

Product: Cub Cadet 8354,8404 Tractors Service Repair Workshop Manual
Full Download: <https://www.arepairmanual.com/downloads/cub-cadet-83548404-tractors-service-repair-workshop-manual/>

Cub Cadet

8354/8404 SERVICE MANUAL



MTD Products, LLC Product Training and Education Department



Sample of manual. Download All 289 pages at:
<https://www.arepairmanual.com/downloads/cub-cadet-83548404-tractors-service-repair-workshop-manual/>

Product: Cub Cadet 8354,8404 Tractors Service Repair Workshop Manual
Full Download: <https://www.arepairmanual.com/downloads/cub-cadet-83548404-tractors-service-repair-workshop-manual/>

Sample of manual. Download All 289 pages at:
<https://www.arepairmanual.com/downloads/cub-cadet-83548404-tractors-service-repair-workshop-manual/>

CONTENTS

CHAPTER 1 GENERAL INFORMATION	1-1
1. TRACTOR VIEW	1-3
2. TIGHTENING TORQUE FOR STANDARD BOLTS AND NUTS	1-4
2.1 TIGHTENING TORQUE	1-4
3. SPECIFICATIONS	1-6
4. IDENTIFICATION	1-8
4.1 ENGINE NUMBER	1-8
4.2 CHASSIS NUMBER OF THE TRACTOR(CHASSIS NUMBER OF THE MACHINE)	1-8
5. CAUTION BEFORE REPAIR	1-9
5.1 BEFORE REPAIR OR INSPECTION	1-9
5.2 ASSEMBLY AND DISASSEMBLY	1-9
5.3 PARTS TO BE REPLACED	1-9
5.4 PARTS	1-9
5.5 ASBESTOS PARTS	1-10
5.6 ELECTRICAL SYSTEM	1-10
5.7 TUBES AND RUBBERS	1-11
5.8 LUBRICANT	1-11
6. REGULAR CHECK LIST	1-12
7. OIL & WATER SUPPLY LIST	1-13
CHAPTER 2 ENGINE SYSTEM	2-1
1. GENERAL	2-3
1.1 APPEARANCE	2-3
1.2 SPECIFICATIONS	2-4
1.3 PERFORMANCE CURVE	2-5
1.4 DIMENSIONS	2-6
1.5 GENERAL WARNING	2-6
2. STRUCTURE AND FUNCTION	2-7
2.1 BODY	2-7
2.2 LUBRICATING SYSTEM	2-11
2.3 COOLING SYSTEM	2-13
2.4 FUEL SYSTEM	2-15
3. DISASSEMBLING AND SERVICING	2-24
3.1 TROUBLESHOOTING	2-24
3.2 SERVICING SPECIFICATIONS	2-27
3.3 CHECKING, DISASSEMBLING AND SERVICING	2-33
CHAPTER 3 CLUTCH	3-1
1. DISASSEMBLY AND ASSEMBLY	3-3
1.1 DISASSEMBLY OF PANEL FRAME	3-3
1.2 DISASSEMBLY OF FENDER AND STEPLADDER ASSEMBLY	3-6

2. CLUTCH.....	3-8
2.1 CHARACTERISTICS	3-8
2.2 LINK STRUCTURE AND CONTROL.....	3-9
2.3 TROUBLESHOOTING	3-10
2.4 SPECIFICATION	3-11
2.5 TIGHTENING TORQUE	3-11
2.6 DISASSEMBLY, MAINTENANCE	3-12
CHAPTER 4 TRANSMISSION	4-1
1. STRUCTURE	4-3
2. POWER TRANSMISSION	4-4
2.1 MAIN TRANSMISSION.....	4-4
2.2 SHUTTLE	4-7
2.3 HI-LO SHIFT	4-8
2.4 MID PTO	4-9
2.5 REAR PTO	4-9
2.6 CREEPER SPEED (IF APPLICABLE).....	4-10
2.7 FRONT WHEEL DRIVE.....	4-10
3. TRANSMISSION SHIFT LINK STRUCTURE	4-11
3.1 MAIN SHIFT	4-11
3.2 SHUTTLE SHIFT	4-11
3.3 HI-LO SHIFT	4-12
3.4 PTO SHIFT	4-12
3.5 CREEPER SPEED	4-12
3.6 MID PTO SHIFT	4-13
3.7 FRONT WHEEL DRIVE SHIFT	4-13
4. PTO CLUTCH.....	4-14
4.1 CHARACTERISTICS	4-14
4.2 HYDRAULIC CIRCUIT	4-14
4.3 OIL FLOW	4-15
5. DIFFERENTIAL GEAR	4-16
5.1 STRUCTURE	4-16
5.2 OPERATION	4-17
6. TROUBLESHOOTING	4-19
7. MAINTENANCE SPECIFICATION	4-20
8. TIGHTENING TORQUE	4-21
9. CLUTCH HOUSING	4-22
9.1 TRANSMISSION OIL DRAINING	4-23
9.2 CLUTCH HOUSING GROUP DISASSEMBLY	4-23
10. CLUTCH HOUSING DISASSEMBLY	4-28
10.1 FIRST STAGE (DISCONNECTION OF MAIN TRANSMISSION COVER).....	4-28
10.2 SECOND STAGE (DISCONNECTION OF PROPULSION SHAFT CASE)	4-29

10.3	THIRD STAGE (DISASSEMBLY OF 25 GEAR SHAFT AND PROPULSION SHAFT 1)	4-30
10.4	FOURTH STAGE (DISASSEMBLY OF BEARING COVER ASSEMBLY)	4-30
10.5	FIFTH STAGE (DISCONNECTION OF TRANSMISSION FORK)	4-31
10.6	SIXTH STAGE (DISASSEMBLY OF 22 GEAR SHAFT)	4-32
10.7	SEVENTH STAGE (DISASSEMBLY OF MAIN TRANSMISSION COUNTER SHAFT)	4-33
10.8	MAINTENANCE	4-35
11.	INTERMEDIATE CASE	4-37
11.1	DISASSEMBLY, ASSEMBLY	4-38
11.2	MAINTENANCE	4-43
12.	TRANSMISSION CASE	4-46
12.1	DISASSEMBLY, ASSEMBLY	4-46
12.2	MAINTENANCE	4-56
CHAPTER 5 REAR AXLE		5-1
1.	STRUCTURE	5-3
2.	TIGHTENING TORQUE	5-4
3.	SERVICE SPECIFICATION	5-5
4.	DISASSEMBLY, ASSEMBLY	5-6
4.1	DISCONNECTION OF REAR AXLE GROUP	5-6
4.2	DISASSEMBLY OF REAR AXLE	5-8
5.	MAINTENANCE	5-9
5.1	BEARING CHECK	5-9
5.2	GEAR CHECK	5-9
5.3	CLEARANCE CHECK OF PLANETARY GEAR AND PLANETARY GEAR SHAFT	5-9
5.4	CHECK THRUST COLLAR FOR WORN	5-9
CHAPTER 6 BRAKE		6-1
1.	STRUCTURE	6-3
2.	OPERATION	6-4
3.	TROUBLESHOOTING	6-5
4.	MAINTENANCE SPECIFICATION	6-6
5.	TIGHTENING TORQUE	6-6
6.	BRAKE PEDAL	6-7
6.1	DISASSEMBLY, MAINTENANCE	6-7
6.2	MAINTENANCE	6-8
7.	BRAKE CASE	6-9
7.1	DISASSEMBLY AND ASSEMBLY	6-9
7.2	OPERATION CHECK OF BRAKE CAM LEVER	6-12
CHAPTER 7 FRONT AXLE		7-1
1.	STRUCTURE	7-3
2.	WHEEL ALIGNMENT	7-4
3.	TROUBLESHOOTING	7-5
4.	MAINTENANCE SPECIFICATION	7-6

5. TIGHTENING TORQUE	7-7
6. DISASSEMBLY, MAINTENANCE	7-8
6.1 STRUCTURE.....	7-8
7. DISCONNECTION OF FRONT AXLE GROUP	7-10
7.1 DISASSEMBLY, ASSEMBLY	7-10
8. DISASSEMBLY OF FRONT AXLE	7-12
8.1 FIRST STAGE (DISCONNECTION OF FRONT AXLE CASE AND BEVEL GEAR CASE)	7-12
8.2 SECOND STAGE (DISASSEMBLY OF FRONT AXLE)	7-12
8.3 THIRD STAGE (DISASSEMBLY OF FRONT AXLE CASE)	7-13
8.4 FOURTH STAGE (DISASSEMBLY OF FRONT AXLE SUPPORT)	7-14
8.5 FIFTH STAGE (DISASSEMBLY OF FRONT AXLE SUPPORT)	7-15
8.6 SIXTH STAGE (DISASSEMBLY OF BEVEL PINION SHAFT)	7-16
8.7 SEVENTH STAGE (DISASSEMBLY OF DIFFERENTIAL GEAR)	7-17
9. MAINTENANCE	7-18
9.1 CLEARANCE CHECK BETWEEN CENTER PIN, FRONT AXLE SUPPORT BOSS AND FRONT AND REAL BRACKETS	7-18
9.2 CHECK FOR BACKLASH AND TOOTH CONTACTED IN FRONT AXLE CASE	7-18
9.3 CHECK FOR BEVEL GEAR BACKLASH AND TOOTH CONTACTED IN BEVEL GEAR CASE ..	7-19
9.4 CHECK FOR SHIM BETWEEN AXLE CASE SUPPORT AND FRONT AXLE CASE	7-19
9.5 CHECK FOR BACKLASH AND TOOTH CONTACTED BETWEEN BEVEL PINION SHAFT AND SPIRAL BEVEL GEAR	7-20
9.6 CLEARANCE CHECK BETWEEN DIFFERENTIAL PINION SHAFT AND DIFFERENTIAL PINION	7-21
9.7 CLEARANCE CHECK BETWEEN FRONT DIFFERENTIAL CASE, DIFFERENTIAL CASE COVER AND DIFFERENTIAL SIDE GEAR.	7-21
9.8 CHECK FOR BACKLASH AND TOOTH CONTACTED BETWEEN DIFFERENTIAL PINION AND DIFFERENTIAL SIDE GEAR	7-22

CHAPTER 8 STEERING SYSTEM 8-1

1. CHARACTERISTICS	8-3
2. HYDRAULIC CIRCUIT OF POWER STEERING SYSTEM	8-4
3. GEAR PUMP	8-5
3.1 PUMP CHARACTERISTICS	8-5
3.2 MAJOR SPECIFICATION	8-5
3.3 STRUCTURE OF GEAR PUMP	8-5
3.4 OPERATION	8-6
4. POWER STEERING UNIT	8-7
4.1 MAJOR SPEC.	8-7
4.2 STRUCTURE AND OPERATION	8-7
5. STEERING CYLINDER	8-8
5.1 STRUCTURE	8-8
5.2 MAJOR SPECIFICATION	8-8

6. OIL FLOW	8-9
6.1 IN NEUTRAL	8-9
6.2 TURNING TO THE RIGHT	8-9
6.3 TURNING TO THE LEFT	8-10
6.4 MANUAL STEERING	8-10
7. TROUBLESHOOTING	8-11
8. DISASSEMBLY, MAINTENANCE	8-12
8.1 GEAR PUMP	8-12
8.2 POWER STEERING UNIT	8-14
8.3 STEERING CYLINDER	8-21
CHAPTER 9 HYDRAULIC SYSTEM	9-1
1. HYDRAULIC CIRCUIT DIAGRAM	9-3
2. STRUCTURE	9-4
3. HYDRAULIC CIRCUIT DIAGRAM OF 3-POINT HYDRAULIC SYSTEM	9-5
4. HYDRAULIC PUMP	9-6
4.1 STRUCTURE OF HYDRAULIC PUMP	9-6
4.2 OPERATION	9-6
5. OIL FILTER	9-7
5.1 STRUCTURE OF OIL FILTER	9-7
5.2 FUNCTION AND OPERATION	9-7
6. CONTROL VALVE (MLS VALVE)	9-8
6.1 STRUCTURE	9-8
6.2 CIRCUIT DIAGRAM	9-8
6.3 OPERATION PRINCIPLE	9-9
7. RELIEF VALVE (HYDRAULIC BLOCK)	9-12
8. HYDRAULIC CYLINDER	9-13
9. STRUCTURE AND OPERATION	9-14
9.1 STRUCTURE	9-14
9.2 OPERATION	9-14
10. OUTSIDE HYDRAULIC EXTRACTION	9-18
10.1 HYDRAULIC BLOCK	9-18
10.2 ACTING VALVE	9-19
10.3 QUICK COUPLER	9-19
11. TOP LINK BRACKET DEVICE	9-20
11.1 STRUCTURE	9-20
11.2 OPERATION	9-20
12. TROUBLESHOOTING	9-21
13. MAINTENANCE SPECIFICATION	9-22
13.1 3-POINT SYSTEM HYDRAULIC PUMP	9-22
13.2 RELIEF VALVE	9-22
13.3 LINK CONTROL	9-22
13.4 HYDRAULIC CYLINDER	9-23

14.TIGHTENING TORQUE	9-24
15.DISASSEMBLY, ASSEMBLY	9-25
15.1 GEAR PUMP	9-25
15.2 MAINTENANCE	9-27
15.3 RELIEF VALVE	9-27
15.4 HYDRAULIC CYLINDER	9-28
15.5 CHECK AND ADJUSTMENT	9-34
CHAPTER 10 ELECTRIC SYSTEM	10-1
1. ELECTRONIC INSTRUMENTATION	10-3
1.1 INSTRUMENT GAUGE	10-3
1.2 INDICATORS AND WARNING LIGHTS	10-4
2. TROUBLE SHOOTING	10-6
3. SERVICING SPECIFICATIONS	10-8
4. MECHANISM	10-9
4.1 STARTING SYSTEM	10-9
4.2 CHARGING SYSTEM	10-12
4.3 PREHEATING SYSTEM	10-14
4.4 FUSE	10-15
4.5 GAUGE AND SENSORS	10-16
5. MAIN CIRCUIT DIAGRAM	10-17

CHAPTER 1

GENERAL INFORMATION

1. TRACTOR VIEW



615W101A

2. TIGHTENING TORQUE FOR STANDARD BOLTS AND NUTS

2.1 TIGHTENING TORQUE

Screws, bolts and nuts whose tightening torques are not specified in this workshop manual should be tightened according to the table below.

A. TIGHTENING TORQUE FOR STANDARD BOLTS AND NUTS

Grade Unit Nominal Diameter	No grade 4T 			7T 			9T 		
	N·m	Kgf·m	lbf·ft	N·m	Kgf·m	lbf·ft	N·m	Kgf·m	lbf·ft
M 6 (6 mm, 0.24 in.)	7.85	0.80	5.79	9.80	1.00	7.24	12.3	1.25	9.1
	~	~	~	~	~	~	~	~	~
	9.30	0.95	6.87	11.2	1.15	8.32	14.2	1.45	10.5
M 8 (8 mm, 0.31 in.)	17.7	1.8	13.0	23.6	2.4	17.4	29.4	3.0	21.7
	~	~	~	~	~	~	~	~	~
	20.5	2.1	15.2	27.4	2.8	20.2	34.3	3.5	25.3
M 10 (10 mm, 0.39 in.)	39.2	4.0	29.0	48.1	4.9	35.5	60.8	6.2	44.9
	~	~	~	~	~	~	~	~	~
	45.0	4.6	33.2	55.8	5.7	41.2	70.5	7.2	52.1
M 12 (12 mm, 0.47 in.)	62.8	6.4	46.3	77.5	7.9	57.2	103	10.5	76.0
	~	~	~	~	~	~	~	~	~
	72.5	7.4	53.5	90.1	9.2	66.5	117	12.0	86.8
M 14 (14 mm, 0.55 in.)	108	11.0	79.6	124	12.6	91.2	167	17.0	123
	~	~	~	~	~	~	~	~	~
	125	12.8	92.5	147	15.0	108	196	20.2	144
M 16 (16 mm, 0.63 in.)	167	17.0	123	196	20.0	145	260	26.5	192
	~	~	~	~	~	~	~	~	~
	191	19.5	141	225	23.0	166	303	31.0	224
M 18 (18 mm, 0.71 in.)	245	25.0	181	275	28.0	203	343	35.0	254
	~	~	~	~	~	~	~	~	~
	284	29.0	210	318	32.5	235	401	41.0	297
M 20 (20 mm, 0.79 in.)	334	34.0	246	368	37.5	272	490	50.0	362
	~	~	~	~	~	~	~	~	~
	392	40.0	289	431	44.0	318	568	58.0	420

* The figures on the table above are indicated the top of screw of bolt.

B. TIGHTENING TORQUE FOR STUDS

M8	11.7 ~ 15.7 N·m	1.2 ~ 1.6 kgf·m	8.6 ~ 11.5 lbf·ft
M10	24.5 ~ 31.4 N·m	2.5 ~ 3.2 kgf·m	18.0 ~ 23.1 lbf·ft
M12	34.3 ~ 49.0 N·m	3.4 ~ 5.0 kgf·m	25.3 ~ 36.1 lbf·ft

C. TIGHTENING TORQUE FOR HIGH PRESSURE HOSE UNION NUTS

Hose Size (Inside Diameter: Inches)	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	5/8", 3/4"	1"
Screw Size (PF)	1/8"	1/4"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Tightening (N·m)	9.8	24.5	24.5	49.0	49.0	58.8	117.7	137.3
Torque (kgf·m)	1	2.5	2.5	5	5	6	12	14
(lbf·ft)	7.2	18.0	18.0	36.1	36.1	43.3	86.8	101.2

3. SPECIFICATIONS

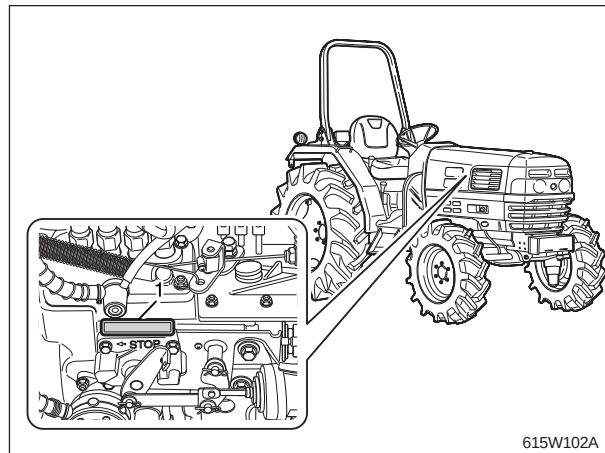
Model			8354	8404
Maximum PTO power			28.3 HP	33.4 HP
Engine GROSS power			33.5 HP	40.4 HP
Engine	Model		3A165D	4A200
	Type		Indirect injection, vertical, water-cooled, 4-cycle diesel	
	Number of cylinders		3	4
	Bore and stroke		87 × 92.4 mm (3.425 × 3.637 in.)	83 × 92.4 mm (3.268 × 3.637 in.)
	Total displacement		1,647	1,999
	Rated revolution		2,700 rpm	
	Injection timing		18° before T.D.C.	
	Injection order		1-2-3	1-3-4-2
	Compression ratio		22 : 1	
	Lubricating system		Forced lubrication by trochoidal pump	
	Cooling system		Pressurized radiator, Forced circulation with water pump	
	Alternator		12 V, 50 AMPS	
	Weight (Dry)		179 kg	205 kg
Capacities	Fuel tank		40 ℓ (10.6 U.S.gal.)	
	Engine crankcase		5.8 ℓ (1.5 U.S.gal.)	7.0 ℓ (1.9 U.S.gal.)
	Engine coolant		7.0 ℓ (1.9 U.S.gal.)	8.9 ℓ (2.4 U.S.gal.)
	Transmission case		44 ℓ (11.6 U.S.gal.)	←
	Front axle case		7.5 ℓ (2.0 U.S.gal.)	←
Dimensions (with std. Tires)	Overall length (without 3p)		3,357 mm (132.2 in.)	3,365 mm (132.5 in.)
	Overall length (with 3p)		3,468 mm (136.5 in.)	3,550 mm (139.8 in.)
	Overall width (minimum tread)		1,440 mm (56.7 in.)	1,505 mm (59.3 in.)
	Overall height (Top of ROPS)		2,445 mm (96.5 in.)	2,465 mm (97.0 in.)
	Overall height (Top of steering wheel)		1,530 mm (60.2 in.)	1,545 mm (60.8 in.)
	Wheelbase		1,668 mm (65.7 in.)	1,780 mm (70 in.)
	Ground clearance		239 mm (9.4 in.)	257 mm (10.1 in.)
	Tread	Front	1,235 mm (48.4 in.)	1,235 mm (48.4 in.)
		Rear	1,166 mm (45.9 in.)	1,158 mm (45.6 in.)
			1,077 ~ 1,387 mm (42.4 ~ 54.6 in.)	1,158 ~ 1,467 mm (45.6 ~ 57.8 in.)
Traveling system	Tire size (Std. tires)	Front	7-16	8-16
		Rear	12.4-24	13.6-24
	Clutch		Dry single stage	
	Steering		Hydrostatic steering system	

Model			8354	8404
Traveling system	Transmission		Synchronized shuttle and transmission 8 forward and 8 reverse speeds (CR: 16 forward and 16 reverse speeds)	
	Brake	Traveling	Wet disc type	
		Parking	Connected with the traveling brake	
	Differential		Bevel gear	
Hydraulic system	Hydraulic lift control system		Position, Draft and Mixed control	
	Pump capacity	Main pump	29.7 ℓ /min (7.8 U.S.gal.)	
		Power steering pump	17.8 ℓ /min (4.7 U.S.gal.)	
	Three point hitch		SAE Category I	
	Maximum lifting capacity (the end of lower ling)		1,650 kg (3,638 lb)	1,550 kg (3,417 lb)
PTO	No. of Remote control valve ports(Optional)		2 or 4	2 or 4
	PTO shaft		SAE 1-3/8, 6 splines	
	Revolution (independent PTO)	MID PTO	2,000 (2,542 rpm)	2,000 (2,542 rpm)
		Rear PTO	540 (2,451 rpm)	540 (2,451 rpm)
Min. turning radius (without brake)			3,100 mm (112.7 in.)	3,125 mm (123 in.)
Traction system			Swing Draw-Bar	
Weight (with ROPS)			1,515 kg	1,665 kg
Traveling speed (at 2700 engine speed with Std. tires)	Forward (creeper)		1.6 (0.21) ~ 23.2 km/h 0.99 (0.13) ~ 14.41 mph	1.7 (0.21) ~ 23.4 km/h 1.06 (0.13) ~ 14.54 mph
	Reverse (creeper)		1.55 (0.20) ~ 21.4 km/h 0.96 (0.12) ~ 13.30 mph	1.56 (0.20) ~ 21.6 km/h 0.97 (0.12) ~ 13.42 mph

4. IDENTIFICATION

4.1 ENGINE NUMBER

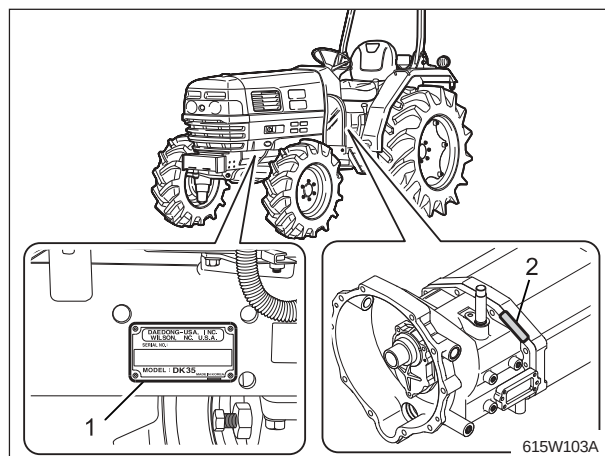
The engine serial number is stamped on the left side of the cylinder block as shown in the figure. Engine serial number provides important information.



(1) Engine Serial Number

4.2 CHASSIS NUMBER OF THE TRACTOR (CHASSIS NUMBER OF THE MACHINE)

The chassis serial number of the tractor is stamped on the left side of the front axle frame as shown in the figure.



(1) Manufacture Plate

(2) Transmission Serial Number

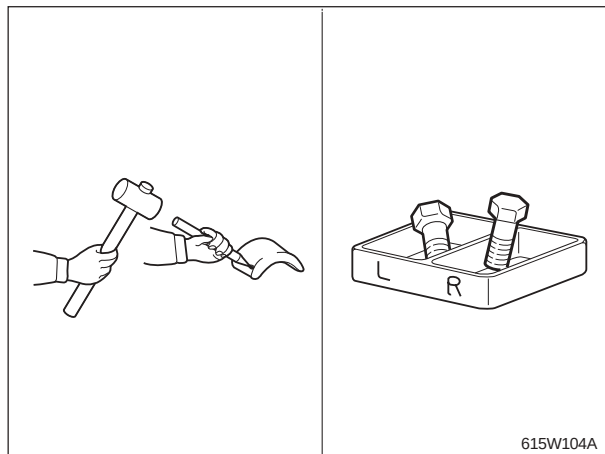
5. CAUTION BEFORE REPAIR

5.1 BEFORE REPAIR OR INSPECTION

1. In case of repair or inspection, locate the tractor on the flat ground and pull the parking brake on.
2. Except for the items to be checked while the engine is running, be sure to stop the engine prior to the work.
3. When washing parts, use parts washing solvent for industrial use (avoid using gasoline so to prevent environmental pollution). For the hydraulic parts, apply designated hydraulic oil in washing.
4. When disassembling and assembling of the hydraulic apparatus, pay special attention not to allow dust or foreign substance to be attached or intermixed.

5.2 ASSEMBLY AND DISASSEMBLY

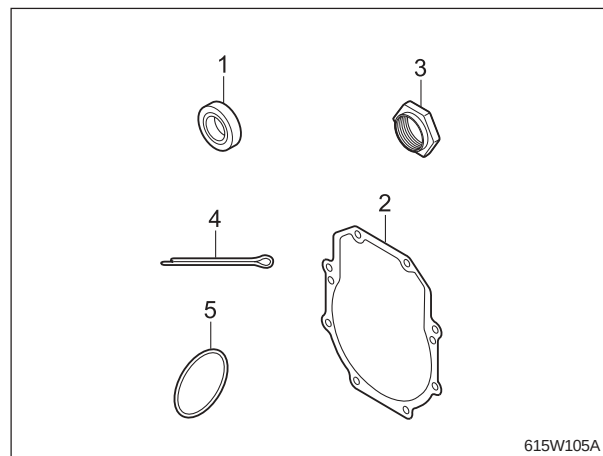
To check a failure, try to find out its underlying cause. If assembly or disassembly is needed, perform the work in regular sequence as specified in this repair manual.



1. Disassembled parts shall be arranged orderly.
2. Sort out the parts to be replaced from the ones to be reused.
3. Be sure to use standard bolts and nuts that are designated.
4. When assembling snap rings or spring pin types, take care of assembling direction.
5. Split pin shall be spread surely not to escape when installed.
6. When using sealant (such as gasket bond) on the assembled surfaces, apply it evenly and consistently in a height of 3 ~ 5 mm (0.12 ~ 0.2 in.) on the contact surface after removing the old bond and cleaning the sealing surface with solvent. Apply sealant on the center of the contact surface for the space between the bolt holes of the contact surface, and on the more inner side than the bolt hole for the bolt area.

7. Finish assembly within 20 minutes after applying sealant, after that, wait approx. 30 minutes later before filling with oil.

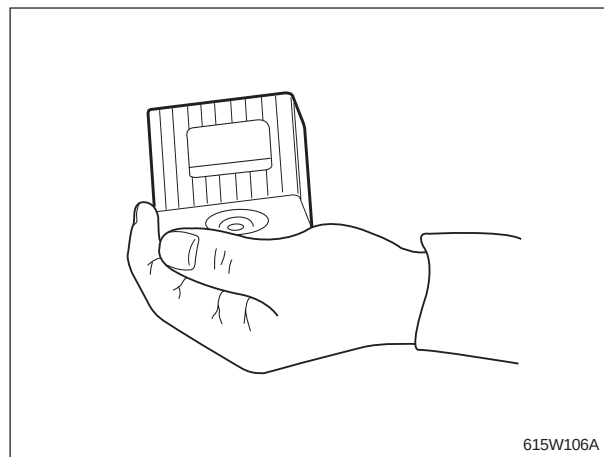
5.3 PARTS TO BE REPLACED



The following parts should be replaced with new ones when removed.

- (1) Oil Seal
- (2) Gasket
- (3) Lock Nut
- (4) Split Pin
- (5) O-Ring

5.4 PARTS



When replacing parts, use only genuine Cub Cadet parts.

5.5 ASBESTOS PARTS

Since dust out of asbestos fibrous parts is extremely dangerous to your health, be sure to clean such parts carefully, do not use compressed air.

5.6 ELECTRICAL SYSTEM

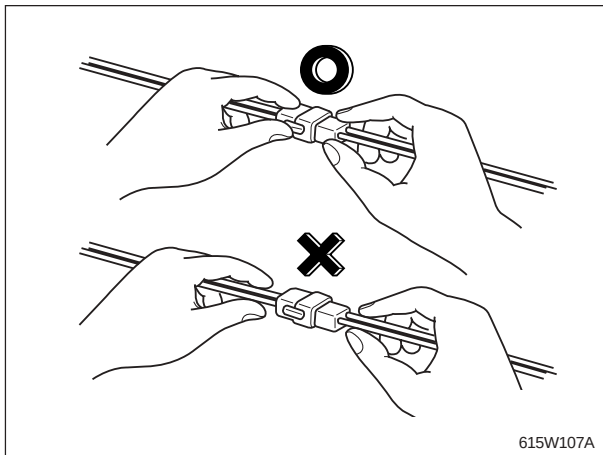
1. Check electrical wiring every year for any damage or short circuit at the connections. In addition, have your dealer inspect the electric system regularly.
2. Do not modify or reorganize the wiring of the electric field parts.
3. When disconnecting the battery cable, disconnect negative cable first, reinstall the positive cable first when reinstalling.

Disconnect battery negative terminal



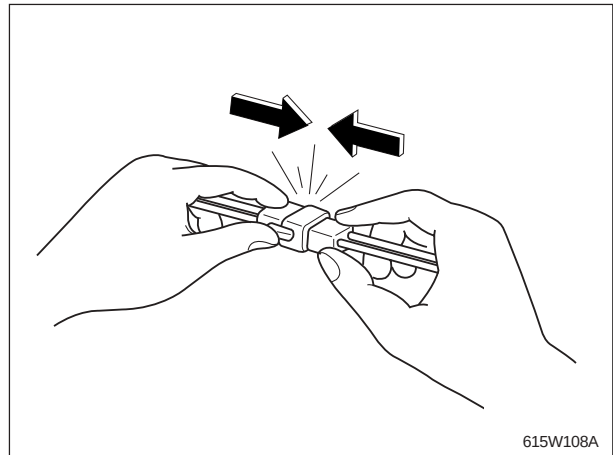
CAUTION

- Be sure to turn the starting key OFF when connecting or disconnecting the cable.



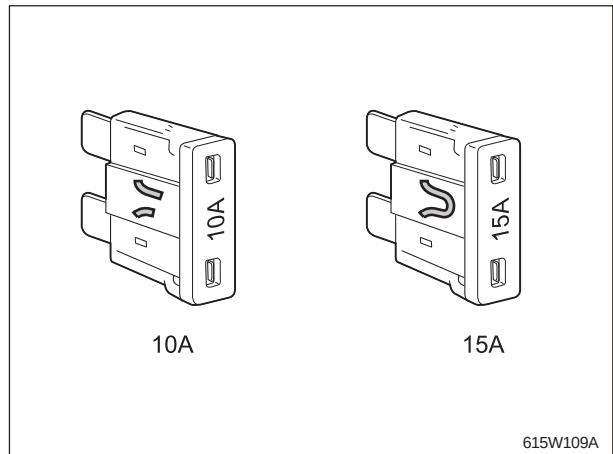
615W107A

4. Remove the connector by pulling the plastic section, not the wiring.



615W108A

5. When connecting the connector, insert it until it snaps.



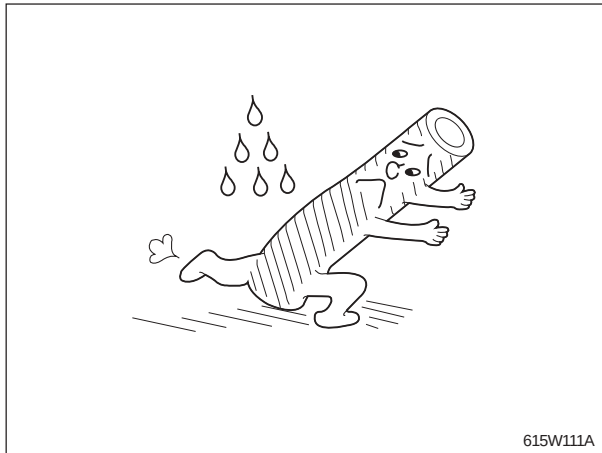
10A

15A

615W109A

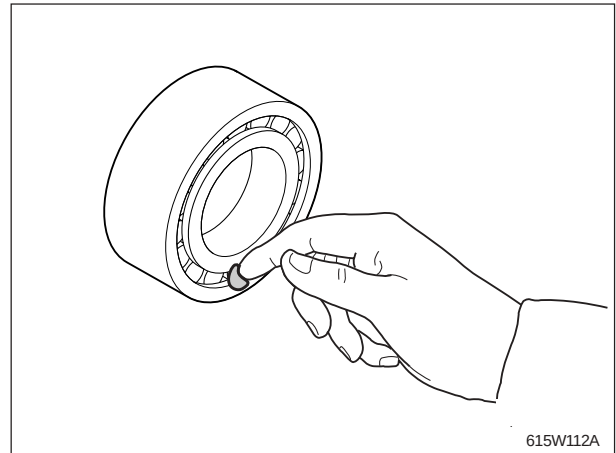
6. Be sure not to drop sensors and relays which are fragile.
7. When replacing a broken fuse with a new one, be sure to use the fuse of capacity as specified.

5.7 TUBES AND RUBBERS



Be cautious of oil or other petroleum products on the hoses and rubber parts, this may cause damage.

5.8 LUBRICANT



When assembling and fixing, apply designated lubricant where specified in accordance with this repair manual.

6. REGULAR CHECK LIST

⊙ The first

○ Periodically

Check Items	Indicated Hours By Hour Meter														Since Purchased	
	50	100	150	200	250	300	350	400	450	500	600	700	800	1500hr	1yr	2yr
Engine oil change	⊙	○		○		○		○		○	○	○	○			
Engine oil filter cartridge change	⊙			○				○			○		○			
Transmission oil change	⊙					○					○					
Hydraulic oil filter change	⊙			○				○			○		○			
Front axle oil change	⊙					○					○					
Applying grease	○	○	○	○	○	○	○	○	○	○	○	○	○			
Clutch pedal deflection	⊙		○			○			○		○		○			
Brake pedal deflection			○			○			○		○		○			
Fan belt tension				○				○			○		○			
Fuel filter element change								○					○			
Air cleaner element change		○		○		○		○		○	○	○	○			
Battery electrolyte			○			○			○		○		○			
Oil pressure fuel pipe's inlet screw if loosened	○	○	○	○	○	○	○	○	○	○	○	○	○			
Radiator hose's inlet bands if loosened			○			○			○		○		○			
Fuel pipe change																○
Radiator hose change																○
Hydraulic pipe joint change																○
Steering hose change																○
Toe-in			○			○			○		○		○			
Deflection adjustment in front and rear of the front axle											○					
Direction control section													○			
Bolt, nuts and pins of each part															○	
Battery positive code adjustment & change	○	○	○	○	○	○	○	○	○	○	○	○	○			
Bleeding water in clutch housing	○	○	○	○	○	○	○	○	○	○	○	○	○			
Check injection nozzle*														○		

* Maintenance intervals in basis on the EPA instructions.

7. OIL & WATER SUPPLY LIST

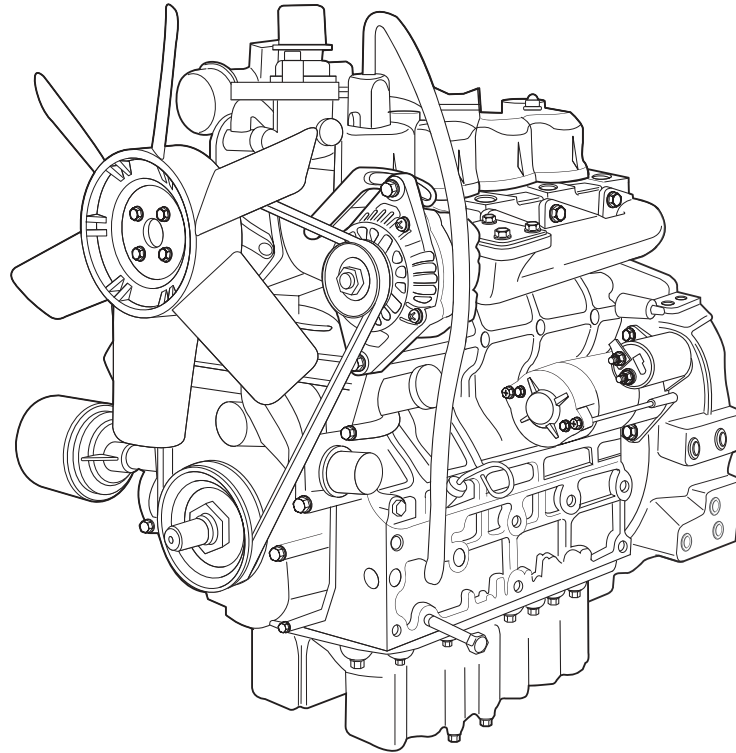
Supply Items		Capacity	Recommended Spec.
Fuel		40 ℓ (42.3 U.S.gal.)	No. 2 - D diesel fuel No. 1 - D diesel fuel if temperature is below - 10 °C (14 °F)
Coolant	3A165D	7.0 ℓ (1.85 U.S.gal.)	Fresh clean water with antifreeze
	4A200B	8.9 ℓ (2.35 U.S.gal.)	
Engine Oil	3A165D	5.5 ℓ (1.45 U.S.gal.)	SAE 15 W - 40
	4A200B	7.0 ℓ (1.85 U.S.gal.)	
Transmission Oil		44 ℓ (11.6 U.S.gal.)	Universal tractor/transmission hydraulic oil
Front Axle Section		7.8 ℓ (2.0 U.S.gal.)	
Applying Grease	Hydraulic control lever shaft section	Small quantity	SAE multi - purpose type grease
	3 point link section	Until grease exits	
	Brake pedal link section		
	Bracket section in front and rear of the front axle		
	Clutch release hub	Supply when removed	

CHAPTER 2

ENGINE SYSTEM

1. GENERAL

1.1 APPEARANCE



615W201A

The DAEDONG A series engines are vertical, water-cooled, 4-cycle, three or four cylinders diesel engines, they concentrate DAEDONG's foremost technologies.

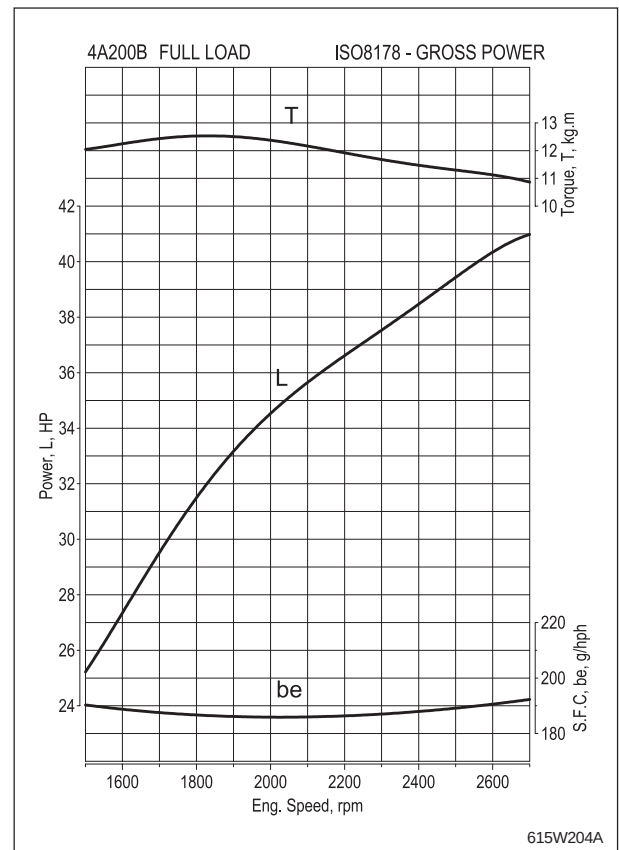
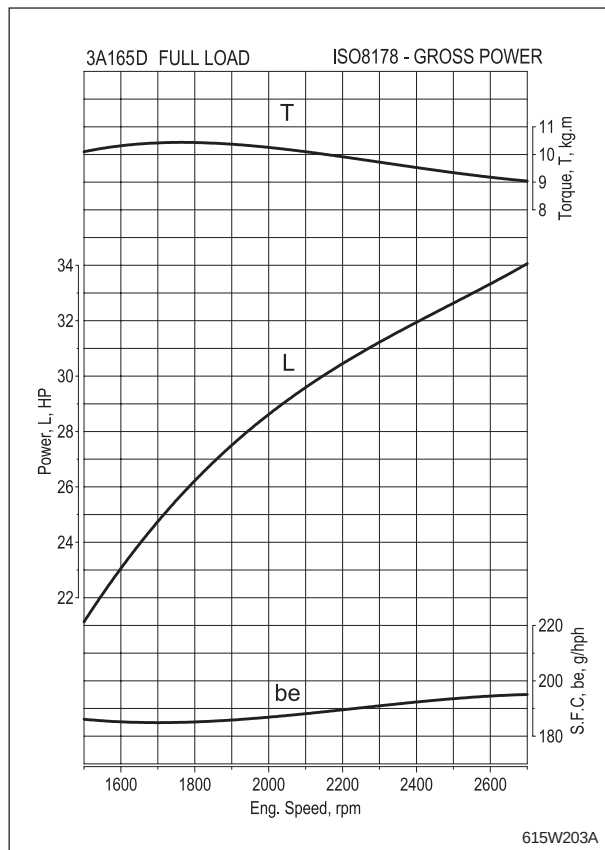
With swirl combustion chamber, bosch K type fuel injection pump, well-balanced designs, they feature greater power, low fuel consumption, less vibration and noise, and low emission.

1.2 SPECIFICATIONS

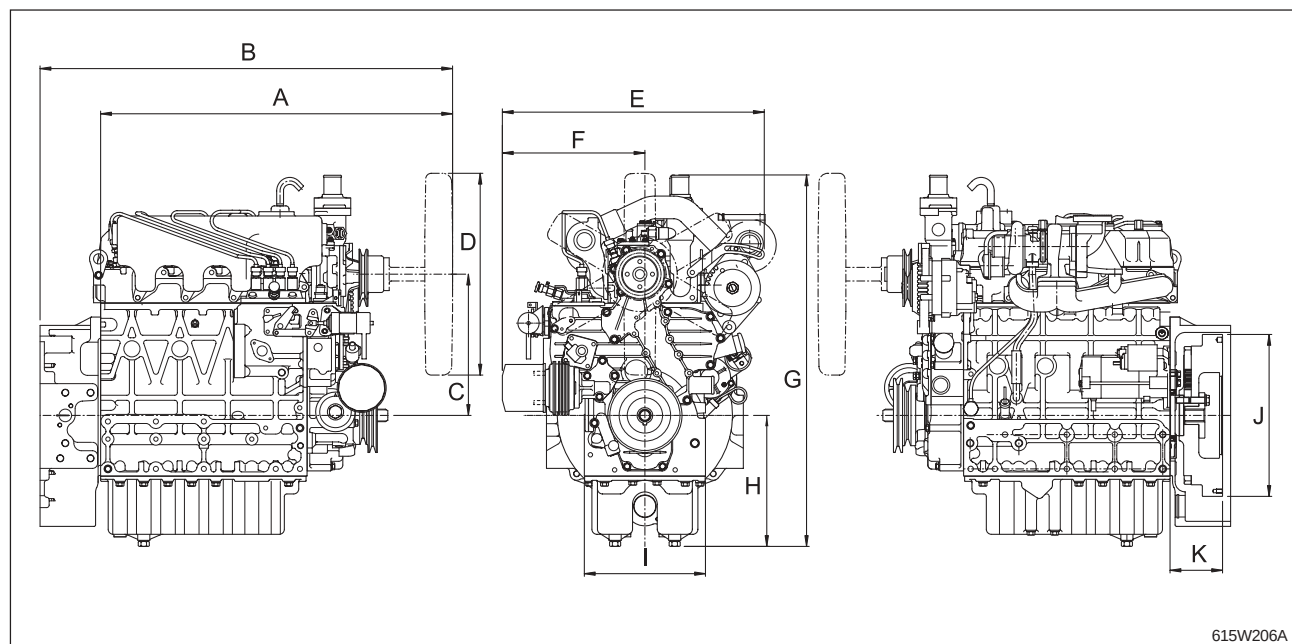
Model	3A165D	4A200B
Type	Vertical, water-cooled, 4-cycle diesel engine	Vertical, water-cooled, 4-cycle diesel engine
Number of cylinder	3	4
Bore and stroke	87 x 92.4 mm 3.43 x 3.64 in.	83 x 92.4 mm 3.27 x 3.64 in.
Total Displacement	1,647 cc 100.5 in ³	1,999 cc 122.0 in ³
Combustion Chamber	Spherical type	Spherical type
Gross power	33.5/2,700 HP/rpm 30.0/2,700 kW/rpm	40.4/2,700 HP/rpm 36.2/2,700 kW/rpm
Maximum idling speed	2,900 rpm	2,900 rpm
Minimum idling speed	850 ~ 900 rpm	850 ~ 900 rpm
Order of firing	1 - 2 - 3	1 - 3 - 4 - 2
Direction of rotation	Counterclockwise (viewed from flywheel side)	Counterclockwise (viewed from flywheel side)
Injection pump	Bosch K TYPE mini pump	Bosch K TYPE mini pump
Injection pressure	140 ~ 150 kgf/cm ² 13.73 ~ 14.71 MPa 1,991 ~ 2,133 psi	140 ~ 150 kgf/cm ² 13.73 ~ 14.71 MPa 1,991 ~ 2,134 psi
Injection timing (Before T.D.C)	18 °	18 °
Compression Ratio	22 : 1	22 : 1
Fuel	Diesel fuel	Diesel fuel
Lubricant	Engine oil SAE 15W-40	Engine oil SAE 15W-40
Dimensions (length x width x height)	722.3 x 488.1 x 729.9 mm 28.4 x 19.2 x 28.7 in.	817.3 x 488.1 x 735.8 mm 32.2 x 19.2 x 29.0 in.
Dry weight	179 kg 395 lbs.	183 kg 403 lbs.

* **NOTE:** Change of parts are not subject to advance notice.

1.3 PERFORMANCE CURVE



1.4 DIMENSIONS



615W206A

	A	B	C	D	E	F	G	H	I	J	K
3A165D (mm)	602.3	722.3	280.0	400.0	488.1	251.6	729.9	259.7	240.0	315.0	95.0
(in.)	23.71	28.44	11.02	15.75	19.22	9.91	28.74	10.00	9.45	12.40	3.74
4A200B (mm)	697.3	817.3	280.0	400.0	488.1	251.6	735.8	259.7	240.0	321.0	92.0
(in.)	27.45	32.18	11.02	15.75	19.22	9.91	28.97	10.22	9.45	12.64	3.62

1.5. GENERAL WARNING

- When disassembling, arrange each part on a clean place. Do not mix them up. Replace bolts and nuts where they were.
- When servicing electrical parts or connecting instruments to electrical equipment, first disconnect the battery negative terminal.
- Replace gaskets or O-rings with new ones when reassembling, and apply grease on a O-ring and the oil seal when reassembling.
- When exchanging parts, use Cub Cadet parts to maintain engine performance and safety.
- To prevent oil and water leakage, apply non-drying adhesive to the gaskets according to this manual before reassembling.
- When hoisting up the engine, use the hook provided on the cylinder head.
- When reinstalling the engine, use the hook provided on the cylinder head.
- When installing external cir-clips or internal cir-clips, direct corner end to the non-loosening direction.

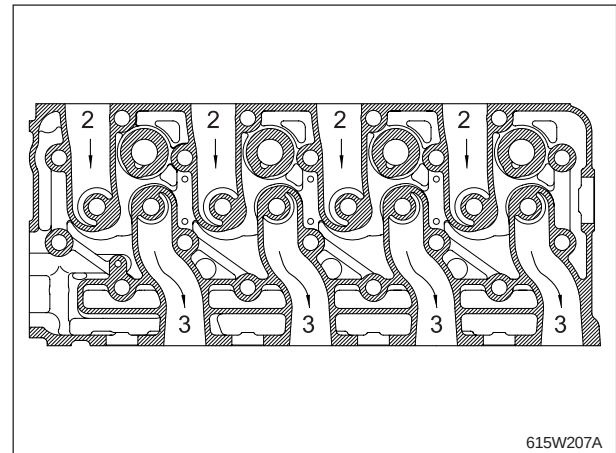
2. STRUCTURE AND FUNCTION

2.1 BODY

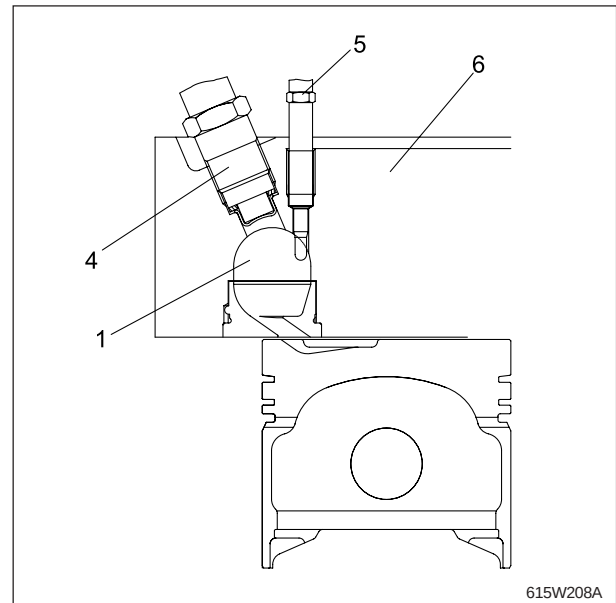
A. CYLINDER HEAD

The cylinder head is made of special alloy cast iron which can resist high temperature and pressure caused by combustion. The inlet and exhaust ports are arranged cross-flow type to get high combustion efficiency by protecting the suction air from being heated and expanded by heated exhaust air.

The DAEDONG vortex type combustion chamber is designed for high combustion efficiency and reducing fuel consumption. The glow plug assures easier than ever engine starts even at -15 °C (5 °F).

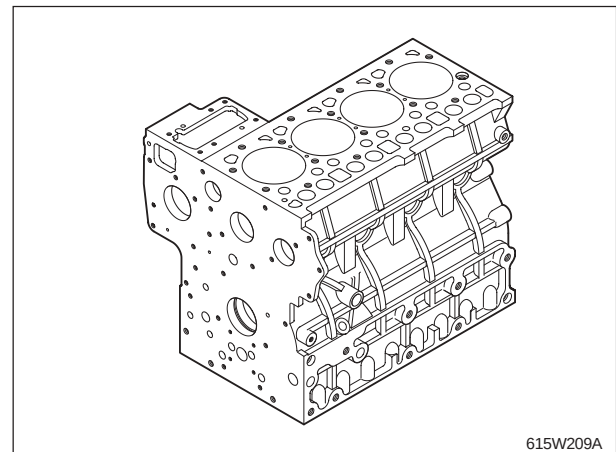


- (1) Combustion Chamber
- (2) Inlet Port
- (3) Exhaust Port
- (4) Injection Nozzle
- (5) Glow Plug
- (6) Cylinder Head



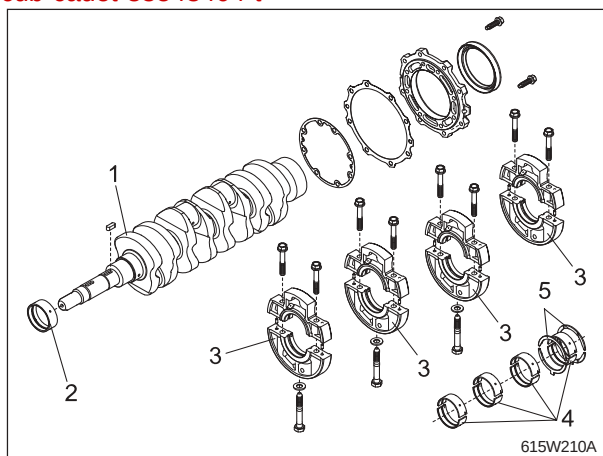
B. CYLINDER BLOCK

The engine has a high durability tunnel-type cylinder block. Furthermore, liner less type, allows effective cooling, less distortion, and greater wear-resistance using special material. The noise is reduced to a minimum because each cylinder has its chamber.



C. CRANKSHAFT

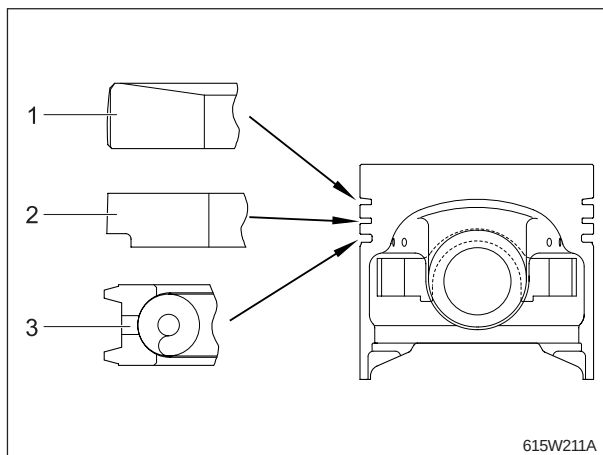
The crankshaft is made of forged steel and the journals, the crankpins and the bearing surface for the oil seal are induction-hardened to increase wear resistance. Each crankshaft journal is supported by the main bearing case (3) having a bearing inside. The front bearing-crankshaft bearing (2) is a solid type bushing and rear and intermediate bearings are a split type. The crankshaft, crankshaft bearings have oil holes for lubricant flow.



- (1) Crankshaft
- (2) Crankshaft Bearing 1
- (3) Main Bearing Case
- (4) Crankshaft Bearing 2
- (5) Thrust Bearing

D. PISTON AND PISTON RINGS

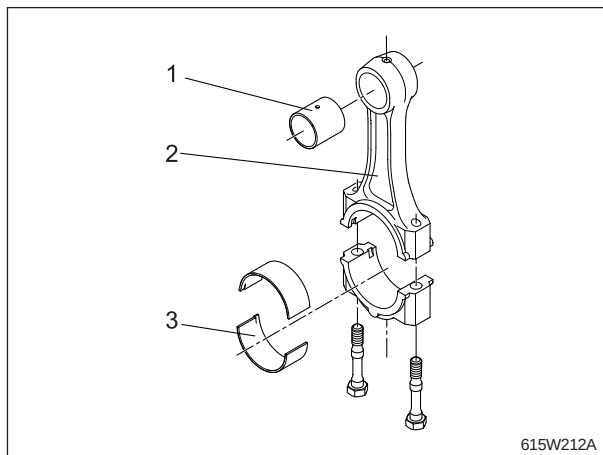
The piston is made of an aluminum alloy which is temperature and pressure resistant. Three rings are installed in the grooves of the piston. The top ring (1) is a keystone type, which can withstand heavy loads, and the barrel face on the ring fits well to the cylinder wall. The second ring (2) is an undercut type, which prevents the oil from being carried up. The oil ring (3) has chambered contact faces and an expander ring, which increase the pressure of the oil ring against the cylinder wall to scrape the oil. The top ring is plated with hard chrome to increase wear resistance (The ring of 4A200T engine is made of a special steel).



- (1) Top Ring
- (2) Second Ring
- (3) Oil Ring

E. CONNECTING ROD

The connecting rod (2), which converts the reciprocating motion of the pistons caused by the fuel combustion into the rotating motion of the crankshaft, is made of hard forged steel. The connecting rod has bearings at both ends. The small end has a solid type bearing (small end bushing (2)) and the big end has a split type bearing (crankpin bearing (3)).



- (1) Small End Bushing
- (2) Connecting Rod
- (3) Crankpin Bearing

Sample of manual. Download All 289 pages at:

<https://www.arepairmanual.com/downloads/cub-cadet-83548404-tractors-service-repair-workshop-manual/>