SERVICE MANUAL

N843H / N843L / N843 / N844LT / N844L / N844T / N844
ISM Tier 3
Engine

Part number 47632248
2nd edition English
April 2014
Replaces part number 84392572

NEW HOLLAND CONSTRUCTION

CONSUMABLES INDEX

Consumable	Reference	PAGE
Molykote® G-N Metal assembly paste	Camshaft Tappets - Install	10.3 / 19
Molykote®	Cylinder head - Install	10.4 / 14
Loctite® 243	Crankshaft oil seal Rear seal - Install	10.6 / 10

Crankcase - Dimension

Bore	
Standard	**84 - 84.019 mm** (**3.3071 - 3.3078 in**)
Head surface warp	
Standard	**0.05 mm** (**0.002 in**)
Maximum	**0.12 mm** (**0.005 in**)

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Pan and covers - 102

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Consumable	Reference	PAGE
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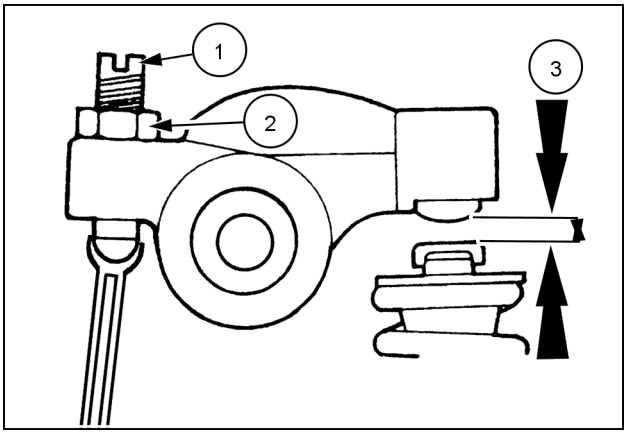
Rocker arm - Clearance

NOTICE: *Adjust the valve clearance only while the engine is cold.*

1. Rotate the crankshaft clockwise and bring each piston to Top Dead Center (TDC) on the compression stroke (both valves closed).

NOTE: *This will ensure the tappet is in its lowest position before making the adjustment.*

2. Loosen the nut **(2)** and adjust the clearance of both the intake and exhaust valves to **0.2 mm** (**0.008 in**) **(3)** with the adjusting screw **(1)**.
3. Hold the adjusting screw from turning and torque nut to **12 - 16 N·m** (**9 - 12 lb ft**).



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Valve drive and gears - 106

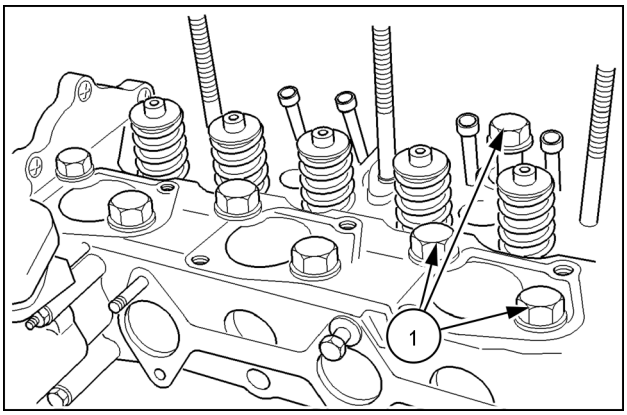
Cylinder head - Remove

Prior operation:
Rocker support - Remove (10.106)

1. Remove the cylinder head bolts **(1)** by alternately loosening a half turn at a time to prevent warping the head.

NOTE: *Keep all valve components in separately marked containers for reassembly in their original location.*

2. Remove the cylinder head.



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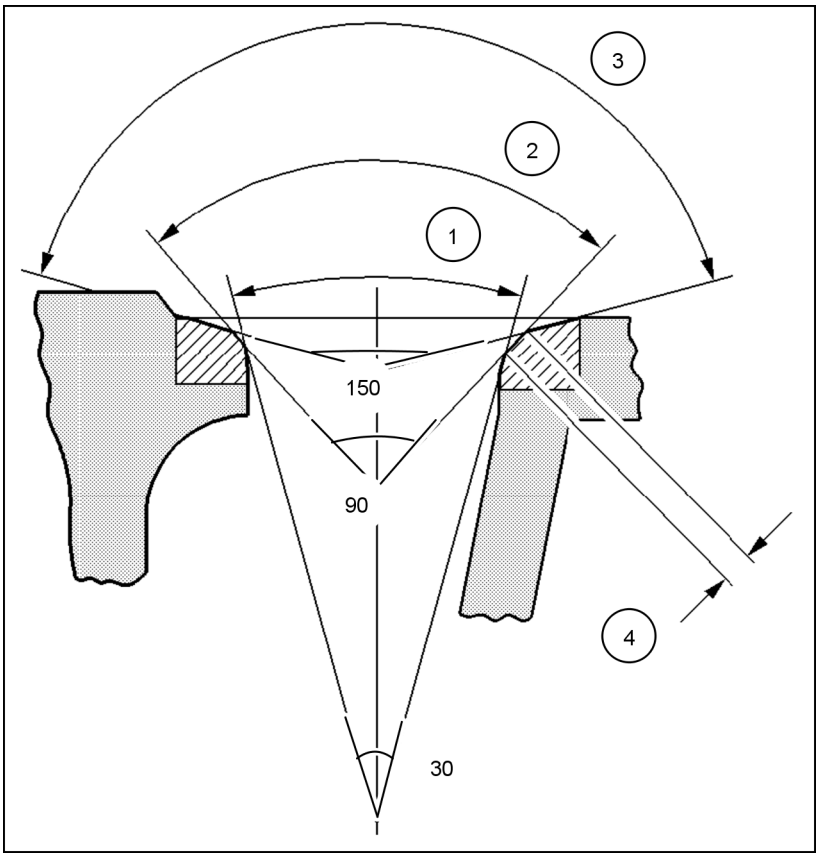
1. Check the seat for surface defects. Use a **45 °** stone to reface if needed.

NOTE: *Grind away only enough material to provide a smooth even seat.*

2. Check the seat width. If necessary, use a **15 °** stone to lower the seat contact point and use a **75 °** stone to raise the seat contact point.

NOTE: *Refacing the seat should always be coordinated with refacing of the valve to ensure a compression tight fit.*



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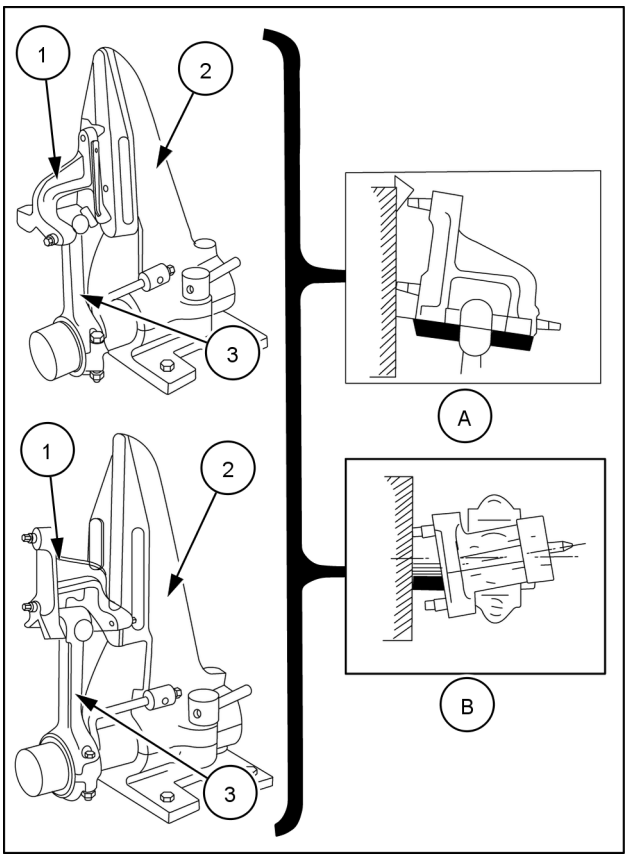
(1) Lower seat location - **15 °** stone		
(2) Seat angle - **45 °** stone		
(3) Raise seat location - **75 °** stone		
(4) Contact width	Intake	Exhaust
Standard assembling value	**2.16 - 2.38 mm** (**0.08504 - 0.09370 in**)	**1.50 - 1.86 mm** (**0.05906 - 0.07323 in**)
Service limit	**2.7 mm** (**0.10630 in**)	**2.5 mm** (**0.09843 in**)

Connecting rod and piston Connecting rod - Inspect



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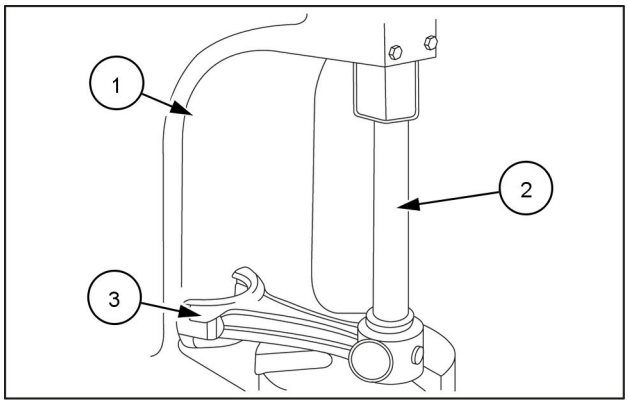
(1) Gauge
(2) Alignment fixture
(3) Connecting rod
(A) Bent rod
(B) Twisted rod

1. Check the connecting rods for damage and alignment. Place each rod in an alignment fixture to check for bent or twisted condition.
2. Straighten or replace rods that are bent or twisted more than the following dimensions:
   - Maximum bend **(A)**: **0.15 mm** (**0.0059 in**) per **100 mm** (**3.94 in**).
   - Twist **(B)**: **0.2 mm** (**0.0078 in**) per **100 mm** (**3.94 in**).

Piston pin bushings - Replace

1. Remove and install the connecting rod **(3)** piston pin bushings using a suitable driver **(2)** and press **(1)** a new bushing into the rod bore.



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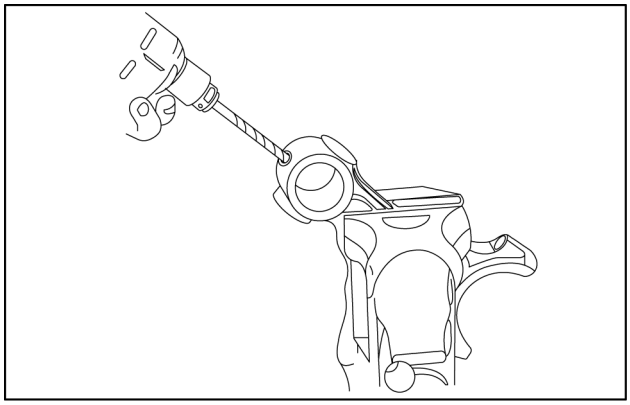
2. Ream and hone the bushing to the following finish size:
   - Pin to Bushing Clearance:
     - Standard = **0.010 - 0.027 mm** (**0.00039 - 0.00106 in**)
     - Max. = **0.08 mm** (**0.00315 in**)
3. Drill a hole in the new bushing using the lube port in the connecting rod as a guide.



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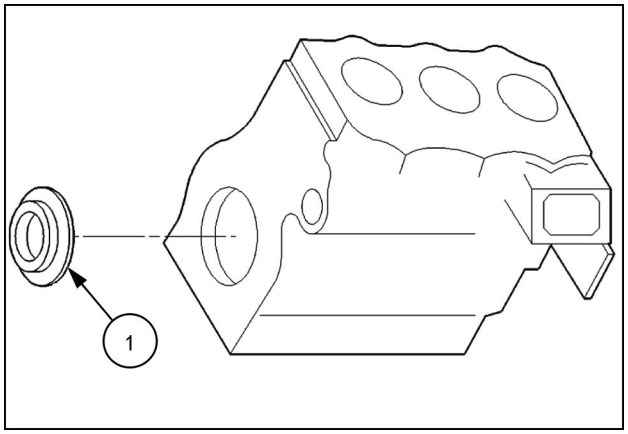
Crankshaft oil seal Rear seal - Remove

1. Remove the backplate retaining bolts and remove the backplate.
2. Use a seal puller to remove the rear oil seal **(1)**.



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7. Check the thrust washer for wear, poor contact, burning, or other defects. Using a micrometer measure the washer thickness. If washer thickness is not within allowable limits or found to be defective, the washers must be replaced.
   - Standard thickness: **2.95 - 3.0 mm** (**0.116 - 0.118 in**).
   - Allowable limit: **2.8 mm** (**0.11 in**).

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Pump drives - 114

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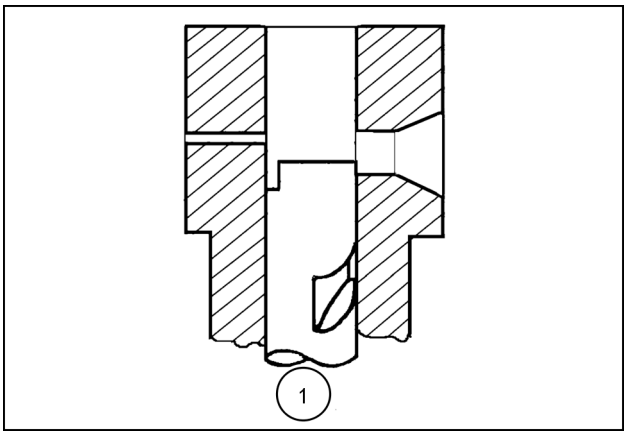
Fuel injectors

Injection pump - Dynamic description – Compact timing device mechanism

NOTE: *The Compact Timing Device (CTD) mechanism is installed on the tractors to reduce noise, smoke, and exhaust gas emission etc.*

When the plunger descends, fuel oil is sucked into the barrel, and when the plunger reaches its lowest point, the suction is finished.



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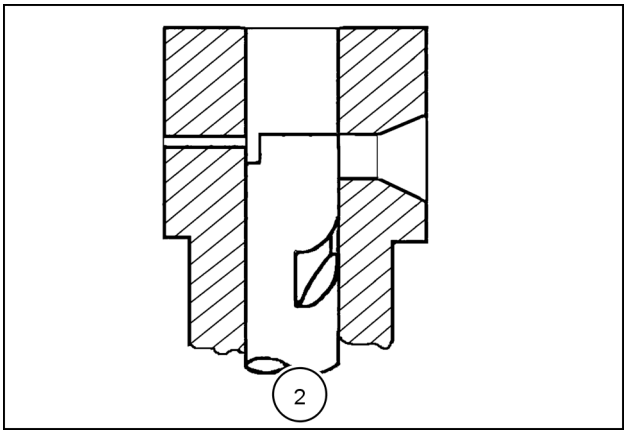
(1) Suction

In case of the standard plunger, the plunger then ascends, and when the barrel's main port is closed by the plunger, the fuel oil pressure increases, and the fuel delivery starts. CTD type plunger (the barrel has sub port), whether the fuel delivery starts or not is determined by the en- gine's rev speed. When the engine's rev speed is low, the delivery does not start, because the sub port is still opened, and fuel oil pressure does not increase. But, when the engine's rev speed is high, the sub port's diameter is so small that it can be considered as being closed. For this reason, fuel oil pressure increases and the delivery starts.



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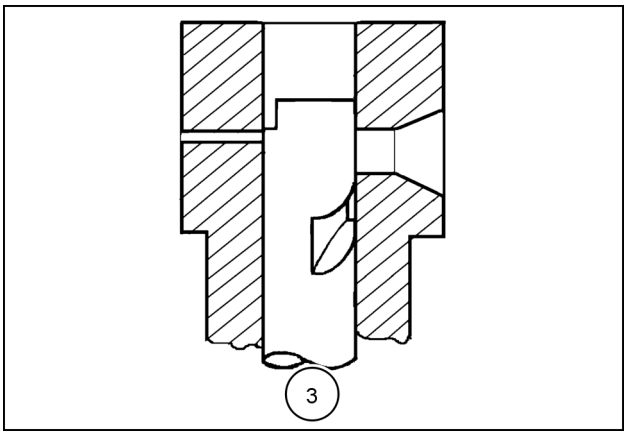
(2) Delivery start (high speed)

The plunger further ascends, and when the barrel's sub port is closed by the plunger, the fuel oil pressure increases and the delivery starts, regardless of the engine's rev speed.



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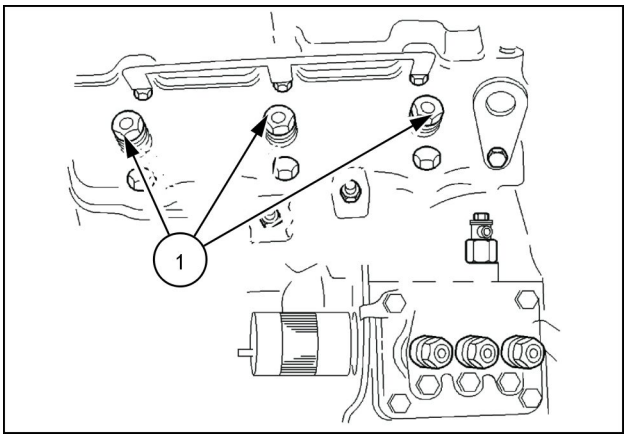
(3) Delivery start (low speed)

Fuel injectors - Install

1. Install the fuel injectors **(1)** and torque to **60 - 69 N·m** (**43.4 - 50 lb ft**).



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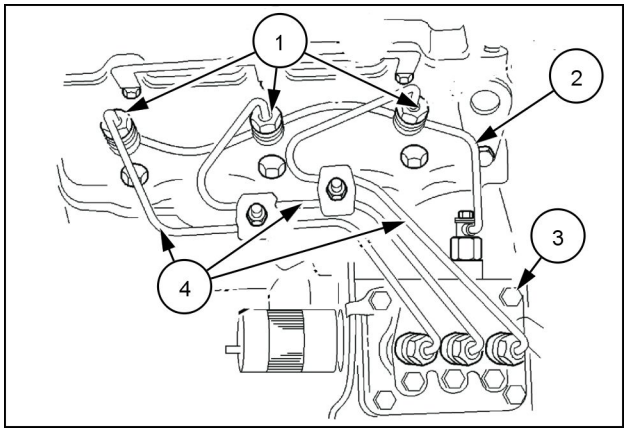
2. Install the fuel return line **(2)** on the injectors **(1)** and injection pump **(3)**.
3. Install the injection piping **(4)** and torque to **15 - 24 N·m** (**11 - 18 lb ft**).



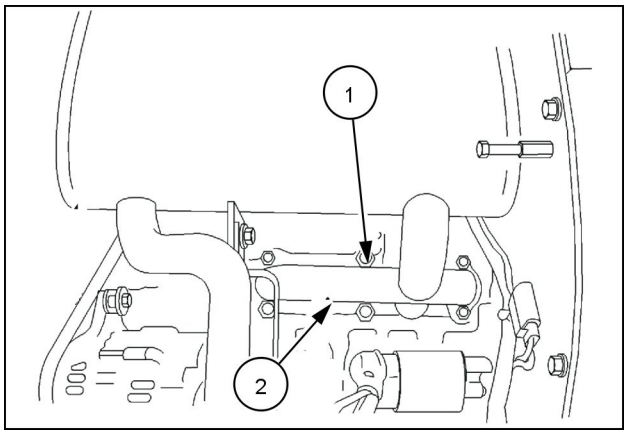
SECT10C01PG78_3 2

Turbocharger - Inspect

1. Check turbine (exhaust side) and compressor (intake side) housings for cracks.
2. Check oil line (return and supply) connections for damage to mating surfaces, stripped threads, or clogged ports.
3. Check turbine shaft for play. Also check the inside of the turbine and compressor housings for any signs of oil leakage or damage resulting from a loose shaft.
4. Check turbine and compressor for any signs of missing pieces.
5. Check mating surfaces for damage that may not allow gaskets to seal.
6. If any damage is found on inspection, the turbocharger must be replaced with a new unit.

Exhaust manifold - Remove

1. Remove the bolts **(1)** from the exhaust manifold **(2)**.
2. Remove the manifold **(2)** from the cylinder head.



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Engine cooling system - Service instruction

1. Clean the cooling system to remove rust, sludge, and other foreign material by using a coolant system cleaning solvent. In severe cases, pressure flushing may be required. A pulsating or reverse flow flushing will more effectively loosen and remove foreign material than a steady flushing in normal direction of coolant flow. If pressure flushing is to be used, always remove the thermostat and make sure the head bolts are tightened properly.
2. Coolant:
   - The coolant is a permanent type ethylene-glycol base antifreeze and should be used all year.
   - Drain and flush the cooling system every twelve months and replace the coolant with fresh antifreeze and pure water.
   - After the coolant has been drained, flush the system. With the drain open and the system full of water, start the engine and run it until the water flowing from the drain is clear. Replace the coolant with new 50/50 mixture antifreeze and pure water.

(*) See content for specific models

Engine oil pump - Inspect - Pick-up tube

1. Clean the filter mesh to remove any debris or foreign objects.
2. Inspect the O-ring on the pick-up tube for wear or damage. Replace the O-ring if it becomes stiff or damaged.

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Electrical systems

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Engine starting system - 201

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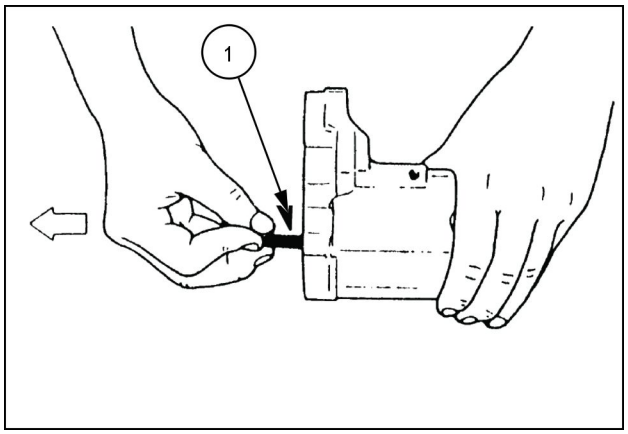
13. Remove the return spring **(1)** from the electromagnetic solenoid.



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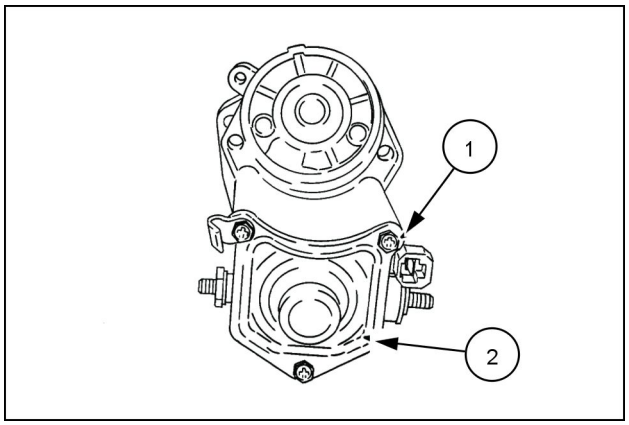
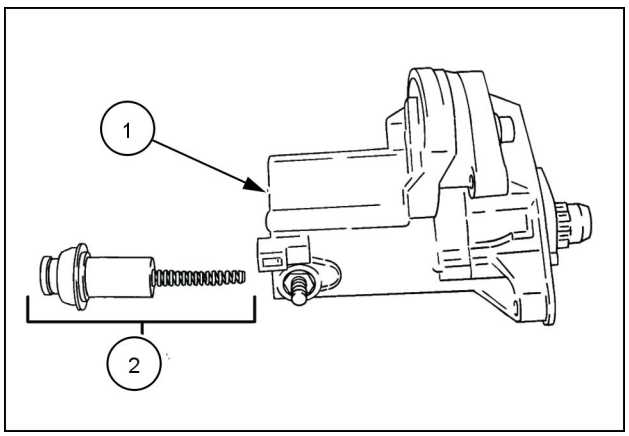
14. Remove the screws **(1)** securing the solenoid cover **(2)** to the starter housing. Pry the cover from the housing.



SEC55CH4PG34_2 12

15. Remove the solenoid plunger and spring assembly **(2)** from the starter housing **(1)**.

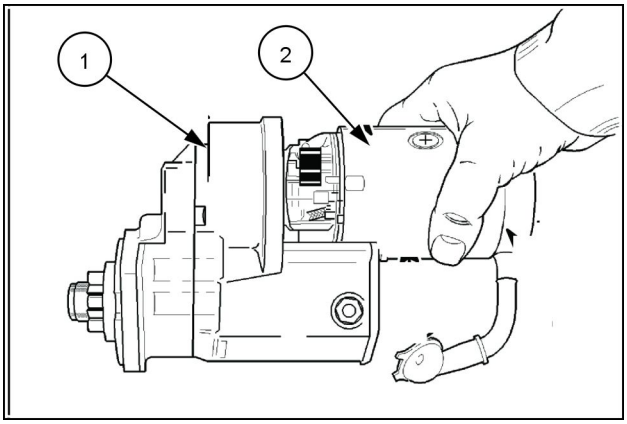


SEC55CH4PG34_3 13

11. Install the field coil brushes **(6)** into the brush holder **(7)** holding the brush springs **(5)** away as the brush is being inserted into the insulated brush holder.
12. Install the brush holder **(7)** onto the armature commutator.
13. Secure the brush cover **(8)** to the brush holder **(7)** using the retaining screws **(9)**.

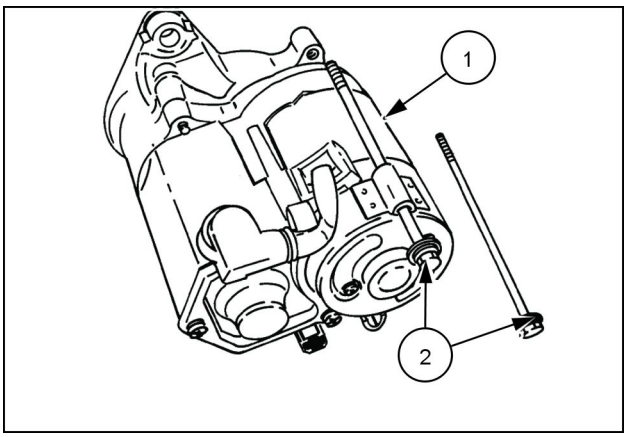
NOTE: *Be sure the aligning marks made on the starter housing and motor/field coil housing line up when installing the motor assembly to the starter assembly.*

14. Install the motor assembly **(2)** into the starter housing assembly **(1)**.



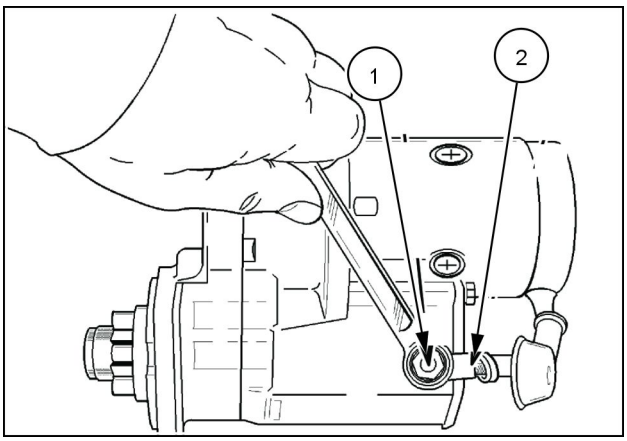
SEC55CH4P31_2 9

15. Secure the motor assembly **(1)** to the starter housing assembly using the long through bolts **(2)**.



SEC55CH4PG47_2 10

16. Install the field coil wire **(2)** the solenoid terminal **(1)**.



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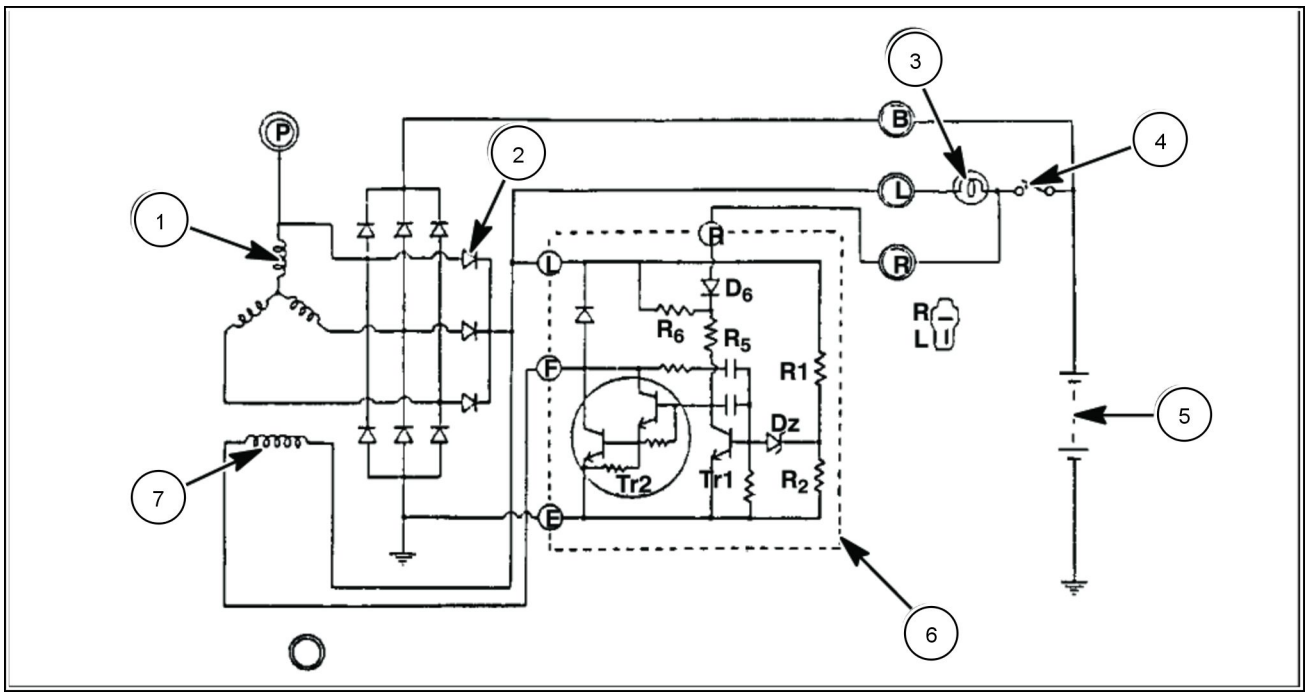


T1530CHARGCIRA 2

Charging circuit

The charging circuit and internal connections are shown. The charging system consists of an IC voltage regulator **(6)** (enclosed with dotted lines), a battery **(5)** and connecting wires. Because of the use of IC, the voltage regulator is very compact and is built into the alternator.

The IC voltage regulator **(6)** limits the field current to flow directly from the diode trio **(2)** to the field coil **(7)** without passing through the external circuit. Consequently, there are no voltage drops caused by the key switch or the external wiring as with conventional vibrating-contact regulators mounted separately from the alternator. To aid in initial voltage buildup when the engine is started the field current is supplied through the indicator lamp **(3)** from the battery **(5)**.

Since the frequency pulse output of 1/10 the alternator speed develops on the 'P' terminal, this terminal is used for speed detection.

Principle of IC regulator

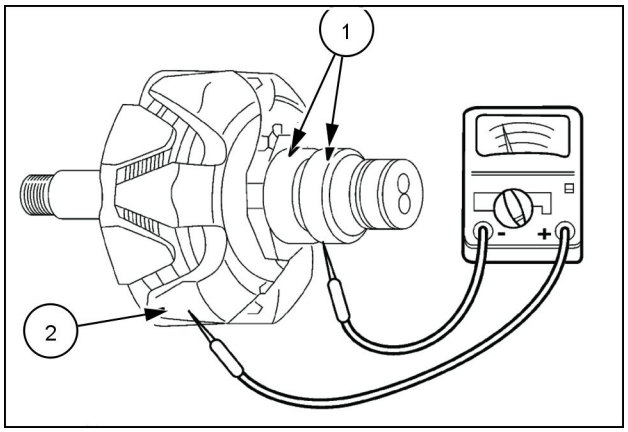
The basic function of the IC voltage regulator is to make the terminal voltage constant by detecting the generated voltage and increasing/decreasing the field current.

As indicated, the regulator consists of two basic sections: a voltage control device and an output device to handle the field current. The voltage control device includes the voltage divider network, R1 and R2, a zener diode, DZ, for voltage reference, and a single amplifying transistor, Tr1. The output device is a darlington-type amplifier which is called power transistor, Tr2. The power transistor, Tr2, is placed in series with the alternator field coil and ground.

The signal amplifying transistor, Tr1, senses the generated voltage and turns the power transistor, Tr2, on and off many times per second most of the time the engine is in operation.

NOTICE: *When testing the resistance between the brush contacts and rotor poles, be sure that the ohmmeter test probe touching the rotor pole is not insulated by paint.*

5. Use an ohmmeter and touch one ohmmeter test probe to one of the rotor brush contacts **(1)** and the other test probe to one of the rotor poles **(2)**.
6. Observe the ohmmeter. Resistance should be high, indicating no continuity between the rotor poles and brush contacts. If there is continuity, the rotor is defective and needs replaced.



SEC55CH4PG17_1 4

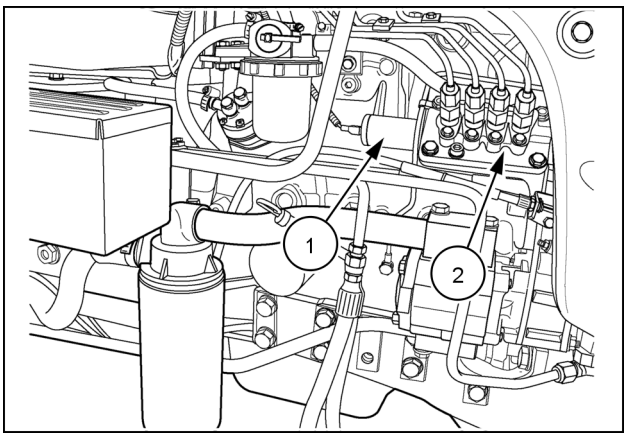
Electrical systems - 55

Cold start aid - 202

N843H , N843L , N843 , N844LT , N844L , N844T , N844

Fuel shutoff solenoid - Dynamic description

The fuel shutoff solenoid **(1)** is located on the right side of the engine, threaded into the rear of the fuel injection pump **(2)**. The fuel shutoff solenoid contains a spring-loaded plunger that pushes the injection pump control rack to the closed (shut-off) position when the solenoid is not energized. When the key switch is turned to the "ACC/RUN" or "START" position, the safety stop relay closes completing the circuit that energizes the solenoid. This retracts the plunger from the injection pump, and the injection pump control rack moves into the position that allows the engine to start.



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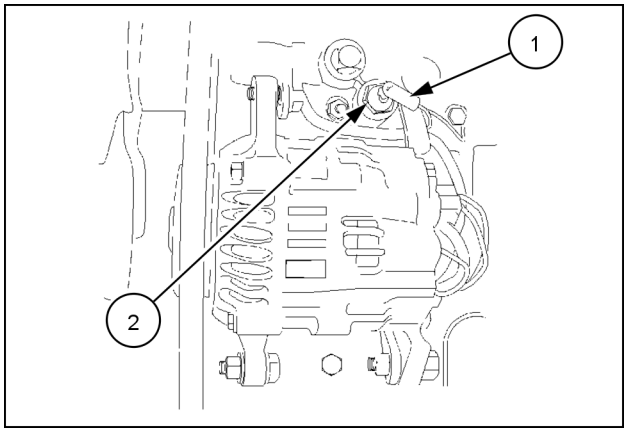
Engine coolant temperature sensor - Remove

1. Disconnect wiring harness connector **(1)** from temperature sending switch.
2. Remove the temperature sending switch **(2)** by unscrewing from the coolant passage in the front of the cylinder head.



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