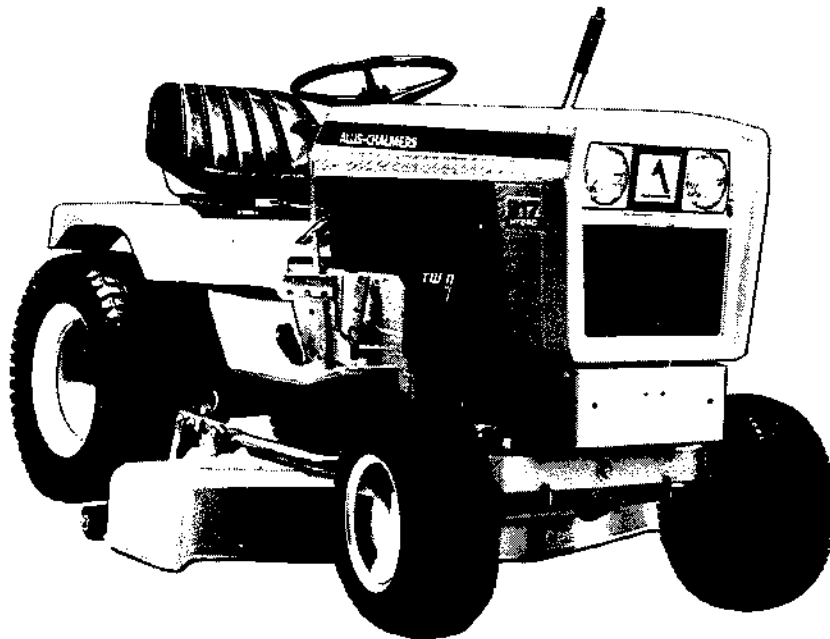




# MODEL 900 SERIES

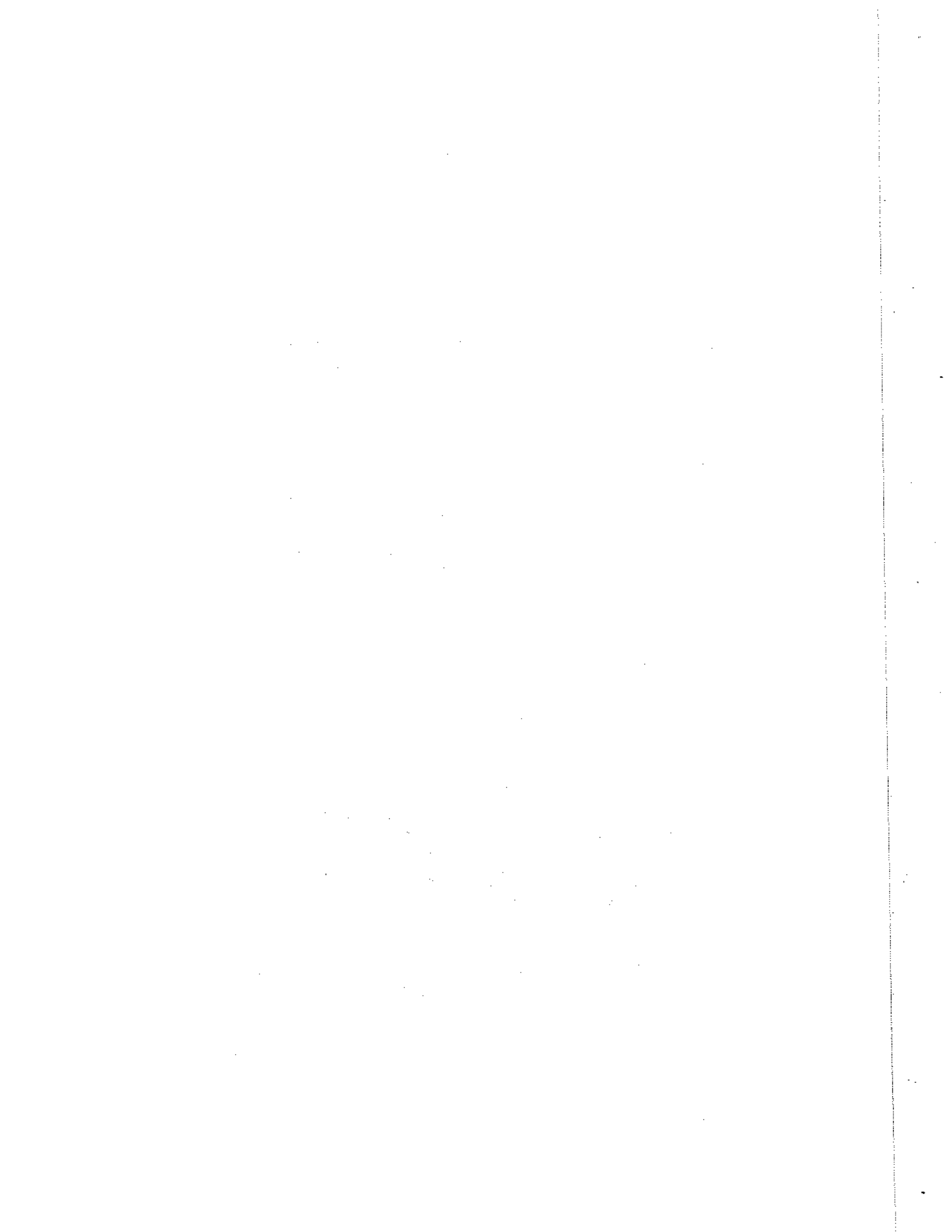
**910-6 Speed, 912-H,  
914-S, 916-H and 917-H**

**LAWN & GARDEN TRACTORS**



1690515 1690519  
1690516 1690538  
1690517

Part Number 1666746  
March, 1980



**DEALER'S PREDELIVERY SERVICE GUIDE FOR 900 SERIES TRACTOR****DETAILS OF ITEMS LISTED BELOW ARE COVERED IN THIS MANUAL****CHECK BEFORE OPERATING UNIT**

- Shipping Damage Corrected
- Fill Battery with Electrolyte & Fully Charge
- Engine Oil Level Checked (Add When Needed)
- Hydrostatic Oil Level Checked
- Transmission Oil Level Checked
- Bevel Gear Box Oil Level Checked
- Final Drive Oil Level Checked
- Check & Tighten Steering Wheel
- Torque Rear Wheels

**OIL LEAKS**

- Tractor Operated
- Check for Oil Leaks after Engine Warms Up
- Check for Transmission Oil Leaks
- Check for Hydraulic Oil Leaks
- Check for Final Drive Oil Leaks

**ENGINE**

- Check Timing
- Check high & low Idle Speeds
- Check Governor Response
- Air Cleaner Properly Installed

**COOLING SYSTEM**

- Check Cooling Fins for Damage or Obstruction
- Check Engine Shrouds for Obstruction

**POWER TRAIN**

- Brake & Clutch Adjusted Properly
- All Belts Adjusted Properly
- Safety Switches Adjusted Properly
- Shuttle Clutch Adjusted Properly
- P.T.O. Clutch Adjusted Properly
- Hydrostat Adjusted Properly
- Unit Operates Properly in all gears

**GENERAL**

- All Grease Fittings Lubricated
- Front Tire Pressure Set
- Rear Tire Pressure Set
- Tractor Operation Checked
- Appearance of Tractor Checked
- All Safety & Operational Decals in place
- Operator's Manual with Tractor

**DEALER'S DELIVERY GUIDE FOR 900 SERIES TRACTORS****EXPLAIN TO YOUR CUSTOMER THE CARE, SAFE OPERATION AND ADJUSTMENTS OF ITEMS LISTED BELOW:****CONTROLS**

- ALL MODELS
- MANUAL - 3 SPEED MODELS
- SHUTTLE CLUTCH MODELS
- HYDROSTATIC MODELS

**OPERATION**

- STARTING ENGINE
- STOPPING ENGINE
- STARTING TRACTOR
- STOPPING TRACTOR
- OPERATING WITH IMPLEMENTS

 **OPERATOR'S SAFETY PRECAUTIONS** **USER'S RESPONSIBILITY & WARRANTY****LUBRICATION AND SERVICE**

- ENGINE OIL
- ENGINE FUEL
- BEVEL GEAR & TRANSMISSION HOUSINGS
- GREASE FITTINGS
- FRONT WHEEL BEARINGS
- AIR CLEANER
- ENGINE COOLING FINS
- BATTERY CARE
- SHUTTLE CLUTCH DRIVE
- HYDROSTATIC PUMP FLUID LEVEL & FILTER
- OFF SEASON STORAGE

**ADJUSTMENTS**

- SEAT
- FRONT P.T.O.
- CLUTCH & BRAKE
- MOWER
- OTHER ATTACHMENTS

**TO OUR CUSTOMER**

The following pages and illustrations are printed to help supply you with the knowledge to better operate and service your new ALLIS-CHALMERS equipment.

We are proud to have you as a customer and feel you will be proud to be an ALLIS-CHALMERS owner.

Any piece of equipment needs, and must have a certain amount of service and maintenance to keep it in top running condition. We have attempted to cover all the adjustments required to fit most conditions; however, there may be times when special care must be taken to fit a condition.

Study this operator's manual carefully and become acquainted with all the adjustments and operating procedures before attempting to operate your new equipment. Remember, it is a machine and has been designed and tested to do an efficient job in most operating conditions and will perform in relation to the services it receives.

If special attention is required for some conditions, ask your ALLIS-CHALMERS dealer; his Parts and Service Organization will be glad to help and answer any questions on operation and service of your new machine.



**ATTENTION! BECOME ALERT!  
YOUR SAFETY IS INVOLVED!**



This symbol is used to call your attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol - Heed Its Warning.

**USER'S RESPONSIBILITY**

It is the responsibility of the user to read the Operator's Manual and understand the safe and correct operating procedures as pertains to the operation of the product, and to lubricate and maintain the product according to the maintenance schedule in the Operator's Manual.

The user is responsible for inspecting his machine, and for having parts repaired or replaced when continued use of the product would cause damage or excessive wear to other parts. It is the user's responsibility to deliver his machine to an Allis-Chalmers dealer for service or replacement of defective parts which are covered by the standard warranty. When requesting warranty service, you must present your copy of delivery record.

The user will advise the Dealer when operation of the unit will be started so dealer representative can be on hand to make necessary adjustments and help you get started properly.

If the Dealer is requested by the Customer to travel to another location, or haul the machine to his shop for the purpose of performing a warranty obligation or free inspection, it would be for the Customer's convenience, and the cost for such trips is to be paid for by the Customer. Any arrangement whereby the Dealer agrees to absorb all or a part of the cost of these trips is to be made between the Dealer and the Customer and is to be considered a courtesy to the Customer.

Allis-Chalmers does not allow credit for the cost of travel time, mileage, or hauling as a warranty allowance.

**WARRANTY . . .** Your Allis-Chalmers warranty for any new equipment listed appears on your copy of the Purchase Order signed by you and your selling dealer. You will be required to pay any premium for overtime labor requested by you, any charge for making service calls and for transporting the equipment to and from the place where warranty work is performed. Normal maintenance service and repair work not covered by the warranty during the warranty period and all service after the warranty period will be charged for at the dealer's regular rates and prices.

7178-5

**THE ALLIS-CHALMERS NEW EQUIPMENT BATTERY SERVICE ADJUSTMENT POLICY  
FOR LAWN AND GARDEN EQUIPMENT  
LIMITED WARRANTY**

1. If within a period of 90 days after day of sale to the original user, an Allis-Chalmers new equipment battery becomes unserviceable (not merely discharged) in normal use, due to defective material or workmanship, the Allis-Chalmers Corporation will replace it with an equivalent new Allis-Chalmers battery, without charge, to the original user.
2. If after the expiration of such 90 days but before the expiration of 24 months from date of sale to the original user (each such month being designated herein as a unit of service) an Allis-Chalmers new equipment battery becomes unserviceable (not merely discharged) in normal use, due to defective material or workmanship, it will be replaced for the original user, in exchange for the unserviceable battery, with an equivalent new Allis-Chalmers battery at an adjusted price. This adjusted price shall be determined by applying to the then current retail price of the new battery, the percentage of the maximum (24) units of service which was received from the unserviceable battery.

This policy does not cover the following:

1. Unserviceability due to abuse or neglect, failure to maintain recommended electrolyte level, fire wreckage, explosion, freezing, the addition to the battery of any chemical or solution other than approved water or battery grade sulfuric acid of proper gravity, the use of a group size smaller than the group size of the original equipment battery, or continued operation of the battery in an undercharged condition (below half charge - 1.190 sp. gr.).
2. Breakage of containers, covers or posts.
3. The cost of transportation, service calls, recharges or the use of rental batteries.

PROOF OF DATE OF PURCHASE IS REQUIRED FOR ALL CLAIMS. ALLIS-CHALMERS CORPORATION WILL HAVE NO OBLIGATIONS UNDER THIS POLICY IF THE DATE CODING ON THE BATTERY IS REMOVED OR DESTROYED. IN NO EVENT WILL ALLIS-CHALMERS CORPORATION BE LIABLE FOR CONSEQUENTIAL DAMAGES.

**LIMITATIONS**

No-charge replacements or adjustments under this policy may be made by any authorized Allis-Chalmers Lawn and Garden Equipment dealer.

L & G 7/75

**TAKE TIME FOR SAFETY**

**BE A SAFE OPERATOR  
AVOID ACCIDENTS BY  
THINKING BEFORE ACTING  
AND BY READING YOUR OPERATOR'S MANUAL**

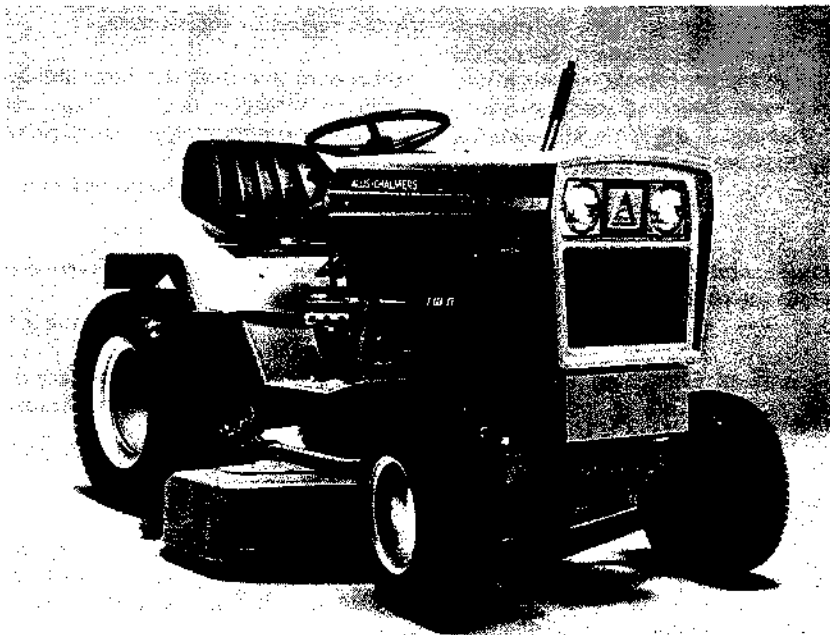
**NOTE:** Some illustrations in this manual show units with optional equipment installed. This optional equipment may be purchased from your local Allis-Chalmers dealer.

**NOTE:** Some photographs in this manual were taken of prototype models. Production models may vary in some detail.



**CAUTION:** Some photographs in this manual may show shields or cover panels removed for purposes of clarity. NEVER OPERATE Unit without all shields and cover panels in place.





T-66985


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## SAFETY

### SAFETY RULES



**CAUTION:** Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of vehicle, severe personal injury to yourself or bystanders, or damage to property or equipment. The triangle  in text signifies important cautions or warnings which must be followed.

#### GENERAL

Read the Operator's Manual carefully. Be thoroughly familiar with the controls and the proper use of the equipment.

Never allow children to operate the machine. Do not allow adults to operate it without proper instruction.

Do not carry passengers.

Use only attachments or accessories designed for your machine. See your dealer for a complete list of recommended attachments or accessories.

Keep the area of operation clear of all persons, particularly small children, and pets.

Never direct discharge of material toward bystanders.

#### MAKE SURE:

- a. Tractor and attachments are in good operating conditions.
- b. All safety devices and shields are in place and in good working condition, and
- c. All adjustments are correct.

#### PREPARATION

Handle gasoline with care - it is highly flammable.

- a. Use approved gasoline container.
- b. Never remove the fuel tank cap or add gasoline to a running or hot engine, or fill the fuel tank indoors. Wipe up spilled gasoline.

Do not run the engine indoors. Exhaust fumes are deadly.

Clear the work area of objects which might be picked up and thrown by attachments.

Disengage all attachment clutches and shift into neutral before attempting to start the engine.

Wear heavy footwear. Do not operate tractor when bare-foot or when wearing open sandals or canvas shoes.

#### OPERATION

Disengage power to attachment(s), stop tractor engine, shift into neutral, set parking brake, lower the attachment,

and remove the key before leaving the operator's position for any reason, such as to unclog attachment chutes or to make repairs or adjustments.

Stop tractor and attachments and inspect for damage after striking a foreign object. Repair any damage before re-starting and operating the equipment.

Watch out for traffic when crossing or operating near roadways.

Operate only in daylight or in good artificial light.

Never make any adjustment while the engine is running.

Operate only up and down the face of slopes; never across the face. Do not stop or start suddenly on slopes.

Reduce speed on slopes and in sharp turns to prevent tipping or loss of control. Use extreme caution when changing direction on slopes.

Be especially careful not to touch tractor or attachment parts which might be hot from operation. Allow such parts to cool before attempting to maintain, adjust, or service.

Stay alert for holes in the terrain and other hidden hazards. Be extra careful when operating on wet or slippery surfaces.

If equipment begins to vibrate abnormally, disengage power to attachments and stop engine at once. Inspect for damage and correct before starting up tractor.

Use care when pulling loads or using heavy equipment.

- a. Use only drawbar hitch point.
- b. Limit loads to those you can safely control.
- c. Do not turn sharply. Use care when backing.
- d. Use weights when recommended in the tractor or attachment Operator's Manual.

Disengage power to attachments when transporting or not in use.

#### MAINTENANCE & STORAGE

Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.

Do not change the engine governor settings or overspeed the engine.

To reduce fire hazard, keep the engine free of grass, leaves, and excess grease.

Never store the equipment with gasoline in the tank inside of building where fumes may reach an open flame or spark. Allow the engine to cool before storing in any enclosure.

**ALL WARNING, CAUTION, and instructional messages on your tractors and mower should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important. The safety messages on the following page are on your tractor and mower.**



**⚠ DANGER**  
 1. Stand clear of discharge opening.  
 2. Do not operate mower without deflector or grass collector in place.

**⚠ CAUTION**  
 DISCONNECT GROUND (-) TERMINAL WHEN WORKING ON ELECTRICAL SYSTEM TO PREVENT SHORT CIRCUIT

**⚠ DANGER**  
 keep hands & feet from under mower

**FOR YOUR SAFETY**  
 TO START ENGINE - SHIFT LEVER MUST BE IN NEUTRAL AND PTO DISENGAGED. KEEP PEOPLE AND PETS A SAFE DISTANCE AWAY FROM MACHINE. KEEP ALL SHIELDS IN PLACE. KEEP HANDS, FEET AND CLOTHING AWAY FROM POWER DRIVE PARTS. BEFORE LEAVING OPERATOR'S POSITION:

1. SHIFT TRANSMISSION TO NEUTRAL.
2. SET PARKING BRAKE.
3. DISENGAGE PTO CLUTCH.
4. SHUT OFF ENGINE AND REMOVE KEY.
5. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING MACHINE.

**WARNING:** BEFORE LEAVING THE TRACTOR, SET PARKING BRAKE. DO NOT RELY ON TRANSMISSION TO HOLD TRACTOR.

Labels: CHOKER, LIGHTS, IGNITION SWITCH, OFF, ON, START, BRAKE-CLUTCH PEDAL, ENGAGE CLUTCH, APPLY BRAKE, PARKING BRAKE LEVER, ON, OFF, CENTER PTO ENGAGE, DISENGAGE.

Location: Console on Hydrostatic Tractor

**⚠ WARNING**  
 TO AVOID INJURY DO NOT RUN ENGINE WITH SEAT DECK RAISED

**FOR YOUR SAFETY**  
 TO START ENGINE - SHIFT LEVER MUST BE IN NEUTRAL AND PTO DISENGAGED. KEEP HANDS, FEET AND CLOTHING AWAY FROM POWER DRIVE PARTS.

1. 2. 3. 4.

START

KEEP ALL SHIELDS IN PLACE. KEEP PEOPLE AND PETS A SAFE DISTANCE AWAY FROM MACHINE.

**BEFORE LEAVING OPERATOR'S POSITION:**

1. SHIFT TRANSMISSION TO NEUTRAL.
2. SET PARKING BRAKE.
3. DISENGAGE PTO CLUTCH.
4. SHUT OFF ENGINE AND REMOVE KEY.
5. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING MACHINE.

**WARNING:** BEFORE LEAVING THE TRACTOR, SET PARKING BRAKE. DO NOT RELY ON TRANSMISSION TO HOLD TRACTOR.

Labels: CHOKER, LIGHTS, IGNITION SWITCH, OFF, ON, START, BRAKE-CLUTCH PEDAL, ENGAGE CLUTCH, APPLY BRAKE, PARKING BRAKE LEVER, ON, OFF, CENTER PTO ENGAGE, DISENGAGE.

Location: Console on Shuttle Tractor

**FOR YOUR SAFETY**  
 TO START ENGINE - SHIFT LEVER MUST BE IN NEUTRAL AND PTO DISENGAGED. KEEP HANDS, FEET AND CLOTHING AWAY FROM POWER DRIVE PARTS.

1. 2. 3. 4.

START

KEEP ALL SHIELDS IN PLACE. KEEP PEOPLE AND PETS A SAFE DISTANCE AWAY FROM MACHINE.

**BEFORE LEAVING OPERATOR'S POSITION:**

1. SHIFT TRANSMISSION TO NEUTRAL.
2. SET PARKING BRAKE.
3. DISENGAGE PTO CLUTCH.
4. SHUT OFF ENGINE AND REMOVE KEY.
5. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING MACHINE.

**WARNING:** BEFORE LEAVING THE TRACTOR, SET PARKING BRAKE. DO NOT RELY ON TRANSMISSION TO HOLD TRACTOR.

Labels: CHOKER, LIGHTS, IGNITION SWITCH, OFF, ON, START, BRAKE-CLUTCH PEDAL, ENGAGE CLUTCH, APPLY BRAKE, PARKING BRAKE LEVER, ON, OFF, CENTER PTO ENGAGE, DISENGAGE.

Location: Console on 6-Speed Tractor

## SPECIFICATIONS

### ENGINE

For engine specifications see Engine Section.

### ELECTRICAL

Starter: Electric gear drive

Ignition: Battery ignition with breaker points

Electric System: 15 amp flywheel alternator, solid state rectifier - regulator, 45 amp hour battery

### CAPACITIES - ALL MODELS

Engine Crankcase Oil: See Engine Section

Bevel Gear Box: Fill to end of dipstick with Allis-Chalmers Power Fluid 821.

Transmission Gear Case - Shuttle & Six Speed: 4.5 pints (2 litres) of Allis-Chalmers Power Fluid 821.

Final Drive Gear Case - Hydrostatic: 3 qts. (2.8 litres) of Allis-Chalmers Power Fluid 821.

Fuel Tank: 3 gallons (11 litres)

### STEERING - ALL MODELS

Type of Linkage: Bevel gear - Spindle lever type

Steering Gear Ratio: 4.66:1

### GROUND DRIVE - HYDROSTATIC

Clutch: Foot operate V-belt clutch between bevel gearbox and transmission

Transmission: Air cooled, hydrostatic with variable displacement axial piston pump and with fixed displacement, reversible axial piston motor. Free wheeling valve for maneuvering of vehicle without starting engine.

Transmission Oil Filter - 12 H.P., 16 H.P. & 17 H.P.: Spin on cartridge type oil filter in charge pump suction line - 25 micron rating.

Final Drive: Hardened spur gears, rolling contact bearings

Differential: Planetary spur gear, controlled traction.

### GROUND DRIVE - SIX SPEED & SHUTTLE

Clutch: Foot operated V-belt clutch between bevel gearbox and transmission.

Transmission - Six Speed: Sliding spur gear with 6 speeds forward and two reverse.

Transmission - Shuttle: Differential shuttle clutch drive to transmission with forward - reverse control. Sliding spur gear with 4 gear ratios - hardened spur gears, rolling contact bearings.

Differential: Planetary spur gear, controlled traction

## SPECIFICATIONS

### GROUND SPEED - HYDROSTATIC

Forward: Variable, up to 7 mph (11 km/h) at 3600 rpm

Reverse: Variable, up to 4 mph (6.4 km/h) at 3600 rpm

### GROUND SPEED - SHUTTLE

#### Gear Forward or Reverse

1	0.96 mph (1.5 km/h)
2	2.3 mph (3.7 km/h)
3	3.7 mph (5.9 km/h)
4	5.1 mph (8.2 km/h)

### GROUND SPEED - SIX SPEED

Gear	Lo-Range	Hi-Range
1	0.7 (1.1 km/h)	1.6 mph (2.5 km/h)
2	1.7 (2.7 km/h)	3.7 mph (5.9 km/h)
3	2.8 (4.5 km/h)	6.1 mph (9.8 km/h)
Reverse	1.5 (2.4 km/h)	3.2 mph (5 km/h)

### DIMENSIONS - ALL MODELS

Height at Steering Wheel: 39.7" (1008 mm)

Height at Dashboard: 35.7" (907 mm)

Width: 36.9" (953 mm)

Length: 70" (1778 mm)

Front Wheel Tread: 30" (762 mm)

Rear Wheel Tread: 27" (686 mm)

Front Axle Clearance: 8" (203 mm)

Wheel Base: 50.7" (1270 mm)

Front Tires: 16 x 6.50 x 8

Rear Tires: - 10 HP, 12 HP, & 14 HP: 23 x 8.50 x 12  
16 HP & 17 HP: 23 x 10.50 x 12

Turning Radius: Inside rear wheels - 32

Outside front wheels - 85

### MOWER

Effective Cutting Width - 42": 42" (1067 mm)

48": 48" (1219 mm)

Overall Width w/Deflector - 42": 55" (1397 mm)

48": 61" (1549 mm)

Cutting Height: Adjustable from 1-5/8" to 3-1/8" (41 to 79 mm)

No. of Blades: 3

Transport Clearance: 3" (76 mm), maximum (low cut)

The Allis-Chalmers Corporation reserves the right to make changes in the above specifications or to add improvements at any time without notice or obligation.

**CONTROLS**

Refer to Figures 1, 2, or 3 to identify the controls for your tractor.

**CHECKS BEFORE STARTING**

1. Check that crankcase is filled to full mark on dipstick. See the engine section for instructions and oil recommendations.
2. Make sure all nuts, bolts, screws and pins are in place and tight.



**WARNING:** Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do not allow open flame, smoking or matches in the area. Avoid overfilling and wipe up any spills.

3. Make sure you can reach all controls from operator's position. If not, see Seat Adjustment.
4. Fill the gasoline tank with a good grade of fresh, regular gasoline. Do not use premium gasoline and **DO NOT** mix oil with gasoline.
5. For hydrostatic tractors, be sure free wheeling latch on hydrostatic pump is engaged. See "Moving Tractor Without Engine Power".

**STARTING THE ENGINE**

**NOTE:** Also see engine section for instructions.

1. Seat yourself in the operator's position.
2. Make sure parking brake is engaged.

3. On 6-speed tractors and shuttle tractors, place gear shift lever in neutral and PTO clutch lever in disengaged position.

On hydrostatic tractors, place the hydrostatic control lever in neutral position and PTO clutch lever in disengaged position.

4. Depress clutch-brake pedal and apply braking pressure. Keep clutch disengaged until engine starts.
5. Pull choke out (unless engine is warm).
6. Set engine speed control to SLOW.
7. Turn ignition key to START. When engine starts, release key. If the engine does not start within 30 seconds, allow starter motor to cool for a minute before making a second attempt.
8. As engine warms up, push choke fully in. Allow engine to warm up for a few minutes before applying a load.

**MOVING TRACTOR WITHOUT ENGINE POWER -- HYDROSTATIC ONLY**

Normally, the hydrostatic transmission will not allow the tractor to be pushed. To push the tractor, push the free wheeling latch (Figure 9) down. This will disengage the transmission. To engage the transmission pull the latch up.



**CAUTION:** Towing the hydrostatic tractor will cause transmission damage. Do not use another vehicle to push or pull the tractor.

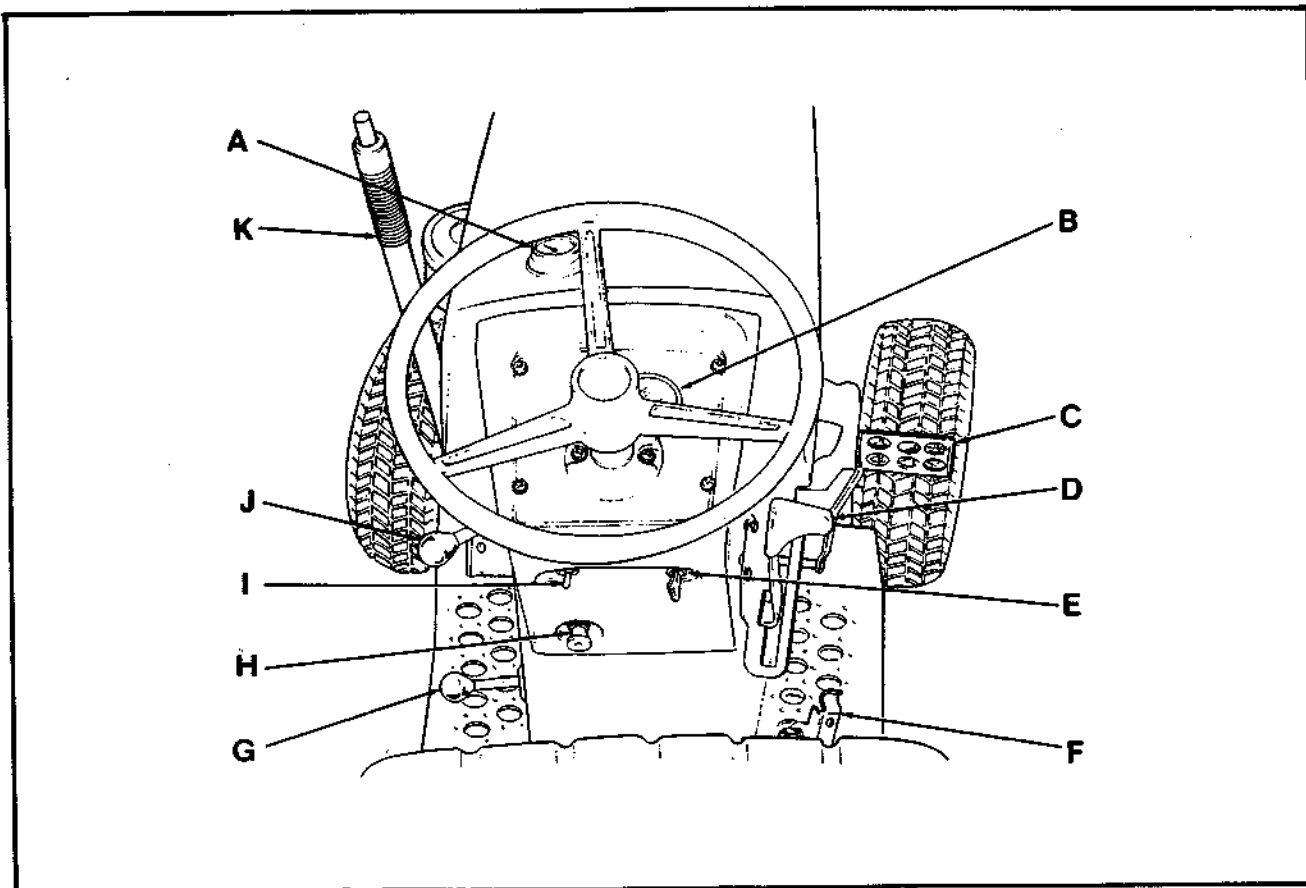


FIGURE 1- Hydrostatic Controls

ITEM	NAME	FUNCTION
A	Gasoline Gauge	Shows gasoline level and serves as tank cap.
B	Ammeter	Shows when battery is being charged or discharged.
C	Clutch-Brake Pedal	Disengages clutch when depressed at least halfway. Applies brake when depressed fully.
D	Hydrostatic Control Lever	Controls tractor speed and direction of travel (forward or reverse)
E	Ignition Switch	Operates with key to start, run or stop engine.
F	Parking Brake Lever	Locks brake to hold tractor in parked position.
G	PTO Lever	Engages and disengages power to attachments.
H	Choke Knob	When pulled out, closes engine choke for cold weather starting.
I	Light Switch	Switches headlights on or off.
J	Engine Speed Control	Controls engine speed.
K	Lift Lever	Lifts and holds attachments in transport position.

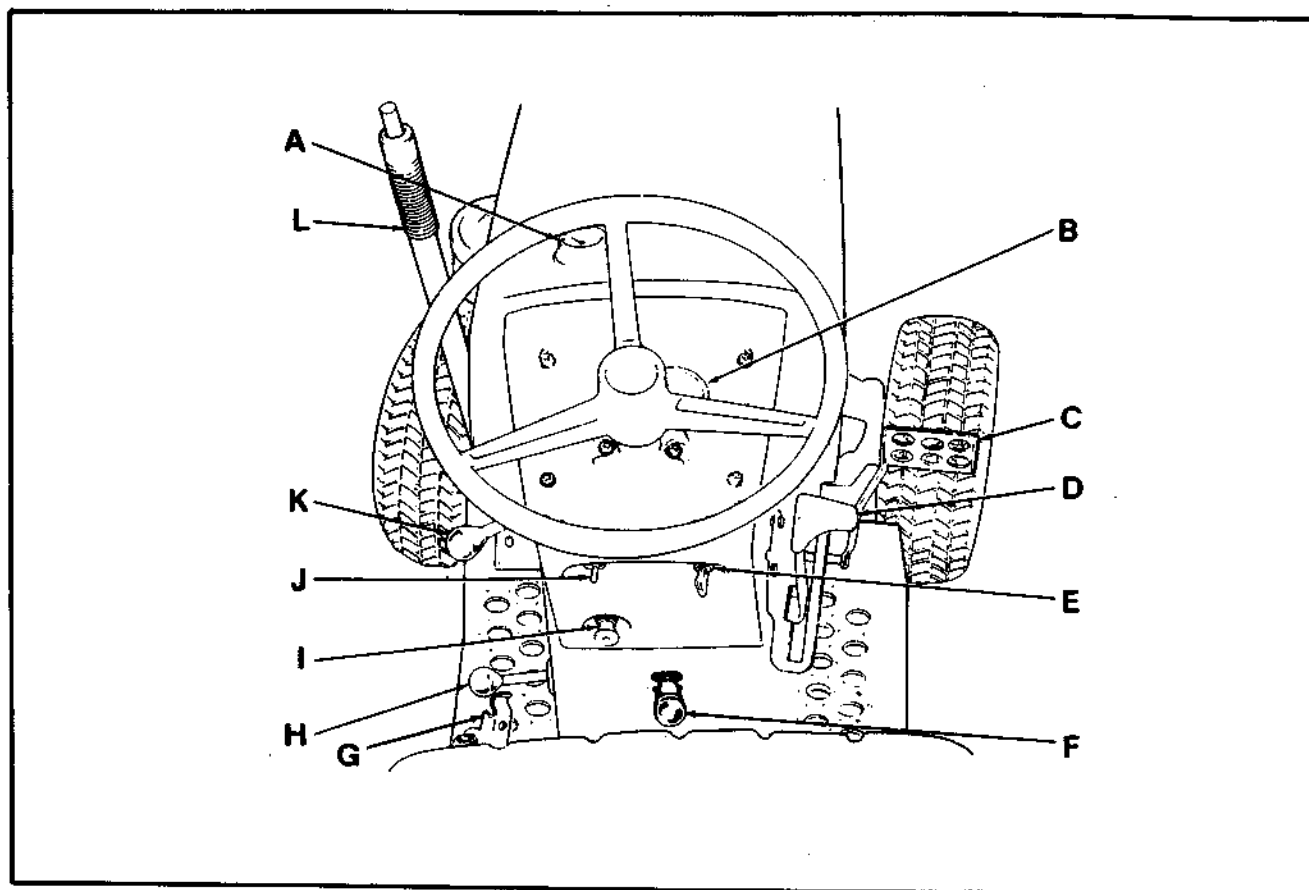


FIGURE 2 - Shuttle Controls

ITEM	NAME	FUNCTION
A	Gasoline Gauge	Shows gasoline level and serves as tank cap.
B	Ammeter	Shows when battery is being charged or discharged.
C	Clutch-Brake Pedal	Disengages clutch when depressed at least halfway. Applies brake when depressed fully.
D	Shuttle Control Lever	Controls direction of travel (forward or reverse).
E	Ignition Switch	Operates with key to start, run or stop engine.
F	Gear Shift Lever	Shifts transmission gears.
G	Parking Brake Lever	Locks brake to hold tractor in parked position.
H	PTO Lever	Engages and disengages power to attachments.
I	Choke Knob	When pulled out, closes engine choke for cold weather starting.
J	Light Switch	Switches headlights on or off.
K	Engine Speed Control	Controls engine speed
L	Lift Lever	Lifts and holds attachments in transport position.

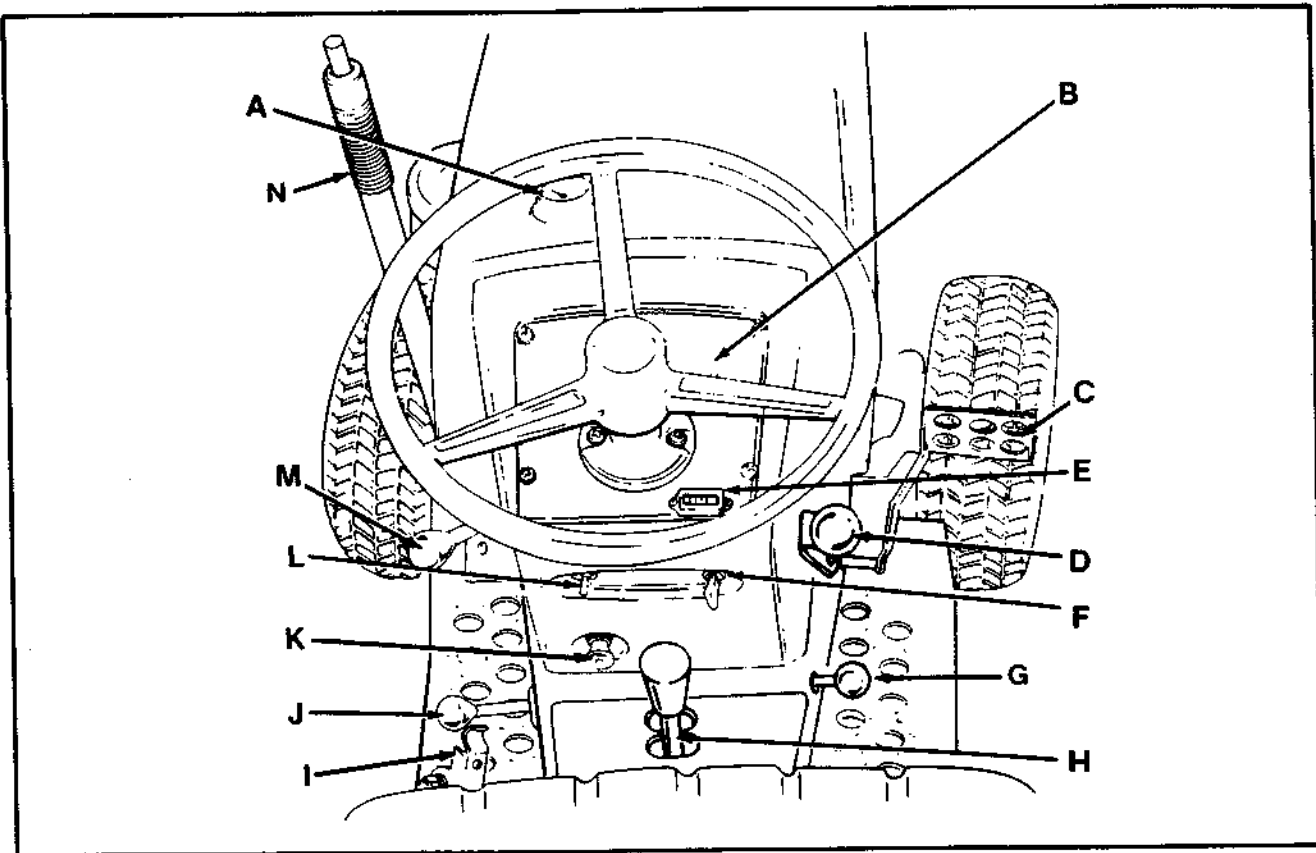


FIGURE 3 - Six Speed Controls

ITEM	NAME	FUNCTION
A	Gasoline Gauge	Shows gasoline level and serves as tank cap.
B	Ammeter	Shows when battery is being charged or discharged.
C	Clutch-Brake Pedal	Disengages clutch when depressed at least halfway. Applies brake when depressed fully.
D	Speed Range Lever	Controls tractor speed. Clutch pedal must be depressed to shift lever.
E	Hourmeter (Optional)	Records operating hours of tractor.
F	Ignition Switch	Operates with key to start, run or stop engine.
G	Front PTO Lever (Optional)	Engages and disengages power to front attachment.
H	Gear Shift Lever	Shifts transmission gears.
I	Parking Brake Lever	Locks brake to hold tractor in parked position.
J	PTO Lever	Engages and disengages power to center and rear mounted attachments.
K	Choke Knob	When pulled out, closes engine choke for cold weather starting.
L	Light Switch	Switches headlights on or off.
M	Engine Speed Control	Controls engine speed.
N	Lift Lever	Lifts and holds attachments in transport position.

**STARTING & STOPPING – HYDROSTATIC**

1. With engine running, set engine speed control between 1/4 and 1/2.
2. Make sure path in desired direction of travel is clear. Release parking brake.
3. With the clutch engaged (pedal up) and the hydrostatic control lever in neutral, push control lever to the right to clear the neutral notch. Move lever slowly forward to move tractor forward or pull lever back to move tractor rearward.
4. Adjust engine speed control for desired engine speed. Adjust hydrostatic control lever to desired ground speed. See Table 1.


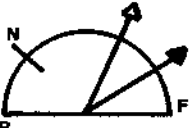

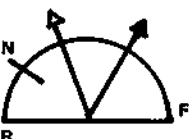
Attachment	Engine Speed Control	Hydrostatic Lever Position
Rotary Mower (Smooth terrain-normal grass)		
Rotary Mower (Rough terrain-heavy or wet grass)		

TABLE 1 - Hydrostatic Operation Chart

5. To stop tractor motion, move hydrostatic control lever to the neutral position notch. For a faster stop, depress the clutch-brake pedal fully.
6. Before leaving tractor, disengage PTO and stop tractor motion. Set engine speed control to SLOW. Set parking brake and lower attachment. Turn key to off and remove it.

**STARTING & STOPPING – SHUTTLE**

1. With engine running, set engine speed control between 1/4 and 1/2.
2. With clutch engaged (pedal up) and shuttle control lever in neutral, place gear shift lever in desired gear. See Table 2.


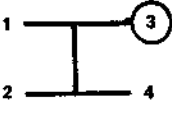

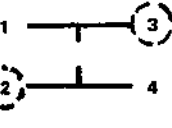
Attachment	Engine Speed Control	Transmission Gear Selection
Rotary Mower (Smooth terrain-normal grass)		
Rotary Mower (Rough terrain-heavy or wet grass)		

TABLE 2 - Shuttle Operation Chart

3. Make sure path in desired direction of travel is clear. Release parking brake.
4. Slowly move the shuttle control lever forward to move forward or back to move in reverse. The tractor can be "creeped" by holding lever part way toward locked drive position, but doing this for a long period of time will cause drive clutch wear. For normal driving lock the lever all the way in drive position.
5. Adjust engine speed control to desired engine speed. See Table 2.
6. To shift gears, tractor motion must be completely stopped.
7. To stop, move the shuttle control lever smoothly from drive position to neutral position and then partway into opposite direction range until tractor stops. When tractor stops, move lever into neutral. The tractor can also be stopped gradually by pressing the pedal down halfway. For a faster stop, depress the clutch-brake pedal fully.
8. Before leaving tractor, disengage PTO and place shuttle control lever in neutral. Set engine speed control to SLOW. Set parking brake and lower attachment. Turn key to OFF and remove it.

## OPERATION

### STARTING & STOPPING – SIX SPEED

1. With engine running, set engine speed control between 1/3 and 1/2.
2. With the clutch-brake pedal fully depressed, use gear shift lever to select desired gear. See Table 3. Move the speed range lever forward for high range or back for low range.

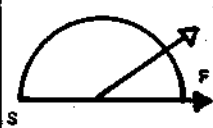

Attachment	Engine Speed Control	Speed Range	Trans. Gear
Rotary Mower (Smooth terrain-normal grass)		LO	3
		HI	2
Rotary Mower (Rough terrain-heavy or wet grass)		LO	2
		HI	1

TABLE 3 - Six Speed Operation Chart

### OPERATION ON SLOPES

For your personal safety, always operate your tractor up and down the face of slopes, and never across the face. Never attempt to operate on steep slopes. Be sure to use slow tractor ground speeds on slopes, and use extreme caution when changing direction on any slope. Do not start or stop suddenly on slopes. Avoid using brake to control downhill speed. Select a low transmission and engine speed before starting downhill.

Also, use tractor wheel weights where required or recommended for added stability and handling on slopes. See your attachment Operator's Manual for wheel weight and slope information when operating with attachments.



**WARNING:** Use two rear wheel weights (one per wheel) when operating your tractor on slopes over 20 percent (11.3°). Never operate on slopes greater than 35 percent (19.3°), which is a rise of 3 feet (914 mm) in 10 feet (3048 mm) forward. Always operate in an up and down direction.

3. Make sure path in desired direction of travel is clear. Release parking brake.
4. Release clutch-brake pedal slowly to start tractor into motion.
5. Adjust engine speed control to desired engine speed.
6. To shift gears, the tractor must be completely stopped and clutch-brake pedal completely depressed.
7. To stop, depress clutch-brake pedal until tractor stops. Pressing pedal down about halfway will give a gradual stop. Pressing pedal down farther will give a more rapid stop.
8. Before leaving tractor, disengage PTO and stop tractor motion. Set engine control to SLOW. Lower the attachment and set parking brake. Shift to neutral. Turn key to OFF and remove it.



**NORMAL CARE SCHEDULE**

Refer to the engine section for normal care of engine. See Table 4 for a schedule of normal care for tractor and mower.

SCHEDULE				
Care Required	See Page	Every 5 Hours	Every 25 Hours	Every 100 Hours or Yearly
Check for loose hardware.	---	•		
Replace fuel filter (if equipped).	---			•
Lubricate tractor.	14		•	
Check fluid levels & tire pressures.	14		•	
Check transmission fluid.	15			•
Clean trans. screen (hydro only).	16	•		
Repack planetary assembly (Shuttle only)	17			•
Clean battery & cables.	15		•	
Clean engine cooling fins.	---	•		
Repack front wheel bearings.	15			•
Lubricate mower idler pulley pivot.	18			•
Clean, sharpen & balance blades.	18			•
<b>SEE ENGINE SECTION FOR ENGINE CARE</b>				

**TABLE 4 - Normal Care Schedule - Tractor & Mower**

## NORMAL CARE

### LUBRICATE TRACTOR

1. There are six grease fittings on the tractor. Wipe fittings clean before greasing. Use a standard grease gun with general purpose automotive grease.
  - a. Two fittings on front axle (right hand shown) (Figure 4).

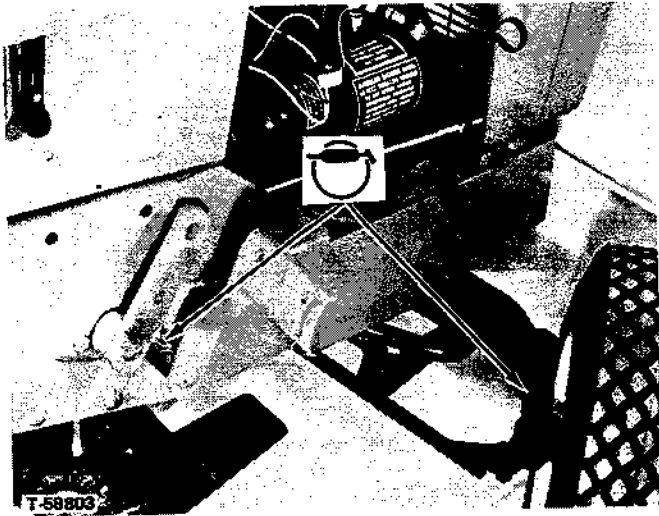


FIGURE 4 - Grease Fittings

- b. One fitting on clutch-brake pedal (Figure 4);
- c. One fitting on steering gear under tractor (Figure 5);

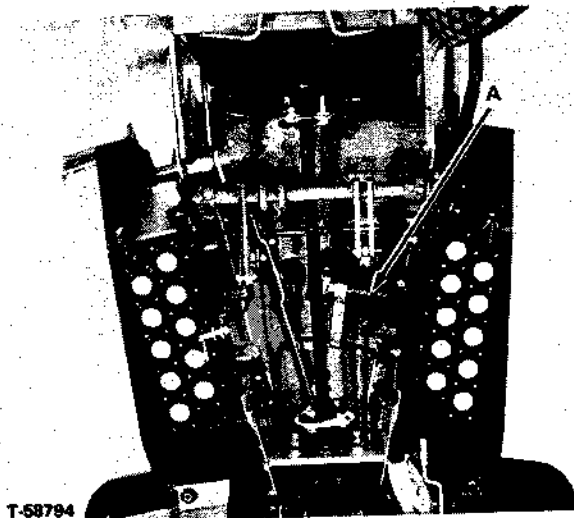


FIGURE 5 - Grease Fittings

A. Grease Fitting

- d. Two fittings on the right hand rear axle (Figure 6);

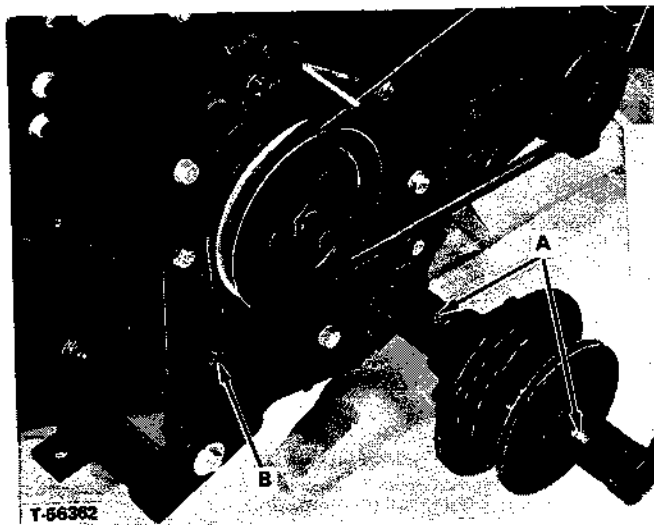


FIGURE 6 - Grease Fittings

A. Grease Fittings  
B. Oil Lever/Fill Plug

2. A few drops of engine oil should be placed on the numerous pivot points and moving parts of the tractor and mower. Keep oil off belts and pulleys to prevent belt damage. Place oil at all points where metal parts rub together, such as rods and rod guides, levers, etc.

### CHECK FLUID LEVELS & TIRE PRESSURES

1. Check the bevel gear box fluid level. Remove the fill plug (A, Figure 7) and wipe oil off attached pin. Insert the fill plug loosely in hole (do not screw in). In this position the fluid should just touch the bottom of the pin. If not, add Allis-Chalmers Power Fluid 821. Do not overfill. A drain plug (C) is located on rear cover.

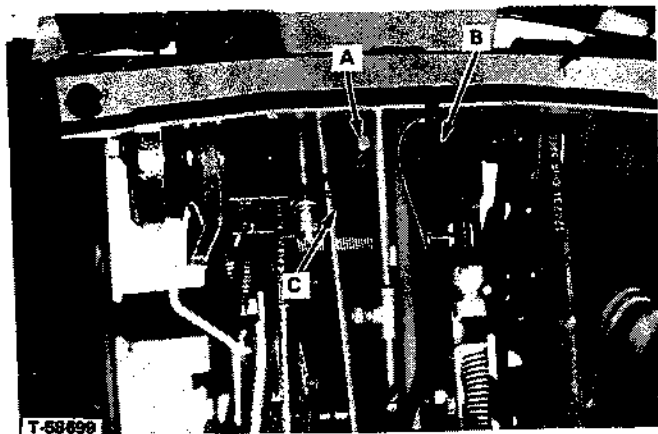


FIGURE 7 - Bevel Gear Box

A. Oil Fill/Check Plug  
B. Bevel Gear Box  
C. Drain Plug

2. Check battery fluid level. The fluid should be even with the split ring full mark. If not, add distilled water. When removing the battery, always disconnect the negative (-) terminal first.
3. Check the air pressure of all four tires. Front tire pressure should be 14 PSI (97 kPa). Rear tire pressure should be 7 PSI (48 kPa).

### CLEAN BATTERY & CABLES

Disconnect negative cable first. Clean battery and cables with baking soda and water. Clean terminals and clamps with a wire brush and coat with grease or petroleum jelly. Connect negative cable last.

### REPACK FRONT WHEEL BEARINGS

1. Block or jack up front of tractor for wheel removal.
2. Pry off grease cup with a screwdriver or a claw hammer (Figure 8).
3. Loosen collar setscrew using an Allen wrench.
4. Remove collar, washer and outer bearing.

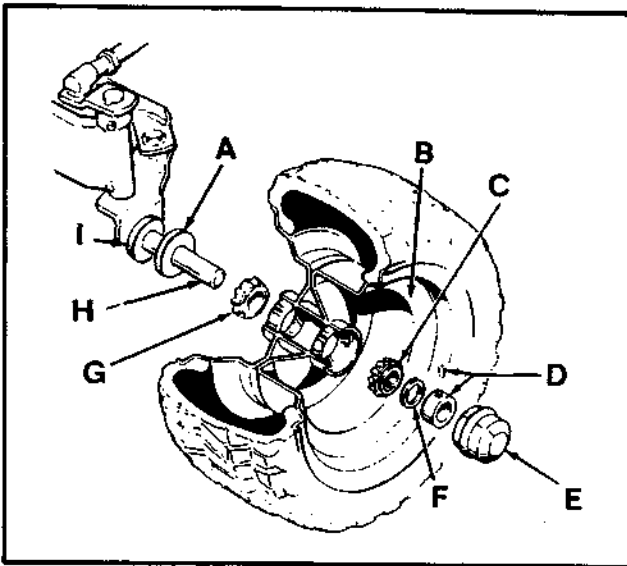


FIGURE 8 - Repack Front Wheel Bearings

- A. Seal
- B. Wheel
- C. Outer Bearing
- D. Collar & Setscrew
- E. Grease Cup
- F. Washer
- G. Inner Bearing
- H. Spindle
- I. Spacer

**NOTE:** Keep the two bearings separated. Each should be put back in its original place.

5. Remove wheel and inner bearing.
6. Wash wheel shaft, bearings and internal part of wheel. Use a solvent and remove all old grease. Wipe dry.
7. Inspect seal. If seal is damaged, replace it.  
**NOTE:** Use only a prime quality wheel bearing grease. Keep grease clean and free of dirt.
8. Coat seal and spindle with grease.
9. Lubricate bearings completely with grease. Use hand to force grease and fill spaces between bearing rollers.
10. Install inner bearing.
11. Install outer bearing, washer and collar.
12. Press collar towards tractor and spin wheel slowly to seat bearing.
13. When wheel and bearings are seated and against seal, hold collar and tighten setscrew securely.
14. Test seating by attempting to wobble wheel. If wobble is more than just evident, loosen setscrew and repeat steps 13 and 14.
15. Replace grease cup and wipe up any excess grease.
16. Repeat entire procedure for other wheel.

### CHECK TRANSMISSION FLUID - SIX SPEED & SHUTTLE

Oil level should be maintained up to the bottom of the oil level/fill plug (Figure 8A). Fill with Allis-Chalmers Power Fluid 821.

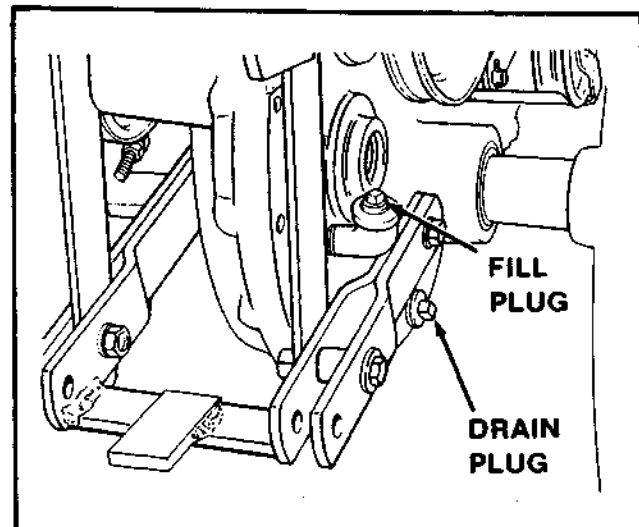


FIGURE 8A - Transmission Fluid Check Six Speed & Shuttle

## NORMAL CARE

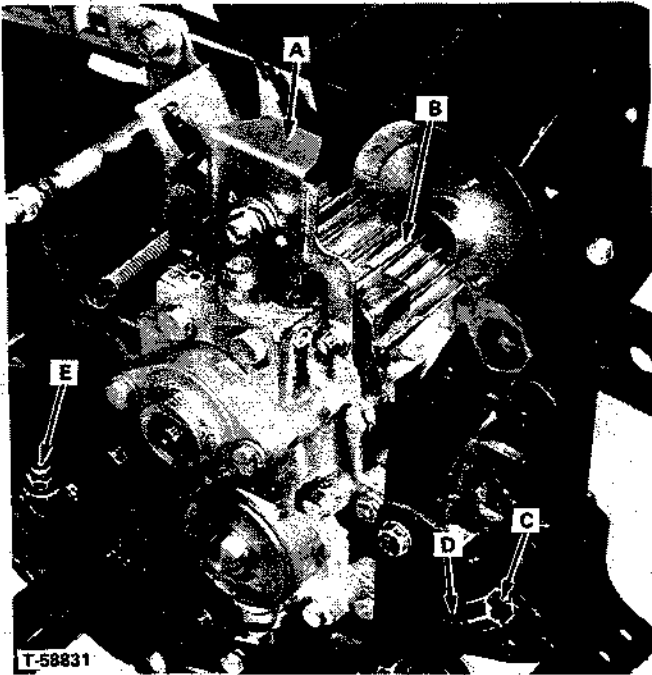


FIGURE 9 - Hydrostatic Transmission

- A. Free Wheeling Latch
- B. Cooling Fins
- C. Fill Cap
- D. Fill Tube
- E. Relief Valve

### CHECK TRANSMISSION FLUID — HYDROSTATIC

1. The tractor must be on a level surface and the free wheeling latch (A, Figure 9) must be completely down.
2. Wipe the transmission fill cap (C) and fill tube (D) clean. Remove the cap (C).
3. Lift and hold the relief valve (E) open.
4. Fluid should be at top of filler pipe. If not, add Allis-Chalmers Power Fluid 821.

### CHANGE TRANSMISSION FLUID & FILTER — HYDROSTATIC

**NOTE:** The filter is visible from bottom of tractor. Replace the filter every 400 hours of operation or whenever changing transmission fluid. Transmission fluid should be changed only when performing repair work on transmission or hydrostatic unit or if it becomes discolored from overheating.

1. With hydrostatic transmission fluid hot, park tractor on level ground, place hydrostatic control lever in neutral, place any PTO clutch levers in the disengaged position, engage parking brake, and stop engine. Press free wheeling latch (Figure 9) down firmly to disengage the hydrostatic pump.

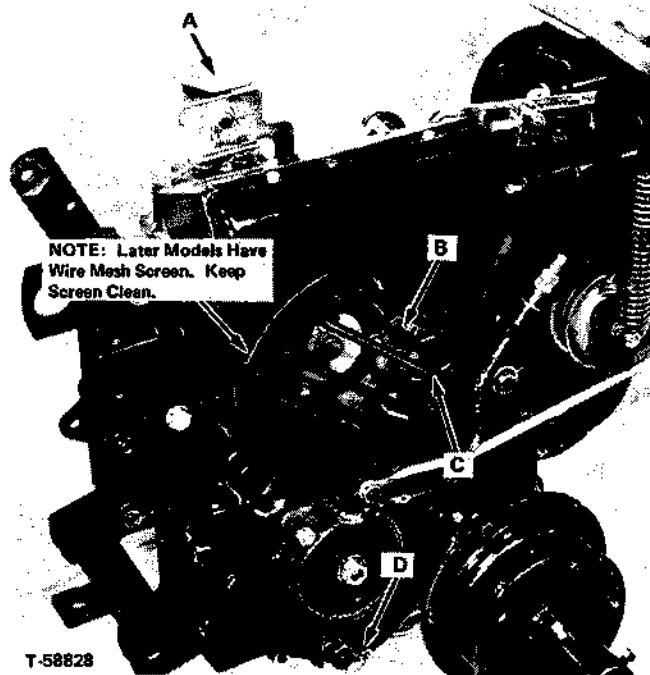


FIGURE 10 - Hydrostatic Transmission

- A. Free Wheeling Latch
- B. Cooling Fan
- C. Cooling Fan Screen (Later Models Have Wire Mesh Screen Not Shown Here)
- D. Drain Plug

2. Remove hydrostatic transmission drain plug (D, Figure 10) from lower R.H. side. Remove dirt from around the fill cap (C, Figure 9) and loosen cap to permit air to enter transmission.
3. Clean dirt from the hydrostatic transmission filter and filter holder into which it is mounted and remove and discard filter.
4. When fluid has drained out of transmission, install new hydrostatic transmission filter in the following way:

Fill the filter with fluid. Coat gasket with transmission fluid, screw filter on until gasket contacts base, then tighten 1/2 to 3/4 turn more. Use no tools. Turn by hand only. Install and tighten drain plug securely.

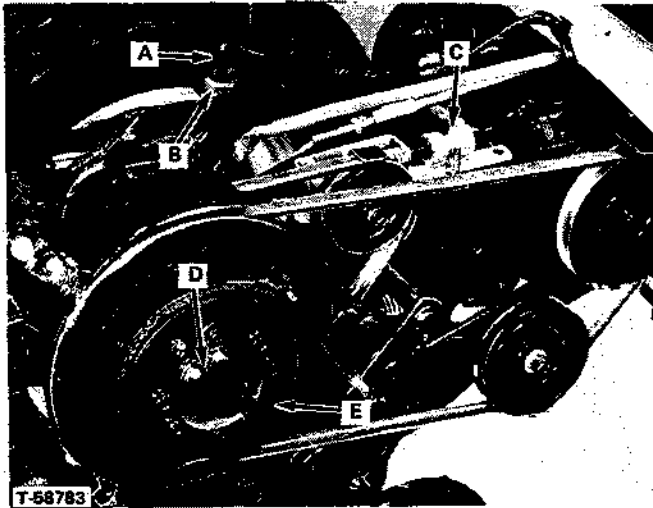
5. Remove the fill cap (C, Figure 9) and clean dirt away from the relief valve (E). Using a clean funnel, add Allis-Chalmers Power Fluid 821 into the fill tube, while holding the relief valve up until fill tube will accept no more fluid. Replace the fill cap hand tight.

**NOTE:** Vent rod must be held fully up for the entire time that fluid is being added.

6. Start engine and set it at idle speed, or slightly above.



**CAUTION:** Make sure that free wheeling latch is firmly down and that parking brake is fully engaged before starting the engine.



**FIGURE 11 - Shuttle Planetary Gear**

- A. Interlock Safety Switch
- B. Switch Actuating Bolt
- C. Brake Detent
- D. Cover Cap
- E. Planetary Gear

7. Let engine run at least five minutes, then stop engine and immediately lift relief valve and remove fill tube cap. While relief valve is up, pour more fluid into the transmission fill tube until level reaches the "run-over" point of the tube. Then install and tighten the fill tube cap. Total fluid installed should be three quarts or more. Be extremely careful to keep all dust and dirt out of transmission while changing oil and filter. Check filter and drain plug for leaks.

**REPACK PLANETARY GEAR ASSEMBLY – SHUTTLE**

1. With tractor engine stopped, key removed, and parking brake set, pry off cover cap (D, Figure 11) carefully with a screwdriver.
2. Work No. 2 Lithium grease into planetary assembly with hand. Be sure no dirt enters the grease or planetary assembly. Also fill the cap half full with grease.
3. Replace the cap and tap it in place.
4. Apply a small amount of grease to the pin groove of the shuttle drive brake detent (C) and to the head of the bolt (B) that actuates the interlock safety switch (A).

**STORAGE (TWO MONTHS OR MORE)**

1. Prepare the mower for storage as follows:
  - a. Remove mower from tractor.
  - b. Clean underside of mower.
  - c. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
  - d. Clean, sharpen and balance the blades.
2. Either add a gasoline stabilizer to the tank or drain the tank. Drain tank as follows:
  - a. Disconnect the fuel line from the carburetor or fuel pump. Drain fuel. Reconnect fuel line and put about 1/2 cup gasoline back into tank. Wipe up any spills.
  - b. Start engine and allow it to run until all gasoline is used up and engine stops.

Drain crankcase oil while engine is hot and refill with a grade of oil that will be required when tractor is used again.

3. Remove spark plug. Pour one ounce of 10W-30 oil into engine through spark plug hole. Crank engine a few times to distribute oil and then reinstall the spark plug.
4. Clean any dirt or grass from cylinder head cooling fins and engine housing and clean air cleaner element.
5. Cover air cleaner and exhaust outlet tightly with plastic or other water proof material to keep moisture, dirt and insects out of the engine.
6. Completely lubricate tractor as outlined in earlier part of this section.
7. Clean up tractor and apply paint or rust preventive to any areas where paint is chipped or damaged.
8. Be sure the battery is filled to the proper level with water and is fully charged. Battery life will be increased if it is removed and put in a cool, dry place and fully charged about once a month.
9. If the tractor is to be stored 6 months or longer block the tractor up off the wheels to relieve weight and keep the tires off a damp floor. Protect the tires from prolonged exposure to direct sunlight.
10. Store the tractor in a dry place indoors.

## NORMAL CARE

### STARTING AFTER STORAGE

Before starting the tractor after it has been stored, do the following:

1. Remove the blocks from under the tractor.
2. Replace the battery.
3. Unplug the exhaust outlet.
4. Remove spark plug and wipe it dry. Crank the engine a few times to blow excess oil out of the plug hole. Reinstall plug.
5. Fill fuel tank with fresh regular grade gasoline.
6. Check crankcase oil level, and add proper oil if necessary.
7. Inflate tires to proper operating pressure. Check fluid levels.
8. Start the engine and let it run slowly. **DO NOT** run at high speed immediately after starting. Be sure to run engine only out of doors or in well ventilated area.

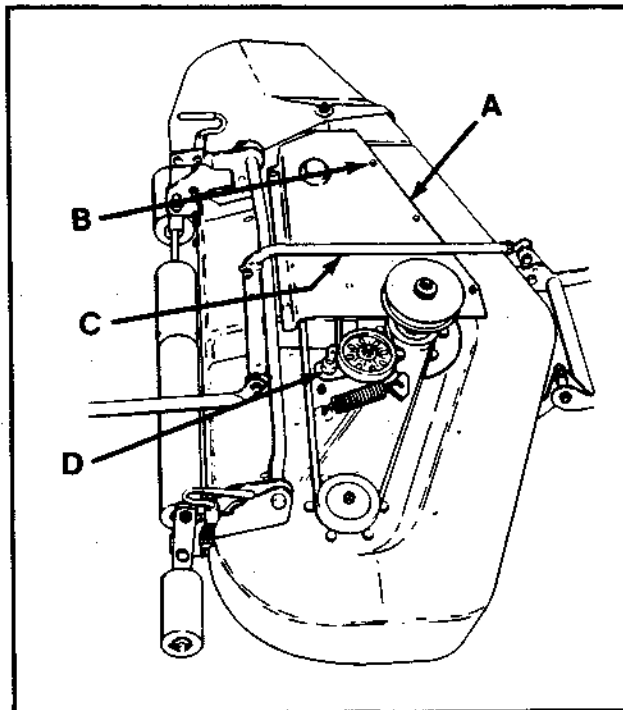


FIGURE 12 - Idler Pulley Pivot

### LUBRICATE MOWER IDLER PULLY PIVOT

1. Remove mower from tractor.
2. Remove cotter pins to fold back the adjusting rods (42" mower) or lift the bail assembly (48" mower).
3. Remove the tap screws to remove the right hand cover (both covers can be removed to check/clean inside of mower deck). See Figure 12.
4. Apply a few drops of oil to idler pulley pivot. Be sure idler pivots freely.
5. Reinstall cover and tap screw.
6. Reinstall adjusting rods or bail assembly and secure with cotter pins. Be sure to spread legs of cotter pins.

- A. Cover
- B. Tapites
- C. Level Adjusting Rod
- D. Idler Pulley Pivot

### CLEAN, SHARPEN & BALANCE BLADES

1. Remove mower from tractor.
2. Check each of the three blades. Blades should be sharp and free of nicks and dents. If not, sharpen blades as described in remaining steps.

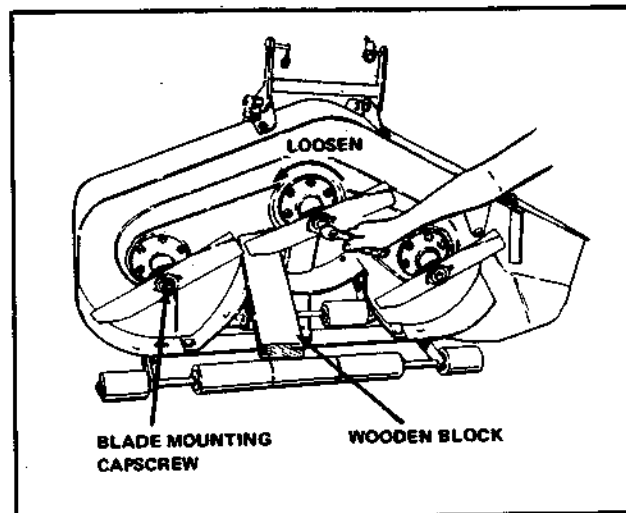


FIGURE 13 - Loosen Blade



**WARNING:** For your personal safety, do not handle the sharp mower blades with bare hands. Careless or improper handling of blades may result in serious injury.

3. To remove blade for sharpening, use wooden block to hold blade while removing its blade mounting cap screw (Figure 13).

4. Use a file to sharpen blade to fine edge. Remove all nicks and dents in blade edge. If blade is severely damaged, it should be replaced.
5. Balance the blade as shown in Figure 14. Center the blade's center hole on a nail lubricated with a drop of oil. A balanced blade will remain level.

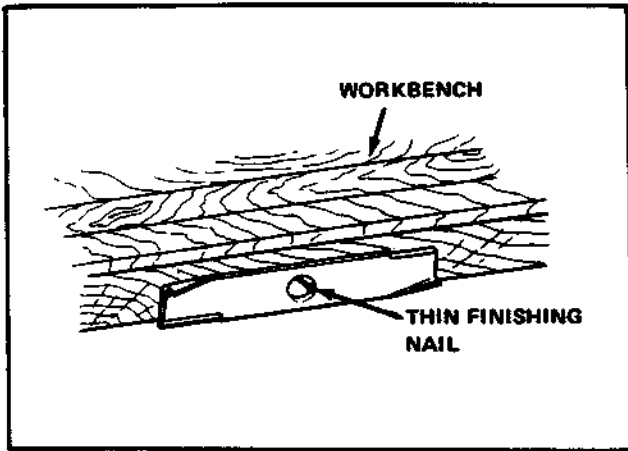
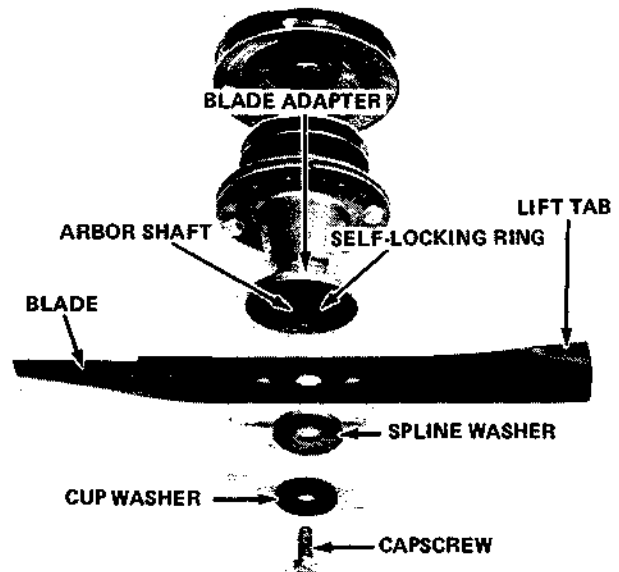


FIGURE 14 - Balance Blade



**WARNING:** For your personal safety, blade mounting capscrews must be installed with the cup washer and spline washer and then securely tightened. Torque blade mounting capscrews to 50 ft.-lbs. (68 N · m).



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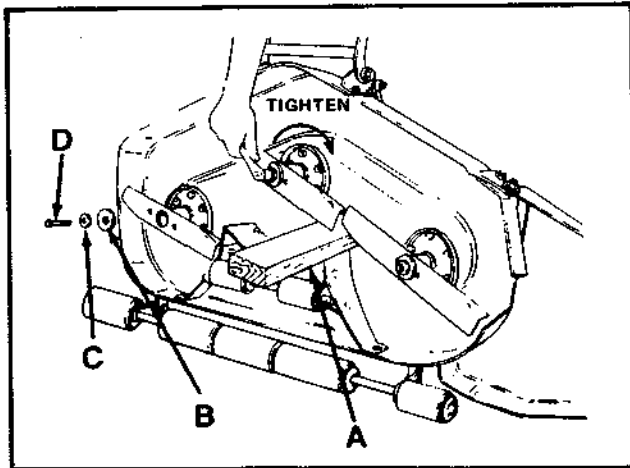


FIGURE 15 - Install Blade

- A. Wooden Block
- B. Spline Washer
- C. Cup Washer
- D. Capscrew

6. Carefully clean the blades and arbors. Before installing the blade, be sure that the self-locking ring is pushed up tight against the blade adaptor. Install the new or sharpened blade with the lift tabs toward the top on the arbor shaft. Install the spline washer, making sure that it is engaged on the splines of the arbor shaft. Install the cup washer with the concave side toward the blade and tighten the capscrew securely. Use a block or wedge to keep the blade from turning while tightening the capscrew.

**NOTE:** The mower blade retaining capscrews should be torqued to 50 ft.-lbs. (68 N · m).

Rotate the blades slowly by hand to see that they clear the housing all around and that the blade tips are running true.

## SERVICE TIPS

### SERVICE TIPS

For difficulties not covered in this manual contact your dealer.



**WARNING:** To avoid serious injury, perform maintenance on the tractor only when the engine is stopped. Always remove the ignition key before beginning the maintenance to prevent accidental starting of the engine.

- 
- |                           |  |
|---------------------------|--|
| 1. Engine does not crank. | A. <b>Shuttle or Six Speed</b> - Gear shift lever not in neutral.<br><b>Hydrostatic</b> - Transmission control lever not in neutral. |
|                           | B. PTO lever(s) not disengaged.  |
|                           | C. Circuit breaker tripped. Wait one minute for automatic reset. If defective, see your dealer.                                      |
|                           | D. Wiring loose or broken. Replace broken wires and tighten connections.   |
|                           | E. Battery discharged or terminals corroded. Clean terminals or have battery charged.  |
|                           | F. Faulty electrical system.   |
- 
- |                                      |  |
|--------------------------------------|--|
| 2. Engine cranks but does not start. | A. Out of gasoline.  |
|                                      | B. Engine flooded. Push in choke and attempt to start.                         |
|                                      | C. Crankcase oil too heavy. See Engine Section.                                |
|                                      | D. Water in gasoline or gasoline is stale. Drain and fill with fresh gasoline. |
|                                      | E. Faulty engine electrical or fuel system. See Engine Section or your dealer. |
- 
- |   |  |
|---|--|
| 3. Engine hard to start or runs poorly. | A. Fuel mixture too rich. Push in choke. Clean air filter.                                     |
|   | B. Carburetor adjusted incorrectly or engine needs tune up. See Engine Section or your dealer. |
|   | C. Water in gasoline. Drain and fill with fresh gasoline.                                      |
- 
- |                   |   |
|-------------------|---|
| 4. Engine knocks. | A. Oil level low. Add oil as required.                            |
|                   | B. Wrong grade of oil. See oil specifications.                    |
|                   | C. Wrong grade of gasoline. Use fresh, regular grade of gasoline. |
- 
- |                               |   |
|-------------------------------|---|
| 5. Excessive oil consumption. | A. Engine running too hot. Clean engine cooling fins and blower screen. |
|                               | B. Wrong weight of oil. See oil specifications.                         |
|                               | C. Too much oil in crankcase. Drain excess oil.                         |
- 
- |                            |  |
|----------------------------|--|
| 6. Exhaust black or smoky. | A. Dirty air filter. Clean or replace.                             |
|                            | B. Choke not open. Push in choke and be sure choke plate opens.    |
|                            | C. Carburetor adjustment wrong. See Engine section or your dealer. |
- 
- |                    |   |
|--------------------|---|
| 7. Shuttle Tractor | Tractor creeps forward or backward with shuttle control lever in neutral<br>Perform shuttle neutral adjustment. |
|--------------------|---|
- 
- |                        |  |
|------------------------|--|
| 8. Hydrostatic Tractor | Tractor creeps forward or backward with hydrostatic control lever in neutral position. Perform hydrostatic neutral adjustment. |
|------------------------|--|
-



### 6. Clutch Rod Clearance Adjustment.

- Shift the speed range lever to HI, and release the clutch.
- Pull back firmly on the clutch rod (C, Figure 35). There should be a 3/8" (9.5 mm) gap between the clutch rod guide (A) and the clutch rod adjusting nut (B).

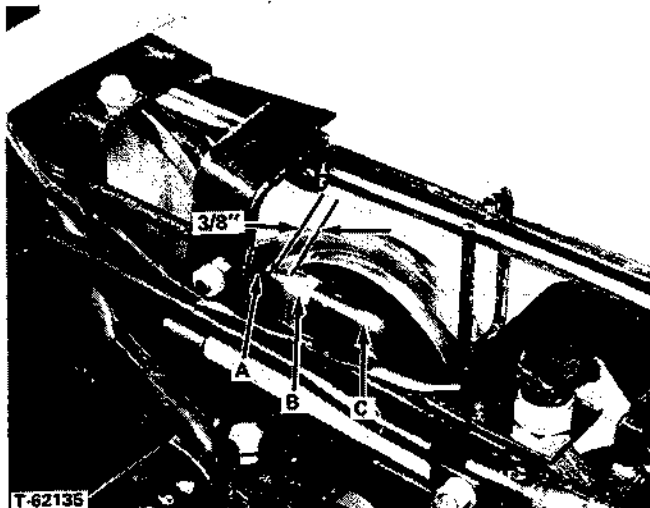


FIGURE 35 - Clutch Rod Clearance Adjustment

- Rod Guide
- Adjusting Nut
- Clutch-Brake Rod

- If the clearance is not 3/8" (9.5 mm) loosen the locking nut from the adjusting nut, and turn the adjusting nut in or out to obtain the 3/8" (9.5 mm) gap.
- When the proper gap is reached, hold the adjusting nut with a wrench and tighten the locking nut to it firmly.

### 7. Pulley Brake Adjustment

- The pulley brake return spring (C, Figure 36) should be compressed enough so that it measures 1-3/8" (34 mm) with the clutch-brake pedal released (up). If it does not, turn the nut (D) to obtain the proper measurement.
- After adjusting the pulley brake return spring, press the clutch-brake pedal down fully to engage the brake.
- While holding the clutch-brake pedal down fully, measure the length of the spring (A) on the pulley brake rod. It should be compressed to 1-3/4" (45 mm). If it is not 1-3/4" (45 mm) loosen the adjusting nut (B) and move it forward or back until the proper measurement is reached.

Then hold adjusting nut and tighten the locking nut firmly to it.

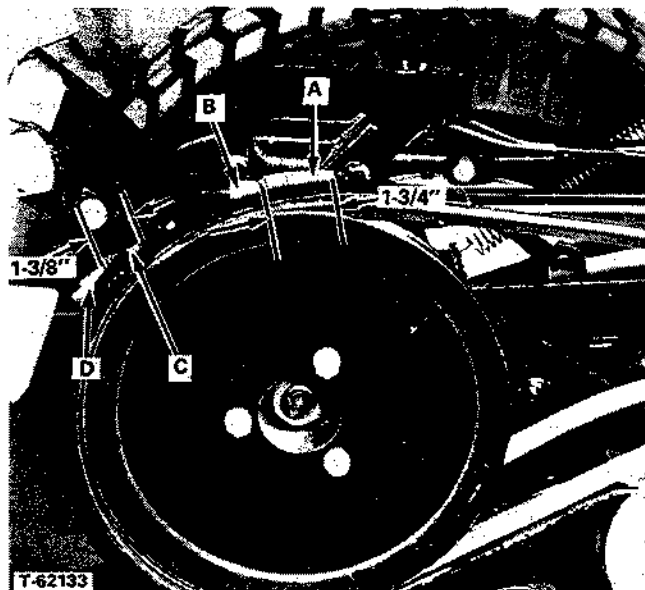


FIGURE 36 - Pulley Brake Adjustment

- Spring, Pulley Brake Rod
- Adjusting Nut
- Rear Spring
- Locknut

## MOWER INSTALLATION & REMOVAL

### MOWER INSTALLATION & REMOVAL

#### MOWER INSTALLATION

To prepare for installation, place the mower on a flat, hard working surface such as a concrete or blacktop drive. Park your tractor to the right of the mower, and position the tractor front wheels for a sharp right hand turn. Then proceed as follows to install the mower.



**WARNING:** For your personal safety, stop tractor engine, remove key, shift into neutral, set parking brake, and disengage Power-Take-Off (PTO) before installing the mower on your tractor.

1. Slide the mower under the tractor.
2. Turn the front wheels to face straight ahead.
3. Using the tractor lift lever or optional electric lift, lower the tractor lift cable.
4. Use the lift cable pin and spring clip to attach the tractor lift cable clevis to the mower lift anchor. (E, Figure 37).

**NOTE:** The front idler pulley (L, Figure 37) should be in the top mounting hole for mower installation.

5. Raise the mower using the tractor lift lever or electric lift.
6. Lift the front of the mower and attach the mower hitch to the tractor front hitch using the pins and safety clips provided with the mower. The pins are installed from the outside, and it is usually easier to install the left hand side pin first.



**WARNING:** For your personal safety, be sure to remove tractor ignition key after using it to operate the optional electric lift. Accidental starting is possible if the key is left in the ignition.

7. Lower the mower fully.
  8. Push the belt tensioning lever (C, Figure 37) fully down and forward.
  9. Raise the tractor seat to gain access to the PTO pulley.
  10. Install the mower drive belt provided on the mower pulley and the tractor pulleys. The belt must be seated in the inner groove of the PTO pulley. Make sure that flat side of the belt contacts the front idler pulley (L).
  11. Pull the belt tensioning lever fully back and up to put tension on the mower drive belt.
  12. Notice that the rear idler pulley (M) is mounted in a slot. The pulley can be moved forward or back to increase or decrease belt tension. For initial setting proceed as follows. With the pulley tensioning lever pulled fully up and back, measure the clearance between the front idler bracket and the stop. See diagram in Figure 37A. The clearance should be approximately 7/8" (22 mm). If not, push the belt tensioning lever down. Change position of the rear idler pulley in the slot. Recheck the measurement with belt tensioning lever pulled up and back.
- NOTE:** Front idler bracket should operate in green range of decal on stop when properly adjusted.
- Drive the mower for about 15 minutes and recheck the measurement. Change the position of the rear idler pulley. If necessary.
13. Lower the tractor seat.
  14. Level the mower according to the Mower Leveling procedure that follows.

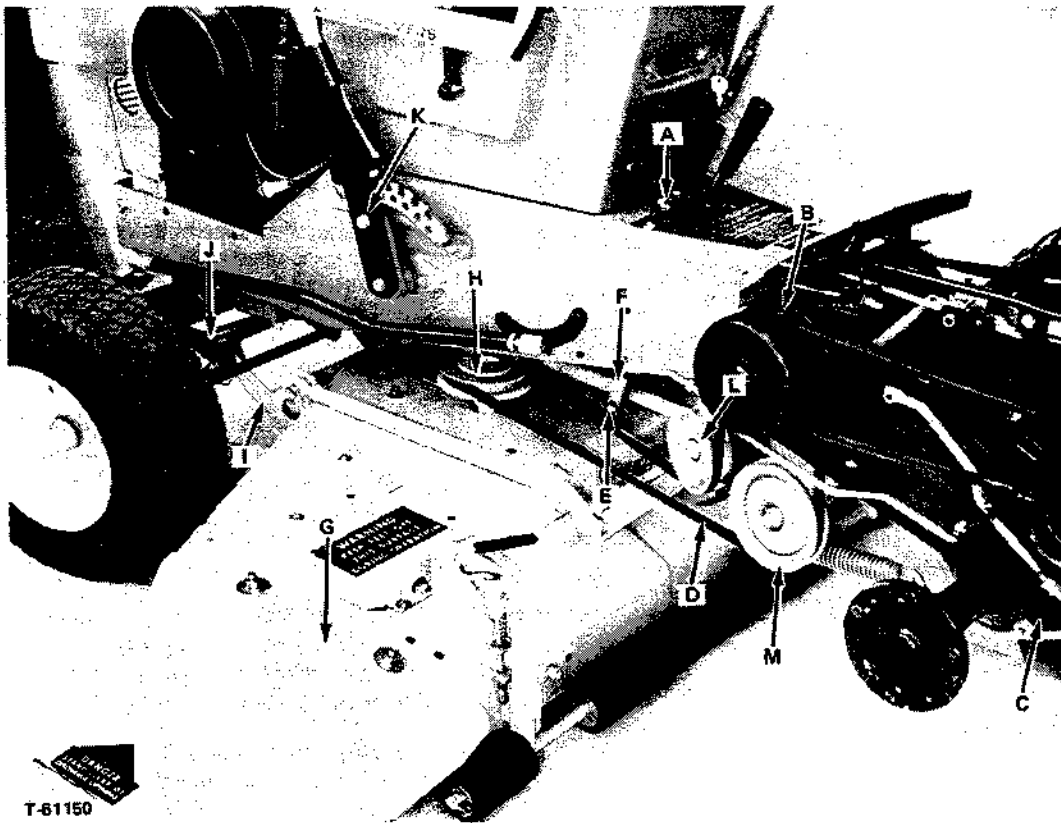


FIGURE 37 - Mower Installation

- |                          |                        |
|--------------------------|------------------------|
| A. PTO Clutch Lever      | H. Mower Driven Pulley |
| B. Tractor Drive Pulley  | I. Rocker Arm          |
| C. Belt Tensioning Lever | J. Tractor Front Hitch |
| D. Drive Belt            | K. Lift Lever          |
| E. Lift Anchor           | L. Front Idler Pulley  |
| F. Lift Cable Clevis     | M. Rear Idler Pulley   |
| G. Deflector             |                        |

**MOWER LEVELING PROCEDURE**

This adjustment is normally required only when installing the mower for the first time or when reinstalling the mower after repairs were made to the tractor or mower hitches which might have affected the level. To level the mower, proceed as follows.

1. Check tractor tire pressures. The front tires should have equal pressure and the rear tires should have equal pressure.
2. Turn both mower height adjustment handles (A, Figure 38) fully clockwise to the highest cutting height position.



**WARNING:** For your personal safety, do not handle the sharp mower blades with bare hands. Careless or improper handling of blades may result in serious injury.

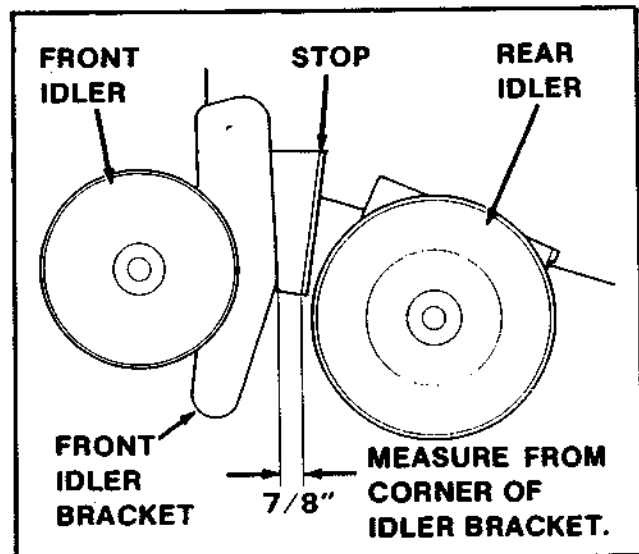


FIGURE 37A

## MOWER INSTALLATION & REMOVAL

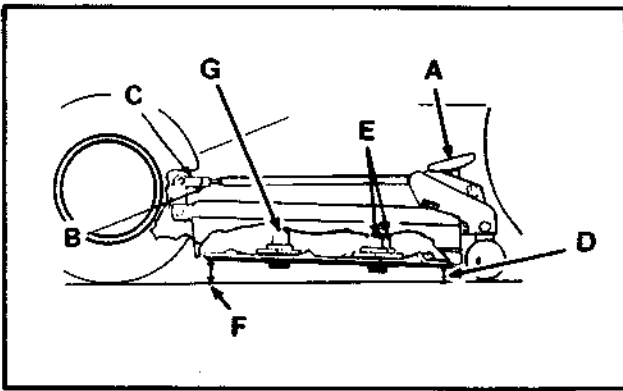


FIGURE 38 - Level Mower

- A. Height Adjustment Handle
- B. Jam Nut
- C. Yoke or Eyebolt
- D. Height of Side Blades
- E. Side Blades
- F. Height of Center Blade
- G. Center Blade

3. Rotate the mower blades so the tips point straight forward and backward as shown in Figure 38.
4. Measure and note the distance from the front tip of the center blade to the ground.
5. Measure the distances from the rear tips of the two side blades to the ground. The side blade measurements should be the same, and the rear measurement should be 1/8 to 1/4" (3 to 6 mm) less than the measurement for the center blade front tip made in step 4.

**NOTE:** If the measurements taken are satisfactory, the mower is level and needs no adjustment. If the measurements are incorrect, the mower bail assembly eyebolts (42" mower) or yokes (48" mower) must be adjusted according to step 6. Both eyebolts or yokes must be adjusted to level the mower front to back. If only slight side-to-side leveling of the two side blades is required, the eyebolt or yoke of only one side need be adjusted.



**WARNING:** To avoid possible injury when performing step 6, block up the front of the mower before removing the eyebolts or yokes so the mower will not drop down.

6. Level the mower according to the following.
  - a. Loosen the jam nuts (B, Figure 38).
  - b. Remove the cotter pins and then disconnect the eyebolts or yokes (C, Figure 38) from the mower hitch.

- c. Turning the eyebolts or yokes changes the length of the bail assembly arms. Shorten the bail assembly arms to decrease the front height of the mower. Lengthen to raise the front height. Be sure to give both eyebolts or yokes an equal number of turns for front to back leveling.
- d. Reinstall the eyebolts or yokes on the hitch (the cotter pins need not be reinstalled yet) to check the blade tip measurements. Continue the adjustment and check until the center blade front tip is 1/8 to 1/4" (3 to 6 mm) higher than the side blade rear tips.
- e. Reinstall the eyebolts or yokes on the hitch and reinstall the cotter pins. Spread the cotter pins around the hitch pins. Then retighten the jam nuts. (B).

## MOWER REMOVAL



**WARNING:** For your personal safety, stop tractor engine, remove key, shift into neutral, set parking brake, and disengage the mower PTO before removing the mower.

1. Park the tractor on a flat, hard surface where there is room to remove the mower at the left side of the tractor.
2. Push the belt tensioning lever (C, Figure 37) fully down and forward to release mower belt tension.
3. Raise the tractor seat deck and remove the mower drive belt from the mower and tractor pulleys (see Figure 37). Close the tractor seat deck.
4. Use the tractor lift lever or electric lift to raise the mower.
5. Remove the safety clips and pins to detach the mower hitch from the tractor hitch. Remove the right hand side pin first. Reinstall the pins and safety clips in the mower hitch for storage.
6. Lower the mower fully.
7. Remove the spring clip and pin to detach the lift cable from the mower. Reinstall the pin and spring clip in the lift cable for storage.
8. Turn tractor wheels for a sharp right hand turn, and slide the mower out the left side of the tractor.
9. Pull the belt tensioning lever fully back and up out of the way to prevent damaging it when using the tractor without the mower.

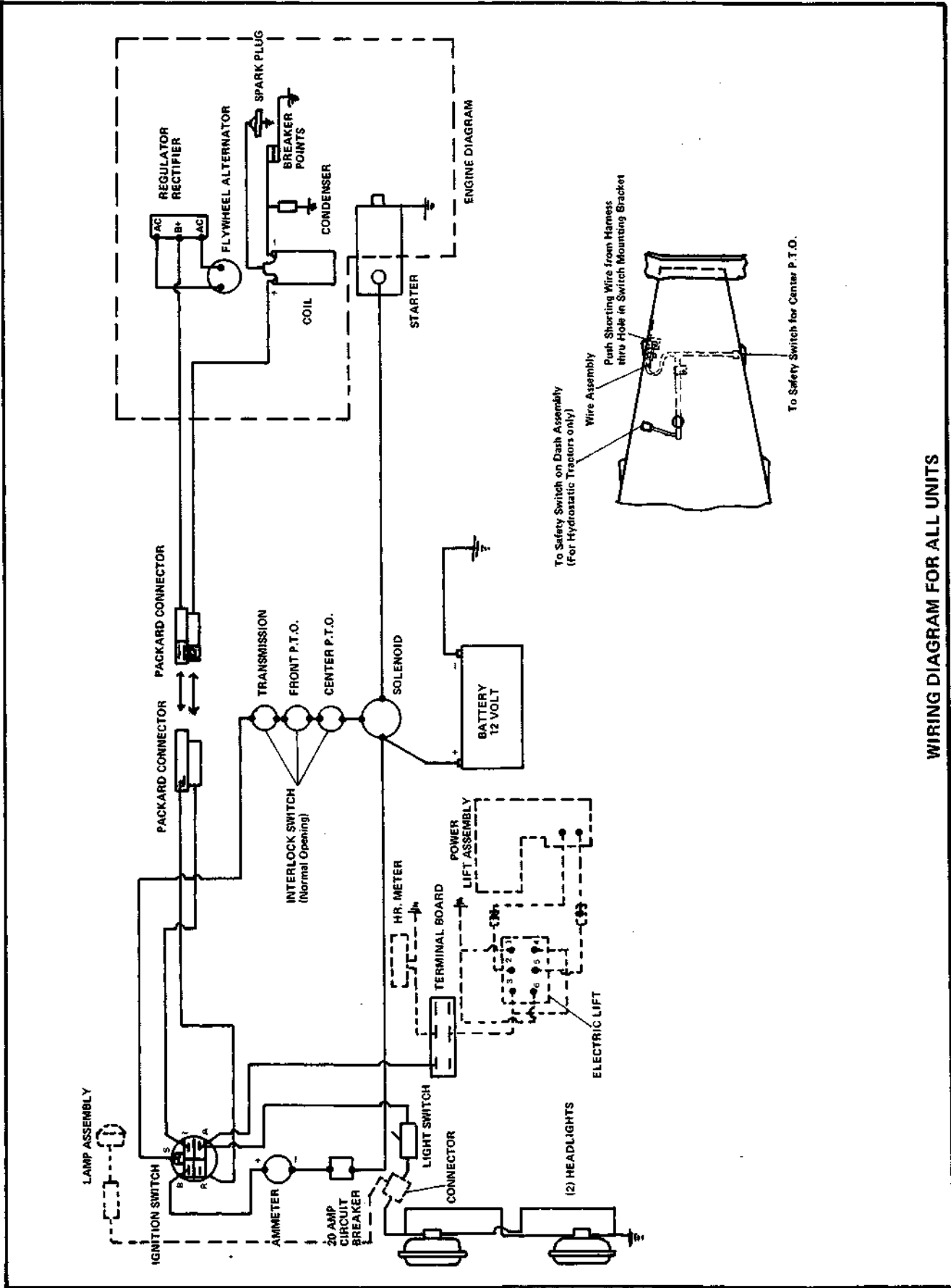
**TRACTOR & MOWER IDENTIFICATION**

When ordering parts, be prepared to give the identification number of the tractor and mower. The I.D. plate for the mower is located on the mower deck. The I.D. plate for the tractor is located on the right hand side of the frame. We suggest that you locate the numbers and record them here for easy reference.

Mower I.D. No. \_\_\_\_\_

Tractor I.D. No. \_\_\_\_\_

WIRING DIAGRAM



WIRING DIAGRAM FOR ALL UNITS

## ENGINE INSTRUCTIONS FOR MODELS K241, K301, K321 AND K341

**SAFETY PRECAUTIONS**

Power mowers, garden tractors, snowblowers, and other machines powered by air-cooled engines have become so commonplace that we may forget the potential dangers involved in servicing and operation of such equipment. In the interest of safety, some general precautions are presented below as safety reminders. Remember that the best safeguard against accidents is the use of good common sense!

**WARNING: – LETHAL EXHAUST GAS!**

An engine discharges carbon monoxide when operating, which causes death if inhaled for even a short period of time - operate only where deadly exhaust gases can be safely dissipated.

**WARNING – DANGEROUS FUELS!**

Use extreme caution when storing, handling and using fuels - they are highly volatile and explosive in vapor state. Store only in approved containers in well ventilated area away from spark or flame producing equipment. Never add fuel to tank while engine is running - stop engine and allow it to cool thoroughly to prevent fuel from igniting on contact with hot parts or ignition spark. Don't store gasoline inside occupied building.

**WARNING – MOVING, HOT PARTS!**

Imprudent operation of power equipment creates hazards to life and limb - never operate with safety guards removed, keep hands, feet, clothing away

from moving and hot parts. Remember that an engine gets hot while running, and exhaust system components get extremely hot. Know how to make emergency stops - don't allow inexperienced persons to operate your equipment. Always disconnect or remove spark plug to prevent unintentional starting while working on equipment. Never tamper with governor setting to gain more power - the governor establishes safe operating limits. Overspeed not only shortens engine life but can be extremely hazardous. Keep people safely away from the operating area and be especially watchful for children. Stop the engine whenever you leave the equipment - don't allow it to idle unattended.

**WARNING – GENERAL PRECAUTIONS!**

Handle starting batteries carefully - they are filled with acid which can eat thru clothing, burn skin, and cause blindness. Keep in mind that a battery gives off highly flammable hydrogen gas while being charged - charge only in well ventilated area. While electrical energy produced in an engine ignition system may not be strong enough to cause injury, reaction to shock produced could cause you to pull away and into contact with hot or moving parts - keep away from ignition while operating. Never operate without adequate muffler or with faulty exhaust system - exposure to excessive noise is not only tiring but can lead to impairment of hearing.

GENERAL SPECIFICATIONS

MODEL	K241	K301	K321	K341
Bore .....	3-1/4"	3-3/8"	3-1/2"	3-3/4"
Stroke .....	2-7/8"	3-1/4"	3-1/4"	3-1/4"
Displacement - Cubic Inches .....	23.9	29.07	31.27	35.89
Weight - Approximate Pounds .....	116	116	119	123
Oil Refill Capacity (U.S. Quart) .....	2	2	2	2
Spark Plug Size (mm) .....	14	14	14	14
Spark Plug Gap - (Champion H-10 or equivalent) ..	.035"	.035"	.035"	.035"
Spark Plug Torque (Ft.-Lbs.) .....	22	22	22	22
Breaker Point Gap .....	.020"	.020"	.020"	.020"
Horsepower (Approximate at 3600 RPM) .....	10.6	12.0	14.0	16.0

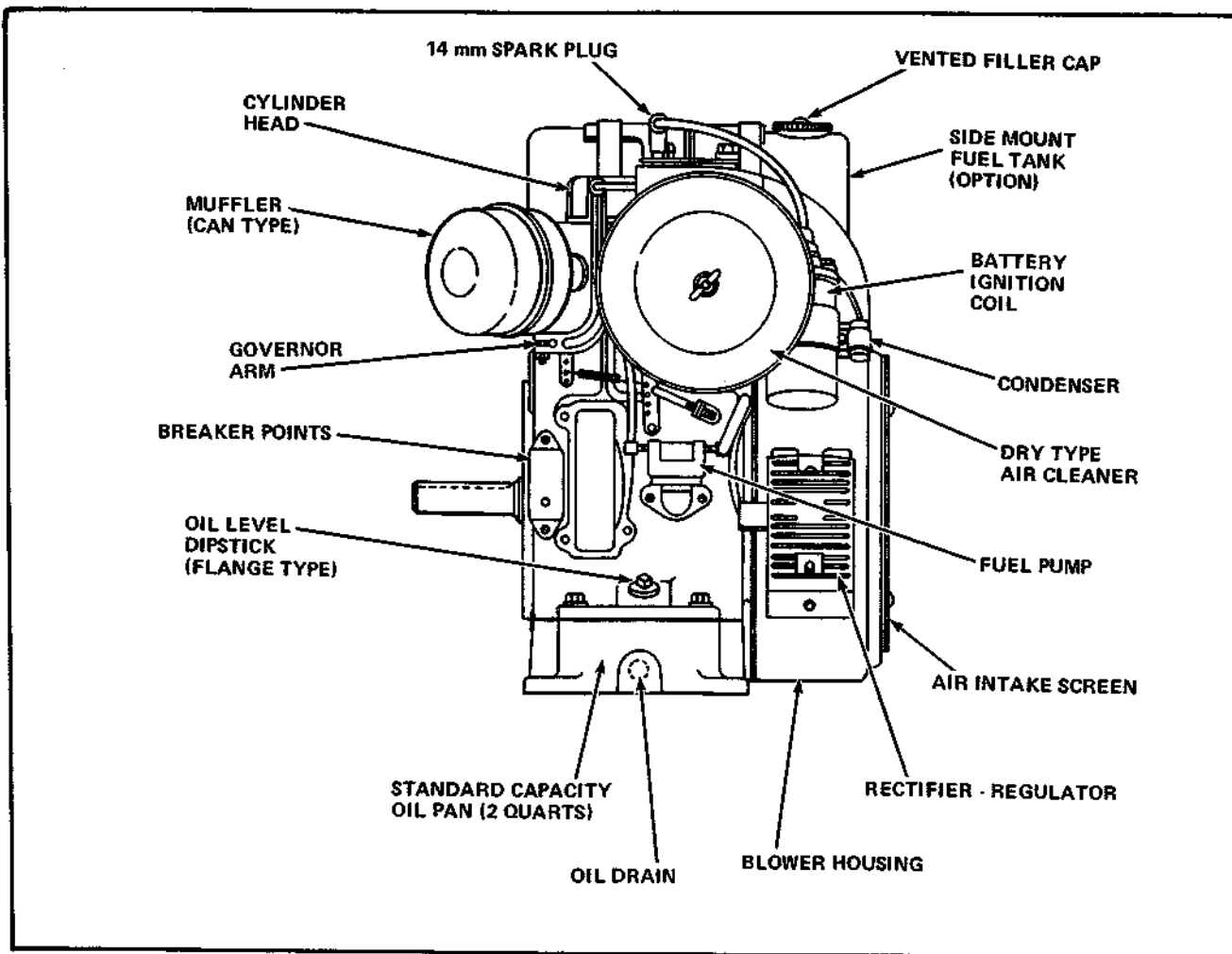


FIGURE 1 - General Location of Components on a Typical Single Cylinder Model



**OPERATING INSTRUCTIONS****PRE-START CHECK LIST**

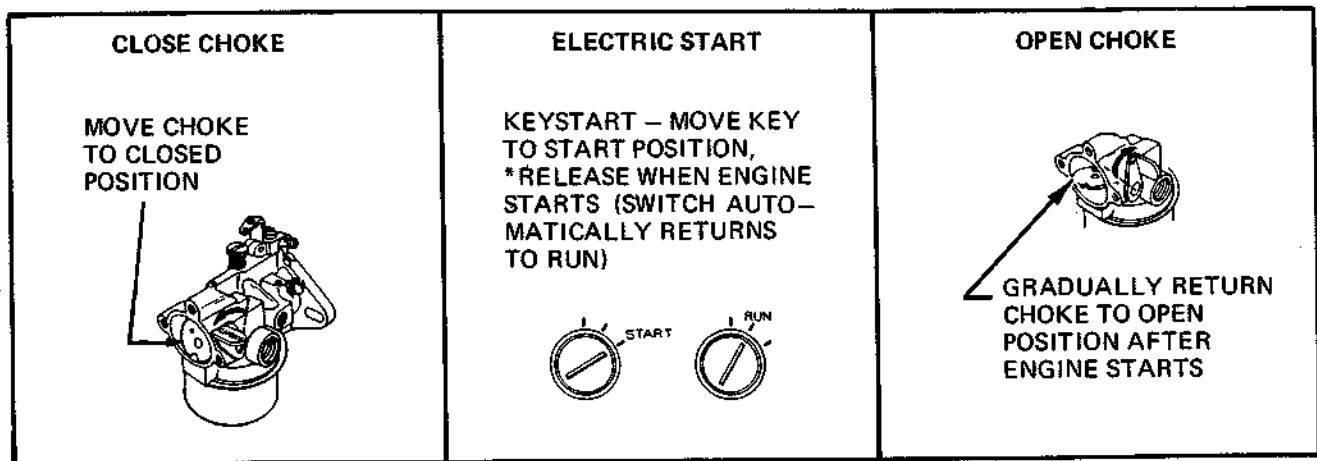
**OIL LEVEL:** Add oil as needed to keep level in safe range between L and F marks on the dipstick.

**FUEL:** Fill fuel tank with clean, fresh REGULAR grade of gasoline. Use leaded or non-leaded type but make sure octane rating is at least 85. Don't mix oil with gasoline. If engine has a fuel filter, clean sediment bowl if needed.

**COOLING:** Check air intake screens and cooling fins -- keep them clean and unrestricted.

**AIR CLEANER:** Make sure cleaner and intake parts are tight and properly installed to prevent unfiltered air from entering the engine.

**BATTERY:** Keep battery surface clean to prevent self-discharge. Check electrolyte level. Connections must be tight and negative (-) terminal must be the ground terminal.

**STARTING PROCEDURE****STOPPING PROCEDURE****DISENGAGE DRIVE – TURN IGNITION OFF**

**EMERGENCY STOP:** If engine continues running when ignition is turned off, close choke and open throttle to stall engine - don't pull ignition leads to stop.

## SERVICE - ADJUSTMENT

## SERVICE SCHEDULE

PERFORM SERVICE AT INTERVALS INDICATED (X)	EACH DAY	EVERY 25 HRS.	EVERY 50 HRS.	EVERY 100 HRS.	EVERY 500 HRS.
CHECK OIL LEVEL (maintain in safe operating range)	X				
CLEAN AIR INTAKE SCREEN (plus other external surfaces)	X				
REPLENISH FUEL SUPPLY (Use clean, fresh fuel)	X				
CHANGE OIL (Use API Service SC of proper weight)		X			
CHECK AIR CLEANER ELEMENT (dry type only)			X		
SERVICE SPARK PLUG (gap .035")				X	
SERVICE BREAKER POINTS (gap .020")					X

**NOTE:** Intervals stated are for good, clean operating conditions - - perform services more frequently if dusty or dirty conditions prevail.

## LUBRICATION

**OIL LEVEL:** With the engine level, the oil level must be maintained on the "Safe" operating range at all times - - this is between the F (full) and L (low) mark on the dipstick. Check the level daily and add oil as needed. **DO NOT OVERFILL** - - oil level must not exceed F mark.

OIL REFILL CAPACITY (U.S. STD. QUARTS)			
K241	K301	K321	K341
2 Quarts	2 Quarts	2 Quarts	2 Quarts

**OIL TYPE:** Oils meeting the requirements of the American Petroleum Institute's (API) Service classification SC\* are suitable for use in Kohler Air Cooled Engines. Service SC oils are detergent type oils. Oil viscosity (weight) is selected according to the anticipated ambient temperatures. The temperature - viscosity recommendations are:

AIR TEMPERATURE	OIL VISCOSITY
Above 30° F	SAE 30
30° F to 0° F	SAE 10 W - 30
Below 0° F	SAE 5 W - 20

\*API Service CC (MIL-2104B) and SD class oils may also be used.

**OIL CHANGE:** On new or rebuilt engines, the oil should be changed after the first five hours of operation - - thereafter each 25 hours of operation under normal conditions. If extremely dusty or dirty conditions prevail, change oil more frequently. If possible, run engine just prior to changing oil - - the oil will flow more freely and carry away a greater amount of contamination when it is hot.

## AIR CLEANERS

Dirt induced through improperly installed, poorly serviced or inadequate air cleaner elements wears out more engines than does long hours of operation. Even a small amount of dirt will wear out a set of piston rings in a few hours. Also, a clogged element causes a richer fuel mixture which may lead to formation of harmful sludge deposits. Always cover carburetor or air horn when air cleaner is removed. Service dry type air cleaners as follows:

**SERVICE - REPLACEMENT:** Dry type elements should be replaced after 100 to 200 hours if engine is operated under good clean air conditions - service and replace element more frequently under extremely dusty or dirty conditions. Dry elements should be cleaned after about each 50 hours of operation - remove element and tap lightly on a flat surface to remove loose surface dirt. Replace element if dirt does not drop off easily. **DO NOT** wash dry elements in any liquid or attempt to blow dirt off with air hose as this will puncture filter element. When replacing element, use only genuine elements. Carefully handle new element - do not use if gasket surfaces are bent or twisted. Check the following when installing new or serviced element:

1. Back plate must be securely tightened to carburetor. Replace back plate if bent or cracked.
2. Gasket surfaces of element must be flat against back plate and cover to seal effectively.
3. Wing nut must be finger tight - don't overtighten.

## PRECLEANER SERVICE PROCEDURE

Precleaners should be cleaned and re-oiled every 25 operating hours, or more often under extremely dusty or dirty conditions, as follows:

1. Wash precleaner in water using a detergent.
2. Rinse thoroughly until all traces of detergent are eliminated.
3. Squeeze away excess water and air dry. (Do not wring precleaner).
4. Soak in fresh, clean engine oil and squeeze to remove excess oil.
5. Reinstall precleaner over air filter element.

Follow this procedure when servicing precleaners.

## COOLING & EXTERNAL SURFACES

Air is drawn into the cooling shroud by fins provided on the flywheel. The rotating air screen and the cooling fins on the block and cylinder head must be kept clean and unobstructed at all times. Never operate engine with blower housing or cooling shrouds removed. These direct air flow past cooling fins. Removal results in improper air circulation and overheating. External surfaces must be in clean condition free of any oil and dirt accumulation.

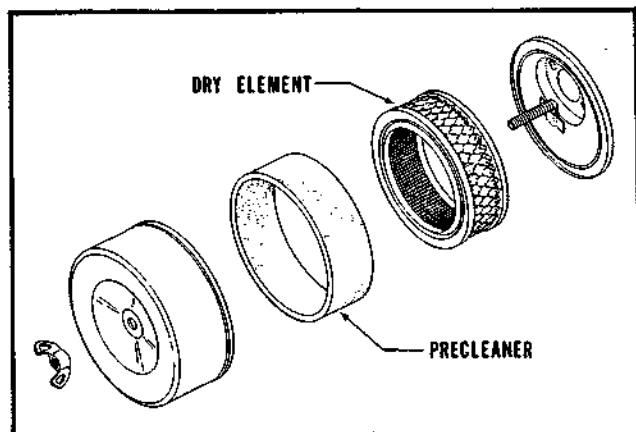


FIGURE 2 - Dry Type Air Cleaner with Serviceable Pre-Cleaner

## FUEL, FUEL SYSTEMS

With the gasoline fuel system, use clean fresh REGULAR grade of leaded or non-leaded gasoline with octane rating of at least 85. The non-leaded (or low lead) fuels offer the advantage of reducing the amount of deposits which build up in the combustion chamber. DO NOT ADD OIL to the gasoline on these 4-cycle engines. Use name brand gasoline purchased from popular stations to prevent use of stale gasoline or fuel not adjusted to seasonal changes. Gasoline becomes "stale" after about 6 months and

tends to form gum deposits which clog the fuel system especially small passages in the carburetor. When placing an engine in storage, completely drain fuel lines, tanks and carburetor bowl or use a fuel stabilizer which prevents formation of gum in the gasoline. Keep the vent hole in the gas filter cap open - if it becomes plugged, flow of fuel will be impaired.

## CARBURETOR

Lack of power accompanied by black, sooty exhaust smoke usually indicates that fuel mixture is too rich. An "overrich" mixture may also be caused by a clogged air cleaner - check this before readjusting carburetor. Main fuel may be set too lean if engine "skips" or backfires at high speed.

**MAIN FUEL ADJUSTMENT:** For preliminary setting, turn MAIN FUEL screw in clockwise direction until it bottoms lightly (do not force) then back out 2 turns. With engine thoroughly warmed up and running at full throttle and full load (when possible), turn MAIN FUEL screw in until engine slows down (lean setting) then turn screw back out until engine regains speed and then starts to slow down again (overrich setting) - turn screw back in until it is positioned halfway between lean and overrich settings - when properly adjusted, engine will accelerate smoothly and operate with steady governor action.

**IDLE ADJUSTMENT:** Rough idle is usually caused by the idle speed being set too low. Turn IDLE SPEED screw in (clockwise direction) to increase speed.\* If engine still idles poorly after speed is increased, stop engine and turn IDLE FUEL screw all the way in (clockwise) until it bottoms lightly (do not force screw) then back out 1-1/4 turns. Restart engine and check idle - turn needle in or out (1/4 turn at a time) until smoothest idle is achieved.

\*Idle speed normally set at 1450-1500 RPM when engine is in equipment.

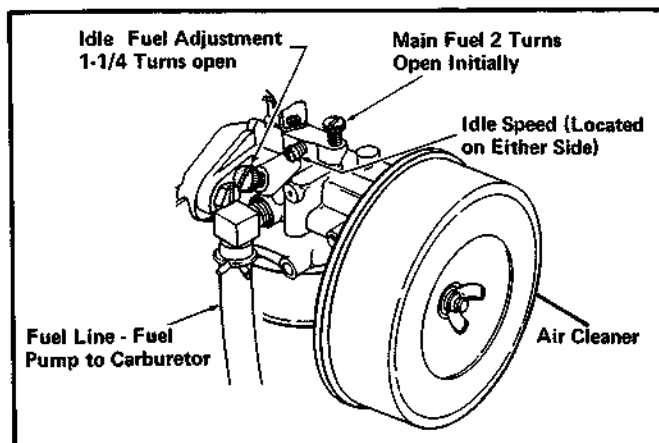


FIGURE 3 - Carburetor

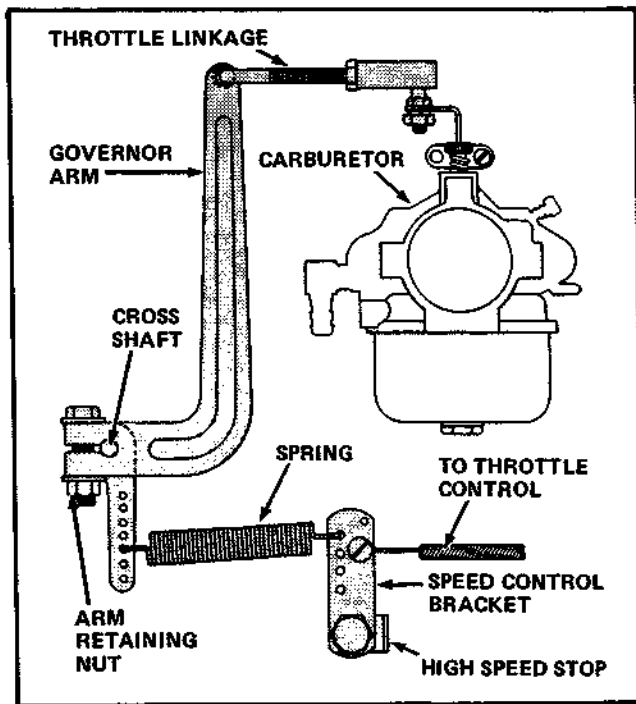


FIGURE 4 - Governor Adjustments

### GOVERNOR

The governor functions to maintain engine speed under changing load conditions and also acts as a speed limiting device. Governors are set in the factory and further adjustment should not be required unless linkage works loose or becomes disconnected. Readjustment should be made if engine surges with changing load or if speed drops considerably when a normal load is applied.

**INITIAL ADJUSTMENT:** With engine stopped, loosen (do not remove) hex nut securing governor arm to governor cross shaft. Grasp end of cross shaft with pliers and turn shaft as far as possible in counterclockwise direction - tab on shaft will stop internally against governor gear mechanism. Hold shaft in this position, pull governor arm all the way away from carburetor then retighten governor arm nut to complete initial adjustment.

**THROTTLE WIRE INSTALLATION:** Install wire as follows: Move throttle control handle to full throttle position (F or Open mark) then bend end of wire into a small hook and insert open end into handle lever hole located inside control cover.

**SPEED ADJUSTMENT:** Maximum allowable speed for most engines is 3600 RPM. This speed must not be exceeded. If overspeed condition is suspected, check RPM's with hand tachometer and readjust as follows:

With variable speed type arrangement as shown, loosen capscrew and move high speed stop bracket until desired maximum speed is attained - - retighten capscrew to lock bracket in new position.

**SENSITIVITY ADJUSTMENT:** If speed drops considerably when a normal load is applied, governor should be set for greater sensitivity. If set too sensitive, speed surging will occur with changing load. Governor sensitivity is adjusted by repositioning governor spring in holes provided on arm and speed control brackets. Increase tension in spring (and sensitivity) by moving spring hooks into holes spaced further apart - - conversely, decrease sensitivity by reducing tension on spring.

### IGNITION SYSTEM SERVICE

This engine has a battery type ignition.

Engine skip, hard starting, poor performance is most often due to incorrect plug gap or breaker point gap. These symptoms may also appear when the plug is fouled or in poor condition or when the points are burned or pitted.

**SPARK PLUG:** Check condition and reset gap at about 100-hour intervals. The gap gradually widens as the electrodes wear under normal conditions. Always clean area around plug before removing to prevent dirt from falling into the head as the plug is removed. Carefully check condition of electrodes after removing the plug as this usually offers a good indication of operating conditions. If the plug has a light coating of gray or tan, this usually indicates normal conditions. A dead white blistered coating may indicate overheating while black coating usually comes from operating with overrich fuel mixture which can be caused by clogged air cleaner or carburetor out of adjustment.

Do not sandblast, wire brush, scrape or otherwise attempt to service a plug that is badly fouled or in poor condition - best results are obtained with a new plug. Before installing plug, set gap at .035", then tighten the spark plug with a torque wrench to 22 ft.-lbs. Use 14 mm, Champion H-10 (or equivalent) spark plug.

**BREAKER POINTS:** Every 500 hours breaker points should be inspected and serviced. If oxidized, dirty or oily, clean with coarse cloth - - do not use emery cloth or sandpaper. Slightly pitted points can be dressed with point file - - replace badly pitted or burned points. The gap must be adjusted whenever points are serviced or replaced since this setting establishes ignition timing. To adjust, turn crankshaft until points are wide open or at maximum separation then check with feeler gauge. If gap is not .020", loosen adjusting screw and shift movable plate until correct gap of .020" is obtained. After retightening screw, check to make sure gap is still properly set at this sometimes alters the setting slightly.

**CONDENSER:** If the condenser shorts out, the coil will be unable to function at all. If it opens and decreases in capacitance, the output voltage will be greatly reduced and the ignition points will burn excessively. If condenser has too little capacitance, metal will transfer from the stationary contact to the moveable contact. If capacitance is too great, the metal will build up on the stationary contact. Make sure the condenser is the correct one for your engine.

**IGNITION COIL:** These coils do not require servicing on a regular basis; however, they should be kept in clean condition and the terminals and connections must be tight to provide good electrical contact. The rubber nipple on the high tension terminal must be in good condition to prevent leakage of current across exposed surfaces.

**STARTING - MOTOR SYSTEM:** These starters are pre-lubricated during assembly and do not require further lubrication or service under normal conditions. Starter service should be performed only at authorized repair shops.

**Precautions:** In the event of a "false start"; that is, if the engine gets up sufficient speed to disengage the starter but then fails to continue running, the engine must be allowed to come to a complete halt before a restart attempt is made. If the flywheel is still rotating when the starter is engaged, the pinion and ring gear may clash and damage the teeth. Continuous cranking time should be limited to 60 seconds. If an engine fails to start after this length of time, it may be out of fuel, flooded, have poor ignition or there is some other condition preventing it from starting. Make sure the special shouldered capscrews (and lock-washers) are used when installing starter. These special capscrews properly align the pinion to the ring gear on the engine - - use of ordinary capscrews will allow the starter to shift and result in clashing of the gears. Keep these mounting capscrews tight.

**Rectifier - Regulator:** The rectifier - regulator unit used with the starting motor system is a solid-state device and is non-serviceable. This unit will be damaged if the engine is operated for any length of time without the battery in the system - - also, to protect this unit, disconnect the leads before doing any welding on equipment in common ground with it.

**BATTERY:** As a battery discharges, sulfuric acid is chemically withdrawn from the electrolyte and lead sulfate

deposits continue to build up on the plates. This results in a diminishing specific gravity of the electrolyte. If the specific gravity drops below 1.240, the battery should be recharged. In fully charged condition, the specific gravity will be in the 1.260 - 1.280 range. (NOTE: In tropical areas where the temperature stays well above freezing, an electrolyte with lower specific gravity may be used - - full charge specific gravity of this is 1.225).

A regulator may be blamed for an undercharged or repeatedly discharged battery when the fault is actually self-discharge caused by a build-up of corrosive acid across the top of the battery. Even a light coating of this grayish-white substance can complete a circuit to drain and exhaust the energy in the battery - - this can be especially bad when moisture is present. Service as indicated in the following.

To maintain a battery in top condition, check and perform the following services at frequent intervals:

1. Regularly check level of electrolyte - - add water as necessary to maintain level above plates - - do not overfill as this can cause poor performance or early failure due to loss of electrolyte.
2. Keep terminals and top of battery clean. Wash with baking soda and rinse with clear water. Do not allow soda solution to enter cells as this will destroy the electrolyte.

#### STORAGE INSTRUCTIONS

Use the following procedure to preserve engine before placing in storage. Drain oil from crankcase (while hot) then flush with clean light oil. Refill crankcase after flushing. Drain fuel from tank and carburetor. Clean exterior of engine then spread light film of oil over surfaces subject to corrosion (unpainted metal surfaces). Pour tablespoon of oil into spark plug hole, turn engine over several times by hand then reinstall plug.

### SERVICE TIPS

If engine stops, don't overlook causes that seem too obvious to be considered such as an empty fuel tank - - check for the simplest causes first. To operate, an engine must have fuel, a good ignition spark and, of course, good

compression - - keep this in mind when trying to pinpoint the difficulty.

The following is offered as a guide for correcting some of the difficulties that are possible with a 4 stroke cycle engine.

### SERVICE TIP CHART

#### HARD STARTING OR LOSS OF POWER

- a. Faulty ignition.
  - 1. Leads grounded or loose.
  - 2. Breaker points faulty or improperly gapped.
  - 3. Spark plug faulty or improperly gapped.
  - 4. Coil or condenser defective.
- b. Faulty carburetion.
  - 1. Fuel line clogged (dirt-gum)
  - 2. Fuel pump faulty.
  - 3. Carburetor dirty or improperly adjusted.
- c. Poor compression.
  - 1. Head loose or gasket leaking.
  - 2. Valves sticking or leaking.
  - 3. Piston rings worn.

#### OPERATING ERRATICALLY

- a. Clogged fuel line.
- b. Water in fuel
- c. Vent in fuel cap plugged.
- d. Faulty fuel pump.
- e. Gasket leaking (Carb. - manifold)
- f. Governor improperly set.
- g. Carburetor improperly adjusted.

#### KNOCKING

- a. Fuel octane too low.
- b. Ignition timing wrong
- c. Carbon build-up in combustion chamber.
- d. Engine overheated.

#### OCCASIONAL "SKIP" AT HIGH SPEED

- a. Spark plug fouled, faulty or gap too wide.
- b. Ignition timing wrong.
- c. Carburetor improperly adjusted.

#### OVERHEATING

- a. Air intake screen or fins clogged.
- b. Oil level too high (or low).
- c. Fuel mixture too lean.
- d. Ignition timing wrong.
- e. Engine overloaded.
- f. Tappet clearance too close.

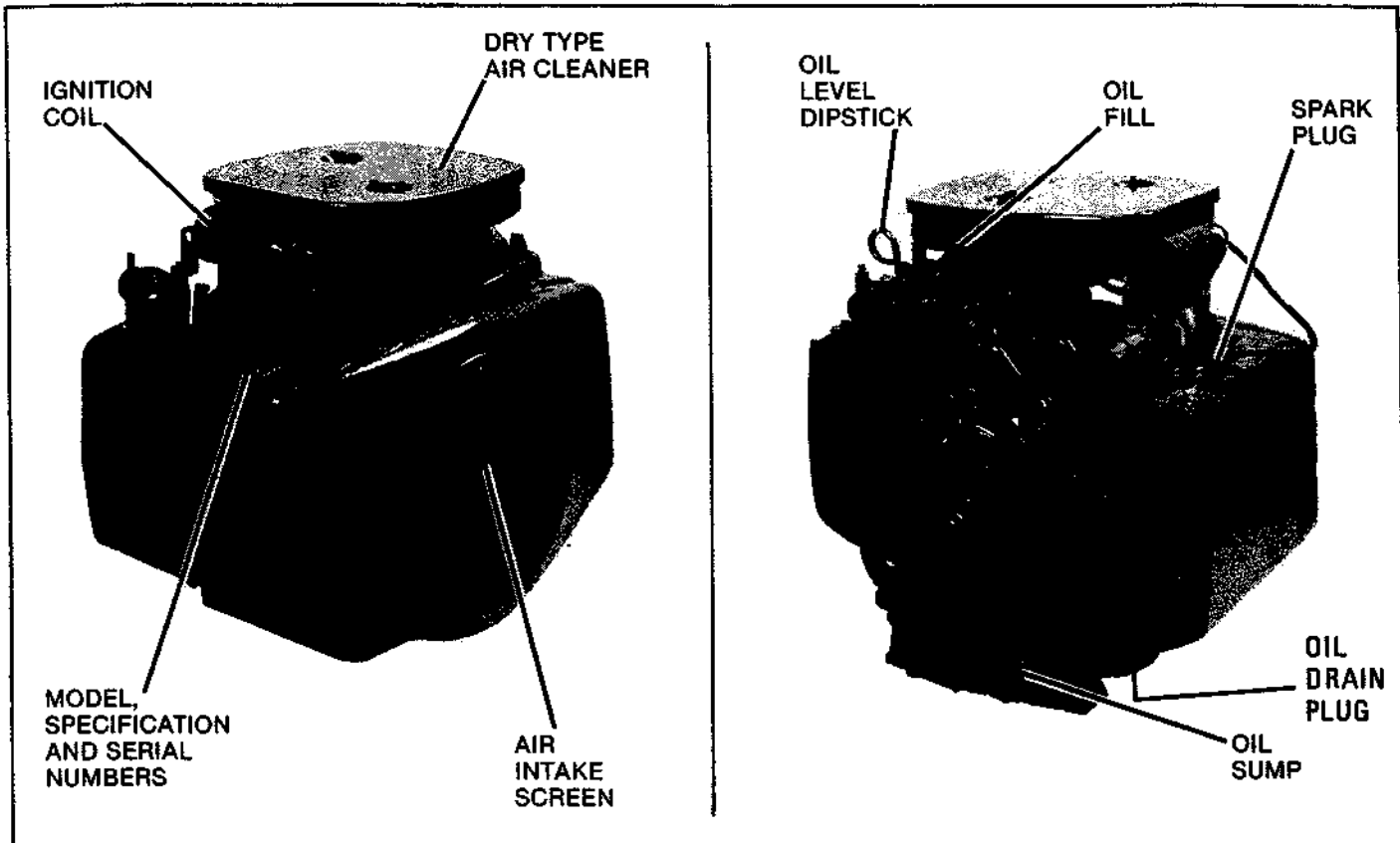
#### IDLES POORLY

- a. Idle Speed too low.
- b. Idle Fuel improperly adjusted.
- c. Gasket leaking (carb. - manifold)
- d. Spark plug gap too close.

#### BACKFIRING

- a. Carburetor set too lean (Main Fuel).
- b. Breaker points improperly gapped (timing).
- c. Valve sticking.

## ENGINE INSTRUCTIONS FOR MODEL KT17



## SAFETY PRECAUTIONS



**WARNING:** Batteries contain sulphuric acid - avoid contact with skin, eyes or clothing. Batteries produce explosive hydrogen gas at all times - especially when being charged. Ventilate area when charging battery. Keep cigarettes, open flame and sparks away from battery at all times. Keep batteries and acid out of the reach of children.

Never leave ignition switch "On" when charging battery - a switch left "On" with the battery connected can cause the ignition coil to overheat and possibly explode. When removing the battery from equipment always disconnect the negative cable first. When replacing battery connect the negative cable first.



**WARNING:** All engine exhaust contains poisonous carbon monoxide. Avoid inhaling exhaust fumes and never run the engine in a closed building or confined area.



**WARNING:** The engine and the exhaust system get extremely hot. Never operate equipment with safety guards removed. Keep hands, feet, clothing and hair away from moving parts.



**WARNING:** Never tamper with the governor setting - overspeed is hazardous and could void warranty.

To prevent shock, keep away from the internal ignition wires while operating.

Do not allow equipment to run unattended.

## FUEL

Use clean, fresh, no-lead gasoline with pump sticker rating of 85 or higher octane. No-lead fuel leaves less combustion chamber deposits. Leaded gasoline may be used if no-lead is unavailable. Do not add oil to the gasoline.

Purchase gasoline in small quantities - it becomes stale and forms gum deposits which can clog the fuel system. Also, refineries adjust fuel to seasonal changes.

Fill tank to "Full" level but do not overfill - leave some room for fuel to expand.



**WARNING:** Store gasoline only in approved containers, in unoccupied buildings, away from spark or flames. Do not add gasoline while engine is running or start engine around spilled fuel. Never use gasoline as a cleaning agent.

**LUBRICATION**

The importance of checking and changing oil cannot be overemphasized. Dirty oil causes premature engine wear and failure.

Check oil before each use when the engine is cool and the oil has drained back into the pan. Be sure to wipe oil fill and dipstick areas clean before checking. Oil should always be checked while engine is level.

**OIL CHANGE**

On a new engine, change oil after the first 5 hours of operation and then at 25 hour operating intervals thereafter. Change oil more frequently under dirty, dusty conditions.

Drain oil when engine is warm - it flows more freely thus carrying away more impurities. (Oil drain plug - bottom of engine.)

Install drain plug then remove oil fill plug and add 3.5 pints (1.7 litres) of proper type oil. Check oil level on dipstick before adding more oil. Wipe off the dipstick and insert it all the way into the tube, then remove the dipstick and check the level.

Engine must be level for accurate reading. Bring the oil level up into the SAFE range, but do not exceed the "F" mark.

**NOTE:** Overfilling can cause engine to overheat.

**OIL TYPE**

Use high quality detergent type oil with service designation SC, CC, SD or SE. Oil weight (SAE viscosity) is selected according to the anticipated temperature in the area of engine operation as shown below:

Temperature	Recommended Weight	Alternate Weights*
Above 32° F (0° C)	SAE-30	SAE 10W-30, SAE 10W-40
Below 32° F (0° C)	SAE 5W-30	

\*Alternate or multi-weight oils should be used only as a last resort, as tests have shown that in warm temperatures more oil is consumed and combustion chamber deposits increase when multi-weight oils are used.



**WARNING:** Before working on engine or equipment always remove spark plug leads to prevent engine from starting accidentally.

**OPERATING INSTRUCTIONS**

**PRE-START CHECKLIST**

Fill fuel tank

With engine level, check oil

Make sure air cleaner wing nut is finger tight

Clean off air intake screen and cooling fins.

Check oil level in driven equipment

Make sure safety guards are in place

If engine is equipped with transmission make sure equipment is in neutral before starting.

**STARTING**

For the exact starting procedure, refer to the equipment manufacturer's instructions. However, when cold, the engine will start more readily with the throttle advanced.

**NOTE:** In the event of "false start", that is, if the engine gets up sufficient speed to disengage the starter, but fails to continue running, the engine must be allowed to come to a complete halt before a restart attempt is made. If the flywheel is still rotating when the starter is engaged, the pinion and ring gears may clash.

Do not attempt to crank the engine continuously more than 10 seconds at a time.

If starter motor will not turn over the engine, shut off starter motor immediately and make no further attempt to start engine until the condition is corrected.

Always allow the starter motor a cool-down period between cranking attempts, if the engine does not start. A 60-second cool-down period is required after each 10-second cranking period. Failure to follow these guidelines may result in burn-out of the starter motor.

If battery charge is not sufficient to turn starter motor over, recharge the battery. Do not attempt to jump start the engine with another battery - batteries larger than those recommended can cause starter motor burnout.

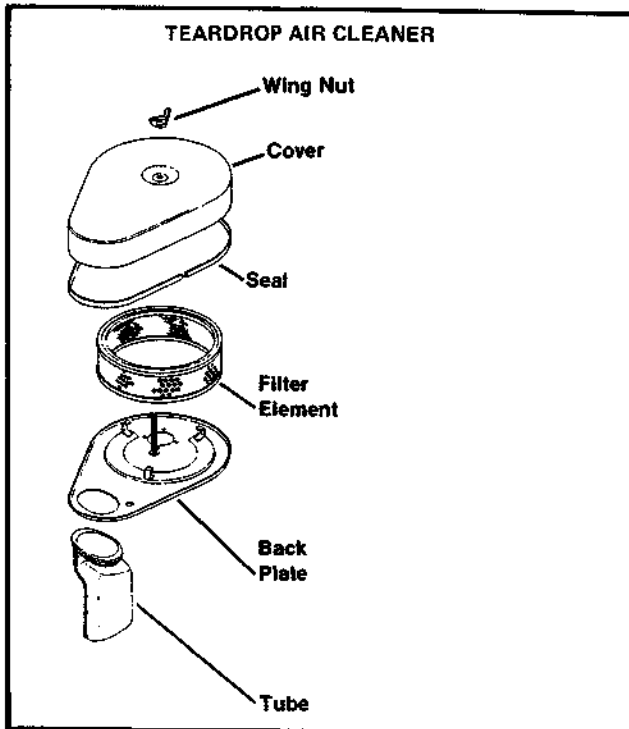
Starter motors are prelubricated and brushes normally require attention only after extended use. If starter fails to kick in, check for physical damage.

**STOPPING**

Turn ignition switch OFF and wait until engine comes to a complete stop before attempting to clean, adjust or lubricate.

**EMERGENCY STOP** - Close choke and open throttle to stall engine.





AIR CLEANER

### AIR CLEANER

A clean air filter is important - only a short period of operation with unfiltered air can ruin an engine.

This engine is equipped with a dry type air cleaner element, which should be checked every 50 operating hours and replaced if dirty. It should be checked and replaced more often under extremely dirty dusty conditions. Do not wash element in any liquid or attempt to blow dirt off with air hose as this will puncture filter element. When replacing element, use only genuine element. Carefully handle new element - do not use if gasket surfaces are bent or twisted.

Wing nut must be finger tightened 1/2 to 1 full turn after nut contacts cover. Do not overtighten.

### COOLING SYSTEM

Before each start-up make sure the air intake screen is clean and unobstructed - an obstructed screen can cause overheating of engine. If debris builds up on the screen while operating, stop the engine and brush off.

Every 50 operating hours remove shrouds and clean fins. Do not operate engine with cooling shrouds removed - this will cause overheating and engine damage. Air is drawn into the blower housing by fins on the flywheel, circulated past cooling fins on the block and head and is discharged toward the power takeoff end of the engine. Clean external surfaces of your engine occasionally as deposits of dust and oil can contribute to improper cooling.

### SPARK PLUGS

Incorrect spark plug, cracked porcelain, or improper spark gap can cause the engine to misfire. Clean area around plug before removing to prevent dirt from getting into engine. Carefully note spark plug appearance - it can indicate ignition trouble. If heavy black or blistered white deposits are noted, see your Allis-Chalmers Dealer for correction.

Every 100 hours remove plug, check condition and reset gap or replace plug - see General Specifications. Do not machine blast spark plugs. Spark plugs should be cleaned by scraping or wire brushing and washing with a commercial solvent. Worn plugs should be replaced. Torque plugs to 15 ft.-lbs. (20 N · m).

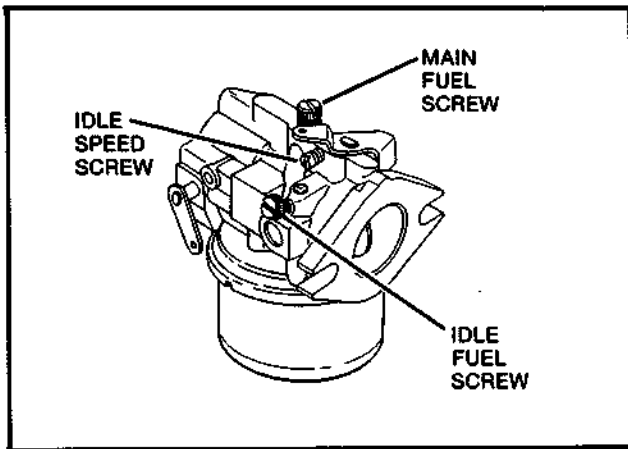
### CARBURETOR ADJUSTMENTS

The KT17 engine is equipped with a side draft, adjustable jet carburetor. It was properly set at factory and should not have to be reset. If, however, one of the following conditions is noted, adjust the carburetor immediately as incorrect setting can lead to fouled spark plugs, overheating, excessive valve wear or other problems.

If adjustment becomes necessary, stop the engine, then turn the MAIN and IDLE fuel adjusting screws all the way in, until they bottom lightly.

**IMPORTANT:** Do not force adjusting screws closed as damage to needle valves will result. See Chart below for Carburetor Adjusting Tips.

Condition	Possible Cause/Probable Remedy
1. Black, sooty exhaust smoke, engine sluggish.	1. Mixture too rich - adjust main fuel screw.
2. Engine misses and backfires at high speed.	2. Mixture too lean - adjust main fuel screw.
3. Engine starts, sputters and dies under cold weather starting.	3. Mixture too lean - turn main fuel screw 1/4 turn counterclockwise.
4. Engine runs rough or stalls at idle speed.	4. Idle speed too slow or improper idle adjustment - adjust idle speed screw, then idle fuel screw if needed.



CARBURETOR

### MAIN FUEL ADJUSTMENT

Preliminary setting - turn screw out 2-1/2 turns. Final setting - start engine and raise engine speed to maximum governed, no load speed. Turn screw in just until engine speed decreases and note the position of the screw. Now turn the screw out. The engine speed will first increase, but then decrease as screw is turned out. Note the position of screw when engine speed starts to decrease. Set the screw midway between the two points noted.

### IDLE SPEED ADJUSTMENT

Run engine at maximum governed, no load speed for a minimum of 30 seconds, then allow engine speed to fall to idle, or put throttle into idle position. Set engine speed to 1200 ( $\pm$  75 RPM) by turning the idle speed screw in or out.

### IDLE FUEL ADJUSTMENT

Set the idle fuel mixture by turning the idle fuel screw out, from the closed position, 3/4 to 1 full turn.

### STORAGE PROCEDURE

If the engine is to be out of service for a considerable length of time, use the following storage procedure.

Clean exterior surfaces of engine.

Drain oil from crankcase while engine is still warm, refill, and run engine briefly.

Drain fuel tank and carburetor (or run engine until tank is empty).

Add a tablespoon of engine oil into each spark plug hole. After installing plugs, crank engine slowly by hand 2 to 3 revolutions.

Pull against compression to close valves.

Spread a light film of oil over any exposed metal surfaces of engine to prevent rust.

Store in clean, dry place.

## SERVICE SCHEDULE

To keep your engine in top running condition, these basic services should be performed at the intervals specified.

Service at Intervals Indicated	Daily (Pre-start)	Every 25 Hours	Every 50 Hours	Every 100 Hours	Every 500 Hours
Clean Air Intake Screen .....	X				
Check Oil Level .....	X				
Replenish Fuel Supply .....	X				
Change Lube Oil .....		X			
Check Air Cleaner (Replace if Dirty) .....			X		
Clean Cooling Fins and External Surfaces .....			X		
Service or Replace Spark Plugs .....				X	
Have Breaker Points Checked and Serviced* ..					X
Have Ignition Timing Checked* .....					X
Have Valve - Tappet Clearance Checked* .....					X
Have Cylinder Heads Serviced* .....					X†
Have Starting Motor Serviced* .....					X

\*Have these services done only by qualified dealer.

NOTE: Intervals stated are for good, clean operating condition only - service items more frequently (even daily) if extremely dusty or dirty conditions prevail.

†If leaded gasoline is used have cylinder head serviced every 250 hrs.

## SERVICE TIPS

If engine stops do not overlook the simple causes. A starting problem could be caused by an empty fuel tank. The chart below lists some common causes of difficulties.

Do not attempt to replace major items or any items that call for special timing or adjustment procedures (governor, carburetor, breaker points) - have this work done only by a qualified dealer.

Difficulty	No Fuel	Improper Fuel	Dirt In Fuel Line	Blocked Cooling	Incorrect Oil	Engine Overloaded	Clogged Air Cleaner	Faulty Spark Plugs	Loose Wires
Will not start	X		X		X	X	X	X	X
Hard starting	X	X	X	X	X	X		X	
Stops suddenly	X		X	X	X	X			X
Lacks power		X	X	X	X	X	X	X	
Operates erratically		X	X	X				X	X
Knocks or pings		X		X		X		X	
Skips or misfires		X	X				X	X	X
Backfires			X			X	X		
Overheats			X	X	X	X	X		
High fuel consumption							X	X	

## ENGINE KT-17

### MODEL DESIGNATION

Model KT17 indicates "K" for Kohler engines, "T" for twin cylinder and "17" for horsepower.

### GENERAL SPECIFICATIONS

Bore (Nominal)	3-1/8" (79.4 mm)
Stroke	2-3/4" (69.8 mm)
Displacement (Cubic Inches)	42.18 (691.4 cc)
Horsepower (at 3600 RPM)	17 (12.7 kW)
Weight (Approximate Pounds)	118 (53.5 kg)
Oil Capacity (U.S. Pints)	3.5 (1.7 litres)
Spark Plug Gap	.025" (.644 mm)
Spark Plug Size	14 mm
Spark Plug Reach	.460 (11.7 mm)
Spark Plug Type	Champion RBL15Y or Equivalent
Breaker Point Gap	.017/.023" (.432/.580 mm)

### PARTS ORDERING INSTRUCTIONS

The engine MODEL, SERIAL and SPECIFICATION numbers found on the nameplate are required when ordering replacement parts from your nearest Dealer. Include the letter suffixes if there are any. The nameplate is located on the top of the engine.

