PARSUN OUTBOARD MOTOR
SERVICE MANUAL

F60/50

Suzhou Parsun Power Machine Co., Ltd.

Introduction

This Manual is a repair instruction for F50/60 and is provided by Parsun to the dealers when maintaining or repairing Parsun outboard motors. Please read this Manual carefully before maintaining and servicing the outboard motor. Please use the repair procedures and tools recommended in this

Manual when repairing and maintaining the outboard motor. If other maintenance procedures and tools are selected, please follow the instructions of experienced maintenance personnel to avoid injury to personnel and outboard motor.

The information, drawings and technical parameters used in this Manual are subject to the prototype at the time of publication, so there can be slight differences between the actual motor you purchased and that described in the Manual. If necessary, the Company will distribute the revised part to the dealers.

When the following characters appear in the Manual, please read the Manual carefully and follow the relevant instructions and descriptions correctly and carefully.

⚠ **Warning:**

Failure to obey the warning may cause injuries to maintenance personnel and bystanders, and in serious cases, this may lead to death.

Attention:

Preventive measures must be taken to prevent outboard motor from being damaged.

Note:

Provide you with key information to make your operation steps simpler and clearer.

The last part of this Manual provides the common faults and troubleshooting methods of outboard motors, so please read them carefully, and it can help you quickly judge the status of the outboard motor and improve your working efficiency when overhauling the motor.

Suzhou Parsun Power Machine Co., Ltd.

After-sales service: 400-882-6659

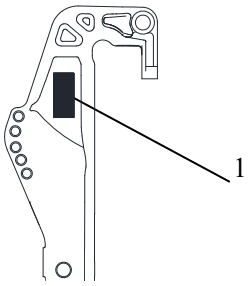
0512-66212797

Contents

Overview

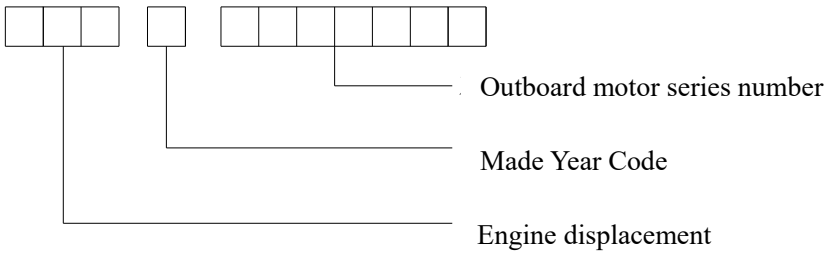
Identification Marks

The serial number of the outboard motor is printed on a label, which is attached to the port side of the clamp bracket or the upper part of the rotary bracket. The serial number is shown in the whitespace of the label to help you order spare parts from the dealer or for reference when the engine is stolen.



1. SN of the outboard motor

The SN indicates the following:



Propeller Selection

The performance of the outboard motor is seriously affected by the selection of propellers. Improper propeller may have adverse effects on the engine. When running with heavy load, the engine will run at low speed for a long time.

At this time, the propeller with smaller pitch should be selected, otherwise the pitch should be selected.

Larger propeller to maintain normal operation of the engine.

When the engine is running at full throttle, refer to the speed and fuel performance of the engine for the most suitable propeller. In this way the propeller can provide the highest performance.

Model	Propeller Dimension	Material
C/D Model Gear ratio: 1.85:1 Gear box capacity:430cc	3-11 3/8" ×12"	Aluminium alloy
	3-11 1/8" ×13"	Aluminium alloy
CD/CT Model Gear ratio: 2.0:1 Gear box capacity:610cc	3-13 1/4" ×17"	Aluminium alloy
	3-13 5/8" ×13"	Aluminium alloy

Protective Measure at Work

In order to prevent hazards or accidents during maintenance and improve work quality, please observe the following safety regulations.

1. Fire control

Gasoline and various lubricating oils and greases are highly combustible, so please keep away from heat sources, sparks and open flames when working.

2. Ventilation

Gasoline steam and engine exhaust gas are highly toxic. Massive inhalation of them can

cause shock and even death. Maintain good ventilation conditions when debugging the engine indoors.

3. Self-protection

Wear protective glasses when drilling, grinding or using air compressors. Wear protective gloves and safety shoes when necessary.

4. Use of lubricants and sealants

When maintaining and repairing outboard motors, only products provided or recommended by Parsun can be used.

Under normal circumstances, the lubricants mentioned in this Manual will not damage your skin. However, please take protective measures before use to reduce risks.

① Apply protective cream to both hands before overhauling outboard motors;

② If clothes are contaminated by lubricant, replace and clean them as soon as possible.

③ Avoid contact with skin;

④ Please wash your hands and skin carefully with soap and hot water after touching lubricant.

⑤ Use a clean, non-fuzzing rag to wipe off the spilled grease.

5. Developing good working habits

① Tighten nuts, bolts and screws according to the specified torque from the center outward and from large ones to small ones.

② Use recommended special tools to avoid damage to parts. Use the right tools in the right way.

Disassembling and Assembling

When disassembling and assembling an outboard motor, please observe the following principles:

1. Use special tools when disassembling and assembling parts;

2. Remove dust and dirt before disassembling parts;

3. Apply engine oil to the contact surface of moving parts before assembly;

4. When installing the bearing, place the manufacturer's mark in the specified direction and lubricate it fully.

5. Before installation, coat a thin layer of waterproof lubricating oil on the protruding part and periphery of the oil seal;

6. After the assembling is completed, check whether the moving parts are working properly.

Disposable Parts

Parts such as gaskets, oil seals, O-rings, cotter pins and spring rings are disposable parts and must be replaced when reinstalling the outboard motor.

Inspection before Delivery

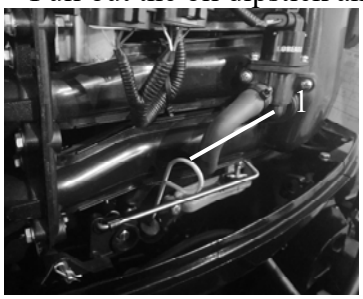
In order to ensure the normal use of the products by customers, please carry out the following inspections before delivery.

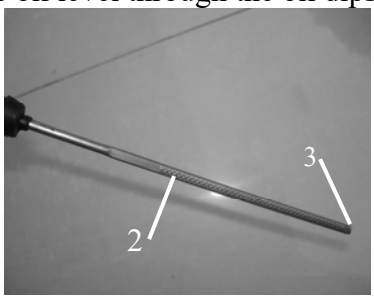
1. Check the fuel system.
   Check that the fuel hose is securely connected and that the fuel tank is full of fuel.
   Attention:
   This is a four-stroke engine and premixed fuel cannot be used.

2. Check oil level.

① Check engine oil level.

Pull out the oil dipstick and observe the oil level through the oil dipstick.





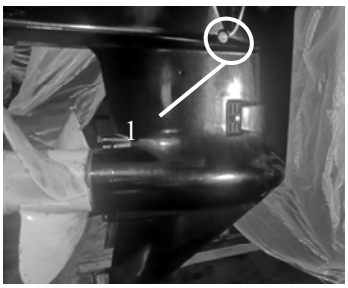
1. Oil dipstick 2. High position mark 3. Low position mark

Ensure that the oil level is between the high position mark and the low position mark; Drain the oil when the oil level is higher than the high position mark, and add oil when it is lower than the low position mark.

② Check gear oil level

Unscrew the oil level hole plug and observe whether there is oil overflow from the oil level plug hole.

If yes, install the oil level hole plug and tighten it according to the specified torque. If not, fill in oil.



1.Oil level hole plug

3. Check the steering system.
   Check whether the steering is smooth;

4. Check shift and throttle operation.
   Check whether the gear shift operation is smooth; Check whether the throttle grip operates smoothly from the fully closed position to the fully open position.

5. Check the emergency stop switch assembly.
   Check whether the engine stops when the emergency stop switch assembly is pressed or the motor stop safety rope is pulled out.

6. Check the cooling water observation hole.
   When the engine is running, check whether the cooling water is flowing out of the cooling water observation hole.

1. Cooling water observation hole

7. Running-in operation.

① The 1st hour: Run the engine at 2000 rpm or at about half the throttle.

② The 2nd hour: Run the engine at 3000 rpm or at about 3/4 of the throttle.

③ Next 8 hours: Avoid running the motor at full throttle for 5 consecutive minutes.

8. Check after running-in operation

① Check the gear oil for water.

② Check the fuel oil pipeline for leaks.

③ After running-in operation, run the engine at idle speed and flush the cooling water channel with fresh water using flushing tools.

9. After running-in operation, check the idle speed of the engine.

① Preheat the engine for 5 minutes.

② Use a tachometer to measure the idle speed of the engine.

Make corresponding adjustment if it does not conform to the specified value. Idle value: 750 ~ 850rpm.

③ Turn the throttle stop screw clockwise or counterclockwise until the specified idle speed is reached.

④ After adjusting the idle speed, speed up several times to check the stability of the engine.

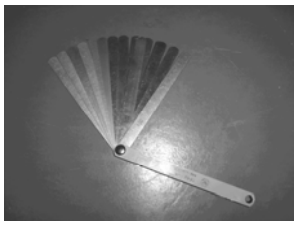
Attention:

Idle speed adjustment needs to be carried out by qualified maintenance personnel using professional equipment; Random adjustment may cause starting difficulties, weakness, jitter and other faults of the engine.

Special Tools and Testing Equipment

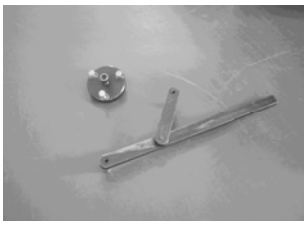
Various special tools and testing equipment will be used in the repair and maintenance of outboard motors. Skilled and correct use of these tools and equipment can help improve your work efficiency avoid damage to personnel and outboard motors.

Special tools:



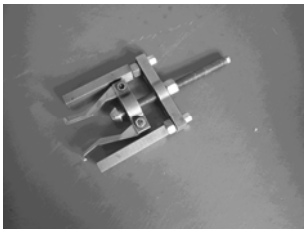
Clearance gauge

Piston slideway

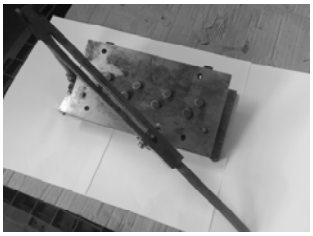


Flywheel gripper and flywheel puller

Oil filter spanner



Bearing puller



Valve spring compressor kit

Bearing mounting tool
Lower unit

Oil seal mounting tool
Lower unit

Needle bearing mounting tool
Lower unit

Shell cover tool
Lower unit

Needle bearing tool
Lower unit

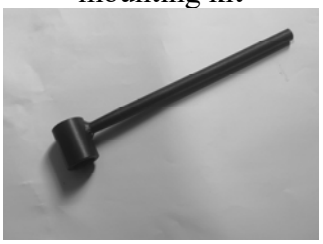
Drive shaft bearing
cover mounting tool

Drive shaft bearing
mounting tool

Drive shaft seat oil seal
mounting kit

Forwarder gear bearing
mounting tool kit

Drive shaft spline sleeve

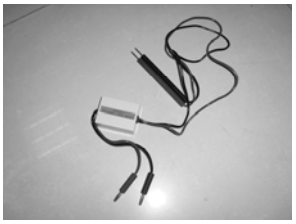


Pinion nut wrench

Testing equipment:

Digital tachometer

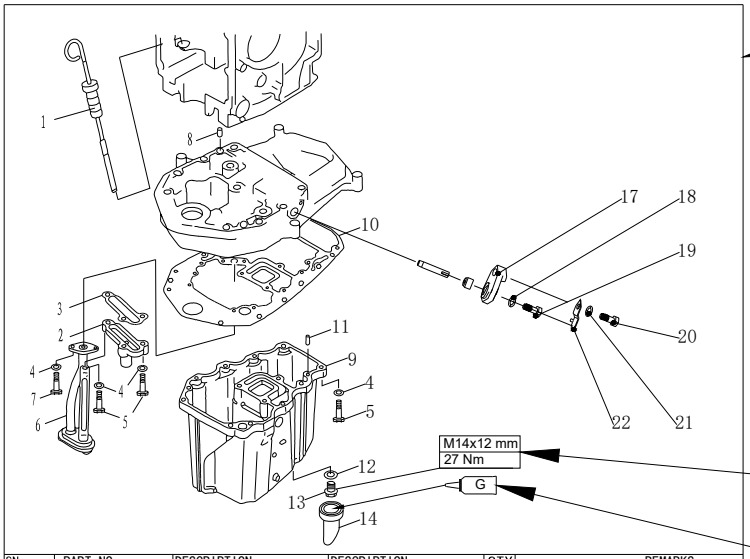
Digital multimeter



Peak voltage adapter

Decomposition Schematic Diagram and Symbolic Description

Decomposition schematic description



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量	REMARKS 备注
1	F25-00000100	机油尺组件	PLUG, OIL LEVEL	1	
2	F25-02010100	溢流阀组件	RELIEF VALVE AUY	1	
3	F25-02010006	溢流阀垫片	GASKET, RELIEF VALVE	1	
4	GB/T97.1-2000	平垫圈6	WASHER , PLAIN	15	
5	GB/T5783-2000	六角螺栓M6x25	HEXAGON BOLT	13	
6	F25-02010200	粗滤器组件	STRAINER, OIL	1	
7	GB/T5783-2000	六角螺栓M6X16	HEXAGON BOLT	2	
8	F25-00000014	定位销8x12	PIN, DOWEL	2	
9	F25-02000006	油底壳	OIL SUMP	1	
10	F25-02010007	排气歧管座垫	HEXAGON BOLT	1	
11	F15-00000006	定位销6x12	PIN, DOWEL	2	
12	F15-04000003	放油螺塞垫片	GASKET	1	
13	F15-04000002	放油螺塞	BOLT, OIL DRAIN	1	
14	F25-02000007	放油口胶套	JACKET, OIL DRAIN	1	
15	F25-02010005	阳极	ANODE	1	
16	F15-07010009	阳极密封圈	SEAL. ANODE	1	
17	F15-07010011	阳极盖板	COVER , ANODE	1	
18	GB/T97.1-1985	平垫圈5	WASHER	1	
19	GB/T5783-2000	六角螺栓M5x12	BOLT	1	
20	GB/T5783-2000	六角螺栓M6x20	BOLT	1	
21	GB/T97.1-1985	平垫圈6	WASHER	1	
22	F15-07010012	阳极锁止片	PLATE , ANODE	1	

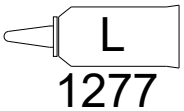
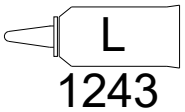
① Decomposition schematic diagram of parts.

② Thread specification and specified torque.

③ Application point of oil, sealant or locker.

④ Parts list

Symbolic description

				
Apply engine oil	Apply waterproof grease	Apply thread locker 1277	Apply thread locker 1243	Apply sealant

Specifications

Parameters of Outboard Motor

Item			Data	Item			Data
Dimension	Overall length (BE/FE)		1383/713 mm	Engine	Spark plug		DPR7EA-9 (NGK))
	Overall width		427 mm		Cooling system		Water cooling
	Overall height	D/T	1435 mm		Exhaust system		Through the propeller hub
		CD/CT	1476 mm		Lubrication system		Pressure lubrication
	Height of stem board		508 mm	Fuel and oil	Fuel type		Ordinary unleaded gasoline
Weight	BEL-D/BEL-CD		113 kg/126.5 kg		Fuel grade		PON86
	BEL-T/BEL-CT		114.5 kg/128 kg		Engine oil type		Four-stroke engine oil
	FEL-T/FEL-CT		113.5 kg/127 kg		Engine oil grade	API	SE, SF, SG, SH, SJ
Performance	Max. output	F50	36.8Kw@5500r/min			SAE	10W30, 10W40
		F60	44.1Kw@5500r/min		Engine oil level		2.2L (replace filter)
	Full throttle operating range		5000～6000 r/min				2.0L (do not replace filter)
	Max. fuel consumption	F50	18.5 L/h@6000 r/min		Gear oil type		Hypoid gear oil
		F60	20 L/h@6000 r/min		Gear oil grade	API	GL-4
	Idle (neutral)		800±50 r/min			SAE	90
Engine	Engine type		In-line four-stroke, overhead cam		Gear oil level	D/T	0.43L
	Number of cylinders		4			CD/CT	0.61L
	Displacement		996 cm³	Bracket	Tilt raise angle		69°
	Bore×Stroke		65 mm×75 mm		Steering angle		40°+40°
	Compression ratio		9.3		Trim angle		-4°～20° (when stem board is 12°)
	Oil supply mode		Electronically controlled fuel injection	Drive device	Gear		F-N-R
	Control mode	BE	Steering handle		Transmission ratio	D/T	2.08
		FE	Remote control			CD/CT	2.0
	Starting mode		Electrical starting		Gear type		Spiral bevel gear
	Ignition system		ECU		Clutch type		Claw clutch
	Ignition timing	TDC	2°±0.5°		Propeller shaft type		Spline
		BTDC	25°±0.5°		Propeller direction		Clockwise (rear view)

Repair Information

Engine

Item			Data	Item			Data
Drive device	Min. compression pressure		840 kPa	Diameter of piston			64.950~64.965mm
	Lubricating oil pressure		100 kPa	Height of measuring point			5mm (from bottom of piston)
Cylinder head	Bending limit		0.03mm	Piston-to-cylinder clearance			0.035~0.065mm
	Inside diameter of camshaft bore		37.00~37.02mm	Piston pin hole aperture			15.974~15.985mm
	Inner diameter of shaft hole of rocker arm		16.000~16.01mm	Piston pin outer diameter			15.965~15.970mm
Cylinder block	Cylinder bore		65.00~65.013mm	Piston ring	Top ring	Thickness	1.17~1.19mm
	Wear limit		65.1mm			Width of end face	2.25~2.4mm
	Taper limit		0.08mm			End gap	0.15~0.30mm
	Roundness limit		0.05mm		Backlash		0.02~0.06mm
	Second ring	Thickness	1.47~1.49mm	Valve spring	Free length		40.0mm
		Width of end face	2.60~2.80mm		Min. free length		38.4mm
		End gap	0.30~0.50mm		Tilt limit		1.7mm
		Backlash	0.02~0.06mm	Connecting rod	Inner diameter of small end		15.985~15.998mm
	Oil ring	Thickness	2.36~2.48mm		Inner diameter of big end		36.000~36.016mm
		Width of end face	2.75mm		Large head oil clearance		0.020~0.052mm
		End gap	0.20~0.70mm		Thickness of big-end bearing	A black	1.496~1.490 mm
		Backlash	0.04~0.18mm			B brown	1.490~1.484mm
Camshaft	Height	Intake cam	30.83~31.03mm	Oil pump	Type		Cycloid pump
		Exhaust cam	30.83~31.03mm		Pressure relief valve opening pressure		382~442 kPa
	Diameter of base circle		25.90~26.10mm		Clearance between outer rotor and casing		0.09~0.15 mm
	Journal diameter		36.935~36.955 mm		Clearance between outer rotor and inner rotor		0.12 mm
	Roundness limit		0.03mm		Clearance between rotor and cover		0.03~0.08 mm
	Clearance between journal and oil		0.045~0.085mm	Crankshaft	Diameter of crankshaft main journal		42.984~43.000 mm
Valve	Valve clearance (Cold state)	Intake valve	0.15~0.25mm		Crank pin diameter		32.984~33.000 mm
		Exhaust valve	0.25~0.35mm		Crank pin width		21.00~21.07mm
	Valve cone Width	Intake valve	1.84~2.97mm		Crankshaft big-end backlash		0.05~0.22mm
		Exhaust valve	1.98~3.11mm		Roundness limit		0.05mm
	Width of contact with race		0.9~1.1mm	Thermostat	Opening temperature		58~62ºC
	Edge thickness	Intake valve	0.8mm		Full open temperature		70ºC
		Exhaust valve	0.9mm		Mini. opening height of valve		3mm
	Head diameter	Intake valve	31.9~32.1mm	Fuel pump	Displacement		70 L@6000 r/min
		Exhaust valve	25.9~26.1mm		Pressure		49kPa
	Rod diameter	Intake valve	5.475~5.490mm		Plunger stroke		5.85~9.65 mm
		Exhaust valve	5.460~5.475mm	Crankcase	Inner diameter of crankshaft main journal		46.000~46.024mm
	Inner diameter of pipe		5.500~5.512mm		Clearance between crankshaft main journal and		0.012~0.044mm

				oil		
	Clearance between pipe and valve stem clearance	0.025~0.052mm		Thickness of crankshaft bearing bush	A black	1.500~1.494 mm
	Valve stem roundness limit	0.03mm			B brown	1.494~1.488mm

Measurement conditions:
Ambient temperature 20 ℃.

Lower casing Installation

Item		Data	Item	Data
Backlash	Pinion to spur gear	0.18~0.54mm	Optional gear shim	0.10,0.12,0.15,0.18, 0.30,0.40,0.50 mm
	Pinion to reverse gear	0.71 ~ 1.07 mm		

Electrical System

Ignition and Ignition Control System

Item		Data	Item		Data
Ignition timing	At idle speed	TDC 2º±0.5°	Magneto resistance (Green-Green)		0.59±0.1Ω
	Optional gear filler plate	BTDC 25°±0.5º	Peak output of electronic igniter Voltage	Secondary output voltage	≥ 34KV
Spark plug clearance		0.8~0.9mm		Primary resistance	2.2±0.22Ω
Trigger coil	Peak voltage	≥13 V@1000 r/min		Secondary resistance	9.84±0.98KΩ
	Resistance*	260～290 Ω	Rectifier regulator output peak voltmeter	1500 r/min (no load)	41.9 V
Magneto output peak voltage	1500 r/min (no load)	47.2 V		3500 r/min (no load)	99.8 V
	3500 r/min (no load)	106 V			

* Data for information only

Locking Torque

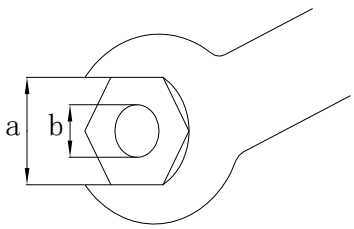
Specified Torque

Position			Name	Thread specification	Torque
Engine	Spark plug		—	—	18 Nm
	Flywheel		Nut	M20	160 Nm
	Cylinder head	1st tightening	Bolt	M9	23Nm
		2nd tightening			47 Nm
		1st tightening	Bolt	M6	6 Nm
		2nd tightening			12 Nm
	Oil filter		—	—	18 Nm
	Oil filter stud		—	—	40 Nm
	Lock nut (rocker arm)		Nut	M6x0.75	14 Nm
	Engine assembly		Bolt	M8	21 Nm
	Exhaust cover plate	1st tightening	Bolt	M6	6 Nm
		2nd tightening			12 Nm
	Thermostat cover		Bolt	M6	7Nm
	Crankc	1st tightening	Bolt	M8	15 Nm

	ase	2nd tightening			30 Nm
		1st tightening	Bolt	M6	6 Nm
		2nd tightening			12 Nm
	Connecting rod	1st tightening	Bolt	M6	6 Nm
		2nd tightening			17 Nm
	Driven pulley		Bolt	M10	38 Nm
Lower casing unit	Lower casing assembly		Bolt	M10	40Nm
	Ring nut		—	—	105Nm
	Water inlet		Screw	M5	5 Nm
	Oil drain bolt		Bolt	—	7Nm
	Oil check hole		Bolt	—	7 Nm
	Pinion gear		Nut	M22	95 Nm
	Propeller nut		Nut	M14	35 Nm
Upper Casing	Steering handle		Nut	M10	10 Nm
	Steering handle		Self-locking nut	M10	22 Nm
	Exhaust manifold		Bolt	M6	10 Nm
	Throttle grip		Screw	M5	3 Nm
	Shift linkage bracket		Bolt	M6	10 Nm
	Gear spring piece		Bolt	M6	10 Nm
	Bottom cover flat		Bolt	M6	10 Nm
	Clamp bracket		Self-locking nut	—	45 Nm
	Oil drain bolt		Bolt	M14	27 Nm
Tilting system	Inclined cylinder end		Screw	—	90 Nm
	Tilting motor		Screw	M5	4 Nm
	Fuel tank cap		—	—	6.5 Nm
	Trim cylinder end		Screw	—	80 Nm
	Tilt piston		Bolt	M12	61 Nm
	Pressure relief valve bracket		Bolt	M5	5.3 Nm
	Gear pump assembly		Bolt	M6	6.5 Nm
	Gear pump bracket		Bolt	M5	5.3 Nm
Electrical system	Trigger coil		Screw	—	4 Nm
	Starter motor		Nut	—	30 Nm
			Bolt	M8	30 Nm
	Starter motor terminal		Nut	—	7 Nm
	Magneto coil		Bolt	M6	7 Nm

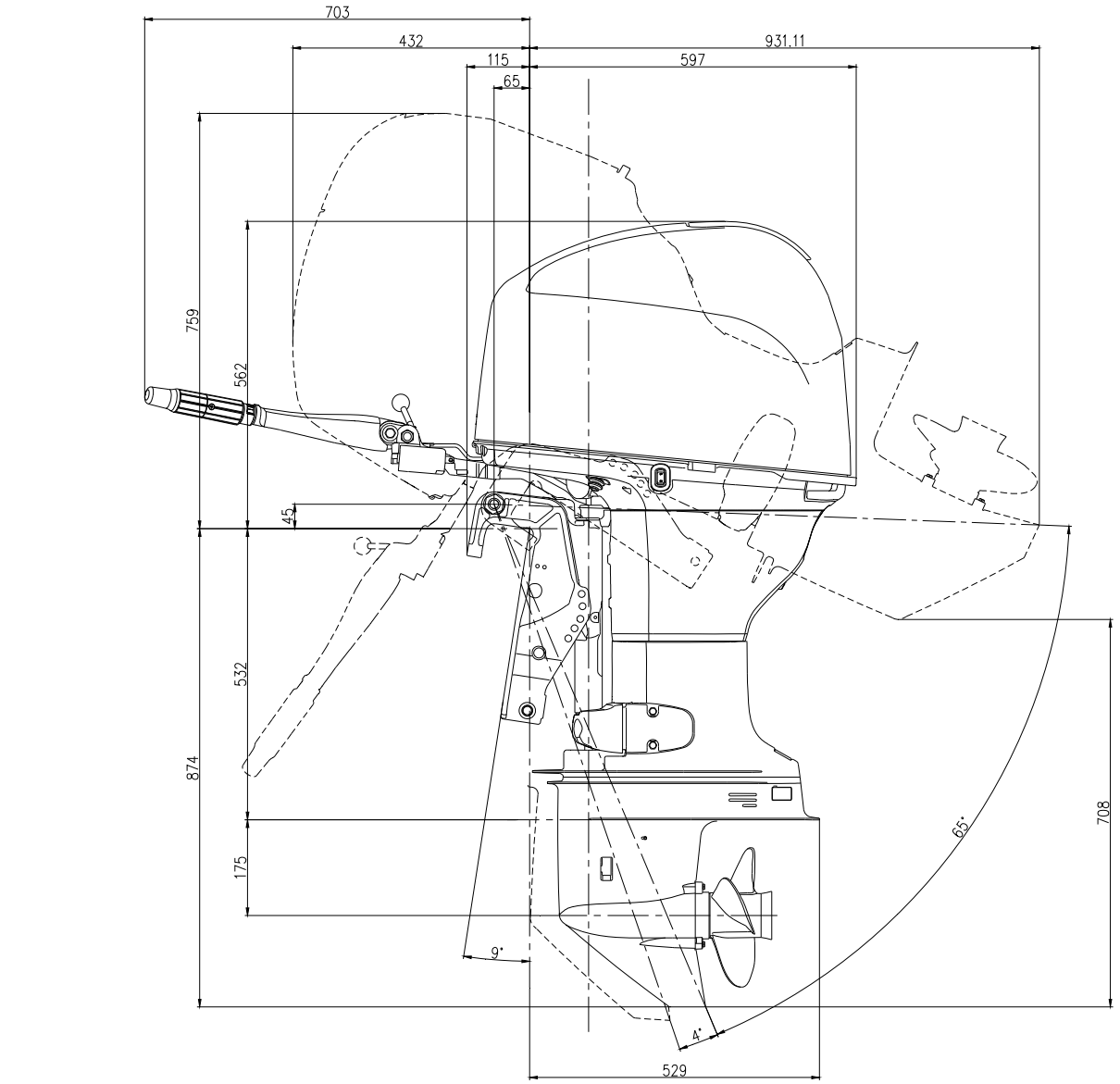
General Torque

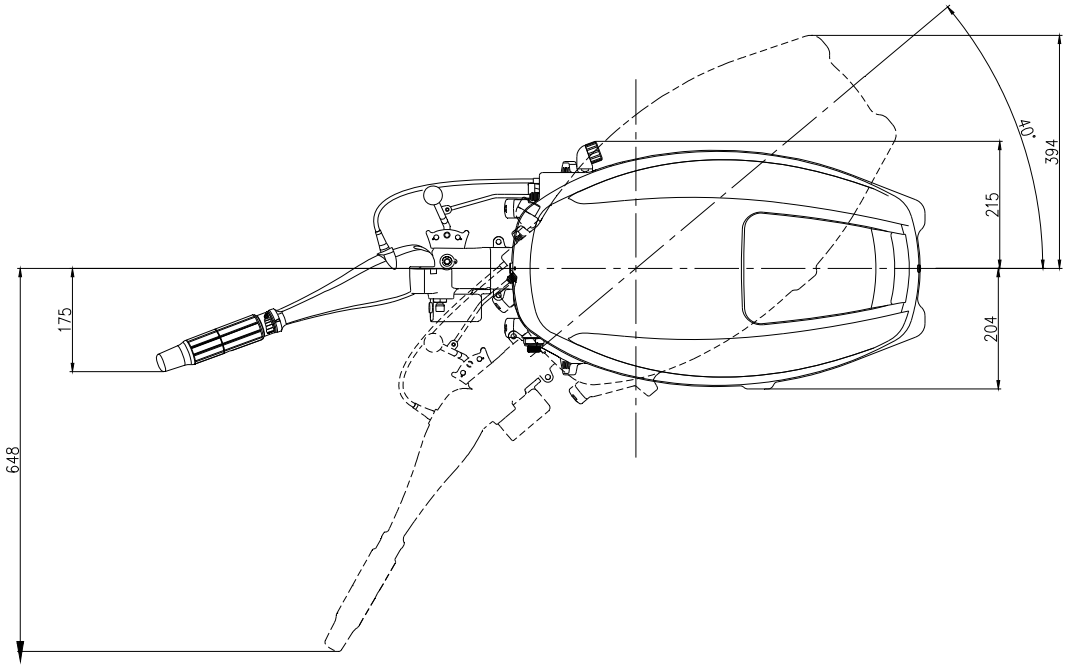
Nut a	Bolt b	Torque
8mm	M5	5Nm
10mm	M6	8 Nm
12mm	M8	18 Nm
14mm	M10	36 Nm
17mm	M12	43 Nm



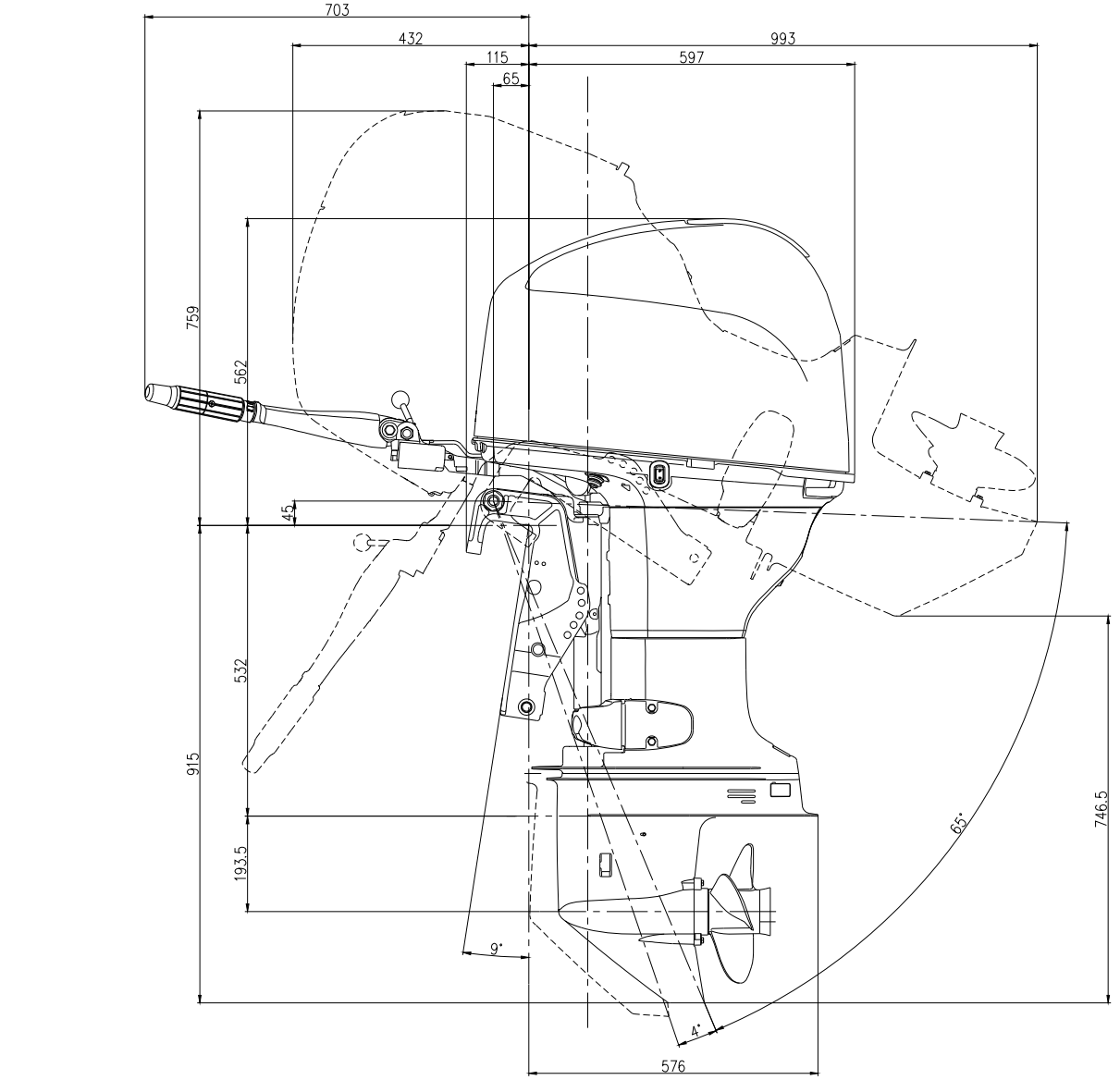
Dimensions

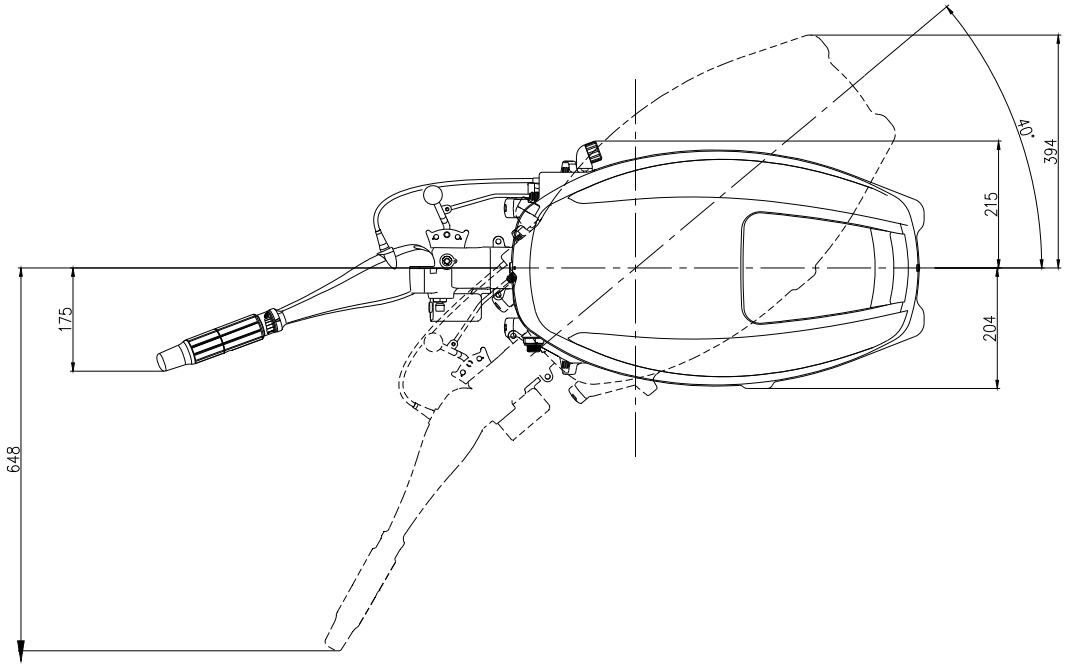
Outline Dimension(D/T model)



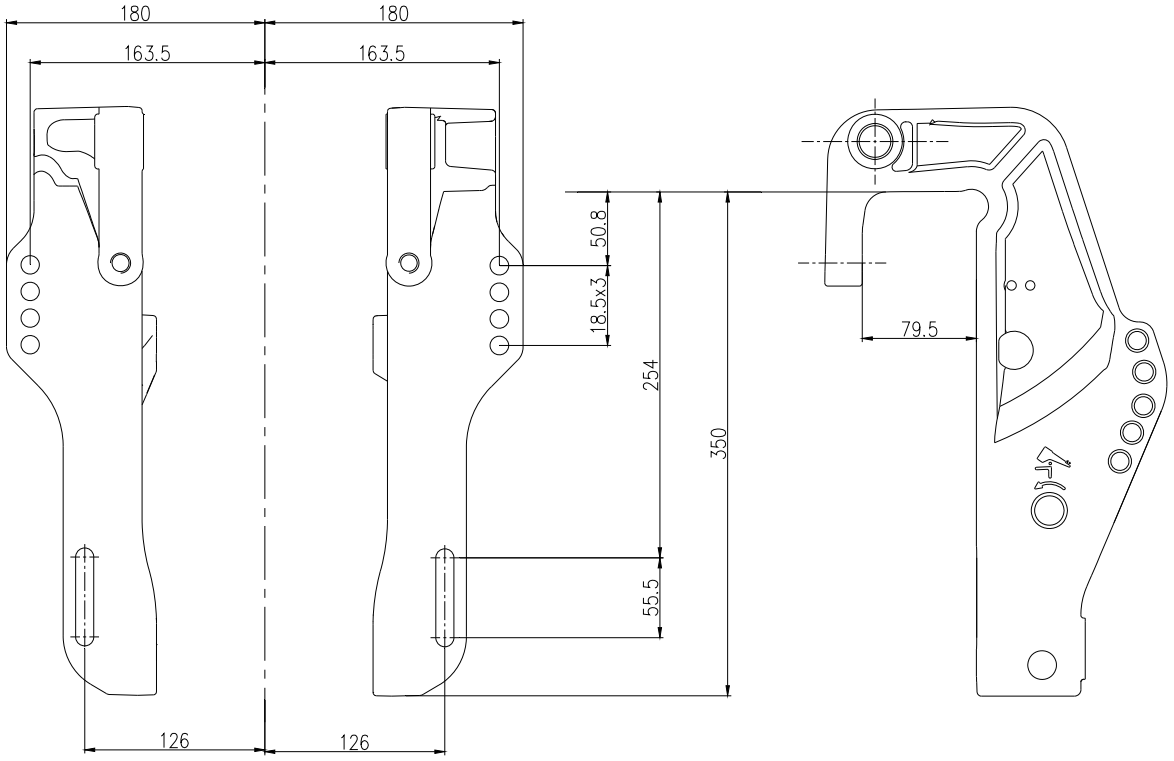


Outline Dimension (CD/CT model)





Mounting dimensions of clamp bracket



Basic Maintenance

Maintenance Interval Chart

Item	Content	Initial maintenance		General maintenance interval	
		10 hours (1 month)	50 hours (3 month)	100 hours (6 month)	200 hours (1 year)
Anode	Check/replace		○	○	
Anode (internal)	Check/replace				○
Cooling water channel	Clean		○	○	
Spark plug	Clean/adjust/replace	○			○
Grease filling point	Add grease			○	
Fuel filter	Check/replace	○	○	○	
Fuel system	Check	○	○	○	
Fuel tank	Check/clean				○
Idle speed	Check/adjust	○		○	
Engine oil	Replace	○		○	
Oil filter	Replace				○
Valve clearance (OHC)	Check/adjust	○		○	
Ignition timing	Check	○		○	
Thermostat	Check				○
Gear oil	Replace	○		○	
Water pump	Check				○
Propeller and cotter pin	Check/replace		○	○	
Timing band	Check/replace			○	○
Throttle cable	Check/adjust				○
Shift lever/shift cable	Check/adjust				○

Attention:

Flush the outboard motor with fresh water immediately after operation in brine, sewage or muddy water.

If leaded petrol is frequently used, check valves and related parts every 100 hours.

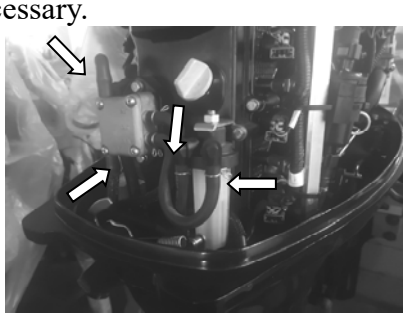
Replace the timing band every 1000 hours (5 years).

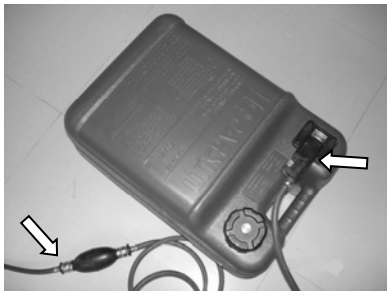
Fuel System

1. Check the fuel tank, fuel pump and fuel pipe.

   Check the fuel tank, fuel pump and fuel pipe for leaks or damage and replace it if necessary.

   Check the fuel oil filter core on the oil tank for any dirt, and clean or replace it if necessary.





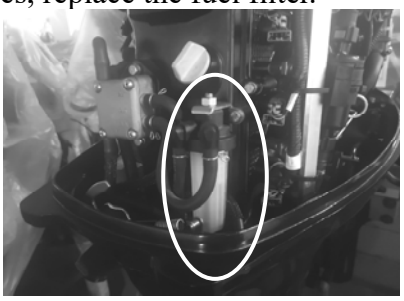
2. Check the fuel joint.

   Check the fuel joint for cracks, leaks or damage. Replace it if necessary.

3. Check the fuel filter.

Check whether the fuel filter is cracked or damaged, and check whether there is any dirt in the fuel filter.

If yes, replace the fuel filter.



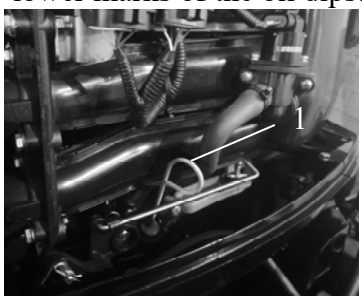
Attention:

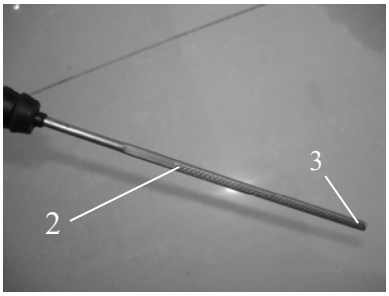
Wipe up the spilled fuel.

Engine

Engine Oil Level

1. Remove the oil dipstick and check whether the oil level is between the upper and lower marks of the oil dipstick.





1. Oil dipstick 2. High position mark 3. Low position mark

2. Drain the oil if it is above the high position mark, and add oil if it is below the low position mark.

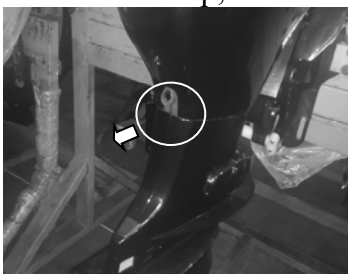
Attention:

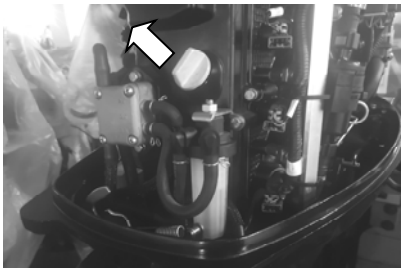
Turn off the engine after running it and let it stand for several minutes. Check the oil level again with the oil dipstick.

If the oil level is not within the specified range, add/drain oil to the specified value.

Replace Engine Oil

1. Remove the oil cap, oil drain bolt and bolt gasket; Drain the oil out.





2. Install a new bolt pad and install the oil drain bolt.

3. Add engine oil through the oil port.

Engine oil level: 2.0 L (The oil filter is not replaced)

2.2 L (oil filter is changed)

Oil type: API： SE, SF, SG, SH, SJ or SAE: 10W30, 10W40

4. Install oil filter cap.

5. Check oil level.

Valve Clearance

1. Remove the engine stop safety cable from the emergency stop switch assembly and remove the spark plug cap from the spark plug.

2. Remove belt cover.

3. Remove the fuel pump and cylinder head cover.

4. Check the timing band for slack, aging, or damage. Replace it if necessary.

5. Turn the flywheel clockwise. Align "1" on the driven pulley with "▼" on the cylinder head.

Check the intake valve clearance of cylinders 1# and 2# and the exhaust valve clearance of cylinders 1# and 3#. Correct it if necessary.

6. Turn the flywheel 180° clockwise; Align "●" on the driven pulley with "▼" on the cylinder head.
7. Check the intake valve clearance of cylinders 3# and 4# and the exhaust valve clearance of cylinders 2# and 4#. Correct it if necessary.

Attention:

It is strictly prohibited to turn the flywheel counterclockwise to avoid damage to the valve system.

Note:

Adjust valve clearance when the engine is cold.

Valve clearance (Cold state)	Intake valve	0.15~0.25mm
	Exhaust valve	0.25~0.35mm

8. Loosen the lock nut and turn the adjusting screw until the specified valve clearance is reached.

Note:

Turn the adjusting screw clockwise to reduce the valve clearance.

Turn the adjusting screw counterclockwise to increase the valve clearance.

9. Reinstall the removed parts.

Spark Plug

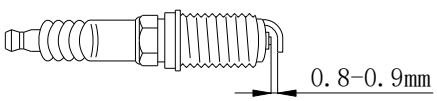
1. Remove the spark plug cap and then remove the spark plug.

2. Remove carbon deposits from the spark plug electrodes.

3. Check whether the electrodes are corroded, whether there is deposit, and whether the gasket is damaged. Replace the spark plugs if necessary.

Spark plug model: DPR7EA-9

4. Check whether the electrode gap meets the specified value; Replace the spark plugs if necessary.



5. Install the spark plug and tighten it with a spark plug wrench according to the specified torque.

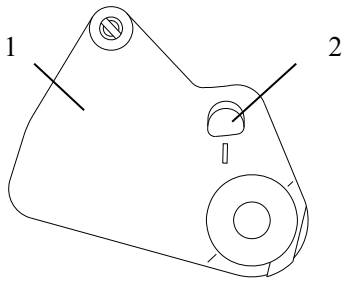
Specified torque: 18 Nm

Control System

Throttle Cable

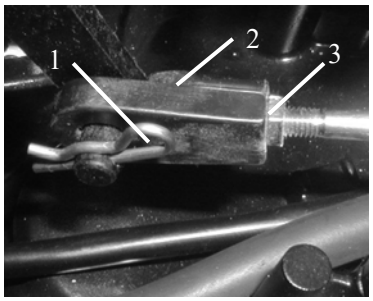
1. Place the throttle grip in the closed position; Put the shift lever to the neutral position for the front operation model.

2. Check whether the roller on the driven pulley of the throttle actuator can be observed in the observation window on the driving pulley of the throttle actuator; If the roller cannot be observed, adjust the length of the cable joint.



1. Driving pulley of throttle actuator; 2. Observation window.

3. Remove the cotter pin, remove the cable connector and loosen the lock nut of the cable joint.



1. Cotter pin 2. Cable joint 3. Lock nut

4.Adjust the screw-in depth of the joint so that the joint hole is aligned with the pin of the throttle actuator driving pulley.

Attention:

Cable joints must be screwed in more than 8mm.

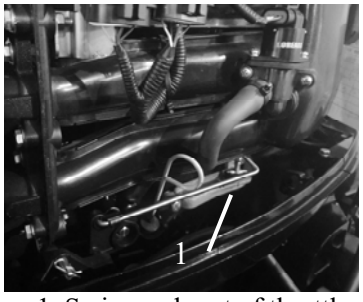
5.Fit the cotter pin and screw the lock nut.

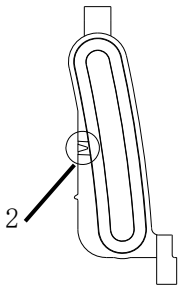
Shift Operation

1. Check whether the gear shifting operation is smooth;

2. Place the shift lever in neutral position.

3. Observe that the pin on the swing rod is aligned with the mark on the swing rod seat of throttle.





1. Swing rod seat of throttle; 2. Mark.

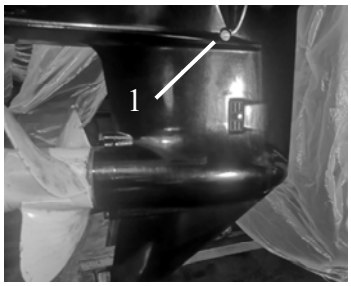
4. If the pin is not aligned with the mark, adjust the screw-in depth of the cable joint. (Refer to the adjustment method of cable joint of throttle)

Lower Casing Unit

Gear Oil

Check gear oil level

Remove the oil level plug screw. If there is oil spill, the oil level is correct. If there is no oil spill, add oil to it.



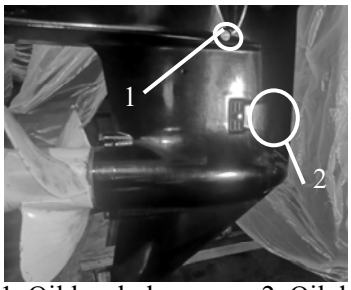
1. Oil level plug screw

Change gear oil

1. Place the outboard motor upright.

2. Place a container with sufficient capacity under the outboard motor.

3. Remove the oil drain screw, and then remove the oil level plug screw to drain the gear oil.



1. Oil level plug screw 2. Oil drain screw

4. Inject gear oil into the oil drain screw hole using the pressure filling device.

5. When gear oil spills out of the oil level plug hole, install the oil level plug screw.

6. Install the oil drain screw; Wipe off the spilled gear oil.

Note:

Check the drained gear oil. If gear oil is emulsified, check the seal and replace it if necessary. If there are metal debris in the gear oil, check the gears and bearings.

Attention:

A new drain screw gasket must be replaced every time**.**

Air tightness Inspection of Lower casing Unit

Connect the leak detection device to the oil level plug hole to check the air tightness of the Lower casing unit. If the pressure drops (the pressure is 1kg/cm^3), check the oil seal and other components.

General maintenance

Anode

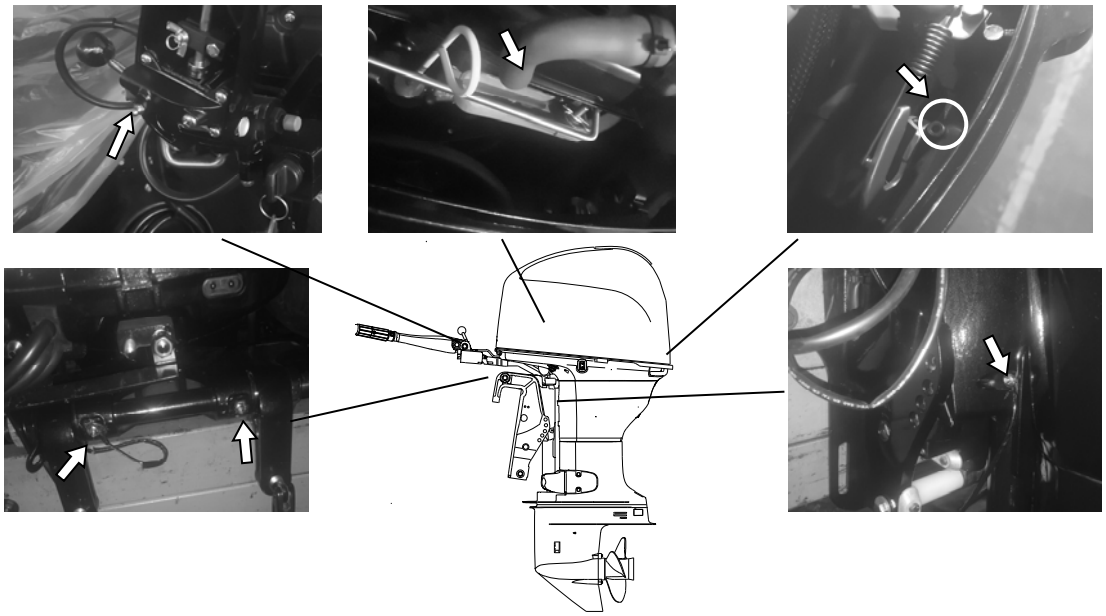
Check the anodes of the Lower casing unit and the engine (installed on the thermostat cover); Remove oil and scale; If damage or corrosion exceeds 1/2, replace the anode.

Attention:

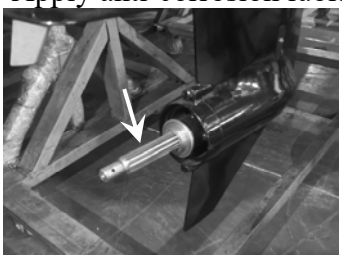
Do not apply oil or paint to the anode to avoid failure of the anode.

Lubrication Point

1. Fill or apply waterproof grease to the parts shown in the figure with an oil gun.

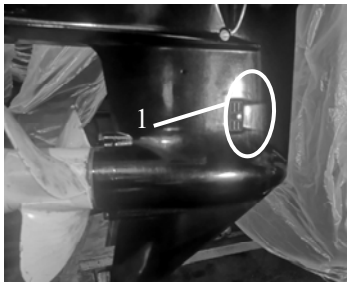


2. Apply anti-corrosion lubricating oil to the propeller shaft.



Cooling Water Channel

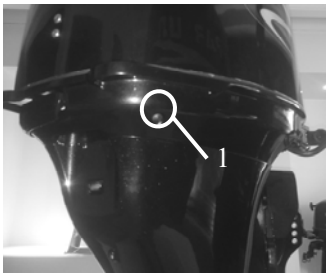
1. Check the inlet of the cooling water channel for blockage. Clean it if necessary.



1. Inlet of cooling water channel

2. Place the outboard motor in the water to ensure that the water level is above the anti-swirl plate and start the engine.

3. Check whether there is cooling water flowing out from the observation hole. If there is no water or the water flow is intermittent, check the cooling water channel in the outboard motor.



1. Cooling water observation hole

Thermostat

1. Remove the thermostat cover, and then remove the thermostat.

2. Hang the thermostat in a container with water.

3. Heat the container.

4. Check the opening of thermostat valve at the specified water temperature; If it does not conform to the specifications, replace it.

Water temperature	Opening height of valve
Below 60 ℃	Not open
Above 70 ℃	More than 3mm

5. Install the thermostat and thermostat cover and tighten the bolts to the specified values.

Propeller

Inspect the propeller blades and internal splines for rupture, damage or wear. Replace it if necessary.

Electrical System

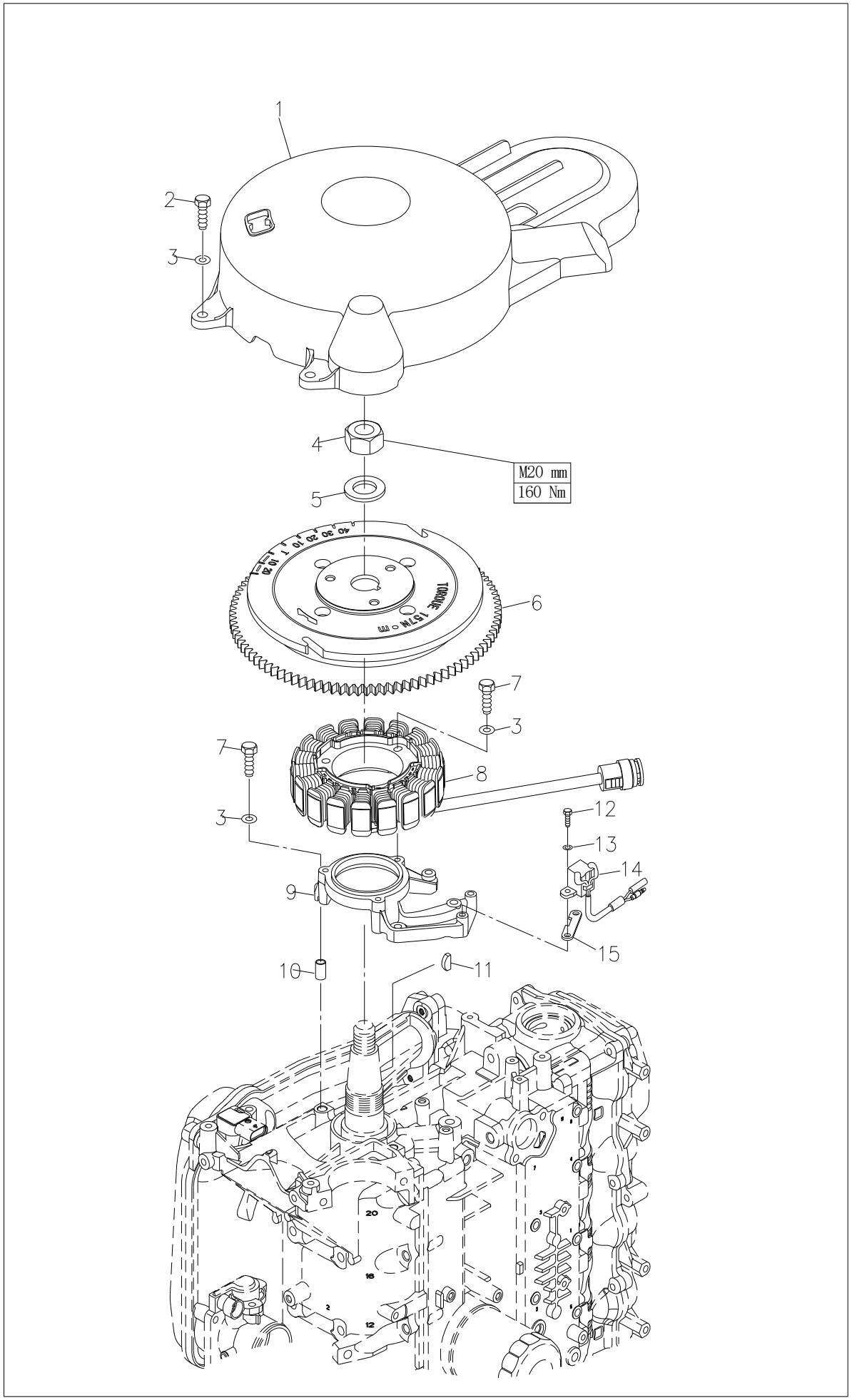
Attention:

Please be careful when monitoring and repairing the ignition system Do not place your hands, clothes, hair or accessories close to the running flywheel.

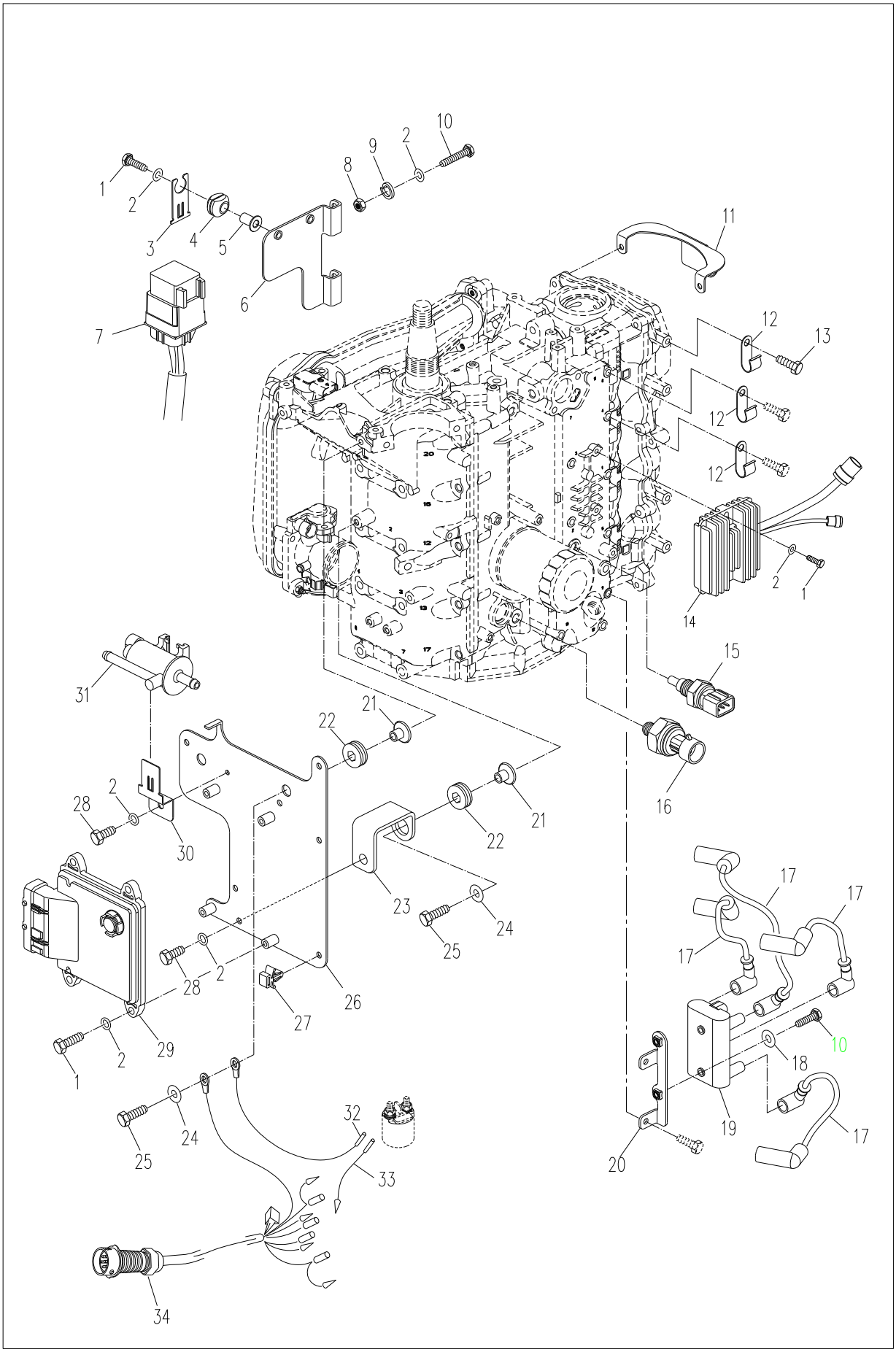
Test the ignition coil on an insulated workbench to prevent electric leakage and electric shock.
When the engine is running, do not touch the ignition coil or spark plug to avoid electric shock. Make sure that the wire is away from the running flywheel to prevent the wire from being cut off or the wire insulation from being worn.

When replacing fasteners (nuts and bolts), pelase use the parts provided by the manufacturer or of the same material and strength and tighten them with specified torque.

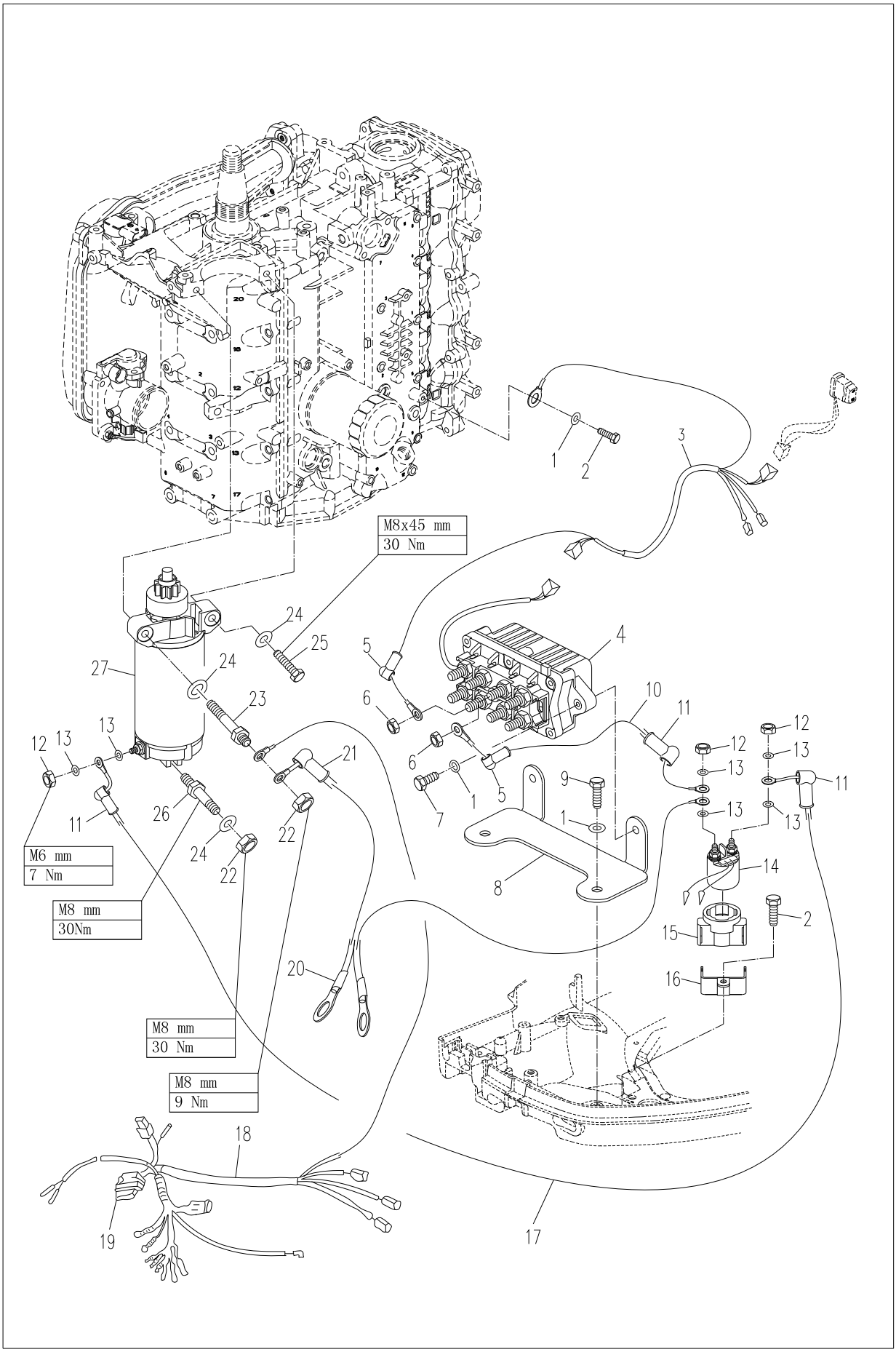
Decomposition Schematic Diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F60-05000041	飞轮罩	COVER, FLYWHEEL	1					
2	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	4					
3	GB/T97.1-6	平垫圈 6	WASHER 6	11					
4	F25-05000026	飞轮螺母	FLYWHEEL NUT	1					
5	F25-05000025	飞轮螺母垫圈	WASHER, FLYWHEEL NUT	1					
6	F60-05000300	飞轮	FLYWHEEL	1					
7	GB/T5783-M6x30	六角螺栓 M6x30	BOLT M6x30	7					
8	F40-05000600EI	磁电机线圈组件	MAGNETO COIL ASSY	1					
9	F40-05000034	线圈支架	BRACKET, COIL	1					
10	F8-00000005	空心定位销 ⌀8x10	DOWEL PIN ⌀8x10	2					
11	F25-05000024	飞轮半圆键	WOODRUFF KEY, FLYWHEEL	1					
12	GB/T5783-M5x12	六角螺栓 M5x12	BOLT M5x12	2					
13	GB/T97.1-5	平垫圈 5	WASHER 5	2					
14	F60-05000200	触发线圈组件	PULSER COIL ASSY	1					
15	F60-05000052	触发器垫板	PLATE, PULSER COIL	1					

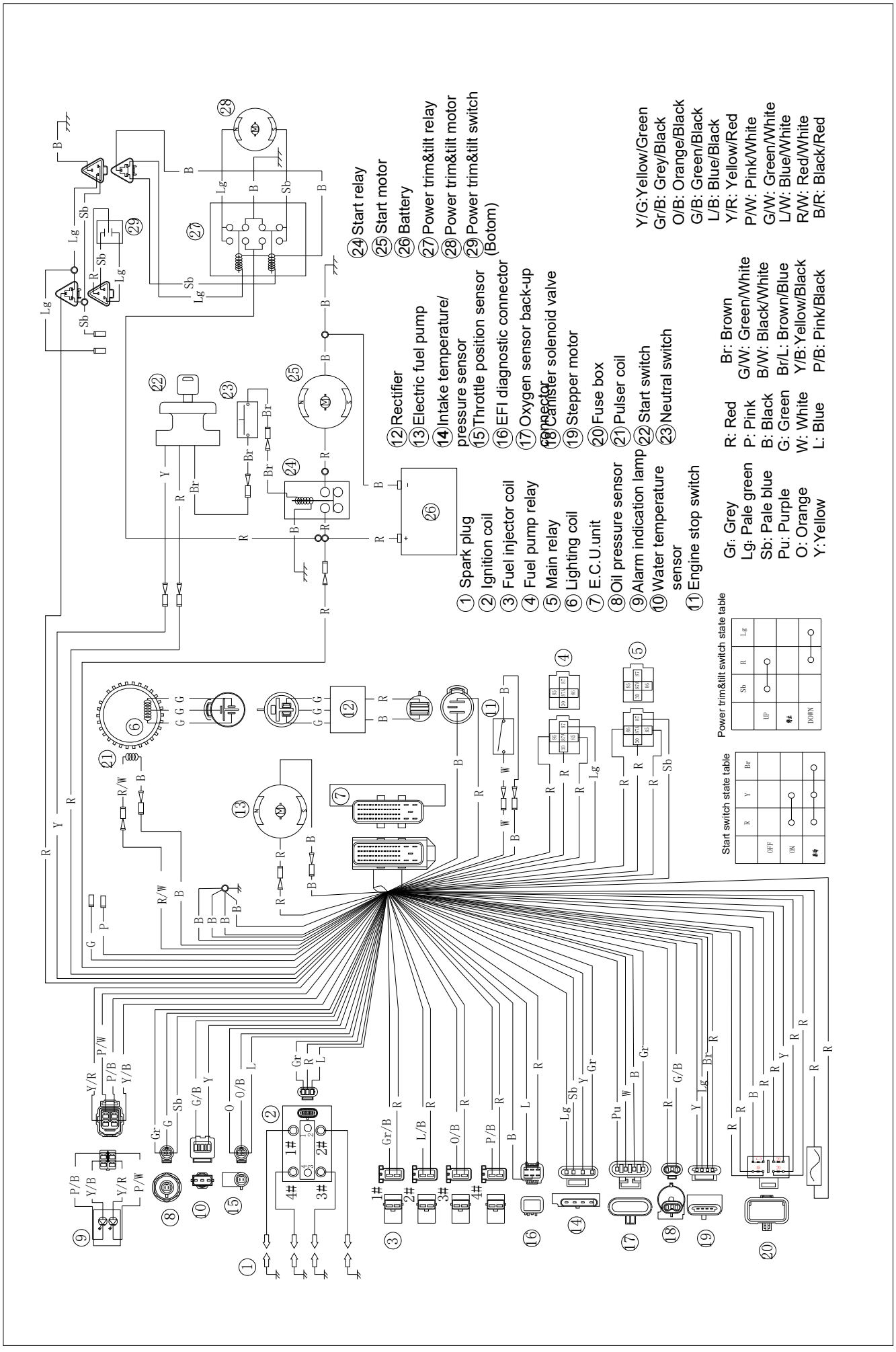

1
2
3
4
5
6
7
8
9
2
10
11
12
13
12
12
2
1
14
15
16
31
21
22
2
28
30
21
22
23
24
25
28
2
26
27
29
1
2
24
25
32
33
34
17
17
17
10
18
19
20
17

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	8					
2	GB/T97.1-6	平垫圈 6	WASHER 6	12					
3	F40-05091401EI	主继电器固定支架	BRACKET, MAIN RELAY	2					
4	F40-05091402EI	主继电器减震圈	DAMPER, MAIN RELAY	2					
5	T40-05000028	点火器垫管	TUBE, IGNITER	2					
6	F40-05000060EI	主继电器固定板	FIXED PLATE, MAIN RELAY	1					
7	F40-05091400EI	主继电器	MAIN RELAY	2					
8	GB/T6170-M6	六角螺母 M6	NUT M6	2					
9	GB/T93-6	弹性垫圈 6	SPRING WASHER 6	2					
10	GB/T5782-M6x35	六角螺栓 M6x35	BOLT M6x35	4					
11	F40-05000059EI	线卡 C	CLAMP C	1					
12	F40-05000003	线卡	CLAMP	3					
13	GB/T5783-M6x10	六角螺栓 M6x10	BOLT M6x10	1					
14	F40-05000500EI	整流器组件	RECTIFIER ASSY	1					
15	F40-05090700EI	水温传感器	SENSOR, WATER TEMPERATURE	1					
16	F40-05000042EI	机油压力传感器	OIL PRESSURE SENSOR	1					
17	F60-05000601	高压线	IGNITION COIL	4					
18	GB/T96-6	大垫圈 6	WASHER 6	2					
19	F60-05000600	集成高压包	IGNITION COIL ASSY	1					
20	F60-05000023	高压包固定架	PLATE, IGNITION COIL ASSY	1					
21	F15-07000021	进气消音器垫管	BUSHING, INTAKE SILENCER	3					
22	F8-05000007	减震圈	DAMPER	3					
23	F60-05000031	固定板支架	BRACKET, FIXED PLATE	1					
24	F8-05000021	大垫片	WASHER	3					
25	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	3					
26	F40-05000009-1EI	模块固定板	FIXED PLATE, ECU	1					
27	HDB-6x1.5	扎带固定座	FIXED SEAT, CLAMP	4					
28	GB/T5783-M6x12	六角螺栓 M6x12	BOLT M6x12	2					
29	F60-05001000	ECU 模块	ECU	1					
30	F40-05000049EI	碳罐电磁阀固定板	FIXED PLATE, MAGNETIC VALVE	1					
31	F40-05091500EI	碳罐电磁阀	MAGNETIC VALVE, CARBON POT	1					
32	F60-05000036	继电器引出线（黑）	CONNECT LINE(BLACK), RELAY	1					
33	T85-05030003	继电器引出线（棕）	CONNECT LINE(BROWN), RELAY	1					
34	F40-05030500EI	点火线束组件	C.D.I CABLE ASSY	1					FOR FW

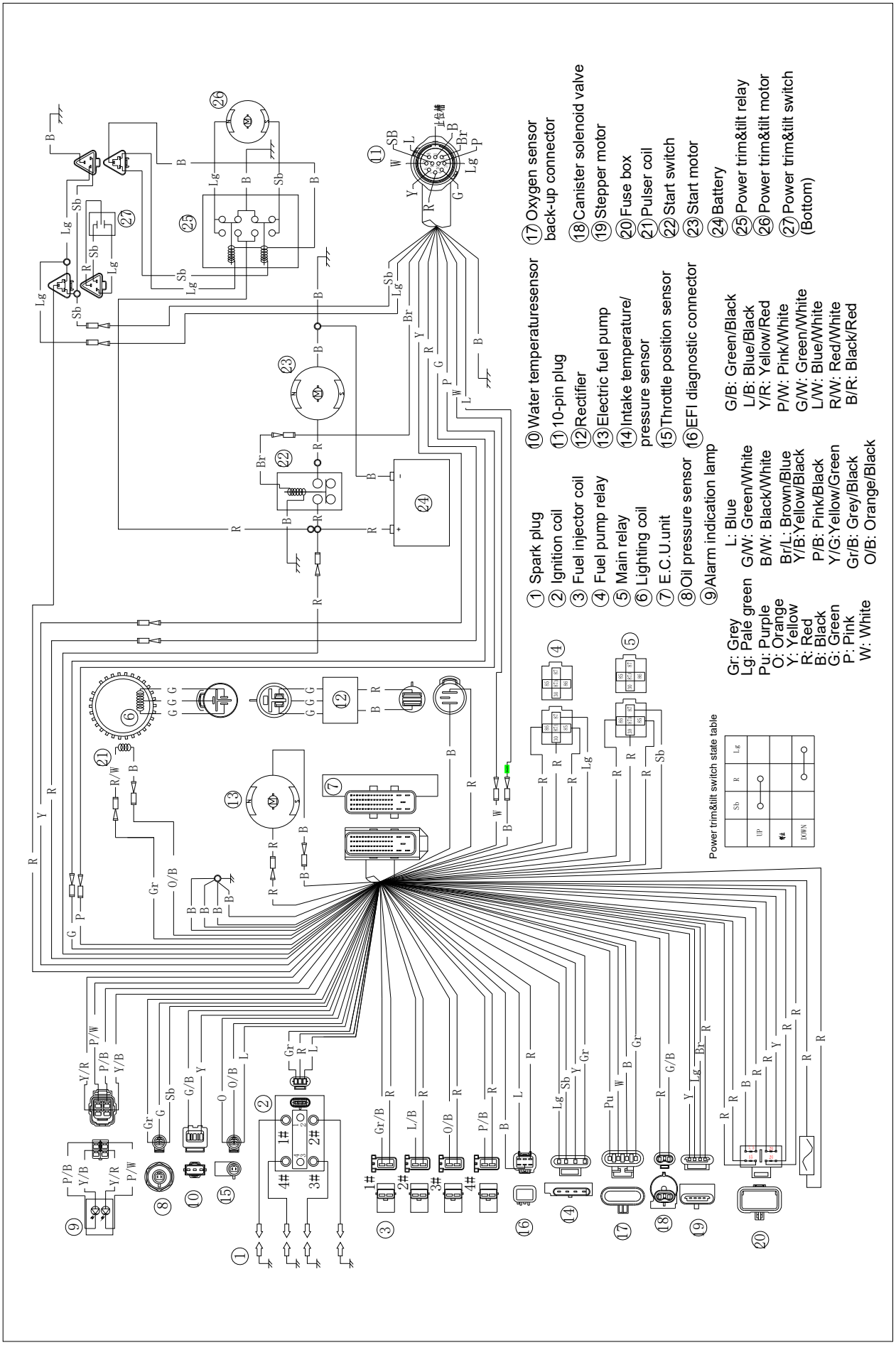

M8x45 mm
30 Nm
M6 mm
7 Nm
M8 mm
30Nm
M8 mm
30 Nm
M8 mm
9 Nm

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T97.1-6	平垫圈 6	WASHER 6	5					
2	GB/T5783-M6x10	六角螺栓 M6x10	BOLT M6x10	2					
3	F60-05000800	液压起翘线束	CONNECTION LINE, TILT	1					FOR FE-T/BE-T
4	T85-05030200	继电器组件	RELAY ASSY	1					
5	F15-05170501W	电源连接线护套	JACKET	2					
6	GB/T 6170 －M6	六角螺母 M6 （镀银）	NUT, SILVERING	2					
7	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	2					
8	F40-03000013EI	起翘继电器固定架	FIXED BRACKET, TILT RELAY	1					
9	GB/T5783-M6x12	六角螺栓 M6x12	BOLT M6x12	2					
10	T85-05030002	继电器连接线（红）	CONNECT LINE(RED), RELAY	1					
11	F25-05170202W	电源连接线护套 B	JACKET B	3					
12	GB/T6170-M6	六角铜螺母 M6	NUT M6(COPPER)	3					
13	GB/T97.1-6	铜垫圈 6	WASHER 6(COPPER)	6					
14	F15-07150300W	启动电机继电器	RELAY, MOTOR	1					
15	F15-05170301W	继电器护套	JACKET, RELAY	1					
16	T60-03000300W	继电器固定板组件	BRACKET, RELAY	1					
17	T85-05000022	电机连接线	CONNECTION LINE, MOTOR	1					
18	F60-05000900	模块控制线束	C.D.I LINE ASSY	1					
19	F40-05001000-1EI	保险丝（ 40A ）	FUSE WIRE (40A)	1					
	F40-05001000-2EI	保险丝（ 20A ）	FUSE WIRE (20A)	1					
	F40-05001000-3EI	保险丝（ 15A ）	FUSE WIRE (15A)	1					
	F40-05001000-4EI	保险丝（ 7.5A ）	FUSE WIRE (7.5A)	1					
20	T85-05000023	电源连接线	CONNECTION LINE, POWER	1					
21	F25-05170201W	电源连接线护套 A	JACKET A	1					
22	GB/T6170- M8	六角螺母 M8	NUT M8	1					
23	F25-05170001W	电机固定螺栓 M8	FIXATION BOLT , MOTOR	1					
24	GB/T97.1-8	平垫圈 8	WASHER 8	3					
25	GB/T5783-M8x45	六角螺栓 M8x45	BOLT M8x45	1					
26	F60-05000042	启动电机螺钉	BOLT, MOTOR	1					
27	F60-05000500	启动电机	STARTING MOTOR	1					

Wiring Diagram



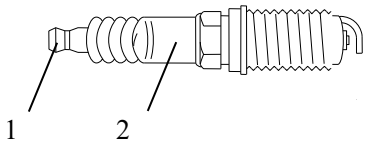
Back-operation electrical starting



Front-operation electrical starting

Spark Plug Ignition

1. Remove the spark plug cap from the spark plug.



1. Spark plug cap; 2. Spark plug

2. Connect the ignition detector to the spark plug cap.

3. Start the engine and observe the spark through the discharge window of the detector.

⚠ **Warning:**

Do not touch any joint of the detector lead.

Stay away from combustible gases or liquids to avoid accidents caused by spark ignition.

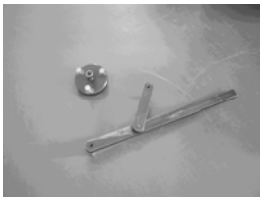
Spark Plug Cap

1. Unscrew spark plug cap. Check the spark plug cap for damage. Replace it if necessary.

2. Install spark plug cap.

Flywheel Maintenance

1. Remove the flywheel nut using the flywheel gripper; Remove the flywheel using the flywheel puller.



2. Check whether the flywheel is damaged and whether the permanent magnet is firm. Replace it if necessary.

Check the Ignition Coil

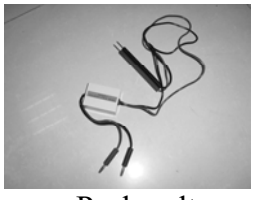
1. Remove the ignition coil and the spark plug cap.

2. Measure the resistance of the ignition coil. If the specified value is not met, replace it.
   Primary resistance: 2.2±0.22Ω
   Secondary resistance 9.84±0.98kΩ

Check the trigger coil

1. Trigger coil peak voltage
   Use a digital multimeter and a peak voltage adapter to measure the coil output peak voltage. If it is below the specified value, check the tri|gger coil resistance.

Digital multimeter



Peak voltage adapter

Pulse coil peak voltage: ≥13 V@1000 r/min (load)

2. Tri|gger coil resistance

Measure coil resistance. If the specified value is not met, replace it.

Resistance: 260 ~ 290 (the positive electrode of the detector is connected with red/white line and the negative electrode is connected with black line)

Note:

The data are for reference only.

Check the Engine Start Switch

Check the conductivity of the engine start switch. If it is not conductive, replace it.

Note:

See wiring diagram for starting switch status table,

Check the Engine Start Switch

Check the conductivity of the engine stop switch. If it is not conductive, replace it.

Remove locking plate: Conductive

Install locking plate: Not conductive

Press the button: Conductive

Check the Starting Relay

1. Connect the brown lead to the positive electrode of the battery.

2. Connect the black lead to the negative electrode of the battery.

3. Check the conductivity between relay terminals. If it is not conductive, replace the relay.

4. Disconnect the lead connection to the battery and check the conductivity between relay terminals. If it is conductive, replace the relay.

Check the Magneto Coil

Measure the peak voltage of the magneto coil (between the green lines).

Use a digital multimeter and a peak voltage adapter to measure the coil output peak voltage. If it is below the specified value, replace the magneto coil.

Magneto coil peak voltage	1500 r/min (no load)	47.2 V
	3500 r/min (no load)	106 V

Check the Rectifier Regulator

Measure the rectifier regulator peak voltage (dc).

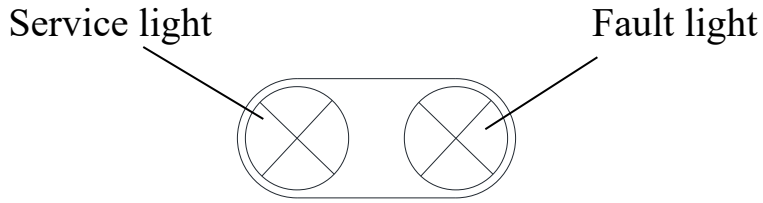
Open the circuit of rectifier output (red line and black line) and use a digital multimeter to measure the voltage between the red line and black line at the rectifier regulator output.

If it is below the specified value, check the magneto coil output peak voltage. If the peak output voltage of the magneto coil is higher than the specified value, replace the rectifier regulator.

Rectifier regulator peak voltage	1500 r/min (no load)	41.9V
	3500 r/min (no load)	99.8V

How to Use the Diagnostic Scan Tool

When the engine is running, if the fault light on the bottom cover is always on or the service light is always on/the buzzer is always ringing, it means that there is a fault in the engine. At this time, connect the scan tool with the corresponding detection port on the engine. Through the APP software downloaded in the mobile phone, the operating parameters and fault codes of the engine can be displayed on the mobile phone. Then check the fault code table to determine the fault of the engine and replace the faulty electrical components.



Fault Code Table

Failure type	Failure item	Code
Intake pressure failure	Short circuit to ground or open circuit in intake pressure sensor line	107
	Short circuit to high level in intake pressure sensor line	108
Intake air temperature failure	Short circuit to high level in intake air temperature sensor line	112
	Short circuit to ground or open circuit in intake air temperature sensor line	113
Water temperature failure	Short circuit to ground in coolant temperature sensor line	117
	Short circuit to high level in coolant temperature sensor line	118
Throttle failure	Short circuit to ground in throttle position sensor line	122
	Short circuit to high level in throttle position sensor line	123
Oxygen sensor failure	Short circuit to ground in oxygen sensor	131
	Short circuit to high level in oxygen sensor	132
Oxygen sensor heating failure	Oxygen heater failure	135
Fuel injector failure	Nozzle line failure of cylinder 1	201
	Nozzle line failure of cylinder 2	202
	Nozzle line failure of cylinder 3	203
	Nozzle line failure of cylinder 4	204
Fuel pump failure	Oil pump relay failure	230
Crankshaft position sensor failure	Crankshaft position sensor line signal interference	336
	Crankshaft position sensor line no signal	337
Ignition coil failure	Ignition coil failure of cylinder 1	351
	Ignition coil failure of cylinder 2	352
Idle speed failure	Excessive idle speed	507

	Low idle speed	506
System voltage failure	Low system voltage	562
	High system voltage	563
Failure type	**Failure item**	**Code**
Fault light	Fault indicator lamp failure	650
Oil pressure failure	Short circuit to ground in oil pressure sensor line	523
	Short circuit to high level in oil pressure sensor line	522
Carbon canister solenoid valve failure	Short circuit to ground in carbon canister solenoid valve	443
Main relay failure	Main relay failure	685

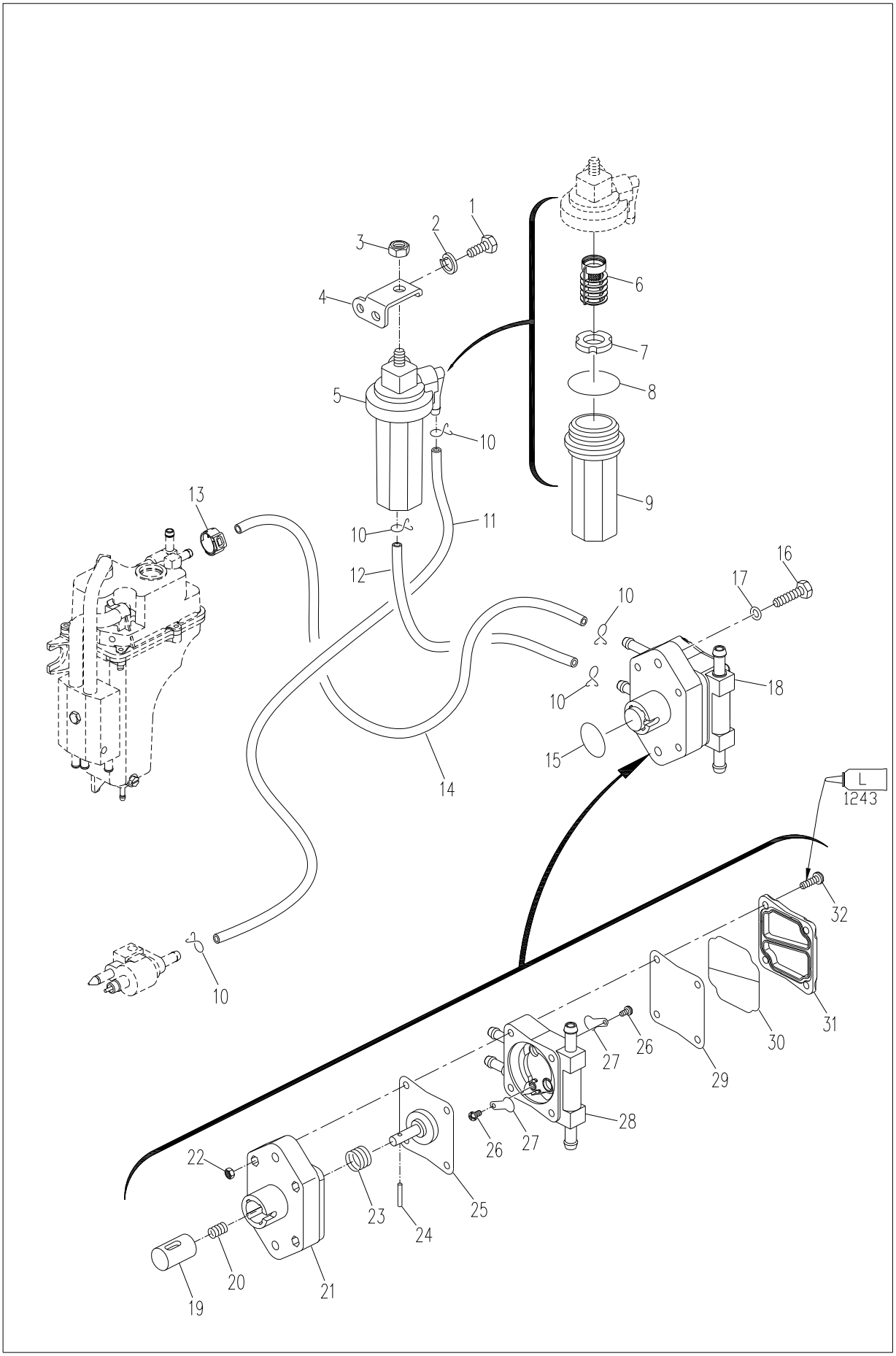
Fuel System

Attention:

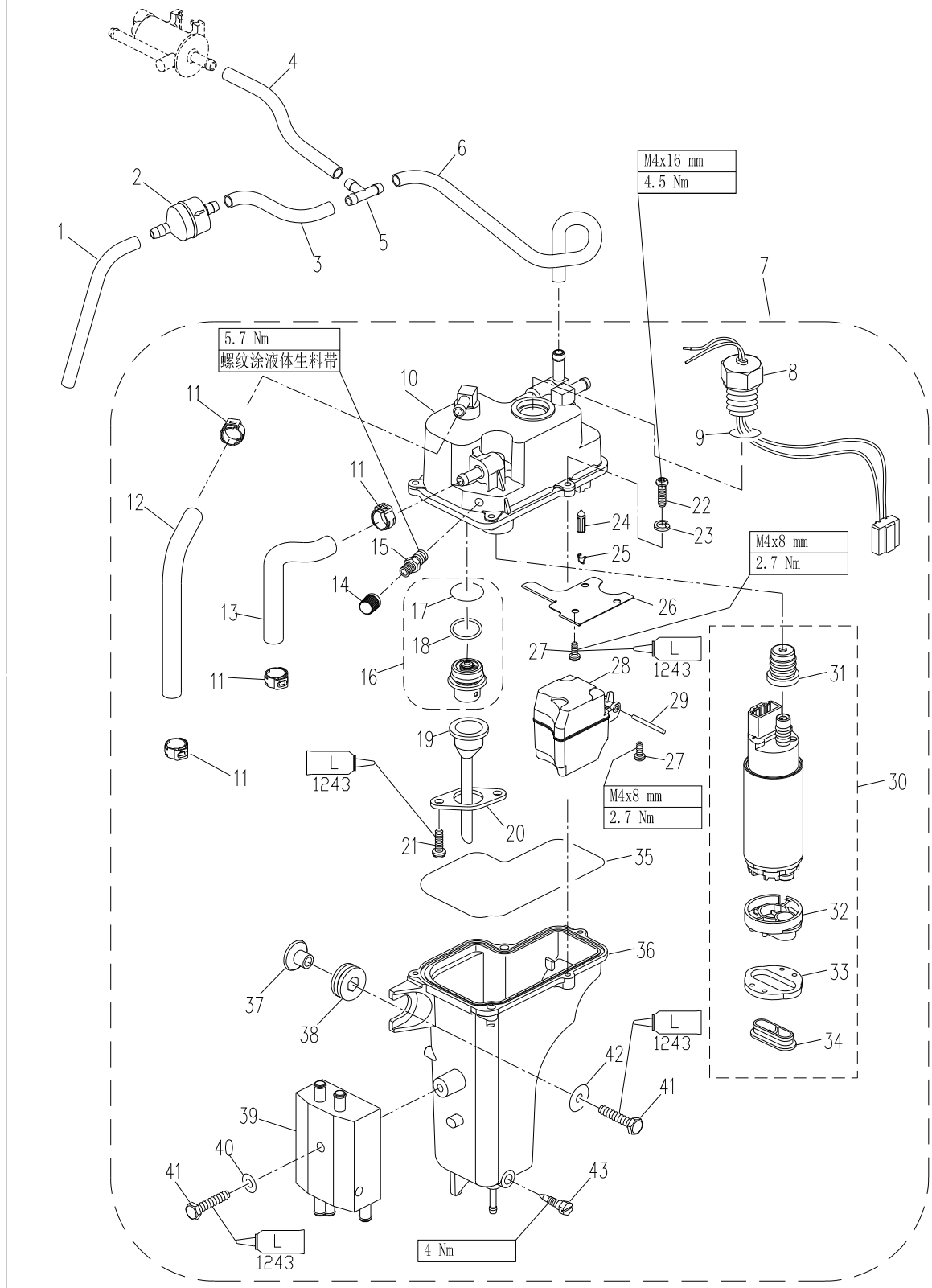
Fuel is a highly flammable and volatile liquid. Fuel leakage can cause fire and explosion.

Do not attempt to start the engine before determining that the components of the fuel system are connected or installed. After completing all repair steps, apply pressure to the fuel system for a short period of time to check for leaks.

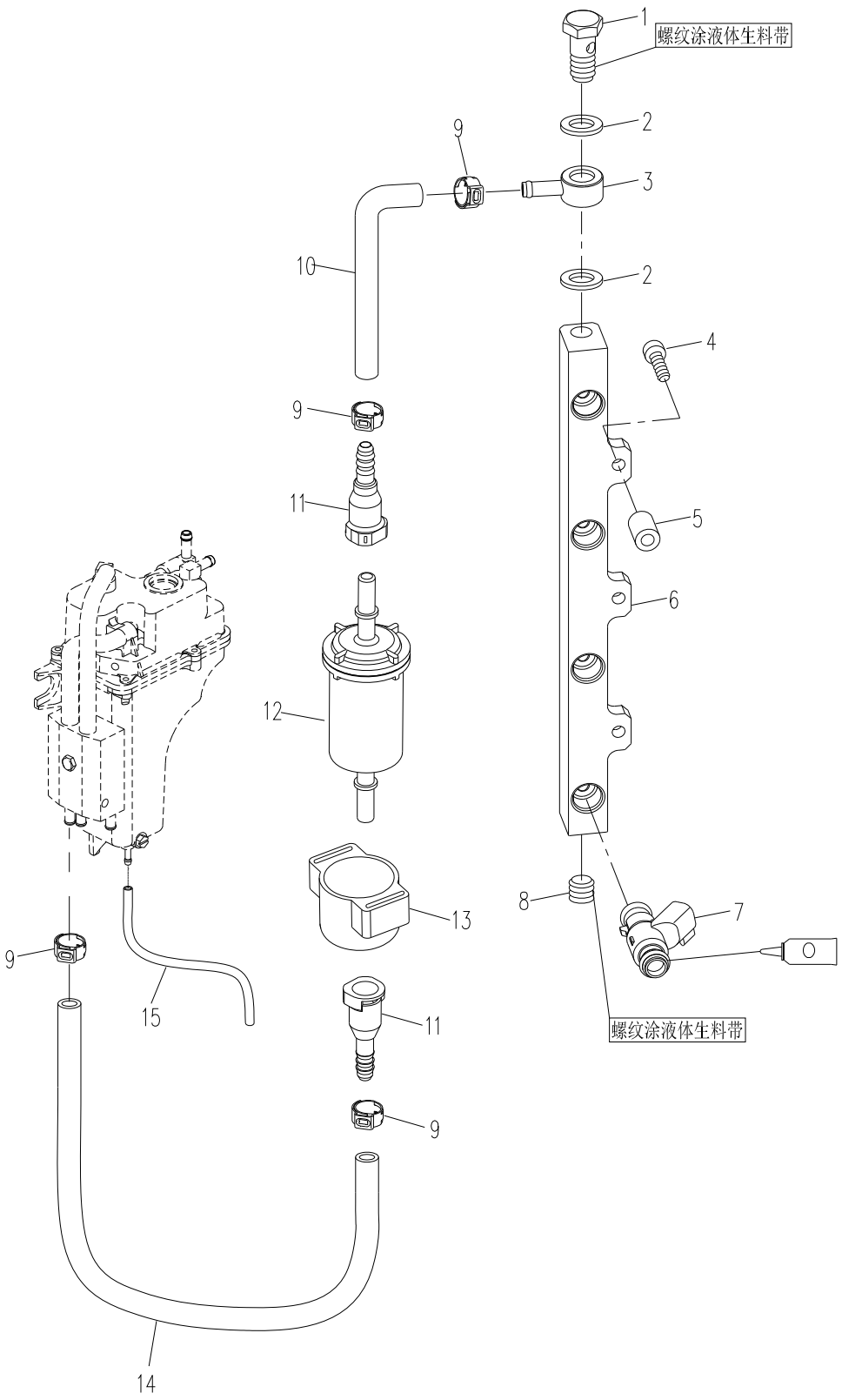
Decomposition Schematic Diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M6x14	六角螺栓 M6x14	BOLT M6x14	1					
2	GB/T93-6	弹性垫圈 6	SPRING-WASHER 6	1					
3	GB/T6170-M8	六角螺母 M8	NUT M8	1					
4	F40-05000036	滤油杯支架	BRACKET ,FILTER CUP	1					
5	T85-05000300	滤油杯组件	FILTER CUP ASSY	1					
6	F15-07080001	滤网架	ELEMENT,FILTER	1					
7	T85-05000302	浮子	FLOATER	1					
8	GB/T3452.1- ⌀32.5x1.8	滤油杯密封圈 ⌀32.5 x1.8	SEAL,FILTER CUP	1					
9	T85-05000301	滤杯	CUP,FILTER	1					
10	F4-04000030	油管夹簧 B	SPRING ,FUEL PIPE "B"	6					
11	F60-03000012	燃油管 A ⌀5x⌀10x650(EPA)	FUEL P IPE A ⌀5x⌀10x650(EPA)	1					EFI
12	F60-05000051EI	燃油定型管 (EPA)	FUEL P IPE (EPA)	1					EFI
13	S7133-13.3	单耳无极卡箍 13.3	SINGLE LUG CLAMP	1					
14	F60-05000006	燃油管 B ⌀6x⌀12.5x730(EPA)	FUEL P IPE B ⌀6x⌀12.5x730(EPA)	1					EFI
15	GB/T3452.1-25x3.0	O 形圈 25x3.0	O-RING 25x3.0	1					
16	GB/T5783-M6x30	六角螺栓 M6x30	BOLT M6x30	2					
17	GB/T97.1-6	平垫圈 6	WASHER 6	2					
18	F40-05050000	燃油泵组件	FUEL PUMP ASSY	1					
19	F25-05130004	柱塞	PLUNGER	1					
20	F25-05130003	柱塞弹簧	SPRING ,PLUNGER	1					
21	F25-05130001	燃油泵座	SEAT,FUEL PUMP	1					
22	GB/T6170-M5	六角螺母 M5	NUT M5	4					
23	F25-05130002	隔膜弹簧	SPRING,DIAPHRAGM	1					
24	F25-05130008	滚针 ϕ4x16.5	ROLLER NEEDLE ϕ4x16.5	1					
25	F25-05130100	隔膜轴组件	DIAPHRAGM SHAFT ASSY	1					
26	F4-04090011	阀片螺钉 M3x6	SCREW M3x6	2					
27	F4-04090005	单向阀片	UNILATERAL PLATE	2					
28	F40-05050200	燃油泵壳组件	FUEL PUMP SHELL ASSY	1					
29	F25-05130005	上隔膜	UPPER DIAPHRAGM	1					
30	F25-05130006	燃油泵盖密封圈	SEAL ,FUEL PUMP	1					
31	F25-05130007	燃油泵盖	COVER, FUEL PUMP	1					
32	GB/T818-M5x40	十字槽盘头螺钉 M5x40	SCREW, PAN HEAD M5x40	4					


M4x16 mm
4.5 Nm
5.7 Nm
螺纹涂液体生料带
M4x8 mm
2.7 Nm
M4x8 mm
2.7 Nm
L
1243
L
1243
L
1243
L
1243
4 Nm

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F60-05000025	回气管 C ⌀5x⌀10x260	AIR PIPE C	1					
2	T5-04000200	单向阀	CHECK VALVE	1					
3	F60-05000019	回气管 C ⌀5x⌀10x60(EPA)	AIR PIPE C	1					
4	F60-05000016	回气管 B ⌀5x⌀10x270	AIR PIPE B	1					
5	F60-05000054	塑料三通 ⌀6.5	THREE WAY	1					
6	F60-05000053	燃油定型管	FUEL PIPE	1					
7	F40-05100000EI	电动燃油泵组件	OIL PUMP ASSY	1					
8	F40-05010400EI	油泵接头组件	JOINT ASSY,OIL PUMP	1					
9	GB/T3452.1-15.8x3.1	O 型圈 15.8x3.1	O-RING 15.8x3.1	1					
10	F40-05100100EI	电动燃油泵本体组件	BODY ASSY,OIL PUMP	1					
11	S7133-13.3	单耳无极卡箍	SINGLE LUG CLAMP	4					
12	F40-05100010EI	油泵定型管 A	SHAPED TUBE A,OIL PUMP	1					
13	F40-05100004EI	油泵定型管 B	SHAPED TUBE B,OIL PUMP	1					
14	F40-05100202EI	检测阀盖帽	CAP,DETECTION VALVE	1					
15	F40-05100201EI	油泵检测阀	DETECTION VALVE,OIL PUMP	1					
16	F40-05100600EI	压力调节阀	PRESSURE REGULATOR VALVE	1					
17	F40-05100601EI	压力调节阀 O 形圈	O-RING,PRESSURE REGULATOR VALVE	1					
18	F40-05100600-1EI	压力调节阀尼龙垫圈	WASHER,PRESSURE REGULATOR VALVE	2					
19	F40-05100602EI	泄油导管	CONDUIT TUBE	1					
20	F40-05100603EI	压力阀压板	PALTE,PRESSURE REGULATOR VALVE	1					
21	GB/T818-M5x12	十字槽盘头螺钉 M5x12	SCREW M5x12	2					
22	GB/T818-M4x16	十字槽盘头螺钉 M4x16	SCREW M4x16	5					
23	GB/T93-4	弹性垫圈 4	SPRING WASHER 4	5					
24	F40-05100301EI	针阀	NEEDLE VALVE	1					
25	F40-05100302EI	针阀卡簧	CLAMP SPRING,NEEDLE VALVE	1					
26	F40-05100003EI	挡板	BAFFLE PLATE	1					
27	GB/T818-M4x8	十字槽盘头螺钉 M4x8	SCREW M4x8	4					
28	F40-05100001EI	浮子	FLOATER	1					
29	F40-05100002EI	浮子销	PIN,FLOATER	1					
30	F40-05100500EI	油泵组件	OIL PUMP ASSY	1					
31	F40-05100501EI	油泵口胶套	RUBBER SLEEVE,OIL PUMP	1					
32	F40-05100504EI	油泵垫块	PADDING BLOCK,OIL PUMP	1					
33	F40-05100503EI	油泵橡胶垫	RUBBER PAD,OIL PUMP	1					
34	F40-05100502EI	油泵滤网	FILTER NET,OIL PUMP	1					
35	F40-05100704EI	油杯密封圈	SEAL,OIL CAP	1					
36	F40-05100701EI	电动燃油泵油杯组件	OIL CAP,ELECTRIC PUMP	1					
37	F25-05090005	点火模块减震圈衬管	BUSHING,DAMPER	3					
38	F25-05090004	点火模块减震圈	DAMPER	3					
39	F40-05100800EI	燃油冷却器	COOLER,FUEL	1					
40	GB/T97.1-6	平垫圈 6	WASHER 6	1					
41	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	4					
42	GB/T96-6	大垫圈 6	BIG WASHER 6	3					
43	F40-05100703EI	油杯放油螺钉	DRAIN BOLT,OIL CUP	1					

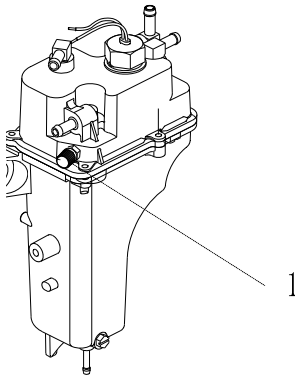

1
螺纹涂液体生料带
2
9
3
10
2
4
9
11
5
6
12
13
8
7
9
15
11
螺纹涂液体生料带
9
14

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000046EI	转接头螺钉	BOLT, ADAPTER	1					
2	GB/T982-12	组合密封垫圈 12	COMPOUND SEAL WASHER 12	2					
3	F40-05000045EI	共轨转接头	ADAPTER, COMMON RAIL	1					
4	GB/T70.1-M6x35	内六角螺钉 M6x35	INNER HEXAGON BOLT M6x35	3					
5	F40-05000044EI	共轨垫管	BUSHING, COMMON RAIL	3					
6	F60-05000024	燃油共轨	COMMON RAIL, FUEL OIL	1					
7	F40-05090300EI	燃油喷射器	FUEL INJECTOR	4					
8	F15-07010004	堵塞 1/8	PLUG SCREW 1/8	1					
9	S7133-13.3	单耳无极卡箍 13.3	SINGLE LUG CLAMP	4					
10	F40-05000071EI	燃油定型管 B	SHAPED TUBE B, FUEL OIL	1					
11	F40-05000040EI	燃油过滤器接头 A	JOINT A, FUEL FILTER	2					
12	F40-05091100EI	高压燃油过滤器	FUEL FILTER	1					
13	F25-07150301W	继电器护套	RELAY JACKET	1					
14	F60-05000008	燃油管 C ⌀6x ⌀12.5x780(EPA)	FUEL PIPE C ⌀6x ⌀112.5x780	1					
15	F40-05100511EI	油泵放油管	OIL PIPE, OIL PUMP	1					

Relieve the Fuel Pressure in the Fuel Lines

Before carrying out maintenance and inspection of the fuel system, the fuel pressure in the fuel pipeline shall be released. Avoid accidents caused by high-pressure fuel injection during maintenance.

1. Connect the pressure gauge with the pressure relief pipe to the oil pump check valve of the electric fuel pump;



1. Fuel pump check valve.

2. Insert the pressure relief pipe into a suitable container;
   Attention:
   Do not release the pressure directly, and the fuel will be discharged while the pressure is released. Fuel spraying can cause accidents and violate local emission regulations.

3. Press the pressure release button to release the pressure until the pressure inside the electric fuel pump is balanced with the outside world.

Remove and Check the Fuel Joint

1. Remove the bolt securing the fuel joint.
2. Remove fuel joint.
3. Check the fuel joint for cracks, leaks or damage.

4. Connect the outlet of the fuel joint to the vacuum manometer.

5. Detect whether the negative pressure can be maintained for more than 10 seconds under the specified pressure. Replace it if necessary.
   Specified pressure: 50kPa

Remove and Check the Fuel Pump

1. Remove the bolt securing the fuel pump.

2. Remove the fuel pump.

3. Connect a vacuum manometer to the inlet of the fuel pump.

4. Block the outlet of the oil pump with your fingers and apply the specified positive pressure. Check for air leaks.
   Specified pressure: 50kPa

5. Apply a prescribed negative pressure. Check for air leaks.
   Specified pressure: 30kPa

6. Connect a vacuum manometer to the outlet of the fuel pump.

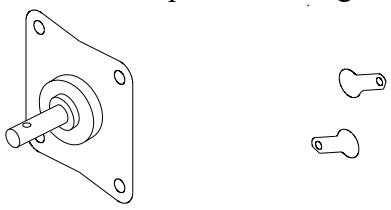
7. Block the inlet of the oil pump with your fingers and apply the specified negative pressure. Check for air leaks.
   If necessary, disassemble the oil pump and check it.
   Specified pressure: 50kPa

8. Remove the 4 bolts and separate the fuel pump cover from the fuel pump seat.

9. Remove the valve plate screw from the fuel pump body and remove the valve plate.

10. Press the plunger and diaphragm, rotate the fuel pump seat and align the notch with the groove on the plunger. Remove needle roller.

11. Check whether there are cracks on the diaphragm, whether the riveting is loose, and whether the valve plate is damaged. Replace it if necessary.



12. Follow steps 8-10 in reverse sequence and assemble the oil pump.

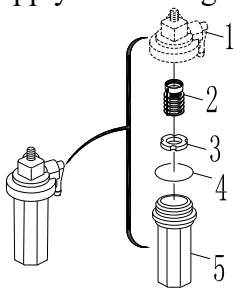
Check the Fuel Filter

Check whether the filter screen of the filter is blocked or there are sundries, and check whether the filter cup is damaged or leaked.

If necessary, clean with gasoline or replace the filter screen.

Note:

Apply lubricating oil to the O-ring before reassembling the filter cup.



1．Filter cup lid
2．Filter screen
3．Float
4．O-ring
5．Filter cup

Remove and Check the Electric Fuel Pump

Disassembly of electric fuel pump

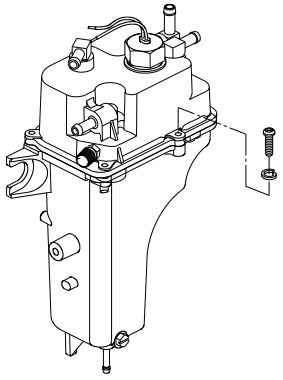
1. Loosen the oil drain screw of the oil cup and drain the fuel in the oil cup into a suitable container.

2. Remove fuel line and cooling water line and disconnect the wiring harness connection.

3. Remove the mounting screws of the electric fuel pump and remove the electric fuel pump from the engine.

4. Disconnect the line connection between the fuel cooler and the electric fuel pump and remove the fuel cooler.

5. Remove the 5 cross-recessed pan-head screws (M4×16) and remove the electric fuel pump body assembly.



6. Pull off the oil pump assembly and disconnect the oil pump connector assembly;

7. Check and clean the oil pump filter screen on the oil pump assembly;

8. Check the rubber sleeve at the oil pump nozzle and replace it if it is aged, damaged or cracked.

9. Loosen the screw fixing the float pin and remove the float;

10. Remove the baffle; (if necessary)

11. Check and clean the oil cup assembly of the electric fuel pump;

12. Loosen the fixing screw of the pressure valve pressure plate and remove the pressure regulating valve;

13. Check the O-ring of the pressure regulating valve; Replace it if necessary;

14. After the check, clean the parts and install the electric fuel pump in the reverse order.

Attention: A new oil cup sealing ring is required; The screws shall be tightened to the specified torque!

Check the Fuel Pipe and Fuel Filter

1. Check the fuel pipe for damage.

2. Check whether the high-pressure fuel filter is cracked and whether the fuel flows smoothly. Replace it if necessary.

Check the Fuel Common Rail

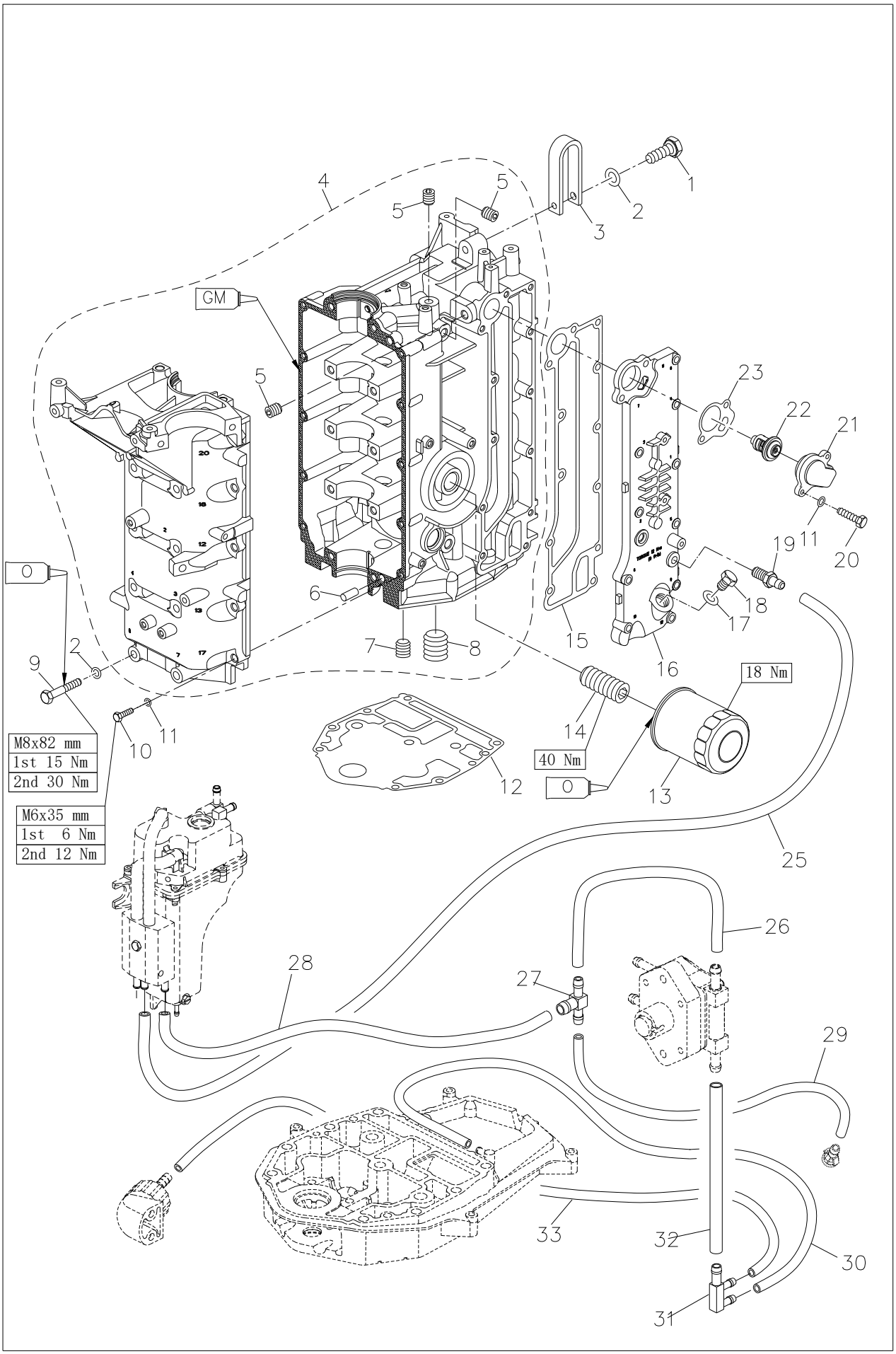
Check the fuel common rail for leaks or cracks and damage, and replace it if necessary.

Engine

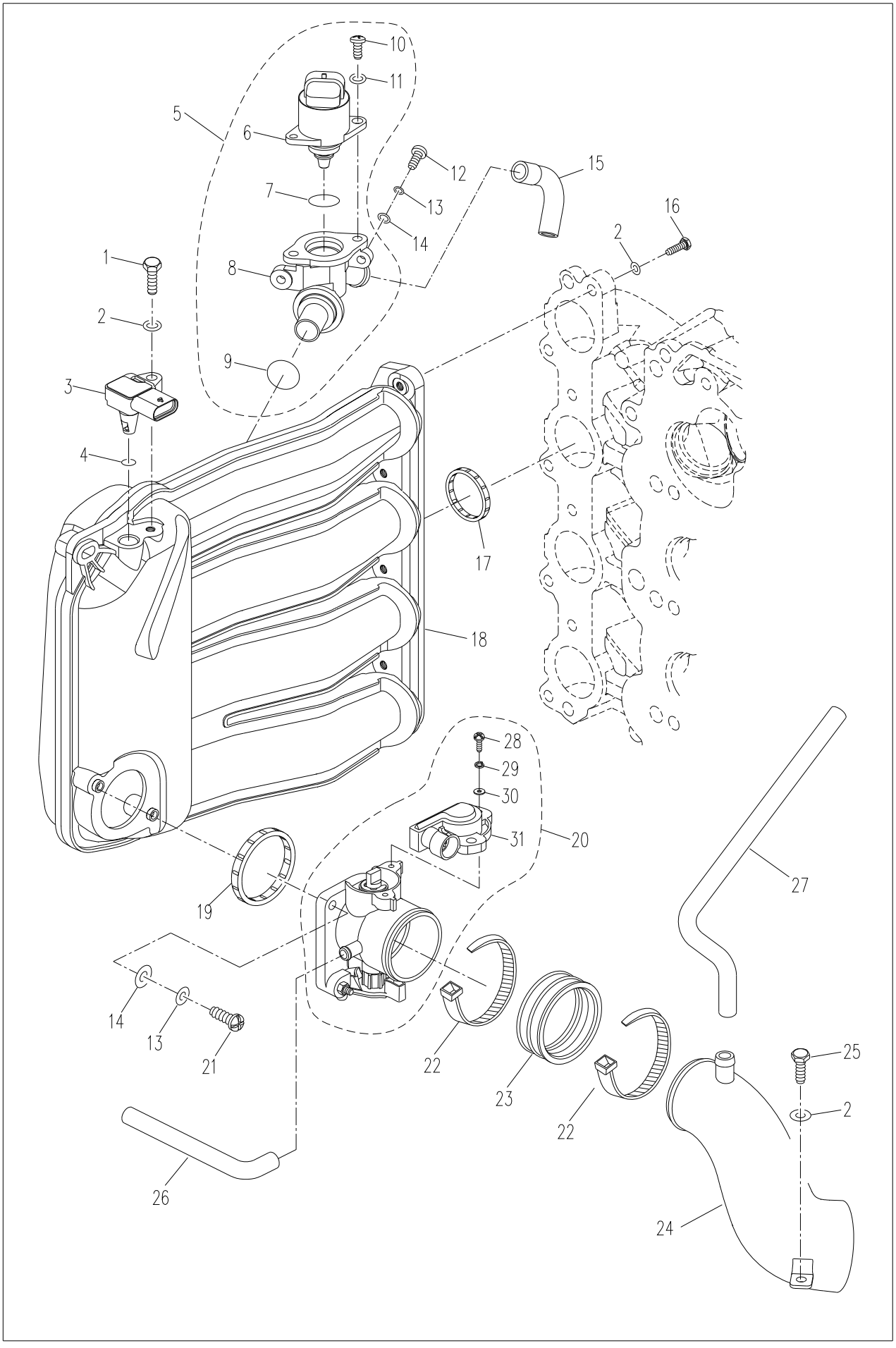
Attention:

In order to avoid accidental starting when repairing the engine, adequate protective measures should be taken to disconnect the ignition system. For example:
Remove the engine stop safety cable from the emergency stop switch assembly and remove the spark plug cap from the spark plug.

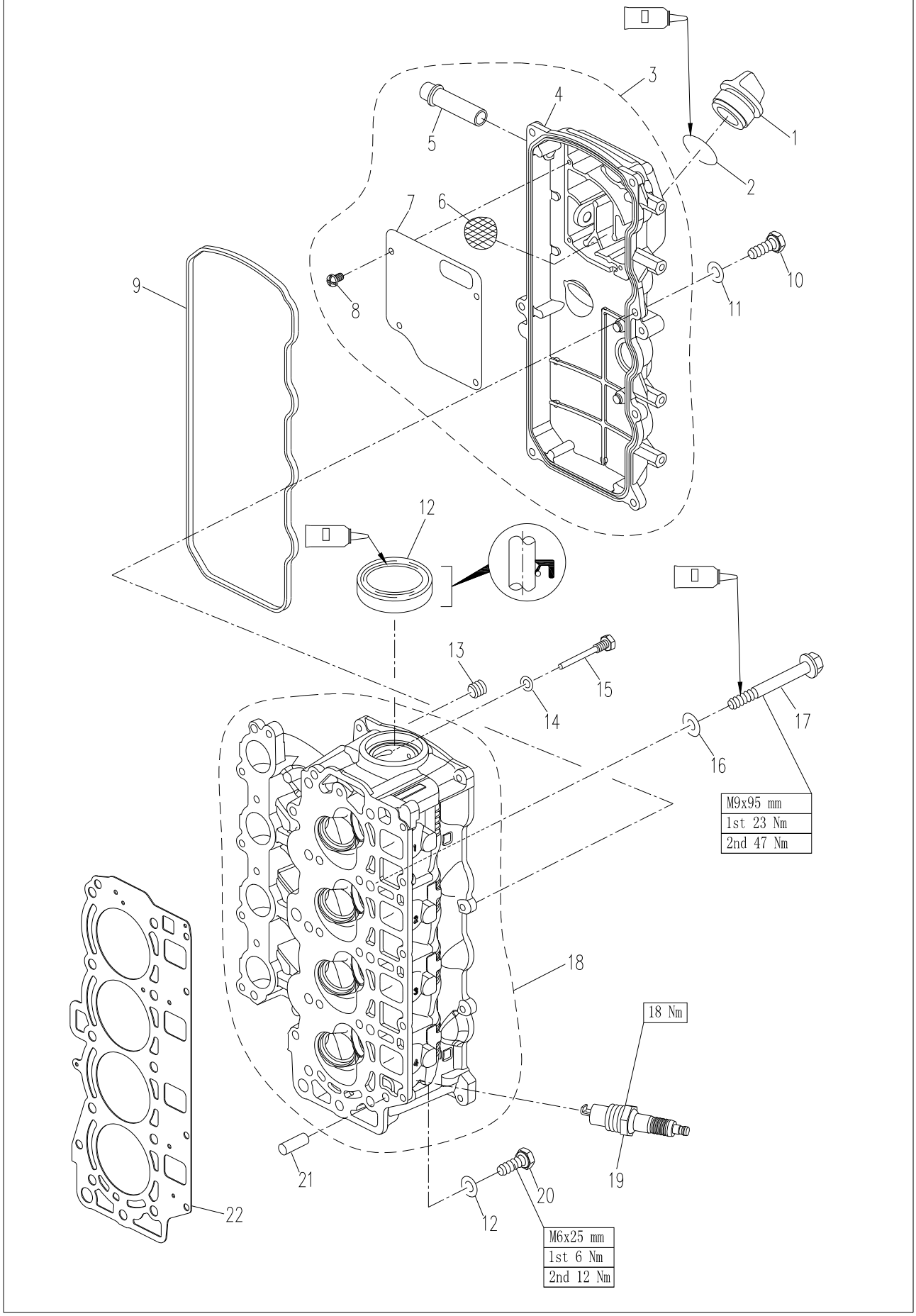
Decomposition Schematic Diagram



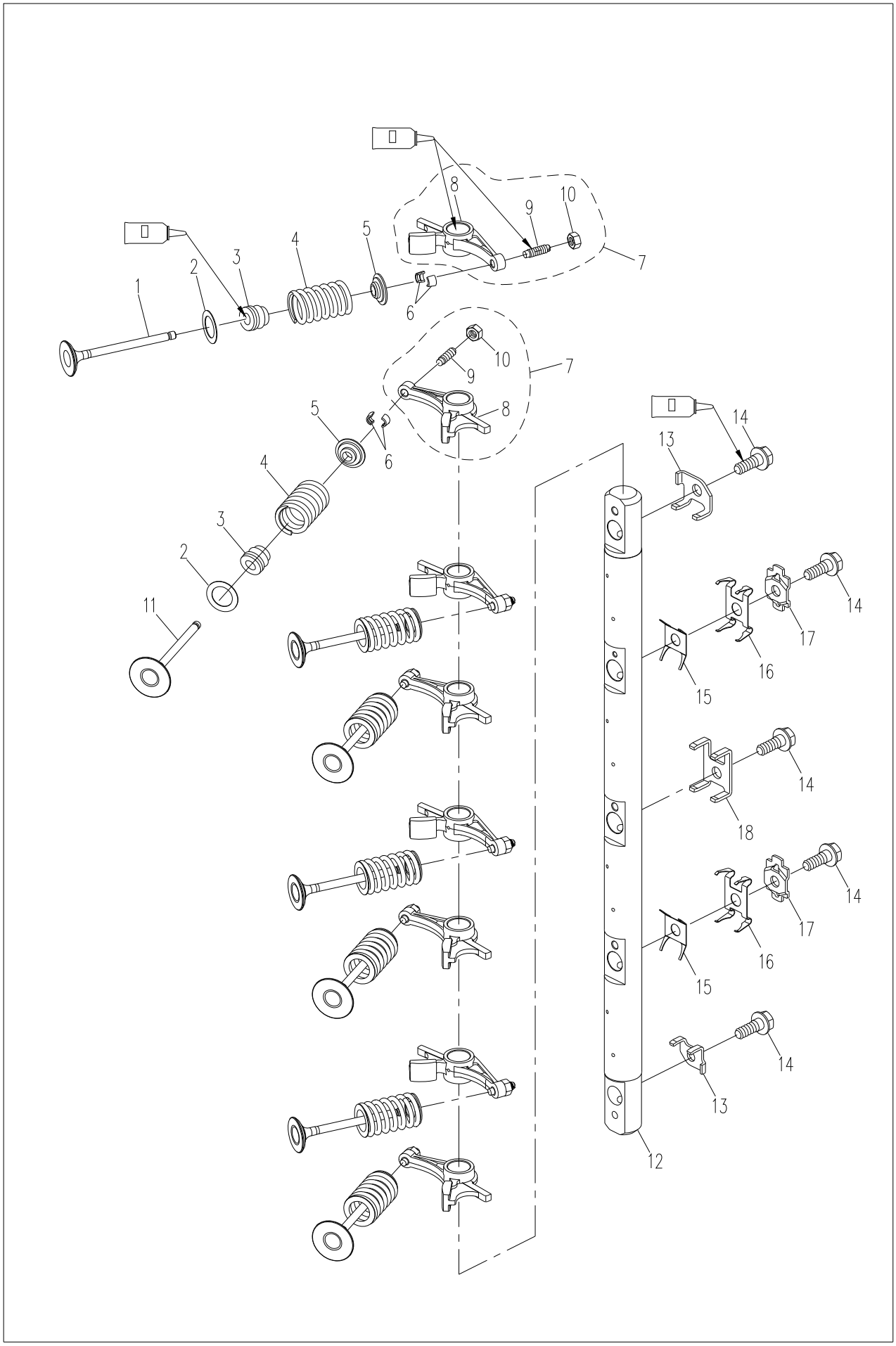
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5782-M8x35	六角螺栓 M8x35	BOLT M8x35	1					
2	GB/T97.1-8	平垫圈 8	WASHER 8	11					
3	F25-05010106	发动机悬挂钩	POTHOOK, ENGINE	1					
4	F60-05010000	机体机座组件	CRANKCASE ASSY	1					
5	F15-07010004	堵塞 1/8 ″	JAM 1/8 ″	3					
6	F25-00000014	定位销 Φ8x12	DOWEL PIN Φ8x12	2					
7	F25-05010104	堵塞 1/2 ″	JAM 1/2 ″	1					
8	F25-05010103	堵塞 3/4 ″	JAM 3/4 ″	1					
9	F25-05000035	六角螺栓 M8x80	BOLT M8x80	10					
10	F15-07000030	六角螺栓 M6x35	BOLT M6x35	10					
11	GB/T97.1-6	平垫圈 6	WASHER 6	22					
12	F40-00000003	发动机密封垫	GASKET, ENGINE	1					
13	F25-05000100	机油滤清器	OIL FILTER	1					
14	F15-07010003	机滤螺柱 M20x1.5x35	STUD SCREW M20x1.5x35	1					
15	F60-05000004	排气盖板密封垫	GASKET, EXHAUST COVER	1					
16	F60-05000005	排气盖板	COVER, EXHAUST	1					
17	F40-05000038	堵塞垫片	GASKET, JAM	1					
18	F40-05000037	堵塞 M18x1.5	JAM M18x1.5	1					
19	F25-05010113	出水嘴接头	JOINT, WATER NIPPLE	1					
20	GB/T5782-M6x35	六角螺栓 M6x35	BOLT M6x35	12					
21	F15-07010021	节温器盖板	COVER, THERMOSTAT	1					
22	F15-07000031	节温器 (S60)	THERMOSTAT (S60)	1					
23	F15-07010022	节温器垫	GASKET, THERMOSTAT	1					
24	F40-05000003	线卡	CLAMP	1					
25	F60-05000028	水管 B ⌀6x⌀11x330	WATER PIPE B ⌀6x⌀11x330	1					
26	F60-05000047	定型水管	WATER PIPE, SHAPED	1					
27	F40-03000016	三通	THREE WAY	1					
28	F60-05000026	水管 A ⌀6x⌀11x500	WATER PIPE A ⌀6x⌀11x500	1					
29	F60-05000030	水管 C ⌀5x⌀10x250	WATER PIPE C ⌀5x⌀10x250	1					
30	F60-05000037	水管 D ⌀5x⌀10x500	WATER PIPE D ⌀5x⌀10x500	1					
31	F60-05000050	F型三通	F-TYPE THREE WAY	1					
32	F60-05000040	水管 F ⌀6x⌀11x100	WATER PIPE F ⌀6x⌀11x100	1					
33	F60-05000032	定型水管	WATER PIPE, SHAPED	1					


10
11
5
6
12
15
7
13
16
14
2
1
8
2
9
3
4
17
18
28
29
30
31
20
19
27
14
13
21
22
23
22
25
2
26
24

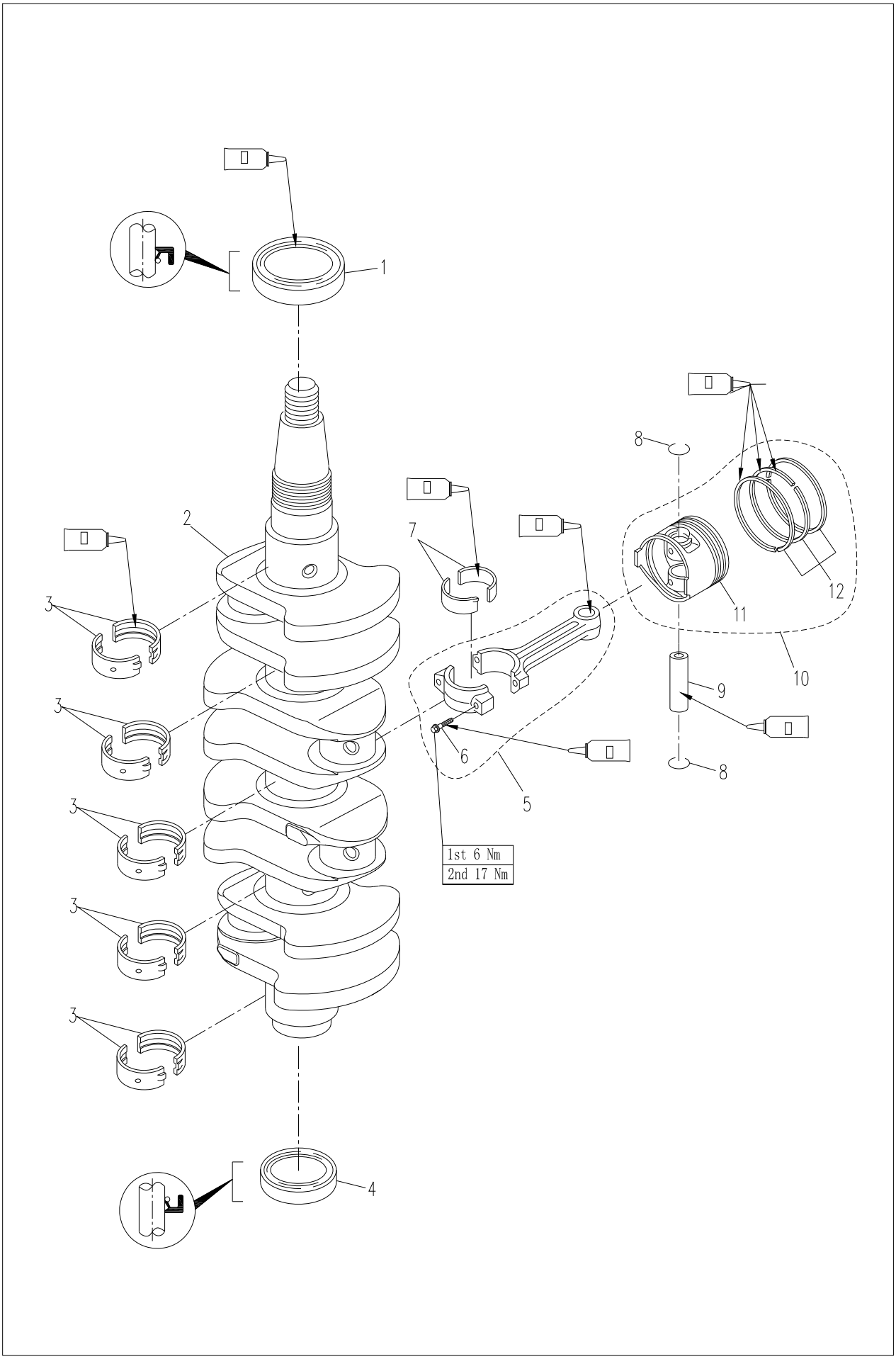
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	1					
2	GB/T97.1-6	平垫圈 6	WASHER 6	9					
3	F40-05090600EI	进气温度压力传感器	SENSOR, INTAKE TEMPERATURE	1					
4	F40-05090601EI	温度压力传感器 O 形圈	O-RING, TEMPERATURE SENSOR	1					
5	F40-05090500EI	怠速控制阀	CONTROL VALVE, IDLE	1					
6	F40-05090503EI	步进电机	STEP MOTOR	1					
7	F40-05090503-1EI	步进电机 O 形圈	O-RING, STEP MOTOR	1					
8	F40-05090501EI	怠速阀体	IDLE CONTROL	1					
9	F40-05090502EI	怠速阀 O 型圈	O-RING, IDLE CONTROL	1					
10	GB/T818-M4x10	十字槽盘头螺钉 M4x10	BOLT M4x10	2					
11	GB/T97.1-4	平垫圈 4	WASHER 4	2					
12	GB/T818-M5x14	十字槽盘头螺钉 M5x14	SCREW M5x14	2					
13	GB/T93-5	弹性垫圈 5	SPRING WASHER 5	4					
14	GB/T97.1-5	平垫圈 5	WASHER 5	4					
15	F40-05000026EI	怠速阀定型管	IDLE CONTROL PIPE	1					
16	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	6					
17	F40-05090803EI	进气消音器密封圈	SEAL, INTAKE SILENCER	3					
18	F60-05001100	进气消音器组件	INTAKE SILENCER ASSY	1					
19	F40-05090403EI	节气门密封圈	SEAL, THROTTLE VALVE	1					
20	F40-05090400EI	节气门体组件	THROTTLE VALVE ASSY	1					
21	GB/T818-M5x20	十字槽盘头螺钉 M5x20	BOLT M5x20	2					
22	HT4.0x300	尼龙扎带 4.0x300	CLAMP 4.0x300	2					
23	F40-05090408EI	节气门橡胶套	RUBBER BOOT, THROTTLE VALVE	1					
24	F60-05000043	节气门导管	CONDUIT, THROTTLE VALVE	1					
25	GB/T5783-M6x16	六角螺栓 M6x16	BOLT M6x16	1					
26	F60-05000011	回气管 A	AIR PIPE A	1					
27	F60-05000048	定型回气管	AIR PIPE	1					
28	GB/T818-M4x16	十字槽盘头螺钉 M4x16	SCREW M4x16	2					
29	GB/T93-4	弹性垫圈 4	SPRING WASHER 4	2					
30	GB/T96-4	平垫圈 4	WASHER 4	2					
31	F40-05090401EI	节气门位置传感器	POSITION SENSOR, THROTTLE	1					


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
M9x95 mm
1st 23 Nm
2nd 47 Nm
18 Nm
M6x25 mm
1st 6 Nm
2nd 12 Nm

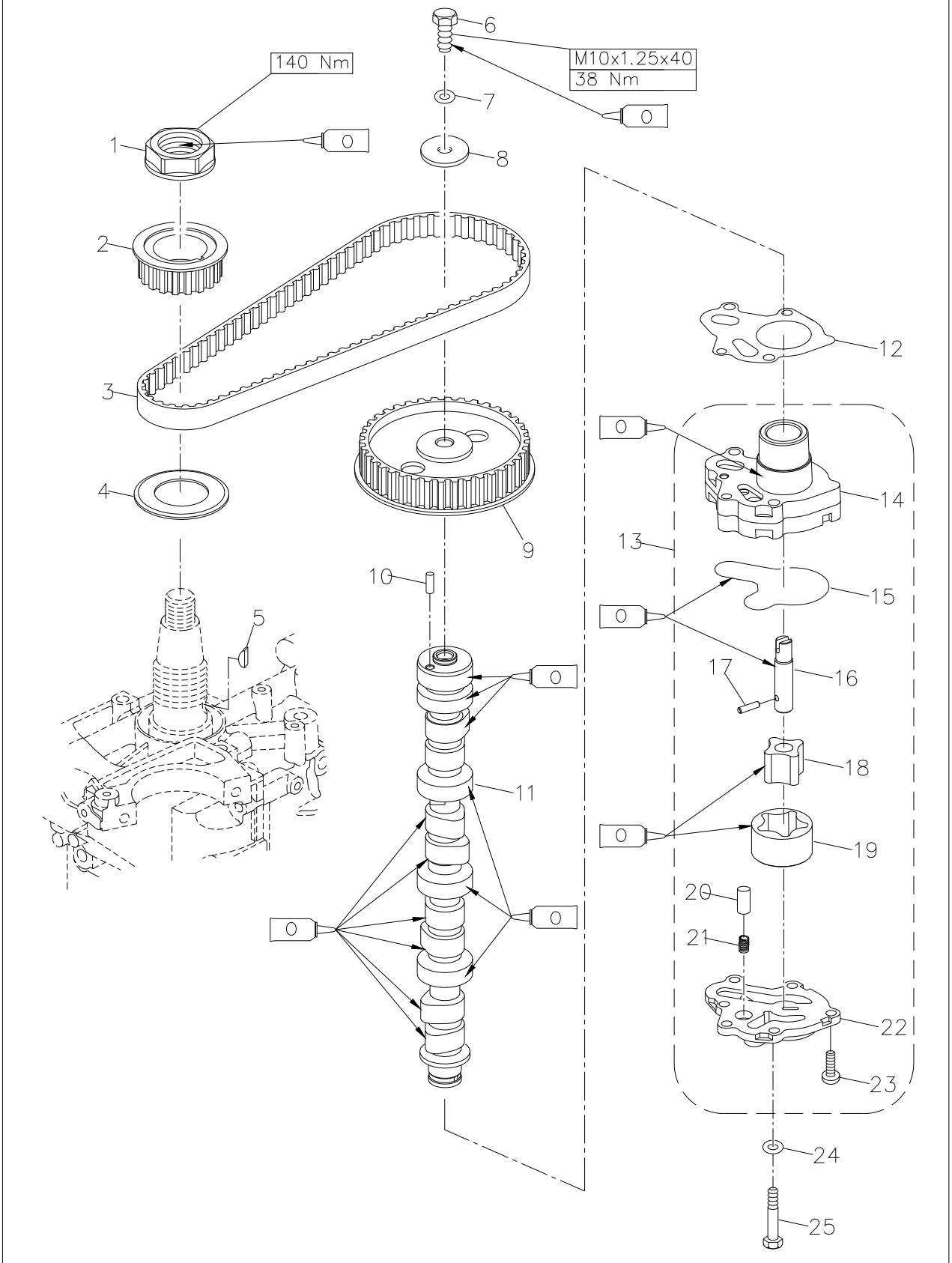
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F15-07050004	加油口盖	FILLER CAP, ENGINE OIL	1					
2	JASO F404 35 025	加油口盖 O 形圈	O-RING	1					
3	F60-05030000	气缸头罩组件	COVER ASSY, CYLINDER HEAD	1					
4	F60-05030001	气缸头罩	COVER, CYLINDER HEAD	1					
5	F40-05070002	呼吸器接头	CONNECTOR, BREATHER	1					
6	F25-05010107	滤网	SIEVE NET	1					
7	F60-05030002	呼吸器盖板	PLATE, BREATHER	1					
8	GB/T818-M4x10	十字槽盘头螺钉 M4x10	SCREW M4x10	4					
9	F60-05000003	气缸头罩密封圈	SEAL, CYLINDER HEAD	1					
10	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	7					
11	GB/T97.1-6	平垫圈 6	WASHER 6	11					
12	F25-05050021	凸轮轴油封 37x50x7 R	OIL SEAL, CAMSHAFT	1					
13	F15-07010005	堵塞 1/4″	PLUG 1/4″	8					
14	F25-05050007	凸轮轴限位螺栓垫片	WASHER, LIMITING BOLT	1					
15	F25-05050006	凸轮轴限位螺栓	LIMITING BOLT, CAMSHAFT	1					
16	F25-05000003	平垫圈 9	WASHER 9	10					
17	F25-05000002	六角凸缘螺栓 M9x1.25	BOLT M9x1.25	10					
18	F60-05020100	气缸头组件	CYLINDER HEAD ASSY	1					
19	F20-05000037	火花塞 DPR7EA-9	SPARK PLUG DPR7EA-9	4					
20	F8-05000022	六角螺栓 M6x25	BOLT M6x25	5					
21	F25-00000014	定位销 ⌀8x12	DOWEL PIN ⌀8x12	2					
22	F60-05000100	气缸垫组件	GASKET ASSY, CYLINDER HEAD	1					


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-05050002	排气门	VALVE, EXHAUST	4					
2	F25-05050003	气门弹簧垫圈	WASHER, VALVE SPRING	8					
3	PS2700.04.03	气门油封	SEAL, VALVE STEM	8					
4	F25-05050005	气门弹簧	SPRING, VALVE	8					
5	F15-07040006	气门弹簧座圈	RETAINER, VALVE SPRING	8					
6	F15-07040007	气门弹簧卡圈	COTTER, VALVE SPRING	16					
7	F25-05050300	摇臂组件	ROCKER ASSY	8					
8	F25-05050301	摇臂	ROCKER	8					
9	F15-07040303	调整螺钉	SCREW, VALVE ADJUSTING	8					
10	F15-07040304	锁紧螺母	LOCK NUT	8					
11	F25-05050001	进气门	VALVE, INTAKE	4					
12	F60-05020001	摇臂轴	SHAFT, ROCKER	1					
13	F25-05050009	摇臂轴固定板A	FIXED PLATE A, ROCKER SHAFT	2					
14	F25-05050019	摇臂轴六角法兰螺栓	FLANGE BOLT, ROCKER SHAFT	5					
15	F40-05040002	弹簧板托板	SUPPORTING PLATE, SPRING PLATE	2					
16	F25-05050011	摇臂限位弹簧板	SPRING PLATE, ROCKER	2					
17	F25-05050012	摇臂轴固定板B	SPRING PLATE B, ROCKER	2					
18	F40-05040003	摇臂轴固定板B	FIXED PLATE B, ROCKER SHAFT	1					


1
2
3
3
3
3
3
4
5
6
7
8
8
9
10
11
12
1st 6 Nm
2nd 17 Nm

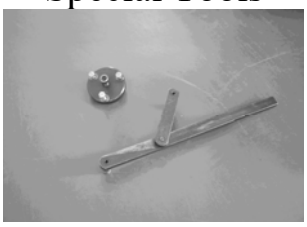
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-05020003	曲轴油封 B ⌀43x ⌀54.8x6 R	OIL SEAL B	1					
2	F60-05000001	曲轴	CRANKSHAFT	1					
3	F25-05010302-1	曲轴轴瓦 （黑色）	BEARING SHELL, CRANKSHAFT	10					BLACK
	F25-05010302-2	曲轴轴瓦 （棕色）	BEARING SHELL, CRANKSHAFT						BROWN
4	F25-05020002	曲轴油封 A ⌀35x ⌀46.85x6 L	OIL SEAL A	1					
5	F25-05020200	连杆组件	CONNECTING ROD ASSY	4					
6	F25-05020204	连杆螺栓	BOLT, CONNECTING ROD	8					
7	F25-05020203-1	连杆轴瓦 （黑色）	BEARING SHELL, CONNECTING ROD	8					BLACK
	F25-05020203-2	连杆轴瓦 （棕色）	BEARING SHELL, CONNECTING ROD						BROWN
8	F25-05020106	活塞销挡圈	CIRCLIP, PISTON PIN	8					
9	F25-05020105	活塞销	PIN, PISTON	4					
10	F40-05020100	活塞组件	PISTON ASSY	4					
11	F40-05020101	活塞	PISTON	4					
12	F25-05020102	活塞环组件	PISTON RING ASSY	4					


140 Nm
M10x1.25x40
38 Nm
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

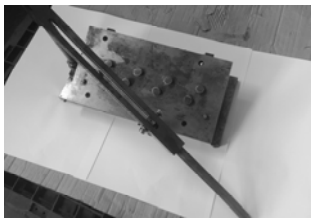
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F40-05000007	正时带轮螺母	NUT, TIMING PULLEY	1					
2	F25-05000021	正时带轮	TIMING PULLEY	1					
3	F25-05000023	正时皮带	TIMING BELT	1					
4	F40-05000008	正时带轮盖板	PLATE, TIMING BELT	1					
5	F4-04000019	半圆键 4x5.3x13	WOODRUFF KEY	1					
6	GB/T5785-M10x1.25x40	六角螺栓 M10x1.25x40	BOLT M10x1.25x40	1					
7	GB/T97.1-10	平垫圈 10	WASHER 10	1					
8	F25-05050018	从动轮垫圈	WASHER, DRIVEN PULLEY	1					
9	F40-05040006	从动轮	DRIVEN PULLEY	1					
10	F25-05050016	从动轮定位销	DOWEL PIN, DRIVEN PULLEY	1					
11	F60-05020200	凸轮轴组件	CAMSHAFT ASSY	1					
12	F40-05040407	机油泵密封垫	GASKET, OIL PUMP	1					
13	F40-05040400	机油泵组件	OIL PUMP ASSY	1					
14	F40-05040401	机油泵体	BODY, OIL PUMP	1					
15	F40-05040405	机油泵密封圈	SEAL, OIL PUMP	1					
16	F40-05040404	油泵转子轴	ROTOR SHAFT , OIL PUMP	1					
17	GB/T309- ∅4x15.8	滚针 ∅4x15.8	NEEDLE ROLLER ∅4x15.8	1					
18	F40-05040403	油泵内转子	INNER ROTOR , OIL PUMP	1					
19	F40-05040402	油泵外转子	OUTER ROTOR , OIL PUMP	1					
20	F15-07110003	溢流阀柱塞	PLUNGER, OIL RELIEF VALVE	1					
21	F40-05040408	溢流阀弹簧	SPRING, OIL RELIEF VALVE	1					
22	F40-05040406	机油泵盖	COVER, OIL PUMP	1					
23	GB/T823-M6x16	十字槽小盘头螺钉 M6x16	SCREW M6x16	2					
24	GB/T97.1-6	平垫圈 6	WASHER 6	4					
25	GB/T5782-M6x40	六角螺栓 M6x40	BOLT M6x40	4					

Special Tools

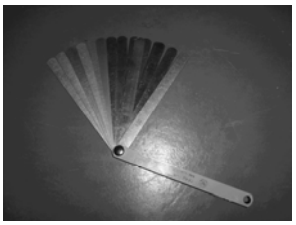
Piston slideway



Flywheel gripper and flywheel puller



Valve spring compressor kit



Clearance gauge

Oil filter spanner

Check the Compression Pressure

1. Start the engine, warm it up for 5 minutes, then shut it down.

2. Remove engine stop safety line.

3. Remove the spark plug and connect the pressure gauge to the spark plug hole.

Attention:
Before removing the spark plug, clean the pit where the spark plug is installed with compressed air to prevent dust or other sundries from entering the cylinder.

4. Fully open the throttle, turn the crankshaft with the starter or starting motor, and check the cylinder pressure when the reading on the pressure gauge is stable.

Note:
For models using the control box, remove the throttle linkage, fully open the carburetor throttle lever by hand, and then detect the pressure.

5. If the pressure is lower than the specified value or there is a difference between the cylinders, add a small amount of oil to the cylinders and then carry out the detection.

Compression pressure: 840 kPa

Note:
If the cylinder pressure continues to increase, check the piston and piston ring for damage. Replace it if necessary.
If the cylinder pressure does not increase, check the valve clearance, valve, valve seat, cylinder liner, cylinder head and cylinder head gasket.
Adjust or replace it if necessary.
The outboard motor is equipped with automatic pressure relief device, and the data cannot be very accurate.

Check the Oil Pressure

1. Start the engine, warm it up for 5 minutes, then shut it down.

2. Remove oil pressure switch and connect pressure gauge.

Note:
Use a manometer with a 1/8 pitch thread adapter.

3. Check oil pressure
   Oil pressure (reference data): 100kpa (800±50 r/min)

Disassemble the Engine

1. Open the top cover.

2. Remove the flywheel cover.

3. Remove the throttle cable.

4. Remove the carburetor.

5. Remove the flywheel with special tools.

Flywheel gripper and flywheel puller

6. Remove the semicircle key.

7. Disconnect the engine stop switch line and the ground wire.

8. Remove the cable joint.

9. Remove the magneto coil.

10. Disconnect the wires of electrical components such as storage battery, starting motor, starting relay, tilting relay and control box connector,
    Disconnect the ground wire and the water pipe.

11. Remove the ignition coil, ECU device, ignition coil and spark plug.

12. Remove the bolts connecting the engine to the water unit.

13. Lift the engine and remove the locating pin.

Pulley and Timing Belt

1. Turn the flywheel clockwise. Align "1" on the driven pulley with "▼" on the cylinder head.

Attention:
Do not turn the flywheel counterclockwise, otherwise the valve system will be damaged.

2. Remove timing belt from the driven pulley side.

Attention:
When the timing belt is not installed, do not turn the pulley, otherwise the valve system will be damaged.

3. Remove the driven pulley bolt, remove the driven pulley and the semicircular key.
   Note:
   Remove the driven pulley bolt with the flywheel gripper.
   Do not turn the camshafts when loosening the timing pulley.

4. Remove the timing pulley washer, timing pulley and semicircular key.

5. Check the pulley and timing belt for cracks, damage or wear. Replace it if necessary.

6. Install the semicircular key and the driven pulley.
   Align "1" on the driven pulley with "▼" on the cylinder head. Then temporarily tighten the driven pulley bolts.

Attention:
When the timing belt is not installed, do not turn the pulley, otherwise the valve system will be damaged.

7. Install the semicircular key and timing pulley.
   Align the notch mark on the timing pulley with the mark "▼" on the body.

8. Install the new timing belt with the part number of the timing belt upright.
   Attention:
   Do not twist, rotate or bend the timing belt, otherwise the timing belt will be damaged.
   Do not put oil or lubricating oil on the timing belt.
   Do not turn the pulley counterclockwise, otherwise the valve system will be damaged.

9. Install the timing pulley cover plate and temporarily tighten the timing pulley nut.

10. Turn the timing pulley clockwise for 2 turns to eliminate the slackness of the timing belt.
    Check if the alignment marks are aligned.

11. Tighten the bolts and nuts.
    Locking torque: Driven pulley bolt 38 Nm
    Note:
    Remove the driven pulley bolt with the flywheel gripper.
    Tighten timing pulley nuts with a special socket wrench for timing pulley nuts.

Disassembling and Check

Cylinder Head

Disassembling

1. Remove cylinder head cover bolts.

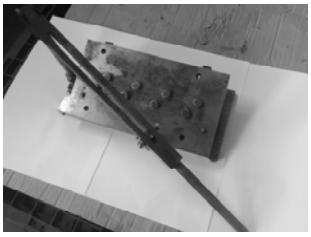
2. Remove the cylinder head bolts in reverse order according to the numeric markings on the cylinder head.

3. Remove the cylinder head and then remove the oil pump.

4. Remove the rocker shaft, spring and rocker assembly.

Note:
Before removing the rocker shaft, loosen the lock nut and adjust the screw to the relaxed state.

5. Remove intake and exhaust valves using the valve spring compressor.



Valves and valve guides

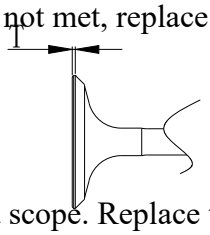
1. Check the width of the valve sealing surface if it is not within the specified scope. Trim the valve seat ring.

Width of sealing surface:

Intake valve	1.84～2.97 mm
Exhaust valve	1.98～3.11 mm

2. Check the valve edge thickness T; If the specified value is not met, replace the valve.
Valve edge thickness:

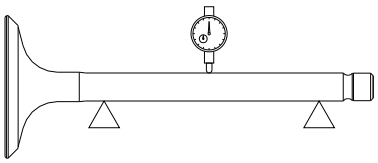
Intake valve	0.6～1.0 mm
Exhaust valve	0.7～1.1 mm



3. Check valve stem diameter. If it is not within the specified scope. Replace the valve.
Valve stem diameter.

Intake valve	5.48～5.49 mm
Exhaust valve	5.46～5.47 mm

4. Check the roundness of the valve stem. If it exceeds the limit, replace the valve.
Valve stem roundness limit 0.03mm



5. Check the inner diameter of the valve guide.
Inner diameter of the valve guide. 5.50～5.51 mm

Attention:
When replacing valve, be sure to use new valve guides and valve seal.

Valve spring

1. Check the free length of the valve spring; If it is less than the specified value, replace it.
Free length: 39.85 mm
Min. free length: 37.85 mm

2. Check the inclination of the valve spring; If it exceeds the limit, replace the valve.
Inclination limit: 1.7 mm

Valve rocker and rocker shaft

1. Check the contact surface of the valve rocker and rocker shaft for wear. Replace it if necessary.

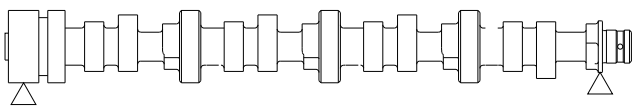
2. Measure whether the inner diameter of the valve rocker and the outer diameter of the rocker shaft conform to the specified values. Replace it if necessary.
Inner diameter of the valve rocker: 16.000～16.01 mm
Outer diameter of rocker shaft: 15.97～15.99 mm

Camshaft

1. Check cam size.
Replace the camshaft if necessary.

Height of cam	Intake	30.89~30.99 mm
	Exhaust	30.82~30.92 mm
Diameter of base circle		25.95~26.05 mm

2. Check camshaft roundness. Replace it if necessary.
Roundness limit： 0.03mm



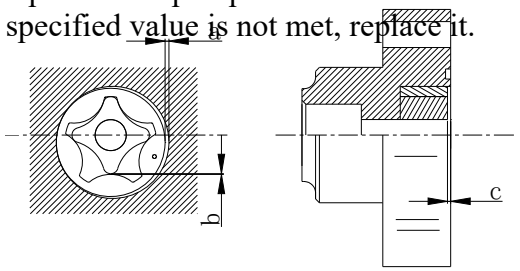
3. Check camshaft journal diameter and cylinder head shaft hole inner diameter. Replace it if necessary.
   Camshaft journal top diameter a1 (driven pulley mounting end): 36.93~36.94 mm
   Camshaft journal centre and rear diametera2: 36.94~36.95 mm
   Cylinder head shaft hole inner diameter b: 37.00~37.02 mm

4. Calculate camshaft oil clearance c (c=b-a), If the specified value is not met, replace it.
   Top of camshaft: 0.06~0.10 mm
   Centre and rear of camshaft: 0.05~0.09 mm
   Attention:
   The camshaft and cylinder head need to be replaced together.

Check the oil pump

1. Remove the screws securing the oil pump and remove the oil pump.

2. Open the oil pump cover and check the oil pump rotor clearance as shown If the specified value is not met, replace it.



Clearance between outer rotor and casing a	0.09~0.15 mm
Clearance between outer rotor and inner rotor b	0.01~0.10 mm
Clearance between rotor and cover c	0.03~0.08 mm

Joint surface of cylinder head and body

1. Remove carbon deposits from the combustion chamber and check for damage.

2. Use a ruler and gap gauge to check the bending of the joint surface. If the specified value is not met, replace it.
   Cylinder head bending limit: 0.03 mm

Replace valve guide

1. Knock off the valve guide from the direction of the combustion chamber.

2. Knock in a new valve guide from the top surface of the cylinder head.

Note:
Apply oil to the surface of the guide before installation.

3. Hinge the inner diameter of the conduit to the specified value with a reamer.
   Inner diameter of the valve guide. 5.50～5.51 mm

Note:
Do not rotate the reamer counterclockwise when taking it out.

Check the valve seat ring.

1. Remove carbon deposits from the valve.

2. Apply a thin layer of dye evenly to the sealing surface of the valve seat ring.

3. Grind the valve on the valve seat with a valve grinding tool.

4. Measure the width of the valve sealing surface.
   Dye will stick to the valve sealing surface.

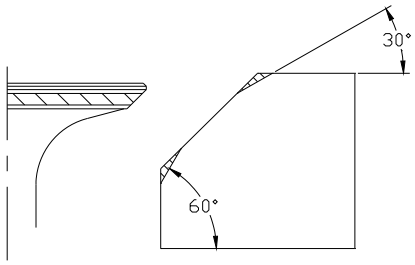
If the valve and valve seat ring are not properly matched or the width of the sealing surface does not conform to the specified value, trim the valve seat.

If the contact is uneven, replace the valve guide.
Width of inlet and exhaust valve sealing surface: 0.9～1.1mm

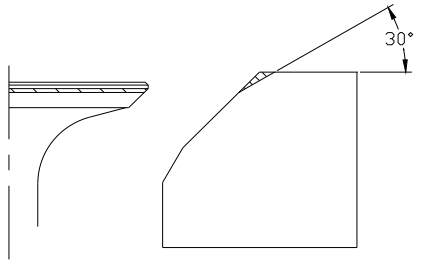
Trim the valve seat ring

1. Trim the valve with a 45° valve seat ring cutter and adjust the width of the sealing surface.
Turn the cutter clockwise until the surface of the seat ring is smooth.

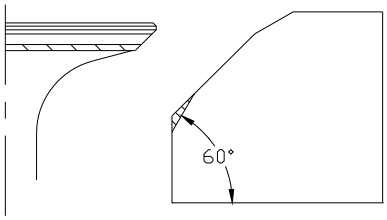
2. If the valve sealing surface is too wide and in the middle of the valve surface, trim the top edge of the seat ring with a 30° cutter and the bottom edge of the seat ring with a 60° cutter and adjust the width of the sealing surface.



3. If the valve sealing surface is too narrow and at the top edge of the valve surface, trim the top edge of the seat ring with a 30° cutter, if so, adjust the width of the sealing surface with a 45° cutter.



4. If the valve sealing surface is too narrow and at the bottom edge of the valve surface, trim the bottom edge of the seat ring with a 60° cutter, and if so, adjust the width of the sealing surface with a 45° cutter.



5. Apply a thin layer of abrasive evenly on the valve seat ring and grind the valve with a valve grinding tool.

6. Remove the residual abrasive.

7. Check the valve sealing surface width again.

Attention:
Don't cut the valve too much, turn the cutter evenly with a downward force of 40 ~ 50N.
Do not attach the abrasive to the valve stem and valve guide.

Install valve

1. Install a new valve oil seal and coat the valve guide with engine oil.

2. Install the valve, valve spring pad, valve spring and spring seat in sequence.

3. Compress the valve spring with a valve spring compressor and install the valve spring retainer.

4. Tap the valve spring seat lightly with a plastic or rubber hammer to secure the retainer.

Assemble cylinder head

1. Install the new oil seal with special tools.

2. Fit the camshaft into the cylinder head from the direction of the oil pump.

3. Check that the camshaft head locating pin hole is positioned in the direction of the cylinder head cover (rocker side). If necessary, make adjustments.

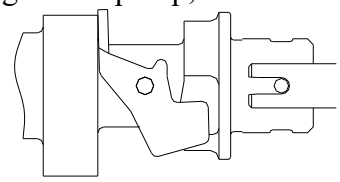
4. Install the rocker assembly, spring and rocker shaft.

5. Assemble the oil pump.

Note:
Ensure that the mark on the outer rotor face the oil pump cover

6. Fit oil pump by aligning oil pump drive shaft and camshaft pin.

Attention:
Before installing the oil pump, make sure that the oil circuit is smooth and fill the oil pump with oil.



Crankcase

Disassembling

1. Remove the oil filter with special tools.
   Note:
   Put a cloth under the oil filter.

Filter wrench

2. Remove the bolts in reverse order according to the serial number on the edge of the screw hole on the exhaust cover plate.

3. Remove thermostat cover, exhaust cover, gasket and locating pin.
   Clean the anode surface, check the anode, and replace the anode if the corrosion exceeds half of the surface.
   Check the exhaust cover plate for cracks, deformation or corrosion. Replace it if necessary.

4. Remove the box bolts in reverse order according to the serial number on the edge fo the screw hole of the engine base, and remove the engine base.

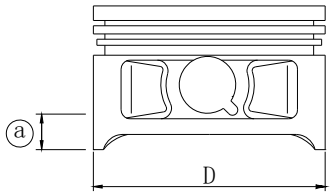
5. Remove the connecting rod bolt and connecting rod cover, remove the crankshaft, and then remove the connecting rod and piston assembly.

6. Remove the piston pin circlip with pliers, then remove the piston pin and the piston.

7. Remove the oil seal, locating pin and bearing bush.

Piston

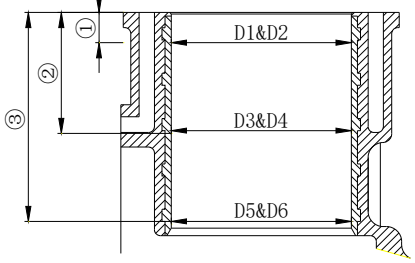
1. Measure the piston outer diameter at the specified measuring point.
   If the specified value is not met, replace it.
   Diameter of piston: 64.950～64.965 mm
   Measuring point⓪: 5mm



2. Check the inner diameter of piston pin bore.
   If the specified value is not met, replace it.
   Inner diameter of piston pin bore: 15.974~15.985mm

Cylinder bore

1. Measure the piston outer diameter ①, ② and ③at the specified measuring point.
   At each measure point, six diameters parallel to the crankshaft direction D1, D3, D5 and perpendicular to the crankshaft direction D2, D4, D6 are measure respectively.



   Height of measuring point ①20 mm;
   ②60 mm;
   ③100 mm
   Cylinder bore: 65.000～65.013 mm

2. Calculate the taper limit and roundness limit. If the specified value is exceeded, replace the crankcase.
   taper limit: 0.08 mm (D1-D5, D2-D6)
   Roundness limit： 0.05 mm (D2-D1, D6-D5)

Piston pin outer diameter

Check the piston pin outer diameter; If it does not conform to the specified value, replace it.

Piston pin outer diameter: 15.965～15.970 mm

Piston ring

1. Check the piston ring cross-sectional dimensions. If the specified value is not met, replace it.

	Thickness	Section width
Top ring	1.17～1.19 mm	2.39～2.41 mm
2nd ring	1.47~1.49mm	2.49～2.51 mm
Oil ring	2.34～2.46 mm	2.75mm

2. Push the piston ring parallel into the cylinder with the piston to the specified measuring point (20mm from the joint surface).

3. Measure the end clearance of piston ring with clearance gauge; If it does not conform to the specified value, replace it.
   End clearance (when installing) Top ring 0.15 ~ 0.30 mm
   2nd ring 0.30～0.50 mm
   Oil ring 0.20 ~ 0.70 mm

4. Install the piston ring on the piston and measure the clearance between the piston ring and the piston ring groove with clearance gauge. If it does not conform to the specified value, replace it.

Specified clearance: Top ring 0.02 ~ 0.06 mm
2nd ring 0.02～0.06 mm
Oil ring 0.04 ~ 0.18 mm

Inner diameter of connecting rod small end

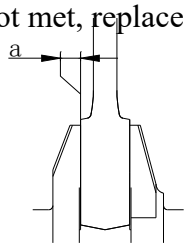
Measure the inner diameter of small end. If the specified value is not met, replace it.

Inner diameter of small end: 15.985～15.998 mm

Connecting rod big-end backlash

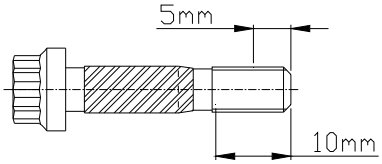
Measure big-end backlash.If the specified value is not met, replace the connecting rod or crankshaft or both.

Big-end backlash: 0.05～0.22 mm



Check the connecting rod bolts

1. Check the thread diameter of the connecting rod bolt at the position shown.



2. Calculate the difference between the diameters of the two threads; If it does not conform to the specified value, replace it.

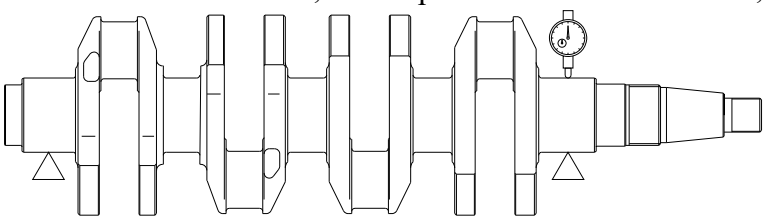
Diameter difference of connecting rod bolt threads: 0～0.1 mm

Crankshaft

1. Measure the crankshaft journal diameter, crank pin diameter and crank pin width. If the specified value is not met, replace the crankshaft.

Crankshaft journal diameter	42.984~43.000 mm
Crank pin diameter	32.984~33.000 mm
Crank pin width	21.000~21.070mm

2. Check crankshaft runout; If the specified value is exceeded, replace it.



Crankshaft runout limit: 0.04mm

Clearance between crank pin and oil

1. Place a plastic clearance gauge on the crank pin and make it parallel to the crankshaft.

2. Fit the connecting rod and bearing bush on the crank pin.

3. Tighten the connecting rod bolts according to the specified torque.

Locking torque: First time 6 Nm
Second time 17 Nm

4. Remove the connecting rod and measure the width of the plastic clearance gauge after being compressed. If the specified value is exceeded, replace the connecting rod bearing bush.
Oil clearance: 0.020~0.052mm

Note:
Do not turn the connecting rod until the measurement is completed**.**

Clearance between main journal and oil

1. Clean the mounting surface of bearing bush, main journal, motor body and engine base.

2. Install the bearing bush and crankshaft to the body.

3. Place a plastic clearance gauge on the main journal and make it parallel to the crankshaft.

Note:
Do not place the plastic clearance gauge on the oil hole of the main journal**.**

4. Install the bearing bush on the engine base and install the engine base on the body.

5. Tighten the bolts with the specified torque in the order of the numeric marks on the engine base.
Locking torque:

1st tightening	M8	15 Nm
2nd tightening		30 Nm
1st tightening	M6	6 Nm
2nd tightening		12 Nm

6. Remove the engine base and measure the width of each plastic clearance gauge after being compressed. If the specified value is exceeded, replace the bearing bush.
Oil clearance: 0.012～0.044mm

Note:
Do not turn the crankshaft until the measurement is completed**.**

Engine body and base

1. Check the engine body and base for cracking, damage and corrosion; If any, replace it.

2. Check the cooling water channel for dirt or blockage; If any, clean it.

Reinstall

Assemble Piston Connecting Rod

Install the piston, connecting rod, piston pin and piston pin clip clutch.

Note:

When installing, make sure that the mark on the connecting rod is on the same side as that on the top of the piston.

Install Piston Ring

1. Install the piston ring in the order of oil ring, second ring and top ring.

   Note:

   When installing the second ring, make sure that the mark faces the top of the piston.

2. Position of the piston ring notch.

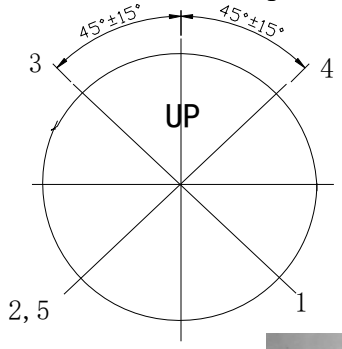
   Oil ring lower retainer 1

   Oil ring elastic ring 2

   Oil ring upper retainer 3

   Second ring 4

   Top ring 5



Install Piston

Install the piston using the piston slide rail,

Ensure that the "UP" sign on the top of the piston faces the flywheel.

Note:

When installing, apply oil to the sides of the piston and piston ring.

Install Crankshaft

1.Install the bearing bush to the body.

Note:

Insert the raised part on the bearing bush into the groove of the corresponding part of the body.

2. Install the crankshaft to the body and install the oil seal.

Note:

Apply oil to the inner side of the oil seal before installation.

3. Install the connecting rod cover to the connecting rod and tighten the bolts to the specified torque in two steps.

   Locking torque: First time 6 Nm

   Second time 17 Nm

Note:

Align the connecting rod cover with the mark on the connecting rod.

Apply oil to the connecting rod bolts before installation.

Assemble the Engine

1. Apply sealant to the joint surface of the base, and install the positioning pin and the base. Tighten the bolts twice according to the order marked on the base.

Locking torque:

1st tightening	M8	15 Nm
2nd tightening		30 Nm
1st tightening	M6	6 Nm
2nd tightening		12 Nm

Note:

Apply oil to the moving surface before installation.

Apply oil to the bolts before installation.

2. Install oil filter using special tools and tighten it to the specified torque.
   Locking torque: 18 Nm

Note:
Before installation, inject oil into the oil channel.

3. Install the exhaust cover, thermostat and thermostat cover.

Tighten them at the specified torque twice in the order indicated on the exhaust cover plate.
Locking torque: First time 6 Nm
First time 12 Nm

6. Install the locating pin, cylinder gasket and cylinder head assembly.

7. Check the keyway position of semicircular key on camshaft

8. Tighten the cylinder head bolts to the specified values in 2 steps according to the sequence marked on the cylinder head.
   Specified torque:

1st tightening	M9	23 Nm
2nd tightening		46 Nm
1st tightening	M6	6 Nm
2nd tightening		12 Nm

Attention:
Do not use old cylinder gaskets.

9. Install the timing pulley, driven pulley, timing belt and breather pipe.

Attention:
When installing the timing belt, ensure that the mark on the driven pulley is aligned with the "▼" on the cylinder head; Ensure that the mark on the timing pulley is aligned with the "▼" on the body.

10. Adjust valve clearance.

11. Install the cylinder head cover and tighten the bolts in the order indicated on the cylinder head cover.

12. Install electrical system components in reverse order according to the removal sequence

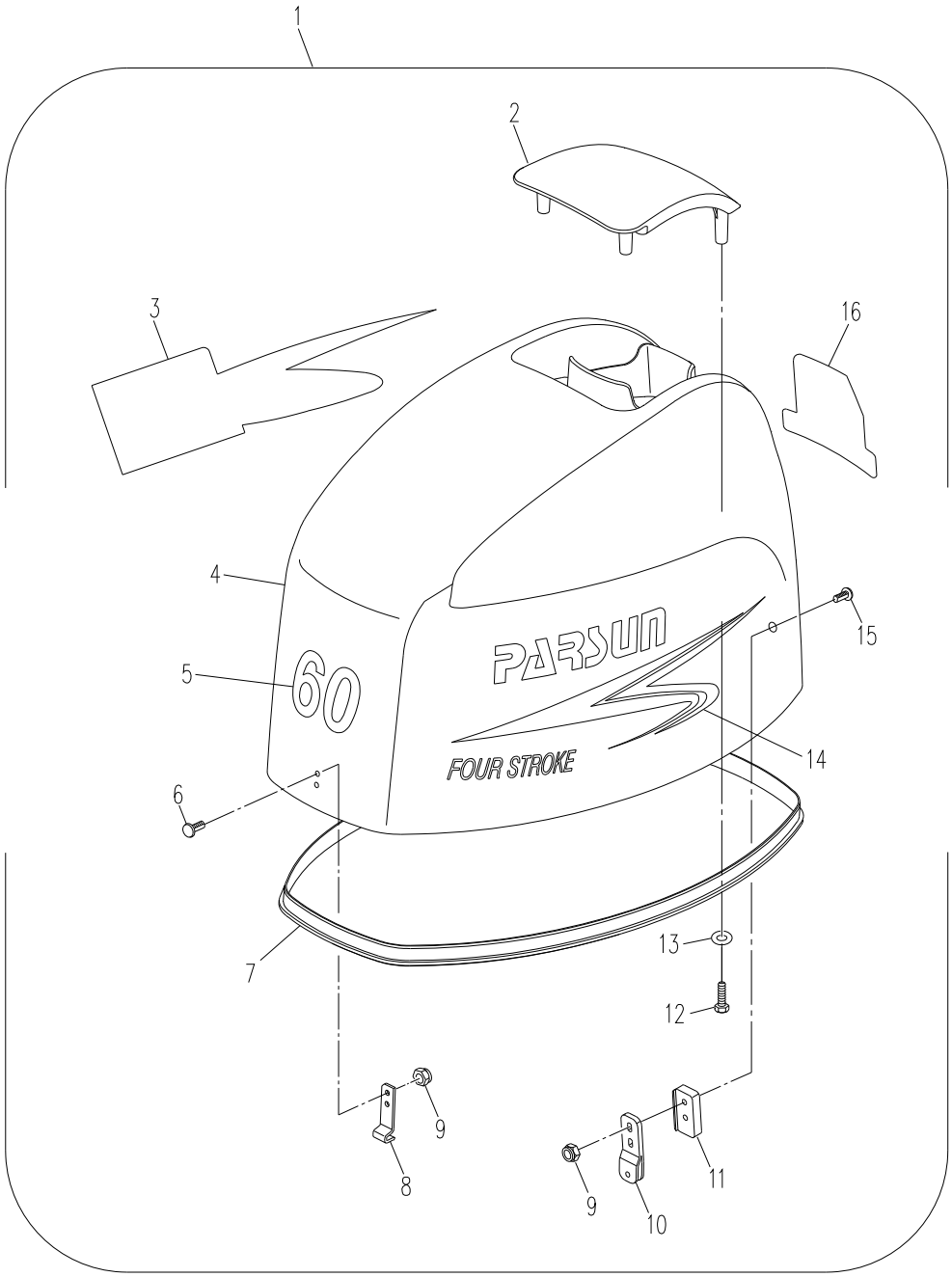
13. Connect the wire of the electrical system.

14. Install the fuel system.

Upper Casing

Top Cowling

Decomposition Schematic Diagram



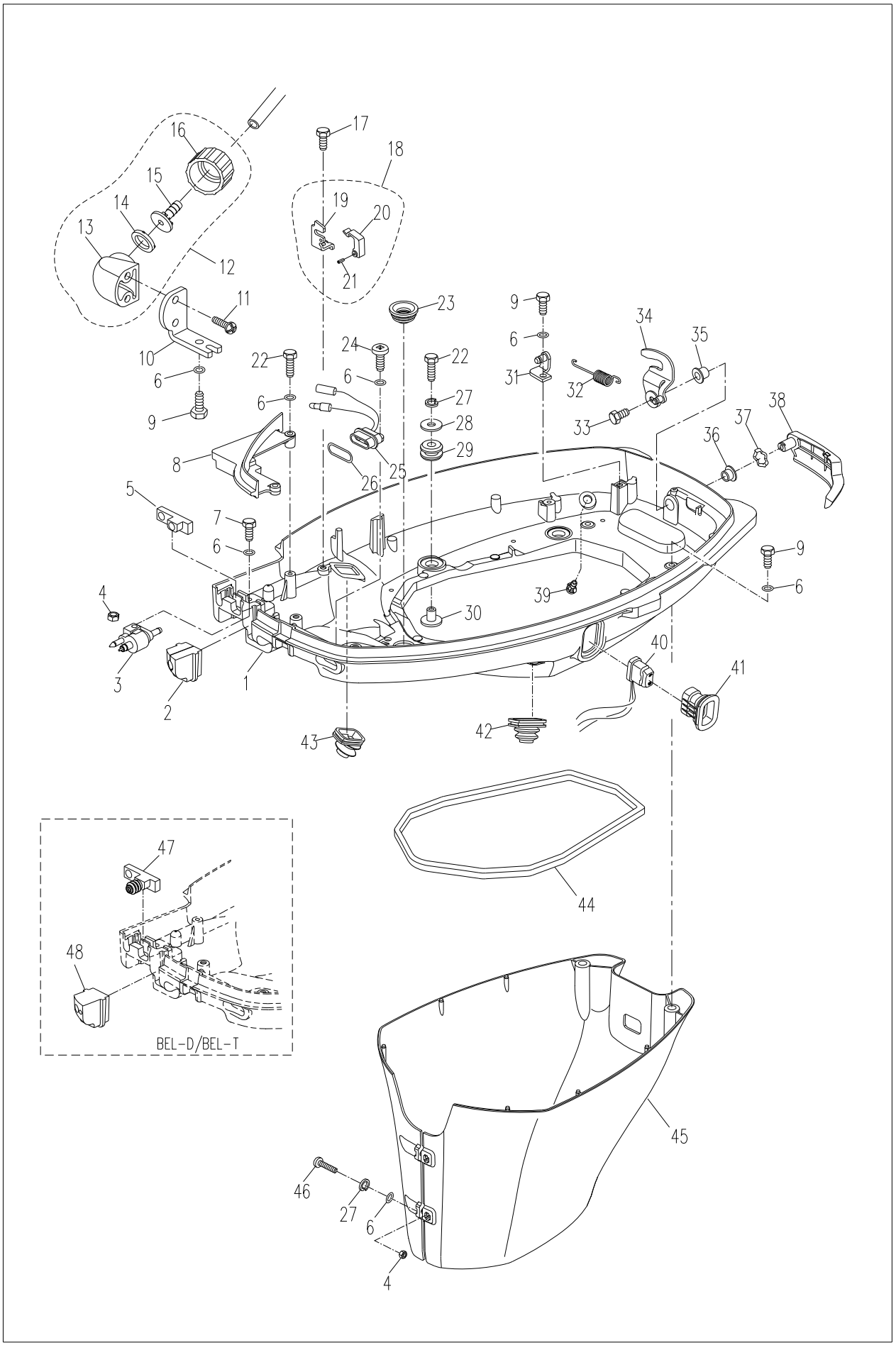
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F60-07000000	顶罩组件	TOP COWLING ASSY	1					
2	F60-07000003	顶罩盖	COVER,TOP COWLING	1					
3	F40-08000002	顶罩 标贴（右）	STICKER (RIGHT),TOP COWLING	1					
4	F60-07000001	顶罩	TOP COWLING	1					
5	F60-08000005	顶罩标贴 （前）	STICKER (FRONT),TOP COWLING	1					
6	F25-06000006	扁头螺栓 B	FLAT BOLT B	2					
7	F60-07000002	顶罩 密封橡胶条	RUBBER SEAL,TOP COWLING	1					
8	F25-06000004	前挂钩	POTHOOK(FRONT)	1					
9	GB/T889.1-M6	Ⅰ型非金属嵌件六角锁紧螺母 M6	LOCKNUT M6	4					
10	F25-06000100	后挂钩组件	POTHOOK ASSY(BACK)	1					
11	F60-07000004	后挂钩垫块	CUSHION,BACK POTHOOK	1					
12	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	4					
13	GB/T97.1-6	平垫圈 6	WASHER 6	4					
14	F40-08000001	顶罩标贴 （左）	STICKER (LEFT),TOP COWLING	1					
15	F40-06000007	扁头螺栓 A	FLAT BOLT A	2					
16	F40-08000003	顶罩标贴 （后）	STICKER (BACK),TOP COWLING	1					

Disassembling and Check

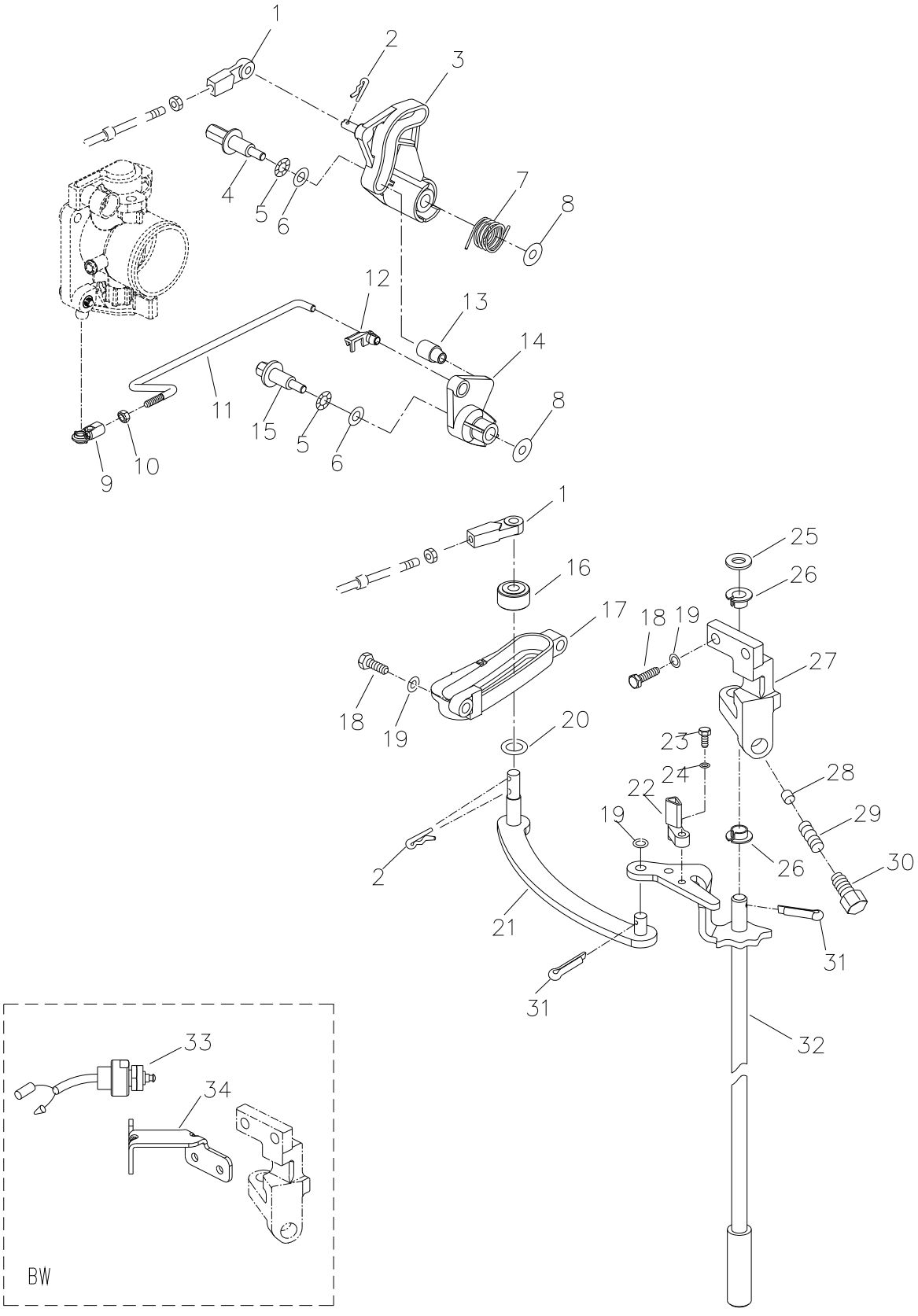
1. Remove sealing rubber strip.
2. Remove the top cover screws.
3. Remove top cover.
4. Remove the locking hook and hook.
5. Check the top cover for cracks, damage or wear. Replace it if necessary.
6. Check the sealing rubber strip for cracks or damage. Replace it if necessary.
7. Check the top cover silencer for cracks or damage. Replace it if necessary.
8. Check the locking hook and hook for cracks, deformation or damage. Replace it if necessary.

Bottom Cowling

Decomposition Schematic Diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F60-03000001	底罩	BOTTOM COWLING	1					
2	F60-03000006FW	异形橡胶闷头	RUBBER PLUG, ABNORMAL	1					
3	F4-05000200	燃油管接头组件	FUEL CONNECTOR ASSY	1					
4	GB/T6170-M6	六角螺母 M6	NUT M6	3					
5	F60-03000005FW	橡胶挡板	BAFFLE BOARD, RUBBER	1					
6	GB/T97.1-6	平垫圈 6	WASHER 6	10					
7	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	1					
8	F60-03000003	底罩小盖板	COVER BOARD, BOTTOM COWLING	1					
9	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	4					
10	F25-03000023W	堵塞支架	BRACKET, JAM	1					
11	GB/T845-ST5.5x19	十字槽盘头自攻螺钉 ST5.5x19	SCREW ST5.5x19	2					
12	F25-03000100W	水管堵塞组件	JAM ASSY	1					
13	F25-03000101W	堵塞本体	JAM	1					
14	F25-03000102W	堵塞橡胶圈	RUBBER RING, JAM	1					
15	F25-03000103W	堵塞接头	JOINT, JAM	1					
16	F25-03000104W	堵塞螺母	NUT, JAM	1					
17	GB/T5783-M6x14	六角螺栓 M6x14	BOLT M6x14	1					
18	F60-03000300	钢索固定架组件	FIXED FRAME ASSY, TIGHTWIRE	1					
19	F60-03000301	钢索固定架	FIXED FRAME, TIGHTWIRE	1					
20	F20-03000202W	推拉索锁夹	CLAMP	1					
21	GB/T879.2-3x12	轻型直槽弹性圆柱销 ⌀3x12	PIN ⌀3x12	1					
22	GB/T5783-M6x30	六角螺栓 M6x30	BOLT M6x30	6					
23	F60-03000008	波纹橡胶套	SHEATH, WAVE	1					
24	GB/T823-M6x12	十字槽小盘头螺钉 M6x12	SCREW M6x12	1					
25	F40-03000300EI	指示灯组件	PILOT LAMP ASSY	1					
26	F20-03000101	指示灯密封件	SEAL, PILOT LAMP	1					
27	GB/T93-6	弹簧垫圈 6	SPRING-WASHER 6	6					
28	F25-00000004	特大垫圈 6	BIG WASHER 6	4					
29	F25-03000006	减震圈	DAMPER	4					
30	F25-03000007	减震圈垫管	BUSHING, DAMPER	4					
31	F25-03000019	拉簧支架组件	BRACKET ASSY, TENSIONAL SPRING	1					
32	F15-05000026	锁紧块拉簧	SPRING, TENSION	1					
33	GB/T5783-M6x12	六角螺栓 M6x12	BOLT M6x12	1					
34	F25-03020000	顶罩锁紧块组件	LOCKING ASSY, TOP COWLING	1					
35	F15-05000036	顶罩锁紧手柄尼龙套 B	BUSHING B	1					
36	F15-05000022	顶罩锁紧手柄尼龙套 A	BUSHING A	1					
37	F15-05000023	波形垫圈	WASHER , WAVE	1					
38	F60-03000100	顶罩锁紧手柄组件	LOCKING ASSY, TOP COWLING	1					
39	F15-05000009	塑料出水嘴	WATER NIPPLE, PLASTIC	1					
40	F40-03000600W	起翘开关组件	SWITCH ASSY, TILT	1					
41	F40-03000008	起翘开关护套	JACKET, TILT SWITCH	1					
42	T85-03000004	电源线护套	JACKET, BATTERY LINE	1					
43	F25-03000022W	水管波纹护套	JACKET, WAVE	1					
44	F25-03000002	底罩密封条	SEAL, BOTTOM COWLING	1					
45	F60-00000014	水上装置罩壳	SHIELD, UPPER CASING	1					
46	GB/T818-M6x25	十字槽盘头螺钉 M6x25	SCREW M6x25	2					
47	F60-03000005BW	橡胶挡板	BAFFLE BOARD, RUBBER	1					BEL-D/BEL-T
48	F60-03000006BW	异形橡胶闷头	RUBBER PLUG, ABNORMAL	1					


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
BW

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F25-07000005W	操控钢索接头A	TIE-IN A, CONTROL CABLE	2					
2	F15-00000012	夹簧 ⌀1.8	COLLET ⌀1.8	3					
3	F60-05000012	油门执行器主动滑轮	PULLEY DRIVE	1					
4	F60-05000014-2	油门执行器螺钉B	BOLT B, PULLEY DRIVE	1					
5	F15-00000009	波形垫圈	WAVE WASHER	2					
6	F60-05000015	油门执行器垫圈	WASHER, PULLEY DRIVE	2					
7	F60-05000013	油门执行器扭簧	TROSIONAL SPRING	1					
8	GB/T96-6	大垫圈 6	BIG WASHER 6	2					
9	T15-04040005	触发线圈接头	TIE-IN	1					
10	GB/T6170-M5	六角螺母M5	NUT M5	1					
11	F60-05000020	油门连杆	ACCELEROGRAPH CONNECTING ROD	1					
12	F15-07130314W	阻风门接头	TIE-IN, CHOKE	1					
13	F60-05000018	执行器滑轮	PULLEY	1					
14	F60-05000017	油门执行器从动滑轮	CHAIN WHEEL, DRIVEN	1					
15	F60-05000014-1	油门执行器螺钉A	BOLT A, PULLEY DRIVE	1					
16	T85-00010010	油门滑轮	PULLEY ，ACCELEROGRAPH	1					
17	F60-00000008	油门摆杆座	BRACKET ，ACCELEROGRAPH	1					
18	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	4					
19	GB/T97.1-6	平垫圈6	WASHER 6	5					
20	T85-00010008	尼龙垫圈	WASHER, NYLON	1					
21	F60-00000300	油门摆杆组件	ACCELEROGRAPH BAR ASSY	1					
22	F60-00000006	微动开关摇臂	ROCKER, INCHING SWITCH	1					
23	GB/T5783-M5x14	六角螺栓 M5x14	BOLT M5x14	1					
24	GB/T97.1-5	平垫圈5	WASHER 5	1					
25	GB/T848-10	小垫圈10	SMALL WASHER 10	1					
26	F60-00000205	变档衬套	BUSH, SHIFT GEAR	2					
27	F60-00000204	变档支座	BRACKET, SHIFT ROD	1					
28	T20-03000006	变档凸轮柱塞	PLUNGER, SHIFT CAM	1					
29	T60-00010003	柱塞弹簧	SPRING PLUNGER	1					
30	F60-00000009	变档柱塞螺母	NUT, PLUNGER	1					
31	GB/T91- Ø2x16	开口销Ø2x16	PIN Ø2x16	2					
32	F60-00000200	变档连杆组件	CONNECTING LEVER ASSY, SHIFT ROD	1					
33	T20-06000037W	微动开关	INCHING SWITCH	1					BW
34	F60-00000007	微动开关固定架	RETAINING PLATE, INCHING SWITCH	1					

Disassembling and Check

1. Remove the rubber plug, corrugated rubber sleeve and throttle cable sheath. Remove the ignition line assembly.

2. Remove the bolts securing the small cover plate of the bottom cover, remove the small cover plate of the bottom cover, and remove the square rubber sealing strip. Remove the opening stop plate and the rectangular rubber plug.

3. Remove the top cover locking handle screw, remove the top cover locking handle and the top cover locking block.

4. Remove the top cover locking handle nylon sleeve A and top cover locking handle nylon sleeve B.

5. Remove corrugated washer.

6. Remove the control cable connector A and remove the bolts of the throttle swing rod seat.

7. Remove the throttle swing rod seat and remove the cotter pin on the throttle swing rod assembly.

8. Remove the shift support, remove the shift linkage assembly, and remove the brake rocker.

9. Check the top cover for cracks, damage or wear. Replace it if necessary.

10. Check the top cover locking handle and the top cover locking block for cracking or damage. Replace it if necessary.

11. Check the corrugated washer and lock handle nylon sleeve A for cracks or damage. Replace it if necessary.

12. Check the throttle swing rod seat and throttle swing for cracks or damage. Replace it if necessary.

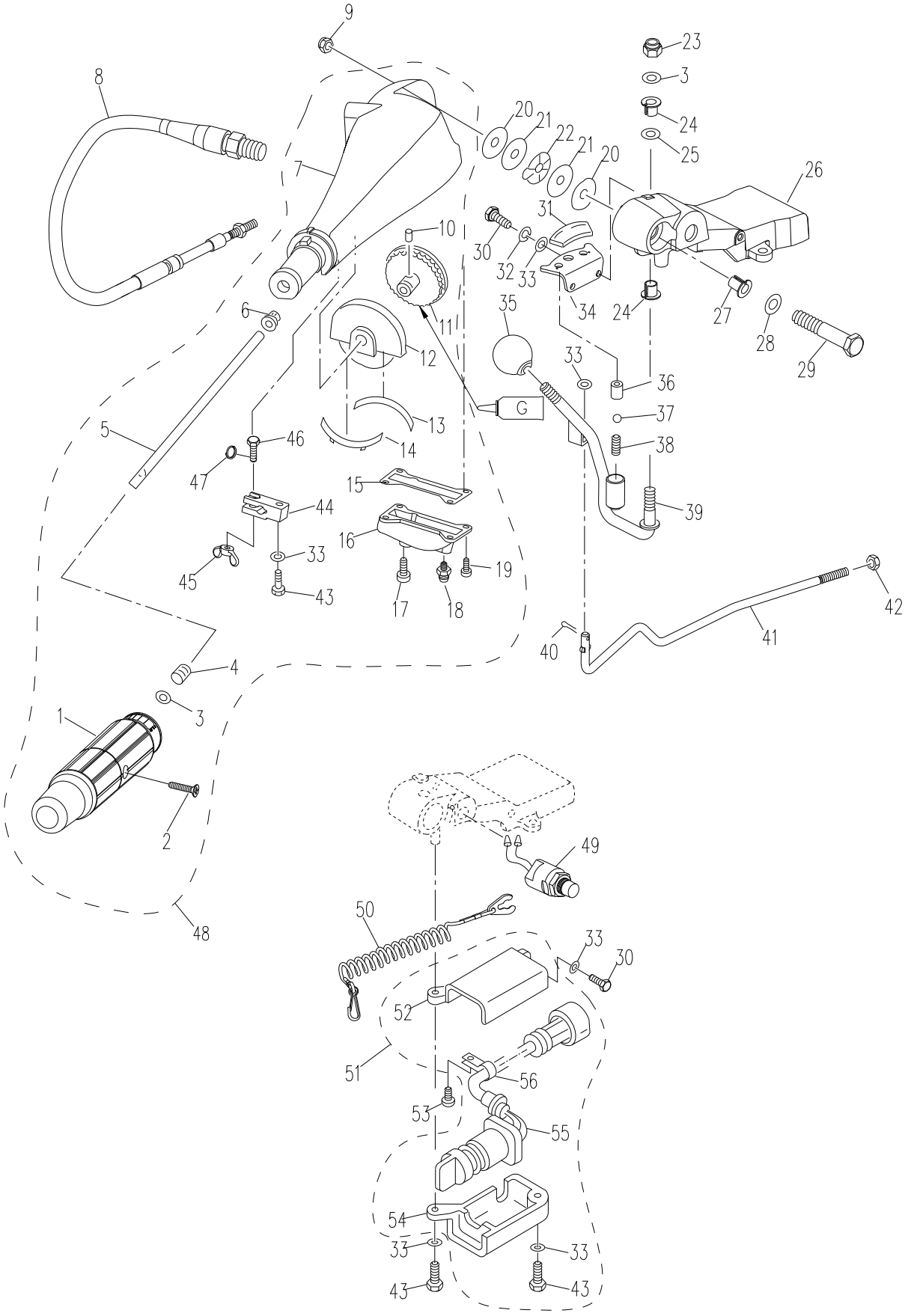
13. Check the shift linkage assembly for bending deformation or damage. Replace it if necessary.

14. Check whether the shift cam plunger in the shift support slides flexibly. Replace it if necessary.

15. For back-operation models, check whether the rocker of the micro switch is worn. Check micro switch conductivity. Replace it if necessary.

Steering Handle

Decomposition Schematic Diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F4-01090300	操舵手柄塑胶套组件	STEERING HANDLE ASSY	1					
2	GB/T820-M5x25	十字槽半沉头螺钉 M5x25	SCREW M5x25	1					
3	GB/T848-10	小垫圈 10	WASHER 10	2					
4	F4-01090007	压缩弹簧	SPRING, COMPRESION	1					
5	T60-01030101	节气门杆芯轴	THROTTLE LEVER	1					
6	F4-01090006	衬套	BUSH	1					
7	T60-01030001	操舵手柄	HANDLE, STEERING	1					
8	F60-01030100	油门推拉索组件	THROTTLE CABLE ASSY	1					
9	GB/T889.2-M12x1.25	非金属嵌件六角锁紧螺母 M12x1.25	NUT, SELF-LOCKING M12x1.25	1					
10	GB/T879.4- Φ3x16	标准型卷制弹性圆柱销 Φ3x16	PIN Φ3x16	1					
11	T85-01030102	节气门杆齿轮组件	GEAR ASSY, THROTTLE LEVER	1					
12	T85-01030002	齿轮盖板	HOUSING, GEAR	1					
13	T85-01030002-1	齿轮盖板嵌件 A	WEDGE A, HOUSING	1					
14	T60-01030002	齿轮盖板嵌件 B	WEDGE B, HOUSING	1					
15	T85-01030005	盖板密封垫	GASKET	1					
16	T60-01030003	节气门盖板	COVER, THROTTLE	1					
17	GB/T818-M6x6	十字槽盘头螺钉 M6x6	SCREW, PAN HEAD M6x6	1					
18	JB/T9740.1-M6	直通压注式油杯 M6	NOPPLE, GREASE	1					
19	GB/T818-M5x12	十字槽盘头螺钉 M5x12	SCREW, PAN HEAD M5x12	4					
20	T85-01030015	手柄减磨圈	ANTIFRICTION RING, HANDLE	2					
21	T85-01030016	手柄垫圈	WASHER, HANDLE	2					
22	T85-01030017	手柄波形垫圈	WAVE WASHER, HANDLE	1					
23	GB/T889.2-M10x1.25	非金属嵌件六角锁紧螺母 M10x1.25	SELF-LUCKING NUT M10x1.25	1					
24	T85-01030007	变档手柄尼龙衬套	BUSH, NYLON	2					
25	F25-01010009	尼龙垫圈	WASHER, NYLON	1					
26	T85-01030301	手柄托架	BARCKET	1					
27	T85-01030013	手柄托架尼龙衬套	BUSH	1					
28	GB/T97.1-12	平垫圈 12	WASHER 12	1					
29	T85-01030014	托架螺栓 M12x1.25x70	BOLT M12x1.25x70	1					
30	GB/T5783-M6x16	六角螺栓 M6x16	BOLT M6x16	3					
31	T85-01030012	档位标牌	INDICATOR, SHIFT	1					
32	GB/T93-6	弹性垫圈 6	WASHER, SPRING	2					
33	GB/T97.1-6	平垫圈 6	WASHER 6	7					
34	T85-01030011	变档档位板	CAM PLATE, HANDLE	1					
35	JB/T7271.1-M10x32	手柄球 M10x32	BALL M10x32	1					
36	T85-01030010	变档弹簧导向套	GUIDE SLEEVE, SPRING	1					
37	GB/T308-12	钢珠 12	BALL 12	1					
38	T85-01030009	变档手柄弹簧	SPRING	1					
39	T85-01030500	变档手柄组件	HANDLE ASSY, GEAR SHIFT	1					
40	GB/T91- Φ2x12	开口销 Φ2x12	PIN Φ2x12	1					
41	F60-01030019	变档连接杆	CONNECTING ROD	1					
42	10-32-UNF-2B	六角螺母 10-32-UNF-2B	NUT 10-32-UNF-2B	1					
43	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	3					

Continued

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
44	T85-01030003	握把摩擦块	FRICTION	1					
45	GB62-M6	蝶形螺母 M6	NUT, WING	1					
46	T85-01030008	六角带孔螺栓 M6X25	BOLT M6X25	1					
47	F4-04120106	钢丝锁圈	EYELET, STEEL WIRE	1					
48	F60-01030000	操舵手柄组件	HANDLE, STEERING ASSY	1					
49	T15-01020003	急停开关组件	STOPER, HANG ROPE ASSY	1					
50	F4-01090401	引擎停止安全索	ENGINE STOP SWITCH ASSY	1					
51	F60-01000100BW	启动开关总成	START SWITCH ASSY	1					
52	T85-01010701BW	启动开关上盖	UPPER COVER, START SWITCH	1					
53	GB/T818-M6x10	十字槽盘头螺钉 M6x10	SCREW, PAN HEAD M6x10	1					
54	T85-01010702BW	启动开关下盖	LOWER COVER, START SWITCH	1					
55	F60-01000101BW	启动开关	START SWITCH	1					
56	T85-01010705BW	导线线卡 B	WIRE CLIP B	1					

Disassembling and Check

1. Remove the handle bracket, remove the shift handle and remove the Steering handle.

2. Remove the throttle cable assembly.

3. Remove the cotter pin and remove the resistance adjustment knob.

4. Remove the throttle grip.

5. Remove the throttle cover and throttle lever.

6. Remove the engine emergency stop switch.

7. Check the steel ball 12 on the shift handle assembly and the shift handle spring for wear, fracture and sticking. Replace it if necessary.

8. Check the Steering handle for cracks or damage. Replace it if necessary.

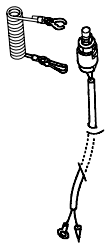
9. Check the handle anti-wear ring and waveform washer for cracks or damage. Replace it if necessary.

10. Check the cable in the throttle cable assembly for wear or fracture. Replace it if necessary.

11. Check the teeth on the throttle lever gear assembly for wear or missing. If yes, replace it.

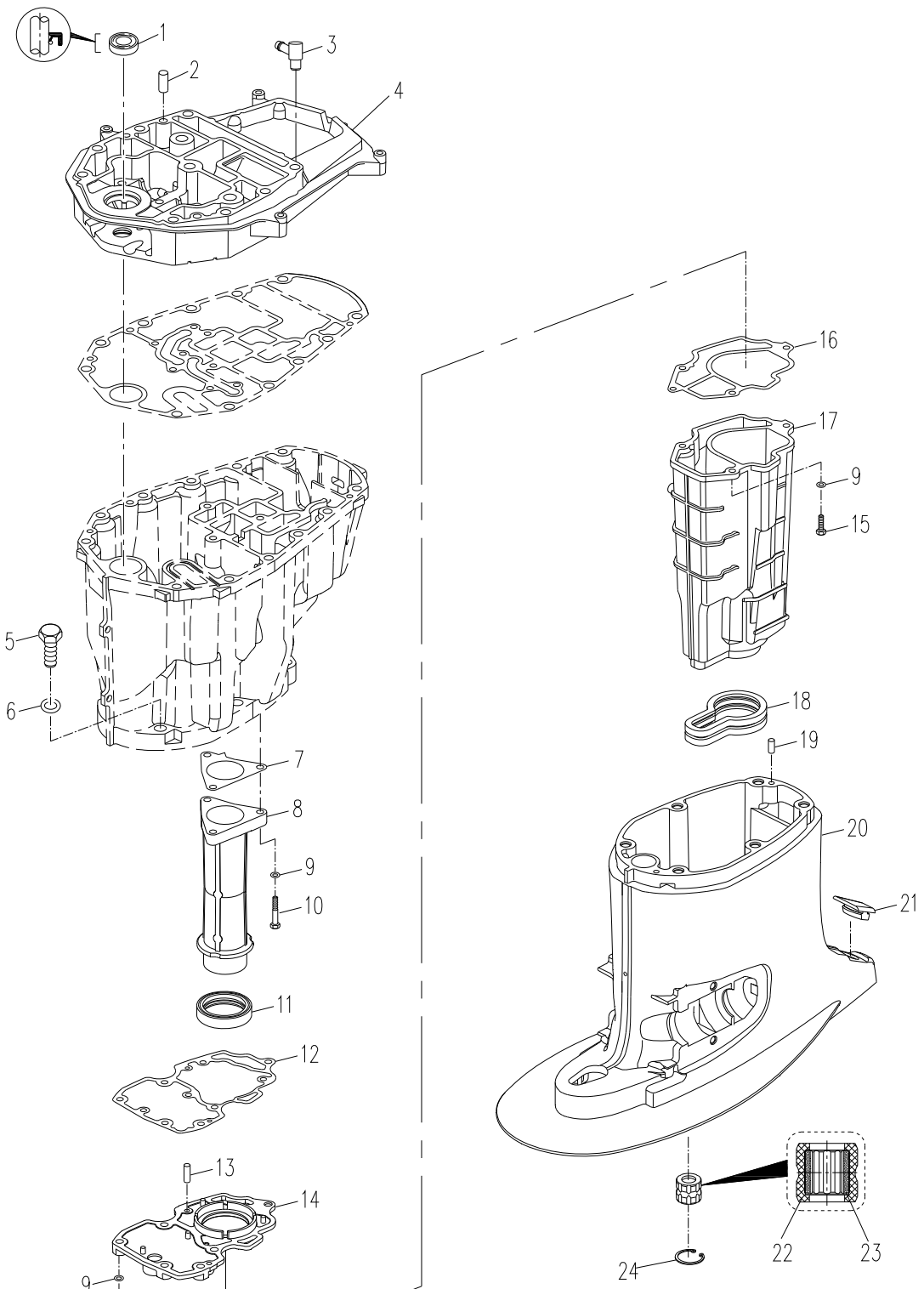
12. Check the conductivity of the engine emergency stop switch; If it does not conform to the regulations, replace it.

Remove locking plate: Conductive
Install locking plate: Not conductive
Press the switch button: Conductive

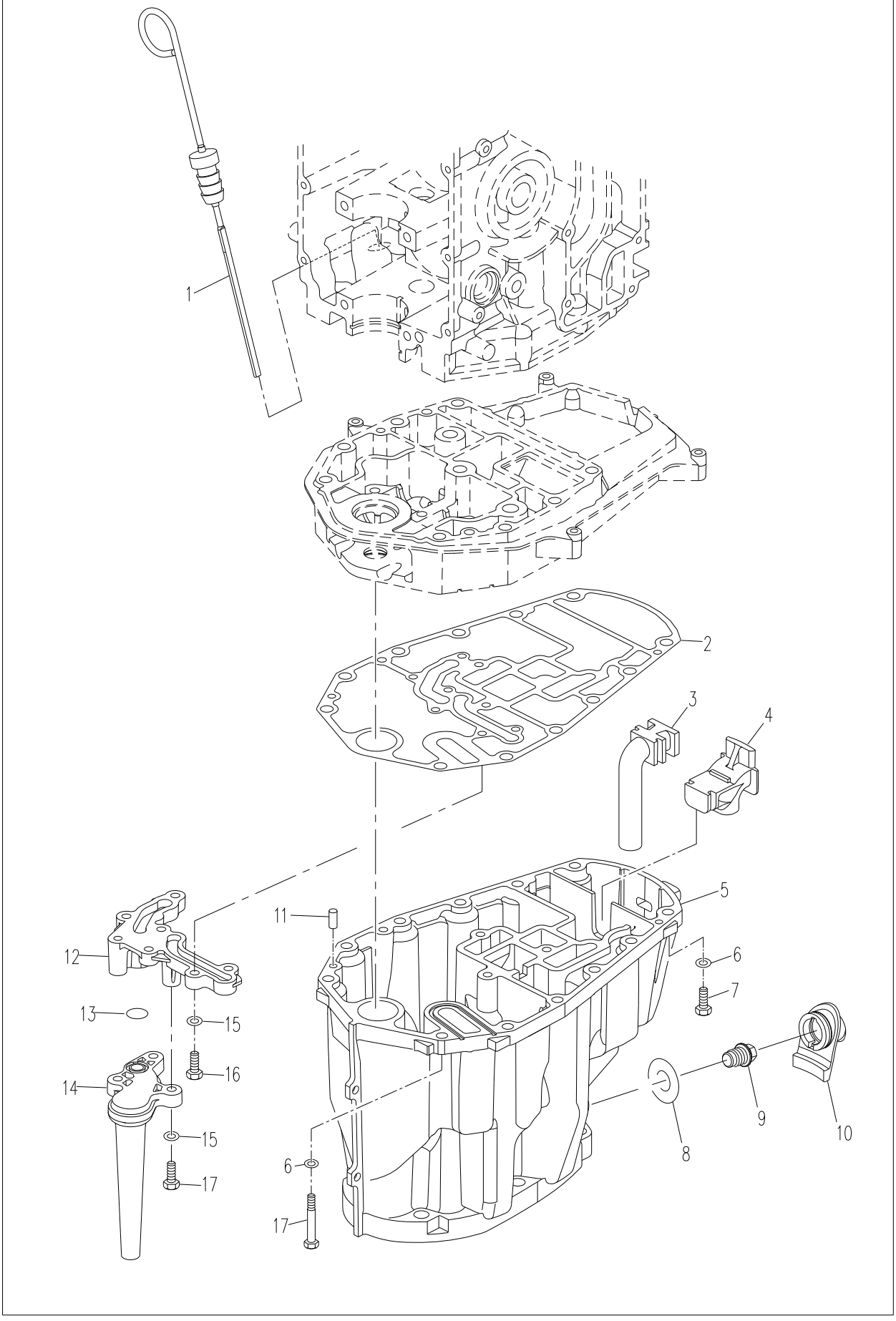


Upper casing unit and Brackets

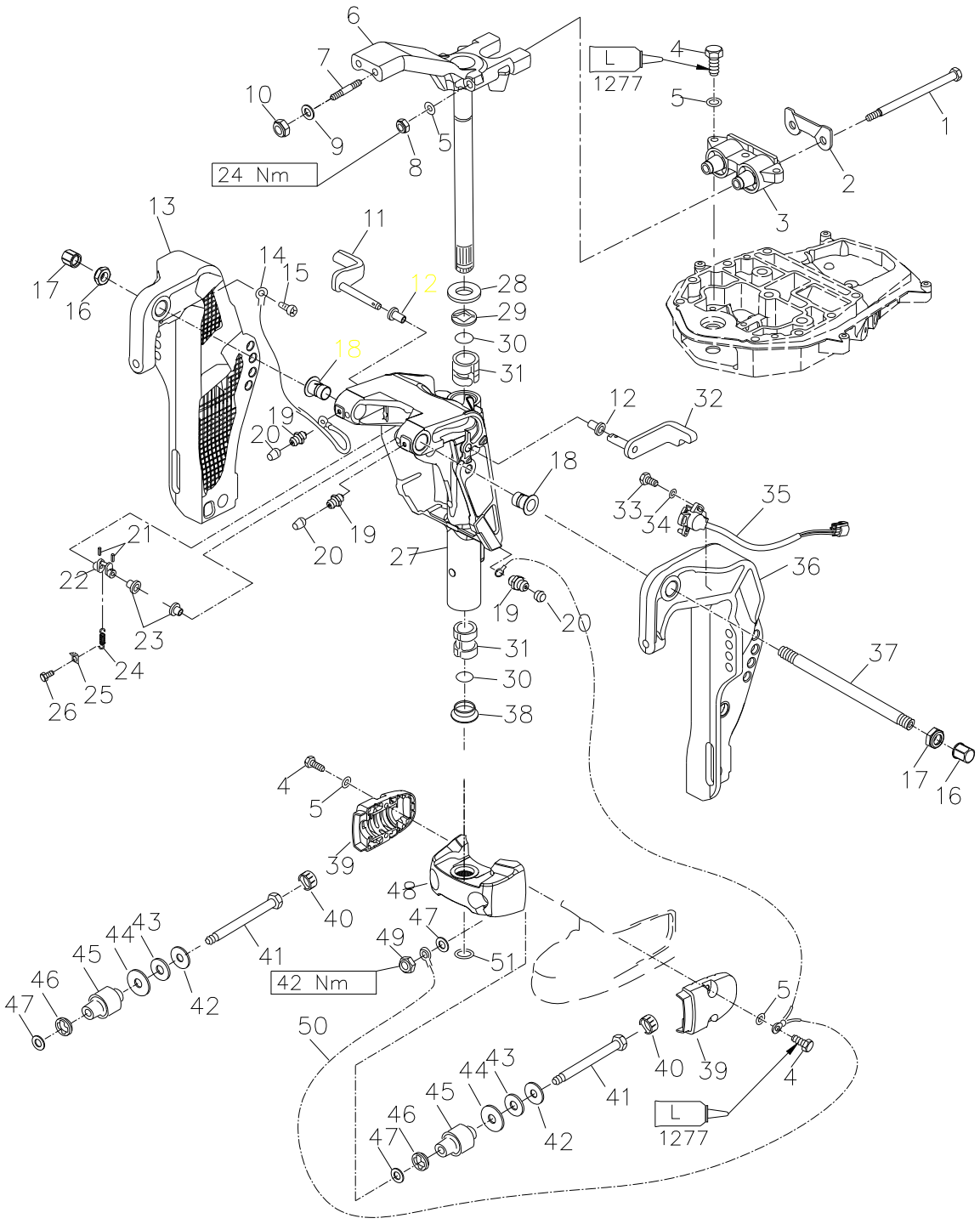
Decomposition Schematic Diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F60-02010002	排气歧管座油封 18x32x9	OIL SEAL 18x32x9	1					
2	F25-00000014	定位销 ⌀8x12	PIN ⌀8x12	2					
3	F15-04000005	水嘴	WATER NOZZLE	1					
4	F60-02010001	排气歧管座	SEAT, OUTLET MANIFOLD	1					
5	T85-00000012	六角螺栓 M10x1.25x45	BOLT M10x1.25x45	6					
6	GB/T97.1-10	平垫圈 10	WASHER 10	6					
7	F60-02010013	排气导管密封垫	GASKET, EXHAUST PIPE	1					
8	F60-02010007	排气导管	EXHAUST PIPE	1					
9	GB/T97.1-6	平垫圈 6	WASHER 6	9					
10	GB/T5782-M6x65	六角螺栓 M6x65	BOLT M6x65	3					
11	F60-02010012	排气管密封圈	RUBBER RING, EXHAUST PIPE	1					
12	F60-02010008	排气隔板上密封垫	UPPER GASKET, CLAPBOARD	1					
13	F25-04000007	定位销 ⌀4x10	PIN ⌀4x10	2					
14	F60-02010009	排气隔板	CLAPBOARD, EXHAUST	1					
15	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	6					
16	F60-02010010	排气隔板下密封垫	LOWER GASKET, CLAPBOARD	1					
17	F60-02010011	排气歧管	OUTLET MANIFOLD	1					
18	F60-02000008	排气歧管密封圈	RUBBER RING, OUTLET MANIFOLD	1					
19	F15-00000006	定位销 ⌀6x12	PIN ⌀6x12	2					
20	F60-02000001	水上装置壳体	UPPER CASING	1					
21	F40-00000002	水上装置橡胶堵塞	RUBBER PLUG, UPPER CASING	1					
22	T36-02000006	驱动轴衬套橡胶套	RUBBER BUSHING	1					
23	F60-02000003	驱动轴衬套	BUSHING, DRIVE SHAFT	1					
24	GB/T893.1-36	A 型孔用弹性挡圈 36	CIRCLIP 36	1					


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
6
17

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F60-05000021	机油尺	OIL LEVEL	1					
2	F60-02010003	排气歧管座垫	GASKET, OUTLET MANIFOLD	1					
3	F60-02000005	橡胶导管 A	RUBBER GUIDE A	1					
4	F60-02000006	橡胶导管 B	RUBBER GUIDE B	1					
5	F60-02010006	油底壳	OIL PAN	1					
6	GB/T97.1-8	平垫圈 8	WASHER 8	12					
7	GB/T5783-M8x30	六角螺栓 M8x30	BOLT M8x30	4					
8	F15-04000003	放油螺塞垫片	WASHER, BOLT	1					
9	F15-04000002	放油螺塞	BOLT, OIL DRAIN	1					
10	F60-02000009A	放油口胶套	JACKET, OIL DRAIN	1					
11	F15-00000006	定位销 ⌀6x12	PIN ⌀6x12	2					
12	F60-02010004	粗滤器支架	BRACKET, COARSE STRAINER	1					
13	JASO F404 24-012	O 形圈 12.5x2.4	O-RING 12.5x2.4	1					
14	F60-02010005	粗滤器组件	COARSE STRAINER ASSY	1					
15	GB/T97.1-6	平垫圈 6	WASHER 6	9					
16	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	9					
17	GB/T5782-M8x80	六角螺栓 M8x80	BOLT M8x80	8					


6
7
10
9
8
5
24 Nm
L
1277
4
5
1
2
3
13
11
14
15
17
16
12
28
29
30
31
18
19
20
12
32
18
33
34
35
36
37
17
16
21
22
23
24
25
26
19
20
27
19
20
31
30
38
4
5
39
48
40
47
49
51
41
42 Nm
43
44
45
46
47
42
50
5
40
39
4
43
44
45
46
47
42
41
L
1277

S.N. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	F60-02000011	长螺栓	LONG BOLT	2					
2	F60-02000010	减震器垫板	PLATE, ABSORBER	1					
3	F60-02020000	双孔减震器组件	SHOCK ABSORBER ASSY, DOUBLE HOLE	1					
4	GB/T5783-M8x30	六角螺栓 M8x30	BOLT M8x30	7					
5	GB/T97.1-8	平垫圈 8	WASHER 8	9					
6	F60-01020000	操舵托架组件	BRACKET ASSY	1					
7	T85-01020008	双头螺栓 M10x1.25x28	BOLT M10x1.25x28	2					
8	GB/T889.1-M8x1.25	Ⅰ型非金属嵌件六角锁紧螺母 M8x1.25	LOCK NUT M8x1.25	2					
9	GB/T97.1-10	平垫圈 10	WASHER 10	2					
10	GB/T889.2-M10x1.25	Ⅰ型非金属嵌件六角锁紧螺母M10x1.25	LOCKNUT M10x1.25	2					
11	F60-01010104	支撑架组件 B	SUPPORTING ASSY B	1					
12	T85-01010203	支撑架尼龙衬套	BUSH, NYLON	2					
13	F60-01010002	夹紧托架（右）	BRACKET, CLAMP(RIGHT)	1					
14	T85-01010003	接地钢索 A	WIRE, LEAD A	1					
15	GB/T818-M6x10	十字槽盘头螺钉 M6x10	SCREW M6x10	1					
16	F15-01010007	托架夹紧 螺母	NUT	2					
17	F25-01010011	塑料装饰 螺母	PLASTIC NUT	2					
18	F60-01010004	螺管尼龙衬套	BUSH, NYLON	2					
19	JB/T7940.1-M6	直通式压注油杯 M6	NIPPLE, GREASE	3					
20	T85-01010210	油杯胶帽	CAP, GREASE NIPPLE	3					
21	GB/T879.2-3x16	轻型直槽弹性圆柱销 3x16	PIN, SPRING	2					
22	T85-01010206	支撑架摆杆组件	COLLAR, DISTANCE	1					
23	F60-01010103	支撑架尼龙衬套	BUSH, NYLON	2					
24	T85-01010207	摆杆拉簧	SPRING	1					
25	T85-01010208	拉簧支架	PLATE	1					
26	GB/T5783-M6x10	六角螺栓 M6x10	BOLT M6x10	1					
27	F60-01010101	旋转支架	BRACKET	1					
28	T85-01020002	旋转支架上垫圈	WASHER	1					
29	T85-01020003	旋转支架上衬套	BUSH	1					
30	T85-01020004	旋转支架 O 形圈	O-RING	2					
31	T85-01020005	旋转支架衬套	BUSH	2					
32	F60-01010102	支撑架组件 A	SUPPORTING ASSY A	1					
33	GB/T5783-M6x20	六角螺栓 M6x20	BOLT M6x20	2					
34	GB/T97.1-6	平垫圈 6	WASHER 6	2					
35	F60-01010200	起翘传感器组件	RAISE SENSOR ASSY	1					
36	F60-01010001	夹紧托架（左）	BRACKET, CLAMP(LEFT)	1					
37	F60-01010003A	夹紧托架双头螺管	DOUBLE-EDGED TUBE	1					
38	T85-01020006	旋转支架下衬套	BUSH	1					
39	F60-00000005	减震器外盖	COVER, ABSORBER	2					
40	F60-00000004	螺母护盖	NUT COVER	2					
41	F60-00000001	减震器螺钉	BOLT, ABSORBER	2					
42	T85-00000002	螺栓垫圈 A	WASHER A	2					
43	T36-02020003	橡胶垫片	RUBBER WASHER	2					

Continued

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
44	F60-00000003	减震器垫板	WASHER, ABSORBER	2					
45	F60-00000100	左右减震器组件	ABSORBER ASSY(LEFT, RIGHT)	2					
46	F60-00000002	橡胶垫圈	RUBBER WASHER	2					
47	T85-00000020	减震器垫圈	WASHER	4					
48	F60-01000001	减震器固定块	ABSORBER BLOCK	1					
49	GB/T6170-M12x1.25	六角螺母 M12x1.25	NUT M12x1.25	2					
50	F60-02000002	接地钢索	WIRE, LEAD	1					
51	T85-01020010	卡圈	CIRCLIP	1					

Disassembling and Check of Bracket

1. Remove the outer cover of the left and right absorbers, remove the left and right absorbers and the retaining nuts of the double-hole absorbers.

2. Remove the water unit, oil pan and outlet manifold socket completely from the bracket

3. Remove the bracket clamp nut and clamp the bracket double-headed screw tube.

4. Disconnect the ground cable A and remove clamping bracket.

5. Remove support frame assembly A & B, remove the nylon bushing.

6. Remove fixed block limit circlip of the absorber, remove fixed block of the absorber.

Attention:
The absorber fixed block and the steering bracket assembly are splined and tightly connected. Please be careful when disassembling and installing it.
Avoid accidental injuries; Do not disassemble unless necessary.

7. Pull out the steering bracket assembly and remove the liner, bushing and O-ring.

8. Check the rotary bracket and clamping bracket for cracks or damage. Replace it if necessary.

9. Check the bushing and liner; If damaged or cracked, replace it.

10. Check the support frame assembly A&B for deformation or damage. Replace it if necessary.

11. Check the rubber of the left and right absorbers for aging, cracking or degumming. Replace it if necessary.

Disassembling and Check of Water Unit

1. Drain the oil.

2. Remove the mounting bolts on and under the water, and remove the water unit.

3. Remove outlet manifold socket, remove the oil pan.

4. Remove coarse filter assembly and coarse filter support from the outlet manifold seat.

5. Remove the exhaust pipe, oil drain screw, oil drain rubber sleeve and rubber conduit A&B and the outlet manifold from the oil pan

6. Remove the exhaust partition and exhaust duct from the oil pan.

7. Remove the double-hole absorber, exhaust partition, round rubber ring for water pipe and the water pipe.

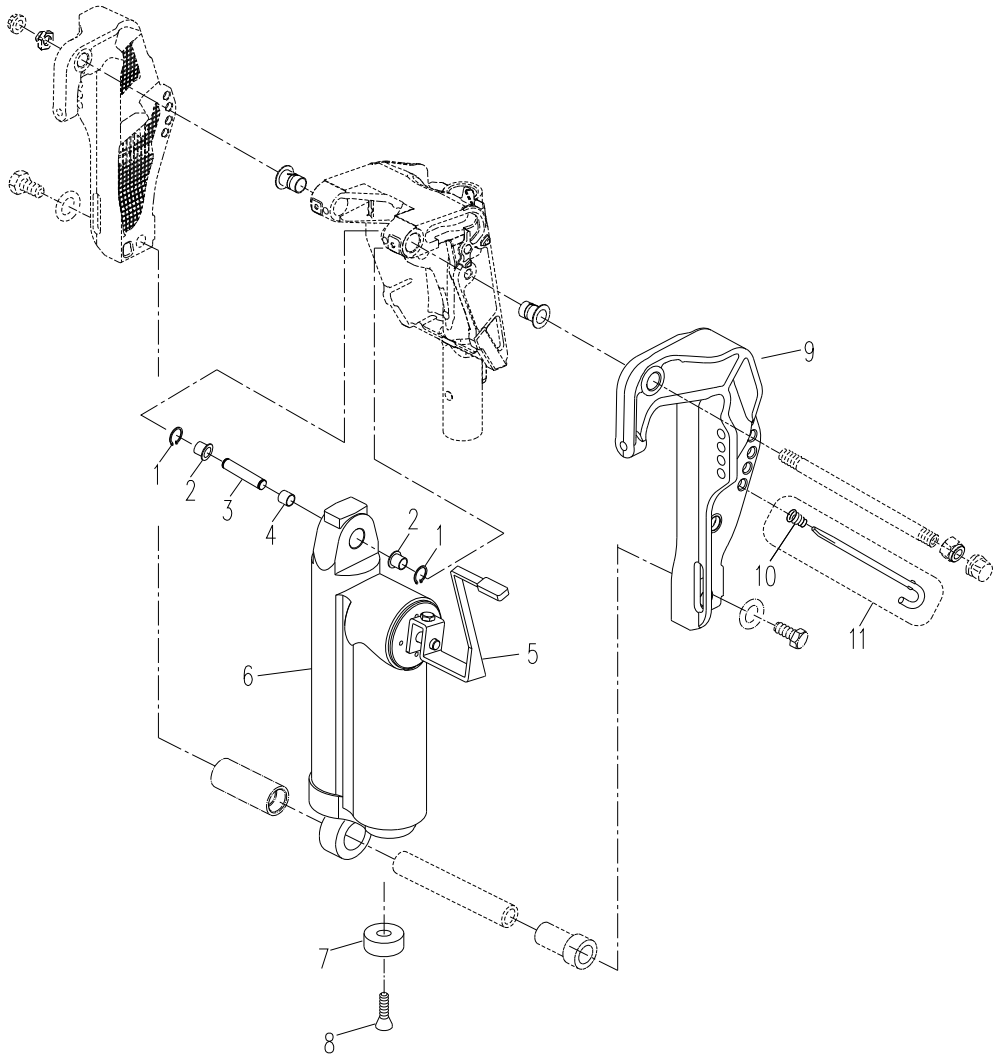
8. Check the water unit casing and oil pan for cracks or damage. Replace it if necessary.

9. Check the exhaust partition for damage or cracks. Replace it if necessary.

10. Check the exhaust duct and manifold for cracks or damage. Replace it if necessary.

11. Check the exhaust duct sealing ring and the outlet manifold sealing ring for aging or cracking. Replace it if necessary.

Manual Tilting Device
Disassembly Schematic Diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T894.1-16	轴用弹性挡圈 16	CIRCLIP 16	2					
2	T60-01010005	销轴衬套 B	BUSH B	2					
3	T60-01010006	起翘销轴	PIN UPPER SHOCK MOUNT	1					
4	T60-01010004	销轴衬套 A	BUSH A	1					
5	T60-01020001D	氮气缸手柄	HANDEL	1					
6	T60-01020000	手动气缸组件	TRIM & TILT ASSY	1					
7	F40-00000006D	气缸阳极	ANODE	1					
8	GB/T820-M6x25	十字槽半沉头螺钉 M6x25	SCREW M6x25	1					
9	T60-01010101	夹紧托架（左）	BRACKET, CLAMP(LEFT)	1					
10	T85-01010403	锥形弹簧	CONICAL SPRING	1					
11	T85-01010400	角度限位杆组件	LIMITATIVE ROD ASSY	1					

Disassembling

1. Fully tilt the outboard motor upwards and lower the support frame to support the outboard motor.

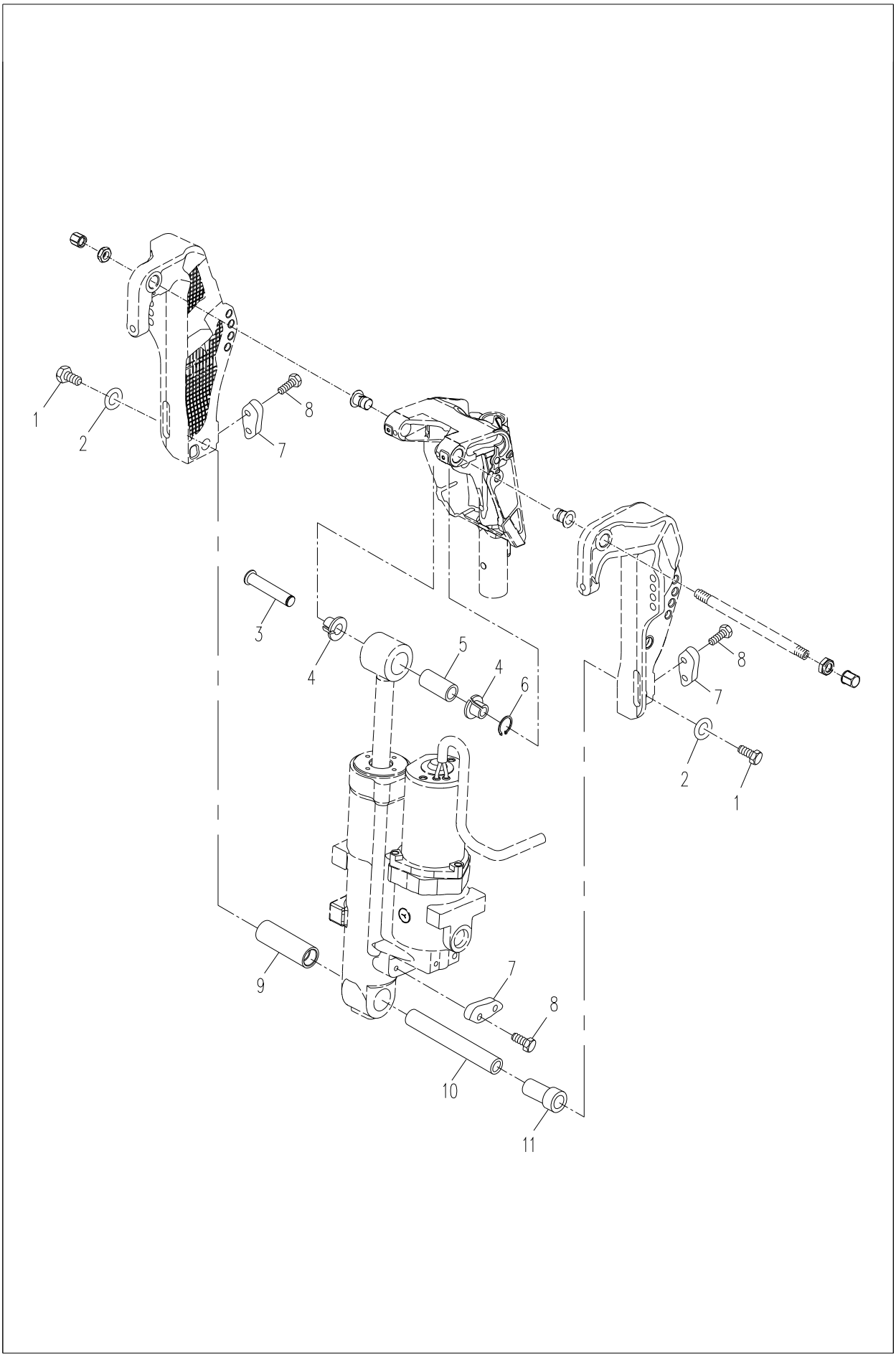
2. Remove the steel wire retaining ring for the shaft and remove the tilting pin shaft.

3. Remove the bolt and remove the hydraulic tilting positioning shaft.

4. Removing the manual cylinder assembly

Hydraulic Tilting Device

Disassembly Schematic Diagram



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5785-M10x1.25x30	六角螺栓 M10x1.25x30	BOLT M10x1.25x30	2					
2	F60-00000015	厚垫圈 10	THICK WASHER 10	2					
3	T85-00000016	起翘销轴	PIN UPPER SHOCK MOUNT	1					
4	T85-00000017	销轴衬套 A	BUSH A	2					
5	T85-01010007	手动气缸衬套	BUSH	1					
6	GB/T894.1-18	轴用弹性挡圈 18	CIRCLIP 18	1					
7	E10-01010008	起翘机构阳极	ANODE	3					
8	GB/T5783-M6x25	六角螺栓 M6x25	BOLT M6x25	6					
9	F60-00000012	定位轴衬套 A	BUSH A	1					
10	F60-00000011	液压起翘定位轴	SHAFT	1					
11	F60-00000013	定位轴衬套 B	BUSH B	1					

Disassembling

1. Fully tilt the outboard motor upwards and lower the support frame to support the outboard motor.

2. Remove the steel wire retaining ring for the shaft and remove the tilting pin shaft.

3. Remove the bolt and remove the hydraulic tilting positioning shaft.

4. Remove the hydraulic tilting assembly.

Oil Level Check

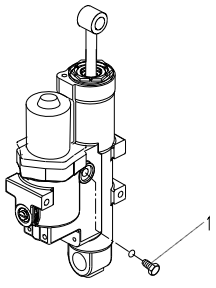
1. Position and secure the hydraulic tilting device vertically.

2. Connect the tilting motor wire of the hydraulic tilting device to the battery.

3. Extend the push rod completely, remove the oil screw and observe the oil level.

Note:

The liquid level should be at the edge of the oil hole,



1. Oil drain screw

4. If necessary, add oil to the edge of the oil hole.

5. Install and tighten the oil drain screw.
   Specified torque: 6.5 Nm

Discharge Air from Oil Circuit of the Hydraulic Tilting Device

After adding oil, discharge the excess air in the oil.

1. . Connect the tilting motor wire of the hydraulic tilting device to the battery.

2. Extend the push rod completely.

3. Change the positive and negative wire connections.

4. Compress the push rod completely.

5. Repeat steps 1 to 4 to move the push rod up and down for 4 to 5 times.

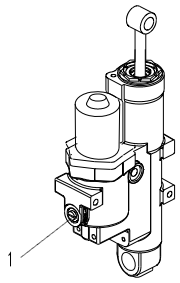
6. Extend the push rod completely, remove the oil screw and observe the oil level.

7. If necessary, repeat the above steps until the oil level is correct.

8. Install and tighten the oil drain screw.
   Specified torque: 6.5 Nm

If the hydraulic lifting device needs to be vented when installed on the outboard outboard motor, please follow the following steps.

1. Turn the hand control valve counterclockwise until it cannot turn.



1. Hand control valve

2. Tilt the outboard motor completely upward and then lower it downward by its own gravity. Repeat 4 ~ 5 times.

3. Turn the hand control valve clockwise until it cannot turn.

4. Wait for 5 minutes to stabilize the oil.

5. Press and hold the tilt switch until the outboard motor is fully tilted.

6. Wait for 5 minutes to stabilize the oil.

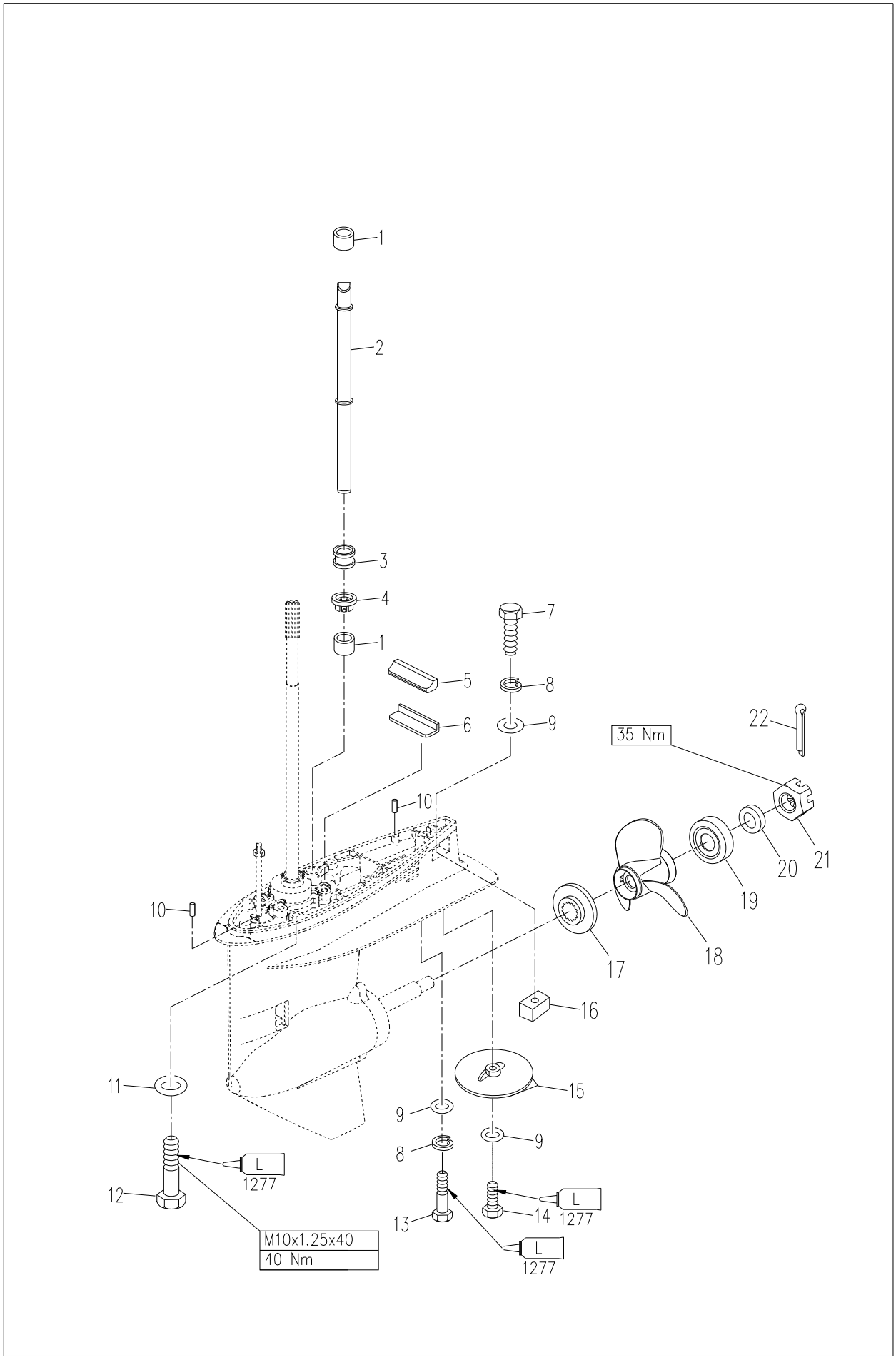
7. Remove the oil drain screw and observe the oil level.

8. If necessary, repeat the above steps until the oil level is correct.

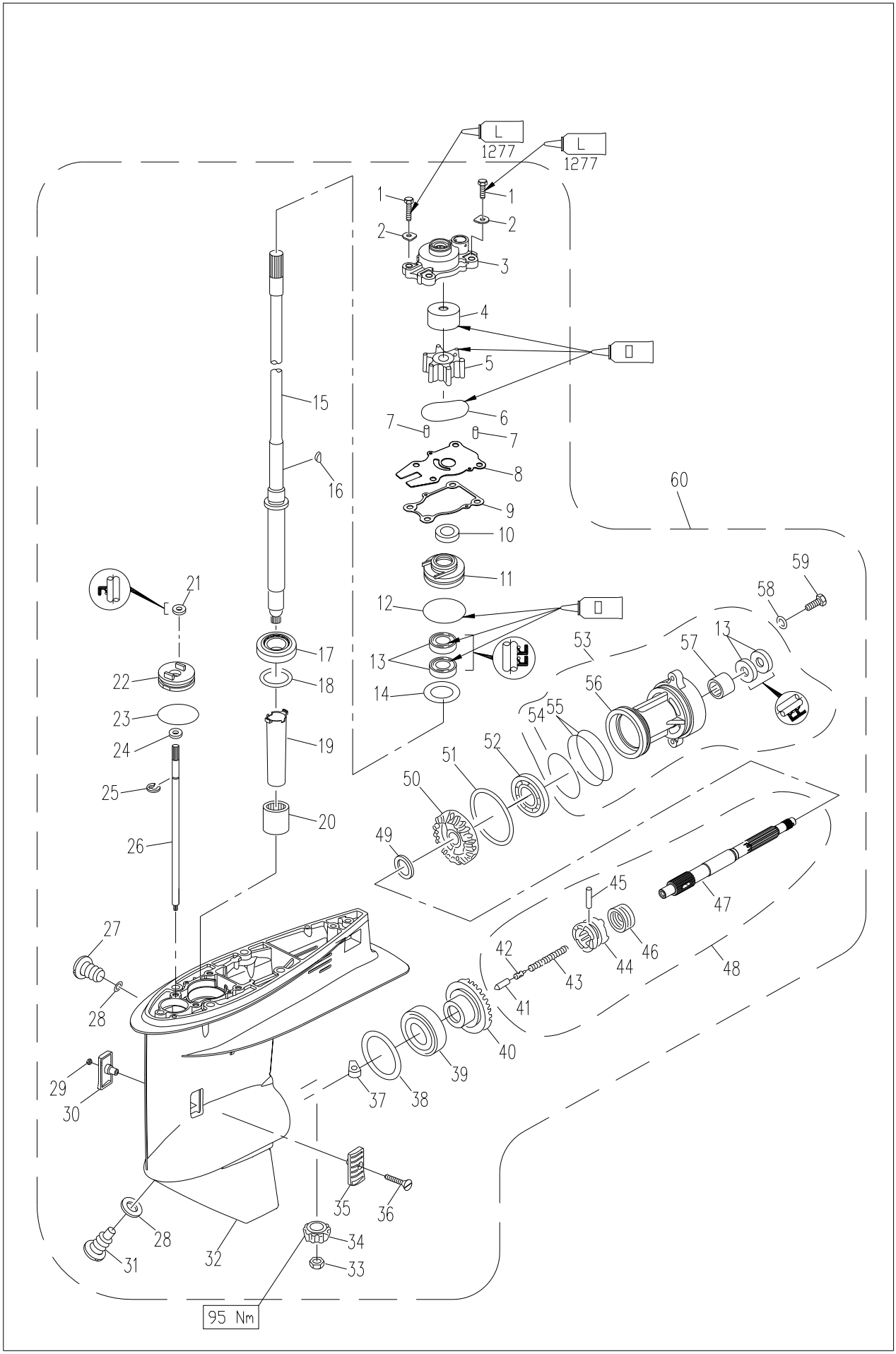
9. Install and tighten the oil drain screw.
   Specified torque: 6.5 Nm

Lower casing Part

Decomposition Schematic Diagram(D/T model)

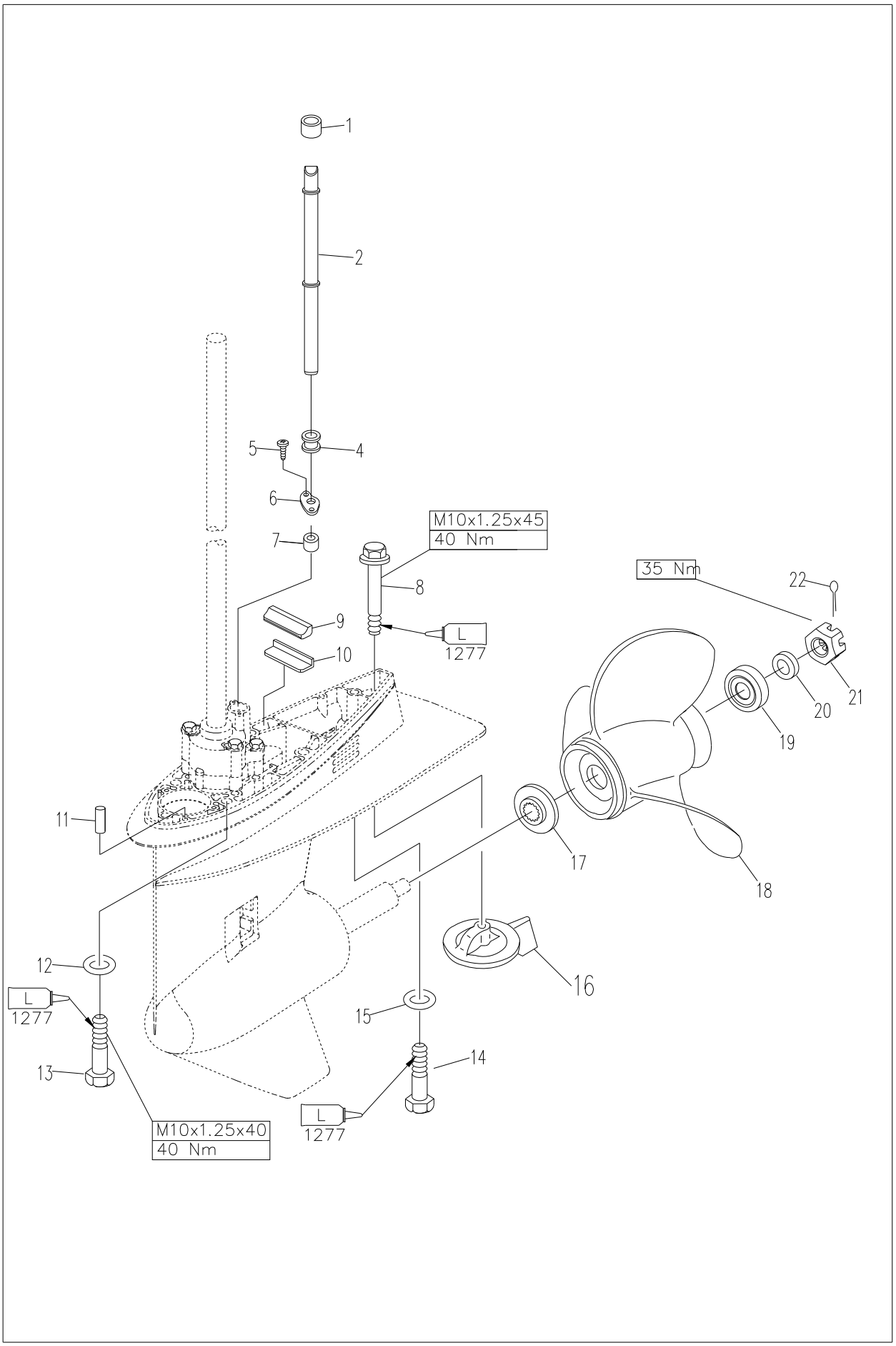


SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	T40-04000203	水管下密封圈	SEAL	2					
2	F60-02000007	水管	WATER PIPE	1					
3	T40-02000002	水管导向套	GUIDE BUSHING, WATER PIPE	1					
4	T40-04000204	水管尼龙导向套	NYLON BUSHING, WATER PIPE	1					
5	T40-04000014	水封	WATER ENVELOP	1					
6	T40-04000013	水封垫板	PLATE, WATER ENVELOP	1					
7	GB/T5782-M8x35	六角螺栓 M8x35	BOLT M8x35	1					
8	GB/T93-8	弹簧垫圈 8	SPRING-WASHER 8	2					
9	GB/T97.1-8	平垫圈 8	WASHER 8	3					
10	F15-00000006	定位销 φ6x12	DOWEL PIN φ6x12	2					
11	GB/T97.1-10	平垫圈 10	WASHER 10	4					
12	F40-02000010	六角螺栓 M10x1.25x40	BOLT M10x1.25x40	4					
13	GB/T5782-M8x65	六角螺栓 M8x65	BOLT M8x65	1					
14	GB/T5783-M8x25	六角螺栓 M8x25	BOLT M8x25	1					
15	T40-00000010	航向调整片	ANODE	1					
16	T40-00000009	水下阳极 A	ANODE A, LOWER CASING	1					
17	T40-04000018	螺旋桨垫块	SPACER, PROPELLER	1					
18	T40-04070000-13	螺旋桨体组件 3-11 1/8″x13″	PROPELLER ASSY 3-11 1/8″x13″	1					
	T40-04070000-12	螺旋桨体组件 3-11 3/8″x12″	PROPELLER ASSY 3-11 3/8″x12″						
	T40-04070000-11	螺旋桨体组件 3-11 5/8″x11″	PROPELLER ASSY 3-11 5/8″x11″						
19	T40-04000019	螺旋桨衬套 A	BUSH A, PROPELLER	1					
20	T40-04000020	螺旋桨衬套 B	BUSH B, PROPELLER	1					
21	T40-04000021	开槽六角螺母	NUT	1					
22	GB/T91-3.2x25	开口销 φ3.2x25	COTTER PIN φ3.2x25	1					


L
1277
L
1277
95 Nm

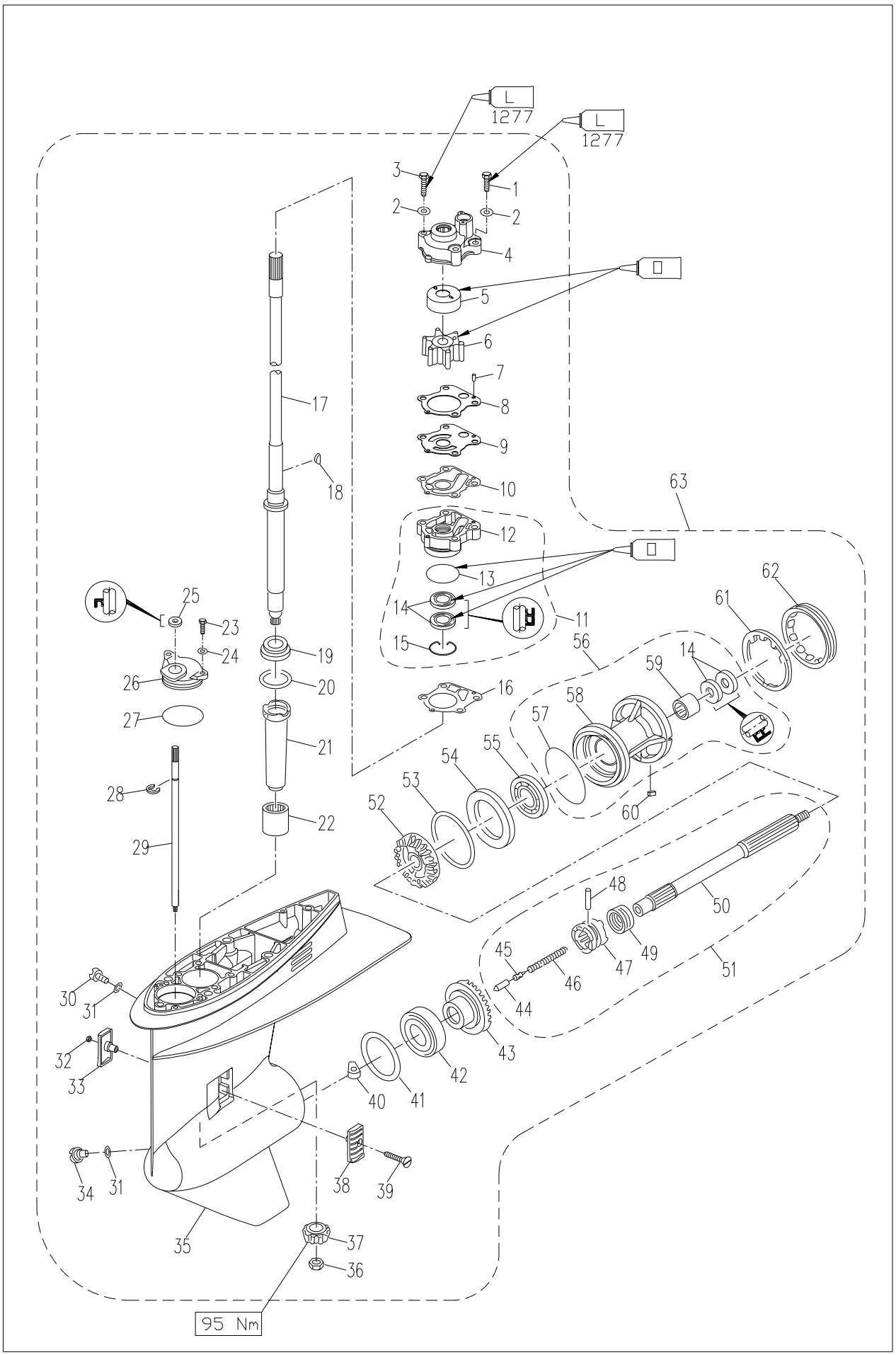
SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5783-M8x30	六角螺栓 M8x30	BOLT M8x30	4					
2	T40-04000012	水泵壳体压板	PLATE, WATER PUMP	4					
3	F60-04000401	水泵壳体	SHELL , WATER PUMP	1					
4	T40-04000202	水泵内壳	INNER SHELL, WATER PUMP	1					
5	F60-04000300	水泵叶轮组件	IMPELLER ASSY, WATER PUMP	1					
6	T40-04000205	壳体 O 形密封圈	O-RING	1					
7	F25-04000007	定位销 Φ4x10	DOWEL PIN Φ4x10	2					
8	F60-04000009	外挡板	OUTER PLATE	1					
9	T40-04000010	水泵座密封垫	GASKET , WATER PUMP	1					
10	F60-04000008	油封盖	COVER , OIL SEAL	1					
11	T40-04040001	油封壳体 A	CASING A, OIL SEAL	1					
12	JASO F404 24-50	油封壳体 A O 型密封圈	O-RING, CASING A	1					
13	F25-04010003	驱动轴油封 22x36x6	OIL SEAL 22x36x6	4					
14	T40-04000008	大垫圈	BIG WASHER	1					
15	F60-04010000	驱动轴组件	DRIVE SHAFT ASSY	1					
16	F25-04000015	半圆键	WOODRUFF KEY	1					
17	T40-04000027	驱动轴圆锥滚子轴承 32005	BEARING 32005	1					
18	T40-04000003	驱动轴填隙片	SHIM						
	T40-04000003-1	填隙片（ T＝0.10 毫米）	SHIM （T＝0.10mm ）						
	T40-04000003-2	填隙片（ T＝0.12 毫米）	SHIM （T＝0.12mm ）						
	T40-04000003-3	填隙片（ T＝0.15 毫米）	SHIM （T＝0.15mm ）						
	T40-04000003-4	填隙片（ T＝0.18 毫米）	SHIM （T＝0.18mm ）						
	T40-04000003-5	填隙片（ T＝0.30 毫米）	SHIM （T＝0.30mm ）						
	T40-04000003-6	填隙片（ T＝0.40 毫米）	SHIM （T＝0.40mm ）						
	T40-04000003-7	填隙片（ T＝0.50 毫米）	SHIM （T＝0.50mm ）						
19	T40-04000002	长尼龙套管	BUSHING, NYLON	1					
20	T40-04000026	滚针轴承 B 1416	BEARING B 1416	1					
21	T85-04000011	变档凸轮油封 9x19x5	OIL SEAL 9x19x5, CAM SHAFT	1					
22	F60-04000101	变档凸轮盖板	PLATE, CAM SHAFT	1					
23	JASO F404 31-035	O 型密封圈 34.4x3.1	O-RING 34.4x3.1	1					
24	JASO F404 19-007	O 型密封圈 6.8x1.9	O-RING 6.8x1.9	1					
25	GB/T896-8	开口挡圈 8	CIRCLIP 8	1					
26	F60-04000004	变档凸轮轴	CAMSHAFT	1					
27	F4-03000023	注油孔螺塞	PLUG, HOLE OIL	1					
28	F4-03000024	注油孔螺塞垫	GASKET	2					
29	GB/T889.1-M5	非金属嵌件 六角 锁紧 螺母 M5	LOCKING NUT M5	1					
30	T40-04000023	进水口 B	WATER INLET B	1					
31	F25-04000031	放油螺塞	PLUG, OIL RELEASE	1					
32	F60-04000001	水下装置壳体	LOWER CASING	1					
33	T40-04000006	小齿轮螺母 M12X1.25	NUT, PINION	1					
34	F60-04000002	小齿轮	PINION	1					
35	T40-04000022	进水口 A	WATER INLET A	1					
36	GB/T820-M5x30	十字槽半沉头螺钉 M5x30	SCREW, PAN HEAD M5x30	1					

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
37	F60-04000003	变档凸轮	CAM, SHIFT	1					
38	T40-04000004	正档齿轮填隙片	SHIM						
	T40-04000004-1	填隙片（ T＝0.10 毫米）	SHIM （T＝0.10mm ）						
	T40-04000004-2	填隙片（ T＝0.12 毫米）	SHIM （T＝0.12mm ）						
	T40-04000004-3	填隙片（ T＝0.15 毫米）	SHIM （T＝0.15mm ）						
	T40-04000004-4	填隙片（ T＝0.18 毫米）	SHIM （T＝0.18mm ）						
	T40-04000004-5	填隙片（ T＝0.30 毫米）	SHIM （T＝0.30mm ）						
	T40-04000004-6	填隙片（ T＝0.40 毫米）	SHIM （T＝0.40mm ）						
	T40-04000004-7	填隙片（ T＝0.50 毫米）	SHIM （T＝0.50mm ）						
39	KOYO H1-CAP 332/32	圆锥滚子轴承 332/32	ROLLER BEARING 332/32	1					
40	F60-04000600	正档齿轮组件	FORWARD GEAR ASSY	1					
41	F60-04020005	变档柱塞	PLUNGER, SHIFT	1					
42	T36-03000403	离合器垫块	SPACER, CLUTCH	1					
43	F60-04020002	离合器弹簧	SPRING, CLUTCH	1					
44	F60-04020003	爪型离合器	CLUTCH, DOG	1					
45	T40-04050004	离合器销 ⌀6.3x33	PIN, CLUTCH	1					
46	T40-04050005	离合器簧环	RING, CLUTCH	1					
47	F60-04020001	螺旋桨轴	SHAFT, PROPELLER	1					
48	F60-04020000	螺旋桨轴组件	PROPELLER SHAFT ASSY	1					
49	T40-04050007	倒档齿轮垫圈	WASHER, REVERSE GEAR	1					
50	F60-04000500	倒档齿轮	GEAR, REVERSE	1					
51	T40-04060005	倒档齿轮填隙片	SHIM						
	T40-04060005-1	填隙片（ T＝0.10 毫米）	SHIM （T＝0.10mm ）						
	T40-04060005-2	填隙片（ T＝0.12 毫米）	SHIM （T＝0.12mm ）						
	T40-04060005-3	填隙片（ T＝0.15 毫米）	SHIM （T＝0.15mm ）						
	T40-04060005-4	填隙片（ T＝0.18 毫米）	SHIM （T＝0.18mm ）						
	T40-04060005-5	填隙片（ T＝0.30 毫米）	SHIM （T＝0.30mm ）						
	T40-04060005-6	填隙片（ T＝0.40 毫米）	SHIM （T＝0.40mm ）						
	T40-04060005-7	填隙片（ T＝0.50 毫米）	SHIM （T＝0.50mm ）						
52	T40-04000025	深沟球轴承 6007	BALL BEARING 6007	1					
53	F60-04030000	水下装置壳体盖组件	COVER ASSY, LOWER CASING	1					
54	T40-04060002	水下装置壳体盖 O 型密封圈 A	O-RING A, COVER	1					
55	T40-04060003	水下装置壳体盖 O 型密封圈 B	O-RING B, COVER	2					
56	T40-04060001	水下装置壳体盖	COVER, LOWER CASING	1					
57	T40-04000028	滚针轴承 2220	QUILL BEARING	1					
58	GB/T97.1-8	平垫圈 8	WASHER 8	2					
59	GB/T5783-M8x25	六角螺栓 M8x25	BOLT, HEXAGON M8x25	2					
60	F60-04000000	水下装置组件	LOWER CASING ASSY	1					


1
2
4
5
6
7
M10x1.25x45
40 Nm
8
9
10
L
1277
35 Nm
22
21
20
19
18
17
16
11
12
L
1277
13
15
14
L
1277
M10x1.25x40
40 Nm

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	T40-04000203	水管下密封圈	SEAL	1					
2	F60-02000007BF	水管	WATER PIPE	1					
	T40-02000002	水管导向套	GUIDE BUSHING, WATER PIPE	1					
3									
4	T85-02000002	水管导向套	ORIENTED BUSHING, WATER PIPE	1					
5	GB/T845-ST4.2x14	十字槽盘头自攻螺钉 ST4.2x14	SCREW ST4.2x14	2					
6	T85-04000405	水管下导向套	LOWER BUSHING, WATER PIPE	1					
7	T85-04000404	水管下衬圈	SEAL, WATER PIPE	1					
8	T85-00000012	凸缘螺栓 M10x1.25x45	BOLT M10x1.25x45	1					
9	T85-04000013	水封	WATER ENVELOP	1					
10	T40-04000013	水封垫板	PLATE, WATER ENVELOP	1					
11	F15-00000006	定位销 φ6x12	DOWEL PIN φ6x12	2					
12	GB/T97.1-10	平垫圈 10	WASHER 10	4					
13	GB/T5785-M10x1.25x40	六角螺栓 M10x1.25x40	BOLT M10x1.25x40	4					
14	GB/T5783-M8x60	六角螺栓 M8x60	BOLT M8x60	1					
15	GB/T97.1-8	平垫圈 8	WASHER 8	1					
16	T85-00000011	水下阳极	ANODE, LOWER CASING	1					
17	T85-04000024	螺旋桨垫块	SPACER, PROPELLER	1					
18	T85-04020000	螺旋桨组件	PROPELLER ASSY	1					
19	T85-04000025	螺旋桨 衬套 A	BUSH A, PROPELLER	1					
20	T85-04000026	螺旋桨 衬套 B	BUSH B, PROPELLER	1					
21	T40-04000021	开槽六角螺母	NUT	1					
22	GB/T91-3.5x25	开口销 φ3.5x25	COTTER PIN φ3.5x25	1					

Decomposition Schematic Diagram (CD/CT model)



SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
1	GB/T5782-M8x50	六角螺栓 M8x50	BOLT M8x50	2					
2	GB/T97.1-8	平垫圈 8	WASHER 8	4					
3	GB/T5782-M8x60	六角螺栓 M8x60	BOLT M8x60	2					
4	F60-04000401BF	水泵壳体	SHELL ,WATER PUMP	1					
5	F60-04000402BF	水泵内壳	INNER SHELL,WATER PUMP	1					
6	F60-04000300	水泵叶轮组件	IMPELLER ASSY,WATER PUMP	1					
7	F25-04000007	定位销 Φ4x10	DOWEL PIN Φ4x10	2					
8	F60-04000016BF	外挡板上密封垫	UPPER GASKET,OUTER PLATE	1					
9	F60-04000009BF	外挡板	OUTER PLATE	1					
10	T85-04000015	外挡板下密封垫	LOWER GASKET,OUTER PLATE	1					
11	F60-04000200BF	水泵座组件	WATER PUMP BASE ASSY	1					
12	F60-04000202BF	水泵座	BASE,WATER PUMP	1					
13	T85-04000204	水泵座 O 形圈 46.7x3.1	O －RING,WATER PUNP BASE	1					
14	T85-04000202	水泵座油封 25x40x6	OIL SEAL 25x40x6	4					
15	T85-04000203	油封挡圈	CIRCLIP,OIL SEAL	1					
16	T85-04000014	水泵座密封垫	GASKET,WATER PUNP BASE	1					
17	F60-04010000BF	驱动轴组件	DRIVE SHAFT ASSY	1					
18	F25-04000015	半圆键	SEMICIRCULAR KEY	1					
19	L44649 H1-CAP KOYO	驱动轴圆锥滚子轴承	ROLLER BEARING	1					
20	T85-04000003-1	驱动轴填隙片 (t:0.12 毫米)	SHIM(t:0.12mm)						
	T85-04000003-2	驱动轴填隙片 (t:0.30 毫米)	SHIM(t:0.30mm)						
	T85-04000003-3	驱动轴填隙片 (t:0.40 毫米)	SHIM(t:0.40mm)						
	T85-04000003-4	驱动轴填隙片 (t:0.50 毫米)	SHIM(t:0.50mm)						
21	T85-04000002	长尼龙套管	BUSHING ,NYLON	1					
22	NSK 1620	滚针轴承	QUILL BEARING	1					
23	GB/T5783-M6x16	六角螺栓 M6x16	BOLT M6x16	2					
24	GB/T97.1-6	平垫圈 6	WASHER 6	2					
25	T85-04000011	变档凸轮油封 9x19x5	OIL SEAL 9x19x5,CAM SHAFT	1					
26	T85-04000009	变档凸轮盖板	PLATE,CAM SHAFT	1					
27	JASO F404 31-50	盖板 O 型圈 50x3.1	O-RING 50x3.1	1					
28	GB/T896-8	开口挡圈 8	CIRCLIP 8	1					
29	T85-04000008	变档凸轮轴	CAMSHAFT	1					
30	F4-03000023	注油孔螺塞	PLUG,HOLE OIL	1					
31	F4-03000024	注油孔螺塞垫	GASKET	2					
32	GB/T889.1-M5	非金属嵌件 六角 锁紧 螺母 M5	LOCKING NUT M5	1					
33	T85-04000023	进水口 B	WATER INLET B	1					
34	F25-04000031	放油螺塞	PLUG,OIL RELEASE	1					
35	T85-04000001	水下装置壳体	LOWER CASING	1					
36	T85-04000006	小齿轮螺母	NUT,PINION	1					
37	T60-04000002	小齿轮	PINION	1					
38	T85-04000022	进水口 A	WATER INLET A	1					
39	GB/T820-M5x45	十字头半沉头螺钉 M5x45	SCREW M5x45	1					
40	T85-04000007	变档凸轮	CAM,SHIFT	1					

SN. 参照号码	PART NO. 零件编号	DESCRIPTION 零件名称(中文)	DESCRIPTION 零件名称(英文)	QTY 数量					REMARKS 备注
41	T85-04000004-1	正档齿轮填隙片 (T=0.10 毫米)	SHIM(t:0.10mm)						
	T85-04000004-2	正档齿轮填隙片 (T=0.12 毫米)	SHIM(t:0.12mm)						
	T85-04000004-3	正档齿轮填隙片 (T=0.20 毫米)	SHIM(t:0.20mm)						
	T85-04000004-4	正档齿轮填隙片 (T=0.30 毫米)	SHIM(t:0.30mm)						
	T85-04000004-5	正档齿轮填隙片 (T=0.40 毫米)	SHIM(t:0.40mm)						
	T85-04000004-6	正档齿轮填隙片 (T=0.50 毫米)	SHIM(t:0.50mm)						
42	KOYO 26882-R/22	圆锥滚子轴承	ROLLER BEARING	1					
43	T60-04000100	正档齿轮组件	FORWARD GEAR ASSY	1					
44	T60-04000008	变档柱塞	PLUNGER, SHIFT	1					
45	T85-04000506	离合器垫块	SPACER, CLUTCH	1					
46	T60-04000502	离合器弹簧	SPRING, CLUTCH	1					
47	T60-04000501	爪型离合器	CLUTCH, DOG	1					
48	T85-04000504	离合器销	PIN, CLUTCH	1					
49	T85-04000505	离合器簧环	RING, CLUTCH	1					
50	T85-04000501	螺旋桨轴	SHAFT, PROPELLER	1					
51	T85-04000500	螺旋桨轴组件	PROPELLER SHAFT ASSY	1					
52	T60-04000601	倒档齿轮	GEAR, REVERSE	1					
53	T85-04000606-1	倒档齿轮填隙片 (T=0.12 毫米)	SHIM(t:0.12mm)						
	T85-04000606-2	倒档齿轮填隙片 (T=0.20 毫米)	SHIM(t:0.20mm)						
	T85-04000606-3	倒档齿轮填隙片 (T=0.30 毫米)	SHIM(t:0.30mm)						
	T85-04000606-4	倒档齿轮填隙片 (T=0.40 毫米)	SHIM(t:0.40mm)						
	T85-04000606-5	倒档齿轮填隙片 (T=0.50 毫米)	SHIM(t:0.50mm)						
54	T85-04000604	倒档齿轮垫块	SPACER, REVERSE GEAR	1					
55	NTN 6207 15 C-3	深沟球轴承	BALL BEARING	1					
56	T60-04000600	水下装置壳体盖组件	COVER ASSY, LOWER CASING	1					
57	T85-04000603	水下壳盖 O 形圈	O-RING, COVER	1					
58	T55-04000601A	水下装置壳体盖	COVER, LOWER CASING	1					
59	NTN HK 2526NS	滚针轴承	QUILL BEARING	1					
60	T85-04000027	壳盖定位件	PIECE, ORIENTATION	1					
61	T85-04000020	锁止垫圈	WASHER, LOCKED	1					
62	T85-04000021	壳盖螺母	CROWN NUT	1					
63	F60-04000000BF	水下装置组件 (L)	LOWER CASING ASSY(L)	1					

Disassembling and Check

1. Remove the water pipe.

2. Remove the water pump casing.

3. Remove the impeller and pump inner casing.

4. Remove the semicircular key and outer baffle.

.

5. Check the water pump casing and outer baffle for cracks, twists or damages. Replace it if necessary.

6. Check the water pump inner casing and impeller for cracking, deformation, burning or wear. Replace it if necessary.

7. Drain the gear oil.

8. Remove the cotter pin; Place the shift lever in neutral position. Place a piece of wood between the swirl plate and the propeller,
to prevent the propeller from rotating freely.

9. Remove the slotted hexagon nut, remove the propeller, remove the cushion block.

10. Remove the anode and water inlet.

11. Remove cover for the Lower casing unit casing.
Remove reverse gear and shim and remove oil seal.

12. Remove the propeller shaft assembly.

13. Remove the shift plunger.

14. Remove the clutch ring, clutch pin and claw clutch. Remove the clutch spring.

15. Remove the oil seal casing A.
Remove water pump seat (CD/CT model)

16. Remove the pinion nut with an internal splined wrench and remove the drive shaft.

17. Remove shift cam, remove forward gear.
Remove shift cam cover plate and remove shift cam. Remove the forward gear (CD/CT)

18. Remove the needle roller bearing on the Lower casing unit.

19. Remove the oil seal of the oil seal casing A and remove the bearing on the forward gear.
Remove the oil seal of the water pump seat and remove the bearing on the forward gear. (CD/CT)

Propeller Shaft and Clutch Block

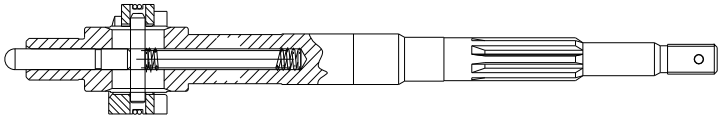
1. Check the claw clutch; If broken or damaged, replace it.

2. Check the propeller shaft; If worn or bent, replace it.

Install the Claw Clutch

1. Install the clutch spring into the bore at the rear of the propeller shaft.

2. Install the claw clutch. Position the "F" or "●" towards the forward gear. Fit the clutch pin.



3. Fit the clutch ring and shift plunger.

Lower casing Unit Casing Cover

1. Check the bearing for rust and noise when rotating. If yes, replace it.

2. Remove the bearing and oil seal with the bearing puller.
   Note:
   Do not remove the bearing unless it is replaced.

3. Remove needle roller bearing with special tools.
   Note:
   When reinstalling the oil seal and needle roller bearing, use new ones.

4. Clean the casing cover with a soft brush and solvent.

5. Check the casing cover; If there is cracking or damage, replace it.

Install the Casing Cover Oil Seal and Bearing

1. Install the oil seal.

2. Fit a new bearing on the reverse gear.
   Note:
   Install the oil seal and bearing with special tools.
   Pay attention to the installation direction and depth.
   Ensure that the manufacturer's mark of the bearing faces the reverse gear.
   Installation depth:

Needle roller bearing		31.0~31.5 mm
Oil seal	Depth 1	13.0~13.5 mm
	Depth 2	6.0~6.5 mm


Bearing mounting tool


Oil seal mounting tool


Needle bearing mounting tool

3. Install the reverse gear and shim.

Note:
When installing the new reverse gear and bearing, adjust the shim as required.

Drive Shaft

Check the drive shaft for bending or wear. Replace it if necessary.

Shift Cam

Check the shift cam for wear or deformation. Replace it if necessary.

Gear

Check the forward gear, reverse gear and pinion for wear or damage. Replace it if necessary.

Forward Gear Bearing

Check whether the bearing for rust and noise when rotating. Replace it if necessary.

Note:

Do not remove the bearing unless it is replaced.

When installing a new bearing, adjust the shim as required.

Check the Lower casing Unit Casing

Check whether the Lower casing device casing is cracked or damaged, and check whether the cooling water inlet is blocked. Replace it if necessary.

Check the Water Pipe

Request params was error Replace it if necessary.

Assemble the Lower casing Device Casing

1. Install the needle roller bearing with special tools.

Needle roller bearing mounting tool kit

2. Install new forward gear bearing. (If replace it)

Forward gear bearing casing mounting kit

3. Install the drive shaft seat oil seal.

Drive shaft seat oil seal installation tool kit

4. Install the shift cam, gasket and oil pump casing A, and install forward gear, drive shaft, shim and pinion.

   Install the shift cam, gasket and water pump seat, and install forward gear, drive shaft, shim and pinion.

Attention:

When installing a new drive shaft, adjust the shim as required.

5. Tighten the pinion nut.

   Specified torque: 95 Nm

6. Install the propeller shaft assembly.

7. Install the Lower casing unit casing cover

Lower casing unit casing cover assembly mounting tool

8. Check whether the shift gear is working properly.

9. Install the water pump assembly.

10. Install the anode and water inlet.

11. Install the propeller and slotted hexagon nut, and place a piece of wood between the anti-swirl plate and the propeller to prevent the propeller from rotating freely. Tighten the nut to the specified torque, insert the cotter pin and bend the foot of the cotter pin. Specified torque: 35 Nm

Note:
If the groove on the nut is not aligned with the cotter pin hole on the propeller shaft, tighten the nut further until it is aligned.

Install the Lower casing Unit

1. Install the locating pin.

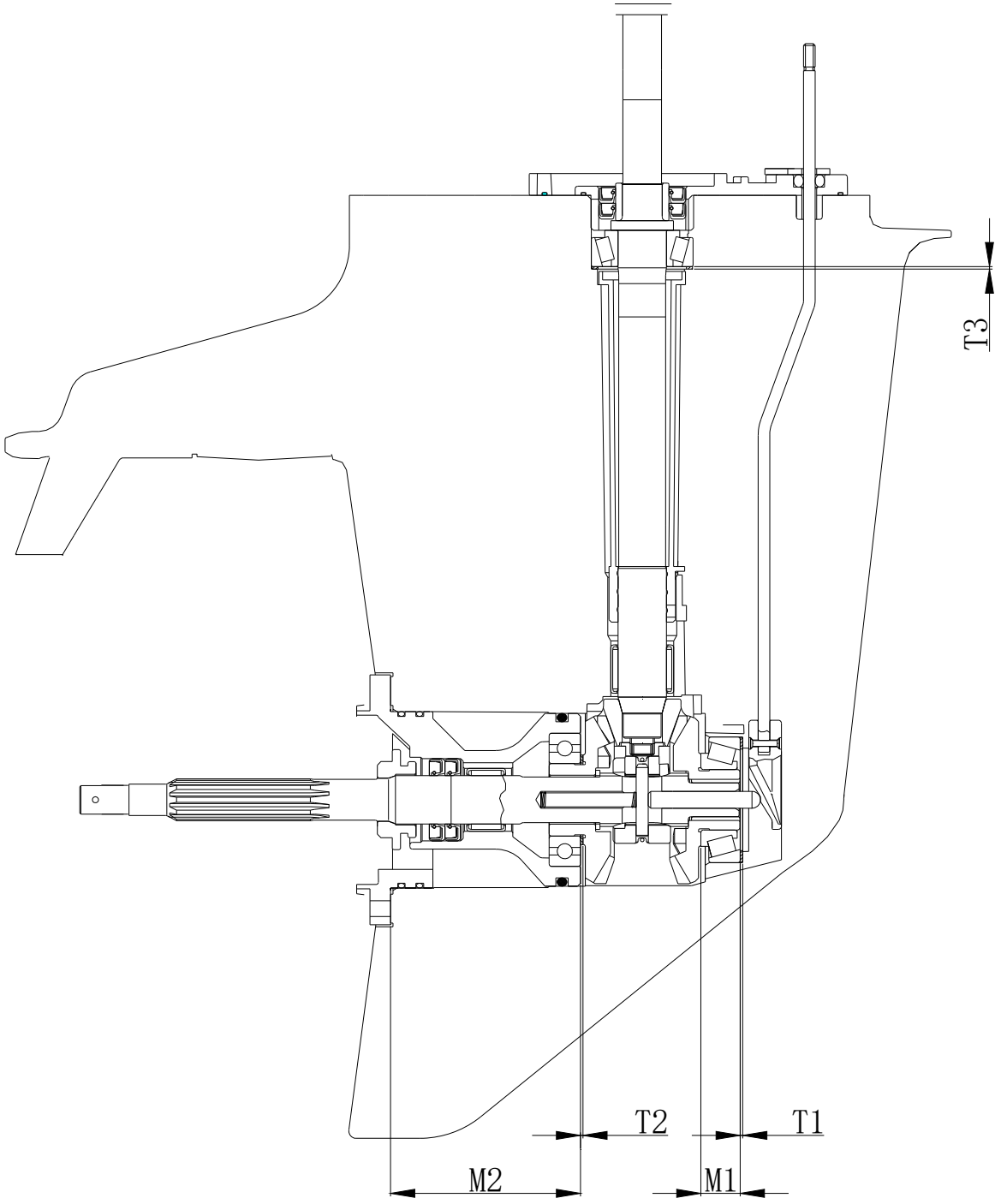
2. Place the shift cam in the forward position. Install the Lower casing unit to the casing of the Lower casing unit and tighten the bolts to the specified value.
   Specified torque: 37 Nm

3. Perform the shift operation and check whether it is operating properly.

4. Inject gear oil into the oil drain screw hole with the pressure filling device.

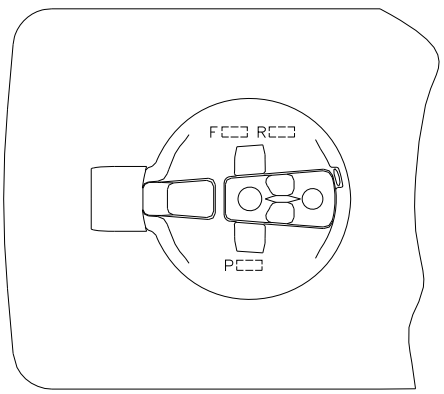
Selection of Shims

When replacing the internal parts of the Lower casing unit or assembling a new Lower casing unit, adjust the shims as required.



Deviation Value Mark

The installation surface of the anode/heading adjusting piece of the Lower casing unit is engraved with deviation value marks, namely F, R and P respectively; Represents the difference between the actual size and the theoretical size on the casing of the Lower casing unit.



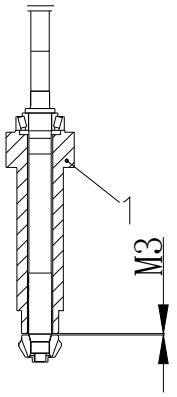
For example, the mark P is followed by +3, representing the actual size which is 0.03 mm more than the theoretical size; If there is no number after that deviation value, the value of P is considered to be 0.

Pinion Shim

1. Check the P value engraved on the Lower casing unit.

2. Attach the drive shaft to the special tool. Fit the pinion and lock the pinion nut according to the specified torque.
   Specified torque: 95 Nm

3. Measure the clearance between the special tool and the pinion with a gauge,
   Calculate the thickness T3 according to the formula.
   Formula: T3=M3－(P/100)
   Formula for CD/CT: T3=M3－(P/100)+0.1



1. 专用工具

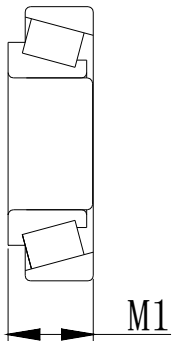
4. Shims that can be selected.
   0.10, 0.12, 0.15, 0.18, 0.3, 0.4, 0.5 mm
   Note:
   The thickness of the shim can be 0 ~ 0.05 thicker than T3, and the closest size is selected.

Shims for Forward Gear

1. Check the F value engraved on the Lower casing unit.

2. Turn the outer ring of the forward gear bearing so that the roller falls completely into the bearing casing.

3. Measure the bearing height and calculate the thickness T1 according to the formula.
   Formula: T1=26.70＋(F/100)－M1
   Formula for CD/CT: T1=24.2＋(F/100)－M1



Note:
When measuring the thickness, it is measured at 3 points. Average the results.

4. Shims that can be selected.
   0.10, 0.12, 0.15, 0.18, 0.3, 0.4, 0.5 mm
   Note:
   The thickness of the shim can be 0 ~ 0.05 thinner than T1, and the closest size is selected.

Shims for Reverse Gear

1. Check the R value engraved on the Lower casing unit.

2. Formula: T2=0.5＋(R/100)
   Formula for CD/CT: T2=0.5－(R/100)

3. Shims that can be selected.
   0.10, 0.12, 0.15, 0.18, 0.3, 0.4, 0.5 mm

Note:
The thickness of the shim can be 0 ~ 0.05 thinner than T2, and the closest size is selected.
For CD/CT, the thickness of the shim can be 0 ~ 0.05 thicker than T2, and the closest size is selected.

Common Faults and Solutions

Fault Type	Cause	Solution
The engine cannot start	No fuel in the fuel tank	Fill up the fuel tank with clean fresh fuel
	Fuel is contaminated or obsolete	
	Fuel filter is blocked	Replace the fuel filter
	Fuel pump failure	Repair or replace the fuel pump
	Fuel tank cap vent screw not loosened	Loosen the vent screw
	Spark plug is contaminated or the type is incorrect	Check the spark plug. Clean the spark plug or replace with the correct type of spark plug
	Incorrect installation of the spark plug cap	Check and reinstall the spark plug cap
	Ignition wire failure	Check the wiring. Tighten the loose wire and replace aged or broken wire.
	Ignition parts Failure	Replace
	The engine stop safety cable is not connected to the emergency stop switch assembly.	Connect the cable to the switch
	Engine internal parts failure	Repair
Abnormal engine idle or stall	Spark plug is contaminated or the type is incorrect	Clean the spark plug or replace with the correct type of spark plug
	Fuel system is clogged	Check the fuel pipe for extrusion, winding or blockage
	Fuel is contaminated or obsolete	Fill up the fuel tank with clean fresh fuel
	Fuel filter is blocked	Replace the fuel filter
	Incorrect spark plug clearance	Adjust the clearance to the specified value
	Ignition wire failure	Check the wiring. Tighten the loose wire and replace aged or broken wire.
	Incorrect oil grade	Change to the oil of the specified grade
	Thermostat failure	Replace
	Fuel pump failure	Replace
	The vent screw for the fuel tank cap is not loosened	Loosen the vent screw
	Fuel joint is not connected correctly	Connect it correctly
	Chock valve handle is pulled out	Return it to its original position
	Outboard angle too high	Return it to its normal operating position
Engine weakness	Propeller is broken	Repair or replace the propeller
	Incorrect trim angle	Adjust the trim angle to an appropriate angle
	Incorrect installation height of outboard motor	Adjust it to the correct height
	The bottom of the ship is polluted by Lower casing organisms.	Clean the bottom of the ship
	The gearbox is twined by aquatic plants or foreign matters	Remove foreign matter and clean it

Continued table (I)

Fault type	Cause	Solution
Engine weakness	Spark plug is contaminated or the type is incorrect	Clean the spark plug or replace with the correct type of spark plug
	Fuel system is clogged	Check the fuel pipe for extrusion, winding or blockage
	Fuel filter is blocked	Replace the fuel filter
	Fuel is contaminated or obsolete	Fill up the fuel tank with clean fresh fuel
	Incorrect spark plug clearance	Adjust the clearance to the specified value
	Ignition wire failure	Check the wiring. Tighten the loose wire and replace aged or broken wire.
	Ignition parts failure	Replace
	The engine oil grade is incorrect or too much oil is added.	Change to the oil of the specified grade or add it to the appropriate position of the oil dipstick.
	Thermostat failure	Replace
	Fuel pump failure	Replace
	Fuel joint is not connected correctly	Connect it correctly
	Incorrect spark plug specification	Replace it with the correct model
Excessive vibration of outboard motor	Propeller is broken	Repair or replace the propeller
	Propeller shaft is broken	Replace
	The propeller is twined by aquatic plants or foreign matters	Remove foreign matter and clean it
	Mounting bolt of outboard motor is loose	Tighten the bolt
	Steering shaft is loose	Tightening the spindle
	Steering shaft is broken	Replace