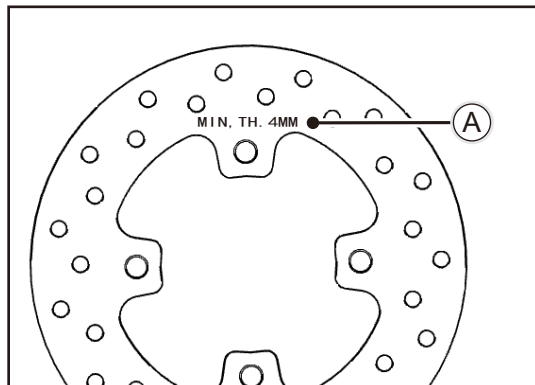
- ◆ Remove the front wheel hub (see Wheels/Tires chapter pages 9-15)
- ◆ Remove the front brake disc mounting bolt **【A】**
- ◆ Remove the front brake assembly (see Front Brake Assembly Removal)
- ◆ Remove the front brake disc **【B】**

**FRONT BRAKE DISC INSTALLATION**

- ◆ The front brake disc must be installed with the marked side
- ◆ **【A】** Toward the steering knuckle.
- ◆ Non-permanent locking agents should be used:
- ◆ Tighten:

Brake disc mounting bolts
25 N·m (2.5 kgf·m, 18 ft·lbs)

- ◆ After installing the disc brake rotor, check the front brake rotor for runout. Thoroughly remove any accumulated grease and coat both sides of the disc brake rotor with oil-free solvent. Do not use products that leave an oily residue.



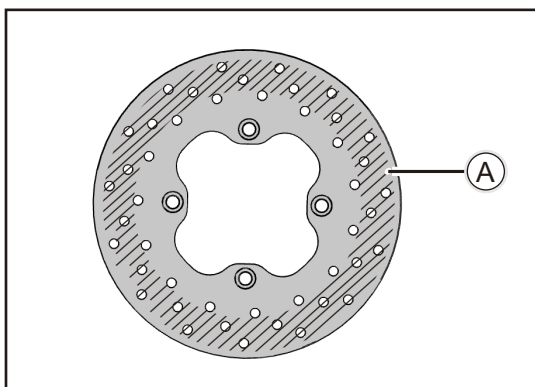
**FRONT BRAKE DISC INSPECTION**

- ◆ Measure the thickness of each point
- ◆ **【A】** The place with the most wear.
- ◆ If the front brake disc wear exceeds the thickness limit, please replace the brake disc.

**Brake disc thickness**

Standard thickness:: 4.8~5.2mm (0.19 ~ 0.205 in.)

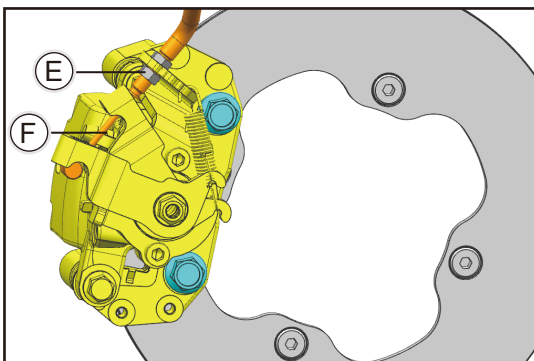
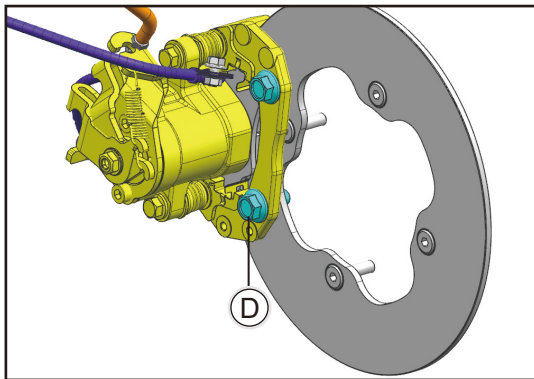
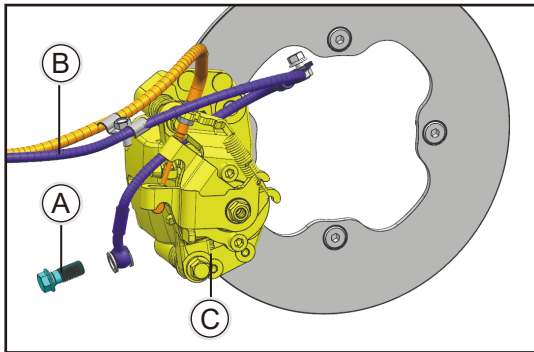
Maximum thickness : 4mm (0.16 in.)



**⚠ WARNING**

Be sure to use new brake disc mounting bolts. Bolts come with pre-applied locking compound that is destroyed when disassembled.

## REAR BRAKE ASSEMBLY



### REAR BRAKE ASSEMBLY REMOVAL

- ◆ Remove the rear wheel (see Wheels/Tires section).
- ◆ Loosen the fixing bolt 【A】 of the brake hose 【B】 without completely removing it yet.
- ◆ Loosen the two mounting bolts 【D】 of the rear brake assembly.
- ◆ Loosen the parking cable bolt 【E】 and remove the parking cable assembly 【F】 from the brake.
- ◆ Remove the rear brake caliper body assembly 【C】

#### ⚠ WARNING

Flush any spilled brake fluid immediately. Brake fluid can damage the surface of parts. Do not let brake fluid come into contact with the surface of the part.

#### ⚠ CAUTION

When removing the brake caliper, be careful not to damage the brake lines.

Support the brake caliper to avoid kinking or bending the brake lines.

### REAR BRAKE ASSEMBLY INSTALLATION

- ◆ Install the rear brake assembly, brake oil pipe and parking oil pipe.
- ◆ When installing the hose, replace the sealing gaskets on both sides of the brake hose with new ones.
- ◆ Tighten:

Brake assembly mounting bolts

45 N·m (4.5 kgf·m, 33 ft·lbs)

brake hose fixing bolt

25 N·m (2.5 kgf·m, 18.4 ft·lbs)

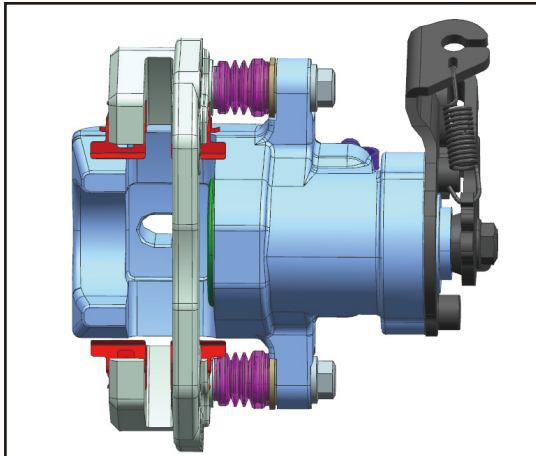
- ◆ Check the fluid level in the master cylinder oil cup.
- ◆ Bleed the brake lines.
- ◆ Check whether the brakes have good braking force, there is no drag on the vehicle, and there is no leakage in the brake lines.

#### ⚠ WARNING

Before driving the vehicle, lightly press the brake pedal a few times to make the brake pads and brake discs fit effectively to reduce the idle travel during the initial braking.

- ◆ After the rear brake assembly is installed on the vehicle and the pipeline is connected, steps 9-11 of brake fluid replacement/brake bleeding are required.

## REAR BRAKE CALIPER BODY



### REAR BRAKE CALIPER BODY REMOVAL

- ◆ Remove the rear brake assembly first (see Brake Assembly Removal 11-6)
- ◆ Remove the rear brake pad (see Rear Brake Pad Removal)
- ◆ Using special tools, remove the piston.

Cover the brake caliper housing **【A】** with a clean thick cloth.

Clean the caliper body, piston and retaining bracket with brake cleaner or alcohol.

#### ⚠ WARNING

To avoid serious injury, never place fingers or palms inside caliper openings.

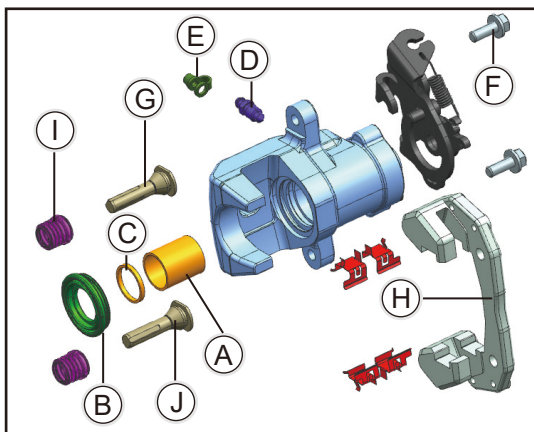
This prevents the piston from crushing your hands or fingers.

Make sure the sealing groove of the clamp body is clean.

#### ⚠ CAUTION

If compressed air is not available, follow these steps:

- ◆ Brake hose connected to caliper
- ◆ Prepare brake fluid container
- ◆ Use special tools



Dismantle in order:

Piston **【A】**

Dust ring **【B】**

Rectangular circle **【C】**

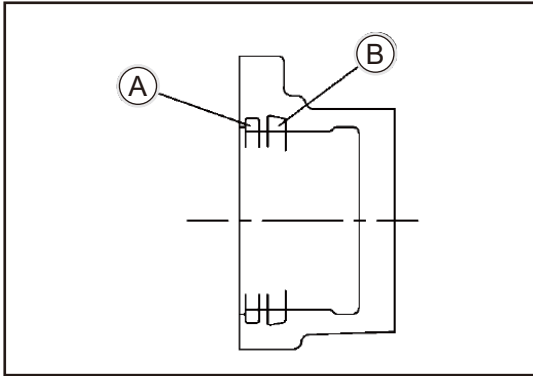
Exhaust nozzle **【D】** and rubber cover **【E】**

Hexagonal flange bolt M8\*20 **【F】**

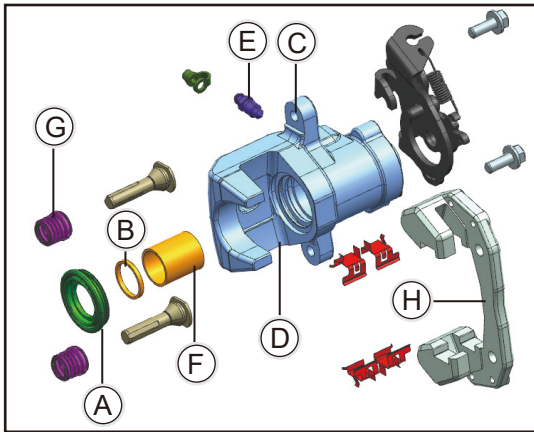
Upper guide rod **【F】** and caliper bracket **【H】**

Dust cover **【I】** and lower guide rod **【J】**

### REAR BRAKE CALIPER BODY INSTALLATION



- ◆ Replace with a new rectangular circle **【B】** .
- ◆ Apply a thin layer of silicone grease to the rectangular ring and install it into the rear brake caliper.
- ◆ Replace with new dust ring **【A】** ,
- ◆ Apply a thin layer of silicone grease to the wiper and install it into the rear brake caliper.

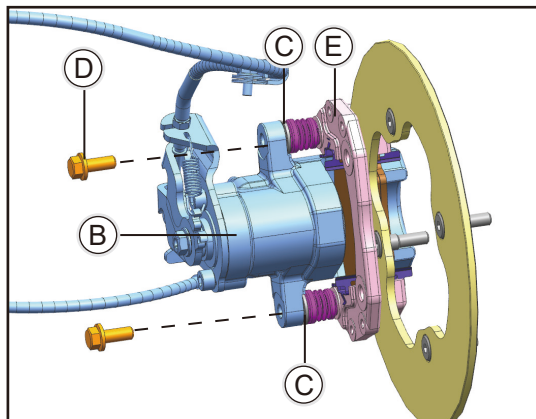
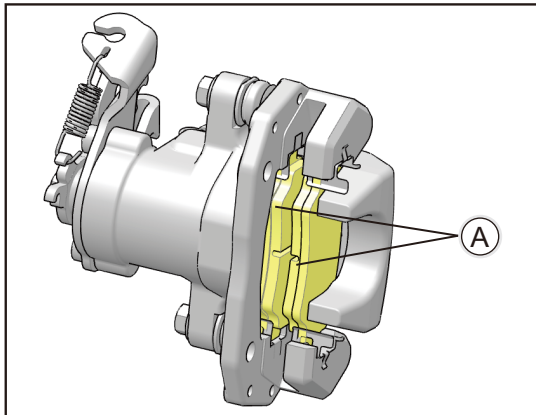


- ◆ Apply a thin layer of silicone grease to the outside of the piston **【F】** and push the piston into the brake caliper **【D】** by hand. Be careful of scratches on the piston and piston skirt.
- ◆ If the dust cover **【G】** is damaged, replace it with a new one.
- ◆ Apply a thin layer of silicone grease to the upper guide rod, lower guide rod and the guide rod installation inner hole **【C】** of the caliper bracket for lubrication (silicone grease is a special high-temperature-resistant and water-resistant grease).
- ◆ Install the caliper bracket **【H】** and exhaust tip **【E】**

Exhaust nozzle **【E】**

7.9 N·m (0.8 kgf·m, 5.8 ft·lbs)

## REAR BRAKE PAD



### REAR BRAKE PAD REMOVAL

Remove the rear rim assembly or rear rim assembly.

- ◆ Loosen the fastening bolt **【D】** from the brake assembly guide rod **【C】**. During the process of loosening the bolt **【D】**, it is required that the head of **【C】** is always in contact with the brake caliper body **【B】**. Otherwise, **【C】** will rotate with **【D】** because **【C】** is not limited, making **【D】** unable to be disassembled.
- ◆ Rotate the brake caliper body at least 90 degrees so that the brake pad **【A】** can be easily removed from the spring holder **【E】** on the inside and outside of the brake disc.

### REAR BRAKE PAD INSTALLATION

- ◆ Push the caliper piston all the way in with your hand.
- ◆ Install the brake pads in the upper and lower spring holders **【E】** on the inner (or outer) side, and fit them into the brake discs respectively.
- ◆ Unscrew the brake caliper so that its installation hole coincides with the hole of the brake assembly guide rod **【C】**, and the brake assembly guide rod **【C】** must be limited to the brake caliper **【B】** and aligned with the brake caliper **【B】**. Caliper **【B】** fits.
- ◆ Apply thread glue to the newly loosened fastening bolt **【D】**.
- ◆ Tighten the caliper mounting bolts **【D】**

Caliper mounting bolt **【D】**

25N·m(2.5kgf·m,18 ft·lb)

### ⚠ WARNING

Do not attempt to drive the vehicle until the brakes are tightened. Braking force is obtained by depressing the brake pedal several times until the brake pads contact each brake disc. If you don't do this, the brakes will not work the first time they are applied.

### REAR BRAKE PAD WEAR INSPECTION

- ◆ Refer to the Brake Pad Maintenance chapter in Regular Maintenance

### ⚠ WARNING

If the brake pads are contaminated with grease, oil or soaking fluid, do not use brake pads. Use only new cleaning pads.

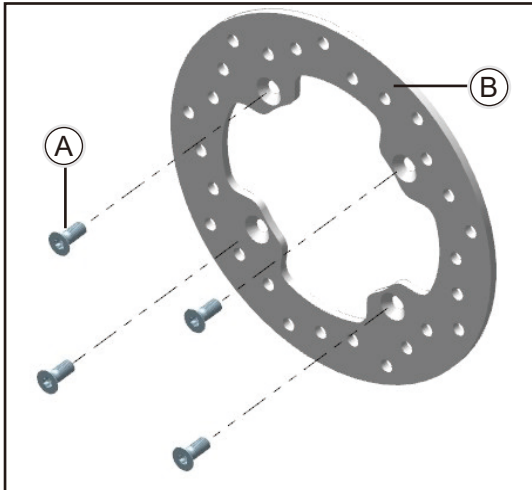
## REAR BRAKE DISC

### REAR BRAKE DISC CLEANING

Poor braking can be caused by dirt on the brake discs. Stains on brake discs must be cleaned with an oil-free cleaning fluid such as trichlorethylene or acetone.

#### **⚠ WARNING**

These cleaning fluids are often highly flammable and can be harmful to humans if inhaled over a prolonged period of time. Always heed the manufacturer's warnings.



### REAR BRAKE DISC REMOVAL

- ◆ Remove the rear hub (see Wheels/Tires section)
- ◆ Remove the rear brake disc mounting bolt **【A】**
- ◆ Remove the rear brake assembly (see Rear Brake Assembly Removal)
- ◆ Remove the rear brake disc **【B】**

### REAR BRAKE DISC INSTALLATION

- ◆ Brake discs must be installed with the marked side
- ◆ **【A】** Toward the steering knuckle.
- ◆ Non-permanent locking agents should be used:
- ◆ Tighten:

Brake disc mounting bolts

45 N·m (4.5 kgf·m, 33 ft·lbs)

- ◆ After installing the disc brake disc, check the disc brake disc runout. Thoroughly remove any accumulated grease and coat both sides of the disc brake rotor with oil-free solvent. Do not use products that leave an oily residue.

### REAR BRAKE DISC INSPECTION

- ◆ Measure the thickness of each point
- ◆ **【A】** The place with the most wear.
- ◆ If the rear brake disc is worn beyond the thickness limit, please replace the rear brake disc.

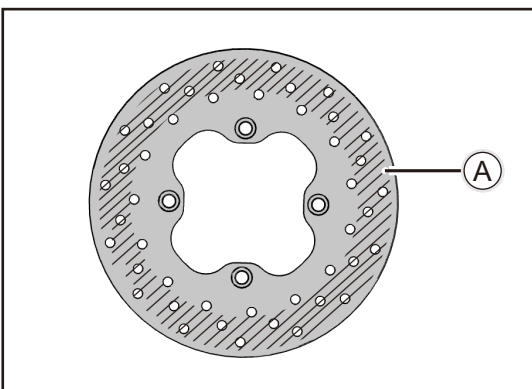
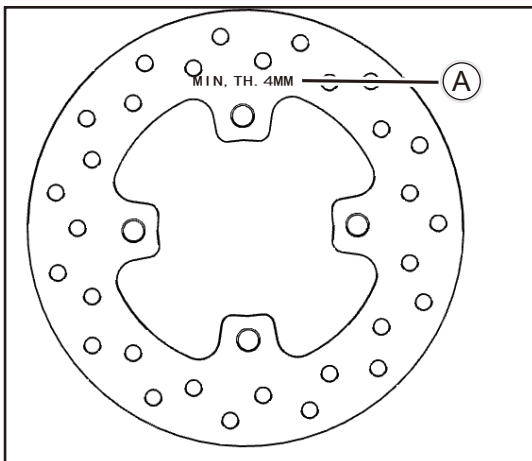
#### Brake disc thickness

**Brake disc standard thickness: 4.8~5.2mm (0.19~0.205 in.)**

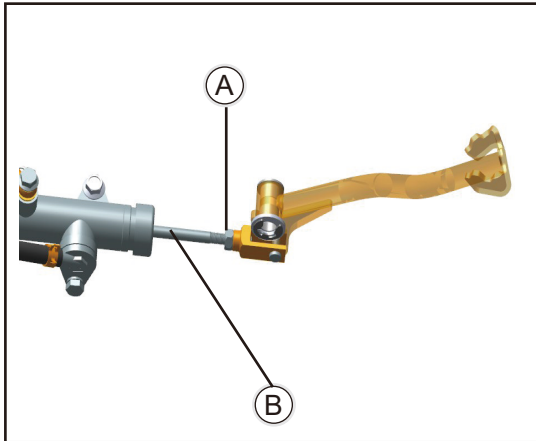
**Brake disc maximum thickness: 4 mm (0.16 in.)**

#### **⚠ WARNING**

Be sure to use new brake disc mounting bolts. Bolts come with pre-applied locking compound that is destroyed when disassembled.

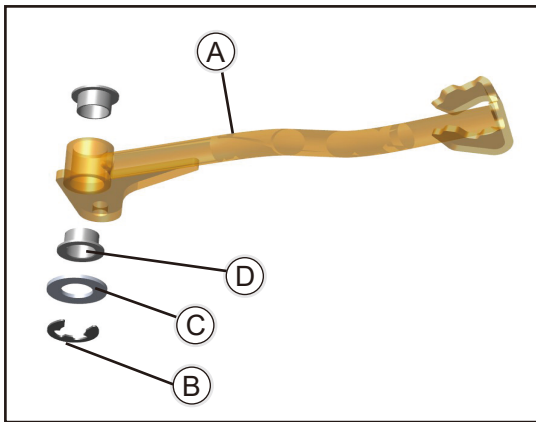


## REAR BRAKE PEDAL



### BRAKE PEDAL POSITION ADJUSTMENT

- ◆ Loosen the locknut **【A】**, and turn the adjusting bolt **【B】** until the brake pedal is correctly positioned.
- ◆ Tighten the locknut.
- ◆ Check the brake pedal free play .



### REAR BRAKE PEDAL REMOVAL

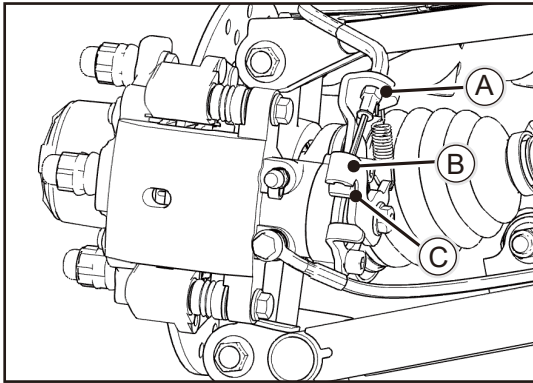
- 【A】** Brake pedal
- 【B】** Retaining ring
- 【C】** Large flat pad
- 【D】** Brake pedal flanged bushing
- ◆ Use pliers to remove the retaining ring **【B】**
- ◆ Remove the large flat pad **【C】**
- ◆ Remove the brake pedal **【A】** assembly
- ◆ Remove Remove piece **【D】** from the brake pedal

### INSTALLATION OF REAR BRAKE PEDAL

Grease the end of the brake pedal shaft.

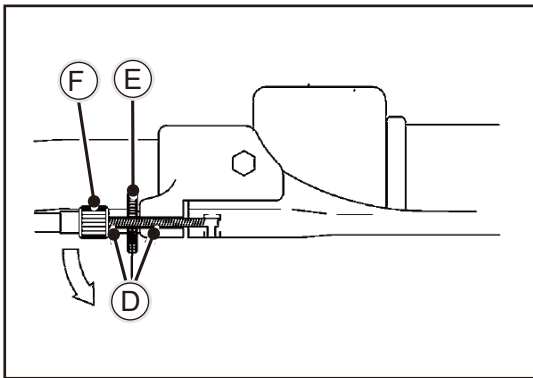
- ◆ Install the 2 pieces of brake pedal flange bushing **【D】** into the brake pedal **【A】**
- ◆ Install the large flat pad **【C】**
- ◆ Then install the elastic retaining ring **【B】** in place.

## PARKING CABLE



### PARKING CABLE REMOVAL

- ◆ Take the parking cable head **【C】** out of the swivel arm **【B】** in the rear brake.
- ◆ Disassemble 2 pieces of M8 nuts **【A】** .



- ◆ Loosen the knurled locknut **【E】** on the parking handle and screw in the adjuster **【F】** .
- ◆ Align the slot **【D】** in the parking handle with the knurled lock nut and adjust card slot.
- ◆ Remove the parking cable from the parking handle.

### INSTALLATION OF PARKING CABLE

Follow the reverse order of the "Parking Cable Removal" above to complete the installation of the parking cable.

## BRAKE SYSTEM TROUBLESHOOTING

### TROUBLESHOOTING BRAKE NOISE

Dirt or dust buildup on the brake pads and discs is the most common cause of brake noise (squealing caused by vibration).

It is necessary to strengthen the cleaning of the contact surfaces of the brake pads and the brake discs to reduce the noise caused by dust or other particles existing between the two working surfaces.

### TROUBLESHOOTING BRAKE NOISE

Reason	Solution
Dirt, dust or embedded material on the pad or disc	Non-flammable aerosol brake cleaner. Remove the brake pad and/or brake disc hub seat to clean the embedded material on the brake pad or disc.
Brake pad dragging on brake disc (noise or premature pad wear), Because of improper adjustment Master pump reservoir overfilled Master cylinder compensation port is restricted The master cylinder piston does not return completely Brake caliper piston does not return Operator error (brake applied)	Adjust pad stop  Set the cleaning compensation port between the highest liquid level and the lowest liquid level of the oil cup. Check. Repair and clean the piston seal if necessary. Training operators
Loose wheel hub or bearing	Check the wheels and hubs for any unusual movement.
Brake discs are warped or excessively worn	Replace brake disc
Brake discs are misaligned or loose	Inspect and repair when necessary
Noise coming from other sources (axle, hub, brake disc or wheel)	If the noise does not change when braking, check for other sources. Inspect and repair when necessary

**Brake squealing/poor braking performance, please check the following components or systems**

- ◆ air intake system
- ◆ There is water in the system (brake fluid is contaminated)
- ◆ Caliper/disc misalignment
- ◆ Dirty or damaged calipers
- ◆ Damaged brake line or broken brake pad
- ◆ Worn brake discs and/or friction pads
- ◆ Improper adjustment of fixed pad
- ◆ Worn or damaged master cylinder or components
- ◆ Damaged brake pad sound insulation material

**Pedal vibration, please check the following components or systems**

- ◆ Damaged brake disc
- ◆ Brake disc wear (runout or thickness change beyond service limit)

**Caliper overheating (brake resistance), please check the following components or systems**

- ◆ Compensation port clogged
- ◆ Brake pad gap setting is incorrect
- ◆ Brake pedal is stuck or won't return all the way
- ◆ Residue buildup under caliper seal
- ◆ Driver high frequency service brake

**Brake drag, please check the following components or systems**

- ◆ Alignment of calipers and brake discs
- ◆ caliper piston stuck
- ◆ Improper assembly of brake system components

# STEERING SYSTEM

**EXPLODED VIEW OF STEERING SYSTEM ..... 12-2**

**DIRECTION BAR REMOVAL / INSTALLATION..... 12-3**

    INSTALLATION OF STEERING WHEEL..... 12-5

**STEERING COLUMN REMOVAL / INSTALLATION ..... 12-6**

**EPS REMOVAL / INSTALLATION ..... 12-9**

    EPS REMOVAL..... 12-9

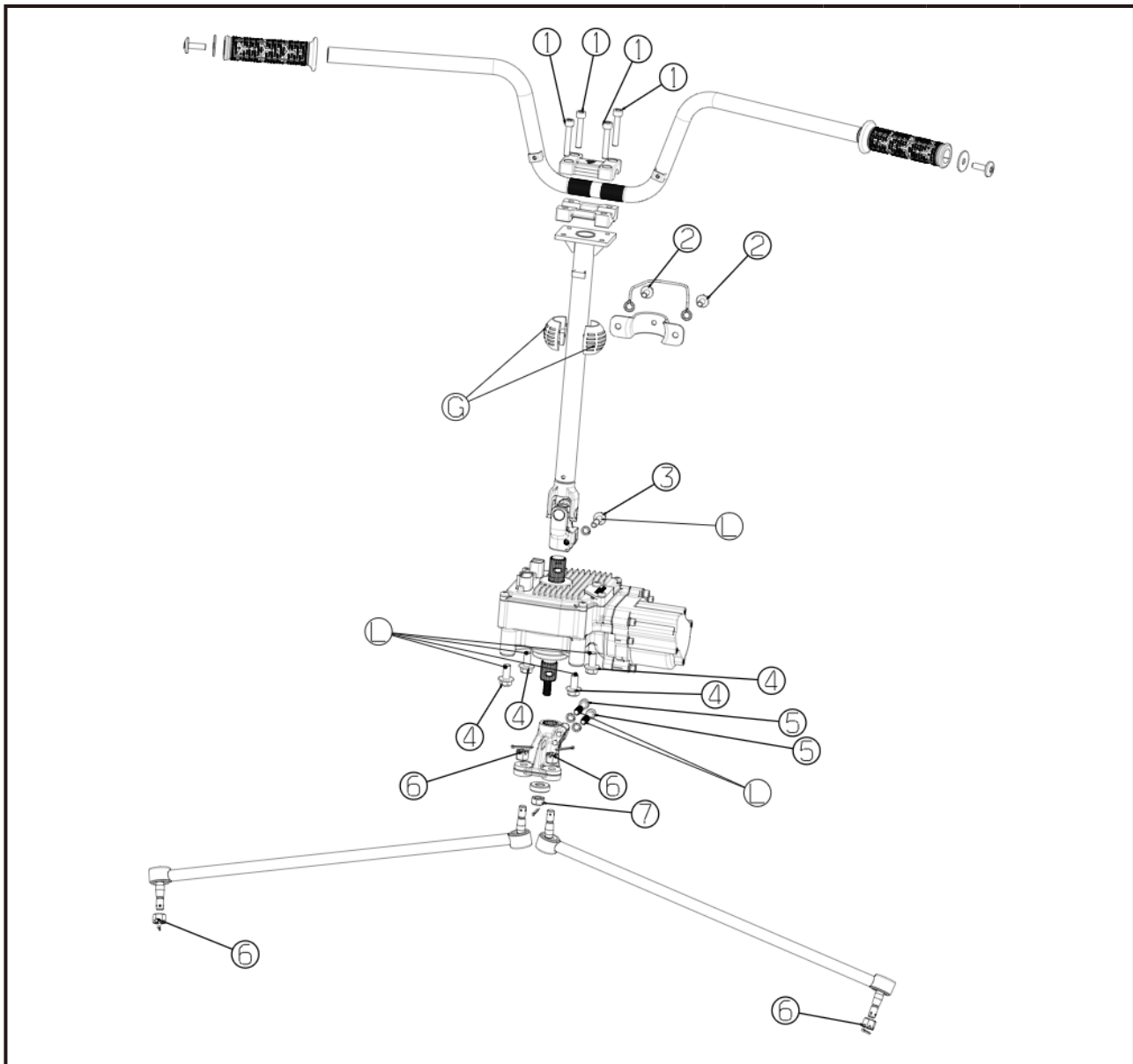
    EPS INSTALLATION..... 12-11

**STEERING TIE ROD..... 12-12**

    STEERING ROD FOLDING ..... 12-12

    STEERING TIE ROD INSTALLATION ..... 12-12

## EXPLODED VIEW OF STEERING SYSTEM



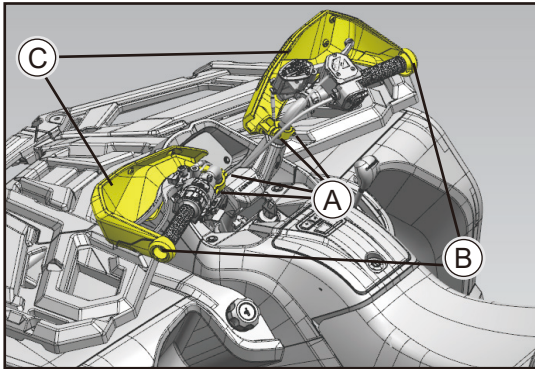
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon socket head cap screw M8 × 45	35	3.6	25.9	
2	Hexagon flange bolt M8 × 16	25	2.6	18.5	
3	Special bolt for hexagon flange M8 × 35	37	3.8	27.4	
4	Hexagon flange bolt M10 × 20	35	3.6	25.9	
5	Special bolt for hexagon socket steering rocker arm M8 × 40	37	3.8	27.4	
6	Type 1 hexagon slotted nut M10 × 1.25	45	4.6	33.3	
7	Type 2 full metal hexagon self-locking nut M10 × 1.25	47	4.8	34.78	

G: Apply grease (butter)

S: Follow specific tightening sequence

L: Apply a non-permanent locking agent (thread glue)

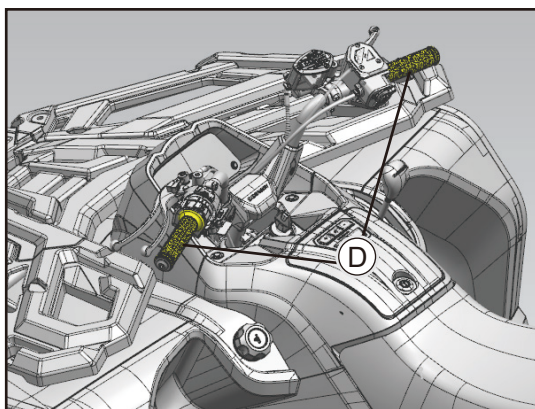
## DIRECTION BAR REMOVAL / INSTALLATION



## DIRECTION BAR REMOVAL

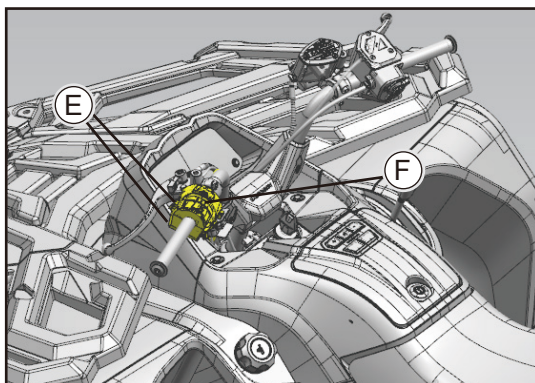
## Handguard Assembly Removal

- ◆ Remove the four M6×20 hexagon socket head cap screws 【A】
- ◆ Remove the two M8×25 hexagon socket large pan head bolts 【B】
- ◆ Remove the handguard assembly C



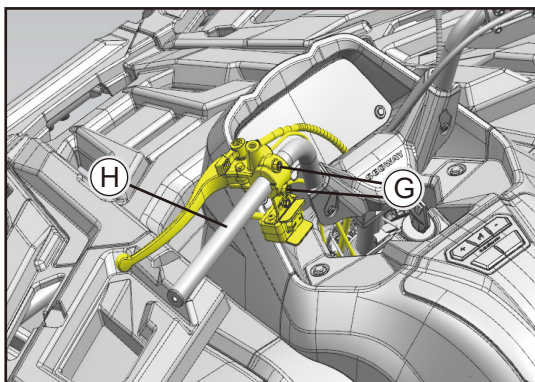
## GRIP REMOVAL

- ◆ Remove the grip 【D】
- ◆ Remove the handguard assembly 【C】



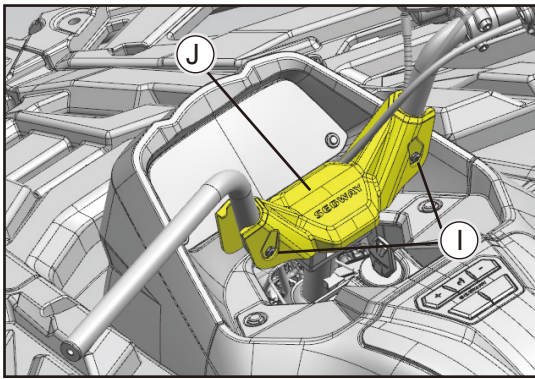
## REMOVE THE SWITCH WITH THE LEFT HAND.

- ◆ Loosen the 2 screws at the bottom of the left hand switch 【E】
- ◆ Disconnect the wiring harness connector and remove the left hand switch 【F】



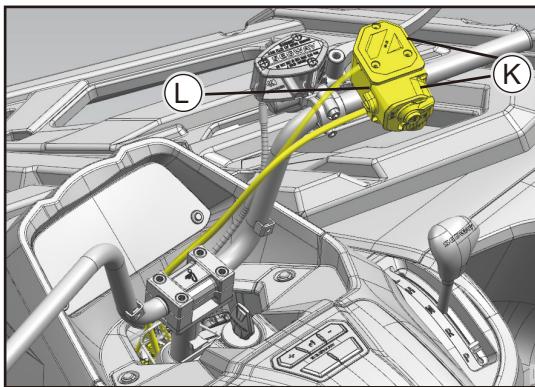
## PARKING LEVER REMOVAL

- ◆ Loosen the two integral hexagon socket bolts 【G】 on the parking lever.
- ◆ Disconnect the wiring harness connector and remove the parking lever 【H】 .



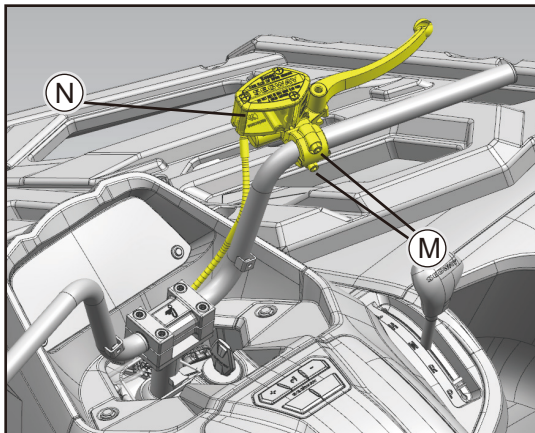
### STEERING HANDLE COVER ASSEMBLY REMOVAL

- ◆ Remove the two screws 【I】
- ◆ Remove the steering handle cover assembly 【J】



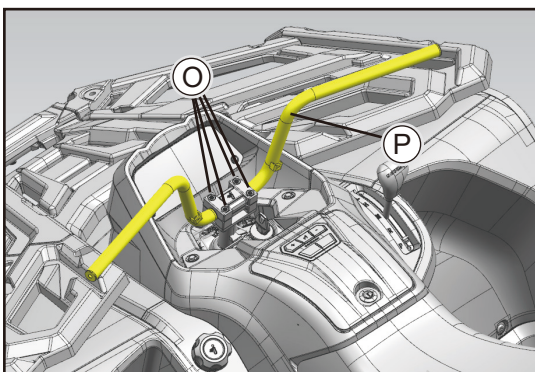
### RIGHT HAND SWITCH REMOVED

- ◆ Loosen the 2 screws at the bottom of the right hand switch 【K】
- ◆ Disconnect the wiring harness connector and remove the right hand switch 【L】



### HANDBRAKE UPPER PUMP ASSEMBLY REMOVAL

- ◆ Loosen the 2 hexagon socket bolts of the hand brake upper pump assembly 【M】
- ◆ Remove the hand brake upper pump assembly 【N】



### DIRECTION TO REMOVE

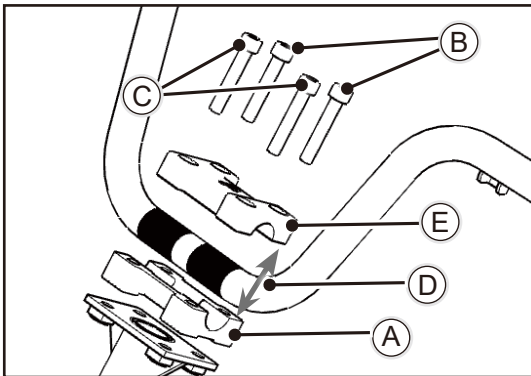
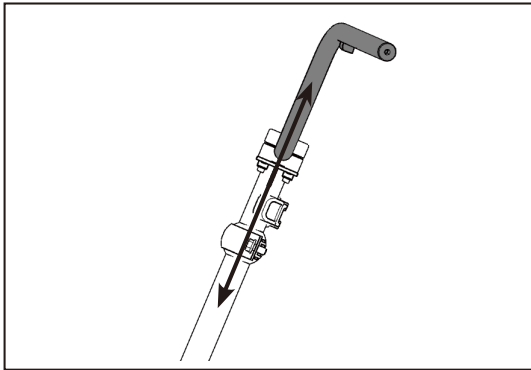
- ◆ Remove 4 hexagon socket head cap screws M8 × 45 【O】
- ◆ Remove the direction control 【P】

## INSTALLATION OF STEERING WHEEL

- ◆ Install it in the reverse order of direction.

**⚠ CAUTION**

Install the steering handle to match the angle of the steering handle with the angle of the steering column and keep it parallel, as shown in the left picture.



【A】 Steering Wheel Lower Gland

【B】 locking bolt

【C】 locking bolt

【D】 clearance

【E】 Steering handle gland

- ◆ Place the steering handle lower gland 【A】 on the steering column with the holes aligned
- ◆ Centre the steering wheel in the lower cover of the steering wheel, cover the upper cover of the steering wheel 【E】 , align the holes with the lower cover.
- ◆ Tighten the front locking bolts 【B】 , and then tighten the rear locking bolts 【C】 .

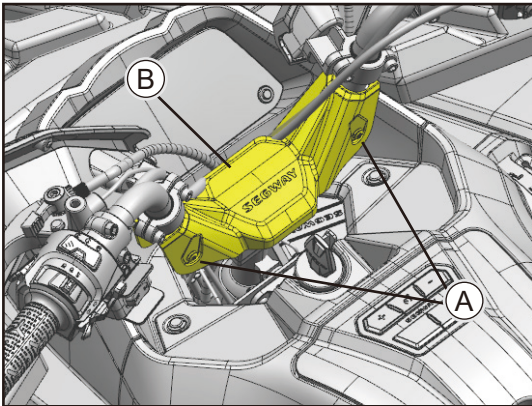
**Locking bolt torque**

35 N·m (3.5 kgf·m, 25 ft·lb)

**⚠ CAUTION**

If the installation sequence of the hexagon socket head cap screws M8 × 45 is incorrect, the gap 【D】 between the upper and lower covers will be uneven.

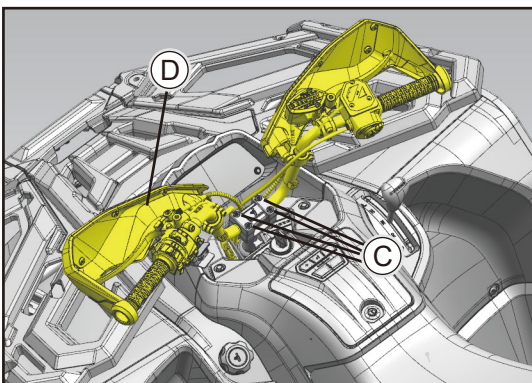
## STEERING COLUMN REMOVAL / INSTALLATION



### STEERING COLUMN REMOVAL

Steering Handle Cover Assembly Removal

- ◆ Remove the two screws 【A】
- ◆ Remove the steering handle cover assembly 【B】

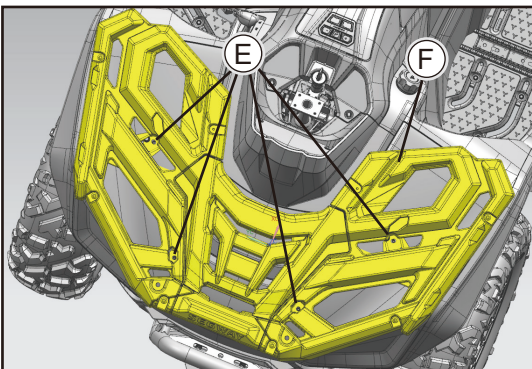


### HANDLEBAR TUBE KIT REMOVAL

- ◆ Remove the four M8×45 hexagon socket head cap screws 【C】
- ◆ Remove the handlebar tube kit 【D】

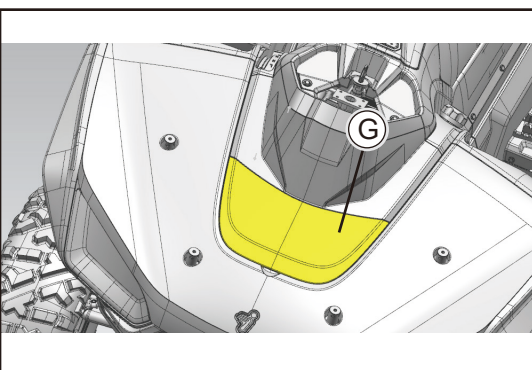
Screws M8×45

35 N·m (3.6 kgf·m , 25.9 ft·lb)



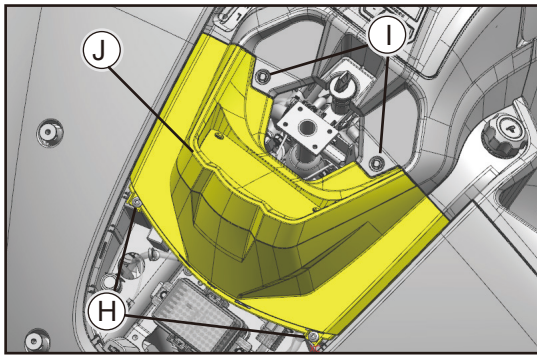
### FRONT RACK COVER PLATE KIT REMOVAL

- ◆ Remove the four hexagonal flange bolts 【E】
- ◆ Remove the front rack cover plate kit 【F】



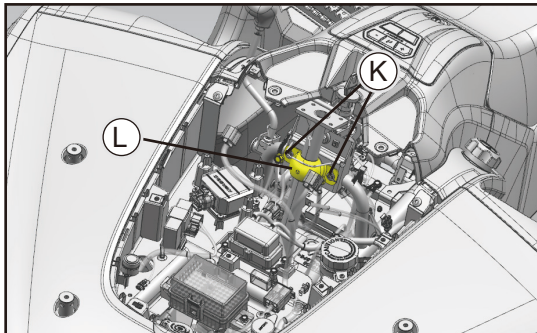
### FRONT INSPECTION COVER ASSEMBLY REMOVAL

- ◆ Remove the front inspection cover assembly 【G】



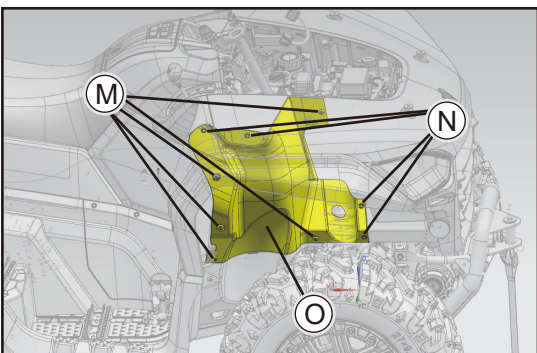
**INSTRUMENT COVER KIT REMOVAL**

- ◆ Remove 2 hexagon socket head cap screws 【H】
- ◆ Remove 2 expansion buckles 【I】
- ◆ Remove the instrument cover kit 【J】



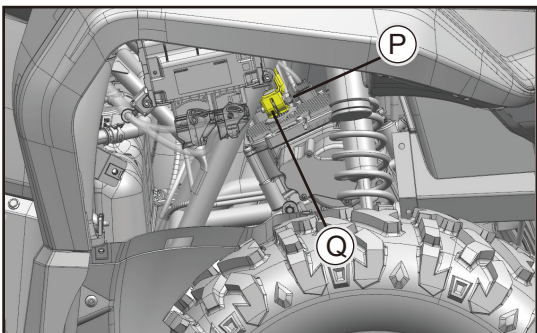
**REMOVAL OF SPHERICAL SEAT LOCKING PLATE AND STEERING SPHERICAL SEAT**

- ◆ Remove the two M8×16 hexagonal flange bolts 【K】
- ◆ Remove the spherical seat locking plate and steering spherical seat 【L】



**RIGHT FRONT UPPER MUDGUARD ASSEMBLY REMOVAL**

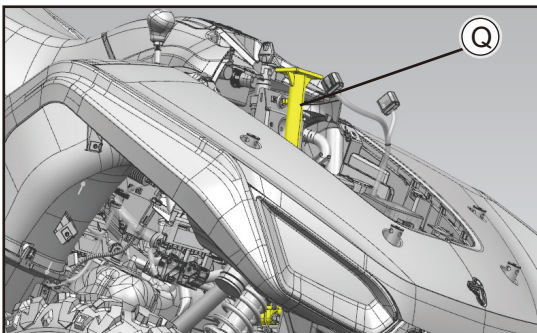
- ◆ Remove 5 hexagon socket head cap screws 【M】
- ◆ Remove 4 expansion buckles 【N】
- ◆ Remove the right front upper fender assembly 【O】



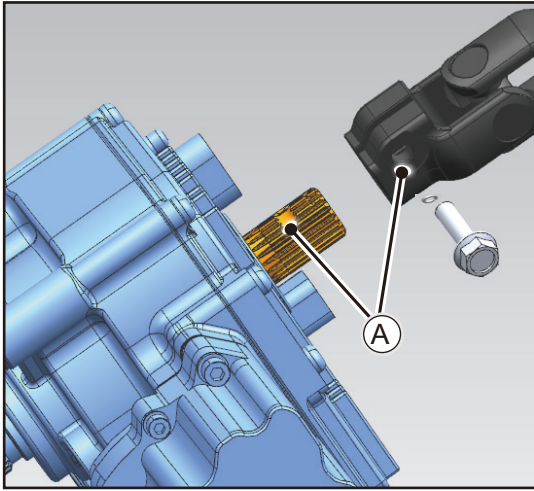
**DISASSEMBLY OF STEERING COLUMN**

Remove special bolts M8 × 35 for hexagonal flange face and spring washer 8 【P】

Bolt M8 × 35 Torque  
37 N·m (3.8 kgf·m , 28 ft·lb)



- ◆ Remove the steering column 【Q】 .



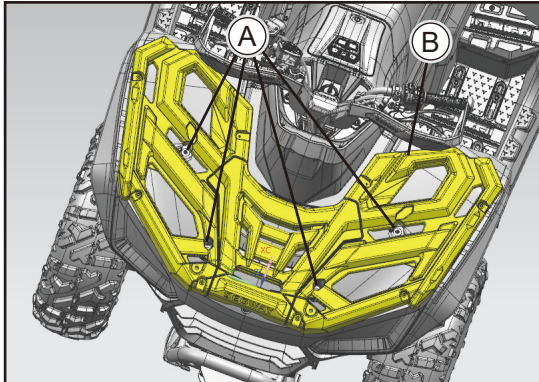
### STEERING COLUMN INSTALLATION

- ◆ Install in the reverse order of steering column removal.

#### **CAUTION**

If the splined groove of the lock bolt is misaligned at the position indicated in Figure A (left), it will cause bolt thread damage and misalignment of the handlebar.

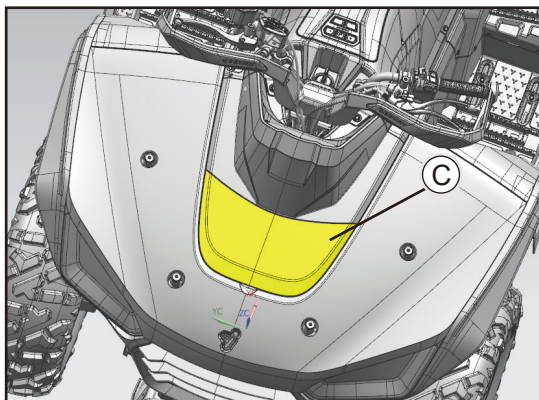
## EPS REMOVAL / INSTALLATION



## EPS REMOVAL

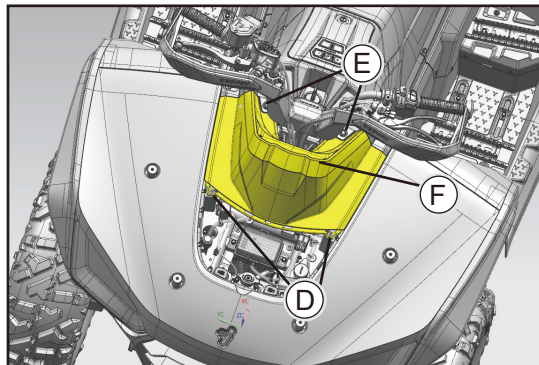
## FRONT RACK COVER PLATE KIT REMOVAL

- ◆ Remove the four hexagonal flange bolts 【A】
- ◆ Remove the front rack cover plate kit 【B】



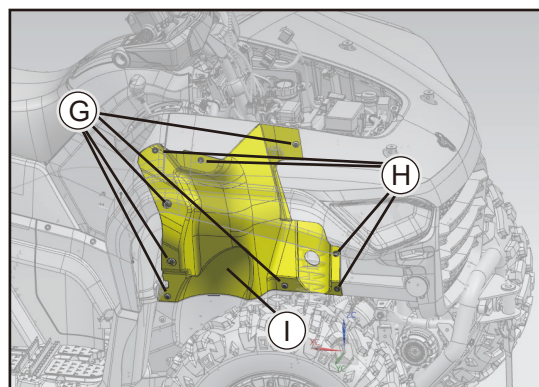
## FRONT INSPECTION COVER ASSEMBLY REMOVAL

- ◆ Remove the front inspection cover assembly 【C】



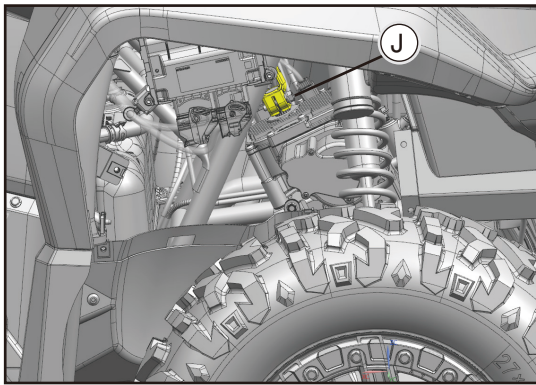
## INSTRUMENT COVER KIT REMOVAL

- ◆ Remove the two hexagon socket head cap screws 【D】
- ◆ Remove the two expansion clips 【E】
- ◆ Remove the instrument cover kit 【F】



## RIGHT FRONT UPPER FENDER ASSEMBLY REMOVAL

- ◆ Remove the five hexagon socket head cap screws 【G】
- ◆ Remove the four expansion clips 【H】
- ◆ Remove the right front upper fender assembly 【I】

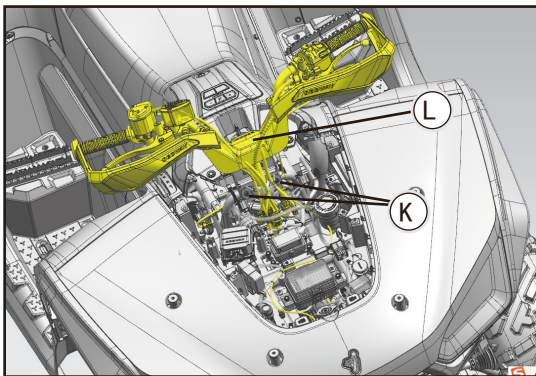


### REMOVAL OF HANDLEBAR TUBE KIT AND STEERING COLUMN ASSEMBLY

- ◆ Remove the one special M8×35 hexagonal flange bolt and the No.8 spring washer 【J】

Bolt M8×35

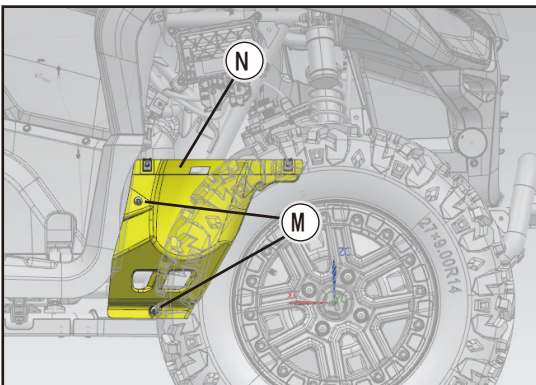
37 N·m (3.8 kgf·m , 28 ft·lb)



- ◆ Remove the two M8×16 hexagonal flange bolts 【K】
- ◆ Remove the handlebar tube kit and steering column assembly 【L】

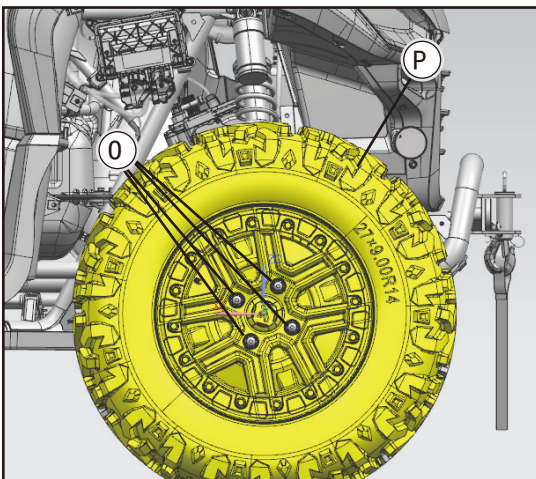
Bolt M8×16

25 N·m (2.6 kgf·m , 18.5 ft·lb)



### NM RIGHT FRONT LOWER MUDGUARD ASSEMBLY REMOVAL

- ◆ Remove 2 hexagon socket head cap screws 【M】
- ◆ Remove right front lower fender assembly 【N】

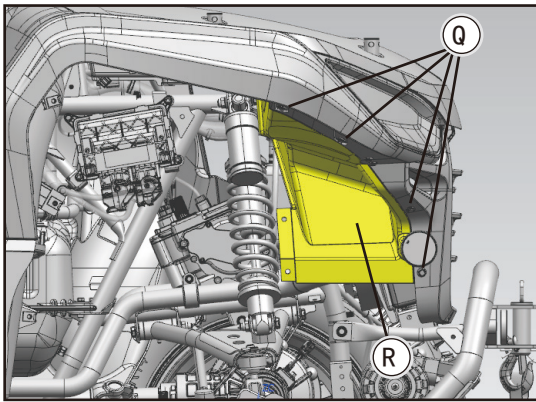


### RIGHT FRONT TIRE KIT REMOVAL

- ◆ Remove 4 rim mounting nuts 【O】
- ◆ Remove right front tire kit 【P】

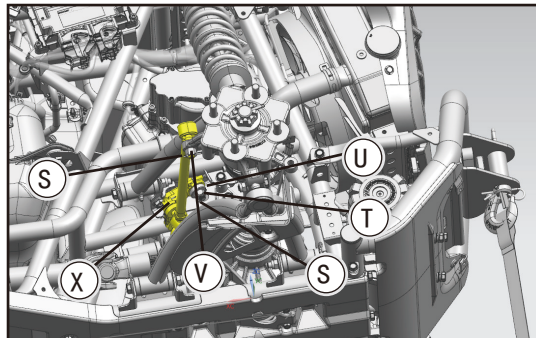
Rim mounting nut torque

110 ~ 120 N·m



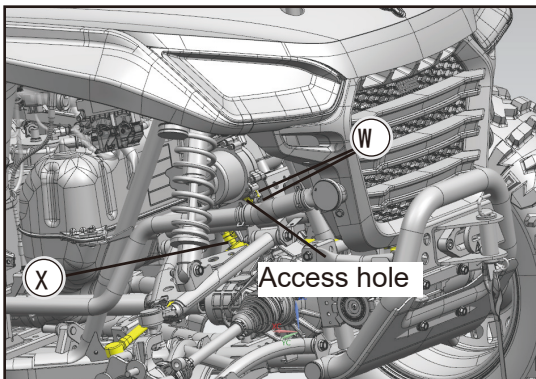
## RIGHT FRONT HEADLIGHT COVER ASSEMBLY REMOVAL

- ◆ Remove the four expansion clips 【Q】
- ◆ Remove the right front headlight cover assembly 【R】 "



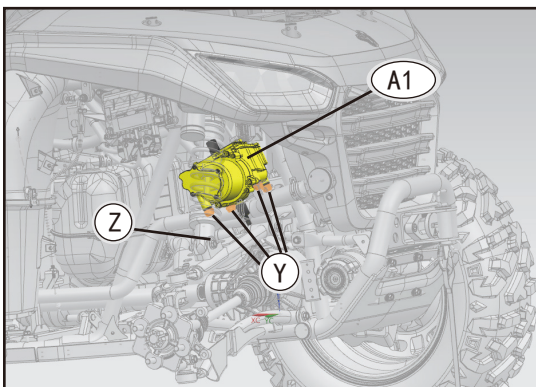
## REMOVAL OF STEERING ROCKER ARM AND TIE ROD KIT

- ◆ Remove the three cotter pins 【S】
- ◆ Remove the one Type 2 All-Metal Hexagon Self-Locking Nut M10×1.25 【T】
- ◆ Remove the one steering rocker arm washer 【U】
- ◆ Remove the two Type 1 Hexagon Slotted Nuts M10×1.25 【V】 "



- ◆ Rotate the steering rocker arm to align the M8×40 hexagon socket special bolts for the steering rocker arm with the service hole, then remove the two M8×40 hexagon socket special bolts for the steering rocker arm and the No.8 spring washers 【W】
- ◆ Remove the steering rocker arm and tie rod kit 【X】

Bolt M8×40
37 N·m (3.8 kgf·m ,27.4 ft·lb)



## EPS REMOVAL

- ◆ Remove the four M10×20 hexagonal flange bolts 【Y】
- ◆ Remove the one lower mounting bolt of the right front shock absorber 【Y】
- ◆ Unplug the EPS wiring harness connector, move aside the right front shock absorber, and remove the EPS 【A1】 "

Bolt M10×20
35 N·m (3.6 kgf·m ,25.9 ft·lb)

## EPS INSTALLATION

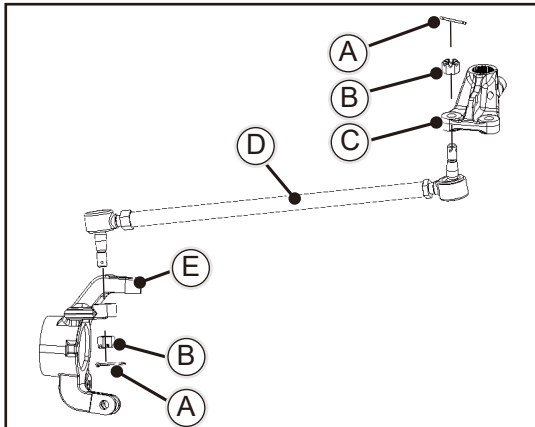
- ◆ Install in the reverse order of EPS removal."

### ⚠ CAUTION

Do not perform live operations during disassembly and assembly; protect the EPS connectors to avoid damage to the system.

## STEERING TIE ROD

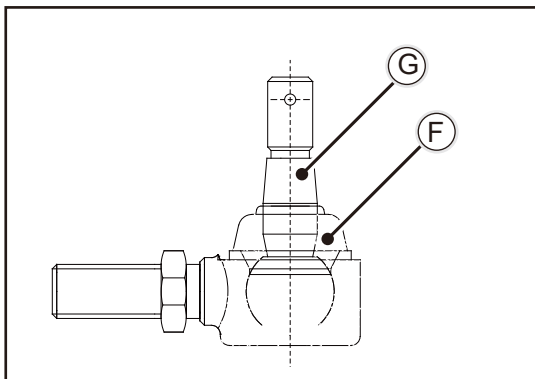
### STEERING ROD FOLDING



- 【A】 cotter pin
  - 【B】 Slotted nut M10
  - 【C】 Steering rocker arm
  - 【D】 Tie rods
  - 【E】 knuckle
- ◆ Remove the split pin 【A】 and slotted nut M10 【B】
  - ◆ Remove the steering tie rods 【D】 from the steering rocker arms 【C】 and steering knuckles 【E】 .

**⚠ WARNING**

Pay attention to protect the ball thread and dust cover when taking the steering tie rod to avoid damage.

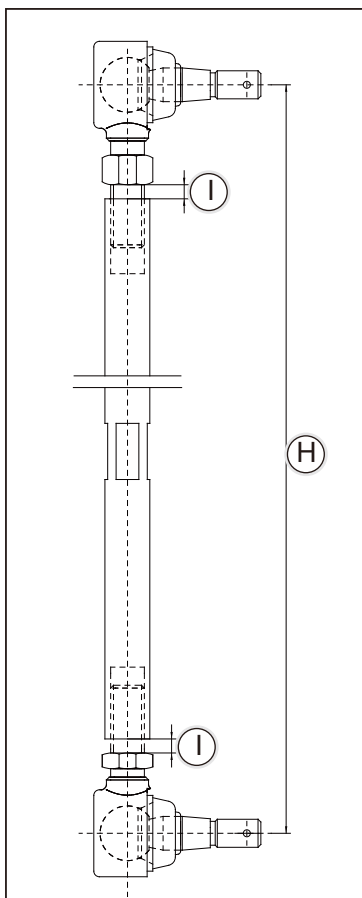


### STEERING TIE ROD INSTALLATION

Install in reverse order of steering tie rod removal.

**⚠ WARNING**

Do not remove the dust cover 【F】 , which is filled with grease.

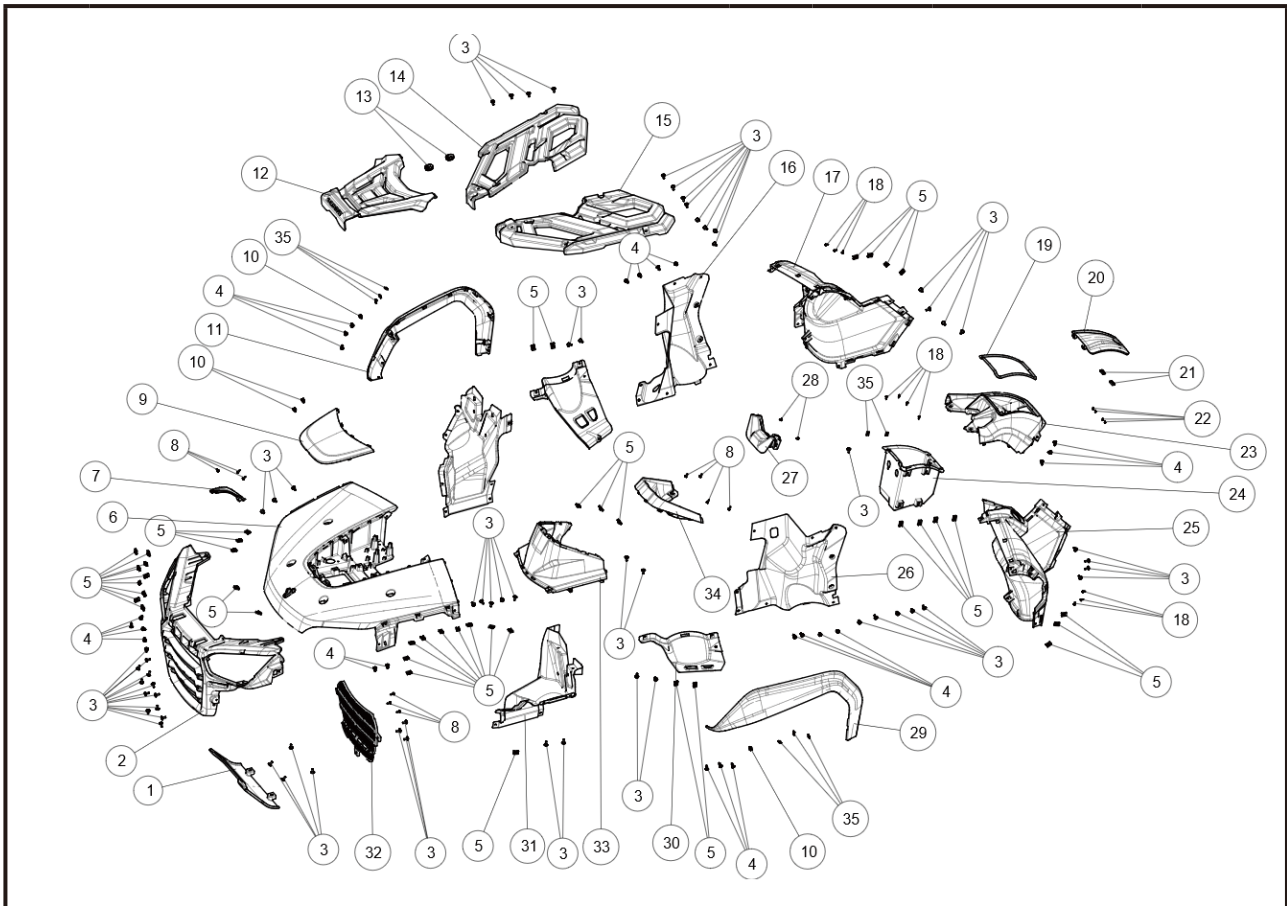


The small end of the taper on the steering tie rod is mounted towards the steering knuckle and steering rocker arm taper holes. The cross tie rod has the correct length 【H】 and the two visible thread lengths 【I】 are approximately equal. Steering tie rod length 【H】 398±1.5 mm.

## BODY AND FRAME

EXPLOSION DIAGRAM OF FRONT BODY PARTS .....	13-2
EXPLOSION DIAGRAM OF MID BODY PARTS .....	13-4
EXPLOSION DIAGRAM OF TAIL BODY PARTS.....	13-5
EXPLOSION DIAGRAM OF BOTTOM PARTS .....	13-6
SEAT REMOVAL.....	13-7
FRONT EXTERIOR TRIM-REMOVAL.....	13-9
MIDDLE EXTERIOR TRIM-REMOVAL .....	13-14
REAR EXTERIOR TRIM-REMOVAL .....	13-16
EXPLOSION DIAGRAM OF ENGINE/GEARBOX/FRONT AXLE DISASSEMBLY .....	13-20
FRAME ACCESSORY EXPLOSION DIAGRAM.....	13-21
FRAME ACCESSORY EXPLOSION DIAGRAM(MUD VERSION) .....	13-22
FRONT AND REAR SHELF DISASSEMBLY EXPLOSION DIAGRAM .....	13-23
FRONT BUMPER EXPLOSION DIAGRAM .....	13-24

## EXPLOSION DIAGRAM OF FRONT BODY PARTS

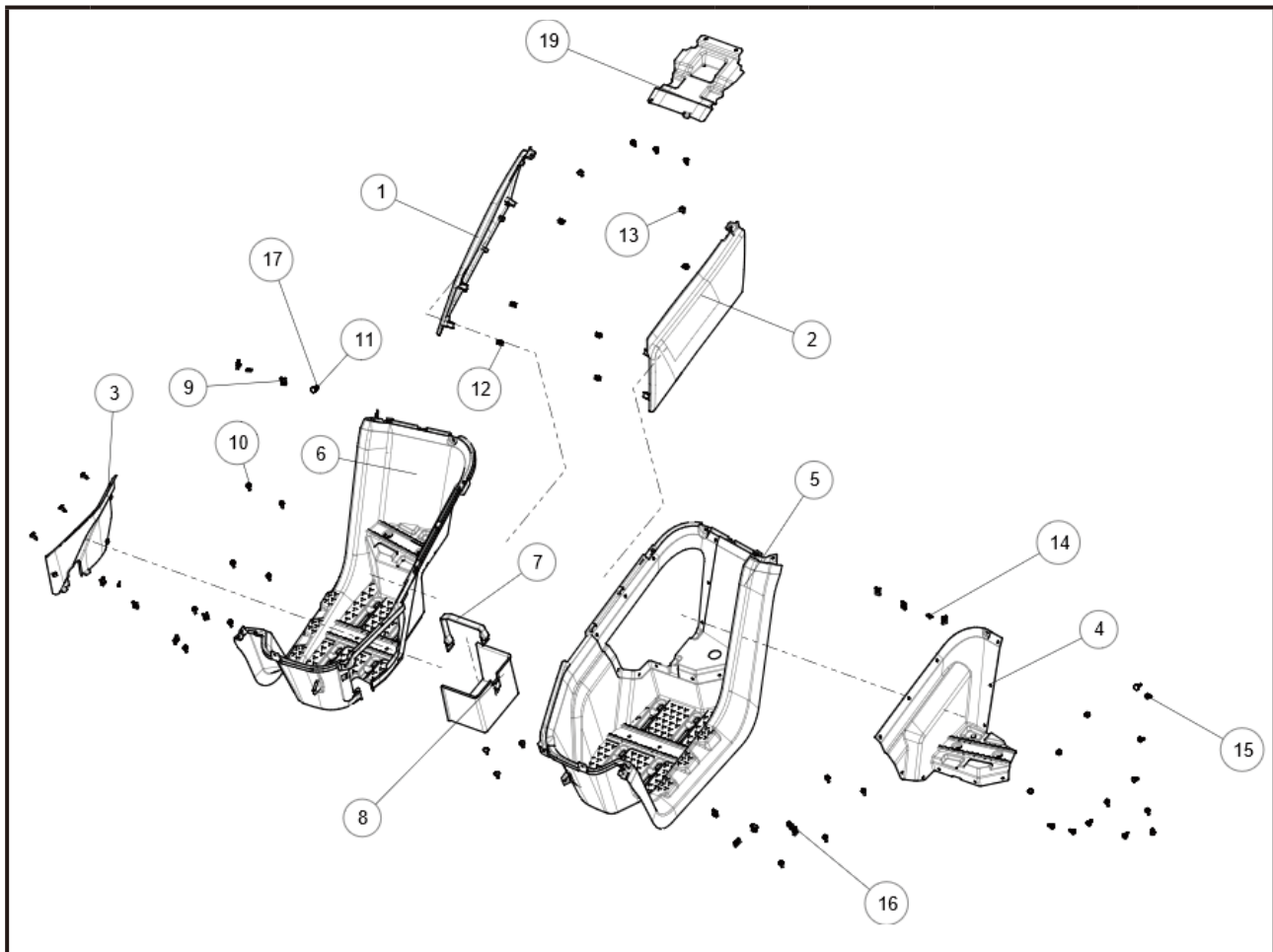


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	FRONT GUARD				
2	FRONT FASCIA				
3	LARGE PAN HEAD HEX SOCKET BOLT M6×16	8~12	0.8~1.2	69~103.6 in·lb	
4	EXPANSION BUCKLE COMPONENT				
5	M6 NUT CLAMP				
6	FRONT PANEL - TAN				
7	SHIFT RUBBER				
8	CROSS RECESSED HEXAGON SCREW ST4.8×16				
9	FRONT REPAIR COVER				
10	SPRING BUCKLE				
11	FRONT RIGHT SIDE PANEL				
12	FRONT SHELF MIDDLE COVER PLATE				
13	RUBBER RING				
14	FRONT SHELF RIGHT COVER				
15	FRONT SHELF LEFT COVER				
16	RIGHT FRONT UPPER MUDGUARD				

## SEGWAY AT10

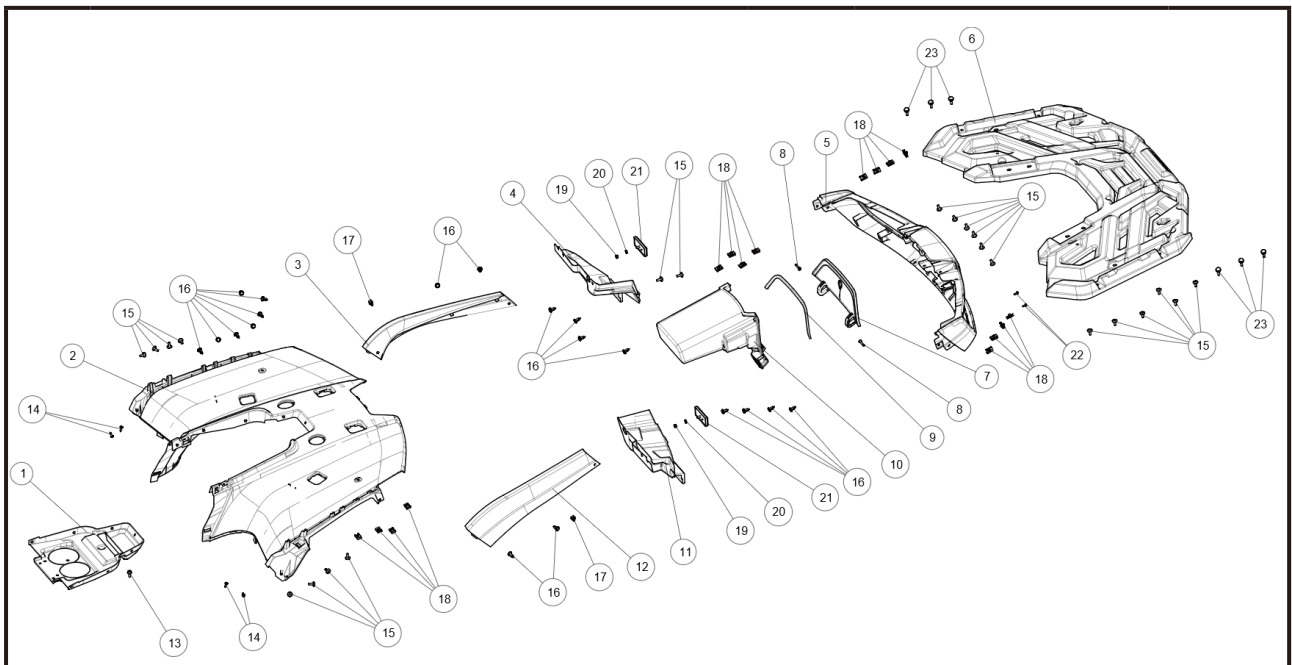
17	FRONT RIGHT FENDER				
18	CROSS HEAD SCREWS ST4.2×13				
19	SEAL STRIP				
20	FRONT STORAGE BOX SMALL COVER				
21	LOWER FENDER LR LOF				
22	SCREW ST2.9×9.5				
23	FRONT STORAGE BOX UPPER COVER				
24	FRONT STORAGE BOX				
25	FRONT LEFT FENDER				
26	LEFT FRONT UPPER MUDGUARD				
27	HANDLEBAR COVER				
28	CROSS RECESSED HEXAGON BOLTS M5×8				
29	FRONT LEFT SIDE PANEL				
30	LEFT FRONT LOWER MUDGUARD				
31	FRONT LEFT HEADLIGHT COVER				
32	BLACK FRONT GRILLE				
33	LOWER COVER,INSTRUMENT				
34	COVER,INSTRUMENT				
35	4.2 SELF-TAPPING SCREW				
36	ALUMINUM LOGO(60×45)				

## EXPLOSION DIAGRAM OF MID BODY PARTS



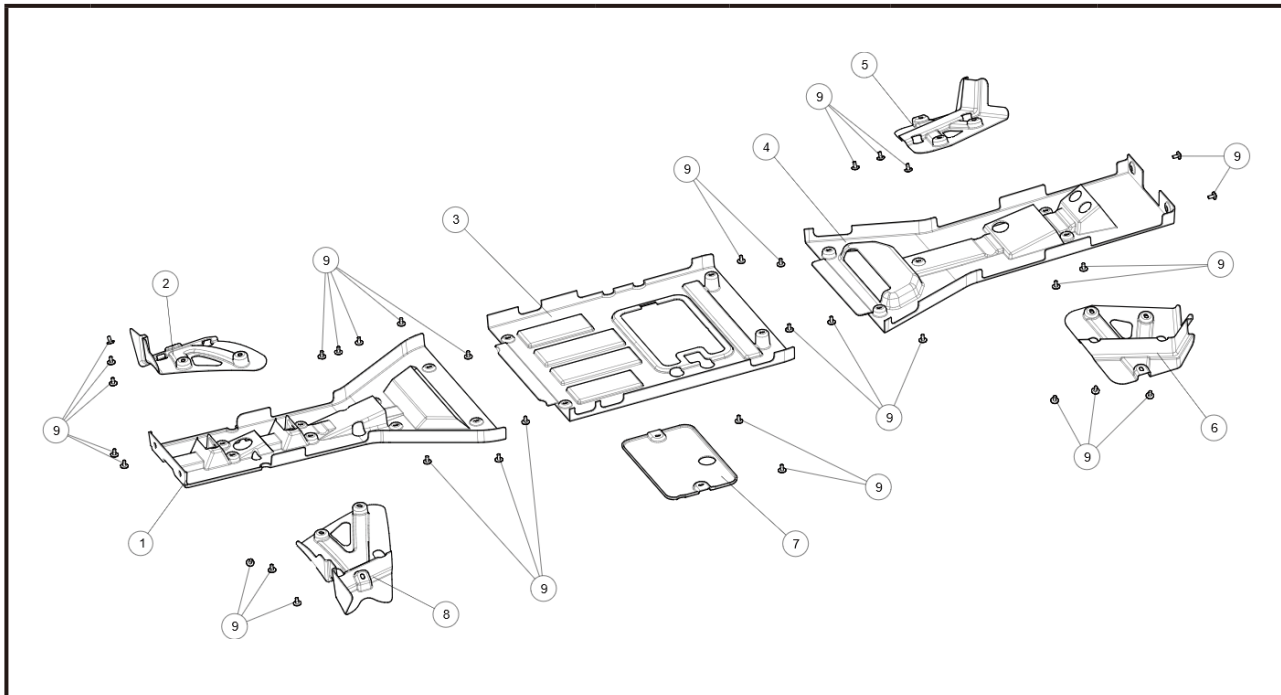
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Right guard plate				
2	Left guard plate				
3	Battery access cover				
4	CVT access cover				
5	Left pedal				
6	Right foot pedal				
7	Battery strap				
8	Battery box				
9	M6 nut clamp				
10	Hexagon flange bolt M6 × 16	8~12	0.8~1.2	69~103.6 in·lb	
11	Hexagon socket bolt with large pan head M6 × 20	8~12	0.8~1.2	69~103.6 in·lb	
12	Spring clip				
13	Hexagon socket bolt with large pan head M6 × 16	8~12	0.8~1.2	69~103.6 in·lb	
14	4.2 self-tapping nail splint				
15	Expansion buckle assembly				
16	Black self-tapping nail ST4.2 × 13				
17	Non-metallic insert hexagon flange lock nut M6				
18	Seat cushion bottom wind shield				
19					

EXPLOSION DIAGRAM OF TAIL BODY PARTS



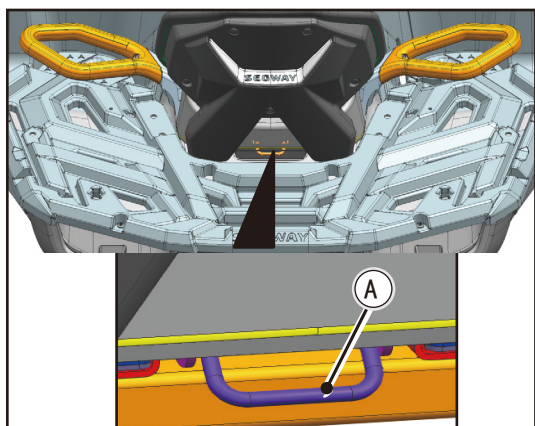
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	MIDDLE STORAGE BOX				
2	REAR PANEL - BLACK				
3	RIGHT REAR SIDEBAR				
4	RR TAIL LIGHTS MASKS				
5	REAR TAILLIGHT PANEL				
6	REAR SHELF COVER				
7	REAR STORAGE BOX COVER				
8	TAIL BOX COVER PIN SHAFT				
9	SEAL STRIP				
10	REAR STORAGE BOX				
11	RL TAIL LIGHTS MASKS				
12	LEFT REAR SIDEBAR				
13	BOLT M6×16	8~12	0.8~1.2	69~103.6 in·lb	
14	CROSS RECESSED HEXAGON SCREW ST4.8×16				
15	LARGE PAN HEAD HEX SOCKET BOLT M6×16	8~12	0.8~1.2	69~103.6 in·lb	
16	EXPANSION BUCKLE COMPONENT				
17	SPRING BUCKLE				
18	M6 NUT CLAMP				
19	NUT M6				
20	GASKET 6				
21	SQUARE REFLECTOR				
22	CROSS HEAD SCREWS ST4.2×13				
23	BOLT M8×16	8~12	0.8~1.2	69~103.6 in·lb	

## EXPLOSION DIAGRAM OF BOTTOM PARTS



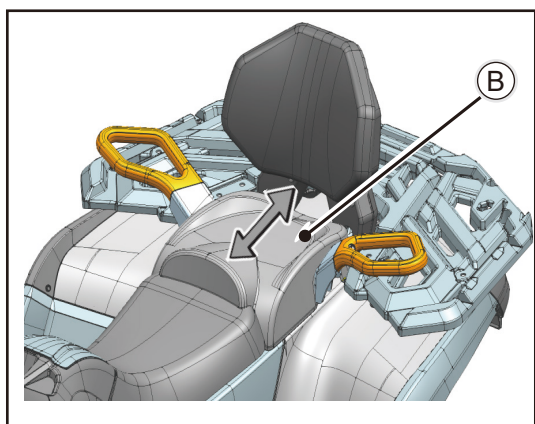
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	FRONT BOTTOM GUARD				
2	FRONT RIGHT ROCKER ARM GUARD				
3	MID GUARD				
4	REAR BOTTOM GUARD				
5	REAR RIGHT ROCKER ARM GUARD				
6	REAR LEFT ROCKER ARM GUARD				
7	MAINTENANCE COVER				
8	FRONT LEFT ROCKER ARM GUARD				
9	HEXAGON FLANGE BOLT M6×12	8~12	0.8~1.2	69~103.6 in·lb	

## SEAT REMOVAL

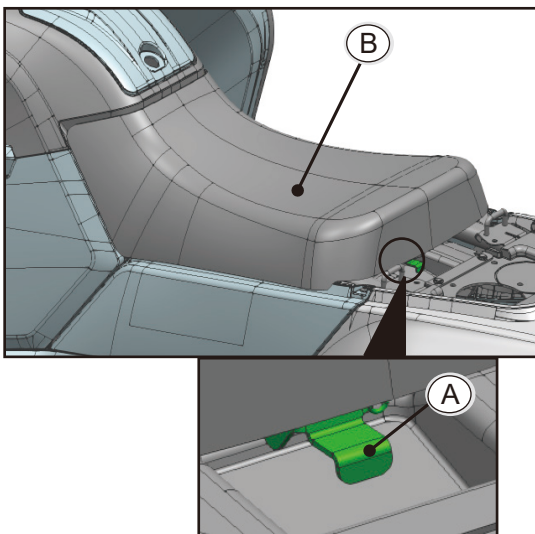


## REAR SEAT CUSHION REMOVAL

- ◆ Move the rear cushion lock by hand 【A】

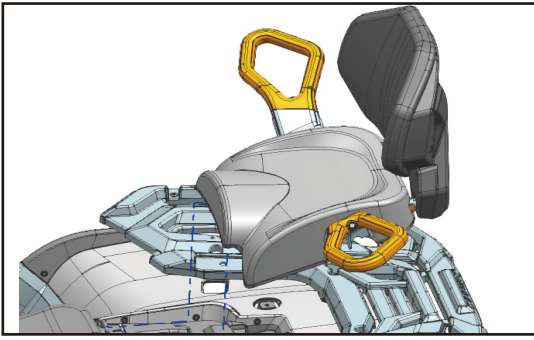


- ◆ Pull out the rear seat backward and upward.



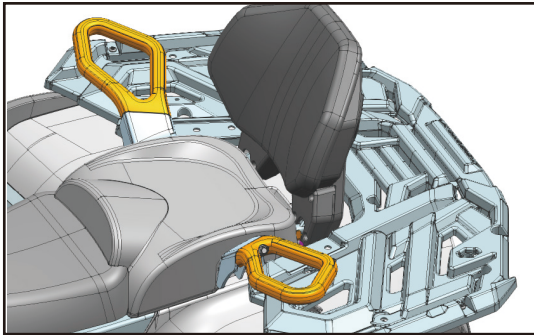
## FRONT SEAT CUSHION REMOVAL

- ◆ Remove the seat cushion and pry open the seat cushion lock hook 【A】
- ◆ Remove the seat cushion and pull the seat cushion 【B】 out backward and upward

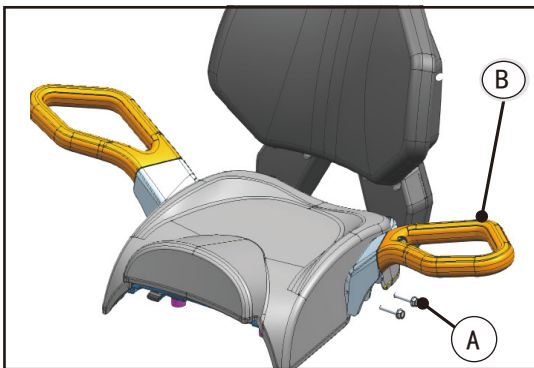


### INSTALL REAR CUSHION:

- ◆ Align the front end of the rear seat cushion with the installation position on the frame;

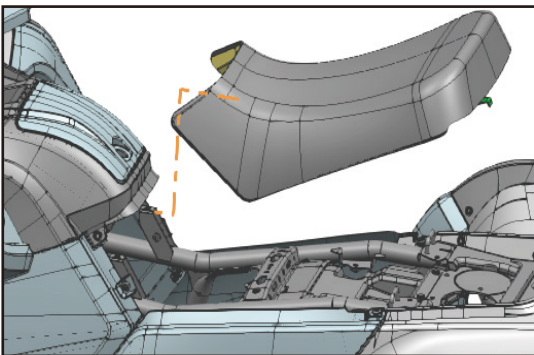


- ◆ Press the seat cushion down, hear the click sound, and lock the lock hook behind the seat cushion to lock the seat cushion hook on the frame



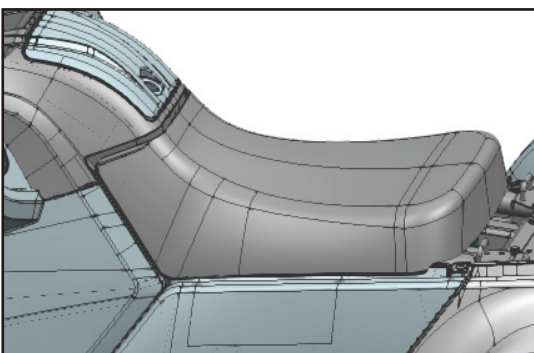
### ARMREST REMOVAL

- ◆ Take out 2 bolts 【A】 and remove the handrail 【B】
- ◆ The left and right handrails are disassembled in the same way;



### FRONT SEAT CUSHION INSTALLATION

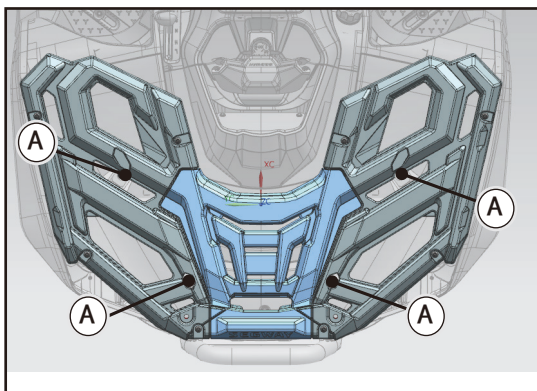
- ◆ Insert the two limit blocks at the front end of the front cushion into the two limit slots on the frame



### FRONT SEAT CUSHION INSTALLATION

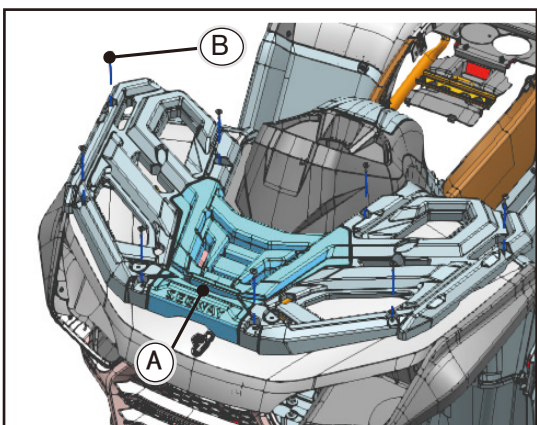
- ◆ Press the front seat cushion down, hear a click, and lock the lock hook behind the seat cushion to lock the seat cushion hook on the frame

## FRONT EXTERIOR TRIM-REMOVAL



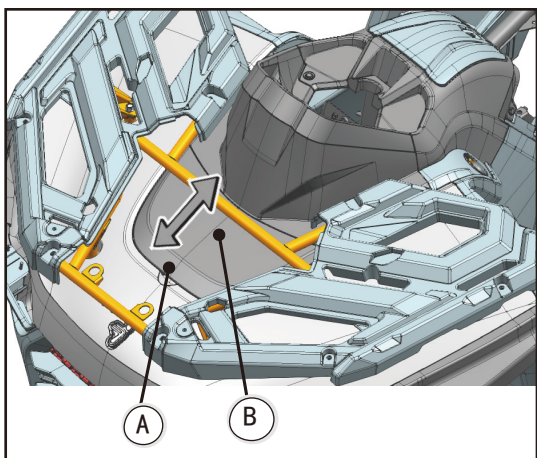
### FRONT SHELF REMOVAL

- ◆ Put the car body in a horizontal position first
- ◆ Take out 4 left and right fixing bolts of front shelf 【A】 ;
- ◆ Remove the front shelf from the body;



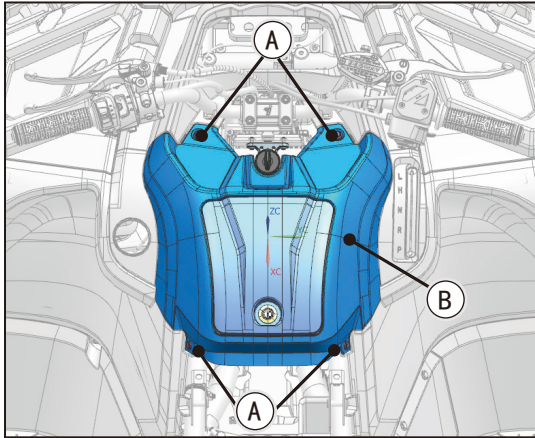
### FRONT RACK COVER REMOVAL

- ◆ First place the vehicle body in a horizontal position.
- ◆ Pull upward firmly at the hand grip 【A】 to remove the middle cover of the front rack.
- ◆ Remove the eight fixing bolts for the left and right front rack covers 【B】 ;
- ◆ Remove the left and right front rack covers from the vehicle body;



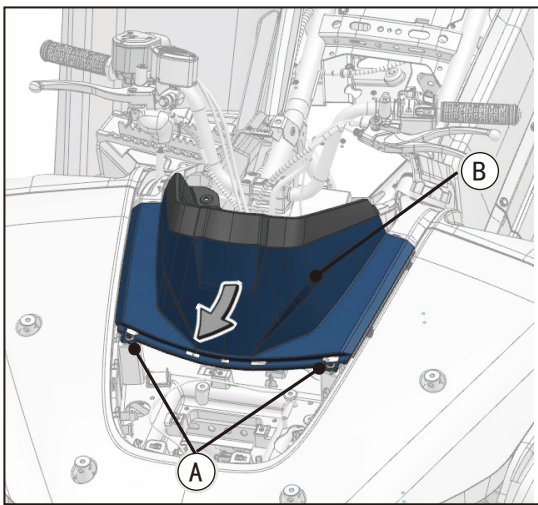
### FRONT INSPECTION COVER REMOVAL

- ◆ Remove the middle cover of the front rack.
- ◆ Place your hand at 【A】 and pull upward.
- ◆ Pull the front inspection cover 【B】 out backward and upward.



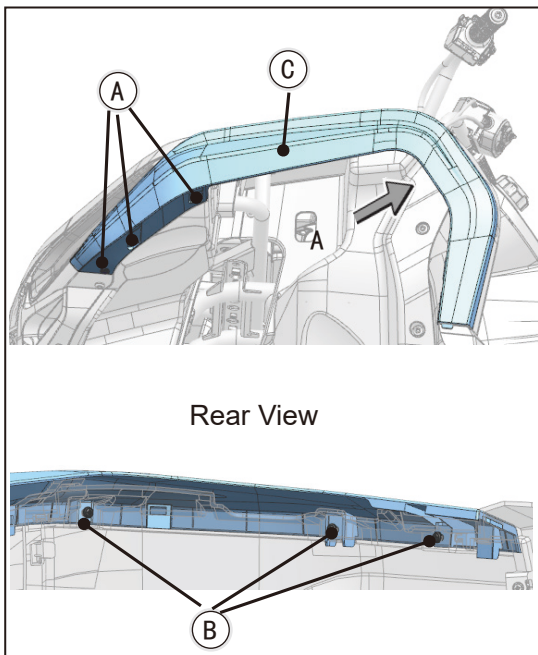
### FRONT STORAGE BOX ASSEMBLY REMOVAL

- ◆ Remove the rear seat cushion.
- ◆ Remove the front seat cushion.
- ◆ Remove the four expansion screws 【A】 ;
- ◆ Pull the front storage box assembly 【B】 upward a certain distance;
- ◆ Remove the electrical components to completely remove the front storage box assembly 【B】 .



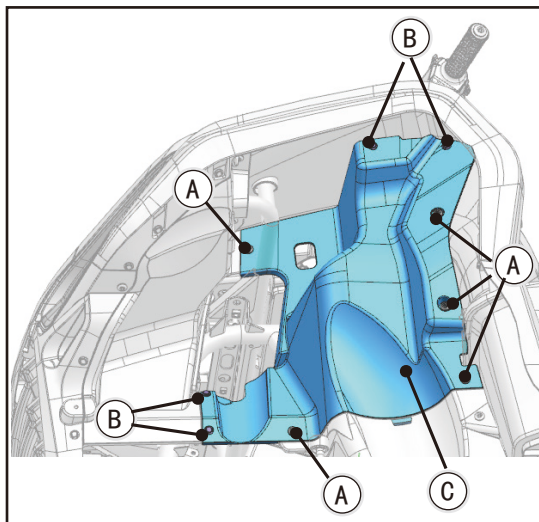
### INSTRUMENT COVER ASSEMBLY REMOVAL

- ◆ Remove the rear seat cushion
- ◆ Remove the front seat cushion
- ◆ Remove the front inspection cover
- ◆ Remove the front storage box assembly
- ◆ Remove the two screws 【A】
- ◆ Pull out the instrument cover 【B】 along the arrow



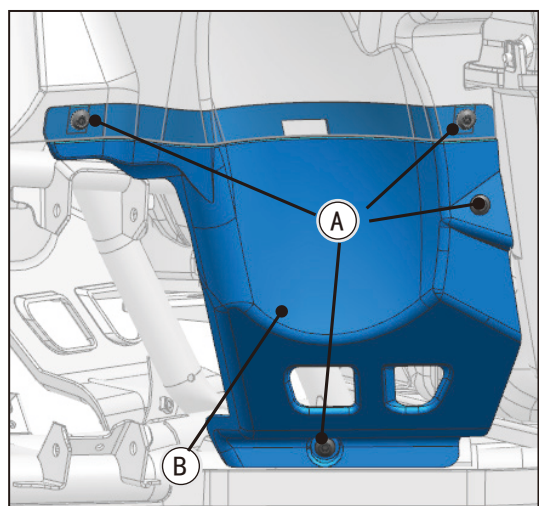
### FORWARD VIEW EDGE STRIP-REMOVAL

- ◆ Take out 3 expansions 【A】 ;
- ◆ Take out 3 screws 【B】 ;
- ◆ Pull the front access cover 【C】 upward;
- ◆ The removal method of the front edge strip is the same on the left and right.



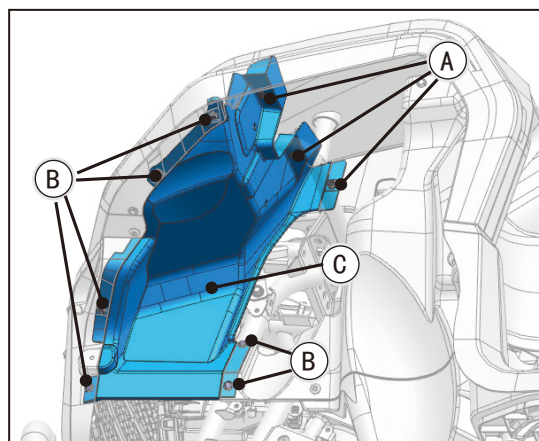
#### FRONT UPPER FENDER REMOVAL

- ◆ Remove the five studs 【A】 ;
- ◆ Remove the four expansion screws 【B】 ;
- ◆ The front upper fender 【C】 can then be removed.
- ◆ The removal method for the front upper fender is the same for both left and right sides.



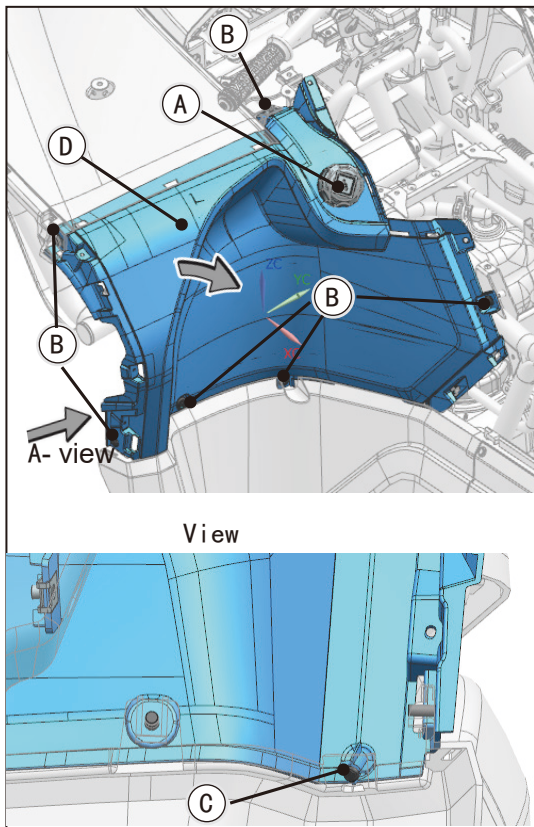
#### FRONT LOWER FENDER REMOVAL

- ◆ Turn the handlebar fully to one side (turn fully to the right when removing the left component; turn fully to the left when removing the right component).
- ◆ Remove the four studs 【A】 ;
- ◆ The front lower fender 【B】 can then be removed.
- ◆ The removal method for the front lower fender is the same for both left and right sides.



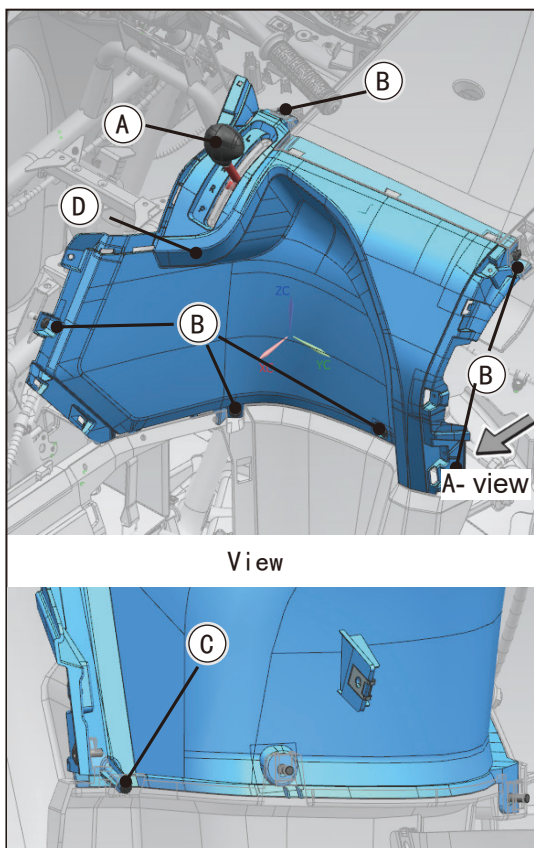
#### FRONT HEADLIGHT COVER REMOVAL

- ◆ Remove the three studs 【A】 ;
- ◆ Remove the six expansion screws 【B】 ;
- ◆ The front headlight cover 【C】 can then be removed.
- ◆ The removal method for the front headlight cover is the same for both left and right sides.



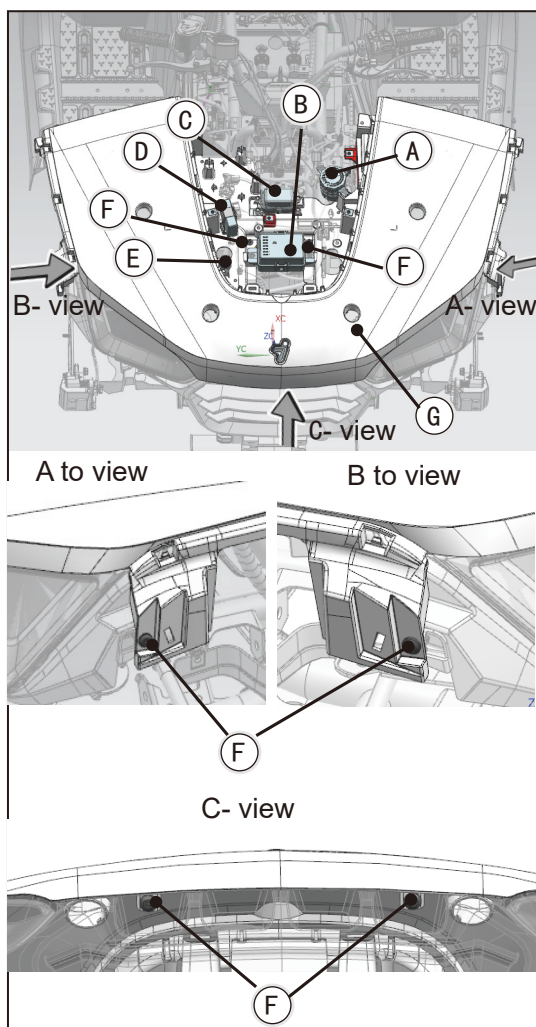
### REMOVAL OF THE LEFT FRONT FENDER

- ◆ Remove the rear seat cushion
- ◆ Remove the front seat cushion
- ◆ Remove the left and right guards. Please refer to page 13.22 for removal of left and right protective plates.
- ◆ Remove the front shelf.
- ◆ Remove the front maintenance cover.
- ◆ Remove the front storage box assembly.
- ◆ Remove the instrument cover.
- ◆ Remove the left front fender;
- ◆ Remove the left front side strip;
- ◆ Remove the fuel tank cover 【A】 ;
- ◆ Take out 6 screws 【B】 ;
- ◆ Take out 1 self-tapping screw 【C】 ;
- ◆ Pull out the front fender along the arrow 【D】



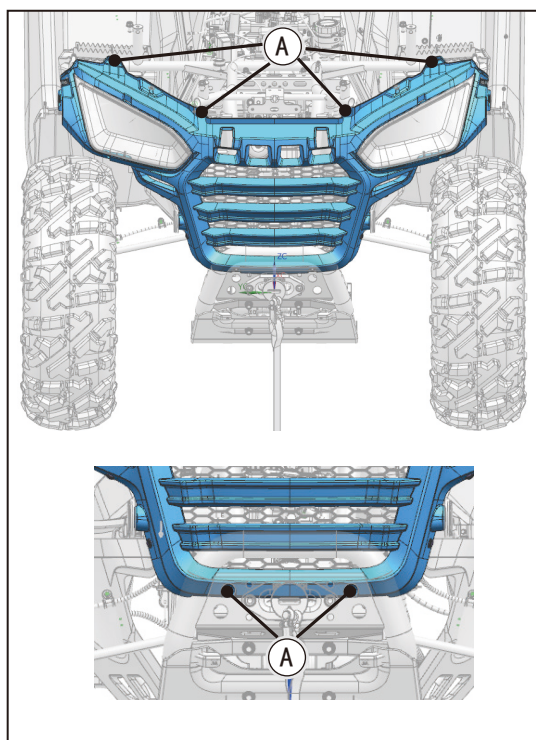
### REMOVE THE RIGHT FRONT FENDER

- ◆ Remove the rear seat cushion
- ◆ Remove the front seat cushion
- ◆ Remove the left and right guards. Please refer to page 13.22 for left and right guard plate removal
- ◆ Remove the battery access cover. Please refer to page 13.22 for battery access cover disassembly
- ◆ Remove the front shelf
- ◆ Remove the front maintenance cover
- ◆ Remove the front storage box assembly
- ◆ Remove the instrument cover
- ◆ Remove the right front upper fender
- ◆ Remove the right front side strip
- ◆ Remove the shift handle 【A】
- ◆ Take out 6 screws 【B】
- ◆ Take out 1 self-tapping screw 【C】
- ◆ Pull out the front fender 【D】 along the arrow to remove the front exterior trim



### FRONT PANEL REMOVAL

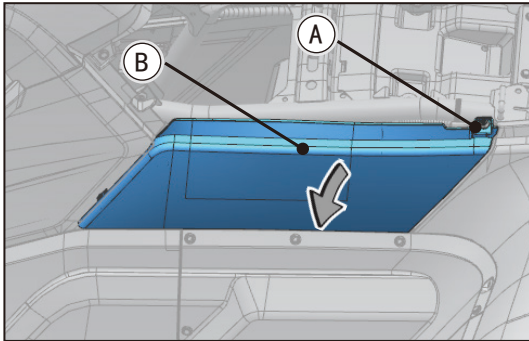
- ◆ Remove the rear seat cushion.
- ◆ Remove the front seat cushion.
- ◆ Remove the front rack.
- ◆ Remove the front inspection cover.
- ◆ Remove the front storage box assembly.
- ◆ Remove the instrument cover.
- ◆ Remove the front upper fender;
- ◆ Remove the front headlight cover;
- ◆ Remove the front side strip.
- ◆ Remove the left and right side panels. See Left and Right Side Panel Removal on Page 13.22.
- ◆ Remove the front fender;
- ◆ Loosen the mounting screw of the brake fluid reservoir **【A】** .
- ◆ Loosen the mounting screw of the fuse box **【B】** .
- ◆ Loosen the mounting screw of the winch relay **【C】** .
- ◆ Remove the flasher **【D】** .
- ◆ Loosen the mounting screw of the buzzer **【E】** .
- ◆ Remove the six studs **【F】** ;
- ◆ Remove the front panel **【G】** .



### FRONT HEADLIGHT MASK AND FRONT GRILLE ASSEMBLY REMOVAL

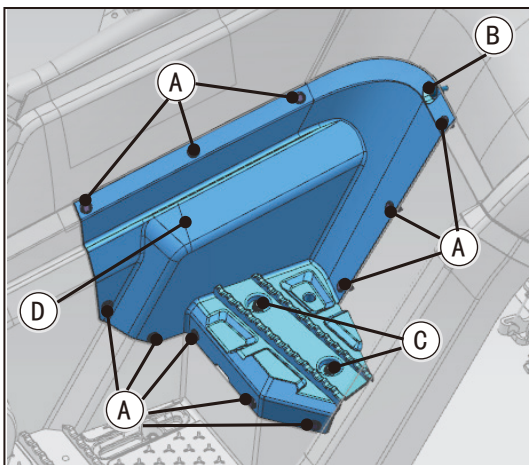
- ◆ Remove the rear seat cushion.
- ◆ Remove the front seat cushion.
- ◆ Remove the front rack.
- ◆ Remove the front inspection cover.
- ◆ Remove the front storage box assembly.
- ◆ Remove the instrument cover.
- ◆ Remove the front upper fender;
- ◆ Remove the front lower fender;
- ◆ Remove the front headlight cover;
- ◆ Remove the front side strip;
- ◆ Remove the left and right side panels. See Left and Right Side Panel Removal on Page 13.22;
- ◆ Remove the front fender;
- ◆ Remove the six screws **【A】** ;
- ◆ Pull out the front headlight mask **【B】** along the arrow.

## MIDDLE EXTERIOR TRIM-REMOVAL

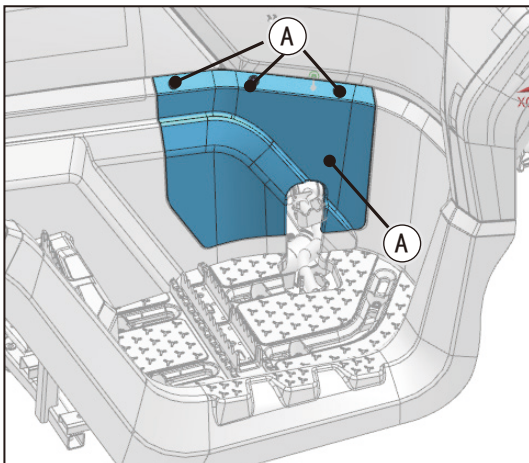


### MIDDLE GUARD REMOVAL

- ◆ Remove the rear seat cushion
- ◆ Remove the front seat cushion
- ◆ Take out one screw 【A】 ;
- ◆ Drag the front edge strip along the arrow 【B】
- ◆ The removal method of the guard plate is the same on the left and right;

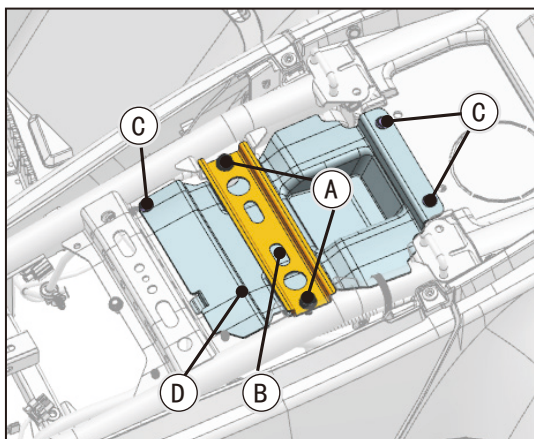


- ◆ Take out 2 bolts 【C】
- ◆ Take out one bolt 【B】
- ◆ Take out 11 expansion screws 【A】 ;
- ◆ Pull the front access cover 【D】 upward.

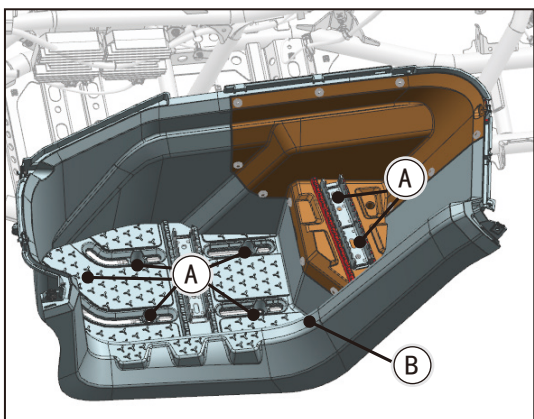


### BATTERY INSPECTION COVER REMOVAL

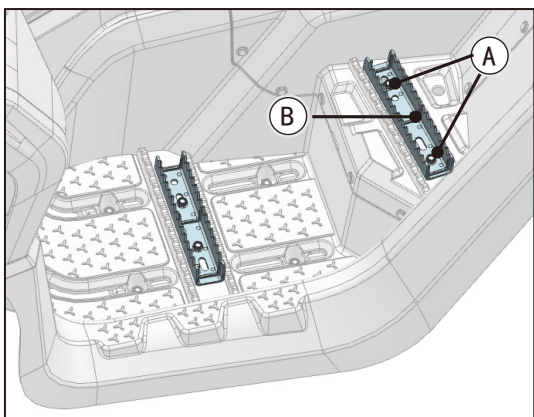
- ◆ Remove the three expansion screws 【A】 ;
- ◆ Pull the front inspection cover 【B】 out upward.

**SEAT C BOTTOM WINDSHIELD REMOVAL**

- ◆ Remove the rear seat cushion
- ◆ Remove the rear seat cushion
- ◆ Remove the front seat cushion
- ◆ Take out 2 screws
- ◆ Remove the seat bracket welding assembly **【A】** ;
- ◆ Take out 3 expansion screws **【C】** ;
- ◆ Drag the wind deflector at the bottom of the seat cushion along the arrow **【D】** ;

**A LEFT FOOT PEDAL REMOVAL**

- ◆ Remove the rear seat cushion
- ◆ Remove the front seat cushion
- ◆ Remove the front storage box assembly
- ◆ Remove the instrument cover
- ◆ Remove the front upper fender;
- ◆ Remove the front lower fender;
- ◆ Remove the front side strip;
- ◆ Remove the middle guard plate;
- ◆ Remove the front fender;
- ◆ Please refer to the left and right guard plates on page 13.22 to remove the rear edge strip;
- ◆ Please refer to the left and right guard plates on page 13.22 to remove the rear baffle;
- ◆ Take out 7 screws **【A】** ;
- ◆ Drag out the pedal **【B】**
- ◆ The foot pedal is disassembled in the same way on the left and right;

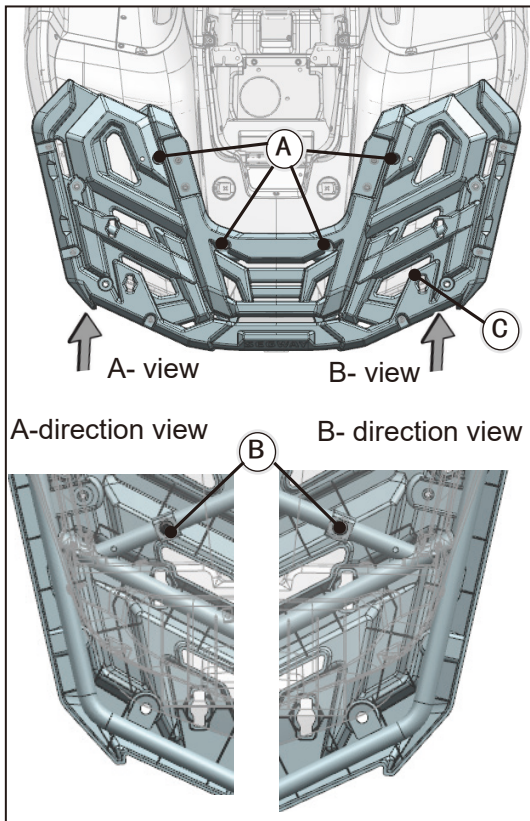
**PEDAL SERRATION REMOVAL**

- ◆ Take out 2 screws **【A】** to remove the pedal serration **【B】**

## REAR EXTERIOR TRIM-REMOVAL

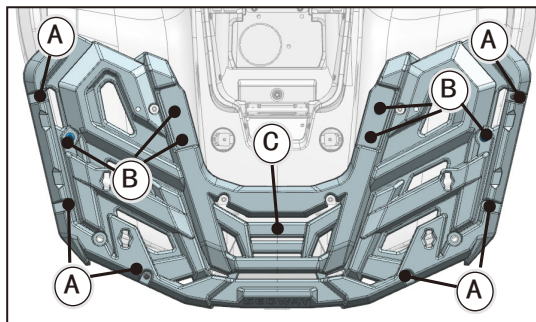
### REMOVE THE REAR SHELF ASSEMBLY

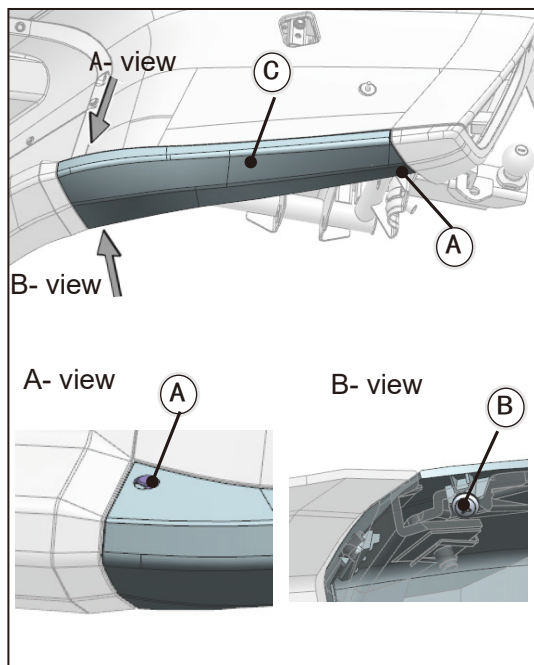
- ◆ Put the car body in a horizontal position first
- ◆ Take out 4 front shelf fixing bolts 【A】 ;
- ◆ Take out 2 fixing bolts on the back of the front shelf 【B】
- ◆ Remove the front shelf from the body;



### FRONT SHELF PANEL REMOVAL

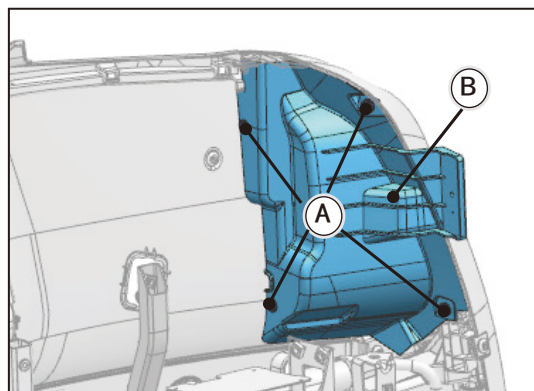
- ◆ Put the car body in a horizontal position first
- ◆ Take out 6 fixing bolts of left and right cover plates of front shelf 【A】 ;
- ◆ Take out 6 fixing bolts of left and right cover plates of front shelf 【B】
- ◆ The front shelf cover plate can be removed from the body;





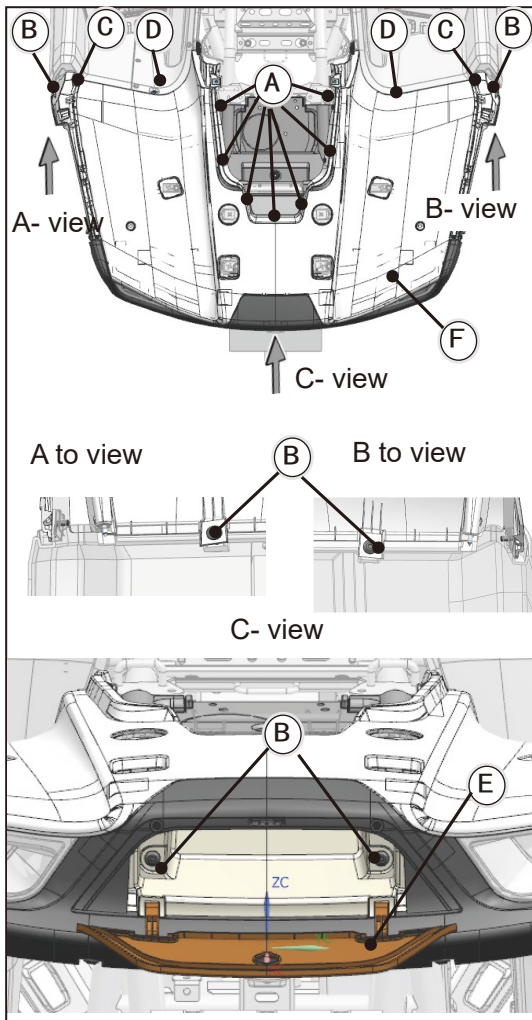
#### REAR SIDE STRIP REMOVAL

- ◆ Remove the one self-tapping screw 【B】 ;
- ◆ Remove the two expansion screws 【A】 ;
- ◆ Pull out the front side strip 【C】 upward.
- ◆ The removal method for the front side strip is the same for both left and right sides.



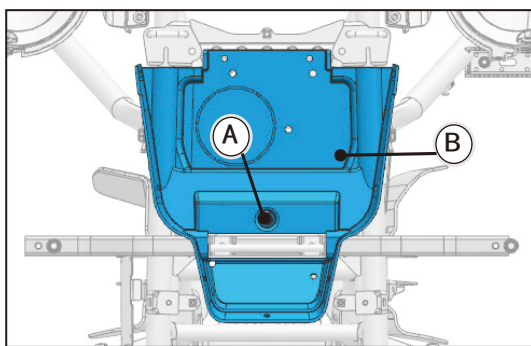
#### REAR TAIL LIGHT LENS-REMOVAL

- ◆ Take out 4 expansion nails 【A】 ;
- ◆ The rear tail lamp cover can be removed 【B】 ;
- ◆ The removal method of rear tail lamp cover is the same on the left and right sides.



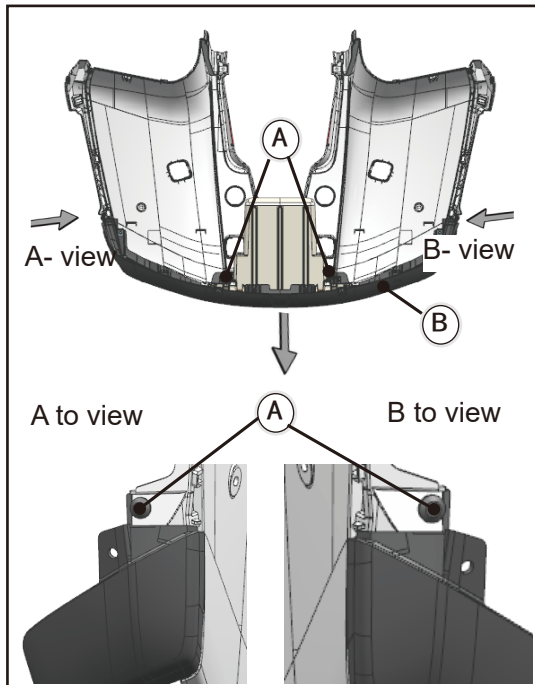
### REAR FENDER, REAR TAIL LIGHT PANEL AND REAR STORAGE COMPARTMENT COMBINATION REMOVAL

- ◆ Remove the rear seat cushion;
- ◆ Remove the front seat cushion;
- ◆ Remove the rear shelf and set one
- ◆ Remove the side strip of the middle guard plate;
- ◆ Remove the rear edge strip;
- ◆ Remove the rear tail lamp cover;
- ◆ Take out 7 expansion nails 【A】
- ◆ Take out 4 screws 【B】
- ◆ Take out 2 screws 【C】
- ◆ Take out 2 self-working screws 【C】
- ◆ Open the rear storage box cover with the key 【E】 , and take out 2 screws 【B】
- ◆ Pull off tail light connector
- ◆ Take out the tailgate assembly 【F】



### MIDDLE STORAGE BOX REMOVAL

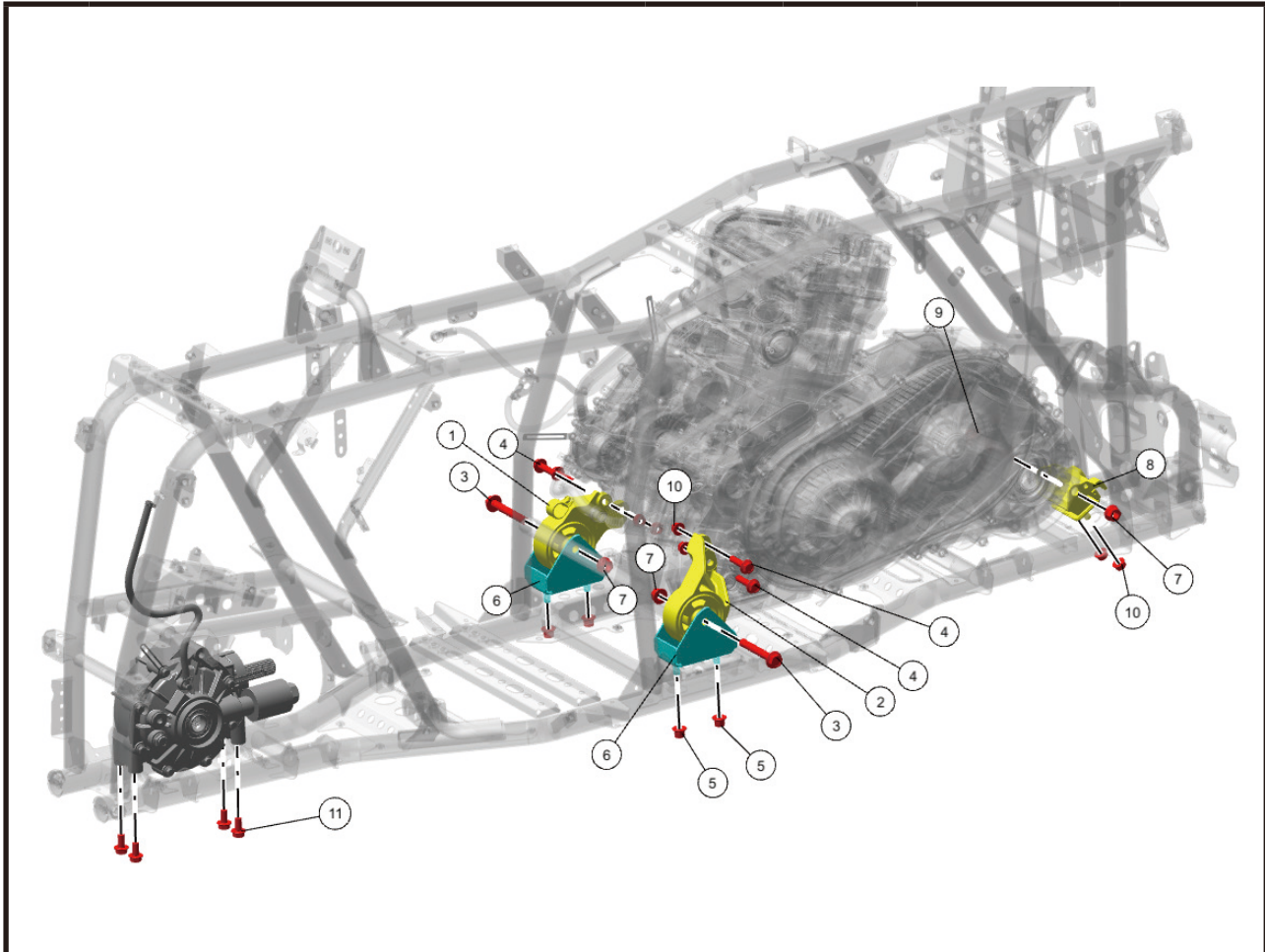
- ◆ Remove the rear seat cushion;
- ◆ Remove the front seat cushion;
- ◆ Remove the rear shelf assembly
- ◆ Remove the side strip of the middle guard plate;
- ◆ Remove the rear edge strip;
- ◆ Remove the rear tail lamp cover;
- ◆ Remove the rear baffle combination
- ◆ Remove the seat bracket welding assembly
- ◆ Remove the wind shield at the bottom of the seat cushion
- ◆ Take out one screw 【A】
- ◆ Take out the middle storage box 【B】



#### REAR TAILLIGHT PANEL AND REAR STORAGE BOX ASSEMBLY REMOVAL

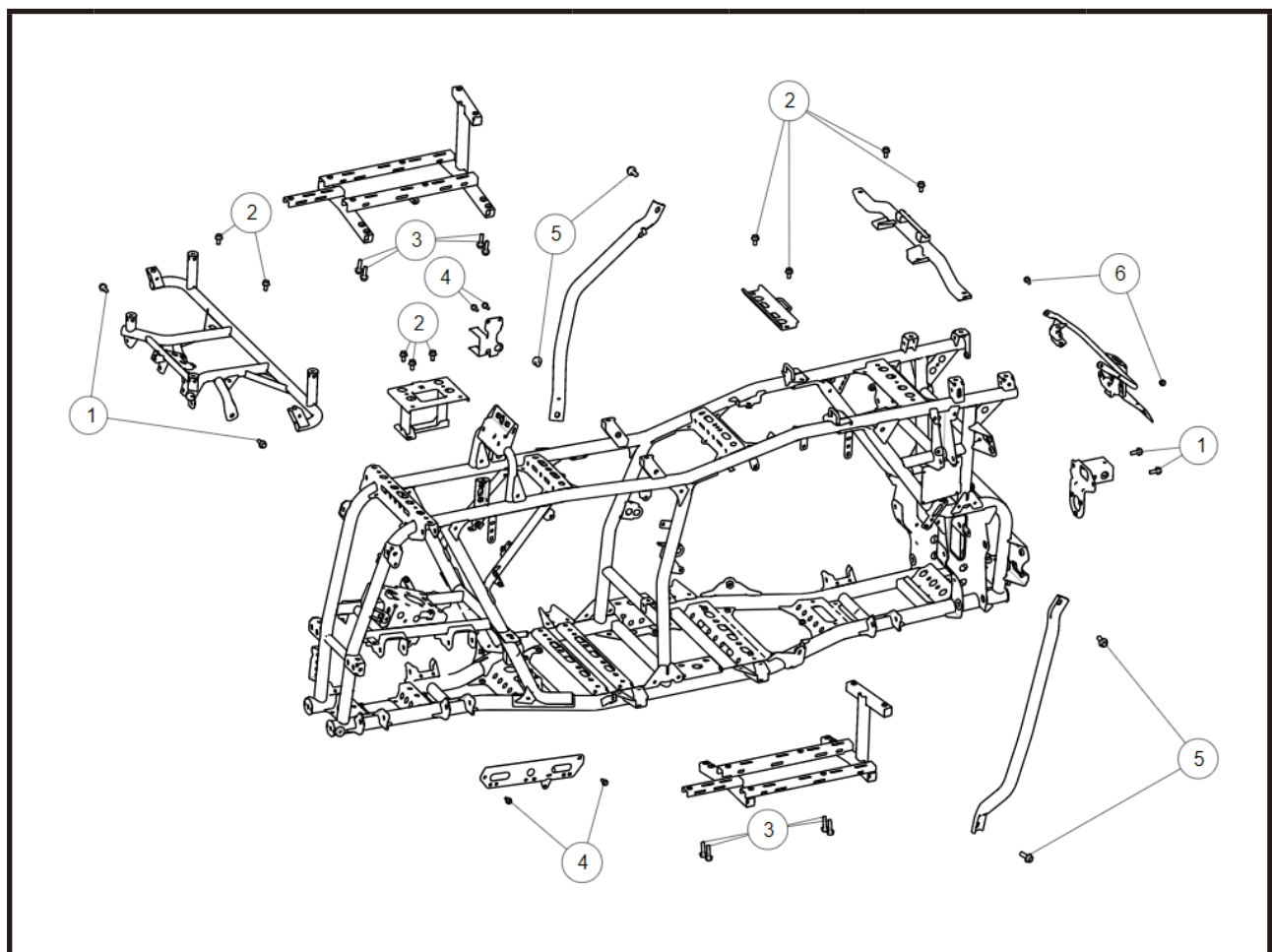
- ◆ Remove the rear baffle assembly as a whole.
- ◆ Remove the four bolts 【A】.
- ◆ Pull out the rear taillight cover and rear storage box assembly 【B】 along the arrow direction.

## EXPLOSION DIAGRAM OF ENGINE/GEARBOX/FRONT AXLE DISASSEMBLY



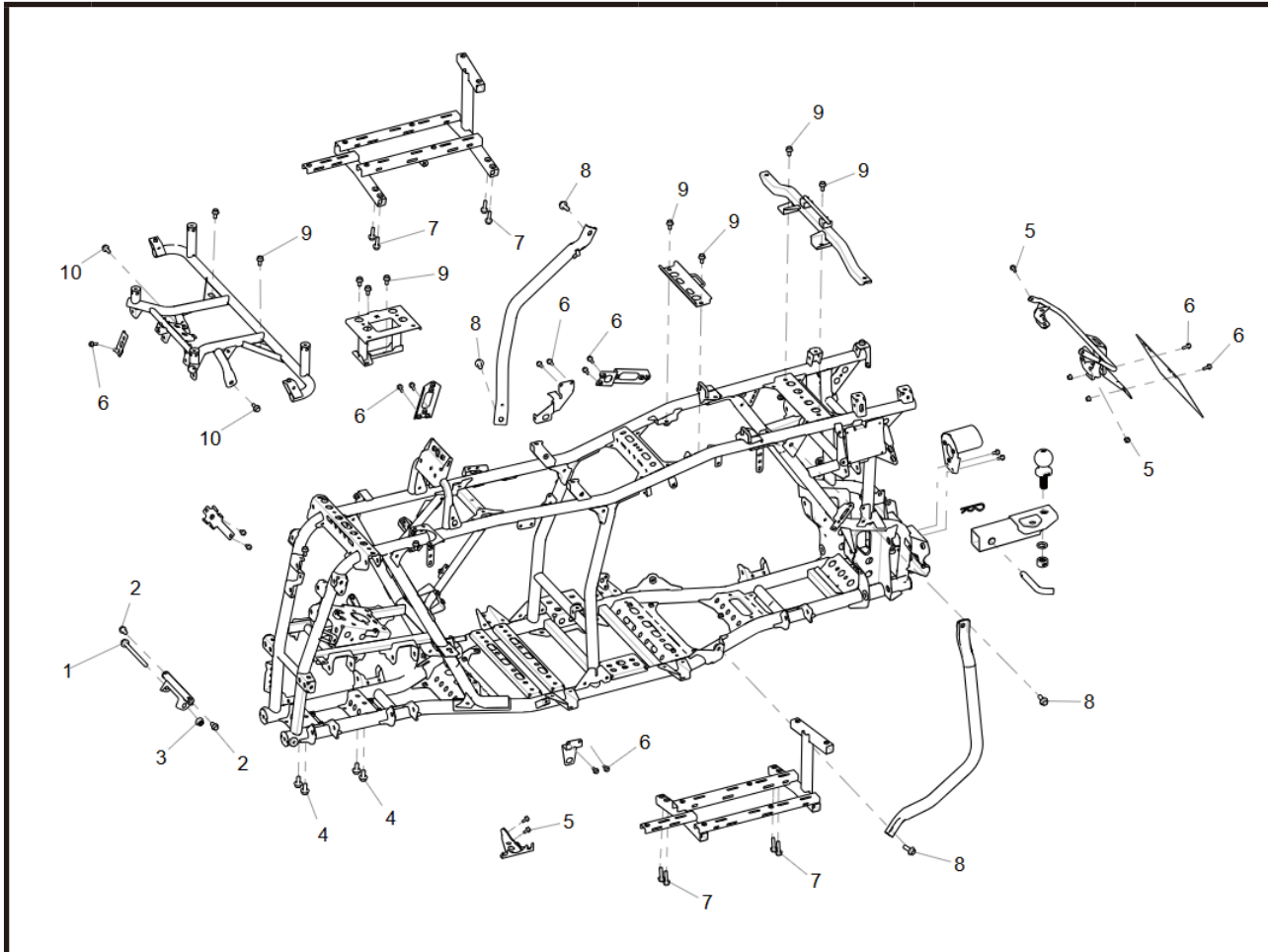
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	FRONT RIGHT SUPPORT SEAT				
2	FRONT LEFT SUPPORT SEAT				
3	HEXAGON FLANGE BOLT M12×1.25×85(BLACK)	50~60	5.0~6.0	36.9~44.3	
4	HEXAGON FLANGE BOLT M10×1.25×40	30~40	3.0~4.0	22.1~29.5	
5	NUT M10×1.25	30~40	3.0~4.0	22.1~29.5	
6	FRONT SUSPENSION BASE				
7	NUT M12×1.25	50~60	5.0~6.0	36.9~44.3	
8	REAR SUPPORT SEAT				
9	HEXAGON FLANGE BOLT M12×1.25×110	40~50	4.0~5.0	29.5~36.9	
10	NUT M10×1.25	30~40	3.0~4.0	22.1~29.5	
11	HEXAGON FLANGE BOLT M10×1.25×20	30~40	3.0~4.0	22.1~29.5	

**FRAME ACCESSORY EXPLOSION DIAGRAM**



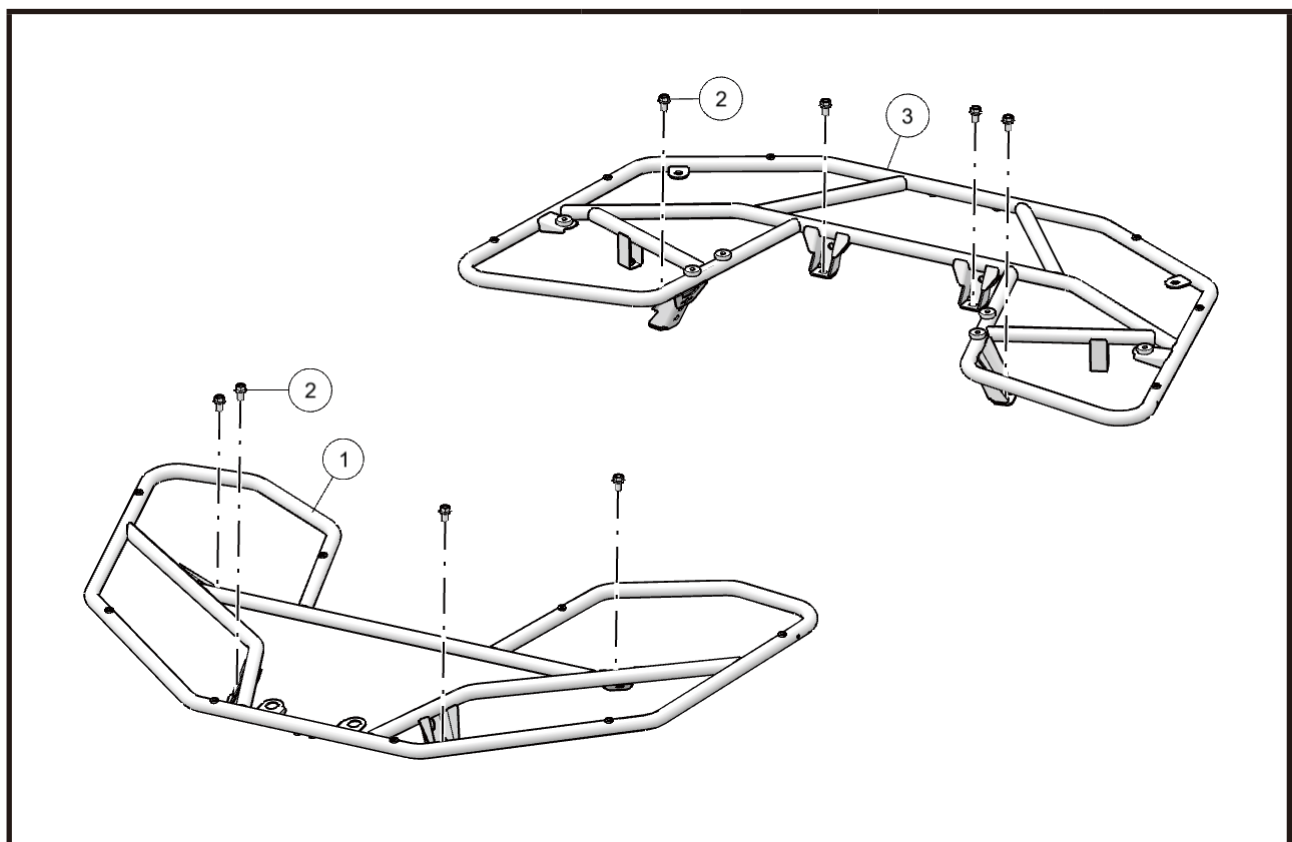
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	HEXAGON FLANGE BOLT M8×20	30~40	3.0~4.0	22.1~29.5	
2	HEXAGON FLANGE BOLT M8×16	30~40	3.0~4.0	22.1~29.5	
3	HEXAGON FLANGE BOLT M8×25	30~40	3.0~4.0	22.1~29.5	
4	HEXAGON FL ANGE BOLTM8×16	30~40	3.0~4.0	22.1~29.5	
5	HEXAGON FLANGE BOLT M10×25	40~50	4.0~5.0	29.5~36.9	
6	HEXAGON FLANGE BOLT M6×12	8~12	0.8~1.2	69~103.6 in·lb	

## FRAME ACCESSORY EXPLOSION DIAGRAM(MUD VERSION )



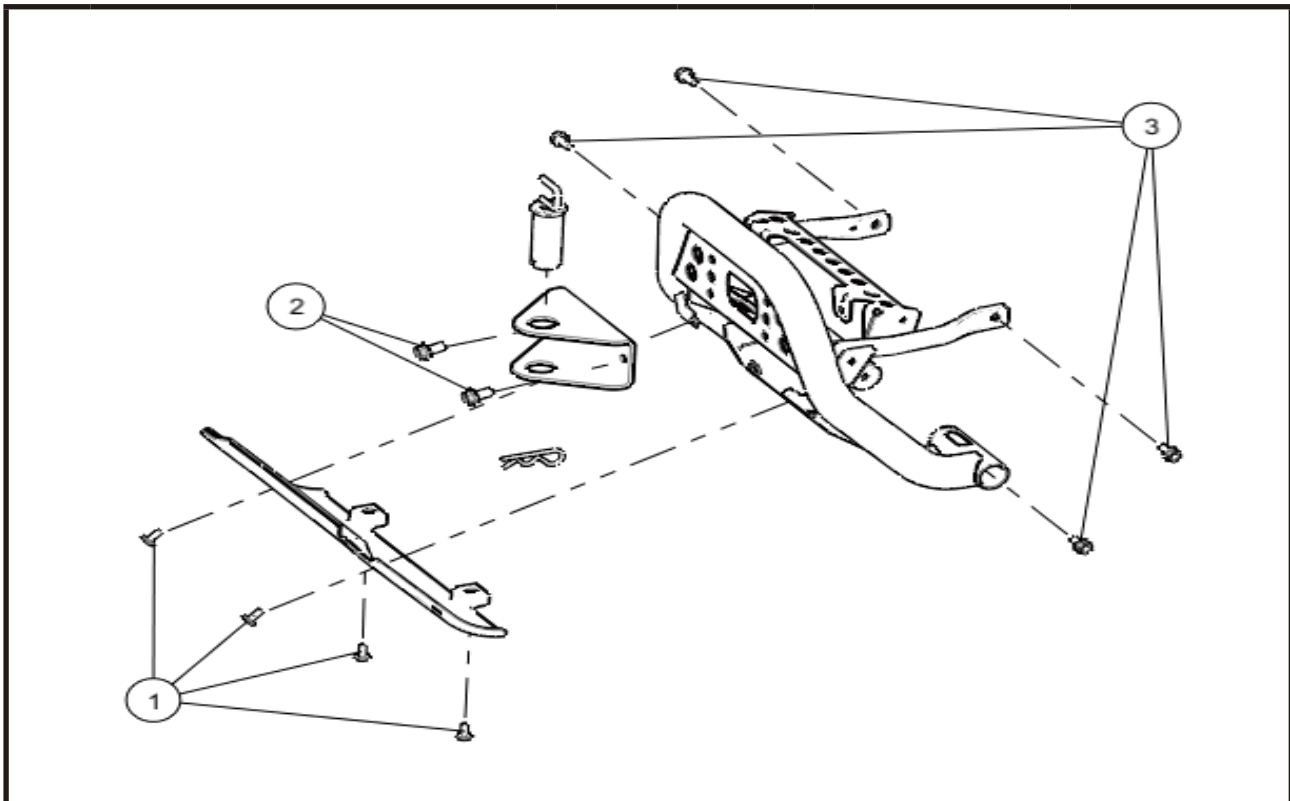
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	HEXAGON FLANGE BOLT M10x1.25x125	40~50	4.0~5.0	29.5~36.9	
2	BOLT M10x1.25x16	40~50	4.0~5.0	29.5~36.9	
3	NUT M10	40~50	4.0~5.0	29.5~36.9	
4	HEXAGON FLANGE BOLT M10x125x20	40~50	4.0~5.0	29.5~36.9	
5	HEXAGON FLANGE BOLT M6x12	8~12	0.8~1.2	69~103.6 in·lb	
6	HEXAGON FLANGE BOLT M6x16	8~12	0.8~1.2	69~103.6 in·lb	
7	HEXAGON FLANGE BOLT M8x30	30~40	3.0~4.0	22.1~29.5	
8	HEXAGON FLANGE BOLT M10x125x25	40~50	4.0~5.0	29.5~36.9	
9	HEXAGON FLANGE BOLT M8x16	30~40	3.0~4.0	22.1~29.5	
10	HEXAGON FLANGE BOLT M8x20	30~40	3.0~4.0	22.1~29.5	

**FRONT AND REAR SHELF DISASSEMBLY EXPLOSION DIAGRAM**



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	FRONT RACK				
2	REAR RACK				
3	HEXAGON FLANGE BOLT M8×16	22~30	2.2~3.0	17~22	

**FRONT BUMPER EXPLOSION DIAGRAM**



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	LARGE PAN HEAD HEX SOCKET BOLT M6×16	8~12	0.8~1.2	69~103.6 in·lb	
2	HEXAGON FLANGE BOLT M10×20	40~50	4.0~5.0	29.5~36.9	
3	HEXAGON FLANGE BOLT M8×20	22~30	2.2~3.0	17~22	

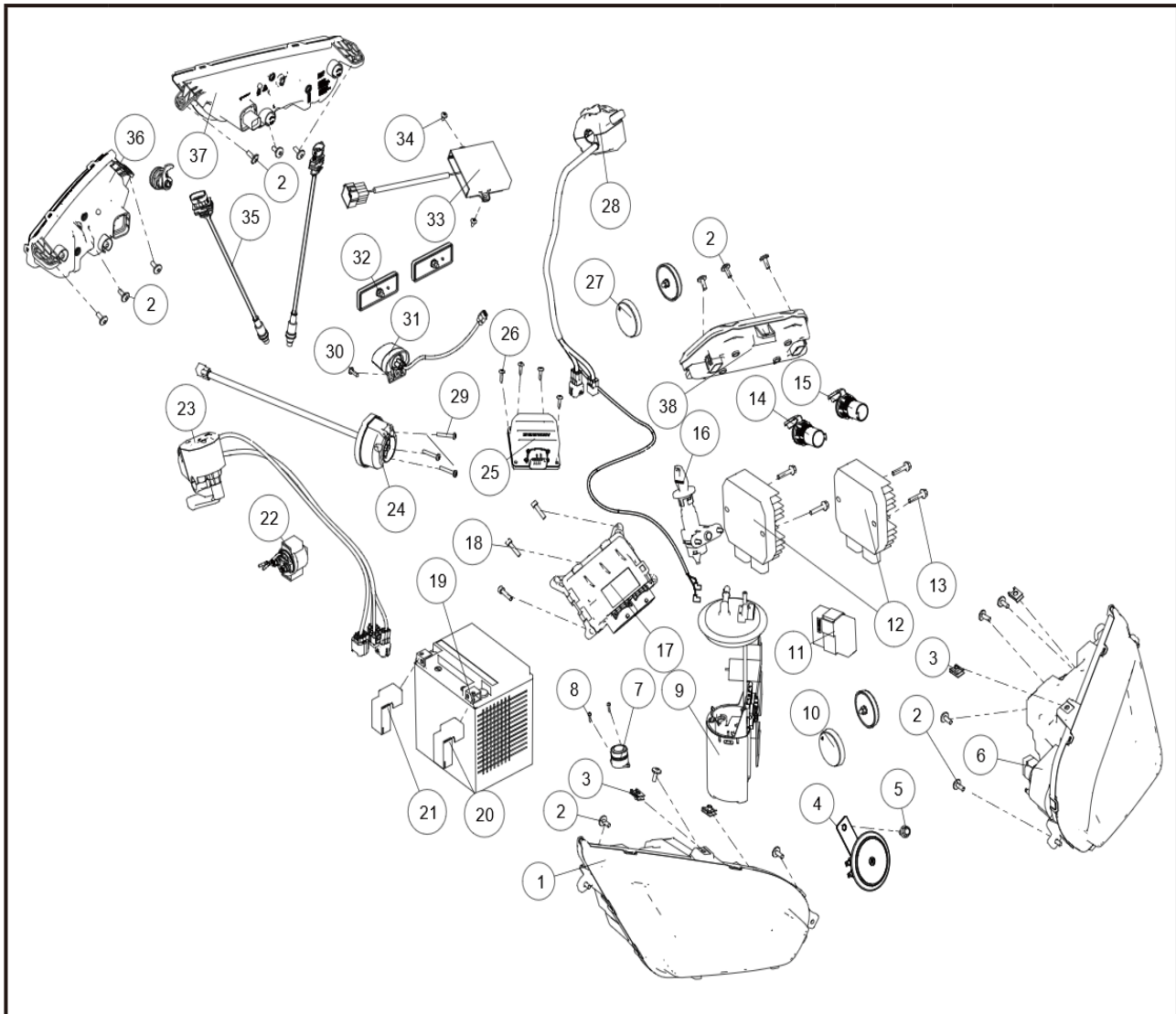
# ELECTRICAL SYSTEM

<b>EXPLODED VIEW</b> .....	<b>14-4</b>
<b>EXPLODED VIEW</b> .....	<b>14-6</b>
<b>TECHNICAL PARAMETERS</b> .....	<b>14-7</b>
<b>SPECIAL TOOLS</b> .....	<b>14-8</b>
<b>BATTERY</b> .....	<b>14-9</b>
REMOVE THE BATTERY .....	14-9
REINSTALL BATTERY .....	14-9
<b>BATTERY CHARGING</b> .....	<b>14-10</b>
CHARGING CONDITION CHECK .....	14-12
GENERATOR INSPECTION .....	14-13
CIRCUIT DIAGRAM OF CHARGING SYSTEM.....	14-14
VOLTAGE REGULATING RECTIFIER INSPECTION.....	14-15
REMOVAL .....	14-15
<b>LIGHTING SYSTEM CIRCUIT</b> .....	<b>14-16</b>
HEADLAMP.....	14-17
TAIL LIGHT.....	14-18
LICENSE PLATE LAMP .....	14-19
SCINTILLATOR.....	14-19
<b>EPS-BRUSHLESS</b> .....	<b>14-20</b>
EPS SYSTEM WIRING SCHEMATIC DIAGRAM .....	14-21
EPS TROUBLE REMOVAL.....	14-22
<b>SWITCH</b> .....	<b>14-24</b>
POWER LOCK.....	14-24
LEFT HANDLEBAR SWITCH .....	14-25
RIGHT HANDLEBAR SWITCH.....	14-28
ABS ADJUSTABLE SPEED LIMIT SWITCH .....	14-29
<b>WINCH ASSEMBLY</b> .....	<b>14-30</b>
REMOVAL .....	14-30
<b>FUSE BOX</b> .....	<b>14-33</b>
FUEL BOX LABEL(AT10/AT10W).....	14-34
FUEL BOX LABEL(AT10 ABS/AT10W ABS).....	14-35
FUEL BOX LABEL(AT10 MUD/AT10W MUD).....	14-36
<b>EFI SYSTEM</b> .....	<b>14-37</b>
SCHEMATIC DIAGRAM OF EFI SYSTEM .....	14-37
<b>TEMPERATURE SENSOR</b> .....	<b>14-38</b>
FUNCTION INTRODUCTION .....	14-38

WORKING PRINCIPLE .....	14-38
TEMPERATURE SENSOR REMOVAL .....	14-38
PERFORMANCE PARAMETER .....	14-39
FAULT DIAGNOSIS.....	14-39
<b>OXYGEN SENSOR .....</b>	<b>14-40</b>
FUNCTION INTRODUCTION .....	14-40
WORKING PRINCIPLE.....	14-40
OXYGEN SENSOR REMOVAL.....	14-40
PERFORMANCE PARAMETER .....	14-41
ELECTRICAL CHARACTERISTIC PARAMETER.....	14-41
TROUBLESHOOTING .....	14-42
<b>ELECTRONIC CONTROL UNIT ( ECU ) .....</b>	<b>14-43</b>
FUNCTION INTRODUCTION .....	14-43
ELECTRICAL CHARACTERISTICS .....	14-43
FAULT DIAGNOSIS.....	14-43
ECU REMOVAL.....	14-43
ELECTRONIC THROTTLE BODY DVE SELF-LEARNING PROCESS.....	14-44
ECU STITCH DEFINITION .....	14-45
FAULT CODE READING.....	14-47
TROUBLESHOOTER OPERATION.....	14-47
SUMMARY OF ECU FAULT CODES.....	14-48
<b>INJECTOR .....</b>	<b>14-61</b>
WORKING PRINCIPLE.....	14-61
ELECTRICAL CHARACTERISTICS .....	14-61
FAULT DIAGNOSIS.....	14-61
FUEL INJECTOR REMOVAL .....	14-61
<b>IGNITION COILS.....</b>	<b>14-62</b>
WORKING PRINCIPLE.....	14-62
PERFORMANCE PARAMETERS.....	14-63
FAULT DIAGNOSIS.....	14-63
<b>FUEL PUMP ASSEMBLY .....</b>	<b>14-64</b>
INSPECTION OF FUEL PUMP ASSEMBLY .....	14-64
<b>SPARK PLUG .....</b>	<b>14-65</b>
REMOVING SPARK PLUGS.....	14-65
<b>ENGINE SPEED SENSOR .....</b>	<b>14-66</b>
TECHNICAL PERFORMANCE TEST .....	14-66
FAULT DIAGNOSIS.....	14-66
SPEED SENSOR REMOVAL.....	14-66
<b>OIL PRESSURE SENSOR .....</b>	<b>14-67</b>

FAULT DIAGNOSIS.....	14-67
OIL PRESSURE SENSOR REMOVAL.....	14-67
<b>THROTTLE POSITION SENSOR AND THROTTLE ACTUATOR .....</b>	<b>14-68</b>
DISASSEMBLY REQUIREMENTS .....	14-68
TROUBLESHOOTING .....	14-69
THROTTLE ACTUATOR (DC MOTOR) TECHNICAL PERFORMANCE PARAMETERS .....	14-69
<b>INTAKE AIR PRESSURE TEMPERATURE SENSOR .....</b>	<b>14-70</b>
<b>ELECTRONIC THROTTLE.....</b>	<b>14-71</b>
TECHNICAL PERFORMANCE PARAMETERS.....	14-72
TROUBLESHOOTING .....	14-72
<b>ABS SYSTEM (APPLICABLE TO ABS MODELS).....</b>	<b>14-73</b>
FUNCTION DESCRIPTION .....	14-73
ABS SYSTEM PARTS.....	14-73
ABS SENSOR.....	14-74
ELECTRONIC CONTROL UNIT .....	14-74
ABS SYSTEM WORKING PRINCIPLE DIAGRAM .....	14-75
ABS FAULT DIAGNOSIS CODE .....	14-76
<b>DISPLAY AND HUMAN-COMPUTER INTERACTION.....</b>	<b>14-77</b>
DASHBOARD.....	14-77
DASHBOARD INDICATOR LIGHT DESCRIPTION .....	14-77
INSTRUMENT INFORMATION DISPLAY .....	14-80
DASHBOARD BUTTON FUNCTION INTRODUCTION.....	14-83
DASHBOARD DISASSEMBLY AND ASSEMBLY .....	14-83
REPLACE INSTRUMENT CONFIGURATION (FOR MODEL 2 ONLY: NEGATIVE DISPLAY INSTRUMENT).....	14-84
<b>T-BOX.....</b>	<b>14-87</b>
AT-BOX REMOVAL .....	14-87
T-BOX FAULT CODE DISPLAY AREA.....	14-87
T-BOX INTERFACE DEFINITION .....	14-88
<b>SOLENOID VALVE CONTROL MODULE.....</b>	<b>14-89</b>
SOLENOID VALVE CONTROL MODULE REMOVAL AND INSTALLATION .....	14-89
<b>GENERAL VERSION MAIN CABLE ASSEMBLY.....</b>	<b>14-91</b>
<b>SCHEMATIC DIAGRAM OF TRAILER SYSTEM.....</b>	<b>14-94</b>
COLOR COMPARISON TABLE .....	14-95
<b>WIRING DIAGRAM.....</b>	<b>14-95</b>
<b>WIRING DIAGRAM.....</b>	<b>14-96</b>

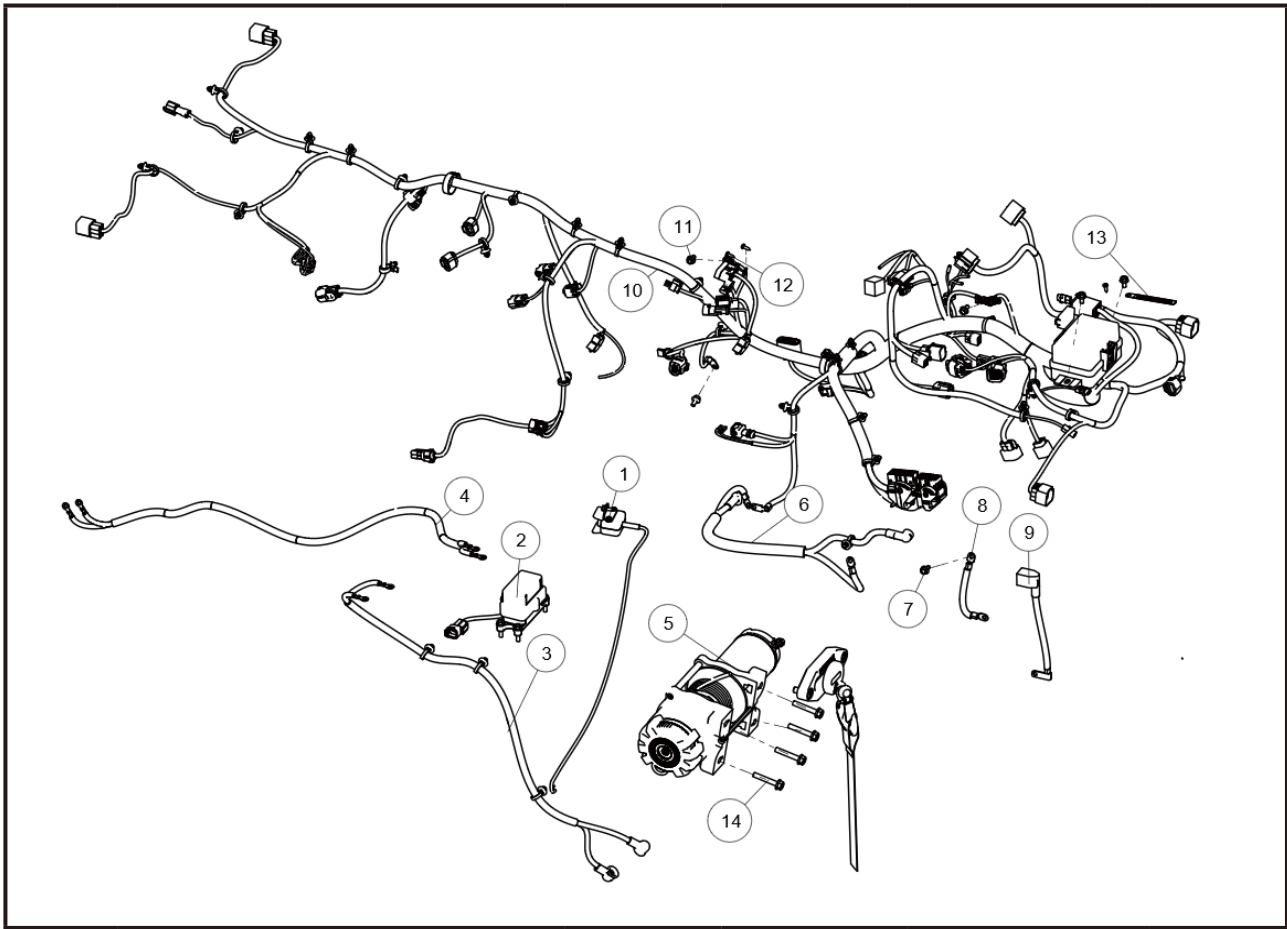
### EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Right combined headlight				
2	Hexagon socket bolt with large pan head M6 × 16				
3	M6 nut clamp				
4	Horn				
5	Hexagon flange bolt M8 × 12				
6	Left combined headlight				
7	Buzzer				
8	Self-tapping screw ST3 × 12				
9	Oil pump assembly				
10	Circular reflector (amber)				
11	Scintillator				

12	Voltage-regulating rectifier				
13	Hexagon flange bolt M6 × 30				
14	USB power output socket				
15	12V power output seat				
16	Power lock assembly				
17	ECU				
18	Hexagon socket head cap screw M6 × 25				
19	Battery 32Ah				
20	Battery double column assembly (red sheath)				
21	Battery double column assembly (black sheath)				
22	Starting relay				
23	Right hand switch				
24	Trailer power socket				
25	T-BOX				
26	Cross recessed large semicircular head tapping screw ST4.2 × 19				
27	Circular reflector (red)				
28	Left hand switch				
29	Cross recessed pan head screw M5 × 30				
30	Cross recessed pan head screw M5 × 16				
31	Rear license plate lamp				
32	Square reflector (red)				
33	Solenoid valve control module				
34	T-BOX				
35	Small oxygen sensor				
36	Right combination tail light				
37	Left combination tail light				

## EXPLODED VIEW



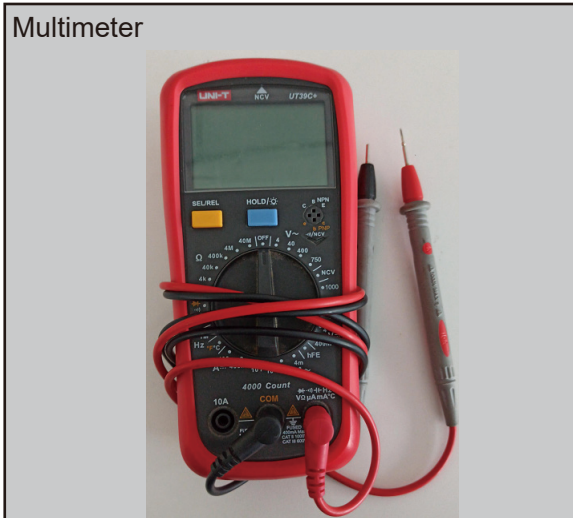
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Winch switch				
2	Winch relay				
3	Winch motor line				
4	Winch power line				
5	4500 winch motor (nylon rope)				
6	Positive and negative wires of starter motor				
7	Hexagon flange bolt M6 × 12				
8	Battery negative wire				
9	Battery positive line				
10	Main cable assembly				
11	Hexagon flange bolt M6 × 10				
12	Black self-tapping nail ST4.2 × 13				
13	Plastic-coated clamp (10x 95)				
14	Hexagon flange bolt M8 × 45				

## TECHNICAL PARAMETERS

Project	Standard	Use limit
<b>Battery:</b> Type Capacity	Sealed Battery 12 V 32 Ah	---
<b>Charging System:</b> Alternator type Charging voltage (Regulator/rectifier output voltage) Alternator output voltage Stator coil resistance	Three-phase DC 14 ~ 15 V AC 36 ~ 54 V 3 000 r/min (rpm) 0.33 ~ 0.49	---
<b>Ignition System:</b> Spark plug: Spark plug gap Spark plug cap resistance Ignition coil: Primary winding resistance Secondary winding resistance	0.6~0.8 mm 3~12k $\Omega$ 466~593m $\Omega$ 8.2~10.5k $\Omega$	---
<b>Electric Starter System:</b> Starter motor: Commutator diameter Brush length	28mm 11.5mm	---
<b>Fuel Pump:</b> Fuel pump pressure	400 $\pm$ 20KPa	---
<b>Switch:</b> Brake light switch timing of pedal travel Rising temperature	ON after 10 mm (0.4 in.) of pedal travel From OFF to ON at 88°C From ON to OFF at 83.5°C	---

## SPECIAL TOOLS

Multimeter



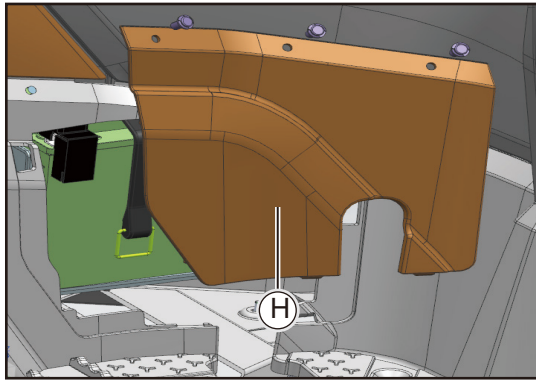
Fault diagnosis instrument



### ⚠ CAUTION

- ◆ When the multimeter is measuring voltage, the meter pen should not be inserted into the current measuring hole
- ◆ When measuring resistance, please be sure to disconnect the battery positive pole.

## BATTERY

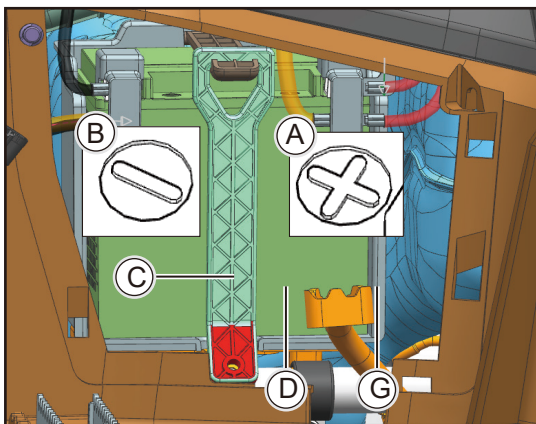


## REMOVE THE BATTERY

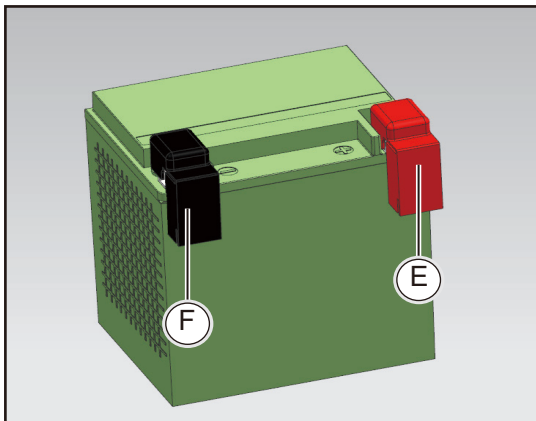
【A】 positive pole (+)

【B】 negative pole (-)

- ◆ Turn off the ignition switch.
- ◆ Remove the battery inspection cover 【H】 (see Chapter 13 for the steps in Battery Inspection Cover Removal).



- ◆ Loosen the battery strap 【C】 .
- ◆ Take out the battery 【D】 and the attached cable.
- ◆ First disconnect the negative (-) cable of the battery, and then disconnect the positive (+) cable.
- ◆ Finally, the battery can be removed 【D】 .



## REINSTALL BATTERY

- ◆ Turn off the ignition switch of the vehicle first.
- ◆ Install the battery positive double column assembly 【E】 and negative double column assembly 【F】 to the battery 【D】 .
- ◆ Then connect the vehicle positive cable to the positive double column assembly 【E】 , and then connect the negative cable to the negative double column assembly 【F】 .
- ◆ Apply a thin layer of grease to the battery terminal and the double post assembly to prevent corrosion.
- ◆ Install the battery to the battery box 【G】 and use the battery strap 【C】 is fixed.
- ◆ Reinstall the battery access cover 【H】 (contrary to the steps in Chapter 13 【Battery Maintenance and Disassembly】 ).

Match the model name of the battery, these names must be the same.

**Battery model Name: GHD32HL-BS**

**⚠ CAUTION**

This battery is a colloidal battery and does not need to add electrolyte.

## BATTERY CHARGING

In the case shown in the following table, to start the vehicle fully to start the engine, and it should be charged before use. However, if the battery voltage is higher than 12.6V after 10 minutes of charging, no initial charge is required.

The conditions under which an initial charge is required	charging method
At low temperatures (below 0°C)	1.4 A x 2 _ 3 Hours
Batteries have been stored at high temperatures and in high humidity	1.4 A x 15 _ 20 Hours
The seal has been removed or cracked - flaked, torn or torn	
The battery life is more than 2 years after manufacture	

**NOTE: Terminal voltage - To measure the terminal voltage of the battery, use a digital voltmeter. When measuring the terminal voltage after charging, the battery should stand still for more than 20 minutes.**

### Preventive measures:

#### 1) Colloidal battery, no liquid filling is required

- ◆ Before normal use, there is no need to replenish the battery as long as it is not exhausted. It is very dangerous to pry open the sealing plug and add water. Never do that.

#### 2) Recharge

- ◆ If the engine fails to start, the horn becomes weaker or the indicator light goes dark, it shows the battery is exhausted.
- ◆ Charge the battery for 5 to 10 hours according to the charging current as shown in the specification.
- ◆ When it is inevitable to need quick charging, please charge in strict accordance with the maximum charging current and the time conditions indicated on the battery.

**⚠ WARNING**

The battery is designed to withstand no abnormal damage if it is recharged as specified above. However, if charged under conditions other than those described above, the performance of the battery may degrade significantly. Do not remove the seal cover during recharging. If excess gas is generated due to overcharging, a safety valve ensures battery safety.

---

**3) When you don't use the vehicle for months**

- ◆ Charge your motorcycle before storing it and store it before removing the negative cable.
- ◆ Fully charged once a month while in storage.

**4) Battery life time**

- ◆ If the battery fails to start the engine after several charges, the battery has exceeded its useful life; replace it with a new one.

**⚠ WARNING**

Keep batteries away from sparks and open flames during charging.

Explosive gas mixtures that emit hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning it on. This procedure prevents sparking at the battery terminals, which may ignite any flammable gases.

Keep ignition sources away from the battery and do not loosen the terminals. The electrolyte contains sulfuric acid. Be careful not to let it come into contact with your skin or eyes. If touched, wash it off with plenty of water. If serious, seek medical attention.

---

**Exchange service**

- ◆ Sealed batteries can only perform to their fullest extent when used in conjunction with the proper vehicle electrical equipment.
- ◆ Therefore, sealed batteries can only be replaced on vehicles originally equipped with the tool.
- ◆ If a sealed battery is installed in a vehicle with a regular battery, beware of the equipment, the life of the sealed battery will be shortened.

### CHARGING CONDITION CHECK

The battery state of charge can be checked by measuring to check the battery terminal voltage.

- ◆ Remove the battery (refer to the section on Removing the battery).

#### ⚠ WARNING

First, make sure to disconnect the negative (-)

- ◆ Measure the battery terminal voltage.

#### ⚠ CAUTION

Measure the voltage to one decimal place with a digital voltmeter **【A】** that can be read.

If the reading falls below the specified value, it needs to be recharged.

#### Battery terminal voltage

**Standard: 12.6 V or higher**

- ◆ Remove the battery (see section Removing the Battery).
- ◆ Recharge the battery according to the following method.

#### ⚠ WARNING

The battery is sealed. Do not open it. Do not add water when charging.

**Charging current and time as described below.**

**Charging current and time as described below.  
Terminal Voltage: 11.5 \_ below 12.5 V Standard Charge:**

**3.2 A x 5 \_ 10 hours (see schedule)**

**Fast Charge:**

**32 A x 1.0 hour**

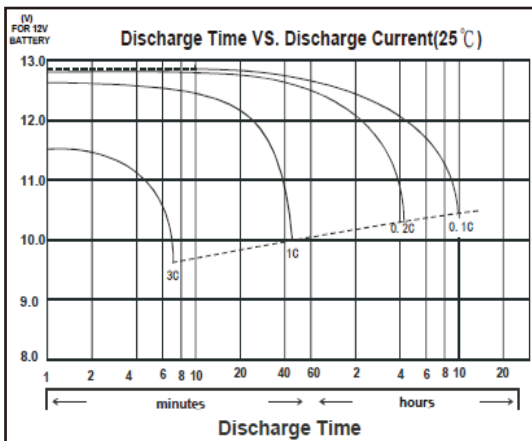
#### ⚠ WARNING

If possible, do not charge quickly. If an unavoidable situation occurs that requires rapid charging, pay attention to the ambient temperature.

**Test against the standard voltage later.**

**Terminal voltage: less than 11.5V**

**Charging method: 3.2 A x 20 hours**



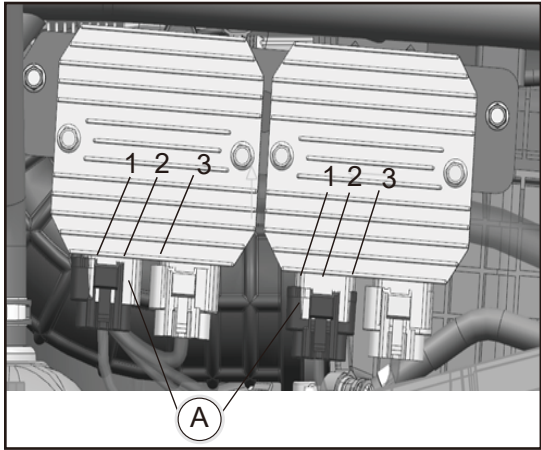
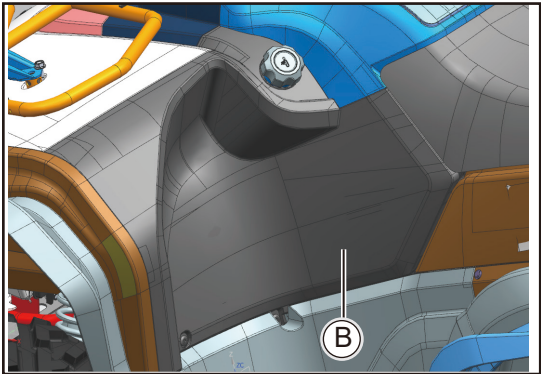
SEGWAY AT10

GENERATOR INSPECTION

There are three types of alternator failures: short circuits, disconnections, or rotor magnetic losses. A shorted or disconnected wire in one of the coils will result in low output or no output at all. A loss of rotor magnetic field, which can be caused by a fall or by placing the alternator near an electromagnetic field that hits the alternator magnetic field or low output due to aging alone

To check the alternator output voltage, perform the following procedure.

- ◆ Remove the rear fenders (see chapter "Frame").
- ◆ Disconnect the alternator connectors A (two sets) (1, 2, 3 in the connector are the magneto three-phase leads),
- ◆ (1, 2, 3 in the connector are the three-phase magneto leads).
- ◆ Connect the handheld tester as shown in the table below.
- ◆ Start the engine.
- ◆ Run it at the speed given in the table.
- ◆ Note the voltage readings (a total of 3 measurements per set). Alternator Output Voltage



Range tester	Tester connection		Reading @3000 rpm
	(+)	(-)	
250 V AC	One Yellow wire	Another Yellow wire	36~54 V

If the output voltage is within the value in the table, the alternator is operating normally and the regulator/rectifier has been damaged. A much lower reading indicates that the AC generator is defective.

Check the stator coil resistance as follows:

- ◆ Stop the engine
- ◆ Disconnect the AC generator connector

Connect the handheld tester as shown in the table below.

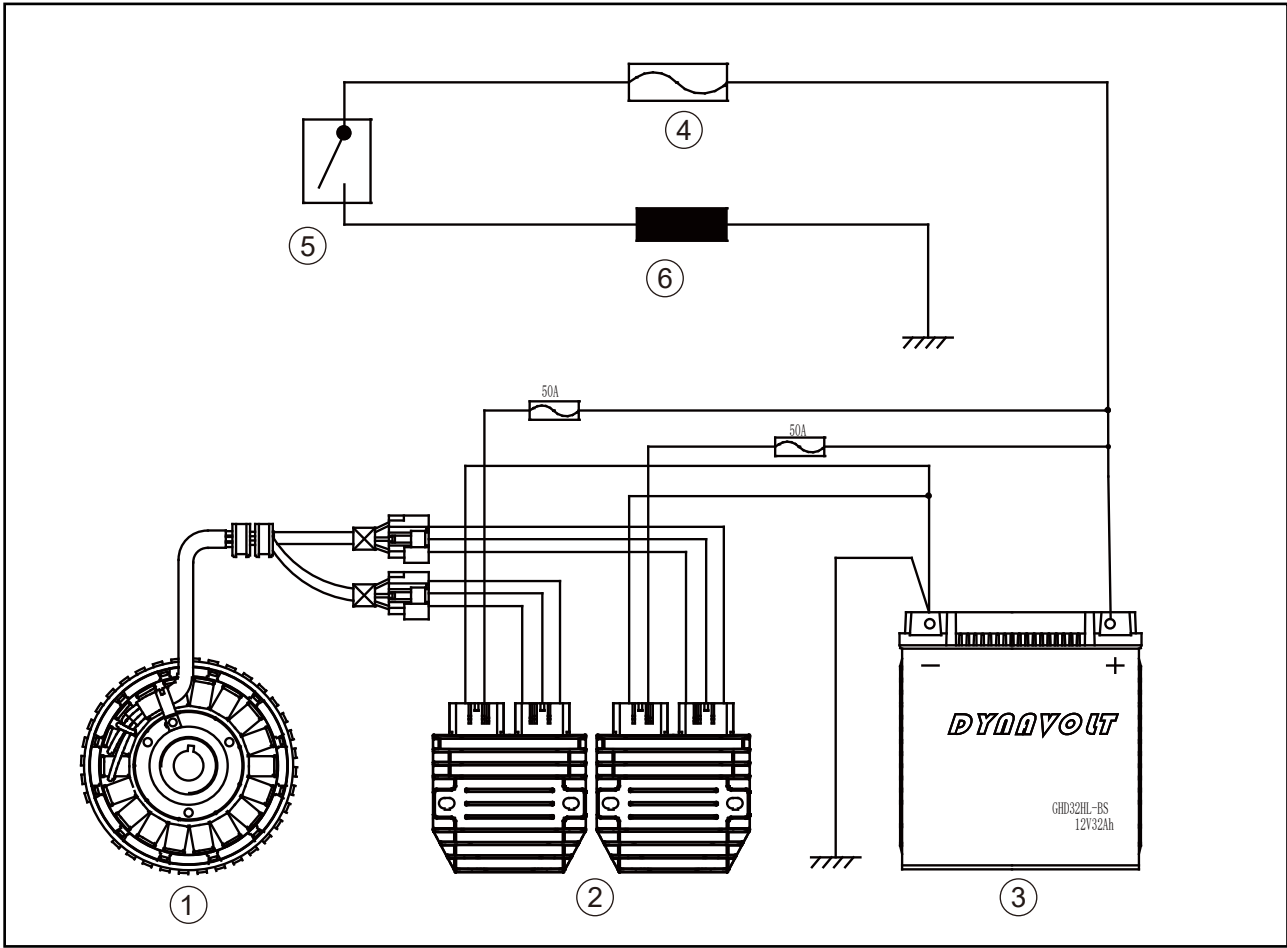
Pay attention to the readings (3 measurements in total).

Stator coil resistance

Range tester	Tester connection		Reading @3000 rpm
	(+)	(-)	
×1 Ω	One Yellow wire	Another Yellow wire	0.30 _ 0.49Ω

- ◆ One yellow wire and the other yellow wire if the resistance is greater than that shown in the table, or show nothing. Read the (infinity) of any two wires, the stator has an open circuit and must be replaced. Less resistance means that the stator is short-circuited and must be replaced.
- ◆ Using a handheld tester, measure the resistance between each yellow lead with the engine. Any reading less than infinity must be replaced.
- ◆ If the stator coil has normal resistance, but the voltage check shows that the AC generator is faulty then the rotor magnetism may have weakened and the rotor must be replaced.

## CIRCUIT DIAGRAM OF CHARGING SYSTEM



- 1. Alternator
- 2. regulator/rectifier
- 3. Battery
- 4. Main Fuse
- 5. Ignition lock
- 6. Load

### VOLTAGE REGULATING RECTIFIER INSPECTION

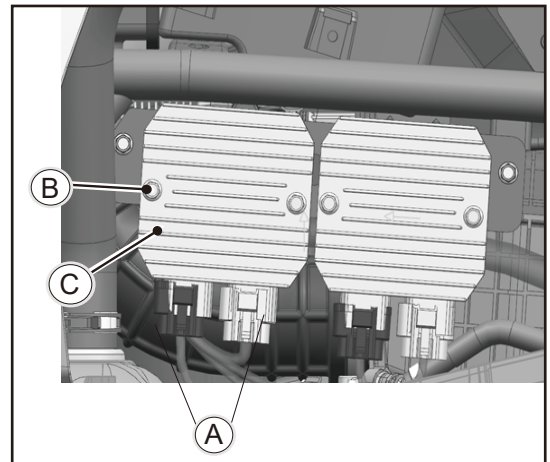
Test and Judgment Method of Charging Voltage on Whole Vehicle

Test conditions and methods	Output voltage
<ol style="list-style-type: none"> <li>1. Connect the product according to the normal loading state, after the vehicle started, the speed will remain above 2000rpm;</li> <li>2. Bring a fully charged battery;</li> <li>3. Use a multimeter to test the voltage at the output terminal of the regulator</li> </ol>	<p>Output voltage:14.0-15.0V</p> <p>Qualified; otherwise unqualified</p>

### REMOVAL

Remove the left front fender (refer to the relevant steps in Front Fender Removal in Chapter 13).

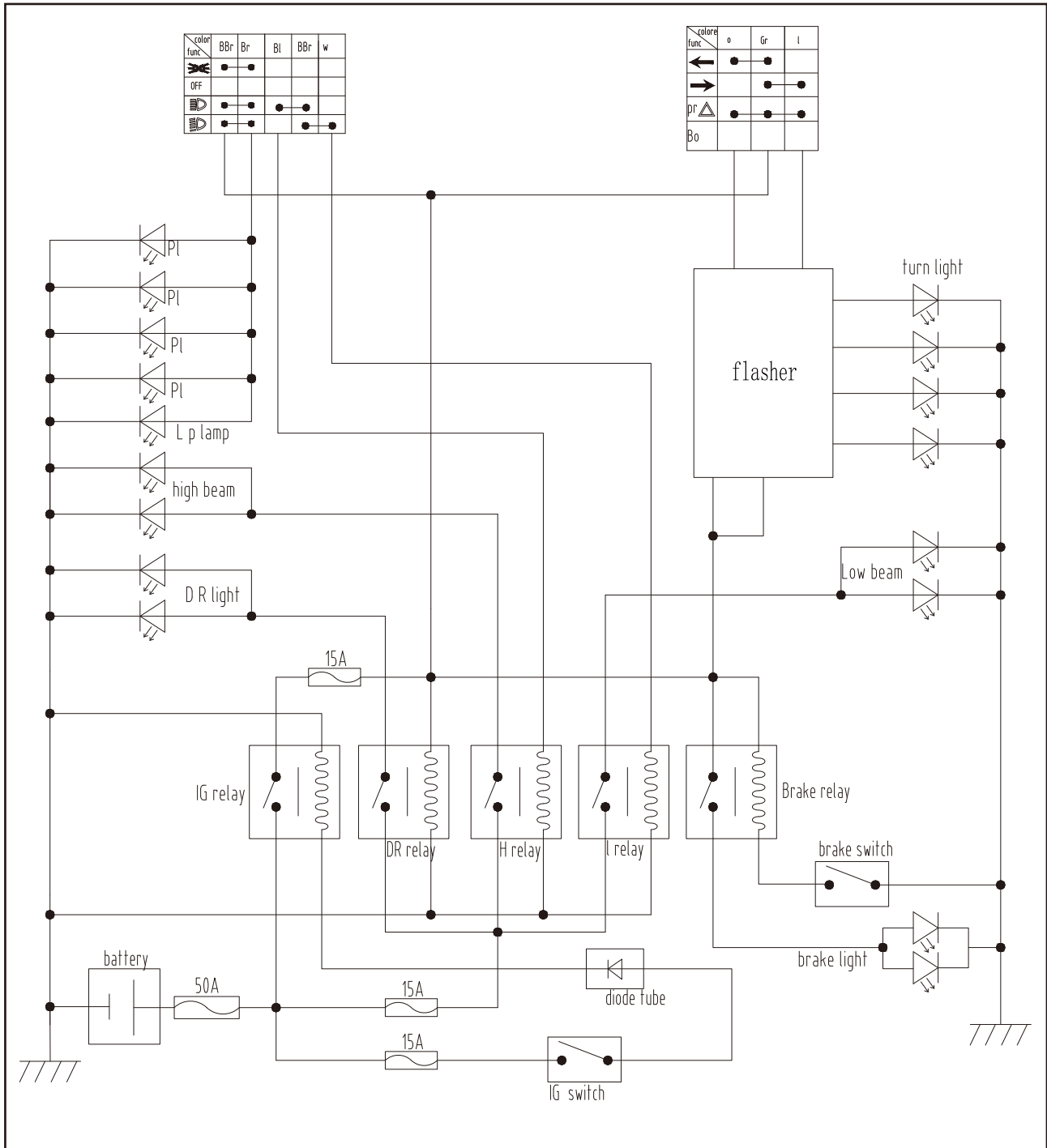
- ◆ Disconnect the two sets of connectors **【A】** .
- ◆ Remove the four bolts **【B】** .
- ◆ Remove the two voltage regulators **【C】** .



### Output resistance characteristics (unit $\Omega$ )

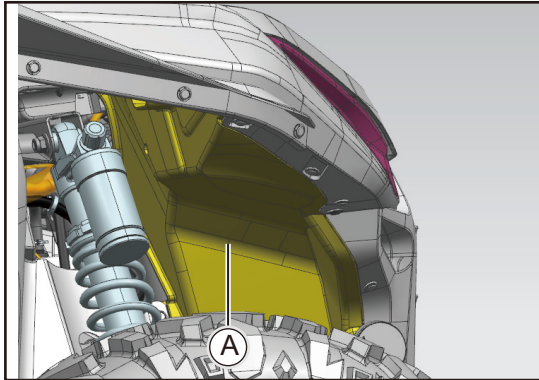
Output resistance characteristics (unit $\Omega$ )						
	Output +	Y1	Y2	Y3	Output-	Digital multimeter (Diode gear)
Output+		$\infty$	$\infty$	$\infty$	$\infty$	Connect the red pen to output +, and the black test pen to measure the remaining terminals
Y1	0.12-0.25		$\infty$	$\infty$	$\infty$	Connect the red pen to Y1, and the black test pen to measure the remaining terminals
Y2	0.12-0.25	$\infty$		$\infty$	$\infty$	Connect the red pen to Y2, and the black test pen to measure the remaining terminals
Y3	0.12-0.25	$\infty$	$\infty$		$\infty$	Connect the red pen to Y3, and the black test pen to measure the remaining terminals
Output-	0.5-0.7	0.4-0.6	0.4-0.6	0.4-0.6		Connect the red pen to output -, and the black test pen to measure the remaining terminals

## LIGHTING SYSTEM CIRCUIT

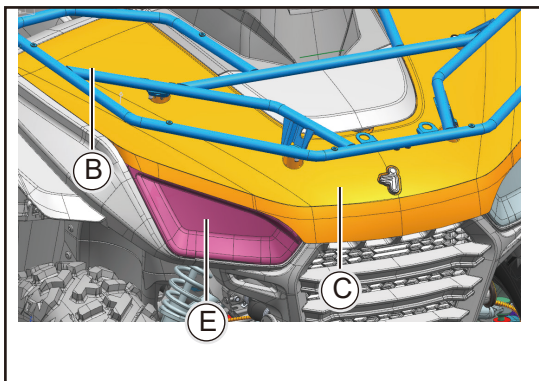


## HEADLAMP

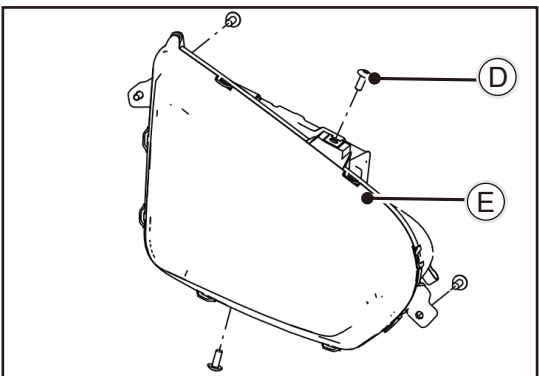
Removing and installing the right headlight (left headlight and right headlight steps)



- ◆ Remove the front right headlamp rear cover **【A】** (see Chapter 13, Headlamp Cover Removal)



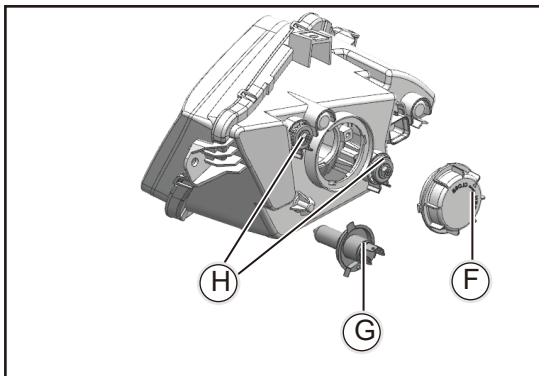
- ◆ Remove the front shelf welding assembly **【B】** (see Chapter 13 for details)
- ◆ Remove the front panel **【C】** (see Chapter 13 for details)



- ◆ Remove 4 headlight bolts **【D】** with tools, pull out the headlight plug and remove the headlight body **【E】**
- ◆ The reassembly steps are opposite to the disassembly steps.

### ⚠ CAUTION

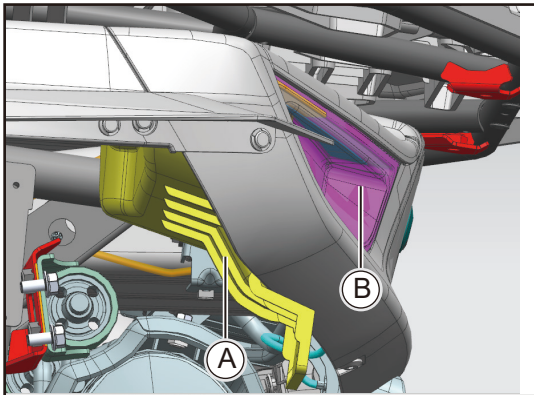
- ◆ Lamps are divided into LED lamps and halogen lamps (please confirm according to the actual vehicle)
- ◆ LED headlights are damaged in far and near beams, only headlights can be replaced;
- ◆ If the far and near beams of halogen headlights are damaged, the same type of bulb can be replaced.
- ◆ If other light sources are damaged, only headlights can be replaced.



If you need to replace the headlight bulb, please continue to perform the following procedures:

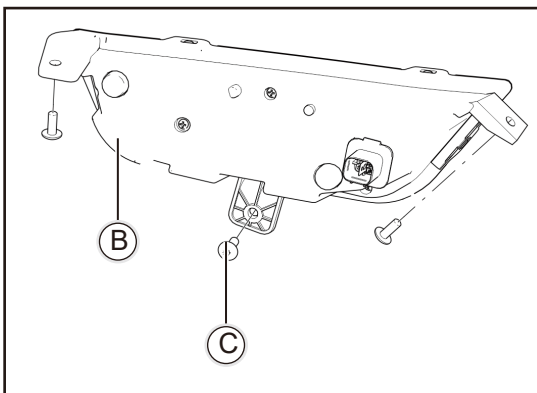
- ◆ Rotate the bulb shield clockwise **【F】**
- ◆ Take out the headlight bulb **【G】**, and replace the new bulb. The headlight bulb model is: H4
- ◆ Adjust the far and near beam adjustment bolt after replacement **【H】**, and high and low the headlight beam to the appropriate position.

### TAIL LIGHT

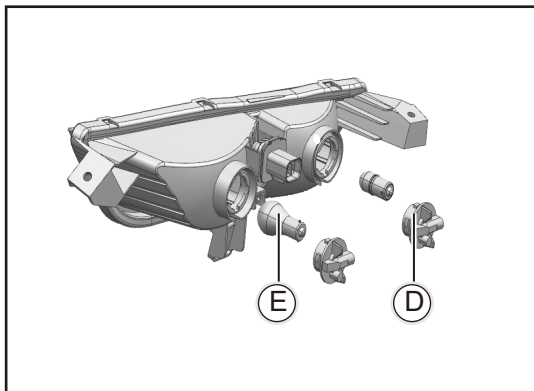


Removing left tail light (steps for right tail light are the same as for left tail light)

- ◆ Remove the rear tail lamp cover 【A】 (see the removal steps of rear tail lamp cover for details)



- ◆ Remove the tail lamp bolt 【C】
- ◆ Remove the tail lamp body after unplugging the tail lamp plug 【B】



- ◆ If the tail lamp bulb needs to be replaced during reinstallation, please continue to perform the following procedures:
- ◆ Rotate the tail lamp holder clockwise 【D】
- ◆ Remove the tail lamp holder 【E】 to be replaced, and replace the new bulb tail lamp bulb model: P21/5W rear steering bulb model: RY10W!

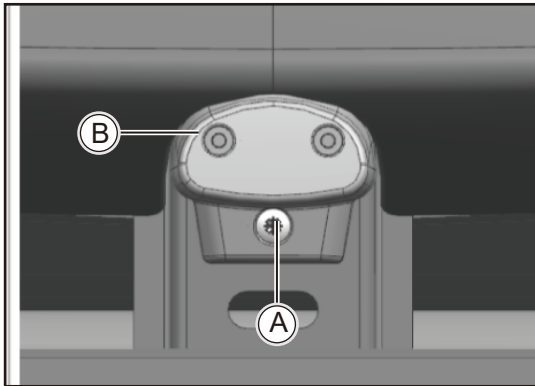
#### ⚠ CAUTION

- ◆ Lamps are divided into LED lamps and halogen lamps (please confirm according to the actual vehicle)
- ◆ LED headlights are damaged in far and near beams, only headlights can be replaced;
- ◆ If the far and near beams of halogen headlights are damaged, the same type of bulb can be replaced.
- ◆ If other light sources are damaged, only headlights can be replaced.

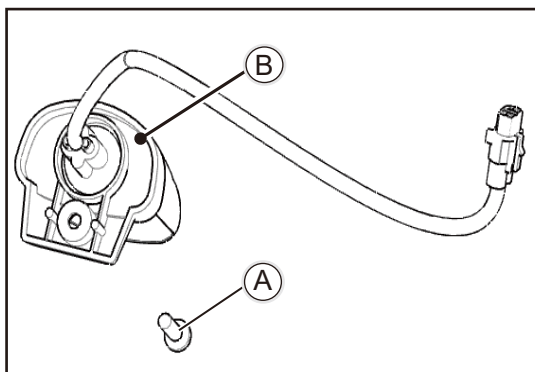
LICENSE PLATE LAMP

Removing and installing license plate light

- ◆ Remove the license plate lamp bolt 【A】



- ◆ Unplug the license plate light connector and remove the license plate light [B]
- ◆ The reassembly sequence is the reverse of the removal sequence.

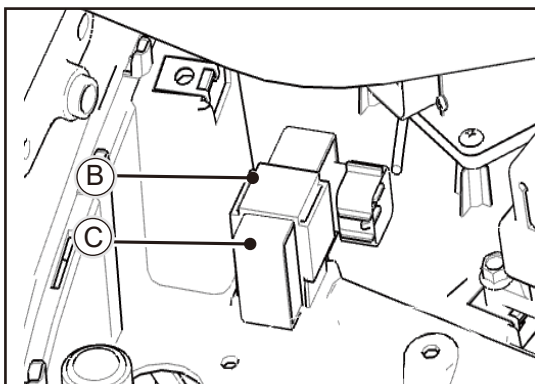
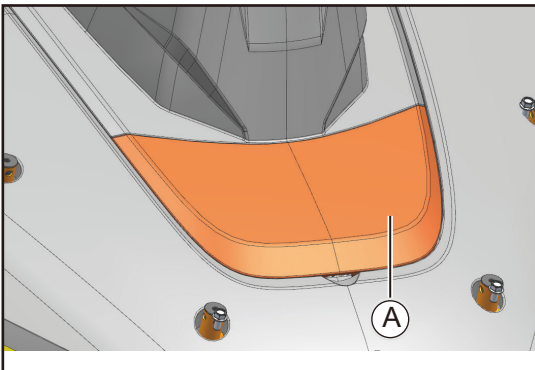


SCINTILLATOR

Front cargo and front cover removal and installation (refer to the relevant body sections)

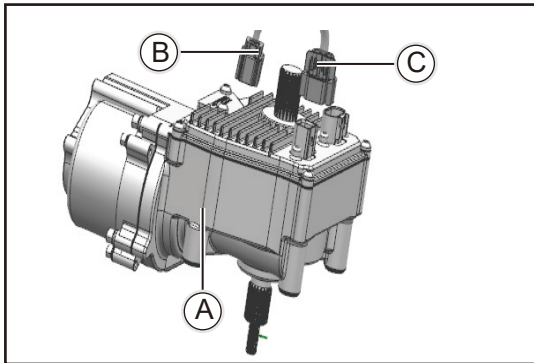
Removing and installing flasher

- ◆ Remove the front access cover 【A】 (see Chapter 13 for the removal process of front access cover)
- ◆ Remove the mounting rubber sleeve 【B】 from the mounting bracket
- ◆ Remove the wire harness connector
- ◆ Remove the scintillator 【C】
- ◆ The reinstallation process is opposite to the disassembly process.



→	Test
◆	◆ If the turn signal does not flash or flashes abnormally on the vehicle (the normal turn signal flickering frequency is 85/min)
◆	◆ The lamp lacks a lamp (unilateral forward or rear turn signal is damaged), and the turn signal flickering frequency is 120/Minute

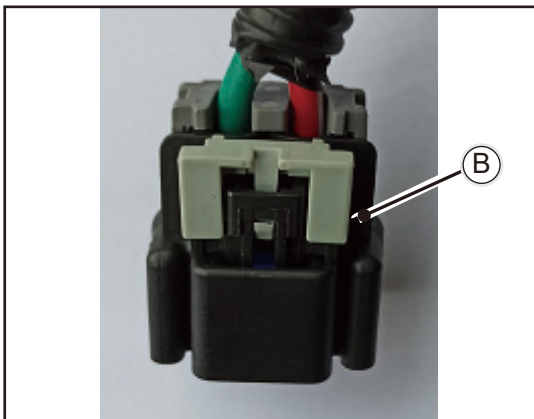
## EPS-BRUSHLESS



### ⚠ CAUTION

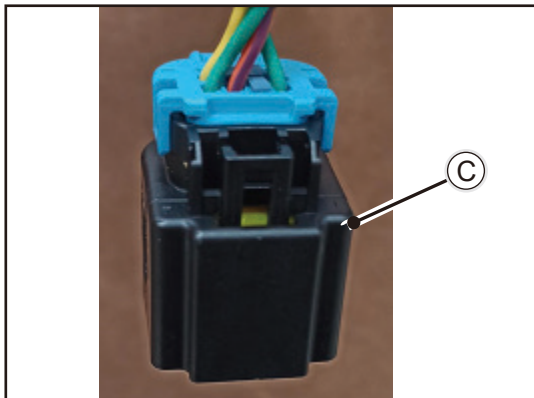
The method of disassembling the EPS assembly refers to the method of disassembling the steering assembly. Only the electrical functions of the EPS are introduced here.

Before disassembling the EPS assembly **【A】**, firstly remove the power connector **【B】** and power connector **【C】**



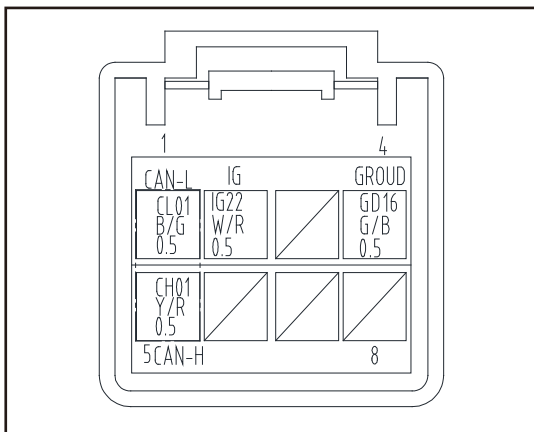
The interface of the plug **【B】** is defined as follows

- ◆ G means green wire, wire diameter 5.0, for grounding
- ◆ RW means red white wire, wire diameter 5.0, 12V+

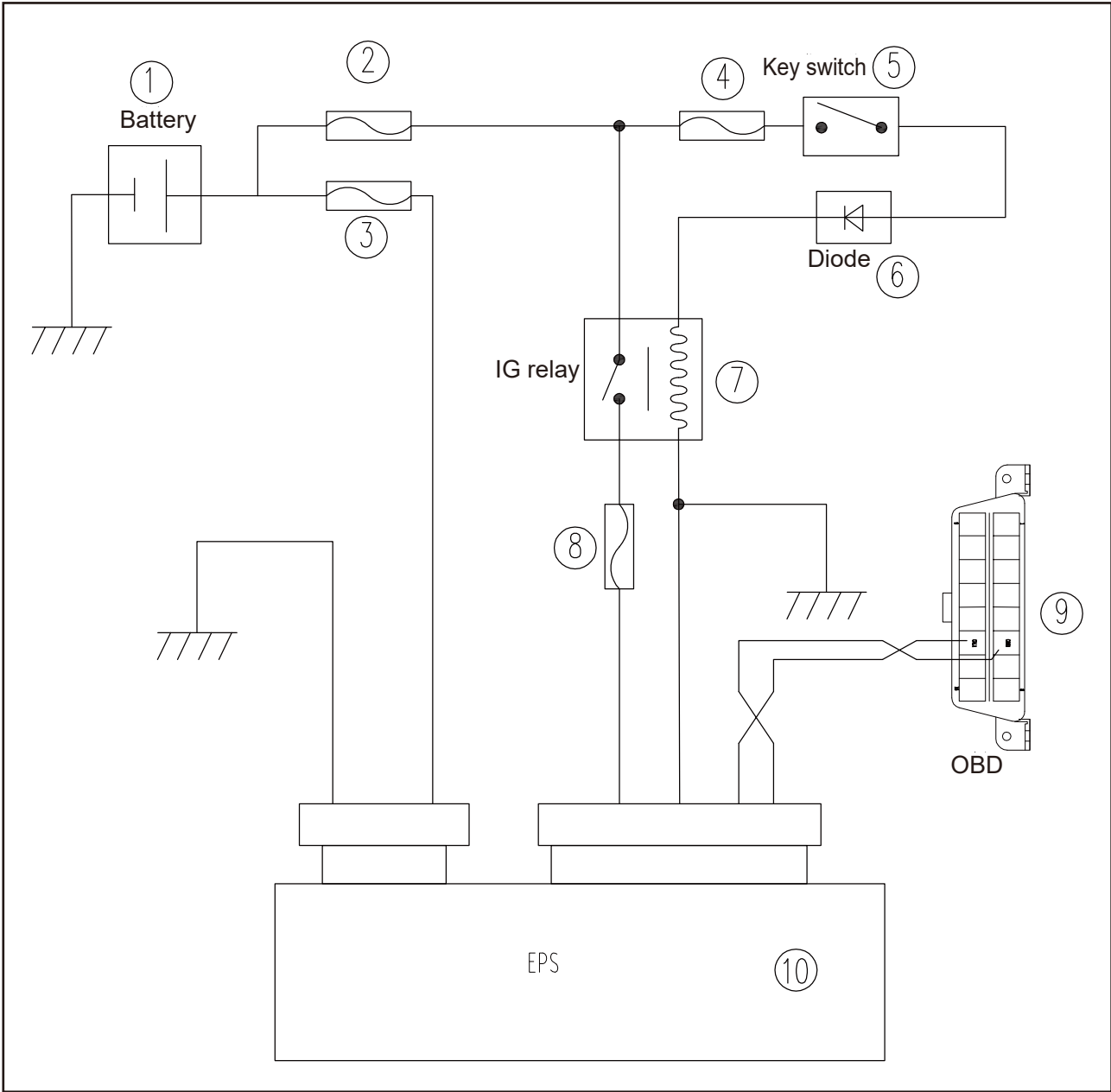


The interface of the plug **【C】** is defined as follows

- ◆ G means green wire, the wire diameter is 0.5, CANL
- ◆ Y means yellow wire, wire diameter 0.5, CANH
- ◆ OV means orange-purple wire, wire diameter 0.5, 12V+ for key power
- ◆ G means green wire, wire diameter 0.5, for grounding



EPS SYSTEM WIRING SCHEMATIC DIAGRAM

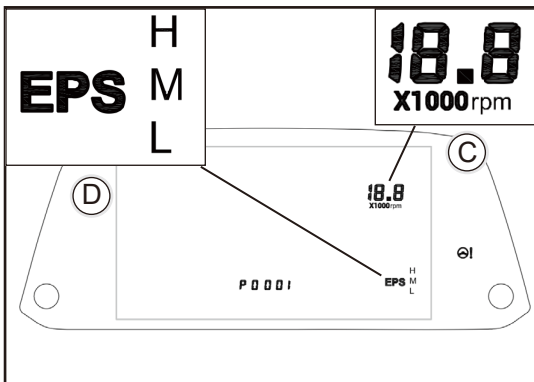
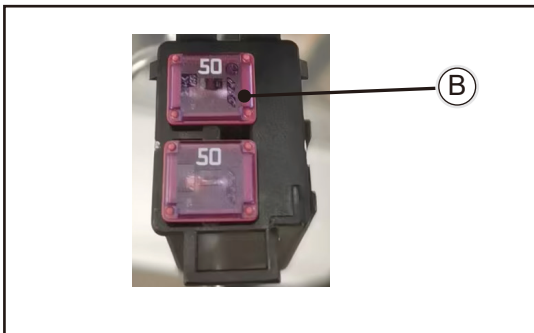
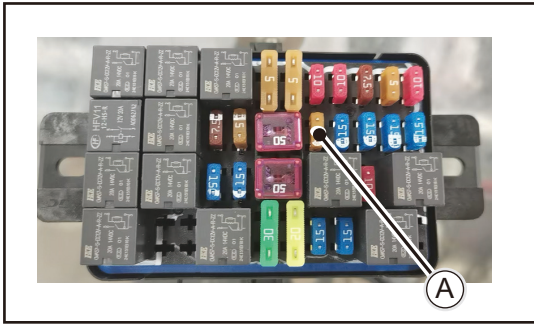


- 1. Battery      2.EPS fuse      3. Main fuse      4. Key switch fuse      5. Key switch
- 6. Diode      7.IG relay      8.EPS fuse      9.OBD      10.EPS

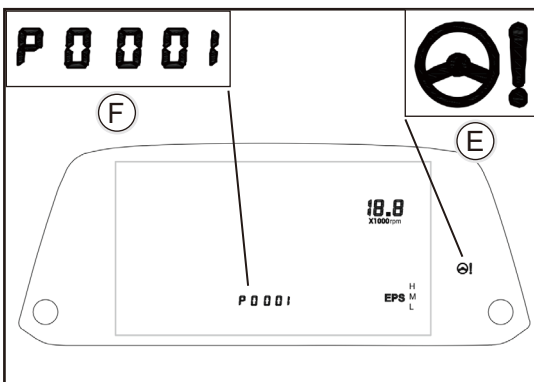
### EPS TROUBLE REMOVAL

#### → TROUBLE SHOOTING

If the EPS is not working, first check whether the EPS fault light on the meter is on. If the fault light is not on, check whether the 5A fuse **【A】** and 50A fuse **【B】** in the fuse box are blown, and check whether there is speed on the meter **【C】** display, if there is no speed display, EPS will not work, and the EPS fault light on the meter will not light up.



- ◆ The position of EPS gear in the meter, EPS is divided into three gears: H/M/L **【D】**, the default is M gear, when in four wheel drive locking mode, it will immediately switch to H gear; M gear and L gear are adjusted on the Segway Powersports APP (only vehicles with TBOX can be adjusted)



If the EPS fault light on the meter is on, it means that the EPS is malfunctioning.

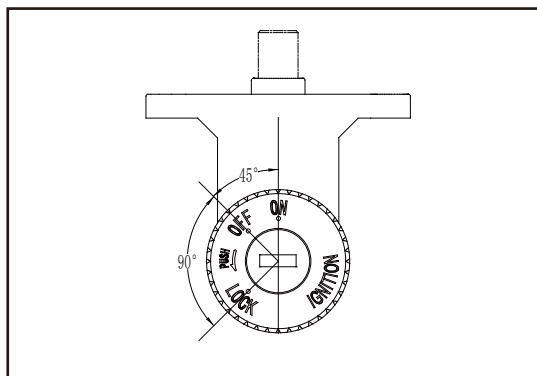
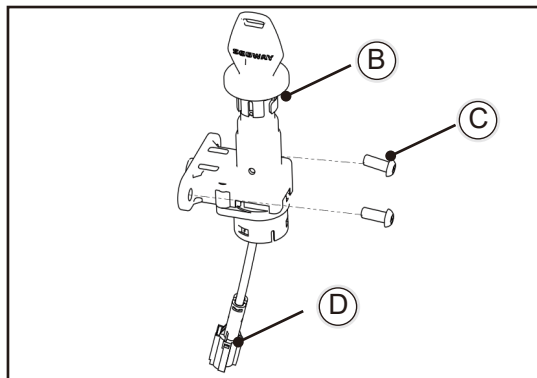
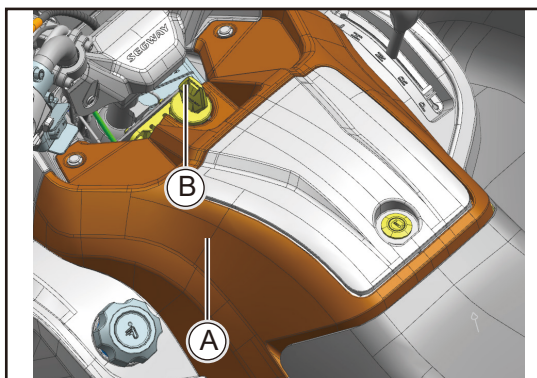
- ◆ EPS fault light **【E】** and fault code **【F】** in the indicator
- ◆ The location is shown left.

The EPS fault codes displayed in the instrument are listed below:

NO.	Fault description	Fault grade	With or without power	Recoverability within the current ignition cycle	Fault code	Fault light
1	Torque midpoint not written	3	Yes	Recoverable after fault elimination	E0001	on
2	Rotor angle midpoint not written	1	No	Recoverable after fault elimination	E0002	off
3	Storage read and write failure	1	Yes	Yes	E0003	on
4	The main torque sensor is disconnected	1	Vehicle speed is set to 30	No	E0004	off
5	The main torque sensor output is abnormal	1	Vehicle speed is set to 30	No	E0005	off
6	The secondary torque sensor is disconnected	1	Vehicle speed is set to 30	No	E0006	off
7	Secondary torque sensor output failure	1	Vehicle speed is set to 30	No	E0007	off
8	Excessive difference between primary and secondary torque	1	Vehicle speed is set to 30	No	E0008	off
9	Abnormal primary and secondary torque	1	No	No	E0009	on
10	Motor offer no assistant power	1	No	No	E0010	on
11	overcurrent	1	No	No	E0011	on
12	Abnormal current	1	No	No	E0012	on
13	CAN communication abnormal	2	Vehicle speed is set to 30, cancel aligning and damping	Recoverable after CAN normalization	E0013	on
14	Rotor angle sensor disconnected	1	No	No	E0015	on
15	Power module failure	1	No	No	E0016	on
16	A phase current abnormal	1	No	No	E0017	on
17	C phase current abnormal	1	No	No	E0018	on

## SWITCH

FUNC \ CLR	R	B	Key can be taken out
	ON	● — ●	
OFF			YES
LOCK			YES



### POWER LOCK

#### ⚠ CAUTION

When the indicator does not display after the key is turned on, check the circuit failure (see page xx), and replace the power lock after confirming that the power lock is broken

#### → Check Power lock

After unplugging the connector, turn the multimeter to the conduction position. When the key is turned to the OFF position, the two wires should not be able to conduct; when the key is turned to the ON position, the two wires should be able to conduct;

### REMOVING AND INSTALLING POWER LOCK

When the power lock needs to be replaced, first remove the seat cushion and fuel tank cover; **【A】** front storage box cover

**【A】** M6 bolt

**【B】** power lock

**【C】** bolt

**【D】** connector

- ◆ Remove the front storage box assembly (see Chapter 13 for removal steps of front storage box assembly)
- ◆ Remove the 2 bolts fixed by the power lock **【C】**
- ◆ After removing the bolt, unplug the connector **【D】** and take down the power lock as shown in the figure;

#### NOTICE

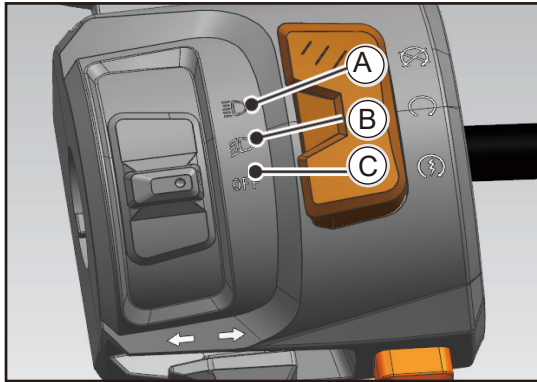
In the normal state, the ON gear is in the forward direction, turning 45 degrees counterclockwise is the OFF gear, pressing down the key while rotating 90 degrees counterclockwise is the LOCK gear

In the ON gear, the entire vehicle circuit is connected and the key cannot be removed;

In the OFF gear, the entire vehicle circuit is disconnected and the key can be removed;

In the LOCK gear, the front of the vehicle is in a locked state (see "vehicle body and frame") and the key can be removed;

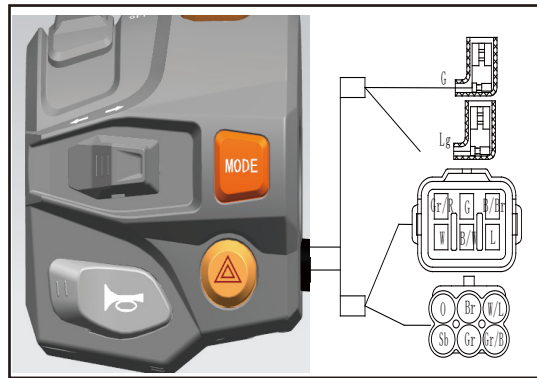
LEFT HANDLEBAR SWITCH



**⚠ CAUTION**

The switch is valid only when the power lock is in the ON position

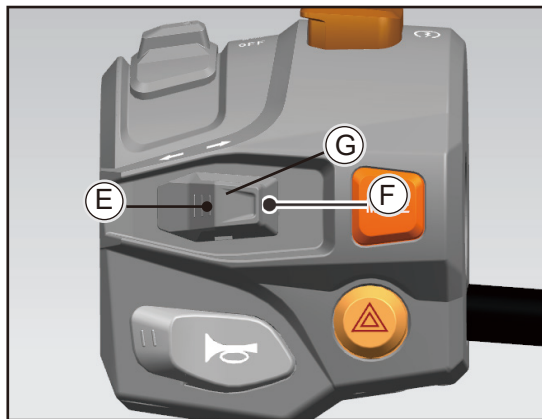
- 【A】 gear for high beam on
- 【B】 gear for low beam on
- 【C】 gear for OFF



**⚠ CAUTION**

Since the switch is an integral part, any damage to the switch requires replacement of the entire switch

CLR	B/Br	Br	L	B/Br	W
FUNC OFF					
	○	○	○	○	
	○	○		○	

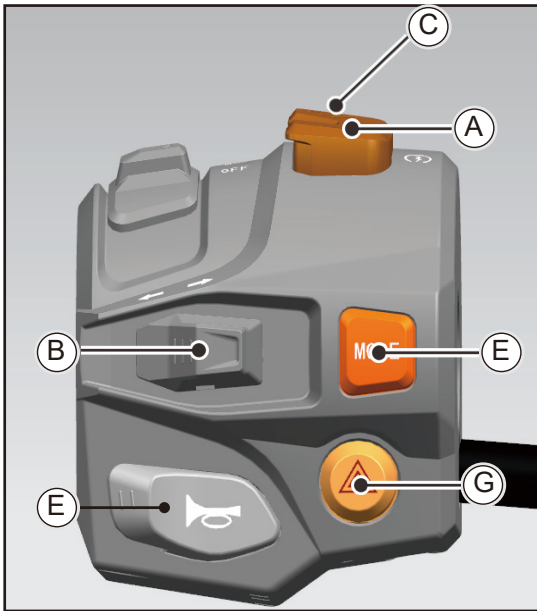


- 【E】 Turn on left turning light
- 【G】 Turn off the turning light
- 【F】 Turn on the right turning light

→ Check if the turning light switch work normally

When the switch is turned to the left steering position, gray and orange can be connected, while gray and light blue cannot be connected ; when the switch is turned to the right steering position, gray and light blue can be connected, and gray and orange cannot be connected;

CLR	0	Gr	Sb
FUNC			
	○	○	
		○	○



**【A】** Start button

**【B】** Left and right turn signal switch

**【C】** Flameout switch

When the engine is running, press the flameout switch button

to stop the engine;

when the engine is stopped, first pop up the flameout switch button, and then press the start button to start the engine;

When the function fails, check the related circuit first;

when all circuits are checked to be OK, test the internal circuitry of the flameout switch.

### ⚠ CAUTION

The engine can only be started by pressing the start button when the flameout switch is in the pop-up position

	CLR	B/W	/	W/L
FUNC				

	CLR	Gr/R	/
FUNC			

#### → Test flameout switch for damage

When the flameout switch is popped up, black-white and white-blue should be able to conduct, and when the start button is pressed at this time, gray-red, black-white, white-blue should be able to conduct;

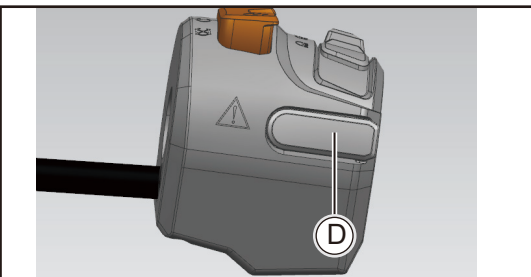
when the flameout switch is pressed, black-white and white-blue cannot be conducted, and when the start button is pressed at this time, the gray-red, black-white, white-blue all cannot be conducted;

**【D】** Booster Switch

When the booster switch is pressed, the ECU deactivates the vehicle speed limit upon receiving the signal.

#### → Test if the booster switch is damaged

When the booster switch is pressed, the green and grey-black wires should conduct.



	CLR	Gr/B	G
FUNC			
VERRIDE			

**【E】** Horn Switch

#### → Test horn switch for damage

When the key is in the ON position, it should make a sound when pressing the horn switch;

when the horn cannot make a sound, first check relevant circuit;

when there is no problem with the circuit, test the internal circuit of the horn switch;

when pressing the horn switch, light-green and black-brown should be able to conduct;

	CLR	Lg	B/Br
FUNC			

CLR FUNC	GW	G
MODE	●	●

**【F】 Mode display**

When the mode switch is pressed, the ECU receives the signal and the power output is in normal or sport mode;

In normal mode: power output is smooth and fuel consumption is more economical; in sport mode: co-power output is strong and fuel consumption is higher;

CLR FUNC	0	Gr	Sb
DOWN △	○	○	○
UP			

**【G】 Emergency switch**

When the emergency switch is pressed, the four front and rear turning lights flash at the same time; when the emergency switch is pressed, if a single turning light does not light up, check the relevant fuse or the lamp itself.;

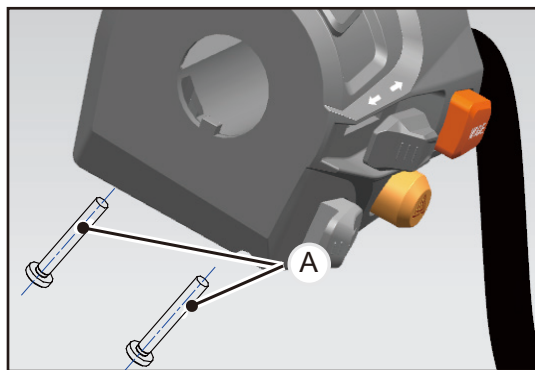
**→ Check emergency switch**

When the emergency switch is pressed, if the four front and rear turning lights do not flash, the internal circuit of the emergency switch can be tested;

when the emergency switch bounces, the orange, gray, and light blue should not be conductive;

when the emergency switch is pressed, orange, , gray and light blue should be able to conduct;

**REMOVAL AND INSTALLATION OF LEFT HAND PUT SWITCH**

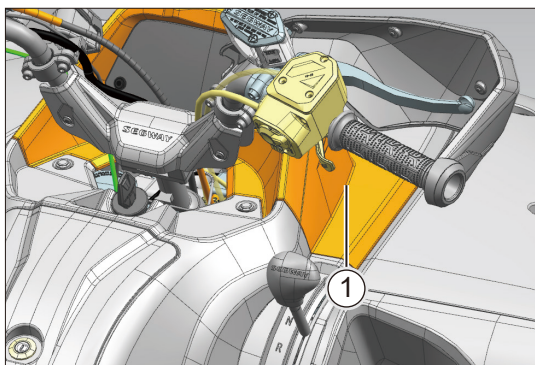


**【A】 fixed bolt**

- ◆ Remove the two fixing bolts with tools;
- ◆ Remove the switch from the handle;
- ◆ When installing a new switch, pay attention to putting the limit card of the lower cover into the limit slot, and then tighten the two fixing bolts with tools;

**【B】 limit point**

- ◆ After installation, rotate the switch around the handle tube to confirm whether it is installed in place, and it should not rotate after installation in place.



**【C】 Disconnect the plug-in**

- ◆ Remove the instrument cover **【1】** (see Chapter 13 Instrument Cover Removal Steps for details), and disconnect the harness connector.

**【D】 reinstallation**

- ◆ Reassemble in the reverse order of disassembly.

## RIGHT HANDLEBAR SWITCH

**CAUTION**

The switch is valid only when the power lock is in the ON position

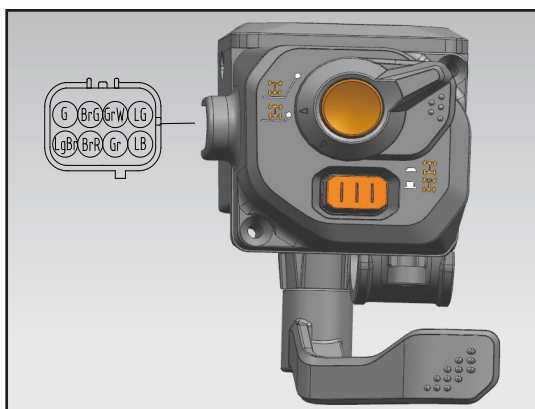
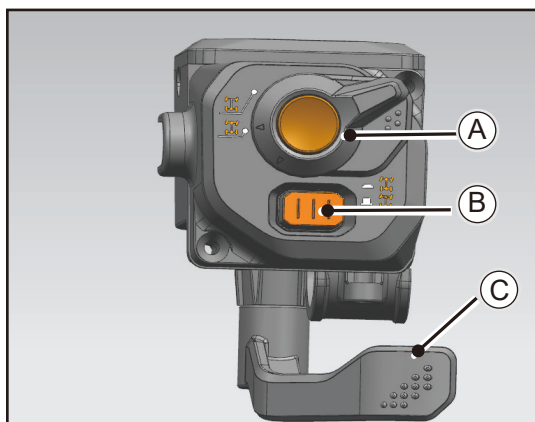
- 【A】 2-4WD switch
- 【B】 4WD lock switch
- 【C】 Accelerator

→ Test 2-4WD switch for damage

When the knob switch is turned to the 2WD position, the switch is in 2WD, at which time brown-red and blue-green and blue-black can conduct;

When the knob switch is turned to the 4WD position, the switch is in 4WD state, at this time the brown-red and brown-green, blue-green and blue-black can conduct;

When the knob switch is rotated to the 4WD position, after popping up the 4WD lock switch, at this time the gray and gray-white, brown-red and brown-green, light green-brown and green can lead through respectively.



FUNCTION	KNOB	BUTTON	Sb	L/R	B	G/R	Br/B	G/B
2WD	2WD						●	●
4WD	4WD		●	●			●	●
4WD	4WD	LOCK	●	●	●		●	●

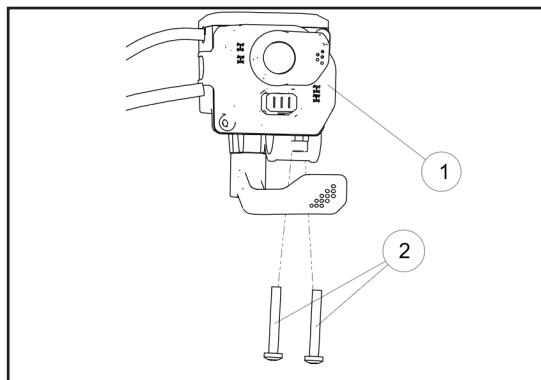
FUNCTION	COLOUR		Br/R	Br/G	Gr/B	G/B
	BUTTON					
2WD	R-WD		●	●	●	●
4WD	R-LOCK				●	●

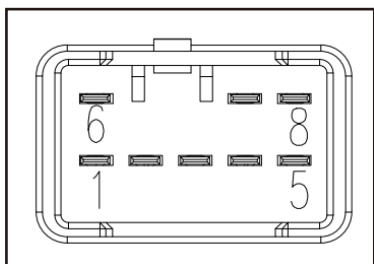
### REMOVE AND PRESS THE RIGHT HAND SWITCH

- ◆ Remove the grip (see Chapter 12 Removal and Installation Steps of Direction Handle for details)
- ◆ Loosen the 2 screws at the bottom of the right hand switch 【2】 .
- ◆ Remove the right hand switch 【1】 .
- ◆ Remove the instrument cover (see Chapter 13 Instrument Cover Removal Steps for details), and disconnect the harness connector.

### RE-ASSEMBLY

- ◆ It is opposite to the disassembly step.





**ABS ADJUSTABLE SPEED LIMIT SWITCH**

detection replacement:

- ◆ The ABS switch is damaged or the electrical signal is abnormal, and the fault point is confirmed;
- ◆ Confirm that the problem is a damaged or malfunctioning ABS switch.

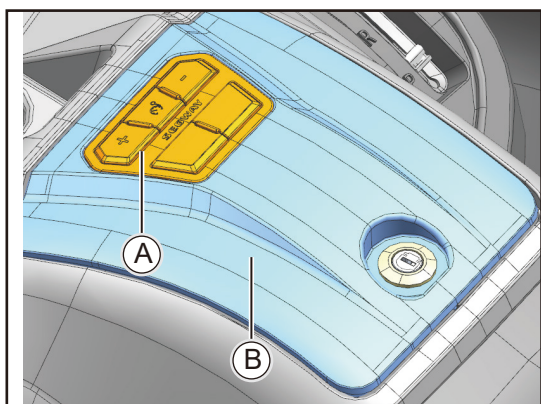
	FUNCTION	SIGNAL	LIGHT-COLOUR	NOTES
1	NULL	—		
2	NULL	—		
3	+	VOL		INCHING
4	⚙	VOL		INCHING
5	-	VOL		INCHING
6	⚙	—		
7	GROUD	GROUD		
8	BAT	+12V		

**REMOVAL AND INSTALLATION STEPS**

Replace as follows.

- 【A】 ABS speed control switch
- 【B】 storage box small cover

1. Open the small cover of the front storage box with the key
2. Use tools to loosen the ABS switch and several buckles of the small cover of the storage box,
3. Unplug the connector
4. Remove ABS switch



**⚠ CAUTION**

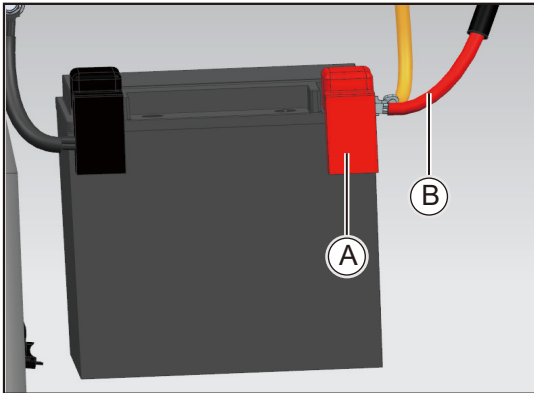
When replacing the ABS switch, the wiring harness should first pass through the small hole under the storage box cover, assemble the wiring harness plug with the ABS switch, and then snap it into the storage box cover.

## WINCH ASSEMBLY

### REMOVAL

#### ⚠ CAUTION

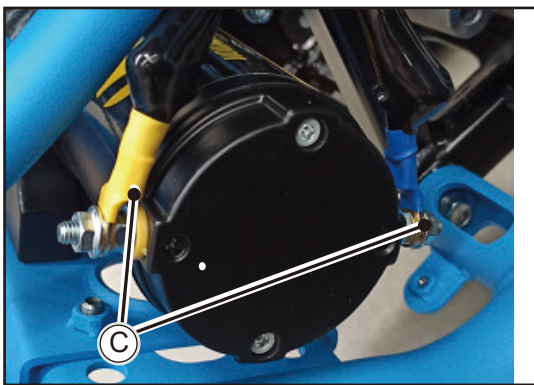
When removing the winch, first power off the vehicle power



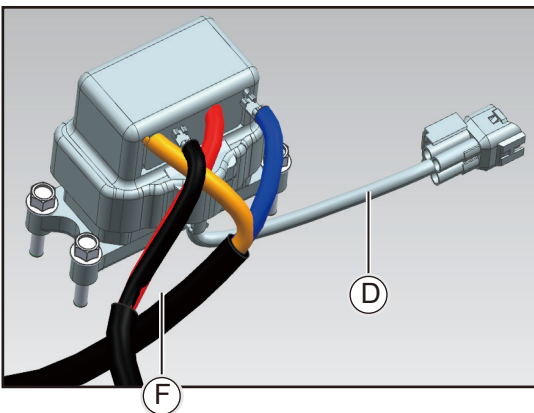
- ◆ Remove external related plastic parts
- ◆ First remove the battery positive electrode 【A】
- ◆ Remove the power cable of the winch 【B】
- ◆ Remove the winch motor cable nut 【C】
- ◆ Unplug the plug 【D】
- ◆ Cut off the cable tie along the cable

#### ⚠ WARNING

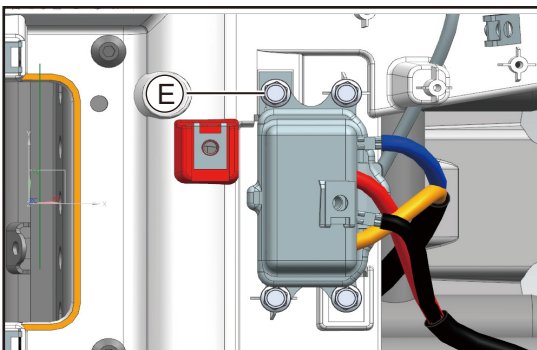
Be sure to disconnect the battery before disassembling the winch assembly to avoid short circuit



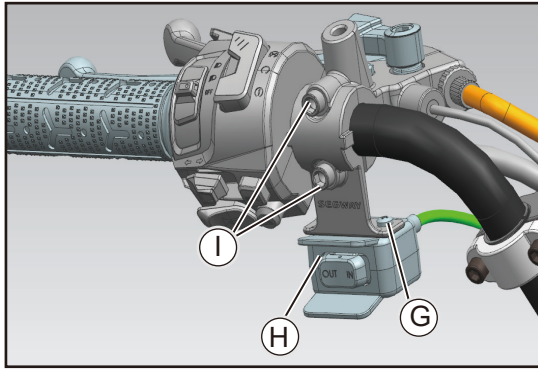
- ◆ Unplug the connector of winch relay and left hand switch 【D】
- ◆ Cut the fixed cable tie along the cable



- ◆ Remove the four M6 bolts 【E】 , and then the winch relay 【F】 can be removed.

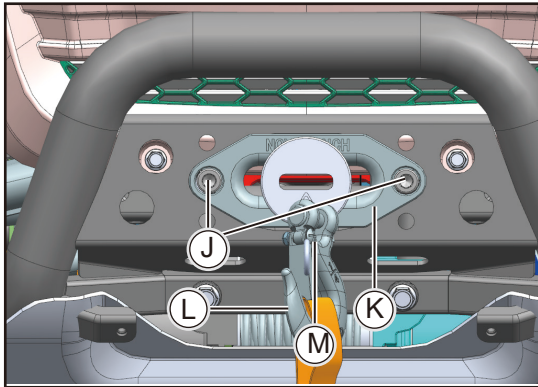


## WINCH SWITCH REMOVAL



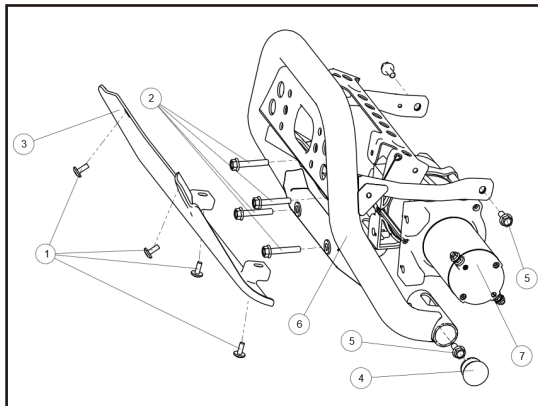
- ◆ Remove the bolt 【I】
- ◆ Remove the bolt 【G】 , you can remove the winch switch 【H】

## DEFLECTION WHEEL REMOVAL



- ◆ After removing the bolt 【M】 , you can remove the hook 【L】
- ◆ Remove the bolt 【J】 and take down the guide wheel 【K】

## REMOVAL AND INSTALLATION OF WINCH MOTOR



- ◆ Remove 4 bolts 【1】 , and remove the front guard plate 【3】
- ◆ Remove 2 front bumper plugs 【4】
- ◆ Remove 4 bolts 【5】 , and remove the front bumper welding assembly 【6】
- ◆ Remove 4 bolts 【2】
- ◆ Disassembly of winch motor 【7】
- ◆ The reassembly process is opposite to the disassembly process

### ⚠ CAUTION

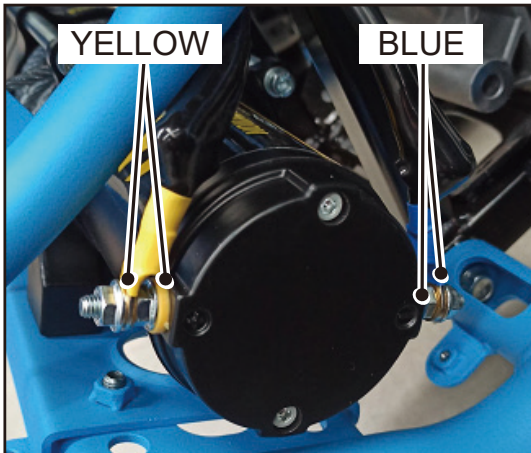
The winch work does not exceed 1min each time, and then works after an interval of 30S

- ◆ Rated working voltage DC12V
- ◆ Maximum working tension 2500LBS or 3000LBS
- ◆ The maximum working current  $\leq 185$  A, the maximum working current lasts for 1 min, and work after an interval of 30 seconds. Continue to work in this way
- ◆ The wire rope diameter is 4.8 and the wire rope length is 14.5

The color of the insulation pad of the winch motor terminal and the heat shrinkable tube of the cable is one-to-one correspondence

【A】 YELLOW

【B】 BLUE



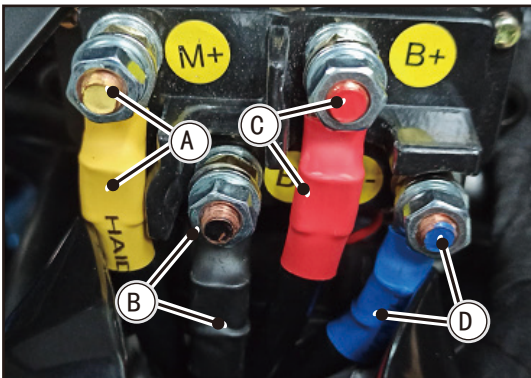
The color of the insulation pad of the winch motor terminal and the heat shrinkable tube of the cable is one-to-one correspondence

【C】 YELLOW

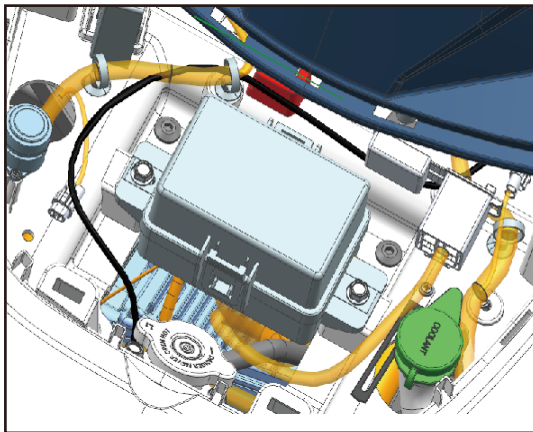
【D】 BLACK

【E】 RED

【F】 BLUE



FUSE BOX



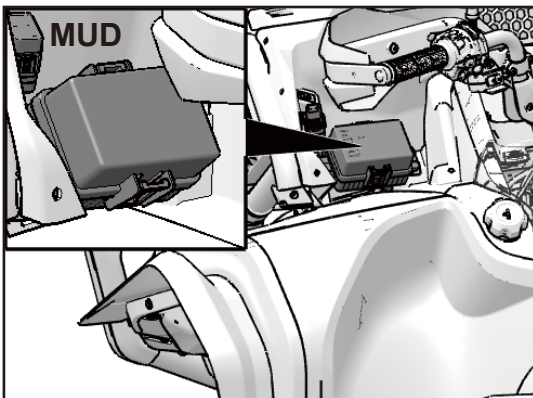
All fuses for the vehicle are in the fuse box

The fuse box is located under the front instrument mask.

The mud version vehicle fuse box is located under the front radiator cover.

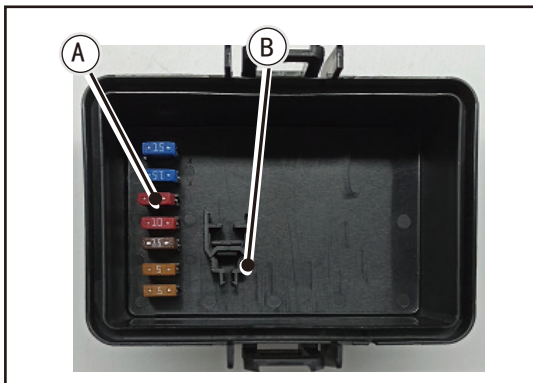
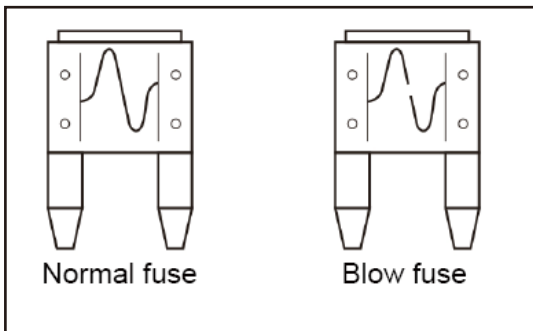
Remove front panel repair cover .

- ◆ After the front panel repair cover is removed, the fuse box located at the bottom can be seen.
- ◆ Move the clasp on the left and right sides of the fuse box cover to the outside. Loosen the clasp and open the fuse box.



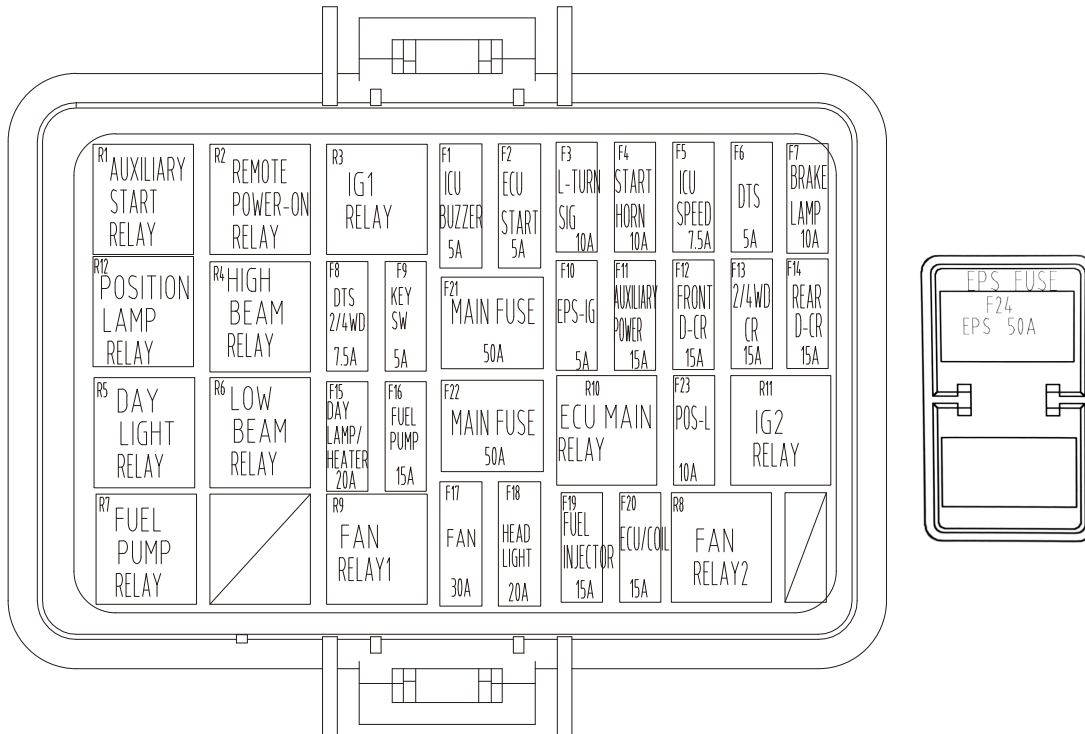
**⚠ CAUTION**

- ◆ Do not use a fuse above the rated ampere value or replace it with anything else.
- ◆ Please use the same product. Never use wires for fuses, even temporary replacements are not allowed.
- ◆ Do not modify fuses or fuse boxes.



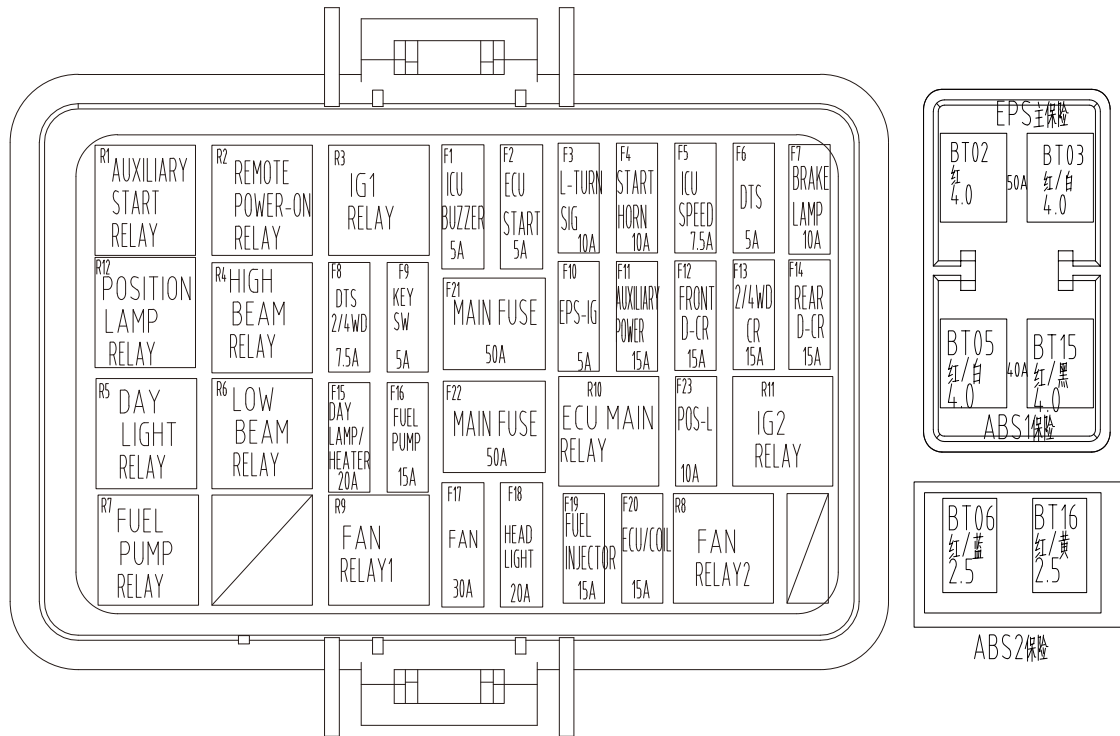
- ◆ If a chip fuse is broken, you can replace it with a spare fuse 【A】 of the same specification in the fuse box cover. Please use a fuse clamp 【B】 to replace the fuse.

## FUEL BOX LABEL(AT10/AT10W)



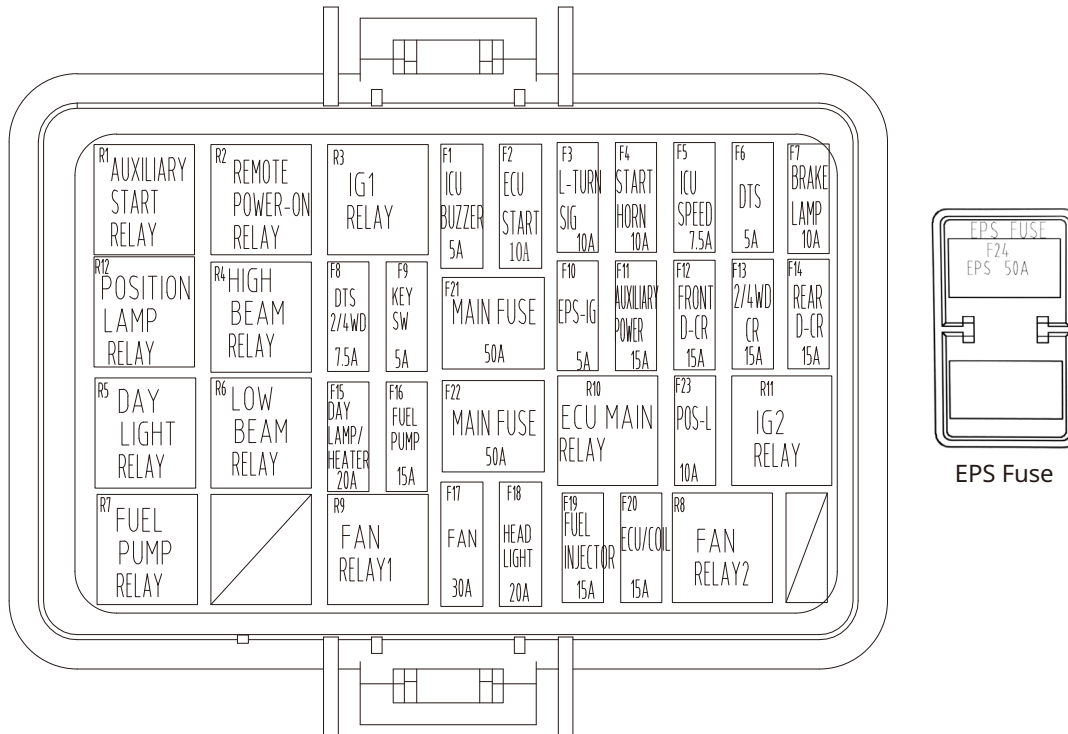
No.	Fuse/Relay	Power	No.	Fuse/Relay	Power
F1	Display/Buzzer	5A	F19	Fuel Injector/Ignition Coil/Oxygen Sensor	15A
F2	ECU Start Relay	5A	F20	Non-sustained Power Supply	15A
F3	Turn Signal	10A	F21	Main Fuse	50A
F4	Start /Horn	15A	F22	Main Fuse	50A
F5	Display/Vehicle Speed Sensor	7.5A	F23	Position light fuse	10A
F6	DTS	5A	F24	EPS Fuse	50A
F7	Brake Light	10A			
F8	DTS/2-4WD Module	7.5A	R1	Auxiliary Start Relay	12V 20A
F9	Power Switch	5A	R2	DTS Relay	12V 20A
F10	EPS-IG	5A	R3	IG1 Relay	12V 20A
F11	Auxiliary Outlet	15A	R4	High Beam Relay	12V 20A
F12	Front Differential	15A	R5	Daytime Running Light Relay	12V 20A
F13	2WD and 4WD Switching	15A	R6	Low Beam Relay	12V 20A
F14	Rear Differential	15A	R7	Fuel Pump Relay	12V 20A
F15	Daytime Running Light	20A	R8	Cooling Fan Relay 2	12V 20A
F16	Fuel Pump	15A	R9	Cooling Fan Relay 1	12V 20A
F17	Cooling Fan	30A	R10	ECU Main Relay	12V 20A
F18	High/Low Beam	20A	R11	IG2 Relay	12V 20A

### FUEL BOX LABEL(AT10 ABS/AT10W ABS)



No.	Fuse/Relay	Power	No.	Fuse/Relay	Power
F1	Display/Buzzer	5A	F20	Non-sustained Power Supply	15A
F2	ECU Start Relay	5A	F21	Main Fuse	50A
F3	Turn Signal	10A	F22	Main Fuse	50A
F4	Start /Horn	15A	F23	Position light fuse	10A
F5	Display/Vehicle Speed Sensor	7.5A	F24	EPS Fuse	50A
F6	DTS	5A	F25	ABS 1 Fsue	40A
F7	Brake Light	10A	F26	ABS 2 Fsue	30A
F8	DTS/2-4WD Module	7.5A			
F9	Power Switch	5A	R1	Auxiliary Start Relay	12V 20A
F10	EPS-IG	5A	R2	DTS Relay	12V 20A
F11	Auxiliary Outlet	15A	R3	IG1 Relay	12V 20A
F12	Front Differential	15A	R4	High Beam Relay	12V 20A
F13	2WD and 4WD Switching	15A	R5	Daytime Running Light Relay	12V 20A
F14	Rear Differential	15A	R6	Low Beam Relay	12V 20A
F15	Daytime Running Light	20A	R7	Fuel Pump Relay	12V 20A
F16	Fuel Pump	15A	R8	Cooling Fan Relay 2	12V 20A
F17	Cooling Fan	30A	R9	Cooling Fan Relay 1	12V 20A
F18	High/Low Beam	20A	R10	ECU Main Relay	12V 20A
F19	Fuel Injector/Ignition Coil/Oxygen Sensor	15A	R11	IG2 Relay	12V 20A

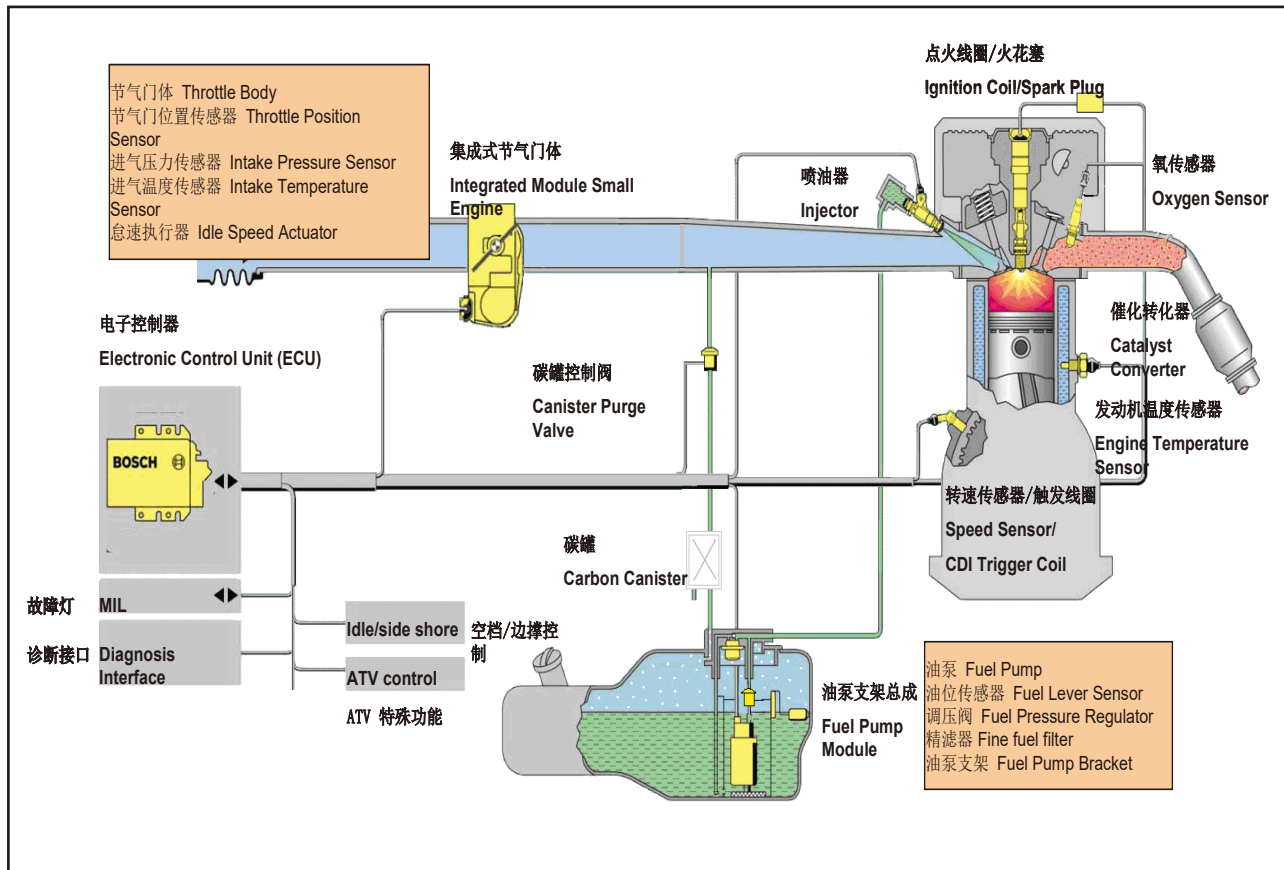
## FUEL BOX LABEL(AT10 MUD/AT10W MUD)



No.	Fuse/Relay	Power	No.	Fuse/Relay	Power
F1	Display/Buzzer	5A	F19	Fuel Injector/Ignition Coil/Oxygen Sensor	15A
F2	ECU Start Relay	10A	F20	Non-sustained Power Supply	15A
F3	Turn Signal	10A	F21	Main Fuse	50A
F4	Start /Horn	15A	F22	Main Fuse	50A
F5	Display/Vehicle Speed Sensor	7.5A	F23	Position light fuse	10A
F6	DTS	5A	F24	EPS Fuse	50A
F7	Brake Light	10A			
F8	DTS/2-4WD Module	7.5A	R1	Auxiliary Start Relay	12V 20A
F9	Power Switch	5A	R2	DTS Relay	12V 20A
F10	EPS-IG	5A	R3	IG1 Relay	12V 20A
F11	Auxiliary Outlet	15A	R4	High Beam Relay	12V 20A
F12	Front Differential	15A	R5	Daytime Running Light Relay	12V 20A
F13	2WD and 4WD Switching	15A	R6	Low Beam Relay	12V 20A
F14	Rear Differential	15A	R7	Fuel Pump Relay	12V 20A
F15	Daytime Running Light	20A	R8	Cooling Fan Relay 2	12V 20A
F16	Fuel Pump	15A	R9	Cooling Fan Relay 1	12V 20A
F17	Cooling Fan	30A	R10	ECU Main Relay	12V 20A
F18	High/Low Beam	20A	R11	IG2 Relay	12V 20A

EFI SYSTEM

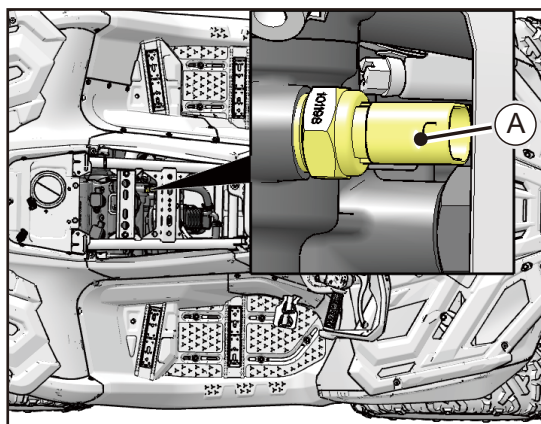
SCHEMATIC DIAGRAM OF EFI SYSTEM



## TEMPERATURE SENSOR

### FUNCTION INTRODUCTION

The temperature sensor function is used to monitor the temperature of the engine coolant. The sensor delivers engine temperature information to the ECU to determine engine performance and the display. The temperature sensor is generally installed on the intake side of the engine block. The cylinder temperature sensor can be seen by disassembling the left side cover and seat cushion of the whole vehicle (see **【A】** in the figure below).



### TEMPERATURE SENSOR REMOVAL

The temperature sensor is mounted on the intake side of the engine block.

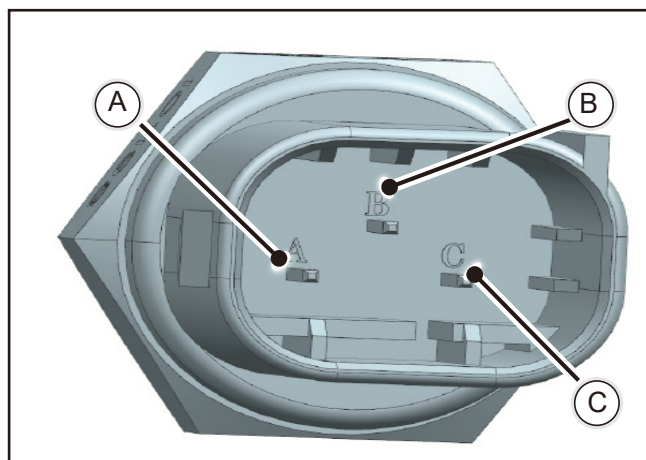
- ◆ Remove the seat, seat cushion and their bottom wind deflector to expose the temperature sensor.
- ◆ Unplug the connector from the temperature sensor.
- ◆ Use a tool to loosen and then remove the temperature sensor.
- ◆ Installation steps correspond to the removal steps.

Temperature Sensor Removal
12 N·m

### WORKING PRINCIPLE

The NTC thermistor is encapsulated in the temperature sensor, and its resistance value changes with the change of the ambient temperature, so as to accurately and timely measures the small change of the external temperature. The temperature of the contact medium can be reflected by measuring its output resistance. Where, terminal **【A】** and Terminal **【C】** output signals to the electric control unit ECU, and terminal **【B】** is suspended. The stitch definition is shown in the figure below.

**【A】** Connect the signal positive      **【B】** Suspended      **【C】** Connect the negative positive



### PERFORMANCE PARAMETER

- ◆ **Power:** 0.25W under standard use conditions
- ◆ **Working temperature:** -30°C~+130°C
- ◆ **Vibration level:** ≤600m/s<sup>2</sup>
- ◆ **Insulation resistance:** DC voltage of 500V is applied between the A and C end circuits and the B end circuit, and the insulation resistance is greater than 10MΩ.
- ◆ **Resistance-temperature characteristics are shown in Table 1**

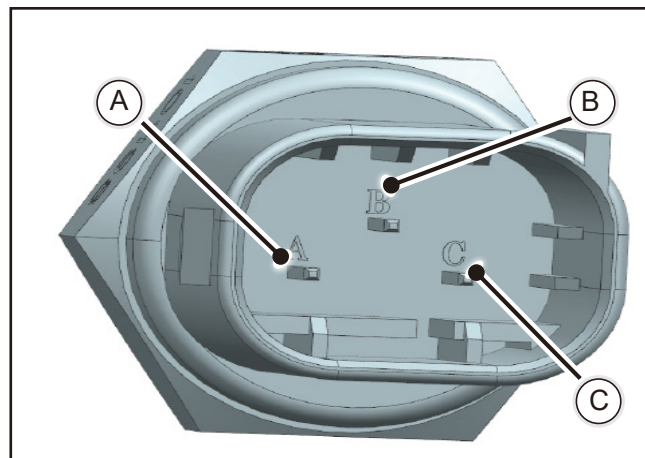
Table 1 Temperature sensor resistance-temperature characteristics

Temperature range (°C)	A and C end resistances (KΩ)
-20±0.1	13.71~16.49
25±0.1	1.825~2.155
80±0.1	0.303~0.326
110±0.1	0.1383~0.1451
	B end resistances (Ω)
50±0.2	176~280
80±0.2	63.4~81.4
110±0.2	24.6~30.6

### FAULT DIAGNOSIS

When the cylinder temperature is greater than its credible upper limit or less than its credible lower limit, the fault flag is set, and the common fault codes are shown in the fault summary table. Cylinder temperature sensor failure check:

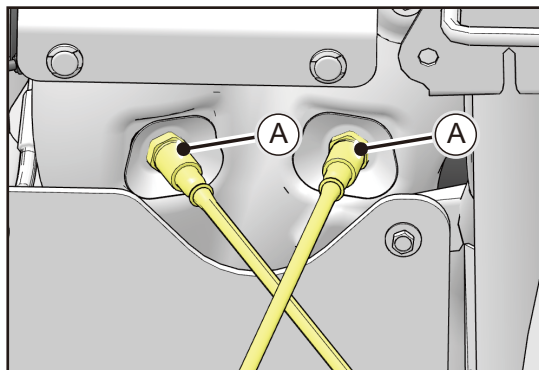
- ◆ First check whether the sensor harness connector is well connected
- ◆ Unplug the connector, check whether the sensor and the wire harness end pins are bent or deformed, etc.
- ◆ Use M19mm open-end wrench to remove the sensor and check whether the sensor probe is deformed
- ◆ Check the resistance between pins **【A】** and **【C】**
- ◆ Connect the connector and check the voltage between pins **【A】** and **【C】**



## OXYGEN SENSOR

### FUNCTION INTRODUCTION

It is used in the feedback system of the electronic control fuel injection device to achieve closed-loop control and improve the control accuracy of the air-fuel ratio of the electronic control unit. It is installed on the exhaust pipe (see **【A】** in the figure below) close to the engine end. It determines whether the gasoline is completely burned by measuring the oxygen content in the exhaust gas to ensure that the three-way catalytic converter has the maximum of HC, CO and NOx in the exhaust gas.



### OXYGEN SENSOR REMOVAL

The oxygen sensor is located above the exhaust pipe. Remove the exhaust pipe. Refer to Chapter 7—Exhaust Pipe Removal.

- ◆ Pull out the plugs on the two oxygen sensors.
- ◆ Unscrew and disassemble the 2 oxygen sensors **【B】**.

Oxygen
17 N·m

### ⚠ WARNING

When removing the oxygen sensor, be careful of the muffler and engine, and pay attention to burns!

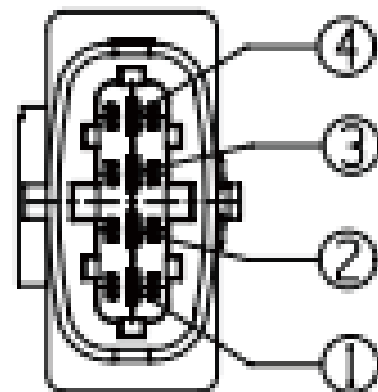
### WORKING PRINCIPLE

This is achieved by converting the difference in oxygen concentration inside and outside the sensing ceramic tube into a voltage signal output. When the temperature of the ceramic tube of the sensor reaches 350°C, the ceramic solid electrolyte has conductive properties. The oxygen molecules on both sides of the ceramic are catalyzed into oxygen ions by the platinum electrode of the sensor, and the oxygen ions can move inside the ceramic, therefore, the oxygen on both sides of the ceramic can diffuse through the ceramic itself.

It is this feature that converts the difference in oxygen concentration between the inner and outer sides of the ceramic into a potential difference, thereby forming an electrical signal output. If the mixed gas is thicker and the oxygen concentration in the exhaust gas produced by combustion is low, the oxygen ion concentration difference between the inside and outside of the ceramic tube is higher, the potential difference is higher, a large amount of oxygen ions move from the inside to the outside, and the output voltage is higher (about 800mv --1000mv); if the mixed gas is lean and the oxygen concentration in the exhaust gas produced by combustion is high, the difference in oxygen ion concentration between the inside and outside of the ceramic tube is low, the potential difference is low, the output voltage is low (about 100mv), and the signal voltage is A sudden change occurs near the theoretical equivalent air-fuel ratio ( $\lambda=1$ ).

The oxygen sensor electrical connector has 4 pins:

1. Connect to the positive pole of the heatingpower supply (red)
2. Connect to the negative pole of the heating power supply (white)
3. Connect to the negative signal of the signal (gray)
4. Connect to the positive signal of the signal (black)



## PERFORMANCE PARAMETER

Item	New oxygen		500h Durable after oxygen	
	350°C	850°C	350°C	850°C
Exhaust temperature	350°C	850°C	350°C	850°C
$\lambda = 0.97$ when the sensor element voltage(mv)	840±70	710±70	840±80	710±70
$\lambda = 1.10$ when the sensor element voltage(mv)	20±50	55±30	20±50	40±40
Internal resistance of sensing element (kΩ)	≤1.0	≤0.1	≤1.5	≤0.3
Response time (ms) (600mv-300mv)	≤150	≤150	≤300	≤200
Response time (ms) (300mv-600mv)	≤150	≤150	≤300	≤200

## ELECTRICAL CHARACTERISTIC PARAMETER

Item		Value	Unit
Edge resistance between the new sensor heating element and the sensor connector	Ambient temperature, heating element break resistance	≥30	MΩ
	Exhaust temperature 350°C	≥30	MΩ
	Exhaust temperature 850°C	≥30	KΩ
Power supply voltage on plug	Rated voltage	12	V
	Continuous working voltage	12-14	V
	Working voltage that can maintain 1% of total life at most (exhaust temperature ≤850°C)	15	V
	Up to 75s working voltage can be maintained (exhaust temperature ≤350°C)	24	V
	Test voltage	13	V
Working voltage is 13V, heating power when reaching thermal equilibrium (exhaust temperature 350°C, exhaust flow velocity is about 0.7m/s)		12	W
Working voltage is 13V, heating current when ambient temperature is -40°C (exhaust temperature is 350°C, exhaust flow velocity is about 0.7m/s)		5	A
Fuse of heating circuit		8	A

### TROUBLESHOOTING

The electronic control unit ECU monitors various sensors, actuators, power amplifier circuits and detection circuits. Common fault codes are shown in the fault list.

#### CAUTION

When the fault of oxygen sensor signal is checked, the engine should be run for at least 5-10min to ensure the completion of heating of oxygen sensor.

Oxygen sensor failure check:

- ◆ Check whether the oxygen sensor connector is well connected
- ◆ Unplug the connector, check whether the sensor and the wire harness end pins are bent or deformed, etc.
- ◆ Check whether the resistance between pins 1 and 4 is normal
- ◆ Check whether the voltage between pin 1 and the main relay is normal
- ◆ Connect the connector and run the engine for a period of time, check whether the voltage between pins A and C is normal.

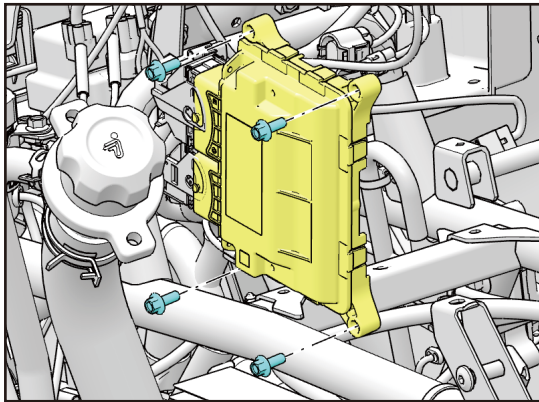
In addition, the oxygen sensor is an indirect reflection sensor. If other sensors are faulty, the oxygen sensor will also report a fault:

- ◆ Unreliable battery voltage
- ◆ The absolute pressure signal of the intake manifold is unreliable
- ◆ The signal of the engine temperature sensor is unreliable
- ◆ Injector driver stage failure

## ELECTRONIC CONTROL UNIT (ECU)

### FUNCTION INTRODUCTION

As a key component of the engine control management system, the electronic control unit (ECU) detects and controls the normal operation of the engine system, collects load information through sensors, predicts the driver's driving intentions, and at the same time ensures optimal fuel economy to meet the emission standards required by regulations. The engine management system is equipped with sensors and actuators necessary for the ECU's work. The ECU calculates the required air-fuel mixing ratio and the ignition advance angle of the engine according to the input data from the sensors, and controls the engine's fuel supply, fuel injection timing, high-pressure ignition timing, ignition closure angle, engine idle speed, speed closed-loop control, etc., under various operating conditions based on the measured data and the operating status of other accessory systems. Speed closed-loop control, etc.



### ECU REMOVAL

The ECU is located inside the left front fender.

**Remove the left front fender. Refer to Chapter 13-Left Front Fender Removal.**

- ◆ Remove the 4 fixing bolts on the ECU.
- ◆ Remove the ECU.

#### Working voltage:

**Rated voltage: 13.5V**

**Full functional operating voltage range: 9 V ~ 16 V**

**Function limited voltage range: 6V ~ 9V, 16V ~ 18V**

**Ensure the diagnostic function voltage range: 8V ~ 16V**

#### Working current:

**Working current : < 1.1 A@13.5v**

**Static current: <1 mA@13.5v**

#### Electrical protection:

- ◆ Overvoltage protection: ECU can withstand 24V overvoltage for 60 seconds (ambient temperature is  $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$ ). If the system returns to normal operating voltage within 60 seconds, ECU can still ensure normal operation.
- ◆ System reverse voltage protection: If UBR (Pin8) is powered by the main relay, the ECU can withstand a reverse voltage of 14.0 V for 60 seconds (ambient temperature is  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , other connections are correct), within 60 seconds If the system returns to normal working voltage, ECU can still guarantee normal operation.
- ◆ Output level protection: The controller drive level has diagnostic protection functions, such as short-circuit to ground, short-circuit to power supply and open circuit. But it needs to be pointed out that the ECU ignition pin does not have a short circuit protection function.

### FAULT DIAGNOSIS

The No. 34 pin of the ECU is connected to the K line for fault diagnosis. The K line can be used to call up the fault information record in the ECU, or manually input some instructions such as clearing the fault information record, self-learning, etc. ECU failure inspection mainly checks whether the connectors are well connected and whether the pins are bent or deformed.

## ELECTRONIC THROTTLE BODY DVE SELF-LEARNING PROCESS

1. After replacing either ECU or electronic throttle body, it is necessary to restart the electronic throttle body self-learning;
2. For vehicles that have completed self-learning, turn the key to the ON again, after waiting for 29 seconds, the electronic throttle body self-learning will also be started again.
3. DVE self-learning must meet the following conditions at the same time
  - ① Vehicle speed (vfzg) is 0
  - ② The engine speed (nmotll) is less than 250RPM
  - ③ The engine water temperature (tmot) is between 5.25°C-100.5°C
  - ④ The intake air temperature (tans) is not less than 5.25°C
  - ⑤ Battery voltage (ub) is more than 10V
4. Self-learning operation method:

For the first DVE self-learning, just switch the ignition key to ON and wait for 10 seconds. Do not do anything else at this time.

### 5. Analysis of possible failures in self-learning and their causes:

If the initial self-learning cannot be completed, the following DVE fault codes may appear:

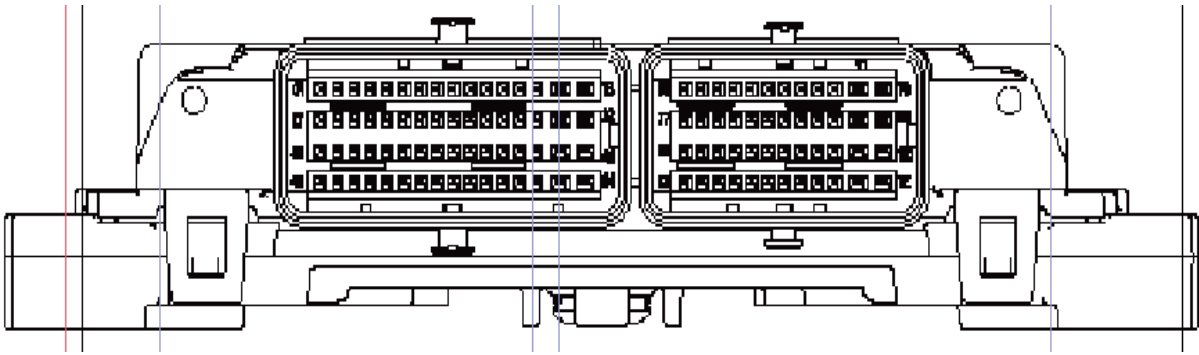
Fault codes	meaning	Fault light
P1565	DVE mechanical bottom dead center first self-learning failure	Bright SVS/EPC
P1579	Unsatisfactory environmental conditions lead to withdrawal from DVE self-study	—
P1564	The battery voltage condition is not met, which leads to exit DVE self-learning	—

(Note: The above fault codes are only for DVE fault codes recommended by UAES for OEMs. If customers have their own requirements for DVE fault codes, the fault codes may be different)

If the above faults are reported, the dveadchst variable needs to be measured by KIC to confirm what causes the DVE to fail self-learning, and the DVE self-learning can be successfully carried out only after the reasons are identified and eliminated.

dveadchst	The following conditions are not met
24	Engine speed (nmotll) is less than 250RPM
25	Vehicle speed (vfzg) is 0
26	Electronic gas pedal (wped) is 0
27	Battery voltage (ub) is greater than 10V
28	100 °C => engine water temperature (tmot)>=5 °C
30	Inlet air temperature (tans) not less than 5 °C

## ECU STITCH DEFINITION

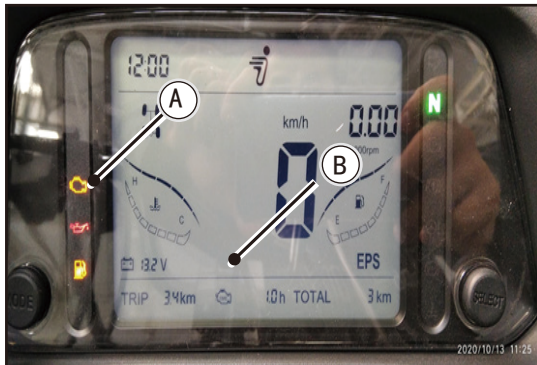


Item	Name	item	Name
1	CAN1H CAN (HIGH)	26	NC
2	NC	27	NEUTRAL SWITCH SIGNAL
3	NC	28	NC
4	NC	29	REVERSE GEAR SWITCH
5	MAIN RELAY	30	ACCELERATOR PEDAL SENSOR2
6	FOUR-WHEEL DRIVE SWITCH	31	NC
7	GROUND FOR PEDAL 1	32	NC
8	NC	33	NC
9	NC	34	NC
10	VEHICLE SPEED INPUT	35	IGNITION SWITCH
11	NC	36	SENSOR SUPPLY FOR PEDAL 2
12	NC	37	SENSOR SUPPLY FOR PEDAL 1
13	NC	38	NC
14	THRUST AUGMENTATION SWITCH	39	NC
15	SWITCHED BATTERY VOLTAGE	40	NC
16	SWITCHED BATTERY VOLTAGE	41	FUEL PUMP RELAY
17	CAN1L CAN (LOW)	42	HEAD LAMP RELAY
18	NC	43	GROUND FOR LAMBDA
19	NC	44	SPORT-MODE SWITCH
20	CONTINOUS SUPPLY VOLTAGE	45	ACCELERATOR PEDAL SENSOR1
21	LAMBDA SENSOR2	46	NC
22	NC	47	NC
23	BRAKE SWITCH	48	LAMBDA SENSOR HEATING2
24	LOW SPEED SWITCH	49	NC
25	BRAKE LIGHT	50	NC

Item	Name	item	Name
51	NC	82	NC
52	NC	83	NC
53	NC	84	GROUND FOR SENSOR
54	NC	85	GROUND FOR MANIFOLD
55	NC	86	GROUND FOR THROTTLE
56	FAN RELAY CONTROL	87	THROTTLE ACTUATOR
57	NC	88	NC
58	CRANK RELAY	89	NC
59	GROUND FOR PEDAL2	90	NC
60	NC	91	INTAKE MANIFOLD PRESSURE1
61	NC	92	NC
62	NC	93	NC
63	ECU MAIN GROUND 2	94	CANISTER PURGE VALVE
64	ECU MAIN GROUND 1	95	NC
65	NC	96	ENGINE SPEED SENSOR A
66	NC	97	ENGINE SPEED SENSOR B
67	NC	98	NC
68	INJECTOR1(CYL.1)	99	IGNITION COIL2
69	NC	100	IGNITION COIL2
70	NC	101	ENGINE COOLANT TEMP SENSOR
71	NC	102	INTAKE AIR TEMPERATURE SENSOR1
72	INJECTOR2(CYL.2)	103	NC
73	LAMBDA SENSOR HEATING1	104	LAMBDA SENSOR1
74	NC	105	NC
75	THROTTLE ACTUATOR	106	PARKING SWITCH
76	NC	107	SENSOR SUPPLY FOR THROTTLE
77	THROTTLE POSITION SENSOR 1	108	NC
78	THROTTLE POSITION SENSOR 2	109	SENSOR SUPPLY FOR MAINFOLD
79	NC	110	NC
80	GROUND FOR LAMBDA	111	ECU MAIN GROUND 4
81	NC	112	ECU MAIN GROUND 4

**FAULT CODE READING**

There is a fault indicator (【A】 in the left figure) in the instrument. When the key switch is turned on, the fault indicator is always on. When the engine is running, if the vehicle electronically controlled fuel injection system has no faults, the indicator light should go out; if there is a fault, the indicator light should always be on, indicating that the system is faulty. The indicator (【B】 in the left figure) can display the relevant fault code, and the specific fault information can be queried through the fault code summary table.



**TROUBLESHOOTER OPERATION**

When the engine is running, the instrument fault indicator is always on, indicating that the system is faulty. At present, use a dedicated fault diagnosis instrument (bottom left) to read the corresponding fault information. Use the OBD diagnostic interface to connect to the corresponding diagnostic interface of the vehicle, and connect the other end of the device to the computer (diagnostic software and corresponding drivers should be installed on the computer), and the key switch should be turned on. Specific steps:



- ◆ Connect the device, select "Open CAN", and press the OK button.
- ◆ Enter the main interface, you can view engine operating parameters and fault information



**! CAUTION**

When the engine is not running, it is normal that the fault light is always on, and there is no need to deal with it

## SUMMARY OF ECU FAULT CODES

NO.	Pcode	Description (UAES)	fault indicator on
1	P0108 17	Manifold Absolute Pressure/Barometric Pressure Circuit High	√
2	P0107 16	Manifold Absolute Pressure/Barometric Pressure Circuit Low	√
3	P2A0D 17	Mass or Volume Air Flow "B" Circuit Low	√
4	P2A0C 16	Mass or Volume Air Flow "B" Circuit High	√
5	P0113 17	Intake Air Temperature Sensor 1 Circuit High	√
6	P0112 16	Intake Air Temperature Sensor 1 Circuit Low	√
7	P0118 17	Engine Coolant Temperature Sensor 1 Circuit High	√
8	P0117 16	Engine Coolant Temperature Sensor 1 Circuit Low	√
9	P0650 11	MIL Control Circuit Low	√
10	P0650 13	MIL Control Circuit Open	√
11	P0692 12	Fan 1 Control Circuit High	√
12	P0691 11	Fan 1 Control Circuit Low	√
13	P0480 13	Fan 1 Control Circuit	√
14	P0629 12	Fuel Pump "A" Control Circuit High	√
15	P0628 11	Fuel Pump "A" Control Circuit Low	√
16	P0627 13	Fuel Pump "A" Control Circuit /Open	√
17	P0459 12	Evaporative Emission System Purge Control Valve Circuit High	√
18	P0458 11	Evaporative Emission System Purge Control Valve Circuit Low	√
19	P0444 13	Evaporative Emission System Purge Control Valve Circuit Open	√
20	P0412 12	Secondary Air Injection System Switching Valve "A" Circuit	√
21	P0414 11	Secondary Air Injection System Switching Valve "A" Circuit Shorted	√
22	P0413 13	Secondary Air Injection System Switching Valve "A" Circuit Open	√
23	P0262 12	Cylinder 1 Injector Circuit High	√
24	P0261 11	Cylinder 1 Injector Circuit Low	√
25	P0201 13	Injector Circuit/Open – Cylinder 1	√
26	P0265 12	Cylinder 2 Injector Circuit High	√
27	P0264 11	Cylinder 2 Injector Circuit Low	√
28	P0202 13	Injector Circuit/Open – Cylinder 2	√
29	P0563 17	System Voltage High	√
30	P0562 16	System Voltage Low	√
31	P0560 1C	System Voltage Not plausible	√
32	P0501 29	Vehicle Speed Sensor "A" Range/Performance	√
33	P0641 00	Sensor Reference Voltage "A" Circuit/Open	√
34	P0651 00	Sensor Reference Voltage "B" Circuit/Open	√
35	P0571 29	Brake Switch "A" Circuit	√
36	P0571 1C	Brake Switch "A" Circuit	√

NO.	Pcode	Description (UAES)	fault indicator on
37	P0123 17	Throttle/Pedal Position Sensor/Switch "A" Circuit High	√
38	P0122 16	Throttle/Pedal Position Sensor/Switch "A" Circuit Low	√
39	P0121 29	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	√
40	P0223 17	Throttle/Pedal Position Sensor/Switch "B" Circuit High	√
41	P0222 16	Throttle/Pedal Position Sensor/Switch "B" Circuit Low	√
42	P0221 29	Throttle/Pedal Position Sensor/Switch "B" Circuit Range/Performance	√
43	P2106 12	Throttle Actuator Control System Forced Limited Power	√
44	P2106 19	Throttle Actuator Control System Forced Limited Power	√
45	P2106 92	Throttle Actuator Control System Forced Limited Power	√
46	P2106 13	Throttle Actuator Control System Forced Limited Power	√
47	P1568 00	Idle Speed Contr.Throttle Pos. mechanical Malfunction	√
48	P1545 00	Throttle Pos.Contr. Malfunction	√
49	P1545 22	Throttle Pos.Contr. Malfunction	√
50	P1545 21	Throttle Pos.Contr. Malfunction	√
51	P1565 00	Idle Speed Control Throttle Position lower limit not attained	
52	P2123 17	Throttle/Pedal Position Sensor/Switch "D" Circuit High	
53	P2122 16	Throttle/Pedal Position Sensor/Switch "D" Circuit Low	√
54	P2138 29	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation	√
55	P2128 17	Throttle/Pedal Position Sensor/Switch "E" Circuit High	√
56	P2127 16	Throttle/Pedal Position Sensor/Switch "E" Circuit Low	√
57	P0606 94	ECM/PCM Processor	√
58	P0606 92	ECM/PCM Processor	√
59	P2106 29	Throttle Actuator Control System Forced Limited Power	√
60	P0606 64	ECM/PCM Processor	√
61	P0606 61	ECM/PCM Processor	√
62	P0606 67	ECM/PCM Processor	√
63	P0606 1C	ECM/PCM Processor	√
64	P0606 55	ECM/PCM Processor	√
65	P0606 00	ECM/PCM Processor	√
66	P0606 62	ECM/PCM Processor	√
67	P0606 96	function monitoring: fault of ECU ADC - Null Load Test Pulse	√
68	P0606 97	function monitoring: fault of ECU ADC - test voltage	√
69	P0606 47	function monitoring: fault of ECU monitoring modul error	√
70	P0606 17	Reported OverVoltage of VDD5	√
71	P0606 16	Reported UnderVoltage of VDD5	√
72	P0606 49	Diagnostic fault check to report "WDA active"	√
73	P0606 48	Diagnostic fault check to report "WDA active" due to errors in query-/response communication	√
74	P0606 91	Diagnostic fault check to report "WDA active" due to overvoltage detection	√

NO.	Pcode	Description (UAES)	fault indicator on
75	P0032 12	O2 Sensor Heater Control Circuit High Bank 1 Sensor 1	√
76	P0031 11	O2 Sensor Heater Control Circuit Low Bank 1 Sensor 1	√
77	P0030 13	O2 Sensor Heater Control Circuit Bank 1 Sensor 1	√
78	P0132 17	O2 Sensor Circuit High Voltage Bank 1 Sensor 1	√
79	P0131 16	O2 Sensor Circuit Low Voltage Bank 1 Sensor 1	√
80	P0130 29	O2 Sensor Circuit Bank 1 Sensor 1	√
81	P0134 13	O2 Sensor Circuit No Activity Detected Bank 1 Sensor 1	√
82	P0052 12	O2 Sensor Heater Control Circuit High Bank 2 Sensor 1	√
83	P0051 11	O2 Sensor Heater Control Circuit Low Bank 2 Sensor 1	√
84	P0050 13	O2 Sensor Heater Control Circuit Bank 2 Sensor 2	√
85	P0152 17	O2 Sensor Circuit High Voltage Bank 2 Sensor 1	√
86	P0151 16	O2 Sensor Circuit Low Voltage Bank 2 Sensor 1	√
87	P0150 29	O2 Sensor Circuit Bank 2 Sensor 1	√
88	P0154 13	O2 Sensor Circuit No Activity Detected Bank 2 Sensor 1	√
89	U0073 88	Control Module Communication Bus Off	√
90	U0140 87	Lost Communication With Body Control Module	√
91	U0121 87	Lost Communication With Anti-Lock Brake System (ABS) Control Module	√
92	P0322 00	Crankshaft signal loss	√
93	U0155 87	Lost Communication With Instrument Panel Cluster (IPC) Control Module	√
94	U0198 87	Lost communication with TBOX	√
95	U0293 00	Lost Communication With Hybrid/EV Powertrain Control Module	√
96	P0688 16	ECM/PCM Power Relay Sense Circuit/Open	√
97	P0688 29	ECM/PCM Power Relay Sense Circuit/Open	√
98	P0650 12	MIL Control Circuit High	√
99	P2138 00	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation	√
100	P1559 00	Idle Speed Contr.Throttle Pos. Adaptation Malfunction	√
101	P1579 00	Idle Speed Contr.Throttle Pos. adaptation not started	√
102	P1564 00	Idle Speed Contr.Throttle Pos. Low Voltage During Adaptation	√
103	P1559 29	Idle Speed Contr.Throttle Pos. Adaptation Malfunction	√
104	P0300 00	Misfire detected	√
105	P0301 00	Misfire detected on cylinder 1	√
106	P130A 00	Cylinder selective fuel cutoff active due to catalyst damaging misfire	√
107	P0302 00	Misfire detected on cylinder 2	√

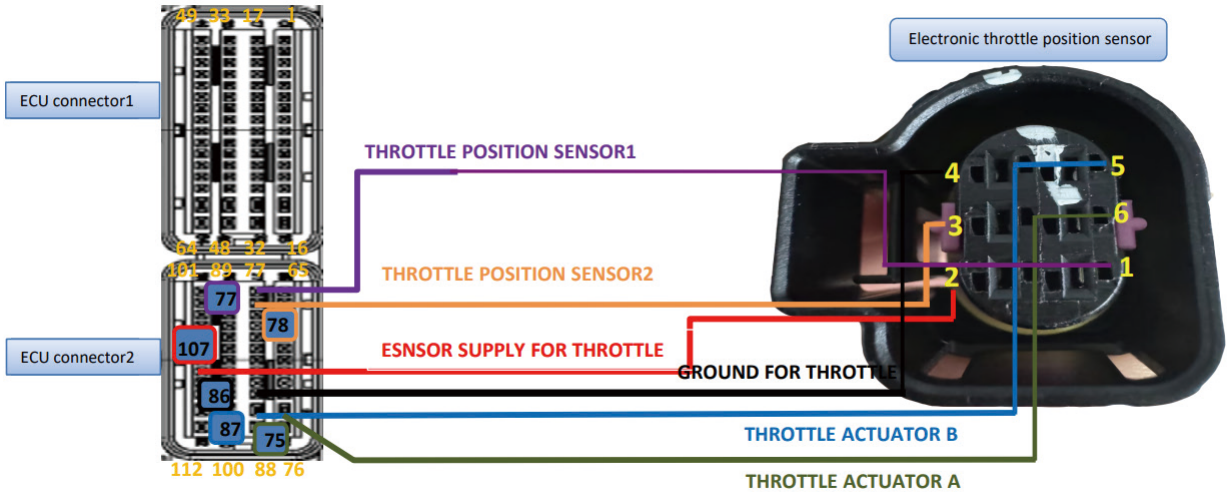
## SEGWAY AT10

P012216---This Trouble Code Sets if the electronic throttle position sensor 1 short circuit to ground.

P012317---This Trouble Code Sets if the electronic throttle position sensor 1 short circuit to power

P012216---This Trouble Code Sets if the Electronic throttle position sensor 1 open circuit

Can be caused by the electronic throttle position sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

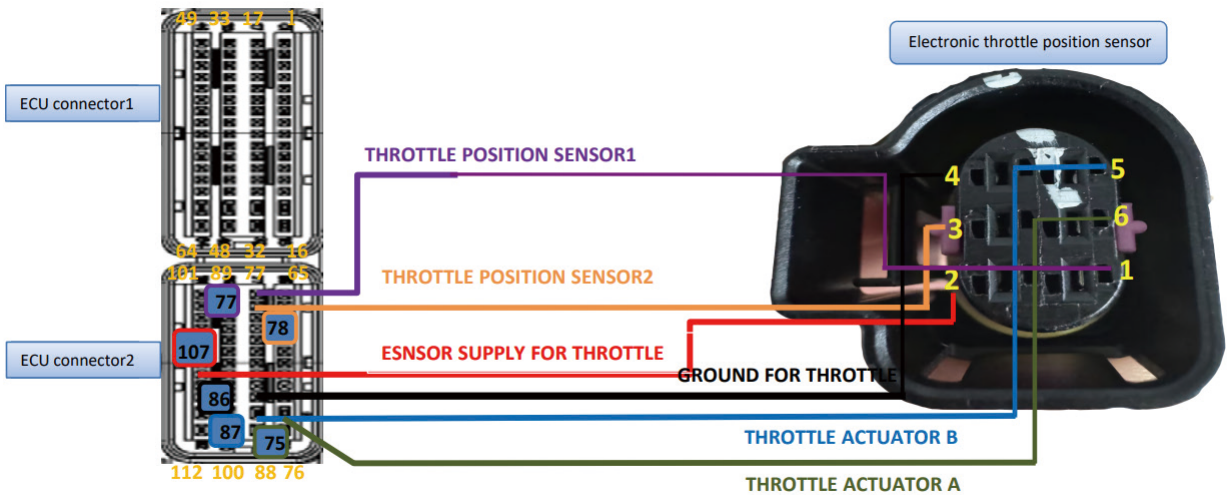


P022216---This Trouble Code Sets if the electronic throttle position sensor 2 short circuit to ground

P022216---This Trouble Code Sets if the electronic throttle position sensor 2 open circuit

P022317---This Trouble Code Sets if the electronic throttle position sensor 2 short circuit to power

Can be caused by the electronic throttle position sensor 2 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

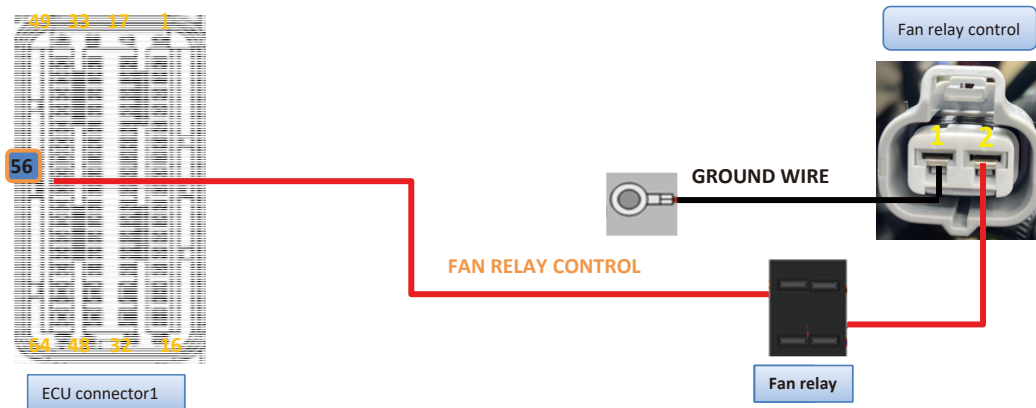


P069212---Indicates that the Cooling Fan Relay Driver Circuit is Shorted to Battery Voltage.

P069111---This Trouble Code Sets if the Cooling Fan Driver Circuit is Shorted to Ground.

P048013---This Trouble Code Sets if the Cooling Fan Driver Circuit is Open.

Can be caused by a Faulty Coolant Fan Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

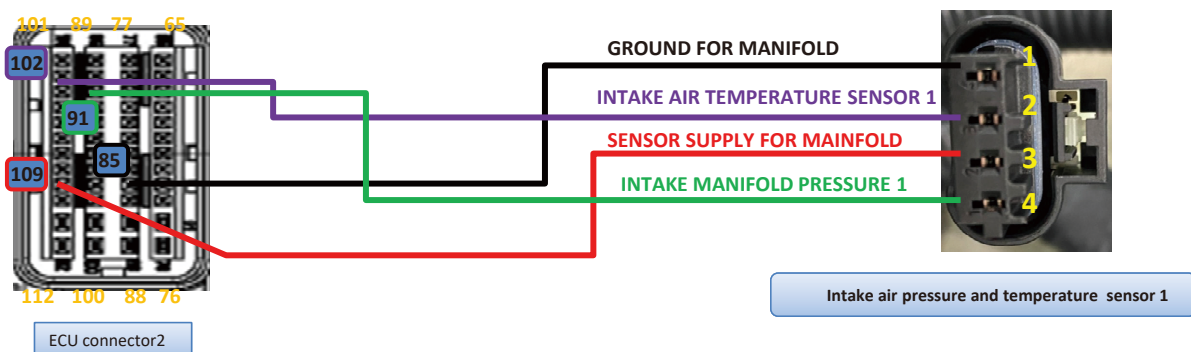


P010817--- This Trouble Code sets if the Intake pressure sensor 1 open circuit

P010817---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure Sensor 1 Circuit is Shorted to Battery Voltage.

P010716---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure Sensor 1 Circuit is Shorted to Ground.

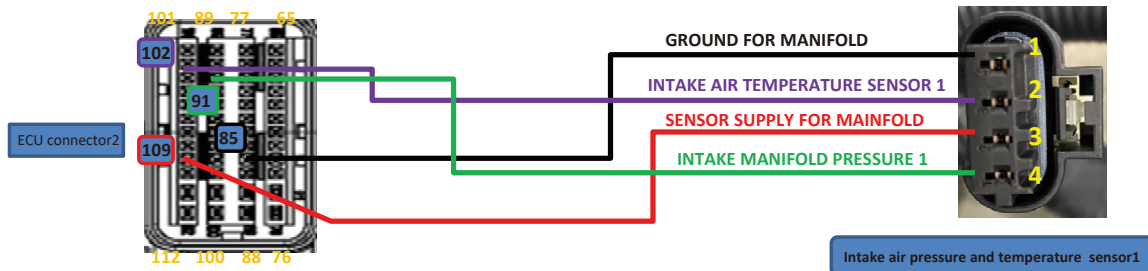
Can be caused by a Manifold Absolute Pressure/Barometric Pressure Sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



P011317---This Trouble Code sets if the Intake air temperature sensor 1 open circuit  
 P011317---This Trouble Code sets if the Intake Air Temperature Sensor 1 Circuit is Shorted to Battery Voltage.

P011216---This Trouble Code sets if the Intake Air Temperature Sensor 1 Circuit is Shorted to Ground.

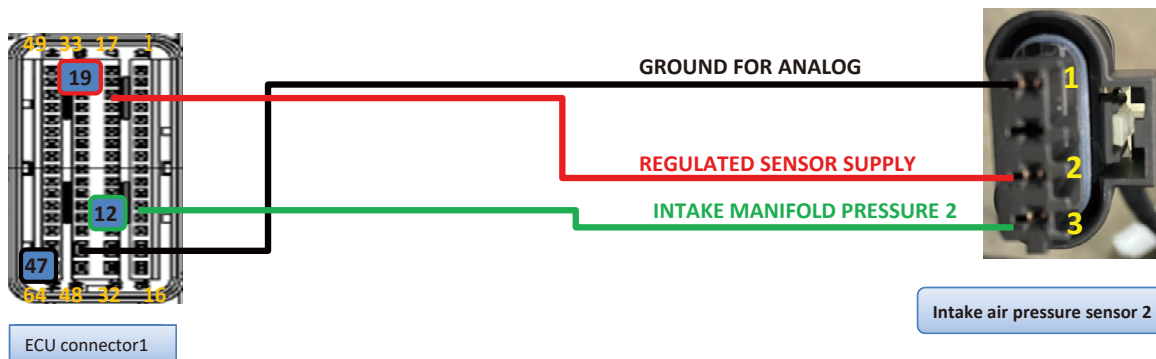
Can be caused by a Intake Air Temperature Sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



P2A0D17---This Trouble Code sets if the Intake pressure sensor 2 open circuit  
 P2A0D17---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure Sensor 2 Circuit is Shorted to Battery Voltage.

P2A0C16---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure Sensor 2 Circuit is Shorted to Ground.

Can be caused by a Manifold Absolute Pressure/Barometric Pressure Sensor 2 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

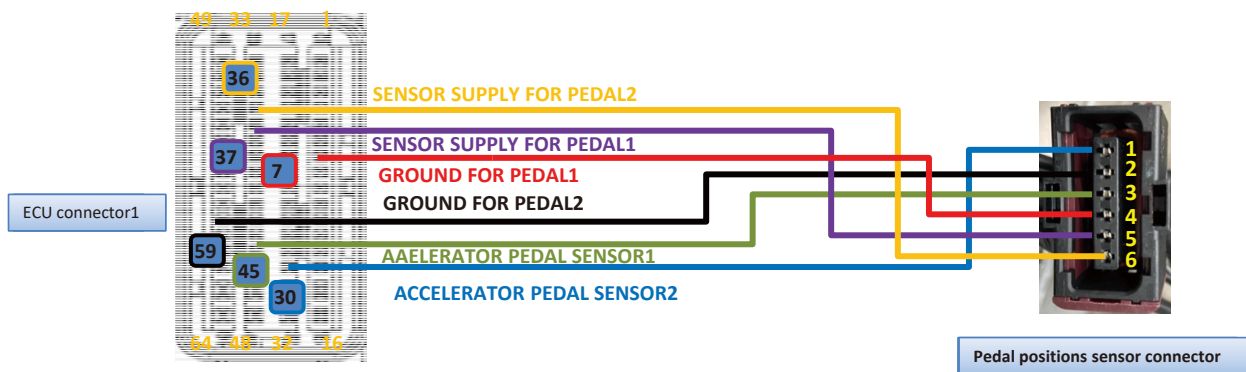


P212317---This Trouble Code Sets if the electronic accelerator pedal position sensor 1 short circuit to power

P212216---This Trouble Code Sets if the electronic accelerator pedal position sensor 1 short circuit to ground

P212216---This Trouble Code sets if the electronic accelerator pedal position sensor 1 open circuit

Can be caused by the electronic accelerator pedal position sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

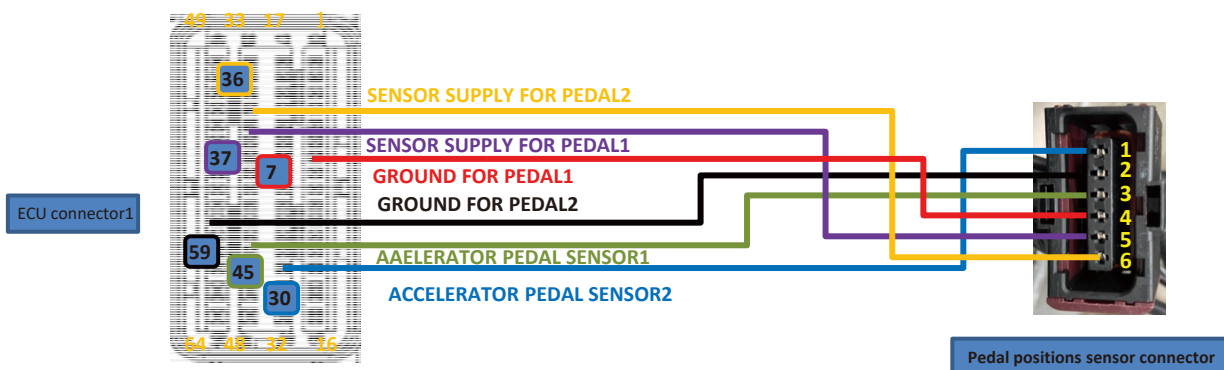


P212817---This Trouble Code Sets if the electronic accelerator pedal position sensor 2 short circuit to power

P212716---This Trouble Code Sets if the electronic accelerator pedal position sensor 2 short circuit to ground

P212716---This Trouble Code sets if the electronic accelerator pedal position sensor 2 open circuit

Can be caused by the electronic accelerator pedal position sensor 2 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



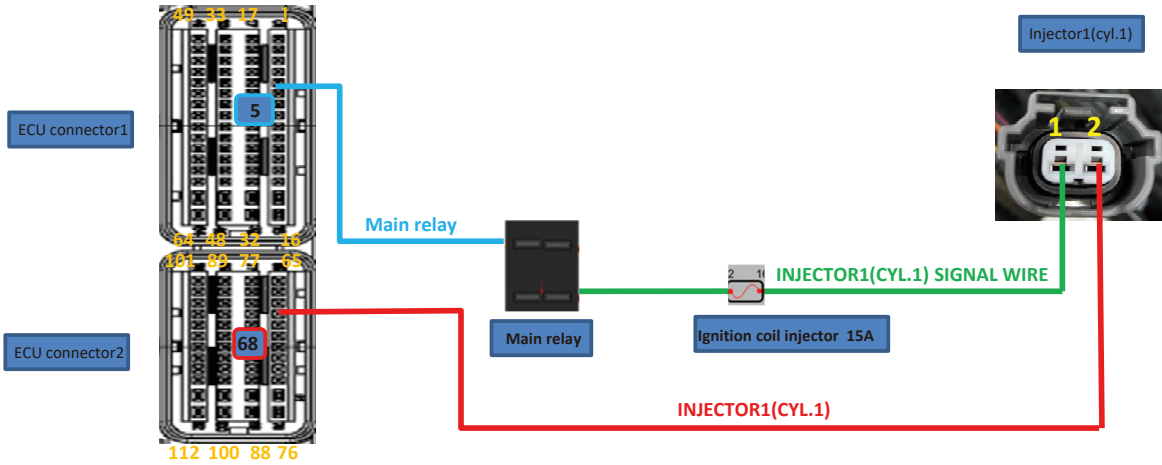
SEGWAY AT10

P026212---This Trouble Code Sets if the fuel injection nozzle 1(cylinder1)short circuit to power

P026111---This Trouble Code Sets if the fuel injection nozzle 1(cylinder1)short circuit to ground

P020113---This Trouble Code Sets if the fuel injection nozzle 1(cylinder1)open circuit

Can be caused by a fuel injection nozzle 1(cylinder1) Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

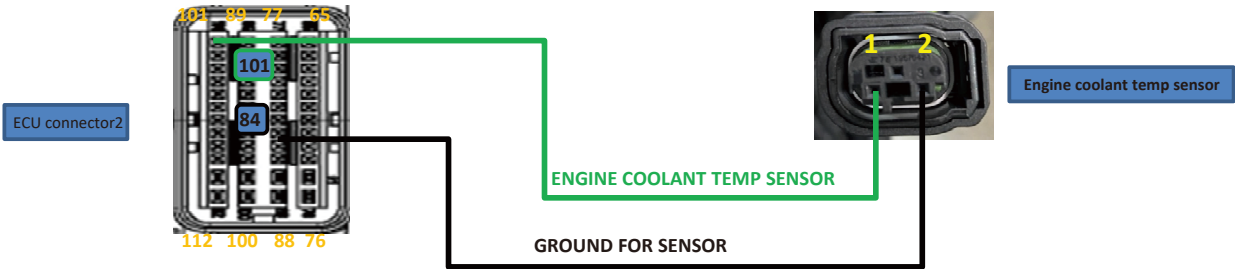


P011716---This Trouble Code sets if the Engine Temperature Sensor Circuit is Shorted to Ground.

P011817---This Trouble Code sets if the Engine Temperature sensor open circuit

P011817---This Trouble Code sets if the Engine Temperature Sensor Circuit is Shorted to Battery Voltage.

Can be caused by a Engine Temperature Sensor Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

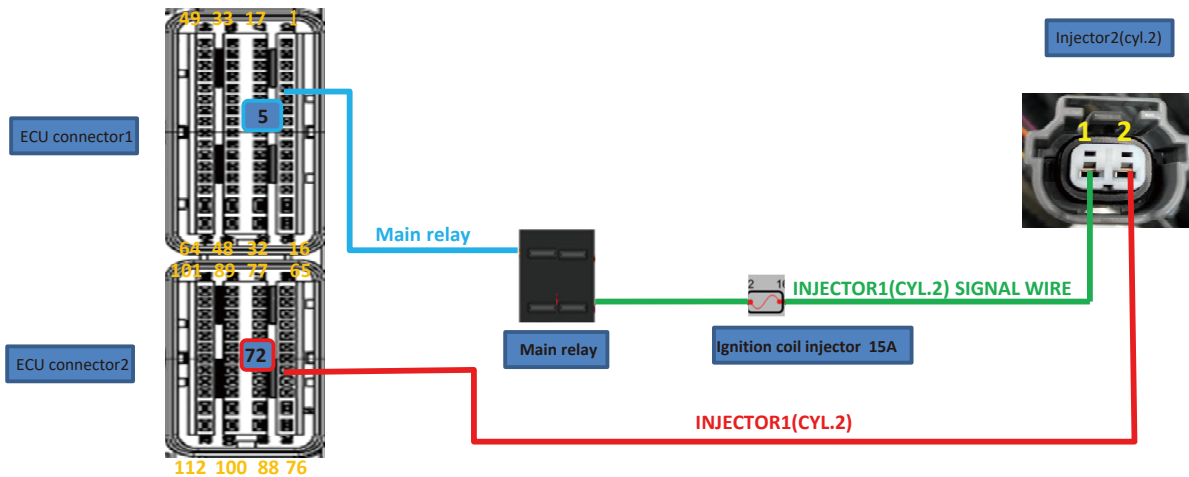


P026512---This Trouble Code Sets if the fuel injection nozzle 2(cylinder2)short circuit to power

P026411---This Trouble Code Sets if the fuel injection nozzle 2(cylinder2)short circuit to ground

P020213---This Trouble Code Sets if the fuel injection nozzle 2(cylinder2)open circuit

Can be caused by a fuel injection nozzle 2(cylinder2) Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



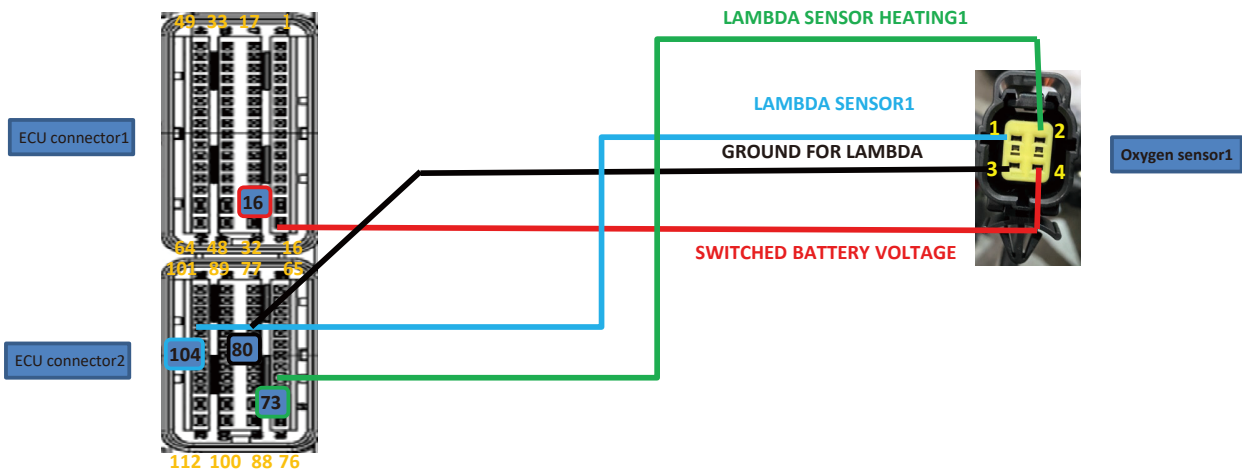
P013217---This Trouble Code Sets if the oxygen sensor 1 short circuit to power

P013116---This Trouble Code Sets if the oxygen sensor 1 short circuit to ground

P013413---This Trouble Code Sets if the oxygen sensor 1 open circuit

P013029---This Trouble Code Sets if the oxygen sensor 1 signal circuit voltage unreasonable

Can be caused by a oxygen sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



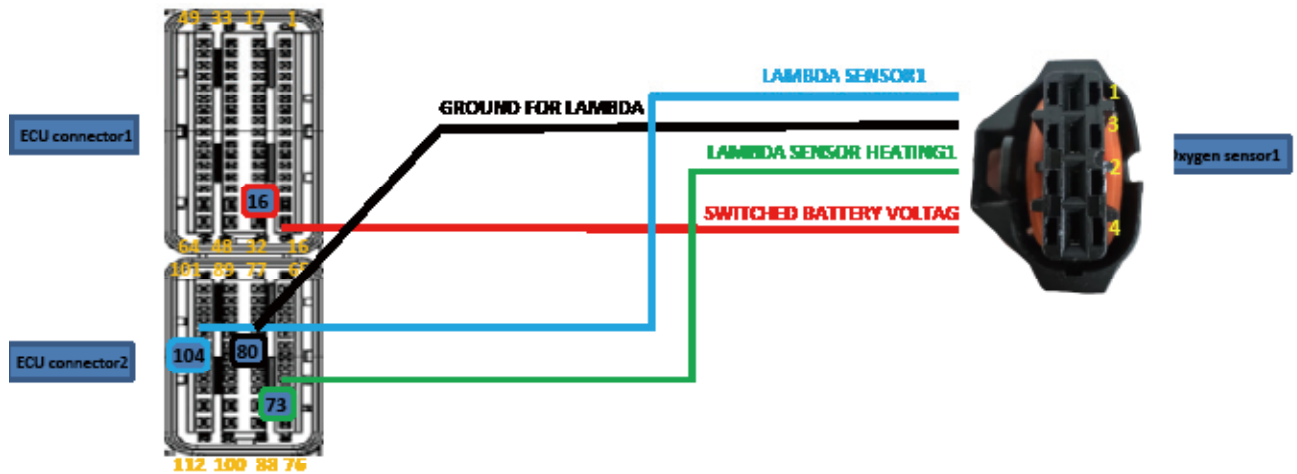
## SEGWAY AT10

**P003212---This Trouble Code Sets if the oxygen sensor heating 1 control circuit short circuit to power**

**P003111---This Trouble Code Sets if the oxygen sensor heating 1 control circuit short circuit to ground**

**P003013---This Trouble Code Sets if the oxygen sensor heating 1 control circuit open circuit**

**Can be caused by a oxygen sensor heating 1 control circuit Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections**



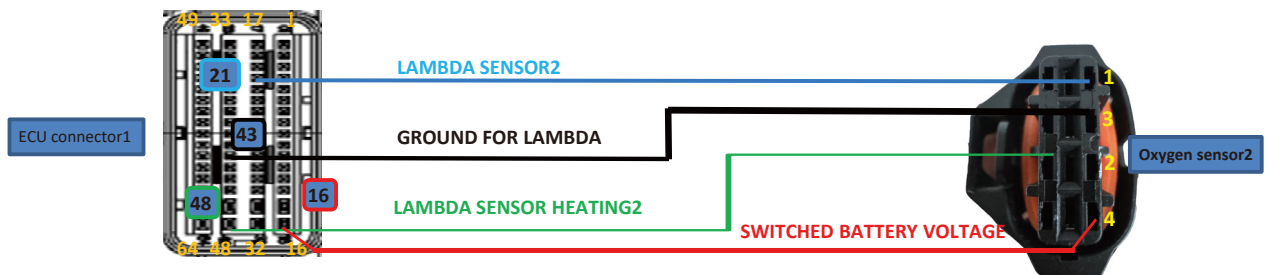
**P015217---This Trouble Code Sets if the oxygen sensor signal 2 circuit short circuit to power**

**P015116---This Trouble Code Sets if the oxygen sensor signal 2 circuit short circuit to ground**

**P015413---This Trouble Code Sets if the oxygen sensor signal 2 circuit open circuit**

**P015029---This Trouble Code Sets if the oxygen sensor signal 2 circuit voltage unreasonable**

**Can be caused by a oxygen sensor signal 2 circuit Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections**

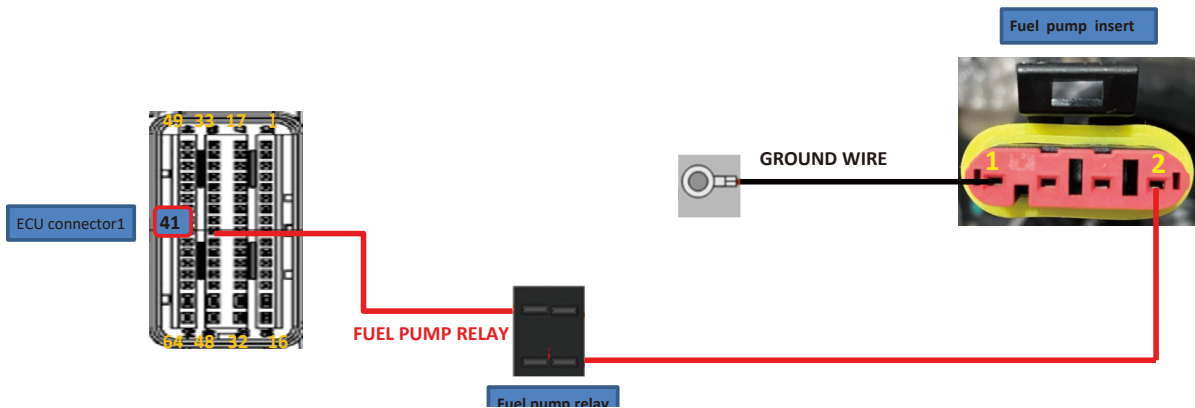


P062912---This Trouble Code sets if the Fuel Pump Control Circuit is Shorted to Battery Voltage.

P062811---This Trouble Code sets if the Fuel Pump Control Circuit is Shorted to Ground.

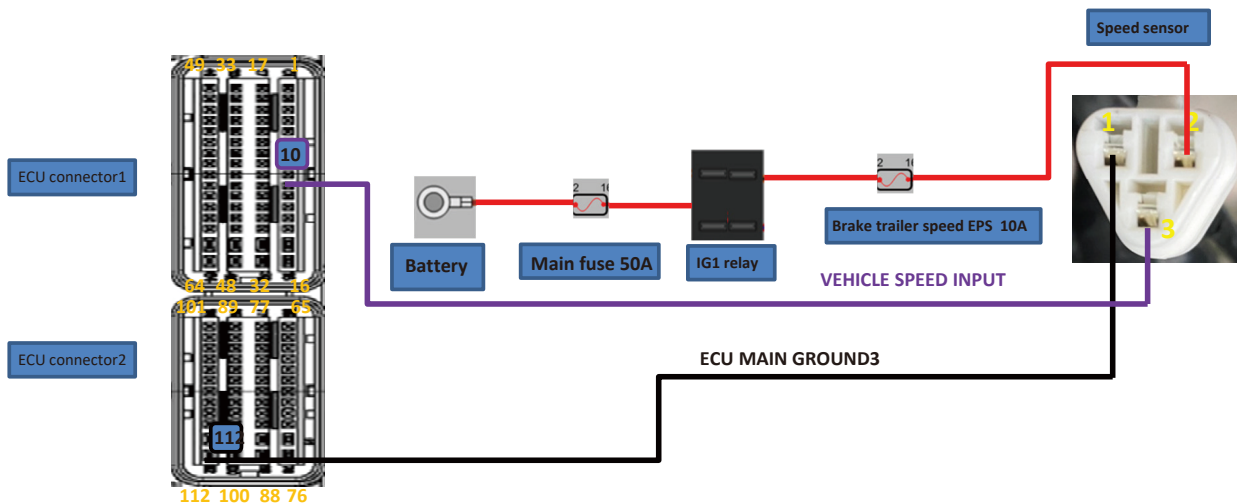
P062713---This Trouble Code sets if the Fuel Pump “A” Control Circuit is Open.

Can be caused by a Fuel Pump Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



P050129---This Trouble Code sets if the Vehicle speed signal failure

Can be caused by a Vehicle speed signal Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



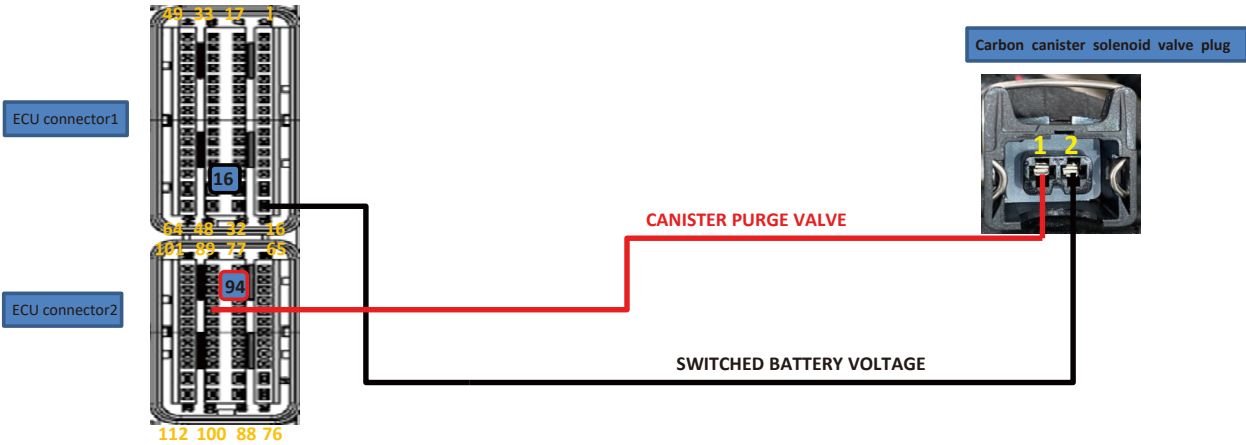
## SEGWAY AT10

P056317---This Trouble Code sets if the System power supply voltage too high  
P056216--- This Trouble Code sets if the System power supply voltage too low  
P05601C---This Trouble Code sets if the Unreasonable system power supply voltage signal

Can be caused by a System power supply voltage Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

P045912---This Trouble Code sets if the Evaporative Emission System Purge Control Valve Control Circuit is Shorted to Battery Voltage.  
P045811---This Trouble Code sets if the Evaporative Emission System Purge Control Valve Control Circuit is Shorted to Ground.  
P044413---This Trouble Code sets if the Evaporative Emission System Purge Control Valve Control Circuit is Open.

Can be caused by a Evaporative Emission System Purge Control Valve Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

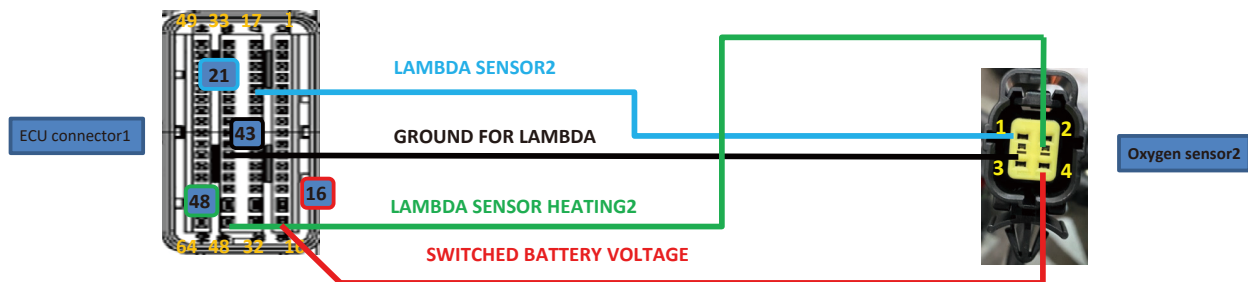


P005212---This Trouble Code Sets if the oxygen sensor heating 2 short circuit to power

P005111---This Trouble Code Sets if the oxygen sensor heating 2 short circuit to ground

P005013---This Trouble Code Sets if the oxygen sensor heating 2 open circuit

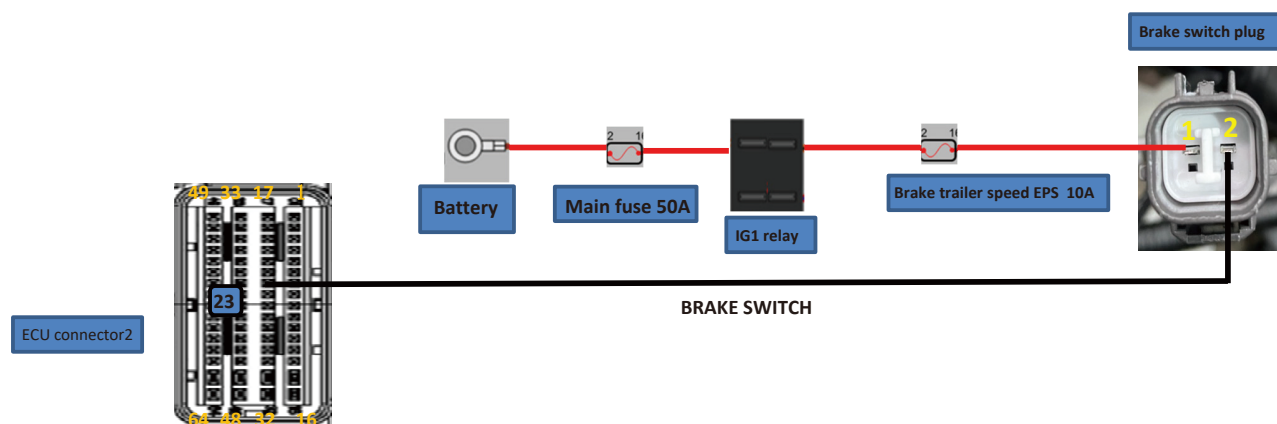
Can be caused by a oxygen sensor heating 2 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



P057129---This Trouble Code Sets if the brake lamp signal circuit failure

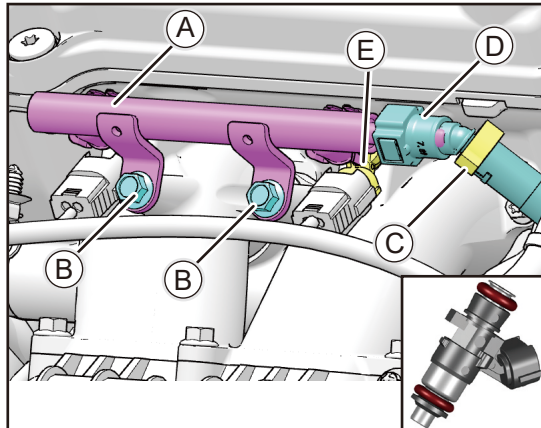
P05711C---This Trouble Code Sets if the brake signal out of synchronization

Can be caused by a brake lamp signal circuit Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



**INJECTOR**

The injector provides fuel to the engine and atomizes it within the specified time according to the instructions of the ECU.



**FUEL INJECTOR REMOVAL**

The fuel injector is located above the intake manifold, under the seat.

- ◆ Remove the seat.
- ◆ Remove the wind deflector at the bottom of the seat cushion
- ◆ Remove the 2 bolts on the fuel rail **【A】 【B】**
- ◆ Loosen the clamp **【C】** and unplug the quick-fitting plug **【D】**
- ◆ Unplug the plug on the fuel injector and unplug the fuel injector.
- ◆ The installation steps are opposite to the removal steps.

<b>Bolt <b>【B】</b> Torque</b>
10 N·m

**WORKING PRINCIPLE**

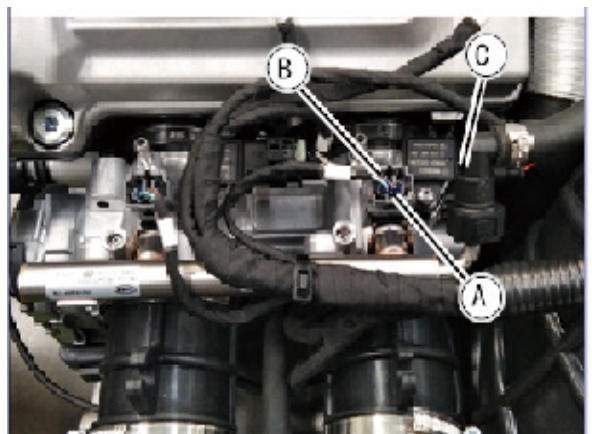
The ECU sends an electrical pulse signal to the injector coil, creating a magnetic field force. When the magnetic field force rises enough to overcome the combined force of the return spring pressure, the gravity of the needle valve and the sassafras force, the needle valve starts to rise and the injection process begins. The maximum lift of the needle valve is not more than 0.1mm, when the injection pulse cutoff, the return spring pressure makes the needle valve and then close again!

**ELECTRICAL CHARACTERISTICS**

Project	Parameter	Project	Parameter
Static flow	207.8g/min	Coil resistance	12Ω
Dynamic flow	6.65mg/stroke (stroke)	Hydraulic leak	1.8mm <sup>3</sup> /min
Jet angle	23°		

**FAULT DIAGNOSIS**

ECU only implements fault diagnosis for the fuel injector drive stage. When the fuel injector drive stage is short-circuited or overloaded to the battery voltage, short-circuited to the ground, or open circuit, the fault flag is set. At this time, close the closed-loop control of the oxygen sensor and its self-learning pre-control. The last self-learning data is valid. After the fault is removed, the fault flag is reset. Common fault codes are shown in the fault summary table



**Injector failure inspection:**

- ◆ Check the connectors are well connected
- ◆ Check whether the wiring harness and injector pins are bent or deformed
- ◆ Check whether the injector cap and the oil pipe are reliably connected
- ◆ Unplug the connector and check the coil resistance between pins A and B
- ◆ Check the resistance between the pins (A on the left figure) and the main relay
- ◆ Check the resistance between the pins (B in the left figure) and ECU pin 12 (see ECU pin definition)

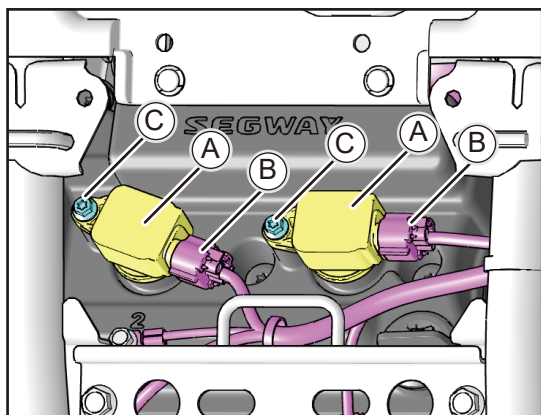
**⚠ WARNING**

When removing the fuel pipe, there is high-pressure fuel in the fuel pipe. Pay attention to fire safety and spray it into your eyes carefully.

### IGNITION COILS

The ignition coil converts the low-voltage electricity of the primary winding into the high-voltage electricity of the secondary winding, and generates sparks through the discharge of the spark plug to ignite the fuel-air mixture in the gas cylinder.

The ignition coil is installed on the engine. Remove the seat cushion to see the ignition coil installed on the engine (see **【A】** in the figure below).

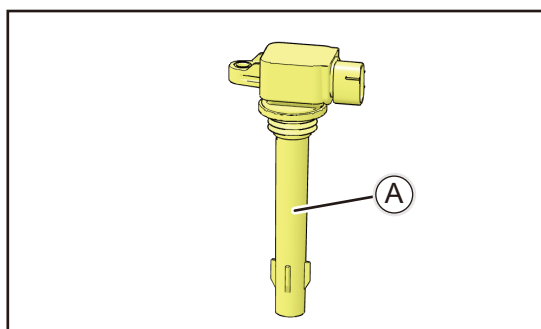


#### IGNITION COIL REMOVAL

The ignition coil is located under the seat.

- ◆ Remove the seats.
- ◆ Remove the wind deflector at the bottom of the seat cushion.
- ◆ Unplug the plug [B] from the ignition coil [A], remove the ignition coil bolt [C], and then pull out the ignition coil.
- ◆ The installation steps are the reverse of the disassembly steps.

Ignition coil bolt torque
10 N·m



#### ⚠ WARNING

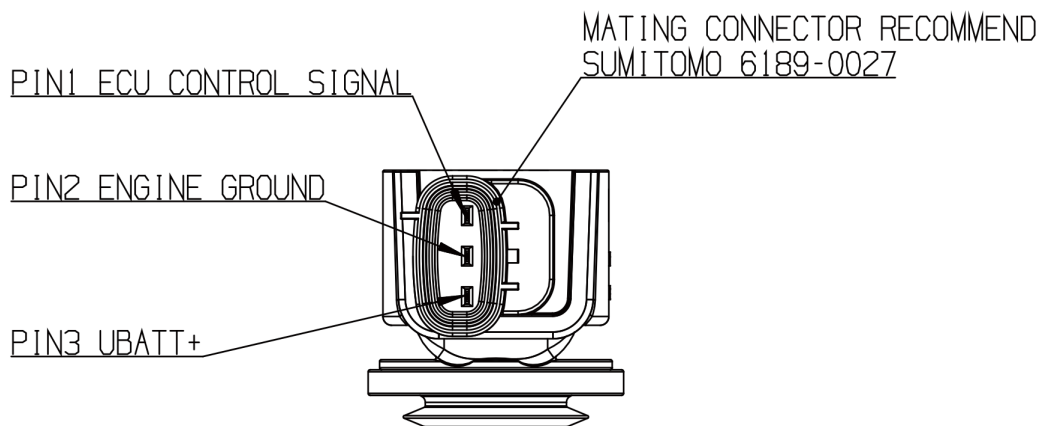
If the spark plug wire (located at A in the left image) is installed incorrectly, it will cause the engine to misfire.

#### WORKING PRINCIPLE

The ignition coil is composed of a primary winding, a secondary winding, an iron core, and a shell. When the battery voltage is applied to the primary winding, the primary winding is charged, once the ECU cuts off the primary winding loop, the charging is stopped and high voltage is induced in the secondary winding.

There are 3 pins on the low voltage side of the ignition coil:

- ◆ PIN 1: Connect to ECU control signal
- ◆ PIN 2: Pin Ground
- ◆ PIN 3: Connect to the positive terminal of the battery



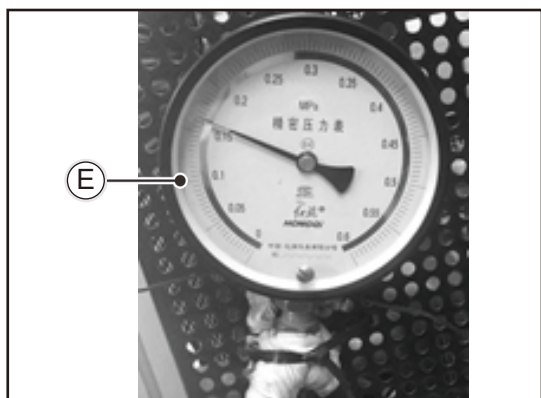
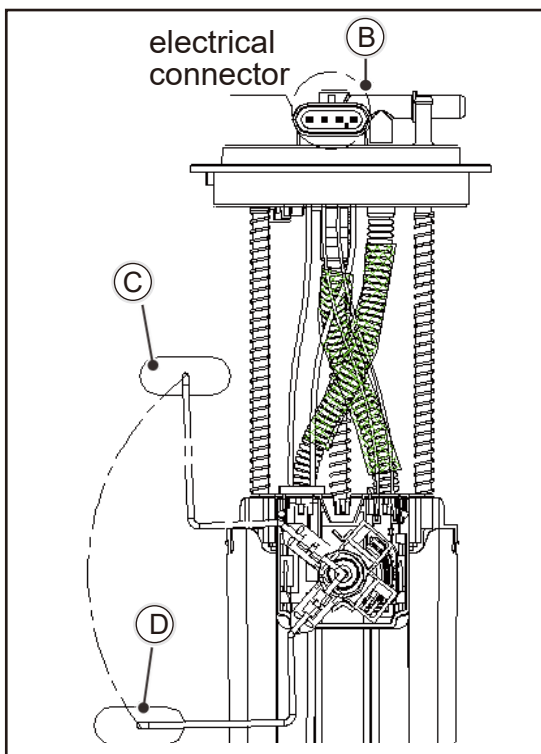
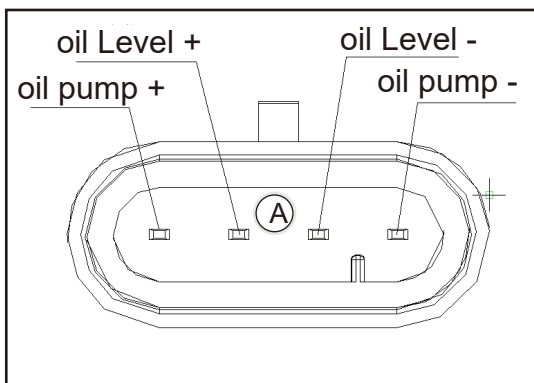
## PERFORMANCE PARAMETERS

Item	Value			Unit	
	Min	Rated	Max		
Calibration voltage	/	14	/	V	
Operating voltage	6	14	16.5	V	
Resistance (20--25°C)	Primary winding	466	530	593	mΩ
	Secondary winding	8.27	9.4	10.53	kΩ
Primary current (Charging time 3.9ms)	7.4	8.0	8.6	A	
Secondary voltage (Load 35pF)	34	/	/	kV	
Ignition energy (Zener voltage 1000V)	40	/	/	mJ	

## FAULT DIAGNOSIS

The ECU does not have a fault diagnosis function for the ignition coil, so there is no ignition coil related code in the fault code list. If there is no ignition, please check whether the ignition coil connector is well connected, whether the pin is deformed, and whether the ignition coil wire is in good contact with the spark plug.

## FUEL PUMP ASSEMBLY



### INSPECTION OF FUEL PUMP ASSEMBLY

- ◆ Structure diagram of front view of oil pump assembly **【B】** ;
- ◆ Function definition diagram of pins of oil pump electrical connector **【A】** ;
- ◆ Remove the driver's seat assembly and the lower cover of the driver's seat; then use the multimeter set to the resistance ohm position to check the oil level sensor of the oil pump according to the following steps;
- ◆ Move the floating rod to check whether it can move freely. The float assembly shall be free to return to the lower position. If not, replace the fuel pump..
- ◆ Test the fuel position sensor by connecting the multimeter to the middle two pins of the cable plug. The multimeter displays  $250\pm 5 \Omega$  at full fuel position **【C】** and  $40\pm 5 \Omega$  at empty fuel position **【D】** .

Bottom (L)	Height (mm)	$54\pm 3$
	Resistance( $\Omega$ )	$40\pm 5$
Top (H)	Height (mm)	$222\pm 5$
	Resistance( $\Omega$ )	$250\pm 5$

- ◆ Test the fuel pump supply port pressure by means of pressure gauge **【E】** , and the test pressure value is  $330\pm 17\text{Kpa}$  under energized condition.

Model	Test pressure(Kpa)	Flow (L/h)	Electric current(A)	Sealing pressure (Kpa)
380224A	300	110-140	5.5	550-850
A882CHT	300	$\geq 100$	$\leq 5.8$	$330\pm 5\%$

### ⚠ CAUTION

- ◆ If the resistance reading shows unstable, please clean the resistance wiper with alcohol and retest. If it is still incorrect, please replace the fuel pump.
- ◆ If the fuel pump supply pressure test fails, please replace the fuel pump.

### FUEL PUMP REMOVAL

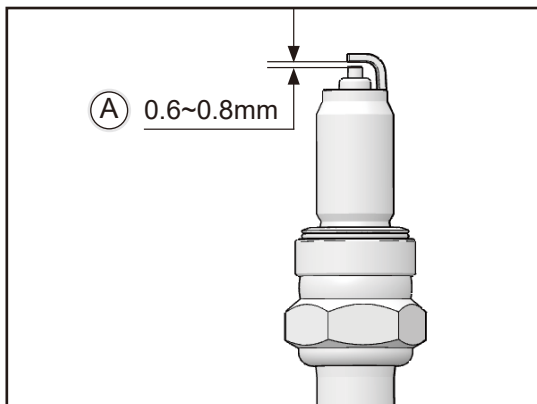
For fuel pump removal, refer to Chapter 5-Fuel Pump Removal/Installation.

## SPARK PLUG

The spark plug introduces the pulsed high voltage electricity generated by the ignition coil into the combustion chamber, and uses the electric spark generated by the electrode to ignite the mixture to complete the combustion. The spark plug sample diagram (see the figure below).

### ⚠ WARNING

If the spark plug gap (point **A** in the left picture) is outside the range of  $0.7\pm 0.1$ , it will lead to unreliable ignition or failure to ignite. Please adjust the gap or replace the spark plug in time



### REMOVING SPARK PLUGS

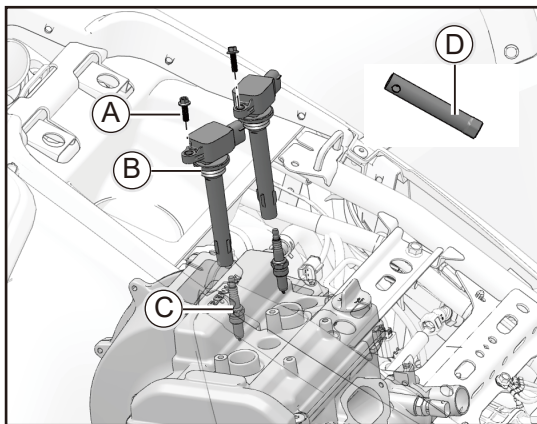
#### TIPS

It is suggested that all spark plugs should be replaced when replacing.

- 【A】 bolt
- B 【B】 ignition coil
- 【C】 spark plug
- 【D】 spark plug sleeve

The C spark plug is located under the seat cushion.

- ◆ Remove the seat cushion and the wind deflector at the bottom of the seat cushion;
- ◆ Remove the wind deflector at the bottom of the seat and seat cushion.
- ◆ Unplug the plug on the point coil, remove the ignition coil bolt, and pull out the ignition coil.
- ◆ Remove the spark plug with the spark plug sleeve.
- ◆ Take out the spark plug and check the status of the spark plug.
- ◆ If there is no problem, please replace the spark plug with a new one.



#### Spark plug torque

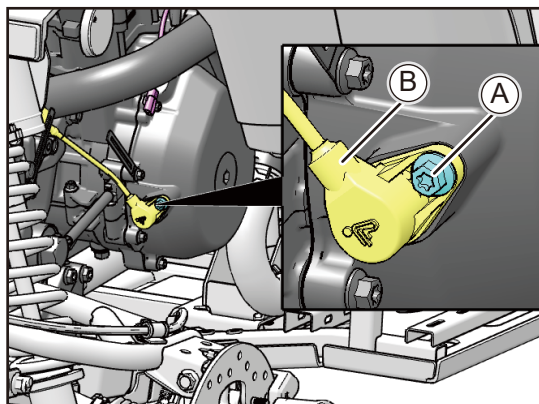
13 N·m

### ⚠ CAUTION

In the process of disassembly and installation, be careful not to hit the spark plug against any hard objects such as the engine block. If so, please replace with new spark plugs in time.

## ENGINE SPEED SENSOR

The working principle of the speed sensor is to use the magnetolectric effect. When the shaft rotates, the signal wheel is driven to rotate together, and the teeth on the signal wheel will cut the magnetic line of the sensor. This change in magnetic flux causes a certain frequency at both ends of the sensor coil. The output voltage is output to the electronic controller, and the output signal can represent the crankshaft speed and position (see A in the figure below).



### SPEED SENSOR REMOVAL

The speed sensor is located at the rear of the crankcase on the right side of the engine.

- ◆ To facilitate the removal of the speed sensor, the right rear body component of the vehicle may be removed first.
- ◆ Unplug the connector from the speed sensor.
- ◆ Remove the bolt **【A】**, and then take off the speed sensor.
- ◆ The installation steps are the reverse of the removal steps.

Speed Sensor Bolt Torque
10 N·m

### TECHNICAL PERFORMANCE TEST

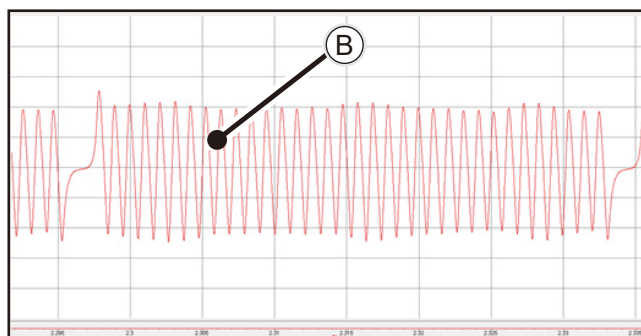
The speed sensor outputs a sinusoidal voltage signal, and the output signal (see **【B】** on the left)

**Coil resistance (23 °C) : 950±20 Ω**

**Coil inductance (1000HZ) : 450±15 mH**

### FAULT DIAGNOSIS

- ◆ When the engine cannot be started, the remaining fault points have been eliminated. Use a multimeter to test whether the coil resistance of the speed sensor is the resistance required by the technical performance.
- ◆ If the resistance value is normal, please use an oscilloscope to check whether the voltage signal output by the sensor is as shown in the figure (B in the left figure)

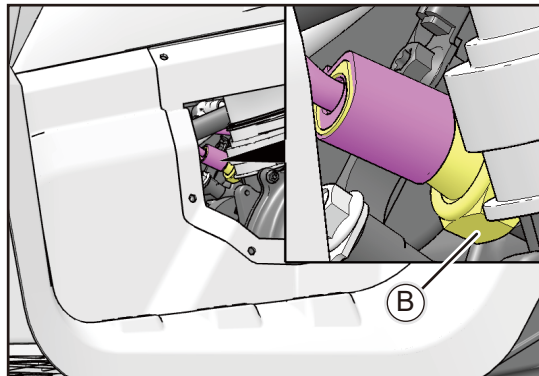
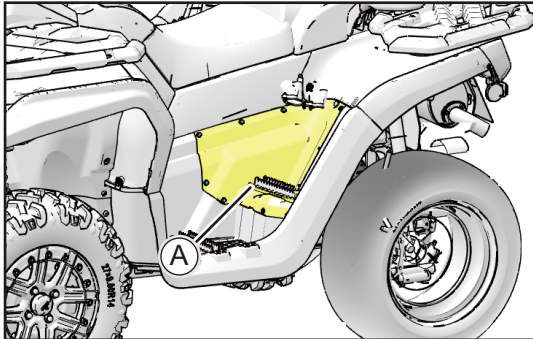


### ⚠ CAUTION

When the two pins of the sensor are connected reversely, the first gear signal after the missing gear in the output voltage signal is negative, which will cause the engine to be turbulent, idling unstable or unable to start.

## OIL PRESSURE SENSOR

The oil pressure sensor detects the size of the engine oil pressure when it is working, and it is usually screwed into the oil passage of the cylinder block. Its working principle is that there is a variable resistor inside the sensor, one end outputs the signal, and the other end is connected to the grounded sliding arm. When the oil pressure increases, the oil pressure pushes the diaphragm through the lubricating oil channel interface to bend, and the diaphragm pushes the sliding arm to a low resistance position, which increases the output current in the circuit, and vice versa, reduces the output current in the circuit. (See **【A】** in the figure below). The sensor is a normally open contact, the working pressure is  $250\pm 10\text{kPa}$ , and the maximum working temperature is greater than  $150^{\circ}\text{C}$ . When the oil pressure is too low, the oil pressure indicator on the instrument is always on.



### OIL PRESSURE SENSOR REMOVAL

The oil pressure sensor is located inside the CVT inspection cover.

- ◆ Remove the fastening bolts on the CVT inspection cover **【A】**, and then take off the cover.
- ◆ Unplug the connector from the oil pressure sensor **【B】**.
- ◆ Use a tool to remove the oil pressure sensor.
- ◆ The installation steps are the reverse of the removal steps.

#### Oil Pressure Sensor Torque

14 N·m

### FAULT DIAGNOSIS

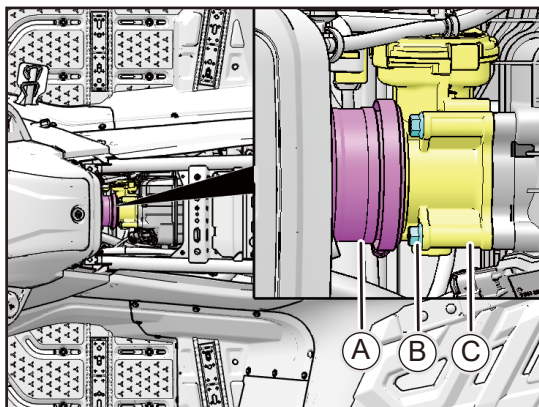
1. When there is no oil pressure indicator, it is generally because the wiring harness connector is poorly connected.
2. When the wiring harness connector is well connected, the sensor itself is faulty. It is recommended to replace the sensor with a new one.

### ⚠ WARNING

When an oil pressure failure occurs, you must troubleshoot the failure. Forcible operation will damage the engine.

## THROTTLE POSITION SENSOR AND THROTTLE ACTUATOR

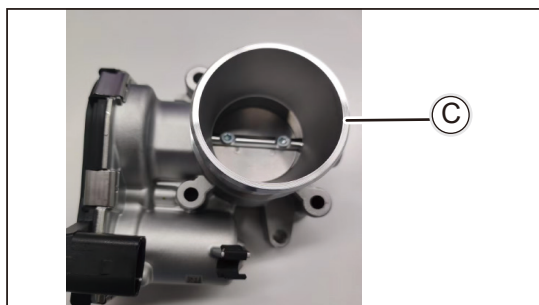
The throttle position sensor is a Hall sensor with a linear output. 5V is added to both ends of the sensor to create a Hall voltage output when the throttle is turned, similar to a corner potentiometer.



### DISMANTLING OF ELECTRONIC THROTTLE VALVE BODY

The electronic throttle valve body is located between the air filter and the pressure stabilizing chamber.

- ◆ Remove the seats.
- ◆ Loosen the clamp on the intake pipe of the pressure regulating chamber and pull out the intake pipe.
- ◆ Remove the four M6 hexagon flange bolts on the valve body.
- ◆ Unplug the plug on the valve body and remove the electronic throttle valve body.
- ◆ The installation steps are opposite to the removal steps.



Hexagon flange bolt M6 torque
10 N·m

### ⚠ CAUTION

After the electronic throttle body is installed, you must ensure that a throttle body self-learning is carried out. After the self-learning is completed, start the vehicle and observe whether it works properly.

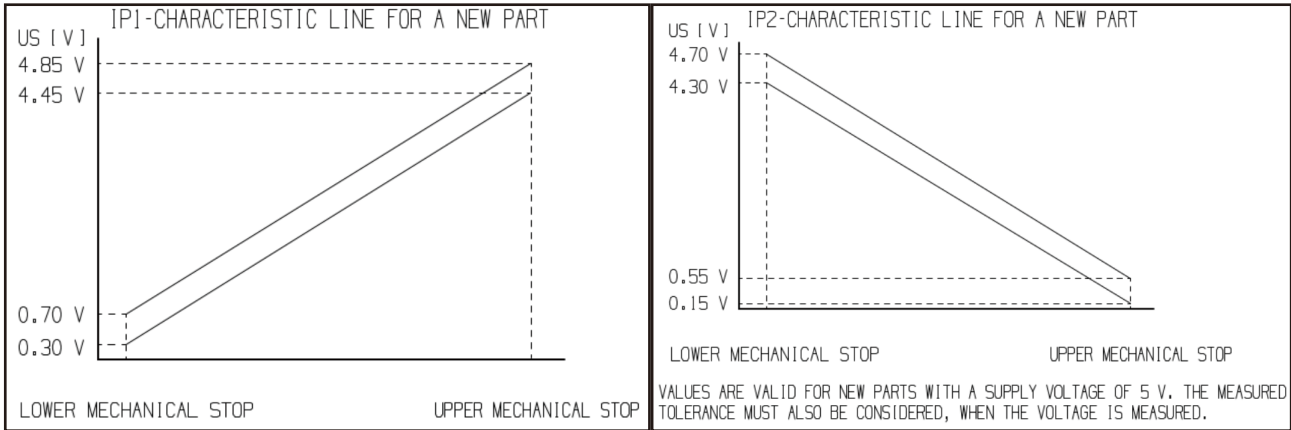
### DISASSEMBLY REQUIREMENTS

- ◆ It is strictly prohibited to disassemble the electrically charged electronic throttle body;
- ◆ Do not disassemble the electronic throttle body until the vehicle has cooled to room temperature to prevent the overheated antifreeze from wetting the black cover plate and connectors;
- ◆ During disassembly, remove the mounting bolts diagonally and evenly, without damaging the upper and lower mounting surfaces, and make sure that the electronic throttle body is not dropped or hit.
- ◆ Make sure that the electronic throttle body is not dropped or hit;
- ◆ The force of the reset spring inside the electronic throttle body is large, so be careful to pinch your hand when gently pushing the valve plate.

### ⚠ WARNING

Impact with the electronic throttle body is prohibited during repair, and use of the electronic throttle body is prohibited after it has been dropped.

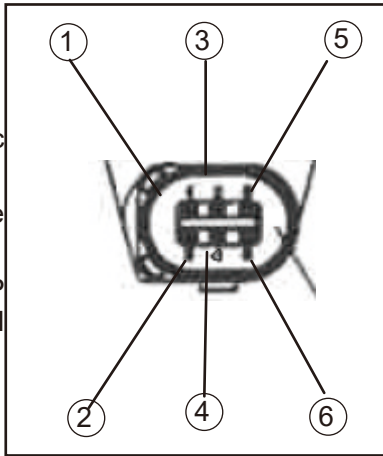
THROTTLE POSITION SENSOR PERFORMANCE CHARACTERISTICS



Throttle Position Sensor	
Linearity	See left picture
Working Temperature	-30°C--+110°C

THROTTLE ACTUATOR (DC MOTOR) TECHNICAL PERFORMANCE PARAMETERS

- Nominal value of resistance between motor PIN pins on electronic throttle body connector (room temperature)  $R = 1.4\Omega \pm 0.3\Omega$
- Inductance  $L = 1.1 \pm 0.1$  mH at 1kHz (room temperature) 3、 Allowable force in the opposite direction of operation: < 200 N.
- Maximum continuous power loss at ambient temperature  $T = 100^\circ\text{C}$   $P = 8$  W  
Maximum permissible reversal current  $I \leq 10$  A when reversed
- Minimum working voltage: 8V
- Rated operating voltage: 12V
- Overload working voltage: 17V



The throttle actuator and sensor are mounted on the throttle valve body (see left at B) with pin definitions:

- |                               |                        |                    |
|-------------------------------|------------------------|--------------------|
| 1: Throttle position signal 1 | 2: sensor power supply | 3: actuator motor+ |
| 4: Throttle position signal 2 | 5: actuator motor -    | 6: sensor ground   |

TROUBLESHOOTING

The ECU monitors various sensors and actuators as well as power amplifier circuits and detection circuits, and when there is a malfunction in the throttle position signal, the engine may not be able to start or may be difficult to start, and the commonly used malfunction codes are listed in the "Malfunction Codes Summary Table":

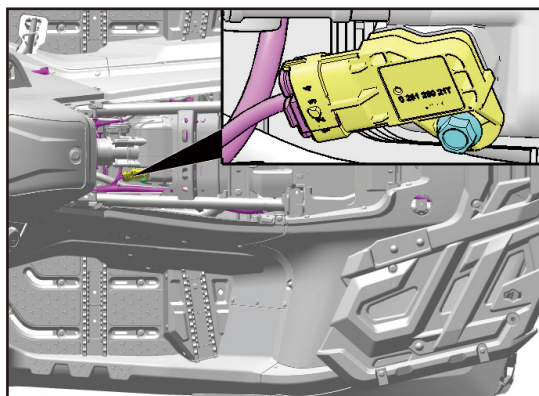
Throttle position sensor and actuator fault check:

- ◆ Check that the connectors are well connected.
- ◆ Check whether the wiring harness and sensor pins are bent and deformed;
- ◆ Check that each pin is energized and disconnected (see left for pin definitions);
- ◆ Check if the power supply voltage of pin 2 sensor is 5V;
- ◆ Check if the voltage of pin 3 is 12V;

## INTAKE AIR PRESSURE TEMPERATURE SENSOR

The core of the intake air temperature sensor is a thermistor that responds quickly to temperature.

The intake pressure sensor is connected with the main channel of the throttle body through the air pressure channel on the throttle body to detect the absolute pressure of the intake air. When the pressure in the main channel changes, the output voltage of the pressure chip will also change accordingly. Through the correspondence between the output voltage and the absolute pressure of the main channel, the ECU can obtain the absolute pressure value of the main channel at this time.



### INTAKE PRESSURE TEMPERATURE SENSOR REMOVAL

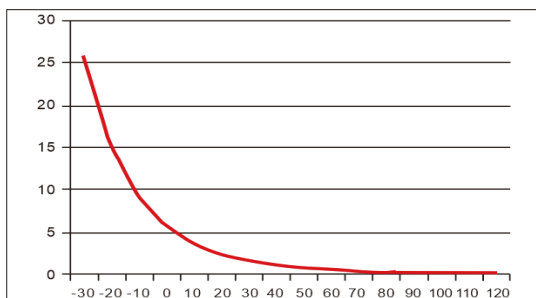
The intake air pressure temperature sensor is located between the air filter and the surge chamber.

- ◆ Remove the seat.
- ◆ Unplug the plug on the valve body.
- ◆ Remove the bolt on the intake pressure and temperature sensor.
- ◆ Remove the intake pressure and temperature sensor.
- ◆ The installation steps are opposite to the removal steps.

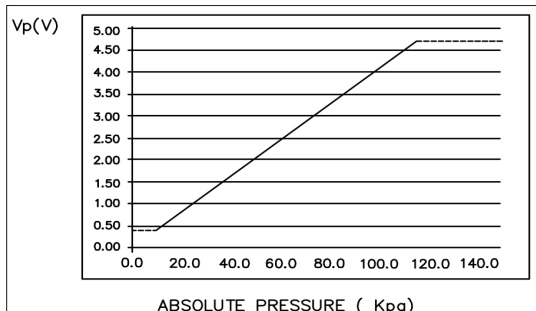
Bolt torque
10 N·m

### ⚠ CAUTION

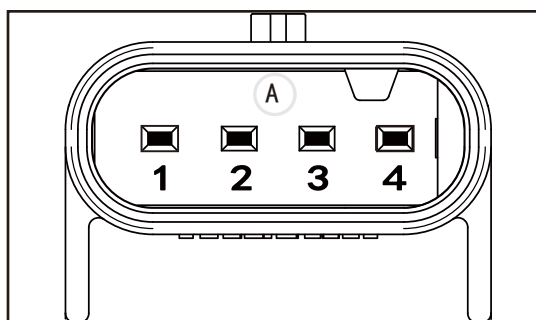
When disassembling and assembling the intake pressure and temperature sensor, ensure that there is no condensed water on the pressure sensitive element. It is forbidden to use high-pressure gas to impact the vacuum element during maintenance.



Intake temperature sensor	
R25	2kΩ±3%
B25/85	3520k±2%
Temperature-resistance characteristics	See the left picture



Intake pressure sensor	
Change sensitivity	40.5mv/kPa
Output voltage characteristic	See the left picture

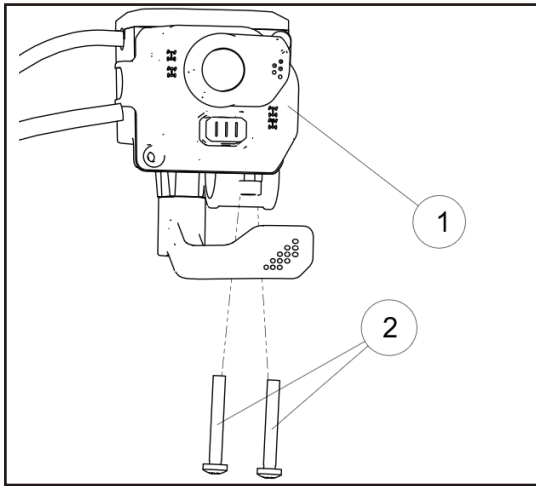


The intake air pressure and temperature sensor includes: intake air pressure and intake air temperature sensor. See the left figure 【A】 for the pin diagram.

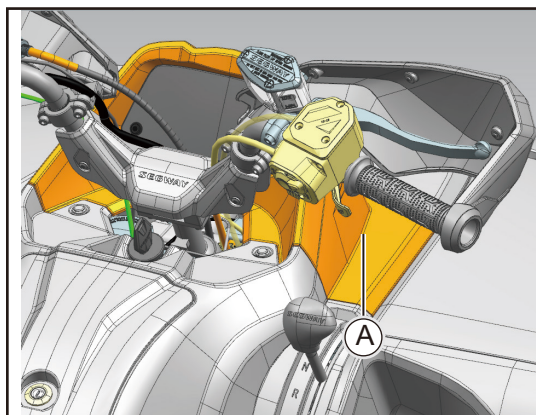
- 1: Sensor ground; GROUND
- 2: Thermistor; NTC
- 3: supply voltage 5V; SUPPLY VOLTAGE
- 4: Intake pressure signal output; OUTPUT SIGNAL

## ELECTRONIC THROTTLE

## ELECTRONIC THROTTLE HANDLE-REMOVAL



- ◆ Remove the grip (see Chapter 12 Removal and Installation Steps of Direction Handle for details)
- ◆ Loosen the 2 screws at the bottom of the right hand switch 【2】 .
- ◆ Remove the right hand switch 【1】 .



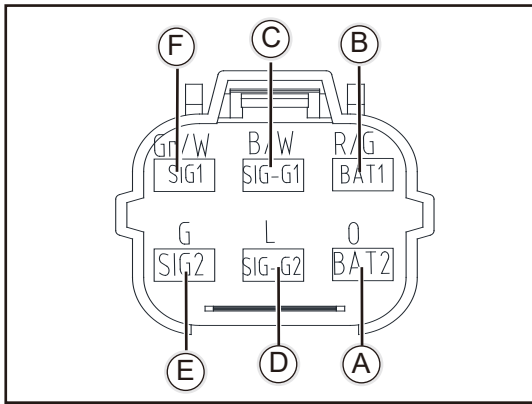
- ◆ Remove the instrument cover [A] (see Chapter 13 for the disassembly steps of the instrument cover), and disconnect the harness connector.

## REFIT ELECTRONIC THROTTLE HANDLE

The removal procedure is reversed.

**⚠ WARNING**

The electronic throttle handle must be installed and fixed as specified. It is not allowed to hit its parts, and it is not allowed to disassemble the shell and any internal parts.



### PIN DEFINITION OF ELECTRONIC ACCELERATOR HANDLE CONNECTOR:

- 【A】 : 5V power supply of throttle 2
- 【B】 : 5V power supply of throttle 1
- 【C】 : Throttle 1 ground wire
- 【D】 : Throttle 2 ground wire
- 【E】 : Throttle signal 2
- 【F】 : Throttle signal 1

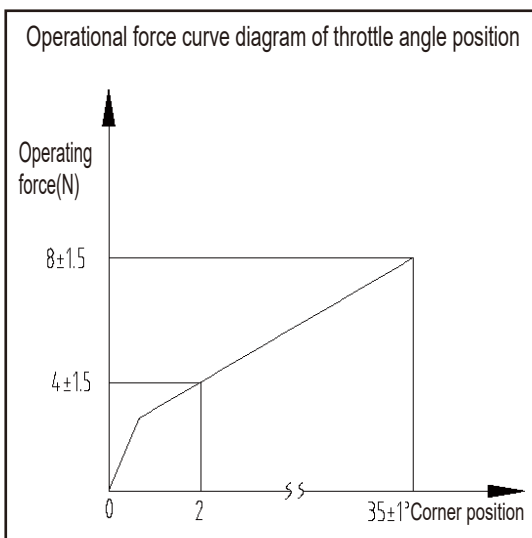
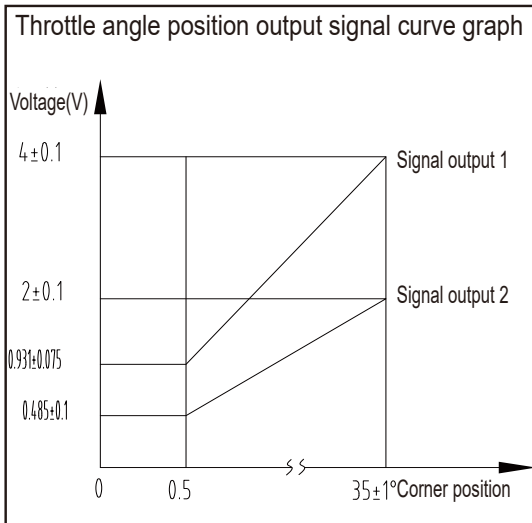
### TECHNICAL PERFORMANCE PARAMETERS

1. 1. Input voltage:  $5 \pm 0.5V$ , working current:  $\leq 30mA$ .
2. 2. Linearity:  $\%2V_{cc}$  (room temperature),  $\%3V_{cc}$  (high temperature),
3. 3. Signal 1 ground disconnect, signal 1 output voltage  $5 \pm 0.15V$ ,
4. 4. Signal 2 ground disconnect, signal 2 output voltage  $5 \pm 0.15V$ ,
5. 5. Electronic accelerator pedal electric-displacement characteristics (see the left figure at A)

Working conditions:

Allowable working temperature:  $-40^{\circ}C \sim +85^{\circ}C$ . Storage conditions: dust-free.

Temperature:  $-30^{\circ}C \sim +60^{\circ}C$



### TROUBLESHOOTING

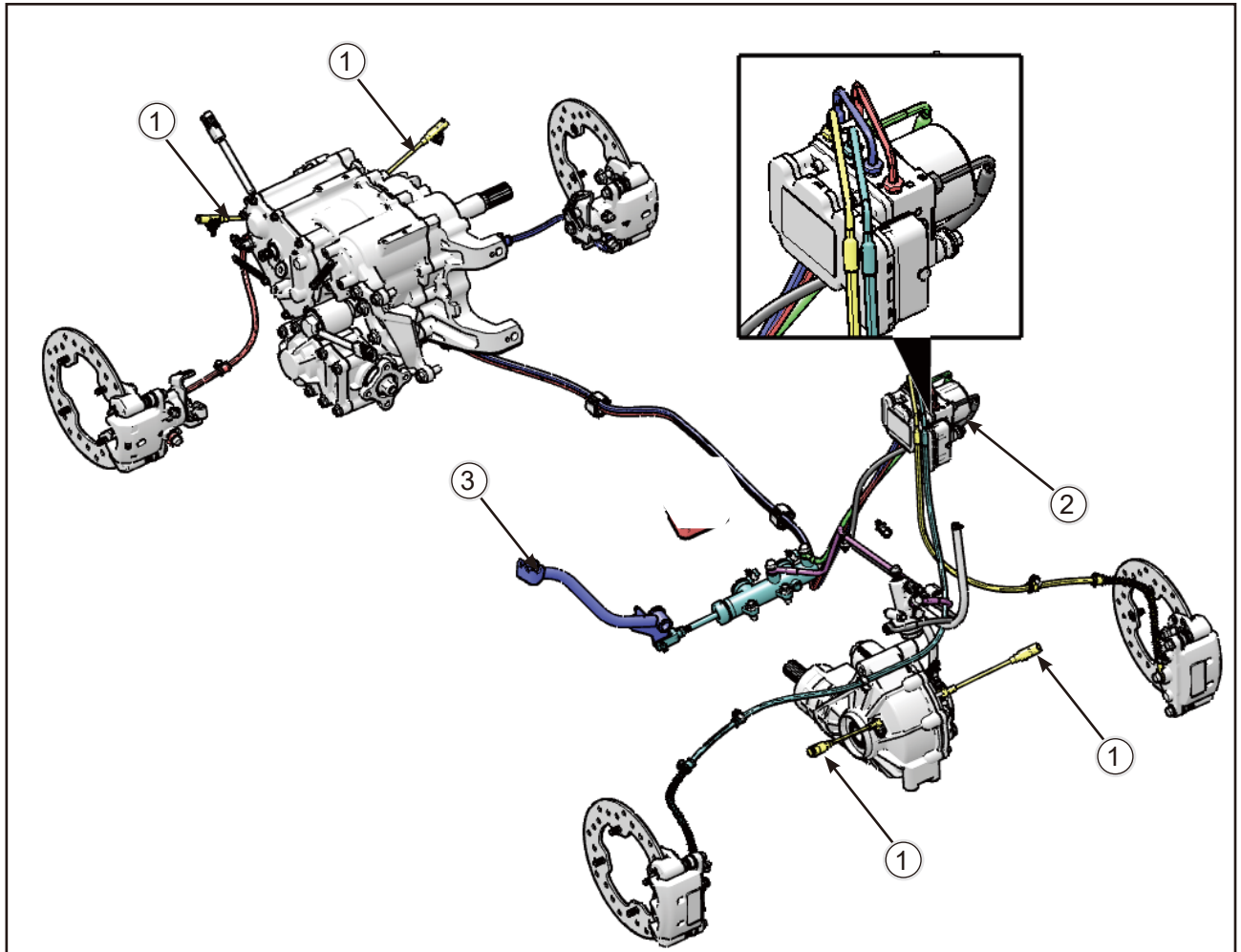
ECU monitors various sensors, actuators, and power amplifier circuits and detection circuits, and when there is a malfunction in the electronic gas pedal, the vehicle may have phenomena such as inability to accelerate, abnormal engine speed, etc. The commonly used malfunction codes are shown in the malfunction summary table:

Electronic gas pedal fault check:

- ◆ Check that the connectors are well connected.
- ◆ Check whether the wiring harness and gas pedal pins are bent or deformed.
- ◆ Measure the voltage of pin C and pin F.
- ◆ Measure the voltage of pin C and pin E.
- ◆ Measure the voltage of pin E and pin D.
- ◆ Measure the voltage of pin C, pin F
- ◆ Measure the voltage of pin E, pin D
- ◆ Measure the on-off of all pins of the wiring harness

**ABS SYSTEM (APPLICABLE TO ABS MODELS)****FUNCTION DESCRIPTION**

The main function of ABS (Anti-lock Braking System) is to prevent the wheels from locking up during emergency braking, so as to maintain the stability and control of the vehicle. During emergency braking, ABS can automatically adjust the braking force of the brakes to keep the wheels in a rolling and sliding state, ensuring that the adhesion between the wheels and the ground is at its maximum value, thus improving braking effect and driving safety.

**ABS SYSTEM PARTS**

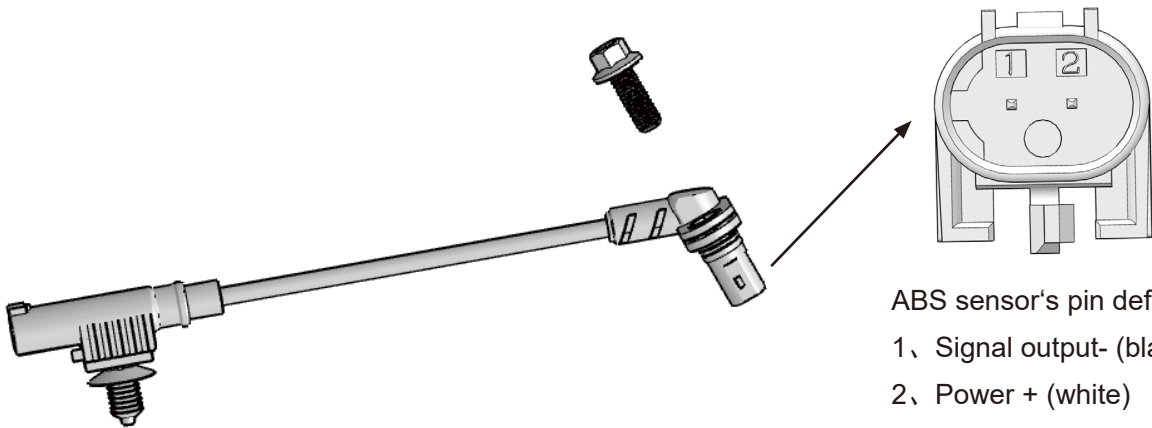
1、 ABS Sensor

2、 ABS Control Unit

3、 Brake Pedal

### ABS SENSOR

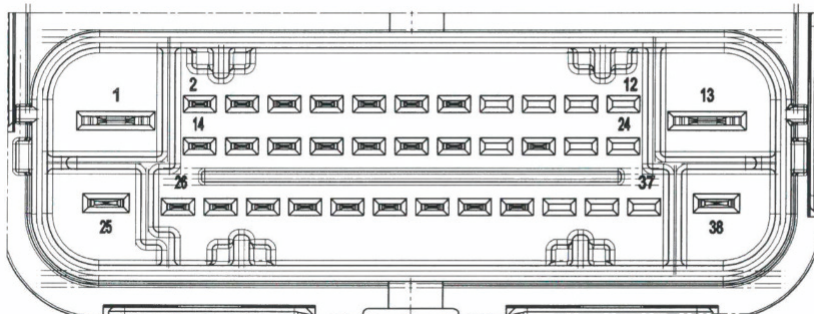
The vehicle is equipped with four ABS sensors, two of which are located on the left and right sides of the front axle gearbox, and the other two are located on the left and right sides of the rear axle gearbox. The ABS sensors can be replaced if they fail.



ABS sensor's pin definition:

- 1、 Signal output- (black)
- 2、 Power + (white)

### ELECTRONIC CONTROL UNIT

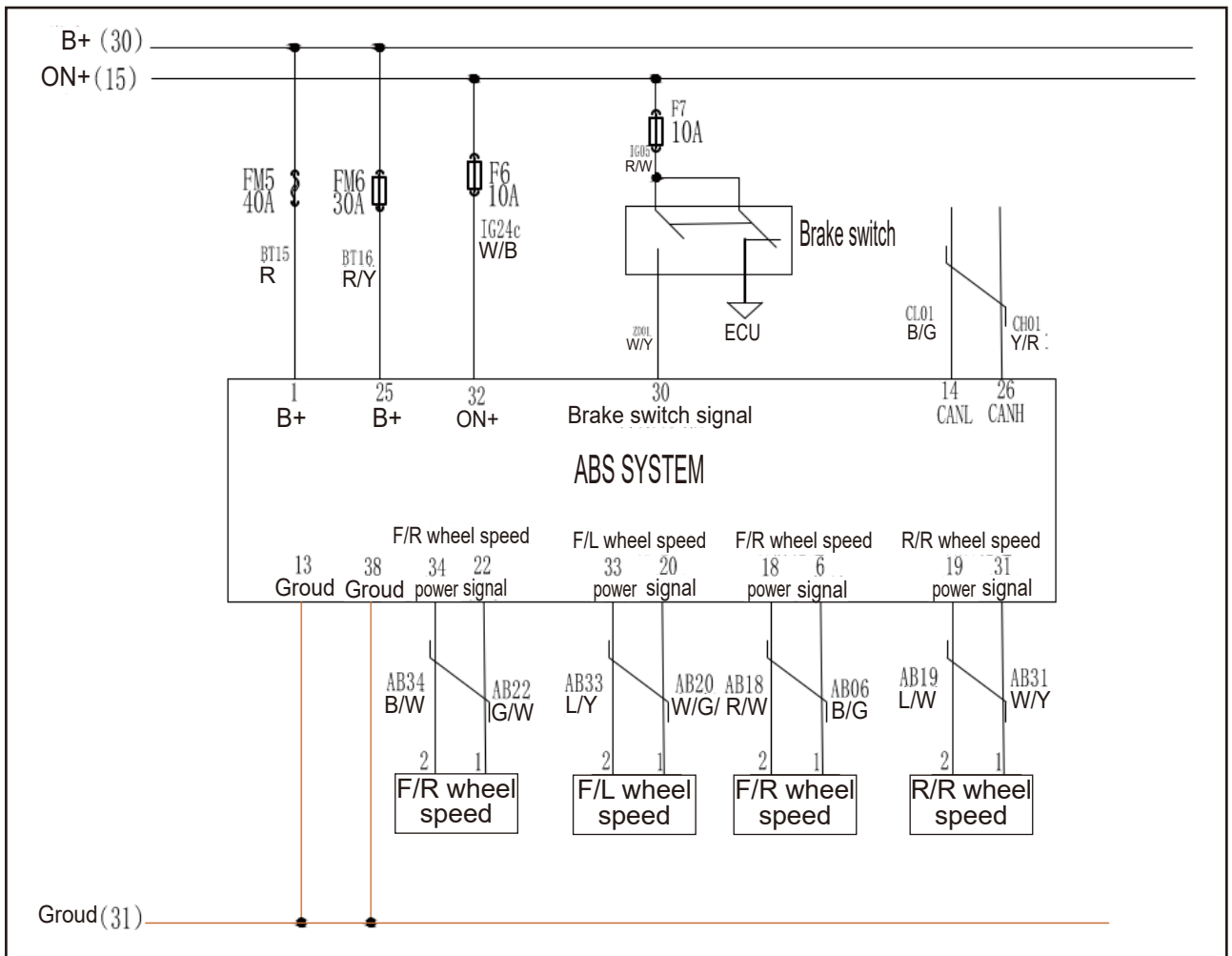


38-Pin Pin Definition			
1	Motor power supply	25	Valve relay sense power end (positive)
2	FR wheel speed signal output	26	High-level CAN bus
4	Active ABS	27	VSO
6	Wheel speed sensor signal end (FR)	28	EBD warning light
13	Motor Ground	30	Brake switch
14	Low-level CAN bus	31	Wheel speed sensor signal end (RR)
17	Diagnostic K-Line	32	ECU power end (ignition power cable)
18	Wheel speed sensor power end/ground (FR)	33	Wheel speed sensor power end/ground (RL)
19	Wheel speed sensor power end/ground (RR)	34	Wheel speed sensor power end/ground (FL)
20	Wheel speed sensor signal end (RL)	38	ECU Ground
22	Wheel speed sensor signal end (FL)		

### ABS SYSTEM WORKING PRINCIPLE DIAGRAM

ABS works by monitoring the speed signal of each wheel through the wheel speed sensor (ABS sensor), which quickly determines the state of wheel lock-up. When it detects that a wheel is about to lock up, ABS quickly adjusts the braking pressure to prevent the wheel from locking up completely. In this way, ABS is able to maintain the optimum wheel slip rate (approx. 20%) during emergency braking, thereby maximising braking effect and reducing brake consumption, extending the service life of brake components.

In addition, ABS has the advantage of improving braking efficiency, enhancing vehicle stability and strengthening driving safety. By intelligently regulating the braking pressure on the wheels, ABS makes more efficient use of braking force, optimises energy recovery and reduces the risk of loss of control due to tyre lock-up.



## ABS FAULT DIAGNOSIS CODE

Fault code	Explanation (UAES)
A0001	ECU Voltage:too high
A0002	ECU Voltage:too low
A0003	"Wheel-speed sensor, front left: Signal Line short to GND/Open; Supply Line open"
A0004	Wheel-speed sensor, front left: (signal failure) out of range, jitter, Intermittent
A0005	Wheel-speed sensor, front left:No signal
A0006	"Wheel-speed sensor, front right: Signal Line short to GND/Open; Supply Line open"
A0007	Wheel-speed sensor, front right: (signal failure) out of range, jitter, Intermittent
A0008	Wheel-speed sensor, front right: No signal from wheel speed sensor
A0009	"Wheel-speed sensor, rear left: Signal Line short to GND/Open; Supply Line open"
A0010	Wheel-speed sensor, rear left: (signal failure) out of range, jitter, Intermittent
A0011	Wheel-speed sensor, rear left: No signal from wheel speed sensor
A0012	"Wheel-speed sensor, rear right: Signal Line short to GND/Open; Supply Line open"
A0013	Wheel-speed sensor, rear right: (signal failure) out of range, jitter, Intermittent
A0014	Wheel-speed sensor, rear right: No signal from wheel speed sensor
A0015	Wheel-speed sensor generic error (General error of wheel speed sensor (frequency error, gear number error, tire error)
A0016	Valve relay error
A0017	valve fault, inlet valve FL
A0018	valve fault, outlet valve FL
A0019	valve fault, inlet valve FR
A0020	valve fault, outlet valve FR
A0021	valve fault, inlet valve RL
A0022	valve fault, outlet valve RL
A0023	valve fault, inlet valve RR
A0024	valve fault, outlet valve RR
A0025	valve fault(overheating,overcurrent,short circuit,signal error,hadware error)
A0026	Motor error
A0027	Motor relay error
A0028	ECU error (hardware error)
A0029	CAN hardware error
A0030	CAN Bus Off error
A0031	ABS control anomalies failure
A0032	CAN Bus Off error

## DISPLAY AND HUMAN-COMPUTER INTERACTION

### DASHBOARD

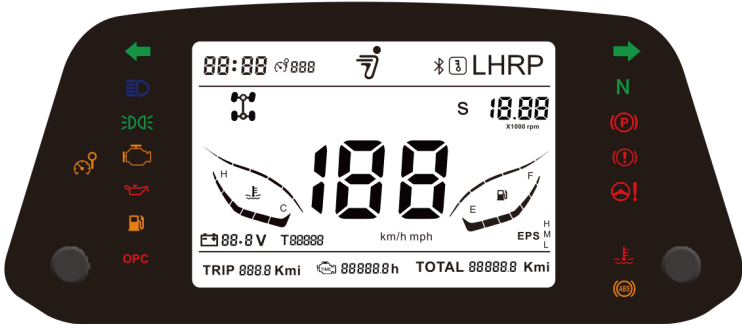
The dashboard displays key information to the user.

See the next page for display functions and instructions

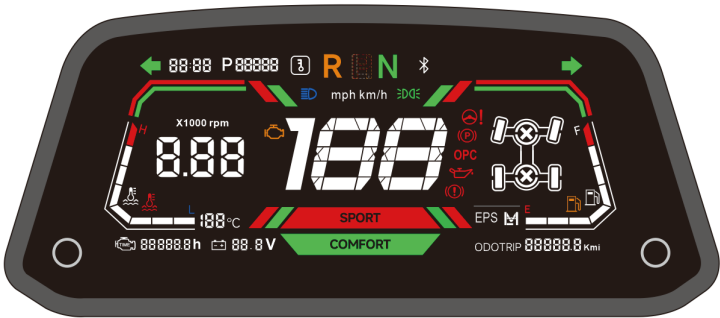
**⚠ WARNING**

Using a high-pressure water gun may damage the dashboard. You should use your hands or hoses to clean the vehicle with neutral soap. Do not use alcohol or corrosive cleaning agents, such as insect repellents, to clean the dashboard.

MODEL 1:















MODEL 2:



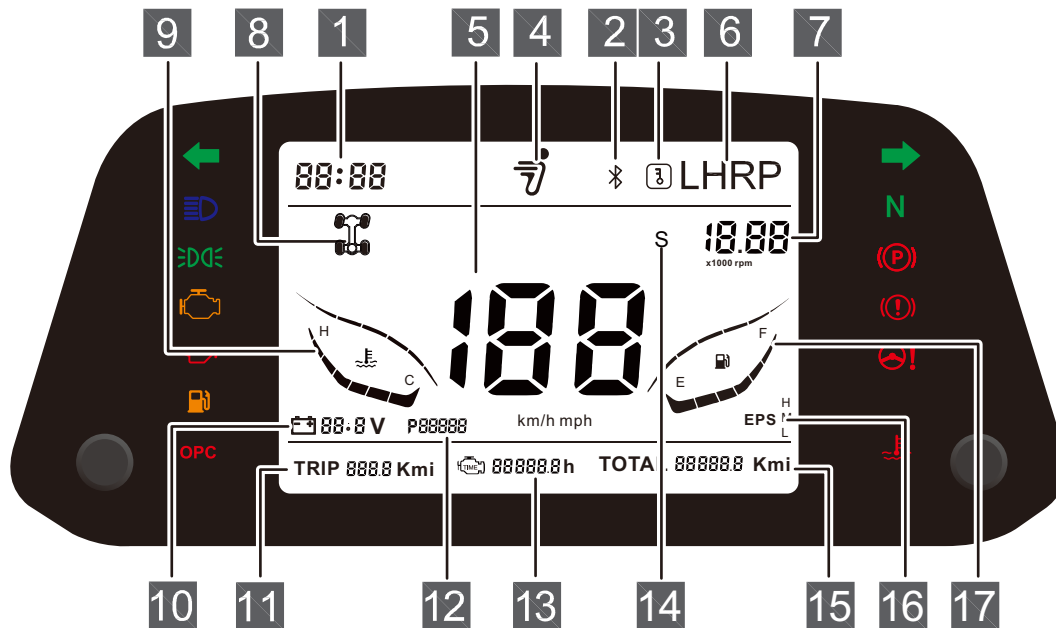
### DASHBOARD INDICATOR LIGHT DESCRIPTION

Item	Icon	Function description	Fault phenomenon	Analysis of cause and trouble shooting
Left turning		This indicator will be on when turn on the left turning light	This indicator not on when the left turning light is on	Check whether PIN 29 has high level input, if yes, replace the meter, if not, check the relevant electric line
High beam		This indicator will be on when turn on the high beam	This indicator not on when high beam is on	Check whether PIN 30 has high level input, if yes, replace the meter, if not, check the relevant electric line
Position indicator		This indicator will be on when front light, tail light, license plate light, dashboard light are on	This indicator not on when position light is on	Check whether PIN31 has high level input, if yes, replace the meter, if not, check the relevant electric line







Fault indicator		When the fault indicator light is on, it indicates that the following systems have faults: Emission control system; Engine electronic control system;	—	—
Right turning light indicator		This indicator will be on when right turning light is on	This indicator not on when right turning light is on	Check if PIN12 has high level input, if so ,replace the meter, if No. check the related wiring
'N' gear indicator		Shift lever in 'N' gear	Shift lever in 'N' gear and the indicator not on	Check if PIN11 has low level input, if so, replace the meter, if No, check the related wiring, whether the wiring harness is loose or broken
Parking indicator		The indicator will be on when the parking switch is applied	The indicator not on when the parking switch is applied	Check if PIN10 has low level input, if so, replace the meter, if No, check the related wiring, whether the wiring harness is loose or broken
Brake system alarming		<ul style="list-style-type: none"> <li>• Brake fluid level too low</li> <li>• Brake system have fault</li> </ul>	—	—
Electric steering system alarming		EPS have fault (optional)	—	—
Parking indicator		The indicator will be on when the parking switch is applied	The indicator not on when the parking switch is applied	Check if PIN10 has low level input, if so, replace the meter, if No, check the related wiring, whether the wiring harness is loose or broken
Brake system alarming		<ul style="list-style-type: none"> <li>• Brake fluid level too low</li> <li>• Brake system have fault</li> </ul>	—	—
Electric steering system alarming		EPS have fault (optional)	—	—

<p>Speed limit alarm Indicator</p>		<p>In the speed limit mode, when the driving speed is greater than the set speed limit, the speed limit indicator (yellow) flashes and the buzzer alarms at the same time, and the alarm is lifted when the driving speed is <math>\leq 100</math> km/h.</p>	<p>—</p>	<p>—</p>
<p>“ABS” Alarm light</p>		<p>The following system have fault</p> <ul style="list-style-type: none"> <li>•ABS ;</li> <li>• Brake auxiliary system (optional)</li> </ul>	<p>—</p>	<p>Check the level of the coolant and the leakage of the coolant</p>
<p>Coolant high temperature indicator</p>		<p>This indicator show the high temperature of the engine coolant. stop the engine immediately when the indicator on</p>	<p>—</p>	<p>—</p>

## INSTRUMENT INFORMATION DISPLAY

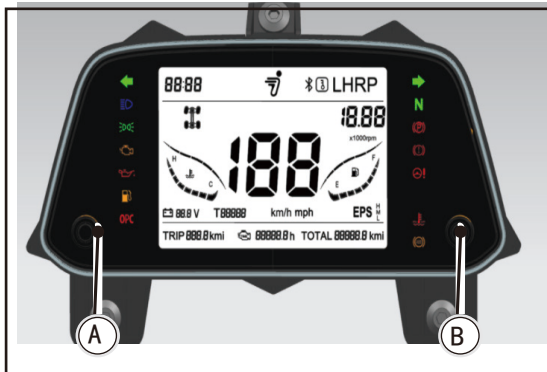


NO.	Area	function description	Fault	Toubleshouting
1	Time display	Showing current time	—	—
2	Bluetooth	When mobile Buuetooth and T-BOX are connected successfully and the light will be on.	Power on remotely by Bluetooth, this icon not lights up	Check dashboard CAN-H,CAN-L wire harness, if not solve it , replace TBOX if still no replace dashboard
3	Power on remotely	When power on the ATV, the APP in the mobile phone, Click the remote power on button and the light will be on. (The premise is that T-BOX networking is successful)	Power on remotely by APP, this icon not lights up	Check dashboard CAN-H,CAN-L wire harness, if not solve it, replace TBOX if still not,replace dashboard
4	Company logo	This icon light up when vehicle on power	—	—
5	Vehicle speed display	Display actual vehicle speed	Display wrong speed or no display	Check PIN4 loose check vehicle speed sensor, replace meter or speed sensor
6	Gear display	Display the correctly gear L -Low speed H -High speed R -Reverse P -Parking	No gear display	Check gear position sensor and related electric line

7	RPM	Display actual engine speed	No engine speed display	Check CNA-H,CAN-L Wire harness, check ECU, and crankshaft position
8	Four-wheel drive full differential lock	 2 x 4 patterns  4 x 4 patterns  4x4 locking mode  2 x 4 patterns(With differential)  4 x 4 patterns(With differential)  4x4 locking mode(With differential)	—	—
9	Coolant temperature indicator	Displays current coolant temperature <b>H</b> -High temperature <b>C</b> -Low temperature	No coolant temperature display	Check CNA-H,CAN-L wire harness check ECU
10	Accumulator voltage	Displays the current voltage of the vehicle battery	—	—
11	Subtotal mileage	Single trip mileage	—	—
12	Fault code display	Fault code will display when ECU、EPS、T-BOX Fails	—	—
13	Engine operation time	Display engine operation time	Display wrong engine operation time	Check if display engine operation time ,if yes, replace meter, if no ,check as the procedure of inspection engine speed
14	Mode display	When the vehicle is in sport mode, "S" lights up at this time		
15	Total mileage	Displays the total mileage accumulated by the vehicle	—	—
16	EPS On	EPS mode was set in the APP and the preferred mode of the rider was selected: M -Normal mode, power normal H -Comfort mode, power light L -Motion mode, booster weight	E P S model no display	Check CNA-H, CAN-L Wire harness Check EPS Check TBOX

17	Fuel meter	Displays the current amount of fuel	No display of the fuel mass	Check CNA-H, CAN-L Wire harness Check fuel level sensor Check TBOX
18	Speed limit setting icon	The instrument displays the speed limit icon when the speed limit is on, but not when it is off		

DASHBOARD BUTTON FUNCTION INTRODUCTION



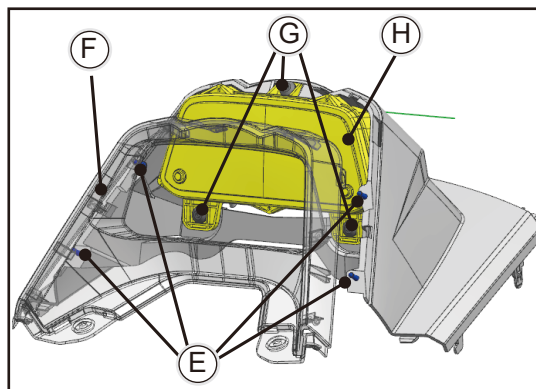
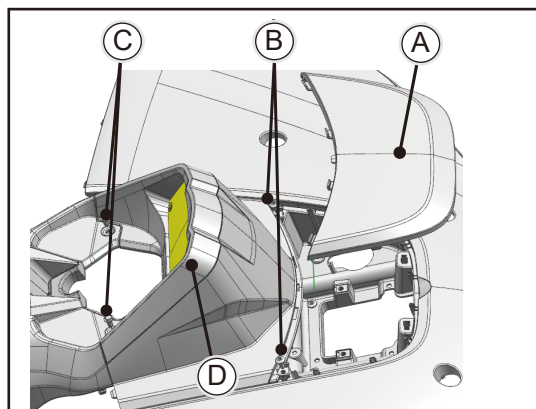
Function	A button	B button	Display
Brightness adjustment	Short press		Adjust backlight brightness (default: brightest)
Subtotal Clear	Long press		Zero subtotal mileage
EPS gear switching		Short press	EPS level shift signal sent
Metric or imperial units		Long press	Metric or imperial units switching
Clock settings	Long press	Long press	Clock hour flashing
	Short press		Hour+1
		Long press	Hour continuous+1
	Short press		Clock minute flashing
		Short press	Minute+1
		Long press	Minute continuous +1

- ◆ Zeroing total mileage: under power off condition, press and hold button A and B at the same time, then turn on the key and power on, the interface "CCC--" will appear, adjust by button: short press left button to shift, short press right button to adjust the current position. After adjusting "CCC--" to 226, zero the mileage, the condition of zeroing the mileage is within 200KM and the number of times of zeroing the mileage is less than 3 times.

DASHBOARD DISASSEMBLY AND ASSEMBLY

**⚠ CAUTION**

Before removing the meter, be sure to power off the vehicle.



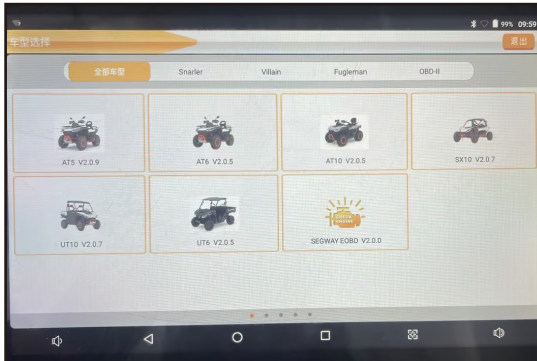
- ◆ Remove the front access cover assembly **【A】**
- ◆ Remove two fixed large pan head hexagon socket head bolts M6 \* 16 **【B】**
- ◆ Remove two expansion buckle assemblies **【C】**
- ◆ Take out the instrument sub-assembly component **【D】** and turn it over to a certain angle before pulling out the instrument plug-in
- ◆ Turn the instrument sub-assembly assembly **【D】** to the back and remove the four cross recessed pan head self-tapping screws ST4.8 × 1 **【E】**
- ◆ Take out the instrument cover **【F】**
- ◆ Remove 3 large pan head hexagon socket head bolts M6 \* 16 **【G】**
- ◆ Remove the instrument and replace it with a new instrument **【H】**
- ◆ The installation steps of the new instrument are opposite to the removal steps

### REPLACE INSTRUMENT CONFIGURATION (FOR MODEL 2 ONLY: NEGATIVE DISPLAY INSTRUMENT)

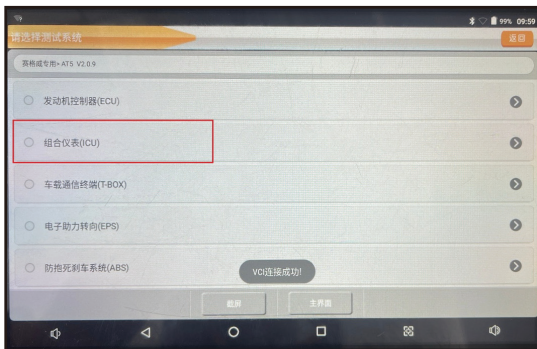
#### TIPS

If a new Negative Display Instrument is to be replaced for the vehicle, the following configuration operations must be performed with a diagnostic tool.

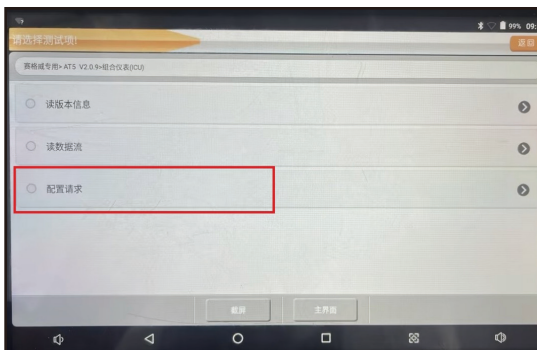
1、Open the main page of the diagnostic tool and select the current vehicle model.



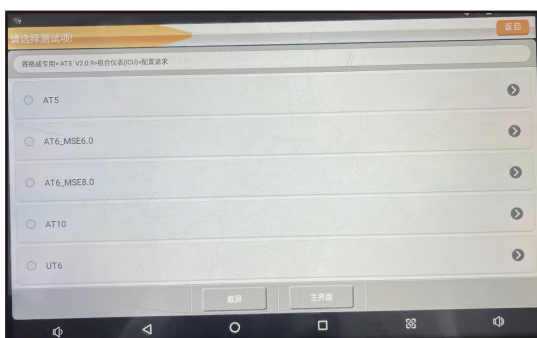
2、Select the component part Combination Instrument (ICU)

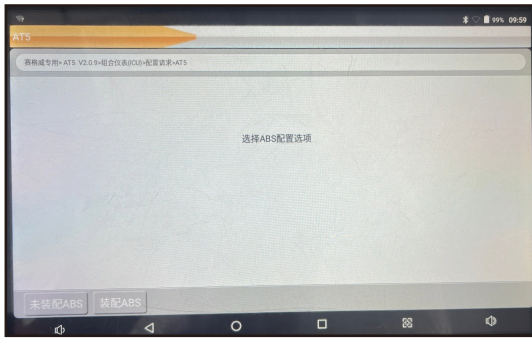


3、Select the function Configuration Request

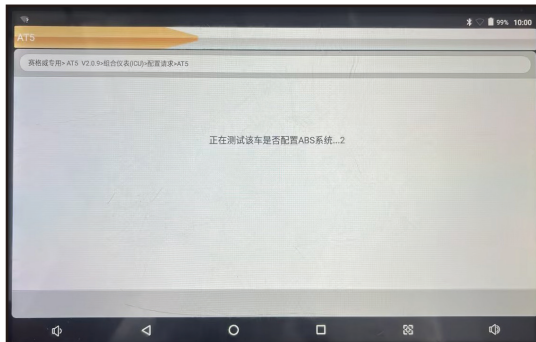


4、Select the currently configured vehicle model.

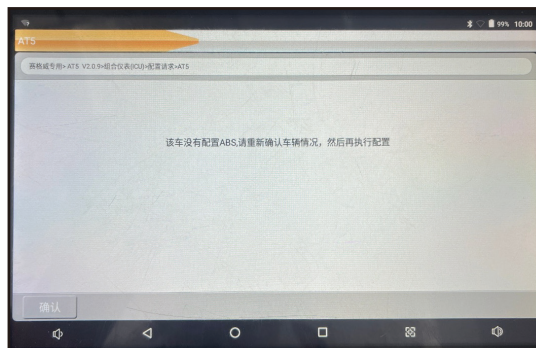




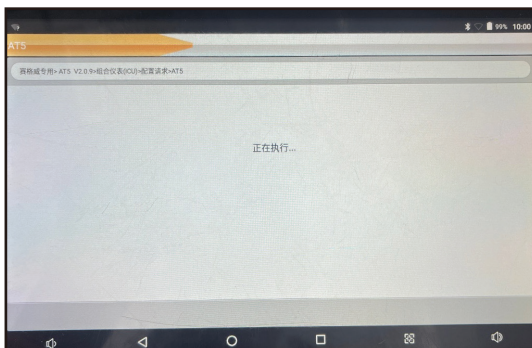
5、 Select whether to equip with ABS.



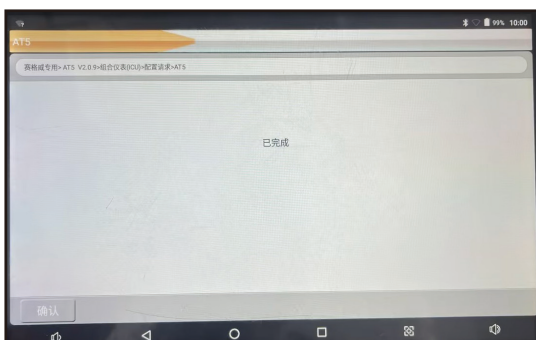
6、 After the selection is completed, the system will self-check the ABS equip status.



7、 If a manual selection error or system verification failure occurs (e.g., ABS is selected to be equipped but fails to power on and operate, or ABS is selected not to be equipped but the system detects the vehicle is fitted with ABS), the system will prompt for reconfirmation. Click OK to return to Step 4.

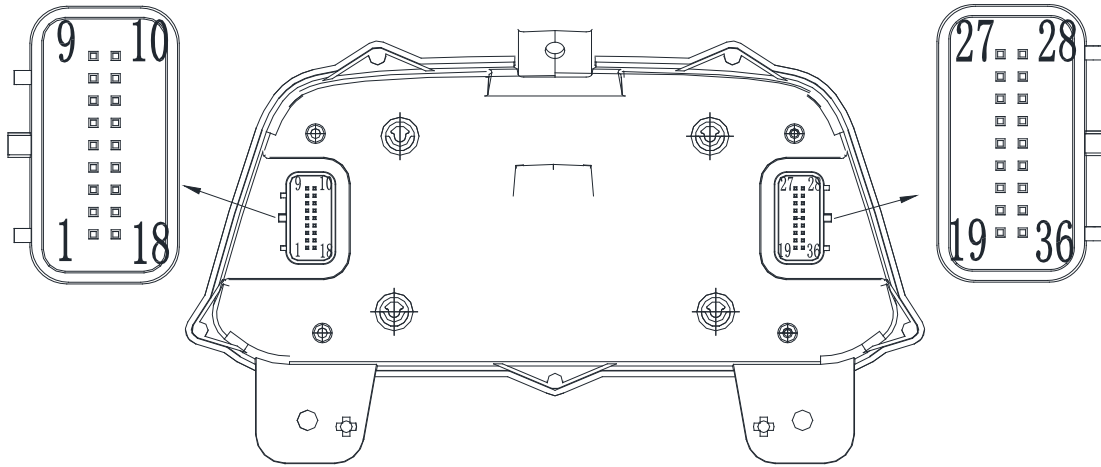


8、 If the system self-checks with no errors, the configuration process will start.



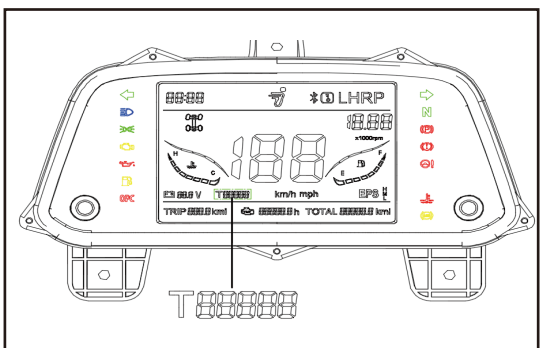
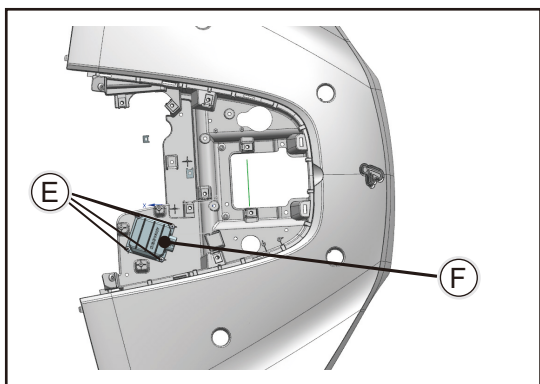
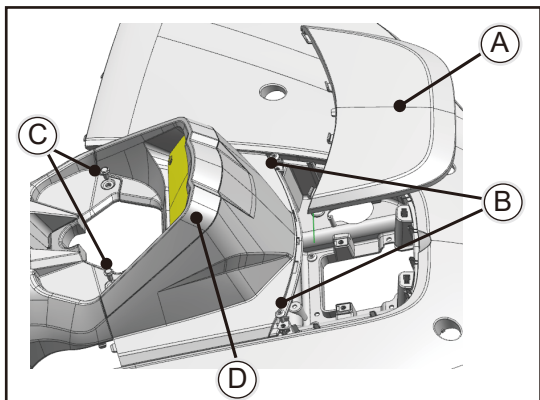
9、 Tyre Specification Configuration: Select the tyre specification to perform configuration.

10、 Configuration completed.



pin	Description	note	pin	Description	note
1	CAN-L	—	19	Brake failure alarm	Low voltage
2	CAN-H	—	20	4WD lock signal	—
3	Sensor power	—	21	4WD signal	—
4	Vehicle speed	Pulse signal	22	Off cushion switch	Low voltage
5	Power ground	—	23	Oil pressure	Low voltage
6	—	—	24	R gear	Low voltage
7	—	—	25	P gear	Low voltage
8	Fuel signal	Resistance signal	26	H gear	Low voltage
9	Fuel ground	—	27	L gear	Low voltage
10	Parking signal	Low voltage	28	2WD signal	—
11	N gear	Low voltage	29	Left turning light	High voltage
12	Right turning light	Low voltage	30	High beam	High voltage
13	ABS light (reserved)	Low voltage (reserved)	31	Position light	High voltage
14	B+	—	32	Engine Fault	Low voltage
15	Power ground	—	33	—	—
16	—	—	34	Power ground	—
17	Key power	—	35	Buzzer output	—
18	—	—	36	Rear axle differential lock	—

**T-BOX**



**AT-BOX REMOVAL**

**⚠ CAUTION**

If multiple vehicles are repaired at the same time, do not replace and install the TBOX.

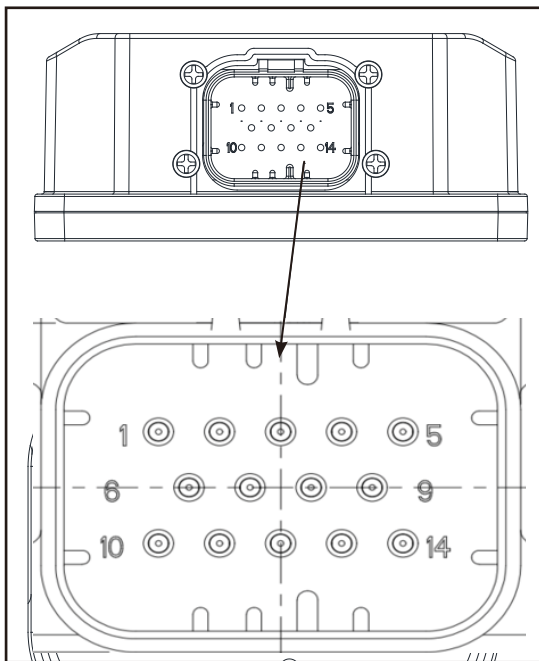
- ◆ Power off the whole vehicle first
- ◆ Remove the front access cover assembly 【A】
- ◆ Remove two fixed large pan head hexagon socket head bolts M6 \* 16 【B】
- ◆ Remove two expansion buckle assemblies 【C】
- ◆ Take out the instrument sub-assembly assembly 【D】 and turn it over to a certain angle, then pull out the instrument plug-in plug-in, and take out the instrument sub-assembly
- ◆ Remove four cross recessed large semicircular head self-tapping screws ST4.2 × 19 【E】
- ◆ Unplug the plug-in and replace TBOX 【F】
- ◆ The installation steps of the new TBOX are opposite to the removal steps.

**T-BOX FAULT CODE DISPLAY AREA**

T0001	GPS module failure
T0002	4G module failure
T0003	Bluetooth module failure
T0004	Sensor failure
T0005	Power CAN failure
T0006	Body CAN failure

Failure phenomenon and failure reason		
NO.	Trouble	Solution
1	Fault code T0001	Replace T-BOX
2	Fault code T0002	Replace T-BOX
3	Fault code T0003	Replace T-BOX
4	Fault code T0004	Replace T-BOX
5	Fault code T0005	Check PIN9 and PIN14 have signal
6	Fault code T0006	Check PIN4 and PIN5 have
7	APP can not power on remote	Check signal circuit replace T-BOX

### T-BOX INTERFACE DEFINITION

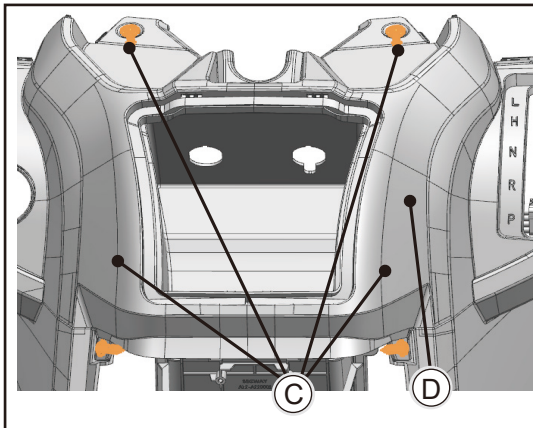
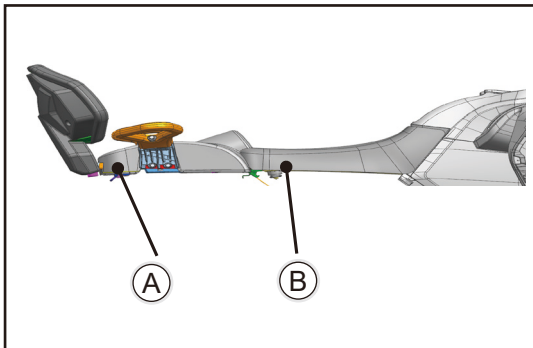


Pin	Description	Function	Note
1	GND	Vehicle Chassis Ground	
2	MIgnition	Mechanical Key Detection	Check if the mechanical key to power on or not
3	USB_VBUS	USB 5V Power Supply	—
4	CAN1+	BCAN	Body CAN+
5	CAN1-	BCAN	Body CAN-
6	Relay_OUT	Relay Control	Power on remotely relay interface
7	ACC	ACC Detection	
8	USB_DM	Shared Network	
9	CAN2+	PCAN	Engine CAN+
10	POWER	Battery Power & Constant Power	Battery power
11	RES+	Fuel Level Detection	
12	GND	Fuel Level Detection Ground	
13	USB_DP	Shared Network	
14	CAN2-	PCAN	Engine CAN-

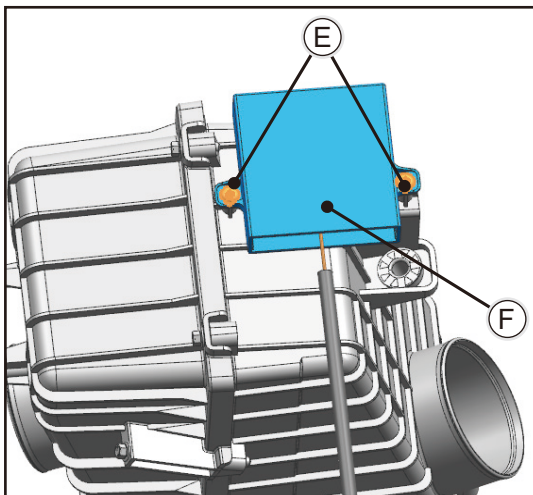
## SOLENOID VALVE CONTROL MODULE

SOLENOID VALVE CONTROL MODULE  
REMOVAL AND INSTALLATION**⚠ CAUTION**

Before removing the Solenoid Valve Control Module, the vehicle must be powered off.

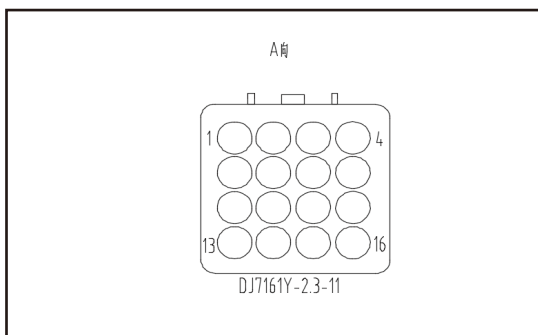
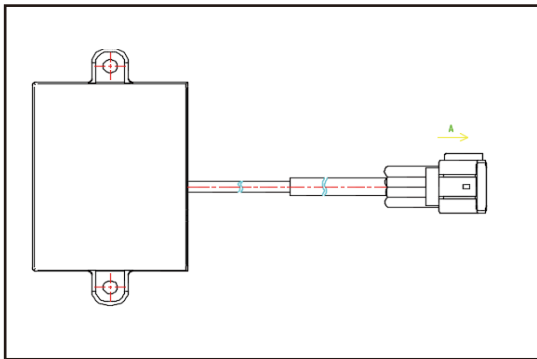


- ◆ Remove the blue and purple part of the buckle and remove the rear seat assembly 【A】
- ◆ Remove the green part of the buckle and remove the front seat cushion assembly 【B】
- ◆ Remove the four expansion buckle assemblies 【C】
- ◆ Remove the front storage box assembly 【D】



- ◆ Remove two cross recessed large semicircular head self-tapping screws ST4.2 × 13 【E】
- ◆ Unplug the plug-in to replace the solenoid valve control module 【F】
- ◆ The installation steps of the new solenoid valve control module are opposite to the removal steps

No.	Fault phenomenon	Failure Cause Analysis and Solution
1	Two and four-wheel drive solenoid valve does not work.	First, use a universal meter to measure the voltage at both ends of the solenoid valve plug-in. If there is no voltage, check whether the pin PIN8 has input. If there is input, check the two-wheel drive insurance. If the insurance is not damaged, the solenoid valve control module is damaged. If there is voltage at both ends of the solenoid valve, check whether the solenoid valve is damaged.
2	Front axle differential lock solenoid valve	First, use a universal meter to measure the voltage at both ends of the solenoid valve plug-in. If there is no voltage, check whether the pin PIN12 has input. If there is input, check the front axle differential speed_lock solenoid valve fuse. If the fuse is not damaged, the solenoid valve control module is damaged. If there is voltage at both ends of the solenoid valve, check whether the solenoid valve is damaged.
3	Rear axle differential lockup solenoid	In the L/H/R gear, first use a universal meter to measure the voltage at both ends of the solenoid valve plug-in. If there is no voltage, check whether pin PIN13 has input. If there is input, check the rear axle differential speed_lock solenoid valve fuse. If the fuse is not damaged, the solenoid valve control module is damaged. If there is voltage at both ends of the solenoid valve, check whether the solenoid valve is damaged.



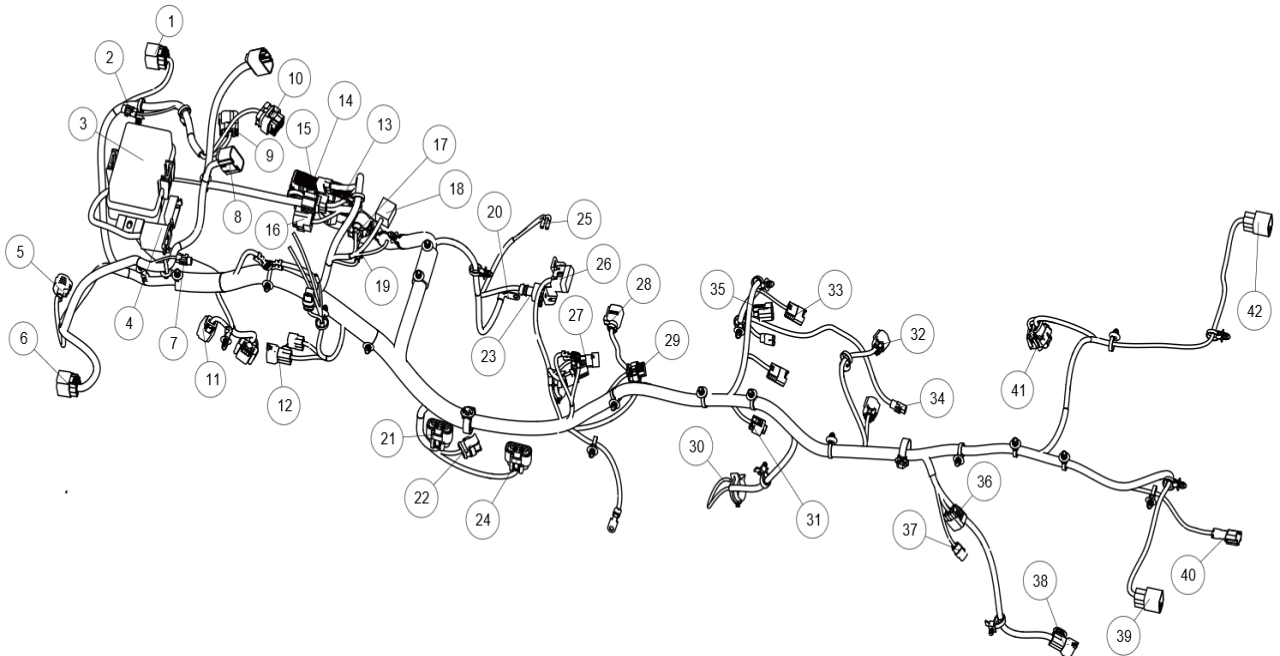
pin	Description	Remarks
1	Ignition electricity	Key electric
2	B+	Normally on
3	GND	Vehicle ground
4	GND	Vehicle ground
5	GND	Vehicle ground
6	Two-four-wheel drive discharge	Output
7	Rear Axle Differential Lock Relief	Output
8	Four-wheel drive	Low level
9	Front axle differential locked	Low level
10	Rear axle differential locked	Low level
11	Two four-wheel drive solenoid valve	Control solenoid valve
12	Front axle differential lock solenoid valve	Control solenoid valve
13	Rear axle differential lockup solenoid	Control solenoid valve
14	H	Low level
15	L	Low level
16	R	Low level
14		

## GENERAL VERSION MAIN CABLE ASSEMBLY

## GENERAL VERSION MAIN CABLE ASSEMBLY

 **CAUTION**

1. The positive and negative terminals of the battery cannot be reversed, which will cause the wires to burn.
2. All wiring screws must be tightened according to the required torque
3. To replace the main cable, remove all exterior parts (see Chapter 13 for details).

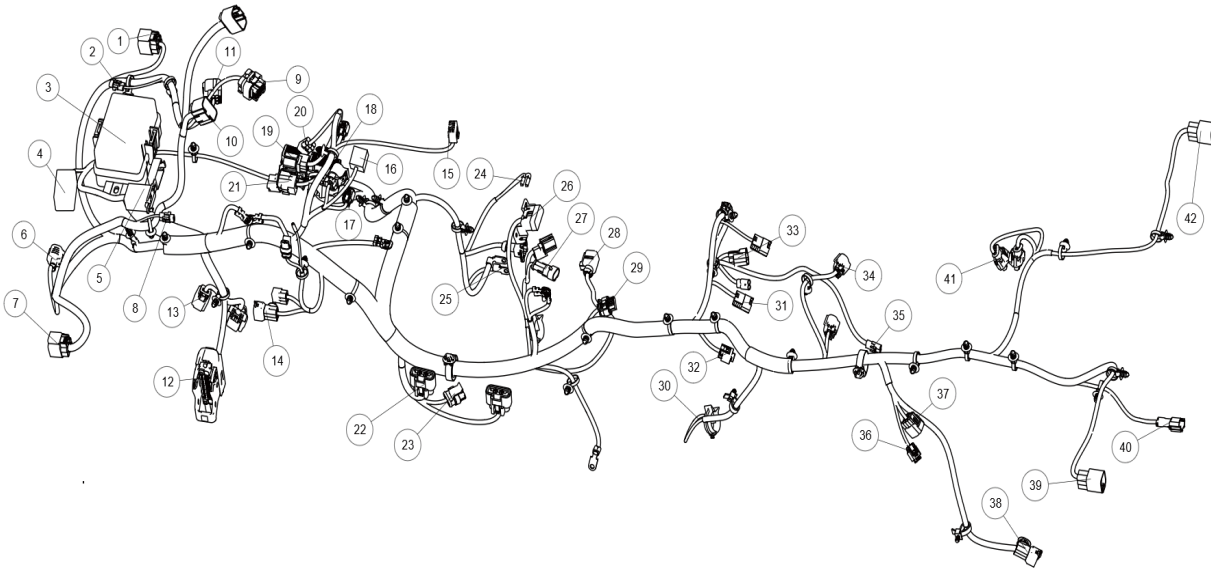


- |                                     |   |
|-------------------------------------|---|
| 【1】 -Right front headlight          | 【24】 -Voltage regulator                     |
| 【2】 -Buzzer                         | 【25】 -Starting relay                        |
| 【3】 -Main fuse box                  | 【26】 -OBD diagnostic port                   |
| 【4】 -slow melting fuse box          | 【27】 -Seat departure alarm                  |
| 【5】 -Cooling fan                    | 【28】 -Electronic Throttle                   |
| 【6】 -Left headlamp                  | 【29】 -Intake pressure temperature           |
| 【7】 -Level switch                   | 【30】 -Oil pressure                          |
| 【8】 -Instrument                     | 【16】 -Solenoid valve control module plug-in |
| 【9】 -Scintillator                   | 【31】 -Water temperature sensor              |
| 【12】 -Left hand switch              | 【32】 -Ignition coil                         |
| 【13】 -Right hand switch             | 【33】 -Injector                              |
| 【15】 -Throttle switch               | 【34】 -Rear axle solenoid valve              |
| 【16】 -Brake switch                  | 【35】 -Crankshaft sensor                     |
| 【17】 -Cigarette lighter             | 【36】 -Gear position sensor                  |
| 【18】 -Solenoid valve control module | 【37】 -Vehicle speed sensor                  |
| 【19】 -Power lock                    | 【38】 -Trailer power supply                  |
| 【20】 -Battery positive              | 【39】 -Rear left tail light                  |
| 【21】 -Voltage regulator             | 【40】 -License plate lamp                    |
| 【22】 -oil pump                      | 【41】 -Oxygen sensor                         |
| 【23】 -Canister Solenoid Valve       | 【42】 -Rear right tail light                 |

## ABS VERSION OF THE MAIN CABLE ASSEMBLY

### **CAUTION**

1. The positive and negative terminals of the battery cannot be reversed, which will cause the wires to burn.
2. All wiring screws must be tightened according to the required torque
3. To replace the main cable, remove all exterior parts (see Chapter 13 for details).

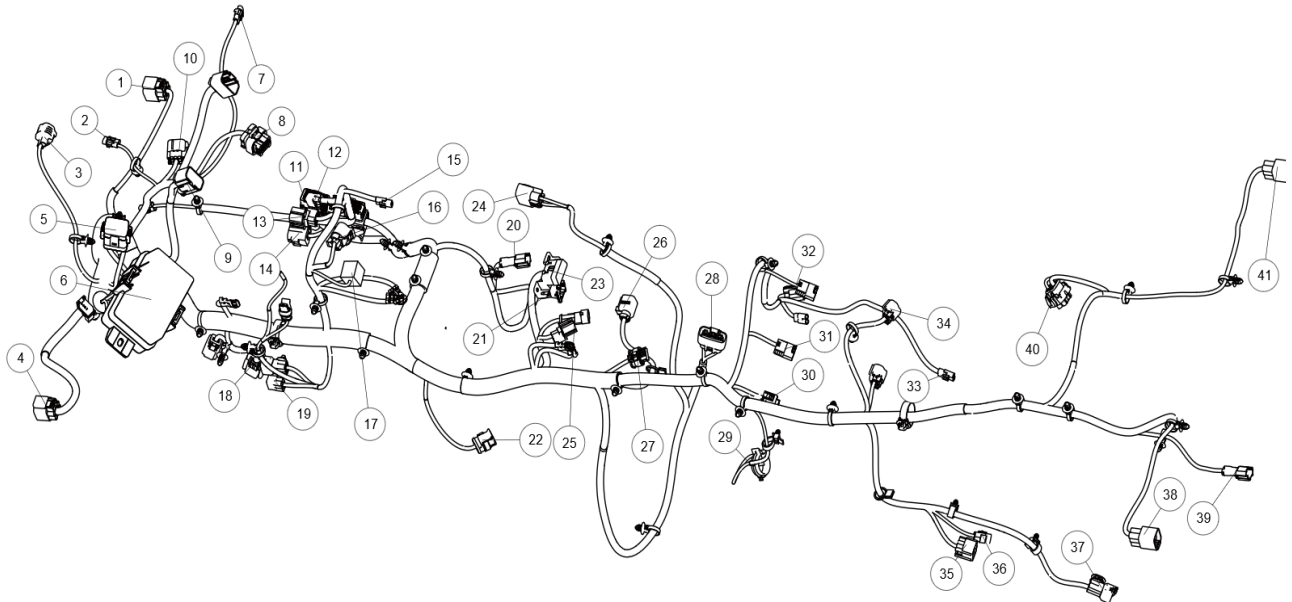


- |                                     |   |
|-------------------------------------|---|
| 【1】 -Right front headlight          | 【24】 -Starting relay                        |
| 【2】 -Buzzer                         | 【25】 -Battery positive                      |
| 【3】 -Main fuse box                  | 【26】 -OBD diagnostic port                   |
| 【4】 -ABS small fuse box             | 【27】 -Seat departure alarm                  |
| 【5】 -slow melt fuse box             | 【28】 -Electronic Throttle                   |
| 【6】 -Cooling fan                    | 【29】 -Intake pressure temperature           |
| 【7】 -Left headlamp                  | 【30】 -Oil pressure                          |
| 【8】 -Level switch                   | 【16】 -Solenoid valve control module plug-in |
| 【10】 -Instrument                    | 【31】 -Injector                              |
| 【11】 -Scintillator                  | 【32】 -Water temperature sensor              |
| 【12】 -ABS controller                | 【33】 -Crankshaft position                   |
| 【14】 -Left hand switch              | 【34】 -Ignition coil                         |
| 【15】 -ABS speed control switch      | 【35】 -Rear axle solenoid valve              |
| 【16】 -Solenoid valve control module | 【36】 -Left rear wheel speed sensor          |
| 【17】 -Left front wheel speed sensor | 【37】 -Gear position sensor                  |
| 【19】 -Throttle switch               | 【38】 -Trailer power supply                  |
| 【20】 -right hand switch             | 【39】 -Rear left tail light                  |
| 【21】 -Brake switch                  | 【40】 -License plate lamp                    |
| 【22】 -Voltage regulator             | 【41】 -Oxygen sensor                         |
| 【23】 -oil pump                      | 【42】 -Rear right tail light                 |

## MUD VERSION OF THE MAIN CABLE ASSEMBLY

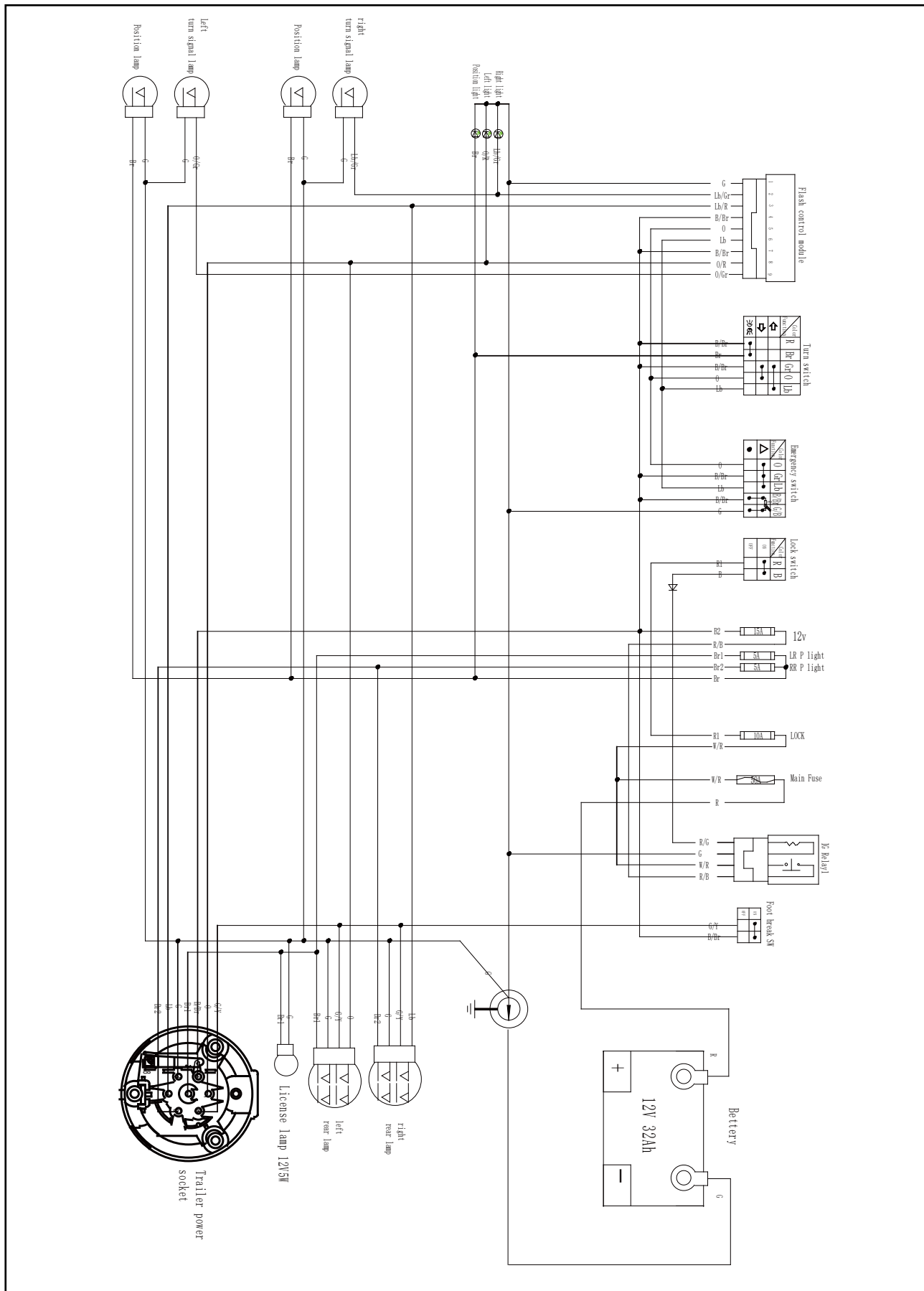
**⚠ CAUTION**

1. The positive and negative terminals of the battery cannot be reversed, which will cause the wires to burn.
2. All wiring screws must be tightened according to the required torque
3. To replace the main cable, remove all exterior parts (see Chapter 13 for details).



- |                                     |   |
|-------------------------------------|---|
| 【1】 -Right front headlight          | 【24】 -Voltage regulator                     |
| 【2】 -Buzzer                         | 【25】 -Seat departure alarm                  |
| 【3】 -Cooling fan                    | 【26】 -Electronic Throttle                   |
| 【4】 -Left headlamp                  | 【27】 -Intake pressure temperature           |
| 【5】 -slow melt fuse box             | 【28】 -Voltage Regulator                     |
| 【6】 -Main fuse box                  | 【29】 -Oil pressure                          |
| 【7】 -Level switch                   | 【30】 -Water temperature sensor              |
| 【9】 -Instrument                     | 【16】 -Solenoid valve control module plug-in |
| 【10】 -Scintillator                  | 【31】 -Injector                              |
| 【12】 -right hand switch             | 【32】 -Crankshaft position                   |
| 【13】 -Throttle switch               | 【33】 -Rear axle solenoid valve              |
| 【14】 -Brake switch                  | 【34】 -Ignition coil                         |
| 【15】 -Power lock                    | 【35】 -Gear position sensor                  |
| 【16】 -Cigarette lighter             | 【36】 -Vehicle speed sensor                  |
| 【17】 -Solenoid valve control module | 【37】 -Trailer power supply                  |
| 【19】 -Left hand switch              | 【38】 -Rear left tail light                  |
| 【20】 -Starting relay                | 【39】 -License plate lamp                    |
| 【21】 -Battery positive              | 【40】 -Oxygen sensor                         |
| 【22】 -oil pump                      | 【41】 -Rear right tail light                 |
| 【23】 -OBD diagnostic port           |   |

## SCHEMATIC DIAGRAM OF TRAILER SYSTEM



### WIRING DIAGRAM

COLOR COMPARISON TABLE

CODE	R	R/B	R/W	R/G	R/Y	R/L	R/Br	R/O
COLOUR	Red	Red/Black	Red/White	Red/Green	Red/Yellow	Red/Blue	Red/Brown	Red/Orange
CODE	P	B	B/R	B/W	B/Y	B/L	B/V	B/Br
COLOUR	Pink	Black	Black/Red	Black/White	Black/Yellow	Black/Blue	Black/Violet	Black/Brown
CODE	W	W/R	W/B	W/G	W/Y	W/L	W/V	W/Gr
COLOUR	White	White/Red	White/Black	White/Green	White/Yellow	White/Blue	White/Violet	White/Gray
CODE	Gr	Gr/R	Gr/B	Gr/W	BR	Br/R	Br/B	Br/Y
COLOUR	Gray	Gray/Red	Gray/Black	Gray/White	Brown	Brown/Red	Brown/Black	Brown/Yellow
CODE	O	O/R	O/B	OW	O/G	O/L	O/Gr	
COLOUR	Orange	Orange/Red	Orange/Black	Orange/White	Orange/Green	Orange/Blue	Orange/Gray	
CODE	G	G/R	G/B	GW	G/Y	G/L	GV	G/Br
COLOUR	Green	Green/Red	Green/Black	Green/White	Green/Yellow	Green/Blue	Green/Violet	Green/Brown
CODE	Y	Y/R	Y/B	YW	Y/G	Y/L	Y/Gr	Y/Br
COLOUR	Yellow	Yellow/Red	Yellow/Black	Yellow/White	Yellow/Green	Yellow/Blue	Yellow/Gray	Yellow/Brown
CODE	L	L/R	L/B	LW	L/G	L/Y		
COLOUR	Blue	Blue/Red	Blue/Black	Blue/White	Blue/Green	Blue/Yellow		
CODE	V	V/R	V/B	VW	V/G	V/L	V/Br	V/O
COLOUR	Violet	Violet/Red	Violet/Black	Violet/White	Violet/Green	Violet/Blue	Violet/Brown	Violet/Orange
CODE	Lg	Lg/R	Lg/G	Lg/Y	Lg/Br	Lg/P		
COLOUR	Light Green	Light Green/Red	Light Green/Green	Light Green/Yellow	Light Green/Brown	Light Green/Pink		
CODE	Lb	Lb/R	Lb/B	Lb/W	Lb/Gr			
COLOUR	Light Blue	Light Blue/Red	Light Blue/Black	Light Blue/White	Light Blue/Gray			

**Wire color instruction:**

Wire color contains main color and secondary color.

For example: R/L means the main color is red and the secondary color is blue.

