Engine, Fuel & Electrical System (Kohler)

Service Manual

GSS-1465-B

Reprinted

CASE

STANDARD TORQUE DATA FOR INCH NUTS AND BOLTS – NEWTON METERS

Recommended torque for all Standard Unplated Nuts and Bolts, provided:

A. Surface finish is oxide coated, oil quenched or bright.

B. All thread surfaces are clean and lubricated with SAE-30 engine oil or equivalent (See NOTE.)

C. Joints are rigid, that is, no gaskets or compressible materials are used.

D. When reusing nuts or bolts use minimum torque values.

NOTE: Multiply the standard torque by:
.65 when finished jam nuts are used.
.70 when Molykote, white lead or similar mixtures are used as lubricants.
.75 when phosphate coated or oiled bolts or nuts are used.
.85 when cadmium or zinc dichromate bolts or nuts are used.
.90 when hardened surfaces are used under the nut or bolt head (this applies to standard unplated hardware only).

1 NEWTON METER = 0.738 FOOT POUND

Bolt or Stud Diameter	**Type 1** Studs Only		**Type 1 Bolts** 6" length or less		**Type 1 Bolts** longer than 6"		**Type 5** (all lengths)		**Type 8 (all lengths)**			
									Only when used† in cast (gray) iron		All other applications	
Inches	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	7	8	8	9	5	5	12	14	15	18	18	19
5/16	16	18	15	18	9	11	24	27	30	34	34	38
3/8	28	33	28	33	18	19	45	50	56	62	61	68
7/16	47	52	47	52	27	31	72	81	88	100	102	115
1/2	71	79	71	80	42	47	109	122	136	152	156	176
9/16	95	109	102	115	61	69	156	176	197	217	224	251
5/8	133	149	141	159	84	95	217	244	271	305	305	346
3/4	236	265	251	278	149	170	387	434	482	543	543	611
7/8	380	427	244	271	244	271	624	780	773	868	875	984
1	570	638	360	407	360	407	929	977	1160	1303	1316	1479
1-1/8	807	909	516	577	516	577	1153	1289	1642	1845	1866	2096
1-1/4	1140	1282	726	814	726	814	1628	1832	2313	2605	2632	2958
1-3/8	1492	1682	950	1065	950	1065	2130	2388	3033	3412	3446	3881
1-1/2	1995	2225	1255	1418	1255	1418	2822	3175	4030	4532	4579	5149

†When bolt penetration is 1-1/2 times the diameter of the bolt.

BOLT TYPE IDENTIFICATION CHART

IH TYPE	S.A.E. GRADE	DESCRIPTION	BOLT HEAD MARKING*
1	Equivalent 1 or 2	WILL HAVE A "IH" STANDARD MONOGRAM IN THE CENTER OF THE HEAD Low or Medium Carbon Steel Not Heat Treated	
5	5	WILL HAVE A "IH" AND 3 RADIAL LINES Quenched and Tempered Medium Carbon Steel	
8	8	WILL HAVE A "IH" AND 6 RADIAL LINES Quenched and Tempered Special Carbon or Alloy Steel	

*The center marking identifies the bolt manufacturer.

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6. Remove the blower housing, cylinder baffle, head baffle, muffler and baffle.

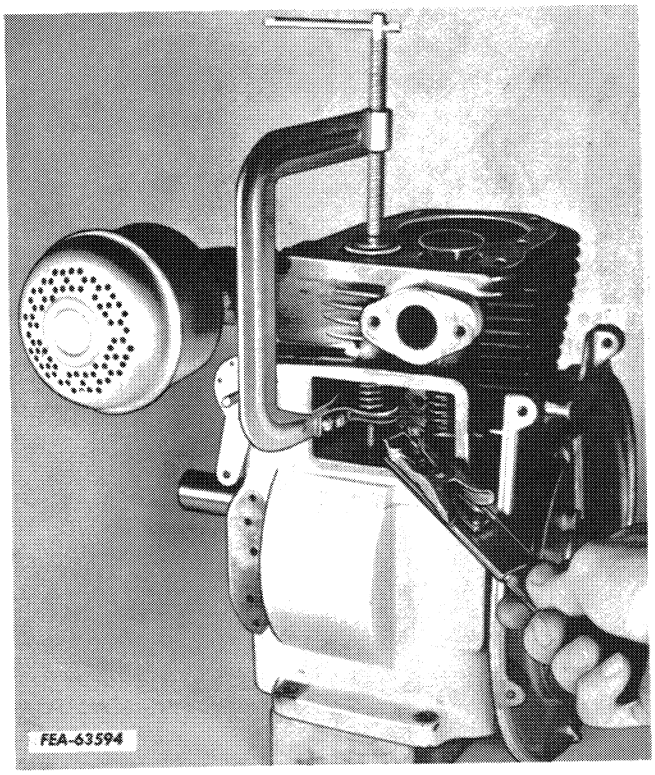
7. Remove the flywheel and alternator if equipped.

NOTE: The flywheel is mounted on a tapered shaft and must be removed with the use of a puller. Do not hammer on puller or nut. If necessary tap lightly on puller to jar flywheel loose.

8. Remove breather plate assembly.

9. Remove the cylinder head.

10. Compress the valve springs and remove the valve keepers, springs, retainers and valves.



11. Remove the oil base.

12. Remove the connecting rod cap. Remove the ridge at top of cylinder wall, if present, and slide the piston and rod out the top of the cylinder block.

13. Remove the front PTO clutch and bearing.

14. Remove the two Allen set screws in the front pulley hub. Remove the pulley with two long screwdrivers. Place the screwdrivers between the pulley and the crankcase, 180 degrees apart. Pry against the pulley near the crankshaft to prevent bending the pulley.

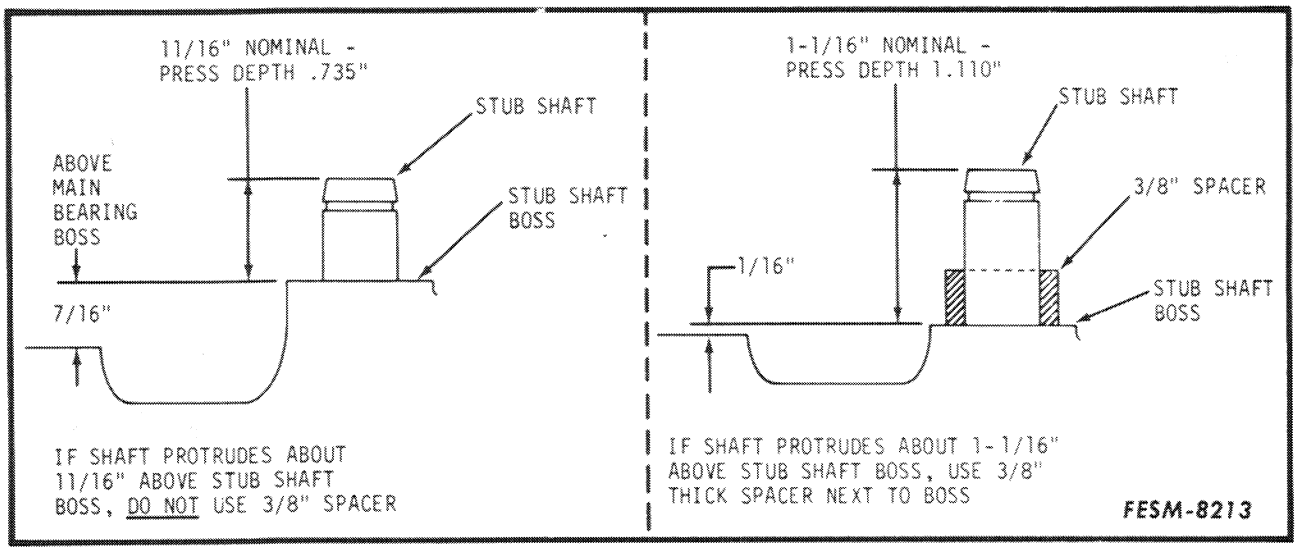
15. Remove crankshaft, oil seals, and if necessary, press out the crankshaft main ball bearings.

NOTE: It may be necessary to press the crankshaft out of the cylinder block. The bearing plate should be removed first if this is done. The bearing plate can be removed with a bridge type puller, using the two tapped holes in the bearing plate.

16. Turn the cylinder block upside down and using a small punch, drive the camshaft pin from the gear end of the camshaft. The pin will slide out easily after it is driven free of front side of cylinder block.

17. Remove the camshaft and valve tappets. Save the washer type shim or shims if any located between the end of the camshaft (opposide camshaft gear) and the cylinder block. These shims will be reused in reassembly.

Installation of Balance Gears and Stub Shafts



1. If new stub shafts are required:

a. Press out the old shafts.

b. If the stub shaft boss protrudes about 7/16" above the main bearing boss, press the new shaft in until it is .735" above the stub shaft boss.

c. If the stub shaft boss protrudes about 1/16" above the main bearing boss, press the new shaft in until it is 1.110" above the stub shaft boss and install a 3/8" spacer.

2. Check the balance gear end clearance as follows:

a. Install the 3/8" spacer, if equipped, on the stub shaft.

b. Install a .010" shim on the stub shaft.

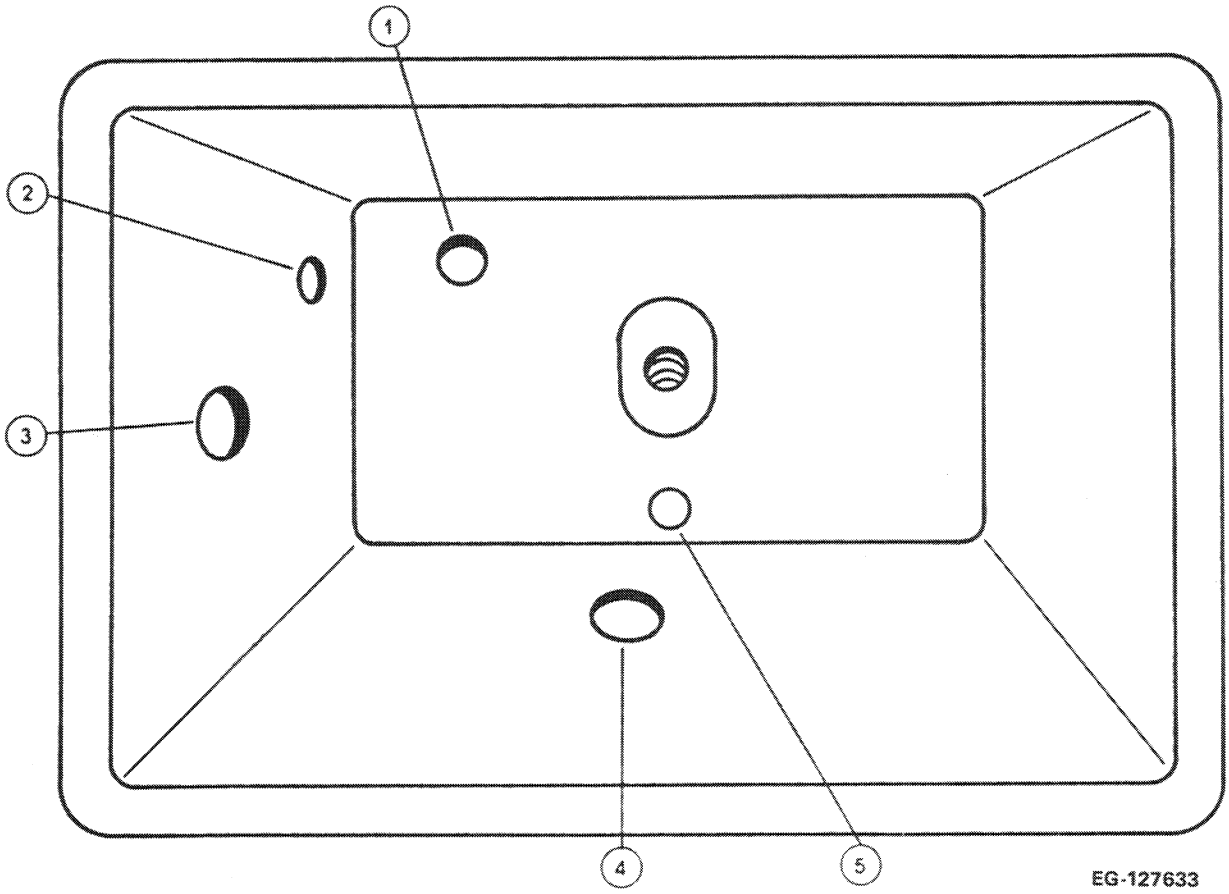
c. Install the balance gear and bearing assembly on the stub shaft.

d. Install one .005" shim, one .010" shim, one .020" shim and the retainer (thickest shim to be next to the retainer).

e. Specified end clearance is .002"-.010". Adjust by adding or removing .005" shims. Use a feeler gauge between the gear and boss to measure the end play. A dial indicator may not give a true reading due to the side to side "wobble" created by the needle bearings of the gear.

f. Remove and tag the balance gear and shim pack for each stub shaft.

VALVE CHAMBER



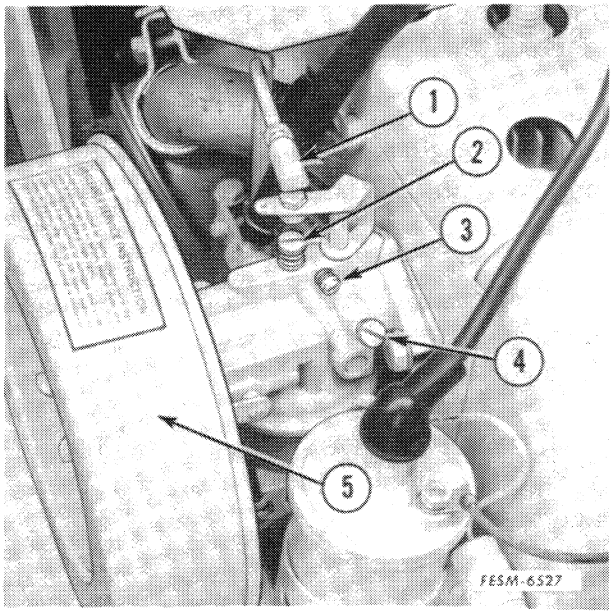
Hole Number	Size	Engine Model
1	1/4" Drilled	K-141, K-161, K-181
2	11/64" Drilled	K-91
3	3/8" Cast	K-241, K-301, K-321, K-341
4	3/8" Drilled	K-361
5	3/16" Drilled	All models Except K-361

Spark Plug

1. Gap the spark plug to specifications.

2. Use new gasket when installing new or serviced spark plug. Torque to 18-22 ft. lbs.

a. If the engine misses and backfires under full load, the high speed mixture is too lean. The high speed mixture screw must be turned counterclockwise 1/4 turn at a time until the condition is corrected.



Carburetor - Models K-241, K-301, K-321 and K-341.

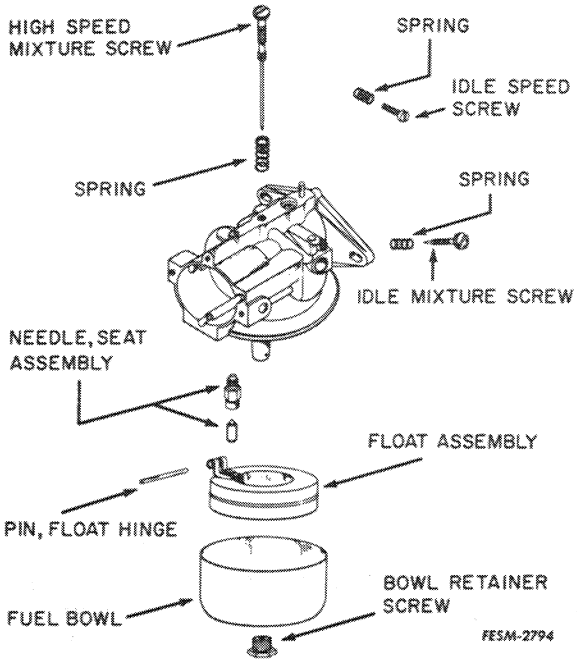
b. If engine shows sooty exhaust and is sluggish under full load, the high speed mixture is too rich. The high speed mixture screw must be turned clockwise 1/4 turn at a time until the condition is corrected. Final check of high speed mixture; operate the engine under full load and make any corrections necessary for smooth operation.

3. The final idle adjustment should be made at an engine speed of not less than 1000 rpm. Adjust until smoothest idle is obtained.

NOTE: Do not use force on high speed mixture screw or idle speed mixture screw -- they will be damaged.

1. Governor control rod
2. High speed mixture screw
3. Idle speed screw
4. Idle mixture screw
5. Air cleaner

Disassembly



1. Remove the carburetor from engine.

2. Remove the bowl nut, gasket, and bowl.

3. Remove the float pin, float, needle and needle seat. Check the float for dents or leaks. Check float pin holes for wear.

4. Remove the bowl ring gasket.

5. Remove the idle mixture screw and high speed mixture screw and spring.

commutator, indicates the generator has been overloaded or allowed to produce excessive output. The resulting overheating has melted solder at the connections of armature windings to commutator bars.

This loss of solder from the commutator bars, more often than not, results in an open circuit and burned commutator bars.

If the commutator is dirty, out of round, or has high mica, the correction is to turn the commutator down in a lathe and undercut the insulation 1/32 inch deep. New brushes should be installed and seated. Blow out abrasive dust after using seating stones.

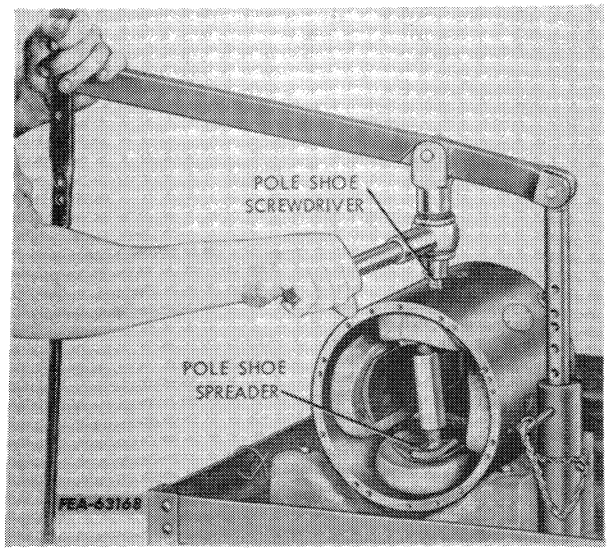
After periods of storage or prolonged low speed operation, the generator commutator tends to glaze over with an oxidized coating that prevents a good electrical contact with the generator brushes. This condition prevents the generator from operating in a normal manner.

The correction is to polish the commutator by placing a piece of number "00" sandpaper in contact with the commutator while the armature is slowly revolving.

IMPORTANT: Never use emery or carborundum cloth as these abrasives are conductors of electricity and would create short circuits between the bars of the commutator. After the polishing operation is completed, blow all dust from the commutator.

Fields

If the generator is not found to be grounded, check the field for an open circuit with the test lamp. The lamp should light when one test point is placed on the "F" terminal and the other point is placed on the brush holder to which the field is connected. If it does not light, the field circuit is open.



If the open circuit is due to a broken lead or poor connection, it may be repaired but if the open circuit is inside one of the field coils, the coil must be replaced.

If the field coil is not open, check for a short circuit in the field by connecting a battery of the specified voltage and an ammeter in series with the field circuit. Proceed with care because a shorted field may draw excessive current which might damage the ammeter. If the field draw is not within specifications, new field coils will be required.

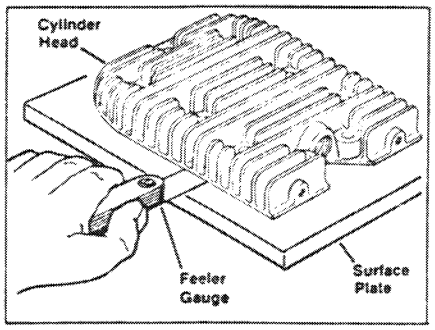
NOTE: If a shorted field is found, check the regulator contact points because a shorted field may have caused excessive current that has damaged the points. Clean points or replace as necessary.

When the testing procedure indicates uncontrolled high output of the generator, even after the external lead of the generator "F" field terminal is disconnected,

CYLINDER HEAD

Check the cylinder head for flatness. Use a feeler gauge and a surface plate or piece of plate glass to make this check. Clearance between the head and plate should not exceed .003" at any point. Replace the cylinder head if out of specification.

Note: The cylinder block should also be checked for flatness in the same manner.



Specification _____

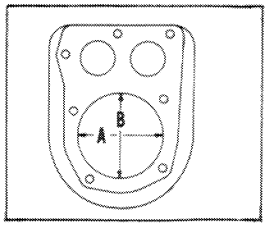
Measurement _____

Cylinder Head #1 _____

Cylinder Head #2 _____

CYLINDER BORE

Check the bore for size, roundness, and taper. Measurements can be made with an inside micrometer, telescoping gauge, or bore gauge. The measurements should be taken at three places in the cylinder: at the top, middle, and bottom. Two measurements should be taken, perpendicular to each other, at each of the three locations.



Engine Model _____

New Diameter _____

Bore Size

	A	B
Top	_____ in	_____ in
Middle	_____ in	_____ in
Bottom	_____ in	_____ in

Out of Round

Specification _____

Measurement _____

Taper

Specification _____

Measurement _____