case

1290 - 1390 Tractor Operators Manual

Rac 9-922[illegible]

Written In *Clear And Simple English*

J I Case
A Tenneco Company

TENNECO

THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL WHEN YOU SEE THIS SYMBOL CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

IMPORTANT

If This Machine Is Used By An Employee Or Is Loaned Or Rented, Make Certain That The Operator(s), Prior To Operating:

1. **Is Instructed In Safe And Proper Use.**
2. **Reviews And Understands The Manual(s) Pertaining To The Machine.**

SAFE OPERATING INSTRUCTIONS

1. SECURELY FASTEN YOUR SEAT BELT IF THE TRACTOR HAS A ROPS.
2. WHERE POSSIBLE, AVOID OPERATING THE TRACTOR NEAR DITCHES, EMBANKMENTS, AND HOLES.
3. REDUCE SPEED WHEN TURNING, CROSSING SLOPES, AND ON ROUGH, SLICK, OR MUDDY SURFACES.
4. STAY OFF SLOPES TOO STEEP FOR SAFE OPERATION.
5. WATCH WHERE YOU ARE GOING, ESPECIALLY AT ROW ENDS, ON ROADS, AND AROUND TREES.
6. DO NOT PERMIT OTHERS TO RIDE.
7. OPERATE THE TRACTOR SMOOTHLY, NO JERKY TURNS, STARTS OR STOPS.
8. HITCH ONLY TO THE DRAWBAR AND HITCH POINTS RECOMMENDED BY TRACTOR MANUFACTURER.
9. WHEN TRACTOR IS STOPPED, SET BRAKES SECURELY AND USE PARK LOCK IF AVAILABLE.

PER OSHA 1928.51.
EMPLOYER SHALL NOTIFY EMPLOYEES WHO OPERATE AGRICULTURAL TRACTORS OF THESE INSTRUCTIONS AT INITIAL ASSIGNMENT AND ANNUALLY THEREAFTER.

CONTENTS

CONTENTS

TO THE OWNER OF A CASE TRACTOR

Use this manual as your guide. If you follow the instructions given in this manual, your Case Tractor will work well for many years.

Your authorized Case Dealer can give you assistance with J I Case Company made parts and persons with special training that know the best methods of repair and maintenance for your tractor.

Call your Authorized Case Dealer if you need any assistance or information.

Your Authorized Case Dealer

NOTE: *When you are in the tractor seat looking forward, the right hand and left hand of the tractor are the same as your right hand and left hand.*

If you carefully operate this equipment, you will be safe and the persons around you will be safe. Before you operate any equipment, make sure you know the positions and operation of all the controls. BEFORE YOU START YOUR WORK, PUT THE MACHINE IN A SAFE AND OPEN AREA. THEN CHECK ALL THE CONTROLS.

READ EVERY PAGE OF THIS MANUAL. Make sure you understand the instructions. Do not operate this machine before you know the specifications of this machine for speed, braking, steering, stability, and load.

The safety codes, insurance rules, country and local laws are not in this manual. Know the rules and laws for your area. Make sure your machine is correctly fitted according to these laws and rules.

It is our recommendation that the following safety rules be put in a place where they can be seen clearly.

BEFORE YOU START THE MACHINE

CAUTION: Check the machine for leaks or any parts that are broken, not working correctly, or not there at all. Before you start the machine, tighten all caps, dipsticks, battery covers, etc.

CAUTION: If you cannot read any safety decal, clean or change it.

CAUTION: Before you operate this machine on a road check local rules.

***CAUTION**: Before leaving the tractor, stop the engine, place all controls in neutral and set the parking brake.*

***WARNING**: Operate controls only when seated in the Operator's seat.*

***WARNING**: On roads, use flasher/lights according to local laws. Keep SMV emblem visible.*

***WARNING**: Tractor travel speed should be such that complete control and tractor stability is maintained at all times. Where possible, avoid operating the tractor near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.*

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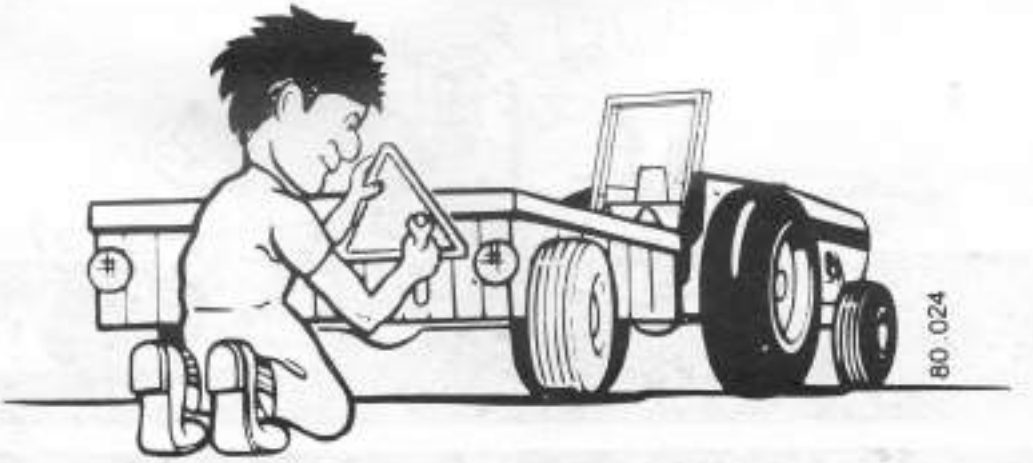
WARNING: On roads, use flasher lights according to local laws. Keep SMV emblem visible



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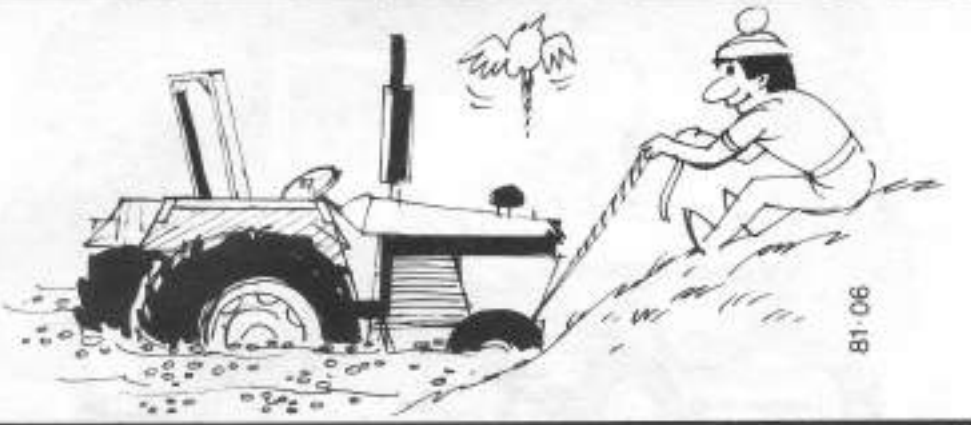
CAUTION: Stop, look and listen before entering a highway, stay on your side of the road and pull over to let faster traffic pass. Slow down and signal as you turn off.

WARNING: Do not permit others to ride. Only one person—the operator—should be on a tractor when it is in operation.

***WARNING:** The braking distance will increase in conditions of mud, ice or whenever the traction at one wheel is less than the traction at the opposite wheel. The operator must allow adequate distance to stop in these conditions.*



***WARNING:** Securely fasten your seat belt as this tractor is equipped with a ROPS cab. The seat belts can help ensure your safety if they are used and maintained.*

***CAUTION:** Never wear a seat belt loosely or with slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.*

DANGER: Excess tractor speed is the big killer. Only experienced drivers should be permitted on highways.

WARNING: Extra weight increases your braking distance. Remember that liquid in the tyres, weights on the tractor or wheels, tanks filled with fertiliser, herbicides or insecticides—all these add weight and increase the distance you need in which to stop.

WARNING: When the differential lock is engaged, the tractor will not steer correctly. Use the differential lock as an aid to traction only. Before you operate on any road, make sure the differential lock is disengaged. Failure to do this can cause an accident.

CAUTION: Try to balance the load primarily on the implement wheels—as in loading a trailer or spreader. Avoid overloading the drawbar. Add front end weights for improved stability. Engage the clutch smoothly, avoid jerking and use the brakes cautiously to avoid jack-knifing.

WARNING: Rear upset can result if pulling from wrong location on tractor. Hitch only to the drawbar. Use 3 point hitch only with the implements designed for its use, not as a drawbar.

WARNING : Never service or make adjustments to the tractor with the engine running or with the tractor in motion.

WARNING : Extreme care must be exercised when adjusting and checking hitch and control linkage when the engine is running and when linkage is under hydraulic or mechanical load. Study the linkage and hitch travel—keep the hands, arms, legs and feet out of the travel arc of the hitch and linkage.

WARNING: Rotating machine parts, stay clear. keep shields installed to help protect from clothing entanglement and injury. Wear close-fitting clothing.

WARNING: Stop engine before working on PTO driven machine or PTO shaft, or performing any maintenance.

WARNING: Whenever a PTO driven machine is in operation, the safety guard must always be in place to prevent injury to the operator. The safety guard must never be removed at any time, except for replacement. When the PTO is not in use, the guard must be installed.

WARNING: When doing stationary PTO work and dismounting from the tractor with the PTO running, keep clear of all moving parts as they are a potential safety hazard.

WARNING: On a mobile power take-off application, always disengage the PTO before dismounting from the tractor.

***WARNING**: Never operate the engine in a closed building. Proper ventilation is required under any circumstance.*

***CAUTION**: Never refuel the tractor when the engine is hot or running.*

***CAUTION**: Never smoke while refuelling the tractor, servicing the fuel system, checking the batteries or using cold weather starting aids.*

***CAUTION**: Never use petrol, naptha or any other volatile material for any cleaning purposes. These materials may be toxic and/or flammable.*

***CAUTION**: To provide more secure hand and foot mobility, preventing slipping and possible injury, always face the tractor when mounting and dismounting.*

***WARNING**: Lower or block hydraulically or mechanically elevated implements and other attachments before servicing or when leaving the equipment.*

DANGER: BATTERY ACID CAUSES SEVERE BURNS. Batteries contain sulphuric acid. Avoid contact with skin, eyes or clothing.
Antidote: EXTERNAL—Flush with water. INTERNAL—Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately. EYES—Flush with water for 15 minutes and get prompt medical attention.
BATTERIES PRODUCE EXPLOSIVE GASES. Keep sparks, flame and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN.

WARNING: When working around storage batteries, remember that all of the exposed metal parts are live". Never lay a metal object across the terminals because a spark or short circuit may result.

WARNING: Battery explosion and/or damage to electrical components can result from improper connection of booster battery or charger. Connect positive to positive and negative to negative. Do not connect booster across terminals on starter. Always start tractor from operator's seat.

CAUTION: Do not attempt to make electrical system connections with the engine running.

HAND SIGNALS

For communication under noise conditions and special operations the American Society of Agricultural Engineers has made standard agricultural hand signals. You will find that the hand signals can decrease time loss and prevent accidents.

Start the Engine

Start the engine. Move arm in a circle at waist level.

This Far To Go

This far to go. Put your hands in front of your face with the back of your hands outward. Move your hands in or out as an indication how far to go.

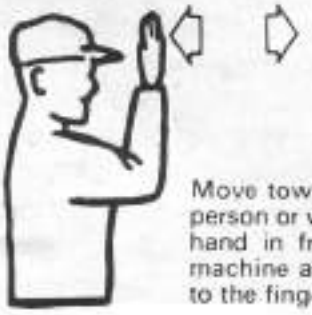
Stop the Engine

Stop the engine. Move your right arm across your neck from left to right.

Move Out

Move out. Face in the needed direction of movement. Put your arm straight out behind you. Then, swing your arm over your head and forward until your arm is straight out in front of you with the back of your hand up.

Move Toward Me – Follow Me



Move toward me or follow me. Look toward person or vehicle you need to move. Hold one hand in front of you with the back of the machine and move your arm from the elbow to the fingers backward and forward.

HAND SIGNALS

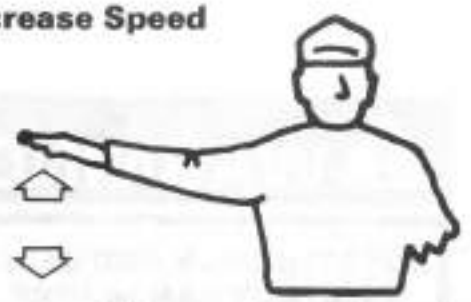
Come to Me

Come to me (Can also be come to me because I need assistance). Lift your arm vertically over your head with the back of your hand to the rear and turn your arm in large horizontal circles.

Raise Equipment

Raise equipment. Point up with one finger and at the same time, move your hand in a circle at head level.

Decrease Speed



Decrease speed. Put your arm out horizontally with the back of your hand up and then move your arm down about 45 degrees minimum many times. Keep your arm straight and do not move your arm above your shoulder.

Lower Equipment

Lower equipment. Point to the ground with one finger and at the same time, move your hand in a circle.

Increase Speed

Increase speed. Lift your hand to shoulder level with your fingers closed. Move your closed hand fully up and then return to shoulder level. Do this fast, many times.

Stop

Stop. Raise your arm fully up with the back of your hand to the rear. Keep this position until the signal is understood.

DECALS

IMPORTANT: *Install new decals if the old decals are destroyed, lost, painted over or can not be read. When parts are replaced that have decals, make sure you install a new decal with each new part.*

NOTE: *New decals are available from your Authorized Case Dealer or write to:*

J I Case Company
Agricultural Equipment Division
25th and Mead Street
Racine, Wisconsin 53403

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WARNING

HOT COOLANT CAN SPRAY OUT IF CAP IS REMOVED SUDDENLY. REMOVE CAP BY TURNING TO FIRST NOTCH. WAIT UNTIL PRESSURE IS RELEASED, THEN CONTINUE REMOVAL. SCALDING CAN RESULT FROM FAST CAP REMOVAL.

WARNING

BATTERY EXPLOSION AND/OR DAMAGE TO ELECTRICAL COMPONENTS CAN RESULT FROM IMPROPER CONNECTION OF BOOSTER BATTERIES OR CHARGER. CONNECT POSITIVE TO POSITIVE AND NEGATIVE TO NEGATIVE.
BATTERY ACID IS POISON AND CAN CAUSE BURNS AND BLINDNESS.

POISON / DANGER

BATTERY ACID CAUSES SEVERE BURNS

BATTERIES CONTAIN SULFURIC ACID. AVOID CONTACT WITH SKIN, EYES OR CLOTHING. ANTIDOTE EXTERNAL: FLUSH WITH WATER. INTERNAL: DRINK LARGE QUANTITIES OF WATER OR MILK. FOLLOW WITH MILK OF MAGNESIA, BEATEN EGG OR VEG. OIL. CALL PHYSICIAN IMMEDIATELY. EYES: FLUSH WITH WATER FOR 15 MINUTES AND GET PROMPT MEDICAL ATTENTION.

BATTERIES PRODUCE EXPLOSIVE GASES

KEEP SPARKS, FLAME AND CIGARETTES AWAY. VENTILATE WHEN CHARGING OR USING IN ENCLOSED SPACE. ALWAYS SHIELD EYES WHEN WORKING NEAR BATTERIES.

KEEP OUT OF REACH OF CHILDREN

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WARNING

ENGINE CAN START WITH TRANSMISSION IN GEAR WHEN NEUTRAL SAFETY SWITCH IS BY-PASSED.
1. DO NOT CONNECT ACROSS TERMINALS ON STARTER.
2. ATTACH BOOSTER BATTERIES ACCORDING TO SAFE METHOD IN OPERATOR'S MANUAL. THEN USE RECOMMENDED STARTING PROCEDURE FROM OPERATOR'S SEAT.
MACHINE RUN-AWAY CAN CAUSE INJURY OR DEATH TO OPERATOR AND BYSTANDERS.

80 045

DECALS

WARNING

REAR UPSET CAN RESULT IF PULLING FROM WRONG LOCATION ON TRACTOR.
HITCH ONLY TO THE DRAWBAR
USE 3 POINT HITCH ONLY WITH IMPLEMENTS DESIGNED FOR ITS USE – NOT AS A DRAWBAR.

WARNING

A ROLLOVER PROTECTIVE STRUCTURE (ROPS) USED WITH SEAT BELTS CAN MINIMIZE INJURY IN THE EVENT OF ACCIDENTAL UPSET. IF ROPS HAS BEEN REMOVED, RE-INSTALL.

IF THIS TRACTOR HAS BEEN PURCHASED WITHOUT ROPS AND SEAT BELT, THEY CAN BE PURCHASED FROM AND INSTALLED BY YOUR CASE DEALER.

WARNING

BEFORE STARTING ENGINE
STUDY OPERATOR'S MANUAL SAFETY MESSAGES
READ ALL SAFETY SIGNS ON MACHINE
CLEAR THE AREA OF OTHER PERSONS

LEARN & PRACTICE SAFE USE OF CONTROLS BEFORE OPERATING

WARNING

TO PREVENT PERSONAL INJURY FROM ENTANGLEMENT IN MACHINERY-BEFORE DOING ANY WORK ON OR NEAR THE PTO SHAFT OR DRIVEN MACHINE: PLACE PTO CLUTCH LEVER IN LATCHED POSITION, PTO SHIFT LEVER IN NEUTRAL, AND **STOP** TRACTOR ENGINE.

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WARNING

ROTATING MACHINE PARTS
STAY CLEAR, KEEP SHIELDS INSTALLED
TO HELP PROTECT FROM CLOTHING
ENTANGLEMENT AND INJURY

WARNING

THIS TRACTOR IS EQUIPPED WITH A DUAL SPEED P.T.O. –

6 SPLINE	21 SPLINE
540 R.P.M.	1000 R.P.M.

BE SURE IMPLEMENTS ARE MATCHED FOR THE PROPER DRIVE SPEEDS. CENTER AND LOCK DRAWBAR WHEN USING P.T.O.

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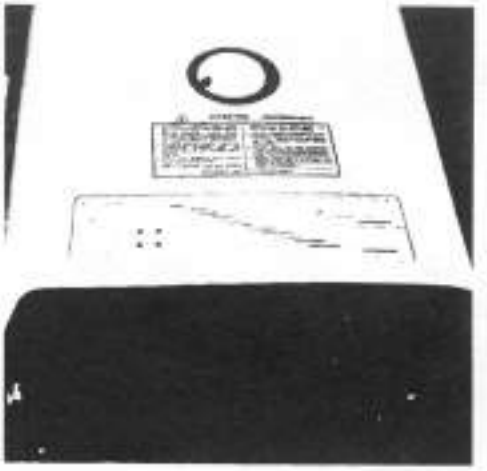

OPERATING INSTRUCTIONS

1. SECURELY FASTEN YOUR SEAT BELT IF THE TRACTOR HAS A ROPS.
2. WHERE POSSIBLE, AVOID OPERATING THE TRACTOR NEAR DITCHES, EMBANKMENTS AND HOLES.
3. REDUCE SPEED WHEN TURNING, CROSSING SLOPES AND ON ROUGH, SLICK, OR MUDDY SURFACES.
4. STAY OFF SLOPES TOO STEEP FOR SAFE OPERATION.
5. WATCH WHERE YOU ARE GOING, ESPECIALLY AT ROW ENDS, ON ROADS AND AROUND TREES.
6. DO NOT PERMIT OTHERS TO RIDE.
7. OPERATE THE TRACTOR SMOOTHLY – NO JERKY TURNS, START SMOOTHLY.
8. HITCH ONLY TO THE DRAWBAR AND HITCH POINTS RECOMMENDED BY TRACTOR MANUFACTURER.
9. WHEN TRACTOR IS STOPPED, SET BRAKES SECURELY AND USE PARK LOCK IF AVAILABLE.

REFERENCE: OSHA TITLE 29 CFR 1928.51

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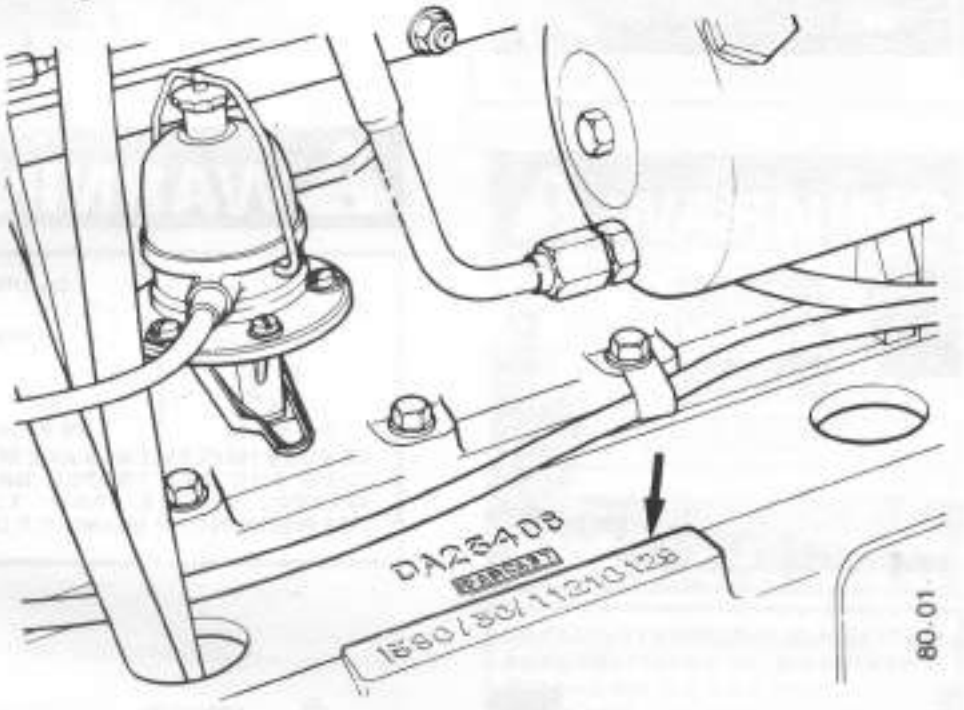
PRODUCT IDENTIFICATION NUMBER (PIN)

The product identification number is on the right-hand top face of the main frame.
The engine serial number is on the right-hand side of the cylinder block behind the starter motor.
A PIN plate is also fastened to the left-hand side of the clutch housing.
The front axle (MFD) serial number is on the right-hand front face of the axle casting.



PRODUCT IDENTIFICATION NUMBER

ENGINE SERIAL NUMBER

FRONT AXLE (MFD) SERIAL NUMBER

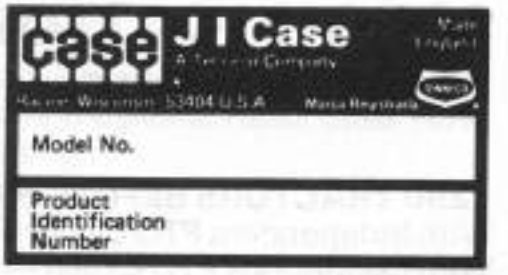


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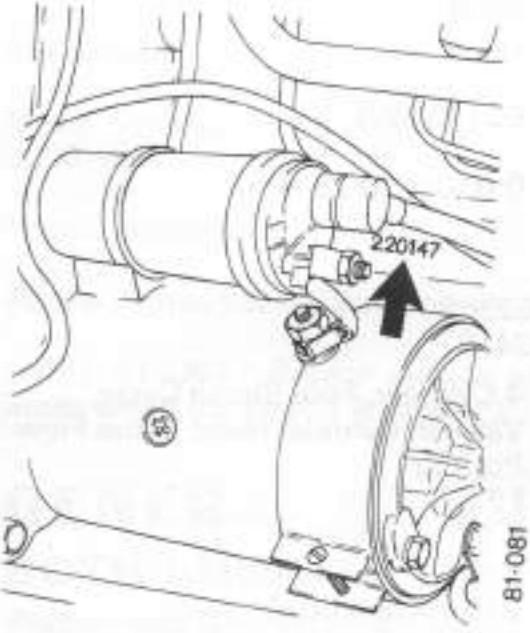
FIGURE 1. PIN NUMBER



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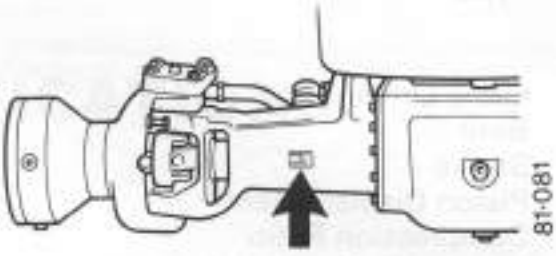

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FIGURE 2: ENGINE SERIAL NUMBER AND FRONT AXLE (MFD) SERIAL NUMBER

SPECIFICATIONS:
DIESEL ENGINE

1290 TRACTORS BEFORE PIN:
With Independent PTO Clutch — 11052369
With Continuous PTO Clutch — 11052410

Type	4 Cylinder, Four Stroke Cycle, Valve in Cylinder Head, Cross Flow Porting
Firing Order	1243
Bore	3·94 in (100 mm)
Stroke	4·0 in (101·6 mm)
Piston Displacement	195 in³ (3·2 litre)
Compression Ratio	17 to 1
Maximum Speed (Full Load)	2200 r/min
Idle Speed	750 r/min
Maximum Brake Horsepower at 2200 r/min * Power Rating to SAE J270	60 (45 kW)
Rocker Arm to Valve Clearance	0·010 in (0·25 mm)

1290 TRACTORS AFTER PIN:
With Independent PTO Clutch — 11052369
With Continuous PTO Clutch — 11052410

Type	4 Cylinder, Four Stroke Cycle, Valve in Cylinder Head, Cross Flow Porting
Firing Order	1243
Bore	3·94 in (100 mm)
Stroke	4·5 in (114·3 mm)
Piston Displacement	219 in³ (3·6 litre)
Compression Ratio	17 to 1
Maximum Speed (Full Load)	2200 r/min
Idle Speed	750 r/min
Maximum Brake Horsepower at 2200 r/min * Power Rating to SAE J270	60 (45 kW)
Rocker Arm to Valve Clearance	0·010 in (0·25 mm)

IMPORTANT: *Rocker arm to valve clearance adjustments must be made when the engine is cold.*

1390 TRACTORS

Type	4 Cylinder, Four Stroke Cycle, Valve in Cylinder Head, Cross Flow Porting
Firing Order	1243
Bore	3·94 in (100 mm)
Stroke	4·5 in (114·3 mm)
Piston Displacement	219 in³ (3·6 litre)
Compression Ratio	17 to 1
Maximum Speed (Full Load)	2200 r/min
Idle Speed	750 r/min
Maximum Brake Horsepower at 2200 r/min	70 (52 kW)
*Power Rating to SAE J270	
Rocker Arm to Valve Clearance	0·010 in (0·25 mm)

IMPORTANT: *Rocker arm to valve clearance adjustments must be made when the engine is cold.*

GENERAL SPECIFICATIONS:

BOTH ENGINES

Piston and Connecting Rod

Compression Rings per Piston	3
Scraper Rings per Piston	1
Type of Piston Pin	Full Float
Type of Bearings	Steel Back with Aluminium Tin Liners

Main Bearings

Quantity of Bearings	3
Type of Bearings	Steel Back with Aluminium Alloy Liners. Replacement Bearings Available.

Engine Lubrication System

Oil Pressure	40 to 55 lb in² at Operating Temperature
Type of System	Pressure and Spray
Oil Pump	Gear Type
Oil Filter	Full Flow, Cartridge Type with By-pass Valve
Oil Capacity	7·8 U.S. Qt (7·4 litre)

Fuel System

Fuel Injection Pump	Distributor Type
Pump Timing	25 Degrees Before Top Dead Centre
Fuel Injectors	CAV BDLL 140S 6592
Fuel Transport Pump	Diaphragm Type, Engine Camshaft Operated
Water Trap	Part of Fuel Transport Pump
Fuel Filters	Two Stage Micronic Paper Elements
Fuel Tank Location	One Under Hood
Fuel Tanks Total Capacity	19 U.S. gallon (72 litre)

GENERAL SPECIFICATIONS

Starting Aid

Thermostart	Component activated by the starter switch which injects heated fuel into the intake manifold

Air Intake System

Type	Two Stage with Service Indicator and Dust Release Valves
Filter	Dry Type with Main and Safety Element

Cooling System

Type	Pressure System, Thermostat Controlled with Expansion Tank
Pump	Impeller Type
Radiator	Heavy Duty Fin and Tube
Fan	7 Blades, 16 in (406 mm) diameter
Thermostat	Starts to Open at 174 to 181°F (79 to 83°C) Fully Open at 199 to 205°F (93 to 96°C)
Pressure Cap	Set to 10lb in² (69 kPa)
Capacity	14·8 U.S. Qt (14 litre)

Differential Lock

Type	Mechanical
Operation	Engaged by Pedal, Disengaged by Spring Pressure

SPECIFICATIONS

Electrical System

Type of System	12 Volt, Negative Ground
Battery	One 12 Volt, 96 Amp/hr
Alternator	28 Amp
Voltage Regulator	Inside Component of the Alternator
Starter Motor	Engaged by Solenoid
Head Lights	12v 40/60W Sealed Beam
Side Lights	12V 5W
Side Direction Turn Signals	12V 21W
Rear and Stop Light	12V 5/21W
Rear Direction Turn Signals	12V 21W
Instrument Warning Lights	No. 168
Instrument Illumination Lights	No. 194
Fuses (4)	2 35A, 1 25A, 1 15A

Power Steering

Type	Hydrostatic, Metering Actuated by Steering Wheel
Pump	Rotor, Engine Driven
Steering Cylinder	Equal Displacement
Oil Capacity	1½ U.S. qt (1·25 litre)

Synchromesh Transmission

Type	Four Speed Range Gear with a Three Forward, One Reverse Gear Section.
Gear Selection	Twelve Speeds Forward, Four Speeds Reverse
Shift Control	Manual with Synchromesh between Second and Third Gear

Clutch

Type	Double Dry Disc, 11 in (280 mm) Diameter
Operation	
Transmission Clutch	Pedal and Mechanical Linkage
PTO Clutch: Continuous	Same pedal as Transmission Clutch
PTO Clutch: Independent	Hand Lever and Cable

Brakes

Type	Internal Expanding Drum
Operation	
Service	Mechanical by Pedal
Park	Mechanical by Lever

Power Take Off: 1390 Tractors

Reversible Shaft	
6 Spline	540 r/min at 2050 r/min engine speed
21 Spline	1000 r/min at 2050 r/min engine speed
Single Speed	
6 Spline	540 r/min at 2000 r/min engine speed

Power Take Off: 1290 Tractors

Single Speed	
6 Spline	540 r/min at 1800 r/min engine speed

Hydraulic System: 1290 Tractors

Pump Type	Gear, Rear Mounted, Driven from PTO Gear Train
Control Valve	Open center with return to neutral position
Number of Remote Outlets	One or Two
Maximum Oil Flow to Remote Outlets	7·2 gal/min (27·4 litre/min)
Maximum Operating Pressure	2200 lb/in² (15 168 kPa)

Hydraulic System: 1390 Tractors

Pump Type	Gear, Front Mounted, Engine Driven, Tandem
Control Valve	Open center with return to neutral position
Combining Valve	Provides for hitch and remote valve operation or supplies total capacity to remote valves
Number of Remote Outlets (Standard)	One or Two
Maximum Oil Flow to Remote Outlets	Combine Position 15·3 gal/min (58 litre/min) Separate Position 8·7 gal/min (33 litre/min)
Maximum Operating Pressure	2200 lb in² (15 168 kPa)

Hitch System

Type of Sensing	Top Link
Control	Hand Lever
Draft Arms	Swinging with Fixed or Float Position on Lift Arms. Adjustable Lift Link and Levelling Adjustment
Type of Hitch	Three Point, Category I and II
Lifting Capacity	3100 lb (1406 Kg) at 24 in (610 mm) Load Centers

Drawbar

Type	Swinging, extendable, height adjustable
Swinging Range	13 in (330 mm)
Lateral Positions	2
Height Adjustments	11 to 17 in (279 to 432 mm)
Pin Hole Diameter	1 in (25·4 mm)

Front Axle: MFD Models	Center Pivot with Planetary Reduction Hubs

Approximate Weights

1290 Tractor with 2 Post ROPS	5390 lb (2445 kg)
1390 Tractor with 2 Post ROPS	5500 lb (2500 kg)
Maximum Operating Weight (1290 and 1390)	10 500 lb (4762 kg)

APPROXIMATE TRACTOR SPEEDS IN MILES AND KILOMETRES PER HOUR AT 2200 r/min ENGINE SPEED

RANGE LEVER	GEAR LEVER								TIRE SIZE
	1		2		3		R		
	miles	km	miles	km	miles	km	miles	km	
1	1·0	1·7	1·7	2·8	3·0	4·8	1·7	2·7	16.9–30
2	2·1	3·3	3·4	5·5	5·9	9·5	3·4	5·4	13.6–36
3	2·6	4·2	4·3	7·0	7·5	12·0	4·3	6·9	12.4–36
4	5·2	8·4	8·7	1·6	15·0	24·0	8·6	13·8	18.4–30
1	1·1	1·8	1·8	2·9	3·2	5·1	1·8	2·9	13.6–38
2	2·2	3·5	3·6	5·8	6·3	10·1	3·6	5·8	16.9–34
3	2·8	4·5	4·6	7·4	8·0	12·9	4·6	7·4	
4	5·6	9·0	9·2	14·9	16·0	25·7	9·2	14·8	
1	0·9	1·4	1·5	2·4	2·6	4·2	1·5	2·4	
2	1·8	2·9	3·0	4·8	5·1	8·3	3·0	4·8	12.4–28
3	2·3	3·7	3·8	6·1	6·5	10·5	3·8	6·1	14.9–28
4	4·6	7·3	7·6	12·2	13·1	21·0	7·5	12·1	

APPROXIMATE OVERALL MEASUREMENTS

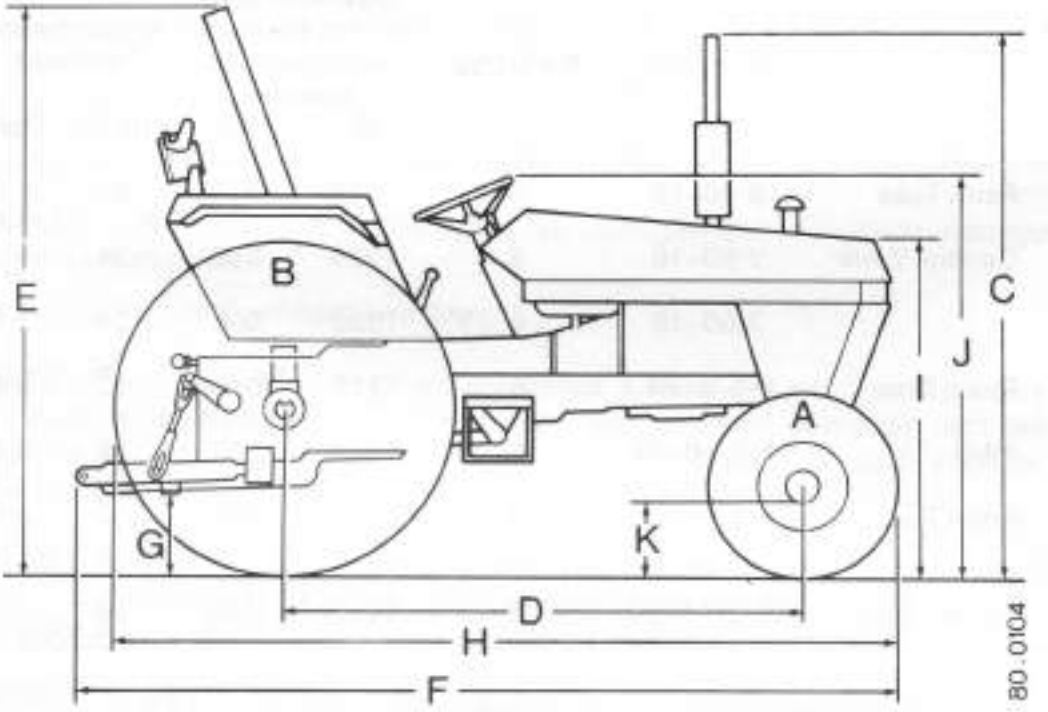


FIGURE 3. LOW PROFILE 2 POST ROPS

A	7·50–16 TIRE	B	16·9–30 TIRE

C	96·5 in 2 451 mm	D	83 in 2 108 mm	E	88 in 2 235 mm
F	135 in 3 429 mm	G	16 in 406 mm	H	128 in 3 252 mm
I	55 in 1 397 mm	J	62·5 in 1 587 mm	K	21 in 533 mm

IMPORTANT: *The total tractor weight with ballast and weights must never be more than 10 500 lb (4762 kg).*

TIRE PRESSURES AND MAXIMUM LOADS

	Tire size	Ply rating	Maximum load on each tire at the recommended pressure		Recommended pressure	
			lb	kg	lb/in²	bar
Front Tires	6·00–19	6	1185	535	32	2·2
General Work	7·50–16	6	1235	560	24	1·7
	7·50–18	8	1330	600	24	1·7
Front Tires	9·5/9–24	6	1215	550	12	0·8
4WD	11·2/10–24	6	1480	670	12	0·8
Front Tires	9·5/9–24	6	2070	940	30	2·1
Road and Loader Work	11·2/10–24	6	2210	1000	24	1·7
Rear Tires	12·4/11–28	6	1890	860	12	0·8
	12·4/11–36	6	2120	960	12	0·8
Field Work	13·6/12–36	6	2730	1240	14	1·0
	13·6/12–38	6	2810	1275	14	1·0
	16·9/14–30	6	3920	1780	16	1·1
Rear Tires	12·4/11–28	6	2810	1275	24	1·7
Road Work	12·4/11–36	6	3180	1445	24	1·7
	13·6/12–36	6	3365	1525	20	1·4
	13·6/12–38	6	3470	1575	20	1·4
	16·9/14–30	6	4200	1905	18	1·2

Tire Arrangements: MFD Tractors

Front	Rear
	16·9/14–34
11·2/10–24	13·6/12–36
	13·6/12–38
9·5/9–24	16·9/14–30
	12·4/11–36

IMPORTANT: *The use of any other tire arrangement will cause damage to the transmission.*

Do not install dual wheels and tires.

NOTE: *Keep tires filled to given pressures. Check tire air pressure every 50 hours of operation or one time per week. Do not decrease rear tire pressure to increase traction. When using the tractor to pull a plow, increase the furrow wheel tire pressure 4 PSI (28 kPa) (0.28 bar).*

NOTE: *The given tire pressures are for normal tractor operation. If different tire pressures are needed because of special traction conditions, see your Authorized Case Dealer before you change pressures.*

IMPORTANT: *Do not remove, install or make repairs to a tractor tire on a rim. Take the tire and rim to a tire shop where persons with special training and special safety tools are available. If the tire is not in correct position on the rim, or if too full of air, the tire bead can loosen on one side and cause air to leak at high speed and with large force. Because the air leak can thrust the tire in any direction, and with much force, you will be in danger of injury.*

TREAD POSITIONS

FRONT WHEEL TREAD POSITIONS: 2 WHEEL DRIVE MODELS (750–16 Tires)

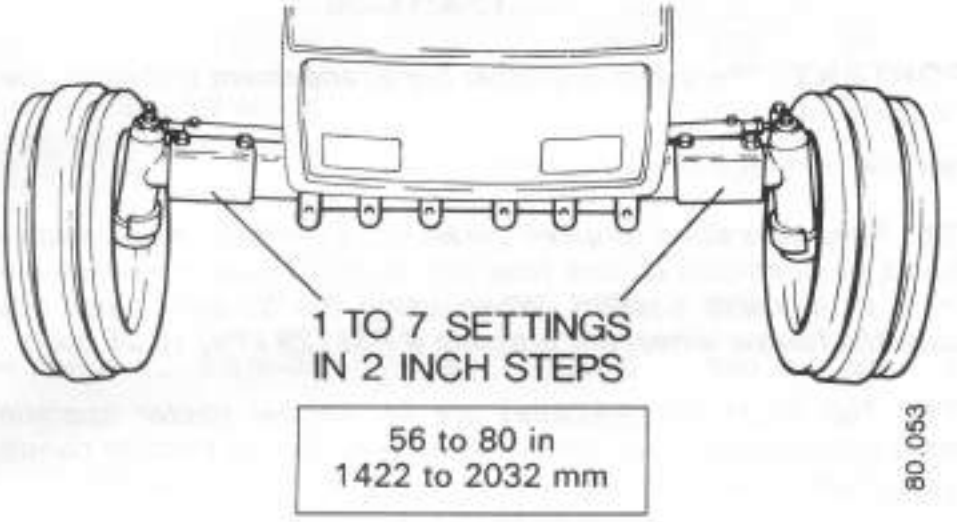


FIGURE 4. TREAD POSITIONS STANDARD FRONT AXLE

NOTE: *Tread widths are measured between the centers of each tire at a point as near the ground as possible.*

FRONT WHEEL TREAD POSITIONS: MFD TRACTORS (9·5–24 Tires)

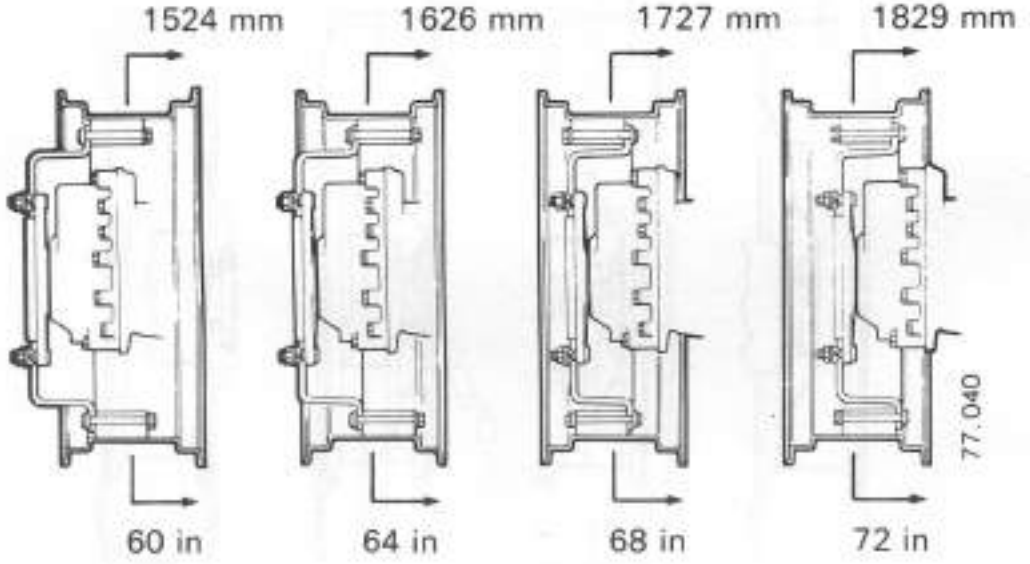


FIGURE 5. FRONT WHEEL TREAD POSITIONS: MFD

REAR WHEEL TREAD POSITIONS (16·9–30 Tires)

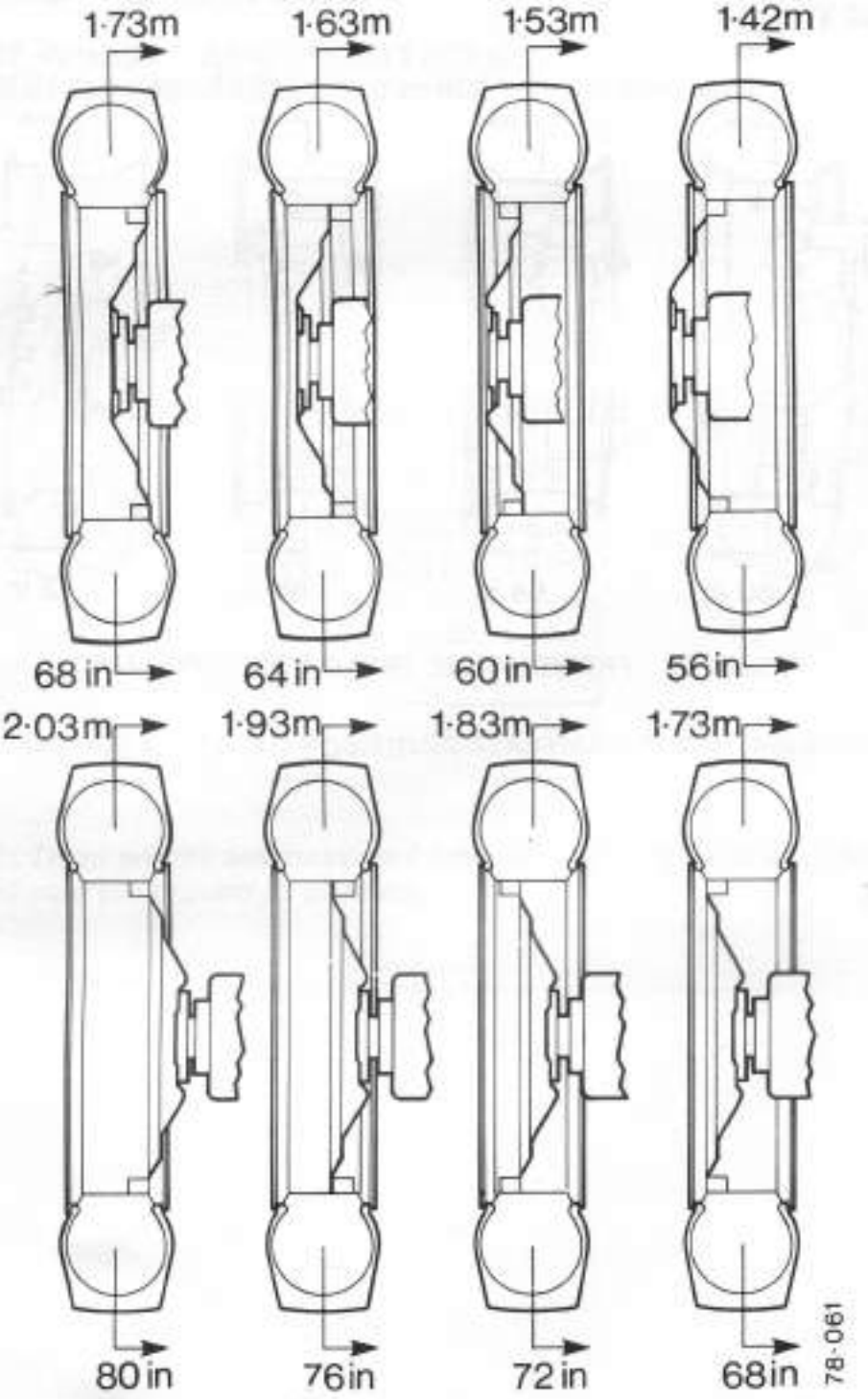


FIGURE 6. REAR WHEEL TREAD POSITIONS

REAR WHEEL TREAD POSITIONS: POWER ADJUSTED (16·9–30 Tires)

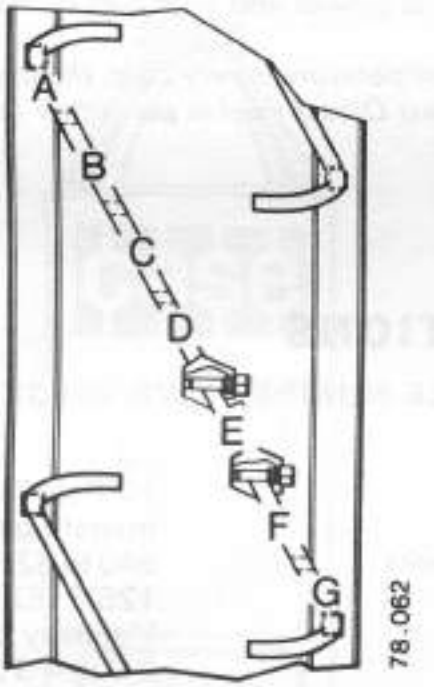


FIGURE 7. POWER ADJUSTED WHEELS

A. *60 in (1524 mm)*
B. *64 in (1626 mm)*
C. *68 in (1727 mm)*
D. *72 in (1829 mm)*
E. *76 in (1930 mm)*
F. *80 in (2032 mm)*
G. *84 in (2134 mm)*

FUEL SPECIFICATIONS

DIESEL

Use a good grade of Number Two Diesel Fuel in your Case Diesel Engine. Do not use other types or grades of fuel. The use of other fuels will result in loss of engine power and high fuel consumption.

NOTE: *When the temperature is very cold, the use of a mixture of Number One and Number Two Diesel Fuel is permitted for a short period of time.*

SPECIFICATIONS

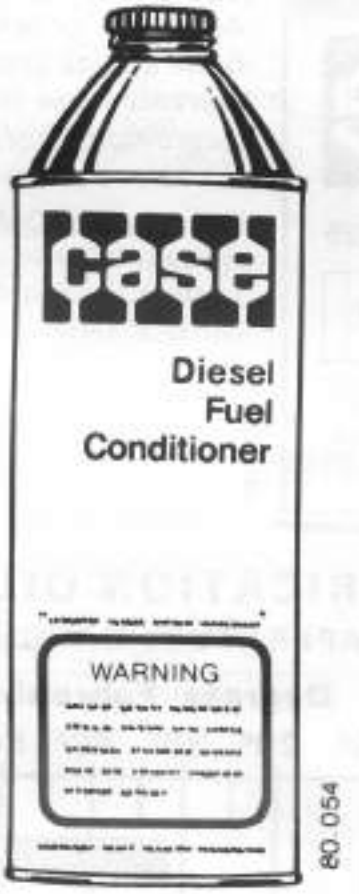
FOR ACCEPTABLE NUMBER TWO DIESEL FUEL

A.P.I. Gravity (Min)	30
Pour Point (Max)	10°F (5°C) below ambient operating temperature
Distillation (90% Point)	540 to 625°F (282 to 329°C)
Flash Point (Min)	125°F (52°C) or legal Kinematic Viscosity Centistokes
at 100°F (38°C)	2·0 to 4·3 Seconds*
Cetane Number (Min)	40 (45 to 55 for Cold Temperature or High Altitude use)
Water and Sediment Volume (Max)	0·05%
Ash Weight (Max)	0·01%
Sulphur Weight (Max)	0·5%
Carbon Residue or 10% Residuum (Max)	0·2%
Corrosion, Copper Strip, 3 hours at 212°F (100°C)	Number 3

(*32 to 40 Saybolt Universal Seconds)

FUEL CONDITIONER

Case Diesel Fuel Conditioner is available from your Authorized Case Dealer. Instructions for the use of the fuel conditioner is on the container.



The use of Case Diesel Fuel Conditioner will:

1. Prevent deposits that can form in the fuel system.
2. Make an improvement in lubrication of the engine.
3. Prevent stopping of the fuel injector nozzles, valves and manifold.
4. Keep water in the fuel in suspension so that the water can be burned with the fuel.
5. Give better engine performance from the fuel the engine burns.

LUBRICANTS

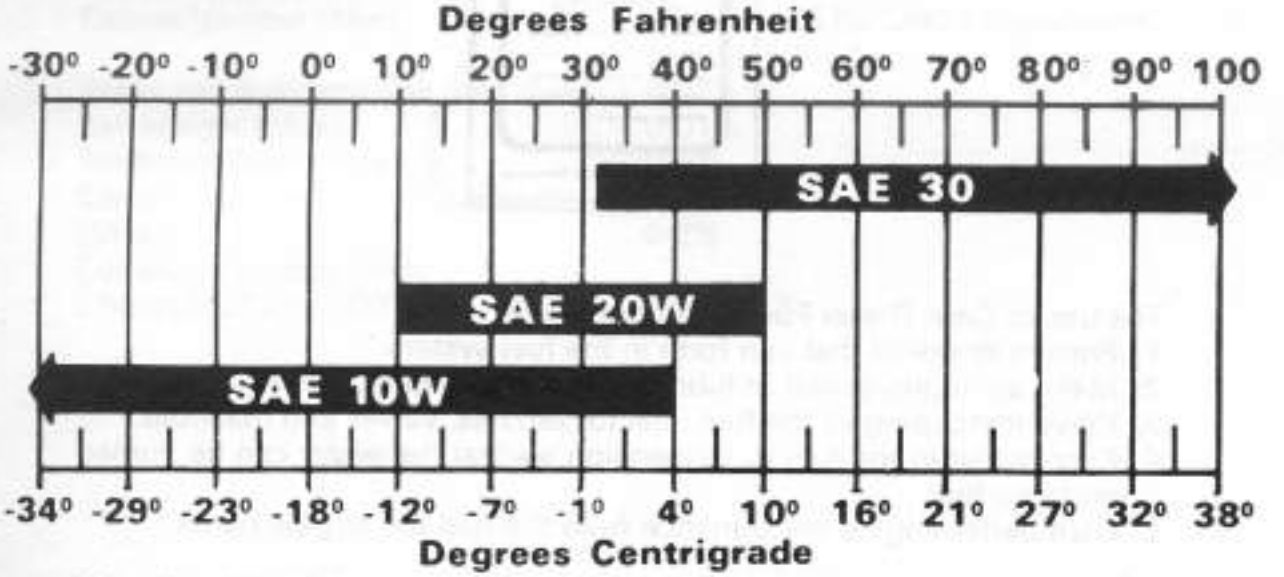
Case HDM Engine Oil is the J I Case Company recommendation for use in your Case Tractor Engine. The Case HDM oil formula will give lubrication to your engine correctly under all operating conditions.

NOTE: *Do not put "Performance Additives" or other oil additive products in the engine crankcase. The oil change intervals given in this manual are according to tests with Case lubricants.*

When Case HDM Engine Oil is not available use only oil that is the same as API engine oil service category SE/CD and Mil-L-2104C.

ENGINE LUBRICATION OIL VISCOSITY

AMBIENT AIR TEMPERATURE RANGES



Use the correct viscosity oil for the ambient temperature range in which you are operating your tractor. Do not use a multi-viscosity oil.

RECOMMENDED LUBRICANTS AND CAPACITIES

COMPONENT	SPECIFICATION	CAPACITY	
		U.S.	Metric
Engine Crankcase	30° to 100°F (1° to 38°C) HDM SAE 30 10° to 50°F (−12° to 10°C) HDM SAE 20W −30° to 40°F (−34° to 4°C) HDM SAE 10W	7·8 qt	7·4 litres
Transmission (Power Shift and Synchromesh)	Case TFD Fluid US B17445 (5 gal) B 17446 (55 gal)	44 qt	42 litres
Final Drive Units (each)	Case ETHB Fluid	2½ qt	2·3 litres
Power Steering	Case TFD Fluid	1½ qt	1¼ litres
Front Differential Case (MFD)	Case FDL SAE 90	8½ qt	8·0 litres
Front Hubs (MFD)	Case FDL SAE 90	1 qt	0·85 litres
Pressure Fittings (Oil)	Case FDL SAE 140		
Pressure Fittings (Grease)	32°F (0°C) and above Below 32°F (0°C)	No. 2 Lithium Base No. 1 Lithium Base	

OPERATING INSTRUMENTS

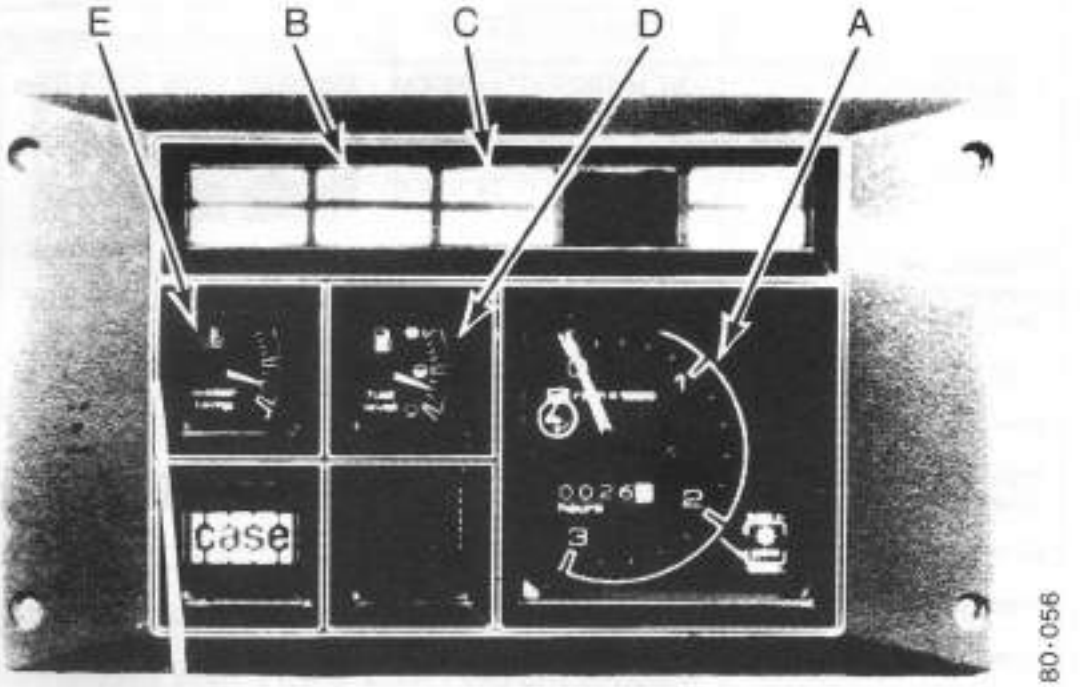


FIGURE 8

A. Tachometer and Hourmeter

The tachometer shows the engine speed in revolutions per minute (RPM). The normal operating range of the engine must be in the green area for maximum engine life. The engine must not operate in the red area. A mark on the tachometer shows the required engine speed for correct PTO operation.

NOTE: *It is normal for the engine to operate for a moment in the amber area when you move the transmission controls to a slower gear while pulling a light load.*

The hourmeter shows the hours and tenths of hours that the engine has run. The hourmeter does not show clock hours. The hourmeter shows the hours that the engine runs at an average RPM.

B. Engine Oil Pressure Lamp

The engine oil pressure warning lamp will illuminate when the key switch is turned to the ACC or START positions. It must stop illuminating when the engine starts to run. If the warning lamp keeps illuminating or illuminates at any time during operation, STOP THE ENGINE AND CHECK FOR THE CAUSE.

C. Alternator Warning Lamp

The alternator warning lamp will illuminate when the key switch is turned to the ACC or START positions. It must stop illuminating when the engine starts running. If the warning lamp is illuminated when the engine starts and runs, the batteries will discharge because the alternator is not working. If the engine is started at low idle speed, the warning lamp can be illuminated until the engine RPM is increased. When the engine speed is increased, the warning lamp must stop illuminating. If the warning lamp continues to illuminate when the engine speed is increased or the lamp illuminates at any time during operation, STOP THE ENGINE AND CHECK FOR THE CAUSE.

D. Fuel Gauge

The pointer can be in any position when the key switch is turned to OFF. To get a fuel level indication, the key switch must be turned to ACC position.

The gauge shows how much fuel is in the tank. If the pointer is in the red area, the fuel tank is empty. Fuel level is shown by three balls.
⅛ black ball - fuel is needed.
½ black ball - fuel tank is ½ filled with fuel.
All black ball - fuel tank is filled with fuel.

E. Engine Water Temperature Gauge

The pointer can rest in any position when the key switch is turned to OFF position. To get a water temperature indication, the key switch must be turned to ACC position.

The gauge has a green area, amber area and red area.
Pointer in green area - Engine operating at normal temperature.
Pointer in amber area - Engine operating below normal temperature.
Pointer in red area - STOP THE ENGINE AND CHECK FOR THE CAUSE.

OPERATING INSTRUMENTS

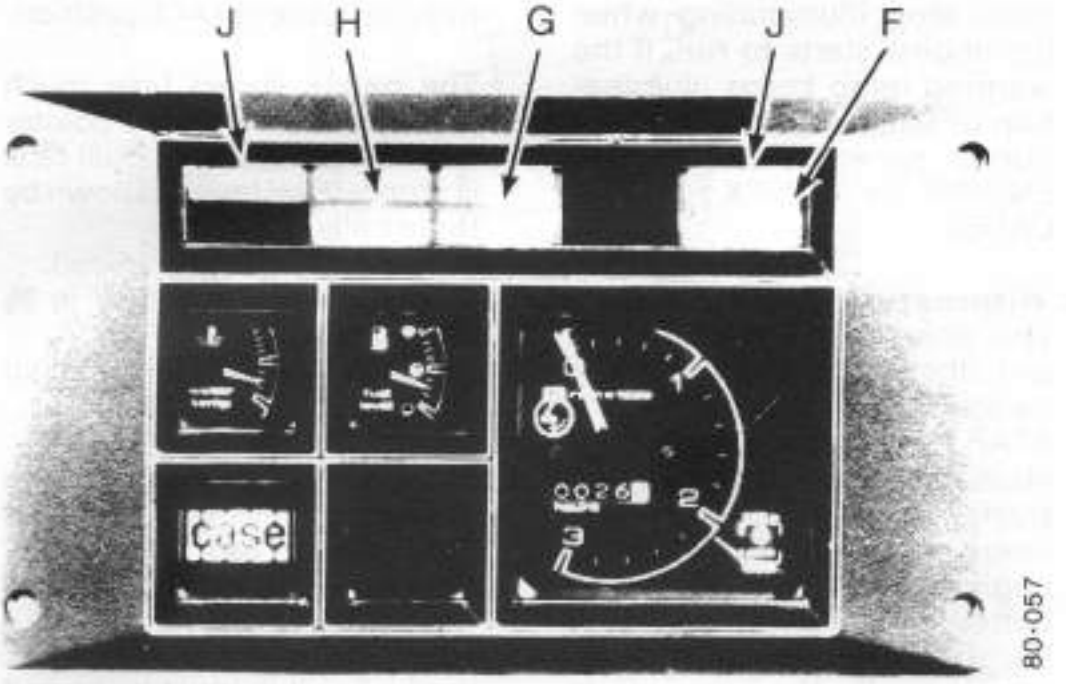


FIGURE 9

F. Air Filter Warning Lamp
The warning lamp will illuminate if there is a restriction in the air filter. If the lamp illuminates when the engine is running, STOP THE ENGINE AND CHECK THE CAUSE.

G. Headlamp Main Beam Warning Lamp
The warning lamp is illuminated when the main beam of the headlamp is being used.

H. Transmission Filter Pressure Lamp (1290 Tractors)

The transmission filter pressure warning lamp will illuminate when the key switch is turned to the ACC or START position. It will stop illuminating when the engine starts to run. The lamp can be illuminated a little longer period of time in cold ambient temperatures. If the lamp is illuminated after the engine is running or illuminates during tractor operation, the filters are dirty and must be changed. If the lamp is illuminated after a filter change, STOP THE ENGINE AND CHECK FOR THE CAUSE.

J. Turn Signal Indicator Lamps

When the direction turn signal switch is turned to the left, the indicator lamp for the left hand turn signal will illuminate on and off. When the direction turn signal switch is turned to the right, the indicator lamp for the right hand turn signal will illuminate on and off. See page 59 for complete instructions.

NOTE: *To clean the gauge and warning lamp windows, use a soft cloth or air under low pressure. Do not use rough material of any type which will scratch or damage the windows.*

OPERATING CONTROLS

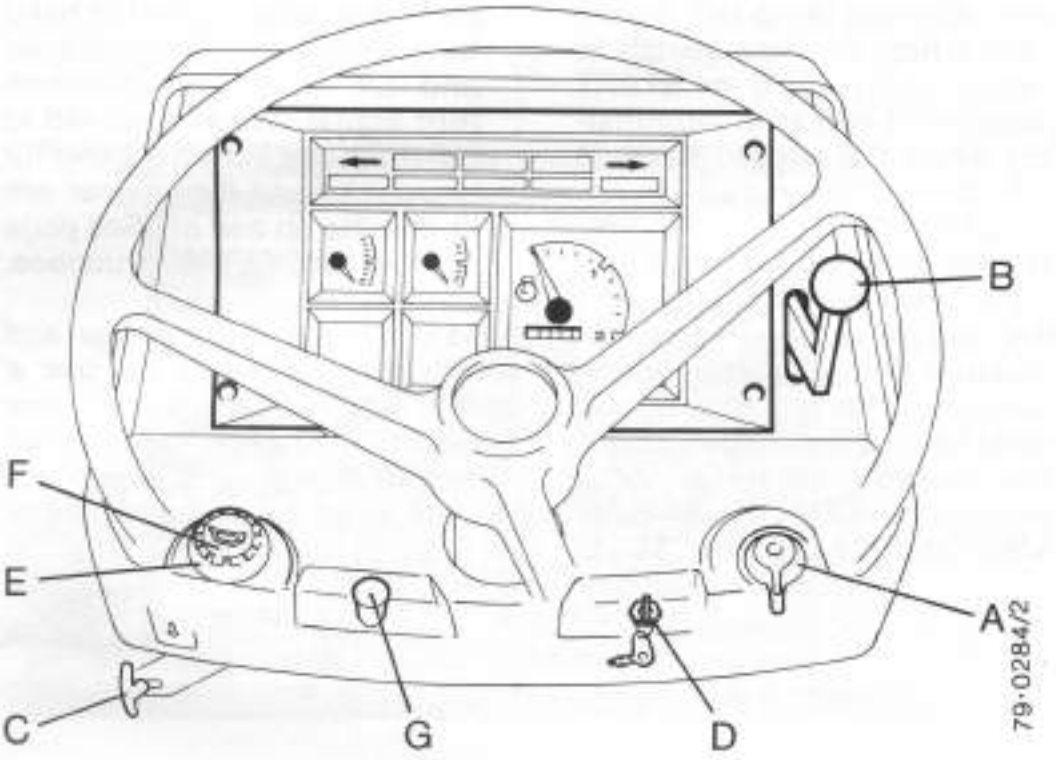


FIGURE 10

A. Direction Turn Signal Switch

To indicate that you will turn the tractor to the right, move the turn signal to the right. To indicate that you will turn the tractor to the left, move the turn signal switch to the left.

B. Hand Throttle Control Lever

Move the lever to the rear for maximum speed. Move the lever forward for idle speed.

C. Engine Stop Control

To start the engine, pull the stop control handle out of the safety position. Move the handle to the left and push the handle forward.

To stop the engine, pull the stop control handle to the rear. Move the handle to the right and push the handle forward into the safety position.

D. Ignition Key Switch

Four position switch as follows:

Number 1- OFF Position. The key is in the vertical position.

Number 2- Accessory Position. First position clockwise from OFF. This position energizes the accessories.

Number 3- Heat Position. Second position clockwise from OFF. This position energizes the thermostat.

Number 4- Start Position. Third Position clockwise from OFF. This position energizes the starter motor.

NOTE: *To prevent operation by persons not authorized to operate, and discharge of batteries when you leave the tractor, remove the key.*

IMPORTANT: *While the engine is operating, keep the key switch in ACCESSORY position so that the instruments and warning lamps will function.*

IMPORTANT: *Do not keep the key switch in ACCESSORY position for long periods of time with the engine not operating. Warning lamps will be illuminated which will cause too much heat in the instrument cluster.*

E. Main Lamp Switch

Four position switch as follows:

Number 1- OFF Position (fully counter-clockwise). All lamps are OFF.

Number 2- First position clockwise from OFF. Illuminates from fender lamps, tail lamps and instrument panel lamps.

Number 3- Second position clockwise from OFF, illuminates head lamps (low beam), front fender lamps, tail lamps and instrument panel lamps.

Number 4- Third position clockwise from OFF. Illuminates head lamps (high beam), front fender lamps, tail lamps and instrument panel lamps.

F. Horn

Press the centre of the main lamp switch to operate the horn.

G. Amber Warning Lamps

Pull the knob to operate the amber warning lamps. Push the knob to stop the amber warning lamps (see page 59).

OPERATING PEDALS

DANGER: Before you operate the tractor on a highway, connect the brake pedals with the lock. If this is not done, the tractor will make a sudden turn when the brakes are applied which can cause an accident.

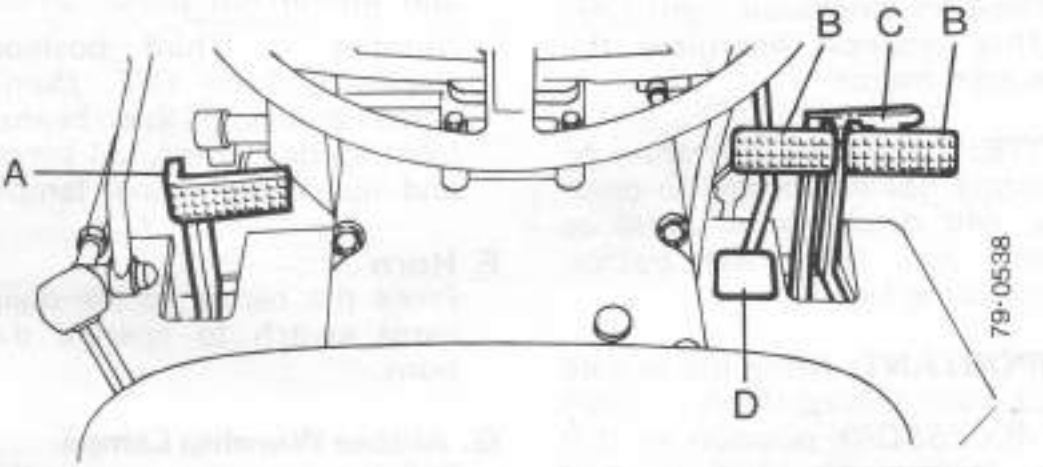


FIGURE 11. PEDALS

A. Clutch Pedal: Tractors with Independent Clutch

Push the pedal down to disengage the clutch. Engage the clutch smoothly using the available gears and the throttle to control the tractor speed.

Remove your foot from the pedal until it is necessary to stop the tractor or select a different gear.

A. Clutch Pedal: Tractors with Continuous Clutch

This pedal is used to disengage both the PTO and the transmission clutches.

To disengage the transmission clutch, push the pedal down until you can feel an increase in pedal pressure.

To disengage the PTO clutch, continue to push the pedal down the maximum amount.

NOTE: When the PTO clutch is disengaged, the drive to the hydraulic oil pump is also disengaged.

B. Brakes

The left-hand pedal operates the left-hand brake. The right-hand pedal operates the right-hand brake.

The lock C joins both pedals so that both brakes are applied evenly.

D. Foot Throttle

This pedal is additional to the hand throttle and makes it easier to operate the tractor on road work.

OPERATING LEVERS

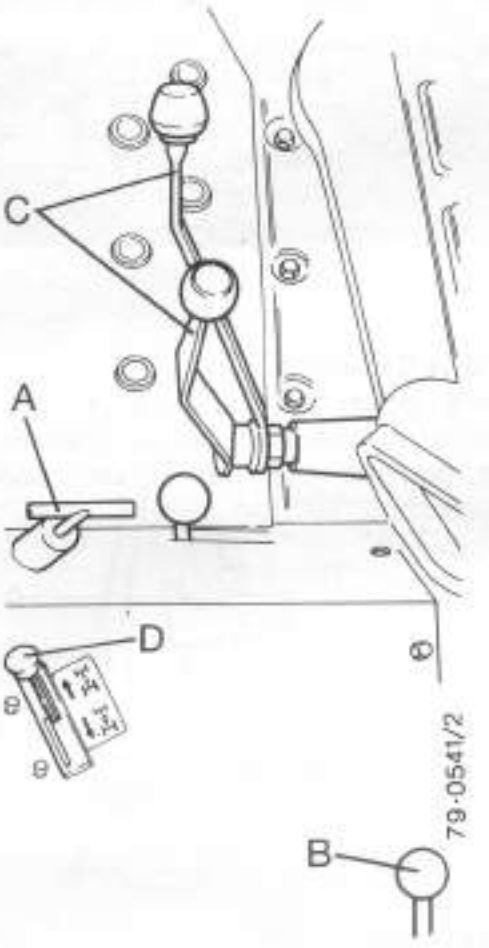


FIGURE 12. OPERATING LEVERS

A. Power Take-off (PTO) Clutch Lever (1390 Tractors)
The PTO Clutch is operated by a handle at the left-hand side of the operator's seat. When the handle is in the down position, the PTO clutch is engaged. To disengage the PTO clutch, pull the handle up. To keep the PTO clutch in the disengaged position move the handle toward the operator's seat until the collar on the handle is engaged in the edge of the sleeve.

B. PTO Selector Lever
(Single Speed and Reversible Shaft)
This lever has two positions, engaged or disengaged.

Before engaging the drive to the PTO, disengage the PTO clutch.

C. Range Levers
Use these levers to select one of four ranges needed for the operating conditions. Disengage the transmission clutch before moving the range lever to any of the range positions.

D. Front Wheel Drive Selector (If equipped)
To engage the front wheel drive, move the control lever to the rear. To disengage, move the control lever forward.

NOTE: *To engage the four-wheel drive, the tractor must be operating under conditions of little or no load.*

E. Differential Lock

Push the pedal E down to engage the differential lock. The lock will be engaged until the pressure on the pedal is released.

IMPORTANT: Do not try to engage the differential lock unless:

1. *Both the rear wheels are turning at the same speed, or*
2. *You have disengaged the transmission clutch.*

NOTE: The differential lock has a spring to push it out of engagement when the pedal is released. If the differential lock does not disengage easily, push down on either of the brake pedals. If the tractor is stopped and the differential lock is engaged, reverse the tractor for a short distance.

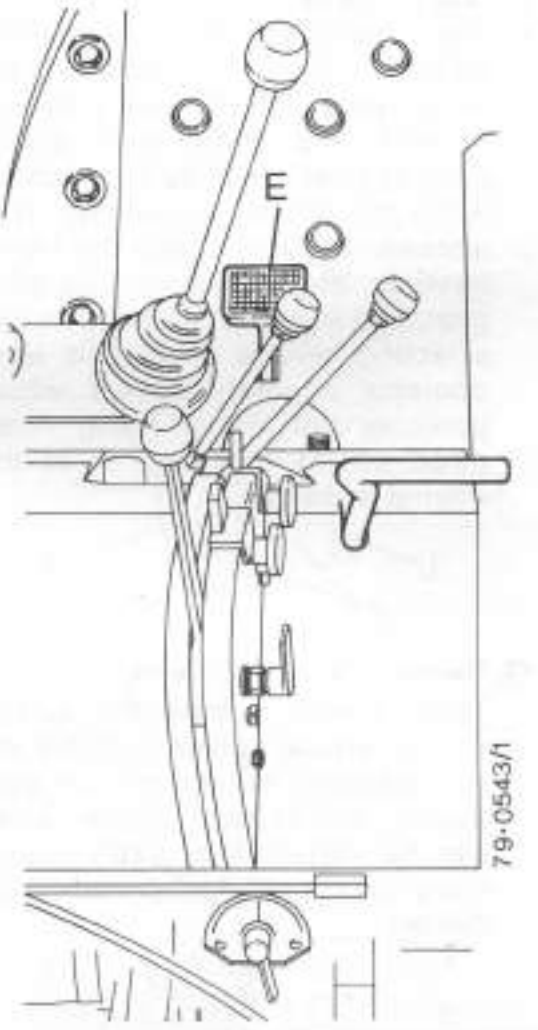


FIGURE 13. OPERATING LEVERS

WARNING: When the differential lock is engaged, the tractor will not steer correctly. Use the differential lock as an aid to traction only. Before you operate on any road, make sure the differential lock is disengaged. Failure to do this can result in an accident.

F. Gear Lever

Use this lever to select three forward speeds or reverse. There is a synchromesh hub between second and third gear which permits gear changes to be made while the tractor is moving. It is necessary to disengage the transmission clutch when changing gear, and to stop the tractor before selecting reverse gear. This lever operates a safety switch which prevents the starter being energised unless the lever is in the neutral position.

G. Remote Valve Levers

These levers operate the double acting remote valves. If these are not standard equipment on your tractor, one or two remote valves can be installed as extra equipment by your Authorized Case dealer.

H. Lowering Control Valve

The speed of lowering the three-point hitch is controlled by the knob. Turn the knob to change the rate of lowering.

J. Parking Brake Handle

To apply the parking brake pull the handle up then turn it to the right. Press the brake pedals to make this operation easier. To release the parking brake, pull the handle up, turn it to the left, then push it down.

K. Finger Guide

The finger guide, can be moved to any position on the lever quadrant and is held by a thumb screw.

L. Catch Unit

When you use external hydraulic equipment that includes a separate control unit, a continuous supply of hydraulic oil is needed. To get this supply, move the hand lever to the rear and then engage the catch unit.

M. Selector Dial Lever

This lever is used to select either draft control or position control. Draft control is used for implements without gauge wheels, that are used in the ground. Position control is used for implements that are used above ground.

N. Hand-lever
This lever controls the position of the three point hitch and the supply of oil to external equipment.

P. Level Screw Control
This lever is used to adjust the height of the RH draft arm to level the hitch and mounted implements as required. Turn the lever counterclockwise to raise the draft arm and clockwise to lower the draft arm.

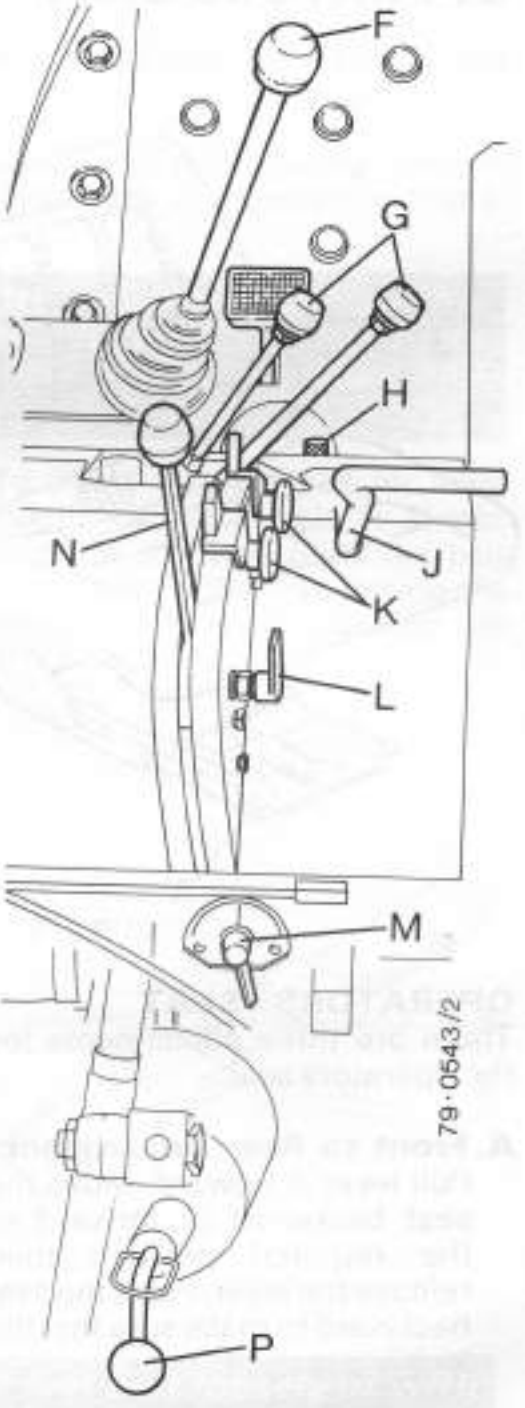


FIGURE 14. OPERATING LEVERS

OPERATORS SEAT

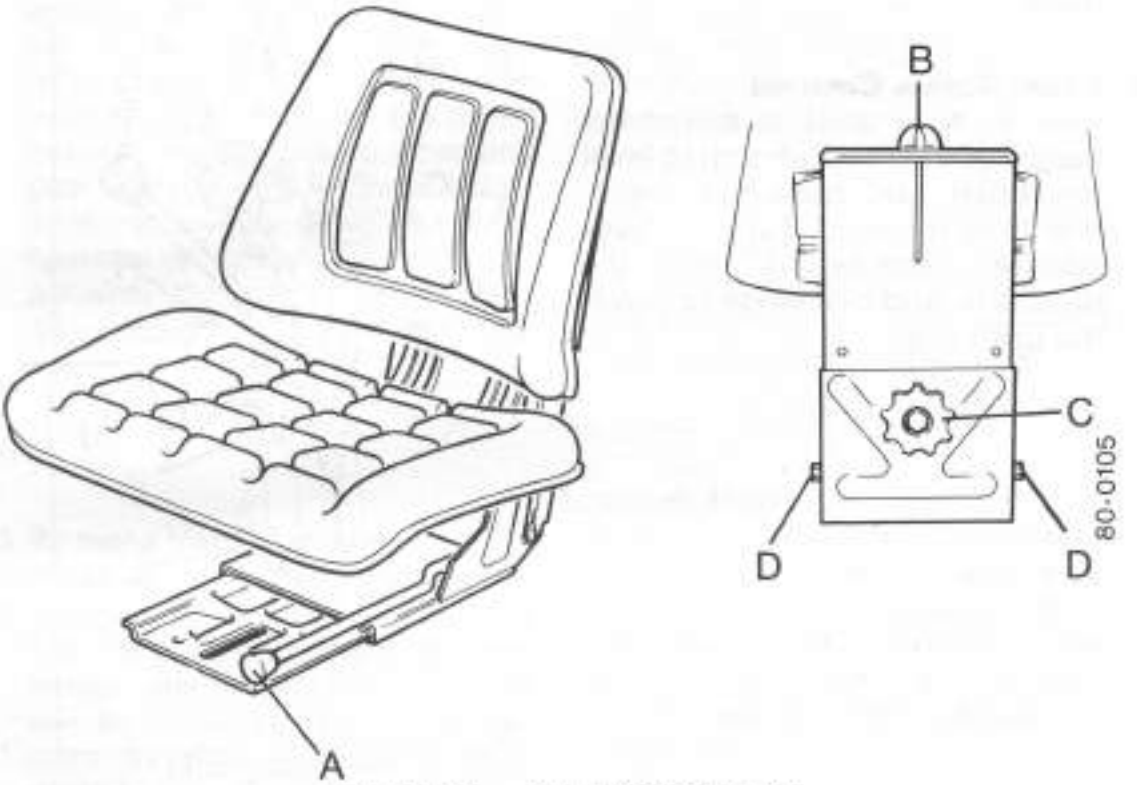


FIGURE 15. OPERATORS SEAT

OPERATORS SEAT
There are three adjustments for the operators seat.

A. Front to Rear Adjustment: Pull lever A upward. Move the seat backward of forward to the required position then release the lever. Press the seat backward to make sure that the lock is engaged.

B. Weight Adjustment: Use knob B to make this adjustment Turn the knob clockwise for heavier operators or counterclockwise for lighter operators.

C. Height Adjustment: Turn the knob C counterclockwise. Loosen the two nuts D then lift or lower the seat to the required height. Tighten the nuts then turn the knob clockwise.

SEAT BELTS

Tractors equipped with a rollover protective structure (ROPS) will also have seat belts.

IMPORTANT: For maximum safety, use the seat belts. During a tractor accident, the ROPS equipment works best when the operator is held in position inside the ROPS.

WARNING: Securely fasten your seat belt as this tractor is equipped with a ROPS. The seat belts can help insure your safety if they are used and maintained correctly.

Operate your seat belts using this procedure:

1. Adjust the seat to your need.
2. Keep your back straight in the seat. Hold the buckle of the seat belt in one hand and the eye end in the other hand.
3. Put the belt across your hips as LOW ON YOUR BODY AS POSSIBLE.
4. Push the metal eye into the open end of the buckle until you hear the buckle fasten.
5. To prevent sliding under the belt, pull the end of the belt that extends from the buckle until the belt is tight.

NOTE: The low, tight position of the belt is necessary so that the pressure put on the body by the seat belt during an accident will be held by the strong hip area. Any other belt position will result in injury.

To adjust the seat belt for more length, put the buckle at a right angle to the belt. Slide the belt through the buckle. To release the seat belt, push the button on top of the buckle.

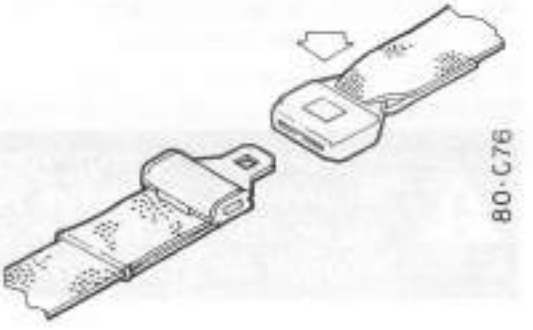


FIGURE 16.

CAUTION: Never wear a seat belt loosely or with slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.

AMBER WARNING LAMPS – DIRECTION TURN SIGNALS AND SMV SYMBOL

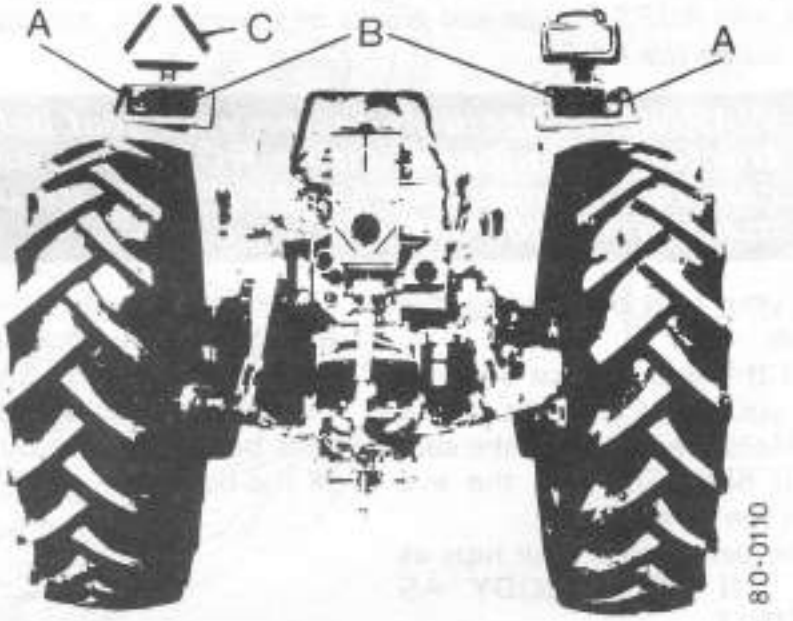


FIGURE 17.

A. *Amber Warning Lamps and Direction Turn Signals*
B. *Tail Lamps*
C. *SMV Symbol*

CAUTION: Stop, look and listen before entering a highway, stay on your side of the road and pull over to let faster traffic pass. Slow down and signal as you turn off.

For the safety and protection of the tractor operator and of the vehicle operators when running the tractor on a road, Case tractors have flashing warning lamps, direction turn signals, tail lamps and Slow Moving Vehicle (SMV) symbol. The flashing amber warning lamps must be operating when the tractor is operated on a road during the day or night. A vehicle operator that comes near the tractor must see the SMV symbol and tail lamps from the rear and the flashing amber warning lamps from the front and rear.

OPERATING THE TRACTOR ON THE ROAD

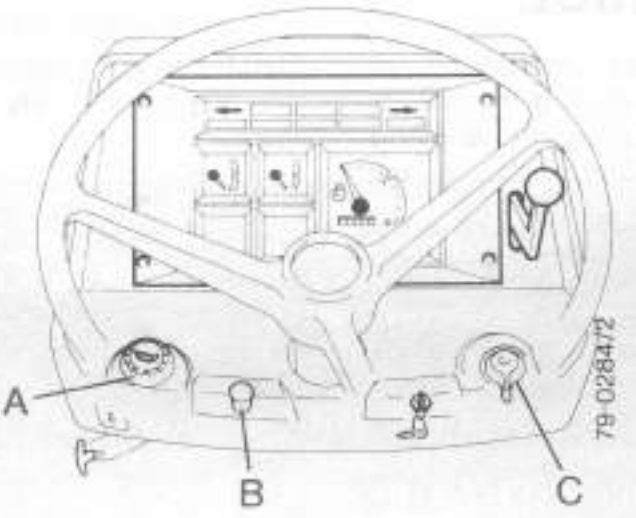


FIGURE 18.

Turn the lamp switch A two positions clockwise. This will illuminate the head lamps (low beam), front fender lamps, tail lamps and instrument panel lamps. Pull the knob B to operate the amber warning lamps.

To make a right turn push the knob B to stop the amber warning lamps. Move the turn signal switch C to the right. Make the right turn then move the turn signal switch to its centre position. Pull the knob B to operate the amber warning lamps. To make a left turn repeat the sequence except move the turn signal switch to the left.

IMPORTANT: When towing an implement or wagon with the tractor, the complete rear area warning system (amber warning lamps, red tail lamps and SMV symbol) must be easily seen by any vehicle operator coming near the tractor.

WARNING: On roads, use flasher/lights according to local laws. Keep SMV emblem visible.

DANGER: Excess tractor speed is the big killer. Only experienced drivers should be permitted on highways.

IMPLEMENT WARNING LAMPS – SMV SYMBOL

When pulling an implement or wagon on roads during the day or at night, use implement warning lamps for the safety of the tractor and other vehicle operators.

The implement warning lamps must be used:

1. If the flashing warning lamps and red taillights on the tractor can not be seen because of the implement.
2. If the implement is four feet (1·2 m) or longer behind the hitch point of the tractor.
3. If the towed implement is four feet (1·2 m) or more to the left of the center of the tractor.

Install the warning lamps to show the very far left side of the implement.

The Slow Moving Vehicle (SMV) symbol must be installed on the center, rear part of the implement or wagon. Install the SMV symbol on the implement or wagon using a special bracket which you can get from your Authorized Case Dealer.

IMPORTANT: USE THE IMPLEMENT WARNING LAMP AND THE SMV SYMBOL FOR PROTECTION OF VEHICLE OPERATORS.

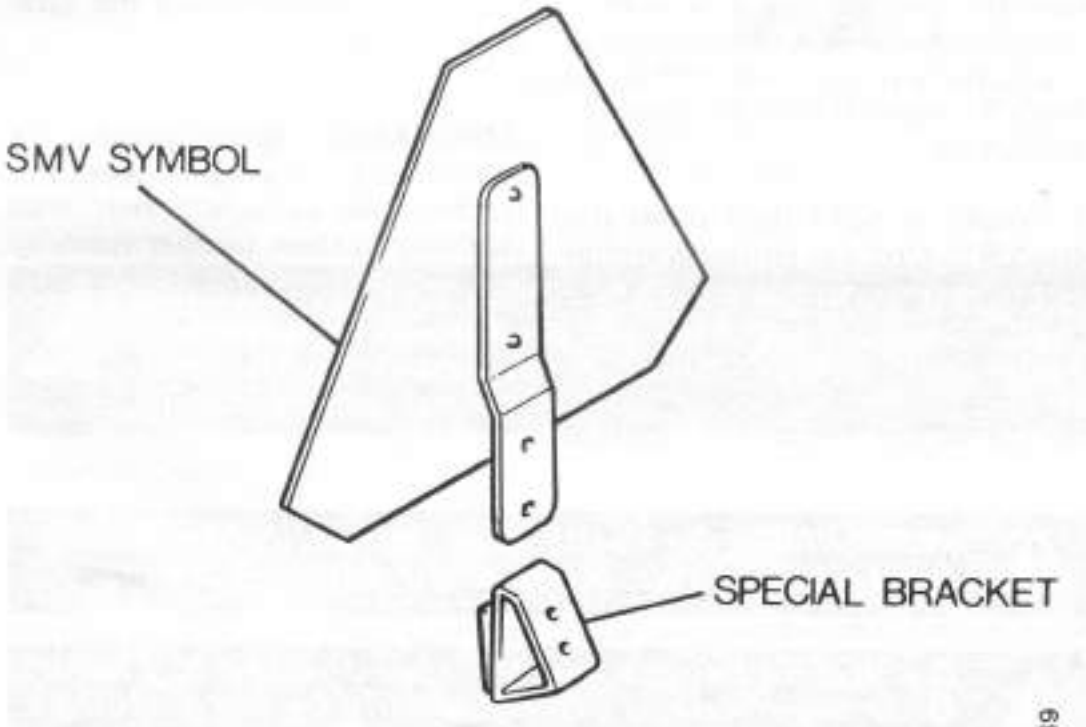


FIGURE 19.

DIESEL ENGINE

BEFORE STARTING THE ENGINE

WARNING: Before starting engine study Operator's Manual safety messages.
Read all safety signs on the tractor.
Clear the area of other persons.
Learn and practice safe use of controls before operating.
It is your responsibility to understand and follow manufacturer's instructions on machine operation and service and to observe the laws and regulations in your area.

Before starting the engine for the first time and before each operating period, check the following:

1. Make sure there is enough fuel of the correct grade in the tank.
2. Check all oil and fluid levels and add oil or fluid as necessary.
3. Check for oil, fuel and coolant leaks.
4. Check the tension of fan belt.
5. Remove any water or dirt from the fuel pump water trap.
6. Check the tire pressures.
7. If the tractor has a PTO make sure that the safety guard is correctly installed.
8. Make sure that you know how to stop the engine.

STARTING THE ENGINE

1. Make sure that the gear lever, is in the neutral position.

2. Move the engine stop control out of the safety position.

3. Move the hand throttle lever forward approximately one quarter of the maximum distance.

NOTE: When the engine is cold, move the throttle lever to the maximum speed position.

4. Turn the starter key clockwise to the ACC position. Check that all the warning lamps are illuminated. If any lamp is not illuminated, repair the defect or change the bulb.

5. Continue to turn the starter key against the pressure of a spring inside the switch, to the HEAT position. In this position the Thermostat is energised.

   Hold the starter key in this position for between 20 and 25 seconds.

6. Then turn the key in the same direction to the START position. This will energise the starter motor. Release the starter key when the engine starts. If the engine does not start when it has turned for 30 seconds, release the starter key. Wait for 30 seconds, then repeat the starting procedure.

   DO NOT push the clutch pedal down when operating the starter.

7. Before starting the engine make sure you know the stopping procedure.

NOTE: There is a safety switch on the gear lever which prevents the starter operating unless the lever is in the neutral position.

WARNING: Engine can start with transmission in gear when neutral safety switch is by-passed.
1. Do not connect across terminals on starter.
2. Attach booster batteries according to safe method in Operator's Manual. Then use recommended starting procedure from Operator's seat.
Machine run-away can cause injury or death to operator and bystanders.

BEFORE STOPPING THE ENGINE

Before the engine is stopped, it must be given time to cool. If this is not done, the sudden increase in temperature can cause damage to the exhaust valves and a possible loss of coolant.

Do the following procedure:

1. Run the engine at 1600 r/min for two minutes.

NOTE: If the engine stalls at any any time, it must be restarted immediately.

STOPPING THE ENGINE

1. Decrease the engine speed to idle.
2. Put the stop control into the STOP position.

   Make sure that the control is in the safety slot.
3. Turn the starter key to the OFF position.
4. Remove the key.

WARNING: Before leaving the tractor, put the PTO clutch in the engaged position, the PTO selector lever in the disengaged or neutral position and stop the engine. Then apply the parking brake and remove the switch key.

SYNCHROMESH TRACTOR

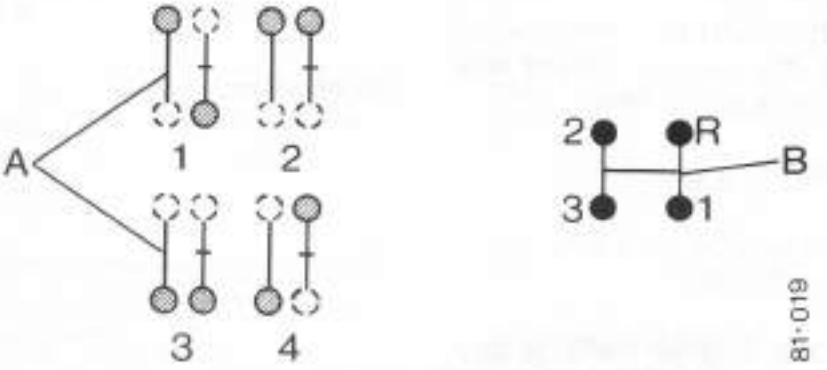


FIGURE 20. LEVER POSITIONS

A. *Range Levers* B. *Gear Levers*

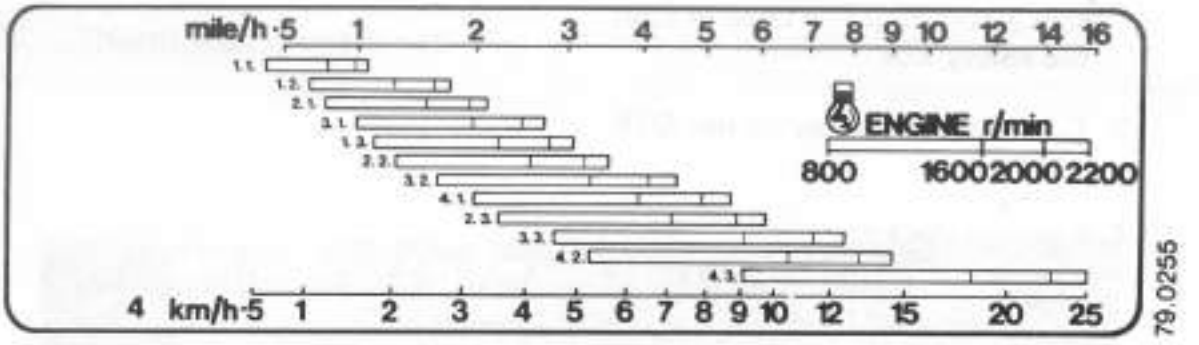


FIGURE 21. TYPICAL TRAVEL SPEED CHART

SYNCHROMESH TRACTOR

The synchromesh transmission has a three forward and one reverse gear section and a four-speed range section. This arrangement gives 12 forward and four reverse speeds.

The lowest gear ratios, 1·1, 1·2 and 2·1 have been designed to give slow speeds for light cultivation and PTO work.

Use gear ratios 1·3, 2·2 and 2·3 only for light traction and PTO work.

For continued heavy traction work, use gear ratios 3·1, 3·2, 4·1, 3·3, 4·2 and 4·3.

Method of Operation:

1. Disengage the transmission clutch and move the gear lever to first or reverse gear.
2. Engage the transmission clutch slowly.
3. When the tractor is moving, you can change gear from first to second, second to third and third to second.
4. To do this, disengage the transmission clutch and move the gear lever to the position needed.

NOTE: When shifting from third to second, be careful not to run the engine at more than its maximum speed.

IMPORTANT: When changing direction from reverse to forward, or forward to reverse, the tractor must be stationary before the gear is selected.

Using the Travel Speed Chart

A travel speed chart is fastened to the hood of your tractor.

The horizontal bars indicate the gears. The three engine speed ranges are shown by yellow, green and blue bands.

The travel speed is shown in mile/h and km/h at the top and bottom lines of the chart.

EXAMPLE 1:
Engine speed 2100 r/min Gear 3·1.
Travel speed 2·5 mile/h (4 km/h)

EXAMPLE 2:
Engine speed 1200 r/min Gear 3·3
Travel speed 4 mile/h (6·3 km/h)

BALLAST

Introduction

Adding ballast to a tractor is an easy and efficient method of increasing traction in most conditions. When ballast is used, it is very important that the total weight of the tractor is not more than the maximum operating weight.

Front chassis weights improve the steering characteristics when heavy hitch loads cause a movement of tractor weight from the front to the rear wheels.

Rear wheel weights and adding liquid to the rear tires increase traction by putting weight on to the driving wheels.

The ballasting method of adding weight to a tractor where it is needed is the same for tractors with mechanical front drive.

How and when to use ballast

Ballast for your tractor is rear wheel weights, chassis weights and liquid ballast in the tires. Some implements cause a large amount of weight to move from the front of the tractor to the rear. In these conditions always add weights to the front of the tractor to keep correct balance.

Always remove the ballast when it is not needed. Do not add too much weight to try to pull very heavy loads.

Remember that the power used to move a tractor that has too much weight will decrease the power available to pull the implement.

The front weight is made of a frame and a number of weights. The assembly weighs approximately 715 lb (324 kg).

The rear wheel weights can be fastened to the outside of the rear wheels. They weigh 96 lb (44 kg) each.

If you need to add weight by putting liquid in the rear tires, see your Authorized Case Dealer for the procedure and special cautions that must be followed.

IMPORTANT: The total weight of your tractor must not be more than 10 500 lb (4762 kg).

MEASURING WHEEL SLIP

To get maximum efficiency from your tractor, wheel slip of approximately 10% on full load is necessary.

To measure the amount of wheel slip use the following method:

1. Put a reference mark on the side of one of the rear tires.
2. Operate the tractor with the implement in the ground.
3. Get an assistant to put a mark on the ground at the place where the reference mark on the tire comes to the ground. (Tractor moving)
4. Count 10 wheel revolutions. Put a second mark on the ground where the reference mark on the tire comes to the ground for the tenth time.
5. Raise the implement out of the ground. Move the tractor to the start of the test.
6. Put the tractor in position with the rear tire next to the first mark. Put a new mark on the tire next to ground. Wipe off the old mark.
7. Move the tractor slowly, with the implement raised, from the first mark on the ground to the second mark. Count the number of revolutions of the wheel between the two marks.
8. Use the number of revolutions of the wheel (from paragraph 7) in the following table to find the wheel slip (%).

Revolutions of the Wheel from paragraph 7	Wheel Slip (%)
$9\frac{1}{2}$	5
9	10
$8\frac{1}{2}$	15
8	20
$7\frac{1}{2}$	25
7	30

9. Add or remove ballast from the tractor to decrease or increase slip to approximately 10%.

POWER TAKE-OFF (PTO)

WARNING: PTO driven machinery can cause serious injury if it is not used correctly. Make sure that you do the following:
Use the correct speed of PTO shaft for the implement.
Keep the guards fastened correctly at all times.
Before working on or near the PTO shaft or driven machine, put the PTO clutch lever in the disengaged position, the PTO lever in the neutral position, and STOP the tractor engine.

SINGLE SPEED TYPE (1290 Tractors)

A single speed PTO is installed as standard equipment.

It has a 6-splined shaft and operates at 540 r/min with an engine speed of 1800 r/min.

The drive to the PTO can be engaged or disengaged by a hand lever at the side of the PTO casing.

SINGLE SPEED TYPE (1390 Tractors)

The single speed PTO is available as optional equipment.

It has a 6-splined shaft and operates at 540 r/min with an engine speed of 2000 r/min.

REVERSIBLE SHAFT TYPE (1390 Tractors)

One end of the drive shaft has 6 splines to use with 540 r/min implements. The other end has 21 splines to use with 1000 r/min implements. To get these speeds, run the engine at 2050 r/min.

The dirve to the PTO can be engaged or disengaged by a hand lever at the side of the PTO casing.

To change the speed of the drive shaft, do the following:

1. Remove the four special bolts which fasten the flange of the drive shaft to the driving flange of the PTO.
2. Pull the drive shaft out of the PTO.
3. Install the drive shaft in the PTO with the splined end that you need toward the outside.
4. Install and tighten the bolts to 90 lb ft (122 Nm).

NOTE: Make sure that you install the bolts in the correct holes. Do not try to install the bolts in the holes which have sharp edges or damage will be caused to the PTO.

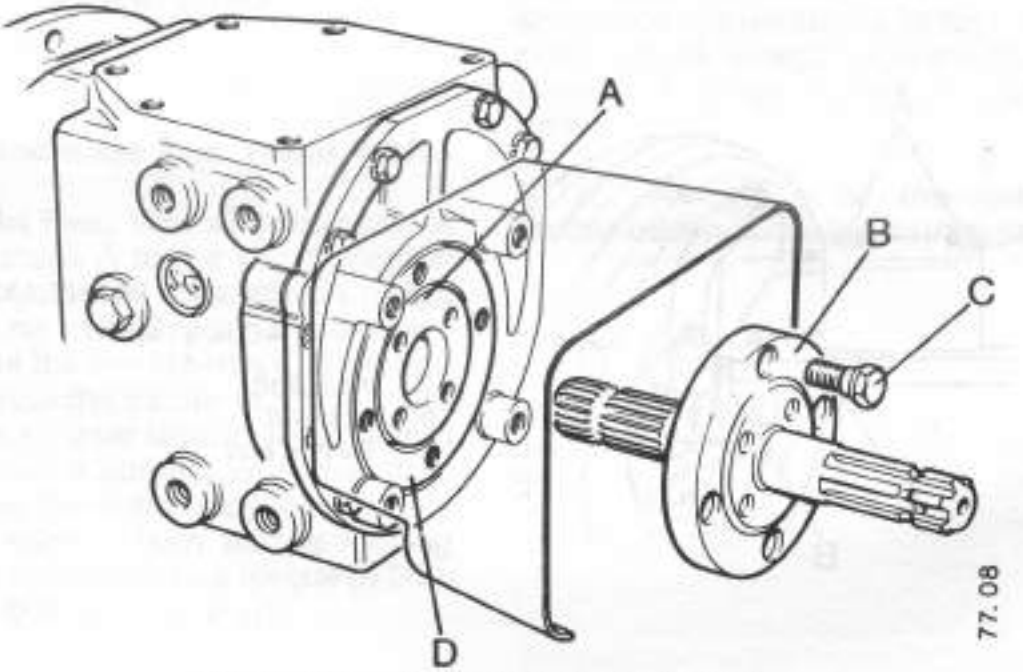


FIGURE 22. REVERSIBLE SHAFT PTO

A. *1000 r/min face*
B. *Drive shaft*
C. *Special bolts*
D. *540 r/min face*

TREAD ADJUSTMENT

FRONT AXLE: STANDARD

NOTE: Tread widths are measured between the centers of each tire at a point as near to the ground as possible.

To change the tread width, do the following:

1. Use a jack to raise the front wheels off the ground.
2. Remove the bolts A and C from either beam extension.
3. Move the axle extension to the position you need.
4. Install the bolts A and tighten to 130 lb ft (176 Nm).
5. Move the wheel so that both wheels are parallel, install the bolt C and tighten to 15 lb ft (20 Nm).
6. Do operations 2, 3, 4 and 5 to the other beam extension.
7. Check that the toe-in of the front wheels is $\frac{1}{8}$ in (3 mm).
8. If the toe-in is not correct, loosen the locknut B, remove the bolt C and turn the tie rod half a turn at a time until the toe-in is correct.
9. Install and tighten the bolt C. Tighten the locknut B.

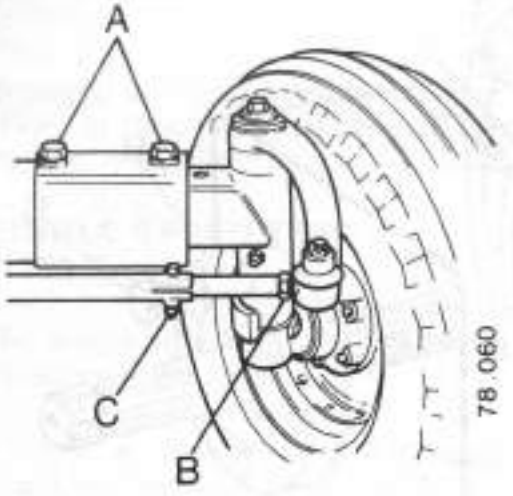


FIGURE 23. FRONT AXLE ADJUSTMENT

A. *Axle Bolts*
B. *Locknut*
C. *Tie Rod Bolt*

REAR TREAD: POWER ADJUSTED

The tread width can be changed using the power of the tractor. Use the following procedures to make the necessary changes.

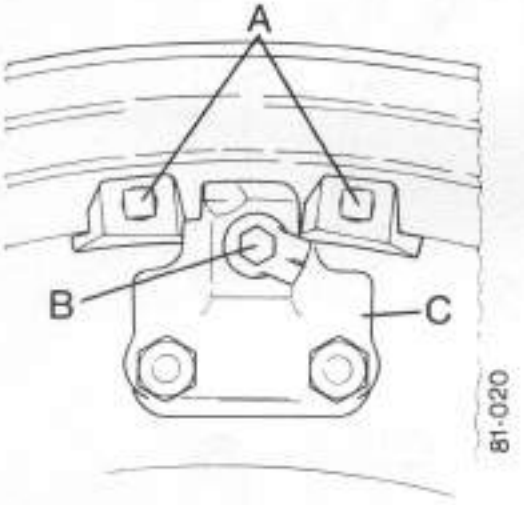


FIGURE 24. RIM CLAMP AND STOPS

To Increase The Tread Width

Right Rear Wheel: Move one of the stops A to the tread position required (see page 39). Turn the locking pin B counterclockwise on all the rim clamps C. Start and operate the tractor in range 1 and reverse gear until the rim clamp comes in contact with the stop. Move the other stop against the rim clamp. Turn all the locking pins clockwise to a torque of 200-250 lb ft (271-339 Nm).

Left Rear Wheel: Repeat the sequence of operations as for the right rear wheel except; operate the tractor in range 1 and 1st gear.

To Decrease The Tread Width

Right Rear Wheel: Move one of the stops A to the tread position required (see page 39). Turn the locking pin B counterclockwise on all the rim clamps C. Start and operate the tractor in range 1 and 1st gear until the rim clamp comes in contact with the stop. Move the other stop against the rim clamp. Turn all the locking pins clockwise to a torque of 200-250 lb ft (271-339 Nm).

Left Rear Wheel: Repeat the sequence of operations as for the right wheel except; operate the tractor in range 1 and reverse gear.

NOTE: Always clean the rails before making tread adjustments.

HITCH

The hitch has been made to use with Category 1 or Category 2 implements. The lower links have a small ball, Category 1, at one end, and a larger ball, Category 2, at the other. Both hitch pins have ends to fit either balls. The check chains have a link with two holes so that the length of the chains can be changed for either Category 1 or 2 implements. The holes are marked Cat 1 or Cat 2 against the holes through which the clamp bolt is installed.

To change the Category of the hitch, do the following:

1. Remove the clamp bolt from both check chains.
2. Remove both hitch pins.
3. Turn the lower links from front to rear.
4. Install the correct sized end of the hitch pins.
5. Install the clamp bolts in the correct holes.

Settings:

Nominal length of lift rods	485 mm (19 in)
Maximum length of lift rods	535 mm (21 in)
Maximum length of top link	705 mm (26½ in)
Maximum length of levelling lever	540 mm (21¼ in)

As a start point, adjust the lift rods, top link and levelling lever to the lengths as shown above. Measure these lengths between the pivot centers.

DO NOT adjust any part longer than the maximum permitted length as damage will be caused to the threads.

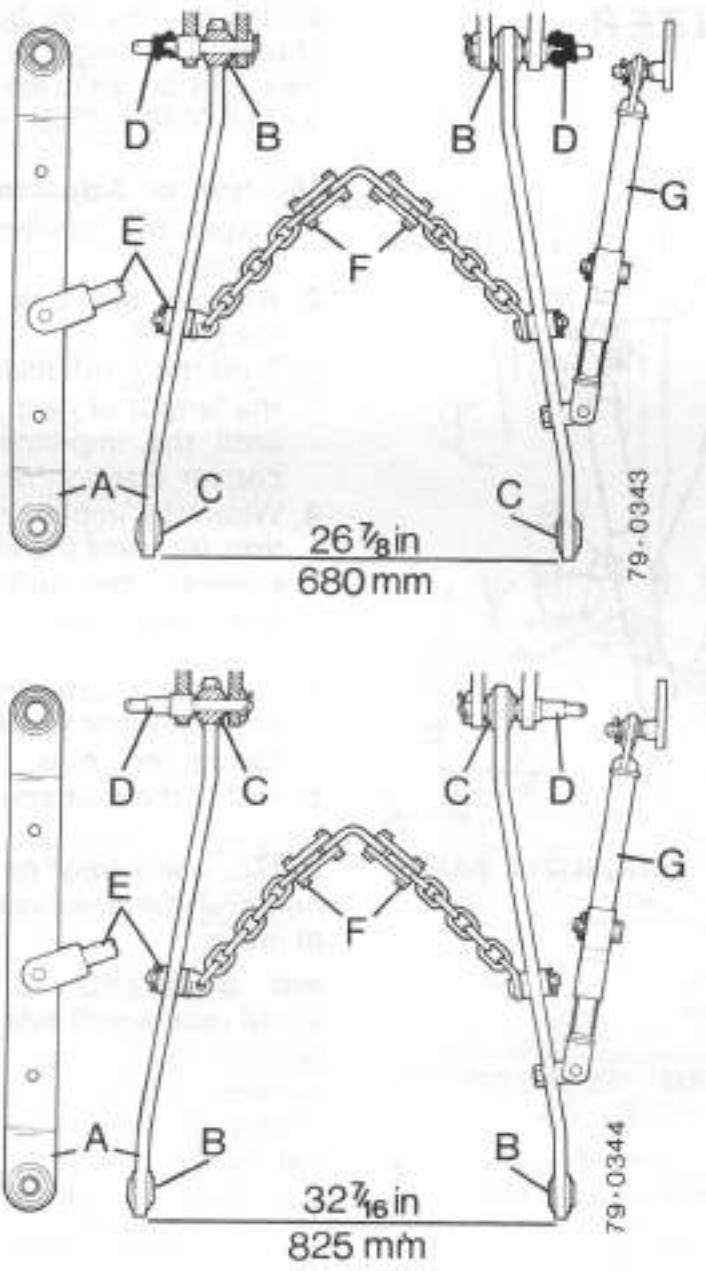


FIGURE 25. LINKAGE SETTINGS

A. *Lower link*
B. *Large ball*
C. *Small ball*
D. *Hitch pin with large end through ball*
E. *Lift rod*
F. *Check chain bolt through hole marked CAT 1 or CAT 2*
G. *Linkage stabilizer bar*

STABILIZER BARS

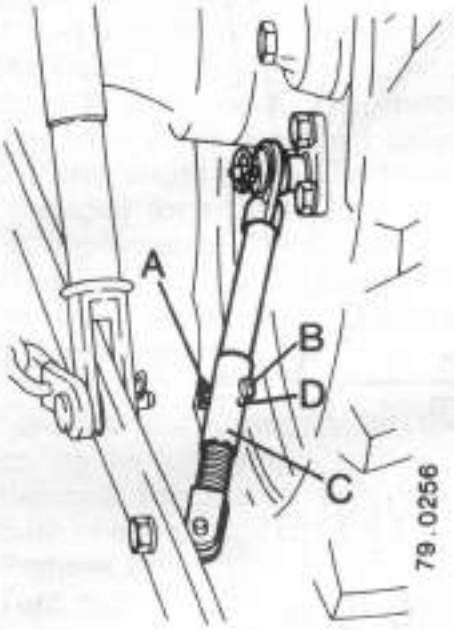


FIGURE 26. STABILIZER BARS

A. *Lock pin*
B. *Pin*
C. *Turnbuckle*
D. *Hole for bar*

Stabilizer bars can be installed as shown. The length of the stabilizer bars can be adjusted from $24\frac{3}{4}$ to $27\frac{3}{4}$ in (630 to 705 mm).

Method of Adjustment

1. Install the implement on the linkage.
2. Remove the lock pins A, and the pins B.
3. Turn the turnbuckle D to adjust the length of each stabilizer bar until the implement is in the correct position on the linkage.
4. When the implement is in position, increase the length of each stabilizer bar until there is no free side movement of the linkage.
5. Turn each turnbuckle the minimum amount to align the holes, for the lock pins.
6. Install the pins and lock pins.

NOTE: Use a small bar through the hole C if the turnbuckle is difficult to move.

DRAWBAR

The drawbar has movement from side to side, three forward and four height positions.

There are three holes in the drawbar to give three different positions.

Use the forward position for weights up to a maximum of 3000 lb (1360 kg).

The other positions is for PTO driven implements.

NOTE: The maximum drawbar load in the PTO positions must not be more than 2500 lb (1130 kg).

Removing or Changing the Position of the Drawbar: Move the drawbar until it is aligned with the slot B in the drawbar frame. Remove the lock pin from the pivot pin A, and lower the front of the drawbar until it is away from the pivot pin.

Remove the drawbar toward the rear.

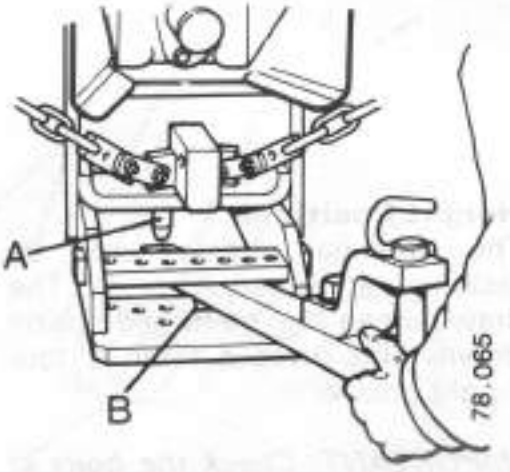


FIGURE 27. DRAWBAR ADJUSTMENT

A. *Drawbar Pivot Pin*
B. *Slot in Drawbar Frame*

Lateral Adjustment

Remove the bolts C, move the drawbar to the position you need and install the bolts.

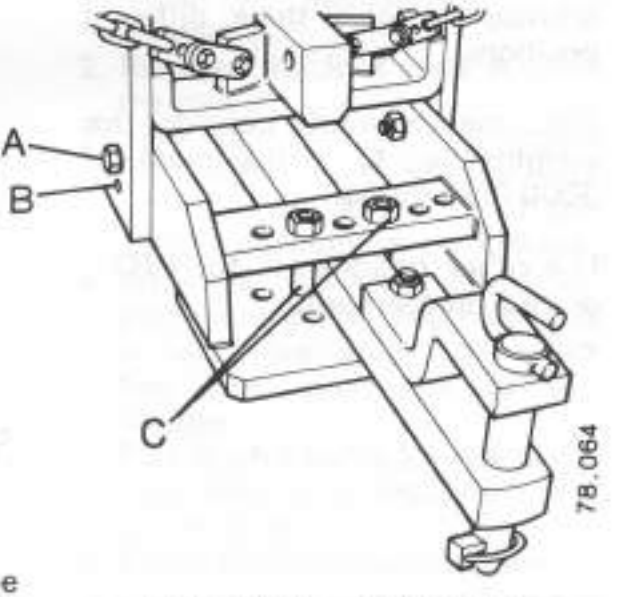


FIGURE 28. DRAWBAR POSITIONS

Height Positions

The drawbar frame can be fastened at either A or B. The drawbar can also be turned upside down. This gives a total of four height positions.

IMPORTANT: Check the bolts at regular intervals to make sure they are tight.

Mechanical Flotation

The pins which fasten the check chains to the draft arms also go through the lift rods. There are two positions for these pins. Holes A give a fixed position and slots B permit the implement to move 3 in (75 mm) up or down on either or both sides. Use slots B when operating on ground which is not level.

NOTE: Check the Operator's Manual for the implement to see if mechanical flotation is the recommendation of the maker of the implement.

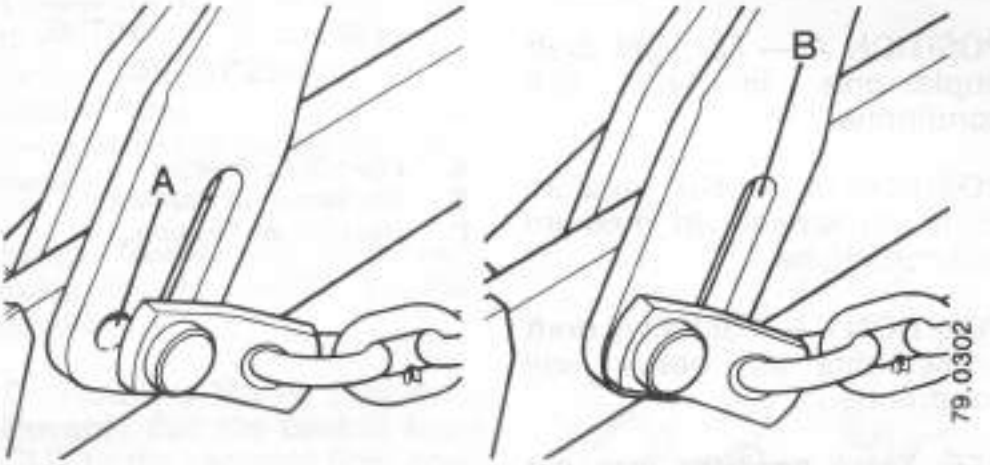


FIGURE 29. MECHANICAL FLOTATION

A. *Holes* B. *Slots*

CAUTION: Make sure that the implement does not make contact with the cab in the operating or fully raised position.

WARNING: Rear upset can result if pulling from wrong location on tractor. Hitch only to the drawbar. Use 3 point hitch only with the implements designed for its use—not as a drawbar.

DRAFT CONTROL

POSITION OF LEVERS FOR DRAFT CONTROL

Before using an implement without a gauge wheel, do the following procedure:

1a. **Selective Sensing Unit:** Move the control lever to one of the three positions.

Before you change the position of the control lever make sure that there is no load on the top link.

POSITION A — For light draft implements in light soil conditions.

POSITION B — For medium draft implements in medium soil conditions.

POSITION C — For heavy draft implements in heavy soil conditions.

NOTE: These positions may not be correct for all implements, and can be changed according to the characteristics of an implement.

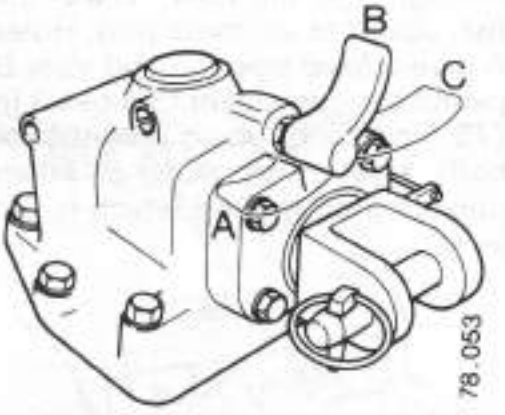


FIGURE 30. SELECTIVE SENSING UNIT

A. *Light Draft Position*
B. *Medium Draft Position*
C. *Heavy Draft Position*

1b. **Single Rate Sensing Unit:** This sensing unit has no adjustment. It can be used for all draft conditions.

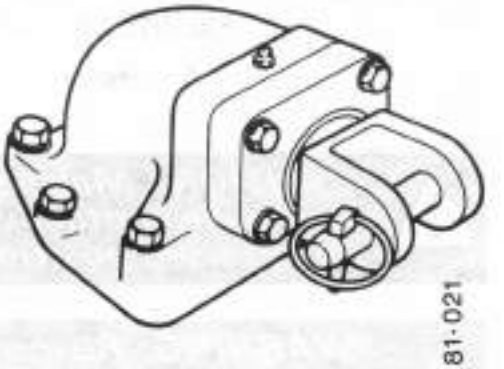


FIGURE 31. SINGLE RATE SENSING UNIT

2. **Selector Dial:** Move the hand lever to the SELECT position, hold the hand lever in this position and move the pointer of the selector dial to DRAFT CONTROL.

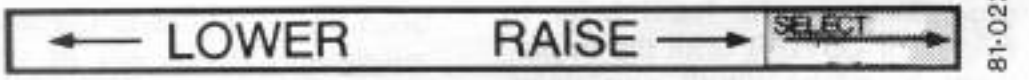


FIGURE 32. SELECTOR DIAL

3. **Lowering Control:** Turn the the knob fully in, then out four turns. When operating the tractor move the knob to get the speed of lowering that you need.

4. **Finger Guide:** Move the finger guide to the center of the quadrant.

5. **Combining Valve (Tandem Pump):** Pull the control knob OUT to the separate flow position to direct oil to hitch and remote circuits.

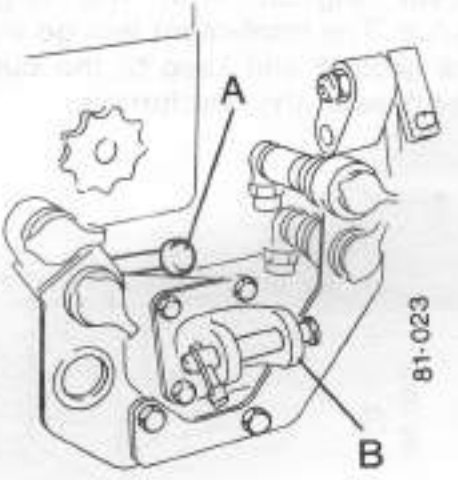


FIGURE 33. COMBINING VALVE

A. *Valve Control Knob*
B. *Sensing Unit*

OPERATING WITH DRAFT CONTROL

Move the tractor forward and at the same time move the hand lever forward to the maximum LOWER position.

When the implement is in the ground, move the hand lever to RAISE or LOWER until the implement is at the depth you need. Move the finger guide until it is aligned with the hand lever and tighten the knob to keep the guide in position. At the end of the furrow, move the hand lever to RAISE to raise the implement.

At the start of the next furrow, move the hand lever so that it is again aligned with the finger guide. The implement will go into the ground and keep to the same depth as in the first furrow.

POSITION CONTROL

POSITION OF LEVERS FOR POSITION CONTROL

Before using an implement that works above the ground, do the following procedure:

1. **Selector Dial:** Move the hand lever to the SELECT position, hold the hand lever in this position and move the pointer of the selector dial to POSITION CONTROL.

FIGURE 34. SELECTOR DIAL

2. **Lowering Control:** Turn the knob fully in, then out four turns. When operating the tractor move the knob to get the speed of lowering that you need.

3. **Finger Guides:** Move the finger guide to the center of the quadrant.

4. **Combining Valve (Tandem Pump):** Pull the control knob OUT to the separate flow position to direct oil to hitch and remote circuits.

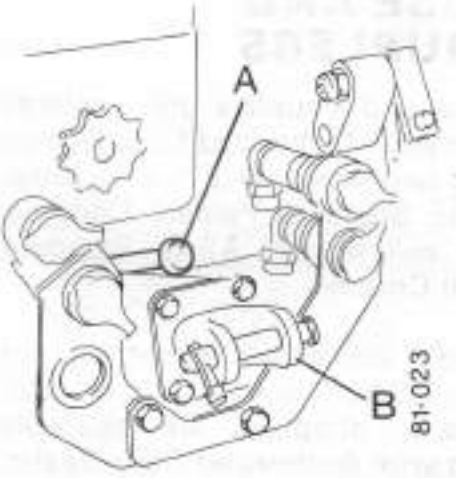


FIGURE 35. COMBINING VALVE

A. *Valve Control Knob*
B. *Sensing Unit*