

**MANUEL DU CONDUCTEUR  
ET LISTE DES PIÈCES DE RECHANGE**

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**OPERATOR'S MANUAL  
AND SPARE PART LIST**









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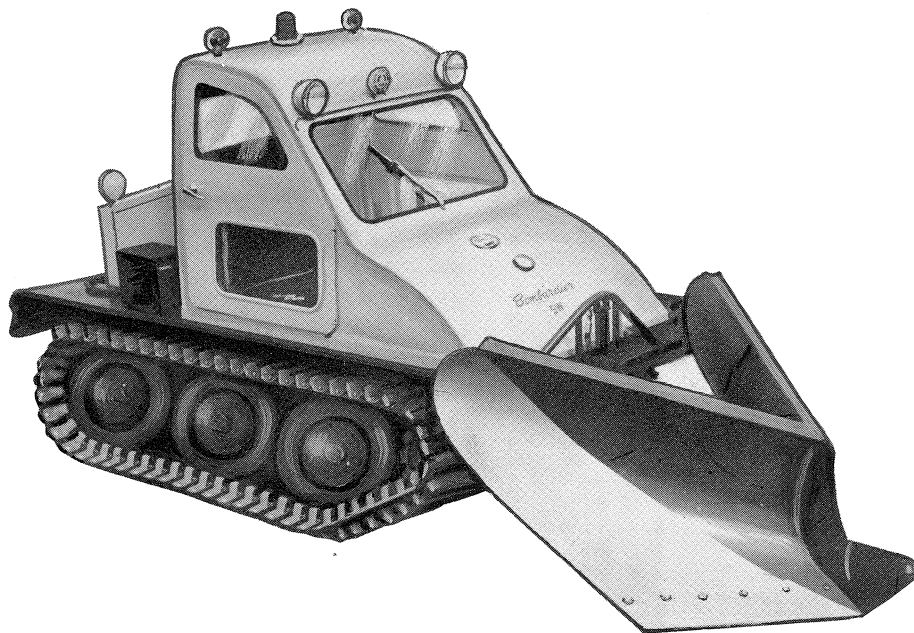
## INTRODUCTION

*You now have, to serve you, a vehicle mounted on tracks and which was specifically conceived to clear snow on streets and sidewalks. This, however, is not the limit of its application since several tasks may be performed by the unit which, you will find, delivers exceptional performance.*

*Your SW tractor is the result of some 40 years of experience acquired by "Bombardier" in the developing and manufacturing of soft soil and snow, off-road vehicles.*

*It is built to give you long, safe and efficient service; but for it to continue delivering the fine performance of which it is capable, it must be given proper maintenance.*

*This booklet contains detailed operating and maintenance instructions. We know you will want to read and follow these instructions with care. Their use will assure you long, satisfactory service from your Bombardier SW tractor.*





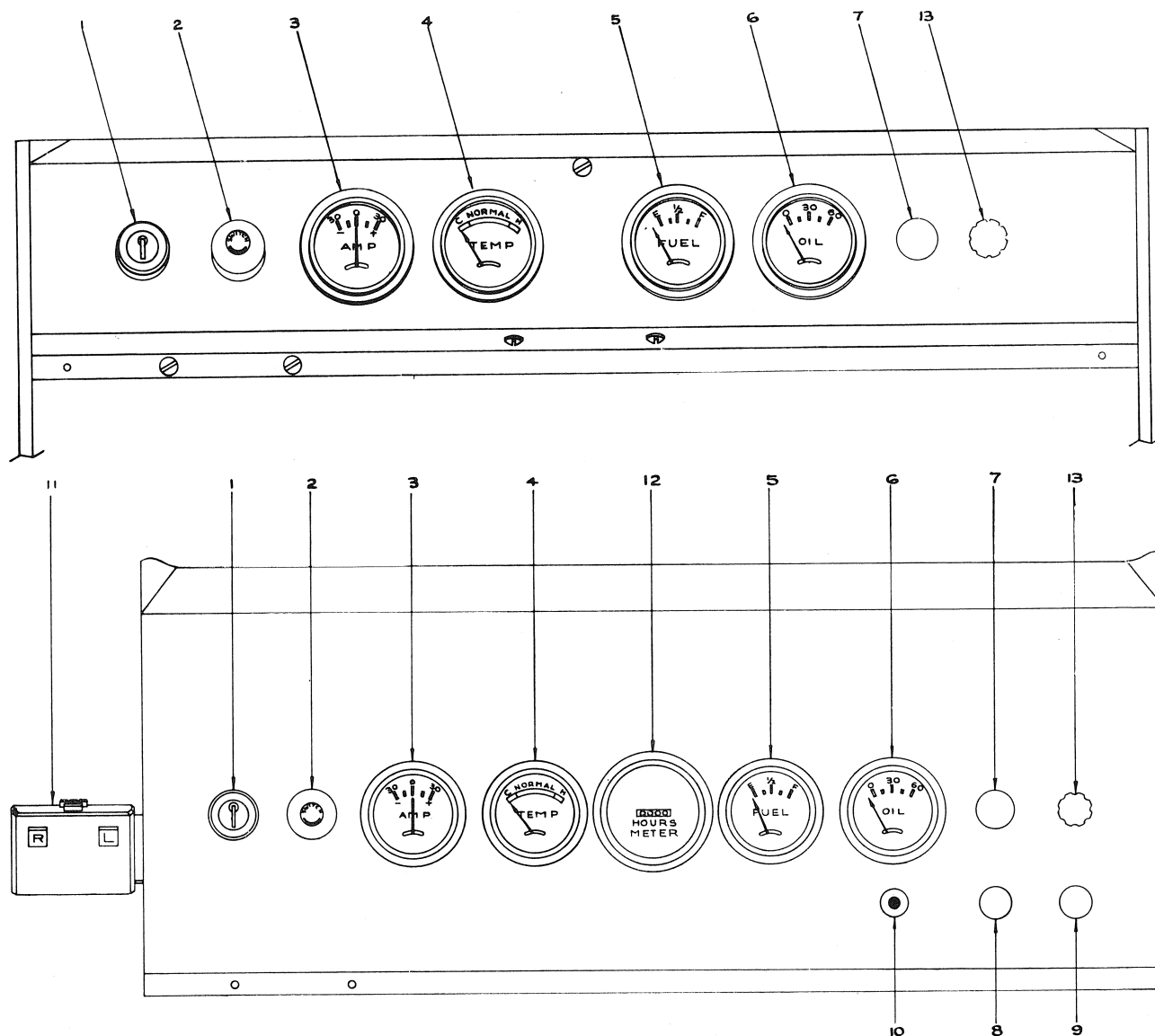
## CONTROLS — OPERATION

### Steering levers:

The Bombardier tractor differs from conventional vehicles by its steering and braking system.

The two steering levers replace both the steering wheel and the brake pedal. To effect a left turn, pull on the left hand lever and to make a right turn, pull on the right hand lever.

Pulling on both levers simultaneously will stop the vehicle promptly.



### Dashboard :

- |                       |  |
|-----------------------|--|
| 1. Ignition switch    | 7. Headlights switch                   |
| 2. Starter button     | 8. Rear light switch                   |
| 3. Ammeter            | 9. Blue or red blinker switch          |
| 4. Temperature gauge  | 10. Horn button                        |
| 5. Fuel gauge         | 11. Directional signal four way switch |
| 6. Oil pressure gauge | 12. Hour meter                         |
|                       | 13. Heater—Defroster switch            |

Items 7 to 13 (incl.) are optional on J-5 tractors.



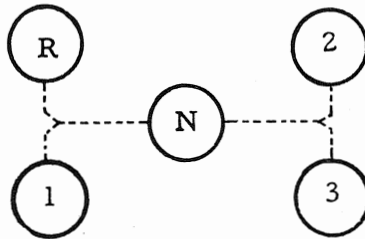
**Controls :**

Bombardier tractors are equipped with a manual choke located to the left of operator's seat back rest.

There are two pedals on the floor: the clutch pedal on the left and the throttle on the right.

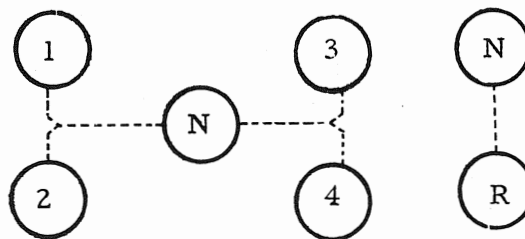
**Three speed transmission control :**

Gearshift lever position :



**Four speed transmission control (optional equipment):**

Gearshift lever position :



The right hand lever has but a single travel and is used to engage reverse gear.

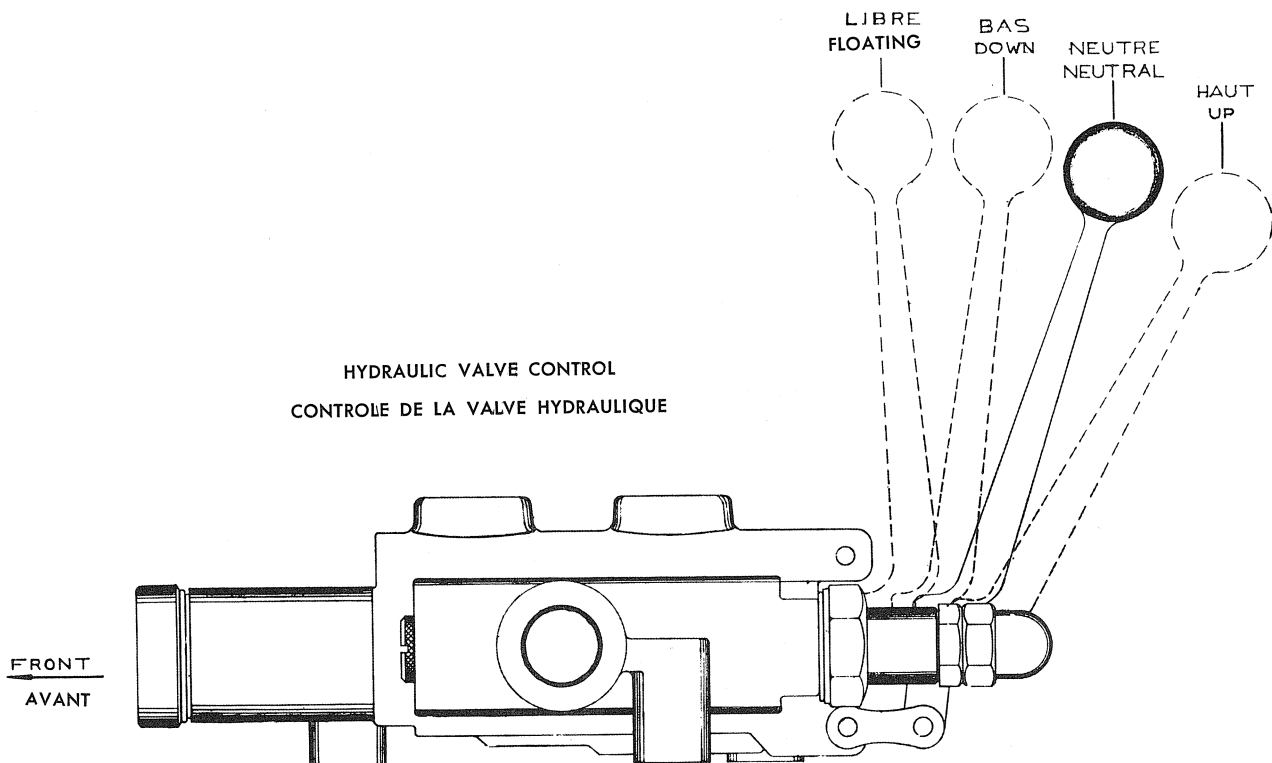
The left hand lever engages the 4 forward speeds.

Each lever has to be shifted back to neutral position before engaging the other.



**OPERATING BLADE OR PLOWS:**

**OPÉRATION DE LA CHARRUE:**





## STARTING THE ENGINE

- 1 — Throw gearshift lever in neutral position.  
In cold weather, depress clutch pedal and pull choke.
- 2 — Turn ignition switch "On".
- 3 — Press starter button.
- 4 — Before driving away, let engine run at idling speed and check instrument panel:
  - a) Fuel
  - b) Temperature
  - c) Oil pressure
  - d) Ammeter

NOTE: In cold weather, drive tractor slowly for a while to allow proper lubrication of parts under friction and to flex the tracks; this will insure longer track life.

## MAINTENANCE INSTRUCTIONS

The use of a Bombardier tractor requires from the part of its operator, a working knowledge of its construction design and principles in order to take advantage of its qualities and avoid abuse or erratic uses of the unit which could cause premature wear and unnecessary repairs.

For example, speed which is a definite advantage could be a cause of breakdowns if the tractor is driven at exaggerated speeds, specially when terrains conditions do not allow it.

In order that you obtain maximum performance from your tractor, it is very important that you follow recommendations given for maintenance and lubrication.



## **DAILY CHECK**

### **Chassis :**

Maintain the interior of the chassis thoroughly clean at all times.

### **Tracks :**

Detect defective cross links, bolts and guards.

THE RIGHT TENSION OF THE TRACK IS DETERMINED BY A 2½" TO 3" FREE PLAY AT THE CENTER OF THE TRACK BETWEEN THE SPROCKET WHEEL AND THE REAR WHEEL.

A TIGHT TRACK WILL DAMAGE THE SPROCKET WHEEL AND CAUSE ABNORMAL WEAR ON TRANSMISSION SYSTEM AND FINAL DRIVE.

A LOOSE TRACK WILL SLIP OVER AND DAMAGE A SPROCKET WHEEL AS WELL AS CAUSE SHOCKS TO THE DRIVE SYSTEM.

### **Wheels :**

Maintain tire pressure at 100 lbs.

Lack of pressure will cause rubber separation on tire walls.

This separation takes place around the rim of the wheel.

### **Suspension :**

Remove mud and foreign matters which could clog the suspension system and cause friction against wheels and tires.

Check condition of bolts which support the springs as well as cross shaft nuts and cotter pins.

### **Steering levers :**

Maintain a 3" free play.

### **Engine :**

Check oil and fuel and detect possible fuel or oil leaks.

### **Cooling system :**

Check anti-freeze or water level in radiator and look for possible leaks.

Keep radiator thoroughly clean to ensure maximum engine cooling.



## **WEEKLY CHECK**

### **Tracks :**

Examine condition of belts and cross links.

Tighten bolts if necessary.

### **Sprocket wheels :**

Examine condition of rubber and tighten bolts.

Tighten bolts on the axle support at the chassis.

### **Wheels :**

Check adjustment of wheel bearings.

### **Suspension :**

Check wheel alignment and adjustment of suspension bearings.

### **Engine :**

Check fan bolts.

Check fan belt tightness.

Check air cleaner condition.

### **Electrical System :**

Clean and tighten battery cables if necessary.

Check wires.

Check water level in battery and gauges on instrument panel.

### **Differential :**

Check level and condition of the oil. If oil is contaminated by water, drain, clean and replace with 4 gallons (3½ gals. for SW-48) of non-corrosive, non-hypoid gear oil, SAE 90 or SAE 80, according to prevailing temperature. A drain plug is located under right axle support and another under pinion housing inside the cab.

Change oil every 100 hrs. of operation.

If tractor operates in mud or water, change the oil more often.

## **REMOVAL AND INSTALLATION OF THE TRACK :**

To remove a track :

- 1— Jack up the tractor
- 2— Remove the center wheel
- 3— Remove the adjusting screw completely from the tandem axle
- 4— Loosen the 4 bolts of the pressure plate of the rear spindle
- 5— Push the rear wheel forward to free the track
- 6— Pull out the track

To install a track :

- 1— Jack up the tractor and lift the front wheel
- 2— Carry out operations 2 to 5 incl. given above
- 3— Install track on sprocket and over the wheels
- 4— Start engine and engage transmission to turn sprocket forward while the track is guided to fall in place
- 5— Push rear wheel to rear and install adjusting screw
- 6— Install center wheel
- 7— Adjust track and tighten bolts of pressure plate on rear spindle

## **INSTALLATION AND REPLACEMENT OF DRIVE AXLE, DRIVE SPROCKET OR AXLE BEARINGS.**

To replace a drive sprocket, a drive axle or drive axle bearings, it is necessary to remove the track as per procedure described before.

- 1 — Remove track
- 2 — Remove bolts which hold drive axle housing to the tractor and place the sprocket flat on the ground
- 3 — Press on the lock sleeve and remove the lock ring using a screw driver
- 4 — The axle can then be removed from the housing.

To reinstall, reverse above procedure.

If it should be necessary to change the axle bearings, remove bolts from the bearing retaining cap and remove bearings.

Bearings are well adjusted when they will turn by mere hand pressure without any slack.



## ADJUSTMENT OF THE CONTROL LEVERS

The steering and brake levers are adjusted by means of a nut which should be tightened of the levers have too much free play.

The adjusting nut is located at the bottom of the lever. Loosen the lock-nut and tighten the adjusting nut leaving about 3" free play between the steering lever and the dashboard. Tighten the lock-nut.

When the tractor is in operation, steering brake bands should not be allowed to drag on the drums and pulling the levers should only be done when turning or breaking is necessary. All control rods from the pedals are adjustable by means of adjusting nuts or clevises.

## ADJUSTMENT OF BEARINGS

### Adjustment of suspension tapered roller bearings.

Suspension bearings should be tightened firmly

However, when replacing suspension parts and reinstalling the bearings, it would be preferable to turn the stop-washer inside out so as to tighten the bearings more firmly. If bearing is still loose, add a shim between the inner grease retainer and the frame cross-tube.

### Pinion Bearing Adjustment :

To adjust the pinion bearings, use shims if necessary and tighten the bolt so that there is not too much play that the pinion may be turned by hand without any resistance.

The adjustment of the crown on the pinion is made by loosening the bearing adjuster on one side and by tightening the other so that there is only .008 to .010" free play between the crown and the pinion.

### Adjustment of Wheel Bearings :

Tighten the wheel nut firmly then loosen it  $1\frac{1}{2}$  to 2 slots and insert the cotter pin.

MEMO

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# INSTRUCTIONS FOR REPAIRING THE DIFFERENTIAL ASSEMBLY

Remove the tracks.

Remove the sprockets and axles assembly.

Remove the gas tank.

Remove differential cover. Disconnect upper part of brake bands and remove steering and brake lever adjusting nut (J-209-1). Unscrew the bearing adjusters on each side of the differential carrier until the differential assembly can be lifted out of the chassis.

## Dissassembling Differential Assembly

Remove the differential side bearings (M-491) at both ends of the differential case using a bearing remover part no. M-1360. Lift the steering brake drum (M-492) including the brake drum gear (M-504), off the differential case. Hold the planetary gears and the center part of the side case. Remove the cotter pins and castellated nuts that secure the three planetary gears to the differential pinion gears (M-515) at each side of the case. Insert a heavy screw driver between the planetary gears and the case and pry the gears off the differential pinion gears.

NOTE : Each planetary gear is punch marked to match the differential pinion gears to assure proper synchronization.

Remove the cotter pins and nuts. Use a brass hammer if necessary to tap the case apart. However doing so make sure to mark both sides of the casing in order to reassemble it in same position. Remove the differential pinion gears (M-515) and axle to differential pinion gear (M-513) from the case.

## Differential Assembly Inspection

The crown and pinion gear (M-493) are supplied in matched sets, and, if either is damaged, both must be replaced. Replace the crown gear if it has chipped or missing teeth following the procedure outlined under : "Crown gear replacement" below. Replace the bushings and the differential case if they are worn and same applies to differential spacers. Replace any differential pinion gears that have chipped or missing teeth. Replace any planetary gears or axle to differential pinion gears (M-513) that have chipped or missing teeth or have worn splines. Replace the steering brake drum if it is cracked, scored or badly worn. However, if the scores on the brake drum are not too deep, the drum may be machined on a lathe.

## Crown Gear Replacement

Remove the lock wire and the 12 bolts that secure the crown gear to the differential case. Using a brass hammer, tap the crown gear off the case. To install the crown gear, lay it on a bench with the teeth facing downward. Place the case on the crown gear and line up the holes. Install the 12 bolts that secure the gear to the case. Lock the bolts with the locking wire.

## Differential Pinion Gear Bushing Replacement

Remove the differential pinion gear bushings from the differential case, using a suitable driver. Line ream the bushings if necessary.

## Differential Case Bushing Replacement

Place the center case (M-517) of the differential case in a vise. Remove the two bushings. Install new bushings using suitable bushing replacer. To remove the bushings from the side cases, insert a center punch between the bushing and the case and pry the bushing out of the case. To install new bushings, place the bushing in position on the case and using a suitable driver, drive the bushing into the case.

## Brake Drum Gear Bushing Replacement

Remove the steering brake drum (M-492) from the brake drum gear (M-504) and remove the bushings. To install new bushings, place one of the bushings in position in the brake drum gear. Drive the bushing in place with a suitable driver. Install the other bushing on the opposite side using the same procedure.



## **Steering Brake Drum Repair**

Remove the lock wire, six cap screws and nuts that secure the brake drum gear to the steering drum and remove the gear from the drum. Turn down the brake drum on a lathe until all evidence of scores is removed. If the brake drum does not clean up at a diameter of 10-7/16 inches or more, the brake drum must be discarded.

## **DIFFERENTIAL REASSEMBLY**

### **Install the Axle to Differential Pinion Gear in the Differential Case**

Place the differential case left side (M-518) with crown gear attached on a bench. Place a thrust washer in position in each hole provided for the six differential pinion gears being sure the side having the radius is facing away from the case surface (upward). Place the axle to differential pinion gear (M-513) in its bearing on the case.

#### **Note :**

The hub in the axle to differential pinion gear is identical on both sides and can be installed either side up.

### **Install Center Case in Differential Case**

Place the center case on the axle to differential pinion gear being sure the matching marks on the center case are in line with the marks on the differential case. Tap the center case with a brass hammer until it is seated firmly in the dowels.

### **Install Differential Pinion Gears**

Holding one of the differential pinion gears with the splined end of the gear facing downward, insert it into one of the larger differential pinion gear holes in the case. Turn the differential pinion gear until the tooth on the gear having the reference mark faces the exact center of differential. Do not turn the axle to differential pinion gear after the first differential pinion gear has been installed. Insert the other two differential pinion gears in the large holes in the case in the same manner so that the reference mark on the teeth faces the exact center of differential.

#### **Note :**

All six of the pinion gears have a punch mark (reference mark) on one of the splines at the spline end of the gear. The reference mark on one of the teeth of each of these gears is on the tooth which is in line with the mark on the splined end of the gear. In some cases the mark on the teeth does not appear, in which case select the tooth which lines up with the mark on the splined end of the gear and align this tooth to face the exact center of differential.

### **Install Upper Part of Differential Case (Right Side M-509)**

Place the axle to differential pinion gear in the bushing on the center case. Place the six thrust washers on the differential pinion gears being sure the side having the radius is facing away from the case surface (downward). Place the upper part of the differential case (M-509) on the differential pinion gears, being sure the matching marks on the upper case are in line with the marks on the center case. Tap the case with a brass hammer until it is seated firmly on the center case. Insert the six differential case bolts through the case assembly and install the castellated nuts and cotter pins on the bolts.

### **Install Planetary Gears**

Place a planetary gear (M-508) on each of the differential pinion gears, making sure that the punch mark on each planetary gear is in line with the punch mark on the spline of each differential pinion gear. Install the flat washers and nuts that secure the planetary gear to the differential pinion gear. Use the same procedure to assemble the planetary gears on the other half of the case.

## **Assemble and Install Steering Brake Drum**

Place the brake drum gear in position on the steering brake drum and install the six cap screws and nuts that secure the brake drum gear to the drum. Lock the six cap screws with locking wire or self locking nuts. Place the assembly on the differential case and install the differential side bearing.

## **Assemble the Drive Pinion**

Insert the drive pinion including the inner bearing into the housing. Place the spacer and original thickness of shims on the pinion gear. If the original thickness of shims is unknown, install shims totalling approximately 0.035 inch thick and place the outer bearing on the pinion. Place the pinion flange on the pinion. Do not install the oil seal at this time. Install the bolt, flat washer, and lock washer that secure the flange to the pinion and draw the flange down tight. The pinion bearing adjustment is correct when the pinion turns freely but there should not be any free play. If the pinion turns with difficulty, shims will have to be added behind the outer bearing. If the pinion is loose shims will have to be removed. After the correct adjustment is obtained, remove the pinion flange, install a new oil seal in the pinion housing, install the pinion flange, the flat washer, lock washer and bolt.

## **Check Crown Gear and Pinion Backlash**

Install the differential assembly in the differential carrier, install the carrier stiffener bar and adjust the carrier bearings. Check the backlash which must not be less than 0.008 inch or more than 0.010 inch. If the backlash is less than 0.008 inch, unscrew the bearing adjuster on the left and screw the bearing adjuster on the right until the correct backlash is obtained. If the backlash is more than 0.010 inch, unscrew the bearing adjuster on the right and screw the bearing adjuster on the left until the backlash is within the specified limits. Lock the bearing adjusters through the adjuster bearing lock bolts.

## **LUBRICATING BOMBARDIER TRACTORS**

### **Engine Crankcase :**

Change oil every 50 hours of operation using the right oil viscosity for the prevailing temperature. If engine has been idle for 30 days or more, replace the oil (4 imperial quarts). Every other oil change, replace oil filter cartridge and re-fill crankcase with 5 imperial quarts.

### **Air Cleaner :**

Every 100 hrs., empty and clean reservoir; wash filter element in kerosene. Refill to level mark with SAE 50 oil in summer or SAE 20 oil in winter. When the tractor works in severe dust conditions, repeat this operation more often.

### **Distributor :**

2 or 3 drops of light oil in the oil cup every 100 hours.

### **Crankcase filler cap :**

Remove, wash element and re-oil with SAE 50 oil.

### **Transmission :**

Check oil level and condition every 50 hours. If there are traces of condensation in the oil, change oil and use SAE 90 or SAE 80 according to temperature.

Change oil every 200 hours.

To drain transmission, remove cover and use a suction pump

In severe cold weather conditions, use thinner oil.

### **Differential :**

Check level and oil condition. If oil is contaminated by water, drain, clean and replace with 4 gallons of non-corrosive, non-hypoid gear oil SAE 90 or SAE 80 according to prevailing temperature.

A drain plug is located under right axle support and another under pinion housing inside the cab.

Change oil every 100 hours of operation.

If tractor operates in mud or water, change the oil more often.

### **Hydraulic system :**

The hydraulic system requires 3 imperial gallons of hydraulic oil.

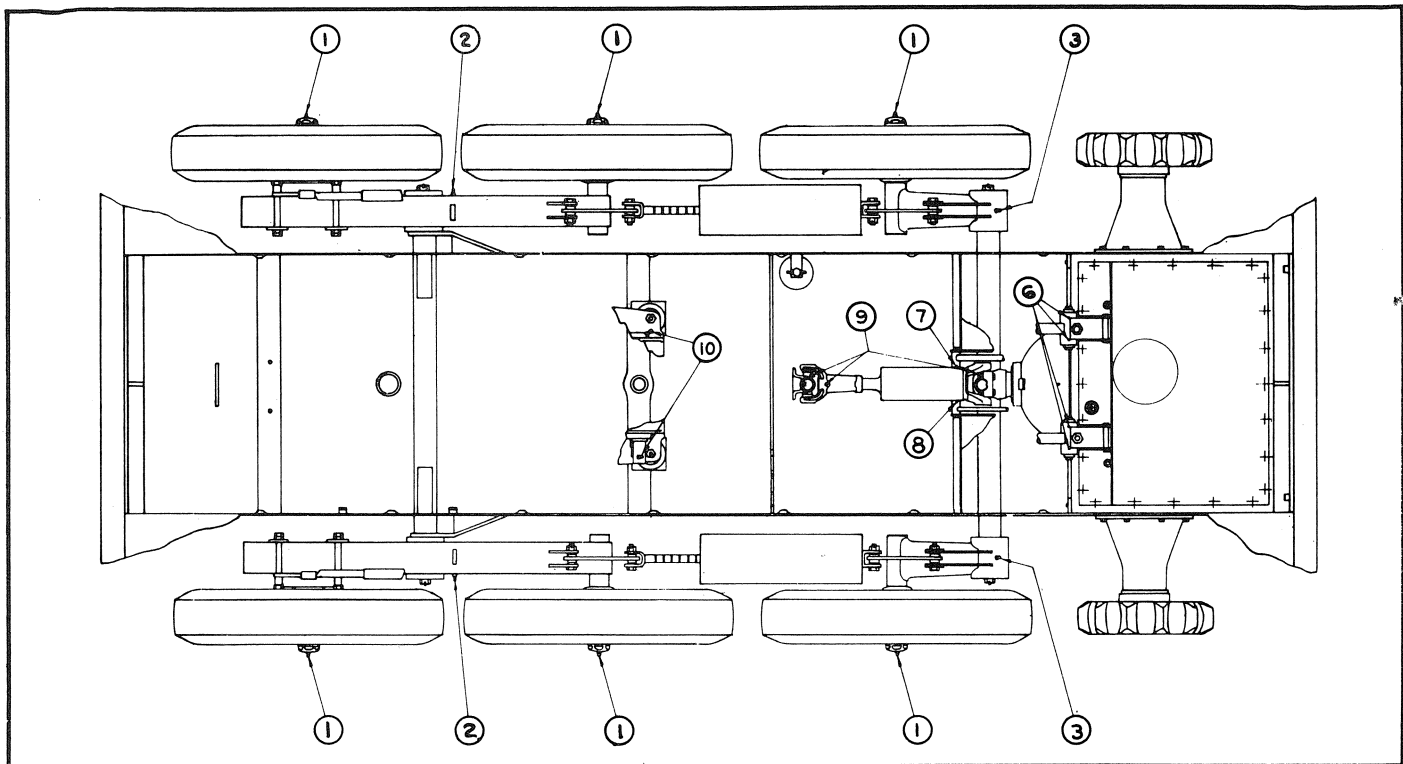
The reservoir itself contains 2½ imperial gallons.

Change oil every 500 hours or at the beginning of a new operating period.

Strainer in reservoir should be removed and cleaned with benzine (or other hydrocarbon) every 250 hours. Change strainer whenever damaged or corroded.

There is a filter located inside the cabin and the cartridge should be changed at least every 250 hours.





## LUBRICATION SCHEDULE

### Recommended Lubricant :

It is most important to use such greases that do not mix with water and will retain texture and viscosity at operating temperatures varying from  $-65^{\circ}$  to  $+150^{\circ}$  FAR. (Consult your supplier).

1 Wheel bearings :	Lubricate with grease gun	} Once a month
2 Tandem axle :	Twice a week when working on firm ground or snow	
3 Bogie spindle :	Once a day when working in mud or water	
6 Steering & Brake levers :	At lower end, a few drops of oil	
7 Clutch pedal :	Remove drive shaft cover and put a few drops	
8 Throttle pedal :	of oil each side of pedal shaft	
9 Propeller shaft	With grease gun	
U-joint :	Once a month	
10 Clutch release fork :	With grease gun	
	Once a year	

## PROTECTING THE TRACTOR DURING STORAGE

### Engine :

The recommended procedure for rust preventive treatment when the tractor is not operated during 30 days or more is outlined below :

- 1— Remove carburetor air cleaner.
- 2— Run engine at a fast idle speed until normal operating temperature has been reached. While engine is running, slowly pour one pint of rust preventive lubricant through the carburetor air intake. The speed of pouring should be sufficient to slow down the engine speed slightly without stalling. The addition of rust preventive lubricant in this manner should take approximately one minute.
- 3— Stop the engine after the rust preventive has been added.

Note — Provide adequate ventilation while introducing the rust preventive. as considerable smoke will be exhausted.

### Tractor :

- 1— To prevent corrosion, clean the tractor and lubricate as per instructions.
- 2— Remove the battery.
- 3— Remove the tension on the tracks and suspension.
- 4— Jack-up the tractor so that the tracks will not touch the ground

### METHOD OF DRAINING ENGINE AND RADIATOR :

- 1— Install a flexible plastic or rubber hose on the engine drain cock. This hose should have a maximum inside diameter of  $\frac{1}{2}$  inch and should be 4 feet long.
- 2— From the drain cock, this hose should pass over the mudguard and the end should come down below the level of the drain cock, so that it will act as a siphon to drain the engine block completely.





## ENGINE TROUBLE SHOOTING

NOTE : In this section, the possible causes of trouble are given in order of frequency. Therefore, when diagnosing an engine abnormal condition, always make the checks by following the order of the list given under "possible causes" section and "repairs or corrective measures."

Trouble	Possible Causes	Repairs or Corrective Measures
1) When starting, engine does not turn over	a - Dead battery	Check battery specific gravity; recharge if too low.
	b - Battery or starter connections loose	Check connections; tighten if loose.
	c - Battery with a dead cell	Replace battery.
	d - Open or short circuit in the starter	Repair or change starter.
	e - Starter pinion not engaging into flywheel ring gear	Repair or change bendix drive, or overrunning clutch assembly, if these seem to be defective.
	f - Engine seized	Try to turn engine by hand, if impossible, repair the engine.
2) When starting, cranking speed is normal but engine does not start	a - Carburetor flooded	For the complete operation, hold throttle wide open and with choke open, engage starter for periods of 30 seconds on, 60 seconds off, until engine is running.
	b - Moisture on ignition wires and distributor	Dry out ignition wires, distributor cap and coil.
	c - Dirty or corroded distributor breaker points	Clean or change. Readjust breaker points according to specifications.
	d - Faulty carburetion (fuel line, fuel pump, carburetor)	A - Check for water in fuel line. Clean the line if necessary. B - Check action of the fuel pump and repair if necessary. Clean carburetor if you have any doubts about its cleanliness.
(to be cont'd.)		

## ENGINE TROUBLE SHOOTING (Cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
2) When starting, cranking speed is normal but engine does not start (cont'd.)	e - Faulty ignition ( <i>spark plug gap, loose connections, coil, condenser</i> ).	A - Check spark plug gap. Readjust if off specifications. B - Check all connections attached to distributor and coil. Tighten or clean any doubtful connections. C - Check coil and condenser. If one of them seems defective, replace it.
	f - Improper ignition timing	Check and, if necessary, readjust ignition timing.
3) Engine does not start because of a slow, weak or erratic cranking speed	a - Weak battery	Check specific gravity of the battery. Recharge or change battery if it seems defective.
	b - Starter	A - Check the starter and battery connections. If they are loose, tighten them. B - Check starter for an open or shorted field. In any of these cases, repair or change the starter.
	c - Faulty starter	Check solenoid. If defective, repair or change.
4) Engine stalls while idling  (to be cont'd.)	a - Idle speed too low	Adjust idle speed with the idle speed adjusting screw.
	b - Improper idle mixture	Adjust idle mixture with the idle mixture adjusting screw(s) (2 barrels).
	c - Faulty choke	Check choke for free operation and lubricate the choke shaft if necessary. Check choke thermostat spring adjustment. If needed, readjust it.
	d - Improper fuel level in carburetor	Check and correct carburetor float setting.
	e - Faulty coil or condenser	Check all coil and condensed connections for looseness, test the coil and condenser. Change the defective part(s) if needed.

## ENGINE TROUBLE SHOOTING (Cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
5) When idling, engine misses	a - Moisture on ignition system	Dry out ignition wires, distributor cap and spark plugs.
	b - Worn, dirty spark plugs or incorrect gap	Remove spark plugs, check, clean and readjust the gap before replacing them on the engine.
	c - Faulty fuel system	A - Check and adjust carburetor idle adjustment. B - Check and adjust carburetor float level.
	d - Ignition system	A - Check for burnt or pitted breaker points, change them if necessary. B - Check for broken or loose ignition wires. If they are broken change them. C - Check for burnt, cracked or worn distributor rotor and distributor cap. If they are defective, change the faulty part(s). D - Check for faulty coil or condenser. Change them if necessary. E - Check for excessive play in distributor shaft, change shaft or distributor assembly if there is too much play.
	e - Engine	A - Check for burnt, warped or pitted valves. If needed, repair or change the faulty parts. B - Check for unequal compression between cylinders. If the compression is uneven, repair as required.
6) When accelerating, engine misses	a - Ignition timing	A - Check, clean and readjust breaker points which are dirty or improperly gapped. B - Check, clean and readjust spark plugs which are dirty or the gap set too high.
	b - Ignition system	A - Check for defective coil or condenser. Replace the faulty part(s). B - Check and, if needed, readjust the ignition timing.
(to be cont'd.)		



## ENGINE TROUBLE SHOOTING (Cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
6) When accelerating, engine misses (cont'd.)	c - Fuel system	A - Check and clean dirt accumulation. B - Check if the carburetor accelerating pump works properly. If not, repair it. C - Check the fuel pump for erratic operation; if needed, repair the pump.
	d - Engine	Check for burnt, warped or pitted valves. Repair or change the defective valve(s).
7) Engine missing at high speed	a - Dirt or water in fuel line or carburetor	Clean the fuel line and, if necessary, the carburetor.
	b - Breaker points, spark plugs, rotor, coil and condenser	A - Clean breaker points and readjust the gap. B - Check, clean and readjust spark plugs which are dirty or with too wide a gap. C - Check for a burnt, cracked or worn rotor. Change if necessary. D - Check and test coil and condenser. If needed, change the defective part(s).
	c - Dirty carburetor high speed jet(s)	Clean or change the jet(s) if necessary.
	d - Incorrect ignition timing	A - Check and, if needed, readjust the ignition timing with engine turning at both, low and high speeds. B - Check the vacuum and centrifugal advance mechanism. If faulty, repair or change it.
	e - Distributor shaft	A - Check for excessive play in distributor shaft, change distributor assembly, if necessary. B - Check distributor shaft for worn cam. Change distributor shaft or distributor assembly if needed.
8) Engine with low efficiency (loss of power) (to be cont'd.)	a - Spark plugs ( <i>wrong gap or dirty</i> )	Check, clean and adjust spark plugs.

## ENGINE TROUBLE SHOOTING (Cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
8) Engine with low efficiency (loss of power) (cont'd.)	b - Fuel system ( <i>dirt or water, float level, fuel pump</i> )	A - Check for water or dirt in fuel feed line and carburetor. Clean if needed. B - Check and, if needed, readjust the carburetor float level. C - Check the fuel pump pressure and output. Repair or change the fuel pump if it seems defective.
	c - Ignition timing	Check ignition timing. Adjust if necessary.
	d - Valve clearance	Check and, if necessary, readjust valve (tap-pet) clearance.
	e - Distributor advance	A - Check, repair or change the vacuum advance mechanism, if necessary. B - Check the functioning of the centrifugal advance mechanism. Repair if the mechanism seems defective.
	f - Exhaust system	Check for plugged or restricted exhaust pipes or muffler. Repair or change the faulty part(s).
	g - Ignition system	A - Check for defective coil or condenser. If necessary, change the defective part(s). B - Check for worn rotor or distributor cap. Change them if necessary. C - Check for excessive play in distributor shaft. Change shaft or distributor if the play is excessive. D - Check for a worn distributor shaft cam. If needed, change distributor shaft or distributor assembly.
(to be cont'd.)	h - Engine	A - Check engine valve timing and, if necessary, make necessary repairs or adjustments. B - By taking a compression test, determine the condition of the valves. If their condition seems bad, proceed to the needed repairs. C - Also, with the compression test, check for a damaged cylinder head gasket. Change the gasket if necessary.

## ENGINE TROUBLE SHOOTING (Cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
9) Engine with noisy valves	a - Valves	<p>A - Check for excessive clearance (valve tappet or lifter). Readjust if necessary.</p> <p>B - Check for runout of valve seat and valve face. Install new valve and valve seat if necessary.</p> <p>C - Check for broken or weak valve spring(s). Change the faulty spring(s) if necessary.</p>
	b - Valve guides and tappets	<p>A - Check for worn valve guides. If the clearance (stem to guide) is too big, make the necessary changes.</p> <p>B - Check for worn tappet. If, according to specifications, there is too much clearance, repair.</p>
10) Oil pressure drop or too low	a - Oil	<p>A - Check oil level. Add if necessary.</p> <p>B - Check for thin or diluted oil. If oil is too thin, use higher S.A.E. number. If oil is diluted, check for coolant leak, and repair if necessary.</p>
	b - Oil system	<p>A - Check if the oil pump relief valve is stuck open. If needed, disassemble the valve. Change as necessary.</p> <p>B - Check for excessive bearing clearance and, if needed, change the bearings.</p> <p>C - Check for worn parts in the oil pump, repair if necessary.</p> <p>D - Check, repair or change bent or misaligned oil pump suction tube.</p> <p>E - Check for oil leaks at the fittings, tubes, etc. Repair if necessary.</p>
11) Excessive oil consumption	a - External leaks	<p>A - Check, visually, for oil leaks around the oil pan and at the front and rear oil seals. If necessary, change pan gasket or crankshaft oil seal(s).</p> <p>B - Check the crankcase ventilation system for proper functioning. (Breather pipe and filter, crankcase ventilator outlet pipe, P.C.V. valve). Repair as required.</p>

(to be cont'd.)



## ENGINE TROUBLE SHOOTING (Cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
11) Excessive oil consumption (cont'd.)	b - Engine	<p>A - Check for cracked valve stem oil shield(s). Change defective part(s).</p> <p>B - Check for excessive clearance between valve stem and guide. Change faulty part(s).</p> <p>C - Check for worn, scored or broken rings. If needed, change the rings.</p> <p>D - Check for rings too tight in their grooves. Repair if necessary.</p> <p>E - Check for too much side clearance between rings and piston grooves. If needed, change rings, piston(s), or both. At the same time, check for clogged oil ring slots.</p> <p>F - Check cylinder wear (out of round or taper). If necessary, restraighten the cylinder(s).</p> <p>G - Check for proper ring seating. Repair if necessary.</p>
12) Connecting rod bearings noisy	a - Low oil pressure	Refer to "oil pressure drop or too low" in this section. (Trouble # 10)
	b - Insufficient oil supply to the bearings .	Check and clean oil galleries and oil passages.
	c - Connecting rod bearings	Check connecting rod bearing clearance. If the clearance exceeds specifications, change the bearings.
(to be cont'd.)	a - Vibration pulley damper	Check for loose vibration pulley damper. Repair if necessary.
	b - Low oil pressure	Refer to "oil pressure drop or too low" in this section. (Trouble # 10)
	c - Insufficient oil supply to the main bearings	Check and clean oil galleries and oil passages.

## ENGINE TROUBLE SHOOTING (Cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
13) Crankshaft main bearings noisy (cont'd.)	d - Main bearings	Check main bearings clearance. If clearance is out of specification, make the needed repair(s) or change(s).
	e - Flywheel	Check for loose flywheel and repair if defective.
	f - Crankshaft end play	Check for an excessive crankshaft end play and, if necessary, correct the end play.

## ENGINE TROUBLE SHOOTING (COOLING SYSTEM)

Trouble	Possible Causes	Repairs or Corrective Measures
1) External leakage	a - Radiator	<p>A - Check and tighten loose hose clamps.</p> <p>B - Check and change any defective rubber hose.</p> <p>C - Check for broken radiator seams. Repair radiator if necessary.</p>
	b - Engine	<p>A - Check for worn water pump. Change or repair if defective.</p> <p>B - Check and change loose core hole plugs.</p> <p>C - Check and change damaged gaskets.</p> <p>D - Check for (a) warped cylinder head(s). Repair if necessary.</p> <p>E - Check for (a) cracked cylinder head(s). Repair or change defective head(s).</p> <p>F - Check for (a) cracked cylinder block(s). Repair or change if defective.</p> <p>G - Check for cracked thermostat housing. Repair or change defective housing.</p> <p>H - Check and repair leaks at exhaust manifold center studs.</p>
2) Internal leakage	a - Cylinder head	<p>A - Check, change or repair (a) warped cylinder head(s).</p> <p>B - Check and change blown cylinder head gasket(s).</p>
	b - Cylinder block	<p>A - Check for cracked cylinder walls. Change cylinder block if necessary.</p> <p>B - Check and tighten loose cylinder head bolts.</p> <p>C - Check for cracked valve port(s). Change cylinder block or cylinder head(s) if necessary.</p> <p>D - Check for cracked block in valve chamber. Repair or change block or cylinder head if necessary.</p>
3) Overcooling (to be cont'd.)	a - Thermostat	Check and change defective thermostat.

## ENGINE TROUBLE SHOOTING (COOLING SYSTEM) - (cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
3) Overcooling (cont'd.)	b - Temperature gauge assembly	Check for inaccurate temperature gauge assembly. Change faulty item(s). (temperature pick-up plugs or cable, gauge).
4) Loss of coolant by overflow system	a - Cooling system	Refer to the section "poor circulation" Trouble # 5.
	b - Boiling	A - Refer to the section "Poor circulation" trouble # 5. B - Check and clean excessive sludge formation in engine crankcase. C - Check for plugged radiator core. Clean radiator if necessary. D - Check for obstruction in front of radiator. If needed, clean all dirt or dust accumulation in front of radiator.
	c - Cylinder head	Check for leak in cylinder head gasket(s). Change gasket(s) if leaking.
	d - Radiator overfilling	Check if radiator has not been overfilled.
5) Poor circulation of Coolant	a - Engine	A - Check for restricted water jacket. Clean cooling system if restricted. B - Check for scale build-up in cylinder block. If necessary, clean cooling system with scale remover solution.
	b - Radiator	A - Check for too low coolant level. Add coolant if level too low. B - Check and change defective or collapsed radiator hose.
	c - Water pump	A - Check for too loose water pump impeller on its shaft. If impeller too loose, repair or change. B - Check for loose fan belt. Readjust belt according to specifications.
(to be cont'd.)		

## ENGINE TROUBLE SHOOTING (COOLING SYSTEM) - (cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
6) Corrosion or rust build-up into cooling system.	a - Coolant	A - Check for impurities in water or coolant. Drain system if necessary. B - Check for improper previous cooling system draining and service.
	b - Cooling system	A - Check and repair air leaks into system. (Water-pump, hoses). B - Check and repair exhaust gas leakage. (Cylinder head gaskets).
7) Overheating	a - Crankcase radiator	Refer to trouble # 5, possible cause "B".

**NOTE :**      FACTORS WHICH MAY CAUSE ENGINE OVERHEATING :

- a) Incorrect ignition timing
- b) Incorrect valve timing
- c) Oil level too low
- d) Tight engine
- e) Defective heat control valve (manifold)
- f) Plugged or defective muffler
- g) Overloading
- h) Excessive engine idling



## ENGINE TROUBLE SHOOTING (FUEL PUMP)

Trouble	Possible Causes	Repairs or Corrective Measures
1) Fuel pump leaks (fuel)	a - Housing	A - Check and re-tighten loose housing screws. B - Check and tighten, if necessary, loose inlet or outlet line fittings.
	b - Diaphragm	A - Check and replace, if necessary, worn, ruptured or torn fuel pump diaphragm. B - Check and change fuel pump diaphragm mounting plates.
2) Fuel pump leaks (oil)	a - Fuel pump pull rod	Check for deteriorated pull rod seal. Change seal if defective.
	b - Fuel pump assembly	A - Check for loose rocker-arm pivot pin. Change pin if defective. B - Check and tighten, if necessary, loose fuel pump mounting bolts. C - Check for defective fuel pump gasket. Change gasket if necessary.
3) Fuel pump is noisy	a - Fuel pump	Check and tighten loose fuel pump mounting bolts.
	b - Rocker-arm	A - Check for scored or worn rocker-arm. Change fuel pump rocker-arm if needed. B - Check for weak or broken rocker-arm spring. Change spring if necessary.
4) Insufficient fuel delivery	a - Fuel line (tank to pump)	A - Check, clean and repair restricted or blocked fuel tank air. B - Check for leaks in fuel line and fittings up to fuel pump (when running fuel pump can draw air in). Repair line if necessary. C - Check for dirt or restriction into fuel tank. Clean or repair if necessary. D - Check for frozen gas line. If necessary, use special anti-freeze or deicer.
	b - Fuel pump and fuel filter	A - Check for worn, torn or ruptured diaphragm. Change fuel pump diaphragm if necessary. B - Check for improperly seated fuel pump valves. Change fuel pump valves if defective. C - Check for weak main spring on fuel pump. If necessary, change the spring (follower spring). D - Check for restricted fuel filter. Change or clean filter if needed.

## ENGINE TROUBLE SHOOTING (CARBURETION)

Trouble	Possible Causes	Repairs or Corrective Measures
1) Poor idle (refer to engine trouble, section 5-3-A, troubles 5 & 6)	a - Faulty idle circuit	Check for carbonized or plugged : 1 - Idle tube 2 - Idle air bleed 3 - Idle discharge holes  If necessary, clean faulty parts or whole carburetor assembly.
	b - Defective carburetor assembly	A - Check for carbonized throttle body or worn throttle shaft. Clean or change defective part(s). B - Check for leaking joint (gasket) between carburetor and intake manifold. Tighten joint or change gasket. C - Check and change damaged or worn idle mixture adjusting screw(s). D - Check and readjust incorrect float level. E - Check if choke operates properly. Repair choke if necessary. F - Check and tighten carburetor main body to throttle body loose screws.
	c - Engine and ignition system	Refer to engine trouble shooting - section 5-3-A, troubles 5 & 6
	d - Manifold (intake and exhaust)	A - Check and repair intake manifold leaks. B - Check and repair manifold heat control valve if stuck.
2) Poor performance (mixture too rich)	a - Ignition system	Refer to troubles # 6, 7, 8, in engine trouble shooting (section 5-1).
	b - Carburetor ( <i>main jet, vacuum piston, float, choke</i> )	A - Check and change damaged main metering jet(s). B - Check for a worn or stuck vacuum piston. Change or repair if necessary. C - Check and readjust too high float level. D - Check automatic choke for proper functioning. Repair choke if needed.
(to be cont'd.)		

## ENGINE TROUBLE SHOOTING (CARBURETION) - (cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
2) Poor performance (mixture too rich) (cont'd.)	c - Engine ( <i>fuel pump, heat control valve</i> )	A - Check fuel pump pressure. Repair pump if necessary. B - Check functioning of manifold heat control valve (stuck open). Repair if valve stuck.
3) Excessive fuel consumption	a - Carburetor (choke, fuel level)	A - Check and repair sticky choke. B - Check and correct too high fuel level.
	b - Ignition timing and ignition system	Refer to section 5-1, troubles # 6, 7 and 8.
	c - Engine ( <i>manifold heat control valve, low engine compression, sticking valve</i> )	A - Check and repair sticky manifold heat control valve. B - Check engine compression. If compression too low or erratic, make needed repairs. C - Check and repair any sticky valve(s).
4) Carburetor is leaking or flooding	a - Carburetor	A - Check for cracked carburetor body. If cracked, change carburetor body. B - Check for defective body gaskets. If defective, change gaskets and tighten body. C - Check and correct too high float level. D - Check and clean if foreign materials are inserted between needle valve and its seat.
	b - Fuel pump	Check for excessive fuel pump pressure; if pressure too high, repair.
5) Poor acceleration	a - Carburetor	A - Check and repair stuck step-up piston in down position. B - Check functioning of accelerating pump. If defective, repair. C - Check and readjust too high or low fuel level. D - Check automatic choke for proper functioning, repair if necessary.
	b - Engine	A - Check, repair or change worn or defective throttle linkages. B - Refer to engine trouble shooting, section 5-1, troubles 6, 7 and 8.

## POWER TRAIN TROUBLE SHOOTING (CLUTCH)

Trouble	Possible Causes	Repairs or Corrective Measures
1) The clutch is slipping	a - Adjustments	A - Check clutch release lever adjustment. Correct lever adjustment if necessary. B - Check clutch linkage adjustment. Correct adjustment if needed.
	b - Clutch mechanism	A - Check and change weak or broken clutch pressure plate spring(s). B - Check for worn or glazed facings on clutch disk. Change clutch disk assembly if necessary. C - Check for oil or grease on clutch disk facings. Clean or change clutch disk if necessary. D - Check for a warped clutch disk. Change clutch disk assembly if needed. E - Check for a warped or scored pressure plate. If necessary, get pressure plate machined. F - Check for binding clutch release lever. Change levers if they seem defective.
2) The clutch is noisy (chattering)	a - Clutch release lever	Check for improper clutch release lever adjustment. If needed, correct the adjustment.
	b - Disk facings	Check for oil or grease on disk facings. Clean or change the clutch disk assembly if necessary.
	c - Transmission shaft	Check for worn spline on transmission shaft or on clutch disk hub. If necessary, change transmission shaft or clutch disk assembly.
(to be cont'd.)	d - Pressure plate	Check for binding pressure plate and repair defective parts if necessary.
	e - Clutch release lever	Check for binding release lever. If necessary, change lever or assembly.
	f - Clutch disk	A - Check for a binding clutch disk hub. If necessary, change disk assembly or repair faulty part(s). B - Check for bent clutch disk. Change disk if needed.

## POWER TRAIN TROUBLE SHOOTING (CLUTCH) - (cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
2) The clutch is noisy (chattering) (cont'd.)	g - Clutch release lever spring	Check for uneven release lever spring pressure. If necessary, change the spring(s).
	h - Alignment	A - Check transmission to clutch housing alignment. If necessary, take corrective measures to realign. B - Check clutch housing to engine alignment. If alignment incorrect, repair faulty items.
	i - Clutch disk	A - Check for loose clutch disk facing. If the facings are loose, change clutch disk assembly. B - Check for glazed disk facing. If necessary, change clutch disk.
3) The clutch is grabbing	a - Adjustments	A - Check and readjust improper clutch release lever adjustment. B - Check and repair transmission to clutch housing misalignment.
	b - Clutch disk	A - Check for oil or grease on clutch facing. Clean or change disk if necessary. B - Check for clutch disk hub sticking on transmission shaft. Investigate on condition of spline and repair if needed. C - Check for worn or glazed facings (clutch disk). If necessary, change the clutch disk assembly.
	c - Clutch mechanism	A - Check for worn pressure plate or flywheel. If one of them defective, remachine faulty item(s). B - Check for worn or binding clutch release lever. If lever is found defective, change it. C - Check and change broken or weak clutch release springs.
	d - Engine mounting support	Check and change loose or deteriorated engine mounting support, if necessary.
(to be cont'd.)		



## POWER TRAIN TROUBLE SHOOTING (CLUTCH) - (cont'd.)

Trouble	Possible Causes	Repairs or Corrective Measures
4) The clutch is dragging	a - Adjustments	<p>A - Check adjustment of clutch release lever. If necessary, correct it.</p> <p>B - Check adjustment of clutch linkages. Correct it if necessary.</p>
	b - Clutch assembly	Check for dust or dirt accumulation into clutch assembly. Clean assembly if too dirty.
	c - Clutch mechanism	<p>A - Check for worn or broken disk facings. If necessary, change clutch disk assembly.</p> <p>B - Check for binding clutch disk hub on transmission shaft. If necessary, change the faulty part(s).</p> <p>C - Check for binding transmission shaft into flywheel pilot brushing. Correct or repair defective part(s).</p> <p>D - Check for sticking clutch release bearing sleeve. Repair or change defective part(s).</p> <p>E - Check for a warped pressure plate. If necessary, remachine pressure plate.</p> <p>F - Check for improper transmission to clutch housing alignment. Repair if necessary.</p>

## POWER TRAIN TROUBLE SHOOTING (TRANSMISSION)

Trouble	Possible Causes	Repairs or Corrective Measures
1) Transmission hard to shift	a - Clutch mechanism	<p>A - Check and readjust an incorrect clutch pedal free play.</p> <p>B - Check for binding of the clutch throw out bearing. Change or repair defective parts.</p> <p>C - Check the alignment of clutch housing with transmission housing. Repair if housings are misaligned.</p>
	b - Transmission mechanism	<p>A - Check for binding of shaft linkage and adjustment off. Readjust, repair or change defective part(s), if necessary.</p> <p>B - Check for worn part(s) in shift housing. Repair or change defective part(s).</p> <p>C - Check for burred splines or defective shifting parts. Change or repair faulty items.</p> <p>D - Check if lubricant used in transmission is of the correct type. Drain and change oil if necessary.</p>
2) Transmission is noisy	a - Internal mechanism	<p>A - Check and change badly worn, pitted or chipped gears.</p> <p>B - Check and change badly worn, pitted or chipped bearings.</p> <p>C - Check for excessive clearance (play) due to worn shaft(s). Change the shaft(s) if the play is out of specifications.</p>
	b - Transmission assembly	<p>A - Check for loose transmission mounting bolts. Tighten bolts or change mounting(s) if necessary.</p> <p>B - Check if transmission is well lined up with engine and drive line. Correct or repair if necessary.</p> <p>C - Check transmission oil level. Correct the level if needed.</p>
(to be cont'd.)		

## POWER TRAIN TROUBLE SHOOTING (TRANSMISSION) - (cont'd.)

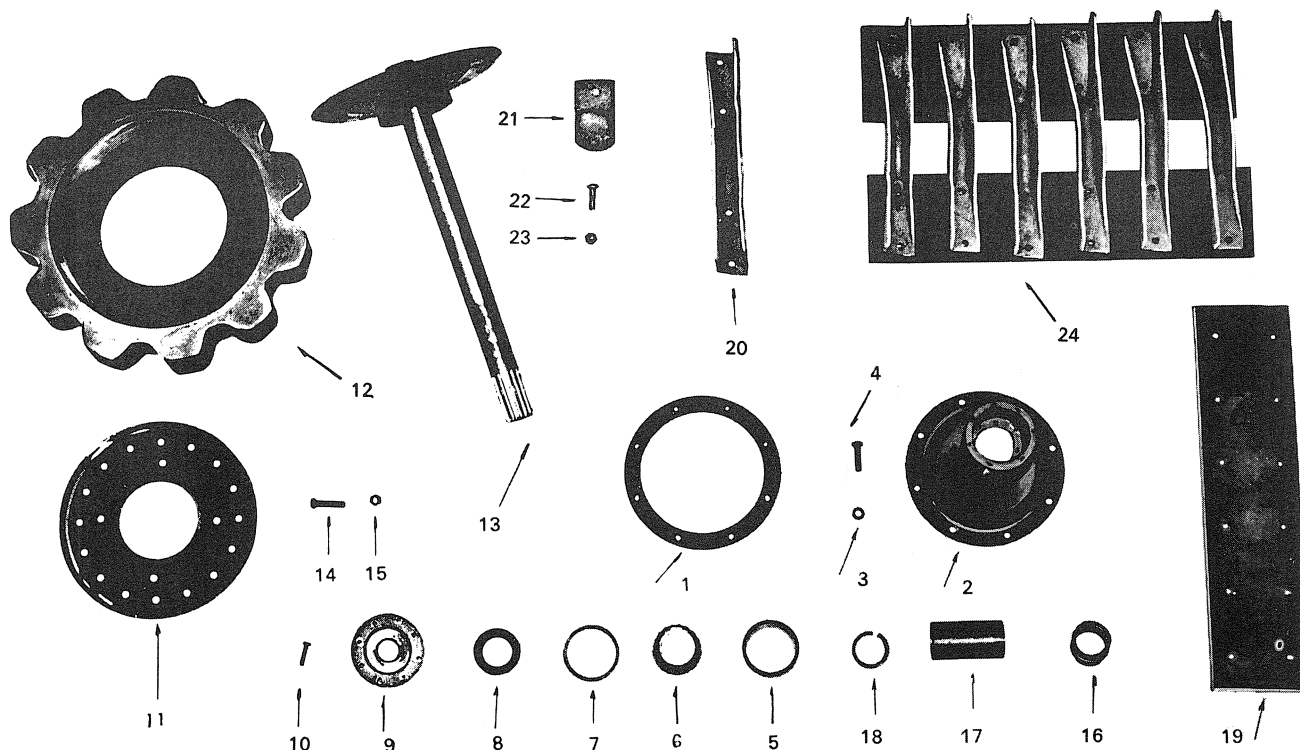
Trouble	Possible Causes	Repairs or Corrective Measures
3) Transmission does not stay in gear	a - Shifting mechanism	<p>A - Check for broken or weak shift rail poppet notch, worn interlock and poppet balls. Repair or change any defective part(s).</p> <p>B - Check for sprung or loose transmission shift fork or loose gear shift cover bolts. If necessary, change the defective part(s) and tighten the bolt(s).</p>
	b - Transmission assembly	<p>A - Check for proper alignment of transmission, clutch housing and flywheel. If necessary, correct the alignment.</p> <p>B - Check end play of transmission main shaft. If out of specifications, repair or correct the transmission main shaft end play.</p> <p>C - Check linkage adjustment. If necessary, readjust to the specifications.</p>
4) Transmission oil leak	a - Oil	<p>A - Check for overfilled transmission. Correct transmission oil level if needed.</p> <p>B - Check type of oil used. Drain transmission oil if oil type is incorrect.</p>
	b - Transmission assembly	<p>A - Check for excessive bolt threads clearance. Repair if necessary.</p> <p>B - Check for broken or misaligned gasket(s) and oil seal(s). Change defective part(s) if necessary.</p>

## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.



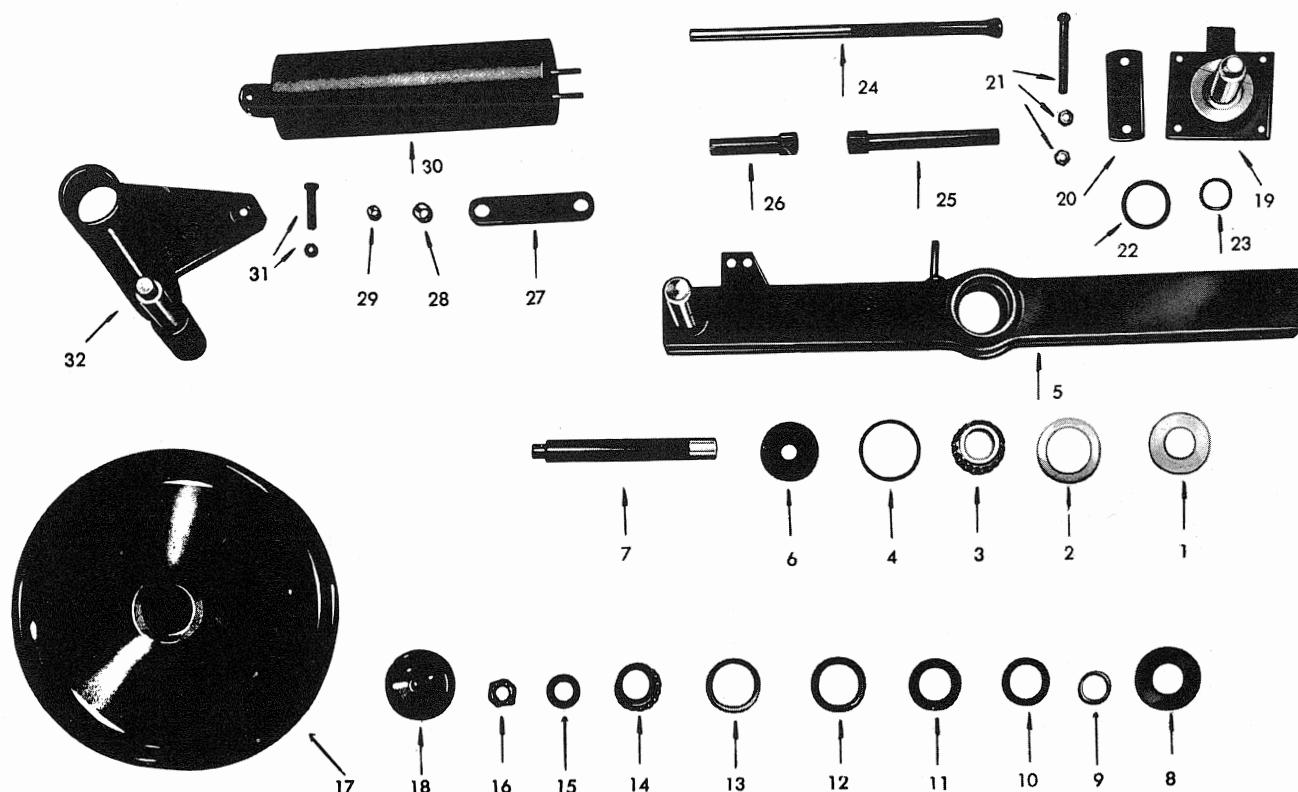
## **PARTS SECTION**





### DRIVE and TRACK

Ref. No.	Part No.	Description	SW-48	SW-54
1	670 0113	Axle Housing Gasket	2	2
2	601 0024	Drive axle housing — up to serial no. JW6-5350	2	2
2	601 0029	Drive axle housing — from serial no. JW6-5350	2	2
3	399 8004	Drive axle housing washer — up to serial no. JW6-5350	16	16
3	392 0026	Drive axle housing washer — from serial no. JW6-5350	16	16
4	300 0085	Drive axle housing bolt — up to serial no. JW6-5350	16	16
4	300 0125	Drive axle housing bolt — from serial no. JW6-5350	16	16
5	105 0004	Axle Bearing Cup	4	4
6	105 0003	Axle Bearing Cone	4	4
7	601 0018	Axle Bearing Shim .003	as required	
	601 0019	Axle Bearing Shim .005	as required	
	601 0020	Axle Bearing Shim .010	as required	
8	624 0330	Axle Bearing Seal	4	4
9	601 0052	Axle Bearing Cap	2	2
10	300 0004	Drive axle bearing cap bolt	16	16
11	601 0038	Drive Sprocket Flange	2	2
12	670 0105	Sprocket	2	2
13	601 0013	Drive axle & flange ass'y	—	2
13	601 0014	Drive axle & flange ass'y	2	—
14	309 8006	Drive Sprocket Bolt	32	32
15	386 6024	Nut	32	32
16	114 0001	Axle bearing sleeve spring	2	2
17	601 0030	Axle Bearing Lock Sleeve	2	2
18	601 0021	Axle Bearing Lock	2	2
19	670 0010	Track belt	4	4
20	600 0013	Cross link	112	112
21	600 0022	Track Guard	224	224
22	360 8003	Track Bolt	448	448
23	386 6024	Nut	448	448
24	680 0025	Track ass'y	2	2



## SUSPENSION AND WHEEL

Ref. No	Part No.	Description	SW-48	SW-54					
1	603 0104	Grease Retainer Inner	4	4		392 0028	Lock Washer	8	8
2	105 0004	Bearing Cup	8	8	22	670 0202	Mud Excluder Rubber		
3	105 0003	Bearing Cone	8	8			(Rear Wheel only)	2	2
4	670 0302	Grease Retainer Seal	8	8	23	603 0193	Wheel Spacer Rear Wheel	2	2
5	603 0131	Tandem Axle L.H.	1	1	24	103 0027	Adjusting Screw	2	2
	603 0045	Tandem Axle R.H.	1	1	25	103 0025	Adj. Screw & Tube ass'y	2	2
6	603 0101	Grease Retainer Outer	4	4	26	103 0029	Adj. Screw Lock Nut	2	2
7	603 0054	Replaceable Spindle	4	4	27	603 0078	Susp. Spring Link Ass'y	4	4
8	602 0007	Mud Excluder	4	4	28	603 0186	Susp. Spring Link Bushing	8	8
9	603 0192	Wheel Spacer	4	4	29	603 0188	Susp. Spring Link Bushing Small	8	8
10	670 0203	Mud Excluder Rubber	4	4	30	603 0065	Bogie Spring	2	2
11	682 0002	Wheel Seal ass'y	6	6	31	660 3002	Link Screw	8	8
	624 0140	Seal Spring	6	6	31	382 4028	Link Screw Nut	8	8
12	602 0016	Seal Support	6	6		371 0031	Link Screw Cotter Pin	8	8
13	105 0010	Wheel Cup	12	12	32	603 0011	Bogie Spindle ass'y L.H.	1	1
14	105 0012	Wheel Cone	12	12		603 0005	Bogie Spindle ass'y R.H.	1	1
15	602 0025	Spindle Washer	6	6		408 2001	Tandem Axle Grease Fitting	2	2
16	389 8006	Wheel Spindle Nut	6	6		108 2003	Bogie Spindle Grease Fitting	2	2
	371 1062	Spindle Nut Cotter Pin	6	6		603 0059	Bearing Shim	As required	
17	602 0031	Wheel ass'y	6	6		603 0086	Cross Shaft	—	2
	602 0021	Valve Protector Cap	6	6		603 0087	Cross Shaft	2	—
18	602 0013	Hub Cap	6	6		389 8007	Cross Shaft Nut	4	4
	408 2001	Hub Cap Grease Fitting	6	6		371 0064	Cross Shaft Nut Cotter Pin	4	4
19	603 0021	Rear Spindle ass'y	2	2		107 0002	Wheel Tire	6	6
20	603 0032	Rear Spindle Plate	4	4		107 0005	Wheel Tube	6	6
21	300 9167	Rear Spindle Bolt	8	8		629 0004	Hub Cap Wrench	1	1
21	380 6028	Rear Spindle Bolt Nut	8	8					

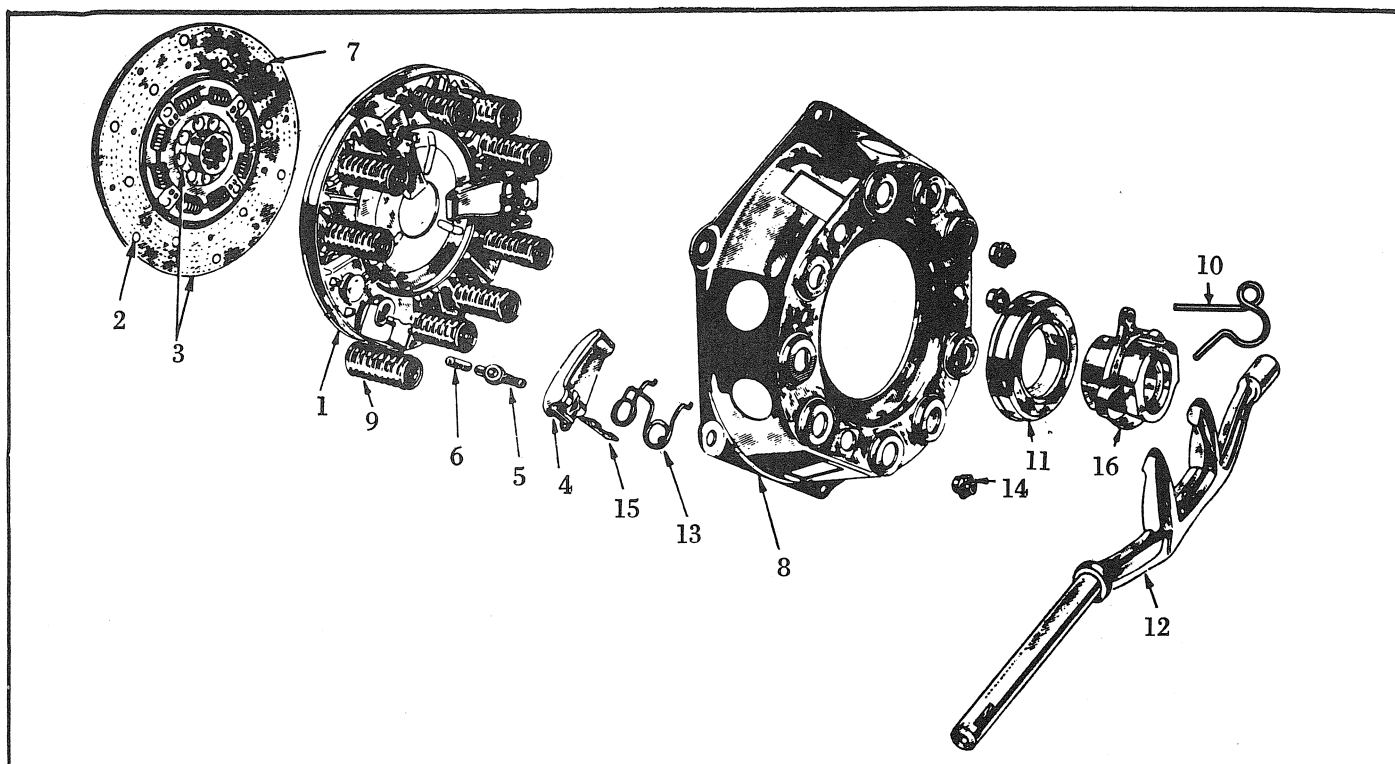
This diagram illustrates the exploded view of a mechanical assembly, with components numbered 1 through 70. The parts are distributed across the image as follows:

- Top Section:** Includes a large curved component (1), a handle (14), a curved blade (17), and a long curved arm (25).
- Left Section:** Features a large bracket (66), a handle (69), a small handle (70), and a spring (63).
- Center Section:** Contains a long shaft (2), a handle (3), a bracket (4), a handle (5), a handle (10), a handle (11), a handle (12), a handle (13), a handle (15), a handle (16), a handle (18), a handle (19), a handle (20), a handle (21), a handle (22), a handle (23), a handle (24), a handle (26), a handle (27), a handle (28), a handle (29), a handle (30), a handle (31), a handle (32), a handle (33), a handle (34), a handle (35), a handle (36), a handle (37), a handle (38), a handle (39), a handle (40), a handle (41), a handle (42), a handle (43), a handle (44), a handle (45), a handle (46), a handle (47), a handle (48), a handle (49), a handle (50), a handle (51), a handle (52), a handle (53), a handle (54), a handle (55), a handle (56), a handle (57), a handle (58), a handle (59), a handle (60), a handle (61), a handle (62), a handle (64), a handle (65), a handle (67).
- Right Section:** Includes a large bracket (66), a handle (69), a small handle (70), and a spring (63).

# CONTROL PARTS

Steering & Brake			SW 48	SW 54	Clutch			Propeller Shaft						
Ref. No.	Part No.	Description			Ref. No.	Part No.	Description	SW 48	SW 54	Ref. No.	Part No.	Description	SW 48	SW 54
1	606 0007	Brake Lever Sector (Optional)	2	2	21	609 0003	Clutch Pedal	—	1	41	103 0002	Propeller Shaft	1	1
2	606 0009	Steering Brake Lever	2	2	21	609 0004	Clutch Pedal	1	—	42	300 0083	Propeller Shaft Bolt 5/8" x 1" NF	4	4
3	606 0010	Lever Pin	2	2	22	670 0901	Pedal Pad Assy	—	1	43	380 6024	Propeller Shaft Nut 3/8"	4	4
4	114 0033	Steering Lever Pin Clip	2	2	23	609 0008	Clutch Rod	—	1	44	392 0024	Propeller Shaft Lock Washer 3/8"	4	4
5	606 0013	Yoke	2	2	23	609 0005	Clutch Rod	1	—	45	103 0029	Propeller Shaft U Bolt	2	2
6	380 6030	Steering Brake Yoke Nut	2	2	24	609 0014	Clutch Rod Return Spring	1	1		611 0004	Propeller Shaft Cover	—	1
7	606 0002	Yoke Adjusting Nut	2	2	25	609 0015	Clutch Return Spring Bracket	—	1		611 0008	Propeller Shaft Cover	1	—
8	606 0036	Yoke Packing	2	2	25	609 0016	Clutch Return Spring Bracket	1	—		103 0006	U-joint repair package at transmission	1	1
9	681 0006	Steering Lever Plate	2	2	26	300 0153	Clutch Pedal Bolt 1/2" x 1 1/4"	1	1		103 0007	U-joint repair package at differential	1	1
	606 0006	Brake Band & Lining	2	2	27	609 0018	Clutch Release Fork Lever	1	—					
	606 0006	Brake Lining & Rivets	1	1		660 9002	Clutch Release Fork Flange	1	—					
	390 5001	Rivets	66	66	27	609 0039	Clutch Release Fork Lever	—	1					
10	606 0019	Short Band Pin	2	2		660 9001	Clutch Release Fork	1	—					
11	371 0031	Band Pin Cotter Pin	2	2		300 4040	Spring Bracket Bolt 5/16" x 1/2" NC	1	1					
12	606 0019	Short Band Pin	2	2		371 0011	Cotter Pin 3/32" x 3/8"	1	2					
13	371 1061	Band Pin Cotter Pin	2	2	28		Grease fitting	2	2					
14	414 0002	Handle Grip	2	2										
15	380 6019	Nut 1/4"	2	2										
16	300 0009	Steering Lever Plate Bolt 1/4" x 2 1/2"	2	2										
<b>Differential Carrier</b>														
	608 0039	Differential Carrier Assy	—	1										1
	660 8003	Bearing Adj. Lock Bolt 5/8" x 3"	2	2										1
17	608 0041	Stiffener	1	—	29	610 0004	Throttle Pedal Assy	—	1	48	604 0089	Shifter Rod (Second & High)	4	1
17	608 0042	Stiffener	1	—	29	610 0004	Throttle Pedal Assy	1	—	49	371 0012	Cotter Pin	4	4
18	300 0154	Diff. Stiffener Bolt 1/2" x 1 1/2"	2	2	30	300 0043	Pedal Bolt 5/16" x 1" NF	1	1	50	604 0088	Shifter Rod (Low & Reverse)	1	1
19	392 0028	Diff. Stiffener Lock Washer 1/2"	2	2	31	610 0016	Throttle Pedal Pad Assy	1	1	51	380 6022	Shifter Rod Nut	1	1
20	380 9028	Diff. Stiffener Nut 1/2"	2	2	32	610 0045	Lever Rod	1	1	52-54	114 0062	Adjuster Yoke & Pin	1	1
	670 0807	Gasket	—	1	33	380 6019	Lever Rod Nut 1/4"	1	1	55	604 0090	Speed Selector Protector	1	1
	608 0032	Diff. Cover Assy	—	1	34	610 0010	Throttle Rod Return Spring	1	1	56	604 0083	Base Bracket Assy	1	1
	608 0034	Diff. Cover Assy	—	1	35	610 0011	Throttle Lever	1	1	57-58	604 0087	Shifter Lever	2	2
	670 0804	Cover Gasket	1	1	36	101 3001	Throttle ball joint	1	1		604 0104	Shifter Spring	1	1
	670 0805	Cover Gasket	1	1	37	610 0005	Throttle Rod	1	1	59	604 0084	Shaft	1	1
	660 8004	Filler Plug	1	1	37	610 0006	Throttle Rod	—	1	60	408 2001	Grease Fitting	1	1
	608 0038	Oil Level Gauge	1	1	38	380 6019	Lever Rod Nut 1/4"	1	1	61	108 2003	Grease Fitting	2	2
	300 0041	Diff. Cover Assembling Bolt 5/16" x 5/8"	24	24	39	610 0012	Swivel	1	—	62	604 0034	T-Lever Assy	2	2
	392 0022	Diff. Cover Assembling Bolt	24	24	40	101 8005	Swivel Clip	1	1	62	604 0034	T-Lever Assy	—	—
		Lockwasher 5/16"	24	24		114 0145	Hand Choke Wire & Button	1	1	63	604 0091	Protector Spring	2	2
	300 0085	Diff. Carrier Assembling Bolt 3/8" x 1 1/2"	—	16		114 0145	Hand Choke Wire Housing	1	1	64	372 0091	Roll Pin 3/16" x 1"	1	1
	399 8004	Diff. Carrier Assembling Bolt Washer 3/8"	—	16		300 4040	Carburetor Air Horn Bolt 5/16" x 1/2" NC	3	3	65	372 0151	Pin 5/16" x 1 1/4"	1	1
	108 7008	Drain Plug	1	1		392 0022	Lock Washer 5/16"	3	3		300 4043	Bolt 5/16" x 1"	1	1
	660 8007	Diff. Dumper Bolt 1/2" x 2"	1	1		371 0001	Cotter Pin 1/16" x 3/8"	1	1		392 0022	Lock Washer 5/16"	1	1
	380 6028	Diff. Dumper Bolt Nut 1/2"	—	1		371 0011	Cotter Pin 3/32" x 3/8"	2	2		300 0123	Flat Washer 5/16"	2	2
			—	1		610 0046	Spring Hook	1	1		380 0123	Bolt 7/16" x 1"	2	2
			—	1				1	1		380 6026	Nut 7/16" x 1"	1	1
			—	1				1	1		392 0026	Lock Washer 7/16"	1	1

SW

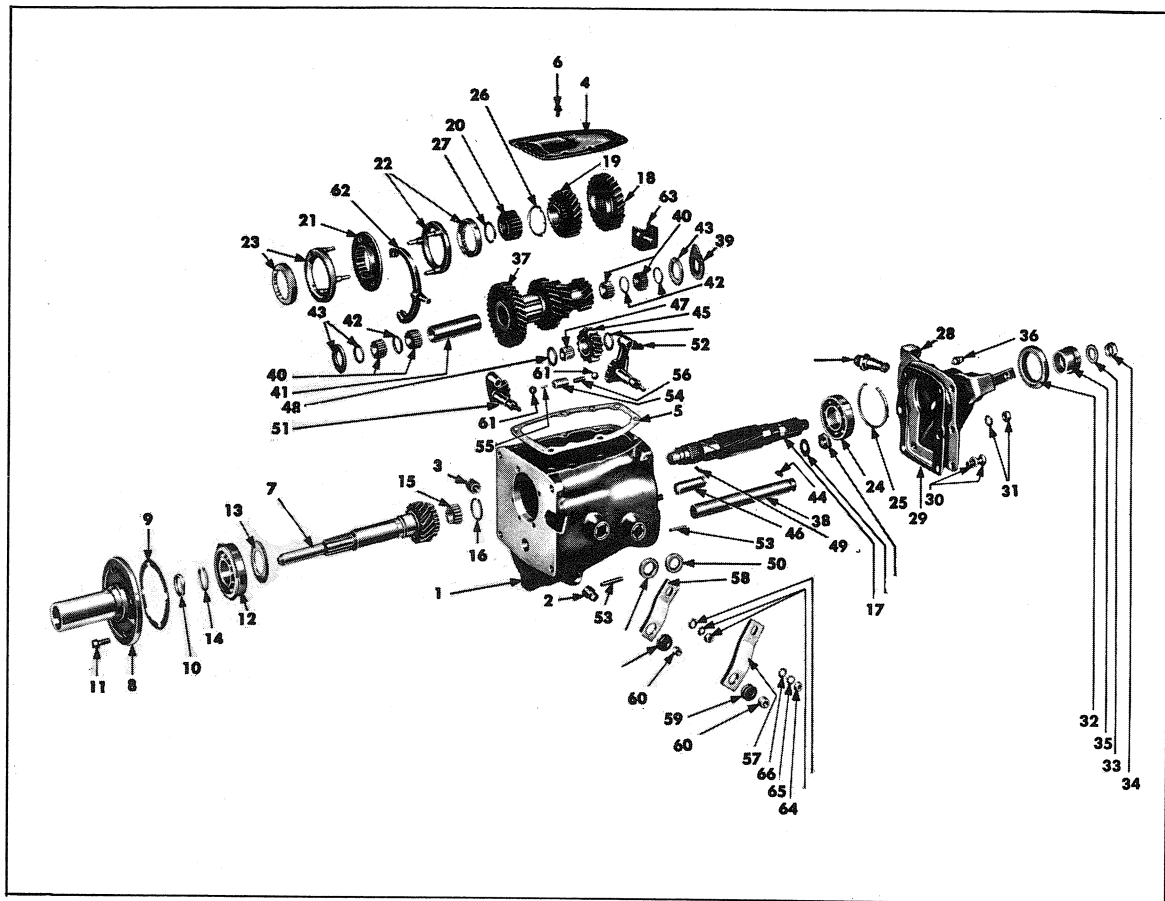


## CLUTCH

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>	<i>Quantity</i>
	102 6048	Housing assembly	1
1	102 6021	Pressure plate	1
2	102 6047	Disc facing rivets	24
3	102 6053	Disc assembly (with 3-speed transmission)	1
3	102 6005	Disc assembly (with 4-speed transmission)	1
4	102 6017	Release lever	4
5	102 4003	Release lever eye bolt	4
6	102 6010	Release lever pin	4
7	102 6023	Disc facing	2
8	102 6037	Cover	1
9	101 6002	Pressure spring	8
10	102 6007	Release bearing pull back spring	1
11	102 6006	Release bearing	1
12	101 2004	Release fork	1
13	102 4025	Release lever spring	1
14	102 4004	Release lever eye bolt nut	4
15	102 6011	Release lever strut	4
	102 6039	Housing pan	1
	102 6009	Clutch cover & pressure plate assembly	1
11 & 16	102 6029	Release bearing & sleeve assembly	1



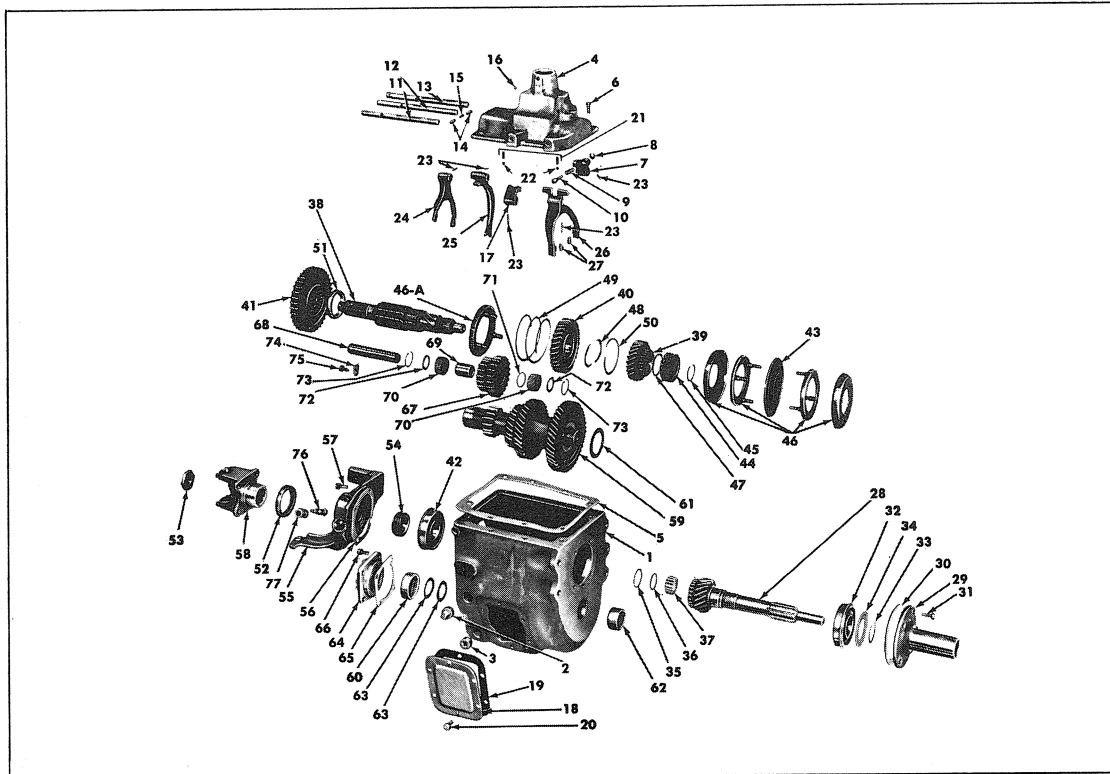
# TRANSMISSION 3 SPEED



## 3 SPEED TRANSMISSION

Ref. No.	Part No.	Description	Quantity	Ref. No.	Part No.	Description	Quantity
1	102 2312	Transmission case assembly	1	40	102 2320	Cluster gear brg. (short roller)	88
2	102 2364	Transmission drain plug	1	41	102 2240	Cluster spacer	1
3	108 7004	Transmission filler plug	1	42	102 2188	Cluster roller washer	4
4	102 2239	Transmission case cover	1	43	102 2153	Cluster gear thrust washer	2
5	102 2240	Transmission case cover gasket	1	44	102 2211	Countershaft key	1
6	102 2351	Transmission case cover screw & washer	6	45	102 2260	Reverse idler gear	1
7	102 2308	Transmission M/D gear	1	46	102 2210	Reverse idler gear shaft	1
7	102 2233	Transmission M/D gear for V-8 engine	1	47	102 2152	Idler gear roller bearing	22
8	102 2309	Transmission M/D gear retainer	1	48	102 2353	Idler gear thrust washer	2
8	102 2257	Transmission M/D gear retainer for V-8 engine	1	49	102 2211	Idler gear shaft key	1
9	102 2247	Transmission M/D gear retainer gasket	1				
10	102 2232	Transmission M/D gear retainer oil seal	1	50	102 2229	Shift lever shaft seal	2
11	102 2129	Transmission M/D gear retainer screw & washer	4	51	102 2246	2nd and high shift lever	1
12	105 4020	Transmission M/D gear bearing	1	52	102 2256	Low and reverse shift lever	1
13	102 2318	Transmission M/D gear bearing oil slinger	1	53	102 2313	Shift shaft lever pin	2
14	102 2314	Transmission M/D gear snap ring	1	54	102 2230	Shaft interlock sleeve	1
14	102 2315	Transmission M/D snap ring	1	55	102 2231	Shaft interlock pin	1
14	102 2316	Transmission M/D snap ring as required	1	56	102 2263	Shaft interlock spring	1
14	102 2317	Transmission M/D snap ring	1	57	102 2226	L & R operating lever	1
15	102 2253	Transmission M/D gear brg. snap ring	1	58	102 2227	2nd and high operating lever	1
15	102 2108	Transmission M/D gear pilot bearing	14	59	102 2228	Operating lever grommet	2
16	102 2267	Transmission M/D gear pilot brg. snap ring	1	60	102 9241	Operating lever bushing	2
17	102 2259	Transmission mainshaft	1	61	102 2003	Interlock ball	2
18	102 2258	Transmission M/S low slider gear	1	62	102 2237	2nd and high shift fork	1
19	102 2262	Transmission M/S second speed gear	1	63	102 2238	Low and Rev. shift fork	1
20	102 2241	Synchronizer ass'y	1	64	380 7022	Shift lever shaft nut	2
21	102 2262	Synchronizer clutch gear	1	65	399 8001	Shift lever shaft L/W	2
22	102 2235	Synchronizer clutch sleeve	1	66	391 0024	Shift lever shaft washer	2
22	102 2242	Synchro stop ring (inner)	1				
23	102 2241	Synchro stop ring (outer)	1	102 4033	Brake band and lining assembly	1	
24	105 4009	Main Shaft rear bearing	1	102 2226	M/S rear flange (yoke)	1	
25	102 2248	Main Shaft rear bearing snap ring	1	102 4032	Brake drum	1	
25	102 2250	Main Shaft rear bearing snap ring)	1	102 4044	Brake drum bolt	4	
25	102 2251	Main Shaft rear bearing snap ring) as required	1	102 4057	Brake drum bolt nut	4	
25	102 2252	Main Shaft rear bearing snap ring)	1	102 4043	Brake adjusting bolt	1	
26	102 2387	Synchronizer spring	1	102 4008	Brake adjusting bolt spring	2	
27	102 2264	Synchro clutch gr. snap ring	1	380 9024	Brake adjusting nut	2	
28	102 2261	M/S rear brg. retainer	1	102 4045	Brake bracket adj. screw	1	
29	102 2254	M/S rear brg. retainer gasket	1	380 9019	Brake bracket adj. screw nut	2	
30				102 4005	Brake anchor clip spring	1	
31	392 0026	Retainer screw L/W	6	102 4011	Brake anchor clip screw lockwise	1	
32	102 2039	M/S rear bearing retainer oil seal	1	102 4001 OBS.	Brake spacer link clevis cotter	1	
33	102 2352	M/S flange nut washer	1	102 4042	Brake anchor clip screw	1	
34	102 2181	M/S flange nut	1	102 4034	Brake link	1	
34	102 2268	Speedo gear spacer	1	102 4035	Brake link clevis pin	1	
35	102 2265	Speedo gear	1	102 4018	Brake cam lever	2	
36	OBS.	M/S rear brg. retainer breather	1	102 4006	Brake cam lever clevis pin	1	
37	102 2234	C/S cluster gear	1	102 4002 OBS.	Brake cam lever clevis pin cotter	1	
38	102 2236	Countershaft	1	102 0032	Gasket package	1	
39	102 2244	Thrust plate (cluster front)	1				

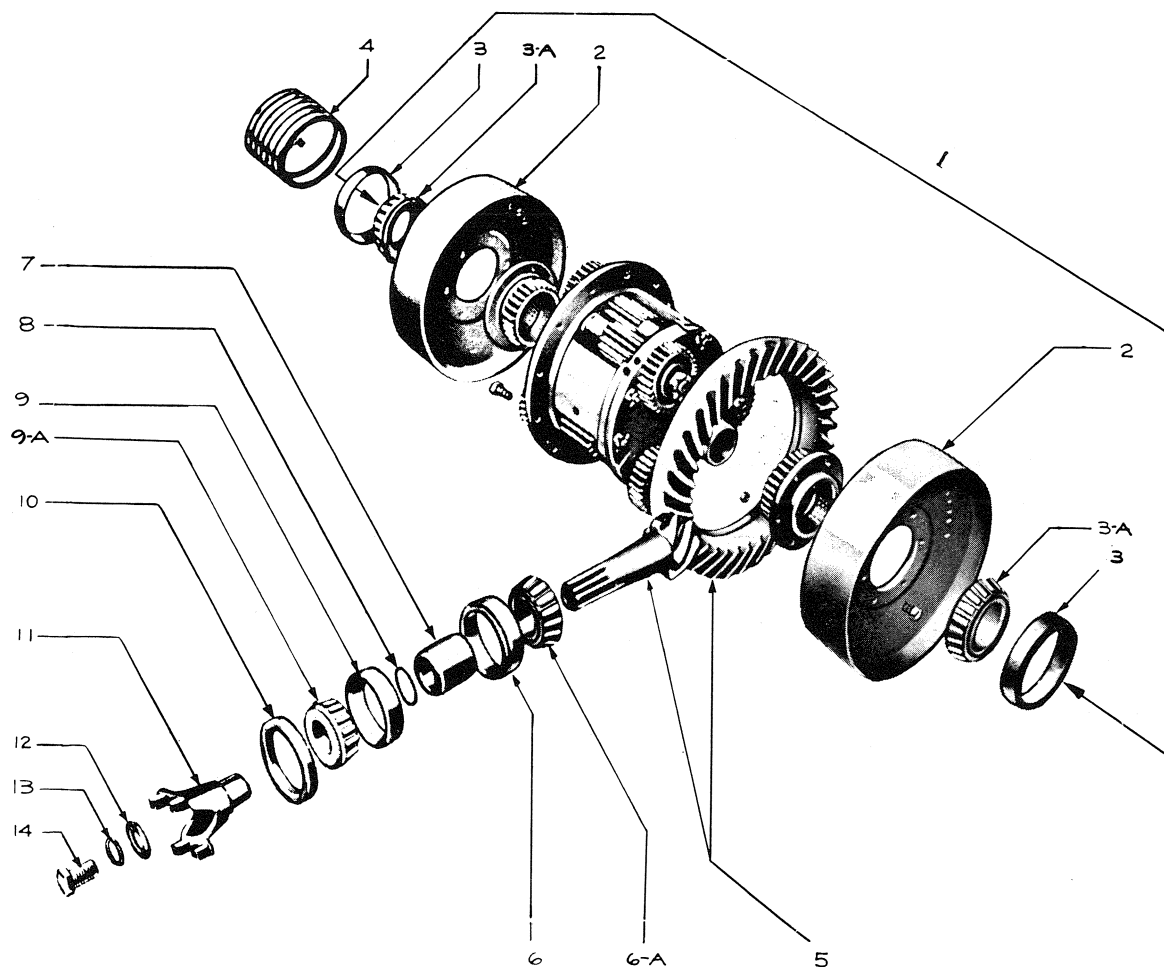
# TRANSMISSION (4 Speed) SYNCHROMESH



## 4 SPEED TRANSMISSION

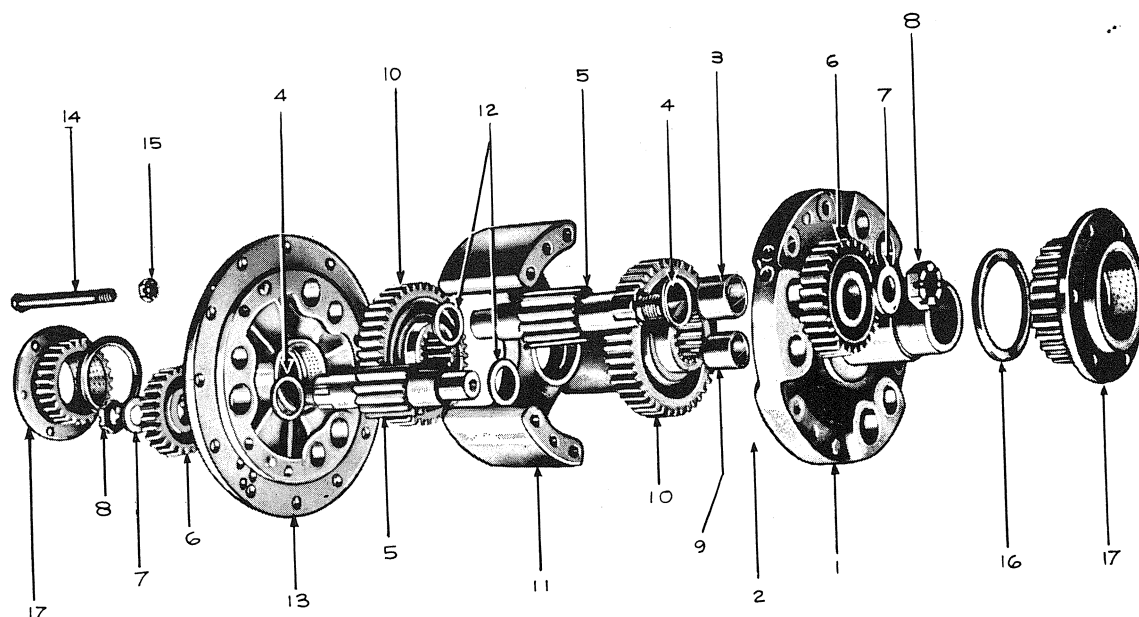
Ref. No.	Part No.	Description	Quantity
1	102 2071	Trans. Case	1
2	102 9358	Filler Plug	1
3	102 9127	Drain Plug (Magnetic)	1
4	101 2018	Transmission Case Cover	1
4	660 4001	Trans. Case Cover (modified for Muskeg tractor)	1
5	102 2300	Trans. Case Cover Gasket	1
5	102 2218	Trans. Case Cover Trunion	1
6	102 2128	Case Cover Screw/Washer	6
6	102 2142	Case Cover Body Fit Screw	2
6	392 0026	Case Cover Body Fit Screw L/W	2
7	102 2225	Reverse lug	1
8	102 2344	Rev. Shift Plunger snap ring	1
9	102 2020	Rev. Shift Plunger Spring	1
10	102 2346	Rev. Shift Lug Plunger	1
11	102 2303	Low & Second shift Rail	1
11	660 4025	Low & Second shift Rail (for Muskeg tractor)	1
12	102 2301	Third & direct Shift Rail	1
12	660 4003	Third & direct Shift Rail (for Muskeg tractor)	1
13	102 2302	Reverse Shift Rail	1
13	660 4002	Reverse Shift Rail (for Muskeg tractor)	1
14	102 2015	Rail Interlock Plunger	2
15	102 2017	Rail Interlock Pin	1
16	102 2360	Rail Interlock Hole Plug	1
17	102 2306	Second & Low Shift Lug	1
18	102 2013	PTO Cover	1
19	102 2009	PTO Cover Gasket	1
20	102 2135	PTO Cover Screw & Washer	6
21	102 2198	Shift Rail Poppet & Ball Spg.	3
22	102 2004	Poppet & Ball	3
23	102 2217	Shift Fork Lock Pin	5
24	102 2310	Second & Low Shift Fork	1
25	102 2305	Rev. Shift Fork	1
26	102 2304	Third & Direct Shift Fork	1
27	102 2224	Third & Direct Shift Fork Insert	1
27	102 2311	Second & Low Shift Fork Insert	1
28	102 2272	Trans. Maindrive Gear	1
29	102 2271	Drive Gear Bearing Retainer	1
30	102 2277	Drive Gear Bearing Retainer Gasket	1
31	102 2129	Drive Gear Bearing Retainer Screw	4
32	105 4019	Drive Gear Bearing	1
33	102 2278	Drive Gear Bearing Retaining Snap Ring)	1
33	102 2279	Drive Gear Bearing Retaining Snap Ring) as req'd	1
33	102 2280	Drive Gear Bearing Retaining Snap Ring)	1
33	102 2281	Drive Gear Bearing Retaining Snap Ring) as req'd	1
34	102 2282	Drive Bearing Oil Slinger	1
35	102 2284	Drive Gear Pilot Bearing Snap Ring	1
36	102 2354	Pilot Bearing Washer	1
37	102 2319	Pilot Bearing Roller	14
38	102 2283	Trans. Mainshaft	1
39	102 2286	Mainshaft Third Speed Gear	1
40	102 2287	Mainshaft Second Speed Gear	1

Ref. No.	Part No.	Description	Quantity
41	102 2288	Mainshaft Low Speed Gear	1
42	105 4019	Mainshaft Rear Bearing	1
43	102 2216	Synchro Sliding Clutch	1
44	102 2285	Synchro Clutch Gear	1
45	102 2060	Synchro Clutch Gear Snap Ring)	1
45	102 2061	Synchro Clutch Gear Snap Ring)	1
45	102 2062	Synchro Clutch Gear Snap Ring) as req'd	1
45	102 2066	Synchro Clutch Gear Snap Ring)	1
46	102 2219	Synchro Inner Stop Ring & Pin ass'y	1
46	119 1007	Synchro Inner Stop Ring Pin	1
47	102 2214	Synchro Adjusting Shim	as req'd
47	102 2215	Synchro Adjusting Shim	as req'd
48	102 2213	Mainshaft Second Speed Gear Split Ring	1
46-A			
46			
46	102 2363	Second Speed Synchro Ring Rivet	6
49	102 2289	Second Speed Synchronizer Spring	1
50	102 2290	Second Speed Synchronizer Pin Snap Ring	1
51	102 2291	Mainshaft Spacer	1
52	101 2012	Mainshaft Rear Retainer Oil Seal	1
53	102 2356	Mainshaft Nut	1
53	102 2357	Mainshaft Nut Washer	1
54	102 2022	Mainshaft Speedometer Gear	1
55	101 2011	Mainshaft Rear Bearing Retainer	1
56	102 2021	Mainshaft Rear Bearing Retainer Gasket	1
57	301 2083	Mainshaft Rear Bearing Retainer Screw/Washer	4
57	102 2340	Mainshaft Rear Bearing Retainer Screw/Washer	1
58	102 2273	Mainshaft Flange	1
59	102 2275	C/S Cluster Gear Ass'y	1
60	102 2290	Cluster Gear Front Bearing	1
61	102 2355	Cluster Gear Front Thrust Washer	1
62	102 2321	Cluster Gear Rear Bearing	1
63	102 2292	Cluster Gear Rear Bearing Race	1
62	102 2125	Cluster Gear Needle Bearing	1
64	102 2293	Cluster Gear Rear Bearing Retainer	1
65	102 2294	Cluster Gear Rear Retainer Gasket	1
66	102 2128	Cluster Gear Rear Retainer Screw & Washer	4
67	102 2295	Reverse Idler Gear	1
68	102 2165	Reverse Idler Gear Shaft	1
69	102 2296	Reverse Idler Gear Inner Race	1
70	102 2322	Reverse Idler Gear Needle Brg.	68
71	102 2297	Reverse Idler Gear Needle Brg. separator	2
72	102 2380	Reverse Idler Gear Needle Retainer Washer	2
73	102 2298	Reverse Idler Gear Needle Retainer Ring	1
74	102 2166	Reverse Idler Gear Shaft Lock Plate	1
75	102 2135	Rev. Idler Gear Sh. Lock Plate Screw & Washer	1
	102 0034	Gasket package	1
76	102 2025	Speedometer drive pinion	1
77	102 2307	Speedometer drive pinion sleeve	1



### DIFFERENTIAL ASSEMBLY

Ref. No.	Part No.	Description	Quantity
1	681 0005	Differential assembly	1
2	608 0002	Steering brake drum	2
	309 8008	Brake drum bolt	12
		Brake drum bolt nut	12
3	105 0024	Diff. carrier bearing cup	2
3A	105 0025	Diff. carrier bearing cone	2
4	608 0018	Bearing adjuster	2
5	103 1002	Crown gear & pinion	1
	309 8018	Crown gear bolt	12
6	105 0026	Drive pinion rear brg. cup	1
6A	105 0027	Drive pinion rear brg. cone	1
7	608 0003	Dive pinion sleeve	1
8	608 0004	Pinion bearing adj. shim .003	As required
	608 0005	Pinion bearing adj. shim .005	As required
	608 0006	Pinion bearing adj. shim .010	As required
	608 0007	Pinion bearing adj. shim .037	As required
9	105 0028	Drive pinion front bearing cup	1
9A	105 0029	Drive pinion front bearing cone	1
10	106 3002	Pinion gear housing oil seal	1
11	103 1004	Pinion flange	1
12	608 0008	Pinion flange locking washer	1
13	392 0035	Pinion flange bolt lockwasher	1
14	660 8006	Pinion flange bolt	1
	608 0044	Pinion bearing cup shim .010	1
	608 0046	Pinion bearing cup shim .024	1



## DIFFERENTIAL ASSEMBLY

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>	<i>Quantity</i>
1	608 0017	Diff. side case R.H.	1
	105 6007	Center & side case bushing	4
2	608 0019	Diff. case dowell pin	5
3	105 6003	Pinion gear bushing (large)	6
4	114 0162	Diff. planetary thrust washer	6
5	608 0026	Diff. pinion gear	6
6	608 0015	Differential planetary gear	6
7	391 0036	Differential pinion washer	6
8	389 8008	Differential pinion nut	6
9	105 6002	Pinion gear bushing (small)	6
10	608 0024	Axle to diff. pinion gear	2
11	608 0028	Diff. center spacer	1
12	114 0163	Diff. pinion thrust washer	6
13	608 0030	Diff. case L.H.	1
14	309 8015	Diff. gear case bolt	6
15	381 2028	Gear case bolt nut	6
16	608 0013	Brake drum gear thrust washer	2
17	608 0011	Brake drum gear	2
	105 6001	Brake drum gear bushing	4

## ENGINE

<i>No de pièce</i>	<i>Description</i>	<i>SW-48</i>	<i>SW-54</i>
300 0087	Motor Support Kit	1	1
387 2024			
380 6026			
300 0133			
670 1203			
661 2005			
661 2006			
612 0025			
670 1204			
612 0023			
612 0025	Motor Support at Fan	1	1
670 1204			
360 8003			
387 2024			
300 0133	Engine Support Bolt 7/16" x 3 1/2" NF	2	2
380 6026	Engnie Support Bolt Nut 7/16"	2	2
612 0024	Oil Gauge Extension Tube	1	1
114 0083	Air Cleaner	1	1
613 0042	Air Cleaner Hose	1	1
613 0043	Air Horn	1	1
300 4040	Air Horn Bolt 5/16" NC x 1/2"	3	3
392 0022	Air Horn Lock Washer 5/16"	3	3
	Reducer for Temp. Gauge	1	1
321 6100	Air Cleaner Bolt 1/4" NC x 1/2"	2	2
385 1019	Nut 1/4" NC	2	2
392 0019	Lockwasher 1/4"	2	2
110 9008	Governor With Lock	1	1
110 9009	Installation Kit	1	1
670 1202	Oil Pan Insulator	—	1
612 0009	Rear Engine Mounting Bracket L.H.	1	1
612 0013	Rear Engine Mounting Bracket R.H.	1	—
612 0011	Rear Engine Mounting Bracket R.H.	—	1
661 2004	Oil Dip Stick Guide Pipe	1	—
613 0001	Fuel Tank Outlet Elbow	1	1
613 0008	Fuel Tank	—	1
613 0033	Fuel Tank	1	—
613 0014	Fuel Tank Straps	2	2
613 0026	Fuel Line Bracket at engine	1	1
613 0027	Fuel Line Bracket at transmission	1	1
670 1301	Gas Tank Insulator	1	1
114 0010	Fuel Tank Cap	1	1
110 0005	Fuel Gauge Tank	1	1
110 0007	Fuel Gauge Gasket	1	1
321 7103	Fuel Line Bracket Bolt 1/4" NC x 1" RH	2	2
392 0019	Fuel Line Bracket Lock washer 1/4"	2	2
321 6061	Fuel Gauge Bolt 10/24" x 1/2" RH	6	6
617 0270	Crankcase Ventilator Tube	1	1
108 0022	Ventilator Tube Fitting	1	1
107 6001	Fuel Line	1	1
<b>EXHAUST</b>			
614 0003	Muffler Outlet Pipe	1	1
614 0005	Muffler	1	1
614 0010	Muffler Outlet Pipe Spring	1	1
300 0126	Muffler Bolt 7/16" NF x 3 3/4"	2	2
389 8002	Muffler Bolt Brass Nut	2	2

## ELECTRICAL

<i>No de pièce</i>	<i>Description</i>	<i>SW-48</i>	<i>SW-54</i>
615 0004	Battery Bracket Ass'y	1	1
300 0044	Battery Bracket Bolt	2	2
392 0022	Battery Bracket Bolt Washer	2	2
110 3002	Battery	1	1
615 0023	Wiring Support Tube	—	1
615 0025	Wiring Support Tube	1	—
615 0020	Headlight Housing	3	3
615 0021	Headlight Ring ass'y	3	3
615 0009	Battery Guard Cover	1	1
515 0018	Headlight Support Rubber	3	3
615 0012	Headlight Seat	3	3
110 6029	Sealed Beam	3	3
109 1001	Sealed Beam Connector	3	3
110 5002	Bulb	2	2
360 4082	Headlamp Bolt	3	3
385 1024	Headlamp Bolt Nut 3/8" x 1" NC	3	3
391 0025	Headlamp Bolt Flat Washer	3	3
110 1001	Ignition Switch	1	1
110 1002	Headlight and Wiper Switch	2	2
110 1003	Starter Switch Button	1	1
670 1701	Battery Cable Grommet	2	2
110 7008	Wiper Motor	1	1
110 7003	Wiper Arm	1	1
110 7004	Wiper Blade	1	1
615 0047	Wiring Clip	1	—
300 0005	Cover Bolt 380 6019 - 392 0019	2	2
110 0015	Ammeter	1	1
110 0018	Temperature Gauge Dash	1	1
110 9004	Voltage Regulator	1	1
110 0021	Engine Temperature Gauge	1	1
110 0010	Oil Gauge Dash	1	1
110 0013	Engine Oil Gauge	1	1
110 0002	Fuel Gauge Dash	1	1
109 7008	Wire Circuit Breaker to Headlight Switch	1	1
109 7008	Wire Circuit Breaker to Back-up light	1	1
109 7008	Wire Circuit Breaker to Hour Meter	1	1
109 4003	Wiring Harness Ass'y	1	1
109 5011	Wire Circ. Breaker to Ign. Switch	1	1
109 5013	Wire Circuit Breaker to Ammeter	1	1
109 5014	Wire Gauge to Gauge Extension	1	1
110 9001	Circuit Breaker	1	1
110 9012	Wire and Socket Dashlight	1	1

<i>No de pièce</i>	<i>Description</i>	<i>SW-48</i>	<i>SW-54</i>
109 5016	Wire Ignition Switch to Wiper motor	1	1
109 5009	Wire Heater Switch to Heater	1	1
109 5020	Wire Ignition switch to Heater switch	1	1
615 0026	Light Wiring ass'y Right Hand	1	1
615 0027	Light Wiring ass'y Left Hand	1	1
110 6020	Directional Signal Lamp	2	2
661 5007	Push Button Turn signal switch	1	1
661 5004	Signalstat connector	1	1
110 6021	Stop and Tail Lamp	1	1
110 6022	Stop and Tail Lamp Lens	1	1
110 1012	Stop and Tail Lamp Switch	1	1
110 6002	Blue Flasher	1	1
110 1008	Blue Flasher Switch	1	1
110 1009	Signalstat Flasher	1	1
110 1007	Push Button Switch	1	1
110 0029	Hour Meter	1	1
615 0044		1	1
615 0029	Wire Voltage Divider to Temperature Gauge	1	1
615 0030	Wire Plug Connector to Back up Light	1	1
615 0013	Wire Hour Meter to Dash Ground	3	3
615 0032	Wire Headlight and Back up Light Ground	1	1
110 9006	Horn	1	1
109 5003	Cable Ground Battery 27"	1	1
109 5033	Battery Cable 33"	1	1
615 0015	Stop Light Switch Bracket		



## COOLING

<i>No de pièce</i>	<i>Description</i>	<i>SW-48</i>	<i>SW-54</i>
661 6008	Water Outlet Elbow	1	1
616 0025	Radiator Metal Hose 2"	1	1
101 9002	Radiator Fan	1	1
114 0013	Radiator	1	1
114 0011	Radiator Cap	1	1
107 4007	Radiator Hose 2" I.D. x 3"	1	1
108 8007	Radiator Hose Clamp 1½"	2	2
108 8001	Radiator Hose Clamp 2"	4	4
670 1301	Radiator Rubber Insulator	1	1
380 6019	Nut 1/4"	4	4
392 0025	Lock washer	4	4
616 0008	Heater Bracket	1	1
616 0029	Heater Hose Strap	—	1
616 0028	Heater Hose Strap	1	—
616 0020	Heater Elbow	1	1
616 0033	Heater Casing	1	1
616 0021	Defroster Hose 2½" I.D. x 14"	2	2
616 0015	Heater Hose 100"	1	1
616 0017	Heater Hose 77"	1	1
108 0003	Fitting	1	1
616 0036	Heater Core	1	1
108 8004	Clamp 4¼"	4	4
110 9019	Heater Motor	1	1
110 9020	Heater Fan	1	1
110 1013	Heater Switch	1	1
107 4002	Radiator Hose (Elbow)	1	1
107 4008	Radiator Hose 2" I.D. x 8"	1	1

## BODY

617 0040	Operator Brackrest ass'y	1	1
617 0036	Operator Seat	1	—
617 0037	Operator Seat	—	1
617 0086	Leatherette - Backrest cushion	1	1
617 0090	Leatherette - Seat cushion	1	1
108 8003	Engine Side Door clamp	2	2
617 0073	Drain Fastener Cap	1	1
670 1701	Battery Cable Grommet	2	2
617 0074	Drain Fastener Screw	1	1
300 0041	Bolt 5/16" N.F. x 3/4"	6	6
380 6022	Nut 5/16" N.F. x 3/4"	6	6
392 0022	Lock Washer 5/16"	6	6
114 0028	Grease Gun	1	1
114 0027	Wrench Key	1	1
617 0162	Front Plate Transmission	—	1
617 0097	Under Plate Transmission	1	1
617 0168	Lower Plate Transmission	—	1

<i>No de pièce</i>	<i>Description</i>	<i>SW-48</i>	<i>SW-54</i>
617 0133	Pedal Cover and Footrest R.H.	1	—
617 0134	Pedal Cover and Footrest R.H.	—	1
617 0136	Pedal Cover Plate L.H.	1	—
617 0059	Engine Cowling and Fan Guard ass'y	1	—
617 0060	Engine Cowling and Fan Guard ass'y	—	1
617 0050	Engine Cowling Top ass'y	1	—
617 0054	Engine Cowling Top ass'y	—	1
617 0009	Engine Side Door R.H.	1	—
617 0064	Engine Side Door R.H.	—	1
617 0005	Engine Side Door L.H.	1	—
617 0066	Engine Side Door L.H.	—	1
617 0169	Lower Front Plate	1	—
617 0076	Pump Cover Plate	1	—
617 0163	Upper Front Plate	1	—
107 7001	Doortite Weatherstrip	20'	20'
111 0002	Rear Glass	1	1
617 0095	Rear Glass Frame	1	1
111 0004	Windshield Glass	1	1
617 0045	Dash Ass'y	1	1
107 8001	Windshield Weatherstrip	1	1
617 0265	Door Glass Frame Ass'y R.H.	1	1
617 0267	Door Glass Frame Ass'y L.H.	1	1
617 0184	Retaining Clip	2	2
617 0181	Door Hinge Spacer Washer	4	4
114 0039	Safety Belt	1	1
617 0227	Door Assembly R.H.	1	1
617 0257	Door Assembly L.H.	1	1
617 0261	Door Hinge	4	4
380 6019	Door Hinge Nut 1/4" N.F.	4	4
617 0170	Rod Retainer Door	2	2
617 0196	Rod Retainer Door Spring	2	2
111 0007	Side Lower Glass	2	2
111 1001	Side Glass	2	2
107 8001	Side Lower Glass Weatherstrip	2	2
681 0032	Door Handle and Catch Ass'y with lock	2	2
661 7003	Catch Case Ass'y	2	2
661 7005	Door Handle	2	2
661 7006	Latch	2	2
661 7004	Latch Holder	2	2
114 0030	Lach Spring	2	2
114 0076	Pin	2	2
371 0001	Cutter Pin	2	2
114 0075	Door Handle Lock	2	2
320 0063	Door Handle Screw mach. S.C. 10-32 x 3/4" R.H.	8	8
617 0269	Pull Rod and Chain	2	2
617 0270	Pull Rod and Chain Rubber	2	2
114 0072	Brass Door Pull	2	2
617 0243	License Bracket	1	1

## HYDRAULIC SYSTEM

<i>No de pièce</i>	<i>Description</i>	<i>SW-48</i>	<i>SW-54</i>
626 0092	Add. Tank	1	1
626 0176	Oil Tank Cover	1	1
114 0010	Oil Tank Cap	1	1
300 0000	Tank Cover Bolt	10	10
670 2602	Tank Cover Gasket	1	1
108 7020	Oil Tank Close Nipple	1	1
108 7021	Oil Tank Reducer	1	1
114 0034	Oil Tank Strainer	1	1
108 0014	Oil Tank Elbow	1	1
114 0031	Filter	1	1
114 0032	Filter Cartridge	1	1
107 9003	Pump Driving Belt	1	1
662 6014	Pump Tank ass'y	1	1
626 0144	Plug	1	1
626 0146	Pump Bracket Ass'y	1	1
626 0147	Pump Support Bracket	1	1
626 0148	Pump Support Bracket	1	1
300 0097	Pump Bolt $\frac{3}{8}$ " N.F. x $4\frac{1}{2}$ "	1	1
386 6024	Pump Bolt Nut $\frac{3}{8}$ " N.F.	1	1
626 0145	Alternator Bracket Ass'y	1	1
626 0045	Alternator Adjustor Strap	1	1
300 4041	Alternator Adjustor Strap Bolt 5/16" N.C. x $\frac{3}{4}$ "	1	1
392 0022	Alternator Adjustor Strap lockwashe 5/16"	1	1
391 0023	Alternator Adjustor Strap Bolt Flat washer	1	1
300 0080	Alternator Bolt $\frac{3}{8}$ " N.F. x $\frac{3}{4}$ "	2	2
300 0103	Alternator Bolt $\frac{3}{8}$ " N.F. x 6"	1	1
386 6024	Alternator Bolt Nut $\frac{3}{8}$ " N.F.	1	1
300 0041	Oil Tank Attaching Bolt 5/16" N.F. x $\frac{3}{4}$ "	2	2
392 0022	Lockwasher 5/16"	2	2
107 2001	Flexible Hose (Pump to valve)	1	1
107 2002	Flexible Hose (Pump to cylinder)	2	2
626 0087	Hose (Pump to Tank)	—	1
626 0087	Hose (Pump to Tank)	1	—
626 0098	Return Hose (Valve to Filter)	1	1
626 0096	Return Hose (Filter to Tank)	1	1
108 5013	Pump Outlet Adapter	1	—
108 8004	Hose Clamp	6	6
626 0159	Hose Housing	1	1
115 0002	Control Valve	1	1
115 3001	Control Valve Lever	1	1
662 6020	Valve Extension	4	4

<i>Ref. No.</i>	<i>No de pièce</i>	<i>Description</i>	<i>SW-48</i>	<i>SW-54</i>
	108 0015	Valve Elbow	2	2
	300 0089	Valve Bolt	3	3
	380 6024	Nut.	3	3
	392 0024	Lockwasher	3	3
	108 7017	Valve Outlet Reducer (to tank)	1	1
	108 7022	Inlet Valve Elbow	1	1
	108 7002	Filter Reducer	2	2
	108 7010	Elbow	2	2

### HYDRAULIC CYLINDER

39	626 0057	Cylinder Bracket ass'y	1	1
40	300 0152	Cylinder Bracket bolt 1/2" N.F. x 1"	4	4
8	380 6028	Cylinder Bracket bolt nut 1/2"	4	4
6	392 0028	Cylinder Bracket bolt lock washer	4	4
	680 0115	Cylinder ass'y	1	1
38	626 0064	Cylinder housing ass'y	1	1
33	626 0070	Stuffing Box	1	1
35	626 0076	Piston Ass'y	1	1
30	626 0079	End cap	1	1
31	626 0188	Sleeve Packing	1	1
	108 0016	Cylinder Elbow	2	2
34	106 0006	Cylinder O Ring	1	1
32	106 4002	Chevron Packing	1	1
36	106 0009	Back-up washer	2	2
37	106 7003	Cylinder U Cup	2	2

### Memo

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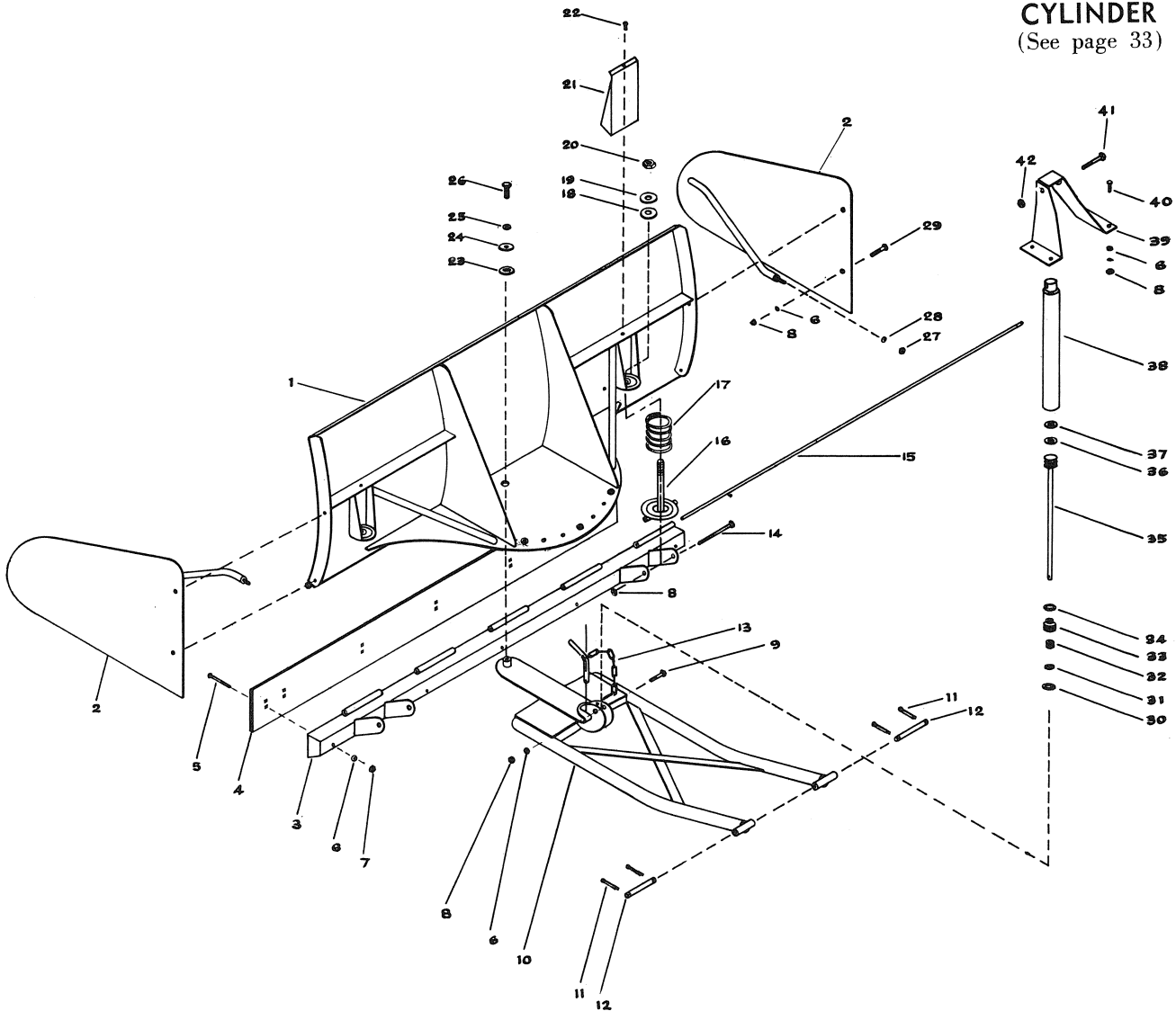
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# STRAIGHT BLADE

## HYDRAULIC CYLINDER (See page 33)



# STRAIGHT BLADE

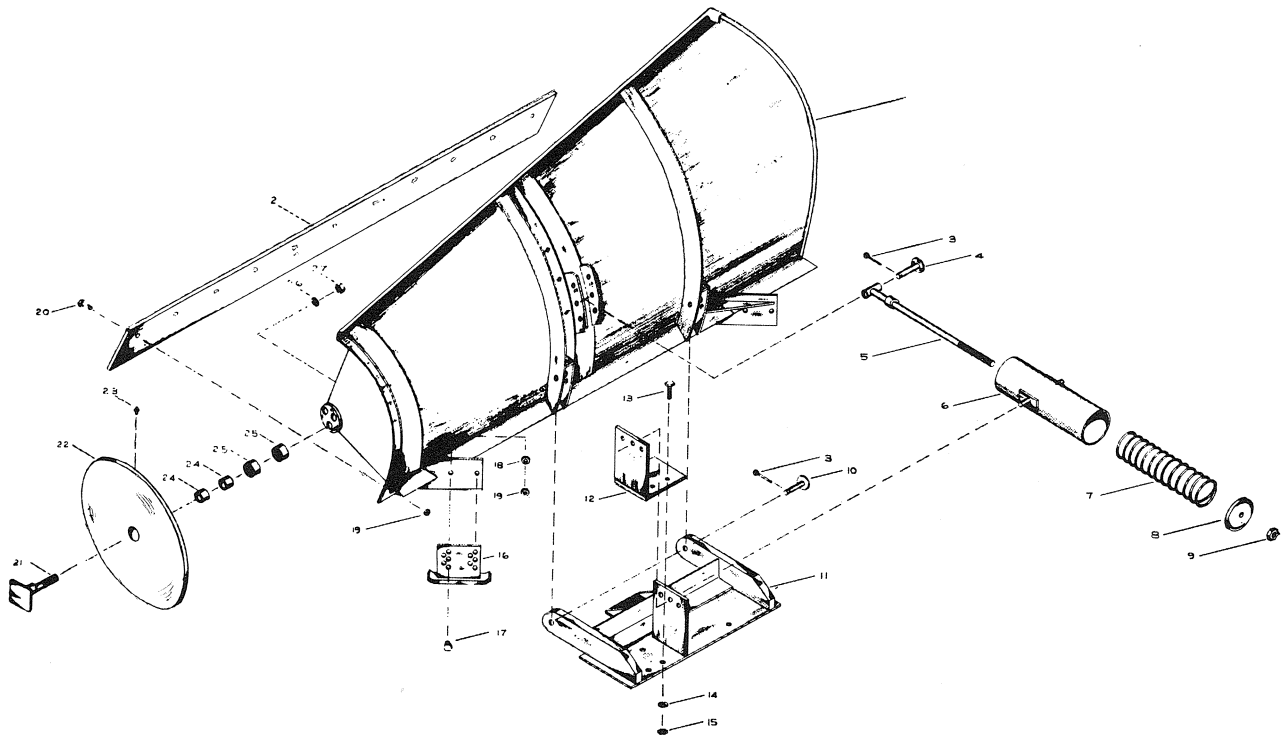
Ref. No.	No de pièce	Description	SW-48	SW-54
10	625 0002	Blade Support Bracket	1	—
10	625 0003	Blade Support Bracket	—	1
12	625 0012	Pin	2	2
1	625 0005	Upper Blade	1	—
1	625 0006	Upper Blade	—	1
43	625 0007	Washer	3	3
44	625 0039	Bushing	3	3
3	625 0008	Lower Blade Ass'y	1	—
3	625 0009	Lower Blade Ass'y	—	1
15	625 0015	Blade Hinge Rod	1	—
15	625 0014	Blade Hinge Rod	—	1
17	114 0214	Blade Spring	2	2
16	625 0026	Spring Seat	2	2
21	625 0027	Spring Guard Cover	2	2
18	603 0064	Rubber Pad	2	2
19	603 0063	Washer	2	2
4	625 0018	Cutting edge	1	—
4	625 0017	Cutting edge	—	1
24	625 0029	Washer	1	1
23	625 0030	Rubber Washer	1	1
13	625 0031	Angling Pin	1	1
2	625 0020	End Cutting edge R.H.	1	1
2	625 0023	End Cutting edge L.H.	1	1
27	380 6032	Brace Rod Nut $\frac{5}{8}$ " N.F.	2	2
28	392 0032	Brace Rod Nut Lock Washer	2	2
29	300 0153	End Cutting Edge Bolt $\frac{1}{2}$ " x $1\frac{1}{4}$ " N.F.	4	4
8	380 6028	End Cutting Edge Bolt Nut $\frac{1}{2}$ "	4	4
6	392 0028	End Cutting Edge Bolt Lockwasher	4	4
14	300 0172	Spring Seat Bolt — $\frac{1}{2}$ " x 6" N.F.	2	2
8	380 6028	Spring Seat Bolt Nut — $\frac{1}{2}$ " N.F.	2	2
5	360 4170	Cutting edge bolt — $\frac{1}{2}$ " N.C. x $3\frac{1}{2}$ "	7	9
7	380 9028	Cutting edge bolt nut — $\frac{1}{2}$ " N.C.	7	9
6	392 0028	Cutting edge bolt Lockwasher $\frac{1}{2}$ "	7	9
22	300 0000	Spring Guard Bolt — $\frac{1}{4}$ " N.F. x $\frac{1}{2}$ "	2	2
45	392 0019	Spring Guard Bolt lockwasher $\frac{1}{4}$ "	2	2
26	300 0252	Blade Pivot Bolt $\frac{3}{4}$ " N.F. x $1\frac{1}{2}$ "	1	1
25	392 0035	Blade Pivot Bolt lockwasher $\frac{3}{4}$ "	1	1
11	371 0123	Bracket Pin Cotter Pin	4	4
20	380 6035	Spring Nut	4	4
41	300 0162	Cylinder attaching bolt (Up) $\frac{1}{2}$ " N.F. x $3\frac{1}{2}$ "	1	1
42	387 2028	Cylinder attaching bolt nut (Up) $\frac{1}{2}$ " N.F.	1	1
9	300 0158	Cylinder attaching bolt (Lower) $\frac{1}{2}$ " N.F. x $2\frac{1}{4}$ "	1	1
8	380 6028	Cylinder attaching bolt nut (Lower) $\frac{1}{2}$ " N.F.	1	1
6	392 0028	Cylinder attaching bolt lockwasher $\frac{1}{2}$ "	1	1



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# ONE-WAY PLOW



Ref. No.	No de pièce	Description	SW-48	SW-54
1	625 0050	Blade	1	—
1	625 0051	Blade	—	1
2	625 0048	Cutting edge	1	—
2	625 0049	Cutting edge	—	1
20	300 0154	Cutting edge bolt 1/2" N.F. x 1 1/2"	10	11
19	380 6028	Cutting edge bolt nut 1/2"	10	11
16	625 0045	Shoe	2	2
17	300 0156	Shoe bolt 1/2" N.F. x 2	4	4
19	380 6028	Shoe bolt nut	4	4
18	392 0028	Shoe bolt lockwasher	4	4
22	625 0052	Disc ass'y	1	1
21	625 0053	Disc bolt	1	1
27	380 9039	Disc bolt nut 1"-8 N.C.	1	1
26	393 0039	Disc bolt lock washer	1	1
24	105 6008	Bushing	2	2
25	105 2003	Bearing	2	2
	625 0054	Spring ass'y	1	1
7	114 0003	Coil spring	1	1
9	380 6039	Plunger nut 1"	1	1
4	625 0055	Plunger pin	1	1
3	371 0094	Cotter pin	3	3
12	625 0057	Spring bracket	1	1
13	300 0223	Bracket bolt 5/8" N.F. x 1 1/2"	3	3
14	392 0032	Bracket bolt Lockwasher	3	3
15	380 6032	Bracket bolt Nut 5/8"	3	3
11	625 0058	Spring supp. att.	1	1
10	625 0059	Pin	2	2

## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.







