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400 Series OEM Engines Stationary Power Unit & Accessories

JOHN DEERE

TECHNICAL MANUAL

John Deere Engine Works
TM-1106 (Jan-79)
LITHO IN U.S.A.

400 SERIES OEM ENGINES STATIONARY POWER UNITS & ACCESSORIES

TECHNICAL MANUAL TM-1106 (Jan-79)

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Section 10
GENERAL

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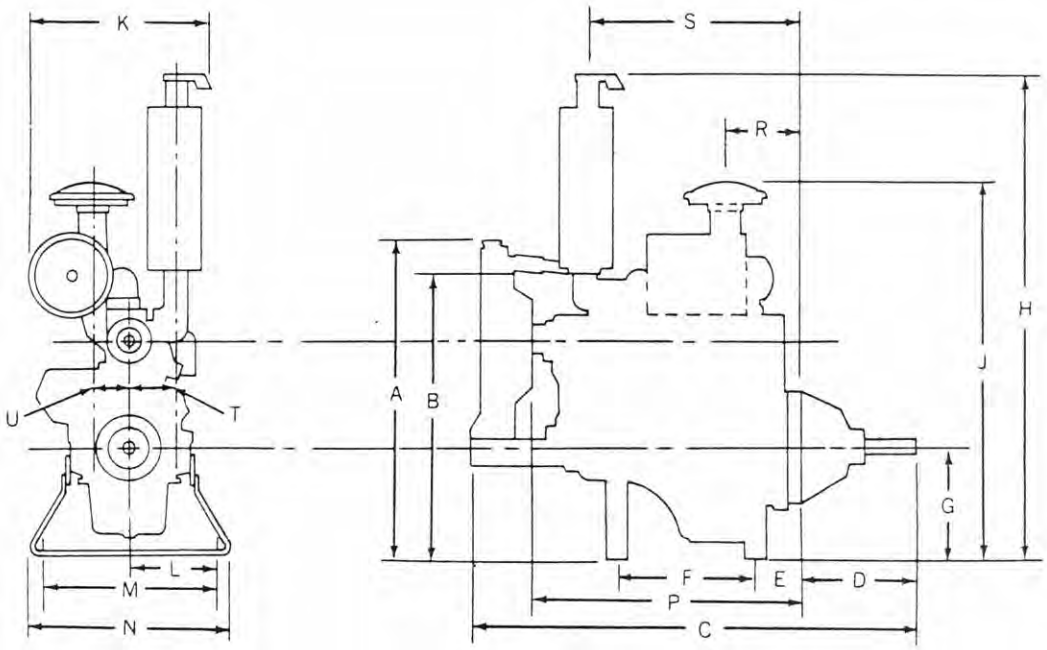
SPECIFICATIONS AND SPECIAL TOOLS

GENERAL ENGINE SPECIFICATIONS

GENERAL	4270D	6404D	6404T	6404A	6466D	6466T	6466A
Engine type	4-cycle, in-line diesel, valve-in-head						
Number of cylinders	4	6	6	6	6	6	6
Bore, in. (mm)	4.25 (108)	4.25 (108)	4.25 (108)	4.25 (108)	4.56 (116)	4.56 (116)	4.56 (116)
Stroke, in. (mm)	4.75 (121)						
Displacement, cu. in. (L)	270 (4.4)	404 (6.6)	404 (6.6)	404 (6.6)	466 (7.6)	466 (7.6)	466 (7.6)
Compression ratio	16.3:1	16.3:1	14.7:1	14.7:1	14.9:1	14.9:1	14.9:1
Valve clearance (nominal), in. (mm)							
Intake	0.018 (0.46)						
Exhaust	0.028 (0.71)						
Rated full-load speed, RPM	2500			2200			
Horsepower at rated speed, hp (kW)							
Intermittent	80 (60)	117 (87)	144 (107)	177 (132)	130 (97)	157 (117)	224 (167)
Continuous	68 (51)	99 (74)	122 (91)	150 (112)	117 (87)	133 (99)	190 (142)
Working Range, RPM	1500-2500	1500-2200	1500-2200	1500-2200	1500-2200	1500-2200	1500-2100
Low idle, RPM	800						
Injection pump timing	TDC						
Firing order	1-3-4-2			1-5-3-6-2-4			
LUBRICATION							
Pump type	Gear						
Filter	Full-flow, replaceable element						
Oil capacity with filter change, qts (L)	8 (7.6)	17 (16)	17 (16)	17 (16)	16 (15)	16 (15)	21 (20)
with optional deep oil pan					21 (20)	21 (20)	21 (20)
COOLING							
Pump type	Centrifugal, with V-belt drive						
Coolant capacity with radiator, qts (L)	24 (23)	24 (23)	30 (28)	30 (28)	30 (28)	30 (28)	36 (34)
ELECTRICAL							
12 volt alternator, amps	55	35	35	35	61	61	61
Starter	12 volt, with overrunning clutch						
Main fuse	MDL-25						
Safety switch fuse	SFE-14						
POWER TAKE-OFF							
Shaft diameter, in. (mm)	2.25 (57)					2.5 (64)	
WEIGHT							
With radiator and PTO, lbs	1500	1960	2060	2090	2385	2435	2695
(kg)	(680)	(889)	(934)	(948)	(1082)	(1105)	(1222)
Basic engine, lbs	1100	1550	1670	1690	1625	1750	1800
(kg)	(500)	(703)	(758)	(767)	(737)	(794)	(816)



A—Height to radiator cap
B—Height to exhaust elbow
C—Overall length
D—PTO assembly length
E—Rear mounting hole to flywheel
F—Mounting holes length
G —Crankshaft height
H —Height to top of muffler
J —Height to top of air cleaner
K —Width less radiator
K_1—Width with radiator (not shown)
L —Crankshaft to mounting hole
M —Mounting holes width
N—Overall mount width
P—Block length
R—Air cleaner to flywheel
S—Muffler to flywheel
T—Crankshaft to exhaust manifold (left)
U—Crankshaft to air intake (left)

Measurement in inches (mm)

	4270D	6404D	6404T	6404A	6466D	6466T	6466A
A	49.0 (1245)	49.0 (1245)	52.0 (1321)	52.0 (1321)	52.0 (1321)	52.0 (1321)	52.5 (1334)
B	42.0 (1067)	42.25 (1073)	47.16 (1190)	50.26 (1277)	45.0 (1143)	50.5 (1283)	50.5 (1283)
C	56.5 (1435)	69.0 (1753)	69.0 (1753)	70.0 (1778)	69.0 (1753)	69.0 (1753)	70.62 (1794)
D	15.5 (394)						16.13 (410)
E	9.3 (236)						
F	16.88 (428)	28.0 (711)					
G	15.0 (381)						
H	66.5 (1689)	69.5 (1765)	81.5 (2070)	81.5 (2070)	69.0 (1753)	86.25 (2190)	86.25 (2190)
J	61.0 (1549)						

K	20.75 (527)	19.25 (489)	20.20 (513)	21.56 (547)	21.3 (541)	21.5 (546)	22.0 (559)
K_1	22.0 (559)	22.0 (559)	24.5 (622)	24.5 (622)	24.5 (622)	24.5 (622)	30.5 (775)
L	12.75 (324)						
M	25.5 (648)						
N	31.5 (800)						
P	32.36 (822)	42.75 (1086)	45.59 (1158)	46.04 (1169)	45.75 (1162)	45.75 (1162)	47.54 (1208)
R	15.0 (381)						
S	26.65 (677)	35.0 (889)	43.0 (1092)	43.0 (1092)	35.0 (889)	43.0 (1092)	43.0 (1092)
T	5.28 (134)	5.28 (134)	6.59 (167)	6.59 (167)	5.28 (134)	6.59 (167)	6.59 (167)
U	4.0 (101)	4.0 (101)	1.0 (25)	1.0 (25)	4.0 (101)	1.0 (25)	1.0 (25)

INSTALLATION AND AFTER-SALE SERVICE

Item	Specification
Injection Pump Timing	TDC
Engine speeds	
Slow idle	800 rpm
Fast idle†	4270D - 2650 rpm; 6404D, T, A and 6466D, T — 2400 rpm 6466A — 2300 rpm
PTO lever engagement pressure	60 to 70 lbs. (27.2 to 31.8 kg)
Torques	
Flywheel housing-to-cylinder block	300 ft-lbs (407 Nm) (40.7 kgm)
PTO housing-to-flywheel housing	35 ft-lbs (47 Nm) (4.7 kgm)
Engine mount-to-cylinder block	170 ft-lbs (231 Nm) (23.1 kgm)
Radiator support-to-cylinder block	300 ft-lbs (407 Nm) (40.7 kgm)
Other accessible nuts and cap screws:	

TORQUE CHART

Bolt Diameter	Plain Head*			Three Radial Dashes*			Six Radial Dashes*		
	ft-lbs	Nm	kgm	ft-lbs	Nm	kgm	ft-lbs	Nm	kgm
1/4 in. (6.35 mm)	6	8	0.8	10	14	1.4	14	19	1.9
5/16 in. (7.93 mm)	13	18	1.8	20	27	2.7	30	41	4.1
3/8 in. (9.53 mm)	23	31	3.1	35	47	4.7	50	70	7.0
7/16 in. (11.11 mm)	35	47	4.7	55	75	7.5	80	110	11
1/2 in. (12.70 mm)	55	75	7.5	85	115	12	120	160	16
9/16 in. (14.29 mm)	75	100	10	130	175	18	175	240	24
5/8 in. (15.88 mm)	105	140	14	170	230	23	240	325	33
3/4 in. (19.05 mm)	185	250	25	300	410	41	425	575	58
7/8 in. (22.23 mm)	160	220	22**	445	600	60	685	930	93
1 in. (25.40 mm)	250	340	34**	670	900	90	1030	1400	140

**The types of bolts and cap screws are identified by head markings as follows:*

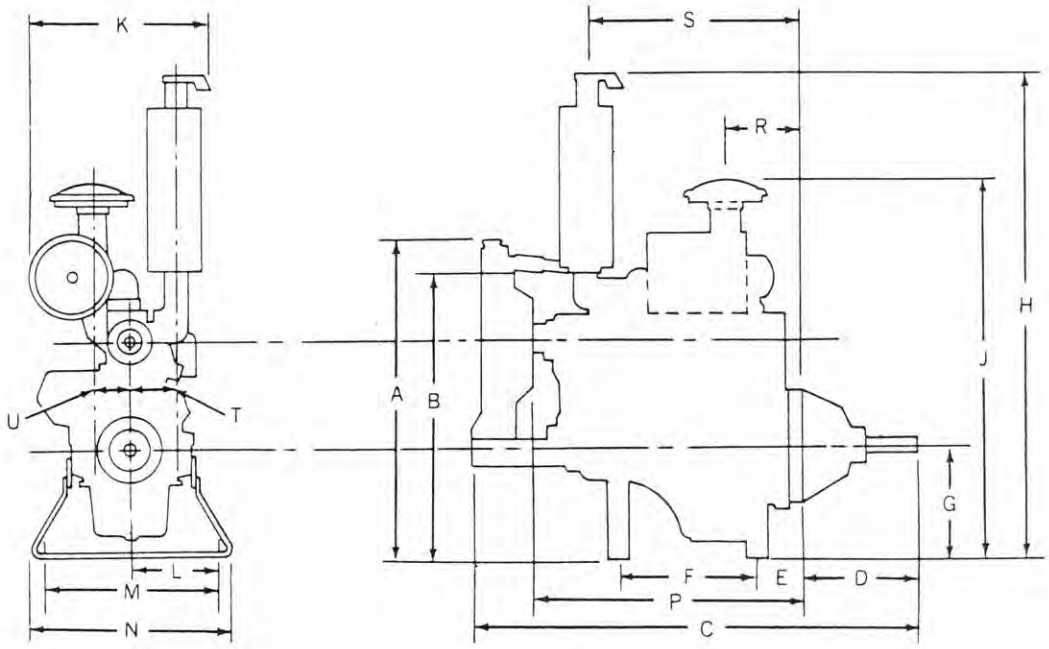
Plain Head: regular machine bolts and cap screws.

3-Dash Head: tempered steel high-strength bolts and cap screws.

6-Dash Head: tempered steel extra high-strength bolts and cap screws.

***Machine bolts and cap screws 7/8-inch and larger are sometimes formed hot rather than cold, which accounts for the lower torque.*

†NOTE: Speeds given above are for basic engines. Some engines have different fast idle speeds, depending on the application. For example, 4270D, 6404D,and 6466D engines used in generator set applications have a fast idle speed of 1850 rpm. Some 6404T and A engines have a 2300 rpm fast idle speed. See page 5.



A—Height to radiator cap
B—Height to exhaust elbow
C—Overall length
D—PTO assembly length
E—Rear mounting hole to flywheel
F—Mounting holes length
G —Crankshaft height
H —Height to top of muffler
J —Height to top of air cleaner
K —Width less radiator
K_1—Width with radiator (not shown)
L —Crankshaft to mounting hole
M —Mounting holes width
N—Overall mount width
P—Block length
R—Air cleaner to flywheel
S—Muffler to flywheel
T—Crankshaft to exhaust manifold (left)
U—Crankshaft to air intake (left)

Measurement in inches (mm)

	4270D	6404D	6404T	6404A	6466D	6466T	6466A
A	49.0 (1245)	49.0 (1245)	52.0 (1321)	52.0 (1321)	52.0 (1321)	52.0 (1321)	52.5 (1334)
B	42.0 (1067)	42.25 (1073)	47.16 (1190)	50.26 (1277)	45.0 (1143)	50.5 (1283)	50.5 (1283)
C	56.5 (1435)	69.0 (1753)	69.0 (1753)	70.0 (1778)	69.0 (1753)	69.0 (1753)	70.62 (1794)
D	15.5 (394)						16.13 (410)
E	9.3 (236)						
F	16.88 (428)	28.0 (711)					
G	15.0 (381)						
H	66.5 (1689)	69.5 (1765)	81.5 (2070)	81.5 (2070)	69.0 (1753)	86.25 (2190)	86.25 (2190)
J	61.0 (1549)						

	4270D	6404D	6404T	6404A	6466D	6466T	6466A
K	20.75 (527)	19.25 (489)	20.20 (513)	21.56 (547)	21.3 (541)	21.5 (546)	22.0 (559)
K_1	22.0 (559)	22.0 (559)	24.5 (622)	24.5 (622)	24.5 (622)	24.5 (622)	30.5 (775)
L	12.75 (324)						
M	25.5 (648)						
N	31.5 (800)						
P	32.36 (822)	42.75 (1086)	45.59 (1158)	46.04 (1169)	45.75 (1162)	45.75 (1162)	47.54 (1208)
R	15.0 (381)						
S	26.65 (677)	35.0 (889)	43.0 (1092)	43.0 (1092)	35.0 (889)	43.0 (1092)	43.0 (1092)
T	5.28 (134)	5.28 (134)	6.59 (167)	6.59 (167)	5.28 (134)	6.59 (167)	6.59 (167)
U	4.0 (101)	4.0 (101)	1.0 (25)	1.0 (25)	4.0 (101)	1.0 (25)	1.0 (25)

INSTALLATION AND AFTER-SALE SERVICE

Item	Specification
Injection Pump Timing	TDC
Engine speeds	
Slow idle	800 rpm
Fast idle†	4270D - 2650 rpm; 6404D, T, A and 6466D, T — 2400 rpm 6466A — 2300 rpm
PTO lever engagement pressure	60 to 70 lbs. (27.2 to 31.8 kg)
Torques	
Flywheel housing-to-cylinder block	300 ft-lbs (407 Nm) (40.7 kgm)
PTO housing-to-flywheel housing	35 ft-lbs (47 Nm) (4.7 kgm)
Engine mount-to-cylinder block	170 ft-lbs (231 Nm) (23.1 kgm)
Radiator support-to-cylinder block	300 ft-lbs (407 Nm) (40.7 kgm)
Other accessible nuts and cap screws:	

TORQUE CHART

Bolt Diameter	Plain Head*			Three Radial Dashes*			Six Radial Dashes*		
	ft-lbs	Nm	kgm	ft-lbs	Nm	kgm	ft-lbs	Nm	kgm
1/4 in. (6.35 mm)	6	8	0.8	10	14	1.4	14	19	1.9
5/16 in. (7.93 mm)	13	18	1.8	20	27	2.7	30	41	4.1
3/8 in. (9.53 mm)	23	31	3.1	35	47	4.7	50	70	7.0
7/16 in. (11.11 mm)	35	47	4.7	55	75	7.5	80	110	11
1/2 in. (12.70 mm)	55	75	7.5	85	115	12	120	160	16
9/16 in. (14.29 mm)	75	100	10	130	175	18	175	240	24
5/8 in. (15.88 mm)	105	140	14	170	230	23	240	325	33
3/4 in. (19.05 mm)	185	250	25	300	410	41	425	575	58
7/8 in. (22.23 mm)	160	220	22**	445	600	60	685	930	93
1 in. (25.40 mm)	250	340	34**	670	900	90	1030	1400	140

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***Machine bolts and cap screws 7/8-inch and larger are sometimes formed hot rather than cold, which accounts for the lower torque.*

†NOTE: Speeds given above are for basic engines. Some engines have different fast idle speeds, depending on the application. For example, 4270D, 6404D,and 6466D engines used in generator set applications have a fast idle speed of 1850 rpm. Some 6404T and A engines have a 2300 rpm fast idle speed. See page 5.

TUNE-UP

Preliminary Testing

ITEM	SPECIFICATION		
Dynamometer test at full load RPM (Engine equipped with fan)	Horsepower (Kilowatts)		
Engine	**Maximum Continuous**	**Intermittent**	**RPM**
4270DR (Regular Governor)	62 (46)	68 (51)	2200
4270DF (3-5% Governor)	47 (36)	59 (44)	1800
6404D	84 (63)	99 (74)	2200
6404DR-20 (Regular Governor)	97 (72)	107 (80)	2200
6404DF (Reg. Governor	97 (72)	107 (80)	2200
6404DF (3-5% Governor)	71 (53)	86 (64)	1800
6404TR-13 (Regular Governor)	106 (79)	125 (93)	2200
6404TR-14 and TF (3-5% Governor)	115 (86)	135 (101)	2200
6404AR-09 (Regular Governor)	141 (106)	168 (125)	2200
6404AR-16 and AF (3-5% Governor)	142 (106)	168 (125)	2200
6466DR-05 and DF (Regular Governor)	105 (78)	118 (88)	2200
6466DF (3-5% Governor)	97 (72)	109 (82)	1800
6466TF (Regular Governor)	121 (90)	145 (108)	2200
6466TR-09 and TF (3-5% Governor)	121 (90)	145 (108)	2200
6466AF (Regular Governor)	174 (130)	208 (155)	2100
6466AR-03 and AF (3-5% Governor)	174 (130)	208 (155)	2100

Compression test at 200 to 250 RPM	
4270D (at 250 to 325 RPM)	380 to 420 psi (25.9 to 28.6 bar) (26.7 to 29.5 kg/cm²)
6404D; 6466D	370 to 400 psi (25.5 to 27.2 bar) (26.0 to 28.0 kg/cm²)
6404T and A; 6466T and A	330 to 370 psi (22.5 to 25.5 bar) (23.0 to 26.0 kg/cm²)
Intake manifold pressure at full load (2200 RPM)	
6404T	15 to 17 psi (1.0 to 1.2 bar) (1.0 to 1.2 kg/cm²)
6404A	16 to 20 psi (1.1 to 1.4 bar) (1.1 to 1.4 kg/cm²)
6466T	14 to 16 psi (1.0 to 1.1 bar) (1.0 to 1.1 kg/cm²)
6466A	18 to 23 psi (1.2 to 1.6 bar) (1.2 to 1.6 kg/cm²)
Thermostat opening temperature	160 to 180°F (71 to 82°C)
Radiator cap release pressure	6.25 to 7.50 psi (0.4 to 0.5 bar) (0.4 to 0.5 kg/cm²)
Engine speeds (rpm)	

Engine	**Slow Idle**	**Fast Idle**	**Rated**
4270DR (Regular Governor)	800	2750	2500
4270DF (3-5% Governor)	800	1900	1800
6404DR-20 (Regular Governor)	800	2400	2200
6404DF (3-5% Governor)	800	1900	1800
6404TR-13 (Regular Governor)	800	2400	2200
6404TR-14 and TF (3-5% Governor)	800	2300	2100
6404AR-09 (Regular Governor)	800	2400	2200
6404AR-16 and AF (3-5% Governor)	800	2300	2100
6466DR-05 and DF (Regular Governor)	800	2400	2200
6466DF (3-5% Governor)	800	1900	1800
6466TF (Regular Governor)	800	2400	2200
6466TF and TR-09 (3-5% Governor)	800	2300	2200
6466AF and AR-03 (3-5% Governor)	800	2200	2100
6466AF (Regular Governor)	800	2300	2100

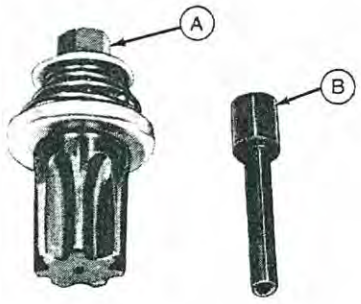
LUBRICATION

Crankcase oil capacity with filter change	
4270D	8 qts. (7.6 L)
6404	17 qts. (16.1 L)
6466	21 qts. (20.8 L)
Service intervals	
Check engine oil level	Every 10 hours
Change engine oil	Every 100 hours
Change engine oil filter	Every 200 hours
Lubricate PTO clutch release bearing	Every 10 hours
Lubricate PTO clutch linkage	Every 600 hours

SPECIAL TOOLS

Installation and After-Sale Service

TOOL	USE
JDE-81-1 Engine Rotation Tool and JDE-81-4 Timing Pin	Turn engine to TDC to check injection pump timing on 6-cylinder engines



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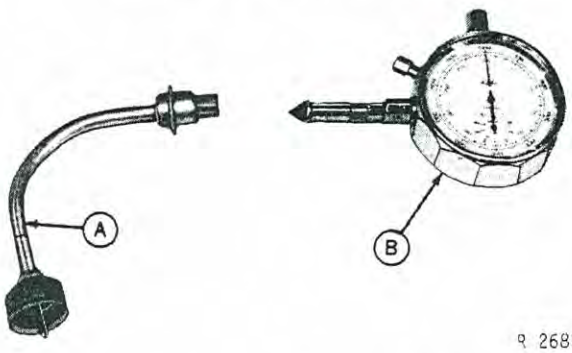
A—JDE-81-1 Engine Rotation Tool*
B—JDE-81-4 Timing Pin*

Fig. 1-Tools Required for Checking Timing

JDE-28 Adapter and Hand Tachometer	Check engine speeds



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A—JDE-28 Adapter* **B—Hand Tachometer**

Fig. 2-Tools Required for Checking Engine Speeds

TUNE-UP

Preliminary Testing

ITEM	SPECIFICATION		
Dynamometer test at full load RPM (Engine equipped with fan)	Horsepower (Kilowatts)		
Engine	**Maximum Continuous**	**Intermittent**	**RPM**
4270DR (Regular Governor)	62 (46)	68 (51)	2200
4270DF (3-5% Governor)	47 (36)	59 (44)	1800
6404D	84 (63)	99 (74)	2200
6404DR-20 (Regular Governor)	97 (72)	107 (80)	2200
6404DF (Reg. Governor	97 (72)	107 (80)	2200
6404DF (3-5% Governor)	71 (53)	86 (64)	1800
6404TR-13 (Regular Governor)	106 (79)	125 (93)	2200
6404TR-14 and TF (3-5% Governor)	115 (86)	135 (101)	2200
6404AR-09 (Regular Governor)	141 (106)	168 (125)	2200
6404AR-16 and AF (3-5% Governor)	142 (106)	168 (125)	2200
6466DR-05 and DF (Regular Governor)	105 (78)	118 (88)	2200
6466DF (3-5% Governor)	97 (72)	109 (82)	1800
6466TF (Regular Governor)	121 (90)	145 (108)	2200
6466TR-09 and TF (3-5% Governor)	121 (90)	145 (108)	2200
6466AF (Regular Governor)	174 (130)	208 (155)	2100
6466AR-03 and AF (3-5% Governor)	174 (130)	208 (155)	2100

Compression test at 200 to 250 RPM	
4270D (at 250 to 325 RPM)	380 to 420 psi (25.9 to 28.6 bar) (26.7 to 29.5 kg/cm²)
6404D; 6466D	370 to 400 psi (25.5 to 27.2 bar) (26.0 to 28.0 kg/cm²)
6404T and A; 6466T and A	330 to 370 psi (22.5 to 25.5 bar) (23.0 to 26.0 kg/cm²)
Intake manifold pressure at full load (2200 RPM)	
6404T	15 to 17 psi (1.0 to 1.2 bar) (1.0 to 1.2 kg/cm²)
6404A	16 to 20 psi (1.1 to 1.4 bar) (1.1 to 1.4 kg/cm²)
6466T	14 to 16 psi (1.0 to 1.1 bar) (1.0 to 1.1 kg/cm²)
6466A	18 to 23 psi (1.2 to 1.6 bar) (1.2 to 1.6 kg/cm²)
Thermostat opening temperature	160 to 180°F (71 to 82°C)
Radiator cap release pressure	6.25 to 7.50 psi (0.4 to 0.5 bar) (0.4 to 0.5 kg/cm²)
Engine speeds (rpm)	

Engine	**Slow Idle**	**Fast Idle**	**Rated**
4270DR (Regular Governor)	800	2750	2500
4270DF (3-5% Governor)	800	1900	1800
6404DR-20 (Regular Governor)	800	2400	2200
6404DF (3-5% Governor)	800	1900	1800
6404TR-13 (Regular Governor)	800	2400	2200
6404TR-14 and TF (3-5% Governor)	800	2300	2100
6404AR-09 (Regular Governor)	800	2400	2200
6404AR-16 and AF (3-5% Governor)	800	2300	2100
6466DR-05 and DF (Regular Governor)	800	2400	2200
6466DF (3-5% Governor)	800	1900	1800
6466TF (Regular Governor)	800	2400	2200
6466TF and TR-09 (3-5% Governor)	800	2300	2200
6466AF and AR-03 (3-5% Governor)	800	2200	2100
6466AF (Regular Governor)	800	2300	2100

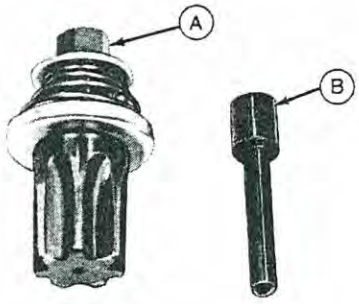
LUBRICATION

Crankcase oil capacity with filter change	
4270D	8 qts. (7.6 L)
6404	17 qts. (16.1 L)
6466	21 qts. (20.8 L)
Service intervals	
Check engine oil level	Every 10 hours
Change engine oil	Every 100 hours
Change engine oil filter	Every 200 hours
Lubricate PTO clutch release bearing	Every 10 hours
Lubricate PTO clutch linkage	Every 600 hours

SPECIAL TOOLS

Installation and After-Sale Service

TOOL	USE
JDE-81-1 Engine Rotation Tool and JDE-81-4 Timing Pin	Turn engine to TDC to check injection pump timing on 6-cylinder engines

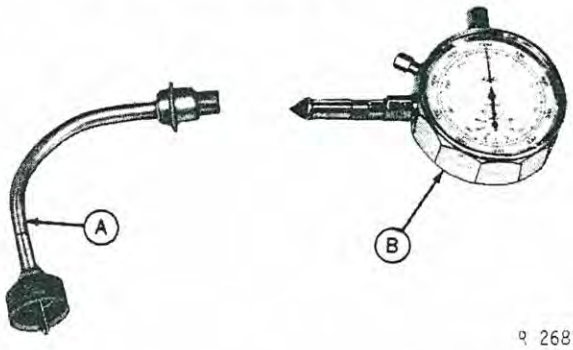


R 26134N

A—JDE-81-1 Engine Rotation Tool*
B—JDE-81-4 Timing Pin*

Fig. 1-Tools Required for Checking Timing

JDE-28 Adapter and Hand Tachometer	Check engine speeds



R 26818N

A—JDE-28 Adapter* **B—Hand Tachometer**

Fig. 2-Tools Required for Checking Engine Speeds

TOOL	USE
JDG-23 Lifting Sling	Lifting Engine

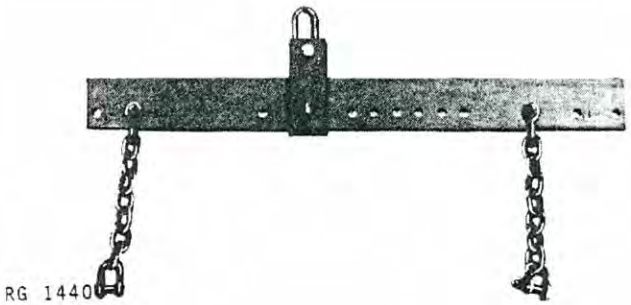


Fig. 3-JDG-23 Lifting Sling

Tune-Up

AR62377 Dry Element Cleaning Gun	Clean primary element of air cleaner

Fig. 4-AR62377 Dry Element Cleaning Gun

D-05022ST Water Vacuum Gauge	Measure air intake vacuum

Fig. 5-D-05022ST Water Vacuum Gauge (Formerly JDST-11)

TOOL	NUMBER	USE
R 26133N	D-05104ST Pressure Pump	Pressure test cooling system and radiator caps

Fig. 5-D-05104ST Pressure Pump

** - Order from Service Tools, Inc., P.O. Box 314, Owatonna, MN 55060*

TOOL	USE
JDG-23 Lifting Sling	Lifting Engine

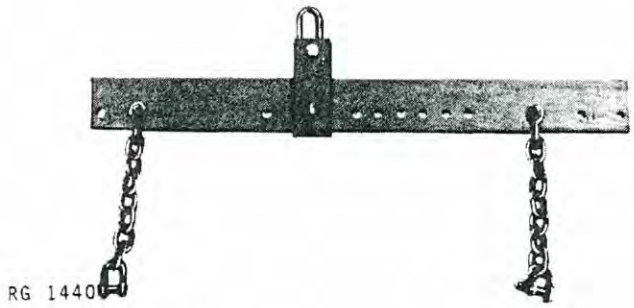


Fig. 3-JDG-23 Lifting Sling

Tune-Up

AR62377 Dry Element Cleaning Gun	Clean primary element of air cleaner

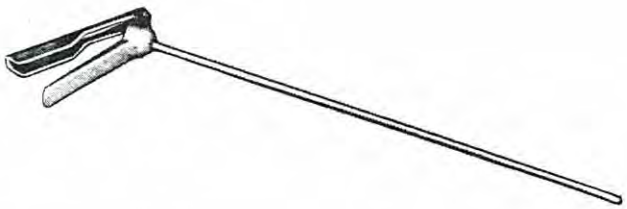


Fig. 4-AR62377 Dry Element Cleaning Gun

D-05022ST Water Vacuum Gauge	Measure air intake vacuum

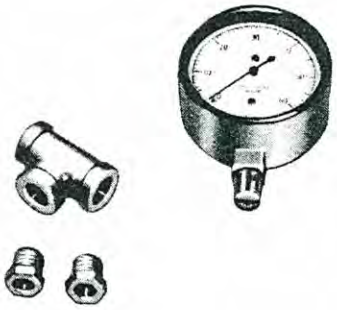


Fig. 5-D-05022ST Water Vacuum Gauge (Formerly JDST-11)

TOOL	NUMBER	USE
R 26133N	D-05104ST Pressure Pump	Pressure test cooling system and radiator caps

Fig. 5-D-05104ST Pressure Pump

** - Order from Service Tools, Inc., P.O. Box 314, Owatonna, MN 55060*

Group 05
INSTALLATION AND AFTER-SALE SERVICE

INSTALLATION SERVICE

Because of the shipping factors involved, plus extra finishing touches that are necessary to promote customer satisfaction, proper installation service is of prime importance to the dealer.

A tag pointing out the factory-recommended procedure for installation service is attached to each new engine before it leaves the factory.

After completing the factory-recommended dealer checks and services listed on the predelivery tag, remove the tag from the engine and file it with the shop order for the job. The tag will certify that the engine has received the proper predelivery service when the portion of the customer's John Deere Delivery Receipt is completed.

A thorough discussion of the operation and service of a new engine at the time of delivery helps to assure complete customer satisfaction. Proper delivery should be an important phase of a dealer's program. A portion of the John Deere Delivery Receipt emphasizes the importance of proper delivery service.

Many complaints have arisen simply because the owner was not shown how to operate and service his new engine properly. Enough time should be devoted, at the customer's convenience, to introducing the owner to his new engine and explaining to him how to operate and service it.

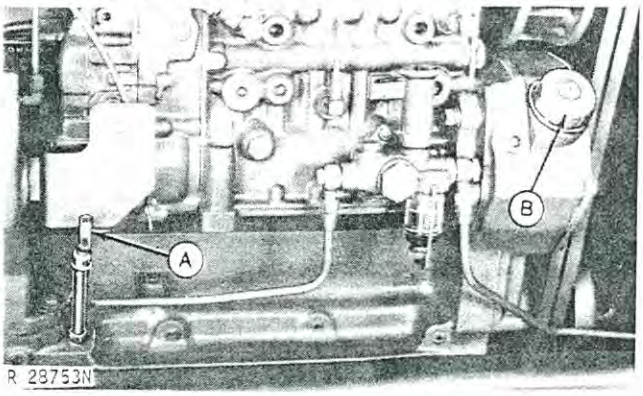
The following procedure is recommended before the serviceman and owner complete the delivery acknowledgements portion of the delivery receipt.

Using the engine operator's manual as a guide, be sure the owner understands these points thoroughly:

1. Controls and instruments.
2. How to start and stop the engine.
3. The importance of the break-in period.
4. Using the power takeoff.
5. The importance of safety.
6. The importance of lubrication and periodic services.

After explaining and demonstrating the above features, have the owner sign the delivery receipt and give him the operator's manual.

Checking Engine Oil Level



A—Dipstick B—Filler Cap

Fig. 1-Engine Oil Dipstick and Filler Cap

Remove engine oil dipstick (A, Fig. 1). Observe oil level. If necessary, add sufficient oil to bring oil level to full mark on dipstick. Use John Deere Torq-Gard Supreme SAE 10W-20 or its equivalent.

Checking Coolant Level

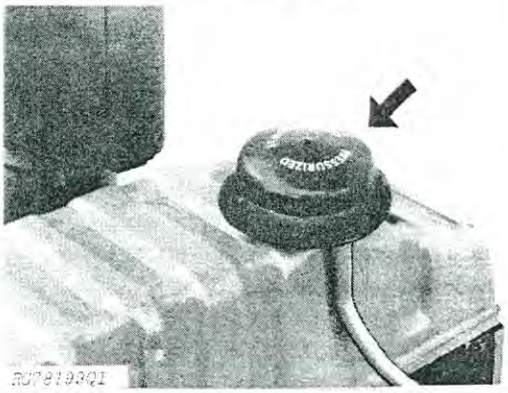


Fig. 2-Radiator Cap

Remove radiator cap and check coolant level. Level should be at least 1-1/2 inches (38 mm) above baffle in radiator top tank. If coolant is low, fill to proper level and try to determine why coolant was lost.

Anti-Freeze Protection

Use a dependable, temperature-correcting hydrometer to check anti-freeze protection of coolant. If more is needed, use permanent type, ethelyne glycol anti-freeze which contains a rust inhibitor but does not contain a stop-leak additive.

Leaks

Check entire cooling system—radiator engine oil cooler, intercooler, and all connecting pipes and hoses—for any sign of leaks. Tighten clamps on radiator hoses and heater hoses.

Belt Tension

Check belt tension. If necessary, adjust, using a Burroughs BT-33-73 Belt Tension Gauge or equivalent, following manufacturers' instructions.

Loosen alternator mounting bolts. Apply an outward force to front half of alternator until belt tension is correct. Tighten alternator mounting bolts.

BELT TENSION SPECIFICATION

	New Belt	Belt In Service*
1-belt system	130-140 lbs. (578-622 N)	85-94 lbs. (378-423 N)
2-belt system (Tension front belt only)	95-104 lbs. (423-467 N)	

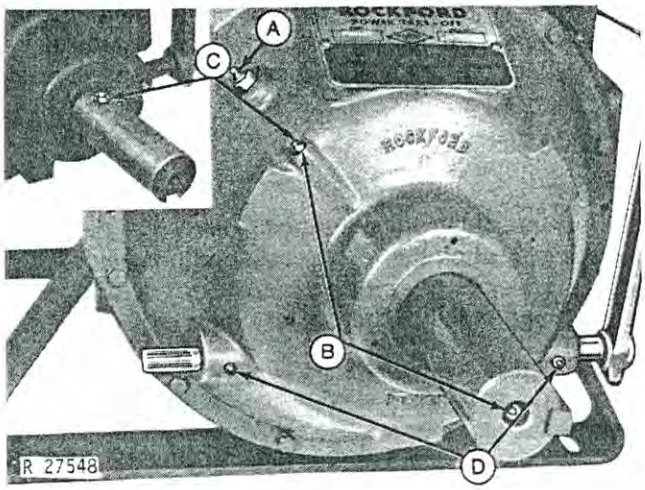
**Any belt that has been run more than 10 minutes.*

IMPORTANT: Do not tension or release belts when hot.

After installing new belt, run engine for 10 minutes. Stop engine and check belt tension. If tension is not within New Belt limits, wait 10 minutes, loosen belt and set to Belt In Service specifications.

When either belt needs replacing on a 2-belt system, install two new belts. The belts must be a matched set to obtain satisfactory service life.

PTO Clutch Release Bearing



A—Release Bearing Grease Fitting
B—Fittings for Side-Loaded Drive
C—Fittings for In-Line Drive
D—Lever Shaft Fittings

Fig. 3-PTO Lubrication Points

Apply one shot of John Deere Multi-Purpose Lubricant or its equivalent at release bearing grease fitting (A).

Apply several shots of John Deere Multi-Purpose Lubricant or its equivalent at the drive shaft bearing grease fittings (B or C). Less grease may be required for the lever shaft bearings (D).

NOTE: Pilot bearing grease fitting location depends on type of PTO load.

Checking Air Intake Connections

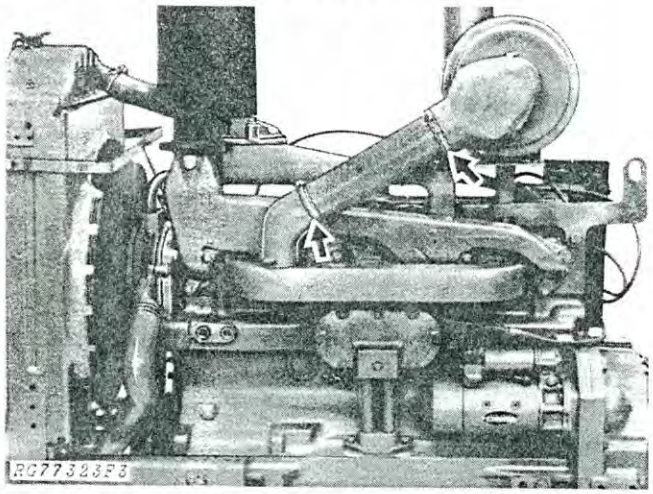


Fig. 4-Air Intake Connections (6466D Shown)

Check all connections in air intake system for possible leaks. Tighten any loose clamps. Be sure rubber dust unloading valve is on air cleaner.

Checking Engine Timing - 4270D

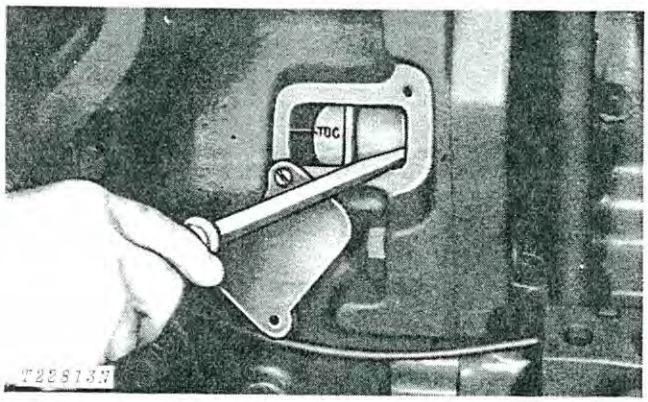
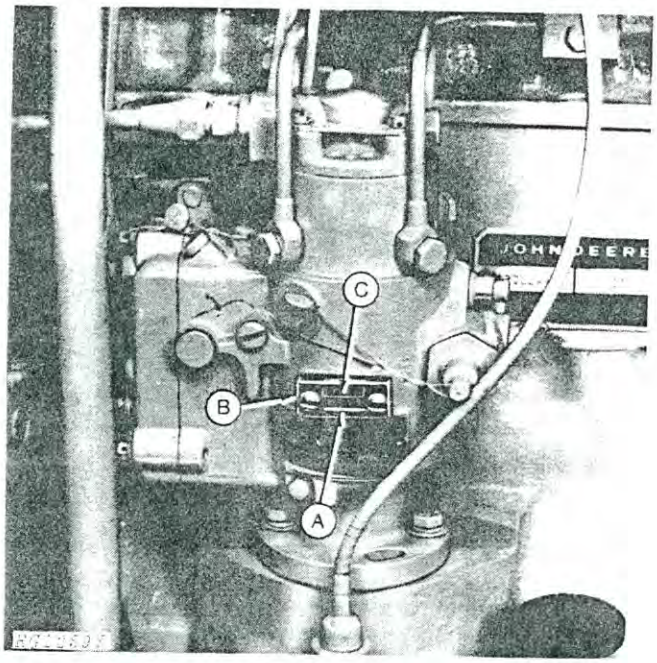


Fig. 5-Setting Engine to TDC

1. Open inspection plate.

2. Using a screwdriver or similar tool, manually turn flywheel until TDC mark on flywheel aligns with reference mark on flywheel housing. Always turn flywheel MANUALLY when aligning timing marks.

IMPORTANT: Normal backlash of gears is enough to throw pump timing off by several degrees, resulting in poor engine performance. To avoid backlash, always approach timing mark by turning engine in direction of normal rotation.



A—Weight Retainer Timing Line
B—Timing Window
C—Cam Timing Line

Fig. 6-Injection Pump Timing Lines

3. Remove timing window cover (B, Fig. 6).

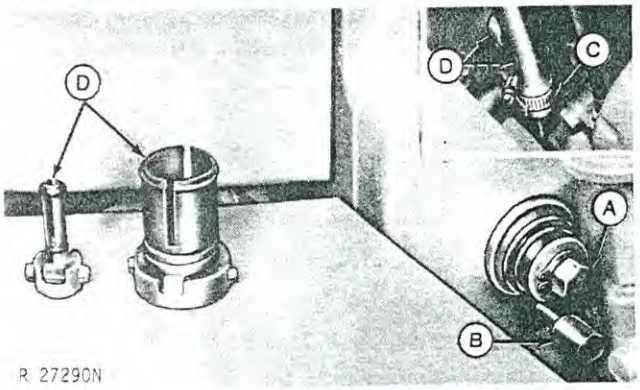
4. If both timing marks (A and C, Fig. 6) are not visible, engine is at TDC of the exhaust stroke. Rotate flywheel another 360° in running direction until TDC marks on flywheel and housing align.

5. See if injection pump timing marks are aligned.

6. If timing is correct, replace timing window cover.

7. .If timing is not correct, loosen pump mounting screws and rotate pump housing until marks align. Tighten pump mounting cap screws securely.

Checking Engine Timing - 6404D; 6466D



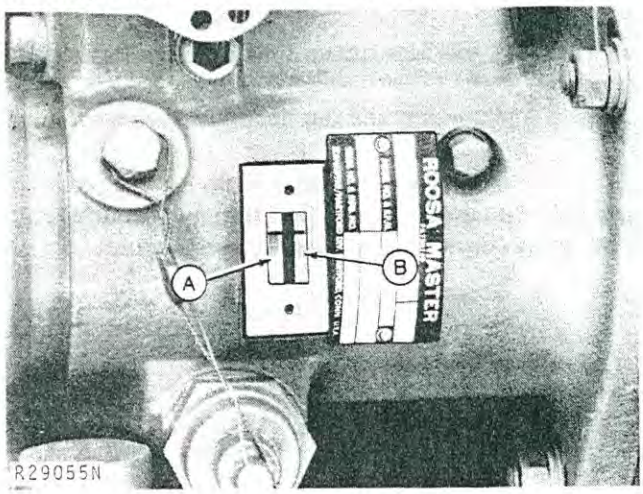
A—Engine Rotation Tool
B—Timing Pin
C—Crankcase Vent Hose
D—Plastic Plugs

Fig. 7-Installing Engine Rotation Tool and Timing Pin

1. Disconnect crankcase vent hose (C, Fig. 7). Remove plastic plugs (D), and install engine rotation tool and timing pin as shown.

2. Hold timing pin lightly against flywheel, and slowly turn engine IN DIRECTION OF NORMAL ROTATION (clockwise, as viewed from front of engine) until pin engages hole in flywheel.

IMPORTANT: Normal backlash of gears is enough to throw pump timing off by several degrees, resulting in poor engine performance. To avoid backlash, always approach timing mark by turning engine in direction of normal rotation.



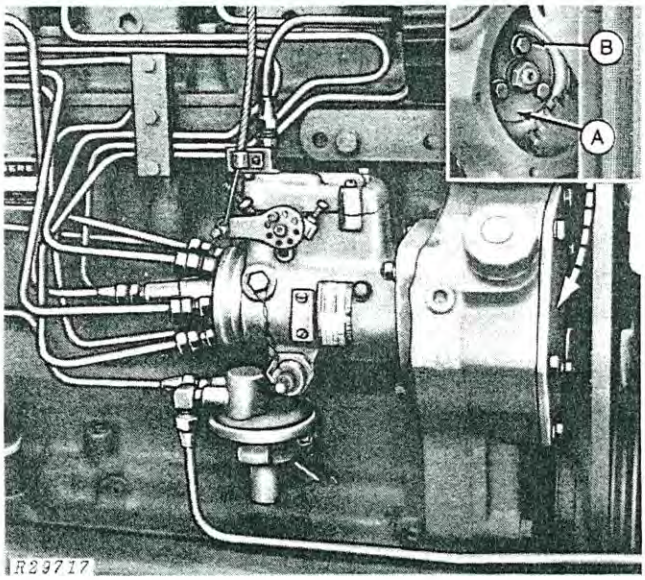
A—Cam Ring
B—Weight Retainer

Fig. 8-Injection Pump Timing Marks

3. Remove timing hole cover. See if timing marks are aligned.

4. If drive hub timing mark is not visible, number one piston is at top of exhaust stroke instead of compression stroke. Turn flywheel another 360° in direction of normal rotation until timing pin engages hole in flywheel. See if timing marks are aligned.

5. If timing is correct, replace plugs and reconnect hose.



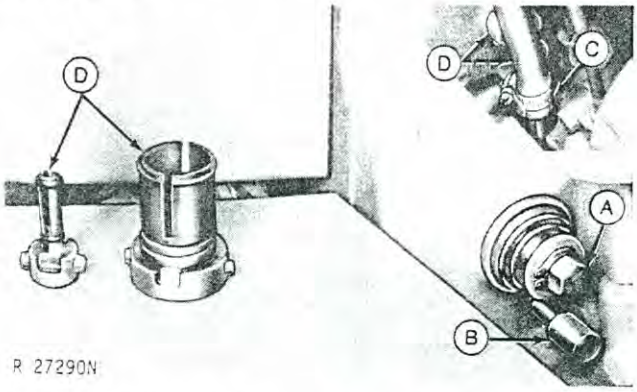
A—Pump Gear
B—Cap Screw

Fig. 9-Adjusting Timing

6. If timing is not correct, remove timing gear cover. Loosen three cap screws (B, Fig. 9), and turn pump drive shaft nut to align timing marks. Tighten cap screws. Replace timing gear cover and plugs, and reconnect hose.

07 | 3277 5244 | 1240 0413 155 424

Checking Engine Timing - 6404T, A; 6466T, A



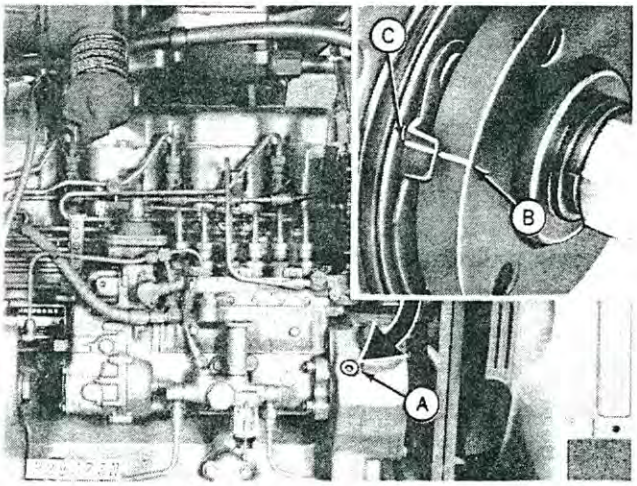
A—Engine Rotation Tool
B—Timing Pin
C—Crankcase Vent Hose
D—Plastic Plugs

Fig. 10-Installing Engine Rotation Tool and Timing Pin

1. Disconnect crankcase vent hose (C, Fig. 10). Remove plastic plugs (D), and install engine rotation tool and timing pin as shown.

2. Hold timing pin lightly against flywheel, and slowly turn engine IN DIRECTION OF NORMAL ROTATION (clockwise, as viewed from front of engine) until pin engages hole in flywheel.

IMPORTANT: Normal backlash of gears is enough to throw pump timing off by several degrees, resulting in poor engine performance. To avoid backlash, always approach timing mark by turning engine in direction of normal rotation.



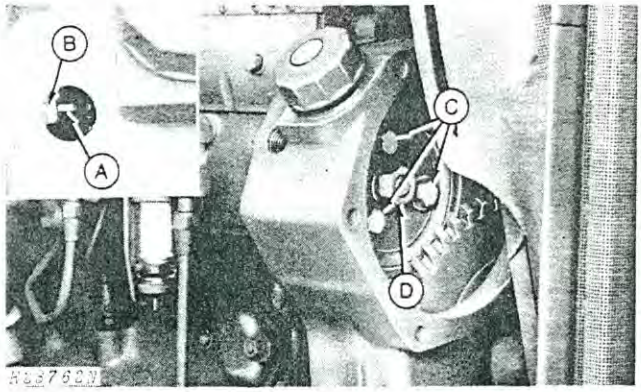
A—Timing Hole Plug
B—Drive Hub Mark
C—Pointer Mark

Fig. 11-Injection Pump Timing Marks

3. Remove timing hole plug (A, Fig. 11). See if timing marks are aligned.

4. If drive hub timing mark is not visible, number one piston is at top of exhaust stroke instead of compression stroke. Turn flywheel another 360° in direction of normal rotation until timing pin engages hole in flywheel. See if timing marks are aligned.

5. If timing is correct, replace plugs and reconnect hose.



A—Drive Hub Mark
B—Pointer Mark
C—Cap Screws
D—Pump Drive Shaft Nut

Fig. 12-Adjusting Timing

6. If timing is not correct, remove timing gear cover. Loosen three cap screws (C, Fig. 12), and turn pump drive shaft nut (D) to align timing marks. Tighten cap screws. Replace timing gear cover and plugs, and reconnect hose.

Starting Engine - "D" Engines and "T" and "A" Engines With RP-75 Rack Puller

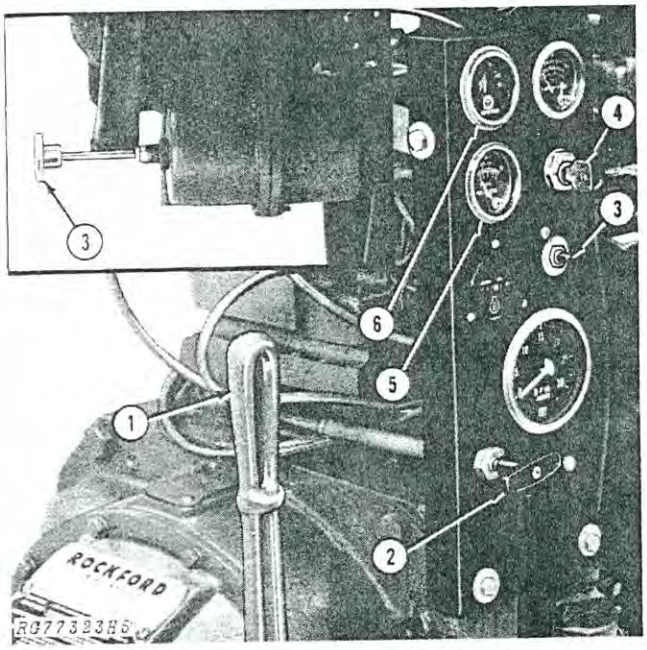


Fig. 13-Starting "D" Engines and "T" and "A" Engines With RP-75 Rack Puller

1. Disengage clutch.

2. Pull hand throttle 1/3 of the way out. Turn handle either direction to lock in place.

3. Push and hold reset button while starting engine. On "T" and "A" engines, also push and hold rack puller knob.

4. Turn key switch clockwise to start engine. Release key switch as soon as engine starts.

IMPORTANT: Do not operate starter more than 30 seconds at a time. Wait at least two minutes before trying again. If key is released before engine starts, wait until starter and engine stop turning before trying again.

5. After engine starts, oil pressure gauge should indicate pressure of 20 psi (1.4 bar) (1.4 kg/cm²) or more.

6. Ammeter should indicate that alternator is charging battery.

7. Release the reset button.

8. If either gauge does not indicate normal operation after 10 seconds of operation, stop engine and determine cause.

Starting Engine - "T" and "A" Engines With RP-20 Rack Puller

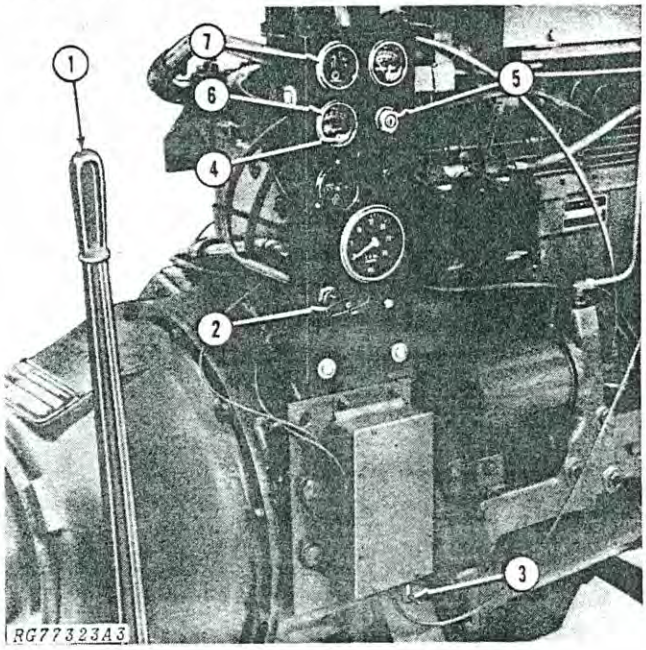


Fig. 14-Starting "T" and "A" Engines with RP-20 Rack Puller

1. Disengage clutch

2. Pull hand throttle 1/3 of the way out. Turn handle either direction to lock in place.

3. Pull reset handle down until it stops.

4. Push and hold button on oil pressure gauge while starting.

5. Turn key switch clockwise to start engine. Release key switch as soon as engine starts.

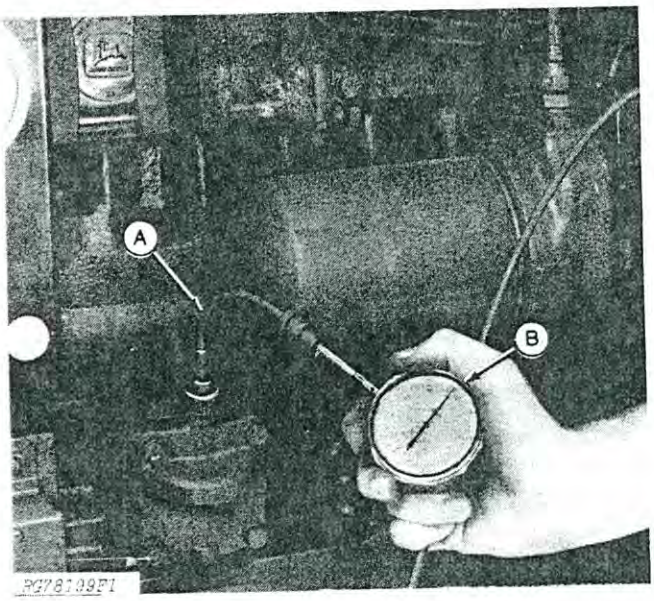
IMPORTANT: Do not operate starter for more than 30 seconds at a time. Wait at least two minutes before trying again. If key is released before engine starts, wait until starter and engine stop turning before trying again.

6. After engine starts, oil pressure gauge should indicate pressure of 20 psi (1.4 bar) (1.4 kg/cm²) or more.

7. Ammeter should indicate that alternator is charging battery.

8. If either gauge does not indicate normal operation after 10 seconds of operation, stop engine and determine cause.

Checking Engine Speeds



A—JDE-28 Adapter **B—Hand Tachometer**

Fig. 15-Checking Engine Speeds

1. With engine stopped, disconnect tachometer drive cable and install JDE-28 adapter in its place.

2. Start engine. Push hand throttle in all the way. Check speed with hand tachometer. Speed should be 800 rpm.

3. Pull hand throttle out all the way. Check speed with hand tachometer. See page 10-00-5 for a listing of engine speeds for each application.

4. If idle speeds are incorrect, disconnect throttle linkage and test engine speeds as instructed in Group 10 of Section 230.

5. If idle speeds are correct with throttle linkage disconnected, check and adjust linkage as instructed in Group 15 of Section 230. If not, remove and test injection pump as instructed in Group 10 of Section 30.

ENGINE APPLICATION REQUIREMENTS

A John Deere engine is a versatile machine and may be adapted to numerous job requirements in almost any environmental circumstance. Proper performance will require selecting the right engine for the job to be done, whether it be irrigation, generating, or propulsion.

Use the John Deere Engine Application Manual for help in determining the requirements for engine application. Such things as handling and mounting the engine, transmission of power requirements, and other related items are covered in this manual.

AFTER-SALE INSPECTION

The purchaser of a new John Deere engine is entitled to a free inspection within the warranty period after the equipment has been "run in". The terms of this after-sale inspection are outlined on the back of the John Deere Delivery Receipt.

The purpose of this inspection is to make sure that the customer is receiving satisfactory performance from his engine. At the same time, the inspection should reveal whether or not the engine is being operated, lubricated, and serviced properly.

If the recommended after-sale service inspection is followed, the dealer can eliminate a needless volume of service work by preventing minor irregularities from developing into serious problems later on. This will promote strong dealer-customer relations and present the dealer an opportunity to answer questions that may have arisen during the first few days of operation. During the inspection service, the dealer has the further opportunity of promoting the possible sale of other new equipment.

Cooling System

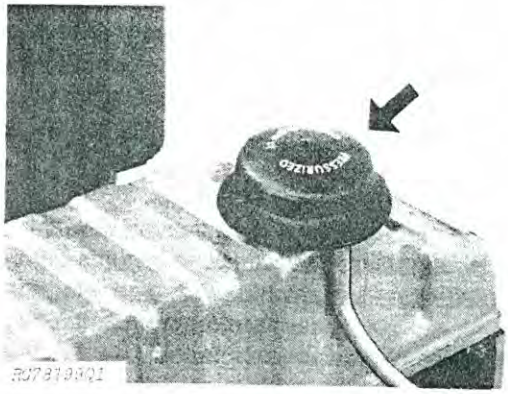


Fig. 16-Radiator Cap

1. Remove radiator cap and check coolant level. Level should be at least 1-1/2-inches (38 mm) above baffle in radiator top tank. If coolant is low, fill to proper level and try to determine why coolant was lost.

2. Remove any trash that has accumulated on the radiator.

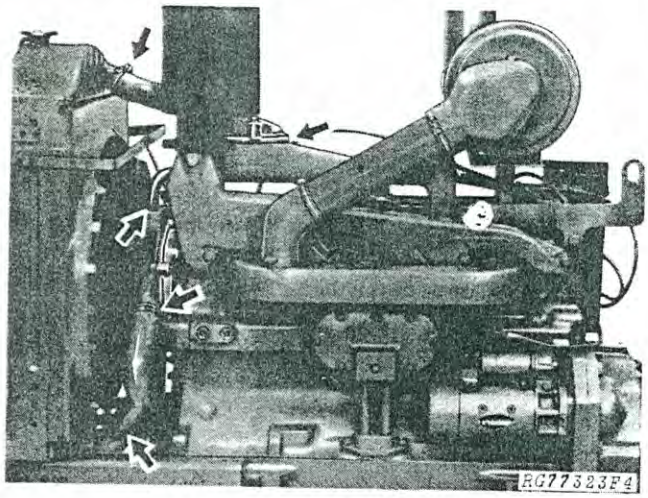


Fig. 17-Cooling System (6466D Shown)

3. Check all hoses and connections for leaks. Correct as necessary.

Fuel System

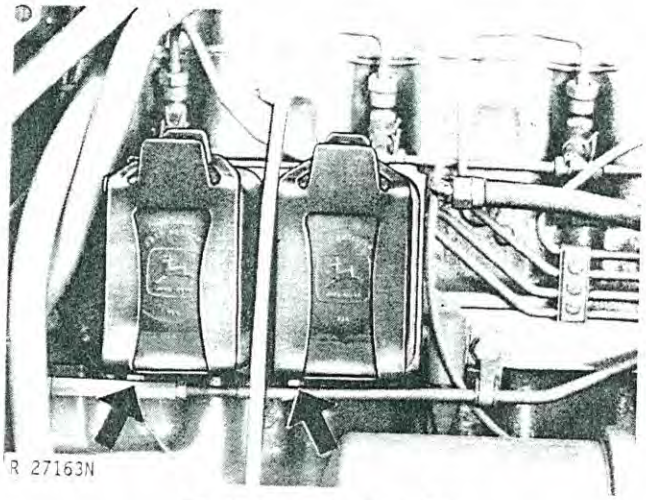
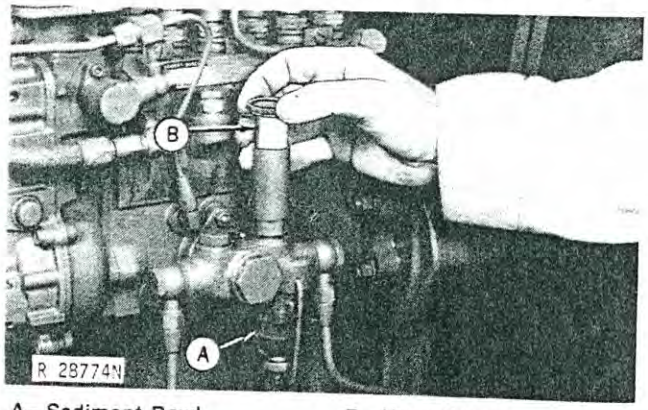


Fig. 18-Fuel Filter Drain Plugs

1. Check fuel filters for water or sediment. If any is present, remove drain plugs and drain it out. Caution customer about importance of proper fuel storage.



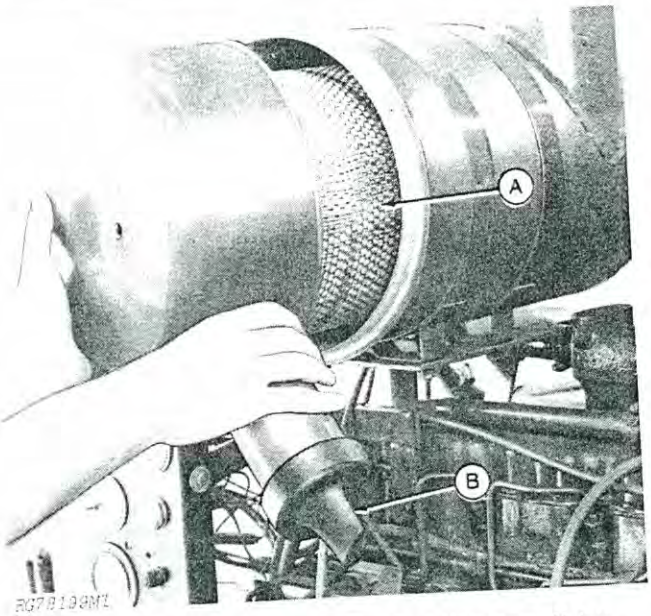
A—Sediment Bowl B—Hand Primer

Fig. 19-Fuel Transfer Pump

2. Check sediment bowl (A, Fig. 19) on fuel transfer pump. If water or sediment is present, clean it out. Close valve on fuel tank before removing sediment bowl.

3. If either fuel filters or sediment bowl is drained, bleed air from system. Loosen hand primer (B) and pump until most of air bubble disappears.

4. Check entire fuel system for leaks. Correct as necessary.

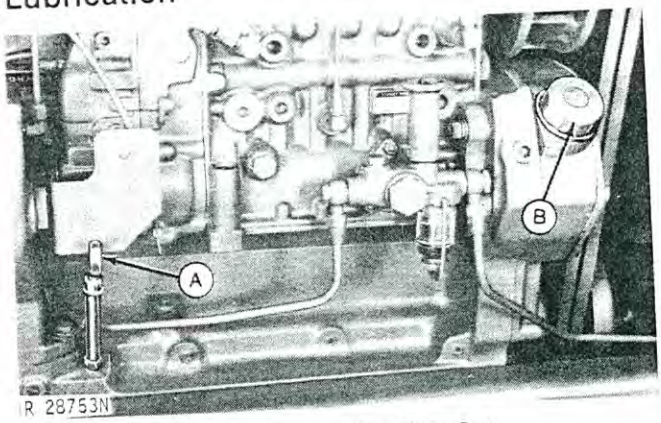


A—Air Cleaner Element B—Dust Unloading Valve

Fig. 20-Air Cleaner

5. Inspect air cleaner element (A, Fig. 20) and dust unloading valve (B). Clean element if needed.

Lubrication



A—Dipstick B—Filler Cap

Fig. 21-Crankcase Dipstick and Filler Cap

1. With the engine stopped for 10 minutes or more, remove the dipstick. Observe the engine oil level on the dipstick, with the dipstick seated evenly. If the oil level is down to the lower marks on the dipstick, add sufficient John Deere Torq-Gard Supreme Engine Oil or its equivalent of the proper viscosity to bring the level to the upper marks.

Electrical System

1. Check tension of fan belts as directed on pg. 10-05-2.

2. Start engine and check operation of all controls and gauges. If you find any problems, refer to Group 05 of Section 240.

Power Take-Off

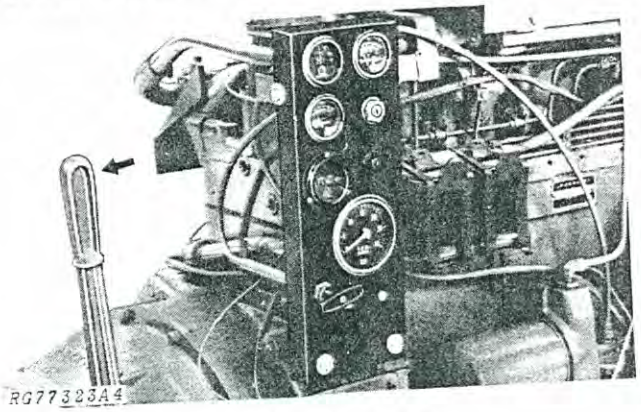


Fig. 22-PTO Clutch Lever

1. Check PTO clutch lever for proper engaging pressure. Adjust if necessary. A force of 60 to 70 lbs (267 to 311 N) should be required to engage clutch. If adjustment is necessary, refer to Group 05 of Section 50.

General Engine

1. Check engine speeds as instructed on page 10-05-7.

2. Check engine valve clearance as instructed in Group 10 of Section 20. Adjust if necessary to the specifications given there.

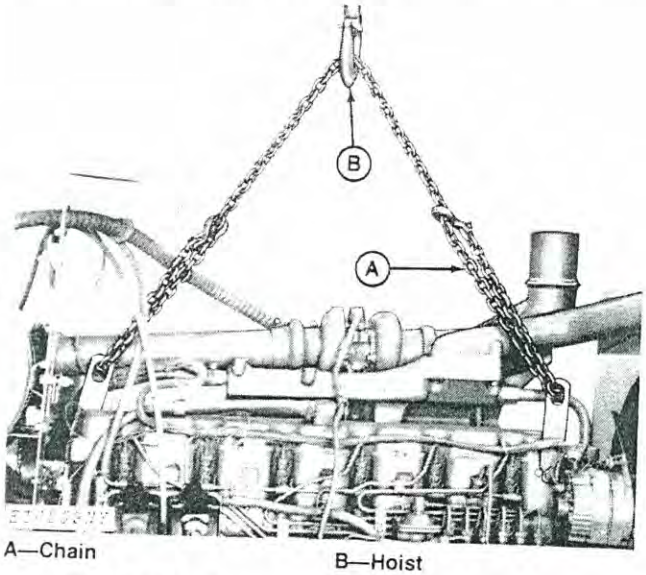
3. Tighten the following cap screws to the torques specified:

	ft-lbs	Nm	kgm
Flywheel housing-to-cylinder block	300	407	40.7
PTO-to-Flywheel housing	35	47	4.7
Engine mount-to-cylinder block	170	231	23.1
Radiator support-to-cylinder block	300	407	40.7

Tighten other accessible nuts and cap screws according to the chart on page 10-00-04.

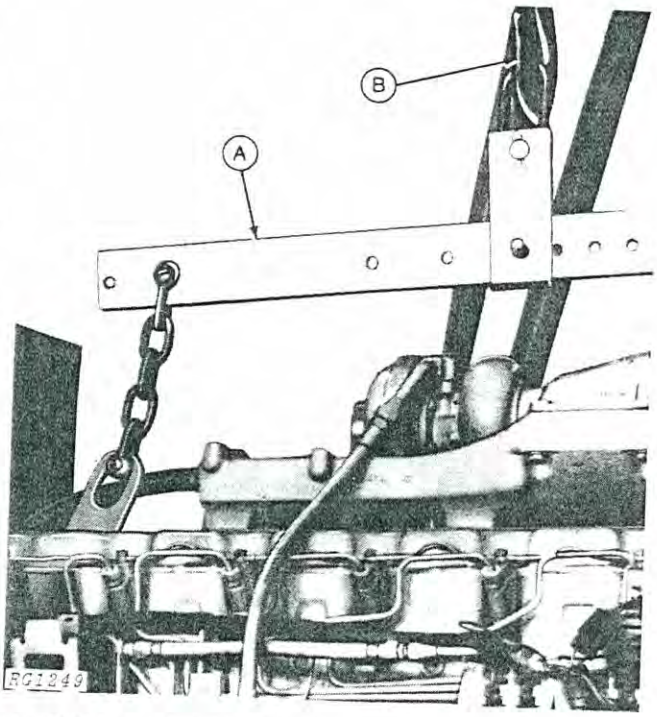
LIFTING ENGINE

IMPORTANT: The factory-installed lifting straps or eyes are intended for lifting the engine and PTO (if so equipped) ONLY! Do not attempt to lift any other engine-driven equipment or attachments with the lifting straps or eyes.



A—Chain B—Hoist

Fig. 23-Lifting Engine With Chain and Hoist (Typical)



A—JDG-1 or -23 Lifting Sling B—Hoist

Fig. 24-Lifting Engine With Lifting Sling (Typical)

Lift engine at factory-installed lifting straps or eyes, using either a chain and hoist (Fig. 23) or JDG-1 or -23 Lifting Sling and hoist (Fig. 24).

Use care when installing and positioning chain or sling to avoid damaging air cleaner, muffler or other parts. If necessary, remove parts that might be damaged.

Group 10
TUNE-UP

PRELIMINARY ENGINE TESTING

Before tuning up an engine, determine whether a tune-up will restore operating efficiency. When there is doubt, the following preliminary tests will help to determine if the engine can be tuned-up. Choose from the following procedures only those necessary to restore the unit.

1. After engine has been stopped for several hours, carefully loosen crankcase drain plug and watch for any water to seep out. A few drops could be due to condensation, but any more than this would indicate problems which require engine repairs rather than just a tune-up. Refer to Section 220.

2. With engine stopped, inspect engine coolant for an oil film. With engine running, inspect coolant for air bubbles. Either condition would indicate problems which require engine repairs rather than just a tune-up. Refer to Section 220.

3. Perform a dynamometer test as instructed in Group 10 of Section 220, and record horsepower. Repeat dynamometer test after tune-up, so horsepower output before and after tune-up can be compared.

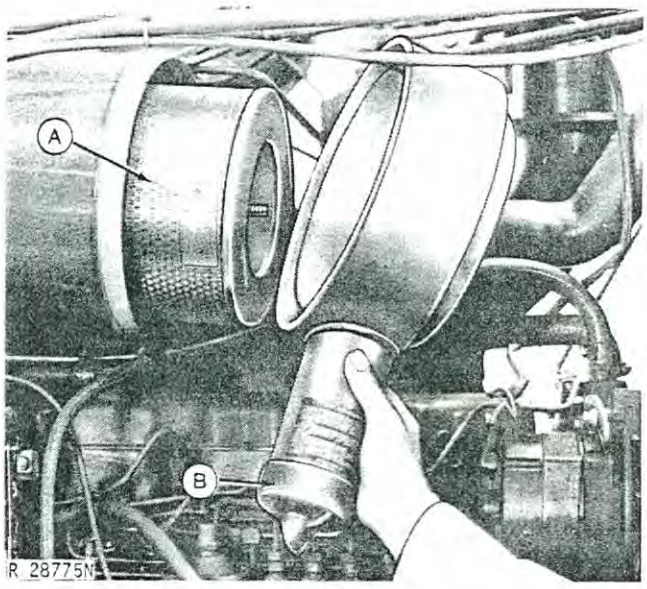
4. Perform compression test as instructed in Group 10 of Section 220.

Air Intake System

1. Inspect air cleaner primary element (A, Fig. 1). If dirty, clean by patting element with your hand or use AR62377 Dry Element Cleaning Gun.

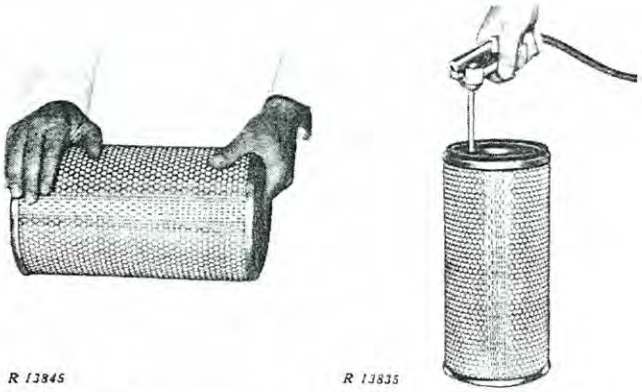
NOTE: Both primary and secondary elements should be replaced at least once a year. During a tune-up is a good time to perform this service.

ENGINE TUNE-UP



A—Air Cleaner Element **B—Dust Unloading Valve**

Fig. 1-Air Cleaner



Patting Element *Air-Cleaning Element*

Fig. 2-Cleaning Filter Element

IMPORTANT: Do not blow air from outside of element to inside. Be sure metal screen does not touch paper element, as it would quickly rub holes. Inspect element carefully before reinstalling. Do not clean secondary element.

Air Intake System—Continued

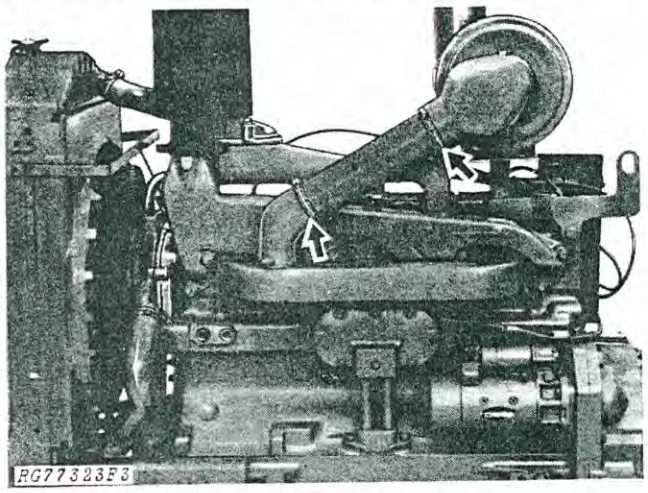


Fig. 3-Air Intake Connections (6466D Shown)

2. Check all connections in air intake system for possible leaks. Tighten any loose clamps. Be sure rubber dust unloading valve is in good condition.

3. Check intake manifold pressure as instructed in Group 05 of Section 230.

Exhaust System

Inspect exhaust system for any leaks or restrictions. Correct as necessary.

Crankcase Ventilation System

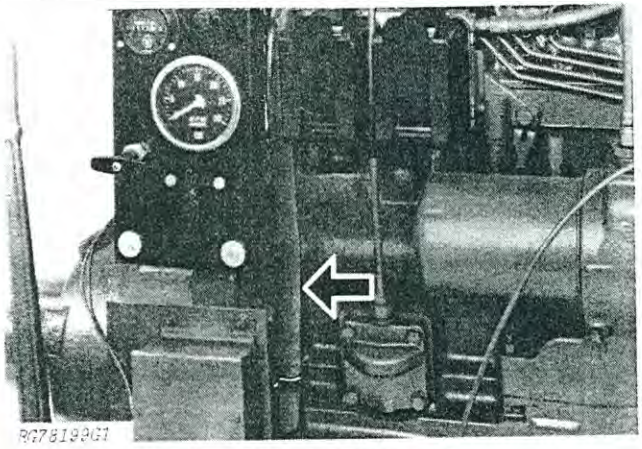


Fig. 4-Crankcase Vent Tube

Inspect crankcase ventilation system for restrictions. Lack of ventilation causes sludge to form in engine crankcase. This can lead to clogging of oil passages, filters, and screens, resulting in serious engine damage.

Clean crankcase vent tube in solvent if it is restricted.

Cooling System

1. Remove any trash that has accumulated on the radiator.

2. Drain and flush cooling system.

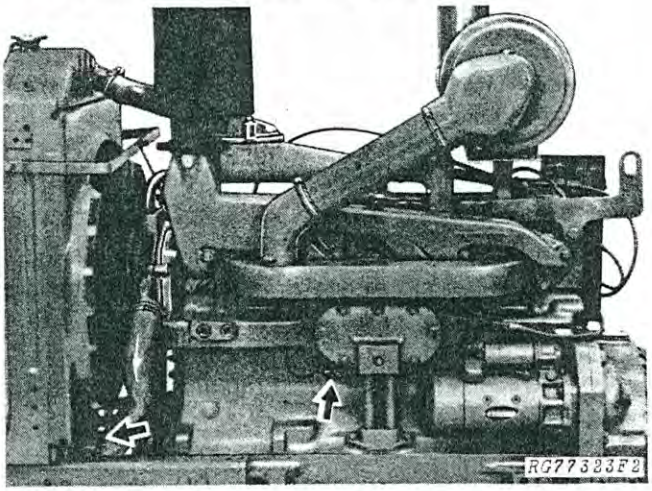


Fig. 5-Cooling System Drain Fitting (6466D Shown)

(a) Drain cooling system by opening drain cocks on radiator and engine block.

(b) Close drain cocks and fill cooling system with clean water.

(c) Run engine until it reaches operating temperature to stir up possible rust or sediment.

(d) Stop engine and drain coolant before rust or sediment settles.

(e) Close drain cocks and fill cooling system with a solution of John Deere Cooling System Cleaner and water. Follow the instructions with the cleaner.

(f) After cleaning, flush the system with clean water.

(g) Fill cooling system with clean, soft water and antifreeze. Use a permanent-type, ethylene glycol antifreeze which contains a rust inhibitor but does not contain a stop-leak additive.

(h) Recheck coolant level after starting engine. Coolant should be 1-1/2 inches (38 mm) above baffle in radiator top tank.

Group 10
TUNE-UP

PRELIMINARY ENGINE TESTING

Before tuning up an engine, determine whether a tune-up will restore operating efficiency. When there is doubt, the following preliminary tests will help to determine if the engine can be tuned-up. Choose from the following procedures only those necessary to restore the unit.

1. After engine has been stopped for several hours, carefully loosen crankcase drain plug and watch for any water to seep out. A few drops could be due to condensation, but any more than this would indicate problems which require engine repairs rather than just a tune-up. Refer to Section 220.

2. With engine stopped, inspect engine coolant for an oil film. With engine running, inspect coolant for air bubbles. Either condition would indicate problems which require engine repairs rather than just a tune-up. Refer to Section 220.

3. Perform a dynamometer test as instructed in Group 10 of Section 220, and record horsepower. Repeat dynamometer test after tune-up, so horsepower output before and after tune-up can be compared.

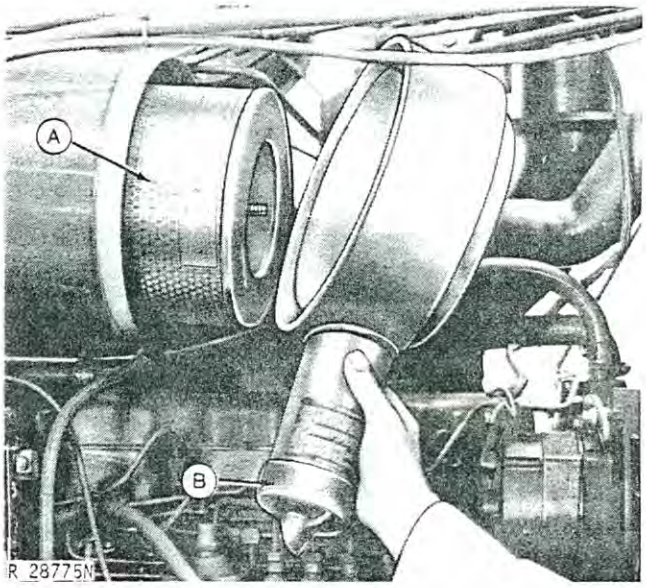
4. Perform compression test as instructed in Group 10 of Section 220.

Air Intake System

1. Inspect air cleaner primary element (A, Fig. 1). If dirty, clean by patting element with your hand or use AR62377 Dry Element Cleaning Gun.

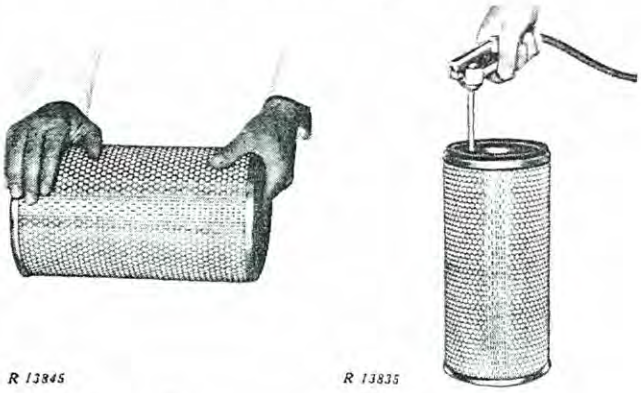
NOTE: Both primary and secondary elements should be replaced at least once a year. During a tune-up is a good time to perform this service.

ENGINE TUNE-UP



A—Air Cleaner Element B—Dust Unloading Valve

Fig. 1-Air Cleaner



Patting Element *Air-Cleaning Element*

Fig. 2-Cleaning Filter Element

IMPORTANT: Do not blow air from outside of element to inside. Be sure metal screen does not touch paper element, as it would quickly rub holes. Inspect element carefully before reinstalling. Do not clean secondary element.

Air Intake System—Continued

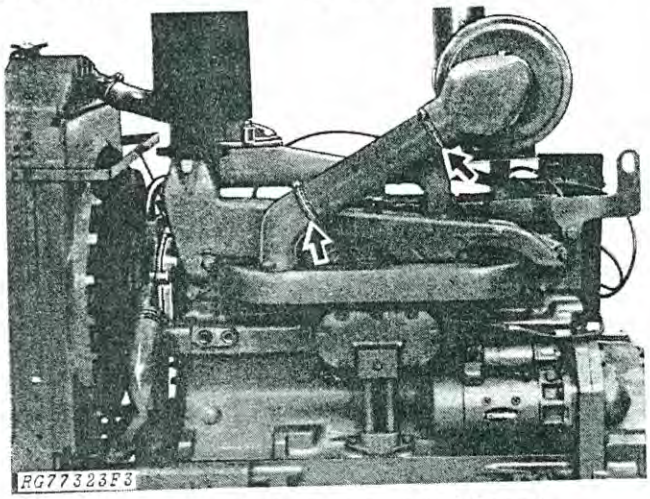


Fig. 3-Air Intake Connections (6466D Shown)

2. Check all connections in air intake system for possible leaks. Tighten any loose clamps. Be sure rubber dust unloading valve is in good condition.

3. Check intake manifold pressure as instructed in Group 05 of Section 230.

Exhaust System

Inspect exhaust system for any leaks or restrictions. Correct as necessary.

Crankcase Ventilation System

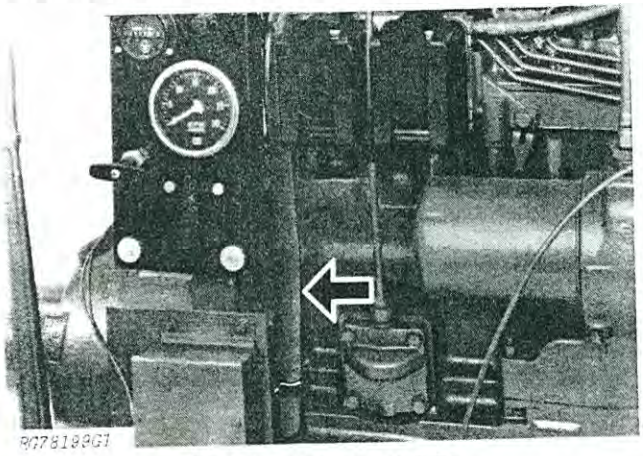


Fig. 4-Crankcase Vent Tube

Inspect crankcase ventilation system for restrictions. Lack of ventilation causes sludge to form in engine crankcase. This can lead to clogging of oil passages, filters, and screens, resulting in serious engine damage.

Clean crankcase vent tube in solvent if it is restricted.

Cooling System

1. Remove any trash that has accumulated on the radiator.

2. Drain and flush cooling system.

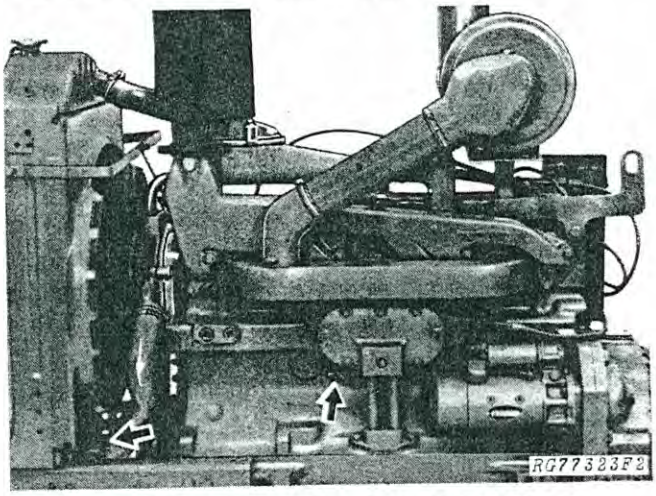


Fig. 5-Cooling System Drain Fitting (6466D Shown)

(a) Drain cooling system by opening drain cocks on radiator and engine block.

(b) Close drain cocks and fill cooling system with clean water.

(c) Run engine until it reaches operating temperature to stir up possible rust or sediment.

(d) Stop engine and drain coolant before rust or sediment settles.

(e) Close drain cocks and fill cooling system with a solution of John Deere Cooling System Cleaner and water. Follow the instructions with the cleaner.

(f) After cleaning, flush the system with clean water.

(g) Fill cooling system with clean, soft water and antifreeze. Use a permanent-type, ethylene glycol antifreeze which contains a rust inhibitor but does not contain a stop-leak additive.

(h) Recheck coolant level after starting engine. Coolant should be 1-1/2 inches (38 mm) above baffle in radiator top tank.

3. Remove and check thermostats as instructed in Group 25 of Section 20. Thermostats should open at 160 to 180°F (71 to 82°C).

4. Check radiator and pressure cap for leaks.

(a) Visually check cooling system for leaks or damage.

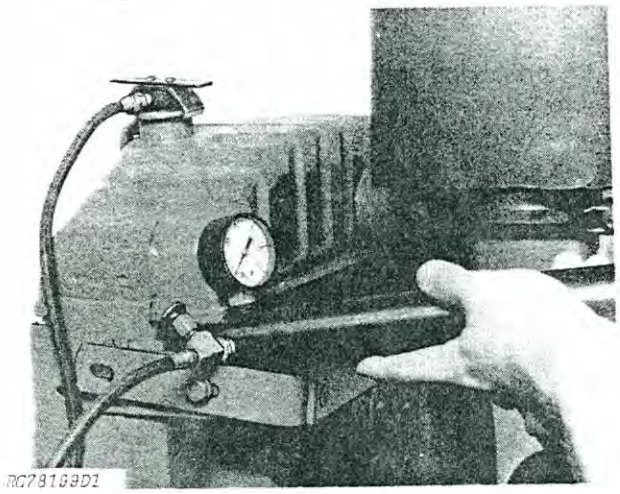


Fig. 6-Testing Cooling System

(b) Remove radiator cap and attach D-05104ST Pressure Pump to filler neck.

(c) Pump pressure up to 18 psi (1.25 bar) (1.25 kg/cm²). System should hold the pressure. If it does not, try to find and correct the problem.

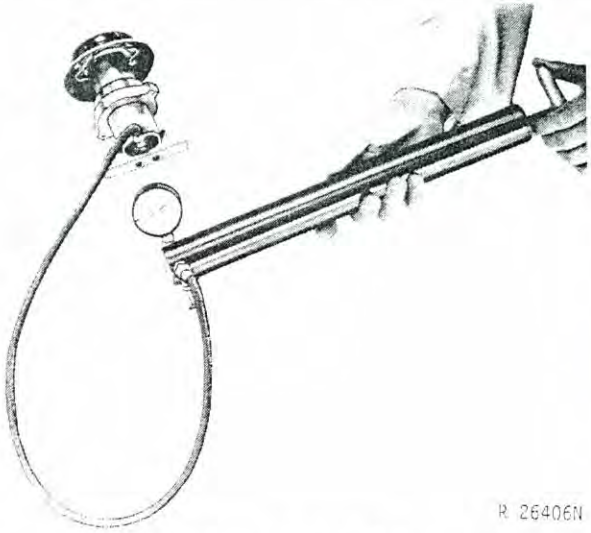


Fig. 7-Testing Radiator Cap

(d) Attach radiator cap to Pressure Pump and pump up to limit of radiator cap. Cap should maintain 6.25 to 7.50 psi (0.4 to 0.5 bar) (0.4 to 0.5 kg/cm²) pressure.

Diesel Fuel System

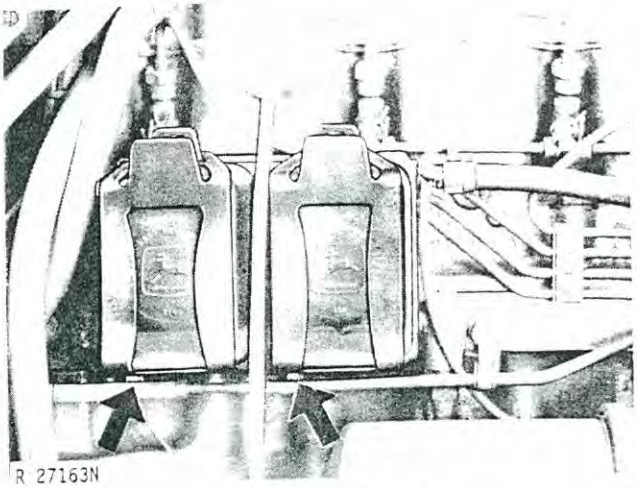
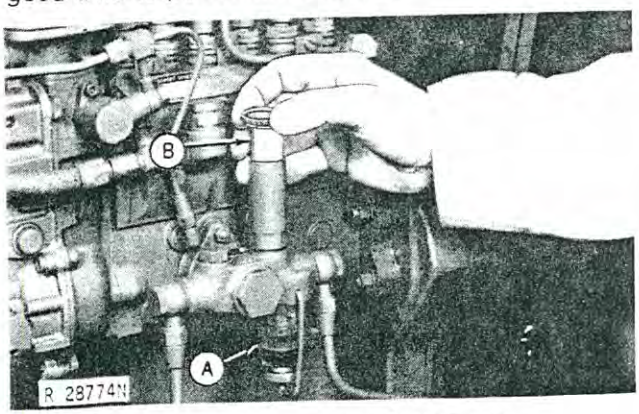


Fig. 8-Fuel Filter Drain Plugs

1. Check fuel filters for water or sediment. If any is present, remove drain plugs and drain it out. Caution customer about importance of proper fuel storage.

NOTE: Fuel filters must be replaced periodically to prevent excessive restriction. During a tune-up is a good time to perform this service.



A—Sediment Bowl **B—Hand Primer**

Fig. 9-Fuel Transfer Pump

2. Check sediment bowl (A, Fig. 9) on fuel transfer pump. If water or sediment is present, clean it out. Close valve on bottom of fuel tank before removing sediment bowl.

3. If either fuel filters or sediment bowl is drained, bleed air from system. Loosen hand primer (B) and pump until most of air bubble disappears.

Diesel Fuel System—Continued

4. Loosen or remove fuel tank drain plug, and drain any water or sediment from tank.

5. Check entire fuel system for leaks. Correct as necessary.

6. Check injection pump timing as instructed in Group 05 of this section.

7. Check engine idle speeds as instructed in Group 05 of this section.

Electrical System

1. Clean batteries, and cables with a damp cloth. If corrosion is present, remove it and wash the terminals with a solution of ammonia or baking soda in water. Then flush area with clean water.

2. Coat battery terminals and connectors with petroleum jelly mixed with baking soda to retard corrosion.

3. Test batteries as instructed in Group 5 of Section 240. If batteries are not near full charge, try to find out why.

4. Check level of electrolyte in each cell of each battery. Level should be to bottom of filler neck. If water is needed, use clean, mineral-free water.

If water must be added to batteries more often than every 200 hours, alternator may be overcharging. Refer to Group 10 of Section 240.

5. If batteries appear to be either undercharged or overcharged, check alternator and charging circuit. Follow diagnosis and testing procedures outlined in Group 10 of Section 240.

6. Check tension of fan belts as directed on page 10-05-2.

7. Follow engine starting instructions beginning on page 10-05-6. Check operation of starter and gauges.

Group 15
LUBRICATION

Effective use of lubricating oils and greases is perhaps the most important step toward low upkeep cost, long engine life, and satisfactory service. Use only lubricants specified in this section. Apply them at intervals and according to the instructions in the lubrication and periodic service section.

ENGINE LUBRICATING OILS

X3377N

We recommend John Deere Torq-Gard Supreme engine oil for use in the engine crankcase. Torq-Gard oil is compounded specifically for use in John Deere engines and provide superior lubrication under all conditions. NEVER PUT ADDITIVES IN THE CRANKCASE. Torq-Gard oil was formulated to provide all the protection your engine needs. Additives could reduce this protection rather than help it.

If Torq-Gard Supreme is NOT USED, use an engine oil that conforms to one of the following specifications.

Single Viscosity Oils

API Service CD/SD
MIL-L-2104C

Multi-Viscosity Oils

API Service CC/SE, CC/SD, or SD
MIL-L-46152

Depending on the expected atmospheric temperature at start for the fill period, use oil of viscosity as shown in the following chart.

Some increase in oil consumption may be expected when SAE 5W-20 or SAE 5W oils are used. Check oil level more frequently.

Air Temperature	John Deere Torq-Gard Supreme Oil	Other Oils	
		Single Viscosity Oil	Multi-Viscosity Oil
Above 32°F (0°C)	SAE 30	SAE 30	Not recommended
−10 to 32°F** (−23 to 0°C)	SAE 10W-20	SAE 10W	10W-30
Below −10°F (−23°C)	SAE 5W-20	SAE 5W	SAE 5W-20

***If air temperature is below 10°F (−12°C), use an engine heater. SAE 5W-20 oils may also be used to insure optimum lubrication of engine and turbocharger.*

GREASES

Use John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease for all grease fittings. Application of grease as instructed in the lubrication section will provide proper lubrication and will prevent bearing contamination.

STORING LUBRICANTS

Your engine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.

GENERAL INFORMATION

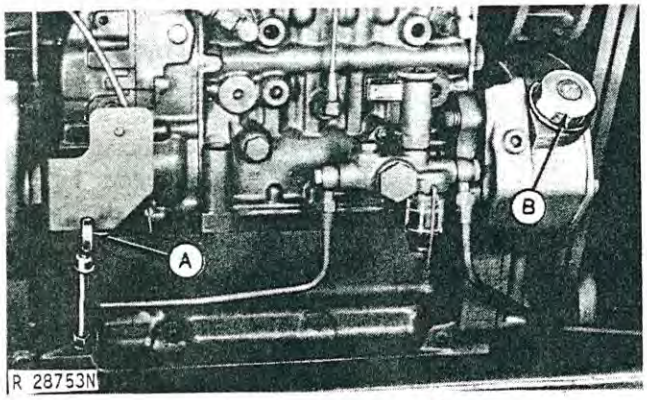
Carefully written and illustrated instructions are included in the operator's manual. Remind your customer to follow the recommendations in these instructions.

For your convenience when servicing the engine, the following chart shows capacities and types of lubricants for the various components.

Component	Type of Lubricant	Interval of Service
Engine Crankcase	See "Engine Lubricating Oils" on page 1	10 Hours—Check level 100 Hours—Change oil 200 Hours—Replace filter 200 Hours—Clean breather filter
PTO Grease Fittings	John Deere Multipurpose Lubricant	See page 10-3
Clutch Linkage	Engine Oil	See page 10-3

ENGINE CRANKCASE

Checking Oil Level



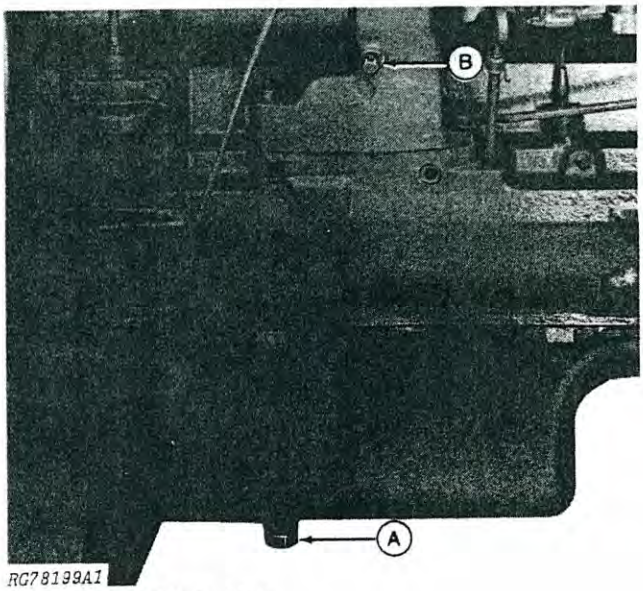
A—Dipstick **B—Filler Cap**

Fig. 1-Crankcase Dipstick and Filler Cap

With the engine stopped for 10 minutes or more, remove the dipstick. Observe the engine oil level on the dipstick, with the dipstick seated evenly. If the oil level is down to the lower marks on the dipstick, add sufficient John Deere Torq-Gard Supreme Engine Oil or its equivalent of the proper viscosity to bring the level to the upper marks.

SERVICE INTERVAL: At predelivery and after every 10 hours.

Changing Oil and Filter



A—Crankcase Drain Plug
B—Filter Drain Plug

Fig. 2-Crankcase Drain Plug

With the engine warm, remove the crankcase drain plug (A, Fig. 2) and drain the oil from the crankcase. Also remove the oil filter drain plug (B) and drain the filter.

Install the drain plugs and add new John Deere Torq-Gard Engine Oil or its equivalent of the proper viscosity (page 1). Run the engine at slow idle speed. Check for leaks around the crankcase drain plug. Retighten if necessary. The oil level on the dipstick 10 minutes after stopping should be at the upper marks.

Keep a record of all oil and filter changes on the stickers that come with the filters.

SERVICE INTERVAL: Every 100 hours.

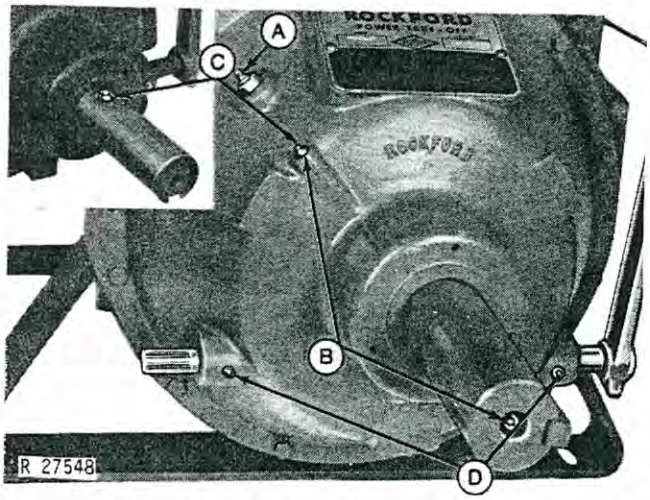
While draining the crankcase oil, change the crankcase oil filter. Remove the filter element by turning it counterclockwise. Clean the filter mounting pad. Install new sealing ring. Apply a thin film of oil to the sealing ring and screw the new element in place by hand until it is tight.

IMPORTANT: The element does not have a by-pass valve. Replace only with a genuine John Deere filter element.

SERVICE INTERVAL: Every 200 hours.

POWER TAKE-OFF

Grease Fittings



A—Release Bearing Grease Fitting
B—Fittings for Side-Loaded Drive
C—Fittings for In-Line Drive
D—Lever Shaft Fittings

Fig. 3-PTO Lubrication Points

1. Apply one shot of John Deere Multi-Purpose Lubricant or its equivalent at release bearing fitting (A, Fig. 3).

2. Apply several shots of John Deere Multi-Purpose Lubricant or its equivalent at drive shaft bearing fittings (B or C).

3. Apply one shot of John Deere Multi-Purpose Lubricant or its equivalent at the lever shaft fittings (D).

Clutch Linkage Lubrication

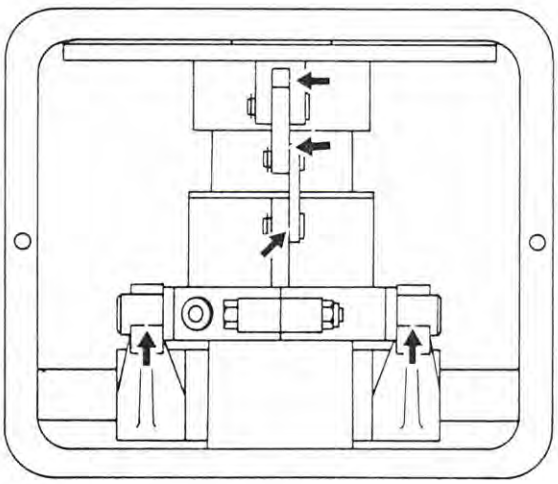


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Fig. 4-PTO Clutch Linkage Lubrication Points

1. Remove inspection plate. (Always stop engine before removing plate).

2. Apply one or two drops of engine oil to points indicated. Rotate engine if necessary to reach all three sets of linkage.

3. Replace inspection plate.