# 1445 Tractor
# Operator Instruction Book

# MASSEY FERGUSON®

*TO OUR CUSTOMER:*

*Congratulations on your selection of a Massey Ferguson Product. We believe you have exercised excellent judgment in the purchase of your Massey Ferguson machine. We are most appreciative of your patronage.*

*Your Dealer has performed the pre-delivery service on your new machine.*

*He will discuss with you the operating and maintenance instructions given in this manual, and instruct you in the proper and varied applications of this machine. Call on him at any time when you have a question, or need equipment related to the use of your machine.*

*We recommend that you carefully read this entire manual before operating the unit. Also, time spent in becoming fully acquainted with is performance feature, adjustments and maintenance schedules will be repaid in a long and satisfactory life of the product.*

*This equipment is covered by a written warranty which will be provided to you and your Massey Ferguson Dealer at time of purchase.*

**Massey Ferguson reserves the right to make changes or add improvements to its products at any time without incurring any obligation to make such changes to products manufactured previously. Massey Ferguson, or its dealers, accept no responsibility for variations which may be evident in the actual specifications of its products and the statements and descriptions contained in this publication.**

*Massey Ferguson® is a worldwide brand of AGCO Corporation, Duluth, Georgia*

CALIFORNIA

Proposition 65 Warning

**WARNING:** Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

**WARNING:** Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm. **Wash hands after handling.**

# MF 1445 TRACTOR
# OPERATOR INSTRUCTION BOOK
## 1449560M1

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# SAFETY

The safety of the operator is one of the main concerns in designing a new piece of equipment. Designers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions. To avoid personal injury, study the following precautions and insist those working with you or for you follow them.

In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, the equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace shield prior to further operation.

## SAFETY ALERT SYMBOL

**FIG. A:** This is the safety alert symbol. It means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED**! Look for it, both in this manual and on safety decals on the equipment. It will direct your attention to information that involves your safety and the safety of others.

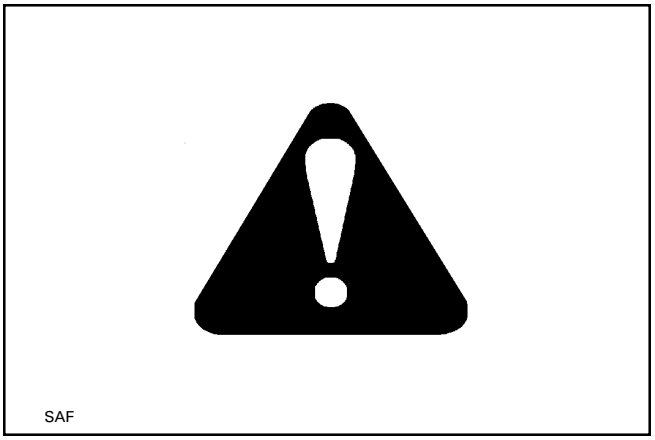



**FIG. A**

## SIGNAL WORDS

**FIG. B:** The words **DANGER, WARNING** or **CAUTION** are used with the safety alert symbol. Learn to recognize these safety alerts, and follow the recommended precautions and safe practices.

**DANGER indicates an imminently hazardous situation that, it not avoided, will result in death or serious injury.**

**WARNING indicates an imminently hazardous situation that, it not avoided, could result in death or serious injury.**

**CAUTION indicates an imminently hazardous situation that, if not avoided, could result in minor or moderate injury.**




**FIG. B**

Replace any DANGER, WARNING, CAUTION or instructional decal that is not readable or is missing. The location and part number of these decals is identified later in this section of the manual.

*IMPORTANT: The word IMPORTANT is used to identify special instruction or procedures which, if not strictly observed, could result in damage to, or destruction of the machine, process or its surroundings.*

*NOTE: The word NOTE is used to indicate points of particular interest for more efficient and convenient or operation.*

## GENERAL SAFETY RULES

**FIG. 1: Always keep this Operator Instruction Book with the Tractor**—This book must be made available to the operator of the Tractor at all times.

Read this book carefully and learn how to use the machine correctly.

Do not let anyone operate this machine without thorough instruction.

**Beware of bystanders, particularly children!**—Always look around to make sure that it is safe to start the engine or move the Tractor. This is particularly important with higher noise levels as you may not hear people shouting.

**FIG. 2: No passengers allowed**—DO NOT carry passengers anywhere on the Tractor or on any implement or attachment connected to, or installed on Tractor.

**Dismount and park Tractor in the correct manner**—When dismounting and/or leaving the operator's seat FOR ANY REASON always:

1. Disengage PTO drive.
2. Lower implements and attachments to ground.
3. Shut off engine.
4. Apply parking brake securely.
5. Select transmission lever(s) to neutral.
6. Remove the key.

**WARNING: An operator should not use alcohol or drugs which can affect their alertness or coordination. An operator on prescription or 'over the counter' drugs needs medical advice on whether or not he or she can properly operate equipment.**

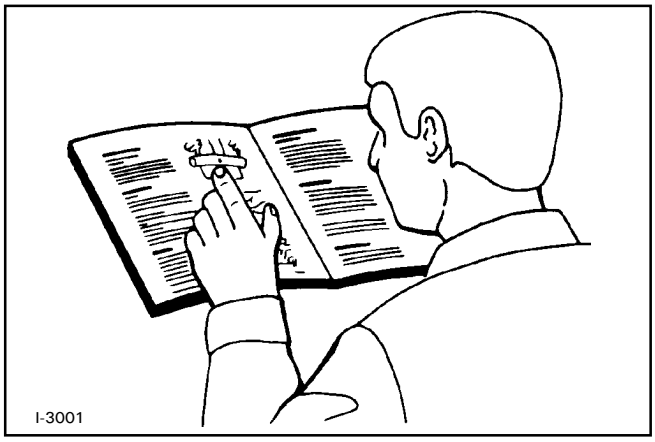



**FIG. 1**




**FIG. 2**

**FIG. 3: Roll-over protective structure (ROPS)**—DO NOT weld, drill or alter the ROPS. Damaged ROPS must not be straightened or used. If damage does occur, consult your Massey Ferguson Dealer and replace all damaged parts.

If the ROPS is removed from the Tractor, for any reason, it must be refitted immediately. Original bolts or equivalent replacements must be used and tightened to the correct torque.

DO NOT attach chains, ropes or cables to the ROPS for pulling purposes as this will cause the tractor to tip backwards. Always pull from the Tractor drawbar.

Massey Ferguson does not recommend usage of Tractor with ROPS removed.

**Falling object protective structure (FOPS)**—Observe all recommendations and instructions regarding the installation of covers or roofs which are used as SUNSHIELDS ONLY and do not afford the operator protection from falling objects.

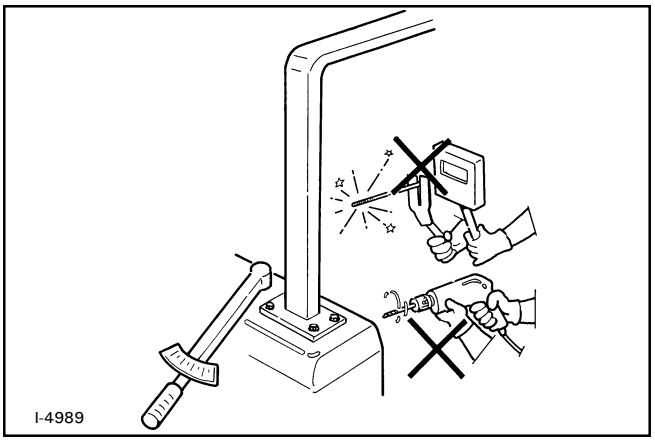



**FIG. 3**

**FIG. 4: Seat belt usage**—With ROPS installed, it is imperative that seat belt be installed, used and correctly adjusted at all times. Replace damaged seat belts.

DO NOT use a seat belt if operating with ROPS folded down or removed.

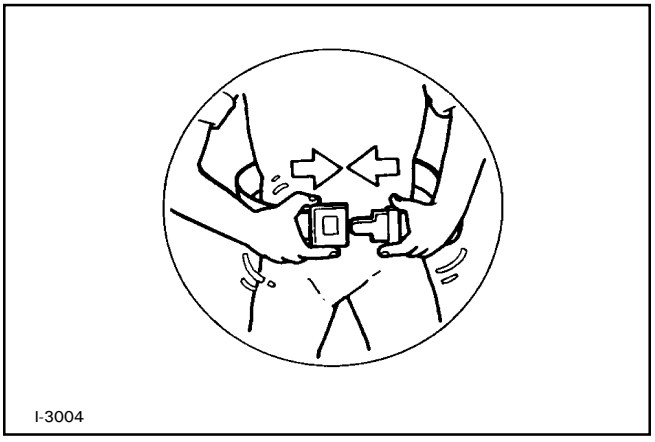



**FIG. 4**

**FIG. 5: Wear protective clothing**—DO NOT wear loose clothing, as this may catch on moving parts of the Tractor or implement causing injury.

Always wear protective clothing and appropriate equipment.

It is recommended that suitable protective hearing and sight protectors be worn.

Specific personal protective equipment may be required for the application of fertilizers, pesticides, etc. Follow all recommendations given by the chemical supplier and manufacturer.

**Keep clear of all rotating driveline components**—Be especially observant of implement areas of discharge, intake or other mechanical motion.

**Do not attempt to service machine, clear obstructions or unplug blockages with the engine running**—Always shut off engine and allow all motion to cease.

When dismounting and/or leaving the operator's seat FOR ANY REASON, always:

1. Disengage PTO drive.
2. Lower implements, attachments to ground.
3. Shut off engine.
4. Apply parking brake securely.
5. Select transmission lever(s) to neutral.
6. Remove the key.

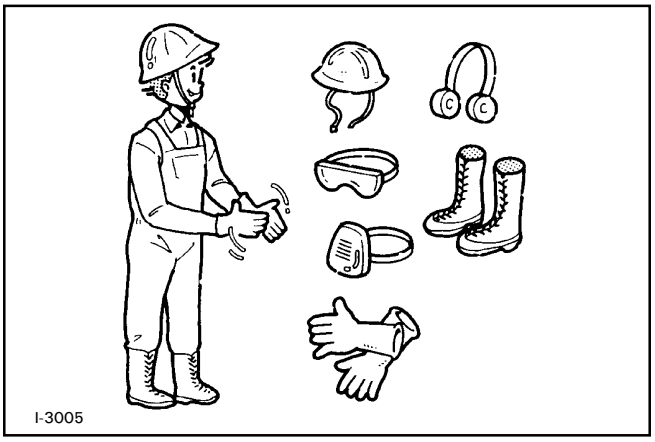



**FIG. 5**

**FIG. 6: Keep all shields in place**—Rear PTO (Power Take- Off) master shield, 1, must be correctly installed at all times. PTO shaft cover(s) must be installed when PTO drive line is not in use.

**Always consult implement or attachment instructions**—When implements or attachments are used with the Tractor, always follow the safety precautions listed in the appropriate operating instructions.

**Do NOT use PTO adapters**—PTO shaft adapters, reducers and/or extensions extend the implement drive shaft coupler and universal joint beyond the protection of the PTO master shield.

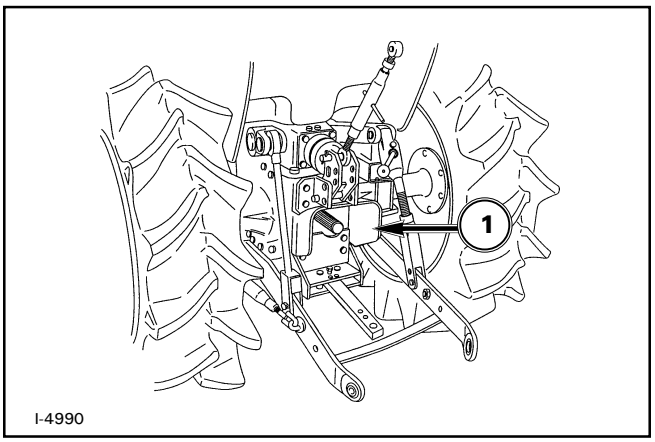



**FIG. 6**

**FIG. 7: Securely lock implement drive shaft**—Check that all Tractor and implement drive lines are in good working order.

Implement drive shaft coupler, 1, must securely lock to and be retained by annular groove on Tractor PTO shaft.

**Always disengage PTO and shut off engine**—Park the Tractor safely before:

Connecting or disconnecting the implement drive shaft.

Adjusting the PTO drive line or PTO-driven machine.

Cleaning, unplugging or servicing PTO-driven machine.

**Reduce PTO speed slowly**—When stopping any PTO driven machine, idle the engine to reduce the PTO speeds before disengaging.

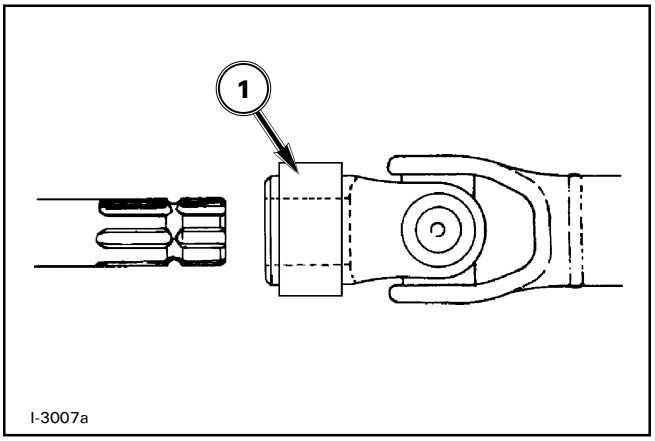



**FIG. 7**

**FIG. 8: Pull only from the approved drawbar**—Towing or attaching to other locations may cause the Tractor to overturn.

**Use a chain with towed implements**—A chain connecting the tractor to the implement will help control pull-type equipment should it accidentally separate from the drawbar.

Always attach the chain to the Tractor drawbar support.

Provide only enough slack in the chain to permit turning. See your Massey Ferguson Dealer for a chain with strength rating equal to or greater than the gross weight of the towed machine.

For towed equipment WITHOUT brakes, DO NOT tow equipment at speeds over 20 mph (32km/h). DO NOT tow equipment that, when fully loaded, weighs more 1.5 times the weight of the towing unit.

For towed equipment WITH brakes, DO NOT tow equipment at speeds over 25 mph (40 km/h). DO NOT tow equipment that, when fully loaded, weighs more than 4.5 times the weight of the towing unit.

Stopping distance increases with speed and weight of towed loads, and on hills and slopes. Towed loads with or without brakes, that are too heavy for the tractor or are towed too fast, can cause loss of control. Consider the total weight of the equipment and its load.

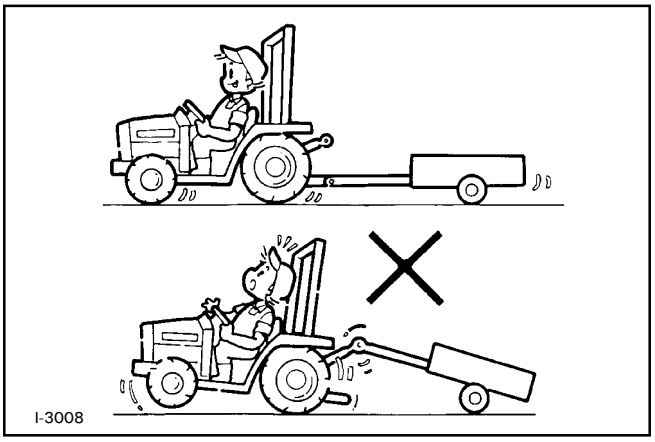



**FIG. 8**

**FIG. 9: Additional equipment**—A fire extinguisher and first aid box should be carried with the Tractor or be kept readily available at all times. Consult your Massey Ferguson Dealer.

Keep emergency telephone numbers for immediate access.

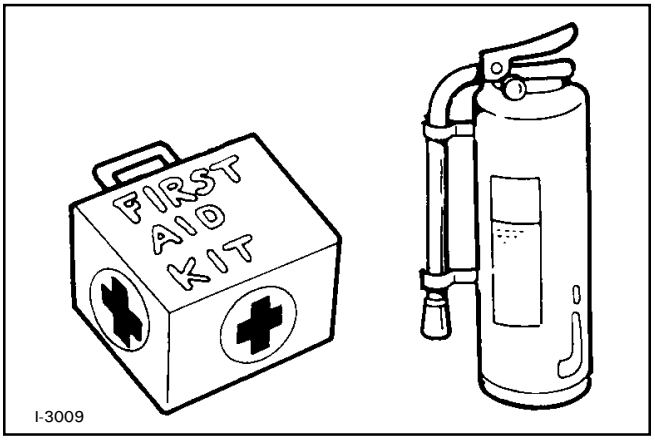



**FIG. 9**

## OPERATION

**Keep the Tractor properly maintained**—Do not operate a Tractor if it is broken or has missing parts. Make sure that the maintenance procedures in this operator's book are completed before using the Tractor.

Check all controls regularly and adjust where necessary. Make sure that the brakes are evenly adjusted.

Periodically check all nuts and bolts for tightness, especially wheel hub and rim nuts.

**FIG. 10: Clear the area**—Ensure that all bystanders, particularly children, are away from the Tractor before starting the engine.

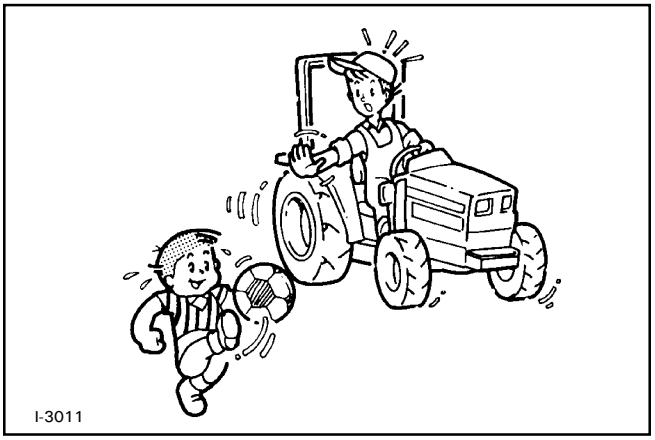



**FIG. 10**

**FIG. 11: Never attempt to start the engine while standing beside the Tractor**—Always start the engine from the operators seat with the transmission lever and the PTO lever in neutral.

DO NOT bypass the starting circuit by shorting across the terminals of the starter motor to start the engine. This may cause the Tractor to move suddenly.

Periodically check starting circuit to make sure all system components operate correctly.

If the starting system does not work, consult your Massey Ferguson Dealer immediately.

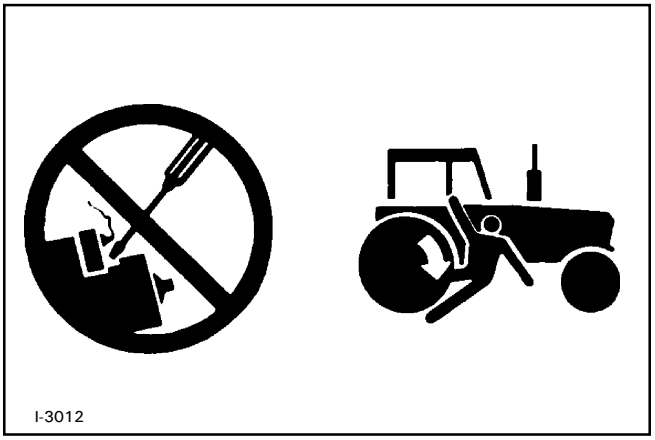



**FIG. 11**

**FIG. 12: DO NOT use starting fluid**—Starting fluid must only be used when an ether-start aid is fitted as original equipment by the manufacturer or when installed by a Dealer as an approved accessory.

When Tractors are equipped with glow plugs or other heating device, these MUST be removed prior to the usage of starting fluid or ether-starting aid.

Use of starting fluid on engine equipped with glow plugs can result in severe engine damage.

**Make sure there is plenty of ventilation**—Never operate the engine in a closed building.

Always start and operate engine in a well-ventilated area.

If in an enclosed area, vent the exhaust to the outside.

Do not tamper with or modify the exhaust system with unapproved extensions.

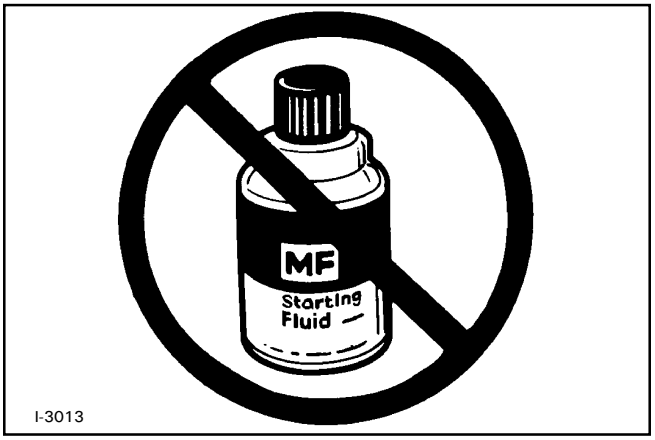



**FIG. 12**

**FIGS. 13 & 14: Adopt correct driving practices**—On models with independent brake pedals, keep the brake pedals latched together at all times unless independent braking is required. Never use independent braking during transport.

Always drive at a proper speed relative to local conditions and ensure that your speed is low enough for an emergency stop.

Reduce speed prior to turns to avoid the risk of overturning.

Keep speed to a minimum.

Avoid sudden uphill turns on steep slopes.

Always keep the Tractor in gear to provide engine braking when going downhill. Do not coast.

Avoid sudden or heavy brake applications when operating in wet, muddy or icy ground conditions, or on loose surfaces such as sand or gravel.

Sudden or heavy braking during turns increases the tendency to oversteer. This effect is more pronounced with trailed equipment.

Keep a firm grip on the steering wheel at all times, with the thumbs clear of the spokes when driving the Tractor.

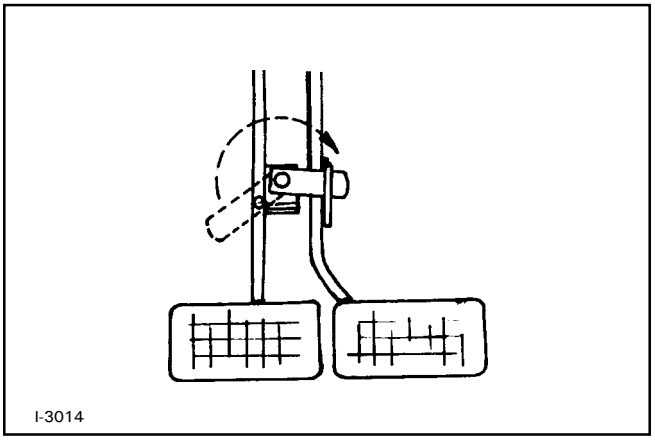



**FIG. 13**

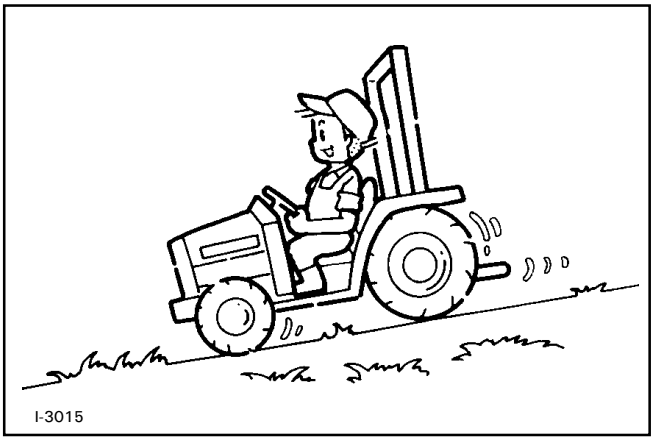



**FIG. 14**

**FIG. 15: Be observant of the operating area and terrain**—Watch for holes, rocks, or other hidden hazards. ALWAYS inspect area prior to operation.

DO NOT operate near edge of banks. Set-back distance from bank should equal, or exceed, the overall height of the bank.

DO NOT operate on steep slopes as overturn may result.

If necessary to cross a steep slope, avoid turning uphill. Slow down and make a wide turn. Travel directly up or down the slope, never cross it. Keep the heavy end of the tractor on the uphill side.

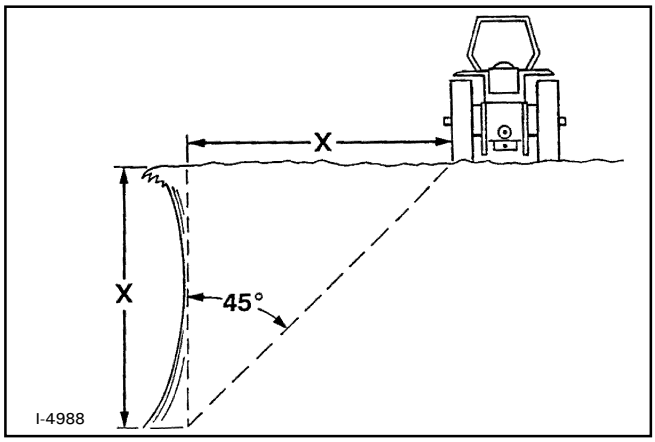



**FIG. 15**

**FIG. 16: Remain seated in operator's seat**—When a ROPS is installed and the Tractor overturns, hold the steering wheel firmly and do not attempt to leave the seat until the Tractor has come to rest. Use the seat belt with ROPS.

DO NOT leave operator's seat when engine is running.

**When stopping the Tractor —**

1. Disengage PTO drive.
2. Lower implement, attachments to ground.
3. Stop the engine.
4. Apply parking brake securely.
5. Place all gear shift levers in neutral.
6. Remove the key BEFORE leaving the seat.

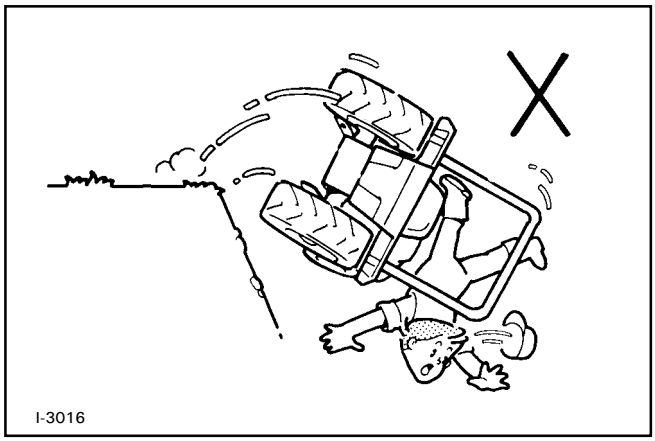



**FIG. 16**

## OPERATING ON PUBLIC ROADWAY

**FIG. 17: Use recommended warning devices**—When driving the Tractor and implement on the road or highway under 40 kph (25 mph), at night or during the day, use flashing amber warning (hazard) lights and the Slow Moving Vehicle (SMV) identification emblem.

The use of flashing amber (hazard) lights is acceptable in most localities. However, some localities may prohibit their use. Local laws should be checked for all highway lighting and marking requirements.

Make sure warning devices are visible and not obscured by towed loads or attachments.

**Rules of the road**—When operating your Tractor on a public roadway, a number of precautions must be taken:

Know the route you are going to travel.

Familiarize yourself with, and obey, all laws appropriate to your Tractor.

Lock your brake pedals together (if equipped with dual brake pedals).

Raise implements to transport position and lock in place.

Place all implements into narrowest transport configuration.

Disengage the PTO and differential lock.

Clean off all reflectors and road lights, front and rear, and be certain they are in working order.

Use caution when towing a load at transport speeds especially of the towed equipment is NOT equipped with brakes.

When towing a load, start braking sooner than normal and slow down gradually.

With towed implements, make sure you use a proper hitch pin with a clip retainer. Use recommended safety chain.

Observe all local or national regulations regarding the road speed of your Tractor.

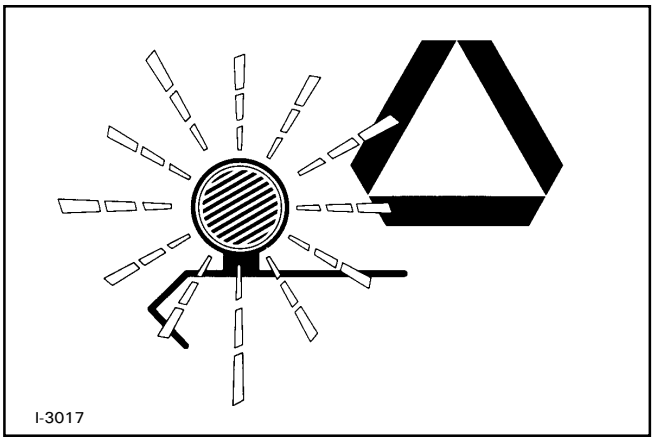



**FIG. 17**

Use extreme caution when transporting on slippery roads.

Wait for traffic to clear before entering a public road.

Beware of blind intersections. Slow down until you have a clear view.

DO NOT attempt to pass at any intersection.

Slow down for turns and curves.

Make wide, gentle turns.

Signal your intent to slow, stop or turn.

Shift to lower gear before going up or down hills.

Keep tractor in gear. DO NOT coast with the clutch disengaged or transmission in neutral.

Stay out of the path of oncoming traffic.

Drive in your correct lane keeping as near to the curb as possible.

If traffic builds up behind you, pull off the road and let it go by.

Drive defensively. Anticipate what other drivers might do.

Watch out for overhead obstructions.

## SERVICING THE TRACTOR

**FIG. 18: Stop the Tractor**—DO NOT service the Tractor while the engine is running or hot, or if the Tractor is in motion.

*NOTE: When making major repairs or complicated adjustments, it is recommended that you consult your Massey Ferguson Dealer and have the work carried out by trained personnel.*

**Servicing the Tractor** — The following precautions should be observed-These have been arranged by Tractor area or component:

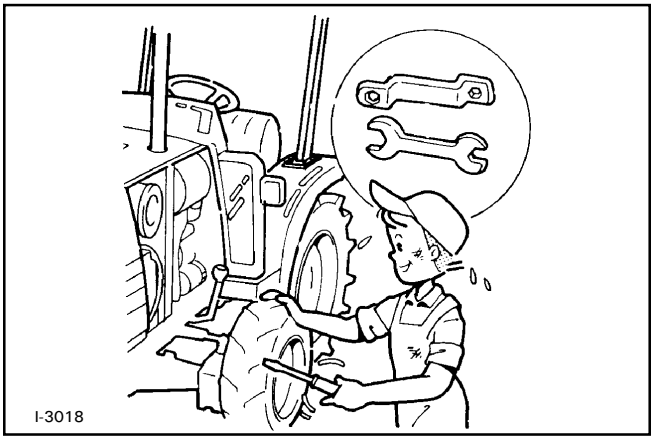



**FIG. 18**

### Cooling System

**FIG. 19:** DO NOT remove the radiator cap, 1, when the engine is running or hot.

DO NOT add coolant to the radiator while the engine is running.

Before removing the radiator cap, turn the cap slowly to relieve the pressure.

When adding coolant, make sure coolant being added is compatible and will mix with existing coolant.

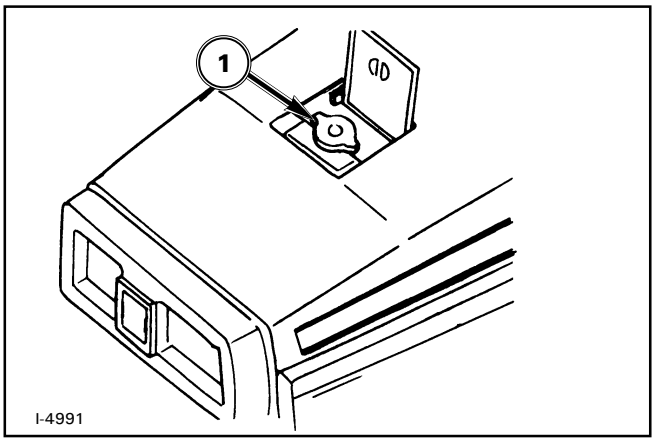



**FIG. 19**

### Electrical System

**FIG. 20:** Before making adjustments or servicing the electrical system, disconnect the battery negative (-) cable, 1, first to prevent short circuits.

Do not use a naked flame to check battery electrolyte level. Always use a voltmeter or hydrometer to check the state of charge.

Keep sparks, flames and cigarettes away. Use a flashlight to check the battery electrolyte level if necessary.

Do not produce sparks with cable clamps when charging the battery or starting the Tractor engine with a slave (jumper) battery.

Batteries contain sulfuric acid electrolyte. Always wear protective clothing and eye protection when servicing.

In case of electrolyte contact, rinse area with plenty of water and seek medical attention.

Batteries produce explosive hydrogen gas when charged. Charge in area with adequate ventilation. Halt charging if battery temperature exceeds 52°C (125°F).

Wash hands after handling battery.

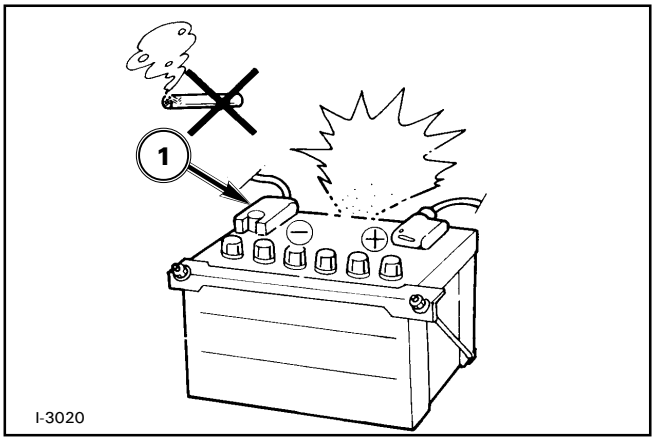



**FIG. 20**

## Hydraulic System

**FIG. 21:** Ensure that all hydraulic connections are tight.

Relieve all pressures before disconnecting hoses or lines. Escaping oil under pressure can cause serious injury.

All fluids should be handled with care. If you are injured by, or swallow, any fluid seek medical attention immediately and show the label on the product.

Fluids escaping from a very small hole can be almost invisible and they can penetrate the skin causing serious injury. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure. When checking for leaks always use a piece of cardboard or wood. Never use your hands to find a pressure leak.

If ANY fluid is injected into the skin, it must be attended to by a doctor immediately.

When adjustments are being made or attachments are being fitted to the Tractor or implement (whether at the front or rear of the Tractor), the operator must ensure that all persons are well clear before operating the hydraulics.

DO NOT use the Tractor hydraulics as a jack or hoist when working on the Tractor or an implement. Always block securely.

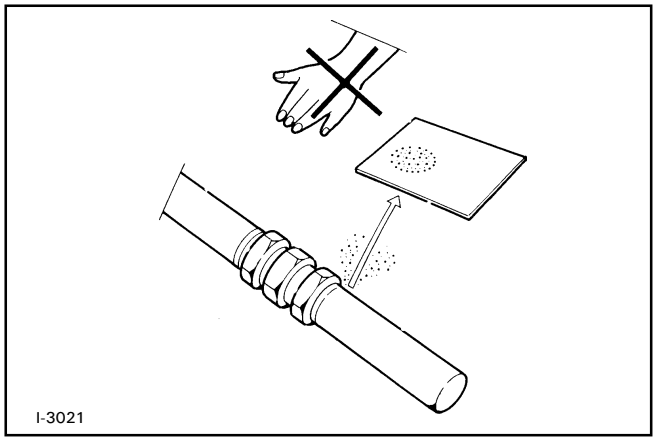



**FIG. 21**

## Fuel System

**FIGS. 22 & 23:** Diesel fuel is flammable and must be handled with care.

Never refuel or service the fuel system on the Tractor while smoking or when near open flames or sparks.

Never refuel the Tractor while the engine is running.

DO NOT use cans unless necessary.

Always clean up any spilled fuel.

Fuel system components rely upon clean fuel for lubrication and optimum performance. Extreme care must be taken to prevent ingress of dirt and moisture to prevent damage.

Fuel injection system servicing must be referred to your Massey Ferguson Dealer. Unauthorized servicing may void all warranties.

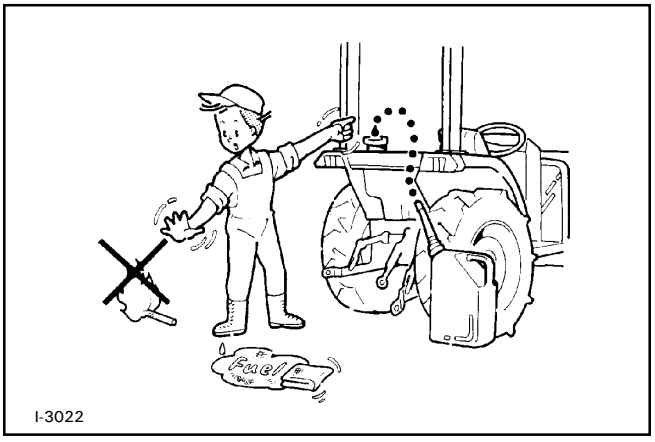



**FIG. 22**

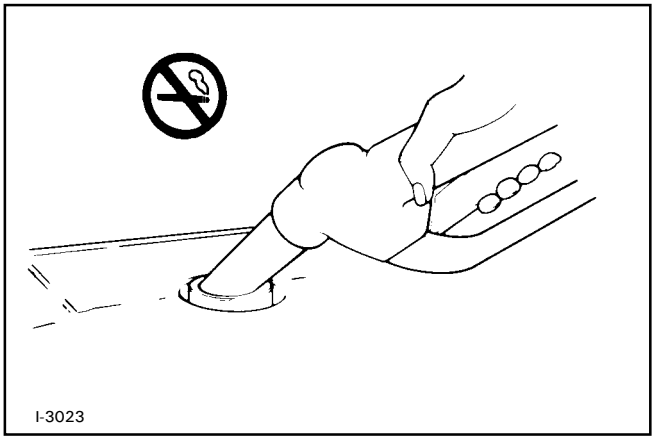



**FIG. 23**

## Wheels And Tires

**FIGS. 24 & 25:** The Tractor and/or implement must be supported on suitable blocks or stands, NOT a hydraulic jack.

Do not attempt to service a tire unless you have the proper equipment and experience to perform the job. Have the work carried out by your Massey Ferguson Dealer or a qualified repair service.

When seating tire beads onto rims, never exceed 2,4 bar (35 psi) or the maximum inflation pressure specified on the tire. Inflation beyond this maximum pressure may break the bead, or even the rim, with dangerous, explosive force.

When preparing a calcium chloride solution for fluid balasting the Tractor tires, NEVER pour water onto the calcium chloride. A chlorine gas can be generated which is poisonous and explosive. This can be avoided by slowly adding calcium chloride flakes to water and stirring until they are dissolved.

Wear suitable protective clothing, gloves, eye/face protection.

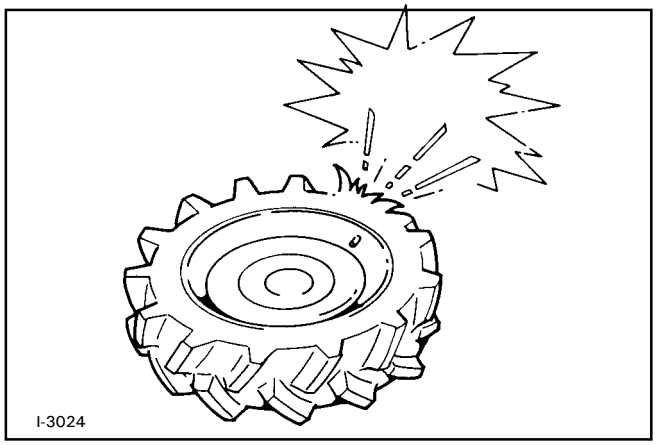



**FIG. 24**

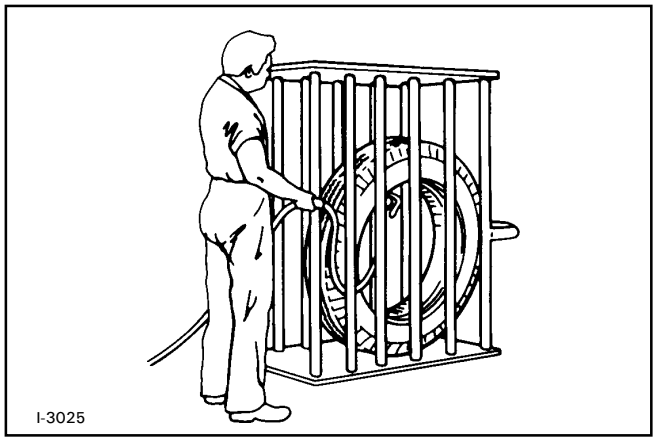



**FIG. 25**

## Asbestos Materials

**FIG. 26:** This Tractor does not contain parts having asbestos. When servicing the Tractor, always use authorized parts. Unapproved parts may contain asbestos.

Breathing asbestos dust is hazardous to your health. You are therefore advised to have any maintenance or repair operations on such components carried out by your Massey Ferguson Dealer. If service operations are to be undertaken on parts containing asbestos, contact your Massey Ferguson Dealer for advice on handling components containing asbestos.




**FIG. 26**

## Replacement Parts

**FIG. 27:** Where replacement parts are necessary for periodic maintenance and servicing, genuine Massey Ferguson replacements must be used to restore your equipment to original specifications.

Massey Ferguson will not claim responsibility for fitment of unapproved parts and/or accessories and damages as a result of their usage.

## INSTRUCTION DECALS

**FIG. 28:** Location of all instruction decals provided as a reference. Replace any decals that are damaged, missing or are not readable. Consult your dealer.

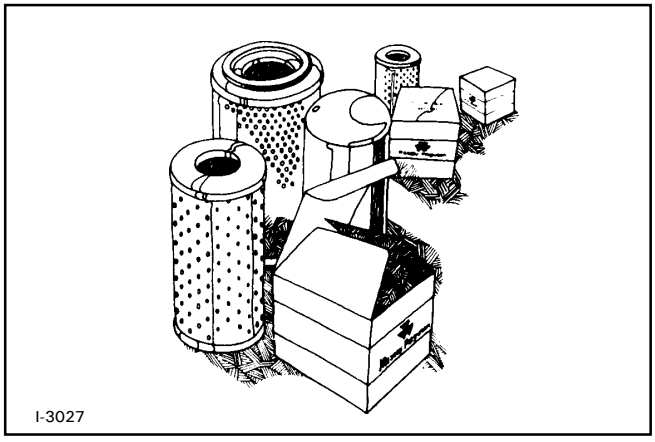
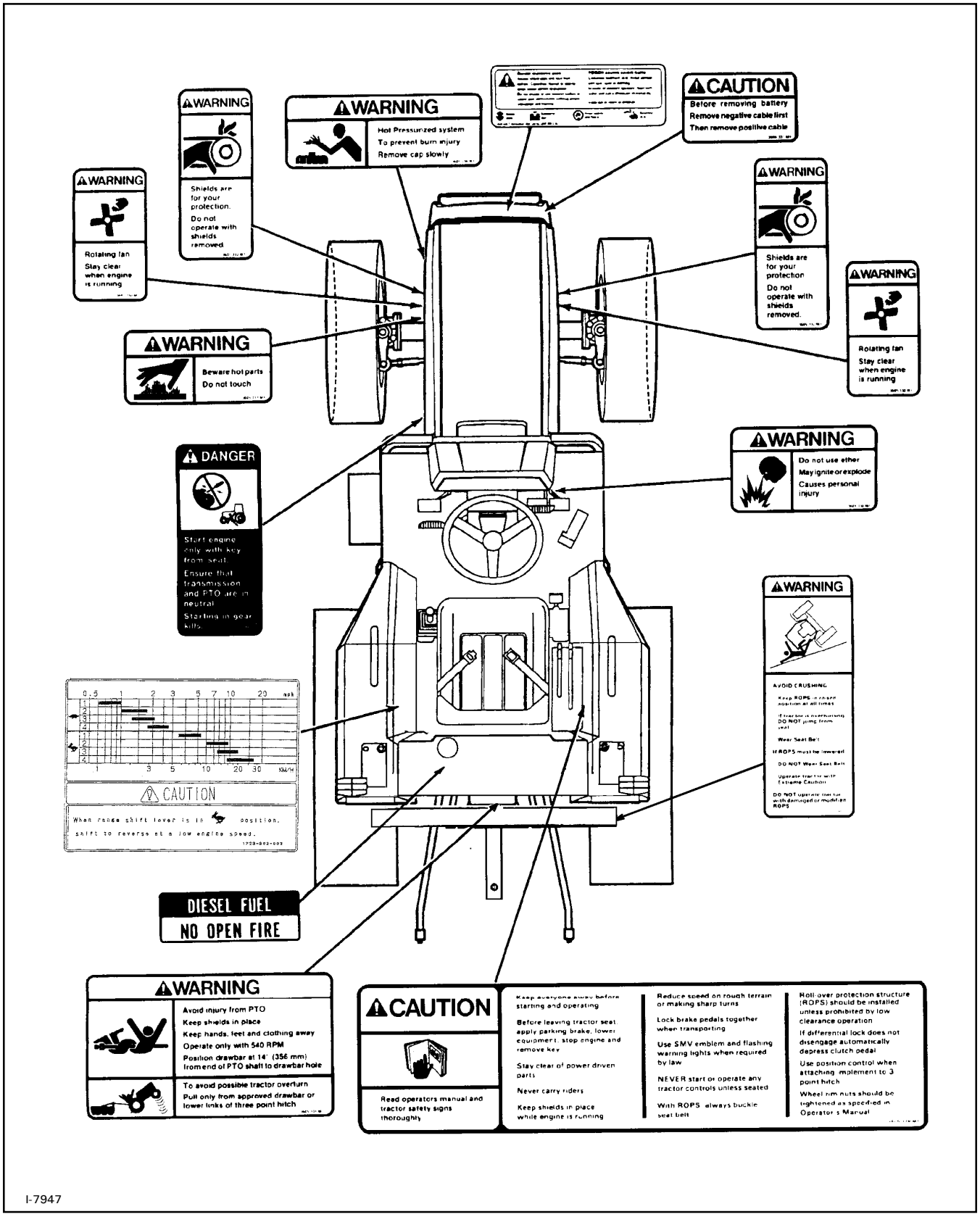



**FIG. 27**


⚠WARNING
Rotating fan
Stay clear when engine is running
⚠WARNING
Shields are for your protection.
Do not operate with shields removed.
⚠WARNING
Hot Pressurized system
To prevent burn injury
Remove cap slowly
⚠CAUTION
Before removing battery
Remove negative cable first
Then remove positive cable
⚠WARNING
Shields are for your protection
Do not operate with shields removed.
⚠WARNING
Rotating fan
Stay clear when engine is running
⚠WARNING
Beware hot parts
Do not touch
⚠ DANGER
Start engine only with key from seat.
Ensure that transmission and PTO are in neutral.
Starting in gear kills.
⚠WARNING
Do not use ether
May ignite or explode
Causes personal injury
⚠WARNING
AVOID CRUSHING
Wear Seat Belt
DO NOT Wear Seat Belt
⚠CAUTION
When range shift lever is in position, shift to reverse at a low engine speed.
DIESEL FUEL
NO OPEN FIRE
⚠WARNING
Avoid injury from PTO
Keep shields in place
Keep hands, feet and clothing away
Operate only with 540 RPM
Position drawbar at 14" (356 mm) from end of PTO shaft to drawbar hole
To avoid possible tractor overturn
Pull only from approved drawbar or lower links of three point hitch
⚠CAUTION
Read operators manual and tractor safety signs thoroughly
Keep everyone away before starting and operating
Before leaving tractor seat, apply parking brake, lower equipment, stop engine and remove key
Stay clear of power driven parts
Never carry riders
Keep shields in place while engine is running
Reduce speed on rough terrain or making sharp turns
Lock brake pedals together when transporting
Use SMV emblem and flashing warning lights when required by law
NEVER start or operate any tractor controls unless seated
With ROPS, always buckle seat belt
Roll-over protection structure (ROPS) should be installed unless prohibited by low clearance operation
If differential lock does not disengage automatically depress clutch pedal
Use position control when attaching implement to 3 point hitch
Wheel rim nuts should be tightened as specified in Operator's Manual

I-7947

**FIG. 28**

# INTRODUCTION

**FIGS. 29, 30 & 31:** The information in this publication describes the operation, maintenance and servicing of the MF 1445 Tractor. Every effort has been made to provide correct and concise information to you, the operator, as available at date of book publication. Your Massey Ferguson Dealer is available should items in this book or details of your machine not be understood.

This book is supplied with each machine to familiarize the operator with proper instructions needed for operation and maintenance. Studying and adhering to these instructions will insure optimum machine performance and longevity. A machine that is maintained properly and operated in the intended manner will provide greater dividends than one that is neglected and/or operated in manner other than as intended. Design and servicing of this machine has been kept as simple as possible to permit maintenance operations to be carried out with tools normally available.

This book should be thoroughly read and understood prior to operation of this machine. Inexperienced operators should study contents of this publication and receive instruction from an experienced operator when possible. Your MF Dealer can also assist in areas concerning machine operation and provide details concerning safe operation. It is suggested that this booklet be kept readily accessible, preferably with the machine, for future reference if questions or concerns arise. If the original book should become damaged, consult your Dealer in regards to acquiring a replacement.

Customers are strongly advised to use an official Massey Ferguson Dealer in connection with any service problems and adjustments that may occur. The Massey Ferguson Dealer network is specially trained and equipped for all service work and to advise customers on specific applications of the Tractor in local conditions.

**CAUTION: In some of the illustrations used in this Operator Instruction Book, panels or guards may have been removed for clarity. Never operate the Tractor with these panels and guards removed. If the removal of a shield is necessary to make a repair, it MUST be replaced before operation.**

**CAUTION: READ THIS BOOK IN ITS ENTIRETY PRIOR TO OPERATING MACHINE. Use only Massey Ferguson parts for repairs and/or replacement.**

*NOTE: This manual contains all possible configurations of this tractor and may not be available to all markets.*




**FIG. 29**




**FIG. 30**




**FIG. 31**

# IDENTIFICATION

## MODEL/SERIAL NUMBERS

Each Tractor is identified by means of Tractor model and serial numbers. As a further identification, engine and chassis are provided with identification numbers.

To ensure prompt, efficient service when ordering parts or requesting repairs from authorized MF Dealer, record these numbers in spaces provided.

| TRACTOR MODEL | MACHINE SERIES (M.S.N.) |
|---|---|
| | |

| TRACTOR SERIAL NUMBER |
|---|
| |

**FIGS. 32 & 33:** Tractor identification plate, 1, located below operator's seat on left-hand side of vertical floor panel. Contains model number, machine series number and weight in addition to Tractor serial number.

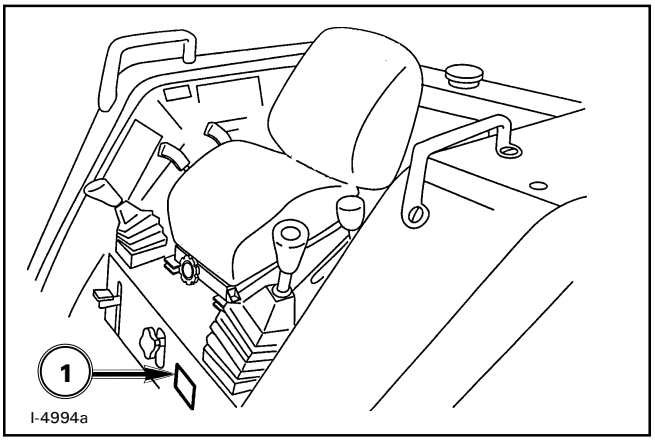



**FIG. 32**

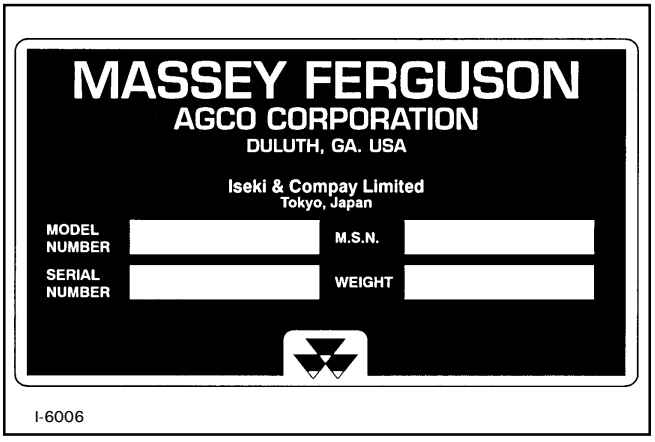



**FIG. 33**

**ENGINE MODEL NUMBER**

**ENGINE SERIAL NUMBER**

**FIG. 34:** Engine model number, 1, is cast on right side of engine block, below the injection pump.

Engine serial number, 2, is stamped into cylinder block, below engine model number.

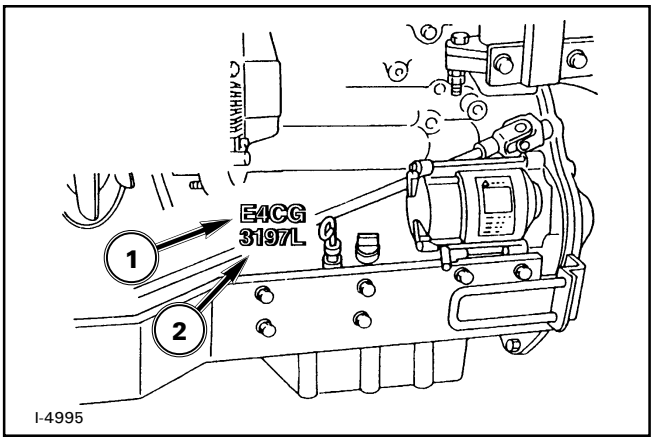



**FIG. 34**

**CHASSIS NUMBER**

**FIG. 35:** Chassis number, 1, is stamped in right side of front frame.

*NOTE: Reference to left-hand and right-hand, used throughout this book, refers to the position when seated in the operator's seat and facing forward.*

*NOTE: Information in this book pertains to manual "shuttle" and "power shuttle" transmission versions unless indicated.*

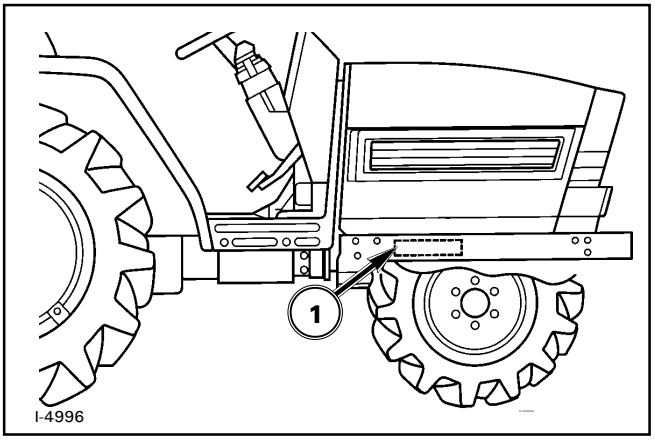



**FIG. 35**

## MAJOR COMPONENTS

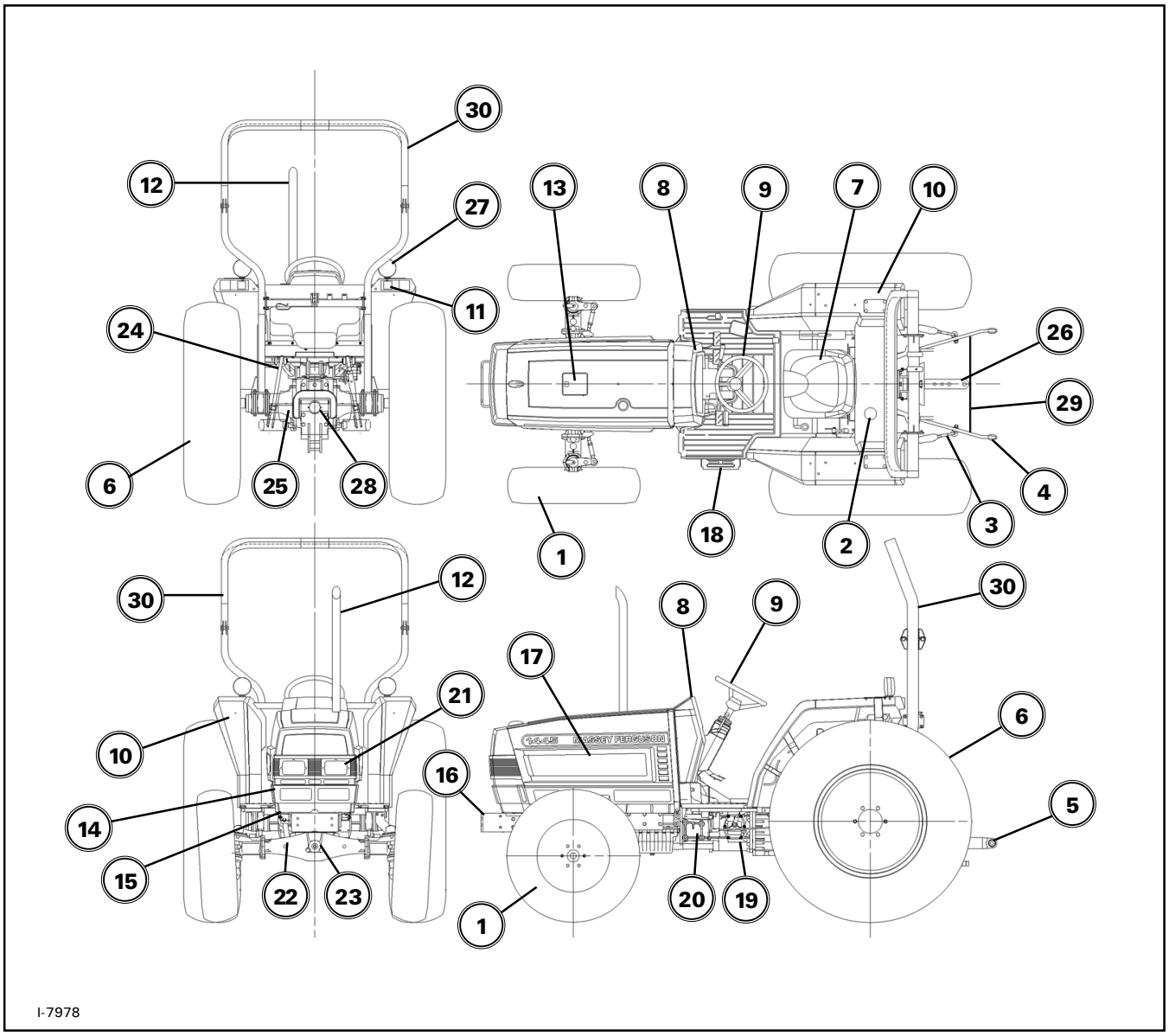



**FIG. 36**

**FIG. 36:** Identification and terminology of major components, as given in this book, are as follows:

1. **Front Wheels**
2. **Fuel Tank Filler**
3. **Stabilizer**
4. **Lift Rod**
5. **Lower Link**
6. **Rear Wheels**
7. **Operator's Seat**
8. **Instrument Panel**
9. **Steering Wheel**
10. **Fender**
11. **Reflector/Tail Light**
12. **Exhaust Pipe**
13. **Hood**
14. **Front Grille**
15. **Battery**
16. **Front Bumper**
17. **Engine**
18. **Foot Step**
19. **Transmission**
20. **Front Wheel-Drive Shaft (4-WD)**
21. **Headlight**
22. **Front Axle**
23. **Front Axle Pivot**
24. **Lift Arm**
25. **Rear Axle**
26. **Drawbar**
27. **Turn/Hazard Light**
28. **Center Housing**
29. **Lower Link Strap**
30. **Roll-Over Protective Structure (ROPS)**

# INSTRUMENTS & CONTROLS
# STANDARD AND POWER SHUTTLE

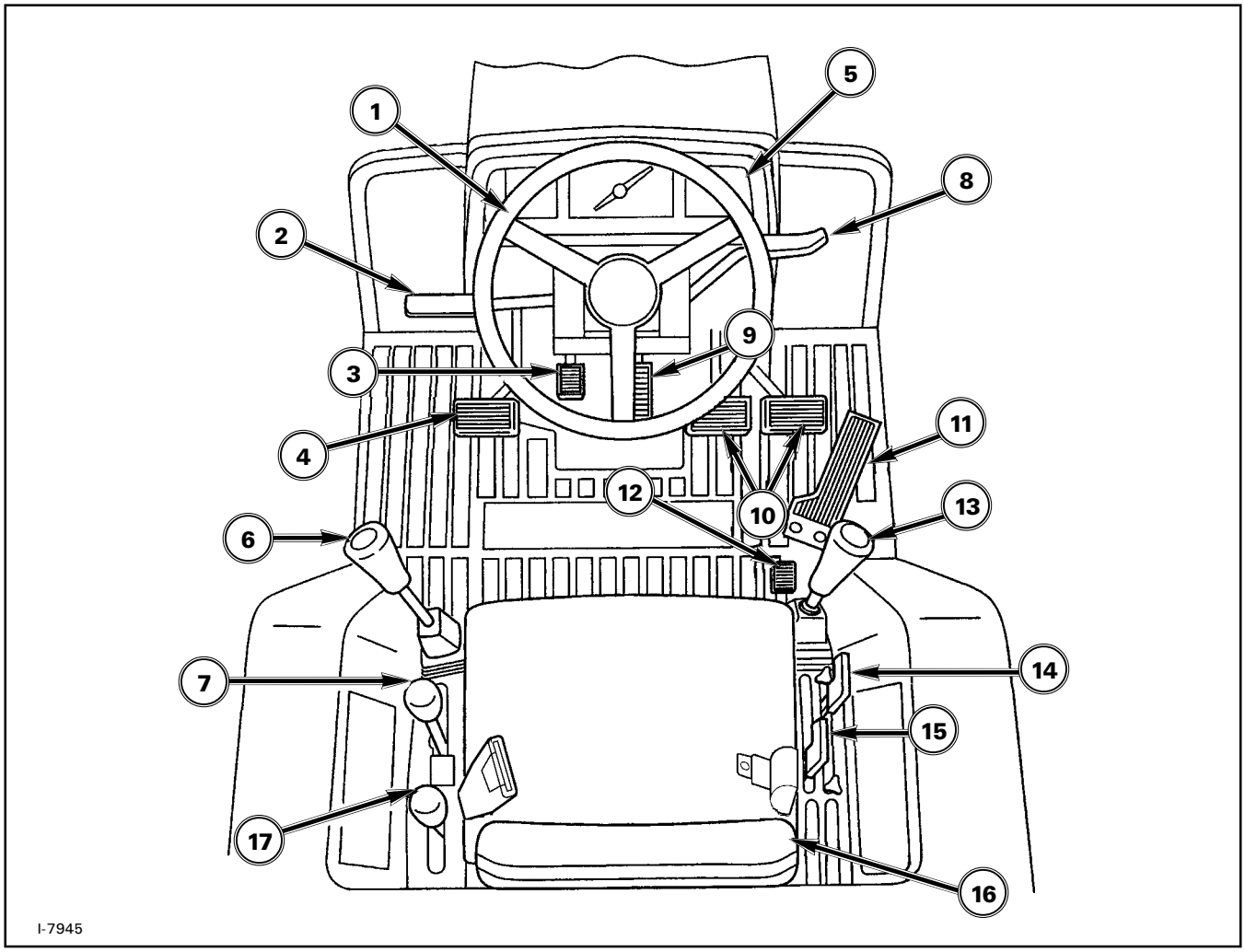



**FIG. 37**

**FIG. 37:** General layout and location of controls within operator's area on Tractor. Specific use of these controls is given later in this section and also in "Operation" section of this book:

1. **Steering Wheel**
2. **Forward/Reverse Lever**
3. **Parking Brake Pedal**
4. **Clutch Pedal**
5. **Instrument Panel**
6. **Range Shift Lever**
7. **Rear Power Take-Off (PTO) Selector Lever**
8. **Hand Throttle Lever**
9. **Steering Column Tilt Pedal**
10. **Brake Pedals**
11. **Foot Throttle Pedal**
12. **Differential Lock Pedal**
13. **Gear Shift Lever**
14. **Three-Point Hitch Position Control Lever**
15. **Three-Point Hitch Draft Control Lever**
16. **Operator's Seat**
17. **Four Wheel Drive (4-WD) Shift Lever**

**CAUTION: Become familiar with all operating controls prior to operating Tractor. Read this book in its entirety before starting.**

# INSTRUMENTS & CONTROLS
# HYDROSTATIC

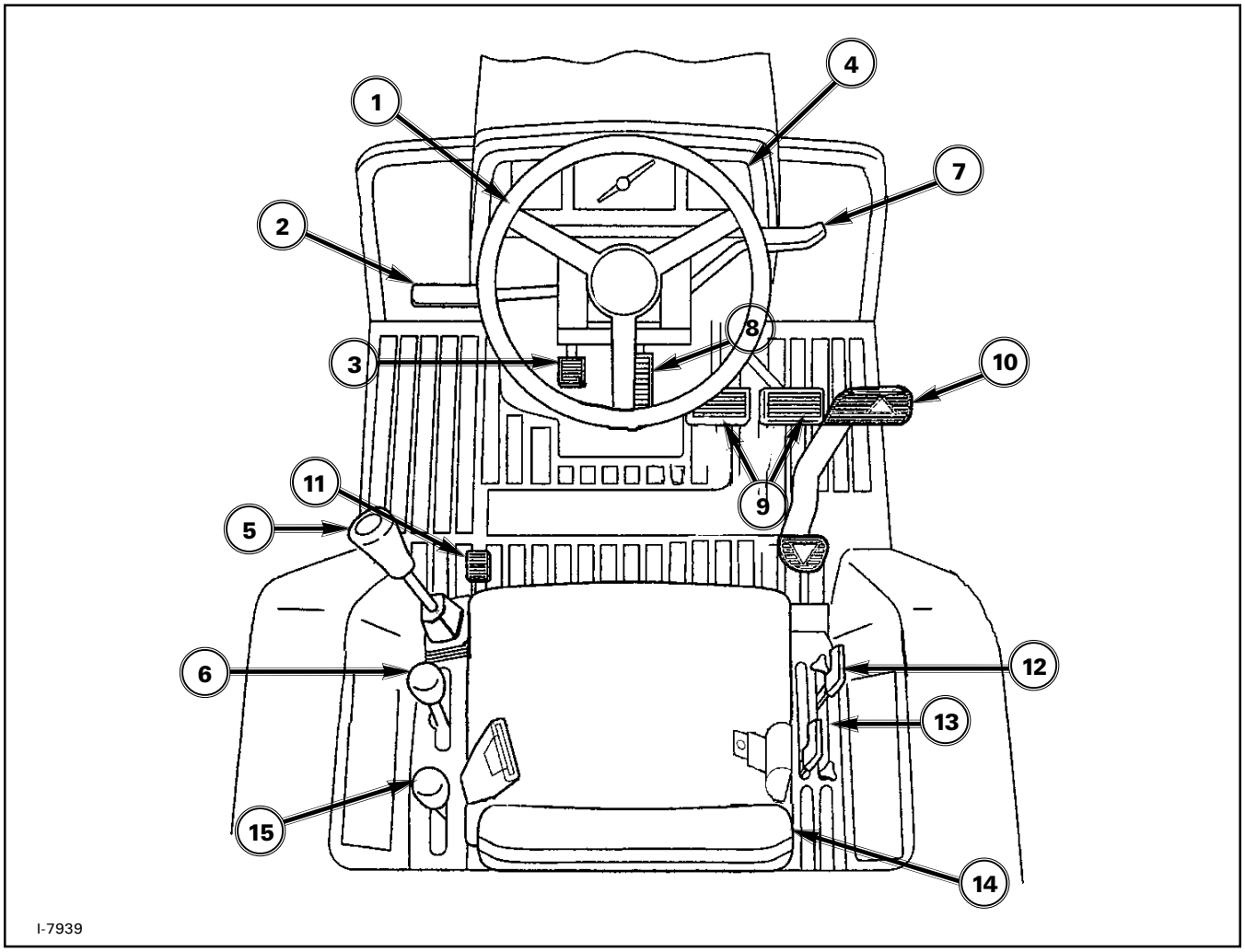



**FIG. 38**

**FIG. 38:** General layout and location of controls within operator's area on Tractor. Specific use of these controls is given later in this section and also in "Operation" section of this book:

1. **Steering Wheel**
2. **Cruise Control Lever**
3. **Parking Brake Pedal**
4. **Instrument Panel**
5. **Range Shift Lever**
6. **Rear Power Take-Off (PTO) Selector Lever**
7. **Hand Throttle Lever**
8. **Steering Column Tilt Pedal**
9. **Brake Pedals**
10. **Hydro Forward Reverse Pedal**
11. **Differential Lock Pedal**
12. **Three-Point Hitch Position Control Lever**
13. **Three-Point Hitch Draft Control Lever**
14. **Operator's Seat**
15. **Four Wheel Drive (4-WD) Shift Lever**

**CAUTION: Become familiar with all operating controls prior to operating Tractor. Read this book in its entirety before starting.**

## INSTRUMENT PANEL

### Standard & Power Shuttle

**FIG. 39:** Arrangement of gauges. Control switches and indicators located in instrument panel. Items are detailed in the descriptions that follow:

*NOTE: Instrumental panel and switches may vary sightly from those shown.*

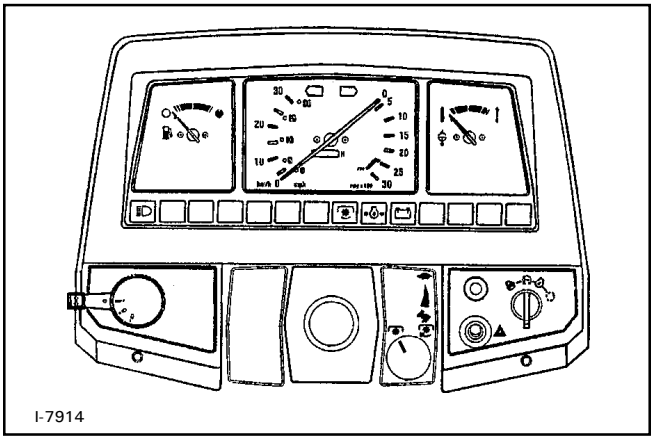



**FIG. 39**

### Hydrostatic

**FIG. 40:** Arrangement of gauges. Control switches and indicators located in instrument panel. Items are detailed in the descriptions that follow:

*NOTE: Instrumental panel and switches may vary sightly from those shown.*

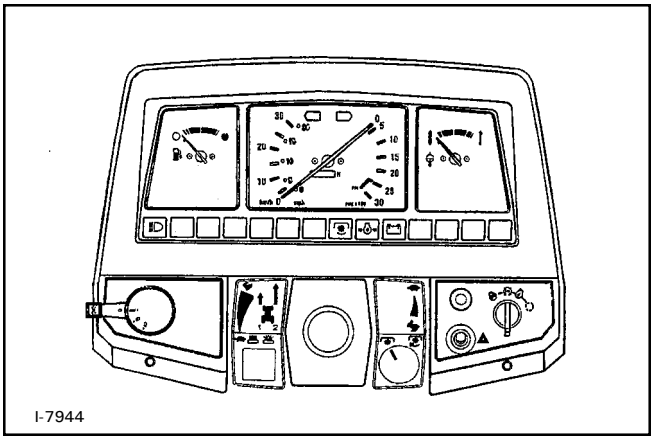



**FIG. 40**

### Electric Fuel Shut-Off

Turning main switch to off (stop) position will stop engine.

## Main Switch

**FIG. 41:** Main switch, 1, has the four following positions:

- **OFF (STOP)** - Tractor engine and all electrical circuits off. Key can be removed
- **ON** - Power supplied to all circuits. Normal operating position. Linkage on fuel injection pump moves (electrically) to the run position.
- **START** - Starter activated. This position spring-loaded to "ON".
- **GLOW** - (Turned to left) Energizes glow plugs to preheat combustion chambers and assist starting. Spring-loaded to "OFF".

*NOTE: Main switch must be turned to "ON" before any circuits will operate. PTO switch must be off and gear shift lever in neutral before engine can be started.*

*This Tractor is equipped with an electric fuel shut-off. When main switch, 1, is turned to "start", "on", or "glow" position and gear shift lever is placed in neutral, a solenoid moves the fuel linkage on injection pump to run position to start engine. When main switch is turned to "off" (stop), solenoid moves fuel linkage to off position to stop engine.*

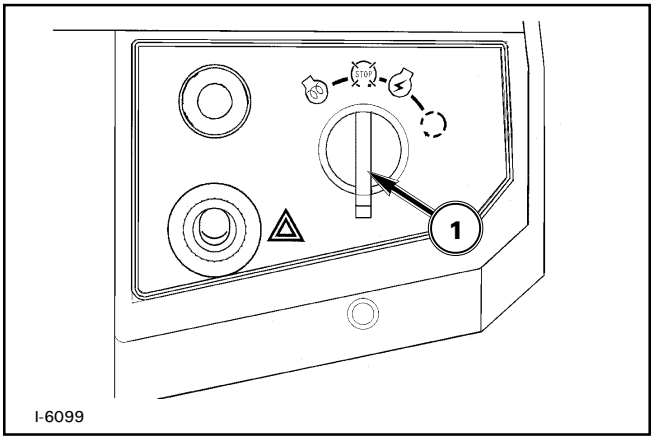



**FIG. 41**

**FIG. 42:** When main switch, 1, is selected to "GLOW" position, glow indicator, 2, will illuminate after several seconds to indicate the engine combustion chambers are preheated and allow cold engine to be started.

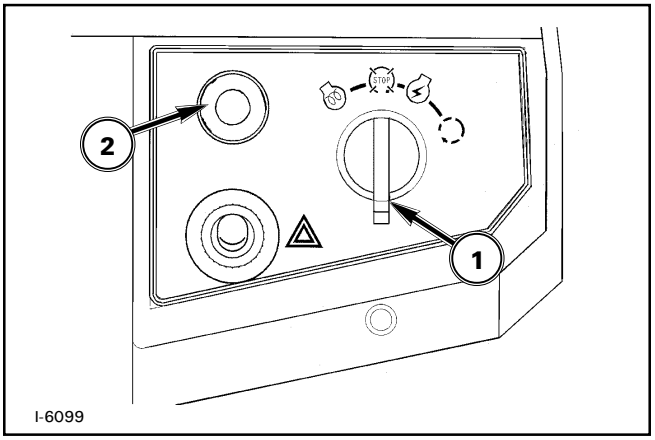



**FIG. 42**

## Indicator Light Strip

**FIG. 43:** Indicator light strip, 3, contains several warning lights to monitor certain functions. Currently used positions (from left to right) are:

- **Main (High) Beam** - Illuminates when headlamps in front grille are selected to high beam position by light switch.
- **Power Take-Off (PTO)** - Illuminates when PTO control switch is moved to engage PTO clutch pack (PTO operating). Light will go out when PTO switch is moved to off.
- **Engine Oil Pressure** - Illuminates if engine oil pressure is low. If light comes on while engine is running, shut off engine immediately and investigate cause.
- **Battery Charge** - Illuminates when main switch is turned "ON" and will go out after engine starts, to indicate battery is being charged.

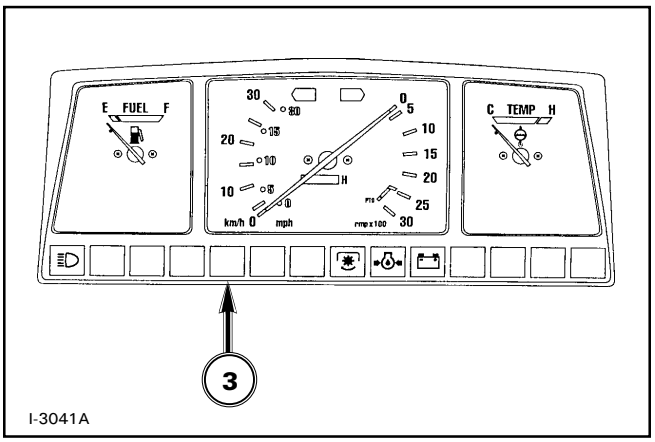



**FIG. 43**

## Coolant Temperature Gauge

**FIG. 44:** Gauge, 4, indicates engine coolant temperature when main switch is selected to "ON".

- **C (Cold)** - Shows too cool temperature for severe work. Allow to warm (needle in mid position) before applying heavy load.
- **H (Hot)** - Indicates over-heating (red area on gauge). Reduce engine speed to idle, allow to run at no load several minutes and investigate cause (refer to "Troubleshooting").

**CAUTION: Do not service hot engine. Allow to completely cool before servicing or removing radiator cap.**

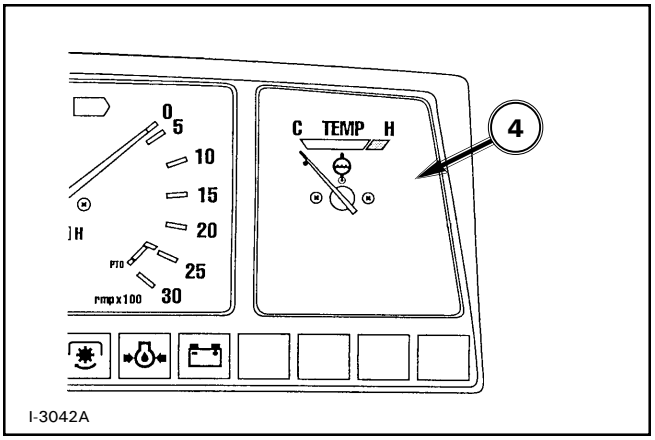



**FIG. 44**

## Speedometer/Tachometer

**FIG. 45:** Left scale on gauge, 5, indicates travel speeds in highest gear (high range/gear 4) in Kilometers per hour (Km/h) and in miles per hour (mph).

Right scale on gauge indicates engine speed in crankshaft revolutions per minute (rpm). Index is also provided to show rear PTO speed of 540 at approximately 2400 engine rpm.

Hour meter in center of gauge indicates engine and tractor use to assist in maintenance intervals. The extreme right digit indicates 1/10 hour increments.

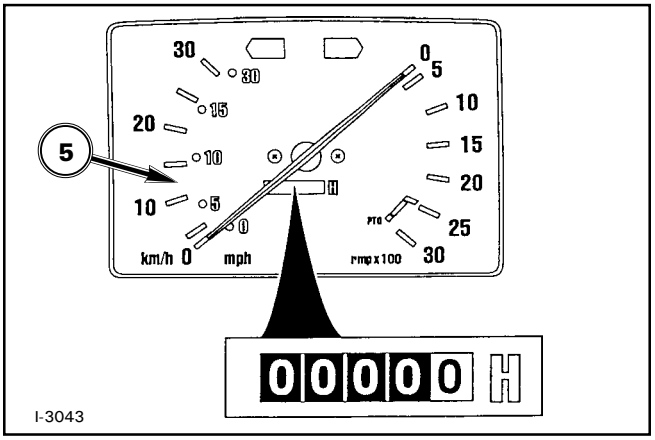



**FIG. 45**

## Fuel Gauge

**FIG. 46:** Gauge, 8, indicates level of diesel fuel in fuel tank when main switch is "ON".

*NOTE: Use only clean diesel fuel and clean area to prevent dirt/water entry into fuel tank when refilling.*

*DO NOT run out of fuel as bleeding air from the system will be required. Keep fuel tank full to minimize condensation.*

**CAUTION: DO NOT refill fuel tank with engine running or hot. Allow cooling period. DO NOT smoke near fuel tank. Clean up any spilled fuel.**

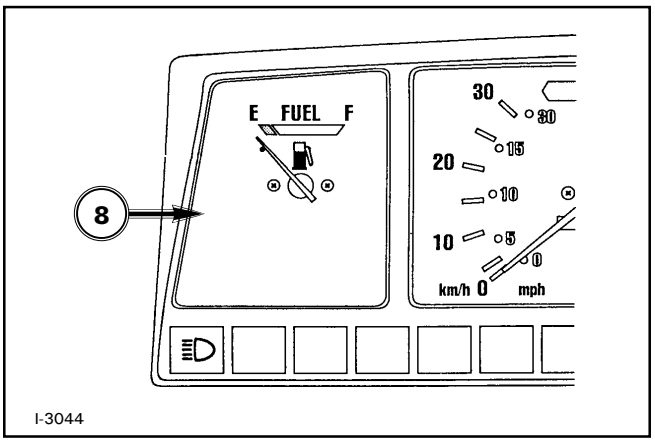



**FIG. 46**

## Horn & Light Turn Switch

**FIG. 47:** With main switch "ON":

**Light Switch, 7** - Is a rotary switch with three operating postitions:

- **OFF** - Fully counterclockwise. All lights off.
- **1st** - Low beam headlamps and rear tail lights.
- **2nd** - Main (high) beam headlamps and rear tail lights.

*NOTE: When high beam is selected (2nd position), light in indicator light strip will come on.*

**Turn Switch, 8** - Operate switch handle in direction Tractor is being turned. The appropriate flashing amber warning light (fender-mounted) will operate as turn signal. Return switch to center position to cancel.

*NOTE: Turn lights will not self-cancel. Select turn/hazard lights switch to center position after completing turn.*

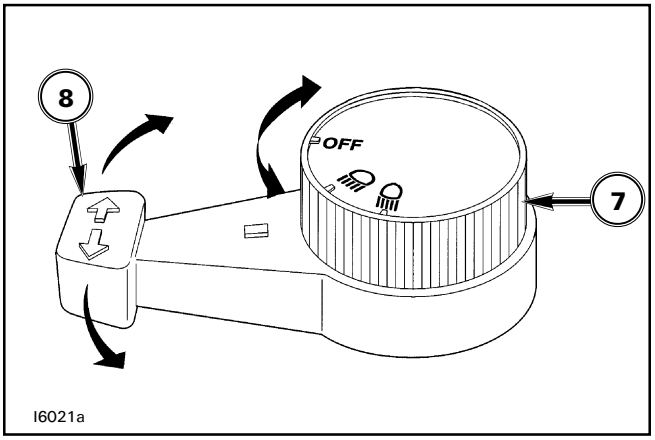



**FIG. 47**

## Hazard Light Switch

**FIG. 48:** Flip on switch, 9, to turn on hazard lights. Both flashing amber warning lights will operate at the same time.

**CAUTION: Hazard lights must be used any time Tractor is driven on public roadway. Consult local agencies for other marking requirements.**

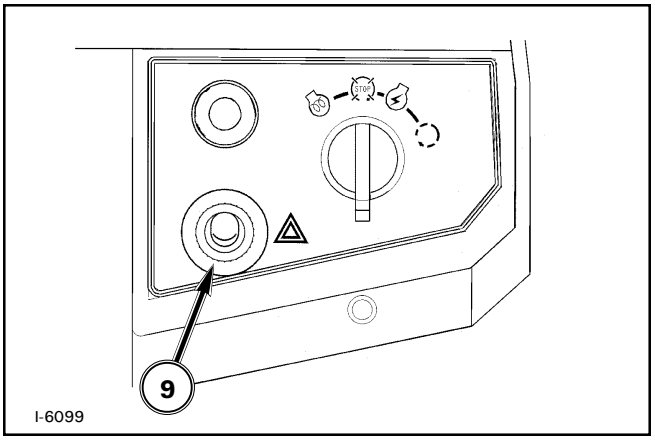



**FIG. 48**

**FIG. 49:** Turn/hazard indicator lights, 6 and 7, will operate with fender-mounted warning lights. This provides operator with easy indication of warning light selection.

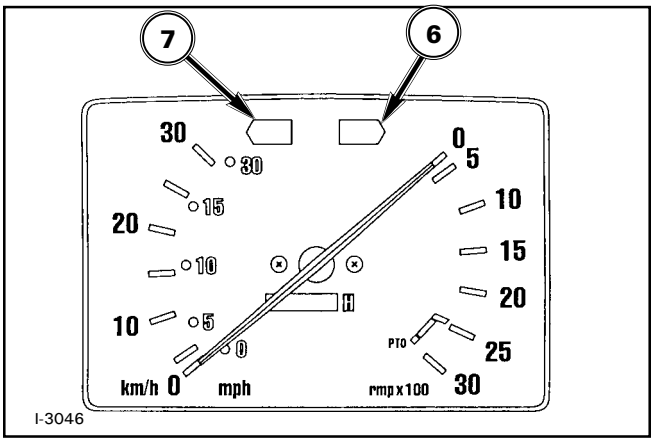



**FIG. 49**

## Power Take-Off (PTO) Switch

**FIG. 50:** A push/rotate-type safety switch, 12, is used to engage and disengage the PTO drive system.

The switch must **first be pushed in** and then rotated clockwise to engage PTO. When engaged, the PTO indicator light in the indicator light strip will illuminate.

The switch is pushed to disengage PTO.

*IMPORTANT: PTO switch is equipped with a lock-out to prevent accidental engagement of PTO system. To engage PTO,* ***first push in*** *on switch to unlock AND THEN, rotate knob clockwise to ON position. DO NOT FORCE SWITCH.*

*NOTE: PTO switch, 12, must be used in conjunction with rear PTO selector lever, to left of operator's seat, when rear PTO is used. Refer to "Operation "section for complete details.*

*When PTO control switch is "ON," the engine cannot be started. Always switch off PTO and place main gear shift lever in neutral to start engine.*

**WARNING: Always shut off PTO and shut off Tractor engine before servicing PTO-driven implement. Allow movement and motion to stop before leaving operator's seat.**

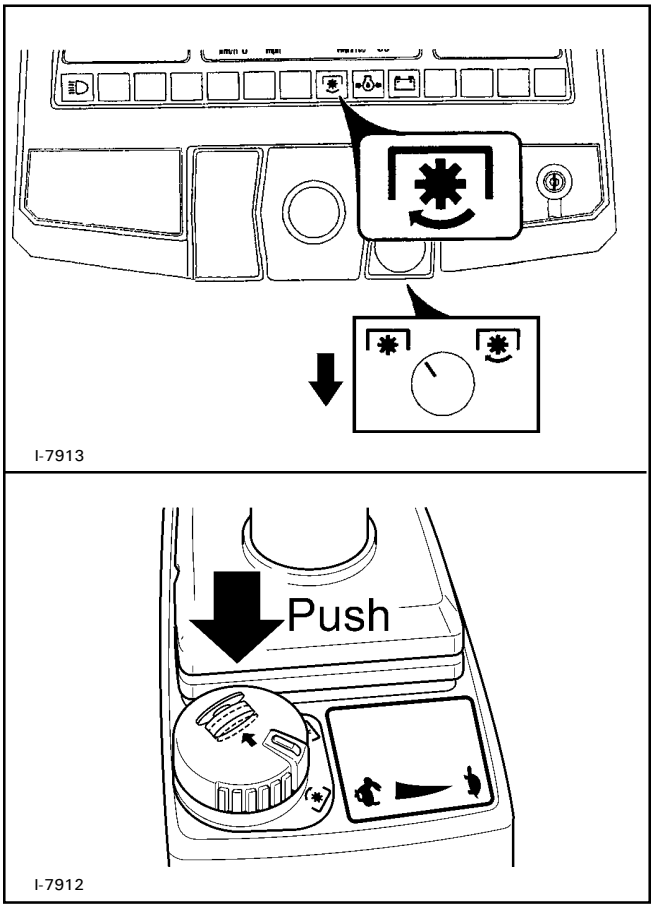



**FIG. 50**

## MAIN CLUTCH PEDAL

**FIG. 51 & 52:** Foot pedal, 1, disengages engine from transmission when fully depressed, to permit engine starting, selecting/changing gears and stopping Tractor movement. Four-wheel drive selection also requires clutch disengagement.

Slowly raising the pedal will engage clutch and start Tractor moving in selected gear.

*NOTE: Clutch pedal should be depressed quickly to prevent abnormal wear. Clutch pedal should be raised smoothly to prevent sudden movement. DO NOT "ride" clutch pedal with your foot.*

*IMPORTANT: Correct clutch pedal free-play adjustment is a must. Consult "Maintenance" section.*

*NOTE: Hydrostatic model does not have a clutch (Fig. 54).*

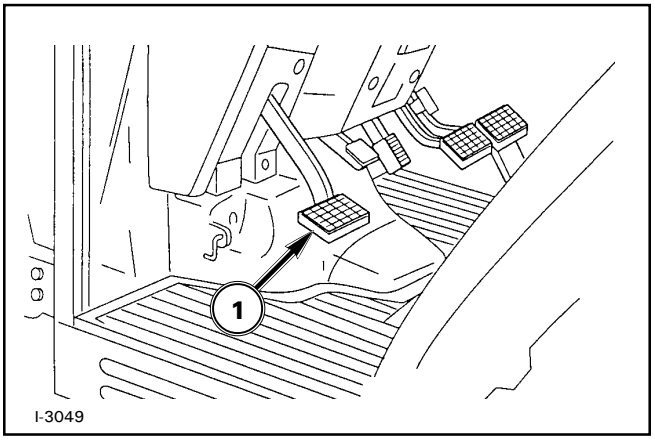



**FIG. 51**

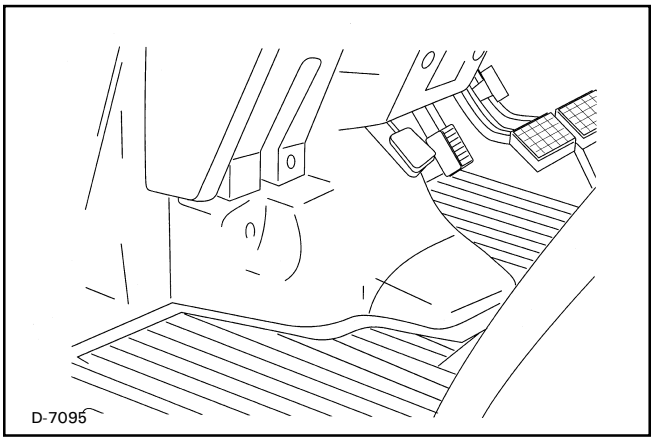



**FIG. 52**

## BRAKES

### Brake Pedals

**FIGS. 53 & 54:** Inner brake pedal, 1, and outer brake pedal, 2, independently control the respective left and right wheel brakes, to assist in turning.

During Tractor transport or high speed operation, brake pedals must be latched together using interlocking plate, 3.

*NOTE: Fig. 55 illustrates standard and power shuttle models, Fig. 56 illustrates hydrostatic model.*

**CAUTION: Do not use individual wheel brakes for transporting or operating at high speed. Always latch pedals together using interlocking, plate, 3. Make sure brakes are adjusted evenly.**

**CAUTION: For towing safety, the towed equipment, when fully loaded, should not exceed 1.5 times weight of towing unit.**

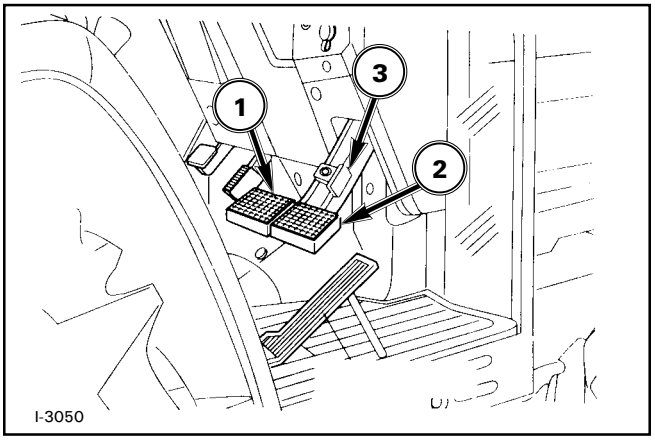



**FIG. 53**

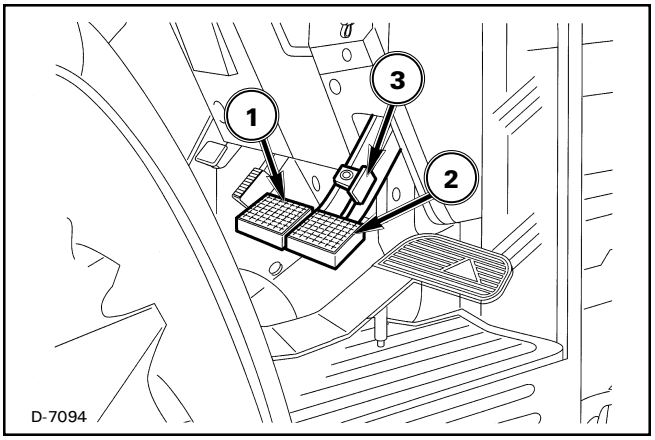



**FIG. 54**

### Parking Brakes

**FIG. 55:** To engage parking brakes, latch brake pedals together using interlocking plate and depress brake pedals fully. While brake pedals are depressed, push downward on parking brake pedal, 4, to lock.

To disengage parking brakes, firmly depress both brake pedals to release locking mechanism, allowing brake pedals up to normal operating position.

*IMPORTANT: Disengage brakes before driving Tractor to prevent abnormal wear.*

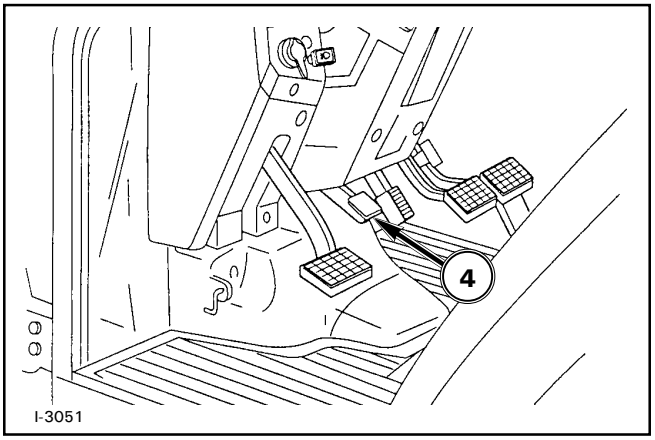



**FIG. 55**

## ENGINE SPEED CONTROLS

**CAUTION: Always select engine speed to ensure safe operation. Reduce speed prior to turning or backing Tractor.**

*IMPORTANT: DO NOT "race" or excessively load cold engine.*

**FIG. 56: Hand Throttle Lever, 1** - Controls engine speed and will remain in position selected by the operator. With hand lever forward, engine will idle. Engine speed increases as lever is pulled progressively rearward.

**Foot Throttle Pedal, 2** - Will override setting of hand throttle lever for increased engine speed. When pedal is released, engine speed returns to hand throttle lever setting.

*NOTE: Hydrostatic model does not have a foot throttle pedal.*

**CAUTION: When using foot throttle pedal, the hand throttle lever must be in the low idle speed position. This ensures maximum "engine braking" when pedal is released.**

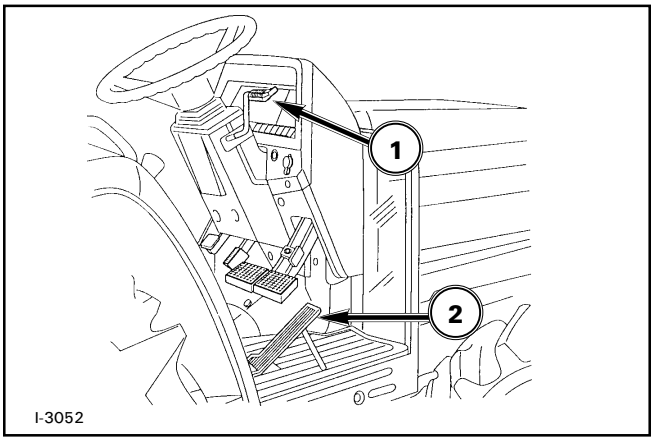



**FIG. 56**

## TRANSMISSION SHIFT LEVERS - STANDARD AND POWER SHUTTLE MODELS

Three shift levers are used to select ground travel speed through different gear reductions within the drive train. Forward and reverse travel directions are also possible in all gear selections.

*IMPORTANT: All range and gear change selections require complete disengagement of main clutch (depressing pedal).*

### Forward/Reverse Manual "Shuttle" Lever

**FIG. 57:** Forward or reverse travel is selected by lever, 1, on steering column. Moving lever forward will select forward travel, lever rearward will select reverse travel. A center neutral position should be selected whenever Tractor is stopped.

*IMPORTANT: Direction selection using manual "shuttle" requires complete disengagement of main clutch (pedal depressed).*

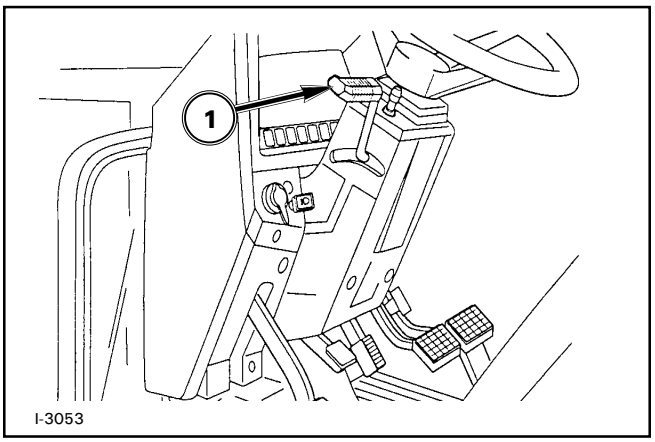



**FIG. 57**

## Forward/Reverse "Power Shuttle" Lever

**FIG. 58:** With power shuttle lever, 2, forward or reverse direction change are possible without depressing the main clutch pedal. Lift up and move lever forward to shift to the forward travel position, move lever rearward to shift to the reverse travel position.

*NOTE: Make sure power shuttle lever is in neutral position before starting engine.*

**CAUTION: Forward/reverse direction changes must not be made at high speed. Refer to operation section for complete details.**

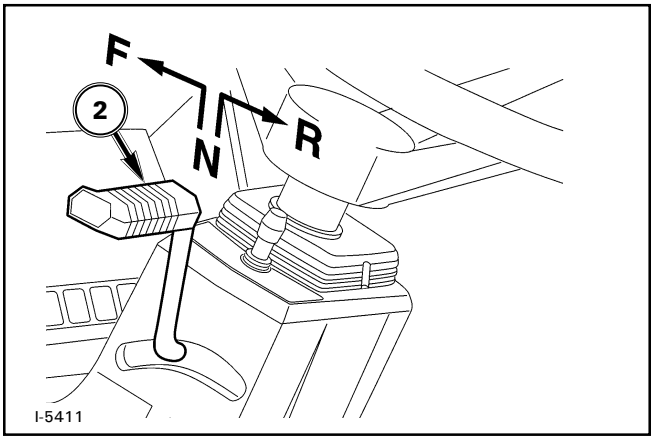



**FIG. 58**

## Range And Gear Shift Levers

**FIG. 59:** Range shift lever, 2, is located to left of operator's seat. Gear shift lever, 3, is located to right of operator's seat.

**Range Shift Lever, 2** - Provides four major speed changes from slowest speed range through second, third and highest speed range.

**Gear Shift Lever, 3** - Provides four smaller gear speed changes within each range, from first through fourth gear positions.

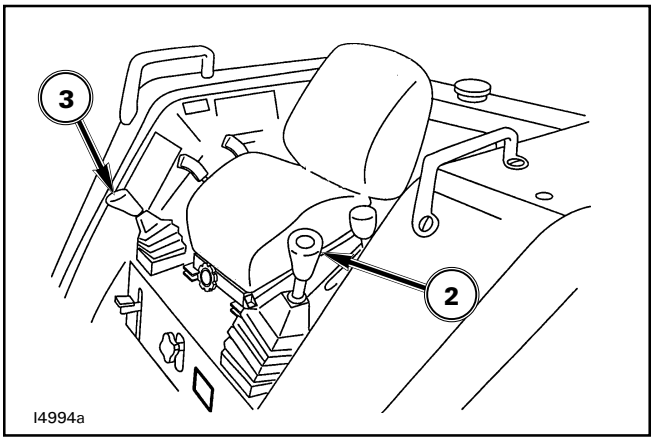



**FIG. 59**

**FIG. 60:** In total, sixteen forward and sixteen reverse gear speeds are possible. Synchronized shifting allows gear shift lever and manual shuttle shift lever to be changed with Tractor in motion (with main clutch pedal depressed).

Synchronized shifting is possible when the following gear changes are desired:

| Shift Lever: | Shifts From: |
|---|---|
| Gear Shift Lever (All) | 1 to 2<br>2 to 3<br>3 to 4<br>4 to 3<br>3 to 2<br>2 to 1 |
| Shuttle Shift Lever (All) | F to R<br>R to F |

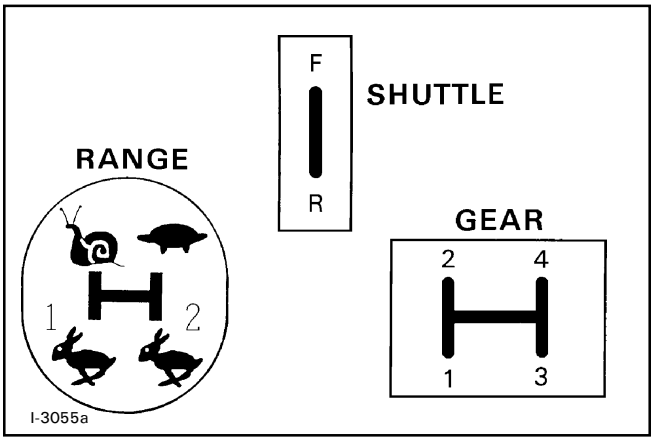



**FIG. 60**

*NOTE: All range lever changes must be made with clutch depressed and TRACTOR MOTION STOPPED.*

**CAUTION: Reduce engine speed prior to changing any shift lever position. Make forward to reverse, and reverse to forward, direction changes with Tractor stopped or traveling at very slow ground speed.**

## TRANSMISSION SHIFT LEVER AND CONTROLS - HYDROSTATIC

One shift lever is used to select a range of ground travel speed through different gear reductions within the drive train. A hydrostatic control unit (using a control pedal and electric control button) allows infinitely variable speeds, from zero to top speed, in each range.

**FIG. 61: Range Shift Lever**, 1, is located to the left of the operator's seat, range lever provides two major speed changes.

*IMPORTANT: Tractor must be completely stopped when shifting.*

**Range Change Button, 2.** Located on the right side of the instrument panel, this button electrical over hydraulic changes the position of the motor swash plate, this also provides two speed changes. Tractor can be moving when shifting.

**Hydrostatic Control Pedal, 3.** Located on the right side of the platform and it actuates the hydrostatic unit in forward or reverse travel direction.

Depressing the forward portion of the pedal moves tractor forward, depressing the rearward portion of the pedal moves Tractor rearward. As each movement is progressively depressed, a corresponding increase in ground speed of Tractor will be noticed in the appropriate direction.

Returning pedal towards spring-loaded center position, will slow Tractor and stop it when neutral position is reached. When pedal is completely released, Tractor should remain stopped with the pedal assembly in neutral position.

**Cruise Control Lever, 4.** Located on the left side of the steering wheel. This lever actuates hydrostatic control unit for forward travel only. Move forward pedal down until desired forward speed is achieved, then move cruise control lever forward to hold this speed. Move lever rearward to slow down and stop.

**WARNING: Cruise control should only be used in open spaces, without obstacles, with unobstructed view or traveling on road.**

You should be thoroughly familiar with releasing cruise control. See operation section.

*NOTE: Do not move cruise control lever without first moving the hydrostatic control pedal downward in the forward position, to prevent mechanical failures. Cruise control is NOT available in reverse direction.*

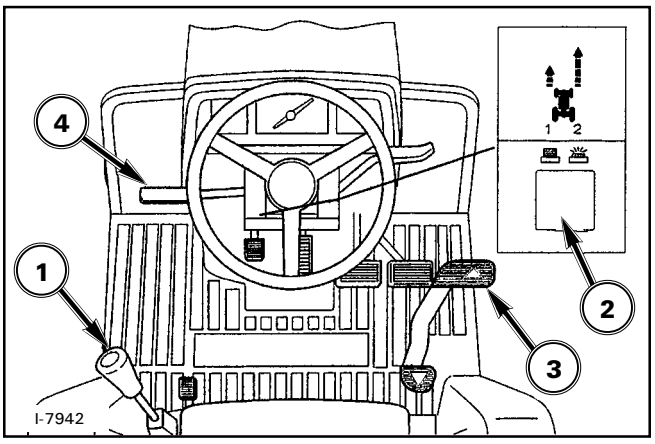



**FIG. 61**

## Control Lever Positions

*NOTE: Complete transmission operating information is given later in the Operation section of this book.*

**FIG. 62:** General view of operating positions of transmission control levers:

**A: Range shift lever** - has "tortoise" and "hare" positions with neutral at center.

*IMPORTANT: Tractor must be stopped to shift.*

**B: Range change button** - has two positions. With button up, range is in low range. When button is depressed, range is in high range, button will light up indicating that button has been depressed.

With the combination of the Range shift lever and the Range change button, four forward and four reverse ranges are possible.

**C: Hydrostatic cruise control** - is used for forward travel only. Move forward pedal down until desired forward speed is achieved, then move lever forward until desired travel speed is maintained. Move lever rearward to slow down and stop.

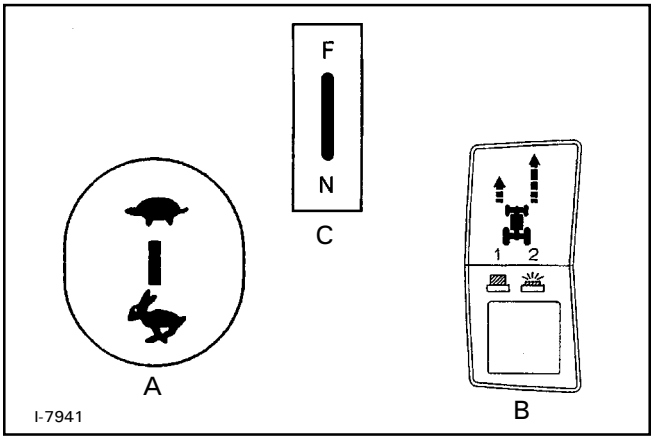



**FIG. 62**

## DIFFERENTIAL LOCK PEDAL

**FIGS. 63 & 64:** When differential lock pedal, 1, is depressed, both rear axles are locked together to provide equal traction to both rear wheels. This is especially important when operating in loose soil or slippery conditions.

*IMPORTANT: Depress main clutch pedal and stop before engaging differential lock.*

Disengage differential lock, by releasing foot pedal. If lock does not immediately disengage, tap right and left brake pedals alternatively until pedal is released.

*NOTE: Fig. 64 illustrates standard and power shuttle model, fig. 65 illustrates hydrostatic model.*

**CAUTION: When differential lock is engaged, steering ability of Tractor will be greatly reduced. Disengage before attempting a turn. Do not use during transport.**

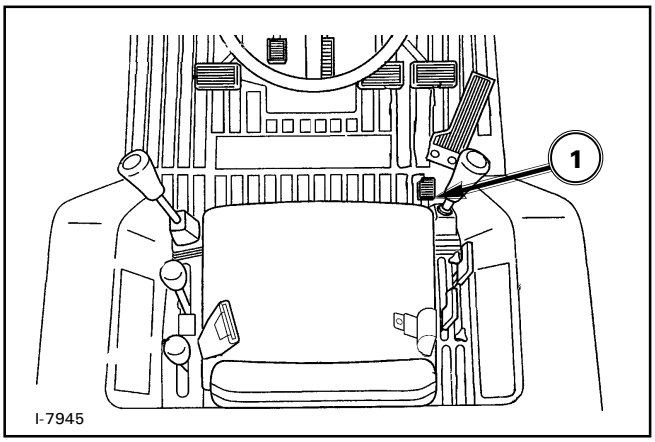



**FIG. 63**

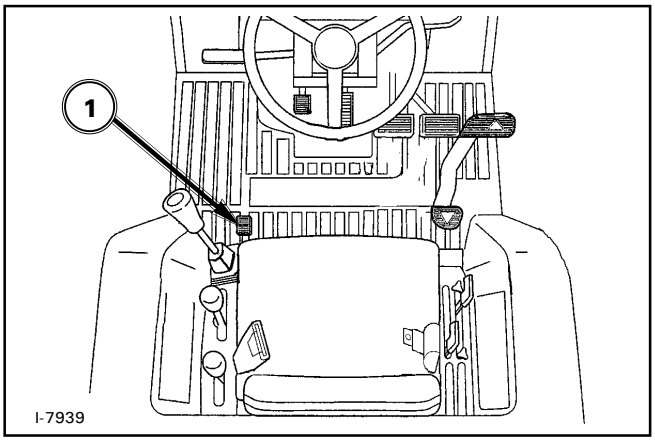



**FIG. 64**

## FOUR-WHEEL DRIVE SHIFT LEVER

**FIG. 65:** Shift lever, 1, engages and disengages drive for the front axle. Lever forward, the front axle (4-WD) is disengaged. Lever rearward, the front axle is engaged, and power is available to both front and rear axle.

*IMPORTANT: Depress main clutch pedal and stop Tractor before engaging or disengaging four wheel drive.*

*Do not use 4-WD on hard surface. Rapid wear of front tires and possible drive line damage could occur if 4-WD is operated for prolonged periods on hard surface.*

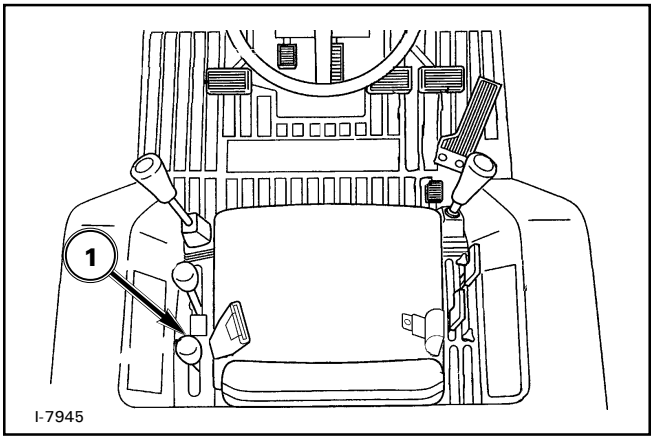



**FIG. 65**

## REAR PTO SELECTOR LEVER

**FIG. 66 & 67:** Rear PTO (power take-off) selector lever, 1, controls rear PTO on Tractor.

When lever is forward, 540 rpm rear PTO is selected. When lever is returned to rear neutral (N) position, the gear drive is disengaged. Rear position is blanked off by locking plate, 2.

Rear PTO selector lever is used with PTO control switch on instrument panel. Refer to "Operation" section for complete details.

*IMPORTANT: Before moving rear PTO selector lever, PTO control switch on steering column must be off.*

**CAUTION: Always shut off PTO and shut off Tractor engine before servicing PTO-driven implement. Allow all movement and motion to stop before leaving operator's seat.**

**CAUTION: DO NOT remove locking plate as this prevents usage of 1000 rpm rear PTO. Operating low speed (540 rpm) implements at high speed will result in implement damage.**

*NOTE: Locking plate is not on later models. Operates only at 540 rpm (Fig. 66).*

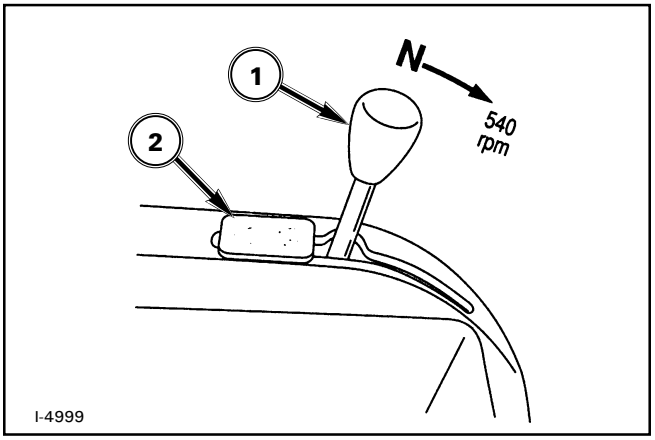



**FIG. 66**

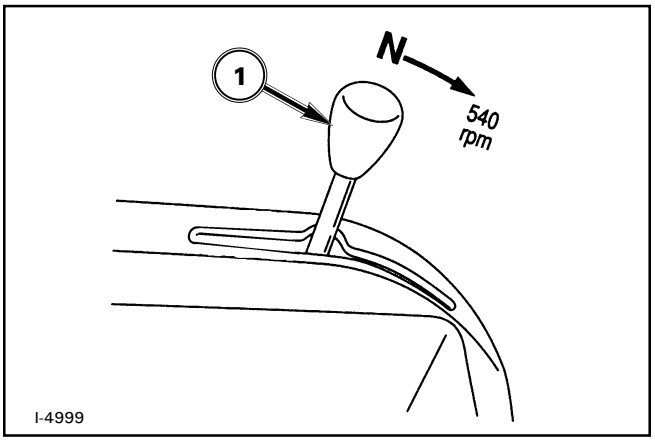



**FIG. 67**

## THREE-POINT HITCH

Complete operating instructions for three-point hitch are given in "Operation" section of this book.

### Control Levers

**FIG. 68:** Position control lever, 1, adjusts height of three point hitch on rear of Tractor. Setting lever in a particular position will set the height respectively. Full up position is with lever fully rearward and full down position is with lever completely forward.

Draft control lever, 2, adjusts height of three-point hitch according to the "draft" or pull of ground-engaging implements. This provides consistent load on Tractor and provides weight transfer to Tractor rear wheels to reduce wheel slippage.

Lever stops, 3 & 4, can be adjusted within slot to limit implement raising/lowering.

**CAUTION: use position control lever, 1, when attaching or detaching implement. If equipped with draft control, move lower lever, 2 fully forward when using position control.**

*NOTE: When starting engine, ensure implement is lowered to the ground and both levers are fully forward. This reduces load on starter due to hitch trying to raise when engine is cranked.*

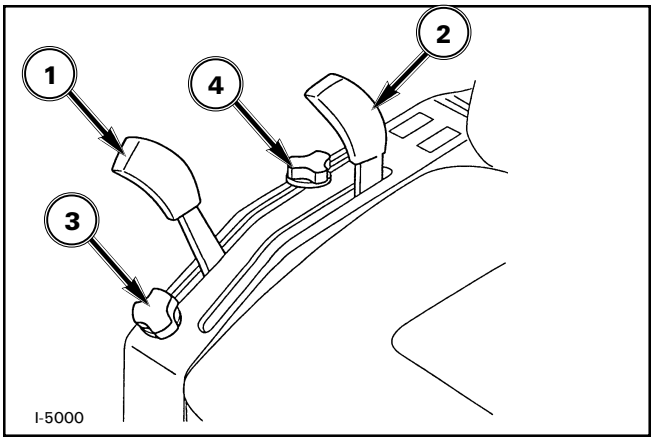



**FIG. 68**

### Lowering Rate Control Knob

**FIG. 69:** Lowering rate knob, 1, adjusts "rate of drop" of three-point hitch and implement. Turning knob clockwise will increase lowering time and counterclockwise will decrease lowering time. Turning knob fully clockwise will lock implement (or hitch) in raised position for transport.

**CAUTION: When working near or under mounted equipment, securely block in position and turn lowering rate clockwise to "stop".**

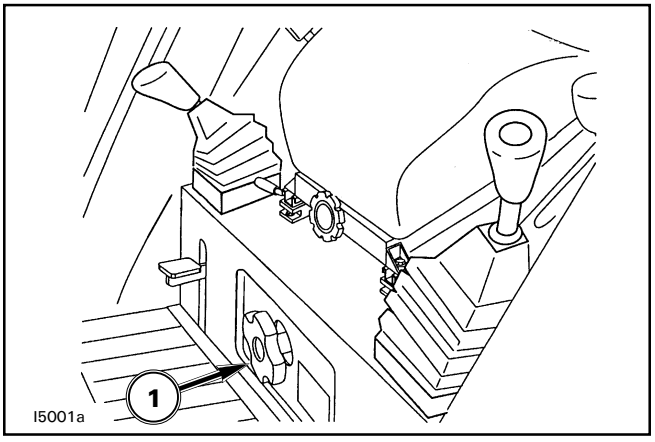



**FIG. 69**

## COMFORT ADJUSTMENTS

**CAUTION: Never make seat or steering column adjustments while Tractor is in motion. Make sure all adjustments are "locked" prior to operating unit.**

### Seat Adjustment

**FIG. 70:** Seat has spring suspension. Lift seat latching lever, 1 , to release seat latch and permit seat to be adjusted fore and aft.

Seat also has an adjustment to compensate for operators weight. Turn weight adjuster knob, 2, clockwise, for increased operator weight, counterclockwise for reduced operator weight.

### Steering Column Tilt

**FIG. 71:** Steering column can be adjusted forward and rearward to any one of three positions, enabling operator to select best steering wheel position.

While holding steering wheel with both hands, depress tilt locking pedal, 1, and select desired position. Release pedal and make sure column is securely locked by pedal returning to original position.

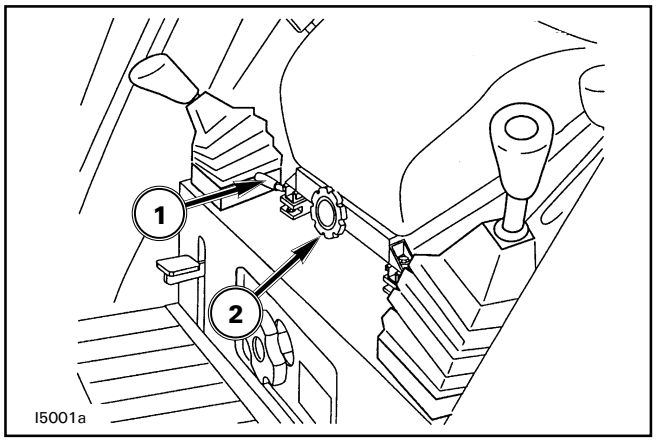



**FIG. 70**

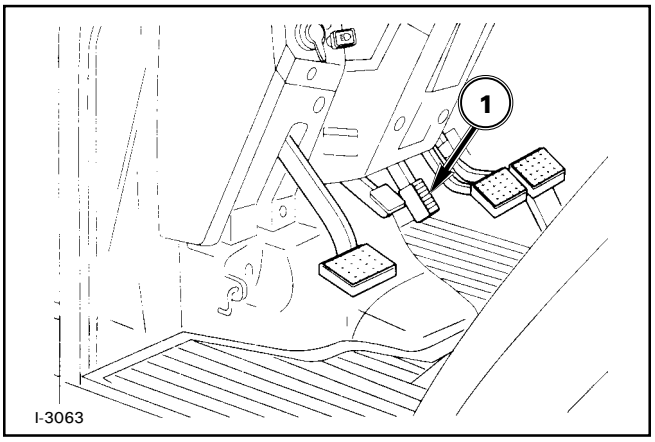



**FIG. 71**

# OPERATION

## BREAK-IN PERIOD

Operation of Tractor within the first fifty hours can be a major factor in determining the performance and life of the engine and Tractor:

- The engine may be operated at full rpm but excessive load should be avoided. If engine begins to "lug", operate in a lower gear to maintain higher engine speed.
- Check coolant level and check engine, transmission and other oil levels frequently during break-in period. Watch for evidence of leakage of above fluids. Replenish levels as required and repair any leaks that may have formed.
- Tighten any nuts, bolts, or screws that may have loosened and tighten as necessary. This is especially true of wheel retaining bolts. **All fasteners on this Tractor are metric.**
- Be observant of clutch pedal free-play adjustment and brake adjustment and readjust as required. Lining materials used on clutch and brake discs "bed in" in the first few hours of operation and may necessitate the need for early and frequent re adjustment.
- Keep area around fuel tank filler clean and make sure diesel fuel is of correct grade and free of contamination.
- Initial engine oil and oil filter change is after first fifty hours of operation. Subsequent change interval is every one hundred hours for engine oil and filter.

**CAUTION: Proper maintenance practices cannot be overemphasized. They are required for safe operation. Consult "Lubrication and Maintenance" section for full details.**

## STARTING

### Pre-Start Inspection

Prior to daily start-up of Tractor, a few basic procedures should be followed to ensure Tractor is in operating order to insure life and dependability:

- Make sure all safety shields are in place and secured properly.
- Make sure operator is instructed on correct and safe operation of Tractor and related attachments or implements.
- Check coolant, engine oil and transmission oil levels and replenish as necessary.
- Check fan belt tension and adjust as required.
- Make sure radiator, air intake screens and radiator screen are clear of debris to provide maximum engine cooling.
- Check operation of clutch, brake and throttle controls. All controls must operate freely and be adjusted correctly.
- Conduct a general inspection of tires, tire pressure and wheel bolt torque. Observe for external signs of leakage and correct before operating Tractor. Check steering for excessive looseness.
- Check for adequate fuel supply. It is recommended fuel tank be filled following each day's use to reduce condensation and provide full tank for next use.
- Check operation of lights and warning flashers. If Tractor is to be transported on public road, ensure slow-moving vehicle emblem is in place.

*NOTE: Requirements may vary regarding use of warning flashers and slow moving vehicle emblem depending on locality. Check local safety codes.*

**WARNING: Carefully read and understand the SAFETY section of this book. Your life, and that of others, can be in danger during the starting of the Tractor.**

**Always start and operate the engine in a well ventilated area.**

**If in an enclosed area, vent the exhaust to the outside.**

**DO NOT modify or tamper with the exhaust system.**

## Normal Starting - Standard and Power Shuttle

**CAUTION: Do not attempt to start Tractor unless seated in operator's seat. Do not allow anyone on Tractor except for the operator.**

**FIGS. 72 & 73:** To start engine, proceed as follows:

1. Latch brake pedals together, depress pedals firmly and apply parking brake lock.
2. Place range shift lever, gear shift lever and shuttle lever in centered neutral positions.
3. Make sure rear PTO selector lever is in neutral position and PTO control switch is in OFF position.
4. Fully depress main clutch pedal to disengage clutch.

**WARNING: Gear shift lever must be placed in neutral position and PTO switch must be off to actuate safety switches and permit operation of the starter motor.**

5. Set position and draft control levers (three-point hitch) in the down position.
6. Turn main switch to the left to "glow" position for 5-10 seconds until indicator glows.
7. Set hand throttle lever at half to fully open position.
8. Turn main switch to "on" position for 1-2 seconds, then turn to "start" position. Release switch the moment engine starts.
9. Once engine runs smoothly, set engine speed to approximately 1500 rpm to allow engine and hydraulic system to warm for several minutes. DO NOT LOAD COLD ENGINE.

*IMPORTANT: Do not crank engine for more than 10 seconds at a time. Allow starter to cool at least 20 seconds before repeating procedure. Never turn main switch to "start' with engine running. Severe damage will result.*

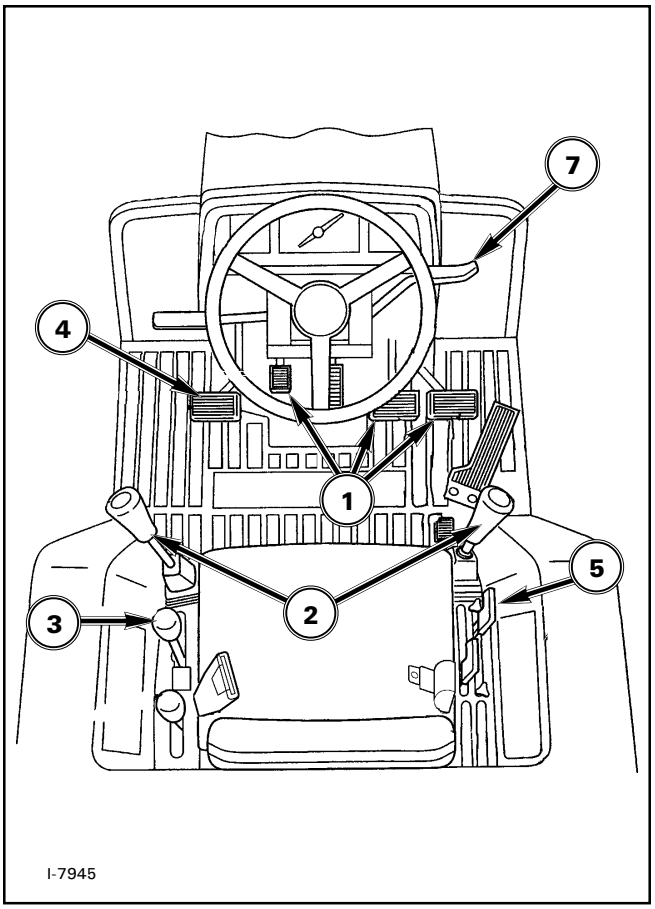



**FIG. 72**

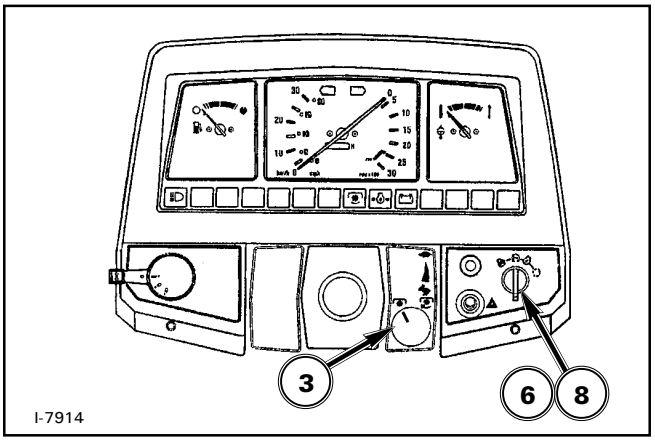



**FIG. 73**

## Normal Starting - Hydrostatic

**FIGS. 74 & 75: To start engine, proceed as follows:**

1. Latch brake pedals together, depress pedals firmly and apply parking brake lock.
2. Place range shift lever in neutral position.
3. Make sure rear PTO selector lever is in neutral position and PTO control switch is in OFF position.

**WARNING: Range shift lever must be placed in neutral position and PTO switch must be off to actuate safety switches and permit operation of the starter motor.**

4. Do not depress hydrostatic pedal, it must be in neutral position.
5. Make sure cruise control lever is in the rearward position.
6. Set position and draft control levers (three-point hitch) in the down position.
7. Turn main switch to the left to “glow” position for 5-10 seconds until indicator glows.
8. Set hand throttle lever at half to fully open position.
9. Turn main switch to “on” position for 1-2 seconds, then turn to “start” position. Release switch the moment engine starts.
10. Once engine runs smoothly, set engine speed to approximately 1500 rpm to allow engine and hydraulic system to warm for several minutes. DO NOT LOAD COLD ENGINE.

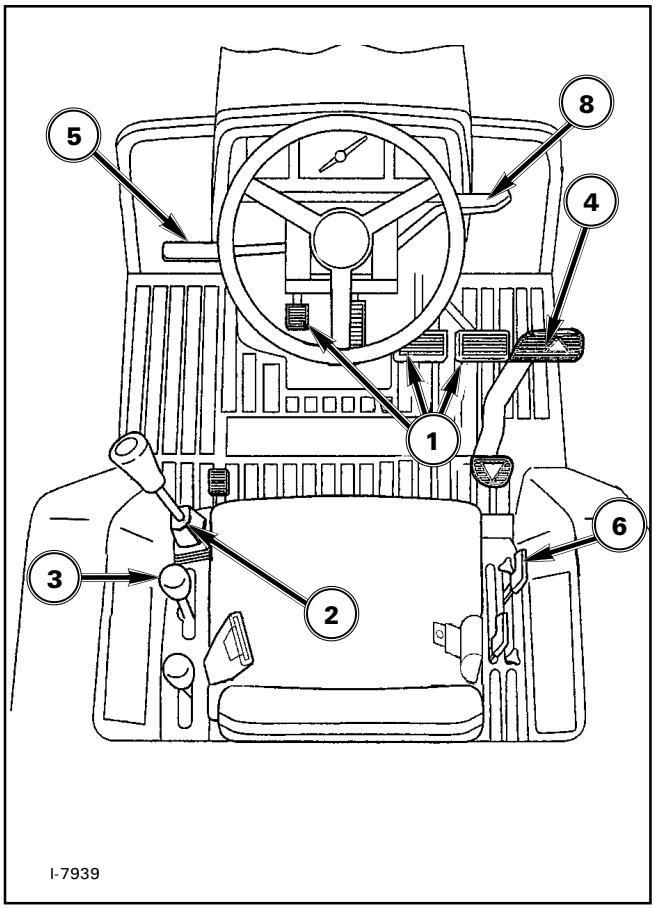



**FIG. 74**

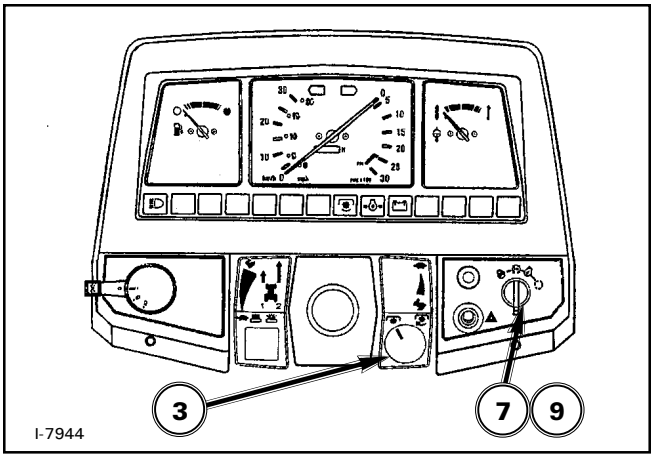



**FIG. 75**

**FIG. 76:** Battery charge indicator lamp and engine oil pressure lamp in indicator light strip should go out when the engine starts. If either light remains lit, **STOP ENGINE IMMEDIATELY** and investigate source of problem.

*NOTE: If engine will not start and run after several attempts, refer to “Maintenance” section in this book and bleed any air that may be present in the fuel system.*

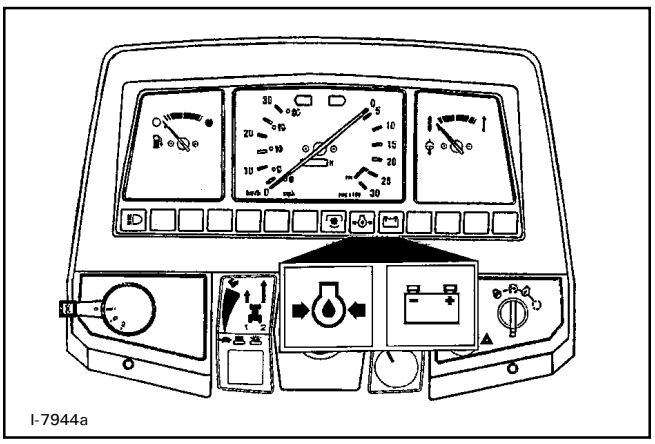



**FIG. 76**

## Restarting Warm Engine

When restarting an engine that is still warm from previous use, the same procedure is used as with "Normal Starting" except step no. 6 may be omitted. Use of glow plugs is not necessary when starting a warm engine.

## Cold Weather Starting

Procedure for starting an engine in colder ambient temperatures is identical to "Normal Starting" procedure except for the following:

- Longer use of glow plugs may be required. Instead of the normal 5-10 seconds, main switch may need to be selected to "glow" for 10-20 seconds to adequately warm engine combustion chambers.
- At temperatures below 39° F (4° C) use of No. 1 (No. 1-D) diesel fuel is recommended due to possible "fuel gelling" characteristics of No. 2 (No. 2D) fuel at cold ambient temperature.
- The central hydraulic reservoir, which provides supply of hydraulic fluid in addition to transmission and center housing lubrication, will require additional warm-up time due to colder (thicker) oil. Refer to "Warm Up Period" at right.
- Test all controls (steering, braking, etc.) prior to operating unit.

*NOTE: Installation of accessory engine block heater is recommended in cold weather conditions. Consult your Dealer.*

*IMPORTANT: Under no circumstances should ether or other starting fluid be used to start engines equipped with glow plugs. Severe engine damage will result should starting fluid contact a hot glow plug.*

*If, for some reason, a booster battery is required to start Tractor, ensure booster battery is connected in parallel. When using booster battery and booster cables always connect positive (+) terminals together first. Then install booster cable on booster battery negative (-) terminal and ground final booster cable end on Tractor away from Tractor battery.*

## Warm Up Period

After starting a cold engine, let engine idle at slow speed to make sure all engine components are lubricated.

In colder ambient temperatures, extended warm-up will be required to also warm hydraulic fluid and lubricate driveline components.

Suggested warm-up period:

| Ambient Temp. | | Warm-Up Time |
|---|---|---|
| F° | C° | |
| 32° & Up | 0° & Up | 5 to 10 minutes |
| 32° to 24° | 0° to –10° | 10 to 20 minutes |
| 24° to –20° | 0° to –20° | 20 to 30 minutes |
| -20° & less | -20° & less | 30 or more |

*IMPORTANT: Improper warm-up can result in severe engine damage, hydraulic pump seizure, driveline bearing/gear damage and/or sluggish steering/braking*

**CAUTION: Make sure parking brake is securely applied and all controls are in neutral while warming unit. Do not leave unit unattended.**

*IMPORTANT: Models with "power shuttle" - In colder ambient temperatures, more time may be required to accomplish forward/reverse direction changes. This is normal. There is nothing wrong with Tractor. The power shuttle will function properly as oil warms. Be sure to warm up the Tractor sufficiently.*

## Operator Observations

Constant attention should be paid to the following points during operation:

- Engine oil pressure lamp will come on in case of low engine oil pressure. Stop engine immediately.
- Battery charge lamp will come on if battery is not being charged properly. Stop engine and investigate cause.
- Coolant temperature gauge needle will indicate H (hot) in case of overheated engine. Stop engine, allow to cool and investigate cause.
- Fuel gauge should not be allowed to E (empty) as running out of fuel may result with need to bleed air from fuel system.



**CAUTION: DO NOT attempt to service Tractor with engine running or hot. Allow to cool.**

*NOTE: Refer to "Troubleshooting" when defect is indicated, to assist locating problem.*

## Starting Circuit Operation

Tractor is equipped with a starting system to protect the operator. To permit tractor to be started (start motor to operate), ALL the following is required:

- Main Gear Shift Lever in Neutral
- Rear PTO Switch in Off position.



**WARNING: Neutral switch system is installed for your protection. DO NOT bypass or modify the neutral start switch system. If the neutral start switch system does not operate properly as detailed above, contact your Dealer immediately and have the system repaired.**

Periodically check that the starting circuit is functioning correctly. The procedure for this is check is as follows:

1. Check that there are no bystanders around the tractor should it inadvertently start.
2. Depress clutch and brake pedals. Attempt to start the tractor with the gear shift levers and PTO control switch OFF. The tractor should start.
3. Depress the clutch and brake pedals. Attempt to start the Tractor with the gears engaged and the PTO switch ON. The Tractor should NOT start.
4. Depress the clutch and brake pedals. Attempt to start the tractor with the gears in neutral and the PTO switch ON. The Tractor should NOT start.

If starting system is not working correctly it must be repaired immediately by your Dealer.

## GROUND SPEED SELECTION

### Standard and Power Shuttle

Tractor is equipped to provide sixteen forward gear speeds and sixteen reverse gear speeds.

**FIG. 77:** Gear shift lever, 1, provides four gear selections. These gear selections are compounded by range shift lever, 2. The range shift lever provides four major changes in ground speed. Gear shift lever provides smaller ground speed changes.

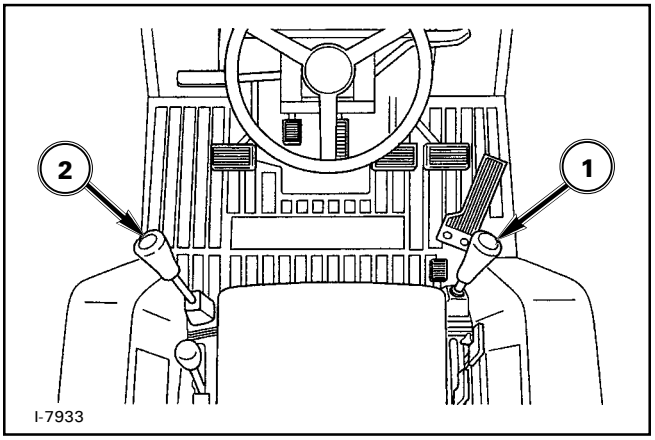



**FIG. 77**

**FIG. 78:** Forward/reverse shuttle lever, 3, provides synchronized changes in travel direction in each gear/range combination. Reverse travel speed is slightly slower than forward travel in the same gear speed selection.

**CAUTION: Reduce engine speed before changing travel direction. Tractors with manual "shuttle" require complete disengagement of main clutch (depressed clutch pedal) before changing shuttle lever position.**

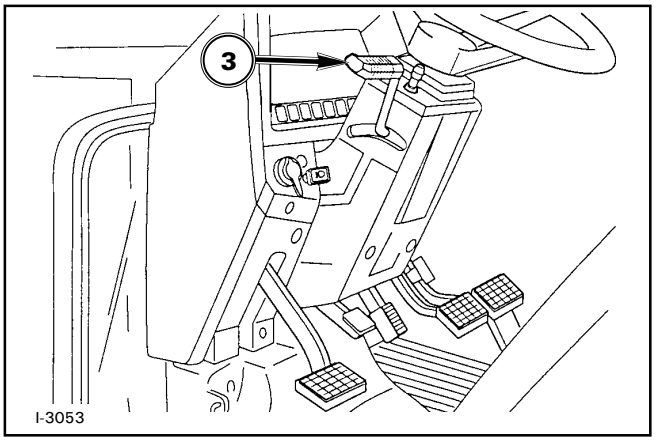



**FIG. 78**

**FIG. 79:** Depress clutch pedal and position shift levers in desired positions. Depress brake pedals to release parking brake lock and then slowly release clutch pedal.

Should another transmission gear be desired:

- **Synchronized Gears -** Shifting into or changing any gear position can be made with Tractor moving provided clutch pedal is depressed
- **Range Changes -** Depress clutch and brake pedals stopping the Tractor. Select desired range lever position and continue with operation.

*IMPORTANT: Depress clutch and stop Tractor before all range lever shifts.*

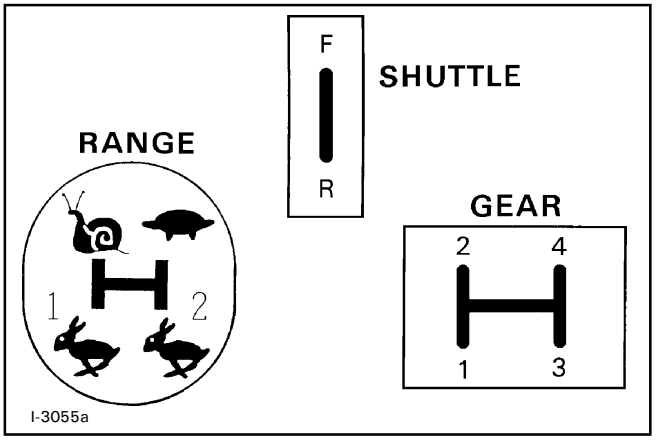



**FIG. 79**

**FIG. 80:** Arrangement of gears with appropriate ground speeds, in order from slow to fast, are shown in chart at right.

*NOTE: Ground speed indicated at 2500 engine rpm with 13.6-28 agricultural type rear tires and 475/65D-20 turf rear tires. Ground speed with R-4 (industrial tread) tires will vary slightly.*

| SHIFT POSITIONS | | MF1445 MANUAL SHUTTLE | | | | MF1445 POWER SHUTTLE | | | |
|---|---|---|---|---|---|---|---|---|---|
| Range | Gear | MPH | *KPH* | MPH | *KPH* | MPH | *KPH* | MPH | *KPH* |
| Tire | | Agri | | *Turf* | | Agri | | *Turf* | |
| | | Forward | | | | | | | |
| | 1 | 0.43 | *0.69* | 0.37 | *0.59* | 0.44 | *0.70* | 0.37 | *0.60* |
| | 2 | 0.53 | *0.85* | 0.45 | *0.73* | 0.53 | *0.86* | 0.46 | *0.74* |
| | 3 | 0.60 | *0.97* | 0.52 | *0.83* | 0.61 | *0.98* | 0.52 | *0.84* |
| | 4 | 0.85 | *1.36* | 0.73 | *1.17* | 0.86 | *1.38* | 0.74 | *1.19* |
| | 1 | 1.29 | *2.07* | 1.11 | *1.78* | 1.31 | *2.10* | 1.12 | *1.81* |
| | 2 | 1.58 | *2.55* | 1.36 | *2.19* | 1.60 | *2.58* | 1.38 | *2.22* |
| | 3 | 1.81 | *2.92* | 1.56 | *2.51* | 1.84 | *2.96* | 1.58 | *2.55* |
| | 4 | 2.55 | *4.11* | 2.20 | *3.54* | 2.59 | *4.17* | 2.22 | *3.58* |
| 1 | 1 | 3.54 | *5.69* | 3.04 | *4.89* | 3.58 | *5.76* | 3.08 | *4.95* |
| | 2 | 4.35 | *7.00* | 3.74 | *6.01* | 4.41 | *7.09* | 3.78 | *6.09* |
| | 3 | 4.98 | *8.02* | 4.28 | *6.89* | 5.05 | *8.12* | 4.34 | *6.98* |
| | 4 | 7.01 | *11.28* | 6.02 | *9.69* | 7.10 | *11.42* | 6.10 | *9.82* |
| 2 | 1 | 9.04 | *14.55* | 7.78 | *12.51* | 9.16 | *14.74* | 7.87 | *12.67* |
| | 2 | 11.12 | *17.90* | 9.56 | *15.39* | 11.27 | *18.13* | 9.69 | *15.59* |
| | 3 | 13.99 | *22.51* | 10.96 | *17.63* | 12.91 | *20.78* | 11.10 | *17.86* |
| | 4 | 17.94 | *28.86* | 15.41 | *24.80* | 18.17 | *29.23* | 15.61 | *25.12* |
| | | Reverse | | | | | | | |
| | 1 | 0.39 | *0.63* | 0.34 | *0.54* | 0.41 | *0.66* | 0.35 | *0.56* |
| | 2 | 0.48 | *0.77* | 0.41 | *0.66* | 0.50 | *0.81* | 0.44 | *0.70* |
| | 3 | 0.55 | *0.88* | 0.47 | *0.76* | 0.58 | *0.93* | 0.50 | *0.80* |
| | 4 | 0.77 | *1.24* | 0.67 | *1.07* | 0.81 | *1.30* | 0.70 | *1.12* |
| | 1 | 1.18 | *1.90* | 1.01 | *1.63* | 1.24 | *1.99* | 1.06 | *1.71* |
| | 2 | 1.45 | *2.33* | 1.24 | *2.00* | 1.52 | *2.44* | 1.31 | *2.10* |
| | 3 | 1.66 | *2.67* | 1.43 | *2.30* | 1.74 | *2.80* | 1.50 | *2.41* |
| | 4 | 2.34 | *3.76* | 2.01 | *3.23* | 2.45 | *3.94* | 2.10 | *3.38* |
| 1 | 1 | 3.23 | *5.20* | 2.78 | *4.47* | 3.38 | *5.44* | 2.91 | *4.68* |
| | 2 | 3.97 | *6.39* | 3.42 | *5.50* | 4.16 | *6.70* | 3.58 | *5.76* |
| | 3 | 4.56 | *7.33* | 3.92 | *6.30* | 4.77 | *7.67* | 4.10 | *6.60* |
| | 4 | 6.41 | *10.31* | 5.51 | *8.86* | 6.71 | *10.80* | 5.77 | *9.28* |
| 2 | 1 | 8.27 | *13.30* | 7.10 | *11.43* | 8.66 | *13.93* | 7.44 | *11.97* |
| | 2 | 10.17 | *16.36* | 8.74 | *14.06* | 10.65 | *17.14* | 9.15 | *14.73* |
| | 3 | 11.65 | *18.75* | 10.01 | *16.11* | 12.21 | *19.64* | 10.49 | *16.88* |
| | 4 | 16.39 | *26.37* | 14.09 | *22.67* | 17.17 | *27.63* | 14.76 | *23.75* |

I-5004d

**FIG. 80**

## Power Shuttle Operation

**FIG. 81:** Tractors with power shuttle transmission utilize hydraulic clutch system to permit direction changes without using the main clutch pedal. When conditions permit, this feature is useful when operating at slow speeds with mounted implements or loader.

**WARNING: Do NOT use power shuttle to begin travel at high engine speed, on a hillside or with towed implement. Use main clutch pedal to control tractor.**

Always observe the following instructions when using the power shuttle:

- **When beginning travel -** Depress the clutch pedal and select desired range/gear lever positions and adjust engine speed to below 1500 rpm. Engage main clutch by releasing the pedal and then begin travel in the desired direction using the power shuttle lever.
- **When changing forward/reverse travel direction -** Reduce tractor travel speed to below 5 mph (8 kph), or 3.5 mph (5.6 kph) when using a loader, and then slowly move power shuttle lever to alternate position.

**WARNING: High speed and/or rapid movement of power shuttle lever will cause abrupt change of direction, jerky operation and possible damage. Use the clutch pedal to begin and stop tractor travel or to change directions, if necessary.**

- **When parking the unit -** Always select gear and range shift levers to neutral, move power shuttle lever to the lowered, center neutral position and apply the parking brake.

*NOTE: Power shuttle lever will lower and be retained in the center neutral position. To select travel, it is necessary to raise lever and then move to desired position.*

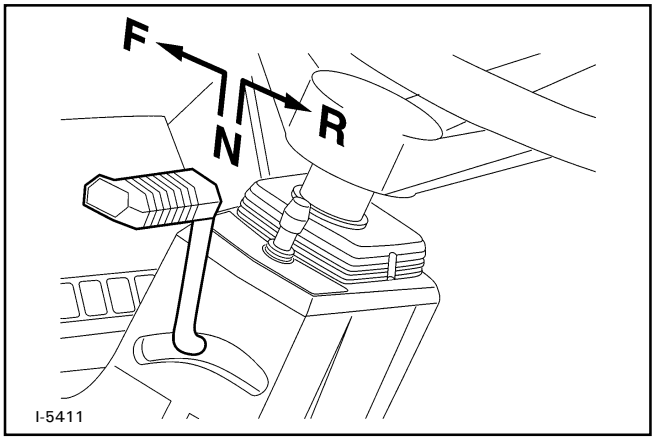



**FIG. 81**

## Hydrostatic Transmission

**FIG. 82:** The hydrostatic transmission provides variable speed control in forward or reverse.

**Range shift lever**, 1, provides two major changes in ground speed.

**Range change button**, 2, provides two additional ranges that can be shifted on the go. The combination of the two then gives a total of four ranges for operation.

*IMPORTANT: STOP tractor whenever shifting the range shift lever 1, the range change button, 2, can be shifted with the tractor in motion.*

**Hydrostatic control pedal**, 3, controls forward travel speed. As pedal is progressively pushed down, a corresponding increase in ground speed will be noticed. When released, pedal will return to neutral position or position selected by cruise control lever.

Reverse travel speed is obtained by pushing the rearward portion of the pedal downward. As pedal is progressively pushed down, a corresponding increase in ground speed will be noticed. When released, pedal will return to neutral position.

*IMPORTANT: For optimum operation, keep engine speed above 1500 rpm whenever operating the Hydrostatic control pedal.*

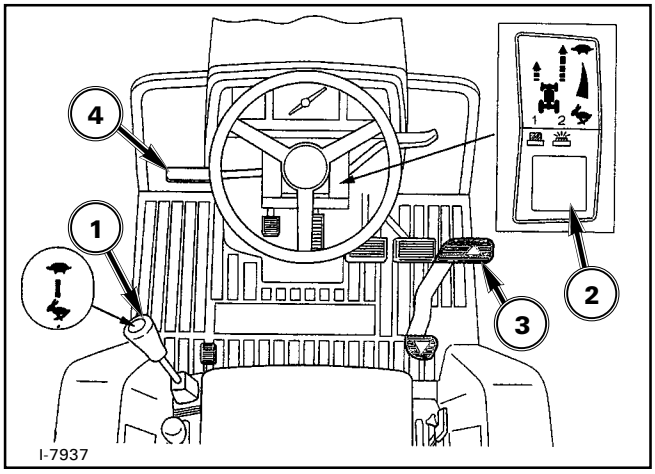



**FIG. 82**

**FIG. 83: Setting cruise control, cruise control lever,** 4. To set the cruise control depress the hydrostatic control pedal, 3, forward until the desired speed is achieved. Move the cruise control lever, 4, forward until resistance is felt, this is the same setting as the location of the foot operated control pedal. Release the hydrostatic control pedal, 3, tractor will continue to move at the preset position.

**To slow down**, move the cruise control lever, 4, rearward. Then to increase speed depress the hydrostatic control pedal, 3, down to the desired speed and move the cruise control lever to hold the speed as described above.

**WARNING: Cruise control should only be used in open spaces, without obstacles, with unobstructed view or traveling on road. You must also be thoroughly familiar with releasing cruise control.**

*NOTE: Do not move cruise control lever without first moving the hydrostatic control pedal downward in the forward position, to prevent mechanical failures. Cruise control is NOT available in reverse direction.*

**Releasing cruise control, cruise control is released** by moving the cruise control lever, 4, to the rear position.

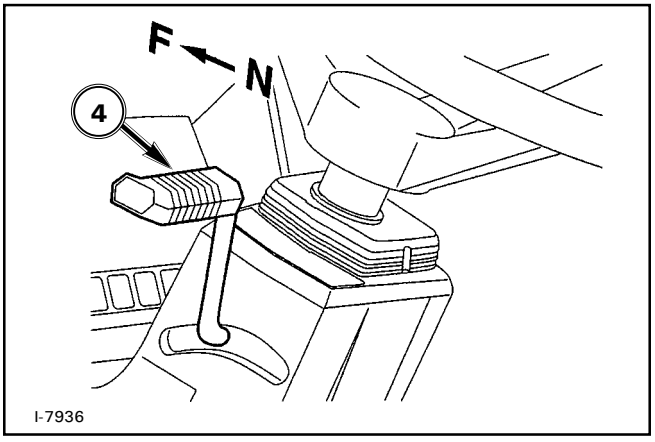



**FIG. 83**

**FIG. 84:** Arrangement of gears with appropriate ground speeds, in order from slow to fast, are shown in the chart at right.

*NOTE: Ground speed indicated at 2500 engine rpm with 13.6-28 agriculture type rear tires and with 475/65D-20 turf rear tires. Ground speed with R-4 (industrial tread) tires will vary slightly.*

| SHIFT POSITIONS | | MF 1445 HST | | | |
|---|---|---|---|---|---|
| Range | HST Motor | MPH | KPH | MPH | KPH |
| Tire | | Agri | | Turf | |
| | | Forward | | | |
| | 1(on) | 2.60 | 4.19 | 2.24 | 3.60 |
| | 2 (off) | 4.40 | 7.08 | 3.78 | 6.08 |
| | 1 (on) | 9.48 | 15.25 | 8.14 | 13.10 |
| | 2 (off) | 16.01 | 25.77 | 13.76 | 22.15 |
| | | Reverse | | | |
| | 1 (on) | 2.08 | 3.35 | 1.79 | 2.88 |
| | 2 (off) | 3.52 | 5.66 | 3.03 | 4.87 |
| | 1 (off) | 7.58 | 12.20 | 6.51 | 10.48 |
| | 2 (off) | 12.81 | 20.61 | 11.01 | 17.72 |

**FIG. 84**

## STOPPING TRACTOR

**FIG. 85:** Brake pedals, 1 and 2, may be used independently to operate respective brake and assist turning at low speed operation. Unlatch brake pedals and use as required to assist turning.

When Tractor is being used at higher rate of speed, brake pedals must be latched together with interlocking plate, 3, so both brakes will apply at the same time.

**CAUTION: Do not use one wheel braking at high speed. Always latch brake pedals together when Tractor is being transported. Make sure brakes are adjusted evenly.**

*NOTE: When stopping or parking tractor be sure brakes are locked. With transmissions of constant mesh design or hydrostatic they have a tendency to creep (particularly with cold oil).*

**CAUTION: Never start traveling with the parking brakes applied, brake performance will be effected as they heat up.**

Reduce engine speed and depress clutch and brake pedals. Position range shift lever and gear shift lever in neutral positions. Latch brake pedals together, depress firmly and press downward on parking brake pedal to lock brake pedals.

Allow engine to idle several minutes to allow even cooling. Then turn main switch to "off" shutting off engine. Lower three-point hitch and remove key from ignition.

**FIG. 86:** If engine fails to stop when main switch is turned off, open right side cover and push inward on end of solenoid boot, 1, until engine stops. Consult your Dealer when manual operation of engine shut-off device is necessary

**CAUTION: Before leaving Tractor unattended, make sure brakes are locked, rear mounted implement is lowered to the ground and key is removed from the ignition.**

**FIG. 87:** Always park Tractor on level area whenever possible. If hillside parking is necessary, securely block both rear wheels as shown.

*NOTE: When stopping or parking Tractor, be sure brakes are locked. With transmission of constant mesh design, Tractor may have a tendency to creep (particularly with cold oil).*

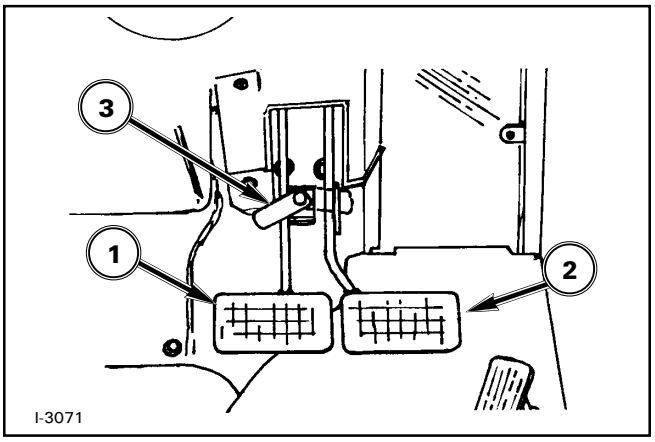



**FIG. 85**

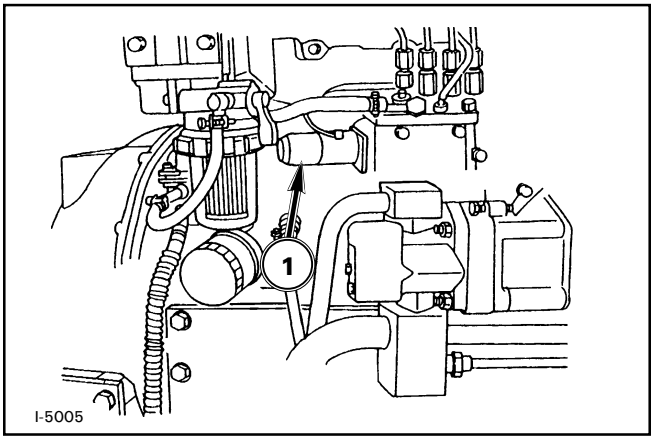



**FIG. 86**

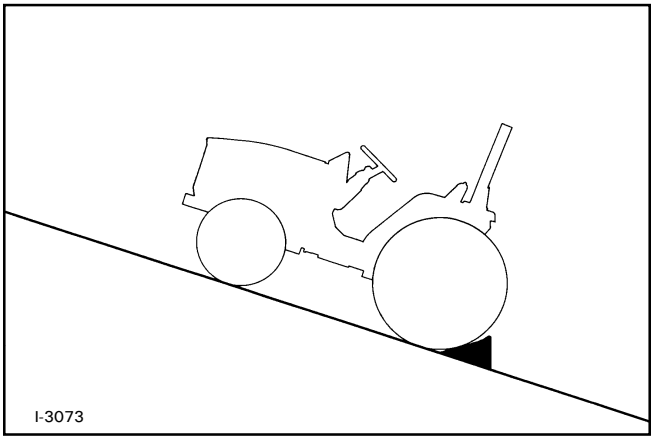



**FIG. 87**

## DIFFERENTIAL LOCK

**FIGS. 88 & 89:** Differential lock pedal, 1, should only be depressed when required as steering ability is greatly reduced.

To engage differential lock, depress clutch pedal and allow all rear wheel movement to stop. Depress lock pedal and slowly engage the clutch.

To disengage differential lock, depress clutch pedal and release differential lock pedal. Lock pedal should normally return to the "off" position.

*NOTE: On occasion, differential lock pedal may remain engaged due to torque difference exerted by rear wheels. In this case, tap brake pedals alternatively while Tractor is slowly in motion to release the pedal.*

*Fig. 88 illustrates differential lock on standard and power shuttle models, fig. 89 illustrates hydrostatic model.*

**CAUTION: DO NOT use differential lock on hard surfaces or when transporting unit. DO NOT, engage with rear wheel(s) spinning as severe damage may result.**

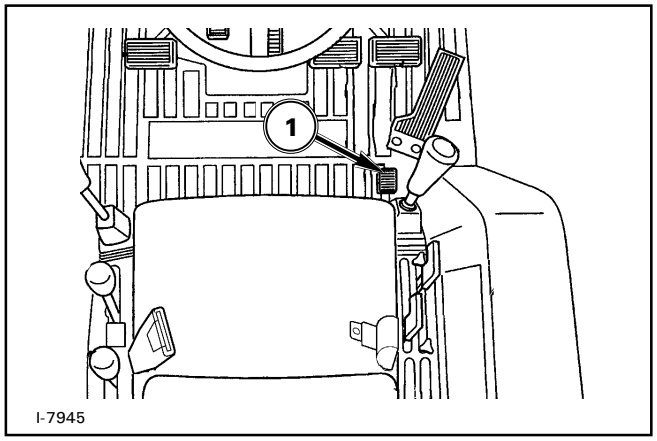



**FIG. 88**

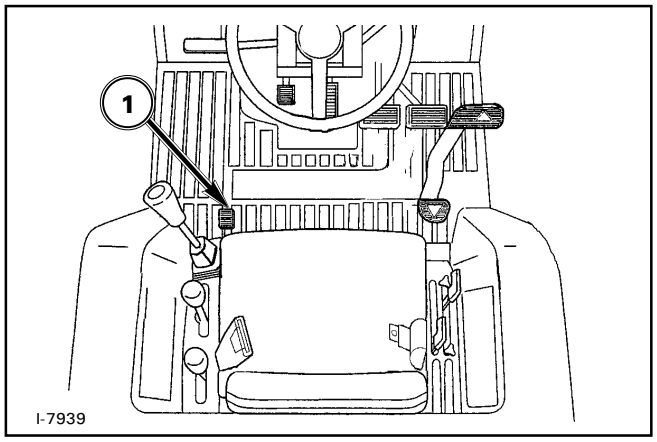



**FIG. 89**

## FOUR-WHEEL DRIVE

**FIG. 90:** Four-wheel drive models have a mechanically driven front axle. Engagement and disengagement of front drive axle is controlled by lever, 1, on left side of Tractor.

*IMPORTANT: Prior to engaging or disengaging 4WD, clutch pedal must be depressed and Tractor stopped.*

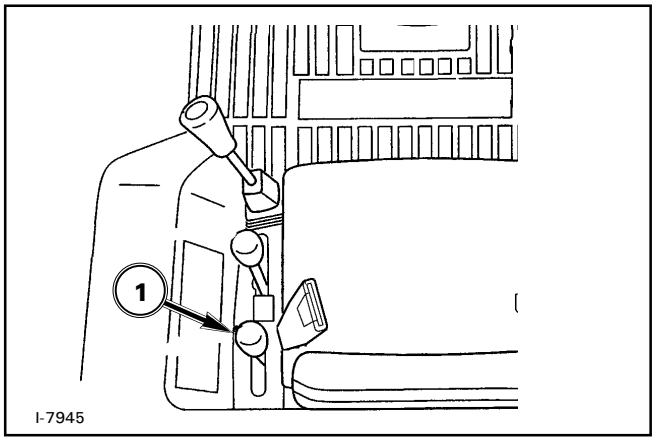



**FIG. 90**

**FIG. 91:** When front axle is engaged, ground speed of front tires will vary from ground speed of rear tires. This is to assist steering when four-wheel drive is selected.

For this reason, front axle must be disengaged when Tractor is transported or operated on a hard, dry surface. Failure to do so will result in rapid wear of front drive tires and possible driveline damage.

*IMPORTANT: Always disengage front drive axle when operating in conditions with minimal wheel slippage (DRY OR HARD SURFACES).*

*If tire replacement is necessary, identical replacements must be installed to maintain correct front/rear axle ratio.*

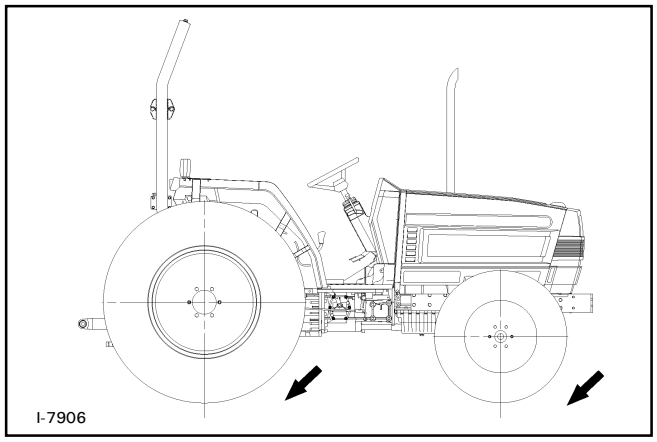



**FIG. 91**

## POWER TAKEOFF (PTO)

**WARNING: PTO shafts and PTO driven implements can be extremely dangerous. Observe the following important points:**

**DO NOT operate tractor without a PTO cap installed. The cap protects people from injury as well as the splines from damage.**

**Before attaching, adjusting or working on PTO driven implements, disengage the PTO, stop the engine and remove the key. DO NOT work under raised equipment.**

**Before engaging a PTO-driven implement, ALWAYS carefully raise and lower the implement using Position Control. check clearances, PTO shaft sliding range and articulation.**

**Ensure that all PTO safety shields are in place at all times.**

**Ensure all PTO-driven implements are in good condition and conform to current standards.**

**NEVER step across any driveline.**

**DO NOT use the tractor drawbar or the implement drawbar as a step.**

**NEVER use the driveline as a step.**

**NEVER wear loose fitting clothes.**

**Keep at least your height away from a rotating driveline.**

## Rear PTO Shaft

**FIG. 92:** A six-spline 1 3/8" (35 mm) PTO shaft, 1, is provided at rear of Tractor to provide power for mounted and other PTO driven equipment as required.

A protective cover is positioned over shaft splines when not in use.

Normal rear PTO shaft operating speed of 540 rpm is attained at 2391 engine rpm.

*IMPORTANT: When rear PTO is used with three-point mounted equipment, it may be necessary to remove drawbar, 2, at rear of Tractor. Some types of mounted equipment, when lowered, may allow PTO shaft to contact drawbar.*

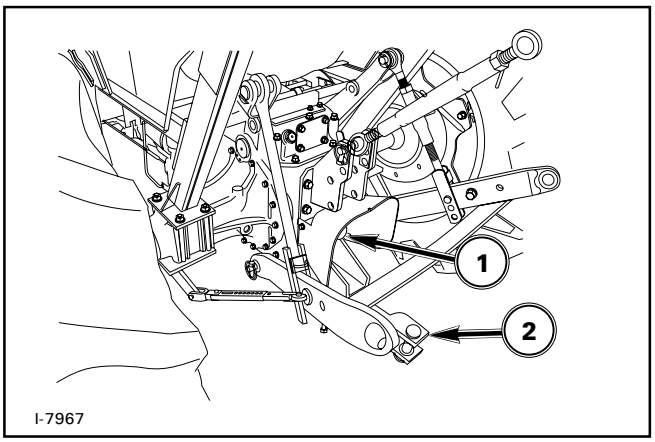



**FIG. 92**

**FIG. 93:** Implement driveshaft shown connected to Tractor rear PTO shaft.

**CAUTION: Make sure all PTO shields are installed on Tractor and equipment. Before cleaning or adjusting Tractor or PTO driven machine, SHUT OFF ENGINE AND DISENGAGE PTO.**

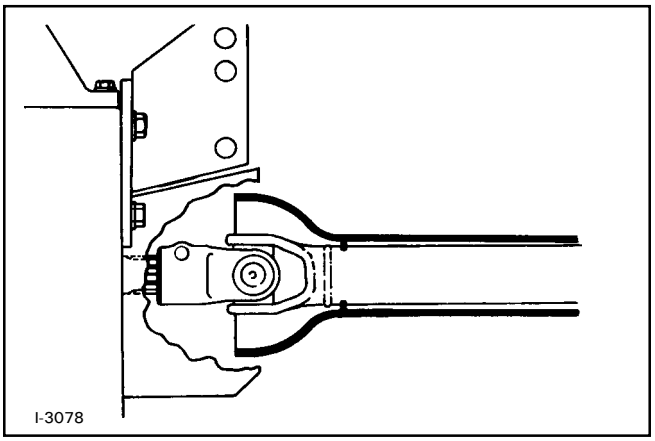



**FIG. 93**

## Mid PTO Shaft (Accessory Hydrostatic Model Only)

**FIG. 94:** Mid PTO, 1, is forward-facing shaft located at underside of Tractor. This accessory can be installed to operate certain mid or front-mounted implements. A 1" (25.4mm) fifteen spline shaft is used.

Mid PTO cover must be installed when use of mid PTO is not required.

2000 rpm @ 2460 engine rpm

**CAUTION: Make sure all PTO shields are installed on Tractor and equipment. Before cleaning or adjusting Tractor or any PTO driven machine, SHUT OFF ENGINE AND DISENGAGE PTO.**

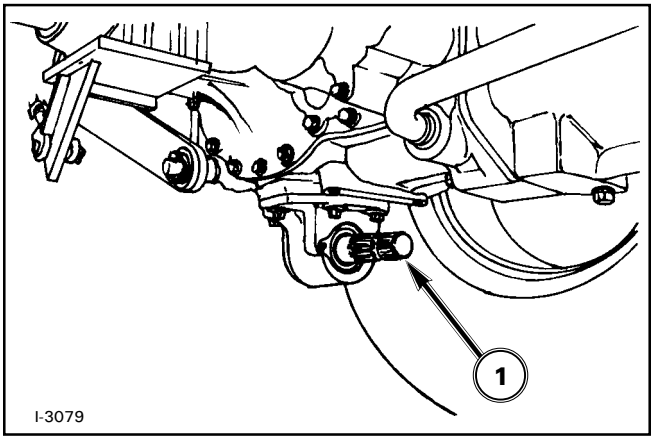



**FIG. 94**

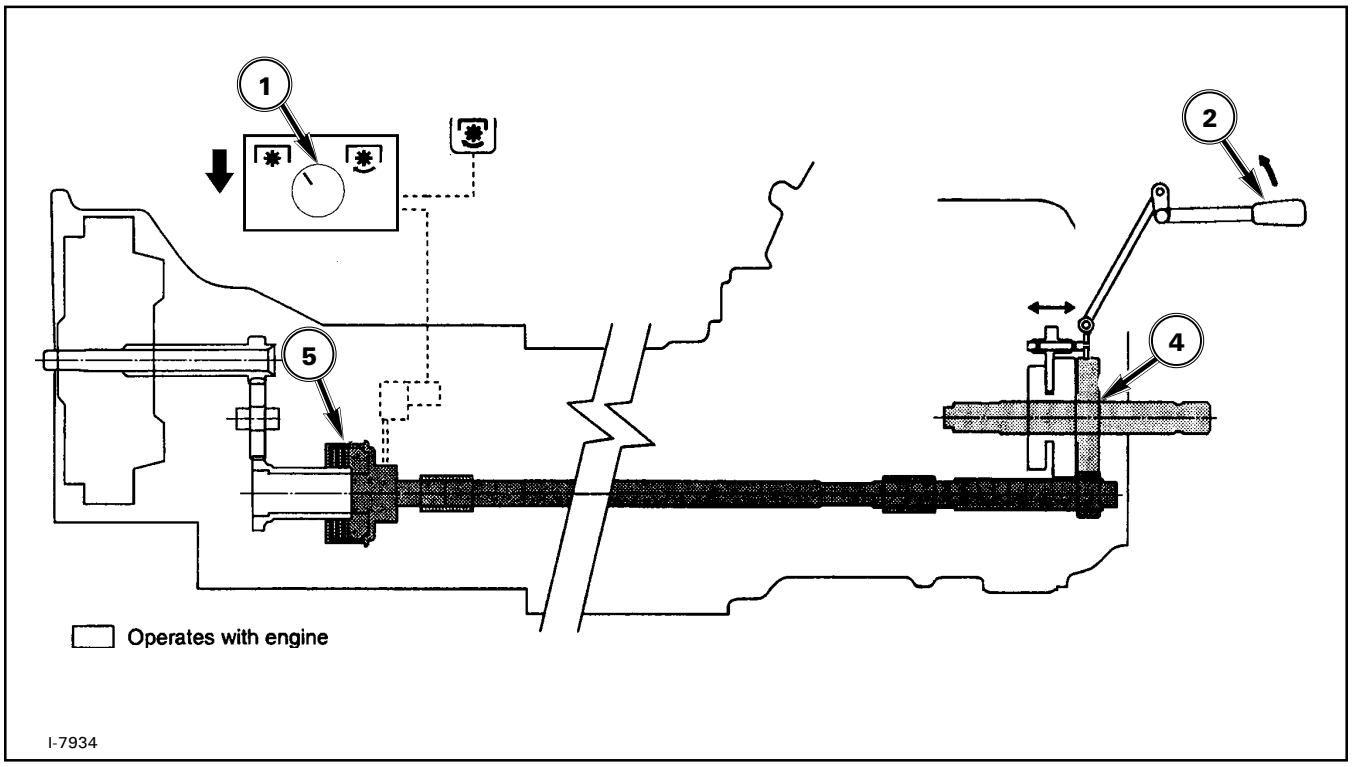



**FIG. 95**

## PTO Operating Controls

**FIGS. 95 & 96:** Rear PTO and accessory mid PTO are both controlled by PTO control switch, 1.

Rear PTO selector lever, 2, is used to select position of rear PTO drive gears inside rear housing.

**To select rear PTO** - Make sure PTO control switch is OFF and then move rear PTO selector lever, 2, forward to "540" position to engage gear set, 4, inside rear housing.

**To engage PTO** - **Push PTO switch**, 1, and then move rotate clockwise to actuate hydraulic clutch, 5, and complete the drive. The indicator light in the warning light strip will come on, showing PTO clutch is engaged.

*NOTE: Push switch knob and then rotate clockwise to prevent switch damage. Do not force PTO switch to ON position.*

**To disengage PTO** - Push PTO control switch, 1, to release hydraulic clutch, 5.

When further use of rear PTO is not required, depress clutch pedal and return rear PTO selector lever, 2, to neutral position.

*NOTE: PTO can be engaged/disengaged by control switch, 1, independently of main clutch. Reduce engine rpm prior to engaging (switching on) and disengaging (switching off) PTO.*

*Always move PTO control switch to OFF before shifting rear PTO selector lever, 2.*

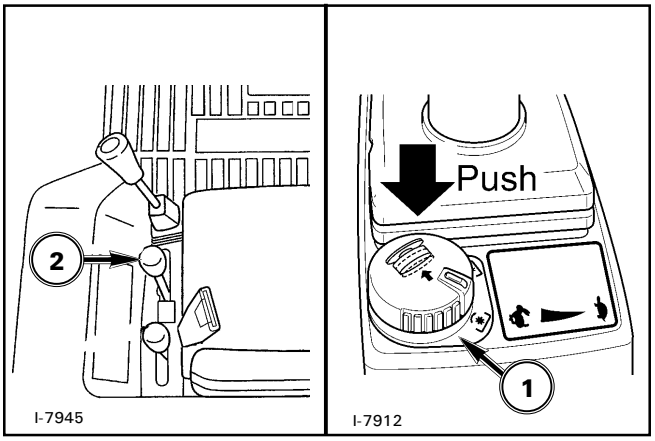



**FIG. 96**

*NOTE: Mid PTO (when installed) will operate whenever PTO control switch, 1, is turned on.*

## THREE-POINT HITCH

Three-point hitch combines Tractor and implement into one working unit. Implement position and raising are controlled hydraulically. In addition, implement weight and loads impose downward pressure at Tractor rear wheels to increase traction.

### Hitch Controls

**FIG. 97:** Control quadrant, to right of operator's seat, controls the system to provide the following hitch control functions:

**Position Control** - Maintains hitch position at constant height in relation to the Tractor. As position control lever, 1, is moved rearward, hitch (and implement) are raised. Moving lever forward will lower hitch to selected position. Each lever setting provides a specific hitch (and implement) position.

**Draft Control** - Regulates hitch height to provide constant draft, or "pull," of ground engaging implements (plows, subsoilers, etc.). Moving draft control lever, 2, forward will provide deeper implement working depth. Moving lever rearward will provide a shallower depth. As ground contours and/or soil conditions change, the system will raise or lower implement as needed to keep even load on Tractor.

**CAUTION: Use position control lever, 1, when attaching or detaching implements. Place draft control lever, 2, fully forward when using position control.**

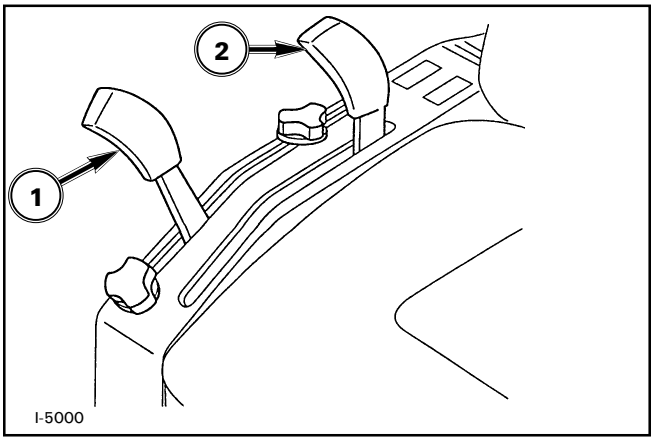



**FIG. 97**

**FIG. 98: Lowering Rate Control -** Knob, 3, controls discharge rate of hydraulic oil to adjust lowering speed of hitch and implement. Turn knob clockwise to slow drop rate, counterclockwise to increase drop rate. Turning knob fully clockwise will lock implement in raised position.

**CAUTION: When working on or around mounted implements, always lower to ground prior to work. If implement must be raised, always block implement and lower links securely.**

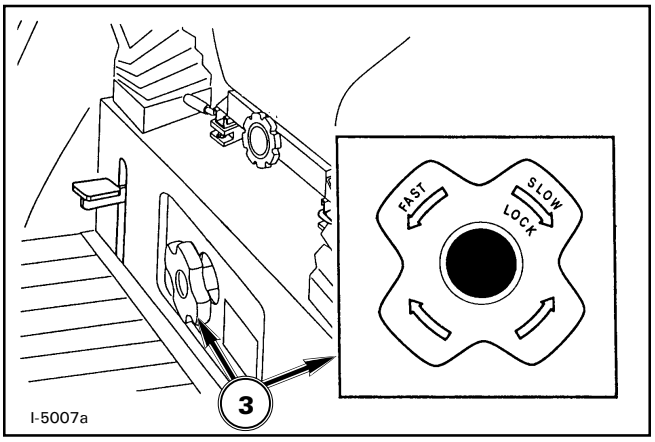



**FIG. 98**

## Rear Linkage

**FIG. 99:** Linkage consists of several major components for implement attachment and operation:

**Lower Links, 1** - Primary attaching points to lower implement pins.

**Lift Rods, 2** - Connect lower links to hydraulic lift arms for raising/lowering of lower links. The lift rod connected to the right lower link has provisions for leveling the implement (side to side).

**Stabilizers, 3** - Reduce side sway of implement.

**Top Link, 4** - Adjustable, turnbuckle type to level implement (front to rear). Top link also provides draft load sensing for draft control.

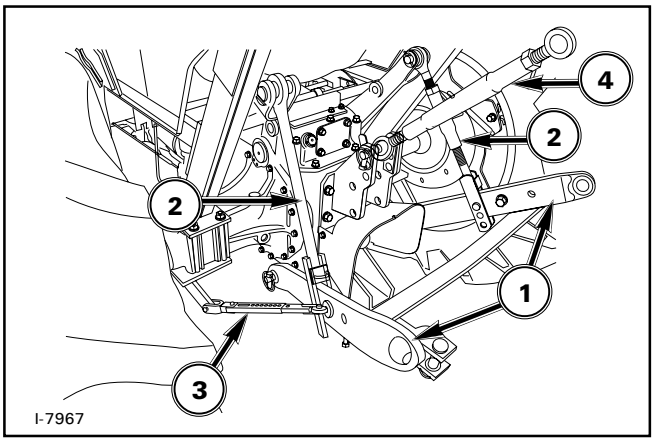



**FIG. 99**

**FIG. 100:** To match varying implements, rear linkage is standardized according to spacing, pin size, etc. This enables usage of alternate implements with minimal adjustments as long as matching size or "Category" is used.

This Tractor is equipped for "Category I" implements with following attaching point dimensions:

| Ref. | Description | Dimension (Size) |
|---|---|---|
| A | Lower Link Width | 26.8" (681 mm) |
| B | Lower Link Pin Diameter | 0.88" (22 mm) |
| C | Top Link Height | 18" (457 mm) |
| D | Top Link Pin Diameter | 0.75" (19 mm) |

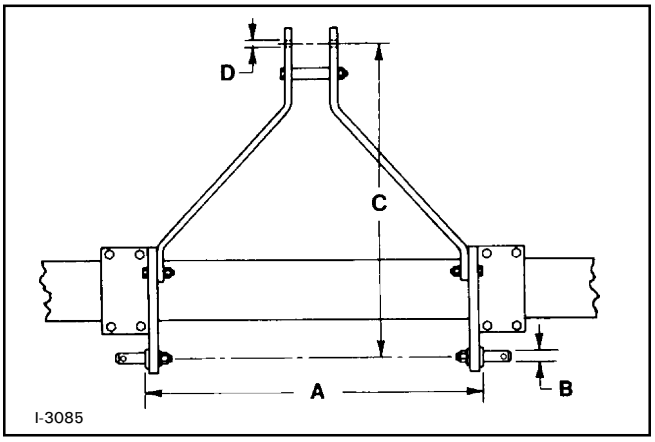



**FIG. 100**

**FIG. 101:** Linkage provides three positions of connecting top link, 1, to Tractor.

For most implements, securing top link, 1, in center hole, B, is satisfactory, but position may be varied to provide increased implement height during transport. These positions are also used to adjust draft sensitivity:

- Use upper hole, A, for implements with low draft, or for more sensitivity.
- Use middle position, B, for average implements.
- Use lower hole, C, for high draft implements, or for less sensitivity.

*NOTE: To operate in draft control, pin, 2, must be installed (as shown) and locking pin must be removed from position, X, and stored at, Y.*

*To operate in position control, locking pin should be removed from position, Y, and installed at position, X.*

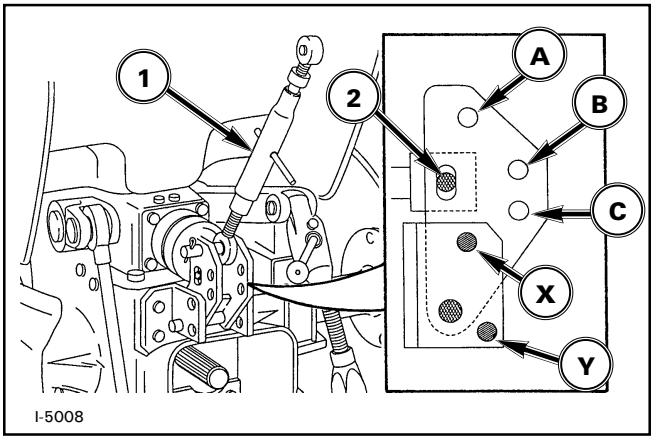



**FIG. 101**

**FIG. 102:** Lift rods, 1, and lower links, 2, also have multiple positions. Normally, lower hole, B, in each lift rod is attached to forward hole, X, in lower link.

Selecting upper hole, A, will provide increased lift height, reduced depth.

Selecting rear hole, Y, will provide increased lift capacity, reduced lift range.

**CAUTION: Secure all pins after adjustment is made. Always use pins supplied with Tractor.**

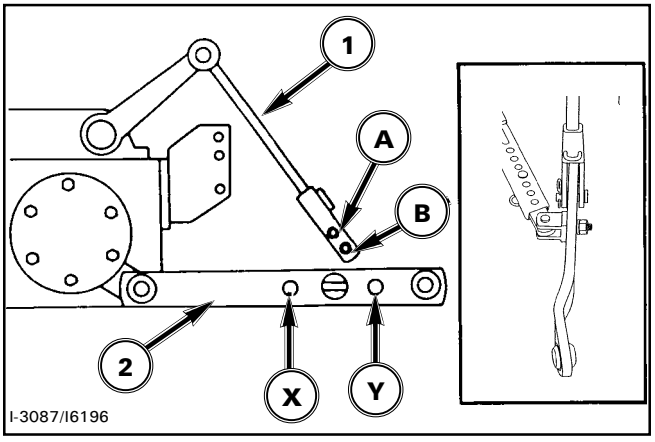



**FIG. 102**

## Attaching Implements

**CAUTION: Always use POSITION CONTROL to attach/detach implements to provide precise control of hitch.**

**FIG. 103:** Back Tractor to implement, centering Tractor with implement hitch frame. Place draft control lever, 2, in fully lowered position as it will not be used.

Raise or lower hitch using position control lever, 1, and align left lower link end with corresponding implement attaching pin.

Lock the brakes, shut off engine and remove key.

**FIG. 104:** Slide ball end of left lower link, 1, over implement pin and secure with linch pin.

Adjust height of right lower link using leveling crank, 2. Attach and secure right lower link, 3, to implement with linch pin.

Attach top link, 4, to top of implement hitch frame using pin supplied with Tractor. Rotate center barrel section of top link, to lengthen or shorten it, and level implement from front to rear.

After the implement is attached, it can be readjusted for level operation using leveling crank and top link. Secure all adjustments.

*IMPORTANT: With some mounted implements, it will be necessary to remove drawbar at rear of Tractor to permit implement to be raised and lowered without obstruction.*

**FIG. 105:** To attach an implement push lever, 1, down, pull out lower link ends, attach to implement. Back up tractor slightly to make sure lower links are pushed in securely.

(A) Push.

(B) Pull out.

**FIG. 106:** Certain implements require minimal side-play. Stabilizer, 1, at each lower link should be evenly adjusted to reduce side-play to desirable level. Do not remove all side-play as lower link damage may result.

*NOTE: The amount of side-play (stabilizer looseness) is dependent upon implement and type of operation. Normally 2 " (50 mm) of total side movement is desired, 1" (25 mm) to each side of Tractor centerline.*

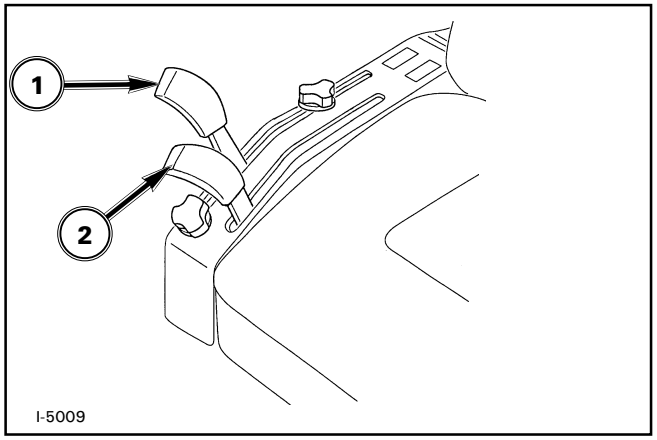



**FIG. 103**

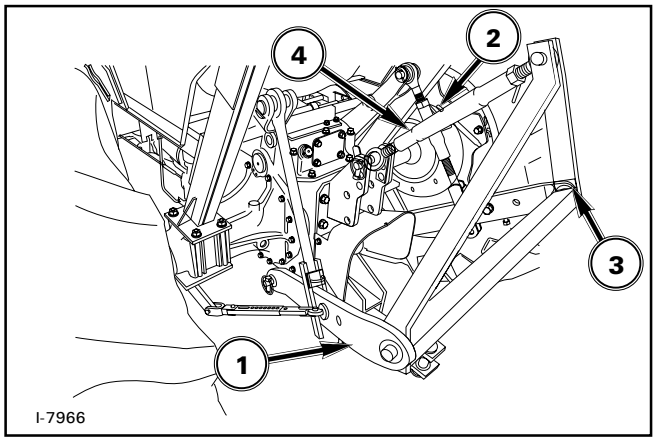



**FIG. 104**

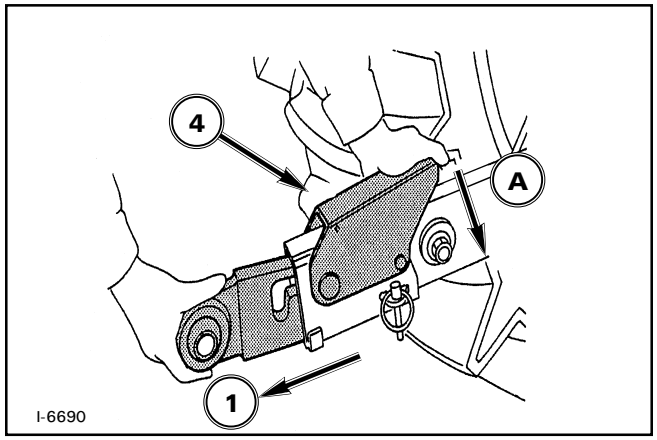



**FIG. 105**

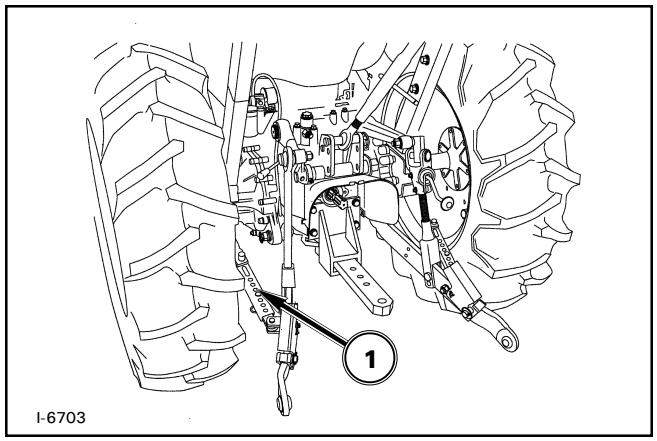



**FIG. 106**

## Using Position Control

**FIG. 107: Type of Work** - Attaching/detaching implements and other operations requiring implement to be kept at constant height above ground. Also used with tool bars having flexible row units and implements equipped with gauge (support) wheels.

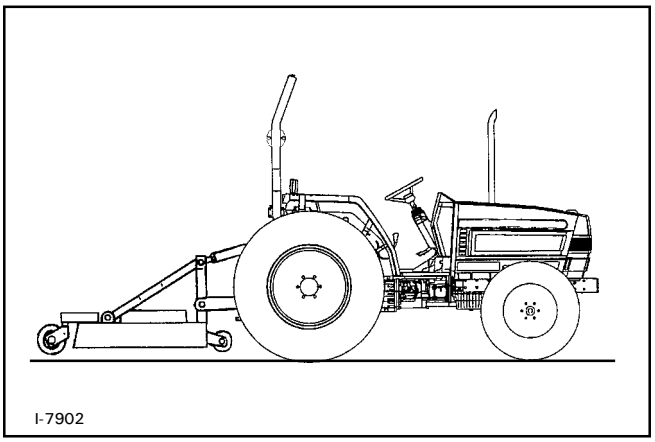



**FIG. 107**

**FIG. 108: Lever Positions** - Move draft control lever, 2, fully down (not used). Use position control lever, 1, to adjust hitch and implement position.

*NOTE: Front lever stop, 3, can be set to contact position control lever in implement work position. This enables implement to be returned to identical position after hitch has been raised for turning, transporting, etc. Rear lever stop, 4, can be set to limit raising height, if required.*

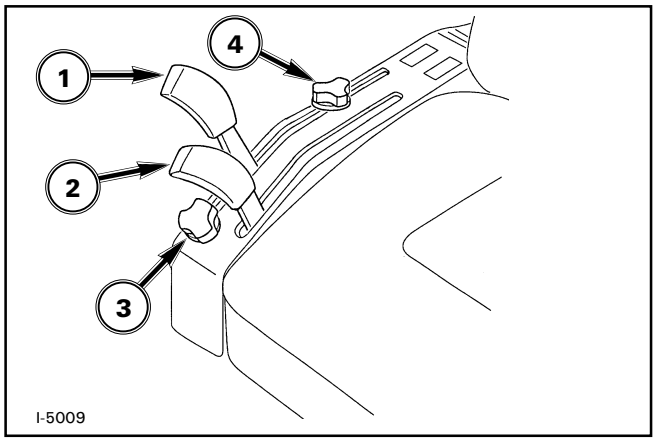



**FIG. 108**

**To Begin Work** - Align Tractor and implement in field and move position control lever, 1, forward (toward DOWN). Adjust implement height using position control lever and set adjustable stops, 3 and 4, as desired.

**When Turning** - Move position lever, 1, rearward (toward UP) to raise implement. Finish turning and return lever against stop to resume operation.

**To Finish Work and Transport** - Move position control lever, 1, fully rearward in quadrant.

**FIG. 109:** Lowering speed can be readjusted as necessary using lowering rate control knob, 5.

**CAUTION: When using mounted implements with PTO driveline, make sure:**

**PTO drive shaft has minimum 2" (51 mm) engagement of telescoping sections, at all hitch/implement positions.**

**Hitch height during raising does not bind drive shaft universal joints due to extreme drive shaft angles. Limiting raising height may be required.**

**PTO drive is disengaged during transport.**

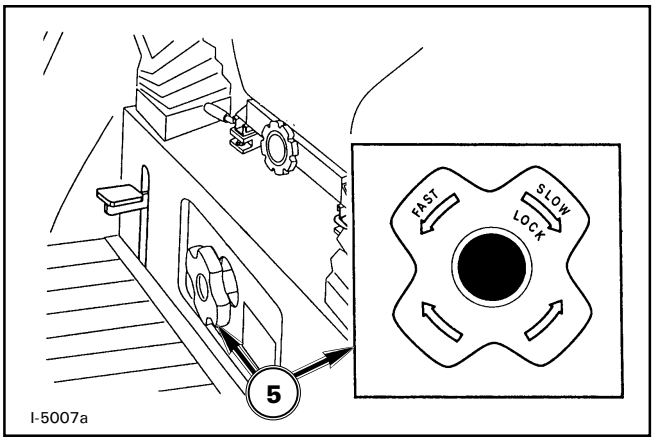



**FIG. 109**

## Using Draft Control

**FIG. 110: Type of Work** - When ground-engaging implements such as plows, subsoilers, cultivators, etc. are used.

*NOTE: Refer to "Rear Linkage" (fig. 90) for locking pin details.*

**CAUTION: Do not use draft control when precise hitch positioning is required (attaching/detaching implements for example). Using draft control on non ground-engaging implements should not be attempted.**

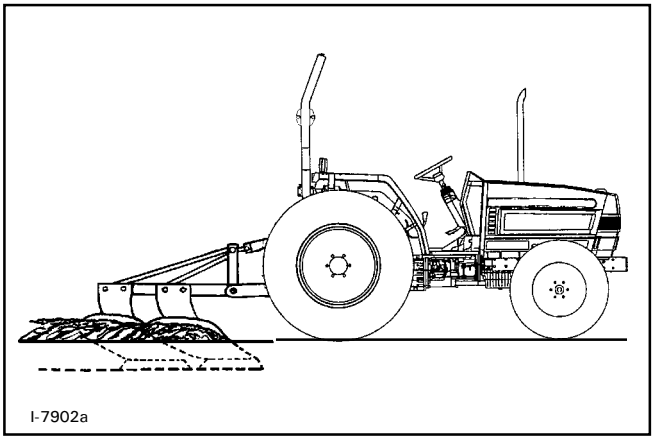



**FIG. 110**

**FIG. 111: Lever Positions** - Use position control lever, 1, to raise and lower implement and use draft control lever, 2, to adjust implement working depth and system sensitivity in soil.

Position control lever, 1, can also be used to prevent excessive lowering of hitch when low draft areas (sandy soil) are encountered.

*NOTE: Adjustable lever stops, 3 and 4, can be set to contact position control lever in implement work or raised positions. This enables implement to be returned to identical setting after hitch has been raised for turning at field ends.*

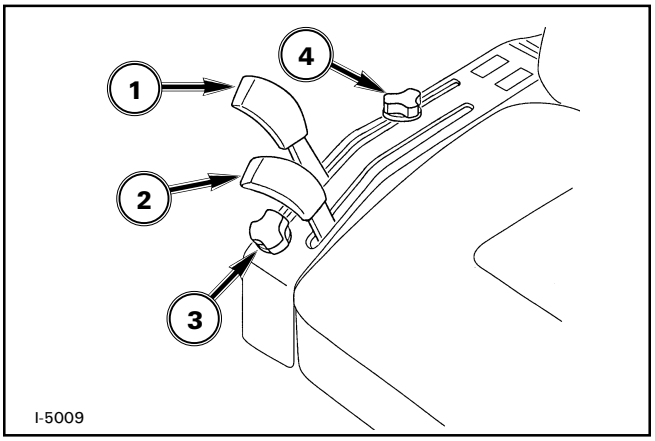



**FIG. 111**

**To Begin Work** - Align Tractor and implement in field and move position control lever, 1, forward (to DOWN) while driving Tractor forward, lowering implement. Then adjust draft control lever, 2, until correct working depth is maintained.

**When Turning** - Move position control lever, 1, rearward to raise implement and permit completion of turn. Return implement to work position by selecting position control lever to previous position against stop.

**To Finish Work and Transport** - Pull position control lever rearward fully to up setting.

**FIG. 112:** Lowering speed can be readjusted as necessary with lowering rate control knob, 5.

*NOTE: Changes in soil texture or ground speed of unit may require slight readjustment of draft control lever to maintain consistent working depth as these can have a direct influence on implement draft load.*

*If erratic operation is encountered, turn lowering rate control knob, 5, clockwise to slow. Lowering top link attaching location on Tractor will also decrease sensitivity.*

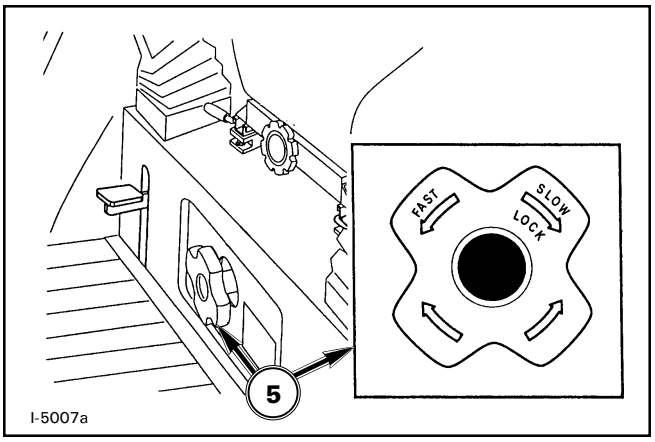



**FIG. 112**

## Detaching Implements

**CAUTION: Always use POSITION CONTROL to attach/detach implements to provide precise control of hitch.**

Select a level area to detach and store the implement. Lower implement to ground by moving position control lever to DOWN. If necessary, adjust leveling crank on right lift link to level implement on ground.

Shut off engine, securely lock brakes and remove key from Tractor.

Disconnect implement PTO drive shaft (as applicable). Detach top link from implement and place in storage position on Tractor by engaging spring on top link in slot in rear center panel.

*NOTE: Lengthening or shortening of top link may be required to permit disconnection from implement.*

**FIG. 113:** Disconnect lower links from implement pins. Make sure stablizer pins, 1, are reinstalled, to prevent tire interference.

Take position in operator's seat, start engine and drive Tractor clear of implement.

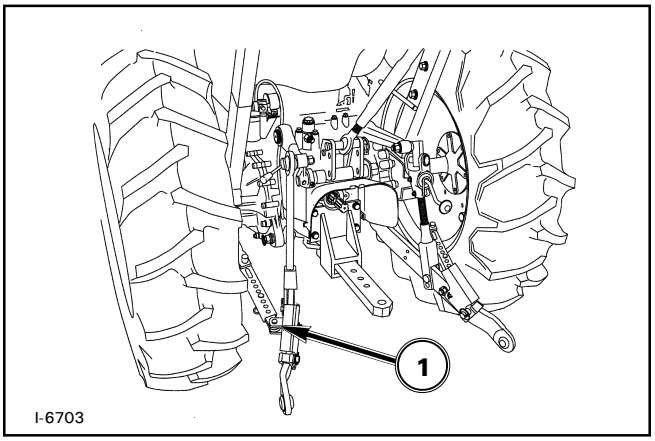



**FIG. 113**

## EXTERNAL AUXILIARY HYDRAULICS (ACCESSORY)

Auxiliary hydraulics can be Dealer installed to operate implements requiring external hydraulic source for operation. Kits are available as single-spool (one auxiliary circuit) or two-spool (two hydraulic circuits).

**FIG. 114:** Control lever, 1, controls implement raising/lowering when first set of remote couplers are used. Control lever, 2, controls implement when second set of remote couplers are used (two-spool kit only).

Control lever(s) are spring-loaded to center neutral position, from normal raise or lower positions.

**FIG. 115:** Remote couplers are located at rear of Tractor, above three-point hitch. Rear location shown.

Coupler set, 1, corresponds with control lever, 1 (Fig. 115), coupler set, 2, with control lever, 2 (Fig. 115).

Implement hoses must be connected to each coupler set so when respective control lever is pulled rearward, implement raises and, when pushed forward, implement lowers. Male coupler tips (on implement hoses) must be compatible with Tractor couplers and must also be inserted fully and locked into Tractor couplers to operate correctly.

**CAUTION: Always lower implement to ground, shut off engine and relieve system pressure (by operating control levers with engine off) before connecting or disconnecting implement hoses.**

**CAUTION: Make sure all hydraulic hoses, couplers and cylinders are in good condition before use. Damaged equipment can be hazardous to use.**

**FIG. 116:** Most implements require, double-acting hydraulics. Each implement cylinder will have two hoses connected to it.

When single-acting service is required (cylinder with only one hose), the upper "A" coupler will be used and selector function, must be turned to the left.

*NOTE: For normal double-acting operation selector function must be turned to the right.*

An optional joystick control (single lever operating two spools) is available to control the two spool auxiliary control valve and provides two double-acting hydraulic circuits with rear mounted couplers.

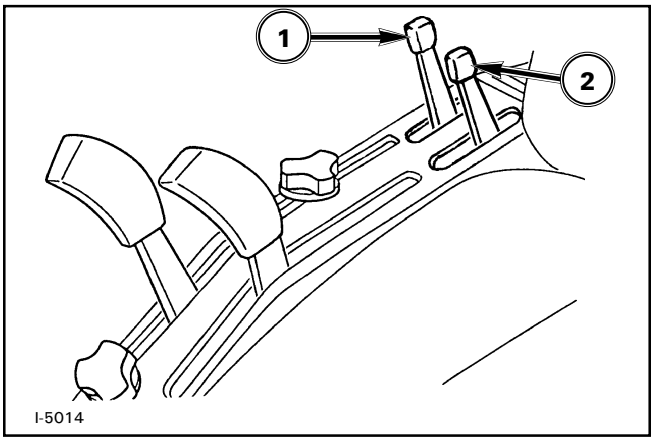



**FIG. 114**

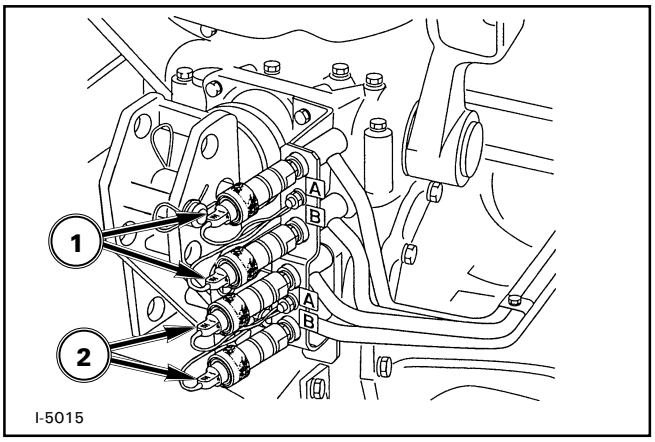



**FIG. 115**

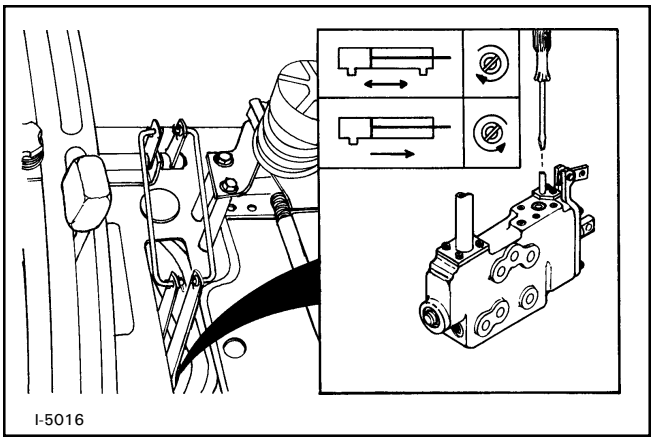



**FIG. 116**

## DRAWBAR

**FIG. 117:** Drawbar, 1, at rear of Tractor allows pull-type implements to be attached to Tractor. Maximum vertical load on drawbar must not exceed 880 lbs (400 kg).

**CAUTION: Pulling heavy loads will require extended braking distances. Reduce travel speed.**

Make sure attachment is properly secured and safety chain is used.

*NOTE: When using three-point hitch, it may be necessary to remove drawbar by removing clip and pin and sliding drawbar from bracket to improve operating clearance. This is particularly true with mounted implements using PTO drive.*

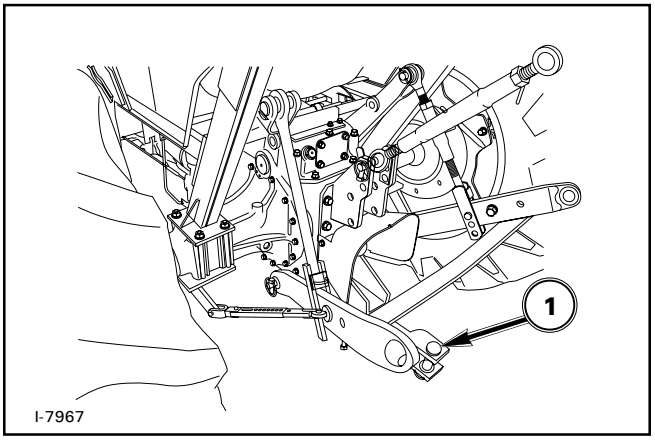



**FIG. 117**

## ROLL OVER PROTECTIVE STRUCTURE (ROPS)

**FIG. 118:** These tractors are equipped with fold-down ROPS which can be folded down and tractor functionally used in that condition for low clearance situations such as orchards, vineyards, barns, and chicken houses, etc. When ROPS is lowered, seat belts **must not** be worn.

Always raise ROPS into fully erect position at earliest possible time and then seat belts **must** be worn. ROPS must be maintained in this fully raised position at all times unless practical operation of tractor dictates otherwise as described above.

**WARNING: If ROPS is damaged during operation, do not weld, drill, bend or straighten. Make sure all components are in correct working order to provide the intended protection.**

**Only original bolts and pins, or equivalent replacements, must be used and tightened to the correct torque value. Make sure both "hinge" joints are properly secured.**

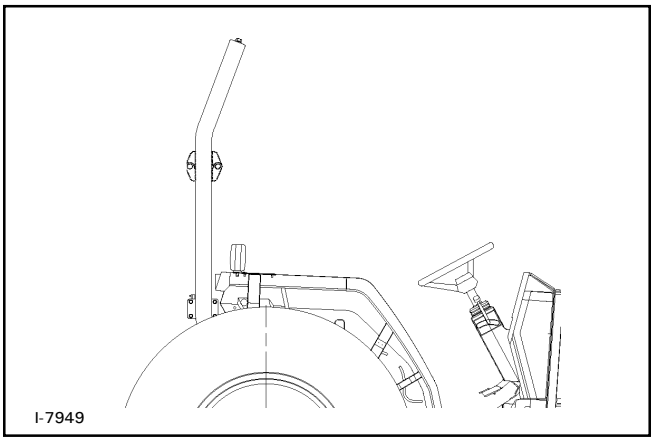



**FIG. 118**

# LUBRICATION & PERIODIC MAINTENANCE

## SPECIFICATIONS & CAPACITIES

### Engine Oil

Use Massey Ferguson Multiguard® or equivalent in the appropriate SAE viscosity. Oil must meet or exceed MIL-L-46152 requirements, API Service "CC".

Capacity (Crankcase and Filter) ..... 8.5 US qt. (8.0 liters)

Recommended Viscosity:

78°F (25°C) and Above ..... SAE 30W, 10W-30

32°-78°F (0°-25°C) ..... SAE 20W, 10W-30

Below 32°F (0°C) ..... SAE 10W, 10W-30

*Multiguard® 15W-40 may be used in ambient temperatures above 14°F (-10°C).*

Recommended Change Interval:

Initial Oil and Filter Change ..... 50 hours

Oil and Filter Change, Thereafter ..... Every 100 hours

### Engine Coolant

Freezing Protection (Original Factory Fill) ..... . -30°F (-34°C)

Recommended Coolant ..... 50/50 mixture ethylene glycol and water

System Capacity ..... 11.1 US qt. (10.5 liters)

### Fuel Tank

Capacity ..... 12.7 US gals. (48.0 liters)

Fuel Recommended, Above 39°F (4°C) ..... No. 2 or No. 2-D

Fuel Recommended, Below 39°F (4°C) ..... No. 1 or No. 1-D

### Transmission & Differential Housing (Including Hydraulic System)

Capacity:

Manual Shuttle Models ..... 8.7 US gals. (33.0 liters)

Power Shuttle and Hydrostatic Models ..... 9.2 US gals. (35.0 liters)

Recommended Lubricant ..... MF Permatran III®, or SAE 80 GL-4

Recommended Change Interval ..... First 50 hours, every 300 hours thereafter

### Front Axle (4-WD)

Capacity ..... 6.9 US qt. (6.5 liters)

Recommended Lubricant ..... MF Permatran III®, or SAE 80 GL-4

Recommended Change Interval ..... First 50 hours, every 600 hours thereafter

### Grease Fittings

Grease Interval (All Fittings) ..... Every 50 hours

Recommended Grease ..... Massey Ferguson M-1105 or equivalent lithium base grease No. 2

*NOTE: Change intervals stated above are for normal usage. Due to adverse operating conditions, that may be experienced (extremely dusty or muddy), change intervals may need to be more frequent.*

## LUBRICATION/FILL POINTS

**FIG. 119:** General layout of lubrication, fill and drain locations on Tractor:

| Ref. | Description: | Type: |
|---|---|---|
| 1 | Crankcase | Engine Oil |
| 2 | Engine Radiator | Coolant |
| 3 | Radiator Overflow Reservoir | Coolant |
| 4 | Fuel Tank | Diesel Fuel |
| 5 | Rear Housing | Hydraulic Oil |
| 6 | 4-WD Axle | Hydraulic Oil |
| 7 | Axle Pivots (4-WD) | Grease |
| 8 | Front Spindles (4-WD) | Grease |
| 9 | Tie Rod Ends | Grease |
| 10 | Clutch Shaft | Grease |
| 11 | Brake Pivots | Grease |
| 12 | Leveling Crank | Grease |
| 13 | Pedal Linkage (Hydrostatic) | Grease |

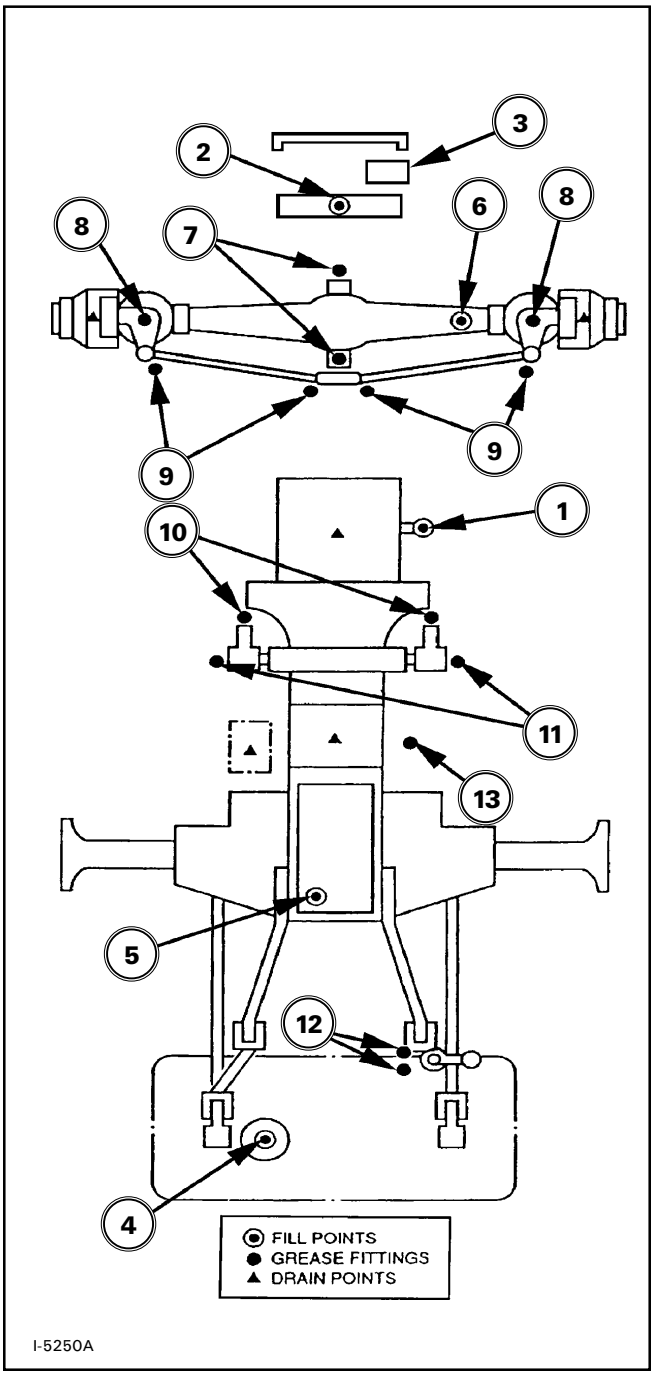



**FIG. 119**

## PERIODIC MAINTENANCE SCHEDULE

Recommended Interval, Each:

| Day | 50 hr | 100 hr | 300 hr | Year | Item To Check | Action Required | Fig. Ref. |
|---|---|---|---|---|---|---|---|
| ● | | | | | All controls, switches | Inspect and repair | - |
| ● | | | | | All fasteners, hardware | Check and tighten | - |
| ● | | | | | Hoses, fan belt, wiring | Inspect and repair | - |
| | ● | | | | Grease fittings | Lubricate | 119 |
| ● | | | | | Engine oil level | Check and replenish | 122 |
| | (*) | ● | | | Engine oil & filter | Replace | 123-124 |
| ● | | | | | Transmission oil level | Check and replenish | 125 |
| | (*) | | ● | | Transmission oil & filter | Replace and clean | 126-130 |
| | ● | | | | Front axle oil level (4-WD) | Check and replenish | 131 |
| | (*) | | ● | | Front axle oil (4-WD) | Replace | 131 |
| ● | | | | | Air screens & radiator | Clean of debris | 132 |
| ● | | | | | Radiator coolant level | Check and replenish | 132 |
| | | | | ● | Radiator coolant | Drain, flush & replace | 133 |
| ● | | | | | Fan belt tension | Check and adjust | 134-135 |
| ● | | | | | Air cleaner dust ejector | Clean | 136 |
| | ● | | | | Air cleaner elements | Inspect, clean or replace | 137-139 |
| ● | | | | | Fuel tank level | Fill | - |
| ● | | | | | Fuel filter sediment bowl | Inspect and clean | 140 |
| | | | ● | | Fuel filter element | Replace and bleed | 141-142 |
| | ● | | | | Battery & cables | Check, clean & tighten | 144-145 |
| | ● | | | | Battery electrolyte level | Check and replenish | 146 |
| ● | | | | | Lights, flashers & horn | Check and repair | - |
| ● | | | | | Clutch pedal free-play | Check and adjust | 151-152 |
| ● | | | | | Brake adjustment & balance | Check and adjust | 153-154 |
| ● | | | | | Tire pressure & condition | Check and adjust | 155 |
| ● | | | | | Wheel bolt torque | Check and tighten | 156 |
| | | | ● | | Front wheel alignment | Check and adjust | 157 |
| ● | | | | | Steering free-play | Check and repair | 163 |
| | | | ● | | Front axle end-float (4-WD) | Check and adjust | 164 |
| | | | | ● | Clutch housing leaks | Remove plug & check | - |

Items marked (*) indicate initial service interval only. Subsequent (later) intervals marked “0”. Intervals above are for normal usage. Severe operating conditions (wet, dusty, etc.), or when previous servicing has indicated need for more frequent action, intervals may need to be more often.

## SERVICE ACCESS

**CAUTION: Shut off engine before servicing Tractor. Hood side panels and front grille must be installed and secured prior to operating unit.**

**FIG. 120:** To access radiator, battery and engine components, right and left hood side panels can be easily removed.

To remove; turn locking knob, 1, counterclockwise to unlock. Pull outward on points indicated and then lift side panel upward to disengage and remove.

Reinstall in reverse order making sure top edge of side panel engages correctly. Push inward on panel and turn knob, 1, clockwise to lock.

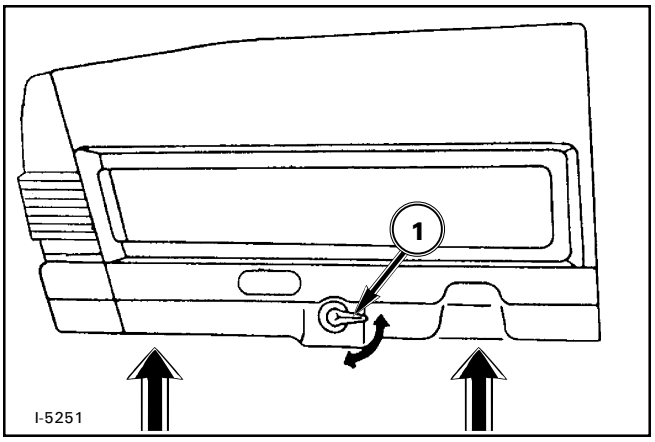



**FIG. 120**

**FIG. 121:** To permit battery servicing and removal, front grille should be removed.

To remove; turn lock, 2, one-quarter turn counterclockwise. Tip top of grille outward and disconnect headlight wiring couplers. Lift grille upward to disengage lower hooks and remove from Tractor.

Reinstall in reverse order making sure lower hooks engage on pins. It will be necessary to push inward on top of grille to secure.

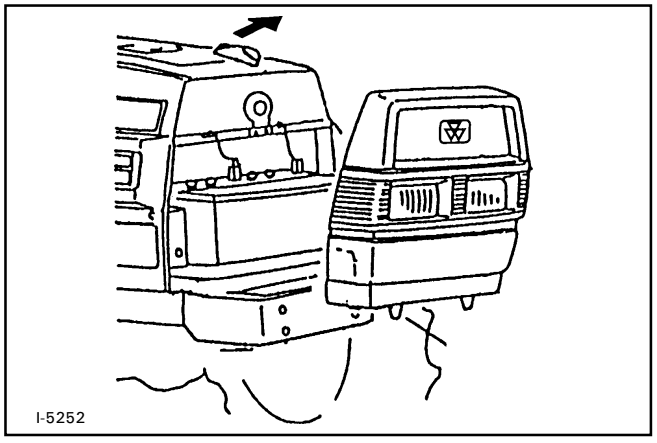



**FIG. 121**

## LUBRICATION DETAILS

### Grease Fittings

Lubricate all grease fittings (refer to fig. 119) every 50 hours of operation using M-1105 or equivalent no. 2 multipurpose lithium base grease. Clean grease gun and fittings before and after greasing to prevent contamination from dirt.

*NOTE: When operating in muddy or extremely wet conditions, daily lubrication of fittings is recommended.*

### Engine Oil & Filter

Engine oil and filter should be changed after first 50 hours of operation and then every 100 hours thereafter.

**FIG. 122: To Check Engine Oil Level -** Tractor must be parked on level ground with engine off. Pull out dipstick, 1, and check that oil level is between upper limit, F, and lower limit, L, on dipstick. Wipe off dipstick, momentarily reinstall in engine and check oil level again.

Add oil through filler opening, 2, as required.

*NOTE: Add oil slowly to assist in venting air from crankcase.*

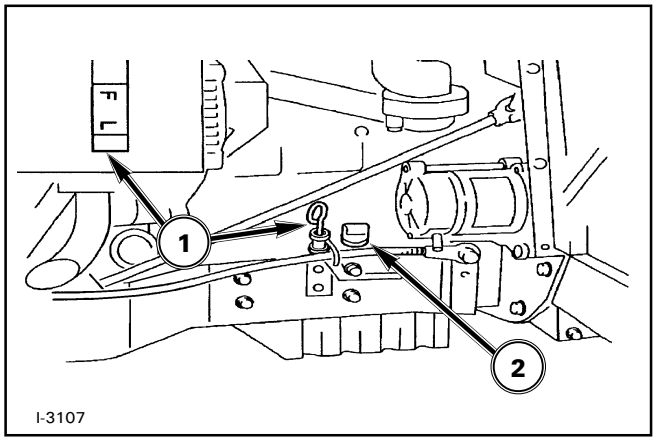



FIG. 122

**FIG. 123: To Change Engine Oil -** Operate Tractor until oil is adequately warmed. Remove drain plug(s), 3, from engine and allow all oil to drain.

Reinstall drain plug(s) and fill engine crankcase to upper limit on dipstick.

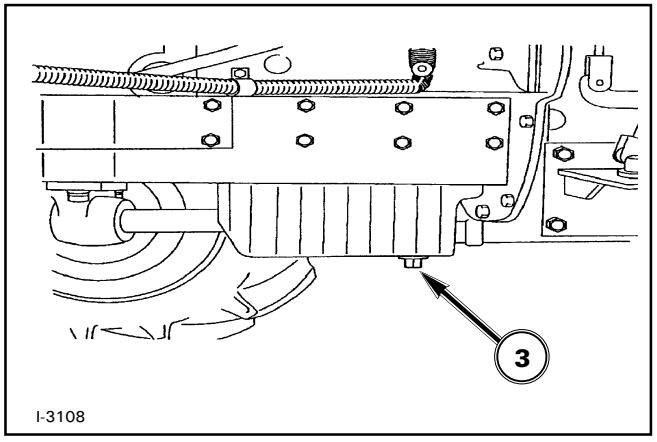



FIG. 123

**FIG. 124: To Replace Engine Oil Filter -** Unscrew element, 4, from engine and discard. Make sure original filter gasket has been removed.

Lubricate new gasket on replacement element with clean engine oil. Screw on new element until gasket contacts adapter and then tighten element 1/2 turn more.

Clean spilled oil and refill crankcase. Start engine, check for leaks and replenish oil level as required.

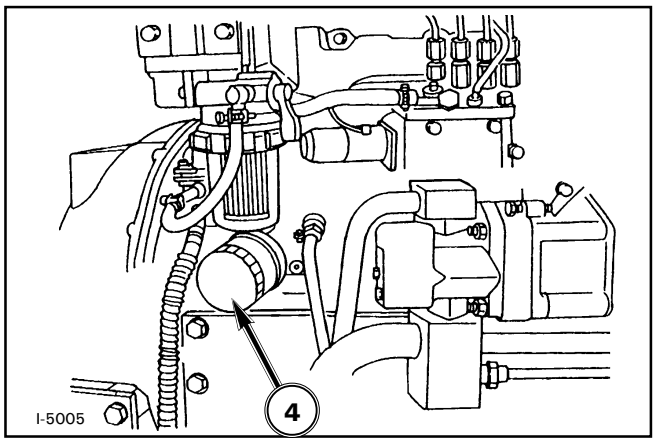



FIG. 124

## Transmission Oil & Filters

Transmission oil lubricates transmission, center housing, and rear axles and also serves as hydraulic fluid. Transmission oil and filter should be changed after first 50 hours of operation and then every 600 hours thereafter.

**FIG. 125: To Check Transmission Oil Level -** Park Tractor on level ground. Oil level should be indicated in oil level window, 1.

Oil level is replenished, as necessary, by removing filler plug, 2, and adding oil through filler opening.

*NOTE: Adding oil to transmission will also maintain correct oil level in center housing and rear axles.*

**FIG. 126: To Replace Transmission Oil -** Remove drain plug, 3, and completely drain oil from system.

*IMPORTANT: Completely lower three-point hitch prior to draining transmission oil.*

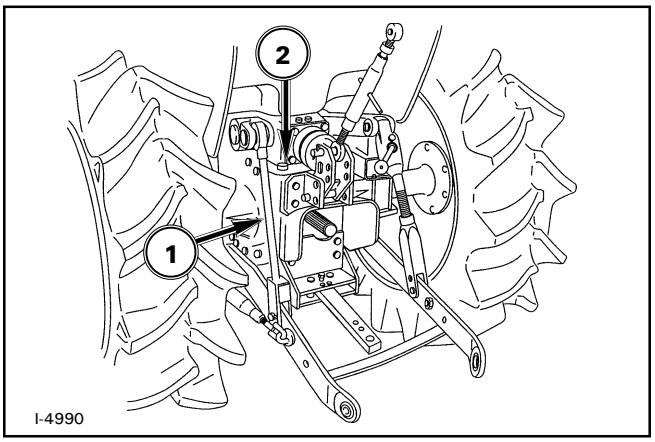



**FIG. 125**

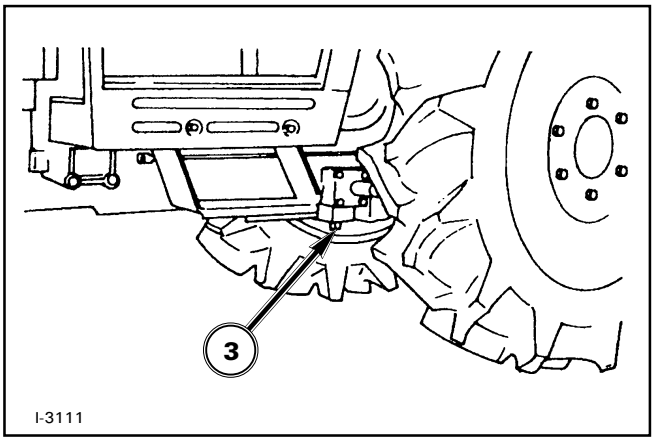



**FIG. 126**

**FIG. 127: Mechanical Shuttle:** Always replace hydraulic oil filter while oil is removed. Carefully unscrew oil filter, 4, from its adapter. Use of a filter wrench may be necessary.

Clean filter adapter and lubricate gasket on replacement filter with clean hydraulic oil. Install new filter until gasket contacts adapter and tighten additional 2/3 turn, by hand. Do not use filter wrench to install filter.

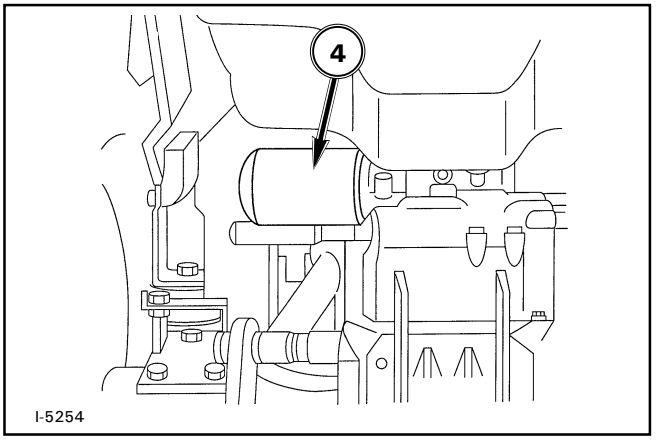



**FIG. 127**

**FIG. 128: Mechanical Shuttle:** Transmission filter, 5, must also be cleaned when oil is replaced. With oil drained, remove retaining bolt, 6, and withdraw filter from rear case.

*NOTE: Transmission filter for manual shuttle model shown. Refer to fig. 129 for power shuttle filter details.*

Clean filter in solvent or kerosene, dry thoroughly and reinstall. Make sure seal is not damaged.

Apply sealant to threads on drain plug(s) and reinstall. Refill system with clean oil to level as detailed.

Start Tractor and allow to idle several minutes while operating hydraulic controls, Shut engine off, lower the three-point hitch and recheck oil level. Replenish transmission oil as necessary. Check for leaks and correct as necessary.

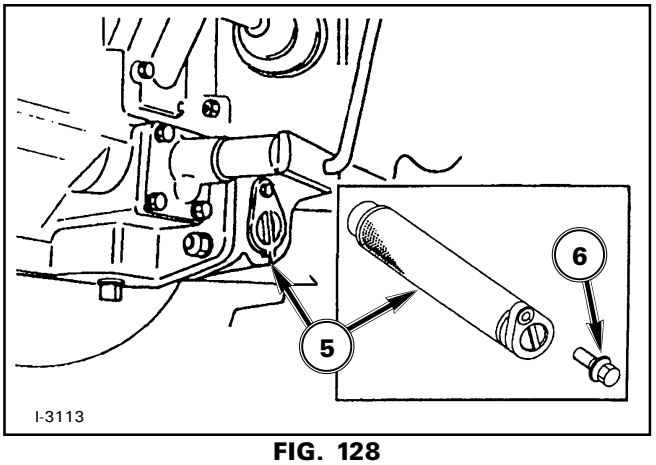



**FIG. 128**

**FIG. 129:** Transmission filter, 5, for **power shuttle and hydrostatic** model shown. With oil drained, unscrew filter from adapter (filter wrench may be required).

Clean adapter and lubricate seat on new filter. Install until filter gasket contacts adapter and tighten additional 2/3 turn, by hand. Do not use filter wrench to tighten.

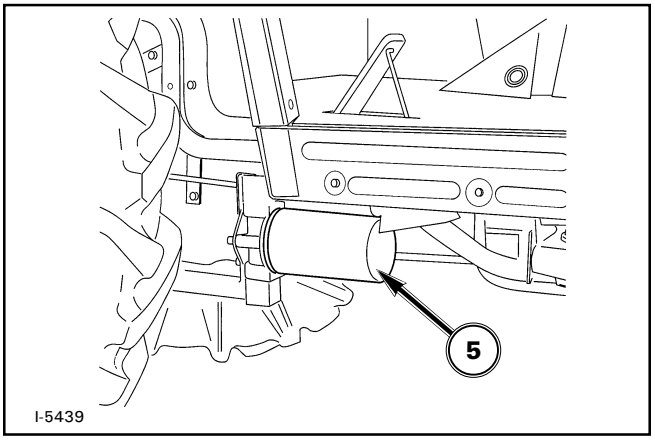



**FIG. 129**

**FIG. 130:** Charge filter, 5, for **hydrostatic model** shown. With oil drained, unscrew filter from adapter (filter wrench may be required).

Clean adapter and lubricate seat on new filter. Install until filter gasket contacts adapter and tighten additional 2/3 turn, by hand. Do not use filter wrench to tighten.

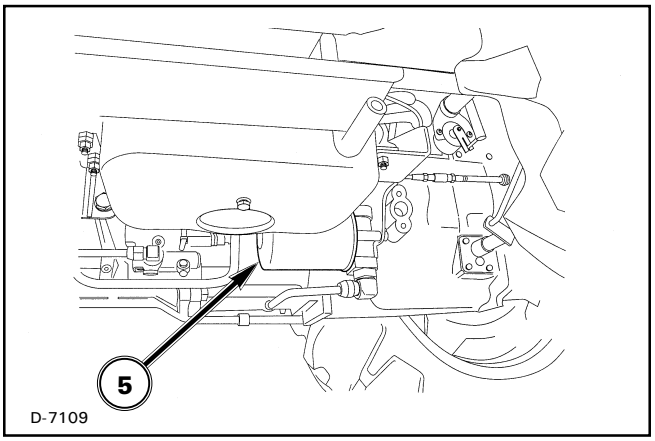



**FIG. 130**

## Front Axle Oil (4-WD)

Front drive axle has a common oil level for front differential housing and each wheel reduction unit. Oil level should be checked every 50 hours of Tractor operation. The oil should be changed after the first 50 hours or operation and then replaced after every 600 hours thereafter.

**FIG. 131: To Check Oil Level -** Park Tractor on level ground and then remove oil level plug, 1. Oil should be level with or slightly below level plug opening. Remove fill plug, 2, and add oil until oil is expressed from level plug opening. Replace level plug and fill plug.

**To Change Oil -** Remove drain plug, 3, from both wheel reduction units. When all oil has drained, replace drain plugs and fill housing to level plug opening. Replace level plug and fill plug.

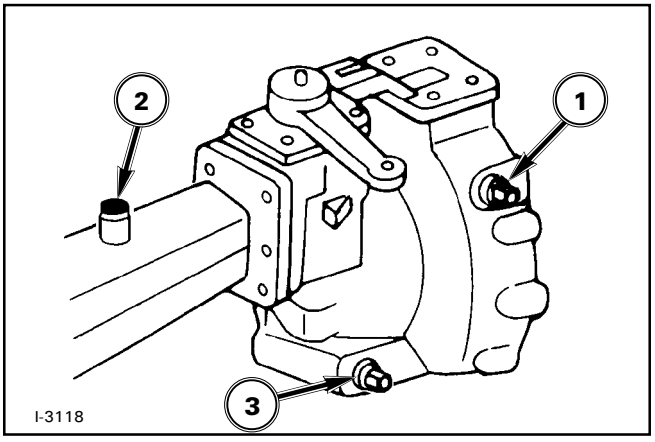



**FIG. 131**

## COOLING SYSTEM

**CAUTION: DO NOT remove radiator cap when engine is hot.**

Rotate cap slowly to release pressure. Then cap can be safely removed.

**FIG. 132:** Cooling system is filled at factory with anti-freeze solution to protect engine and radiator to -30° F (-34° C). Coolant level should be maintained to 1/2" (12 mm) below the filler neck opening, 1. Check coolant protection from freezing annually.

*NOTE: After adding coolant, start engine and operate until thoroughly warmed so coolant is mixed. Periodically check level of coolant in overflow reservoir to make sure level is located between marks when engine is cold.*

Periodically check condition of hoses, belt and clamps and tighten or replace as necessary.

Keep radiator, radiator screen and hood screens clean to permit maximum cooling.

*IMPORTANT: Use care when cleaning radiator to prevent cooling fin damage.*

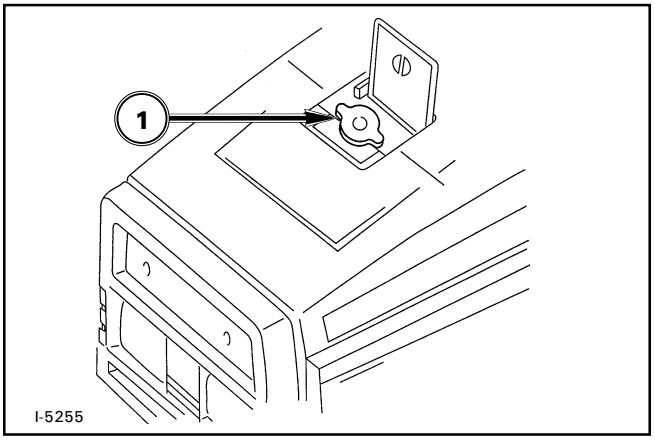



**FIG. 132**

**FIG. 133:** Drain cock, 2, will drain coolant from cylinder block and radiator. Drain cock is located on right side of engine. Coolant should be replaced if it becomes contaminated with rust or sludge. Loosening radiator cap will assist draining.

*NOTE: When coolant is replaced, flush inside of radiator and engine block with clean water.*

Radiator and engine must be drained if freezing temperatures are expected and cooling system is not filled with coolant having adequate protection from freezing.

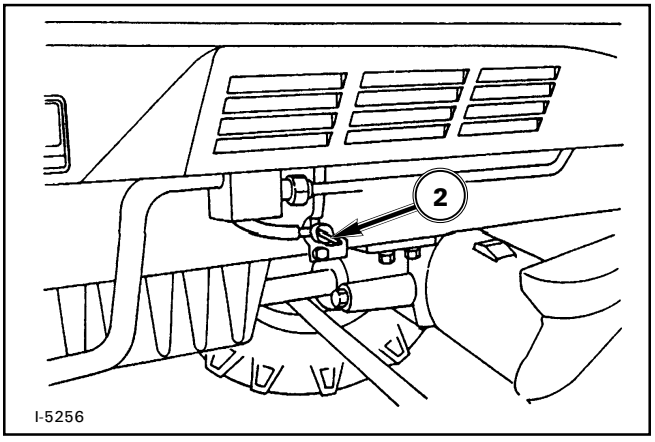



**FIG. 133**

**FIG. 134:** Correct fan belt tension helps to insure adequate coolant flow through cylinder block and radiator. Belt is correctly tensioned when belt deflection is approximately 1/2" (13 mm) when thumb pressure is exerted at center of belt span.

**CAUTION: Due to muffler position, allow to cool before checking or adjusting fan belt tension.**

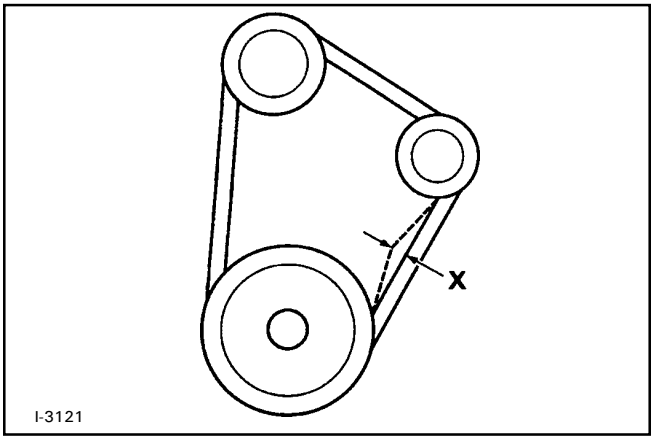



**FIG. 134**

**FIG. 135:** To adjust belt tension, loosen alternator pivot bolt, 1, and tensioning bracket bolt, 2. Pull outward on top of alternator to correctly tension belt and tighten bolt, 2, first and then tighten pivot bolt, 1.

*IMPORTANT: Do not pry against alternator housing or pulley. Carefully pry against alternator mounting flange to prevent damage.*

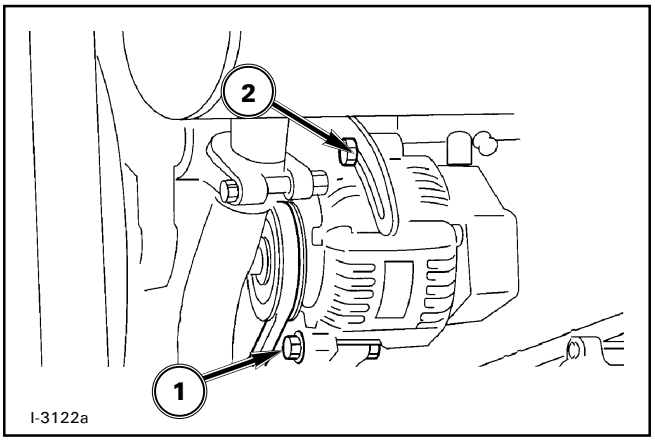



**FIG. 135**

## ENGINE AIR CLEANER

*IMPORTANT: Never operate engine with air filters removed.*

**FIG. 136:** Remove hood left side panel to access air cleaner, 1. Air cleaner consists of an outer dry paper element to filter dust particles from intake air. A safety inner element is installed to prevent engine damage should outer element become damaged or ruptured. Dust ejector, 2, traps dust accumulation that falls from outer element.

Periodically "pinch" dust ejector to release accumulated particles. If accumulation is damp, wipe ejector clean with a cloth.

*NOTE: Regular cleaning of dust ejector can reduce filter element maintenance.*

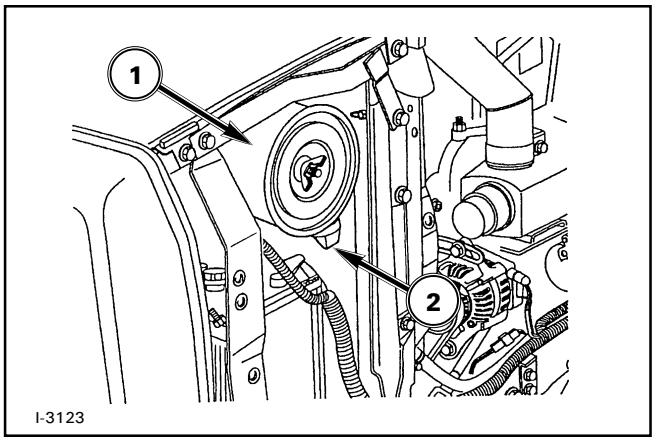



**FIG. 136**

**FIG. 137:** Remove wing nut and seal, 3, securing outer element in air cleaner.

Withdraw outer element, 4. Examine element end seal for damage and brittleness. If element or element seal are damaged in any way, the outer element must be replaced.

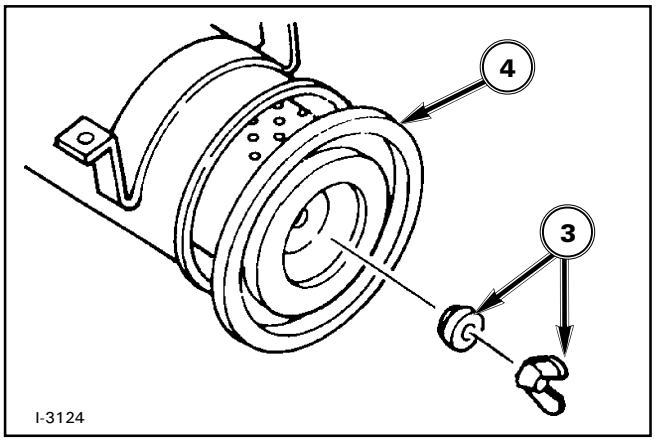



**FIG. 137**

**FIG. 138:** Outer element, 4, may be cleaned (if in serviceable condition) using following procedures:

- Using compressed air not to exceed 30 psi (200 kPa) from inside element, remove loose dirt, grass, chaff, etc. Be careful not to damage element pleats with air flow.
- If outer element is coated with oil or soot:

1. Prepare solution of warm water and non-foaming detergent.
2. Soak element for thirty minutes.
3. Agitate element in solution until oil and soot are loosened.
4. Rinse element until rinse water is clear.
5. Allow element to completely dry. Do not dry by using compressed air or heat.

- After cleaning (or washing) element examine for pin holes, punctures, or tears. If element paper, canister or seal show any signs of physical damage, element must be replaced.

*NOTE: Replace outer element which has already been washed five times.*

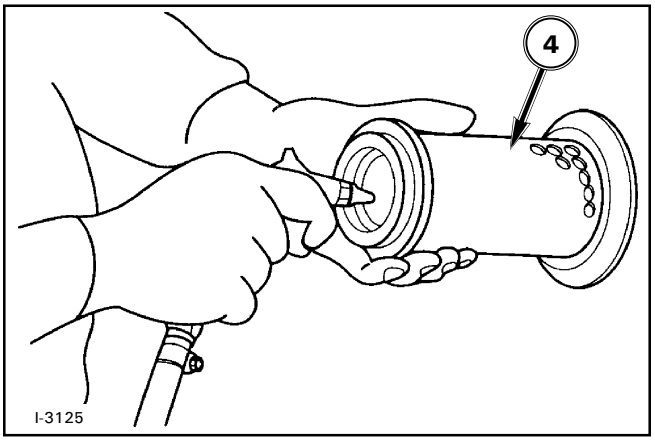



**FIG. 138**

**FIG. 139:** Remove second nut and inner safety element, 5, from air cleaner. If inner element shows any discoloration (indicating dirt in element) or is damaged in any way, the inner element must be replaced and the outer element thoroughly inspected.

*IMPORTANT: Do not attempt to clean inner safety element. Its primary purpose is to protect the engine from dust ingress should outer element fail.*

Reassemble elements into air cleaner making certain that each element seal is evenly compressed. Do not overtighten securing nuts.

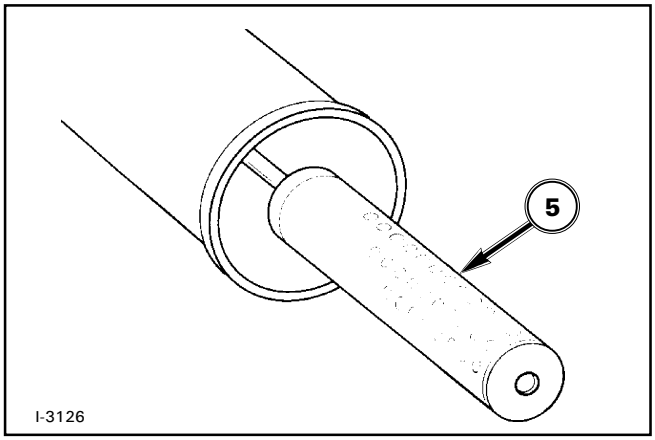



**FIG. 139**

## FUEL SYSTEM

Use only clean diesel fuel of correct grade. Introduction of water or dirt into fuel tank or other portion of fuel system can cause repeated plugging of fuel filter and possible injection pump and injector damage.

*IMPORTANT: Do not tamper with injection pump or injector adjustments as doing so may render engine and/or Tractor warranty void and may cause severe engine damage. Refer to local MF Dealer.*

### Fuel Filter

**FIG. 140:** Fuel filter assembly, 1, is located at right side of engine and is used to strain impurities from fuel before fuel reaches injection pump. Fuel filter incorporates valve, 2, to aid in filter servicing and air-bleeding of fuel system.

Check filter bowl for accumulation of sediment or water and clean as required.

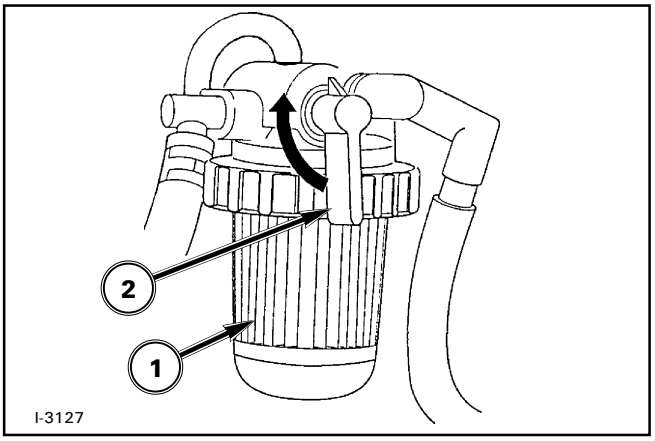



**FIG. 140**

**FIG. 141:** To replace fuel filter element or clean sediment bowl, turn fuel valve to OFF position (handle to rear).

Carefully loosen spanner nut, 1, and remove nut, sediment bowl, 3, and "O"-ring, 4. Sediment bowl can be cleaned at this time.

*NOTE: Do not lose spring, 5, between bowl and filter element.*

Pull downward on filter element, 6, and discard. Examine small "O"-ring, 7, in filter head and replace as necessary. Install new element, pushing upward until seated.

Install sediment bowl with spring, "O"-ring, and nut. Tighten nut and wipe up spilled fuel. Proceed to "Air-bleeding Fuel System" on following page.

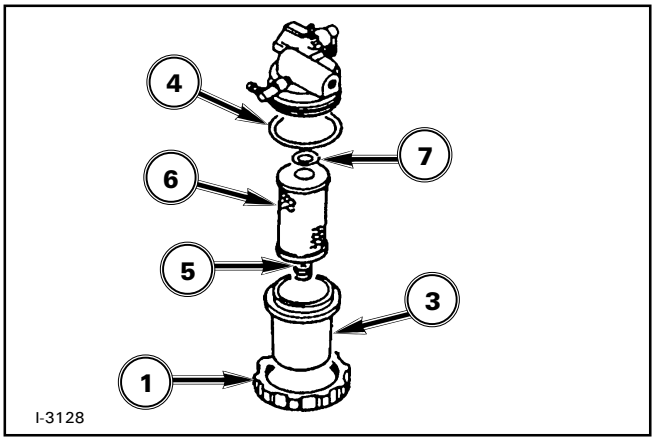



**FIG. 141**

## Air-Bleeding Fuel System

If any of the following conditions have occurred, system should be bled:

- Fuel tank has been permitted to run dry.
- Fuel lines, filter element(s) and other components within system have been disconnected or removed.
- If engine has not been operated for a considerable period of time.
- If engine fails to start, or if it starts but stops again after a few minutes of operation.

**FIG. 142:** Make sure fuel tank is full to provide gravity flow of fuel to filter. Turn valve, 2, on fuel filter to AIR position (handle to front).

Allow air bubbles and fuel to drain from overflow pipe, 3, until air bubbles disappear and only fuel drains out.

Turn valve, 2, to ON position (handle down).

Key to fuel system components:

| Ref. | Description | Location |
|---|---|---|
| 1 | Fuel Filter | Right front |
| 2 | Filter Valve | On filter |
| 3 | Overflow Pipe | Right front |
| 4 | Electric Pump | Right front |
| 5 | Injection Pump | Engine, right |
| 6 | Fuel Tank | Rear |
| 7 | Auxiliary Fuel Tank | Under footstep |

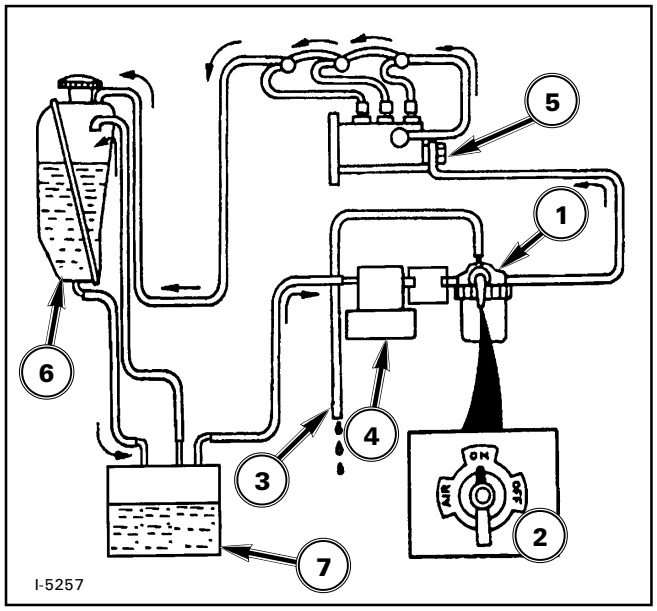


FIG. 142

*NOTE: Normally, further air-bleeding is not required due to electric fuel pump operating when main switch in instrument panel is ON.*

*If engine will not start after several attempts, check fuel pump fuses (see "Electrical System").*

## Fuel Tank Filler Cap

When fuel tank filler cap is removed, a hissing or popping noise may be noticed. This is due to cap design and is a normal condition. Do not alter cap or use unapproved replacement as fuel leakage may occur in event of Tractor upset.

## Throttle Lever

**FIG. 143:** Hand throttle lever should remain in position selected by operator. Through normal use, friction against lever may decrease, causing lever to move out of selected position. Turn adjusting nut, 1, as required to retain throttle lever in position selected.

*NOTE: Throttle lever friction adjustment is accessed by removing rear steering column cover.*

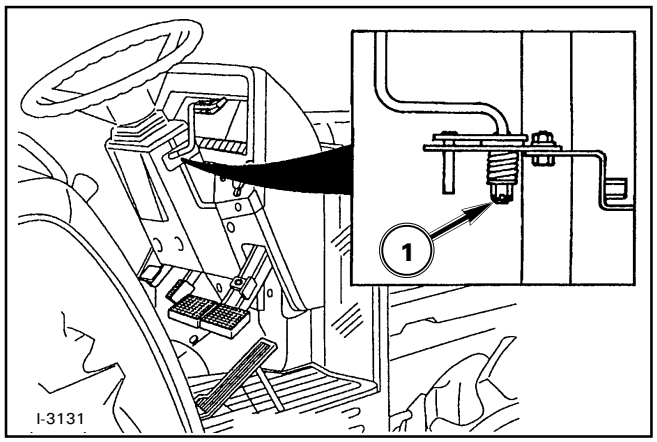


FIG. 143

## ELECTRICAL SYSTEM

### Battery

**FIG. 144:** Battery, 1, is located under engine hood in front of radiator. If battery requires only minor servicing or charging, it is recommended that hood side panels be removed to access battery.

When battery removal, electrolyte inspection or cable cleaning is necessary, front grille must be removed from Tractor.

Keep top of battery clean and ensure cable connections are clean and tight. Debris on battery can cause discharge of battery and possible source of fire.

**DANGER: Batteries produce explosive hydrogen gas when charged. Keep all sparks and open flame away from battery.**

When necessary to disconnect battery cables, always disconnect the grounded (-) cable first to prevent short circuits.

Batteries contain sulfuric acid electrolyte (fluid). Wear eye and face protection. If electrolyte comes in contact with skin or clothes, wash immediately. Contact physician if electrolyte is ingested or gets in eyes.

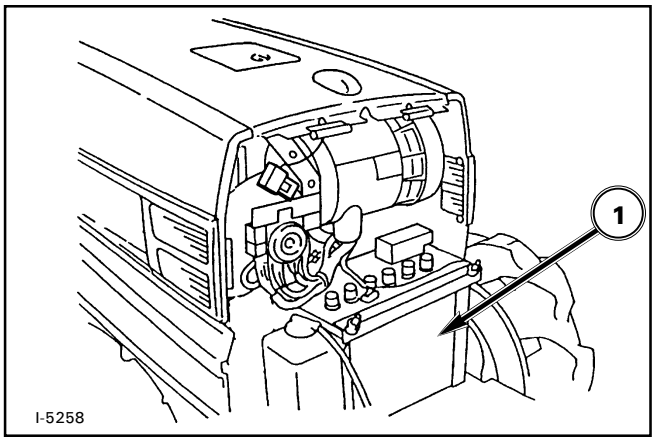



**FIG. 144**

**FIG. 145:** Tractors are shipped with battery installed. If battery replacement should become necessary, disconnect negative (-) cable, 1, first and then remove positive (+) cable, 2. Loosen and remove battery securing clamp and carefully remove battery from Tractor.

When installing battery, cable, 2, connected to starter solenoid should be connected to positive (+) battery terminal first then cable, 1 , grounded to Tractor frame can be connected to negative (-) battery terminal.

*NOTE: Make sure replacement battery is of identical size and equal capacity.*

*IMPORTANT: Do not reverse battery cable connections as severe electrical system damage will result.*

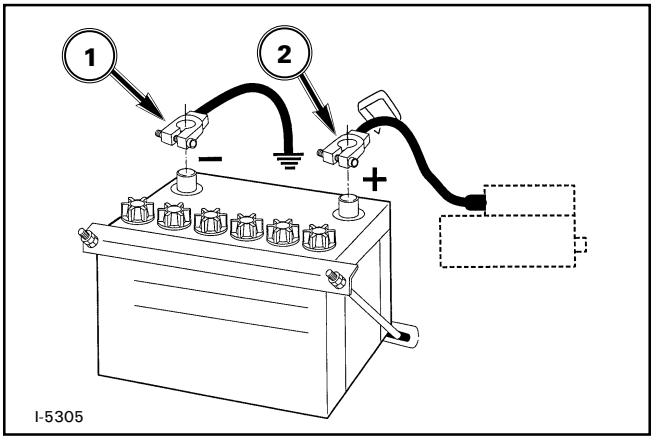



**FIG. 145**

**FIG. 146:** Water normally need not be added to battery as battery is of maintenance-free type.

However, electrolyte level should be inspected and must be maintained between upper limit, A, and lower limit, B. DO NOT overfill as electrolyte will spill and cause corrosion. Add only distilled water to individual "cells," when required.

*IMPORTANT: To mix electrolyte and distilled water, Tractor must be operated or battery charged. Failure to mix will result in frozen battery in low temperatures.*

Should battery performance be questioned, the battery should be removed and recharged from an external source following battery charger instructions. Repeated battery charging or electrolyte usage may be due to a defect in Tractor charging system and/or a defective battery.

*NOTE: When charging battery from an external source, battery temperature must not exceed 125° F (54°C) If overheating occurs, charge rate must be reduced or halted.*

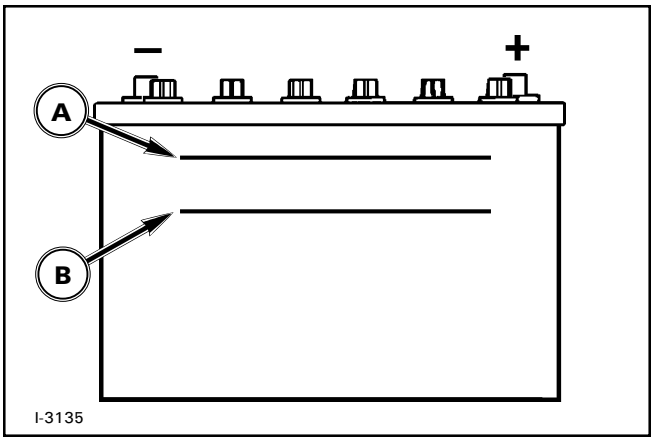



**FIG. 146**

## Starting Switches

This Tractor is equipped with a neutral-start system consisting of neutral switches and a relay. To start Tractor, ALL the following is required:

- Gearshift lever must be in neutral position
- PTO control switch must be OFF

**WARNING: DO NOT bypass or modify the neutral switch system. If the neutral start system does not operate properly, consult your Dealer immediately.**

## Wiring/Fuse Arrangement

**CAUTION: Keep all wiring connections clean and tight. Make sure wiring is correctly secured to prevent damage.**

**CAUTION: DO NOT alter wiring by adding "homemade" extensions or replacements. Doing so can eliminate fuse protection and/or eliminate safety features of the system.**

**CAUTION: Tractor is equipped with negative (-) ground system. Tractor metal parts provide many electrical connections. For this reason, all positive (+) circuits must be insulated to prevent "grounding" or short circuits and prevent possible fire.**

**CAUTION: DO NOT replace any fuse with a fuse of higher amperage rating. DO NOT use wire (or foil) to bypass fuse protection. Fire can result.**

**If fuses blow repeatedly, examine electrical system for "grounded" or "shorted" circuits.**

**FIG. 147:** General layout and location of electrical system components and fuses:

- **Main Fuse Box, A -** Located on right side, to rear of engine, beneath cover.

| Ref. | Amp | Function |
|---|---|---|
| 1 | 10A | Left Tail Light |
| 2 | 10A | Right Tail Light |
| 3 | 30A | Work Light*, Monitor, Alternator |
| 4 | 15A | Turn (Warning) Lights, Horn |
| 5 | 30A | Spare Power Supply |
| 6 | 30A | Head Lights, Spare Power Supply |
| 7 | 15A | Fuel Pump, Spare Power Supply, PTO |

**Work light (rear) is an accessory*

- **Slow-Blow Fuses, B & C -** In-line fuses protect relevant circuit by melting when sustained heavy electrical load or short circuit is encountered. Feature a delayed action to prevent current disruption when brief surges are encountered.

  One (40A) slow-blow fuse, B, for main circuit is green in color. Fuse is located on right side in front of radiator.

  One (60A) slow-blow fuse, C, for alternator circuit is yellow in color. Fuse is located on right side of engine above injection pump.

*NOTE: Failure of fuse, C, is usually caused from incorrect polarity (such as reversed cables when using a booster battery). Failed fuse will not allow battery to be charged during normal operation.*

*IMPORTANT: Fuses are of specific amperage capacity for the circuit in which they are located. Do not replace fuses with unauthorized parts.*

- **Trailer Harness Connector, D -** Provides electrical connection for trailer socket (when installed).

| Ref. | Wire Color | Function |
|---|---|---|
| 1 | White | Ground H |
| 2 | Black | Work Lights |
| 3 | Yellow | Left Turn/Warning Light |
| 4 | Red | Auxiliary Power (+) |
| 5 | Green | Right Turn/Warning Light |
| 6 | Brown | Tail lights |
| 7 | Blue | Auxiliary Power |
| *Make sure trailer connector wiring and plug are compatible prior to use* | | |

- **Rear Work Light Connectors, E -** For connection of rear work light power supply when this accessory is installed.
- **Unused Wire Leads, F -** Not used in this application.

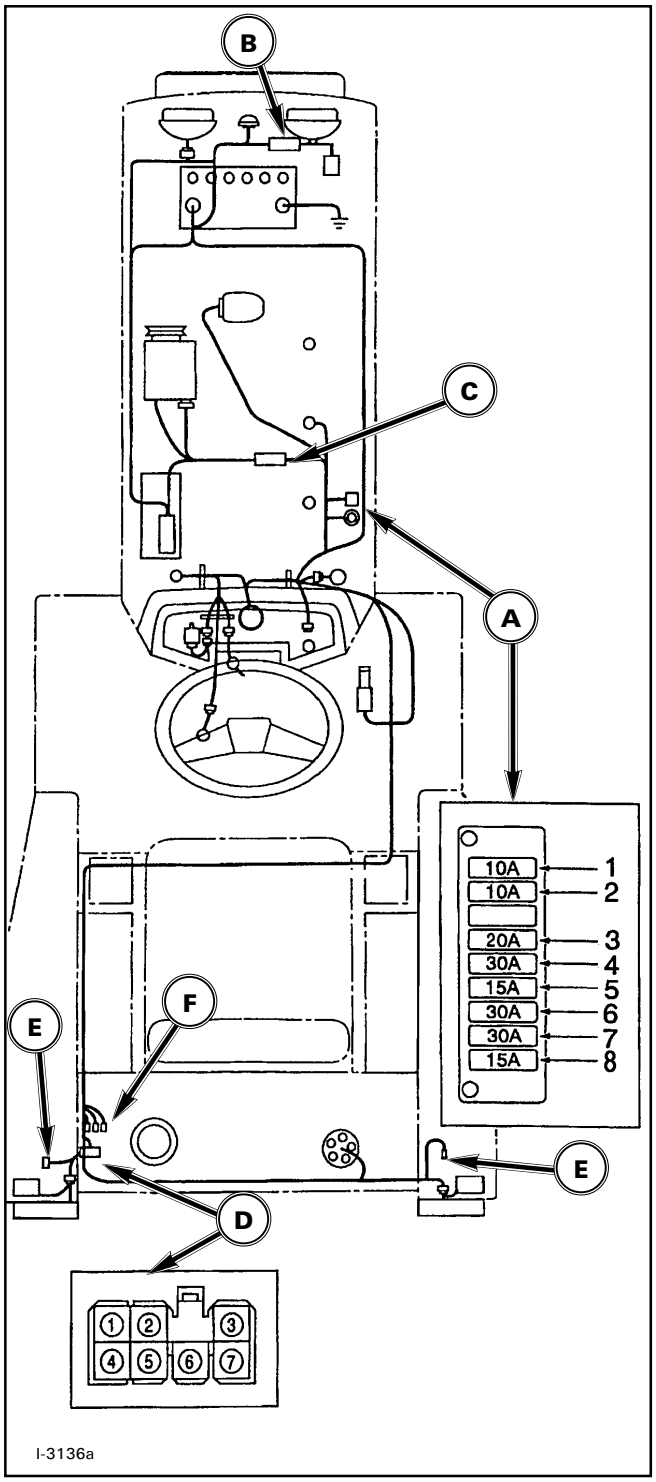
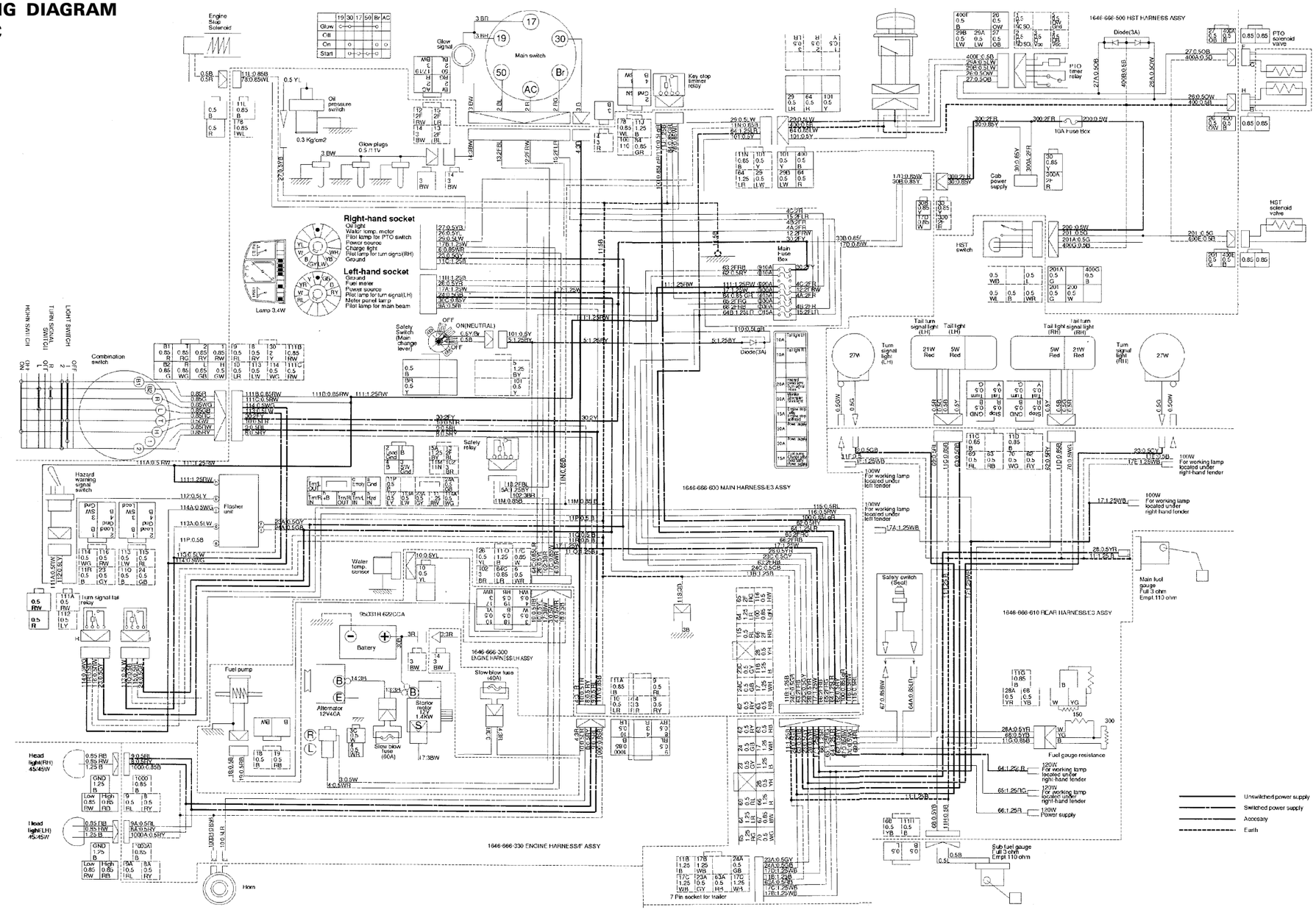



**FIG. 147**

## ELECTRICAL WIRING DIAGRAM FOR HYDROSTATIC

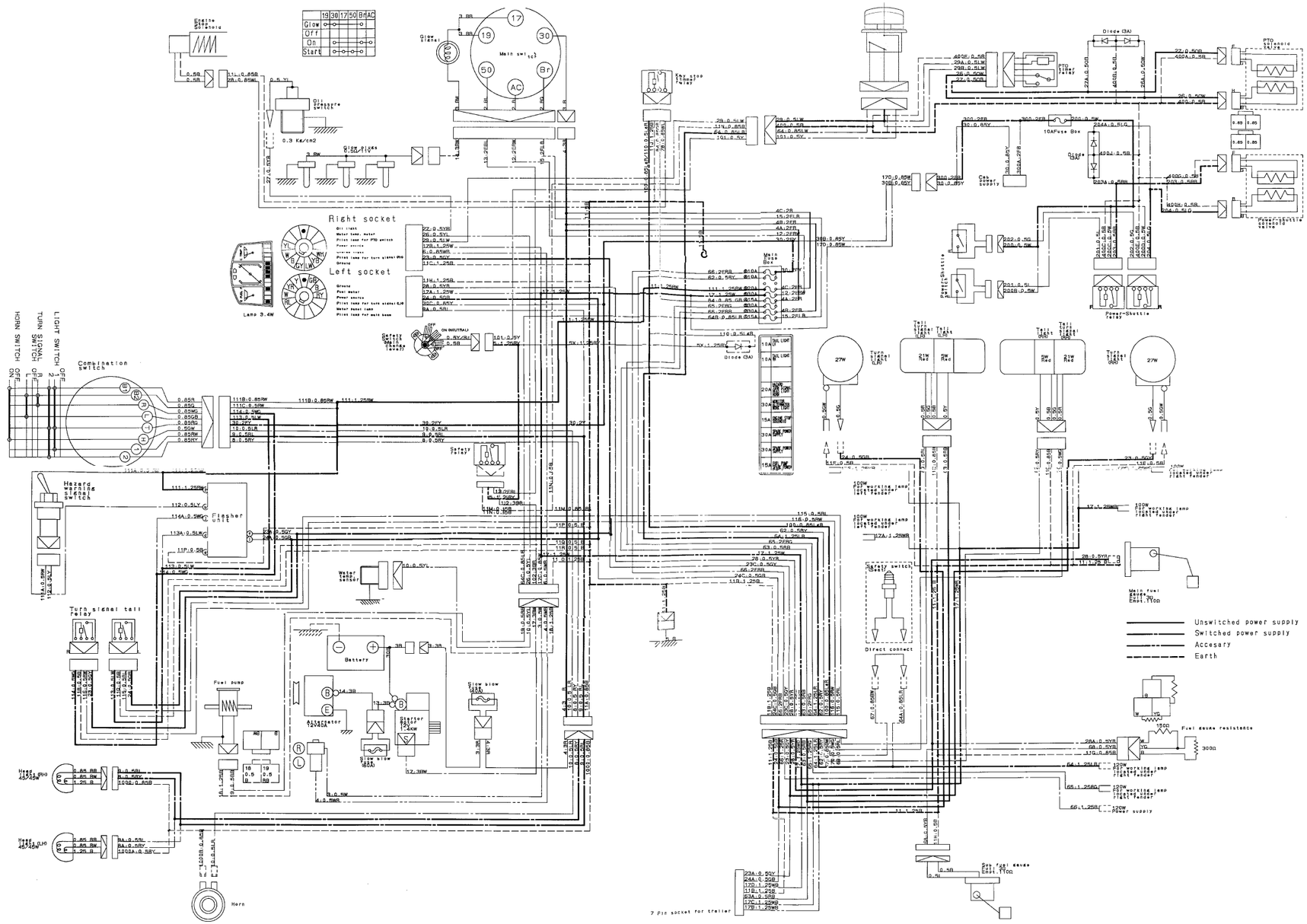



D-7108A

**FIG. 148**

**FIG. 148:** Wiring diagram for “hydrostatic”.

## ELECTRICAL WIRING DIAGRAM FOR POWER SHUTTLE

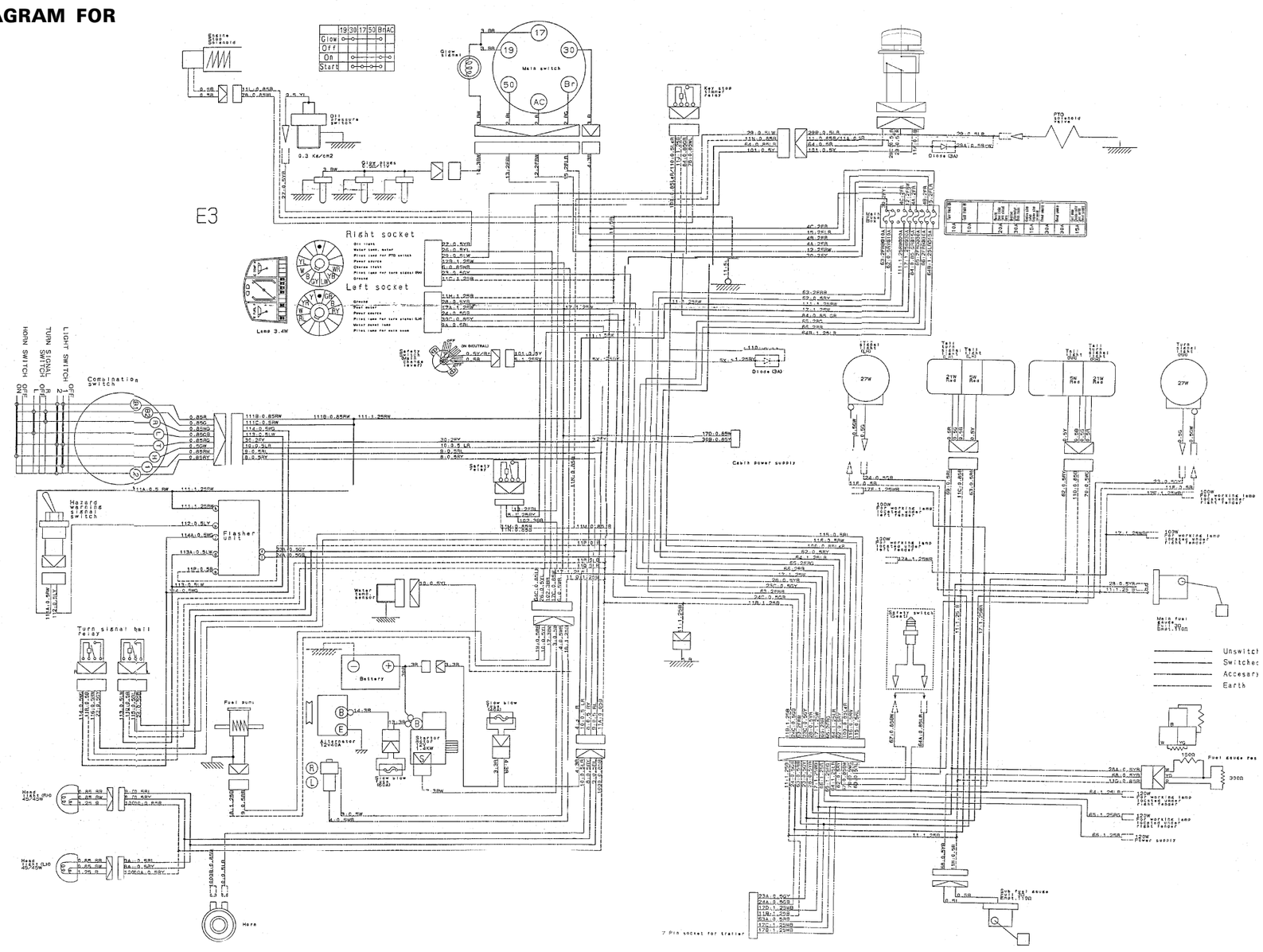



D-7054a

**FIG. 149**

**FIG. 149:** Electrical wiring diagram for “power shuttle”.

## ELECTRICAL WIRING DIAGRAM FOR MANUAL SHUTTLE




D-7053a

**FIG. 150**

**FIG. 150:** Electrical wiring diagram for “manual shuttle”.

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## CLUTCH FREE-PLAY ADJUSTMENT

**FIG. 151:** Check clutch pedal free-play regularly and adjust as necessary. Correct clutch pedal free-play, A, is 7/8" to 1-1 /8" (20 to 30 mm) when measured at the end of the pedal as shown.

*NOTE: Through use, clutch free-play will be reduced.*

*IMPORTANT: Correct free-play must be maintained to; reduce wear on clutch and release bearing, and allow complete disengagement when pedal is depressed.*

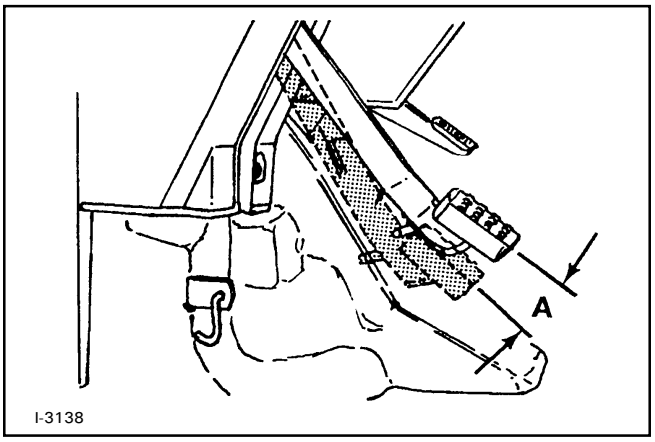



**FIG. 151**

**FIG. 152:** To adjust clutch pedal free-play, remove hood left side panel and loosen lock nut, 1 (right-hand thread), and lock nut, 2 (left-hand thread). Adjust turnbuckle, 3, on linkage until free-play is correct. Lengthening linkage will increase free-play, shortening linkage will reduce free-play.

Secure by retightening lock nuts.

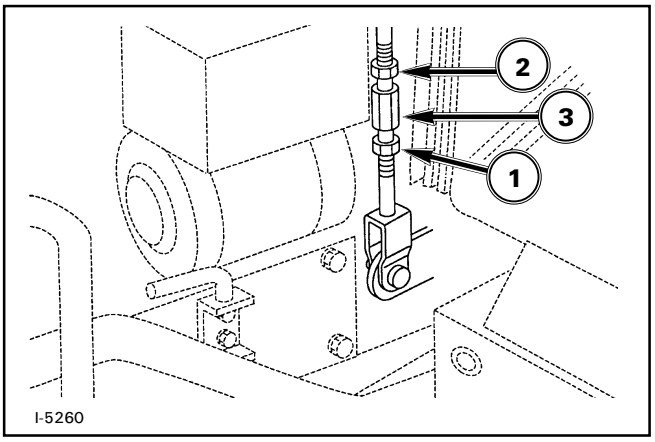



**FIG. 152**

## BRAKE ADJUSTMENT

**FIG. 153:** Unlatch pedals and check free-play of each brake pedal. Correct free-play, A, of each individual brake pedal is 1-1/8" to 1-9/16" (30 to 40 mm).

*NOTE: Through use, free-play will increase and brake balance will be affected. Adjust and balance brakes before free-play is excessive.*

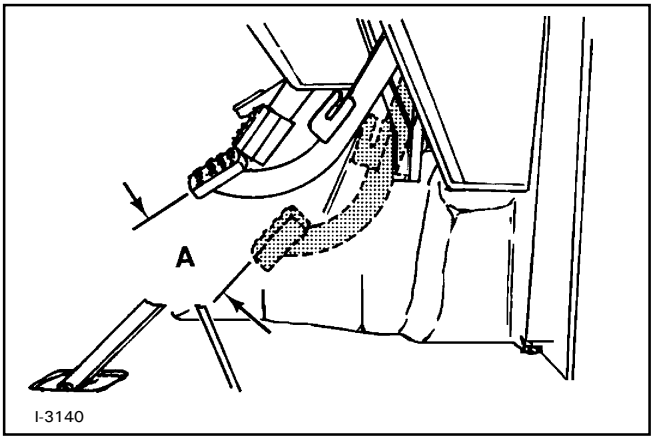



**FIG. 153**

**FIG. 154:** Loosen lock nut, 1 (right-hand thread), and lock nut, 2 (left-hand thread). Adjust turnbuckle, 3, so free-play is correct for respective brake pedal.

Repeat procedure for other brake so free-play in pedals is equal. Secure lock nuts against turnbuckles.

When adjustment is complete, latch pedals together and operate Tractor at low speed. Depress pedals. If Tractor has tendency to “pull” to one side, slight readjustment of one brake is required.

Make sure lock nuts are secured when brake adjustment is complete. Check operation of parking brakes after adjustment is made.

**CAUTION: Brakes must be adjusted evenly to permit equal braking action at both rear wheels when brake pedals are latched together.**

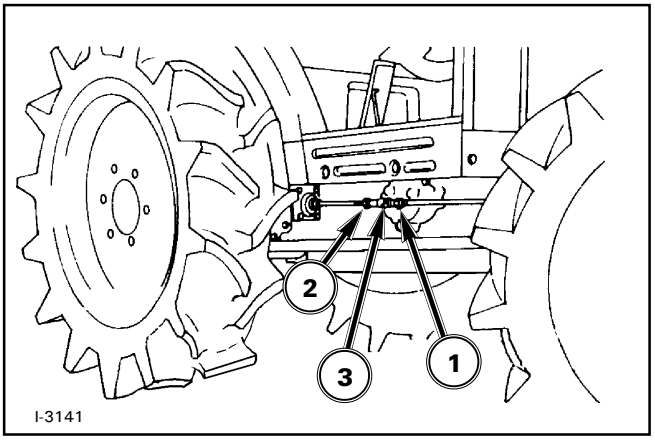



**FIG. 154**

## HYDROSTATIC ADJUSTMENTS

For adjustments of the hydrostatic linkage, see your dealer.

## WHEELS & TIRES

Examine wheels and tires periodically for correct inflation pressures, tight wheel bolts, and any physical damage that may be a detriment to Tractor operation and operator safety. Correct condition prior to Tractor operation.

### Tire Inflation Pressures

**FIG. 155:** Maintaining correct tire pressure will help insure tire long life. If tires have deep scratches, cuts or punctures, the respective tire should be repaired or replaced by qualified personnel as soon as possible.

*IMPORTANT: If necessary to replace any tire(s), ensure original tire size is used. This is particularly true on 4-WD models to ensure correct amount of front axle over-speed (or "lead") is maintained.*

| Type Tires | Tire Location/Size | Pressure PSI (KPA) |
|---|---|---|
| AG | Front 9.5-16 R1 | 31 (216) |
| | Rear 13.6-28 R1 | 20 (137) |
| Turf | Front 29x12.0 -15 R3 | 23 (157) |
| | Rear 475/65D-20 R3 | 11 (78) |
| R-4 | Front 10x16.5 | 30 (209) |
| | Rear 17.5L-24 | 20 (137) |
| LSW Golf | Front 27x12LL -15 | 35 (244) |
| | Rear LSW 570-648 | 6 (41) |

**FIG. 155**

### Wheel Bolt Torque

**FIG. 156:** Periodically check all wheel bolt torques. Correct bolt torques:

Front Wheel Bolts, 1 .. 120 ft.-lbs.(163N.m)

Rear Wheel Bolts, 2 ... 120 ft.-lbs.(163N.m)

Rear Wheel Center .... 120ft.-lbs.(163N.m) to Rim Bolts, 3

**CAUTION: Correct wheel bolt torque must be maintained. Installation of front mounted implements (ex; loaders) impose increased loads and require frequent checking of wheel bolts.**

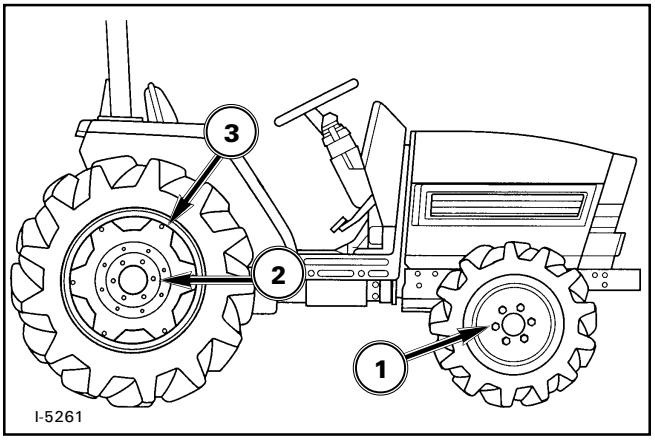



**FIG. 156**

## Front Wheel Alignment

**FIG. 157:** Correct "toe-in" dimension of front wheels (A minus B) is 0.08 to 0.24" (2-6 mm).

*NOTE: Measure toe-in from tire center to tire center at a point halfway up on face of each tire.*

To adjust, remove clip securing rubber boot to tie rod, 3. Loosen lock nut, 2, and rotate the tie rod, 3, to adjust. Tie rod ball joints, 1, should freely rotate in cylinder ends. Adjust each side evenly. Ball joints must move freely after lock nuts are tightened.

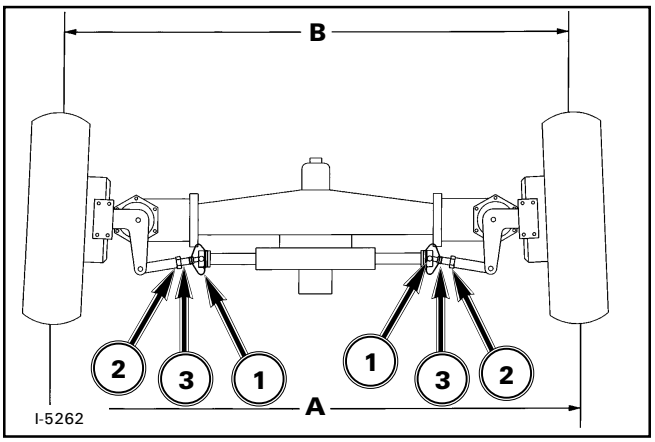



**FIG. 157**

## Wheel Spacing

Tread widths may be varied by using the following methods, as applicable. Tread widths are measured tire center to tire center as close to the ground as possible.

*NOTE: Make certain desired setting is compatible with implements to be used to prevent clearance and interference problems.*

**FIG. 158: Front 4-WD Wheels -** Due to design, agricultural tires or turf tires can not be reversed.

| Ref. | Tires | Setting |
|---|---|---|
| A | Ag | 51.8" (1315 mm) |
| | Turf | 53.0" (1345 mm) |
| | R-4 | 52.5" (1334 mm) |

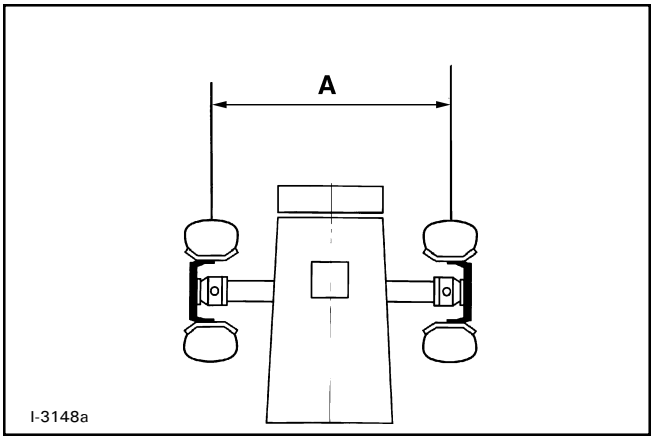



**FIG. 158**

**FIG. 159:** When installing ring, 1, on front wheels, make sure ring is installed as shown.

*NOTE: Ring is not required with R-4 (industrial tread) wheels.*

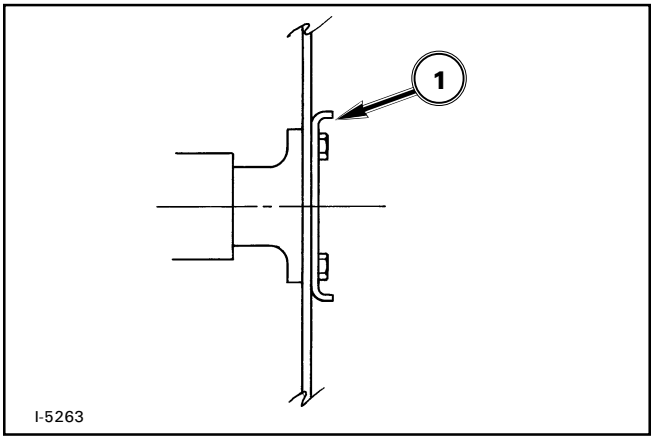



**FIG. 159**

## Agricultural-Type Rear Wheels

Four different rear tread width settings may be achieved by reversing wheel centers, switching rear tires and wheels from side to side, and/or by repositioning wheel rim on the wheel center.

*NOTE: Agricultural lug-type tires must always be installed so when viewed from the rear, the "V" pattern of the tread points upward.*

**FIG. 160:** To adjust rear tread width, jack Tractor sufficiently and securely block in raised position.

**To change rim offset -** Remove rim, 2, from wheel center, 1. Rotate wheel center slightly (so rim brackets can move past outer edge of wheel center) and reposition rim on opposite side of wheel center.

Repeat procedure with remaining side.

**To reverse entire wheel and tire assembly -** Raise both rear tires of Tractor. Remove bolts securing both rear wheel assemblies to rear axle hubs and switch wheel assemblies to opposite sides of Tractor

**CAUTION: Rear wheels are heavy. Use care when moving. Make sure Tractor is blocked securely.**

Tighten all wheel bolts securely and recheck after short period of operation.

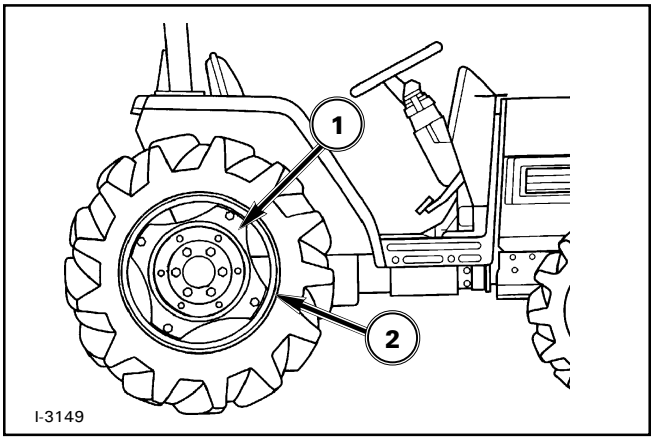



**FIG. 160**

**FIG. 161:** Agricultural and R.H. (adjustable) rear tire settings for 4-WD tractor models.

| Ref. | Tires | Setting |
|---|---|---|
| 1 | Ag | 45.7" (1160 mm) |
| 2 | Ag | 50.0" (1270 mm) |
| 3 | Ag | 53.5" (1360 mm) |
| 4 | Ag | 57.9" (1470 mm) |
| 2 | R-4 | 52.0" (1321 mm) |
| 3 | R-4 | 55.7" (1415 mm) |
| 4 | R-4 | 60.0" (1524 mm) |

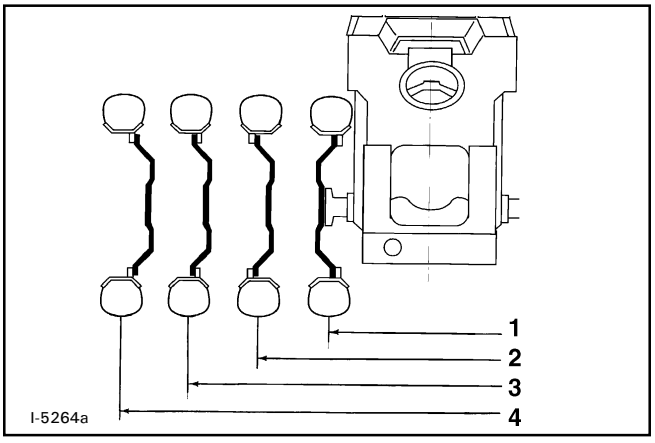



**FIG. 161**

**FIG. 162:** Turf and R-4 (non adjustable) rear tire setting for 4-WD tractors:

| Ref. | Tires | Setting |
|---|---|---|
| A | Turf | 53.7" (1365 mm) |
| | R-4 | 52.9" (1344 mm) |

*IMPORTANT: Rear turf and R-4 wheels cannot be reversed to "dished in" position. The valve stem will interfere and may be cut off.*

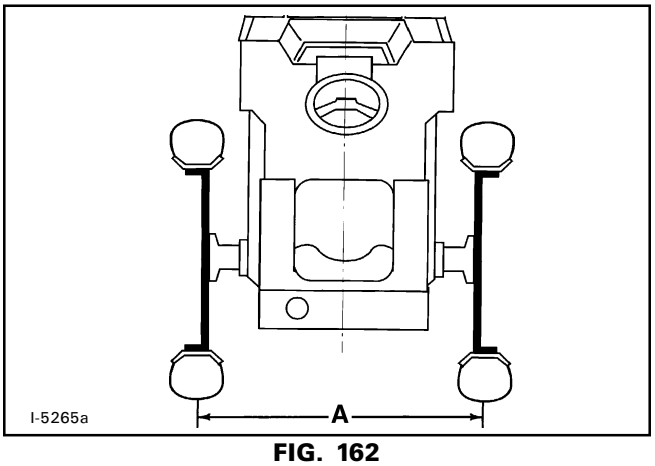



**FIG. 162**

## Steering Free-Play

**FIG. 163:** Steering should be checked for excessive looseness, as indicated by steering wheel free- play. Maximum free-play is approximately 1-1/4" (30 mm) when measured at outside of steering wheel rim.

Excessive free-play can be caused by:

- Loose or worn ball joints.
- Worn or damaged steering column shaft/universal joints.
- Air in steering system.
- Worn or damaged power steering unit.

**CAUTION: Excessive steering free-play must be corrected before use. Contact your Massey Ferguson Dealer.**

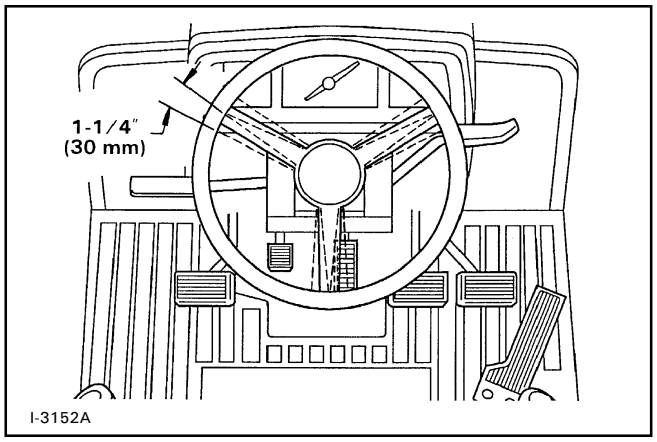



**FIG. 163**

## Front Axle End-Float (4-WD)

**FIG. 164:** Fore and aft play of front drive axle, 1, in its supports should be 0.004-0.012" (0.1-0.3 mm). End float is measured with axle raised off ground.

Loosen lock nut, 2, and turn adjusting bolt, 3, as needed to achieve correct measurement. Tighten lock nut.

*NOTE: Excessive end-float will cause noise. This noise will be more pronounced when using 4-WD.*

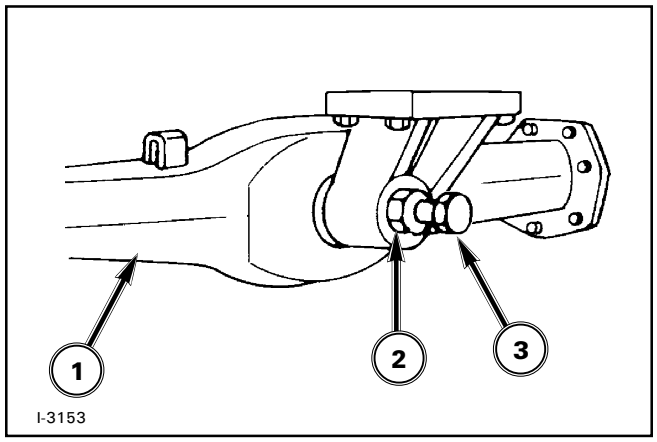



**FIG. 164**

## CLUTCH HOUSING PLUG

Pipe plug should be removed from bottom of clutch housing once a year or when clutch slipping is apparent. Any oil leakage from engine rear crankshaft seal and/or transmission input will be indicated by oil draining through hole. Contact your Massey Ferguson Dealer if oil leakage is evident.

## TORQUE CHART

**FIG. 165:** All fasteners should be tightened in accordance with torque chart unless a specific torque value is called out in relevant maintenance information.

| | 4T | | 7T | |
|---|---|---|---|---|
| | ft.-lbs. | N.m | ft.-lbs. | N.m |
| M6 | 4.3 - 5.7 | 5.8 - 7.7 | 7.2 - 9.3 | 9.8 - 12.6 |
| M8 | 9.3 - 13.0 | 12.6 - 17.6 | 18.0 - 25.2 | 24.4 - 34.2 |
| M10 | 14.4 - 21.6 | 19.5 - 29.3 | 39.7 - 50.5 | 53.8 - 68.5 |
| M12 | 36.1 - 43.3 | 48.9 - 58.7 | 65.0 - 79.4 | 88.1 - 107.7 |
| M14 | 50.5 - 57.8 | 68.5 - 78.4 | 93.9 - 108.4 | 127.3 - 147.0 |
| M16 | 72.2 - 86.7 | 97.9 - 117.5 | 115.6 - 130.0 | 156.7 - 176.3 |
| M18 | 86.7 - 101.1 | 117.5 - 137.0 | 144.5 - 173.4 | 195.9 - 235.0 |
| M20 | 108.4 - 122.8 | 146.0 - 166.5 | 173.4 - 187.8 | 235.0 - 254.6 |

I-3163

**FIG. 165**

## STORAGE

**FIG. 166:** If Tractor is to be stored for extended periods, such as off-season nonuse, certain measures should be taken for its preservation during such periods. These measures will vary according to geographical area and storage season.

1. Replace engine oil and filter. Operate at low idle five minutes to lubricate parts.
2. Lubricate all grease fittings and lightly oil control linkage pivots.
3. Detach implements.
4. Store Tractor in enclosed area, if possible, for protection from weather.
5. Block up Tractor to remove weight from tires and to protect tires from oily or damp floor.
6. Raise and lock three-point lift linkage in up position by turning lowering rate control knob, 6, fully clockwise.

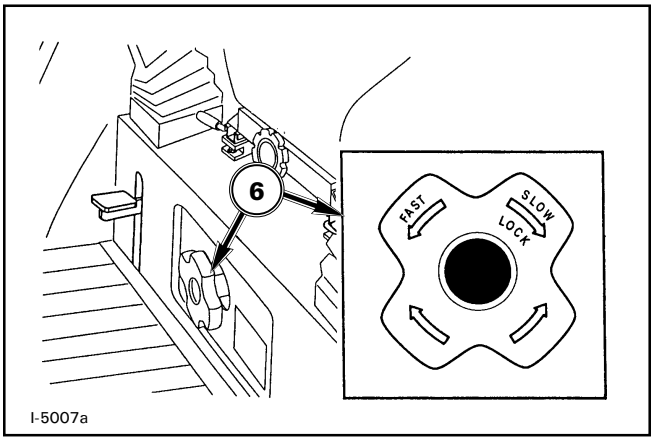


FIG. 166

**FIG. 167:** Step 7 - Fill fuel tank to prevent condensation from forming on inside of tank. Turn filter valve, 7, to OFF position (handle to rear).

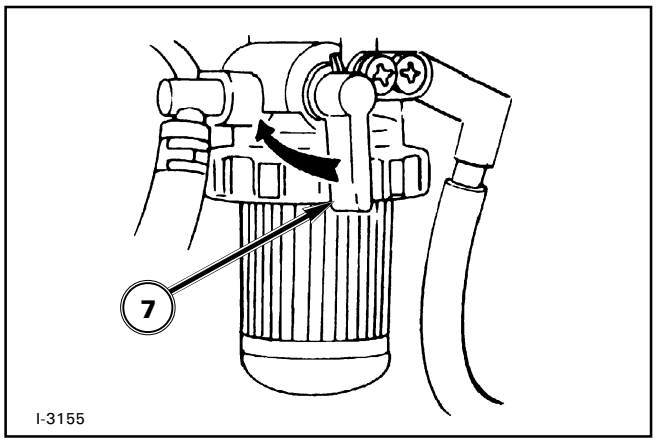


FIG. 167

8. Remove battery and store in cool dry place. Maintain charge during storage period.
9. If Tractor is stored during cold weather season insure that antifreeze is adequate. Alternatively, radiator and engine block may be drained.
10. Check with your diesel fuel supplier on the availability of a diesel fuel additive to place in the fuel system during storage period.
11. If Tractor cannot be placed in an enclosed area place it under some sort of cover and cover exhaust pipe to prevent entrance of rain or snow.

**FIG. 168:** Step 12 - Depress clutch pedal (except HST) and secure in the disengaged position with hook, 12.

*NOTE: This is to prevent clutch seizure during long periods of Tractor storage.*

13. Touch up scratches with paint.

At the end of storage period;

Perform appropriate lubrication and maintenance before placing Tractor back in service. See “Lubrication and Maintenance” section.

- Conduct full pre-start inspection. Make sure all controls operate correctly.
- Allow engine to idle approximately 30 minutes. Check for leaks and repair as required.

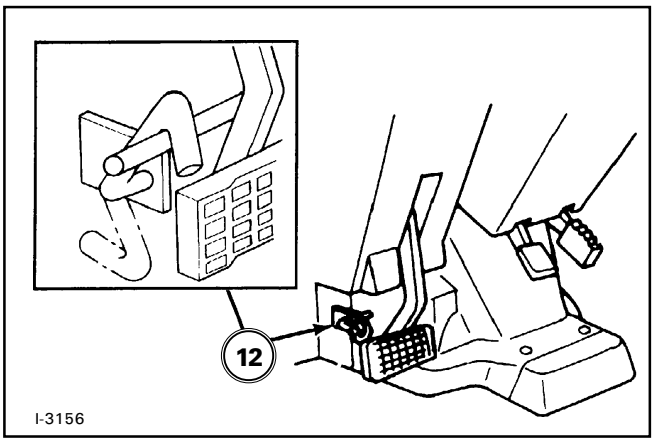


FIG. 168

# TROUBLESHOOTING

## ENGINE

| Problem | Possible Cause | Remedy |
|---|---|---|
| Starter motor does not operate with key turned to START | Gear shift lever not in neutral | Place gear shift lever in neutral. |
| | PTO clutch engaged | Switch off PTO. |
| | Broken safety switch | Consult your Dealer. |
| | Discharged battery | Charge battery. |
| | Loose or dirty terminals | Clean and retighten securely. |
| | Broken main switch | Consult your Dealer. |
| | Broken starter | Consult your Dealer. |
| Starter motor operates but not at full speed | Discharged battery | Charge battery. |
| | Loose or dirty terminals | Clean and retighten securely. |
| | Defective ground | Clean and tighten starter mounting. |
| | Improper oil viscosity | Replace with oil of proper viscosity. |
| | Defective engine | Consult your Dealer. |
| Starter motor operates but engine does not start | Electric fuel control not operating | Consult your Dealer. |
| | Air in fuel system | Air-bleed fuel system. |
| | Clogged fuel filter | Clean filter. |
| | Fuel is not being supplied | Check fuel level, open fuel valve. |
| | Incorrect preheating procedure | Longer use of glow plugs. |
| | Defective engine | Consult your Dealer. |
| Irregular engine running | Air in fuel system | Air-bleed fuel system. |
| | Clogged fuel filter | Clean filter. |
| | Clogged fuel injectors | Consult your Dealer. |
| | Fuel line is leaking air | Retighten clamps, replace defective pipes. |
| | Fuel injection pump timing | Consult your Dealer. |
| | Defective engine | Consult your Dealer. |
| When decelerated, engine stops | Incorrect low idle setting | Consult your Dealer. |
| | Malfunctioning fuel injection pump | Consult your Dealer. |
| | Improper valve clearance | Consult your Dealer. |
| Engine over-speeds | Defective fuel injectors | Consult your Dealer. |
| | Defective governor | Consult your Dealer. |
| | Incorrect high speed setting | Consult your Dealer. |
| | Engine oil is getting into combustion chambers | Consult your Dealer. |

## ENGINE (CONTINUED)

| Problem | Possible Cause | Remedy |
|---|---|---|
| Engine stops unexpectedly during operation | Insufficient fuel supply | Top up fuel and air-bleed fuel system. |
| | Defective fuel injectors | Consult your Dealer. |
| | Defective fuel injection pump | Consult your Dealer. |
| | Engine seizure due to low or poor oil | Consult your Dealer. |
| Engine overheats | Insufficient coolant | Top up coolant. |
| | Broken or loose fan belt | Adjust belt tension or replace. |
| | Clogged grille, radiator screens | Clean. |
| | Clogged radiator fins | Clean. |
| | Defective thermostat | Replace. |
| | Insufficient engine oil | Inspect oil level and replenish if necessary. |
| Exhaust fumes are white | Clogged air cleaner | Clean or replace element(s). |
| | High engine oil level | Inspect oil level and correct. |
| | Insufficient fuel delivery | Consult your Dealer. |
| | Cold-running engine | Allow to warm, check thermostat. |
| Exhaust fumes are too black | Poor fuel | Replace with better grade. |
| | Excessive fuel delivery | Consult your Dealer. |
| | Insufficient fuel injector pressure | Consult you Dealer. |
| | Insufficient combustion air | Check clean or replace air filter. |
| Poor engine output | Seized fuel injectors and/or carbon deposit | Consult your Dealer. |
| | Insufficient compression or leaking valves | Consult your Dealer. |
| | Incorrect valve clearances | Consult your Dealer. |
| | Incorrect fuel injection timing | Consult your Dealer. |
| | Insufficient fuel supply | Check fuel system. |
| | Clogged air cleaner | Clean or replace elements(s). |
| Oil pressure monitor is lit during operation | Insufficient engine oil | Replenish. |
| | Too low oil viscosity | Replace with oil of proper viscosity. |
| | Defective pressure switch | Replace. |
| | Clogged oil filter | Replace element cartridge. |
| | Defective oil pump | Consult your Dealer. |
| Charging monitor is lit during operation | Defective wiring | Correct loose or dirty terminals, short circuit, poor etc. |
| | Defective alternator | Consult your Dealer. |
| | Defective regulator | Consult your Dealer. |
| | Low electrolyte level or defective battery | Correct electrolyte level or replace battery. |
| | Loose or damaged fan belt | Adjust belt tension or replace. |

## CLUTCH

| Problem | Possible Cause | Remedy |
|---|---|---|
| Clutch slips | Poor clutch pedal adjustment | Adjust free-play. |
| | Worn or burnt clutch lining | Consult your Dealer. |
| | Engine, transmission oil leak | Consult your Dealer. |
| Clutch won't disengage | Poor pedal adjustment | Adjust free-play. |
| | Seized clutch lining | Consult your Dealer. |
| | Transmission shafts seized | Consult your Dealer. |

## BRAKES

| Problem | Possible Cause | Remedy |
|---|---|---|
| Brakes do not work well or not balanced with each other when applied | Too much free play of pedals | Adjust free-play. |
| | Worn or seized linings | Consult your Dealer. |
| | Different pedal strokes | Correct so both pedals are equal. |
| Brake pedals do not return smoothly | Broken return springs | Replace broken springs. |
| | Poor lubrication | Remove rust, then lubricate. |

## HYDRAULIC SYSTEM

| Problem | Possible Cause | Remedy |
|---|---|---|
| Insufficient oil pressure | Low engine speed | Increase speed. |
| | Low transmission oil | Fill to specified level. |
| | Intake piping is sucking air | Retighten clamps or replace cracked pipes and defective o-rings. |
| | Clogged oil filter(s) | Clean or replace. |
| | Defective hydraulic oil pump | Consult your Dealer. |
| | Defective control valve | Consult your Dealer. |
| | Broken cylinder | Consult your Dealer. |
| Leaking piping | Loose joints | Retighten. |
| | Cracked pipes | Replace pipes, o-rings. |
| With control lever in RAISE position, relief valve blows | Poorly adjusted rod on position control lever | Correct rod adjustment. |
| Three-point hitch does not lower | Locked lowering speed control knob | Turn counterclockwise to LOWERING position. |
| | Defective control valve | Consult your Dealer. |
| | Broken cylinder | Consult your Dealer. |
| | Seized lift shaft bearing | Consult your Dealer. |

## STEERING SYSTEM

| Problem | Possible Cause | Remedy |
|---|---|---|
| Steering wheel is hard to turn or turns in one direction | Poorly installed steering column | Correct |
| | Air in steering hydraulic system | Air-bleed steering system |
| | Clogged suction filter | Remove and clean |
| | Improper toe-in | Correct |
| | Different front tire inflation | Inflate both tires to same pressure |
| | Loose steering or ball joints | Retighten or replace defective parts |
| | Defective steering unit, pump | Consult your Dealer |
| Steering wheel has too much free-play | Worn steering column | Consult your Dealer |
| | Loose ball joints | Retighten |
| | Defective steering unit | Consult your Dealer |

## ELECTRICAL SYSTEM

| Problem | Possible Cause | Remedy |
|---|---|---|
| Battery cannot be charged | Blown fuse | Check fuse and replace. |
| | Defective wiring | Correct loose, dirty terminals, short circuit, poor ground, etc. |
| | Loose or damaged fan belt | Give belt proper tension or replace. |
| | Defective battery | Correct loose terminal connection, corrosion, or eletrolyte level. |
| | Defective alternator | Consult your Dealer. |
| | Defective regulator | Consult your Dealer. |
| Head lamps are dim | Discharged battery | Charge battery, check charging system |
| | Poor connections | Check ground points and terminals. Clean and tighten. |
| Particular function will not operate | Burnt bulb (as applicable) | Replace. |
| | Blown fuse | Check fuse and replace. |
| | Poor contact | Inspect ground points and terminals, clean if necessary. |
| | Defective switch | Replace as required. |

## HYDROSTATIC TRANSMISSION

| Problem | Possible Cause | Remedy |
|---|---|---|
| Tractor does not move | Parking brake applied | Release |
| | Too low engine rpm | Accelerate engine |
| | Low transmission oil level | Fill to upper level |
| | Air trapped in system | Consult Dealer |
| | Improper adjusted hydro pedals | Consult Dealer |
| | Clogged hydraulic filter | Replace |
| | Clogged suction filter | Replace |
| | Defective hydrostatic unit | Consult Dealer |
| Tractor creeps without hydro pedals being operated | Stuck neutral arm | Consult Dealer |
| | Incorrect neutral adjustment | Consult Dealer |
| | Defective hydrostatic unit | Consult Dealer |

# ASSEMBLY & PRE-DELIVERY INSPECTION

*IMPORTANT: Do not commence assembly of this Tractor until reading these instructions completely and carefully.*

*NOTE: For certain lubrication, adjustments, etc., refer to appropriate section of this booklet. All nuts, bolts, etc., on these Tractors are in METRIC dimensions.*

Tractor is shipped in individual container. The Tractor will be partially disassembled to make container as compact as possible. Wheels, fenders, ROPS, steering wheel, lift linkage, drawbar, and some attaching hardware will be removed.

Larger items will be fastened in container and remainder of items will be shipped in sundry boxes also in container.

Certain areas of Tractor may be covered with thin film of protective wax. It may be removed by steam cleaner and detergent solution during assembly.

Tractors will arrive with battery installed.

To assemble and pre-deliver the Tractor, proceed as follows:

**CAUTION: Be observant of components (wheels, ROPS, etc.) that may be attached to, or held in position by container panels.**

1. Disassemble four sides from container.
2. Remove sundry boxes from container.
3. Remove front bumper, drawbar, exhaust pipe and seat from container.
4. Inspect Tractor for damage and any evidence of coolant, fuel or lubricant leaks.
5. Inspect and remove all hardware securing Tractor to lower crate panel.

**CAUTION: ROPS (Roll-Over Protective Structure) and seat belts must be installed. Refer to the procedure that follows.**

## ROLL OVER PROTECTIVE STRUCTURE (ROPS) AND SEAT BELTS

**CAUTION: ROPS securing hardware is of increased hardness. If replacements are required, hardware of matching specification must be used.**

Parts included for ROPS assembling.

| No. | Name | Qty. |
|---|---|---|
| 1 | Lower Frame/LH | 1 |
| 2 | Lower Frame/RH | 1 |
| 3 | Upper Frame | 1 |
| 4 | Bolt (M16) | 4 |
| 5 | Washer (M16) | 2 |
| 6 | Nut (M16) | 2 |
| 7 | Pin | 2 |
| 8 | Linchpin | 2 |
| 9 | O-ring | 2 |
| 10 | Insulator | 2 |
| 11 | Bolt (M12) | 8 |
| 12 | Nut (M12) | 8 |
| 13 | Bracket | 1 |
| 14 | Bolt (M10) | 8 |
| 15 | Spring Washer (M10) | 8 |

*NOTE: Check quantity before assembling.*

**FIGS. 169, 170 & 171:** 5. Build up the frame as follows:

a. Mount lower frame of left-hand and right-hand, 1 & 2 on axle (rear)

b. Fix the frame and install the bracket, 13

c. Tighten the bolts by correct torque as indication.

d. Position upper frame with washers, 5, and nuts, 6, to inside. Clevis pins, 7, and linchpins, 8, should be installed at front frame, with linch pins to inside.

*NOTE: Clevis pins and linchpins are each fitted with O-ring, 9, to prevent ratting, In addition, rubber pad (insulator), 10, is installed between mating surfaces to reduce noise.*

e. Install safety decal inside ROPS on left side near PTO engagement lever.

| Ref | Torque |
|---|---|
| A | 38 – 50 ft-lbs (51 – 66 Nm) |
| B | 85 ft-lbs (116 Nm) |
| C | 65 – 80 ft-lbs (90 – 105 Nm) |

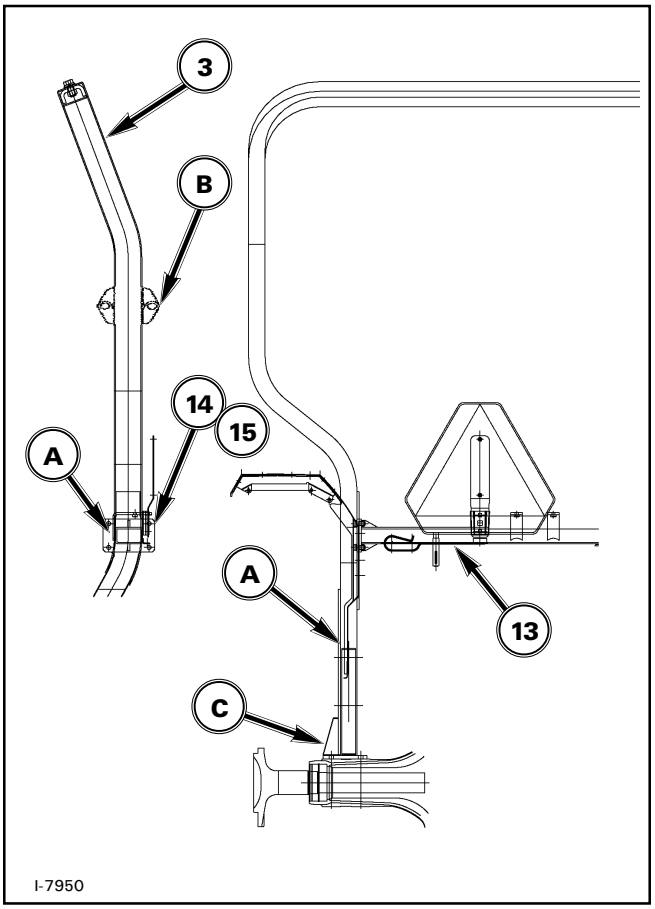



FIG. 169

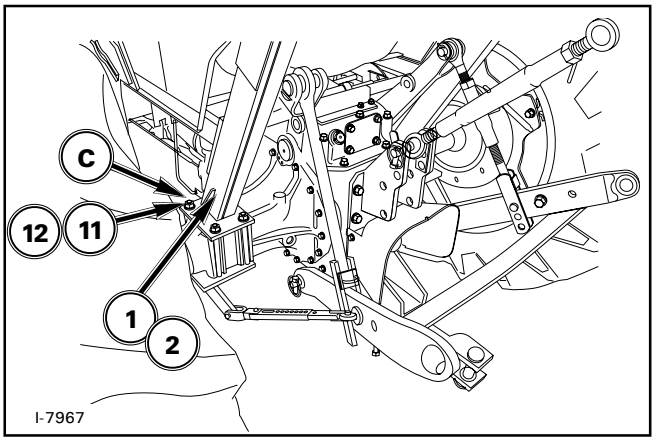



FIG. 170

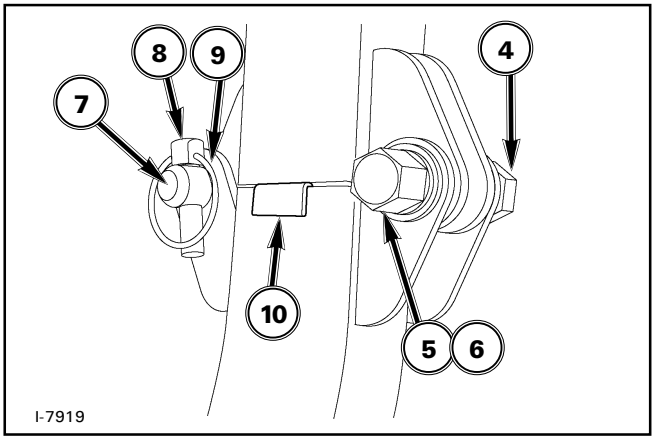



FIG. 171

**Seat Belt**

**FIG. 172:** Step 6 - Seat belts, 1 and 2, are installed at factory. Make sure both belts are securely anchored to seat bracket. Seat belts must be used by operator whenever ROPS is installed.

7. Warning Flashers - Install amber turn/warning lights to top of each fender as follows:

   a. Remove nut, internal lock washer and ground wire from light.

   b. Insert bolt with center wire down through hole in fender, and reinstall ground wire, internal lock washer and nut. Tighten nut.

   c. There are three wires, with single connectors, coming out at top rear of fenders. Two wires are the same length. They attach to wires from warning/flasher light. Male and female couplers prevent improper installation.

   d. The remaining connector is used if a work light or radio is installed.

8. Carefully raise and block front of Tractor.

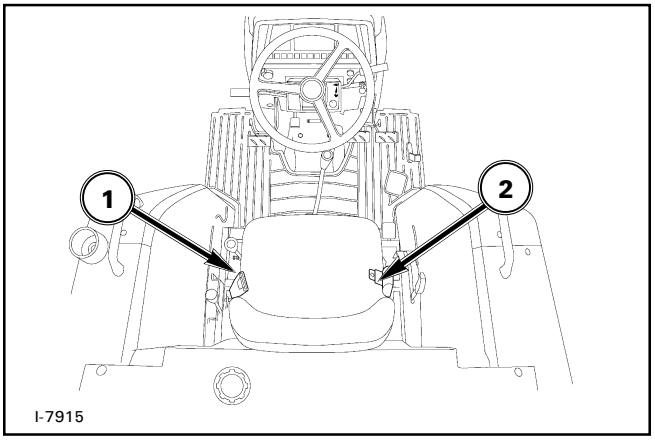



**FIG. 172**

**FIG. 173:** Step 10 - Install front wheel/tire assemblies and secure using reinforcing ring, 1, with lock washers and nuts on studs and/or bolts and lock washers in remaining holes (as applicable). Tighten to 75 ft-lbs. (102 Nm).

*NOTE: Ring is not required when R-4 (industrial tread) wheels are installed.*

11. Remove blocking and lower front of Tractor.

12. Carefully raise and block rear of Tractor at each side to prevent pivoting of front axle.

13. Install rear wheel/tire assemblies and secure using lock washers and bolts. Tighten to 120 ft-lbs. (163 Nm).

*NOTE: For clearance, rear turf wheels and tires must be installed to "dished-out" (sider) position.*

14. After wheels have been installed, place front wheels in a straightforward position.

15. Remove cotter pin, nut and flat washer from steering wheel shaft.

16. Use a screw driver or flat blade to pry between steering wheel and cap to remove cap.

*IMPORTANT: Don't use a punch through hole in steering wheel to remove cap. It will separate the center emblem from cap.*

17. Set steering wheel on splined steering shaft with spokes in a "Y" position when viewed from seat (wheels straight). This will provide operator with an excellent view of gauges.

18. Install center cap with emblem correctly positioned for drivers view.

19. Install front bumper.

20. Install 1/8" pipe plug into hole in bottom of clutch housing.

21. Plastic Covering - Remove all plastic covering from front nose, instrument console, decals and gauges, each side of side frames, and fuel cap.

22. Three-Point Hitch -

    a. Lower links are secured to Tractor attaching points and secured with lynch pins. Lower links will flare outward at rear.

    b. Attach lift rod assemblies to lift arms on Tractor using 22 mm x 85 mm clevis pins and cotter pins. Install pins from outside. Secure lower ends of lift rods to identical positions on lower links using 16 mm x 51 mm clevis pin and hair pin (refer to fig. 102 for details).

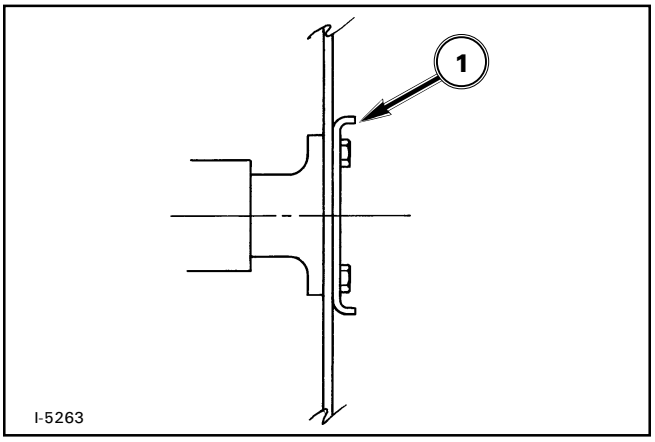



**FIG. 173**

**FIG. 174:** Step 21 – Drawbar: Install drawbar, 1, into bracket at rear of tractor and secure with pin and clip provided.

22. Exhaust Pipe – Install vertical exhaust pipe through hole in hood center section and clamp to muffler. Outlet (upper end) opening should be positioned toward right side.

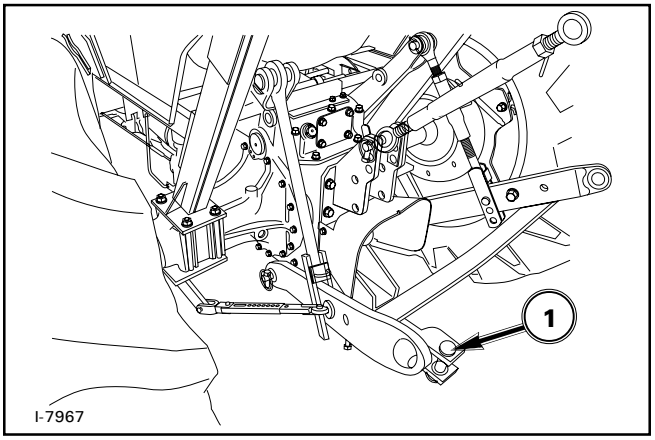



**FIG. 174**

## PRE-DELIVERY

- Check that engine oil level is correct.
- Check that coolant level is correct.
- Check fan belt tension, 1/2" (13 mm) deflection, when subjected to a force of thumb pressure.
- Check that transmission oil level is correct.
- Install a sufficient amount of No. 2 diesel fuel to complete pre-delivery service.
- Ensure clean and tight cable connections at battery. Battery must be securely mounted.
- Check air cleaner, elements, hoses and clamps for correct installation.
- Check brake and clutch pedal linkage for correct free-travel.
- Check steering, brake and clutch linkage cotter pins and lock nuts for secure installation.
- Check filter element and, all connections and clamps for hydraulic pump and filter.
- On 4-WD models, check oil level in front drive axle.
- Place fuel filter shutoff valve in the “ON” position.
- Take up position in operator’s seat and engage parking brake.
- Place all shift levers in neutral and then depress clutch pedal.
- Place rear PTO selector lever in neutral and place PTO control switch in off.

*NOTE: Engine will not start unless gear shift lever is in neutral and PTO control switch is off*

- Set throttle lever at half to full throttle and turn main switch counterclockwise 5-10 seconds until glow indicator glows red.
- Turn main switch clockwise to “ON.” Oil pressure and alternator warning lights will illuminate. Hold in “on” position 1-2 seconds.
- Turn main switch to “Start” to crank the engine. Release key to “ON” position the moment engine starts. Check that warning lights go out.
- Allow engine to warm up to operating temperature at about 1500 rpm.
- Operate Tractor to confirm it operates smoothly at all speeds including four-wheel drive (if so equipped).
- Operate PTO to see that it functions properly.
- Check that all lights and instruments operate properly.
- Check brakes for balanced operation.
- Check warm engine low idle speed, 950 rpm.
- Check warm engine high idle speed, 2750 rpm.
- Set throttle lever at idle, shut off engine and check Tractor for coolant, lubricating oil or fuel leaks.
- Check that safety start system functions correctly.
- Lubricate all fittings.
- Check tire inflation pressures.
- Check front wheel toe-in.
- Test antifreeze to see that it is adequate for local climate conditions.

*NOTE: Factory fill is set to -30º F (-34º C).*

- Check to see that all safety decals and safety switches are in place.
- Clean and polish sheet metal as necessary.
- Fill fuel tank to prevent moisture accumulation.
- Review this Operator’s Book with the customer when delivering or demonstrating Tractor.

# SPECIFICATIONS

**ENGINE**

| | |
|---|---|
| Make | Iseki Diesel |
| Model | E4-CG |
| Type | Indirect injection, overhead valve |
| Aspiration | Natural |
| Displacement | 134.1 cu. in. (2197 cc) |
| Number of Cylinders | 4 |
| Bore | 3.43" (87 mm) |
| Stroke | 3.64"(92.4 mm) |
| Engine Horsepower (Gross) | 44.2 (33.0 kw) @ 2500 rpm |
| (Net) | 42.4 (31.6 kw) @ 2500 rpm |
| PTO Horsepower (Estimate) STD & Power Shuttle | 37.0 (27.6 kw) @ 565 PTO rpm |
| PTO Horsepower (Estimate) Hydrostatic | 36.0 (26.9 kw) @ 565 PTO rpm |
| Firing Order | 1-3-4-2 |
| Compression Ratio | 21.8 to 1 |
| Low Idle Speed | 950 rpm |
| High Idle Speed | 2750 rpm |
| Valve Clearance (Cold); Intake | .014" (0.35 mm) |
| Exhaust | .014" (0.35 mm) |
| Air Cleaner | Dual stage, dry element |
| Engine Cooling | Liquid, forced circulation |
| Cold Starting Aid | Glow plugs (4) |

**TRANSMISSION - STANDARD AND POWER SHUTTLE**

| | |
|---|---|
| Type; Primary | 4-speed fully synchronized, constant mesh |
| Range | 4-speed constant mesh |
| Shuttle; Manual | Synchronized, 95% reverse reduction |
| Power Shuttle | Electrohydraulic control with multi-plate wet disc, 95% reverse reduction |
| Gear Speeds | 16 gears forward, 16 reverse |
| Clutch | Split torque, single stage dry with 10.2" (260 mm) disc |
| Brakes | Mechanically actuated sealed wet disc |

**TRANSMISSION - HYDROSTATIC**

| | |
|---|---|
| Type; Primary | Infinite |
| Range | 2 speed constant mesh, 2 motors |
| Gear and Motor speeds | 4F/4R |
| Clutch | None |
| Brakes | Mechanically actuated sealed wet disc |

**POWER TAKEOFF (PTO)**

Type ..... Independent, engine driven

Control ..... Electrohydraulic control

Clutch ..... Hydraulically engaged, multi-plate wet disc

Rear PTO; Shaft ..... 1.375" (35 mm) diameter, six spline

Output ..... Clockwise rotation

Engine Speed @ 540 PTO rpm ..... 2391 rpm

**MID PTO OPTIONAL HYDROSTATIC**

Shaft ..... 1" (25.4mm) diameter, 15 spline

Output ..... Clockwise rotation (as view from end of shaft)

Engine Speed @ 2000 PTO rpm ..... 2460 rpm

**HYDRAULICS**

Steering System; Type ..... Hydrostatic (power)

Pump ..... Engine-mounted gear pump

Maximum Output ..... 5.2 U.S. gals/min (19.8 l/min)

Pressure ..... 2485 psi (17,134 kPa)

Main Hydraulic System; Pump ..... Engine-mounted gear pump

Maximum Output ..... 7.4 U.S. gals./min. (28.0 l/min.)

Pressure ..... Relief valve setting 2321 psi (16,003 kPa)

Rear Linkage; Type ..... Three-point hitch

Size ..... Category I

Control ..... Position and draft control

Draft Control ..... Top link sensing

Lift Capacity ..... 3083 lbs. (1400 kg) measured at ball ends

Hydrostatic Pressure ..... 4970 psi (350kg/cm²)

**ELECTRICAL SYSTEM**

System Voltage ..... 12 volt, negative (-) ground

Battery cca @ 0° F (-18°) ..... 622 cca

Charging ..... 45 amp alternator with internal regulator/rectifier

**CAPACITIES**

Engine Crankcase with Filter ..... 8.5 U.S. qts. (8.0 liters)

Transmission:

Manual Shuttle ..... 8.7 U.S. gals. (33.0 liters)

Power Shuttle & Hydrostatic ..... 9.2 U.S. gals. (35.0 liters)

Fuel Tank ..... 12.7 U.S. gals. (48.0 liters)

Cooling system ..... 11.1 U.S. qts. (10.5 liters)

### TREAD WIDTH SETTINGS

Front 4-WD

| | |
|---|---|
| Ag. Tires (“Dished In” Only) | 51.8" (1315 mm) |
| Turf Tires (“Dished In” Only) | 53.0" (1345 mm) |
| R-4 Industrial Tread (“Dished In” Only) | 52.5” (1334 mm) |

Rear 4-WD

| | |
|---|---|
| Ag. Tires (Adjustable Wheels) | 45.7" (1160 mm), 50.0" (1270 mm) 53.5" (1360 mm), 57.9" (1470 mm) |
| Turf Tires (“Dished Out” Only) | 53.7" (1365 mm) |
| R-4 Industrial Tread (“Dished Out” Only) (Non Adjustable) | 52.9” (1344 mm) |
| R-4 Industrial Tread (“Dished Out” Only) (Adjustable) | 52.0” (1321 mm), 55.7” (1415 mm) 60.0 (1524 mm) |

### MAXIMUM AXLE LOADING

| | |
|---|---|
| Front 4-WD | 3967 lbs. (1800 kg) |
| Rear Axle | 4631 lbs. (2100 kg) |

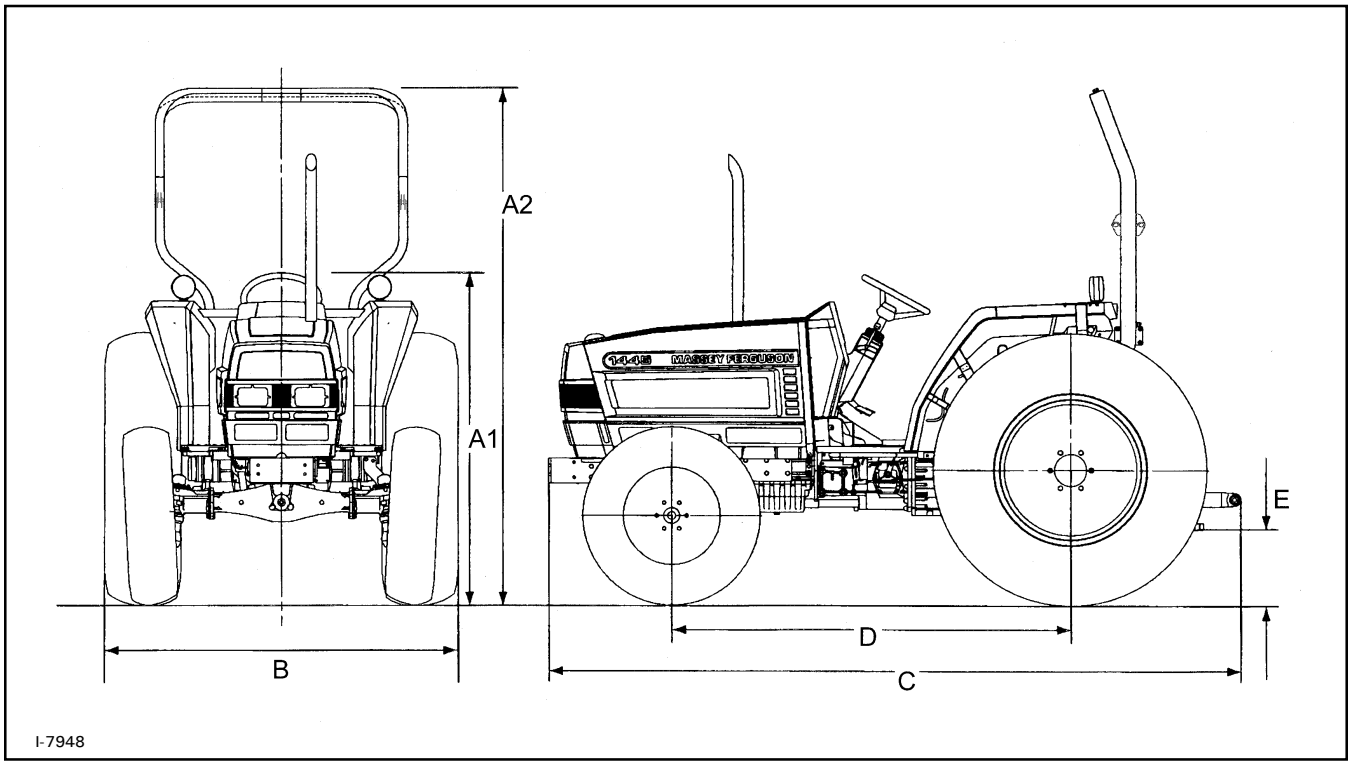



**FIG. 175**

| Reference | MF 1445 MANUAL SHUTTLE | | | MF 1445 POWER SHUTTLE | | | MF 1445 HYDROSTATIC | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ag. 4-WD | Turf 4-WD | R-4 | Ag. 4-WD | Turf 4-WD | R-4 | Ag. 4-WD | Turf. 4-WD | R-4 |
| A1 | 61.8" (1570 mm) | 58.3" (1480 mm) | 60.4″ (1535 mm) | 61.8" (1570 mm) | 58.3" (1480 mm) | 60.4″ (1535 mm) | 61.8" (1570 mm) | 58.3" (1480 mm) | 60.4″ (1535 mm) |
| A2 | 97.2" (2470 mm) | 93.7" (2380 mm) | 95.9″ (2435 mm) | 97.2" (2470 mm) | 93.7" (2380 mm) | 95.9″ (2435 mm) | 97.2" (2470 mm) | 93.7" (2380 mm) | 95.9″ (2435 mm) |
| B | 64.6" (1640 mm) | 72.0" (1830 mm) | 71.5″ (1816 mm) | 64.6" (1640 mm) | 72.0" (1830 mm) | 71.5″ (1816 mm) | 64.6" (1640 mm) | 72.0" (1830 mm) | 71.5″ (1816 mm) |
| C | 138.0" (3505 mm) | 138.0" (3505 mm) | 138.0" (3505 mm) | 140.9" (3580 mm) | 140.9" (3580 mm) | 140.9" (3580 mm) | 138.0" (3505 mm) | 138.0" (3505 mm) | 138.0" (3505 mm) |
| D | 73.0" (1855 mm) | 73.0" (1855 mm) | 73.0" (1855 mm) | 76.0" (1930 mm) | 76.0" (1930 mm) | 76.0" (1930 mm) | 73.0" (1855 mm) | 73.0" (1855 mm) | 73.0" (1855 mm) |
| E | 12.0" (305 mm) | 8.5" (215 mm) | 12.0″ (305 mm) | 12.0" (305 mm) | 8.5" (215 mm) | 12.0″ (305 mm) | 12.0" (305 mm) | 8.5" (215 mm) | 12.0″ (305 mm) |
| Turning radius w/o brake | 129.9" (3300 mm) | 129.9" (3300 mm) | 129.9" (3300 mm) | 133.9" (3400 mm) | 133.9" (3400 mm) | 129.9" (3300 mm) | 133.9" (3400 mm) | 133.9" (3400 mm) | 129.9" (3300 mm) |
| Turning radius w/brake | 102.4" (2600 mm) | 102.4" (2600 mm) | 102.4" (2600 mm) | 106.3" (2700 mm) | 106.3" (2700 mm) | 102.4" (2600 mm) | 106.3" (2700 mm) | 106.3" (2700 mm) | 102.4" (2600 mm) |
| Weight | 3733 lbs. (1694 kg) | 3667 lbs. (1644 kg) | 3820 lbs. (1773 kg) | 3777 lbs. (1714 kg) | 3711 lbs. (1684 kg) | 3864 lbs. (1753 kg) | 3831 lbs. (1738 kg) | 3765 lbs. (1708 kg) | 3918 lbs. (1778 kg) |

# ACCESSORIES

**Canopy** — Sunshade that attaches to ROPS to improve operator comfort. NOT to be used for protection from falling objects.

**Engine Block Heater** — Installed into engine block coolant cavity, through expansion plug opening, to assist starting in colder ambient temperatures.

**Rear Work Light(s)** — Attaches to rear of ROPS to illuminate implement for night use. With separate control switch.

**Rear Weight Frame** — Attaches to rear of Tractor on 3-point hitch, allowing hang-on weights to be installed. Maximum of fourteen (14) weights recommended.

**Hang-On Weights** — For installation on front of Tractor or on rear weight frame above. Each weight weighs 25 lbs. (11.3 kg).

**Single or Two Spool Auxiliary Valve** — Valve installed on right side of Tractor and incorporated into existing Tractor hydraulic system to provide one or two, single/double-acting remote hydraulic circuits for implement operation.

**Extra TURF Wheels and Tires** — For Tractors originally equipped with agricultural-type or R-4 industrial tread tires.

**Implements and Attachments** — Your Massey Ferguson Dealer offers a complete line of implements and attachments, such as; mowers, loaders, backhoes, tillers and numerous ground-engaging tools, to fulfill your needs. Please check with him on your requirements and he will be happy to show you his full line of “matched” equipment.

# AGCO CORPORATION
# FEDERAL AND CALIFORNIA EMISSION WARRANTY
# FOR CERTIFIED NON-ROAD ENGINES

The engine in this equipment was manufactured by Iseki Matsuyama Mfg. Co., Ltd. (Iseki), which is responsible for emissions warranty coverage for all Iseki non-road engines that have been certified as in conformity with applicable requirements of the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB). You can determine whether this engine is EPA and CARB-certified if there is a label on the engine or the equipment stating that "This engine conforms to [current model year] U.S. EPA and California regulations for non-road compression ignition engines". Since AGCO Corporation (AGCO) is the U.S. importer and distributor of this equipment, comprehensive service for this equipment, including all service covered by this warranty, is provided in the U.S. by AGCO.

## WARRANTY STATEMENT

AGCO warrants to the initial purchaser and each subsequent owner that the engine in this equipment is designed, built, and equipped to conform at the time of initial sale to all applicable regulations of EPA and CARB, and that the engine is free of defects in materials and workmanship that would cause it to fail to conform with EPA or CARB regulations during its warranty period. This warranty is effective in all states.

## WARRANTY PERIOD

The warranty period for this engine begins on the date of sale to the initial ultimate purchaser and continues for a period of five (5) years or 3,000 hours for 19-37kW (25-50 HP) engines, and two (2) years or 1,500 hours for <19kw (below 25 HP) engines, whichever comes first.

## PARTS COVERED

Listed below are the parts covered by this warranty. Any part listed below that is subject to scheduled maintenance during the warranty period is warranted up to the first scheduled replacement point for that part. A part repaired or replaced under this warranty is warranted for the remainder of the warranty period. Parts replaced under this warranty become the property of the manufacturer. The warranted parts include:

a. Rubber Flange

b. Fuel Injector pump

c. Fuel Injectors

d. Intake Manifold

e. Exhaust Manifold

f. Nozzle Assembly

g. Turbo Charger (if equipped)

## LIMITATIONS

This warranty shall not cover any of the following:

a. Conditions resulting from tampering, misuse, abuse, improper adjustment, engine alteration, use of modified parts, use of replacement parts that are not the same in performance and durability as genuine replacement parts, accident, failure to use the recommended fuel or oil, use of unapproved fuel or oil additives, or not performing required maintenance.

b. Consequential damages such as loss of time, inconvenience, or loss of use of this engine or equipment.

c. Damages or repair costs caused by the owner's unreasonable delay in making the engine available for warranty inspection and repair.

d. Repairs not covered by this warranty, and diagnosis or inspection fees that do not result in eligible warranty service being performed.

e. Any replacement with non-genuine parts, or malfunction of genuine parts due to use of non-approved parts.

## OWNER'S MAINTENANCE AND REPAIR RESPONSIBILITY

As the engine owner, you are responsible for the proper use and maintenance of this engine, as specified in the Owner's Manual.

**AGCO reserves the right to deny coverage under this warranty if the owner has not properly maintained the engine.**

You should keep the original purchase receipt (with the date of initial purchase), and all repair receipts and maintenance records, and transfer them to any subsequent owner.

However, AGCO will not deny warranty repairs solely for the lack of receipts or your failure to document the performance of all scheduled maintenance.

Subject to the limitations above, non-warranty maintenance or repair of emission control parts on this engine may be performed by the owner, or by any repair establishment or individual, without affecting coverage under this warranty; **however, warranty repairs must be performed by a dealer or service center authorized by AGCO or the manufacturer of this equipment.**

The use of parts that are not equivalent in performance and durability to genuine parts may impair the effectiveness of the emission control system and prevent coverage under this warranty. If non-genuine parts are used for maintenance or replacement on this engine, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to genuine parts in performance and durability.

## OBTAINING WARRANTY SERVICE

**All repairs qualifying under this limited warranty must be performed by a dealer or service center authorized by AGCO or the manufacturer of this equipment.**

To obtain warranty service, take your engine to the nearest dealer or service center authorized by AGCO or the equipment manufacturer. If available, bring the original purchase receipt (showing the initial date of purchase) and all available maintenance records. The authorized dealer or service center will perform the necessary repairs or adjustments within a reasonable time and furnish you with a copy of the repair order. AGCO wants to ensure that you receive all the services to which you are entitled under this warranty. If you need assistance in locating the nearest authorized dealer or service center, or have any questions about this warranty, you may contact the AGCO warranty representative at:

Product Reliability Group

AGCO Corporation

P.O. Box 4300

Hesston, KS 67062-2002

## FACTORY RECOMMENDED

## PRE-DELIVERY INSPECTION CHECK LIST

DEALER CODE | | | | | | | DEALER NAME _____ DATE _____

ADDRESS _____ CITY _____

STATE/PROV _____ ZIP CODE _____

MODEL NO. _____ SERIAL NO. _____

OWNER'S NAME & ADDRESS (If available) _____

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**THIS PRE-DELIVERY INSPECTION CHECK LIST IS PROVIDED TO IDENTIFY THE ITEMS TO BE CHECKED AND IF NECESSARY, ADJUSTED BY THE DEALER PRIOR TO DELIVERY.**

Verify and record the serial numbers of the tractor, engine, cab and Power front axle (4-WD).
Assemble parts removed for transport.

**Check and adjust the following:**

- ☐ Cooling system level
- ☐ Fuel tank level
- ☐ Engine oil level
- ☐ Transmission and rear axle level
- ☐ Power front axle (4-WD)
- ☐ Battery connections and level
- ☐ Torque front and rear weights
- ☐ Engine air cleaner elements
- ☐ Windshield washer reservoir (as applicable)
- ☐ Lubricate all grease points
- ☐ Lightly lubricate linkages, hinges, latches, etc.
- ☐ Tension of all drive belts
- ☐ Torque of all wheel and rim, nuts and bolts
- ☐ Tire pressure
- ☐ Check all drain plugs
- ☐ General inspection of unit

**Turn switch to "Auxiliary" position and check:**

- ☐ All warning lights - ON
- ☐ Lights - head, side, indicator, work, interior and panel
- ☐ Hazard warning lights and horn
- ☐ Cab heater and fresh air blower (as applicable)

**Start the engine and check:**

- ☐ Safety start switches operation
- ☐ Air cleaner restriction indicator
- ☐ Fuel cutoff solenoid operation

**Restart, warm up the tractor, and check:**

- ☐ Balance and operation of brakes
- ☐ Operation in all gears
- ☐ Differential lock function
- ☐ Power front axle function
- ☐ Operation of cab heater and blower (as applicable)
- ☐ Operation of air conditioner (as applicable)
- ☐ Operation of all gauges and instruments
- ☐ Parking brake effectiveness
- ☐ Draft control (with weight attached)
- ☐ Position control (with weight attached)
- ☐ Engine low idle speed
- ☐ Engine high idle no load speed
- ☐ External hydraulic controls
- ☐ Three-point linkage control

**Stop engine and check:**

- ☐ Ensure that there are no oil, fuel or coolant leaks
- ☐ Clean off all preservatives and shipping labels
- ☐ Clean the tractor
- ☐ Ensure tool box contents and literature pack are to specification
- ☐ Explain operation and safety with the owner
- ☐ Ensure all safety decals are in place

**White Copy - Leave in book**

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**Yellow Copy - Tear Out & Mail**

Comments:

(Fold here first)

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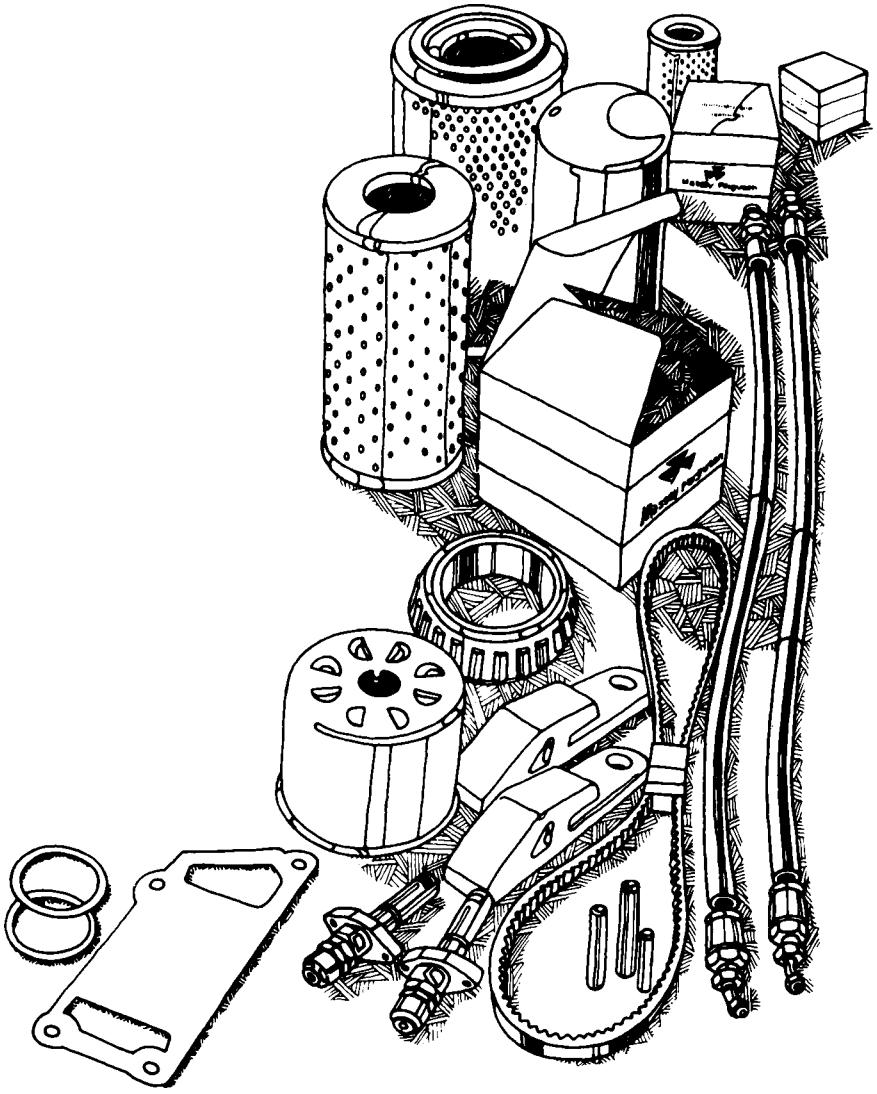
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Publication No. (English) 1449560M1