350, 500B, 600B Series Tractors

Service Manual

9-92281

Reprinted

CASE

LIST OF CONTENTS

LIST OF CONTENTS (Continued)

As a Member of the National Safety Council, we are priviledged to use the Green Cross for Safety to designate not only our interest in Farm Safety, but to point out more clearly the safety precautions in this manual.

SECTION I, USE OF MANUAL

This manual is divided into sections, with each section made up as an individual book. Each section or book is punched and can be combined into a complete manual with the cover and screw posts furnished or can be put in a standard ring book binder for convenient removal of individual sections as required in the service shop.

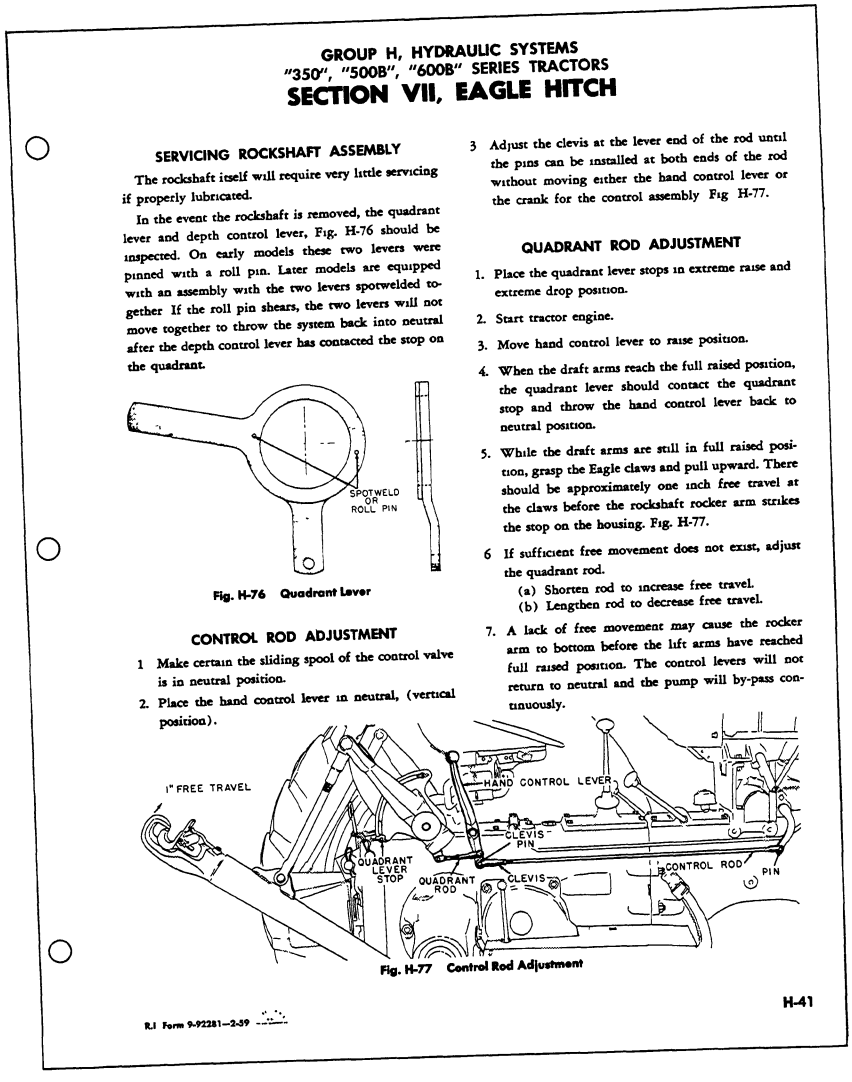
Here is how to use this manual:

1. *Groups.* Each complete unit or sub-assembly is covered in a "Group." Groups are identified by letters (A, B, C, etc.) To locate a *group* in which any particular assembly is contained, refer to the front page of this book.

To enable you to locate each group readily, the index is on the front and back sides of the first yellow page. The group index lists the items covered within each section and page references.

2. *Sections.* In each Group are Sections covering specific parts of the Group. Sections are designated by numerals (I, II, III, etc.)

3. *Pages.* The pages are numbered consecutively within each Group. Page numbers, along with Group identification, appear in the lower *outside* corner of the page while the date on which the page is printed, along with the form number, appears in the lower inside corner.



GROUP H, HYDRAULIC SYSTEMS
"350", "500B", "600B" SERIES TRACTORS
SECTION VII, EAGLE HITCH

SERVICING ROCKSHAFT ASSEMBLY

The rockshaft itself will require very little servicing if properly lubricated.

In the event the rockshaft is removed, the quadrant lever and depth control lever, Fig. H-76 should be inspected. On early models these two levers were pinned with a roll pin. Later models are equipped with an assembly with the two levers spotwelded together If the roll pin shears, the two levers will not move together to throw the system back into neutral after the depth control lever has contacted the stop on the quadrant.

SPOTWELD OR ROLL PIN

Fig. H-76 Quadrant Lever

CONTROL ROD ADJUSTMENT

1 Make certain the sliding spool of the control valve is in neutral position.

2. Place the hand control lever in neutral, (vertical position).

3 Adjust the clevis at the lever end of the rod until the pins can be installed at both ends of the rod without moving either the hand control lever or the crank for the control assembly Fig H-77.

QUADRANT ROD ADJUSTMENT

1. Place the quadrant lever stops in extreme raise and extreme drop position.
2. Start tractor engine.
3. Move hand control lever to raise position.
4. When the draft arms reach the full raised position, the quadrant lever should contact the quadrant stop and throw the hand control lever back to neutral position.
5. While the draft arms are still in full raised position, grasp the Eagle claws and pull upward. There should be approximately one inch free travel at the claws before the rockshaft rocker arm strikes the stop on the housing. Fig. H-77.
6 If sufficient free movement does not exist, adjust the quadrant rod.
   (a) Shorten rod to increase free travel.
   (b) Lengthen rod to decrease free travel.
7. A lack of free movement may cause the rocker arm to bottom before the lift arms have reached full raised position. The control levers will not return to neutral and the pump will by-pass continuously.

1" FREE TRAVEL
HAND CONTROL LEVER
CLEVIS PIN
QUADRANT LEVER STOP
QUADRANT ROD
CLEVIS
CONTROL ROD
PIN

Fig. H-77 Control Rod Adjustment

H-41

R.I Form 9-92281—2-59

SECTION III, LUBRICATION

RECOMMENDED ENGINE AND TRANSMISSION LUBRICANTS

Lubrication Points	*Approx. Capacities*	*Anticipated Air Temperature*			
		Above ±70°F.	*70°F. to ±32°F.*	*32°F. to ±20°F.*	*—20°F. and below*
*Engine Crankcase (with filter)	4 qts. 5 qts.	SAE 30 SAE 30	SAE 20-W SAE 20-W	SAE 10-W SAE 10-W	SAE 5-W SAE 5-W
Air Cleaner Cup	1 pt.	SAE 30	SAE 20-W	SAE 10-W	SAE 5-W
Transmission and Differential Case	11 gal.	Multi-Purpose Type Lubricant (E.P.) SAE 90	 SAE 90	 SAE 90**	 SAE 90**
Case-O-Matic		4 gals. ***SAE No. 10-W Motor Oil (MS-DG)			
Reservoir Generator		A few drops of oil — Light oil			
All Pressure Fittings		Use No. 1 Pressure Gun Grease			
Steering Gear Housing		Use SAE No. 140 Multi-Purpose Lubricant (E.P.)			
Power Steering Reservoir		1 qt. Automatic Transmission Fluid, Type "A"			

*When operating a tractor under continuous service, use SAE 10-W oil, in the engine crankcase even though the temperature range indicates SAE 5-W oil should be used.

**During extremely cold weather transmission oil should be thinned with light weight engine oil. This will prevent gears from channeling in cold stiffened gear lubricant.

***Alternate Oil — Automatic Transmission Fluid, Type A.
±SAE 10W-30 Motor Oil can be used in this temperature range.

To simplify the selection of a suitable engine lubricating oil to meet any spark ignition engine service conditions, the American Petroleum Institute (composed of most major oil companies and refineries) has adopted three service designations for spark ignition engine service use:

1. Service "ML" — Not recommended for tractor engine use.
2. Service "MM" — Moderate to severe engine service.
3. Service "MS" — Severe engine service.

These designations will usually be marked on the oil container.

Service "MM" — Moderate to severe engine use where there are *no harmful low or high* operating temperatures, or *no prolonged idling.*

Service "MS" — For severe engine service such as:

1. *Low temperature engine operating conditions* as a result of frequent stop and start operations, prolonged idling, operating with a light load (especially during cold weather).
2. *High temperature engine operating conditions* as a result of heavy loads during very hot weather. Lubricating oils that do not have protection additives to withstand high temperatures may break down under this type of condition, resulting in excessive engine wear and deposits.

Always use a high quality, stable, engine oil having a service designation of either MM or MS depending upon the engine operating conditions.

Front Wheel Bearings	Wheel Bearing Grease
All Pressure Fittings	Use No. 1 Pressure Gun Grease
Steering Gear Housing	Use SAE No. 140 Extreme Pressure Lubricant

SECTION III, LUBRICATION

EAGLE HITCH AND HYDRAULIC CONTROL SYSTEM CAPACITIES AND OIL RECOMMENDATIONS

Torque-Tube Housing Capacity	Oil Recommendation
12 qts.* (With Tripl-Range or Shuttle Unit)	**SAE No. 10-W Motor Oil (MS-DG)
14 qts.* (Without Tripl-Range or Without Shuttle Unit)	**SAE No. 10-W Motor Oil (MS-DG)

**Alternate Hydraulic Oil — Automatic Transmission Fluid, Type A

LUBRICATION CHART

The lubrication instructions that follow are essentially the same instructions given in the operator's manual but will assist the service man with a convenient lubrication reference when the tractor is in the shop for repair or annual check-up.

It is recommended that a strong effort be made to have each tractor owner bring his tractor into his Case dealers shop for an annual checkup; at which time a complete lubrication service can be performed.

10 HOUR SERVICE

Item to Be Serviced	No. of Fittings	Type of Lubricant	Amount
Steering tie rod ends	2	Pressure Gun Grease	1 Stroke
Spindle bearings	2	Pressure Gun Grease	2 Strokes
Steering arm fittings	2	Pressure Gun Grease	1 Stroke
Power steering drag link (Utility)	2	Pressure Gun Grease	1 Stroke
Power steering valve (Utility)	1	Pressure Gun Grease	1 Stroke
Front axle pivot	1	Pressure Gun Grease	1 Stroke
Front axle pivot, rear	1	Pressure Gun Grease	1 Stroke
Steering column	2	Pressure Gun Grease	2 Strokes
Eagle Hitch draft arms	2	Pressure Gun Grease	1 Stroke

SECTION III, LUBRICATION

60 HOUR SERVICE

Item to Be Serviced	No. of Fittings	Type of Lubricant	Amount
Generator oil cups	2	Light oil	2 Drops
Distributor oil cups	1	Light oil	2 Drops
Eagle Hitch rockshaft bearings	2	Pressure Gun Grease	2 Strokes

100 HOUR SERVICE

Item to Be Serviced	No. of Fittings	Type of Lubricant	Amount
Engine crankcase		See temperature chart	5 Quarts
Clutch bellcrank	1	Pressure Gun Grease	1 Stroke
Clutch pedal	1	Pressure Gun Grease	2 Strokes
Brake pedal	1	Pressure Gun Grease	2 Strokes
Brake pedal cross shaft	2	Pressure Gun Grease	2 Strokes
Eagle Hitch turnbuckle	2	Pressure Gun Grease	1 Stroke
Eagle Hitch R.H. lift link adj. screw	2	Pressure Gun Grease	2 Strokes
Single front wheel hub	1	Pressure Gun Grease	2 Strokes

The governor and carburetor control linkage, Case-O-Matic control linkage and hydraulic control linkage should be cleaned and lightly lubricated at all hinge, pivot or contact points.

200 HOUR SERVICE

Engine oil filter	Replace Cartridge

250 HOUR SERVICE

Steering gear housing — add enough to bring level to top of worm.

1,000 HOUR SERVICE OR ONCE EACH YEAR

Transmission — Drain flush and refill

Note—To do a thorough job, place at least three gallons of a reliable flushing oil in the transmission; jack up one rear wheel; start engine and operate in each gear for a period of 2-3 minutes.

Torque Tube — Drain flush and refill

Note—Do not start engine while flushing oil is in torque tube. Be sure to completely drain Torque Converter and housing in Case-O-Matic tractors. See Case-O-Matic Section "K."

SECTION IV, SPLITTING TRACTOR

This section deals with steps and safety precautions to be followed when splitting the tractor for engine removal. Notice the method in holding, supporting or lifting the various assemblies. Dimensional drawings are shown so similar devices can be made in your shop.

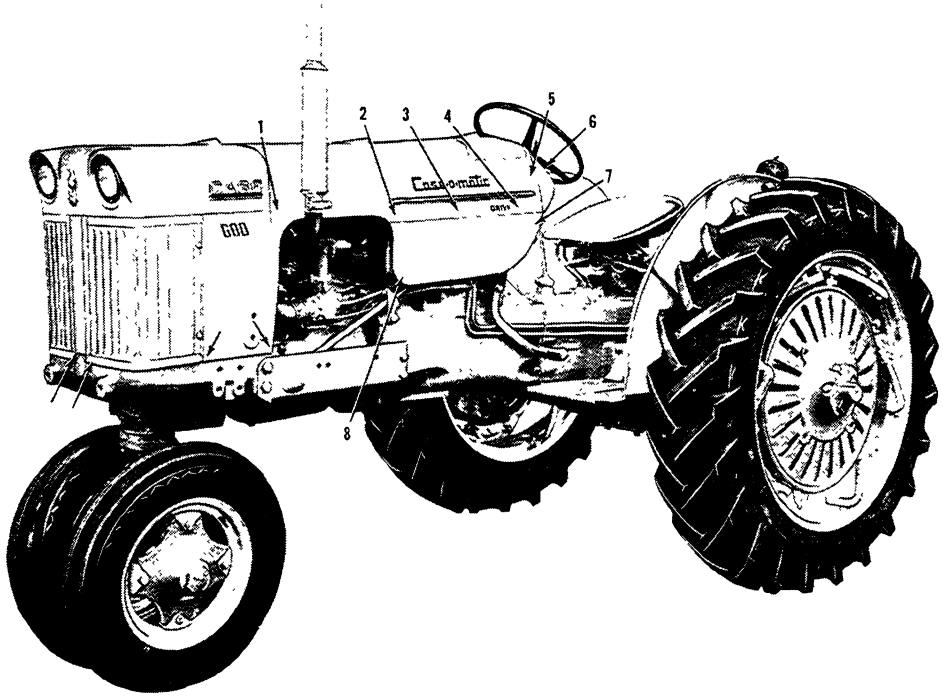


Fig. A-1 Sheet Metal Fasteners

See "300" Series Service Manual, Form 9-92001, for proceedure to follow when removing sheet metal from a "350" series tractor.

REMOVING SHEET METAL COVER "500B" AND "600B"

1. Remove Phillips head bolts in order shown.
2. Remove rear side panel.
3. Repeat same procedure on other side of tractor and remove both rear panel and hood.
4. Remove grill screens.
5. Remove bolts at inside bottom of front side panels.
6. Remove 2 Phillips head bolts at bottom of grill center brace.
7. Disconnect light wires at snap coupler at rear of grill cap.
8. Remove grill cap and panel assembly.

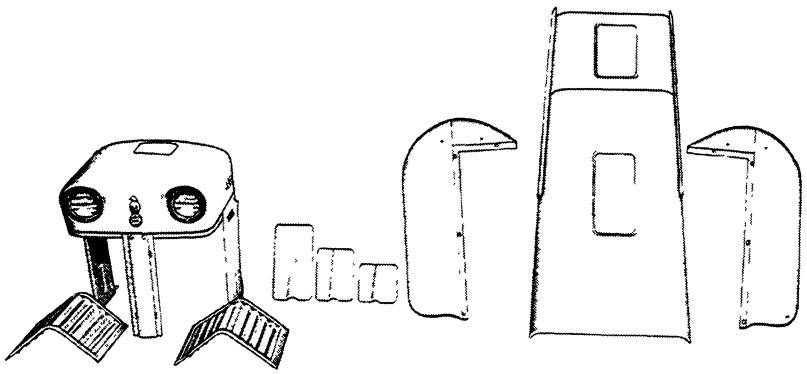


Fig. A-2 Sheet Metal Removed "500B" and "600B"

SECTION IV, SPLITTING TRACTOR

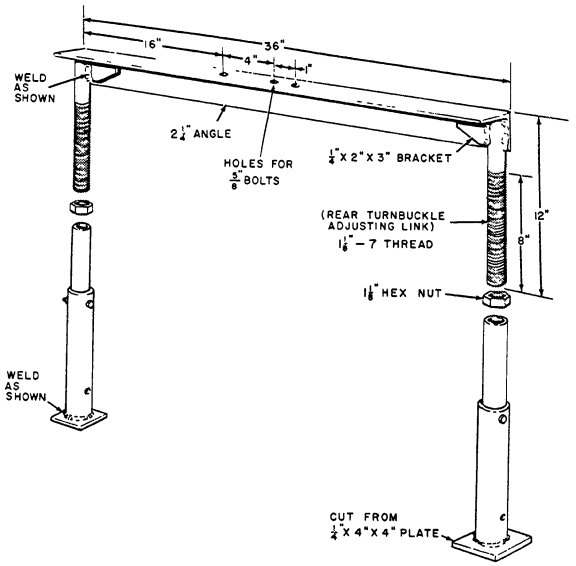


Fig. A-3 Torque Tube Saddle Stand

When making a torque tube saddle stand as shown in Fig. A-3, any heavy duty pipe can be used for the legs.

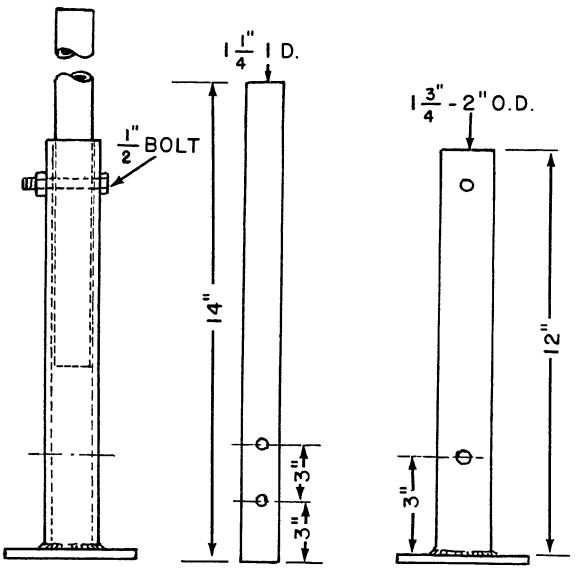
The inside telescoping pipe should be 1-1/4" I.D. to accommodate the 1-1/8" threaded adjusting rods. The size of the outside telescoping pipe will depend upon the wall thickness of the 1-1/4" I.D. pipe.

If the telescoping pipes are cut to length and drilled as shown the stand can be used for splitting all models of the following tractors, 200B, 300, 300B, 400B, 500B, and 600B.

Any available angle can be used for the top section, however, it should not be lighter than 3/8"x2-1/4" leg to provide sufficient strength and stability.

It will be noted that the hole spacing in the torque pad is 4 inches in standard tractors and 5 inches in the Case-O-Matic tractors making 3 holes necessary in the stand top angle to accommodate all models.

In making the transmission jack Fig. A-5, a piece of 3/8" plate steel, three swivel casters and a screw jack are the basic materials needed for assembling this handy roller jack. A safety support rod which attaches to the jack and the drawbar support bracket is essential in preventing the jack from skidding.



The G11322 engine lifting bracket, Fig. A-4, can be ordered from the Branch Parts Department, or made in the Service Shop according to the dimensions given.

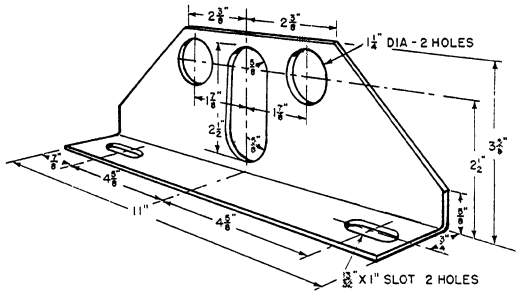


Fig. A-4 Engine Lifting Bracket

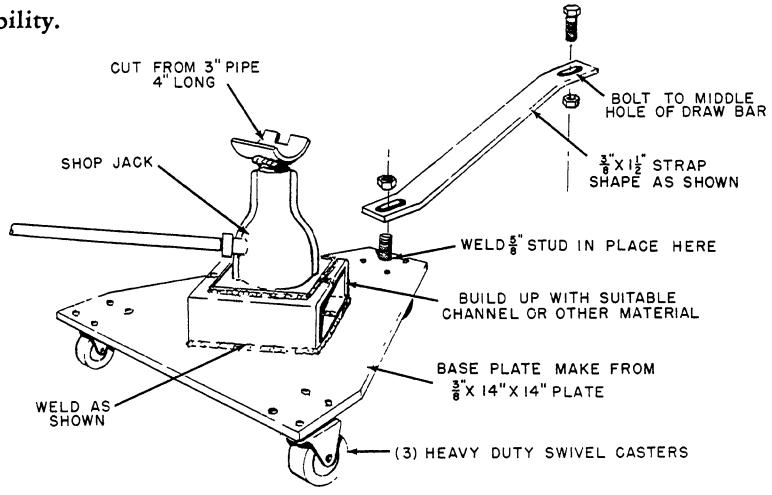


Fig. A-5 Transmission Jack

SECTION IV, SPLITTING TRACTOR

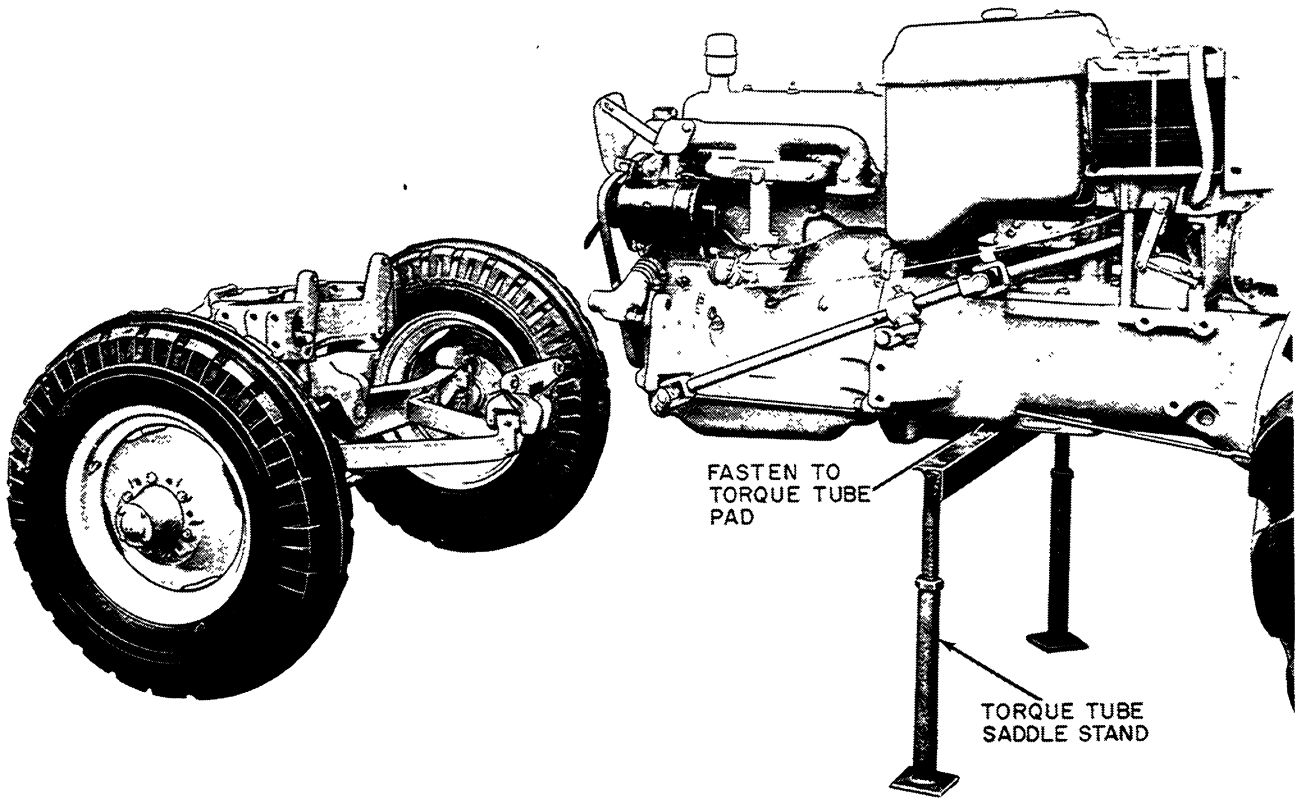


Fig. A-6 Separating from Front Support Bracket

SEPARATING FROM FRONT SUPPORT BRACKET

Separation at this point will vary slightly with the model and type of front axle; however, the corresponding steps should be followed in any case:

1. Drain cooling system.
2. Remove tractor sheet metal.
3. Remove air cleaner.
4. Remove radiator.
5. Attach the torque tube saddle support stand.
6. Disconnect steerage linkage at front universal joint by tapping out the roll pin and moving the assembly rearward.
7. Disconnect radius rod pivot bracket from forward end of torque tube.
8. Disconnect front support from engine block and roll front end forward.

ASSEMBLY

Install front support bracket in reverse order in which it was removed.

SECTION IV, SPLITTING TRACTOR

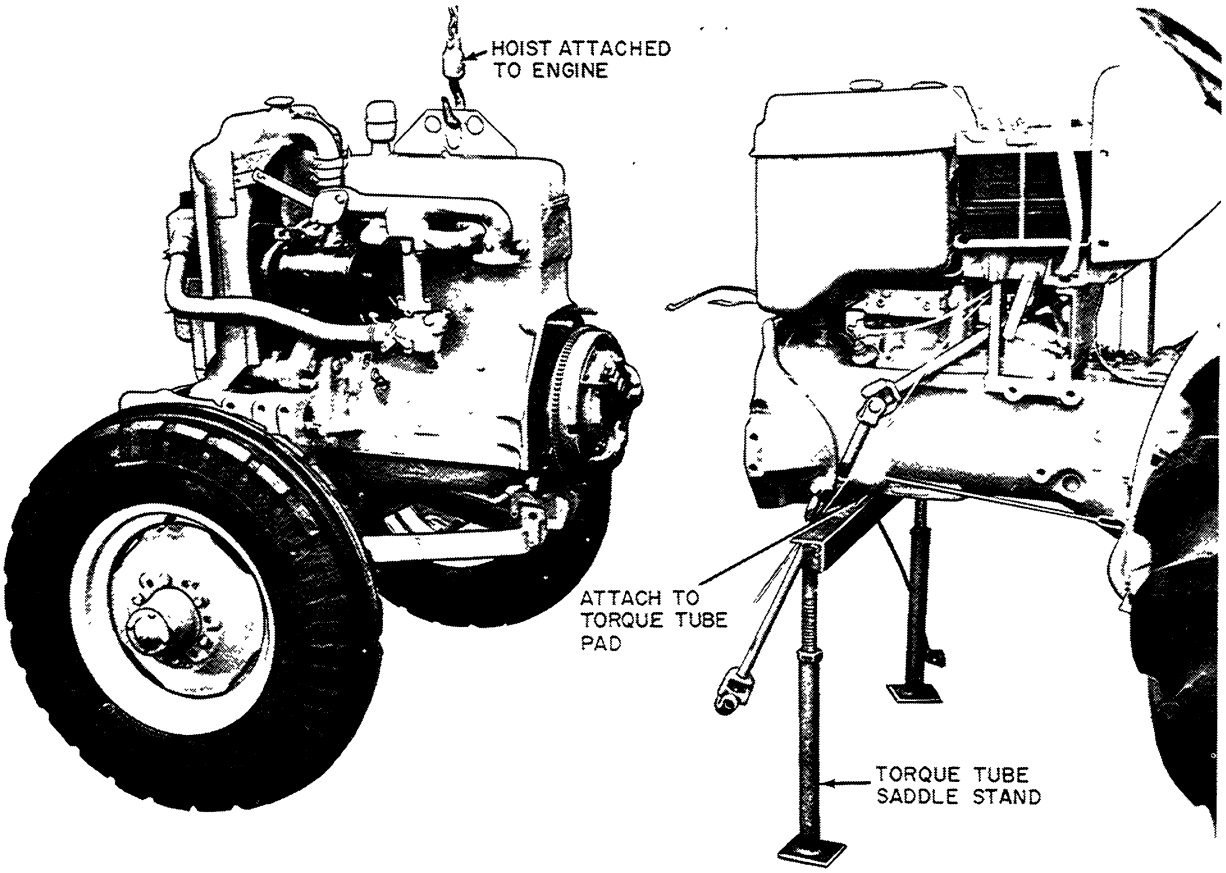


Fig. A-7 Separating at Torque Tube

SEPARATION AT TORQUE TUBE

1. Remove starter assembly.
2. Shut off fuel supply and loosen fuel line at carburetor.
3. Extract temperature gage at adaptor in cylinder head.
4. Remove primary wire to coil and generator wires.
5. Remove oil gage line.
6. Attach engine hoist brackets and hoist.

ASSEMBLY

Install engine and front end assembly to the tractor in reverse order to which they were removed.

Note—See Group B Section VII for installation and service procedure covering clutches for standard model tractors. See Group K for removal or installation of torque converter in Case-O-Matic tractors.

SECTION IV, SPLITTING TRACTOR

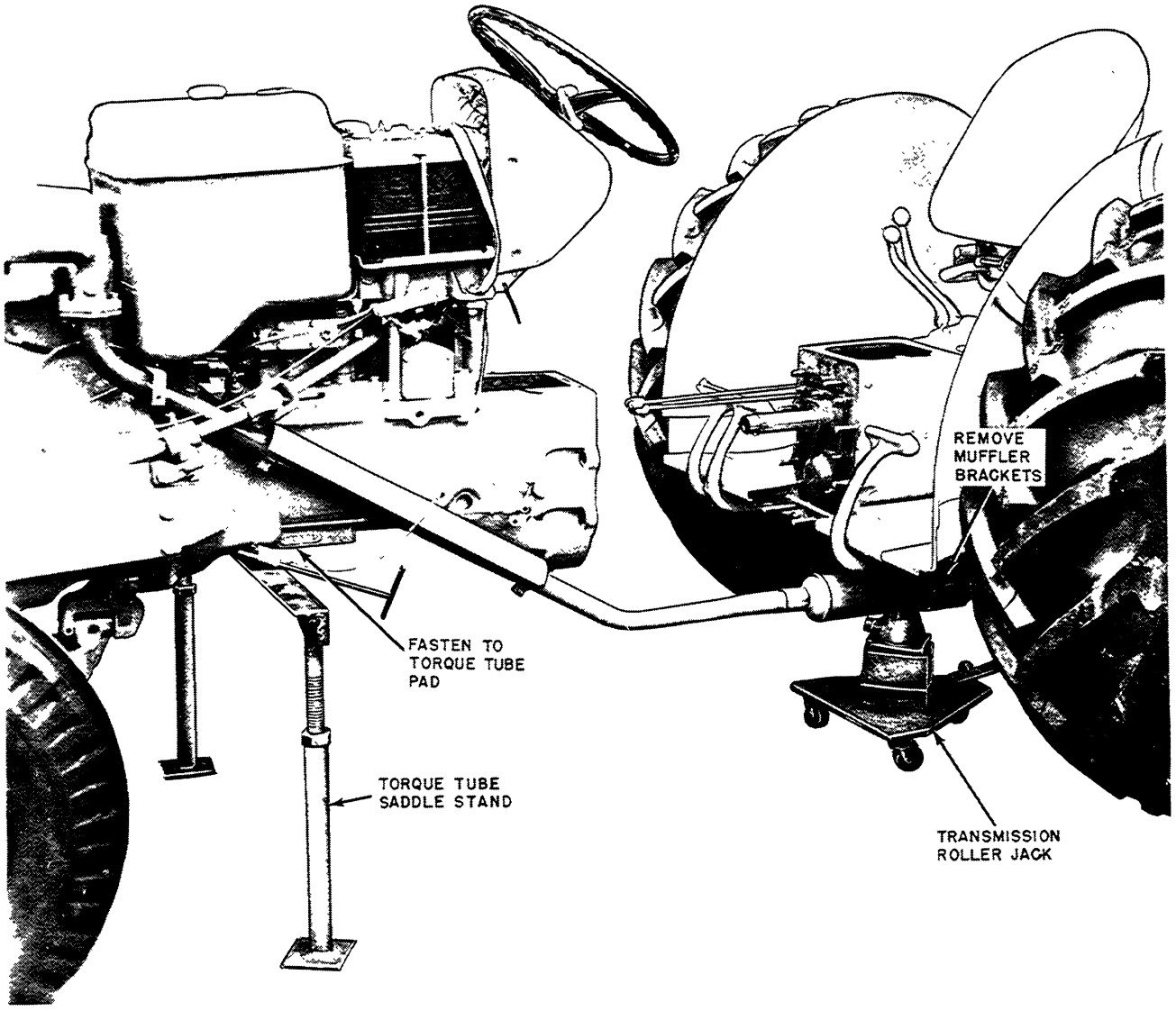


Fig. A-8 Splitting Tractor at Transmission and Torque Tube

SPLIT TRACTOR AT TRANSMISSION TORQUE TUBE

1. Install torque tube saddle stand.
2. Place roller jack under transmission case.
3. Drain oil from hydraulic reservoir in torque tube.
4. Disconnect clutch rod.
5. Remove gear shift cover and disconnect speedometer drive assembly.
6. Disconnect muffler bracket under operator's platform.
7. Disconnect torque tube at transmission and move transmission section rearward.

ASSEMBLY

Install transmission and torque tube in reverse order of which they were removed.

SECTION IV, SPLITTING TRACTOR

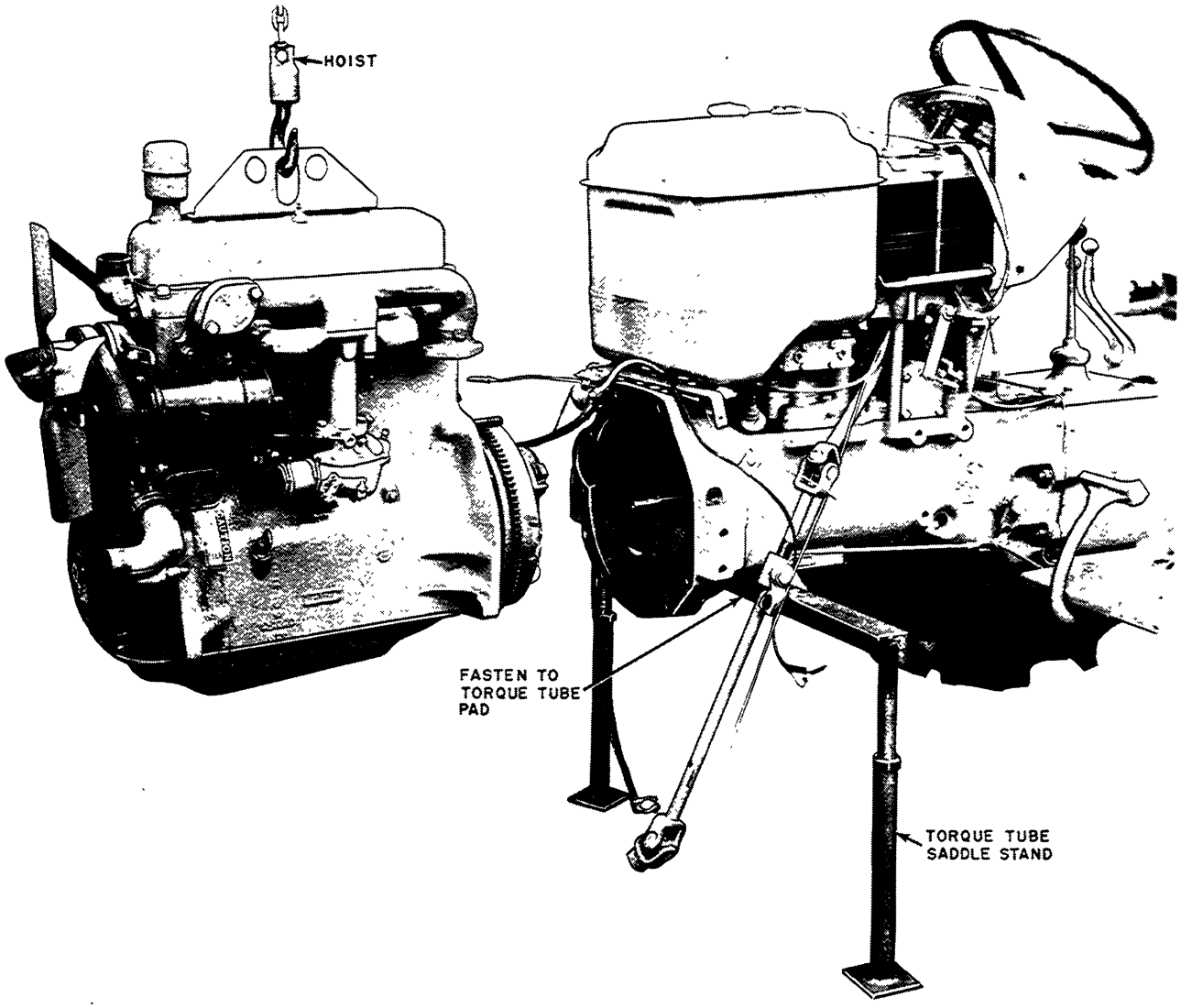


Fig. A-9 Separating Engine from Front Support and Torque Tube

SEPARATING ENGINE ASSEMBLY FROM FRONT SUPPORT AND TORQUE TUBE

Follow procedures outlined on Page A-11.

ASSEMBLY

Install engine and front support in reverse order in which they were removed.

On L.P. equipped tractors the fuel line and filters must be disconnected out of doors and the fuel tank removed and stored in a well ventilated area. Perform these operations in an open area where there is no danger of escaping gas entering building or enclosure of any type. Refer to Group B, Section XIII.

"350", "500B", "600B" SERIES TRACTORS

GROUP B — ENGINE

SECTION I — SPECIFICATION

SECTION II — SERVICE HINTS

SECTION III — CYLINDER HEAD ASSEMBLY

SECTION IV — TIMING GEAR COVER

SECTION V — LUBRICATION SYSTEM

SECTION VI — WATER PUMP AND COOLING SYSTEM

SECTION VII — CLUTCH ASSEMBLY

GROUP B — ENGINE

SECTION VIII — CAMSHAFT

SECTION IX — CRANKSHAFT

SECTION X — CRANKSHAFT BEARING

SECTION XI — PISTON AND ROD ASSEMBLY

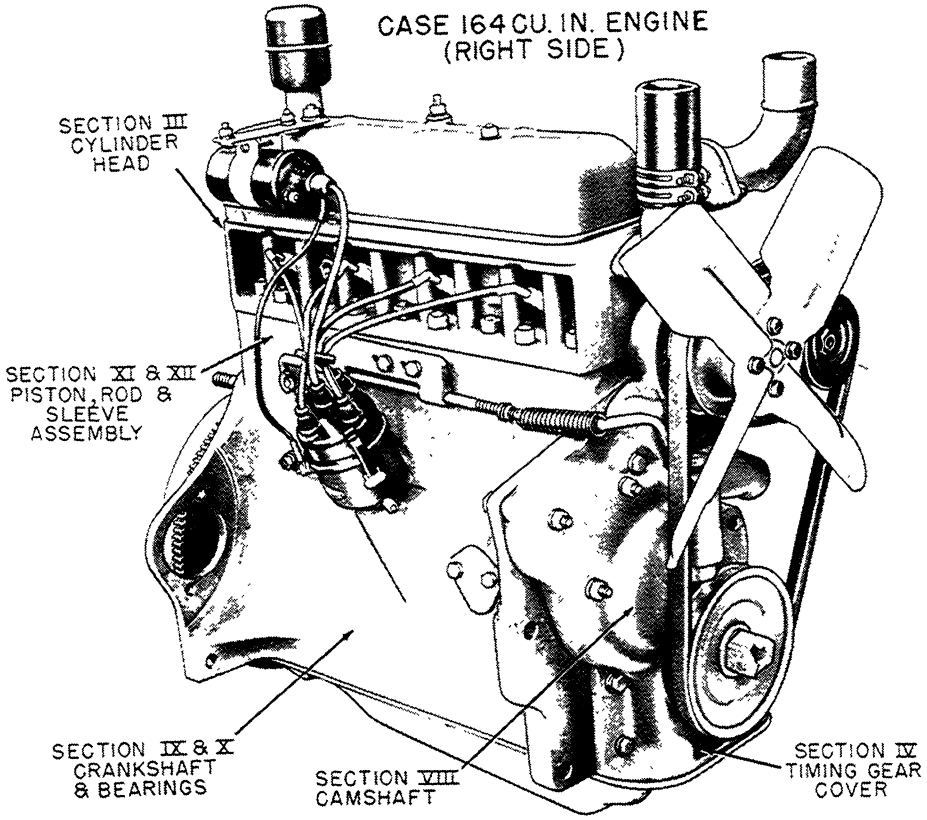
SECTION XII — ENGINE SLEEVES

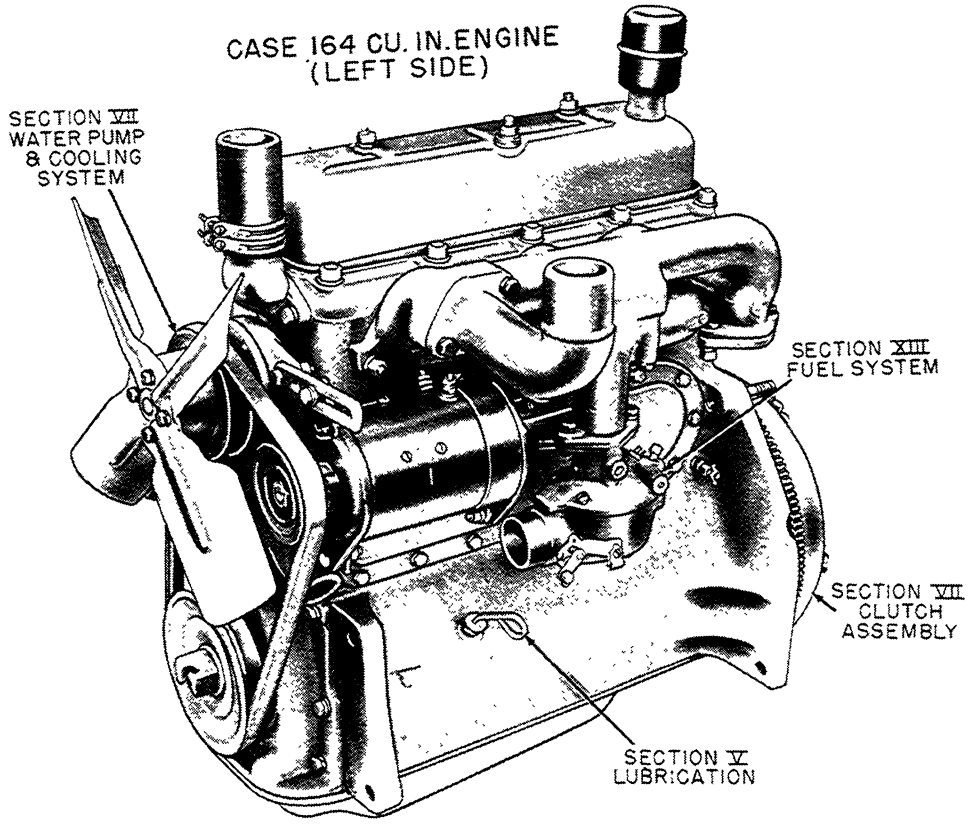
SECTION XIII — GASOLINE FUEL SYSTEM

SECTION XIV — L.P. FUEL SYSTEM

SECTION XV — GOVERNOR LINKAGE

CONTENTS OF ENGINE GROUP





SECTION I, GENERAL SPECIFICATIONS

CYLINDER HEAD

Type	Valve in Head
Firing Order	1-3-4-2
Valve Tappet Clearance	(cold) .014"
Compression Ratio	7.25-1 (gas.) 8.5 to 1 (high altitude & LP)
Exhaust Valve Rotators	Positive Type
Valve Guides	Replaceable

TIMING GEAR AND GOVERNOR

Governor	Flyweight (Wts. on timing gear)

WATER PUMP AND COOLING SYSTEM

Water Pump	Centrifugal Type
Water Pump Drive	"V" Belt
Thermostat Position	Outlet Elbow
Upper Hose	3 ply (3¼" long) (1¾" I.D.) (2⅛" O.D.)
Drain Elbow Hose	3 ply (2" long) (1¾" I.D.) (2⅛" O.D.)
Fan — Pull Type	16" — 4 blade
Radiator	Pressurized 4 lb. pressure cap

LUBRICATING SYSTEM

Oil Pump	Gear Type—Floating Intake Screen
Oil Filter	Replaceable Cartridge
Oil Pressure	14-20 lbs. @ 1900 R.P.M.

PISTONS AND SLEEVES

Cylinders	4
Type Cylinder	Dry Sleeve
Bore	3 9/16"
Stroke	4⅛"
Piston Displacement	164 Cu. In.
Pistons	Aluminum Alloy
Piston Rings	3 compression; 1 oil

FUEL SYSTEM

Carburetor	Updraft
Air Cleaner	Oil Bath

ELECTRICAL AND IGNITION SYSTEM

Ignition Switch	Includes Key Starting
Battery (Dry charge type)	12V, 50 Amp. Hr. Positive Post Grounded
Spark Plugs	Gasoline Champion No. D16 LPG Champion No. D14 (or equivalent) Thread 18-M/M; Gap .025"
Distributor (Std.)	Automatic Advance 26° Point Gap .020"
Magneto (Optional) Case No. 41	Mag. Advance 25° Point Gap .008" - .012"
Generator	3 brush type W/Voltage Regulator 3rd brush not adjustable
Starting Motor	W/sealed Starter Drive
Head Lights	12V, Sealed Beam Units
Rear Lights	12V, Combination Tail & Flood W/electrical Outlet for Safety Light Attachment
Fuse	20 Amp. in Light Circuit

ENGINE SPEED

	No Load	Full Load
350 Tractors	2050	1900
500B Tractors	2125	2000
600B Tractors	2400	2250
Engine Idle Speed		500 RPM

(Engine must be reduced to 1750 RPM for all Power Take-Off Operations)

CLUTCH (Foot)

350-510B (Std.)	11" Single Disc, Spring Loaded Organic Type Lining
351-511B	10" Single Disc, Spring Loaded Organic Type Lining
350-510B (Extra Equip.)	11" Single Disc Spring Loaded W/Feramic Lining
600B	(See Case-O-Matic Section)

APPROXIMATE CAPACITIES (Engine)

		U.S.	Imperial
Cooling System	(Qts.)	13	10.02
Engine Crankcase	(Qts.)	4	3.34
(With Filter)	(Qts.)	5	4.18
Air Cleaner Oil Cup	(Pts.)	1	0.83
Hydraulic System (Torque Tube)			
350	(Qts.)	12	10.02
500B	(Qts.)	12	10.02
600B	(Qts.)	16	13.3
Fuel Tank (350)	(Gals.)	13	10.86
Fuel Tank (500B,600B)	(Gals.)	13.8	11.4

SECTION I, GENERAL SPECIFICATIONS

Camshaft Bearing Clearance	.002 to .004 inch
Camshaft End Clearance	.003 to .007 inch
Connecting Rod Bearing Running Clearance	.0015 to .002 inch
Connecting Rod Side Clearance	.006 inch
Crankshaft End Clearance	.003 to .007 inch
Flywheel Clutch Face Runout When Assembled on Engine Not to Exceed .006 Inch Total Indicator Reading	
Main Bearing Running Clearance	.0015 to .002 inch
Oil Pump — Gear End Clearance	.0035 to .0065 inch
Oil Pump — Gear to Housing (Radial Clearance)	.002 to .005 inch
Oil Pump — Drive Shaft to Bushing	.002 to .0045 inch
Oil Pump — Drive Gear to Shaft	.005 to .002 (tight)
Oil Pump Drive Gear to Crankshaft Gear (back lash)	.005 to .010 inch
Piston Rings in Groove (top)	.004 inch
Piston Rings in Groove — No. 2 and No. 3	.003 inch
Piston Rings in Groove — No. 4 or oil control	.0015 inch
Piston Ring Gap in Cylinder — Compression Ring	.010 to .020 inch
Piston Ring Gap in Cylinder — Oil Ring	.010 to 0.18 inch
Piston Pin in Connecting Rod Bushing	.0000 to .0005 (loose)
Piston Pin in Piston	Light Push Fit
Piston Fit in Sleeve — 3.5625" bore — 5 to 10 lbs. pull on .003" Feeler (Feeler stock ½" wide)	

VALVES AND GUIDES

Valve Tappet Clearance	.014" (cold)
Intake Valve in Guide	.0015 to .003 inch
Exhaust Valve in Guide — L.P. and High Altitude Head	.004 to .0055 inch
Intake Seat Width	.066" to .078" after grinding
Exhaust Seat Width	.064" to .078" after grinding

Suggest:

If the above button click is invalid.

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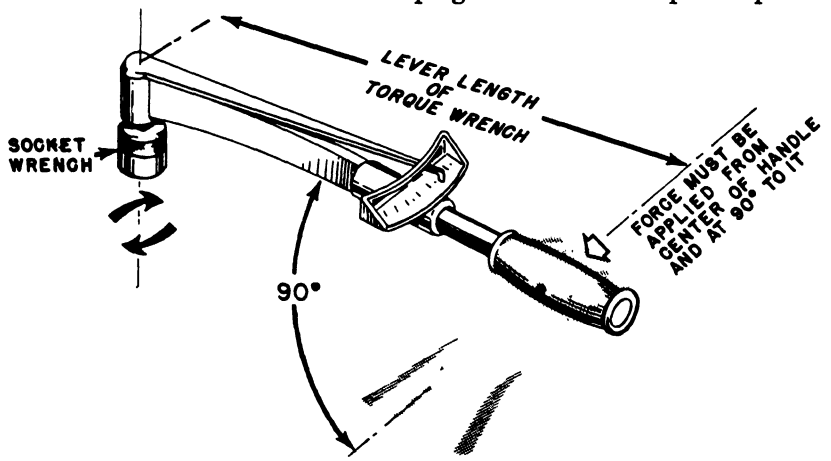
first, and then click the above link

to download the complete manual.

Thank you so much for reading

SECTION I, GENERAL SPECIFICATIONS

When a nut is tightened on a bolt or stud, a clamping action is set up between the nut and the component parts. Actually as the nut is tightened, the bolt or stud is stretched or elongated slightly. This stretching action of the bolt or stud maintains the clamping force on the component parts being held together.



In order to properly control this stretch and not build up excessive pressures, (which can snap a bolt in two) the torque wrench should be used. However in order to obtain fairly accurate torque wrench tightness several factors must be understood. Failure to consider the following conditions will prevent an accurate torque wrench reading.

1. Be sure to lubricate the threads of the bolt before the nut is installed.
2. Use the exact type of washer, under the nut, that is called for in the service manual.
3. Be sure to pull the torque wrench handle with a steady even pull, exerted at right angles to the wrench handle, when the dial is being read. (DO NOT USE AN EXTENSION ON THE HANDLE. IT WILL CAUSE THE DIAL READING TO BE INACCURATE.)

Your torque wrench dial will register in "foot-pounds" of torque tightness. Be sure to use the recommended torque tightness shown in this manual, for each specific assembly procedure.

TORQUE WRENCH RECOMMENDATIONS

Camshaft Nut	80-90 ft. lbs.
Clutch to Flywheel	18 ft. lbs.
Clutch Yoke Alignment Bolt	35 ft. lbs.
Connecting Rod Bolts	45-50 ft. lbs.
Cylinder Head Stud Nuts	95-100 ft. lbs.
Engine Oil Pan Bolts	15 ft. lbs.
Engine Oil Pump	8 ft. lbs.
Flywheel Crankshaft	65-70 ft. lbs.
Fuel Tank Support Bracket (Gas)	15 ft. lbs.
Fuel Tank Support Bracket (L.P.)	40 ft. lbs.
Governor Control Rod Guide to Engine Block	15 ft. lbs.
Main Bearing Cap Place Bolts	90-100 ft. lbs.
Manifold Stud Nuts	30 ft. lbs.
Manifold to Carburetor Bolts	15 ft. lbs.
Mounting Rail to Engine	115 ft. lbs.
Mounting Rail to Torque Tube	115 ft. lbs.
Oil Filter to Base	25 ft. lbs.
Push Rod Adjusting Nuts	15 ft. lbs.
Radiator Mounting Bracket to Front End Casting	40 ft. lbs.
Radiator Studs to Bracket	25 ft. lbs.
Rear Main Bearing Seal and Retainer	6-8 ft. lbs.
Shoulder Bolt — Clutch Throwout Lever	75 ft. lbs.
Spark Plugs	34 ft. lbs.
Starter to Torque Tube	40 ft. lbs.
Timing Gear Cover Bolts	25 ft. lbs.
Torque Tube to Engine	115 ft lbs.
Valve Rocker Arm Brackets	20 ft. lbs.
Water Pump	25 ft. lbs.