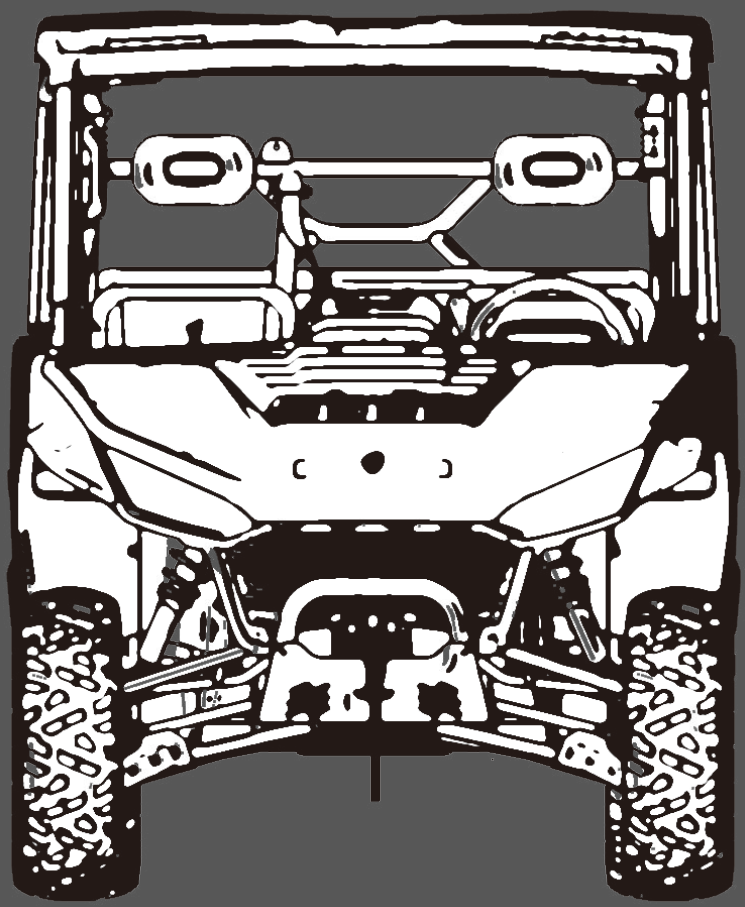
SEGWAY®

SEGWAY UT 10 / SEGWAY UT 10 CREW

SERVICE MANUAL

UTV SERIES PRODUCTS



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SUMMARY

This manual provides information on UTV diagnosis, maintenance procedures, adjustments, and specifications for use by maintenance 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.

With quality, improve vehicle continuous research and development, this 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 dealership, mentioned the latest status of this manual or information relating to the product part number or special tools.

No part of this manual may be copied or stored in any form without the permission of Segway Technologies LTD. The above declaration applies to all texts, ICONS and forms.

1. This manual is provided by Segway Technology Co., Ltd. and is prepared for qualified professional and technical personnel. Attempts to repair and maintain the vehicle without proper training and without proper tools and equipment may injure the maintainer or others and may damage or disable the vehicle in normal operation.

2. Correct vehicle repair and maintenance is very important for the personal safety of maintenance personnel and the safe and reliable operation of motor vehicles. If a part needs to be replaced, please use the same part or the part designated by Segway.

3. The maintenance procedures recommended in this manual are effective methods of repair and maintenance, some of which require the use of specialized tools.

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

This manual is applicable to the fillowing vehicle models:

SINGLE CAB VEHICLES：SGW1000F-U1、SGW1000F-U2、SGW1000F-U6

CREW CAB VEHICLES：SGW1000F-U3、SGW1000F-U4、SGW1000F-U5、

SEGWAY TECHNOLOGY CO., LTD.

Web: SegwayPowersports.us

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/cm²	Kilograms per square centimeter	W	watt(s)
h	hour(s)	Ω	ohm(s)
L	liter(s)		

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.

GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER/ENGINE SERIAL CODE 1-2

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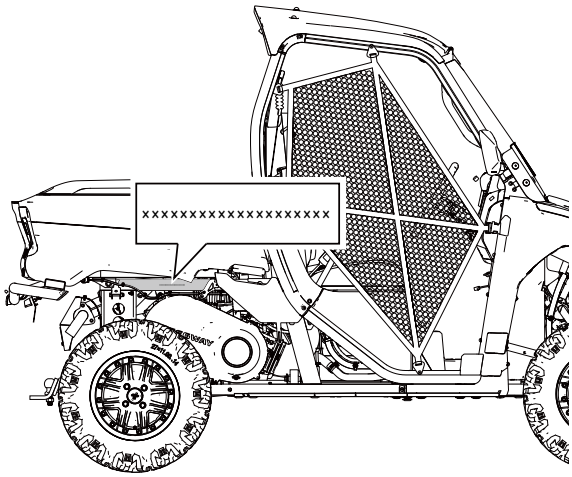
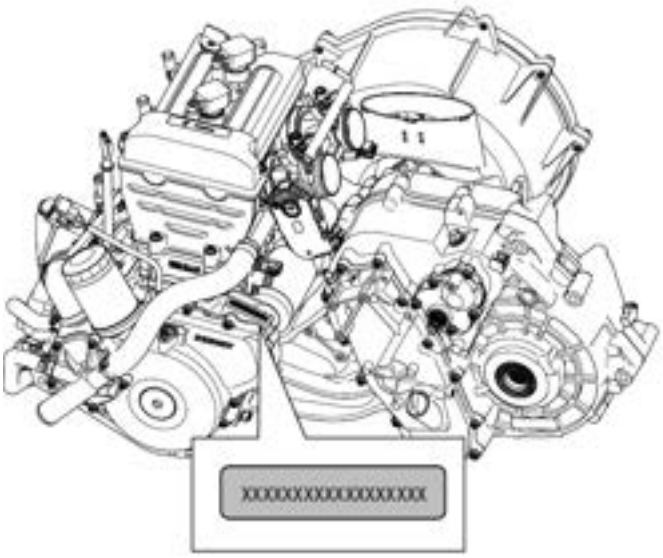
VEHICLE IDENTIFICATION NUMBER/ENGINE SERIAL CODE

VEHICLE IDENTIFICATION NUMBER

The frame number is stamped on the frame cross tube under the right cargo box at the rear of the vehicle.

Reference the vehicle identification number (VIN) when corresponding about the Segway Powersports vehicle.





VEHICLE IDENTIFICATION CODE COMPOSITION			
☆X X X X X X X X X × × × × × × × × ☆ 1-3 4 5 6 7 8 9 10 11 12-17			
No.	SERIAL NUMBER MEANING	No.	SERIAL NUMBER MEANING
1-3	MANUFACTURER'S IDENTIFICATION CODE	8	DESIGNED SEQUENCE NUMBER
4	VEHICLE CATEGORY	9	CHECK NUMBER
5	POWER TYPE	10	YEAR OF PRODUCTION
6	NOMINAL ENGINE DISPLACEMENT	11	ASSEMBLING PLANT CODE
7	RATED POWER OF DRIVE MOTOR	12-17	PRODUCTION SEQUENCE NUMBER

VEHICLE PARAMETER TABLE (SINGLE CAB VEHICLES)

SGW1000F-U1、SGW1000F-U2、SGW1000F-U6

Item	Parameters
Length×width×height（mm）	3100×1625×2014
Wheelbase（mm）	2085
Front axle track（mm）	1350
Rear axle track（mm）	1320
Curb weight（kg）	793(U1/U6) 854(U2)
Ground clearance（mm）	320
Inside turning radius measurment（mm）	8500
Height of seat（mm）	500
Steering wheel diameter（mm）	350
Maximum weight capacity （payload）（Kg）	454(U1、U6) 350(U2)

Item	Parameters
VEHICLE	
EPS type	Electric（Optional）
Air filter type	Paper filter type
Muffler type	Impedance
Shift operation mode	Mechanical
POWER/TRANSMISSION	
Engine type	Double cylinder Liquid cooling 4 strokes
Engine model	293MY-1
Displacement	999.9 CC
Compression ratio	10.9 : 1
Bore×Stroke	93 mm×73.6 mm
Starting method	Electric start
Engine Rated Power	77kw/7500rpm(U1/U6) 68kw/7500rpm(U2)
Engine Rated Torque	95Nm/6500rpm(U1/U6) 93.5Nm/6000rpm(U2)
Ignition type	Eletcricity (ECU)
Spark plug type	NGK CPR7EA /TORCH B7RTC
Spark plug clearance	0.7-0.9 mm

Lubrication method		Liquid	
Cooling method		Liquid	
Coolant capacity		6500 ml	
Generator power		580 W	
Fuel label number		87# or higher (U3/U4) Petrol (E10)(U5)	
Tank		45 L	
Lubricating oil	Engine	SAE 5W-40/SN or higher	
	Gearbox	SAE 75/80W-90 GL5	
	Front Axle	SAE 75/80W-90 GL5	
Lubricating oil volume	Engine	3300 mL	
	Gearbox	1400 mL	
	Front Axle	260 mL	
CVT transmission ratio		0.75~3.74（CVTech） 0.891~3.608(hongzheng)	
Primary transmission ratio		H：1.4062	
		L：2.15	
		R：2.3888	
Secondary transmission ratio		1.8	
Three-stage transmission ratio		1.52	
Final transmission ratio		To Fr. Bridge ： 0.90476	
Power transmission method		Axle	
Fr. Bridge		3.67	
Rr. Bridge		3.3125	
TIRE			
Rim type （Specification）	Fr. Wheel	Aluminum rim（14×6.5）or Steel rim（14×6.0）	
	Rr. Wheel	Aluminum rim（14×7.0）or Steel rim（14×7.5）	
Tire type （Specification）	Fr. Wheel	27×9.00 - 14	27×9.00-14
	Rr. Wheel	27×9.00R14	27×11.00R14
Tire pressure	Fr. Wheel	15.0 PSI. (103 Kpa)	
	Rr. Wheel	16.0 PSI. (110 Kpa)	
Driving brake	Type	Hydraulic/Disc	
	Operation method	Right feet	

Parking brake	Type	Mechanic，Automatic compensation type
	Operation method	Hand
SUSPENSION		
Fr. Suspension stroke		9.5 in. (240 mm)
Rr. Suspension stroke		10.6 in. (270 mm)
Suspension type	Fr.	Double-wishbone independent Suspension
	Rr.	Double-wishbone independent suspension
Shock absorber	Fr.	Hydraulic spring
	Rr.	Hydraulic spring
ELCTRIC		
Rectifier maximum output power		50A
Headlight	Headlight	55W×2-32000cd（H4）
	Fr. Position light	LED×2
	Daytime Running Light	LED×2
	Fr.Winker	Amber LED
Tail light	Rr.Brake light	Red 21W (P21/5W)
	Rr. Position light	Red 5W（P21/5W）
	Rr.Winker	Amber 10W（RY10W）
Battery（Capacity）		Maintenance-free/lead acid（12V 32Ah）
Dashboard		TFT screen (LCD screen,optional)
Winch（lb/m）		3500（2500）（4500）

VEHICLE PARAMETER TABLE (CREW CAB VEHICLES)

SGW1000F-U3、SGW1000F-U4、SGW1000F-U5

Item	Parameters
Length×width×height（mm）	4000×1580×1920
Wheelbase（mm）	2985
Front axle track（mm）	1350
Rear axle track（mm）	1320
Curb weight（kg）	930(U3/U4) 1010(U5)
Ground clearance（mm）	320
Inside turning radius measurment（mm）	11500
Height of seat （mm）	520
Steering wheel diameter（mm）	350
Maximum weight capacity （payload）（Kg）	350(U3、U4) 205(U5)

Item	Parameters
VEHICLE	
EPS type	Electric（Optional）
Air filter type	Paper filter type
Muffler type	Impedance
Shift operation mode	Mechanical
POWER/TRANSMISSION	
Engine type	Double cylinder Liquid cooling 4 strokes
Engine model	293MY-1
Displacement	999.9 CC
Compression ratio	10.9 : 1
Bore×Stroke	93 mm×73.6 mm
Starting method	Electric start
Engine Rated Power	75kw/7500rpm(U3/U4) 68kw/7500(U5)
Engine Rated Torque	95Nm/6500rpm(U3/U4) 93.5Nm/6000rpm(U5)
Ignition type	Eletcricity (ECU)

Spark plug type		NGK CPR7EA /TORCH B7RTC	
Spark plug clearance		0.7-0.9 mm	
Lubrication method		Liquid	
Coolant capacity		8000 ml	
Cooling method		Liquid	
Generator power		680W or 980W	
Fuel label number		92#	
Tank		11.9 gal. (45 L)	
Lubricating oil	Engine	SAE 5W-40/SN or higher	
	Gearbox	SAE 75/80W-90 GL5	
	Front Axle	SAE 75/80W-90 GL5	
Lubricating oil volume	Engine	3300 mL	
	Gearbox	1400 mL	
	Front Axle	260 mL	
CVT transmission ratio		0.75~3.74（CVTech） 0.891~3.608(弘正)	
Primary transmission ratio		H：1.4062	
		L：2.15	
		R：2.3888	
Secondary transmission ratio		1.8	
Three-stage transmission ratio		1.52	
Final transmission ratio		To Fr. Bridge ：0.90476	
Power transmission method		Axle	
Fr. Bridge		3.67	
Rr. Bridge		3.3125	
TIRE			
Rim type （Specification）	Fr. Wheel	Aluminum rim（14×6.5）or Steel rim（14×6.0）	
	Rr. Wheel	Aluminum rim（14×7.0）or Steel rim（14×7.5）	
Tire type （Specification）	Fr. Wheel	27×9.00-14	30×10.00R14
	Rr. Wheel	27×11.00-14	30×10.00R14

Tire pressure	Fr. Wheel	103Kpa(15 PSI)	70 Kpa(10 PSI)
	Rr. Wheel	120 KPa(17.4psi)	110 KPa(16 psi)
Driving brake	Type	Hydraulic/Disc	
	Operation method	Right feet	
Parking brake	Type	Mechanic，Automatic compensation type	
	Operation method	Hand	
SUSPENSION			
Fr. Suspension stroke		240 mm	
Rr. Suspension stroke		270 mm	
Suspension type	Fr.	Double-wishbone independent Suspension	
	Rr.	Double-wishbone independent suspension	
Shock absorber	Fr.	Hydraulic spring	
	Rr.	Hydraulic spring	
ELCTRIC			
Rectifier maximum output power		50A	
Headlight	Headlight	55W×2-32000cd（H4）	
	Fr. Position light	LED×2	
	Daytime Running Light	LED×2	
	Fr.Winker	Amber LED	
Tail light	Rr.Brake light	Red 21W (P21/5W)	
	Rr. Position light	Red 5W（P21/5W）	
	Rr.Winker	Amber 10W（RY10W）	
Battery（Capacity）		Maintenance-free/lead acid （12V 32Ah）	
Dashboard		TFT screen(LCD screen,optional)	
Winch（lb/m）		3500（2500）（4500）	

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/CM²
KPA	× 0.1450	PSI
KPA	× 0.7501	CMHG
KG/CM²	× 98.07	KPA
KG/CM²	× 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.

MO: Apply molybdenum disulfide oil solution (mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1).

EO: Apply engine oil.

SS: Apply silicone sealant

Lh: Left-hand Threads

R: Replacement Parts

S: Follow the specific tightening sequence.

Engine standard fastener torque						
No.	Fastener	Torque			Fastening part	Remarks
		N·m	Kgf·m	Ft·lb		
1	Screw m6×16	8~12	0.8~1.2	5.9~8.8		
2	Screw m8×25	22~28	2.2~2.8	16.2~20.7		
3	Screw m6×16	16~20	1.6~2.0	11.8~14.7		
4	Screw m8×25	29~35	2.9~3.5	21.4~25.8		
5	Hexagon flange bolt M10×1.25×25	75~85	7.5~8.5	55.3~62.7		
6	Hexagon flange bolt M12×1.25×30	112~128	11.2~12.8	82.6~94.4		
Engine special fastener torque						
1	Bolt m12×1.25×165	112~128	11.2~12.8	82.6~94.4	Cvt clutch primary	
2	Bolt m10×1.25×45	75~85	7.5~8.5	55.3~62.7	Cvt clutch secondary	
3	Cylinder head bolt M11×1.25×150	1. 12 2. 35 3. Tighten at 180° angle 70~80	1. 12 2. 35 3. Tighten at 180° angle 7.1~8.1	1. 12 2. 35 3. Tighten at 180° angle 52~59	Cylinder head assemble bolt	Through three tightening
4	Box bolt combination M10×1.25×110	1. 12 2. 28 3. Tighten at 90° angle 65~75	1. 12 2. 28 3. Tighten at 90° angle 6.5~7.5	1. 12 2. 28 3. Tighten at 90° angle 40.5~55.3	Lower crankcase assembly bolt	Through three tightening
5	Bolt m8×90	30~34	3.0~4.0	34~29.5	4 Lower crankcases bolts	
6	Bolt m8×40	30~34	3.0~4.0	34~29.5	2 Upper crankcase bolts	
7	Double-ended stud M10×1.25×60	40～50	4.0~5.0	29.5~36.9	Transmission connection	

8	Bolt m10	1. 25 2. 45 3. Tighten at 60° angle 70~110	1. 2.5 2. 4.5 3. Tighten at 60° angle 7.1~11.2	1. 18.4 2. 33 3. Tighten at 60° angle 52~81	Connecting rod bolt	Through three tightening
9	Bolt m12×1.25×30-Lh	150~160	15.3~16	111~118	Crankshaft magneto rotor	
10	Bolt m10×1.0×18	65～75	6.5~7.5	40.5~55.3	Differential Mechanism	L
11	Bolt m24	23~27	2.3~2.7	17~20	Lower crankcase	
12	Bolt m10×1.25×45	60~70	6.1~7.1	44~52	Driven bevel gear cover	L
13	Bolt m8×40	30~34	3.0~4.0	34~29.5	Cvt inner cover 6	
14	Bolt m14	16~20	1.6~2.0	12~15	Upper crankcase 1	
15	Nut m33×1.5	245~255	25~26	180~188	1 Driven bevel gear nut, 2 3rd axle nuts	L
16	Nut m30×1.5-Lh	195~205	19.5~20.5	144~151	Four-axis driving bevel gear	L
17	Nut m30×1.5	195~205	19.5~20.5	144~151	Four-axis assembly	
18	Neutral position spring plug	16~20	1.6~2.0	12~15	Left crankcase	
19	Engine drain plug m14	16~20	1.6~2.0	12~15	Oil drain screw hole	
20	Shoulder bolt	8~12	0.8~1.2	5.9~8.8	4 Cylinder head cover bolts	
21	Shoulder bolt	8~12	0.8~1.2	5.9~8.8	Tension plate, guide plate	
22	Water pipe adapter	16~20	1.6~2.0	12~15	Lower crankcase cover, left crankcase cover	
23	Oil filter adapter	30~40	3.0~4.0	22~29	Left crankcase cover oil filter	
24	Flow orifice φ1	1.9~2.5	0.19~0.25	17~22 In·lb	Gear box oil pump body	L
25	Oil regulator valve unit	20~24	2.0~2.4	14.7~17.7	Lower crankcase m16 screw hole	
26	Stud m8×43	20~24	2.0~2.4	14.7~17.7	Cylinder head exhaust port assembly exhaust pipe	L
27	Bolt m6×40	12~16	1.2~1.6	8.8~12	Shift gear of shift drum	
28	Nut m22×1	135~145	13.8~14.8	100~107	Starting gear 1、transmission countershaft 1	L
29	Bolt m6×12	16~20	1.6~2.0	12~15	Timing driven sprocket	
30	Shoulder bolt m6×21	8~12	0.8~1.2	5.9~8.8	Shift positioning plate	
31	Screw m6×16	16~20	1.6~2.0	12~15	Magneto overrunning clutch	L
32	Spark plug(ngk)	16~20	1.6~2.0	12~15	Cylinder head assy 2	

33	Water temperature Sensor	10~14	1.0~1.4	7~10	Cylinder head	
34	Oil filter	23~27	2.3~2.7	17~20	Left crankcase cover	
35	Oil pressure sensor	16~20	1.6~2.0	12~15	Cylinder	
36	Oil passage plug	6~10	0.6~1.0	4.4~7	Left crankcase cover1	
37	Stator cover plug	10~14	1.0~1.4	7~10	Left crankcase cover	
38	Solenoid valve Assembly	33~37	3.3~3.7	24~27	Differential Transmission	
Other threaded fasteners						
1	M6×1.0	9~11	0.9~1.1	80~97 In·lb		
2	M8×1.25	20~26	2.0~2.6	14.7~19		
3	M10×1.5	55~65	5.5~6.5	40.5~48		

Standard fastener torque of the whole vehicle						
No.	Fastener	Torque			Fastening part	Remarks
		N·m	Kgf·m	Ft·lb		
1	Bolt m6	8~12	0.8~1.2	69~103.6 In·lb		
2	Bolt m8	30～40	3.0~4.0	22.1~29.5		
3	Bolt m10	40～50	4.0~5.0	29.5~36.9		
4	Bolt m12	50～60	5.0~6.0	36.9~44.3		
Torque of special fasteners for vehicle						
1	Bolt gb/t 5789 m10×1.25×40	65～75	6.5~7.5	40.5~55.3	Engine install	L
2	Bolt gb/t 5789 m10×1.25×155	65～75	6.5~7.5	40.5~55.3	Engine install	L
3	Bolt gb/t 5789 m12×1.25×85	110～120	11.2~12.2	81~88	Engine install	L
4	Bolt gb/t 5789 m10×1.25×20	40～50	4.0~5.0	29.5~36.9	Front axle gearbox install	L
5	Bolt gb/t 5789 m10×1.25×120	65～75	6.5~7.5	40.5~55.3	Front axle gearbox install	L
6	Bolt gb/t 5789 m10×1.25×20	65～75	6.5~7.5	40.5~55.3	Intermediate shaft support seat	L
7	Bolt gb/t 5789 m8×35	30～40	3.0~4.0	22.1~29.5	Transmission shaft	L
8	Bolt gb/t 5789 m8×30	30～40	3.0~4.0	22.1~29.5	Front arm	L
9	Bolt gb/t 5789 m10×1.25×45	65～75	6.5~7.5	40.5~55.3	Front arm	L
10	Bolt gb/t 5789 m10×1.25×55	65～75	6.5~7.5	40.5~55.3	Front arm	L
11	Bolt gb/t 5789 m12×1.25×90	110～120	11.2~12.2	81~88	Front arm	L
12	Bolt gb/t 5789 m12×1.25×95	110～120	11.2~12.2	81~88	Front arm	L
13	Bolt gb/t 6183.2 M10×1.25	40～50	4.0~5.0	29.5~36.9	Left stabilizer bar pin	
14	Bolt gb/t 5789 m8×30	30～40	3.0~4.0	22.1~29.5	Rear arm	L
15	Bolt gb/t 5789 m10×1.25×55	65～75	6.5~7.5	40.5~55.3	Rear arm	L
16	Bolt gb/t 5789 m12×1.25×90	110～120	11.2~12.2	81~88	Rear arm	L
17	Bolt gb/t 5789 m12×1.25×120	110～120	11.2~12.2	81~88	Rear arm	L
18	Bolt gb/t 5789 m12×1.25×145	110～120	11.2~12.2	81~88	Rear arm	L
19	Bolt gb/t 5789 m12×1.25×170	110～130	11.2~12.2	81~88	Rear arm	L

20	Nut	100～120	10~12	74~88	Rim mounting nut	
21	Bolt gb/t 5789 m8×25	15~20	1.5~2.0	10~14.7	Anti-drop ring mounting bolt	
22	Nut gb/t 9459 m24×2	280～300	28.5~30.6	206~221	Axle mounting nut	
23	Bolt gb/t 5789 m10×1.25×95	65～75	6.5~7.5	40.5~55.3	Eps mounting bolt	
24	Bolt m12×1.25	110～130	11.2~13.2	81~96	Steering rod (assembled with eps)	L
25	Bolt gb/t 70.1 M8×16	30～40	3.0~4.0	22.1~29.5	Eps	L
26	Bolt gb/t 5789 m8×16	30～40	3.0~4.0	22.1~29.5	Eps	L
27	Nut gb/t 6187 m14×1.5	65～75	6.5~7.5	40.5~55.3	Steering wheel	
28	Bolt m8	30～40	3.0~4.0	22.1~29.5	Steering column mounting bolt	L
29	Bolt gb/t 5789 m10×1.25×25	65～75	6.5~7.5	40.5~55.3	Brake caliper mounting bolt	L
30	Bolt	30～40	3.0~4.0	22.1~29.5	Brake disc mounting bolt	L
31	Bolt gb/t 5789 m8×25	30～40	3.0~4.0	22.1~29.5	Hanging screw under muffler	L

MAINTENANCE

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MAINTENANCE PERIODIC TABLE

A good maintenance is vital for safety and driving. Regular maintenance is especially important. Please follow this table to make regular maintenance for your vehicle.

⚠ WARNING

Improperly performing the procedures marked with a D could result in component failure and lead to serious injury or death. Have an authorized dealer or other qualified person perform these services.

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.

Perform all services at whichever maintenance interval is reached first. Record maintenance and service in the Maintenance Log.

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.

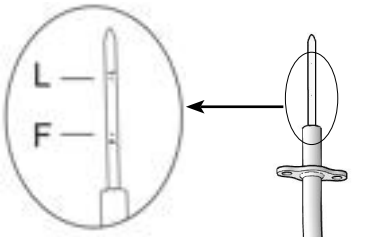
ITEM		MAINTENANCE INTERVAL (WHICHEVER COMES FIRST)			REMARKS
		HOURS	CALENDAR	MILES（KM）	
►	Brake pad wear	10 H	Monthly	100 (160)	Inspect periodically; replace as needed
	Battery	20 H	Monthly	200 (320)	Check terminals; clean; test
►	Air filter, main element	50H		500 (800)	Inspect; replace as needed; inspect 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
►	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

	ITEM	MAINTENANCE INTERVAL (WHICHEVER COMES FIRST)			REMARKS
		HOURS	CALENDAR	MILES（KM）	
	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

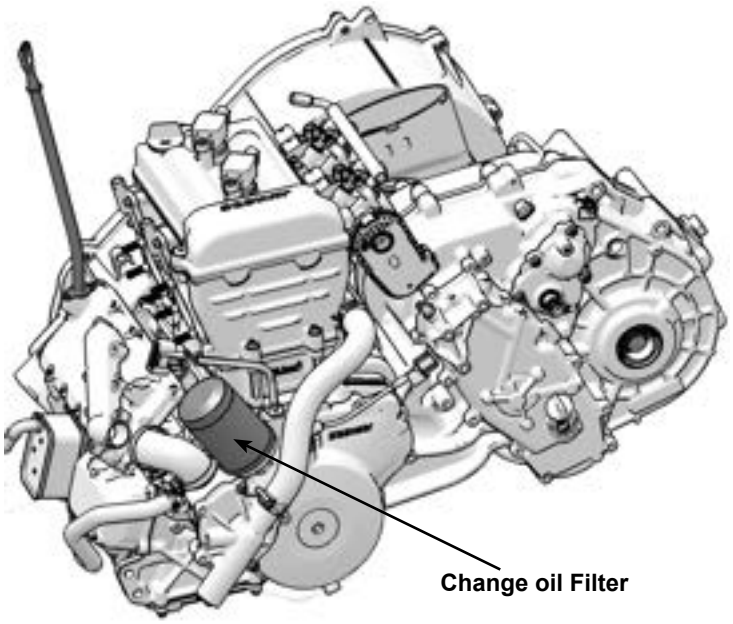
Maintenance Reference

Item	Recommended Model	Capacity	Inspection Method	Schedule
Engine Oil	SAE 5W-40/SN or higher	3.5 qts. (3300 mL)	Maintain level in safe range on dipstick	Refer to Maintenance Schedule
Engine Coolant		UT10：6500 mL UT10 CREW：8000 mL	Maintain the level between the fill lines.	Refer to Maintenance Schedule

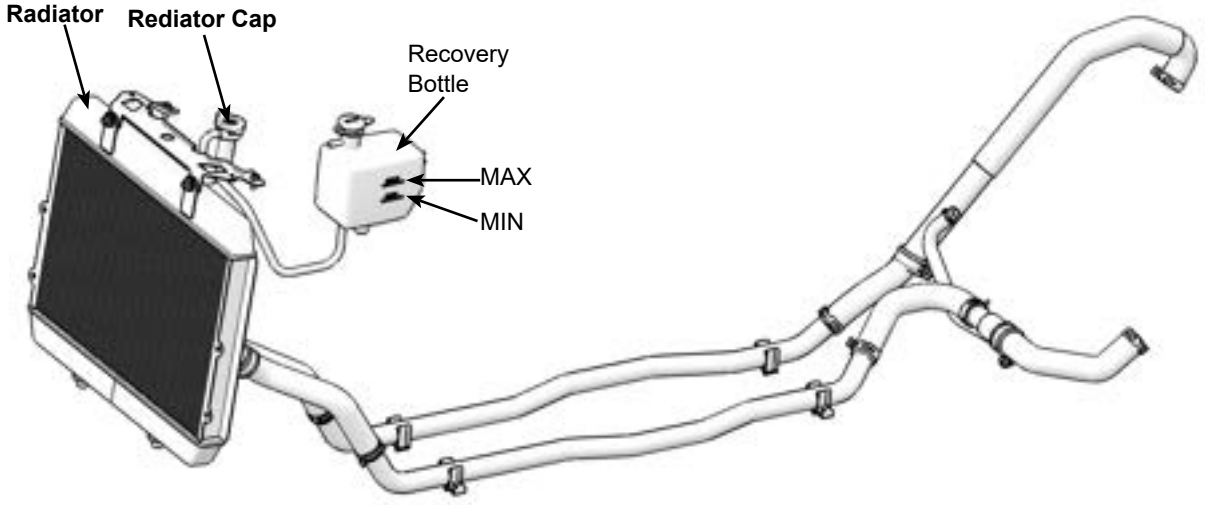
Engine Oil



The oil level is between the Upper engraved line“F” and the Lower engraved line “L” . It is the proper oil level.



Engine Coolant

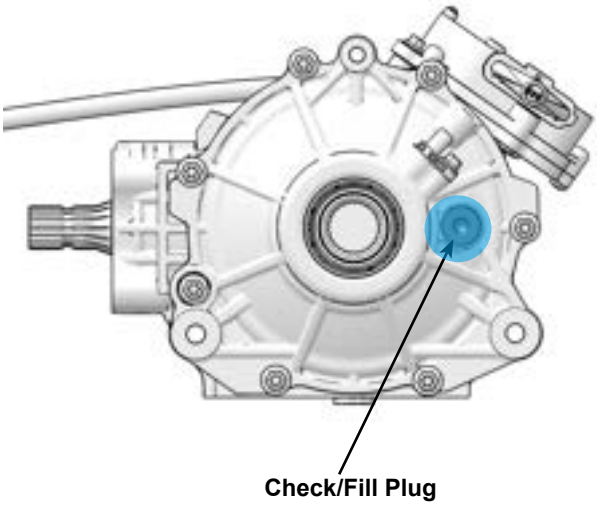


Item	Recommended Model	Capacity	Inspection Method	Schedule
Brake fluid	DOT4	——	Maintain the level between the fill lines.	Refer to Maintenance Schedule
Front axle gear oil	SAE 75/80W-90 GL5	0.27 qts. (260 mL)	Maintain the fluid to the Fill Plug level	Refer to Maintenance Schedule
Rear axle gear oil	SAE 75/80W-90 GL5	1.5 qts. (1400 mL)	Maintain the fluid to the Fill Plug level	Refer to Maintenance Schedule

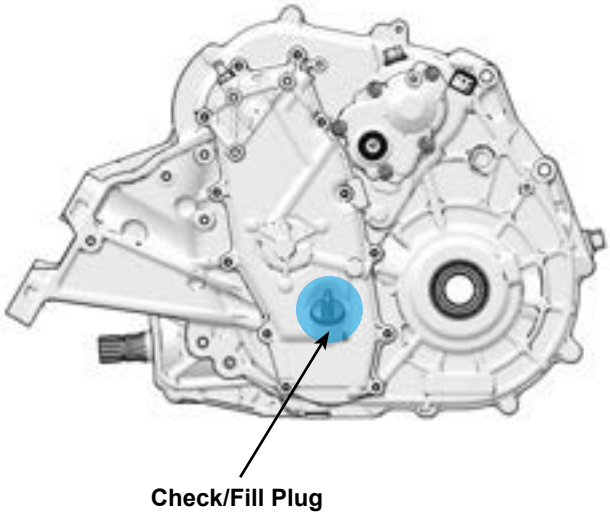
Brake fluid

Keep the coolant level between the MIN and MAX mark on the bottle (while the liquid cools)

Front axle gear oil



Rear axle gear oil

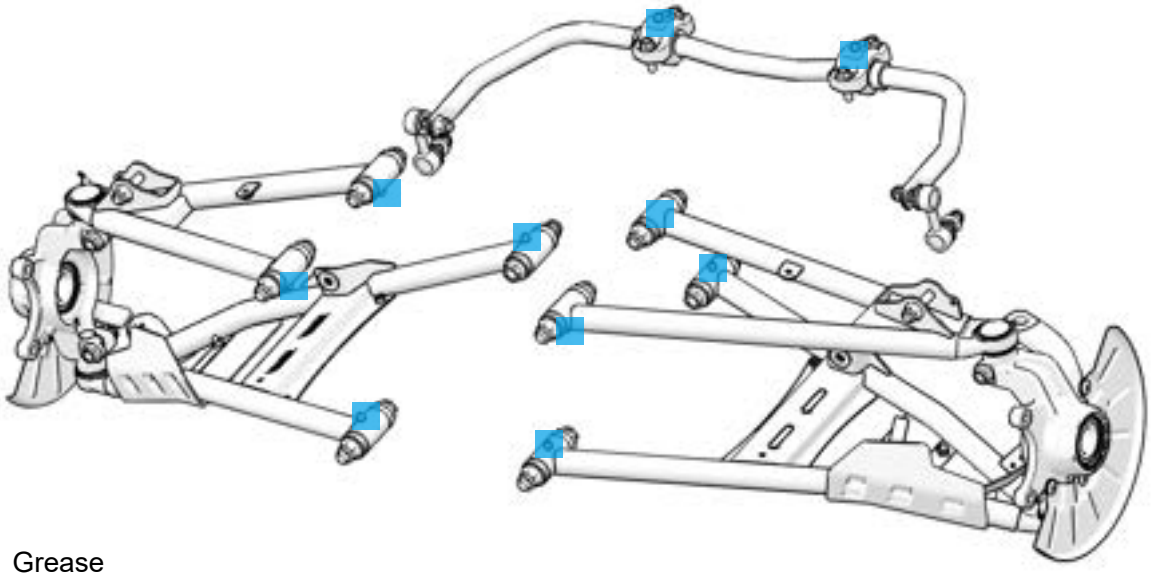


Grease

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	Inspection Method	Schedule
Front arm (upper and lower) / Front balance bar	Semi-synthetic waterproof grease	Grease fill (MAX 2 pumps)		Per 2000 miles
Rear balance bar	Semi-synthetic waterproof grease	Grease fill (MAX 2 pumps)	Grease fill (MAX 2 pumps)	Per 2000 miles
Driving shaft	Semi-synthetic waterproof grease	Grease fill (MAX 2 pumps)	Grease fill (MAX 2 pumps)	Per 2000 miles

Front arm (upper and lower) / Front balance bar

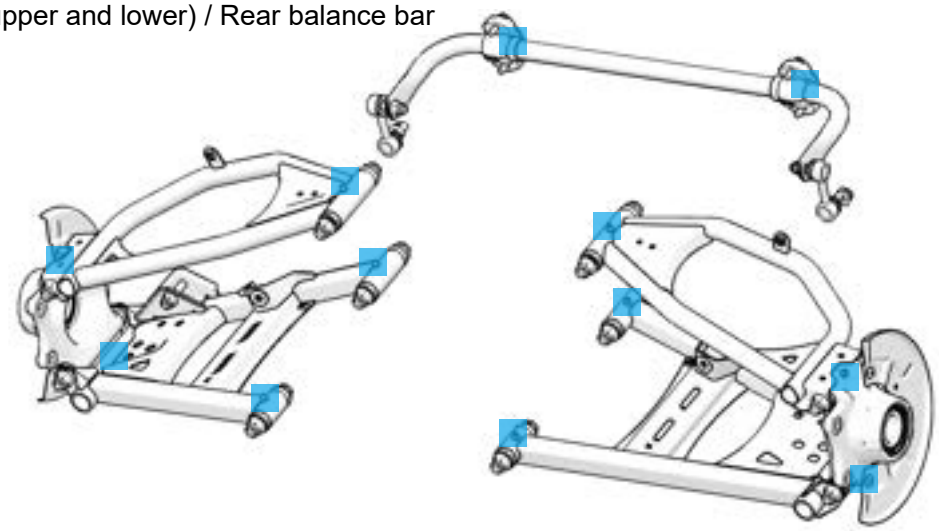


Grease

Driving shaft

Grease

IRear arm (upper and lower) / Rear balance bar



Grease

GENERAL VEHICLE INSPECTION AND MAINTENANCE

Pre-Ride / Daily Inspection

Perform the following pre-ride inspection daily, and when servicing the vehicle at each scheduled maintenance.

- Engine Oil - Check for proper level on dipstick located in oil tank (refer to “Engine Oil Level” procedure)
- Tires - check condition and pressures
- Fuel tank - fill to proper level
- All brakes - check operation and fluid level and adjustment (includes parking brake on INT’L Model)
- Throttle - check for free operation and closing
- Headlights/Taillights/Brakelights - also check operation of all indicator lights, instrument cluster and switches
- Ignition switch - check for proper function
- Wheels - check for tightness of wheel nuts and axle nuts; check to be sure axle nuts are secured by cotter pins
- Engine Intake Pre-Filter - Inspect pre-filter and clean with soapy water and compressed air if necessary
- Steering - check for free operation noting any unusual looseness in any area
- Loose parts - visually inspect vehicle for any damaged or loose nuts, bolts or fasteners
- Engine coolant - check for proper level at the recovery bottle
- Drive Shaft Boots - Inspect inner and outer boots for tears or damage on both front and rear drive shafts
- Check all front and rear suspension components for wear or damage.

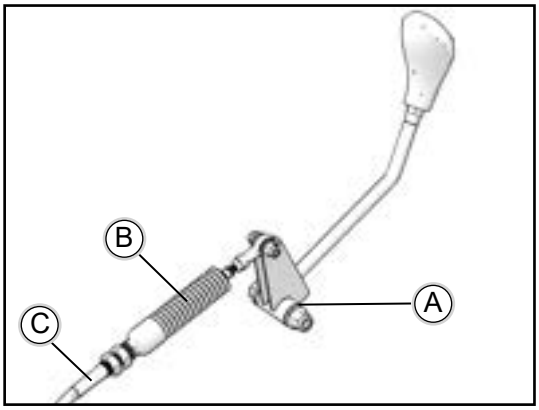
Frame, Nuts, Bolts, and Fasteners

- Periodically inspect the torque of all fasteners in accordance with the maintenance schedule. Check that all cotter pins are in place. Refer to specific fastener torques listed in each chapter.

Shift Cable Inspection / Adjustment

Shift cable adjustment may be necessary if symptoms include:

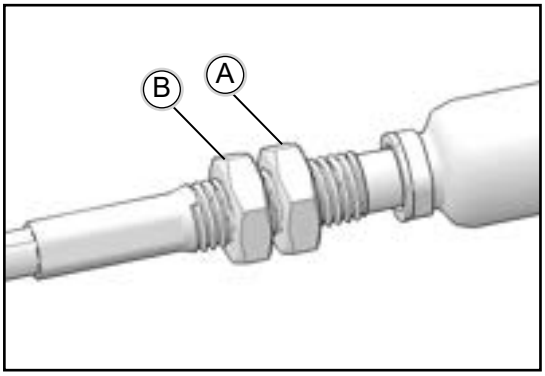
No gear position on instrument cluster
Ratcheting noise on deceleration
Inability to engage into a gear
Excessive gear lash (noise)
Gear selector moving out of desired range



【A】pivot bushings
【B】dust boot
【C】shift cable

- Locate the shift cable attached to the transmission case in the right rear wheel well area.
- Inspect shift cable, pivot bushings, and dust boot. Replace if worn or damaged.

If adjustment is required, loosen the lower jam nut and pull the cable out of the mount to move the upper jam nut.



【A】upper jam nut
【B】lower jam nut

- Adjust the shift cable so there is the same amount of cable travel when shifting slightly past HIGH gear and PARK.
- Thread the upper or lower jam nut as required to obtain proper cable adjustment.

NOTE

This procedure may require a few attempts to obtain the proper adjustment.

- Once the proper adjustment is obtained, place the shift cable and upper jam nut into the mount. Tighten the lower jam nut against the mount.
- Start engine and shift through all gears to ensure the shift cable is properly adjusted. If transmission still ratchets after cable adjustment, the transmission will require service.

FUEL SYSTEM AND AIR INTAKE

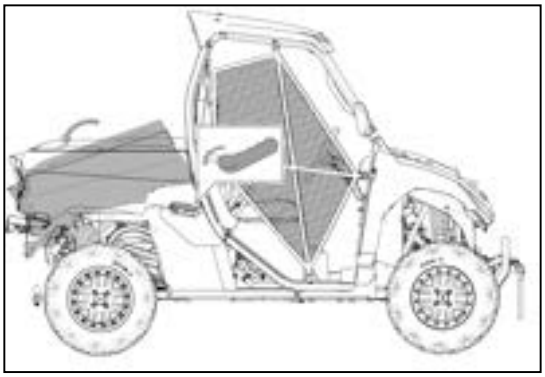
Fuel System

⚠ WARNING

Gasoline is very flammable 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 location. 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: collapsing fuel tank, engine miss or hesitation, loss of engine performance or high exhaust temperatures.

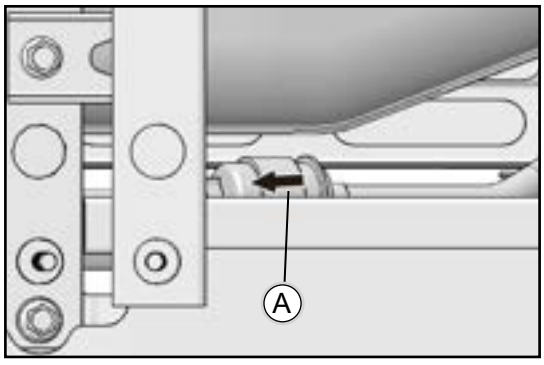
【A】Fuel Filter

The fuel filter is located on the back of the middle seat and is visible when the cargo box is turned over.

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

NOTE

- Be sure to install the filter in the orientation shown in the previous photo.

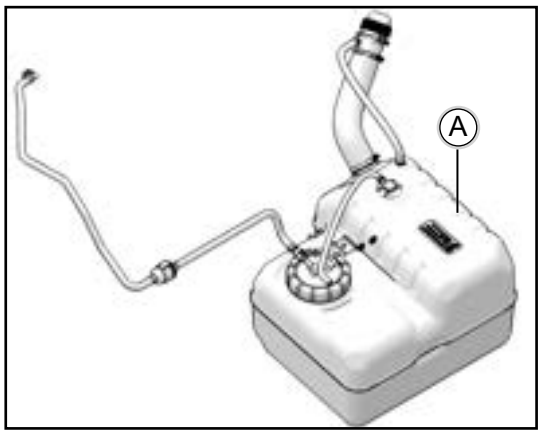


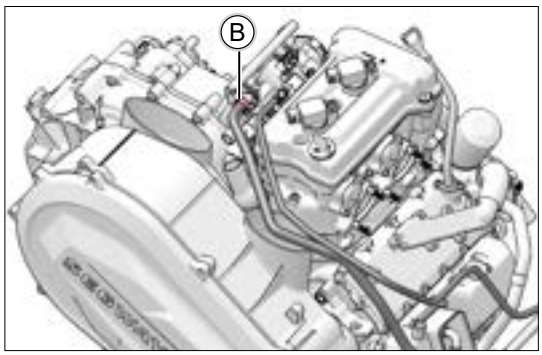
- Check the fuel tank vent line for signs of wear, deterioration or damage. Replace vent line if necessary.
- Be sure the vent line is routed properly and secured with cable tie(s).

IMPORTANT

Make sure vent line is not kinked or pinched.

Fuel Lines





【A】Fuel tank

【B】High pressure nozzle

- First check whether there is leakage at the pipeline connected onto the fuel tank, and check whether the fuel pipeline connected to the fuel tank is worn, deteriorated, or damaged. Replace the fuel line if necessary.
- Locate the high pressure oil line connected to the engine under the cargo box， Check the line and quick-connect fitting for signs of wear, deterioration, damage or leakage. Replace line if necessary.
- Locate the high pressure oil line connected to the engine under the cargo box，Check the line and quick-connect fitting for signs of wear, deterioration, damage or leakage. Replace line if necessary.
- Be sure fuel lines are routed and retained properly.

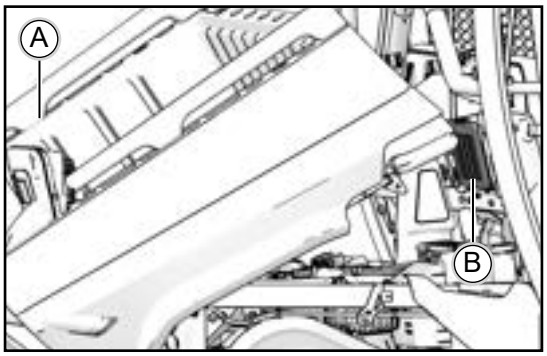
IMPORTANT

Make sure lines are not kinked or pinched.

Engine Intake Pre-Filter Service

It is recommended to check the engine intake pre-filter regularly. The filter should be inspected using the following procedure:

The engine air intake pre-filter is located behind the seat, which is visible when the cargo box is turned over.



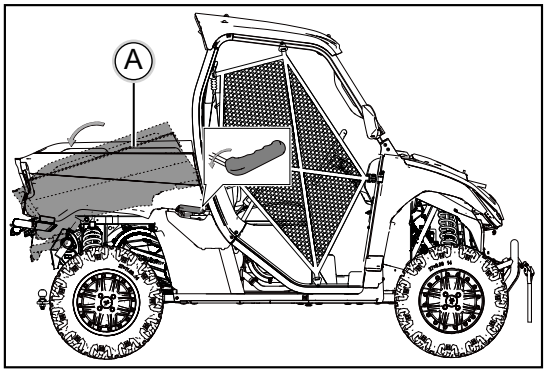
【A】Cargo box

【B】Air filter inlet cover

- First turn the cargo box
- Press the buckle on the air filter inlet cover
- Remove the air filter inlet cover
- Clean the inlet cover of the air filter
- If necessary, replace the air filter inlet cover

Air Filter Service

The air filter element is paper air filter element. The air filter needs to be replaced after being used for a period of time. In extremely dusty conditions, air filter replacement will be required more often. The air filter is located behind the seat and is visible when the cargo box is turned over.

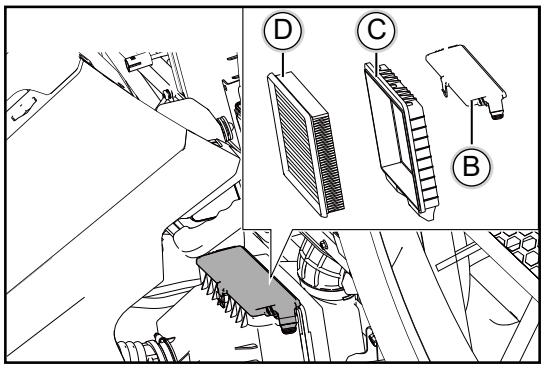


【A】Cargo box

【B】Air filter cover

【C】Filter bracket

【D】Air filter core



- First，turn the cargo box open
- Press the plastic buckle around the air filter cover inward and pull out the air filter cover
- Pull out the air filter cartridge
- Take the filter element out of the box and clean or replace the filter element according to its cleanliness
- Reinstall the filter element on the filter
- Reinstall the air filter cover
- Engage the cover latches and tighten the retaining knobs.
- Close the cargo box.

ENGINE

Engine Oil Level

IMPORTANT

Running the engine with an improper oil level can cause serious engine damage.

Engine oil model:

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

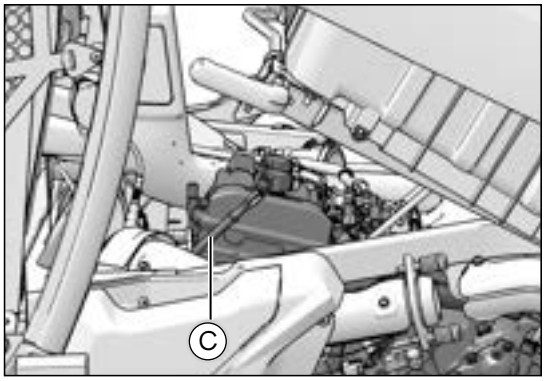
Engine oil capacity:

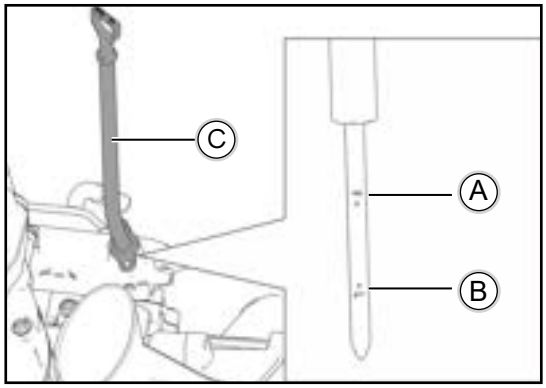
3.5 qts. (3300 ml)

To check oil level follow the procedure listed below:

Turn the open the cargo box

- Park the vehicle on a level ground.
- Start the vehicle and let the engine idle for 3 minute.
- Pull the dipstick out and check the oil level.





【A】Upper engraved line
【B】Lower engraved line
【C】Dipstick

Check the oil level as shown in the figure below: The oil level is between the Upper engraved line【A】and the Lower engraved line【B】. It is the proper oil level. Below the lower scale means the oil is too little, and the upper scale means the oil is too full, too little or Too full is not suitable.

- After cleaning the oil dipstick, fully insert it again.

Engine Oil Change

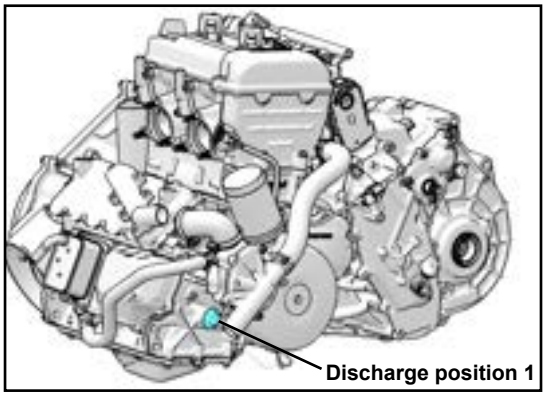
Always change engine oil and filter at the intervals outlined in the Periodic Maintenance Chart. Always change the oil filter whenever changing the engine oil.

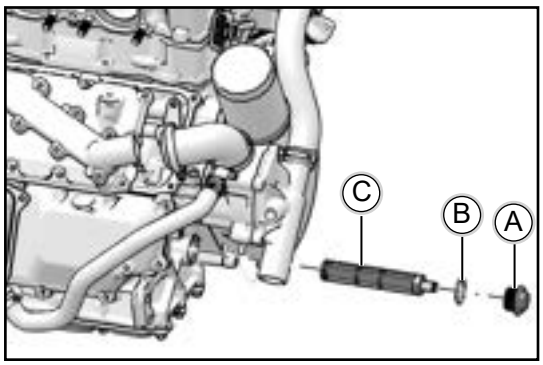
The oil tank drain plug is located on the bottom of the oil tank. Access the drain plug through left rear wheel well.

⚠ WARNING

Whenever changing oil change the oil filter.

Oil emission position 1 is located inside the left rear wheel of the vehicle, and oil emission position 2 is located the bottom of the vehicle.





【A】oil drain

【B】O-ring

【C】oil plug

【D】O-ring

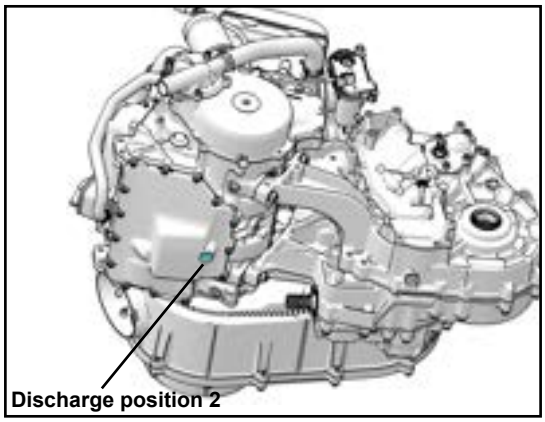
【E】oil drain plug

Discharge position 1

- Put the vehicle on the horizontal surface;
- Start the engine.Let it heat up for two to three minutes while it's idle;
- Stop the engine;
- Remove drain plug【A】and remove O-ring【B】;

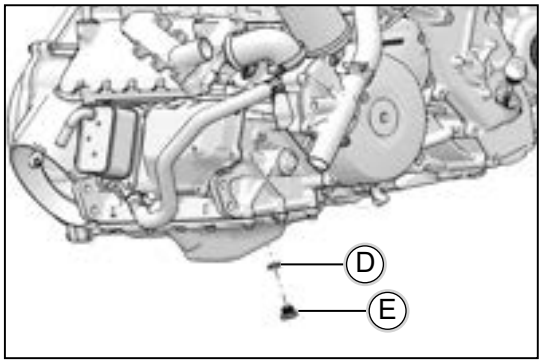
Torque of Drain Plug
16-20N.m(11.8-14.8ft·lb)

5. Take out the oil strainer【C】and wait for the waste oil to be discharged completely.



Discharge position 2

- Remove drain plug【E】, take off O-ring【D】and wait for the waste oil to be discharged completely. Hot oil can cause skin burns.Keep the hot oil away from the skin.
- Reinstall drain plug .



Torque specifications:

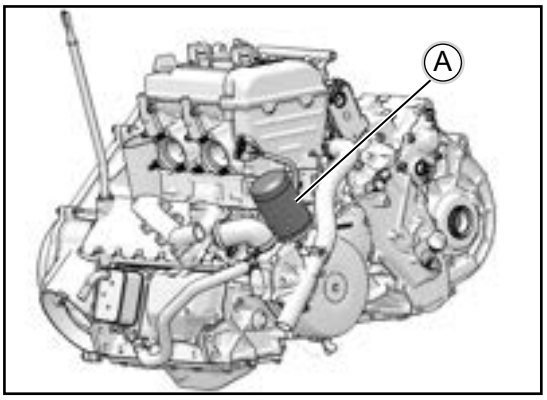
Torque of Drain Plug
16-20N.m(11.8-14.8ft·lb)

Replace oil filter/oil strainer

IMPORTANT

Change the oil filter and clean the oil strainer every time you change the oil

Change oil Filter

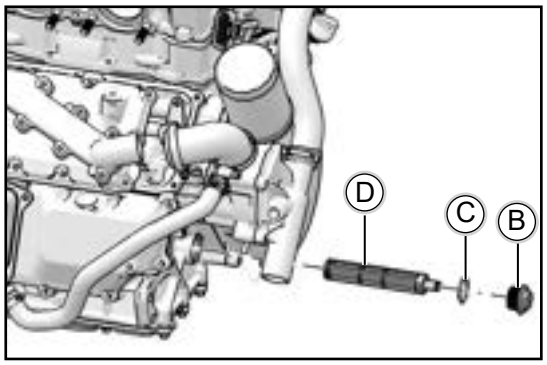


The oil filter is located inside the left rear wheel of the vehicle. Refer to fluid Recommendations for capacity and plug torque.Always change the filter at the same time you change the oil.

【A】oil Filter

- Unscrew the oil filter with tools and pay attention to the direction when unscrew.
- Install the new filter and manually rotate clockwise until the filter gasket touches the tight cover, then rotate by 3/4 turns.

Clean oil strainer



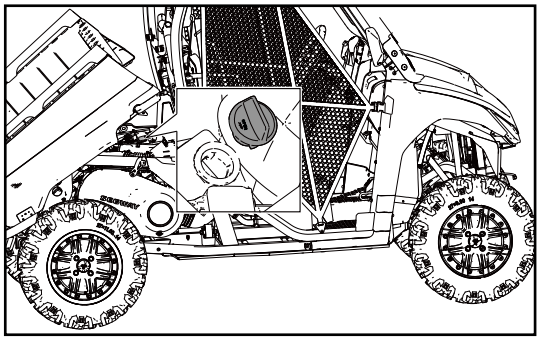
【B】oil drain plug

【C】O-ring

【D】oil strainer

Torque of Drain Plug
16-20N.m(11.8-14.8ft·lb)

- Remove the drain plug, take off the O-ring, and take out the oil strainer.
- Put the oil strainer into the cleaning aid for cleaning, and dry the cleaned strainer.
- Reinstall the washed oil strainer and replace the new O-ring when installing.



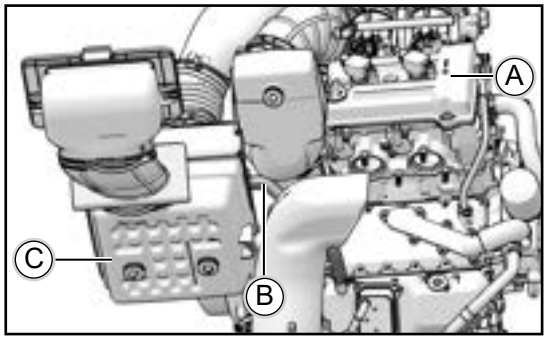
Add engine oil

Turn the cargo box , the engine oil cover is underneath the cargo box.

- Unscrew the oil cap counterclockwise.
- Add an appropriate amount of the recommended type of oil and do not overfill it. The oil level between the upper scale and the lower scale is appropriate.
- Retighten the oil cap.
- Put the gear shifter in parking gear.
- Lock parking brake.
- Start the engine and leave it idle for 1 to 2 minutes.
- Stop the engine.
- Check for leaks.
- Check the oil level and add oil as needed to make the oil level reach the mark on the ruler.
- Properly handle used filters and oil.

Engine / Oil Tank Breather Hose Inspection

The engine and oil tank are equipped with a breather hose. Inspect the breather hoses for possible kinks or wear. The hoses are form fitted for proper fit.

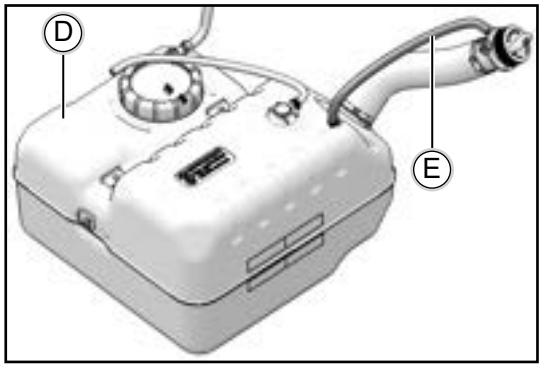


【A】Engine
【B】Engine breather hose
【C】Air filter
【D】Oil tank
【E】Oil tank breather hose

- **Engine Breather Hose: from the engine to the air filter.**.

- **Oil Tank Breather Hose:** from the middle of the fuel tank to fuel filler。

NOTE: Make sure hoses are not kinked or pinched.

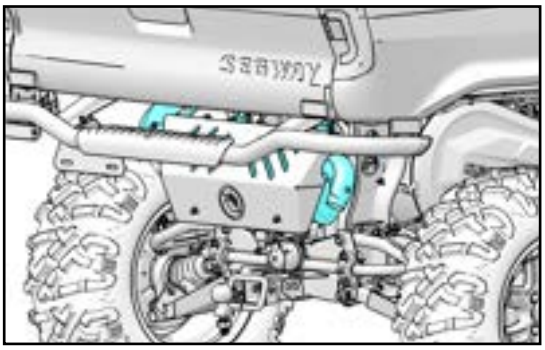


Engine Cylinder Leakdown Test

A cylinder leak-down test is the best indication of engine condition. Follow tester manufacturer's instructions to perform a cylinder leak-down test. Never use high pressure leakage testers as crankshaft seals may dislodge and leak.

Spark arrester

Spark eliminator prevents random sparks from entering other vehicles parts. Regular maintenance can prevent carbon accumulation, whereas delayed maintenance will reduce engine performance.



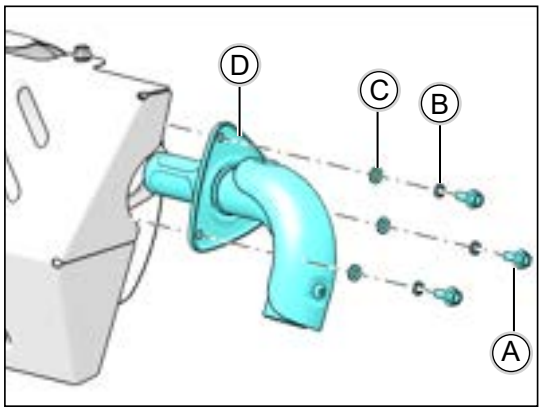
⚠ WARNING

Make sure the exhaust pipes are cool. The engine has just stopped working and the pipes can overheat and cause people burn.

To reduce fire hazards, ensure that there are no combustible material in the area when removing them from spark plugs.

Safety glasses are recommended in this procedure.

The exhaust pipe must be cleaned of accumulated carbon periodically as follows:



【A】Pan head screw M6×12
【B】Spring washer
【C】Flat washer
【D】Muffler spark arrester

1. Remove the 6 fastening bolts on the left and right muffler spark arrester【A】

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

2. Disassemble the muffler spark arrester
3. Use a non-synthetic brush to clean the arrester screenr. A synthetic brush may melt if components are warm. If necessary blow debris from the screen with compressed air.
4. Inspect the screen for wear and damage. Replace a worn or damaged screen.
5. Reinstall the muffler spark arrester and fastening screws

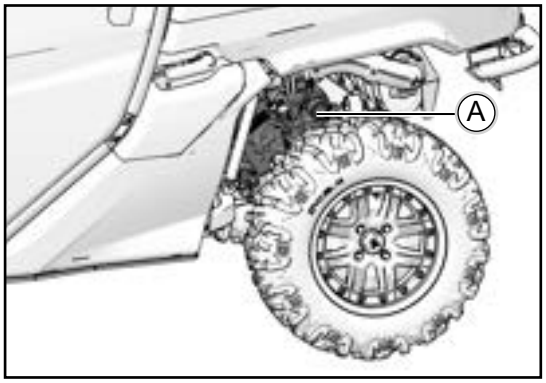
TRANSMISSION AND FRONT GEARCASE

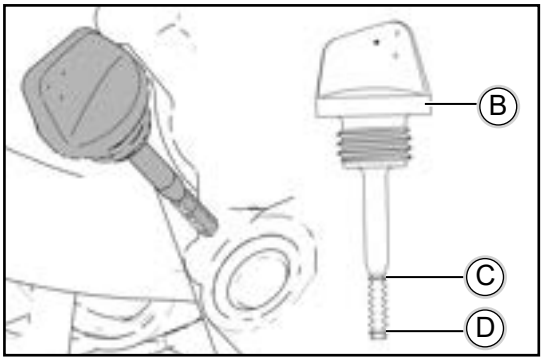
Check and replace the demand drive fluid at intervals in the periodic maintenance diagram.

⚠ CAUTION

If the front gearbox makes too much noise during 4WD operation, change the demand drive fluid.If the noise continues, please check the service of your dealer or other qualified service facility.

Use the recommended oil.Use of other liquids may result in improper unit operation. Maintain liquid level at bottom of filling hole thread.



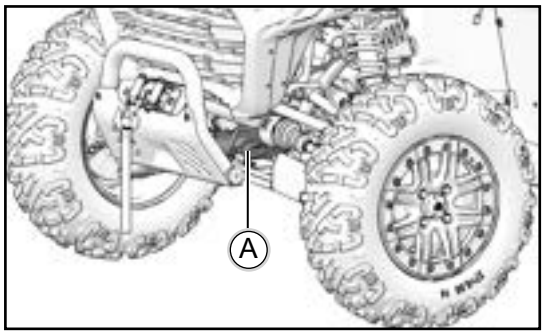


Check the level of rear gear box

【A】Rear axle gearbox
【B】Oil dipstick
【C】Upper reticle
【D】Undercut

1. Park the vehicle on the level ground.The engine warmer should wait at least five minutes to allow the oil to flow back to the bottom of the engine.
2. Place a piece of cotton cloth under the end of the oil ruler and pull out the oil ruler.
3. Wipe the oil ruler clean.
4. Re-insert completely;
5. Put a piece of cotton cloth under the end of the oil ruler, then pull out the oil ruler and check the oil level. Check the oil level as shown in the figure below: upper scale and lower scale. The oil level between upper scale and lower scale is the appropriate oil level. Lower than the lower scale means the oil level is too low, while higher than the upper scale means the oil level is too full, too little or too full is not appropriate
6. Wipe the oil ruler before reinserting it completely.

Check the level of front gear box

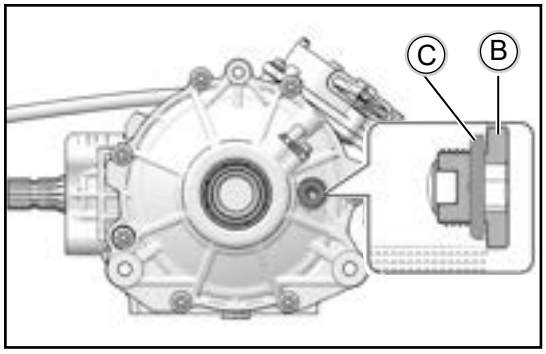


The front axle gearbox filling plug is located on the left side of the front gearbox, keeping the lubricating oil level flush with the bottom of the filling plug.

【A】Front axle gearbox

【B】Filling plug

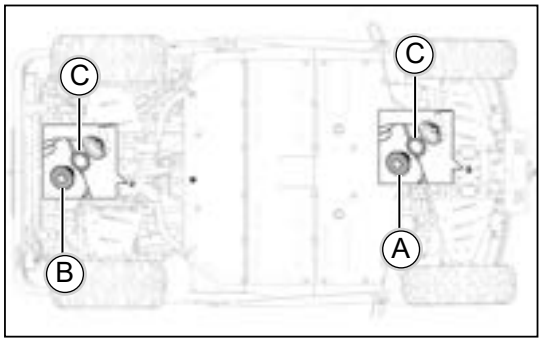
【C】O ring



1. Position vehicle on a level surface.
2. Remove the fill plug and check the lubricant level.
3. If lubricant level is not even with bottom threads, add recommended lubricant as needed. Do not overfill.
4. Reinstall the fill plug and torque to specification.

Torque of **Drain Plug**
16-20N.m(11.8-14.8ft·lb)

Front/rear gearbox oil discharge



【A】 Front axle oil drain plug

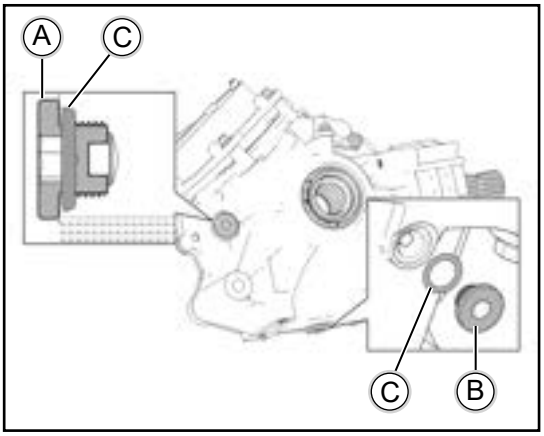
【B】 Rear gearbox oil drain plug

【C】O ring

1. Place a container under the vehicle to collect waste oil.
2. Put the vehicle on the horizontal surface and remove the injection plug and O ring.
3. Reinstall the injection plug after oil discharge is completed.Torque to required value:

Torque of **Drain Plug**
16-20N.m(11.8-14.8ft·lb)

Front axle oil filling



【A】**Filling plug**

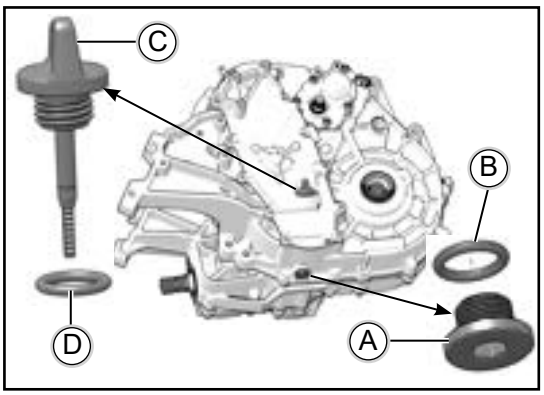
【B】**Drain Plug**

【B】O-ring

Torque of **Filling Plug/Drain pulg**
16-20N.m(11.8-14.8ft·lb)

1. Position the vehicle on a horizontal plane. Remove the drain plug.
2. Place the drain tray under the demand drive unit. Remove the drain plug【B】. Allow the fluid to drain completely.
3. Clean and reinstall the drain plug【B】. Torque to desired value.
4. Add the recommended amount of liquid.
5. Reinstall the injection plug.Torque to desired value.
6. Check the leakage situation. Dispose of used liquids properly.

Rear gearbox oil filling



【A】drain plug

【B】O-ring

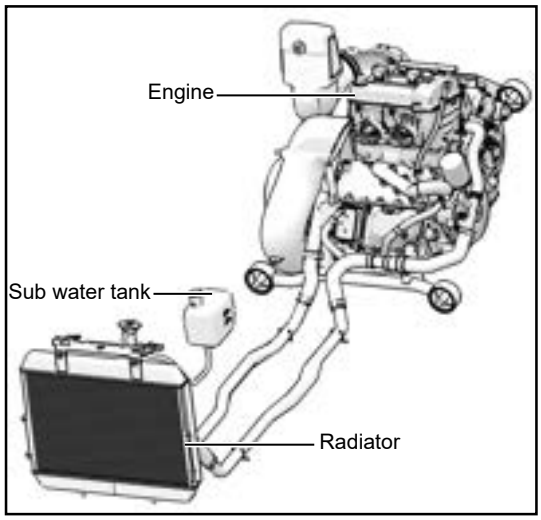
【C】Oil dipstick

【D】O-ring

Torque of **Drain pulg**
16-20N.m(11.8-14.8ft·lb)

1. Position the vehicle on a horizontal plane. Remove the drain plug.
2. Place the drain tray under the demand drive unit. Remove the drain plug【A】. Allow the fluid to drain completely.
3. Clean and reinstall the drain plug【A】. Torque to desired value.
4. Unscrew the oil dipstick of the rear gearbox.Add the recommended amount of liquid.
5. Re-tighten the oil dipstick of the rear gearbox.
6. Check the leakage situation. Dispose of used liquids properly.

COOLING SYSTEM



Cooling System Overview

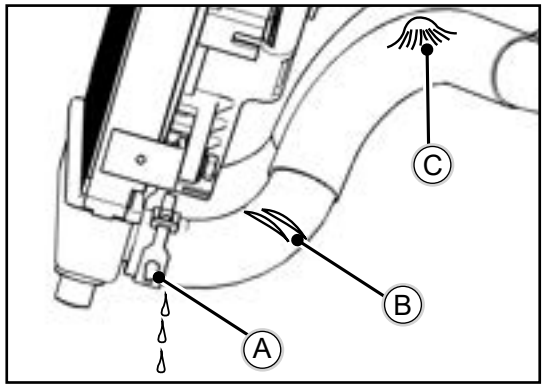
The engine coolant level is controlled, or maintained, by the recovery system. The recovery system components are the recovery bottle, radiator filler neck, radiator pressure cap and connecting hose.

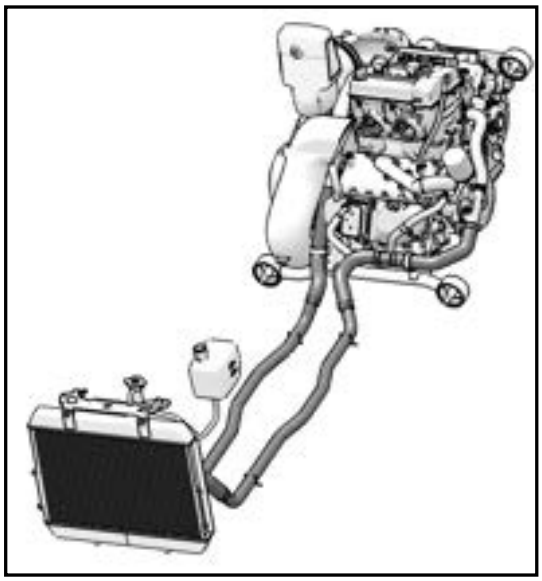
As coolant operating temperature increases, the expanding (heated) excess coolant is forced out of the radiator past the pressure cap and into the recovery bottle. As engine coolant temperature decreases the contracting (cooled) coolant is drawn back up from the tank past the pressure cap and into the radiator.

⚠ WARNING

Some coolant level drop on new machines is normal as the system is purging itself of trapped air. Observe coolant levels often during break-in period.

Overheating of engine could occur if air is not fully purged from system.





Cooling System Hoses

The high pressure inside the radiator hose can cause coolant to leak【A】 or the hose to burst if the line is not properly maintained. Visually inspect the hoses for signs of deterioration. Squeeze the hoses. A hose should not be hard and brittle, nor should it be soft or swollen.

Replace the hose if any fraying, cracks 【B】 or bulges 【C】 are noticed.

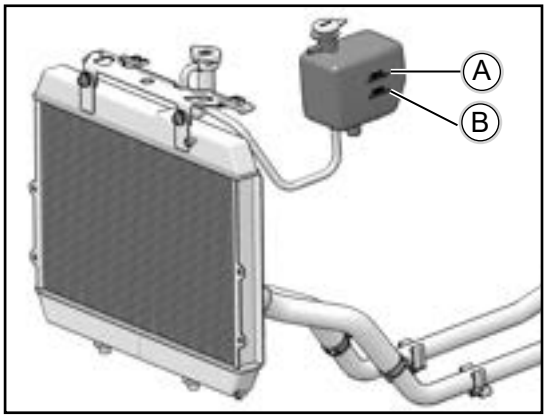
Check that the hoses are securely connected and clamps are tightened correctly.

- Inspect all vehicle hoses for cracks, deterioration, abrasion or leaks. Replace if necessary.
- Check tightness and condition of all hose spring clamps. Replace if necessary.
- Inspect all engine hoses for cracks, deterioration, abrasion or leaks. Replace if necessary.
- Check tightness and condition of all hose spring clamps. Replace if necessary.

Cooling bottle coolant

The coolant bottle is located under the hood of the vehicle's cargo compartment.

1. Remove the hood to observe the liquid level in the bottle.
2. If the liquid level is low, remove the cap and add the coolant as needed.Keep the coolant level between the MIN and MAX mark on the bottle (while the liquid cools).



【A】MAX

【B】MIN

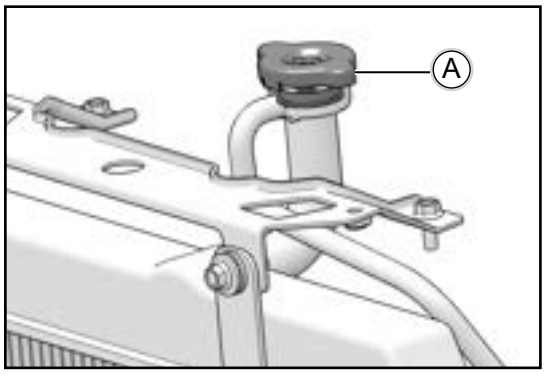
3. Unscrew the lid and pour in new coolant. Observe the coolant position when pouring and do not exceed the maximum liquid level;
4. Reinstall the lid.
5. Install the ventilation hood.

Radiator Coolant

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

⚠ CAUTION

A steam overflow can cause burns.Do not remove the pressure cap when the engine is warm or hot. The engine must be cooled before the pressure cap is removed



Replace coolant with fresh antifreeze 50/50 premix when any cooling system fluid is discharged for maintenance or repair.If the recovery bottle is empty, check the liquid level in the radiator.Add coolant as needed.

【A】Pressure CapRecovery

1. Remove the ventilation hood.
2. Remove the pressure cap.
3. Add the coolant slowly through the radiator filling port using a funnel.
4. Reinstall the pressure cap.The use of non-standard pressure caps will affect the normal operation of the recovery system. Your dealer can provide the correct replacement parts

PVT / FINAL DRIVE / WHEEL AND TIRE

CVT belt

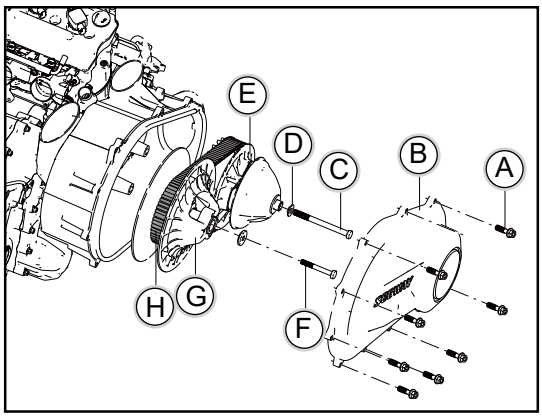
Replace the CVT drive belt according to the time specified in the vehicle maintenance schedule. If the CVT belt is damaged, it should also be replaced.

When replacing the belt, clean the pipe and clutch and the engine compartment for debris.

⚠ WARNING

Failure to remove all debris when the belt is replaced can result in vehicle damage, loss of control and serious injury or death

stop the engine of the vehicle before replacement and allow the vehicle to cool down adequately



【A】Cover Bolt 【B】CVT Cover

【C】CVT Driving Wheel mounting bolt

【D】Washer 【E】Driving wheel parts

【F】CVT Driven Wheel mounting bolt

【G】Driven wheel parts 【H】CVT belt

1. Loosen the 10 fastening bolts on the CVT cover and remove the CVT cover
2. Loosen the fixing bolts and washers on the CVT driving wheel component and the driven wheel respectively
3. Loosen the fixing bolts and washers on the CVT driving wheel component and the driven wheel respectively
4. Remove the CVT belt to be replaced

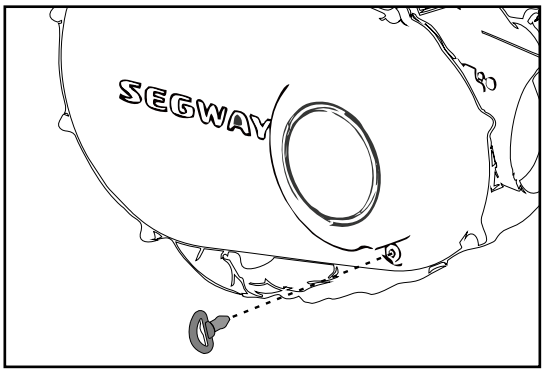
If there are debris in the CVT inner box, please remove all debris completely

5. Move the driven moving plate assembly forcefully to increase the gap between the driven and driving plate, and then install the new CVT belt on the driven wheel part
6. Install the other end of the CVT belt on the driving wheel, reinstall the driving wheel and driven wheel components with the new belt installed on the engine, and tighten the bolts to the specified torque

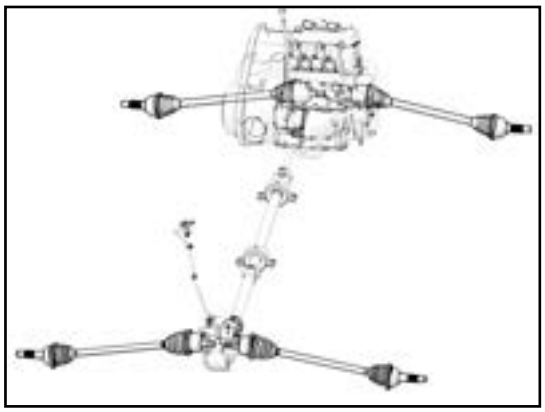
7. Turn the driven wheel component counterclockwise until the CVT belt is fully tightened
8. Install the CVT cover and tighten the fixing bolts

The CVT dry

In some cases, the water may soak into the CVT system and dry it before driving.



1. Remove the clutch drain plug.
2. Wait for the water to drain out and reinstall the water drain plug.
3. Place the transmission in "P" gear and pull up the parking handle.
4. Start the engine.
5. Lightly step on the accelerator pedal to increase the engine speed and maintain it for 10-15 seconds to expel moisture and air, and dry the belt and CVT. It is strictly forbidden to fully open the throttle.
6. Allow engine speed to be kept at idle speed.Use the brake.Convert transmission to the lowest available range.
7. Belt skid test.If the belt slides, repeat the process.
8. Your segway dealer can help if your vehicle needs service.



Drive Shaft Boot Inspection

Inspect the front and rear drive shaft boots for damage, tears, wear or leaking grease. If the boots exhibit any of these symptoms, they should be replaced. Check to see the boot clamps are properly positioned. Refer to Chapter 7 for drive shaft boot replacement.

NOTE

Do not lubricate the stud or the lug nut.

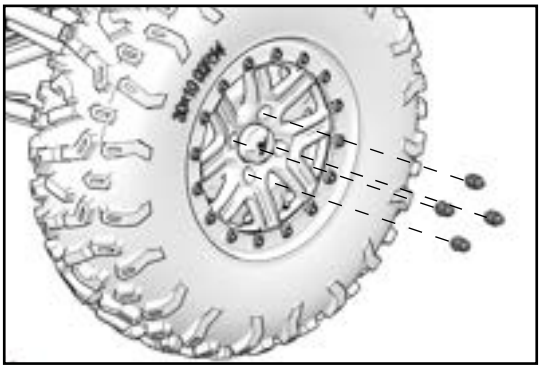
Wheel

Driving a vehicle with incorrect tire pressure may result in the following consequences:

- Reduce fuel efficiency
- Reduce driving comfort and shorten tire life
- Safety reduction

When checking tire pressure, follow the following instructions:

Tire pressure	The front wheel	The rear wheel
SINGLE CAB 27"	15 psi (103 kPa)	16 psi (110 kPa)
CREW CAB 27"	15 psi (103 kPa)	17.4 psi (120 kPa)
CREW CAB 30"	10 psi (70 kPa)	16 psi (110 kPa)



- Inspection can only be carried out after the tire cools down.
- If the vehicle has been parked for at least 3 hours, or has not driven more than 1.5km (0.9mi), the check at this time can get an accurate reading of the cold tire inflation pressure.
- Do use tire pressure gauges. Tire appearance can sometimes be misleading. In addition, even a few pounds less air in a tire can affect driving and handling performance.
- Don't reduce the tire pressure after driving. Increased tire pressure is normal after driving.

The recommended size		
Applications	The front wheel	The rear wheel
SINGLE CAB/ CREW CAB	27×9.00-14(NHS)	27×11.00-14(NHS)
SINGLE CAB/ CREW CAB	27×9.00-14	27×11.00-14
CREW CAB	30×10.00–R14	30×10.00–R14

Wheel Removal

1. Position the vehicle on a level surface.
2. Place the transmission in PARK and stop the engine.
3. Loosen the wheel nuts slightly. If wheel hub removal is required, remove the wheel cap, cotter pin and loosen the hub nut slightly.
4. Elevate the appropriate side of the vehicle by placing a suitable stand under the frame.
5. Remove the wheel nuts and remove the wheel.

Wheel Installation

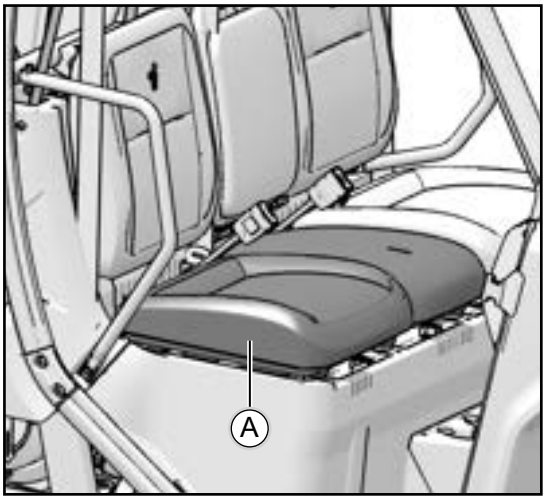
The installation of tires is opposite to the removal of tires. Please tighten the four tire nuts to the specified torque value.

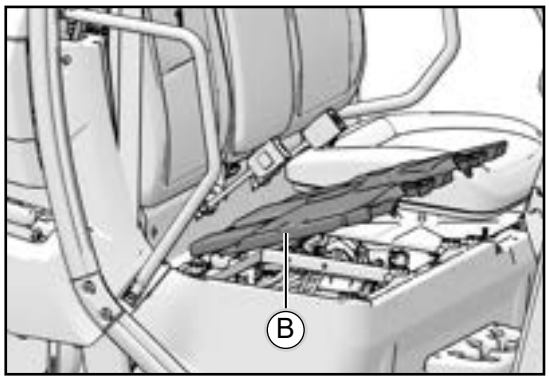
Torque of Mounting nuts
100~120N.m (74~88ft·lb)

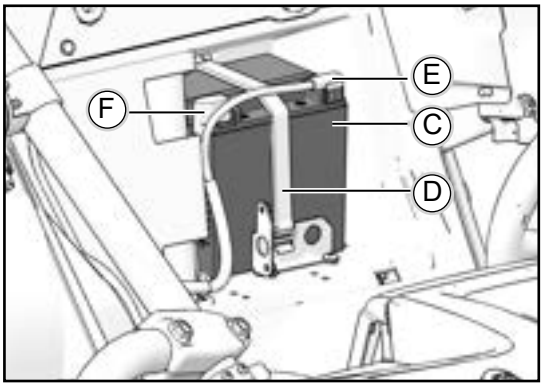
⚠ WARNING

Do not use wheels of different sizes than recommended in the User's Manual as this can cause the vehicle to lose control.

ELECTRICAL AND IGNITION SYSTEM







Battery disassembly

⚠ CAUTION

If the electrolyte overflows, immediately wash it off with a solution of 1 tablespoon baking soda and 1 cup water to prevent damage to the vehicle.

The battery is located behind the driver seat. If you want to replace or maintain the battery, please follow the following steps:

Cut off the power before removing battery

【A】Driver's seat

【B】Battery protective cover

【C】Battery

【D】Battery strap

【E】Battery positive wire

【F】Battery negative wire

- Please remove the seat【A】.
- Hold the groove behind the battery guard plate with your hands and move forward, and remove the battery board;
- Remove the battery strap;
- Turn up the Protective rubber sleeve;
- Remove the battery negative pole screw and disconnect the black (negative)【F】battery cable.
- Remove the battery positive pole screw and disconnect the red (positive)【E】battery cable.
- Remove the battery from the vehicle。

Battery charging

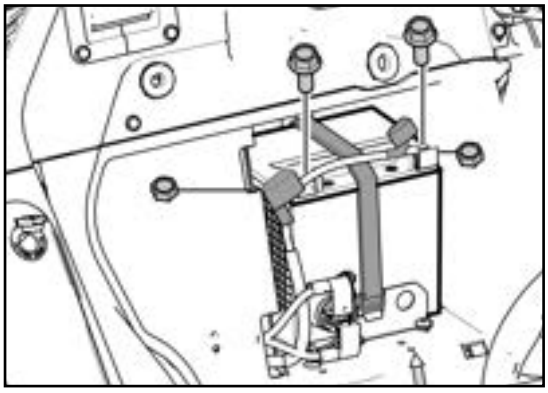
⚠ CAUTION

When charging, the hydrogen produced by the 12V battery is combustible explosive gas.Therefore, please follow the following precautions before charging:

If charging the 12V battery is still installed in the car, be sure to disconnect the ground cable.

Make sure the power switch on the charger is off when connecting and disconnecting the charger cable to the 12V battery.

Only charge slowly (5A or less).If charged quickly, the 12V battery may explode.

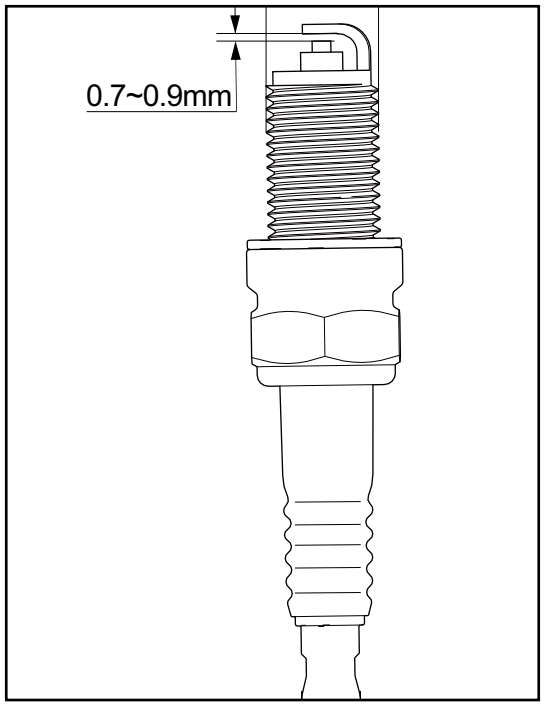


Battery installation

⚠ CAUTION

To reduce the chance of sparks: Whenever the battery is removed, disconnect the black (negative) cable first. When reinstalling the battery, finally install the black (negative) cable.

1. Clean battery cables and terminals with a hard wire brush.Corrosion can be removed with a solution of 1 cup water and 1 tablespoon baking soda.Rinse well and dry thoroughly.
2. Put the battery in the tray.
3. Connect and tighten the red (positive) cable.
4. Connect and tighten the black (negative) cable.
5. Install a clear battery vent from the vehicle to the battery vent.(For conventional batteries only).
6. Install the battery press plate;
7. Tighten the battery clamp bolt;
8. Verify that cables are properly wired.

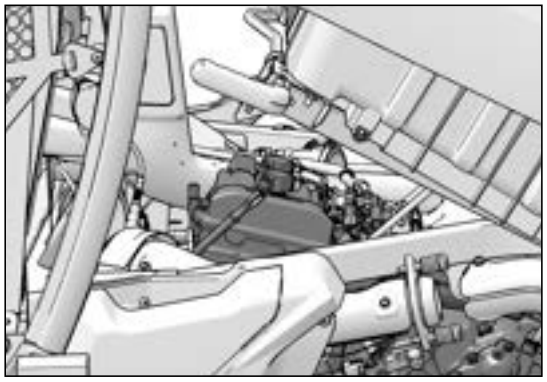


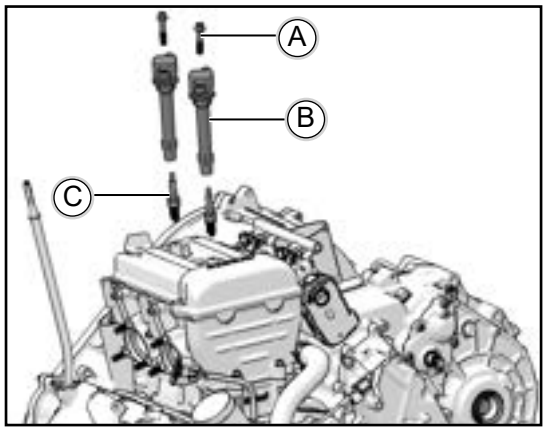
Spark plug

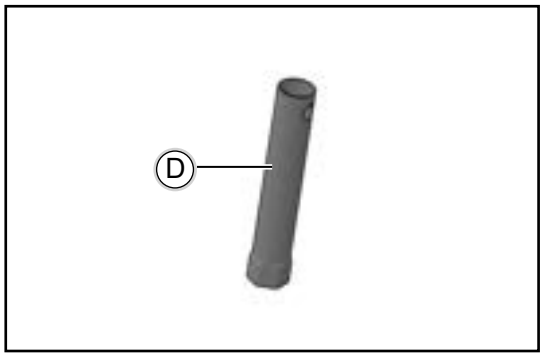
Refer to the recommended spark plug type and clearance specifications. Spark plug torque specification.

⚠ CAUTION

Using unrecommended spark plugs can cause serious engine damage. Always use the recommended spark plugs or their equivalents.







Spark Plug	Model	spark plug clearance
	CPR7EA / B7RTC	0.7-0.9mm

Spark plug inspection

Spark plug condition indicates engine running. Check or change the spark plugs with reference to the maintenance time of the periodic maintenance schedule.

⚠ CAUTION

Remove the spark plug for inspection need wear protective gloves, or hot exhaust system and engine will cause burns.

【A】Bolt

【B】Ignition coil

【C】Spark plug

【D】Spark plug sleeve

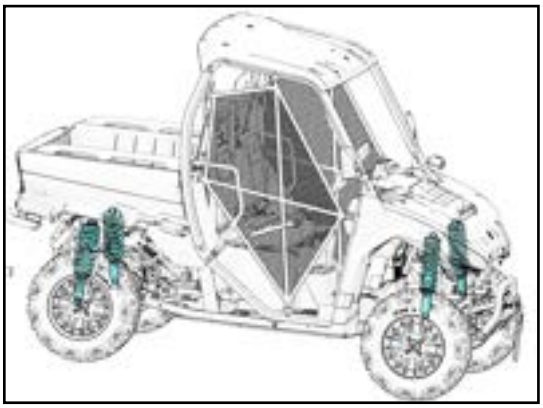
The spark plug is located under the cargo box. First turn the cargo box open. The twin-cylinder engine has two spark plugs. When replacing the spark plugs, please replace both spark plugs at the same time.

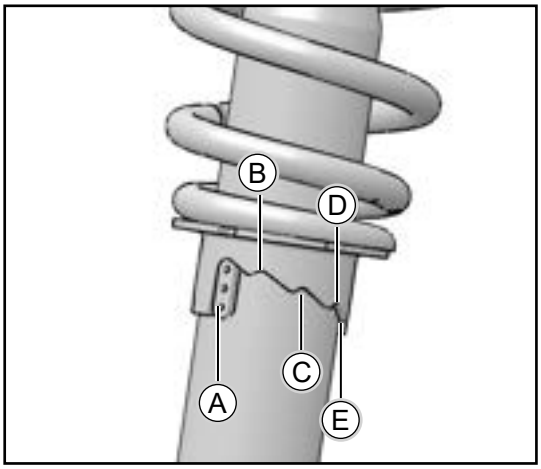
1. Remove the ignition coil fixing bolts;
2. Take out the ignition coil;
3. The spark plug is located below the ignition coil. Use tool to turn the spark plug cap 1/4 and remove it from the spark plug.
4. Rotate the spark plug counterclockwise and remove it.
5. Inspect the spark plug

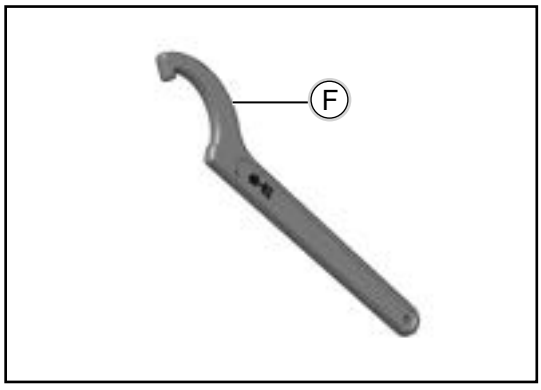
Spark plug normal status: The electrode part is grayish white, grayish yellow or light brown, and the electrode gap is about 0.7-0.9mm.

Spark plug to be replaced: The spark plug appears electrode ablation, carbon deposition, clearance is too large, at this time the spark plug should be replaced.

SUSPENSION







Oil shock absorber

There are different kinds of shock absorber fitted in UTVs depending on different configurations. Please adjust the shock absorber according the actual kind fitted in your UTV.

1. There are 5 shock absorption positions, which are used for different loads or driving conditions.

Position【A】: Standard position.

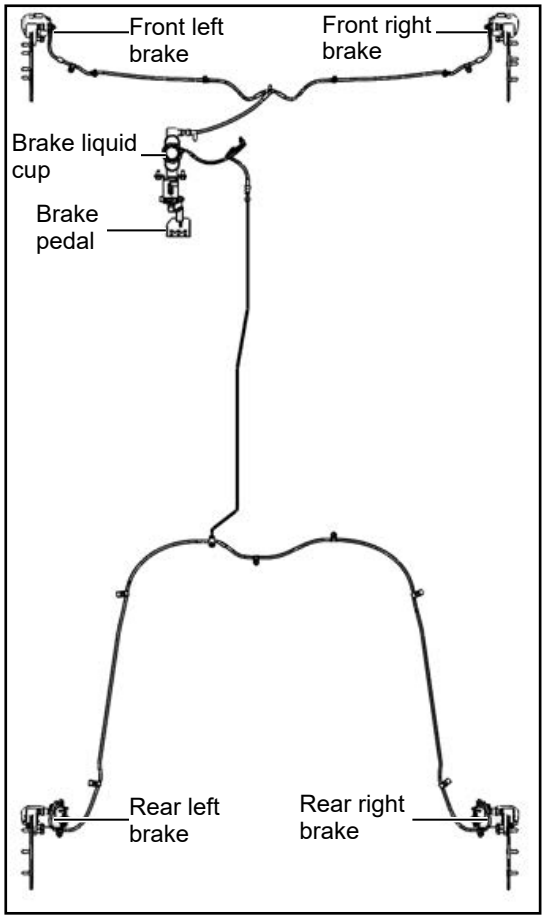
Position【B】~【E】: When UTV load is heavy, it can be adjusted to this position.

2. Use crescent wrench【F】to adjust the impact spring pressure.

⚠ CAUTION

When adjusting the shock absorption position, always adjust the left and right shock absorption to the same position; Step up or down one position at a time during adjustment. Do not try to make large adjustments which may damage the shock absorber.

BRAKE SYSTEM



The front and rear brakes are hydraulic disc type brakes activated by the brake pedal.

⚠ WARNING

Brake fluid levels must be checked periodically: overfilling of the brake cylinder may cause brake resistance or brake locking, which may result in serious injury or death. Keep brake fluid at the recommended level and do not overfill. Must check brake disc brake disc wear condition regularly: if brake disc wear, should be replaced.

The following inspection is recommended to keep the braking system in good working condition. If the brake is in heavy use during normal operation, check it frequently.

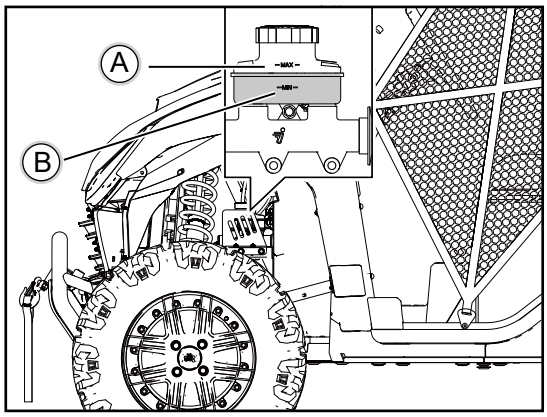
- Always keep the brake fluid at an appropriate level. Please refer to master cylinder/brake fluid section for details.
- Check the braking system for liquid leakage.
- Check whether the brake travels too long or feels soft.
- Check whether the friction gasket is worn, damaged or loose. When replacing the brake gasket, the brake pad must be replaced when the remaining limit thickness of the brake pad is not less than 1mm.
- Check the safety and surface condition of the disc. Use the recommended brake cleaner or liqueur to clean any grease. Do not use spray lubricants or other petroleum-based products. If any damage (crack, excessive corrosion, warping) is found, please check the dealer's service before operation.

Brake oil

Use the recommended brake oil:

Brake Oil	DOT4

No adjustment is required for the hydraulic assisted braking system. Check the brake oil level of the auxiliary braking system frequently. If the level is shown to be low, perform the following operations. The brake oil cup is located below the front panel.



1. The brake fluid cup is located at the lower left of the front panel .
2. Observe the liquid level in the container:

【A】**MAX**

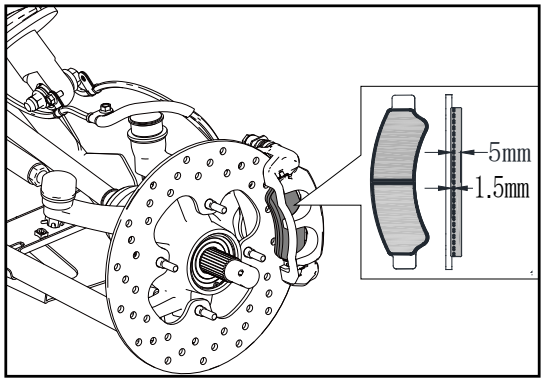
【B】**MIN**

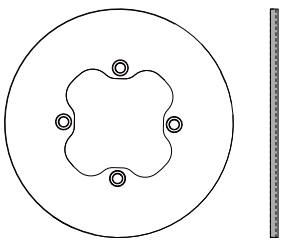
3. The brake fluid level is most suitable between the upper plane and the lower plane. If it is lower than the lower plane, please add the recommended brake fluid and observe the liquid level.

⚠ CAUTION

After replenishing or replacing the brake fluid, check whether the oil gasket under the oil cup cover is in an extended state. If the oil gasket is in an extended state, the oil gasket needs to be reset at this time (as shown in the figure). If the oil cup gasket is not reset, when the oil cup cover is tightened, the brake fluid will overflow the oil cup.Brake fluid can damage plastic and painted surfaces and should be added with caution.If the brake fluid comes into contact with the skin or eyes, flush with plenty of water immediately. If you feel unwell, seek medical advice immediately.

Brake component





Brake component consumption will depend on the severity of operating and operating conditions. Brake component consume faster in wet and muddy conditions. Periodically inspect brake component for consumption according to the maintenance periodic table. if the brake pad thickness is less than or equal to minimum thickness of 1.5 mm, the brake component must be replaced.

Brake pad thickness	Standard thickness	5.0 mm
	Minimum thickness	1.5 mm
brake discs thickness	Standard thickness	5.0 mm
	Minimum thickness	4.0 mm

ENGINE LUBRICATION SYSTEM

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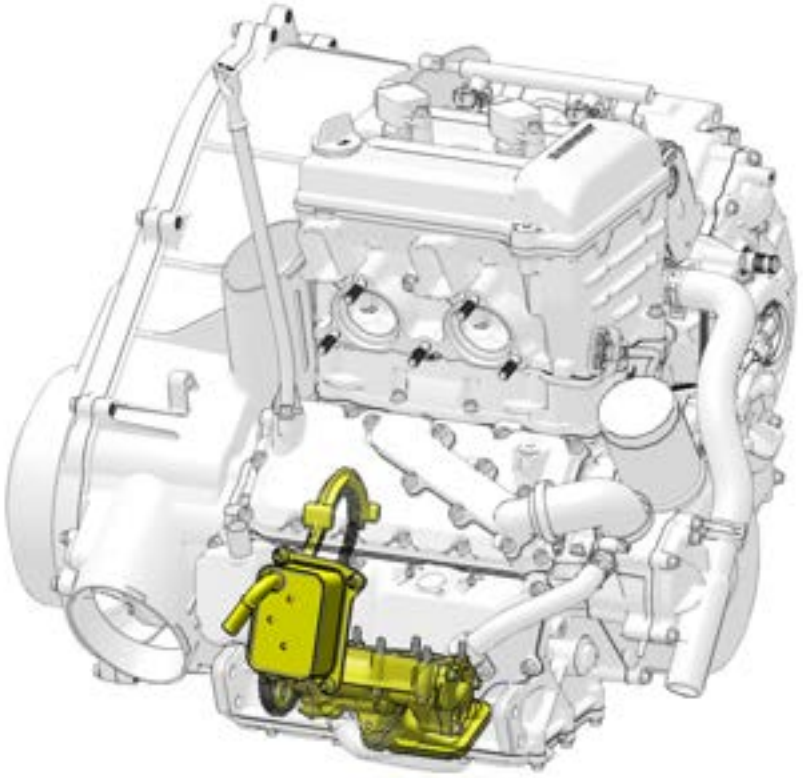
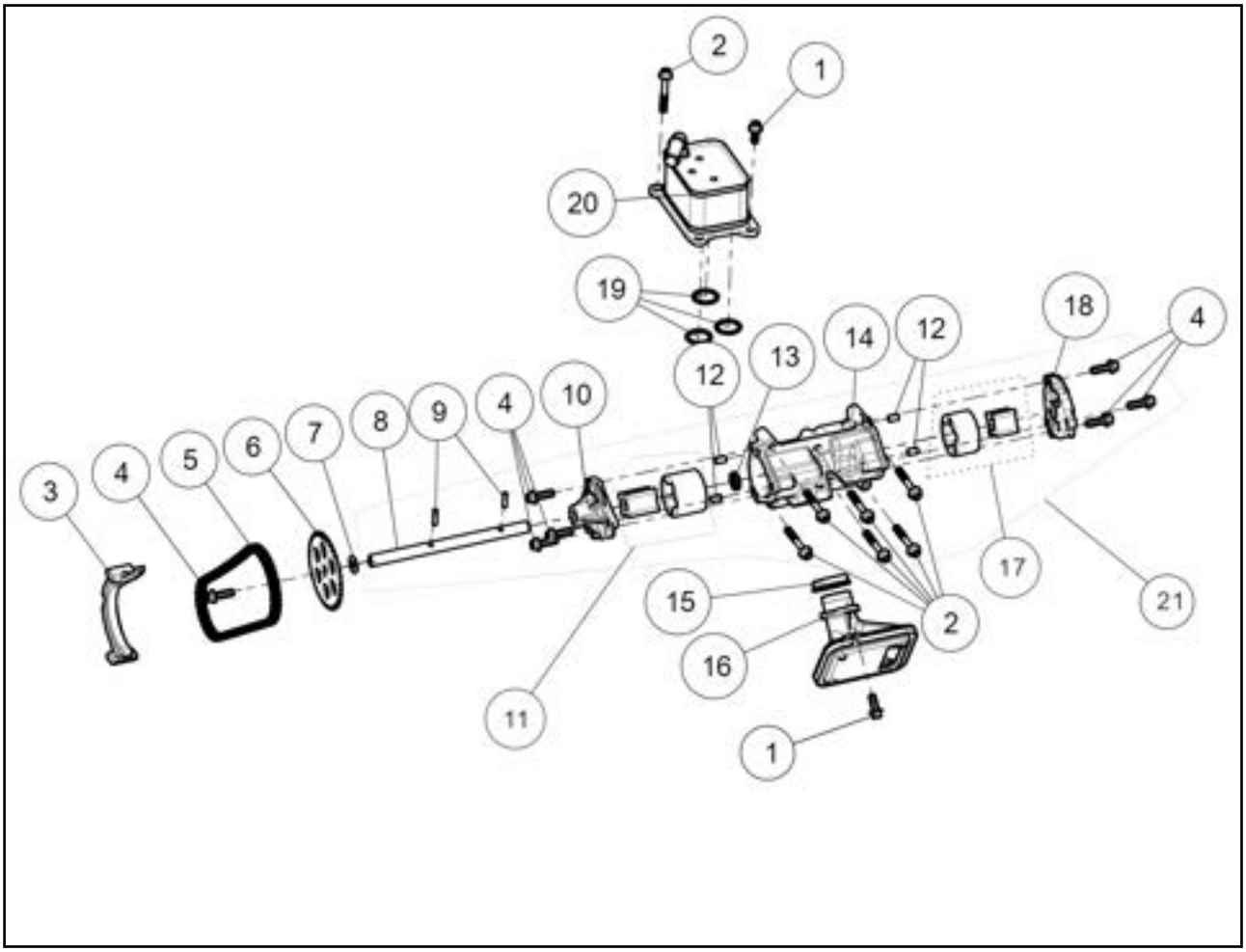
ENGINE LUBRICATION SYSTEM

EXPLODED VIEW





No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Bolt m6×16	9.8	1.0	87 in•lb	
2	Bolt m6×45	9.8	1.0	87 in•lb	
3	Oil pump chain guard plate				
4	Bolt m6×20	9.8	1.0	87 in•lb	
5	Oil pump chain assembly				
6	Oil pump driven sprocket				
7	Washer 6.5				
8	Oil pump shaft				
9	Needle roller p4×15.8				
10	Oil pump cover ii				
11	Auxiliary oil pump rotor combination				
12	Washer 10.6×18×1				
13	Oil seal 11×17×4				
14	Oil pump body				
15	Oil strainer seal ring				
16	Oil strainer assembly				
17	Main oil pump rotor combination				
18	Oil pump cover i				
19	Oil pump components				
20	Oil cooler assembly				
21	Oil pump components				

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

ENGINE LUBRICATION SYSTEM

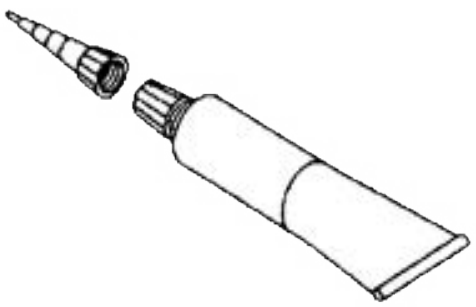
TECHNICAL PARAMETER

Item	Parameter
Engine Oil: Grade Viscosity Filling amount	 API SN or higher 5W-40/SN or higher 3.8 L (4.0 US qt) (First time，no residual oil in the engine） 3 L (2.72 US qt) (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^2

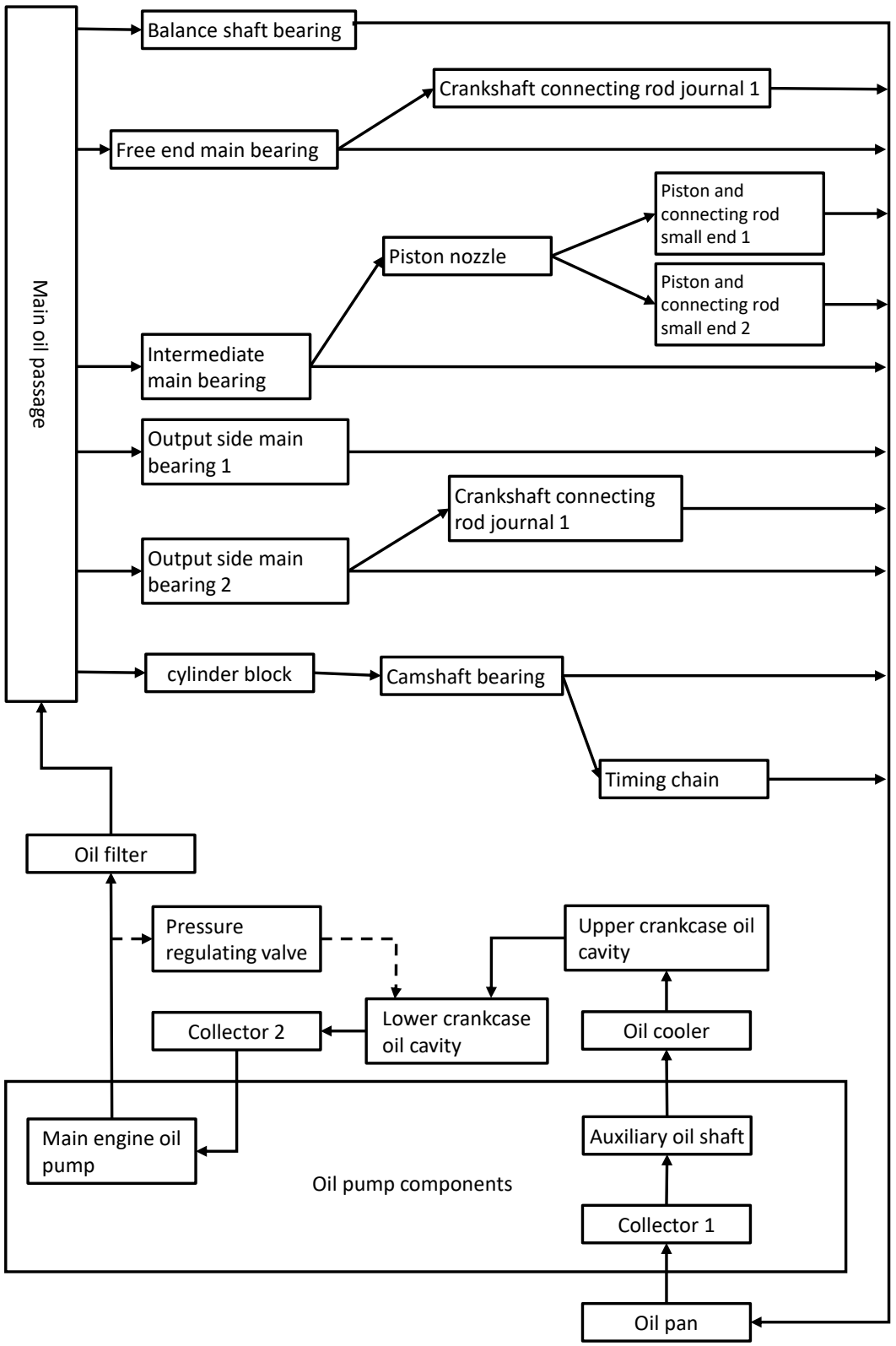
Thread fastening glue



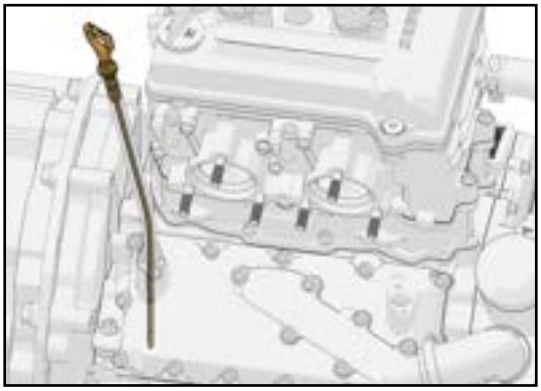
Oil pressure gauge connector

Oil fliter wrench
F02-G005003-000-01

ENGINE OIL FLOW CHART



OIL AND OIL FILTER



⚠ WARNING

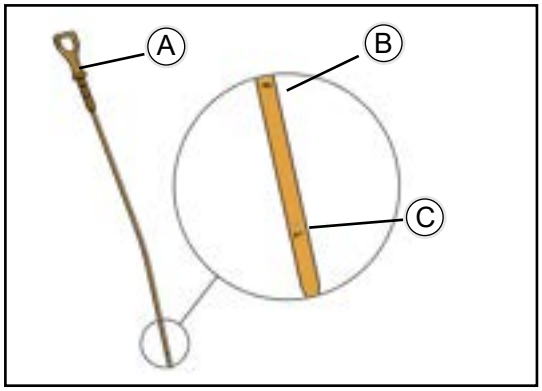
Running the vehicle with insufficient engine oil, deterioration or contamination may cause the engine or transmission system to jam, malfunction and damage

Oil level check

- Park the vehicle on a flat ground and keep it level
- If the oil has just been changed, start the engine, run it at idle speed for 5 minutes, fill the oil filter

⚠ CAUTION

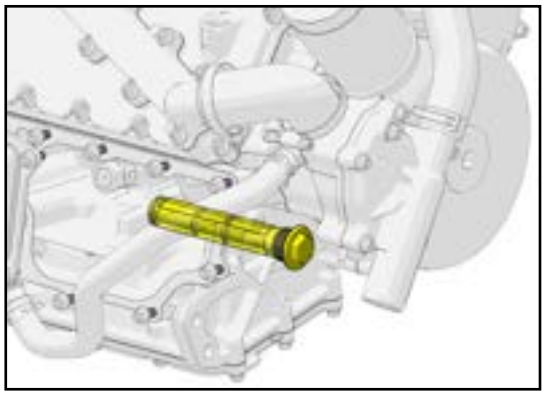
Let the engine idle for a few minutes so that the oil can reach all parts of the engine. Engine running in a state of lack of fuel will cause serious damage



- Stop the engine, wait 2 minutes, let the oil in the oil circuit return to the oil pan
- Pull out the oil dipstick assembly 【A】, dry the oil on the dipstick, and reinsert the dipstick tube
- Pull out the oil dipstick assembly 【A】 and check the oil level. The liquid level should be between the upper "H" level line 【B】 and the lower "L" level line 【C】

If the oil level is too high, the excess oil can be released through the oil drain plug

If the oil level is too low, you can replenish the oil through the oil filler. Using Segway Specialize Lubricant Oil Synthetic Blend Engine Oil 5W-40 is highly recommended.



Engine oil change

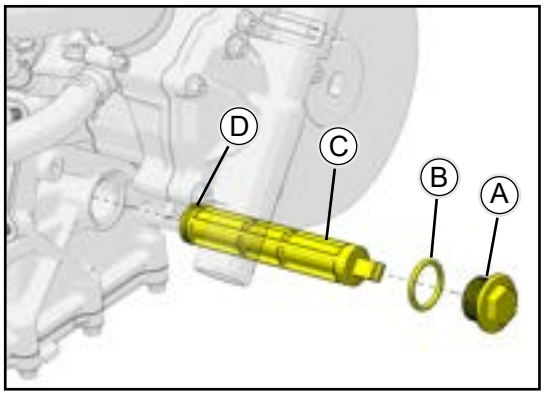
- Please refer to the Engine Oil Replacement Chapter in the Regular Maintenance chapter.

Remove the oil filter

- Please refer to the engine oil filter removal chapter in the regular maintenance chapter to refuel the oil filter

Clean the oil filter combination

- Disassemble
  - 【A】 Screw plugM24
  - 【B】 O-ring23×2.65
  - 【C】 Oil filter combination
  - 【D】 O-ring18×1.9



Clean the oil filter combination

- In any case, 【C】 should be cleaned thoroughly after taking out .
- Clean the coarse filter with a high flash point solvent to remove particles sticking to the filter.

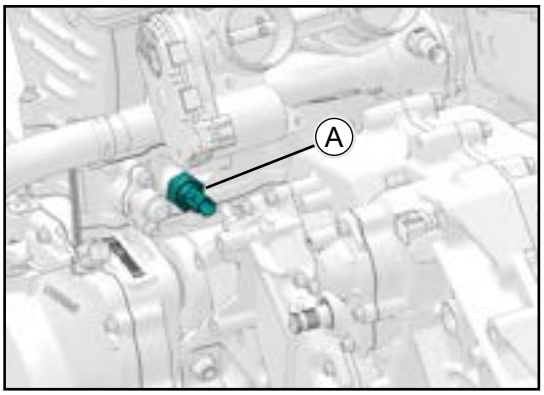
WARNING

Clean the filter in a well-ventilated area, and pay attention to no sparks or flames near the work area. Do not use gasoline or other low-flammability solvents to avoid the risk of fire.

TIPS

- When cleaning rough filters, check for metal particles that can damage the engine's interior
- Check the filter carefully for damage, holes, broken wires, or peeling gaskets. If the filter is damaged, replace with new parts

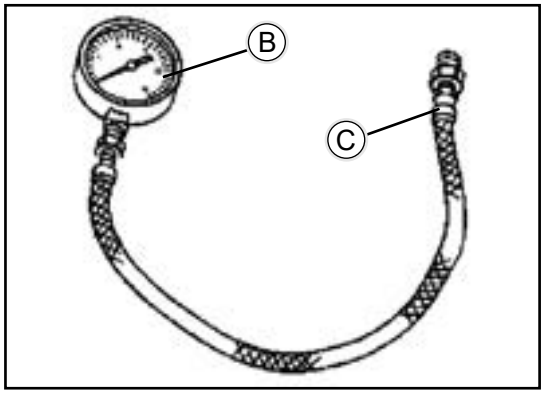
OIL PRESSURE



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/cm²
Oil pressure gauge connector



Oil pressure requirement (heat engine state)
More than 69 kPa (10 psi) @1400r/min (rpm) *More than 276 kPa (40 psi) @7000r/min (rpm)*

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

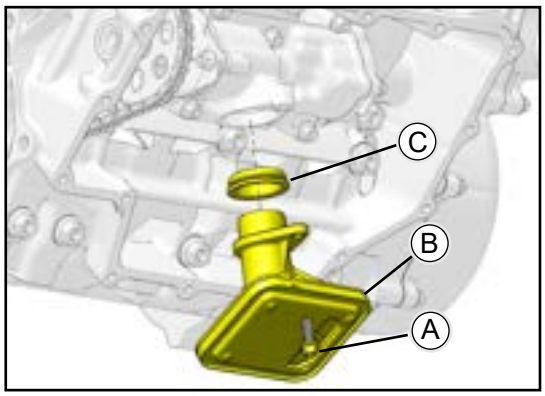
⚠ *WARNING*

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 PUMP



Remove the oil filter assembly

◆ Disassemble：

【A】 Bolt M6×16

【B】 Oil strainer assembly

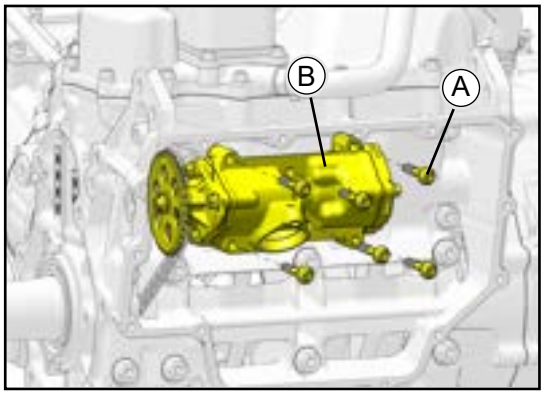
【C】 Oil strainer seal ring

Install the oil filter assembly

Put 【C】 on the 【B】 tube, the larger side of the outer ring is in contact with the upper flange surface of 【B】 Apply a proper amount of engine oil to the outer ring of 【C】, align the position of the oil hole, and press in 【B】 Install bolt 【A】, tighten it by torque

Tightening torque

Bolt 【A】
9.8 N•m (1.0kgf•m, 87 in•lb)



Remove the oil pump assembly

Disassemble

【A】 Bolt M6×45

【B】 Oil pump components

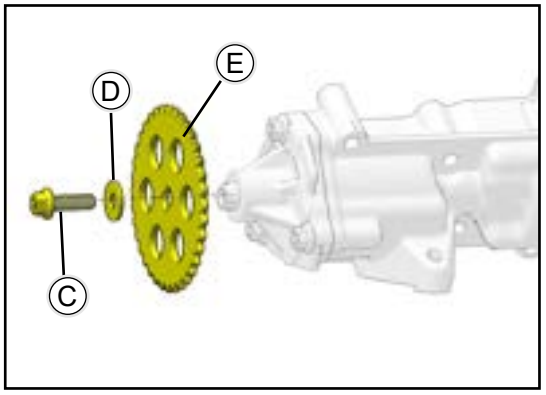
◆ Remove the bolt 【A】, turn 【B】 to an appropriate angle, and take it out after the chain is disconnected

◆ Disassemble：

【C】 Bolt M6×20

【D】 Washer 6.5

【E】 Oil pump driven sprocket



Install the oil pump assembly

◆ Align the position of the 【E】 notch with the upper shaft of 【B】, and install 【E】 and 【D】

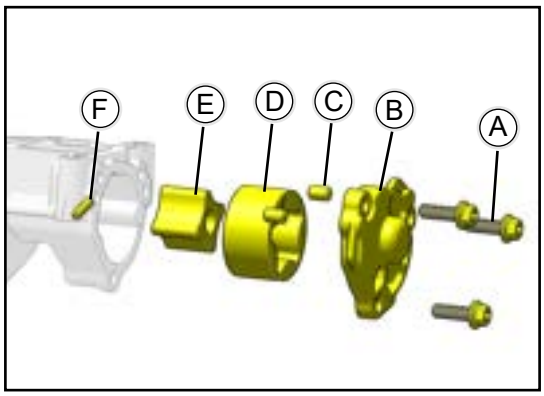
◆ Apply thread fastening glue to the thread of 【C】, screw in the bolt, and tighten it according to the torque

◆ Turn 【E】, it should turn flexibly and should not be stuck

◆ Put 【E】 into the chain, screw in the bolts 【A】 in order, and tighten to the specified torque

◆ Tightening torque

Bolt 【C】
9.8 N•m (1.0kgf•m, 87 in•lb)



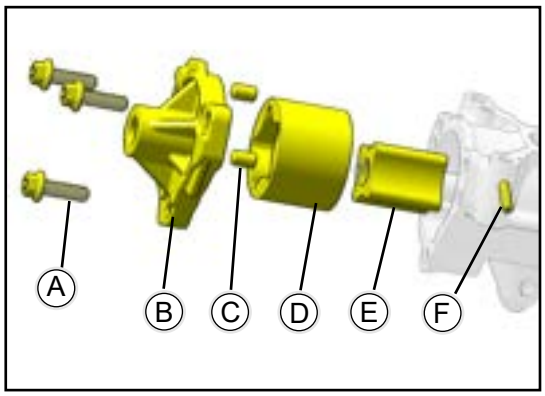
Remove the main engine oil pump rotor

- Disassemble：
  【A】 BoltM6×20
  【B】 Oil pump cover Ⅰ
  【C】 Cylindrical pin 6×10
  【D】 Main engine oil pump outer rotor
  【E】 Inner rotor of main engine oil pump
  【F】 Roller pin

Install the main engine oil pump rotor

- Insert the needle 【F】 into the needle hole of the oil pump shaft
- Install the main engine oil pump inner rotor 【E】, main engine oil pump outer rotor 【D】, cylindrical pin 【C】 in order
- Apply sealant on the joint surface of the oil pump cover Ⅰ【B】, align the position of the pin hole and install it
- Screw in the bolt 【A】 and tighten to the specified torque in sequence
- Tightening torque

Bolt 【A】
9.8 N•m (1.0kgf•m, 87 in•lb)



Remove the auxiliary oil pump rotor

◆ Disassemble：

【A】 Bolt M6×20

【B】 Oil pump cover Ⅱ

【C】 Cylindrical pin 6×10

【D】 Outer rotor of auxiliary oil pump

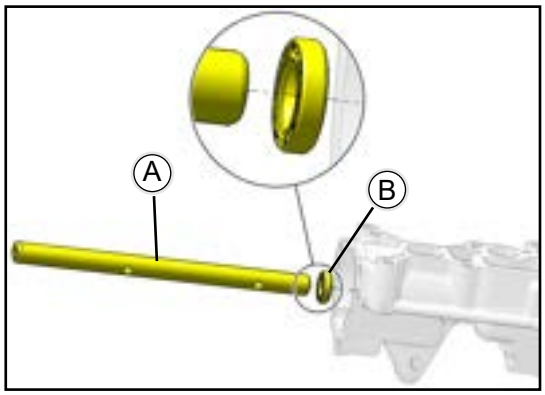
【E】 Inner rotor of auxiliary oil pump

【F】 Roller pin

Install the auxiliary oil pump rotor

◆ Replace with a new oil seal 【B】 and press it into the oil pump body. The sealing lip side should face inward

◆ Insert the oil pump shaft, the side with the threaded hole should face outward



Remove the oil pump shaft and oil seal

【A】 Oil pump shaft

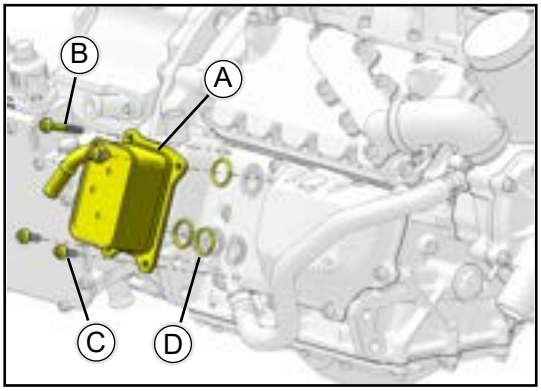
【B】 Oil seal 11×17×4

Install the oil pump shaft and oil seal

◆ Replace with a new oil seal 【B】 and press it into the oil pump body. The sealing lip side should face inward

◆ Insert the oil pump shaft, the side with the threaded hole should face outward

OIL COOLER ASSEMBLY



Remove the oil cooler assembly

◆ Drain the engine coolant and oil

◆ Disassemble

【A】 Oil cooler assembly

【B】 Bolt M6×40

【C】 Bolt M6×16

【D】 OO-ring 19×2.5

Install the oil cooler assembly

◆ Use a new O-ring and press it into the seal groove

◆ Align the bolt holes of the oil cooler and screw in the bolts 【B】 【C】

◆ Tightening torque

Bolt 【B】 【C】
9.8 N•m (1.0kgf•m, 87 in•lb)

◆ Replenish engine coolant and oil

⚠ *CAUTION*

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

EFI SYSTEM

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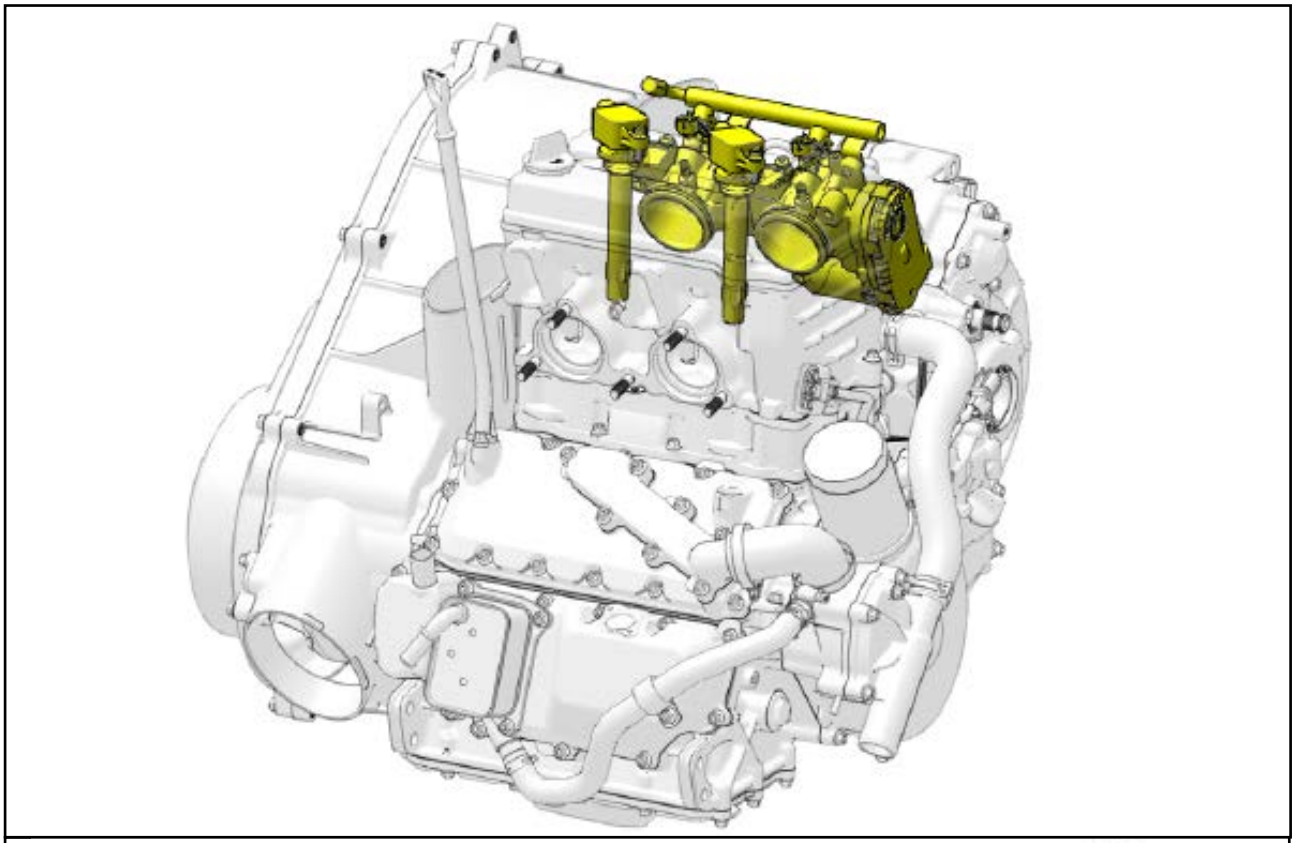
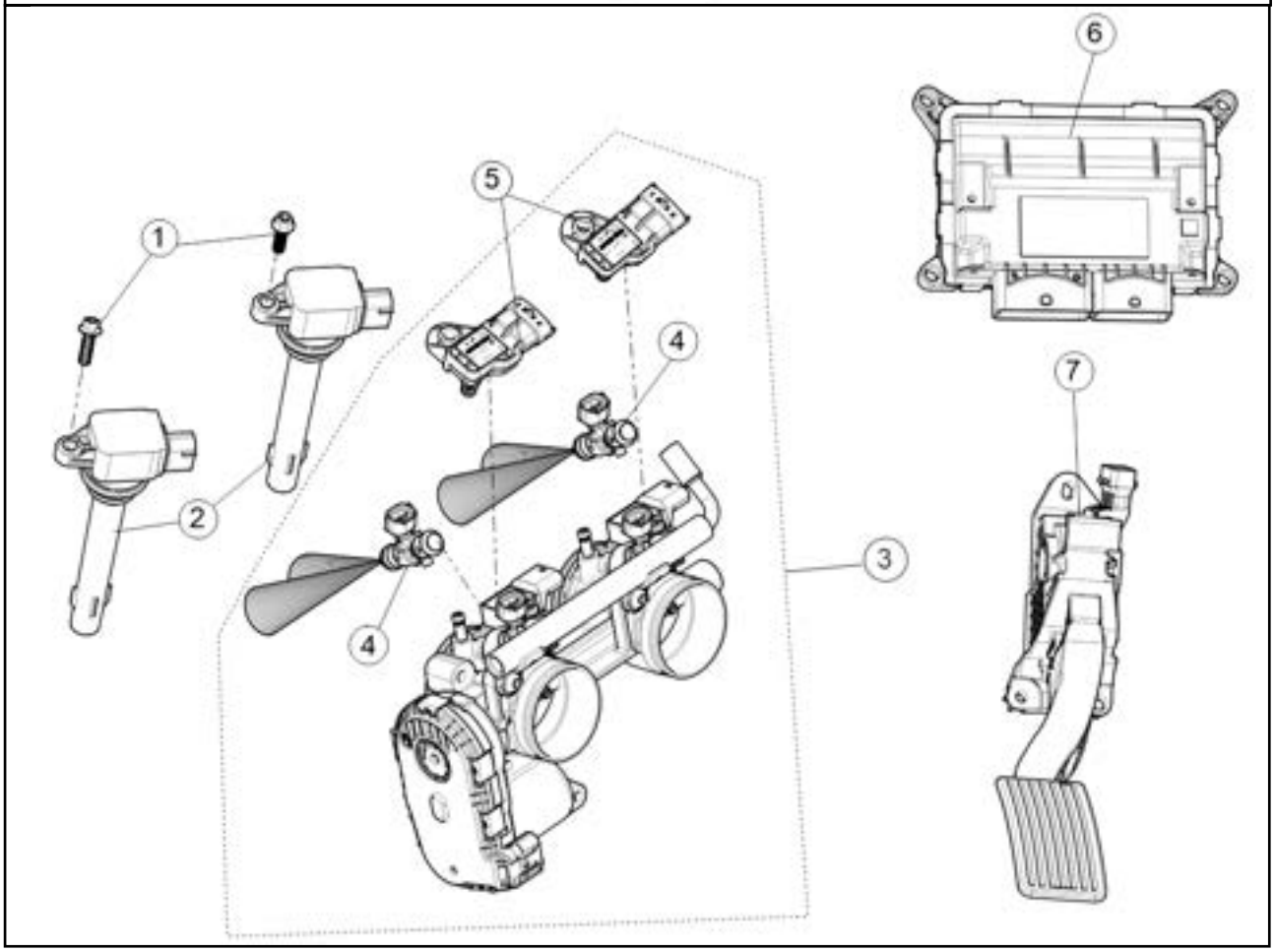
Disassemble the electronic throttle body assembly.....3-2-4

Install the ignition coil.....3-2-4

Install the electronic throttle body assembly.....3-2-4

EXPLODED VIEW





No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Bolt M6×20	9.8	1.0	87 in•lb	
2	Ignition coils				
3	Electronic throttle body assembly				
4	Fuel injector				
5	Intake air temperature pressure sensor				
6	ECU				
7	Accelerator pedal assembly				

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

L: Use fastening agent.

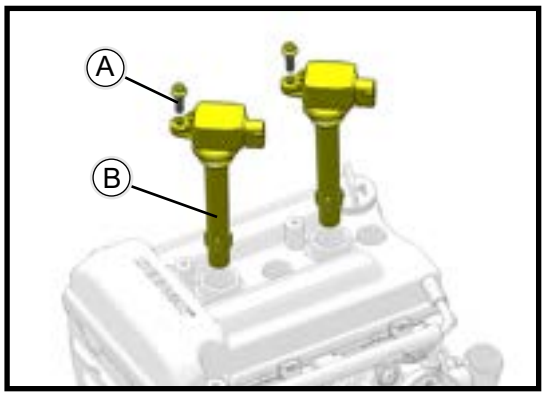
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

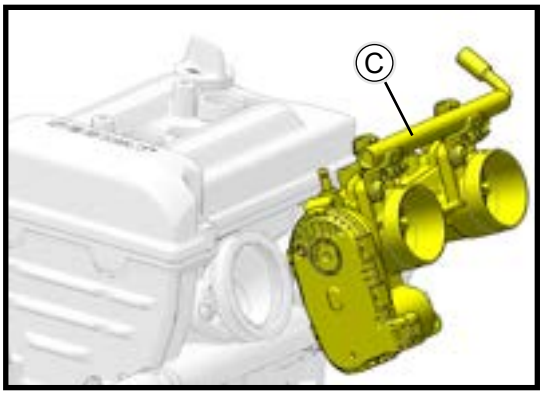
R: Spare parts

EFI SYSTEM



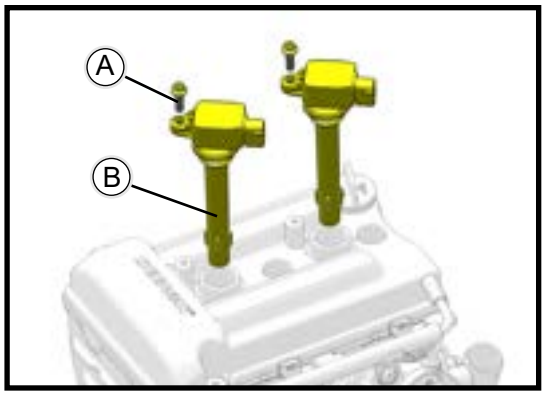
Remove the ignition coil

◆ Remove the two bolts 【A】, pull out the ignition coil 【B】



Disassemble the electronic throttle valve assembly

◆ Loosen the clamps on the intake pipes and disassemble the electronic throttle valve assembly



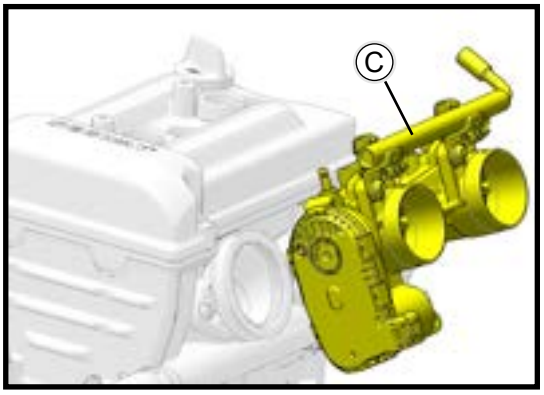
Install the ignition coil

◆ Insert the ignition coil 【B】 into the ignition coil hole of the cylinder head cover, and connect the spark plug

◆ Screw in the bolt 【A】 and tighten it according to the torque

◆ Tightening torque

Bolt 【A】
9.8 N·m (1 kgf·m, 87 in•lb)



Install the electronic throttle valve assembly

◆ Loosen the clamps on the intake pipes, align the electronic throttle valve assembly with the intake pipe and insert, and tighten the two intake pipe clamps.

STARTING SYSTEM

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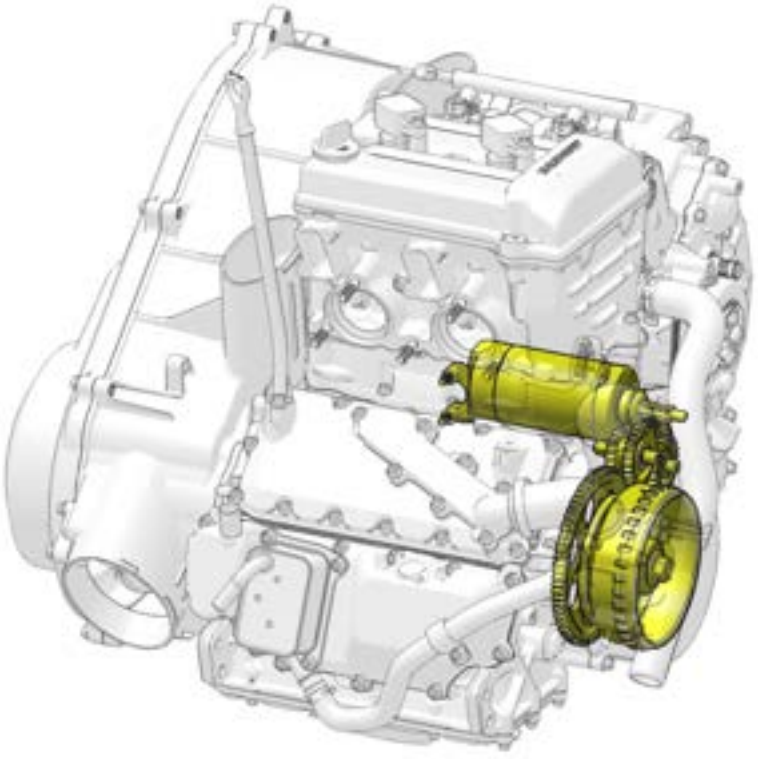
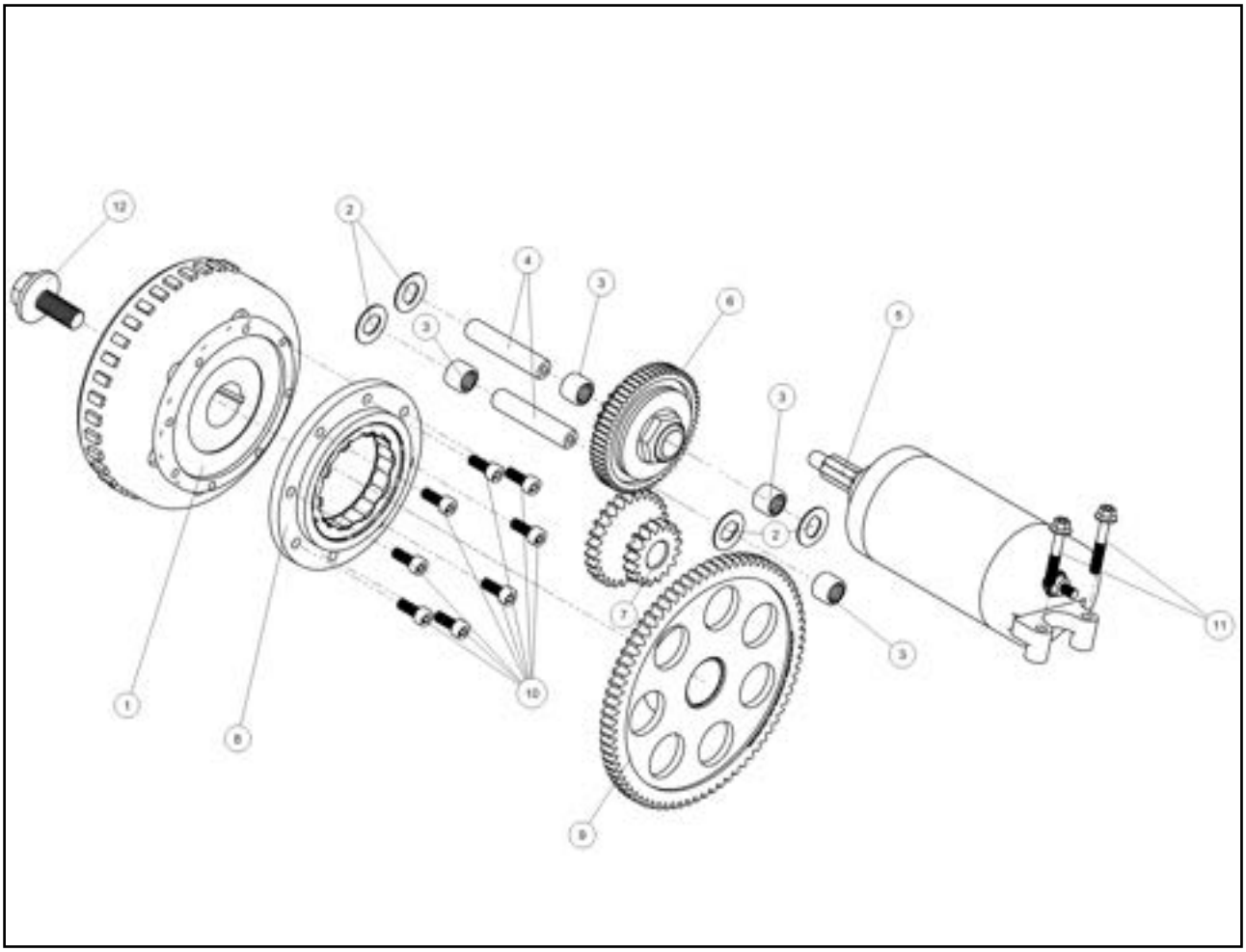
Check the starting overrunning clutch.....3-3-7

Disassemble the starting overrunning clutch 3-3-8

Install the starting overrunning clutch 3-3-8

EXPLODED VIEW





No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Magneto rotor assembly				
2	Flat Washers 12×24×1				
3	Needle bearing HK121612				
4	Double gear shaft				
5	Starter motor				
6	Starting overload protector				
7	Starting double gear				
8	Starting overrunning clutch assembly				
9	Starting driven gear assembly				
10	Hexagon socket head screw M6×16	9.8	1.0	87 in•lb	L
11	Bolt M6×35	9.8	1.0	87 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.

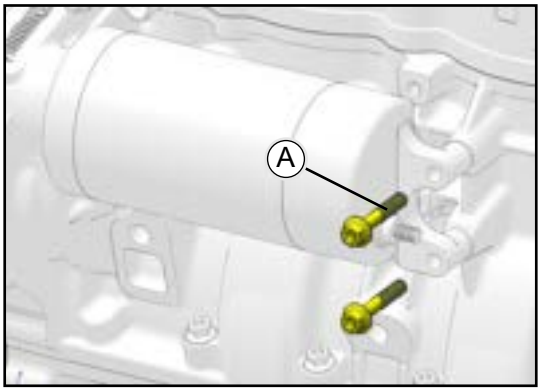
R: Spare parts

SPECIAL TOOLS

Flywheel anti-rotation wrench
E02J23002001

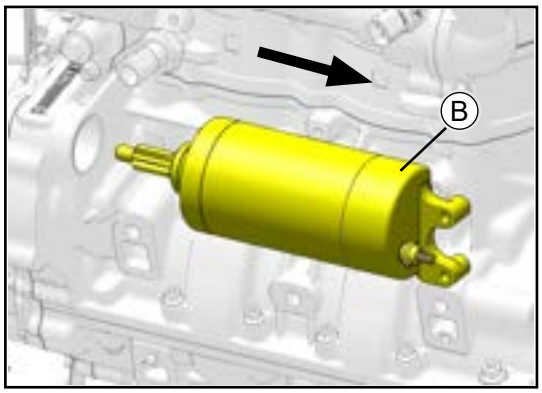
Magneto rotor puller
E01GZ0010001

STARTING SYSTEM

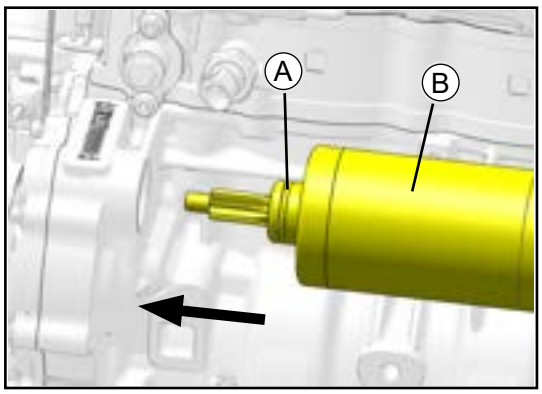


Remove the starter motor

◆ 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



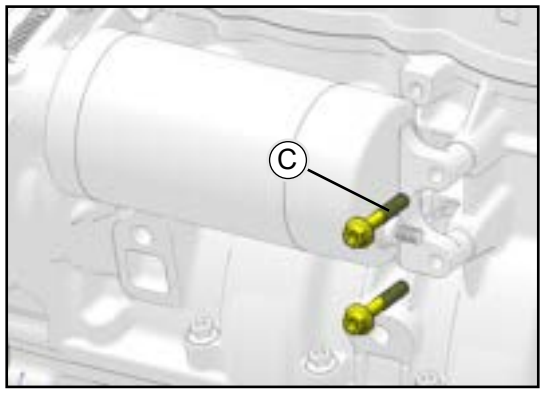
Install the starter motor

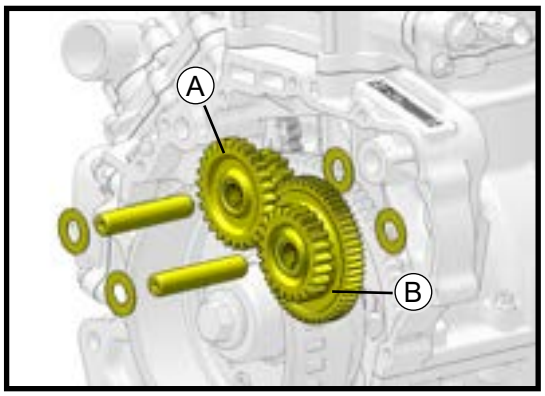
◆ Check whether the O-ring 【A】 at the gear end of the starter motor is intact, and apply a proper amount of engine oil on the surface of the O-ring

◆ Align the starter motor 【B】 with the mounting hole and insert

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

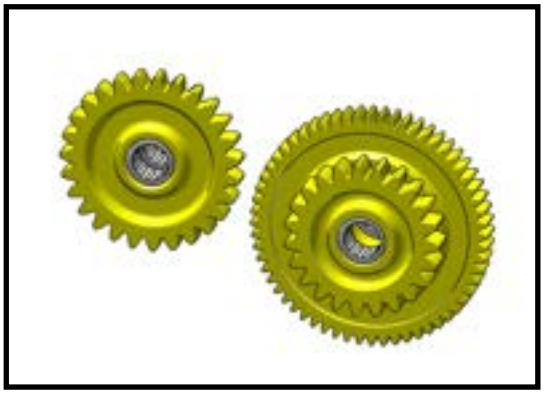
Bolt 【C】
9.8 N·m (1 kgf·m, 87 in•lb)



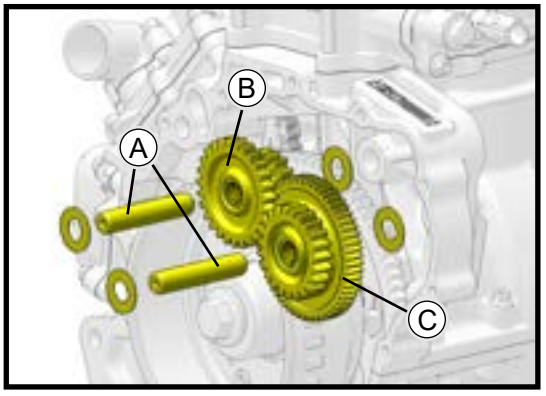


Disassemble the starting overload protector and the double gear assembly

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

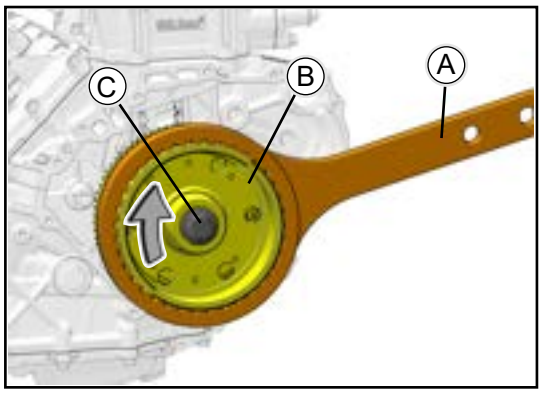


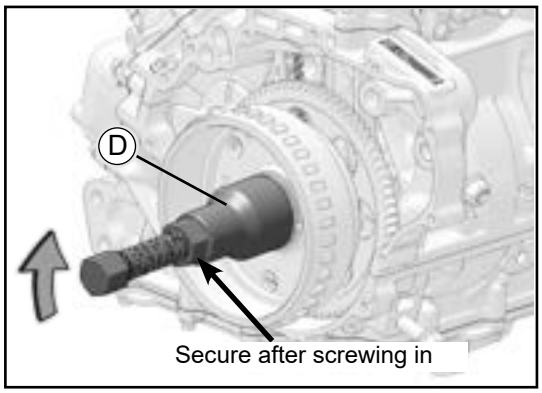
- Check whether the gear is damaged, check the clearance of the gear shaft hole, if the clearance is too large, you need to replace the gear assembly

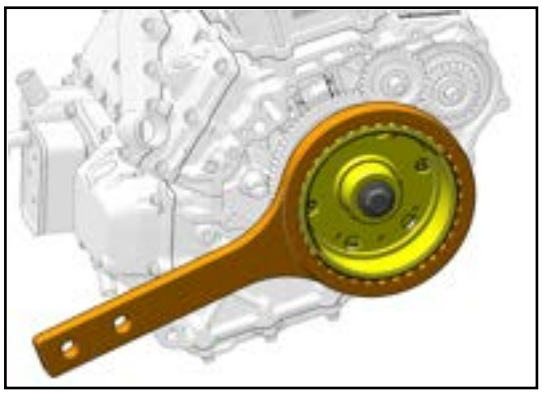


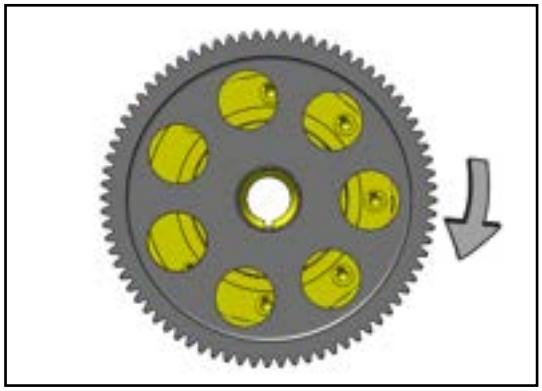
Install starting overload protector and double gear assembly

- 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

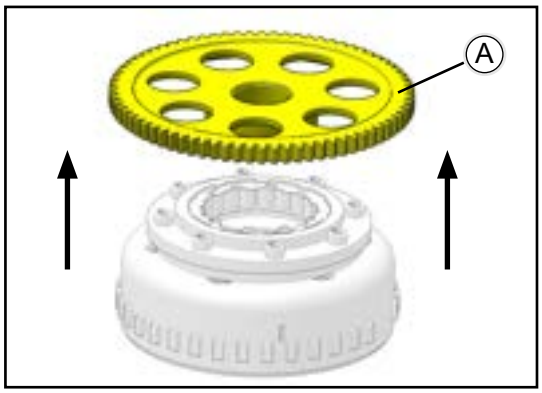
- Remove impurities and oil on the crankshaft installation cone and the matching cone of the magneto rotor
- Combine the magneto rotor and the overrunning clutch and align it with the crankshaft.
- Use special tools to fix the magneto rotor and tighten the mounting bolts

Bolt
150 N•m (15.3kgf•m, 111ft•lb)

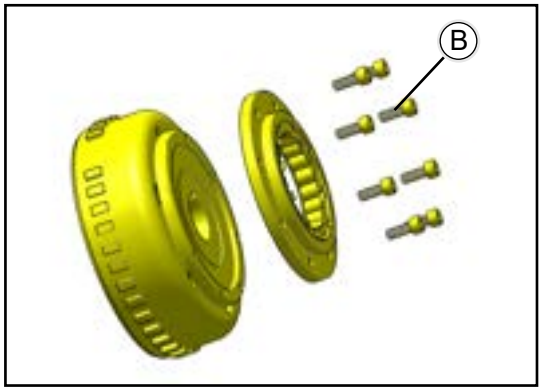
Check the starting overrunning clutch

- 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

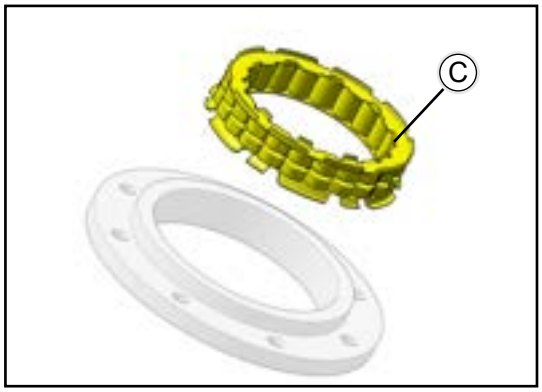
Disassemble the starting overrunning clutch



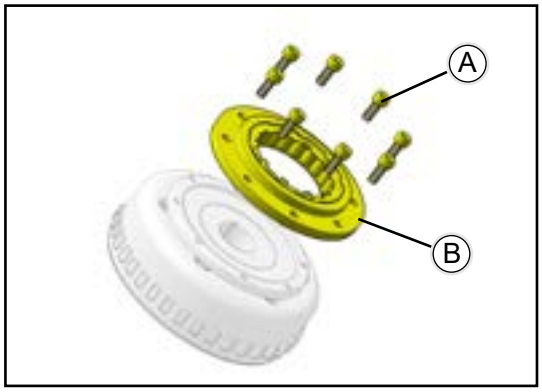
- Take out the starting driven gear assembly 【A】 from the overrunning clutch
- Check whether the bearing surface of the starting driven gear and the bushing surface are worn, check whether the bearing surface of the starting driven gear and the bushing surface are worn and damaged



- 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 【A】
9.8 N·m (1 kgf·m, 87 in•lb)

CRANKCASE\CRANKSHAFT\BALANCE SHAFT

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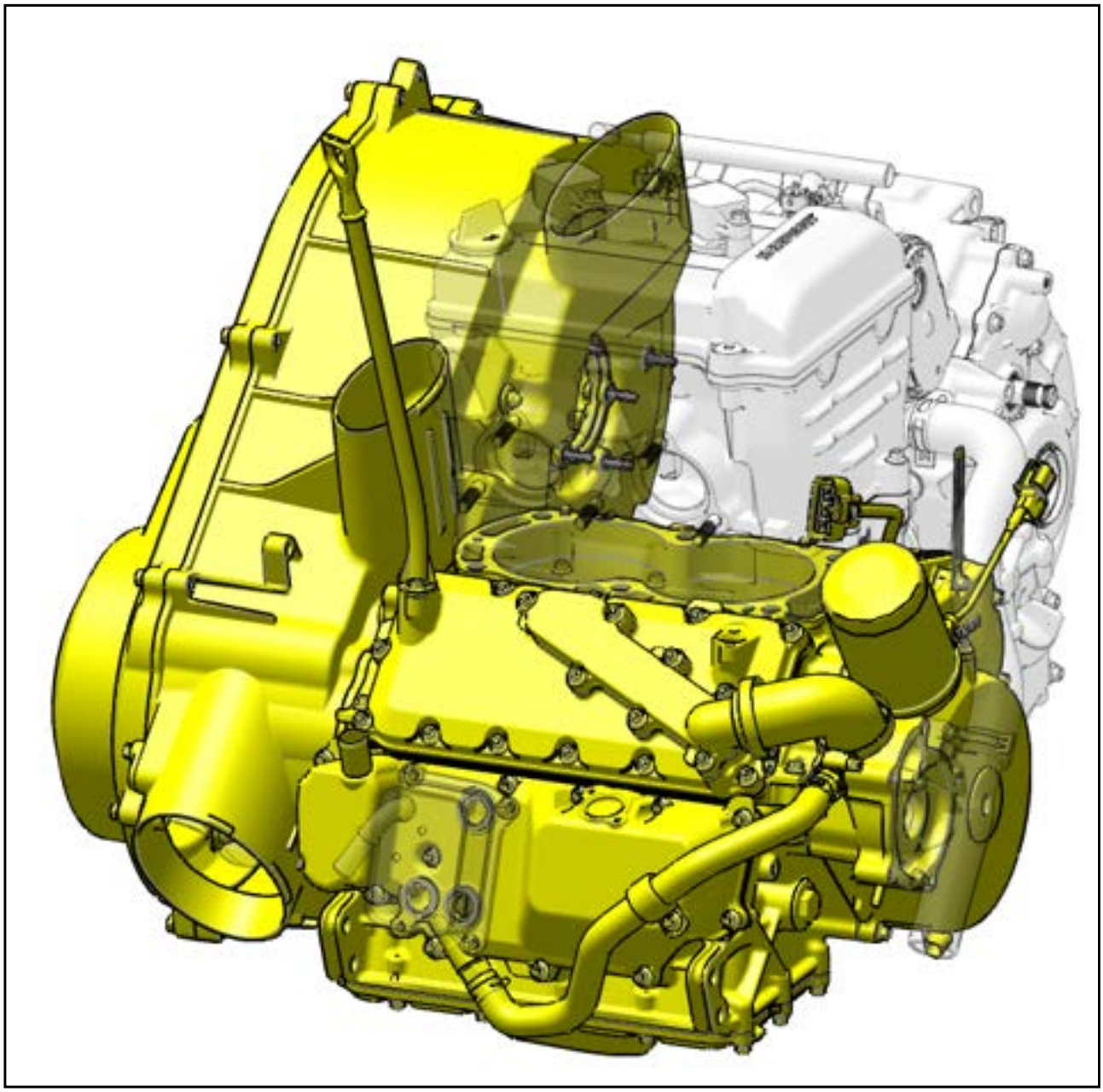
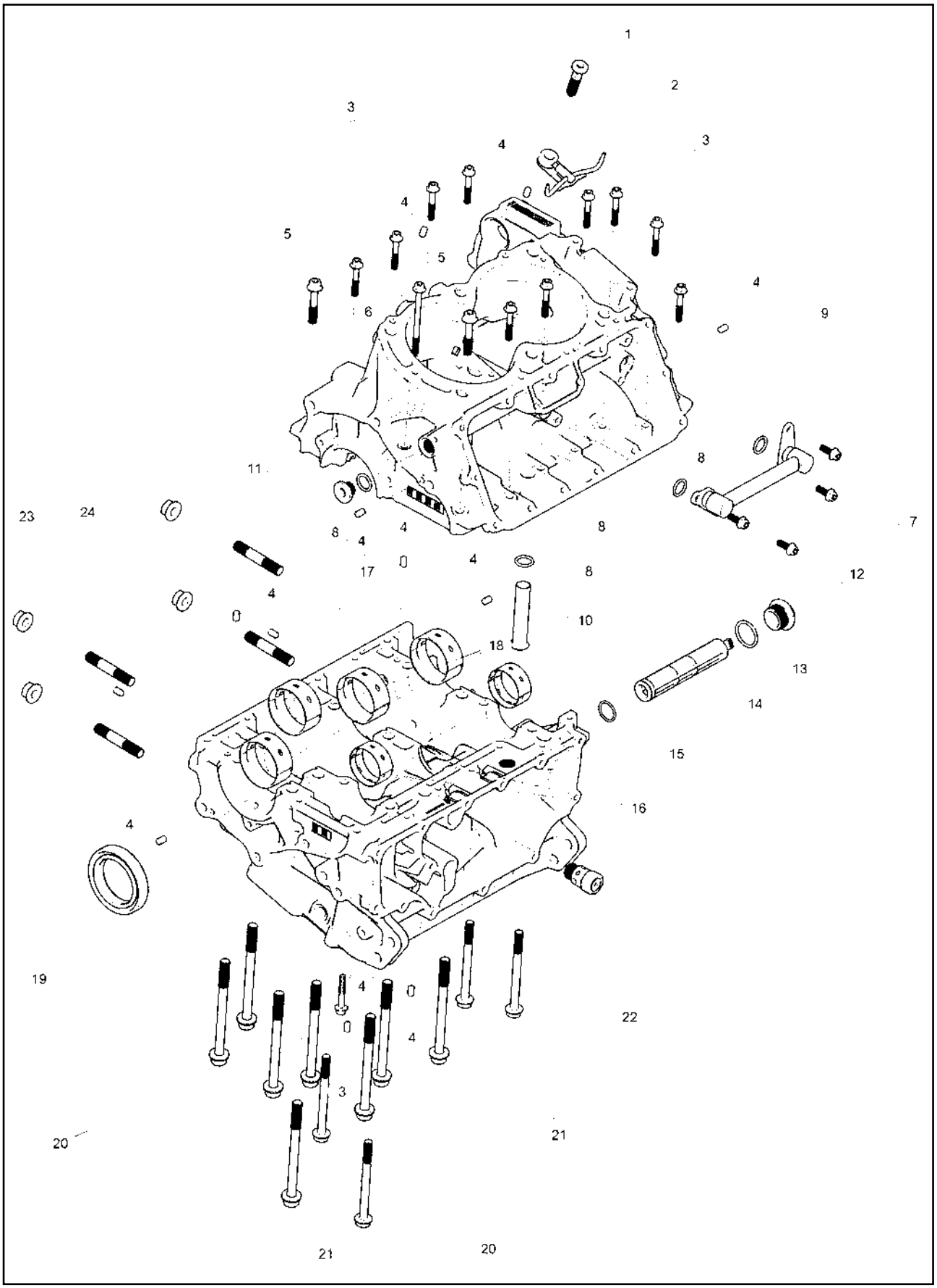
EXPLOSIVE VIEW



Explosive view of Up and down the case sub-assembly



CRANKCASE\CRANKSHAFT\BALANCE SHAFT

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Piston injector pressure regulating valve				
2	Piston injector assembly	20	2	14.8	
3	Bolt M6×35	9.8	1.0	87 in•lb	
4	Dowel Pin 6×10				
5	Bolt M6×75	25	2.5	18.4	
6	Bolt M6×75	9.8	1.0	87 in•lb	
7	Bolt M6×16	9.8	1.0	87 in•lb	
8	Oil Seal 13.8x2.5				
9	oil pipe assembly				
10	oil outlet pipe				
11	Screw plug M14	18	1. 8	13. 3	
12	Screw plug M24	22	2. 2	16. 2	
13	Oil Seal 23x2.65				
14	Oil filter Assembly				
15	Oil Seal 18x1.9				
16	Balance shaft bushing				
17	Upper crankcase crankshaft bush				
18	Lower crankcase crankshaft bush				
19	Oil Seal 47×70×12				
20	Bolt M10×1.25×110				
21	Bolt M8×90	35	3.5	26	
22	oil pressure regulating valve				
23	Nut M10 x 1.25				
24	Stud M10×1.25×60				

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

L: Use fastening agent.

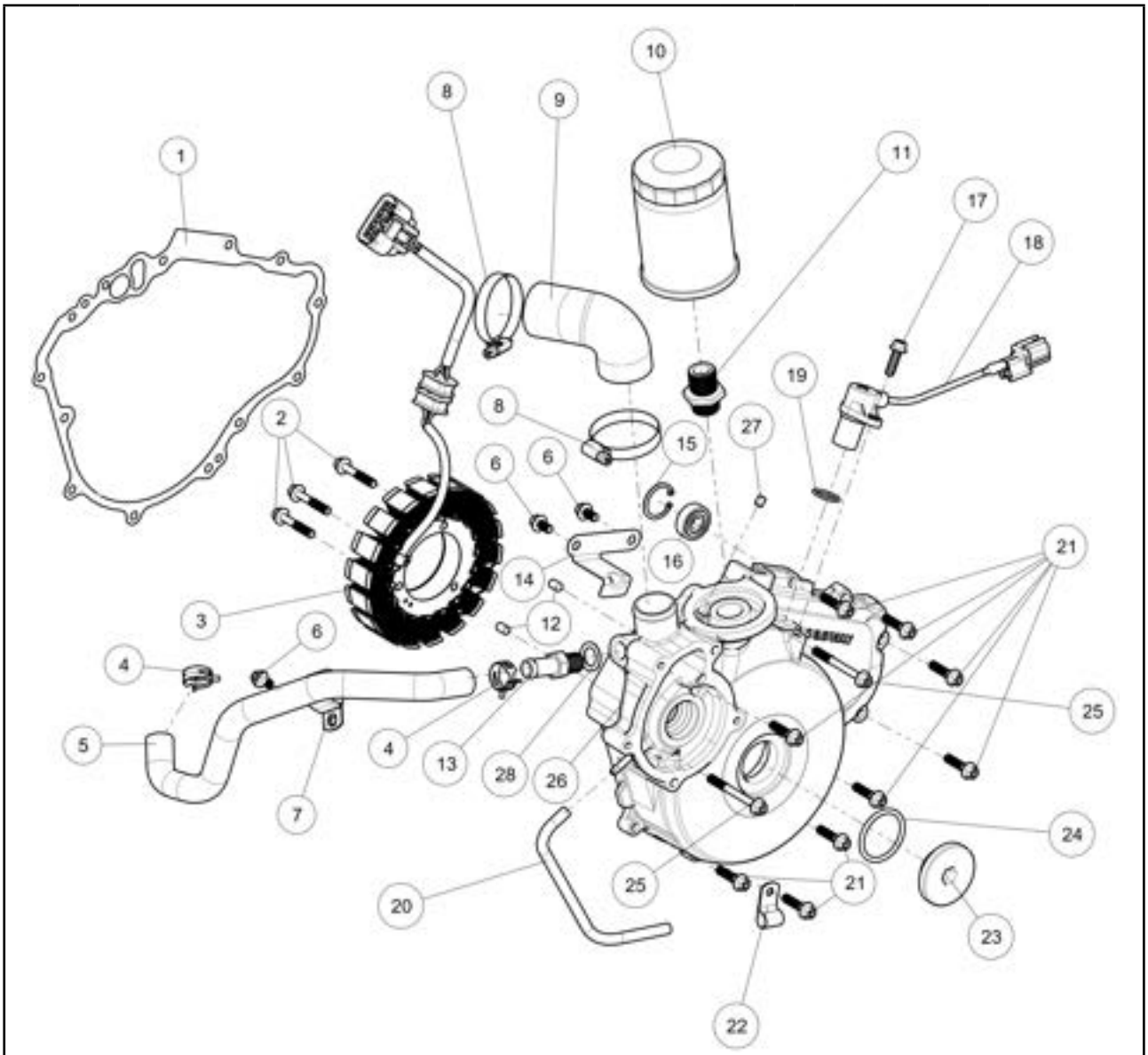
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

Explosive view of Left crankcase cover sub-assembly



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Left crankcase cover gasket				
2	Bolt M6X 35	9.8	1.0	87 in•lb	
3	Magneto stator assembly				
4	Steel belt elastic hose clamp 19				
5	Oil cooler inlet pipe				
6	Bolt M6X 12	9.8	1.0	87 in•lb	
7	water pipe clamp				
8	A worm drive hose hoop 50				
9	water Pump outlet pipe				
10	Oil filter	12	1.2	8.9	
11	Oil filter connector	35	3.5	17	
12	Dowel Pin 6×10				
13	Connecting water pipe joint				

14	Magneto line pressing plate				
15	hole circlip 20				
16	Deep groove ball bearings 629-2RS				
17	Bolt M6X 20	9.8	1.0	87 in•lb	
18	crankshaft position sensor				
19	O-Ring 17X2				
20	overflow pipe				
21	Bolt M6X25	9.8	1.0	87 in•lb	
22	Sensor wire harness clamp				
23	inspection cover				
24	O-Ring 35X3.5				
25	Bolt M6X 55	9.8	1.0	87 in•lb	
26	Left crankcase cover assembly				
27	OIL duct plug				
28	Aluminum Spacer 14×21×1.5				

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

L: Use fastening agent.

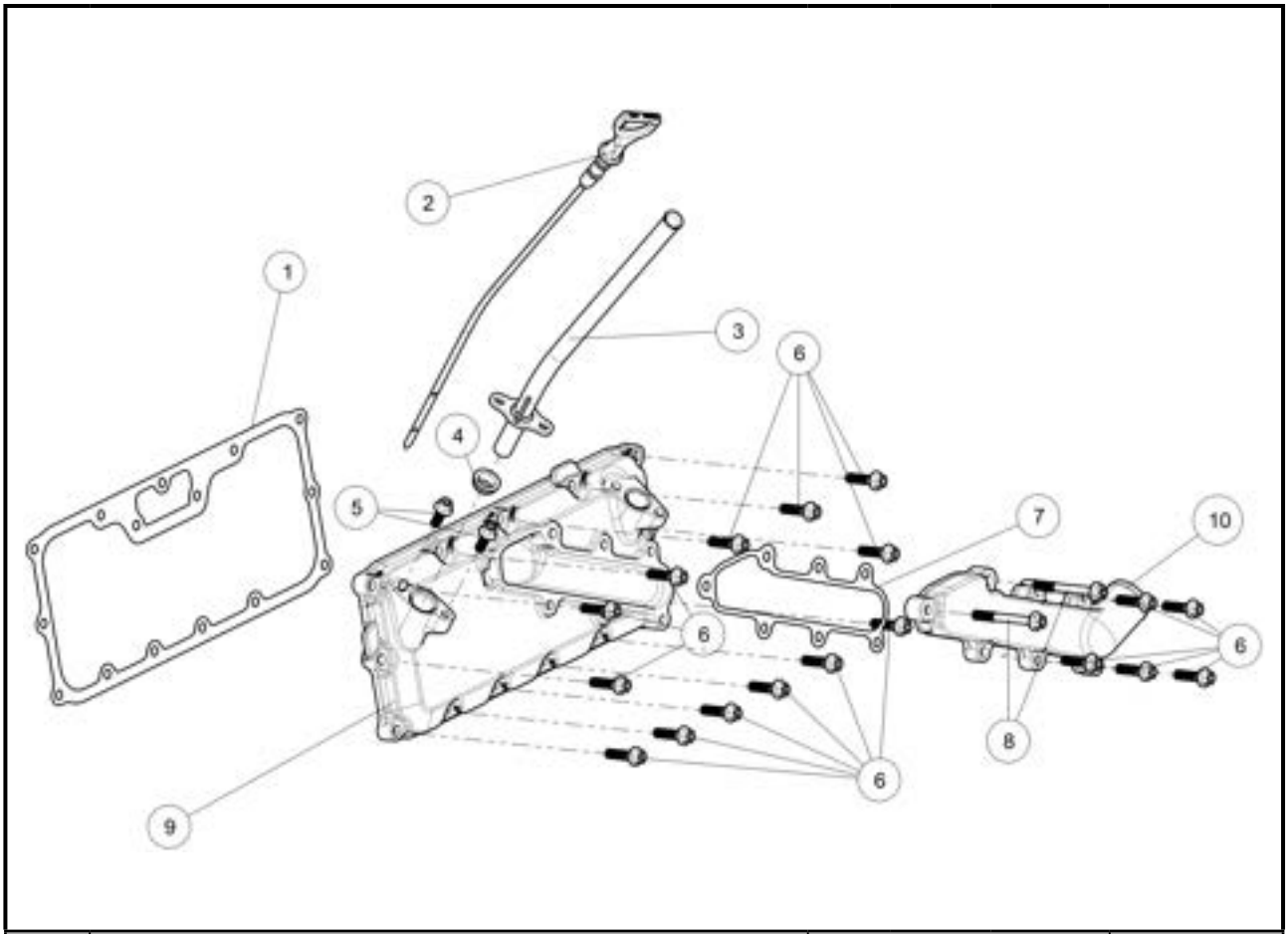
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

Explosive view of Upper crankcase cover sub-assembly



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Upper crankcase cover gasket				
2	Oil gauge assembly				
3	Oil gauge pipe assembly				
4	Oil gauge pipe gasket				
5	Bolt M6×16	9.8	1.0	87 in•lb	
6	Bolt M6×25	9.8	1.0	87 in•lb	
7	Watercourse connector gasket				
8	Bolt M6X 55	9.8	1.0	87 in•lb	
9	Upper crankcase cover				
10	Watercourse connector				

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

L: Use fastening agent.

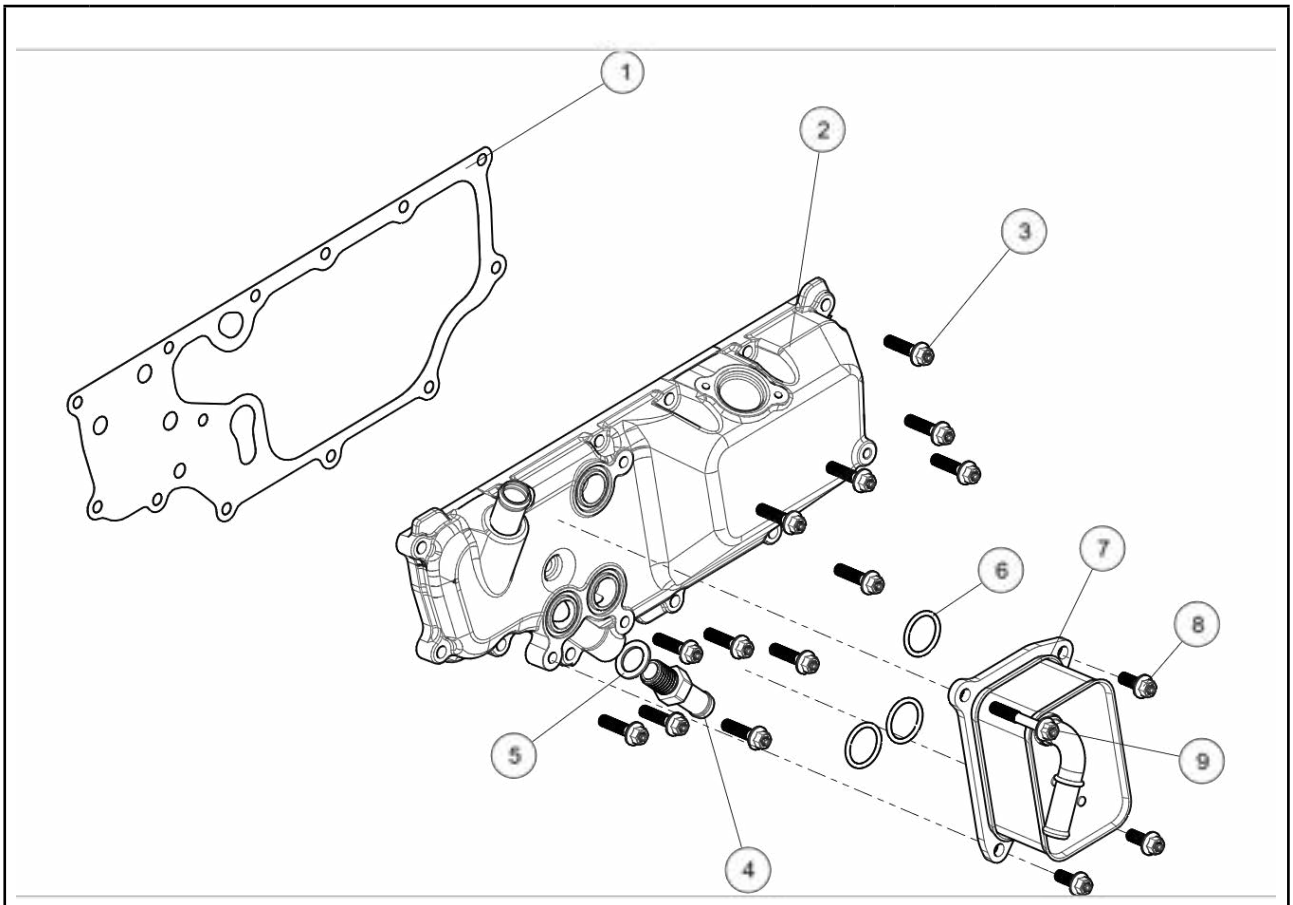
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

Explosive view of Lower crankcase cover sub-assembly



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Lower crankcase cover gasket				
2	Lower crankcase cover assembly				
3	bolt M6×25	9.8	1.0	87 in•lb	
4	Connecting water pipe joint				
5	Aluminum Spacer 14×21×1.5				
6	O-ring 19X2.5				
7	Oil cooler assembly				
8	bolt M6×16	9.8	1.0	87 in•lb	
9	bolt M6×40	9.8	1.0	87 in•lb	

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

L: Use fastening agent.

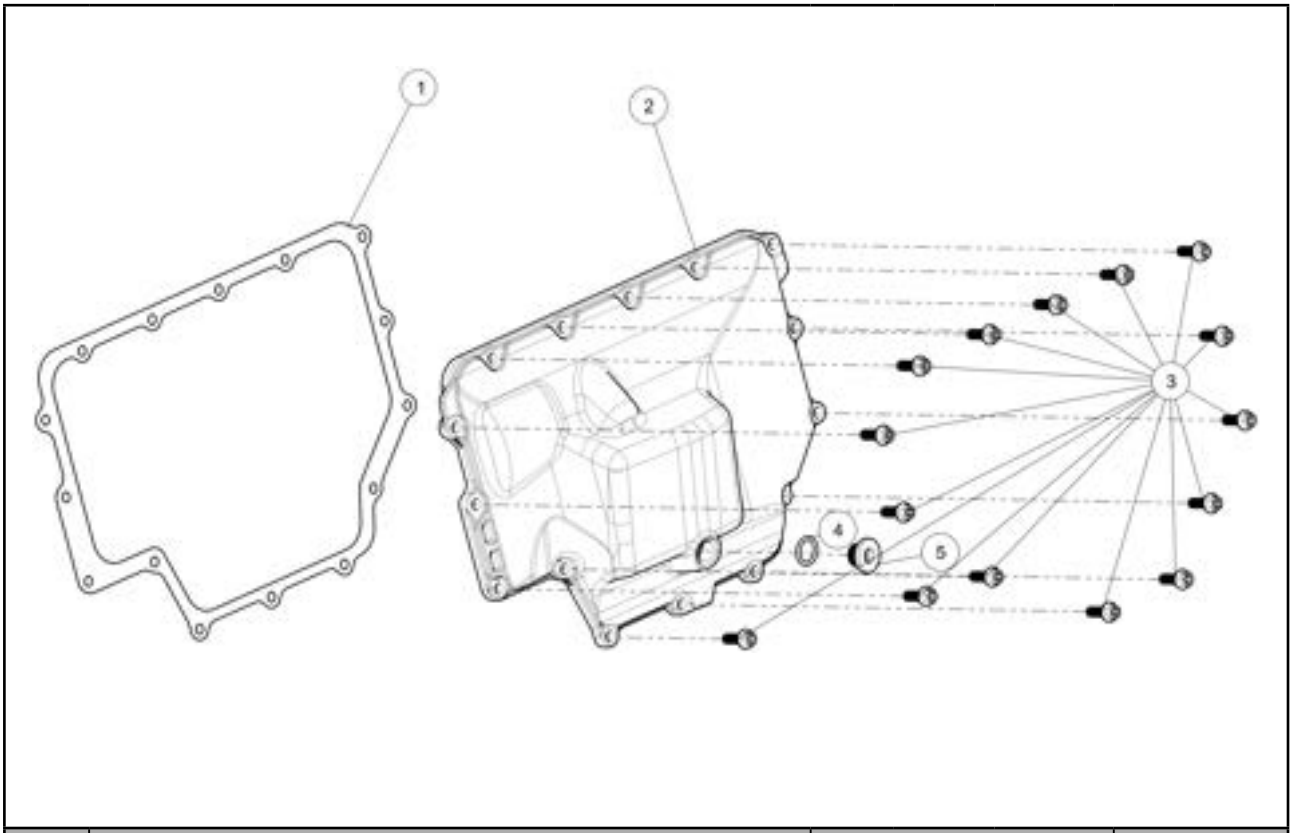
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

Explosive view of Oil pan sub-assembly



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Oil pan gasket				
2	Oil pan				
3	Bolt M6X20	9.8	1.0	87 in•lb	
4	O-Ring 13.8X2.5				
5	Screw plug M14 assembly	16	1.6	11.8	

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.

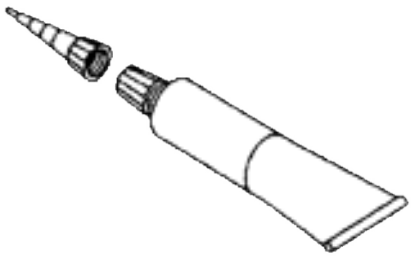
R: Spare parts

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")

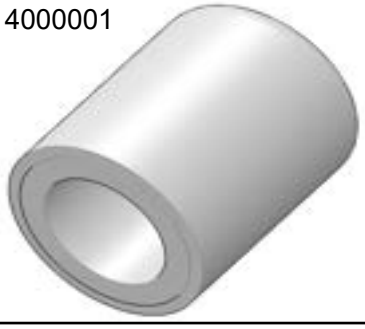
SPECIAL TOOLS

Sealant

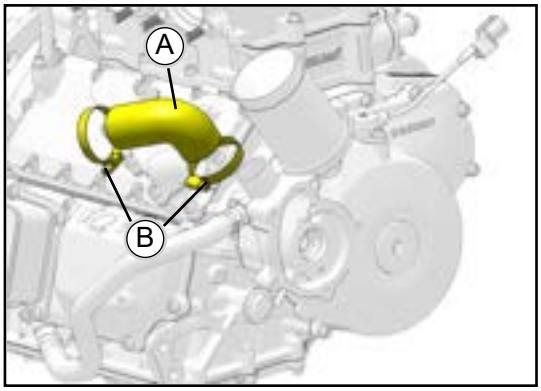


crankshaft oil seal pressure-installment tool

F02B14000001

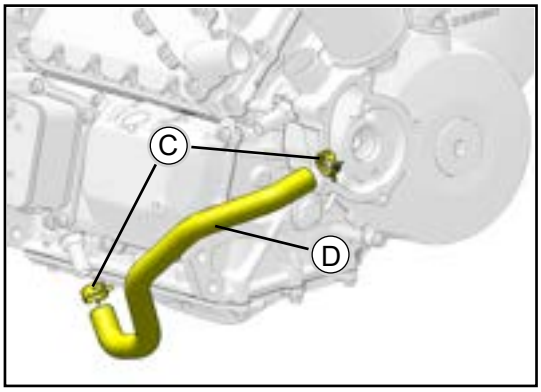


LEFT CRANKCASE COVER

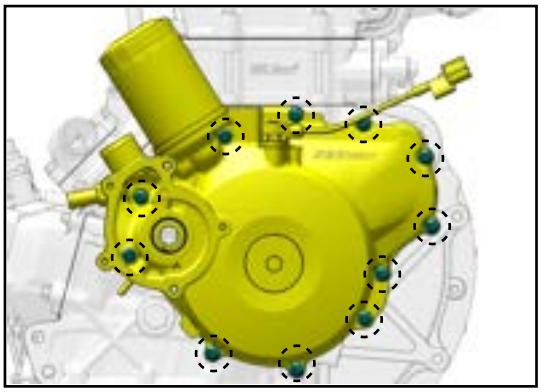


left crankcase cover Disassembly

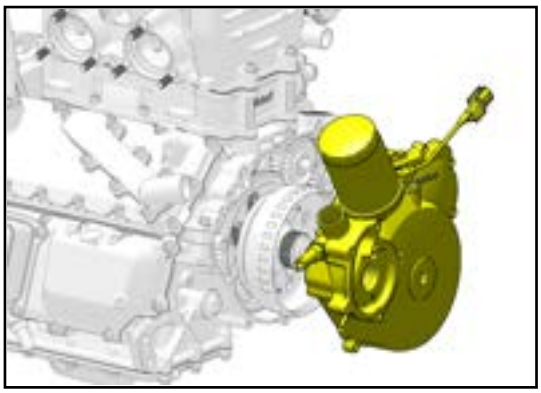
◆ Loosen the clamp in two places 【B】, remove the water pump outlet pipe 【A】



◆ Loosen the clamp in two places 【C】, remove the oil cooler inlet pipe 【D】



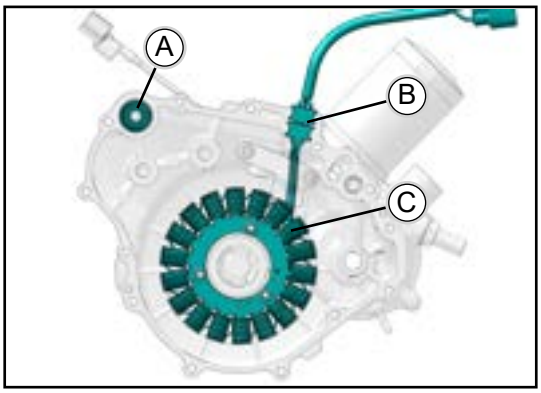
◆ Remove 11pcs bolts for left crankcase cover



◆ Gently pry around the left crankcase cover and take the left crankcase cover out from the crankcase

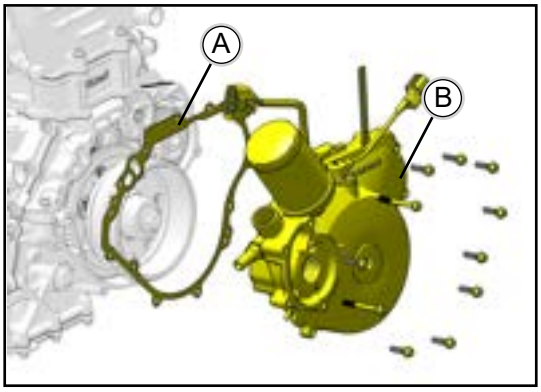
⚠ CAUTION

The magneto rotor is magnetic, so be careful when installing and removing the left crankcase cover. Do not place your finger between the left crankcase cover and the crankcase to avoid injury.



check left crankcase cover

- Check the state of bearing 【A】, wire harness 【B】, stator coil 【C】.
- If you need to replace the bearing, can be heated by the left crankcase cover bearing hole or use special bearing disassembly tools to remove the bearing.

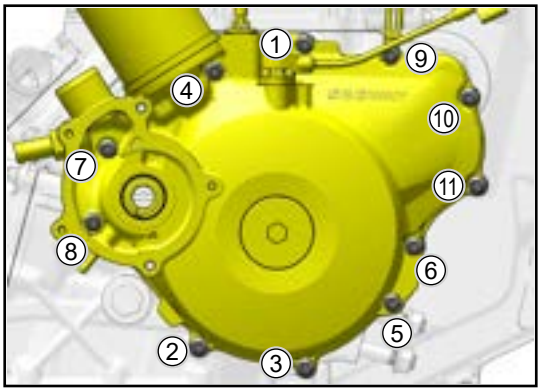


install left crankcase cover

- Align the left crankcase cover assembly 【B】 and the new gasket 【A】 with the positioning pins on the crankcase and load into the left crankcase cover.

⚠ CAUTION

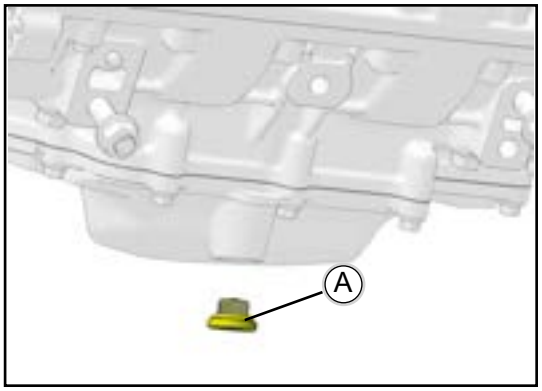
The magneto rotor is magnetic, so be careful when installing and removing the left crankcase cover. Do not place your finger between the left crankcase cover and the crankcase to avoid injury.



- Tighten the bolts in sequence

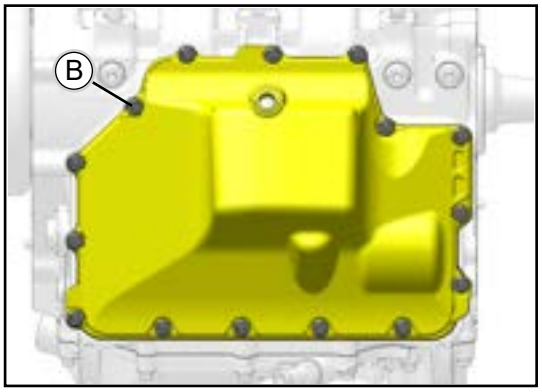
Bolt
9.8 N·m (1 kgf·m, 87 in•lb)

CRANKCASE\CRANKSHAFT\BALANCE SHAFT

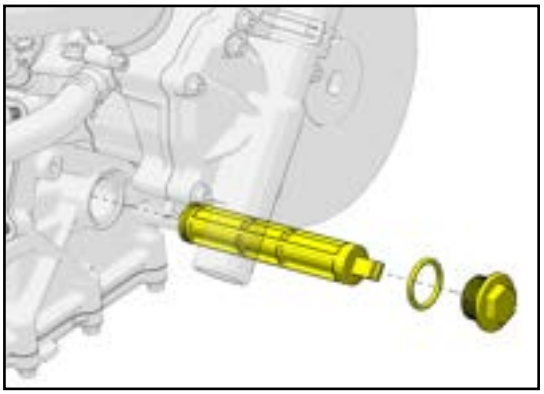


Crankcase Assembly

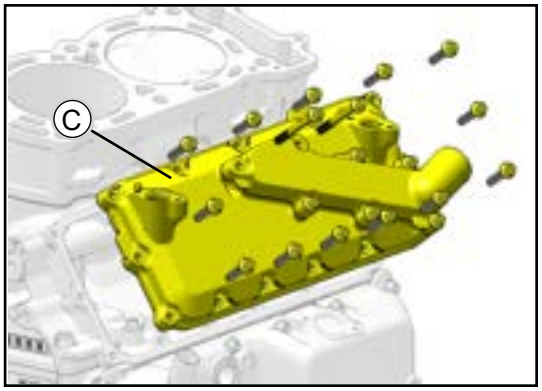
- Remove oil drain plug【A】from oil pan to drain oil in oil pan.



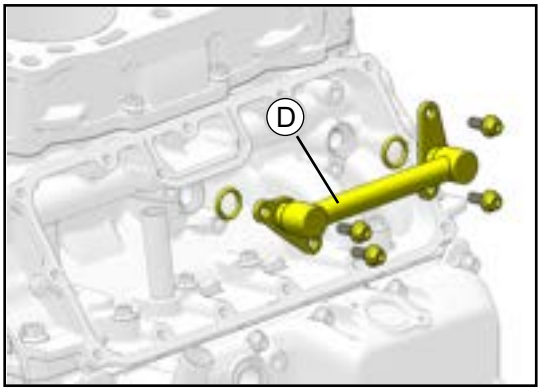
- Remove 15 oil pan mounting bolts【B】and remove oil pan from crankcase.



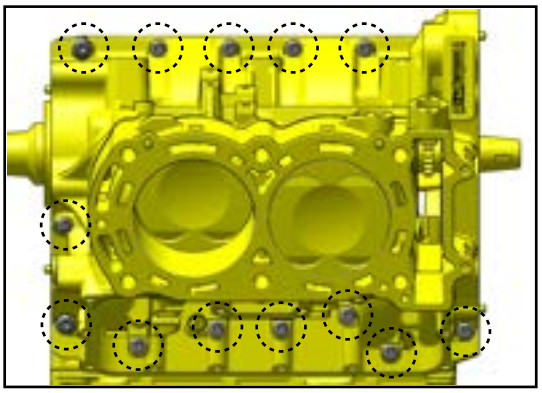
- Remove the crankcase oil strainer assembly and drain the oil in the crankcase oil chamber (see lubrication System section)
- Remove the oil pump assembly (refer to lubrication System section)



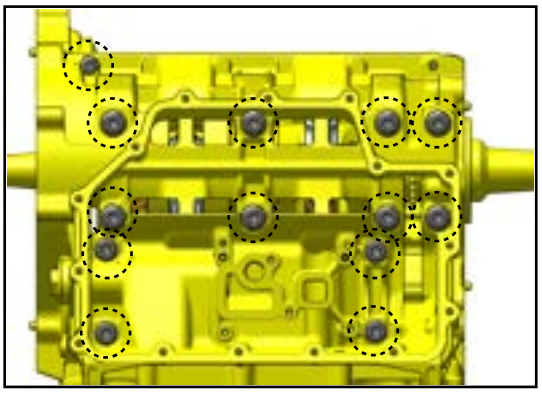
- Remove 2 M6x55 bolts and 13 M6x25 bolts from the upper crankcase cover【C】and remove the upper crankcase cover.



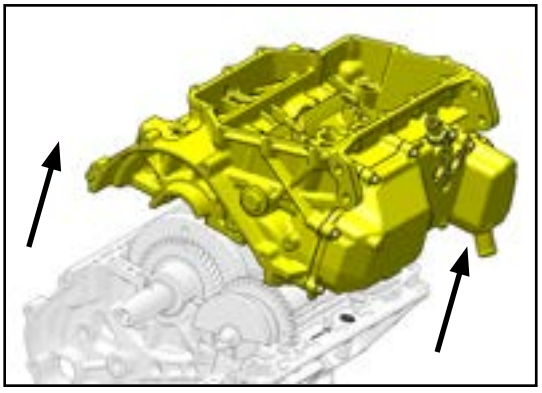
◆ Remove 4 through-tubing mounting bolts and remove through-tubing assembly【D】.



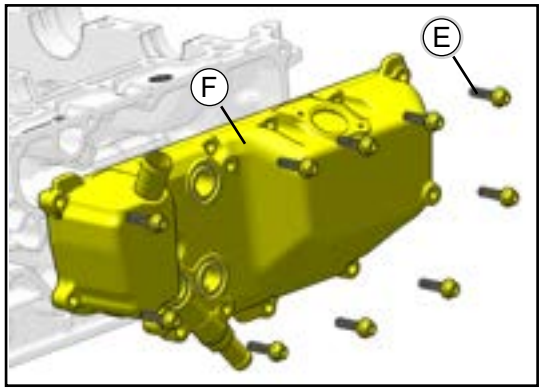
◆ Remove 11pcs M6 bolts and 2pcs M8 bolts from the upper crankcase



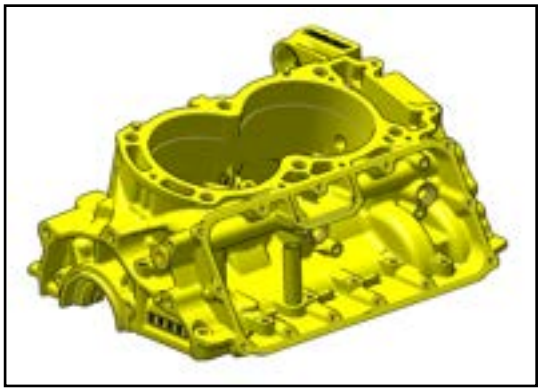
◆ Turn the crankcase and remove the 8pcs M10 bolts, 4pcs M8 bolts and 1pcs M6 bolt on the crankcase



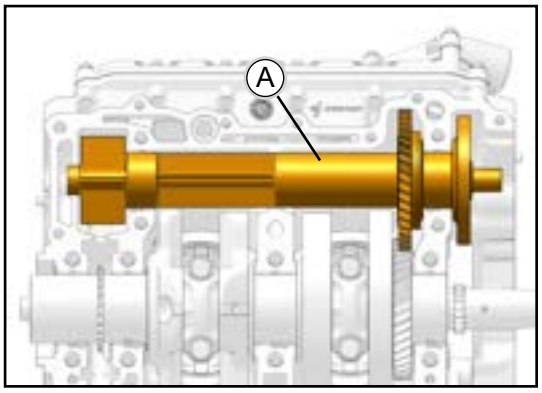
◆ Use a rubber hammer to gently knock around the crankcase, the crankcase will be loosened after the lower crankcase up.



- Remove 10 bolts 【E】, take lower crankcase cover assembly 【F】.

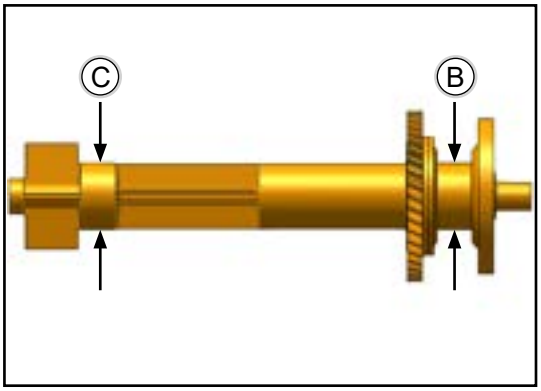


- Remove crankshaft piston connecting rod (see crankshaft Connecting Rod Piston Assembly section).
- Remove the upper crankcase.



Remove balance shaft

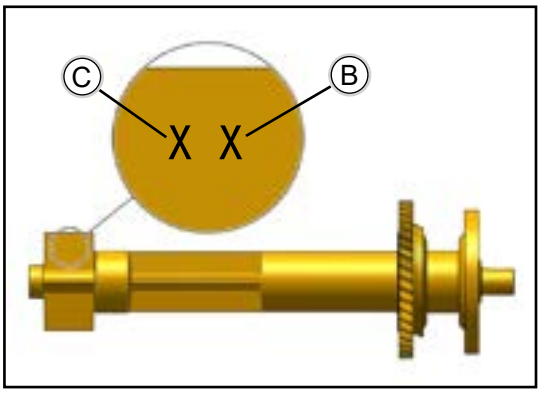
- Slowly turn the balancing shaft 【A】 and remove the balancing shaft from the upper crankcase.



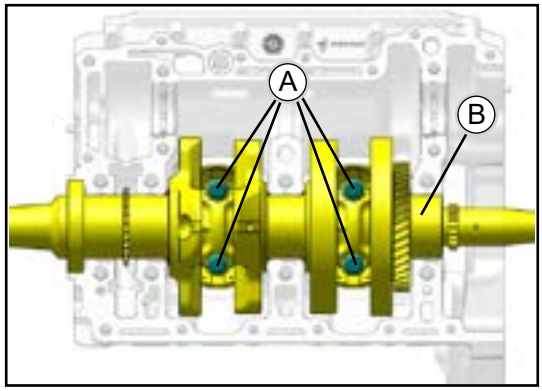
Check balance shaft

- Check whether the balance shaft gear is damaged.
- Measurement of shaft diameter 【B】, 【C】 size, the measurement of the interval of 90° in two directions. If the journal size exceeds the limit, the balance shaft needs to be replaced.
- There is journal size group identifier engraved on the balance block plane in the figure. The external test identifier is journal 【C】 size, and the internal test is journal 【B】 size.

Group identification is divided into "I" and "II", size comparison table below. If the measured size exceeds the limit, the balance shaft needs to be replaced.

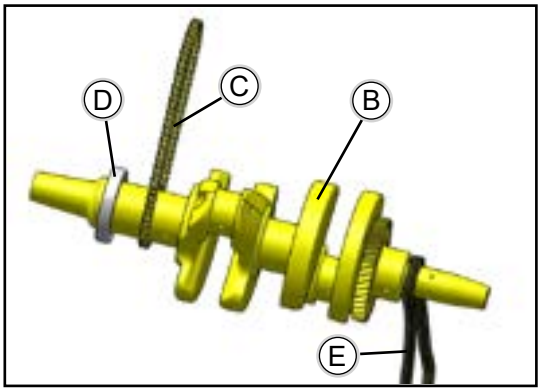


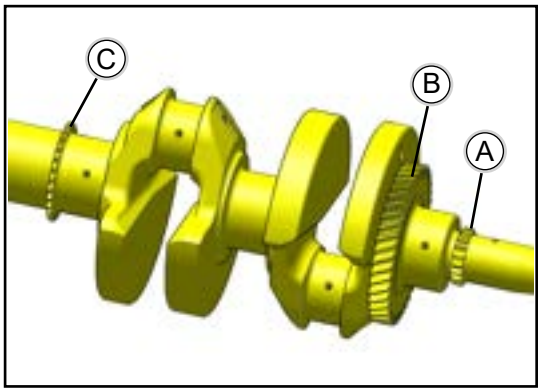
Balance shaft journal dimensions		
	I	II
Standard values：	37.992 ~ 37.996 mm (1.4957" ~ 1.4959")	37.996 ~ 38 mm (1.4959" ~ 1.4961")
limit:	37.973 mm(1.495")	

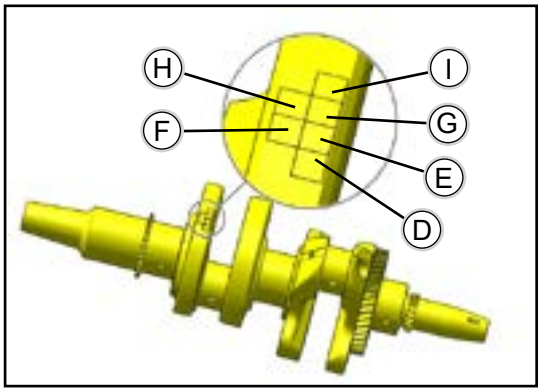


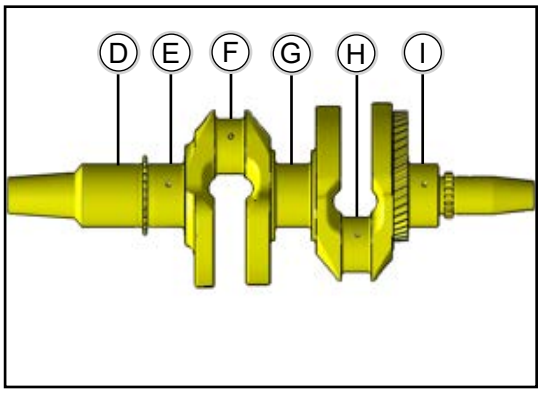
Remove the crankshaft

- Remove:
- 【A】 Connecting rod bolts
- Remove the big end cover of the connecting rod.
- Carefully remove the crankshaft 【B】 from the upper crankcase.
- Remove the oil pump chain assembly on the crankshaft 【C】, oil seal 【D】, timing chain assembly 【E】.







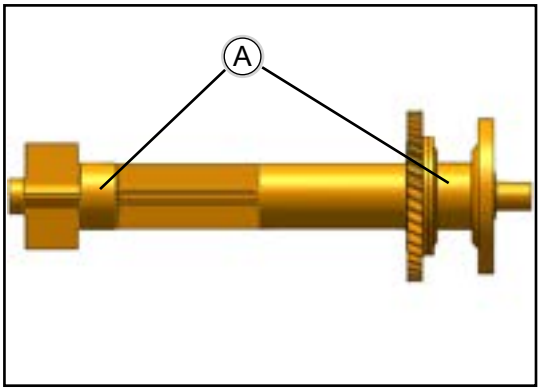


Check the crankshaft

- Check the timing sprocket tooth 【A】, balance driving gear 【B】 and sprocket tooth 【C】 on crankshaft for damage or wear.
- If the teeth are damaged, the entire crankshaft component needs to be replaced
- Measure the size of each main shaft journal and connecting rod journal, and choose two directions at each position, 90° apart. If the journal wear exceeds the limit, the crankshaft needs to be replaced
- There are two lines of marks with a total of 6 characters on the balance block near the output end of the crankshaft. One column is the grouping mark of the main shaft journal, using numbers, and the other column is the grouping mark of the connecting rod journal, using uppercase English letters
- The following table lists the corresponding dimensions for each group. Check whether the dimensions are within the specified range. If the limits are exceeded, the crankshaft parts need to be replaced.

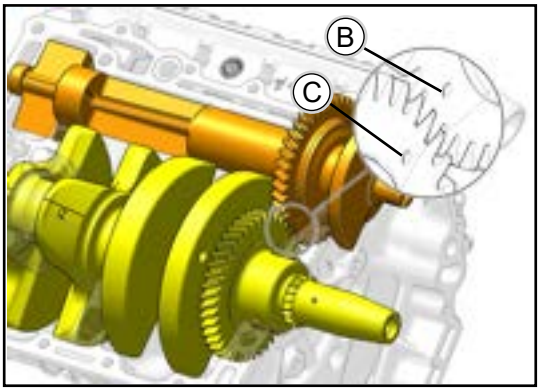
- crankshaft journal diameter

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



Mounting balancing shaft

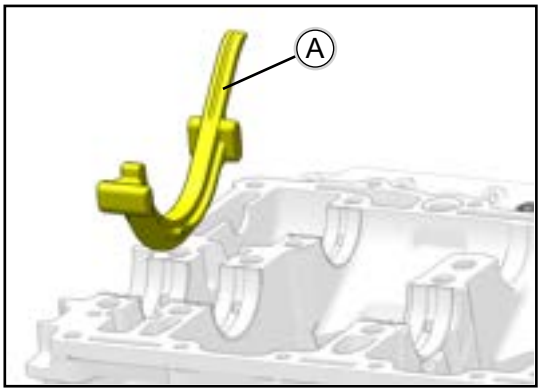
- According to the grouping mark on the crankcase, select the corresponding balance bearing bush (see the optional bearing bush).
- Clean the surface of the balance shaft hole on the upper crankcase, select the corresponding group of balance shaft bush and install it into the bearing hole.
- Turn the crankshaft so that the mark 【C】 on the crankshaft gear is facing the side of the balancing shaft.
- Apply engine oil to the balance shaft journal 【A】.
- Load the balance shaft, turn it at an appropriate Angle, and align the mark 【B】 on the balance shaft gear with the mark 【C】 on the crankshaft gear.



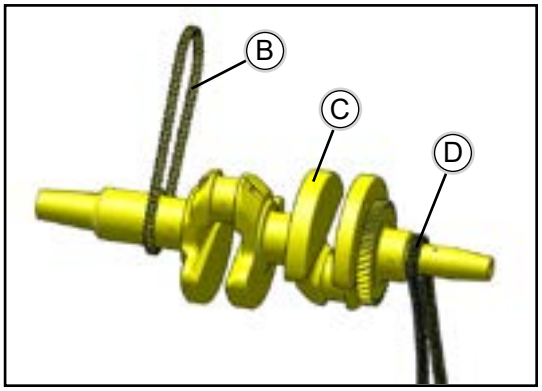
Install the crankshaft

TIPS

Whether you are reassembling with a new crankshaft or an original crankshaft, refer to the Bush selection section (see "Crankcase Assembly" section) to select the appropriate bush.

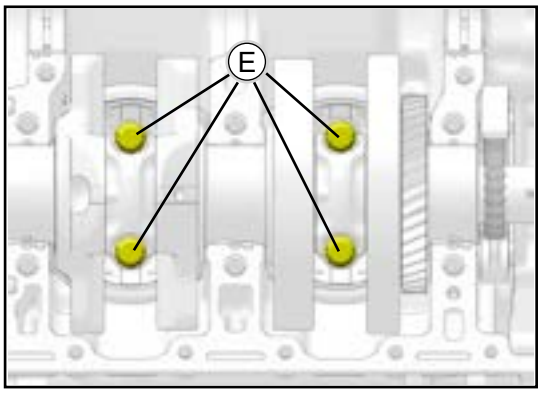


- Install the spindle pad and press it into the crankcase main bearing seat.
- Install the spindle pad and press it into the crankcase main bearing seat.
- Put the oil pump chain guard plate 【A】 into the crankcase.
- Apply engine oil to the main bearing bush and connecting rod bush.
- Install the timing chain 【D】 and the oil pump chain 【B】 on the crankshaft 【C】 sprocket.
- Place the crankshaft and chain as a whole into the upper crankcase.



- Align the large end of the connecting rod with the crankshaft connecting rod journal and install the corresponding connecting rod cover.
- Install connecting rod bolts 【E】 and tighten them as required.

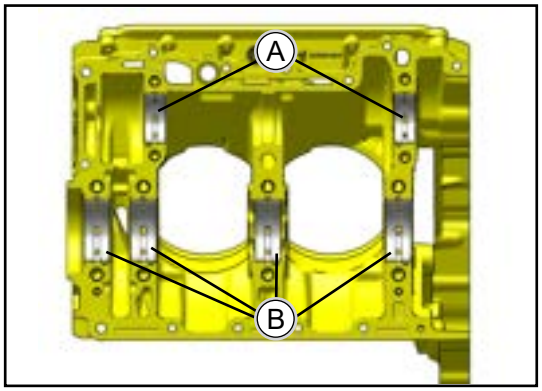
The connecting rod bolt
one step: 25 N·m (2.55 kgf·m, 18.4 ft·lb)
two step：45 N·m (4.59 kgf·m, 33 ft·lb)
three step:Turning 60 °



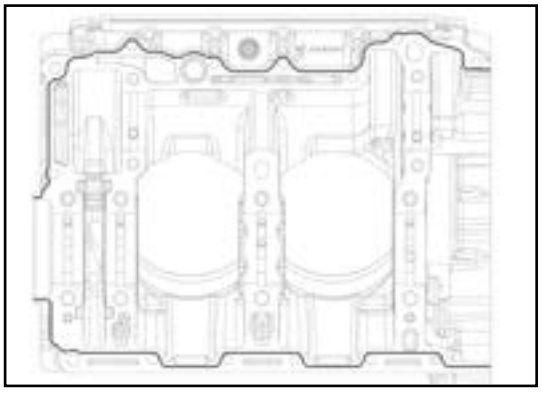
Crankcase assembly

Preparation before assembly:

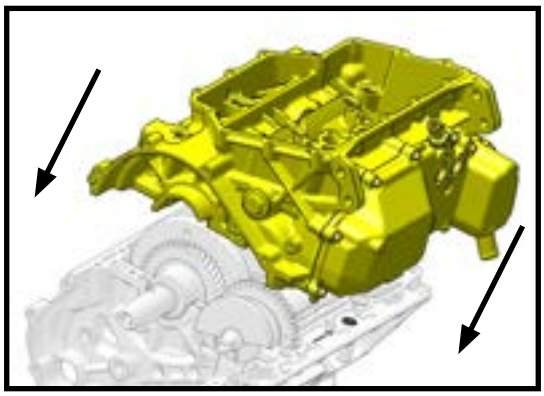
1. Remove traces of sealant and gaskets from the crankcase sealing mating surface. Check the surface for scratches or damage.
2. Remove impurities such as sealant from the bolt holes.
3. Install the positioning pins into the positioning pin holes.
4. Check the oil channel to ensure that it is clean and free of impurities.



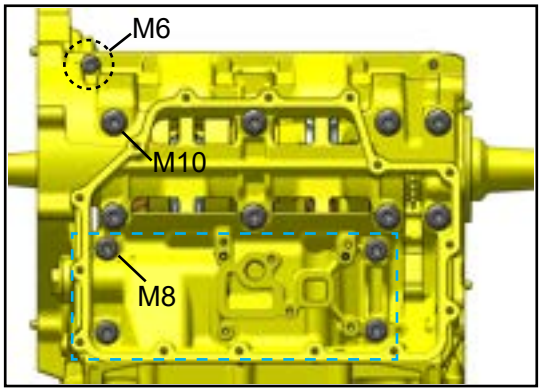
- According to the crankshaft box, crankshaft, balance shaft grouping, select the appropriate bearing bush (see the bearing Bush selection section).
- Put the balance shaft bush 【A】 and spindle bush 【B】 into the corresponding shaft holes of the upper and lower boxes respectively.



- Install crankshaft, balance shaft (refer to crankshaft connecting rod Piston Assembly, Balance shaft Assembly section)
- Apply sealant to the sealing surface at the bottom of the upper crankcase, and the track of the glue line is as shown in the figure. The glue line should be continuous and uniform.



- Align the position and load the lower crankcase.
- The rubber hammer can be gently tapped around the crankcase to ensure that there is no gap on the sealing surface of the upper and lower cases.



- Screw in four M8 bolts, eight M10 bolts, and one M6 bolt.

⚠ CAUTION

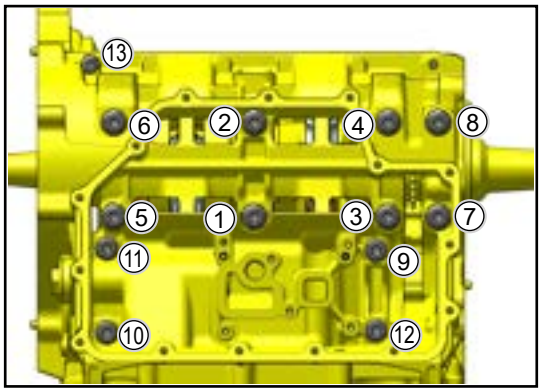
Replace the M10 bolt each time you install the crankcase.

- Tighten the bolts in place in sequence.

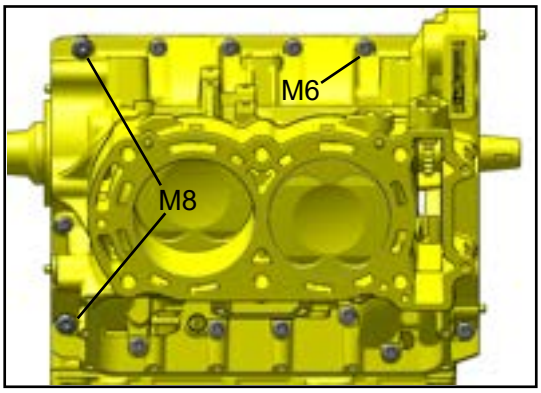
Bolt M10
one step:: 12 N·m (1.2 kgf·m, 8.6 ft·lb)
two step:： 28 N·m (2.8 kgf·m, 20.6 ft·lb)
three step: turning 90°

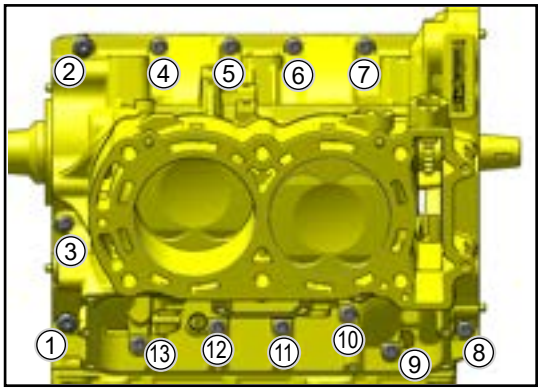
Bolt M8
35 N·m (3.5 kgf·m, 26 ft·lb)

Bolt M6
12 N·m (1.2 kgf·m, 106 in·lbs)



- Turn the crankcase and screw 2pcs M8 bolts and 11pcs M6 bolts into the upper crankcase.

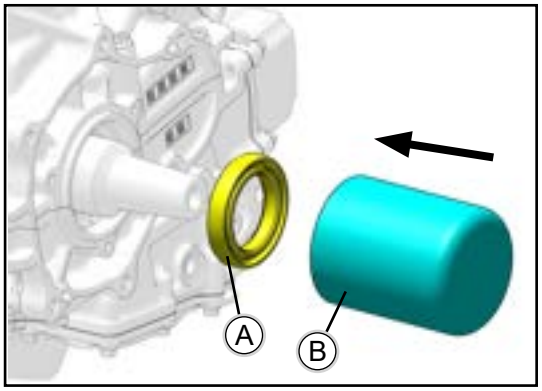




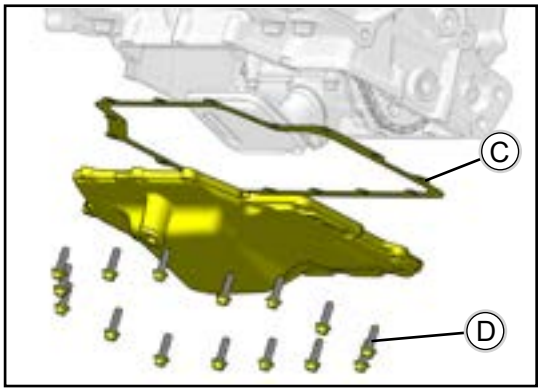
◆ Tighten the bolts in sequence to the specified torque.

Bolt M8
25 N·m (2.5 kgf·m, 18.4 ft·lb)

Bolt M6
9.8 N·m (1 kgf·m, 89 in·lbs)



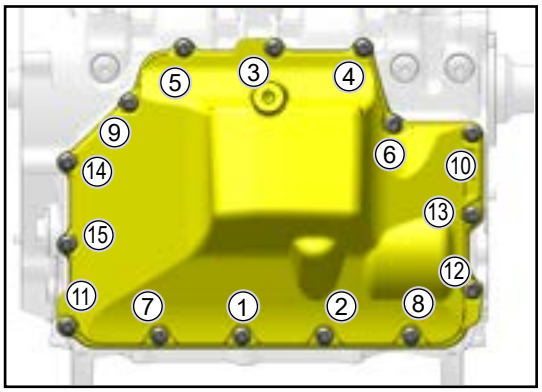
◆ Take a new rotary shaft oil seal 【A】 and apply a proper amount of oil to the lip and outer ring surface. With one side of the sealing lip facing inwards, press vertically into the crankcase using the crankshaft oil seal pressing tool 【B】.



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

◆ Take a new oil pan gasket 【C】, put it into the oil pan, tighten the bolts in sequence 【D】.

Bolt 【D】
9.8 N·m (1 kgf·m, 89 in·lbs)

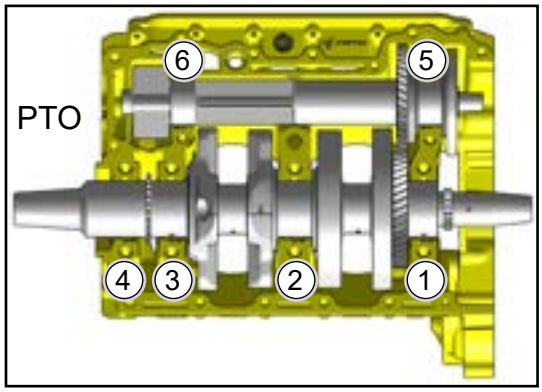


BEARING SELECTION

Group identifier

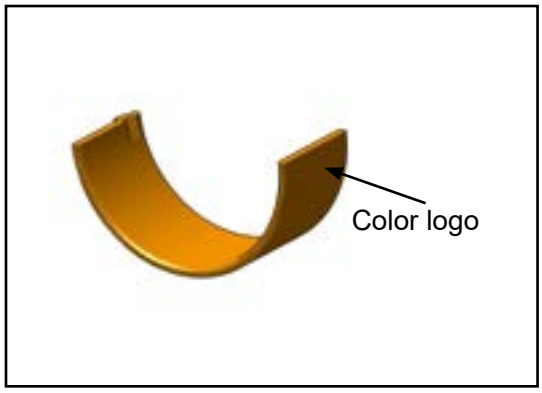
Crankcase grouping

- The upper and lower box sub-assembly has two rows of grouping marks at the output end, and one row of grouping marks for the main shaft hole, numbered 1, 2, 3 and 4. Another behavior balance shaft hole group identifier, serial number 5, 6. Mark the axle hole size with figure, corresponding to the following table:



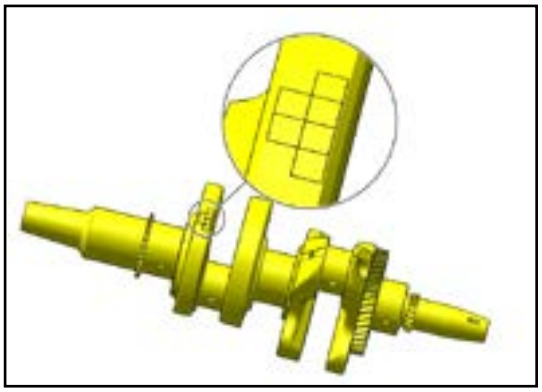
Main shaft hole grouping		
Group NO.	size	Group code
I	51.007 ~ 51.012 mm	1
II	51.012 ~ 51.017 mm	2
III	51.018 ~ 51.026 mm	3

Balance shaft hole grouping		
Group NO.	size	Group code
I	41.000 ~ 41.008 mm	1
II	41.008 ~ 41.016 mm	2



Bearing shell group

- The bearing bush is grouped according to different thicknesses and the grouping marks are located on the outside of the bearing bush.
- Main shaft tile has 4 thickness, group color is blue, white, red, black.
- Balance shaft bearing bush has 3 thicknesses, group color is blue, red, black.
- Connecting rod bearing bush has 4 thicknesses, group color is red, white, blue, green.



Spindle bushing selection

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

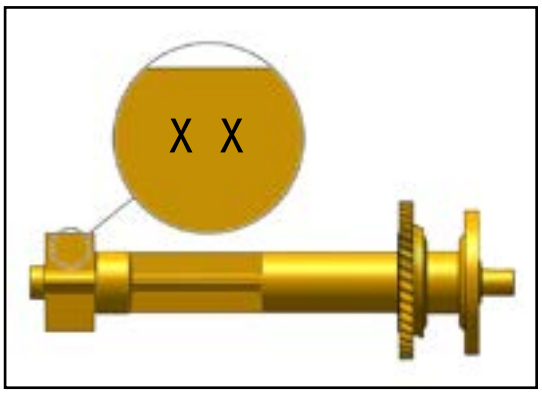
Spindle bushing selection table			
Crankcase main shaft hole grouping	Crankshaft main diameter grouping		
	1	2	3
	Correct bearing bush color identification		
1	red	white	blue
2	red	white	blue
3	black	red	white

◆ The sample

Crankcase grouping 1-2, 2-2, 3-2, 4-2, 5-1, 6-1

Crankshaft grouping 2-3-3-2-A-A

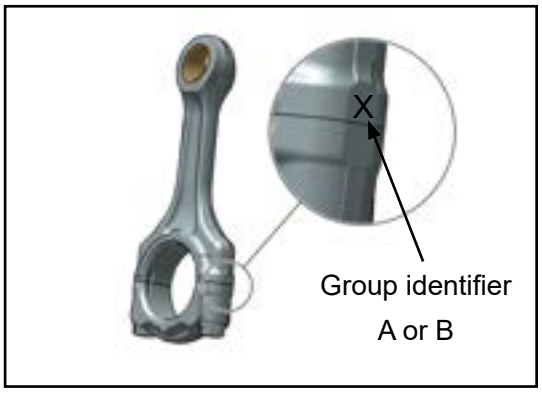
According to the above table, the selected main shaft tile marks are white, blue, blue, white.



Balancing shaft bearing bush optional

◆ According to the crankcase and the grouping mark on the balance shaft to choose the appropriate balance shaft bearing.

Balance bearing bush matching table		
Crankcase balance shaft hole grouping	Balance shaft diameter grouping	
	I	II
	Correct bearing bush color identification	
1	red	blue
2	black	red



Connecting rod bearing bush optional

◆ According to the group mark on the connecting rod and crankshaft select the appropriate connecting rod bearing.

Connecting rod bearing bush optional form			
Connecting rod large aperture grouping	Crankshaft connecting rod diameter grouping		
	A	B	C
	Correct bearing bush color identification		
A	blue	white	green
B	red	blue	white

CYLINDER HEAD, CYLINDER, PISTON

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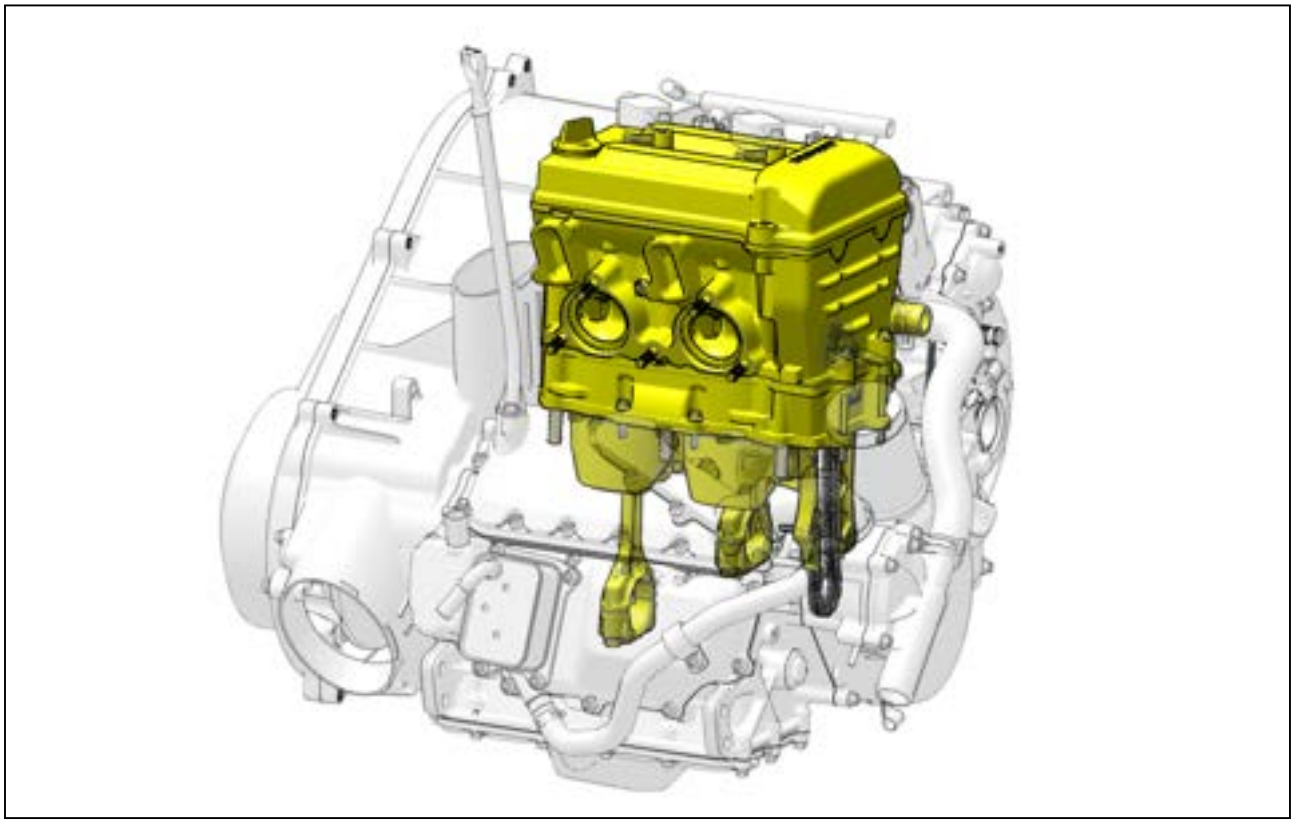
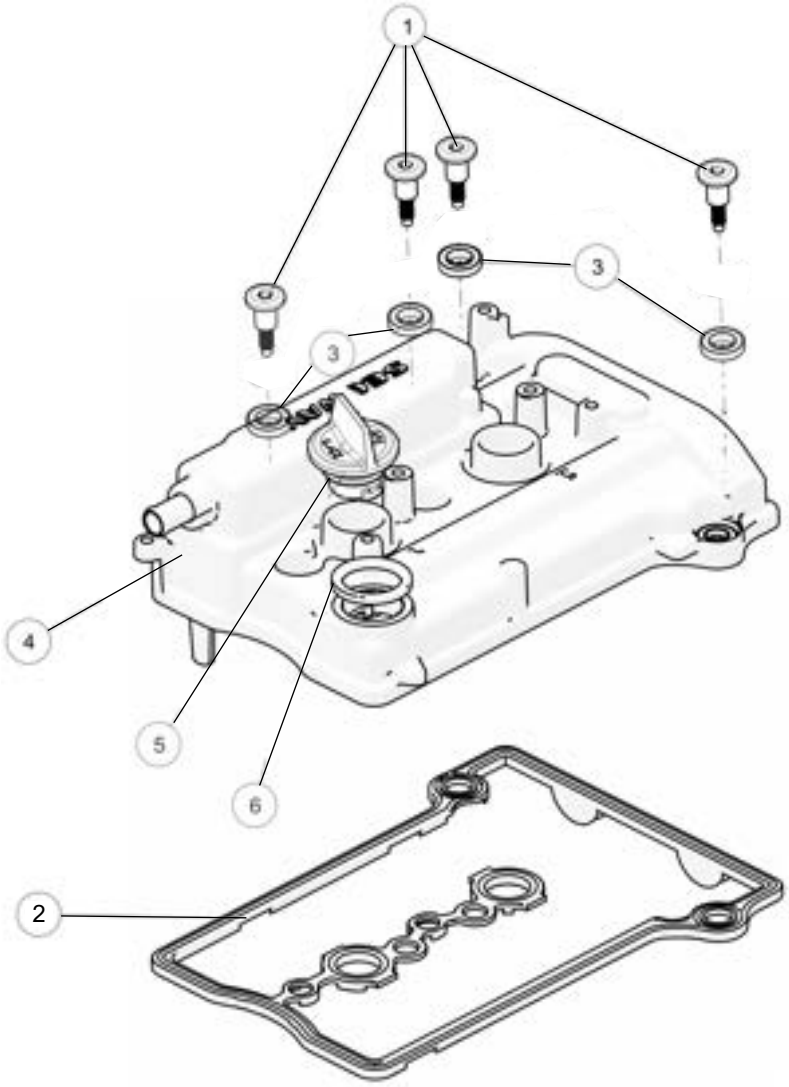
EXPLODED VIEW



Explosive view of Cylinder head cover sub-assembly



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon socket pan head stepped bolt	9.8	1.0	87 in•lb	
2	Cylinder head cover sealing ring				
3	Bolt rubber gasket 10				
4	Cylinder head cover				
5	Fuel filler cap				
6	Fuel filler cap sealing ring				

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

L: Use fastening agent.

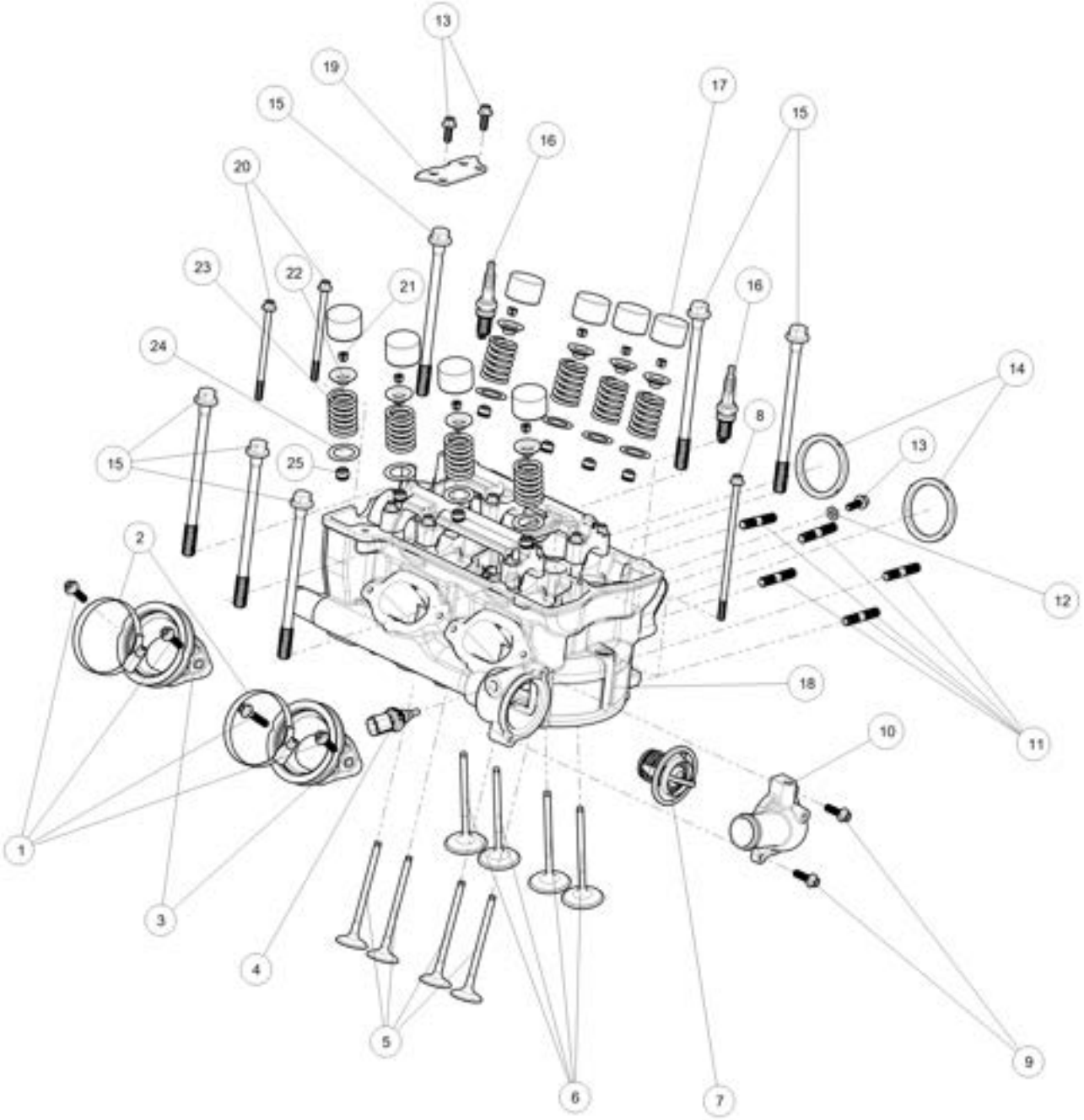
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

Explosive view of Cylinder head sub-assembly



CYLINDER HEAD, CYLINDER, PISTON

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Bolt M6×25	9.8	1.0	87 in•lb	
2	Type A worm drive hose hoop 70				
3	Intake pipe assembly				
4	Water temperature sensor assembly				
5	Exhaust valve				
6	Intake valve				
7	Thermostat components				
8	bolt M6×135	9.8	1.0	87 in•lb	
9	Bolt M6×20	9.8	1.0	87 in•lb	
10	Thermostat cover				
11	Exhaust port double-ended stud M8×43				
12	Copper washer 6				
13	Bolt M6×16	9.8	1.0	87 in•lb	
14	Exhaust pipe gasket 47×57×5				
15	Cylinder bolt combination M11×1.25×150				S
16	Spark plug	11	1. 1	97in•lb	
17	Valve tappet				
18	Cylinder head parts				
19	Chain guide plate assembly Ⅱ				
20	bolt M6×90	9.8	1.0	87 in•lb	
21	Lock clip				
22	Lock clip seat				
23	Valve spring				
24	valve spring seat				
25	valve oil seal				

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

L: Use fastening agent.

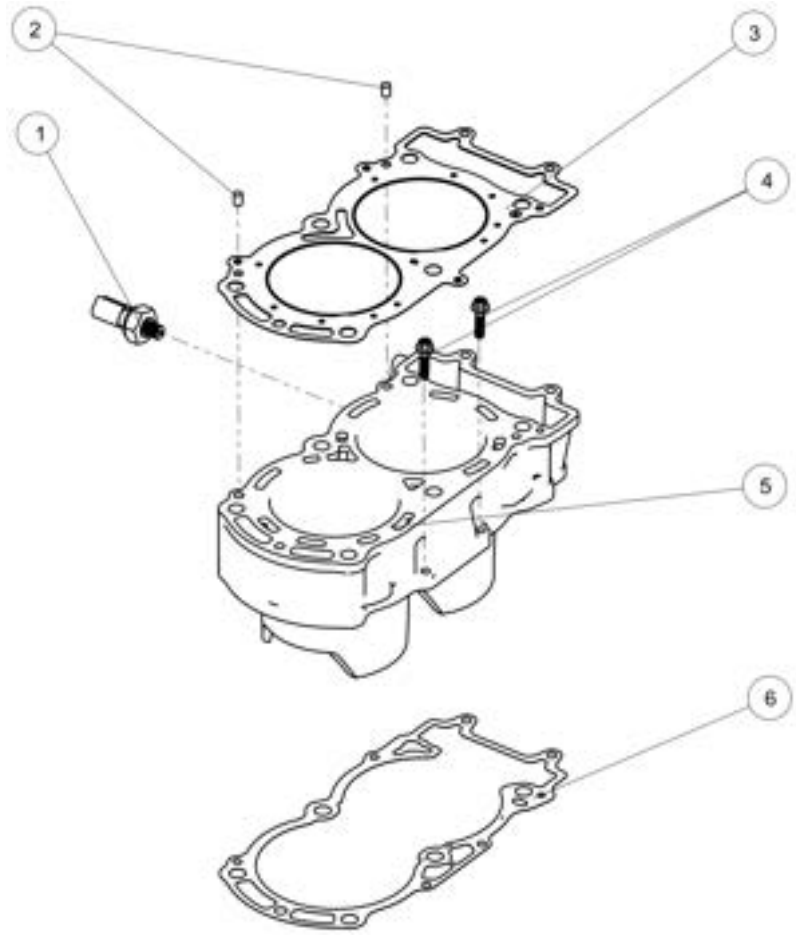
O: Apply oil.

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	Oil Pressure Sensor	15	1.5	11	
2	Cylindrical pin 6×10				
3	Cylinder head gasket assembly				
4	Bolt M6×25	9.8	1.0	87 in•lb	
5	cylinder block				
6	Cylinder block gasket				

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

L: Use fastening agent.

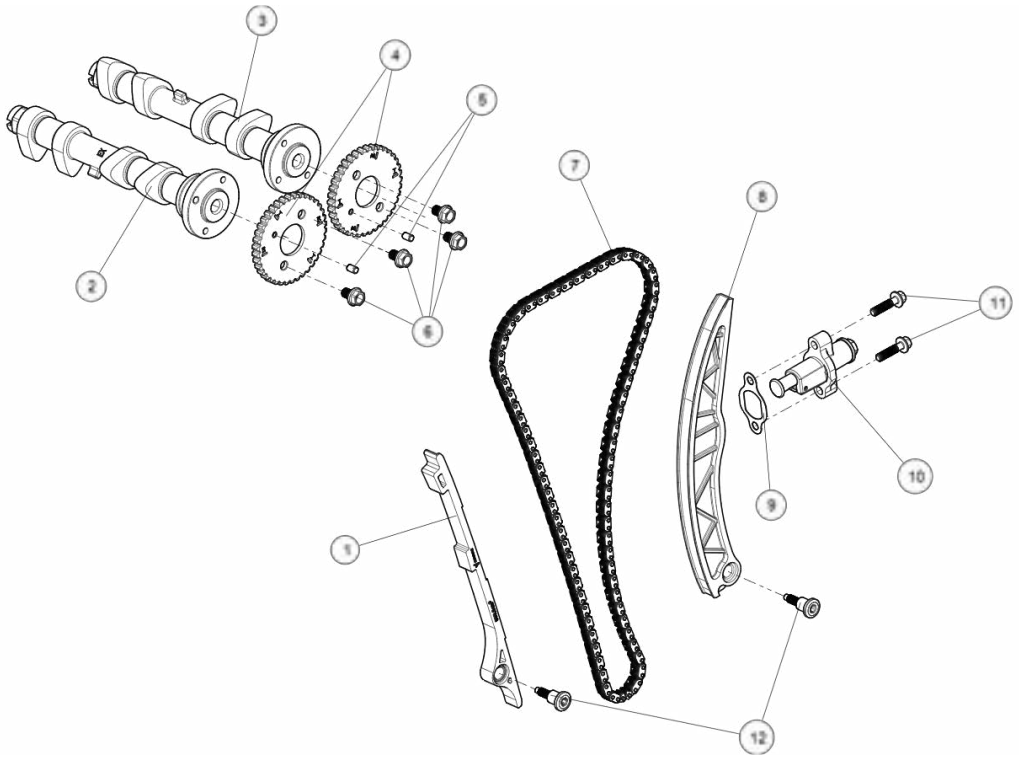
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

Explosive view of Valve Mechanism



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Chain guide plate assembly				
2	Exhaust camshaft combination				
3	Intake camshaft combination				
4	Timing chain assembly				
5	Cylindrical pin 5×8				
6	Hexagon flange bolt M6×12	9.8	1.0	87 in•lb	L
7	Timing chain assembly				
8	Chain tensioner				
9	Tensioner gasket				
10	Tensioner gasket				
11	Bolt M6×25	9.8	1.0	87 in•lb	
12	Hexagon socket pan head stepped bolts				

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

L: Use fastening agent.

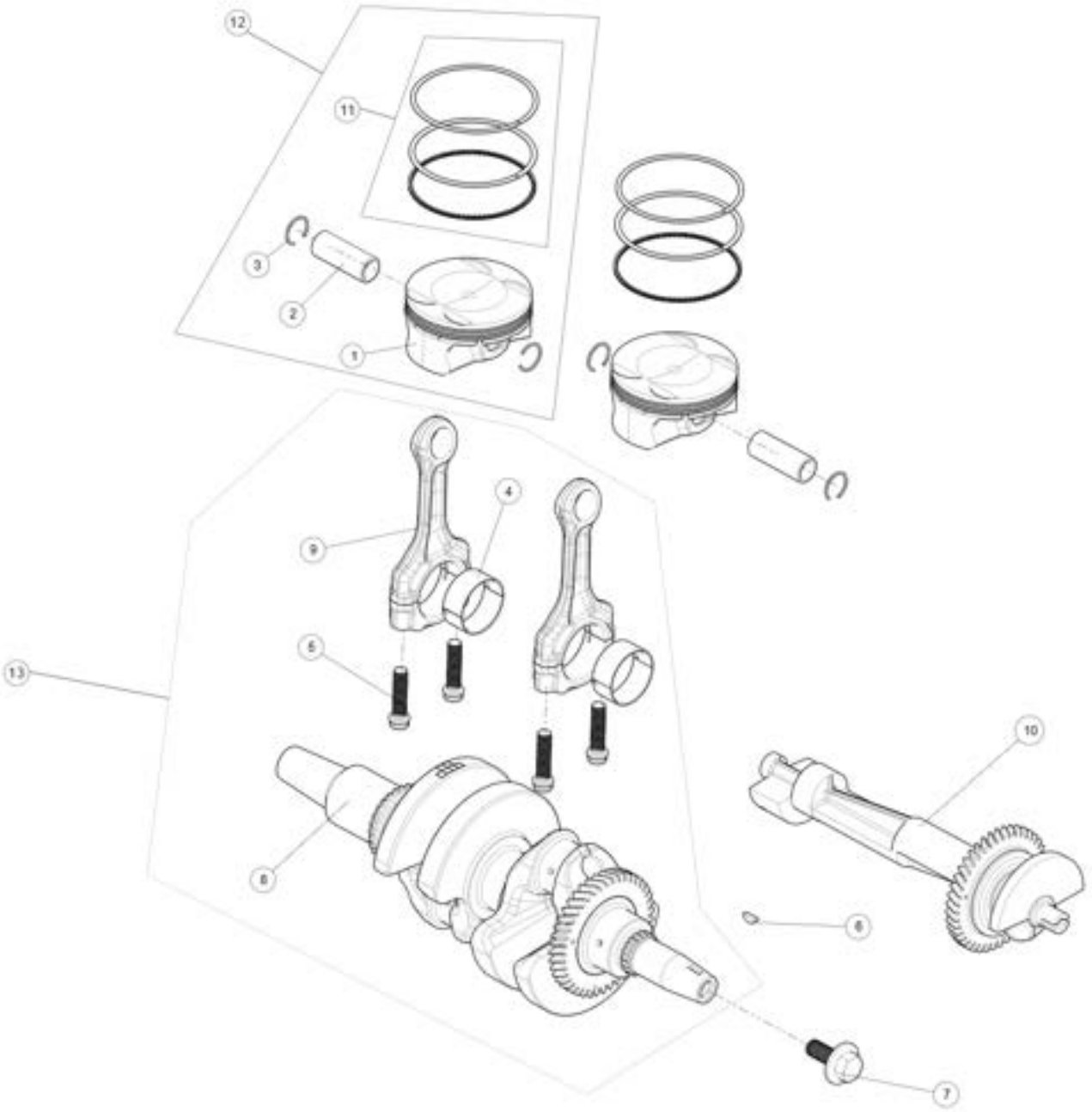
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

R: Spare parts

Explosive view of Piston connecting rod assembly



CYLINDER HEAD, CYLINDER, PISTON

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	piston				
2	Piston pin				O
3	Piston pin retaining ring				
4	Connecting rod tile				O
5	Connecting rod bolt				
6	Half-round key				
7	Bolt M12x1.25x30-LH	150	15.3	111	
8	Crankshaft parts				
9	Connecting rod assembly				
10	Balance shaft assembly				
11	Piston ring combination				
12	Piston set				
13	Crankshaft connecting rod assembly				

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

TECHNICAL PARAMETERS

Item	Standard	Limit
Cylinder head:		
Cylinder pressure value (use range)		
Electric starter	1.1 ~ 1.3 MPa (11~13 kgf/cm², 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")

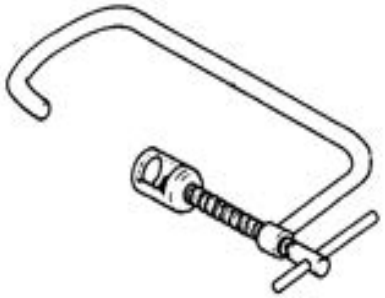
TECHNICAL PARAMETER

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")

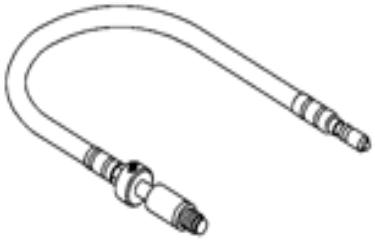
SPECIAL TOOLS

Cylinder pressure gauge

Valve spring presser assembly

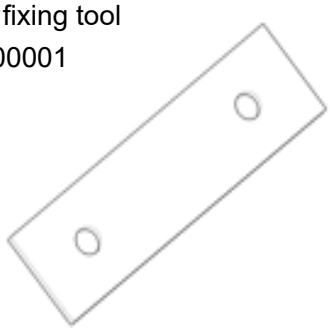


Cylinder pressure gauge connector,
M10×1.0

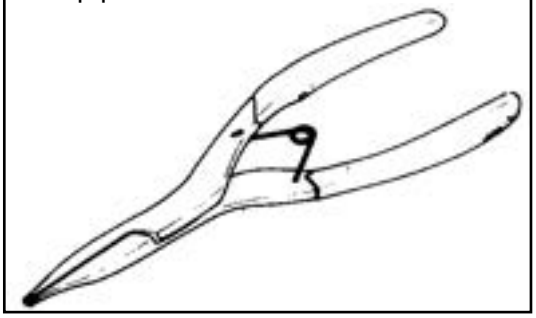


Valve spring press fitting head

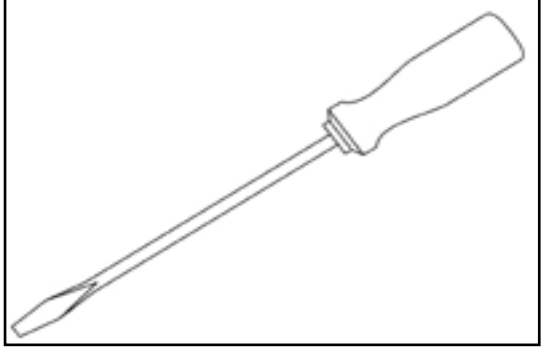
Camshaft fixing tool
E02A40000001



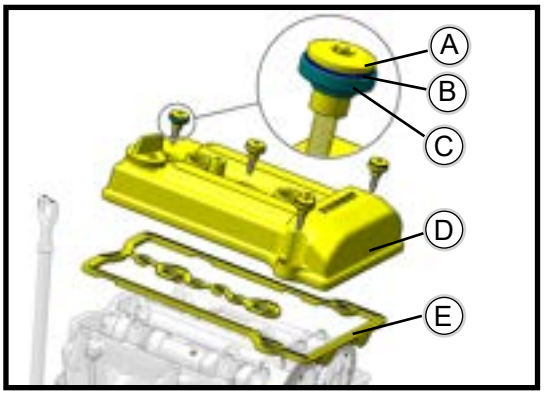
Circlip pliers



screwdriver



CYLINDER HEAD COVER



Remove the cylinder head cover

◆ Disassembly:

【A】 Hexagon socket pan head stepped bolt

【B】 Washer 10.6×18×1

【C】 Rubber gasket 10

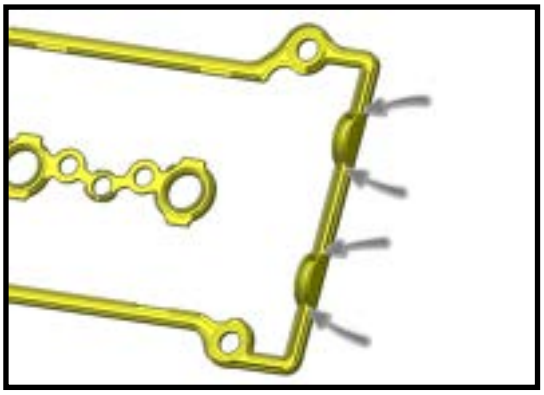
【D】 Cylinder head cover

【E】 Cylinder head cover sealing ring

Install the cylinder head cover:

◆ If oil leakage occurs, the gasket 【B】 and sealing ring 【E】 should be replaced.

◆ Before installing the sealing ring 【E】, apply silicone rubber to the corners of the two raised blocks.



◆ Sealing agent.

◆ Installation

【E】 Cylinder head cover sealing ring

【D】 Cylinder head cover

【C】 Rubber gasket 10

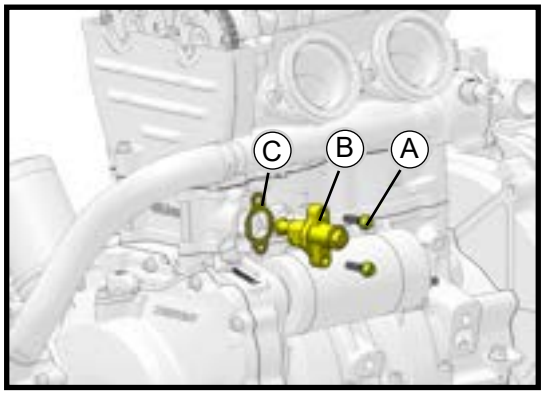
【B】 Washer 10.6×18×1

【A】 Hexagon socket pan head stepped bolt

◆ Tightening torque

Bolt 【A】
9.8 N•m (1.0kgf•m, 87in•lb)

CAMSHAFT COVER / CAMSHAFT

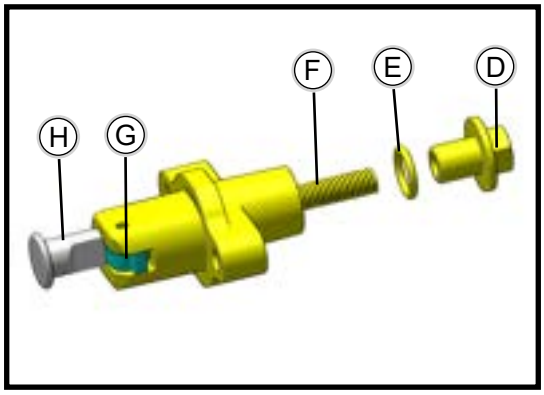


⚠ CAUTION

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

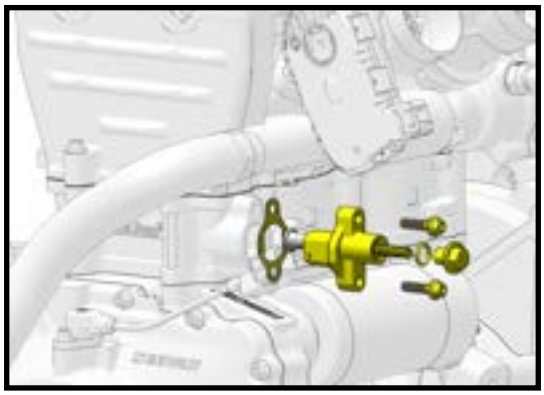
【C】 Tensioner gasket

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】.

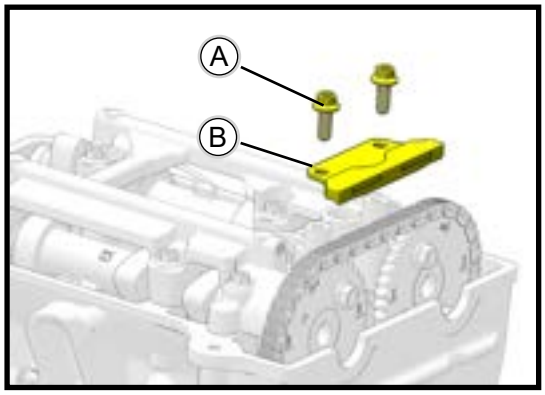
◆ Put 【E】 on the bolt 【D】, and install the spring 【F】 and bolt 【D】 in sequence.

◆ Tightening torque

Chain tensioner mounting bolt
9.8 N•m (1.0 kgf•m, 87 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

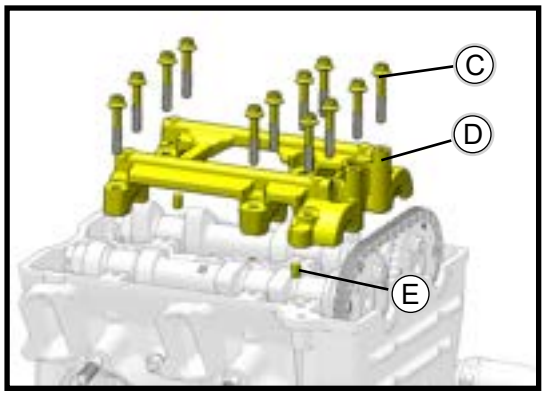
【C】 Bolt M6×35

【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.

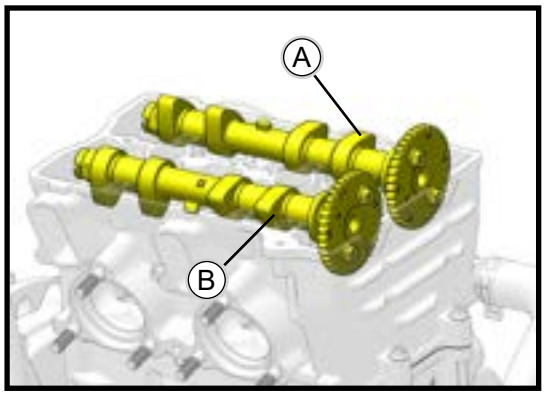


◆ Remove the chain from the camshaft so that the camshaft can be taken out.

TIPS

Be careful when removing the camshaft from the cylinder head

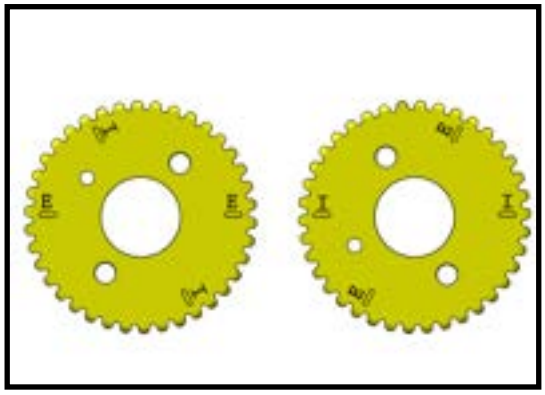
◆ Use a tool similar to an S-shaped hook to hang the timing chain. Prevent the chain from falling into the crankcase.



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.

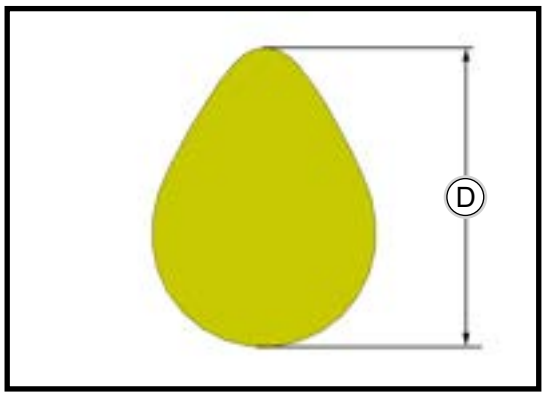


Camshaft sprocket inspection

- 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

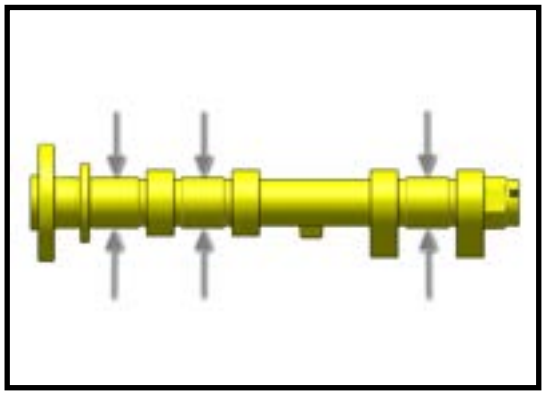
- Visually check whether the camshaft lobe is worn or damaged.
- Use a micrometer to measure the height of the camshaft lobe【D】.



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.

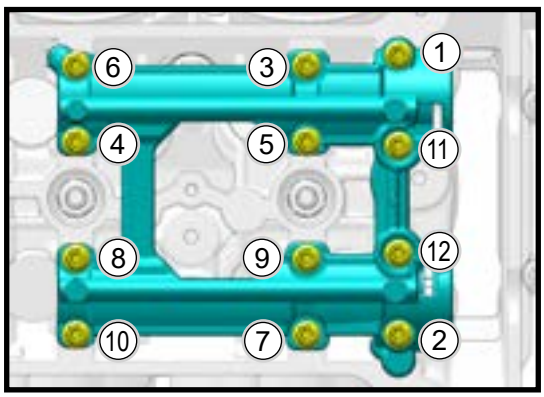


Standard	Limit
22.954 ~ 22.975 mm(0.9036" ~ 0.9045")	22.944 mm (0.9033")

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.

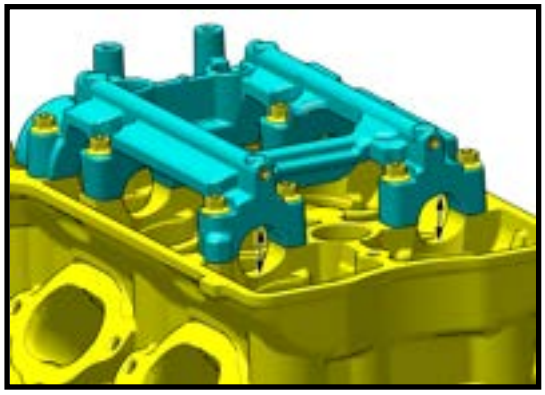


Camshaft cover bolt
10 N•m (1.0 kgf•m, 89 in•lb)

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

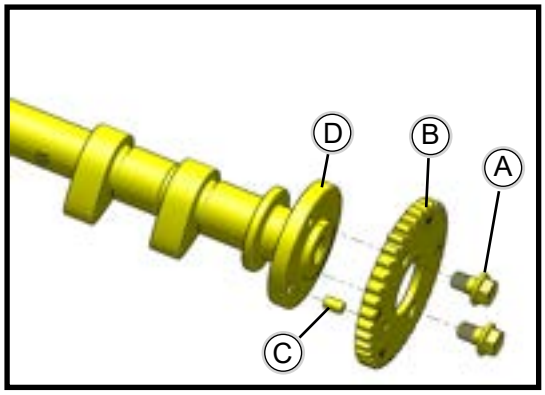


◆ Calculate the clearance value by subtracting the camshaft shaft diameter from the camshaft bearing bore, and compare it with the specification

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

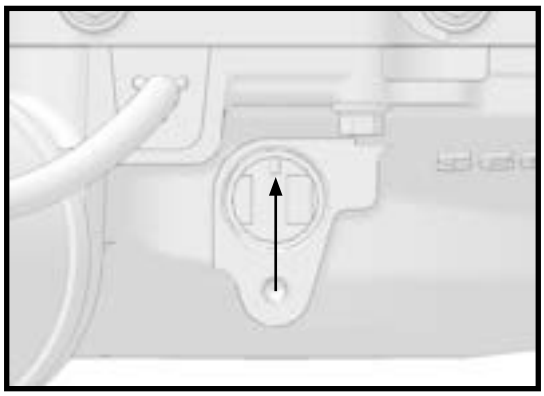
◆ Install the cylindrical pin 【C】 into the camshaft 【D】.

◆ 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)

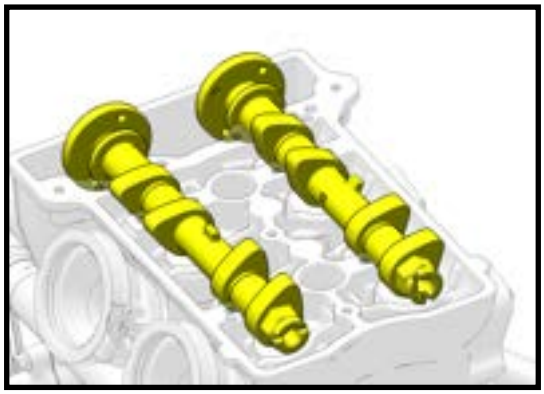


Camshaft installation / timing adjustment

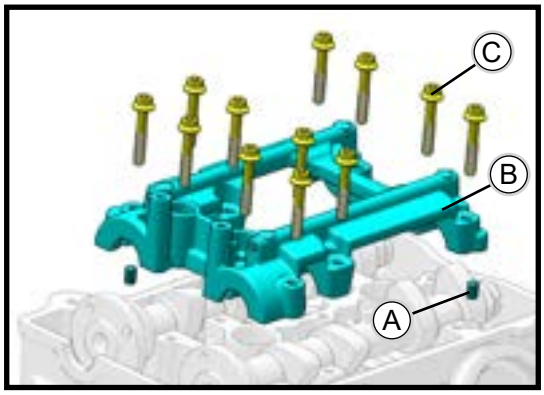
⚠ CAUTION

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.

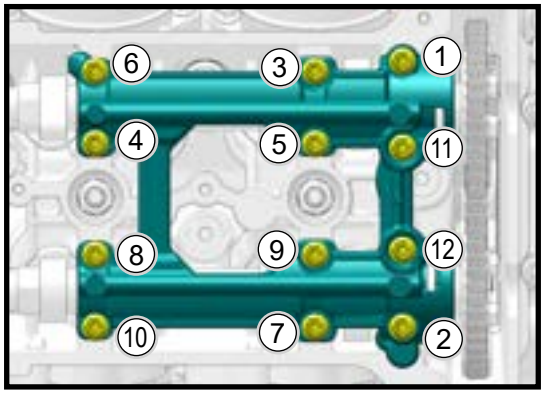


- Installation:

【A】 Cylindrical pin 6×10

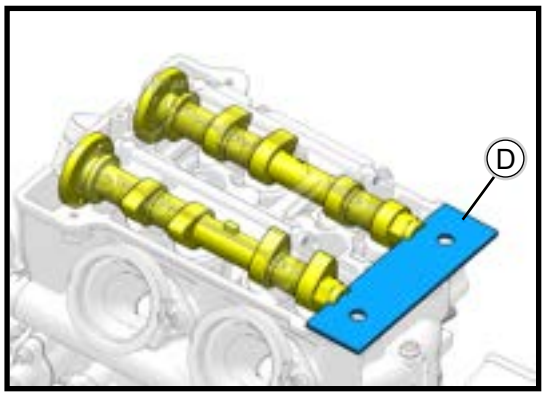
【B】 Camshaft cover assembly

【C】 Bolt M6×35

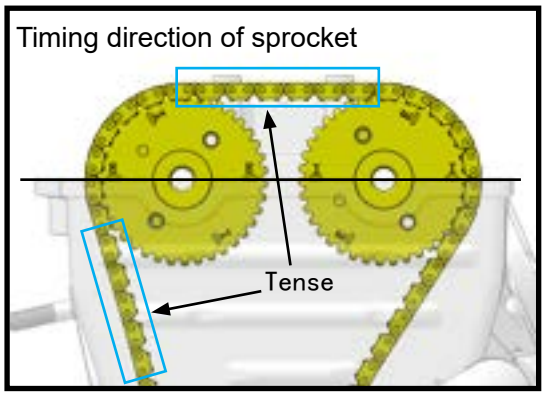


- Tighten the camshaft cover mounting bolts 【C】 in order.
- Tightening torque

Bolt M6
9.8 N•m (1.0kgf•m, 87in•lb)

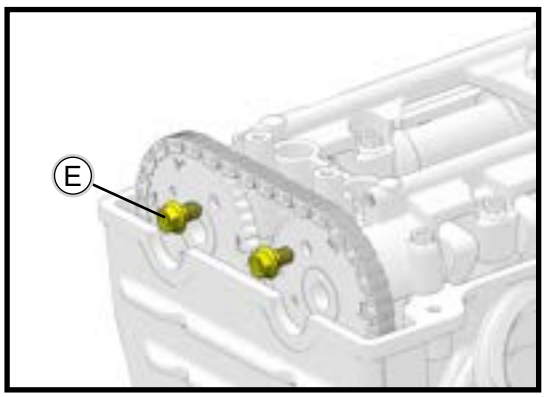


- Insert the camshaft fixing tool 【D】 into the camshaft end groove shown in the figure to fix the intake and exhaust camshafts. If necessary, use an open-end wrench to turn the camshaft.
- According to the method in the first step, confirm that the top dead center mark has not changed.
- Lift the timing 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



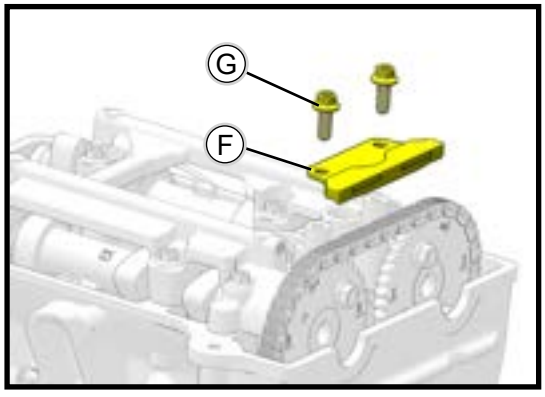
⚠ CAUTION

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】.

Bolt M6
9.8 N•m (1.0kgf•m, 87in•lb)



- Installation

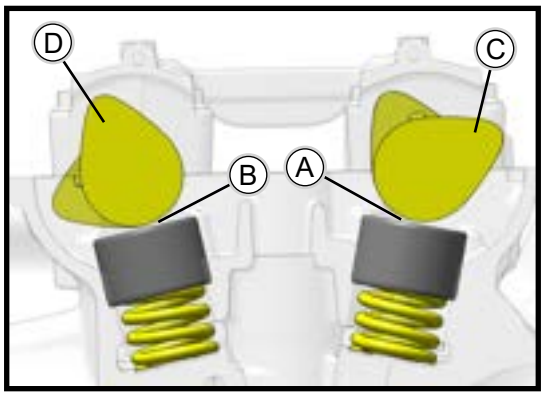
【F】 Chain guide plate assembly II

【G】 Bolt M6×16

- Tightening torque

Bolt M6
9.8 N•m (1.0kgf•m, 87in•lb)

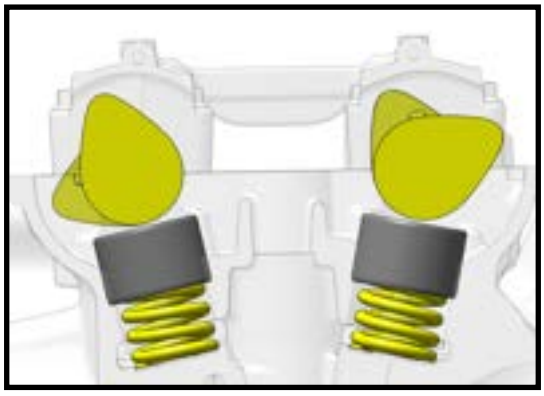
Valve clearance adjustment



⚠ 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

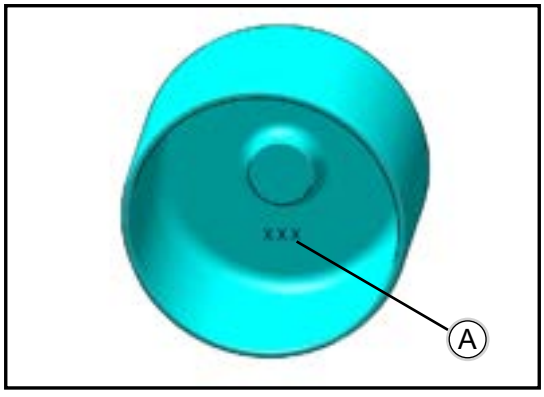


Valve clearance requirements (cold)	
exhaust:	0.2 ~ 0.25mm (0.0079" ~ 0.0098")
Air intake:	0.1 ~ 0.15mm (0.0039" ~ 0.0059")

- 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

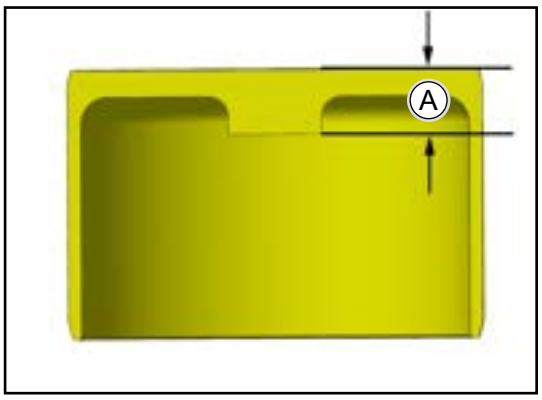
are adjusted.

- Reinstall the camshaft and camshaft cover, and tighten the bolts as required.
- Tightening torque:

Bolt (M6)
9.8 N•m (1.0kgf•m, 87in•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

Intake valve clearance-valve tappet selection matrix

valve clearance (mm)before adjustment	Existing valve lifter specifications (3 digits on the lifter)	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580
	Correct valve lifter specifications (3 digits on the lifter)																																																				
0.000-0.024		-	-	-	-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570
0.025-0.049		-	-	-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572
0.050-0.074		-	-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574
0.075-0.099		-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576
0.100-0.150（Standard）																																																					
0.151-0.175		484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580		
0.176-0.200		486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580			
0.201-0.225		488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580				
0.226-0.250		490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580					
0.251-0.275		494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580							
0.276-0.300		496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580								
0.301-0.325		498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580									
0.326-0.350		500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580										
0.351-0.375		504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580												
0.376-0.400		506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580													
0.401-0.425		508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580														
0.426-0.450		510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580															
0.451-0.475		514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																	
0.476-0.500		516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																		
0.501-0.525		518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																			
0.526-0.550		520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																				
0.551-0.575		524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																						
0.576-0.600		526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
0.601-0.625		528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																								
0.625-0.650		530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																									
0.651-0.675		534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																									
0.676-0.700		536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																										
0.701-0.725		538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																											
0.726-0.750		540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																												
0.751-0.775		544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																														
0.776-0.800		546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																															
0.801-0.825		548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																																
0.826-0.850		550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																																	
0.851-0.875		554	556	558	560	562	564	566	568	570	572	574	576	578	580																																			
0.876-0.900		556	558	560	562	564	566	568	570	572	574	576	578	580																																			
0.901-0.925		558	560	562	564	566	568	570	572	574	576	578	580																																			
0.926-0.950		560	562	564	566	568	570	572	574	576	578	580																																			
0.951-0.975		564	566	568	570	572	574	576	578	580																																				
0.976-1.000		566	568	570	572	574	576	578	580																																				

Exhaust valve clearance-valve lifter selection matrix

valve clearance (mm)before adjustment	Existing valve lifter specifications (3 digits on the lifter)	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580
	Correct valve lifter specifications (3 digits on the lifter)																																																				
0.000-0.024		-	-	-	-	-	-	-	-	-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560
0.025-0.049		-	-	-	-	-	-	-	-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	
0.050-0.074		-	-	-	-	-	-	-		480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564
0.075-0.099		-	-	-	-	-	-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	
0.100-0.124		-	-	-	-	-	-	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	
0.125-0.149		-	-	-	-	-	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	
0.150-0.174		-	-	-	-	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	
0.175-0.199		-	-	-	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	
0.200-0.250 (Standard)																																																				
0.251-0.275		484	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580		
0.276-0.300		486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580			
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0.326-0.350		492	494	496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580						
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0.376-0.400		496	498	500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580								
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0.426-0.450		500	502	504	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580										
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0.476-0.500		506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580													
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0.576-0.600		516	518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																		
0.601-0.625		518	520	522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																			
0.625-0.650		522	524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																				
0.651-0.675		524	526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																					
0.676-0.700		526	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																						
0.701-0.725		528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
0.726-0.750		530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
0.751-0.775		534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
0.776-0.800		536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
0.801-0.825		538	540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
0.826-0.850		540	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
0.851-0.875		544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576	578	580																							
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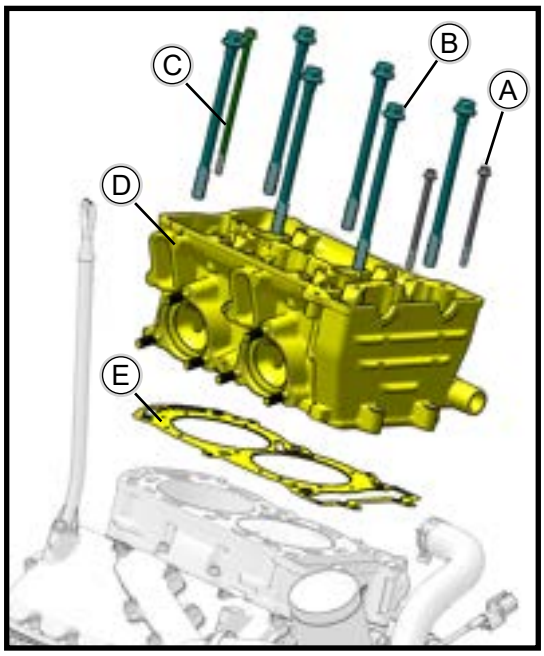
0.951-0.975		554	556	558	560	562	564	566	568	570	572	574	576	578	580																									
0.976-1.000		556	558	560	562	564	566	568	570	572	574	576	578	580																										



CYLINDER HEAD

◆ Remove the cylinder head

TIPS

Maintenance of the cylinder head can be carried out on the entire vehicle.

◆ Disassembly:

【A】 Bolt M6×90

【B】 Cylinder bolt M11×1.25×150

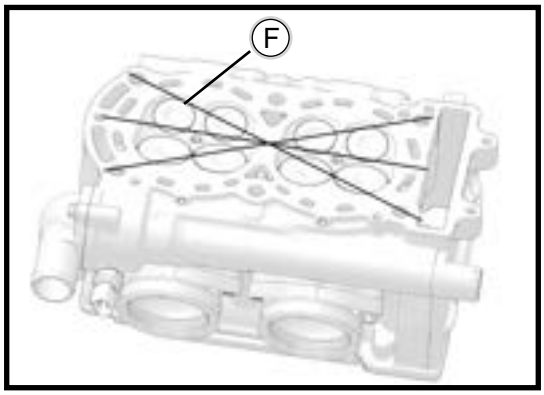
【C】 Bolt M6×16

◆ Remove the cylinder head 【D】, if necessary, you can use a plastic hammer to tap the cylinder head lightly to loosen the cylinder head for easy removal.

◆ Remove the cylinder head gasket 【E】.

Cylinder head inspection

◆ Thoroughly clean the cylinder head gasket material and carbon deposit marks on the bottom surface of the cylinder head.



Check the cylinder head deformation

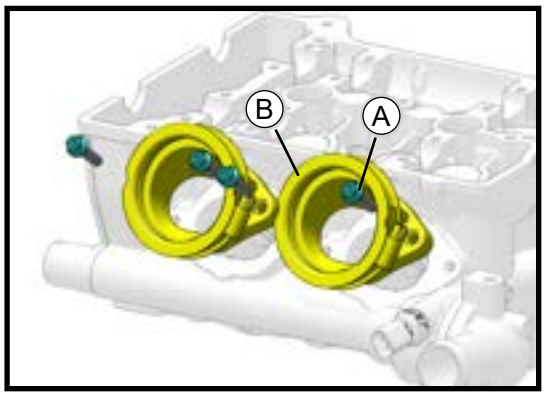
◆ Keep the bottom surface of the cylinder head clean.

◆ Place a ruler 【F】 on the bottom surface of the cylinder head.

◆ Use a feeler gauge to measure the distance between the ruler 【F】 and the different positions of the cylinder head.

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

Remove the intake pipe assembly



- Disassembly:

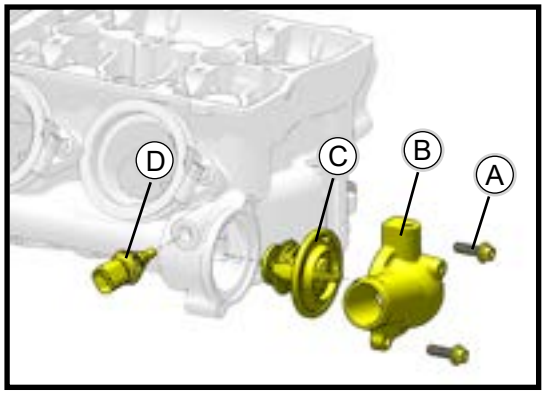
【A】 Bolt M6×25

【B】 Intake pipe assembly

Install the intake pipe assembly

- Install the intake pipe assembly 【B】, and tighten the bolt 【A】.
- Tightening torque

Intake pipe assembly bolt
9.8 N·m (1.0 kgf·m, 87 in·lb)



Disassemble the thermostat and water temperature sensor

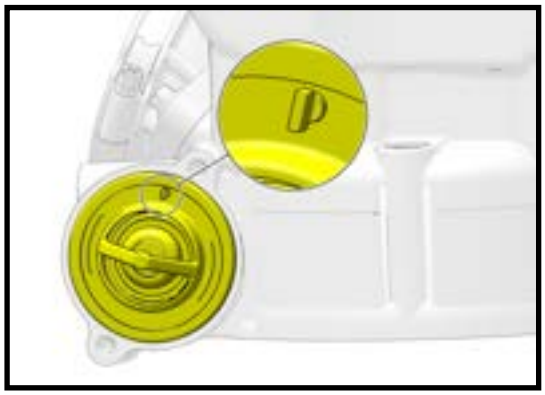
- Disassembly:

【A】 Bolt M6×20

【B】 Thermostat cover

【C】 Thermostat

【D】 Water temperature sensor assembly

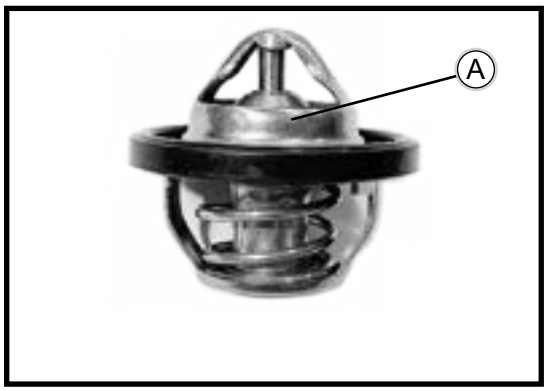


Install thermostat and water temperature sensor

- Install the thermostat 【C】, the vent of the thermostat should be upward when installing, aligned with the notch on the cylinder head.
- Install the thermostat cover 【B】, and tighten the bolt 【A】.
- Install the water temperature sensor assembly 【D】, and apply thread sealant when installing.
- Tightening torque

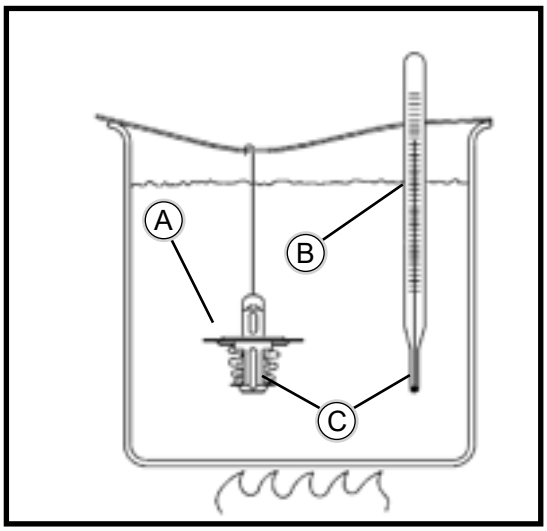
Thermostat cover bolt
9.8 N•m (1.0kgf•m, 87 in•lb)

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 is turned on, please replace it with a new one.
- Check the opening temperature of the thermostat, put the thermostat 【A】 and an accurate thermometer 【B】 into the water, and adjust the temperature sensing part to the same height.
- Gradually increase the temperature of the water while gently stirring the water to make the temperature even.
- Thermostat opening temperature 74～87°C (165.2～188.6°F)
- If the measurement is out of range, replace the thermostat.



Disassemble the spark plug

- Disassembly:

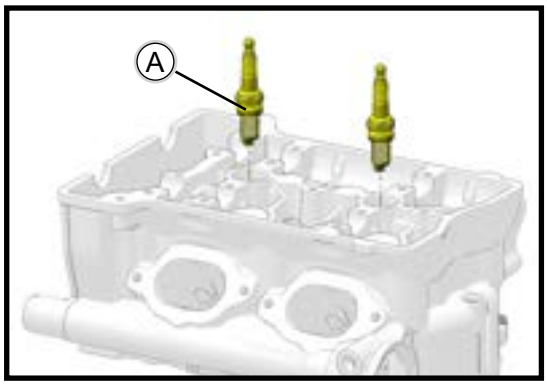
【A】 Spark plug

⚠ CAUTION

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

TIPS

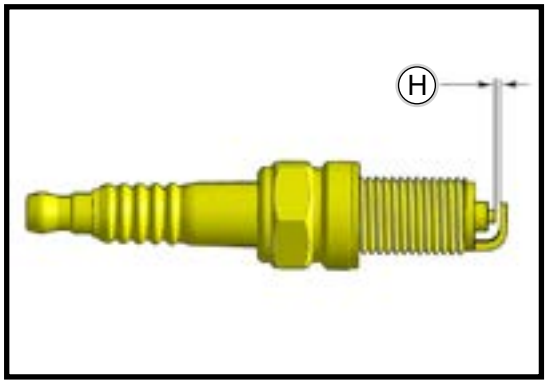
When removing the spark plug, put a rag on the spark plug hole to prevent anything from falling into the combustion chamber.



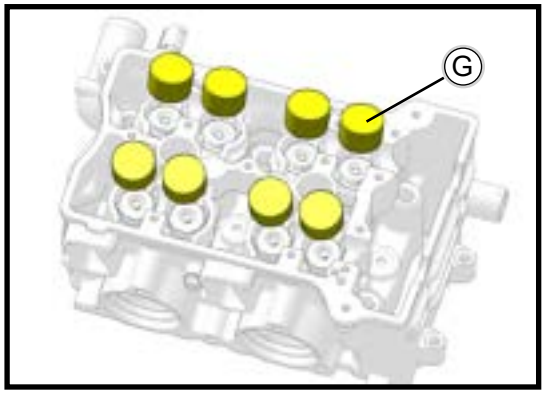
Install spark plug

- Apply anti-rust agent to the spark plug thread.
- Install spark plugs.
- Tightening torque:

Spark plug
11 N•m (1.1kgf•m, 97in•lb)



- Spark plug inspection:
- Spark plug electrode gap: 【H】=0.7 ~ 0.9



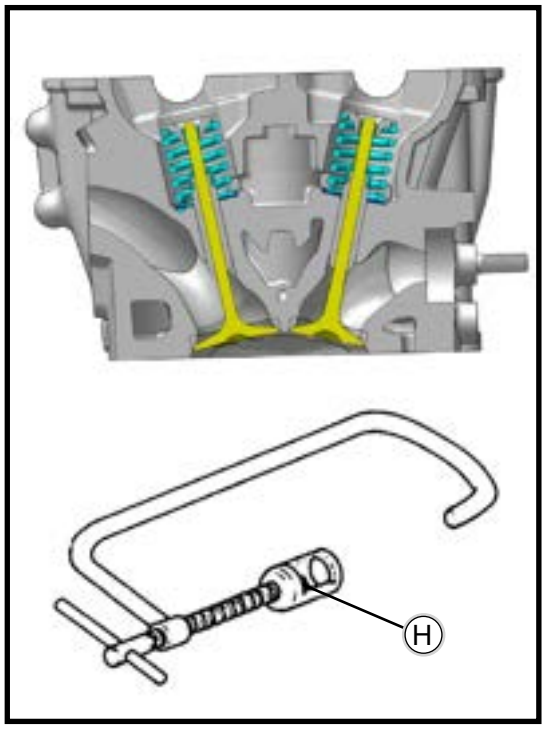
Remove the valve

⚠ WARNING

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

TIPS

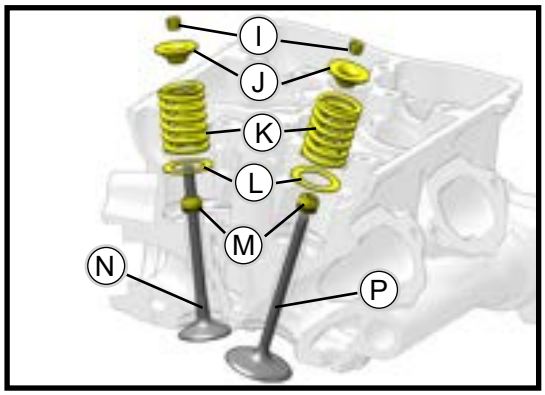
In order to ensure that the parts can be installed back to the original position, the matching parts should be put together and arranged according to their position on the cylinder head. The removed parts should be marked or placed on an arranged shelf.



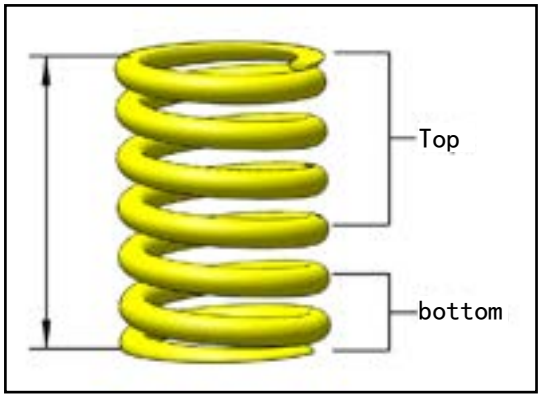
- Remove the valve lifter 【G】 from the cylinder head.
- Use the valve spring compressor 【H】 to press down the valve spring.
- Remove the valve lock clamp 【I】.
- Slowly release the valve spring compressor and remove the compressor.
- Remove the lock clamp seat 【J】, valve spring 【K】, valve spring seat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



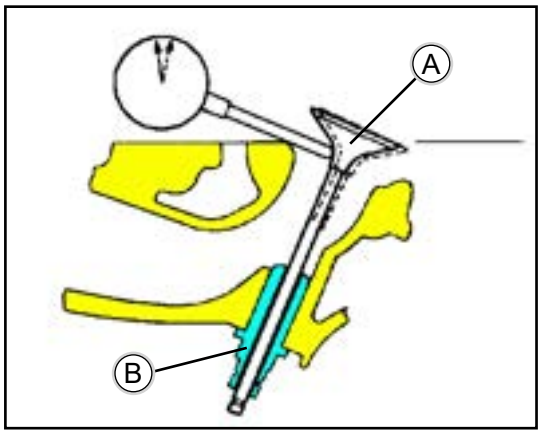
- Measure the free length of each valve spring with a vernier caliper and compare it with the standard value.
- Free length of valve spring:standard:1.726" (43.85 mm), service limit:1.683" (42.75 mm)

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

Valve guide / valve inspection

- Valve stem clearance measurement:

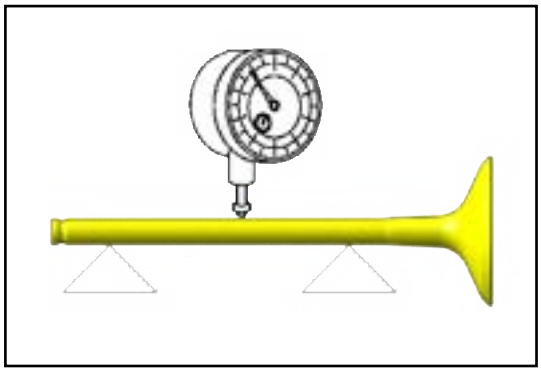
If there is no small aperture gauge, use the swing method to measure the gap between the valve and the valve guide and check the wear of the valve guide. The method is as follows.



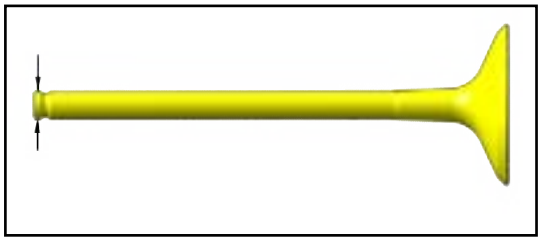
- Insert a new valve【A】into the valve guide【B】, and place a dial indicator perpendicular to the valve stem on the valve stem, as close as possible to the cylinder head mating surface.
- Swing the valve lever to measure the valve/valve guide gap.
- Repeat the measurement in the direction at right angles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

TIPS

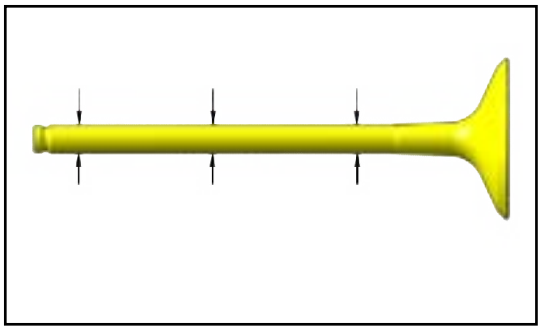
The reading is not the true gap between the valve and the valve guide, because the measurement position is above the guide.



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. .

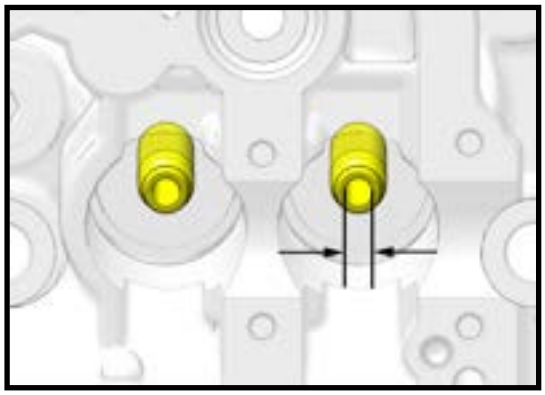


TIPS

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.

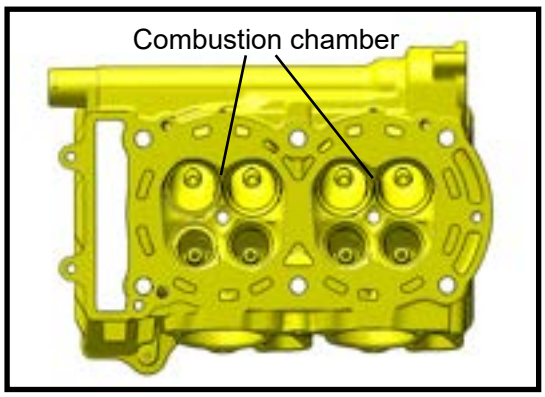
TIPS

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).

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")

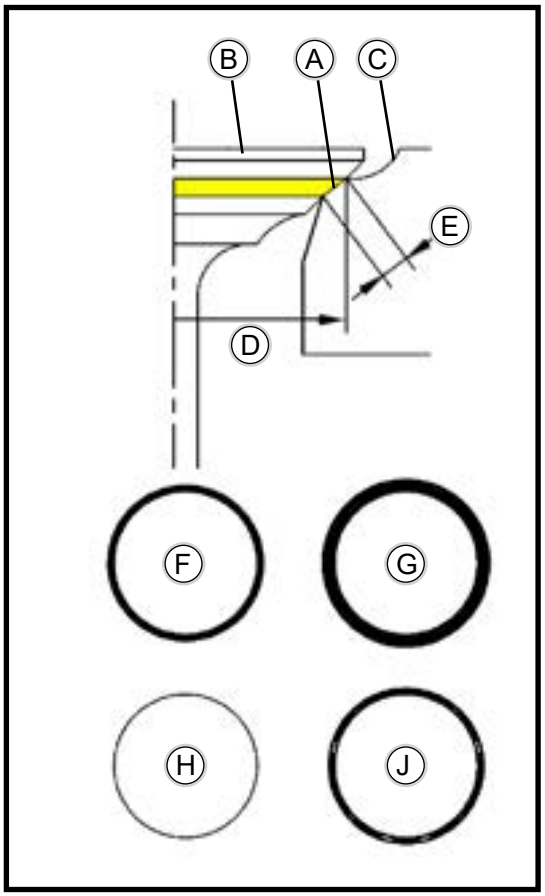
TIPS

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)



【F】Good

【G】 Too wide

【H】 too narrow

【J】 Uneven

Seat ring repair (valve grinding)

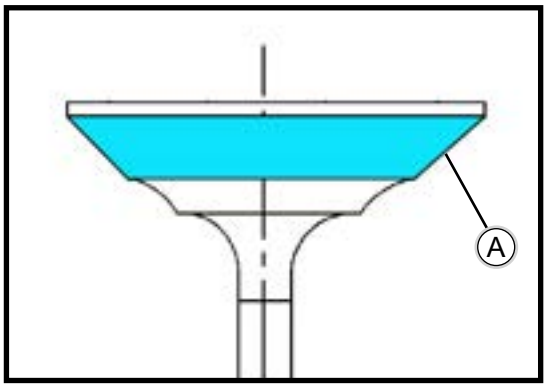
- Insert the guide into the valve guide.
- Apply cutting oil to the seat ring and tool.
- Place the 46° tool on the guide and perform light cutting.
- Check the cutting area of the seat ring:

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

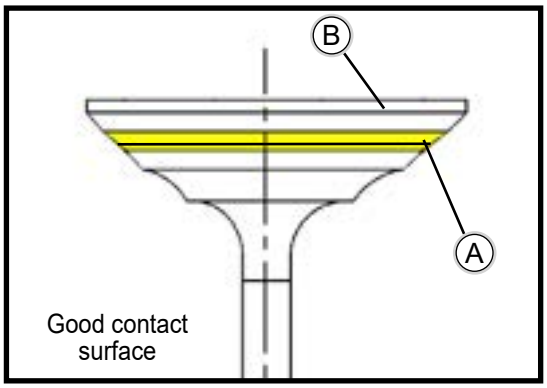
If the tool touches the uncut part of the seat ring, check the guide. Check for burrs, scratches, or excessive jumps. If the guide is bent, it must be replaced.

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.

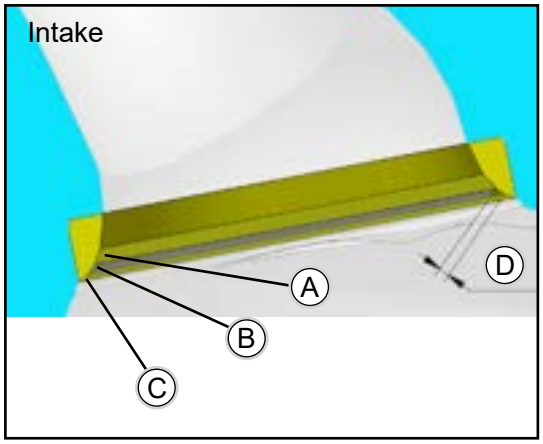
If it is too low, use a 60° tool to raise the seat ring. When the contact area is concentrated on the valve surface, measure the width of the valve seat.

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.



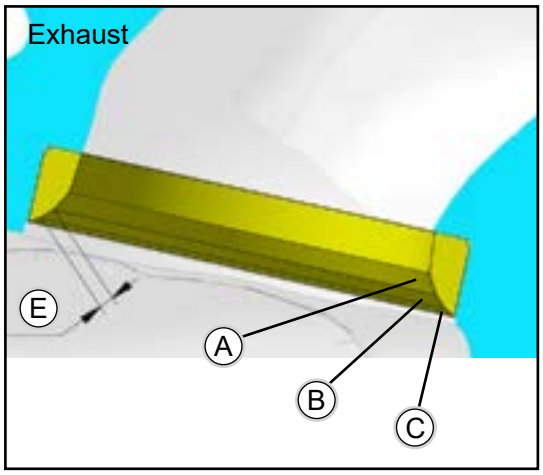
【A】 30°

【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.

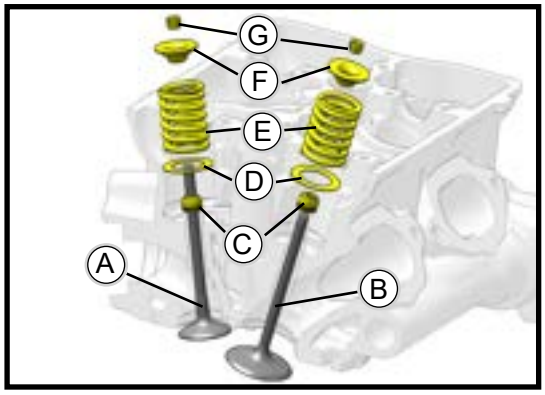
TIPS

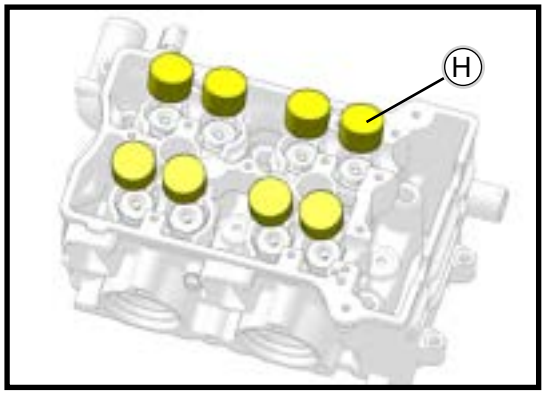
If the interference angle repair method is used, no grinding is required.

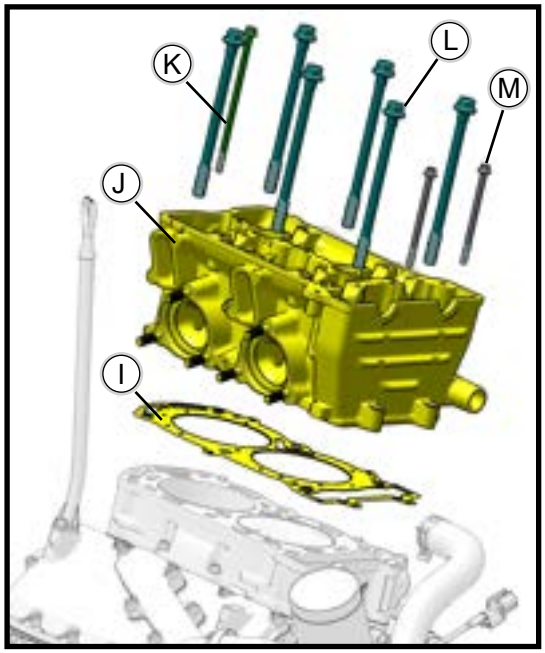
- Use a grinding tool or a section of fuel line connected to the valve stem to insert the valve into the respective guide rail and grind it.
- Rotate the valve back and forth quickly until the cutting sound is smooth. Lift the valve slightly away from the seat, rotate it 1/4 turn, and repeat the grinding 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.

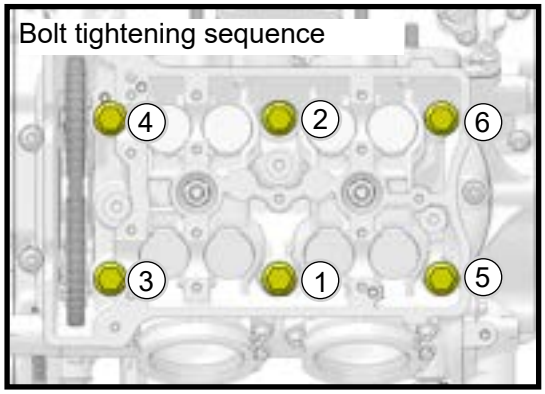
⚠ CAUTION

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.

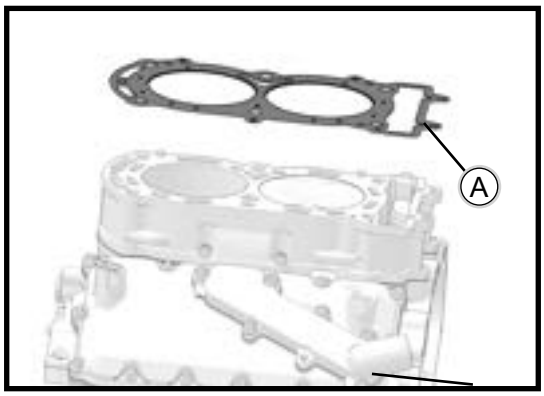
- To install the valve lifter, refer to the chapters of "Valve Clearance Adjustment" and "Selection of Lifter".
- Align the positioning pins on the cylinder block and place the cylinder head gasket 【I】. The gasket should be clean and free of grease.
- Align the position of the positioning pin, and place 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:

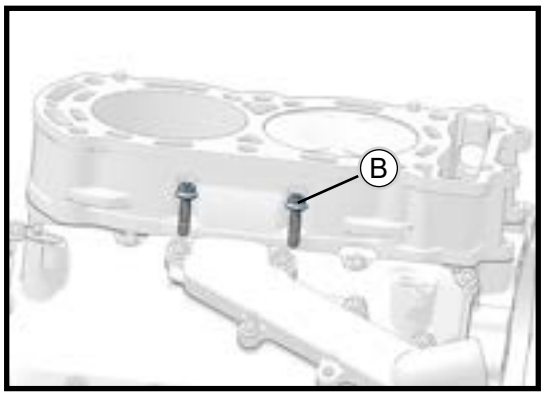
Bolt【K】, 【M】
9.8 N·m (1.0 kgf·m, 87 in·lb)

CYLINDER BLOCK AND PISTON



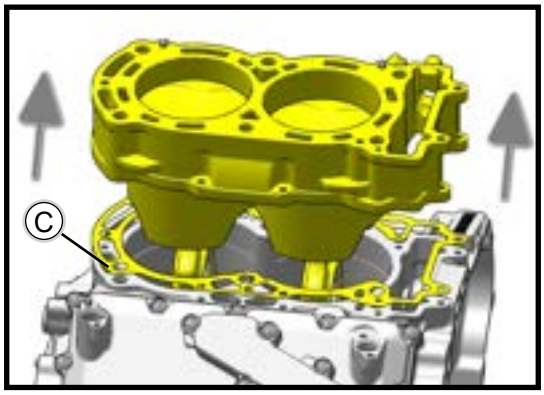
Cylinder block removal

- 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.

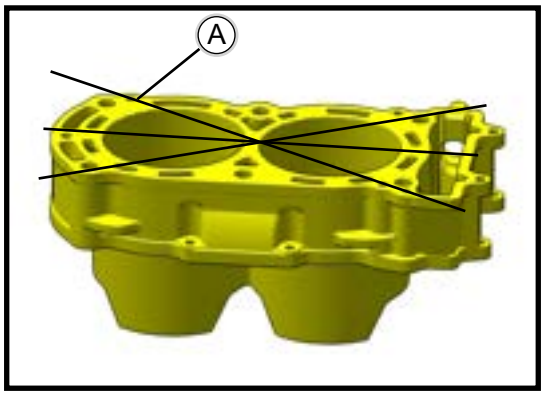


TIPS

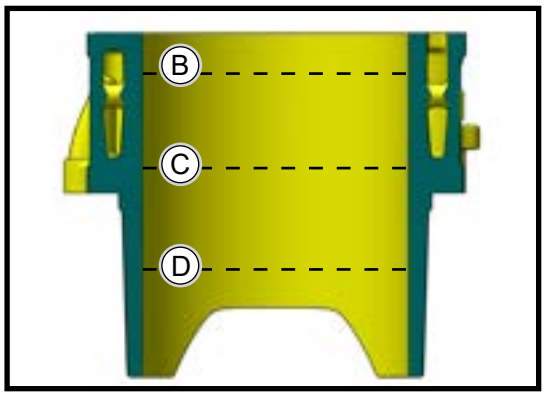
If the piston will continue to be used, please make a mark according to the installation position during disassembly, so that the same cylinder position can be installed in the next assembly.



Cylinder block inspection



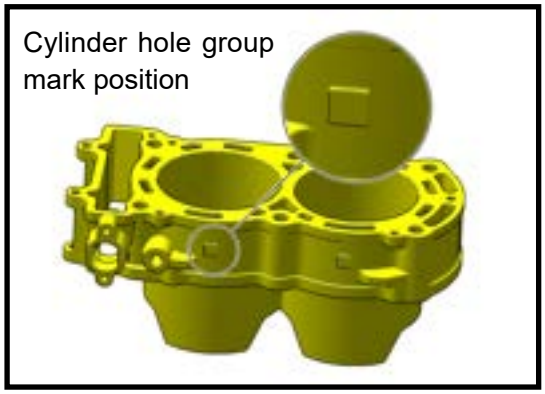
- Keep the top surface of the cylinder block clean, place a ruler【A】on the top surface of the cylinder block, and measure the distance between the ruler【A】and different positions of the cylinder block with a feeler gauge. Cylinder head deformation limit: 0.05 mm (0.002"). If the cylinder head deformation exceeds the limit, replace the cylinder block.
- Check the cylinder bore for wear, scratches or damage.
- Measure the inner diameter of the cylinder hole according to the three heights shown in the figure (【B】is 15mm from the top surface, 【C】is in the middle, and 【D】is 15mm from the bottom),



two directions (front and back, left and right), each cylinder There are a total of 6 holes for measurement.

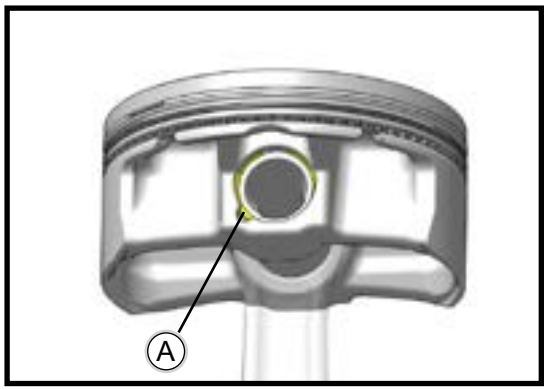
◆ Cylinder hole grouping marks (I or II) are marked on the steps on the intake side of each cylinder of the cylinder block. According to the cylinder hole measurement results and the corresponding group size comparison, if the measured value of any cylinder hole exceeds the use limit, please replace it cylinder block.

◆



Cylinder hole 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")



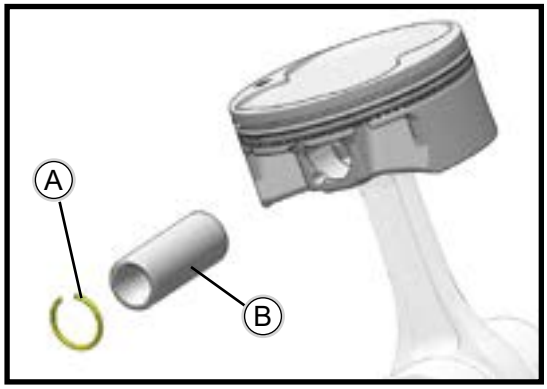
Disassemble the piston

◆ 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.

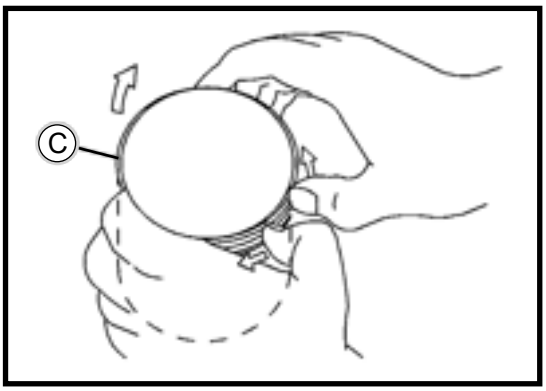
⚠ CAUTION

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】.

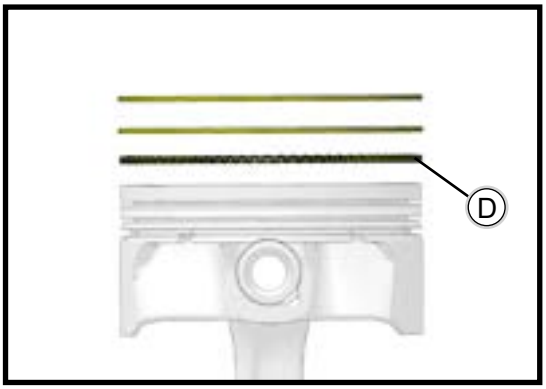
◆ Remove the piston.



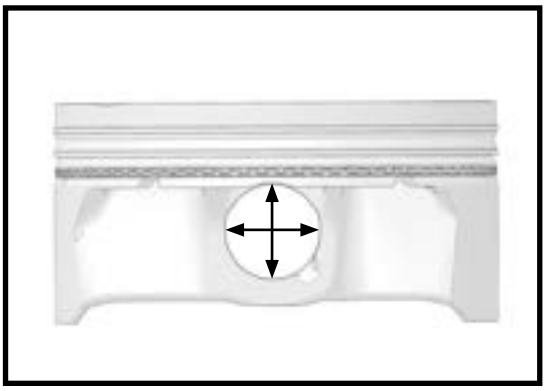
- Use your fingers to carefully open the opening of the piston ring 【C】, then lift the piston ring up and remove it from the piston.
- Remove the remaining piston ring in the same way.

⚠ 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.



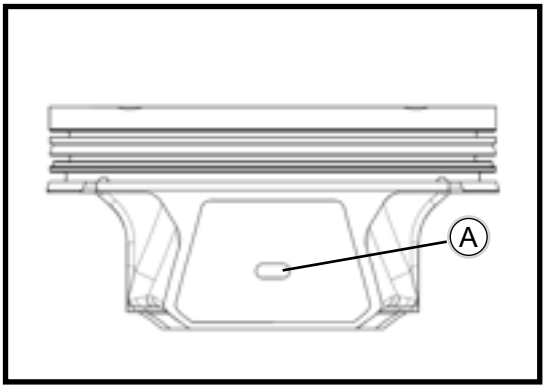
- The oil ring assembly 【D】 is composed of two upper and lower blade rings and an intermediate liner ring. When disassembling, first remove the upper blade ring, then the lower blade ring, and finally the intermediate liner ring.



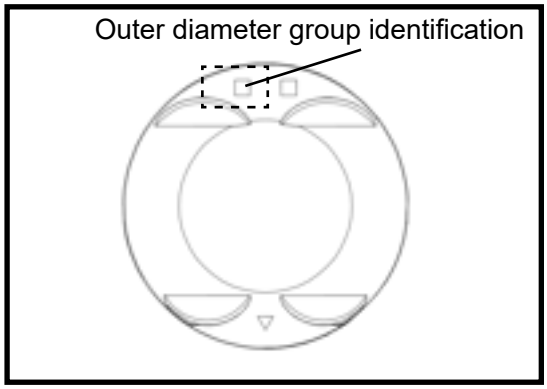
Piston measurement

- 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.



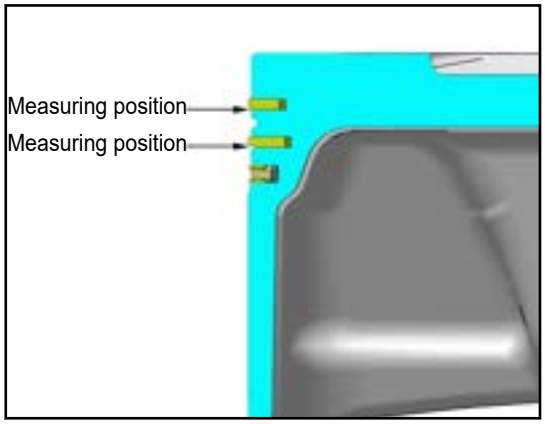
◆ Check the grouping mark on the top surface of the piston, and compare the measurement result with the grouping value of the outer diameter of the piston. If it exceeds the limit, it needs to be replaced.

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")

Measure the gap of the piston ring groove

◆ The piston ring should be parallel to the surface of the piston ring groove. If not, you need to replace the piston and piston ring.

◆ The piston ring is placed in the piston ring groove, and the feeler gauge is used for multiple measurements to determine the piston ring/groove gap.



Piston ring groove clearance:	
Top ring:	0.020 ~ 0.060 mm (0.0007" ~ 0.0023")
second ring:	0.020 ~ 0.060 mm (0.0007" ~ 0.0023")
limit:	0.12 mm (0.0047")

If the piston ring groove gap is greater than the use limit, measure the thickness of the piston ring and the width of the ring groove according to the following methods to determine whether to replace the piston ring or the piston or at the same time.

Piston ring groove width

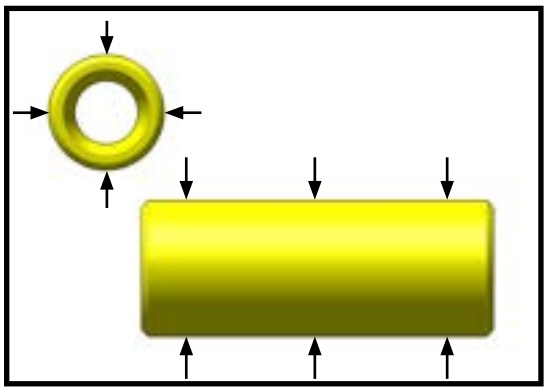
◆ Measure multiple positions on the piston with a caliper.

Piston ring groove width		
	standard	Limit
Top ring: second ring:	1.22 ~ 1.24 mm (0.0480" ~ 0.0489")	1.31mm (0.0516")

◆ If the width of any ring groove exceeds the limit, the piston needs to be replaced.Piston ring thickness

◆ Use a micrometer to measure multiple positions on the piston ring.

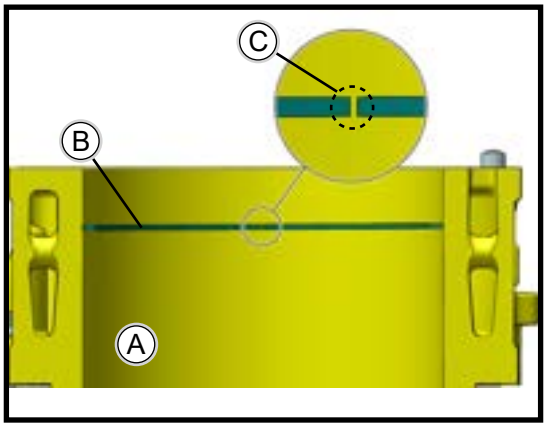
Piston ring thickness		
	standard	Limit
Top ring: second ring:	1.17 ~ 1.19 mm (0.0461" ~ 0.0469")	1.10mm (0.0433")



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】.

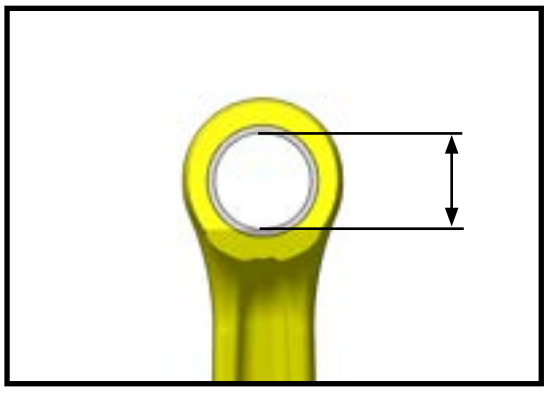
◆ ◆ Use a feeler gauge to measure the closed gap 【C】 when the piston ring is at the top and bottom of the cylinder bore.

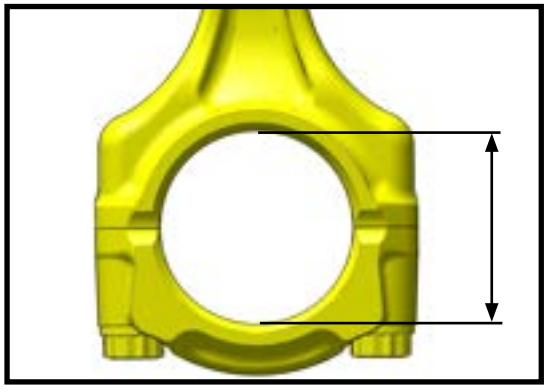
TIPS

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")

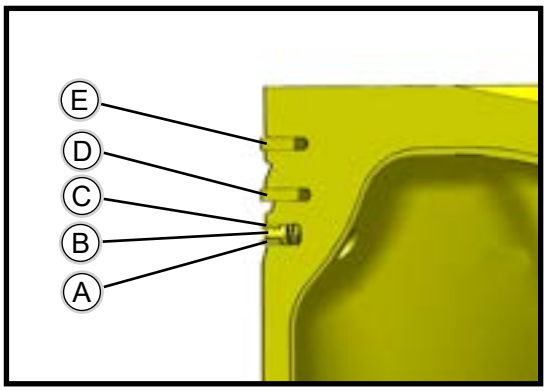
◆ Install the corresponding connecting rod cover (without bearing bushes), and screw in the connecting rod bolts.

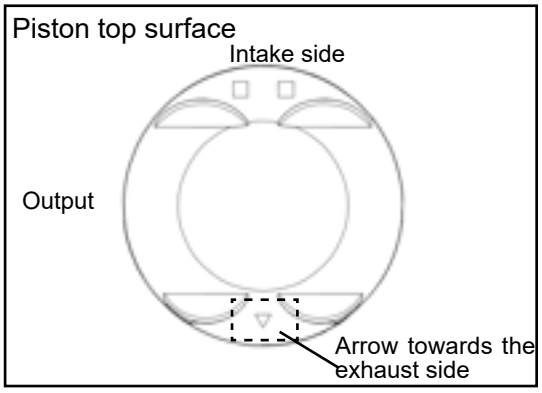
◆ Tighten the connecting rod bolts to 25Nm (2.5 kgf·m, 18.4 ft·lb).

◆ 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



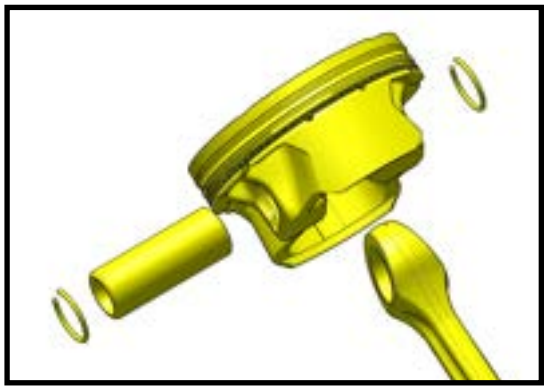


TIPS

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

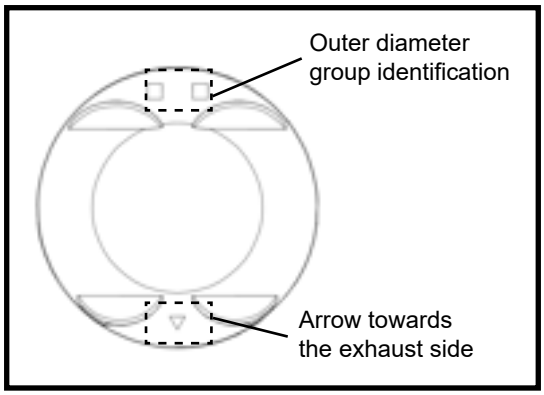


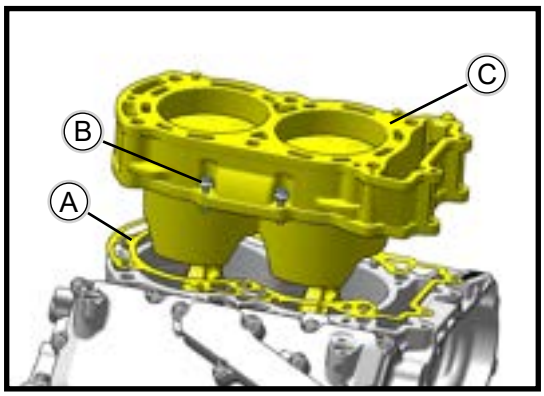
- Piston pin hole, connecting rod small end hole, and piston pin are smeared with clean engine oil.
- Insert the piston pin and install the new piston pin retaining ring. Turn the retaining ring so that the opening faces upward or downward.

⚠ 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】
9.8 N·m (1.0 kgf·m, 87 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/cm², 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

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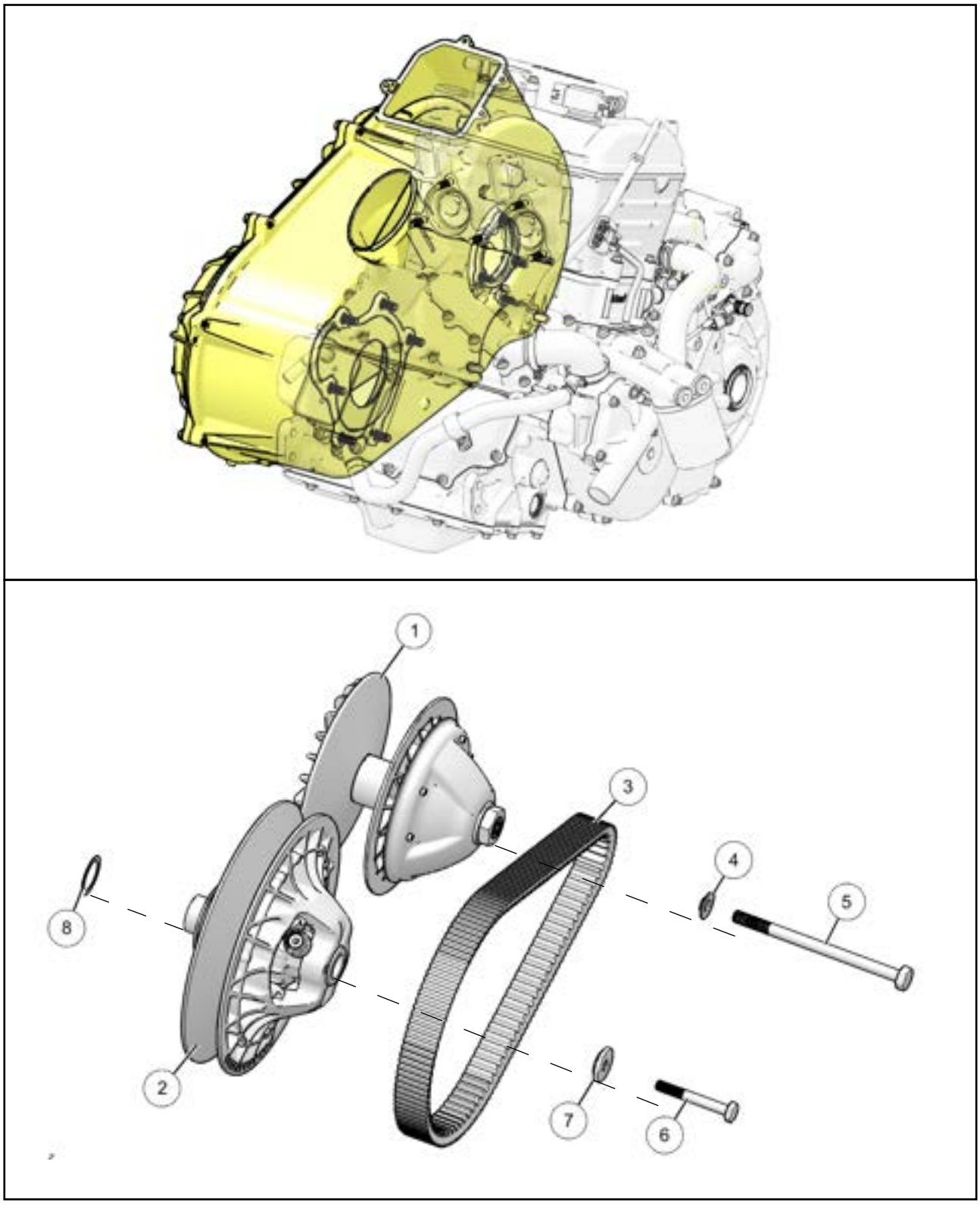
EXPLODED VIEW



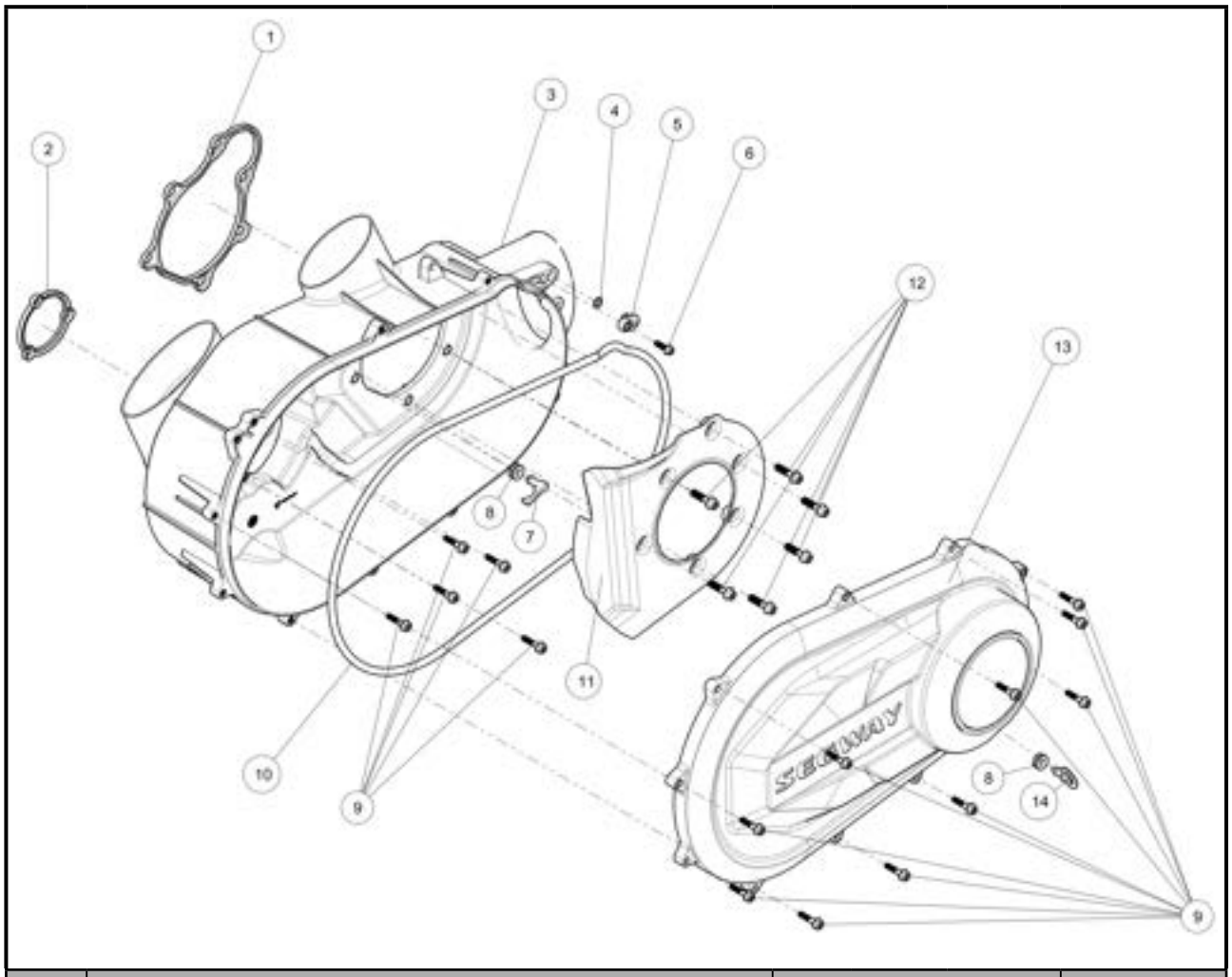
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	CVT drive pulley assembly				
2	CVT driven pulley assembly				
3	Transmission belt				
4	Washer 12×28×6				
5	CVT driven pulley bolt M12×1.25×185-LH	120	12.2	88.5	
6	CVT driven pulley bolt M10×1.25×80	80	8.2	59	
7	Flanging liner 10.5×36×8				
8	Adjusting pad 32×42×0.2				

G: Grease the oil seal and o-ring.

L: Use a non-permanent locking agent.

Lh:Left-hand thread

R: Replacement spare parts



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	cvt inner cover seal□				
2	cvt inner cover seal □				
3	cvt inner cover				
4	o-ring 8×2				
5	CVT temperature sensor plug assembly				
6	Bolt M6×20	9.8	1.0	87 in•lb	
7	Plug				
8	cvt cover plug seal				
9	Bolt M6×28	6	0.6	53 in•lb	
10	CVT cover seal				
11	Baffle				
12	Bolt M8×30	26	2.7	20	
13	CVT outer cover				
14	cvt cover plug				

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

L: Use fastening agent.

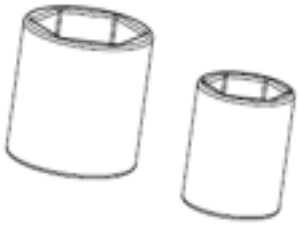
O: Apply oil.

SS: Use silicone sealant.

S: Tighten in order.

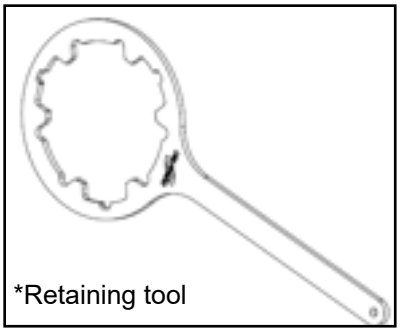
R: Spare parts

SPECIAL TOOLS



Appropriate socket for fixation bolt and 36 mm socket for the pulley nut

Torque wrench

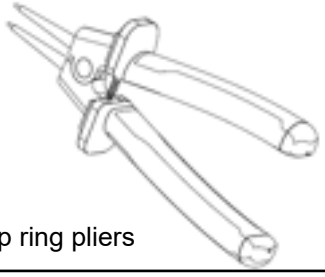


*Retaining tool

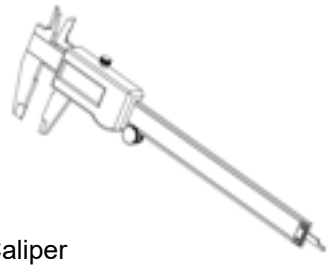
Puller

Breaker bar

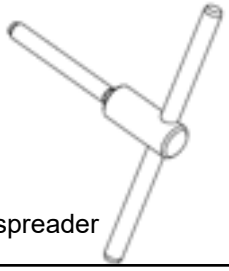
Pulley disassembly tool



Snap ring pliers

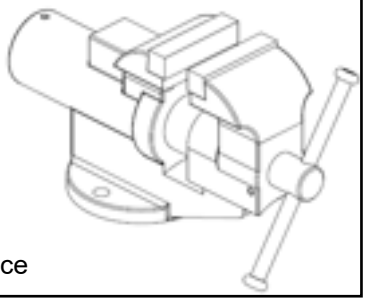


Caliper



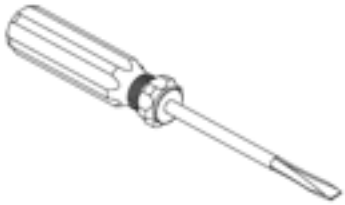
*Flange spreader

3mm hex. key



Vice

Appropriate sockets for removing pulley fixation bolt

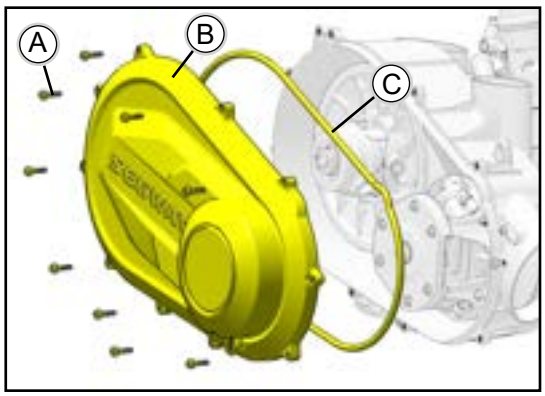


Flat head screwdriver

CVT BOX

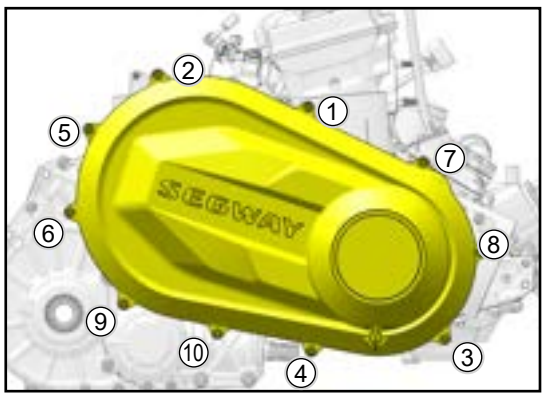
⚠ WARNING

Excessive imbalance or excessive speed may cause the failure of the CVT pulley, resulting in serious injury or death. The CVT pulley is a precisely balanced component designed to operate within a specific speed range. The disassembly/assembly and maintenance procedures of the pulley assembly must be strictly followed. Modifying the engine or pulley to increase the speed may cause malfunctions.



disassemble the CVT cover

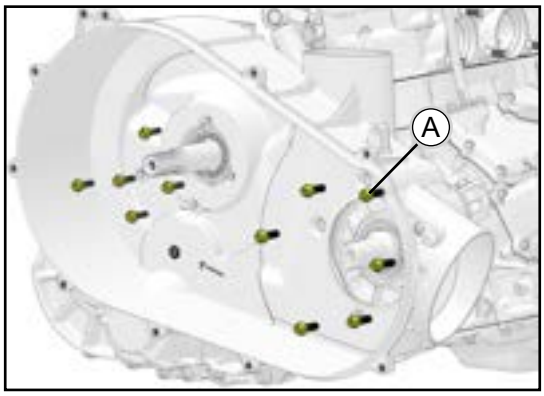
- Turn off the ignition switch.
- disassemble the CVT cover bolts 【A】, disassemble the CVT cover 【B】, and the CVT cover seal 【C】.



Install the CVT cover

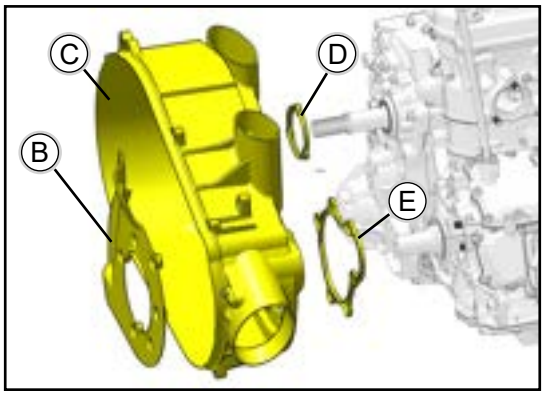
- Check the CVT cover sealing ring 【C】. If it is damaged, replace it with a new one.
- Install the CVT cover sealing ring 【C】 into the sealing groove of the CVT outer cover 【B】.
- Tighten the outer cover bolts according to the tightening sequence shown in the figure.
- Tightening torque

CVT outer cover bolt
6 N•m (0.6 kgf•m, 53 in•lb)



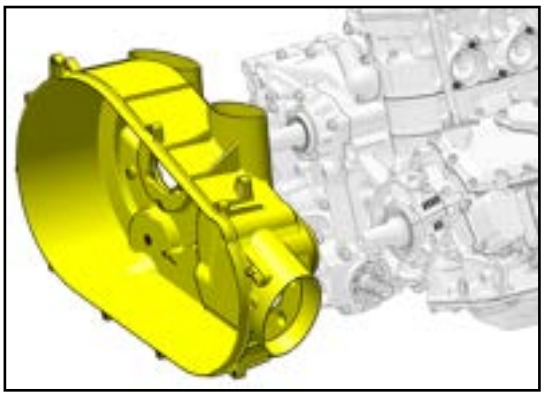
disassemble the CVT inner cover

- Disassemble the CVT drive pulley and driven pulley (refer to the drive pulley and driven pulley section)



- disassemble the CVT inner cover mounting bolts 【A】, remove the baffle 【B】, CVT inner cover 【C】, CVT inner cover sealing ring Ⅰ 【E】, CVT inner cover sealing ring Ⅱ 【D】.

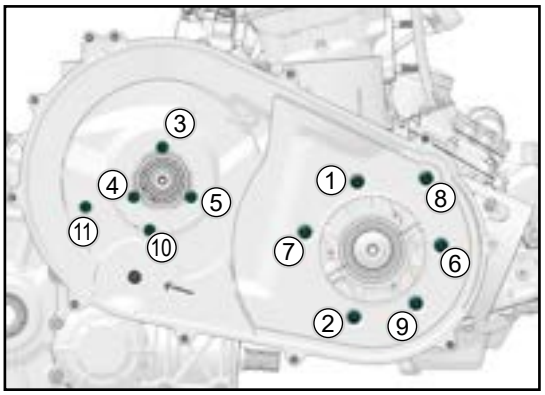
Install the CVT inner cover:



TIPS

If there is water leakage in the CVT box, please replace the CVT cover sealing ring, CVT inner cover sealing ring I, CVT inner cover sealing ring II.

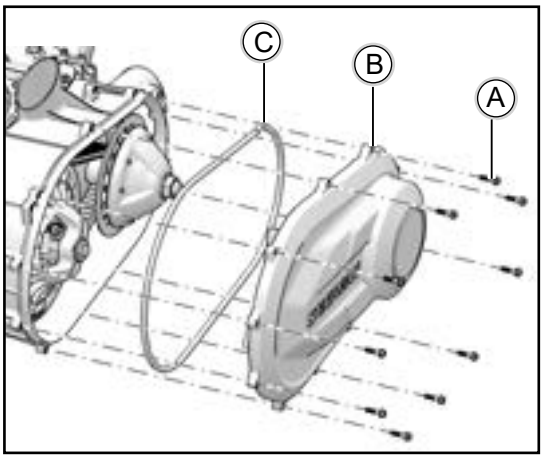
- Remove impurities on the sealing surface of the CVT inner cover and keep it clean.
- Assemble the baffle and the seal ring of the CVT inner cover to the CVT inner cover.



- Tighten the CVT inner cover bolts according to the tightening sequence shown in the figure.
- Tightening torque

bolt
9.8 N•m (1.0kgf•m, 87 in•lb)

CVT BELT



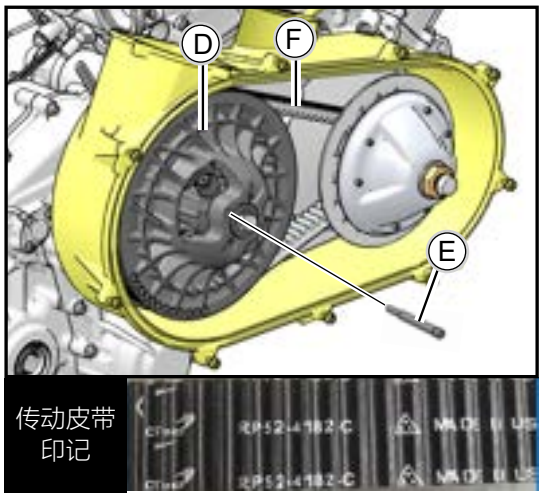
Disassemble the drive belt

【A】CVT outer cover bolt　【B】CVT outer cover
【C】CVT cover seal　【D】Driven pulley
【E】CVT belt replacement tool　【F】CVT belt

1. Remove the CVT outer cover bolts, outer cover and the sealing ring.
2. With the kit-out pin for driven pulley(special tool) against the driven wheel as shown in the figure of the hole, make the driven wheel open.
3. Take out the drive belt to be replaced, and clean up the debris in the CVT compartment.

⚠ CAUTION

Before removing the drive belt, please note the direction of the marks on the drive belt (such as manufacturer name, arrow mark, etc.) so that the drive belt can be reinstalled on the pulley in the original direction.

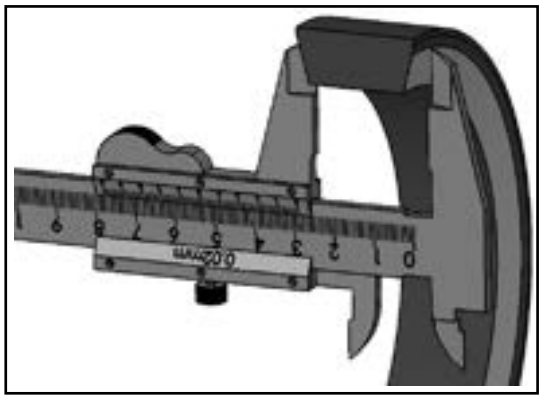


Check the drive belt

⚠ WARNING

The drive belt must be inspected in order to avoid any risk of personal injury and/or material damage.

- The drive belt must be replaced if cracks are seen when turning it inside out.
- The drive belt must be replaced when the width at the cord level is approximately 2 mm less than it is on a new belt (refer to owner's manual).
- Make sure to take the measurement at the cord level of the belt.



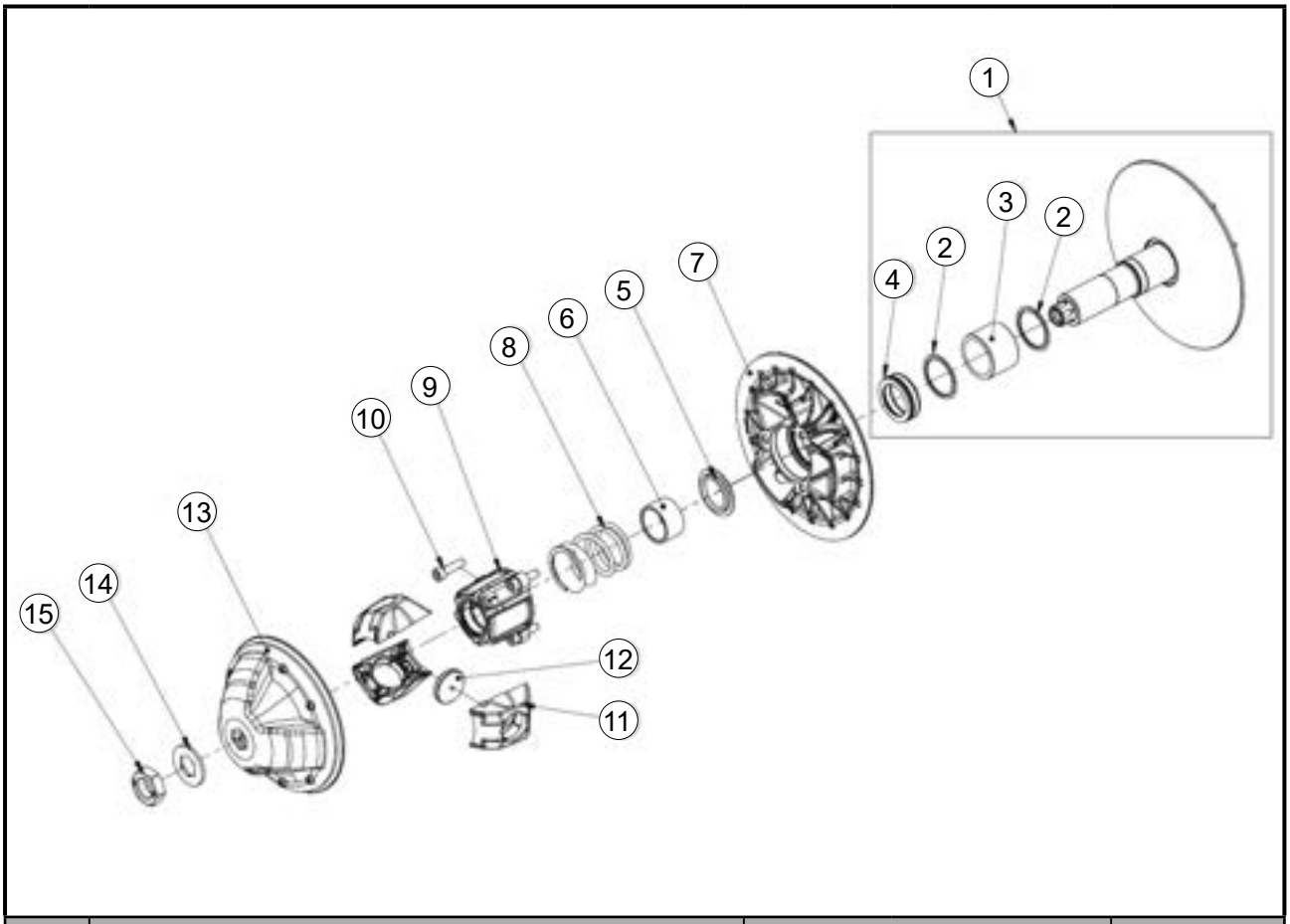
Install the drive belt

The installation steps are basically the reverse of the removal.

1. Wrap the drive belt around the CVT driving wheel.
2. Use the CVT belt replacement tool to open the CVT driven pulley,wind the drive belt into the CVT driven pulley.
3. Install the CVT sealing ring and the CVT outer cover, tighten the CVT outer cover.

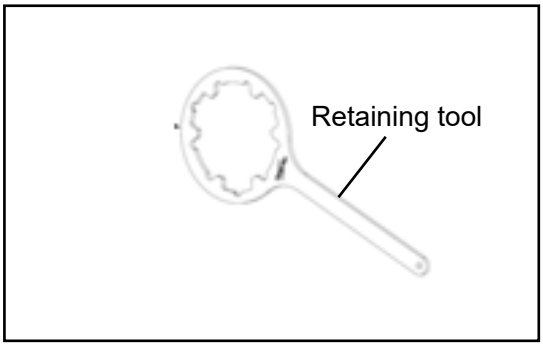
CVT outer cover bolt
6 N•m (0.6 kgf•m, 53 in•lb)

DIAGRAM OF DRIVE PULLEY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Fixed sheave				
2	Bearing thrust washer				
3	Freewheel				
4	Spring - bushing support				
5	Spring seat				
6	Stroke limiter				
7	Sliding sheave				
8	Spring				
9	Spring cover				
10	Screws	24.5			
11	Blocks				
12	Mass				
13	Cap				
14	Washer				
15	Nut	150			

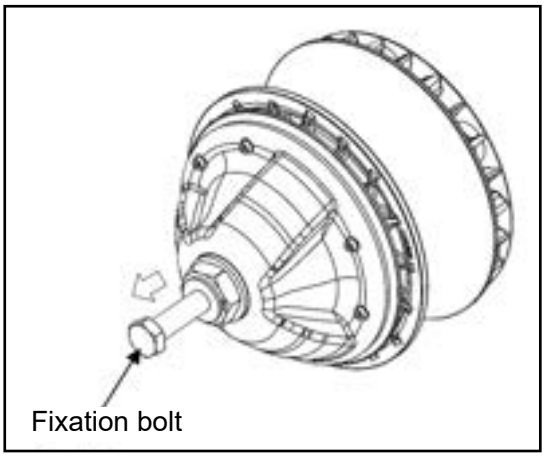
DISASSEMBLY AND INSTALLATION OF DRIVE PULLEY



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).

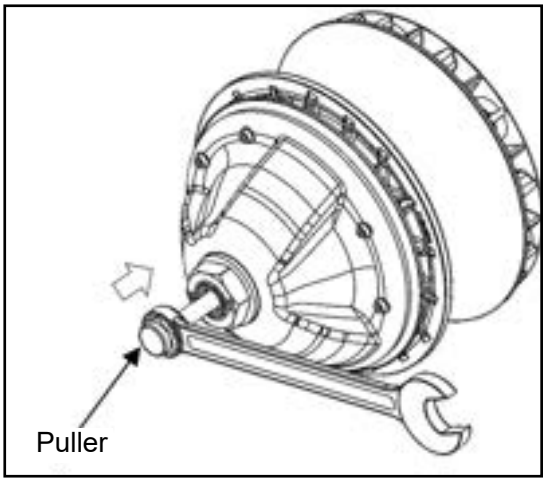


- Screw the puller in the drive pulley shaft and use a breaker bar; torque the puller until the pulley comes off.

NOTE

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

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



Drive Pulley Disassembly

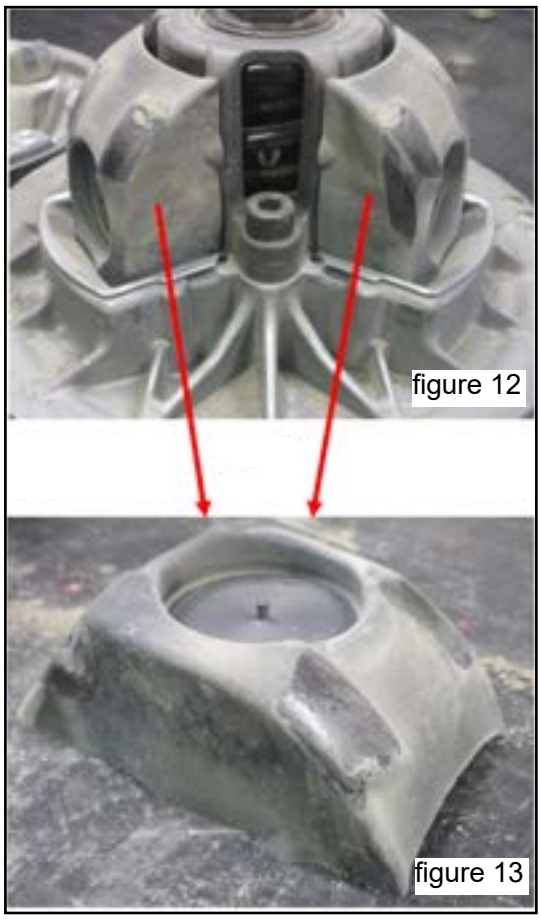


figure 12

figure 13

NOTE

It is recommended to use a marker pen to identify the position of the components before disassembling the pulley.

Recommended inspection and replacement

1. Check the general condition of the blocks ⑪ and clean them off (figures ⑫ and ⑬).
2. Check that the freewheel ③ turns freely on the fixed sheave shaft ① (figure ⑭).

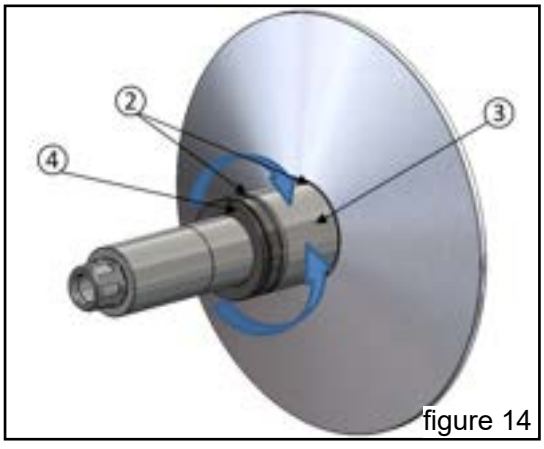


figure 14

⚠ CAUTION

Do not disassemble items ②③④ if the freewheel spins freely

figure 15

figure 15

figure 15

Drive Pulley Re-Assembly

Recommended inspection and remplacement

3. Clean the sliding sheave assembly (items ⑤⑥⑦⑧⑨⑩) with an air gun.
4. If it is necessary to disassemble the sliding sheave ⑦ and the spring cover ⑨, use the disassembly tool 5055 - 0002 (figure 15).

RECOMMENDATIONS :

- It is strongly recommended to replace the 3 screws ⑩ if they are disassembled

NOTE

To maintain the performance of the pulley, make sure that the sliding flange ⑦ and spring cover ⑨ bushings are cleaned with a microfiber towel or dry cloth.

⚠ CAUTION

Do not use acetone to clean the bushings.

DRIVE PULLEY RE-ASSEMBLY

figure 16

figure 17

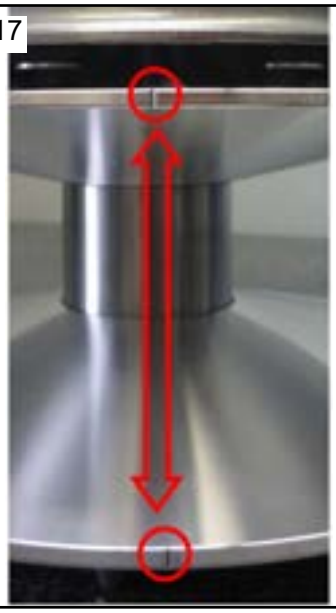


figure 18

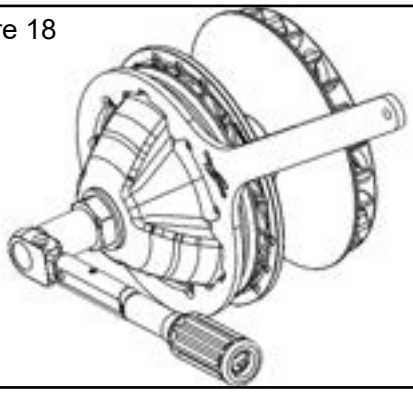
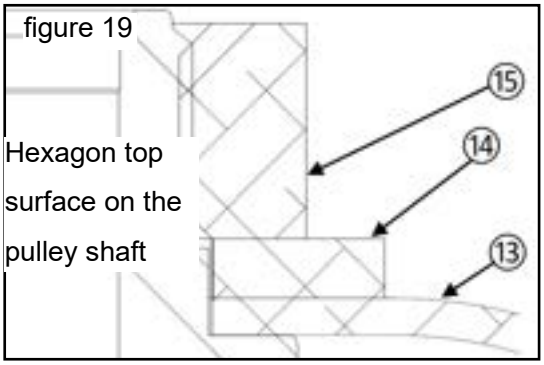


figure 19



Hexagon top surface on the pulley shaft

Alignment of fixed sheave ①, sliding sheave ⑦ and cap ⑬:

- Align the 2 notches on the sheaves ① and ⑦ (figure 17), as well as the part number on the cap ⑬ (figure 16) to make sure the pulley assembly is balanced.

Tightening the Pulley nut ⑮

- Use a torque wrench and a 36 mm socket to tighten the pulley nut ⑮ (figure 18) (for replacement pulleys, see the tightening torque chart by pulley number on the CVTech website – for OEM pulleys, see your owner's manual)

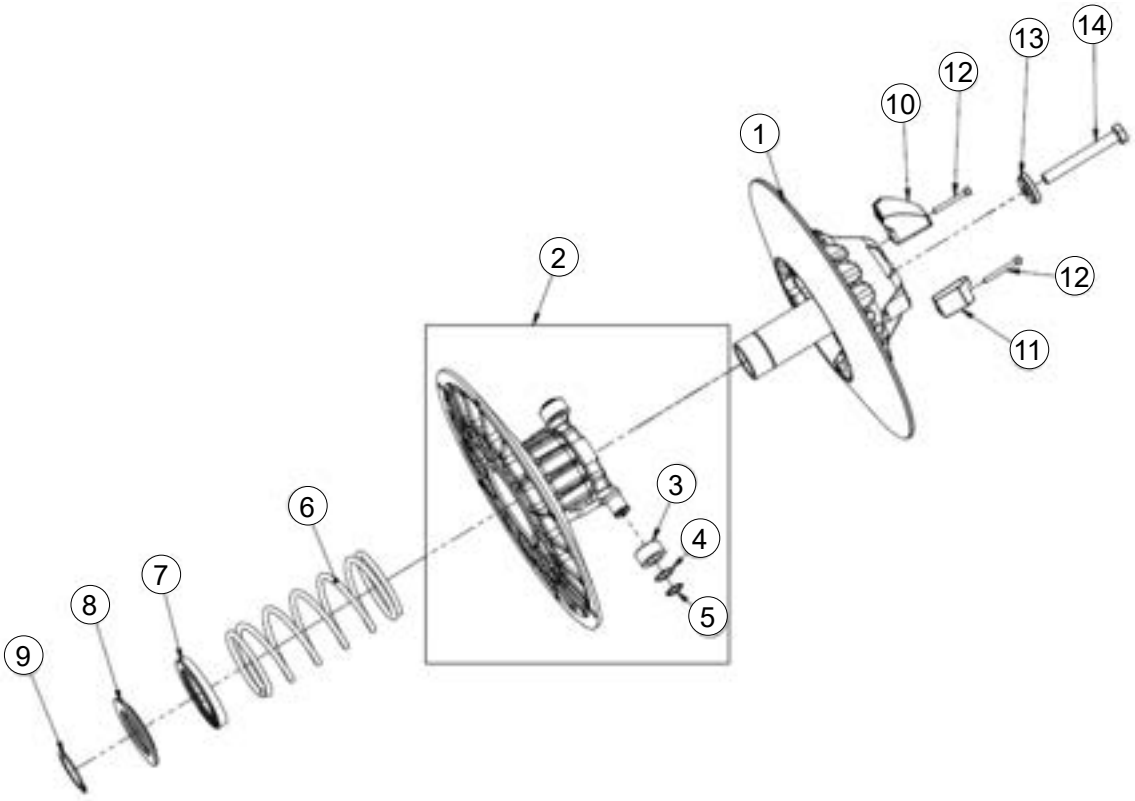
⚠ WARNING

Use the tightening torque value listed on the tightening torque chart by pulley number on the website www. cvtech - ibc.com or in your owner's manual.

NOTE

Make sure the alignment of the hexagon shapes of the cap ⑬ and washer ⑭ are fully engaged on the shaft hexagon shape before applying torque to the nut ⑮ (see figure 19).

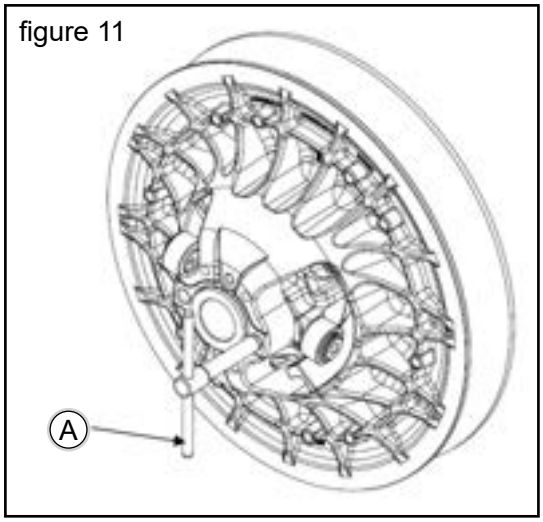
DIAGRAM OF DRIVEN PULLEY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Fixed Sheave				
2	Sliding Sheave				
3	Roller				
4	Washer				
5	External Retaining Ring				
6	Spring				
7	Spring Seat				
8	Spring Abut				
9	Spring Ring				
10	Forward Ramp				
11	Rear Ramp	3.5	0.35		
12	Screw	80	8.2	59	
13	Washer (If Applicable)				
14	Screw (If Applicable)				

PULLEY REMOVAL FROM THE VEHICLE

figure 11



Removing the driven pulley

- If the drive belt is installed, screw the flange spreader ‘‘A’’ in the one of threaded holes, as shown in figure 13, to remove the drive belt.
- Lock the pulley rotation by engaging in gear and apply the vehicle brakes.
- Remove the bolt or nut from the driven pulley

NOTE

Before disassembling the CVT belt, identify drive belt rotation direction so that it will be the same when reassembling.

figure 17

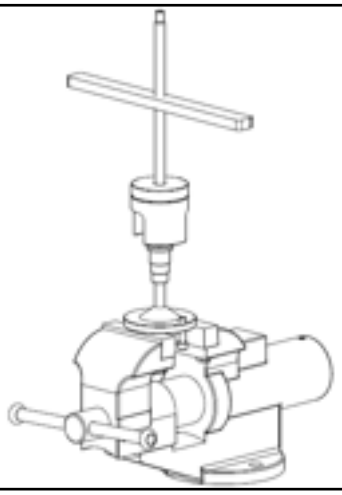


figure 18

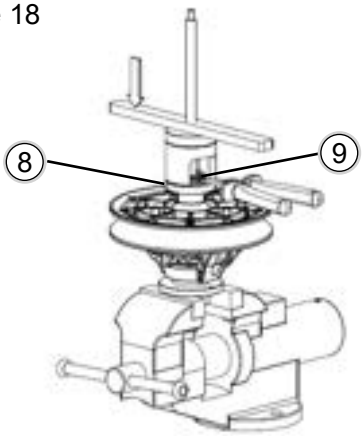


figure 19

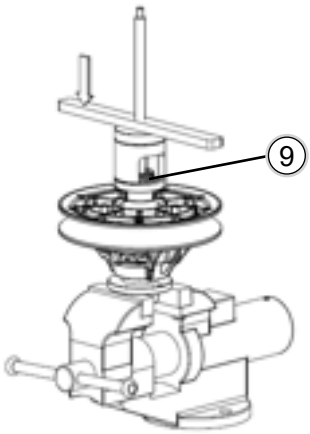
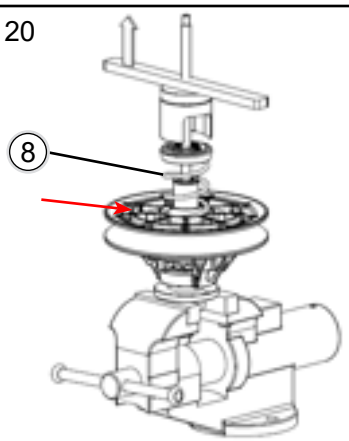


figure 20



Spring disassembly

- Using a vice, mount the disassembly tool as shown in figure 17.
- Install the pulley on the disassembly tool as shown in figure 18.
- By screwing the bar on the threaded rod, press down the spring abutment ⑧ (3 to 4 mm max.) in order to free up the snap ring ⑨.
- Remove the snap ring ⑨ using the snap ring pliers (figure 19).
- Slowly unscrew the bar on the threaded rod to release the spring ⑥ tension (figure 20).
- Remove the snap ring ⑨, the spring abutment ⑧, the spring seat ⑦ and the spring ⑥.

⚠ WARNING

Use the disassembly tool to disassemble the spring abutment 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 spring abutment ⑧ to free it from the shaft by unscrewing the disassembly tool once the snap ring ⑨ is removed.

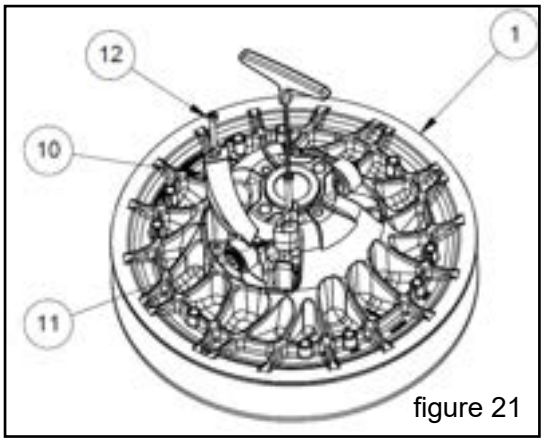


figure 21

Forward ramps ⑩ and rear ramps ⑪ disassembly

- Using the 3mm hexagonal key, remove the 4 screws ⑫ of the 2 forward ramps ⑩ and the 2 rear ramps ⑮ from the fixed sheave ① (figure 21).
- Remove the 2 forward ramps ⑩ and the 2 rear ramps ⑪.
- Disassemble the 2 sheaves ① and ②.

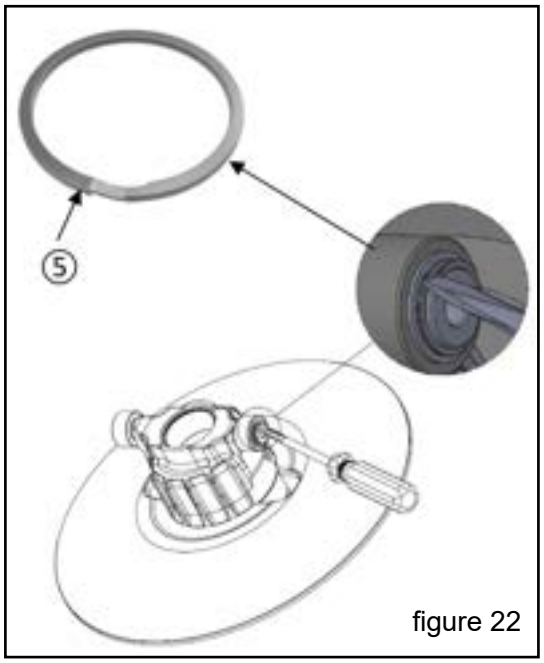


figure 22

Rollers ③ disassembly

- With a flat head screwdriver, remove the external retaining ring ⑤ from the sliding sheave ② (figure 22).
- Remove the 2 washers ④ and the 2 rollers ③ from the sliding sheave ② (figure 23)

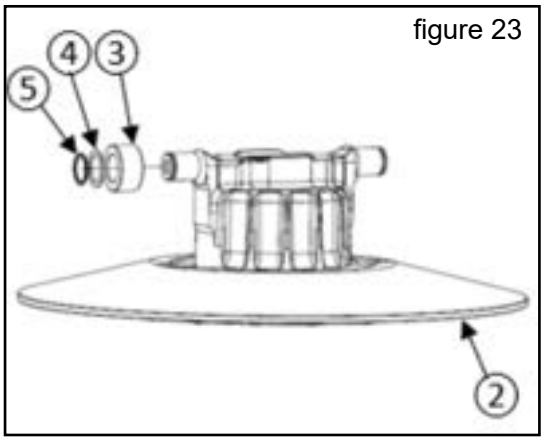
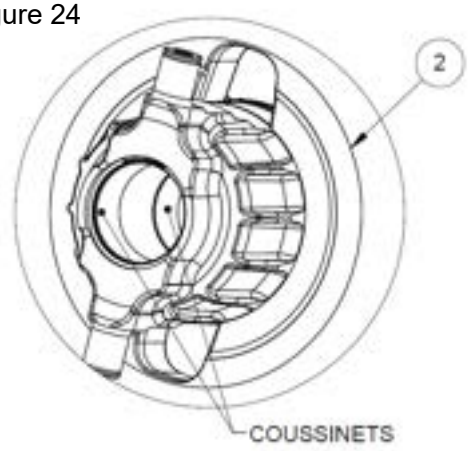


figure 23

SLIDING FLANGE MAINTENANCE

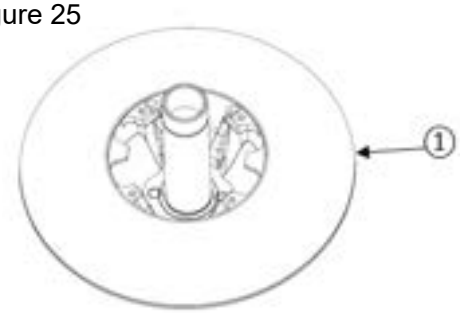
figure 24



Recommended inspection

- Check for wear marks on the forward ramps ⑩ and rear ramps ⑪.
- Check for wear marks on the spring ⑥.
- Perform a visual inspection of the components.
- Check the wear of the sliding sheave ② bushings (visual inspection only, figure 24). If there is excessive wear, you must replace the whole sheave assembly ②

figure 25



NOTE

The bushings cannot be removed from the sliding sheave ② (figure 24)

NOTE

The shaft cannot be disassembled from the fixed sheave ① (figure 25)

NOTE

To maintain the performance of the pulley, make sure the sliding sheave ② bushings are cleaned with a microfiber towel or dry cloth.

⚠ CAUTION

do not use acetone to clean the bushing.

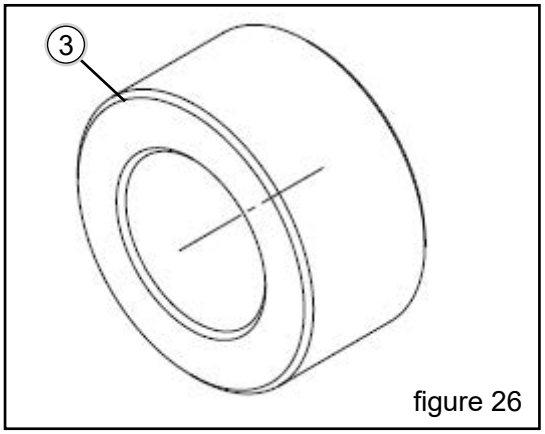


figure 26

heck for wear on the outside surface of the rollers □

- No flat spot on the outside surface.
- The external diameter must by larger than 24 mm (see figure 27).

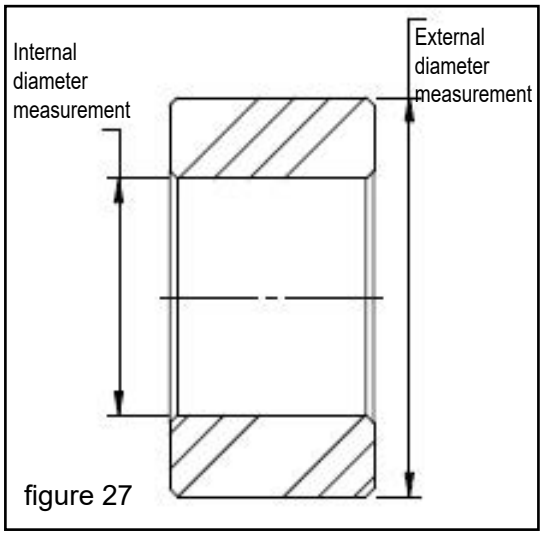


figure 27

Check for wear on the inside surface of the rollers ③

- The internal diameter must be smaller than 15.5 mm(see figure 27).

PULLEY RE-ASSEMBLY

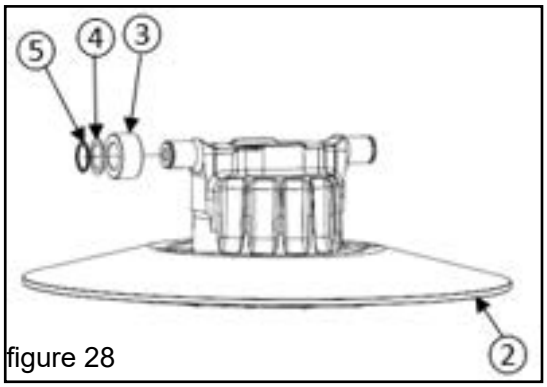


figure 28

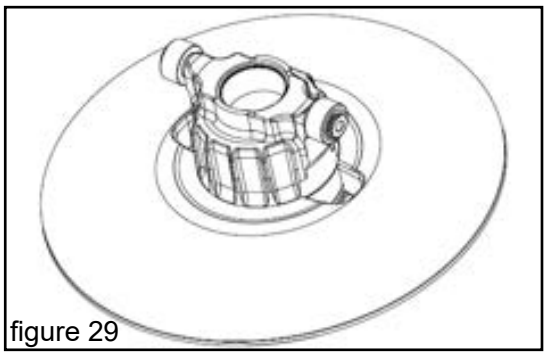


figure 29

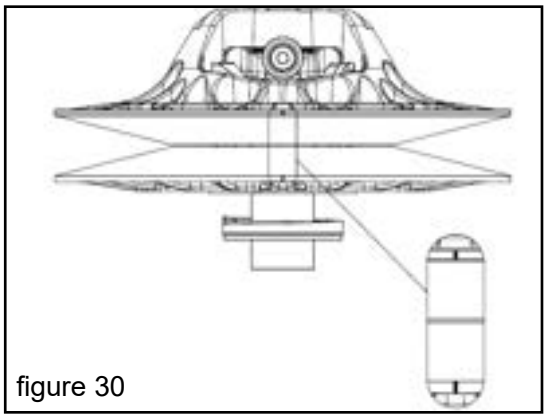


figure 30

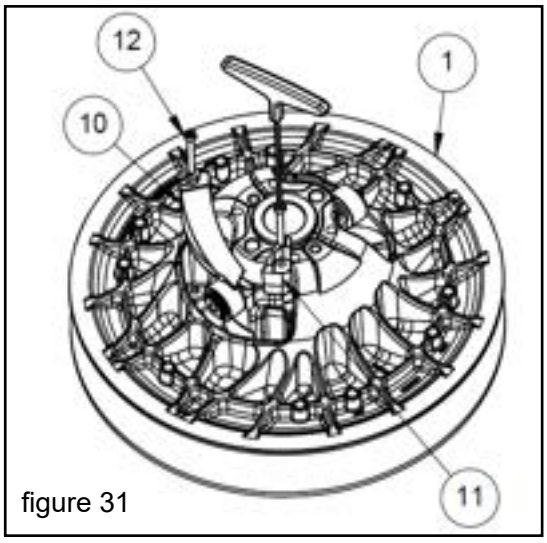


figure 31

Rollers ③ re - assembly

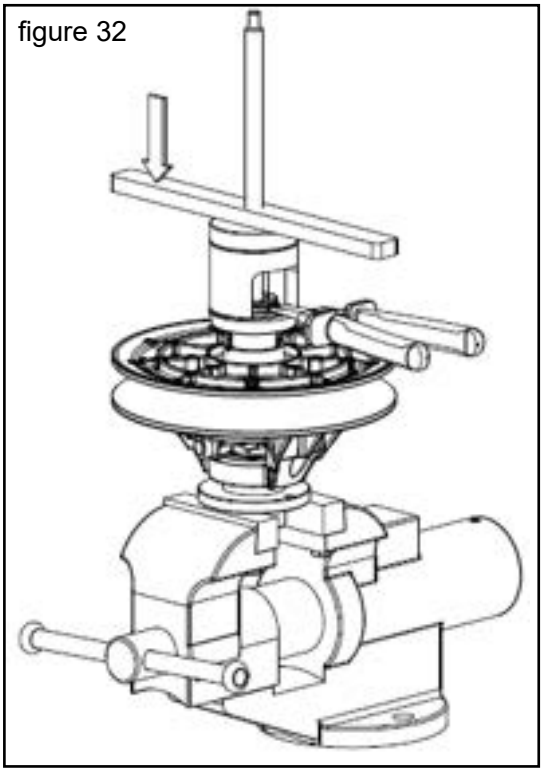
- Insert the 2 rollers ③, the 2 washers ④ and the 2 external retaining rings ⑤ on the roller pins of the sliding sheave ② (see figures 28 and 29)

Foward ramps ⑩ and rear ramps ⑪ re - assembly

- Insert the sliding sheave ② on the fixed sheave ① and make sure that the alignment notches are aligned (see figure 30).
- Insert the 2 forward ramps ⑩ and the 2 rear ramps ⑪ in the fixed sheave ①.
- Torque the 4 screws ⑫ to 3,5 Nm (see figure 31) .

Screw
3.5 Nm (0.35 kgf•m,31in•lb)

figure 32



Pulley re - assembly

- Install the pulley on the disassembly tool as shown in figure 32.
- Insert the spring ⑥ in the sliding sheave ②.
- Put the spring seat ⑦ on the spring ⑥ and turn it clockwise until it comes to a stop in rotation; maintain the spring ⑥ by hand during the operation.
- Put the spring abutment ⑧ and the snap ring ⑨ on the spring seat ⑦.
- Make sure that the snap ring ⑨ is in the notch made for that purpose (figure 33).
- With the compression tool, lower the spring ⑥, the spring seat ⑦ and the spring abutment ⑧ until they clear the snap ring groove in the shaft.
- Install the snap ring ⑨

⚠ WARNING

Slowly unscrew the disassembly tool to makesure the snap ring is properly secure.

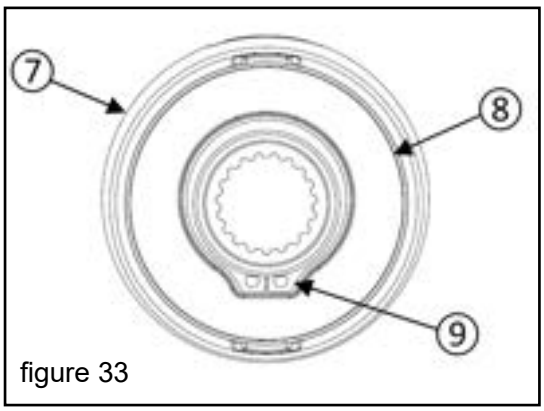


figure 33

⚠ WARNING

The use of the disassembly tool is required in order to assemble the sliding sheave ② to the fixed sheave ①.

WATER PUMP ASSEMBLY

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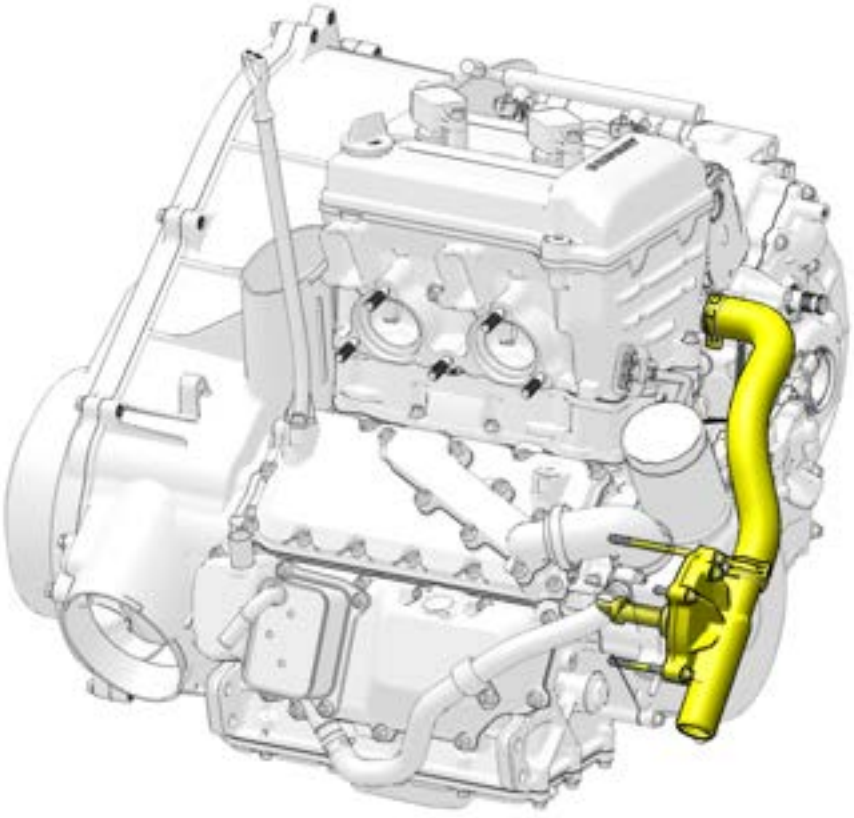
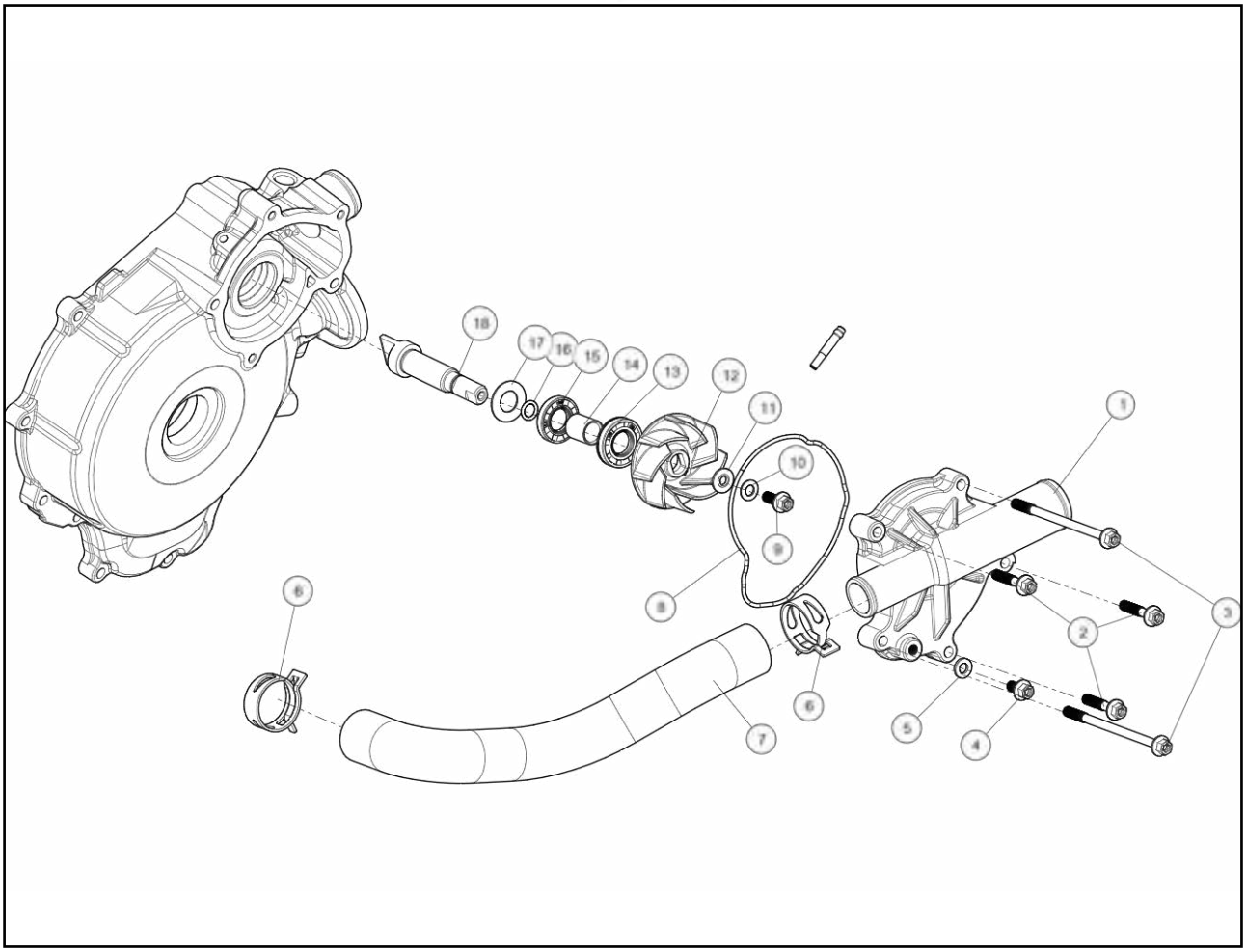
Disassemble the water pump.....3-7-5
Install the water pump.....3-7-6

WATER PUMP ASSEMBLY

EXPLODED VIEW





No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Water pump cover				
2	Bolt M6×30	9.8	1.0	87 in•lb	
3	Bolt M6×95	9.8	1.0	87 in•lb	
4	Bolt M6×12	9.8	1.0	87 in•lb	
5	Aluminum washer 6				
6	Steel belt elastic hose clamp 30				
7	Small circulating water pipe				
8	Water pump cover sealing ring				
9	Bolt M6×16	9.8	1.0	87 in•lb	
10	Disc spring 12.5×6.4×1				
11	Combination washer				
12	Water pump impeller				
13	Oil seal 15×30×5				
14	Bushing				
15	Oil seal 15×28×5				
16	OO-ring seal 8×2				
17	Flat washer 13.1×25×1				
18	Water pump shaft				

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

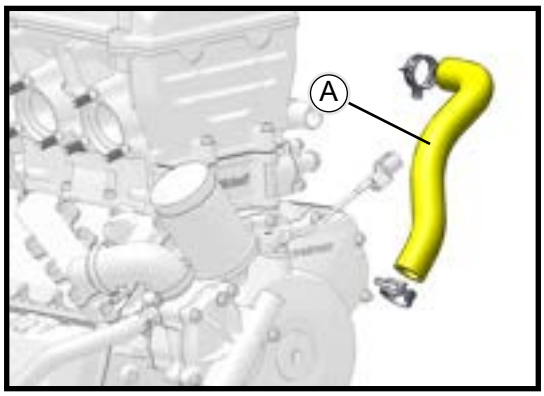
Oil seal press tool15-28-5

F02H00010003

Oil seal press tool15-30-5

F02H00010004

WATER PUMP ASSEMBLY

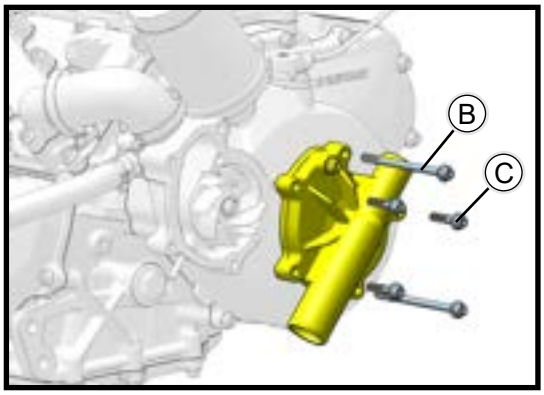


Disassemble the water pump

⚠ WARNING

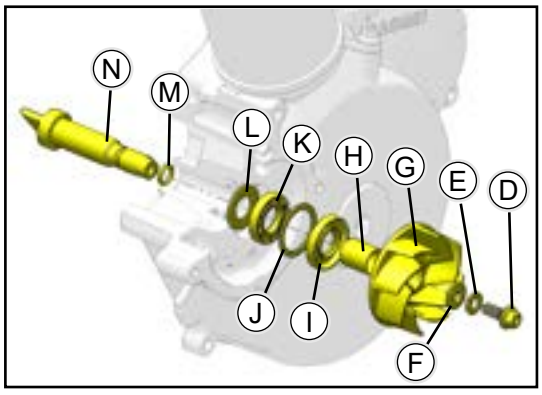
Make sure that the engine has cooled down before disassembly. Hot coolant and steam can cause serious injury.

◆ Disassemble the two clamps and remove the small circulating water pipe【A】.



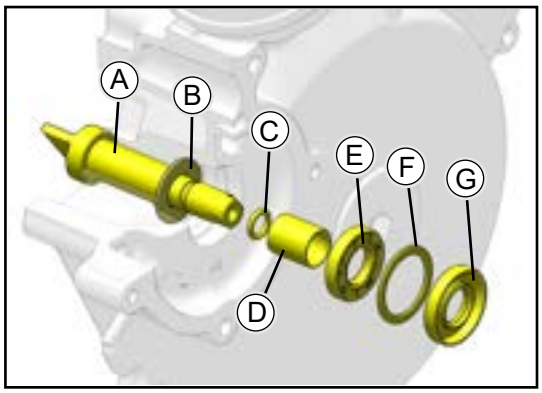
◆ Disassemble two M6×95 bolts【B】, three M6×30 bolts【C】, and remove the water pump cover.

◆ Remove the left crankcase cover sub-assembly (see the section of crankcase assembly).



◆ Unscrew the bolt【D】, take off the stack spring【E】, combined washer【F】, and water pump impeller【G】in sequence.

◆ Remove the water pump shaft【N】and O-ring【M】, and then remove the bushing【H】, oil seal【I】, flat washer【J】, oil seal【K】, and flat washer【L】in turn.



Install the water pump

- Insert the water pump shaft 【A】 into the left crankcase cover, and install the flat washer 【B】.
- Take a new O-ring 【C】, apply appropriate amount of engine oil on the surface, and install it into the O-ring groove of the water pump shaft.

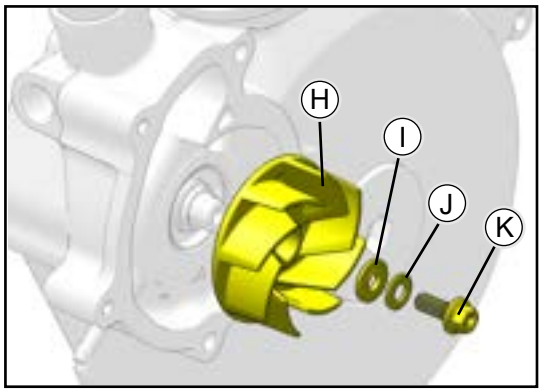
TIPS

A new O-ring should be replaced every time the pump is disassembled and assembled. After the O-ring is installed, check whether the O-ring is intact and not twisted.

- Install washer 【B】, bushing 【D】 in sequence, use oil seal press tool 15-28-5 to press in new oil 【E】, install washer 【F】, use oil seal press tool 15-30-5 to press in the new oil seal 【G】.

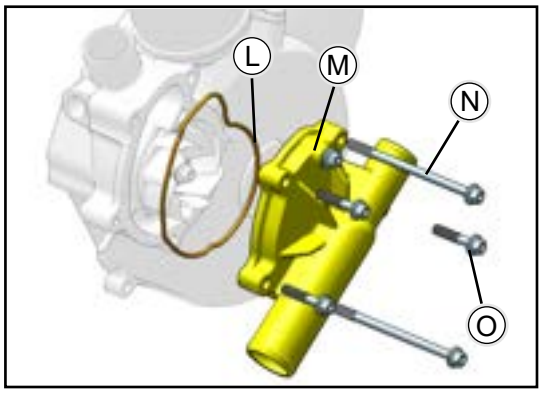
TIPS

The sealing lip of the oil seal 【E】 faces the inside when installed, and the sealing lip of the oil seal 【G】 faces the outside.



- Install the water pump impeller 【H】, install the combined washer 【I】, and the disc spring 【J】 in sequence.
- Apply thread fastening glue to the bolt 【K】, and screw in the bolt.

Bolt 【K】
9.8 N·m (1 kgf·m, 87 in•lb)



- Put the new seal ring 【L】 into the seal ring groove of the water pump cover 【M】, install the water pump cover, and screw in the bolts 【N】 and 【O】.

Bolt 【K】
9.8 N·m (1 kgf·m, 87 in•lb)

FRONT AXLE AND REAR GEARBOX

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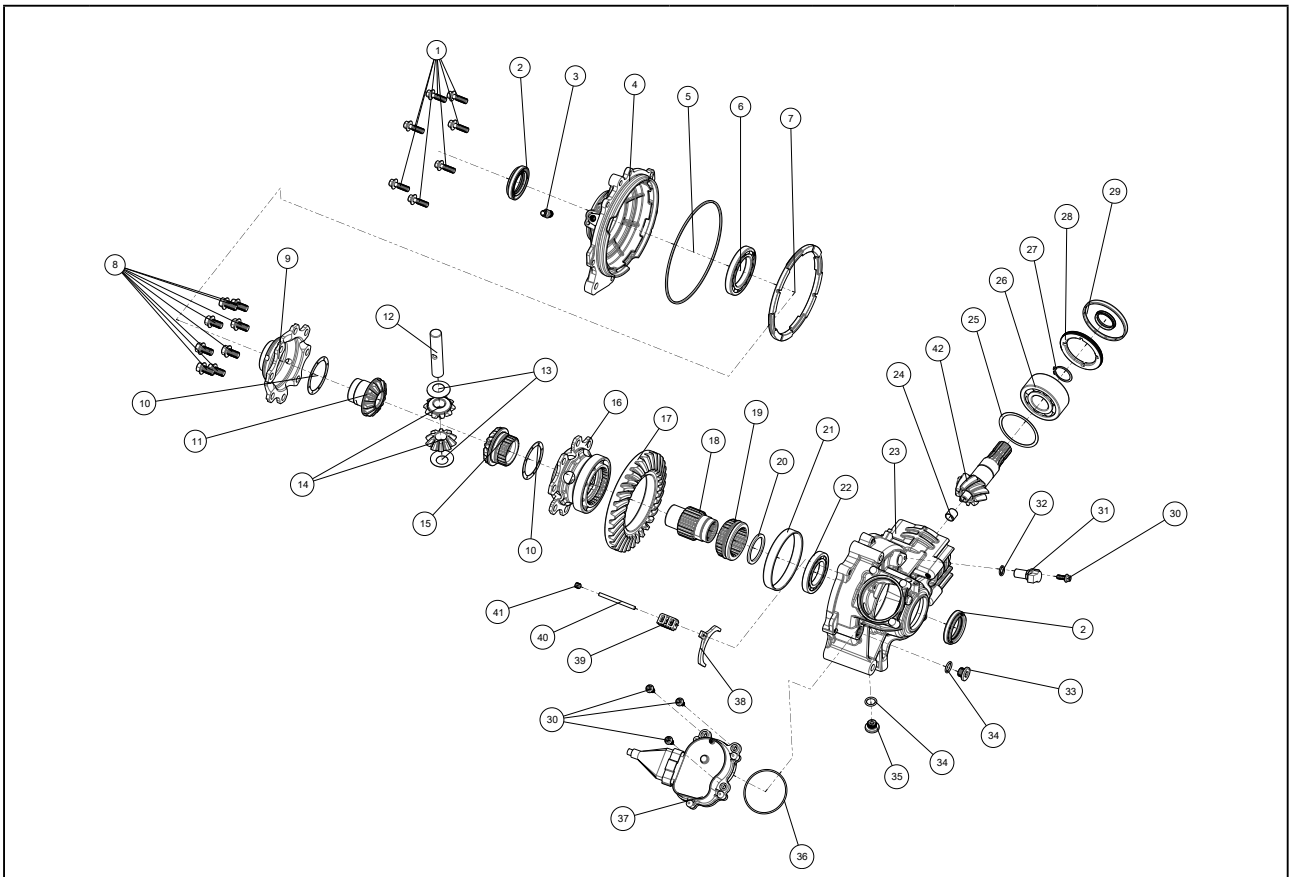
Install the shift mechanism 4-30

EXPLODED VIEW OF FRONT AXLE



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon flange bolt m8×25	24	2.4	17	
2	Oil seal 30×55×7				G
3	Breathing joint	15	1.53	11.1	L
4	Front axle end cover				
5	Rectangular gasket				
6	Deep groove ball bearings 16010				
7	Limiting liner				
8	Hexagon flange bolt m10×1.0×18	70	6.8	49	L
9	Differential cover				O
10	Axle bevel gasket				O
11	Axle bevel gear ⅰ assembly				O
12	Differential planetary gear shaft ⅴ				
13	Planetary gear liner				O
14	Planetary gear				O
15	Axle bevel gear ⅱ				O
16	Differential housing				
17	Driven bevel gear				
18	Axle shaft assy				O
19	Spacer 40.2×50×3				
20	Spacer 40.2×50×3				
21	Bushing ⅰ (φ97)				O

FRONT AXLE AND REAR GEARBOX

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
22	Deep groove ball bearings 16008				
23	Front axle housing				
24	Bushing ii (φ15)				O
25	Drive bevel gear shims				
26	Bearing 3306				
27	Circlip 30				
28	Input shaft driving gear plug	70	6.8	49	L
29	Oil seal 30×45×6.5				G
30	Bolt m6×16	10	1	7	
31	Vehicle speed sensor assembly				
32	O-ring 12×2				O
33	Screw plug m14	18	1.8	13	
34	O-ring 13.8×2.5				O
35	Screw plug m14 assembly	18	1.8	13	
36	O-ring 67.9×2.2				O
37	Front axle shift motor assembly				
38	Shift fork				
39	Sliding rack				
40	Fork shaft 5×65				
41	Hexagon screw m8×8	12	1.2	9	L
42	Driving bevel gear				

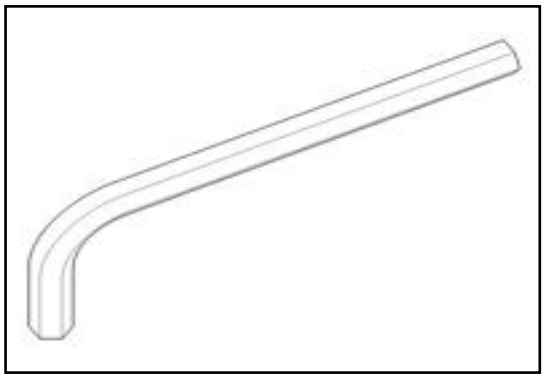
G: Apply grease for oil seal and O-ring.
L: Apply a non-permanent locking agent.
O: Apply gear oil(SAE 80W/90/GL-5).
SS: Apply silicone sealant.
R: Replacement Parts.

TECHNICAL SPECIFICATIONS

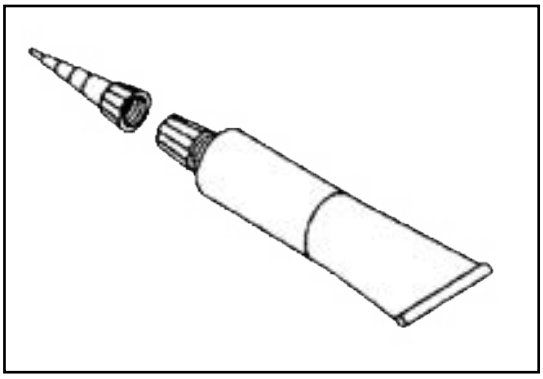
Item	Standard	Service limit
Front axle:		
Type	Sae 80w/90/gl-5	
Fill position	Side of the box (screw plug m14)	
Drain position	Bottom of the box (screw plug m14 assembly)	
Volume	280 mL (0.3 US qt) (when there is no oil stains after internal cleaning) 260 mL (0.27 US qt) (only when changing gear oil)	
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 screw plug)	
Volume	1500 Ml (1.35 Us qt) (refill gear oil for the first time) 1400 Ml (1.26 Us qt) (change gear oil)	
Bevel gear backlash	0.15~0.25 Mm(0.06~0.10 In.)	

SPECIAL TOOLS

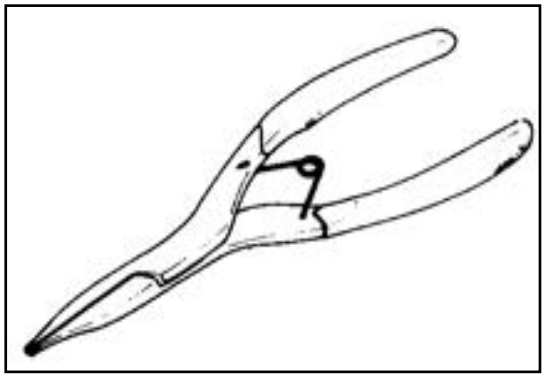
Allen wrench 8mm / 12mm:



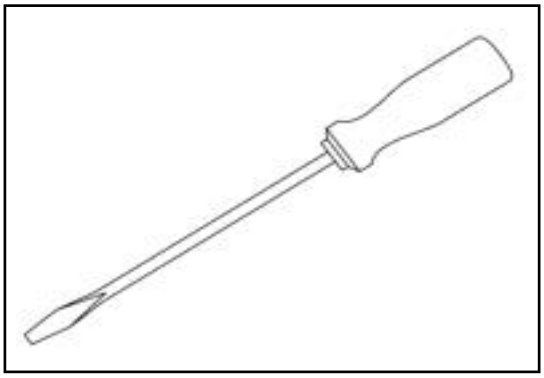
Silicone rubber flat sealant：



External circlip pliers



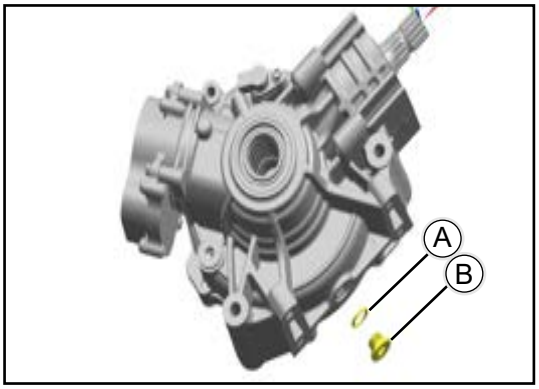
Screwdriver



Input shaft drive gear plug sleeve

T-sleeve 10mm

REPLACEMENT OF FRONT AXLE GEAR OIL

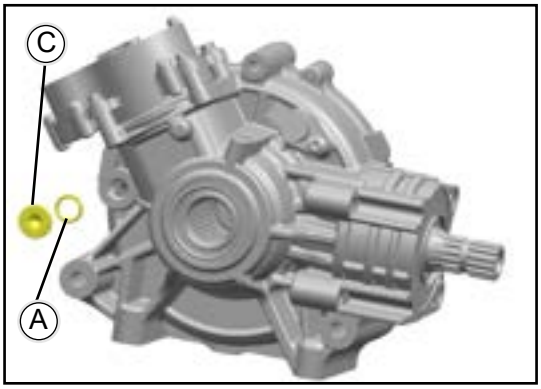


⚠ WARNING

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 13.8×2.5
【B】 screw plug m14 assembly
【C】 screw plug m14

Drain the old gear oil



- Tools: 8mm Allen key
- Rotate B counterclockwise and unscrew it, let it stand for 10 minutes to let the old gear oil flow out, then put A on the threaded end of B, tighten it clockwise, and wipe clean the gear oil spilled around it.
- Please dispose of waste gear oil in an environmentally friendly manner, please take care of the environment

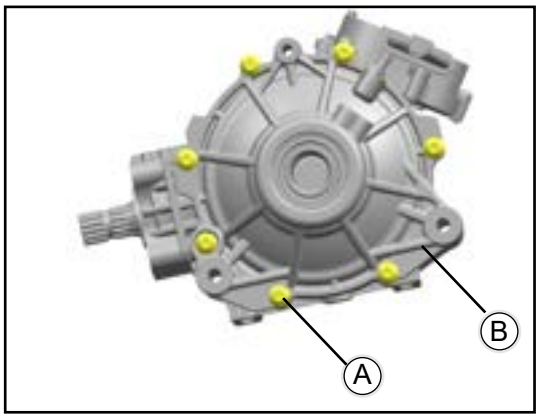
Add new gear oil

- Tools: 8mm Allen key
- Rotate C counterclockwise to unscrew it, add a certain amount of new gear oil, and then tighten the threaded end of sleeve A and C 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.

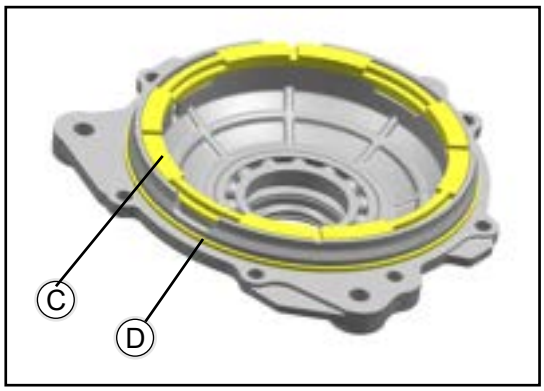
INSPECTION OF PARTS WEAR



⚠ WARNING

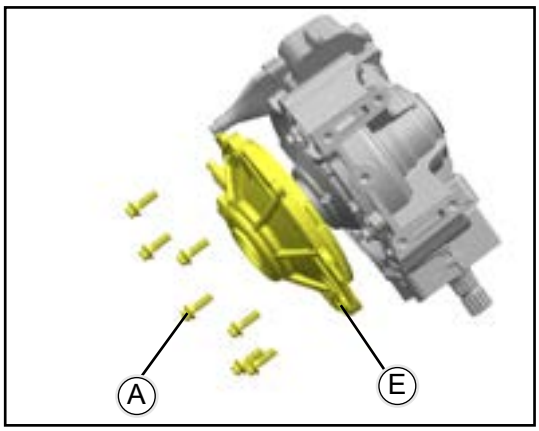
If it is not replaced in time, it will cause abnormal wear of other parts, and the overall temperature of the gearbox will increase, which will shorten its service life.

【A】 Hexagon flange bolt m8×25
【B】 Front axle end cover
【C】 Limiting liner
【D】 Rectangular gasket
【E】 Front axle end cover assembly



DISASSEMBLE

- Tool: 10mm t-sleeve (air trigger gun)
- Rotate c (7 pcs) counterclockwise to unscrew, pry b (three points) to take out e
- Take out c and measure the thickness. If the thickness is less than 6.85Mm, a new limit gasket a needs to be replaced.



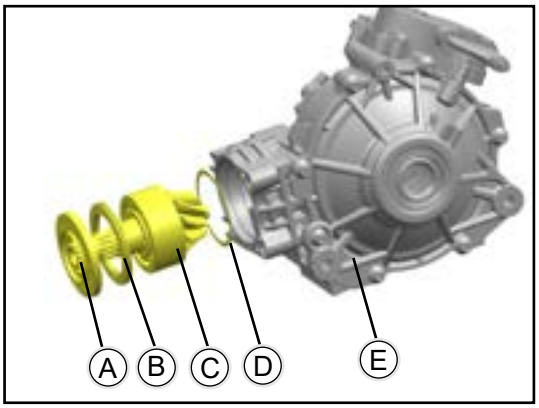
Install

- Tool: 10mm T-sleeve (air trigger gun)
- Install C in B, pay attention that the boss of C corresponds to the groove of B
- Check D, there must be no distortion or damage, if any, please replace it in time
- Then assemble E as a whole back to the front axle housing, and tighten bolt A diagonally.

⚠ WARNING

If the oil leaks during the replacement, please make up the oil and check whether the oil seal and sealing ring on B are damaged. If there is any damage, please replace it in time.

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】 Oil seal 30×45×6.5
【B】 Input shaft driving gear plug
【C】 Driving bevel gear assembly
【D】 Drive bevel gear shims
【E】 Front axle box assembly

Disassemble

- Tool: Input shaft driving gear plug sleeve;
- Destroy and remove A from E, then use a round nut sleeve to turn B clockwise out, take out C, and then take out D from the inner hole of E.

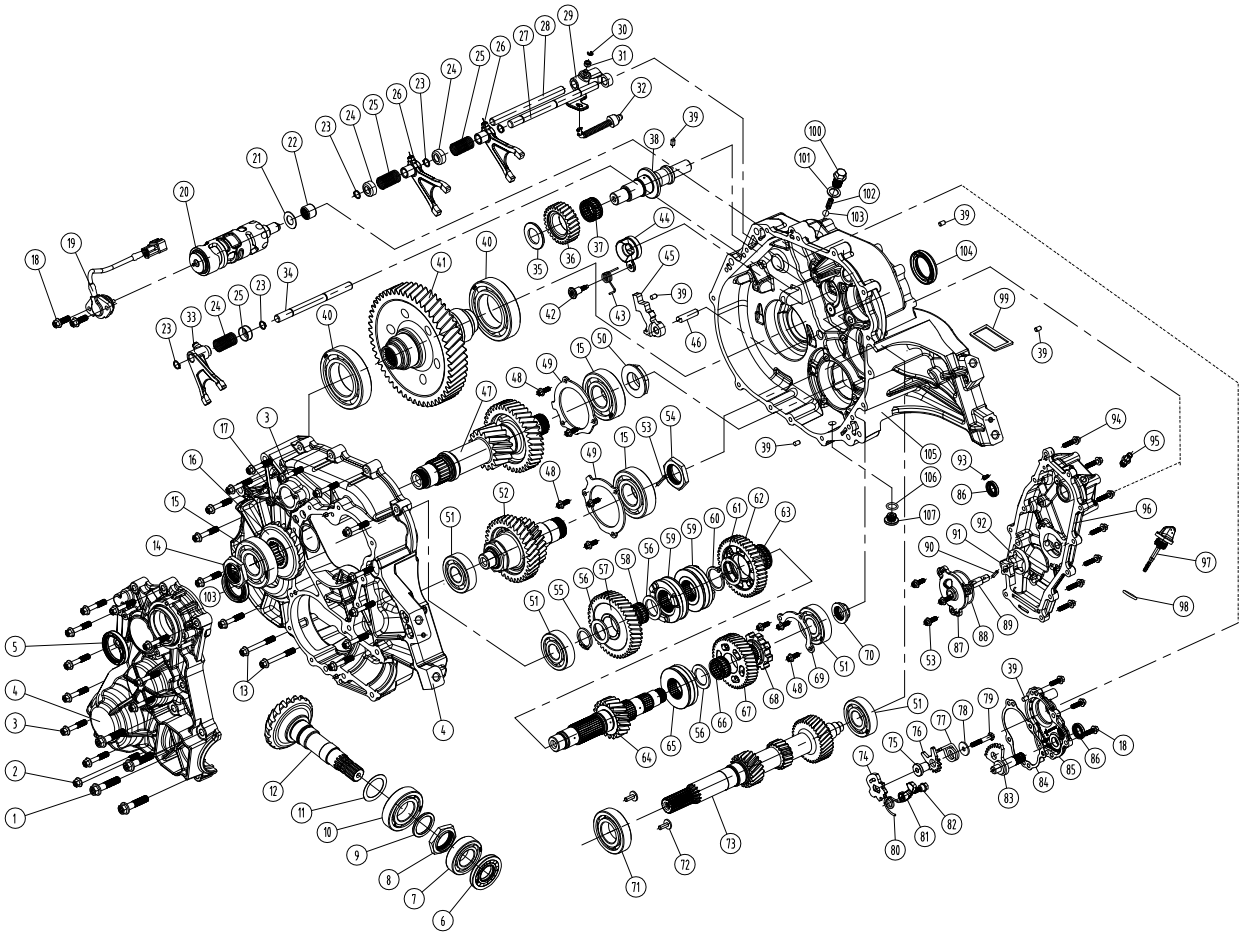
Install

- Tool: Input shaft drive gear plug sleeve;
- Take the corresponding thickness of D according to the gear gap value, put D into the inner hole of E, put C into the inner hole of E, apply tightening thread glue on B, and then use the Input shaft driving gear plug sleeve Rotate B counterclockwise, tighten it, reconfirm the gear gap, install new A on E after it is accurate (note that the oil seal lip cannot be scratched, and the oil seal as a whole cannot be deformed), and wipe clean the gear oil spilled 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 m10x1.25X45	45	4. 59	33.3	
2	Bolt m8×125	25	2. 55	18. 5	
3	Bolt m8×40	25	2. 55	18. 5	
4	Right gearbox assembly machining parts				SS
5	Oil seal 42×55×8				G
6	Oil seal 27×60×7				G
7	Deep groove ball bearings 6206				
8	Nut m33×1.5	240	24.49	177.12	L
9	Driven bevel gear shaft enclosure				
10	Deep groove ball bearings 6207				
11	Driven bevel gear shaft adjustment pad 35×48×0.4				
12	Driven bevel gear shaft				
13	Bolt m8×60	25	2. 55	18. 5	
14	Nut m30×1.5-Lh	210	21.43	154.98	L
15	Deep groove ball bearings 6307				
16	Driving bevel gear				
17	Drive bevel gear shaft adjustment pad 42×48×0.6				
18	Bolt m8×20	25	2. 55	18. 5	
19	Gear Sensor Assembly				

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
20	Shift drum				
21	Spacer 15×28×1				
22	Needle roller bearing hk1516				
23	Circlip 12				
24	Shift fork spring seat				
25	Shift fork spring				
26	Hr gear shift fork assembly				
27	Hr gear shift fork shaft				
28	Parking guide shaft				
29	Push rod seat assembly				
30	Scroll wheel				
31	Washer with split 4				
32	Push rod assembly				
33	L gear shift fork assembly				
34	L gear shift fork shaft				
35	Washer 26×44×3				
36	Reverse gear idler				
37	Needle bearing k30×35×17				
38	Reverse gear idler shaft				
39	Cylindrical pin 6×10				
40	Deep groove ball bearings 6211				
41	Rear axle output gear				
42	Hexagon socket pan head stepped bolts				
43	Parking arm return torsion spring				
44	Push rod guide seat				
45	Parking brake arm				
46	Parking arm shaft				
47	Fourth axis assembly				
48	Bolt m6×16	12	1.22	8.86	
49	Triaxial bearing press plate				
50	Nut m30×1.5-Lh	210	21.43	154.98	L
51	Deep groove ball bearings 6305				
52	Third axis assembly				
53	Needle roller p4×29.8				
54	Nut m33×1.5				
55	Circlip 28×2.5				
56	Washer 28×40×2.5				
57	L gear driven bevel				
58	Needle roller bearing k28×33×17				
59	Rl gear coupling sleeve				
60	Circlip 35×2.5				
61	Washer 32×42×1.5				
62	R gear driven bevel				
63	Needle roller bearing k35×40×13				
64	Countershaft				
65	H gear engagement sleeve				
66	Washer 30×40×1.5				
67	H gear driven gear				
68	Parking gear				
69	Countershaft bearing press plate				
70	Hex flange nut m22×1	145	14.8	107	L

FRONT AXLE AND REAR GEARBOX

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
71	Deep groove ball bearings 6207				
72	Hexagon socket large pan head bolt m6×16	12	1.22	8.86	
73	Main shaft				
74	Shift positioning wheel				
75	Bushing				
76	Shift driven gear				
77	Shift torsion spring				
78	Spacer 6.5×22×2				
79	Hexagon head bolt m6×40	15	1.53	11.1	
80	Shift positioning plate spring				
81	Positioning plate				
82	Positioning plate bolt m6×21	15	1.53	11.1	
83	Shift shaft assembly				
84	Shift shaft cover gasket				
85	Shiftshaft cover				
86	Oil seal 15×25×5				G
87	Oil pump cover				
88	O-ring 52×2				
89	Oil pump shaft				
90	Needle roller p4×15.8				
91	Oil pump inner rotor				
92	Outer rotor of oil pump				
93	Flow orifice φ1	2.5	0.26	1.85	L
94	Bolt m6×25	12	1.22	8.86	
95	Breathing joint	15	1.53	11.1	L
96	Oil pump assembly				SS
97	Oil dipstick				
98	O-ring 18×3.5				
99	Oil filter				
100	Gear positioning bolt	20	2.04	14.8	
101	Gear positioning spring				
102	Gear positioning spring				
103	Steel ball 9.5				
104	Oil seal 38×55×7				G
105	Left gearbox assembly				SS
106	O-ring 13.8×2.5				
107	Screw plug m14 assembly	15	1.53	11.1	

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

L: Use thread glue

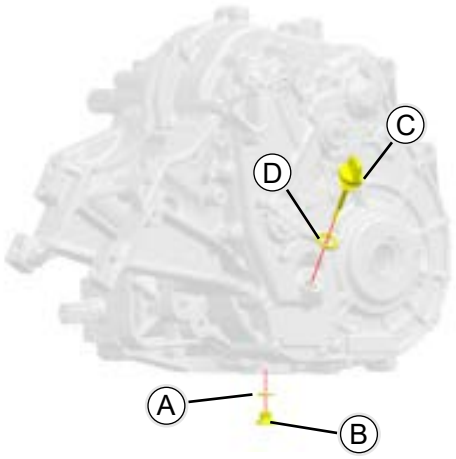
O: Use gear oil (SAE 75W/90/GL-5, AGL80W/90/GL-5)

SS: Use silicone sealant

R: Spare parts

LH：Left-hand thread

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.

【A】O-ring seal 13.8×2.5
【B】Screw plug m14 assembly
【C】Oil dipstick
【D】O-ring seal 18×3.5

Drain the gearbox oil

- Tools: 8mm Allen key.
- Unscrew 【B】 counterclockwise, remove 【A】 and 【B】, let the gearbox oil flow out, and keep it for 10 minutes. Then put 【A】 on the bottom of the thread of 【B】, tighten it clockwise, and wipe clean the surrounding oil. Waste oil should be poured into a special container to avoid environmental pollution.

Tightening torque of screw plug M14 assembly
15N·m(1.53kgf·m,11.1ft·lb)

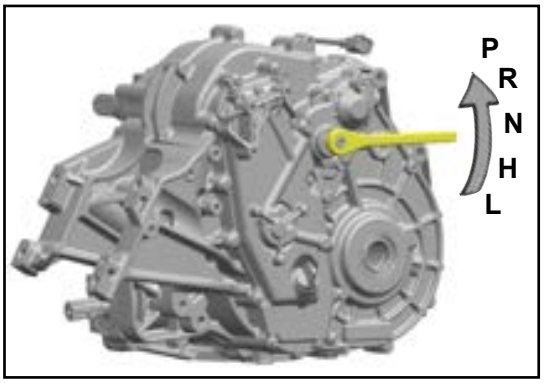
Add gearbox oil

- Turn on the oil dipstick
- Unscrew 【C】 counterclockwise, remove 【D】 and 【C】 and add new gearbox oil. Put 【D】 on the bottom of 【C】 thread. Tighten 【C】 and wipe off the surrounding oil.

⚠ CAUTION

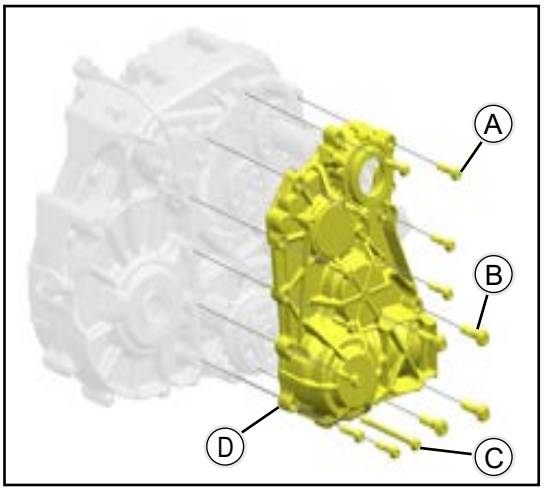
During installation, check whether the O-ring is intact and not twisted. If the O-ring is damaged, it will cause gearbox oil leakage, which may cause abnormal wear of the internal parts of the gearbox or even damage the gearbox. Please replace the O-ring with a new one in time.

DISMANTLING THE GEARBOX



Gear setting

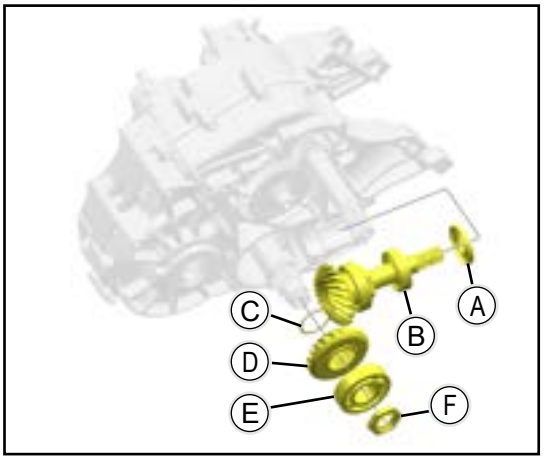
- Tool: gear wrench
- Hang the gear counterclockwise to the end as P gear.



Dismantling the driven bevel gear cover assembly

【A】Bolt M8×40
【B】 Bolt M10X1.25X45
【C】Bolt M8×125
【D】Driven bevel gear cover assembly

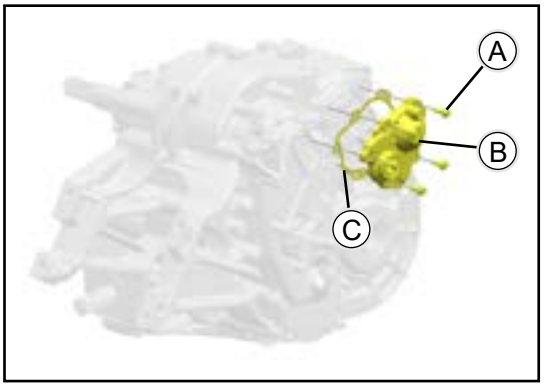
- Tools: 10mm sleeve, 13mm sleeve.
- Unscrew 【A】 【B】 【C】 counterclockwise, remove the driven bevel gear cover assembly, if necessary, use a rubber hammer to hit the joint surface around the box.



Dismantling the driving bevel gear

【A】 Oil seal 27×60×7
【B】 Driven bevel gear shaft assembly
【C】Driving bevel gear shaft adjustment pad
【D】 Driving bevel gear
【E】 Deep groove ball bearing 6307
【F】 Nut M30×1.5-LH

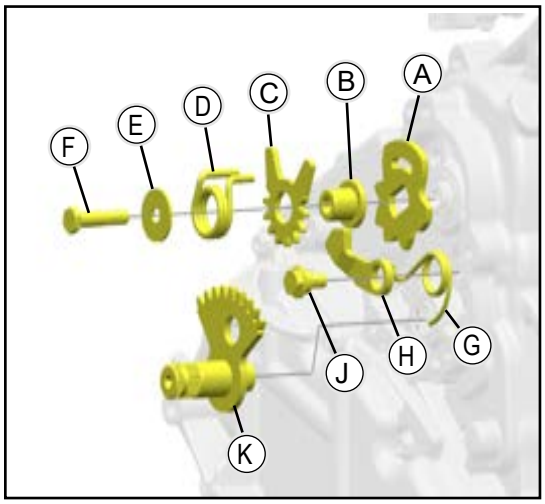
- Tool: 46mm sleeve
- Pry open【F】locking card, unscrew it clockwise, and remove 【A】, 【B】, 【C】, 【D】, 【E】.



Dismantling the shift shaft cover assembly

【A】 Shift shaft cover assembly
【B】 Bolt M6×20
【C】 Shift shaft cover gasket

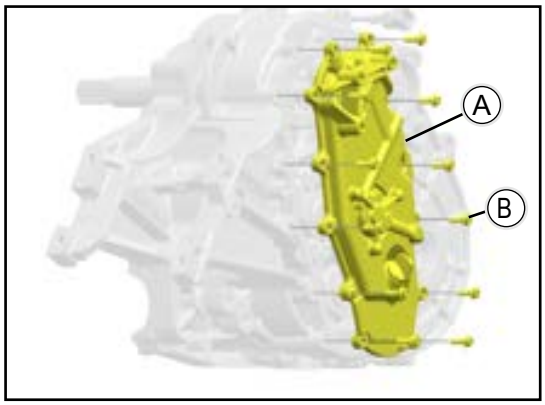
- Tool: 8mm sleeve.
- Unscrew the bolt 【A】 counterclockwise, and remove【B】and【C】.



Dismantling the shift mechanism

【A】 Shift positioning wheel
【B】 Bushing
【C】 Shift driven gear
【D】 Shift torsion spring
【E】 Washer 6.5×22×2
【F】 Hexagon head bolt M6×40
【G】 Shift positioning plate spring
【H】 positioning plate
【J】 positioning plate bolt M6×21
【K】 Shift shaft assembly

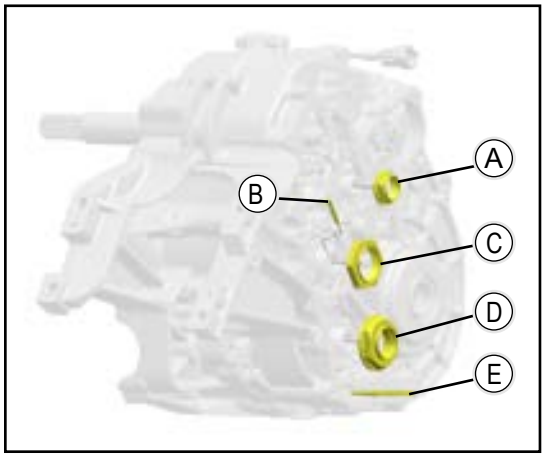
- Tool: 10mm sleeve.
- Remove【K】, unscrew the bolt 【F】 counterclockwise, remove 【E】, 【D】, 【C】, 【B】, unscrew the bolt 【J】 counterclockwise, and remove 【J】, 【 H】, 【G】, remove 【A】.



Dismantling the oil pump components

【A】 Oil pump assembly
【B】 Bolt M6×25

- Tool: 8mm sleeve.
- Unscrew the bolt【B】counterclockwise, and remove【A】

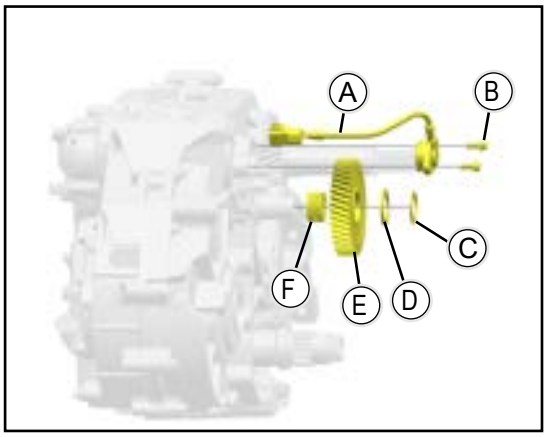


Dismantling the connecting nut between the shaft and the box body

【A】Hex flange nut M22×1
【B】Needle roller P4×29.8
【C】Nut M33×1.5
【D】Nut M30×1.5
【E】Oil filter

Tools: 27mm sleeve, 46mm sleeve.

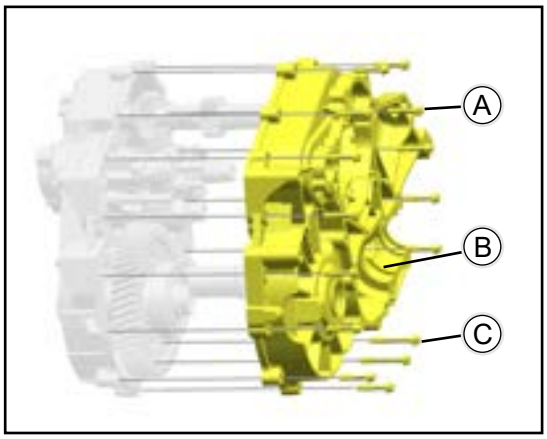
- Pry open the【A】,【C】, and【D】locking pieces, unscrew the nuts【A】,【B】,【C】 counterclockwise, and remove【B】【E】.



Dismantling the right gearbox connector

【A】Gear sensor assembly
【B】 Bolt M6×16
【C】 Circlip 30×2.5
【D】 Washer 30×40×1.5
【E】L gear driven gear
【F】Needle roller bearing K28×33×17

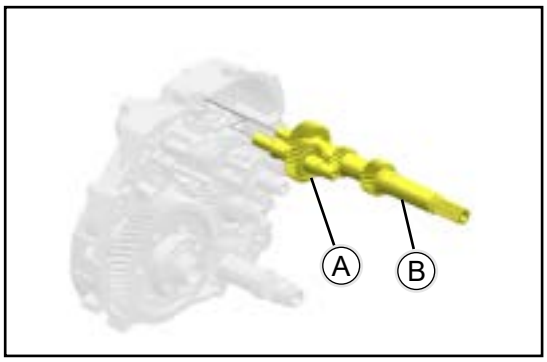
- Tools: 8mm sleeve, external circlip pliers.
- Unscrew the bolt【B】 counterclockwise, remove 【A】, and use circlip pliers to remove Next 【C】, remove 【D】and【E】in turn.



Dismantling the right gearbox assembly

【A】 Bolt M8×40
【B】Right gearbox assembly
【C】 Bolt M8×60

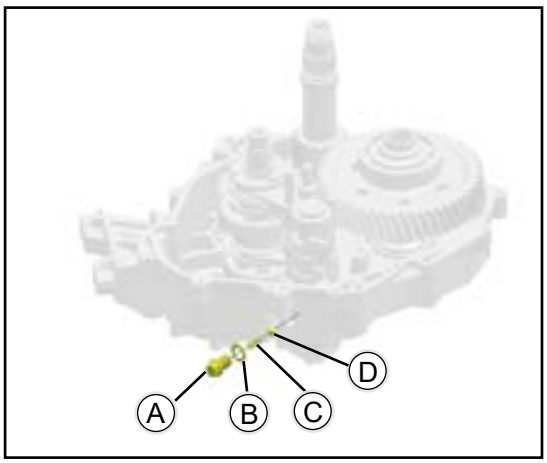
- Tool: 10mm sleeve.
- Unscrew the bolts【A】and【C】 counterclockwise, and remove 【B】.
- Separate the right box assembly, if necessary, use a rubber hammer to hit the joint surface around the box.



Dismantling the reverse gear idler shaft assembly and main shaft assembly

【A】Reverse gear idler shaft assembly
【B】 Spindle assembly

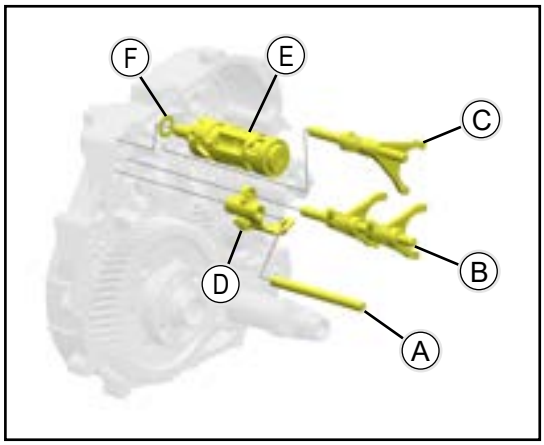
- Remove【A】, then remove【B】.



Dismantling the Gear positioning bolt

【A】 Gear positioning bolt
【B】 Aluminum washer 14×21×1.5
【C】 Gear positioning spring
【D】 Steel ball 9.5

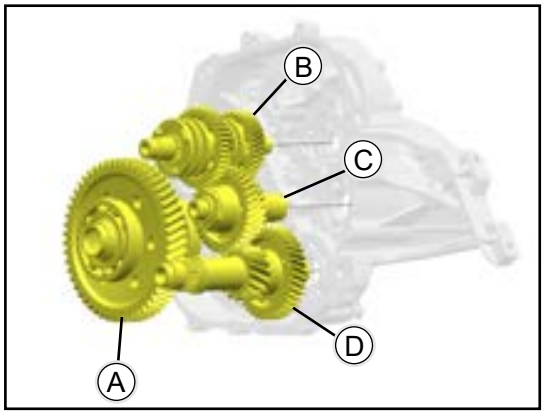
- Tool: 14mm sleeve.
- Use a sleeve to unscrew the bolt 【A】 counterclockwise, and take out 【B】, 【C】, and 【D】.



Dismantling the shifting system

【A】Parking guide shaft
【B】 HR gear shift fork shaft assembly
【C】 L gear shift fork shaft assembly
【D】Push rod seat assembly
【E】 Shift drum assembly
【F】 Washer 15×28×1

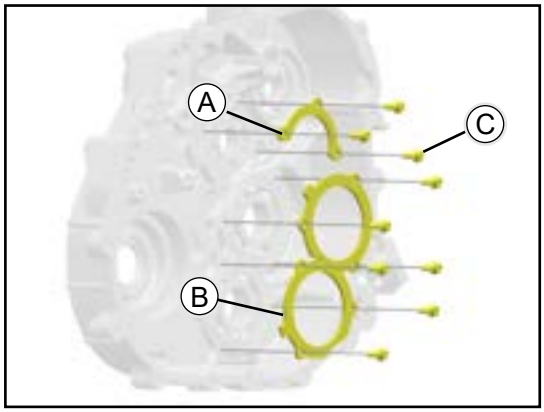
◆ Take down 【A】, 【B】, 【C】, 【D】, 【E】, 【F】 in sequence.



Dismantling the gear transmission parts

【A】 Rear axle output gear assembly
【B】 Countershaft assembly
【C】 Third axis assembly assembly
【D】Fourth axis assembly

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

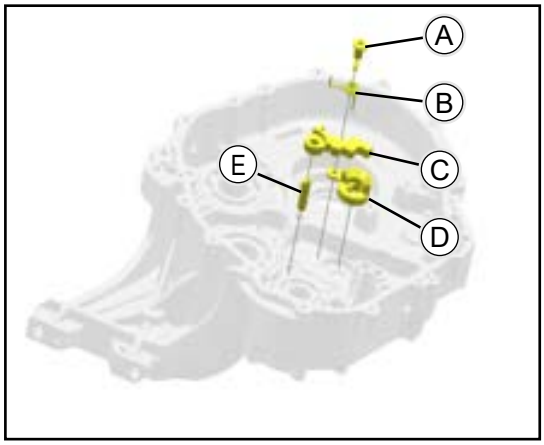


Dismantling the box connector

【A】 Countershaft bearing pressure plate
【B】 Triaxial bearing press plate
【C】 Bolt M6×16

◆ Tool: 8mm sleeve.

◆ Unscrew the bolt 【C】 counterclockwise, and remove 【A】 and 【B】.

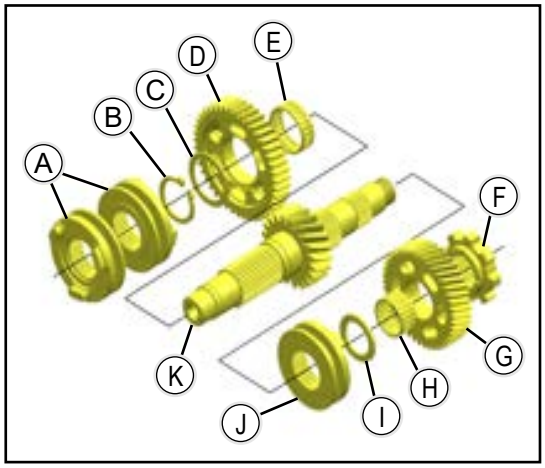


Dismantling the parking mechanism

【A】 Hexagon socket pan head stepped bolt
【B】Parking arm return torsion spring
【C】Parking arm
【D】Push rod guide seat
【E】Parking arm shaft

◆ Tool: inner spline sleeve.

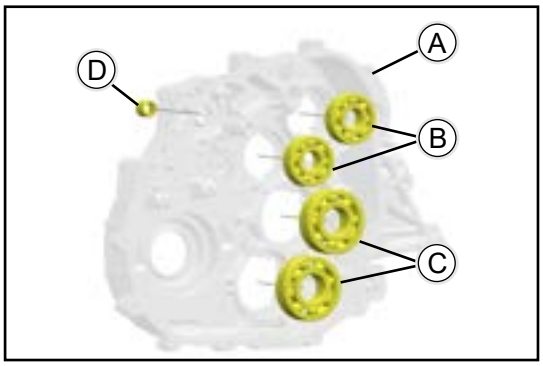
◆ Unscrew the bolt 【A】 counterclockwise, and remove 【B】, 【C】, 【D】, and 【E】 in sequence.



Dismantling the countershaft assembly

【A】 RL gear engagement sleeve
【B】 Circlip 35×2.5
【C】 Washer 32×42×1.5
【D】R gear driven gear
【E】 Needle roller bearing K35×40×13
【F】Parking gear
【G】 H gear driven gear
【H】 Needle roller bearing K28×33×17
【I】 Washer 30×40×1.5
【J】H gear engagement sleeve
【K】 Countershaft

- Tools: external circlip pliers.
- Remove 【A】, use external circlip pliers to remove 【B】, then take out 【C】, 【D】, and 【E】, and take the other end 【F】 【G】 【H】 【I】 【 J】 【K】 Take out one by one.



ASSEMBLE THE GEARBOX

Install the left box bearing

【A】Left gearbox body

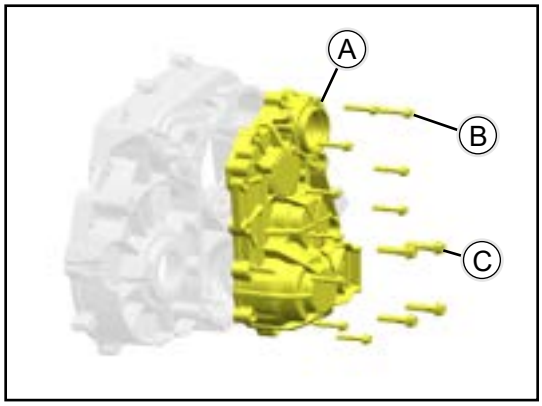
【B】 Deep groove ball bearing 6305

【C】 Deep groove ball bearing 6307

【D】Needle roller bearing HK1516

- Tools: bearing tooling 6305, bearing tooling 6307, needle bearing indenter HK121612.
- Lay the box 【A】 flat, with the inner cavity facing up, press into the bearing 【B】 【C】, and then press the inner cavity down to press into the bearing 【D】.

Install the right gearbox combined bearing:



Dismantling

【A】 Driven bevel gear cover

【B】 Bolt M8×40

【C】 Bolt M10X1.25X45

- Tools: 10mm sleeve, 13mm sleeve.
- Unscrew the bolts 【B】 and 【C】 counterclockwise, and remove 【A】.

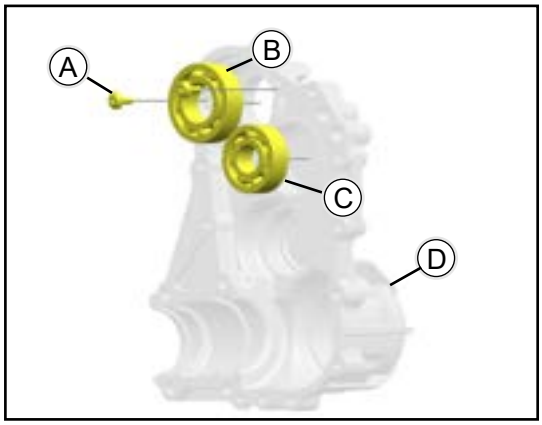
Installation

【A】 Hexagon socket large pan head bolt m6×16

【B】 Deep groove ball bearing 6207

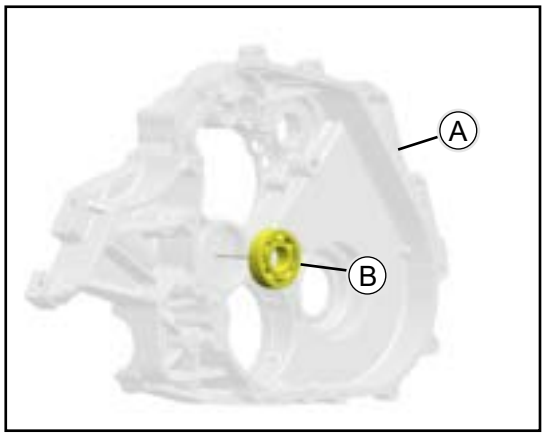
【C】 Deep groove ball bearing 6305

【D】 Driven bevel gear cover



- Tools: bearing tooling 6207, bearing indenter 6305, bearing tooling 6305, 5mm hexagon socket.
- Lay the case cover 【D】 flat with the inner cavity facing upwards, press into the bearing 【B】 【C】, apply thread glue to the connecting surface of the driven bevel gear cover and bolt 【A】, and then tighten the bolt 【A】.

Hexagon socket large pan head bolt m6×16
12N·m(1.22kgf·m,8.86ft·lb)



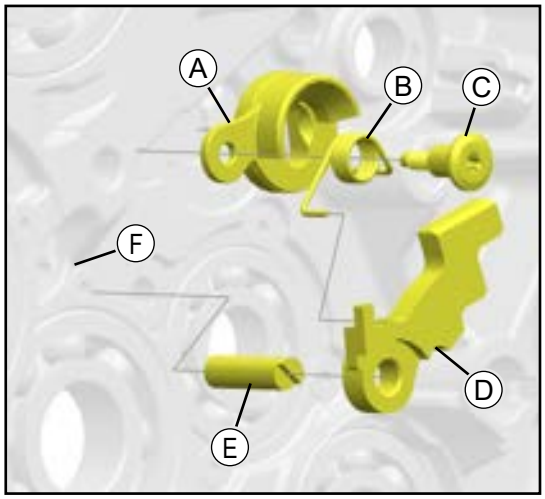
Installation

【A】Right gearbox

【B】 Deep groove ball bearing 6305

- Tools: Bearing tooling 6305.
- Lay the box 【A】 flat, with the inner cavity facing upwards, and press into the bearing 【B】.

Install the parking mechanism



【A】Push rod guide seat

【B】Parking arm return torsion spring

【C】 Hexagon socket pan head stepped bolt

【D】Parking arm

【E】Parking arm shaft

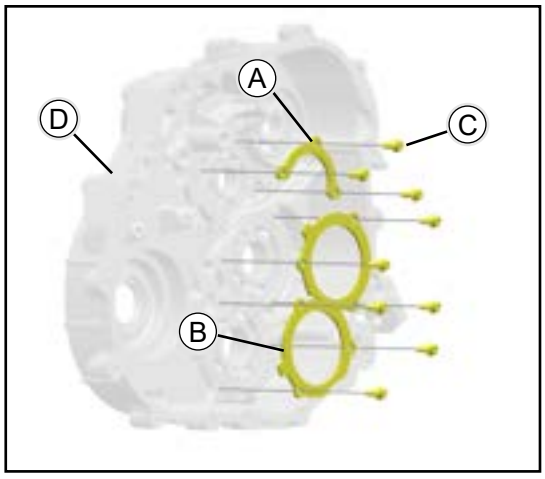
【F】Left box

- Tool: T40 inner plum blossom sleeve.
- Put 【A】 into the left box 【F】, 【B】 install it as shown by the dotted line in the figure, apply thread glue to the bolt 【C】 and lock it, install it into the shaft 【E】 and then install 【D】, The torsion spring 【B】 the moment arm snaps into the dotted

⚠ CAUTION

After installation, check that the parking arm 【D】 can be flexibly moved without jamming and rebounding.

Install the bearing plate of the left box body



【A】 Countershaft bearing pressure plate

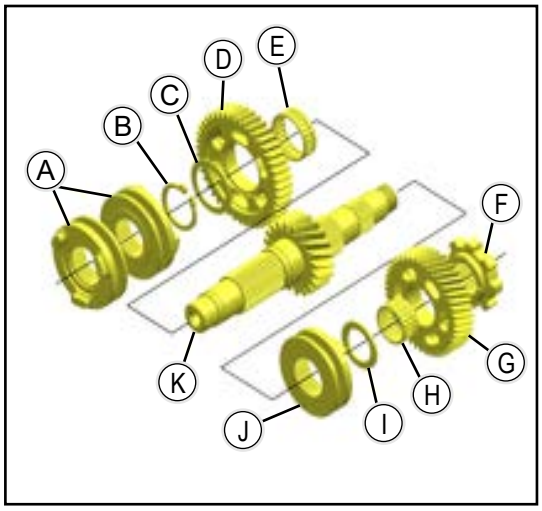
【B】 Triaxial bearing press plate

【C】 Bolt M6×16

【D】Left box

- Tool: 8mm sleeve.
- Apply thread glue to the connecting surface of the left box 【D】 and bolt 【C】, and lock the pressure plates 【A】 and 【B】 in the direction shown in Figure B.

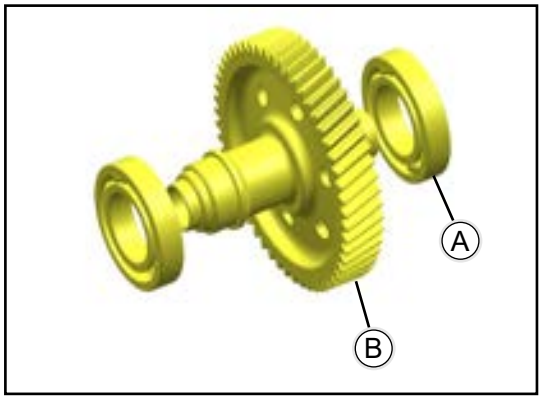
Bolt M6×16
12N·m(1.22kgf·m,8.86ft·lb)



Install the countershaft assembly

【A】 RL GEAR COUPLING SLEEVE
【B】 Circlip 35×2.5
【C】 Washer 32×42×1.5
【D】R gear driven gear
【E】 Needle roller bearing K35×40×13
【F】Parking gear
【G】 H gear driven gear
【H】 Needle roller bearing K28×33×17
【I】 Washer 30×40×1.5
【J】 H GEAR COUPLING SLEEVE
【K】 Countershaft

◆ Tools: external circlip pliers.
◆ Load 【E】, 【D】, 【C】, 【B】, and 【A】 into 【K】 in sequence, and then 【J】, 【I】, 【H】, 【G】, 【F】, Also load 【K】in sequence.



Assemble the rear axle output gear assembly

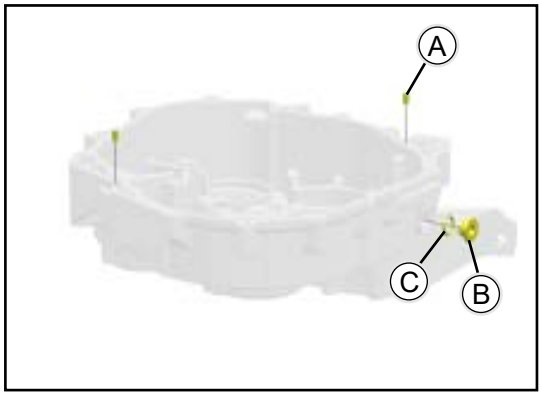
【A】 Deep groove ball bearing 6211
【B】 Rear axle output gear

◆ Tool: Bearing tool 6211.
◆ Assemble and press the bearings 【A】 to 【B】 respectively.

Install the left box connector

【A】 Cylindrical pin 6×10
【B】 Screw plug M14
【C】 O-ring 13.8×2.5

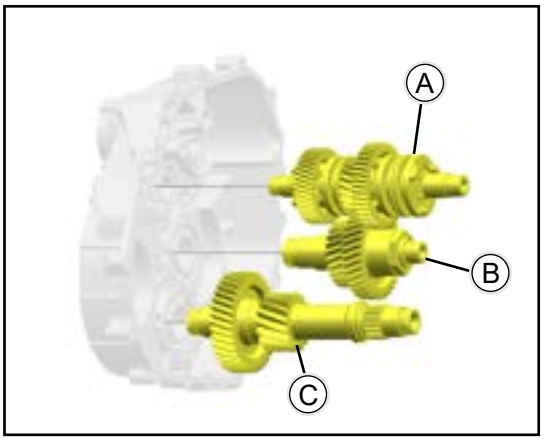
◆ ◆ Tools: brass hammer, 8mm hexagon wrench.
◆ ◆ Knock 【A】 into the left box, put 【C】 on the bottom of the thread of 【B】, and tighten 【B】.



screw plug M14 component
15N·m(1.53kgf·m,11.1ft·lb)

⚠ CAUTION

During installation, check whether the O-ring is intact and not twisted. If the O-ring is damaged, it will cause transmission 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.



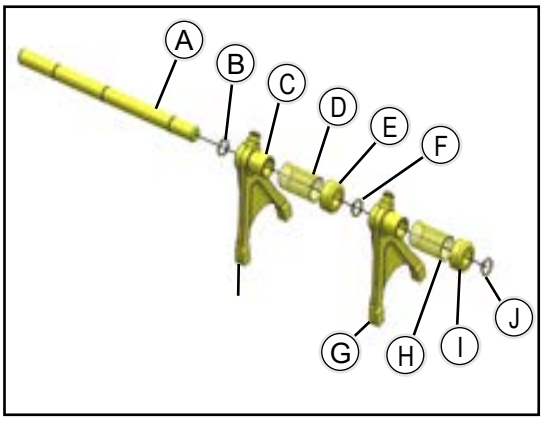
Install the gear set

【A】 Countershaft assembly

【B】 Third axis assembly

【C】 Fourth axis assembly

◆ After putting 【C】into the left box body first, install 【A】and【B】into the left box body together as shown in the figure.



Assemble the HR shift fork shaft assembly

【A】 HR gear shift fork shaft

【B】 Retaining ring for shaft 12

【C】 HR gear shift fork assembly

【D】 shift fork spring

【E】 shift fork spring seat

【F】 Circlip 12

【G】 HR gear shift fork assembly

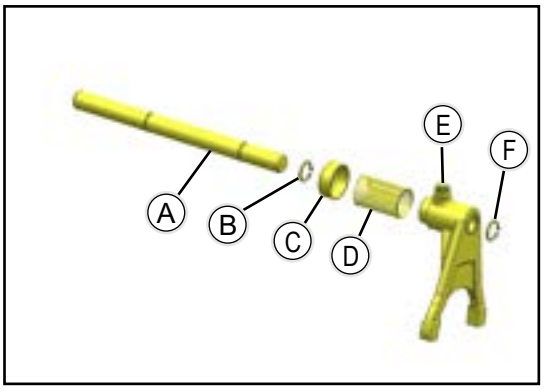
【H】 shift fork spring

【I】 shift fork spring seat

【J】 Circlip 12

◆ Tools: external circlip pliers.

◆ Load 【B】, 【C】, 【D】, 【E】, 【F】, 【G】, 【H】, 【I】, 【J】 into 【A】 in the order shown in the figure.



Assemble the L gear shift fork shaft assembly

【A】 L gear shift fork shaft

【B】 Circlip 12

【C】 shift fork spring seat

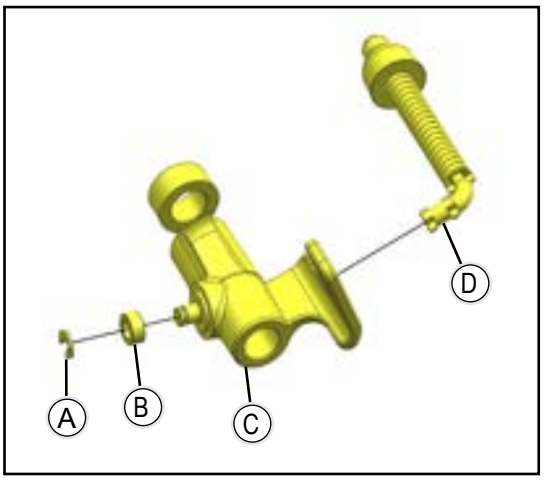
【D】shift fork spring

【E】L gear shift fork assembly

【F】 Circlip 12

◆ Tools: external circlip pliers.

◆ Load 【B】, 【C】, 【D】, 【E】, and 【F】 into 【A】 in the order shown in the figure.



Assemble the L gear shift fork shaft assembly

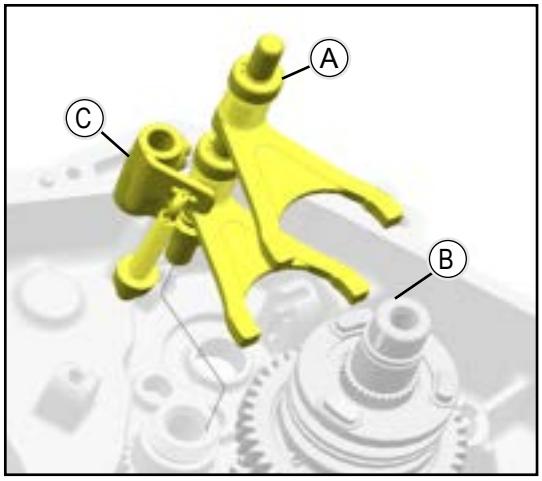
【A】 Washer with split 4

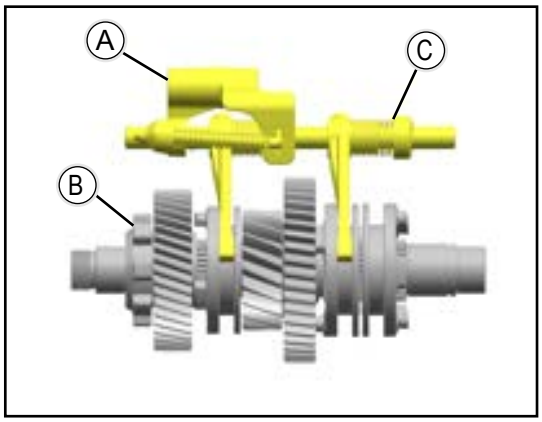
【B】 scroll wheel

【C】Push rod seat assembly

【D】Push rod assembly

◆ Load 【A】 and 【B】 into 【C】 in the order shown in the figure, and then 【D】 into 【C】.





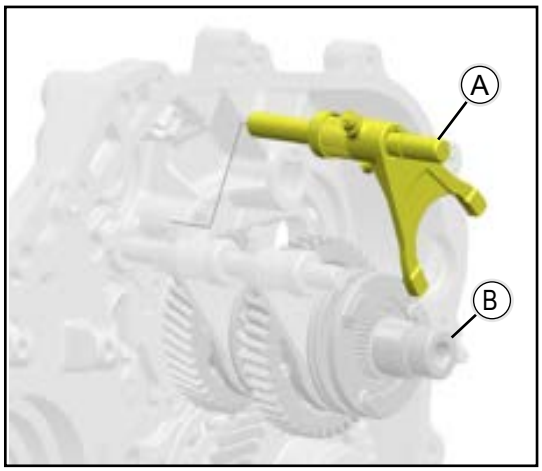
Install the HR shift fork shaft assembly:

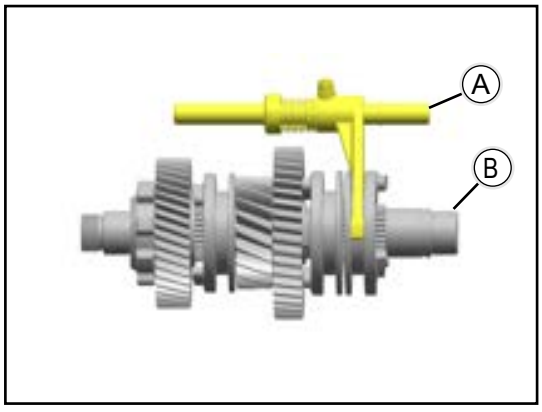
【A】 HR gear shift fork shaft assembly Push rod assembly

【B】 Countershaft assembly

【C】 Countershaft assembly

◆ Assemble 【A】 【C】 as shown in the figure, then put it into the left box and connect with 【B】.



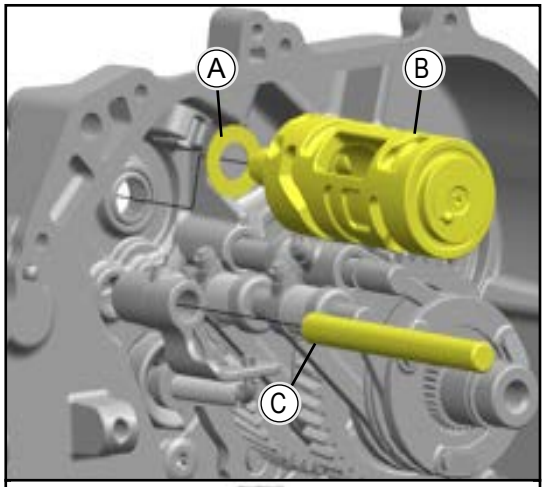


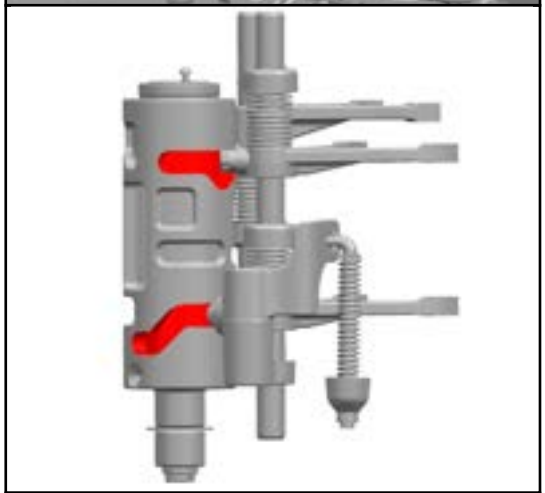
Install the L gear shift fork shaft assembly

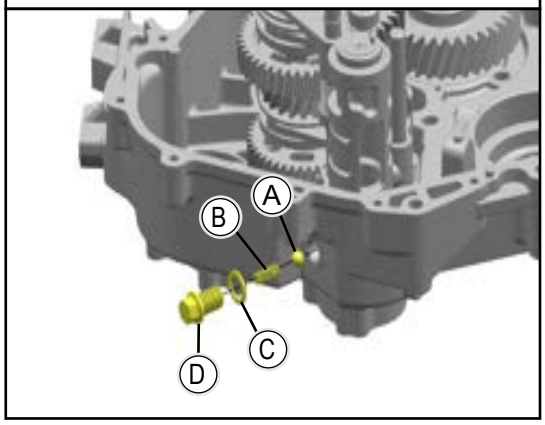
【A】 L gear shift fork shaft assembly

【B】 Countershaft assembly

◆ Assemble according to the figure, put 【A】 into the left box and connect with 【B】.







Install the parking shaft and shift drum assembly

【A】 Washer 15×28×1

【B】 shift drum

【C】Parking guide shaft

◆ Assemble 【A】 【B】 as shown in the figure and install it into the left box body, and then put 【C】 into the left box body.

⚠ CAUTION

When installing, check that the roller part of the HR gear shift fork, L gear shift fork, and push rod seat assembly should be in the guide groove of the red-painted part of the shift drum.

Install the parking shaft and shift drum assembly

【A】 Steel ball 9.5

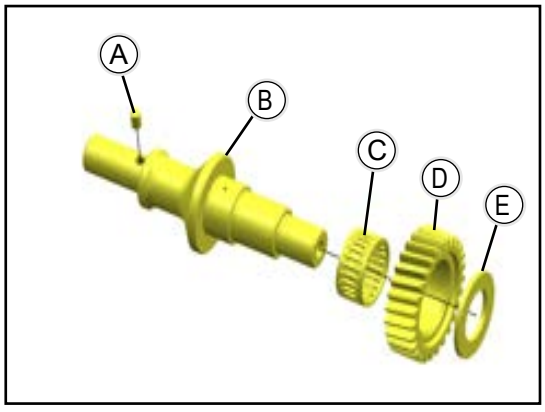
【B】 Gear positioning spring

【C】 Aluminum washer 14×21×1.5

【D】 Gear positioning bolt

◆ Tool: 14mm sleeve.

◆ Put 【A】, 【B】, and 【C】 into 【D】 in the order shown in the figure, and then into the left box.



Assemble the reverse gear idler shaft assembly

【A】 Cylindrical pin 6×10

【B】 Reverse gear idler shaft

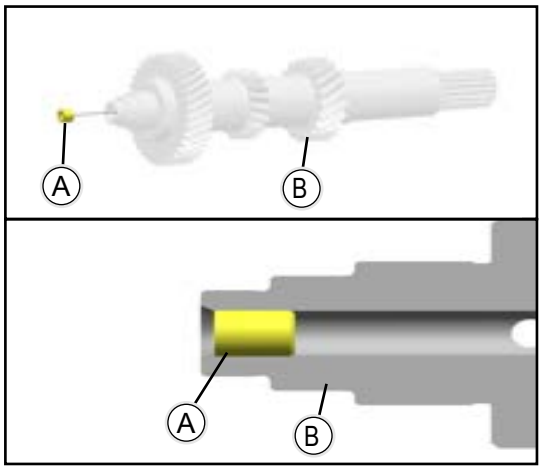
【C】 Needle roller bearing K30×35×17

【D】Reverse gear idler

【E】 Washer 26×44×3

◆ Tools: copper hammer.

◆ After typing 【A】 into 【B】, load 【C】, 【D】, and 【E】 in the order shown in the figure.



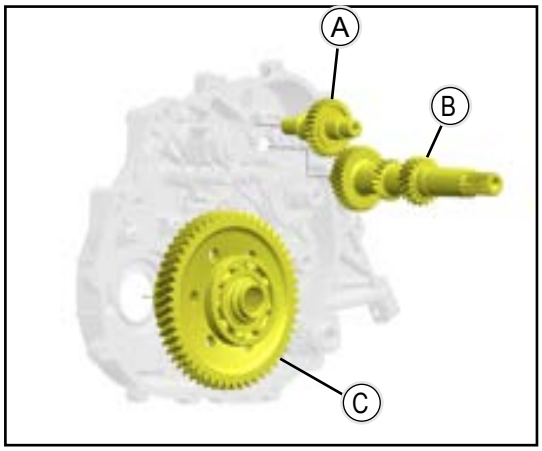
Install the main shaft assembly

【A】 Bushing

【B】 Main shaft

◆ Tools: copper hammer.

◆ Press 【A】 into 【B】 according to the icon.



Install the gear assembly

【A】Reverse gear idler shaft assembly

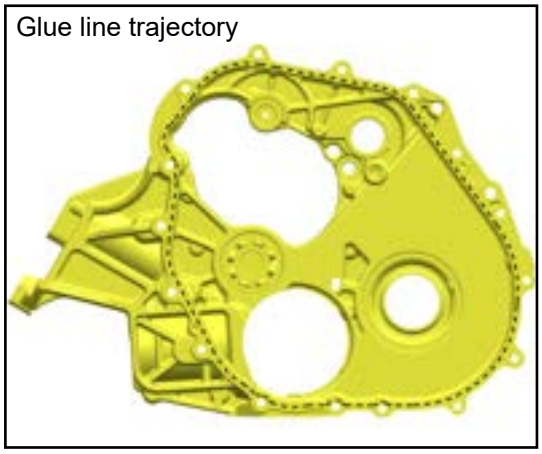
【B】 Main shaft assembly

【C】 Rear axle output gear assembly

◆ First put 【A】 into the left box body according to the figure, then put 【B】 into the left box body, and finally put 【C】 into the left box body.

⚠ CAUTION

When installing the 【C】 rear axle output gear, pay attention to the gap between the gear and the box body to prevent fingers from being pinched.



Install the right box body combination

【A】Right gearbox

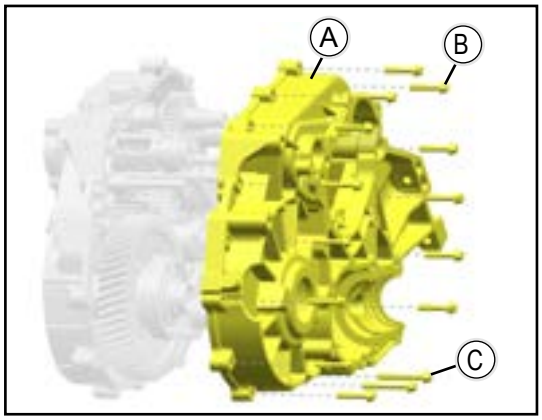
【B】 Bolt M8×40

【C】 Bolt M8×60

◆ Tool: 10mm sleeve.

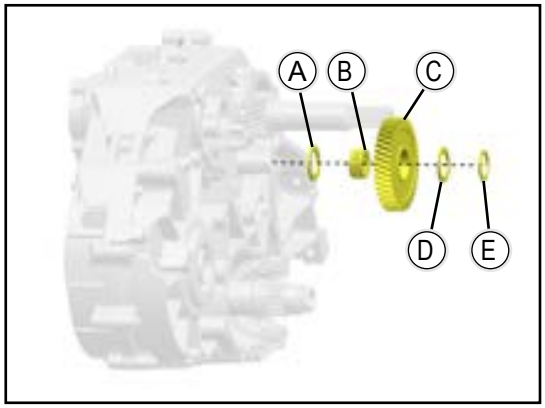
◆ Apply sealant according to the gluing track as shown in the figure. The glue application should be uniform and continuous, and the glue line width should be about 1.5-2mm.

◆ Align with the positioning pin hole of the left box body, install 【A】, and tighten the bolts in sequence.



Bolt M8×40
12N·m(1.22kgf·m,8.86ft·lb)

Bolt M8×60
12N·m(1.22kgf·m,8.86ft·lb)



Install the countershaft low-speed gear:

【A】 Washer 30×40×1.5

【B】 Needle roller bearing K28×33×17

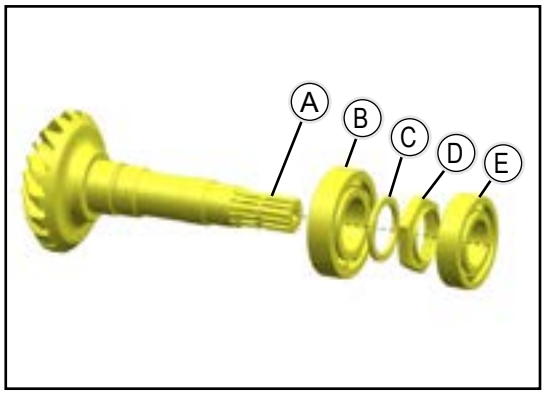
【C】L gear driven gear

【D】 Washer 30×40×1.5

【E】 Circlip 30×2.5

◆ Tools: external circlip pliers.

◆ Load 【A】, 【B】, 【C】, 【D】, and 【E】 into the countershaft in the order shown in the figure.



Install the driven bevel gear shaft:

【A】 Driven bevel gear shaft

【B】 Deep groove ball bearing 6207

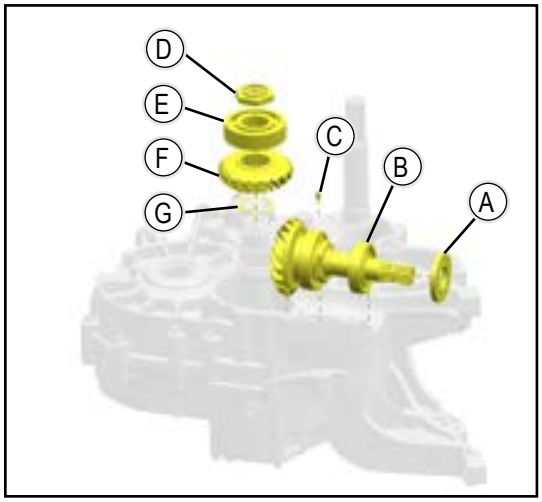
【C】 Driven bevel gear shaft spacer

【D】Nut M33×1.5

【E】 Deep groove ball bearing 6206

◆ Tools: 46mm sleeve, 32mm sleeve, driven bevel gear shaft tooling seat, driven bevel gear shaft spline sleeve.

◆ Install 【B】 and 【C】 into 【A】 in the order shown in the figure, lock 【D】 clockwise to a torque of 240N·m, and then install 【E】 into 【A】.

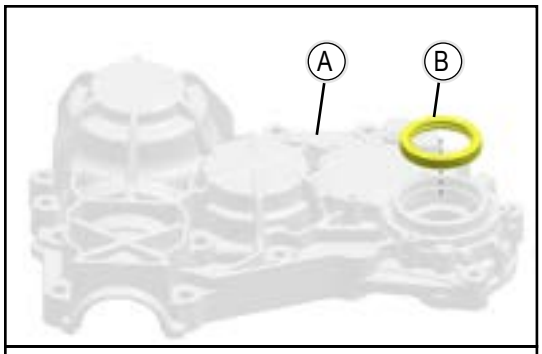


Install the driven bevel gear shaft

【A】 Oil seal 27×60×7
【B】 Driven bevel gear shaft
【C】 Cylindrical pin 6×10
【D】 Driving bevel gear shaft adjustment pad 42×48×0.6
【E】 Driving bevel gear
【F】 Deep groove ball bearing 6307
【G】 Nut M30×1.5-LH

- Tools: 46mm sleeve, copper hammer.
- Put 【A】 into 【B】 and then into the box, knock in the cylindrical pin 【C】, install 【G】, 【F】, 【E】 in the order shown in the figure, and lock 【D】 counterclockwise.

Nut M30×1.5-LH
210N·m(21.4kgf·m,155ft·lb)

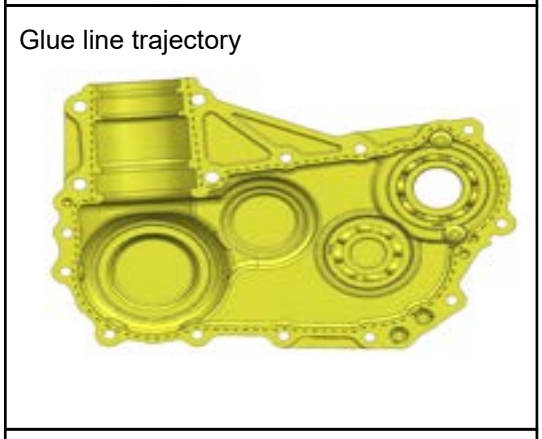


Install the driven bevel gear cover oil seal

【A】 Driven bevel gear cover
【B】 Oil seal 42×55×8

- Tools: oil seal 42×55×8 punch.
- Install the oil seal in place using an oil seal press tool.

Glue line trajectory



Install the driven bevel gear cover

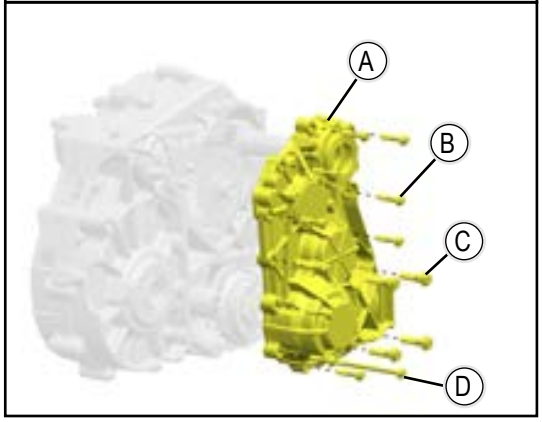
【A】 Driven bevel gear cover
【B】 Bolt M8×40
【C】 Bolt M10X1.25X45
【D】 Bolt M8×125

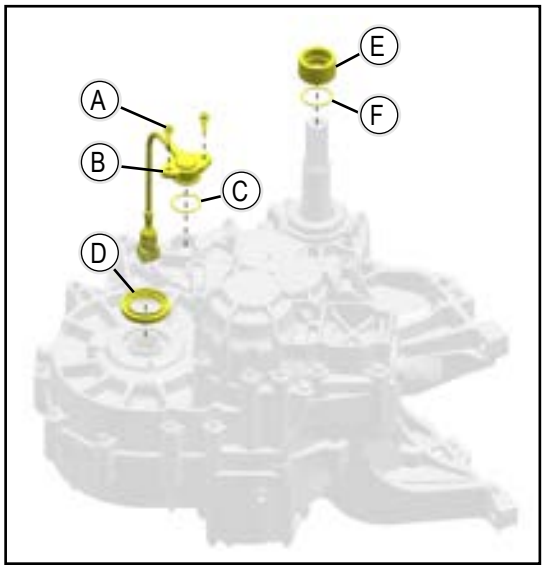
- Tools: 10mm sleeve, 13mm sleeve.
- Align the positioning pin holes of the box body, install 【A】, and tighten the bolts【B】, 【C】, and 【D】 in order.

Bolt M8×40
25N·m(2.55kgf·m,18.5ft·lb)

Bolt M10×1.25×45
45N·m(4.59kgf·m,33.3ft·lb)

Bolt M8×125
25N·m(2.55kgf·m,18.5ft·lb)





Install the gear sensor and rotary shaft oil seal

【A】 Bolt M6×20
【B】 Gear sensor assembly
【C】 O-ring 29.6×2.4
【D】 Oil seal 38×55×7
【E】 CVT driven wheel bushing
【F】 O-ring 31×2.5

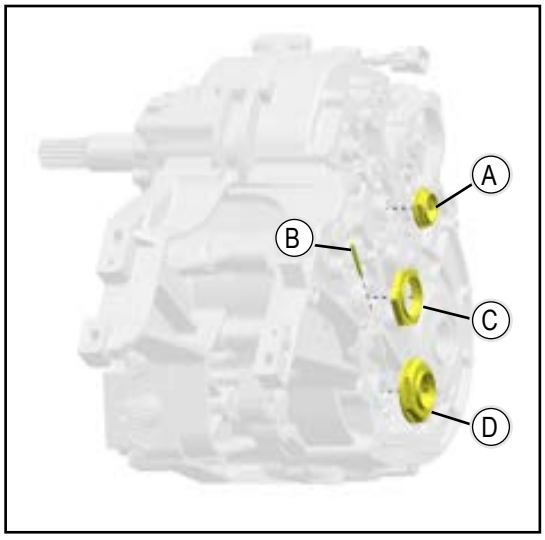
- Tools: 38×55×7, 10mm sleeve with oil seal guide punch at the output end.
- Put 【C】 into 【B】 and then into the box body and tighten the bolt 【A】, install 【F】 into 【E】, first install 【G】 and then 【E】, the oil seal is press-fitted with an oil seal Tool to install the oil seal in place.

Nut M6×20
12N·m(1.22kgf·m,8.86ft·lb)

Install the gear set nut

【A】 Hex flange nut M22×1
【B】 Needle roller P4×29.8
【C】 Nut M33×1.5
【D】Nut M30×1.5

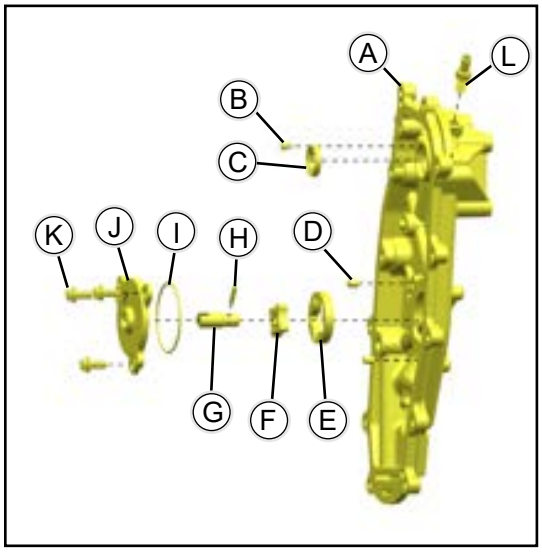
- Tools: 27mm sleeve, 46mm sleeve.
- After applying thread glue to the nut 【A】, tighten it clockwise, insert 【B】 into the needle hole of the four-axis assembly, apply thread glue to the nut 【C】 and tighten it clockwise, and apply thread glue to the nut 【D】, clockwise Tighten.



hex flange nut m22×1
145N·m(14.8kgf·m,107ft·lb)

Nut m33×1.5
240N·m(24.5kgf·m,177ft·lb)

Nut M30×1.5-LH
210N·m(21.4kgf·m,155ft·lb)



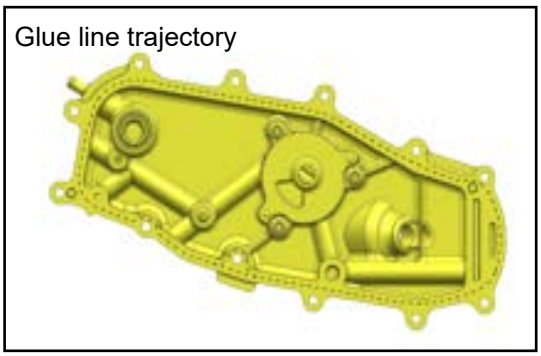
Assemble the oil pump components

【A】 Oil pump
【B】 Flow orifice φ1
【C】 Oil seal 15×25×5
【D】 Cylindrical pin 6×10
【E】 Outer rotor of oil pump
【F】 Oil pump inner rotor
【G】 Oil pump shaft
【H】 Needle roller P4×15.8
【I】 O-ring 52×2
【J】 Oil pump cover
【K】 Bolt M6×16
【L】 Breathing connector

Tools: 10 m m sleeve, 1 2 m m sleeve, shift chamber cover oil seal 15×25×, copper hammer.

◆ Install 【H】 into 【A】 as shown in the figure and tighten it clockwise, screw 【B】 and 【L】 clockwise into 【A】, use an oil seal press tool to install the oil seal, and first set the cylindrical pin 【D】 in order 】 Knock in 【A】, put the needle 【H】into【G】, put the O-ring【I】into【J】,into【E】, 【G】, 【J】in order, finally lock Tighten the bolt 【K】.

Nut M6×16
12N·m(1.22kgf·m,8.86ft·lb)



Install the oil pump assembly

【A】 Cylindrical pin 6×10
【B】 Oil pump assembly
【C】 Oil dipstick
【D】O-ring 18×3.5
【E】 Bolt M6×25
【F】Oil filter

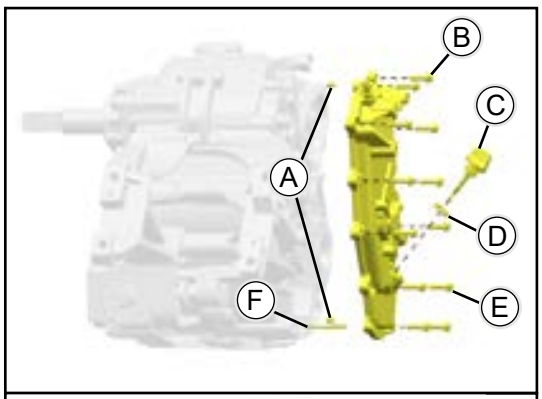
Tools: 8mm sleeve, copper hammer.

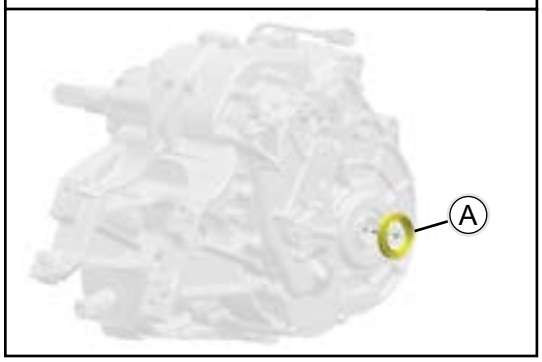
◆ Put two cylindrical pins 【A】 into the box, and 【F】 into the box.

◆ Align the positioning pin holes of the box body, install 【B】, and tighten the bolts in sequence.

◆ Put 【D】 into 【C】 and screw in 【B】.

Nut M6×25
12N·m(1.22kgf·m,8.86ft·lb)



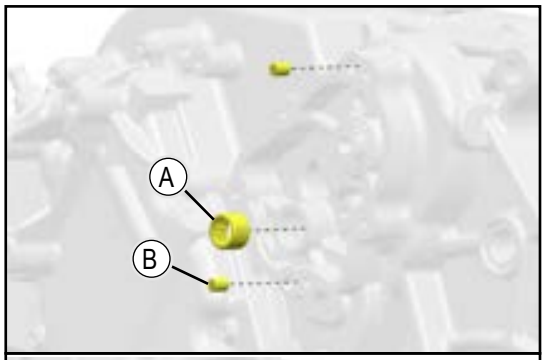


Install the rear axle output shaft oil seal

【A】 Oil seal 38×55×7

Tools: output end oil seal guide punch 38×55×7.

◆ Use an oil seal press tool to install the oil seal in place.



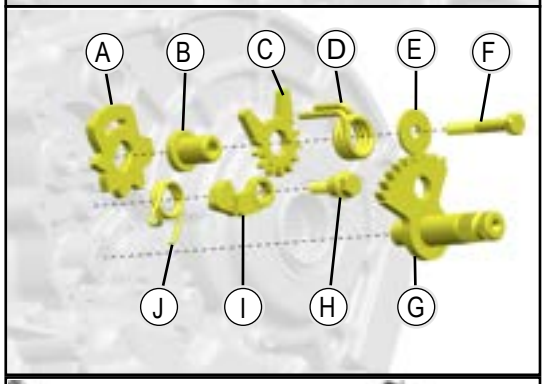
Install the needle bearing and locating pin

【A】 Needle roller bearing HK121612

【B】 Cylindrical pin 6×10

Tools: Needle bearing indenter-HK121612, copper hammer.

◆ Press 【A】 into the box, and put two cylindrical pins 【B】 into the box.



Install the shift mechanism

【A】Shift positioning wheel 【F】Hexagon head bolt M6×40

【B】Bushing 【G】Shift shaft assembly

【C】Shift driven gear 【H】Positioning plate bolt m6×21

【D】Shift torsion spring 【I】 Positioning plate

【E】Washer 6.5×22×2 【J】Shift positioning plate spring

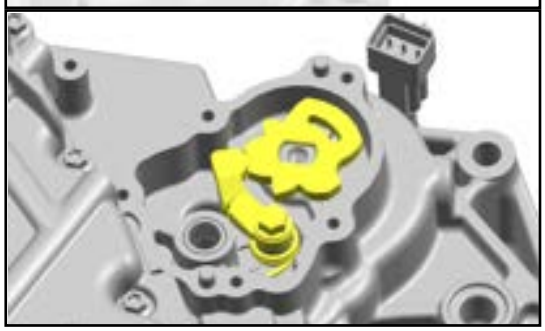
Tool: 10mm sleeve.

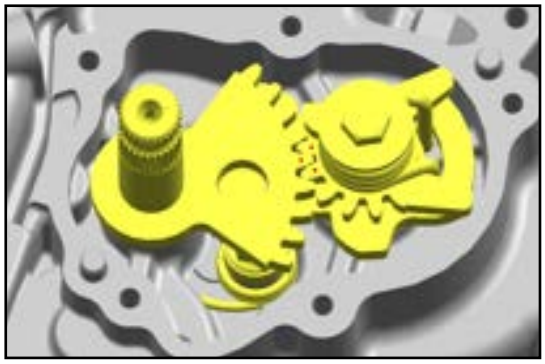
◆ Put 【J】 into the box, then put 【I】 and 【H】 into the box, and then put 【A】 into the box and jam with 【I】 as shown in the figure.

◆ Install【B】,【C】, 【D】, 【E】, and【F】in sequence.

◆ Put the installed 【B】, 【C】, 【D】, 【E】, and 【F】into the box and tighten.

◆ Finally, install 【G】 as shown in the figure to align the points.





Hexagon head bolt M6×40
15N·m(1.53kgf·m,11.1ft·lb)

Positioning plate bolt M6×21
15N·m(1.53kgf·m,11.1ft·lb)

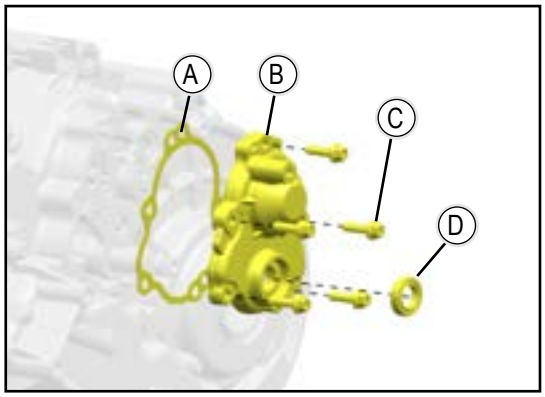
Install the needle bearing and locating pin

【A】 Shift shaft cover gasket 【C】 Bolt M6×20

【B】 Shift shaft cover 【D】 Oil seal 15×25×5

◆ Tools: 15×25×, 8mm sleeve for the oil seal pressure head of the shift chamber cover.

◆ Press 【D】 into 【B】, then install 【A】 according to the position of the locating pin, then install 【B】 in sequence, and tighten the bolts in sequence.



Bolt M6×20
12N·m(1.22kgf·m,8.86ft·lb)

FUEL SYSTEM

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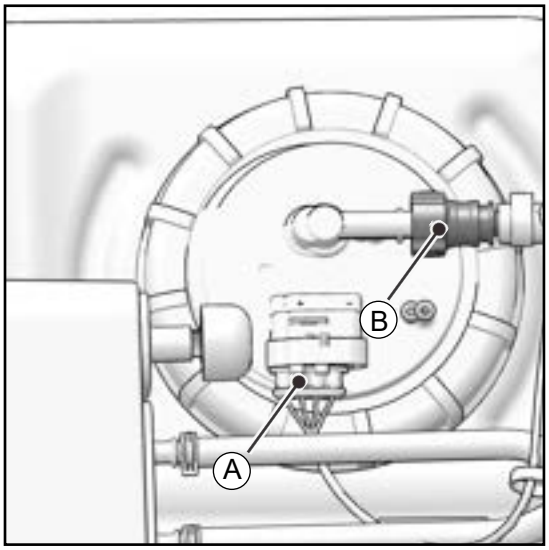
EXPLODED VIEW OF FUEL SYSTEM

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Bolt M6×20	8~12	0.8~1.2	5.9~8.8	
2	Install screw cap on oil pump	75~85	7.5~8.5	55~63	

FUEL TANK

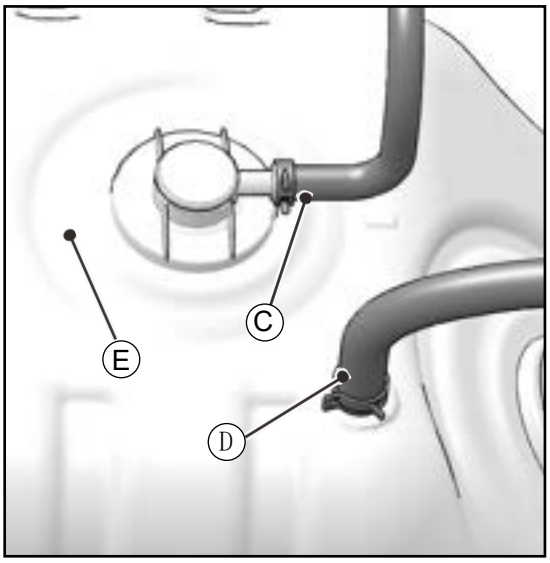


⚠ WARNING

- Whenever the gasoline line is removed, the battery must be disconnected to prevent accidental starting of the fuel pump.
- Fuel leakage may occur whenever any repair or inspection is carried out on the fuel system, and welding, smoking, open fires, etc., shall not be allowed in the area.

Disassembly

【A】Fuel pump cable plug
【B】High-pressure tubing plug
【C】Carbon canister adsorption tube
【D】Fuel tank breather
【E】Fuel tank



- Remove the plastic parts of the body, the seat and the seat bracket (see the body part for details)
- Disconnect the battery cable
- Disconnect the fuel pump cable plug【A】and the high-pressure fuel pipe plug【B】
- Remove the carbon canister adsorption pipe【C】and fuel tank vent pipe【D】
- Remove the fuel tank

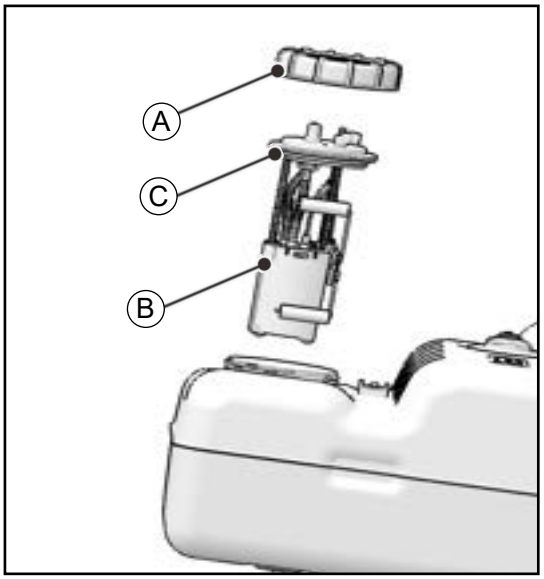
⚠ CAUTION

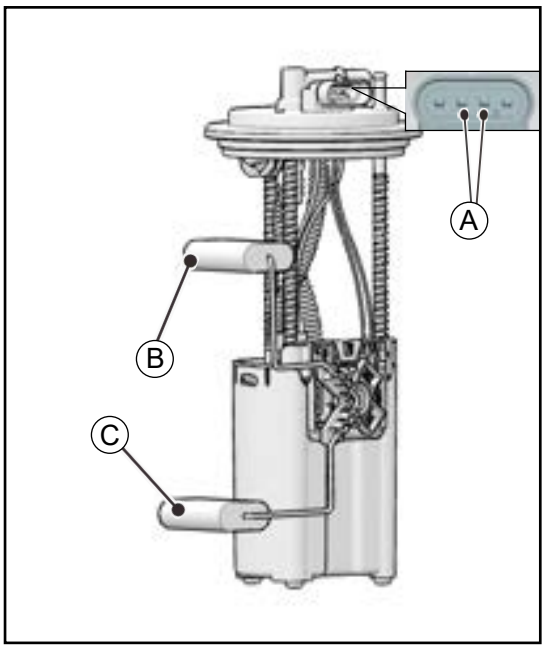
During the process of disassembling any part of the fuel system, fuel leakage may occur. Wipe off the residual oil with a cloth.

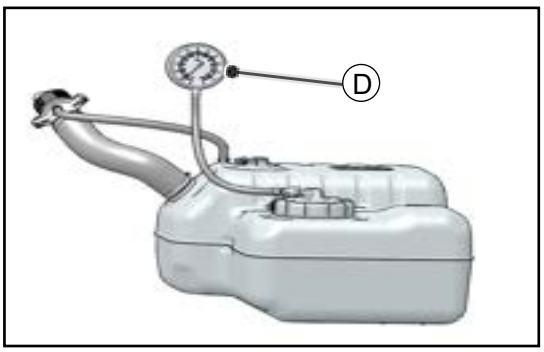
Assembly

When assembling, please reverse assembling in the order of disassembly.
When assembling the high pressure oil pipe plug, please confirm that the assembly is correct and reliable.

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】Oil pump installation screw cap
【B】Fuel Pump
【C】Sealing ring

- Remove the oil pump installation screw cap counterclockwise【A】.
- Mark the direction of the fuel pump on the fuel tank, and remove the fuel pump【B】.
- Keep the sealing ring【C】to prevent loss.

⚠ CAUTION

After removing the fuel pump, please protect the fuel tank port effectively to prevent debris from falling into the fuel tank and damage the fuel pump.

Inspection

【A】Cable plug
【B】Full position
【C】Empty position
【D】Pressure gauge

- Move the floating rod to check if it can move freely. The float assembly should be able to return to a lower position freely. If not, please replace the fuel pump.
- Connect the multimeter to the middle two pins of the cable plug【A】to test the fuel position sensor. When measuring with a multimeter in the full oil position, the resistance value shows 235±5Ω, and when measuring with a multimeter in the empty position, the resistance value shows 40±2Ω.

- Test the pressure of the fuel pump supply port through the pressure gauge【D】, and the test pressure value is 400Kpa±5% under the power-on state.

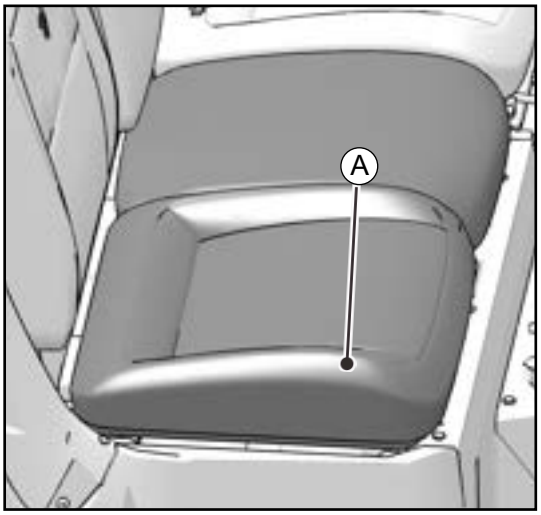
⚠ CAUTION

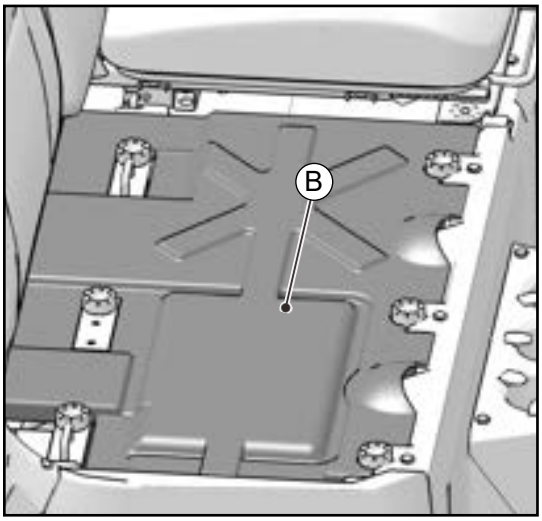
- If the resistance reading shows unstable, please clean the resistance wiper with alcohol and retest. If it is still incorrect, please replace the fuel pump.
- If the fuel pump supply pressure test fails, please replace the fuel pump.

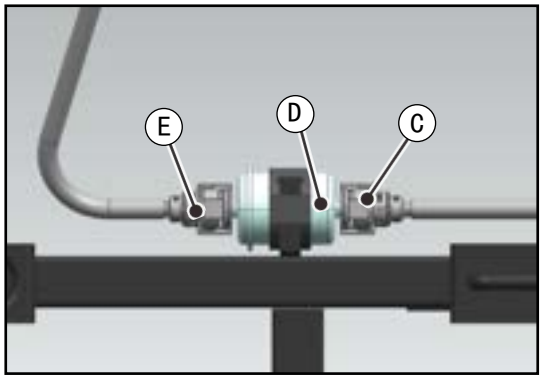
Assembly

- Confirm that the sealing ring is installed on the fuel tank port.
- Confirm the orientation of the fuel pump and install it on the fuel tank.
- Tighten the oil pump installation screw cap clockwise

Oil pump installation screw cap
75N·m







FUEL FILTER

⚠ WARNING

- Whenever the gasoline pipeline is removed, the battery must be disconnected to prevent the fuel pump from starting accidentally.
- Whenever any maintenance or inspection of the fuel system is carried out, fuel leakage may occur, and there shall be no welding, smoke, open flames, etc. in the area

Disassembly

The fuel filter is under the passenger seat on single cab vehicles, and under the rear passenger seat on crew cab vehicles.

【A】Passenger seat

【B】Seat cover

- Remove the passenger seat and the lower seat cover (see the vehicle body section for details)；
- Use a suitable tool to remove the clamp【C】and take out the fuel filter【D】

⚠ CAUTION

During the process of disassembling any part of the fuel system, fuel leakage may occur. Wipe off the residual oil with a cloth.

Installation

【C】High pressure fuel hose 1

【D】 Fuel filter

【E】High pressure fuel hose 2

- When assembling the fuel filter, pay attention to the installation direction of the fuel filter (shown on the left).
- Assemble the remaining parts in the reverse order of disassembly.

COOLING SYSTEM

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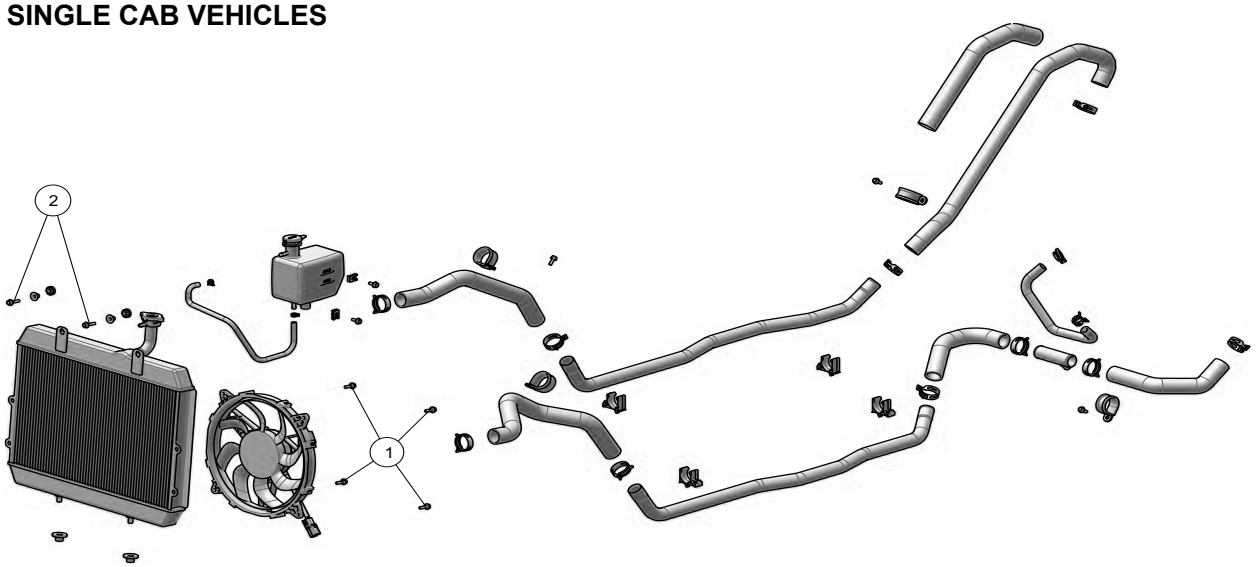
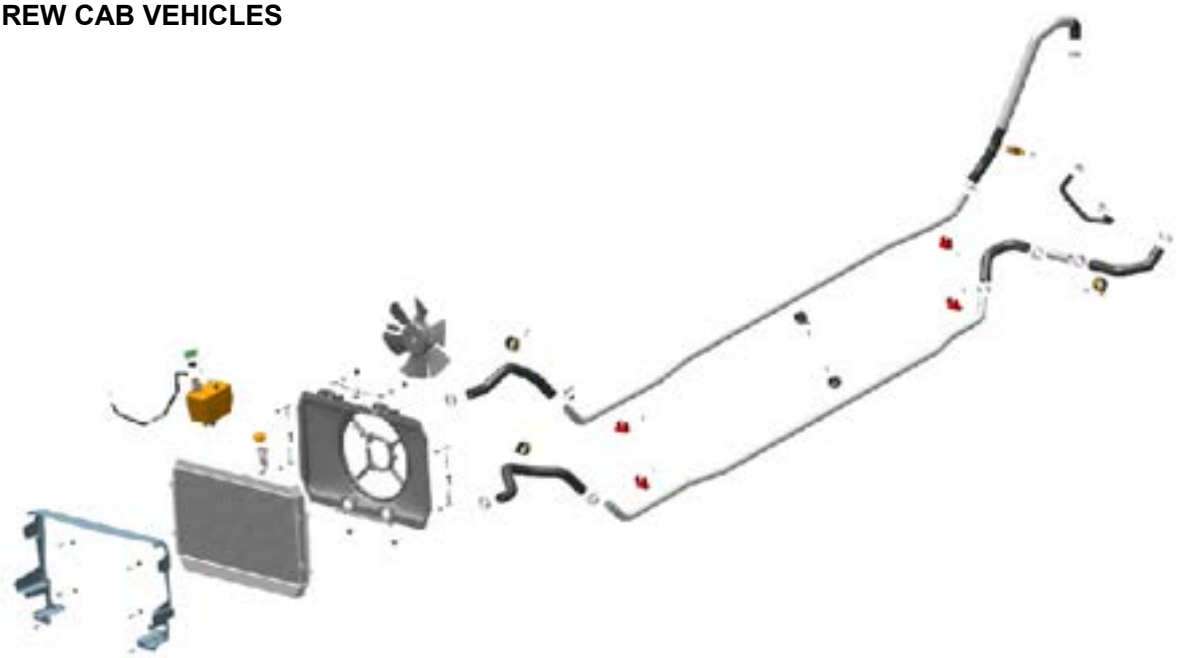
EXPLODED VIEW OF COOLING SYSTEM

SINGLE CAB VEHICLES



CREW CAB VEHICLES



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Radiator fan assembly bolt M6	8~12	0.8~1.2	5.9~8.8	
2	Bolt M6×20	8~12	0.8~1.2	5.9~8.8	

COOLANT FLOW

Choose 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 type of wax pellets, which opens or closes as the temperature of the coolant changes. The thermostat continuously changes its valve opening to keep the coolant temperature at an appropriate level. When the coolant temperature is lower than 74～87^{0}C（165.2～188.6^{0}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 74～87^{0}C（165.2～188.6^{0}F）, the thermostat will open and the coolant will flow. When the coolant temperature reaches 90^{0}C（194^{0}F）, the radiator fan switch is turned on,

The radiator fan is working. When there is not enough airflow (for example, at low speeds). The radiator fan draws in air through the radiator core. This increases the cooling effect of the radiator. When the temperature is lower than 85.5^{0}C（185.9^{0}F）, the fan switch is turned off and the radiator fan stops working.

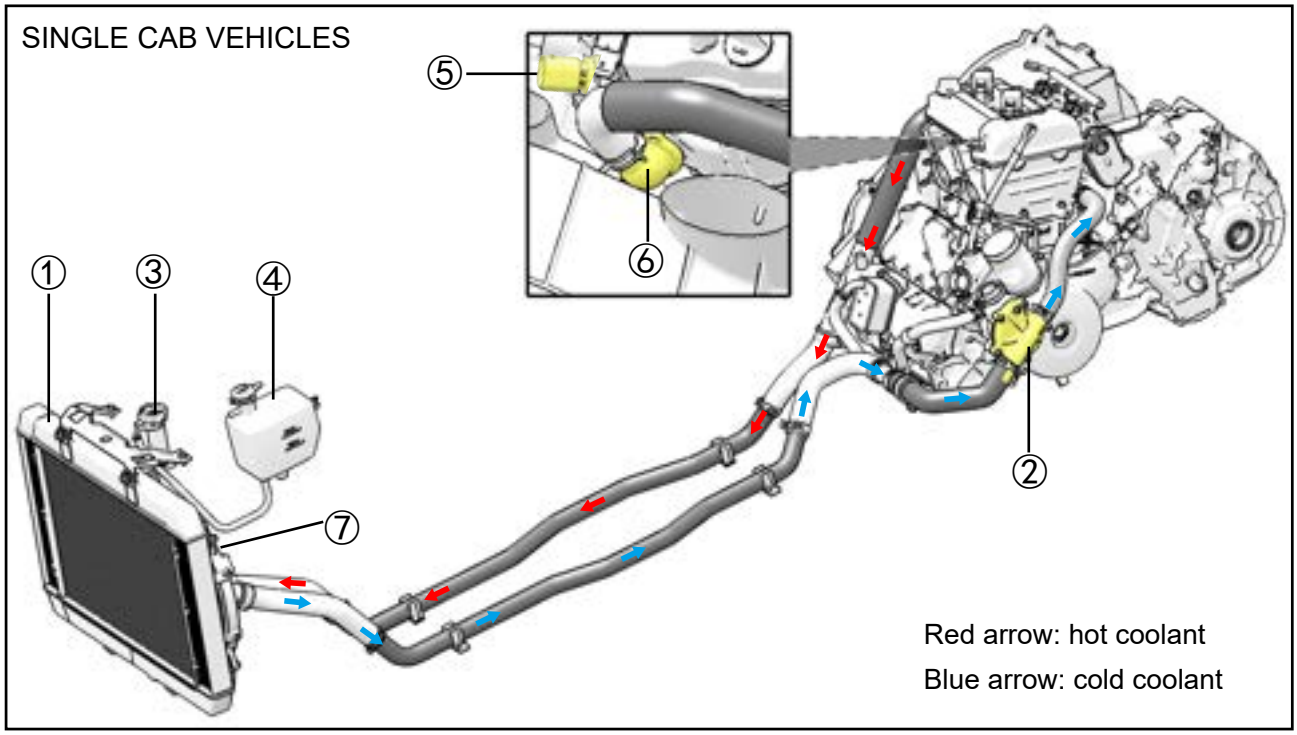
In this way, the system controls the engine temperature within the narrow range of engine operation. Even if the engine load changes, the engine has the highest operating efficiency.

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 water tank back to the radiator.

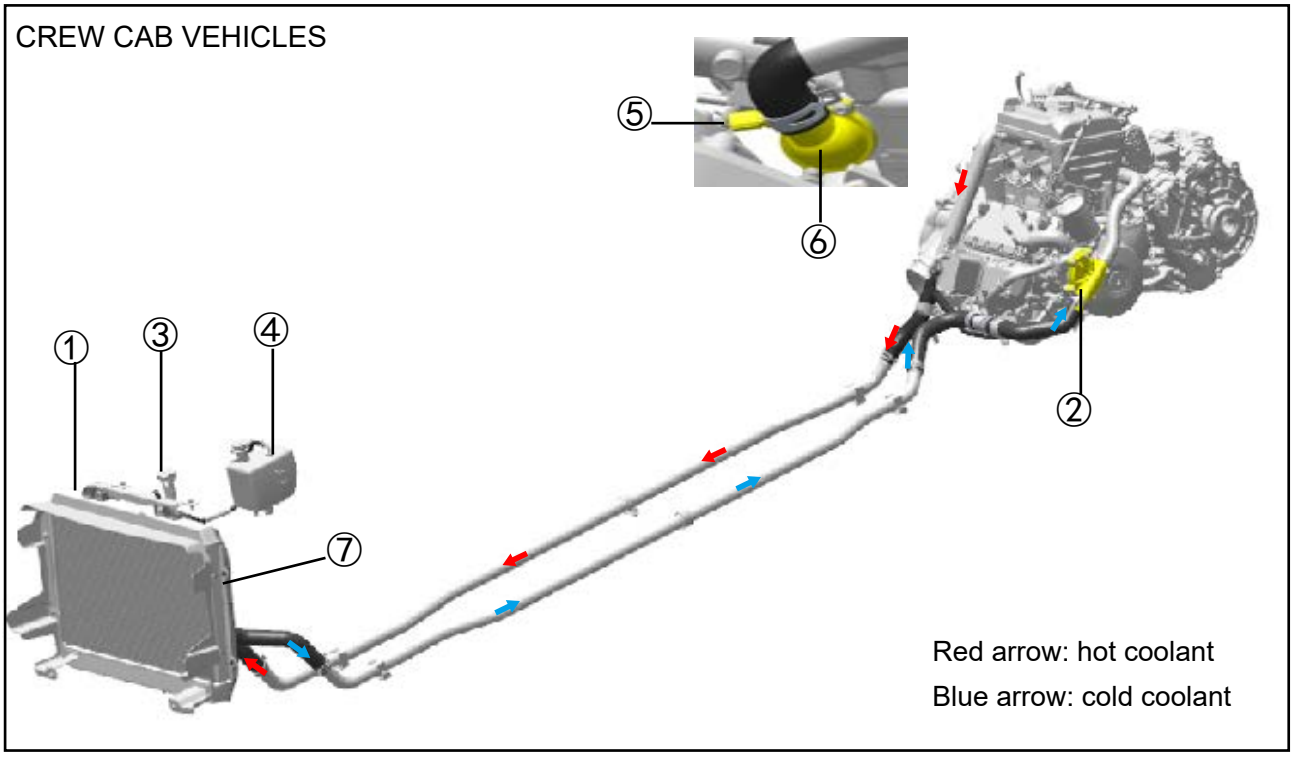
The radiator cap has two valves. One is a pressure valve, which maintains the pressure in the system when the engine is running. When the pressure exceeds 93 ~ 123kPa (0.95 ~ 1.25 kgf/cm², 14 ~ 18psi), the pressure valve opens and releases the pressure to the water storage tank. Once the pressure overflows, the valve is closed and the pressure is maintained at 93 ~ 123kPa (0.95 ~ 1.25kgf/cm², 14 ~ 18psi). 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

SINGLE CAB VEHICLES



CREW CAB VEHICLES



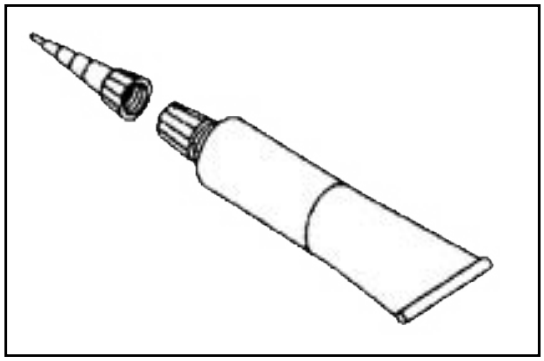
2.Water pump
3.Radiator cover
4.Storage tank
6.Radiator fan
7.Thermostat

TECHNICAL PARAMETER

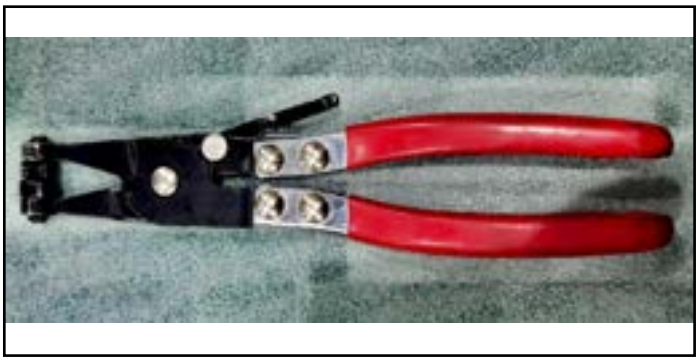
Item	Standard	Service Limit
Coolant provided during transportation：		
Type	Permanent antifreeze (soft water and glycol for aluminum engines and radiators plus corrosion inhibitors and rust inhibitor chemicals)	- - -
Color	Green	- - -
Mixing ratio	Soft water 50%, cooling water 50%	
Total	Single cab vehicles：6.8 L（7.2 qt）(Full level of the water storage tank, including radiator and engine) Crew cab vehicles：8.0 L（8.5 qt）(Full level of the water storage tank, including radiator and engine)	- - -
Radiator cover		
Pressure relief	93～123 kPa（0.95～1.25 kgf /cm^2，14～18psi）	- - -
Thermostat		
Valve opening temperature	74 ～ 87^{0}C（165.2 ～ 188.6^{0}F）	- - -
Valve fully open lift	≥8mm or over 87°C（188.6°F）	- - -
Coolant filter/valve	74°C（165.2^{0}F）	
Cooling valve closing temperature（For reference）	74°C（165.2^{0}F）	- - -

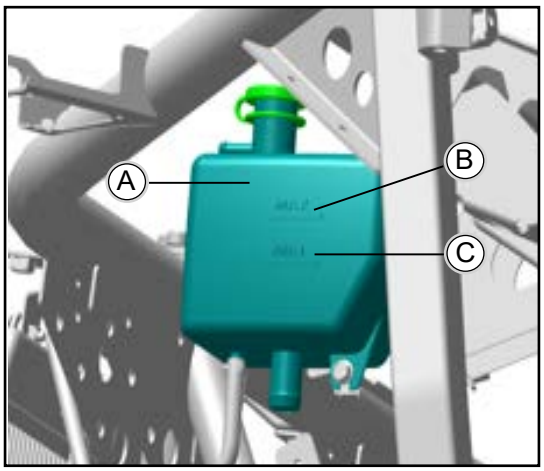
SPECIAL TOOLS AND SEALANTS

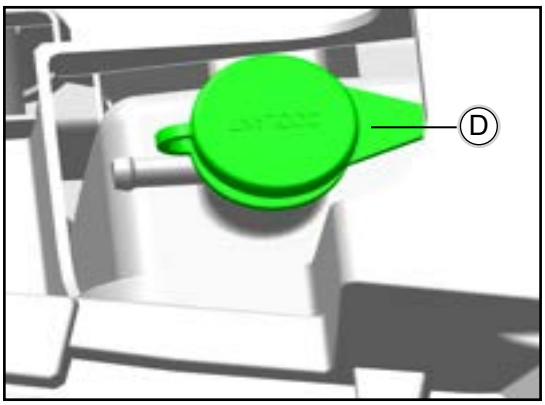
Silicone Sealant:

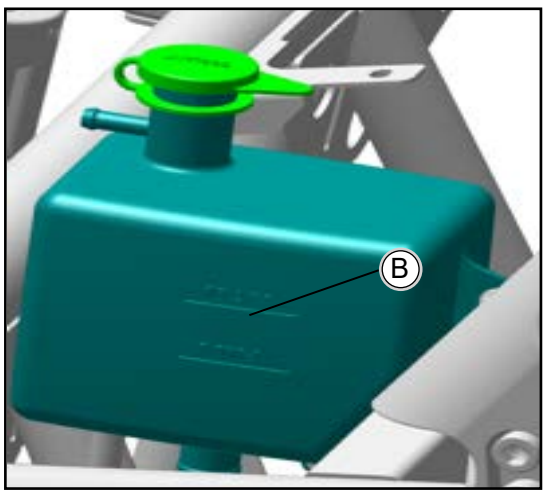


Special tools and sealants：









COOLANT

Coolant deterioration inspection

【A】Water storage tank

Visually inspect the coolant in the water storage tank【A】. If whitish cotton-like fluff is observed, the aluminum parts in the cooling system are corroded. If the coolant is brown, the iron or steel parts are rusty. In either case, flush the cooling system. If the coolant emits a strange smell, check the cooling system for leaks.

Coolant level check

⚠ CAUTION

Check the liquid level when the engine is cold (room temperature or ambient temperature)

◆ Check the coolant level in the water storage tank (keep the water storage tank vertical)

【A】Water storage tank

【B】Max mark

【C】Min mark

【D】Water storage tank cover

If the coolant level is lower than the MIN mark, remove the front access cover and the cover of the water storage tank【D】, and then add coolant to the MAX mark【B】.

⚠ WARNING

When refilling, add the specified mixture of coolant and soft water. Adding water alone will dilute the coolant and reduce its corrosion resistance. The diluted coolant will adhere to aluminum engine parts. In an emergency, soft water can be added, but the diluted coolant must be restored to the correct mixing ratio within a few days. If coolant must be added frequently, or the water storage tank is completely dry, there may be a leak in the cooling system. Please check the system for leaks.

Pressure test

- Remove the front access cover and the radiator cover, and install the cooling system pressure tester on the radiator filler pipe.

⚠ CAUTION

Wet the sealing surface of the cover with water or coolant to prevent pressure leakage.

Slowly pressurize until the pressure rises to 123kPa (1.25 kgf/cm^2, 18psi).

⚠ WARNING

During the pressure test, do not exceed the design pressure of the system. The maximum pressure is 123kPa（1.25 kgf/cm^2，18psi）.

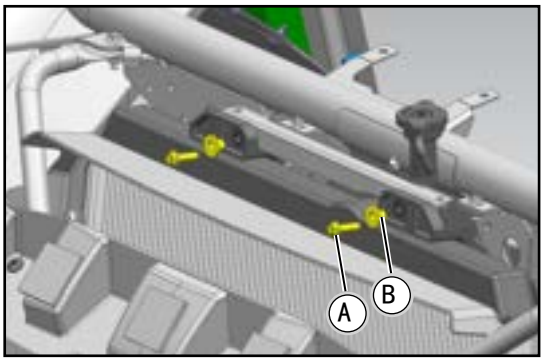
- Observe the pressure gauge for at least 6 seconds.
- If the pressure remains stable, the system is normal. If the pressure drops quickly, check for leaks.

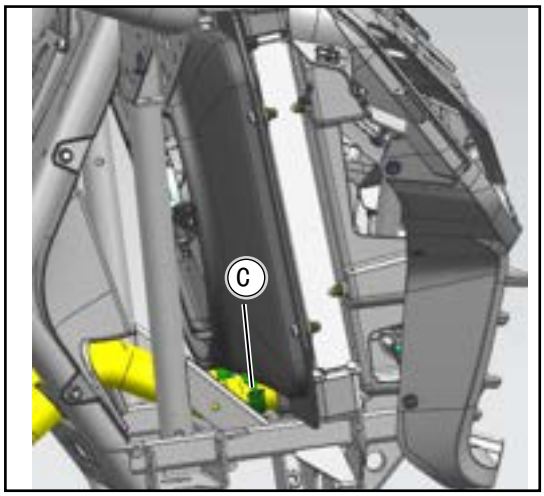
RADIATOR REMOVAL

⚠ WARNING

- The start and stop of the radiator fan are controlled by the vehicle ECU. When the water temperature of the engine cylinder head reaches 90°C, the fan automatically starts; until the water temperature of the cylinder head drops below 85.5°C, the radiator fan automatically stops. Do not touch the radiator fan when it is rotating, as this may cause injury.
- When disassembling the radiator, it must be done in a low temperature vehicle and in a flameout state.

Removal





【A】Upper bracket bolt of radiator M6X25

【B】Radiator upper mounting bracket bolts M6X25

【C】Steel belt type elastic hose clamp hoop 38

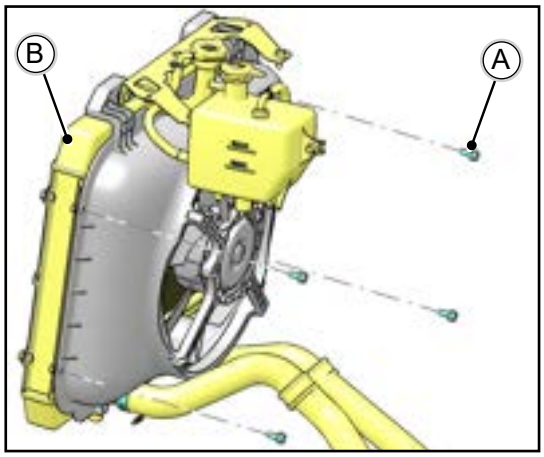
【D】Radiator

- Remove the plastic parts of the front section of the vehicle (see the vehicle body section for details)
- Remove the radiator upper mounting bracket bolts M6X25【A】and radiator upper mounting T-bushings【B】.
- Tilt the radiator forward and remove the clamps【C】from above with a suitable tool and pull out the 2 radiator front section hoses.
- Remove the radiator

⚠ WARNING

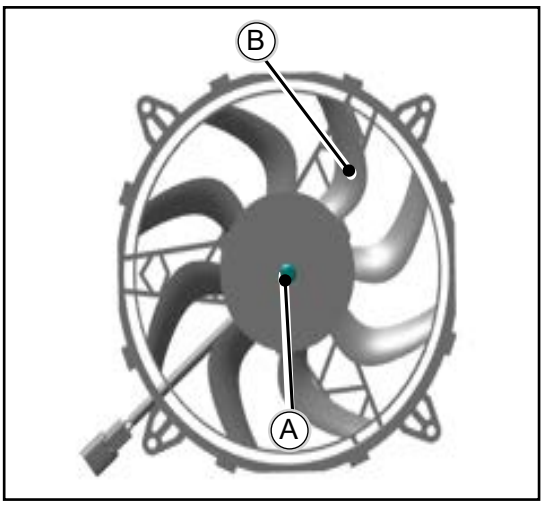
Do not touch the radiator core. This may damage the radiator, resulting in reduced cooling efficiency.

Radiator fan removal



Radiator (see radiator removal)

- Radiator fan assembly bolt【A】
- Fan assembly【B】

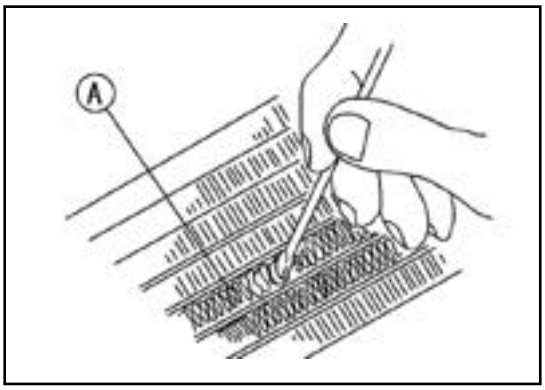


- Radiator fan mounting nut【A】
- Radiator fan【B】

Radiator fan installation

- Radiator fan
- Radiator fan assembly
- Tighten

Radiator fan assembly bolt torque
8.8N.m（0.9 kgf·m，6.5 ft·lbs）

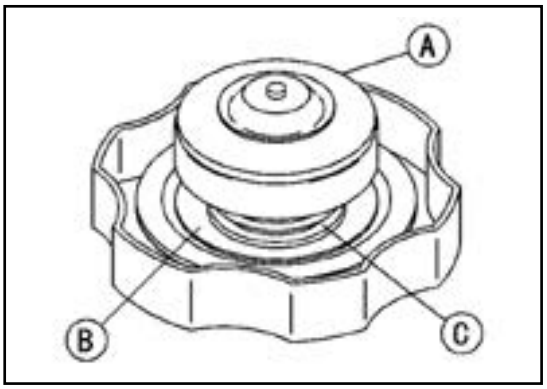


Radiator Inspection

- Check the radiator core.
- If there are obstructions to air flow, remove the radiator and remove obstructions.
- If the corrugated fins [A] are deformed, carefully straighten them.
- If the air passages of the radiator core are blocked more than 20% by unremovable obstructions or irreparably deformed fins, replace the radiator with a new one.

Radiator Cleaning

- Refer to the Cooling System in the Periodic Maintenance chapter.



Radiator Cap Inspection

- Check the condition of the top and bottom valve seals of the radiator cap.

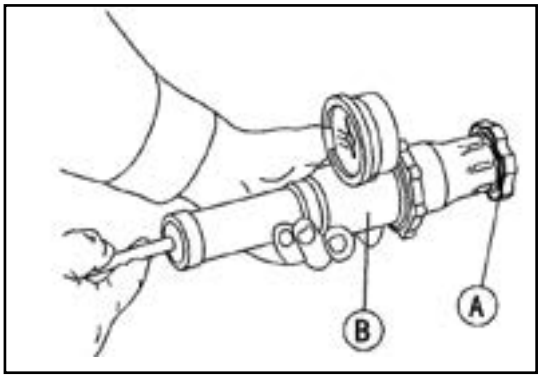
If any one of them shows visible damage, replace the cap.

【A】Bottom Valve Seal
【B】Top Valve Seal
【C】Valve Spring

- Install the cap 【A】 on a cooling system pressure tester 【B】.

⚠ CAUTION

Wet the cap sealing surfaces with water or coolant to prevent pressure leakage.



- Watching the pressure gauge, slowly pump the pressure tester to build up the pressure. The relief valve opens,indicated by the gauge hand flicks downward.
- The relief valve must open within the relief pressure range in the table below and the gauge hand must remain within the specified range at least 6 second.

Radiator Cap Relief Pressure

Standard: 93~123 kPa（0.95~1.25 kgf /cm^2, 14~18psi）

If the cap cannot hold the specified pressure, or if it holds too much pressure, replace it with a new one.

Cooling System Exhaust Procedure

⚠ WARNING

Always wear safety glasses and appropriate work clothing when performing this procedure. Failure to do so may result in injury or death.

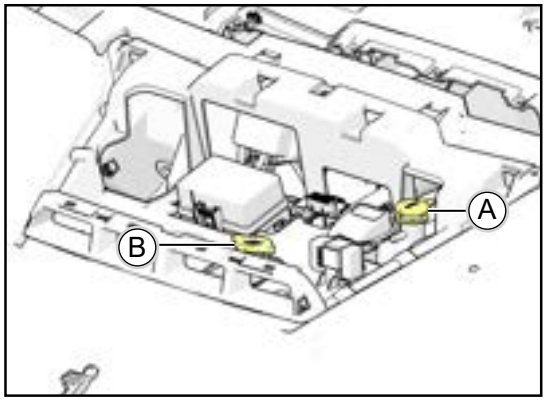
TIP

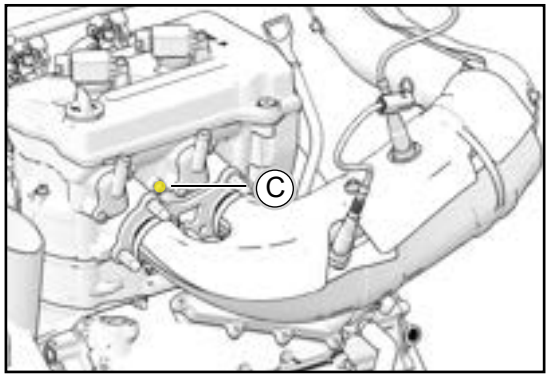
If the coolant level in the radiator is low, or if there is a leak in the system, the coolant system will not draw coolant from the reservoir.

- Allow the engine and cooling system to cool.

⚠ CAUTION

Spilled steam may cause burns, never remove the pressure cap while the engine is warming or hot, always allow the engine to cool down before removing the pressure cap





- Remove the front panel of the front of the vehicle
- Remove the sub-tank cap【A】and fill the bottle with coolant to the maximum.
- Remove the radiator pressure cap【B】and fill with the proper amount of coolant
- Open the cargo box by turning it over.
- Open the venting screw to allow all air remaining in the cooling system to escape. As soon as the coolant begins to escape, install the venting screw and tighten it.

Venting screw【C】
8 N.m

- Fill the coolant and install the pressure cap properly【B】.
- Start the engine and allow it to idle until the radiator fan cycles twice.

INTAKE/EXHAUST SYSTEM

EXPLODED VIEW OF INTAKE SYSTEM..... 7−2

Air filter element replacement..... 7−3

AIR INLET FILTER DISASSEMBLY..... 7−3

Air cleaner disassembly ..... 7−4

EXPLODED VIEW OF EXHAUST SYSTEM..... 7−5

Disassemble..... 7−6

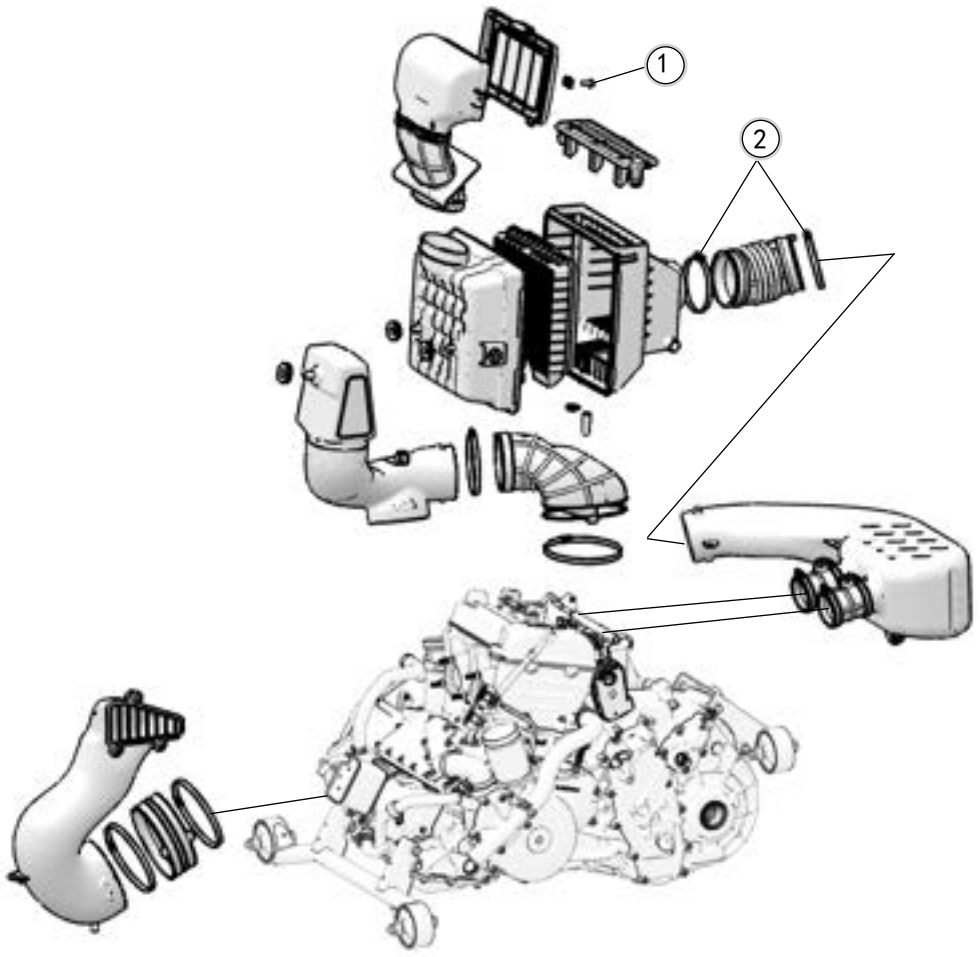
Rubber buffer sleeve disassembly ..... 7−6

MUFFLER ..... 7−6

Air exhaust disassembly..... 7−7

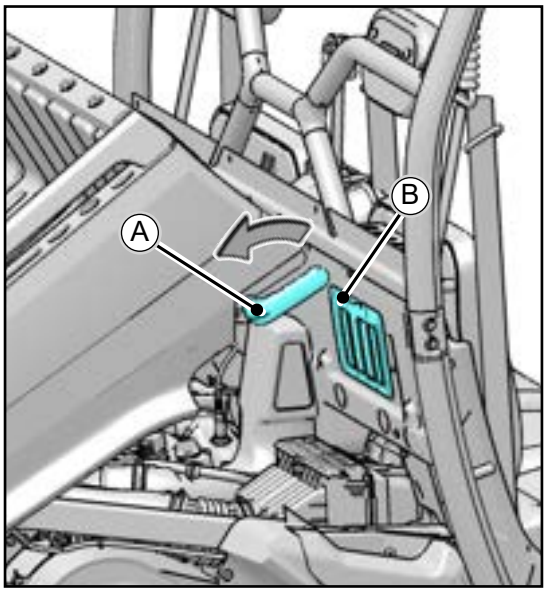
Air exhaust system inspection..... 7−8

EXPLODED VIEW OF INTAKE SYSTEM



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Bolt M6×30	10	1	7.5	
2	Clamp φ100				
3	Clamp φ140				
4	Clamp φ90～φ110				

AIR INLET FILTER DISASSEMBLY

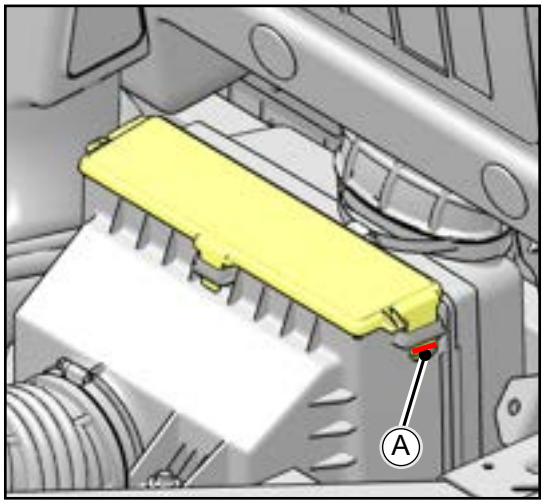


Place the vehicle in a flat road

【A】Cargo box hand shank

【B】Air inlet filter

- Rotate handle shank【A】in the right to overturn the cargo box.
- Take out air inlet filter screen【B】.
- Check if any debris or dust on the filter screen【B】regularly, if yes, clean it to keep air inlet clear.



Air filter element replacement

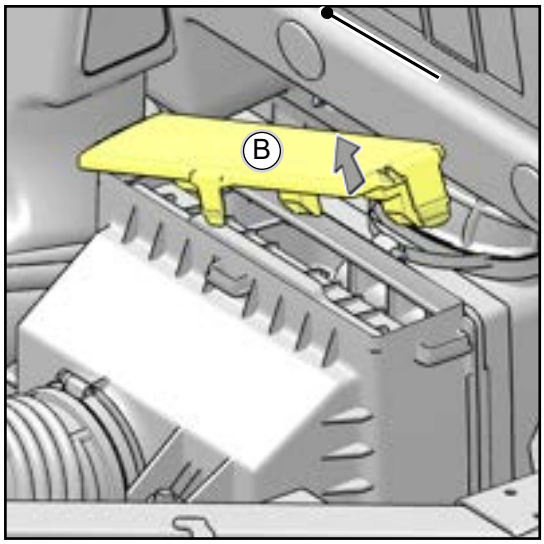
【A】Clamp

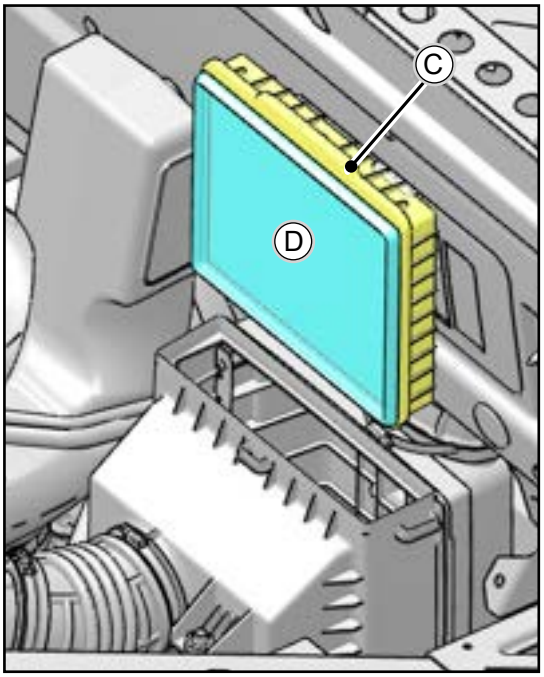
【B】End cover

【C】Air filter bracket

【D】Air filter

- Press clamp【A】.
- Meanwhile, push out end cover【B】upwards.





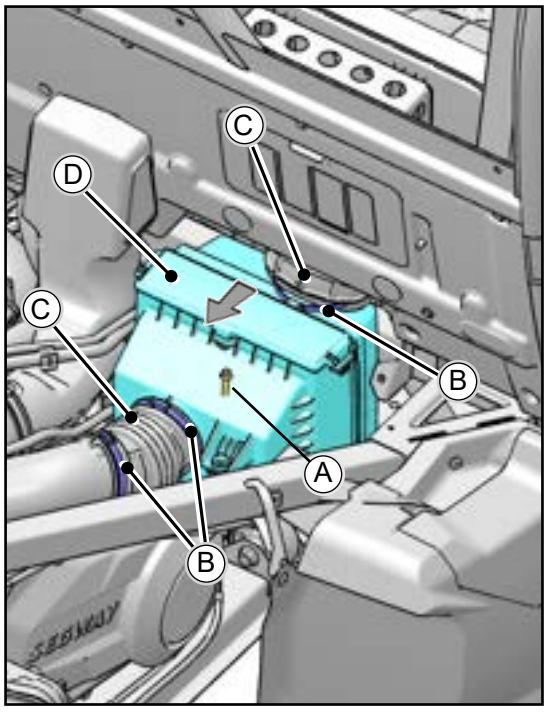
- Take out air filter bracket【C】
- Replace air fitler【D】

⚠ WARNING

Make sure air filter and end cover clamp are assembled in right position or it will cause engine failure or reduce lifetime.

Please shorten interval to check air fitler if the vehicle is working in heavy dust environment.

If air filter is soaked or filter element is wet, please discharge water and replace air fitler.

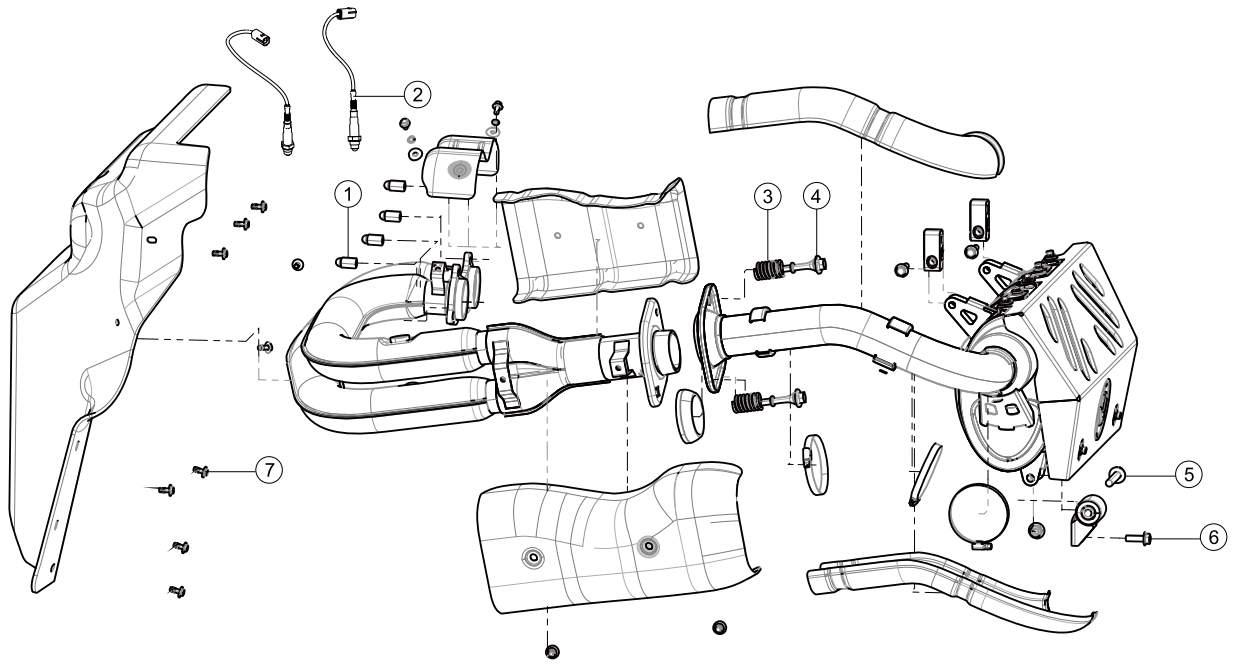


Air cleaner disassembly

【A】Bolt
【B】Clamp
【C】Rubber hose
【D】Air cleaner

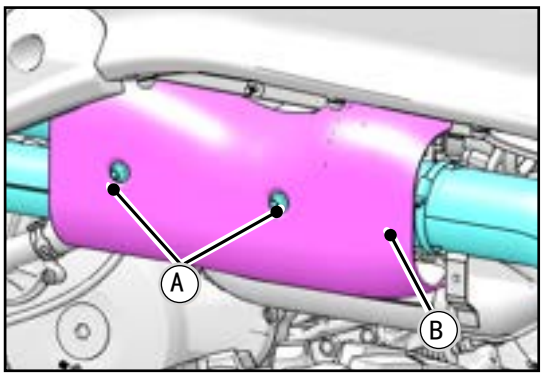
- Disassemble bolt【A】.
- Disassemble clamp【B】.
- Disassemble rubber hose【C】.
- Take out air cleaner 【D】 in the arrow direction.

EXPLODED VIEW OF EXHAUST SYSTEM



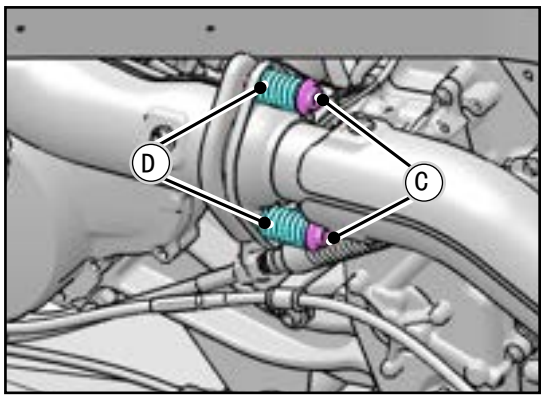
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Nut M8	23~27	2.3~2.7	17~20	
2	Oxygen sensor	40 ～ 60	4.0~6.0	29.5~44.3	
3	Spring				
4	bolt				
5	bolt M8×25	35 ～ 45	3.5~4.5	25.8~33.2	
6	bolt *M10×1.25×70*	70	7.1	52	
7	bolt M6×*16*	10	1	7.5	

MUFFLER REMOVAL



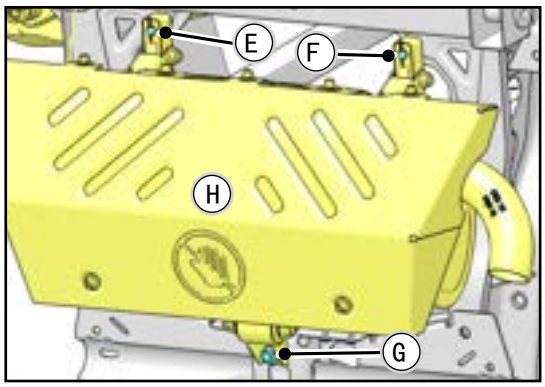
⚠ WARNING

Whenever the components of the exhaust system are inspected or maintained, the parts of the exhaust system must be checked for overheating to avoid being scalded by high temperatures.



【A】Bolts
【B】Tee outer heat shield
【C】Bolts
【D】Springs

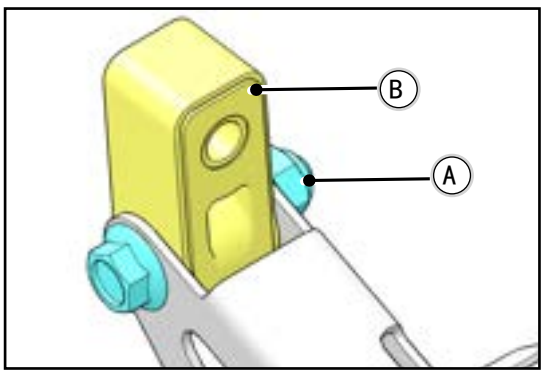
- Remove the Bolts 【A】and take off the Tee outer heat shield 【B】.
- Remove the Bolts 【C】and take off the Springs 【D】.



【E】Cotter pins
【F】Gaskets
【G】Bolt
【H】Muffler

- Remove the Cotter pins and Gaskets.
- Remove the Bolts.
- Remove the Muffler.

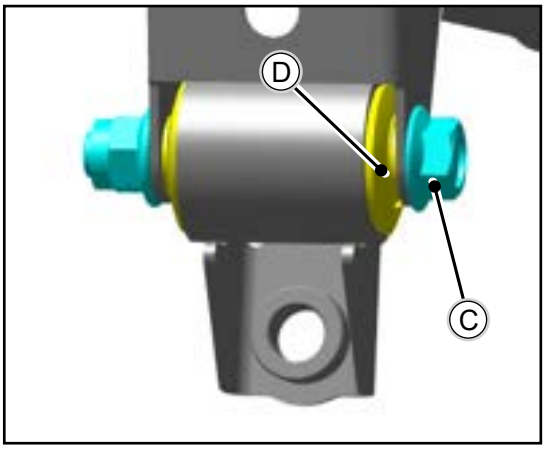
BUFFER SLEEVE REMOVAL



【A】Bolt
【B】Upper buffer sleeve

Remove the Bolt【A】 and then remove the Upper buffer sleeve 【B】.

【C】Bolt
【D】Lower rubber buffer sleeve

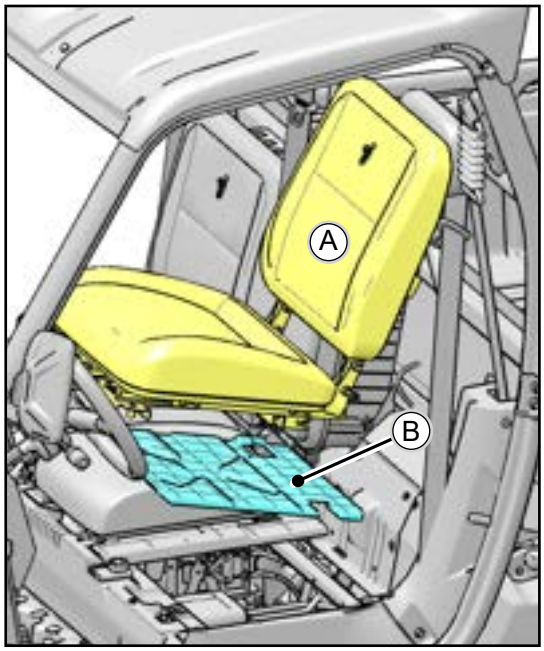


◆ Disassemble bolt【C】and remove lower rubber buffer sleeve【D】

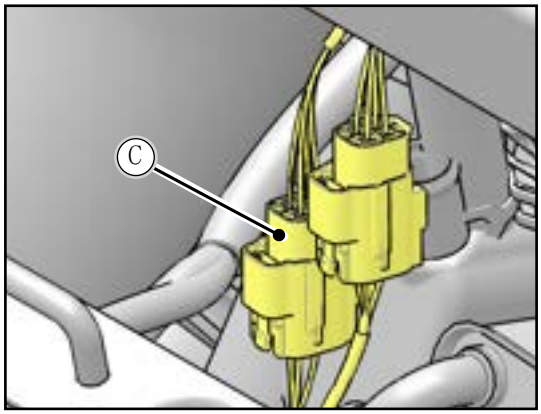
Air exhaust disassembly

⚠ WARNING

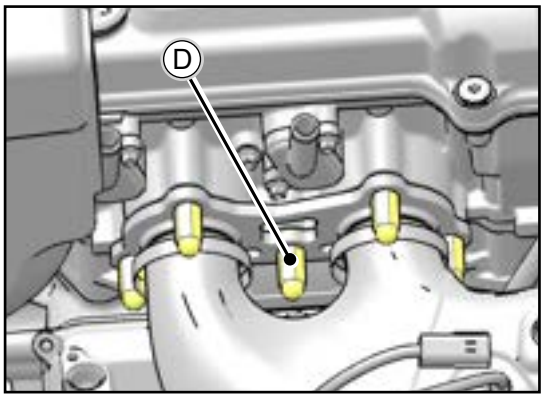
When you check or maintain parts of air exhaust system, you must check if the part is overheat in case of scald.



【A】Seat
【B】End cover
【C】Wiring plug
【D】Nut

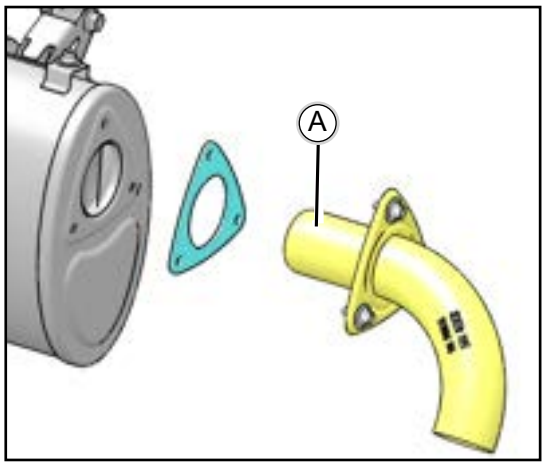


◆ Disassemble driver seat【A】
◆ Disassemble end cover【B】
◆ Disconnect oxygen sensor wiring plug【C】



- Rotate cargo box hand shank to overturn it.
- Disassemble fixing nut【D】
- Disassemble air exhaust pipe.

Air exhaust system inspection



1. Check externally if any crack, hole or damage in the muffler then replace related parts. This will affect engine performance and emmission.
2. Shake the muffler then replace related parts to check if any looseness, noise or debris inside.
3. Check if air exhaust pipe is disconnected with cylinder end. If yes, fasten nut or replace seal gasket.
4. Check if air exhaust pipe is disconnected with muffler then replace related parts. If yes, fasten nut or replace muffler then replace related parts spring and seal sleeve.
5. 5. Check if any carbon deposition in the filter screen of muffler then replace related parts 【A】. If yes, clean it by proper brush. If screen or seal gasket is broken, please replace them.

DRIVE SYSTEM

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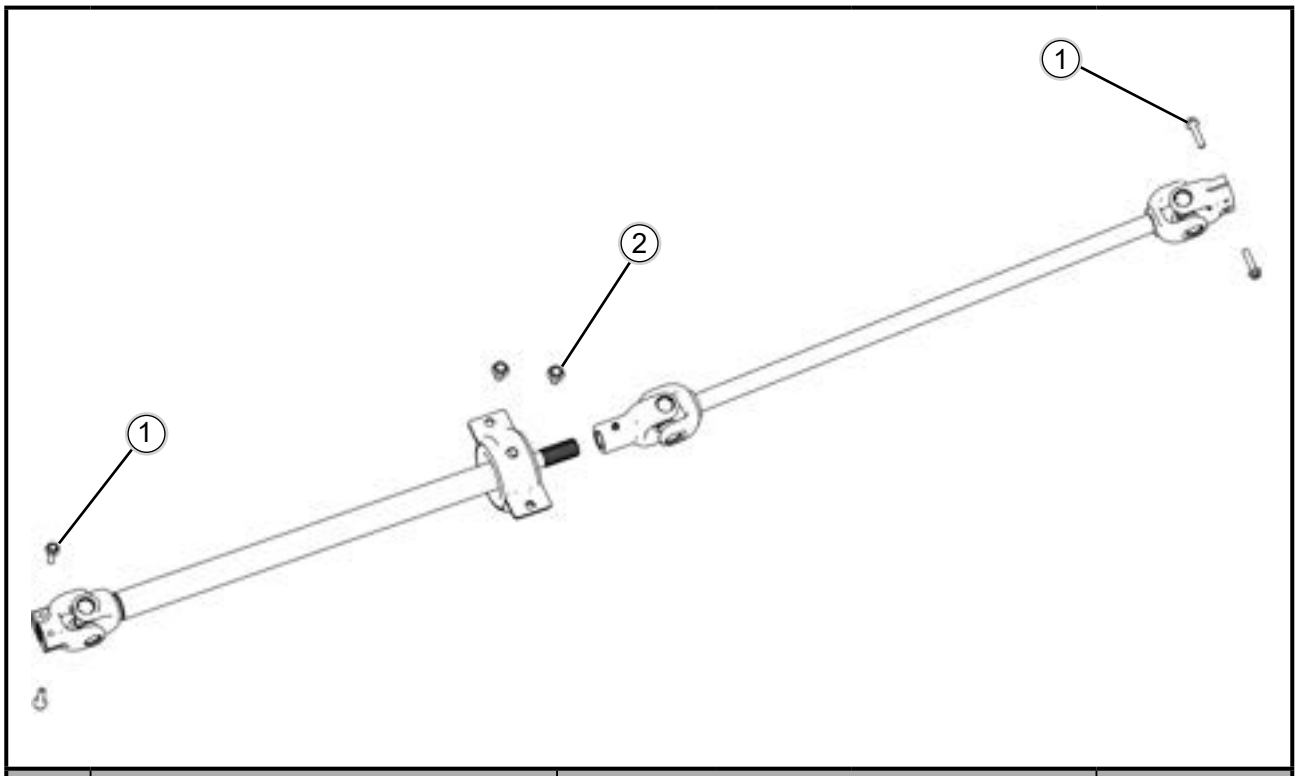
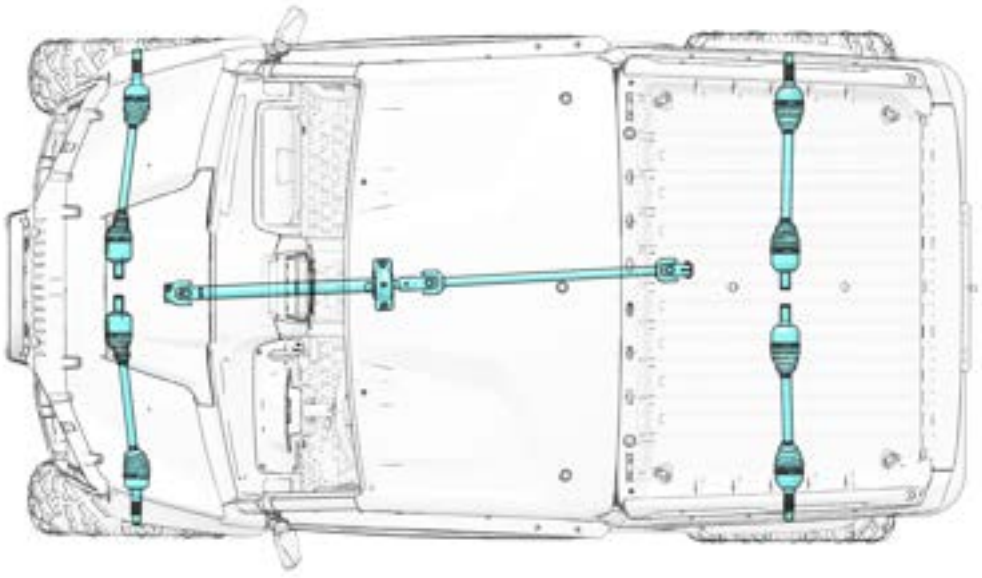
EXPLODED VIEW OF DRIVESHAFT (SINGLE CAB VEHICLES)

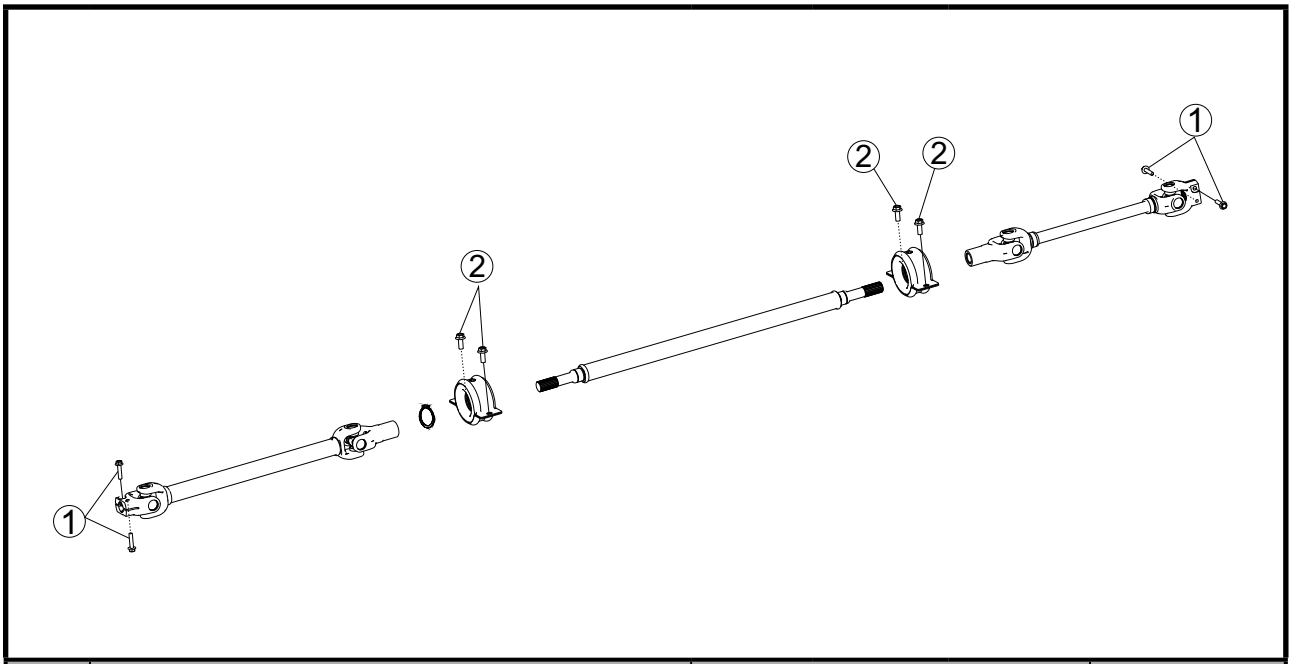


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Bolts M8×35（10.9）	35 ～ 40	3.5~4.0	22.1~26.5	A
2	Bolts M10×1.25×20	70	7.1	52	A

A：Apply Impermanent Locking Agent.

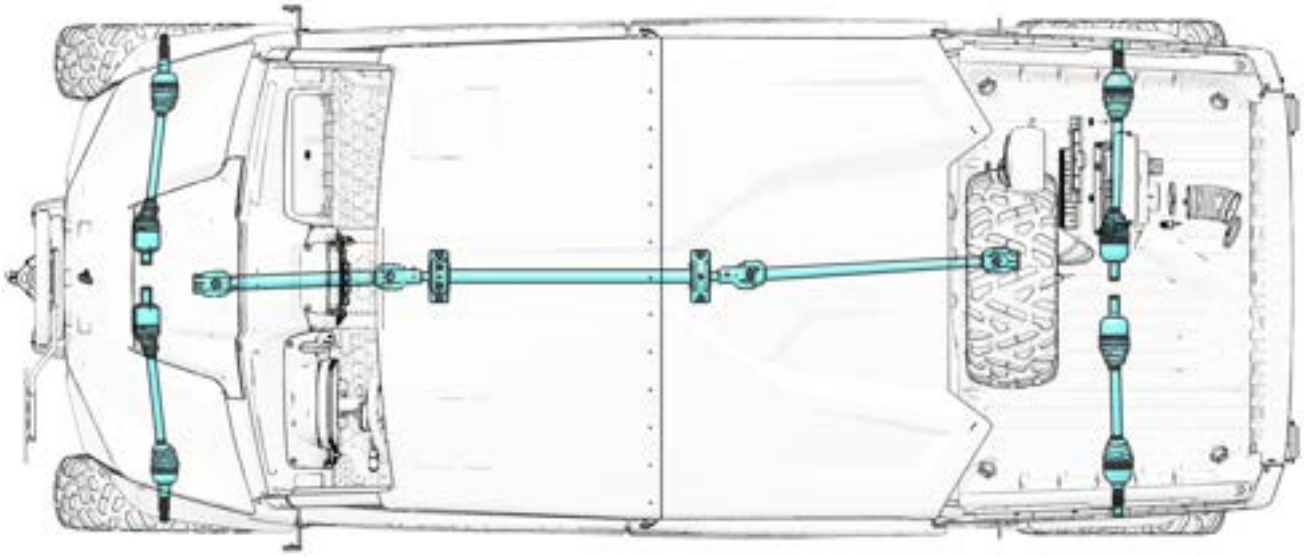


EXPLODED VIEW OF DRIVESHAFT (CREW CAB)

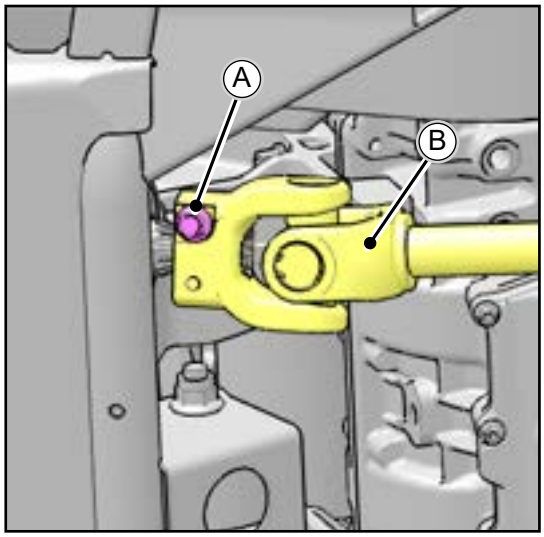


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Bolts M8×35	37	3.7	27	A
2	Bolts M10×1.25×25	70	7.1	52	A

A：Apply Impermanent Locking Agent.



DISASSEMBLY OF THE REAR SECTION OF THE DRIVE SHAFT

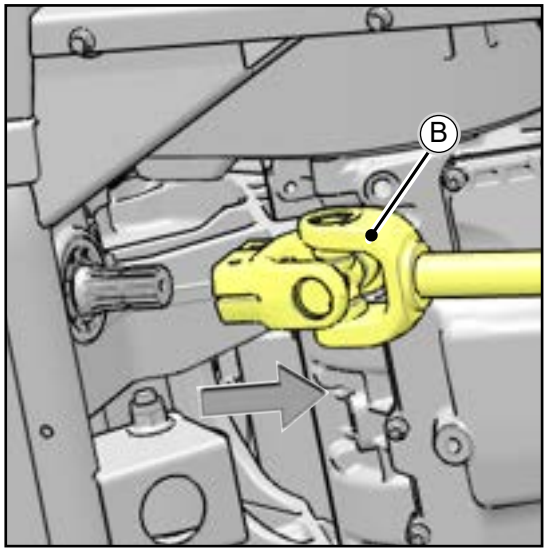


Put the vehicle in a horizontal position first

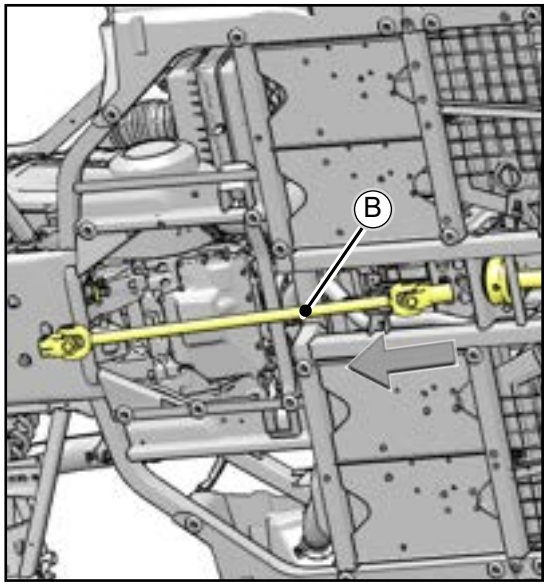
【A】Bolt

【B】Rear section of drive shaft

- From the bottom of the vehicle, remove the fixing bolts【A】of the drive shaft at the engine end
- Rotate the drive shaft 180°, and remove the other fixing bolt;

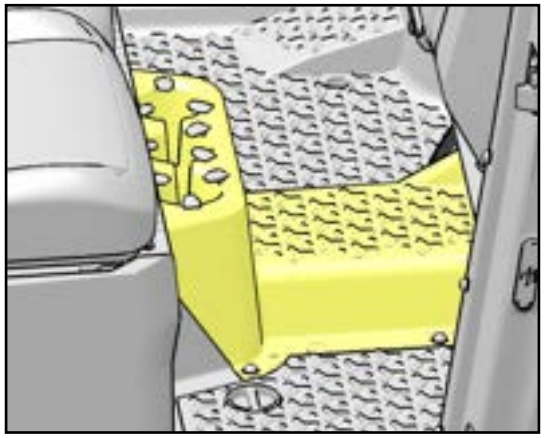


- Move the rear section of the drive shaft forward【B】to separate it from the output end of the engine.



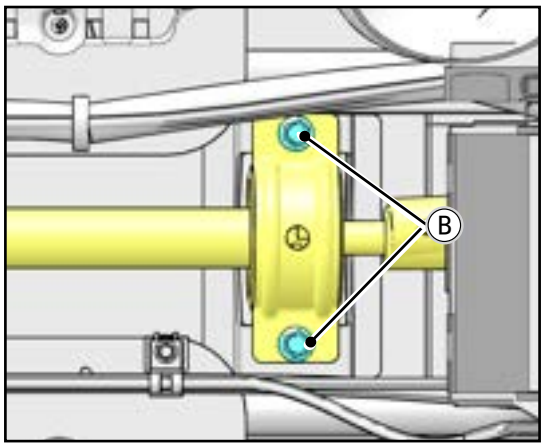
- Then exit the rear section of the drive shaft as a whole backward to separate it from the front drive shaft

DRIVE SHAFT CENTER SECTION REMOVAL (CREW CAB)

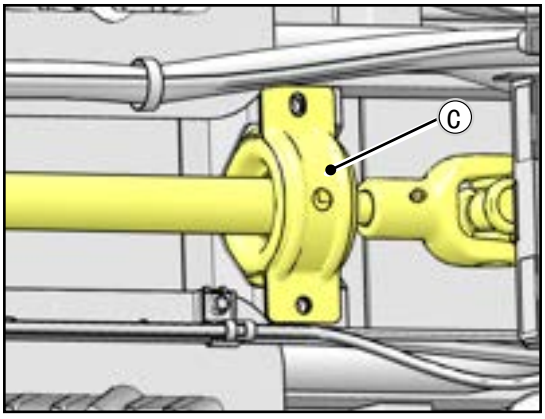


【A】Rear tunnel floor cover
【B】Bearing housing bolts
【C】Bearing housing【
D】Drive shaft center section

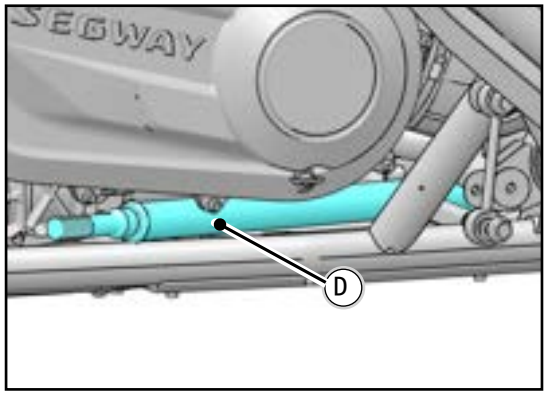
◆ Remove the Rear tunnel floor cover【A】.



◆ Remove the bearing housing mounting bolts at both ends of the drive shaft center section【B】.

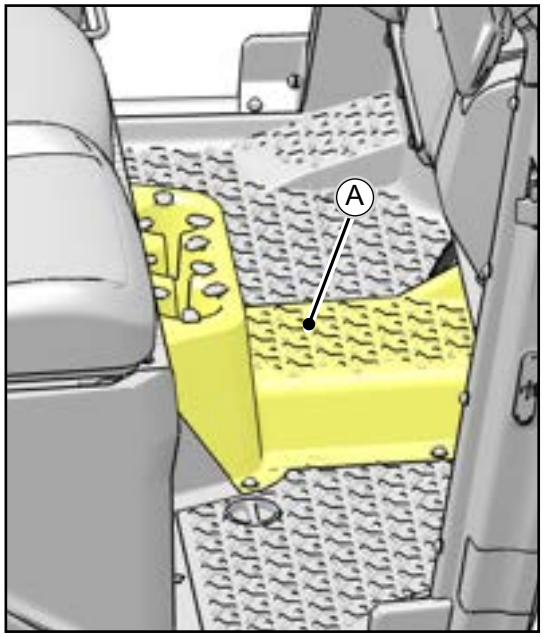


◆ Remove the bearing housing at both ends【C】.



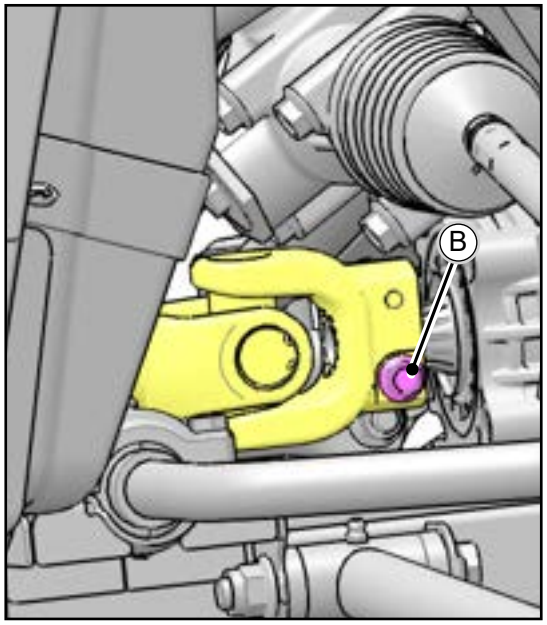
◆ Then take out the drive shaft middle section【D】as a whole backward to separate it from the front end drive shaft.

DISASSEMBLY OF THE FRONT SECTION OF THE DRIVE SHAFT

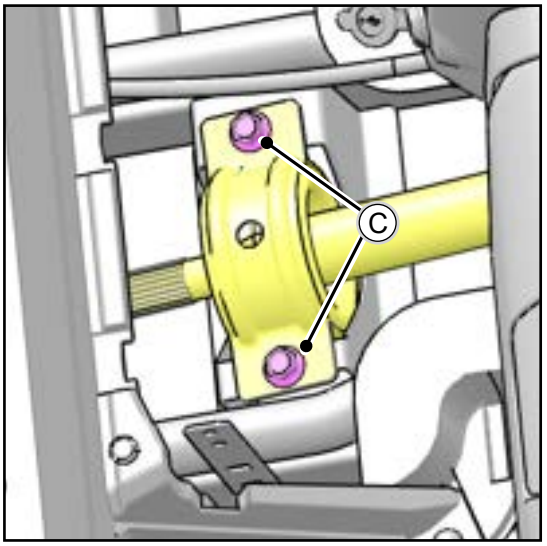


【A】Plastic parts
【B】Drive shaft mounting bolt
【C】Bearing seat bolt

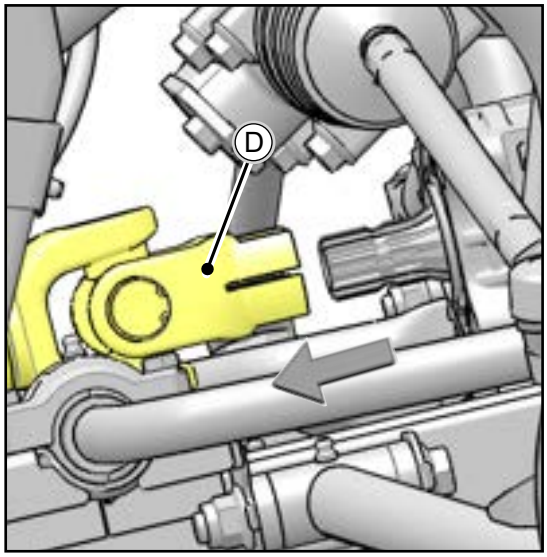
◆ Disassemble the plastic part【A】



◆ Remove the mounting bolts between the drive shaft and the front axle end【B】.

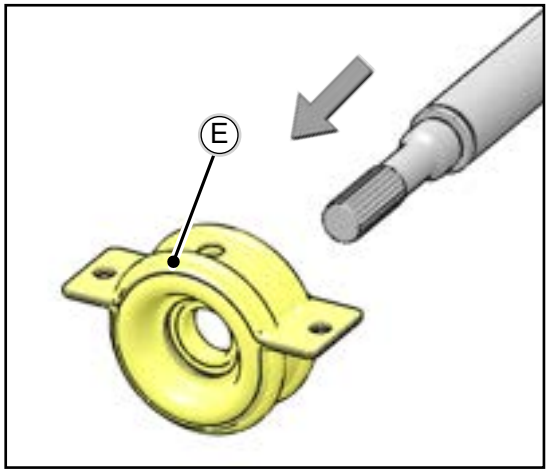


◆ Remove the mounting bolts of the drive shaft bearing seat【C】.



【D】The front section of the drive shaft
【E】Bearing seat
【F】Butter mouth

◆ Disassemble the front section of the drive shaft from front to back to separate it from the front axle

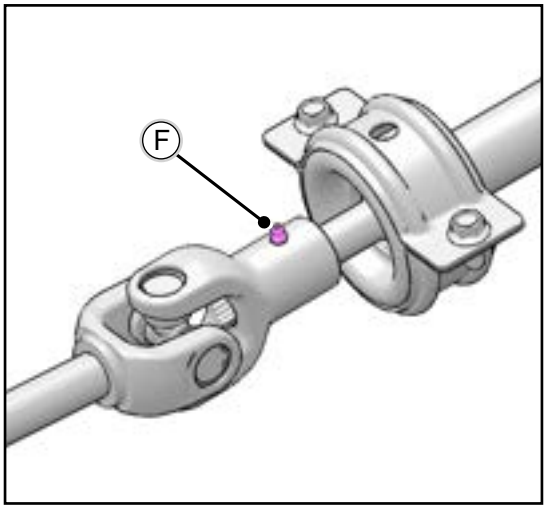


◆ Remove the bearing housing【B】

⚠ CAUTION

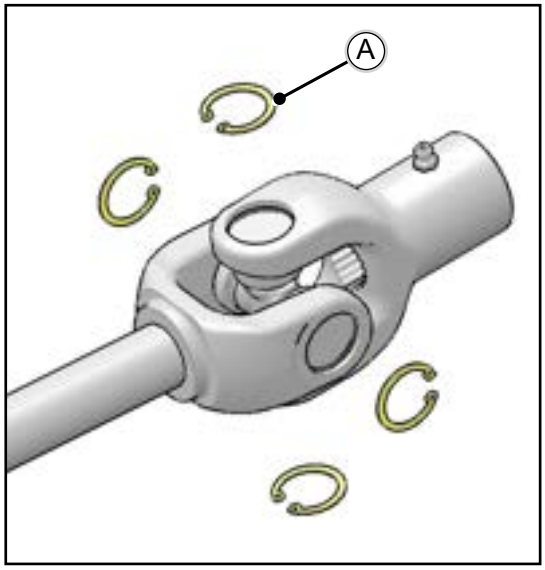
Need to check whether the bearing has abnormal noise or large gap or excessive wear, if any defects need to replace the bearing seat as a whole.

DRIVE SHAFT MAINTENANCE



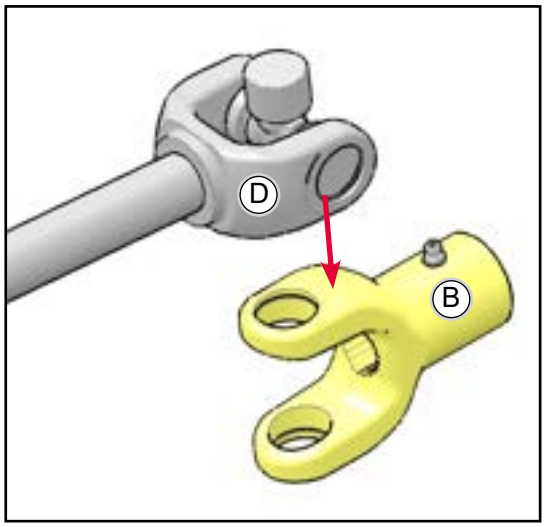
◆ Filling with grease
◆ When the inspection finds that the grease in the drive shaft is reduced, or every time the vehicle drives，After 2000Km, it needs to be lubricated by the grease zerk【F】using grease gun tool.

BEARING REPLACEMENT

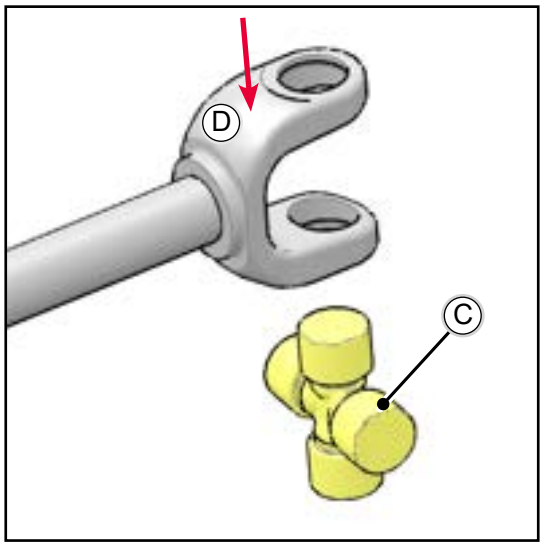


【A】Retaining ring for hole
【B】Spline fork
【C】Bearing
【D】Welding fork

◆ Retaining ring for disassembly hole【A】



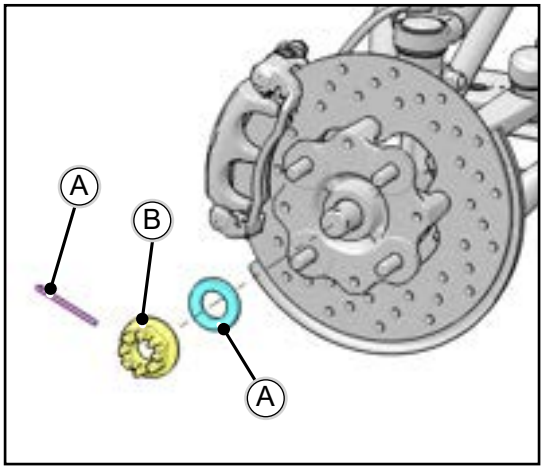
◆ Fix the welding fork【D】on the clamp, hit the spline fork【B】, and take out the roller needle bearing group to separate the spline fork from the ten-byte bearing;



◆ Fix the ten-byte bearing on the clamp, hit the welding fork【D】, and take out the roller needle bearing set to separate the welding fork from the ten-byte bearing
◆ Replace the cross shaft bearing and assemble it in reverse according to the disassembly procedure above.

FRONT DRIVE SHAFT REMOVAL

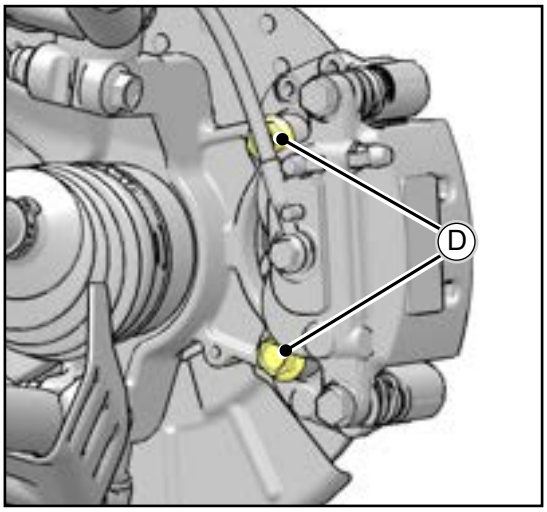
【A】Split pin
【B】Nut
【C】Washer
【D】Bolt
【E】Wheel hub mount



◆ Park the vehicle in a horizontal position and use a jack or support frame to support the vehicle so that the wheels do not touch the ground, and then remove the front tires

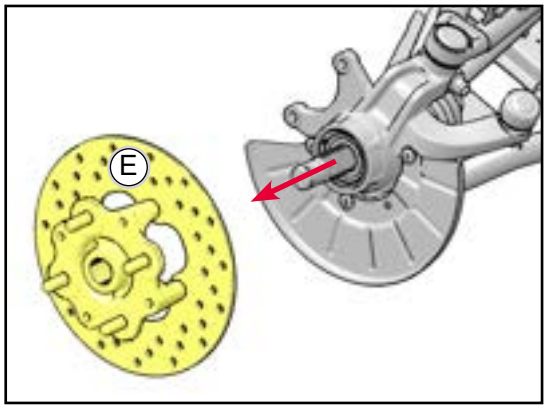
◆ Disassemble the split pin【A】and nut【B】, remove the washer【C】;

Nut【B】Torque
300 N·m（30.6 kgf·m，220ft·lbs）



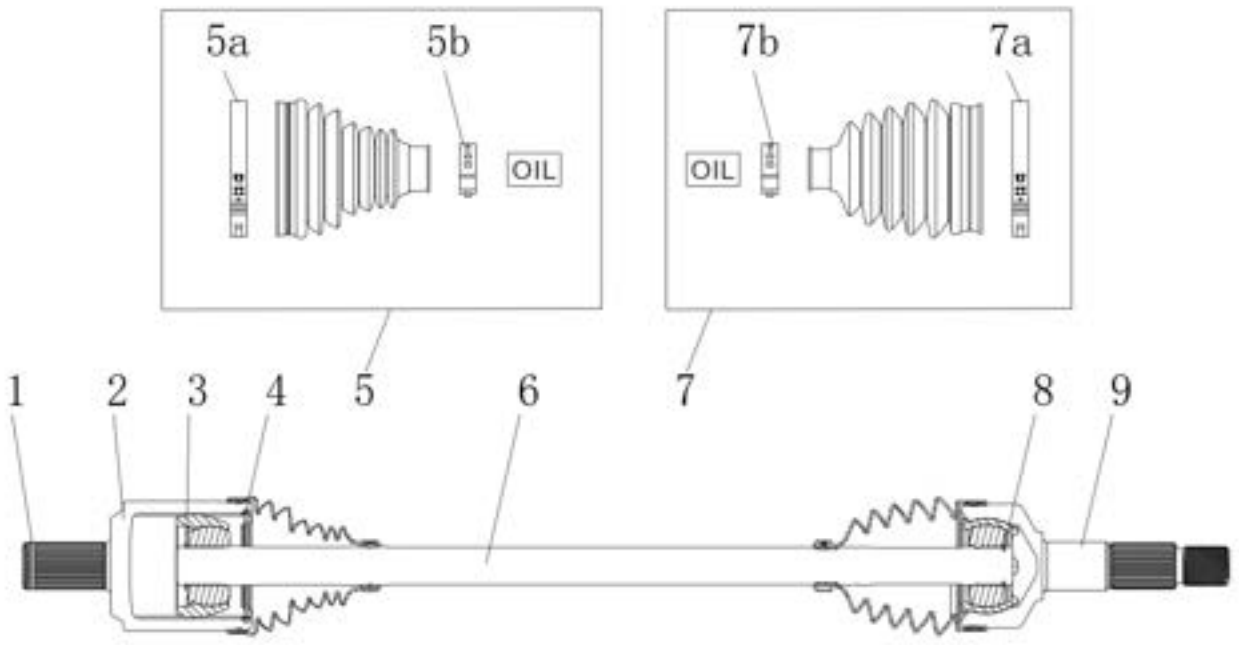
◆ Remove the brake caliper mounting bolt [D], and remove the brake caliper;

Bolt【D】Torque
70 N·m（7.1 kgf·m，52ft·lbs）



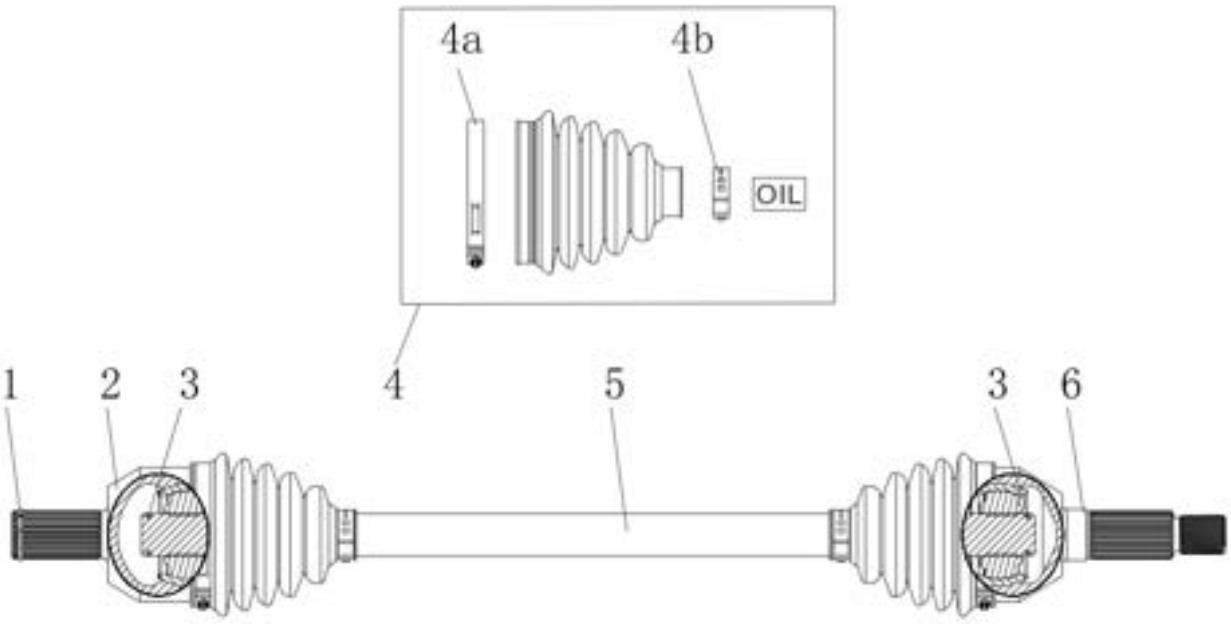
◆ Take out the rim mount in the direction of the arrow【E】

FRONT DRIVE SHAFT EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Retaining ring				
2	Front left/right inner ball cage assembly				
3	Retaining ring				
4	Retaining ring				
5	Inner CV boot repair kit				
5a	large clamp				
5b	Small clamp				
6	Intermediate shaft				
7	Outer cage corrugated sleeve repair kit				
7a	large clamp				
7b	Small clamp				
8	Retaining ring				
9	Outer cage components				

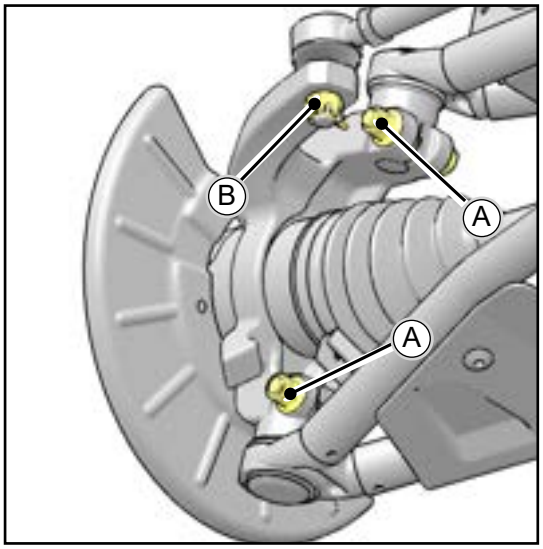
REAR DRIVE SHAFT EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Retaining ring				
2	Rear left/right inner ball cage assembly				
3	retaining ring				
4	Rear axle bellows repair kit				
4a	large clamp				
4b	small clamp				
5	Intermediate shaft				
6	Outer cage components				

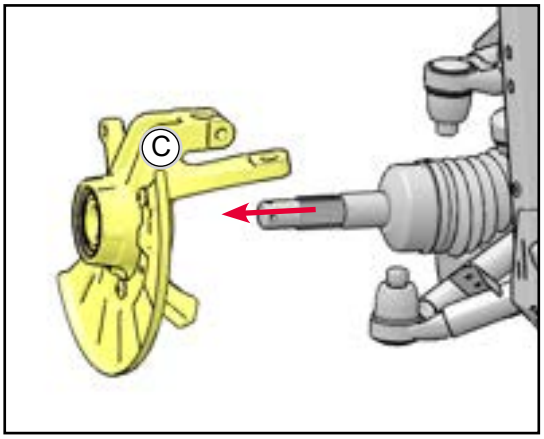
DRIVE SHAFT REMOVAL

【A】Bolt
【B】Slotted nut
【C】Front steering knuckle
【D】Bolt

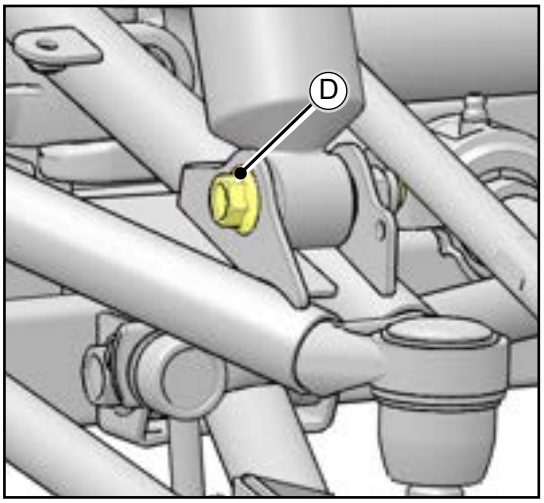


- Remove the fixing bolts【A】of the upper and lower king pins to make the upper and lower rocker arms and steering section separation
- Remove the slotted nut【B】of the steering tie rod to separate the steering tie rod from the steering knuckle from;

Bolt【A】Torque
70 N·m（7.1 kgf·m，52ft·lbs）



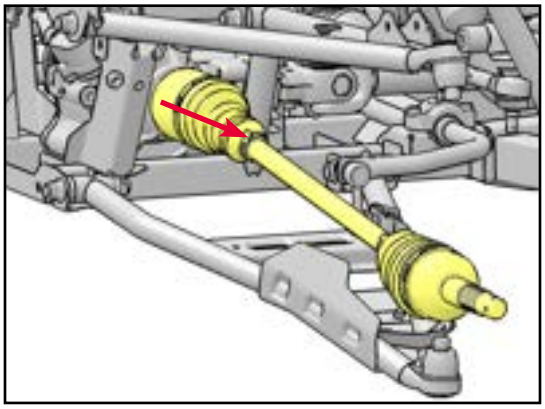
- Remove the steering knuckle in the direction of the arrow【C】



- Remove the mounting bolts from the lower part of the shock absorber【D】

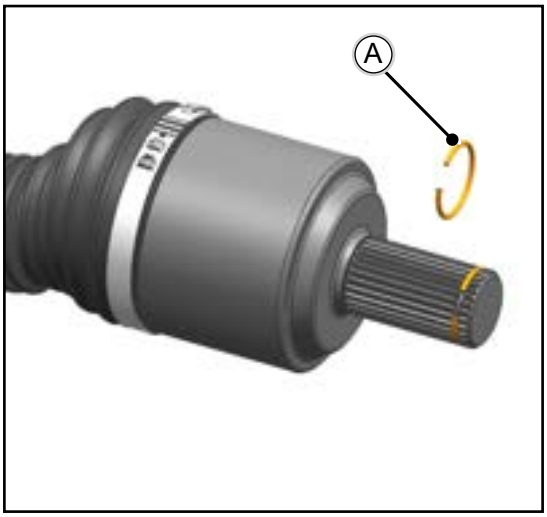
Bolt【D】Torque
70 N·m（7.1 kgf·m，52ft·lbs）

DRIVE SHAFT REMOVAL



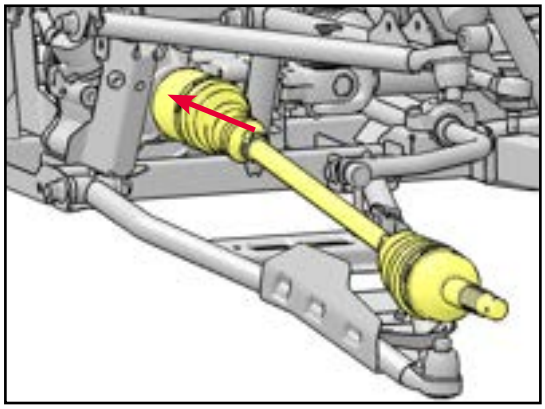
- Place the drive shaft horizontally and use a quick and short one in the direction of the horizontal arrow temporarily pull out the drive shaft, if it does not come out, please try a few more times

INSTALLATION OF DRIVE SHAFT



- Install a new retaining ring [A] in the spline groove, and smear on the spline anti-seizure agent

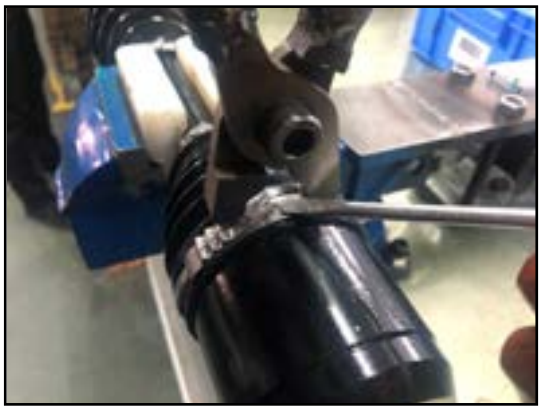
- Align the spline of the drive shaft with the spline of the differential and use it in the direction of the horizontal arrow push inward to fit the drive shaft



- If necessary, use a rubber hammer to hit the outer end of the drive shaft and install the drive moving shaft;

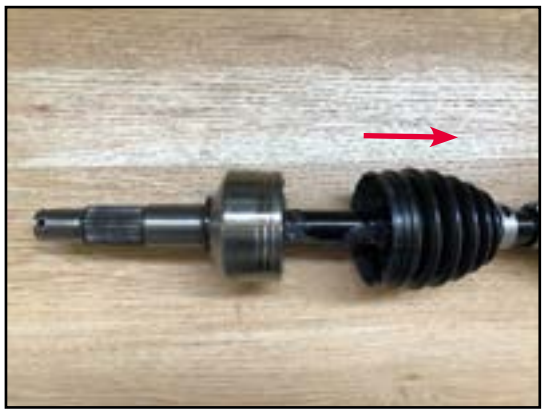
- The steering knuckle, rocker arm, steering rod, shock absorber, etc. follow the above disassembly sequence reverse assembly

OUTBOARD CV JOINT DRIVE SHAFT REPAIR



⚠ CAUTION

The drive shaft is a precision part, and cleanliness must be ensured when replacing and installing.
And operate strictly in accordance with 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, and then use a small screwdriver to place it on the clamp at the end, while lifting the clamp upwards, loosen the clamp clamp and remove the clamp

- Remove the clamps at both ends of the dust cover, and pull the dust cover out along the middle axis some distance

- Remove the grease in the dust cover and on the universal joint

- Find a hard workbench and force the bottom of the universal joint on the workbench up, make the intermediate shaft and the universal joint come out

⚠ CAUTION

Pay attention to the position of the dust cover during disassembly. Do not hit the dust cover on the workbench to avoid damage.
Padded nylon plates on the workbench to avoid damage to the universal joints

- After disassembling the intermediate shaft, pay attention to whether there is a retaining ring in the groove. Make sure that the retaining ring is not left inside the universal joint and replace it with a new one.

Replace the dust cover or universal joint as needed

⚠ CAUTION

There are precision components inside the universal joint. It is not recommended to disassemble and repair separately. If the universal joint is damaged or the internal grease is contaminated or liquefied, the universal joint needs to be replaced as a whole

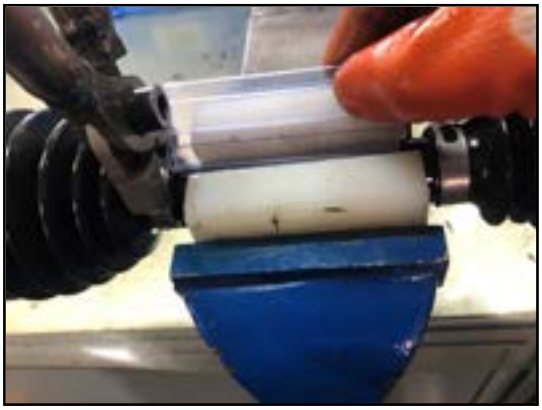
- Remove the grease on the intermediate shaft spline, first put the small clamp on the intermediate shaft, and then install the dust cover on the intermediate shaft

- Pour grease into the universal joint and the dust cover, then align the outer spline of the intermediate shaft with the inner spline of the universal joint, and knock the intermediate shaft into the universal joint on a hard workbench.

⚠ CAUTION

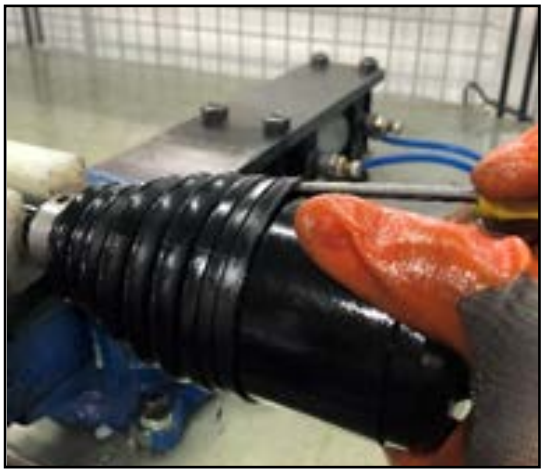
If you only replace the grease, you need to clean the remaining grease inside the universal joint, and it is forbidden to mix different greases or use other greases instead

OUTBOARD CV JOINT DRIVE SHAFT REPAIR



- 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 clamp pliers to clamp the small clamp

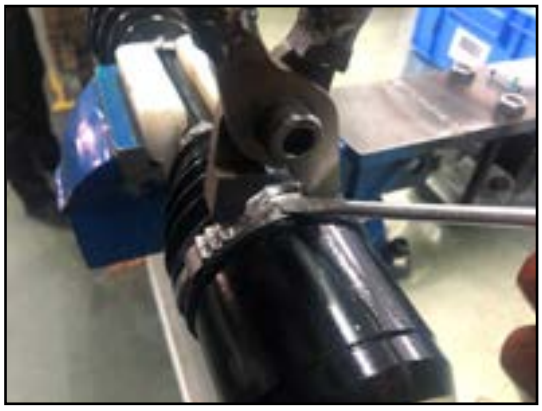
- When installing the large clamp, the dust cover is now stuck in the groove of the universal joint, and then the gas in the dust cover is discharged, and a corner of the dust cover is lifted with a screwdriver. Be careful not to puncture the dust cover, and then go back and forth. Push and pull the universal joint, you can hear the sound of gas flowing, stay the universal joint in the middle position, take out the screwdriver and clamp the big clamp



- Wipe clean the grease on the universal joint and the intermediate shaft and then use it

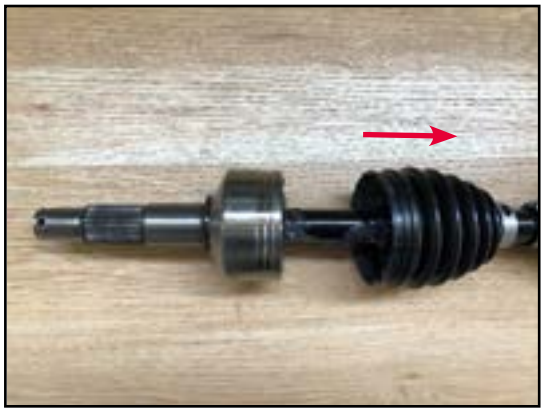
- The above maintenance procedures are applicable to the outer ball cage of the front drive shaft, and the inner and outer ball cages of the rear drive shaft.

INBOARD CV JOINT DRIVE SHAFT REPAIR

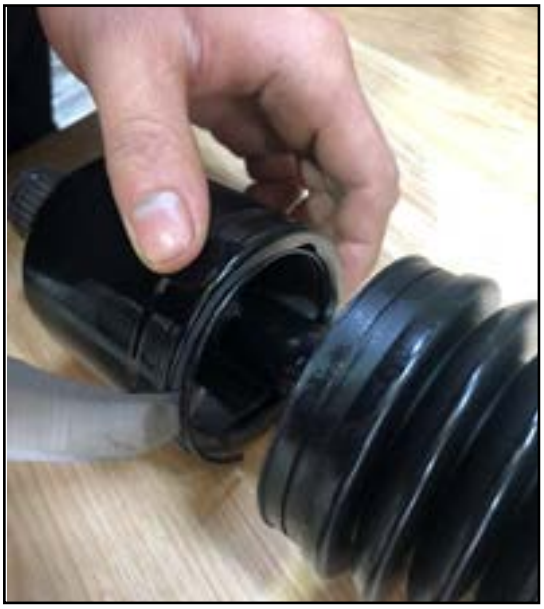


⚠ CAUTION

The drive shaft is a precision component. It is necessary to ensure cleanliness when replacing and installing, and operate in strict accordance with 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, and then use a small screwdriver to place it on the clamp at the end, while lifting the clamp upwards, loosen the clamp clamp and remove the clamp



- Remove the clamps at both ends of the dust cover, and pull the dust cover out a distance along the middle axis

- Use a sharper tool to remove the retaining ring in the universal joint

INBOARD CV JOINT DRIVE SHAFT REPAIR

- After removing the retaining ring, you can directly pull out the intermediate shaft, pay attention to the steel ball on the cage and star sleeve not to fall, and clean the grease in the universal joint and the dust cover

⚠ CAUTION

If you only replace the grease, you need to clean the remaining grease inside the universal joint, and it is forbidden to mix different greases or use other 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 place, and finally install the retaining ring

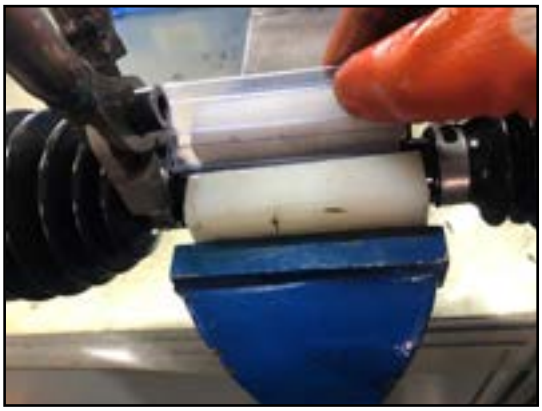
⚠ CAUTION

The inside of the star sleeve is a precision component. It is not recommended to disassemble and repair separately. If it is damaged or the internal grease is contaminated or liquefied, the universal joint needs to be replaced as a whole

- Pour grease into the universal joint and the dust cover, and then install the star sleeve assembly into the universal joint. Pay attention to the number of steel balls in the star sleeve. If the number is wrong, installation is not allowed

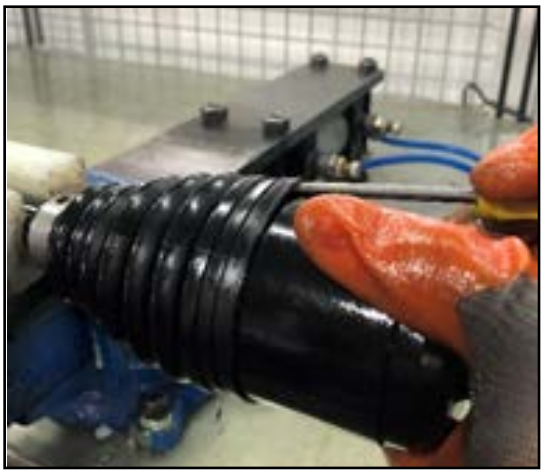
⚠ CAUTION

If you only replace the grease, you need to clean the remaining grease inside the universal joint, and it is forbidden to mix different greases or use other 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 clamp pliers to clamp the small clamp

- When installing the large clamp, first clip the dust cover into the groove of the universal joint, and then exhaust the gas in the dust cover. Use a screwdriver to lift up a corner of the dust cover, being careful not to puncture the dust cover, and then go back and forth. Push and pull the universal joint, you can hear the sound of gas flowing, stay the universal joint in the middle position, take out the screwdriver and clamp the big clamp



- Wipe clean the grease on the universal joint and the intermediate shaft and then use it

- The above maintenance procedures are applicable to the inner ball cage of the front drive shaft

FRONT & REAR SUSPENSION

EXPLODED VIEW OF FRONT SUSPENSION 9–2

EXPLODED VIEW OF REAR SUSPENSION 9–3

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Normal hydraulic damping absorber preloading adjustment 9–5

Spring adjustment table 9–5

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Disassembly of rear axle support assembly 9–9

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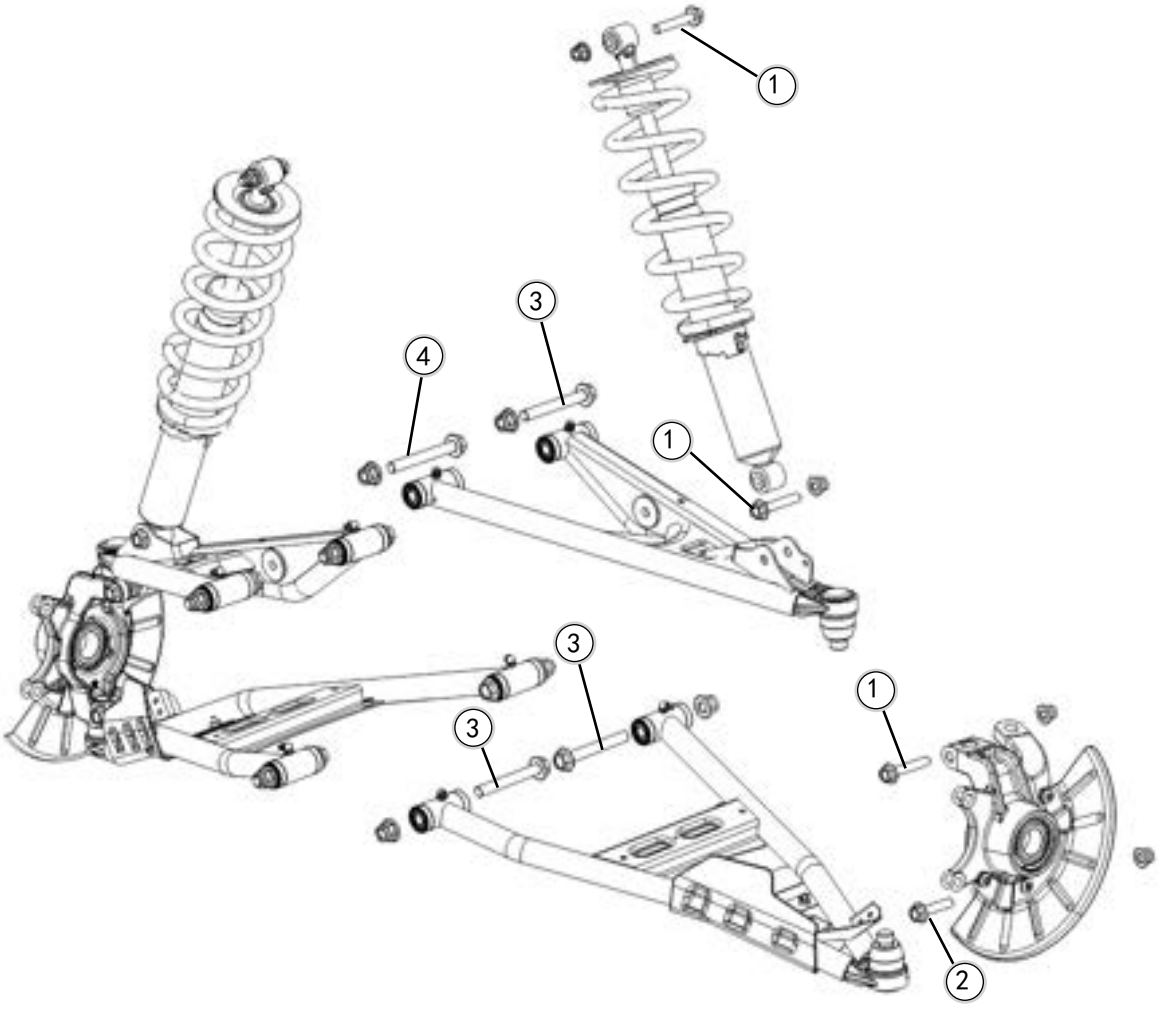
REAR STABILIZER BAR MAINTENANCE 9–10

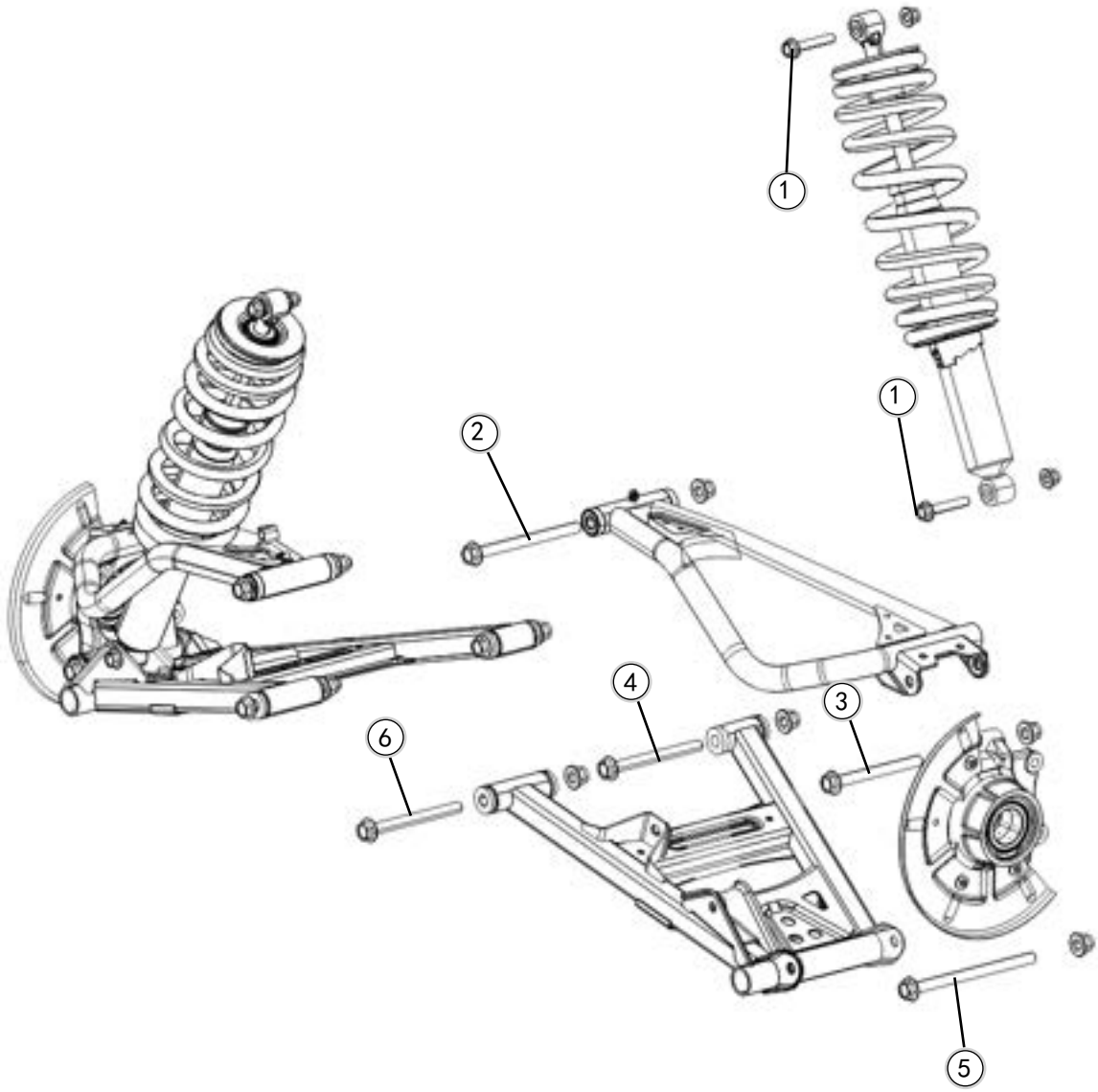
EXPLODED VIEW OF FRONT SUSPENSION



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Bolt M10×1.25×55	70	7.1	52	L
2	Bolt M10×1.25×45	70	7.1	52	L
3	Bolt M12×1.25×90	115	11.7	84.7	L
4	Bolt M12×1.25×95	115	11.7	84.7	L

L: Apply a non-permanent locking agent.

EXPLODED VIEW OF REAR SUSPENSION



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Bolt M10×1.25×55	70	7.1	52	L
2	Bolt M12×1.25×145	115	11.7	84.7	L
3	Bolt M12×1.25×120	115	11.7	84.7	L
4	Bolt M12×1.25×90	115	11.7	84.7	L
5	Bolt M12×1.25×170	115	11.7	84.7	L
5	Bolt M12×1.25×125	115	11.7	84.7	L

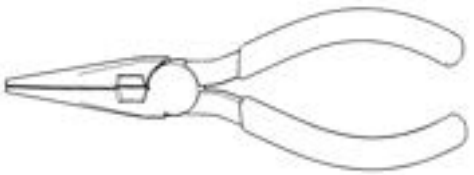
L: Apply a non-permanent locking agent.

TECHNICAL PARAMETER

Item	Setting	Available range
Front absorber: • Preloading setting position of normal hydraulic damping absorber spring	Gear 1	Gear 1 ～ Gear 5
Rear absorber： • Preloading setting position of normal hydraulic damping absorber spring	Gear 1	Gear 1 ～ Gear 5

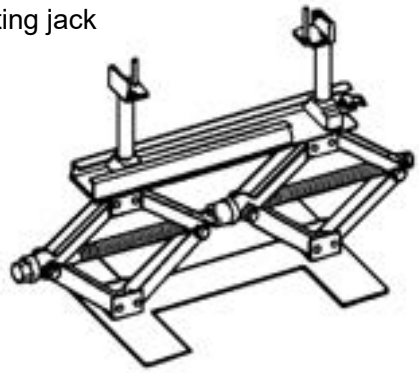
Dedicated Tools

Needle nose pliers

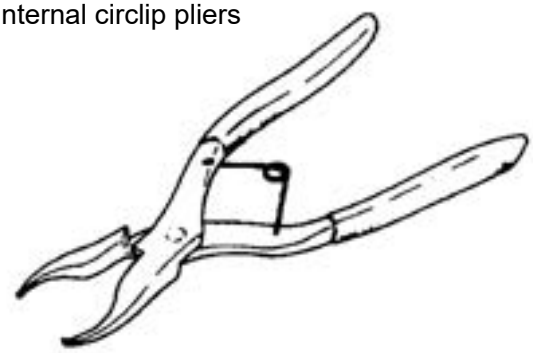


Hook wrench

Lifting jack

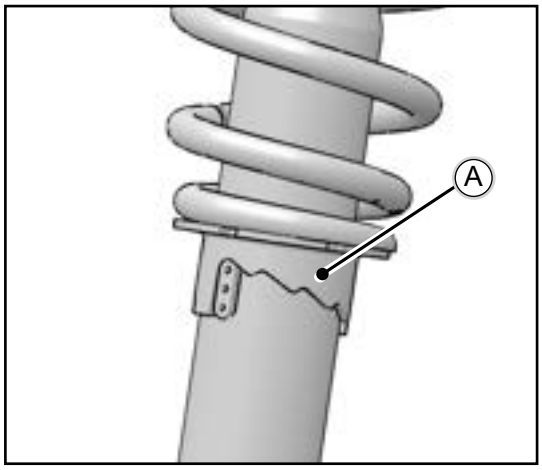


Internal circlip pliers



Bearing drive kit

SHOCK ABSORBER



Absorber inspection

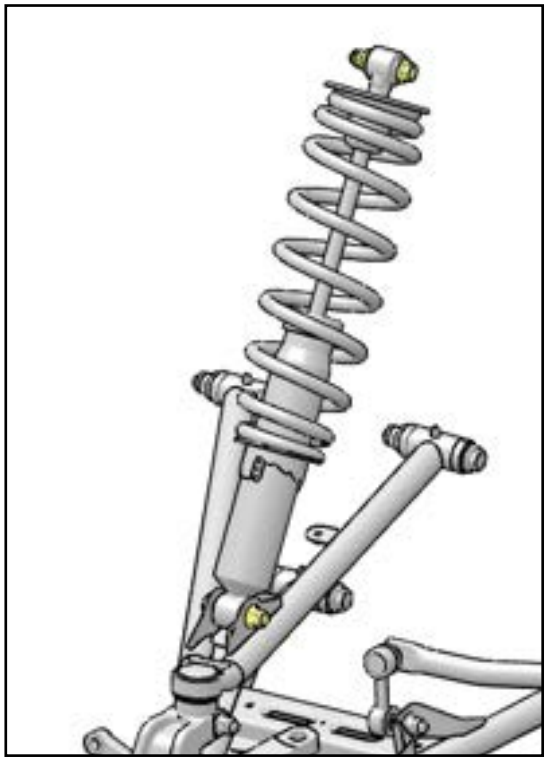
Because the front shock absorber is a sealed unit, it cannot be disassembled,only external inspection is required. If one unit is damaged, replace two shock absorbers together as a set. If only one unit is replaced, when the two shock absorbers are out of balance, it may cause the vehicle to become unstable at high speeds or deteriorate the overall comfort.

Normal hydraulic damping absorber preloading adjustment

【A】The spring adjustment sleeve of the hydraulic shock absorber【A】There are 5 adjustment positions, the spring can be adjusted according to different terrain and loading conditions, if you feel too soft and too hard, it can be adjusted by the spring table adjustment.

Spring adjustment table

Position	Spring	Environment	Load	Terrain	Speed
1	Soft	Soft	Light	Flat	Low
2	↑	↑	↑	↑	↑
3					
4	↓	↓	↓	↓	↓
5	Hard	Hard	Heavy	Bumpy	High



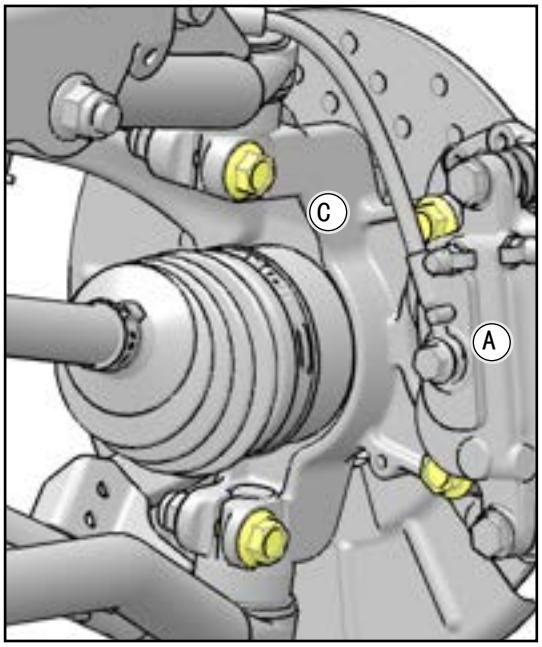
◆ Turn the adjustment sleeve on the shock absorber to the required gear position with a tool.

ABSORBER DISASSEMBLY

Park the vehicle in a horizontal position and lift the vehicle with a jack or support frame,Make the wheels do not contact the ground, remove the bolts and nuts at both ends of the shock absorber, and remove the shock absorber

⚠ WARNING

As the oil container of the shock absorber contains nitrogen, do not incinerate the gas that has not been released in the container, otherwise it may explode.

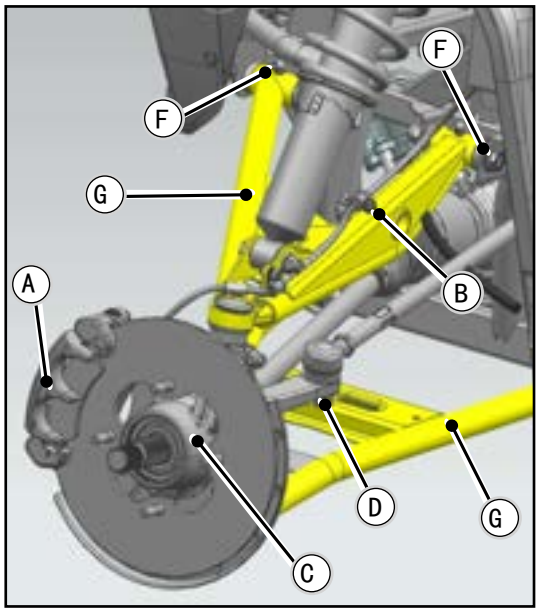


SUSPENSION

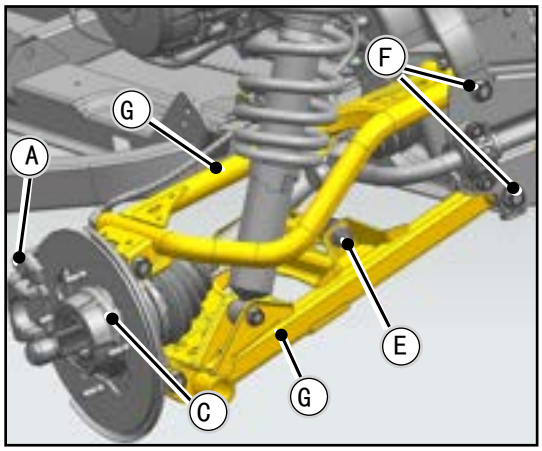
Removal of suspension arms

【A】Brake Caliper
【B】Bolt
【C】Steering knuckle\Hub seat assembly
【D】Steering tie rod nut
【E】Stabilizer bar link
【F】Suspension arm mounting bolts
【G】Suspension arm assembly

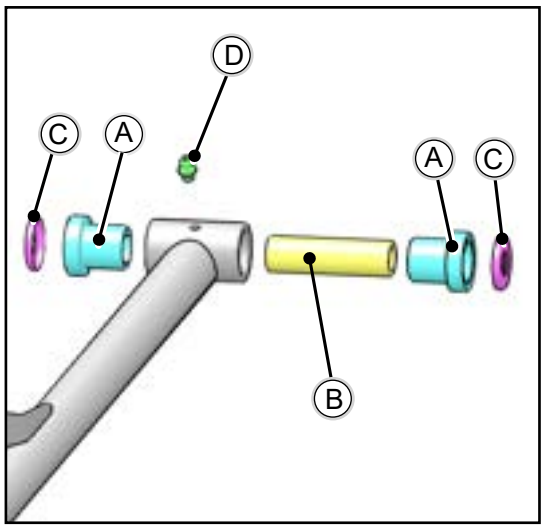
- Remove the Brake caliper [A] and take off the brake fluid hose fixing bolt [B]
- Remove the Steering knuckle\Hub seat assembly [C].



- Remove the Steering tie rod nut [D] (front suspension arm)
- Remove the Stabilizer bar link [E]
- Remove the Suspension arm mounting bolts [F]
- Remove the Suspension arm assembly [G]



Torque of steering tie rod nut [D]
45 N・m (4.6 kgf・m, 33ft・lbs)



Rocker arm disassembly

【A】Rocker arm buffer sleeve

【B】Rocker liner

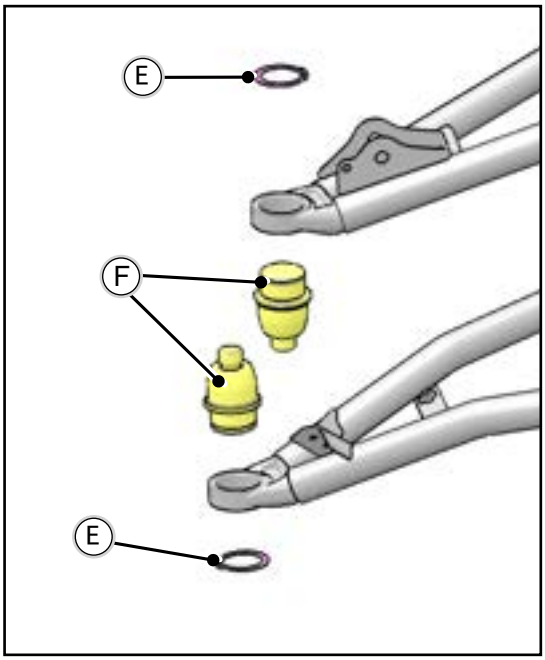
【C】dust cover

【D】Glib

【E】Upper and lower circlip

【F】Elastic ring for shaft

- remove the dust cover;
- press out the rocker arm liner【B】
- press out the buffer sleeve at both ends of rocker arm【C】
- remove the grease cup【D】

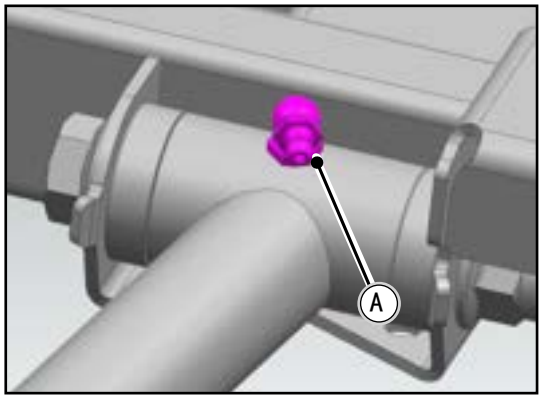


- remove Elastic ring for shaft【E】
- Press out the circlip assembly【F】by Bearing drive kit

Dedicated tool*: *Circlip plier, Bearing drive kit

⚠ CAUTION

Before installing the circlip, make sure that it is in good condition, the rubber seal sleeve is not damaged, the circlip and hole are cleaned without impurities, and the circlip can be rotated by hand after pressing



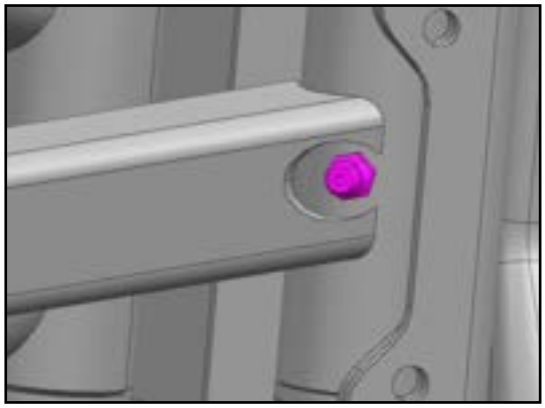
Rocker arm maintenance

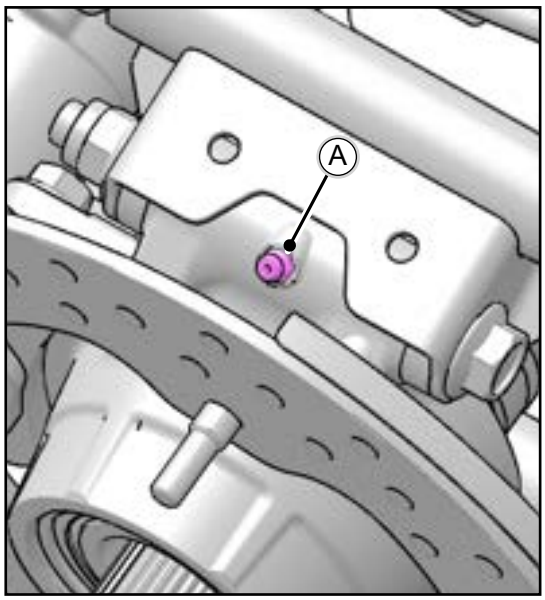
◆ Fill grease into the straight type cup with grease gun When it is found that the grease in the suspension rocker arm shaft sleeve ,axle support and axle sleeve is reducing, or after the vehicle runs every 1600km(990mi), grease the straight type glib【A】in the suspension system(Including upper and lower rocker arm, rear axle support and rear stabilizer bar) with an grease gun.

Dedicated tool*：*Grease gun

⚠ *WARNING*

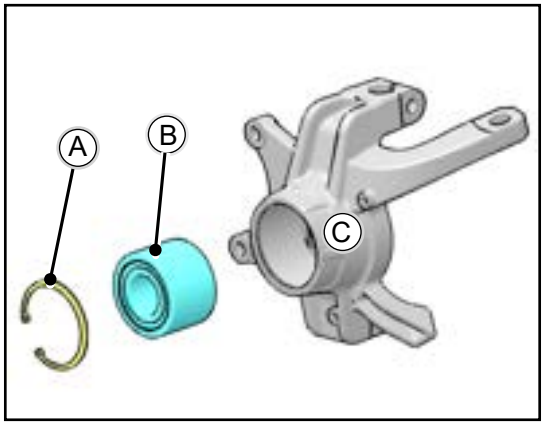
When there is no proper lubrication for the suspension joints, it needs to be filled with grease and maintained regularly to avoid excessive wear of shaft sleeve.





Hub bearing replacement

If the hub bearing in the knuckle assembly and rear axle support assembly is damaged, it needs to be replaced.



【A】split ring

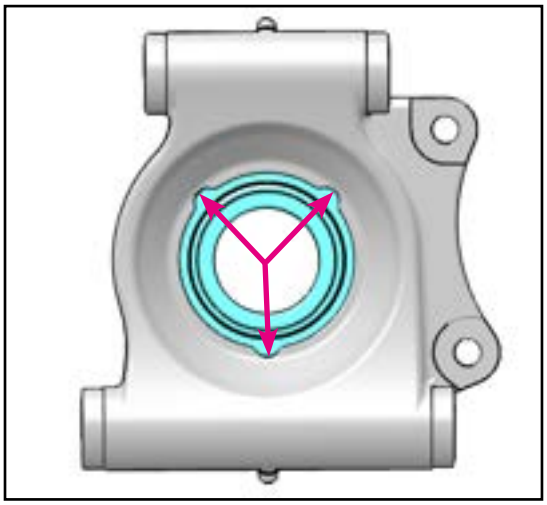
【B】hub bearing

【C】Front knuckle

【D】Rear axle mount

◆ Take out the split ring【A】with the circlip pliers

From the three openings opposite the bearing, use the bearing driver to press out the hub bearing【B】on the press and replace it

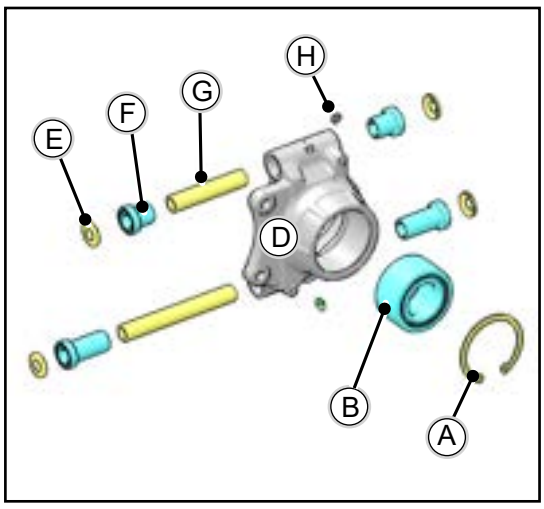


Dedicated tool*: *Circlip plier, Bearing drive kit

⚠ CAUTION

Before installing hub bearings, make sure that the bearings are in good condition without scratches and rust, the bearings and holes are cleaned without impurities, and the bearings can be rotated flexibly by hand after pressing

Disassembly of rear axle support assembly



【E】dust cover

【F】Buffer sleeve

【G】liner pipe

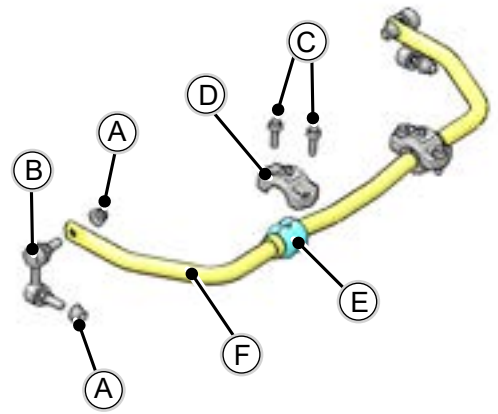
【H】Glib

Dedicated tool*: *Circlip plier, Bearing drive kit

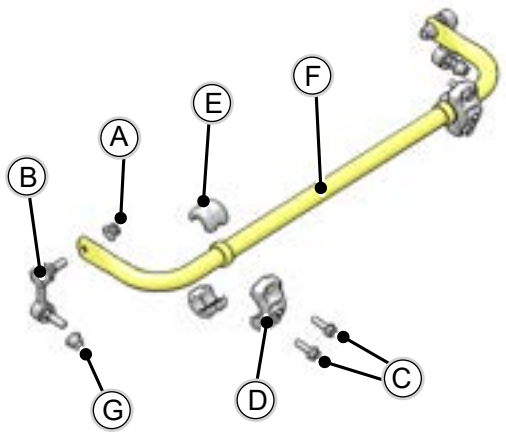
⚠ CAUTION

Check the buffer sleeve【F】, If the inner hole is seriously worn, it needs to be replaced, and the grease should be refilled after assembly.

FRONT



REAR



REAR STABILIZER BAR DISASSEMBLY

【A】Nut×1.25

【B】connecting Stabilizer bar

【C】bolt

【D】mounting plate

【E】Stabilizer bar buffer sleeve

【F】Stabilizer bar

【G】Nut M12×1.25

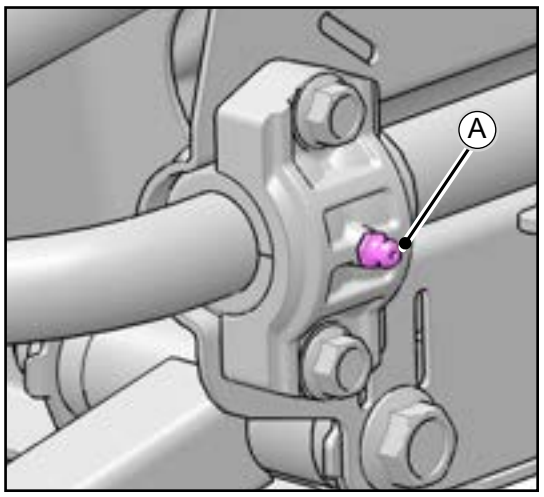
- Remove the nut 【A】
- Take down connecting Stabilizer bar 【B】
- Remove the bolts【C】
- Take down mounting plate【D】and Stabilizer bar buffer sleeve 【E】
- take down Stabilizer bar 【F】

Fixing bolt of mounting base 【C】 torque requirement
25N·m（2.6kgf·m，18 ft·lbs）

Connecting rod assembly mounting nut 【A】torque requirement（L）
45 N·m（4.6 kgf·m，33ft·lbs）

Connecting rod assembly mounting nut 【G】torque requirement（L）
70 N·m（7.1 kgf·m，51.6 ft·lbs）

L: Apply a non-permanent locking agent.



REAR STABILIZER BAR MAINTENANCE

When the vehicle runs 1600km(990mi), it is necessary to add proper amount of grease into the buffer sleeve of stabilizer bar by the grease zerk【A】.

Special tool*: *Grease gun

WHEELS AND TIRES

EXPLODED VIEW OF WHEELS AND TIRES 10-2

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Wheel Assembly 10-8

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Tire Disassembly 10-10

Tire Assembly 10-10

TIRE 10-10

Tire Disassembly (for anti-drop rims) 10-12

Tire Assembly 10-12

Tyre mounting (for anti-drop rims) 10-13

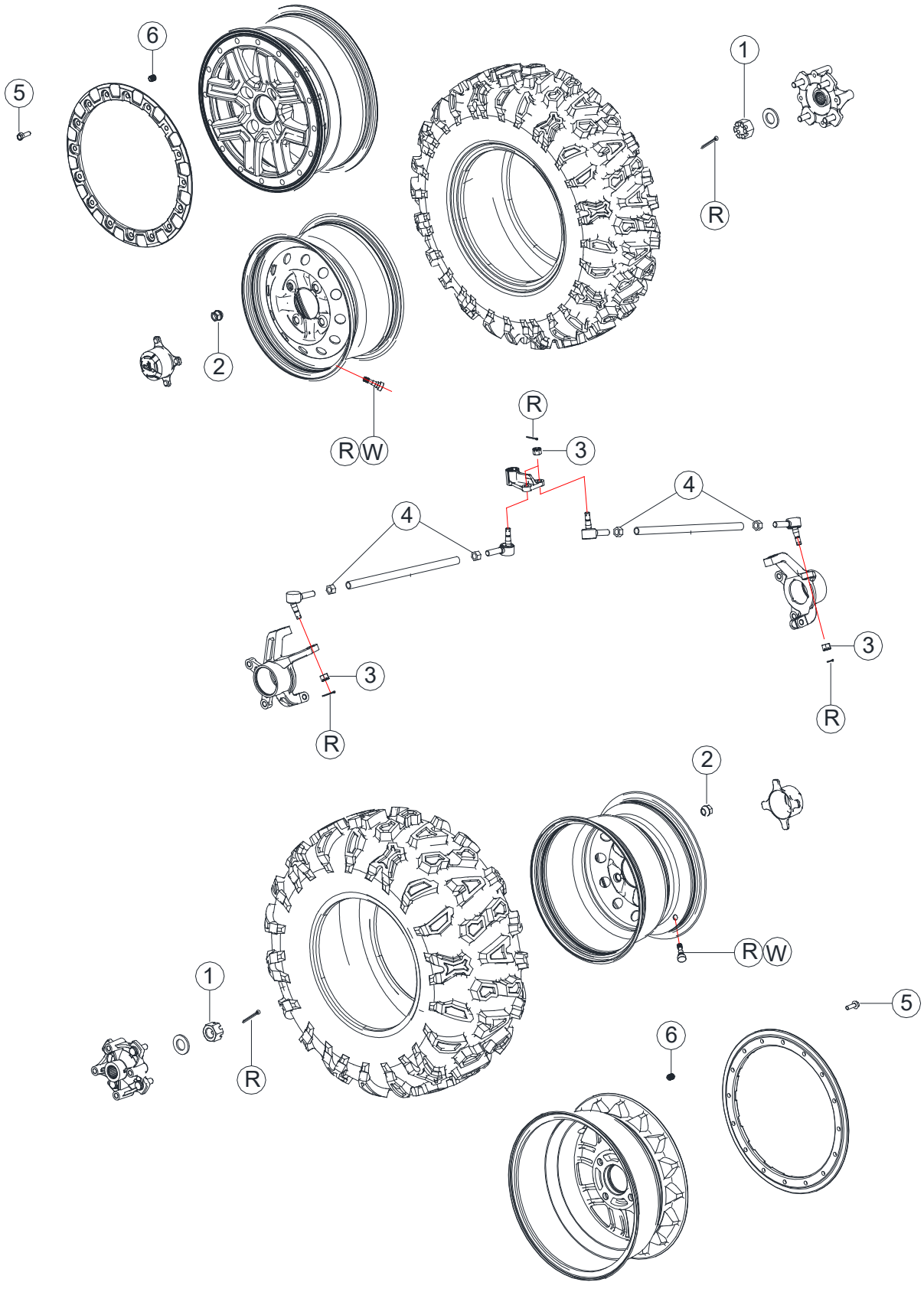
Tire check 10-14

WHEEL HUB 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	Shaft nut M24X2	300	30	221	
2	Wheel nut M12X1.25	100～120	10～12	74～88	
3	Cross tie rod end nut M12	40～50	4.0～5.0	30～36.9	
4	Cross tie rod adjustment lock nut M14	40～50	4.0～5.0	30～36.9	
5	Anti-slip mounting bolt M8	15~20	1.5~2.0	10~14.7	
6	Detachable spiral shell M12	22～25	2.2～2.5	16.2～18	

W: Water or soapy water

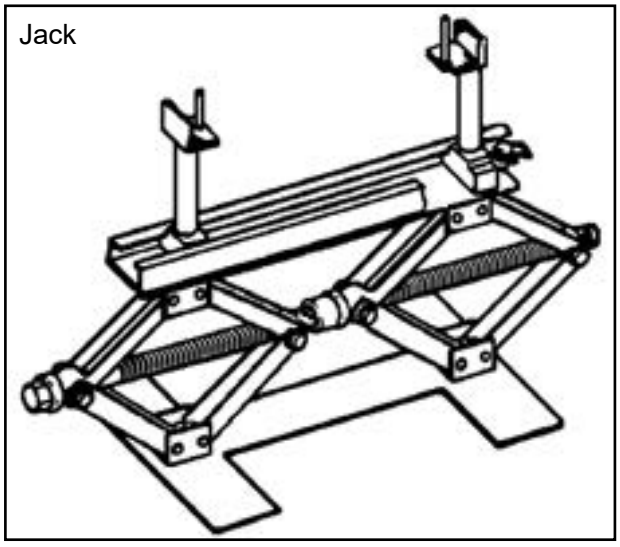
R: Replace parts

TECHNICAL PARAMETERS

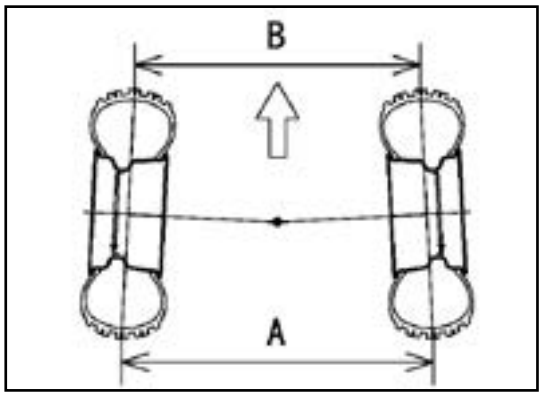
Item	Standard	Use Limit
轮胎： 标准轮胎： 前 后	 27×9.00-14 Tubeless Nylon 27×11.00-14 Tubeless Nylon	
单排轮胎气压（冷态时）： 前 后	 103kPa (15psi) 110kPa (16psi)	
双排轮胎气压（冷态时）： 27" 前轮胎： 27" 后轮胎： 30" 前轮胎： 30" 后轮胎：	 103 kPa (15 psi) 120 kPa (17.4 psi) 70 kPa (10 psi) 110 kPa (16 psi)	
最大轮胎气压 （冷态时）	250 kPa (36 psi)	
轮胎胎面花纹高度：前 后	- - - - - -	3毫米（0.12英寸） 3毫米（0.12英寸）
车轮定位： 前轮前束：	 4~10毫米（0.16~0.39英寸）	
主销后倾角（°）	5	
车轮外倾角（°）	0.5	
主销内倾角（°）	9	
主销偏距（mm）	29	

SPECIAL TOOLS

Jack



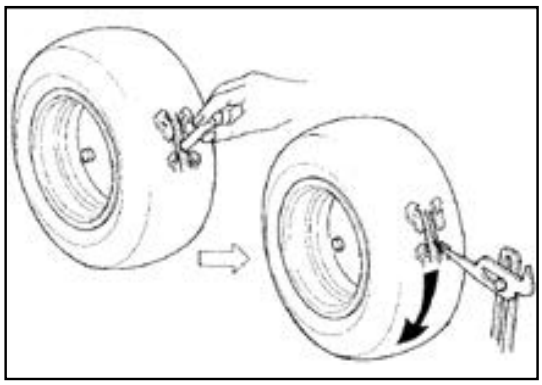
WHEEL ALIGNMENT



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.

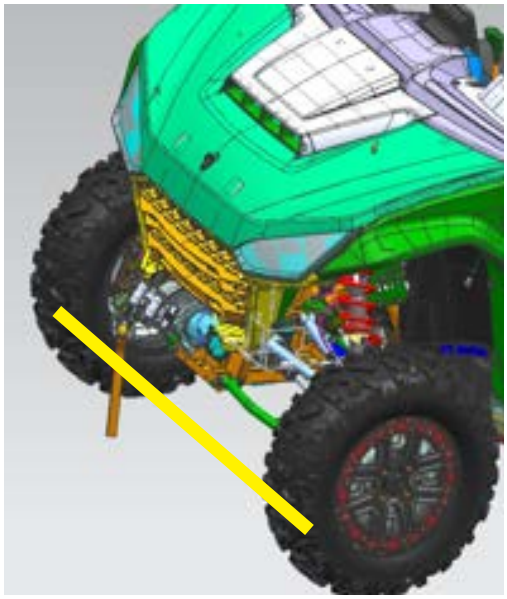
The caster and camber angles of the kingpin are built-in and di bit reqyure adjustment.



A（rear）– B（front）=toe value

（The distances A and B are measured at the height of the axle when the vehicle is parked on a flat surface.）

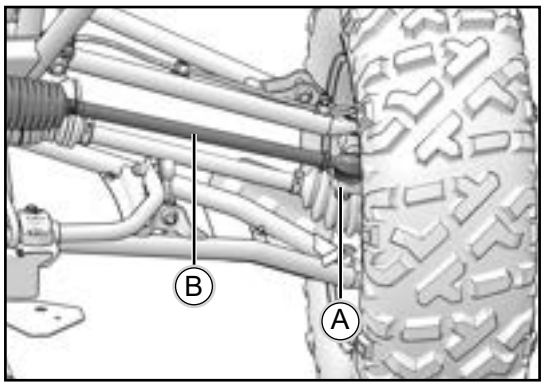
- Apply thick chalk or paint line near the center of the front tire.
- When turning a wheel, make a small mark near the center of the chalk coating with a needle marker.



- 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*: *5~10 mm (0.17~0.39 inch)

Front bundle adjustment



【A】locknut
【B】Pull rod

- Loosen the locknut【A】and rotate the adjustment lever【B】on both sides number of turns to reach the specified front bundle.

⚠ WARNING

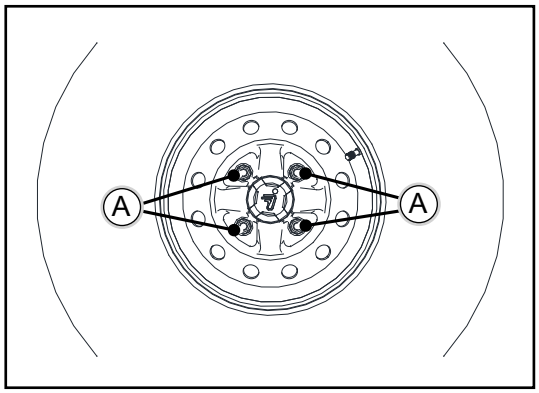
Adjust the length of the tie rod so that the visible thread length at both ends of the tie rod is even,Uneven thread length can cause damage to the end of the tie rod.

- Check the front bundle.
- Tighten：

The tie rod adjusts the torque of the locking nut
40~50 N.m（4.0~5.0kgf·m，29~36.8ft·lb）

- Test drive vehicle.

WHEEL（RIM）



Wheel Disassembly

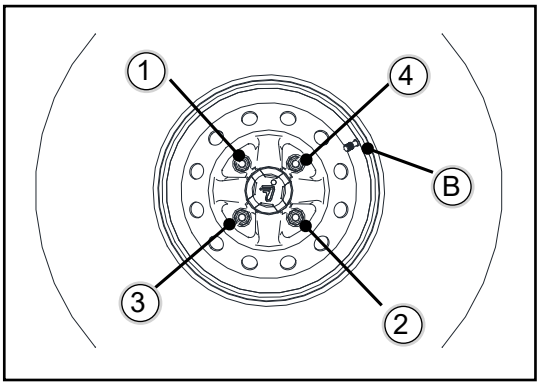
【A】Wheel nut

- 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:

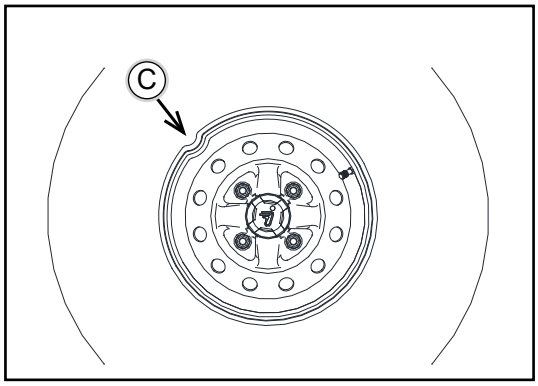
- Wheel nut
- wheel



Wheel Assembly

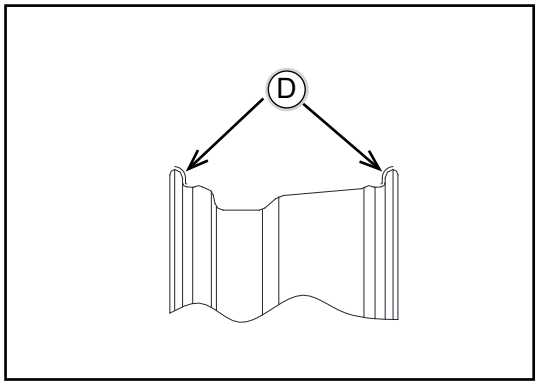
- Position the wheels so that the air valve 【B】faces the outside of the vehicle
- Tighten the wheel nuts in a cross way

Tightening bolt torque
100~120N.m（74~88ft·lb）



Wheel check

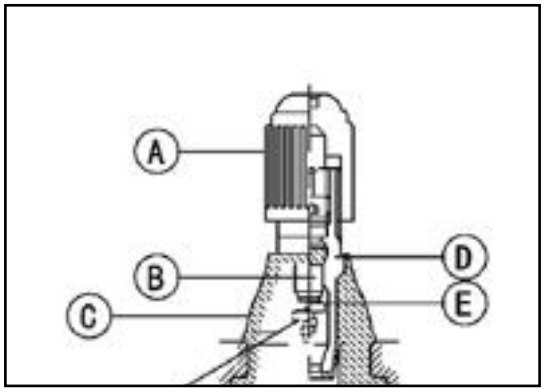
- Check whether there are depressions on both sides of the rim 【C】. If there are depressions, please replace them.



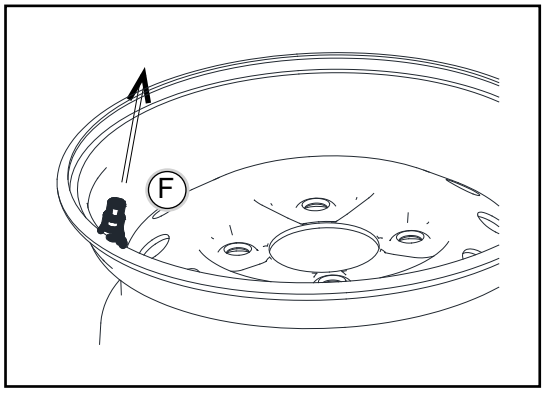
- Remove the tire and check the air sealing surface 【D】 of the rim for scratches or scratches. If necessary, use a fine emery cloth to polish the air sealing surface.

The replacement of the wheel

- 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.



【A】 Plastic cover
【B】 Spool
【C】 Stem seal
【D】 Stem
【E】 Seat



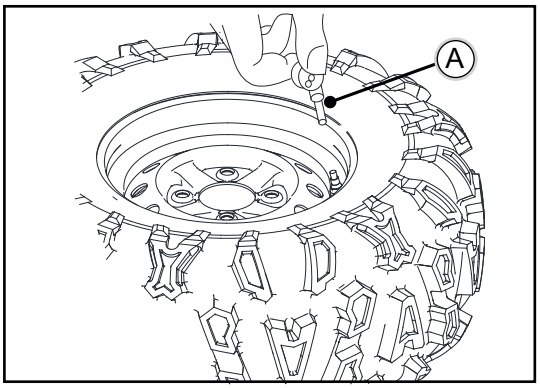
- Install new air valve on new rim.
- Remove bonnet, moisten stem with soap solution, and pull stem 【F】from inside out through rim until it gets stuck in place.

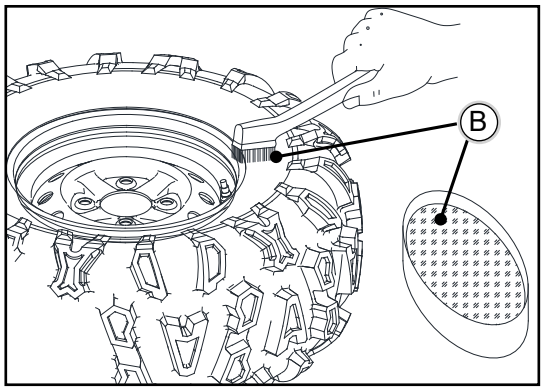
⚠ CAUTION

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

- Check rim (refer to wheel check).
- Replace the new air valve.

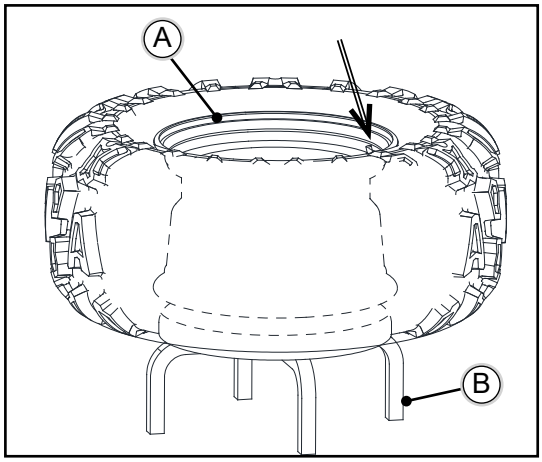
⚠ WARNING

Whenever you change a tire, change the air valve.Do not reuse the air valve.

- Whenever you change a tire, change the air valve. Do not reuse the air valve.
- Lubricate the tire rim and tire rim with soap solution or water.

⚠ CAUTION

Do not use lubricants other than aqueous soap and water.



- 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.

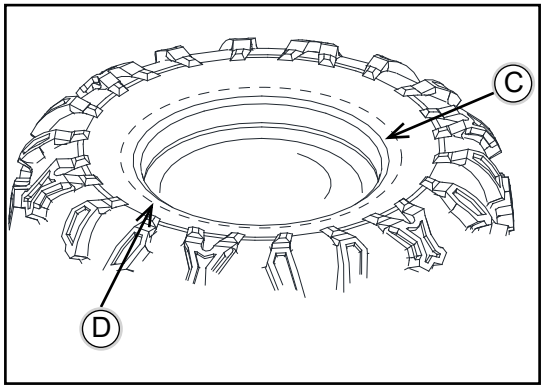
Maximum air pressure of tire (fixed on wheel when cold)

front and rear: 250 kPa（2.5 kgf /cm^2, 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 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)

Tire pressure	The front wheel	The rear wheel
UT10 27"	15 psi (103 kPa)	16 psi (110 kPa)
UT10 CREW 27"	15 psi (103 kPa)	17.4 psi (120 kPa)
UT10 CREW 30"	10 psi (70 kPa)	16 psi (110 kPa)

Wheel mounting (see Wheel mounting).

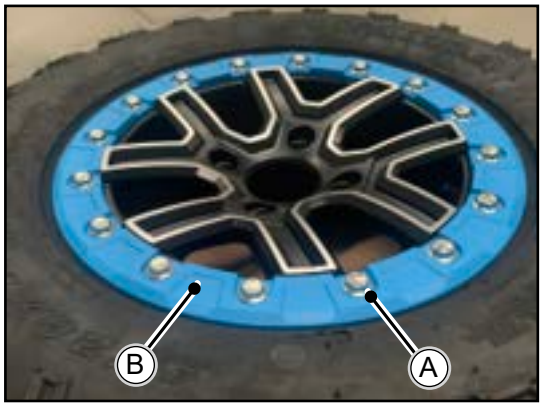
- Wipe the soap and water solution from the tire and dry the tire before operation.

⚠ 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.

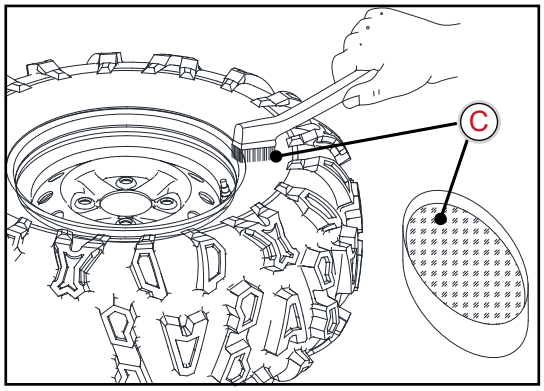
Tire Disassembly (for anti-drop rims)）



【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

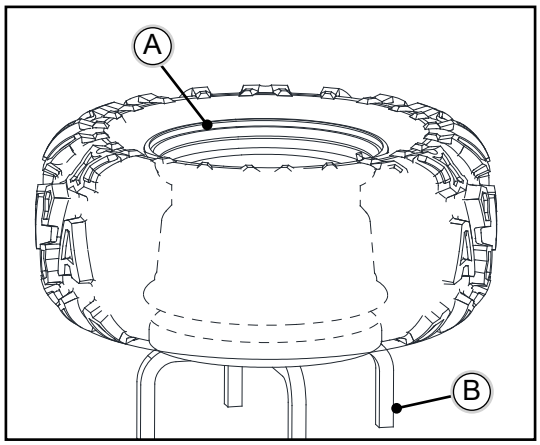
Whenever you change a tire, change the valve port. Do not reuse valve mouth.

- 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.

Tyre mounting (for anti-drop rims)



【A】Rim

【B】Bracket

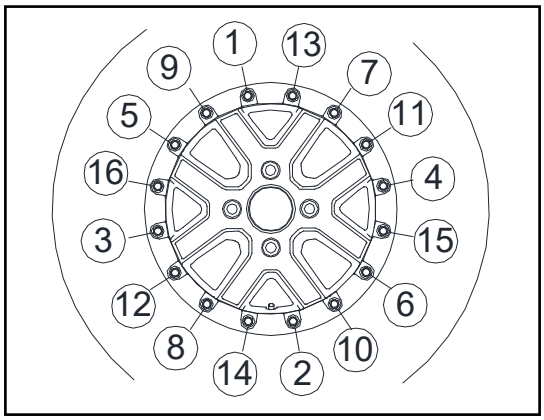
- Support the rim 【A】 on A suitable bracket【B】to prevent the tire from slipping off.
- Tighten the detachable ring fastening bolts in a cross way.

Torque of anti-drop ring screw
18 N.m（1.8 kgf·m，12 ft·lb）

- Inflate the tire until the rim is fixed to the tire rim.

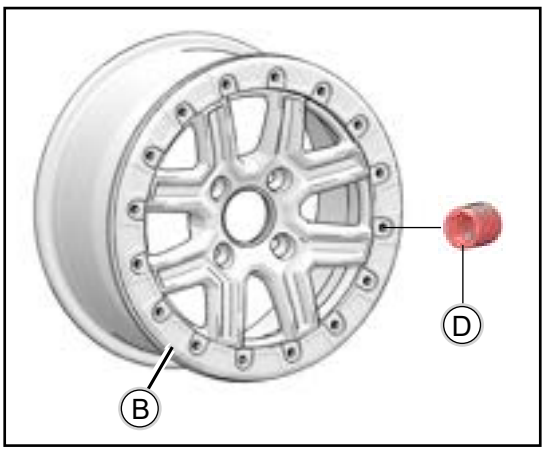
Maximum tire inflation pressure (can be fixed to rim when cold)

Front and rear: 250 kPa (2.5 KGF /cm^2, 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.



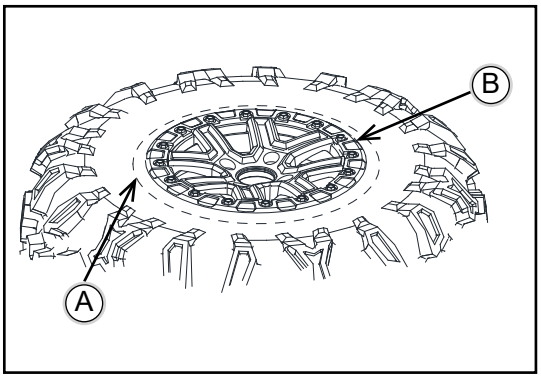
【C】Rim

【D】Screw sleeve

- If the anti-drop ring screw sleeve 【D】is damaged, please replace the anti-drop ring screw sleeve

screw sleeve torque
22~25N.m（2.2~2.5kgf·m，16.2~18.4ft·lb）

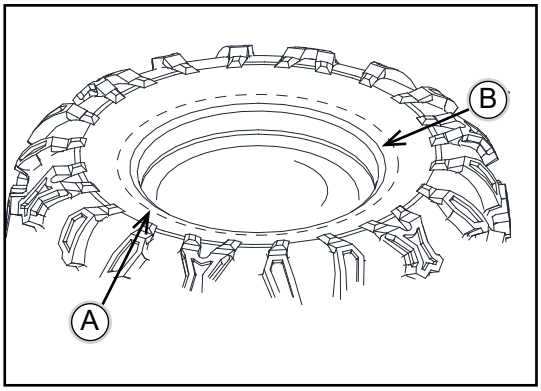
- If necessary, replace rim 【B】and screw sleeve 【D】 as a whole.



- Check whether the rim lines 【A】 on both sides of the tire are parallel to the anti-slip rim/rim flange 【B】 and the surrounding relative clearance is uniform.

If the rim line and the rims/rim flange are not parallel or the relative gap around the tire is uneven, bleed the tire, re-lubricate the sealing surface, and then re-inflate the tire.

- Check whether there is air leak after the tire is in place correctly.
- Apply soap solution to the tire rim, and check whether there is air bubble.
- Bleed the tire to the specified pressure.
- Check the tire pressure with the barometer.



TIPS

Segway offers tire pressure gauges and user kits.。

Tire pressure (in cold state)

UT10 27"(Front)：103 kPa（15 psi）
UT10 27"(Rear)：110 kPa（16 psi）
UT10 CREW 27"(Front)：103 kPa（15 psi）
UT10 CREW 27"(Rear)：120 kPa（17.4 psi）
UT10 CREW 30”(Front)： 70 kPa (10 psi)
UT10 CREW 30”(Rear)： 110 kPa (16 psi)

Wheel mounting (see Wheel mounting).

- Wipe the soap and water solution from the tire and dry the tire before operation.

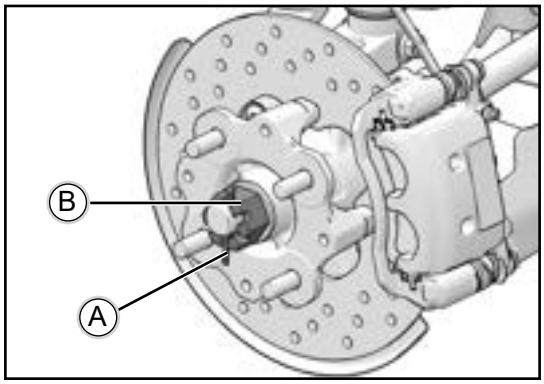
⚠ WARNING

Do not operate the vehicle with soap and water around the wheel rim.
It can cause tyre separation and can lead to dangerous conditions.

Tire check

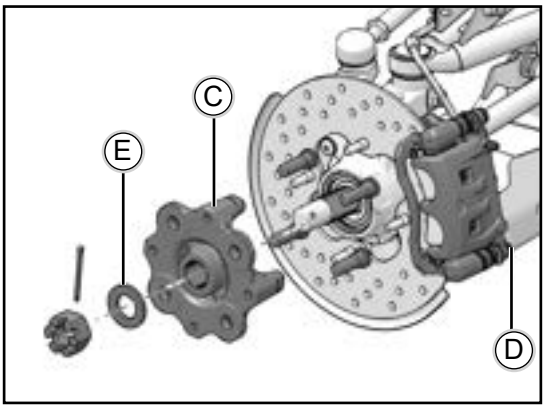
- Refer to the "Wheels/Tires" section of the Regular Maintenance section.

WHEEL HUB



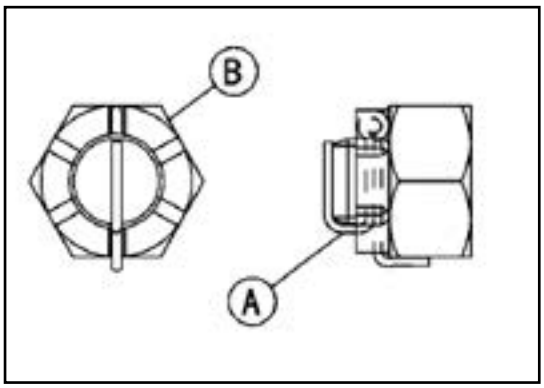
Remove rim mounting seat assembly

- Remove the wheel (see wheel removal).
- Unplug: split pin [A]
- Loosen half axle nut [B]



- Unscrew the mounting bolt, remove the caliper [D], and let the caliper hang freely Hang up.
- Remove axle nut [B], remove washer [E] and pull down hub Install seat assembly [C] and brake disc.
- Separate the brake disc from the hub

Wheel hub assembly



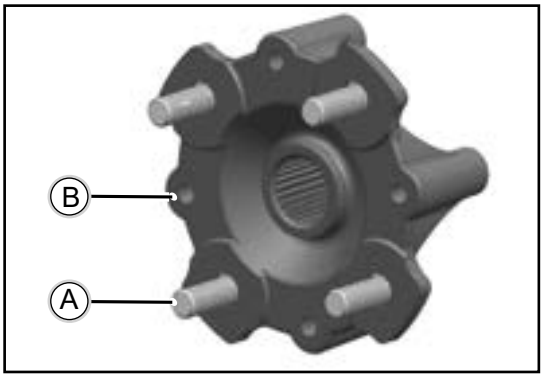
- Installing a brake disc (see "Braking" chapter)

Tighten axle nut torque
300 N.m（ 30.6kgf·m，221ft·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【A】.
- If any hub bolts are damaged, please replace hub mounting seat 【B】 and bolt 【A】 totally.

BRAKE SYSTEM

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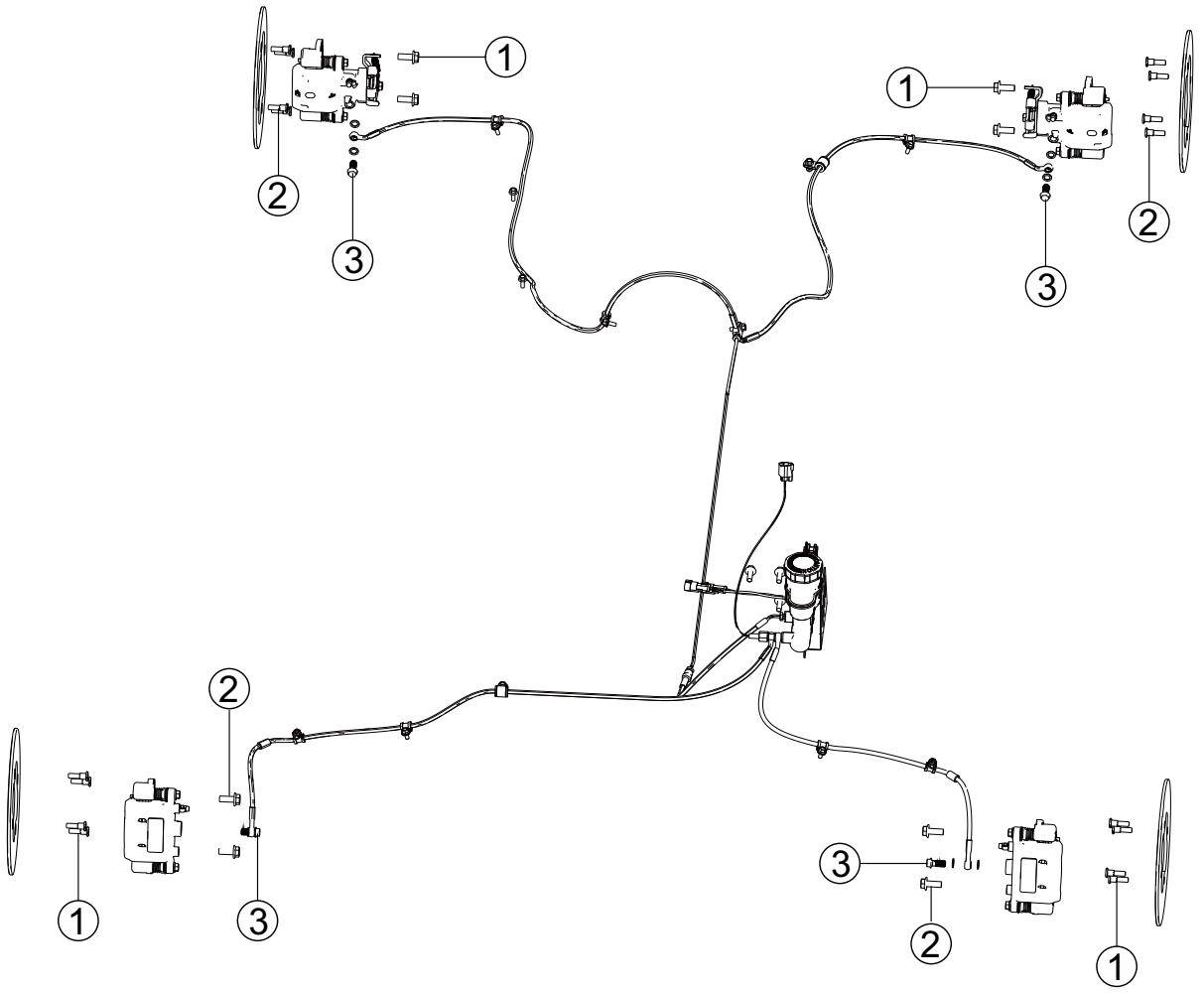
EXPLODED VIEW OF BRAKE SYSTEM

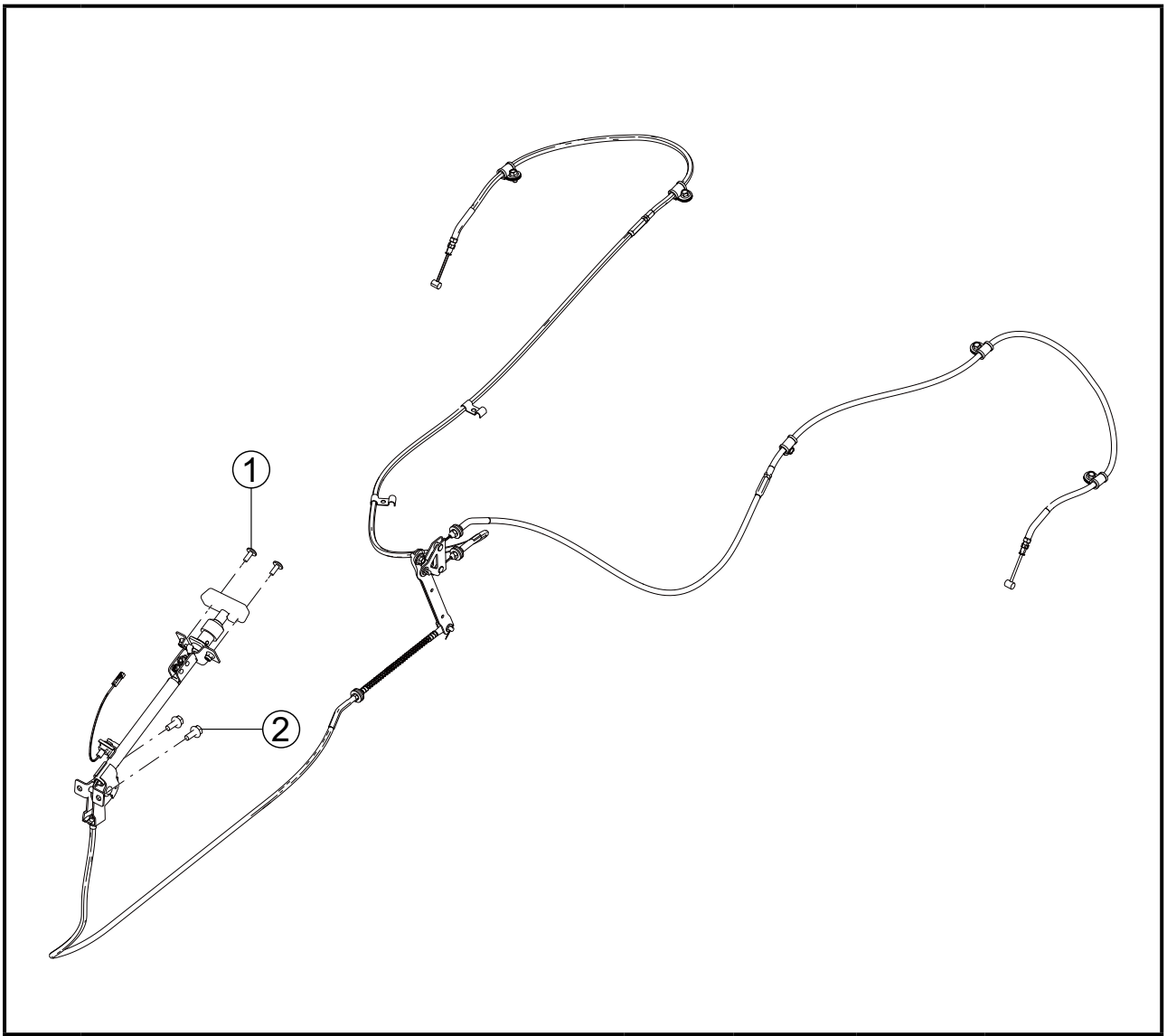


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Disc Mounting Bolts	38	3.8	28	L
2	Brake fastening bolt	45	4.5	33	L
3	Brake Hose Banjo Bolts	25	2.5	18	

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 brake sliding rod dust cover needs to be coated with silicone oil to ensure flexible movement.

EXPLODED VIEW OF PARKING BRAKE



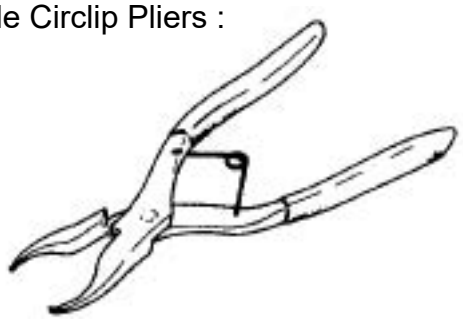
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Parking handle base fastening bolt	10	1.0	7.4	
2	Parking handle fastening bolt	10	1.0	7.4	

SPECIFICATIONS

Item	Standard	Service Limit
Brake Fluid: Type	 DOT 4	 – – –
Front Disc Brake: Pad lining thickness Disc thickness Disc runout	 5.0 mm (0.19 in.) 4.8~5.2mm (0.19～ 0.205 in.) TIR 0.08 mm (0.003 in.) or less	 1.5 mm (0.06 in.) 4 mm (0.16 in.) TIR 0.1 mm (0.004 in.)
Rear Brake Lever, Pedal: Working stroke of parking handle Working stroke of rear brake pedal	 60~80 mm (2.4～ 3.14in.) 25~30 mm (1.0～1.2in.)	 – – – – – –

SPECIAL TOOLS

Inside Circlip Pliers :



BRAKE FLUID

⚠ WARNING

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

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

Brake Fluid Recommendation

Use extra heavy-duty brake fluid only from a container marked DOT4.

Recommended Disc Brake Fluid

Type : DOT4

Brake Fluid Level Inspection

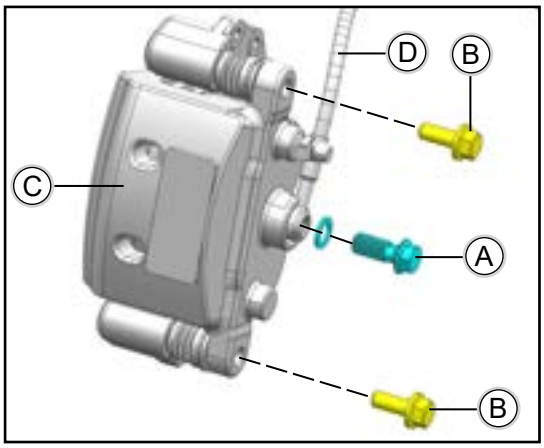
•Refer to the Brakes in the Periodic Maintenance chapter.

Brake Fluid Change

•Refer to the Brakes in the Periodic Maintenance chapter.

Brake Line Air Bleeding

•Refer to the Brakes in the Periodic Maintenance chapter.



CALIPER

- Remove the front wheel (see Wheels/Tires chapter).
- Loosen the banjo bolt 【A】 at the brake hose lower end, and tighten it loosely.
- Unscrew the caliper mounting bolts 【B】.
- Detach the caliper 【C】 from the disc.
- Unscrew the banjo bolt and remove the brake hose 【D】 from the caliper.

⚠ WARNING

Immediately wash away any brake fluid that spills.

CALIPER INSTALLATION

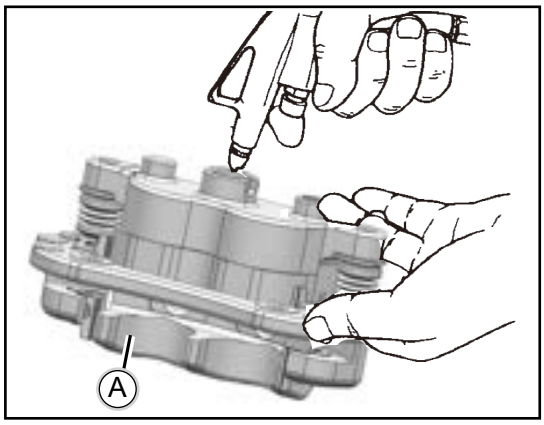
- Install the caliper and brake hose lower end.
- Replace the washers that are on each side of hose fitting with new ones.
- Tighten:

Caliper Mounting Bolts: 【C】	Brake Hose Banjo Bolt 【A】
25N·m(2.5kgf·m,18 ft·lb)	

- Check the fluid level in the brake reservoir.
- Bleed the brake line .
- Check the brake for good braking power, no brake drag,and no fluid leakage.

⚠ WARNING

Do not attempt to drive the vehicle until a firm brake lever can be obtained by pumping the brake lever until the pads are against each disc. The brakes will not function on the first application of the lever if this is not done.



Caliper Disassembly

◆ Remove:

Caliper (see Caliper Removal)

Pads (see Brake Pad Removal)

Anti-rattle Spring

◆ Using compressed air, remove the piston.

Cover the caliper opening with a clean, heavy cloth【A】. Remove the piston by lightly applying compressed air【B】to where the brake line fits into the caliper.

⚠ WARNING

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

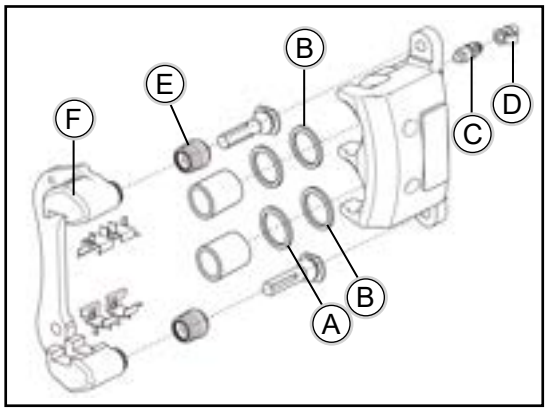
⚠ CAUTION

•If compressed air is not available, do as follows with the brake hose connected to the caliper.

•Prepare a container for brake fluid.

•Remove the pads and spring (see Brake Pad Removal).

•Pump the brake lever to remove the caliper piston.



◆ Remove:

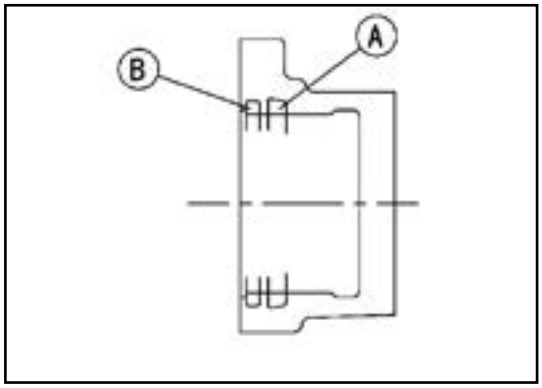
Dust Seal【A】

Fluid Seal【B】

Bleed Valve【C】and Rubber Cap【D】

Boots【E】and Caliper Holder【F】

Caliper Assembly

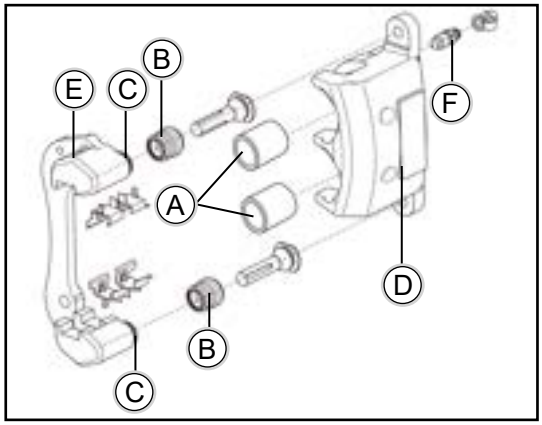


◆ Replace the fluid seal【A】with a new one.

◆ Apply brake fluid to the fluid seal, and install it into the cylinder by hand.

◆ Replace the dust seal【B】with a new one if it is damaged.

◆ Apply brake fluid to the dust seal, and install it into the cylinder by hand.

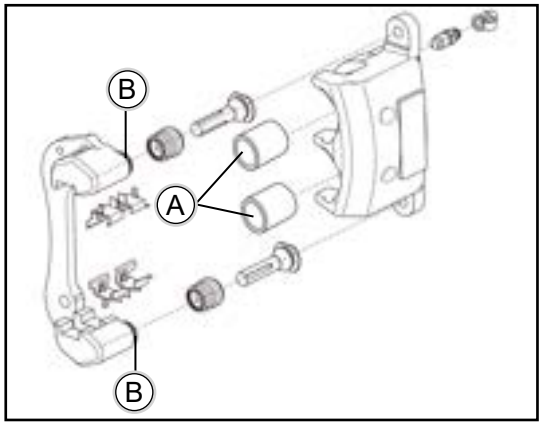


- Apply brake fluid to the outside of the pistons 【A】, and push them into the cylinder by hand. Take care that neither the cylinder nor the piston skirt gets scratched.
- Replace the rubber boots 【B】 if they are damaged.
- Apply a thin coat of silicone grease to the caliper holder shafts 【C】 and holder holes 【D】 (Silicone grease is a special high temperature, water-resistant grease).
- Install:

Caliper Holder 【E】

Bleed Valve 【F】 and Rubber Cap

Torque-Bleed Valve
7.9N·m (0.7 kgf·m,5.9 ft·lb)



Piston and Cylinder Damage

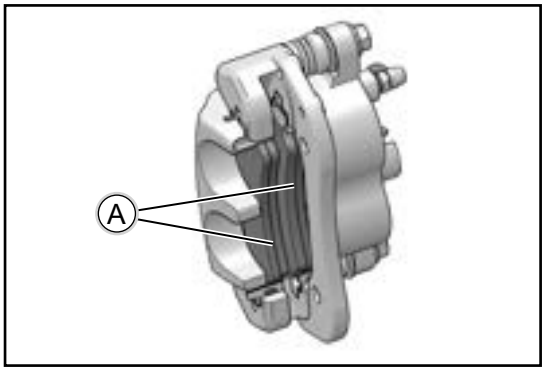
- Visually inspect the pistons 【A】 and cylinder surfaces.
- Replace the caliper if the cylinder and piston are badly scored or rusty.

Caliper Holder Shaft Wear Inspection

The caliper body must slide smoothly on the caliper holder shafts 【B】. If the body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

- Check to see that the caliper holder shafts are not badly worn or stepped, and that the rubber friction boots are not damaged.
- If the rubber friction boot is damaged, replace the rubber friction boot.
- If caliper holder shaft is damaged, replace the caliper holder shaft and rubber friction boot as a unit.

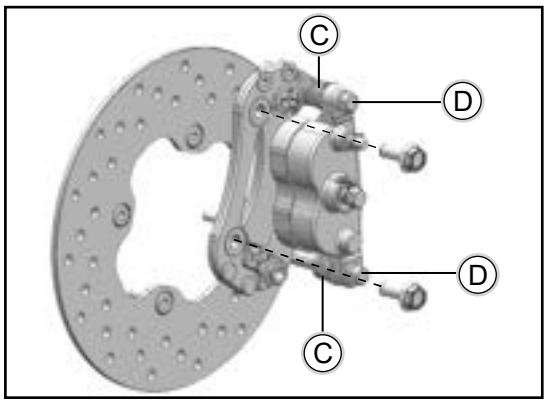
BRAKE PADS

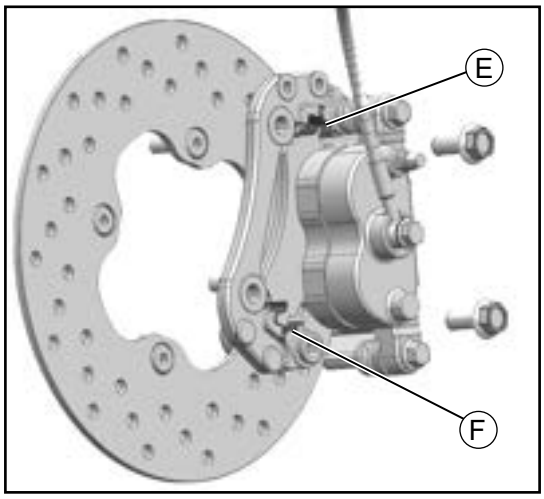


Brake Pad Removal

- Remove the front rim assembly or the rear rim assembly.
- Loosen the fastening bolt【D】from the guide rod of the brake assembly【C】. In the process of loosening the bolt【D】, the head of【C】must always be in close contact with the brake caliper body【B】and limit. Otherwise, it will follow【D】because【C】is not in position, and【D】cannot 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 inner and outer sides of the brake disc.

Brake Pad Installation





- Push the caliper piston in by hand as far as it will go.
- Be sure that the anti-rattle spring is in place.
- Install:

1. Install the brake pads in the upper spring holders【E】and lower spring holders【F】on the inner (or outer) side and fit the brake discs respectively
2. Rotate the brake caliper down so that the mounting hole position coincides with the hole position of the brake assembly guide rod【C】, and the brake assembly guide rod【C】must be confined to the brake caliper 【B】 and be in contact with the brake Calipers【B】fit.
3. Apply thread glue to the tightening bolt【D】that has just been loosened.

Tighten the fastening bolt【D】
25N·m(2.5kgf·m,18 ft·lb)

⚠ WARNING

Do not attempt to drive the vehicle until a firm brake lever can be obtained by pumping the brake lever until the pads are against each disc. The brake will not function on the first application if this is not done.

Brake Pad Wear Inspection

- Refer to the Brakes in the Periodic Maintenance chapter.

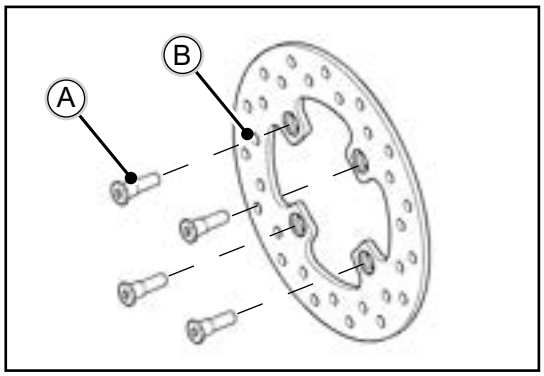
BRAKE DISCS

Disc Cleaning

Poor braking can be caused by oil on a disc. Oil on a disc must be cleaned off with an oilless cleaning fluid such as trichloroethylene or acetone.

WARNING

These cleaning fluids are usually highly flammable and harmful if breathed for prolonged periods. Be sure to heed the fluid manufacturer's warnings.



Disc Removal

- Remove:

Front Hub (see Wheels/Tires chapter)
Brake Disc Mounting Bolts【A】
Brake Disc 【B】

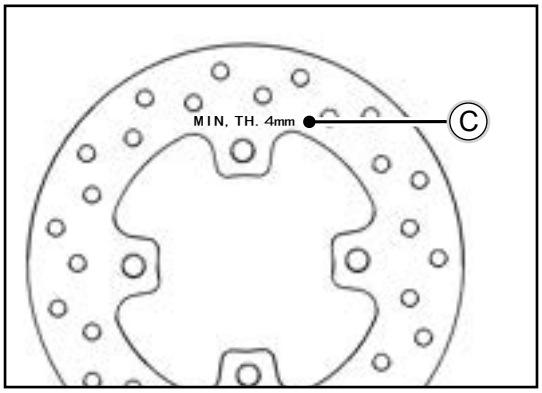
Disc Installation

- The disc must be installed with the marked side 【C】facing toward the steering knuckle.
- Apply a non-permanent locking agent:

Disc Mounting Bolts

- Tighten:

Torque - Disc Mounting Bolts
38 N·m (3.8 kgf·m, 28 ft·lb)



- After installing the discs, check the disc runout. Completely clean off any grease that has gotten on either side of the disc with a high flash-point solvent. Do not use one which will leave an oily residue.

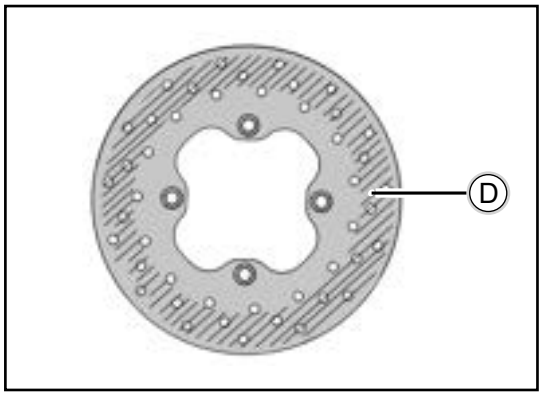
Disc Wear

- Measure the thickness of each disc at the point 【D】where it has worn the most.
- Replace the disc if it has worn past the service limit.

Disc Thickness

Standard: 4.8 ～ 5.2mm (0.19 ～ 0.205 in.)

Service Limit: 4 mm (0.16 in.)

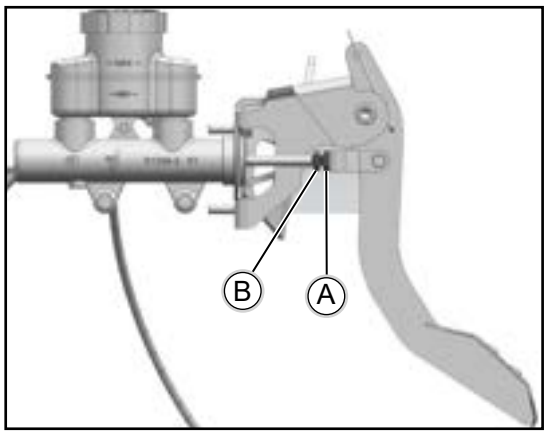


BRAKE HOSES

Brake Hose Inspection

- Refer to the Brakes in the Periodic Maintenance chapter.
- Brake Hose Replacement
- Refer to the Brakes in the Periodic Maintenance chapter.

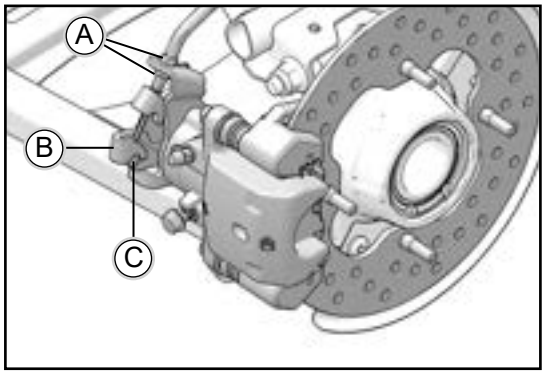
BRAKE PEDAL



Brake Pedal Position Adjustment

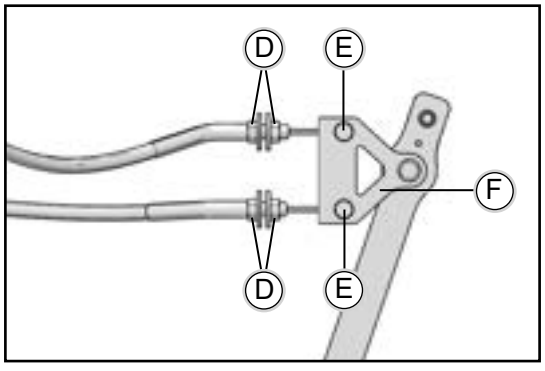
- Loosen the locknut 【A】, and turn the adjusting bolt 【B】 until the brake pedal is correctly positioned.
- Tighten the locknut.
- Check the brake pedal free play .

PARKING CABLE



Parking cable removal

- Take the head of the parking cable【C】out of the rotating arm【B】in the rear brake
- Disassemble 2 pieces of M8 nuts 【A】
- Remove the middle guard plate, loosen the corresponding 4 pieces of M8 nuts【D】on the parking cable to be dismantled, and then take the corresponding parking cable head【E】out of the splitter plate【F】.



Installation of parking cable

The installation of the parking cable can be completed according to the reverse order of the above-mentioned "parking cable removal".

STEERING SYSTEM

EXPLODED VIEW OF STEERING SYSTEM（NON-EPS MODELS） 12-2
STEERING WHEEL REMOVAL (NON-EPS MODELS) 12-3
STEERING SHAFT REMOVAL (NON-EPS MODELS) 12-4
BEARING REPLACEMENT..... 12-6
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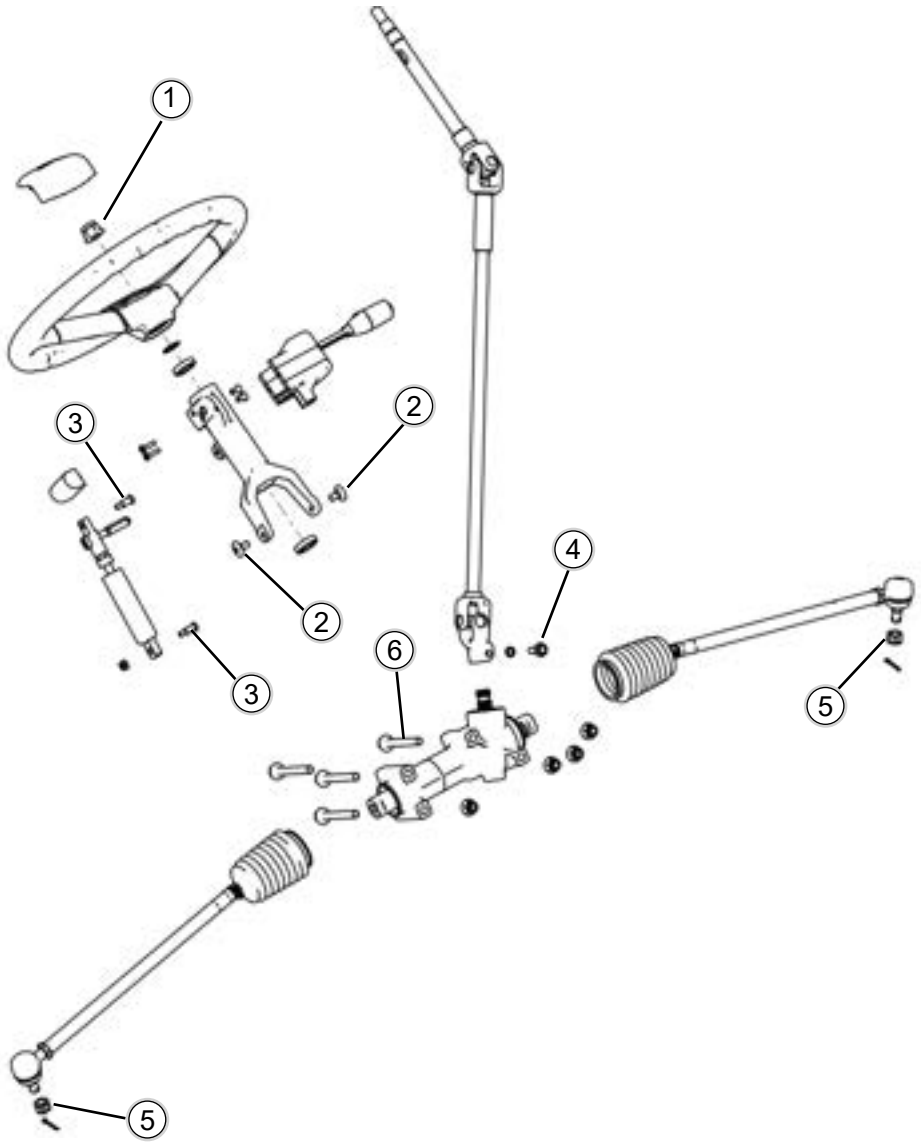
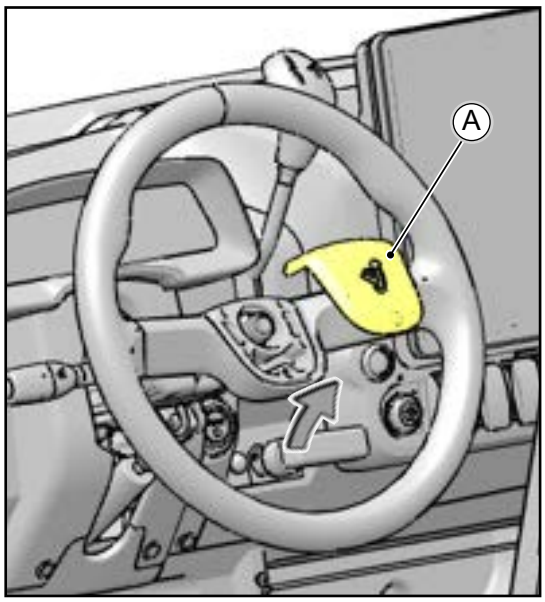
INSTALLATION OF STEERING SYSTEM 12-12

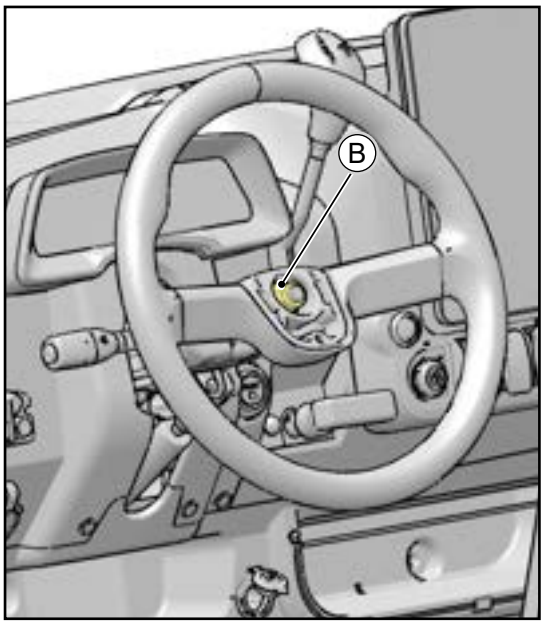
EXPLODED VIEW OF STEERING SYSTEM（NON-EPS MODELS）

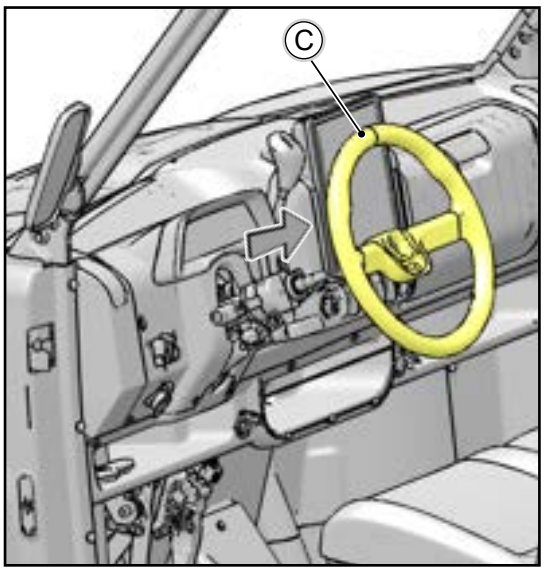


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Nut M14×1.5	70	7.1	52	
2	Step bolt M8	23	2.3	17	Thread fastening glue
3	Step bolt M6	10	1	7.5	
4	bolt M8×25	35	3.6	26	
5	Slotted nut M12	45	4.6	33	
6	Bolt M10×1.25×95	70	7.1	52	

STEERING WHEEL REMOVAL (NON-EPS MODELS)







⚠ CAUTION

This procedure is suitable for non-EPS models, using this procedure to operate the EPS models vehicle may cause damage to the EPS or power steering system.

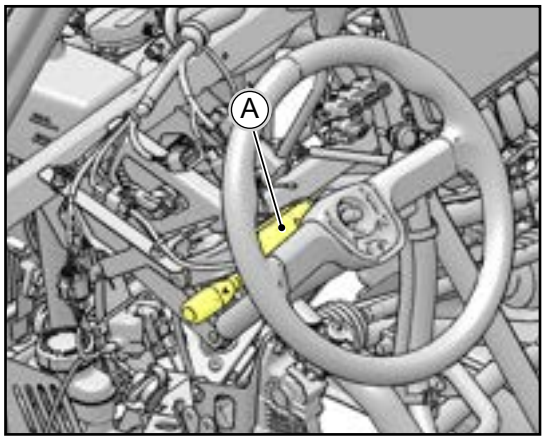
【A】Steering wheel cover
【B】Nut
【C】Steering wheel

◆ Remove the steering wheel cover【A】in the direction of the arrow

◆ Remove the steering wheel fixing nut【B】

◆ Remove the steering wheel in the direction of the arrow【C】
◆ If the steering wheel cannot be removed, please continue to follow this procedure to remove the steering shaft

STEERING SHAFT REMOVAL (NON-EPS MODELS)



【A】Integrated switch

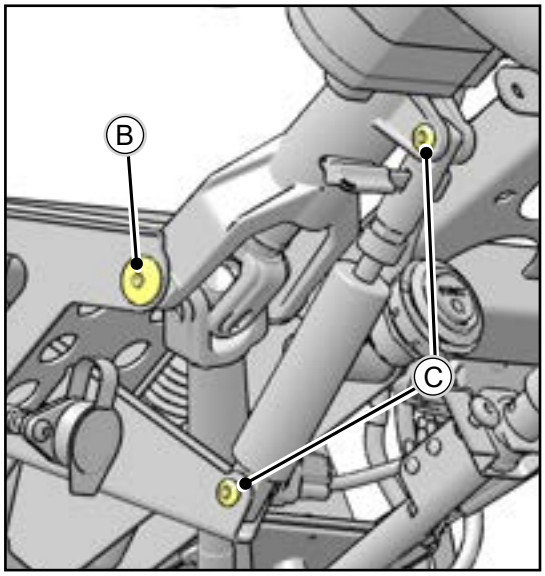
【B】Steering column bolt

【C】Gas spring bolt

【D】Steering shaft

【E】steering wheel

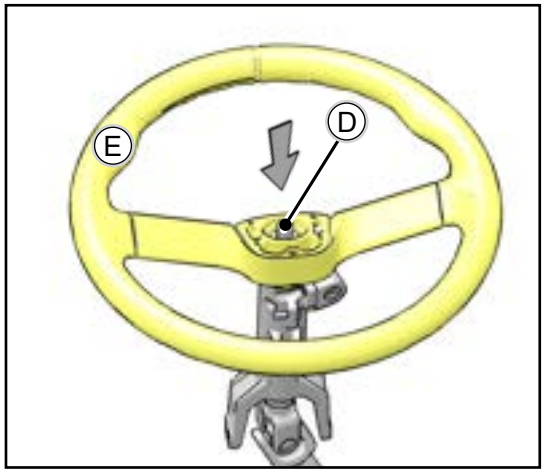
- Remove interior parts such as instrument panel, refer to (see “vehicle body”)
- Remove the integrated switch【A】



- Remove the bolts【B】on both sides of the steering column
- Remove the gas spring bolt【C】, and remove the steering column assembly

⚠ WARNING

Since the gas spring contains high-pressure gas, please do not burn it or dismantle it privately, otherwise it may explode.

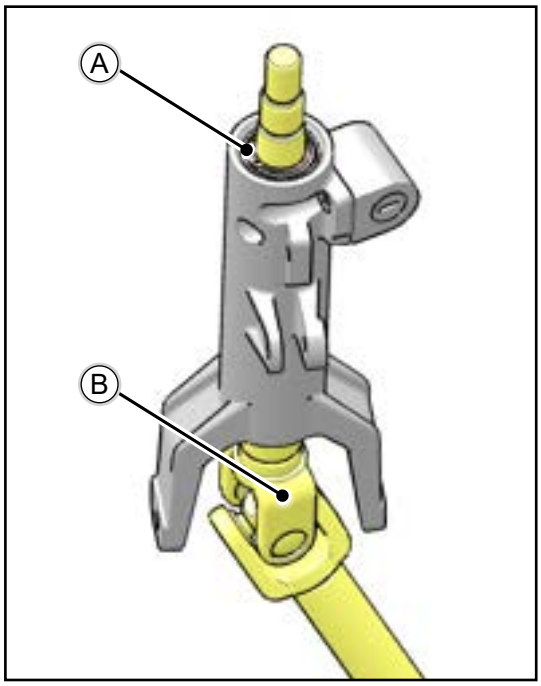


- Fix the steering wheel on the vise and hit the steering shaft【D】with a hammer to separate the steering wheel【E】from the cone of the steering shaft;

⚠ CAUTION

Be careful not to damage the threaded when hitting the steering shaft.

STEERING SHAFT REMOVAL (NON-EPS MODELS)



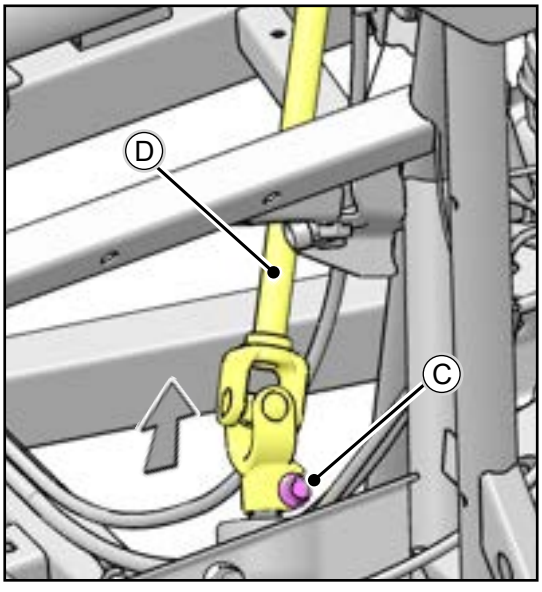
【A】Circlip for shaft

【B】Upper section of steering shaft

【C】Bolt

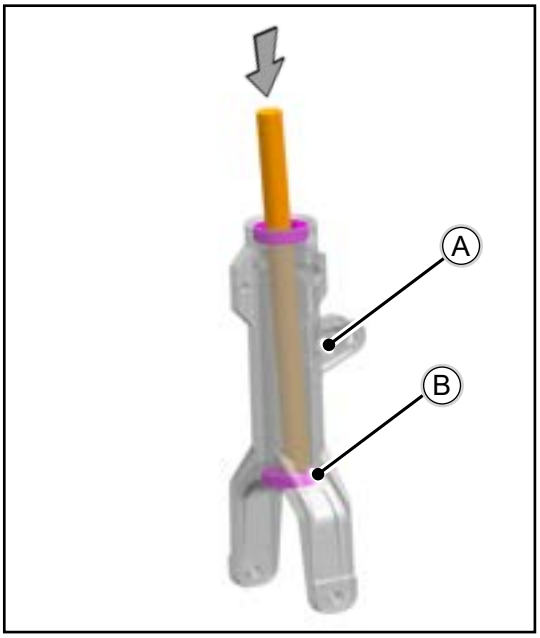
【D】Lower section of steering shaft

◆ Remove the circlip for the shaft【A】, and remove the upper section of the steering shaft【B】



◆ Remove the fixing bolt【C】, and remove the lower part of the steering shaft【D】

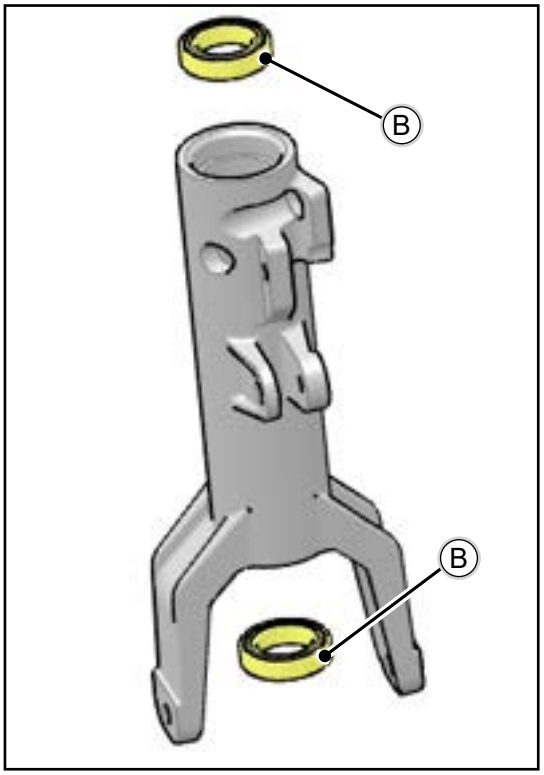
BEARING REPLACEMENT



【A】Steering column

【B】Steering

◆ Clamp the steering column【A】with a vise, use a suitable crowbar to go deep into the steering column, and knock out the bearings【B】at both ends;

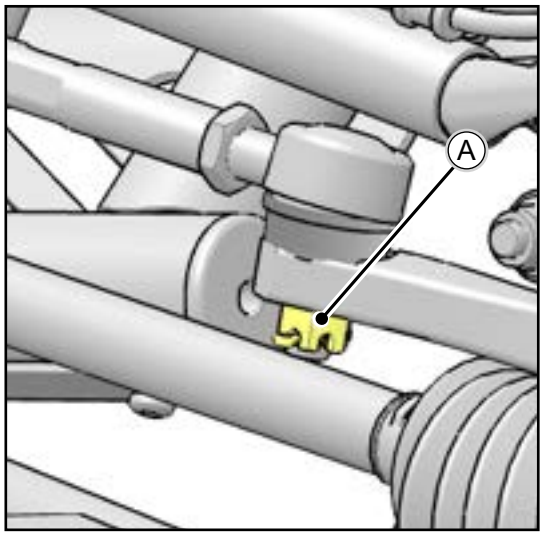


◆ Using a bearing driver, press the bearings【B】at both ends into the steering column on the pressure equipment【B】

⚠ CAUTION

Before installing the bearing, make sure that the bearing is intact without scratches and corrosion. The bearing and the hole are cleaned and free of impurities. The bearing can be flexibly rotated by hand after pressing.

STEERING MACHINE REMOVAL (NON-EPS MODELS)



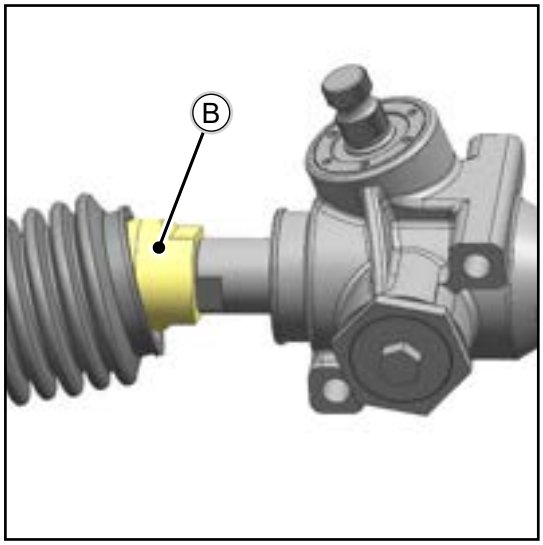
【A】Nut

【B】Steering rod

【C】Bolt

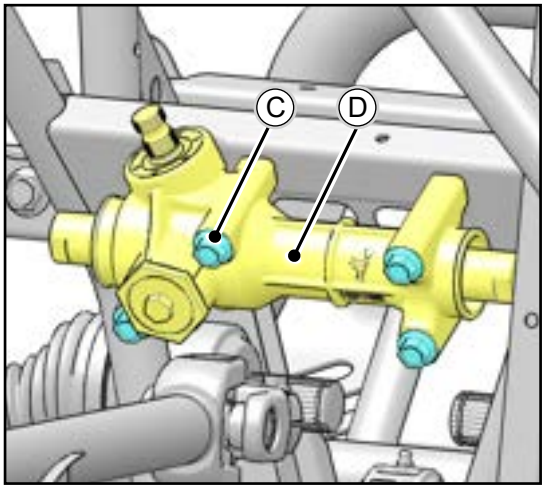
【D】Steering machine

◆ Remove the steering rod nut【A】



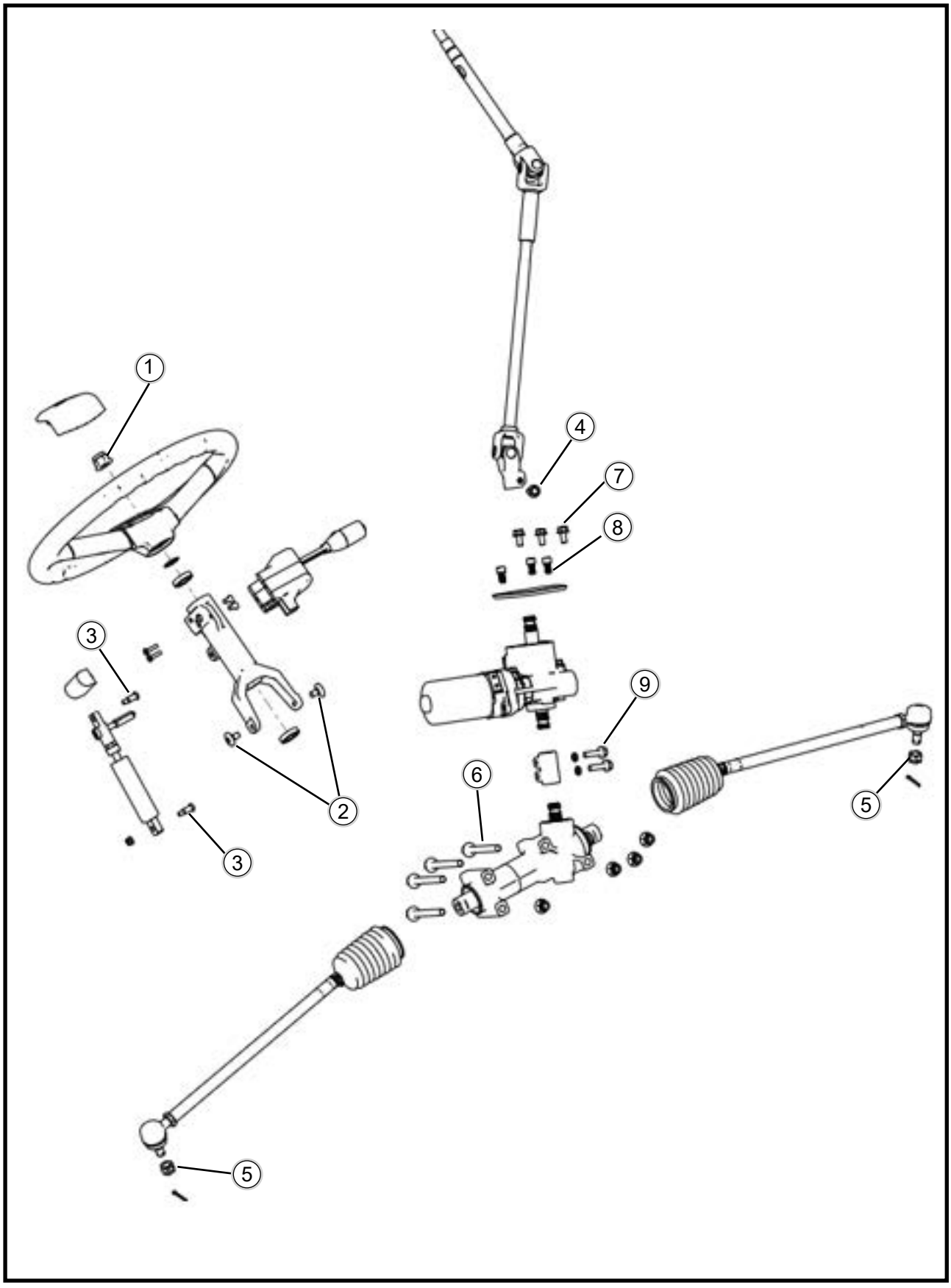
◆ Pull out the corrugated sleeve of the steering rod, and use an open-end wrench to remove the ball end of the steering rod【B】

Steering rod[B] ball end assembly torque(apply thread fastening glue)
115 N·m（11.7kgf·m，84.7 ft·lbs）



◆ Remove the 4 fixing bolts【C】, and remove the steering machine【D】

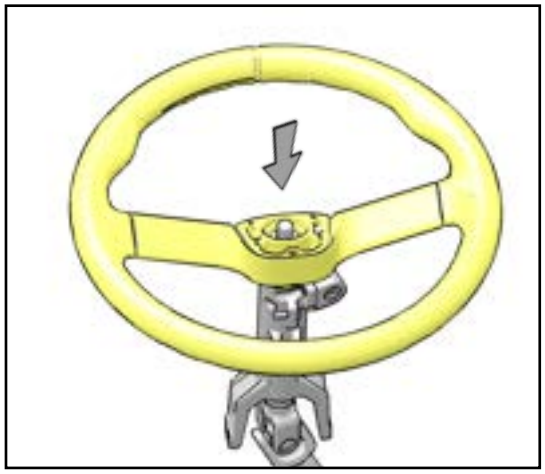
EXPLODED VIEW OF STEERING SYSTEM (EPS MODELS)



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lbs	
1	Nut M14×1.5	70	7.1	52	
2	Step bolt M8	23	2.3	17	L
3	Step bolt M6	10	1	7.5	
4	Bolt M8×25	35	3.6	26	
5	Slotted nut M12	45	4.6	33	
6	Bolt M10×1.25×95	60	6.0	44.3	
7	Bolt M8×16	23	2.3	17	L
8	Bolt M8×16	23	2.3	17	L
9	Bolt M8×35	35	3.6	26	

L: Apply a non-permanent locking agent.

STEERING SHAFT REMOVAL (EPS MODELS)



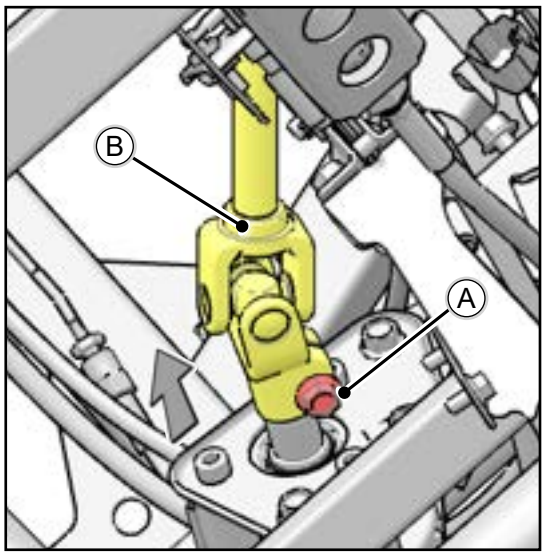
⚠ CAUTION

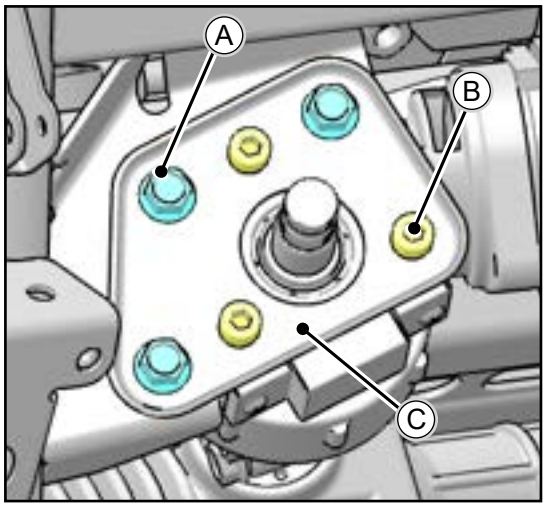
Knocking on the steering wheel or steering shaft incorrectly may cause permanent damage to the EPS unit or power steering system.

【A】Bolt

【B】Lower section of steering shaft

- Lower section of steering shaft
- Remove the upper section of steering shaft according to "Steering shaft removal (Non-EPS Models)";
- Remove the fixing bolt【A】
- Remove the lower part of the steering shaft【B】





EPS MOTOR REMOVAL

【A】Bolt

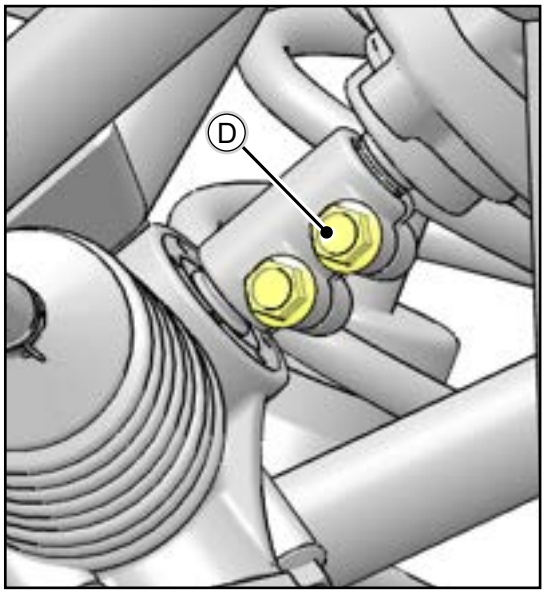
【B】Bolt

【C】Mounting plate

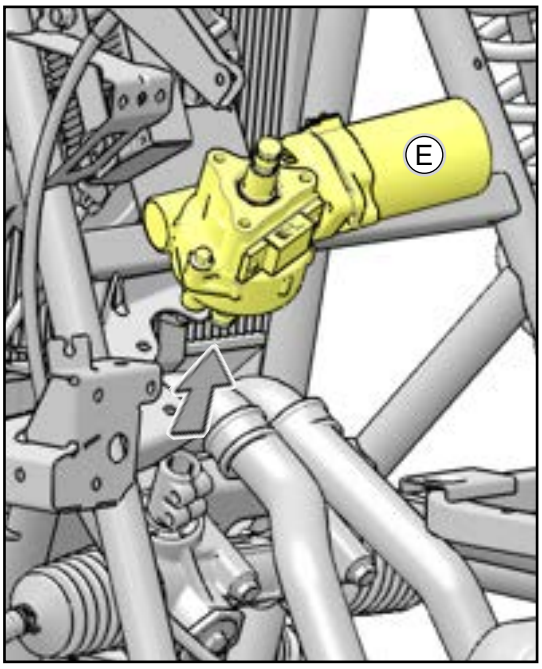
【D】Bolt

【E】EPS motor

- Remove the fixing bolt [A];
- If you need to replace the EPS motor, remove the fixing bolt [B], and remove the mounting plate【C】



- Remove the fixing bolt 【D】



- Disassemble the wire harness connector of the EPS motor
- Remove the EPS motor【E】in the direction of the arrow

INSTALLATION OF STEERING SYSTEM

- Reverse install steering machine according to removal procedure

- Install the steering rod in the reverse direction of the removal procedure, and check the left and right steering rods to be the same length before installation

- Before installing the steering shaft or EPS, it is necessary to ensure that the two front wheels are facing straight ahead, and the steering shaft is not rotated during the assembly process

- Connect the power and signal wiring harness of the EPS motor

- After the installationd, the toe parameters of the front wheels need to be adjusted (see“wheel” for details) to ensure that the vehicle can drive in a straight line

Adjust the installation angle of the steering wheel so that the turns of left and right turning is the same, and the steering wheel is centered when driving in a straight line

- Tighten the steering wheel nut according to the torque requirement, and install the steering wheel cover

- Check function of each switch and test EPS.

VEHICLE BODY AND FRAME

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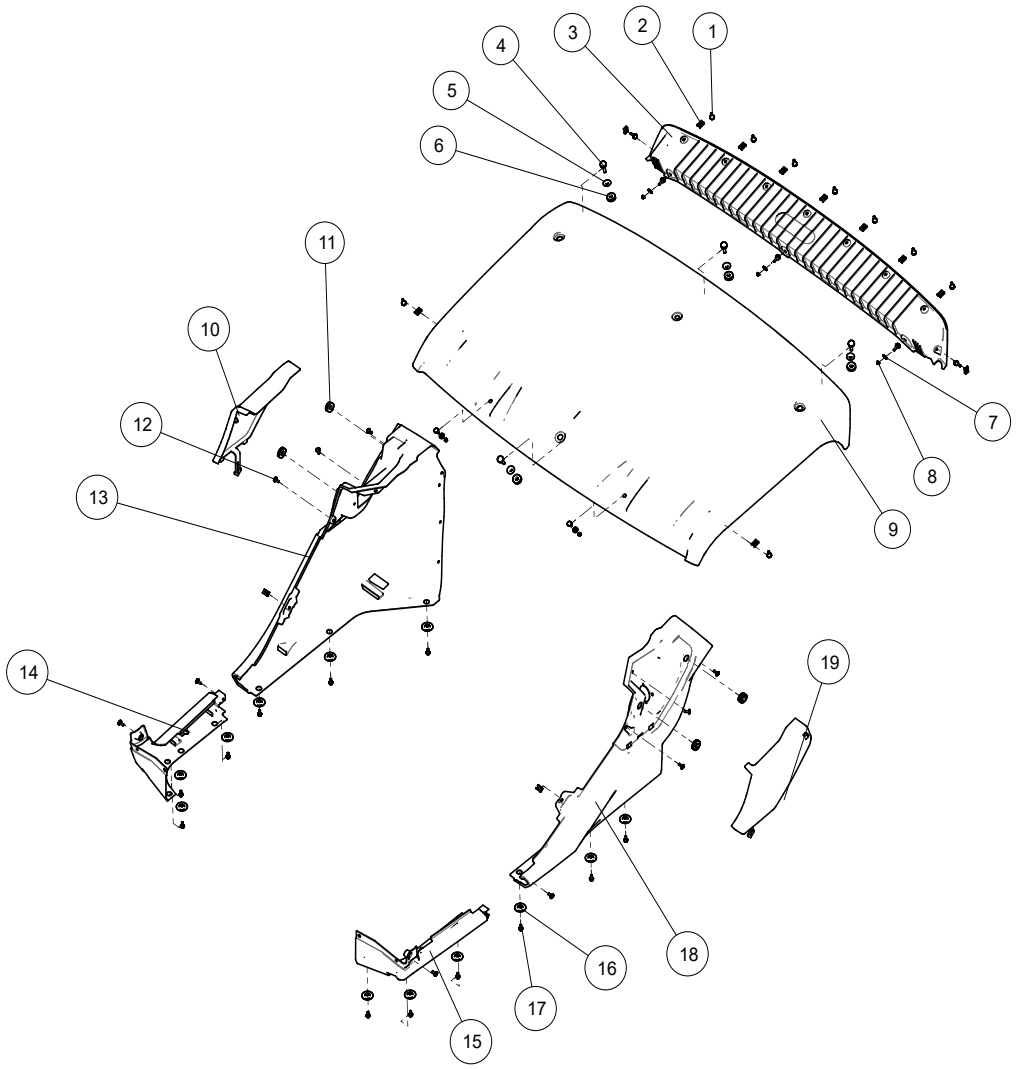
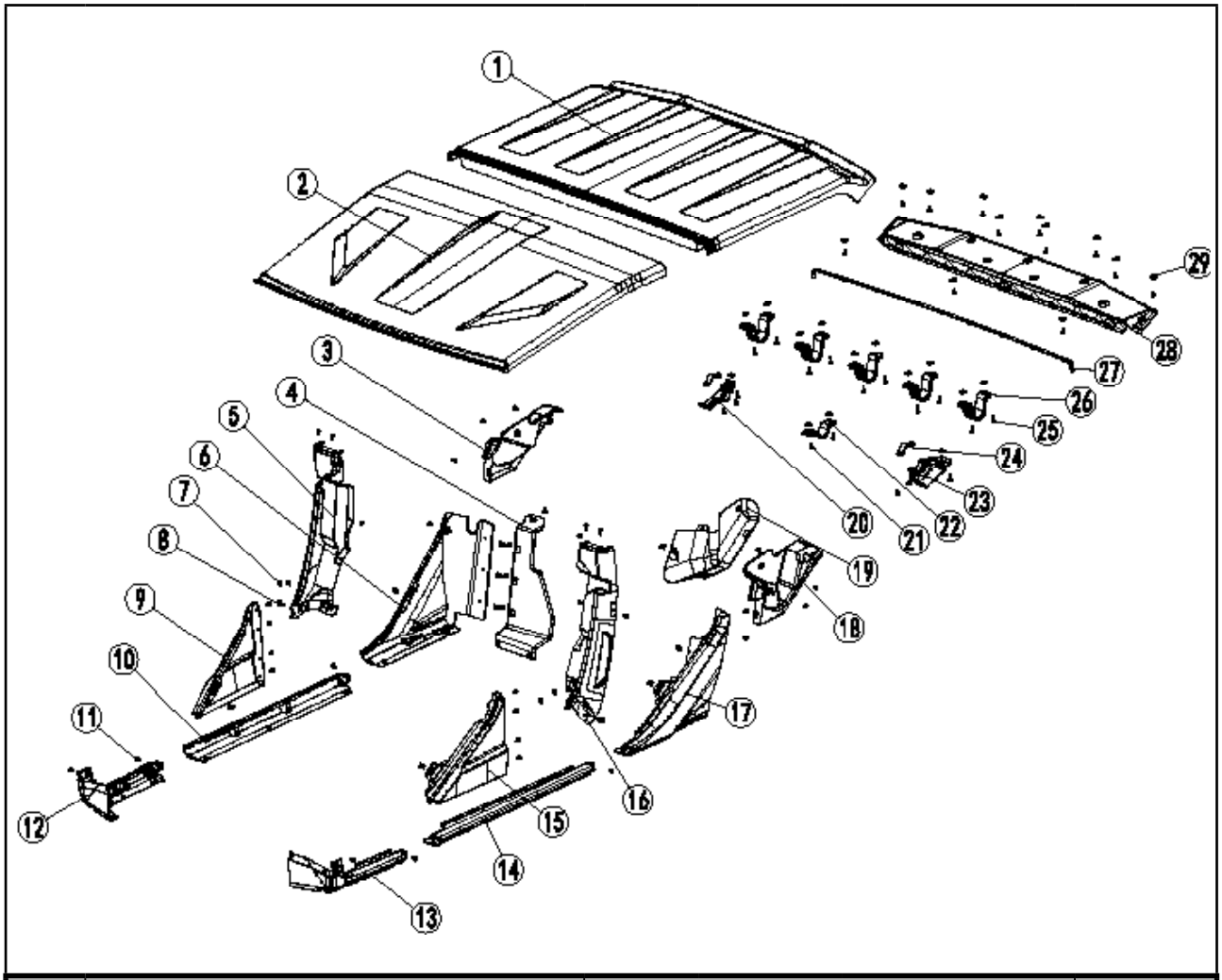
EXPLODED VIEW OF ROOF (SINGLE CAB)



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Large pan head hexagon socket bolt M6×20	8~12	0.8~1.2	69~103.6 in·lb	
2	nut clamp M6				
3	roof tail				
4	Large pan head hexagon socket bolt M8×35	30 ～ 40	3.0~4.0	22.1~29.5	
5	Roof flanging bushing				
6	I-shaped rubber pad				
7	Large washers A grade 6				
8	Hexagon flange lock nuts with non-metallic inserts M5				
9	Roof				
10	Charging port cover				

11	Waist I-shaped rubber ring				
12	Hexagon socket bolt with large pan head M6×16				
13	Rear section of right side cover				
14	Front section of right side cover				
15	Front section of left side cover				
16	Fisheye washer				
17	Hexagon flange boltsM6×16				
18	Rear section of left side cover				
19	Fuel filler cap				

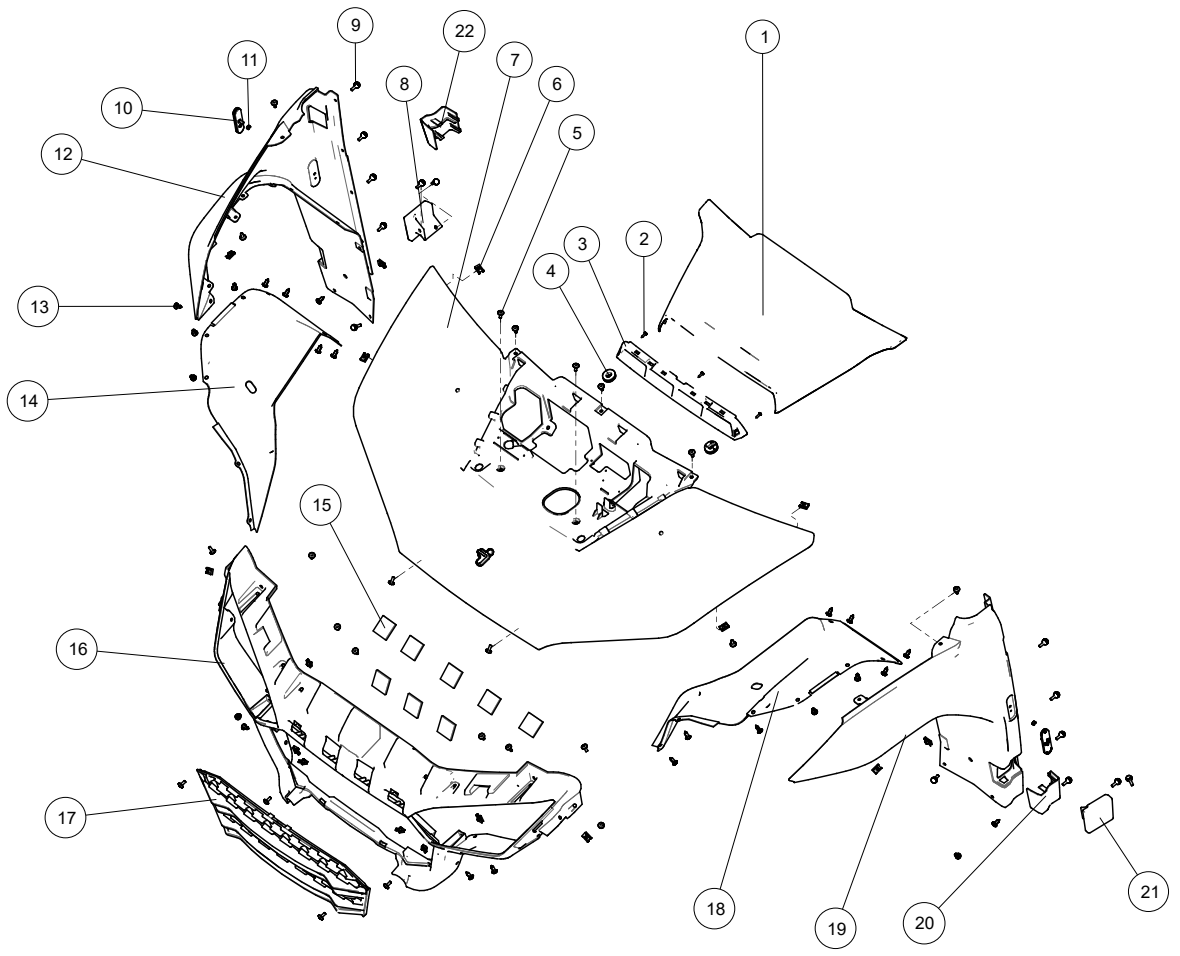
EXPLODED VIEW OF ROOF (CREW CAB)



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear roof				
2	Front roof				
3	Right handle shield				
4	Rr inner fender				
5	Cab rr coverplate				
6	Rear section of right panel				
7	Expansion buckle kit				
8	Large pan head hexagon socket bolt m8×25				
9	Middle section of right panel				
10	Middle section of right bottom guard				
11	Large pan head hexagon socket bolt m6×16				

12	Front section of right panel_pp black_ leather grain				
13	Front section of left panel_pp black_ leather grain				
14	Middle section of left bottom guard				
15	Middle section of left panel				
16	Cab rl coverplate				
17	Rear section of left panel				
18	Left handle shield				
19	Fuel filler flap				
20	Right inner roof cover				
21	Large pan head hexagon socket bolt m6×20				
22	U-pressing plate 2				
23	Left inner roof cover				
24	Inner roof cover hoop				
25	Large pan head hexagon socket bolt m6×25				
26	U-pressing plate				
27	Roof center sealing strip				
28	Roof tailpiece				
29	M6 nut clip				

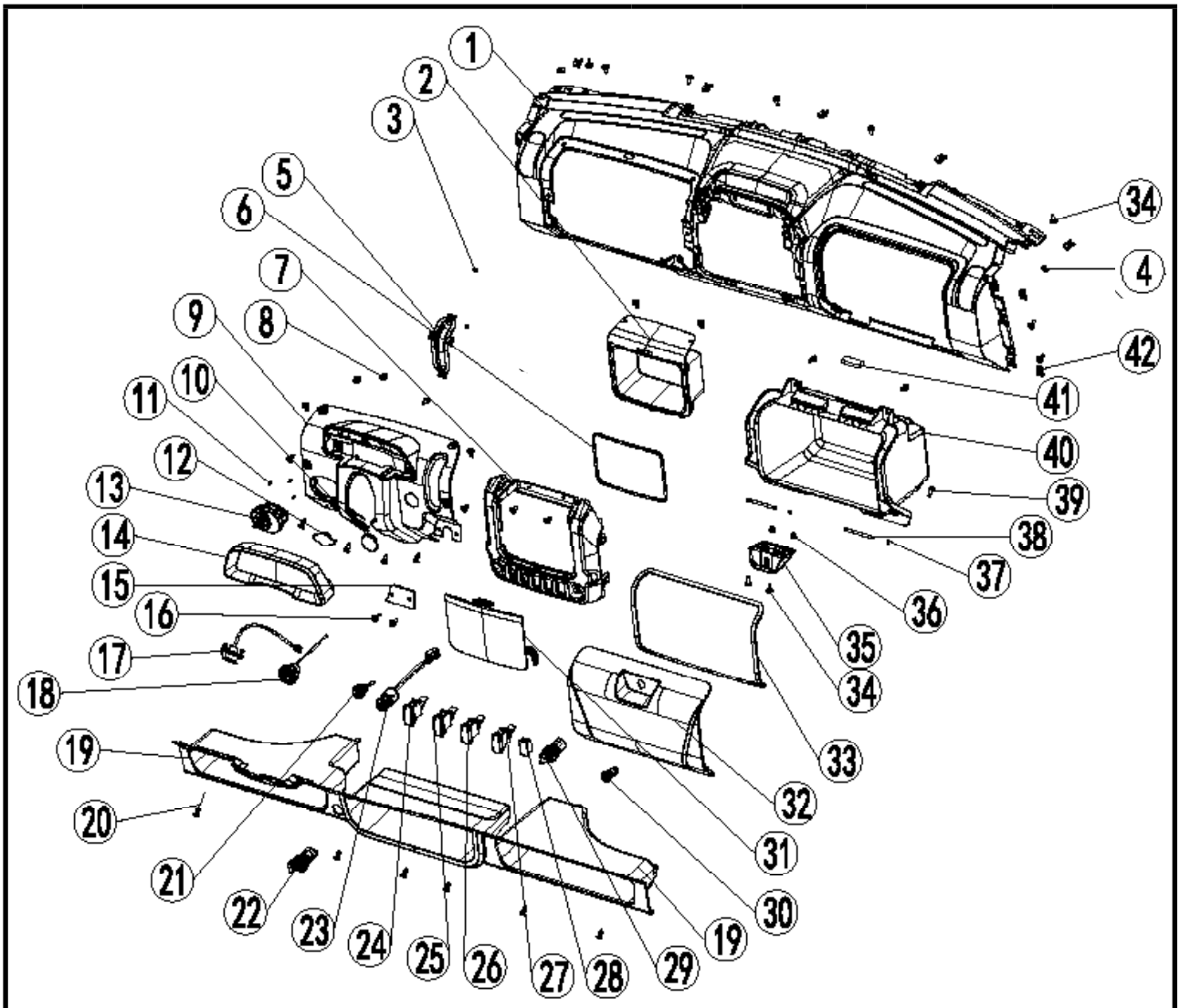
EXPLODED VIEW OF BODY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front access cover				
2	Cross recessed pan head tapping screws ST4.2×16				
3	Maintenance cover air guide grille				
4	Waist I-shaped rubber ring				
5	Large Pan Head Hexagon Bolt M6×16	8~12	0.8~1.2	69~103.6 in·lb	
6	M6 nut clamp				
7	Front panel				
8	Right toeboard				

9	Large pan head hexagon socket bolt M6×20	8~12	0.8~1.2	69~103.6 in·lb	
10	Capsule reflector (amber)				
11	Type 1 hexagon nut M6				
12	Right front wheel mudguard				
13	Expansion buckle components				
14	Right front headlight mask				
15	Battery foam pad				
16	Headlight mask plate				
17	Forward wind barrier				
18	Left front headlight guard				
19	Left front wheel mudguard				
20	Lower blocking cover of left door hinge				
21	Left foot guard				
22	Lower blocking cover of right door hinge				

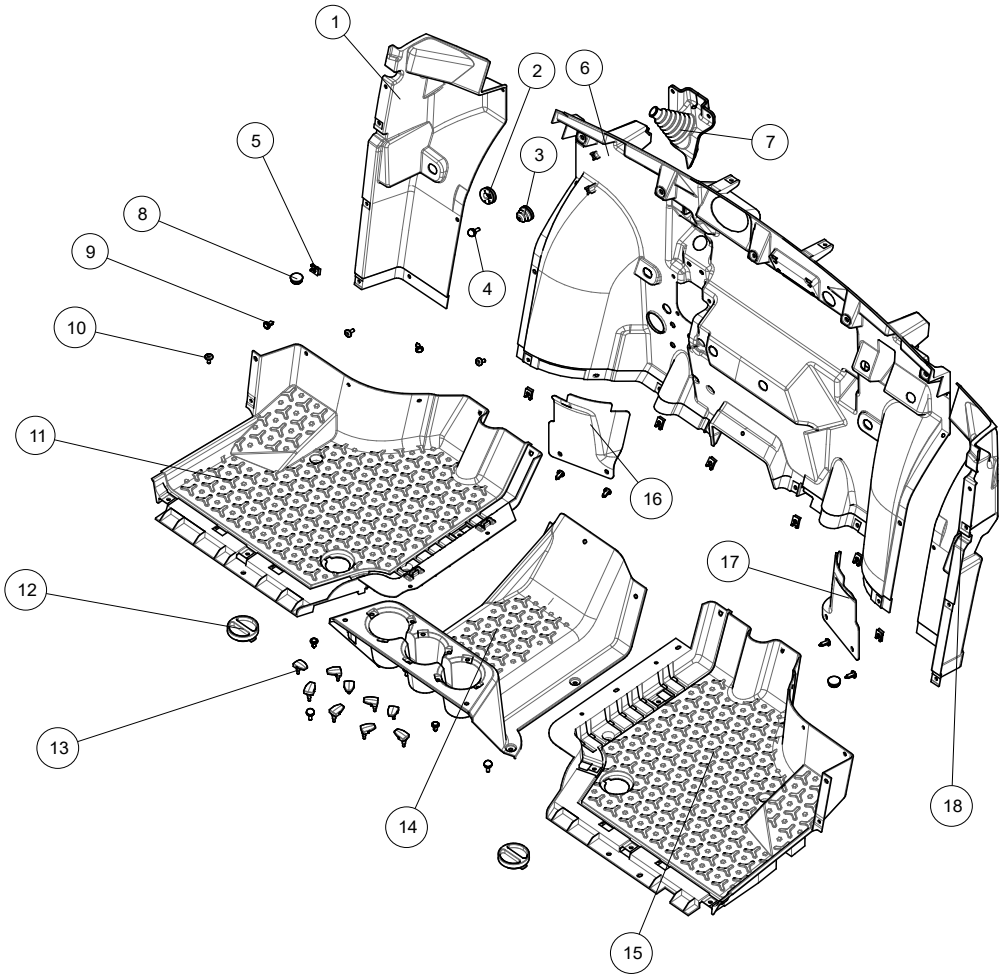
EXPLODED VIEW OF BODY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Instrument panel body				
2	Center storage box				
3	Cross recessed pan head tapping screws st4.2×13				
4	4.2 Self-tapping nail clamp				
5	Dustproof rubber for gearshift				
6	Sealing strip for center storage box				
7	Switch panel				
8	Hexagonal flange face bolt m6×12	8~12	0.8~1.2	69~103.6 in·lb	
9	Instrument cover				
10	Push start cap				
11	Self-tapping screws st2.9×8				

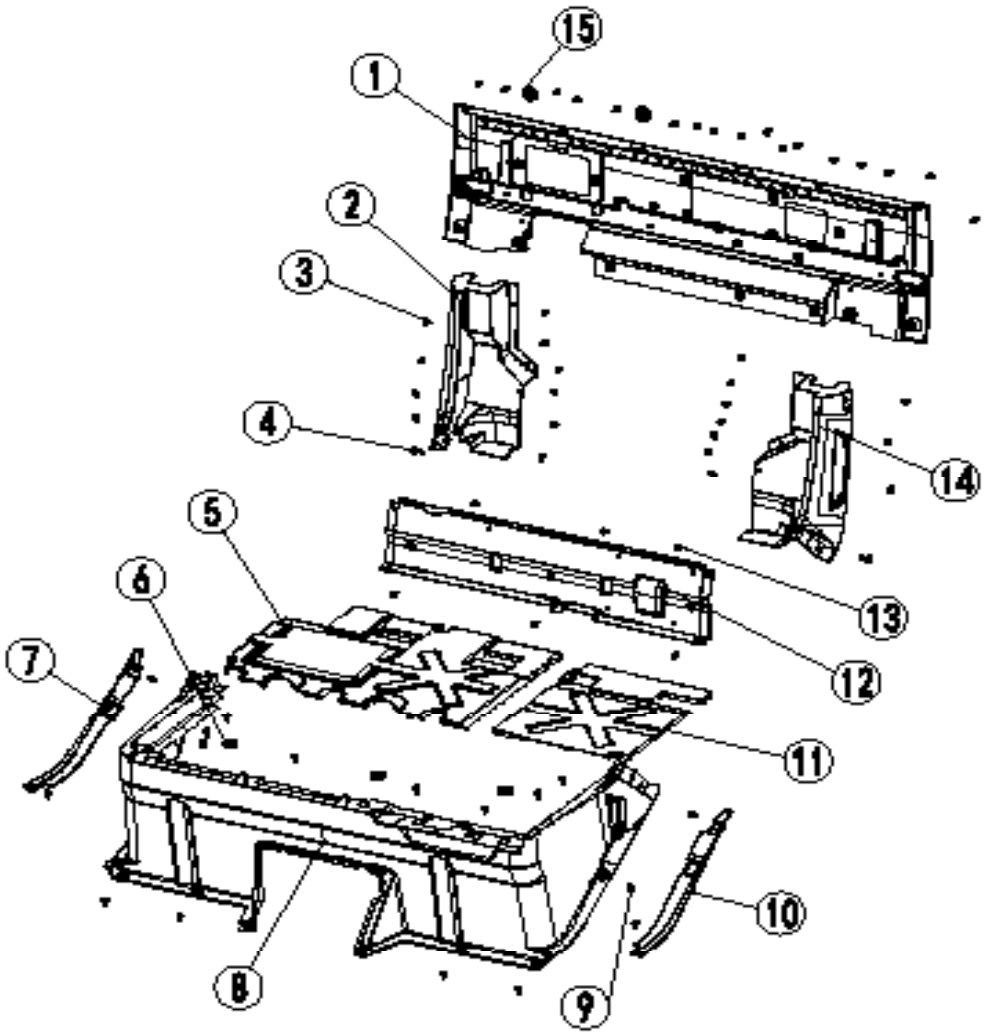
12	Winch socket cap				
13	2/4 Wd switch				
14	Instrument combination				
15	Handbrake cover				
16	Hexagon socket head cap screw m6×20	8~12	0.8~1.2	69~103.6 in·lb	
17	Winch switch socket				
18	Start button assembly				
19	Center console lower storage compartment				
20	Expansion buckle kit				
21	Intercom switch				
22	12V power outlet				
23	Ignition lock				
24	Flameout switch				
25	Emergency switch				
26	Mode switch				
27	Force-multiplier switch				
28	Blank cap				
29	Usb power outlet				
30	Utv storage box lock				
31	Center storage box cover				
32	Passenger storage box cover				
33	Passenger storage box seal				
34	Large pan head socket head cap screws m6×16	8~12	0.8~1.2	69~103.6 in·lb	
35	Passenger storage box latch				
36	Hexagonal flange locknut m6				
37	Split washer 5				
38	Passenger storage box rotating shaft				
39	Hexagonal flange bolt m6×16	8~12	0.8~1.2	69~103.6 in·lb	
40	Passenger storage box body				
41	Passenger storage box usb fixing strip				
42	M6 nut clip				

EXPLODED VIEW OF BODY



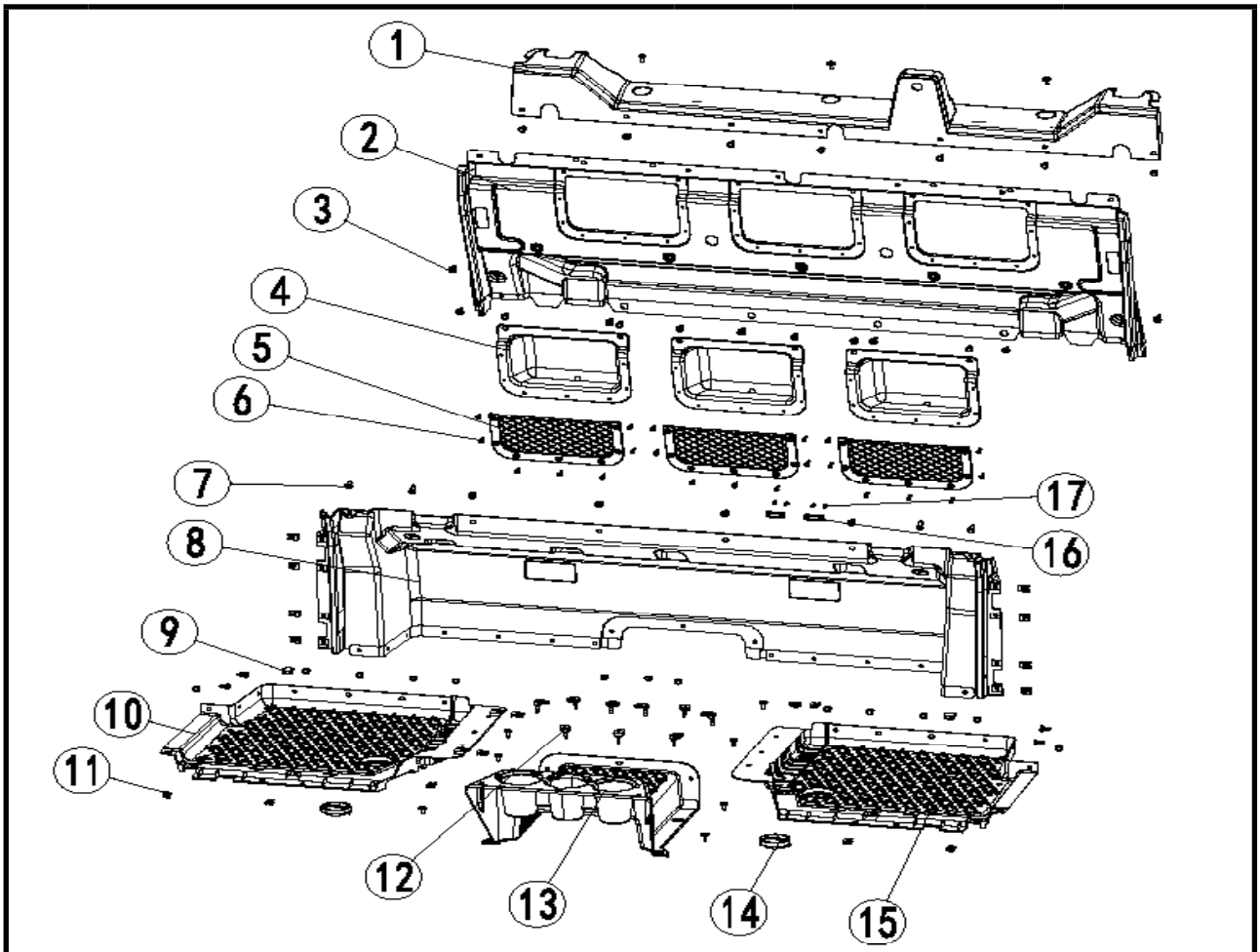
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front left bezel				
2	Waist I-shaped rubber ring				
3	Shift lock zipper bellows				
4	Large pan head hexagon socket bolt M6×20	8~12	0.8~1.2	69~103.6 in·lb	
5	M6 nut clamp				
6	Front middle baffle				
7	Steering cross shaft sealing sleeve				
8	Foot pedal screw plug				
9	Expansion buckle components				
10	Large pan head hexagon socket bolt M6×16	8~12	0.8~1.2	69~103.6 in·lb	
11	Left foot pedal				
12	Pedal cap				
13	Water cup fixing clip				
14	Middle guide cover				
15	Right foot pedal				
16	Left foot stab prevention board				
17	Right foot stab prevention board				
18	Front right baffle				

EXPLODED VIEW OF BODY



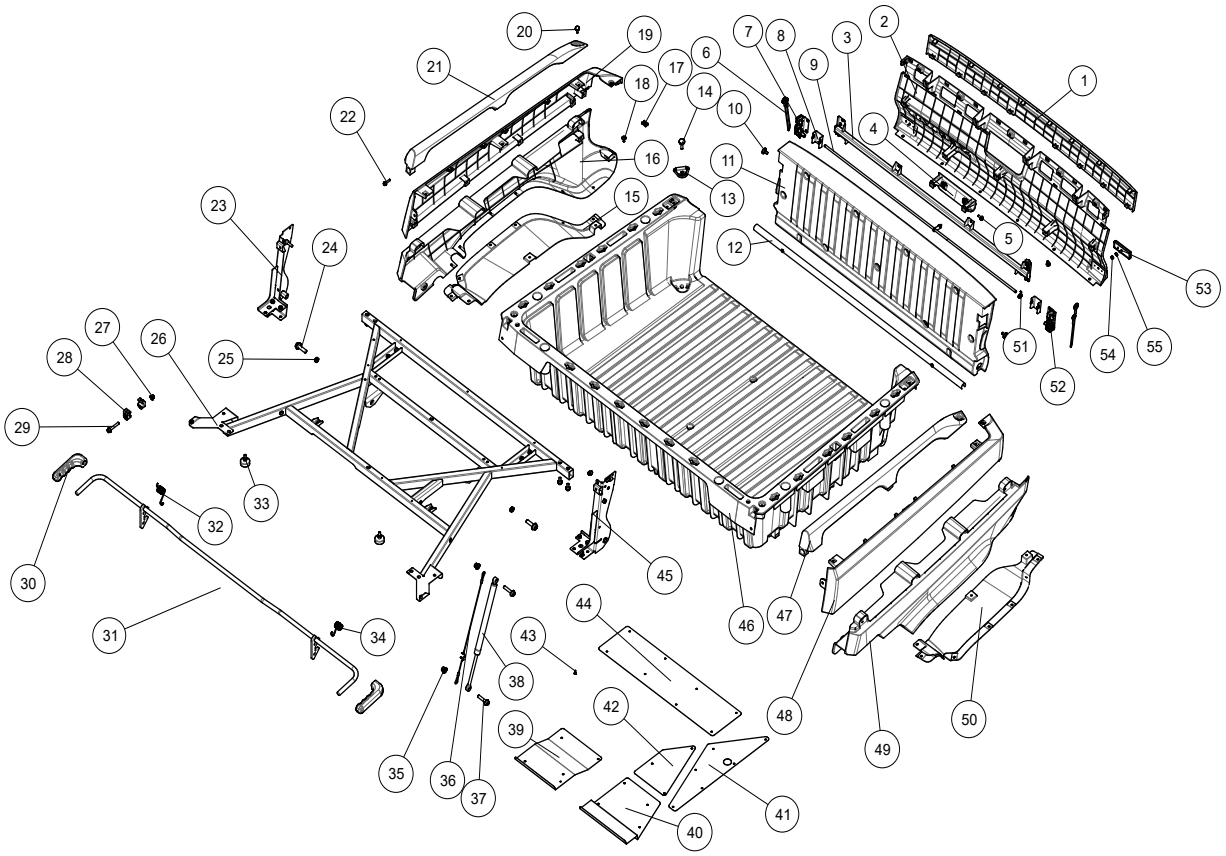
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Cab rear panel				
2	Rr cab panel				
3	Large pan head socket head cap screw m6×16	8~12	0.8~1.2	69~103.6 in·lb	
4	Large pan head socket head cap screw m8×25	30 ～ 40	3.0~4.0	22.1~29.5	
5	Seat lower cover				
6	Rubber ring				
7	Right lower guard of right seat				
8	Seat lower front guard				
9	Large pan head socket head cap screw m6×20	8~12	0.8~1.2	69~103.6 in·lb	
10	Left lower guard of left seat				
11	Driver's seat lower cover				
12	Seat rear guard				
13	Expansion buckle kit				
14	Rl cab panel				
15	Cab rear plate cap				

EXPLODED VIEW OF THE PLASTIC PARTS OF THE BODY (CREW CAB)



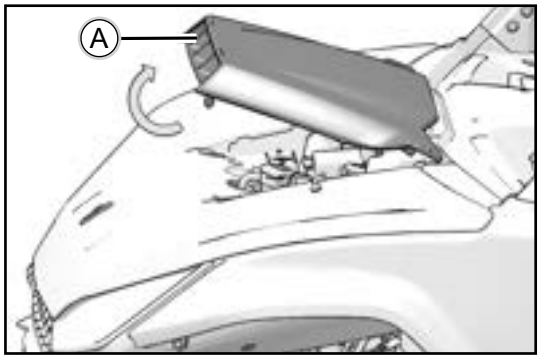
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Cab rear middle coverplate				
2	Middle section of cab rear panel				
3	Large pan head socket head cap screw m6×16				
4	Middle storage box				
5	Middle storage box cover				
6	Cross recessed large round head tapping screws st4.2×19				
7	Expansion buckle kit				
8	Floor connecting plate				
9	Floor screw cap				
10	Rl floor				
11	M6 nut clip				
12	Cup holder_nbr				
13	Rear tunnel floor cover				
14	Floor screw cap_pp black_leather grain				
15	Rr floor				
16	Press plate a				
17	Cross recessed pan head tapping screws st4.2×13				

EXPLODED VIEW OF BODY



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Cargo box door trim strip				
2	Outer door panel of cargo box				
3	Cargo box lock fixing bracket assembly				
4	Cargo box rear door handle				
5	Hexagon flange bolt M6×16				
6	Cargo box door panel cable assembly				
7	Right cargo box lock assembly				
8	Lock rod fixing bracket				
9	Cargo box lock lever assembly				
10	step bolt M8				
11	Inner door panel of cargo box				
12	Cargo box door hinge				
13	Rear cargo hook				
14	Large pan head hexagon socket bolt M8×35	30 ～ 40	3.0~4.0	22.1~29.5	
15	Right lower guard plate of cargo box				

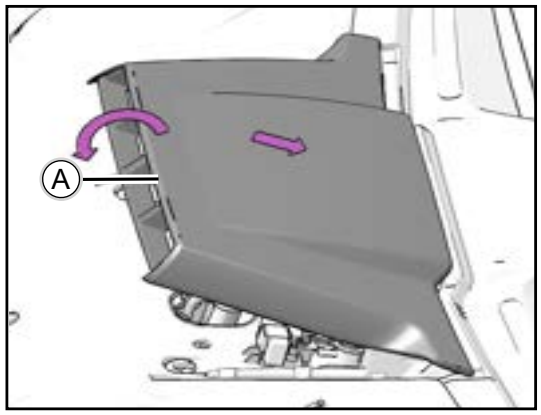
16	Right outer panel of cargo box				
17	M6 nut clamp				
18	Large pan head hexagon socket bolt M6×16	8~12	0.8~1.2	69~103.6 in·lb	
19	Cargo box right decorative cover				
20	Large pan head hexagon socket bolt M6×20	8~12	0.8~1.2	69~103.6 in·lb	
21	Right armrest of cargo box				
22	Hexagon flange boltM6×25	8~12	0.8~1.2	69~103.6 in·lb	
23	Right side panel assembly of cargo box				
24	Hexagon flange bolt M12×1.25×40 (black zinc)	50 ～ 60	5.0~6.0	36.9~44.3	
25	Cargo box bracket welding assembly				
26	Right front fixing bracket				
27	Hexagon flange lock nuts with non-metallic insert M8				
28	Cargo box lock hook fixing block				
29	Hexagon flange bolt M8×50	30 ～ 40	3.0~4.0	22.1~29.5	
30	Cargo box flip handle				
31	Cargo box lock hook welding assembly				
32	Cargo box lock hook right torsion spring				
33	Cargo box cushion block assembly				
34	Cargo box lock hook left torsion spring				
35	Non-metallic insert hexagonal flange face lock nut M10×1.25				
36	Cargo box cable assembly				
37	Hexagon flange bolt M10×1.25×45	40 ～ 50	4.0~5.0	29.5~36.9	
38	Pneumatic push rod assembly				
39	Cargo box insulation board Ⅱ				
40	Cargo box insulation board Ⅰ				
41	Cargo box insulation board Ⅳ				
42	Insulation board Ⅵ				
43	Cross recessed pan head tapping screws ST4.2×16				
44	Cargo box insulation board Ⅲ				
45	Left side panel assembly of cargo box				
46	Rear cargo box				
47	Left handrail of cargo box				
48	Cargo box left decorative cover				
49	Left outer panel of cargo box				
50	Cargo box left lower guard plate				
51	Cargo box door handle torsion spring				
52	Left cargo box lock assembly				
53	Square reflector (red)				
54	Type 1 hexagon nut M6				
55	Aluminum washer 6				



DISASSEMBLY OF THE PLASTIC PARTS OF THE VEHICLE BODY

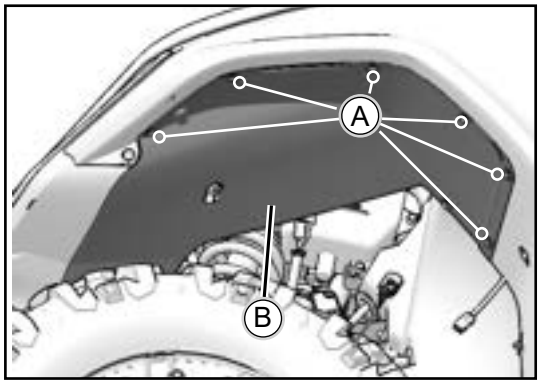
Access cover removal

- Grab the guide style grid hole with your hand and pull it up, and then pull the repair cover assembly【A】forward to remove【A】



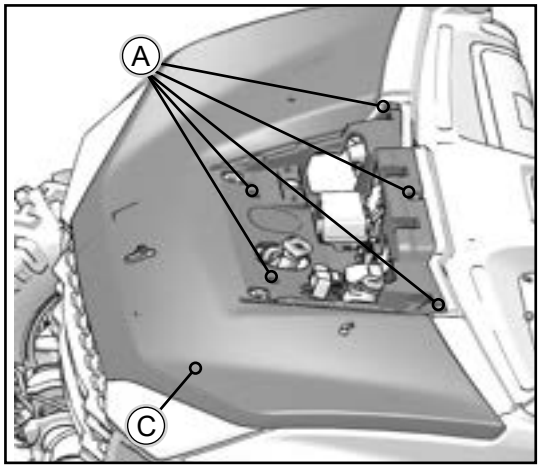
Access cover installation

- Insert the repair cover assembly【A】into the front panel obliquely, and then press the front part down into the clamp ring, and it can't be lifted slightly.



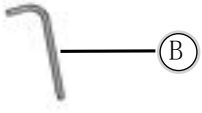
Headlight guard removal

- Use a flat-blade screwdriver and other suitable tools to remove the expansion nail【A】to remove the headlight shield【B】.

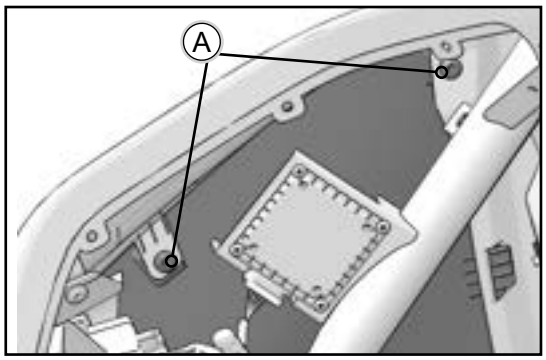


Front panel removal

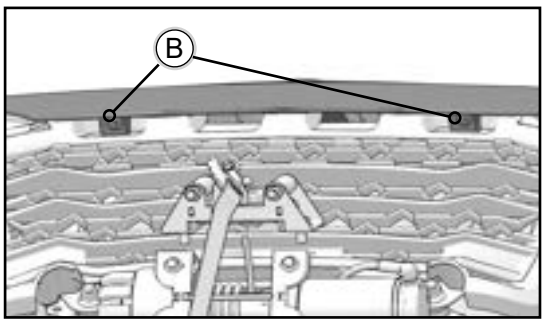
- Remove the repair cover assembly
- removal Headlight guard
- Use a 5mm Allen key【B】to remove the M6 bolt【A】



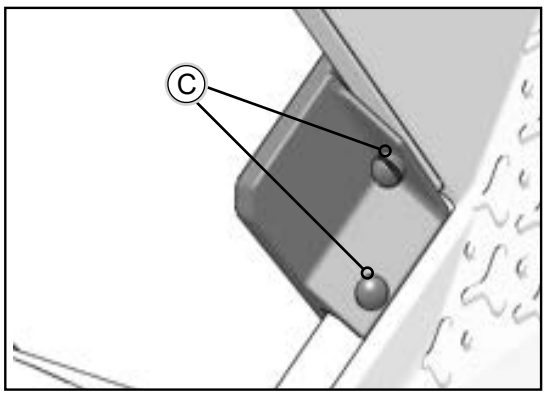
Front panel removal



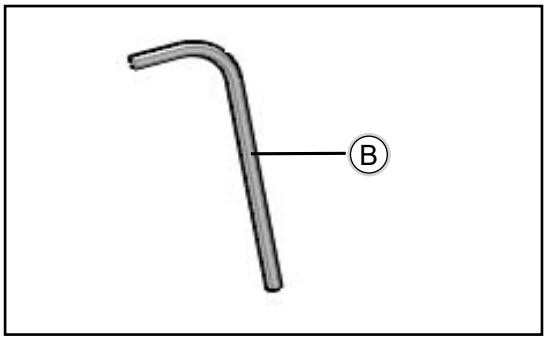
- Use a 5mm Allen key【B】to remove the M6 bolts【A】on the left and right sides

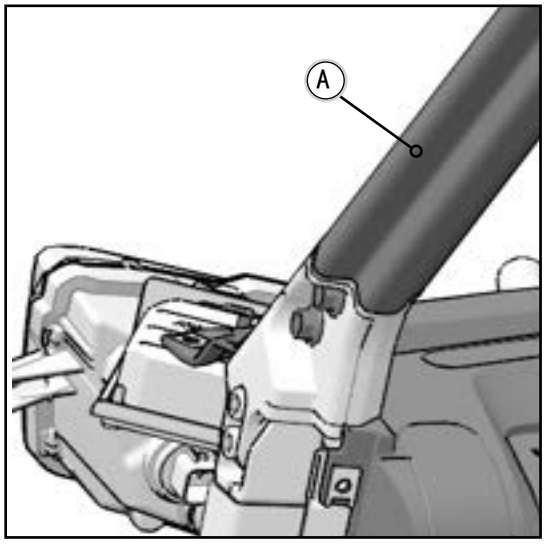


- Use a 5mm Allen key【B】to remove the M6 bolt【A】at the front lower part
- Grasp the front lower edge of the front panel and pull it forward to remove the front panel.



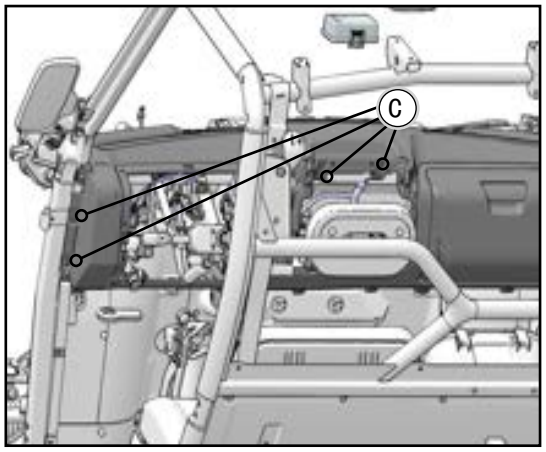
- Removal of left and right foot guards
- Use a 5mm Allen key【B】to remove the M6 bolt【A】to remove the foot stopper.



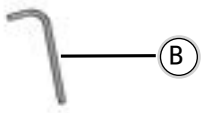


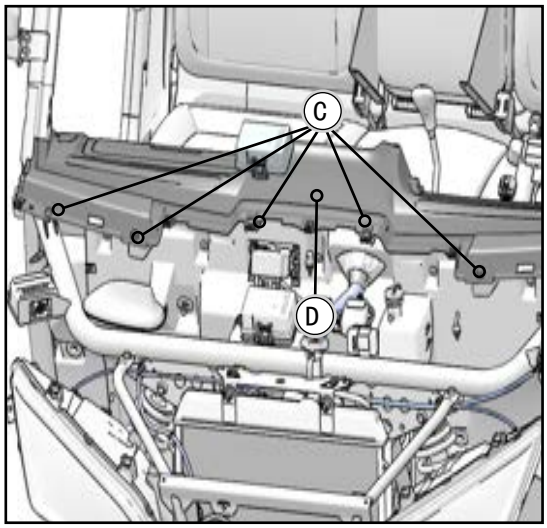
Instrument panel body assembly removal

- Remove the service cover assembly;
- Remove the headlight shield;
- Remove the front panel;
- Remove the footboard;
- Remove the front fender assembly;
- Remove the instrument cover assembly;
- Remove the middle storage box assembly;
- Remove the switch panel assembly;
- Remove the center console lower storage compartment assembly;
- Remove the left and right A-pillar welding assemblies【A】, see the cab frame repair diagram for details.



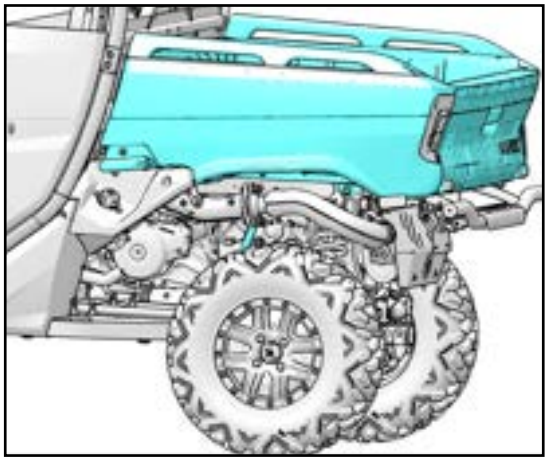
- Remove the M6 bolts【C】on both sides and in the center of the instrument panel body with a 5mm Allen wrench 【B】.



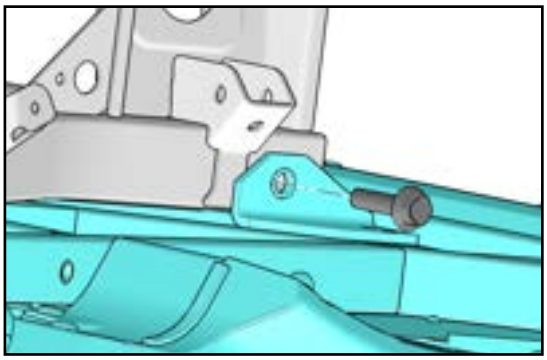


- Remove the M6 bolts【C】on the front of the instrument panel body with a 5mm Allen wrench 【B】
- Grab the instrument panel body【D】with your hand and pull it back, so that the positioning post at the bottom of the storage box body is detached from the rubber ring on the front plate, and then the instrument panel body assembly can be removed.

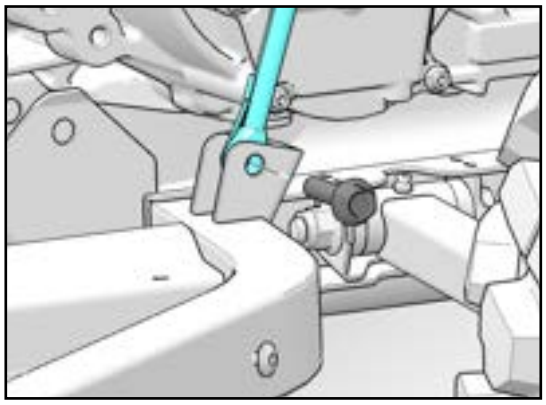
Removal of cargo box assembly



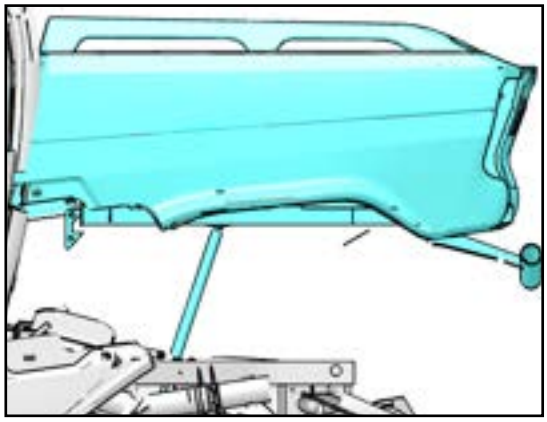
- Unplug the rear taillight from the cargo box.



- Remove the fastening bolts that attach the rear of the cargo box to the frame.

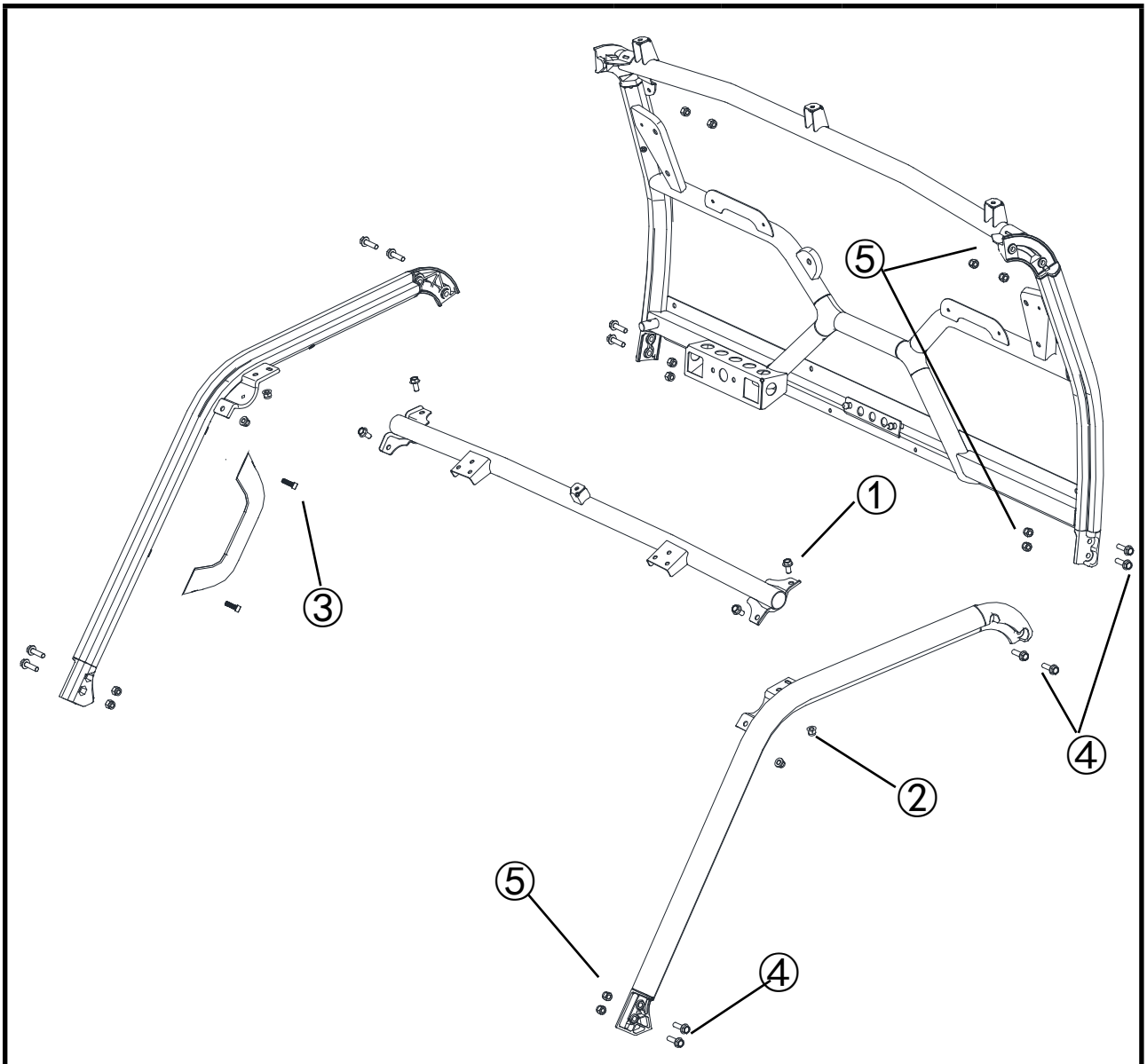


- Remove the fastening bolt from under the hydraulic spacer.



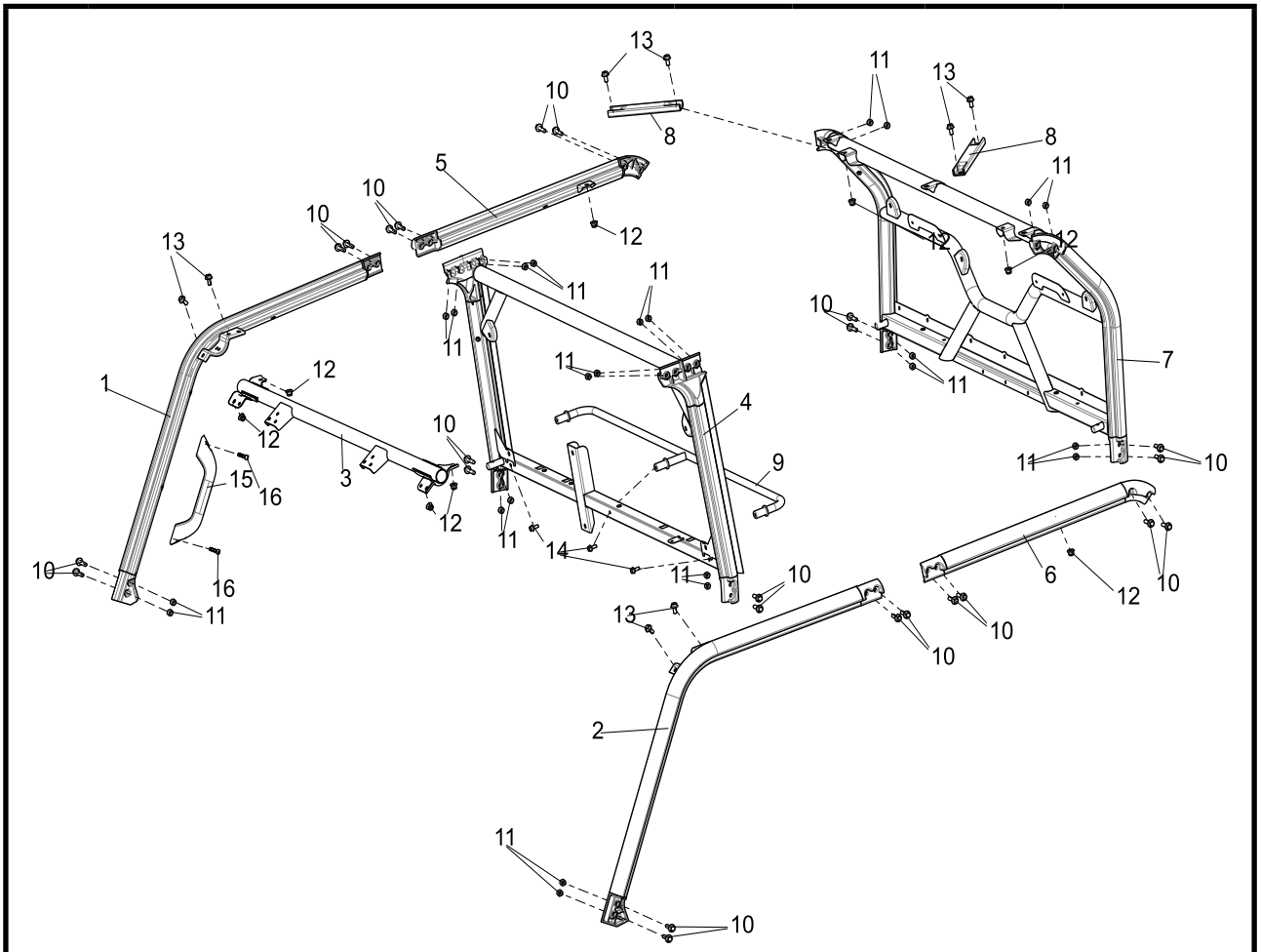
- The entire cargo box assembly can be removed at this point.

EXPLODED VIEW OF CAB (SINGLE CAB)

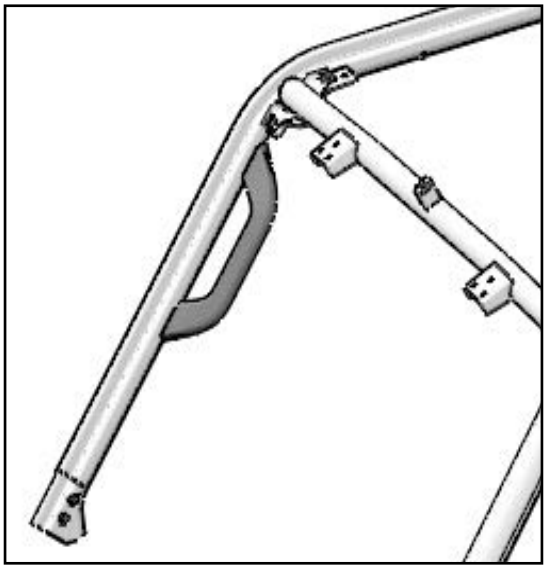


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon flange bolt M10×1.25×20	40～50	5. 0～6.0	30～37	
2	Hexagon flange lock nut M10×1.25	40～50	5. 0～6.0	30～37	
3	Hexagon socket head screw M8×25	30 ～ 40	3.0~4.0	22.1~29.5	
4	Hexagon flange bolt M10×1.25×35	40～50	5. 0～6.0	30～37	
5	Hexagon lock nut M10×1.25	40～50	5. 0～6.0	30～37	

EXPLODED VIEW OF CAB (CREW CAB)

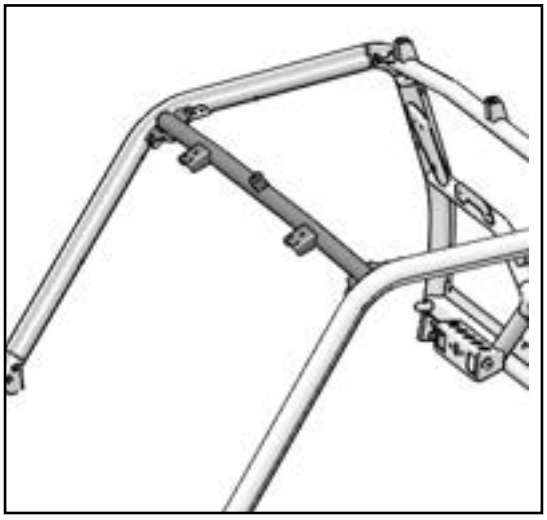


序号	名称	扭力值			备注
		N·m	kgf·m	ft·lbs	
1	Right a-pillar welding assembly				
2	Left_a-pillar welding assembly				
3	A-pillar connection welding assembly				
4	Front back beam welding assembly				
5	Rr roof beam welding assembly				
6	Rl roof beam welding assembly				
7	Rear back beam welding assembly				
8	Rear lower support pipe of top bar				
9	Rear handle assembly				
10	flange face bolt m10×1.25×35	40～50	5.0～6.0	30～37	
11	Hexagonal lock nut m10×1.25	40～50	5.0～6.0	30～37	
12	Hexagon flange lock nut m10×1.25	40～50	5.0～6.0	30～37	
13	Hexagonal flange bolt m10×1.25×20	40～50	5.0～6.0	30～37	
14	Hexagonal flange bolts m8×20	22～30	2.2～3.0	17～22	
15	Passenger handle assembly				
16	hexagon socket cheese head screws m8×25	22～30	2.2～3.0	17～22	

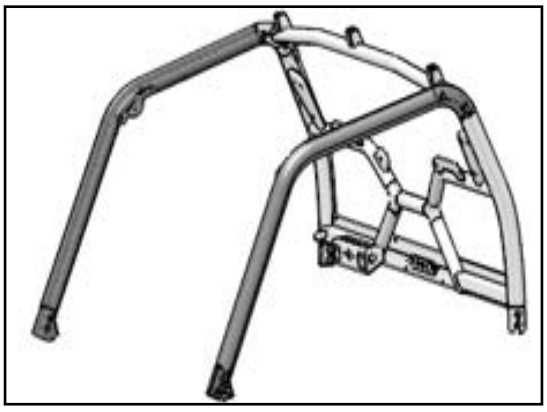


Cab frame disassembly

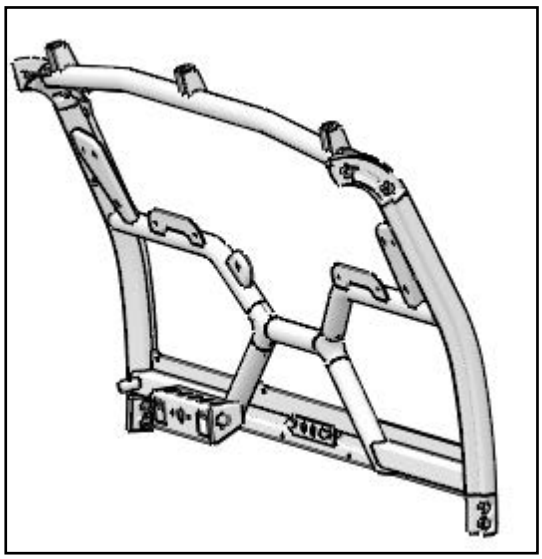
- Remove the bolts of the occupant handle assembly (hexagon socket head screw M8×25) and remove the occupant handle assembly.



- Remove the bolts (hexagonal flange bolts M 10 × 1.2 5 × 20) and nuts (hexagonal flange lock nuts M10 × 1.25) of the A-pillar connection welding assembly, and remove the A-pillar connection and welding components. Before this, you may need to remove the roof and related parts (refer to the relevant chapters for details)



- Remove the bolts (hexagonal flange bolt M10×1.25×35) and nuts (hexagonal lock nut M10×1.25) of the A-pillar welding assembly, and remove the A-pillar welding assembly.



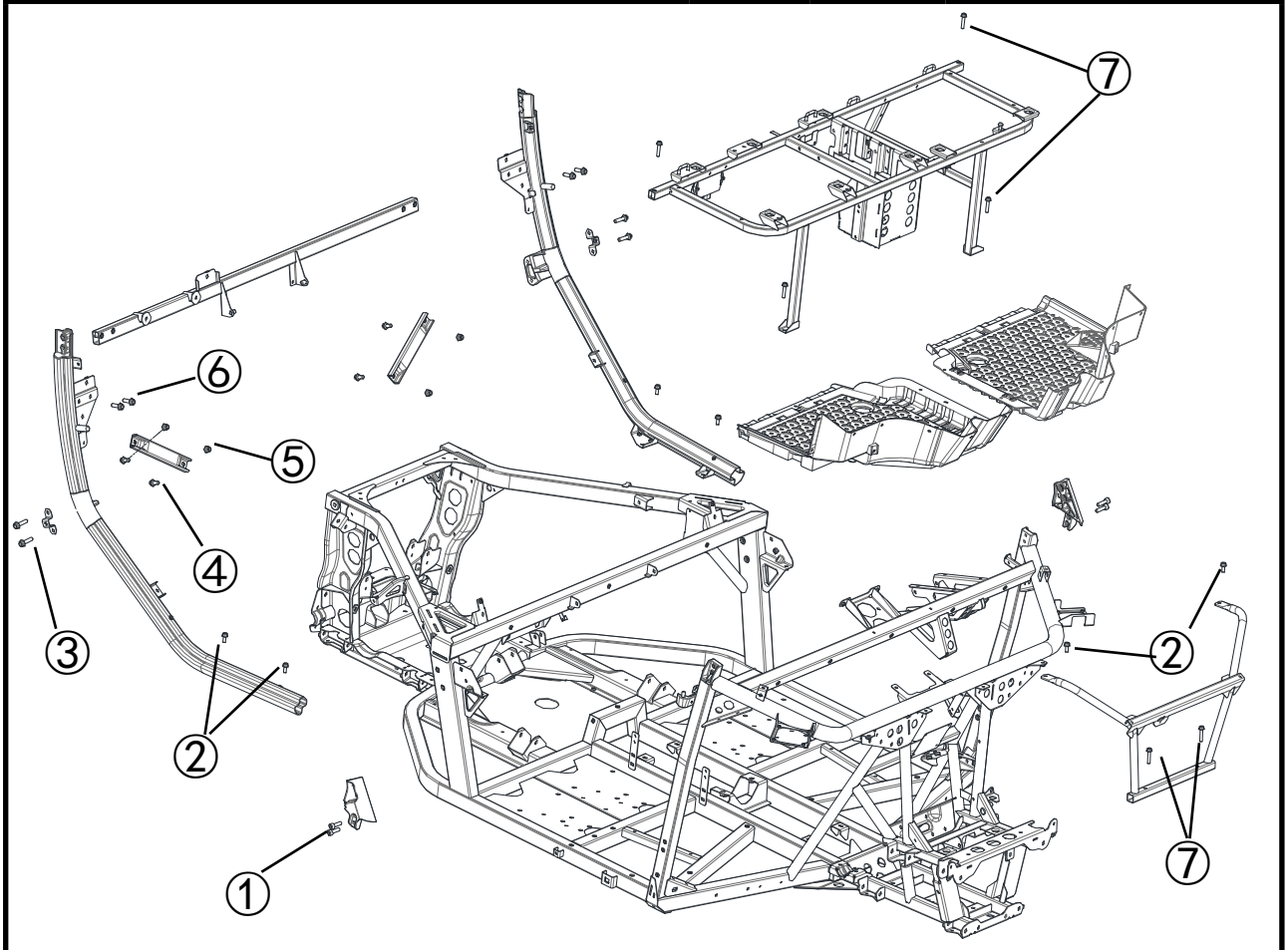
- Remove the bolts (hexagonal flange bolt M10×1.25×35) and nuts (hexagonal lock nut M10×1.25) at the rear of the top beam and remove the A-pillar welding assembly. Before this, you may need to remove the seat belt and seat back (refer to the relevant chapters for details)

- To install the cab frame, follow the reverse procedure.

⚠ CAUTION

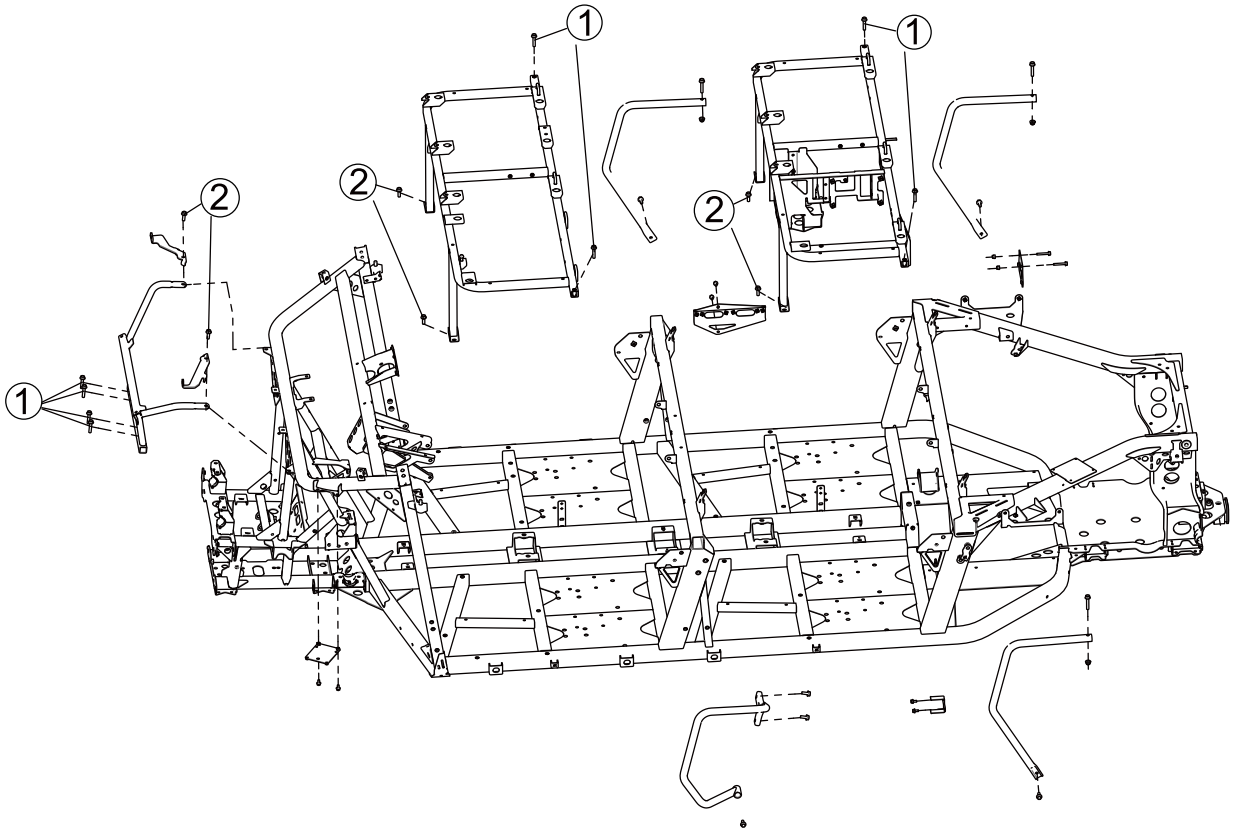
Tighten all parts by hand during installation, until the cab frame is fully assembled on the vehicle, and then tighten to the listed specifications.

FRAME ACCESSORIES (SINGLE CAB)

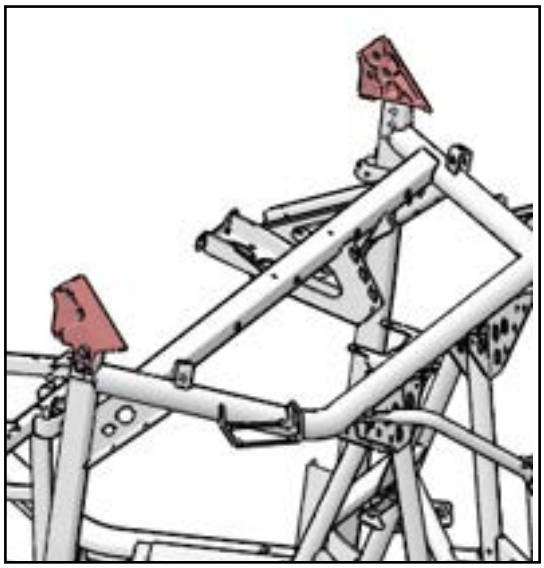


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon socket screw M10×1.25×35	40～50	4.0～5.0	30～37	
2	Hexagon flange bolt M8×20	30 ～ 40	3.0~4.0	22.1~29.5	
3	Hexagon flange bolt M10×1.25×40	40～50	4.0～5.0	30～37	
4	Hexagon flange bolt M10×1.25×20	40～50	4.0～5.0	30～37	
5	Hexagon flange lock nut M10×1.25	40～50	4.0～5.0	30～37	
6	Hex flange bolt M10×1.25×30	40～50	2.2～3.0	17～22	
7	Hexagon flange bolt M8×40	30 ～ 40	3.0~4.0	22.1~29.5	

FRAME ACCESSORIES (CREW CAB)



序号	名称	扭力值			备注
		N·m	kgf·m	ft·lbs	
1	Hexagonal flange bolts m8 x 40	22～30	2. 2～3.0	17～22	
2	Hexagonal flange bolts m8×25	22～30	2. 2～3.0	17～22	

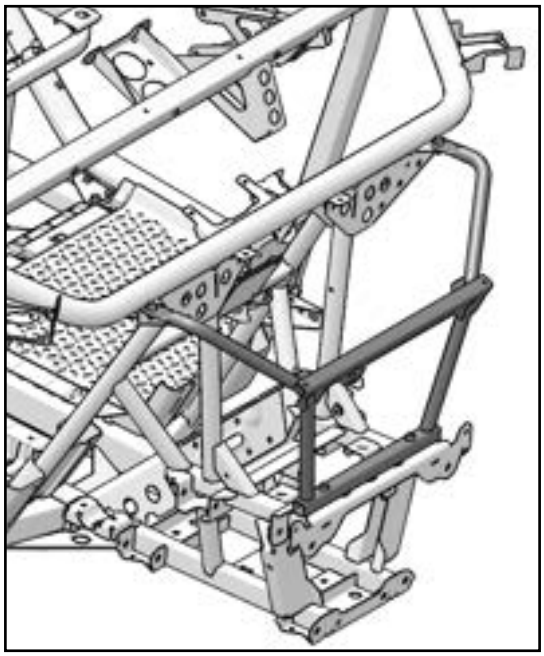


Frame attachment removal

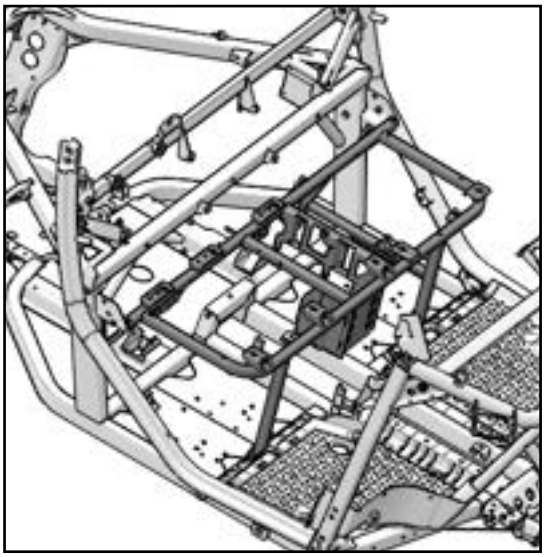
- Remove the mounting bolts of the A-pillar adapter (hexagonal screw M10×1.25×35) and remove the A-pillar adapter. Before this, you may need to remove the relevant plastic parts (refer to the relevant chapters for details)

⚠ CAUTION

When installing the A-pillar adapter, apply a proper amount of thread glue to the thread.



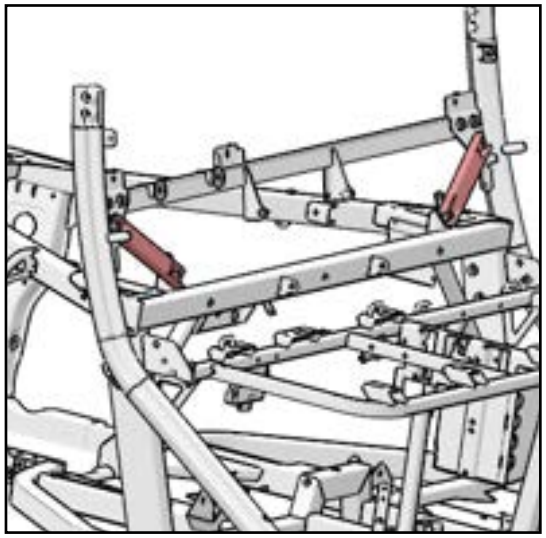
- Remove the mounting bolts of the front bracket (hex flange bolts M8×20 and hexagon flange bolts M8×40), and remove the occupant handle assembly. Before this, you need to remove some of the plastic parts and electrical components of the car head (refer to the relevant chapters for details)



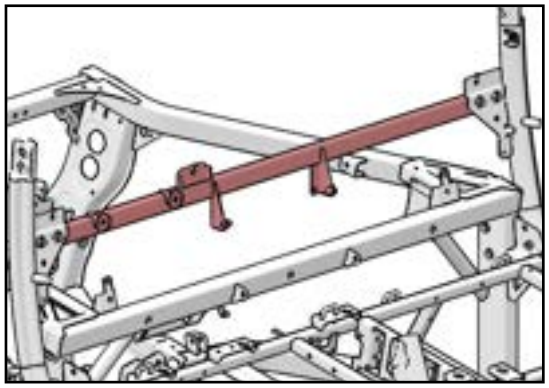
- Remove the mounting bolts (hexagonal flange bolts M8×40) of the welding assembly of the seat lower bracket, and remove the welding assembly of the seat bracket. Before this, you need to remove the seat, the lower seat cover, the driver's lower cover, the lower seat guard, and the parking mechanism, battery, and some electrical components that are fixed on the seat lower bracket. (Refer to relevant chapters for details)

⚠ CAUTION

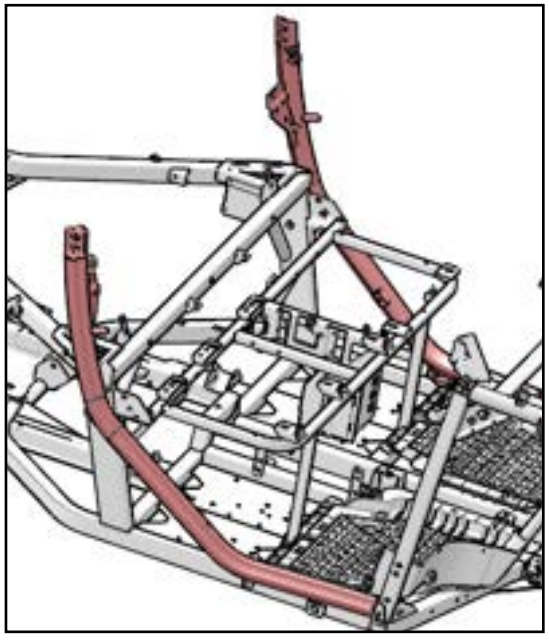
Before installing the welding assembly of the seat lower bracket, install the foot pedal first



- Remove the mounting bolts (hexagonal flange bolts M10×1.25×30) of the connecting pipe assembly under the B-pillar, and remove the connecting pipe assembly under the B-pillar. Before this, you may need to remove the seat belt and seat back (refer to the relevant chapters for details)



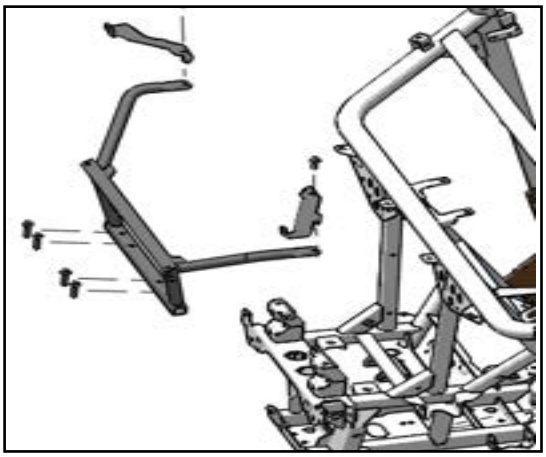
- Remove the mounting bolt (hexagon flange bolt M10×1.25×20) and nut (hexagon flange lock nut M10×1.25) of the lower support tube at the rear of the ejector rod, and remove the lower support tube at the rear of the ejector rod.



- Remove the mounting bolts (hexagonal flange bolts M10×1.25×40 and hexagonal flange bolts M8×20) of the welding components at the lower part of the top beam and remove the lower welding components of the top beam. Before this, you may need to disassemble the seat belt and related plastic parts (refer to the relevant chapters for details)

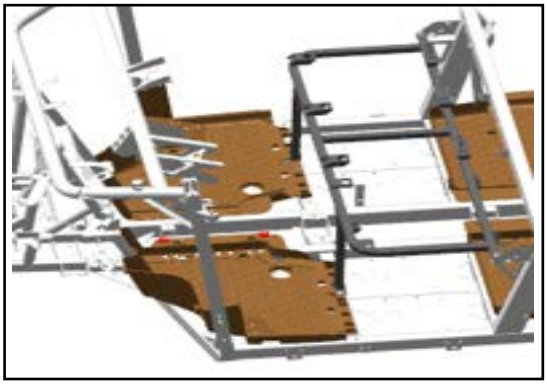
- To install the cab frame, please follow the reverse procedure

Removal of frame accessories

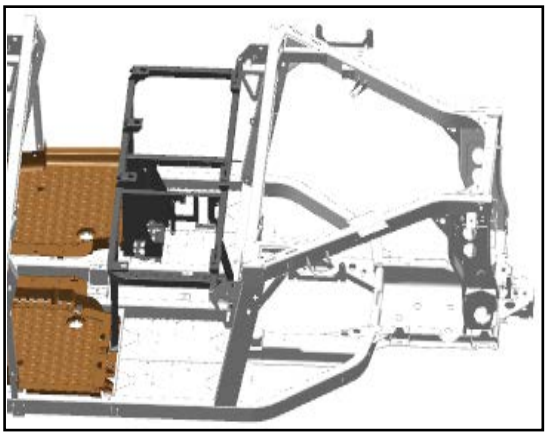


- You may need to remove the relevant plastic parts before doing so (refer to the relevant sections for details).

- Remove the mounting bolts of the front bracket (hexagonal flange bolt M8×20 and hexagonal flange bolt M8×40), and take off the left and right headlight brackets. Before doing so, you need to remove some of the plastic parts and electrical parts of the front end of the vehicle (refer to the relevant sections for details).



- Remove the mounting bolts (hexagonal flange bolts M8×40) of the front seat lower bracket welding assembly, and remove the seat bracket welding assembly. Before doing so, remove the seat, lower seat cover, lower driver's seat cover, and lower seat guard (refer to the related sections for details).

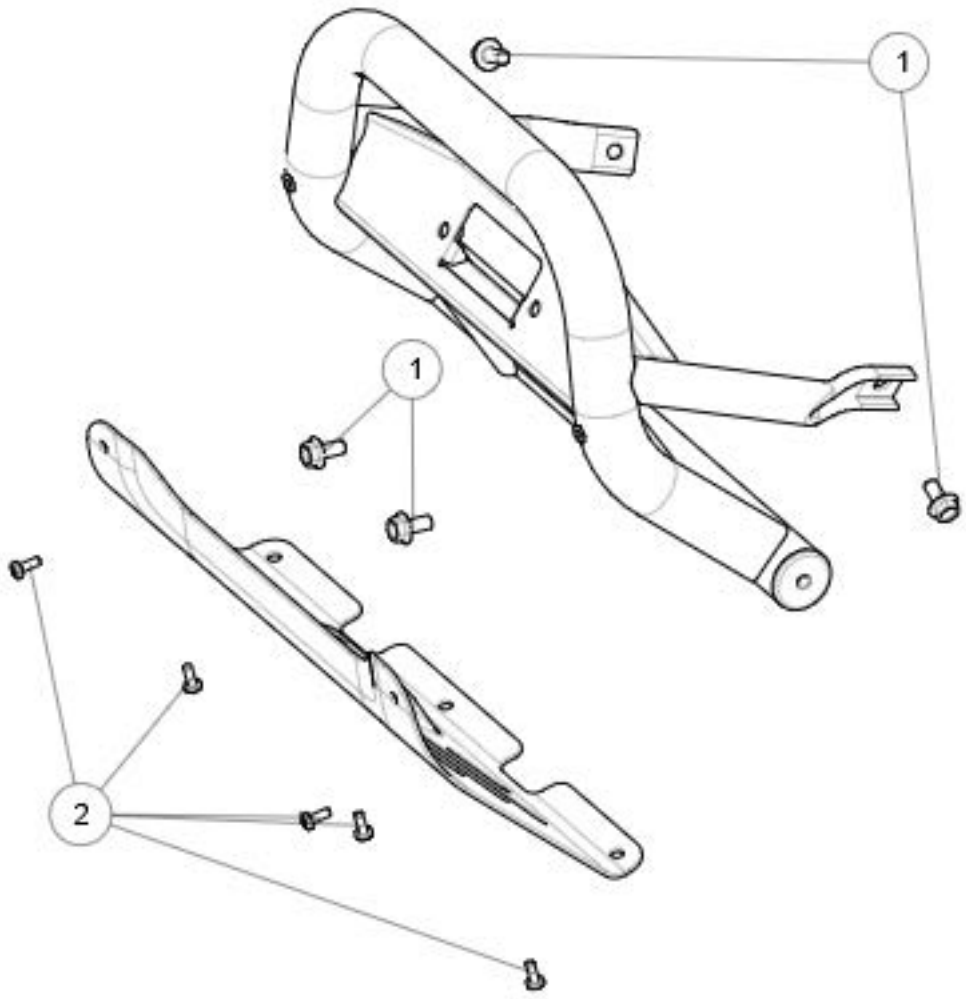


- Remove the mounting bolts (hexagonal flange bolts M8 × 40) of the rear seat lower bracket welding assembly, and remove the seat bracket welding assembly. Before doing so, remove the seat, the lower seat cover, the lower driver's seat cover, the lower seat guard, the parking mechanism, the battery and some electrical parts fixed to the lower seat bracket (refer to the appropriate section for details).

⚠ CAUTION

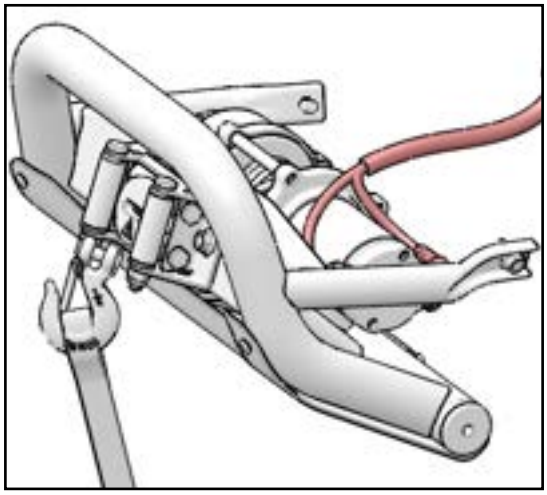
Install the floor before installing the lower seat bracket welding assembly

EXPLODED VIEW OF FRONT BUMPER



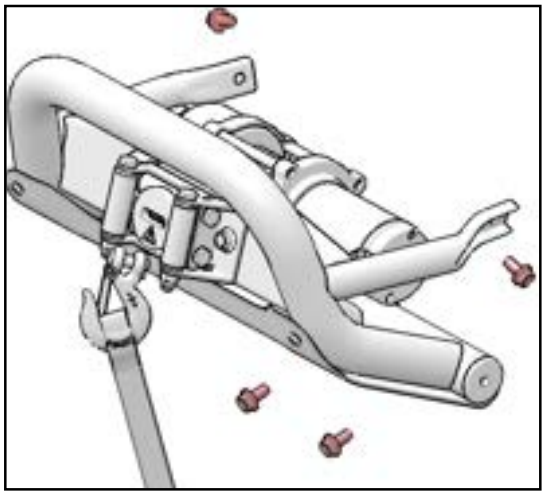
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon flange bolt M10×1.25×20	40～50	4. 0～5.0	30~37	
2	Large pan head hexagon socket bolt M6×16	8~12	0.8~1.2	69~103.6 in·lb	

Front bumper removal

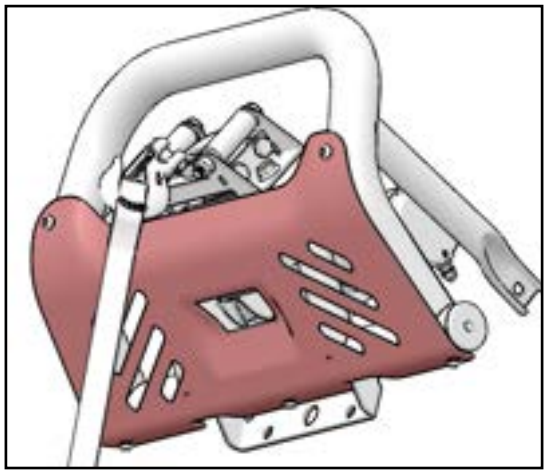


⚠ CAUTION

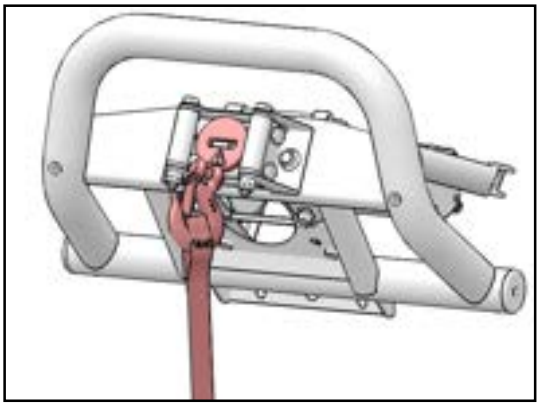
After removing the motor wire of the winch, the head of the cable should be protected to prevent short circuit.



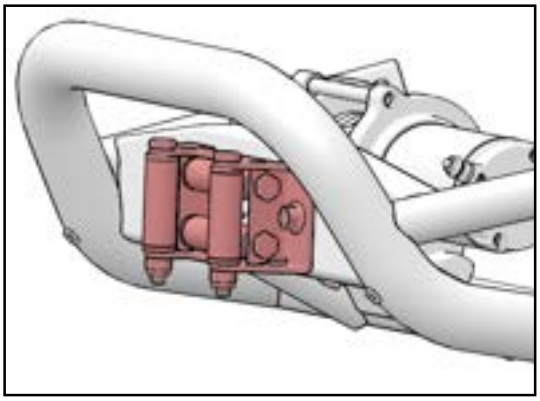
- Remove the mounting bolts of the front bumper assembly (hexagon flange bolts M10×1.25×20) and take the bumper assembly



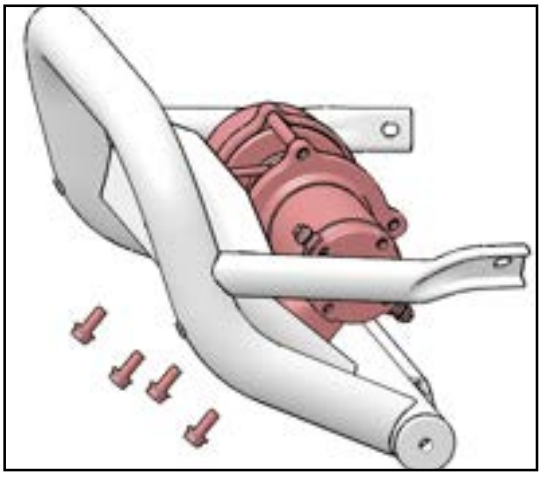
- Remove the mounting bolts of the front bumper guard plate assembly (large pan-head hexagon socket bolts M6×16), and remove the front bumper guard plate assembly.



- Unplug the pin of the winch hook, remove the winch hook and the winch rubber pad.



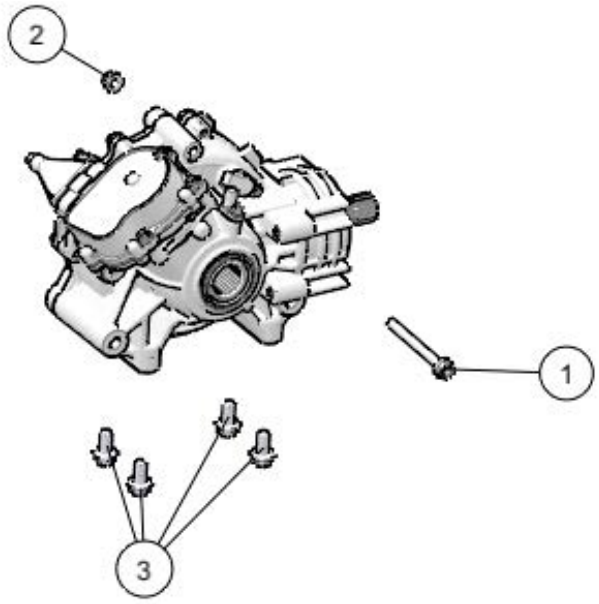
- ◆ Remove the mounting bolts of the winch guide wheel (hexagon flange bolt M10×1.25×20), and the winch guide wheel.



- Remove the mounting bolts of the winch guide wheel (hexagon flange bolt M10×1.25×20), and the winch guide wheel.

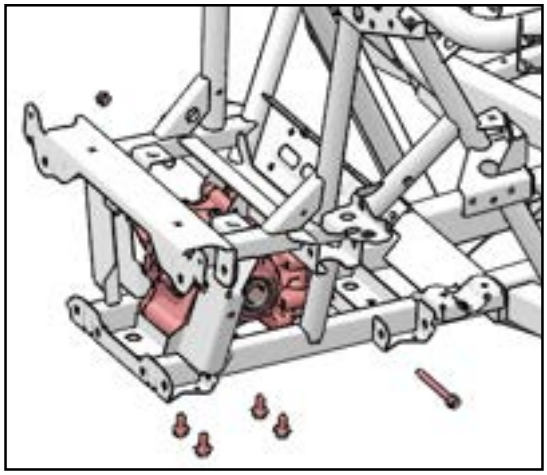
- To install the front bumper, please follow the reverse procedure

EXPLODED VIEW OF FRONT AXLE ASSEMBLY DRAWING

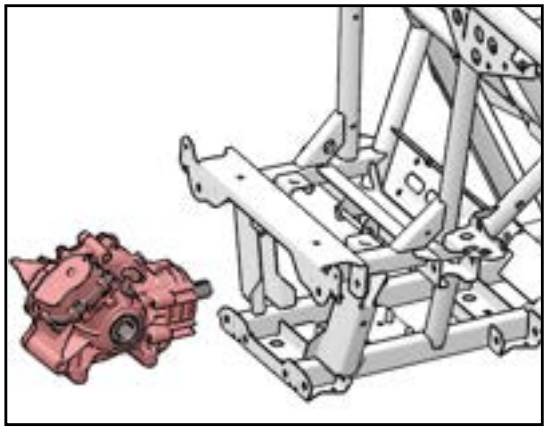


No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hexagon flange bolt M8×90	30 ～ 40	3.0~4.0	22.1~29.5	
2	Hexagon flange face lock nut M8	30 ～ 40	3.0~4.0	22.1~29.5	
3	Hexagon flange bolt M10×1.25×20	40～50	4. 0～5.0	30~37	

Front axle disassembly



- Remove the front drive shaft and the front drive shaft (see the chapter on transmission system for details).
- Unplug the cable input plug on the front axle.
- Remove the mounting bolts (hexagon flange bolts M8×90) and nuts (hexagon flange bolts M8) on the upper part of the front axle.
- Remove the mounting bolts at the lower part of the front axle (hexagonal flange bolts M10×1.25×20)



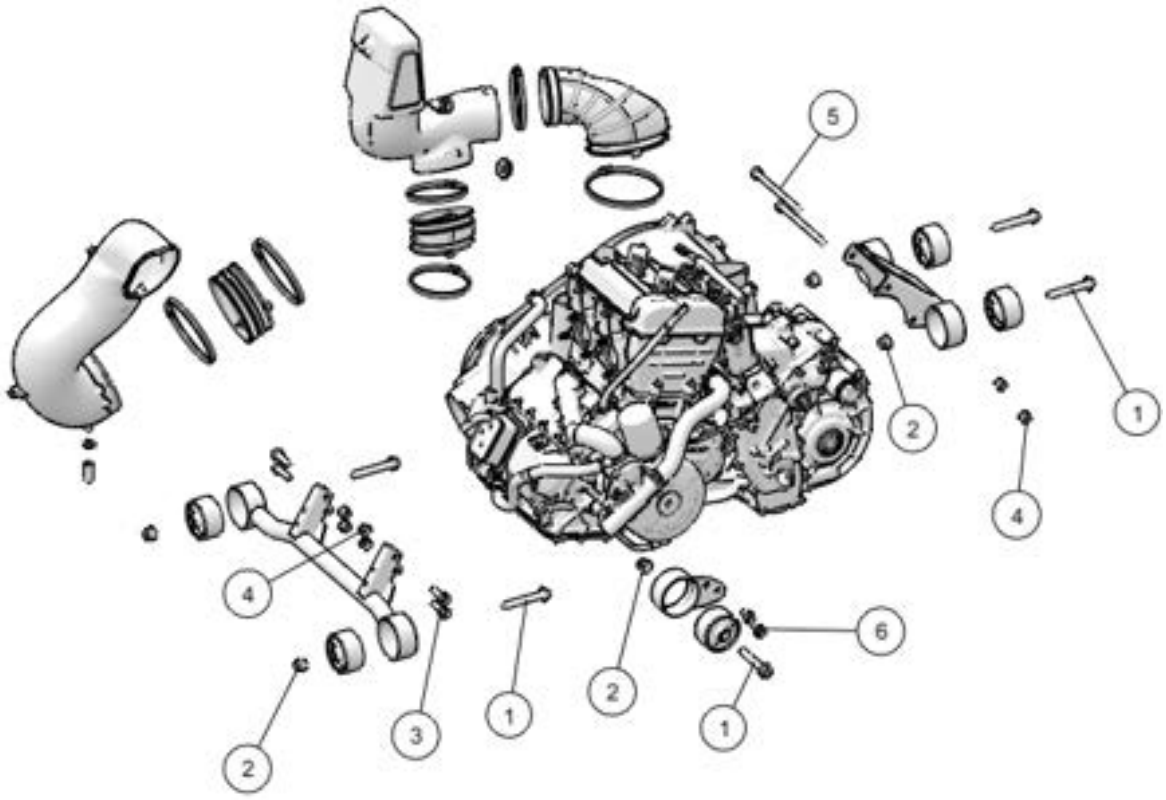
- Carefully remove the front axle from the front of the frame (you may need to remove the front bumper before this, see the chapter on front bumpers for details)

- To install the front axle, follow the reverse procedure

⚠ CAUTION

When installing the lower bolts of the front axle, apply a proper amount of thread glue to the threads.

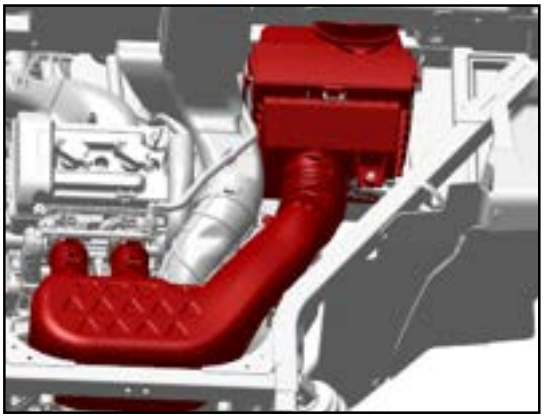
ENGINE ASSEMBLY DRAWING



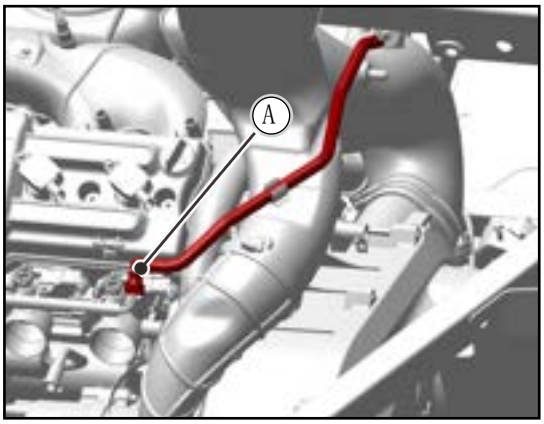
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Hex flange bolt M12×1.25×85	50～60	5. 0～6.0	37～45	
2	Hexagon flange face lock nut M12×1.25	50～60	5. 0～6.0	37～45	
3	Hexagon flange bolt M10×1.25×40	40～50	40～50	30~37	
4	Hexagon flange lock nut M10×1.25	40～50	40～50	30~37	
5	Hexagon flange bolt M10×1.25×155	40～50	40～50	30~37	
6	Hexagon flange bolt M10×1.25×20	40～50	40～50	30~37	

Engine disassembly

- Place the car body steadily on the lifting equipment.
- Remove the cargo box assembly. (See related chapters for details)



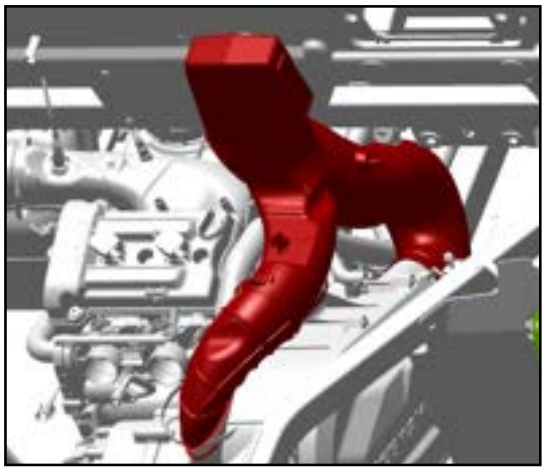
- Remove the air intake system. (See related chapters for details)



- Unplug the tubing connector【A】.

⚠ CAUTION

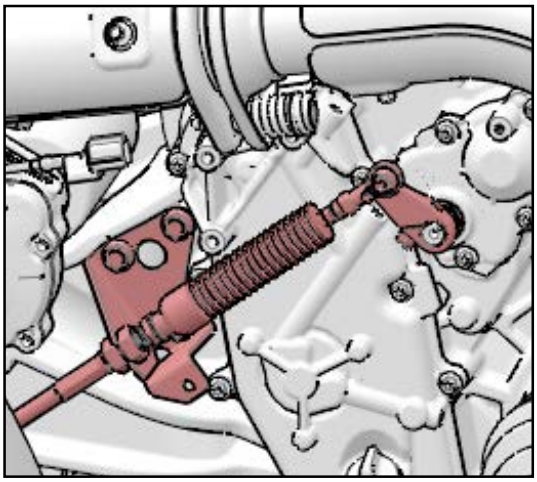
When pulling out the oil pipe joint, please make sure that the oil pump of the whole vehicle is powered off and use a rag to protect the joint to prevent gasoline spraying.



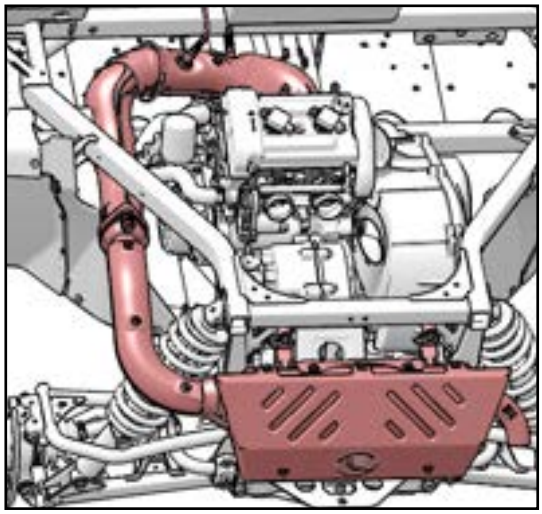
- Loosen the hoop and remove the CVT air inlet pipe and CVT air outlet pipe.

⚠ CAUTION

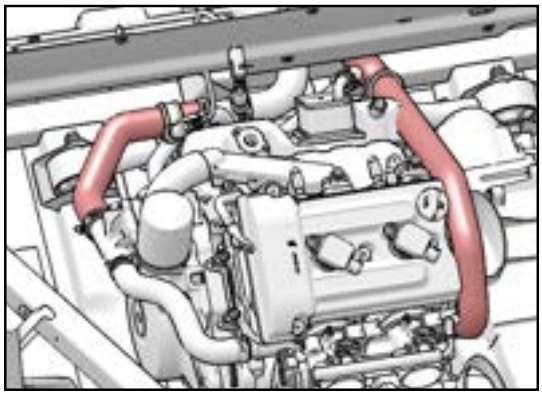
After removing the CVT air duct, please effectively protect the air inlet and outlet of the CVT to prevent debris from falling into the engine and damage the engine.



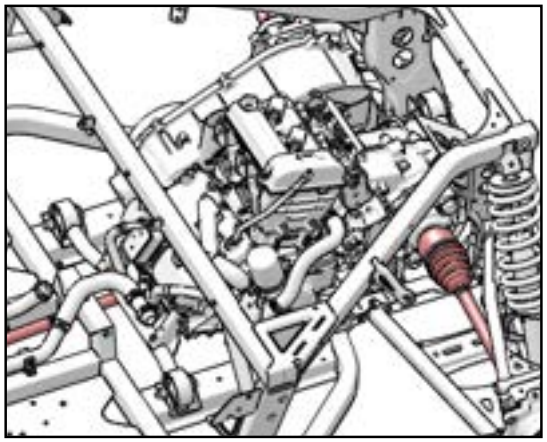
- Remove the gear shift components installed on the engine. (See related chapters for details)



- Remove the muffler assembly. (See related chapters for details)

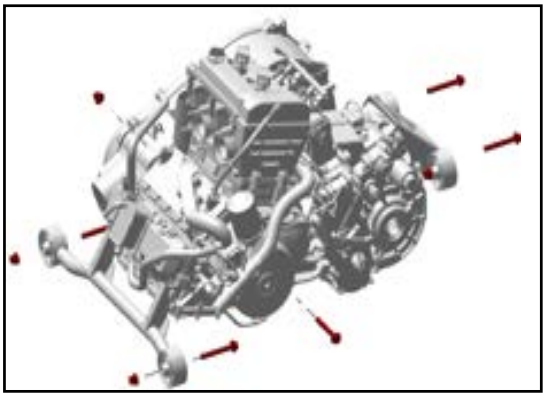


- Use water hose clamp pliers, remove the clamp, remove the hose and let off the coolant

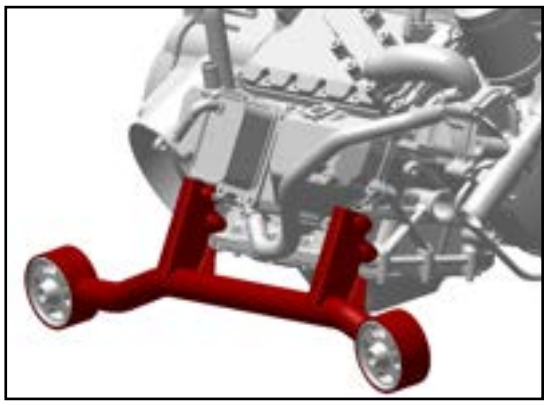


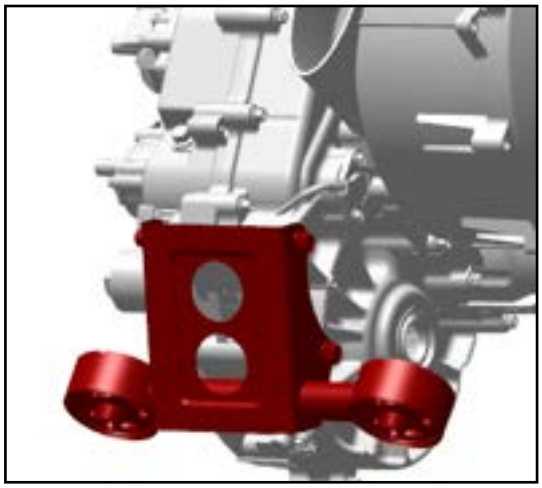
- Remove the rear section of the front drive shaft and the rear drive shaft. (See related chapters for details)

- Remove the mounting bolts (hexagon flange bolts M12×1.25×85) and nuts (hexagon flange lock nuts M12×1.25) of the engine mounting bracket and the frame, and lift the engine out from the upper part.

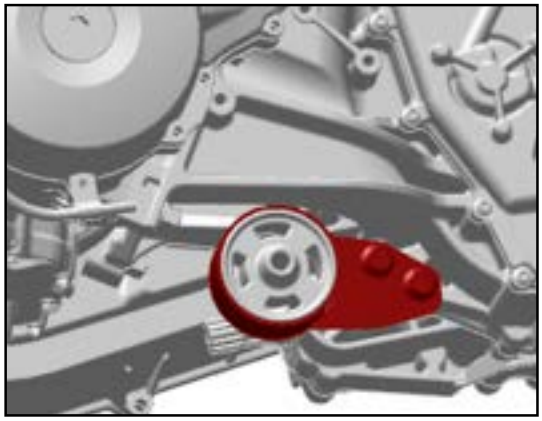


- Remove the mounting bolts (hexagon flange bolts M10×1.25×40) and nuts (hexagon flange lock nuts M10×1.25) of the engine mounting bracket assembly I, and remove the engine mounting bracket assembly I.

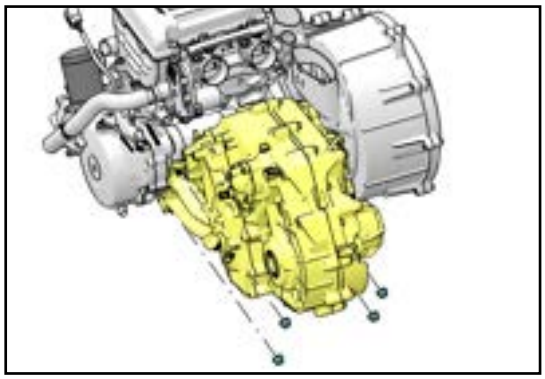




- Remove the mounting bolts (hexagon flange bolts M10×1.25×155) and nuts (hexagon flange lock nuts M10×1.25) of the engine mounting bracket assembly II, and remove the engine mounting bracket assembly II.



- Remove the mounting bolts (hexagonal flange bolts M10×1.25×20) of the engine lower bracket assembly, and remove the engine lower bracket assembly.
- To install the engine, follow the reverse procedure.



- The transmission cannot be removed alone and must be removed together with the engine
- Connect the four nuts M10x1.25 connecting the engine and transmissi on remove,you can remove the transmission components.

ELECTRICAL SYSTEM

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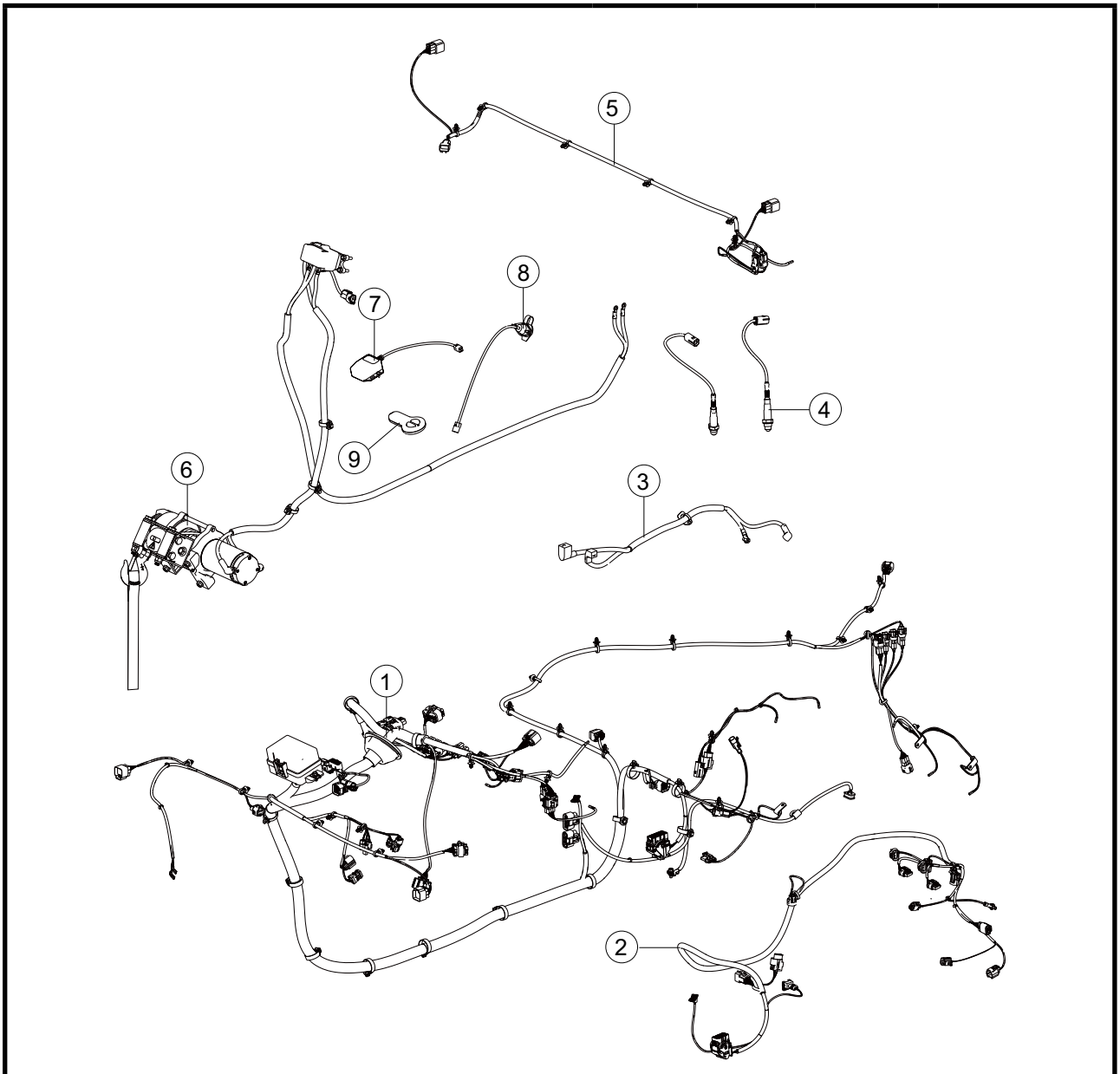
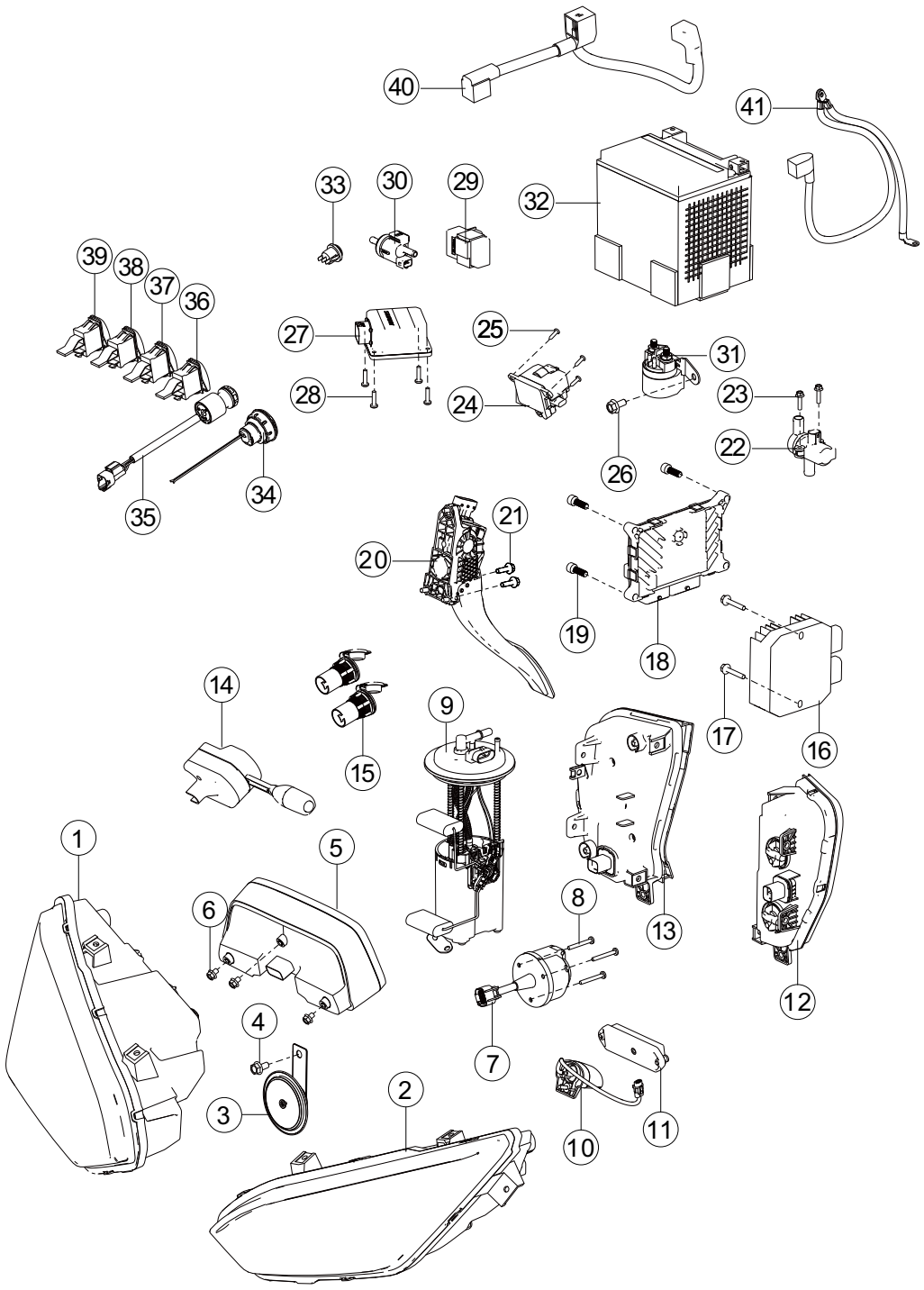
EXPLODED VIEW



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Main cable				
2	EFI Secondary cable				
3	Starting motor Positive / Negative wire assembly				
4	Oxygen sensor				
5	Tail light secondary cable				
6	Winch assembly				
7	Winch remote control module				
8	Winch switch socket				
9	Winch remote switch				



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Right headlight				
2	Left headlight				
3	Horn				
4	Hexagon flange bolts M8×16	30 ～ 40	3.0~4.0	22.1~29.5	
5	Dashboard				
6	Hexagon flange boltsM6×12	8~12	0.8~1.2	69~103.6 in·lb	
7	Trailer power socket				

8	Cross groove disc head screw M5×40	4～5	0.4～0.5	35.4～44.2in.lb	
9	Fuel pump assembly				
10	Licence Lamp				
11	Rear fog lamp				
12	Left taillight				
13	Right taillight				
14	Combination switch				
15	USB power output holder				
16	Voltage adjustment regulator				
17	Hexagonal flange boltsM6×35	8~12	0.8~1.2	69~103.6 in·lb	
18	ECU				
19	Hexagon stud screwsM8×25	30 ～ 40	3.0~4.0	22.1~29.5	
20	Gas pedal assembly				
21	Hexagonal flange bolts M6×20	8~12	0.8~1.2	69~103.6 in·lb	
22	Secondary air supply solenoid valve				
23	Hexagonal flange bolts M5×20	4～5	0.4～0.5	35.4～44.2in.lb	
24	2WD / 4WD integrated switch				
25	Cross groove head tapping screw ST4.2×16				
26	Hexagonal flange boltsM6×12	8~12	0.8~1.2	69~103.6 in·lb	
27	T-BOX				
28	Cross groove disc screwM5×20	4～5	0.4～0.5	35.4～44.2in.lb	
29	Flasher				
30	Carbon tank solenoid				
31	Activation starter				
32	Battery 32Ah				
33	Rear fog light switch				
34	Start button switch				
35	Ignition switch				
36	Power off switch				
37	Emergency switch				
38	Mode switch				
39	Power unlock switch				
40	Battery positive pole cable				
41	Battery negative pole cable				

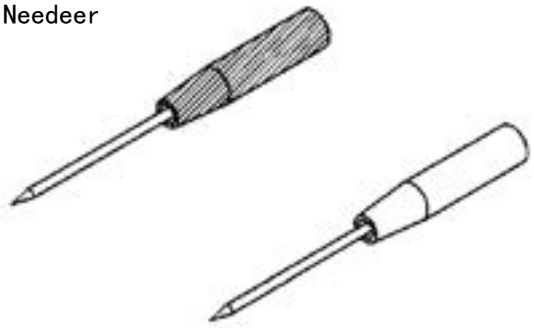
TECHNICAL PARAMETERS

Project	Standard	Use limit
Battery:		
Type	Sealed Battery	---
Capacity	12 V 32 Ah	
Charging System:		
Alternator	Three-phase	
type	AC	
Charging voltage	DC 14 ～ 15 V	---
(Regulator/rectifier output voltage) Alternator		
output voltage	36 ～ 54 V 3 000 r/min (rpm)	
Stator coil resistance	0.33 ～ 0.49	
Ignition System:		
Spark plug:		
Spark plug gap	0.7~0.9 mm	
Spark plug cap resistance	3~12kΩ	---
Ignition coil:		
Primary winding resistance	466~593mΩ	
Secondary winding resistance	8.2~10.5kΩ	
Electric Starter System:		
Starter motor:		
Commutator diameter	28mm	---
Brush length	11.5mm	
power	1200W	
Rectifier：		---
Maximum output power	50A	
Fuel Pump:		---
Fuel pump pressure	400±20KPa	
Switch:		
Brake light switch timing of pedal travel	ON after 10 mm (0.4 in.) of pedal travel	---
Rising temperature	From OFF to ON at 90°C From ON to OFF at 85.5°C	

SPECIAL TOOLS

Multimeter

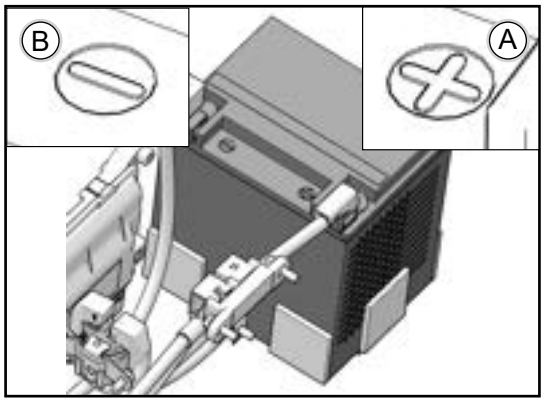
Needeer



⚠ 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 seat (see the Frame Section)
- Loosen the bolt of the battery seat.
- Remove battery fixing tape.
- Disconnect the battery negative (-) cable first, and then disconnect the positive (+) cable.
- Take out the battery.

Battery installation

- Turn off the ignition switch.
- Put the battery with the battery box and fixer in place.
- Connect the positive cable first, and then connect the negative cable.
- Apply a thin layer of grease to the terminal to prevent corrosion.
- Tighten battery seat bolts.

Match the model type of the battery. The name should be the same.

Battery type 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℃)	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

- Before storing the vehicle, please charge it and store it before removing the negative wire.
- Fully charged once a month during storage.

4）Battery life time

- If the battery fails to start the engine after several charges, it indicates that the battery has exceeded its service life. Please replace it. (But only if the vehicle itself has no problem starting the system.)

⚠ WARNING

During charging, keep the battery away from sparks and naked fire. An explosive gas mixture that releases hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This process prevents the battery terminals from generating sparks that could ignite any combustible gas. Do not put the fire near the battery and do not loosen the terminal. Electrolytes contain sulfuric acid. Be careful and do not let it come into contact with your skin or eyes. If touched, rinse with plenty of water. If serious, seek medical attention immediately.

Swap places

- The sealed battery can give full play to its performance only when used in conjunction with appropriate vehicle electrical equipment.
- Therefore, the sealed battery can only be replaced on the vehicle originally equipped with the tool.
- If sealed batteries are installed on vehicles with ordinary batteries, please take care of the equipment, the life of sealed batteries will be shortened.

Charging condition check

Battery charging status can be measured 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

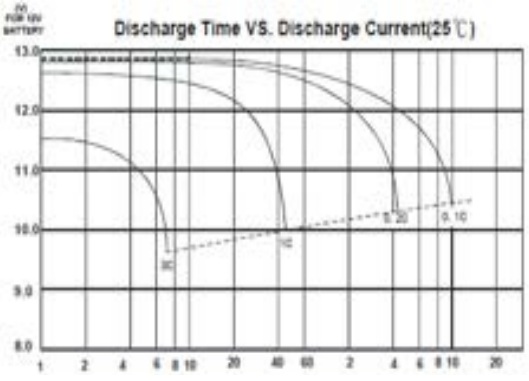
The voltage to one decimal point is measured with a readable digital voltmeter【A】.
If the reading is below the rated value, it needs to be recharged.

Battery terminal voltage standard: 12.6V or higher

- Remove the battery (refer to the Removal of batteries section)
- Recharge the battery in the following way.

⚠ WARNING

The battery is sealed. Do not open it. Do not add water when charging.



The charging current and time are described below.

Terminal voltage: 11.5 _ Less than 12.5 V
Standard charge: 3.2 amps x 5 _ 10 hours
(see attached table)
Quick charge: 32 A x 1.0 hours

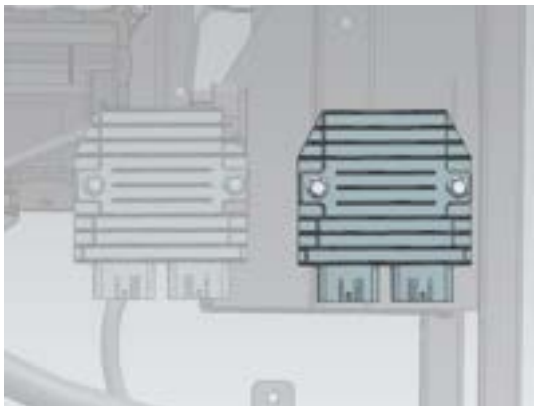
⚠ WARNING

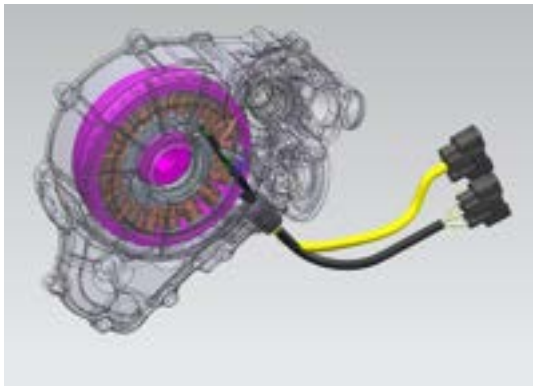
If possible, do not charge quickly. If there is an inevitable situation that requires a quick charge, pay attention to the ambient temperature.

Test against the standard voltage later.

Terminal voltage: less than 11.5V
Charging method: 3.2 A x 20 hours

Generator inspection





There are three types of alternator faults: short circuit, disconnection, or rotor magnetic loss. Short-circuiting one of the coils or disconnecting the wire will result in low output or no output at all. A loss of the magnetic field of the rotor may be caused by a drop or by placing the AC generator near the electromagnetic field, thereby hitting the magnetic field of the AC generator or simply due to aging, resulting in low output. To check the output voltage of the alternator, perform the following procedures.

- Remove rear fender (see Chapter "Frames")
- Disconnect the alternator connector 【A】 (1, 2, 3 in the connector are magneto three-phase outgoing lines)
- Connect the handheld tester as shown in the following table
- Start the engine. Run it at the speed shown in the table. Note the voltage reading (three measurements in total).Ac generator 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.

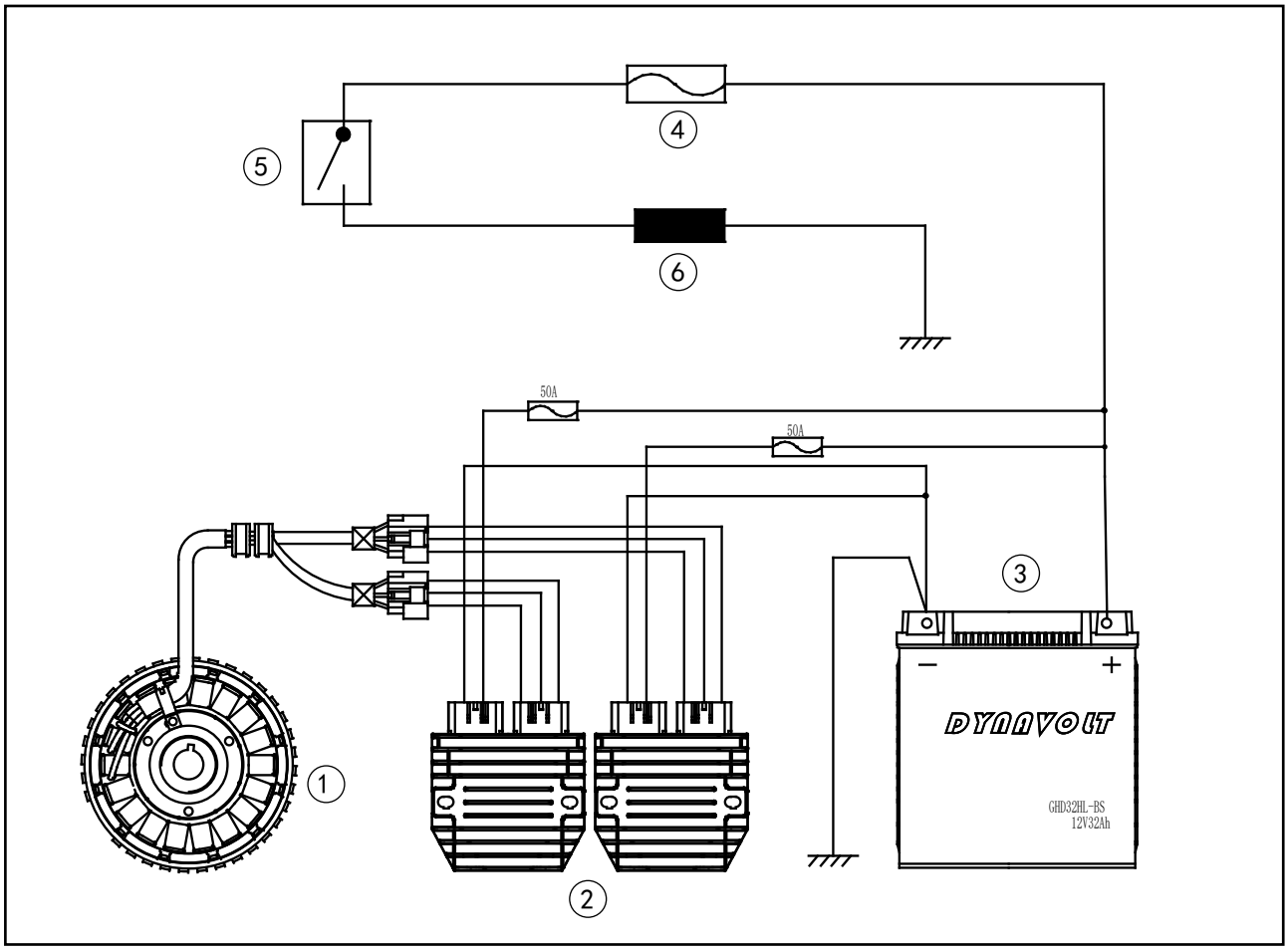
Pay attention to the readings (3 measurements in total).

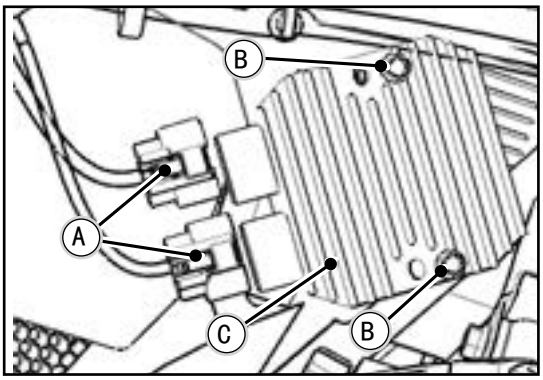
Stator coil resistance

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

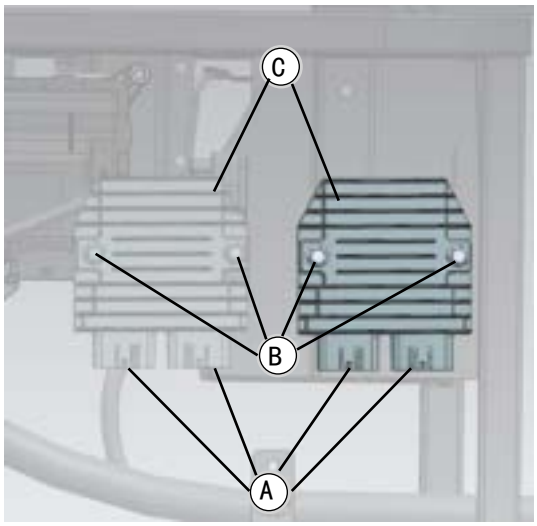
Test and Judgment Method of Charging Voltage on Whole Vehicle

Test conditions and methods	Output voltage
1. Connect the product according to the normal loading state, after the vehicle started, the speed will remain above 2000rpm 2. Connect a fully charged battery 3. Use a multimeter to test the voltage at the output terminal of the regulator	Output voltage:14.0-15.0V Qualified otherwise unqualified

Remove

- Connector【A】（Disconnect）
- Bolt【B】and Voltage regulating rectifier【C】

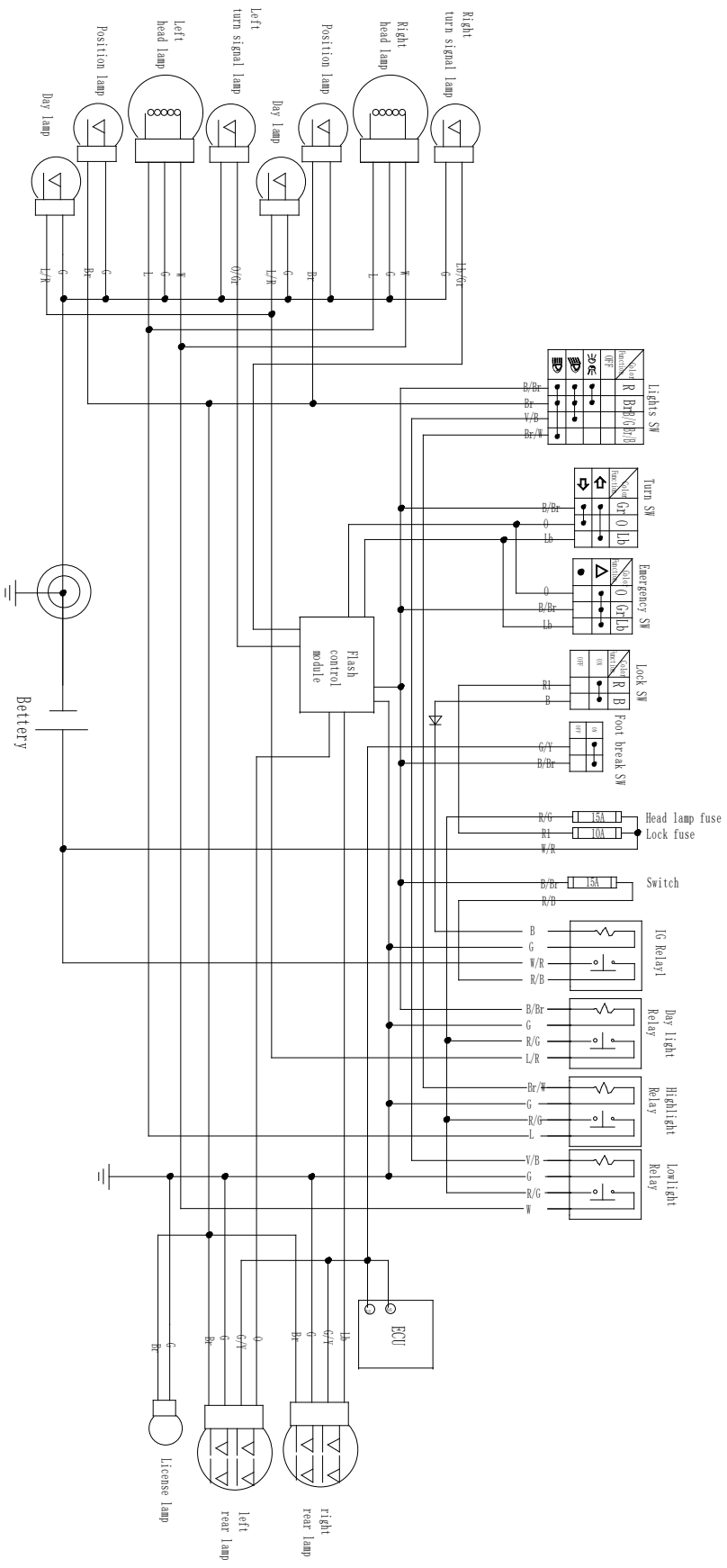
See the table below for the determination method of the voltage regulating rectifier resistance:



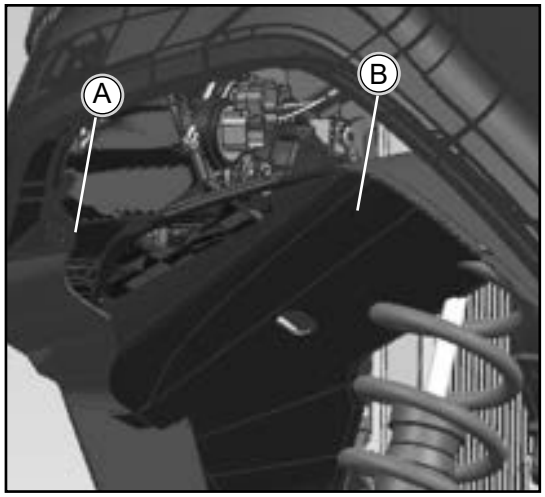
Output resistance characteristics（unit Ω）

Output resistance characteristics（unit Ω）						
	Output +	Y1	Y2	Y3	Output-	Digital multimeter (Diode gear)
Output+		∞	∞	∞	∞	Connect the red pen to output +, and the black test pen to measure the remaining terminals
Y1	0.12-0.25		∞	∞	∞	Connect the red pen to Y1, and the black test pen to measure the remaining terminals
Y2	0.12-0.25	∞		∞	∞	Connect the red pen to Y2, and the black test pen to measure the remaining terminals
Y3	0.12-0.25	∞	∞		∞	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



HEADLIGHT



Headlamp rear guard (see "Frame" chapter)

【A】Install clasp

【B】Headlamp rear guard

【C】Headlamps

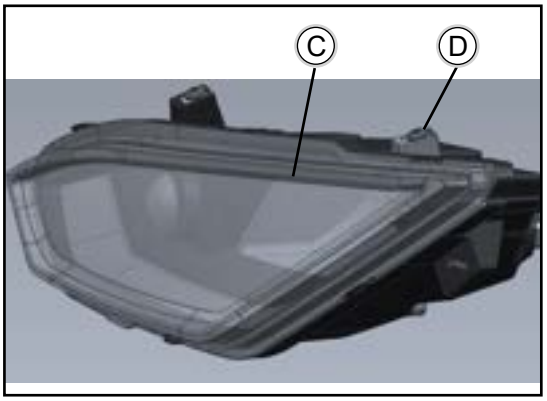
【D】Headlamp bolts*4

【E】Light bulb shield

【F】Headlight bulb

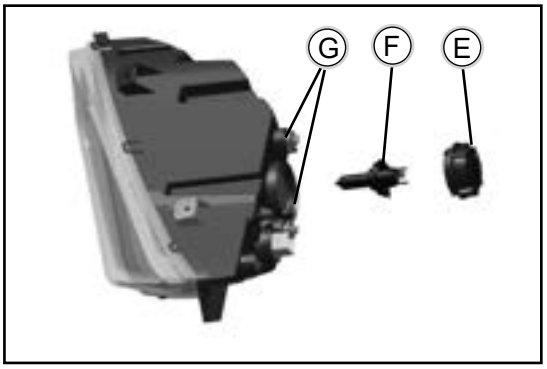
【G】High-Low beam adjustment bolt

Replace



⚠ CAUTION

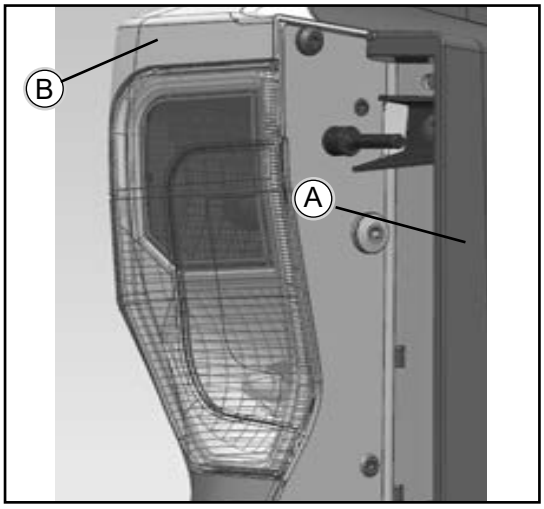
- Lamps are divided into LED lamps and halogen lamps (please confirm according to the actual vehicle)
- LED beam light damage, it should only replace headlamp
- Halogen headlamps can be replaced with the same type of light bulb if they are damaged
- Other lights damaged, it should only replace the headlamp.



- Remove 10 clasps from rear guard of headlamp【A】
- Remove headlight rear cover【B】and front cover, side shield (refer to disassembly and assembly of plastic parts)
- Remove 4 headlamp bolts【D】with tools, disconect the headlamp connector【C】, take down the headlamp

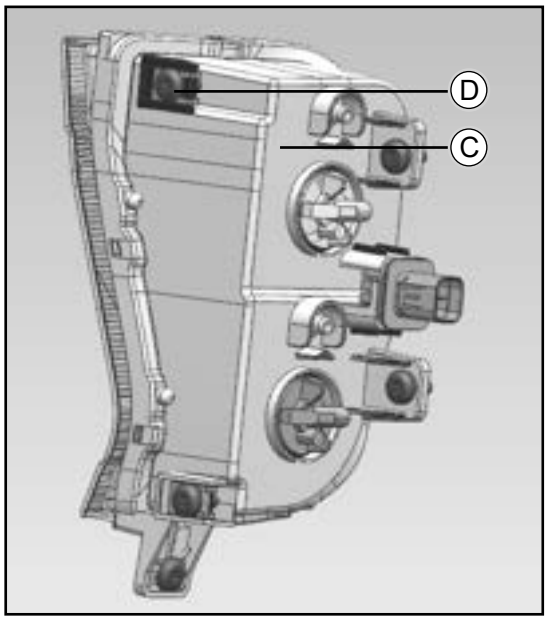
If you need to replace the headlamp bulb, continue with the following procedures:

- Clockwise rotation of【E】
- Remove headlight bulb【F】, Replace new bulb
  Headlight bulb type: H4
- After replacing the adjustment beam light adjustment bolt【G】, adjust the headlight left/right and high/low to the proper position.



TAIL LIGHT

Rear guard for taillight (see the "Frame" chapter)【A】
Cargo doors
【B】Tail light shield
【C】Tail light lamp body
【D】Tail light bolt*5
【E】Tail light lamp holder
【F】Tail light bulb

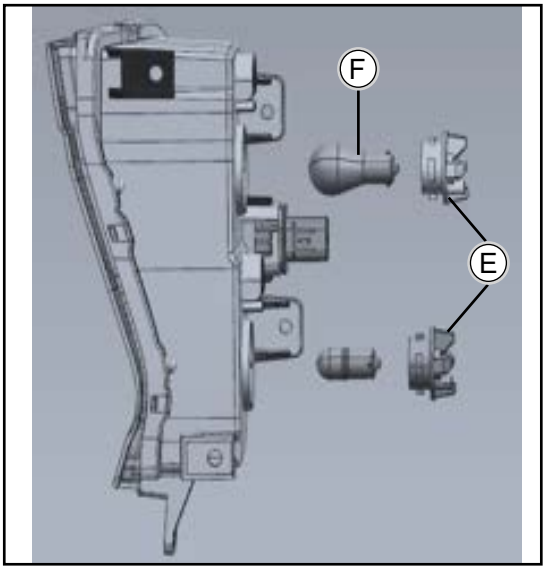


Replace

⚠ CAUTION

Lamps are divided into LED lamps and halogen lamps (please confirm according to the actual vehicle)

- LED tail light damage, it should only replace
- Halogen tail light lamps can be replaced with the same type of light bulb if they are damaged



- Open the box door, remove the two side tail light mounting bolts*2
- Remove tail light guard【B】, removal method reference plastic installation.
- Remove the tail light bolts and remove the rear light body after removing the tail light plug【C】

To replace the tail light bulb, continue with the following procedure:

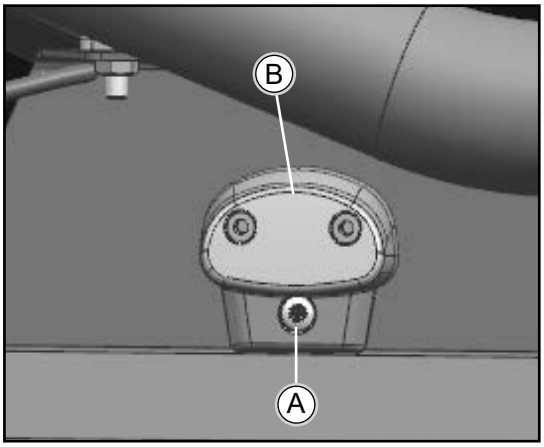
- Clockwise rotation of【E】
- Remove the rear lamp to replace【F】, replace the new bulb

The type of tail light bulb is:：P21/5W

The rear-steering bulb replace same as to replace tail light bulb,

The rear steering bulb type is:：RY10W

LICENCE LAMP



【A】Licence Lamp Bolt*1

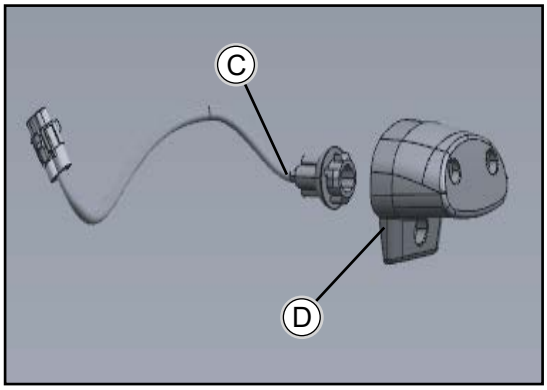
【B】Licence Lamp

【C】Licence lamp harness

【D】Licence lamp holder

Remove

- Remove licence lamp bolt【A】
- Remove Licence Lamp【B】
- Remove licence lamp wire harness【C】



Replace

- Remove the bulb holder,

Remove the license plate light bulb and replace

Licence light bulb Type：W5W

- Place the licence lamp in the licence lamp installation position
- Locking of light bolts*1【A】

⚠ CAUTION

Lamps are divided into LED lamps and halogen lamps (please confirm according to the actual vehicle)

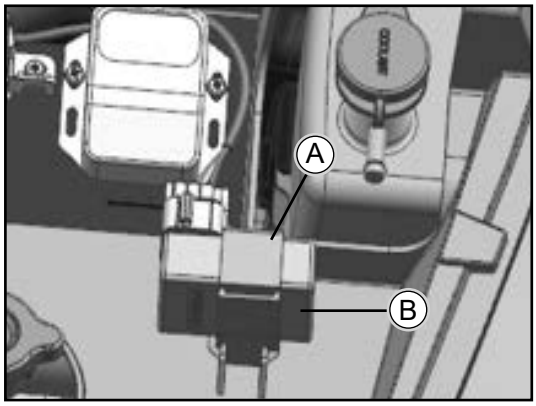
- LED license light damage, it should only replace
- Halogen tail light lamps can be replaced with the same type of light bulb if they are damaged

FLASHER

Remove front cover (see the "Frame" chapter)

【A】Install rubber sleeve

【B】Flasher



Disassembly

- Remove the installation rubber sleeve【A】from the installation bracket
- Remove the wiring harness connector
- Replace the flasher【B】

→ TEST

- If the turn signal does not flash or flashes abnormally on the whole vehicle (the normal turn signal flash frequency is 85/min)
- The lamp is out of light (one-side forward or backward turn light is damaged), and the turn signal flashes at a frequency of 120/min）

SWITCH

COLOR / Option(Angle)	Red	Black	Can be taken out
OFF(0°)	○		YES
ON(60°)	○	○	NO

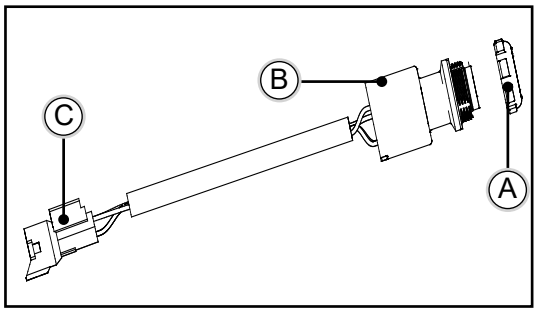
Power lock

⚠ CAUTION

When the indicator does not display after the key is turned on, check the circuit failure , 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



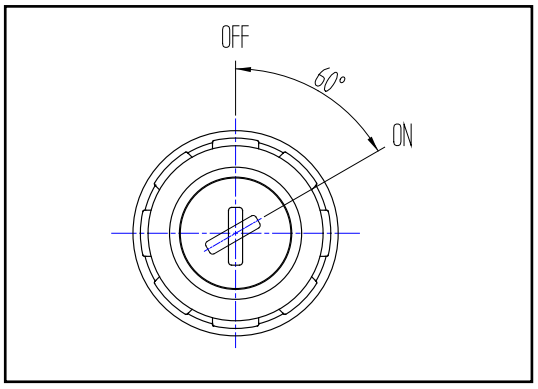
When you need to replace the power lock, first remove the seat cushion and fuel tank guard （see "vehicle body and frame"）.

【A】Ignition lock cover

【B】Ignition lock

【C】 Connector

- ◆ After removing the plastic parts, rotate the ignition lock cap counterclockwise【A】.
- ◆ Remove connector【C】， Replace ignition lock.



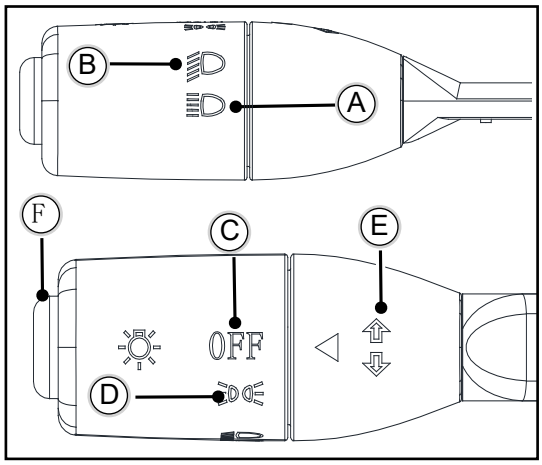
TIP

When in normal condition, ON is directly above, clockwise rotation of 60 degrees is OFF

At ON, the vehicle circuit connected, the key can not be pulled out

At OFF, the vehicle circuit is disconnected and the key can be removed

Combination Switch



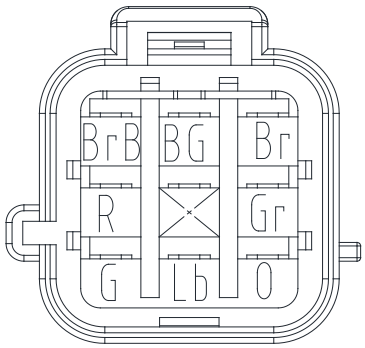
⚠ CAUTION

The switch is valid only when the power lock is in the ON position

【A】High Beam
【B】Low beam
【C】OFF
【D】Position Light
【E】Left and right turn signals
【F】Horn

⚠ CAUTION

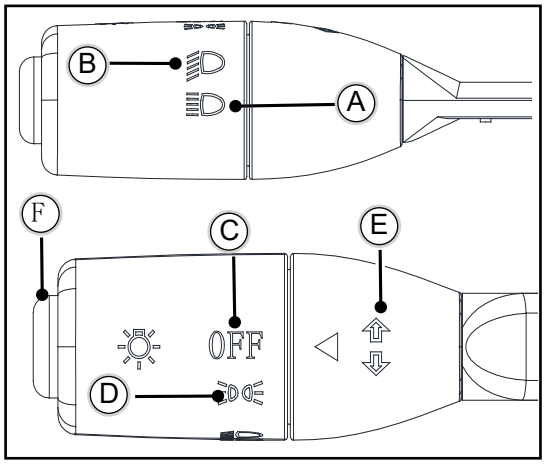
Since the switch is an integral part, any damage to the switch requires replacement of the entire switch



→ Connector definition

The left picture is the wire color position diagram of the combination switch connector, and the corresponding wire color corresponds to the function

Please refer to the function diagram



→ Combination switch function-【E】Turn signal switch

When the switch is turned to the left steering position, the gray and orange can be turned on, and the gray and light blue cannot be turned on.

When the switch is turned to the right turning position, gray and light blue can be turned on, while gray and orange cannot be turned on.

When the switch is set to the middle position, the gray, light blue, and orange wires cannot be turned on

→ Combination switch function-【F】Horn switch

When the horn switch is pressed down, the red and green are turned on

Test whether the horn switch is damaged

When the key is in the ON position, it should make a sound when pressing the horn switch

When the horn can't make a sound, check the related circuit first

When there is no problem with the circuit, test the internal circuit of the horn switch

When pressing the horn switch, the red and green should be able to conduct

C / F	Horn	+12V	Position light	LoW beam	High beam	turn power	Left turn	right turn
⇦						●		●
⇨						●	●	
OFF								
≡D		●	●					
≡D		●	●	●				
≡D		●	●		●			
🔔	●	●						

→ Combination switch function-【A，B，C，D】Light source switch

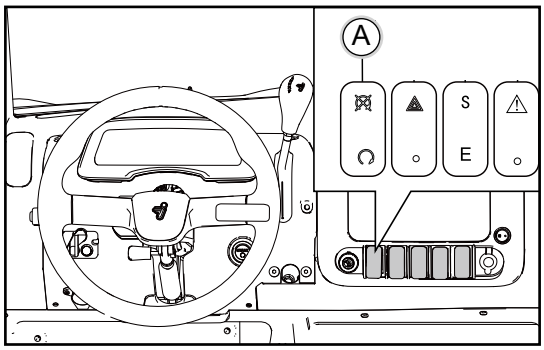
When confirming that the key is in the ON position, when the switch is turned to the OFF position, all light wires cannot be conducted

When the switch is set to the position light position, the red wire and the brown wire should be able to conduct, and none of the others can be conducted

When the switch is turned to the low beam, red and brown should be able to conduct, at the same time red and black and green should be able to conduct, and the others cannot be conducted

When the switch is set to the high beam position, red and brown should be able to conduct, at the same time red and brown and black should be able to conduct, and the others cannot be conducted

Flameout Switch

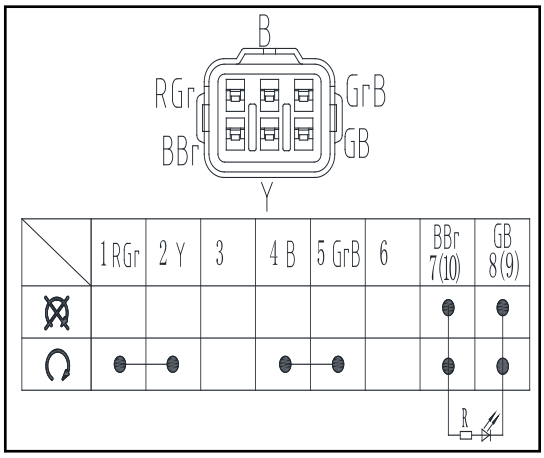


When the engine is running, press the stop switch button to stop the engine

When the engine is stopped, first press the stop switch button and then press the start button to start the engine

When the function fails, check the related circuit first

When there is no problem in the inspection circuit, test the internal circuit of the flameout switch



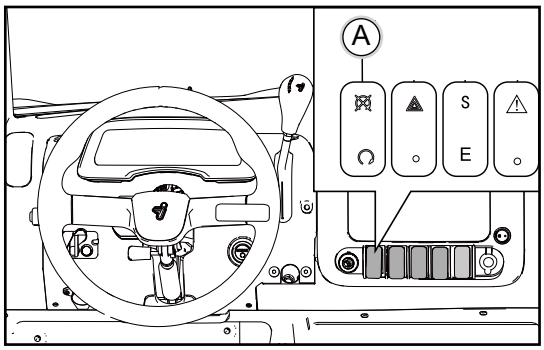
⚠ CAUTION

Only when the flameout switch is in working condition, the engine can be started by pressing the start button

→ Test whether the flameout switch is damaged

When the flameout switch is pressed, red, gray and yellow should be able to conduct, and black and gray and black should be able to conduct, and when the start button is pressed at this time

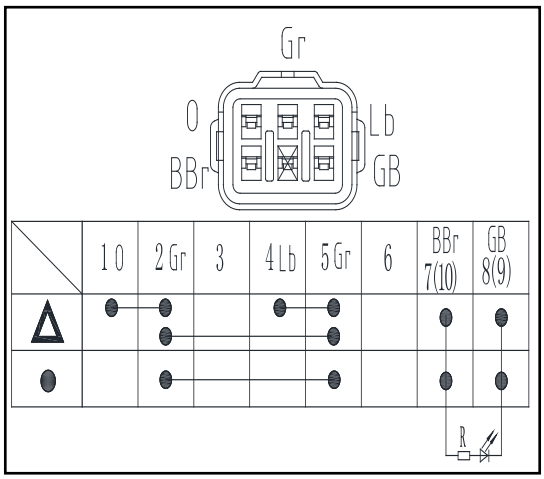
When the flameout switch is pressed, red, gray and yellow black, gray and black can not be conducted



Emergency switch

When the emergency switch is pressed, the four front and rear turn signals flash at the same time

When the emergency switch is pressed, if a single turn signal does not light up, the relevant insurance or the lamp itself should be checked.

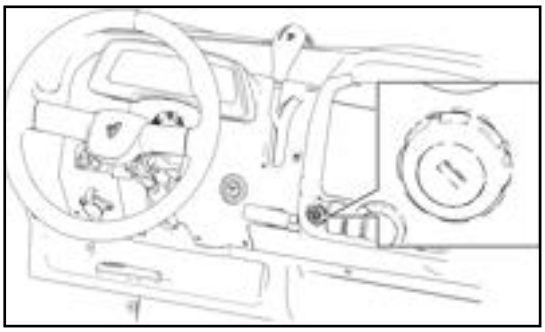


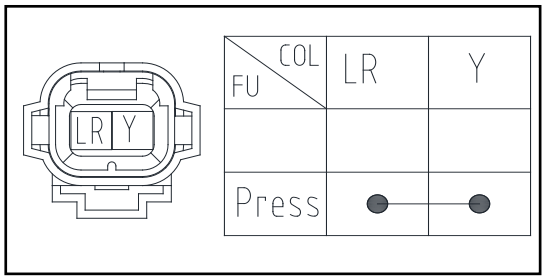
→ Test whether the emergency switch is damaged

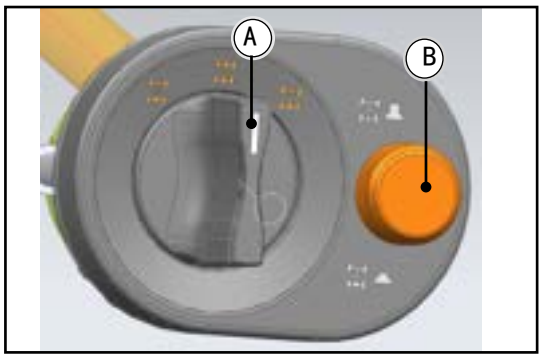
When the emergency switch is pressed, if the four front and rear turn signals do not flash, the internal circuit of the emergency switch can be tested

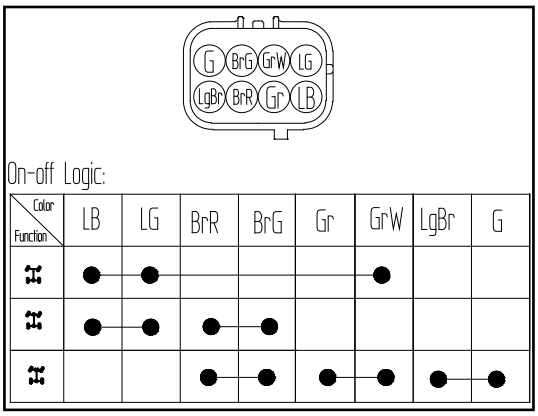
When the emergency switch is not pressed, the orange, gray, and light blue should not be turned on

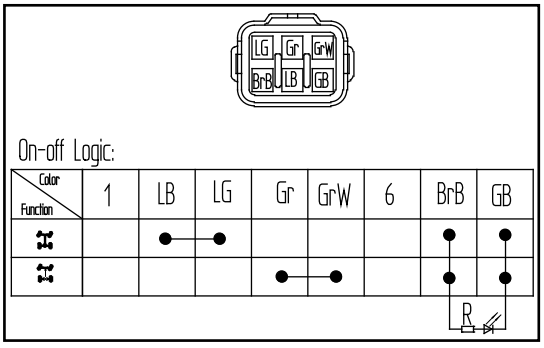
When the emergency switch is pressed, the orange, gray, and light blue should be able to conduct at the same time











Start switch

When the flameout switch is turned on, press the start switch button and the engine starts to run

When the function fails, check the related circuit first

When there is no problem in the inspection circuit, test the internal circuit of the start switch

⚠ CAUTION

Only when the flameout switch is in working condition, the engine can be started by pressing the start button

→ Test whether the start switch is damaged

When the start switch is pressed, the blue, red and yellow should be able to conduct, and when the start button is pressed at this time, the engine can be started under normal conditions of other functions

2WD/4WD Drive mode Switch

⚠ CAUTION

The switch is valid only when the power lock is in the ON position

【A】 Front axle 2/4 WD switch button

【B】 Rear axle switch

→ Test the front axle 2/4 WD switch for damage

The switch is in the 2 WD state, with blue green and gray white, and blue black conducting.

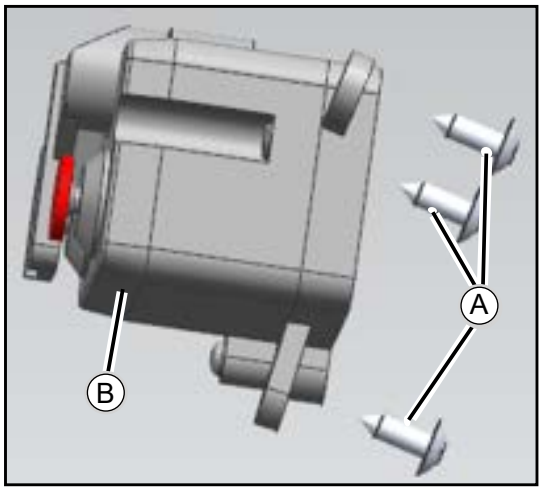
The switch is in 4 WD state, and at this time, blue green and blue black, brown red and brown green can be connected.

When the switch is turned to the locked state, brown red and brown green, gray and gray white, light green brown and green can respectively conduct.

→ Test the rear axle switch for damage

When the rear axle switch is pressed, blue green 1 and blue black 1 can conduct at this time.

On the contrary (not pressed), then gray 1 and gray 1 are conductive



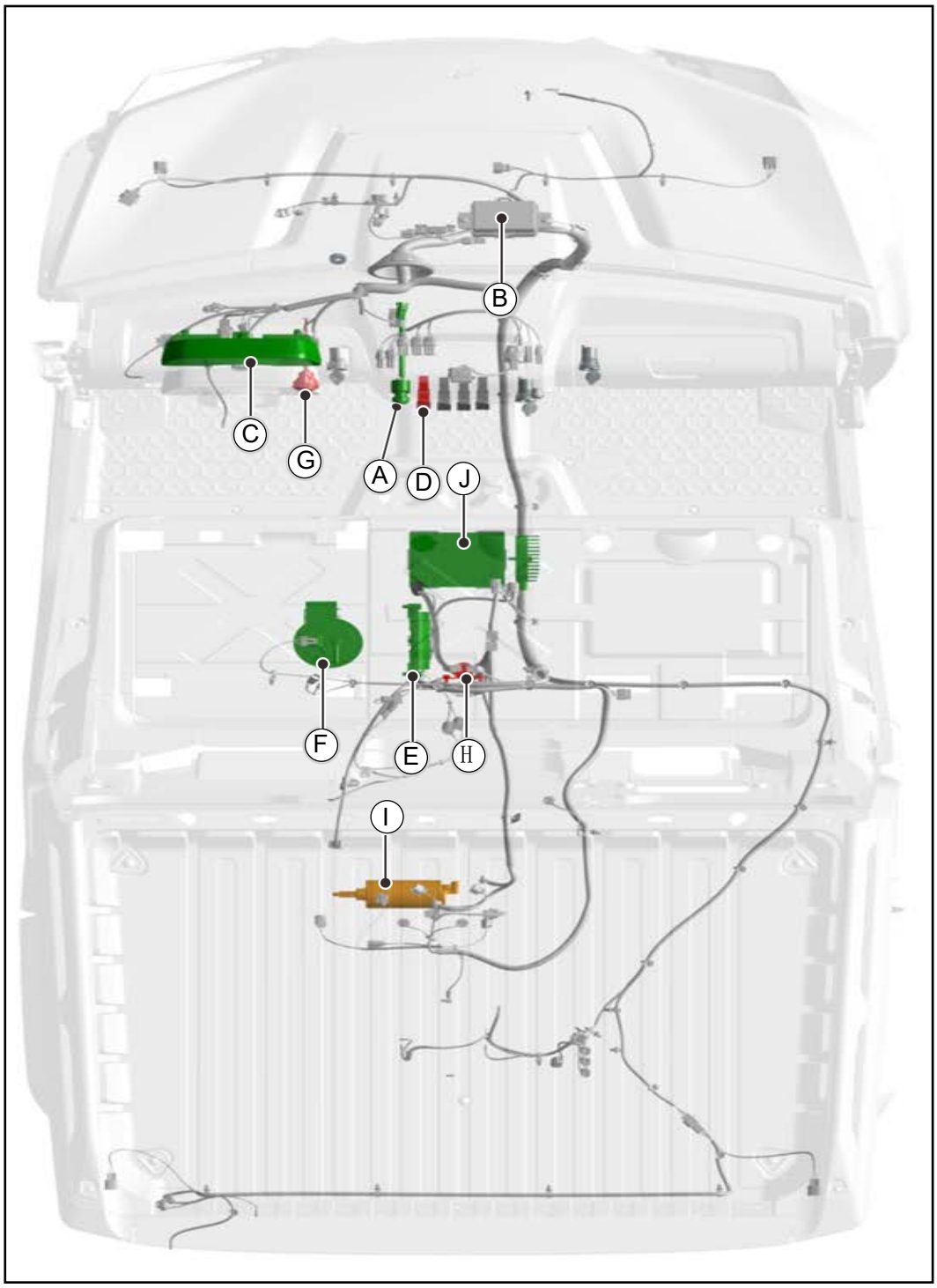
2WD/4WD drive mode switch removal and installation

【A】Fixing bolts

【B】2WD/4WD Drive mode switch

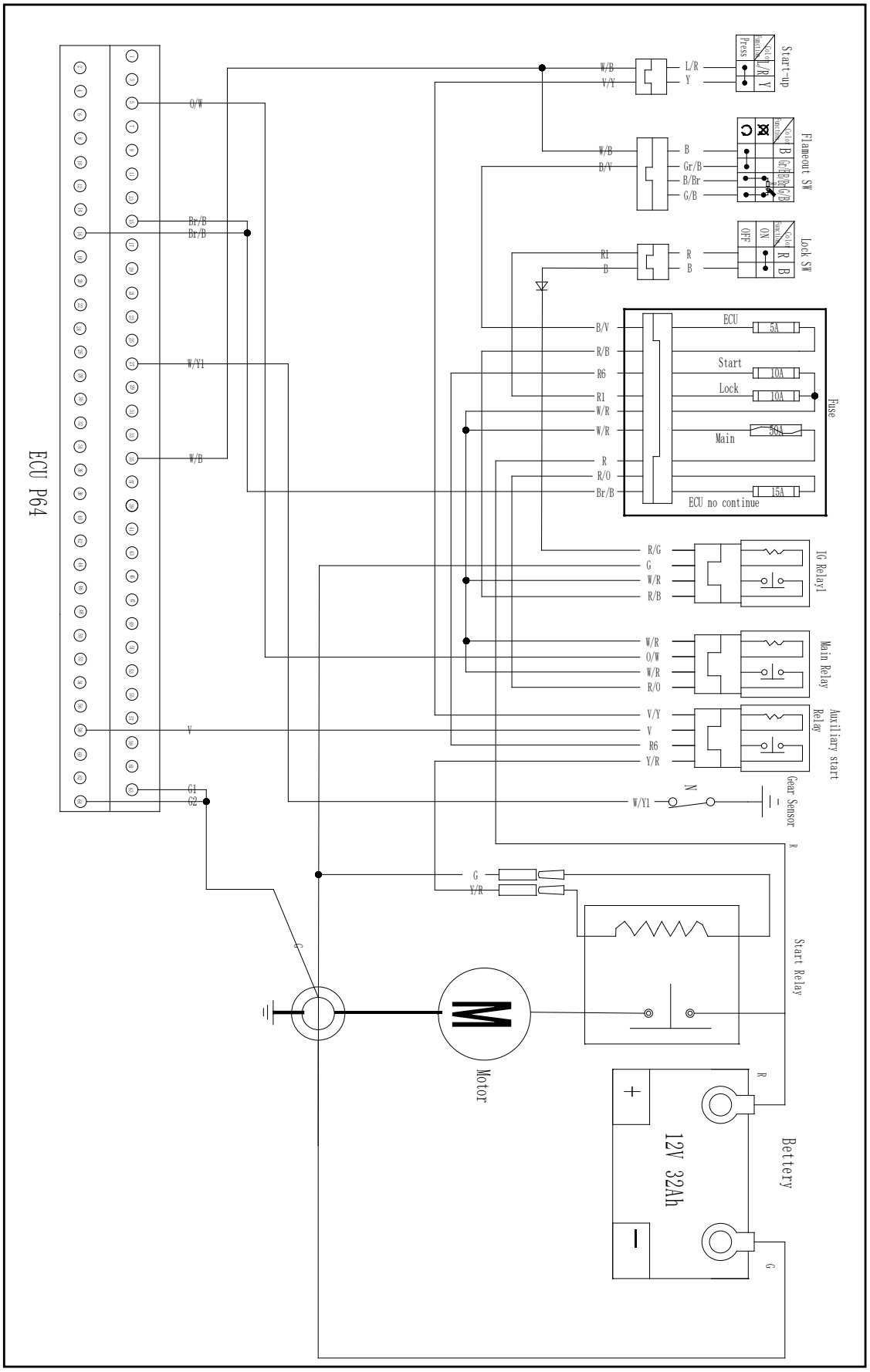
- Remove the three fixing bolts with tools.
- Remove the switch from the plastic part.
- When installing a new switch, tighten the three fixing bolts with a tool

STARTING SYSTEM LAYOUT

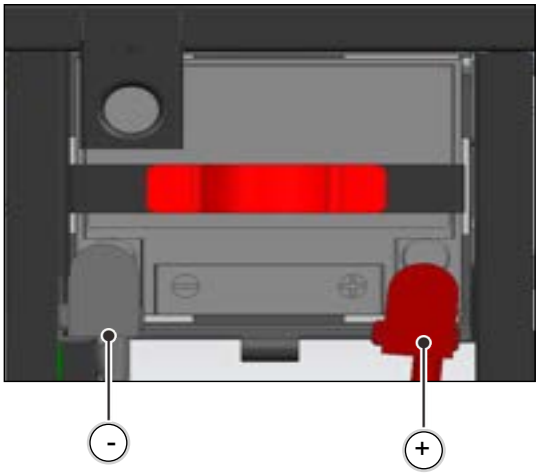


【A】Power lock
【B】Main relay
【C】Instrument
【D】Flameout switch
【E】ECU
【F】Fuel pump
【G】Start button
【H】Start relay
【I】Starter motor
【J】32Ah battery

SCHEMATIC DIAGRAM OF STARTING SYSTEM



STARTING TECHNICAL CONDITIONS AND SPECIAL TOOLS



Battery wiring check

- ◆ Visually check whether the positive [+] and negative [-] terminals of the battery are connected correctly..

☆ If the connection is wrong or missed, please assemble it as required first.

- ◆ Whether the positive and negative end bolts of the battery are assembled in place according to the requirements of the whole vehicle torque table.

☆ If the bolts are not in place, please use a common tool-screwdriver to assemble the bolts in place

- ◆ Visually inspect the terminals at both ends of the battery for signs of ablation, corrosion or dirt

☆ Please clean carefully, if damaged, please replace the battery

Battery voltage check

- ◆ Connect the red and black test leads of the multimeter 【B】to the【+】 and 【-】 poles of the battery【A】, and set the multimeter to the DC position

☆ If the multimeter display shows ≥12V, go to the next step

☆ If the multimeter display shows <12V, please charge it in time according to the battery charging conditions

⚠ WARNING

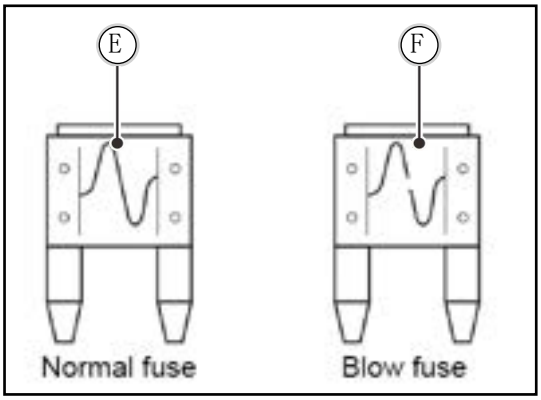
First, make sure to disconnect the negative pole（-）

⚠ WARNING

The battery is a sealed type. Do not open the package. Do not add water when charging.

⚠ WARNING

If possible, do not charge quickly. If fast charging is unavoidable, pay attention to the ambient temperature.



Fuse check

All fuses and relays of the vehicle are in the combination fuse box

- All fuses and relays of the vehicle are in the combination fuse box.
- Remove the front access cover (see vehicle body parts for details).
- After removing the access cover on the front panel, you can see the combined fuse【D】at the bottom. Move the front and rear buckles of the combined fuse box upward, release the buckles and open the fuse box cover..

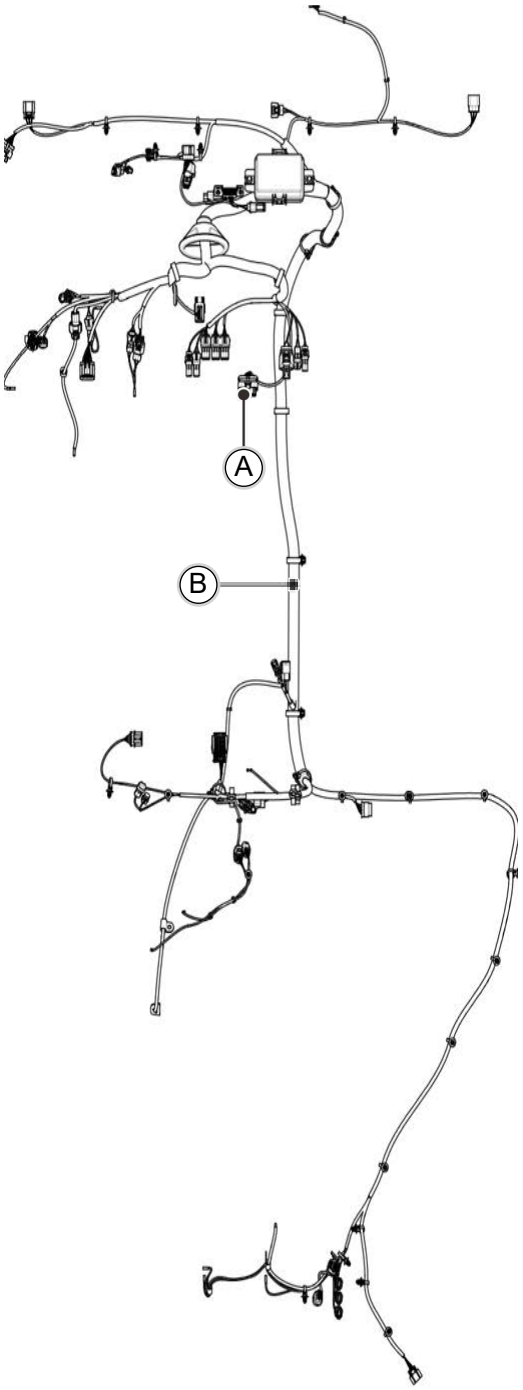
According to the function label on the fuse box cover, take out the corresponding fuse

- Visually check whether the fuse is fused, see Figure【E】and【F】. If the fuse is the same as【F】, please replace the fuse with the same size.

⚠ 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.

ELECTRICAL WIRING



Wiring check

◆ Visually inspect the wiring for signs of ablation, wear, etc.

☆ If any wire is faulty, replace the damaged wire.

◆ Remove each connector【A】and check for corrosion, dirt and damage.

☆ If the connectors or copper parts are corroded or dirty, please clean them carefully, and replace them if they are damaged.

Check the continuity of the wire

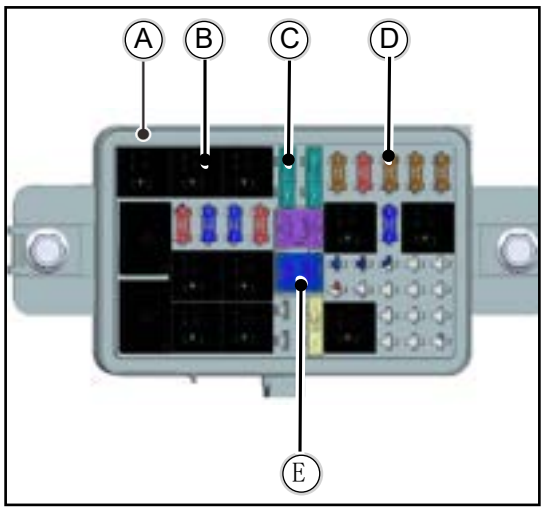
◆ Refer to the electrical schematic diagram to find the wire end suspected to be problematic.

◆ Connect the manual tester (multimeter) to both ends of the wire.

◆ Set the manual tester (multimeter) to the on-off gear.

☆ If the reading of the manual tester (multimeter) is not 0 or the buzzer does not work, the wire is defective if necessary, replace the wire or the main harness【B】.

COMBINATION FUSE BOX MAIN BODY SEGMENT



Combination fuse box main body segment

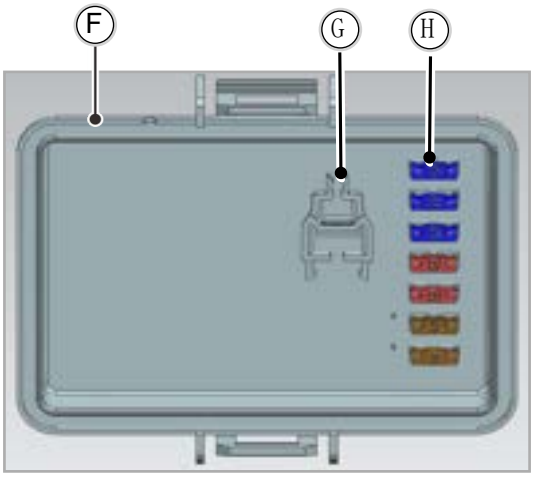
【A】Combination fuse box body

【B】Relay (four-way)

【C】Medium fuse

【D】Micro fuse

【E】Fuse

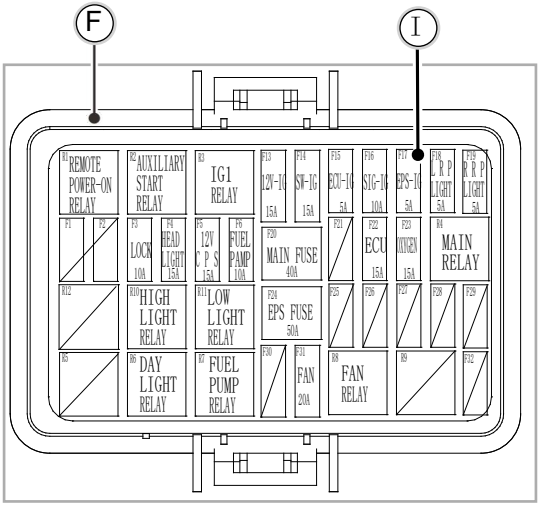


Combination fuse box cover inner part

【F】 Combination fuse box cover

【G】Special tool for fuse removal

【H】Spare fuse



Combination fuse box cover outer branch

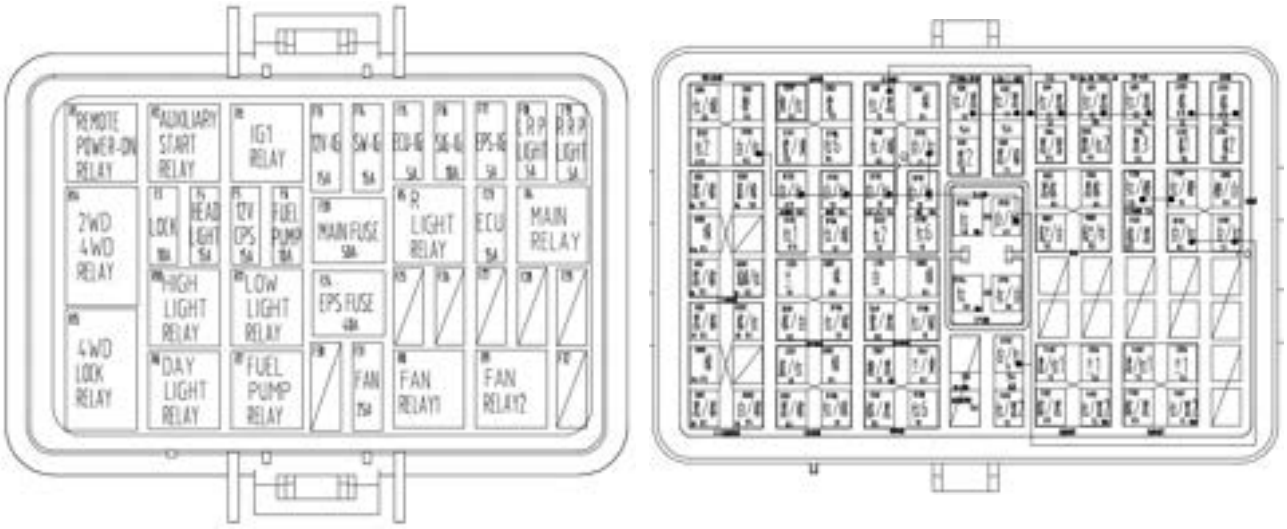
【F】 Combination fuse box cover

【I】Function label

NOTICE

The functional positions and specifications in the combined fuse box shall be subject to the actual product, and the content of the label on the cover of the combined fuse box shall be subject to the actual product. (There may be slight changes)

◆ Functions and specifications of fuse plates and box relays at various positions in the combined fuse box

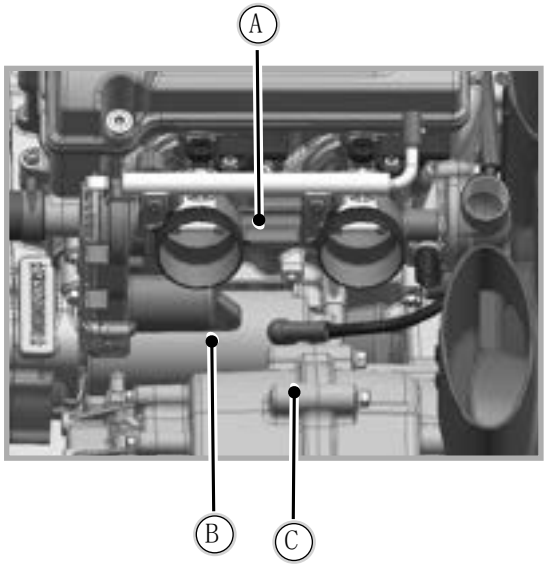


No.	Fuse/Relay	Power	No.	Fuse/Relay	Power
F3	LOCK FUSE	10A	R1	REMOTE POWER-ON RELAY	12V 20A
F4	HEAD LIGHT FUSE	15A	R2	AUXILIARY START RELAY	12V 20A
F5	12V C P S FUSE	15A	R3	IG1 RELAY	12V 20A
F6	FUEL PUMP FUSE	10A	R4	MAIN RELAY	12V 20A
F13	12V-IG FUSE	15A	R5	R LIGHT RELAY	12V 20A
F14	SW-IG fuse	15A	R6	DAY LIGHT RELAY	12V 20A
F15	ECU-IG fuse	5A	R7	FUEL PUMP RELAY	12V 20A
F16	SIG-IG fuse	10A	R8	FAN RELAY 1	12V 20A
F17	EPS-IG fuse	5A	R9	FAN RELAY 2	12V 20A
F18	L R P LIGHT	5A	R10	HIGH LIGHT RELAY	12V 20A
F19	R R P LIGHT	5A	R11	LOW LIGHT RELAY	12V 20A
F20	MAIN FUSE	50A	R14	2WD 4WD RELAY	12V 20A
F23	ECU FUSE	15A	R15	4WD LOCK RELY	12V 20A
F24	EPS fuse	40A			
F31	FAN FUSE	25A			

NOTICE

All functional positions and specifications in the combined insurance are subject to the actual product (subject to slight changes).

STARTER MOTOR



The starting motor【B】is located between the crankcase【A】and the gearbox【C】.

⚠ CAUTION

The starting motor is a component that cannot be repaired. If the motor is faulty, the component must be replaced in time.

Disassemble the starter motor

- Disconnect the battery
- Loosen the nut of the positive wire of the starter motor, and then remove the starter cable
- Loosen the two fixing bolts fixing the starting motor on the crankcase, and then remove the starting motor. Note down the wiring form and O-ring.

Assemble the starting motor

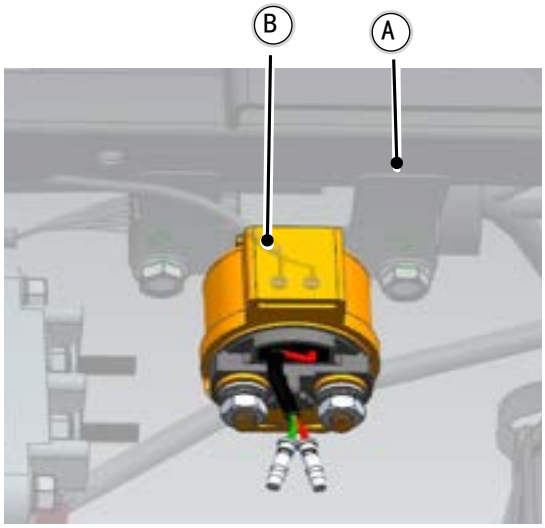
- Apply a small amount of grease to the O-ring of the starter motor, then install the starter motor into the crankcase and fix it with two bolts.
- Fix the starting cable on the starting motor with a nut
- Connect the battery.

⚠ WARNING

First, make sure to disconnect the battery negative (-) cable.

Then, disconnect the battery positive (+) cable.

STARTING RELAY



The starting relay【B】is located under the passenger seat cushion assembly

- Remove the occupant seat cushion assembly (as shown in the left view).
- The starting relay【B】is installed on the bracket welding component under the seat cushion—rear cross tube 【A】—the starting relay bracket component【C】.

Starting relay detection

Remove the occupant seat cushion assembly then use a multimeter set to the DC voltage position to check the relay according to the following steps.
Connect the red test lead of the multimeter to the battery wire end, and then connect the black test lead to the start wire end of the starting relay. The meter must display the battery voltage.

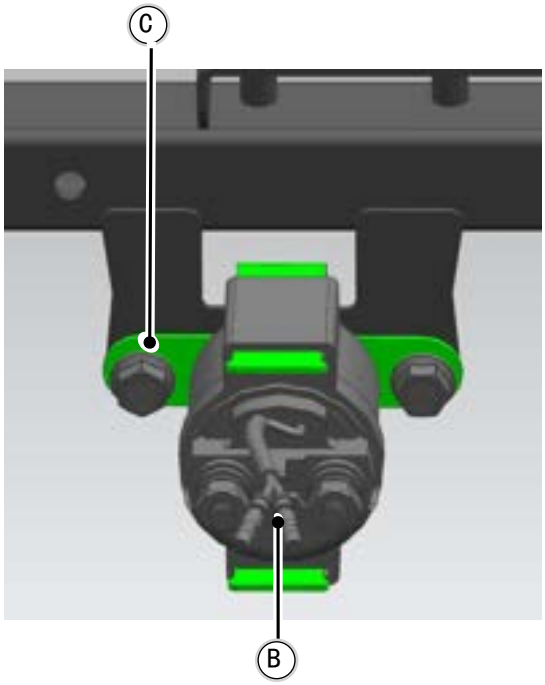
⚠ CAUTION

Ensure that the ignition switch is in the ON position and the transmission is in the parking gear.

While observing the multimeter, press the start button.
The multimeter should drop to 0 volts and the starter motor should start.

⚠ CAUTION

If the starting relay is closed, and the multimeter shows that the voltage exceeds 1 volt, please replace the starting relay if you do not hear the "click" sound, and the multimeter continues to indicate the battery voltage, please continue to the next step.

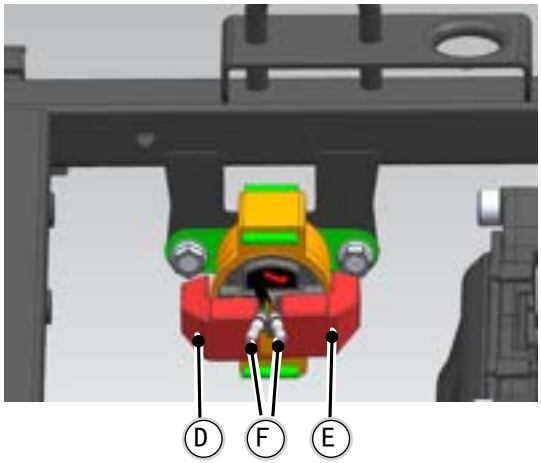


Disconnect the main cable connector from the starting relay then connect the red test lead to the "green" wire and the black test lead to the "yellow/red" wire
Press the start button and observe the multimeter.

⚠ CAUTION

If the battery voltage is displayed, please replace the starting relay if the voltage is not displayed, please continue to check the circuit module, combination fuse box, etc.

DISASSEMBLE THE STARTING RELAY



Disassemble the starting relay

- Disconnect the battery.
- Unplug the main cable connector from the starting relay【F】.
- Loosen the starting wire【D】on the starting relay and the battery【E】nut, and then remove the cable.

Assemble starting relay

- The order of assembly and disassembly is reverse, install the starting relay and connect the cables.
- Then connect the battery.

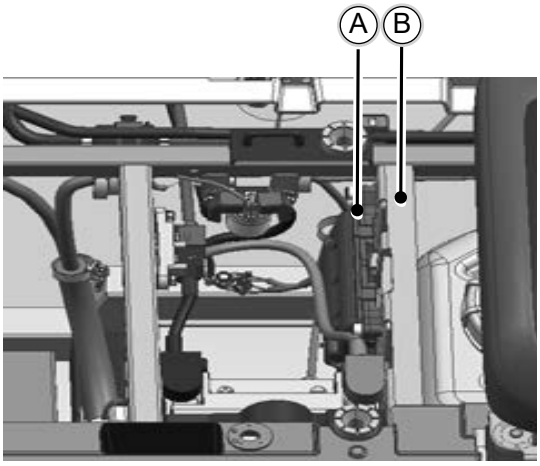
TIP

The starting relay is a component that cannot be repaired. If the relay is faulty, the component must be replaced in time.

⚠ WARNING

The starting relay is a component that cannot be repaired. If the relay is faulty, the component must be replaced in time.

ECU



The ECU is located under the passenger seat cushion assembly.

- Remove the occupant seat cushion assembly (as shown in the left view)
- ECU【A】is installed on the bracket welding assembly under the seat cushion—brake transfer fixing bracket assembly【B】.

ECU Detection

- Remove the occupant seat cushion assembly.
- ECU is rarely the cause of electrical problems however, if you suspect that there is a problem with the ECU, please change to a compatible ECU with the same model and the same state to verify whether there is a problem with the ECU.

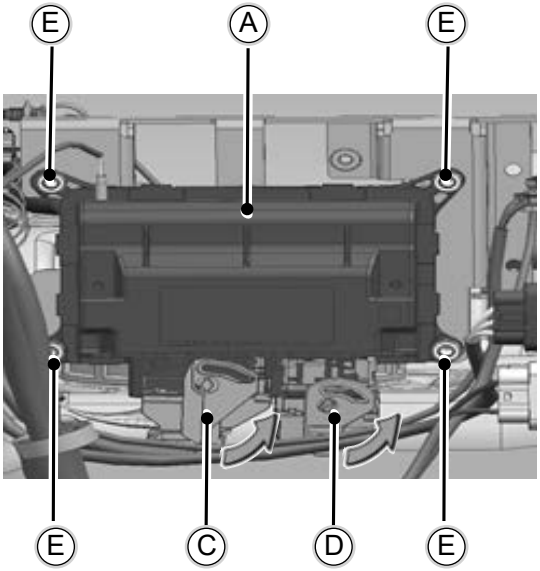
⚠ CAUTION

The EFI system has a built-in function, which only allows ECUs with the same part code to be used in these modules. Do not try to replace ECU with other modules, because the system will not support starting.

The specific detection method of ECU, the steps of diagnosing fault code (DTC) (displayed on the instrument) and clearing the error code, etc., can refer to the detailed content of the electrical electronic injection system.

NOTICE

ECU is a component that cannot be repaired. If the ECU is faulty, the component must be replaced in time.



Disassemble ECU

- Disconnect the battery.
- Loosen (counterclockwise as the direction of the arrow) the connector lock, and unplug the main cable connector【C】and the EFI auxiliary cable connector【D】on the ECU.
- Loosen the four fixing bolts【E】of the ECU fixed on the brake adapter fixing bracket assembly, and then remove the ECU.

Assemble ECU

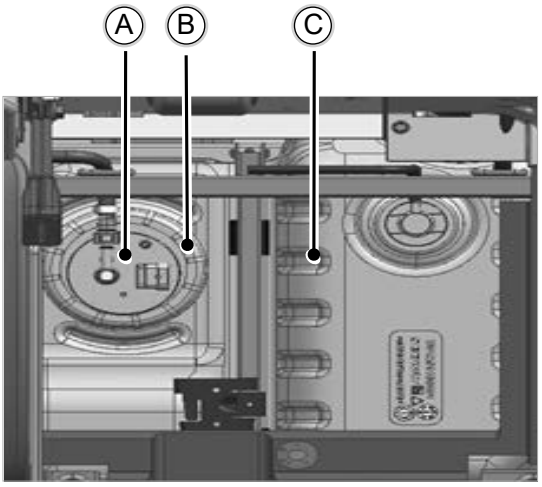
- The order of assembly and disassembly is reverse, and ECU should be installed.
- Connect the ECU and the main cable and the EFI auxiliary cable connector, and then (clockwise as the arrow direction) lock the buckle
- Then connect the battery.

⚠ WARNING

First, make sure to disconnect the battery negative (-) cable.

Then, disconnect the battery positive (+) cable.

FUEL PUMP ASSEMBLY

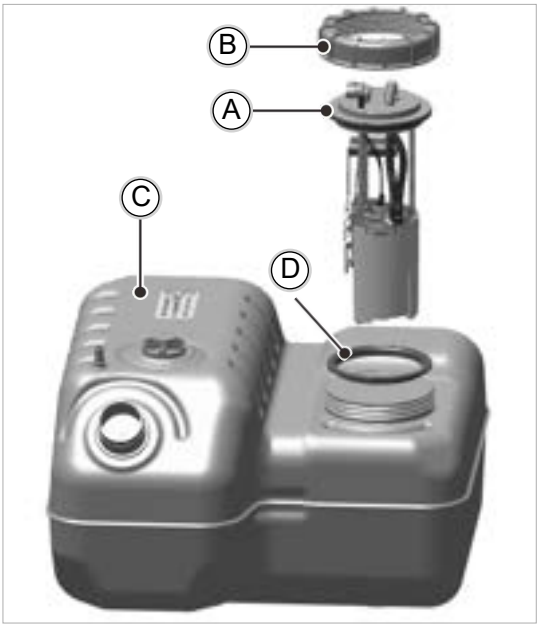


The fuel pump assembly is located under the driver's seat assembly and the lower cover of the driver's seat.

- Remove the driver's seat assembly and the lower cover of the driver's seat (as the left side view).
- Fuel pump assembly【A】Install screw cap with fuel pump【B】+ fuel pump seal ring【D】fixedly installed in the plastic fuel tank assembly【C】.

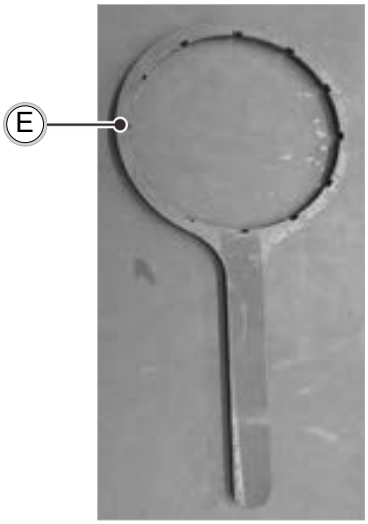
⚠ WARNING

- Whenever the gasoline pipeline is removed, the battery must be disconnected to prevent the fuel pump from starting accidentally.
- Whenever any maintenance or inspection of the fuel system is carried out, fuel leakage may occur. There must be no welding, smoke, open flames, etc. in this area.



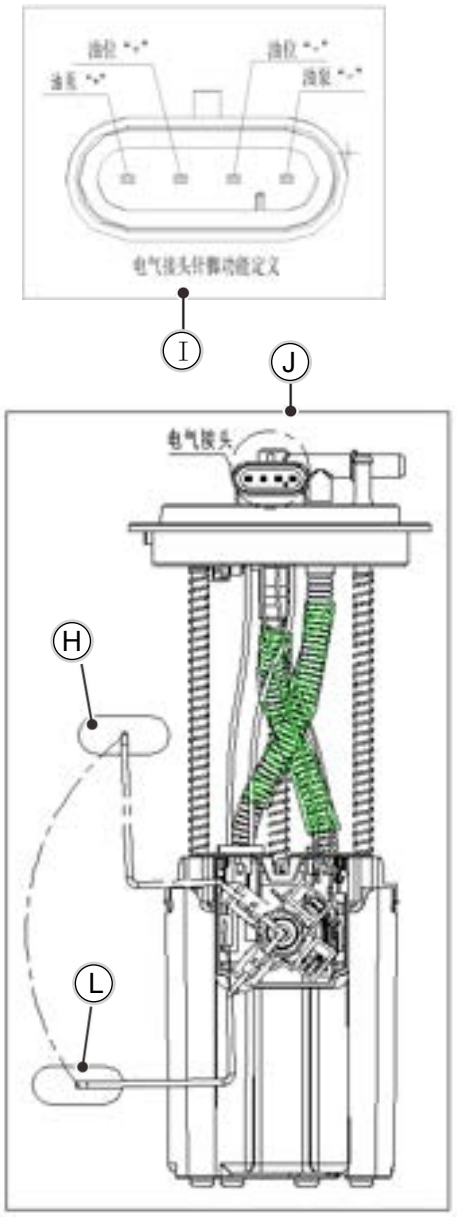
Disassemble the fuel pump assembly

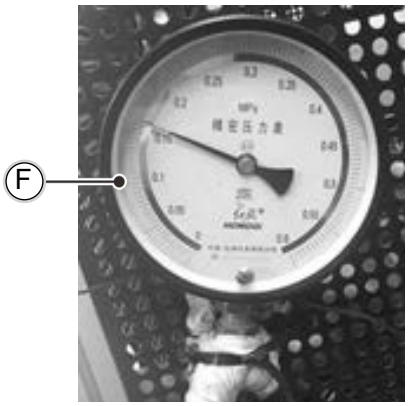
- Remove the driver's seat assembly and the lower cover of the driver's seat (see the vehicle body section for details).
- Use special tool【E】to remove the fuel pump installation screw cap 【B】 counterclockwise.
- Mark the direction of the fuel pump on the fuel tank, and remove the fuel pump【A】.
- Keep the fuel pump sealing ring【D】to prevent loss.



⚠ CAUTION

After removing the fuel pump, please protect the fuel tank port effectively to prevent debris from falling into the fuel tank and damage the fuel pump.





Fuel pump assembly inspection

- Structural drawing of the front view of the fuel pump assembly【J】.
- Definition diagram of pin function of fuel pump electrical connector【I】.
- Remove the driver's seat assembly and the lower cover of the driver's seat then use a multimeter set to the resistance ohm position to check the fuel level sensor of the fuel pump according to the following steps.
- Move the floating rod to check if it can move freely. The float assembly should be able to return to a lower position freely. If not, please replace the fuel pump.
- Connect the multimeter to the middle two pins of the cable plug【D】to test the fuel position sensor. The multimeter displays 235±5Ω on the full fuel position [H], and 40±2Ω on the empty fuel position【L】.

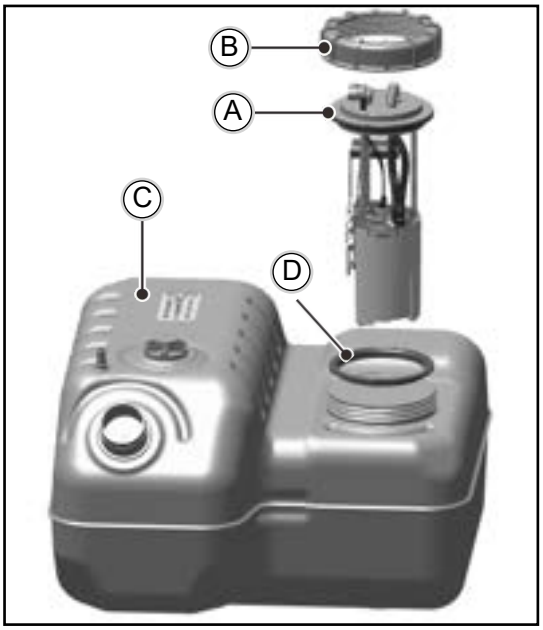
Lowest point (L point)	Height（mm）	41±4
	Resistance (Ω)	40±2
Highest point (H point)	Height（mm）	186±5
	Resistance (Ω)	235±5

- Use the pressure gauge【F】to test the pressure of the fuel pump supply port, and the test pressure value is 400±20Kpa under the power-on state.

Type	Test pressure(Kpa)	Flow（L/h）	Electric current(A)	Sealing pressure(Kpa)
W380224A-JK	300	110-140	5.5	550-850
A882CHT	300	≥100	≤5.8	400±20

⚠ 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 does not meet the requirements, please replace the fuel pump.



⚠ CAUTION

During the process of disassembling any part of the fuel system, fuel leakage may occur. Wipe off the residual fuel with a cloth.

Fuel pump assembly

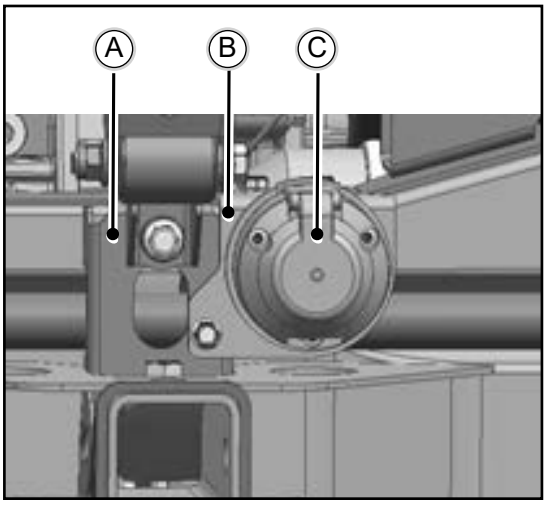
- Confirm that the sealing ring【D】is installed on the fuel tank port.
- Confirm the orientation of the fuel pump and install it on the fuel tank.
- Tighten the fuel pump installation screw cap clockwise【B】.

Fuel pump installation screw cap
75N·m

⚠ CAUTION

When disassembling the fuel pump, be sure to turn off the vehicle and leave it for more than 30 minutes to ensure that the pressure of the high-pressure fuel pipe is released to avoid danger.

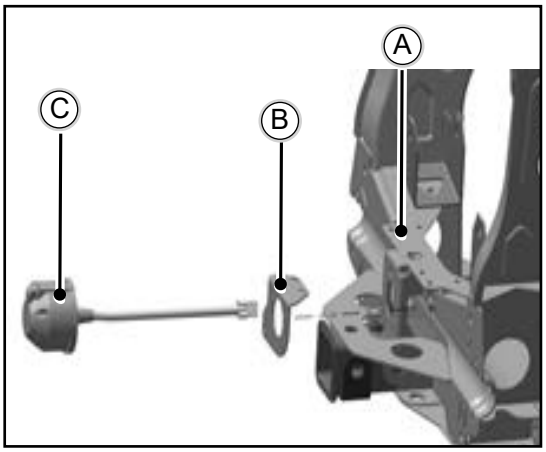
TRAILER POWER SOCKET



- The trailer power supply 【C】 is located at the rear of the vehicle, on the trailer power supply mounting bracket assembly【B】of the rear reinforcement plate assembly【A】under the muffler cylinder assembly.

Remove trailer power socket

- Use a screwdriver to loosen the 3 screws that fix the trailer's power socket.
- Loosen the plastic connector connecting the trailer power socket with the main cable.
- Take out the trailer power socket.

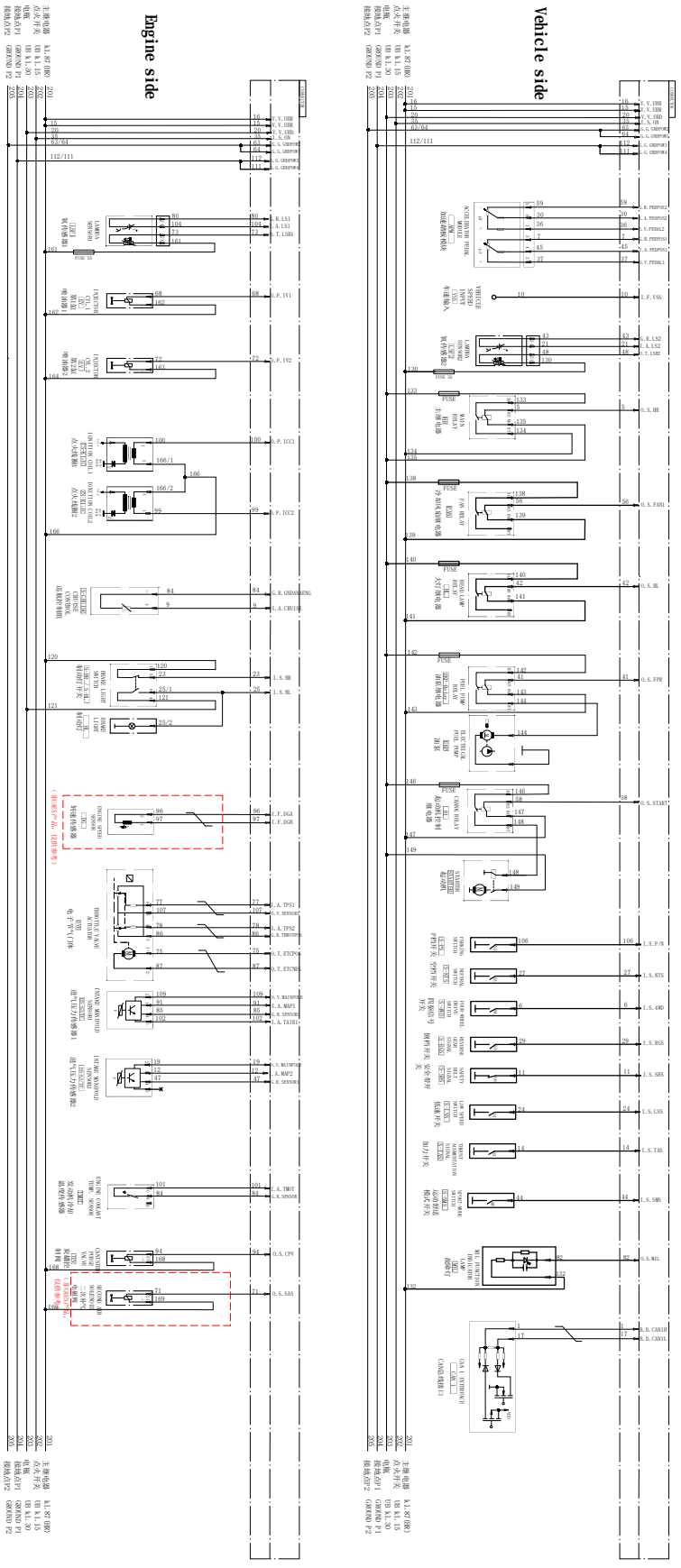


Install trailer power socket

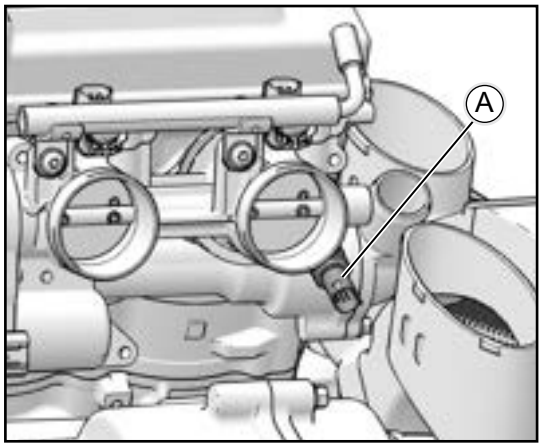
- First pass the lead connector of the trailer power socket through the middle hole of the trailer power supply mounting bracket assembly.
- Then connect the plastic connector with the main cable.
- Use a screwdriver to fix the trailer power socket on the trailer power supply mounting bracket assembly with 3 screws.

EFI SYSTEM

Schematic diagram of EFI system



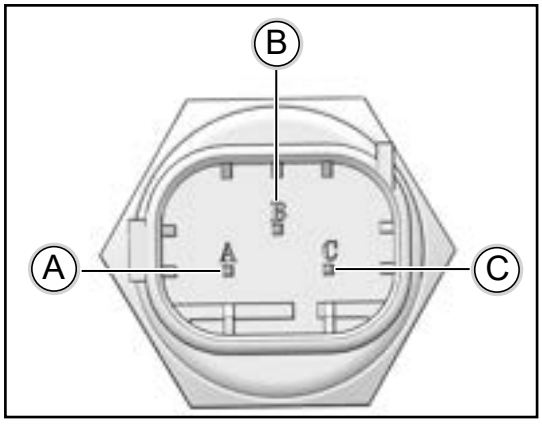
COOLANT TEMPERATURE SENSOR



Function Description

The coolant temperature sensor function is used to monitor the temperature of the engine coolant,on the one hand, the output signal enables the electronic system to make a judgment on the working condition of the engineon the other hand, the output signal to the instrument allows the operator to directly judge the working state of the engine by visual inspection.

The temperature sensor is generally installed on the intake side of the engine block, and the cylinder temperature sensor can be seen after disassembling the cargo box (see A in the figure below).



working principle

The NTC thermistor is packaged in the temperature sensor, and its resistance value changes with the change of the ambient temperature, so that the small change in the external temperature can be accurately and timely measured. Measuring its output resistance can reflect the temperature of the contacting medium. Among them, the A and C terminals output signals to the electronic control unit ECU, and the B terminal is suspended. The pin definition is shown in the figure below.

【A】Connect the positive signal

【B】Hanging

【C】Connect to the negative pole of the signal

Performance parameter

- ***Power: 0.25W under standard use conditions***
- ***Working temperature：-30°C～+130°C***
- ***Vibration level：≤600m/s2***
- ***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***

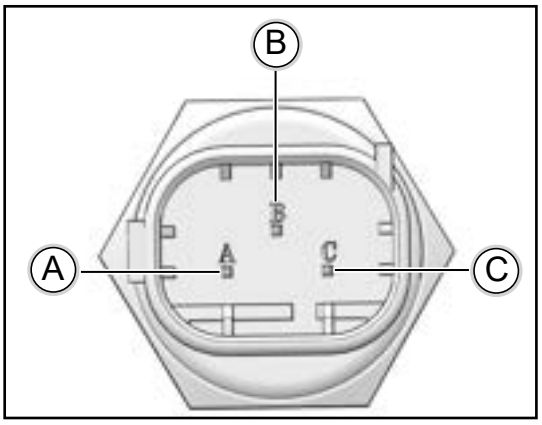
Table 1 Temperature sensor resistance-temperature characteristics

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:

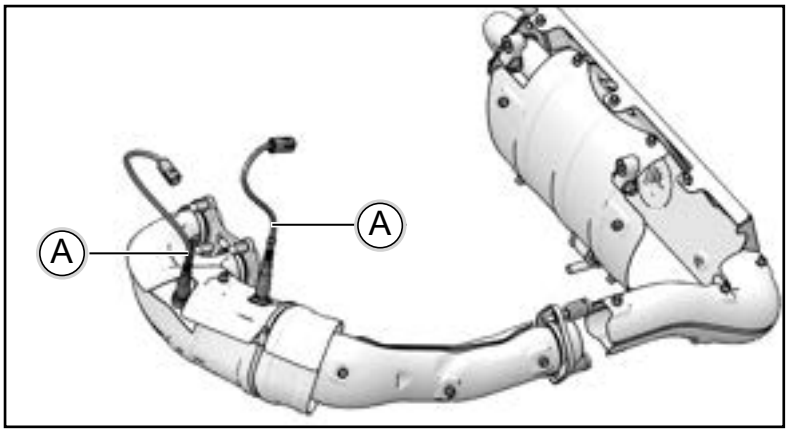
- First check whether the sensor harness connector is well connected
- Unplug the connector, check whether the sensor and the wire harness end pins are bent or deformed, etc.
- Use M19mm open-end wrench to remove the sensor and check whether the sensor probe is deformed
- Check the resistance between 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.



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℃, 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 (λ=1).

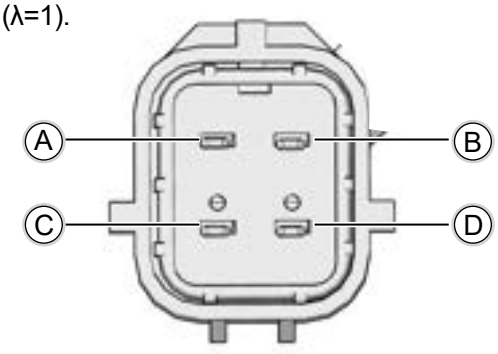
The oxygen sensor electrical connector has 4 pins:

【A】connect to the negative signal of the signal (gray)

【B】connect to the positive pole of the heating power supply (white)

【C】connect to the positive signal of the signal (black)

【D】connect to the negative pole of the heating power supply (white)



Performance parameter

Item	New oxygen		500h Durable after oxygen	
Exhaust temperature	350˚C	850˚C	350˚C	850˚C
λ = 0.97 when the sensor element voltage(mv)	840±70	710±70	840±80	710±70
λ = 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

Electrical characteristics

The electronic control unit ECU monitors various sensors, actuators, and power amplifier circuits and detection circuits. When the oxygen sensor fails, the system performs open-loop control, and the corresponding fuel consumption will increase. Common fault codes are shown in the fault summary table.

⚠ CAUTION

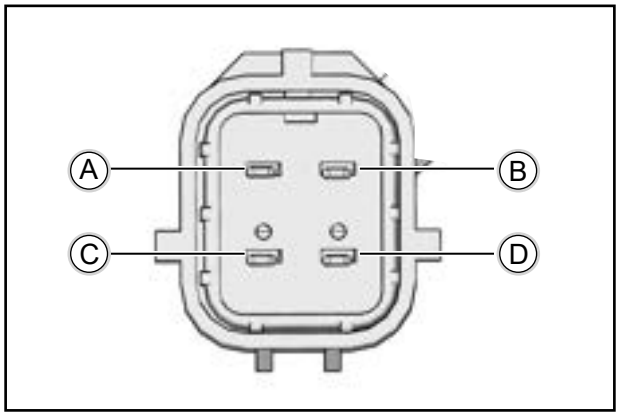
When checking the oxygen sensor signal failure, the engine should be operated for at least 5-10min to ensure that the oxygen sensor heating is completed.

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 B and D is normal.
- Check whether the voltage between pin B 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.
- Use an M22mm open-end wrench to remove the sensor, and check whether the sensor probe is deformed or damaged.

In addition, the oxygen sensor is an indirect reflection sensor. If other sensors are faulty, the oxygen sensor will also report a fault:

- The battery voltage is not credible.
- The absolute pressure signal of the intake manifold is unreliable.
- The signal of the engine temperature sensor is unreliable.



⚠ WARNING

When disassembling the oxygen sensor, be careful of the muffler and engine, and be careful of burns!

碳罐电磁阀

功能说明

碳罐电磁阀用于控制油箱蒸气流经活性炭的再生气流量，它是通过脉冲触发的，脉冲的持续时间或电子控制器的频率根据发动机的工况进行调整，无电流时处于闭合状态。

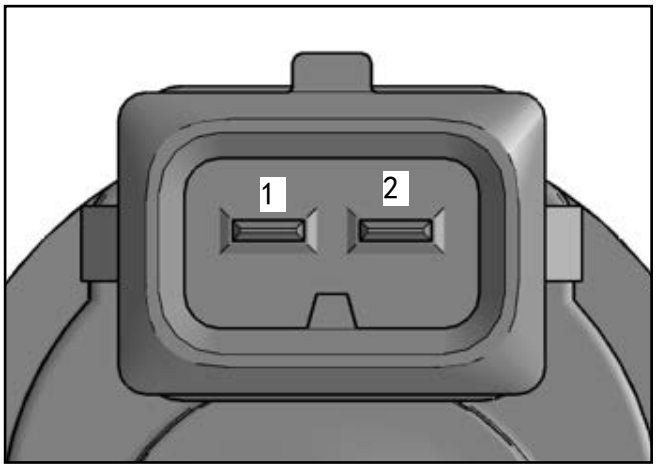
技术参数

额定电压和电流：13.5V/0.79A
工作电压：9V~16V
工作温度：-40℃~ 140℃
电阻（室温）：17Ω

故障诊断

当碳罐电磁阀的线路出现短路或者开路故障时，仪表上的故障灯会亮起并且会出现故障代码，常见故障代码见故障总表。

1. 检查碳罐电磁阀的线束插件是否接插良好。
2. 拔下接插件查看碳罐电磁阀和线束端以及ECU端插件是否存在变形或者退针。
3. 室温下测量碳罐电磁阀的电阻是否为17Ω。
4. 拔掉接插件后启动车辆，测量接插件端线路1的电压是否在9V~16V之间，熄火后测量线路2与ECU端接插件的6号引脚是否相通。

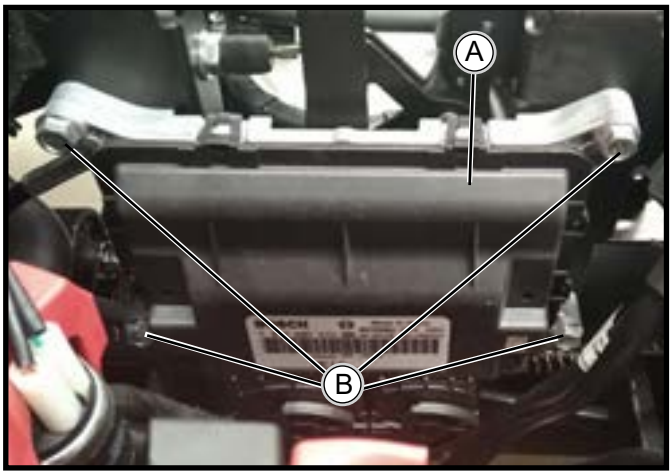


ELECTRONIC CONTROL UNIT（ECU）

Function Description

The engine electronic control unit (ECU for short), as a key component of the engine control management system, is used to detect and control the normal operation of the engine system.load information is collected through sensors to predict the driver's driving intention and at the same time ensure the best fuel economy to meet the emission standards required by regulations.The engine management system is equipped with sensors and actuators necessary for ECU work,the ECU calculates the required air-fuel mixture ratio and the ignition advance angle of the engine according to the input data of the sensor,and according to the measured data and the working status of other accessory systems, it controls the fuel supply, fuel injection timing, high-pressure ignition timing, ignition closing angle, closed-loop control of engine idling speed, etc. under various operating conditions.

The ECU is installed under the seat cushion (see A in the figure below) and is fixed to the frame by 4 M8 bolts B (see B in the figure below), with the ECU socket facing downwards.



⚠ CAUTION

The ECU socket faces downwards to prevent water and dust.

Electrical characteristics

Working voltage:：

- ***Rated voltage: 13.5V***
- ***Full-function working voltage range: 9 V～16 V***
- ***Function limited voltage range: 6 V～9 V, 16 V～18 V***
- ***Guaranteed diagnostic function voltage range: 8 V～16 V***

Working current:：

- ***Working current: <10A@13.5V***
- ***Quiescent current: <1mA@13.5V***

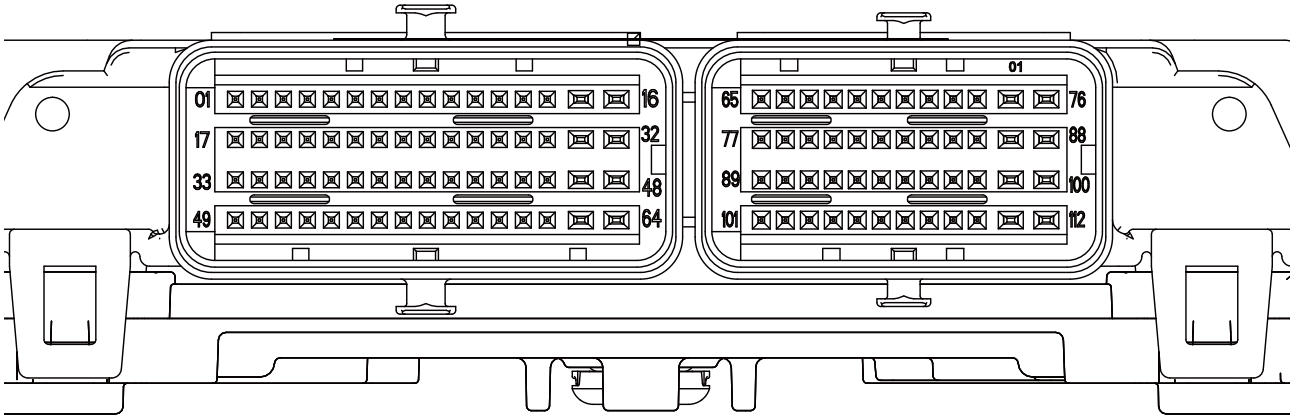
Electrical protection:：

- Overvoltage protection: ECU can withstand 24V overvoltage for 60 seconds (ambient temperature is 23℃±5℃). If the system returns to normal operating voltage within 60 seconds, ECU can still ensure normal operation.
- System reverse voltage protection: If UBR (Pin15, 16) is powered by the main relay, the ECU can withstand a reverse voltage of 14.0 V for 60 seconds (ambient temperature is 23℃ ±5℃, other connections are correct),if the system recovers to normal operating voltage within 60 seconds, the ECU can still ensure normal operation.
- Output level protection: The controller driver level has diagnostic protection functions, such as short-circuit to ground, short-circuit to power supply, and open circuit.

Fault diagnosis

The ECU can call out the fault information record in the ECU, or manually input some instructions such as clearing the fault information record, self-learning, etc.when the ECU has a fault, the engine will generally fail to start, the actuator does not work, etc. The ECU fault check mainly checks whether the connectors are well connected and whether the pins are bent or deformed.

ECU pin definition



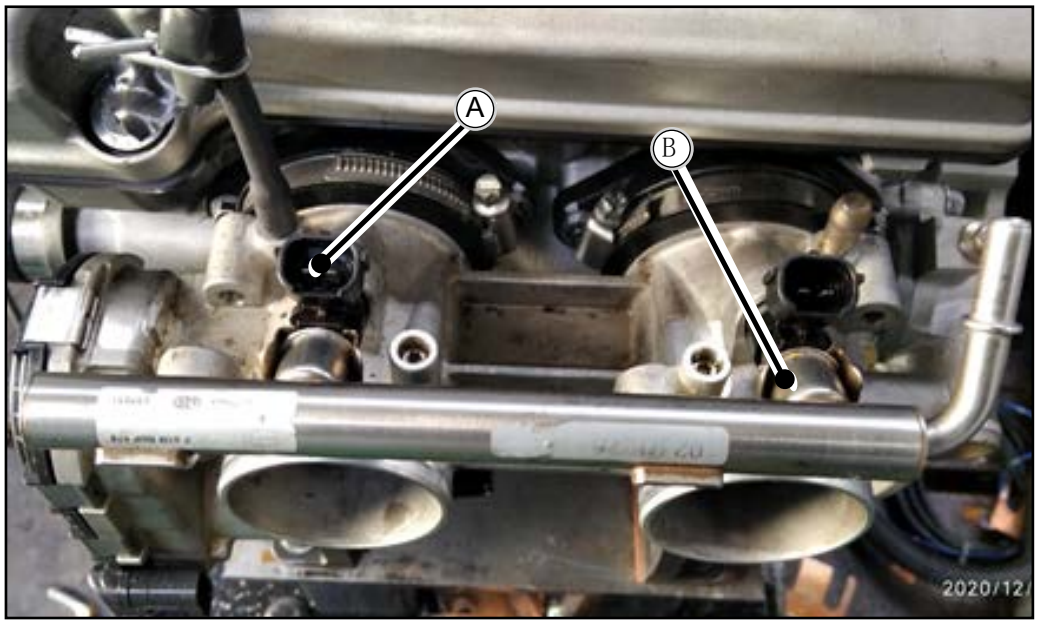
Item	Name	Item	Name
1	CAN1H CAN（HIGH）	25	BRAKE LIGHT
2	NC	26	NC
3	NC	27	NEUTRAL SWITCH SIGNAL
4	NC	28	NC
5	MAIN RELAY	29	REVERSE GEAR SWITCH
6	FOUR-WHEEL DRIVE SWITCH	30	ACCELERATOR PEDAL SENSOR2
7	GROUND FOR PEDAL 1	31	NC
8	NC	32	NC
9	CRUISE CONTROL INPUT	33	NC
10	NC	34	NC
11	SAFETY BELT SWITCH	35	IGNITION SWITCH
12	INTAKE MANIFOLD PRESSURE2	36	SENSOR SUPPLY FOR PEDAL 2
13	NC	37	SENSOR SUPPLY FOR PEDAL 1
14	THRUST AUGMENTATION SWITCH	38	NC
15	SWITCHED BATTERY VOLTAGE	39	NC
16	SWITCHED BATTERY VOLTAGE	40	NC
17	CAN1L CAN（LOW）	41	FUEL PUMP RELAY
18	NC	42	HEAD LAMP RELAY
19	REGULATED SENSOR SUPPLY 5V	43	GROUND FOR LAMBDA
20	CONTINOUS SUPPLY VOLTAGE	44	NC
21	LAMBDA SENSOR2	45	ACCELERATOR PEDAL SENSOR1
22	NC	46	NC
23	BRAKE SWITCH	47	GROND FOR ANALOG
24	LOW SPEED SWITCH	48	LAMBDA SENSOR HEATING2

Item	Name	Item	Name
49	NC	82	MIL FUNCTION INDICATOR LAMP
50	NC	83	NC
51	NC	84	GROUND FOR SENSOR
52	NC	85	GROUND FOR MANIFOLD
53	NC	86	GROUND FOR THROTTLE
54	NC	87	THROTTLE ACTUATOR
55	NC	88	NC
56	FAN RELAY CONTROL	89	NC
57	NC	90	NC
58	CRANK RELAY	91	INTAKE MANIFOLD PRESSURE1
59	GROUND FOR PEDAL2	92	NC
60	NC	93	NC
61	NC	94	CANISTER PURGE VALVE
62	NC	95	NC
63	ECU MAIN GROUND 2	96	ENGINE SPEED SENSOR A
64	ECU MAIN GROUND 1	97	ENGINE SPEED SENSOR B
65	NC	98	NC
66	NC	99	IGNITION COIL2
67	NC	100	IGNITION COIL2
68	INJECTOR1(CYL.1)	101	ENGINE COOLANT TEMP SENSOR
69	NC	102	INTAKE AIR TEMPERATURE SENSOR1
70	NC	103	NC
71	SECOND AIR SOLENOID	104	LAMBDA SENSOR1
72	INJECTOR2(CYL.2)	105	NC
73	LAMBDA SENSOR HEATING1	106	PARKING SWITCH P
74	NC	107	SENSOR SUPPLY FOR THROTTLE
75	THROTTLE ACTUATOR	108	NC
76	NC	109	SENSOR SUPPLY FOR MAINFOLD
77	THROTTLE POSITION SENSOR 1	110	NC
78	THROTTLE POSITION SENSOR 2	111	ECU MAIN GROUND 4
79	NC	112	ECU MAIN GROUND 4
80	GROUND FOR LAMBDA		
81	NC		

FUEL INJECTOR

The fuel injector provides fuel to the engine and atomizes it within a specified time according to the instruction of the ECU.

The fuel injector (see A in the figure below) is installed on the electronic throttle body, and the other end is connected to the fuel pipe through the injector rail (see B in the figure below).



working principle

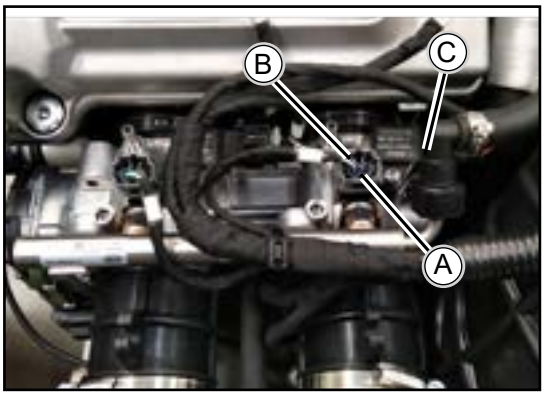
The ECU sends out electrical pulse signals to the injector coil to form a magnetic field force.When the magnetic field force rises enough to overcome the combined force of the return spring pressure, the needle valve's gravity and the friction force, the needle valve begins to rise and the fuel injection process begins.The maximum lift of the needle valve does not exceed 0.1mm. When the fuel injection pulse is cut off, the pressure of the return spring causes the needle valve to close again.

Performance parameter

project	parameter
Static flow	207.8g/min
Dynamic flow	6.65mg/stroke（冲程）
Jet angle	23°
Coil resistance	12Ω
Hydraulic leak	1.8mm^3/min

Fault diagnosis

ECU only performs 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 disconnected, the fault flag is set.When the injector fails, the engine cannot start without the injector or the injector keeps injecting fuel, causing the cylinder to flood, etc. The common fault codes are shown in the fault summary table.



Fuel injector failure inspection:

- Check that the connectors are well connected.
- Check whether the wiring harness and injector pins are bent or deformed.
- Check whether the fuel injector cap (at 【C】 in the left picture) and the fuel 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) and the main relay.
- Check the resistance between the pins (B in the left picture) and the ECU pins (see ECU pin definition).

⚠ WARNING

When removing the oil pipe, there is high-pressure oil in the oil pipe, pay attention to fire safety and be careful to spray it into your eyes.

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.

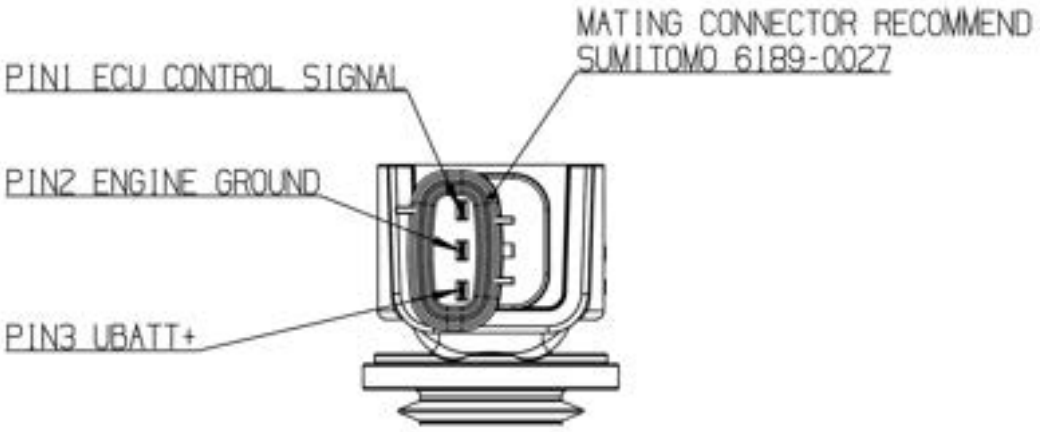
The ignition coil is installed on the engine, and the ignition coil installed on the engine can be seen after disassembling the cargo box (see A in the figure below).

Working principle

The ignition coil is composed of a primary winding, a secondary winding, an iron core, and a shell.When the voltage of the battery 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 electricity is induced in the secondary winding at the same time.

There are three pins on the low voltage side of the ignition coil:

- PIN 1: Connect to ECU control signal
- PIN 2: The pin is grounded
- PIN 3: Connect to the positive pole 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℃	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

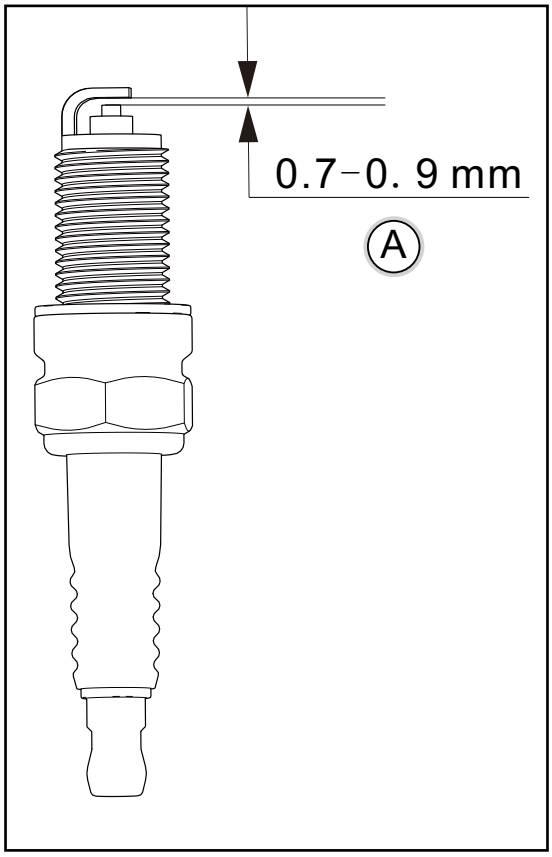
The ECU does not perform the fault diagnosis function for the ignition coil, so there is no ignition coil related code in the fault code list. If there is no ignition, please check whether the ignition coil connector is well connected, whether the pins are deformed, and whether the ignition coil wire and the spark plug are in good contact.

⚠ WARNING

If the spark plug wire (point【A】in the left picture) is installed incorrectly, it will cause the engine to shut down.

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 0.8±0.1, it will lead to unreliable ignition or failure to ignite. Please adjust the gap or replace the spark plug in time .

Remove and install spark plugs

- Remove the ignition coil.
- Use the spark plug sleeve to remove the spark plug.
- Take out the spark plug and check the state of the spark plug.
- If there is no problem, please replace with a new spark plug .

Spark plug torque
15N·m（1.5kgf·m，11.1ft·lb）

⚠ 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

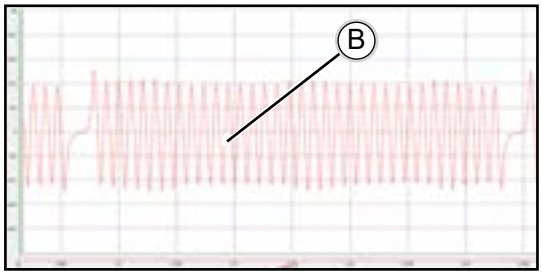
The working principle of the speed sensor is to use the magnetoelectric effect. When the shaft rotates, the signal wheel is driven to rotate together, and the teeth on the signal wheel will cut the magnetic line of the sensor. This change in magnetic flux causes a certain frequency at both ends of the 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).

Technical performance test

The speed sensor outputs a sinusoidal voltage signal, and the output signal (see 【B】 on the left).

Coil resistance (23 ℃) : 950-20 Ω

Coil inductance (1000HZ) : 450±15 mH



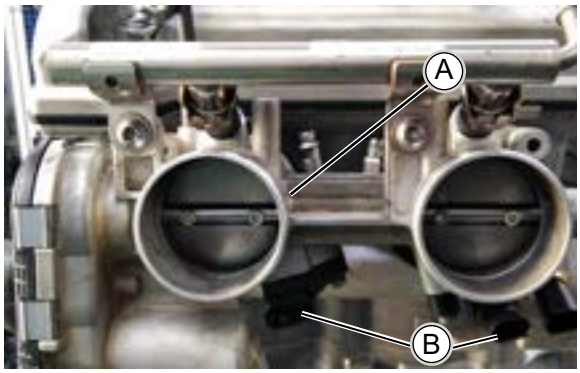
Fault diagnosis

- 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.

ELECTRONIC THROTTLE VALVE BODY ASSEMBLY



The electronic throttle valve body assembly is connected to the engine and the air filter, and the electronic throttle body is installed in the intake system of the engine.the air flow into the cylinder is controlled by adjusting the angle of the throttle valve plate.its main function is to adjust the opening and closing angle of the throttle valve plate according to the driver's driving intention to meet the intake demand of the engine under different operating conditions. At the same time, it feeds back the position signal of the throttle valve plate to the control unit for precise control.the valve body assembly includes: throttle valve body, fuel injector, fuel rail assembly, pressure and temperature sensor, throttle position sensor, throttle actuator, etc.

Open the cargo box to see the electronic throttle valve body assembly (see A in the figure below).

⚠ CAUTION

After the electronic throttle body is installed, you must make sure to perform a throttle body self-learning. After the self-learning is completed, start the vehicle and observe whether it works normally.

Disassembly requirements

- It is strictly forbidden to disassemble the charged electronic throttle body.
- The electronic throttle body can be disassembled after the vehicle is cooled to room temperature to prevent the black cover and connectors from being wetted by the overheated antifreeze liquid.
- During the disassembly process, disassemble the mounting bolts diagonally, with even force, not to damage the upper and lower mounting surfaces, and at the same time ensure that the electronic throttle body does not fall or hit.
- The force of the return spring inside the electronic throttle body is relatively large. Be careful to hurt your hands when pushing the valve plate gently.

⚠ WARNING

It is forbidden to collide with the electronic throttle body during maintenance, and it is forbidden to use the electronic throttle body after it has fallen.

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

①Vehicle speed (vfzg) is 0 ②The engine speed (nmotll) is less than 250RPM

③The engine water temperature (tmot) is between 5.25℃-100.5℃

④The intake air temperature (tans) is not less than 5.25℃ ⑥Battery 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:

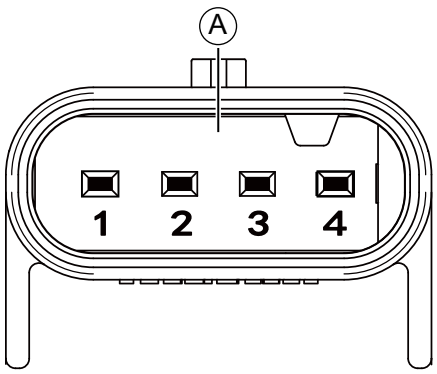
Fault codes	meaning	Fault light
P1565	DVE mechanical bottom dead center first self-learning failure	Bright SVS/EPC
P1579	Unsatisfactory environmental conditions lead to withdrawal from DVE self-study	—
P1564	The battery voltage condition is not met, which leads to exit DVE self-learning	—

(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

INLET PRESSURE TEMPERATURE SENSOR



The intake air pressure and temperature sensors include: intake air pressure and intake air temperature sensors. The pin diagram is shown at【A】in the left figure.

1: Inlet pressure signal output OUTPUT SIGNAL

2: Supply voltage SUPPLY VOLTAGE

3: Thermistor NTC

3: Sensor ground GROUND

The core of the intake air temperature sensor is the thermistor that reacts quickly to temperature.

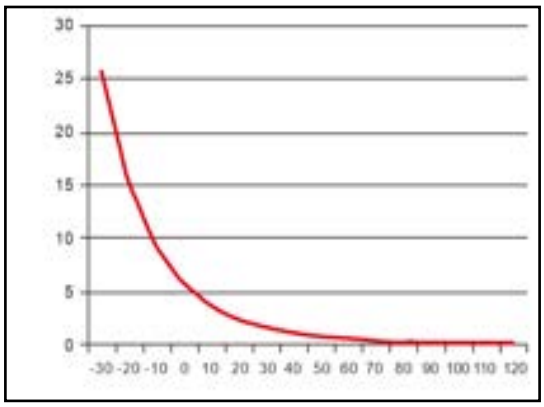
The intake pressure sensor passes through the air pressure channel on the throttle body and the main throttle body.

The channels are connected together 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 corresponding relationship 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.

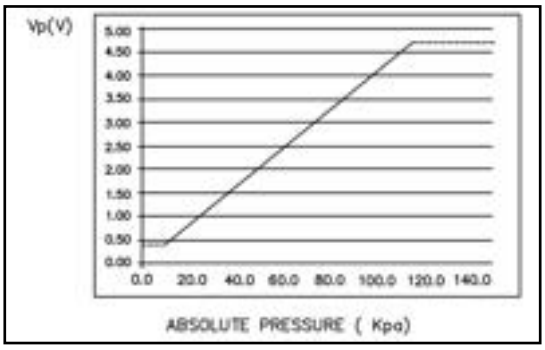
⚠ CAUTION

When disassembling the intake air pressure and temperature sensor, to ensure that there is no condensed water on the pressure sensitive element, it is forbidden to use high-pressure gas to impinge on the vacuum element during the maintenance process.

Three-in-one sensor performance characteristics



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

Fault diagnosis

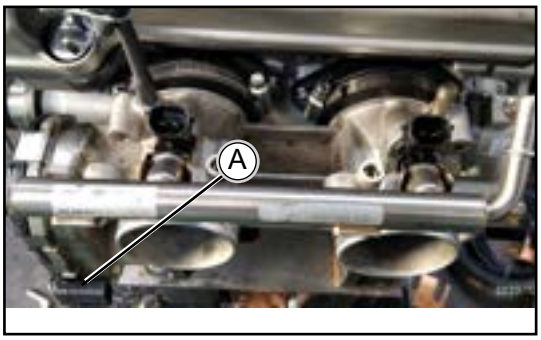
ECU monitors various sensors, actuators, power amplifier circuits and detection circuits.When the intake pressure is faulty, the engine may not be able to start or it may be difficult to start. The common fault codes are shown in the fault summary table.

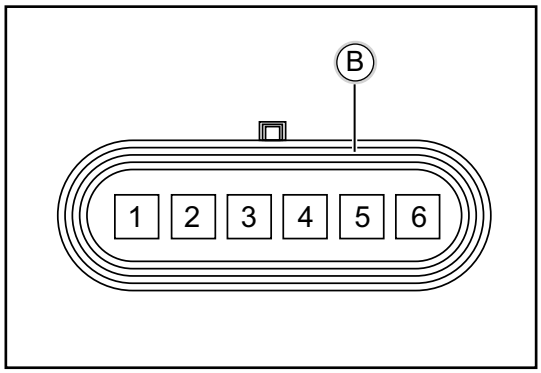
Inlet pressure temperature sensor failure check:

- Check that the connectors are well connected.
- Check whether the wiring harness and sensor pins are bent or deformed.
- Check the continuity of each pin.

THROTTLE POSITION SENSOR AND THROTTLE ACTUATOR

The throttle position sensor is a Hall sensor with a linear output, pass【A】voltage of 5V is applied to both ends of the sensor to form a Hall voltage when the throttle rotates Output, like an Angle potentiometer.





The throttle actuator and sensor are mounted on the throttle body (see figure B on left).

Definition of its stitches:

1: actuator motor +
2: actuator motor -
3: sensor ground
4: throttle position signal 2
5: sensor power supply
6: throttle position signal 1

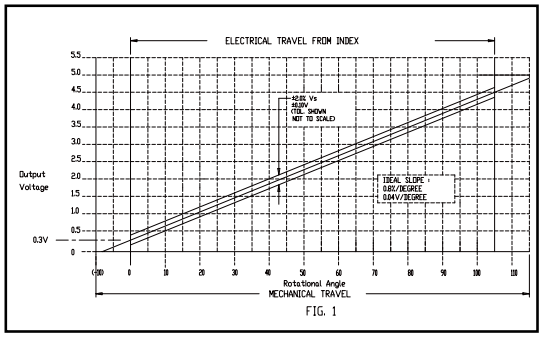


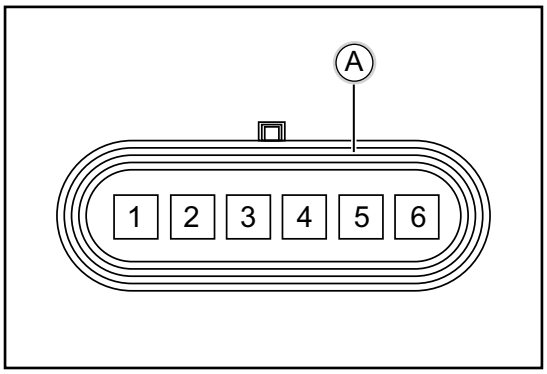
FIG. 1

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

1. electronic throttle body connector on the motor PIN between the (room temperature) resistance name Mean value R = 1.4Ω±0.3.
2. Inductance L=1.1± 0.1MH3 at 1KHz (room temperature), working in the opposite direction the allowable force on: < 200 N.
3. Maximum continuous power loss P = 8 W at ambient temperature T=100°C，The maximum allowable reversal current I is less than or equal to 10 A during reversal.
4. Minimum working voltage: 8V
5. rated working voltage: 12V
6. overload working voltage: 17V



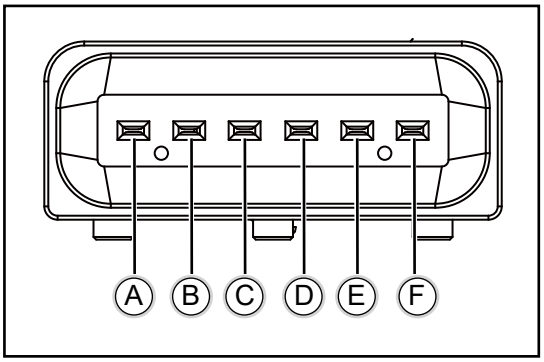
Fault diagnosis

ECU for a variety of sensors, actuators, and power amplifier and detection circuits，To monitor when the throttle position signal has a fault, the engine may not have，If the method is started or the startup is difficult, the common fault codes can be seen in the General Table of Fault Codes.

Fault inspection of throttle position sensor and actuator:

- Check that the connector is well connected.
- Check whether the wire harness and sensor pins are bent and deformed.
- Check the opening and breaking of all stitches (see the definition of stitches in Figure A on the left).
- Check whether the supply voltage of pin 5 sensor is 5V.
- Check whether pin 1 voltage is 12V.

ELECTRONIC ACCELERATOR PEDAL



Electronic accelerator pedal connector pin definition:

【A】: 5V power supply for accelerator pedal 2

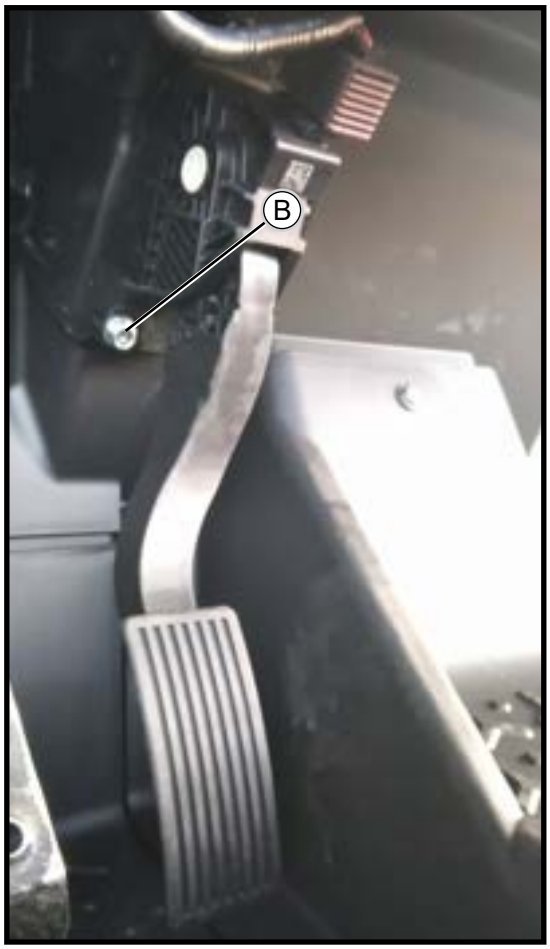
【B】 : 5V power supply of accelerator pedal 1

【C】 : accelerator pedal 1 ground wire

【D】 : Acceleration pedal sensor 1

【E】: Acceleration pedal 2 ground wire

【F】: Acceleration pedal sensor 2

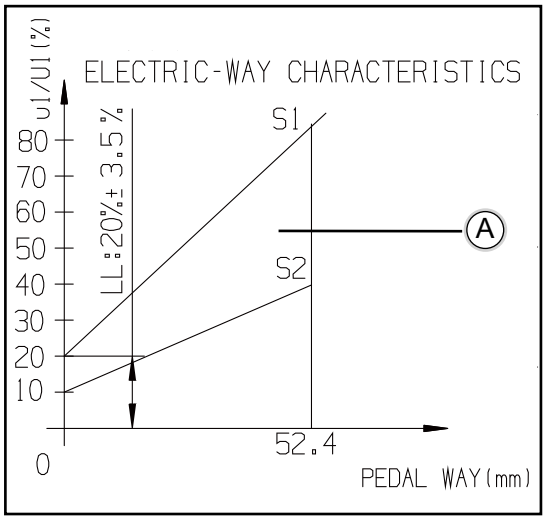


Remove and install the accelerator pedal

- Unplug the wire harness connector and remove 3 self-locking bolts with the nail sleeve (see figure B on the left).
- The fastening torque of the mounting bolt of the accelerator pedal module should be less than 10Nm, recommended value 8Nm(M6), connect the harness connector.
- Impurity must be prevented during and after the installation of the accelerator pedal module quality entry, otherwise may predamage the throttle pedal module function.

⚠ WARNING

The accelerator pedal module must be installed and fixed in accordance with the drawings.Don't Allow to use the accelerator pedal module to support other parts, do not allow to disassemble any parts.



Technical performance parameters

1. Permissible pedal pressure in the working direction: < 500 N (400N①).
2. Allowable force perpendicular to the rotation plane: < 200 N
3. Allowable force in the opposite direction of work: < 200 N.
4. The spring reset time at -40˚C : ≤ 3 s②.
5. The spring reset time at -18˚C : ≤ 1 s②.
6. Minimum pedal rebound force: ≥ 5N.

① 400N is suitable for projects with external mechanical stops.

② To ensure that one of the two springs can meet the requirements.

7. Electric-displacement characteristics of electronic accelerator pedal (see A in the left figure)

Working conditions:

Permissible operating temperature: -40˚C ***~+85***˚C***.***

Storage condition: dust-free.

Temperature: -30˚C ***~ +60***˚C***.***

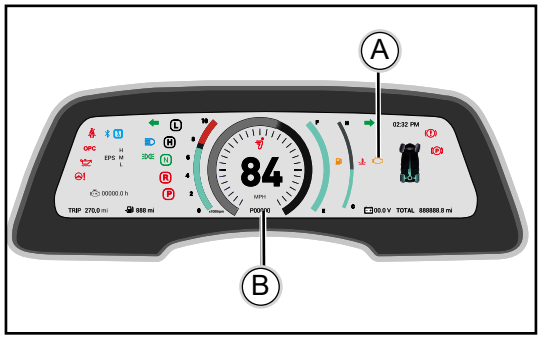
Fault diagnosis

ECU for a variety of sensors, actuators, and power amplifier and detection circuits monitoring, when the electronic accelerator pedal has a fault, the vehicle may not exist method acceleration, abnormal engine speed and other phenomena, commonly used fault code see the total fault table:

Electronic accelerator pedal fault inspection:

- Check that the connector is well connected
- Check whether the wire harness and accelerator pedal pins are bent and deformed
- Measure the voltage of pin 1 and pin 2
- Measure the voltage of pin 4 and pin 6
- Measure the on-off of all stitching wire harness ends

Fault code reading



There is【A】fault indicator light in the meter (Fig. 【A】on the left). When the key switch is turned on.

Trouble indicator light is always on.When the engine is running, the vehicle electronically controls the fuel.

If there is no fault in the jet system, the indicator light should be extinguishedIndicator light in case of failure.

It should be on frequently to indicate a failure of the system.It can be shown in the meter (left figure【B】).

Show the relevant fault codes, and query the specific fault letters through the fault code master table.

Troubleshooting instrument operation

When the engine is running, the instrument fault indicator light is always on, indicating the existence of a system fault.

A system fault.Currently, the phase should be read using a dedicated fault diagnoser (lower left).

Should be the fault information.Use the OBD diagnostic interface corresponding to the vehicle diagnostic interface Connect and connect the other end of the device to the computer (the computer should be equipped with diagnostics.

Software and corresponding driver), the key switch should be in the open state.specific.

Operation steps:

- Connect the device, select "Open CAN", and press the "OK" button.
- Enter the main interface, you can check the engine operating parameters and fault message Interest rates.

⚠ CAUTION

If the vehicle is on without the engine running, then the failure light will remain on. This is not an indication of failure and does not require attention.

SUMMARY OF FAILURE 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	√

NO.	Pcode	Description（UAES）	fault indicator on
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	√
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	

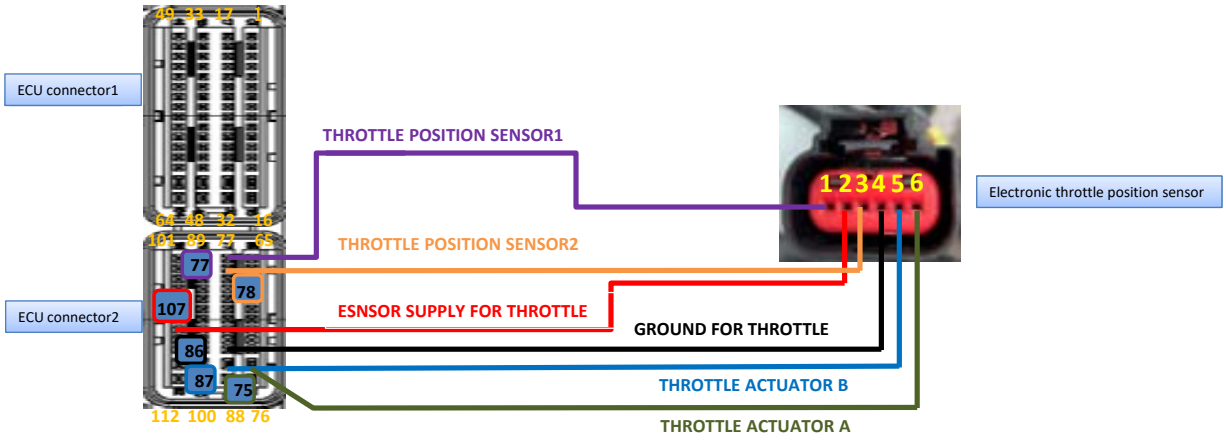
NO.	Pcode	Description（UAES）	fault indicator on
53	P2122 16	Throttle/Pedal Position Sensor/Switch “D” Circuit Low	√
54	P2138 29	Throttle/Pedal Position Sensor/Switch “D”/“E” Voltage Correlation	√
55	P2128 17	Throttle/Pedal Position Sensor/Switch “E” Circuit High	√
56	P2127 16	Throttle/Pedal Position Sensor/Switch “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	√
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	√

NO.	Pcode	Description（UAES）	fault indicator on
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	√

ECU 故障代码排查

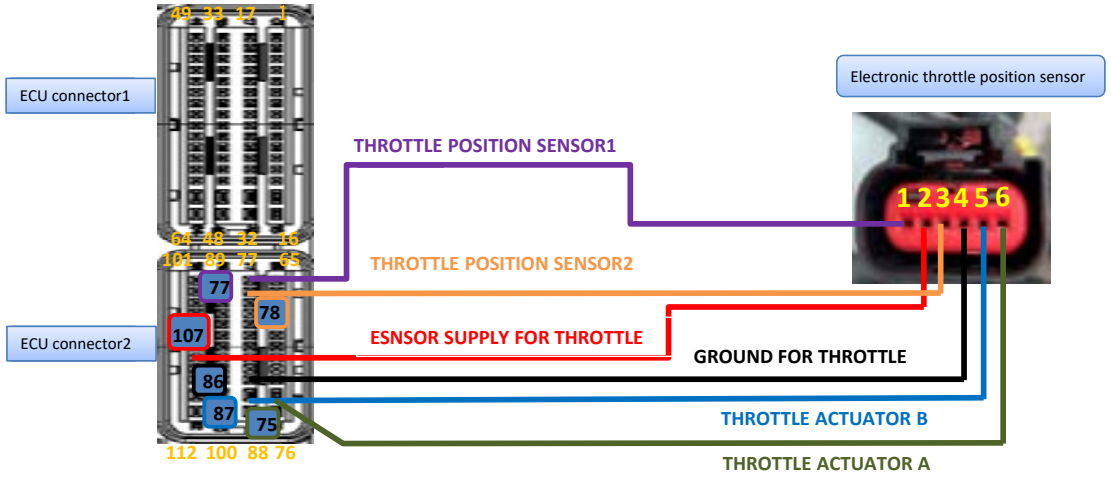
P012216---This Trouble Code Sets if the electronic throttle position sensor 1 short circuit to ground.
P012317---This Trouble Code Sets if the electronic throttle position sensor 1 short circuit to power
P012216---This Trouble Code Sets if the Electronic throttle position sensor 1 open circuit

Can be caused by the electronic throttle position sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



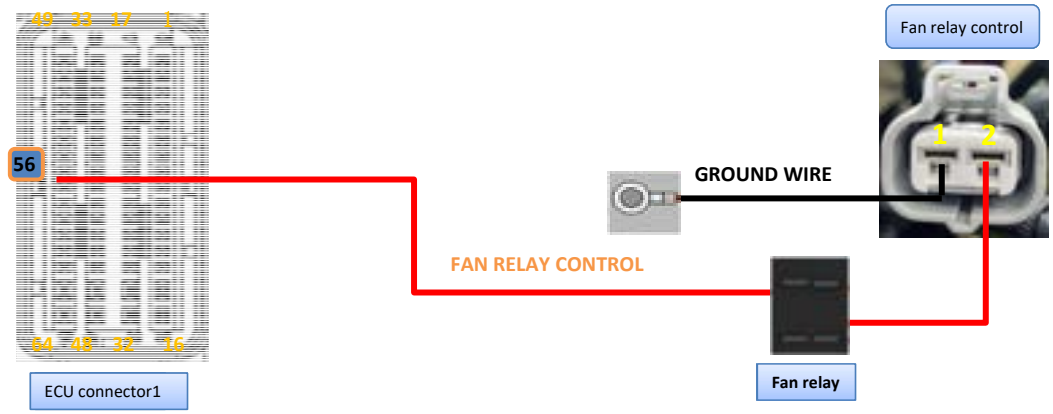
P022216---This Trouble Code Sets if the electronic throttle position sensor 2 short circuit to ground
P022216---This Trouble Code Sets if the electronic throttle position sensor 2 open circuit
P022317---This Trouble Code Sets if the electronic throttle position sensor 2 short circuit to power

Can be caused by the electronic throttle position sensor 2 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



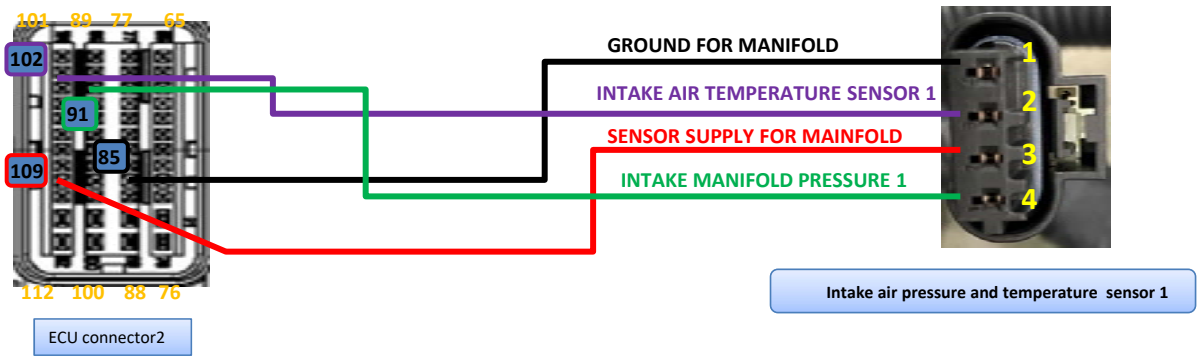
P069212---Indicates that the Cooling Fan Relay Driver Circuit is Shorted to Battery Voltage.
P069111---This Trouble Code Sets if the Cooling Fan Driver Circuit is Shorted to Ground.
P048013---This Trouble Code Sets if the Cooling Fan Driver Circuit is Open.

Can be caused by a Faulty Coolant Fan Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



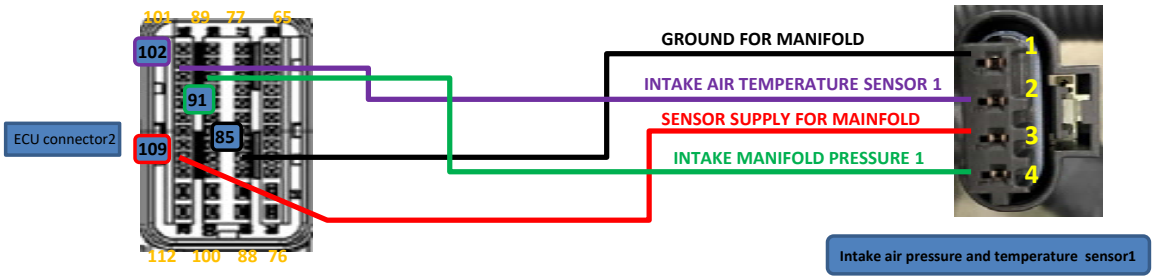
P010817--- This Trouble Code sets if the Intake pressure sensor 1 open circuit
P010817---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure Sensor 1 Circuit is Shorted to Battery Voltage.
P010716---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure 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



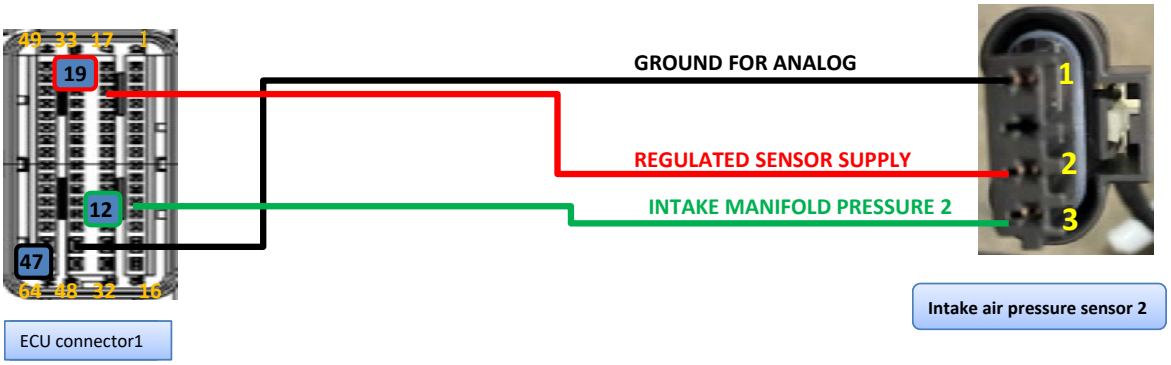
P011317---This Trouble Code sets if the Intake air temperature sensor 1 open circuit
P011317---This Trouble Code sets if the Intake Air Temperature Sensor 1 Circuit is Shorted to Battery Voltage.
P011216---This Trouble Code sets if the Intake Air Temperature Sensor 1 Circuit is Shorted to Ground.

Can be caused by a Intake Air Temperature Sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



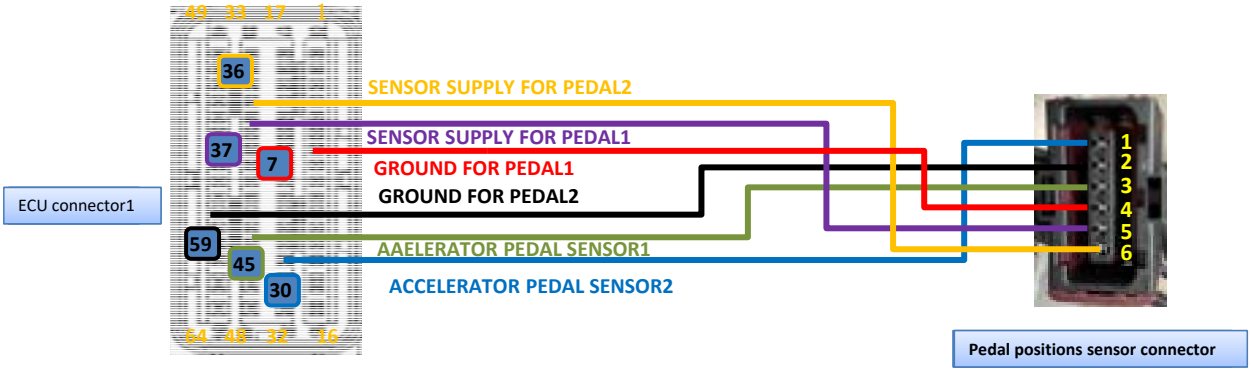
P2A0D17---This Trouble Code sets if the Intake pressure sensor 2 open circuit
P2A0D17---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure Sensor 2 Circuit is Shorted to Battery Voltage.
P2A0C16---This Trouble Code sets if the Manifold Absolute Pressure/Barometric Pressure Sensor 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



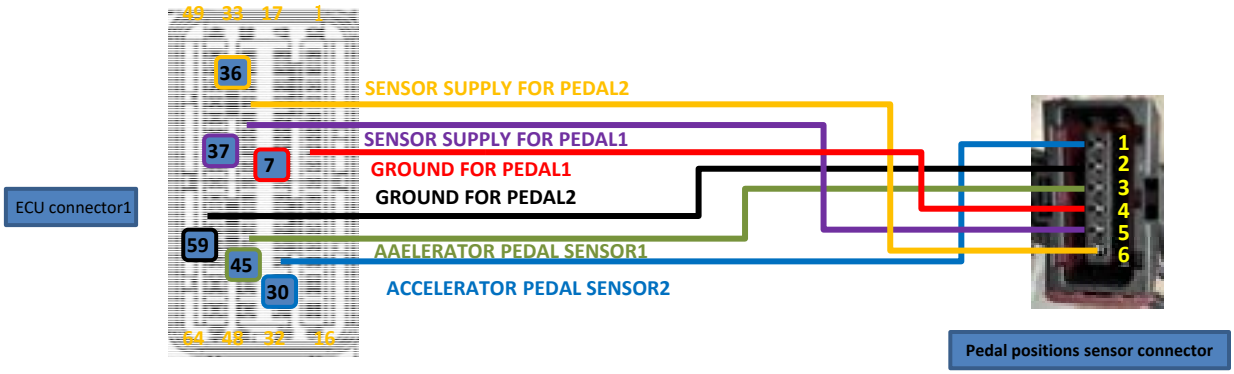
P212317---This Trouble Code Sets if the electronic accelerator pedal position sensor 1 short circuit to power
P212216---This Trouble Code Sets if the electronic accelerator pedal position sensor 1 short circuit to ground
P212216---This Trouble Code sets if the electronic accelerator pedal position sensor 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

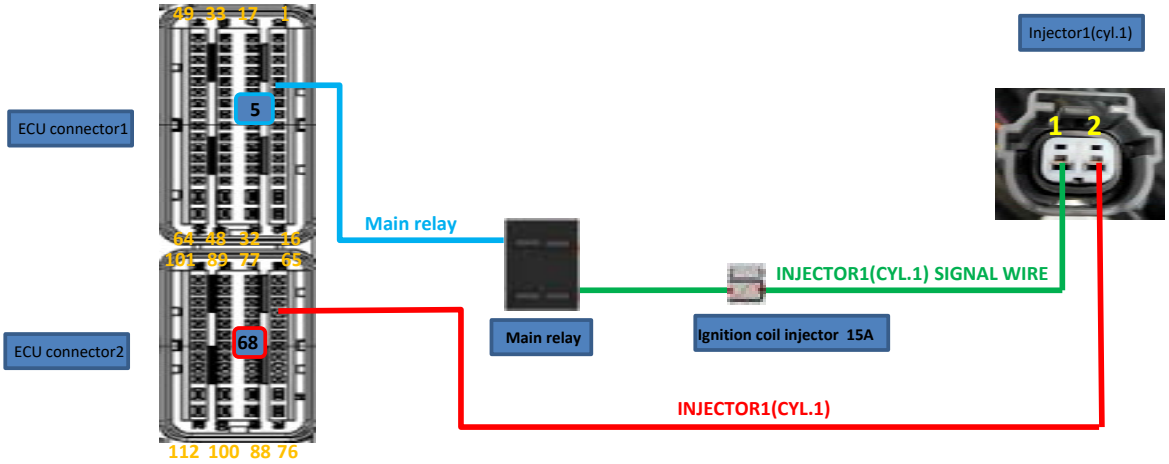


P212817---This Trouble Code Sets if the electronic accelerator pedal position sensor 2 short circuit to power
P212716---This Trouble Code Sets if the electronic accelerator pedal position sensor 2 short circuit to ground
P212716---This Trouble Code sets if the electronic accelerator pedal position sensor 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

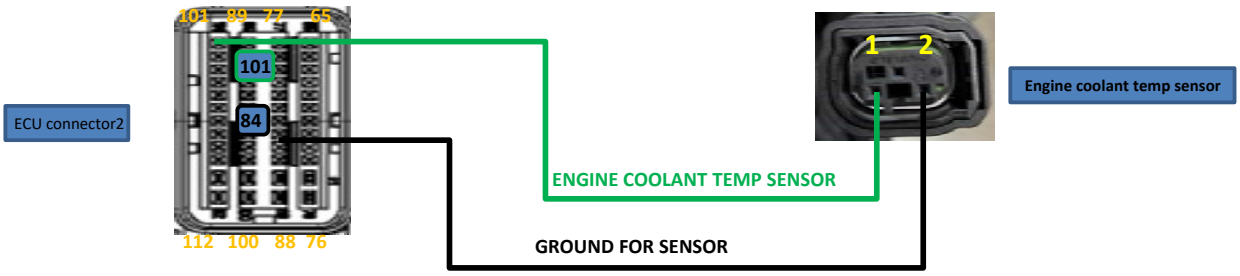


P026212---This Trouble Code Sets if the fuel injection nozzle 1(cylinder1)short circuit to power
P026111---This Trouble Code Sets if the fuel injection nozzle 1(cylinder1)short circuit to ground
P020113---This Trouble Code Sets if the fuel injection nozzle 1(cylinder1)open circuit
Can be caused by a fuel injection nozzle 1(cylinder1) Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

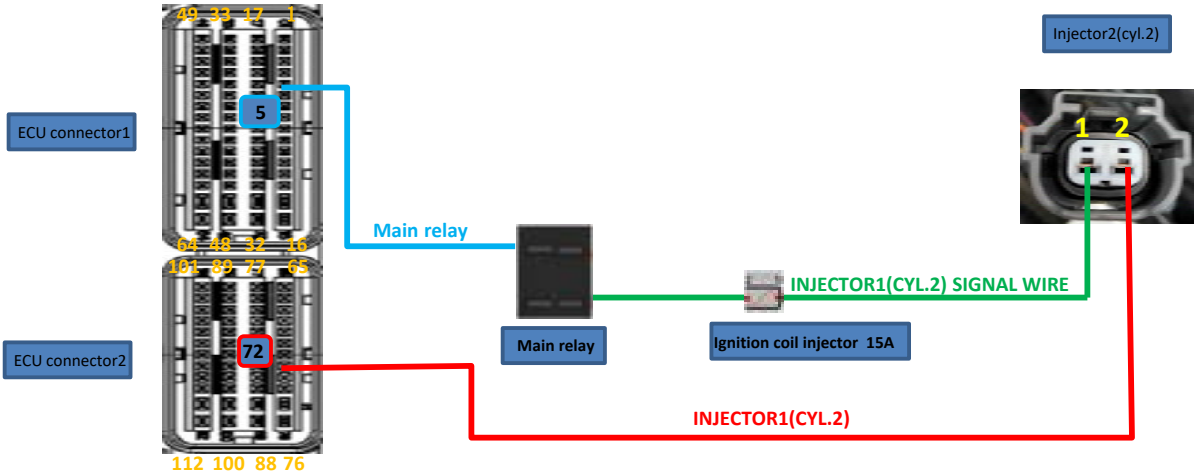


P011716---This Trouble Code sets if the Engine Temperature Sensor Circuit is Shorted to Ground.
P011817---This Trouble Code sets if the Engine Temperature sensor open circuit
P011817---This Trouble Code sets if the Engine Temperature Sensor Circuit is Shorted to Battery Voltage.

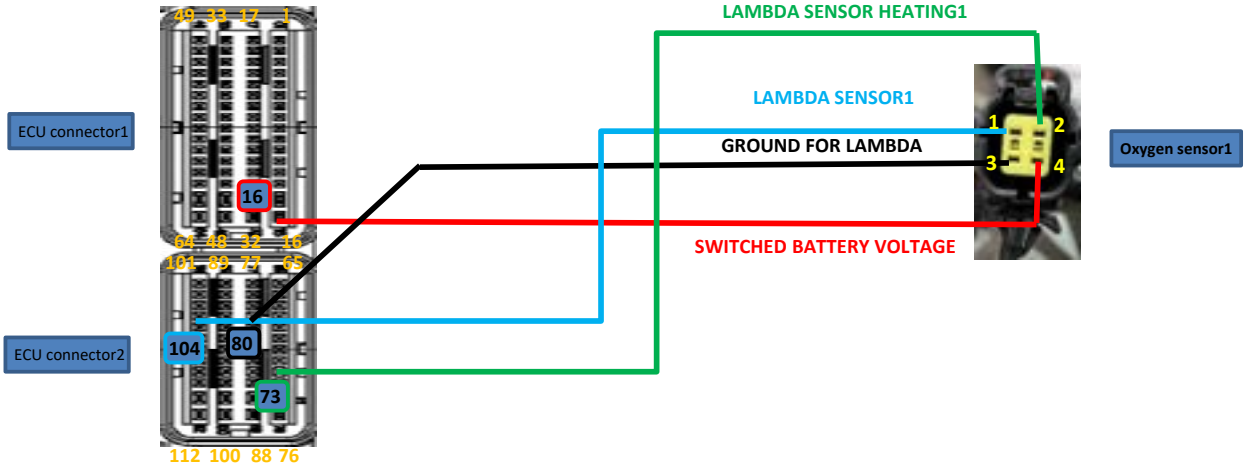
Can be caused by a Engine Temperature Sensor Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



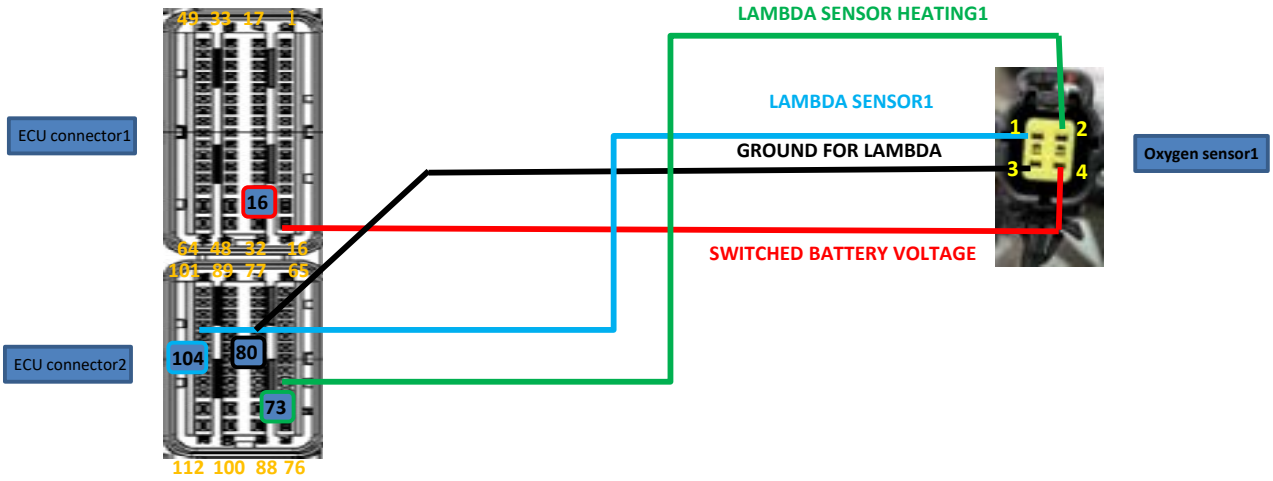
P026512---This Trouble Code Sets if the fuel injection nozzle 2(cylinder2)short circuit to power
P026411---This Trouble Code Sets if the fuel injection nozzle 2(cylinder2)short circuit to ground
P020213---This Trouble Code Sets if the fuel injection nozzle 2(cylinder2)open circuit
Can be caused by a fuel injection nozzle 2(cylinder2) Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



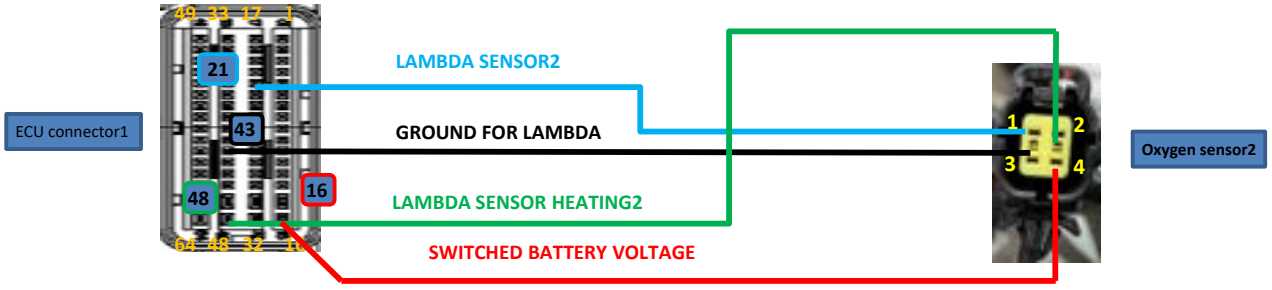
P013217---This Trouble Code Sets if the oxygen sensor 1 short circuit to power
P013116---This Trouble Code Sets if the oxygen sensor 1 short circuit to ground
P013413---This Trouble Code Sets if the oxygen sensor 1 open circuit
P013029---This Trouble Code Sets if the oxygen sensor 1 signal circuit voltage unreasonable
Can be caused by a oxygen sensor 1 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



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

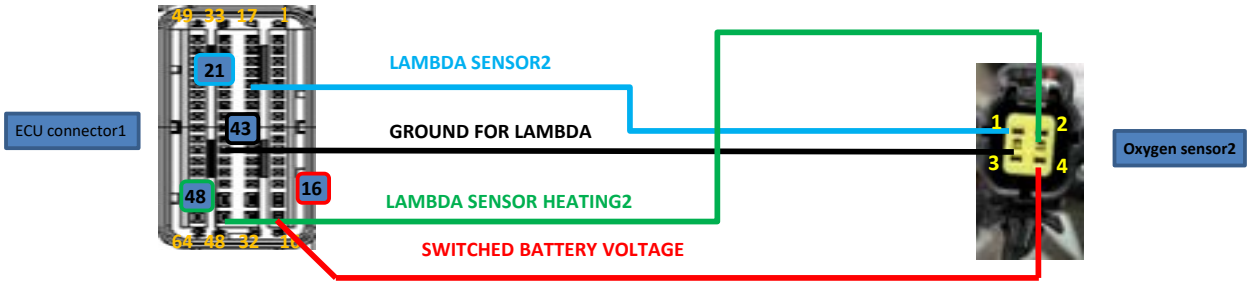


P015217---This Trouble Code Sets if the oxygen sensor signal 2 circuit short circuit to power
P015116---This Trouble Code Sets if the oxygen sensor signal 2 circuit short circuit to ground
P015413---This Trouble Code Sets if the oxygen sensor signal 2 circuit open circuit
P015029---This Trouble Code 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



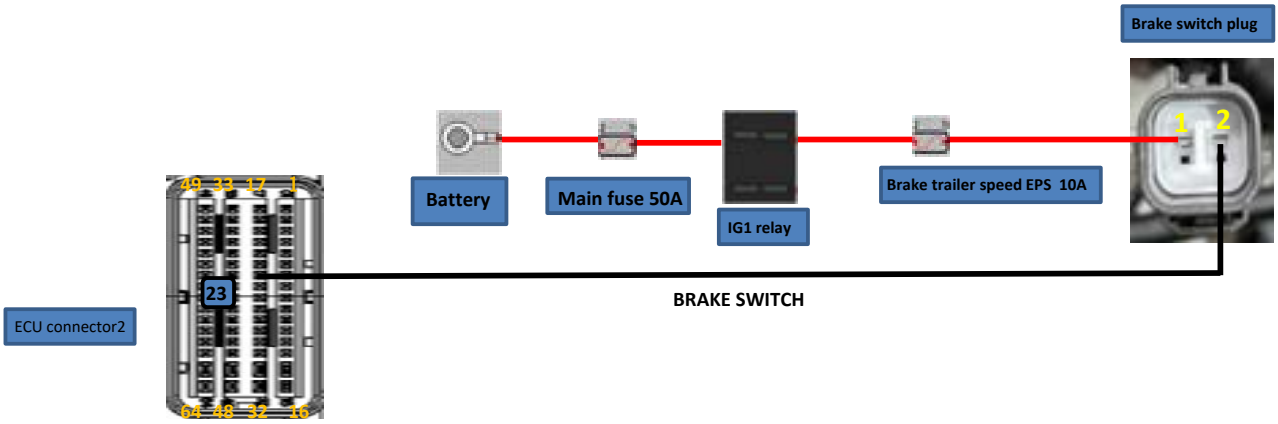
P005212---This Trouble Code Sets if the oxygen sensor heating 2 short circuit to power
P005111---This Trouble Code Sets if the oxygen sensor heating 2 short circuit to ground
P005013---This Trouble Code Sets if the oxygen sensor heating 2 open circuit

Can be caused by a oxygen sensor heating 2 Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



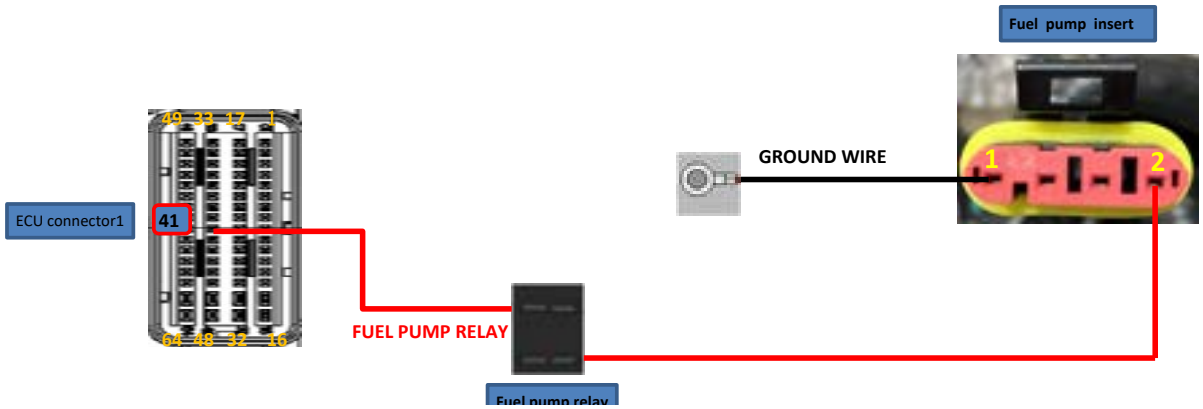
P057129---This Trouble Code Sets if the brake lamp signal circuit failure
P05711C---This Trouble Code Sets if the brake signal out of synchronization

Can be caused by a brake lamp signal circuit Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections



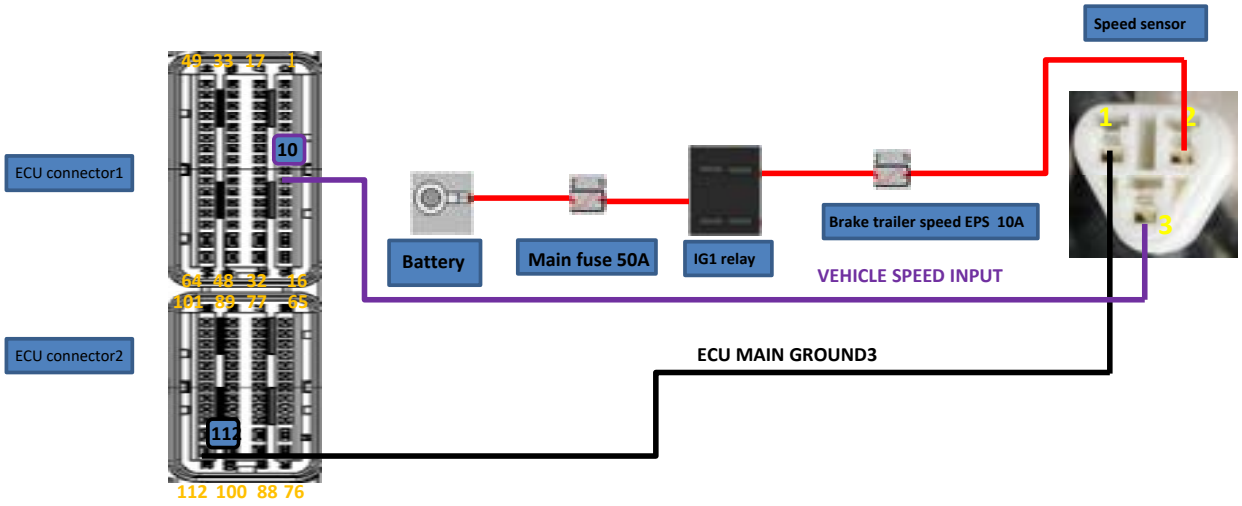
P062912---This Trouble Code sets if the Fuel Pump Control Circuit is Shorted to Battery Voltage.
P062811---This Trouble Code sets if the Fuel Pump Control Circuit is Shorted to Ground.
P062713---This Trouble Code sets if the Fuel Pump "A" Control Circuit is Open.

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

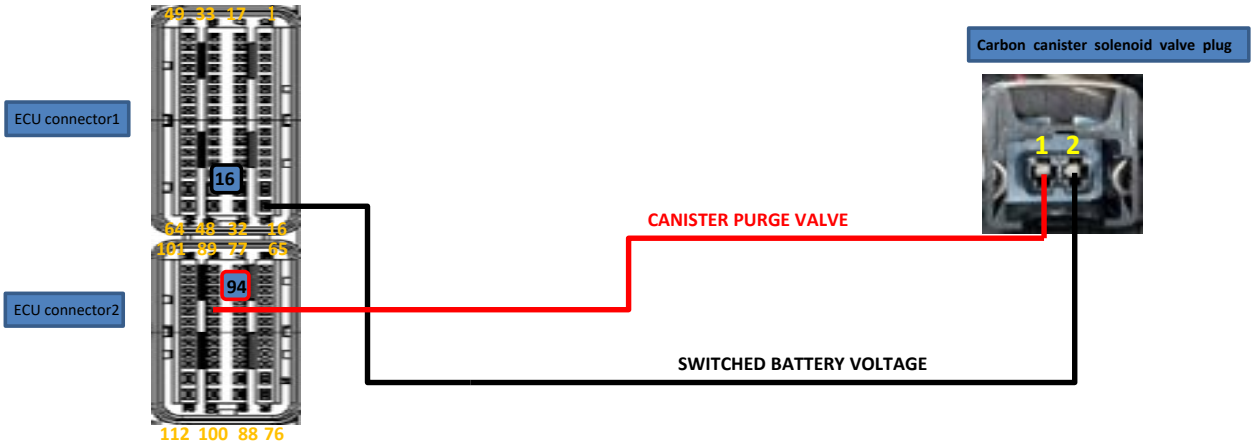


P056317---This Trouble Code sets if the System power supply voltage too high
P056216--- This Trouble Code sets if the System power supply voltage too low
P05601C---This Trouble Code sets if the Unreasonable system power supply voltage signal

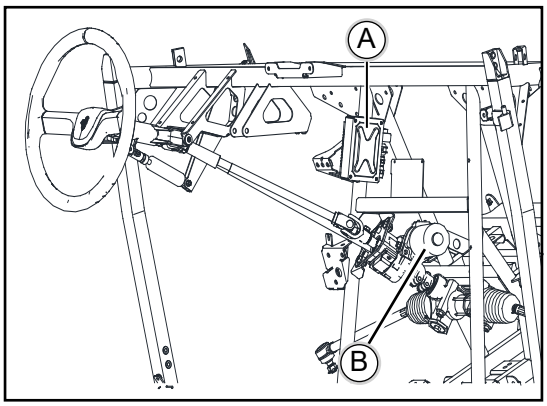
Can be caused by a System power supply voltage Relay, Damaged Wiring or Connector Terminals or a Faulty ECU/Connections

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



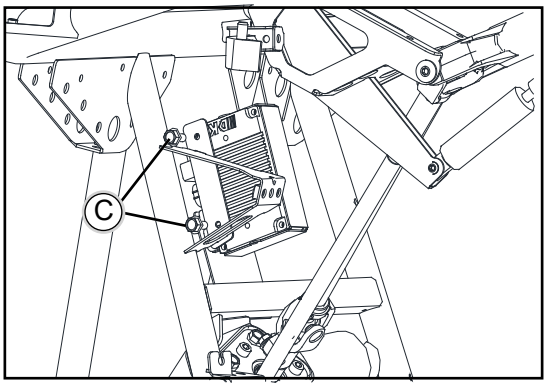
EPS



⚠ CAUTION

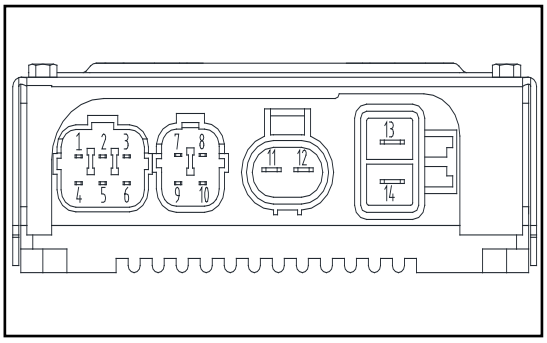
Refer to the method of removing the EPS assembly for the method of removing the steering assembly, which is only introduced here electrical function of SAO EPS.

- Remove EPS controller method is as follows:
- Remove bolt【C】, remove EPS controller【A】 from the frame

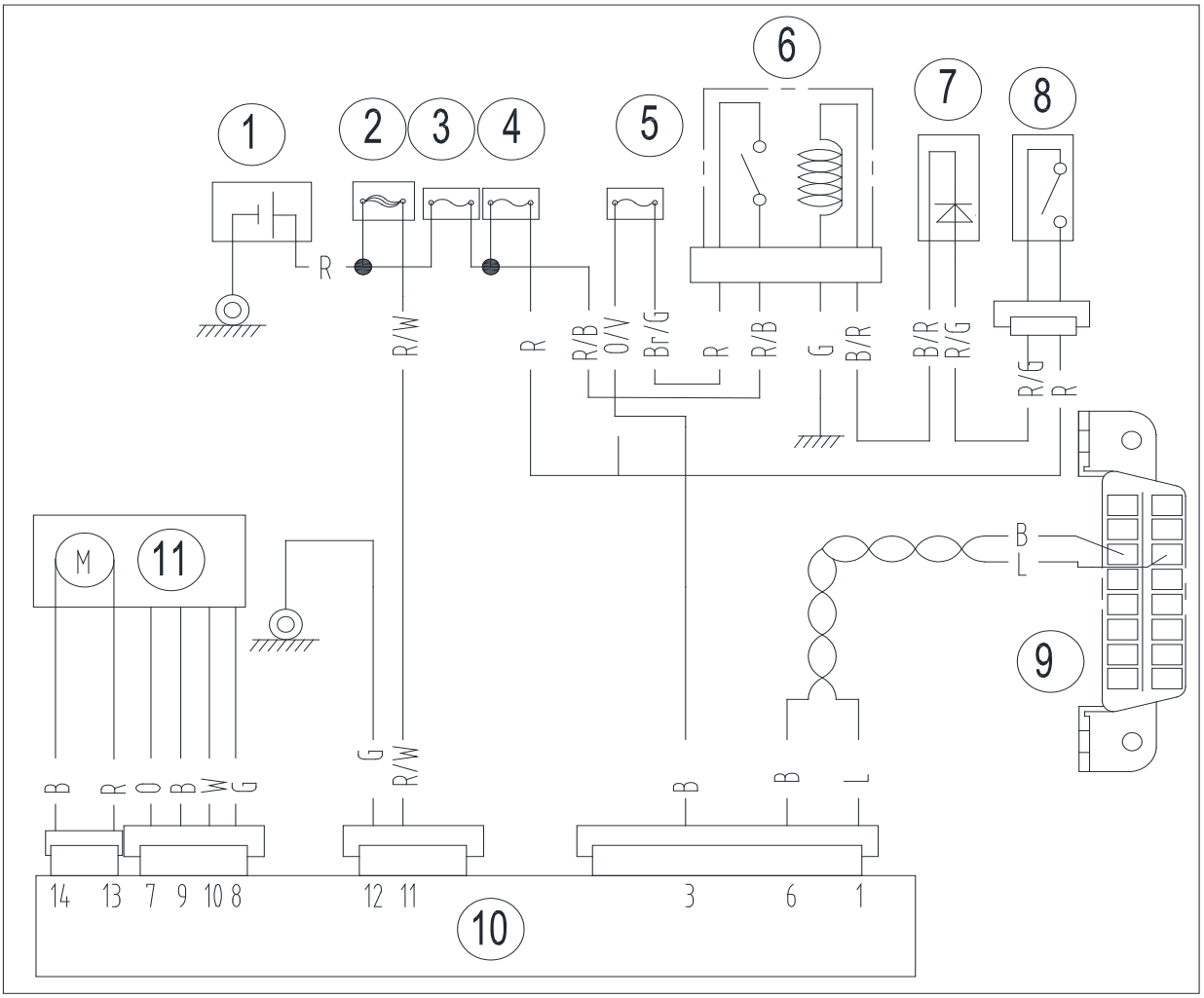


- The electrical interface is defined as follows：

NO.	Function definition	parameter
1	CANL	1.5V～3.5V
2	/	1
3	Ignition signal	12V+
4	/	/
5	/	/
6	CANH	1.5V～3.5V
7	Positive pole of sensor power supply 5V+	5V+
8	The negative electrode of sensor power supply is 0V	0V
9	sensor auxiliary torque	voltage signal
10	Main torque voltage signal of sensor	voltage signal
11	The current of the positive pole of the power	supply is 12V+
12	The negative electrode of power supply is 0V	0V
13	Motor power supply	voltage signal
14	Motor power supply	voltage signal

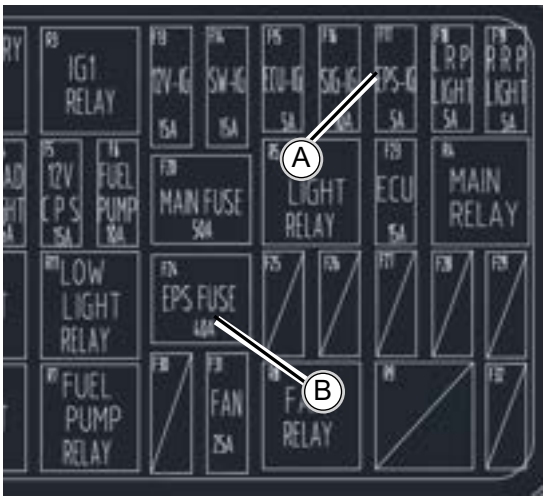


EPS system wiring schematic diagram



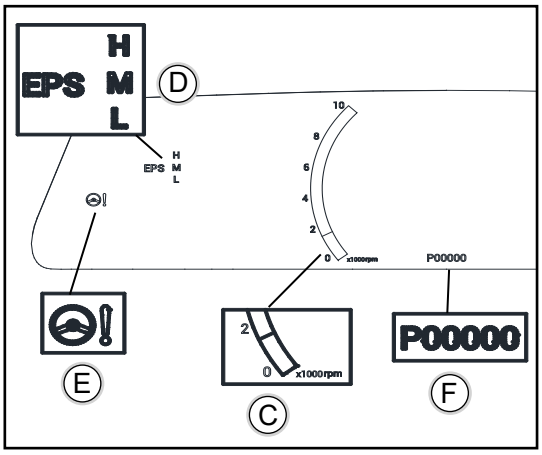
1. Battery 2. Fuse 50A 3. Fuse 30A 4. Fuse 5A 5. 5A fuse
6. IG relay 7. Diode 8. Key switch 9. OBD 10. EPS

EPS Fault diagnosis



→ Fault diagnosis

If EPS does not work, first see whether the instrument EPS fault light is on. If the failure light does not work, check the 5A fuse inside the fuse box. And whether the 50A fuse【B】is burnt out. In addition, check whether there is rotation on the instrument speed【C】display, if there is no speed display, EPS will not work, At this time the instrument EPS fault light will not light up



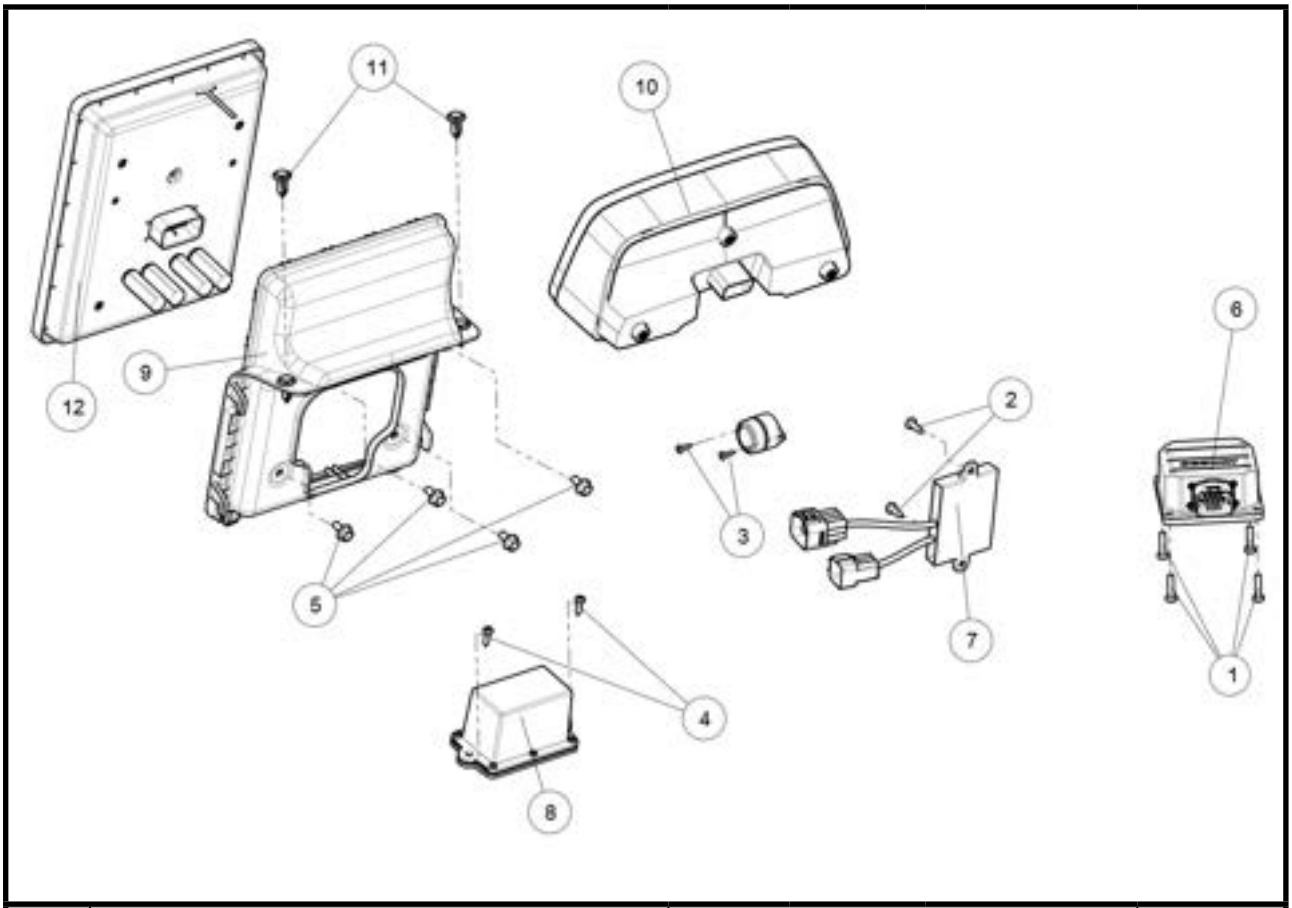
- EPS gear position in the instrument,EPS is divided into H/M/L three gear【D】, the default M file, when the four-wheel drive lock, immediately switch to the H fileM file the L and L files are adjusted on the mobile APP (only for vehicles with TBox adjust)

- If the instrument EPS fault light is on, it means that EPS is obstructed EPS failure light【E】and failure code【F】in the instrument see the following figure for location.

EPS fault code

NO.	Fault description	Fault rank	Have EPS or not	Power on then restorability or not	Fault code	Trouble light
1	Torque midpoint not written	3	Yes	Yes	E0001	on
2	End of rotor angle is not written	1	No	No	E0002	off
3	Storage read and write failure	1	Yes	Yes	E0003	on
4	The main torque sensor is disconnected	1	No	No	E0004	on
5	The main torque sensor output is abnormal	1	No	No	E0005	on
6	The secondary torque sensor is disconnected	1	No	No	E0006	on
7	Secondary torque sensor output failure	1	No	No	E0007	on
8	The main and auxiliary torque differ too much	1	No	No	E0008	on
9	differenc of the main torque is too large before and after amplification	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	Set the vehicle speed to 30, cancel the positive and damping	restorability after normal CAN	E0013	on
14	Rotor angle jump (abnormal output)	1	No	No	E0014	off
15	Rotor angle sensor disconnected	1	No	No	E0015	on
16	Power module failure	1	No	No	E0016	on
17	A phase current abnormal	1	No	No	E0017	on
18	C phase current abnormal	1	No	No	E0018	on
19	Steering wheel angle small teeth abnormal	2	No returnability	No	E0019	No
20	Steering wheel angle middle teeth abnormal	2	No returnability	No	E0020	off
21	Steering wheel angle jump	2	No returnability	No	E0021	off
22	The steering wheel angle value exceeds the limit	2	No returnability	No	E0022	off
23	Steering wheel angle is not centered	2	No returnability	No	E0023	off
24	Motor terminal voltage is abnormal	1	No	No	E0024	off

DISPLAY ASSEMBLY WITH HUMAN-COMPUTER INTERACTION



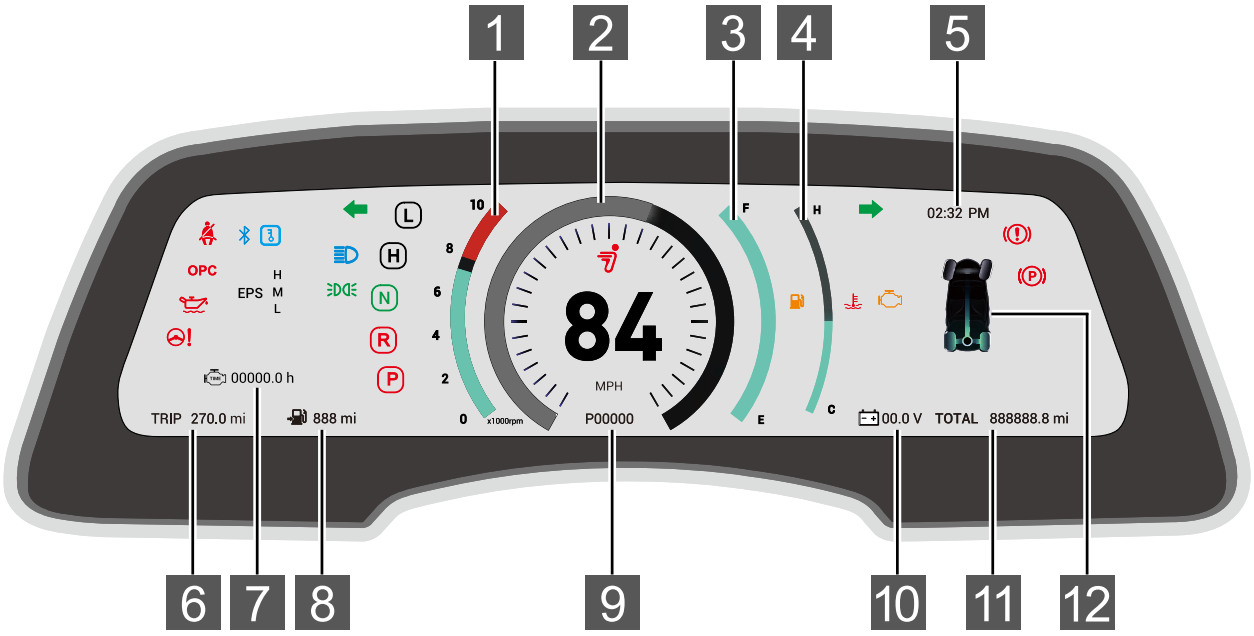
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Cross recessed pan head screw M5×20	4～5	0.4～0.5	35.4～44.2in.lb	
2	*Cross recessed pan head tapping screw ST4.8×16*	4～5	0.4～0.5	35.4～44.2in.lb	
3	Cross recessed large semicircle head tapping screws ST2.9×13				
4	Cross recessed pan head tapping screw ST4.2×16				
5	Hexagon flange bolt M6×12	18～22	1.8～2.2	13～16in.lb	
6	T-BOX				
7	Instrument control module				
8	Antenna combination				
9	Rear cover of central control screen				
10	Instrument combination				
11	Expansion buckle assembly				
12	Central control display				

Instrumentation

The dashboard displays key information to the user.See next page for display features and instructions

WARNING

The use of a high-pressure water gun may damage the meter.The vehicle should be cleaned with neutral soap, either by hand or through a hose.Do not use alcohol or corrosive detergents, such as insect repellent, to clean your meter.



No.	Item	Function description	Fault phenomenon	Fault cause analysis and solution method
1	Engine speed	shows the real-time engine speed, ECU message is read through CAN	Engine speed is not displayed Or showing an exception	◆ Check the CNA-H,CAN-L wiring harness ◆ Unresolved check ECU ◆ Check the crankshaft position sensor
2	Speed display	displays the current real-time speed	Powering with APP Bluetooth After the instrument did not display the figure mark	◆ Check the meter CAN-H,CAN-L lines beam ◆ Unsolved, change TBox ◆ Unsolved, change instrument

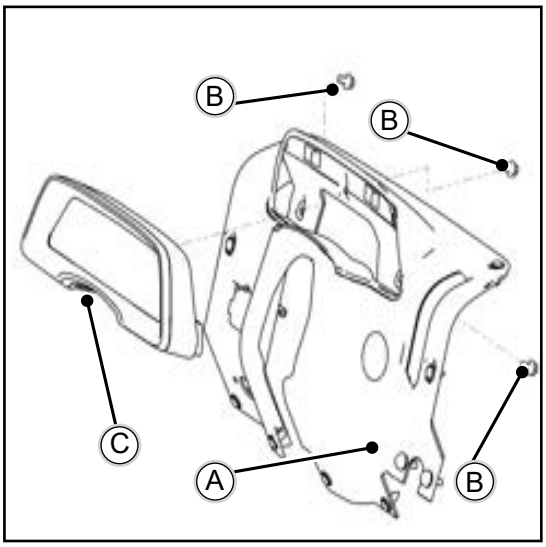
3	Fuel quantity indicator	shows the current oil quantity fuel	The fuel not displayed	◆ Check the CNA-H,CAN-L wiring harness ◆ Check oil level according to electrical schematic diagram line ◆ Replace the instrument control module
4	Coolant temperature indicator	Displays current coolant temperature **H** -High temperature **C** -Low temperature	Water temperature not displayed	◆ Check the CNA-H,CAN-L wiring harness ◆ Check the water temperature sensor and related lines beam ◆ Replace the ECU
5	Time	display Current time	display Inaccurate	check TBox
6	Submeter mileage	shows submeter mileage		
7	Engine running	Engine running time is not correct	Check meter engine running time	◆ Whether or not shown ◆ If displayed, replace the instrumentIf you don't, Display the reference engine speed not, Display inspection items
8	Dynamic Residual Mileage	Display Dynamic Residual Mileage	not display	Check CNA-H,CAN-L wiring harness Replacement of TBox is not resolved
9	Fault code display	When the vehicle is equipped with CAN electrical parts When a failure occurs in this area Display fault code		
10	Vehicle voltage	shows current vehicle battery power pressure		
11	Total mileage	Displays the total mileage accumulated by the vehicle		

project	Diagram	diagram function	describes the fault phenomenon	fault cause analysis and solution
Left turn Indicator		This light when left turn signal is turned on Light up	With the turn signal on the indicator light is not on	Check left turn to the lamp protection wire, check PIN16 is a high level input, if Yes, replace meter, if not, check phase close the circuit
High beam indicates		this light point when the high beam is turned on bright	With the high beams on the indicator light is not on	Check the remote light switch off circuit, check whether PIN10 has a high level input, if Yes, replace meter, if not, check phase close the circuit
Position indicator		Front light, rear light, license plate Lamp and instrument panel headlight This lamp lights when it is turned on	With the position light on The indicator light is not on	Check the switch circuit of the position lamp, check whether PIN11 has a high level input, if Yes, replace meter, if not, check phase close the circuit
Failure light		When the fault indicator light is on The following systems are failing: ◆ Emission control system ◆ Electrical control system of engine	____	____
Oil pressure		This lamp is used when oil pressure is too low Light up	If the meter misreports the oil pressure alarm lamp	Check the oil pressure sensor
off cushion alarm		Leaving your seat without pulling up parking switches ,this lamp on and Accompanied by buzzer alarm	Leave your seat unlifted parking switch, OPC The alarm light isn't working, Hummy,The buzzer didn't go off	Check the parking switch signal
Right turn indication		This light point when the right turn signal is turned on bright	Turn right signal on rear instrument indicator light No bright	Check the right turn signal fuse, check is there a high level input for PIN15, If so, replace the meter. If not, Check related wiring
Gear display Gear display		Gear display Gear display	Gear display is not correct or the gear position is not displayed	◆ Check the gear related wiring harness ◆ Replace the instrument control module ◆ Replace the gear sensor

The braking system Warning lights		• Low brake fluid level • Failure of braking system	——	——
EPS System warning light		Indicates that the EPS system has a fault (Optional equipment, if equippeda)	——	——
"ABS" Warning lights		ABS Indicates a failure of the following system: ◆ ABS ◆ Brake Assist System (Optional equipment, if equippeda)	——	
Coolant high temperature Warning lights		Displays engine coolant temperature high indicator light, this lamp point when the alarm lights on, stop immediately turn off the engine and allow to cool Continue to normal temperature drive	——	——
Seat belt light		Not tied while the vehicle is in motion Safety belt alarm	Not tied while driving seat belts, but gauges there is no alarm	◆ Check the safety belt switch ◆ Check the gauge to see if the speed is normal
Parking instructions		After using the parking brake this light point bright	When the parking switch is pulled up, Instrument parking indicator light No bright	Check whether PIN10 has low power flat input, if so, replace the instrument Table, if not, check the correlation wiring, wiring harness whether loose or The fracture
The bluetooth indicator		When the mobile APP successfully connects Display this icon when TBox bluetooth	Use the APP Bluetooth to power it rear meter does not display icon	Check the instrument CAN-H,CAN-L wiring harness ◆ Unsolved, change TBox ◆ Unsolved, change instrument

Technical parameters

- Working voltage range: DC 8V-18V
- Maximum resistance voltage: DC 24V < 60 seconds
- Static current: less than 1mA
- General current consumption: 120mA + 20mA
- Maximum current consumption: 175mA±20mA
- Storage temperature- 30 ˚C to + 80 ˚C
- Working temperature: -20˚C -+ 70˚C

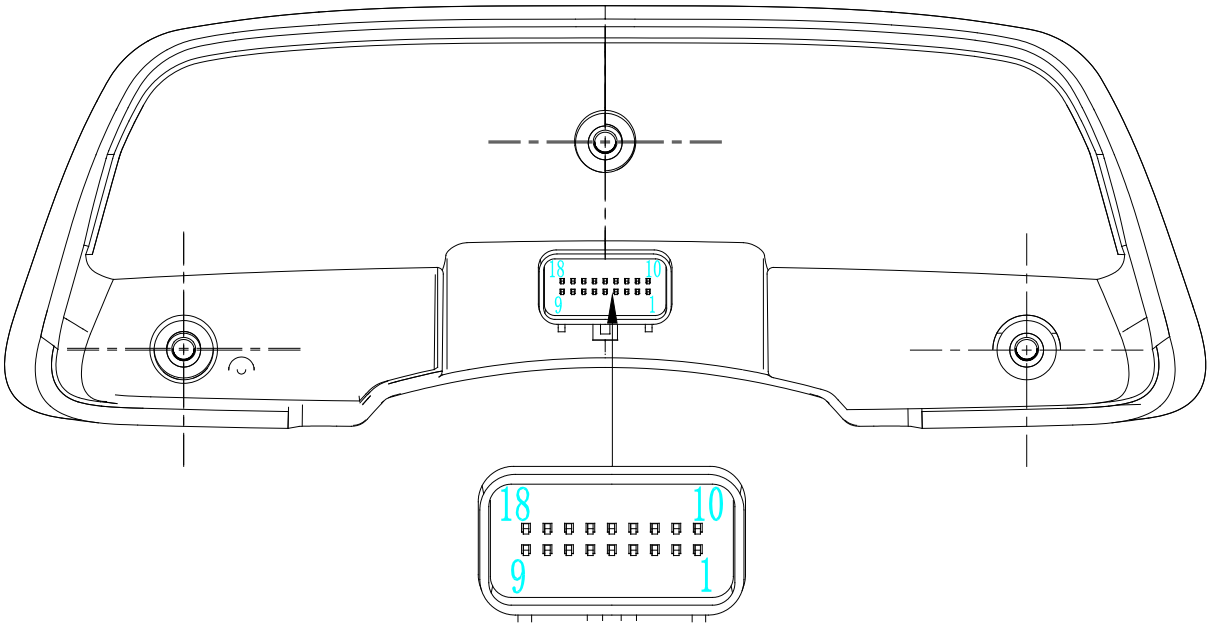


Meter dismantling

⚠ CAUTION

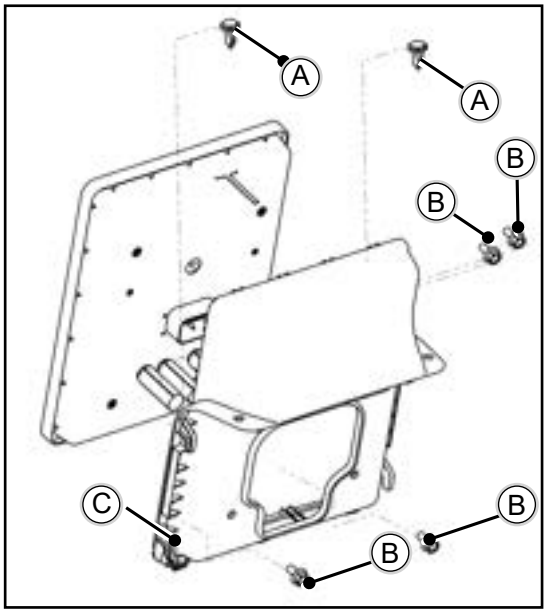
Be sure to turn off the power before removing the instrument.

- Remove the plastic【A】first
- Remove three bolts【B】
- Pull out the connector from the back of the meter, remove the meter【C】and replace it with new instrument.



PIN	Description	Note	PIN	Description	Note
1	——	——	10	high beam level	high level
2	——	——	11	position lamp	high level
3	OPC Cushion Switch	low level	12	——	——
4	Parking	low level	13	Engine failure light	low level
5	key power	——	14	buzzer alarm output	low level
6	voltage	——	15	right turn	high level
7	ground	——	16	left turn	high level
8	Speed	pulse signal	17	CANL	——
9	——	——	18	CAN-H	——

CENTRAL DISPLAY

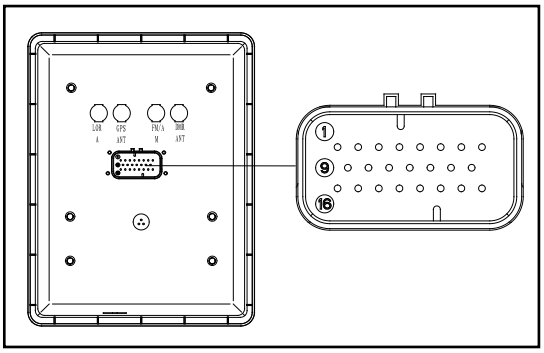


⚠ CAUTION

Before dismantling the central control, be sure to turn the vehicle off.

Control of dismantling

- First power the whole car, remove the buckle【A】
- Remove the four bolts【B】
- Remove the central control back cover【C】



pin	Illustrate	Remarks
1	BAT+	Battery electric
2	GND	GND body grounding
3	ACC	key electricity
4	ANT-VCC reserved	
5	USB1-VCC	
6	USB1-DM	
7	USB1-DP	
8	USB1-GND	
9	CVBS-GND reserved	
10	CVBS-IN reserved	
11	CVBS-VCC reserved	
12	CAN1-L	
13	CAN2-L reserved	
14	USB2-VCC reserved	
15	USB2-DP reserved	
16	RCA-RL reserved	
17	RCA-RR reserved	
18	RCA-GND reserved	
19	CAN1-H	
20	CAN2-H reserved	
21	LIN Key	

Function introduced

- 10.4 inch ultra clear color screen touch
- Local audio playback
- Bluetooth music, phone
- Mixer FM/AM
- Dual USB interface
- Customized map
- Mixer V2V team
- Mixer DMR intercom
- Bluetooth headset adaption
- Body information display
- Vehicle parameter display and control

Performance parameter

No.	Items	Description	
1	Rated voltage	DC12V	
2	Working voltage	DC 9-16V	
3	Dark current (i.e. standby)	ACC OFF:≤3mA	Turn off ACC for about 1 hour and enter standby mode
4	Sleeping current	ACC OFF:≤10mA	Turn ACC into hibernation mode for about 30S
5	Peak current	5A	
6	Display Specifications	10.4寸	
7	Display resolution	1280（H）*960（V）	
8	USB interface communication protocol	USB2.0	
9	Working Humidity	10%-95%	normal temperature
10	Display working temperature	-30℃— +75℃	
11	Operating temperature of the main engine	-30℃— +85℃	
12	Storage temperature	-40℃— +95℃	

AM performance index

Test Item	Unit	
Test project	KHZ	531-1629KHz (AM1、AM2)步长9KHz
Frequency range	KHZ	450±5
Intermediate frequency	dBμV	≤30
Finite noise sensitivity	dB	≥50
Manic ratio	dB	36±10
Automatic selection of station sensitivity	dB	≥45
Single signal selectivity	dB	≥60
Image reject	dB	≥60
Intermediate frequency suppression	dB	≤3
balance	dB	0— -3dB
Frequency characteristics	dB	≤1.0
Harmonic distortion	dB	≤1.0
Overload distortion	dB	≥45
-10dB Automatic Gain Control (AGC) (5mV input)		

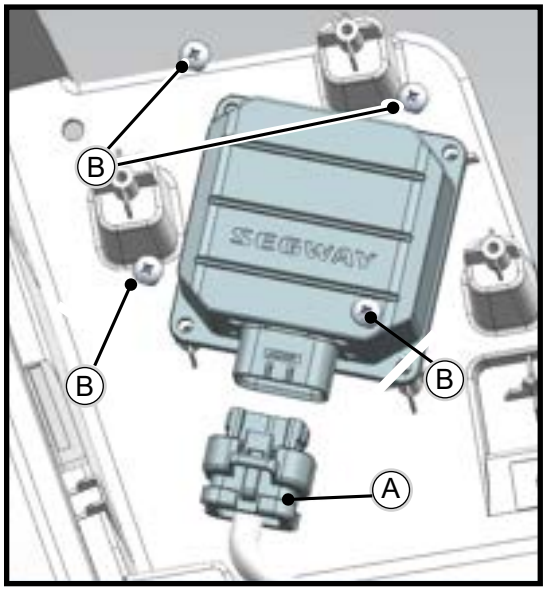
FM performance index

Test Item	Unit	
Frequency range	KHZ	87.5-108MHz (FM1、FM2、FM3)步长 0.1MHz
Intermediate frequency	KHZ	10.7±0.3
Finite noise sensitivity (30dB S/N)	dBμV	≤6
Signal impetuous ratio (monophonic)	dB	≥55
Static sensitivity	dB	≤20
Stereo noise limit sensitivity (S/N=30dB)	dB	≤15
Stereo noise limit sensitivity (S/N=50dB)	dB	≤26
Stereo Signal to Noise Ratio (A weight)	dB	≥50
Automatic selection station sensitivity dB 24±8	dB	24±8
Double signal selectivity	dB	≥70(±400KHZ)
Image reject	dB	≥70
Intermediate frequency suppression	dB	≥70
Am inhibition	dB	≥45
balance	dB	≤15
Stereo separation (A weight)	dB	≥22
balance	dB	≤1
Frequency characteristics (50uS pre-weighted)	dB	0---3
-3dB limiting sensitivity	dB	≤15

Fault diagnosis

Failure phenomenon	failure cause analysis
The key switch turns on and the screen goes black	◆ Check whether the central control fuse is in good condition and the circuit is in good condition according to the electrical schematic diagram ◆ Check whether the central control connector is loose ◆ Check whether the central control power supply voltage is normal, if less than or equal to 7V or 18V, the screen will be black
The map cannot be loaded	◆ Check the location to see if there is an offline map downloaded in advance ◆ If you do not download the offline map, check whether the central control is connected to WiFi
The map cannot display the current position of the vehicle in real time.	◆ Check whether the central control PIN12 and PIN19 have signals ◆ If there is a signal, replace the TBOX
Radio can not search the radio	Check whether the radio antenna interface is loose
When the radio works or the music works When, the external speaker or Bluetooth headset can not listen To the sound	◆ Check whether the external device is normal ◆ Reconnect the external device with Bluetooth

TBOX



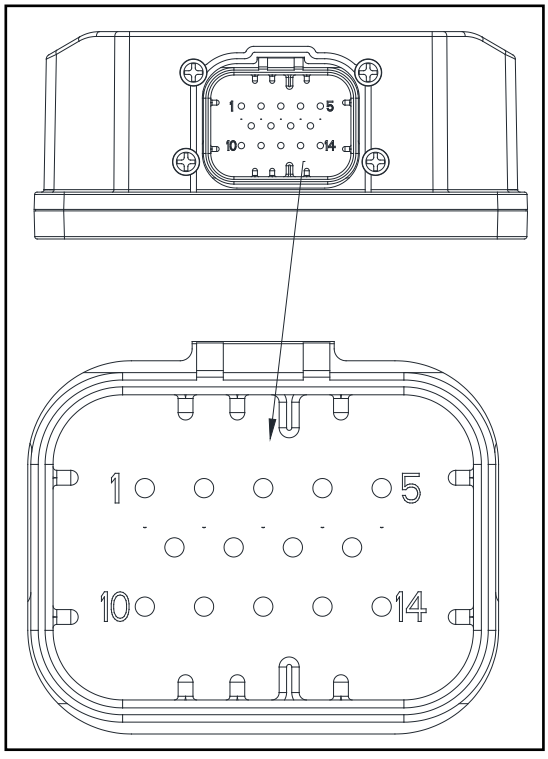
⚠ CAUTION

If more than one vehicle is maintained at the same time, do not replace and install the TBOX.

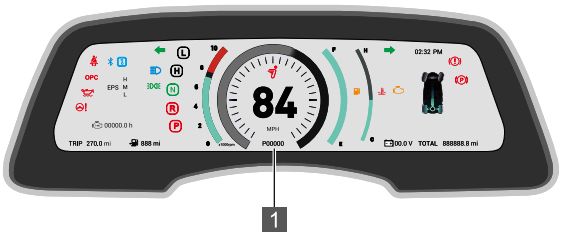
- First, the vehicle will be powered down, remove the shelf and front shelf cover.
- Unplug connector【A】
- Remove the four bolts【B】

⚠ WARNING

If you replace a new TBox, be sure to use the Segway APP-TBox replacement function for operation, so that the intelligent function can serve the customer properly. See the APP operation guide for the specific TBox replacement process.



PIN	Description	Note
1	GND	
2	MIgnition	Check whether the mechanical key is energized
3		
4	CAN1+	The body CAN +
5	CAN1-	The body CAN -
6	REALY_OUT	Remote power on relay interface
7	ACC	
8	CAN3+(Reserve)	
9	CAN2+	The engine CAN +
10	B+	Battery electric
11	OIL+	
12	OIL-	
13	CAN3-(Reserve)	
14	CAN2-	The engine CAN-

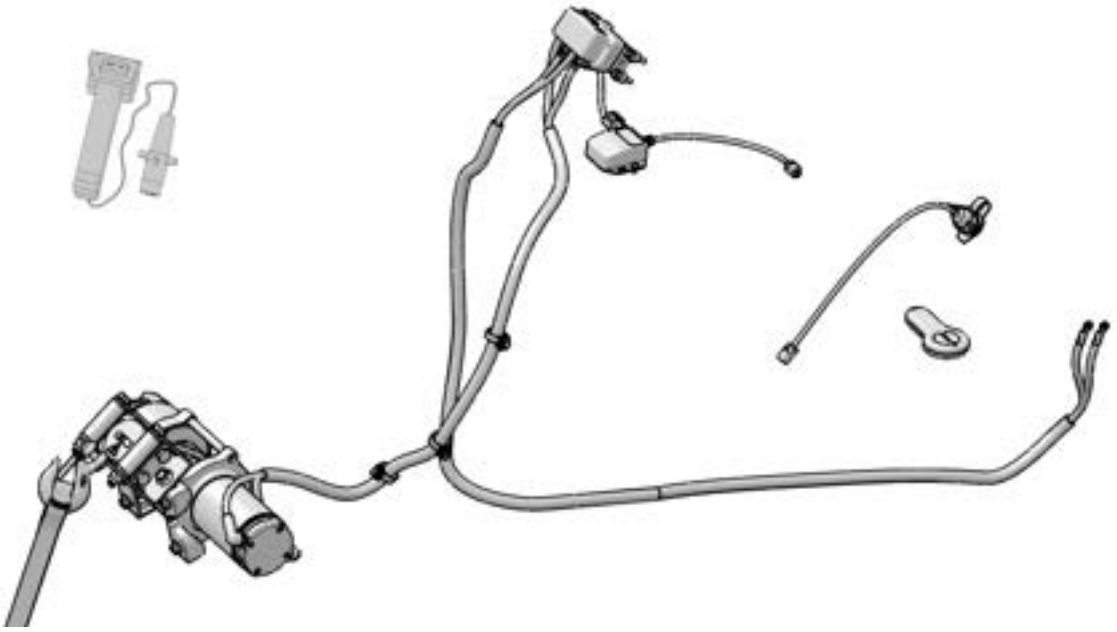


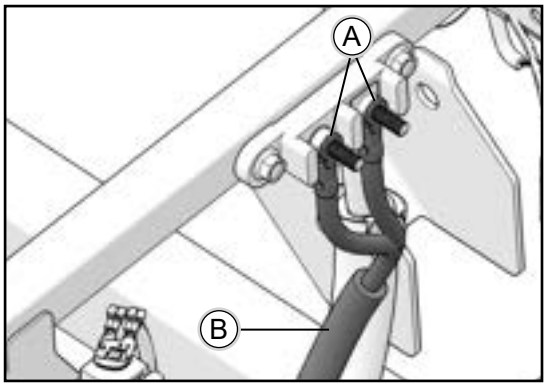
TBox fault code display area

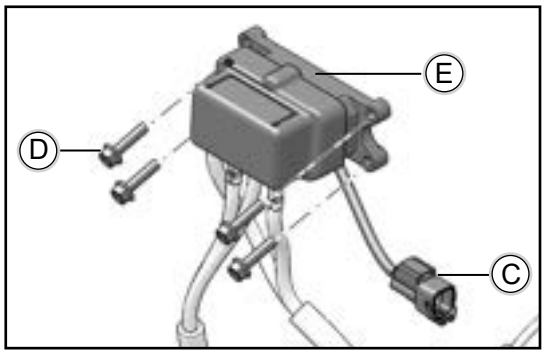
T0001	*GPS module failure*
T0002	*4G module failure*
T0003	*Bluetooth module failure*
T0004	*Sensor failure*
T0005	*Power CAN failure*
T0006	*Body CAN failure*

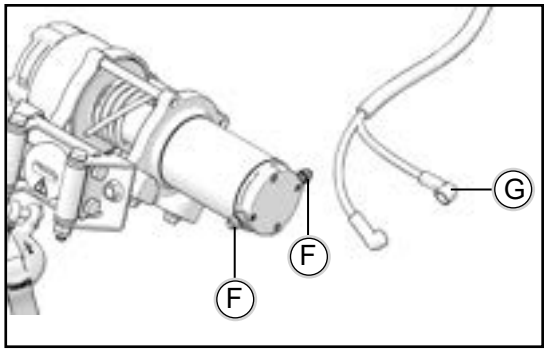
Failure phenomena and causes		
NO.	Trouble phenomenon	solution
1	when the meter appears T0001	Replace the TBOX
2	when the meter appearsT0002	Replace the TBOX
3	when the meter appearsT0003	Replace the TBOX
4	when the meter appearsT0004	Replace the TBOX
5	when the meter appearsT0005	check whether PIN9 and PIN14 have letters No.
6	when the meter appearsT0006	check whether PIN4 and PIN5 have signal
7	APP has no response after remote power on.	There is no problem after checking the relevant circuit after the replacement of TBOX

WINCH ASSEBLY







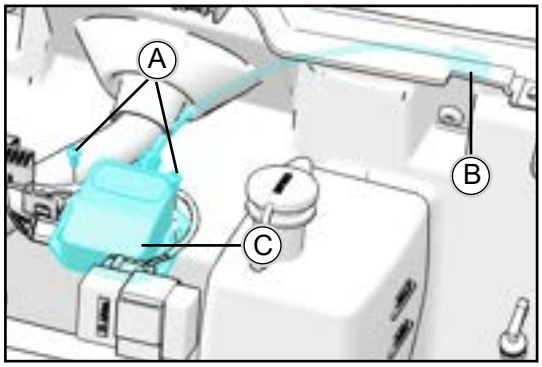


CAUTION

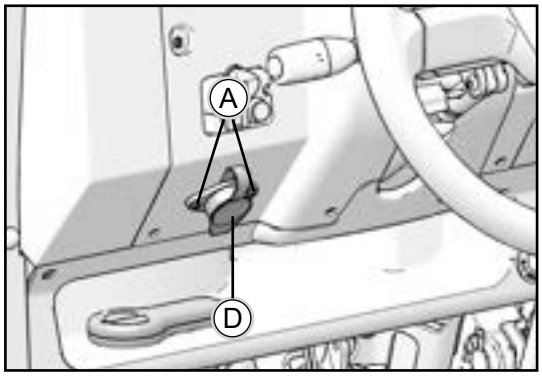
When removing the winch, first turn off the vehicle key.

The wireless control module is removed

- Remove the external plastic parts
- First remove the nut【A】
- Unplug the power cord【B】
- Winch assembly
- Unplug the plug first【C】
- Remove the bolt again【D】
- Remove the screw again【F】
- You can remove the motor line【G】
- Then cut off the wiring harness, you can remove the relay【E】

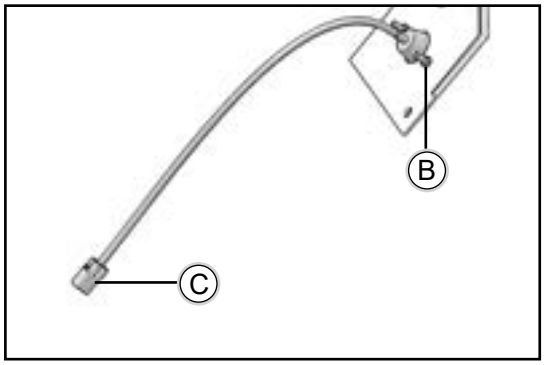


- Remove the external plastic parts
- First remove the tapping nail【A】
- Unplug plugins【B】
- Removable winch wireless control module【C】

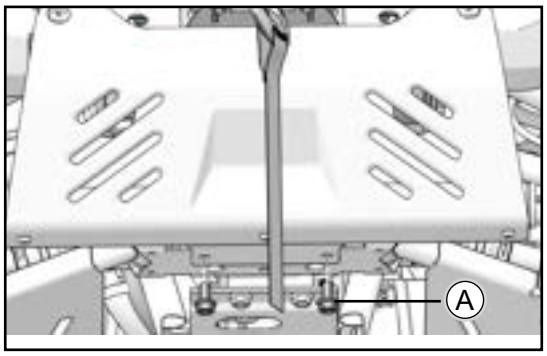


Winch socket removed

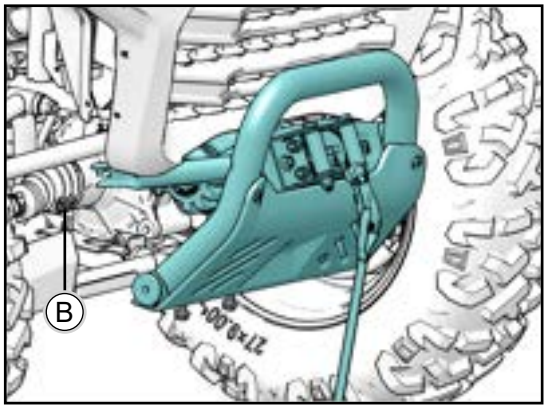
- After removing the external plastic parts
- First remove the bolt【A】and nut【B】.
- Unplug the plug-in again【C】
- You can remove the capstan socket【D】

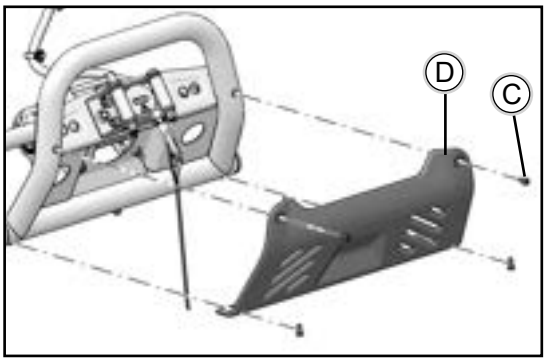


Winch motor removed

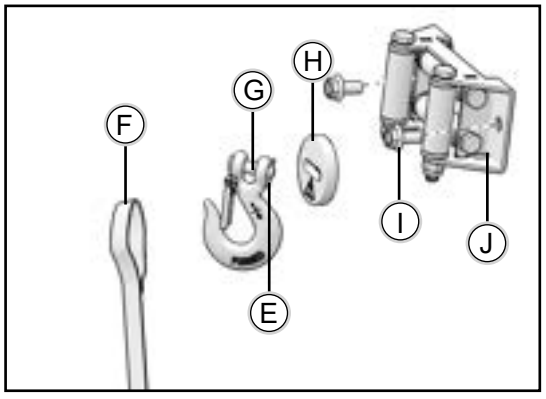


- Remove the bolt【A】
- Then remove the bolts on the left and right sides of the bumper【B】
- The front winch motor and the front bumper can be removed as a whole

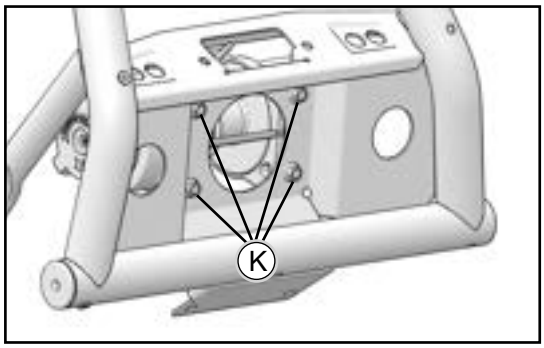




- Remove the bolt【C】
- The guard plate【D】can be removed



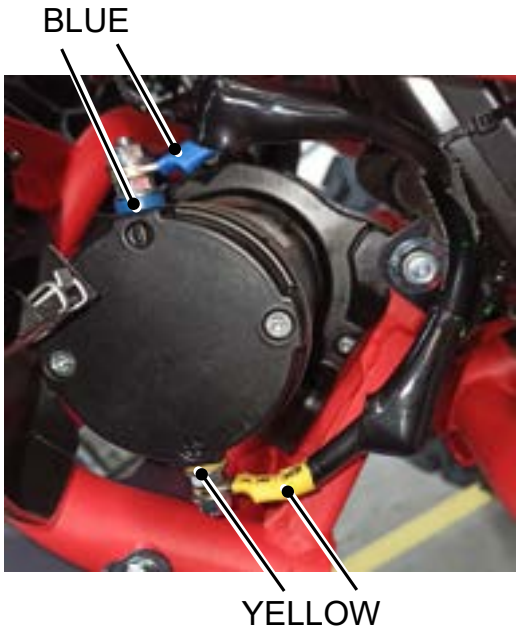
- After removing the bolt【E】and the wire rope, the pull belt【F】and can be removed
- Hook【G】, and rubber pad【H】
- Remove the bolt【I】, remove the guide wheel【J】



◆ Remove the bolt【Z】， that is, take down the winch motor

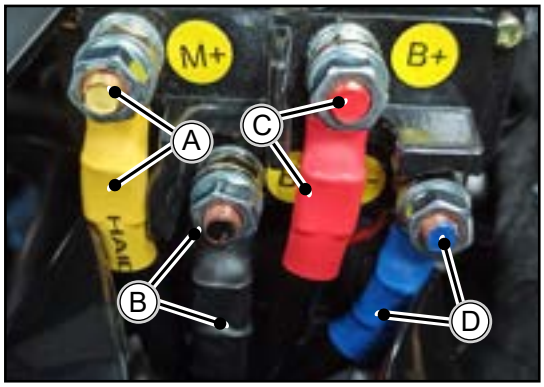
⚠ CAUTION

winch work shall not exceed 1min each time, and shall work after 30S interval



◆ Rated working voltage DC12V
◆ Maximum working tension 3500LB,
◆ The maximum working current ≤1 85 A, the maximum working current duration is
◆ Continue working in this way for 30 seconds after 1 minute
◆ Wire diameter of wire rope is 4.8. Wire rope length is 14.5 meters

The color of the insulation pad of the winch motor terminal and the heat-shrinkable tube of the cable correspond one to one
【A】YELLOW
【B】 BLUE



The color of the terminal post of the winch relay corresponds to the color of the heat-shrinkable tube of the cable
【A】YELLOW
【B】BLACK
【C】RED
【D】BLUE

Instructions for winch Remote Control Switch:

- At the same time, press 2 buttons, for 3S, activate the remote control fire, this the indicator will blink 3 times when
- You can press 1 button to control the rotation of the winch motor
- At the same time, press 2 buttons, for 3S, turn off the remote control fire, this when the indicator light will go off

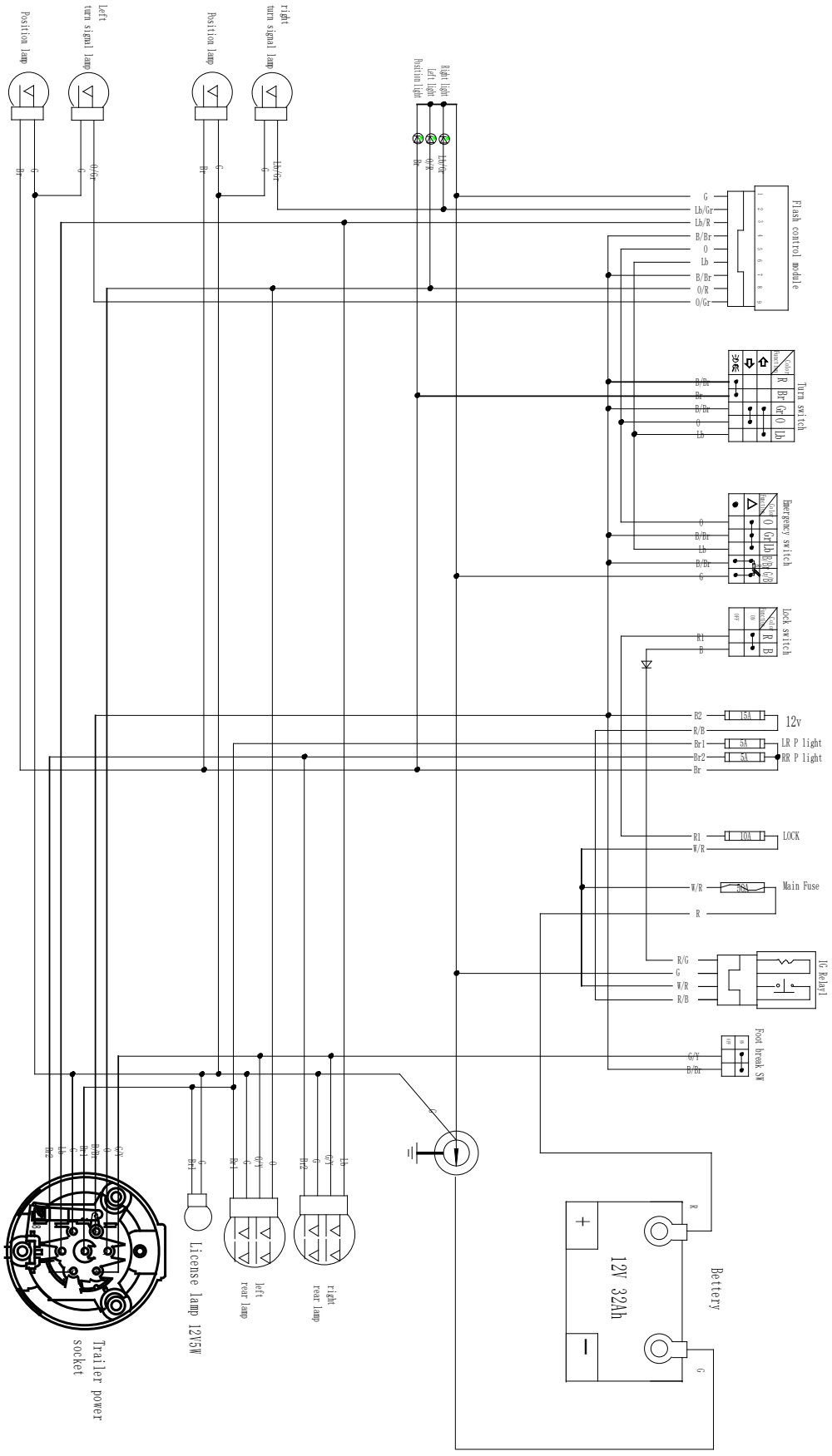
Instructions for Winch Switch:

- Insert the winch switch into the winch socket, then press the winch switch left and right. Capstan motor rotation can be controlled

Manual release switch of winch

- Turn the manual release switch clockwise to pull out the wire rope by hand. If the wire rope needs to be retracted, it must be manually released by turning it counterclockwise Off, with the switch control motor rotation, in order to recover the wire rope

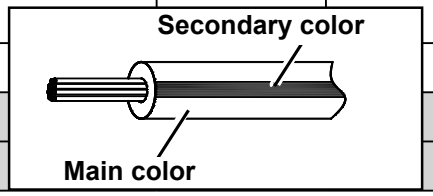
SCHEMATIC DIAGRAM OF TRAILER SYSTEM



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	W/Br
COLOUR	White	White/Red	White/Black	White/Green	White/Yellow	White/Blue	White/Violet	White/Gray	White/Brown
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	O/W	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	G/W	G/Y	G/L	G/V	G/Br	
COLOUR	Green	Green/Red	Green/Black	Green/White	Green/Yellow	Green/Blue	Green/Violet	Green/Brown	
CODE	Y	Y/R	Y/B	Y/W	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	L/W	L/G	L/Y			
COLOUR	Blue	Blue/Red	Blue/Black	Blue/White	Blue/Green	Blue/Yellow			
CODE	V	V/R	V/B	V/W	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.

Wiring diagram