Fuse description		
Fuse 1	Turn and brake lights	Fuse 5
Fuse 2	Instruments	Fuse 6
Fuse 3	Headlight high beam	Fuse 7
Fuse 4	Headlight low beam	Fuse 8

Key to wiring diagram							
1.	Connector to front harness	8.	Panel lights	15.	Connector to instrument panel	22.	Connector to light switch
2.	Connector to front harness	9.	Tachometer	16.	Fuel level sender	23.	Light switch
3.	Connector to front harness	10.	Main beam indicator warning lamp	17.	Horn switch	24.	Hazard light switch
4.	Alternator warning lamp	11.	Right indicator warning lamp	18.	Connector to rear harness	25.	Hazard light connector
5.	Left indicator warning lamp	12.	Oil pressure gauge	19.	Start/Ignition switch	26.	Connector to indicator switch
6.	Hour meter gauge	13.	Engine temperature gauge	20.	Connector to start switch	27.	Indicator switch
7.	Fuel gauge	14.	Connector to instrument panel	21.	Connector to safety start switch	28.	Flasher unit

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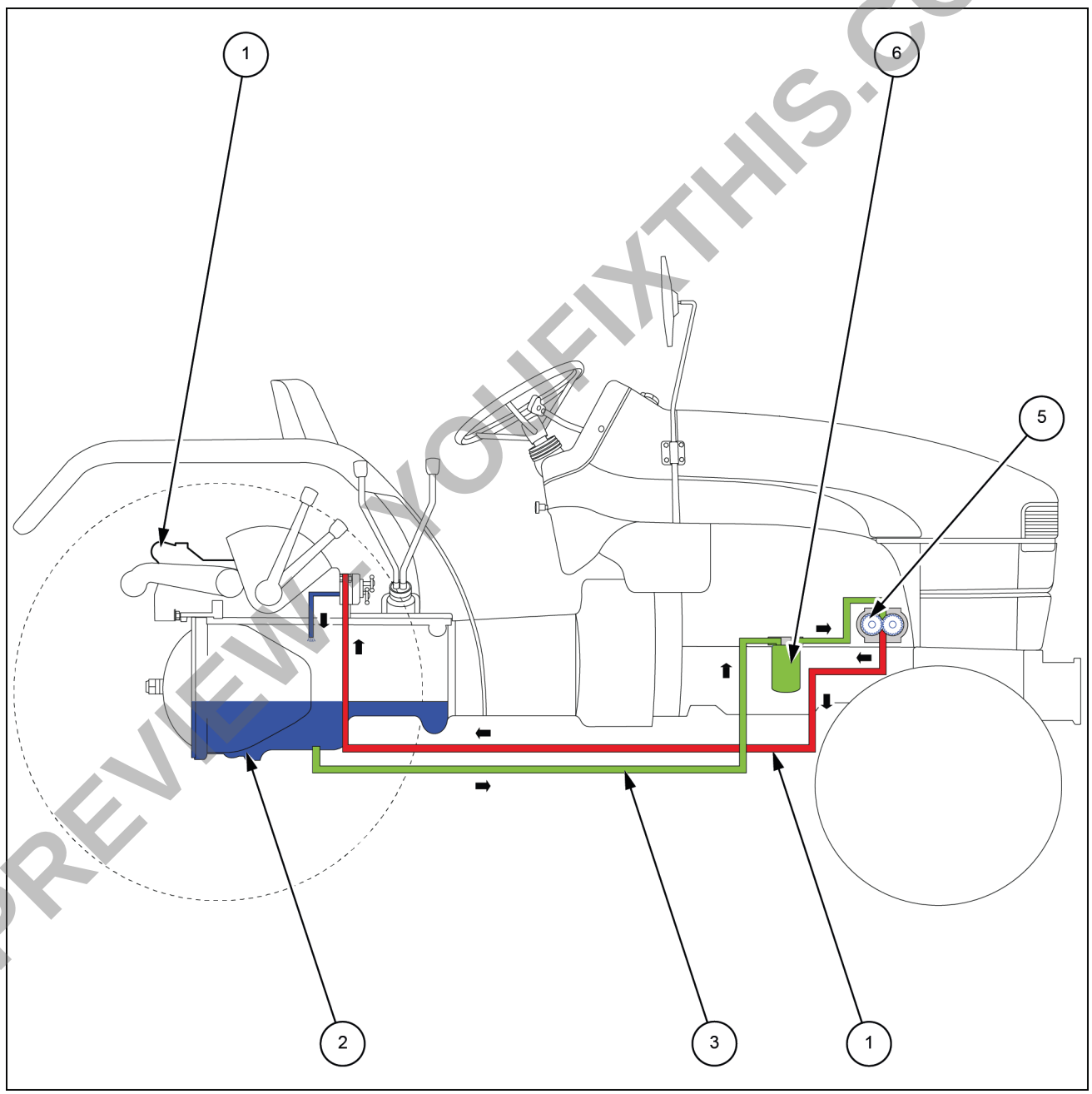
Hydraulic systems - Overview - Hydraulic circuit and mechanical lift

With reference to figure **1**, **2**.

High pressure pump is directly connected on rear side of engine timing gear. Oil is drawn from transmission case through filter. The pump supplies constant oil flow according to engine speed. High pressure oil enters the distributor valve located at the front of the lift assembly, which controls the raising and lowering of the lift.

All excess oil flow produced by the hydraulic pump is returned direct to the gear box through the control valve spool located in the distributor.

Also located within the distributor is the lift cylinder safety valve, which protect the lift cylinder and seals from excessive peaks of pressure during operation. For further details refer to the “hydraulic lift assembly”.



GNIL14TR05494GB 1

1. Mechanical lift
2. Oil sump (transmission housing)
3. Suction line
4. Delivery line
5. Pump
6. Filter

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Rating	
Maximum gross rating before top dead centre	**49.5 kW (67.3 Hp) @ 2250 RPM**
Maximum gross torque	**180 N·m (133 lb ft) @ 1200 – 1400 RPM**
Rating standard	ISO 14396
De-rating for altitude	
Where engines are called upon to operate in very high atmospheres occasioned by attitude, such engines should be derated.	
Approximate engine weights	
Basic weight (with alternator but without starter motor flywheel and flywheel housing)	**204 kg (449.7 lb)**
Typical installed weight (with starter motor flywheel and flywheel housing)	**290 kg (639 lb)**
Engine dimension	
Height	**2270 mm (89 in)**
Length	**3515 mm (138 in)**
Width	**1690 mm (67 in)**

Engine - Torque

Description	Thread size	Torque	
Cylinder head nuts and setscrews (non retorque type)	M10 x 1.0	**10.8 kgf (23.8 lbf)**	**10.8 kgf (23.8 lbf)**
Connecting rod nuts (cadmium plated)	7/16 - 20 UNF	**6.1 kgf (13.4 lbf)**	**6.1 kgf (13.4 lbf)**
Connecting rod nuts (phosphated)	7/16 - 20 UNF	**8.3 kgf (18.3 lbf)**	**8.1 kgf (17.9 lbf)**
Main bearing setscrews	M14 x 2	**15.9 kgf (35.1 lbf)**	**15.6 kgf (34.4 lbf)**
Balance weight setscrews	7/16 - 20 UNF	**7.6 kgf (16.8 lbf)**	**7.5 kgf (16.5 lbf)**
Idler gear retaining setscrew	M10 x 1.25	**2.9 kgf (6.4 lbf)**	**6.8 kgf (15.0 lbf)**
Camshaft gear retaining setscrews	M12 x 1.75	**7.6 kgf (16.8 lbf)**	**2.9 kgf (6.4 lbf)**
F.I. pump adaptor to F.I. pump camshaft nut	M12		
Fuel Injection Pump (FIP) gear to adapter setscrew	M8 x 1.25	**2.9 kgf (6.4 lbf)**	**2.9 kgf (6.4 lbf)**
Flywheel setscrew	M12 x 1.25	**11.1 kgf (24.5 lbf)**	**10.8 kgf (23.8 lbf)**
Crankshaft pulley retaining setscrew	M22 x 2.5	**15.2 kgf (33.5 lbf)**	**14.9 kgf (32.8 lbf)**
Injector securing nuts	M8 x 1.00	**1.7 kgf (3.7 lbf)**	**1.6 kgf (3.5 lbf)**
Engine to front support buckle up bolts	M16 x 2	**22.0 kgf (48.5 lbf)**	**22.0 kgf (48.5 lbf)**
Engine to clutch housing buckle up bolts	M12 x 1.5	**9.0 kgf (19.8 lbf)**	**9.0 kgf (19.8 lbf)**
Support radiator to engine setscrew	M10 x 1.25	**4.5 kgf (9.9 lbf)**	**4.5 kgf (9.9 lbf)**
Fuel tank support bolt	M12 x 1.25	**8.0 kgf (17.6 lbf)**	**8.0 kgf (17.6 lbf)**
Fuel tank support bolt	M8 x 1	**3.2 kgf (7.1 lbf)**	**3.2 kgf (7.1 lbf)**
Fan assembly bolt	M8 x 1	**2.6 kgf (5.7 lbf)**	**2.6 kgf (5.7 lbf)**
Hydraulic pump to coupler setscrew	M8 x 1	**3.0 kgf (6.6 lbf)**	**3.0 kgf (6.6 lbf)**
Hydraulic pump assembly bolt	Hex. 3/8"	**2.5 kgf (5.5 lbf)**	**2.5 kgf (5.5 lbf)**
Radiator assembly bolt	M10 x 1.5	**3.0 kgf (6.6 lbf)**	**3.0 kgf (6.6 lbf)**
Air cleaner to bracket set screw	M10 x 1.5	**5.0 kgf (11.0 lbf)**	**5.0 kgf (11.0 lbf)**
Air cleaner bracket to shell nut	M10 x 1.5	**3.2 kgf (7.1 lbf)**	**3.2 kgf (7.1 lbf)**
Starter motor mounting bolts	M10 x 1.5	**7.4 kgf (16.3 lbf)**	**7.4 kgf (16.3 lbf)**
Alternator mounting bracket nuts	M10 x 1.25	**4.0 kgf (8.8 lbf)**	**4.0 kgf (8.8 lbf)**
Alternator hinge bolt	M10 x 1.5	**8.0 kgf (17.6 lbf)**	**8.0 kgf (17.6 lbf)**
Fan belt tension adjusting bolt	M8 x 1.25	**2.4 kgf (5.3 lbf)**	**2.4 kgf (5.3 lbf)**

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Engine - Troubleshooting

NOTE: *When attending a repair the cause of the problem must also be investigated and corrected to avoid repeat failures.*

Problem	Possible Cause	Correction
Low cranking speed	Battery capacity low	Charge or renew the battery
	Bad electrical connections	Check the connections or renew electricals
	Faulty starter motor	Overhaul starter motor
	Lubricating oil of incorrect grade	Drain and refill with specified grade of oil
Engine does not start	Low cranking speed	See problem - Low cranking speed
	Fuel tank empty	Fill the tank with fuel
	Faulty stop control operation	Check the stop control cable movement and setting
	Blocked fuel feed pipe	Clean the pipe
	Faulty fuel feed pump	Overhaul fuel feed pump
	Choked fuel filters	Renew filter elements
	Air in fuel system	Remove air lock
	Faulty injectors	Overhaul injectors
	Faulty fuel injection pump	Overhaul injection pump
	Broken fuel injection pump drive	Fit new drive
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Poor compression	See problem - Poor compression
	Incorrect type or grade of fuel	Drain and refill with correct type or grade of fuel
	Worn cylinder bores	Re-bore / re-sleeve block and fit new pistons
	Pitted valves and seats	Replace valve with new standard or oversize, and or machine the valve guide bores
	Broken, worn or sticking piston rings	Fit new rings, check bore and pistons for damage
Difficult starting	Low cranking speed	See problem - Low Cranking Speed
	Faulty stop control operation	Check the stop control cable movement and setting
	Blocked fuel feed pipe	Clean
	Faulty fuel feed pump	Overhaul fuel feed pump
	Choked fuel filters	Renew filter elements
	Restriction in air cleaner or induction system	Check and clean or remove the restriction
	Air in fuel system	Remove air lock
	Faulty fuel injection pump	Overhaul injection pump
	Faulty injectors	Overhaul injectors
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Poor compression	See problem - Poor compression
	Blocked fuel tank vent	Clean
	Incorrect type or grade of fuel	Drain the fuel and refill with correct grade of fuel
	Exhaust pipe restriction	Check and clean or remove the restrictions
	Sticking valves	Replace valve with new standard or oversize, and or machine the valve guide bores
	Worn cylinder bores	Re-bore or re-sleeve block and fit new pistons
	Pitted valves and seats	Replace valve with new standard or oversize, and or machine the valve guide bores
	Broken, worn or sticking piston rings	Fit new rings, check bore and pistons for damage
Lack of power	Blocked fuel feed pipe	Clean the pipe
	Faulty fuel feed pump	Overhaul fuel feed pump
	Choked fuel filters	Remove filter components

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Engine - Remove

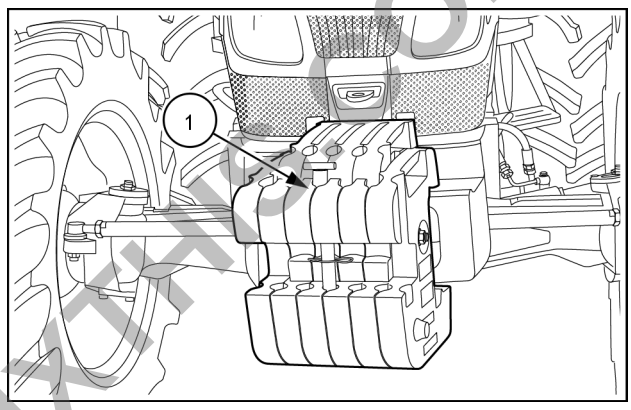
⚠ WARNING

Avoid injury!
Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.
Failure to comply could result in death or serious injury.

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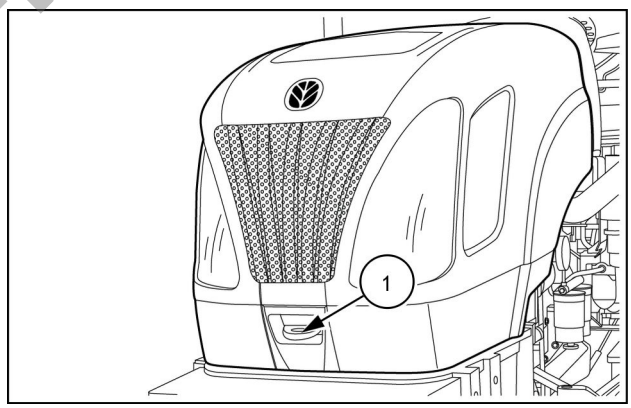
Separating engine from centre housing

1. Remove the front weight carrier **(1)**.



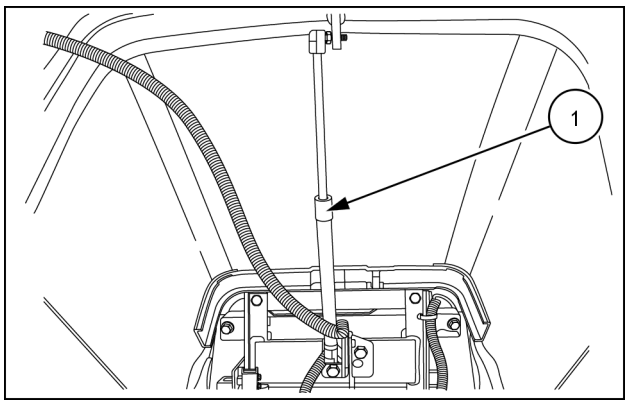
GNIL17TRO0953AA 1

2. Slide the lock to right, and with the help of handle **(1)** raise hood.



GNIL17TRO0954AA 2

3. To maintain the hood in raised position a gas strut **(1)** is provided underside hood.



GNIL14TR04759AA 3

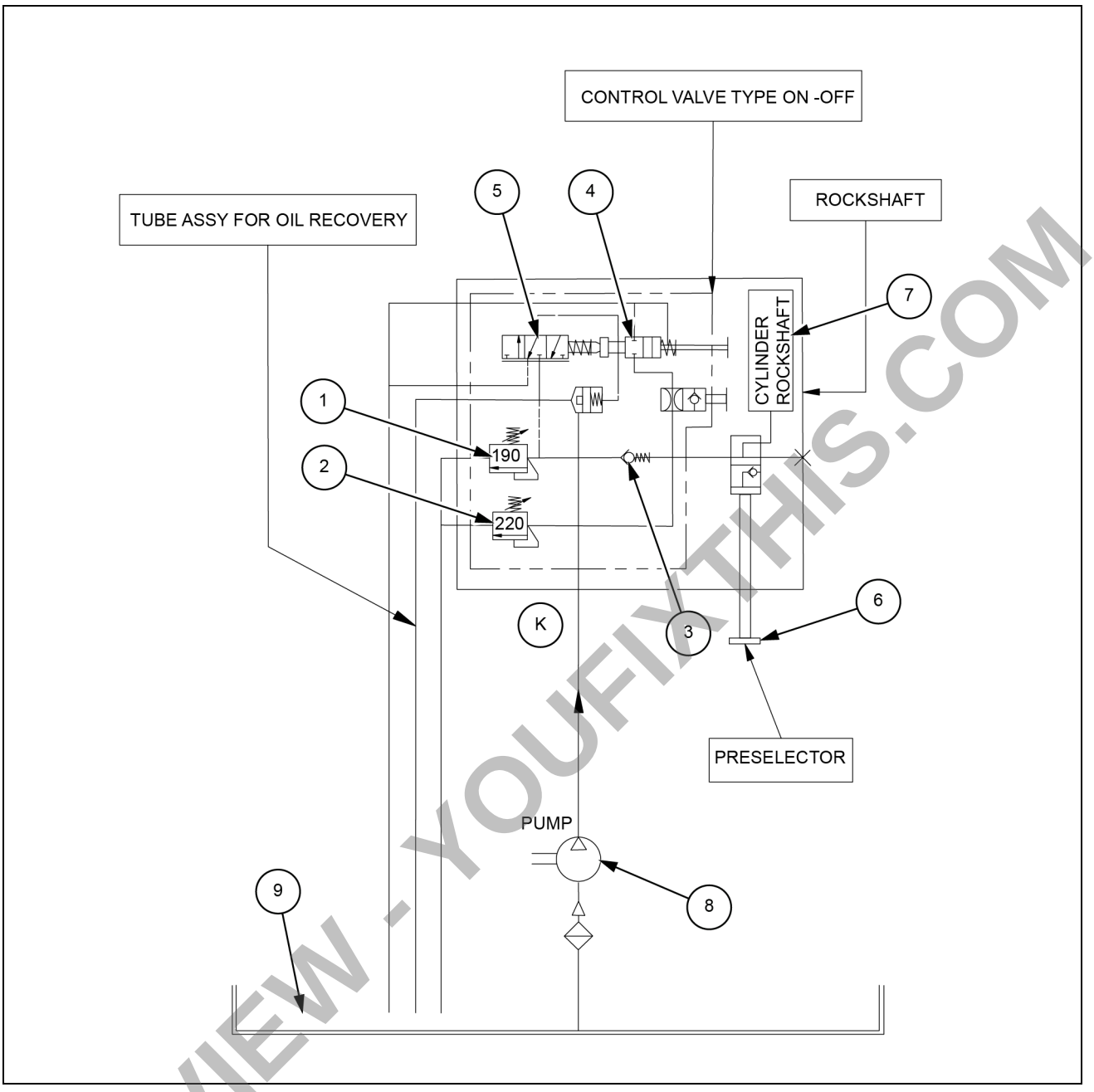
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Key to wiring diagram					
1.	Right head lamp	6.	Left head lamp connector	11.	Starter solenoid
2.	Right head lamp connector	7.	Battery	12.	Chasis connection
3.	Horn	8.	Alternator	13.	Connector to centre harness. located front of fuel tank
4.	Horn connector	9..	Temperature sender	14.	Connector to centre harness. located front of fuel tank
5.	Left head lamp	10.	Oil pressure switch	15.	Connector to centre harness. located front of fuel tank

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Hydraulic circuit diagram

1. System safety relief valve
2. Cylinder safety valve
3. Check valve
4. Discharge valve
5. Control valve
6. Diverter valve
7. Cylinder rockshaft
8. Pump
9. Sump

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Engine - Torque

Description	Thread size	Torque
Cylinder head setscrew (camshaft tunnel side)	M10 x 1.0	**65.0 N·m** (**47.9 lb ft**)
Cylinder head setscrew	M12 x 1.5	*
Connecting rod nuts (phosphated)	7/16" - 20 UNF	**80.0 N·m** (**59.0 lb ft**)
Main bearing setscrews	M14 x 2	**155.0 N·m** (**114.3 lb ft**)
Balance weight setscrews	7/16"- 20 UNF	**75.0 N·m** (**55.3 lb ft**)
Idler gear hub nut (lower and upper)	M10 x 1.25	**28.0 N·m** (**20.7 lb ft**)
Camshaft gear retaining setscrews	M12 x 1.75	**75.0 N·m** (**55.3 lb ft**)
Fuel injection pump adaptor to fuel injection pump camshaft nut	M12	**60.0 N·m** (**44.3 lb ft**)
Fuel injection pump gear to adaptor setscrew	M8 x 1.25	**27.0 N·m** (**19.9 lb ft**)
Flywheel setscrews	M12 x 1.25	**110.0 N·m** (**81.1 lb ft**)
Crankshaft pulley retaining setscrew	M22 X 2.5	**150.0 N·m** (**110.6 lb ft**)
Thermostat	7/8” - 14 UNF	**13.6 N·m** (**10.0 lb ft**)
High pressure fuel pipe nuts	–	**20.0 N·m** (**14.8 lb ft**)
Atomiser	M24 x 1.5	**60.0 N·m** (**44.3 lb ft**)

Engine - Special tools

NOTE: *Operations described in this section of the manual must be performed using the following essential tools, to work safely and achieve the best technical results with additional saving of time and effort.*

Tool description	Tool number
Injector tester	290284
Sling hook, engine	290740
Cylinder head valve spring compressor	291050
Tractor splitting trolley	292320
Installer rear main oil seal	9970846
Installer front oil seal	9970845
Dummy injector (compression test kit)	9970847
Swan neck pipe (fuel timing)	9970848
Engine mounting bracket (to be used with engine stand 293860)	9970844
Steering wheel puller	82834312
Bushes for steering wheel puller	9971375
Remover injector	9971238
Cylinder pressure test kit	Local
Lube pressure check kit	Local
Piston ring compressor	Local
Piston ring expander	Local

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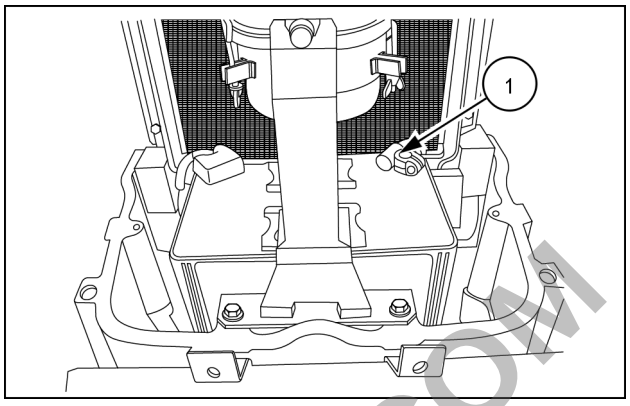
Problem	Possible Cause	Correction
	Restriction in air cleaner or induction system	Check and clean or remove the restriction
	Air in fuel system	Remove air lock
	Faulty fuel injection pump	Overhaul injection pump
	Faulty injectors	Overhaul injectors
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Poor compression	See problem - Poor compression
	Blocked fuel tank vent	Clean
	Incorrect type or grade of fuel	Drain the fuel and refill with correct grade of fuel
	Sticking throttle or restricted movement	Check, clean, lubricate and adjust settings
	Exhaust pipe restriction	Check and clean or remove the restrictions
	Cylinder head gasket leaking	Check the cylinder head bolts torque or renew the gasket
	Overheating	See problem - Overheating
	Worn cylinder bores	Re-bore or re-sleeve block and fit new pistons
	Pitted valves and seats	Replace valve with new standard or oversize, and or machine the valve guide bores
	Broken, worn or sticking piston rings	Fit new rings, check bore and pistons for damage
Misfiring	Blocked fuel feed pipe	Clean pipe
	Faulty fuel feed pump	Overhaul fuel feed pump
	Choked fuel filters	Remove filter elements
	Air in fuel system	Remove air lock
	Faulty fuel injection pump	Overhaul injection pump
	Faulty injectors	Overhaul injectors
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Poor compression	See problem - Poor compression
	Cylinder head gasket leaking	Check the cylinder head bolts torque or renew the gasket
	Overheating	See problem - Overheating
	Incorrect tappet adjustment	Check and reset the adjustment
	Sticking valves	Replace valve with new standard or oversize, and or machine the valve guide bores
	Incorrect high pressure pipes	Renew the pipes of correct specification
	Pitted valves and seats	Replace valve with new standard or oversize, and or machine the valve guide bores
Excessive fuel consumption	Restriction in air cleaner or induction system	Check and clean or remove the restriction
	Faulty fuel injection pump	Overhaul injection pump
	Faulty injectors	Overhaul injectors
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Poor compression	See problem - Poor compression
	Incorrect type or grade of fuel	Drain the fuel and refill with correct grade of fuel
	Sticking throttle or restricted movement	Check, clean, lubricate and adjust settings
	Exhaust pipe restriction	Check and clean/remove the restrictions
	Cylinder head gasket leaking	Check the cylinder head bolts torque or renew the gasket
	Incorrect tappet adjustment	Check and reset the adjustment
	Sticking valves	Replace valve with new standard or oversize, and or machine the valve guide bores
	Worn cylinder bores	Re-bore or re-sleeve block and fit new pistons
	Pitted valves and seats	Replace valve with new standard or oversize, and or machine the valve guide bores

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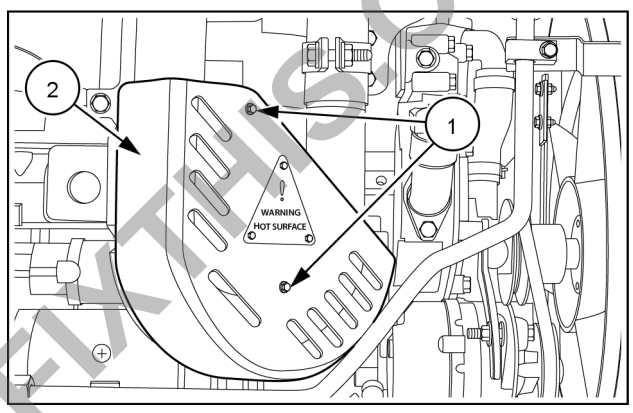
4. Disconnect battery terminals.

NOTE: *Always disconnect the negative cable **(1)** first.*



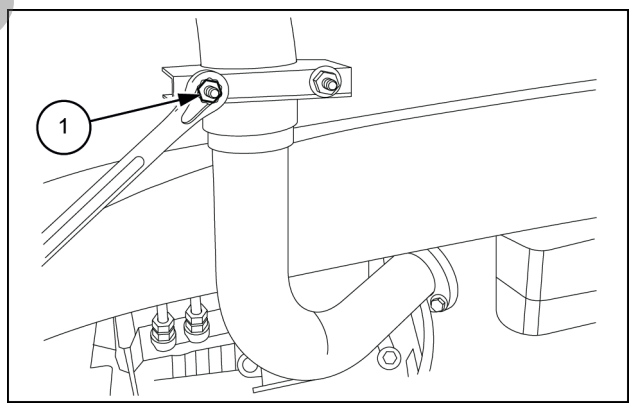
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5. Loosen the silencer guard bolts **(1)** along with washers and remove the silencer guard **(2)**.



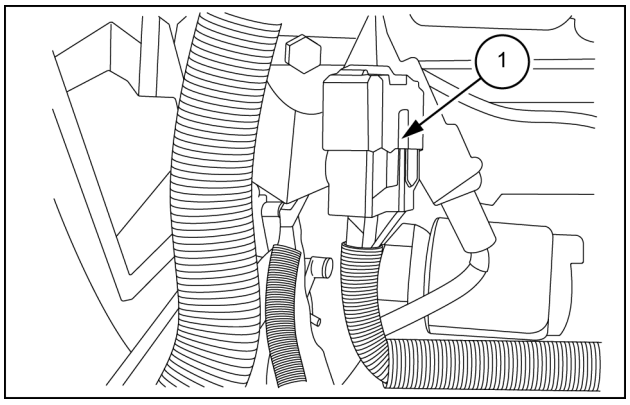
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6. Loosen the silencer mounting clamp bolts **(1)** and remove the silencer assembly.



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7. Remove the electrical couplers **(1)** for rear lamps, flasher unit, fuse box etc.
8. Remove fuse box.



GNIL14TR04762AB 7

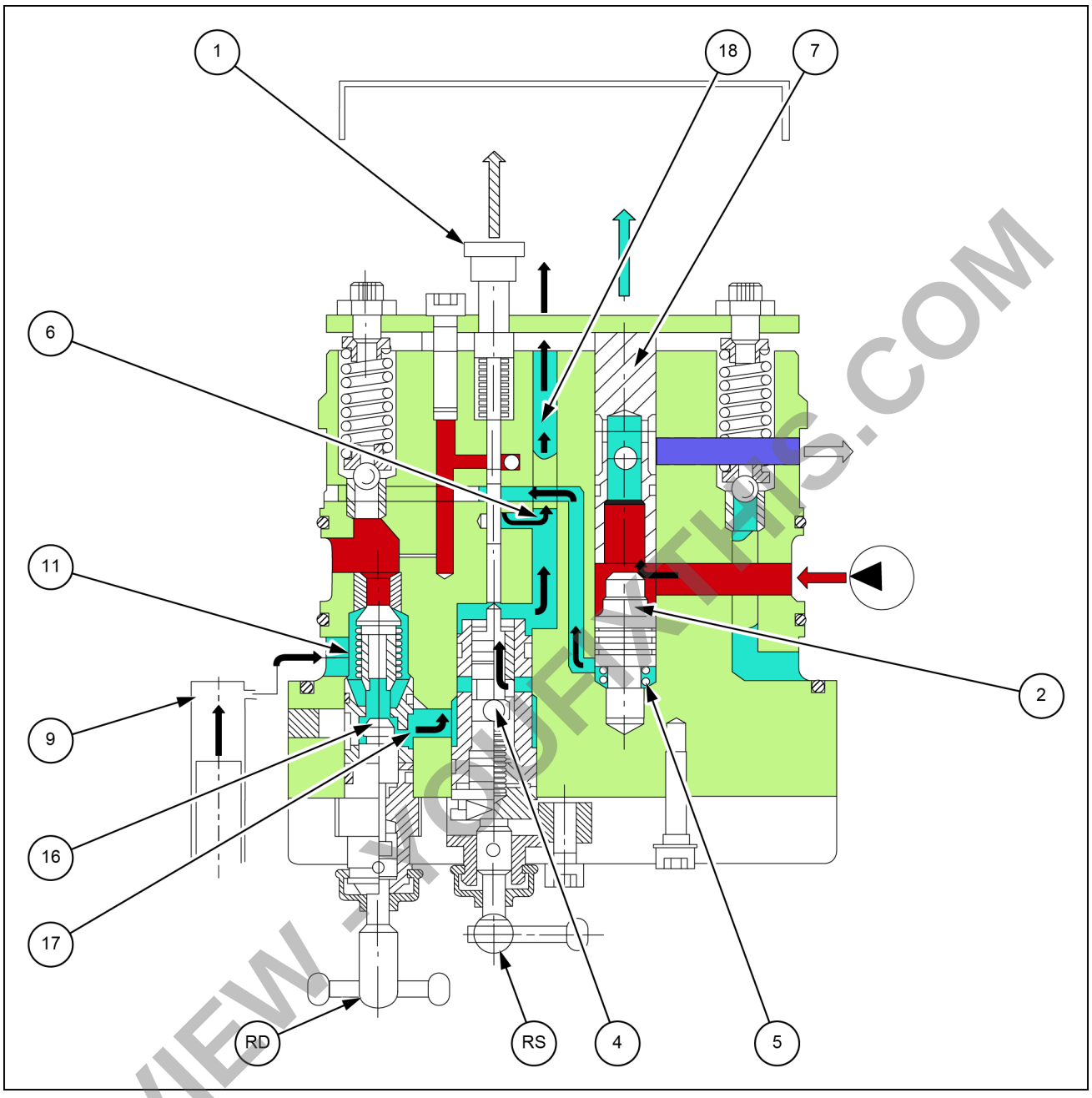
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Key to wiring diagram					
1.	Rear right indicator lamp	9.	Rear brake lamp	17.	Brake light switch
2.	Rear right park lamp	10.	Rear left indicator lamp	18.	Right front park lamp
3.	Right brake lamp	11.	Connector, located behind lamp housing	19.	Right front indicator lamp
4.	Connector, located behind lamp housing	12.	Connector, located behind lamp housing	20.	Connector, located behind lamp housing
5.	Work lamp	13.	Left front indicator lamp	21.	Connector to front harness
6.	Connector, located behind rear lamp housing assembly	14.	Left front park lamp	22.	To front harness
7.	Plough lamp switch	15.	Connector, located under left foot–plate	23.	Safety start switch
8.	Left brake lamp	16.	Connector, located under left foot–plate		

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Connecting rod bearings	
Type	Pre-finished steel backed aluminum tin (or) copper lead
Inside diameter	**57.190 – 57.210 mm** (**2.252 – 2.252 in**)
Bearing running clearance	**0.060 – 0.100 mm** (**0.002 – 0.004 in**)
Recommended sizes in service	**0.250 mm** (**0.010 in**), **0.510 mm** (**0.020 in**), **0.760 mm** (**0.030 in**)
Crankshaft	
A - Main journal diameter (standard)	**69.810 – 69.830 mm** (**2.748 – 2.749 in**)
B - Crank pin diameter (standard)	**57.110 – 57.130 mm** (**2.248 – 2.249 in**)
C - Main journal length number 2 and 3	**30.850 – 31.060 mm** (**1.215 – 1.223 in**)
D - Crank pin length	**39.670 – 39.880 mm** (**1.562 – 1.570 in**)
E - Main journal length-rear	**46.800 – 46.880 mm** (**1.843 – 1.846 in**)
R1 - Main journal fillet radii number 1, 2 and 3	**3.170 – 3.556 mm** (**0.125 – 0.140 in**)
R2 - Crank pin fillet radii	**4.760 – 5.160 mm** (**0.187 – 0.203 in**)
R3 - Main Journal fillet radius number 4 (last)	**3.970 – 4.220 mm** (**0.156 – 0.166 in**)
Surface finish (all pins and journals)	0.4 microns (maximum)
Crankshaft end float	**0.050 – 0.380 mm** (**0.002 – 0.015 in**)
Crankshaft rear end seal	Cassette type
Regrind under sizes main and pins	**0.250 mm** (**0.010 in**), **0.510 mm** (**0.020 in**), **0.760 mm** (**0.030 in**)

NOTE: *When regrinding the crank pin length should not exceed **40.000 mm** (**1.575 in**) and the rear main journal (crankshaft with lip type rear oil seal) length should not exceed **47.269 mm** (**1.861 in**) and numbers 2 and 3 main journals width should not exceed **31.179 mm** (**1.228 in**) maximum. The maximum permissible undersize is **0.760 mm** (**0.030 in**).*

Crankshaft thrust washers	
Type	Steel backed aluminum tin (or) copper lead
Position in engine	Cylinder block rear main bearing housing
Thickness-standard size	**3.070 – 3.120 mm** (**0.121 – 0.123 in**)
Thickness-oversize	**3.260 – 3.310 mm** (**0.128 – 0.130 in**)

NOTE: *While locating the thrust washers make sure that the plain surface/steel back is towards the block and the rear main bearing cap.*

Main bearings	
Type	Pre-finished steel backed aluminum tin / cooper lead
Inside diameter (fitted)	**69.898 – 69.940 mm** (**2.752 – 2.754 in**)
Running clearance	**0.070 – 0.130 mm** (**0.003 – 0.005 in**)
Recommended size in service	**0.250 mm** (**0.010 in**), **0.510 mm** (**0.020 in**), **0.760 mm** (**0.030 in**)

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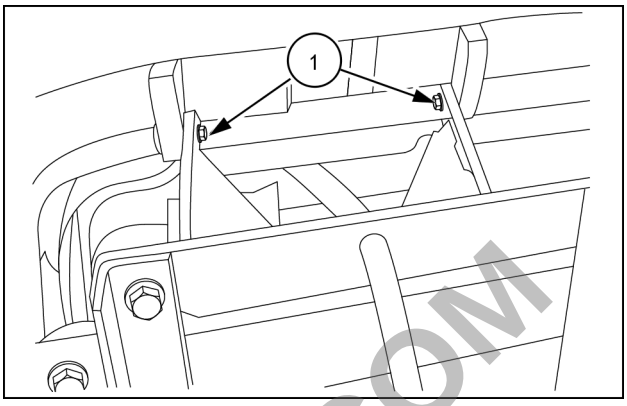
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Problem	Possible Cause	Correction
	Broken, worn or sticking piston rings	Fit new rings, check bore and pistons for damage
Black smoke	Restriction in air cleaner or induction system	Check and clean or remove the restriction
	Faulty fuel injection pump	Overhaul injection pump
	Faulty injectors	Overhaul injectors
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Poor compression	See problem - Poor Compression
	Incorrect type or grade of fuel	Drain the fuel and refill with correct grade of fuel
	Exhaust pipe restriction	Check and clean or remove the restrictions
	Cylinder head gasket leaking	Check the cylinder head bolts torque or renew the gasket
	Incorrect tappet adjustment	Check and reset the adjustment
	Sticking valves	Replace valve with new standard or oversize, and or machine the valve guide bores
	Worn cylinder bores	Re-bore or re-sleeve block and fit new pistons
	Pitted valves and seats	Replace valve with new standard or oversize, and or machine the valve guide bores
	Broken, worn or sticking piston rings	Fit new rings, check bore and pistons for damage
Blue or white smoke	Incorrect grade of lubricating oil	Drain and refill with specified grade of oil
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Poor compression	See problem - Poor compression
	Cylinder head gasket leaking	Check the cylinder head bolts torque or renew the gasket
	Incorrect tappet adjustment	Check and reset the adjustment
	Worn cylinder bores	Re-bore or re-sleeve block and fit new pistons
	Broken, worn or sticking piston rings	Fit new rings, check bore and pistons for damage
	Worn valve stems and guides	Renew valves and guides
	Piston seized	Replace piston assembly and check the bore for damage
	Overfilled air cleaner oil or use of incorrect grade of oil	Check the oil level and remove as necessary or refill with correct grade oil
Engine knocks	Faulty fuel feed pump	Overhaul fuel feed pump
	Faulty injectors	Overhaul injectors
	Incorrect fuel pump timing	Check and reset
	Incorrect valve timing	Check and reset
	Incorrect type or grade of fuel	Drain and refill with correct grade of fuel
	Overheating	See problem - Overheating
	Incorrect tappet adjustment	Check and reset the adjustment
	Sticking valves	Replace valve with new standard or oversize, and or machine the valve guide bores
	Worn cylinder bores	Re-bore or re-sleeve block and fit new pistons
	Broken, worn or sticking piston rings	Fit new rings, check bore and pistons for damage
	Overfilled cleaner or use of incorrect grade of oil	Check the level or drain out and refill with correct grade oil
	Worn or damaged big end bearings	Renew the bearings
	Piston seized	Replace piston assembly and check the bore for damage
	Broken valve spring	Replace new springs
Low engine oil pressure	Incorrect grade of lubricating oil	Drain and refill with specified grade of oil
	Worn or damaged big end bearings	Renew the bearings

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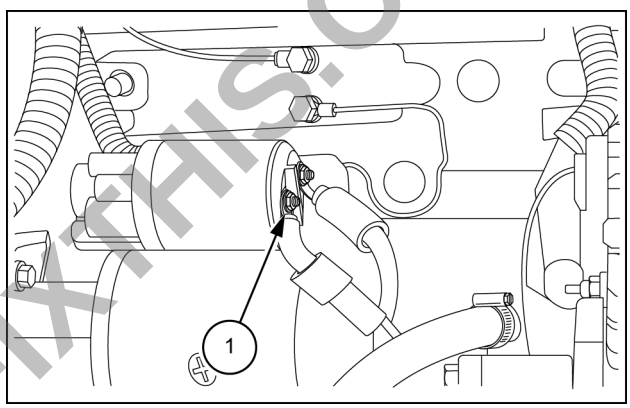
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9. Unscrew hood mounting bracket bolts **(1)** from engine frame.
10. Unscrew gas strut bolts and remove the front hood.



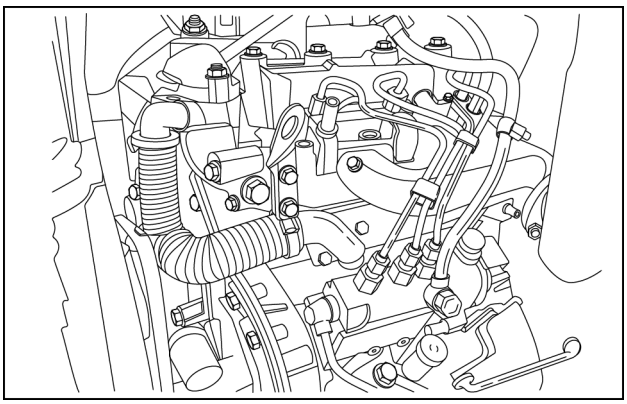
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11. Disconnect electric connections **(1)** from starter motor.



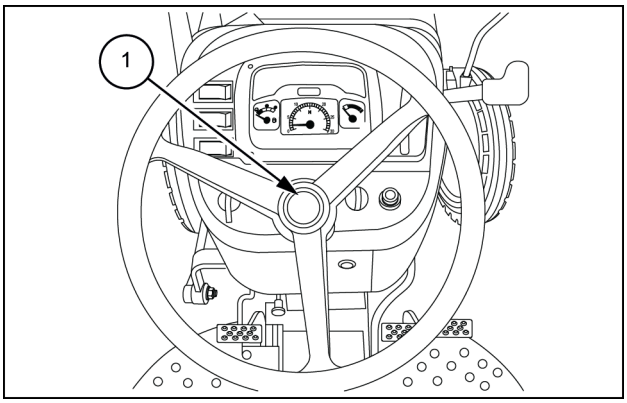
GNIL14TR04764AB 9

12. Disconnect hand throttle cable fuel shut-off cable fuel line and overflow lines and remove fuel tap bracket bolts.



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13. Remove the steering wheel cover. **(1)**



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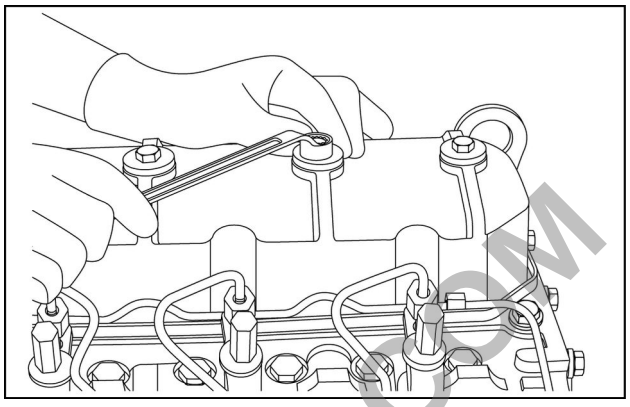
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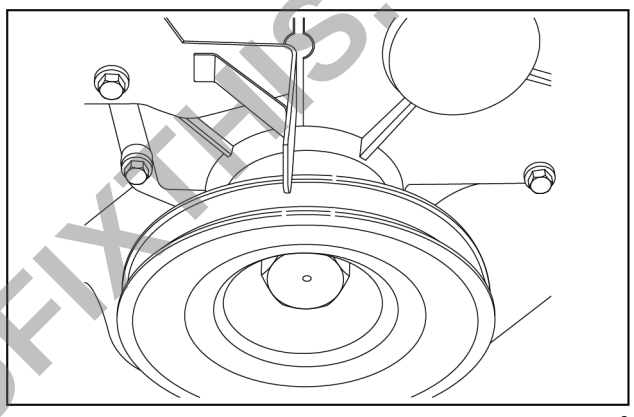
Valves - Adjust

1. Remove the cylinder head cover.



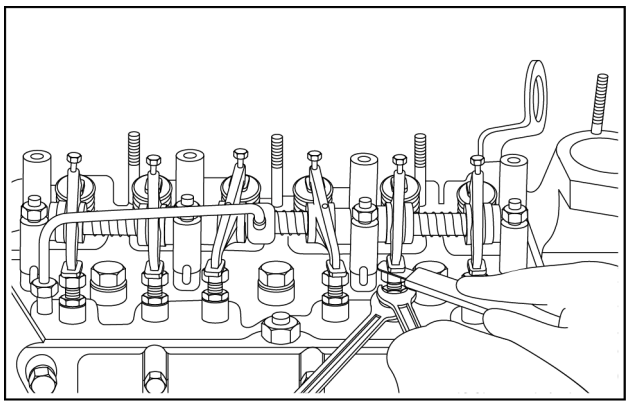
GNIL18TRO0009AB 1

2. Rotate the crankshaft in clockwise direction and bring No. 1 Cylinder piston to top dead centre (TDC) at the end of compression stroke. Check No.3 cylinder Exhaust valve has fully opened. Check the crankshaft pulley mark is inline with the pointer.



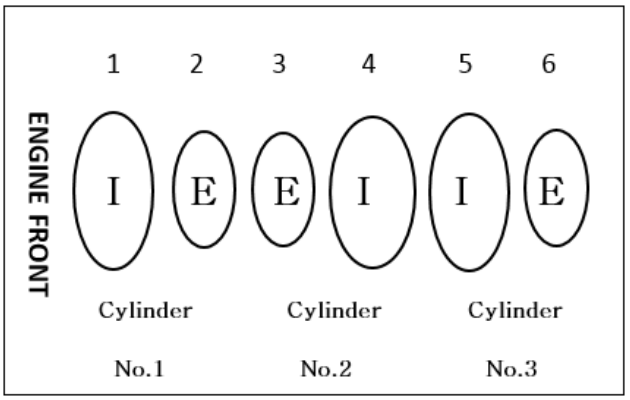
GNIL18TRO0026AB 2

3. Set No. 1, 2, 3 and 5 valves tip clearance to **0.30 mm** (**0.01 in**) in cold (from front).
4. Then rotate crankshaft **360°** in the same direction and set the valve tip clearance for No.4 and 6 valves to **0.30 mm** (**0.01 in**) in cold.



GNIL18TRO0022AB 3

Valve layout

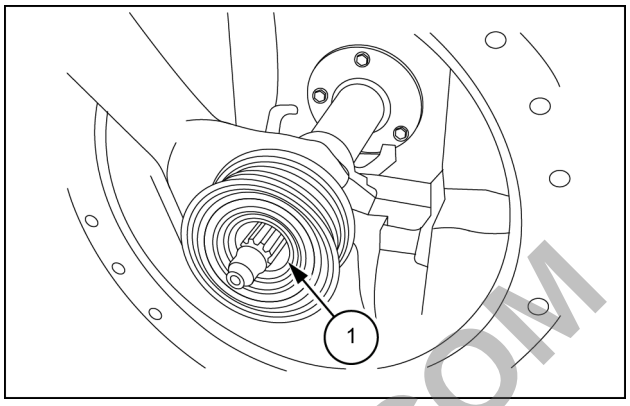


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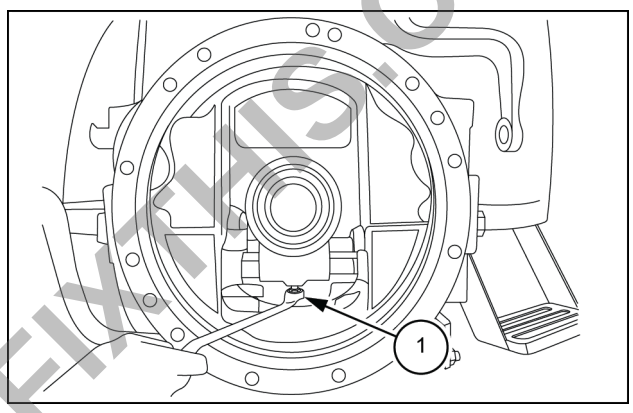
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2. Slide out both main clutch release bearing and Power Take-Off (PTO) clutch release bearings **(1)** from the shaft.



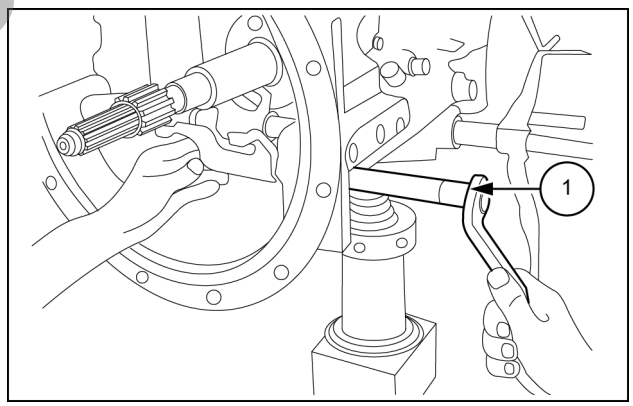
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3. Loosen the Power Take-Off (PTO) clutch fork lock screw **(1)**.



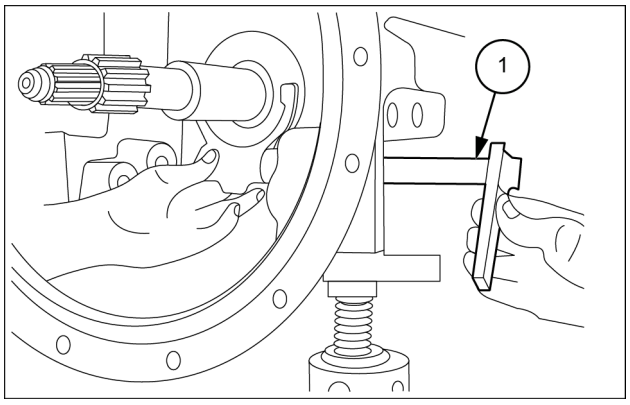
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4. Loosen the main clutch release bearing clutch fork screw.
5. Pull out the Power Take-Off (PTO) clutch cross shaft **(1)** from left-hand side of the transmission housing and retrieve fork from the housing.



GNIL14TR04676AB 13

6. Pull out the main clutch release cross shaft **(1)** from left-hand side of transmission housing and retrieve fork from the housing.



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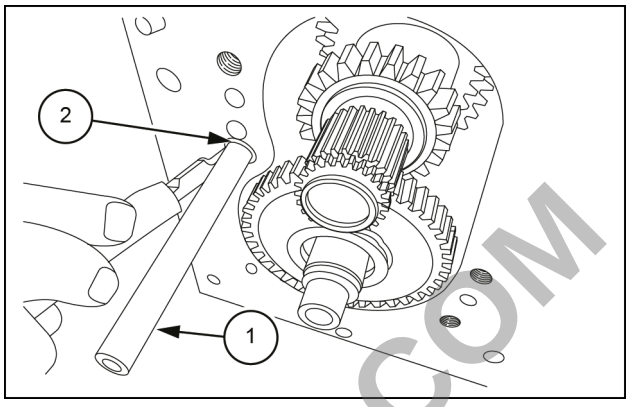
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Driven shaft - Remove - 8+8 Synchro shuttle

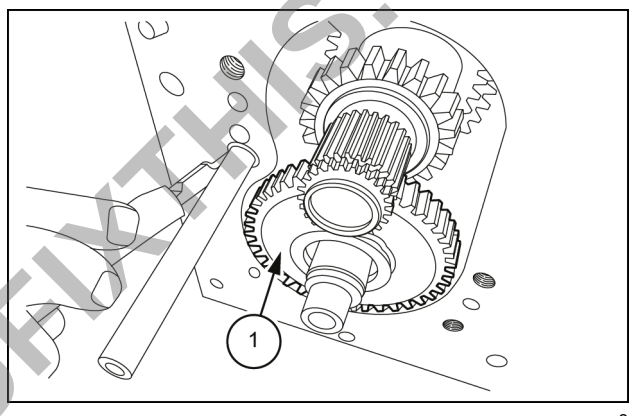
1. Remove the bottom shift rail **(1)**.

NOTE: *The bottom shift rail has a M12 plug* ***(2)****. That must be removed from the front of the housing.*



GNIL14TR04169AB 1

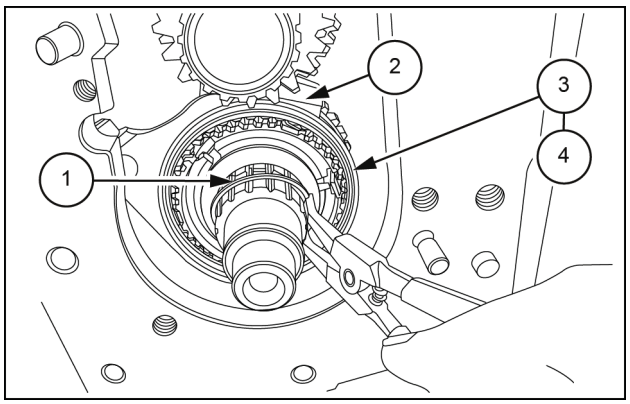
2. Remove 1st gear **(1)** from the synchromesh driven shaft.



GNIL14TR04170AB 2

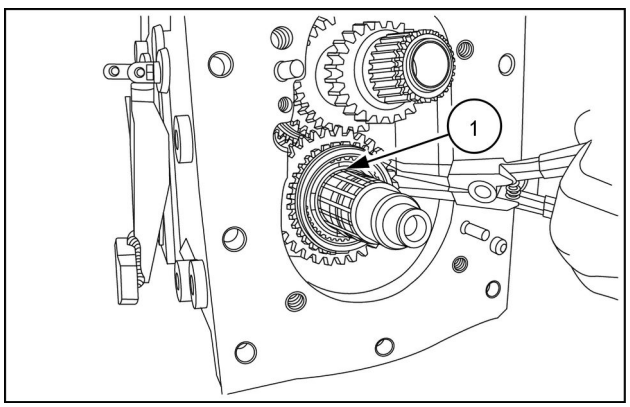
3. Remove the snap ring **(1)** from the driven shaft and take out the 1st/2nd gear shift fork **(2)** the 1st/2nd gear coupler **(3)** the hub **(4)** from the driven shaft.

NOTE: *Keep the face of the hub with the cut towards the pinion side.*



GNIL14TR05493AB 3

4. Remove the snap ring **(1)** securing the 2nd gear.



GNIL18TRO5583AB 4

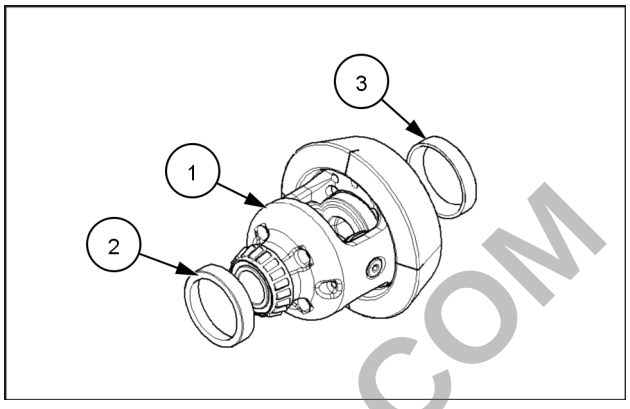
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Powered front axle - Assemble - Differential support

1. Install the bearing cups **(2)** and **(3)** on the differential housing **(1)**.

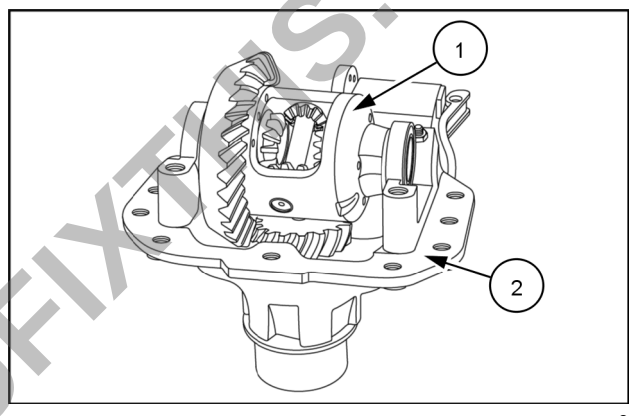
NOTE: *Do not invert the bearing cups if the bearings are not replaced.*



GNIL17TRO1194AA 1

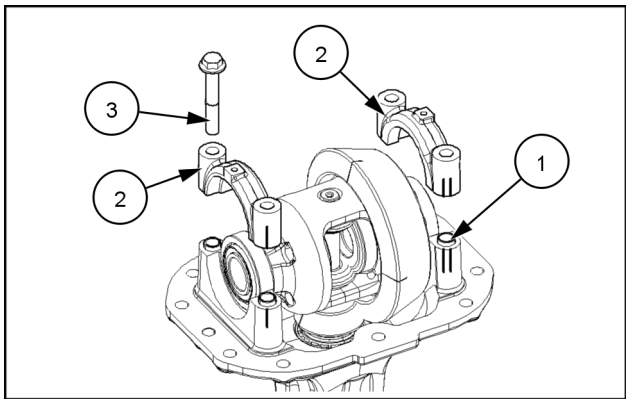
2. Position the complete differential housing **(1)** on the differential support **(2)**.

NOTE: *Check the right side of the bevel crown assembly for proper alignment.*



GNIL17TRO1124AA 2

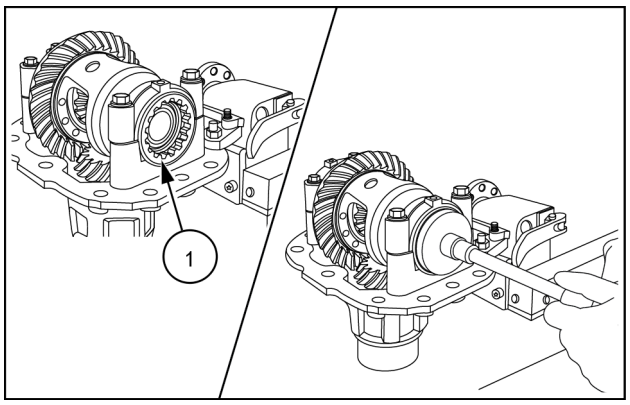
3. If required, slightly adjust differential group to place the bevel crown gear on the pinion.
   Check that all bushes **(1)** are in their housings and position both half collars **(2)** on their seats using the previously traced reference marks.
   Lock both collars with their fastening screws **(3)**.



GNIL17TRO1195AA 3

4. Install the adjusting ring nuts **(1)** to the differential support by using special tool 380200683.

NOTE: *The ring nuts must be screwed without force, do not damage the ring nuts thread during the ring nut assembly.*



GNIL18TRO1228AB 4

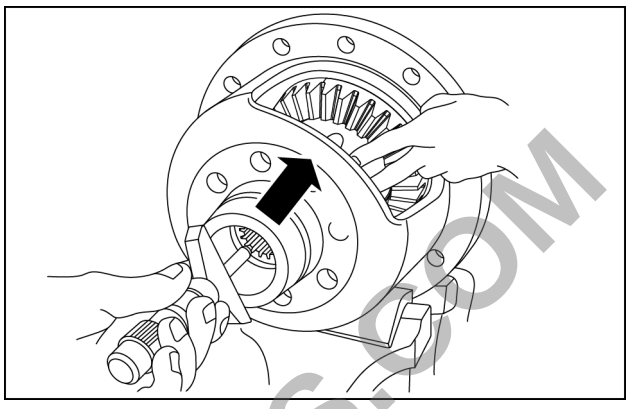
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Differential - Backlash - Adjustment

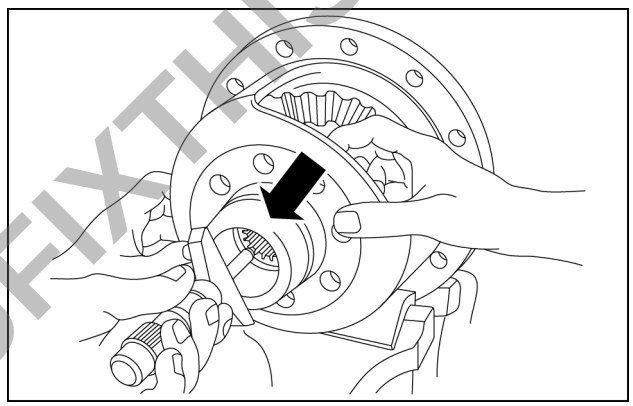
Differential pinion and side gear backlash adjustment

Fit the two side gears in the differential carrier without the shims .
Install differential pinions complete with thrust washer and journal and tighten bolts a few turns to prevent journal work out.
Bring left-hand side gear into full contact with differential pinion.
Using a depth gauge measure dimension at two diametrically opposed points and average the two readings.



GNIL14TR04269AB 1

Then push side gear into contact with differential carrier and measure dimension .
Repeat the same operations on right-hand side gear.
End float of each side gear without the baulk ring must be:
Gs or Gd = H1 - H2
where:
Gs = Left-hand side gear end float.
Gd = Right-hand side gear end float.
H1 and H2 = Dimensions measured on left-hand side or right-hand side gears.
Normal differential pinion and side gear backlash is **0.15 mm** (**0.01 in**).
Note that the average ratio normal backlash to the equivalent side gear end float is 1 to 1.7.
Side gear end float corresponding to normal backlash will be:
0.15 x 1.8 = **0.250 mm** (**0.010 in**).
Consequently the shim thickness required in the differential carrier is given by:
Ss = Gs - 0.25 (for left-hand side gear)
Sd = Gd - 0.25 (for right-hand side gear)
Available shims are **1.200 – 2.000 mm** (**0.047 – 0.079 in**).
Install closest to calculated thickness.

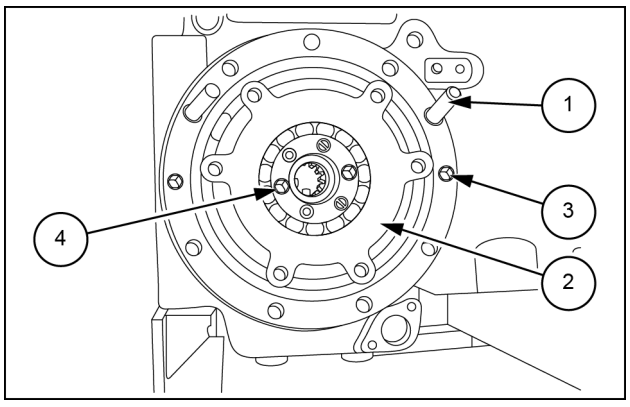


GNIL14TR04270AB 2

Adjustment of bevel wheel bearings and crown pinion

NOTE: *Place O-ring in the housing before fitting cover plate.*

1. Fit the locator pins **(1)** and fit the cover plate **(2)** tighten the plate with Allen screws **(3)**, screw out two Allen screws **(4)** and remove lock plate from both sides.



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