## [SPECIFICATIONS]

| Model | | ER1500 | ER1500N | KND1500 | ER1900DI | ER1900DI-N |
|---|---|---|---|---|---|---|
| Type | | Horizontal water-cooled, 4-cycle diesel engine | | | | |
| Number of cylinders | | 1 | | | | |
| Bore x stroke | | 110 x 105 mm (4.3 x 4.1 in.) | | | | |
| Displacement | | 997 $cm^3$ (60.8 cu.in.) | | | | |
| Continuous output | (HP/rpm) | 15/2200 | | | 16/2200 | |
| | (kW/r/s) | 11.0/36.7 | | | 11.8/36.7 | |
| Maximum output | (HP/rpm) | 18/2200 | | | 19/2200 | |
| | (kW/r/s) | 13.2/36.7 | | | 14/36.7 | |
| Idling speed | (rpm) | 800 to 1000 | | | | |
| Maximum bare speed | (rpm) | 2200 | | | | |
| Maximum torque | | 71.6 N·m/1400 rpm<br>7.3 kgf·m/1400 rpm<br>52.8 ft-lbs/1400 rpm | | | 72.8 N·m/1200 rpm<br>7.42 kgf·m/1200 rpm<br>57.67 ft-lbs/1200 rpm | |
| Compression ratio | | 22 | | | 16.5 | |
| Fuel injection pump | | PFR1K70 | | | PFR1KV95/1NP1 | |
| Plunger O.D (Injection pump) | | 7.0 mm dia. (0.28 in. dia.) | | | 9.5 mm dia. (0.374 in. dia.) | |
| Governor | | Contrifugal mechanical governor | | | | |
| Injection nozzle type | | ND-ND4SD24ND80 | | | ND-DLLA155S324N468 | |
| Injection timing | | 0.33 to 0.37 rad. (19° to 21°)<br>before Top Dead Center | | | | |
| Injection pressure | | 13.73 to 14.22 MPa, 140 to 145 $kgf/cm^2$, 1991 to 2062 Psi | | | 18.14 to 18.63 MPa, 185 to 190 $kg/cm^2$, 2631 to 2702 Psi | |
| Lubricant filter | | Magnetic filter | | | | |
| Oil pressure adjustment | | Regulation valve | | | | |
| Combustion system | | Precombustion swirl chamber | | | Direct injection chamber | |
| Cooling system | | Radiator | | Hopper | Radiator | |
| Lubricating system | | Forced lubrication with trochoid pump | | | | |
| Starting system | | Speed doubling handle by hand | | | | |
| Dynamo output | | 12V, 2×25W extra 25W Available | — | | 12V, 2×25W extra 25W Available | — |
| Lubricant capacity | | 5ℓ, 5.3 U.S. qts., 4.40 Imp. qts. | | | | |
| Cooling water capacity | ℓ | 4.7 | | 24 | 4.7 | |
| | U.S. qts. | 5.0 | | 25.4 | 5.0 | |
| | Imp. qts. | 4.14 | | 21.12 | 4.14 | |
| Fuel | | Light diesel oil (SAE No. 2-D) | | | | |
| Fuel tank capacity | | 16ℓ, 16.9 U.S. qts., 14.08 Imp. qts. | | | | |
| Dry weight | kg | 190 | 187 | 180 | 185 | 182 |
| | lbs. | 419 | 412 | 397 | 408 | 401 |
| Direction of rotation | | Counterclockwise facing flywheel | | | | |

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## [4] TROUBLESHOOTING

| Symptom | Probable Cause | Solution | Reference Page |
|---|---|---|---|
| **Engine does not start.** | • No fuel | Replenish fuel | |
| | • Air in the fuel system | Bleed air | S-29 |
| | • Water in the fuel system | Replace fuel and repair or replace fuel system | |
| | • Fuel pipe clogged | Clean | |
| | • Fuel filter clogged | Clean | S-27 |
| | • Excessively high viscosity of fuel at low temperatuere. | Use the specified fuel | |
| | • Fuel with low cetane number | Use the specified fuel | |
| | • Fuel leak due to loose injection pipe nut. | Tighten nut | |
| | • Incorrect injection timing | Adjust | S-93 |
| | • Fuel camshaft worn | Replace | |
| | • Injection nozzle clogged | Clean | S-98, 99, 101, 102 |
| | • Injection pump malfunctioning | Replace or repair | S-94, 95, 96, 97 |
| | • Seizure of crankshaft, camshaft, piston, cylinder liner or bearing | Replace or repair | S-84 |
| | • Compression leak from cylinder | Replace head gasket<br>Tighthen cylinder head nut and nozzle holder | S-60 |
| | • Deficient compression | Check and correct valve recessing<br>Check and correct valve clearance | S-61, 62, 64 |
| | • Piston rings and liner worn | Replace | S-75, 76, 83 |
| | • Improper valve timing | Correct or replace | S-50 |
| | • Excessive valve clearance | Adjust | S-45 |
| **Engine revolution is not smooth.** | • Fuel filter clogged or dirty | Clean | S-27 |
| | • Air cleaner clogged | Clean or replace | S-28 |
| | • Fuel leak due to loose injection pipe nut | Tighten nut | |
| | • Injection pump malfunctioning | Repair or replace | S-94, 95, 96, 97 |
| | • Incorrect nozzle opening pressure | Repair injection nozzle | S-98, 99 |
| | • Injection nozzle stuck or clogged | Repair or replace | S-98, 99, 101, 102 |
| | • Fuel overflow pipe clogged | Clean | |
| | • Governor malfunction | Repair | S-103 |



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## [5] SERVICE STANDARDS

R.V.: Reference Value
A.L.: Allowable Limit

| Item | | ER1500<br>ER1500-N<br>KND1500 | ER1900DI<br>ER1900DI-N<br>KND1900DI | ER1700DI, ER2200DI<br>ER1700DI-N, ER2200DI-N<br>KND1700DI, KND2200DI |
|---|---|---|---|---|
| **ENGINE BODY** | | | | |
| **Cylinder Head** | | | | |
| Compression pressure | R.V. | 3.18 MPa<br>32 kgf/cm$^2$<br>455 psi | 2.844 to 3.138 MPa<br>29 to 32 kgf/cm$^2$<br>412 to 455 psi | |
| | A.L. | 2.363 MPa<br>24.1 kgf/cm$^2$<br>343 psi | 2.295 MPa<br>23.4 kgf/cm$^2$<br>333 psi | |
| Top clearance | R.V. | 0.8 to 1.1 mm<br>(0.031 to 0.043 in.) | | |
| Cylinder head surface flatness | A.L. | 0.3 mm<br>(0.012 in.) | | |
| Gasket thickness (Grommet section) | Free | 2.1 to 2.4 mm<br>(0.083 to 0.094 in.) | | 2.0 to 2.3 mm<br>(0.079 to 0.091 in.) |
| | Retight-ened | 1.70 to 1.80 mm<br>(0.067 to 0.071 in.) | | |
| **Decompression** | | | | |
| Compression release | R.V. | 1.1 to 1.5 mm<br>(0.043 to 0.059 in.) | | |
| **Valve** | | | | |
| Valve clearance (Intake and exhaust valves) | R.V. | 0.140 to 0.224 mm<br>(0.00551 to 0.00882 in.) | | |
| Valve recessing | R.V. | 1.2 to 1.4 mm<br>(0.047 to 0.055 in.) | | |
| | A.L. | 1.7 to 1.9 mm<br>(0.067 to 0.075 in.) | | |
| Valve seat width | R.V. | 2.1 mm<br>(0.083 in.) | | |
| Valve seat angle | R.V. | 0.79 rad.<br>(45°) | | |
| Valve face angle | R.V. | 0.79 rad.<br>(45°) | | |
| Valve stem O.D. (Intake, exhaust) | R.V. | 8.960 to 8.975 mm<br>(0.35276 to 0.35335 in.) | | |
| Valve guide I.D. (Intake, exhaust) | R.V. | 9.020 to 9.035 mm<br>(0.35512 to 0.35571 in.) | | |
| Clearance between valve stem and guide | R.V. | 0.045 to 0.075 mm<br>(0.00177 to 0.00295 in.) | | |
| | A.L. | 0.2 mm<br>(0.008 in.) | | |



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## [6] MAINTENANCE CHECK LIST

**⚠ CAUTION:**

- When changing or inspecting, be sure to level and stop the engine.

| Item \ Running hours | | Daily | Initial 20 h | Every 50 h | Every 100 h | Every 300 h | Every 1000 h | Reference page |
|---|---|---|---|---|---|---|---|---|
| Fuel tank | Replenish | ○ | | | | | | |
| | Cleaning | | | | | ○ | | |
| Crankcase oil | Check | ○ | | | | | | S-26 |
| | Change | | ○ | | ○ | | | S-27 |
| Oil strainer | Cleaning | | ○ | | ○ | | | S-27 |
| Air cleaner | Check | ○ | | | | | | S-28 |
| | Cleaning | | | | ○ | | | S-28 |
| Cooling water | Check | ○ | | | | | | |
| Fuel filter | Cleaning | | | | ○ | | | S-27 |
| Oil piping | Check | | | ○ | | | | |
| Tightening of bearing cylinder head, pump, etc. | Check | | | | ○ | | | |
| Valve clearance | Check | | | | ○ | | | S-45 |
| Intake valve lapping | Lapping | | | | | | ○ | S-67 |
| Exhaust valve lapping | Lapping | | | | | ○ | | S-67 |
| Nozzle opening pressure and spray pattern | Check | | | | | ○ | | S-98, 99 |
| Cylinder | Cleaning | | | | | | ○ | |
| Piston | Cleaning | | | | | | ○ | |
| Fuel injection pump | Check | | | | | | ○ | |

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## [3] TIGHTENING TORQUES

Bolts and nuts must be tightened to the specified torque using a torque wrench.
Several bolts and nuts such as used on the cylinder head must be tightened in proper sequence and to the proper torque.

**1) Tightening torques for special use bolts and nuts**

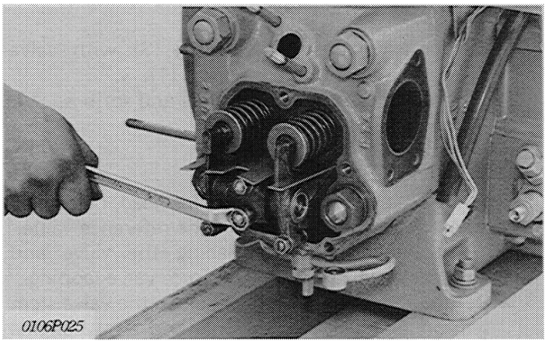
■ **Note:**

- For "○" marked nuts on the table, apply engine oil to their threads and Moricoat to their seats before tightening.
- For "△" marked bolts and nuts on the table, apply engine oil to their threads and seats before tightening.

| Item | | | Size x Pitch | Tightening Torque | | |
|---|---|---|---|---|---|---|
| | | | | N·m | kgf·m | ft-lbs |
| ○ Cylinder Head | Stud | | M20 x P2.5 | 147 to 177 | 15 to 18 | 108 to 130 |
| | Nut | 1500 Series | | 245 to 304 | 25 to 31 | 181 to 224 |
| | | 1700, 1900 2200 Series | M20 x P1.5 | 249 to 353 | 30 to 36 | 217 to 260 |
| ○ Connecting Rod Bolt | | | M11 x P1.25 | 73.5 to 78.5 | 7.5 to 8.0 | 54.2 to 57.9 |
| ○ Flywheel Nut | | | M36 x P2.0 | 392 to 490 | 40 to 50 | 289 to 362 |
| Main Bearing Case Bolt | | | M10 x P1.25 | 39.2 to 45.1 | 4.0 to 4.6 | 28.9 to 33.3 |
| Main Bearing Case Cover Bolt (1500 and 1900 Series only) | | | M8 x P1.25 | 23.5 to 27.5 | 2.4 to 2.8 | 17.4 to 20.3 |
| Crankcase Cover Bolt | | | M6 x P1.0 | 11.8 to 12.7 | 1.2 to 1.3 | 8.7 to 9.4 |
| ○ Oil Pipe Eye Joint Bolt | | | | 23.5 to 27.5 | 2.4 to 2.8 | 17.4 to 20.3 |
| Fuel Pump Mounting Bolt | | | M8 x P1.25 | 23.5 to 27.5 | 2.4 to 2.8 | 17.4 to 20.3 |
| Fuel Pump Delivery Valve Holder | | 1500 Series | | 49.0 to 58.8 | 5.0 to 6.0 | 36.0 to 43.4 |
| | | 1700, 1900 2200 Series | | 58.8 to 63.7 | 6.0 to 6.5 | 43.4 to 47.0 |
| Nozzle Holder Mounting Nut | | | M8 x P1.25 | 17.7 to 20.6 | 1.8 to 2.1 | 13.0 to 15.2 |
| Nozzle Nut and Nozzle Holder | | 1500 Series | | 98 to 118 | 10 to 12 | 72.0 to 87.0 |
| | | 1700, 1900 2200 Series | | 58.8 to 78.5 | 6.0 to 8.0 | 43.4 to 57.9 |
| Nozzle Cap Nut (except 1500 Series) | | | | 39.2 to 49.0 | 4.0 to 5.0 | 28.9 to 36.2 |
| Cylinder Head Cover Bolt | | | M8 x P1.25 | 23.5 to 27.5 | 2.4 to 2.8 | 17.4 to 20.3 |
| Gear Case Bolt | | | M8 x P1.25 | 23.5 to 27.5 | 2.4 to 2.8 | 17.4 to 20.3 |
| Speed Control Lever Support | | | M20 x P1.5 | 34.3 to 39.2 | 3.5 to 4.0 | 25.3 to 28.9 |
| Idle Gear Shaft Bolt | | | M10 x P1.5 | 48.1 to 55.9 | 4.9 to 5.7 | 35.4 to 41.2 |
| Rocker Arm Bracket Nut | | | M8 x P1.25 | 17.7 to 20.6 | 1.8 to 2.1 | 13.0 to 15.2 |
| △ Crankshaft Bearing Retainer Bolt (except 1500, 1900 Series) | | | M6 x P1.0 | 11.8 to 12.7 | 1.2 to 1.3 | 8.7 to 9.4 |
| △ Crankshaft Counterweight Bolt | | | M10 x P1.25 | 63.7 to 68.6 | 6.5 to 7.0 | 47.0 to 50.6 |



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## Rocker Arm

1. Remove the rocker arm and plate.
2. Remove the push rod.

**(When reassembling)**

- After tightening the rocker arm to the specified torque, make sure that it moves smoothly.

| | | |
|---|---|---|
| Tightening torque | Bracket mounting nut | 17.7 to 20.6 N·m<br>1.8 to 2.1 kgf·m<br>13.0 to 15.2 ft-lbs. |

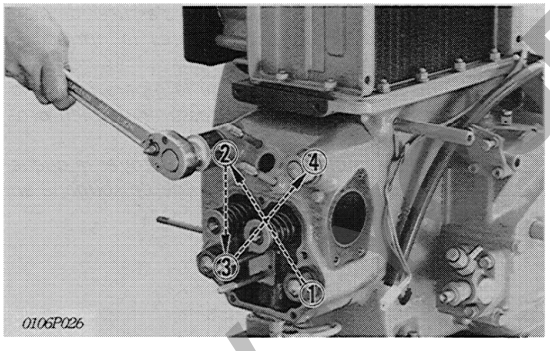
## Culbuteur

*1. Déposer le culbuteur et la plague.*
*2. Déposer la tige de culbuteur*

**(Au remontage)**

- *Après de serrage du culbuteur au couple spécifié, vérifier s'il tourne régulièrement.*

| | | |
|---|---|---|
| *Couple de serrage* | *Ecrou de montage de rampe de culbuteur* | *17,7 à 20,6 N·m*<br>*1,8 à 2,1 kgf·m* |




## Cylinder Head

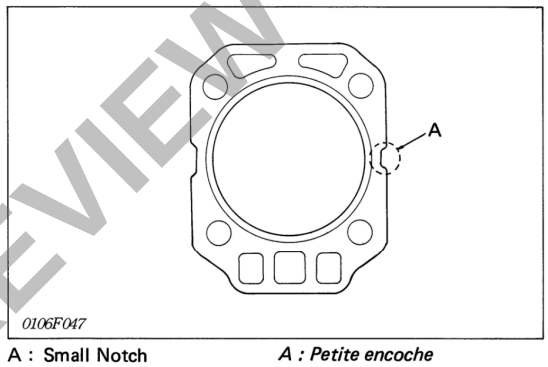
1. Remove the cylinder head mounting nuts in the order of (4) to (1) as shown in the photo.
2. Remove the cylinder head.

**(When reassembling)**

- Apply engine oil to each nut.
- Tighten the cylinder head mounting nuts to the specified torque in the order of (1) to (4) as shown in the photo.
- After running the engine, for 30 minutes or more, be sure to retighten the nuts.

**■ Important:**

- Install the head gasket, facing it's smaller notch (A) to the gear case.




A : Small Notch

## Culasse

*1. Dévisser les écrous de montage de la culasse dans l'ordre indiqué dans la photo (de (4) à (1)).*
*2. Déposer la culasse.*

**(Au remontage)**

- *Appliquer l'huile de moteur à chaque écrou.*
- *Serrer les écrous de montage de la culasse au couple spécifié dans l'ordre indiqué dans la photo (de (1) à (4)).*
- *Après la mise en marche du moteur pour 30 minutes ou plus, s'assurer de bien resserrer les écrous.*

**■ Important:**

- *Mettre en place le joint de culasse en orientant sa petite encoche (A) vers le carter de distribution.*

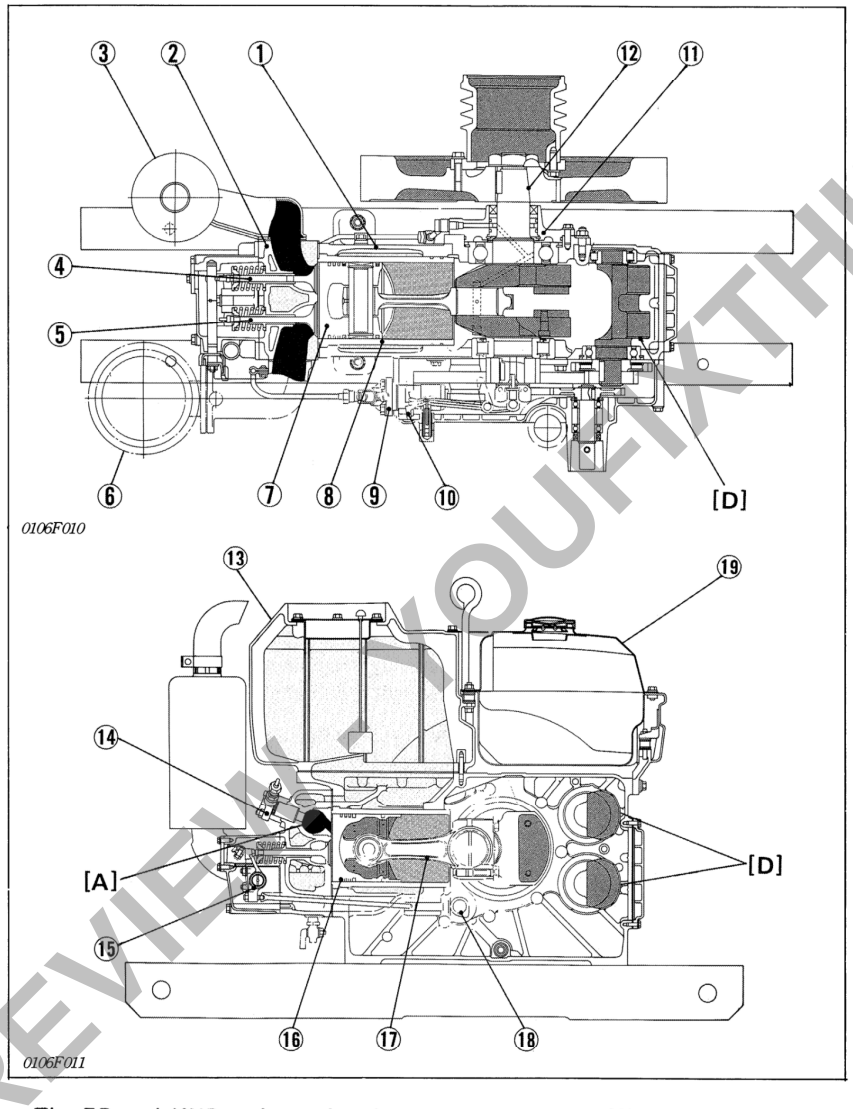
*A : Petite encoche*



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# GENERAL
# *GENERAL*

## ER1500, KND1500




(1) Cylinder Block
(2) Cylinder Head
(3) Muffler
(4) Exhaust Valve
(5) Intake Valve
(6) Air Cleaner
(7) Piston
(8) Cylinder Liner
(9) Injection Pump
(10) Governor
(11) Main Bearing Case
(12) Crankshaft
(13) Hopper
(14) Injection Nozzle
(15) Rocker Arm
(16) Piston Ring
(17) Connecting Rod
(18) Camshaft
(19) Fuel Tank
[A] Spherical Vortex Chamber
(See page M-3)
[D] Dynamic Balancer
(See page M-7)

*(1) Bloc-cylindre*
*(2) Culasse*
*(3) Pot d'échappement*
*(4) Soupape d'échappement*
*(5) Soupape d'admission*
*(6) Filtre à air*
*(7) Piston*
*(8) Chemise*
*(9) Pompe d'injection*
*(10) Régulateur*
*(11) Carter de roulement principal*
*(12) Vilebrequin*
*(13) Trémie*
*(14) Porte-injecteur*
*(15) Culbuteur*
*(16) Segment*
*(17) Bielle*
*(18) Arbre à cames*
*(19) Réservoir à combustible*
[A] *Chambre sphérique de turbulence*
*(Voir page M-3)*
[D] *Equilibrage dynamique*
*(Voir page M-7)*

- The ER and KND series engines have the same construction except the cooling system.
- The ER series adopts a radiator cooling system.
- The KND series adopts a hopper type cooling system.

- *Mis à part leurs systèmes de refroidissemnt, les moteurs de série ER et KND sont identiques.*
- *La série ER est équipée d'un système de refroidissement à radiateur.*
- *La série KND est équipée d'un système de refroidissement à trémie.*



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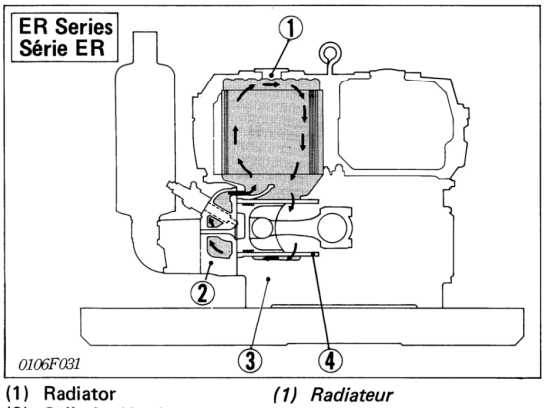
| | KND1900DI | ER1700DI | ER1700DI-N | KND1700DI | KND1700DI | ER2200DI-N | KND2200DI |
|---|---|---|---|---|---|---|---|
| | Horizontal water-cooled, 4-cycle diesel engine | | | | | | |
| | 1 | | | | | | |
| | 110 x 105 mm (4.3 x 4.1 in.) | 116 x 105 mm (4.6 x 4.1 in.) | | | | | |
| | 997 $cm^3$ (60.8 cu.in.) | 1109 $cm^3$ (67.7 cu.in.) | | | | | |
| | 16/2200 | 17/2200 | | | | | |
| | 11.8/36.7 | 12.5/36.7 | | | | | |
| | 19/2200 | 22/2200 | | | | | |
| | 14/36.7 | 16.2/36.7 | | | | | |
| | 800 to 1000 | | | | | | |
| | 2200 | | | | | | |
| | 72.8 N·m/1200rpm<br>7.42 kgf·m/1200 rpm<br>53.67 ft-lbs/1200 rpm | 81.4 N·m/1200 rpm<br>8.3 kgf·m/1200 rpm<br>60.0 ft-lbs/1200 rpm | | | | | |
| | 16.5 | | | | | | |
| | PFR1KV95/1NP1 | | | | | | |
| | 9.5 mm dia. (0.374 in. dia.) | | | | | | |
| | Contrifugal mechanical governor | | | | | | |
| | ND-DLLA155S324N468 | | | | | | |
| | 0.33 to 0.37 rad. (19° to 21°) before Top Dead Center | | | | | | |
| | 18.63 to 19.42 MPa, 190 to 198 kg/$cm^2$, 2698 to 2816 Psi | | | | | | |
| | Magnetic filter | | | | | | |
| | Regulation valve | | | | | | |
| | Direct injection chamber | | | | | | |
| | Hopper | Radiator | | Hopper | Radiator | | Hopper |
| | Forced lubrication with trochoid pump | | | | | | |
| | Speed doubling handle by hand | | | | | | |
| | — | 12V, 2x25W extra 25W Available | — | | 12V, 2x25W extra 25W Available | — | |
| | 5ℓ, 5.3 U.S. qts., 4.40 Imp. qts. | | | | | | |
| | 24 | 4.7 | | 24 | 4.7 | | 24 |
| | 25.4 | 5.0 | | 25.4 | 5.0 | | 25.4 |
| | 21.2 | 4.14 | | 21.2 | 4.14 | | 21.2 |
| | Light diesel oil (SAE No. 2-D) | | | | | | |
| | 16ℓ, 16.9 U.S. qts., 14.08 Imp. qts. | | | | | | |
| | 175 | 189 | 182 | 192 | 192 | 189 | 182 |
| | 386 | 417 | 401 | 423 | 423 | 417 | 401 |
| | Counterclockwise facing flywheel | | | | | | |



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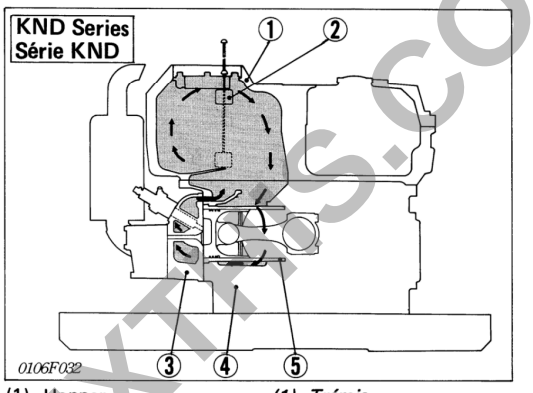
# COOLING SYSTEM
# *SYSTEME DE REFROIDISSEMENT*

## [1] GENERAL
## GENERALITES




(1) Radiator
(2) Cylinder Head
(3) Crankcase
(4) Cylinder Liner

*(1) Radiateur*
*(2) Culasse*
*(3) Bloc-cylindre*
*(4) Chemise*




(1) Hopper
(2) Water Float
(3) Cylinder Head
(4) Crankcase
(5) Cylinder Liner

*(1) Trémie*
*(2) Flotteur*
*(3) Culasse*
*(4) Bloc-cylindre*
*(5) Chemise*

The ER Series engines equips a pressurized radiator natural convection type cooling system. Cooling water moves downward, as the water is cooled by the fan at the radiator (1), increases in specific gravity.
And it absorbs combustion heat of the cylinder liner (4) and cylinder head (2), and friction heat generated from moving parts.
Cooling water moves upward, as the water absorbs heat and decrease in specific gravity and cooled again in the radiator, thus, the cooling water circulates naturally to cool the engine.
The KND Series engines equips a hopper cooling system. This system also features natural convection cooling as does the above-mentioned radiator. This system, however, differs from the pressurized radiator type in that the cooling water evaporates as it becomes high in temperature.
The water float (2) lowers as the cooling water evaporates and decreases, and informs the operator of the cooling water quantity.

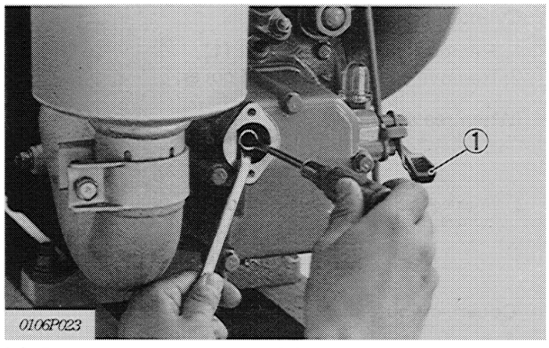
■ **Important:**
For the hopper system occasionally check the cooling water level and replenish if not sufficient. Running the engine without cooling water will causes seizure.

*Les moteurs de série ER sont équipés d'un système de refroidissement de radiateur préssurisé à convection naturelle.*
*L'eau de refroidissement meut vers le bas, quand l'eau est refroidie par le radiateur (1) et le ventilateur augmente en gravité spécifique.*
*Et elle absorbe la chaleur de combustion de la chemise (4) et de la culasse (2) ainsi que la chaleur de friction produite par les pièces en mouvement.*
*L'eau de refroidissement meut vers le haut quand l'eau absorbe la chaleur, diminue en gravité spécifique et est refroidie encore dans le radiateur; ainsi l'eau de refroidissement s'écoule normalement pour refroidir le moteur.*
*Les moteurs de série KND sont équipés d'un système de refroidissement à trémie. Ce système se caractérise également, comme le cas du radiateur mentionné ci-dessus, par un système de refroidissement à convection naturelle.*
*Ce système diffère cependant du type de radiateur pressurisé en ce que l'eau de refroidissement s'évapore quand elle atteint le point d'ebullition. Le flotteur (2) baisse quand l'eau de refroidissement s'évapore et diminue en informant ainsi l'opérateur de la quantité d'eau de refroidissement.*

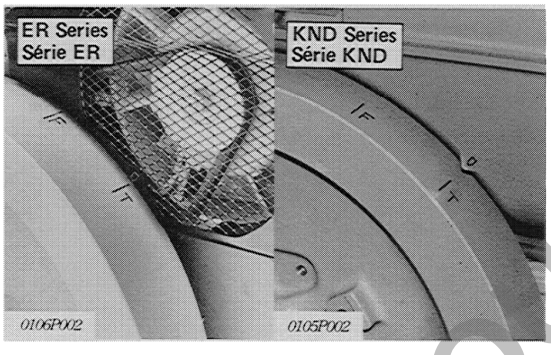
■ **Important:**
*Pour le système à trémie, vérifier de temps en temps le niveau d'eau de refroidissement et remplir de nouveau si elle n'est pas suffisante. Le fait de mettre en marche le moteur sans eau de refroidissement peut le faire caler.*

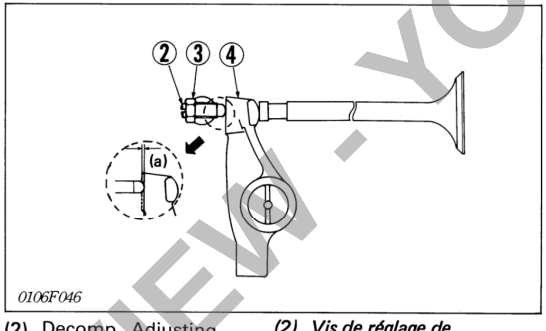


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(1) Decompression Lever *(1) Levier de décompression*




(2) Decomp. Adjusting. Screw
(3) Lock Nut
(4) Rocker Arm
(a) 1.1 to 1.5 mm (0.043 to 0.059 in.)

*(2) Vis de réglage de décompression*
*(3) Ecrou de blocage*
*(4) Culbuteur*
*(a) 1,1 à 1,5 mm*

## Adjusting Decompression Device

1. Align the "T" mark on the flywheel to the mark on the fan cover (Hopper casting mark for KND Type) at the T.D.C. in the compression stroke.
2. Remove the decompression cover from the cylinder head over.
3. Set the decompression lever (1) to the operating position.
4. Loosen the lock nut (3) and screw in the decompression adjusting screw until it contacts the rocker arm.
5. From the position where the adjusting screw contacts the rocker arm, further screw in the adjusting screw by a turn and a half (9.42 to 12.57 rad. 540° to 720°).
6. Tighten the lock nut.
7. After adjustment, make sure that the piston does not push up the valve when slightly rotating the flywheel, using the decompression lever.

| | | |
|---|---|---|
| Decompression device | Reference valve | 1.1 to 1.5 mm<br>0.043 to 0.057 in. |

## *Réglage de dispositif de décompression*

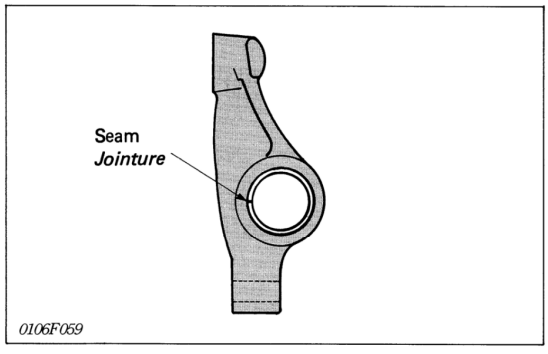
*1. Aligner le repère "T" sur le volant avec le repère sur le couvercle de ventilateur (Marque de coulée de trémie pour le type KND) au P.M.H. dans la course de compression.*
*2. Déposer le couvercle de décompression du couvre-culbuteur.*
*3. Mettre le levier de décompression (1) en position d'opération.*
*4. Desserrer l'écrou de blocage (3) et viser la vis de réglage de décompression jusqu'à ce qu'elle touche le cultuteur.*
*5. De la position à laquelle la vis de réglage entre en contact avec le culbuteur, viser encore la vis de réglage d'un tour et demi 0,42 à 12,57 rad., (540° à 720°).*
*6. Serrer l'écrou de blocage.*
*7. Après le réglage, s'assurer que le piston ne pousse pas la soupape vers le haut quand, utilisant le levier de décompression, on tourne le volant leégèrement.*

| | | |
|---|---|---|
| *Dispositif décompression* | *Valeur de référence* | *1,1 à 1,5 mm* |

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**Replacing Rocker Arm Bushing**

1. Press-out the bushing using a rocker arm bushing replacing tool. (See page S-34)
2. Thoroughly clean the fitting section between a new bushing and the rocker arm, and apply enigne oil.
3. Press-fit the rocker arm bushing so that the bushing seam is facing in the direction as shown in figure. (No inner diameter finishing is required after press-fitting.)

**Remplacement de la bague de culbuteur**

1. *Chasser la bague au moyen de l'outil de remplacement de bague de culbuteur. (Voir page S-34).*
2. *Nettoyer d'un bout à l'autre la section entre la nouvelle bague et le culbuteur, puis appliquer de l'huile moteur.*
3. *Mettre en placer la bague de culbuteur de façon à ce que la jointure de bague soit orientée dans la direction indiquée dans la figure. (L'usinage du diamètre interne n'est pas nécessaire après la mise en place.)*

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